

INTERNATIONAL COURT OF JUSTICE

PLEADINGS, ORAL ARGUMENTS, DOCUMENTS

**CASE CONCERNING DELIMITATION  
OF THE MARITIME BOUNDARY  
IN THE GULF OF MAINE AREA**

(CANADA/UNITED STATES OF AMERICA)

**VOLUME III**

**Counter-Memorial of Canada**



COUR INTERNATIONALE DE JUSTICE

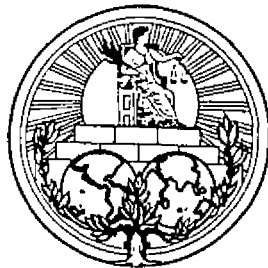
MÉMOIRES, PLAIDOIRIES ET DOCUMENTS

**AFFAIRE DE LA DÉLIMITATION  
DE LA FRONTIÈRE MARITIME  
DANS LA RÉGION DU GOLFE DU MAINE**

(CANADA/ÉTATS-UNIS D'AMÉRIQUE)

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**Contre-mémoire du Canada**



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The case concerning *Delimitation of the Maritime Boundary in the Gulf of Maine Area*, entered on the Court's General List on 25 November 1981 under number 67, was the subject of a Judgment delivered on 12 October 1984 by the Chamber constituted by the Order made by the Court on 20 January 1982 (*Delimitation of the Maritime Boundary in the Gulf of Maine Area, Judgment, I.C.J. Reports 1984*, p. 246).

The pleadings and oral arguments in the case are being published in the following order:

- Volume I. Special Agreement; Memorial of Canada.
- Volume II. Memorial of the United States of America.
- Volume III. Counter-Memorial of Canada.
- Volume IV. Counter-Memorial of the United States of America.
- Volume V. Replies of Canada and the United States of America.
- Volume VI. Commencement of Oral Arguments.
- Volume VII. Conclusion of Oral Arguments; Documents submitted to the Court after closure of the written proceedings; Correspondence.
- Volume VIII. Maps, charts and illustrations.

Canada filed its pleadings both in English and in French. Although Canada has two official languages, only the English text of those documents is reproduced on the ensuing pages of these volumes, as Canada has informed the Registry that the English text should be seen as authoritative for the purposes of interpretation.

Certain pleadings and documents of this edition are reproduced photographically from the original printed text.

In addition to the normal continuous pagination, the Volumes feature on the inner margin of pages a bracketed indication of the original pagination of the Memorials, the Counter-Memorials, the Replies and certain Annexes.

In internal references, bold Roman numerals (in the text or in the margin) are used to refer to Volumes of this edition; if they are immediately followed by a page reference, this relates to the new pagination of the Volume in question. On the other hand, the page numbers which are preceded by a reference to one of the pleadings relate to the original pagination of that document and accordingly refer to the bracketed pagination of the document in question.

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L'affaire de la *Délimitation de la frontière maritime dans la région du golfe du Maine*, inscrite au rôle général de la Cour sous le numéro 67 le 25 novembre 1981, a fait l'objet d'un arrêt rendu le 12 octobre 1984 par la Chambre constituée par ordonnance de la Cour du 20 janvier 1982 (*Délimitation de la frontière maritime dans la région du golfe du Maine, arrêt, C.I.J. Recueil 1984*, p. 246).

Les pièces de procédure écrite et les plaidoiries relatives à cette affaire sont publiées dans l'ordre suivant :

Volume I. Compromis; mémoire du Canada.

Volume II. Mémoire des Etats-Unis d'Amérique.

Volume III. Contre-mémoire du Canada.

Volume IV. Contre-mémoire des Etats-Unis d'Amérique.

Volume V. Répliques du Canada et des Etats-Unis d'Amérique.

Volume VI. Début de la procédure orale.

Volume VII. Suite et fin de la procédure orale; documents présentés à la Cour après la fin de la procédure écrite; correspondance.

Volume VIII. Cartes et illustrations.

Le Canada a déposé ses pièces de procédure écrite en anglais et en français. Bien que le Canada ait deux langues officielles, seul le texte anglais de ses écritures est reproduit dans les volumes ci-dessus, le Canada ayant fait savoir au Greffe que, en cas d'interprétation, c'était le texte anglais qui devait faire foi.

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**COUNTER-MEMORIAL OF CANADA**

**CONTRE-MÉMOIRE DU CANADA**

## INTRODUCTION

1. This Counter-Memorial is filed in accordance with the order of 5 November 1982<sup>1</sup> issued by the President of the Chamber of the International Court of Justice formed to deal with the case concerning Delimitation of the Maritime Boundary in the Gulf of Maine Area, fixing 28 June 1983 as the time limit for the filing of the Counter-Memorials of both Parties.

2. The purpose of this Counter-Memorial is three-fold: *first*, to rebut and correct the contentions made in the United States Memorial with regard to the United States claim and to demonstrate the unreasonable and inequitable character of that claim; *secondly*, to rebut and correct the contentions made in the United States Memorial with regard to the Canadian claim and to confirm the reasonable and equitable character of the Canadian line; and *thirdly*, to supplement as necessary the considerations of fact and law set out in the Memorial submitted by Canada on 27 September 1982. The fact that a contention or allegation appearing in the United States Memorial is not discussed in the present Counter-Memorial cannot be construed as an admission by Canada that such contention or allegation is correct or relevant, or that the facts on which it may be based are accurately presented and properly interpreted.

3. Part I of this Counter-Memorial provides a brief review of the Canadian position in these proceedings and a general assessment of the United States Memorial. Part II reviews the relevant circumstances in this case and brings factual corrections to both the relevant and irrelevant circumstances adduced in the United States Memorial. Part III reviews the concept of the single maritime boundary and the law applicable thereto. Part IV seeks to demonstrate that the Canadian line is consistent with the rules and principles governing the determination of a single maritime boundary, while the United States claim is not consistent with these rules and principles. Part V provides a summary of principal conclusions. Part VI sets out Canada's Submission. In addition, this Counter-Memorial includes an Annex in five volumes.

### The New United States Line

4. The Canadian Memorial dealt with the United States maritime boundary claim as it stood at the time. The United States Memorial, however, has put forward a new claim, or rather a new "method" to advance the claim to the whole of Georges Bank that the United States first put forward in 1976.

5. The new United States boundary proposal expands the disputed area within 200 nautical miles of the coasts of *both* Parties from 11,700 square nautical miles to 16,190 square nautical miles. This is the first time the United States has ever indicated a jurisdictional interest in the *additional area encompassed within its new line*. Canada has exercised undisputed jurisdiction in respect of the continental shelf in this area since 1964, and in respect of fisheries since 1977. When the United

<sup>1</sup> *I.C.J. Reports 1982*, pp. 560-561.

States reserved its rights concerning the delimitation of the continental shelf in late 1969, that reservation extended only to Georges Bank, and not to other areas east of the equidistance line.

### Proclamation of an Exclusive Economic Zone by the United States

6. On 10 March 1983, President Reagan proclaimed "the sovereign rights and jurisdiction of the United States of America" within an exclusive economic zone extending to a distance of 200 nautical miles from the baselines of the territorial sea<sup>2</sup>. This zone appears to be coterminous with the 200-mile fishing zone claimed by the United States in 1977. Its total area is estimated to exceed 2 million square nautical miles, according to the White House press release issued with the proclamation.

7. By virtue of Article III of the Special Agreement, the single maritime boundary to be established by the Court will apply to this United States economic zone in the Gulf of Maine area. Canada has not yet established an exclusive economic zone as such. However, the rights and jurisdiction Canada exercises within its 200-mile fishing zone are substantially similar to the rights and jurisdiction associated with the concept of the exclusive economic zone; they include sovereign rights in respect of seabed resources and jurisdiction in respect of environmental protection.

8. President Reagan's proclamation declares that the boundaries of the United States exclusive economic zone with neighbouring States "shall be determined by the United States and other State concerned in accordance with equitable principles". This provision differs from Article 74 and Article 83 of the 1982 Convention on the Law of the Sea, which state that the delimitation of the exclusive economic zone and the continental shelf "shall be effected by agreement on the basis of international law as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable solution"<sup>3</sup>. The United States Memorial placed particular emphasis on the fact that the Convention on the Law of the Sea "mentions neither the equidistance method nor equitable principles"<sup>4</sup>.

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<sup>2</sup> For the text of the proclamation and related documents, and for the text of a diplomatic note of 26 April 1983 setting out these Canadian reservations, see *Counter-Memorial, Annexes*, Vol. IV, Annexes 1-2.

<sup>3</sup> The provision on delimitation in the United States proclamation, to the extent that it differs from internationally accepted norms, is not entitled to recognition in these proceedings and cannot, for example, affect the United States' obligations under the 1958 Convention on the Continental Shelf.

<sup>4</sup> *United States Memorial*, p. 163, para. 275.

**PART I. AN OVERVIEW**  
**CHAPTER I**

**BRIEF REVIEW OF THE CANADIAN POSITION**

9. The Government of Canada reaffirms its position in these proceedings as set out in its Memorial. That position is further developed in this Counter-Memorial and for the convenience of the Court is briefly summarized in the present chapter.

10. In Canada's view, the fundamental rule of law is that maritime boundaries are to be determined in accordance with equitable principles, taking account of all the relevant circumstances, in order to achieve an equitable result. Canada further submits that equitable principles must be identified on the basis of the total body of law applicable to a single maritime boundary delimiting jurisdiction in respect of both the continental shelf and the water column, in the light of developments in the law of the sea from 1958 to the present.

11. The applicable law in this case includes considerations relating to: (i) the legal basis of title of the coastal States to the multi-purpose zones to be delimited by the single maritime boundary; (ii) the legal nature and object of the rights to be exercised therein; (iii) the conventional rules of delimitation binding upon the Parties; and (iv) relevant principles of customary international law. Accordingly, the Court should have regard to the interrelated principles of adjacency and proximity as fundamental elements of the legal basis of title. It should have regard to the economic nature and object of the rights in question. It should pay particular regard to Article 6 of the Convention on the Continental Shelf as the sole conventional rule of law binding upon both Parties in relation to the seabed and as the expression of a principle that is equally compatible with the delimitation of the 200-mile fishing zone. And finally, the Court should give special weight to the conduct of the Parties as an indication of what they themselves may have considered an equitable result, and as the basis for application of the doctrines of acquiescence or recognition, and estoppel.

12. In Canada's submission, the Canadian line takes account of all the relevant geographical and non-geographical circumstances in the Gulf of Maine area. Within the single continental shelf and integrated ocean system of the Gulf of Maine area, Georges Bank is closely linked with Canada in terms of geology, geomorphology, oceanography and biology. All the area encompassed within the Canadian line is closer to Canada than it is to the United States, except for the adjustment required to correct the distorting and disproportionate effect of Cape Cod and Nantucket Island. There are no special geographical circumstances on the Canadian coast that deflect the equidistance line from a course that reflects the general configuration of the coasts. The Canadian coast is an extensive one backed by a substantial land mass.

13. The geographical logic of the Canadian claim is confirmed and strengthened by the fact that a major Canadian fishery in the area claimed by Canada is conducted from the adjacent Canadian coast; in

addition, Canada's economic dependence on the fishery of this area is far greater than that of the United States. Only Canada has granted offshore oil and gas concessions in what later became the "disputed area", and the United States has acquiesced in and recognized this exercise of jurisdiction by Canada. The conduct of the United States, especially in this acquiescence and in the conclusion of the 1979 Agreement on East Coast Fishery Resources, demonstrates its acceptance of the fundamentally equitable character of the result achieved by the Canadian line.

14. Against this background, Canada submits that the Canadian line is in accordance with equitable principles determined on the basis of the applicable law. It respects the criteria of non-encroachment and of equality within the same order, and leaves more than half of Georges Bank to the United States. Both in the selection of basepoints and in its direction, the Canadian line represents a sensitive reflection of the geographical configuration of the Gulf of Maine area and the coastal relationships of the Parties; and on this basis alone it is equitable and in accordance with international law. Its equitable character is further confirmed by all the relevant circumstances, by the practice of the United States and other States in comparable situations, and by tests of proportionality and disproportionality as applicable in the present proceedings. The Canadian line, moreover, fully reflects the diplomatic history of the boundary question in the Gulf of Maine area.

15. Finally, as demonstrated in the Canadian Memorial, the United States' acquiescence in and recognition of the use of the equidistance method in the Gulf of Maine area, and its acquiescence in and recognition of the exercise of Canadian jurisdiction on Georges Bank, create an estoppel in favour of Canada. The single maritime boundary to be determined by the Court should be compatible with the rights vested in Canada.

## CHAPTER II

### GENERAL ASSESSMENT OF THE UNITED STATES MEMORIAL

#### Introduction

16. This chapter gives a summary analysis of the United States Memorial in order to provide certain signposts for the assessment of the United States Memorial as a whole. Reduced to its essential elements, that Memorial rests on four untenable propositions:

- (a) that Nova Scotia does not exist;
- (b) that nature itself has fixed a maritime boundary in the Gulf of Maine area;
- (c) that the United States has an inherent or acquired right of "dominance" over the Gulf of Maine area;
- (d) that administrative convenience or managerial expediency requires that all the resources of Georges Bank should be allocated to the United States.

The following sections will demonstrate how these propositions underlie the United States Memorial. The balance of this Counter-Memorial will show in detail their lack of foundation.

#### **Section 1. The United States Memorial Presents a Monopolistic and Unreasonable Claim That Bears No Relationship to the Relevant Circumstances or to the History of the Dispute**

17. The United States Memorial has proposed a new line — the so-called "adjusted perpendicular line" — but has maintained the underlying claim to the whole of Georges Bank that the United States first advanced in 1976. This claim to the whole of Georges Bank is in itself unreasonable and inequitable, whatever methodology the United States may choose for its expression. It is unreasonable and inequitable because the resources of Georges Bank are in effect the subject matter of the dispute, and the United States seeks a monopoly<sup>1</sup> of these resources that

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<sup>1</sup> The term "monopoly" provides a particularly apt description for the United States claim and is not without historical precedent. An early example of an assertion of monopoly in a boundary matter — and of its vigorous rejection — comes from the Decree of the Executive Council of the French Republic of 16 November 1792, which stated:

"That the stream of a river is the common, inalienable property of all the countries which it bounds or traverses; that no nation can without injustice claim the right exclusively to occupy the channel of a river and to prevent the neighbouring upper riparian States from enjoying the same advantages; that such [an exclusive] right is a remnant of feudal servitude, or at any rate, an odious monopoly which must have been imposed by force and yielded by impotence; that it is therefore revocable at any moment and in spite of any convention, because nature does not recognize privileged nations any more than privileged individuals, and the rights of man are for ever imprescriptible."

G. Kaeckenbeek: *International Rivers*. Grotius Society Publications, No. 1. London, Sweet and Maxwell, Limited, 1918, p. 32. See also *Yearbook of the International Law Commission*, 1980, Vol. II, p. 128; *Counter-Memorial, Annexes*, Vol. IV, Annex 3.

sets at naught Canada's geographical position in relation to Georges Bank, its vested rights in the hydrocarbon potential of this area, and its substantial interests and intensive traditional participation in the fisheries of the Bank as a coastal State adjacent thereto.

18. The unreasonable nature of this monopolistic claim obliges the United States to found it on a further claim of general "dominance" of the entire Gulf of Maine area and to invoke a variety of irrelevant circumstances relating, for instance, to defence, navigation, and search and rescue activities<sup>2</sup>. At the same time, the United States attempts to paint a picture of the Northeast Channel as a "natural" dividing line for human activities in the area. In so doing, however, the United States ignores the existence of the Great South Channel off the coast of Massachusetts and forgets its own assertions regarding United States and Canadian activities on both sides of the Northeast Channel. The line proposed by the United States does not, in any event, follow the course of the Northeast Channel, which is nothing but a superficial depression on the single continental shelf of the Atlantic coast of North America.

19. The United States claim assumes that the United States alone is a coastal State in relation to Georges Bank. It represents not a proposed delimitation but rather an attempt to avoid delimitation by denying or disregarding the geographical fact of Nova Scotia. Only in this way is the United States able to construct a theory that would deprive Canada of the sovereign rights that flow from this reality under Article 1 of the 1958 Convention on the Continental Shelf, under the 1982 Convention on the Law of the Sea, and under customary international law.

20. The unreasonable nature of the United States claim is further confirmed by the fact that it is divorced from the diplomatic history of the dispute and totally ignores rights and legitimate interests proper to Canada that the United States itself previously recognized. The United States Memorial for this reason is obliged to maintain an embarrassed reticence on the subject of the United States attitude toward the offshore oil and gas exploratory permits issued by Canada on the basis of the equidistance method from 1965 on, and to characterize official communications between the Parties as a kind of private correspondence between "Mr. Hoffman" and "Mr. Hunt"<sup>3</sup>. Similarly, the United States Memorial makes only passing reference to the 1979 Agreement on East Coast Fishery Resources<sup>4</sup>, despite the fact that its negotiation was commissioned by the President of the United States of America and the Prime Minister of Canada, and that it was duly signed and approved by the executive arms of both governments (although never acted upon by the United States Senate). This treatment of history is readily explained.

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<sup>2</sup> See, for instance, *United States Memorial*, pp. 81-82, para. 135, where it is asserted that: "No State questioned United States jurisdiction and control over the continental shelf of the Gulf of Maine Basin and Georges Bank until the 1960s. Through that long period, all activities in this area — fishing, charting and surveying, scientific research, and defense — evidenced the complete dominance of the United States over it."

<sup>3</sup> *United States Memorial*, p. 82, para. 136.

<sup>4</sup> *United States Memorial*, pp. 97-98, paras. 161-163.



For in the 1979 Agreement on East Coast Fishery Resources the United States did what it has failed to do in its Memorial: that is, to recognize Canada's established presence on Georges Bank and Canada's legal and equitable entitlement to a major part of the area and to its resources.

21. The use of an "adjusted perpendicular line" to advance a claim to the whole of Georges Bank represents the latest step in a progressive encroachment upon an area appertaining to Canada under international law. Thus, the United States from 1965 to 1969 adhered to an equidistance line for the delimitation of the continental shelf in the Gulf of Maine area; later, from 1969 to 1976, the United States reserved its rights regarding this delimitation, without enunciating any further claim; in 1976, upon adopting the legislation necessary to extend its fisheries jurisdiction to 200 miles, the United States expanded its claim to a line purportedly based on seabed topography and the Northeast Channel; finally, in its Memorial of 27 September 1982, the United States has expanded its claim yet again, to a line that comes within 25 nautical miles of Yarmouth harbour on the coast of Nova Scotia at a point that is three times as far from the coast of Maine and more than six times as far from that of Massachusetts [Figure 1].

22. It should be recalled here that it was on the basis of the claims of the Parties as they stood at the time of signature of the Special Agreement that Point "A", the starting point for the determination of the single maritime boundary, was established. It was also on the basis of these claims that the Parties decided that the seaward terminal point of the boundary should fall within the triangle described in the Special Agreement. The United States Memorial does not illustrate the relationship of the new United States line to the outer limit of the United States or Canadian 200-mile zones, nor the relationship of the new line to the triangle within which the boundary must terminate. An illustration of these relationships is provided for the convenience of the Court in Figure 2. It can be seen that the United States line is simply a straight line from Point "A" to the northeast corner of the triangle, "adjusted" along its course to provide support for the United States view that fishing banks should not be divided.

23. It should also be recalled here that the triangle was constructed so as to include three points: the two points where the Canadian and United States claims (as they stood at the time of signature of the Special Agreement) intersect the outer limits of the Parties' 200-mile zones, and the point at which the outer limits of these zones intersect each other. (Figure 1 in the Canadian Memorial shows these three points.) The corners of the triangle were fixed by reference to geographical coordinates corresponding to the nearest full degrees of latitude and longitude that can form a plane figure enclosing these three points. The triangle thus constitutes the simplest cartographic device that enables the Court to complete its task, while at the same time avoiding prejudice to the claims of either Party as they stood in 1979. Seen in this light, the link between the 1979 claims and the triangle is a fundamental one.

24. As can be seen in Figure 2, the new line proposed by the United States does not and cannot intersect the 200-mile limit of the

United States zone within the triangle. Accordingly, it would not allow the Court to fully delimit the 200-mile zone of *either* Party. It would also complicate the task of the Parties — and potentially the task of the Court — in determining, in accordance with Article VII of the Special Agreement, the later seaward extension of the maritime boundary established in the present proceedings.

25. The United States Memorial anticipates the position the United States will take in later negotiations or judicial proceedings under Article VII of the Special Agreement. The seaward extension of the United States line, as described and depicted in the United States Memorial<sup>5</sup>, would allocate to the United States an area of 9,380 square nautical miles lying beyond 200 nautical miles of the United States but within 200 nautical miles of Canada. This area (larger than Belgium) would thus become part of the United States continental shelf. The United States presumably intends that the superjacent waters, in which Canada has exercised undisputed fisheries jurisdiction since 1977, would revert to their former status as high seas not subject to coastal State jurisdiction. Canada would thus be deprived of a substantial part of its existing and until now undisputed fishing zone, and of its future exclusive economic zone, in order that the United States might exercise jurisdiction over a substantial area of the continental shelf lying outside its own exclusive economic zone.

26. The new United States line, in sum, carries the extreme United States claim of 1976 to the point of extravagance, so as to encompass not only the whole of Georges Bank but very nearly the whole of the Gulf of Maine area, scarcely stopping short at claiming part of Nova Scotia's land territory. For, as the United States is obliged to admit, its line would "intersect the Nova Scotia peninsula" if it were not "adjusted" so as to "take account of Nova Scotia"<sup>6</sup>.

## Section II. The United States Memorial Reduces Equity to a Matter of Administrative Convenience

27. The United States Memorial emphasizes the theme that the whole of Georges Bank should fall within United States jurisdiction for reasons of administrative convenience or managerial expediency. Monopoly is presented as equity under the guise of principles that purportedly relate to the conservation of resources and to minimizing the potential for disputes<sup>7</sup>. The United States in effect asserts that there is an "equitable" principle of maritime boundary delimitation requiring that the entirety of a large and rich fishing bank should be apportioned to only one of the two coastal States adjacent to it, with the professed objective of facilitating management. The United States further asserts

④ <sup>5</sup> *United States Memorial*, p. 199, Figure 34. See also p. 185, para. 304.

<sup>6</sup> *United States Memorial*, p. 179, para. 302.

<sup>7</sup> *United States Memorial*, p. 5, paras. 16-17; pp. 205-209, paras. 316-324; p. 209, para. 329.

that there is an "equitable" principle of maritime boundary delimitation requiring that disputes should be avoided by giving one coastal State all the rights at stake and the other none.

28. The theme of administrative convenience or managerial expediency underlies and helps to explain the United States Memorial's preoccupation with the notion of "natural features", a "natural buffer zone", and a "natural" or "readily observed" boundary<sup>8</sup>. This preoccupation is further reflected in unsupported, erroneous or distorted contentions regarding fish distributions, "three separate ecological régimes", and the Northeast Channel as "one of only two significant breaks in the surface of the continental shelf". The United States Memorial seizes upon the Northeast Channel and attempts to construct a doctrine of administrative convenience in fisheries management that ignores the management of seabed mineral resources and yet at the same time is ultimately based on this wrinkle of geomorphology. Nowhere is it explained how the surface of an admittedly continuous continental shelf can be "broken" by a feature that can be depicted only with the aid of multiple vertical exaggeration. Despite all the emphasis on natural features, however, the United States Memorial relegates to obscurity the Great South Channel that marks the western limit of Georges Bank off the coast of Massachusetts.

29. The doctrine of administrative convenience enunciated in the United States Memorial is inconsistent with the concept of the single maritime boundary. It strikes at the very legal basis of title of the coastal State. It is untenable under any view of international law or equitable principles. It is untenable in the light of international practice, including the practice of the United States. And, above all, it is clearly untenable under the 1982 Convention on the Law of the Sea, despite the attempt of the United States to justify it on the grounds that the "thrust" of the convention is allegedly in favour of "single-State management"<sup>9</sup>. In fact, neither of the two basic thrusts of the Convention on the Law of the Sea in relation to fisheries jurisdiction can be made to support such a view. The first of these thrusts is to give the *coastal State or States* (and not some mythic "single State") the management of fishery resources adjacent to their shores, on the basis of the 200-mile principle and *not* on the basis of fish distributions. The second and complementary thrust is to require States to cooperate in the conservation of fishery resources where they occur within the economic zones of two or more States, or in the economic zone and in adjacent areas of the high

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<sup>8</sup> *United States Memorial*, p. 121, para. 196; p. 144, para. 256; pp. 175-176, paras. 292 and 296; p. 201, para. 315; p. 206, para. 322.

<sup>9</sup> *United States Memorial*, p. 20, para. 31; p. 175, para. 296; p. 201, para. 315.

<sup>10</sup> *United States Memorial*, p. 120, para. 192.

seas<sup>11</sup>. The convention, in fact, foresees and provides for the division of fish stocks or fishing banks between neighbouring coastal States. The United States Memorial stands the convention on its head in invoking it to reject cooperation in the conservation of transboundary stocks.

30. The general interest of the international community in avoiding disputes in international relations is also made to perform similar acrobatics. The United States Memorial attempts to translate this interest into a spurious principle for the determination of a specific maritime boundary, allegedly minimizing the potential for disputes by excluding one of the two Parties from an area that is common to both of them. No authority for such arguments can be found in the Convention on the Law of the Sea or in general principles of international law. Carried to their logical conclusion, they would imply, for instance, that the Canada-United States boundary through the Great Lakes should be redrawn to give them all to one country<sup>12</sup>.

31. In sum, the treatment of conservation and dispute avoidance in the United States Memorial is tendentious in the extreme. Each of these principles or objectives represents a perfectly valid *modus operandi*. Neither can be tortured into the semblance of a *modus delimitandi*, despite the transparent reasoning the United States Memorial devotes to the attempt.

### Section III. The United States Memorial Seeks to Refashion Geography

32. The geography of the Gulf of Maine area is scarcely recognizable from the description provided in the United States Memorial. Nova Scotia becomes an unnatural "protrusion" that can be ignored for purposes of delimitation, despite the fact that it is the decisive geographical feature in the Gulf of Maine area and a major feature defining the

<sup>11</sup> United Nations Convention on the Law of the Sea. A/CONF.62/122, 7 October 1982. Signed 10 December 1982 at Montego Bay. The first "thrust" is reflected, *inter alia*, in:

Article 56: Rights, jurisdiction and duties of the coastal State in the exclusive economic zone;

Article 57: Breadth of the exclusive economic zone;

Article 61: Conservation of the living resources; and

Article 62: Utilization of the living resources.

The second "thrust" is found, *inter alia*, in:

Article 63: Stocks occurring within the exclusive economic zones of two or more coastal States or both within the exclusive economic zone and in an area beyond and adjacent to it;

Article 64: Highly migratory species;

Article 66, para. 4: Anadromous stocks;

Article 67, para. 3: Catadromous species; and

Article 123: Co-operation of States bordering enclosed or semi-enclosed seas.

<sup>12</sup> In negotiations leading up to the Treaty of Paris of 1783, Great Britain proposed to fix the boundary between the United States and Canada on the southern shore of the Great Lakes in order to award them entirely to one State. This proposal was rejected and for most of the boundary the median line was adopted. See P. Pondaven: *Les Lacs-frontière*. Paris, Editions A. Pedone, 1970, p. 61.

Gulf itself. On the one hand, the entire area is treated as if it had a simple and straight coastline, and on the other hand the United States Memorial makes much of the "concavity" of the Gulf of Maine and of "four-fold" change of direction in the Canadian coast. These magic-lantern effects are produced by a process of over-simplification and by a selective presentation of the facts.

33. The United States Memorial is especially notable for emphasizing macrogeography at the expense of the particular geography of the Gulf of Maine area. The device is most obvious in the United States' attempt to suggest that the north-south orientation of the land boundary in the area is an east-west orientation, in clear contradiction of the facts as they may readily be established by a mere glance at a map. Thus the United States Memorial simply states that the "principal" international boundary extends from the Pacific to the Atlantic in a "generally" west to east direction<sup>13</sup>, and leaves it to be assumed — and wrongly assumed — that this description also applies in the Gulf of Maine area.

34. To reinforce the suggestion of a universal east-west boundary orientation, the United States Memorial insists repeatedly that Canada lies north of the United States — if one excludes the state of Alaska and its not inconsiderable area of 1,518,700 square kilometres<sup>14</sup>. This insistence is ill-founded. In fact, large parts of Canada lie latitudinally south of large parts of the United States. Over 70 percent of Canada's population lives south of the 49th parallel, and over 30 percent of the United States landmass (excluding Alaska, and there is of course no reason for excluding Alaska) lies north of the most southerly point of the Canadian landmass at Middle Island in Lake Erie, at latitude 41°41' N. More pertinent still, several important regions of Canada lie due east or due west of neighbouring regions of the United States across a generally north-south boundary. In particular, New Brunswick lies due east of Maine, and Nova Scotia lies east of New England, across the Gulf of Maine.

35. The careful refashioning of geography is essential to the United States claim. Only in this way is the United States able to suggest that, because Canada and the United States are adjacent States on the continental scale, they somehow cannot have opposite coasts in the Gulf of Maine area<sup>15</sup>. Only in this way is the United States able to invent the notion of so-called "primary" and "secondary" coasts in a vain effort to dismiss Nova Scotia from consideration and to discount the fact that the Parties indeed do have opposite coasts in the Gulf of Maine area. And only in this way is the United States able to advance the patently absurd contention that Nova Scotia "protrudes south of the land boundary" or "southeast of the international boundary terminus<sup>16</sup>" and somehow invades United States space. Such a view of geography would make Nova Scotia part of the United States, and most of Maine and all of Alaska part of Canada.

<sup>13</sup> *United States Memorial*, p. 11, para. 20.

<sup>14</sup> *United States Memorial*, p. 11, para. 20; p. 169, para. 280; p. 174, para. 289.

<sup>15</sup> *United States Memorial*, p. 169, para. 281.

<sup>16</sup> *United States Memorial*, p. 4, para. 11; p. 174, paras. 288-289; p. 214, Submission B(1)(c).

36. This quasi-obsession with the alleged “protrusion” of Nova Scotia “southeast of the international boundary” is reflected in the United States view that Canada’s participation in the Georges Bank fishery represented an “intrusion” that can be likened to the advent of distant-water fishing vessels from across the Atlantic and the Pacific after World War II<sup>17</sup>. Thus, the United States is driven to asserting that Canada’s geographical relationship to Georges Bank in effect is the same as that of Japan or the Union of Soviet Socialist Republics — despite Nova Scotia’s “protrusion” southeast of the international boundary”.

37. Another example of the United States’ attempt to refashion geography is its treatment of the Bay of Fundy. The existence of the Bay of Fundy is acknowledged for purposes of determining the general direction of the coast as seen by the United States, as well as the orientation of its “adjusted perpendicular line”. The Bay, for these purposes and for the purpose of identifying the relevant circumstances, is considered to be part of the Gulf of Maine area or the “relevant area” as defined by the United States<sup>18</sup>. On the other hand, for purposes of applying the lopsided and highly artificial proportionality test devised by the United States, the Bay of Fundy ceases to be a part of the Gulf of Maine area — even though it is used to determine the eastern limit of the test area<sup>19</sup>. Only through such contrivances and inconsistencies is the United States able to construct some frail defence for a totally disproportionate claim on the grounds of alleged proportionality.

38. The refashioning of geography is also manifest in the graphics that appear in the United States Memorial. Through selective labelling and selective bathymetry, the Great South Channel is not shown at all (and is only once mentioned by name in the text of the Memorial<sup>20</sup>, in contrast with the repeated references to the Northeast Channel). Moreover, the general bathymetry of the Gulf of Maine area is represented in an incomplete fashion, calculated to suggest that Georges Bank constitutes a kind of physical “natural prolongation” of Massachusetts. (See <sup>40</sup> *Figure 3* for an indication of the effects that can be achieved through selective bathymetry.)

#### **Section IV. The United States Memorial Misconstrues the Legal Nature of the Single Maritime Boundary, the Legal Nature of the Zones in Issue, and the Legal Basis of Maritime Jurisdiction**

39. The United States is in agreement with Canada that the single maritime boundary to be determined in this case will serve for all purposes in international law<sup>21</sup>. The United States Memorial, however,

<sup>17</sup> *United States Memorial*, pp. 49-50, paras. 80, 81 and 83.

<sup>18</sup> *United States Memorial*, p. 3, para. 10; p. 19, para. 25; p. 169, para. 278; p. 170, para. 283.

<sup>40</sup> <sup>41</sup> *United States Memorial*, pp. 192-193, paras. 312-313; p. 199, *Figure 34*, and p. 203, *Figure 35*.

<sup>20</sup> *United States Memorial*, p. 23, para. 33.

<sup>21</sup> *Canadian Memorial*, pp. 17-18, paras. 14-15; *United States Memorial*, p. 3, para 6; p. 101, para. 164.

fails to examine the concept of the single maritime boundary, its origins in the law of the sea, and its legal consequences for the present proceedings. This concept flows from the new doctrine of the exclusive economic zone and its spatial "unification" of the various forms of functional jurisdiction of the coastal State within a distance of 200 miles<sup>22</sup>. The legal consequences are clear. *First*, the 200-mile distance principle gives much greater importance to the factor of proximity, and greatly reduces or eliminates any significance that might have attached to geomorphology and to the doctrine of natural prolongation. *Secondly*, the single maritime boundary concept requires a careful balancing of those factors that relate to all the jurisdictional purposes in question — in particular those that pertain to living resources and to mineral resources — in order to ensure or confirm that an equitable overall result is in fact achieved. Among these factors, economic dependence must figure prominently, in view of the economic character of the rights of the coastal State in relation to the shelf, the 200-mile fishing zone and the exclusive economic zone.

40. The United States Memorial pays no heed to any of these necessary implications of the single maritime boundary concept. Much is said about the emergence of the 200-mile fishing zone but nothing is said about the source of title to that zone; nor about the profound transformation of the concept of the continental shelf with the emergence of the concept of the exclusive economic zone; nor about the new importance of the 200-mile distance principle; nor about the economic dependence of the coastal State. In this and in other respects the United States Memorial is remarkable for its silences and omissions.

#### Section V. The United States Memorial Divorces Equitable Principles from International Law

41. The Parties are in essential agreement that the delimitation to be effected in this case must be in accordance with equitable principles, taking account of all relevant factors or circumstances, in order to achieve an equitable result<sup>23</sup>. Nevertheless, they differ profoundly in their general approach to the law governing the determination of the single maritime boundary in the Gulf of Maine area. The United States has worked backward, from objective to principles. Canada has worked forward, from principles to result. The history of the dispute alone is enough to prove this point.

42. There are a number of reasons for this divergence from a norm that the Parties profess to hold in common. Perhaps the most important is that the United States Memorial, in developing and applying the agreed rule that delimitation must be effected in accordance with equitable principles, overlooks or ignores the more basic rule that delimitation must be effected *on the basis of international law* — a general

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<sup>22</sup> Functional jurisdiction, of course, includes sovereign rights in respect of seabed and water-column resources but falls well short of outright sovereignty.

<sup>23</sup> *Canadian Memorial*, p. 119, para. 278; *United States Memorial*, p. 139, para. 237.

rule that is expressly incorporated in Article II of the Special Agreement and in Articles 74 and 83 of the Convention on the Law of the Sea<sup>24</sup>. This statement is not a mere paradox. It is true of course that equitable principles themselves constitute the fundamental norm in the law of maritime boundaries. But that norm loses its character of law if it is applied outside the total framework of international law applicable in a given case — that is, if equitable principles and relevant circumstances are identified without reference to this framework.

43. The development and application of so-called equitable principles outside the law is seen, for instance, in the United States Memorial's treatment of the sources of law, which is at variance with the Special Agreement, with Article 38 of the Statute of the Court, and with Articles 74 and 83 of the Convention on the Law of the Sea<sup>25</sup>. The United States discounts the relevance of Article 6 of the Convention on the Continental Shelf to the present proceedings<sup>26</sup>, despite the fact that it is the only applicable conventional rule of law binding both Parties and is equally compatible with the delimitation of the 200-mile fishing zone or economic zone. The United States finds its arguments on the *Grisbadarna* award, despite the fact that, even where it might have some relevance, that case could only be a subsidiary means for determining rules of law. And finally, the United States ignores major developments in the contemporary law of the sea — in particular, the emergence of the 200-mile distance principle and the doctrine of the exclusive economic zone — despite their being at the origin of the very concept of the single maritime boundary.

44. The attempted divorce of equitable principles from international law results in a boundary proposal that is as eccentric as it is extravagant, for the very reason that it is not based on law. The United States leaps from the incontrovertible statement that the Court may not

<sup>24</sup> Article II of the Special Agreement provides that the question before the Court is to be decided "in accordance with the principles and rules of international law applicable in the matter as between the Parties". Article 74(1) of the Convention on the Law of the Sea states:

"The delimitation of the exclusive economic zones between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable solution."

Article 83(1) states:

"The delimitation of the continental shelf between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable solution."

<sup>25</sup> As seen in footnote 24, Articles 74(1) and 83(1) of the Convention on the Law of the Sea specifically refer to Article 38 of the Statute of the International Court of Justice, which in turn sets out the sources of law the Court is empowered to apply.

<sup>26</sup> The United States Memorial scarcely touches upon the applicability of Article 6 to the present proceedings. In the few instances where Article 6 is mentioned, the United States Memorial focuses on its "special circumstances" provision and on judicial statements regarding the applicability of Article 6 in other cases. *United States Memorial*, p. 101, para. 165; p. 125, para. 204; p. 126, para. 206; pp. 129-131, paras. 215, 216, 218 and 220.



"split the difference"<sup>27</sup> to the indefensible proposition that the Court may not "split" Georges Bank. In attempting this leap, the United States forgets that dividing Georges Bank is not "splitting the difference". On the contrary, it is a result that stems from the application of law or, in other words, from the identification of equitable principles and relevant circumstances within the law.

#### **Section VI. The United States Memorial Relies upon a Precedent That Is Not a Precedent and a Method That the Memorial Does Not Apply**

45. The 1909 *Grisbadarna* award between Norway and Sweden<sup>28</sup>, which applied seventeenth-century law to give effect to a seventeenth-century treaty, was decided long before the emergence of the continental shelf doctrine and the 200-mile distance principle. It has never been considered a leading case in the field of modern maritime boundary law, especially in relation to boundaries beyond the territorial sea. It has not been followed in State practice, nor in any judicial or arbitral decisions; and it was expressly discarded by the International Law Commission as a source for determining the legal rules governing even the delimitation of the territorial sea<sup>29</sup>. The reasons for this are not hard to find: the *Grisbadarna* award was dictated by special circumstances<sup>30</sup> unique to that case. The most important of these circumstances was *the common view of the parties* that the small *Grisbadarna* lobster fishing grounds should not be divided, given that both Norway and Sweden claimed them in their entirety<sup>31</sup>. The contrast with the present proceedings could not be sharper.

<sup>27</sup> *United States Memorial*, p. 101, para. 166.

<sup>28</sup> *Arbitral award in the question of the delimitation of a certain part of the maritime boundary between Norway and Sweden*. See J. B. Scott, ed.: *The Hague Court Reports*. New York, Oxford University Press, 1916, pp. 121-140. Hereinafter cited as the *Grisbadarna* award.

<sup>29</sup> *Yearbook of the International Law Commission*, 1954, Vol. II, p. 158; *Yearbook of the International Law Commission*, 1956, Vol. II, p. 272.

<sup>30</sup> As regards the *Grisbadarna* award, the United States delegate to the International Law Commission, M. O. Hudson, expressed the view that "the arbitration award had been dictated by special considerations". *Yearbook of the International Law Commission*, 1951, Vol. I, p. 286, para. 119. See also the letter to the United Nations from the Permanent Delegation of Norway, dated 13 February 1953, *Yearbook of the International Law Commission*, 1953, Vol. II, pp. 83-84, which stated: "It was due to special reasons that the dividing line in the award was in fact drawn in direction West, 19° South and not 20° South." See also the letter to the United Nations from the Swedish Delegation dated 7 May 1953, at pp. 87-88, which stated: "The insignificant departure from the (perpendicular) principle represented by the frontier established by the Court in this particular case was due to special circumstances."

<sup>31</sup> J. B. Scott, ed.: *The Hague Court Reports*, 1916, p. 129. The Tribunal stated:

"Whereas, the parties agree in admitting the great unsuitability of tracing the boundary-line across important bars."

The Tribunal's award thus reflected the agreement of Sweden and Norway that the *Grisbadarna* Bank should not be divided. The United States Memorial suggests, erroneously, that this view was shared by the Tribunal, which in fact did not pronounce on the matter but simply took into account the common view of the parties. See *United States Memorial*, p. 113, para. 180; p. 121, para. 196; p. 143, para. 251 and p. 144, para. 255.

46. It is perhaps not surprising that the United States Memorial, in casting about for some authority to support an untenable proposal relating to the new phenomenon of a single maritime boundary extending out to 200 miles, should find itself obliged to rely on an old and unrepresentative case dealing with a narrow territorial sea delimitation. What is surprising, on the other hand, is that the United States should so far misread the *Grisbadarna* award as to all but overlook its enunciation of one principle that is indeed germane to the present proceedings: namely, that the relative importance of established fishing patterns to the States concerned represents a factual circumstance to be given considerable weight in a delimitation affecting fishing rights<sup>32</sup>.

47. The *Grisbadarna* award, in sum, does not stand for what the United States says it stands for. So far as it may be relevant to the present proceedings, it supports the Canadian position. So far as it illustrates the application of the perpendicularity method in a territorial sea delimitation, that method is employed only in name in the United States Memorial. For the line proposed by the United States bears no resemblance to a perpendicular line, no relationship to the general direction of the coasts, and indeed no relationship to any of the "equitable principles" it is alleged to observe. It is manifestly an arbitrary line, so constructed as to widen the area of dispute and to maximize the United States claim — a claim that was inherently unreasonable and inequitable even before it assumed the mantle of perpendicularity in the United States Memorial.

#### **Section VII. The United States Memorial Rejects or Prejudices Forms of Cooperation That Are Fundamental to International Order**

48. The United States Memorial ignores the principles embodied in the 1982 Convention on the Law of the Sea regarding cooperation in the conservation and management of fishery resources occurring in the economic zones of neighbouring coastal States, in an effort to justify a monopolistic claim and to fashion a self-serving doctrine of administrative convenience. Underlying this approach is the implicit thesis that bilateral cooperation in fisheries management and conservation is unattainable and unworkable — although the United States is prepared to

<sup>32</sup> J. B. Scott, ed.: *The Hague Court Reports*, 1916, pp. 130-131:

"The circumstance that lobster fishing in the shoals of *Grisbadarna* has been carried on for a much longer time, to a much larger extent, and by a much larger number of fishermen by the subjects of Sweden than by the subjects of Norway.

Lobster fishing is much the most important fishing on the *Grisbadarna* banks, this fishing being the very thing that gives the banks their value as fisheries; and

Without doubt the Swedes were the first to fish lobsters by means of the tackle and craft necessary to engage in fishing as far out to sea as the banks in question are situated; and

Fishing is, generally speaking, of more importance to the inhabitants of *Koster* than to those of *Hvaler*, the latter having, at least until comparatively recent times, engaged rather in navigation than fishing."

make an exception for tuna or salmon, for example. Fortunately, this thesis is not borne out by the long and generally successful history of cooperative management of fisheries and other resources by Canada and the United States<sup>33</sup>. Unfortunately, however, the United States Memorial's advocacy of this thesis could prejudice international efforts to promote cooperation in the management of transboundary resources around the world; for the extension of fisheries jurisdiction to 200 miles, far from doing away with the need for such cooperation, has made it more necessary than ever. The United States Memorial does no service to international order by arguing that the solution to conservation problems lies in rejecting cooperation and granting a monopoly to the allegedly "dominant" party.

49. There is, moreover, yet another profoundly disturbing way in which the United States Memorial calls into question forms of cooperation that are fundamental to international order. Modern transportation systems require cooperative operational arrangements that cannot be based on or restricted by national boundaries. Thus, for instance, humanitarian cooperation in the field of sea and air search and rescue has long been organized without reference to national boundaries and without prejudice to claims of sovereignty and jurisdiction. Canada and the United States, like many other countries, have entered into cooperative search and rescue arrangements on such a non-prejudicial basis. It is to be regretted that the United States Memorial now seeks to have these arrangements serve the quite different ends of a maritime boundary determination. And it is an occasion for even greater regret that the United States Memorial misuses cooperative defence arrangements in the same way, and in the process gives an inaccurate picture of Canada's contribution to North American defence.

50. The cooperative arrangements in question — like most of the State activities invoked by the United States — are totally unrelated to the present dispute in law, in subject matter, or in time. They have nothing to do with equitable principles or relevant circumstances. Their irrelevance apart, Canada is concerned that they have been raised at all in the context of a maritime boundary dispute. Such arrangements require mutual confidence. Governments may now well feel compelled to review their cooperative arrangements for civil aviation, defence and similar matters to ensure that they cannot give even the remotest appearance of compromising their sovereignty or sovereign rights.

51. More generally, there is something disquieting about the preoccupation with the notion of a "natural boundary", "natural buffer zone" and "natural features" that is so pervasively manifested in the United States Memorial. There is no natural boundary in the Gulf of Maine area, unless it be the biological transition zone in the Great South Channel-Nantucket Shoals-Cape Cod area that has been identified and described by United States scientists<sup>34</sup>. More important still,

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<sup>33</sup> The record of cooperative bilateral management of fisheries and other resources by Canada and the United States is discussed in paras. 234-242.

<sup>34</sup> See *Canadian Memorial*, pp. 52-54, para. 97. See also paras. 203-207 of this Counter-Memorial.

international law seeks *equitable* boundaries in the sea, and these must be left for human beings and human institutions to determine; for the equitable result is a human concept and a human concern, and not a concern of nature or providence. It is precisely the absence of natural boundaries that has made the sea a great highway for international transport and communication. Certainly the Northeast Channel has not been a boundary or a barrier for Canadian fishermen fishing on Georges Bank or for the other shared uses of the Gulf of Maine area. Reliance on "natural boundaries" or "natural buffer zones" is misplaced in both fact and law.

### Conclusion

52. The United States Memorial has introduced not only a new line but a novel conception of equitable principles and relevant circumstances. But this novelty does not flow from creative development of the applicable law. It is a novelty without substance. The attempt to give it substance in the United States Memorial, however, obliges Canada to review the facts of this case in some detail in order to distinguish between relevant and irrelevant circumstances and to correct inaccuracies. This task is addressed in Part II of this Counter-Memorial.

## PART II. RELEVANT CIRCUMSTANCES

### CHAPTER I

#### POINTS OF AGREEMENT

##### Introduction

53. Because of the vast wealth of factual material available concerning the *Gulf of Maine* area, and in order that the central points in controversy not be obscured by an over-abundance of detail, Canada wishes to take this opportunity to emphasize that certain critical facts in the present case are essentially undisputed. In the light of the Memorials submitted by the Parties, there is a hard core of relevant facts or circumstances that support Canada's case. Although the Parties differ on the emphasis to be placed upon them and the conclusions to be drawn from them, the following facts, in Canada's view, may be taken to have been agreed to by both Canada and the United States<sup>1</sup>.

##### Section I. The Object of the Dispute

54. Both Memorials recognize implicitly or explicitly that the object of the present dispute is Georges Bank, one of the world's richest fishing grounds. As provided in the Special Agreement, the Court is asked to determine the course of a single maritime boundary dividing the Parties' continental shelves and fishing zones (now, in the case of the United States, an exclusive economic zone). The single maritime boundary will delimit multi-purpose zones, effective with respect to "sovereign rights or jurisdiction for any purpose over the waters or seabed or sub-soil<sup>2</sup>".

##### Section II. Geography

55. The two Memorials agree on certain geographical facts. While the *Gulf of Maine* area is a physical continuum, the United States Memorial has characterized it as having an "interior" and an "exterior" component<sup>3</sup>, resembling the "inner" and "outer" portions described in the Canadian Memorial<sup>4</sup>. The Parties are also agreed that the relevant area includes some part of the Atlantic-facing coasts outside the *Gulf of Maine* itself<sup>5</sup>.

<sup>1</sup> So far as Canada is concerned, these facts may be deemed to have been admitted for purposes of Rule 49, para. 2, of the Rules of Court, or for any other purposes.

<sup>2</sup> Special Agreement, Articles II and III.

<sup>3</sup> *United States Memorial*, p. 19, para. 25.

<sup>4</sup> *Canadian Memorial*, p. 137, paras. 329-330.

<sup>5</sup> *United States Memorial*, p. 19, para. 25; *Canadian Memorial*, p. 24, paras. 21-22; p. 27, para. 32.

### Section III. Fisheries

56. As to resource exploitation and established patterns of dependence on Georges Bank, the two Memorials both demonstrate that, at least since World War II, the historic development of Canada's participation in the fisheries of Georges Bank has been considerably more dynamic than that of the United States<sup>6</sup>. Both Memorials further show that — particularly as regards the crucial scallop catch — contemporary Canadian harvests of Georges Bank fishery resources have equalled or surpassed those of the United States<sup>7</sup>. This was indeed the situation at the time both Parties extended their fisheries jurisdiction to 200 miles within three months of each other<sup>8</sup>.

57. As to the ports involved in the Georges Bank fishery, the United States Memorial simply states that "United States" or "New England" fishermen, on the one hand, and "Canadian" fishermen, on the other, frequent this fishing ground<sup>9</sup>. The Canadian Memorial is more specific in pointing out that the United States fishery on Georges Bank is concentrated in a handful of ports of Massachusetts and extends beyond that state only to a small portion of the Rhode Island coast; whereas the Canadian fishery on the Bank is dispersed among many coastal communities in Nova Scotia's southwestern counties of Lunenburg, Queens, Shelburne, Yarmouth and Digby<sup>10</sup>.

### Section IV. The Conduct of the Parties

58. Both Memorials also note that the Parties signed (although the United States later proved unwilling to ratify) the 1979 Agreement on East Coast Fishery Resources. They chronicle the history of the appointment of special representatives of the Prime Minister of Canada and the President of the United States, and their negotiation of the Special Agreement now before the Court, as well as its companion East Coast Fishery Resources Agreement. The Canadian Memorial, however, places greater emphasis on the substance of the latter agreement both as a historical fact and as an objective indication of the nature of an equitable result in the present proceedings<sup>11</sup>.

59. Regarding other areas of the history of the dispute, the two Memorials both show that in 1965 Canada began to use an equidistance boundary for the issuance of offshore oil and gas exploratory permits on Georges Bank, and that Canada on several occasions communicated this policy and practice to the United States, providing maps showing the

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<sup>6</sup> *Canadian Memorial*, pp. 66-71, paras. 133-142; *United States Memorial*, pp. 43-55, paras. 68-84.

<sup>7</sup> *Canadian Memorial*, p. 67, para. 134; *United States Memorial*, p. 50, para. 83.

<sup>8</sup> *Canadian Memorial*, pp. 99-100, para. 223; *United States Memorial*, pp. 55-56, para. 87.

<sup>9</sup> *United States Memorial*, pp. 41-56, paras. 60-88 and *passim*.

<sup>10</sup> *Canadian Memorial*, p. 28, Figure 10; pp. 32-36, paras. 46-63.

<sup>11</sup> *Canadian Memorial*, pp. 111-115, paras. 260-276; *United States Memorial*, pp. 93-94, para. 155; pp. 97-98, paras. 161-163.

location of the Canadian permits<sup>12</sup>. It can also be seen from either Memorial that the United States for some years questioned only the precise application of Canada's equidistance methodology in accordance with Article 6 of the 1958 Convention on the Continental Shelf<sup>13</sup>.

### Section V. The Continental Shelf

60. A substantial measure of accord can also be found in the two *Memorials on certain other points relating to the continental shelf*. It is of course agreed that both countries are parties to the 1958 Convention on the Continental Shelf<sup>14</sup>. It is equally undisputed that the continental shelf in the Gulf of Maine area is a part of a single uninterrupted shelf; in the words of the United States Memorial, the seabed of this area "is a part of the North American Atlantic continental margin, which extends from the Straits of Florida in the southwest to beyond the Grand Banks of Newfoundland in the northeast<sup>15</sup>", and its geological structure "is believed to be essentially continuous<sup>16</sup>". Although differing markedly in the emphasis placed on the Northeast Channel, the Memorials seem to agree on the basic physical characteristics of that channel.

61. Both Memorials show that the Northeast Channel is a shallow depression compared to its surrounding continental shelf areas<sup>17</sup>. The United States Memorial recognizes that the Northeast Channel is 145 metres shallower than the deepest point in Georges Basin, which lies between Georges Bank and the coast of Maine<sup>18</sup>. Concerning the Great South Channel, although the United States assiduously keeps this feature in the background, the two Memorials also show essential agreement on its basic physical characteristics. While mostly attempting to ignore its existence, the United States Memorial does at one point describe the Great South Channel as a shallow depression that "reaches depths of no more than 46 fathoms (85 metres)<sup>19</sup>"; the Canadian Memorial agrees that it is "about 80 metres deep<sup>20</sup>". Because of the choice of 50 fathoms (91.5 metres) as their lowest contour, the illustrations in the United States Memorial fail to depict the Great South Channel, but, as the Canadian Memorial shows by its use of standard contours, the Great South Channel is roughly bounded by the 60-metre

<sup>12</sup> *Canadian Memorial*, pp. 93-94, paras. 206-208; *United States Memorial*, p. 82, paras. 136-137.

<sup>13</sup> *Canadian Memorial*, pp. 93-94, paras. 206-208; *United States Memorial*, p. 82, para. 136.

<sup>14</sup> *Canadian Memorial*, pp. 97-98, para. 217; *United States Memorial*, p. 82, para. 135; p. 84, para. 142.

<sup>15</sup> *United States Memorial*, p. 20, para. 30; *Canadian Memorial*, p. 25, para. 24; p. 37, para. 64.

<sup>16</sup> *United States Memorial*, p. 24, para. 36; *Canadian Memorial*, p. 47, para. 83.

<sup>17</sup> *United States Memorial*, p. 20, para. 31; *Canadian Memorial*, pp. 24-25, para. 23; p. 25, para. 25.

<sup>18</sup> *United States Memorial*, p. 20, para. 31.

<sup>19</sup> *United States Memorial*, p. 23, para. 33.

<sup>20</sup> *Canadian Memorial*, p. 24, para. 23.

line<sup>21</sup>. Thus, the Great South Channel, like the Northeast Channel, is a shallow, gently sloped depression somewhat deeper than its surrounding continental shelf.

62. Finally, the Canadian and United States Memorials further agree that the continental shelf at the eastern edge of Georges Bank descends precipitously, dropping to depths of 1,000 fathoms or 2,000 metres within a few miles<sup>22</sup>. This sharp drop obviously dwarfs the depressions represented by either the Northeast Channel or the Great South Channel.

### Conclusion

63. The foregoing description of points of agreement is not intended to be exhaustive. The facts listed, however, are of central importance and are, it is submitted, sufficient in and of themselves to decide certain key points in favour of Canada. Factual contentions in the United States Memorial that are specifically denied by Canada, and additional facts highlighting the issues in this case, will be set forth in the following chapters.

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②-④<sup>1</sup> <sup>21</sup> *Canadian Memorial*, Figures 2, 4, 9, 15, 16, 23 and 31; Canadian Hydrographic Service Charts 4003C and 4003E; *United States Memorial*, Figures 3, 4, 5, 8, 9, 11, 13, 14, 15, 16, 17, 26, 27, 28, 29, 30, 31, 32, 34 and 35.

<sup>22</sup> *United States Memorial*, p. 23, para. 33 and the Figures referred to in footnote 21 above; *Canadian Memorial*, p. 37, para. 65 and the Figures referred to in footnote 21 above.



## CHAPTER II

### GEOGRAPHY

#### Introduction

64. The Parties are agreed that a maritime boundary determined in accordance with *international law must take account of the geographical circumstances in the area relevant to the delimitation and that in this case the relevant area is the Gulf of Maine area. The United States, however, has defined the Gulf of Maine area in an arbitrary manner without reference to geographical criteria and has relied upon extraneous macrogeographical factors that distort and obscure the situation in the relevant area.*

65. *The Gulf of Maine area comprises (i) the Gulf of Maine itself, with all of its subsidiary embayments; (ii) the banks that form its seaward rim, including Georges Bank; and (iii) the Atlantic-facing coasts of Nova Scotia, northeast of Cape Sable, and of Massachusetts and Rhode Island, southwest of Cape Cod and Nantucket, that demonstrate economic links to the resources of Georges Bank. The geographical relationship of the Parties to the Gulf of Maine area in general and to Georges Bank in particular is marked by an overall balance. Each Party has a roughly equal length of coastline bordering on the Gulf of Maine, and each has a major concave and a major convex feature on its coast: on the Canadian side, the Bay of Fundy and the Nova Scotia peninsula, and on the United States side, the concavity in the northwest corner of the Gulf and the convexity of southeastern Massachusetts. As additional elements of balance, the Fundy coasts of New Brunswick and Nova Scotia and the coasts of Maine and New Hampshire all face the innermost part of the Gulf of Maine; the coast of Nova Scotia and the coast of Massachusetts face each other from opposite sides of the Gulf; and to seaward, the coast of Nova Scotia and the coasts of Massachusetts and Rhode Island face the Atlantic Ocean on either side of Cape Sable and of Cape Cod and Nantucket. This balance is broken only by the protrusion of Cape Cod and Nantucket east and south of the general direction of the United States coasts facing the Gulf of Maine and the Atlantic Ocean.*

66. *The coastal wings of the Gulf — the coast of southwest Nova Scotia from Cape St. Marys to Lunenburg and the coasts of Massachusetts and Rhode Island from Cape Ann to Newport — abut the outer part of the Gulf of Maine area. These coasts are in an essentially symmetrical and opposite relationship to each other vis-à-vis Georges Bank. Factors of physical and human geography — particularly proximity, physiography, established fishing patterns and economic dependence, and probable patterns of hydrocarbon exploitation and environmental impact — all demonstrate that Georges Bank is adjacent to these coastal wings and that the eastern part of the Bank appertains to the coast of Nova Scotia, while the western part appertains to the coasts of Massachusetts and Rhode Island.*

## Section I. The Particular Geographical Situation in the Gulf of Maine Area Is Relevant to the Delimitation; Extraneous Macrogeographical Factors Are Not

### A. DEFINITION OF THE RELEVANT AREA

67. In assessing the geographical and other circumstances relevant to a maritime delimitation, tribunals have focused on the particular situation of the area within which the delimitation is to be effected<sup>1</sup>. The identification of this “relevant area” constitutes an essential step in the process of assessing the relevant circumstances in order to achieve an equitable result, because, without a geographical frame of reference, it is impossible to distinguish between relevant and irrelevant circumstances<sup>2</sup>.

68. In the *Tunisia-Libya Continental Shelf* case, the Court stated:

“It is clear that what is reasonable and equitable in any given case must depend on its particular circumstances. There can be no doubt that it is virtually impossible to achieve an equitable solution in any delimitation without taking into account the particular relevant circumstances of the area . . . It is evident that the first and most essential step in this respect is to determine with greater precision what is the area in dispute between the Parties and what is the area which is relevant to the delimitation<sup>3</sup>.”

Although the Court first surveyed “the geographical context of the dispute . . . the general area in which the continental shelf delimitation, which is the subject of the proceedings, has to be effected<sup>4</sup>”, it “emphasized that the only purpose of the description . . . is to outline the background, and not to define legally the area of delimitation nor to say how the Court views the various geographical features for the purposes of their impact on the legal situation<sup>5</sup>”. Indeed, in that case, the Court had to survey a more general area in order to identify the legally relevant area. Having defined this legally relevant area, the Court “excluded from further consideration” other submarine areas and coasts and focused only on those that lay within the relevant area<sup>6</sup>.

69. The area relevant to the delimitation in the present case is identified in the title and preamble of the Special Agreement as the “Gulf of Maine area”. The Parties agree that this area constitutes the “relevant area” for determining the relevant circumstances in this case<sup>7</sup>,

<sup>1</sup> *I.C.J. Reports 1969*, p. 52, para. 99; *Anglo-French Continental Shelf* award, p. 54, para. 84; p. 113, para. 240.

<sup>2</sup> *Anglo-French Continental Shelf* award, p. 22, para. 2; pp. 88-89, para. 181; pp. 109-110, para. 232; p. 111, para. 236.

<sup>3</sup> *I.C.J. Reports 1982*, pp. 60-61, para. 72.

<sup>4</sup> *I.C.J. Reports 1982*, p. 34, para. 17.

<sup>5</sup> *I.C.J. Reports 1982*, p. 34, para. 18.

<sup>6</sup> *I.C.J. Reports 1982*, p. 61, para. 75. See also, pp. 41-42, paras. 32-35; p. 82, para. 114.

<sup>7</sup> *Canadian Memorial*, p. 21, para. 17; p. 136, para. 327; pp. 155-156, para. 375; *United States Memorial*, p. 19, para. 25 and footnote 2; p. 169, para. 278.

but they do not agree on the definition of the Gulf of Maine area. Canada has defined it as the Gulf of Maine itself and the coasts that border it, plus an outer area that includes Georges Bank and the nearby Atlantic-facing coasts that demonstrate an economic link to the resources of the Bank, extending approximately from Lunenburg, Nova Scotia to Newport, Rhode Island<sup>8</sup>. The United States has defined the *Gulf of Maine area* as "the coasts and geographical features from Nantucket Island to Cape Canso, on both sides of the international boundary terminus, and the marine areas seaward from these coasts to the limits of coastal State maritime jurisdiction"<sup>9</sup>.

70. The Parties are therefore agreed that the relevant area encompasses the Gulf of Maine itself — including the Bay of Fundy and other subsidiary embayments — its seaward rim or sill, including Georges Bank, and the coast of Nova Scotia from Cape Sable to Lunenburg. The United States, however, departs from all recognized criteria by *including* within the relevant area the entire Scotian Shelf and the coast of Nova Scotia northeast of Lunenburg, and by *excluding* therefrom the Atlantic-facing coasts of Massachusetts and Rhode Island from Nantucket to Newport.

71. The Gulf of Maine area is a geographical term and can only be defined by geographical criteria. These are of two kinds: physical and human. There is a clear consensus in the scientific literature that the Gulf of Maine area encompasses the Gulf of Maine itself, including its various subsidiary features, and the seaward rim or sill that forms the southern boundary of the Gulf, namely the shoal areas off Cape Sable, Browns Bank, Georges Bank and the Nantucket Shoals. Henry Bigelow, in works described in the United States Memorial as "the leading scholarly publications in the field"<sup>10</sup>, defined the Gulf of Maine in the following terms:

"The term 'Gulf of Maine' covers the oceanic bight from Nantucket and Cape Cod on the west to Cape Sable on the east, thus including the shore lines of northern Massachusetts, New Hampshire, Maine, and parts of New Brunswick and Nova Scotia. The eastern and western boundaries adopted in this paper are 65° and 70° west longitude, respectively . . . The Gulf of Maine has a natural seaward rim formed by Nantucket Shoals, Georges Bank, and Browns Bank. We have chosen the 150-fathom contour as the arbitrary offshore boundary"<sup>11</sup> . . ."

<sup>8</sup> *Canadian Memorial*, p. 21, para. 17; p. 27, para. 32; p. 29, para. 35.

<sup>9</sup> *United States Memorial*, p. 19, para. 25.

<sup>10</sup> *United States Memorial*, p. 71, para. 123.

<sup>11</sup> H. B. Bigelow: "Fishes of the Gulf of Maine." *Bulletin of the United States Bureau of Fisheries*, Vol. XL, Part I, 1924, p. 7; *Counter-Memorial, Annexes*, Vol. IV, Annex 4.

"It [the Gulf of Maine] is a far better marked natural province below the surface of the sea than the shallow recession of its shore line would suggest, for its southern boundary is marked by a shallow rim, or 'sill', pierced by three narrow passages only. Passing eastward from Nantucket, with its off-lying shoals, these, successively, and the banks that separate them, are: The South Channel (not very well defined and only 40 to 50 fathoms deep), Georges Bank, the Eastern Channel, Browns Bank, the Northern Channel, and finally the Seal Island or coastal bank off Cape Sable. This rim, as Mitchell (1881) long ago pointed out, 259 miles in length from Nantucket to Cape Sable, follows, in its main outlines, the arc of a circle whose radius is about 167 miles. Along this arc the length of Georges Bank, from the deepest trough of the South Channel to the 50-fathom contour on the slope of the Eastern Channel, is about 140 miles, with a greatest breadth of about 80 miles from north to south between the 50-fathom contours. Between these same contours of the Eastern Channel and of the Northern Channel each occupies about 25 miles of the arc. In round figures, the area of Georges Bank is 10,000 square miles; that portion of Browns Bank west of longitude 65°30' W. (taken as the arbitrary boundary of the region under discussion) is about 550 square miles . . .

Its [the Gulf's] largest bays (Massachusetts on the southwest and the still larger Bay of Fundy on the northeast) are too well known to need more than passing mention<sup>12</sup>."

72. Bigelow's definition of the western limit of the Gulf of Maine corresponds roughly with the western entrance points to the Gulf, namely Cape Cod and Nantucket, while the eastern limits, identified variously as 65°30' and 65°, correspond respectively to the eastern entrance point to the Gulf, namely Cape Sable, and to the eastern end of the Bay of Fundy at Cape Chignecto<sup>13</sup>. Other scientists have defined the Gulf of Maine in similar terms<sup>14</sup>.

73. The entire Scotian Shelf from Cape Canso to Cape Sable has never been considered by geographers or scientists to form part of the

<sup>12</sup> H. B. Bigelow: "Physical Oceanography of the Gulf of Maine." *Bulletin of the United States Bureau of Fisheries*, Vol. XL, Part II, 1924, p. 518; *United States Memorial, Documentary Annexes*, Vol. II, Annex 33. Bigelow's terminology for the various channels differs from current usage. The "South Channel" is now the Great South Channel, the "Eastern Channel" is the Northeast Channel, and the "Northern Channel", which is simply the area between Browns Bank and the shoals lying off Cape Sable, does not carry a specific appellation. *Counter-Memorial, Annexes*, Vol. IV, Annex 13.

<sup>13</sup> This definition does not include the upper reaches of the Bay of Fundy where the bay divides into two arms, Chignecto Bay and Minas Basin.

<sup>14</sup> See, for example, D. Merriman: "The History of Georges Bank", in G. McLeod and J. Prescott, eds.: *Georges Bank. Past, Present and Future of a Marine Environment*. Boulder, Colorado, Westview Press, 1982, pp. 11-13; J. B. Colton, W. G. Smith, A. W. Kendall, P. L. Berrien and M. P. Fahay: "Principal spawning areas and times of marine fishes, Cape Sable to Cape Hatteras." *Fishery Bulletin*, Vol. 76, 1979, pp. 911-915.

Gulf of Maine area. Nor has the United States ever suggested previously that it formed part of the area relevant to the delimitation. The United States Memorial's inclusion of the entire Scotian Shelf as part of the Gulf of Maine area, therefore, comes as a complete surprise. Canada does not accept that the Scotian Shelf — except the southwestern portion — constitutes part of the area relevant to this delimitation.

74. In addition to physical geography, Canada considers that *human or socio-economic geography must be taken into account in defining the relevant area*<sup>15</sup>. The United States Memorial appears to agree, for it states that the identification of the relevant area involves a determination of "all of the geographical factors that are themselves relevant or are the situs of relevant resources or activities"<sup>16</sup>. This approach has its basis both in geography and in law. Geography employs physical and human criteria to define regions<sup>17</sup>, and the Court has repeatedly stressed the importance of the maxim "the land dominates the sea"<sup>18</sup>. Man inhabits the land, and it is only from bases on land that he can exploit the resources of the sea and the seabed. Since the issue before the Court concerns precisely the sovereign right to explore these areas and exploit their resources, it is only appropriate to include within the relevant area those coastal communities from which they are or will be exploited.

75. As explained in the *Canadian Memorial*, the United States ports from which significant fishing operations are conducted on Georges Bank extend along the Atlantic coast as far as Newport, Rhode Island<sup>19</sup>. Moreover, any United States exploitation of hydrocarbon resources on Georges Bank would also be conducted mainly from ports situated in Massachusetts and Rhode Island (see paragraph 161). Accordingly, that stretch of the United States coast westward to Newport — like the corresponding stretch of the Nova Scotia coast between Cape Sable and Lunenburg — should be included in the area within which the relevant circumstances in this case may be found.

76. Except for contextual purposes, coastal and sea areas other than those identified in this section should be excluded from further consideration, since they are irrelevant to the issue before the Court.

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<sup>15</sup> *Canadian Memorial*, p. 27, paras. 29-32; p. 29, para. 35; pp. 32-36, paras. 46-63; p. 133, paras. 316-318; p. 153, para. 369.

<sup>16</sup> *United States Memorial*, p. 145, para. 258.

<sup>17</sup> See, for example, R. Hartshorne: "The Nature of Geography: A Critical Survey of Current Thought in the Light of the Past." *Annals of the Association of American Geographers*, Vol. XXIX, Nos. 3 and 4, 1939, pp. 1-469. See especially pp. 296-302; *Counter-Memorial, Annexes*, Vol. IV, Annex 5; R. Chorley, ed.: *Directions in Geography*. London, Methuen, 1974.

<sup>18</sup> *I.C.J. Reports 1969*, p. 51, para. 96; *Anglo-French Continental Shelf award*, p. 51, para. 77; *I.C.J. Reports 1982*, p. 61, para. 73.

<sup>19</sup> *Canadian Memorial*, p. 27, para. 32; p. 34, para. 53; p. 36, paras. 62-63; pp. 146-147, paras. 353-354.

## B. THE MACROGEOGRAPHICAL CONTEXT

77. The function of a survey of the macrogeographical situation is to place the area to be delimited in its proper context and *not* to indicate the factors relevant to the delimitation. These factors, once again, can only be found within the relevant area.

78. The United States Memorial begins with a discussion of macrogeography from which the United States attempts to extract conclusions central to its argument<sup>20</sup>. Part III of the United States Memorial opens with the statement that “an equitable delimitation must respect the broad geographical relationship of the Parties<sup>21</sup>”. No authority is cited, and no legal reasoning is adduced in support of this novel proposition. On the contrary, all the jurisprudence surveyed in the United States Memorial emphasizes the *particular* geographical situation in the *relevant* area. Indeed, the Court in the *Tunisia-Libya Continental Shelf* case laid heavy stress on the need to define the extent of the area relevant to a particular delimitation, so that the relevant circumstances themselves can be identified<sup>22</sup>.

79. The United States Memorial extracts from its discussion of macrogeography three elements to which it attaches legal relevance:

“... the general northeastern direction of the coast ... the adjacency of the two States — Canada to the north and the United States to the south of the common land boundary — and ... the location of the international boundary terminus in the northeastern corner of the Gulf of Maine<sup>23</sup> ...”

80. The geography of the Gulf of Maine area is inimical to the geographical premises on which the United States boundary proposal is based. Hence the appeal to macrogeographical factors extraneous to the delimitation. By concentrating on generalized continental-scale phenomena<sup>24</sup>, the United States seeks to minimize the importance of the particular situation in the Gulf of Maine area and to blur or brush aside matters properly relevant to the issue before the Court, namely: (i) the juxtaposition of the territories of the two States and the general direction of the land boundary in the region bordering the relevant area; (ii) the position of the terminal point of the established international boundary, relative to the agreed starting point of the maritime boundary to be

<sup>20</sup> *United States Memorial*, pp. 11-19, paras. 20-24.

<sup>21</sup> *United States Memorial*, p. 169, para. 280.

<sup>22</sup> *I.C.J. Reports 1982*, p. 41, paras. 32-35; pp. 60-62, paras. 72-75; p. 82, para. 114.

<sup>23</sup> *United States Memorial*, p. 169, para. 280.

<sup>24</sup> Appeals to continental-scale phenomena must be suspect as being *prima facie* productive of distortions. The total land area shared by Canada and the United States on the North American continent is 19,321,326 square kilometres, compared to a land area of 4,895,442 square kilometres for the whole of Europe (exclusive of the Soviet Union). The Canada-United States boundary from the Strait of Juan de Fuca on the Pacific to the Gulf of Maine on the Atlantic stretches some 6,416 kilometres. The east coast of North America from Cape Race, Newfoundland, to Miami, Florida, is 1,897 nautical miles. Such a vast expanse cannot be relevant to a delimitation in the Gulf of Maine area.

delimited by the Court; (iii) the general configuration of the coasts, including their direction; and (iv) their opposite or adjacent relationship to each other relative to the maritime area to be delimited.

### C. THE LAND BOUNDARY

#### *1. The Direction of the Land Boundary and the Juxtaposition of the Territories of the Parties*

81. The United States Memorial states that "Canada lies north of the United States, except for the state of Alaska", and that the "principal international boundary extends from the Pacific Ocean to the Atlantic Ocean in a generally west-to-east direction<sup>25</sup>". While these are valid continental-scale generalizations, they are inapplicable to many particular regions. Alaska, of course, lies north and west of Canada, and again there is no reason why this vast area should be excluded from the macro-geographical context. Alaska apart, however, the continental relationship is controlled by the 49th parallel of latitude which runs due east for 2,044 kilometres from the Strait of Juan de Fuca to the Lake of the Woods. Thereafter, except for a segment of 249 kilometres, the 6,416-kilometre boundary does *not* run in an east-west direction. Instead, it takes on a southerly orientation as it passes through Lake Superior, Lake Huron, Lake St. Clair, and into Lake Erie, where it lies south of latitude 42°N. The boundary then takes on an east-northeast orientation as it passes through Lake Erie and Lake Ontario and into the St. Lawrence River. Between longitude 75°W to 71°30'W, it runs east-west along the 45th parallel. From longitude 71°30'W and 68°W, it runs generally northeast. Thereafter, it adopts a north-south orientation and follows the St. John river system, the meridian of 67°47'W longitude, and the St. Croix River to the sea.

82. The course of the land boundary across the continent is such that large parts of Canada lie latitudinally south of large parts of the United States. The most southerly point of Canadian territory is Middle Island in Lake Erie at latitude 41°41'N. More than 30 percent of the United States land mass, excluding Alaska, lies north of this parallel, including the capitals of 17 states of the United States and such populous cities as Seattle (47°36'N), Minneapolis (44°58'N), Milwaukee (43°03'N), Chicago (41°50'N), Detroit (42°22'N), Buffalo (42°54'N), and Boston (42°18'N). By the same token, substantial parts of Canada and more than 70 percent of its population — 17 million people — lie to the south of parts of the United States, that is to say, south of the 49th parallel [Figure 4].

83. A consequence of the boundary configuration is that several Canadian and United States regions have an east-west or west-east juxtaposition. The southern part of Vancouver Island, including the capital city of British Columbia, lies west of upper Washington state. The whole of southern Ontario, including both Canada's largest city (Toronto) and

<sup>25</sup> *United States Memorial*, p. 11, para. 20.

Canada's capital, lies east of the state of Michigan. All of southern Quebec, including Montreal and the city of Quebec, lies west of the state of Maine. More to the point, the Maritime Provinces — New Brunswick, Nova Scotia and Prince Edward Island — lie east of the New England states.

84. The description of the Canada-United States land boundary in the United States Memorial betrays a startling omission, namely that segment of the New Brunswick-Maine boundary that runs in a north-south direction for 152 kilometres<sup>26</sup>. This segment includes the "due north" line that is the oldest part of the Canada-United States boundary and that figured in the 1621 Charter by which James I granted Nova Scotia to Sir William Alexander; in the Treaty of Paris of 1763 by which France ceded its possessions in Canada; and in the Treaty of Paris of 1783 that ended the War of American Independence<sup>27</sup>. After 1783, the New Brunswick-Maine boundary continued to figure prominently in a long and complex diplomatic history, including six treaties under which disputes were resolved by means of bilateral commissions, and one international arbitration<sup>28</sup>.

85. The "due north" line, which follows longitude 67°47' W, controls the north-south orientation of the land boundary in the Gulf of Maine area. From the southern end of the "due north" line, the boundary follows the St. Croix River to the sea at Passamaquoddy Bay, which lies 113 kilometres to the southeast. At this point the boundary becomes essentially a mid-channel line. It passes between Canadian and United States islands in Passamaquoddy Bay before turning southwest into Grand Manan Channel. It terminates at a point equidistant (3 nautical miles) from either coast, where Canada (Grand Manan Island) lies southeast of the United States.

86. The "due north" line controls the regional east-west relationship of the Maritime Provinces and the New England states in the same manner as the 49th parallel controls the continental north-south orientation of Canada and the United States. To the extent that the juxtaposition of the land territories and the direction of the land boundary are relevant to the determination of the maritime boundary in the Gulf of Maine area, it is the east-west relationship of the Maritime Provinces and the New England states, and the north-south orientation of the boundary between them, that constitute relevant factors.

## *2. The International Boundary Terminus and the Point of Commencement of the Single Maritime Boundary*

87. The Court in the *Tunisia-Libya Continental Shelf* case identified the position of the terminus of the land frontier established by a convention between the Parties, as "a circumstance of considerable relevance", providing an agreed and "basic point of reference" for the

<sup>26</sup> *United States Memorial*, p. 11, para. 20.

<sup>27</sup> *Canadian Memorial*, pp. 29-31, paras. 36-41.

<sup>28</sup> *Canadian Memorial*, p. 31, para. 42.



delimitation<sup>29</sup>. In the present case, there are two agreed points of reference: the terminus of the international boundary at 44°46'35.346"N, 66°54'11.253"W, established in the Treaty of Washington of 1925, and the point of commencement of the single maritime boundary to be determined by the Court at 44°11'12"N, 67°16'46"W, established in the Special Agreement (Point "A"). The relevant factor is the relationship between the two agreed points. The final direction taken by the international boundary before its terminal point in Grand Manan Channel is southwest (214°41'). The starting point of the maritime boundary to be delimited by the Court lies 38.9 nautical miles south-southwest (204°33') of the terminal point [Figure 5]. The position of the agreed starting point of the maritime boundary relative to the international boundary terminus suggests that both Parties considered the controlling coasts in this area to be, first, the coasts of Maine and of Grand Manan Island, New Brunswick, and then the coasts of Maine and of Nova Scotia. If the Parties had considered that the laterally aligned coasts of Maine and of Campobello Island and mainland New Brunswick should control the delimitation, they would logically have had to place the agreed starting point, not southwest of Grand Manan Island but in the vicinity of the "perpendicular to the general direction of the coast at the international boundary terminus" illustrated in Figure 27 of the United States Memorial.

88. The relationship between the two agreed points also constitutes evidence of the assumptions of the Parties regarding the general orientation of the maritime boundary to be established by the Court. The starting point of the boundary was fixed on the basis of the lines claimed by the Parties at the time of signature of the Special Agreement. These claimed lines were oriented in a general southwesterly direction: from Point "A", the Canadian line ran, as it does still, south and then southwest until it reached the seaward rim of the Gulf (approximately the 100-metre contour on Georges Bank), while the United States claim ran in a southwesterly direction until it reached the central part of the Gulf [Figure 1]. Thus, the position of the agreed point of commencement in relation to the international boundary terminus reflects the common view of the Parties, at the time of signature and ratification of the Special Agreement, that the boundary inside the Gulf of Maine itself should run in a general southwesterly direction.

89. The United States alleges that the international boundary terminus lies in the "northern corner" of the Gulf of Maine and seeks to draw conclusions of fact and law from this contention<sup>30</sup>. The obvious purpose of this allegation is to exclude from consideration for certain purposes the long Canadian coast on the Bay of Fundy. By excluding this very substantial part of the coastline of the Gulf of Maine, the United States is able to conclude that "only the short coast of the Nova Scotia peninsula on the northeast side of the Gulf is Canadian<sup>31</sup>", and to

<sup>29</sup> *I.C.J. Reports 1982*, pp. 64-65, paras. 81-82; p. 66, para. 85.

<sup>30</sup> *United States Memorial*, p. 169, para. 280; p. 170, para. 284; p. 174, para. 290.

<sup>31</sup> *United States Memorial*, p. 173, para. 284.

find that the Canadian coastline is convex and the United States coastline concave. However, these contentions are inconsistent with the facts, even as presented in the United States Memorial, which states that:

“From the international boundary terminus, the Canadian coastline, like the eastern seaboard, follows a northeastern direction until it reaches the 17-mile (27-kilometer) wide Chignecto Isthmus, 147 miles (237 kilometers) to the northeast . . . There, the Canadian coastline changes direction dramatically<sup>32</sup>.”

“In both [the Gulf of Maine and *Tunisia-Libya Continental Shelf*] cases, the land boundary reaches the sea at a point where the coastline is relatively straight, but where there is a sharp change in direction further along the coast. In this case, the change occurs 147 miles (237 kilometers) from the international boundary terminus, at the Chignecto Isthmus<sup>33</sup>.”

It is impossible to reconcile the statement that the international boundary terminus is located in the “northern corner” of the Gulf with the statements that the boundary reaches the sea at a point where the coastline is relatively “straight” and that the coastline does not change direction until it reaches a point 237 kilometres to the northeast. How can the international terminus be located, at one and the same place, in a “corner” and on a relatively “straight” coast, and how can this point be the “northern” corner if the coastline changes direction only 237 kilometres *further to the northeast*? It is on geographical riddles such as these that the United States bases its argument.

#### D. THE GENERAL DIRECTION OF THE COASTS

##### 1. *Arbitrary Points and Parallel Lines*

90. The United States tactic of distracting attention from the actual geographical situation in the relevant area by introducing extraneous continental-scale factors is especially evident in its portrayal of the general direction of the coasts of the Parties. The vast expanse of the territories and coasts of Canada and the United States makes this case particularly susceptible to such a stratagem.

91. Apart from the practical irrelevance of the general direction of the continental coast to the general direction of the coasts within the relevant area, the technique used by the United States to establish this continental general direction is contrary to geographical logic and to the express terms of the Special Agreement. Article IV of the Special Agreement provides that:

<sup>32</sup> *United States Memorial*, p. 19, para. 26.

<sup>33</sup> *United States Memorial*, pp. 173-174, para. 288.

“... the Parties in their presentations to the Chamber shall utilize the following technical provisions:

.....  
 (b) All straight lines shall be geodetic lines.”

The lines used by the United States to connect “primary coastal features” and establish the general direction of the coasts are not geodetic lines but loxodromes, that is to say, straight or rhumb lines drawn on a Mercator projection<sup>34</sup>. Geodetic lines can only be represented on a Mercator projection by means of curved lines. Contrariwise, geodetic lines appear as straight lines, and loxodromes as curved lines, on a Lambert conformal projection. The Parties agreed on the technical provisions contained in Article IV of the Special Agreement in order to avoid precisely the kind of geographical distortion resulting from the United States’ portrayal of the general direction of the coasts. While the distortions produced by the use of loxodromes on Mercator projections are small over distances such as those prevailing in the Gulf of Maine area, they are substantial on the macrogeographical scale utilized by the United States.

④9 To illustrate these distortions, *Figure 6* shows the United States directional lines as curved lines — geodetic lines — on the same Lambert conformal projection that was used to illustrate the general direction of the coast in the Canadian Memorial<sup>35</sup>. The Lambert conformal is a conic projection which very largely eliminates the scale distortion inherent in a chart based on the Mercator projection.

92. The technique employed in the *United States Memorial* can be used to produce almost any result. The United States has evidently fixed on a proposed boundary line — a line connecting Point “A” with the extreme northeastern angle of the triangle described in the Special Agreement — and has then selected a number of points on the North American coast on the sole criterion that parallel lines joining these points are roughly perpendicular to the boundary line proposed by the United States<sup>36</sup>. No other rationale for the selection of these points is provided, and none emerges from careful analysis of the *United States Memorial*. Of the 23 “primary coastal features” mentioned or illustrated, five are ports, 12 are capes or headlands, two are general regions (South Florida and North Florida), three are islands, and one is an isthmus. Some of the points, such as Cape Race, Cape Sable and Cape Hatteras, are situated on a convex portion of the coast, while others, such as the Chignecto Isthmus, Cape Charles and North Florida, lie in concave segments of the coast. The method of joining these points demonstrates the same rationale as their selection: the production of a pre-determined result. The arbitrary nature of the methodology is

<sup>34</sup> For a technical explanation of these lines see R. D. Hodgson and E. J. Cooper: “The Technical Delimitation of a Modern Equidistant Boundary.” *Ocean Development and International Law Journal*, Vol. 3, 1976, p. 361; *Counter-Memorial, Annexes*, Vol. IV, Annex 6.

⑦ <sup>35</sup> *Canadian Memorial*, p. 23, Figure 7.

<sup>36</sup> *United States Memorial*, pp. 11-12, para. 21 and footnote 2; p. 170, para. 283 and footnote 7.

perhaps best demonstrated by the fact that two of the points mentioned — Boston and Yarmouth — are said to lie along a bearing of  $56.9^\circ$ <sup>37</sup>,  
 (50) when in fact they lie along a bearing of  $67.2^\circ$  [Figure 7].

93. The United States itself at one stage concedes the irrelevance of a continental-scale approach to the determination of the general direction of the coast within the relevant area, when it states that the azimuth between South Florida and Cape Race “would be advantageous to the United States but is determined by points outside the relevant area in this case<sup>38</sup>”. Of the 23 points used by the United States to determine the general direction of the coast, 11 lie outside the relevant area as defined by the United States.

94. Whatever may be its geographical or legal relevance, the determination of a precise general direction of the coast on a continental scale is an exercise fraught with difficulty. In most areas it will be necessary to establish several such directions — the east coasts of North and South America and the west coast of Africa are clear examples. The line from Cape Race to South Florida, which the United States puts forward as indicating “the broad geographical relationship of the Parties on the east coast of North America”, in fact passes some 388 nautical miles seaward of the coast off Long Island, New York. This clearly suggests that the North American coast changes its general direction in the vicinity of Long Island (as was pointed out in the Canadian Memorial<sup>39</sup>). The macrogeographical general direction of the North American coast from Long Island to Cape Race — represented by a geodetic line that  
 (49) passes through Cape Cod and Cape Sable — is  $67^\circ$  [Figure 6].

95. Five of the 12 points identified by the United States, and lying within the relevant area as defined by the United States, are ports and therefore cannot be described as “primary coastal features”, in that their situation is unrelated to the general configuration of the coast. Two points — Cape Canso and Sable Island — cannot be linked to any other point within the relevant area. Sable Island lies 86 nautical miles seaward of the mainland coast of Nova Scotia. The line that is supposed to define the direction of the northern coast of the Gulf of Maine commences at Cape Ann on the western shore of the Gulf,  $57\frac{1}{2}$  nautical miles southwest of Cape Elizabeth, where the coast begins to veer southward from its general northeast-southwest direction. This line does not strike land until Ross Island, 23 nautical miles off the mainland coast of New Brunswick, and does not touch the mainland coast until it reaches Point Wolfe, 297 nautical miles from its point of commencement at Cape Ann. This last-mentioned line, like the other United States lines purporting to represent the general direction of the coast, runs away from, rather than parallel to, the actual general direction of the coast. The only consistent fact about these lines is that — except for the Boston to Yarmouth line — they are all oriented approximately  $54^\circ$  from true north, which suggests that they were chosen for this reason alone.

<sup>37</sup> *United States Memorial*, p. 11, footnote 2.

<sup>38</sup> *United States Memorial*, p. 170, footnote 7.

<sup>39</sup> *Canadian Memorial*, p. 21, para. 19.

96. An examination of a map of appropriate scale shows that, in fact, there is no single general direction of the coast within the relevant area [Figure 7]. As the United States emphasizes, the Canadian coast changes direction at least four times within the relevant area<sup>40</sup>. The United States Memorial, however, takes quite another view of the United States coastline in the relevant area: this coastline does not “change direction” but only “curves<sup>41</sup>”. Because the distinction between the general and the particular is a matter of scale and of judgment, the determination of the general direction of the coast is a question of interpretation rather than objective scientific fact. The Canadian coastline appears to change its general direction four times within the Gulf of Maine: twice at the head of the Bay of Fundy, and again at Digby and at Cape St. Marys. The United States coastline appears to change its general direction twice within the Gulf: at Casco Bay or its western entrance (Cape Elizabeth) and again at Boston. At the entrance points of the Gulf — Cape Sable and Cape Cod-Nantucket — the coastlines of both countries turn at approximately right angles to the northeast and southwest and continue in these directions until they extend beyond the relevant area. The fact that the coastline appears to change its general direction eight times attests to the complexity of the geography in the Gulf of Maine area.

97. The difference between the Canadian and United States approaches to the determination of the general direction of the coasts is partly a function of scale. These differences of scale are symptomatic of the Parties’ approaches to geography in this case. The United States’ argument — and ultimately its method and proposed line — rests on the unstated premise that the relevant area is the east coast of North America from Newfoundland to Florida, whereas the Canadian argument, method and line rest on the premise that the area relevant to the delimitation is the Gulf of Maine area, which extends approximately from Lunenburg, Nova Scotia to Newport, Rhode Island.

## 2. *The False Hierarchy of Coasts*

98. The United States’ argument slips almost imperceptibly from the premise that there is a single general direction of the North American coast from Newfoundland to Florida, to the premise that there is also a single general direction of the coast within the relevant area, both happily coinciding at 54°. According to the United States, the only coast in the Gulf of Maine area which is at odds with this single general direction is the “short” Nova Scotia coast from Brier Island to Cape Sable, which runs perpendicular to the continental trend and is therefore characterized as a “secondary coast” and an “irregularity<sup>42</sup>”. The United States coastline from Cape Elizabeth to Cape Ann is somehow folded into the 54° general direction, and the coast from Cape Ann to Cape

<sup>40</sup> *United States Memorial*, p. 19, para. 26; p. 173, para. 287.

<sup>41</sup> *United States Memorial*, p. 20, para. 27; p. 174, para. 290.

<sup>42</sup> *United States Memorial*, p. 19, para. 26; p. 20, para. 29; p. 173, paras. 286-287.

Cod is conveniently omitted from the narrative and diagrammatic analysis of the relevant geographical circumstances contained in Part III of the United States Memorial<sup>43</sup>.

99. The concept of primary and secondary coasts is central to the United States view of the relevant geography and to the United States method of delimitation. These terms appear to be new to the literature of maritime delimitation and are not explained in the United States Memorial. In physical geography and geology they refer to eroded and uneroded shorelines<sup>44</sup>. This, however, does not appear to be the sense in which they are used in the United States Memorial, where they seem to distinguish between segments of coast that run roughly parallel and segments that run roughly perpendicular to a continental-scale general direction of the coast<sup>45</sup>. The United States does not explain the geographical significance of this distinction but is perfectly clear about what it sees as its legal consequences: where the maritime extensions of a "primary" and "secondary" coast overlap, the claims of the "primary coast" are to prevail<sup>46</sup>. According to this theory, the relative distance between each coast and the disputed maritime area do not appear to have any bearing upon the respective claims of the two coasts.

100. The principle inherent in the distinction proposed by the United States, if accepted by the Court, would represent a radical departure from the existing law of maritime jurisdiction, with far-reaching consequences for boundary delimitation. Whereas all coasts that have been given equal treatment by nature have until now been given equal treatment by law in the spatial extent of the zones they "generate", this new United States doctrine would provide for unequal — and inequitable — treatment of coasts and of coastal States. The criterion for such unequal treatment would be the orientation of the relevant coasts in relation to a continental-scale general direction.

101. There is an apparent contradiction in the United States position in this regard. The United States Memorial insists on the necessity of defining a relevant area in order to determine the circumstances relevant to the delimitation<sup>47</sup>. Within the Gulf of Maine area, however — even as arbitrarily defined in the United States Memorial — the coast of southwest Nova Scotia cannot be seen as having the deviant character and secondary status which it is assigned<sup>48</sup>. In that area — the legally relevant area — it is as much a part of the natural order as any other segment of the coast and is equally entitled to a maritime zone.

<sup>32</sup> <sup>43</sup> *United States Memorial*, p. 170, para. 283 and footnote 7; p. 171, Figure 26; p. 193, Figure 31.

<sup>37</sup> <sup>44</sup> See, for example, F. P. Shepard and H. R. Wanless: *Our Changing Coastlines*. New York, McGraw-Hill, 1971, p. 7; *Counter-Memorial, Annexes*, Vol. IV, Annex 7.

<sup>45</sup> *United States Memorial*, pp. 191-192, para. 309.

<sup>37</sup> <sup>46</sup> *United States Memorial*, pp. 191-193, paras. 308-311; p. 193, Figure 31.

<sup>47</sup> *United States Memorial*, p. 145, para. 258.

<sup>48</sup> *United States Memorial*, p. 191, para. 309.

**Section II. Apart from the Protrusion of Cape Cod and Nantucket, the Coasts of the Parties Exhibit an Overall Balance in Their Configuration, Length and Predominantly Opposite Relationship**

**A. OPPOSITE OR ADJACENT COASTS**

102. International jurisprudence has distinguished between States with opposite and adjacent coasts, and has noted the relevance of this distinction for the choice and application of methods to arrive at an equitable delimitation. The Court in the *North Sea Continental Shelf* cases stated that:

“Most of the difficulties felt in the International Law Commission related, as here, to the case of the lateral boundary between adjacent States. Less difficulty was felt over that of the median line boundary between opposite States, although it too is an equidistance line. For this there seems to the Court to be good reason. The continental shelf area off, and dividing, opposite States, can be claimed by each of them to be a natural prolongation of its territory. These prolongations meet and overlap, and can therefore only be delimited by means of a median line; and, ignoring the presence of islets, rocks and minor coastal projections, the disproportionately distorting effect of which can be eliminated by other means, such a line must effect an equal division of the particular area involved . . . This type of case is therefore different from that of laterally adjacent States on the same coast with no immediately opposite coast in front of it, and does not give rise to the same kind of problem — a conclusion which also finds some confirmation in the difference of language to be observed in the two paragraphs of Article 6 of the Geneva Convention . . . as respects recourse in the one case to median lines and in the other to lateral equidistance lines, in the event of absence of agreement<sup>49</sup>.”

The Court in the *Tunisia-Libya Continental Shelf* case also noted the significance of the distinction between opposite and adjacent coasts for an equitable delimitation<sup>50</sup>.

103. The United States Memorial contends that Canada and the United States are “adjacent States across the entire North American continent”, that “the broad relationship of the coasts of the Parties within the Gulf of Maine is that of adjacent States”, and that “the relationship of the United States and Canadian coasts is also adjacent seaward of the Gulf of Maine<sup>51</sup>”. The language used suggests that the United States appreciates the significance of the distinction between adjacent or opposite *States*, on the one hand, and adjacent or opposite *coasts*, on the other, but has not found it in its interest to apply this

<sup>49</sup> *I.C.J. Reports 1969*, p. 36, para. 57.

<sup>50</sup> *I.C.J. Reports 1982*, p. 63, para. 78; p. 88, para. 126.

<sup>51</sup> *United States Memorial*, p. 169, para. 281.

distinction to the present case. Faced with a comparable geographical situation, the Court of Arbitration in the *Anglo-French Continental Shelf* award carefully analysed this issue<sup>52</sup> and concluded that:

“The emphasis placed in the *North Sea Continental Shelf* cases on the difference between the situations of ‘opposite’ and ‘adjacent’ States reflects not a difference in the *legal* regime applicable to the two situations but a difference in the *geographical* conditions in which the applicable legal regime operates<sup>53</sup>.”

“The appreciation of the effect of individual geographical features on the course of an equidistance line has necessarily to be made by reference to the actual geographical conditions of the particular area of continental shelf to be delimited and to *the actual relation of the two coasts to that particular area*<sup>54</sup>.” [*Italics added.*]

104. Conventional law also emphasizes the actual relationship of the coasts. Article 6(2) of the 1958 Convention on the Continental Shelf refers to “the territories of two or more States whose *coasts* are opposite each other . . .” [*Italics added*]. Again, Article 83(1) of the 1982 Convention on the Law of the Sea refers to “the delimitation of the continental shelf between States with opposite or adjacent *coasts* . . .” [*Italics added*]. Thus, it is not the juxtaposition of States that is material, but rather the *geographical situation of their coasts relative to the area to be delimited*.

105. Viewed in this light, the statement in the United States Memorial that “the United States and Canada are adjacent States across the entire North American continent”, while technically accurate, is either meaningless or misleading in the context of maritime delimitation. It is to be doubted, for example, that Canada and the United States were considered “adjacent States” for the purposes of delimitation when the boundaries between them were established in Juan de Fuca Strait, in the Great Lakes, or in Grand Manan Channel. Rather, it was the actual (and generally opposite) relationship of the coasts in each particular area that influenced the course of those boundaries. In the present case, therefore, what is geographically and legally significant is the actual relationship of the coasts of the Parties in the Gulf of Maine area to each other and to the area to be delimited.

106. Logic alone suggests that there must be some element of opposition between the coasts that form the sides of any gulf or embayment. The United States Memorial admits as much where it states that:

“The location of the Nova Scotia peninsula *opposite* the international boundary terminus and the curvature of the New England coast combine to create the coastal concavity that is the Gulf of Maine<sup>55</sup>.” [*Italics added.*]

<sup>52</sup> *Anglo-French Continental Shelf* award, pp. 55-60, paras. 87-97; pp. 111-113, paras. 237-242.

<sup>53</sup> *Anglo-French Continental Shelf* award, p. 112, para. 238.

<sup>54</sup> *Anglo-French Continental Shelf* award, p. 113, para. 240.

<sup>55</sup> *United States Memorial*, p. 174, para. 290.



A glance at the map confirms that the coasts of Grand Manan Island and Maine, Nova Scotia and Maine, and Nova Scotia and Massachusetts, lie opposite each other. Furthermore, the relationship of the agreed starting point of the maritime boundary to the terminus of the international boundary suggests a common view of the Parties that the course of the maritime boundary in the innermost area should be governed by the predominantly opposite coasts of Maine and of Grand Manan Island and Nova Scotia.

107. If the relationship between the coasts inside the Gulf of Maine is predominantly one of oppositeness, the situation in the area seaward of the Gulf is less clear-cut. The Canadian Memorial stated that while "at the threshold of the outer area and just beyond . . . the coasts are truly opposite . . . the geographical situation in the more seaward portions of the outer area is a complex one that combines elements of both oppositeness and adjacency, in varying degree<sup>56</sup>".

108. The difficulty of analysing a situation such as that which exists in the area seaward of the Gulf of Maine derives not from the relationship between the coasts themselves, but rather from the geographical relation of the coasts to each other *vis-à-vis the marine area to be delimited*. For, as the Anglo-French Court of Arbitration stated, "in determining whether two States are to be considered as 'opposite' or 'adjacent', for the purpose of delimiting a continental shelf on which each of them abuts, the Court must have regard to their actual geographical relation to each other and to the continental shelf at any given place along the boundary<sup>57</sup>".

109. Where a mixed situation exists, the balance between the elements of oppositeness and adjacency need not be left to approximation; the relationship between two coasts and the marine area off or between them can be precisely assessed by means of mathematical analysis. While this relationship between three locations can be analysed mathematically only in terms of specific points or *loci*, the findings can be extrapolated and applied to the general relationship between the coasts and the marine area to be delimited, to the extent that the points chosen for analysis are representative. One method of applying the analysis — but by no means the only one — is between points along an equidistance line and the basepoints on the coasts controlling the course of the line.

110. The logic of the geometrical analysis is directly based on the meaning of "opposite" and "adjacent" as descriptions of relative orientation, and therefore this analysis makes use of angles. The relationship of perfect oppositeness between two points (*A* and *B*) on opposite coasts relative to a third point (*C*) in the sea area directly between them — that is, along a straight line joining Points *A* and *B* — is represented by means of a relative angle of 180° [Figure 8]. Conversely, a relationship of ideal or perfect adjacency between two points (*A* and *B*) on neighbouring laterally related straight coasts — which for the purpose of analysis will be shown as coincident point *AB* — and a third point (*C*) lying directly in front

<sup>56</sup> *Canadian Memorial*, pp. 142-143; paras. 343-345.

<sup>57</sup> *Anglo-French Continental Shelf* award, p. 58, para. 94.

of the land boundary terminus is represented by a relative angle of  $0^\circ$  between the two coincident lines *AC* and *BC* [Figure 9].

111. Where the elements of oppositeness and adjacency are mixed, as where the area to be delimited lies *off* rather than *between* two opposite coasts, the relationship is represented by a relative angle between  $0^\circ$  and  $180^\circ$ . In particular, if the relative angle is midway between  $180^\circ$  and  $0^\circ$ , that is, an angle of  $90^\circ$  (a right angle), it is logical to regard the elements of oppositeness and adjacency as equal at that point [Figure 10, relative angle at *D*]. Where the element of oppositeness exceeds that of adjacency, the relationship is represented by a relative angle of more than  $90^\circ$  (an obtuse angle); the more open or obtuse the angle, the more the element of oppositeness predominates [Figure 10, relative angle at *C*]. Conversely, in a mixed situation where the element of adjacency is greater, the relationship is represented by a relative angle of less than  $90^\circ$  (an acute angle); the more closed or acute the angle, the more the element of adjacency predominates [Figure 10, relative angle at *E*].

112. Where the sea area to be delimited lies *off* two opposing coasts, there is a definite region in which the relative angle formed by lines from any point in the sea to the most proximate points on the two coasts will be obtuse. This zone of oppositeness is bounded by a semi-circle having as diameter the straight line joining the two coastal points [Figure 10]. Seaward of the semi-circle lies an indefinite zone of adjacency in which the relative angle formed by lines from any point in the sea to the two coasts will be acute. The further out to sea one moves the point from which the relative angle is subtended, the more acute the angle and the more the element of adjacency predominates.

113. The application of this mathematical analysis to the area seaward of the Gulf of Maine demonstrates that the relationship of the abutting coasts of Nova Scotia and Massachusetts vis-à-vis the area to be delimited is predominantly opposite across most of Georges Bank [Figure 11]. This conclusion holds true whether the analysis is applied to the Canadian equidistance line and the basepoints used to determine its course (Seal Island and the Cape Cod Canal); to Cape Sable and Nantucket Island, Cape Cod, or the Cape Cod Canal; or more generally to equivalent points on the coasts of both Parties abutting the outer area. This shows that the Canadian equidistance line basepoints, situated at the hinge points of the coastal wings of the Gulf of Maine, are representative of the coasts that abut the outer area and representative also of their relationship to each other and to Georges Bank.

## B. THE GENERAL CONFIGURATION OF THE COASTS

### 1. Concavity and Convexity

114. "The general configuration of the coasts of the Parties, as well as the presence of any special or unusual features" was the first of the relevant factors identified by the Court in its judgment in the *North Sea Continental Shelf* cases. The Court emphasized, in particular, the significance of concave and convex configurations<sup>58</sup>. While the stress

<sup>58</sup> *I.C.J. Reports 1969*, p. 17, para. 8; p. 49, para. 89; p. 50, para. 91.

placed on these factors was partly a function of the particular geographical situation, there is no doubt that certain juxtapositions of concave and convex coasts can be productive of inequity when particular methods of delimitation are used.

115. The United States has laid great emphasis on the alleged inequitable effects of the concavity or curvature of the New England coast in relation to the convexity or "protrusion" of the Nova Scotia coast<sup>59</sup>. Since in the United States lexicon convexity *perpetrates* inequity, while concavity *suffers* inequity, the United States Memorial never suggests that the United States coast in the relevant area has convex configurations or that the Canadian coast has concave configurations.

116. The Gulf of Maine constitutes one of the four major embayments or concavities along the North American coast (between Cape Race and Cape Breton, Cape Sable and Cape Cod, Cape Cod and Cape Hatteras, and Cape Hatteras and Miami). It lies between two convexities, namely Nova Scotia and southern New England. While the protrusion of southeastern New England has a less pronounced configuration than Nova Scotia, its practical effect on the geography of the Gulf of Maine area is the same: the segment of coast from Boston to the Cape Cod Canal is roughly perpendicular to the coast from Casco Bay to the head of the Bay of Fundy and parallel to the Canadian coast from Cape St. Marys to Cape Sable. While this protrusion of the New England coast seaward and away from the continental-scale general direction begins at Cape Elizabeth, it is especially pronounced southeast of Boston. Although it can be defined in various ways — by a line from Portland to New York City, or simply by extending the general direction line in Figure 26 of the United States Memorial<sup>60</sup> beyond Cape Ann to New York City — the protrusion is most pronounced south and east of Boston and Providence and may be delineated by extending the line of the general direction of the coast from Cape Elizabeth to Boston until it intersects the coast of Rhode Island on Narragansett Bay [*Figure 7*].

117. The concave and convex features of the United States coast are matched by comparable configurations on the Canadian side. Despite its preoccupation with concavities, the United States Memorial never uses the term to describe the Bay of Fundy, even though it is the most markedly concave major coastal feature in the area. This oversight is especially remarkable given the emphasis on the two-fold change of direction of the Canadian coast at the head of the Bay of Fundy and the convex configuration of the Nova Scotia peninsula<sup>61</sup>. It is evident that the change in direction of the Canadian coast at the head of the Bay of Fundy produces both the concavity of the Fundy coast and the convexity of the Nova Scotia peninsula. The concavity and the convexity are two aspects of the same configuration: one could not exist without the other.

118. In fact, the principal difference between the coasts of the Parties is that both the concavity and the convexity on the Canadian side

<sup>59</sup> *United States Memorial*, p. 173, paras. 286-287; p. 174, paras. 289-290; p. 192, para. 310.

<sup>60</sup> *United States Memorial*, p. 171, Figure 26.

<sup>61</sup> *United States Memorial*, pp. 173-174, paras. 287-288.

are more pronounced than the corresponding features on the United States side. The *net* result is that, in their effect on an equitable delimitation of the offlying marine areas, there is an overall balance between the coasts of the Parties. The convex configurations of the coast of southwest Nova Scotia on either side of Cape Sable, and of the coast of southeastern Massachusetts on either side of Cape Cod and Nantucket, ensure that both coasts attract substantial and roughly similar marine areas inside the Gulf and in the open Atlantic seaward of the Gulf. However, the long Canadian coast on the Bay of Fundy — comparable in length to the concave portion of the United States coast from the international boundary terminus to Cape Ann — attracts a very restricted offshore area because of its markedly concave configuration. On the United States side, because the curvature of New England is much less pronounced than the concavity of the Bay of Fundy, the coasts of Maine, New Hampshire and northern Massachusetts (north of Cape Ann) attract a marine area more than three times larger than does the corresponding Canadian coast on the Bay of Fundy, even though, as was just noted, the two coastal segments are roughly equal in length.

119. The question thus arises whether an equidistance line ought to be adjusted in order to abate this potential inequity, since, as the Court stated in the *North Sea Continental Shelf* cases, "what is unacceptable in this instance is that a State should enjoy continental shelf rights considerably different from those of its neighbours merely because in the one case the coastline is roughly convex in form and in the other it is markedly concave, although those coastlines are comparable in length<sup>62</sup>". Canada has not asked for an adjustment of the equidistance line on this account because, in Canada's view, the overall balance between the Canadian and United States coasts in the Gulf of Maine area *as a whole* — with each country exhibiting a major concave and a major convex configuration — renders such an abatement unnecessary. In this case, nature itself has established the requisite checks and balances in the form of roughly matching configurations that produce a *net overall balance* in the maritime areas appertaining to each Party.

## 2. The Sectors Comprising the Gulf of Maine Area

120. Although the Gulf of Maine area is a single physical and oceanographic system, the configuration of its coasts and patterns of resource exploitation suggest a conceptual division into two or more parts or sectors. On a broad scale, the obvious concavity of the Gulf of Maine suggests a division between an inner or interior area comprising the Gulf itself, lying landward of a hypothetical line between Cape Sable and Nantucket, and an outer or exterior area, lying seaward of such a hypothetical line and including the seaward rim of the Gulf<sup>63</sup>.

<sup>62</sup> *I.C.J. Reports 1969*, p. 50, para. 91.

<sup>63</sup> The Parties have identified these areas or components in their Memorials: *Canadian Memorial*, p. 21, para. 17; pp. 25-27, paras. 27-32; p. 137, paras. 328-330; and *United States Memorial*, p. 19, para. 25 and footnote 2.

121. When the focus is narrowed to the Gulf itself, a further division is suggested between two sectors: *first*, the area between the convexities that form the "sides" of the Gulf and, *secondly*, the area adjacent to the innermost curvature that forms the most obviously concave portion of its coastline<sup>64</sup>. While the division between the two sectors comprising the inner area is not so clear-cut as that between the inner and outer parts of the Gulf of Maine area, it is probably most natural to delimit these sectors by a line from Cape St. Marys to Cape Ann [Figure 12]. Such a partition is generally supported by the human geography because, with the exception of coastal communities in Digby County — that is, between Cape St. Marys and Digby — nearly all fishing from ports situated on the innermost part of the coast is prosecuted on inshore grounds or on small offshore banks lying north of the hypothetical line from Cape St. Marys to Cape Ann.

122. The area lying directly between the opposite coasts of Nova Scotia and Massachusetts, seaward of Cape St. Marys and Cape Ann, but landward of Cape Sable and Nantucket, may properly be regarded as a middle or transitional sector. Here the maritime extensions of the coasts of Nova Scotia, Massachusetts and Maine converge.

123. The maritime extensions of the facing coasts of Nova Scotia and Massachusetts project both across the Gulf itself and beyond to the outer area. The close geographical links between these coasts and the seaward rim of the Gulf are demonstrated by the intensive fishery conducted on Georges Bank. Thus, while the transitional sector is obviously part of the Gulf of Maine itself, its coasts — together with the coasts facing the Atlantic on either side of Cape Sable and Cape Cod-Nantucket — form the coastal wings of the Gulf of Maine area, and are geographically relevant to the outer area as well.

### 3. The Innermost Sector

124. The balance and symmetry characterizing the relationship of the coastal wings of the Gulf of Maine area are too obvious to require more than passing mention. However, the geography of the innermost curvature of the Gulf, landward of Cape St. Marys and Cape Ann, is more complex. While the configuration of both the Canadian and United States coasts in this area is concave, there is a difference in the degree of their concavity. The United States seeks to exploit this difference by arbitrary, inconsistent and self-serving treatment of the Bay of Fundy, either taking it into account or ignoring it, as the argument requires.

125. The United States Memorial describes the Bay of Fundy as a "major geographical feature" and includes it in the Gulf of Maine area<sup>65</sup>. However, within the discreet confines of a footnote<sup>66</sup>, it states that the Gulf of Maine does not include the Bay of Fundy. No rationale

<sup>64</sup> *Canadian Memorial*, p. 137, footnote 55.

<sup>65</sup> *United States Memorial*, p. 19, para. 25.

<sup>66</sup> *United States Memorial*, p. 19, footnote 2.

is offered for this extraordinary proposition. The United States uses the Fundy coast to establish the general direction of the coast within the relevant area and uses basepoints on the New Brunswick coast to establish the inclination of the "adjusted perpendicular line"<sup>67</sup>. However, when the coasts in the relevant area are measured for the proportionality test, the United States, again by way of a footnote, dismisses the Bay of Fundy from its calculations, on the grounds that its "coastline" and "waters" do not "face" the Gulf of Maine or the Atlantic Ocean<sup>68</sup>.

126. Since both Parties include the Bay of Fundy in the Gulf of Maine area<sup>69</sup>, the question whether it forms part of the Gulf of Maine itself is largely a semantic one. It is evident, however, that the coastline and waters of the Bay of Fundy have precisely the same relation to the rest of the Gulf as the coastline and waters of the Gulf have to the outer part of the Gulf of Maine area. In common geographic usage, a gulf includes the whole of a major embayment of the sea, including any subsidiary embayments. The standard geographic and scientific works on the area, including Bigelow's classic study, as well as many official United States publications, treat the Bay of Fundy as part of the Gulf of Maine<sup>70</sup>.

127. Studies of the geological and geomorphological evolution of the Gulf of Maine show that the Bay of Fundy constitutes the "head" of the Gulf, which was formed by the inundation of the Fundian drainage system during the post-glacial transgression<sup>71</sup>. Scientific studies also show that the Bay of Fundy together with the rest of the Gulf of Maine and Georges Bank comprises a single oceanographic and biological system. Within this system the Bay plays a vital role analogous to that of the headwaters of a river system<sup>72</sup>.

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<sup>67</sup> *United States Memorial*, p. 170, para. 283; pp. 171 and 181, Figures 26-27.

<sup>68</sup> *United States Memorial*, p. 201, footnote 1.

<sup>69</sup> *United States Memorial*, p. 19, para. 25 and footnote 2; *Canadian Memorial*, pp. 21-24, paras. 20-21.

<sup>70</sup> H. B. Bigelow: "Physical Oceanography of the Gulf of Maine." *Bulletin of the United States Bureau of Fisheries*, Vol. XL, Part II, 1924. *United States Memorial, Documentary Annexes*, Vol. II, Annex 33. Bigelow treats the Bay of Fundy as part of the Gulf of Maine throughout his seminal work on physical oceanography. See, for example, pp. 518-522, 528, 539, 542, 546, 553, 565, 567, 625, 628, 630, 637, 640, 650-651, 653, 661, 664, 665, 670, 677-679, 685, 687, 690, 699, 702, and so on. Other official United States publications that treat the Bay of Fundy as part of the Gulf of Maine include the *United States Coast Pilot-Atlantic Coast: Eastport to Cape Cod*. Washington, United States Department of Commerce, 1982, p. 58, and *Final Environmental Statement, Proposed 1977 Outer Continental Shelf Oil and Gas Lease Sale Offshore the North Atlantic States*. OCS Sale No. 42, United States Department of the Interior, Bureau of Land Management. Washington, Government Printing Office, 1977, Vol. 1, p. 220.

<sup>71</sup> L. H. King and B. MacLean: *Geology of the Scotian Shelf*. Geological Survey of Canada Paper 74-32, 1974, pp. 4-6. *Counter-Memorial, Annexes*, Vol. IV, Annex 8; G. B. Fader, L. H. King and B. MacLean: *Surficial Geology of the Eastern Gulf of Maine and Bay of Fundy*. Geological Survey of Canada Paper 76-17, 1976, pp. 1-4. *Counter-Memorial, Annexes*, Vol. IV, Annex 9.

<sup>72</sup> *Counter-Memorial, Annexes*, Vol. I, p. 28, para. 51; pp. 31-34, paras. 56-61.

128. Any activity that would degrade the water quality or change the dynamics of water circulation in one part of the system would inevitably affect other quite distant locations within the system. This fact has important implications for marine resource management in relation to issues such as fishery conservation, environmental protection and the development of tidal power. The configuration and the physical extent of the Bay of Fundy greatly augment the tidal amplitude in the Gulf of Maine area, including Georges Bank. Using computer simulation, studies on the feasibility of hydroelectric development in Minas Basin have shown that a tidal power barrage in the upper reaches of the Bay of Fundy could result in a potentially significant reduction in the degree of mixing on Georges Bank<sup>73</sup>. This could lower its productivity and lead to long-term reductions or relocation of fish stocks, with potentially disastrous implications for the fisheries of the Bank.

129. The dimensions of the Bay of Fundy attest to its importance. It is about 90 nautical miles long to Cape Chignecto, 54 nautical miles wide at its mouth between Cape St. Marys and the coast of Maine, 33 nautical miles wide at Saint John, and 25 nautical miles wide in its upper reaches, just before it divides on either side of Cape Chignecto into two arms, namely Chignecto Bay and Minas Basin. *Figure 13* compares the Bay with important bodies of water in other parts of the world.

130. The Bay of Fundy is an essential feature of the regional geography. Together with the Gulf of St. Lawrence, it gives Canada's Maritime Provinces the maritime character that informs their history, economy and culture. It is the Bay of Fundy that makes New Brunswick a coastal province on the Gulf of Maine<sup>74</sup> and Nova Scotia a peninsula, separating it from the "mainland" and creating two provinces where there would otherwise be one. The Bay of Fundy fishery is a major component of the regional economy, particularly in Charlotte County, New Brunswick, and Digby County, Nova Scotia, where it constitutes the largest single source of employment. Like the fishery from the corresponding parts of the United States coast, it is predominantly an inshore one. However, the catches from Georges Bank landed by vessels operating from the Fundy ports, including those on Passamaquoddy Bay and St. Marys Bay, exceed both in absolute and relative terms the catch taken on Georges Bank by vessels operating from ports on the United States coast facing the innermost area<sup>75</sup>.

<sup>73</sup> C. J. R. Garrett: "Tidal Influences on the Physical Oceanography of the Bay of Fundy and Gulf of Maine", in G. Daborn, ed.: *Fundy Tidal Power and the Environment*. Wolfville, Acadia University Institute, 1977, pp. 101-115; *Counter-Memorial, Annexes*, Vol. IV, Annex 10.

<sup>74</sup> Saint John, which is situated on the Bay of Fundy, is the largest city in New Brunswick and the second largest in Atlantic Canada. With a tonnage of 16,282,000 metric tons of cargo in 1980, it is the second largest port on the Atlantic coast of Canada (after Halifax), and the second largest port on the Gulf of Maine (after Boston).

<sup>75</sup> Landings in Bay of Fundy ports from Georges Bank for the period 1969-1978 totalled 93,532 metric tons and were valued at \$36,768,613. Landings in Maine and New Hampshire ports from Georges Bank in the same period totalled 3,164 metric tons and were valued at U.S.\$3,219,701. On the Canadian side, the Georges Bank catch represented 18 percent of the value of all landings in Bay of Fundy ports. On the United States side, the Georges Bank catch represented 0.7 percent of the value of all landings in Maine and New Hampshire ports.

## C. INCIDENTAL SPECIAL FEATURES: CAPE COD AND NANTUCKET

131. The United States Memorial to all intents and purposes ignores Cape Cod and Nantucket Island, which constitute the southeastern extremity of a major and progressively attenuated protrusion of the New England coast seaward from the continental general direction of the North American coast. Cape Cod projects out into the Gulf of Maine some 25 nautical miles (46 kilometres) east of a line representing the general direction of the United States coast inside the Gulf, while Nantucket Island projects some 25 nautical miles (46 kilometres) south of a line representing the general direction of the New England coast facing the Atlantic and some 29 nautical miles (54 kilometres) southeast of the hinge point of the two general-direction lines on the heel of Cape Cod [Figure 7].

132. The inner arm of Cape Cod is oriented at a right angle to the general direction of the United States coast facing the Gulf of Maine. Thus, its orientation relative to the general direction of the coast is similar to that of the Zarzis Peninsula and Island of Jerba, which were ignored by the Court in the *Tunisia-Libya Continental Shelf* case in assessing the general direction of the Tunisian coast<sup>76</sup>. The land area of the Zarzis Peninsula and Jerba exceeds that of Cape Cod<sup>77</sup>. On the other hand, the orientation of Cape Cod may be contrasted with that of the Kerkennah Islands and the Scilly Islands, which are oriented along the general direction of the Tunisian and British coasts and merely project them further into the sea. This orientation of Cape Cod, perpendicular to the general direction of the United States coastline facing the Gulf of Maine, increases its distorting effect upon an equidistance line.

133. Cape Cod is separated from the Massachusetts mainland by the Cape Cod Canal, a free-flowing salt-water channel. Since it is completely surrounded by salt water, it may be considered an island. The extent of Cape Cod's deviation from the general direction of the coast is demonstrated by the importance of the Canal as a transportation route that was developed precisely to avoid the need to circumnavigate this long, narrow protrusion into the sea: in 1980, ships carrying 12,210,209 metric tons of cargo passed through the Canal<sup>78</sup>.

134. Although once thriving maritime centres, Cape Cod and Nantucket have ceased to have significant maritime economies. Their populations consist largely of retired persons who have no economic

<sup>76</sup> *I.C.J. Reports 1982*, p. 91, para. 131. In assessing the general direction of the coastline in order to measure the length of the Tunisian coast, the Court drew a line from the most westerly point of the Gulf of Gabes to Ras Ajdir. This line takes no account of the Zarzis peninsula and ignores the island of Jerba.

<sup>77</sup> The land area of the Zarzis peninsula and the Island of Jerba is 1,094 square kilometres and the land area of Cape Cod is 1,063 kilometres.

<sup>78</sup> *Waterborne Commerce of the United States: Calendar Year 1980*. Washington, Department of the Army Corps of Engineers, 1981, p. 12.



dependence on the marine resources at stake in this delimitation. The livelihood of the rest of the population is largely dependent on tourism<sup>79</sup>.

135. The number of full-time commercial fishermen permanently resident on Cape Cod is small in relation to the overall population. Many of the fishing vessels operating from Cape Cod ports, and the fishermen that sail them, come from outside Massachusetts. Many of the others are part-time fishermen, who derive a substantial proportion of their income from other sources. The commercial fishery is coming under increasing pressure from the much more lucrative tourism sector, with which it must compete for space for onshore facilities, including berthing space for vessels. There is no commercial fishery on Nantucket Island<sup>80</sup>.

136. While most of the fishing operations from Cape Cod ports are conducted on nearshore grounds (Cape Cod Bay and the Nantucket Shoals), a few vessels do venture further offshore to the Great South Channel and to the western part of Georges Bank. However, fishing from Cape Cod ports on the eastern part of Georges Bank — the area under Canadian claim — has been sporadic and is insignificant in the economy of Cape Cod<sup>81</sup>.

137. Because of their strategic situation at the entrance points to the Gulf and their radical deviation east and south from the general directions of the United States coasts facing the Gulf of Maine and the Atlantic Ocean, Cape Cod and Nantucket have an effect upon the placement of an equidistance line that is out of all proportion to their size. While these features comprise a total land area of only 1,186 square kilometres (346 square nautical miles), they would attract to the United States at the expense of Canada a marine area of 2,906 square nautical miles: that is, more than eight times their land area. The potential inequity here is compounded by the fact that most of the area that would be so allocated to the United States comprises the rich fishing grounds of eastern Georges Bank, an area upon which the economic dependence of Cape Cod and Nantucket is minimal.

#### D. LENGTH OF THE COASTS IN THE RELEVANT AREA

138. The length of the coasts measured "according to their general direction", so as to "reduce very irregular coastlines to their truer

<sup>79</sup> *Georges Bank, Gulf of Maine, Cape Cod, Nova Scotia. Perspectives in Economics and History*. Portland, Maine, TRIGOM; (Sponsored by the Office of the Geographer, United States Department of State), June 1978, pp. 10-11.

<sup>80</sup> *An Economic Profile of the Cape and Islands Fisheries*, prepared by Cape Cod Planning and Economic Development Commission, 1978, p. 82.

<sup>81</sup> D. W. Allen, B. Allen, R. Black, J. Friedman, et al: *Effects on Commercial Fishing of Petroleum Development off the Northeastern United States*. Woods Hole Institute, Prepared for National Oceanic and Atmospheric Administration, United States Department of Commerce, 1976, p. 51; S. Olsen and T. Grigalunas: "A Profile of New England Ports", in S. Olsen, ed.: *Fishing and Petroleum Interactions on Georges Bank*. Energy Program Technical Report 77-1. Boston, New England Regional Commission, 1976, p. 59; L. J. Smith and S. B. Peterson: *The New England Fishing Industry: A Basis for Management*. Massachusetts, Woods Hole Oceanographic Institution, 1977, p. 87.

proportions", has been identified in the jurisprudence as a factor to be used in appreciating the general geographical situation and in assessing the equity of a proposed boundary<sup>82</sup>.

139. Coasts may be measured "according to their general direction" either by using the straight baselines employed by States in the seaward delimitation of their territorial sea — and constructing hypothetical straight baselines where States have not actually proclaimed them — or by drawing longer straight lines between points where there is a major change in the general direction of the coast. While both methods involve questions of judgment, the number of instances where such judgments will have to be made is far greater when coasts are measured along the low-water line following the sinuosities<sup>83</sup>.

140. Within the Gulf of Maine itself, the coastlines of the Parties are roughly equal in length. The Canadian Memorial measured the coasts employing the system of straight baselines used by Canada in delimiting its territorial sea<sup>84</sup>, the bay closing lines proclaimed by the United States, and hypothetical straight baselines along those sections of the coasts where the Parties have not proclaimed straight baselines or bay closing lines. Using these methods, the length of the Canadian coast from the international boundary terminus to Cape Sable is 287 nautical miles, while the length of the United States coast from the international boundary terminus to the Cape Cod Canal is 299 nautical miles, a ratio of 49:51<sup>85</sup>. When the method of longer straight lines is used, the proportions change in favour of Canada. The length of the Canadian coast, measured along straight lines representing coastal fronts, is 298 nautical

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<sup>82</sup> *I.C.J. Reports 1969*, p. 52, para. 98; *I.C.J. Reports 1982*, p. 93, para. 133 B(5) *dispositive*.

<sup>83</sup> The Gulf of Maine area is characterized by many deep indentations and rivers. Determining the point at which the shore of a river becomes the coast of an inlet is a matter of judgment that can have a major effect on the calculation of the total length of a coastline measured along the low-water line. Moreover, since the degree of indentation varies substantially as between different segments of the coast, the comparative calculation of coastal lengths can differ decisively, depending upon the method used. This point is illustrated by the coastline along the northern side of the Gulf of Maine from Cape Maringouin to Cape Elizabeth. Calculating coastal lengths by means of straight lines from the international boundary terminus to the foregoing features gives Canada a coastal front of 117 nautical miles and the United States a coastal front of 160 nautical miles — a ratio of 42:58. Measuring these same coastlines by means of the low-water line gives Canada a coastal length of 225 nautical miles and the United States a coastal length of 708½ nautical miles — a ratio of 24:76. As the length of the United States coastlines measured along the sinuosities is increased by a factor of 4.4, and the Canadian coastline by only 1.9, it is obvious that the results obtained by the two methods are not comparable.

<sup>84</sup> Canadian baselines in the relevant area were proclaimed in the *Territorial Sea Geographical Co-ordinates Order*, Order in Council P.C. 1972-966, in force 11 May 1972; *Canada Gazette*, Part II, Vol. 106, No. 10; *Canadian Memorial, Annexes*, Vol. II, Annex 25.

<sup>85</sup> Canada has not included the coast of Cape Cod when measuring the length of the coasts according to their general direction, because Cape Cod departs radically from the general direction of the coasts.

miles, while the length of the United States coast is 275 nautical miles, a ratio of 52:48<sup>86</sup>.

141. Both Parties are of the view that the Gulf of Maine area comprises some part of the coastlines facing the Atlantic Ocean outside the Gulf itself, but differ as to how far the relevant coastlines extend on either side of the entrance points to the Gulf. Since natural features like Cape Canso, Nova Scotia and the angle on the United States coast formed by Long Island and New Jersey clearly are well outside any reasonable definition of the Gulf of Maine area, the question of the extent of the Atlantic-facing coastlines to be included in the relevant area must be resolved by other criteria. One approach is to include those parts of the coast that demonstrate economic links to the resources of Georges Bank. Applying this approach, the relevant Canadian coastline from Cape Sable to Lunenburg (83 nautical miles) is approximately twice the length of the relevant United States coastline from the heel of Cape Cod to Newport (41 nautical miles). An alternative approach — bearing in mind the Court's directive that "one must compare like with like" and that the "same approach" should be "adopted to each of the two coasts<sup>87</sup>" — is simply to select equal segments on the coasts of the Parties on either side of the hinge points of the coastal wings of the Gulf, extending no further, however, than the economically relevant coast of one Party or the other.

142. In conclusion, the approximate equality in the length of the Canadian and United States coastlines bordering the Gulf reflects and confirms the overall balance of the coasts of the Parties in the relevant area. This balance is also reflected in the general configuration of the coasts, with a major concave and convex feature on each side, and in the predominantly opposite relationship of the coasts to each other and to the area to be delimited. The balance is broken only by the radical deviation of Cape Cod and Nantucket from the general direction of the United States coast, unmatched by any equivalent feature on the Canadian side.

### **Section III. Georges Bank Is Adjacent to the Coasts of Nova Scotia and Massachusetts That Abut the Outer Area; Eastern Georges Bank Appertains to the Coast of Nova Scotia**

#### **A. THE COASTS ABUTTING THE OUTER AREA**

143. The Court of Arbitration in the *Anglo-French Continental Shelf* award stated that:

<sup>86</sup> The straight lines used in these measurements are, on the Canadian side: from the international boundary terminus to Cape Maringouin, 117 nautical miles; from Cape Maringouin to Cape Split, 24 nautical miles; from Cape Split to Digby, 67 nautical miles; from Digby to Cape St. Marys, 41 nautical miles; from Cape St. Marys to Cape Sable, 49 nautical miles; and, on the United States side: from the international boundary terminus to Cape Elizabeth, 160 nautical miles; from Cape Elizabeth to Boston, 69 nautical miles; from Boston to the Cape Cod Canal, 46 nautical miles. See Figure 7. Note that the two straight lines used to measure the coastal fronts along the northern side of the Gulf extend from the international boundary terminus to Cape Maringouin and Cape Elizabeth. The single straight line representing the general direction of the coast along the northern side of the Gulf in Figure 7 does not pass through the boundary terminus.

<sup>87</sup> *I.C.J. Reports 1982*, p. 91, para. 130.

"The appreciation of the effect of individual geographical features on the course of an equidistance line has necessarily to be made by reference to the actual geographical conditions of the particular area of continental shelf to be delimited and to *the actual relation of the two coasts to that particular area*<sup>88</sup>." [*Italics added.*]

In an area as large as the Gulf of Maine area, an essential element in drawing a boundary in accordance with international law is to determine the parts of the coast to which the various maritime areas are geographically and legally adjacent.

144. The Court of Arbitration divided the relevant area or "arbitration area" into two regions: the English Channel — or more particularly, the Channel Islands region — that lay "between" or "within" the coasts of the Parties, and the Atlantic region that lay "off" their coasts<sup>89</sup>. In rejecting the proposal of France to delimit the shelf in the Atlantic region "by reference to prolongation of the general directions of the Channel coasts of the two countries", the Court of Arbitration stated that *this method was not "compatible with the legal régime of the continental shelf"* because "it detaches the delimitation almost completely from the coasts which actually abut on the continental shelf in the Atlantic region, and is thus not easily reconciled with the fundamental principle that the continental shelf constitutes the natural prolongation of a State's territory under the sea<sup>90</sup>". Rather, the Court of Arbitration continued:

"... the method of delimitation which it adopts for the Atlantic region must be one that has relation to the coasts of the Parties actually abutting on the continental shelf of that region. Essentially, these are the coasts of Finistère and Ushant on the French side and the coasts of Cornwall and the Scilly Isles on the United Kingdom side<sup>91</sup>."

145. The Parties in this case have both identified an "inner and outer area" or "an interior and an exterior component<sup>92</sup>". They are agreed that the inner or interior component comprises the Gulf of Maine itself and the coasts that face onto it. They also agree that the outer or exterior component extends into the Atlantic Ocean seaward of the Gulf of Maine and includes Georges Bank. However, there appears to be no agreement between the Parties as to the coasts to which this outer area is adjacent.

<sup>88</sup> *Anglo-French Continental Shelf* award, p. 113, para. 240.

<sup>89</sup> *Anglo-French Continental Shelf* award, p. 22, para. 2; pp. 109-110, paras. 232-233.

<sup>90</sup> *Anglo-French Continental Shelf* award, p. 115, para. 246.

<sup>91</sup> *Anglo-French Continental Shelf* award, p. 116, para. 248.

<sup>92</sup> *Canadian Memorial*, p. 21, para. 17; pp. 25-27, paras. 27-32; p. 137, paras. 328-330; *United States Memorial*, p. 19, para. 25 and footnote 2.

146. In Canada's submission, the outer area, including Georges Bank, is *geographically and legally adjacent to the coastal wings of the Gulf of Maine* — the coasts of Nova Scotia, northwest and northeast of Cape Sable, and of Massachusetts, northwest and southwest of Cape Cod and Nantucket<sup>93</sup>. These are the coasts that lie closest to Georges Bank and from which the Georges Bank fishery is conducted. While it is not necessary to define the *precise* extent of the coasts that abut the outer part — the seaward rim — of the Gulf of Maine area, they may be seen as extending from Cape St. Marys to Lunenburg on the Canadian side, and from Cape Ann to Newport on the United States side. The geographical relationship of these coasts to the outer area is analogous to the relationship of the coasts of Finistère and Cornwall to the "Atlantic region" in the *Anglo-French Continental Shelf* award (56) [Figure 14].

147. Among the features identified by the Court of Arbitration as forming "part of the geographical and legal framework of the delimitation in the Atlantic region" were the following:

"... although the coasts of the two countries abutting on the continental shelf to be delimited are of somewhat different shapes, they exhibit certain similarities. Both [Finistère and Cornwall] are peninsulas which constitute the ultimate reach of their respective territories into the Atlantic region; both have offshore islands which project their respective territories still further into the region<sup>94</sup>."

148. Again, the geographical situation in the outer part of the Gulf of Maine area is analogous to that in the Atlantic region. Both southwest Nova Scotia and southeast Massachusetts are "peninsulas which constitute the ultimate reach of their respective territories into the Atlantic", that is, into the outer part of the Gulf of Maine area. The coasts are of "somewhat different shapes". Whereas the southwest Nova Scotia peninsula, like Finistère, has a rather blunt configuration, the Massachusetts peninsula, like Cornwall, is progressively attenuated as it thrusts eastward into the Atlantic<sup>95</sup>. Both Canada and the United States also have "offshore islands" or analogous features.

149. The United States gives no clear indication of the coasts to which the various maritime areas are geographically adjacent. Its discussion of geography seems to leave the marine areas constituting the exterior component suspended in space, unattached to any coast<sup>96</sup>. In discussing geomorphology and the marine environment, the United States Memorial gives the impression that it considers Georges Bank to be geomorphologically and ecologically associated with the coast of

<sup>93</sup> *Canadian Memorial*, p. 27, para. 32; p. 29, para. 35; p. 143, para. 345; pp. 146-147, para. 353; p. 147, para. 354.

<sup>94</sup> *Anglo-French Continental Shelf* award, p. 110, para. 234.

<sup>95</sup> A cross-section of the southwest Nova Scotia peninsula from Cape St. Marys to Liverpool (120 kilometres) is twice that of a corresponding section of the southeast Massachusetts peninsula from Boston to Providence (61 kilometres).

<sup>96</sup> *United States Memorial*, p. 19, para. 25.

Massachusetts or, more generally, of southern New England<sup>97</sup>. Yet, when discussing the "seaward extensions" of "coastal fronts", it implies that the outer area, including Georges Bank, appertains to the coasts of Maine and New Hampshire<sup>98</sup>. This seesaw treatment is unfounded. The notion that Georges Bank appertains to or is adjacent to the coast of Maine — and not to the substantially closer coasts of Nova Scotia and Massachusetts — is completely divorced from geography and from the legal basis of title to the 200-mile zone.

#### B. DISTANCE AND PROXIMITY: THE GEOGRAPHICAL BASIS AND IMPLICATIONS OF THE SOURCE OF TITLE

150. Geography is the discipline that concerns itself with the spatial organization of and interrelationships between physical and human phenomena. Distance, proximity and adjacency are geographical concepts. The continental shelf and the 200-mile fishing zone and exclusive economic zone are geographical and legal concepts; they involve the extension of the sovereign rights and jurisdiction of coastal States into ocean space. International law has adopted the geographical concepts of distance, adjacency and proximity as the legal basis of title to areas of the ocean. The choice of these geographical concepts, rather than others, demonstrates their primary importance in purely geographical terms, as well as their particular relevance to the nature of the subject matter of these new jurisdictions — living and non-living resources, environmental protection, scientific research — and to the environment in which they are situated. For distance is the most fundamental of all spatial principles and is of particular relevance to natural phenomena and human activities on the featureless surface of the sea. At the same time, the fact that the law has adopted the distance criterion has implications for the manner in which geography is used as a relevant factor in determining a maritime boundary in accordance with international law.

151. One such implication is that, where a constant distance is used to define the seaward extension of a coastal State, its maritime zone extends outward in every direction within the prescribed distance. No one direction is legally more significant than any other. The maritime zone of a coastal State within this framework is not to be thought of as a platform in front of its coast, but as a broad belt of sea surrounding its territory in every direction. Contrary to the depiction in Figure 31 of the United States Memorial, the concept of the seaward extension of a coastal State cannot be reduced to a rectilinear projection outward from the coast in a single, presumably perpendicular direction. On the contrary, where the spatial relationship between land and sea is expressed essentially in terms of proximity to the coast, the extension of a maritime zone outward from the coast is *radial* rather than *perpendicular* [Figure 15]. This approach to geography is especially important where the coastal configuration is complex, with multiple and radical

<sup>97</sup> *United States Memorial*, p. 23, para. 32; p. 31, paras. 45 and 48; p. 32, para. 51; p. 33, Figure 6; p. 36, para. 57; p. 37, Figure 7.

<sup>98</sup> *United States Memorial*, p. 192, para. 310; p. 193, Figure 31.

changes in the direction of the coast, and where the coastal configurations are rounded and irregular and cannot be made rectilinear without a wholesale refashioning of geography.

152. Such a conceptual framework is well adapted to the broadened subject matter of coastal State jurisdiction beyond the territorial sea. In the case of a single maritime boundary, it is reasonable to interpret the geography as a mariner would see it. To look at the relationship of the submarine areas to the land in terms of formal geometrical properties may have had some relevance in the delimitation of the continental shelf, where the issue was the extent of the prolongation of the land territory under the sea; but it is meaningless where the issue is a single maritime boundary for a multi-purpose zone. To a fisherman — as to a mariner and other users of the sea — the perpendicular juxtaposition of the sea to the coast from which he operates has no meaning or utility. To him, it is of no significance whether the angle between a point at sea and the coastline at a particular point is perpendicular or oblique. What counts is how long it will take him to get there, which of course is a function of distance. The fisherman or mariner can well understand the concept of the general direction of the coast as a measure of its extent — *it corresponds closely to the course of a coasting vessel* — but he would have the greatest difficulty seeing why the angle of juxtaposition should have any practical effect.

153. The whole of Georges Bank lies closer to the coasts of either Nova Scotia or Massachusetts than it does to the coasts of New Brunswick or Maine. Moreover, most of eastern Georges Bank — the disputed area — lies closer to the coast of Nova Scotia than it does to any part of the coast of the United States<sup>99</sup>. The proximity of Georges Bank to the Nova Scotia coast is not a matter of abstract geometry, but rather a fundamentally important fact of physical and human geography.

## C. GEOGRAPHICAL LINKS

### 1. Physical Geography

154. The United States Memorial divides the Gulf of Maine area into three distinct “ecological régimes”. According to this scheme, Georges Bank is separated from the coasts of Maine and New Brunswick by the Gulf of Maine Basin, which allegedly constitutes a distinct ecosystem. The United States further alleges that the Georges Bank “régime” is linked in oceanographic and biological terms to the waters off southern New England<sup>100</sup>. While Canada rejects this simplistic and erroneous analysis of the oceanography and biology of the Gulf of Maine area, it notes that *the United States does not view Georges Bank as*

<sup>99</sup> Only the area immediately to the east of the Canadian line is closer to the United States (Cape Cod and Nantucket) than it is to Nova Scotia. Apart from Cape Cod and Nantucket, the whole of the disputed area on Georges Bank lies closer to Canada than it does to the United States.

<sup>100</sup> *United States Memorial*, p. 31, paras. 45 and 48; p. 32, para. 51.

*being linked with the innermost sector of the Gulf or with the coast of Maine.*

155. A glance at any chart with adequate bathymetric contours will show that the water depths in the Gulf of Maine Basin lying between Georges Bank and the coasts of New Brunswick and Maine are considerably greater than the water depths in the channels separating Georges Bank from the East Coast Shelf and the Scotian Shelf (46) [Figure 3]. Furthermore, the Gulf of Maine Basin is about four and one-half times wider than either the Great South Channel or the Northeast Channel, having as it does an average width of 110 nautical miles, compared with 25 nautical miles for the Northeast Channel and 22 nautical miles for the Great South Channel.

156. Several factors, to be discussed in detail in the following chapter, show that Georges Bank has particular geological, geomorphological, oceanographic and biological affinities to the northeast, that is, to the continental shelf and waters off Nova Scotia<sup>101</sup>.

## 2. Human Geography

157. Socio-economic geography is important in its own right as part of the total geographical framework that is legally relevant to the delimitation of the continental shelf and the 200-mile fishing zone or exclusive economic zone. In addition, it assists in the interpretation and appreciation of the purely physical geography<sup>102</sup>.

158. There is in general a clear distinction between the fishing patterns followed by vessels operating from the ports on the Canadian and United States coasts that face the innermost sector of the Gulf of Maine, and those followed by vessels operating from ports on the coastal wings seaward of Cape St. Marys and Cape Ann. Vessels from the innermost sector carry out inshore fisheries or fish for herring or redfish on offshore banks lying within the Gulf of Maine itself. Less than 1 per cent of Maine's total catch in both volume and value is taken in the Georges Bank area<sup>103</sup>. By comparison, Georges Bank does make a substantial contribution to the landings of ports in Digby County, Nova Scotia (in the lower reaches of the Bay of Fundy), making up, for

<sup>101</sup> See paras. 168-199.

<sup>102</sup> See, for example, the views of one commentator:

"... socioeconomic factors can enable the decision maker to understand the significance of certain features. Thus, the consideration of those factors in the *Anglo-French* arbitration in order to evaluate the importance of the islands and their relationship to their home governments also provided information from the perspective of the earth sciences on the islands' true utility and independence. Similarly, the activity of the coastal inhabitants in adjacent waters would provide information relevant to the issues of adjacency and contiguity. Such uses of the data contribute directly to an appreciation of the actual geographic and geological situation, the better basis for the lateral boundary delimitation."

J. Charney: "The Delimitation of Lateral Seaward Boundaries in a Domestic Context." *American Journal of International Law*, Vol. 75, 1981, pp. 66-67.

<sup>103</sup> S. Olsen and T. Grigalunas: "A Profile of New England Fishing Ports", p. 98.



example, approximately 13 percent of the landings of the town of Digby and about 80 percent of those of Saulnierville<sup>104</sup>.

159. Almost all the fishing on Georges Bank is conducted from ports on the coast of Nova Scotia from Digby to Lunenburg, and on the coast of Massachusetts and Rhode Island from Gloucester to Newport. Thus, with the exception of the Digby County coast, the coasts from which fishing is conducted on Georges Bank correspond to the coastal wings of the Gulf of Maine area. The greater proximity of the eastern part of Georges Bank to Nova Scotia is reflected in the character of the Canadian fishery in that area.

160. A substantial number of the Canadian vessels fishing Georges Bank are small vessels ranging from 10.4 to 19.8 metres in length. Some of the smaller vessels that fish the Bank — those under 25.5 gross tons — have been classified as inshore vessels and so have been traditionally exempted from the statistical reporting system maintained by the Canadian Department of Fisheries and Oceans. The fact that these “inshore” vessels fish on Georges Bank as a normal part of their fishing operations is a striking demonstration of the adjacency of Georges Bank to the coast of southwest Nova Scotia<sup>105</sup>. There is no corresponding fishery by United States vessels of a comparable size on the eastern part of Georges Bank, thus confirming the practical significance of the greater proximity of eastern Georges Bank to fishing ports on the Canadian coast.

161. In his separate opinion in the *Tunisia-Libya Continental Shelf* case, Judge *ad hoc* Jiménez de Aréchaga cited with approval a passage from the German pleadings recalled by Judge Jessup in his separate opinion in the *North Sea Continental Shelf* cases:

“From the point of view of exploitation and control of such submarine areas, the decisive factor is not the nearest point on the coast, but the nearest coastal area or port from which exploitation of the seabed and subsoil can be affected. The distance of an oil, gas or mineral deposit from the nearest point on the coast is irrelevant for practical purposes, even for the laying of a pipe-line, if this point on the coast does not offer any possibilities for setting up a supply base for establishing a drilling station or for the landing of the extracted product<sup>106</sup>.”

Exploratory operations have already been carried out by United States companies on part of western Georges Bank from onshore bases in Quonset Point/Davisville, Rhode Island and New Bedford, Massachusetts. Moreover, studies published in the United States on the onshore siting of facilities for the exploitation of hydrocarbons on the rest of Georges Bank conclude that both drilling bases and processing facilities would probably be sited in Massachusetts or Rhode Island. It is considered unlikely that gas processing plants or oil refineries would be

<sup>104</sup> *Canadian Memorial*, p. 76, Tables 5-6.

<sup>105</sup> See paras. 256, 261, 262, 298 and 315.

<sup>106</sup> *I.C.J. Reports 1982*, p. 121, para. 75.

located on Cape Cod. The siting of onshore facilities and the landing of a pipeline on the coast of Maine are considered improbable<sup>107</sup>. On the Canadian side, onshore bases for drilling on Georges Bank and the sites of landing facilities for gas pipelines are likely to be located in the southwest Nova Scotia ports of Shelburne or Yarmouth.

162. Since the Parties have provided in the Special Agreement that the boundary determined by these proceedings will serve for all purposes under international law, factors relating to the environmental impacts of hydrocarbon exploitation or navigation are relevant to the issue before the Court. The United States recognizes that the Nova Scotia coast faces a significantly higher risk than does the New England coast from any pollution that may be caused by the exploitation and transportation of oil from drilling sites on Georges Bank<sup>108</sup>.

(37) 163. Figure 31 of the United States Memorial depicts Georges Bank as part of the "seaward extension" of the coastal front of Maine. The United States gives no indication of the facts on which it relies for this unique view of the land-sea relationship in the region. It is clearly at odds with geographical fact, in both its physical and human dimensions, and with expert and popular opinion concerning the situation of Georges Bank in relation to the coasts of the Gulf of Maine area. The evidence shows that *Georges Bank is most closely related in physical and in human terms to the coasts to which it is most proximate* — the coastal wings of the Gulf of Maine — and that the eastern part of Georges Bank, the area claimed by Canada, is geographically adjacent to the coast of southwest Nova Scotia.

### Conclusion

164. The identification, interpretation and weighing — "taking account" — of geographical and other circumstances is a process involving issues of fact and law. If that process is to produce an equitable result in accordance with international law, the process itself must respect the pertinent norms of both geography and law. It is the failure of the United States to respect either geographical or legal principles that results in the Parties drawing such different conclusions from the same facts.

165. The United States has failed to respect the norms of geography in its almost total concentration on simple locational factors, to the exclusion of other relevant facts of physical and human geography. The exclusion of economic geography from the delimitation of what is effectively a 200-mile exclusive economic zone runs contrary to common sense, as well as to the legal requirement to take account of *all* the

<sup>107</sup> *Final Environmental Statement, Proposed 1977 Outer Continental Shelf Oil and Gas Lease Sale Offshore the North Atlantic States*, Vol. 2, pp. 902-906; *Estimates for New England. Offshore Facilities Related to Offshore Oil and Gas Development*. Boston, New England River Basins Commission, 1976; *Case Studies in OCS Planning. Onshore Facilities Related to Offshore Oil and Gas Development*. Boston, New England River Basins Commission, 1978.

(61) <sup>108</sup> See paras. 189-191 and Figure 19.

relevant circumstances. Above all, the emphasis on macrogeographical factors is not compatible with the legal requirement, acknowledged in the United States Memorial, to take account of the particular situation within the area relevant to the delimitation. The arbitrary and lopsided definition of the relevant area in the United States Memorial ignores common usage and recognized geographical criteria for the definition of regions. The inconsistent treatment of the Bay of Fundy runs contrary to geographical fact, to logic, to the United States' own definition of the relevant area, and to the legal requirement to take account of *all* the relevant circumstances. The false hierarchy of "primary" and "secondary" coasts rests upon geographically meaningless and legally irrelevant premises and is incompatible with the most fundamental principles of the law of maritime jurisdiction. The suggestion that *Georges Bank* is legally adjacent to the coast of Maine runs contrary to the geographical facts presented in the United States Memorial and to the basis of legal title to the 200-mile zone. In short, the United States Memorial seeks to refashion geography and to divorce the geographical facts from the applicable law.

166. Canada has respected the norms of geography and law in identifying and interpreting the relevant geographical facts. It has defined the relevant area on the basis of common usage and criteria that geographers employ to define regions. It has identified as legally relevant only the geographical facts within the Gulf of Maine area and has interpreted these facts in the context of the applicable law. It has thus given appropriate weight to the geographical criterion of distance and to other relevant factors of physical and human geography.

167. In Canada's submission, the principal geographical circumstances relevant to the determination of the single maritime boundary in the Gulf of Maine area are the proximity of *Georges Bank* to the coastal wings of Nova Scotia and Massachusetts and the proximity of the eastern half of the Bank to Nova Scotia. These primary factors are to be appreciated in a context of overall balance between the coasts of the Parties as reflected in their length and configuration, and in a context of symmetry and oppositeness between the coastal wings of the Gulf relative to *Georges Bank*; this symmetry is broken by the aberrant protrusion of Cape Cod and Nantucket away from the general direction of the United States coast. Other relevant geographical circumstances in this case include the complexity of the geographical situation caused by manifold changes in the general direction of the coasts within the Gulf of Maine area; the east-west juxtaposition of the Maritime Provinces and the New England states, and the generally north-south direction of the land boundary between them; the situation of Point "A", south-southwest of the international boundary terminus, between the opposite coasts of Nova Scotia and Maine; and the pronounced concave configuration of the Bay of Fundy relative to the configuration of the corresponding United States coast bordering the innermost sector of the Gulf.

## CHAPTER III

### THE OFFSHORE ENVIRONMENT

#### Introduction

168. As regards the offshore environment in the Gulf of Maine area, the relevant circumstances are compatible with and indeed support the logic of the Canadian line. The continental shelf in this area is a single, continuous, uninterrupted feature, without discontinuities that might identify separate natural prolongations. Georges Bank is a topographic feature of this single shelf and is defined by both the Great South Channel and the Northeast Channel. Similarly, it is part of a single, integrated oceanographic system and maintains both relatively discrete stocks and stocks of wide-ranging and migratory species.

169. There is no basis for the contentions in the United States Memorial that the Northeast Channel represents a "natural boundary" between the "separate and identifiable ecological régimes associated with Georges Bank and the Scotian Shelf". Still less is there any basis for the assertion that this channel is a "natural boundary" for human activities in the Gulf of Maine area. In any event, the single maritime boundary in this case must be determined in accordance with international law and not in accordance with subjective interpretations of nature.

170. To the extent that there are discontinuities of any kind between Georges Bank and the surrounding seabed and water column, these are found generally to the southwest, in the area of Cape Cod, Nantucket Shoals and the Great South Channel. To the extent that Georges Bank exhibits any particular geological, oceanographic or biological affinities with surrounding areas, these are to the northeast. Thus, the evidence provided by geology, oceanography and biology confirms the view that the Canadian line represents an equitable delimitation in accordance with international law, and that the United States claim does not. International law further requires that the basis for effective conservation of transboundary resources must be found in bilateral cooperation and not in unjustified and inequitable claims to monopoly. Such cooperation is in keeping with global practice and with the well-established regional practice of Canada and the United States.

#### Section I. The Continental Shelf in the Gulf of Maine Area Constitutes a Single Natural Prolongation with Particular Geological Affinities to the Northeast

171. As is recognized by the United States, the single continental margin of the Atlantic coast of North America is essentially continuous in its geological structure from northeast to southwest<sup>1</sup>. In this respect, it resembles the margin considered by the Court in the *Tunisia-Libya*

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<sup>1</sup> *United States Memorial*, p. 24, para. 36.

*Continental Shelf* case, where it was held that the Pelagian Block constituted the common natural prolongation of Tunisia and Libya<sup>2</sup>. The United States Memorial, accordingly, is on solid ground in conceding that "the natural prolongation principle may be inapplicable in this case"<sup>3</sup>. That Memorial, however, is inconsistent in suggesting that there is a separation where it has already admitted that there is no such separation. Indeed, to the extent that Georges Bank exhibits particular affinities to the geological structure of any area of the continuous margin of which it forms a part, these affinities are with areas to the north and northeast. Conversely, the most distinct geological discontinuity evident in the Gulf of Maine area is the New England Seamount Chain, a row of extinct volcanoes that disturbs the structural integrity of the basement block and extends seaward off Cape Cod in the vicinity of the Great South Channel<sup>4</sup>.

#### A. SUBSURFACE STRUCTURES

172. The subsurface geological structure of Nova Scotia is made up of two types of basement rock: the Paleozoic rocks of the *Meguma Group*, and the predominantly Precambrian rocks of the *Avalon Platform*. It is clear from high-sensitivity aeromagnetic data that the basement rocks of Nova Scotia extend in a southwestward direction across the Scotian Shelf and from the Bay of Fundy into the Gulf of Maine. Magnetic anomalies trend southwestward across the Northeast Channel and beneath Georges Bank, confirming the existence of geological affinities between Georges Bank and the Canadian landmass.

173. In its assertions about the sedimentary features known as the Georges Bank Basin and the Scotian Basin, the United States Memorial implies that the Georges Bank Basin alone underlies Georges Bank and that the Scotian Basin is found only beneath the Scotian Shelf to the northeast. In fact, the Scotian Basin extends from the Scotian Shelf southwestward beneath Georges Bank<sup>5</sup>. It is only partially separated from the Georges Bank Basin by the Yarmouth Arch, a basement structure that cuts transversely *across* the Northeast Channel. A prominent United States geologist has observed that:

"... the very thick sedimentary section found under Georges Bank ... by petroleum exploration surveys (Schultz and Grover, 1974), and the higher-velocity sediments in the deeper part of the basin (Drake et al., 1959) are so similar to those of the Scotian Shelf that correlations can be projected<sup>6</sup>." [*Italics added.*]

<sup>2</sup> *I.C.J. Reports* 1982, p. 58, para. 67. See also *Canadian Memorial*, p. 130, para. 308.

<sup>3</sup> *United States Memorial*, p. 201, para. 315.

<sup>4</sup> *Canadian Memorial*, pp. 45-46, Figures 15 and 16; p. 47, para. 81.

<sup>5</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 17-20, paras. 31-37.

<sup>6</sup> R. E. Sheridan: "Atlantic Continental Margin of North America", in C. A. Burk and C. L. Drake, eds.: *The Geology of Continental Margins*. New York, Springer-Verlag, 1974, pp. 396-397; *Counter-Memorial, Annexes*, Vol. IV, Annex 11.

58 Both the Scotian Basin and the Yarmouth Arch are geological features linking Canada and the eastern part of Georges Bank [Figure 16].

### B. HYDROCARBON POOLS

174. There is no single hydrocarbon-bearing structure underlying the whole of Georges Bank. As the preceding paragraphs have shown, three major features underlie the Georges Bank area: the Georges Bank Basin, situated largely beneath the western part of Georges Bank; the Yarmouth Arch extending from Nova Scotia; and, beneath the eastern part of Georges Bank, the extension of the Scotian Basin. In each of these features there are separate oil and gas structural sub-units or "plays", that provide opportunities for hydrocarbon discovery<sup>7</sup>. The greater part of the Georges Bank Basin and its hydrocarbon plays lies west of the Canadian line. The Scotian Basin and almost all the Yarmouth Arch and their hydrocarbon plays lie east of the Canadian line. The United States line, on the other hand, cuts through the Yarmouth Arch and the Scotian Basin and the hydrocarbon plays they contain.

### Section II. Georges Bank Is a Topographic Feature Defined by the Great South Channel and the Northeast Channel and Exhibiting Particular Affinities to the Northeast

175. The United States Memorial omits any reference to the Great South Channel in defining Georges Bank, in an attempt to suggest that the Bank is a physical extension of Massachusetts. Conversely, it seeks to portray the Northeast Channel as a "significant" geomorphological feature and as a "natural boundary" between allegedly distinct "ecological régimes" on Georges Bank and Browns Bank<sup>8</sup>. In fact, Georges Bank is a detached offshore bank, adjacent to and seaward of the coasts of Nova Scotia and Massachusetts that face each other across the Gulf of Maine. It is separated from Nantucket Shoals by the Great South Channel and from Browns Bank by the Northeast Channel. Both channels are the product of glacial and fluvial processes<sup>9</sup>. Thus, the United States Memorial is in error in implying that the Northeast Channel somehow interrupts the single continental shelf of the Gulf of Maine area. The true relevant circumstance in this context is neither the Northeast Channel nor the ecologically more significant area associated with the Great South Channel. Rather, it is Georges Bank itself — the "picture" framed by the two channels, so to speak — that constitutes a relevant circumstance, the very object of the dispute between the Parties. While Georges Bank is an integral part of a single, uninterrupted

<sup>7</sup> The hydrocarbon bearing structures of the Georges Bank Basin, the Yarmouth Arch and the Scotian Basin are described in the *Counter-Memorial, Annexes*, Vol. I, pp. 20-21, paras. 38-42.

<sup>8</sup> *United States Memorial*, p. 20, para. 31; p. 39, para. 58; p. 175, para. 196; p. 209, para. 325.

<sup>9</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 7-10, paras. 17-20.

continental shelf, certain geomorphological factors demonstrate that it has particular affinities with Canada.

#### A. GEOMORPHOLOGICAL FEATURES

176. As was stated in the Canadian Memorial, if the Gulf of Maine area were drained, the continental shelf would appear as a flat and practically featureless plain<sup>10</sup>. *Figure 17* shows that its physiographic features can be revealed only with the assistance of multiple vertical exaggeration. Even the most dramatic physiographic feature of the area — the steep slope below the shelf break — must be exaggerated five times before it becomes truly discernible. Thus, any attempt to treat geomorphological features in the categorical fashion adopted in the United States Memorial must similarly require great exaggeration. A striking example of such exaggeration is the attempt by the United States to equate the Northeast Channel and the Laurentian Channel and to describe them both as the “only significant breaks” in the continental shelf on the Atlantic coast of North America<sup>11</sup>. All that really needs to be said about the Laurentian Channel is that it lies well outside the relevant area in this case, by any definition. For the record, however, it should be noted that the Laurentian Channel is a far larger, longer, deeper and steeper feature than the Northeast Channel. It is clear that the United States has introduced this unique and irrelevant feature into the present proceedings in order to distract attention from the Great South Channel as one of the two features that define Georges Bank. The relative scale of all three features may be seen in *Figure 18*.

177. The Canadian Memorial describes four broad physiographic provinces of the single continental shelf on the Atlantic coast of North America<sup>12</sup>. These provinces reveal that the only significant geomorphological differentiation along this single continental shelf is that between the “East Coast Shelf” — i.e., the seabed southwest of the Great South Channel — and the seabed to the northeast of the Great South Channel, including Georges Bank and the Scotian Shelf. Southwest of the Great South Channel, the continental shelf is essentially a smooth unglaciated plain. In this area, the massive ice sheets of the Wisconsin glacial stage (beginning about 80,000 years ago) did not extend on to the shelf much beyond the present coastline. Northeast of the Great South Channel, however, the entire continental shelf shows the scars of glacial action. Any geomorphological discontinuity in the Gulf of Maine area, accordingly, is from the Great South Channel to the southwest.

178. The suggestion in the United States Memorial<sup>13</sup> that Georges Bank is an “extension” of the Atlantic Coastal Plain is erroneous, as is the implication that the submerged plain terminates at the

<sup>10</sup> *Canadian Memorial*, p. 37, para. 66.

<sup>11</sup> *United States Memorial*, pp. 20-21, para. 31.

<sup>12</sup> *Canadian Memorial*, pp. 37-38, para. 67; p. 38, *Figure 13*; *Counter-Memorial, Annexes*, Vol. 1, p. 3, para. 10.

<sup>13</sup> *United States Memorial*, p. 23, para. 32.

Northeast Channel. The submerged Atlantic Coastal Plain in fact is the continuous sedimentary wedge that constitutes the Atlantic continental margin of North America. It includes not only Georges Bank but also the balance of the Canadian continental shelf to the north, off the Nova Scotia and Labrador coasts and beyond Baffin Island, and the United States continental shelf southwest to Florida<sup>14</sup>.

179. The United States Memorial also claims that glacial and fluvial deposits on the Scotian Shelf are thinner than those on Georges Bank<sup>15</sup>. In fact, they are variable in both areas and no meaningful distinction can be made between sediment thickness on the Scotian Shelf and on Georges Bank. Rather, there is a continuum in glacial and fluvial sediment thickness from northeast to southwest<sup>16</sup>. More important, the several classes of sediment composition clearly reveal continuity from northeast to southwest in terms of percentages of gravel, sand and mud. *The distributions of gravel, mud and (to a somewhat lesser degree) sand extend in a broad band from the Scotian Shelf across Georges Bank<sup>17</sup>*. The assertion in the United States Memorial that the Scotian Shelf and Georges Bank exhibit meaningful differences in seabed sediments is clearly wrong.

#### B. THE DEFINITION OF GEORGES BANK

180. The United States Memorial includes startling inaccuracies regarding the definition and measurement of Georges Bank. It asserts that Georges Bank "extends approximately 200 nautical miles (370 kilometers) from Nantucket Shoals to the Northeast Channel", and that the "area of Georges Bank is measured from the *western* edge of Nantucket Shoals, eastward within the 100-fathom-depth contour to the Northeast Channel<sup>18</sup>" [*Italics added*]. These statements are at odds with the views of recognized authorities and with the descriptions contained in official United States documents. None of these suggests that Georges Bank begins at the western edge of Nantucket Shoals. All of them define Georges Bank by reference to the Great South Channel. For example, a publication issued by the United States Department of the Interior has defined Georges Bank as:

<sup>14</sup> The United States Memorial contains a map showing the physiographic regions of the east coast of North America, but does not illustrate the submerged continuation of the Atlantic Coastal Plain from Florida to Baffin Island. *United States Memorial, Documentary Annexes*, Vol. II, Annex 39. See also *Counter-Memorial, Annexes*, Vol. I, p. 2, para. 9.

<sup>15</sup> *United States Memorial*, p. 24, para. 34.

<sup>16</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 10-11, para. 21.

<sup>17</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 11-15, paras. 22-25, and Figures 5, 6 and 7.

<sup>18</sup> *United States Memorial*, p. 23, para. 32 and footnote 2.



"... an area characterized by parallel shoals and troughs and separated from the Scotian Shelf by Northeast Channel and from the East Coast Shelf by Great South Channel<sup>19</sup>."

More telling still, perhaps, is the definition contained in what has been described in the United States Memorial as "the pioneering study" of Georges Bank by Bigelow:

"... the length of Georges Bank, from the deepest trough of the South Channel to the 50-fathom contour on the slope of the Eastern Channel, is about 140 miles<sup>20</sup>..."

181. The Great South Channel is mentioned in the United States Memorial only in the briefest and most oblique fashion<sup>21</sup>. For this reason, it is necessary to recall that this channel was an important river drainage system in the geomorphological development of the Gulf of Maine area<sup>22</sup>. At one point in its history, the channel was almost 200 metres deep. Only later was it filled by fluvial detritus and glacial outwash. Today, the Great South Channel is generally 80 metres deep and lies between Nantucket Shoals and Phelps Bank on the west and Little Georges Shoals on the east. The Great South Channel cuts a swath through these shoals and constitutes by far the most important navigation and shipping route in the Gulf of Maine area. This route is covered by a traffic separation scheme that has been endorsed by the International Maritime Organization<sup>23</sup>. The Northeast Channel, in contrast, is irrelevant for navigational purposes.

### Section III. Georges Bank Is Part of an Integrated Oceanographic System with Particular Affinities to the Northeast

182. As described in the Canadian Memorial, Georges Bank is part of the oceanographic continuum — a single but complex ocean system — that extends throughout the Gulf of Maine area from northeast

<sup>19</sup> E. Uchupi: *Atlantic Continental Shelf and Slope of the United States — Physiography*, United States Department of the Interior, Geological Survey Professional Paper 529-C. Washington, Government Printing Office, 1968, pp. C3 and C5. Georges Bank is referred to as:

"... an immense barrier flanking the seaward side of the Gulf of Maine: it is separated from the Scotian Shelf by Northeast Channel and from the East Coast Shelf to the west by Great South Channel."

*Counter-Memorial, Annexes*, Vol. IV, Annex 12.

<sup>20</sup> H. B. Bigelow: "Physical Oceanography of the Gulf of Maine." *Bulletin of the United States Bureau of Fisheries*, Vol. XL, Part II, 1924, p. 518; *Counter-Memorial, Annexes*, Vol. IV, Annex 13.

<sup>21</sup> In fact, as already noted, the Great South Channel is mentioned by name only once in the United States Memorial, following a reference to the "remnant of the western drainage system". *United States Memorial*, p. 23, para. 33.

<sup>22</sup> *Counter-Memorial, Annexes*, Vol. I, p. 5, para. 12.

<sup>23</sup> The Great South Channel traffic separation scheme is illustrated on both Canadian and United States hydrographic charts of the Gulf of Maine area. See *Canadian Memorial*, p. 26, Figure 9, Canadian Hydrographic Chart 4003 and United States Coast Survey Chart 13006.

to southwest<sup>24</sup>. Within this oceanographic continuum, Georges Bank exhibits some elements of semi-discreteness. To the extent that Georges Bank is set off from its surrounding waters in oceanographic terms, the Great South Channel and the Northeast Channel are equally important elements in defining this semi-discreteness. Indeed, as was pointed out in the Canadian Memorial, Georges Bank has certain oceanographic affinities to the northeast, bringing it into close association with the Canadian coastal waters within the Bay of Fundy and off south and southwest Nova Scotia. Such oceanographic discontinuities as do exist are associated with the Cape Cod-Great South Channel-Nantucket Shoals area and the waters to the southwest.

#### A. CURRENTS, TEMPERATURE AND SALINITY

183. The United States Memorial asserts that the waters of the Scotian Shelf, the Gulf of Maine Basin and Georges Bank in each case have "distinctive" temperature and salinity characteristics<sup>25</sup>. This assertion requires some clarification and correction. In terms of large-scale patterns, the water characteristics of the Gulf of Maine area are heavily influenced by the colder, less saline water carried southward by the Labrador and Nova Scotian currents, originating along the Canadian continental shelf<sup>26</sup>. Moreover, the temperature and salinity relationships between various water masses over the continental shelf exhibit relative horizontal uniformity. There is a large overlap in temperature-salinity characteristics between the waters above Georges Bank and neighbouring waters of the Gulf itself and the Scotian Shelf, indicating a continuum in which continental shelf water is progressively modified in its southward journey from the eastern Canadian Arctic.

184. Surface temperatures of the waters above Georges Bank, the Gulf of Maine proper, Browns Bank and the western Scotian Shelf are also strikingly constant or similar<sup>27</sup>. The meaningful temperature differential is not found among these waters, but between all surface water on the continental shelf of the Gulf of Maine area and the waters further offshore above the continental slope. The United States Memorial ignores this onshore-offshore difference, and so conveys a misleading impression of the temperature differences between Georges Bank water and Scotian Shelf water.

185. Another way to compare the temperature characteristics of the waters of Georges Bank and contiguous areas is to examine the temperature structure of the water column as a whole. This comparison reveals that there is a very close correspondence between the water column structure above Georges Bank and the water column structure of the banks of the Scotian Shelf, particularly Browns Bank<sup>28</sup>. The temperature range averages from approximately 2° to 3° Celsius in winter to

<sup>24</sup> *Canadian Memorial*, pp. 49-54, paras. 89-97.

<sup>25</sup> *United States Memorial*, p. 28, para. 42.

<sup>26</sup> *Counter-Memorial, Annexes*, Vol. I, p. 23, para. 45.

<sup>27</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 29-31, paras. 52-55.

<sup>28</sup> *Counter-Memorial, Annexes*, Vol. I, p. 29, paras. 52-53; p. 31, Figure 14.

16° to 18° Celsius in summer in the upper water layer in each of these areas. On the other hand, the temperature range in the water column above the East Coast (southern New England) Shelf to the southwest ranges from about 5° Celsius to more than 23° Celsius in the upper layer. Thus, the significant temperature differential is not between Georges Bank and Browns Bank, but rather between these banks and the shelf waters southwest of Cape Cod.

### B. INFLUENCE OF THE BAY OF FUNDY

186. The close similarity in vertical temperature structure between Georges Bank and Browns Bank and the southwestern Scotian Shelf is the result of vigorous mixing of the water column produced by the single, integrated tidal régime of the Gulf of Maine area<sup>29</sup>. Indeed, the tidal currents are the most important factor controlling the oceanographic régime on Georges Bank, demonstrating the crucial interrelationship between the Bay of Fundy and the waters of the Bank. The United States Memorial, however, ignores the Fundy tides in its description of the oceanographic régime on Georges Bank.

187. The relevance of the Bay of Fundy to the oceanographic system of the Gulf of Maine area is further demonstrated by the fresh water discharge into the Gulf area from Canada's St. John River<sup>30</sup>. This river makes by far the largest contribution of fresh water to the Gulf of Maine area, with a mean annual discharge equal to the combined annual discharge of the largest United States rivers in the region (the Penobscot, Androscoggin, Kennebec and Merrimack). In spring, the discharge from the St. John River into the Gulf area is more than 60 percent of the total of the five main rivers. The impact of the St. John River on the oceanographic system of the Gulf of Maine demonstrates both the oceanographic relevance of the Bay of Fundy within the integrated Gulf of Maine system, and the affinities of the entire area to the Canadian coastal zones to the north and northeast.

### C. FRONTS

188. Canada cannot accept the assertion in the United States Memorial that a "marked front" occurs between the waters of Georges Bank and those of the Scotian Shelf, with a slightly less well-defined front occurring between the waters of Georges Bank and those of the Gulf of Maine<sup>31</sup>. The commonly recognized front in the Gulf of Maine area exists all along the continental shelf edge, separating shelf water from slope water further offshore<sup>32</sup>. This is known as the "Shelf-Slope

<sup>29</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 31-34, paras. 56-61.

<sup>30</sup> *Canadian Memorial*, p. 52, para. 95; *Counter-Memorial, Annexes*, Vol. I, p. 28, para. 51.

<sup>31</sup> *United States Memorial*, p. 31, para. 46.

<sup>32</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 34-35, paras. 62-63.

Front". A second kind of front is tidally induced and exists only seasonally. It is most evident along the northern edge of Georges Bank and marks the transition from the tidally-mixed water over the shallowest part of the Bank to the stratified water in the Gulf of Maine itself. In the eastern and southern areas of Georges Bank, it is weak and diffuse. Moreover, to the extent that it can be identified, it is situated well in from the periphery of the Bank and is roughly coincident with the 60-metre contour. Consequently, in Canada's submission, there is no basis for the suggestion that a "marked front" occurs between Georges Bank waters and the waters of the Scotian Shelf.

#### **Section IV. The Environmental Consequences to Canada of an Oil Spill on Georges Bank Attest to the Unity of the Gulf of Maine Area and to Its Links with the Canadian Coast**

189. Canada's long and exposed coastline has led Canadian scientists to spend a great deal of effort studying the impacts of oil spills on the environment. In the Georges Bank-Gulf of Maine area, given the effects of winds and currents, an oil spill can spread and encompass an area as vast as 1,000 square nautical miles within a week<sup>33</sup>. An oil spill on Georges Bank would not only affect living marine resources but could also reach the Nova Scotia shore and cause great environmental damage.

190. Official United States documents have recognized that in certain cases Canada could face greater potential risks than the United States, even in respect of an oil spill occurring on the undisputed United States part of Georges Bank. A study by the United States Department of the Interior makes a number of probability projections relating to hypothetical oil spills occurring west of the Canadian line<sup>34</sup>. These show that the estimated probability of oil coming ashore on the coast of south-west Nova Scotia, including the Fundy coast, is seven to eight times greater than the risk of oil reaching the coast of Maine, New Hampshire or northern Massachusetts, and three and one-half to four times higher than the risk of oil reaching the coast of Cape Cod or other parts of southern Massachusetts. Only the small island of Nantucket would face a risk comparable to that confronting the mainland coast of Nova Scotia

⑥1 [Figure 19].

191. In the context of a discussion of the importance of Georges Bank to the Canadian economy, the Canadian Memorial referred to the risks of oil pollution to Canada from Georges Bank hydrocarbon development<sup>35</sup>. In the present context, the projected impact of a Georges Bank or Georges Bank-related oil spill on the Canadian coast provides

<sup>33</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 61-63, paras. 97-102.

<sup>34</sup> *Final Environmental Statement, Proposed 1977 Outer Continental Shelf Oil and Gas Lease Sale Offshore the North Atlantic States*, Vol. 2, OCS Sale No. 42. United States Department of the Interior, Bureau of Land Management. Washington, Government Printing Office, 1977, p. 762 ff.

<sup>35</sup> *Canadian Memorial*, pp. 81-82, para. 175 and footnote 41.

further evidence of the oceanographic unity of the Gulf of Maine area and of Canada's environmental links with the Bank. It is, after all, wind and ocean currents that determine the movement and spread of an oil slick. The probability of such a slick reaching the Canadian coast also underscores the geographic proximity of Georges Bank to Canada.

### Section V. The Plankton and Benthos of Georges Bank Demonstrate Greater Affinities with Areas to the Northeast than with Areas to the Southwest

#### A. PHYTOPLANKTON

192. The United States Memorial offers the unsupported assertion that phytoplankton are not uniformly distributed throughout the Gulf of Maine area and that those found on Georges Bank "tend" to be larger, while those on the Scotian Shelf are "generally" smaller in size<sup>36</sup>. What implications are to be drawn from these unsubstantiated generalizations is not clear.

193. The Canadian Memorial shows that phytoplankton on Georges Bank are predominantly boreal or northern species closely connected with Canadian waters to the northeast<sup>37</sup>. Although several hundred species live on Georges Bank, the bulk of the phytoplankton biomass is made up of some 30 northern species, none of which displays any discontinuity in distribution between Georges Bank and the Scotian Shelf. The ratio of minute *nannoplankton* to the larger *net* plankton in the Gulf of Maine area varies in accordance with season of the year and local oceanographic processes and features (upwelling, depth, vertical mixing). These variations are not associated with a break in phytoplankton distribution at the Northeast Channel<sup>38</sup>.

194. Figure 6 in the United States Memorial purports to show relative phytoplankton distributions revealed by satellite imagery<sup>39</sup>. Owing to the wavelengths used, this satellite image does not distinguish between suspended mud or silt and chlorophyll — and it is chlorophyll, of course, that gives a measure of the concentration of phytoplankton. Thus it is impossible to discern whether the red colour in this photograph is chlorophyll (representing phytoplankton) or merely suspended sediments. More important, however, the use of a single image conveys the impression that phytoplankton concentration and distribution are constant over days, weeks and seasons, when in reality this photograph is merely a snapshot of a highly complex and variable ocean system at a given instant.

<sup>36</sup> *United States Memorial*, p. 31, para. 48.

<sup>37</sup> *Canadian Memorial*, p. 52, para. 96.

<sup>38</sup> *Counter-Memorial, Annexes*, Vol. I, p. 45, para. 80.

<sup>39</sup> *United States Memorial*, p. 33, Figure 6.

## B. ZOOPLANKTON

195. The United States Memorial asserts that there is a difference in species composition and quantity of the "communities" of zooplankton found on Georges Bank, in the Gulf of Maine Basin and on the Scotian Shelf<sup>40</sup>. No authority is provided for this assertion, apart from a reference to Annex 44 in the United States Memorial<sup>41</sup>. But Annex 44 can hardly be said to offer support for any such assertion. Quite the contrary: the data provided — even to the extent that they can be accepted — clearly demonstrate the close similarities of species within the three areas listed, rather than showing any significant differences between them.

196. In the October 1974 sampling (Table I of Annex 44 of the United States Memorial), eight species common to all three areas form 66.5 percent of the zooplankton biomass on Georges Bank, 97.2 percent of the biomass in the Gulf of Maine Basin, and 93.8 percent of the biomass of the Scotian Shelf. The May 1977 sampling (Table II) shows even greater similarities: four species common to all areas form 95.1 percent of the biomass on Georges Bank, 99.3 percent of the biomass in the Gulf of Maine Basin, and 89.7 percent of the biomass on the Scotian Shelf. The zooplankton listed as being found on Georges Bank but not in the other two areas set out in this Table represent *less than 1 percent* of the total biomass of the Bank. These facts, even if the sampling technique could be verified by more than two seasons of data<sup>42</sup>, can hardly be said to support the United States hypothesis that there are "separate and identifiable ecological régimes" on Georges Bank and the Scotian Shelf.

## C. BENTHOS

197. The United States Memorial asserts that the benthic communities of Georges Bank and the Scotian Shelf differ from each other in species composition and quantity<sup>43</sup>. However, Annex 44 (Table III) of the United States Memorial shows that the taxa said to be found only on Georges Bank represent only a small fraction (3.5 percent) of the total biomass. In fact, for the species listed for Georges Bank (Table III), all but one have their centre of distribution on the Scotian Shelf or even further northward. The benthos on the Bank fall within a recognized

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<sup>40</sup> *United States Memorial*, p. 32, para. 50.

<sup>41</sup> *United States Memorial, Documentary Annexes*, Vol. II, Annex 44.

<sup>42</sup> The highly variable nature of zooplankton both in space and in time requires many samples to be taken to accurately assess the species composition and biomass of any given bank or basin.

<sup>43</sup> *United States Memorial*, p. 32, para. 51. The United States claims that these differences are related to "variations" in bottom sediment. However, there is a continuum of mud, sand and gravel from northeast to southwest in the Gulf of Maine area. See *Counter-Memorial, Annexes*, Vol. I, Figures 5, 6 and 7. The species composition of the benthos on Georges Bank is also similar to that observed in areas to the northeast, in the Bay of Fundy and on the banks of the Scotian Shelf. See *Canadian Memorial*, p. 52, para. 97.

biogeographic unit known as the Nova Scotian province, which extends from Newfoundland down to the Cape Cod-Great South Channel-Nantucket Shoals transition zone. It is this transition zone that is biologically significant, because it is from one biogeographic province to another that species composition shows important differences.

83-88 198. Figures 23 to 31 of Volume I of the Annexes to this Counter-Memorial show the distributions of zooplankton and benthic species from Nova Scotia to Cape Hatteras. These Figures reveal the dominance of species with distributional ranges from the Scotian Shelf southwestward, encompassing Georges Bank. The southern and northern distributional limit of many species is in the Cape Cod-Great South Channel-Nantucket Shoals area. Contrary to the unsubstantiated assertions in the United States Memorial, it is this latter transition zone that is significant in terms of species distribution, and not the Northeast Channel.

199. The foregoing evidence contradicts the assertions by the United States that "three separate and identifiable ecological régimes" can be found in the Gulf of Maine area, with the Georges Bank "régime" neatly separated from the Scotian Shelf "régime" by the Northeast Channel. In reality, the Gulf of Maine area, including Georges Bank, is an integrated ocean system, with oceanographic forces at work that tie Georges Bank closer to the Canadian offshore environment than to that of the United States.

#### **Section VI. Georges Bank Maintains Both Relatively Discrete Stocks and Wide-Ranging and Migratory Species of Fish: The Predominant Affinities are Canadian**

200. The United States Memorial asserts that its theory of "three separate and identifiable ecological régimes" also applies to the fishes of the Gulf of Maine area and that the Northeast Channel provides a "natural boundary" between the stocks of Georges Bank and the stocks of the Scotian Shelf<sup>44</sup>. Studies of the limits of distribution of commercially important species provide no support for this theory. Instead, the data show a continuity in the distribution of species over broad expanses of the continental shelf. To the extent that a discontinuity can be identified, it occurs to the southwest of the Cape Cod-Great South Channel-Nantucket Shoals area. These findings are consistent with the results of studies of the composition of inshore fauna, and consistent also with geomorphology. The fish and invertebrate species of the Gulf of Maine area (including Georges Bank) are predominantly northern in their orientation; they extend southwestward from Scotian Shelf to the Cape Cod-Great South Channel-Nantucket Shoals area and are associated with the Nova Scotian biogeographic province. The southern limit of this province is coincident with the southern limit of the major effects of the most recent ice sheet.

201. With regard to *stocks* — relatively discrete populations within given species — the Canadian Memorial has identified certain

<sup>44</sup> *United States Memorial*, pp. 35-39, paras. 53-58.

"Georges Bank stocks", namely haddock, cod, yellowtail flounder and Atlantic herring<sup>45</sup>. In describing these stocks, the Canadian Memorial did not imply that they were restricted to Georges Bank at all times. Their description in the Canadian Memorial relates to the spawning period only. After spawning, these stocks migrate to a greater or lesser extent from Georges Bank to other areas of the Gulf of Maine and beyond. This dynamic pattern is the norm for almost all species of fish. Thus, contrary to United States assertions, a stock is far from a static unit<sup>46</sup>.

202. In the particular complexities of the Gulf of Maine area, stocks of some species can be grouped in certain geographical locations, though not necessarily in congruent configurations, while stocks of other species defy geographical compartmentalization. It is illusory to suggest, as does the United States, that they can be neatly divided between "Scotian Shelf stocks" and "Georges Bank stocks". And there is an additional flaw in the United States argument. In the case of a great many species, the stocks on Georges Bank are distinct from stocks found to the southwest, beyond the Great South Channel. The implication that "Georges Bank stocks" are somehow synonymous with "United States stocks" is therefore incorrect. On the contrary, many of the fish stocks on Georges Bank are far more closely associated with the waters off Nova Scotia than with waters southwest of Georges Bank.

#### A. THE GREAT SOUTH CHANNEL IS A TRANSITION ZONE IN THE SOUTHWESTWARD RANGE OF FISH DISTRIBUTIONS

203. As the following paragraphs will show, it is simply not possible for the United States to sustain its argument that its 1982 boundary proposal (or equally its 1976 line) somehow respects the "integrity" of the fishery resources of the Gulf of Maine area or their patterns of distribution. Scientific facts demonstrate beyond all doubt that, in terms of species, Georges Bank is inextricably linked with the distribution of living resources from Nova Scotia to as far south as the Great South Channel.

204. *The distributional range of fish species is not dealt with in the United States Memorial*<sup>47</sup>. As explained in the Canadian Memorial, however, the species of the Gulf of Maine area fall into three distributional patterns:

- (a) widely distributed species found both to the northeast and to the southwest of Georges Bank;

<sup>45</sup> *Canadian Memorial*, p. 56, para. 103.

<sup>46</sup> *United States Memorial*, p. 36, para. 55.

<sup>47</sup> The United States Memorial merely notes that: "Many species of fish and shellfish, distributed over large portions of the Gulf of Maine area, are divided into separate stocks . . ." *United States Memorial*, p. 32, para. 52. In Canada's view, the fishery resources in the Gulf of Maine area should be considered in the context of all levels of biological organization: (i) distribution of species; (ii) distribution of stocks; and (iii) distribution of biomass. *Canadian Memorial*, p. 55, para. 98.



- (b) southern species generally not extending northeast of the Great South Channel-Cape Cod-Nantucket Shoals area; and
- (c) northern species generally not extending southwest of the Great South Channel-Cape Cod-Nantucket Shoals area.

205. As explained by United States fisheries scientists cited in the Canadian Memorial:

“... there is an abrupt general division between the biological and physical properties of water east and west of Cape Cod ... The offing of Cape Cod also appears to *be a definite transition zone* (probably thermal) for some northern and southern species of fish and invertebrates<sup>48</sup> ...” [*Italics added.*]

The same point was made in a publication of the United States Department of the Interior in 1977:

“Fish with a northern distribution are found primarily north and east of a line from Cape Cod and the Nantucket Shoals through Georges Bank. Fish with a southern distribution are found south and to the west of the line<sup>49</sup>.”

206. The above-noted facts, recognized by United States scientists and by official United States publications, are aptly illustrated in 62-64 *Figures 20, 21 and 22*, which portray in graphic fashion the species distribution of the Gulf of Maine area in relation to Georges Bank. As can be seen, northern and widely distributed species — *cusks, haddock, redfish, argentine, cod, American plaice, Atlantic herring, pollock, white hake, lobster, Atlantic sea scallop* and *yellowtail flounder* — dominate the Georges Bank species composition. Northern species extend from the Canadian coast southwest across Georges Bank. Only in the Cape Cod-Great South Channel-Nantucket Shoals transition zone do they begin to taper off, reflecting the shift from colder northern waters to more temperate, southern waters.

62-64 207. *Figures 20 to 22* bring out several key factors in the distribution of fish species in the Gulf of Maine area. *First*, for many species the southwestern limit of distribution from the northeast is coincident with the limit of the Nova Scotian biogeographic province<sup>50</sup>. *Secondly*, Georges Bank is clearly dominated by northern and widely distributed species, whose range extends through the Scotian Shelf southwest across Georges Bank. *Thirdly*, to the extent that any geographic discontinuity can be identified in species distribution, it is found in the area to the southwest of Georges Bank and not at the Northeast Channel.

<sup>48</sup> *Canadian Memorial*, p. 56, para. 101.

<sup>49</sup> *Final Environmental Statement, Proposed 1977 Outer Continental Shelf Oil and Gas Lease Sale Offshore the North Atlantic States*, Vol. 1, p. 345; *Counter-Memorial, Annexes*, Vol. IV, Annex 14.

<sup>50</sup> The Nova Scotian biogeographical province comprises northern, cold-water benthic species and extends from Newfoundland to the warmer-water transition zone southwest of Cape Cod. See *Canadian Memorial*, p. 54, Figure 21.

B. THE MAJOR STOCKS OF THE GULF OF MAINE AREA BEAR  
NO RELATIONSHIP TO THE THREE SO-CALLED  
"ECOLOGICAL REGIMES" DESCRIBED IN  
THE UNITED STATES MEMORIAL

1. *The Concept of a "Stock"*

208. To bolster its theory of "three ecological régimes", the United States Memorial attempts to squeeze a complex, dynamic oceanographic and biological system into neat, static compartments. In other words, the United States seeks to force the biological facts — complex, diverse and not always easy to understand — into the rigid mould created by its concept of "three ecological régimes", as an *ex post facto* rationalization for its claim to the entirety of Georges Bank.

209. The United States Memorial refers to stocks almost as if they represented iron-clad divisions<sup>51</sup>. Nature, however, is by nature untidy. In fact, the distribution and migration patterns in the Gulf of Maine area are such that in most cases it is impossible to identify, within an individual species, a discrete aggregation that has independent existence in a limited geographic area. Seasonal movements on and off the banks, intermingling of progeny in one area from spawnings in other areas, transport of eggs and larvae, and annual changes in abundance of every species result in a seasonally variable mélange of species and life history stages throughout the Gulf of Maine area<sup>52</sup>. Because of these characteristics, it is almost impossible to draw a line around the area of distribution of even a single stock. The impossibility of drawing a line that would encompass the total complex of stocks is even more obvious.

210. In fact, the concept of a "stock" is essentially a statistical and management concept. The term describes dynamic and changing realities and cannot be transformed into a principle of maritime boundary delimitation. The difficulties of establishing rigid demarcations of stocks were well expressed by a Canadian scientist, who wrote:

"Biological management of fisheries has been built around the concept of 'the unit stock'. At this late stage in development it is difficult to discern that this apparently commonsense notion may be an instance of misplaced concreteness which places artificial constraints on analyses or on management rules and procedures. *In fact, the 'stock' is an abstract term applied to provide a rationale for a certain kind of aggregation of catch data.* This is not to say that there may or may not be such a thing as a discrete group of fish that may constitute an effective breeding group or stock, but in many cases there is significant uncertainty about the identity of the group from which successive annual catches are made, so that the operational term does not unequivocally refer to an identifiable physical entity. Uncritical usage can obscure the understanding of

<sup>51</sup> *United States Memorial*, p. 35, paras. 53-54.

<sup>52</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 70-72, paras. 115-118.

a number of production features that are relevant to economic considerations<sup>53</sup>." [*Italics added.*]

A similar point was made by two United States scientists, in the following terms:

"In thinking about populations or stocks of fish, there is unfortunately a tendency to consider them static entities, much as philosophers previous to the eighteenth century thought of the features of the earth as instantaneously created and almost immutable. Of course, biologists know from the paleontological record that the fish of today did not always exist, nor did the oceans in their present form. Even with this knowledge, because of the short lifetime of any one man and the extreme brevity of our records, *it is difficult to realize that change is a universal constant in the dynamics of fish populations*<sup>54</sup>." [*Italics added.*]

211. Thus, Canada would wish to register a caveat with regard to the uses of the term "stocks" in the United States Memorial. The concept cannot be taken to suggest a kind of biological segregation, associated with strictly defined and clearly established areas, as the United States Memorial seems to imply. More important still, the United States Memorial does not accurately portray the distributions of stocks in the Gulf of Maine area, to the extent that these are known.

## 2. Major Stock Distributions

212. A review of available scientific evidence on distribution and migration patterns and stock structures of commercially important fish and invertebrate species does not support the contentions of the United States regarding the existence of three so-called "ecological régimes" and a so-called stock barrier at the Northeast Channel. The United States Memorial considered only 16 species in carrying out its assessment of stock structure in the Gulf of Maine area. There are another 12 species of equal or even greater importance than some of those on the United States list: these additional species should have been included in the United States appraisal, bringing the total to 28. Direct evidence on the distribution and migration of fish and invertebrates, and the scientific literature on stocks in the Gulf of Maine area, provide an

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<sup>53</sup> L. M. Dickie: "Perspectives on Fisheries Biology and Implications for Management." *Journal of the Fisheries Research Board of Canada*, Vol. 36, 1979, p. 839; *Counter-Memorial, Annexes*, Vol. IV, Annex 15.

<sup>54</sup> J. P. Wise and A. C. Jensen: "Stocks of the Important Commercial Species of Fish of the ICNAF Convention Area." ICNAF Annual Meeting — 30 May-1 June 1960, Serial No. 743 (D.c. 3), Document No. 25, p. 1. *Counter-Memorial, Annexes*, Vol. IV, Annex 16.

adequate basis for disproving the contentions of the United States<sup>55</sup>. This evidence leads to the conclusions set out in the immediately following sub-paragraphs.

- (a) Of the 28 species of importance to commercial and recreational fisheries in the Gulf of Maine area, one-half (14) clearly span the Northeast Channel.
  - (i) Ten (*mackerel, pollock, shortfin squid, bluefin tuna, swordfish, saury, American shad, spiny dogfish, alewife* and *Atlantic salmon*) are species that conduct migrations throughout all the areas the United States Memorial describes as "separate and identifiable ecological régimes", completely ignoring the "boundaries" of all of them. The Northeast Channel does not separate stocks of these species.
  - (ii) The Northeast Channel, far from being a barrier, is an important area of concentration for stocks of four other less migratory species (*argentine, lobster, cusk* and *angler*). The United States Memorial erroneously claims that the Northeast Channel separates individual stocks of both cusk and lobster.
- (b) Of the remaining fourteen species, one (*longfin squid*) conducts long migrations from Georges Bank to waters as far south as the Carolinas. It does not extend in abundance as far north as the Northeast Channel, which therefore does not represent a stock barrier for this species. *Butterfish*, a southern migratory species, comprises a single stock from Cape Hatteras to Georges Bank. The Northeast Channel does not separate stocks of these two species and they both migrate between so-called "ecological régimes".
- (c) Of the remaining twelve species, four (*redfish, American plaice, witch flounder* and *white hake*) are primarily distributed along the northern slope of Georges Bank, the banks fringing western Nova Scotia, and in the inner Gulf of Maine. The Northeast Channel therefore cannot be represented as a stock barrier for these species. Their cross-basin distribution in the inner Gulf of Maine creates linkages between the so-called Gulf of Maine Basin and Scotian Shelf "ecological régimes", and the line of deepest water does not separate stocks.
- (d) Of the remaining eight species, two (*silver hake* and *red hake*) are divided into stocks by a line running latitudinally across Georges Bank. The northern stocks of these species occupy the northern part of Georges Bank and the inner Gulf of Maine Basin, "violating" the limits of both the so-called Georges Bank and Gulf of Maine Basin "régimes".
- (e) Of the remaining six species, aggregations of one (*Atlantic herring*), which originate in separate spawning areas in each of the three

<sup>55</sup> Thus, in addition to the 16 species in the United States list, the following commercially important fish species are found in the Gulf of Maine area: *American plaice, alewife, angler, Atlantic salmon, bluefin tuna, butterfish, spiny dogfish, saury, American shad, swordfish, witch flounder* and *winter flounder*. See *Counter-Memorial, Annexes*, Vol. I, pp. 70-102, paras. 115-145 and Figure 60, which shows a one-dimensional illustration of stock distributions in the Gulf of Maine area.

so-called "ecological régimes", intermingle as juveniles and as feeding adults, crossing the "boundaries" of all three alleged "régimes" to do so.

- (f) Of the remaining five species, three (*haddock*, *cod* and *scallop*) form separate stocks or aggregations on Georges Bank and in contiguous areas. For each of these species, however, there are equally important stock discontinuities *within* so-called "ecological régimes" as there are *between* "régimes". In addition, there are migrations between areas at both the larval stage and the juvenile and adult stages. Haddock and cod are present in commercial quantities within the Northeast Channel and are fished there by the Canadian fleet.
- (g) For the remaining two species (*yellowtail flounder* and *winter flounder*), stocks are in fact divided by the Northeast Channel.

### 3. Migrations, Mixing and Stock Interrelationships

213. The above paragraphs clearly illustrate that stocks of most species migrate freely between and through the three so-called "ecological régimes" described in the United States Memorial, and that the Northeast Channel and the line of deepest water in the Gulf of Maine Basin do not represent stock barriers. The boundary proposed by the United States does not correspond to this complex reality. Some few species of course do form spawning aggregations on Georges Bank. Even for these species, however, certain stocks show strong affinities with stocks of the same species on the Scotian Shelf to the northeast; others migrate beyond Georges Bank at other stages of their life history. Even species with stocks that do not migrate beyond Georges Bank maintain more than one aggregation on the Bank. Thus it can be seen not only that the United States notion of three separate "ecological régimes" is without scientific foundation, but also that Georges Bank itself cannot be considered to form a single stock "régime". These points are further demonstrated in the following more detailed description of cod, herring, scallop and lobster resources.

#### (a) Cod

214. It is most surprising that the United States would choose cod as an example to support its theory of three so-called "ecological régimes". Analyses of cod stocks by United States scientists show conclusively both the separateness of the eastern Georges Bank stock from those found in the waters to the southwest, and the close interconnection of the cod on Georges Bank with those found in waters further to the northeast. Thus a United States scientist has described the cod stocks of the Gulf of Maine area in the following terms:

"... in the light of all evidence to date, there are *four major groups of cod* in the New England area, all perhaps, and one certainly, divided into subgroups:

1. *The cod of the offshore banks, (Georges and Browns) closely related to the fish of the southwestern Nova Scotia coast.*

2. The cod of the Gulf of Maine, probably divided into many subgroups, and receiving considerable recruitment from the south.

3. The cod of southern New England and the South Channel.

4. The New Jersey coastal cod, which spend part of the year mingled to a greater or lesser degree with the southern New England fish<sup>56</sup>. [Italics added.]

215. This same United States authority proposed that a line be drawn along longitude 68°W, across Georges Bank, to divide the Nova Scotia cod stock from the New England cod stocks to the southwest [Figure 23]. He justified his proposal on the following grounds:

“Consideration of the topography and hydrography of the region shows that the distribution of the fish outlined above is consistent with the physical features of their environment. *A line drawn along the 68th meridian separates the offshore and southern Nova Scotia fish from the more inshore groups*; this is a line which runs through or close to the important physical barriers of the deep mud bottoms of the central basin of the Gulf of Maine, the extreme shoals of central Georges Bank, and the relatively barren southern edge of the bank<sup>57</sup>. [Italics added.]

216. In conclusion, it can be seen that cod present anything but the picture described in the United States Memorial. Two points emerge: *first*, that, to the extent that a Georges Bank cod stock can be isolated, it is an aggregation on eastern Georges Bank that is clearly separate from the cod stocks off the New England coast to the southwest of the Great South Channel area; and *secondly*, that the eastern Georges Bank cod stock is associated with the Browns Bank and southern Nova Scotia cod stocks.

### (b) Herring

217. The Canadian Memorial noted that there is a herring stock identified with Georges Bank. This is a spawning stock found on the northeast edge of the Bank (for a period of weeks in the late summer and fall). It is one of several important spawning stocks in the Gulf of Maine area. All demonstrate extensive migrations and intermingle with each other at non-spawning stages of their life history<sup>58</sup>. Juveniles from the Georges Bank spawning intermingle with juveniles from other stocks

<sup>56</sup> J. P. Wise: “Cod Groups in the New England Area.” *Fishery Bulletin*, Vol. 63, No. 1, 1963, p. 201; *Counter-Memorial, Annexes*, Vol. IV, Annex 17.

<sup>57</sup> J. P. Wise: “Cod Groups in the New England Area”, p. 201. The view that cod stocks in the Gulf of Maine area could be divided by a line drawn along 68°W through Georges Bank is consistent with the description of cod — comprising an eastern and western Georges Bank population — that was given in the ICNAF paper by J. P. Wise and A. C. Jensen, referred to in footnote 54 of this chapter.

<sup>58</sup> *Counter-Memorial, Annexes*, Vol. I, p. 94, paras. 138-139; Figures 49, 50 and 51.

in a common nursery area along the Maine-New Brunswick coast<sup>59</sup> (where they are fished collectively as sardines). Summer-feeding herring found at the mouth of the Bay of Fundy later migrate over long distances, with some going as far south as Cape Cod and others as far north as Cape Breton in northeast Nova Scotia. After spawning, Georges Bank adults disperse to the southwest as far as Long Island. Thus, whereas there may be a number of relatively discrete *spawning* stocks, the migratory behaviour and extensive intermingling habit of the stocks in no way supports the existence of three so-called "ecological régimes". Most stocks traverse "régime" boundaries several times during their life history and during any one year. The identification of relatively discrete spawning stocks does not reflect a segregation of the stocks at the non-spawning phase.

218. The United States' choice of herring as one of the stocks whose integrity its proposed boundary is alleged to respect is ill-founded for another reason. For management purposes, the characterization of a spawning aggregation on Georges Bank as a "separate stock" has little meaning; consideration must be given to the full range and mixtures of stocks throughout their life history. The United States recognizes this fact and, within the International Commission for the Northwest Atlantic Fisheries, joined Canada in undertaking an initiative to deal with the problem of overfishing of Georges Bank herring by overseas fleets in the late 1960s and early 1970s. A memorandum then presented to ICNAF by the United States conflicts with the presentation made in the United States Memorial. Thus, it expressed the view that:

"... *effective management schemes for herring must, when applied to the migratory range of various herring stocks, be designed for the various stocks and not be unduly limited by the rather arbitrary divisions within Convention Subareas*<sup>60</sup>." [*Italics added.*]

<sup>59</sup> This fact is attested to by the work of the International Passamaquoddy Fisheries Board established in 1956 by the International Joint Commission. Research work by Canadian and United States scientists under the board's auspices led to the discovery of Georges Bank herring spawning concentrations and pointed to the conclusion that the Maine-New Brunswick "sardines" (juvenile herring) were partly derived from Georges Bank herring. In addition, the work of the board indicated that the western "boundary" of the Maine-New Brunswick herring stock was in the Penobscot Bay area. S. N. Tibbo, J. E. H. Legaré, L. W. Scattergood and R. F. Temple: "On the Occurrence and Distribution of Larval Herring (*Clupea harengus* L.) in the Bay of Fundy and the Gulf of Maine." *Journal of the Fisheries Research Board of Canada*, Vol. 15, No. 6, 1958, pp. 1451-1469; C. J. Sinderman and D. F. Mairs: "A Major Blood Group System in Atlantic Sea Herring." *COPEIA*, No. 3, 1959, pp. 228-232.

<sup>60</sup> *Special Commission Meeting on Herring, January-February 1972, Conservation of Herring, Memorandum by the United States*. ICNAF Serial No. 2680, Spec.Mtg.Comm.Doc. 72/1; *Counter-Memorial, Annexes*, Vol. IV, Annex 18. Fishing of Georges Bank herring by foreign fleets in the late 1960s and early 1970s was extensive; during this same period, the Canada-United States Maine-New Brunswick juvenile herring stock declined. This is evidence of the interrelationship between Georges Bank herring and herring of the inner Gulf. See *Special Commission Meeting on Herring — January-February 1972, Conservation of Herring, Memorandum by Canada*. ICNAF Serial No. 2685, Spec.Mtg.Comm.Doc. 72/2; *Counter-Memorial, Annexes*, Vol. IV, Annex 19.

219. There is a footnote, albeit an important one, regarding the integrated nature of the herring stock in the Gulf of Maine area. In the 1979 Agreement on East Coast Fishery Resources, herring were divided for management purposes between Canada and the United States on the basis of ICNAF divisions (with both Parties having access to the herring on Georges Bank). The position of the United States during the negotiations, however, was that herring should *not* be so divided, and that the entire area from Cape Breton Island to Long Island encompassed a single, integrated herring stock. Complete agreement on all the facts could not be achieved, but to meet the point raised by the United States, the agreement provided for subsequent review of management arrangements for the herring stocks<sup>61</sup>.

220. The life cycle of the Georges Bank herring stock demonstrates yet again the futility of attempting to segregate fish into neat compartments and seeking to justify a boundary line on the basis of a theory of "ecological integrity".

(c) *Sea Scallops*

221. Scallops merit special attention because of their great commercial value to Canadian fishermen. The Canadian Memorial noted that there is no reliable evidence that a scallop "stock" exists on Georges Bank, and that the most that can be said is that there are areas of relative concentration within the Gulf of Maine area, where the major fisheries have developed<sup>62</sup>. United States scientists accept that recruitment to the various scallop beds can come from contiguous areas as a result of larval drift and dispersion, and that it is therefore impossible to speak of scallops as forming separate stocks. The United States Fishery Management Plan for Atlantic Sea Scallops of January 1982 confirms this fact in the following terms:

"There are no observed biological differences that would lead to a separation of stocks within the area regulated by this management plan . . . considering the long pelagic phase of the larvae and

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<sup>61</sup> Article 4 of Annex B of the 1979 East Coast Fishery Resources Agreement reads:

"After the third fishing year following entry into force of this Agreement, the Parties shall review the management categorization of each of the three stocks of herring listed in paragraphs 1 through 3 of this Annex. If either Party believes data on any of these stocks is inadequate, no change shall be made to the management categorization applicable to any of the three stocks. After the sixth fishing year following entry into force of this Agreement, the management categorization of each of the stocks in question shall again be reviewed by the Parties, and if the Parties cannot agree on the action to be taken, either Party may refer the matter to the Arbitrator for decision in accordance with Chapter II. The Annexes shall be amended as necessary to reflect changes agreed upon by the Parties or determined by the Arbitrator pursuant to this paragraph."

See *Canadian Memorial, Annexes*, Vol. I, Annex 20 for the text of the 1979 agreement.

<sup>62</sup> *Canadian Memorial*, pp. 56-57, para. 104; *Counter-Memorial, Annexes*, Vol. I, p. 102, para. 145.



the speed and complexity of the surface currents in which the larvae are transported, *there is little biological basis for considering these populations as separate stocks*<sup>63</sup>. [Italics added.]

The facts concerning scallop populations in the Gulf of Maine area accordingly do not fit within the United States Memorial's conception of a "stock".

222. Scallops show greatest density in two places — on the north-east part of Georges Bank and on the western side of the Bank near the Great South Channel. This fact is confirmed in the United States Department of State Draft Environmental Impact Statement on the 1979 Agreement on East Coast Fishery Resources:

"On Georges Bank itself, two areas have been important scallop grounds: south western and the northeast parts of the Bank<sup>64</sup>."

Canadian fishermen for the most part have fished the grounds on the eastern part of the Bank, while the fishermen of the United States have concentrated on the western grounds. This fact, as well as biological reality, was reflected in the 1979 fisheries agreement itself. Under the agreement, Canada was designated the party of primary interest for Georges Bank scallops east of longitude 68°30' W, and the United States was designated the party of primary interest for scallops west of that line<sup>65</sup>.

#### (d) Lobster

223. Despite the confident assertions in the United States Memorial that lobster is one of the 12 species that show a stock separation at the Northeast Channel, the National Marine and Fisheries Service of the United States Department of Commerce stated as recently as 1976 that:

<sup>63</sup> *Fishery Management Plan, Final Environmental Impact Statement, Regulatory Impact Review for Atlantic Sea Scallops (Placopecten magellanicus)*. Prepared by New England Fishery Management Council in Consultation with Mid-Atlantic Fishery Management Council and South Atlantic Fishery Management Council, January 1982, p. 6; *Counter-Memorial, Annexes*, Vol. IV, Annex 20.

<sup>64</sup> *Draft Environmental Impact Statement on the Agreement Between the United States and Canada on East Coast Fishery Resources*. Washington, United States Department of State, April 1980, p. 103; *Counter-Memorial, Annexes*, Vol. IV, Annex 21.

<sup>65</sup> A further reflection of the concentration of scallop stocks at the eastern and western ends of Georges Bank was an amendment to the 1979 East Coast Fishery Resources Agreement proposed by United States Senator Edward Kennedy. That amendment would have provided for exclusive United States scallop fishing west of a line drawn across the middle of Georges Bank. Amendment No. 1697, United States Senate, 96th Congress, 2nd Session, 15 April 1980.

“Initial assessment of offshore lobster stocks cannot be accomplished until more reliable statistics are available and stock boundaries have been defined<sup>66</sup>.”

224. On the basis of data available to Canadian scientists, the Northeast Channel is clearly not a stock boundary for lobster in the Gulf of Maine area. Lobster tagged in the Bay of Fundy and off southwest Nova Scotia radiate out into the Gulf of Maine area, on to Georges Bank and Browns Bank. The tagging studies support the view that the lobsters of the Gulf of Maine area, both inshore and offshore, including both Browns Bank and Georges Bank, comprise a single stock<sup>67</sup>. But quite apart from the question of stock configuration, it is a fact that offshore lobster gather along the edge of the continental shelf, as well as in the canyons, channels and basins from the Scotian Shelf to the southwest. Indeed, the principal Canadian lobster catches in the Gulf of Maine area occur partly in the Northeast Channel and in the canyons found along the shelf edge, including Corsair Canyon on Georges Bank.

#### 4. Quantitative Assessments of Biomass

225. The Canadian Memorial has already demonstrated that when the relative abundance of fish — the biomass — on Georges Bank is considered in the aggregate, or even on an individual species basis, there is a reasonably even pattern of distribution from east to west across the Bank<sup>68</sup>.

226. Data from Canadian and United States groundfish research surveys have now been combined to show the distribution of biomass across a wider geographical range than Georges Bank, covering the general extent of the Gulf of Maine area from northeast to southwest<sup>69</sup>. Figure 24 shows the aggregate biomass distribution for all species covered by the program. Biomass is represented by the “mountains” in the Figure, and the relative height of the peaks gives a picture of the relative abundance of fish in any given part of the area. The overall biomass distribution does not suggest or reflect the existence of three separate “ecological régimes”, nor does it reveal the Northeast Channel as a distributional barrier.

<sup>66</sup> M. D. Grosslein and S. H. Clark: *Distribution of Selected Fish Species and Status of Major Fisheries in the Northwest Atlantic*. Technical Reference Document for Bilateral Negotiations between the United States and Canada, July 1976. United States National Marine Fisheries Service, Northeast Fisheries Center, Woods Hole, Massachusetts, Laboratory Reference No. 76-12, 1976, p. 53; *Counter-Memorial, Annexes*, Vol. IV, Annex 22. The same point regarding lack of data on lobster was made in the 1980 Department of State *Draft Environmental Impact Statement on the Agreement Between the United States and Canada on East Coast Fishery Resources*, p. 109. *Counter-Memorial, Annexes*, Vol. IV, Annex 21.

<sup>67</sup> *Counter-Memorial, Annexes*, Vol. I, p. 81, para. 131(b); Figures 40, 41 and 42.

<sup>68</sup> *Canadian Memorial*, pp. 57-58, para. 106; *Canadian Memorial, Annexes*, Vol. IV, Annex 2.

<sup>69</sup> *Counter-Memorial, Annexes*, Vol. I, pp. 102-103, para. 146.

## Section VII. Cooperation in the Conservation and Management of Fishery Resources Is the Norm for Canada and the United States

227. The United States wraps its expansionist claim in an ill-fitting cloak of environmentalism. Thus the United States Memorial intimates that an inequitable result would somehow be rendered appropriate because it would allegedly facilitate conservation and management of the fishery resources of Georges Bank. "Single-State management", however, is a perversion of the doctrine of coastal State management now enshrined in international law. The law of the sea anticipates the division of living resources between neighbouring coastal States and provides for cooperation in their conservation and management<sup>70</sup>. State practice, and especially the bilateral practice of Canada and the United States, affords many examples of successful cooperation in this and related fields.

228. Canada disputes the United States contentions that bilateral cooperation in the effective conservation of transboundary fishery resources is not possible or desirable and that "single-State management" is necessarily more efficient than "conservation by agreement". Canada challenges these views for a number of reasons. *First*, contrary to the assertions in the United States Memorial, the United States management system itself is not based on the concept of the "stock, rather than the species, [being] the appropriate subject of fisheries conservation and management efforts<sup>71</sup>". *Secondly*, the existing United States management system itself is largely based on "conservation by agreement". And *thirdly*, Canada and the United States have a long and successful tradition in the conservation of fishery resources by agreement, and the United States remains a strong advocate of cooperative management except in the area of the northwest Atlantic.

### A. THE UNITED STATES HAS REJECTED UNIT STOCK MANAGEMENT IN ITS DOMESTIC MANAGEMENT PROGRAM IN THE NORTHWEST ATLANTIC

229. The United States Memorial contends that a "fish stock, rather than a species, is the appropriate subject of fisheries conservation and management efforts<sup>72</sup>". Since extending its fisheries jurisdiction to 200 miles in 1977, however, the United States has discarded this unit stock approach in its domestic management program. The New England Regional Fishery Management Council no longer sets quotas for individual groundfish stocks or even for combinations of stocks, or indeed for groundfish *species*. For example, the management unit defined in the council's Interim Fishery Management Plan for Atlantic Groundfish lumps together: "All cod, haddock and yellowtail flounder in

<sup>70</sup> See Articles 63, 117 and 118 of the 1982 Convention on the Law of the Sea.

<sup>71</sup> *United States Memorial*, pp. 32-35, para. 52.

<sup>72</sup> *United States Memorial*, p. 35, para. 52.

the Northwest Atlantic within the jurisdiction of the United States<sup>73</sup>". The seven separate stocks of cod, haddock and yellowtail considered by United States scientists to inhabit the area within United States jurisdiction are ignored and regulated as one conglomerate mass. This system accordingly does not even treat individual species (much less stocks) separately, and is a far cry from the system one might have expected from reading the United States Memorial.

#### B. THE UNITED STATES MANAGEMENT SYSTEM ITSELF REQUIRES "CONSERVATION BY AGREEMENT"

230. Since the solution proposed by the United States would be inequitable in this case, the question whether "single-State management" is more efficient or expedient than cooperative management must be irrelevant. Still, it might be pointed out here, very briefly, that management by a single State, particularly a very large federal State like the United States, may itself require interjurisdictional cooperation. At the national level, as at the international level, the key factor appears to be the coupling of conservation and management incentives with the power to institute and implement sound policies. In short, at all levels, effective conservation and management are dependent upon political will.

231. Under the United States *Fishery Conservation and Management Act*<sup>74</sup>, regulatory jurisdiction is divided between eight separate Regional Fishery Management Councils, four of them on the Atlantic coast. The New England Council is primarily responsible for the living resources here in issue.

232. The regional councils themselves represent amalgamations of interest groups. The New England Council, for example, has 17 voting members, including at least one from each of the five states represented on it and one representative of the United States federal government.

233. In addition, the United States fisheries management system leaves jurisdiction and control over fishery resources in the territorial sea to the states. Federal jurisdiction takes over only beyond that limit<sup>75</sup>. The result is that "conservation by agreement" is the *sine qua non* for effective management in the United States system. As stated by the National Marine and Fisheries Service in its 1981 report:

*"Approximately 90 percent of marine fisheries resources off U.S. coasts are interjurisdictional; that is, they migrate through,*

<sup>73</sup> *Interim Fishery Management Plan for Atlantic Groundfish*. Saugus, Massachusetts, New England Fishery Management Council, 30 September 1981, p. 1; *Counter-Memorial, Annexes*, Vol. IV, Annex 23.

<sup>74</sup> *United States Fishery Conservation and Management Act*, 16 United States Code, secs. 1801, 1852, *et seq.*, authorizes the establishment of the Regional Fishery Management Councils.

<sup>75</sup> *Submerged Lands Act*, 43 United States Code, secs. 1301, *et seq.*; *Outer Continental Shelf Lands Act*, 43 United States Code, secs. 1331, *et seq.*

or transcend, multiple jurisdictions — between State lines, between State territorial waters and the FCZ [Fisheries Conservation Zone], or between U.S. territorial waters and those of another country. *Most of the fisheries being managed under the Magnuson Act are interjurisdictional.* Because the Act calls for comprehensive management of a resource throughout its range, all jurisdictions concerned must assume responsibility for implementing an approved FMP [Fisheries Management Plan]<sup>76</sup>.” [*Italics added.*]

### C. CANADA AND THE UNITED STATES HAVE A LONG TRADITION OF EFFECTIVE CONSERVATION BY AGREEMENT

234. Two major themes — one adversarial and the other cooperative in nature — emerge from the long history of the fisheries and boundary relations of the Canadian Maritime Provinces and New England<sup>77</sup>. Despite occasional jurisdictional and boundary problems, Canada and the United States have established a remarkable record of cooperation in fisheries matters. Over the course of many years, the two countries have developed an effective regional practice of joint exploitation and management of shared fishery resources. Indeed, joint arrangements respecting shared resources cover a wider spectrum than fisheries and have been the norm, rather than the exception, for 200 years.

235. As early as 1891, Canada and the United States became parties to a *modus vivendi* in relation to the fur-seal fisheries in the Bering Sea, and the North Pacific Fur Seal Commission that eventually came into being continues its work to this day<sup>78</sup>. A treaty was signed between the Parties in 1923 to constitute the International Pacific Halibut Commission, which also continues its work to this day<sup>79</sup>. The 1930 Convention between Canada and the United States for the Protection, Preservation and Extension of the Sockeye Salmon Fisheries in the Fraser River is also still in force<sup>80</sup>, although the two countries have negotiated a draft agreement to replace it, so as to deal with Pacific salmon management questions on a broader basis. Other examples are provided by the 1954 Convention between Canada and the United States on Great Lakes Fisheries<sup>81</sup> and the 1981 Treaty on Pacific Albacore Tuna.

236. The negative view of “conservation by agreement” set out in the United States Memorial is not reflected in United States practice

<sup>76</sup> *Calendar Year 1981, Report on the Implementation of the Magnuson Fishery Conservation and Management Act of 1976*. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. Washington, Government Printing Office, 1982, p. 75; *Counter-Memorial, Annexes*, Vol. IV, Annex 24.

<sup>77</sup> See *Canadian Memorial, Annexes*, Vol. I, *Contemporary Treaties Affecting the Northwest Atlantic Fisheries, With a Historical Introduction*.

<sup>78</sup> *United Nations Treaty Series*, Vol. 314, p. 105.

<sup>79</sup> *League of Nations Treaty Series*, Vol. 32, p. 93. See *United Nations Treaty Series*, Vol. 222, p. 77, for the agreement currently in force.

<sup>80</sup> *League of Nations Treaty Series*, Vol. 184, p. 305.

<sup>81</sup> *United Nations Treaty Series*, Vol. 238, p. 97.

nor borne out by United States experience. The United States for example, has consistently been a strong champion of the International Pacific Salmon Fishery Commission, which is charged with the management of Canadian and United States fisheries harvesting salmon bound for the Fraser River in Canada. A United States chairman of the commission summarized his view of its achievements as follows:

“Never in history have two countries approached each other on an international problem with such a spirit of unselfishness and deep desire to cooperate . . . Never in history has so much been accomplished in such a short time<sup>82</sup>.”

237. United States praise for the International Pacific Halibut Commission is no less unstinting. The commission's work, involving management of halibut stocks along the coasts of British Columbia and Alaska, has long been the subject of admiration within the United States Pacific fisheries community. The almost unanimous view of United States interest groups is well summarized in a 1978 editorial of the United States periodical, *The Fishermen's News*, which described the commission's accomplishments in the following terms:

“In the fifty-three years of its existence, the commission rehabilitated a severely over-fished resource and guarded it jealously from over exploitation. In so doing, the staff and the commissioners acquired an outstanding reputation for honest, impartial fisheries management, and amassed a body of knowledge about the halibut resource that is unmatched in the world<sup>83</sup>.”

238. The Halibut Commission in fact is a particularly appropriate example of successful cooperation between Canada and the United States; for the life history and migratory patterns of Pacific halibut are not unlike those of haddock and cod in the Gulf of Maine area. All three species are groundfish that show intermixing between stocks spawning at various points off the Canadian and United States coasts.

239. Further examples of successful bilateral, regional and multilateral conservation efforts involving the United States could readily be provided. Canada and the United States are both members of such other bodies as the International Commission for the Conservation of the Atlantic Tuna<sup>84</sup>, the North Atlantic Salmon Conservation Organization<sup>85</sup>, the Inter-American Tropical Tuna Commission<sup>86</sup>, the International North Pacific Fisheries Commission<sup>87-88</sup>. Such fisheries

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<sup>82</sup> *Pacific Fisherman*, May 1957, pp. 13-14; *Counter-Memorial, Annexes*, Vol. IV, Annex 25.

<sup>83</sup> *The Fishermen's News*, October 1978; *Counter-Memorial, Annexes*, Vol. IV, Annex 26.

<sup>84</sup> *United Nations Treaty Series*, Vol. 673, p. 63.

<sup>85</sup> Canada signed this treaty on 18 March 1982; the United States signed it on 3 March 1982 and ratified it on 30 September 1982. The treaty has not yet entered into force.

<sup>86</sup> *United Nations Treaty Series*, Vol. 80, p. 3.

<sup>87-88</sup> *United Nations Treaty Series*, Vol. 205, p. 65.

commissions are a global phenomenon and demonstrate the continuing need for cooperation in the conservation of the sea's living resources.

240. The United States authorities have at times judged conservation by agreement to be superior to domestic United States conservation programs. For example, a senior United States official, after pointing out some disappointing results of United States programs, wrote as follows in 1970:

"In contrast is the condition in which international fishery resources have been maintained and the manner in which they have been managed. Fur seals, the Pacific halibut, the Fraser River sockeye salmon, the yellowfin tuna stocks of the eastern tropical Pacific, the lake trout resources of the Great Lakes, the fishery resources of the Northwest Atlantic and others quite clearly show that international fishery management has been far more successful than the national fishery management of the United States has been<sup>89</sup>." [*Italics added.*]

Against this background it is difficult to accept without question the assertion made in the United States Memorial that international cooperation is a fruitless pursuit and that the only solution to conservation problems is to allocate a rich fishing ground in its entirety to one State.

241. With specific regard to Georges Bank, the negotiation and signature of the 1979 Agreement on East Coast Fishery Resources was the culmination of a series of joint arrangements fully outlined in the Canadian Memorial<sup>90</sup>. Its cooperative management provisions reflected the recommendations of the October 1977 report of the special negotiators appointed to deal with the full spectrum of maritime boundary and resource issues between Canada and the United States. (Their report, it will be recalled, was formally approved by the two governments.) While furthering the tradition of shared access, the 1979 agreement would have expanded the tradition of cooperative management in the interests of effective conservation. As was explained in the Canadian Memorial, in addition to providing for national catch entitlements, the 1979 agreement would have established a regulatory system that placed some stocks under full joint management, others under qualified joint management, and a third category under the exclusive management of one Party or the other. In short, the 1979 agreement sought to fulfil the objectives of both equity and sound management.

242. Having agreed to and then failed to ratify this equitable arrangement, the United States now seeks to appropriate to itself the entirety of Georges Bank, based on claims of managerial expediency. The United States alleges that:

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<sup>89</sup> D. L. McKernan: "Science and Politics in National Fishery Management." *Publications in Fisheries — New Series*, Vol. V, 1972, p. 114; *Counter-Memorial, Annexes*, Vol. IV, Annex 27.

<sup>90</sup> *Canadian Memorial*, pp. 111-115, paras. 263-276. The text of this agreement is reproduced in *Canadian Memorial, Annexes*, Vol. I, Annex 20.

“A boundary that respects a natural division between stocks, and thus places separate stocks under the jurisdiction of a single State, should be preferred over a boundary that would divide many stocks between different national jurisdictions, because the former boundary will promote, rather than undermine, effective conservation and management<sup>91</sup>.”

The preference expressed by the United States has nothing to do with law and little if anything to do with conservation. Apart from the fact that the simplistic presentation of fish distributions in the United States Memorial is inaccurate and indefensible, the monopolistic solution proposed is inherently inequitable and is therefore entitled to no consideration under the applicable law.

### Conclusion

243. The soundness of the maritime boundary proposed by Canada is confirmed by the evidence of geology, geomorphology, oceanography and biology. If these factors alone were relevant, they would suggest that the whole of Georges Bank should go to Canada in view of its predominantly Canadian affinities. Within the single continental shelf of the east coast of North America, geological structures extend from the Canadian landmass into the Gulf of Maine area, and the Scotian Basin extends southwestward beneath the Northeast Channel and Georges Bank. Surface features also link Georges Bank and the Scotian Shelf; northeast of the Great South Channel area, the entire continental shelf shows the superficial scars of glacial action, unlike the smooth unglaciated East Coast Shelf to the southwest. Georges Bank is defined in physiographic terms by both the Great South Channel and the Northeast Channel. Currents, tides, freshwater discharges and temperature characteristics link Georges Bank with Canada.

244. The microbiological organisms of Georges Bank are of predominantly northern origin. The fish and invertebrate species of the Gulf of Maine area (including Georges Bank) are also predominantly northern in their orientation and extend southwestward from the Scotian Shelf to the Cape Cod-Great South Channel-Nantucket Shoals area, which marks the transition zone between these northern species and species with a southern orientation. The complexities of stock distribution in the Gulf of Maine area defy rigid geographical compartmentalization, and the distribution of most stocks of the 28 commercially important species is not affected by the Northeast Channel. Biomass distribution also shows an overall continuity in the Gulf of Maine area.

245. Despite the predominantly Canadian affinities of Georges Bank as a whole, Canada's claim, being based on law, is limited to the eastern part. The United States, on the other hand, goes against both these affinities and the applicable law in urging that it should enjoy a monopoly over Georges Bank. It advances the unproven and unfounded assumption that the United States alone could more readily provide for the conservation and management of the Bank's living resources,

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<sup>91</sup> *United States Memorial*, p. 143, para. 250.



regardless of equitable considerations. Canada and the United States have both historically evidenced a willingness and capacity to cooperate bilaterally and regionally in the conservation of shared resources; and they should be expected to continue to do so. Equity need not, and should not, yield to objectives — imagined or even real — of mere managerial expediency or administrative convenience. Cooperation in management will be necessary in any event, and experience demonstrates that it will prove at least as effective as any exclusively national management system in ensuring the conservation of the living resources of the Gulf of Maine area.

## CHAPTER IV

### THE HUMAN DIMENSION

#### Introduction

246. The human dimension must be among the more important relevant circumstances in a case involving the division of fishery resources that sustain the very existence of many coastal communities. Central to this human dimension is the disposition to be made of Georges Bank, with the United States claiming the whole of it (and beyond), and Canada claiming somewhat less than half.

247. The Canadian Memorial emphasized that the economic activities of the coastal populations represent an important link between the disputed area and the relevant coasts. The evidence presented in Canada's Memorial demonstrated the strong and continuous presence of Canadian fishermen on Georges Bank at all relevant times. It also established in clear and quantitative terms the degree of Nova Scotia's economic dependence on Georges Bank<sup>1</sup>.

248. The United States Memorial ignores the human dimension and treats economic matters in a self-contradicting and vacillating manner. It agrees with the Canadian view that macroeconomic factors, or "general economic considerations relating to the relative wealth of the two countries"<sup>2</sup>, should be excluded from consideration. Unlike Canada, however, the United States then proceeds to introduce such macroeconomic factors in a variety of subliminal ways.

249. Economic circumstances cannot be divorced from geography. They are a projection of the physical circumstances of the maritime area to be delimited, and of the relevant coasts. The geography of the Gulf of Maine area, and in particular the relation of the coasts to the resources of the adjacent waters, has produced in Nova Scotia a maritime economy based on the exploitation of the resources of the sea, and especially of Georges Bank. For southwest Nova Scotia, this link is vital. In contrast, New England has a diversified economy largely unrelated to the fisheries of the area. The Canadian line would minimize the disturbance to established economic realities. The United States boundary proposal, on the other hand, would severely dislocate the economy of southwest Nova Scotia, while providing only marginal benefits for New England. The equitable solution accordingly must clearly lie with the established dependence rather than the marginal benefit, and thus favour the line proposed by Canada.

250. The following paragraphs will concentrate largely upon the factual basis for the contention that Canada's line is compatible with economic circumstances in the Gulf of Maine area. Detailed discussion of the legal basis for this contention will be left to Part III. The irrelevant economic considerations advanced by the United States will be

<sup>1</sup> *Canadian Memorial*, pp. 59-91, paras. 110-202.

<sup>2</sup> *United States Memorial*, pp. 146-147, para. 260.

dealt with here mainly for the purpose of making necessary factual corrections. It will be shown that from every point of view — whether in terms of coastal State *presence* on the disputed fishing grounds, coastal State *dependence* on the economic benefits derived therefrom, or the economic *impact* of a denial of access thereto — the economic evidence overwhelmingly supports the Canadian claim.

## Section I. The Canadian Claim Is Consistent with the Canadian Presence in the Fishery

### A. THE STATISTICAL RECORD

251. Both Canada and the United States rely in their respective Memorials on fishery statistics collected by the International Commission for the Northwest Atlantic Fisheries. The United States uses these statistics in two ways to give a distorted impression of reality. *First*, before the filing of its Memorial, the United States claimed the major portion of ICNAF subarea 5. It has now extended its claim to include a portion of ICNAF subarea 4, which wraps around southwest Nova Scotia. The United States seeks to support this new demand with catch data that relate generally to subarea 5 alone. *Secondly*, even leaving aside this confusion between subarea 4 and subarea 5, the statistical presentation in the United States Memorial is misleading in lumping together catch data for the whole of the vast expanse of subarea 5, which comprises subdivisions 5Ze, 5Zw and 5Y [Figure 25]. The catch from subdivisions 5Zw and 5Y is wholly irrelevant and has nothing to do with Georges Bank or with the claims of the Parties<sup>3</sup>. Canada's claim is limited to the eastern part of subdivision 5Ze, specifically statistical units 5Zej and 5Zem where its interests are paramount. Less than 10 percent of the United States catch taken in subarea 5 comes from these two statistical units<sup>4</sup>.

252. Accepting, for the sake of argument, the statistical base put forward by the United States, the logical result would be the opposite of what the United States intends. In the period from 1969 to 1978, Canadian vessels took 62 percent of the coastal State catch from Georges Bank in terms of round weight (the measure used in the United States Memorial), as against 38 percent by United States vessels<sup>5</sup>. Canada's share of the total scallop catch from Georges Bank in the same period was 90 percent. Canada's high level of catch in all areas is shown in Figure 26A; the substantially lower United States catch, concentrated on the western part of the Bank, is shown in Figure 26B. By a parity of reasoning with the arguments advanced in the United States Memorial, Canada's claim ought to extend to the whole of Georges Bank.

<sup>3</sup> *United States Memorial*, p. 53, Figure 10. It should be noted that the catch data for subarea 3 in 1980 as given in this Figure is grossly erroneous. Canada's total catch was 375,622 metric tons, not 37,451 metric tons. Northwest Atlantic Fisheries Organization, *Statistical Bulletin*, Vol. 30, 1980, p. 27; *Counter-Memorial, Annexes*, Vol. IV, Annex 28.

<sup>4</sup> Based on landings data for ICNAF subarea 5. See *Canadian Memorial, Annexes*, Vol. IV, Annex 3.

<sup>5</sup> *Canadian Memorial*, pp. 66-67, para. 133, footnote 12.

253. The United States, moreover, avoids comparing the Canadian and United States fisheries in terms of value. The result is that highly valuable species such as scallop and lobster (which are of primary interest to Canada) are equated with "trash fish" applied only to industrial uses, which have a negligible value per unit of weight.

254. The meaningful measure of economic dependence is *value*. When measured in Canadian prices, the Canadian share of the coastal State catch from the area claimed by Canada on Georges Bank (roughly equivalent to ICNAF statistical units 5Zej and 5Zem) amounted to almost 85 percent during the decade leading to the Special Agreement<sup>6</sup> [Figure 27].

255. Even the figures cited in the immediately preceding paragraph have a misleading bias in favour of the United States because the offshore landings of many small Canadian vessels are not included in the official statistics. Canadian landing regulations do not require vessels that are less than 14 metres in length or displace less than 25.5 gross registered tons to report the area in which they harvest their catch<sup>7</sup>. In 1979, only 366 vessels (11 percent) of the 3,309 registered commercial fishing vessels in southwest Nova Scotia were larger than 25.5 gross registered tons<sup>8</sup>.

256. There are a number of statistical consequences resulting from the exclusion of Canadian fishing boats under 25.5 gross tons from the "offshore" category. *First*, this practice results in an understatement of the contribution made by the Canadian small-boat fleet to the offshore fishing industry, since a substantial portion of its catches are automatically classified as inshore even when taken offshore. *Secondly*, the failure to distinguish between the offshore catches and the inshore catches of the small-boat fleet inflates the official total inshore catch statistics, and this may give a false impression of the inshore marine resources to which southwest Nova Scotia has access. *Thirdly*, the inclusion of the offshore catches of the small-boat fleet in offshore statistics would increase (i.e., *correct*) the statistical share of the Canadian fishery in the disputed area<sup>9</sup>.

<sup>6</sup> The value of landings is calculated by aggregating the annual volume of landings for the ten-year period on a species-by-species basis, multiplying these volumes by the 1978 Canadian prices, and aggregating again to give a total value. For a few species not caught by the Canadian fleet (and not among the important commercial stocks of the Bank), there is no Canadian record of prices. In these cases, United States prices are used. See *Canadian Memorial, Annexes*, Vol. IV, Sec. II, Annexes 3 and 4.

<sup>7</sup> *Atlantic Fishery Regulations*, Consolidated Regulations of Canada 1978, Chap. 807, as amended.

<sup>8</sup> Canadian Department of Fisheries and Oceans, unpublished licensing data. See *Counter-Memorial, Annexes*, Vol. IV, Annex 29.

<sup>9</sup> It is possible to make an estimate of the quantity of fish landed by the inshore fleet from Georges Bank for 1980 from unpublished Department of Fisheries and Oceans data. In that year, vessels less than 25.5 gross registered tons in fisheries district 32, which includes Cape Sable Island, landed 2,459 metric tons from Georges Bank. To land this fish, vessels of the inshore fleet made 579 trips to Georges Bank. The inclusion of only these inshore fleet landings would have increased the groundfish landings attributable to Georges Bank by 10 percent. Assuming that inshore fishermen in the two adjacent fishing districts followed the same fishing patterns, the proportion would be even higher. See *Counter-Memorial, Annexes*, Vol. IV, Annex 30.

## B. THE MODERN FISHERY

257. The Canadian Memorial adduced striking evidence of the presence of Canadian fishermen in the Gulf of Maine area throughout the period preceding the present dispute. While much of the Canadian effort was directed to the scallop resource throughout Georges Bank, there was also an extensive Canadian groundfish fishery that included vessels ranging in size from 34-foot (10.4 metre) "Cape Islanders" to large modern trawlers. The precise nature and extent of the Canadian fishery varied through the years, but the Canadian presence on Georges Bank was always a powerful and continuing factor. So also was the dependence of the coastal communities of southwest Nova Scotia on that fishery. The most recent phases in the evolution of the Canadian fishery on Georges Bank have been marked by an expansion in the groundfish fishery and an expansion of small offshore vessel activity. *Figures 28 and 29* illustrate the principal home ports of the large- and small-vessel fleets that make up the Canadian fishery on Georges Bank.

258. In contrast, the United States has experienced a persistent decline in its Georges Bank fishery — a fact that it attributes to unwarranted "intrusions" by Canadian and other "foreign" fishermen. The United States Memorial, however, has sought to redeem this situation by invoking a transitory expansion in its fishery in the immediate wake of the extension of jurisdiction to 200 miles by both the United States and Canada. There was indeed a sudden jump in United States catches of a few species, especially scallops, beginning about 1977 and 1978. The late 1970s witnessed a sharp rise in the price of scallops and the Middle Atlantic scallop grounds — a major traditional source of supply in the United States — had been overfished by the United States and were producing temporarily reduced yields. The combined effect of these and other factors was an influx of additional United States vessels and fishing effort in the Gulf of Maine area immediately after the establishment of the United States 200-mile zone. To a great extent, however, the landings added to the New England catch as a result of this phenomenon came from vessels based in the southern United States<sup>10</sup>. As a recent United States study on this development put it:

"A large influx of fleet-owned fishing vessels from the south are fishing in New England waters . . . Moreover, there is very little that can be done to control the fishing activities of the southern boats even though the economic benefits to the New England region are minimal.

There is every reason to believe that as soon as the southern boats have depleted the stocks on which they are fishing they will turn their efforts to other species and/or areas to make a living<sup>11</sup>."

<sup>10</sup> D. Russell: "Rebel Waters." *Boston Magazine*, December 1981, p. 164; *Counter-Memorial, Annexes*, Vol. IV, Annex 31.

<sup>11</sup> S. Sedgewick, C. Collins and S. Olsen: *Commercial Fishing Facilities Needs in Rhode Island*. Coastal Resources Center, University of Rhode Island, Marine Technical Report 80, 1980, pp. 2 and 20. This report also states that approximately 120 vessels joined New England's fishing fleets between 1976 and 1979, see p. 2. *Counter-Memorial, Annexes*, Vol. IV, Annex 32.

259. It would clearly be inappropriate to take this recent trend into account in these proceedings. It is transitory and opportunistic, and it could not have occurred if the United States had taken timely and adequate measures to conserve the stocks<sup>12</sup>. The United States failed to act with reasonable care in allowing a regulatory vacuum to develop and persist for several years after the extension of jurisdiction — at a time when both the size and the fishing practices of the Canadian fleet were carefully regulated<sup>13</sup>. Furthermore, this diversion from established fishing patterns occurred to a very great extent after the conclusion of the Special Agreement in 1979, and for that reason alone falls outside the period that is properly relevant to the dispute. To the extent that Canada is now required to introduce evidence on developments subsequent to the conclusion of the Special Agreement, therefore, it does so subject to a clear reservation as to their legal relevance.

260. In 1980 and 1981, the United States scallop catches in ICNAF subdivision 5Ze as a whole — including the undisputed part of Georges Bank, the Great South Channel and the inshore grounds of Massachusetts — reached a level of rough parity with those of Canada. Even in these two years, landings from eastern Georges Bank accounted for only one-third of the New England catch (up from less than 4 per cent in 1976<sup>14</sup>). At no time did the incursion of new vessels from elsewhere in the United States have the effect of displacing the Canadian fleet from its traditional Georges Bank grounds, though catch levels of scallops were reduced because of the additional United States pressure on the resource. As was noted in the Canadian Memorial, the Canadian fishery on Georges Bank has maintained its basic economic importance, attaining a landed value of \$80 million in 1981. The Canadian share of the harvest of a number of species other than scallops has continued its gradual increase. In 1982, the value of the Canadian groundfish catch was \$12.6 million, an increase of almost \$4 million over 1981<sup>15</sup>.

261. But what is particularly significant about the developments after the conclusion of the 1979 Special Agreement is the continuing

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<sup>12</sup> The withdrawal of the United States from ICNAF resulted in a regulatory vacuum in the New England fishery. The best example of this vacuum is in the United States scallop fishery, which was uncontrolled until August 1982.

<sup>13</sup> The failure of the United States to take reasonable steps to conserve the resources that were subject to the 1979 Agreement on East Coast Fishery Resources, and to restrict United States catches to the established levels contemplated by that agreement, was, in Canada's view, inconsistent with the principle of law that the object and purpose of a treaty should not be frustrated by a signatory State pending its entry into force. See Article 18 of the 1969 Vienna Convention on the Law of Treaties.

<sup>14</sup> *New England Fishery Management Council: Fishery Management Plan, Final Environmental Impact Statement, Regulatory Impact Review for Atlantic Sea Scallops (Placopecten magellanicus)*. January 1982, Table 333.3, p. 60; *Counter-Memorial, Annexes*, Vol. IV, Annex 20.

<sup>15</sup> Canadian Department of Fisheries and Oceans unpublished landings data. See *Counter-Memorial, Annexes*, Vol. IV, Annex 33.

increase in groundfish catches by the small offshore vessel fleet<sup>16</sup>. Southwest Nova Scotia relies very heavily on owner-operated small-boat enterprises, which are based in a large number of small fishing communities from Shelburne County to Digby County. Georges Bank is of special importance to these small-boat fishermen living along the coasts that are closest to it. Such fishermen depend upon the Bank for their summer groundfish, particularly cod. For some, it is a key component in a year-round strategy of exploitation of Browns Bank, Georges Bank and the region between these banks and west of them. As was noted in the Canadian Memorial<sup>17</sup>, the small-vessel fishery spreads employment widely throughout the traditional fishing communities of the Nova Scotia coast and fulfils an important cultural need by allowing independent fishermen to own and operate their own vessels.

262. The increasing use of Georges Bank by small offshore vessels from Nova Scotia is undoubtedly a stable trend. The geographical proximity of Georges Bank to the ports of southwest Nova Scotia, combined with ever-improving navigational equipment and weather broadcasts, will continue to attract increasing numbers of these smaller vessels. For this reason, the trend is indicative of patterns that can be expected to endure in the years to come.

## Section II. Geography and Other Physical Circumstances Provide the Basis of the Canadian Fishery

### A. THE GEOGRAPHICAL BASIS OF THE FISHERY

263. The patterns of human activity in relation to the resources of Georges Bank are primarily dictated by geography. Indeed, the regional economy in the Gulf of Maine area is as much the product of its physical environment as are the ocean currents and the distribution of the fish. A related point is made in the United States Memorial:

“The location of the fishery resources has, in turn, shaped human activities in the area<sup>18</sup>.”

264. The “relevant circumstances” of the Gulf of Maine area therefore include not only its purely physical characteristics but also the economic and human environment produced by these physical characteristics. The location of the fishing grounds is a physical fact. The exploitation of Georges Bank, historically, has been influenced by physical dis-

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<sup>16</sup> Between 1978 and 1980 summer codfish landings from Georges Bank by the small vessel fleets in Shelburne, Yarmouth and Digby counties increased from 1,245,000 kilograms (25 percent of their total catch) to 2,120,000 kilograms (33 percent). In Shelburne county the proportion rose from 36 percent to 55 percent; in the fishing district which includes Cape Sable Island and the adjacent mainland, the proportion rose from 45 percent to 72 percent. *Counter-Memorial, Annexes, Vol. IV, Annex 34.*

<sup>17</sup> *Canadian Memorial*, pp. 71-72, paras. 143-144.

<sup>18</sup> *United States Memorial*, p. 27, para. 38.

tance from its resources. In the modern period of full exploitation, southwest Nova Scotia and eastern Massachusetts, being closest to Georges Bank, have fished there extensively. By far the greatest proportion of United States landings from the disputed area of Georges Bank is made in the major ports of Massachusetts (Gloucester, New Bedford and Boston). Maine does not have a significant presence on Georges Bank, nor do other New England or mid-Atlantic states<sup>19</sup>.

265. The physical remoteness of southwest Nova Scotia from the principal Canadian population centres in Quebec and Ontario has helped to determine its resource marketing patterns and its economic development. High costs of transportation to the major markets of central Canada worked against the establishment of a broadly based economy.

266. The major Canadian markets for fresh fish in Quebec and Ontario are 1,500 kilometres away. The substantially closer proximity of southwest Nova Scotia to the major population centres of New England, rather than those of central Canada, has made the Canadian Georges Bank fishery particularly vulnerable over the years to United States tariffs and other protectionist policies<sup>20</sup>.

267. Other geographical characteristics have also impeded the development of a broad economic base in southwest Nova Scotia, in particular the lack of resources and the dearth of fertile soil. These have kept the area relatively sparsely populated and dependent on the sea for a livelihood. Since the fishery is the major source of sustenance, Canadians in southwest Nova Scotia have every incentive to manage the resource wisely. In contrast, the relevant coastal areas of Massachusetts, for reasons of history and a greater abundance of natural resources, have produced a more diversified economy in which fishing activities play a very modest role.

268. Physical conditions in southwest Nova Scotia are strongly reminiscent of the Norwegian coastal environment that figured so prominently in the *Fisheries* case:

“As with a consequence of the scarcity of tillable land, and also of the coastal configuration, Norwegians have sought from time immemorial their livelihood from maritime fishing and hunting. Fishing grounds off the coast have been at all times one of the rare natural resources which Norway could offer to her population.”

<sup>19</sup> *Counter-Memorial, Annexes*, Vol. IV, Annex 35.

<sup>20</sup> Policies adopted for other purposes may also have a protectionist effect, for example, the application of United States health regulations to swordfish landings. In 1971, on the basis of medical research, both Canada and the United States implemented regulations on the permissible level of mercury content in fish. However, the United States health regulations were not applicable to fish caught in Massachusetts state waters. It is known that substantial numbers of swordfish were taken well outside this limit and were misreported by United States fishermen. This allowed United States fishermen to land swordfish in the United States under cover of this regulatory exemption, while extinguishing the Canadian swordfish fishery.



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"The characteristics of the Norwegian or coastal waters, as well as the special conditions in which fishing along the coast is done, have created appropriate fishing techniques, a particular organization of the economic activities and a specific social structure for the fishing population. This is particularly true for northern Norway<sup>21</sup>."

269. Indeed, the situation of southwest Nova Scotia closely resembles that of Iceland as well. Although Canada as a whole does not share Iceland's overwhelming dependence on coastal fisheries, southwest Nova Scotia is in precisely such a special situation of dependence.

270. Canada's fishery on Georges Bank results from physical proximity to the resource and lack of alternative employment opportunities. It is a direct consequence of the physical features of the Gulf of Maine area and the distribution of natural resources therein. The economic facts are not divorced from but grow out of the physical facts: the sea, in this instance, dominates the land. To dispossess Nova Scotia of its fishery would be to displace scores of Canadian coastal communities from a role that geography has imposed upon them. To accept the extravagant United States claim to all of Georges Bank would not be to reach a result ordained by physical circumstances but rather to defy geography and its socio-economic consequences.

#### B. THE ECONOMIC BASIS OF THE FISHERY

271. Geographical circumstances and historical experience have combined to create a situation in which the survival of southwest Nova Scotia as a region depends upon its ability to compete in the fish markets of the world. In contrast, Massachusetts is under no such pressure. The Massachusetts fishery will likely continue to decline owing to alternative opportunities for economic development. Nova Scotia has no such alternatives. For this reason the fishing industry of Nova Scotia, and in particular of its five southwestern counties, has necessarily grown. To cut it off from its crucial resource supply in the eastern part of Georges Bank would be not only inequitable but disastrous to the people of Nova Scotia. And because southwest Nova Scotia is uniquely capable of harvesting the resource at the lowest cost, it would be injurious to those everywhere who wish to purchase the fish at the lowest reasonable price.

272. A comparison of southwest Nova Scotia and eastern Massachusetts leads immediately to the conclusion that Nova Scotia is the better place to achieve the lowest relative cost for harvesting the resource.

<sup>21</sup> *Norwegian Counter-Memorial, Fisheries case. I.C.J. Reports 1951, Pleadings, Vol. I, p. 219 and 222.*

The reason for this conclusion lies in the physical circumstances of the Gulf of Maine. As was demonstrated in the Canadian Memorial, southwest Nova Scotia is critically dependent on the fishery. The province lacks a broad and diversified employment base. Its southwest region is a land of rocky barrens, endowed with only the poorest agricultural and forestry potential, devoid of primary resources and wanting in natural advantages for secondary industries except for those directly related to the fishery, such as boat building.

273. The economy of Massachusetts is an entirely different story, as is evident from a comparison of two common statistical measures, the unemployment rate and the labour force participation rate<sup>22</sup>. Whether fishermen in an area remain employed in the fishery depends in large part on the alternative employment opportunities available to them. The greater the number of alternative jobs available and the higher the level of remuneration in these jobs, the greater the level of fishing income that will be necessary to induce enough fishermen to stay in the fishery, and the greater will be the cost of labour in the fishing industry.

274. Unemployment in Nova Scotia has been persistently higher in relation to the Canadian average than unemployment in Massachusetts in relation to the United States average. Jobs in Massachusetts are not only more available and more varied than in Nova Scotia; they are also better paid<sup>23</sup>. As a result of this competition for labour, it has been increasingly difficult to man the Massachusetts fishing fleet.

275. Through a constant infusion of immigrant fishermen and with the protection of tariff barriers, the United States was able to sustain a slow rate of growth in its Gulf of Maine fishery until the 1930s. In the post-war period, however, the advantage switched to Canada and the

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<sup>22</sup> *Unemployment rate* is a measure of the percentage of the labour force that does not have a job but is actively seeking employment. The *participation rate* is the percentage of the total working-age population that is either employed or actively looking for work. A low participation rate in a region indicates a lack of job opportunities, i.e., a large number of potential workers (often in specific categories, e.g., females or young adults) cannot obtain employment although willing to work and hence have never entered the labour force. When combined with a high unemployment rate, it is also often indicative of the existence of a number of "discouraged" workers, i.e., those who have come to feel that the chances of finding a job are so small that it is not worth looking for one. While there is little difference between the average national participation rates of Canada and the United States, the Massachusetts rate is above that of the United States, whereas the Nova Scotia rate is below that of Canada.

<sup>23</sup> The average income from employment for all sectors in Nova Scotia in 1980 was U.S.\$9,211.09. Revenue Canada, *1982 Taxation Statistics, Analyzing 1980 T1 Individual Tax Returns and Miscellaneous Statistics*, Table 5. Ottawa, Department of National Revenue, 1982, pp. 102-103 and unpublished data. In contrast, the 1980 Massachusetts' average annual earnings from employment in all sectors was U.S.\$13,805.00. This is 50 percent higher than the Nova Scotia average employment income. United States Department of Labor, *News*. Washington, Bureau of Labor Statistics, USDL 82-460, 13 December 1982, p. 5. *Counter-Memorial, Annexes*, Vol. IV, Annex 36.

New England fishing fleet fell into decline<sup>24</sup>. A Fishery Work Group, appointed in 1976 by the Governor of Massachusetts "to identify the major impediments to economic revitalization of the Massachusetts fishing industry and to propose some initial solutions to these problems", reported in 1977 that:

"In some areas of the state today, the industry is in a state of decline. Some wharves and warehouses are underutilized and the number of commercial fishermen throughout the state decreases annually . . . The Massachusetts fleet has failed to keep pace even with domestic competition, while a host of economic factors have combined to make revitalization of the fleet an elusive objective<sup>25</sup>."

In respect of the state's fleet of larger fishing vessels, the report further observed that:

"Traditionally, the greatest number of these vessels were berthed in Boston, but as the processing firms have departed, so have the trawlers. The number of large trawlers in Boston has declined from 59 in 1947 to 9 in 1971<sup>26</sup>."

276. The decline of the Massachusetts fishing industry in general, and of the Boston fleet in particular, is not surprising. With the higher paid opportunities open to labour in eastern Massachusetts, and particularly in Boston, this area could be expected to experience difficulty in maintaining extensive fishing operations in competition with regions such as southwest Nova Scotia that do not have equivalent alternative economic opportunities. As between Canada and the United States, the rational economic base for fishing operations on Georges Bank is now southwest Nova Scotia, and this is particularly true for the eastern part of the Bank that is claimed by Canada.

277. The geographical circumstances discussed in paragraphs 263-270 have given Nova Scotia its strong position in the exploitation of the living resources of Georges Bank. They have also made Nova Scotia critically dependent on these resources. But there is a further and more general economic interest that also supports Canada's continued access to Georges Bank. This interest arises from one of the most important tenets of the market system: namely, that resources should be made available at the lowest cost consistent with appropriate resource management and conservation. This tenet is utterly incompatible with the United States contention that its status as the major North American consumer of seafood products supports its claim to all of Georges Bank.

<sup>24</sup> S. Olsen, ed.: *Fishing and Petroleum Interactions on Georges Bank*. Energy Program Technical Report 77-1. Boston, New England Regional Commission, 1977, p. 94. This report indicates that between 1950 and 1975, New England landings declined by approximately 54.5 percent. *Counter-Memorial, Annexes*, Vol. IV, Annex 37.

<sup>25</sup> *Massachusetts Fisheries: A Report of the 200 Mile Fisheries Work Group*. Boston, Commonwealth of Massachusetts, 1977, p. 1; *Counter-Memorial, Annexes*, Vol. IV, Annex 38.

<sup>26</sup> *Massachusetts Fisheries: A Report of the 200 Mile Fisheries Work Group*, p. 4; *Counter-Memorial, Annexes*, Vol. IV, Annex 38.

The United States' attempt to rely on its market power to exclude the fishermen of southwest Nova Scotia from access to Georges Bank amounts to a repudiation of the open and specialized international economic system accepted by Canada and the United States and throughout much of the world, notably in the context of the General Agreement on Tariffs and Trade and the Organization for Economic Cooperation and Development<sup>27</sup>.

### C. CONTEMPORARY UTILIZATION OF THE FISHERY

278. The modern transformation of the fishery in the Gulf of Maine area is not merely a change in degree; it is a change in kind. It is only in the modern period that anything approaching the full spectrum of biological resources has been exploited and that the fishery as a whole has begun to yield its full potential (though some stocks have been overfished and others are still underutilized). The Georges Bank fishery which is in issue in these proceedings is essentially a modern phenomenon.

279. To the extent that the United States fishing effort on Georges Bank may have been stronger from time to time during earlier periods of relatively light exploitation, this may be attributed to the ready demand in the larger domestic market of the eastern United States, and to policies of protectionism that created the privileged position of the United States fleet. A different situation has prevailed in more recent times, when the Georges Bank stocks have been brought under more intensive exploitation. The advantage under competitive conditions is likely to go to the industry that is able to produce fish at the lowest cost. The fact that historically the United States has resorted to substantial tariff protection<sup>28</sup> constitutes a tacit acknowledgment of the Canadian competitive advantage. As the effective tariff level has been reduced since World War II, growing Canadian penetration of United States markets confirms that this advantage is being maintained.

### D. GOVERNMENT ASSISTANCE TO THE FISHERY

280. The United States Memorial apparently attributes some significance to government assistance to the fishing industry but states only that:

<sup>27</sup> *General Agreement on Tariffs and Trade*. Basic Instruments and Selected Documents, Vol. IV, Text of the General Agreement, 1969. Convention on the Organisation for Economic Cooperation and Development with supplementary protocols Nos. 1 and 2, signed at Paris 14 December 1960.

<sup>28</sup> With the exception of the periods of reciprocal liberal tariffs from 1854-1866 and 1871-1885, United States tariffs on the import of fish and fish products from Canada remained high until the introduction of the Underwood Tariff in 1913. However, this period of liberal trade was shortlived. The Fordney-McCumber Tariff of 1922 imposed an average of approximately 25 percent *ad valorem*. This was increased by the Smoot-Hawley Tariff of 1930 to approximately 35 percent. See *Canadian Memorial, Annexes, I*, pp. 196-197, paras. 33-35; *Counter-Memorial, Annexes, Vol. II*, paras. 43-44 and 66-67.

“Large Canadian and provincial government subsidies helped to build the Canadian fleet and to meet its operating costs. These subsidies continue in differing forms to the present day<sup>29</sup>.”

If this is meant to imply that government assistance to the Canadian fishing industry is somehow improper or unfair, then the immediate response is that every coastal State in the world, including the United States, provides such financial assistance in similar forms<sup>30</sup>. Moreover, the scale of Canadian assistance has always been perfectly reasonable by international standards, given the particular challenges that face the Canadian economy outside the highly industrialized areas of central Canada.

281. The United States International Trade Commission in a 1980 study identified only two continuing Canadian “bounties or grants<sup>31</sup>”. One was a vessel construction grant offered by the federal government to aid shipbuilders, not fishermen. This program was designed to assist Canadian shipyards by reducing the price of a Canadian vessel to that of a vessel built in higher-volume, lower-cost foreign yards. It had little effect on the economics of the fishery itself, except to the extent of allowing Canadian fishermen to use Canadian instead of foreign-built vessels. Moreover, it was analogous to the program established under the 1960 United States Subsidy Act and subsequent legislation<sup>32</sup>.

282. The other form of assistance identified in the 1980 United States study was low-cost loans to fishermen by the Nova Scotia Fishermen’s Loan Board. This type of program, which uses government borrowing power to keep interest rates down, is so common with respect to primary producers around the world, including the United States, that it can hardly be considered anything other than a normal condition of operation in the world’s fishing industry. It is also similar to, and has the same purposes as, the United States Fisheries Loan Fund Program (which provides low-cost loans to fishermen) and the United States Capital Construction Fund Program (which effectively provides fishermen with interest-free loans of tax monies<sup>33</sup>).

<sup>29</sup> *United States Memorial*, p. 50, para. 82.

<sup>30</sup> See, for example, the following publications of the Organisation for Economic Cooperation and Development: *Financial Support to the Fishing Industry of OECD Member Countries*. Paris, OECD, 1965; *Financial Support to the Fishing Industry of OECD Member Countries*. Paris, OECD, 1971; *Financial Support to the Fishing Industry of OECD Member Countries*, Paris, OECD, 1980.

<sup>31</sup> *Fish, Fresh, Chilled or Frozen, whether or not Whole, but not Otherwise Prepared or Preserved, from Canada*. United States International Trade Commission, USITC Publication 1066, May 1980, p. A-6; *Counter-Memorial, Annexes*, Vol. IV, Annex 39.

<sup>32</sup> *United States Subsidy Act*, Public Law No. 86-516, 774 United States Statutes at Large 212, 1960 (codified at 46 United States Code, secs. 1401, *et seq.*).

<sup>33</sup> *Massachusetts Fisheries: A Report of the 200 Mile Fisheries Work Group*, pp. 9-13; *Counter-Memorial, Annexes*, Vol. IV, Annex 38. The Capital Construction Fund is found at 46 United States Code, sec. 1177, and the Fisheries Loan Program at 16 United States Code, sec. 742c.

283. The Organization for Economic Cooperation and Development has published two major studies<sup>34</sup> regarding government subsidies, both of which conclude that every OECD country, including the United States, is subsidizing or otherwise assisting its fishing industry. With respect to the United States, however, the OECD data should be supplemented by the more detailed study sponsored by the state of Massachusetts, namely, *Massachusetts Fishery: A Report of the 200 Mile Fisheries Work Group (1977)*<sup>35</sup>. This study lists numerous United States federal and state assistance schemes, including vessel construction, fisheries business development, ports and harbour facilities, marketing, resource management, fleet development and technical assistance.

284. An analysis attempting to weigh United States assistance to the United States fishery against Canadian assistance to the Canadian fishery would not produce a reliable comparison, first because of the complex incidence and impact of the programs in question, and secondly (and more important) because most of the overt United States assistance programs have traditionally been much less significant than the "hidden" subsidies constituted by protective tariffs and other regulatory barriers to shut out the competition. Eventually these protectionist policies produced such a shortfall between supply and demand that in the 1950s the United States' barriers to importation of fresh fish were lowered. This measure greatly benefited United States consumers and contributed to the strengthened Canadian presence on Georges Bank that is complained of in the United States Memorial. Fish products processed to any significant degree outside the United States still face substantial tariff barriers<sup>36</sup>, which of course operate as continuing subsidies to United States processors.

285. In sum, the question of government assistance to the fishing industry is a false issue that simply detracts from the consideration that must be given to truly relevant circumstances.

### Section III. The United States Memorial Relies upon Extraneous Economic Considerations

286. The United States Memorial purports to accept the finding of the Court in the *Tunisia-Libya Continental Shelf* case that "general economic considerations relating to the relative wealth of the two countries" are to be excluded from the relevant circumstances<sup>37</sup>. Canada, for its part, has advanced no general economic considerations bearing on the

<sup>34</sup> OECD, *Subsidies and Other Financial Support to the Fishing Industries of OECD Member Countries*, OECD Paris, 1965, pp. 213-218; OECD, *Financial Support to the Fishing Industries of OECD Member Countries*, OECD Paris, 1980, pp. 141-148.

<sup>35</sup> *Massachusetts Fisheries: A Report of the 200 Mile Fisheries Work Group*, pp. 4-24; *Counter-Memorial, Annexes*, Vol. IV, Annex 38.

<sup>36</sup> In 1982, the duty on fish sticks and similar products was 10 percent *ad valorem* if neither cooked nor in oil, and 15 percent for "others". *United States Import Duties Annotated for Statistical Reporting*, 1982, p. 29.

<sup>37</sup> *United States Memorial*, pp. 146-147, para. 260.

relative wealth of the Parties and has restricted itself to economic factors relating to the Gulf of Maine area and the exploitation of its resources, and the Canadian dependence thereon. The United States Memorial, however, makes numerous submissions based essentially on the relative wealth of the two countries, while ostensibly recognizing that general economic considerations are "virtually extraneous"<sup>38</sup>. Four examples will suffice to demonstrate this point.

#### A. UNITED STATES CONTENTIONS REGARDING NATIONAL WEALTH IN RESOURCES

287. The United States Memorial makes reference to Canada's "vast fisheries off Labrador, on the Grand Banks of Newfoundland, in the Gulf of St. Lawrence, and on the Scotian Shelf"<sup>39</sup>. The United States Memorial also indicates that the United States 200-mile fishing zone on the east coast encompasses approximately 266,000 square nautical miles, while Canada's encompasses approximately 599,000 square nautical miles<sup>40</sup>. What is not pointed out, however, is that the United States *excludes* its historic bays and the Gulf of Mexico in making these calculations, but *includes* Canada's historic bays and the Gulf of St. Lawrence. The Gulf of Mexico alone adds 209,200 square nautical miles to the United States zone. As noted in paragraph 6, the total area of the United States exclusive economic zone is estimated to be 2 million square nautical miles.

288. The United States 200-mile zone, of course, contains one of the largest aggregations of commercial fish stocks in the world, as was noted by the Comptroller General of the United States in his 1976 Report to Congress:

"The United States, with the fourth largest coastline and the third largest continental shelf in the world, has almost one-fifth of the world's marine fish resources within 200 miles of its coastline<sup>41</sup>."

The total value of the United States fishery in that year (1976) was U.S.\$1,349 million<sup>42</sup>. The total value of the Canadian fishery in the same year was \$390 million<sup>43</sup>. (It might also be noted that the value of

<sup>38</sup> *United States Memorial*, pp. 146-147, para. 260.

<sup>39</sup> *United States Memorial*, p. 41, para. 62.

<sup>40</sup> *United States Memorial*, pp. 12-19, para. 24.

<sup>41</sup> Comptroller General of the United States, Report to the Congress: *The U.S. Fishing Industry — Present Condition and Future of Marine Fisheries*. United States General Accounting Office, 1976, cover page. The adoption of a 200-mile exclusive economic zone has enlarged the area of the United States' continental shelf and made it coterminous with its former 200-mile fisheries zone. *Counter-Memorial, Annexes*, Vol. IV, Annex 40.

<sup>42</sup> *Fisheries Statistics of the United States 1976*, Statistical Digest No. 70. Washington, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1980, p. 7; *Counter-Memorial, Annexes*, Vol. IV, Annex 41.

<sup>43</sup> *Annual Statistical Review of Canadian Fisheries, 1955-1976*, Vol. 9, Table 15. Ottawa, Department of Fisheries and Oceans, p. 49; *Counter-Memorial, Annexes*, Vol. IV, Annex 42.

petroleum production in the United States outer continental shelf in the same year was U.S.\$13,000 million<sup>44</sup>.)

289. Of course, the existence of Canadian fishing grounds outside the Gulf of Maine area is no more relevant to the delimitation than are the very rich United States hydrocarbon deposits in Texas and on the north slope of Alaska. The resources of the two countries outside "the relevant area" are *nihil ad rem* for the reason noted by Judge Jessup in the *North Sea Continental Shelf* cases:

"If the argument for a 'just and equitable share' had been rested on a notion of apportioning natural resources, the counter-argument might have insisted (as indeed it hinted) that resources on the adjacent mainland or in the bed of the territorial sea must also be taken into account<sup>45</sup>."

#### B. UNITED STATES CONTENTIONS REGARDING STATE ACTIVITIES

290. The United States Memorial enumerates United States activities in connection with aids to navigation, cartography, search and rescue, defence and scientific research, at a time when the Gulf of Maine area was considered by the United States and other States to be a part of the high seas. Such activities were clearly not attributed at the time by the United States or anyone else to real or imagined jurisdiction over Georges Bank, but were the usual activities of a large and wealthy trading nation indulging in a measure of international cooperation and national self-interest.

291. The irrelevance of these United States activities is brought out in paragraphs 598-606, and the necessary factual corrections to the United States presentation are made in paragraphs 440-445, 432-439, 446-455 and 416-422. The point here is simply to note that the activities in question largely reflect the general wealth and power of the Parties, and fall into the category of "general economic considerations" rejected by the Court in the *Tunisia-Libya Continental Shelf* case. They are the foundation of the United States claim of "dominance" of the Gulf of Maine area, a claim which in its very terms has little to do with equitable considerations. Specific economic considerations, however, such as evidence of the Canadian and United States fisheries on Georges Bank, are fully relevant and lead in law to an equitable division of these resources, as contemplated in the 1979 Agreement on East Coast Fishery Resources.

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<sup>44</sup> W. L. Liscom, ed.: *The Energy Decade, 1970-1980. A Statistical and Graphic Chronicle*. Cambridge, Ballinger Publishing Company, 1982, p. 415; *Counter-Memorial, Annexes*, Vol. IV, Annex 43.

<sup>45</sup> Separate opinion of Judge Jessup in the *North Sea Continental Shelf* cases. *I.C.J. Reports 1969*, pp. 78-79.



### C. UNITED STATES CONTENTIONS REGARDING MARKET POWER

292. The United States Memorial implies that Canada's export of scallops to the United States market is somehow a cloud on Canada's title to the eastern portion of Georges Bank. Many nations, of course, export the bulk of their fish products to the markets of the world. Norway and Iceland are examples that come readily to mind. The United States itself is the world's leading food exporter but would not, of course, accept that this prejudices its title to the agricultural lands or the fishing grounds from which it harvests these products. The United States is also a major consumer of imported petroleum products, imported motor cars, imported raw materials, and many other goods produced by other countries. An understandable desire and capacity on the part of the United States to consume these products does not confer title to or jurisdiction over the site of their production. To advance the argument that consumption is a source of title relevant to the delimitation of international boundaries is to ignore the realities of international economic cooperation and specialization, to put a premium on national wealth, and to impose a further burden on national poverty. In no instance has it ever been suggested by the Court that dependence on export markets should be a relevant consideration in a boundary delimitation. Iceland, Norway and Libya, to cite examples from the leading cases on maritime claims, are all in a position of export dependence similar to that of southwest Nova Scotia.

### D. UNITED STATES CONTENTIONS REGARDING GOVERNMENT ASSISTANCE

293. Paragraphs 280-285 have already rebutted, for the sake of accuracy, the irrelevant allegations in the United States Memorial concerning subsidization of the Georges Bank fishery by the Canadian Government. These allegations are noted again here only because they also represent arguments based on relative national wealth.

294. The greater wealth of the United States, and its immense market power, have given it a wide variety of opportunities to favour the New England fleet at the expense of foreign fishermen, including Canadians. However, a further fallacy of the United States argument is that it fails to recognize the important distinction between *sectoral* subsidization and *regional* subsidization<sup>46</sup>. Many national governments are committed to national policies to reduce regional disparities in income and employment. So fundamental to the maintenance of Canada's

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<sup>46</sup> For a discussion of the differences between *sectoral* and *regional* subsidization see, R. V. Guido and M. F. Morrone: "The Michelin Decision: A Possible New Direction for U.S. Countervailing Duty Law", in J. H. Jackson, ed.: *Legal Problems of International Economic Relations, Cases, Materials and Text on the National and International Regulation of Transnational Economic Relations*. St. Paul, University of Michigan, 1977, pp. 789-801; *Counter-Memorial, Annexes*, Vol. IV, Annex 44.

national fabric is this long-standing policy that it is now entrenched in Article 36 of the *Constitution Act, 1982*<sup>47</sup>. Federal funds and programs are made available to the people of southwest Nova Scotia not because they are fishermen, but because their standard of living is considerably below the national average. This, of course, is not true of the relatively wealthy New England states.

#### **Section IV. Canada's Presence on Georges Bank Reflects a Vital Dependence; the United States Has No Comparable Dependence**

295. As was demonstrated in the Canadian Memorial, the dependence of southwest Nova Scotia on the fishery of Georges Bank has many ramifications that ultimately work their way through the entire regional economy. The United States Memorial, having set out irrelevant catch data for the whole of ICNAF subarea 5, and having inevitably drawn erroneous conclusions from such inappropriate data, fails to examine the economic implications of the Georges Bank fishery for the inhabitants of the relevant coasts, particularly of Nova Scotia. This approach ignores a fundamental aspect of equity in the present case.

296. An analysis of southwest Nova Scotia's dependence must take into account the role played by Georges Bank in the context of the entire fishery. The Bank is a critical element in the harvesting strategy of the region, providing the principal source of income for many fishermen and an essential resource for all.

297. The Georges Bank scallop fleet has not only created significant employment and income; it has also generated capital which has been invested in other sectors of the fishery. The scallop fishery is concentrated in a number of major ports, but the homes of the scallop fishermen are found in many fishing communities in southwest Nova Scotia. This infusion of spending power raises the level of services available throughout the entire region. Further, while Georges Bank is dominated by the large scallopers, it has provided periodic assistance to the Bay of Fundy's fleet of small scallop vessels. This is especially important since the Bay of Fundy scallop fleet is essentially owner-operated and hence has a limited capacity to withstand a severely reduced level of landings.

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<sup>47</sup> Section 36 of the Canadian *Constitution Act, 1982* reads as follows:

36. (1) Without altering the legislative authority of Parliament or of the provincial legislatures, or the rights of any of them with respect to the exercise of their legislative authority, Parliament and the legislatures, together with the government of Canada and the provincial governments, are committed to

- (a) promoting equal opportunities for the well-being of Canadians;
- (b) furthering economic development to reduce disparity in opportunities; and
- (c) providing essential public services of reasonable quality to all Canadians.

(2) Parliament and the government of Canada are committed to the principle of making equalization payments to ensure that provincial governments have sufficient revenues to provide reasonably comparable levels of public services at reasonably comparable levels of taxation

298. The groundfish fleet that regularly fishes Georges Bank also ranges in size from large trawlers to a considerable number of small vessels, whose landings have not been recorded in the past. The small- and medium-boat fleets have a significant dependence on Georges Bank, especially in years when the inshore groundfish harvest is light<sup>48</sup>.

299. Georges Bank makes possible a level of fishing activity that justifies a high level of support services and infrastructure (processing, boat building and repair, gear fabrication and maintenance, transportation) that would not otherwise exist. The incomes so generated are widely distributed throughout the coastal communities of southwest Nova Scotia, so that a far higher level of community infrastructure is sustained than would otherwise be the case. Without the opportunity to fish on Georges Bank, the catches of vessels that regularly fish offshore would decline dramatically and they would lose a principal source of revenue. Offshore catches represent the main source of supply for the region's major fish plants. These plants are often the only buyers of fish from inshore fishermen; at the very least, they offer an outlet for fishermen whose only alternative would be to compete in the limited market for salt fish. Without Georges Bank, a crucial component in the total harvesting strategy would be removed and it would not be practical to operate large segments of the fleet. Without offshore landings, many plants would cease to be economic. The inadequate earnings generated from inshore activities alone would be insufficient to support regional income levels. In short, without Georges Bank, a large part of the fishing fleet of southwest Nova Scotia would be crippled, and the fishing industry that remained would cease to drive the regional economy.

300. During the past two decades the fishing industry in Nova Scotia as a whole has been steadily increasing in size<sup>49</sup>. The proportionate contribution to the Nova Scotia fishing industry made by the five counties of southwest Nova Scotia has also grown<sup>50</sup>. The New England fishing industry, in contrast, has declined in relative importance and represents a much smaller proportion of total employment than is the

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<sup>48</sup> *Canadian Memorial, Annexes*, Vol. IV, sec. II, Annex 5.

<sup>49</sup> *Annual Statistical Review of Canadian Fisheries, 1955-1976*, Vol. 9, Ottawa, Department of Fisheries and Oceans, Table 16, p. 51; *Annual Statistical Review of Canadian Fisheries, 1978*, Vol. 11, Table 22, p. 41. During the 1958-1978 period, the total value of Nova Scotia's fish landings increased steadily from \$25.0 million to \$195.4 million. The corresponding increase in market value of all Nova Scotia fish products was from \$51.3 million in 1958 to \$441.3 million in 1978. *Counter-Memorial, Annexes*, Vol. IV, Annexes 45-46.

<sup>50</sup> The landed value of sea fisheries in the five counties of southwest Nova Scotia as a proportion of the total landed value of sea fisheries in Nova Scotia rose from 49.6 percent in 1958 to 75.6 percent in 1977. Dominion Bureau of Statistics, *Fisheries Statistics of Canada (1958)* — Nova Scotia, Industry and Merchandizing Division, October 1960, Table 4, pp. D18-D31. *Counter-Memorial, Annexes*, Vol. IV, Annex 47; *Annual Statistical Review of Canadian Fisheries, 1978*, Vol. 11, Table 22, p. 41. *Counter-Memorial, Annexes*, Vol. IV, Annex 46; *Digby County Statistical Profile; Queens County Statistical Profile; Lunenburg County Statistical Profile; Yarmouth County Statistical Profile; Shelburne County Statistical Profile*, Nova Scotia Department of Development, Table 18, p. 28; *Counter-Memorial, Annexes*, Vol. IV, Annex 48.

case in Nova Scotia<sup>51</sup>. This pattern is also evident at the community level. In key fishing ports in southwest Nova Scotia that fish Georges Bank — such as Digby, Lunenburg and Riverport — fish processing comprises 70 percent to 100 percent of local manufacturing activity<sup>52</sup>, whereas in key New England ports that fish Georges Bank, such as Boston and New Bedford, fresh fish processing accounts for only 0.1 percent and 1.2 percent of local manufacturing activity, respectively<sup>53</sup>. In short, the Nova Scotia fishing industry represents a much more important component of the local economy than does the fishing industry in each of the New England states.

301. The income lost and jobs eliminated in southwest Nova Scotia could not be replaced. Fishermen would of necessity have to pull up roots established for generations in order to seek employment elsewhere. Their established way of life would be lost, and with it the relative prosperity their efforts have brought them since World War II.

## Section V. The Canadian Claim Respects the Interests of Both Canada and the United States; the United States Claim Does Not

### A. FISHING INTERESTS

302. The line proposed by Canada would leave the relevant New England ports with fishing grounds on Georges Bank whose long-term optimum yields greatly exceed the traditional level of fishing effort from these ports. In the period from 1969 to 1978 (using 1978 Canadian prices), United States fishermen caught an average of \$16.1 million of fish annually from the whole of Georges Bank. On the basis of the Canadian claim, the United States would retain jurisdiction over the fishing grounds of western Georges Bank, which offer long-term optimum yields of \$48.6 million of fish annually (again valued at 1978 Canadian prices) — a net long-term gain over its fishing during the decade preceding the Special Agreement, which the United States is in a position to realize because of the 200-mile limit.

303. United States catches on Georges Bank east of the Canadian line, in the period from 1969 to 1978, averaged \$9.7 million annually.

<sup>51</sup> The fishing industry (harvesting, processing and wholesaling) accounts for .58 percent of employment in Massachusetts. A. McDonald, J. Rowland and R. Fitzgerald: *Employment and the Massachusetts Fishing Industry*. Boston, Labor Area Research Department, Massachusetts Division of Employment Security, undated, p. 2; *Counter-Memorial, Annexes*, Vol. IV, Annex 49. In Nova Scotia, in 1978, the fish harvesting and processing sectors alone accounted for 4.9 percent of employment. *Annual Statistical Review of Canadian Fisheries, 1978*, Vol. 11, Table 16, p. 34; *Counter-Memorial, Annexes*, Vol. IV, Annex 50.

<sup>52</sup> *Nova Scotia Directory of Manufacturers, 1979-1980*. Halifax, Department of Development, Statistical Services Branch, March 1980, pp. Tan 6 and 14-15; *Counter-Memorial, Annexes*, Vol. IV, Annex 51.

<sup>53</sup> Bureau of Labor Statistics: *Employment and Earnings, States and Areas, 1939-78*. Washington, United States Department of Labor, November 1979, Bulletin 1370-13, pp. 271-275; L. J. Smith and S. J. Peterson: *The New England Fishing Industry: A Basis for Management*. Massachusetts, Woods Hole Oceanographic Institution, 1977, pp. 29-30 and 49; *Counter-Memorial, Annexes*, Vol. IV, Annex 52.

Canadian catches on Georges Bank west of the line proposed in the United States Memorial averaged \$39.8 million annually during the same period<sup>54</sup>. The implications are clear: the Canadian line would impose no real hardship on the United States, while the United States claim would have a devastating impact on the Nova Scotia fishery.

## B. HUMAN INTERESTS

304. The impact on Nova Scotia of a loss of access to Georges Bank would not be limited to dry statistics and a shift in national accounts. Equity within the law requires appropriate consideration of the economic impact on the lives of the people who inhabit the relevant coasts and whose dependence on the resources of Georges Bank is an established fact.

305. The short-term impact of the United States claim on southwest Nova Scotia would undoubtedly be greater unemployment, a sharp rise in business failures, and a sharp drop in popular self-confidence and morale. The Canadian claim involves quite different options for New England. The Canadian line would leave Massachusetts the greater part of Georges Bank, and the difference between gaining this greater part and gaining the entire Bank would be marginal and readily absorbed in the overall economy of the state. A characteristic of the New England fishery has always been, in any event, a shifting composition of the work force, with successive groups entering and leaving the industry to accept more attractive economic opportunities in other fields<sup>55</sup>.

306. With respect to the longer-term economic impact, loss of access would clearly involve severe structural damage to the economy of southwest Nova Scotia. In the absence of the support the Georges Bank fishery gives to other fisheries, both inshore and offshore, and in the absence of alternative fishing grounds of comparable proximity capable of generating the same wealth as Georges Bank, a high percentage of the people of southwest Nova Scotia would be forced to emigrate or would be reduced to permanent welfare status. The fishing fleet would have to seek new fishing grounds away from southwest Nova Scotia. Its departure would undermine the commercial base that keeps scores of communities alive. People who were able to do so would move away. The Canadian line, on the other hand, would leave the relevant New England communities largely as they are today.

307. The loss of Georges Bank, to repeat, would cause extensive hardship and dislocation in southwest Nova Scotia. Here, over a coast the length of that of The Netherlands — about 180 nautical miles from Lunenburg to Digby — the edifice of human life is built upon the

<sup>54</sup> *Canadian Memorial, Annexes*, Vol. IV, sec. II, Annexes 3 and 4.

<sup>55</sup> R. N. McPherson: *Gloucester Resource Study*. Boston, Massachusetts Institute of Technology, 1973, p. 108, states: "Gloucester's fishing labor has been largely sustained by waves of immigrant fishing groups. The need has long been recognized and suitable legislation was secured around 1963 to facilitate immigration for the sole purpose of fishing." *Counter-Memorial, Annexes*, Vol. IV, Annex 53. See also A. McDonald, J. Rowland and R. Fitzgerald: *Employment and the Massachusetts Fishing Industry*. *Counter-Memorial, Annexes*, Vol. IV, Annex 49.

fishery, one of the central pillars of which is Georges Bank. If that pillar were knocked out, at least 3,000 direct jobs would be lost at once. Nearly 1,200 scallop fishermen would face immediate unemployment. The roughly 1,000 small-boat fishermen who catch groundfish and who depend on Georges Bank would find their livelihood in jeopardy.

308. There are over 100 fish plants along this coast<sup>56</sup>. Many of the small ones, mostly family-owned, would close. The larger ones would reduce their activity, cutting sharply into the 5,000<sup>57</sup> or so processing jobs that are a mainstay of the region. The aftershock would hit boat-yards, machine shops, sawmills, service and equipment suppliers and other support industries for the fishery, and would finally ripple its way through the construction and retail sectors, and still other areas of the wider consumer economy.

309. Thriving communities would face sudden upheaval and social distress. There are 130 villages and towns along the shores of southwest Nova Scotia that draw their sustenance from fishing. For many, fish processing is their only industry. A striking example of what might happen is supplied by the situation that occurred when a fire destroyed one of two fish processing plants in the town of Lockeport in 1980. Unemployment shot up to 50 percent immediately; the town lost a crucial part of its tax base, while facing increased demands for welfare and other social payments. Federal and provincial government aid was required to support the community and ultimately to rebuild the plant. The loss of Georges Bank would be like many simultaneous fires, except that rebuilding would be out of the question.

310. History has shown a close correlation between the fortunes of the fishery and the migration of people to and from southwest Nova Scotia. For example, a severe loss of population occurred in the period between the two world wars, when the Great Depression and United States tariffs made fishing a subsistence occupation. All this changed in the 1950s, and changed in large part because of Georges Bank.

311. As the fishery improved, an important social phenomenon took place: instead of emigrating, the sons and daughters of these communities stayed home for the first time in the present century. Fishing became a promising occupation. The number of fish plants, boat yards and other related industries multiplied. A full generation has now lived with this reality, on the reasonable assumption that access to Georges Bank would be a continuing fact of life. If Georges Bank were lost, many would be faced with the choice of staying home and living on welfare, or leaving in a new wave of emigration that would depopulate many communities. The regional economy could not absorb them even at the best of times, for it is probable that less than 25 percent of the workforce of 51,000 persons<sup>58</sup> is unaffected by the fishing economy.

<sup>56</sup> *Canadian Memorial*, Figure 29.

<sup>57</sup> *Nova Scotia Directory of Manufacturers, 1979-80*. Halifax, Department of Development, March 1980, pp. Tan. 5-6 and 14-19; *Counter-Memorial, Annexes*, Vol. IV, Annex 54.

<sup>58</sup> *The Labour Force, 1981*. Statistics Canada, Catalogue 71-001, December 1981, Table 110, p. 135; *Counter-Memorial, Annexes*, Vol. IV, Annex 55.

312. The economic shock that would be suffered as a result of the United States proposal may be illustrated by reference to three coastal communities in southwest Nova Scotia: Lunenburg, Cape Sable Island and Saulnierville. Their situation is without parallel in New England.

313. Lunenburg, a major scallop and offshore groundfish port with historic links to Georges Bank (documented as early as 1882 when the *Pioneer* landed a cargo of fresh mackerel from the now disputed area<sup>59</sup>), derives approximately 80 percent of its catch from the waters of Georges Bank. It is the home of the largest part of the Canadian scallop fleet, of one of the world's largest fish plants (1,100 to 1,200 employees<sup>60</sup>), and of an important concentration of industrial facilities that support the entire Nova Scotia fishery. About \$100 million has been invested in boats and plant capacity since 1977<sup>61</sup>. Georges Bank is at the centre of all of this. Its loss would cut to the town's heart. And because Lunenburg is the fishing capital of the province, the shock would be felt throughout Nova Scotia.

314. For Lunenburg, the loss of the scallop fishery would be particularly hard. Virtually all the area's 52 scallop boats (including 14 at Riverport) would have to stop fishing, throwing more than 800 fishermen out of work<sup>62</sup>. Each scallop boat requires an estimated \$400,000<sup>63</sup> in goods and services every year, providing the principal income of the machining, fabricating, electronics, repair and other industries. Ninety-six percent of manufacturing employment in the town is linked to the fishery<sup>64</sup>. With the greater part of its fleet engaged on Georges Bank, this community would suffer a calamitous decline if the United States claim were to be upheld.

315. Cape Sable Island, unlike Lunenburg, is not a major port, but a "community of communities", with small fishing ports strung out along its shores, sustaining a thriving small-boat groundfish industry. This cluster of a dozen villages is the closest human habitation to the eastern part of Georges Bank. The crossing to the Bank, 80 nautical miles away, is made regularly by fishermen in small boats. Activity on the wharves, and in the fish plants and other facilities alongside, is owed in overwhelming measure to the harvest from Georges Bank. Apart from the fishermen who would be ruined by loss of access to the Bank, a large investment in boats, landing facilities and fish plants would be frustrated. Of the 20 or so fish plants (some very small), most report that the bulk of their fish comes from Georges Bank. Probably at least half of

<sup>59</sup> See *Counter-Memorial, Annexes*, Vol. II, para. 19.

<sup>60</sup> Information supplied by the Personnel Department, Lunenburg Division, National Sea Products Ltd.

<sup>61</sup> Canadian Department of Fisheries and Oceans, unpublished data.

<sup>62</sup> An average scallop vessel requires 16 crew members. Therefore, 52 vessels require about 832 crew members.

<sup>63</sup> *Cost and Earnings of Selected Fishing Enterprises, Nova Scotia, 1981*. Halifax, Department of Fisheries and Oceans, Economics Branch, September 1982, p. 30, Table 13C; *Counter-Memorial, Annexes*, Vol. IV, Annex 56.

<sup>64</sup> *Nova Scotia Directory of Manufacturers, 1979-80*. Halifax, Department of Development, March 1980, pp. Tan 14-15; *Counter-Memorial, Annexes*, Vol. IV, Annex 54.

the total workforce engaged in fish processing would lose their jobs. In economic terms, everything that moves on Cape Sable Island does so by virtue of the fishery. In this respect it is typical of this part of Nova Scotia, encompassing Shelburne County and parts of Yarmouth County and Queens County, where the small-boat fishery is particularly intense. In the entire municipality of Barrington, which includes Cape Sable Island, there is only one manufacturing enterprise — a small cement plant — that is not directly linked to fishing. In Shelburne County as a whole, 47 percent of employment is directly linked to the fishery<sup>65</sup>.

316. Further to the north, Saulnierville is the economic hub of the municipality of Clare, home of one of the two principal concentrations of Nova Scotia's Acadians. Only since the 1950s have the Acadians become accustomed to relative prosperity, a prosperity largely attributable to Georges Bank. Fully 79 percent of the value of the fish landed at Saulnierville in 1978 came from this fishing ground<sup>66</sup>.

317. There is, of course, no parallel in the United States to the impact which the loss of access to the disputed portion of Georges Bank would have on Saulnierville, Cape Sable Island, Lunenburg and similar communities in southwest Nova Scotia. The New England fleet demonstrated the existence of adequate alternative fishing grounds when it fished these other grounds by choice between 1965 and 1978. A recent analysis by the University of Rhode Island indicates that when the fish resources on grounds *within undisputed United States jurisdiction* recover from the severe overfishing of the recent past, the New England fleet could be *expanded* by 200 vessels<sup>67</sup>.

### Conclusion

318. Economic considerations are relevant to the determination of a single maritime boundary, not for reasons of relative national wealth, but rather because they constitute a projection of the relevant coasts and of the physical circumstances of the maritime area to be delimited. Canada's presence in the Georges Bank fishery is a commanding one, with deep historical roots. The geography and coastal configuration of the Gulf of Maine area has produced in southwest Nova Scotia an economy based and critically dependent upon the exploitation of the sea, and of Georges Bank in particular. The economy of New England has no comparable dependence.

319. The Canadian line would minimize the disturbance to the fishing activities of the Parties. The United States line would severely dislocate the economy of southwest Nova Scotia, with only marginal benefits for the New England economy. Confronted with these two choices, the application of equitable principles must support the

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<sup>65</sup> *Nova Scotia Directory of Manufacturers, 1979-80*, pp. Tan 17-18; *Counter-Memorial, Annexes*, Vol. IV, Annex 54.

<sup>66</sup> *Canadian Memorial*, p. 76, Table 5.

<sup>67</sup> S. Sedgewick, C. Collins and S. Olsen: *Commercial Fishing Facilities Needs in Rhode Island*, pp. 2 and 11; *Counter-Memorial, Annexes*, Vol. IV, Annex 32.



established dependence over the marginal benefit, and thus favour the line proposed by Canada.

320. Efforts by the United States in its Memorial to discredit Canadian fishing efforts by the use of inappropriate ICNAF statistics, or by suggestions of disproportionate government assistance to the fishery, are ill-founded. On the contrary, it has been demonstrated that the Nova Scotia fleet enjoys an economic advantage over its Massachusetts counterpart in the exploitation of the fishery of Georges Bank.

321. In sum, a consideration of all the pertinent economic aspects of the single maritime boundary proposed by the United States discloses a pronounced disregard for equitable principles. The economic impact of the boundary proposed by Canada, on the other hand, confirms that, on the facts of this case, the Canadian line would produce an equitable result.

## CHAPTER V

### THE HISTORY OF THE GEORGES BANK FISHERY

#### Introduction

322. The United States' contention that its nationals conducted a practically exclusive fishery on Georges Bank before the 1950s does not accord with the facts<sup>1</sup>. Moreover, this contention rests upon early fishing patterns that have long since passed into history and lack any continuing relevance. The Canadian fishery on Georges Bank has a far longer history than the United States Memorial admits, originating in the nineteenth century and taking on increasing strength in more recent times. The contemporary Canadian fishery on Georges Bank is the product of a sustained process of growth that reflects the modern realities of the fishery, the strategic geographical position of southwest Nova Scotia, and the inherent character of its maritime economy. Practical and legal considerations both suggest that it is contemporary fishing patterns that are relevant to this case and not those of the distant past. The essential purpose of this chapter, accordingly, is to provide background information and to bring factual corrections to the history of the Georges Bank fishery as set out in the United States Memorial.

#### Section I. The United States Fishery Has Been in Decline for Fifty Years

323. The central flaw in the United States presentation is that it simply denies the existence of a Canadian fishery on Georges Bank before the 1950s<sup>2</sup>. Paragraphs 335-347 will show this version of the historical record to be utterly at odds with the true facts. Before addressing this fundamental issue, however, it is first necessary to deal with a number of points raised in the United States Memorial with respect to the early development of the New England fisheries.

324. No single theme recurs more often in the United States Memorial than its assertion of the range and dominance of the early New England fishery<sup>3</sup>. Yet the picture that ultimately emerges is not of a fishery that was in any way centred on or especially dependent upon Georges Bank. Instead, the United States has stressed the geographical expansiveness of its early fishery and its "dominance" of the entire northwest Atlantic area. This dominance is largely a myth of its own fabrication.

325. The patterns of the early New England fishery differed radically from those that have come to prevail in the twentieth century. In many respects, it was a distant-water fishery whose range extended far

<sup>1</sup> *United States Memorial*, p. 41, para. 60.

<sup>2</sup> *United States Memorial*, p. 41, para. 61.

<sup>3</sup> *United States Memorial*, pp. 41-45, paras. 60-72; p. 49, para. 80 and p. 176, para. 297.

to the north and east<sup>4</sup>. As the depiction in the United States Memorial makes clear, Georges Bank was merely one segment of a much broader fishery, whose favoured grounds were seldom selected because of their geographical adjacency or proximity to the New England coast<sup>5</sup>. The Bank figured in the operations of the early New England fleet largely as part of a continuum extending over much of the northwest Atlantic area — and not, as in the case of its Canadian counterpart, in the context of a fishery centred on adjacent waters.

326. These widely dispersed New England fishing patterns, extending as far as the Gulf of St. Lawrence, are not indicative of a coastal State interest in the areas concerned. Furthermore, the geographical dispersion of the early New England fishery makes it inherently incapable of suggesting any basis on which the area could be divided. The fishery plainly ignored the Northeast Channel as a so-called dividing line, and its patterns fail to bear out the depiction of that feature as one that serves as a natural buffer zone. In every other respect, these fishing patterns are long obsolete and hence irrelevant to the issues before the Court.

327. The exact locale of the early New England fishing grounds can now be determined only on a basis of inference and conjecture. Yet there can be no doubt that much of the evidence for an early New England fishery on Georges Bank reflects activities that took place on the western, undisputed portion that lies closest to the New England coast<sup>6</sup>. Indeed, an instance of this can be found in the United States Memorial itself. The United States has stated that a new type of halibut vessel known as a “well smack” was designed especially for the New England fishery on Georges Bank, with a shallow draught “allowing it to operate in the shallow waters of Georges Bank<sup>7</sup> . . .”. Clearly these vessels were intended for use in the shoal areas of western Georges Bank and the Great South Channel, not in the deeper waters of eastern Georges Bank where shallow-draught vessels would be of no advantage.

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<sup>4</sup> Cod and white halibut, both northern species, were fished by United States vessels off the Canadian coast.

<sup>5</sup> It is this pattern of New England fishing off Canada that explains much of the treaty history set out in the Historical Introduction to the Canadian Memorial, Annexes, Vol. I, as well as the issues that were arbitrated in the Halifax Commission proceedings of 1877 and the North Atlantic Fisheries Arbitration of 1910. *Canadian Memorial, Annexes*, Vol. I, pp. 2-41, paras. 1-44; *Documents and Proceedings of the Halifax Commission, 1877*. Washington, Government Printing Office, 1878; “Award of the Permanent Court of International Arbitration at The Hague in the North Atlantic Fisheries.” *British and Foreign State Papers*, Vol. 103, 1909-1910. London, His Majesty’s Stationery Office, 1914, pp. 86-132.

<sup>6</sup> Although cod fishing out of Gloucester was carried out on the eastern part of Georges Bank in the winter months, at all other times of the year the fleet concentrated on the western part of Georges Bank and the Great South Channel and on other grounds in the Gulf of Maine area. G. B. Goode: *The Fisheries and Fishery Industries of the United States*, Vol. I. Washington, Government Printing Office, 1887, p. 189, reproduced in *United States Memorial, Documentary Annexes*, Vol. II, Annex 18. The haddock grounds of eastern Georges Bank were not used substantially by New England fishermen in the nineteenth century.

<sup>7</sup> *United States Memorial*, pp. 43-44, para. 70.

328. The men who actually prosecuted the nineteenth-century New England fishery on Georges Bank were to a significant extent Canadians — primarily Nova Scotians. The steamship lines between Yarmouth and Boston sometimes had to double their service at the beginning of the main fishing season in the spring in order to accommodate the crowds of fishermen returning to New England for work<sup>8</sup>. A resident of Cape Sable Island, Nova Scotia, testifying before the Halifax Commission in 1877, stated that half of the Cape Ann fleet — that is, the fleet of the Gloucester area — was commanded by men from his neighbourhood<sup>9</sup>. The Boston Fish Bureau reported in 1885 that it would be impossible to man the New England fishing fleet without the Nova Scotians: “Hords of them come here every spring, man our vessels for the fishing season, and return home when it is over.” The report added that 50 percent to 75 percent of the men in the Gloucester mackerel fleet were Canadian citizens, and that the same would hold true for other fishing ports in New England<sup>10</sup>. Nothing is so authoritative, however, as the annual lists of men who lost their lives in the New England fishery. During the ten-year period from 1891 to 1901, for example, more than 50 percent of the dead were natives of Nova Scotia and Newfoundland; and from 1909 to 1916 the proportion rose as high as 73 percent<sup>11</sup>. No one could possibly doubt the “skill, daring, and resourcefulness” of the fishermen who manned the nineteenth-century New England vessels, in the words of the United States Memorial<sup>12</sup>; but it is important to recognize that Canada was at least as strongly represented as the United States among these men.

329. Quite apart from the factual misconceptions in its account, the emphasis of the United States Memorial on the early fishery at the expense of current realities is misplaced. In Canada’s view, it is contemporary patterns of fishing that should be decisive, and not those of a distant past. There are a number of practical reasons why this should be so, along with the legal considerations to be reviewed in Part III. The industrial revolution in the fishery arrived well over a century later than it did in most other economic sectors. In Canada it arrived far later than it did in many other advanced countries, and it was not until after World War II that Canada committed itself irreversibly to the development of a truly industrialized fishery. The radical changes that have transformed New England fishing patterns since the nineteenth century have already been noted; the Georges Bank fishery is a purely modern phenomenon in

<sup>8</sup> Letter from C. A. O’Connor, United States Consul at Yarmouth, Nova Scotia to W. W. Rockhill, United States Assistant Secretary of State, 10 March 1897. *Dispatches from United States Consuls in Yarmouth, Nova Scotia*, Vol. 2. Washington, Department of State, 1899, No. 51; *Counter-Memorial, Annexes*, Vol. IV, Annex 57.

<sup>9</sup> W. B. Smith, British (Canadian) Witness No. 82. As well, Nathaniel Atwood, United States Witness No. 5, testifying before the Halifax Commission, stated that of the 48 fishing vessels owned at Provincetown, Massachusetts, 33 were commanded by Nova Scotians. *Documents and Proceedings of the Halifax Commission, 1877*. Vol. I, pp. 1075 and 1080 and Vol. II, pp. 2047-2049. *Counter-Memorial, Annexes*, Vol. IV, Annex 58.

<sup>10</sup> “Boston Fish Bureau.” *The Digby Weekly Courier*, 2 October 1885, p. 12; *Counter-Memorial, Annexes*, Vol. IV, Annex 59.

<sup>11</sup> *Counter-Memorial, Annexes*, Vol. II, para. 21 and Appendix II, Table I.

<sup>12</sup> *United States Memorial*, p. 44, para. 71.

both its scale and in the variety of the resources it exploits. Now that the fishery has been thoroughly transformed, in North America as elsewhere, there can be no turning back to the patterns of a simpler technological era.

330. The economic conditions that fostered the early New England fishery are now remote, and its importance is entirely a thing of the past<sup>13</sup>. Indeed, the decline of the fishery in the structure of the regional economy is due precisely to the enormous success of New England in attaining a diversified and rich industrial and commercial economy. Edward Ackerman, a United States fisheries historian, made the following observations on the decline of the New England fishery in his work on this subject published in 1941:

“From its early dominance New England fishing has declined steadily in relative importance in regional life. As the industries which fishing helped to start have prospered, the fishery has contributed less relatively to regional income and has employed fewer and fewer workers. In other words, the fishery has not grown with New England . . . The conclusion, however, cannot be escaped — the New England fishery is not a very significant factor in the present regional life. Few fortunes have been built on fishing in the western North Atlantic since the days of whaling<sup>14</sup>.”

Although Ackerman looked forward to a recovery, the events of the post-war years have confirmed that the diminished importance of the New England fishery has become a permanent feature of the regional economy<sup>15</sup>.

331. The United States claims that the weakness in its Georges Bank fishery during the post-war period, attested by the increasingly sophisticated statistical system developed by ICNAF, was attributable to excessive foreign fishing<sup>16</sup>. There may be a small measure of truth in this version of events, but it is a gross oversimplification. It is all too convenient to place the blame for an industry's decline at the doorstep of other nations. The contraction of the New England fishery began generations

<sup>13</sup> The size of the New England fishing fleet in the eighteenth century has been directly attributed to early trading patterns involving both the West Indies and Africa. D. Merriam: “The History of Georges Bank”, in G. McLeod and J. Prescott, eds.: *Georges Bank. Past, Present and Future of a Marine Environment*. Boulder, Colorado, Westview Press, 1982, p. 21:

“One may ask how it was that so many New England vessels were engaged in the fishing industry in the eighteenth century. The answer, of course, lies in the infamous three-cornered trade called the ‘Golden Triangle’.”

The “Golden Triangle”, as described here, involved a sequence of cargoes in the course of a single extended voyage: first, cod shipped from New England to southern Europe; then slaves purchased in West Africa and transported to the West Indies; and finally shipments of sugar and molasses for the rum distilleries of New England.

<sup>14</sup> E. A. Ackerman: *New England's Fishing Industry*. Chicago, University of Chicago Press, 1941, p. 4; *Counter-Memorial, Annexes*, Vol. IV, Annex 60.

<sup>15</sup> E. A. Ackerman: *New England's Fishing Industry*, p. 4; *Counter-Memorial, Annexes*, Vol. IV, Annex 60.

<sup>16</sup> *United States Memorial*, pp. 49-55, paras. 80-85.

before overseas fishing vessels first appeared in the Gulf of Maine area, as the preceding paragraph has shown. What makes the United States version of the decline of its fishery particularly unconvincing, however, is the successful record maintained by the Canadian fishery during exactly the same period. Canada was equally challenged by the post-war explosion of distant-water fishing fleets in the northwest Atlantic. The difficulties it faced as a coastal State with no significant fishery off the coasts of other nations were even greater than those confronting the United States fishery. Yet none of this prevented the flourishing of the vital Canadian fishery on Georges Bank that has prevailed throughout modern times<sup>17</sup>.

## Section II. The Canadian Fishery Has Grown from Deep Historical Roots

332. The apparent purpose of the United States description of the evolution of the fishery is to obscure the strength and the endurance of the Canadian fishery on Georges Bank. It concludes with the astonishing assertion that "except for occasional foreign vessels, only the United States fished Georges Bank from colonial days until the later years of the ICNAF regime<sup>18</sup>". This assertion contradicts not only the most readily available evidence and numerous official United States documents, but even the United States Memorial itself, which clearly recognizes Canada's presence in the Georges Bank fishery during the 1950s<sup>19</sup>. ICNAF first convened in 1951 and remained extant until 1978: what, then, can the United States possibly intend by its assertion of practical exclusivity until "the later years of the ICNAF regime<sup>20</sup>"?

333. The Department of State Environmental Impact Statement on the 1979 Agreement on East Coast Fishery Resources characterized Canada's fisheries in the disputed area as *traditional* fisheries<sup>21</sup>. Similarly, the Scallop Management Plan of the New England Fishery Management Council described eastern Georges Bank as a "traditional" Canadian fishing ground<sup>22</sup>. The congressional testimony given by officials of the United States Government on the 1979 agreement stressed the equity of the entitlements in that agreement on purely historical grounds. For example, the prepared statement of Ambassador Lloyd Cutler, the United States special negotiator, noted that the "basic

<sup>17</sup> *Canadian Memorial*, pp. 59-73, paras. 110-148; see paras. 347-354 of this Counter-Memorial.

<sup>18</sup> *United States Memorial*, p. 176, para. 298.

<sup>19</sup> *United States Memorial*, p. 49, para. 80.

<sup>20</sup> *United States Memorial*, p. 176, para. 298.

<sup>21</sup> *Draft Environmental Impact Statement on the Agreement Between the United States and Canada on East Coast Fishery Resources*. United States Department of State, Washington, Government Printing Office, 1980, p. 134.

<sup>22</sup> *Fishery Management Plan Final Environmental Impact Statement, Regulatory Impact Review for Atlantic Sea Scallops* (*Placopecten magellanicus*). Appendix 2, "Harvesting and Utilization of the New England Scallop Resources". Boston, New England Fishery Management Council in Consultation with Mid-Atlantic Fishery Management Council and South Atlantic Fishery Management Council, 1982, p. A2-4.

objective of the Fisheries Agreement is to protect *the established fisheries* of both countries *in the disputed area*<sup>23</sup> . . .”, then almost entirely on Georges Bank. [*Italics added.*] The concluding paragraph of the formal submission to Congress by Ambassador Cutler opens with the following assertion:

“The Agreement establishes an equitable balance in terms of entitlements and access *viewed in historical context*<sup>24</sup>.” [*Italics added.*]

The dominant concern of the agreement was the fishery resources of Georges Bank<sup>25</sup>, and it was thus the position of the United States Government that historical considerations by themselves could justify a major and permanent Canadian share in these resources.

334. Volume II of the Annexes to this Counter-Memorial describes the evolution of the Canadian fishery on Georges Bank and its place in the fishing industry of the Maritime Provinces of Canada. It is the broad trends and the factors of continuity that count most, and of these the following may be identified:

*First*, Canada’s fishery on Georges Bank has deep historical roots.

*Secondly*, the fishing industry has always been vital to the Maritime Provinces of Canada, and especially to the regional economy of southwest Nova Scotia.

*Thirdly*, Nova Scotia and the Atlantic provinces have always engaged in a fishery based largely in waters that are adjacent to the coast of Canada — including Georges Bank — and have rarely pursued distant-water fisheries off the coasts of other nations.

*Fourthly*, these factors, along with expanded world markets and increased competition for resources, led to an industrial transformation of the Canadian fishery in the period following World War II. This modernization of the fleet — primarily during the 1950s and early 1960s — led to a significant increase in the Canadian use of the offshore banks.

*Fifthly*, the inevitable outcome of all these factors, coupled with Canada’s geographic and economic advantages in relation to Georges Bank, is that the decisive trend in the Canadian fishery on the Bank since World War II has been one of growth<sup>26</sup>.

<sup>23</sup> Prepared Statement of Lloyd N. Cutler, in United States-Canadian Fishing Agreements: Hearings before the Subcommittee on Fisheries and Wildlife Conservation and the Environment, Committee on Merchant Marine and Fisheries, United States House of Representatives, 96th Congress, 1st Session, 22 June 1979. Washington, Government Printing Office, 1979, p. 40; *Canadian Memorial, Annexes*, Vol. II, Annex 44, I, p. 343.

<sup>24</sup> Prepared Statement of Lloyd N. Cutler, p. 44; *Canadian Memorial, Annexes*, Vol. II, Annex 44, I, p. 347.

<sup>25</sup> *Canadian Memorial*, p. 111, para. 260; p. 112, para. 265.

<sup>26</sup> See *Counter-Memorial, Annexes*, Vol. II, Part II.

### A. THE EARLY DEVELOPMENT OF THE CANADIAN FISHERY ON GEORGES BANK

335. Nova Scotia and southern New Brunswick have always had maritime economies. Their geographic situation has made it so, historically and in modern times. The role of the fishery has always been central, but for much of the nineteenth century it was complemented by shipbuilding and the provision of a merchant marine to serve the trading economy of Imperial Britain<sup>27</sup>. Lunenburg and (especially) Yarmouth were significant centres of these nineteenth-century industries, which gave the maritime economy of the area a more varied character than it has today<sup>28</sup>.

336. Southwest Nova Scotia has always been dependent upon the sea for its livelihood. The region has been the heartland of the Nova Scotia fishery throughout the recorded history of the province. During the last half of the nineteenth century and the first decade of the twentieth, the fleet of southwest Nova Scotia accounted for more than 60 percent of the vessels and three-quarters of the men engaged in the entire sea-going Nova Scotia fishery. Agriculture was never important in the five southwestern counties, and from 1850 to 1910 field crop cultivation dropped to roughly 2 percent of the total area<sup>29</sup>.

337. The assertion by the United States that Canada had only a small offshore fishery in the nineteenth century, secondary in importance to other economic sectors, is totally unfounded<sup>30</sup>. While the fishery lost almost all its importance in the New England economy during the nineteenth century, it maintained the central role in the Maritime Provinces of Canada that it continues to play to this day. A United States study published in 1887 leaves no possible doubt on this point:

“One hundred years ago the Fishery was the principal industry of the North Atlantic seaboard; now it is an inconsiderable factor among the industries of New England, and an infinitesimal one in the business of the whole country. *It would be fairer to say that in the maritime provinces of Canada alone the condition of the Fishery is the measure of prosperity*”<sup>31</sup>. [Italics added.]

If there was ever a time when the New England fishery was larger than that of the Canadian Maritime Provinces, it was simply a result of the earlier development of New England as an economic force. Yet nearly a century ago the vigour of the early New England fishery was already a fading memory.

<sup>27</sup> *Counter-Memorial, Annexes*, Vol. II, Part I, Chap. II.

<sup>28</sup> See, for example, E. W. Sager and L. R. Fischer: “Atlantic Canada and the Age of Sail Revisited.” *Canadian Historical Review*, Vol. LXIII, No. 2, 1982, pp. 125-150; *Counter-Memorial, Annexes*, Vol. IV, Annex 61.

<sup>29</sup> *Counter-Memorial, Annexes*, Vol. II, para. 25 and Appendix I.

<sup>30</sup> *United States Memorial*, pp. 44-45, para. 72.

<sup>31</sup> C. Isham: *The Fishery Question*. New York, G. P. Putnam's Sons, 1887, p. 76; *Counter-Memorial, Annexes*, Vol. IV, Annex 62.



338. The unsubstantiated United States suggestion that the early Canadian fishery had only a slight economic importance is most eloquently belied by the colourful diplomatic history of the fishery, from the time of the Treaty of 1783 to the North Atlantic Fisheries Arbitration of 1910<sup>32</sup>. The tenacity with which Canadian fisheries objectives were pursued, and the importance attached throughout to trade in fish products, cannot be reconciled with the proposition that the fishery was at any time a marginal economic sector in Canada. The proposition is equally incompatible with the tangible evidence. Nova Scotia was renowned for its offshore schooner fleet throughout much of the nineteenth century<sup>33</sup>. For example, in Pubnico alone — one of the closest ports to eastern Georges Bank — more than 60 vessels were making week-long fishing trips to the banks in 1883<sup>34</sup>.

339. The United States assertion that a review of Canadian fishing by the Halifax Commission in 1878 “found” that only one Canadian vessel had fished on Georges Bank up to that time is simply in error<sup>35</sup>. Neither the records of the commission nor the sources cited by the United States bear out this contention. In fact, some of the testimony given before the commission points in exactly the opposite direction, corroborating the participation of Canadian vessels and men in the Georges Bank fishery at and before the time of these proceedings<sup>36</sup>. But the more important point is that the mandate of the commission and its entire jurisdiction were restricted to *inshore fishing* within the three-mile limit and other territorial waters, along with the value of trade privileges in fish products<sup>37</sup>. Indeed, the pleadings submitted by the United States urged vigorously that the deep-sea fisheries “conducted exclusively on the banks, beyond the jurisdiction of any nation<sup>38</sup>” were not within the cognizance of the commission; and on this there was never any disagreement between the Parties. If there were passing references in the oral testimony to Georges Bank, they were incidental and extraneous to the

<sup>32</sup> *Canadian Memorial, Annexes, I*, pp. 182-201, paras. 1-44.

<sup>33</sup> By the time of its entry into the Canadian federation in 1867, Nova Scotia had a fleet that was composed of about 1,000 vessels capable of offshore fishing and 10,000 inshore fishing boats. See T. F. Knight: *Shore and Deep Sea Fisheries of Nova Scotia*. Halifax, A. Grant, 1867, p. 1; *Counter-Memorial, Annexes, Vol. IV, Annex 63*.

<sup>34</sup> *Counter-Memorial, Annexes, Vol. II, para. 18; Vol. IV, Annex 64*.

<sup>35</sup> *United States Memorial*, pp. 44-45, para. 72.

<sup>36</sup> For example, John Nicholson, British (Canadian) Witness No. 22, when asked if Canadian vessels fished with trawl lines replied that “I have seen them used on Georges Bank by western vessels”. The earlier testimony of James Purcell, British (Canadian) Witness No. 20, indicated that the expression “western vessels” (or the “western fleet”) was currently used to refer to vessels from southwest Nova Scotia, from Lunenburg to Westport on the Bay of Fundy. *Documents and Proceedings of the Halifax Commission, 1877, Vol. I*, pp. 643-645; *Counter-Memorial, Annexes, Vol. IV, Annex 65*.

<sup>37</sup> Treaty of Washington, 9 May 1871, Art. XXII; *Canadian Memorial, Annexes, Vol. I*, pp. 18-22, paras. 19-25.

<sup>38</sup> J. B. Moore: *History and Digest of the International Arbitrations to which the United States has been a Party*, Vol. 1. Washington, Government Printing Office, 1898, p. 741. J. B. Moore indicates at p. 742 that the first formal conclusion of the United States Answer also submitted that the mandate of the commission was limited solely “to the fisheries within the territorial waters of the British North American provinces on the Atlantic coast”.

subject matter of the inquiry. Yet, even as such, they provide further evidence of a mid-nineteenth-century Canadian fishery on Georges Bank.

340. The Canadian Memorial has cited clear evidence that Canadian vessels frequented Georges Bank in the second half of the nineteenth century<sup>39</sup>. While the evidence is not extensive (nineteenth-century Nova Scotia was far less thoroughly chronicled than the populous New England society of the time), its clarity and probative value cannot be doubted. The Canadian Memorial refers to two official reports prepared in connection with the federation of Nova Scotia with the other three original Canadian provinces, both of which demonstrate that Georges Bank was an integral component of Nova Scotia's fishing industry at that time<sup>40</sup>. In another report by Thomas Knight, it is clearly indicated that a springtime fishery extending as far west as Georges Shoal, just to the west of Canada's present claim, was a regular annual pattern<sup>41</sup>. The context in which these reports were prepared was that of the transfer of administrative responsibility for the fishery to the newly formed federal government in Ottawa. It was obviously vital that the new authorities in Ottawa should have a full and accurate understanding of Canada's Atlantic fisheries, and these circumstances clearly invest the reports with a special significance and weight.

341. The direct evidence of Canadian fishing activity on Georges Bank in the early years of the twentieth century is far more abundant, and there is every reason to believe that it points to a pattern of activity that had been carried over from earlier times. The evidence set out in Volume II of the Annexes to this Counter-Memorial shows that Canadian fishing vessels engaged in the Georges Bank fishery throughout the period before World War II<sup>42</sup>. This activity encompassed fisheries for halibut, cod, haddock and — especially after World War I — swordfish. Even in the adverse conditions of the Great Depression, schooners from the southwestern ports of Nova Scotia continued to fish on Georges Bank<sup>43</sup>. The Canadian groundfish fishery on Georges Bank was inhibited during the period between the world wars by United States tariff policy, Canadian policy on offshore trawlers, market conditions, and the depletion of haddock resources on the Bank<sup>44</sup>. Canadian vessels continued, nonetheless, to make trips to Georges Bank throughout this period. Indeed, there is direct evidence from an official United States source that in 1919 alone Canadian vessels landed 454 metric tons of

<sup>39</sup> *Canadian Memorial*, pp. 83-84, paras. 179-182.

<sup>40</sup> *Canadian Memorial*, p. 83, para. 181, footnote 43.

<sup>41</sup> T. F. Knight: *Shore and Deep Sea Fisheries of Nova Scotia*. At page 2 it is stated: "From the first of April they [the Nova Scotia fishermen] continue cod-fishing on the various banks which extend from George's Shoal to Bank Quereau, and in parts of the Bay of Fundy, until about the 10th of June." *Counter-Memorial, Annexes*, Vol. IV, Annex 63.

<sup>42</sup> *Counter-Memorial, Annexes*, Vol. II, Part II, Chap. I.

<sup>43</sup> *Counter-Memorial, Annexes*, Vol. II, para. 51.

<sup>44</sup> *Counter-Memorial, Annexes*, Vol. II, paras. 43, 56 and 58. Further information on Canadian groundfish activity on Georges Bank during this period is provided in the *Counter-Memorial, Annexes*, Vol. II, Part II, Chap. I, Sec. II.

their Georges Bank catches — mainly groundfish — in the three New England ports of Boston, Gloucester and Portland<sup>45</sup>.

342. Substantial Georges Bank swordfish activity by Canadian vessels can be traced back to before World War I. Georges Bank was among the most important areas in which this fishery was pursued, and practically its exclusive locale in the late spring and early fall. The Canadian swordfish fleet in the first half of this century was increasingly successful. The Canadian catch grew rapidly, almost matching the United States catch in 1915 and overtaking it in the mid-1930s. This development compensated in large measure for the adversity encountered by the groundfish industry in those years. The participants in the swordfish fishery were among the pioneers of the Canadian Georges Bank scallop fishery after World War II, profiting from their intimate knowledge of the Bank in this new venture<sup>46</sup>.

343. Statistical comparisons with the catches of the United States fleet during this period are not available, because Canadian vessels were not required to report their catches by area of capture until well after the war<sup>47</sup>. Only in recent years has the evidence become reliable, with the development of an elaborate statistical system recording catches in terms of the specific area where they were taken. Unfortunately, the statistical system in Canada was particularly deficient in this respect before the 1950s (although statistical data on many other aspects of the industry were kept). Thus, the Canadian delegate to the first annual meeting of ICNAF in 1951 noted that the collection of offshore statistics in Canada had only begun a few years before:

“This intensive work, both in sampling the fish and in getting detailed statistics of where and when fish were caught, and with what effort, is only about four years old — five years old<sup>48</sup>.”

He also noted the longer and more extensive availability of statistical data collected by the United States on its own fleet, even in areas off the Nova Scotia coast<sup>49</sup>. It is clear from the available evidence, nevertheless, that the level of Canadian activity was significant throughout.

<sup>45</sup> *Report of the United States Commissioner of Fisheries For the Fiscal Year 1919, Appendix X*. Washington, Government Printing Office, 1921, pp. 21-31; *Counter-Memorial, Annexes*, Vol. IV, Annex 66. During the period 1918-1921, Canadian vessels were permitted to land directly in United States ports. However, their landings as reported in the Commissioner of Fisheries' reports included only those Canadian catches from Georges Bank that were unloaded in the United States. Moreover, there is evidence that these landings were under-reported. *Counter-Memorial, Annexes*, Vol. II, para. 39.

<sup>46</sup> *Counter-Memorial, Annexes*, Vol. II, paras. 60 and 66.

<sup>47</sup> *Counter-Memorial, Annexes*, Vol. II, para. 117.

<sup>48</sup> ICNAF, Summary Report (Minutes), Panel, Subarea 4, Restricted Document 29, Serial No. 9, 6 April 1951, p. 3; *Counter-Memorial, Annexes*, Vol. IV, Annex 67.

<sup>49</sup> The Canadian delegate said:

“... as far as the fishery statistics are concerned, and even the sampling of the stocks, the United States investigations were ahead of ours, even on these areas next to our coast, for many years, and although we feel that we have been caught up or are catching up, it is only in the last four or five years.”

ICNAF, Summary Report (Minutes), Panel, Subarea 4, Restricted Document 29, Serial No. 9, 6 April 1951, p. 5; *Counter-Memorial, Annexes*, Vol. IV, Annex 67.

344. There was diversity in the Canadian fishery on Georges Bank before World War II, both in the seasons of its pursuit and in the species sought. Its character and extent can only be appreciated in the light of the concrete account of the vessels and men that fished on Georges Bank, as is set out in Volume II of the Annexes to this Counter-Memorial<sup>50</sup>. A Royal Commission of Inquiry found in 1928 that Georges Bank was among the "principal fishing grounds" resorted to by vessels from the Atlantic ports of Canada<sup>51</sup>. Similarly, fishermen's charts produced during the 1920s reflect this Canadian use of the Bank by showing its distance from major Nova Scotia fishing ports<sup>52</sup>. The evidence can leave no doubt that the Canadian fishery on Georges Bank is a phenomenon with deep historical roots.

345. Yet in earlier times this fishery was doubtless more limited than it might have been if natural geographical and economic factors had been given free play. The Canadian fishery has traditionally been dependent on exports (indeed, the Canadian economy as a whole is very largely based on exports of resource-based products), but the inherent strength of Canada's offshore fishery has often been inhibited by tariff walls and other protectionist measures in the United States<sup>53</sup>. In 1941, Edward Ackerman, the United States fisheries historian referred to in paragraph 330, noted the importance of the issue from the New England perspective:

"New England, near as it is to the fish-producing Canadian Maritime Provinces, probably would be much less important than it is in several branches of the fishing industry if United States tariffs did not protect the efforts of the United States fishermen. Because the Maritimes are even more favorably located with reference to the fishing banks than New England and because their fishermen have lower wage scales (and few economic opportunities other than fishing), Canada could easily take over a good share of the United States market if it were not for tariffs<sup>54</sup>."

These measures, in brief, provided an artificial prop for the New England fishery and inhibited the full development of its Canadian counterpart before World War II.

346. The severe restrictions placed on the use of modern offshore trawlers in Canada before World War II, following the report of the

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<sup>50</sup> *Counter-Memorial, Annexes, Vol. II, Part II, Chap. I.*

<sup>51</sup> *Report of the Royal Commission Investigating the Fisheries of the Maritime Provinces and the Magdalen Islands.* Ottawa, King's Printer, 1928, p. 7; *Canadian Memorial, Annexes, Vol. II, Annex 8.*

<sup>52</sup> *Counter-Memorial, Annexes, Vol. III, Appendices 31-33; Fishermen's and Yachtsmen's Charts, Cape Cod to Newfoundland.* Georges Bank Inset. Albert Close, Ilford, London, 1928 and 1932.

<sup>53</sup> For example, the disastrous effects of the Fordney-McCumber Tariff (sometimes called the "Fordney Tariff") imposed by the United States in 1922 are described in the *Canadian Memorial*, p. 86, para. 188 and *Canadian Memorial, Annexes, Vol. I, p. 30, para. 33.* See also *Counter-Memorial, Annexes, Vol. II, paras. 43-44 and 66-67.*

<sup>54</sup> E. A. Ackerman: *New England's Fishing Industry*, p. 141; *Counter-Memorial, Annexes, Vol. IV, Annex 60.*

Royal Commission of Inquiry in 1928, added a further constraint on the natural growth of the Georges Bank fishery. This policy (which did not affect the traditional schooner fleet) was intended to protect small-boat fishermen from the threat of glut in a time of badly depressed markets<sup>55</sup>. A similar regulatory restriction interfered with the development of an offshore scallop fishery in the late 1930s<sup>56</sup>. These policies ceased to apply after the war. The post-war period also saw a renewed international commitment to free trade, expressed both in the GATT and in the policies advocated and followed by Canada and the United States<sup>57</sup>; and with it came a more liberal policy on trade in fish products<sup>58</sup>. Combined with the greater prosperity of the times and the impetus given by increased competition for resources, these factors all contributed to the vigorous growth of Canada's offshore fishery after World War II and the expansion of its fishery on Georges Bank.

## B. THE EVOLUTION OF THE CONTEMPORARY CANADIAN FISHERY ON GEORGES BANK

347. The United States Memorial puts forward the perplexing suggestion that the post-war expansion of the Canadian fishery on Georges Bank was somehow a "response" to the build-up of foreign fishing effort further to the north and east<sup>59</sup>. This notion cannot survive even the most casual scrutiny. For one thing, the expansion of Canada's Georges Bank fishery was led by the scallop fleet — and scalloping has always been exclusively a coastal State fishery, totally unaffected by the overseas fleets<sup>60</sup>. More generally, the expansion of Canada's fishery on Georges Bank was simply a result of the growth and modernization of Canada's offshore fleet and its fishing industry as a whole after World War II. The post-war era brought new opportunities for development, as well as new economic imperatives stemming from the greater competition for resources that accompanied the intensification of fishing effort

<sup>55</sup> *Canadian Memorial*, p. 86, para. 188. See also *Counter-Memorial, Annexes*, Vol. II, para. 56.

<sup>56</sup> Nova Scotia Fishery Regulations in effect from 1938 to 1940 prohibited the use of "drags" over 18 feet in length for this purpose. Order in Council P.C. 2586, 18 October 1938 and Order in Council P.C. 162, 17 January 1940. See also "Test Scallop Fishery on Offshore Banks", *Fisheries News Bulletin*, Vol. XI, No. 124, February 1940, pp. 2 and 4. *Counter-Memorial, Annexes*, Vol. IV, Annex 68.

<sup>57</sup> See, for example, *Trade Act of 1974*, 88 United States Statutes at Large 2076, Public Law No. 93-618, sec. 612 (codified at 19 United States Code, sec. 2486), which urges the negotiation of a free trade agreement with Canada.

<sup>58</sup> The United States tariff does, however, continue to curtail the level of fish processing employment in Canada. Indeed, it is significant that the Canadian fishery that has most flourished on Georges Bank is the scallop fishery, where the effect of the tariff has been relatively slight. See paras. 284 and 352.

<sup>59</sup> *United States Memorial*, p. 49, para. 80.

<sup>60</sup> Statistical catch records maintained by ICNAF and NAFO confirm that the sea scallop fishery in the northwest Atlantic has been carried out exclusively by Canada and the United States. *Statistical Bulletin*, Vols. 11-28, 1961-1978. Dartmouth, Nova Scotia, ICNAF, 1963-1980; Vols. 29-30, NAFO, 1981-1982. The suggestion by the United States that its scallop fishery began to "rebound" after the establishment of the 200-mile limit is equally groundless. *United States Memorial*, p. 50, para. 83.

and the technological revolution in the fishing industry. The growth of Canada's offshore fishery in the post-war years was a successful response to each of these challenges and opportunities<sup>61</sup>.

348. The gradual expansion of Canadian fishing on Georges Bank began immediately after World War II, gaining momentum from the late 1950s on<sup>62</sup>. The outcome of this evolution as manifested in the present-day Canadian fishery on the Bank has been described in paragraphs 252-262, 302-317 of this Counter-Memorial and in the Canadian Memorial<sup>63</sup>. The following paragraphs will outline the immediate antecedents of some of its most important components.

### 1. The Swordfish Fishery

349. Although the Canadian swordfish fishery on Georges Bank has been largely curtailed since 1971<sup>64</sup>, it has great significance in the evolution of the present-day fishery for two distinct reasons. *First*, the swordfish fishery on Georges Bank was often combined with scalloping in the early years of that fishery, and swordfish fishing may thus be regarded as the immediate precursor of the most important fishery ever to be exploited on Georges Bank. *Secondly*, the curtailment of the swordfish fishery in 1971 led directly to the establishment of Canada's continuing offshore lobster fishery on Georges Bank. When restrictions on the sale of swordfish were imposed in the United States and then in Canada in 1971 (because of naturally occurring high levels of mercury), Canada pioneered this lobster fishery on the Bank to absorb at least some of the displaced vessels and fishermen<sup>65</sup>.

350. The swordfish fishery was a source of strength in the Canadian fishery from the early part of the century. From 1939, the Canadian fleet led this sector of the fishery in the northwest Atlantic, and in the post-war years its commanding position became overwhelming<sup>66</sup>. A 1958 issue of the *Maine Coast Fisherman* described the fishery in the following terms:

"The majority of the commercial fleet that follows the swords when they hit the East Coast offshore waters from the Delaware Capes to the Grand Banks during the summer come [*sic*] from the

<sup>61</sup> *Counter-Memorial, Annexes, Vol. II, Part II, Chap. II.*

<sup>62</sup> *Counter-Memorial, Annexes, Vol. II, Part II, Chap. II.*

<sup>63</sup> *Canadian Memorial, pp. 83-91, paras. 179-202.*

<sup>64</sup> In 1971, the discovery of high levels of mercury in swordfish resulted in the introduction of a ban on sales of swordfish that did not meet a mercury tolerance level of 0.5 parts per million, which only the smallest fish could pass. In 1979, following several years of review, the mercury restriction was lifted in favour of providing information to consumers on consumption rates. *Counter-Memorial, Annexes, Vol. II, paras. 183-185.*

<sup>65</sup> *Canadian Memorial, pp. 87-88, para. 191; Counter-Memorial, Annexes, Vol. II, para. 187.*

<sup>66</sup> *Counter-Memorial, Annexes, Vol. II, paras. 60, 116-140 and Tables 2 and 14.*

Canadian Maritimes. When the fish begin to appear off Georges Bank, the Canadian boats go to work<sup>67</sup>."

Volume II of the Annexes to this Counter-Memorial shows that this Canadian fishery was undertaken by vessels from along the whole south-west Nova Scotia coast, from well above Digby on the Bay of Fundy as far as Lunenburg on the outer Atlantic coast<sup>68</sup>. As elsewhere, the activities of small vessels were either entirely unreported or under-reported in the official statistics. Yet the full extent of this activity became evident in September 1950, when tragedy struck in the form of a severe hurricane. A fleet of small swordfish vessels from Woods Harbour, near Cape Sable Island at the southwest corner of Nova Scotia, along with larger vessels from Yarmouth, was caught by the storm on Georges Bank. A published historical account of the event records that this was to have been the season's last trip to Georges Bank for this fleet of Nova Scotia vessels<sup>69</sup>. Although most of the fleet managed to make its way to the safety of shore, one of the Woods Harbour vessels met with disaster and was later found floating on its side off the Nova Scotia coast with no survivors aboard<sup>70</sup>.

351. Like its successor, the lobster fishery, the Canadian swordfish fishery tended to be concentrated on the seaward side of Georges Bank. An example of the fishing patterns of the Canadian swordfish fleet is given in *Figure 30*. Restrictions on the sale of swordfish have recently been relaxed in the light of further scientific research, and it may be anticipated that Canadians will regain their pre-eminent position in this fishery.

## 2. The Origins of the Scallop Fishery

352. Clearly the most significant development in the Canadian use of Georges Bank after 1945 was the establishment of an offshore scallop fishery that relied almost exclusively on the prolific scallop beds of Georges Bank. Canadian fishermen had expressed interest in

<sup>67</sup> P. Shea: "Swordfish Sleigh Ride." *Maine Coast Fisherman*, July 1958, p. 21; *Counter-Memorial, Annexes*, Vol. IV, Annex 69.

<sup>68</sup> *Counter-Memorial, Annexes*, Vol. II, paras. 140-160.

<sup>69</sup> T. Amiro, M. MacDonald-MacKenzie and J. (Cline) Newell: *A Sea Tragedy Wood's Harbour 1950*, Yarmouth, Sentinel Printing Ltd., 1977, p. 14. See also H. A. Perry: *In and Around Old Barrington*, Yarmouth, Lescarbot Printing Limited, 1979, pp. 22-26; *Counter-Memorial, Annexes*, Vol. II, paras. 123-126; Vol. IV, Annexes 70-71.

<sup>70</sup> T. Amiro, M. MacDonald-MacKenzie and J. (Cline) Newell: *A Sea Tragedy Wood's Harbour 1950*, p. 27. Pearl Goreham of Lower Woods Harbour, daughter of a fisherman who survived the storm, commemorated the incident in a poem reproduced at p. 63 and entitled "The Swordfishing Boats and the Hurricane". The first stanza reads:

The swordfishing boats left Wood's Harbour pier,  
All the boys and men Wood's Harbour holds dear,  
They headed out for the swordfishing grounds,  
To seek their fortune on Georges and Browns.

*Counter-Memorial, Annexes*, Vol. IV, Annex 70.

establishing an offshore scallop fishery in the late 1930s<sup>71</sup>; but as was noted in paragraph 346, Canadian regulations designed to protect the position of small-boat fishermen prohibited the use of equipment suitable for offshore scalloping until 1940. The war further postponed the development of the fishery, but from 1945 on Canadian vessels began to exploit the scallop beds of Georges Bank. By the mid-1950s Canada had become a major producer of Georges Bank scallops, and by the mid-1960s its fleet was practically the sole exploiter of the beds of the eastern half of the Bank. At the beginning, this fishery made use of vessels converted from other fisheries; but, from 1954, a fleet of offshore vessels specially designed for this fishery was constructed, eventually numbering over 70 large vessels. The Canadian scallop fishery on Georges Bank continued to expand through the 1960s, and it quickly assumed an indispensable role in Canada's contemporary fishing industry<sup>72</sup>.

### 3. *The Resurgence of the Offshore Groundfish Fishery*

353. Canadian groundfish fishing on Georges Bank has been pursued at rising levels of activity during the post-war period, when Canada began to develop a modern offshore fleet to replace the dory schooners on which it had traditionally relied. The late 1940s and the 1950s were a period of transition and of relatively light Canadian groundfish activity on Georges Bank, although the statistical record for these years does not accurately reflect the Canadian fishery. The distribution of logbooks to Canadian vessels for the purpose of reporting catches by area of capture was incomplete until the 1960s, and such reporting did not become compulsory until some years later<sup>73</sup>. Volume II of the Annexes to this Counter-Memorial shows, nonetheless, that Georges Bank attracted the interest of the fledgling Canadian dragger and trawler fleet from the late 1940s<sup>74</sup>. What is particularly significant is that the small-vessel fleet of southwest Nova Scotia — a fleet that even today remains partially outside the statistical system for the offshore banks — was active on Georges Bank at this time. The ports of the southwest shore of Nova Scotia — the area of the coast that lies closest to Georges Bank — were then, as now, particularly active in this fishery. As today, moreover, the fishermen of Nova Scotia relied heavily on high-value, low-volume Georges Bank resources such as halibut and swordfish<sup>75</sup>.

354. The haddock stocks of Georges Bank had been depleted when ICNAF was established<sup>76</sup>. They gradually recovered under the ICNAF mesh size program that Canada helped to develop — a striking example of the results that could be accomplished through international

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<sup>71</sup> N. Bourne: *Scallops and the offshore fishery of the Maritimes*. St. Andrews, Fisheries Research Board of Canada, Bulletin No. 145, 1964, p. 21.

<sup>72</sup> *Counter-Memorial, Annexes*, Vol. II, paras. 89-104 and 143-157.

<sup>73</sup> *Northwest Atlantic Fisheries Convention Regulations, amendment*. Order in Council P.C. 1973-1478, 12 June 1973 published in *Canada Gazette*, Part II, Vol. 107, No. 12, 27 June 1973.

<sup>74</sup> *Counter-Memorial, Annexes*, Vol. II, paras. 105-115.

<sup>75</sup> *Counter-Memorial, Annexes*, Vol. II, para. 108.

<sup>76</sup> *Counter-Memorial, Annexes*, Vol. II, para. 108 and footnote 57.



cooperation, given the necessary political will. In the early and mid-1960s, Canadian cod and haddock catches from the Bank rose to record levels, before the stocks were again depleted. The strong performance of Canadian trawlers on Georges Bank during these years was an early expression of the process of growth and modernization in the Canadian offshore fishing fleet after World War II<sup>77</sup>.

### Conclusion

355. A number of specific conclusions emerge from this brief survey of the historical evolution of Canada's fishery on Georges Bank. The first is that it is a deeply rooted pattern, closely associated with the geographical position of southwest Nova Scotia and its traditional fisheries-based economy. The fishery is more than a vital economic resource to the people of Nova Scotia: it is a tradition of the province's popular culture. The second conclusion is that the trend in modern times has been one of orderly growth, the outcome of the modernization and expansion of Canada's offshore fleet since World War II. The Canadian fishery on Georges Bank today outranks the earlier fleets of either country in both importance and scale; but it was developed by communities whose association with Georges Bank has extended over generations. It is the product of this historical process that is significant in the present case, and not the process itself.

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<sup>77</sup> *Counter-Memorial, Annexes*, Vol. II, paras. 158-178.

## CHAPTER VI

### THE CONDUCT OF THE PARTIES

#### Introduction

356. The Court has stressed the importance of State conduct in the delimitation of maritime zones<sup>1</sup>. In the present case, the activities of the Parties may be considered in terms of four general categories on the basis of their legal relevance to the determination of a single maritime boundary.

*First*, the exercise of continental shelf jurisdiction by Canada and its prolonged acceptance by the United States constitute a basis of acquiescence, recognition and estoppel in favour of the Canadian claim.

*Secondly*, both this record of continental shelf activities and the history of the dispute — in particular, the 1979 Agreement on East Coast Fishery Resources — are decisive indicia that the Canadian claim accords with a result that the Parties themselves have regarded as equitable.

*Thirdly*, while the record of coastal State activities respecting the high seas fisheries before the extension of jurisdiction is unrelated to the exercise of sovereign rights or jurisdiction by either of the Parties, the record is fully consistent with Canada's claim.

*Fourthly*, the United States has adduced a variety of State activities that are totally irrelevant because they are unrelated to the subject matter of the single maritime boundary, and because they took place at a time when coastal State sovereign rights and jurisdiction beyond the territorial sea were not contemplated.

#### Section I. A Double Ambiguity Pervades the United States Account

357. A pervasive ambiguity runs through the United States Memorial's account of the various State activities to be reviewed in the following paragraphs. A typical instance may be found in its statement that no State "questioned" United States "jurisdiction and control over the continental shelf of the Gulf of Maine Basin and Georges Bank until the 1960s"<sup>2</sup>. The short answer to this contention is, of course, that there was nothing to question: by its own admission the United States never even attempted to carry out activities relating to the exploration for or exploitation of continental shelf resources in any part of the Gulf of Maine area until the mid-1960s<sup>3</sup>. But the statement is illustrative of the vague and shifting frame of reference with which the United States Memorial has endeavoured to cloud the historical record.

<sup>1</sup> *I.C.J. Reports 1982*, p. 84, para. 118.

<sup>2</sup> *United States Memorial*, pp. 81-82, para. 135.

<sup>3</sup> *United States Memorial*, pp. 57-58, paras. 92-93.

358. In the first place, like so much else in the United States Memorial, the statement quoted in the above paragraph fails to distinguish between those portions of the Gulf of Maine area that are in dispute between the Parties, and those portions — the greater part of the entire area — that are under the undisputed jurisdiction of either Canada or the United States. A recital of United States activities, no matter how exhaustive or impressive, in the areas that are under undisputed United States jurisdiction can hardly assist the Court in clarifying the issues. Even more fundamental is the second ambiguity that runs throughout the United States presentation: the attempt to lend substance to its claim to “dominance” over the entire area by cataloguing a series of high seas activities that bear at most a tenuous relationship to the issues at stake.

359. Canada will counter the specific items in the United States catalogue on their particular facts, and will show how far the United States Memorial falls short of its mark when the facts are appraised in a more objective fashion. Of equal importance, however, is the need to bear in mind throughout the double ambiguity of the entire United States account — its failure to distinguish between activities that relate to the areas in dispute and those that do not, and between activities that are truly relevant to the issues before the Court and those extraneous activities that are more closely related to the traditional régime of the high seas. This admixture of irrelevant areas and irrelevant activities creates a hopelessly confused and distorted image of the historical record, which exaggerates the United States role beyond any semblance of authenticity.

## **Section II. The United States Has Acquiesced in and Recognized the Canadian Equidistance Claim and Its Conduct Has Created an Estoppel in Favour of Canada**

360. The facts Canada has relied upon in support of its contention that the United States has acquiesced in and recognized Canadian jurisdiction up to the equidistance line, and that its conduct has created an estoppel in favour of Canada, stand uncontroverted by the United States Memorial. It is Canada alone that has issued instruments conferring legal interests in the resources of the continental shelf of the disputed area; and for an extended period during the 1960s the United States unequivocally accepted this exercise of jurisdiction without protest and with full knowledge of what was in issue.

### **A. THE EXERCISE OF CONTINENTAL SHELF JURISDICTION BY THE PARTIES**

#### *1. Permits*

361. As was stated in the Canadian Memorial<sup>4</sup>, Canada has issued oil and gas permits for most of the disputed portion of Georges Bank and adjacent areas. While these permits are formally applicable

<sup>4</sup> *Canadian Memorial*, pp. 92-93, paras. 204-205.

only to the exploratory phases of offshore oil and gas operations, the most important single benefit they confer is the prospect of exclusive, long-term production rights within the tract specified in the permit<sup>5</sup>. The permits cover specific tracts at sea — rectangular blocks whose dimensions are either 10 by 11 nautical miles or exactly half that size. They are long-term instruments whose duration is intended to provide ample time to carry out the exploration work necessary to determine whether the permit should be converted to a lease for the commercial production of oil and gas. Because of the special circumstances created by the dispute, the normal term of the permits for tracts in the disputed area (as it stood until the United States Memorial was filed) has been extended by special executive orders. The Canadian permits issued for the disputed portion of the Gulf of Maine area remain in force at the present time, and confer upon the holders the prospect of exclusive resource production rights within the designated tracts.

362. The Canadian Memorial described the publicity given to these permits through the publication of maps showing the areas to which they applied<sup>6</sup>. Moreover, it was the Canadian practice at all material times to notify the leading oil and gas trade publications of all new permits as they were issued. These publications regularly carried notices or stories on newly issued permits — as they did on the occasion of the first Canadian permits issued for Georges Bank in the spring of 1964<sup>7</sup>. The Canadian Government itself published a “Monthly Oil and Gas Report” that listed the permits issued, with the geographical coordinates identifying their location, the name of the permit holder and other pertinent information<sup>8</sup>. All Georges Bank permits were included in this publication within a few weeks of their issuance, and the report was circulated every month to a broad range of recipients, including the United States Embassy in Ottawa.

363. The permits involve a continuing exercise of jurisdiction by the resource management authorities of the Canadian Government, primarily in the supervision and evaluation of the exploratory work the holders are required to carry out. Since 1965, Canadian permit holders have spent substantial sums on seismic, sea gravity and magnetometer surveys on Georges Bank in order to fulfil their work obligations and so maintain the validity of their permits and retain eligibility for production leases. Since 1971, however, the Canadian Government has acceded to requests by companies holding permits in the disputed area for temporary exemptions from their normal work obligations pending the settlement of the dispute; as a result, the exploratory work has not yet

<sup>5</sup> See *Counter-Memorial, Annexes*, Vol. III, pp. 1-12, paras. 1-28 for a full explanation of the Canadian regulatory régime governing the disposition and administration of interests in oil and gas.

<sup>6</sup> *Canadian Memorial*, p. 92, para. 203.

<sup>7</sup> *Oilweek*, 25 May 1964, pp. 21-22; *Counter-Memorial, Annexes*, Vol. V, Annex 72.

<sup>8</sup> *Counter-Memorial, Annexes*, Vol. III, Appendix 5 contains a sample issue of this publication.

proceeded to the more costly drilling phase<sup>9</sup>. These exemptions have not stood in the way of continued progress in the gathering of geophysical data, although the rate of progress has inevitably been affected.

364. The Canadian permits outstanding on Georges Bank were issued under the *Canada Oil and Gas Lands Regulations* — a set of regulations that is made expressly applicable to all federal oil and gas interests both onshore and in submerged lands. A new and comprehensive statute entitled the *Canada Oil and Gas Act*, which will eventually replace the old regulatory régime in its entirety, was proclaimed in force in 1982. The legal force and effect of all oil and gas interests issued under the former régime is expressly maintained by the *Canada Oil and Gas Act*, which also provides for the replacement of these interests by legal instruments that are governed by the terms and conditions of the new legislation. The detailed operation of both the old regulations and the new legislation is described in Volume III of the Annexes to this Counter-Memorial.

365. In brief, the Canadian permits granted exclusive, long-term rights with respect to specific tracts of submerged lands, with the potential for oil and gas production rights upon conversion to a lease at the option of the permit holder. The United States has issued no comparable instruments for the disputed area. It has granted no oil and gas leases or other rights or interests, actual or prospective, in the mineral resources of this area. <sup>(67)</sup> *Figure 31* reproduces the relevant portion of a map from the “Eastern United States Coastal and Ocean Zones Data Atlas”, published by United States Government agencies in 1980, showing the offshore areas under United States lease or Canadian permit as of that time. <sup>(4)</sup> Consistent with the illustration in *Figure 4* of the Canadian Memorial, it shows that *all* oil and gas interests that have been granted in the area claimed by Canada are Canadian.

366. The United States Memorial invokes a series of permits it has issued for geophysical surveys of extensive areas of the Atlantic continental shelf<sup>10</sup>. It alleges that a number of these surveys extended into an undefined area termed the “Northeast Portion of Georges Bank” — apparently the sole instance it can suggest of an exercise of United States jurisdiction in the disputed area. Yet, even on the basis of the contentions in the United States Memorial, the evidence is thin indeed. It demonstrates at most a number of incidental intrusions (mostly since 1972) into the area under Canadian claim, all in the context of a series of broad geophysical surveys of the Atlantic continental shelf. At no point was Canada given notice of these activities, despite United States knowledge and acceptance of the rights Canada had granted to specific tracts on Georges Bank. The circumstances stand in contrast to the public exercise by Canada, with full United States knowledge, of jurisdiction

<sup>9</sup> *Counter-Memorial, Annexes*, Vol. III, p. 6, para. 11 contains an explanation of the “variation orders” used for this purpose, and *Counter-Memorial, Annexes*, Vol. III, Appendix 4 contains copies of the relevant orders. It should be noted that today exploration wells can cost up to \$50 million each.

<sup>10</sup> *United States Memorial*, p. 58, para. 93; *United States Memorial, Documentary Annexes*, Annex 40.

involving the granting of long-term rights to resources in designated sites on Georges Bank.

367. The general nature of the geophysical permits relied upon by the United States is apparent both from Annex 40 to the United States Memorial and from a series of permits provided to Canada by the Agent of the United States under cover of a letter dated 20 January 1983<sup>11</sup>. They were temporary permits for survey programs that generally could be completed in a matter of months, and involved no sustained exercise of jurisdiction. Annex 40 to the United States Memorial shows that the work authorized under all the permits listed has been completed, and the permits accordingly have no continuing validity. Geophysical surveys of the kind authorized involve no fixed operations and seldom require any contact with the sea floor. The permits were general exploratory authorizations, each of them covering vast portions of the continental shelf — in most cases, stretches of hundreds of nautical miles in length. They conferred no rights or interests in the resources of the area surveyed.

368. Canada has not been provided with survey reports or other documentation enabling it to verify the extent to which these surveys may in fact have extended into the disputed area, or the overall context of the operations. The Agent of the United States, however, at Canada's request, has transmitted to Canada a number of geophysical survey permits in addition to the "sample" permit reproduced in Annex 40. Even though the United States has claimed that survey operations extending to the "Northeast Portion of Georges Bank" were carried out under each of the permits listed in Annex 40 to the United States Memorial, the maps attached to some of these permits clearly indicate that the authorized area did *not* in fact extend into the disputed area<sup>12</sup>. Others applied to areas as broad and vaguely defined as "the Atlantic Ocean . . . off all States from Maine to and including South Carolina"<sup>13</sup>. Of the survey permits issued before the United States reserved its position on the boundary in November 1969, only the "sample" permit appears on its face to authorize operations extending into the part of Georges Bank claimed by Canada. In some cases, the survey area covered by the permits supplied to Canada lies well to the west of Georges Bank in its entirety<sup>14</sup>. In several instances the documentation provided is wholly inadequate to permit a determination to be made of the area covered by the permit<sup>15</sup>. What is certain, on the other hand, is that the evidence is inconsistent with the statement in the United States Memorial indicating that United States geophysical surveys of Georges Bank began as early as 1964<sup>16</sup>.

369. Furthermore, the suggestion that the United States authorized surveys extending into the area on the Canadian side of the

<sup>11</sup> The letter was addressed to the Registrar of the Court, with a copy to the Agent for Canada.

<sup>12</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 73. Permits E6-75 and E3-67.

<sup>13</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 73. Permit E3-68.

<sup>14</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 73. Permits E4-64 and E6-75.

<sup>15</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 73. Permits E1-66, E3-68 and E4-69.

<sup>16</sup> *United States Memorial*, p. 58, para. 93.

equidistance line before the United States reserved its rights in this area is contrary to formal representations made to Canada at that time. When the United States first questioned Canadian jurisdiction in the Georges Bank area on 5 November 1969, it informed Canada that it had never authorized mineral exploration or exploitation in this area. The United States aide-mémoire of that date said in part:

“The Government of Canada has already issued exploration permits for the northern portion of the Georges Bank continental shelf. The United States is concerned that, pending settlement of the boundary question, substantial investment in exploration and exploitation of the area could greatly increase the difficulty of negotiating a satisfactory boundary. For this reason, *the United States has refrained from authorizing mineral exploration or exploitation in the area*<sup>17</sup>.” [*Italics added.*]

It was on this basis that Canada was urged to impose a complete moratorium on exploration and exploitation in the Gulf of Maine area.

370. In only one case before the 1970s did Canada become aware that a geophysical survey carried out by a private United States company had in fact intruded into the Canadian portion of the Bank. (This is the same company referred to in the sample permit in Annex 40 to the United States Memorial.) The company itself brought the matter to the attention of the Canadian Government, but without any reference to any permit or authorization from the United States authorities<sup>18</sup>. Significantly, the chart attached to the letter from the survey company [Figure 32] clearly shows that the equidistance line was respected by the company except for a few tentative forays into the Canadian zone. As was stated in the Canadian Memorial, the company was promptly notified by the proper authorities of its obligations under Canadian law with respect to that part of the survey undertaken in the Canadian portion of the Gulf of Maine area<sup>19</sup>. A similar course of action was followed in the few subsequent cases — all of them during the 1970s — where Canada became aware that exploratory surveys not authorized by Canadian law had intruded into areas under Canadian jurisdiction, and the subject was dealt with in formal diplomatic correspondence between the Parties in 1974<sup>20</sup>. Only one other United States geophysical survey in the Georges Bank area came to the attention of the Canadian authorities before the 1970s, and in this case the equidistance line appears to have been strictly observed as a line of demarcation throughout the operations<sup>21</sup>.

<sup>17</sup> *Canadian Memorial, Annexes*, Vol. III, Annex 13.

<sup>18</sup> *Canadian Memorial, Annexes*, Volume II, Annex 50.

<sup>19</sup> *Canadian Memorial*, p. 98, para. 219.

<sup>20</sup> *Canadian Memorial*, pp. 98-99, para. 220.

<sup>21</sup> Sketch map illustrating seismic program carried out by Humble Oil in 1966, attached to letter of 28 September 1966 from Chevron Standard Limited to the Chief, Resource Management Division, Department of Northern Affairs and National Resources. *Counter-Memorial, Annexes*, Vol. V, Annex 74.

*2. The Irrelevance of the Remaining Continental Shelf Activities  
Referred to by the United States*

371. It is unnecessary to undertake an extensive analysis of the account given in the United States Memorial of the general history of continental shelf exploration and development in the United States, and the legislative framework for these activities. Nearly all this material is simply irrelevant because it deals with activities conducted in the undisputed United States portion of Georges Bank and the Gulf of Maine, and not in the boundary area.

372. Thus, for example, the entire series of events surrounding Outer Continental Shelf Lease Sales Nos. 42 and 52, described in exhaustive detail in the United States Memorial<sup>22</sup>, has for the most part no genuine bearing upon the issues in the present dispute. The only truly significant fact to be borne in mind about these two series of transactions is that in neither case do the tracts affected extend into that portion of Georges Bank claimed by Canada [*Figure 31*]. Similarly, the two "stratigraphic test holes" on Georges Bank referred to in the United States Memorial were in fact located nowhere near the Canadian claim<sup>23</sup>.

373. The 1975 "call for nominations", illustrated in Figure 11 of the United States Memorial, was no more than a tentative and preliminary procedural step by which the oil and gas industry was invited to submit comments to the United States Government. It simply indicates that at one point in 1975 the United States Department of the Interior contemplated the possibility that leasing might eventually extend into the disputed area. The United States itself emphasized the tentative nature of both the call for nominations and the associated preparation of a draft environmental impact statement in its diplomatic notes to Canada of 15 May 1975 and 10 February 1976, reassuring Canada that these preliminary procedures would not "entail the creation of any private rights" or obligate the United States to proceed with leasing or other measures<sup>24</sup>. In view of the subsequent deletion of the disputed tracts from the leasing process, no legal consequences ensued from this initiative.

374. The United States has set forth the detailed requirements of its environmental legislation, and has intimated that the Canadian requirements are somehow inferior to its own<sup>25</sup>. Volume III of the Annexes to this Counter-Memorial shows that these suggestions are as

<sup>22</sup> *United States Memorial*, pp. 57-63, paras. 92-99.

<sup>23</sup> *United States Memorial*, p. 59, para. 95. The coordinates for these stratigraphic test holes are:

40°55'52.1"N 68°18'18.92"W

40°50'11.41"N 67°30'29.78"W

<sup>24</sup> *Canadian Memorial, Annexes*, Vol. III, Annexes 22 and 26.

<sup>25</sup> *United States Memorial*, p. 57, para. 91; p. 63, paras. 100-101.



unfounded in fact as they are irrelevant in law<sup>26</sup>. Canada has long been in the forefront of efforts to strengthen the international framework for the protection of the marine environment. Its record of successful environmental management in some of the most hostile ocean areas of the world owes much to the stringency and thoroughness of the protective measures imposed on Canadian offshore operations. It was, on the other hand, only during the 1970s that most of the detailed environmental stipulations referred to in the United States Memorial were adopted. Before the oil spill off Santa Barbara, California in 1969 — and accordingly throughout the period of United States acquiescence in Canadian jurisdiction up to the equidistance line in the Gulf of Maine area — United States legislation imposed only minimal environmental requirements. In fact, the amendment to the *Outer Continental Shelf Lands Act* on environmental protection, which is quoted in the United States Memorial, was enacted only in 1978<sup>27</sup>.

375. In sum, the really important point about the entire record of United States activities with respect to the continental shelf of Georges Bank is that the United States has taken no decisive steps to exercise jurisdiction northeast of the equidistance line. Only Canada has taken such measures in this area through the issuance of the long-term oil and gas permits referred to in paragraphs 361-370. The entire administrative process described at such length in the United States Memorial has a single basic purpose — the granting of leases. Because none of these activities led to the granting or even the offering of United States leases in the disputed portion of Georges Bank, they can have no real bearing on the issues in dispute.

#### B. COMMUNICATIONS BETWEEN THE PARTIES RESPECTING ACTIVITIES ON THE CONTINENTAL SHELF IN THE GULF OF MAINE AREA

376. The United States begins its account of the diplomatic history of this dispute by noting that Canada's oil and gas permits for the portion of Georges Bank claimed by Canada were issued from 1964, "without explanation to the United States<sup>28</sup>". In the Canadian view, of course, Canada is under no obligation to furnish explanations to the United States with respect to activities publicly undertaken in areas under its exclusive jurisdiction in accordance with international law. But

<sup>26</sup> Apart from the regulatory requirements specifically applicable to offshore oil and gas operations, Canada has made its environmental legislation applicable to its full 200-mile fishing zone, including Georges Bank. This was accomplished by the enactment of the *Ocean Dumping Control Act*, 1974-75-76, Statutes of Canada, Chap. 55 (implementing the 1972 London Dumping Convention); Part XX of the *Canada Shipping Act*, Revised Statutes of Canada 1970 (2nd Supp.), Chap. 27, respecting pollution; and the environmental provisions of the *Fisheries Act*, Revised Statutes of Canada 1970, Chap. F-14; Revised Statutes of Canada 1970 (1st Supp.), Chap. 17; Statutes of Canada 1976-77, Chap. 35, secs. 33 to 34.5. See *Counter-Memorial, Annexes*, Vol. III, pp. 13-22, paras. 29-67.

<sup>27</sup> *United States Memorial*, pp. 57-58, para. 92.

<sup>28</sup> *United States Memorial*, p. 82, para. 136.

here, as elsewhere in the account given by the United States of the history of relations between the two governments on this matter, the differences between the Parties are matters of interpretation and commentary more than of factual accuracy.

377. The United States Memorial is so highly selective in its presentation of the chronology of the events surrounding the Canadian administration of eastern Georges Bank during the 1960s that a brief recapitulation is in order. In essence, the sequence of events was as follows:

- (a) From 1964, Canada issued oil and gas permits for Georges Bank, conferring exclusive rights on permit holders for specific tracts, for renewable terms of six years (this has since been extended in light of the dispute), and conferring production rights upon conversion to a lease at the option of the permit holder. These permits were given widespread publicity, including their publication in maps that have always been available to the public at offices of the Government of Canada<sup>29</sup>.
- (b) On 1 April 1965, the United States Bureau of Land Management of the Department of the Interior requested information on the location of Canadian oil and gas exploratory permits in the Gulf of Maine area. *This information was requested for the specific purpose of locating the permits in relation to the median line defined in Article 6 of the 1958 Geneva Convention on the Continental Shelf. Canada promptly responded on 8 April 1965, enclosing detailed maps showing the location of Canadian oil and gas permits off both the Atlantic and Pacific coasts, as well as a sketch map clearly showing the areas under permit on Georges Bank*<sup>30</sup>.
- (c) On 14 May 1965, the United States Department of the Interior responded by a letter requesting that Canada check the locations of its permits that approached submerged lands under United States jurisdiction, inasmuch as "the location of a median line might be subject to different interpretations". The letter made it clear that there was no disagreement on the applicability of the equidistance method itself, but that there might be a misunderstanding with regard to "the elements positioning a median line"<sup>31</sup>.
- (d) The Canadian Government replied by letter of 16 June 1965, assuring the United States that it had used the median line, constructed in accordance with the equidistance principle as defined in Article 6 of the 1958 Convention on the Continental Shelf, and explaining the grid system used by Canada in this regard<sup>32</sup>.
- (e) On 30 August 1966, a letter from the United States Embassy in Ottawa to the Canadian Government was answered at the senior

<sup>29</sup> *Canadian Memorial*, p. 92, para. 203.

<sup>30</sup> *Canadian Memorial*, p. 93, paras. 206-207; *Canadian Memorial, Annexes*, Vol. III, Annexes 1 and 2.

<sup>31</sup> *Canadian Memorial*, p. 94, para. 208; *Canadian Memorial, Annexes*, Vol. III, Annex 4.

<sup>32</sup> *Canadian Memorial*, p. 94, para. 208; *Canadian Memorial, Annexes*, Vol. III, Annex 6.

diplomatic level, by way of a letter from the Canadian Under-Secretary of State for External Affairs. *This letter restated Canadian Government policy respecting the use of the equidistance method in the Gulf of Maine area. Attached to the letter from the Under-Secretary were a map and index providing all available information concerning the permits issued in this area, including those issued up to the equidistance line on Georges Bank*<sup>33</sup> [Figure 33].

- (f) During the next several years, the United States continued to accept Canada's exercise of jurisdiction up to the equidistance line on Georges Bank.
- (g) A United States aide-mémoire of 10 May 1968 proposed discussions on the "exact location of the boundary" in the Georges Bank area, but indicated no objection to the use of the equidistance method in this area. The proposal was accompanied by an invitation to delineate the boundary as well in the area off the Strait of Juan de Fuca on the west coast of North America, where the United States has always adhered, and continues to adhere, to the use of the equidistance method<sup>34</sup>.
- (h) It was not until 5 November 1969 that the United States notified Canada, by way of an aide-mémoire, that it had decided no longer to recognize the validity of Canadian permits for any part of Georges Bank and reserved its rights with respect to that area. No formal claim was put forward to accompany this general reservation of rights<sup>35</sup>.

Clearly, by no later than April 1965, the United States Government had received an unambiguous indication that Canada used the equidistance method in determining the limits of its offshore jurisdiction in the Gulf of Maine area, and had also received maps showing the exact location and the holders of the offshore oil and gas permits that Canada had issued up to that time on Georges Bank. Further, the correspondence clearly indicates that the United States Government acquiesced in and thereby recognized the equidistance principle as a legal method, and no exception was taken to the appropriateness of this method in the particular circumstances of the Gulf of Maine area. No protest resulted either from the initial correspondence with the Department of the Interior or from the subsequent letter and transmission of a detailed permit map from the highest Canadian diplomatic official. This situation continued for several years, during which time Canada continued to exercise jurisdiction and to issue further permits in reliance upon its communications on this matter with the United States Government.

378. The legal implications of the pattern of conduct of the United States have been set out in the Canadian Memorial at some

<sup>33</sup> *Canadian Memorial*, pp. 94-96, para. 210; *Canadian Memorial, Annexes*, Vol. III, Annex 8.

<sup>34</sup> *Canadian Memorial*, p. 96, paras. 211-212; *Canadian Memorial, Annexes*, Vol. III, Annex 11.

<sup>35</sup> *Canadian Memorial*, pp. 96-97, paras. 214-215; *Canadian Memorial, Annexes*, Vol. III, Annex 13.

length<sup>36</sup>, and there is no need to review the matter extensively at this juncture. Canada, however, wishes to recall the words of Professor Hersch Lauterpacht that were quoted in the Canadian Memorial<sup>37</sup>. In underlining the importance and far-reaching effect of a failure to protest, Professor Lauterpacht said, in part, that the legal effect attached to such a failure:

“... is not a mere artificiality of the law. It is an essential requirement of stability — a requirement even more important in the international than in other spheres; it is a precept of fair dealing inasmuch as it prevents states from playing fast and loose with situations affecting others<sup>38</sup> . . .”

Further, the development of the law of the continental shelf and of the exclusive economic zone, and the intensification of maritime activity that has accompanied these legal developments, have taken place at a greatly accelerated rate by historical standards. In this framework, it becomes all the more vital that States should act promptly in challenging any claims or activities of their neighbours that they find themselves unable to accept.

379. Acquiescence — consent evinced by inaction — has been accorded particular importance in the law of maritime boundaries. The Court noted in the *Tunisia-Libya Continental Shelf* case that the Tunisian ZV45° line could not be regarded as decisive precisely because it had never been accepted by Libya; similarly, there could be no assumption of acquiescence by Tunisia in the due north line prescribed in Libya by its Petroleum Regulation No. 1 of 1955<sup>39</sup>. In contrast, what gave legal significance to the perpendicular line from Ras Ajdir was the “silence and lack of protest on the side of the French authorities”, and later the mutual acquiescence involved in the use by the two parties of a 26° line in the granting of petroleum concessions<sup>40</sup>. A similar approach is evident in the *Anglo-French Continental Shelf* award in its treatment of the legitimacy of using Eddystone Rock as a basepoint. For the tribunal, what was decisive was the French acceptance of such use under the 1964 European Fisheries Convention<sup>41</sup>.

380. In sum, there are two fundamental points that emerge beyond any doubt from a review of the conduct of the Parties with respect to the continental shelf in the Gulf of Maine area. The first is that Canada is alone in having granted legal interests to private companies in the resources of the continental shelf of eastern Georges Bank, and these resource rights, or rights derived therefrom, remain outstanding even today. The second is that from 1965 until the end of the decade

<sup>36</sup> *Canadian Memorial*, pp. 159-180, paras. 385-427.

<sup>37</sup> *Canadian Memorial*, pp. 172-173, para. 413.

<sup>38</sup> H. Lauterpacht: “Sovereignty over Submarine Areas.” *British Yearbook of International Law*, Vol. 27, 1950, pp. 395-396.

<sup>39</sup> *I.C.J. Reports 1982*, p. 68, para. 90.

<sup>40</sup> *I.C.J. Reports 1982*, p. 69, para. 92.

<sup>41</sup> *Anglo-French Continental Shelf* award, pp. 67-76, paras. 121-144.

the United States clearly acquiesced in and recognized the exercise of Canadian jurisdiction with respect to what is now the disputed portion of the Gulf of Maine area and the use of the equidistance method.

### **Section III. The Conduct of the Parties Indicates the Equitable Nature of Canada's Claim**

#### **A. THE DIPLOMATIC HISTORY OF THE CONTINENTAL SHELF IN THE GULF OF MAINE AREA**

381. The entire record of the administration of the continental shelf in the Gulf of Maine area and of the dealings between the Parties on this subject, as set out above and in the Canadian Memorial, has a dual aspect. In the first place, it constitutes a recognition of and acquiescence in Canada's jurisdiction over the continental shelf of eastern Georges Bank, and the basis of an estoppel. In the second place, this pattern of conduct is equally significant as a relevant circumstance in the determination of a single maritime boundary in accordance with equitable principles. In this regard, the conduct of the Parties with respect to the continental shelf is joined and reinforced by an equally decisive pattern of conduct with respect to the fisheries of the relevant area.

#### **B. THE 1979 AGREEMENT ON EAST COAST FISHERY RESOURCES**

382. The conclusion of the 1979 Agreement on East Coast Fishery Resources<sup>42</sup> represented the culmination of one of the most intensive diplomatic efforts in the history of Canada-United States relations. The length and meticulous detail of the agreement bear witness to the scale of the effort. The significance of the agreement in the context of the Gulf of Maine boundary dispute is self-evident: it was developed as an integral component of the negotiations aimed at a comprehensive resolution of the boundary dispute, in tandem with the negotiations conducted on the line itself, and it was concluded as part of a single "package" that included the *Special Agreement for the settlement of the boundary*. It is the dominant feature of the entire diplomatic history of the dispute, and the best available evidence of how the Parties approached the real equities in issue.

383. As significant as the detailed provisions of the 1979 fisheries agreement are the basic assumptions and principles that underlie those provisions. First and foremost among them is the unquestioned assumption throughout the negotiations that the contemporary realities of the fishery should prevail and should be respected. The negotiation of the quasi-permanent quotas for Georges Bank fish stocks proceeded throughout on the basis that recent performance — but not transitory, short-terms trends — would govern. Both sides agreed on this basic approach; so much so that it was simply taken for granted. Canada generally favoured quotas based on average catches over a relatively short

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<sup>42</sup> *Canadian Memorial, Annexes*, Vol. I, Annex 20.

period, such as the last five years leading up to the negotiations. The United States argued for a longer base period, starting from the position that it ought to extend as far as 20 years back. The outcome is somewhere between the two, in the order of a little more than ten years. This by itself, of course, represented a reduction in Canadian entitlements in comparison with Canada's recent catches and would have arrested the trend of steady growth that characterized the Canadian fishery in the years preceding the 1979 fisheries agreement. It was never once suggested that obsolete patterns barely within the memory of today's practising fisherman should be taken into account.

384. Equally important, of course, is the principle of cooperation in the management of fisheries, and especially the fisheries of Georges Bank, that underpins the whole 1979 Agreement on East Coast Fishery Resources. Here, the principle was made explicit in the October report of the special negotiators, formally approved by both governments, that provided the guidelines within which the 1979 fisheries agreement was negotiated<sup>43</sup>. The principles set forth in the United States Memorial stand in total contrast to those the United States expressly endorsed jointly with Canada in the later stages of the diplomatic history of this dispute. As the State Department Environmental Impact Statement on the Agreement put the matter: "The major premise underlying the Fisheries Agreement is that stocks used by two or more nations can be protected through a close partnership in cooperative management and regulation<sup>44</sup>."

385. The 1979 Agreement on East Coast Fishery Resources granted both the Parties entitlements to a wide variety of commercial fish stocks on Georges Bank. A few of the major entitlements accorded to Canada have been outlined in the Canadian Memorial<sup>45</sup>. By far the most important, of course, was the entitlement to nearly three-quarters of the scallops in subdivision 5Ze — and a correspondingly much higher percentage of the scallop resources of eastern Georges Bank, where the Canadian fishery is carried out. Accompanying the entitlement was Canada's primary management authority for the scallops of the entire Bank. In the *Grisbadarna* award, the tribunal proceeded on the basis that it should assess the real equities of the area in terms of the lobster fishery, which, it noted, was "much the most important fishing on the *Grisbadarna* banks . . . the very thing that gives the banks their value as fisheries<sup>46</sup>". In this respect, if in no other, there is an almost exact analogy with the fishery of eastern Georges Bank, for here it is scallops that give the Bank much of its special value. The Canadian dominance of this particular fishery as confirmed by the 1979 Agreement on East

<sup>43</sup> *Canadian Memorial, Annexes*, Vol. II, Annex 36.

<sup>44</sup> *Draft Environmental Impact Statement on the Agreement between the United States and Canada on East Coast Fishery Resources*. Washington, United States Department of State, April 1980, p. 7; *Counter-Memorial, Annexes*, Vol. V, Annex 75.

<sup>45</sup> *Canadian Memorial*, pp. 113-114, paras. 268-270. A general description of the agreement is found at pp. 111-115, paras. 260-276, and the text is reproduced in full in *Canadian Memorial, Annexes*, Vol. I, Annex 20.

<sup>46</sup> J. B. Scott, ed.: *The Hague Court Reports*, 1916, p. 130.

Coast Fishery Resources, and the great economic dependence of Canadian coastal communities on this resource, call for a corresponding recognition in the determination of the maritime boundary.

386. The 1979 fisheries agreement gives a clear expression to Canada's interest in Georges Bank as a whole. It is for this reason that Canada insisted upon, and obtained, the right to fish for practically all its entitlements throughout the Bank, in both the disputed and the undisputed portions. Two specific provisions illustrate the geographical extent of this interest with particular clarity. One of them is among the most important in the entire agreement<sup>47</sup>. It designates the exact area in which Canada was to have been vested with primary management authority for scallops. That authority was to have extended over the full length of Georges Bank, as far west as longitude 68°30' W, reserving primary United States authority in the Great South Channel and other adjacent grounds at the western end of subdivision 5Ze. The agreement also precisely defined the areas in which the fishermen of each Party were to have been entitled to fish for herring, a resource that in the immediately preceding years had been harvested almost exclusively by overseas fleets<sup>48</sup>. Again, longitude 68°30' W was used to designate the limit of the area in which Canadians were to fish at the western end of Georges Bank. For the United States fleet, the limit was to have been longitude 66°W at the eastern end of the Bank.

387. The 1979 fisheries agreement, as is indicated in the Canadian Memorial, was predominantly a Georges Bank agreement. The United States describes it as a "regime to govern east coast fishery resources extending from Cape Hatteras to Newfoundland"<sup>49</sup>. This description does not give the Court an accurate picture of the true character of the agreement. As the Canadian Memorial has pointed out<sup>50</sup>, all the stocks that would have been subject to full or qualified joint management by the Fisheries Commission are stocks that occur on Georges Bank. The agreement covered other stocks only in an incidental and ancillary manner, and these non-Georges Bank stocks would have been largely excluded from the elaborate joint management scheme set up by the agreement. According to figures in the Environmental Impact Statement on the agreement, prepared by the Department of State in accordance with United States law, the potential annual value of the agreed entitlements conferred on both countries with respect to stocks that range significantly into or across the boundary region — that is, Georges Bank — was about 97 percent of the total value of all entitlements under

<sup>47</sup> Annex B to the agreement. *Canadian Memorial, Annexes*, Vol. I, Annex 20.

<sup>48</sup> Annex B to the agreement. *Canadian Memorial, Annexes*, Vol. I, Annex 20, Art. 3(d) under the heading "Atlantic Herring".

<sup>49</sup> *United States Memorial*, p. 97, para. 161.

<sup>50</sup> *Canadian Memorial*, p. 112, para. 265; p. 114, para. 271.

the agreement<sup>51</sup>. One need only peruse this Environmental Impact Statement — even the introduction alone — or the congressional testimony given by the United States special negotiator, to see how overwhelmingly the joint management and sharing of Georges Bank stocks dominated the entire 1979 fisheries agreement<sup>52</sup>.

388. The United States Memorial has largely ignored the 1979 fisheries agreement and the agreed principles in the 1977 October report of the special negotiators that led to its conclusion. When it does refer to this agreement, it is to recount with apparent approval the objections that were voiced in the course of congressional hearings<sup>53</sup>. The account at no point recalls the unequivocal support given to the agreement, in both its principles and its detailed provisions, by the United States Administration, and the strong endorsements given to it by the President and the Secretary of State of the United States. One would think, to read the disapproving account of the agreement in the United States Memorial, that it had been negotiated, concluded and signed by a foreign government.

389. While ignoring the substance of the matter, the United States has resorted to a number of contentions about issues related to the 1979 fisheries agreement that are quite impossible to reconcile with the record. For example, Canada was fully willing to accept the maintenance of a United States fishery in the undisputed Canadian portion of the Gulf of Maine area, and the 1979 agreement therefore provided for long-term United States fishing rights in these waters<sup>54</sup>. It is solely because the United States failed to ratify the agreement that United States fishing practices in these Canadian waters — interrupted only temporarily in 1978 pending further negotiations — have now been brought to a halt. In the circumstances, it is truly remarkable that the United States should impute to Canada a refusal to continue reciprocal fishing, and an “intention to exclude the United States from its last fisheries off the coast of Canada<sup>55</sup>”. Similarly, the United States Memorial

<sup>51</sup> *Draft Environmental Impact Statement on the Agreement between the United States and Canada on East Coast Fisheries Resources*, pp. 116-124. The United States entitlements to stocks located primarily in the undisputed Canadian zone would be worth U.S.\$7.7 million per year, while the equivalent Canadian entitlements would be worth U.S.\$4.2 million per year. Total: U.S.\$11.9 million. In the case of the *transboundary* stocks (all of them occurring on Georges Bank), United States entitlements would be worth U.S.\$200.9 million a year, and Canadian entitlements would be worth U.S.\$126.6 million a year. Total: U.S.\$327.5 million. This last figure constitutes 96.5 percent of the total annual value of entitlements under the agreement for both sides (U.S.\$339.4 million). *Counter-Memorial, Annexes*, Vol. V, Annex 75.

<sup>52</sup> Prepared Statement of Lloyd N. Cutler, in United States-Canadian Fishing Agreements: Hearings before the Subcommittee on Fisheries and Wildlife Conservation and the Environment, Committee on Merchant Marine and Fisheries, United States House of Representatives, 96th Congress, 1st Session, 22 June 1979, p. 41; *Canadian Memorial, Annexes*, Vol. II, Annex 44, I, p. 344.

<sup>53</sup> *United States Memorial*, p. 97, para. 162.

<sup>54</sup> See Annex C to the agreement, paras. 1 and 2 under the headings “Atlantic Cod”, “Haddock” and “Atlantic Redfish” (except para. 10); *Canadian Memorial, Annexes*, Vol. I, Annex 20.

<sup>55</sup> *United States Memorial*, p. 176, para. 297.



contends that differences between the fisheries management approaches of the two States made it "impossible" for the United States to accept the agreement its executive had signed and commended to Congress<sup>56</sup>. Yet the management principles codified in Article X of the agreement were purposely designed to reflect the provisions of the *United States Fishery Conservation and Management Act of 1976*<sup>57</sup> in every important respect.

390. The treaty was never put to a vote in the United States Senate and, contrary to the suggestion in the United States Memorial, there was never a definitive "conclusion" in that body<sup>58</sup>. Nor is it accurate to suggest, as the United States Memorial has done, that there was unanimous or even general opposition to the 1979 fisheries agreement at the congressional hearings. There was opposition from some groups and support from others. For example, the Boston fishing industry expressed strong support for the agreement<sup>59</sup>, as did many sectors of the Maine fishing industry. The National Fisheries Institute — a United States trade association of fish harvesters, processors and distributors — endorsed the agreement in the most unequivocal terms. It cited as two of its major reasons that the entitlement for scallops set forth in the treaty would have permitted the maintenance of the United States share in that fishery, and that the agreement:

"... does provide for conservation and management of stocks in the Gulf of Maine and Georges Bank area, and recognizes that effective conservation and management will require cooperation and participation by both countries<sup>60</sup> . . ."

The relative strength of the supporters and opponents of the 1979 fisheries agreement in the United States fishing industry is reflected in the fact that the New England Fishery Management Council was never able to take a position on ratification. According to one member of the council, testifying before a senate committee, the *New England Council*

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<sup>56</sup> *United States Memorial*, pp. 206-209, para. 324.

<sup>57</sup> 16 United States Code, sec. 1851 sets out the "national standards for fishery conservation and management". These were used as a guide in drafting Article X of the agreement.

<sup>58</sup> *United States Memorial*, p. 97, para. 162.

<sup>59</sup> Prepared Statement of Thomas A. Norris, Representing the Boston Fishing Industry, in *United States-Canadian Fishing Agreements: Hearings before the Subcommittee on Fisheries and Wildlife Conservation and the Environment, Committee on Merchant Marine and Fisheries, United States House of Representatives, 96th Congress, 1st Session, 22 June 1979*, pp. 158-160; *Counter-Memorial, Annexes*, Vol. V, Annex 76.

<sup>60</sup> Statements of a Panel Consisting of Gordon Murphy, President, National Fisheries Institute; David Bergson, Representing the Maine Redfish Fishermen; and, James L. Warren, Executive Director, Maine Sardine Council, in *United States-Canadian Fishing Agreements: Hearings before the Subcommittee on Fisheries and Wildlife Conservation and the Environment, Committee on Merchant Marine and Fisheries, United States House of Representatives, 96th Congress, 1st Session, 22 June 1979*, pp. 147-157; *Counter-Memorial, Annexes*, Vol. V, Annex 77.

adopted this position because of "fear by both sides that the other might win a vote<sup>61</sup>".

391. The 1979 Agreement on East Coast Fishery Resources is the most tangible evidence available of how the Parties actually viewed the fisheries equities in the present dispute. These must now depend upon the determination of the boundary alone. And a boundary that disregarded the allocation of resources that the Parties themselves agreed upon as equitable could hardly be one that brings about an equitable result.

### C. THE DIPLOMATIC HISTORY OF THE CLAIMS

#### 1. *The Origins of the Dispute*

392. One of the more fanciful suggestions put forward in the United States Memorial is the attempt to link the origins of the present dispute to the Truman Proclamation of 1945<sup>62</sup>. The intimation that in 1945 the United States claimed all resources within a 100-fathom contour of its shores, regardless of the rights of neighbouring States, and that all of Georges Bank fell within that claim and was therefore annexed — all this by virtue of a simple press release that accompanied the proclamation — is completely unfounded. It is belied by the words of the press release itself, which refers to this contour only to describe the broad concept of the continental shelf as "generally" including all submerged lands within that limit<sup>63</sup>. It is belied by the Truman Proclamation, which calls for delimitation on the basis of equitable principles and makes no reference whatever to the 100-fathom contour. And, finally, it is contradicted even more plainly by the explanatory memorandum the United States issued with the proclamation, stating that delimitation issues could "be left until some future time<sup>64</sup>".

393. The 100-fathom contour (a precursor of the slightly greater 200-metre isobath in the 1958 Geneva Convention) figured in early discussions on the continental shelf as a rough and ready criterion of the shelf "break" at the edge of the continental slope. It was solely in that context, and not as a factor bearing on the delimitation of the continental shelf between coastal States, that the 1945 press release referred in

<sup>61</sup> Statements of Norman H. Olsen, Jr., New England Fisheries Management Council, in Maritime Boundary Settlement Treaty and East Coast Fishery Resources Agreement: Hearings before the Committee on Foreign Relations, United States Senate, 96th Congress, 2nd Session, 15-17 April 1980, pp. 62-71 and 81; *Counter-Memorial, Annexes*, Vol. V, Annex 78. See also Minutes of the New England Regional Fishery Management Council, 25-30 June 1980, p. 35; *Counter-Memorial, Annexes*, Vol. V, Annex 79.

<sup>62</sup> *United States Memorial*, pp. 56-57, para. 89; p. 81, paras. 133-134; p. 177, para. 300.

<sup>63</sup> XIII *Department of State Bulletin*, No. 327. Washington, 30 September 1945, pp. 484-486; *United States Memorial, Documentary Annexes*, Vol. I, Annex 3.

<sup>64</sup> "Explanatory Statement on the Proper Utilization and Development of Natural Resources of the Subsoil and Sea Bed of the Continental Shelf", in *Foreign Relations of the United States*, Vol. 2, 1945, p. 1503; *United States Memorial, Documentary Annexes*, Vol. I, Annex 3.

passing to this contour. Significantly, United States practice and policy have never reflected the use of this criterion in the delimitation of the continental shelf. Not a single instance can be cited of a United States maritime boundary or boundary claim based on the 100-fathom contour. The Georges Bank claim itself fails to adhere to it as a principle of delimitation, and at no point in the diplomatic history of this dispute did the United States suggest that the Truman Proclamation implied a claim to this area. Even with respect to the outer limit of the shelf, United States practice fails to disclose any reliance on a 100-fathom contour. It was not referred to in the original 1953 United States legislation on the continental shelf or in subsequent amendments<sup>65</sup>, and United States jurisdiction has long been exercised over areas of the shelf off California that are separated from the coast by troughs more than 600 fathoms deep<sup>66</sup>. Moreover, with its recent establishment of a 200-mile exclusive economic zone, the United States has clearly abandoned any significance it may have attached to the 100-fathom or 200-metre contour.

394. Clearly then, the retrospective 1945 "claim" is a fiction, conjured up at this late date in order to justify the tardiness of the real United States claim first put forward so many years later. The dispute was born when a difference of view between the Parties became evident, and not before. This occurred not in 1945, but a quarter of a century later after several years of Canadian administration of eastern Georges Bank and prolonged United States acceptance of the exercise of this jurisdiction by Canada. The artificiality of a boundary "claim" originating in 1945 is underscored by the fact that it was not for well over a decade that the doctrine of the continental shelf ripened into positive law. The United States itself has referred on a number of occasions to 5 November 1969 as the date on which it reserved its rights and questioned Canadian jurisdiction in what is now the disputed area<sup>67</sup>. The preceding years of recognition and acquiescence cannot be conjured away by the United States by the invention of an assertion of jurisdiction that simply never took place.

## 2. The Canadian Claim

395. From the outset, the Canadian position has been marked by consistency and a respect for the applicable law. Beginning in the early

<sup>65</sup> *Outer Continental Shelf Lands Act of 1953*, Chap. 345, 67 United States Statutes at Large, 462 (1953) (codified at 43 United States Code, secs. 1331, *et seq.*); *Outer Continental Shelf Lands Act Amendments of 1978*, Public Law No. 95-372, 92 United States Statutes at Large 629 (1978) (amending 43 United States Code, sec. 1331, *et seq.*); *United States Memorial, Documentary Annexes*, Vol. I, Annex 9.

<sup>66</sup> *Canadian Memorial*, p. 125, footnote 24 and United States Department of the Interior legal opinions of 1961 and 1967 discussed in F. Barry: "The Administration of the Outer Continental Shelf Lands Act." *Natural Resources Journal*, Vol. 1, 1968, pp. 46-47. (Mr. Barry was the Solicitor of the United States Department of the Interior, 1961-1968.) Nor have any of the internal "delimitations" effected for the purposes of the Coastal Energy Impact Program referred to the 100-fathom contour; *Counter-Memorial, Annexes*, Vol. V, Annex 80.

<sup>67</sup> For example, United States diplomatic note No. 216 of 16 October 1974; United States diplomatic note of 15 May 1975; United States diplomatic note No. 103 of 20 May 1976. *Canadian Memorial, Annexes*, Vol. III, Annexes 21, 22 and 32.

1960s and continuing through to the present day, Canada has adhered to a single, legally recognized method of delimitation in this area. When the Canadian claim was adjusted in 1977, it remained within the framework of the equidistance method and took as its basis the guidance to the applicable law found in an important clarification of how this method should be adapted to the requirements of particular geographical circumstances.

396. There is an extensive diplomatic history to the Canadian claim, both in its original and adjusted versions. The earlier stages have already been reviewed in detail. The Canadian claim as it now stands has an equally substantive diplomatic history. It was put forward at the outset of the negotiations that led, after about a year and a half of intensive diplomatic activity, to the conclusion of the Special Agreement — the only real negotiations that ever took place on the boundary, for the meetings held in 1970 and 1975 were little more than exploratory discussions. It was thus the claim before the United States throughout the substantive phases of the negotiations.

397. The adjusted claim was preceded by clear and repeated notice to the United States that Canada was not prepared to abandon its potential interest in areas of Georges Bank lying to the west of the "strict" equidistance line. The United States had pressed Canada to take this decisive step, without offering any corresponding assurance of its own. This became the central issue on the east coast in the negotiation of an interim fisheries agreement for 1977 (covering both Atlantic and Pacific coasts), although it was ultimately resolved without prejudice to the position of either Party<sup>68</sup>. On a series of other occasions, by protests and other diplomatic correspondence, Canada made clear its potential interest throughout the area of Georges Bank<sup>69</sup>.

398. In its adherence to legal principles and a consistent methodology, Canada has carefully avoided the presentation of extreme claims of a tactical nature. The Canadian diplomatic note of 22 December 1976, transmitted in the context of the publication of coordinates on the occasion of the creation of 200-mile zones, presented two potential delimitation lines that might have been advanced on principles analogous to those advocated by the United States<sup>70</sup>. Canada nonetheless refrained from the actual adoption of these claims, maintaining throughout its commitment to an equitable result based on legal principles and legally recognized methods applied in a reasonable manner.

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<sup>68</sup> Reciprocal Fisheries Agreement between the Government of Canada and the Government of the United States of America, Article XVII. *Canadian Memorial, Annexes*, Vol. I, Annex 18.

<sup>69</sup> Canadian aide-mémoire of 28 April 1976; Canadian aide-mémoire of 19 August 1976; Canadian aide-mémoire of 17 January 1977; Canadian aide-mémoire of 26 May 1977; Canadian diplomatic note No. 329 of 27 July 1977. *Canadian Memorial, Annexes*, Vol. III, Annexes 31, 39, 50, 53 and 57.

<sup>70</sup> *Canadian Memorial, Annexes*, Vol. III, Annex 46.

### 3. *The United States Claims*

399. In contrast, the current United States claim has no diplomatic history whatever. Canada never had any hint of it before the submission of the Memorials. It comes forward long after what has been termed the "residual" critical date<sup>71</sup>, the signature of the Special Agreement in 1979. It is based on "principles" and a methodology radically at variance with the earlier versions of the United States claims.

400. The sequence of the various lines accepted or publicly proposed by the United States is instructive. When the question first arose and for several years thereafter, the United States accepted the application of the equidistance method. The first United States line that surfaced after the United States questioned Canadian jurisdiction was the "lobster line" of 1975, about which more will be said below<sup>72</sup>. In late 1976, the United States published coordinates in connection with the establishment of its 200-mile zone<sup>73</sup>. The line then promulgated seems to be made up of a series of segments joining deep points on the ocean floor, rising and falling over the seabed like a hydrographic roller coaster. Although this line actually allots more space to Canada in much of the Gulf of Maine itself than does the Canadian line (thus creating the formerly unclaimed area between points "A" and "B" as shown in <sup>①</sup> <sup>②</sup> Figures 1 and 2 of the Canadian Memorial), it advances farther to the east and closer to the Canadian coast in the Georges Bank area than does the earlier "lobster" line. Finally, the claim devised for the United States Memorial, and pieced together on the basis of a completely novel set of "principles" and "methods", moves again much farther to the east and fringes the inshore grounds lying immediately off the Canadian coast <sup>④⑤</sup> [Figure 2]. The only real pattern that can be discerned is the inexorable progress of the United States claim toward the Canadian coast in the Georges Bank area.

401. What emerges clearly from this haphazard collection of lines that the United States has advanced at various points in the history of the dispute is simply this: the United States has espoused a claim that cannot be expressed in terms of a legally plausible method. It cannot be so expressed because it is at odds with legally recognized principles. It is because it is based on no other foundation than monopoly that the claim has proven to be so unstable and erratic, as the United States searches persistently but unsuccessfully for a method that will translate its aspirations into a boundary that can somehow be reconciled with the requirements of law and equity.

<sup>71</sup> G. Fitzmaurice: "The Law and Procedure of the International Court of Justice, 1951-4: Points of Substantive Law." *British Yearbook of International Law*, Vol. 32, 1955-1956, p. 29.

<sup>72</sup> See para. 616.

<sup>73</sup> United States Department of State, Public Notice No. 506, published in *Federal Register*, Vol. 41, No. 214, 4 November 1976, pp. 18619-18620; *Canadian Memorial, Annexes*, Vol. II, Annex 30.

#### Section IV. The Conduct of the Parties Is Fully Consistent with Canada's Claim in All Other Respects

402. The State activities that are primarily relevant in the delimitation of an offshore maritime boundary are those carried out in a legal context of sovereign rights and exclusive jurisdiction, as distinct from activities that amount to no more than the enjoyment of the freedom of the high seas in common with other nations. The State activities that meet this basic test have been reviewed in detail in paragraphs 361-401 and in the Canadian Memorial<sup>74</sup>. They encompass the administration of the continental shelf and the diplomatic history of the dispute, and in the Canadian submission give unequivocal support to the Canadian claim.

403. The 200-mile fishing zones to be delimited were created in 1977. Before that time neither Party questioned the common, high-seas character of the Georges Bank fisheries. Since 1977, each Party has included the disputed area within its proclaimed 200-mile zone; moreover, both Parties have (subject to what is to be said below) managed the fisheries of their own nationals and by mutual agreement have excluded foreign fishing vessels from this area. To this extent, therefore, no decisive legal inferences can be drawn from the sovereign acts of the two States in relation to the fisheries of the disputed area. A review of the activities of the Parties in support of the high-seas fishery of the Gulf of Maine area before 1977 is nonetheless instructive in view of the position taken by the United States on the imperatives of "single-State management". Contrary to the philosophy now advocated by the United States, the record throughout has been one of coastal State partnership in the management of the fisheries of the Gulf of Maine and Georges Bank.

#### A. THE INSTITUTIONAL HISTORY OF INTERNATIONAL FISHERIES MANAGEMENT IN THE GULF OF MAINE AREA

##### 1. *The Development of Multilateral Fisheries Agreements for the Gulf of Maine Area*

404. Canada, for over half a century, has played a leading role, in partnership with the United States, in the development of an institutional framework for international fisheries cooperation in the northwest Atlantic, including the entire Gulf of Maine-Georges Bank area.

405. The record begins with the creation on an informal basis of the North American Council for Fisheries Investigations (NACFI), in 1920<sup>75</sup>. Canada was the main sponsor of this initiative and convened the

<sup>74</sup> *Canadian Memorial*, pp. 83-91, paras. 179-202; pp. 92-104, paras. 203-238.

<sup>75</sup> "Exchange of Notes concerning the Conference of Ottawa, 23 September 1920, for Cooperation in Scientific Investigation of Deep Sea Fisheries", in *Foreign Relations of the United States*, Vol. II. Washington, Government Printing Office, 1921, pp. 466-469; *United States Memorial, Documentary Annexes*, Vol. I, Annex 6.

initial organizational meeting in Ottawa, even though full Canadian sovereignty with responsibility for international relations was not attained until 1931. In 1936, at an executive session of NACFI, Canadian officials played a leading role in an early initiative that ultimately led to the creation of a more formal institutional structure, by presenting a draft convention for the regulation of the haddock fisheries in the northwest Atlantic<sup>76</sup>. Later, in 1943, Canada was an active participant at an International Fisheries Conference held in London to consider international arrangements for the fisheries of this area during the post-war era. The Canadian delegation tabled a set of draft articles providing for the creation of a regulatory body, identical in concept to what later became ICNAF, to manage and conserve the fish stocks of the northwest Atlantic, including the entire Gulf of Maine area<sup>77</sup>. A resolution adopted by the conference recommended the principles set out in the Canadian draft to the "immediate and sympathetic consideration" of the governments concerned<sup>78</sup>.

406. When ICNAF was created in 1949, Canada was from the outset an active contracting party, and the host government for the organization's headquarters at Dartmouth, Nova Scotia<sup>79</sup>. The Canadian Government, moreover, was the principal sponsor of the more recent Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries, establishing NAFO — the Northwest Atlantic Fisheries Organization — as the successor to ICNAF within a framework specifically designed for the new 200-mile era<sup>80</sup>. The Canadian Government hosted the diplomatic conference in Ottawa in 1977, provided the drafts for consideration by the conference and the preparatory meetings, and was designated by the resulting convention as the depository and headquarters government. As is noted in the Canadian Memorial<sup>81</sup>, Canada has been a contracting party to NAFO from the time of its entry into force on 1 January 1979; the United States has not ratified this convention. As in the case of its predecessor, ICNAF, the NAFO "convention area" includes the entire Gulf of Maine area, including Georges Bank.

407. Throughout the development of the institutional history of the Northwest Atlantic Fisheries, the special Canadian interest in the Gulf of Maine area and Georges Bank has been manifested on numerous occasions. *NACFI Area XXII — the area that covers Georges Bank —*

<sup>76</sup> North American Council on Fishery Investigations, Proceedings, 1934-1936, No. 3, Minutes of the Twenty-Third Meeting, 23-25 September 1936, Executive Sessions, Item Nos. 2 and 14. Ottawa, King's Printer, 1939; *Counter-Memorial, Annexes*, Vol. V, Annex 81.

<sup>77</sup> Final Act of the International Fisheries Conference. London, 22 October 1943, Annex II; *Counter-Memorial, Annexes*, Vol. V, Annex 82.

<sup>78</sup> Final Act of the International Fisheries Conference. London, 22 October 1943, Resolution No. 2; *Counter-Memorial, Annexes*, Vol. V, Annex 82.

<sup>79</sup> For a short period after the convention was adopted, the headquarters were at St. Andrews, New Brunswick, and briefly at Halifax before moving to Dartmouth, Nova Scotia.

<sup>80</sup> *Canadian Memorial, Annexes*, Vol. I, Annex 9.

<sup>81</sup> *Canadian Memorial*, p. 63, footnote 6.

was identified as an area of "particular interest" to Canada in the 1931-1932 *Annual Report* of the Department of Fisheries, shortly after such statistical areas were first set up<sup>82</sup>. In its draft convention of February 1948 — a draft that led to the formulation of the ICNAF convention as adopted in 1949 — the United States gave recognition to Canada's interest in the fisheries of Georges Bank<sup>83</sup>. In the annex to its draft convention, the United States proposed that both Canada and the United States — and those two coastal States alone — should have membership in the panel that included Georges Bank within its area of concern<sup>84</sup>. Because the United States also stated in a background paper to its draft that "countries having a major interest in an area are best qualified to adopt and enforce regulations for any particular area", it affirmed by implication that Canada did indeed have a major interest in Georges Bank<sup>85</sup>.

408. Not long before the ICNAF conference in 1949, the United States formally proposed to Canada that a special régime should be established for Georges Bank and much of the Gulf of Maine, involving the joint regulation of the fisheries of this area by Canada and the United States<sup>86</sup>. For the remainder of the northwest Atlantic area, on the other hand, it was suggested that a fisheries organization with more limited powers would suffice. A few months earlier, at a preparatory meeting on the same subject in St. John's, Newfoundland, a senior United States official had proposed that Canada and the United States might enter into an interim arrangement for the joint control of Georges Bank, pending the entry into force of the proposed ICNAF convention<sup>87</sup>. But the successful conclusion of the ICNAF convention in 1949, and its rapid entry into force in July 1950, made it unnecessary to pursue the idea of a special bilateral arrangement for Georges Bank.

409. At the 1949 diplomatic conference itself, Canada again made clear — and the other participating States fully accepted — the special interest of Canada in the fisheries of what is now (66) ICNAF/NAFO subarea 5, which includes Georges Bank [*Figure 25*].

<sup>82</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 83.

<sup>83</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 84.

<sup>84</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 84.

<sup>85</sup> *Proposed International Convention for the Northwest Atlantic Fisheries, Background of the proposed Convention for the Northwest Atlantic*, prepared by the United States, February 1948, p. 2; *Counter-Memorial, Annexes*, Vol. V, Annex 84.

<sup>86</sup> Letter No. 6 of 7 January 1949 from Julian F. Harrington, "American Minister", to the Secretary of State for External Affairs. Canada had requested a postponement of the Washington Conference in order to first resolve complications arising out of the entry of Newfoundland into the Canadian federation in 1948. The United States was unwilling to support this proposal, but suggested that the difficulties might be resolved if joint Canada-United States regulations were provided for subarea 5 (which they referred to as "area 4" in light of the terms of the draft under discussion at that time), with "investigation only" in the remaining portions of the convention area. *Counter-Memorial, Annexes*, Vol. V, Annex 85.

<sup>87</sup> Notes of a meeting held at St. John's, Newfoundland, on 14-16 June 1948, between representatives of Newfoundland, Canada and the United States. The suggestion was made by a United States representative who acted as chairman of the meeting. *Counter-Memorial, Annexes*, Vol. V, Annex 86.



The following excerpt from the proceedings of the twelfth session of the conference, at which the participating States discussed the question of the national composition of the panels set up for each of the subareas of the convention area, shows how unequivocal this assertion and acceptance of Canada's interest was:

"MR. BATES (CANADA): ... If we refer only to the areas fished by Canada proper the areas in which we fish intensively now are Areas 3, 4, and 5 and we would claim representation on these because of contiguity ...

MR. CHAPMAN (CHAIRMAN): That is 3, 4 and 5? Doesn't that apply also to 2? 2 is the Labrador area.

MR. BATES (CANADA): Yes. Our Canadian fishing in Labrador is minor, and I am assuming that will be covered by the Newfoundland claim<sup>88</sup>."

Neither the United States nor any other participating State at the conference commented on this exchange. (The Chairman, Mr. Chapman, was a leading United States fisheries official.) As is noted in the Canadian Memorial<sup>89</sup>, Canada and the United States were the sole charter members of panel 5. This membership in panel 5 reflected the dual criteria set out in Article IV of the ICNAF convention, which stipulated that only those States with "current substantial exploitation" of the fisheries of a subarea, or with a "coastline adjacent to" the subarea, would be eligible for membership<sup>90</sup>.

## 2. *The History and Purpose of the Areas Delineated Under Multilateral Fisheries Agreements*

410. The United States Memorial has relied upon the configuration of the statistical areas informally developed by NACFI at a 1930 meeting, and continued in modified form as "subareas" of the ICNAF convention area<sup>91</sup>. The significance the United States attaches to the lines dividing these areas does violence to their original purpose and disregards the legal context in which they were adopted. These zones were products of the high-seas era, and were designed for the sole purpose of facilitating international cooperation in the context of multilateral fisheries agreements.

411. The NACFI grid, of which the ICNAF system is the successor, was originally intended as a simple extension of the statistical areas

<sup>88</sup> *Canadian Memorial, Annexes*, Vol. II, Annex 15, I, pp. 288-289.

<sup>89</sup> *Canadian Memorial*, p. 89, para. 197.

<sup>90</sup> *Canadian Memorial, Annexes*, Vol. I, Annex 1, p. 58.

<sup>91</sup> *United States Memorial*, pp. 46 and 49, paras. 76, 78 and 79; pp. 209-210, para. 329.

used in the northeast Atlantic by the International Council for the Exploration of the Sea (ICES<sup>92</sup>). It thus formed part of a broader series of statistical areas (designated by a single sequence of Roman numerals) extending across the Atlantic Ocean and north to the high Arctic<sup>93</sup>. It is significant, therefore, that the ICES statistical areas bear no resemblance to maritime boundaries or boundary claims that have subsequently been adopted by States in the northeast Atlantic and the North Sea. A simple comparison of the continental shelf boundaries in the northeast Atlantic and the boundaries of the statistical areas used by ICES as well as by NEAFC (the Northeast Atlantic Fisheries Commission) suffices to prove the point [Figure 34C]. These special-purpose lines have clearly never been taken into account by boundary makers, either in the context of negotiations or in arbitral or judicial proceedings.

412. NACFI was essentially a forum for cooperation among marine biologists, and in this context it was entirely natural that a line separating two different fishing banks should be adopted as the dividing line between areas XXI and XXII. As was noted above, area XXII (covering Georges Bank) was identified as an area of "particular interest" to Canada in a Government of Canada publication issued shortly after the grid was created<sup>94</sup>. The NACFI organization was primarily concerned with groundfish (especially cod and haddock<sup>95</sup>), and the line appears to reflect the scientific thinking of the time with respect to a few of the groundfish stocks found in these waters. It did not take account of the migratory habits of many of the other important species of the Bank, like pollock and the pelagic species such as swordfish and mackerel that migrate freely throughout the area. In its origins, therefore, the line was based upon a very narrow spectrum of resources.

413. The NACFI and ICNAF grids were simply working tools for the technical experts. Nothing could possibly have been further from the minds of the experts who originally drew them up than the allocation of sovereign and exclusive rights to coastal States. To adopt the words of

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<sup>92</sup> The proposal was first raised in NACFI by the French delegate, who indicated that he had been requested by ICES to propose that "the plan for division of the fishery waters into statistical areas, that is in use on the coast of Europe, be extended to the Atlantic coast of North America". Minutes of the Seventeenth meeting of NACFI, 6-7 November 1930, p. 4. See also G. A. Rounsefell: *Development of Fishery Statistics in the North Atlantic*. United States Department of the Interior, Fish and Wildlife Service, Scientific Report No. 47, 1948, p. 8; *Counter-Memorial, Annexes*, Vol. V, Annexes 87 and 88.

<sup>93</sup> NACFI Chart No. 1 (Statistical Areas Atlantic Coast of North America) and a map of ICNAF and ICES statistical areas from ICNAF Statistical Bulletin, Vol. 16, 1966 (1968); *Counter-Memorial, Annexes*, Vol. V, Annex 89.

<sup>94</sup> See para. 407 of this *Counter-Memorial*. The use of the names "New England" and "Nova Scotia" (later eliminated by ICNAF), merely reflects the fact that the coasts bordering the designated areas were preponderantly (though not exclusively) those of New England and Nova Scotia.

<sup>95</sup> Mackerel were also among the principal NACFI interests, but were presumably not taken into account in devising the grid because of their migratory habits. NACFI Proceedings indicate that "cod, haddock and mackerel" were the species on which the council conducted comprehensive investigations. North American Council on Fishery Investigations: Proceedings, 1921-1930, No. 1. Ottawa, King's Printer, 1932, p. 6; *Counter-Memorial, Annexes*, Vol. V, Annex 90.

the Court in the *Tunisia-Libya Continental Shelf* case in connection with a line far more redolent of sovereign rights, these multilateral lines were never "plotted for the purpose of lateral maritime delimitation, either in the seas or on the continental shelf below them"<sup>96</sup>. The ICNAF Convention itself states that its provisions shall be without prejudice to claims respecting the limits of coastal State jurisdiction over fisheries<sup>97</sup>.

414. The ICNAF subareas were used to divide the functions of the organization between committees or "panels" — in other words, between groups of States acting in concert — and never to allocate rights or responsibility to any single State<sup>98</sup>. Canada was always a member of ICNAF panel 5 — the panel responsible for Georges Bank and extensive portions of the Gulf of Maine area, and in the early days of ICNAF it was joined in that capacity only by the United States. At no time were either the NACFI or ICNAF zones used as a basis for dividing jurisdiction or authority of any kind between Canada and the United States, and at no time have they been used to determine the areas in which Canada and the United States should have access to fish, or the extent of their rights to resources as coastal States.

415. The ICNAF and NACFI lines formed part of a complex system of areas and lines stretching from the high Arctic to the middle Atlantic states<sup>99</sup>. The selectivity of the illustration in Figures 8 and 9 in the United States Memorial isolates the lines from their total context, and disguises their real nature and purpose as integral parts of a much larger system. It similarly disregards the fact that both ICNAF and NACFI subdivided the areas they adopted into smaller units. NACFI divided Georges Bank into four distinct statistical units, whose boundaries were drawn so as to separate natural fishing concentrations to the extent possible [Figure 25]. These four units, with slight modifications, are still used by the Parties for statistical purposes. As was noted in the Canadian Memorial, the two eastern units on Georges Bank correspond roughly to the areas that are claimed by Canada<sup>100</sup>. ICNAF later adopted its own subdivisions, including a very approximate separation of the Gulf of Maine proper from the Georges Bank area by means of a line between subdivisions 5Y and 5Ze [Figure 25]. These subdivisions

<sup>96</sup> *I.C.J. Reports 1982*, p. 68, para. 90.

<sup>97</sup> International Convention for the Northwest Atlantic Fisheries (ICNAF), Art. I, para. 2; *Canadian Memorial, Annexes*, Vol. I, Annex 1. See also Convention on Future Multilateral Co-operation in the Northwest Atlantic Fisheries (NAFO), Art. I, para. 5; *Canadian Memorial, Annexes*, Vol. I, Annex 9.

<sup>98</sup> J. A. Gulland: *The Management of Marine Fisheries*. Bristol, Scientechica (Publishers) Ltd., 1974, states at p. 177:

"For example, I.C.N.A.F. has divided the whole area defined by its Convention into five sub-areas, each of which is the responsibility of a particular panel . . . In each case panel membership is limited to countries with a direct interest in the relevant area or species."

*Counter-Memorial, Annexes*, Vol. V, Annex 91.

<sup>99</sup> See the map of ICNAF and ICES statistical areas from ICNAF Statistical Bulletin, Vol. 16, for 1966 (1968); *Counter-Memorial, Annexes*, Vol. V, Annex 89.

<sup>100</sup> *Canadian Memorial*, p. 63, para. 126.

have in some cases taken on as much importance for biological, statistical and regulatory purposes as the lines between the original subareas. But like the larger original units, their purpose is pragmatic and limited. They are devoid of legal or jurisdictional significance and have never once been used to apportion jurisdiction, resources or access between the coastal States of the Gulf of Maine area.

#### B. FISHERIES RESEARCH BEFORE THE EXTENSION OF COASTAL STATE FISHERIES JURISDICTION

416. The extent and importance of Canada's fishery on Georges Bank has been dealt with at length in Chapter IV and in the Canadian Memorial<sup>101</sup>. Throughout the period that preceded the extension of coastal State jurisdiction, the Government of Canada conducted scientific research in support of this vital economic interest. Canada has described this substantial contribution to fisheries research on Georges Bank in its Memorial<sup>102</sup>. Yet the United States has endeavoured to convey an utterly different impression of the scale of this effort, intimating that Canadian research in this area before the extension of jurisdiction was practically insignificant<sup>103</sup>. The contradiction is explained by a selective — and sometimes erroneous — presentation of the evidence by the United States, and especially by a gross distortion of the geographical frame of reference.

417. Canadian research work on the fisheries of the Gulf of Maine and Georges Bank goes far beyond the list of documents submitted by Canada to ICNAF, on which the United States appears to have based its conclusions. Canadian research on groundfish, beginning long before World War II, was vital to the development of international regulatory programs on Georges Bank<sup>104</sup>. It was the initiative of Canadian researchers which led to the discovery of commercial quantities of adult herring on Georges Bank — a stock that provided the largest Georges Bank fishery by volume during the 1960s<sup>105</sup>. Most of the fisheries research on the large pelagic species in the northwest Atlantic — particularly swordfish and bluefin tuna — has been conducted by

<sup>101</sup> *Canadian Memorial*, pp. 59-91, paras. 110-202.

<sup>102</sup> *Canadian Memorial*, pp. 88-89, paras. 195-196.

<sup>103</sup> *United States Memorial*, pp. 71-73, paras. 124-128.

<sup>104</sup> North American Council on Fishery Investigations Proceedings, 1921-1930, No. 1, pp. 24-26; *Counter-Memorial, Annexes*, Vol. V, Annex 90.

<sup>105</sup> S. N. Tibbo, J. E. H. Legaré, L. W. Scattergood and R. F. Temple: "On the Occurrence and Distribution of Larval Herring (*Clupea harengus* L.) in the Bay of Fundy and the Gulf of Maine." *Journal of the Fisheries Research Board of Canada*, Vol. 15, No. 6, 1958, pp. 1451-1469. While United States scientists were involved in the preparation of this study, the initiative for the research and the innovative techniques utilized in the study came from the lead Canadian scientist, S. N. Tibbo.

Canadians, much of it in the Georges Bank area<sup>106</sup>. In the case of Georges Bank scallops, it is Canadian scientific efforts that have largely formed the basis for the management of the resource<sup>107</sup>. Canadian oceanographic work in support of fisheries research on Georges Bank has produced results of acknowledged excellence and utility<sup>108</sup>.

418. The United States Memorial's account of Canadian research effort overlooks more than it includes. That Memorial's selective use of ICNAF literature to support its comparisons excludes much of the work referred to in the preceding paragraph, partly because a number of Canada's principal scientific interests in this area were pursued outside the ICNAF framework. In its early years, ICNAF was concerned only with groundfish. It was not until the late 1960s that serious attention was paid to other resources, such as herring, and the commission never gave consideration to a number of important species including lobster, swordfish and tuna. (The latter in fact were dealt with in an entirely different international commission.) Although Canada carried out substantial research on all these resources, virtually none of this work has been included in the compilation of documents relied on by the United States.

419. Within ICNAF itself, moreover, Canada's scientific contributions were fully consistent with its interests in the resources of subarea 5. The entire approach reflected in the United States compilation obscures the real nature of the scientific work that was carried out within the ICNAF framework. The relationship of the two States in scientific research on the Georges Bank fisheries was one of a highly valued partnership within the ICNAF organization<sup>109</sup>. From the outset,

<sup>106</sup> For example, the first stock assessment of Atlantic bluefin tuna was conducted by Canadian scientists. J. F. Caddy: "Cohort Analysis of Atlantic bluefin tuna and estimates of escapement through the juvenile fisheries under two hypotheses of the catch-age structure." ICCAT SCRS/74/59 Rev. See also S. N. Tibbo, L. R. Day and W. F. Doucet: *The swordfish (Xiphias gladius L.), its life-history and economic importance in the northwest Atlantic*. Ottawa, Fisheries Research Board of Canada, Bulletin No. 130, 1961.

<sup>107</sup> See for example the comprehensive scallop study by N. Bourne: *Scallops and the Off-shore Fishery of the Maritimes*. Ottawa, Fisheries Research Board of Canada, Bulletin No. 145, 1964.

<sup>108</sup> A 1978 physical oceanography study by C. J. R. Garrett, J. R. Keeley and D. A. Greenberg: "Tidal Mixing versus Thermal Stratification in the Bay of Fundy and Gulf of Maine." *Atmosphere-Ocean*, Vol. 16, 1978, pp. 403-423, and a 1977 biological oceanography study by R. W. Sheldon, W. H. Sutcliffe and M. A. Paranjape: "Structure of Pelagic Food Chain and Relationship Between Plankton and Fish Production." *Journal of the Fisheries Research Board of Canada*, Vol. 34, 1977, pp. 2344-2353, are recognized as contributions of major significance to understanding the basis of the biological productivity of the region.

<sup>109</sup> For example, the ICNAF record shows that, in 1959, the United States ICNAF commissioner made the following observations on the successful partnership of Canadian and United States scientists in the work of panel 5 (which was responsible for Georges Bank). The minutes indicate that the United States commissioner:

"... remarked that he had been working with the Panel for nearly ten years and with the mesh regulation since its inception. With this background of experience he pointed out that the scientists of both member countries were working in unison to solve the problems of the Panel and that he felt considerable confidence in their competence eventually to solve these problems."

See ICNAF Report of the Meeting of Panel 5, 2 June 1959, Proceedings No. 10, Serial No. 649 (B. Proc. c/59); *Counter-Memorial, Annexes*, Vol. V, Annex 92.

scientists of both countries cooperated on an equal footing on all major ICNAF issues involving the Georges Bank fisheries. During ICNAF's first decade, Canadian and United States scientists collaborated closely on the planning and assessment of research designed to provide a firm scientific basis for mesh size regulations in the Gulf of Maine and Georges Bank haddock fishery. This program was then the major item on the ICNAF agenda. More generally, Canada was the leader in developing a coordinated research program for the ICNAF convention area as a whole, a program that proved to be of immense benefit in assessing the state of the resources in subarea 5.

420. The United States Memorial speaks broadly of the Gulf of Maine area and Georges Bank in its general description of early research efforts, with no distinction between the disputed boundary areas and the remainder. But a more serious distortion, as in the case of the United States *presentation of fisheries statistics, is in the use of records related to the whole of subarea 5 — and only subarea 5*. The choice of subarea 5 automatically excludes the research done by Canada in the Gulf of Maine area in subarea 4 — the Bay of Fundy and all the waters immediately contiguous to southwest Nova Scotia — while *including* all the research conducted by the United States in the coastal waters of New England. As this Counter-Memorial has already pointed out in paragraph 251, subarea 5 is an extensive area of the sea that happens to encompass the coastal waters of the whole of New England, from the Canadian border to within sight of Long Island. Only about 15 percent of it, mostly on Georges Bank, is under Canadian claim. There can be no real value in a comparison that weighs the activities of the two Parties in this geographically biased fashion<sup>110</sup>.

421. It is equally important to assess the record in its proper legal context. The conduct of fisheries research by the two coastal States in the years leading to the extension of jurisdiction may properly be taken into account as part of the general factual background to the case, and it is from this perspective that Canada has referred to its record of research in the Georges Bank area. But the work carried out by the Parties within ICNAF was internationally sponsored research in collaboration with other States engaged in the high seas fisheries of the northwest Atlantic. The suggestion by any one of those parties that its collaboration in ICNAF activities could then, or at any future time, be regarded as the foundation for a claim of exclusive sovereign rights would have been summarily rejected. Indeed, it would have been incompatible with the ICNAF convention itself<sup>111</sup>. Canada's participation in these activities nonetheless reflected its coastal State status in subarea 5 throughout the history of ICNAF, and its contribution has always been fully commensurate with the extent of its interest and of its present claim to a portion of this area.

<sup>110</sup> A considerable portion of the research apparently relied upon by the United States applied to the entire area studied by ICNAF southwest of subarea 4, of which substantially less than 10 percent is under Canadian claim. (This is the case even when only the three coastal subdivisions of "statistical area 6" southwest of subarea 5 are taken into account.)

<sup>111</sup> International Convention for the Northwest Atlantic Fisheries, Art. 1, para. 2; *Canadian Memorial, Annexes*, Vol. I, Annex 1, pp. 56-57.

422. In sum, the fisheries research conducted by the Parties simply provides additional corroboration of the mutual interest of both countries in the fisheries of Georges Bank and of the potential for productive cooperation. The record is in every respect consistent with Canada's present claim.

### C. MANAGEMENT, CONSERVATION AND ENFORCEMENT BEFORE THE EXTENSION OF COASTAL STATE FISHERIES JURISDICTION

423. Coastal State participation in the management of the high seas fisheries of Georges Bank calls for consideration in much the same sense as the record of scientific research — as part of the general background to the case, and not as a manifestation of sovereignty or exclusive jurisdiction that can support a claim to title.

424. Canada participated fully in ICNAF efforts respecting the conservation of fish stocks on Georges Bank throughout the history of this institution. Once again, the relationship between Canada and the United States was one of coastal State partnership. This partnership was manifested not only in the framing of specific regulatory measures, but in the work of planning and evaluation within the various ICNAF committees responsible for these fisheries. For example, the first regulatory recommendation adopted by ICNAF was a mesh size limit for the haddock fishery in subarea 5 that was developed cooperatively by the two coastal States<sup>112</sup>. The two coastal States later worked in close collaboration to develop a minimum-size regulation for Georges Bank scallops, with Canada submitting the first regulatory proposal in 1972<sup>113</sup>. Moreover, the cooperation between the Parties within the ICNAF framework encompassed the fisheries of the Gulf of Maine area in their totality. The two panels responsible for subareas 4 and 5 (comprising the entire New England and Nova Scotia coastal areas) regularly convened joint meetings, in recognition of the essential unity of the fishery throughout this entire area. In all these concerns, the Parties worked in close association.

425. The ICNAF record, accordingly, points in the direction of coastal State cooperation in the conservation of a shared resource and not in the direction of exclusivity or "single-State management". It was a partnership in which Canada took its full share of the responsibility. For some of the stocks it was the United States that generally developed the regulatory measures, especially those (like yellowtail flounder and the hakes) that are predominantly concentrated on the United States

<sup>112</sup> At ICNAF's first annual meeting in 1951, panel 5 recommended that "... scientists representing the United States and Canada together" investigate the haddock problem. The results of their deliberations were considered at the 1952 meeting, which recommended a mesh regulation. ICNAF, Report by the Chairman of the First Annual Meeting, April 1951; pp. 7-8; and ICNAF, Second Annual Report for the Year 1951-52, pp. 13-15; *Counter-Memorial, Annexes*, Vol. V, Annex 93.

<sup>113</sup> ICNAF, Twenty-Second Annual Meeting, June 1972, Commissioners' Document 72/19. *Counter-Memorial, Annexes*, Vol. V, Annex 94.

side of the Gulf of Maine area. But Canada took frequent initiatives of its own on many of the most important issues, including the first proposals for catch limitations on Georges Bank cod and herring<sup>114</sup>. The role Canada fulfilled in the management of subarea 5 fisheries under ICNAF was commensurate with the extent of its geographical and economic interest in this area. Moreover, Canada's status as a coastal State in the area, originally recognized when the ICNAF convention was first adopted, was reflected as well in the actual workings of the institution. When coastal State preferences in the division of catch quotas were adopted as an ICNAF practice, Canada's entitlement to such a preference in the Georges Bank fisheries was accepted without question<sup>115</sup>.

426. Canada and the United States shared equal responsibility for the enforcement of international fisheries regulations on Georges Bank under an administrative arrangement concluded in 1970<sup>116</sup>. It was agreed at that time that the two coastal States should conduct a joint enforcement patrol of closed fishing areas in ICNAF subareas 4 and 5. Canadian Government vessels undertook approximately one-half of the scheduled patrol on Georges Bank, alternating every second week with United States vessels. Only the closed area immediately adjacent to Cape Cod was excluded from Canadian responsibility, "because of its distance from the other closed areas<sup>117</sup>". This bilateral arrangement included a procedure for requesting compliance by fishing vessels of nations other than Canada and the United States.

427. The United States has invoked its enforcement activities under the *Bartlett Act*<sup>118</sup> lobster program it introduced in the period immediately preceding the extension of fisheries jurisdiction. The information regarding the "lobster line" provisionally adopted for the enforcement of this measure was originally passed to Canada by the United States Coast Guard, and not through diplomatic channels.

<sup>114</sup> ICNAF, Twenty-first Annual Meeting, June 1971, Proceedings No. 6 (Canadian proposal for an interim cod quota for subarea 5). At the 1970 meeting, Canada proposed the development of quotas for herring throughout the convention area (explicitly including division 5Z which contains Georges Bank) and the formation of a Herring Working Group. See ICNAF, Twentieth Annual Meeting, June 1970, Commissioners' Document No. 70/23. As a result of this Canadian initiative, Canada and the United States submitted a joint proposal in 1971 for herring quotas in subareas 4 and 5. See ICNAF, Twenty-first Annual Meeting, June 1971, Proceedings No. 11, Appendix 1; *Counter-Memorial, Annexes*, Vol. V, Annex 95.

<sup>115</sup> *Canadian Memorial*, p. 90, para. 199.

<sup>116</sup> Letter of 17 February 1970 from Rear Admiral R. Y. Edwards, United States Coast Guard, Chief, Office of Public and International Affairs, to R. N. Gordon, Regional Director of the Canadian Department of Fisheries and Forestry, Halifax. *Counter-Memorial, Annexes*, Vol. V, Annex 96.

<sup>117</sup> Letter of 17 February 1970 from Rear Admiral R. Y. Edwards. *Counter-Memorial, Annexes*, Vol. V, Annex 96.

<sup>118</sup> *Bartlett Act*, Public Law No. 88-308, 78 United States Statutes at Large 194 (1964) (formerly codified at 16 United States Code, secs. 1081-1085). Reproduced in *United States Memorial, Documentary Annexes*, Vol. IV, Annex 58. Note that the definition of "continental shelf" in this Act refers to the 200-metre contour from the 1958 Convention on the Continental Shelf — not to the 100-fathom contour apparently used for the "lobster line" in Figure 16 of the *United States Memorial*, p. 87, to encompass Georges Bank.



Canada's opposition was nonetheless strong and unequivocal, as shown by the Canadian aide-mémoire of 12 September 1975<sup>119</sup>. The scheme remained in effect for less than 15 months, until it was overtaken by the general 200-mile fisheries legislation. Although this measure purported to derive its validity from the law of the continental shelf, it is extremely doubtful that lobsters in this area are sedentary species within the meaning of the Convention on the Continental Shelf<sup>120</sup>. The United States, in any event, made it clear in diplomatic correspondence that it would not attempt to enforce its purported lobster jurisdiction against Canada<sup>121</sup>.

428. The United States has stated that there were two seizures of foreign fishing vessels (one Bulgarian, the other Cuban) on the "north-eastern" part of *Georges Bank pursuant to the short-lived lobster program*<sup>122</sup>. Yet the coordinates it gives in one case are well outside the area claimed by Canada, and lie in the *southwest part of the Bank* — a fact that suggests that the undefined expression "northeastern Georges Bank" in United States Annex 40 respecting geophysical surveys must be equally suspect<sup>123</sup>. The coordinates given in the other case do appear to be in the disputed area, at the outer edge of the Bank, but just to the east of the equidistance line used by Canada at the material time. These incidents must in any event be appreciated in the context of the ICNAF Scheme of Joint International Enforcement, under which the enforcement authorities of any ICNAF contracting party were authorized — and expected — to board and inspect the fishing vessels of any other party throughout the convention area<sup>124</sup>. Accordingly, there was nothing in the presence of the United States enforcement vessels in any part of the convention area or in boardings of foreign vessels that could reasonably have been construed as suggesting an exercise of sovereign jurisdiction.

<sup>119</sup> *Canadian Memorial, Annexes, Vol. I, Annex 24.*

<sup>120</sup> The United States initially took the position that lobsters were not sedentary species under the convention. See S. Oda: "Proposals for Revising the Convention on the Continental Shelf." *Columbia Journal of Transnational Law*, 1968, pp. 16-17; *United States Memorial, Documentary Annexes, Vol. V, Annex 96*. In discussing the status of crustacea as natural resources, Oda stated:

"The following interpretation given to the United States Senate by Arthur Dean, Chairman of the United States delegation, is relevant in this respect: 'Hence, clams, oysters, abalone, etc. are included in the definition [of 'natural resources'], whereas shrimp, lobsters, and finny fish are not.'"

<sup>121</sup> United States diplomatic note of 11 September 1974. *Canadian Memorial, Annexes, Vol. III, Annex 19.*

<sup>122</sup> *United States Memorial*, p. 85, para. 145, footnote 4.

<sup>123</sup> See paras. 366-370.

<sup>124</sup> Protocol to the ICNAF Convention relating to Measures of Control, signed 29 November 1965, entered into force 19 December 1969. *Canadian Memorial, Annexes, Vol. I, Annex 4*; ICNAF Scheme of International Joint Enforcement, ICNAF, Twentieth Annual Meeting, June 1970, Proceedings No. 15, Appendix 1; *Counter-Memorial, Annexes, Vol. V, Annex 97.*

429. It was Canada that originally proposed the ICNAF Scheme of Joint International Enforcement<sup>125</sup>. The Canadian Government participated actively in the scheme throughout, regularly dispatching patrol vessels to Georges Bank to assist in the implementation of ICNAF conservation measures. The administrative arrangement under which Canada and the United States shared equal responsibility for patrolling the closed areas on Georges Bank and elsewhere in the Gulf of Maine area was also used to give effect to the ICNAF enforcement scheme after it came into being in 1971. Only a few months before the extension of fisheries jurisdiction, the United States enforcement authorities expressed their thanks to Canada for the services of a Canadian patrol vessel in apprehending a United States fishing vessel in a closed area of eastern Georges Bank<sup>126</sup>. In addition to the alternating coverage of Georges Bank by Canadian and United States fisheries patrol vessels (each country providing coverage every second week), a similar arrangement was adopted for overflights of the area by surveillance aircraft.

430. But Canada's contribution to the management and conservation of the Georges Bank fisheries was by no means limited to the ICNAF framework. A number of commercially important fishery resources were never regulated by ICNAF — scallops, to name only the most important instance — and in these cases Canada took effective unilateral action with respect to its own fleet in order to prevent overfishing<sup>127</sup>. Even in the case of stocks that were in fact regulated by ICNAF, Canada took additional measures with respect to its own flag vessels to supplement those which had been agreed to internationally<sup>128</sup>. For example, Canada has limited both the number and the size of the vessels in its fleet — a measure that accomplishes economic objectives but is vital as well in ensuring that excessive fishing of the resources is prevented. In contrast to the comprehensiveness of Canadian efforts in the management and conservation of Georges Bank resources, the United States was strictly limited by its own pre-1977 legislation to the measures that it was legally obligated to take by virtue of the ICNAF convention<sup>129</sup>.

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<sup>125</sup> ICNAF, Eleventh Annual Meeting, June 1961, Proceedings No. 5 (Revised). Canada also led in proposing the amendment to the convention that was necessary to implement the scheme. See ICNAF, Twelfth Annual Meeting, June 1962, Proceedings No. 3, and ICNAF, Thirteenth Annual Meeting, June 1963, Proceedings No. 10. *Counter-Memorial, Annexes*, Vol. V, Annex 98.

<sup>126</sup> Letter of 16 August 1976 from D. E. Russ, Special Agent in Charge, United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Law Enforcement and Marine Mammal Protection Division, to R. Collie, Chief, Conservation and Protection Branch, Department of the Environment, Fisheries Services, Halifax. *Counter-Memorial, Annexes*, Vol. V, Annex 99.

<sup>127</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 100.

<sup>128</sup> *Counter-Memorial, Annexes*, Vol. V, Annex 101.

<sup>129</sup> *A Legislative History of the Fishery Conservation and Management Act of 1976*, United States Congress Committee Print, 94th Congress, 2nd Session, October 1976, pp. 670, 684, 685 and 1080; *Counter-Memorial, Annexes*, Vol. V, Annex 102.

## Section V. The United States Has Invoked Irrelevant State Activities in Support of Its Claim

431. The United States Memorial has relied on a miscellaneous collection of maritime activities and *ad hoc* arrangements, under the heading "Other Relevant Activities<sup>130</sup>". Practically all these activities are irrelevant in law, as paragraphs 598-606 of this Counter-Memorial will show. They were high-seas activities that never carried any suggestion of sovereign rights or exclusivity. Most of them took place long before the advent of the continental shelf régime or the exclusive economic zone, and they bear no substantive relationship to the subject matter of the rights and jurisdiction that are now in issue. To a considerable extent, moreover, they were the expression, not of a coastal State interest in the relevant area, but rather of the far-ranging activities of a great military and maritime power.

### A. THE REGIONAL CARTOGRAPHICAL RECORD IN HISTORICAL PERSPECTIVE

432. The charting and measurement of the high seas has never implied either a claim of right or even the contemplation of a future claim to sovereign rights over the areas surveyed. The motivation for these activities has always been strategic and commercial, intended mainly for the safe navigation of merchant and naval vessels in the course of their worldwide voyages. Indeed, the global reach of the survey work carried out by the United States of itself serves to show how remote these activities really are from the subject matter of the present dispute. Along with the other great maritime powers, the United States has undertaken surveys throughout the world — including vast stretches of the North American coast off British Columbia, Newfoundland and Mexico<sup>131</sup>. The idea that such activities could support a claim of sovereign rights is audacious in its novelty.

433. The early endeavours by private mapmakers that are recounted in the United States Memorial are even more extraneous<sup>132</sup>. Private mapmaking flourished from the sixteenth century onward, fostered by the global exploration undertaken by the maritime powers<sup>133</sup>. There appears to be no instance in which this vast range of private

<sup>130</sup> *United States Memorial*, pp. 63-74, paras. 102-132.

<sup>131</sup> United States activity in the Atlantic, Pacific and Indian oceans, off Central and South America, Africa and the Arctic is disclosed in W. J. Heynen: *United States Hydrographic Office Manuscript Charts in the National Archives, 1838-1908*. Special List No. 43. Washington, National Archives and Records Service, General Services Administration, 1978. There was a survey off Acapulco in Mexico in 1878 (p. 217); of the coast of Liberia in 1834-1844 (p. 219); of the Grand Banks of Newfoundland in 1880 (p. 57); of Hecate Strait off British Columbia in 1868 (pp. 59-60); and of Victoria Harbour (the capital of British Columbia) in 1891 (p. 60).

<sup>132</sup> *United States Memorial*, pp. 64-67, paras. 104-108.

<sup>133</sup> For example, the first *North American Pilot* (1779) and Thomas Jeffrey's *West Indian and American Atlases* (1775 and 1778) were published in England. *Encyclopaedia Britannica*, Eleventh Edition, Vol. XVII, p. 648; *Counter-Memorial, Annexes*, Vol. V, Annex 103.

undertakings, covering all the oceans of the world, has ever been relied upon by a State to support claims to territory or to sovereign rights over maritime areas. Clearly the inferences the United States has drawn from these private activities would produce extraordinary results if given general application.

434. Yet, even apart from these considerations, the United States account of the charting and measurement of the sea in the Gulf of Maine area fails on historical grounds alone. In the early years of North American colonization and exploration, the charting of the northwest Atlantic and the Gulf of Maine area was dominated by the British more than by any other nation<sup>134</sup>. During the later colonial period, Great Britain carried out extensive charting and survey work in the Gulf of Maine area on behalf of its Canadian possessions. Much of this work was based in Canada where Imperial hydrographic experts were given long-term postings. Indeed, a number of these officers spent the bulk of their professional careers in Canada and became permanent residents. As early as 1818, one of these pioneering experts — Anthony Lockwood, Professor of Hydrography and Assistant Surveyor-General of the Provinces of Nova Scotia and Cape Breton — wrote a work entitled “A Brief Description of Nova Scotia<sup>135</sup>”. This work gives sailing directions to Georges Bank.

435. The dominant figure of the late eighteenth century in the charting of the Gulf of Maine, one whose work retained its authority and influence well into the nineteenth century, was Joseph DesBarres — a naturalized Englishman with close associations with what are now the Maritime Provinces of Canada. Indeed, he was a Nova Scotia resident, Governor of Cape Breton, and ended his career as the Governor of another province of Atlantic Canada, Prince Edward Island. His was the first scientific charting of Georges Bank and his work — originally carried out for the Royal Navy — was drawn on extensively by Edmund Blunt, the New England map publisher whose work is discussed in the United States Memorial<sup>136</sup>.

436. The real breakthrough in nineteenth century charting in the Gulf of Maine area was the publication of a British Admiralty Chart in 1834 — Sheet V in the *North America, East Coast* series also published that year<sup>137</sup>. It was based in large part on the efforts of the Canadian-based hydrographic officers referred to above, as well as on an 1832 survey along the full length of Georges Bank and adjacent areas from Cape Cod to the vicinity of Cape Sable carried out for the British Hydrographic Office by the *HMS Blossom*. Admiralty Sheet V is the first modern chart of Georges Bank and its influence can be traced through its successors to modern times. United States hydrographers and map

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<sup>134</sup> The regional cartographical record discussed in this and the following paragraphs is covered more fully, with references to sources, in *Counter-Memorial, Annexes*, Vol. III, pp. 24-34, paras. 68-93, and Appendices 15-34.

<sup>135</sup> *Counter-Memorial, Annexes*, Vol. III, Appendix 25.

<sup>136</sup> *United States Memorial*, pp. 64-67, para. 108.

<sup>137</sup> *Counter-Memorial, Annexes*, Vol. III, Appendix 26.

publishers borrowed from it freely, with the full approval of the British Hydrographic Office, whose sole objective was the safety of navigation.

437. In the late years of the nineteenth century, the United States Coast Survey grew to become one of the world's most distinguished hydrographic services, as befits an expanding and vigorous maritime power. But it is significant that its first chart of the Gulf of Maine area, which remained in effect from 1857 to 1873, was based on soundings taken only to the *west* of longitude  $68^{\circ}\text{W}$  — hardly extending on to Georges Bank itself, although the soundings did cover much of the shoal area in the vicinity of the Great South Channel on the approaches used by ships trading in and out of Boston. The later charts in Annex 28 of the United States Memorial, depicting the full record of United States survey activity from North Carolina to Nova Scotia, represent a creditable body of work; but, even setting aside the basic question of its legal relevance, this material simply underscores the point that there is no pattern here that could possibly support the adoption of any particular boundary or even carry any general implications about how the area should be divided. Indeed, the first of the three charts shows United States work off the Labrador coast. Further, if any dominant trend can be discerned in this material, it is that the three charts show a pattern of activity that is considerably more intensive in the western, undisputed part of Georges Bank than on the Canadian side of the equidistance line.

438. Responsibility for hydrographic charting was transferred from Great Britain to Canada in 1904. The challenge that faced the Canadian authorities was formidable. Canada had a small population and few naval resources, yet one of the longest coastlines in the world. Most of this coastline was situated in northern areas that were either unsurveyed or else had been charted in only a preliminary way. There was no option but to devote the bulk of Canada's limited resources to the charting of these northern areas. Faced with this challenge, it would have made no sense to accord priority to mere refinements of surveys that had already been thoroughly carried out in the Gulf of Maine area during the nineteenth century — to a very great extent by the British and colonial predecessors of the Canadian service. The charting and surveying of northern and Arctic waters has been vital not only to the interests of commercial navigation but to the strategic security of both Canada and the United States as allies on the North American continent.

439. The United States argument ignores as well the cooperative nature of the hydrographic work that has been carried out on the North American continent and its adjacent waters by the Canadian and United States governments. This cooperative tradition began in the early days of North American surveying and charting, when the more experienced British cartographers willingly passed on their experience to their United States counterparts. In boundary waters, for example — especially on the St. Lawrence and in the Great Lakes — the two countries have traditionally divided areas for surveying into sections that extend from shore to shore across the international boundary. The practice shows how far considerations of jurisdiction and sovereignty have always been from the minds of the officials charged with the conduct of this work.

## B. ASSISTANCE TO NAVIGATION

440. The United States Memorial relies on the Canada-United States agreement of 1964 establishing a LORAN-C position-fixing system, and on the provision by the United States of a variety of other aids to navigation in the Gulf of Maine area<sup>138</sup>. It disregards the important contribution of Canada to the safety of marine and aerial navigation in this area and — more important — ignores the humanitarian and commercial motives of States in providing such assistance. Canada, in fact, provides a variety of navigational services in the Gulf of Maine area that are described in Volume III of the Annexes to this Counter-Memorial<sup>139</sup>. For example, the Canadian Coast Guard operates a number of low- and medium-frequency beacons along the coast of Nova Scotia bordering the Gulf of Maine area, providing coverage throughout the Gulf of Maine and Georges Bank.

441. The LORAN-C agreement is essentially an arrangement for cooperation between two States, making use of stations on the territory of both Parties and employing personnel from both Parties<sup>140</sup>. The system — which provides coverage of the entire Gulf of Maine area, the Gulf of St. Lawrence and the Grand Banks of Newfoundland — can operate only through the location of stations in both countries: two in the United States, and one established by Canada at Cape Race, Newfoundland. Position-fixing systems of this nature operate on a worldwide basis, often as cooperative international ventures<sup>141</sup>. States provide these services without regard to considerations of sovereignty or jurisdiction in order to ensure safe and reliable position-fixing for military and commercial navigation.

442. The United States Memorial also invokes a series of search and rescue agreements between Canada and the United States. It suggests that the zones delineated in these operational agreements between the Canadian Armed Forces and the United States Coast Guard somehow lend support to the United States claim<sup>142</sup>. In fact, the lines used for the purposes of these agreements are simply an *ad hoc* adoption of ICAO zones for the routing and control of aircraft and for search and rescue, which in turn are based upon factors related to aviation. It is difficult to conceive of a rationale more remote from the subject matter of the present dispute.

443. Search and rescue regions are agreed to by States without regard to the delimitation of zones of maritime jurisdiction. For example, *Figure 35* illustrates the search and rescue regions in the Gulf

(69)

<sup>138</sup> *United States Memorial*, pp. 68-70, paras. 114-120.

<sup>139</sup> *Counter-Memorial, Annexes*, Vol. III, pp. 42-46, paras. 110-121, and Appendices 45-52, provide further detail and sources respecting Canadian assistance to navigation in the Gulf of Maine area.

<sup>140</sup> *Counter-Memorial, Annexes*, Vol. III, Appendix 45.

<sup>141</sup> For example, Canada and the United States have contributed funds for the operation of LORAN stations in Greenland, Norway, the United Kingdom and Portugal in order to provide a uniform position-fixing system throughout the North Atlantic.

<sup>142</sup> *United States Memorial*, p. 73, paras. 129-130.

of Mexico. These zones obviously fail to correspond even remotely with the maritime boundaries negotiated by the United States and Mexico and by the United States and Cuba. The same lack of coincidence between ICAO operational zones and maritime boundaries in the North Sea is evident in *Figure 34B*. Similarly, in the 1957 search and rescue agreement referred to in the United States Memorial, the United States assumed responsibility for areas comprising ICAO's Vancouver and Gander regions — two areas to which no United States claim could possibly be contemplated<sup>143</sup>.

444. It is the policy of ICAO that the provision by a State of search and rescue services within areas over the high seas shall not imply sovereignty or sovereign rights over the areas concerned. The ICAO Assembly has resolved that:

“... the boundaries of search and rescue regions, whether over States' territories or over the high seas, shall be determined on the basis of technical and operational considerations<sup>144</sup> . . .”

This preoccupation with operational considerations is evidenced by the three agreements between Canada and the United States referred to in the United States Memorial<sup>145</sup>. In all three, the parties reserved the right to initiate rescue operations in any area without regard to zonal divisions. The United States Memorial cites 54 such incidents attended to by the United States Coast Guard to the east of the search and rescue line used in the Gulf of Maine area<sup>146</sup>. *Figure 36* shows that between January 1975 and June 1982 the Canadian Rescue Coordination Centre responded to over 170 search and rescue incidents in the Gulf of Maine area *to the west and south* of the search and rescue line invoked by the United States — principally on the Canadian fishing grounds of Georges Bank.

445. The suggestion that the provision of search and rescue services might have implications for maritime boundaries is incompatible with the humanitarian basis of these activities and their disregard for considerations of national sovereignty. The use of these practical arrangements for the purpose of asserting jurisdictional claims would have major and unfortunate repercussions on ICAO's role in designating search and rescue and flight information regions. Furthermore, it would be entirely inconsistent with the legal assumptions clearly evinced in the most recent international instruments designed to foster cooperation in maritime search and rescue. Both Canada and the United States are signatories of the 1979 International Convention on Maritime Search and Rescue, which specifically recognizes that search and rescue regions agreed to by States shall not prejudice the determination of any boundary between them<sup>147</sup>.

<sup>143</sup> *United States Memorial, Documentary Annexes*, Vol. II, Annex 35.

<sup>144</sup> *Counter-Memorial, Annexes*, Vol. III, Appendix 51, Document 1.

<sup>145</sup> *United States Memorial*, p. 73, paras. 129-130; *United States Memorial, Documentary Annexes*, Vol. II, Annex 35.

<sup>146</sup> *United States Memorial*, p. 73, footnote 5.

<sup>147</sup> *Counter-Memorial, Annexes*, Vol. III, Appendix 52.

## C. COOPERATION IN DEFENCE

446. Finally, the United States Memorial alleges that during World War II the United States assumed responsibility for the defence of most of the Gulf of Maine area<sup>148</sup>. A wartime "CHOP" line is invoked (an operational device that implied no change of command or restriction on the deployment of naval vessels) along with a line dividing the United States and Canadian "air defence identification zones" in the Gulf of Maine area. These operational arrangements, like the others just considered, long antedate the present claims to maritime jurisdiction and were made without reference to such claims. The factors that determine the areas of responsibility for defence purposes are associated with relative naval and air power, the location of air and sea ports, radar facilities and the like. They are as far removed from the factors relevant to maritime delimitation as can be imagined, and their use in connection with a maritime boundary dispute would verge on the frivolous were it not for their potentially serious implications for defence cooperation.

447. Furthermore, the United States allegations concerning defence arrangements during World War II are erroneous. It is simply not true that during the war the United States assumed "primary responsibility" for the defence of the Gulf of Maine area, or that Canada provided naval and air defence to a distance of only 30 nautical miles of its major ports<sup>149</sup>. For over two years, before the United States entered the war at the end of 1941, Canada and the United Kingdom patrolled and defended the North Atlantic sealanes vital to the supply of Great Britain. In order to carry out this responsibility, Canadian naval vessels regularly crossed the North Atlantic and conducted anti-submarine operations at much greater distances from Canadian and Newfoundland ports than is suggested in the United States Memorial.

448. After the United States entered the war, the Royal Canadian Air Force continued to carry out patrols throughout the Gulf of Maine area and Georges Bank, as is illustrated in *Figure 37*. Efficient convoy control required a similar extension of Canadian naval operations well beyond coastal waters. The Canadian situation reporting area, shown in *Figure 37*, was an area within which the authorities in Canada kept ships and aircraft fully informed of enemy activity. This reporting area covered the whole of Georges Bank and most of the Gulf of Maine and extended southward to latitude 40°N. As from 1939 to 1941, escort groups based at Halifax protected the convoy routes outlined in *Figure 37* for most of 1942. Many of these convoys cut right across the Gulf of Maine, and others moved through the heart of Georges Bank. Indeed, far from restricting their responsibility for surface and air patrols to the limited area identified in the United States Memorial, Canada and the United Kingdom undertook the entire responsibility for defending these convoy routes from April 1943. The United States contribution to joint convoy defence essentially was limited to 1942.

<sup>148</sup> *United States Memorial*, pp. 73-74, para. 131. See also *Counter-Memorial, Annexes*, Vol. III, pp. 35-41, paras. 98-109, and Appendices 35-44 for further detail and the sources respecting Canadian defence operations in the Gulf of Maine area.

<sup>149</sup> *United States Memorial*, pp. 73-74, para. 131.



449. The Canada-United States military alliance that emerged during the war years was strengthened after the end of hostilities<sup>150</sup>. In 1947, a Permanent Joint Board on Defence that had been established for the defence of North America during the war declared that even in peacetime all military projects or exercises (whether jointly conducted or not), "are without prejudice to the sovereignty of either country, [and] confer no permanent rights or status upon either country<sup>151</sup> . . .". Canada and the United States conduct military exercises solely on the basis of operational considerations throughout the northwest Atlantic Ocean, including the Gulf of Maine area. The cooperative nature of the military relationship is vividly illustrated by the events of the international missile crisis of 1962, during which Canadian naval and air forces based in Nova Scotia provided the ships and aircraft to patrol Georges Bank and the eastern approaches to the Gulf of Maine. Their disposition in the Gulf of Maine area is illustrated in *Figure 38*.

450. The North American Air Defence Agreement of 1958 (NORAD) treats North America as a single unit for the purposes of air defence<sup>152</sup>. It follows that CADIZ and ADIZ — the air defence identification zones referred to in the United States Memorial<sup>153</sup> — must be viewed in the context of this agreement for the joint air defence of the continent. It is inconceivable, in this context of strategic arrangements for the defence of the entire North American continent, that the Parties intended the CADIZ-ADIZ zones in the Gulf of Maine area to be relevant to any question of maritime jurisdiction or sovereign rights. The most telling point, however, is that these zones (like most of the ICAO zones referred to above) diverge radically from United States boundary claims in each of the three other offshore areas adjacent to Canada and the United States<sup>154</sup>.

451. Canada, the United States and their allies have implemented several other such operational arrangements designed for similar purposes. *Figure 34D* depicts the command structure of NATO in the northeast Atlantic and the North Sea, and the maritime boundaries agreed to by the States in these areas. It is again evident that these operational zones have been put into effect without regard to State frontiers or maritime boundaries. It is regrettable that non-prejudicial cooperative defence arrangements should now be invoked to serve national interests of this character. The implications of the United States argument would

<sup>150</sup> *Counter-Memorial, Annexes*, Vol. III, Appendices 41 and 43.

<sup>151</sup> *Counter-Memorial, Annexes*, Vol. III, Appendix 42, Document 1.

<sup>152</sup> *Counter-Memorial, Annexes*, Vol. III, Appendix 44.

<sup>153</sup> *United States Memorial*, p. 74, para. 132.

<sup>154</sup> The United States uses the equidistance method in each of the other three Canada-United States offshore boundary areas. None of these claims corresponds to the defence, aviation and search and rescue zones and lines established in those areas. See United States Pacific and Alaskan Air Defense Identification Zones, *United States Memorial, Documentary Annexes*, Vol. II, Annex 36; ICAO, flight information regions and search and rescue zones, *United States Memorial, Documentary Annexes*, Vol. II, Annex 35; NORAD air defence zones, *Counter-Memorial, Annexes*, Vol. III, Appendix 44, Document 3.

place in jeopardy the whole basis of collective security arrangements among States and undermine a form of cooperation that is fundamental to international order.

452. In sum, there can be no plausible reason in law or in equity why the collection of miscellaneous high-seas activities and cooperative arrangements outlined in paragraphs 431-451 should have any bearing on the question of delimitation. It has been shown in the course of this discussion that State practice is incompatible with the view that *ad hoc* operational lines, often adopted for purposes that are at best tenuously related to the subject matter in issue, should be accorded legal significance in drawing a general jurisdictional boundary. To recall only one of a number of equally apposite examples, the ICES and NEAFC fisheries lines in Europe disclose no pattern of correlation with offshore boundaries between States [*Figure 34C*]; and neither do the various operational lines used in other parts of the world for purposes of military cooperation or the safety of navigation.

453. This conclusion is confirmed by a consideration of some of the lines that have been adopted by States for the purpose of environmental protection. *Figure 34E* shows the pollution control zones established in the North Sea under the 1969 Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil<sup>155</sup>. It is readily apparent how little connection they have to the continental shelf boundaries of that area. Indeed, if the legal implications of the United States presentation were to be accepted, it would be no less logical — perhaps more so — to lend weight to time zones as a factor in determining the sovereign rights of States at sea. Eastern Georges Bank is entirely on Nova Scotia time on the basis of the meridians generally accepted for this purpose — one hour east of any of the time zones used in the United States<sup>156</sup>.

454. But even if this material were legally relevant in principle, it is difficult to see how most of it could point to any particular boundary. The entire concept of a generalized United States “dominance” of the Gulf of Maine area, and all the evidence adduced in support, is inherently incapable of suggesting any principle of division, much less an equitable one, unless it be simply the principle that the United States should be given more and Canada less. It is a theme that is incompatible with the concept of a delimitation between sovereign and equal States on the basis of equitable principles. It ultimately rests on the proposition that the greater historical power and wealth of the United States, manifested in its broad record of maritime and naval activities, should now be translated into a boundary that will leave it in a position of permanent superiority to the disadvantage of its neighbour. This cannot be what

<sup>155</sup> Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil, 9 June 1969. *British Treaty Series*, No. 78, 1969. London, Her Majesty's Stationery Office, 1969.

<sup>156</sup> The customary method for determining time zones would place the dividing line between Nova Scotia and New England time at longitude 67°30'W. See *New Encyclopaedia Britannica*, Vol. IX, 1974, p. 1014; *Counter-Memorial, Annexes*, Vol. V, Annex 104.

was envisaged by the framers of the new law of the sea when they determined that all coastal States, whatever their power and status, should enjoy rights and jurisdiction in their adjacent waters on the basis of identical and uniform principles.

455. The United States Memorial lays heavy emphasis on the Northeast Channel as a so-called natural dividing line for human activities, and on the alleged general dominance of the entire Gulf of Maine area by the United States. The "dominance" theme leads the United States into a contradiction from which it cannot easily escape. In the case of aids to navigation, the United States has simply stressed the general coverage of the area as a whole — indeed, of an area extending beyond the Gulf of Maine area and up the Canadian coast to Newfoundland. When it comes to the charting of the sea — as in the case of its historical fisheries discussed in the preceding chapter — the United States again asserts a "dominant" interest extending beyond Georges Bank to Browns Bank and to other maritime areas adjacent to the coast to Nova Scotia. In each case, the concept of the Northeast Channel as a natural barrier has entirely disappeared from view. Thus, these two major themes of the United States Memorial are ultimately incompatible and, in Canada's submission, are equally unfounded both in fact and in law.

### Conclusion

456. The relevant conduct of the Parties is fully consistent with and supports the Canadian claim. Canada alone has granted legal interests to private companies in the mineral resources of the eastern part of Georges Bank. Indeed, the record of continental shelf activities by the Parties shows that the United States has acquiesced in and recognized the exercise of Canadian jurisdiction with respect to this area and the use of the equidistance method, thereby creating an estoppel in favour of Canada. The conduct of the Parties with respect to the continental shelf is reinforced by their conduct with respect to the fisheries of the relevant area. Thus, the 1979 Agreement on East Coast Fishery Resources provides the most objective evidence as to how the Parties have viewed the fisheries equities in the present case. While not manifesting acts of sovereignty or exclusive jurisdiction, the record of coastal State partnership between Canada and the United States in fisheries research, management, conservation and enforcement activities, before the adoption of 200-mile zones, clearly demonstrates the interest of both Parties in the fisheries of Georges Bank. Moreover, it constitutes incontrovertible proof of the United States' recognition of Canada's interest in Georges Bank and of Canada's status as a coastal State in relation thereto. State activities adduced by the United States with respect to aids to navigation, search and rescue, and defence are irrelevant and bear no relationship to the issues involved in this case in terms of law, time or subject matter.

## PART III. THE LAW APPLICABLE TO A SINGLE MARITIME BOUNDARY

### CHAPTER I

#### THE CONCEPT OF THE SINGLE MARITIME BOUNDARY

##### Introduction

457. This chapter examines the origins and the distinguishing features of the concept of a single maritime boundary delimiting multi-purpose zones of maritime jurisdiction beyond the territorial sea. While the concept in this case flows from the provisions of the Special Agreement, it also has logical and functional roots in the contemporary law of the sea and the doctrine of the exclusive economic zone. Its distinctive features have an important bearing on the law applicable to the delimitation of the maritime zones now in issue before the Court.

##### Section I. The Single Maritime Boundary Concept Is Rooted in the Doctrine of the Exclusive Economic Zone

458. The concept of a single maritime boundary beyond the territorial sea and its immediately contiguous waters is new to international law. This case therefore raises a number of legal questions that have not yet been dealt with by the Court or by any international tribunal. As the United States Memorial has put it: "The question before this Court is one of first impression. There are no judicial decisions delimiting between neighboring States a single maritime boundary beyond the territorial sea<sup>1</sup>."

459. The single maritime boundary brings together the newly recognized sovereign rights and jurisdiction of coastal States in respect of the water column and its resources, and their earlier rights and jurisdiction in respect of the continental shelf. It represents an amalgam of the old and the new. The same is true of the rules of law for the determination of a single maritime boundary. The general principles of maritime boundary delimitation that have been developed in other contexts must be integrated with the specific considerations that flow from the new and expanded character of the régime encompassed within the single maritime boundary. In Canada's view, the continuity in the law is found in the application of the fundamental norm of equitable principles. The differences that are indicated by the specific legal character of the new zones, their subject matter and inherent purpose, will be examined below.

460. The combined shelf and water column jurisdiction that coastal States are now entitled to exercise within 200 nautical miles of the coast is the product of the deliberations of the Third United Nations Conference on the Law of the Sea and its predecessor, the "Seabed Committee", which ultimately led to a general acceptance of the concept of the exclusive economic zone. The new zones have antecedents that go back long before these negotiations began — to the 1945 Truman

<sup>1</sup> *United States Memorial*, p. 3, para. 7.

Proclamations<sup>2</sup> and to the 1952 Declaration of Santiago by Chile, Ecuador and Peru on the principle of a 200-mile maritime zone<sup>3</sup>. They were foreshadowed by the recognition of the "special interest" of the coastal State in the 1958 Convention on Fishing and Conservation of the Living Resources of the High Seas<sup>4</sup>. But it was in the early 1970s, during the period leading up to the convening of the Third Conference on the Law of the Sea, that the concept was more widely discussed and began to take shape.

461. The events of that decisive period can help bring to light the essential principles and objects of the 200-mile zone. The developing countries, especially those of Africa and Latin America, played a leading role throughout. At a session of the Asian-African Legal Consultative Committee in early 1972, the Government of Kenya presented a working paper on "The Exclusive Zone Concept", which described the purpose of the 200-mile exclusive economic zone in the following terms:

"Basically the purpose of the economic zone is to safeguard the economic interests of the coastal State in the area without interfering unduly with other States' legitimate interests, particularly in navigation and overflight and laying of submarine cables<sup>5</sup> . . ."

Shortly thereafter, the Yaoundé Report of the African States endorsed an economic zone of this character, and the Declaration of Santo Domingo by the Caribbean countries called for the creation of a "patrimonial sea" of up to 200 nautical miles in breadth<sup>6</sup>. The Government of Kenya later introduced a set of draft articles on the exclusive economic zone to the 1972 summer session of the Seabed Committee, explaining the "strictly economic aspect" of the concept and "its importance for the economic development of coastal States"<sup>7</sup>.

462. These seminal documents disclose a number of fundamental themes. The first, clearly reflected in the passage referred to in paragraph 461, is that the basic purpose of extended coastal State jurisdiction is economic in nature and stems from the special dependence of coastal States on the resources of their adjacent waters. A second is that many of the traditional rights and freedoms of other States remain fully

<sup>2</sup> Proclamation No. 2667, Policy of the United States with Respect to the Natural Resources of the Subsoil and Sea Bed of the Continental Shelf, 28 September 1945; Proclamation No. 2668, Policy of the United States with Respect to Coastal Fisheries in Certain Areas of the High Seas, 28 September 1945. *United States Memorial, Documentary Annexes*, Vol. I, Annex 3.

<sup>3</sup> The Declaration of Santiago, 18 August 1952, *United Nations Legislative Series, Laws and Regulations on the Regime of the Territorial Sea*, ST/LEG/SER.B/6, 1957, p. 723.

<sup>4</sup> *United Nations Treaty Series*, Vol. 559, p. 285, Art. 6, para. 1.

<sup>5</sup> Asian-African Legal Consultative Committee, Report of the Thirteenth Session held in Lagos from 18-25 January 1972, pp. 155-160; *Counter-Memorial, Annexes*, Vol. V, Annex 105.

<sup>6</sup> *Official Records of the 27th Session of the General Assembly, Report of the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction*, Doc. Supp. No. 21 (A/8721), 1972, pp. 70-76.

<sup>7</sup> Summary Records of the 33rd to 47th Meetings, Geneva, 17 July-17 August 1972, Doc. A/AC.138/SC.II/SR.33-47, 29 November 1972, p. 54.

entitled to legal protection. A third is that the economic interests at stake can only be fully protected through effective conservation of the resources by the coastal States, and that cooperation between these States in the conservation of their marine resources is indispensable. Both the Declaration of Santo Domingo and the Yaoundé Report expressly recognize the need for regional cooperation between coastal States in the management of these marine resources<sup>8</sup>.

463. Although several years of intensive negotiations went by before 200-mile zones were implemented throughout the world, these basic elements remained intact. Canada and the United States brought their 200-mile zones into effect in 1977 — not as exclusive economic zones in those terms, but as fishing zones that implemented the basic provisions worked out at the Conference on the Law of the Sea with respect to coastal State jurisdiction over living resources within the 200-mile limit. It is for this reason that the Special Agreement defines the question before the Court as one of determining the single maritime boundary for the continental shelf and the fishing zones of the Parties. The essential reason for only partial implementation of the exclusive economic zone concept in 1977 was that the multilateral negotiations were still under way at that time. There was, however, a consensus on the principal elements of the 200-mile fisheries régime, and it was this innovation that called for immediate action.

464. The negotiations between the Parties proceeded throughout on the assumption that a single boundary should be adopted for all forms of jurisdiction. The practical logic of this approach was compelling and it was never questioned, either during the discussions on the boundary itself or when the Special Agreement was being drawn up. The subject matter immediately before the Court is therefore the delimitation of the continental shelf and 200-mile fishing zones of the Parties — no doubt the two most important components of the exclusive economic zone régime. The Parties have nevertheless anticipated the remaining forms of coastal State jurisdiction authorized by the new law of the sea in offshore areas; and, by virtue of Article III of the Special Agreement, the single maritime boundary will apply to the exclusive economic zone recently proclaimed by the United States<sup>9</sup>. Although Canada has not yet formally established an exclusive economic zone, it has already put in place most of the elements of such a zone<sup>10</sup>.

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<sup>8</sup> The Declaration of Santo Domingo includes a specific principle on "regional cooperation". The Yaoundé Report also recommends at p. 75 that African States "should promote a new policy of cooperation for the development of fisheries so as to increase their participation in the exploitation of marine resources".

<sup>9</sup> Presidential Proclamation 5030, 10 March 1983: "Exclusive Economic Zone of the United States of America"; "Statement by the President"; "Fact Sheet" and "Map". *Counter-Memorial, Annexes*, Vol. IV, Annex 1, Documents 1-4.

<sup>10</sup> Along with the exercise of jurisdiction and sovereign rights in relation to the Canadian continental shelf and fishing zones, a substantial body of Canadian law respecting the protection of the marine environment applies within the 200-mile zone. For an explanation of Canada's role in protection of the marine environment, see *Counter-Memorial, Annexes*, Vol. III, Chap. II.

465. The concept of a single, general-purpose boundary is likely to commend itself to the general practice of States because of its simplicity and convenience. The exclusive economic zone is described in the new Convention on the Law of the Sea as a single bundle of rights, including those respecting the seabed and subsoil within the 200-mile limit, and a number of these coastal State functions could not easily be assigned to either the continental shelf or the water column in isolation from the other. *It is precisely because of this inherent logic and practicality that the Parties so readily agreed upon the principle of a single maritime boundary to delimit their sovereign rights and jurisdiction in the Gulf of Maine area.* Thus, although the single maritime boundary in this case is the product of the Special Agreement, the underlying principle may have a broader relevance in international law.

### **Section II. The Distinguishing Features of the Single Maritime Boundary Have Important Consequences for the Law of Maritime Delimitation**

466. There are a number of general features that characterize the régime to which a single maritime boundary is applicable.

- (a) It is a unified régime, integrating both the seabed and subsoil and the water column into a single bundle of rights.
- (b) It is a multi-purpose régime, more varied in its functions than the continental shelf régime alone.
- (c) It is functional in character, in the sense that it differs from the territorial sea régime in its restriction to a specific and finite number of purposes.
- (d) It is based upon geographical adjacency, expressed largely in terms of a uniform distance from the coast.
- (e) Its purposes are primarily economic, centred on the natural resources of the sea and their management and use by coastal States.

467. The last two factors are of particular importance and will be examined in more depth in Chapter III of this part. In essence, it is Canada's submission that both the legal basis of the coastal State title and the purposes of the offshore rights in issue have an important bearing on the applicable rules and criteria of delimitation. In the first place, the factor of distance from the coast as the sole basis of title to a 200-mile fishing zone or an exclusive economic zone, and as an important element in the revised definition of coastal State rights to the continental shelf<sup>11</sup>, has strengthened the role of proximity in the law of delimitation. Further, the fundamental economic purpose of these 200-mile zones lends a particular importance to the dependence of coastal communities

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<sup>11</sup> Both Canada and the United States have used the new distance criterion for the continental shelf in internal practice. See *Canada Oil and Gas Act*, Statutes of Canada, 1980-81-82, Chap. 81; *Counter-Memorial, Annexes*, Vol. III, Chap. I. The United States Presidential Proclamation on the Exclusive Economic Zone also uses the 200-mile nautical limit for jurisdiction over the resources of the continental shelf.

upon the resources of adjacent areas of the sea as a relevant circumstance in the determination of the boundary.

468. Because the single maritime boundary is applicable to a unified régime that integrates the continental shelf and the water column, the doctrine of natural prolongation cannot be considered the primary source of the applicable rules of law. The essential nature of the continental shelf as described in the *North Sea Continental Shelf* cases was that it is a "continuation of the land territory or domain"<sup>12</sup>, "a species of platform" physically extending the territory of most coastal States to the submerged lands adjacent to their coasts<sup>13</sup>. In speaking of the importance of identifying these extensions of the land under the sea, the Court stated that:

"... the legal régime of the continental shelf is that of a soil and a subsoil, two words evocative of the land and not of the sea<sup>14</sup>."

Clearly, a different conceptual approach is necessary in the case of a single maritime boundary. Along with the role of the distance criterion in modifying the concept of the continental shelf itself as a "species of platform", the integrated nature of the jurisdiction suggests that natural prolongation can no longer be regarded as the principal expression of adjacency and appurtenance<sup>15</sup>. Distance from the coast has largely taken its place.

469. The judgment in the *North Sea Continental Shelf* cases noted a specific correlation between the notion of closest proximity and the integrated seabed-water column jurisdiction that obtains in the territorial sea:

"There is also a direct correlation between the notion of closest proximity to the coast and the sovereign jurisdiction which the coastal State is entitled to exercise and must exercise, not only over the seabed underneath the territorial waters but over the waters themselves, which does not exist in respect of continental shelf areas where there is no jurisdiction over the superjacent waters, and over the seabed only for purposes of exploration and exploitation<sup>16</sup>."

There are two reasons why a composite, heterogeneous form of jurisdiction points more in the direction of proximity than does a single-purpose régime. First, the relative importance of factors that are specific to any one form of jurisdiction is diminished, and to some extent these factors may tend to cancel each other out; on the other hand, the heightened importance of the factors that are common to each of the relevant forms of jurisdiction tends to enhance the importance of proximity. The second reason is that a multi-purpose form of jurisdiction involves a more

<sup>12</sup> *I.C.J. Reports 1969*, p. 31, para. 43.

<sup>13</sup> *I.C.J. Reports 1969*, p. 51, para. 95.

<sup>14</sup> *I.C.J. Reports 1969*, p. 51, para. 96.

<sup>15</sup> *I.C.J. Reports 1982*, p. 48, paras. 47-48.

<sup>16</sup> *I.C.J. Reports 1969*, p. 37, para. 59.



pervasive and extensive interest in the areas of the sea to be delimited. It is no longer simply a matter of isolated offshore drilling sites and specialized coastal facilities. A much broader range of interests, activities and functions comes into play. This reinforces the notion that the areas of the sea lying closest to a coastal State should normally be regarded as natural appurtenances of that State.

470. Finally, in contrast with the general sovereignty of the coastal State that prevails in the territorial sea, the single maritime boundary will apply to a régime that comprises specific limited functions — primarily those relating to the fishery and the resources of the continental shelf. The importance of this characteristic for the purposes of delimitation is that it helps determine what factual circumstances are legally relevant, and how much weight should be attached to each category of circumstances.

### Conclusion

471. The distinctive features of the single maritime boundary régime clearly imply that the role of distance from the coast has been strengthened. This implication emerges from the use of a constant and uniform distance from the coast as the primary basis of coastal State title, and the displacement of natural prolongation from its former central role; it follows too from the more pervasive nature of the interest that an integrated shelf and water column jurisdiction must imply. The effect of this new orientation is not a radical alteration in the fundamental legal principles respecting the delimitation of maritime boundaries. But the law governing the nature and geographical extent of the exclusive economic zone necessarily has consequences for the law applicable to the delimitation of that zone by a single maritime boundary — consequences, that is, for the equitable principles to be applied, the circumstances to be taken into account, and the criteria against which the equity of the result is to be assessed.

## CHAPTER II

### EQUITABLE PRINCIPLES IN THE UNITED STATES MEMORIAL

#### Introduction

472. There is no disagreement between Canada and the United States on the fundamental norm applicable to the delimitation of a single maritime boundary. With minor differences in wording, both Parties have defined this norm in essentially identical terms: the basic rule of law is that maritime boundaries are to be determined in accordance with equitable principles, taking account of all the relevant circumstances, in order to achieve an equitable result<sup>1</sup>. Beyond this point, however, there is a fundamental difference of approach. In Canada's view, equitable principles must be identified and applied — and relevant circumstances identified and weighed — on the basis of the applicable law. The United States Memorial, however, divorces both equitable principles and relevant circumstances from the applicable law. The circumstances relevant to this case have already been fully discussed in Part II. This chapter deals with the "equitable principles" proposed in the United States Memorial.

473. Canada has emphasized the indivisibility of equitable principles from the relevant circumstances of the case, and the need to assess the appropriateness of these principles in achieving an equitable result<sup>2</sup>. The United States, on the other hand, has advanced a series of concepts as equitable principles that purport to have a universal, *a priori* validity that is essentially independent of the varying circumstances of each particular case and the result to be achieved. In other words, the United States has elevated a few propositions to a level of abstract generality that disregards the concrete factual circumstances of each situation and the equity of the solution these concepts would produce.

474. The four specific "equitable principles" identified by the United States are as follows:

". . . (1) principles regarding the relationship between the relevant coasts of the parties and the maritime area lying in front of those coasts, including nonencroachment, proportionality, and (where applicable) natural prolongation; (2) the principle of conservation and management of the resources of the area; (3) the principle of minimization of the potential for international disputes; and (4) the general principle that delimitation should take account of the relevant circumstances in the area<sup>3</sup>."

It is submitted that the manner in which the United States has attempted to use the second and third of these items as principles of delimitation is unfounded in fact and law. Moreover, although the first

<sup>1</sup> *United States Memorial*, p. 139, para. 237; *Canadian Memorial*, p. 119, para. 278.

<sup>2</sup> *Canadian Memorial*, pp. 127-128, para. 300.

<sup>3</sup> *United States Memorial*, p. 139, para. 238.

and last of these four items describe factors that have been recognized in the jurisprudence on maritime boundaries, Canada disagrees with the manner in which they have been characterized and applied in the United States Memorial.

475. Quite apart from the actual content of the four propositions set out by the United States, the Court has cautioned against any attempt to codify equitable principles as a series of universal rules. It has made clear that it is futile to interpret equitable principles in the abstract, apart from the equitable character of the solution they produce. The Court dealt with this issue in the *Tunisia-Libya Continental Shelf* case, where it suggested that, out of a broad range of principles that potentially might be applicable in theory, it is always necessary to apply a criterion of selection in order to determine which of these principles should be used for each specific delimitation. This criterion is essentially the *usefulness* of a principle for the purpose of arriving at an equitable result. As the Court said: "The principles to be indicated by the Court have to be selected according to their appropriateness for reaching an equitable result"<sup>4</sup> [*Italics added*]. It is clear, moreover, that the equitable character of the result can be assessed only in relation to the relevant circumstances of each individual case. It is presumably for this reason that the *dispositif* in the *Tunisia-Libya Continental Shelf* case listed the relevant circumstances of the case, but refrained from codifying a set of equitable principles.

476. In the Canadian view, the United States has failed to pay due heed to these precepts. It has divorced the concept of equitable principles from any appreciation of the equitable nature of the result, as it relates in a practical and concrete sense to the circumstances of the Gulf of Maine area. What is in issue here, moreover, is far more than a question of presentation or juridical logic. It is precisely through this divorce of principles and result that the United States has attempted to mask the extreme inequity of its claim to the whole of Georges Bank. And the result proposed by the United States, even judged in terms of its own conduct and the diplomatic history of the dispute, makes it clear that there are radical flaws in the manner in which it has considered the applicable law and has identified and applied the equitable principles relevant to this case.

### **Section I. Coastal Geography, Non-Encroachment, Proportionality and Natural Prolongation**

477. Subject to what has been said above, Canada is in agreement with the importance accorded to coastal geography in the first of the four "equitable principles" put forward by the United States. But there are fundamental differences in the way that Canada would define and assess the relationship of the relevant coasts and the legal consequences of this relationship.

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<sup>4</sup> *I.C.J. Reports 1982*, p. 59, para. 70.

A. THE PARTIES AGREE THAT NATURAL PROLONGATION IS  
INAPPLICABLE AS A PRINCIPLE OF DELIMITATION  
IN THE PRESENT CASE

478. The United States has asserted that there are three “subsidiary principles” that arise out of the concept of the appurtenance of maritime areas to the adjacent coastal State as an incident of its sovereignty: non-encroachment, proportionality and natural prolongation. The last of these may be dealt with most briefly, for here Canada simply reasserts the position it took in its Memorial<sup>5</sup>. In sum, natural prolongation has seldom provided a practical principle or method of delimitation of the continental shelf; and because this factor pertains to the seabed and subsoil and its physical relationship to the adjacent land mass — and not to the superjacent waters — its relevance is much further diminished in the case of a single maritime boundary. This fact is recognized by the United States Memorial<sup>6</sup>. Moreover, recent developments in the law of the sea have deprived natural prolongation of its earlier role as the sole basis of coastal State title to the continental shelf. The United States has indicated that natural prolongation may not be applicable in the present case<sup>7</sup>, and Canada’s position is that it is not a determining factor.

B. THE UNITED STATES DISTORTS THE CONCEPT OF  
NON-ENCROACHMENT

479. Non-encroachment was linked to natural prolongation in the *dispositif* of the *North Sea Continental Shelf* cases, and thus to the basis of coastal State title in respect of the continental shelf as defined by the Court in that decision<sup>8</sup>. The concept retains its fundamental importance in the case of a single maritime boundary, but its application is clearly affected by the fact that natural prolongation is no longer the primary basis of title for the combined water column and continental shelf jurisdiction to which the single maritime boundary will apply. Furthermore, the formulation of non-encroachment given in the United States Memorial is wrong even in the context of natural prolongation as the sole basis of title, and it ignores the profoundly altered context in which the doctrine must be applied to a single maritime boundary.

480. There is no support for the United States contention that non-encroachment “. . . ensures that the seaward extension of a coastal State’s jurisdiction is confined to those maritime areas that lie in front of its coasts<sup>9</sup>”. In fact, where non-encroachment is governed by natural prolongation as the sole basis of title, the doctrine simply provides that the boundary should leave to each Party as much as possible of those parts of the continental shelf that constitute its natural prolongation “without encroachment on the natural prolongation of the other”. In this context,

<sup>5</sup> *Canadian Memorial*, pp. 123-126, paras. 289-296; pp. 130-131, paras. 306-310.

<sup>6</sup> *United States Memorial*, p. 142, para. 245: “Natural prolongation, as the principle developed in regard to the continental shelf, refers to the physical extension of the land territory of a State into and under the sea. The degree of the extension is determined primarily by the physical character of the seabed.”

<sup>7</sup> *United States Memorial*, p. 201, para. 315.

<sup>8</sup> *I.C.J. Reports 1969*, pp. 46-47, para. 85; p. 53, para. 101(C)(1) *dispositif*.

<sup>9</sup> *United States Memorial*, p. 140, para. 240.

one aspect of non-encroachment is that boundaries generally should avoid extending the continental shelf of a State "in front of" and "close to" the coast of another State. Contrary to the formulation in the United States Memorial, the first of these two criteria has never been divorced from the second: the law of the continental shelf has never applied the doctrine of non-encroachment in isolation from considerations of geographical distance and scale.

481. The United States Memorial has cited the example given in paragraph 44 of the judgment in the *North Sea Continental Shelf* cases, where the use of the equidistance method in particular geographical configurations may bring about an encroachment upon a State's natural prolongation by causing the boundary to swing out laterally in front of its coast. This passage of the judgment refers back to paragraph 8, where the Court explained that the two equidistance lines, "taken conjointly", would meet "at a relatively short distance from the coast", creating a triangle that would cut off the Federal Republic of Germany from extensive areas of the continental shelf. Thus, the United States has overlooked the essential element of closeness to the coast that was inherent in the example of encroachment by "cutting off" that was discussed by the Court in 1969.

482. Closeness to the coast has been fundamental to the concept of non-encroachment from the inception of the continental shelf régime. Judge *ad hoc* Jiménez de Aréchaga in the *Tunisia-Libya Continental Shelf* case quoted a series of interventions at the 1958 Conference on the Law of the Sea, which stressed the importance of coastal State control over areas immediately off the coast<sup>10</sup> and identified the closeness of the offshore areas to the adjacent coast as the essential reason why foreign control would be intolerable. The first three interventions — by Peru, Lebanon and Brazil — refer to operations at a "short distance" from the coasts of a State.

483. While the role of closeness to the coast in the doctrine of non-encroachment is clear, the identification of the continental shelf areas that are "in front of" a coast is more open to interpretation. This is especially true where the geography is complex and not easily reduced to a series of rectilinear coastal fronts. The classic example is the Atlantic region considered in the *Anglo-French Continental Shelf* award, where the Court of Arbitration cautioned that it was important not "to mistake form for substance" in construing the geography, and held that although the British coastline was "more complex in form and less easy perhaps to define, the United Kingdom possesses a frontage upon the region which is comparable broadly in its extent with that of the French Republic"<sup>11</sup> More generally, in every case where the area to be delimited lies seaward of two States whose immediately abutting coasts are opposite each other, the area is more aptly described as lying off or adjacent to each of these coasts rather than in front of either of them. In these and similar configurations, the "closeness" aspect of the non-encroachment concept

<sup>10</sup> *I.C.J. Reports* 1982, pp. 120-121, para. 71.

<sup>11</sup> *Anglo-French Continental Shelf* award, p. 110, para. 234.

necessarily takes on the decisive role in the delimitation of continental shelf boundaries.

484. The definition of non-encroachment set forth in the United States Memorial would therefore be misconceived even if this case involved simply a continental shelf boundary governed by natural prolongation as the sole basis of title. Furthermore, the United States definition disregards the distinctive characteristics of a single maritime boundary and the fundamental importance of the distance principle in defining the basis of coastal State title. This altered context has two general implications that call for consideration in adapting the doctrine of non-encroachment to a single maritime boundary. The first implication is that because distance from the coast is the sole basis of coastal State title to a 200-mile zone (and an important element in the new definition of the continental shelf), it must also play a greater role in determining where "encroachment" upon the maritime areas adjacent to a coastal State may be said to occur. The second is that the application of the distance principle implies a radial projection of the coast in every direction in which ocean space within the prescribed distance is found. It displaces the idea of a purely frontal projection that provides the sole basis of the United States theory of non-encroachment — a theory that, in any event, distorts the law of the continental shelf and that cannot be applied to the complex geography of the Gulf of Maine area. The basis for both these propositions is set out in detail in paragraphs 564 to 576.

485. In the context of maritime zones based more upon distance from the coast than upon natural prolongation, the doctrine of non-encroachment has at least three practical applications. *First*, it continues to be the case that boundaries should be drawn so that neither Party is unduly confined or "cut off" by a boundary that improperly encroaches on the maritime areas lying close to its coast. *Secondly*, in areas of potential overlap between the 200-mile zones of neighbouring States, and in the absence of special geographical or other circumstances, non-encroachment generally precludes any State from exercising jurisdiction over sea areas that are substantially closer to another State. *Thirdly* (as will be shown in paragraphs 570 to 576), where the Parties have agreed to fix a single maritime boundary, non-encroachment weighs against the attribution to a State of areas more than 200 miles from its coast but within the 200-mile limit of another State. Such an attribution would encroach upon the potential exclusive economic zone of a coastal State in order to allow another State to exercise continental shelf rights — and those rights alone — beyond its own exclusive economic zone.

486. Non-encroachment is a general concept, not a method or technique, and respect for the concept is compatible with a variety of methods of delimitation. Distance from the coast has always been an important component of non-encroachment, and it has become far more so with the emergence of the distance principle as the primary basis of coastal State title to a combined shelf and water-column zone. There are, as the *North Sea Continental Shelf* cases pointed out, geographical configurations where the equidistance method may cause an encroachment upon the continental shelf of another State. It is equally important to bear in mind that the equidistance method is particularly apt in a

range of geographical circumstances to ensure that neither State is improperly confined or deprived of its coastal State rights by a boundary that encroaches on the maritime areas adjacent to its coast.

### C. PROPORTIONALITY IS A TEST OF EQUITY, NOT A SUBSIDIARY PRINCIPLE OF APPURTENANCE

487. A third "subsidiary principle" identified by the United States is proportionality. Again, the essential lines of the Canadian position have been set out in the Canadian Memorial and will be further developed in Part IV of this Counter-Memorial, where Canada will show that any reasonable application of the test will confirm the equitable nature of its claim. In the Canadian view, proportionality stands for a number of associated concepts. In one sense, it is a test of the equitable character of a maritime boundary that is applied by comparing the ratios between the lengths of the coastlines of the parties and the offshore areas to be divided by the boundary. In another sense, as the Court of Arbitration pointed out in the *Anglo-French Continental Shelf* award, the factor of proportionality "may also appear, and more usually does, as a factor for determining the reasonable or unreasonable — the equitable or inequitable — effects of particular geographical features or configurations upon the course of an equidistance-line boundary"<sup>12</sup>. More generally still, proportionality has a sense that transcends the purely geographical dimension and requires that the area to be allocated to each of the parties should reflect all the relevant circumstances of the case, so that the resulting entitlements are proportionate in the broadest sense of that word.

488. The idea of proportionality as a ratio between coastal lengths and offshore areas has been closely associated with the application of the doctrine of natural prolongation as the basis of title in the traditional law of the continental shelf. In the *North Sea Continental Shelf* cases, the Court noted that this form of proportionality "obviously" has "an intimate connection with the prolongation principle"<sup>13</sup>. Although it may also have a role to play in testing the equity of a single maritime boundary, that role is clearly less fundamental where title is based on a specified distance from the coast and not upon the extension seaward of the land territory of the coastal State<sup>14</sup>.

489. As the Canadian Memorial has pointed out<sup>15</sup>, the proportionality test in the first sense outlined in paragraph 487 is properly applicable in geographical situations where the extent of the relevant

<sup>12</sup> *Anglo-French Continental Shelf* award, p. 60, para. 100.

<sup>13</sup> *I.C.J. Reports 1969*, p. 31, para. 44.

<sup>14</sup> *United States Memorial*, p. 141, para. 243, footnote 3, cites S. M. Rhee in support of the proposition that the early river, lake and sea boundaries were determined on the basis of proportionality. In fact, Rhee states that proportionality was used as "... a bulwark against the impractical and illogical claim that the whole body of rivers, lakes, or arms of the sea could be used by one coastal state to the total exclusion of the other". S. M. Rhee: "Sea Boundary Delimitation Between States Before World War II." *American Journal of International Law*, Vol. 76, 1982, pp. 555-556.

<sup>15</sup> *Canadian Memorial*, p. 154, para. 371.

coasts and the limits of the relevant sea area can be determined with at least some degree of precision. Such was the case in the delimitation between the Federal Republic of Germany and Denmark and the Netherlands, where the area to be delimited was defined by agreed boundaries with third States. This also appears to have been the case in the delimitation between Tunisia and Libya, where the area to be delimited was semi-enclosed and could be defined by reference to natural features and the existing delimitation between Tunisia and Italy<sup>16</sup>.

490. The chief attraction of this form of proportionality test is that it is a *mathematical* formula and is therefore precise and objective. But for this very reason, the validity of the test is wholly dependent upon the precision and objectivity of the data used. In open-ended situations, where neither the geography nor agreed delimitations with third parties provide readily identifiable limits, the relevant offshore areas and the lengths of coastline cannot be defined in a manner that meets these requirements. In these cases, the use of numerical ratios is no longer appropriate because the determination of the limits of the relevant area is likely to be as complicated and contentious as the determination of the boundary itself. It is presumably for this reason that the Court of Arbitration in the *Anglo-French Continental Shelf* award observed that:

“In particular, this Court does not consider that the adoption in the *North Sea Continental Shelf* cases of the criterion of a reasonable degree of proportionality between the areas of continental shelf and the lengths of the coastlines means that this criterion is one for application in all cases<sup>17</sup>.”

The same factor, no doubt, also explains why this form of proportionality appears to be seldom used in State practice.

491. In the present case, the ratios between coastlines and sea areas cannot be determined by reference to objective criteria because of the open-ended nature of the area to be delimited. The differences between the Parties as to the limits of the relevant area are of the same order as their differences regarding the proper placement of the boundary. This is because (apart from the Gulf of Maine itself, which can be defined by a hypothetical line from Cape Sable to Cape Cod or Nantucket) there are no natural features defining the relevant area. The Atlantic seaboard coasts flanking the entrance points to the Gulf extend indefinitely to the northeast and southwest respectively, well outside any reasonable definition of the Gulf of Maine area.

492. The indeterminate character of both the relevant area and the areas that would be divided by any given boundary is accentuated because:

<sup>16</sup> This no doubt explains why the parties were agreed on the relevance and applicability of a proportionality test using coastline ratios in the circumstances of that case, even though they differed as to the precise extent of the coasts and sea areas that should be taken into account. *I.C.J. Reports 1982*, pp. 43-44, para. 37. In the present case, the Parties differ, not only as to the areas within which a test should be applied, but also as to the relevance and applicability of a proportionality test in this form in the particular circumstances characterizing the outer part of the Gulf of Maine area.

<sup>17</sup> *Anglo-French Continental Shelf* award, p. 60, para. 99.



- (a) the maritime boundary to be fixed by the Court is to commence almost 39 nautical miles from the terminus of the international boundary, the Parties having reserved to themselves the delimitation of the area between the terminus and Point "A"; and
- (b) the outer terminus of the line to be decided in the present proceedings represents only the first of two phases in the delimitation process governed by the Special Agreement.

(40) These difficulties are implicitly recognized by the United States: the first in the arbitrarily determined "excluded area" depicted in Figure 34 of the United States Memorial; the second in the extension of its claim far beyond the triangle so that it can meet the line used by the United States to enclose the test area to seaward.

493. Even if it were possible to determine with reasonable precision the extent of the relevant coasts in the Gulf of Maine area, this would not settle the question how to enclose the sea area, either to seaward or laterally, for the purposes of a proportionality test. Should the lateral enclosure, for example, be effected by meridians or by perpendiculars to the general direction of the coasts, and, if the latter, what is the general direction of the coast<sup>18</sup>? Because there are no natural features that serve to define the area, the construction of an artificial enclosure based on purely arbitrary limits would give a highly misleading illusion of precision. What is required in these circumstances is an assessment of the effects of particular geographical features on the course of a boundary, and a qualitative appreciation of the overall situation in relation to the result achieved by any given line.

494. Proportionality in all its forms is simply an aspect of equity. It is a test that may be applied *ex post facto* in order to determine whether a boundary determined on other principles, and by legally recognized methods, is disproportionate in its effects. The point at which the test was applied in the *Tunisia-Libya Continental Shelf* case — at the very end of the reasons given — and the very approximate correspondence of the ratios used, show clearly that this was the sense in which it was used in the factual circumstances of that case. Proportionality cannot be regarded as a method for the determination of a boundary since the number of lines capable of producing the same proportion or ratio is virtually limitless<sup>19</sup>. More fundamentally, the use of proportionality as a subsidiary principle of appurtenance, as suggested by the United States Memorial, would transform its role into an independent source of rights and "substitute for the delimitation of boundaries a distributive apportionment of shares<sup>20</sup>".

<sup>18</sup> The choice of either parallels and meridians or perpendiculars to the general direction of the coasts (and, if the latter, the general direction selected) can have a major effect upon the result of a proportionality test. If, instead of using meridians and parallels, the Court in the *Tunisia-Libya Continental Shelf* case had enclosed the test area by means of perpendiculars to the coastal fronts (used to measure the length of the coast according to its general direction), the ratios would have been decisively altered, even using the same coasts.

<sup>19</sup> *I.C.J. Reports 1982*, pp. 258-259, para. 162. Dissenting Opinion of Judge Oda.

<sup>20</sup> *Anglo-French Continental Shelf* award, pp. 60-61, para. 101.

495. In sum, the United States Memorial misconstrues the concept of proportionality in at least two important respects. *First*, it restricts the concept to its purely mathematical version based on the ratios of coastal lengths, ignoring its alternative and broader meanings. *Secondly*, it errs in characterizing proportionality as a subsidiary principle arising out of the basic relationship of appurtenance, disregarding its true function as one of a number of tests that may be applied to assess the equitable character of the result. The specific application of the proportionality test in the present case is discussed in Part IV, where it will be seen that the Canadian line meets the test of proportionality and the United States line does not.

#### D. THE UNITED STATES MEMORIAL OMITTS FUNDAMENTAL GEOGRAPHICAL FACTORS

496. There is a fundamental omission in the United States Memorial's treatment of the first of its four "equitable principles". Under this heading the United States has subsumed a variety of factors of a purely geographical or physical character. No mention is made of the dual principles of adjacency and proximity; nor of the relationship of these principles to the title of the coastal State to a continental shelf and an exclusive economic zone; nor of the human aspects of geography. The principles of adjacency and proximity are not only of fundamental relevance to title; they are central to the "non-encroachment" principle that seeks to ensure that a State is not deprived of the areas that lie off and in close proximity to its coast. Like the other principles just reviewed, the principles of adjacency and proximity provide no exact formula that must invariably be followed in the determination of a boundary. They do, however, represent critical factors that must be borne in mind in deciding whether a particular line produces a reasonable result by leaving to each State an expanse of maritime space that is appropriate in the light of all the relevant circumstances of the case. And, in focusing exclusively on physical or, more precisely, *locational* factors, the United States has ignored factors of human geography, the relevance of which is indicated by geographical and legal criteria.

#### Section II. The False Principle of "Single-State Management"

497. The United States Memorial discloses a fundamental legal error in its identification of the second and third of its "equitable principles" — relating to conservation and the avoidance of disputes — especially in the way these two so-called principles have been used to justify a monopolistic claim for the sake of the administrative convenience of "single-State management". It is beyond question that the proper conservation and management of the resources of the sea and the avoidance of international disputes are valid objectives and important rules of behaviour. But their distortion into false principles of delimitation that rule out an equitable division of the resources of the relevant area is almost perverse. The United States has misapplied two perfectly reasonable concepts to justify the most unreasonable of results. For its theory

of "single-State management" would deny to Canada — and to other coastal States similarly placed — the sovereign rights and jurisdiction flowing from the distance principle enshrined in the 1982 Convention on the Law of the Sea and in customary international law.

498. The paradox is easily explained. The fallacy in the treatment given to these two concepts is that the United States has got its reasoning backwards. The principles of conservation and conflict avoidance are principles of international cooperation that presuppose shared, common interests; they are anything but principles of exclusive appropriation and control. These principles are in fact the very opposite of what the United States has made them in its argument: a thinly disguised pretext for an exclusive claim so extensive that it rules out not only the need but even the possibility of such cooperation between States on a basis of sovereign equality.

499. Canada has long been a proponent of coastal State management of fishery resources but finds it impossible to reconcile this concept, as embodied in the 1982 Convention on the Law of the Sea, with the quite different conception advanced in the United States Memorial. Coastal State management is an objective that must often be realized by bilateral or regional cooperation between two or more States with a mutual interest in a transboundary or migratory fishery resource. It is wholly extraneous to the delimitation of sovereign rights or jurisdiction between opposite or adjacent coastal States.

500. In appearance, the United States has proposed conservation and management and the prevention of international disputes as two separate principles. Properly conceived, they are indeed independent. As employed in the United States Memorial, however, they are simply two different ways of rationalizing the single objective that carries the label of "single-State management". But "management" is too innocuous a word. The State that has the right to manage the resources of the exclusive economic zone has also the exclusive right to exploit these resources, subject only to limited exceptions. Single-State management, in practical effect, means single-State access to the economic benefit of the resources in question. It is a euphemism for monopoly, and so too are the twin supporting principles of conservation and dispute prevention as they are used in the United States argument. They are wolves in sheep's clothing. They must not be allowed to obscure the real issue or the practical result they actually stand for in the present case.

#### A. THE UNITED STATES MISAPPLIES THE PRINCIPLE OF CONSERVATION

501. The first of these two concepts, the conservation and management of resources, is misconceived in its application to maritime boundaries for the simple reason that the law provides a quite different solution to the problem of shared natural resources. Yet even if this were not the case, the inference drawn by the United States would be highly suspect. The United States Memorial contends that "the delimitation of

a single maritime boundary should avoid, whenever possible, dividing between two governments the responsibility for conserving and managing a resource<sup>21</sup>". This assertion can only mean that the resources themselves should not be divided between neighbouring States where this can be avoided. In Canada's submission, the requirement of an equitable result is utterly incompatible with this proposition. The principle advocated here by the United States means nothing less than this: that in every case where the boundary zone is dominated by a single resource area of whatever kind — a fishing bank, a sedimentary basin, or a hydrocarbon reservoir — that area should be allotted in its entirety to one or other of the parties and should never be divided between them. Canada submits that so extraordinary a result cannot be contemplated by the law.

502. In fact, the law draws a completely different inference from the need to manage and conserve the natural resources of the relevant area. Instead of holding that these resources should not be divided among the parties, contemporary international law simply assumes the existence of transboundary natural resources and prescribes international cooperation in their management.

### *1. The Conservation of Continental Shelf Resources*

503. The United States has invoked "the principle of conservation" in connection with both the continental shelf and the living resources of the superjacent waters. The Court considered this matter as it applies to the continental shelf in certain passages of its judgment in the *North Sea Continental Shelf* cases, and in Canada's view the approach advocated by the United States is at odds with the findings of the Court. Paragraph 97 of the judgment reads as follows in its entirety:

"97. Another factor to be taken into consideration in the delimitation of areas of continental shelf as between adjacent States is the unity of any deposits. The natural resources of the subsoil of the sea in those parts which consist of continental shelf are the very object of the legal régime established subsequent to the Truman Proclamation. *Yet it frequently occurs that the same deposit lies on both sides of the line dividing a continental shelf between two States*, and since it is possible to exploit such a deposit from either side, a problem immediately arises on account of the risk of prejudicial or wasteful exploitation by one or other of the States concerned. To look no farther than the North Sea, the practice of States shows how this problem has been dealt with, and all that is needed is to refer to the undertakings entered into by the coastal States of that sea with a view to ensuring the most efficient exploitation or the apportionment of the products extracted — (see in particular the agreement of 10 March 1965 between the United Kingdom and Norway, Article 4; the agreement of 6 October 1965 between the Netherlands and the United Kingdom relating to 'the exploitation of single geological structures extending across the

<sup>21</sup> *United States Memorial*, p. 142, para. 247.

dividing line on the continental shelf under the North Sea'; and the agreement of 14 May 1962 between the Federal Republic and the Netherlands concerning a joint plan for exploiting the natural resources underlying the area of the Ems Estuary where the frontier between the two States has not been finally delimited.) *The Court does not consider that unity of deposit constitutes anything more than a factual element which it is reasonable to take into consideration in the course of the negotiations for a delimitation. The Parties are fully aware of the existence of the problem as also of the possible ways of solving it*<sup>22</sup>.” [*Italics added.*]

Clearly, the Court was not suggesting that a whole deposit — or to bring the matter into closer analogy with what the United States is saying about Georges Bank, an entire fishing ground or a sedimentary basin — should go to only one party in an undivided condition. The words of the Court clearly show that more equitable solutions were contemplated, and that intention is put beyond doubt in the examples from regional State practice given by the Court in this passage. The Court did not deal with the “unity of deposits” issue in the *dispositif*, except to refer to the possibility of a régime of “joint jurisdiction, user, or exploitation for the zones of overlap or any part of them<sup>23</sup>”. At no point was it referred to as a factor relevant to the fixing of a maritime boundary.

504. The separate opinion of Judge Jessup attached great importance to the principle of international cooperation in the exploitation of a natural resource in connection with continental shelf boundary problems. Indeed, the concluding passages of his opinion are devoted entirely to this issue. In part, his remarks read as follows:

“Therefore, while, as the Court states, the principle of joint exploitation is particularly appropriate in cases involving the principle of the unity of a deposit, it may have a wider application in agreements reached by the Parties concerning the still undelimited but potentially overlapping areas of the continental shelf which have been in dispute.

Nor is it irrelevant to recall that the principle of international co-operation in the exploitation of a natural resource is well established in other international practice. The Federal Republic invoked the Helsinki Rules of the International Law Association concerning the sharing of the waters of a river basin traversing or bordering more than one State. Whether or not those Rules are the most accurate statement of the existing international law, as to which I express no opinion, there are numerous examples of co-operative use and of sharing of fluvial resources. The history of ocean fisheries is full of examples of co-operative agreements<sup>24</sup> . . .”

Judge Jessup went on to give a wide variety of examples from State practice — including transboundary cooperation within the United

<sup>22</sup> *I.C.J. Reports 1969*, pp. 51-52, para. 97.

<sup>23</sup> *I.C.J. Reports 1969*, p. 53, para. 101(C)(2).

<sup>24</sup> *I.C.J. Reports 1969*, pp. 82-83.

States itself — that show the principle of cooperation in play not only at the stage of dividing up the proceeds of a resource, but also in connection with conservation and management at both the exploration and exploitation phases.

505. Recent State practice is even more decisive. It is now a firmly settled practice that agreements delimiting the continental shelf include stipulations requiring some form of cooperation in the management and exploitation of transboundary oil and gas deposits<sup>25</sup>. One commentator has concluded that the practice of seeking agreement on the cooperative management of common oil and gas deposits on the continental shelf “is not mere usage but has given rise to a customary rule of current international law”, by reason of the extent and uniformity of recent State practice and the *opinio juris* confirming its normative character<sup>26</sup>.

506. In sum, the law of continental shelf boundaries completely discredits the United States claim that the boundary should be drawn so as to avoid dividing an offshore resource area or pool. Whatever the precise meaning of the concept of “unity of deposits”, it clearly does not stand for the proposition that continental shelf boundaries are to be so drawn that the resources are allocated to only one of the adjacent States. As equity and common sense require, the law points instead toward a duty of international cooperation that assumes the existence of transboundary resources.

## 2. Fisheries Conservation

507. The above propositions regarding unity of deposits in a continental shelf delimitation hold equally true for a fishing zone delimitation — if anything, more so, because of the free-swimming character of many of the species and the mobility of the vessels pursuing them. While there have been no judicial decisions on fishing zone boundaries between opposite or adjacent States beyond the territorial sea, State practice — both regional and global — repudiates the United States principles in two distinct ways. *First*, State practice shows that it has never been a concern of boundary-makers to avoid the division of extensive fishing grounds or “ecological régimes”, and that in many situations such a principle would produce anomalous and inequitable results. *Secondly*, international practice in the field of fisheries provides a model — probably the classical model — of cooperation between States in the management of shared natural resources. Contrary to what the United States has argued in its Memorial<sup>27</sup>, international cooperation in fisheries

<sup>25</sup> R. Lagoni: “Oil and Gas Deposits across National Frontiers.” *American Journal of International Law*, Vol. 73, 1979, p. 215. Lagoni dismisses H. V. Mouton’s suggestion that a continental shelf boundary should not cross an oil pool as unsupported by either of the sources cited: (a) a memorandum on the régime of the high seas prepared by the United Nations Secretariat in 1950; and, (b) the *Grisbadarna* award. See also I. Brownlie: “Legal Status of Natural Resources in International Law (Some Aspects).” *Recueil des Cours*, Tome IV, 1978, pp. 249-314, at p. 289 ff.

<sup>26</sup> R. Lagoni: “Oil and Gas Deposits”, p. 241.

<sup>27</sup> *United States Memorial*, pp. 117-120, paras. 189-192.

management presents anything but a record of unredeemed failure. The inadequacies of fisheries management in the years preceding the creation of 200-mile zones arose from the basic jurisdictional framework of the high seas, which had ceased to reflect modern conditions and the intensification of fishing that resulted from these conditions. The problem was one of unlimited access to a finite resource, combined with a deficient regulatory and enforcement framework, and not international cooperation as such.

508. The entire United States argument on this issue is based upon a misplaced analogy. There is no valid comparison between multilateral control of a high seas fishery — involving, in the case of ICNAF, as many as 17 States — and bilateral cooperation between two coastal States in the management of a transboundary fishery resource. Not only is bilateral cooperation simplified by the number of parties involved, but there is also a community of interest between coastal States that makes their differences far easier to reconcile than the deeply rooted conflicts between distant-water and coastal States in the years before extension of jurisdiction. Today, the effectiveness of cooperative measures by the coastal States concerned is ensured by their full regulatory and enforcement authority within the exclusive economic zone. Their decisions will no longer be frustrated by the old *laissez-faire* régime of the high seas.

509. It is by no means self-evident that “single-State management” must be more effective than bilateral cooperation within the regulatory and jurisdictional framework of the exclusive economic zone or fishing zone. Again, experience shows that the opposite is often true. The participation of two countries can upgrade both the quantity and quality of the scientific research and knowledge that is applied to the conservation of the resource; it subjects decisions to a more thorough scrutiny before they are finally adopted; and the give-and-take of consultations between the professional experts of two national administrations can result in a more balanced course of action than one that is decided alone. The objective of managing a single stock or group of stocks as a unit throughout its range is a valid concern of scientific fisheries managers, but it does not follow that this concept can be equated with “single-State management”. It is rather an objective that States must take into account in collaborating in the management of natural resources of mutual concern.

510. The United States contention that its theory of “single-State management” was “a primary basis” for the extension of fisheries jurisdiction is an oversimplification and a distortion<sup>28</sup>. The essential purpose of the extended zones lies in coastal State dependence on the resources of the waters adjacent to the coast, with the twofold implication that coastal States have the greatest incentive to husband these resources and that they are entitled in equity to at least a preferential share — a share now defined in the 1982 Convention on the Law of the Sea as being determined by their harvesting capacity. The point is well made in the

<sup>28</sup> *United States Memorial*, p. 143, para. 250; also pp. 119-120, paras. 191-192.

joint separate opinion in the *Fisheries Jurisdiction* cases, in the context of a discussion of changing views on the extent to which coastal State fisheries jurisdiction might properly be asserted:

“In this respect, economic studies on fisheries have shown that the principle of open and unrestricted access to coastal waters inevitably results in physical and economic waste, since there is no incentive for restraint in the interest of future returns: anything left in adjacent waters for tomorrow may be taken by others today. While the better-equipped States can freely move their fleets to other grounds as soon as the fishing operations become uneconomical, the coastal States, with less mobile fleets, maintain the greatest interest in ensuring that the resources near their own coasts are not depleted<sup>29</sup>.”

At the same time, of course, the geographical proximity of the coastal States gives them the capacity to keep the resources under surveillance and to enforce the necessary conservation measures effectively and economically.

511. The “equitable principles” advanced by the United States are defective in their failure to give any recognition to this factor of present and future economic dependence — the main reason why the extension of coastal State fisheries jurisdiction was adopted and accepted in the first place. Indeed, since the United States principles are specifically and deliberately designed to exclude a neighbouring coastal State from an area in which its coastal communities have a vested economic interest and on which they depend — an area that lies in closest proximity to that coastal State and deep within its 200-mile fishing limit — it is clear that these principles are in disharmony with the fundamental rationale of the exclusive economic zone itself.

512. The object of extended fisheries jurisdiction, in sum, was management by the coastal States in the light of their enduring dependence on the resources and their geographical proximity, and not “single-State management” as such. There is nothing in this objective in any way inconsistent with bilateral or regional cooperation by coastal States to ensure the conservation of transboundary fishery resources, and the new Convention on the Law of the Sea expressly contemplates such cooperative arrangements. What the United States Memorial ignores is that the whole purpose of managing and conserving the living resources of the sea is an economic one — to secure the long-term abundance of the resource in order to protect both the interests of the consumers and the livelihood of the producers. Managerial efficiency is intended to serve these broad considerations of economic and social equity. It is not an end in itself.

513. The exclusive economic zone is a spatial concept, based upon the criterion of distance from the coast and not upon the physical distribution of fishery resources or of any category of resources. Early in the preliminary discussions leading up to the Conference on the Law of the Sea, consideration was given to proposals that would have linked coastal

<sup>29</sup> *I.C.J. Reports 1974*, pp. 48-49, para. 13.



State jurisdiction over fishery resources to biological factors related to the distribution of broad categories of stocks. The important point, however, is that the conference eventually opted for a different basis of jurisdiction, one founded upon a politically determined distance from the coast. As a result, the international consensus on fisheries jurisdiction within the 200-mile limit is one that favours the simplicity of a uniform distance from the coast over the complexity of biological criteria. The recent evolution of the principles of coastal State jurisdiction over fisheries completely undercuts the premises of the United States argument that "single-State management" determined in accordance with biological criteria is a "primary basis for the extension of coastal State fisheries jurisdiction to 200 nautical miles from the coast"<sup>30</sup>.

514. The provisions of the 1982 Convention on the Law of the Sea contradict the tenor of the United States argument even more plainly. Paragraph 1 of Article 63 provides specifically for the case of transboundary stocks, as follows:

"1. Where the same stock or stocks of associated species occur within the exclusive economic zones of two or more coastal States, these States shall seek, either directly or through appropriate subregional or regional organizations, to agree upon the measures necessary to co-ordinate and ensure the conservation and development of such stocks without prejudice to the other provisions of this Part."

Furthermore, Article 61, paragraph 2, provides for cooperation between the coastal State and competent international organizations, "whether subregional, regional or global". The philosophy of the convention could not be more clear: it calls for coastal State management within the 200-mile limit but prescribes cooperation between coastal States in the management of transboundary resources. There is no support here for a principle of delimitation that rules out the division of resources so that their control can be given to a single country at the expense of neighbouring coastal States, in order to avoid the need — and the legal obligation — to cooperate with such neighbours.

515. Contrary to the assertions of the United States, the provisions of the 1982 Convention on the Law of the Sea regarding anadromous and catadromous species do not support its "single-State management" theory. What these provisions actually demonstrate is that it is unrealistic to conceive of the exclusive economic zone as a spatial unit that can be made to correspond to the biological distribution of fish stocks. Even where the boundaries of the zone might be made to conform to the range of a few stocks, others — like the anadromous stocks of salmon that constitute one of the important fishery resources of the Gulf of Maine area — invariably exhibit patterns of distribution that bear no conceivable resemblance to the configuration of the zone. The solution adopted in the convention, therefore, envisages a completely different approach to the management of these species by laying down a framework for international cooperation. The relevant provisions of the

<sup>30</sup> *United States Memorial*, p. 143, para. 250.

articles on anadromous and catadromous species are matched by similar provisions in the articles on highly migratory species, on marine mammals, and — most important of all — on fishery resources shared between the exclusive economic zones of neighbouring States. Clearly, the whole pattern of the convention discloses an underlying principle of cooperation that is fundamentally at odds with the monopolistic principles espoused by the United States for the Gulf of Maine area — and quite inconsistent with United States views on cooperation respecting salmon and tuna resources. These provisions demonstrate, as well, a recognition that biological realities and politically determined spatial units can never really be made to coincide.

516. In seeking to substitute delimitation for cooperation as the proper solution to the question of natural resources in which two countries have a shared interest, the United States Memorial has quoted from a Government of Canada "Working Paper on the Management of the Living Resources of the Sea", submitted to the Seabed Committee in 1972<sup>31</sup>. In fact, the working paper gives no support whatever to the United States position on "single-State management". On the contrary, it recognized the futility of such an approach and expressly endorsed continued international cooperation in this field. The concluding sentences of the paper read in part as follows:

" . . . In more general terms, international fishery commissions, established on a regional basis and comprising both coastal and distant-water fishing states, could provide a forum for cooperation and consultation . . . Similarly, particular forms of consultation and cooperation might be instituted, with or without the establishment of a formal commission, in cases where particular stocks of coastal species fall under the management authority of two or more neighbouring coastal states<sup>32</sup>." [Italics added.]

517. Not only are the United States principles inequitable; despite their surface appeal to managerial efficiency, they are unworkable as well. Paragraphs 200-226 have shown why they cannot be applied successfully in the Gulf of Maine area. But the United States has claimed a general applicability for its principle of "single-State management", and some consideration must therefore be given to how the principle might work in other geographical situations. North America is unusual in that it comprises only a few large countries with very long

<sup>31</sup> "Working Paper on Management of the Living Resources of the Sea", submitted by Canada; in *Report of the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor Beyond the Limits of National Jurisdiction*, pp. 164-174. A statement at the beginning of the document, to which the United States Memorial has omitted any reference, says: "This working paper is submitted by the delegation of Canada for discussion purposes, and does not necessarily reflect the final definitive views of the Canadian Government."

<sup>32</sup> The *United States Memorial*, pp. 119-120, para. 192, and footnote 5, has also referred to another working paper submitted by Canada and Argentina during the late stages of the conference in 1980, on the question of stocks of fish that "straddle" the 200-mile limit. Again, however, the United States has misconstrued the document, as the paper is based upon the premise that jurisdiction over these stocks would be divided by the 200-mile limit and it envisages a pressing need for cooperation between the coastal State and the States engaged in fishing beyond that limit.

coasts. In many areas of the world where the political geography is more complex and typified by much shorter segments of national coastline, the inherent impossibility of forcing offshore boundaries into a biological mould is more obvious still. In these situations, any biological or ecological units that might be identified would normally bear no conceivable resemblance to an allocation of maritime space that could be considered legally admissible on other grounds [Figures 39 and 40].

518. The internal practice of the United States has conspicuously ignored its own unitary management theory; so much so, indeed, that it is abundantly clear that the whole notion is nothing more than an *ex post facto* rationalization of a claim that seeks to appropriate the whole Georges Bank fishery to the exclusive benefit of the United States. As was noted in paragraphs 230-233, the United States legislation creating the 200-mile zone separates the intensive inshore segment of the coastal fisheries from the management of the same stocks further offshore, preserving state authority over fisheries in territorial waters<sup>33</sup>. The management of the fishery is also fragmented by dividing federal authority over the offshore fisheries among the various Regional Fishery Management Councils. The boundaries dividing the "geographical areas of authority between adjacent Councils", as prescribed pursuant to the Act<sup>34</sup>, fail to correspond to "ecological régimes", fishing banks or physical features in any way resembling those argued by the United States to constitute relevant circumstances in the present case<sup>35</sup>. The National Marine Fisheries Service has itself recognized that the framework of United States fishery legislation makes a high degree of interjurisdictional cooperation inevitable<sup>36</sup>. It is surely unreasonable for the United States to ask the Court to endorse an illusory objective that the United States has never even attempted to recognize or pursue in its own domestic arrangements. It is all the more unreasonable when the principle is one whose internal logic is guaranteed to bring about an inequitable distribution of resources.

519. These factors have never been considered judicially in the context of a fisheries boundary. However, there are indications in the law that support the view that cooperation, not a monopolistic delimitation, is the appropriate legal response to situations where more than one country has a legitimate interest in a fishery resource. The passage quoted above from the separate opinion of Judge Jessup in the *North Sea Continental Shelf* case noted that the "history of ocean fisheries is

<sup>33</sup> 16 United States Code, sec. 1811. *United States Memorial, Annexes*, Vol. I, Annex 8.

<sup>34</sup> 16 United States Code, sec. 1854(f)(2). *United States Memorial, Annexes*, Vol. I, Annex 8.

<sup>35</sup> 50 Code of Federal Regulations, sec. 601.12(a). The line dividing the area of the New England Council from that of the Mid-Atlantic Council, for example, extends in a straight line from the Connecticut-Rhode Island boundary terminus in a southeasterly direction to the point of intersection with the 200-mile limit. As described in the Code of Federal Regulations, this line represents the extension seaward of a line constituting an agreed inter-state maritime boundary in territorial waters, to which the United States Congress assented in 1944. The inter-council boundaries between the Mid-Atlantic and the South Atlantic councils, and between the South Atlantic and the Gulf of Mexico councils, are due-east lines; in each case, the line simply extends an inshore political boundary determined for other purposes.

<sup>36</sup> See paras. 230-233.

full of examples of co-operative agreements<sup>37</sup>". The need for cooperation received a more concrete expression in the *Fisheries Jurisdiction* cases, especially in paragraph 4(e) of the *dispositif* of the judgment on the merits and in the following passage:

"... both States have an obligation to take full account of each other's rights and of any fishery conservation measures the necessity of which is shown to exist in those waters. It is one of the advances in maritime international law, resulting from the intensification of fishing, that the former *laissez-faire* treatment of the living resources of the sea in the high seas has been replaced by a recognition of a duty to have due regard to the rights of other States and the needs of conservation for the benefit of all. Consequently, both Parties have the obligation to keep under review the fishery resources in the disputed waters and to examine together, in the light of scientific and other available information, the measures required for the conservation and development, and equitable exploitation, of those resources<sup>38</sup> . . ."

Although the pitfalls of international fisheries management (as they then were) were drawn to the attention of the Court<sup>39</sup>, it adopted a solution that reflects the need for cooperation in the light of the shared nature of the resource. From the established economic dependence of the United Kingdom and the Federal Republic of Germany and the special dependence of Iceland, the Court deduced an obligation to negotiate in good faith for an equitable solution<sup>40</sup>. Certainly this pronouncement refers particularly to the high-seas fisheries; but a 200-mile fishing zone, formerly subject to the high-seas freedom of fishing, would seem to be in like case as between the two coastal States concerned.

520. While the need was recognized long before the extension of fisheries jurisdiction, this recent development has made bilateral and regional cooperation in fisheries management far more workable and effective. A recent commentary on the fisheries provisions of the new Convention on the Law of the Sea confirms both the necessity and the greater practicability of such cooperation under the new régime:

"Comme on l'a souligné au début de cet article, la mobilité et l'interdépendance de la plupart des ressources biologiques exigent que leur gestion soit assurée sur la base d'arrangements entre les États directement intéressés. Ces derniers ne seront généralement pas très nombreux et il sera facile de les identifier une fois que la distribution et les migrations des stocks seront connues. Réaliser un accord entre un nombre déterminé et limité de participants sera probablement plus aisé que dans le cadre du régime antérieur de

<sup>37</sup> See para. 504.

<sup>38</sup> *I.C.J. Reports 1974*, p. 31, para. 72. See also pp. 34-35, para. 79(4)(e); pp. 200-201, para. 64; pp. 205-206, para. 77(4)(e).

<sup>39</sup> *Fisheries Jurisdiction in Iceland*, Icelandic Ministry of Foreign Affairs, February 1972, in *Pleadings, Annex H, Fisheries Jurisdiction* case, Vol. I, pp. 28 and 37.

<sup>40</sup> *I.C.J. Reports 1974*, pp. 29-31, paras. 66-72; pp. 34-35, para. 79; pp. 197-201, paras. 58-64; pp. 205-206, para. 77.

zones de juridiction nationale étroite et de liberté d'accès aux pêcheries situées au-delà de ces zones<sup>41</sup>."

### 3. *General International Law on Shared or Transboundary Resources*

521. In addition to the sources of law that are specifically applicable to the continental shelf and fishery resources, there are analogies to be drawn from other areas of the law. Judge Dillard, in his separate opinion in the *Fisheries Jurisdiction* case, stressed the general relevance of the principle of cooperation in the management of shared natural resources:

"It would be tedious and unnecessary to extend this discussion by referring to analogous problems in areas other than fisheries. Yet, I cannot forbear calling attention to Judge Jessup's observations in his separate opinion in the *North Sea Continental Shelf* cases in which he alluded to the principle, fortified by State practice, of the need for international co-operation in the exploitation of a 'natural' resource common to more than one State<sup>42</sup>."

522. Recent developments in international environmental law have stressed the interdependence of States in the effective management of the shared resources that compose the human environment. Principle 24 of the Stockholm Declaration on the Human Environment calls for international cooperation in the protection and improvement of the environment<sup>43</sup>. Recommendation 37 in the accompanying Action Plan for the Human Environment exhorts States to cooperate in the management of neighbouring and contiguous areas — and cites fishery regulations as one of the subjects on which agreements should be reached<sup>44</sup>. This principle is reconfirmed in General Assembly Resolution 3129 (XXVIII) of 1973 on "Cooperation in the field of the environment concerning natural resources shared by two or more States", as it is by Article 3 of the Charter of Economic Rights and Duties of States adopted by General Assembly Resolution 3281 (XXIX) of 1974<sup>45</sup>.

<sup>41</sup> J. E. Carroz: "Les problèmes de la pêche à la Conférence sur le droit de la mer et dans la pratique des Etats." *Revue Générale de Droit International Public*, n° 84, 1980, pp. 705 and 717. See *Counter-Memorial, Annexes*, Vol. V, Annex 106 for the Table "Summary Information on Marine Fishery Bodies" prepared by J. E. Carroz, Secretary-General, FAO World Conference on Fisheries Management and Development, 1982.

<sup>42</sup> *I.C.J. Reports 1974*, p. 70.

<sup>43</sup> *Report of the United Nations Conference on the Human Environment*, Doc. A/CONF.48/14, 1972.

<sup>44</sup> *Report of the United Nations Conference on the Human Environment*, pp. 6 and 13.

<sup>45</sup> Other important examples of the consensus on the principle of cooperation regarding shared natural resources include: the Draft Principles prepared by the United Nations Environment Programme International Working Group of Experts on Natural Resources Shared by Two or More States. UNEP G.C. Decision 6/14, 19 May 1978. United Nations, *Official Records of the 33rd Session of the General Assembly*, Doc. Supp. No. 25(A/33/25) 1978, pp. 154-155; Organization for Economic Co-operation and Development, Declaration on Environmental Policy OECD — Press Release A(74)47 (1974). Economic Declaration of Algiers, *Report of the Economic and Social Council*, Doc. A/9330 (1973), p. 72.

523. An equally apt analogy may be found in the international law of rivers. Although the concept of the drainage basin and its physical unity has been taken into account by jurists, they have never inferred that territorial boundaries should be made to reflect this unity<sup>46</sup>. At one time the United States held to a theory known as the "Harmon Doctrine", which allowed the upstream State to consume an unlimited quantity of the waters of an international river at the expense of its downstream neighbours. In its monopolistic character, and in its repudiation of the concept of an equitable division of the resource, the doctrine resembles the principles advanced by the United States in the present case. But the Harmon Doctrine has long since passed into legal oblivion; and today, as Professor D. P. O'Connell has said:

"Community and not particularity of interest is thus the object selected by the law in its effort to reconcile the need for economic utilisation of river resources with the requirement of equal distribution of those resources among the various riparians<sup>47</sup>."

This community of interest necessarily points toward international cooperation in the management of shared water resources.

524. What these developments show is that, even on land, States can no longer be thought of as physically self-contained units where the management of resources can remain the exclusive concern of a single national administration. It follows, *a fortiori*, that in the far less controlled environment of the oceans, the attempt to create enclosures where resource management responsibilities can be neatly and rigidly divided between separate States is doomed to failure from the start. Nature is too complex to be made to conform to the simplicity of a jurisdictional line. Nor for that matter can it be assumed that scientific knowledge of the marine environment is so fully and finally developed that the limits of particular "ecological régimes" could be identified with any real confidence. Even if the notion of "single-State management" were not inherently biased towards inequity and inequality, the principle could not be made to work.

<sup>46</sup> Perhaps the most authoritative attempt to synthesize the law of international rivers is found in the Helsinki Rules on the Uses of Waters of International Rivers, adopted by the International Law Association in 1966, *Report of the 52nd Conference*, pp. 477-533. The key principle of the Rules is found in Article IV, which provides that each basin State is entitled to "a reasonable and equitable share of the beneficial uses" of the waters of the basin.

<sup>47</sup> D. P. O'Connell: *International Law*. London, Stevens, 1970, Vol. 1, p. 559. The need for international cooperation is specifically recognized in Recommendations 84 and 90 of the "Mar del Plata Action Plan", adopted by the United Nations Water Conference. *Report of the United Nations Water Conference*, Doc. E/CONF. 70/29 (1977). The ongoing work of the I.L.C. on the Law of the Non-navigational Uses of International Watercourses reflects the same concerns. A United States representative has expressed strong support for the manner in which the Commission developed the concept of shared natural resources. *Official Records of the General Assembly, Sixth Committee*, Summary Record of the 56th Meeting, 20 November 1980. Doc. A/C.6/35 SR.56.

## B. THE UNITED STATES MISUSES THE GENERAL INTEREST IN DISPUTE PREVENTION

### 1. *A Prescription for Inequity and Conflict*

525. The "principle of conservation" figures prominently in the United States catalogue of equitable principles; but an even weaker prop for its theory of single-State management on Georges Bank is its proposition that the boundary "should minimize the potential for international disputes". The inference the United States has attempted to draw from this concept is that natural resources should not be divided between the interested parties; that where possible they should be allotted to only one of the two sides, for then there can be no differences about how they should be managed and exploited. Thus, the United States concludes that the potential for disputes will be minimized "if responsibility for protection of the entire regime is vested in a single State"<sup>48</sup>.

526. It is difficult to imagine an approach to delimitation more likely to lead to international conflict. The United States formula is a prescription for an inequitable division of resources, one that is inherently biased toward a profound inequality in the entitlements of the respective parties. It points in the direction of monopoly and can never be reconciled with the requirements of equity. If implemented, it would create deep imbalances in the rights of States and the prosperity of their populations that would inevitably lead to friction, bitterness and long-term political disequilibrium. Such an approach, were it to be endorsed and applied in the manner suggested by the United States, would frustrate the peaceful settlement of disputes concerning undetermined maritime boundaries, whether by negotiation or adjudication; for if the crucial resources or resource area in issue must go to only one of the two sides, the prospect of a mutually acceptable outcome would be effectively ruled out from the start.

527. The United States Memorial contends that if a boundary divides a fishery, there will be international disputes on the conservation and allocation of resources; there may be "Differences in scientific opinion, incompatible management objectives and techniques, and conflicting enforcement strategies"<sup>49</sup>. This argument confuses the normal incidents of political intercourse between sovereign and equal States with an unhealthy sort of "international discord" that ought to be prevented. Surely, however, the two are of an entirely different order. The kind of international discord that arises from deep inequality or injustice is clearly something to be avoided; but the accommodation of reconcilable interests through ordinary, day-to-day diplomacy is a normal phenomenon in a world of increasing political and economic interdependence.

528. The machinery in Canada and the United States for the bilateral resolution of differences and problems in dozens of technical spheres is highly developed. Paragraphs 234-245 have shown that the fishery is one field where the two countries have established a

<sup>48</sup> *United States Memorial*, p. 144, para. 255.

<sup>49</sup> *United States Memorial*, pp. 143-144, para. 253.

particularly impressive record of technical cooperation. The use of this bilateral machinery is a routine part of the everyday business of government, and, generally speaking, it works well, even without recourse to the diplomatic or political level. Such interaction is the material of a sound political relationship. It could only be eliminated or significantly reduced in a world far less characterized by interdependence, or in a context of political subjection or radical inequality. There may indeed be differences from time to time about quotas and regulations, about scientific judgments and the optimal use of the shared resources of Georges Bank. There have been differences in the past and there could well be more in the future, here and in other boundary areas off the coasts of Canada and the United States. Most can be settled by the technical experts; a few will require diplomacy or occasionally an intervention at the political level. There is nothing to be feared in all of this. It is an inevitable consequence of the sharing of the North American continent.

## 2. Reliance upon False Analogies

529. The whole United States argument respecting the use of "natural features" in the determination of maritime boundaries is based on a false analogy to the case of land boundaries — a false analogy and a misconception. S. Whittemore Boggs, the eminent American geographer, has pointed out that even on land the expression "natural boundary" is something of a misnomer. The decision to use a natural feature as a boundary is always one that is based upon political factors:

"Simply because a line is marked by nature does not necessarily imply that it is a 'natural' thing to utilize it for boundary purposes or that it may constitute a desirable or 'natural' line of separation between neighbouring peoples. A political scientist has remarked that a 'natural boundary' becomes simply that natural feature somewhere beyond a state's present political boundary to which its leaders would like to expand<sup>50</sup>."

Boggs goes on to point out that Lapradelle in *La Frontière* says that "in our day there are no longer any except artificial boundaries<sup>51</sup>".

530. The United States has offered two examples of arbitrated land boundaries that, it claims, support its "dispute prevention" theory<sup>52</sup>. Yet, in both the *Island of Timor* and the *British Guiana* cases the decisions were influenced primarily by the objective of effecting an equitable division of the territory, coupled with the special circumstances arising from its remote and unexplored character<sup>53</sup>. The watershed portion of the boundary resulting from each of these awards formed only a single

<sup>50</sup> S. W. Boggs: *International Boundaries — A Study of Boundary Functions and Problems*. New York, Columbia University Press, 1940, pp. 22-23; *Counter-Memorial, Annexes*, Vol. V, Annex 107.

<sup>51</sup> S. W. Boggs: *International Boundaries*, p. 23; *Counter-Memorial, Annexes*, Vol. V, Annex 107.

<sup>52</sup> *United States Memorial*, pp. 144-145, para. 256 and p. 145, footnote 1.

<sup>53</sup> The *British Guiana* award was based largely upon principles of effective occupation.



sector of a far more extensive boundary based primarily upon thalwegs — upon the *division* of an important geographical feature, contrary to the principles of the United States Memorial. Similarly, the sole arbitrator in the *Walfish Bay Boundary* case of 1911 took account of the fact that the grazing patterns of one group of local inhabitants did not extend to the “plateau” in issue — a factor that argues against the United States claim to the whole of an area where Canada has one of its major fishing grounds. The plain fact is that neither of the land boundary cases cited by the United States actually supports its position, and indeed both of them are entirely inconsistent with the assertion by the United States that these arbitrations adopted watershed or summit lines “in recognition of their advantages in separating human activities<sup>54</sup>”.

531. These considerations aside, the underlying analogy is a false one because in virtually every case where natural features have been used to determine a land boundary, this choice has been prompted by functional considerations that have no counterpart at sea. A mountain range might be chosen because it is conspicuous; but today’s fishermen and mariners can easily and precisely fix their positions in relation to any sort of boundary. A desert or a mountain range may divide ethnic populations; it may serve as a natural partition that will help to keep the peace and strengthen national security; it may reflect established economic patterns or serve as what has been called a “natural barrier to trade”; a lake or a major waterway may serve as a major artery of trade and communication and, on these and other grounds, call for an equitable division between nations. None of this has any application to the maritime domain. The most salient feature of the sea is that it is generally featureless and serves as a medium of unimpeded communication. It has no natural barriers.

532. There are, of course, cases where a “summit” or watershed line has been selected as the most convenient method in all the circumstances. More typical, however, are those cases where a major river system or drainage basin is shared by two or more States — the Danube, the Rhine, the Nile, the Ganges, to name a few of the best-known examples. If a single dominant trend can be discerned in the boundary practice of States respecting inland waterways and river systems, it lies in the direction of equitable division rather than exclusive appropriation. This, of course, is the underlying rationale of the *medium filum aquae* rule, as it is of the thalweg in the case of a navigable river. Where the most important economic benefit offered by a river lies in its function as a channel of communication — in other words, where the real economic issue is navigation — the purpose of the thalweg is to ensure that this benefit is shared equally by the riparian States. The thalweg functions, in other words, as a rule of equitable division.

<sup>54</sup> In the *Island of Timor* case, the sole arbitrator decided to disregard human activities and held that the partition of a nomadic tribe was not a relevant consideration. In the *Turkey-Armenia* award, President Wilson stated in his covering letter that “consideration of a healthy economic life for the future state of Armenia should be decisive”. President Wilson’s award was based upon the primacy of economic, commercial, and trade relations. Where the boundary followed natural features, it was because the pattern of economic relations coincided with “geographic barriers”. *Foreign Relations of the United States*, Vol. 3, 1920, pp. 790-795.

533. In the case of the Canada-United States boundary, these general principles are in evidence from coast to coast. Wherever a natural feature of economic significance is present in the region of the boundary, the solution has been to ensure that both countries have access to it. The most important single instance, of course, is the division of the Great Lakes and of a substantial portion of the St. Lawrence River; but the same general approach is equally apparent from the equal division of the Juan de Fuca Strait at one end of the continent to the mid-channel division of the St. Croix River and the equidistance line in the Grand Manan Channel at the other.

534. The appeal to the "buffer zone" concept in the United States Memorial is totally misplaced<sup>55</sup>. The Memorial refers to natural features "that coincide with the extent of human activities in an area", and to buffer zones "that confine human activities, and their effects, to an identifiable area"<sup>56</sup>. Canadian and United States fishing patterns throughout the Gulf of Maine area are restricted only by jurisdictional barriers of recent origin, which have created no practical difficulties of enforcement or compliance whatever. These fishing patterns have traditionally been and remain unconfined by natural features of any kind. By the very criteria the United States has suggested, there is no feature in the Gulf of Maine area that coincides with the extent of human activities and that is apt to serve as a natural buffer zone. Moreover, the suggestion that human activities should be confined so as to avoid transboundary effects is an indirect assault on the whole concept of shared natural resources and its corollary of international cooperation — and is legally untenable for that very reason. Indeed, the entire notion of a delimitation based upon buffer zones is incongruous in the present circumstances. It assumes a degree of tension between the two States and their nationals that is wholly at variance with the facts, and it makes the equally unfounded assumption that modern offshore fishermen and enforcement vessels are incapable of accurate navigation.

535. The appeal for support to the *Grisbadarna* award is similarly without foundation<sup>57</sup>. The essential point in that case is that the parties had both agreed that the small fishing grounds in contention there should not be divided. No general principle of law can possibly be attributed to the award on this point, which simply reflected the common attitude of the parties throughout the course of the negotiations and the arbitration. There is no evidence that the Tribunal was prompted by a concern with the prevention of future international disputes between the two States, or that it perceived a need to create a buffer zone to keep their fishermen apart. Furthermore, the award does not suggest that the

<sup>55</sup> *United States Memorial*, p. 113, paras. 179-180; p. 121, para. 196; p. 144, para. 255. There can be no analogy intended here to the eight-mile "buffer zones" established by the Italian authorities off Libya "to avoid the danger of friction that might arise from the difficulty of establishing the precise position of a foreign vessel near the frontier . . .". *I.C.J. Reports 1982*, p. 70, para. 94. Today, of course, this difficulty no longer exists — either for fishermen or for enforcement authorities — because of the widespread use of modern navigational equipment.

<sup>56</sup> *United States Memorial*, p. 144, para. 256.

<sup>57</sup> *United States Memorial*, p. 113, para. 180; p. 144, para. 255.

boundary was drawn in order to separate fish stocks into biological units and thus to prevent transboundary effects in the fishery.

536. The reliance on the *Fisheries* case is even more far-fetched<sup>58</sup>. The United States contends that this case somehow supports its principle of dispute minimization by virtue of the consideration that enforcement and compliance by fishermen were facilitated by the Norwegian limits. The pertinent passage of the judgment refers to a diplomatic exchange that occurred over a century ago, in 1870, when the Norwegian Government invoked this factor as a merely subsidiary consideration flowing from the special geographical circumstances of the area<sup>59</sup>. It was not advanced as an independent legal consideration — even in the conditions of 1870, when the navigational equipment available to fishermen might have made a highly broken, “saw-tooth” limit a far greater inconvenience than today. Neither the Norwegian Government nor the Court itself associated this factor with the prevention of international disputes; or with the creation of a “buffer zone” for the separation of fishermen; or with a general need to avoid the division of fishing grounds. Indeed, if the analogy had any legal relevance, it would weigh far more heavily against the irregularities of the new United States line than against the perfectly practicable equidistance line that is claimed by Canada.

537. It ill behoves the United States to rely on “the refusal of States involved to share authority over their fishermen” in support of its argument that authority over the resources should be undivided. True, the United States declined to share such authority when it failed to ratify the 1979 Agreement on East Coast Fishery Resources; but it can hardly be heard to rely on its own unilateral actions in this particular matter to found a general principle of law. Almost every fisheries commission that ever existed is based on such a sharing of authority, in some degree; and paragraphs 234-245 have demonstrated the extensiveness of North American State practice in this regard. Nor is it legitimate for the United States to suggest that shared authority will lead to distrust, a lack of enforcement and a probability that the fishermen “will avoid complying with regulations<sup>60</sup> . . .”. This is an unwarranted inference from the very worst aspects of the unregulated, high seas régime of former years, and one that can have no application to the new 200-mile zones, where the coastal States have a plenary authority to regulate the fisheries and to enforce their regulations.

538. The practical effect of “single-State management” of off-shore resources is the exclusion of one State from the crucial area in order to simplify the life of its neighbour. The incompatibility of this solution with equitable principles is manifest. So too is the impracticability of finding a *single* line to accommodate the varied resources divided by a general purpose boundary — oil and gas, cod, haddock, scallops, lobsters and so on — all of which have their own distributional characteristics, many of them not yet understood with certainty in the present state of scientific knowledge. The United States theory of single-State

<sup>58</sup> *United States Memorial*, pp. 114-115, paras. 181-183.

<sup>59</sup> *I.C.J. Reports 1951*, pp. 135-136.

<sup>60</sup> *United States Memorial*, p. 144, para. 254.

management is a defeatist theory in its assumption that two coastal States cannot cooperate in the management of transboundary resources off their respective coasts. It implies a novel kind of national isolationism, fundamentally at odds with the objectives of equity and cooperation that are increasingly recognized by the law. Its premises are unfounded in experience and have no place in the modern law of maritime boundaries.

### Section III. The United States Provides No Criteria for Selecting and Weighing the Relevant Circumstances

539. The fourth "equitable principle" posited by the United States is the residual principle that all the relevant circumstances in the area should be taken into account<sup>61</sup>. These circumstances are to be balanced in order to produce an equitable solution, and it is the relevant circumstances "taken together" that are determinative. In determining the relevant circumstances it is necessary to identify the relevant area and all the geographical factors that are either relevant in themselves or "are the situs of relevant resources or activities"<sup>62</sup>.

540. Canada is in general agreement with these propositions, except to the extent that the United States has linked its notion of relevant circumstances to the series of specific "equitable principles" it has advanced. In particular, Canada agrees that the relevant circumstances must be considered in their total context, and that the "situs of relevant resources or activities" should be taken into account in identifying the relevant area. This approach is consistent with the Canadian view that there is an interaction between the physical and the social and economic aspects of geography, and that established patterns of resource utilization and dependence should have a bearing on the identification of the relevant coasts<sup>63</sup>.

541. What is missing from the United States analysis, however, is the identification of any criteria for the selection and weighing of the various circumstances that are present in any particular case. In Canada's view, these criteria are to be found in the nature and purpose of the zones to be delimited; in the source of the coastal State title; and in the actual impact the boundary will have.

### Conclusion

542. There are two general reasons why the United States catalogue of equitable principles is legally misconceived. The first is that, even though much of the catalogue has been tailor-made to produce a particular result, the entire approach is one that divorces equitable principles from the need to achieve an equitable solution in the circumstances of each case; and the result proposed by the United States on the basis of its list of principles is patently inequitable.

<sup>61</sup> *United States Memorial*, pp. 145-147, paras. 257-261.

<sup>62</sup> *United States Memorial*, p. 145, para. 258.

<sup>63</sup> *Canadian Memorial*, p. 133, paras. 316-317.

543. *The second reason is that two of the United States "principles" — those dealing with the single-State management — refer to purely operational considerations that have no place in a delimitation that is to be effected in accordance with international law. These operational factors may go to the manner in which coastal States should exercise their sovereign rights and jurisdiction, but they simply beg the more basic and logically prior question of the extent of the areas in which such rights and jurisdiction may lawfully be claimed. Furthermore, the implications the United States has derived from these factors are based upon conjectural and often fanciful "scenarios" or predictions about what might transpire over the years when the boundary has been put in place, and they are legally extraneous on that ground alone.*

544. *The United States' principles and their application are therefore inconsistent with the requirement of the Special Agreement and of the Statute of the Court that the decision is to be made on the basis of international law. They are equally inconsistent with the two most fundamental requirements of the delimitation articles of the new Convention on the Law of the Sea: that the delimitation should achieve an "equitable solution", and that it is to be effected "on the basis of international law".*

## CHAPTER III

### EQUITABLE PRINCIPLES ON THE BASIS OF THE APPLICABLE LAW

#### Introduction

545. The Special Agreement requests that the decision in this case be made "in accordance with the principles and rules of international law applicable in the matter as between the Parties", and the Statute of the Court itself requires the application of international law. The Parties have found common ground in the importance they accord to equitable principles, but there is little agreement between them on the actual content of these principles or on their application in the present case. In Canada's view, there are five propositions that are basic to the application of equitable principles within the law.

- (a) Equitable principles must be identified and applied on the basis of the applicable law.
- (b) The boundary should respect the basis of coastal State title.
- (c) The boundary should respect the basic purposes of the rights and jurisdiction in issue.
- (d) The boundary should take account of legally relevant circumstances.
- (e) The result of the application of equitable principles must itself be equitable in the light of all the relevant circumstances.

#### Section I. Equitable Principles Must Be Identified and Applied on the Basis of the Applicable Law

546. As was stated in paragraphs 472-476, the applicability of a principle depends upon the relevant circumstances of the case and the equitable character of the solution it would produce. Yet equitable principles should clearly be more than relevant circumstances taken out of the context of a particular case and given an abstract, normative expression. There must accordingly be added a second criterion for the identification and application of the principles that are relevant to the determination of a single maritime boundary: these principles themselves must be derived from the applicable law. The Court has repeatedly stressed that equitable principles must be distinguished from equity as a matter of abstract justice, and that what is required is the application of "considerations lying not outside but within the rules".<sup>1</sup> In a slightly different context, the Court put the point very clearly in the *Fisheries Jurisdiction* cases when it said:

"It is not a matter of finding simply an equitable solution, but an equitable solution derived from the applicable law<sup>2</sup>."

<sup>1</sup> *I.C.J. Reports 1969*, pp. 46-47, para. 85; pp. 48-49, para. 88; *I.C.J. Reports 1982*, p. 60, para. 71.

<sup>2</sup> *I.C.J. Reports 1974*, p. 33, para. 78.

## A. ARTICLE 6 OF THE CONVENTION ON THE CONTINENTAL SHELF

547. A single maritime boundary is more than a composite of its various elements, but it is equally clear that the specific rules of law respecting each of these elements must be considered and applied. For the continental shelf, of course, the source of the applicable rule is absolutely clear: it is Article 6 of the Convention on the Continental Shelf, which is binding treaty law upon the Parties.

548. The United States has given scant consideration to Article 6, beyond the ambiguous statement that it is "relevant to this proceeding as a source of principles and rules for delimitation of the continental shelf", but that it is "not determinative" in the delimitation of a single maritime boundary<sup>3</sup>. In the Canadian view, Article 6 has a much greater significance than this isolated reference would suggest. Both Article 38, paragraph 1, of the Statute of the Court, and Article II of the Special Agreement — which requests a decision "in accordance with the principles and rules of international law applicable in the matter as between the Parties" — require the application of this provision. Article 6 of the Convention on the Continental Shelf is the only explicit source of positive law that is available in this case and it must be given its proper effect.

549. Nor is the significance of this provision narrowly limited to the continental shelf. Article 6 has been characterized as a "particular expression to a general norm" that places it within the context of the fundamental principle that both Parties agree upon as the starting point for the determination of a single maritime boundary<sup>4</sup>. Thus, the rule in Article 6 is *directly* relevant to the continental shelf as a component of the single maritime boundary, and it is *indirectly* relevant by way of analogy to the boundary in its entirety. Further, as is implied by the Court's judgment in the *North Sea Continental Shelf* cases, Article 6 is by no means inextricably linked to the concept of natural prolongation. This factor strengthens the analogical relevance of the rule to the single maritime boundary as a whole, coupled with its direct application to the continental shelf as a matter of treaty law between the Parties.

550. Article 6 of the Convention on the Continental Shelf, moreover, should be read together with the "principles of geographical demarcation" referred to in Article 7 of the Convention on Fishing and the Conservation of the Living Resources of the High Seas. (The principles referred to are those defined in Article 12 of the Territorial Sea Convention.) The Convention on the Continental Shelf and the Convention on Fishing provide, respectively, for the sovereign rights of the coastal State in relation to seabed resources, and for the special interest of the coastal State in relation to the living resources of areas of the high seas adjacent to its territorial sea that may be designated by the coastal State for the purpose of applying conservation measures therein. It is clear, therefore, that these two conventions together were in a sense precursors of the concept of the exclusive economic zone; they incorporated

<sup>3</sup> *United States Memorial*, p. 101, para. 165.

<sup>4</sup> *Anglo-French Continental Shelf* award, p. 48, para. 70.

in embryonic form the resource rights and jurisdiction that are central to that concept. Both conventions adopted the equidistance rule, and this convergence of principles for the delimitation of the seabed and the water column beyond the territorial sea tends to confirm the view that Article 6 of the Convention on the Continental Shelf represents "the particular expression of a general norm".

551. The effect of Article 6 is not that it makes equidistance compulsory in all cases, because clearly it does not. Instead, the true effect of the combined equidistance-special circumstances rule in Article 6 is that the equidistance method is to be used in those cases, and only in those cases, where it produces an equitable result in the light of the geographical and other circumstances. If equidistance does not produce an equitable result, an abatement or variation should be tried; or an entirely different method may be used if the circumstances so require. Thus, in the *Anglo-French Continental Shelf* award, the Court of Arbitration referred to the legal role of equidistance in the following terms:

"The Court does not overlook that under Article 6 the equidistance principle ultimately possesses an obligatory force which it does not have in the same measure under the rules of customary law; for Article 6 makes the application of the equidistance principle a matter of treaty obligation for Parties to the Convention<sup>5</sup>."

It is precisely the application of Article 6 that distinguishes the situation here from that considered in the *Tunisia-Libya Continental Shelf* case, where the Court said that it was not required to examine the effect of the equidistance method as a first step — although even there, of course, the position of the equidistance line in the seaward area was considered and given weight as a relevant circumstance<sup>6</sup>.

#### B. SOURCES OF LAW RESPECTING THE EXCLUSIVE ECONOMIC ZONE AND THE 200-MILE FISHING ZONE

552. The specific rules of law for the delimitation of the water column are less clearly defined. Article 74 of the new Convention on the Law of the Sea provides that the delimitation of the exclusive economic zone between States with opposite or adjacent coasts "shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable solution". Thus, Article 74 emphasizes the need to achieve an equitable result; but as the Court noted in the *Tunisia-Libya Continental Shelf* case, in connection with the identical rule in Article 83 respecting the delimitation of the continental shelf, "any indication of a specific criterion" that might have provided specific guidance has been excluded<sup>7</sup>. There is, however, another equally important requirement in Article 74, which formed the basis of the consensus on its

<sup>5</sup> *Anglo-French Continental Shelf* award, p. 48, para. 70.

<sup>6</sup> *I.C.J. Reports 1982*, p. 88, para. 126.

<sup>7</sup> *I.C.J. Reports 1982*, p. 49, para. 50.



formulation. The delimitation is to be effected "on the basis of international law". Clearly, this language requires that some content and precision should be given to the concept of "equitable principles" as it applies in the case of the 200-mile zone. In the Canadian view, this can be achieved only through an analysis of the legal basis of title to such a zone and the legal subject matter and purposes of the jurisdiction it entails.

553. Two principal inferences can be drawn from such an analysis. The first is that the emergence of the exclusive economic zone, in which coastal State title is based upon the criterion of distance from the coast, has given a new importance to proximity in the delimitation of maritime boundaries with the 200-mile limit. The second is that, because economic considerations are central to the basic purpose of the new forms of maritime jurisdiction (as they are to the continental shelf as well), it follows that a significant and established economic dependence upon the resources of the disputed area is a factor that should be given a special weight.

554. These considerations will be reviewed in greater detail later in this Counter-Memorial, but it is important to bear in mind throughout that a single maritime boundary is more than a simple aggregate of its several components. The sovereign rights and jurisdiction delimited by a single maritime boundary should be considered not in isolation but in their total context, as a single bundle of rights. But possibly the most important implication is that because of the very diversity of the matters at stake, the common features that are shared by each of the principal forms of jurisdiction must take on a special weight. In the Canadian view, this reinforces the importance that adjacency and proximity should be accorded, because these are the factors that provide the common denominator of each of the specific forms of coastal State jurisdiction that comprise the total régime. The role of established economic dependence is also strengthened; for the central, dominant concern of the exclusive economic zone (as the name implies) is the resources of the sea and the economic benefits they provide.

## **Section II. The Boundary Should Respect the Basis of Coastal State Title**

### **A. THE DISTANCE PRINCIPLE AND ITS RELATIONSHIP TO NATURAL PROLONGATION AND NON-ENCROACHMENT**

555. There is a close correlation between the basis of coastal State title and the law applicable to the delimitation of maritime zones. It was precisely for this reason that the Court in 1969 made natural prolongation the point of departure for the principles of delimitation it adopted<sup>8</sup>. More generally, the question as to which State has the stronger title is central to the evaluation of competing claims between opposite or adjacent States, and this question can be addressed only in

<sup>8</sup> *I.C.J. Reports 1969*, p. 31, para. 43; p. 51, para. 95; p. 53, para. 101(C)(1).

terms of the basis upon which the law attributes to coastal States title to maritime areas.

556. Developments in the law of the sea have made distance from the coast the decisive factor in the definition of coastal State title to off-shore zones. The most fundamental characteristic of coastal State title to an exclusive economic zone is that it is based on a uniform and constant distance from the coast, which is the same for all coastal States. It is a spatial conception that operates independently of any physical criteria other than simple proximity to the coast. Not only does the 200-mile distance criterion constitute the sole basis of coastal State title to an exclusive economic zone or a 200-mile fishing zone, but it has now been accepted also as a sufficient basis of continental shelf jurisdiction within that distance from the coast<sup>9</sup>. It has become the central factor in giving precise content to the principle of appurtenance and the maxim that the land dominates the sea.

557. There are at least four separate reasons why the new framework of coastal State jurisdiction calls for consideration in the present case. *First*, the 200-mile fishing zones to be delimited are based upon these recent developments. *Secondly*, the combined continental shelf and fisheries jurisdiction to be delimited by the single maritime boundary in the present case closely resembles an exclusive economic zone in all but name. *Thirdly*, the United States has already created an exclusive economic zone, to which the boundary will be applicable by virtue of Article III of the Special Agreement. *Fourthly*, the equidistance-special circumstances rule in Article 6 of the Convention on the Continental Shelf is fully compatible with the new orientation of the law. It has indeed been held that "the rules of customary law are a relevant and even essential means both for interpreting and completing the provisions of Article 6<sup>10</sup>", and customary international law undoubtedly incorporates recent developments in the law of the sea to a very significant degree<sup>11</sup>.

558. The importance now accorded to the distance principle enhances the role of proximity in the delimitation of maritime boundaries within the 200-mile limit. Because distance from the coast is the main basis of title within this new framework, it must also serve as a leading test of the strength of a claim within areas of potentially overlapping zones. It gives new strength to the commonsense precept that the waters lying closest to a State should normally fall under its jurisdiction.

559. But distance from the coast is a factor and not a method. It calls for consideration in conjunction with the concrete factual circumstances in each case — geographical and other — and its role can be

<sup>9</sup> Although Article 76 of the new Convention on the Law of the Sea maintains the role of natural prolongation in principle, its practical effect is that distance is made a sufficient basis of title out to the 200-mile limit. Even beyond the 200-mile limit, the distance principle is partially retained in the use of the 350-mile maximum as part of the formula for determining the outer limit of the shelf.

<sup>10</sup> *Anglo-French Continental Shelf* award, p. 50, para. 75.

<sup>11</sup> *Anglo-French Continental Shelf* award, p. 40, paras. 47-48. In the *Tunisia-Libya Continental Shelf* case, the Court stated that it "would have had *proprio motu* to take account of the progress made at the [Law of the Sea] Conference even if the Parties had not alluded to it in their Special Agreement". *I.C.J. Reports 1982*, p. 38, para. 24.

strengthened or weakened by the operation of these other circumstances. There can be a variety of methods that give it adequate expression in varying situations. Where the coastline is straight, a perpendicular or some variant of that method may leave the waters closest to each State sufficiently within its jurisdiction; and there may be cases where other simplified lines can achieve the same result. Clearly, however, equidistance is the method that does so with the greatest precision, provided that due allowance is made for the presence of special configurations or distorting features. It follows that the emergence of the distance principle as a primary basis of coastal State title lends a new weight to equidistance as a method of delimitation.

560. In the *North Sea Continental Shelf* cases the Court rejected the contention that absolute proximity, and with it equidistance, were inherent in the concept of the continental shelf under customary international law. It held that there is "no necessary, and certainly no complete, identity between the notion of adjacency and proximity", and it stated further that the principle of the natural prolongation or continuation of the land territory was "more fundamental than the notion of proximity"<sup>12</sup>. The judgment recognized, on the other hand, that proximity can be a relevant factor and an important test:

"Even if proximity may afford one of the tests to be applied and an important one in the right conditions, it may not necessarily be the only, nor in all circumstances, the most appropriate one"<sup>13</sup>.

The essential object of the Court was to reject the "fundamentalist" view of absolute proximity and equidistance as possessing an "*a priori* character of necessity or inherency" and a "juristic inevitability"<sup>14</sup>. As such, these statements remain fully applicable today.

561. In another sense, however, the subject matter of a single maritime boundary calls for a much greater emphasis on proximity than was the case under the customary law of the continental shelf in 1969. The crux of the Court's reasoning in the *North Sea Continental Shelf* cases was that the principle of natural prolongation was "more fundamental" than the notion of proximity. In Canada's submission, this proposition no longer holds true of a single maritime boundary applicable both to the water column and to the continental shelf within 200 nautical miles from the coast. Moreover, even in respect of the continental shelf alone, the Court noted in the *Tunisia-Libya Continental Shelf* case that the "basis of the title of a coastal State" and the "legal concept of the continental shelf as based on the 'species of platform'" had been modified by the introduction of the distance criterion in the 1982 Convention on the Law of the Sea<sup>15</sup>. In particular, it noted that the new convention departs in certain respects from natural prolongation as

<sup>12</sup> *I.C.J. Reports 1969*, pp. 30-31, paras. 42-43.

<sup>13</sup> *I.C.J. Reports 1969*, p. 30, para. 42.

<sup>14</sup> *I.C.J. Reports 1969*, pp. 28-29, paras. 37-38.

<sup>15</sup> *I.C.J. Reports 1982*, p. 48, para. 47.

the basis of title, insofar as the convention provides in certain circumstances that:

“... the distance from the baseline, measured on the surface of the sea, is the basis for the title of the coastal State, it departs from the principle that natural prolongation is the sole basis of the title<sup>16</sup>.”

This factor, and more particularly the fact that the issue in the present case is a single maritime boundary, clearly requires a reconsideration of the subordination of proximity to natural prolongation that was the essential rationale of the conclusions reached by the Court in the *North Sea Continental Shelf* cases.

562. The judgment in the *North Sea Continental Shelf* cases linked the concept of non-encroachment to natural prolongation; but as was noted in paragraphs 479-486, Canada's view is that non-encroachment is more logically associated with the distance principle in the context of a single maritime boundary. While natural prolongation cannot be identified, even in a theoretical sense, as the fundamental point of departure for the boundary in issue here, the criterion of distance from the coast lends a continued relevance to the doctrine of non-encroachment. In the absence of special geographical circumstances, any substantial departure from the precept that the waters closest to a State should normally be assigned to its jurisdiction is often likely to lead to an encroachment on the area of the sea most naturally appurtenant to that State.

563. In brief, the use of the distance principle as the sole basis of title with respect to fisheries and water-column jurisdiction, and as an important element in the revised basis of title with respect to the continental shelf, carries a number of important implications which may be summarized as follows.

- (a) The seaward extension of a coastal State includes all waters within 200 nautical miles of its coast, and all such areas must *prima facie* be considered legally adjacent or appurtenant to that State.
- (b) Since distance from the coast is a fundamental basis of coastal State title, it is necessarily an important factor in assessing which State has the stronger claim in an area of overlapping seaward extensions.
- (c) The use of the distance principle similarly strengthens the importance of closeness to the coast in applying the principle of non-encroachment.

## B. THE CONCRETE IMPLICATIONS OF THE DISTANCE PRINCIPLE

### 1. *The Radial Projection of the Coasts*

564. As explained in paragraphs 150-153, where a maritime zone is defined in terms of distance, the seaward extension of the zone must

<sup>16</sup> *I.C.J. Reports 1982*, p. 48, para. 48.

be thought of in terms of a "radial" projection from the coast. Like the range of the swivelling cannon that prefigured the three-mile limit<sup>17</sup>, the seaward projection of the coast extends in every direction toward the open sea and not merely in a rectilinear thrust outward from a coastal front.

(37) 565. It is for this reason that Figure 31 of the United States  
 (70) Memorial is misconceived in its basic legal assumptions. *Figure 41* of this Counter-Memorial shows the absurdities that can result if the seaward extension of the coast is conceptualized in the rectilinear and perpendicular fashion illustrated in the United States Memorial. The anomalies, of course, are apparent whatever the legal basis of title; but where title is based upon distance from the coast, their repugnance to both law and common sense is all the more pronounced. *Figure 41A* illustrates a case where large areas of the sea would necessarily be excluded from the seaward extension of the adjacent land, notwithstanding the length and proximity of the coast, if that extension were strictly dependent upon a perpendicular relationship to a coastal front. More striking still is the effect shown in *Figure 41B*. Paradoxically, the use of broad perpendicular arrows in the manner of the United States Memorial systematically places the offshore areas that are *furthest* from each of the coastal States under the jurisdiction of that State. Although a *reductio ad absurdum*, the effect is exactly the same as the depiction of the relationship of eastern Georges Bank to the coast in Figure 31 of the United States Memorial.

(37) 566. The notion of a radial projection is illustrated by the arcs of circles method of delineating a 200-mile zone, although it is not, of course, dependent upon the use of that method. The arcs of circles technique is a concrete expression of the distance principle as applied in practice. It has been widely accepted by States in recent years in delimiting their 200-mile zones, and it has been used by both Canada and the  
 (5) United States for this purpose. (See Figure 5 of the Canadian Memorial.) The virtue of this method of delimiting a distance-based zone is that it is simple and accurate and avoids any substantial sacrifice of areas that may lawfully be claimed by the coastal State. An outer limit reflecting each and every variation of the baseline — in effect, the so-called "tracé parallèle" method as it was described in the judgment in the *Fisheries*<sup>18</sup> case — would involve a much greater degree of complexity in practice and would be especially anomalous at great distances from an irregular coast.

567. The radial effect of the arcs of circles method is self-evident. It corroborates and illustrates the view that a distance-based maritime zone should be thought of as a broad belt of sea that surrounds the coast of a State — an "envelope" of ocean space that lies "off" the coast — and not as a rectilinear projection toward areas of the sea that lie "in

<sup>17</sup> *I.C.J. Reports 1951*, p. 192. Dissenting Opinion of Judge Read. "In the earliest days, the cannon on the coast, when traversed, traced arcs by the splash of their shots. Later, the imaginary cannon traced imaginary arcs which intersected and marked out the limit based on cannon shot."

<sup>18</sup> *I.C.J. Reports 1951*, pp. 128-129.

front of" the coast in a strictly perpendicular sense. This conceptual approach is particularly apt where the coastal geography is irregular and complex.

568. In the modified conceptual framework suggested by the distance principle and its radial projection, the notion of a spatial relationship that is conceived in essentially perpendicular terms, without regard to distance or scale, is devoid of meaning. The key question becomes that of the relative distance of an area from the adjacent coast, and not whether it is geometrically "in front of" that coast. Distance from the coast, and not alignment or juxtaposition, provides the essential criterion of adjacency in this context; and adjacency itself should be conceived of simply in terms of the sea areas that lie "off" and in relatively close proximity to the coastal area concerned.

### *2. The Point of Intersection of Neighbouring Zones*

569. There are additional factors that give a new weight to equidistance where 200-mile zones are to be delimited, because of the use of the distance principle as the essential defining feature of the zones. The point at which the outer limits defining the 200-mile zones of the two neighbouring States intersect is generally an equidistance point, as shown in *Figure 42*, and the equidistance line may therefore be described as the natural meeting point of the two zones<sup>19</sup>. While this certainly does not imply that equidistance is always the correct approach, it does give a particular weight to this method of delimitation. It means that the position of the equidistance line is always in itself a highly relevant circumstance, to which due consideration should be given.

### *3. The Extension of a Single Maritime Boundary Beyond 200 Miles from the Coast of Either Party*

570. The property of equidistance as the natural meeting point of two neighbouring 200-mile zones has an important corollary. Only if the single maritime boundary intersects the 200-mile limit at a point equidistant from the coasts of both States can it allocate all sea areas within 200 miles of the coast to one of the two States for all purposes of the law. If the boundary does not intersect the 200-mile limit at this point, its extension seaward will create an area within 200 miles of the coast of one party that is beyond the 200-mile jurisdictional range of the other party on whose side of the boundary it falls.

571. The reason for this is as follows. The equidistance point at the 200-mile limit is normally 200 miles from the coast of each party, and each party may, therefore, exercise fisheries and exclusive economic

<sup>19</sup> The effect is produced by the use of the same points both as basepoints for constructing the equidistance line and as control points in drawing the 200-mile arcs. Since the required geographical properties are the same for both (except where distorting effects of islands or promontories require the use of a different basepoint in constructing the equidistance line), the two arcs will intersect on the "strict" equidistance line.

zone jurisdiction throughout the area on its own side of the line. Any boundary other than an equidistance line will first reach a point that is 200 miles from the coast of one party, but less than 200 miles from the coast of the other. The extension of the single maritime boundary beyond that point would create an area within 200 miles of the coast in which neither party could exercise exclusive economic zone jurisdiction. One party would be precluded from exercising such jurisdiction because the area is more than 200 miles from its own coast, and the other party equally would be precluded from exercising jurisdiction because the area lies on the "wrong" side of the single maritime boundary. This factor is of great practical importance where a single maritime boundary is to be extended for continental shelf purposes beyond the area in which the 200-mile limits of the two parties overlap. In the present case, of course, such an extension is envisaged by the terms of Article VII of the Special Agreement.

71 572. The effect is depicted in *Figure 43*. The area within the 200-mile limit that is on the "wrong" side of the boundary — more than 200 miles from the coast of the party on whose side it falls — is illustrated by shading. For convenience, it may be referred to as the "grey area". One way of eliminating the grey area might be to allow the single maritime boundary to turn radically where it intersects the arc drawn from the coast of the more distant State (State B), and to follow the arc back to the equidistance point at the 200-mile limit. This would solve the problem by assigning the entire grey area to the jurisdiction of the State within whose 200-mile limit it falls. But an adjustment of this kind would be open to the objection that it divorces the geographical rationale for the boundary within the 200-mile zone from its seaward "extension" beyond that zone.

573. If the boundary were to be extended seaward in a manner compatible with its final direction at the 200-mile limit, there would be three possible outcomes.

- (a) The boundary can intersect the 200-mile limit at or in the vicinity of the equidistance line, eliminating the grey area problem either entirely or in substantial measure.
- (b) If there is to be a grey area, and the single maritime boundary principle is maintained, one party will have continental shelf jurisdiction within this area and *neither* party will have fisheries or exclusive economic zone jurisdiction.
- (c) If the parties are willing to accept a "vertical superimposition of rights"<sup>20</sup>, one party will have continental shelf jurisdiction and the other party will have fisheries and water column jurisdiction in exactly the same area.

In the present case, the terms of the Special Agreement indicate that the Parties have opted for the single maritime boundary principle throughout, and a vertical superimposition of rights — option (c) — is therefore precluded.

<sup>20</sup> *I.C.J. Reports 1982*, p. 130, para. 98. Separate Opinion of Judge *ad hoc* Jiménez de Aréchaga.

574. It is for analogous reasons that Boggs urged that, even on the narrow geographical scale of the three-mile territorial sea, the point of intersection of the three-mile arcs drawn from the two coasts is the normal terminus of the maritime boundary<sup>21</sup> [Figure 44]. In the circumstances considered by Boggs, of course, the dimensions of the problem were simpler because there could be no question of a vertical superimposition of rights beyond the territorial sea, and because the areas in question were so much smaller.

575. The single maritime boundary principle accordingly favours the use of equidistance, or at least of a line that does not depart too radically from equidistance, in every case where the boundary may be extended further than 200 miles from the coast of either State for the purpose of delimiting jurisdiction over the continental shelf. The grey area effect described in the preceding paragraphs would deprive one State of a portion of its exclusive economic zone so that another State may exercise continental shelf rights beyond its own exclusive economic zone — that is, at a distance of more than 200 miles from its coast. As was noted in paragraph 484, such a result is generally inconsistent with the doctrine of non-encroachment as it applies in the context of the 200-mile distance principle. The larger the grey area — and consequently the greater the divergence from equidistance — the greater the practical and legal difficulties that ensue. The creation of a grey area effect must be considered an exceptional measure that would have to be justified by special circumstances. These factors do not confer an absolute or invariable validity upon equidistance in the case of a single maritime boundary, but they do attach a new weight to the equidistance method in these circumstances.

576. Almost the entire area to be divided by the boundary in the present phase of the present delimitation — the area between Point “A” and the limits of the triangle — is within 200 miles of both coasts. No grey area will result at this stage, unless the single maritime boundary is taken beyond that portion of the triangle in which the 200-mile zones of both Parties overlap. But the provision in Article VII of the Special Agreement for a further extension of the boundary to the outer limit of the continental margin constitutes a relevant circumstance that must be taken into account. If the Canadian line were to be extended seaward along its established course (with no adjustment where it meets the Canadian 200-mile limit), it would create a small grey area because of the offlying situation of Nantucket Island and its effect in creating a bulge in the outer limit of the United States 200-mile zone. The United States claim, on the other hand, would lead to an anomaly of dramatic proportions. The extension of the present United States claim in the manner shown in Figure 34 of the United States Memorial would leave an area the size of Belgium outside the fisheries and water column jurisdiction of any State — even though this entire area is within 200 miles of the Canadian coast. Even an extension of the 1976 United States

<sup>21</sup> S. W. Boggs: *International Boundaries. A Study of Boundary Functions and Problems*. New York, Columbia University Press, 1940, pp. 188-190; *Counter-Memorial, Annexes*, Vol. V, Annex 107.



claim would leave a vast grey area within 200 miles of Canada, but more than 200 miles from the United States, on the United States side of the boundary. Such a result could not be reconciled with either common sense or equity, and it would equally contradict the coastal State management principles of the new law of the sea.

### C. THE PRINCIPLE OF EQUALITY WITHIN THE SAME ORDER

577. The use of equidistance for the delimitation of 200-mile zones is supported as well by the consideration that the standardized nature of these zones points in the direction of equal treatment for the States concerned. Even in the case of the continental shelf, as the Court pointed out in the *North Sea Continental Shelf* cases, where States "have been given broadly equal treatment by nature", it is unacceptable that their continental shelf rights should be considerably different: for then, "in a theoretical situation of equality within the same order, an inequity is created"<sup>22</sup>. Much of the law of delimitation can be traced to this idea. It is the rationale that underlies both equidistance and other legally accepted methods of delimitation, including perpendicularity in the limited range of circumstances where it is applicable. For in each case, the object is to effect a broadly equal division of the area to be delimited.

578. This principle of equality within the same order has been strengthened by the introduction of a constant and uniform distance from the coast as the standard of entitlement for all coastal States, whatever their particular circumstances, subject only to the right to claim beyond that limit where the physical circumstances of the continental shelf permit. The principle of equality so understood is inherent in the uniformity of entitlement that is the most obvious characteristic of the 200-mile limit. It is a principle that the United States has clearly ignored in its claim to the whole of Georges Bank and in claiming for itself about three times as much ocean space as it would allot to Canada in the Gulf of Maine proper. The principle of equality, moreover, cannot be reconciled with the relegation of part of the Nova Scotia coast facing on the Gulf of Maine to the status of a mere "secondary coast"; or with the denial of any significance whatever to the remainder of that coast and (subject to the important inconsistencies noted in paragraphs 124-126) to the entire Gulf of Maine coast of the Province of New Brunswick.

### Section III. The Boundary Should Respect the Basic Purposes of the Rights and Jurisdiction in Issue

579. The basic purposes of the rights and jurisdiction in issue — the objectives the law seeks to achieve — must also have a decisive bearing on the principles for the delimitation of a single maritime boundary. The essential purpose of the exclusive economic zone, as the name

<sup>22</sup> *I.C.J. Reports 1969*, pp. 49-50, para. 91.

implies, is an economic one, rooted in the special dependence of coastal States upon the resources off their coasts. Its main object is to secure for present and future generations of coastal State populations the primary benefit of the maritime resources of their adjacent waters. It is with a view to attaining this basic economic objective, which is balanced by the rights and freedoms of other States, that the management of these resources is entrusted to the coastal States.

580. It follows, in Canada's view, that the economic dependence of a coastal State upon an area of the sea adjacent to its coast should be given a particular weight — especially where the area lies closer to its coast than to that of any other State. This factor is inherent in the very purpose of the zone itself, and accordingly it has an importance in purely legal terms that puts it on a higher plane than many of the other relevant circumstances that might be adduced. The economic interests and dependence of the present and future population are central to the entire legal issue, and the legal relevance and cogency of these factors is reinforced by the need to reach an equitable result within a framework of equitable principles. These considerations, and the support they derive from the law, have been reviewed at length in the Canadian Memorial<sup>23</sup>. Only a few points need be added or recalled at this stage.

581. The evolution of international law discloses an increasing recognition of the importance of economic interests in the attribution of sovereign rights to States — far more than the traditional law of territorial sovereignty was prepared to accord. Although the judgment in the *Fisheries* case rested very largely on traditional considerations of State conduct, it contributed to this development in noting the importance of regional economic interests in the maritime areas in dispute<sup>24</sup>. At the 1958 Conference on the Law of the Sea, the interests of fishermen and coastal communities began to receive a more general recognition, with the adoption of a resolution respecting countries or territories whose people are overwhelmingly dependent on coastal fisheries<sup>25</sup>. The judgment in the *Fisheries Jurisdiction* case of 1974 consolidated the trend and gave it new legal weight in the importance it accorded to fisheries upon which people depend for their livelihood and economic development or well-being<sup>26</sup>. The current régime of the exclusive economic zone is the culmination of this development, weighted decisively in favour of the economic interests of coastal States and transposing these interests into the basis for a new and general assertion of sovereign rights within a 200-mile zone.

582. As has already been noted, the fisheries interests of the Parties operate in conjunction with the geographical circumstances by showing the close linkage and affinity between portions of the adjacent coasts

<sup>23</sup> *Canadian Memorial*, pp. 131-134, paras. 311-319.

<sup>24</sup> *I.C.J. Reports 1951*, p. 133.

<sup>25</sup> Geneva Resolution on Special Situations relating to Coastal Fisheries, 26 April 1958, United Nations Treaty Series, Vol. 450, p. 62 (1963). This development may be traced back to the Rome Conference convened pursuant to General Assembly Resolution 900 (IX) of 14 December 1954.

<sup>26</sup> *I.C.J. Reports, 1974*, p. 34, para. 79(4); pp. 205-206, para. 77(4).

and the disputed area. At the same time, the prevailing patterns of the fishery should have a bearing on the identification of the particular segments of the coast that are relevant — or most relevant — to each portion of the boundary area. There is in this way a relationship between the physical and the economic aspects of the geography, consistent with the proposition in the United States Memorial that the situs of relevant resources or activities should affect the identification of the relevant area<sup>27</sup>. Besides, the introduction of appropriate economic factors in the interpretation of the geography recalls the view that a relevant factor in continental shelf delimitation might well be the nearest coastal area or terminal from which exploitation can be carried out<sup>28</sup>. It seems incontrovertible, in any event, that the adjacent coastal areas from which exploitation is *already* being conducted should be given a particular weight.

583. The United States has relied heavily on the *Grisbadarna* award, and yet it has overlooked or misconstrued some of the most basic aspects of the award. One, in particular, has great significance in terms of the question of economic reliance on the resources of the disputed area. The Tribunal held, in connection with fisheries conducted on the disputed banks, that “it is a principle of the law of nations that a *state of things which actually exists* and has existed for a long time should be changed as little as possible<sup>29</sup>” [*Italics added*]. The Tribunal emphasized the special applicability of this principle where private interests, like those of fishermen, are at stake; and it emphasized too that fishing was traditionally more important to the Swedish inhabitants of Koster than to the Norwegians of Hvaler. In its preoccupation with early historical events, the United States has overlooked the award’s emphasis on contemporary economic realities. Yet the latter were central to the reasoning of the Tribunal. The relevance of historical patterns was made dependent both on their *continuity* up to the time of the award and on the *greater economic importance* of the fishery to Sweden.

584. Moreover, the separate opinion of Judge Jessup in the *North Sea Continental Shelf* cases stressed the need to consider the reasoning of the *Grisbadarna* award in the light of modern conditions. He said in part:

“But it may also be noted that while in the *Grisbadarna* case the Tribunal spoke of a state of things ‘existing . . . for a long time’, the Fisheries Convention considers as ‘habitual’, exploitations during a period of ten years. Considering the rapidity of the progress of exploitation in the petroleum industry in the North Sea, no restrictive limit should be placed on the elapsed time<sup>30</sup>.”

Judge Jessup went on to point out that there were promising petroleum locations in the Danish area, and “to them the *Grisbadarna* principle

<sup>27</sup> *United States Memorial*, p. 145, para. 258.

<sup>28</sup> *I.C.J. Reports 1982*, pp. 121-122, para. 75. Separate Opinion of Judge Jiménez de Aréchaga.

<sup>29</sup> J. B. Scott, ed.: *The Hague Court Reports*. New York, Oxford University Press, 1916, p. 130.

<sup>30</sup> *I.C.J. Reports 1969*, p. 80.

might, in all equity, be applied<sup>31</sup>". Clearly, these considerations were exclusively a matter of contemporary economic interest.

585. What is decisive is not merely the existence of established interests in the disputed area but their real economic importance to the coastal State. There is a profound difference between an economic interest that is merely beneficial and one that is vital to an entire community or region. It lies at the origin of the concept of preferential coastal State rights, ultimately translated into the régime of the exclusive economic zone. This factor, as just noted, was recognized in the *Grisbadarna* award in the weight given to the importance of the fishery on that bank to the local Swedish inhabitants. More significantly, it is fundamental to the reasoning in the *Fisheries Jurisdiction* case, where the Court assessed the equities in terms of "the economic dependence and the livelihood of whole communities<sup>32</sup>". What counts is not merely the extent of exploitation, but the real importance of these activities to the life of the coastal States concerned.

586. The issue here is something quite distinct from the concept of distributive justice or the "just and equitable share". The search for an equitable result, *infra legem*, must begin with the relevant circumstances of the case at hand; the equitable division of the area and of its resources must take place within and be deduced from that framework — the geographical features of the relevant area, the use that the coastal States make of the resources, the degree of their dependence and the distribution of resources within the relevant area. It can never be a question of equitable apportionment as a matter of "abstract justice", as the Court put it in the *North Sea Continental Shelf* cases<sup>33</sup>; the law requires that equity be defined and applied as a function of the factual circumstances and not in terms of an abstract conception of juridical equality. The Court has made the distinction clear in rejecting as a relevant factor the contingent effects of future discoveries on relative national wealth or poverty, but recognizing the importance of known or readily ascertainable resources<sup>34</sup>.

587. Canada's reliance on its established economic dependence upon the resources of Georges Bank respects this framework of equitable principles within the law. It is rooted in the links between the sea and the land — the area to be delimited and the populations of the adjacent coasts — and in a pattern of use and dependence that is actual and present today and not merely a possibility for the future. It proceeds from the actual circumstances of the relevant area and the adjacent coasts, and not from an *a priori* conception of what might be considered a just entitlement in the abstract; and it respects the fundamental principles of law by giving effect to the central purpose of the 200-mile zone

<sup>31</sup> *I.C.J. Reports 1969*, p. 81.

<sup>32</sup> *I.C.J. Reports 1974*, p. 29, para. 66; pp. 197-198, para. 58.

<sup>33</sup> *I.C.J. Reports 1969*, p. 47, para. 85.

<sup>34</sup> *I.C.J. Reports 1969*, pp. 53-54, para. 101(D)(2); *I.C.J. Reports 1982*, pp. 77-78, para. 107.

— the protection of the long-term interest of coastal populations in the resources that provide their traditional livelihood and that lie in closest proximity to their coasts.

#### **Section IV. The Boundary Should Take Account of Legally Relevant Circumstances**

##### **A. GENERAL PRINCIPLES**

588. Even though there is no legal limit to the considerations that States may take into account in the context of a negotiated boundary, the judicial settlement of a boundary in accordance with international law implies the existence of legal criteria governing the relevance and weight of the factual considerations surrounding the case. Not all factual circumstances are legally relevant, and some are more relevant than others. In Canada's view, these criteria may be found in the subject matter of the rights and jurisdiction in issue and in the legal and practical effect the boundary may have.

589. The main purpose of the boundary will be to delimit sovereign rights and jurisdiction respecting both the fisheries and seabed resources of the Gulf of Maine area. It is, therefore, the factors related to these two forms of jurisdiction that are primarily relevant. In addition, however, Article III of the Special Agreement provides that the boundary will apply to any form of sovereign rights or jurisdiction in respect of waters or the seabed and subsoil, and not only to the continental shelf and fishing zone régimes that were then in place in the two States. It is, accordingly, appropriate to consider any additional factors related to the forms of jurisdiction that coastal States may exercise in accordance with international law within the exclusive economic zone.

590. On the other hand, the single maritime boundary will be situated entirely beyond the territorial sea of the Parties, and its seaward terminus is to be located near or at the 200-mile limit. It follows that considerations that might be relevant to a determination of sovereignty in the territorial sea, but that are extraneous to either the continental shelf or the régime of the exclusive economic zone, should logically be excluded from consideration. More generally, all those activities that continue to be governed by the régime of the high seas and its attendant freedoms should properly have no bearing on the case. There is, in consequence, a broad category of factors that should not be considered legally relevant, for the simple reason that they will not be affected in any way by the single maritime boundary to be established in the present case.

591. It is equally important to consider the factual record in its historical context, and in terms of the legal régime in effect at the time of the events in question. The right to assert jurisdiction within zones of 200 nautical miles, and even the continental shelf itself, are comparatively recent innovations. Because the development of the law over the last few years has been nothing short of revolutionary, the basic principles of intertemporal law have an important role to play in assessing the legal significance of the factual record.

592. Several categories of factual circumstances have already been dealt with extensively in this Counter-Memorial and require little or no elaboration here. Geographical circumstances are clearly relevant. So too is the conduct of the Parties as it relates to the delimitation of their sovereign rights and jurisdiction, both as an indicator of an equitable result and as a ground of acquiescence and estoppel. The role of physical factors has been dealt with, both in the context of natural prolongation and as the basis of the novel and legally untenable United States theory of "single-State management" of the mythical entities it has chosen to call "ecological regimes". Finally, the categories of economic factors that Canada considers relevant — and indeed of decisive importance — have also been dealt with at length. To this Canada would only add its agreement that national wealth and poverty is not by itself a relevant factor, as the Court has recently held<sup>35</sup>. The consequences of this determination for the extraneous economic evidence introduced by the United States — for example, the allegations respecting its market power as a major importer of fish products and the significance of government assistance to the fishing industry — have been examined in paragraphs 280-285, and 292-294 of this Counter-Memorial.

593. There are, in addition, a number of categories of factual circumstances that require a more detailed analysis, and it is to these that this section will now turn.

## B. SPECIFIC CATEGORIES OF FACTUAL CIRCUMSTANCES

### 1. *The History of the Fishery*

594. The United States has relied heavily on obsolete fishing patterns that have long since passed into oblivion and have no practical relevance for present or future generations of fishermen. Chapter V of Part II of this Counter-Memorial has shown that the United States account is substantially at variance with the facts and, in particular, that it does not accurately portray the historical depth of Canada's fishery on Georges Bank. It is equally important, however, to place these factors in their proper legal context. In Canada's submission, it is the contemporary reality of the fishery and not its historical evolution that must be decisive in the determination of a single maritime boundary on equitable principles. *The role of historical circumstances is ancillary, serving as a test of the stability and continuity of patterns of use and dependence that are in evidence at the present time. This approach is required both by general considerations of law and by the practical consequences that will flow from the creation of a single maritime boundary.*

595. The fishery in the Gulf of Maine area calls for consideration within a framework of equitable principles, and clearly not as the basis of any historical claim to sovereignty in the disputed area. There is nothing here that resembles the exceptional case of historic fishing rights

<sup>35</sup> *I.C.J. Reports 1982*, pp. 77-78, paras. 106-107.

beyond the territorial sea that was considered in the *Tunisia-Libya Continental Shelf* case, and there can be no question of simply discovering a title through an analysis of the historical background. The distinction between the delimitation of an entirely new jurisdiction on the basis of equitable principles and the maintenance of previously existing territorial rights is fundamental. It alters the extent to which historical circumstances are relevant, the weight they should be accorded and the nature of their legal role.

596. The 200-mile zone is an outgrowth of the recent industrial transformation of the fishery. A single maritime boundary reflecting the past rather than contemporary patterns of fishing would be an anomaly, rather like an approach to land-use planning based on traditional agrarian patterns that have now been overtaken by urban growth. There have been two successive and irreversible revolutions in the fishery: the first, an economic and technological transformation, and the second — very largely a consequence of the first — a fundamental change in the applicable law with the introduction of the 200-mile limit. It would be unrealistic to step outside this framework by invoking the circumstances of a distant past in support of a boundary that is designed for modern conditions. The impact of the single maritime boundary will be limited to present and future generations of fishermen, and the relationship of the boundary to the discontinued fishing patterns of earlier times is essentially of academic interest only.

597. In sum, there are two basic reasons why the contemporary fishery and not its historical background must be accorded a decisive importance in law. *First*, the whole phenomenon of coastal State fisheries jurisdiction in a 200-mile zone is radically new and has been consciously designed as a response to modern realities. *Secondly*, as a practical matter, the effect of the boundary will be felt only by the present generation of fishermen and by posterity. It cannot alter the past or the interests of bygone generations. In consequence, history can provide only as a general background to the understanding of the contemporary situation.

## 2. State Activities

598. The United States has relied on a miscellaneous collection of maritime activities and *ad hoc* arrangements, under the heading "Other Relevant Activities"<sup>36</sup>. In an attempt to demonstrate an alleged historical dominance of the Gulf of Maine area, it has raised matters as diverse as electronic aids to navigation, early cartography, defence arrangements in World War II and the delineation of statistical areas for the purpose of multilateral fisheries cooperation. Canada has dealt with these factual allegations in detail in paragraphs 431-455, as it was obliged to do in order to correct the historical record. The more important point for the purposes of these proceedings, however, is that most of the contentions in this part of the United States Memorial are irrelevant in law.

<sup>27</sup> <sup>28</sup> <sup>36</sup> *United States Memorial*, pp. 63-80, paras. 102-132, and Figures 12-15.

599. In Canada's view, two tests should be applied to determine both the relevance and the weight to be attached to various forms of State conduct. The first is that these activities must be related *in fact* to the subject matter or the zones to be delimited — primarily, in other words, to the fishery and the resources of the continental shelf. The second is that they must be related *in law* to the question of the sovereign rights and exclusive jurisdiction of a coastal State — for example, by implying an assertion or acceptance of sovereign rights and exclusive jurisdiction, or by suggesting a division of the area that the Parties have considered equitable. These are the two common factors linking the categories of State conduct that are directly relevant to the delimitation of a single maritime boundary. They exclude from consideration those activities that are unrelated to the subject matter of the delimitation and those activities that amounted to no more than the enjoyment of the freedom of the high seas in common with other nations.

600. This general approach is supported by the treatment given to State activities in the *Tunisia-Libya Continental Shelf* case. The Tunisian ZV45° line was not considered relevant because it was never intended as an act of delimitation: it “was never a line plotted for the purpose of lateral maritime delimitation, either in the seas or on the continental shelf below them”<sup>37</sup>. The same was true of the due north line prescribed by the Libyan Petroleum Regulation No. 1 of 1955 and the official map attached thereto<sup>38</sup>. What the Court did consider important, on the other hand, was the *de facto* line used by the parties in granting their successive petroleum concessions, a “line of adjoining concessions, which was tacitly respected for a number of years”<sup>39</sup>. There can be no doubt that States grant oil and gas concessions on the basis of their assumptions respecting the limits of their sovereign rights; the significance of the 26° line was that it clearly revealed the attitude of the two parties to the crucial question of the extent of their sovereign rights.

601. The emphasis on “sovereign rights” is fundamental. The activities that States previously carried out in common with other States, by virtue of the concept of the high seas as *res communis*, implied no intention or will to act as sovereign or to exercise exclusive jurisdiction. The legal régime of coastal State jurisdiction and sovereign rights in the water column within the 200-mile limit is only a few years old, and even the doctrine of the continental shelf itself is a product of the post-war era. It would be contrary to basic principles of intertemporal law to attach legal consequences to State conduct that could not have been intended, or even anticipated, when the conduct actually took place. Most of the State conduct relied upon by the United States was in no sense an assertion of “sovereign rights” or exclusive jurisdiction. When it took place, it could never have been perceived as even remotely relevant to the future and un contemplated question of the delimitation of a single maritime boundary beyond the limits of the territorial sea.

<sup>37</sup> *I.C.J. Reports 1982*, p. 68, para. 90.

<sup>38</sup> *I.C.J. Reports 1982*, pp. 68-69, paras. 91-92.

<sup>39</sup> *I.C.J. Reports 1982*, p. 71, para. 96; pp. 83-86, paras. 117-121.



602. It is true that, in the *Tunisia-Libya Continental Shelf* case, the Court noted that the circumstances surrounding a *modus vivendi* division of the Libyan and the Tunisian sponge-banks during the colonial era could warrant its acceptance as an historical justification for the delimitation of the continental shelf, "to the extent that the historic rights claimed by Tunisia could not in any event be opposable to Libya east of the *modus vivendi* line"<sup>40</sup>. But that line involved the exercise of exclusive jurisdiction by each of the two sovereigns, including the licensing and exclusion of foreign vessels. It was an exceptional situation involving an issue of historic rights to a sedentary seabed fishery, aptly described in Judge *ad hoc* Jiménez de Aréchaga's separate opinion as "a form of shelf exploitation *avant la lettre*"<sup>41</sup>. There is no analogy here: the diverse activities of both Parties on Georges Bank, before the advent of the continental shelf and fishing zone régimes respectively, were activities in common with other nations and carried out as traditional freedoms of the high seas.

603. These considerations are confirmed — indeed, required — by the fundamental rule of equitable principles and the need to reach an equitable result. It is inevitable that a great power may be able to demonstrate a broader range of maritime activities than its neighbours, although Chapter VI of Part II has shown that the United States' "dominance" of the Gulf of Maine area is very largely a myth of its own fabrication. It is inevitable as well that a nation that achieved a high level of development at an early date may be able to demonstrate a more extensive historical record of State activities at sea than one which grew more slowly and whose status as an industrial power is more recent. An assessment of the issues based upon an aggregation of maritime activities of all kinds, no matter how remote in time or how tenuously connected with the real subject matter of the dispute, would do serious injustice to the smaller and newer powers.

604. The United States has invoked a wide variety of State activities essentially related to maritime navigation — the maintenance of aids to navigation, the provision of search and rescue services, and the charting of the sea. None of these activities is even remotely connected with the subject matter of the present dispute, or the exercise of coastal State rights or jurisdiction. Navigation has always been a high-seas freedom — perhaps the most fundamental freedom of all — and its maintenance under the régime of the exclusive economic zone is secured by the 1982 Convention on the Law of the Sea. In the *Minquiers and Ecréhos* case, moreover, France invoked the fact that it undertook a hydrographic survey of the Minquiers area and assumed sole charge of the lighting and buoying off the Minquiers. The Court found on this issue as follows:

"The Court does not find that the facts, invoked by the French Government, are sufficient to show that France has a valid title to the Minquiers . . . such acts can hardly be considered as sufficient

<sup>40</sup> *I.C.J. Reports 1982*, pp. 70-71, para. 95.

<sup>41</sup> *I.C.J. Reports 1982*, pp. 131-132, para. 102.

evidence of the intention of that Government to act as sovereign over the islets<sup>42</sup> . . .”

This determination is all the more applicable to claims respecting the continental shelf or the exclusive economic zone, where the issue is jurisdiction over resources and not the control of navigation.

605. The same general considerations apply to the record of defence activities relied upon by the United States. It is true that the Court of Arbitration in the *Anglo-French Continental Shelf* award noted the possibility that, in the circumstances of that case, navigational, defence and security interests “may support and strengthen, but they cannot negative, any conclusions that are already indicated by the geographical, political and legal circumstances of the region<sup>43</sup>”. It is only when the course of the boundary might potentially affect the vital security interests of a coastal State, by excluding it from the control of off-shore areas at a short distance from its ports and coastal defences, that these considerations may call for attention as an aspect of the doctrine of non-encroachment<sup>44</sup>. There is no element of this in the arguments put forward by the United States, which are based upon an alleged historical domination of this entire area of the sea, and not upon the indispensable security interests of either of the coastal States. As such, they are extraneous to the question of coastal State jurisdiction under the contemporary law of the sea and to the whole subject matter of the present dispute.

606. In sum, the determination of a single maritime boundary in accordance with equitable principles is a factually oriented process, but one that equally depends upon the application of international law. Nothing is more central to this process than the careful selection and balancing of the factual elements to be taken into account, and this selection must itself reflect the applicable principles and rules of law. What is vital is that the truly important circumstances should not be submerged in a welter of legally extraneous and factually remote considerations. In Canada’s view, the decisive factual circumstances are those that are directly related to the legal basis and purpose of coastal State jurisdiction, and to the actual effect the boundary will have.

#### **Section V. The Result of the Application of Equitable Principles Must Itself Be Equitable in the Light of All the Relevant Circumstances**

607. Equitable principles are the product of the relevant circumstances in a given case together with the applicable principles and rules of law, selected with a view to obtaining an equitable result. It is only in the context of the relevant circumstances and the method of delimitation

<sup>42</sup> *I.C.J. Reports 1953*, p. 71.

<sup>43</sup> *Anglo-French Continental Shelf* award, p. 91, para. 188.

<sup>44</sup> *I.C.J. Reports 1982*, Separate Opinion of Judge *ad hoc* Jiménez de Aréchaga, pp. 121-122, paras. 72-75.

that the applicability of an equitable principle can be demonstrated. Part II of this Counter-Memorial has dealt with the relevant circumstances in depth, and Part IV will provide an analysis of the appropriate method of delimitation. It is Canada's submission that when all these considerations are taken into account, along with the general legal considerations that have been discussed above, a number of specific principles emerge that will lead to a result that meets the requirement of an equitable result in accordance with international law. These are set out below.

### Conclusion

608. There are, in Canada's view, three principles that will lead to an equitable result in accordance with international law in the present case.

- (a) *In the geographical and other circumstances of this case, the boundary should leave to each Party the areas of the sea that are closest to its coast, provided that due account is taken of the distorting effects of particular geographical features in the relevant area.*

By far the greatest part of the area under Canadian claim is closer to Canada than to the United States. Although this consideration is relevant to both the continental shelf and the water column, its importance is enhanced by the extensive Canadian coastline adjacent to the Canadian-claimed area whose population depends upon its fishery resources for their livelihood. The geographical basis of the Canadian claim is confirmed by the overall balance and predominantly opposite character of the coastal relationship, and its essential symmetry vis-à-vis the outer area. These factors, together with the applicable law, demonstrate the equitable character of a boundary that leaves to each Party the portions of the Gulf of Maine area that are closest to its territory, provided that due account is taken of the distorting effect of incidental special features on the United States coast.

- (b) *The boundary should allow for the maintenance of established patterns of fishing that are of vital importance to coastal communities within the relevant area.*

The reasons that underlie this principle are fundamental to the basic purpose of extended coastal State fisheries jurisdiction. In Canada's submission, the special dependence of entire communities and coastal areas in southwest Nova Scotia lends a particular importance to this principle in the circumstances of the present case.

- (c) *The boundary should respect the indicia of what the Parties themselves have considered equitable as revealed by their conduct.*

This principle was enunciated by the Court in the *Tunisia-Libya Continental Shelf* case<sup>45</sup>, and was made a major ground of decision

<sup>45</sup> *I.C.J. Reports 1982*, p. 84, para. 118.

in that case. It operates in conjunction with the legal rule that the boundary should be compatible with any rights that have vested in either of the Parties by way of acquiescence, recognition or estoppel. The prolonged recognition of Canada's continental shelf rights in the area claimed by Canada provides one indication of what the Parties have considered equitable. A further such indication is found in the United States' acceptance of the extent and legitimacy of Canada's fisheries interests on Georges Bank during the course of the dispute, and especially in the negotiation and conclusion of the 1979 Agreement on East Coast Fishery Resources.

609. These three principles give recognition to the relevant circumstances in the present case, and they do so in a manner that takes account of their interrelationship. Most important of all, they reflect the law applicable to a single maritime boundary, and their application is fundamental to the objective of reaching an equitable result in the light of the relevant circumstances.

**PART IV. THE COURSE OF THE SINGLE  
MARITIME BOUNDARY: AN EQUITABLE RESULT  
ON THE BASIS OF INTERNATIONAL LAW**

**CHAPTER I**

**THE UNITED STATES METHODS AND  
THE UNITED STATES LINES**

**Introduction**

610. Since 1965 the United States has employed several “methods” and lines to give effect to its maritime boundary claim in the Gulf of Maine area. The United States Memorial has now put forward yet another line, fitted out in the garb of perpendicularity and tailored to the dimensions of Georges Bank. The United States “method”, however, is not really a method but a device, a contrivance by which the United States seeks to justify its claim by its method, rather than justifying its method by establishing the equitable nature and legal basis of its claim. This no doubt helps to explain why the United States has now abandoned the “method” it adopted in 1976. But the United States proposal of 1982, like its predecessor, is not based on the law applicable to a single maritime boundary and does not produce an equitable result.

611. The new United States boundary proposal, as has already been seen, is simply a straight line from Point “A” to the northeast corner of the triangle established in the Special Agreement, adjusted along its course to provide support for the United States view that fishing banks should not be divided. The United States has thus exploited a procedural device — designed to avoid prejudice to the claims of the Parties as they stood at the time of signature of the Special Agreement — in order to put forward the most extreme claim possible. In this way, it has managed to expand its claim to include not only the whole of Georges Bank but very nearly the whole of the Gulf of Maine area, stopping only 25 nautical miles short of Nova Scotia<sup>1</sup> [Figure 2].

612. While the objectives behind the United States line are clear, its legal and factual rationale are less so. The perpendicular approach is inappropriate in the present case because it ignores the particular geographical relationship of the Parties and fails to take account of the relevant circumstances. The perpendicular method cannot be applied between opposite coasts or within coastal concavities, and it is generally unsuited for use in complex geographical situations. A line of constant bearing is inherently incapable of reflecting changes in coastal direction, the characteristic identified by the United States itself as constituting the pre-eminent relevant circumstance in the area. Based as it is on the alleged general direction of the New Brunswick and Maine coasts, the so-called “adjusted perpendicular line” cannot and does not take account of the manifold changes in direction of the Canadian coast caused by the

<sup>1</sup> At the same point, the United States line is 72 nautical miles from the nearest United States land (a small island) and 75 nautical miles from the United States mainland.

configuration of Nova Scotia. Any method and any line that ignores the very existence of Nova Scotia is obviously incapable of producing an equitable result in the particular circumstances that characterize the *Gulf of Maine* area.

613. This chapter examines the three different approaches to the delimitation of the maritime boundary in the Gulf of Maine area that the United States has accepted or proposed since 1965: the equidistance approach, the Northeast Channel approach, and the perpendicular approach. The United States Memorial now suggests that the so-called "lobster line" of 1974 was a boundary claim. This assertion is also dealt with below.

### Section I. 1965-1969: The United States Accepts the Equidistance Line

614. As was demonstrated in the Canadian Memorial<sup>2</sup> and in paragraphs 360-380 of this Counter-Memorial, for a period extending at least from 1965 to late 1969, the United States accepted the equidistance method for the determination of the continental shelf boundary in the Gulf of Maine area and on Georges Bank in particular. It was not until the end of 1969 that the United States sought to reserve its position on the boundary in the Gulf of Maine-Georges Bank area. The United States, however, proposed no alternative boundary line until 1976.

615. Adherence to the equidistance method by the United States was to be expected. The Special Adviser on Geography to the United States Department of State, S. Whittemore Boggs, was in many respects the father of equidistance<sup>3</sup>. The United States representative to Committee IV of the 1958 Geneva Conference on the Law of the Sea, Marjorie Whiteman, supported the method as one "which would enable equitable apportionment to be made of the sea-bed area to each coastal State concerned"<sup>4</sup>. The United States was an early party to the Convention on the Continental Shelf, and the practice of the United States has always been based upon the equidistance method<sup>5</sup>. Nevertheless, the United States ultimately abandoned the equidistance line in the Gulf of Maine-Georges Bank area and sought a basis for a far more ambitious claim.

<sup>2</sup> *Canadian Memorial*, pp. 159-172, paras. 385-411. See also *Canadian Memorial, Annexes*, Vol. III, Annexes 1-14 and 34.

<sup>3</sup> S. W. Boggs: "Problems of Water Boundary Definitions: Median Lines and International Boundaries Through Territorial Waters." *Geographical Review*, Vol. 27, 1937, p. 445; *Counter-Memorial, Annexes*, Vol. V, Annex 108 and S. W. Boggs: *International Boundaries — A Study of Boundary Functions and Problems*. New York, Columbia University Press, 1940. The German jurist, F. Munch, had earlier attempted to define a median line. *Die technischen Fragen des Küstenmeers, Abhandlungen zur fortschreitenden Kodifikation des internationalen Rechts*, H. 4. Kiel, Institut für Internationales Recht an der Universität Kiel, 1934. p. 156.

<sup>4</sup> *Official Records of the United Nations Conference on the Law of the Sea, A/CONF. 13/42*, Vol. VI, p. 95 (1958).

<sup>5</sup> M. B. Feldman and D. Colson: "The Maritime Boundaries of the United States." *American Journal of International Law*, Vol. 75, No. 4, 1981, p. 749; *Counter-Memorial, Annexes*, Vol. V, Annex 109.

## Section II. 1976-1982: The United States Adopts the "Northeast Channel Line"

616. In 1974, two years before enunciating a boundary claim for its 200-mile fishing zone, the United States asserted a claim to jurisdiction over the lobster fishery on the United States continental shelf<sup>6</sup>. Canada immediately reserved its position and all its rights in relation to this United States claim<sup>7</sup>. In 1975, Canada became aware that the United States purported to exercise jurisdiction in respect of lobsters up to the 100-fathom line on Georges Bank. Although the United States recognized Canada's specific interest in the resources of Georges Bank and indicated that it would not enforce its lobster legislation against Canadian fishermen, Canada nevertheless objected to the purported lobster law enforcement lines unilaterally advanced by the United States. Canada formally reserved all its rights and emphasized that these lines could have "no force and effect under international law", while also stressing that no United States enforcement action against third parties could be based on or support a United States claim to sovereign rights in areas of the continental shelf appertaining to Canada<sup>8</sup>. Although the United States now implies in its Memorial that the "lobster line" was in fact a continental shelf boundary claim<sup>9</sup>, it is clear that even the United States did not treat it as such. In any event, it was decisively rejected by Canada.

617. In April 1976, the United States enacted legislation providing for the creation of a 200-mile fishing zone on 1 March 1977. In November 1976, the United States promulgated a claimed boundary line in the Gulf of Maine area. According to the United States Memorial, this line "followed the line of deepest water through the Northeast Channel<sup>10</sup>". It applied to both the 200-mile fishing zone and the continental shelf and would have had the effect of excluding Canada from the whole of Georges Bank. Apart from the above-noted reference to the "deepest water" in the Northeast Channel, the United States has never set forth an official rationale for this line. It is this line that was in effect when the Parties signed the Special Agreement and that, together with the Canadian claim, is reflected in the Special Agreement's designation of Point "A" and of the triangle.

618. The seabed of the Gulf of Maine area, the United States agrees, consists of a single, continuous continental shelf. The whole area east of Cape Cod is dotted with banks and depressions. The Northeast Channel is only one of these. Although the 1976 United States line followed the deepest part of the Northeast Channel for some distance, it

<sup>6</sup> United States diplomatic note of 18 January 1974. *Canadian Memorial, Annexes*, Vol. III, Annex 16.

<sup>7</sup> Canadian diplomatic note No. 47 of 8 February 1974. *Canadian Memorial, Annexes*, Vol. III, Annex 17.

<sup>8</sup> Canadian aide-mémoire of 12 September 1975. *Canadian Memorial, Annexes*, Vol. III, Annex 24.

<sup>9</sup> *United States Memorial*, pp. 84-85, paras. 144-145.

<sup>10</sup> *United States Memorial*, p. 89, para. 151.

arrived at the Northeast Channel by a route that does not accord with the deepest channel within the Gulf of Maine. From Point "A" the line runs through Jordan Basin, crosses a sill to Crowell Basin, hops over another sill to Georges Basin and thence proceeds to the Northeast Channel; after leaving the Northeast Channel, the line crosses yet another sill and extends to meet the outer limit of the 200-mile zone claimed by the United States. If nature has provided a boundary in the Gulf of Maine — a proposition that Canada does not accept — the United States has not succeeded in finding it. For the wayward course of the United States' Northeast Channel line exposes this claim for what it is: arbitrary and lacking in rational methodology, following with complete indifference either the "deepest water" or the highest ground, and consistent only with the predetermined objective of encompassing the whole of Georges Bank.

619. The United States seems to have based its Northeast Channel boundary claim upon a thalweg principle, or possibly upon the view that a seabed depression operated as a "special circumstance" within the meaning of Article 6 of the Convention on the Continental Shelf. Both of these theories, however, have been rejected as a basis for maritime delimitation in United States practice<sup>11</sup>, in State practice generally and in international jurisprudence.

620. The thalweg principle has been used in dividing navigable rivers between opposite and adjacent riparian States and in dividing some internal waters, such as bays<sup>12</sup>. The irrelevance of the thalweg principle in broader maritime zones is immediately obvious, for the purpose of a thalweg boundary is to provide an equitable division of a navigable channel, and this issue does not arise in extended zones of functional jurisdiction not subject to the outright sovereignty of coastal States, or in freely navigable deep water areas.

621. The *Anglo-French Continental Shelf* award clearly established doubt that seabed depressions, trenches and troughs could not in themselves provide the basis for continental shelf delimitations. In rejecting the Hurd Deep and the Hurd Deep Fault Zone as features capable of influencing the determination of the continental shelf boundary, the Court of Arbitration said that the features in question were "discontinui-

<sup>11</sup> Trenches that are much deeper than the Northeast Channel have been ignored by the United States for the purpose of continental shelf leasing off the California coast. For discussion of disregard of deep California trenches in defining United States offshore jurisdiction, see F. D. Barry: "The Administration of the Outer Continental Shelf Lands Act." *Natural Resources Lawyer*, Vol. 1, 1968, p. 46. Also the three consultants (including the late Judge Richard R. Baxter) appointed to give advice regarding interstate boundaries for purposes of the United States Coastal Energy Impact Program (C.E.I.P.) rejected arguments that the boundary between Mississippi and Louisiana should follow a seabed channel (the "Pearl River trench"), and similarly ignored the Hudson Canyon in the delimitation between New York and New Jersey. See also J. I. Charney: "The Delimitation of Lateral Seaward Boundaries between States in a Domestic Context." *American Journal of International Law*, Vol. 75, 1981, pp. 46-48.

<sup>12</sup> M. Whiteman: *Digest of International Law*, Vol. 4, 1965, pp. 307-309; G. Gidel: *Le droit international public de la mer*, Tome III, 1934, pp. 771-772, argues that the thalweg principle should replace the median line only where as a result of applying the median line one State would be deprived of a navigable channel.



ties in the seabed and subsoil which do not disrupt the essential unity of the continental shelf<sup>13</sup>". The Court of Arbitration held that to give critical significance to such a feature "would run counter to the whole tendency of State practice on the continental shelf in recent years<sup>14</sup>". Similarly, in the *Tunisia-Libya Continental Shelf* case, the Court indicated that submarine features not representing "a marked disruption or discontinuance of the sea-bed as to constitute an indisputable indication of the limits of two separate continental shelves, or two separate natural prolongations" should not be taken as affording a natural boundary, although they might be relevant circumstances characterizing the area<sup>15</sup>.

622. The United States' Northeast Channel line has passed unceremoniously into history because even its authors have realized that it failed to take account of either the applicable law or the relevant circumstances. Seeking its rationale in the depth of the water column, this line made no pretence of being related to coastal geography. It was therefore fundamentally incompatible with the judgment of the Court in the *Tunisia-Libya Continental Shelf* case, which reaffirmed the principle that "the geographic correlation between coasts and submerged areas off the coast is the basis of the coastal State's legal title<sup>16</sup>". The United States' Northeast Channel line also disregarded the fishing practices of the two States, took no account of their past conduct respecting the area, and ignored the vital economic dependence of Nova Scotia upon the fishery resources of Georges Bank. In short, the Northeast Channel line was divorced from the facts and the law, and produced an inequitable and unreasonable result.

623. The startling difference in form between the United States' claim of 1976 and its proposal of 1982 suggests the question: what is common to them and what led the United States so precipitously to abandon one in favour of the other? The two lines have a common objective — the appropriation of the whole of Georges Bank to the United States. They also suffer from a common deficiency — neither is based on the configuration of the coasts in the relevant area. Accordingly, the abandonment of the Northeast Channel line in the United States Memorial can only attest to its inadequacy as a vehicle for achieving the United States objective; for the important new element in the "adjusted perpendicular line" is that it reaches further to the east to widen the area in dispute.

<sup>13</sup> *Anglo-French Continental Shelf* award, p. 63, para. 107.

<sup>14</sup> *Anglo-French Continental Shelf* award, p. 63, para. 107.

<sup>15</sup> *I.C.J. Reports 1982*, p. 57, para. 66; p. 58, para. 68.

<sup>16</sup> *I.C.J. Reports 1982*, p. 61, para. 73.

### Section III. 1982: The United States Proposes the "Adjusted Perpendicular Line"

#### A. THE PERPENDICULAR METHOD IS A PARTICULAR APPLICATION OF THE EQUIDISTANCE PRINCIPLE; IT IS UNSUITABLE FOR USE IN COMPLEX GEOGRAPHICAL SITUATIONS

624. The United States Memorial proposes a new line, ostensibly based on a perpendicular to the general direction of the coast. The application of the perpendicular method has generally been confined to the territorial sea. It has been used to delimit maritime zones beyond the *territorial sea only where it produces substantially the same result as an equidistance line or where its use has been justified by a special or unique combination of circumstances, as in the area close to the coast in the Tunisia-Libya Continental Shelf case.* Involving as it does a line of constant bearing, it reflects only a single coastal direction and is not capable of taking account of more complex coastal configurations. Moreover, because the perpendicular is controlled by a single coastal direction, it is less susceptible to reasoned and reasonable adjustment to take account of local circumstances.

#### *1. Ends and Means: The Promotion of Equality by Equal Angles and Equal Distances*

625. The objective of the perpendicular method is to promote equality by an equal division of the area to be delimited. Where the coastlines on either side of the land boundary terminus are straight, the perpendicular to the coast at the point of the intersection of the land frontier will achieve an equal division of the maritime space in the immediate vicinity of the coast. Equal division is realized by maintaining equal angles of  $90^\circ$  between the boundary and the coasts, or the general direction of the coasts, of both parties on either side of the boundary. In other words, the perpendicular bisects the angle of  $180^\circ$  formed by the coastlines of the parties. So long as the coastlines of both parties remain straight, the angle will remain at  $90^\circ$  and the objective of equal division through maintaining equal angles is realized. However, any change in the direction of the coast alters the  $90^\circ$  angle and by definition nullifies the perpendicular character of the line. Moreover, unless the change in coastal direction on one side is compensated by a corresponding change in direction on the other side, the line fails to accomplish the essential objective of equal division by bisecting the angle formed by the coasts, and is consequently deprived of its equitable rationale. Since, in nature, straight coastlines are the exception rather than the rule, the geographical conditions necessary for the application of the perpendicular method are seldom present.

626. There is an inherent relationship between the perpendicular and equidistance methods, for both have a common object and rationale: the promotion of equality by the equal division of maritime space. The equidistance method achieves this objective by means of a line every point of which is equidistant from the nearest points on the baselines

from which the breadth of the territorial sea is measured. Geometrically, the line that is equidistant between any two points is the perpendicular bisector of the line joining the two points<sup>17</sup> [Figure 45A]. Consequently, where the coast is straight, the equidistance line and a perpendicular line will coincide. However, since almost all coasts involve some element of irregularity, a single line of constant bearing will seldom remain perpendicular to the relevant coasts for very long. In order to retain its equidistant and perpendicular character, the equidistance line — that is, the initial perpendicular bisector — must therefore change its course to reflect the altered geographical reality represented by a changing relationship between the nearest points on the coasts of the parties [Figure 45B]. A true equidistance line is, in effect, a series of segments of perpendicular bisectors of straight lines joining the nearest points on the coasts of the parties [Figure 45C]. It uses both distance and perpendicularity as criteria in effecting an equal division of the space to be delimited. If the relevant coastlines were to be represented by two straight lines forming an angle with its apex at the starting point of the maritime boundary, the equidistance line would bisect that angle.

627. The equidistance method thus incorporates the fundamental methodology and rationale of the perpendicular method. The perpendicular method, in fact, is a particular expression of equidistance, suitable for use in static, unidimensional geographical situations. As Gidel pointed out, "*La solution de la perpendiculaire sur la côte n'est donc qu'une modalité spéciale de la ligne médiane entendue au sens large*"<sup>18</sup>.

628. To seek to use perpendicularity as a general principle or method of delimitation is, therefore, to mistake form for substance, the particular for the general. Where the coasts, or their general directions, do not form a straight line — an angle of 180° — the perpendicular method can only be applied by refashioning geography and by fitting the facts into a preconceived or artificial mould.

## 2. The Limitations of a Line of Constant Bearing

629. Because a perpendicular line reflects a single coastal direction, it is not suitable for use in complex geographical situations where the general configuration of the coasts is not straight. But it is not only the baseline used to determine its inclination that limits the applicability of the perpendicular line. The course or configuration of the line itself is also a limiting factor. A single straight line, a line of constant bearing, cannot respect a coastal configuration that is characterized by complexity or changes of direction. The perpendicular method is not only incapable of reflecting changes of a local nature, such as minor indentations and protrusions or small offlying islands, it is also incapable of reflecting any change in the *general* direction of the coast.

<sup>17</sup> This description of the construction of an equidistance line is adapted from R. D. Hodgson and E. J. Cooper: "The Technical Delimitation of a Modern Equidistant Boundary." *Ocean Development and International Law*, Vol. 3, 1967, p. 316; *Counter-Memorial, Annexes*, Vol. IV, Annex 6.

<sup>18</sup> G. Gidel: *Le droit international public de la mer*, Tome III, 1934, p. 769.

630. In contrast to an equidistance line, which is objectively determinable because it takes account of the actual coastal configuration, a line based on the perpendicular method requires the determination of a hypothetical general direction of the coast. Because straight coasts are rare, such a determination almost always involves an element of subjectivity. This defect of the perpendicular method was a central consideration in the report of the Group of Experts of the International Law Commission, who stated that "The Committee agreed that it is impracticable to establish any 'general direction of the coast' in many instances, and observed that any effort to do so involves questions as to the scale of the chart used for the purpose, and the somewhat arbitrary decision as to how much coast shall be utilized in attempting to determine any 'general direction' whatever<sup>19</sup>". The Special Rapporteur, J. P. A. François, noted that "*la méthode de la ligne tirée perpendiculairement à la direction générale de la côte manque de précision juridique*<sup>20</sup>".

631. A perpendicular line is in principle a single straight line. The inflexibility that results from this characteristic makes it less susceptible than equidistance to adjustment, and less suitable for use over very great distances. In contrast, an equidistance line is generally composed of a series of segments that respond to successive variations in the geography. This characteristic makes the equidistance line easier to adjust in order to take account of the potentially distorting effects of incidental local features. Such an adjustment can usually be effected by changing the selection of the basepoints that affect the relevant portion of the line, without affecting the course of the boundary in its entirety.

632. Given the limitations of the perpendicular method, it is not surprising that it has been generally supplanted in conventional law and in State practice by equidistance. Its essential objective, however, remains valid today: to secure equality.

#### B. LAW AND STATE PRACTICE CONFIRM THE LIMITED UTILITY OF THE PERPENDICULAR METHOD

633. The United States seeks to derive general support for the perpendicular method from its use in the *Grisbadarna* award, from the fact that it was studied by the International Law Commission, from the

<sup>19</sup> *Yearbook of the International Law Commission*, Vol. II, 1953, p. 78. English translation, United Nations Document A/CN.4/61/Add.1.

<sup>20</sup> *Yearbook of the International Law Commission*, Vol. II, 1954, p. 6. The Special Adviser on Geography to the United States Department of State, S. W. Boggs, stated that the method of the perpendicular to the general direction of the coast, was open to criticism:

"... because it is not always feasible to determine the general trend of the coast: how much coast should be taken into consideration for this purpose — a distance of three miles on each side of the land boundary, or five miles or twenty miles? And how average the sinuosities so as to ascertain the general trend?"

*Geographical Review*, Vol. 27, 1937, p. 454; *Counter-Memorial, Annexes*, Vol. V, Annex 108.

employment of a line perpendicular to the coast in the *Tunisia-Libya Continental Shelf* case, and from State practice<sup>21</sup>. None of these, however, offers any such support.

### 1. Jurisprudence

634. The history of the perpendicular method shows that its application has been generally limited to narrow areas of water of no greater extent than the territorial sea. The *Grisbadarna* award, upon which the United States places so much emphasis, referred only to the territorial sea. In fact, the *Grisbadarna* award provides the only clear example of the application of the method of a perpendicular to the general direction of the coast. That case was based on unique circumstances and on the law of the seventeenth century applied to an area whose scale is not remotely comparable to the Gulf of Maine area<sup>22</sup> [Figure 46].

635. Nor does the reference to perpendicularity in the *Tunisia-Libya Continental Shelf* case provide support for the contentions of the United States. The line fixed upon in the inner sector in that case was the result of a unique combination of circumstances, among which the conduct of the parties was paramount. The origin of the 26° line lay in proposals by Italy for a sponge-fishing line perpendicular "to what was considered to be the direction of the coastline" at the land boundary. The two States gave it *de facto* observance when they issued concessions for offshore hydrocarbon exploration and exploitation<sup>23</sup>. This conduct was treated by the Court as a "highly relevant" circumstance because both parties had thereby demonstrated that they had once considered the 26° line to be equitable and had acted upon it as such<sup>24</sup>. The factors governing the use of the line in the inner sector are set out in the judgment as follows:

"... the land frontier between the Parties, and their conduct prior to 1974 in the grant of petroleum concessions, resulting in the employment of a line seawards from Ras Ajdir at an angle of approximately 26° east of the meridian, which line corresponds to the line perpendicular to the coast at the frontier point which had in the past been observed as a *de facto* maritime limit<sup>25</sup>."

Thus, the "factor of perpendicularity" supported a boundary chosen on other grounds. Like the boundary in the *Grisbadarna* award, the origin of this line predated the development of modern methods of delimitation. Moreover, the Court declined to use an extension of the *modus vivendi* line to delimit the seaward portion of the area because "a line drawn

<sup>21</sup> *United States Memorial*, p. 148, para. 264.

<sup>22</sup> J. B. Scott, ed.: *The Hague Court Reports*, 1916, p. 121. See also A. L. W. Munkman: "Adjudication and Adjustment — International Judicial Decision and the Settlement of Territorial and Boundary Disputes." *British Yearbook of International Law*, Vol. 46, 1972-73, p. 56.

<sup>23</sup> *I.C.J. Reports 1982*, pp. 70-71, paras. 93-96.

<sup>24</sup> *I.C.J. Reports 1982*, pp. 83-85, paras. 117-120.

<sup>25</sup> *I.C.J. Reports 1982, dispositif*, p. 93, para. 133(B)(4).

perpendicular to the coast becomes, generally speaking, the less suitable as a line of delimitation the further it extends from the coast<sup>26</sup>”.

## 2. *The International Law Commission*

636. The limitations of the perpendicular method discussed in this chapter were of less significance in an earlier period when methods of delimitation were relatively primitive and the zones to be delimited extended only three or four miles from the coast. Yet, as has been seen, they were a matter of concern to the International Law Commission's Group of Experts, and the approach of the Group of Experts was adopted by both the Special Rapporteur and the Commission itself. The United States Memorial stresses the fact that the method of the perpendicular to the general direction of the coast was “studied by the International Law Commission in its effort to find one method suitable for all cases<sup>27</sup>”. The Commission certainly studied this method but, of course, rejected it, whether for the delimitation of the territorial sea or for the delimitation of the continental shelf, and adopted the equidistance method instead. The Report of the International Law Commission stated:

“The group of experts was unable to support (the perpendicular) method of drawing the boundary line. It agreed that it was often impracticable to establish any ‘general direction of the coast’ and the result would depend on the ‘scale of the charts used for the purpose and . . . how much coast shall be utilized in attempting to determine any general direction whatever.’ Consequently, since the method of drawing a line at right angles to the general direction of the coastline is too vague for the purposes of the law, the best solution seems to be the median line which the Committee of Experts suggested<sup>28</sup>.”

## 3. *State Practice*

637. The agreements cited by the United States as “examples of the use of perpendiculars to the general direction of the coast or of similar methods to delimit maritime boundaries<sup>29</sup>” indicate that the United

<sup>26</sup> *I.C.J. Reports 1982*, pp. 87-88, para. 125.

<sup>27</sup> *United States Memorial*, p. 148, para. 264.

<sup>28</sup> *Yearbook of the International Law Commission*, Vol. II, 1956, p. 158.

<sup>29</sup> *United States Memorial*, p. 148, para. 265.

States is confusing several delimitation methods<sup>30</sup>. Only one of the agreements referred to, that between Brazil and Uruguay, involves an actual application of the method of the perpendicular to the general direction of the coast. In fact, these two States had first agreed to delimit their boundary in accordance with equidistance; the subsequent delimitation agreement referred to the line as a perpendicular, but the practical difference between the two methods in this instance was negligible and the perpendicular was nothing more than a simplified equidistance line<sup>31</sup> [Figure 47].

638. Two of the boundary lines mentioned in the United States Memorial in support of the perpendicular method (Costa Rica-Panama and Argentina-Uruguay) were in fact *expressly* based on the equidistance or median line method<sup>32</sup>. The fact that the result approximated a perpendicular line demonstrates the point implicit in the Brazil-Uruguay agreement, namely that the perpendicular method is appropriate when the result approximates equidistance. The perpendicular method has merit to the extent that, in appropriate circumstances, it produces a simplified equidistance line.

639. Six of the agreements referred to by the United States in support of the perpendicular method were, in fact, drawn along a parallel of latitude<sup>33</sup>. In some cases this can produce a result that is similar to that produced by a line perpendicular to the general direction of the coast, but in other cases, as the Peru-Chile [Figure 48A] and the Colombia-Ecuador [Figure 48B] boundaries demonstrate, there is no necessary correlation between a boundary drawn along a parallel of latitude and a boundary drawn according to a perpendicular to the general

<sup>30</sup> The Group of Experts advising the International Law Commission's Special Rapporteur on the appropriate method for the delimitation of maritime boundaries in the territorial sea and on the continental shelf was asked to consider, in addition to the median line, the following three methods: extension of the land boundary, a line perpendicular to the coast at the point where the land boundary reaches the coast, and a line perpendicular to the general direction of the coast. *Yearbook of the International Law Commission*, Vol. II, 1953, p. 79. A further method was also discussed in the *travaux préparatoires* of the 1958 Conventions on the Law of the Sea, that of extending the territorial sea boundary along a parallel of latitude from the land boundary. See the remarks of the United Kingdom representative, Commander Kennedy, *Official Records of the United Nations Conference on the Law of the Sea*, Vol. VI, p. 93.

<sup>31</sup> *Limits in the Seas*, No. 73, United States Department of State, Bureau of Intelligence and Research, Office of the Geographer, 1976. *United States Memorial, Documentary Annexes*, Vol. IV, Annex 83.

<sup>32</sup> Treaty on Demarcation of Marine Areas and Maritime Cooperation Between the Republic of Costa Rica and the Republic of Panama, signed 2 February 1980, entered into force 11 February 1982. *United States Memorial, Documentary Annexes*, Vol. IV, Annex 88; *Limits in the Seas*, No. 64, 1975, *United States Memorial, Documentary Annexes*, Vol. IV, Annex 84.

<sup>33</sup> These were the agreements between Chile-Peru: *Limits in the Seas*, No. 86, 1979, *United States Memorial, Documentary Annexes*, Vol. IV, Annex 79; Peru-Ecuador: *Limits in the Seas*, No. 88, 1979, *United States Memorial, Documentary Annexes*, Vol. IV, Annex 80; Columbia-Ecuador: *Limits in the Seas*, No. 69, 1976, *United States Memorial, Documentary Annexes*, Vol. IV, Annex 81; Kenya-Tanzania: *Limits in the Seas*, No. 92, 1981, *United States Memorial, Documentary Annexes*, Vol. IV, Annex 87; Columbia-Panama: *Limits in the Seas*, No. 79, 1979, *United States Memorial, Documentary Annexes*, Vol. IV, Annex 82; The Gambia-Senegal: *Limits in the Seas*, No. 85, 1979, *United States Memorial, Documentary Annexes*, Vol. IV, Annex 85.

direction of the coast. These agreements, therefore, do not provide examples of State practice based on the method of delimitation advocated by the United States.

640. The above analysis of the examples of State practice adduced by the United States in support of the method of a perpendicular to the general direction of the coast demonstrates that there exists to date only one genuine example of its application to extended maritime zones (Brazil-Uruguay)<sup>34</sup>. *The objective in that case was to produce a simplified equidistance line.* The widespread use of the equidistance method in modern times is in sharp contrast to the rare use of the perpendicular method, and confirms that equidistance produces an equitable result in the great majority of cases.

641. As was pointed out in the Canadian Memorial<sup>35</sup>, of some 94 known boundaries beyond the territorial sea settled by agreement, 66 of them — almost 71 percent — utilize the equidistance principle for all or part of the line. The then Geographer of the United States Department of State wrote in 1976 that “most maritime boundary delimitations to date have utilized equidistance, either by direct application or with local modification, to satisfy existing or perceived special circumstances<sup>36</sup>”. These facts are hardly reconcilable with the statement in the United States Memorial that “the equidistance method has not been used more often to delimit boundaries because it is inherently inequitable in irregular geographical situations<sup>37</sup>”. Since the United States Memorial also implies that any configuration other than a straight coast constitutes an “irregularity”, it is clear that “irregular geographical situations” are the norm rather than the exception, and that the employment of the equidistance method in a substantial majority of delimitations attests to its suitability for use in *both* regular and irregular geographical situations.

#### 4. United States Practice

642. In fact, the United States concedes that it too has used equidistance as a method to define certain maritime boundaries with neighbouring States, where it was agreed “that equidistance produced an equitable solution in the relevant geographical and other circumstances of that case<sup>38</sup>”. This concession is more revealing for what it does not say than for what it does. The United States Memorial fails to point out — as is pointed out in another source — that all United States “boundaries that have been negotiated to date generally have been based on the equidistance method to one degree or another<sup>39</sup>”. Moreover, the present case

<sup>34</sup> *United States Memorial*, pp. 148-149, para. 266.

<sup>35</sup> *Canadian Memorial*, p. 151, para. 362.

<sup>36</sup> R. D. Hodgson and E. J. Cooper: “The Technical Delimitation of a Modern Equidistant Boundary”, p. 364; *Counter-Memorial, Annexes*, Vol. IV, Annex 6.

<sup>37</sup> *United States Memorial*, p. 149, para. 270.

<sup>38</sup> *United States Memorial*, p. 149, para. 269.

<sup>39</sup> M. B. Feldman and D. Colson: “The Maritime Boundaries of the United States”, p. 749; *Counter-Memorial, Annexes*, Vol. V, Annex 109.



apart, in each of the boundaries still to be resolved by the United States with its neighbours, with the exception of part of the boundary with the Bahamas<sup>40</sup>, the United States supports the equidistance method. What is significant also is that the boundary agreements concluded by the United States involve areas with irregular coastlines for which some modification of the equidistance line has been necessary. The international practice of the United States belies its contention that the equidistance method is "inherently inequitable in irregular geographical situations<sup>41</sup>". [See, for example, the Mexico-United States boundary illustrated in *Figure 49.*]

643. The United States has used the equidistance method in claiming continental shelf and fisheries jurisdiction in the three Canada-United States boundary areas in the Pacific and Arctic, despite the fact that there exist in each of these areas circumstances analogous to those on which the United States has relied to reject the equidistance method in the Gulf of Maine area<sup>42</sup>. Seaward of Juan de Fuca Strait (off British Columbia and the state of Washington) there exists a submarine depression, the Juan de Fuca Canyon, considerably more pronounced in its configuration than the Northeast Channel<sup>43</sup>. From the United States point of view, however, the canyon is on the wrong side of the equidistance line. The United States accordingly has ignored this feature, as well as traditional Canadian fishing on rich fishing grounds, in claiming an equidistance boundary that divides La Perouse Bank and cuts off the edge of Swiftsure Bank. Within and seaward of Dixon Entrance (off British Columbia and Alaska), where the Canadian coast borders two sides and the United States coast only one side of a large embayment, the United States again claims an equidistance boundary. In the Arctic, where the Canadian and United States coastlines on either side of the point where the land boundary reaches the coast are respectively concave and convex, the United States once more has advanced a claim to jurisdiction up to an equidistance line. Except where boundaries have already been determined by treaty or arbitration, Canada has also exercised jurisdiction up to an equidistance line, pending boundary agreements<sup>44</sup>.

644. United States domestic practice is also at odds with the position taken in the United States Memorial. A Coastal Energy Impact

<sup>40</sup> M. B. Feldman and D. Colson: "The Maritime Boundaries of the United States", pp. 750-751; *Counter-Memorial, Annexes*, Vol. V, Annex 109.

<sup>41</sup> *United States Memorial*, p. 149, para. 270.

<sup>42</sup> "Maritime Boundaries of the United States and Canada." United States Department of State, Public Notice No. 506. Published in *Federal Register*, Vol. 41, No. 214, 4 November 1976, pp. 18619-18620; *Canadian Memorial, Annexes*, Vol. II, Annex 30.

<sup>43</sup> Measured between the 100-fathom contour, Juan de Fuca Canyon is 11 nautical miles wide and has a depth of 874 metres at sea level.

<sup>44</sup> Canadian diplomatic note No. 626 of 22 December 1976, *Canadian Memorial, Annexes*, Vol. III, Annex 46; Canadian diplomatic note of 26 May 1977, *Canadian Memorial, Annexes*, Vol. III, Annex 54. The Canadian position is that the maritime boundaries in the Beaufort Sea and inside Dixon Entrance were determined by the Treaty of 1825 between Great Britain and Russia and confirmed in the Treaty of 1867 between the United States and Russia. The course of the boundary inside the Dixon Entrance was finally fixed by the Alaska Boundary Arbitration Award of 1903.

Program (CEIP), established by amendment of the Outer Continental Shelf Lands Act, requires that special-purpose boundaries be established delimiting the continental shelf adjacent to the coastal states of the United States. These boundaries are to be determined on the basis of principles of international law. A panel of experts (which included the late Judge Richard R. Baxter) set up to recommend interstate offshore boundaries for the purposes of this legislation, has recommended that the equidistance method, modified where appropriate to take account of relevant circumstances, should be used for the maritime boundaries between various coastal states of the United States<sup>45</sup>.

### C. THE GEOGRAPHY OF THE GULF OF MAINE AREA AND THE SPECIAL AGREEMENT PRECLUDE THE APPLICATION OF THE PERPENDICULAR METHOD IN THIS CASE

645. The application of the perpendicular method must be preceded by the identification of a single "general direction of the coast". This the United States has attempted to do by relying on macrogeographical considerations and by assuming that Nova Scotia does not exist. Put another way, the United States has assumed that the Gulf of Maine does not exist; for in eliminating Nova Scotia it has eliminated the concavity of the coast and left only the coasts of New Brunswick and Maine facing directly onto the open Atlantic Ocean. This refashioning of geography by the United States is demonstrated by the fact that, in the absence of Nova Scotia and Grand Manan Island, a line perpendicular to the general direction of the coast might constitute an appropriate boundary. It can therefore be seen that the United States seeks to have the Court recognize as equitable a boundary line that could only be justified if the Province of Nova Scotia did not exist.

50 646. The eight-fold change in the *general* direction of the coast within the relevant area is sufficient to exclude the use of any single line of constant bearing to delimit the entire area [Figure 7]. On this ground alone, the perpendicular method cannot be applied in the area to be delimited in this case.

647. The geography of the innermost sector, as well as the terms of the Special Agreement, preclude the application of the perpendicular method in the area close to the coast within the Gulf of Maine. At the terminal point of the international boundary in Grand Manan Channel, the relationship of the coasts of the Parties is clearly one of oppositeness, and the perpendicular method, of course, is not applicable to opposite coasts. Moreover, the Parties have agreed that the boundary to be fixed by the Court shall commence at Point "A", almost 39 nautical miles *south-southwest* (204°33') of the international boundary terminus. They have thus recognized that it is the opposite coasts of Maine and Grand Manan Island and of Maine and Nova Scotia that should control the course of the line in the innermost sector. If the Parties had intended

<sup>45</sup> For an analysis of the CEIP and the significance of the consultants' reports, see J. I. Charney: "The Delimitation of Lateral Seaward Boundaries between States in a Domestic Context", p. 28.

the laterally aligned coasts of Maine and mainland New Brunswick to control the course of the line, they would have had to fix Point "A" southeast of the boundary terminus in the vicinity of the "perpendicular to the general direction of the coast at the international boundary terminus" illustrated in Figure 27 of the United States Memorial. [See <sup>(33)</sup> Figure 5 of this Counter-Memorial.]  
<sup>(46)</sup>

648. Both the final direction of the established international boundary (214°41') and the direction of a line connecting the international boundary terminus to Point "A" (204°33') are approximately south-southwest. Thus the United States perpendicular line (144°) is at a pronounced angle both to the direction of the international boundary at its terminus and to the future maritime boundary between the terminus and Point "A". Neither the United States Memorial nor a study of a map of the area suggests any change in the configuration of the coast that could cause such a sharp turn in the direction of the maritime boundary at Point "A". One can only surmise that the radical change in the direction of the proposed boundary reflects a change in the tactical position of the United States rather than a change in the orientation of the coasts.

649. The actual method of construction of the United States lines also demonstrates the inapplicability of the perpendicular method in the present case. Initially, the United States employs the international boundary terminus as the starting point in the construction of its perpendicular line, despite the fact that the resulting line, as the United States is obliged to admit, would "intersect the Nova Scotia peninsula" — thus demonstrating the opposite relationship of the coasts<sup>46</sup>. The United States neglects to mention that, even before the perpendicular line intersects the Nova Scotia peninsula, it passes through Canada's Grand Manan Island, again as a result of its opposite relationship with the coast of Maine<sup>47</sup> [Figure 5]. Although the perpendicular line is then "adjusted" to commence from Point "A", the terminus of the land boundary is said to be a relevant circumstance of which the United States line takes account<sup>48</sup>. The United States refers to the international boundary terminus as lying in the "northern corner of the Gulf of Maine"<sup>49</sup>. "Corner" normally suggests an angle rather than a straight line. A perpendicular, however, can only be applied to straight coasts. The starting premise of the United States, therefore, suggests the inapplicability of the perpendicular method.

#### D. THE UNITED STATES MISAPPLIES THE PERPENDICULAR METHOD

650. The United States criticizes the Canadian line on the ground that the equidistance method is said to take into account only "a few

<sup>46</sup> *United States Memorial*, p. 179, para. 302.

<sup>(33)</sup> <sup>47</sup> *United States Memorial*, p. 181, Figure 27.

<sup>48</sup> *United States Memorial*, p. 179, para. 302.

<sup>49</sup> *United States Memorial*, p. 169, para. 280; p. 209, para. 327.

selected points on the coasts of the States involved<sup>50</sup>. Yet the Canadian line is constructed on the basis of *eleven* coastal control points<sup>51</sup>. In contrast, the highly arbitrary line from Cape Ann to Chignecto Isthmus used by the United States as the base of its adjusted perpendicular touches land at only *five* points along the coast — Cape Ann, on the coast of Massachusetts; Ross Island, lying on the seaward side of Grand Manan Island at the entrance to the Bay of Fundy; Point Wolfe, on the Fundy coast of New Brunswick; and two points on Chignecto Bay. According to the United States Memorial, the line is supposed to represent the general direction of the coast “in the vicinity of the international boundary terminus<sup>52</sup>”; and yet it never even approaches the coast of Maine or Nova Scotia, but intersects the coast of New Brunswick at four points.

651. The effect of controlling the inclination of the perpendicular by a series of points situated on *the most concave position* of the Canadian coast, but on *a convex portion* of the United States coast, is to swing the line toward the Canadian coast. The net effect is to make the concavity of the Bay of Fundy and the convexity of the Massachusetts coast the *sole determinants of the entire United States line*. The *inequity* of the result is both obvious and extreme.

652. In another sense, the United States line has been projected from *a single point*, Point “A”. Even if it did reflect the actual relationship of the coasts of the Parties at that point, a line of constant bearing projected from that single point cannot reflect the changing configuration and relationship of the coasts as the line proceeds seaward between the coasts facing onto the Gulf and out into the Atlantic, where the sea lies off rather than between the coasts. Thus, after it leaves Point “A”, the United States line clearly ceases to bear any relationship to the coasts that border the area being delimited.

653. Like its predecessor, the Northeast Channel line, the perpendicular line defies methodology. The line is “adjusted” to avoid cutting across Browns Bank and German Bank and so provide support for the United States contention that Georges Bank should not be divided. The *Grisbadarna* award is invoked to support this adjustment, but the method employed in that case has not been followed. In the *Grisbadarna* award, the direction of the line was adjusted by one degree, thereby allocating the *Grisbadarna* Bank to Sweden in accordance with the parties’ own view that this small lobster fishing ground should not be divided<sup>53</sup>. In the present case, the United States has chosen to adjust the perpendicular line to follow the 50-fathom line. The United States then adjusts the 50-fathom line itself, to turn it into a series of straight lines running at right angles to each other, on the grounds that the 50-fathom

<sup>50</sup> *United States Memorial*, p. 149, para. 268.

③ ①⑨ <sup>51</sup> *Canadian Memorial*, p. 13, Figure 3; Canadian Hydrographic Service chart 4003E deposited with the Registrar of the Court.

③② <sup>52</sup> *United States Memorial*, p. 170, para. 283; p. 171, Figure 26; p. 179, para. 302, p. 181, Figure 27.

③③ <sup>53</sup> J. B. Scott, ed.: *The Hague Court Reports*, 1916, p. 129.

contour is "a complex and difficult boundary to define permanently"<sup>54</sup>. (This problem, of course, did not prevent the United States from adopting the 100-fathom line for its assertion of jurisdiction over the lobster fishery in 1974.)

654. The result of this series of arbitrary choices by the United States is in no sense a perpendicular line. In part, it is perpendicular to a series of parallel lines joining points arbitrarily selected by the United States; in part, it is parallel to those same parallel lines. To describe this contrived and self-serving construction as an application of a perpendicular "method" is a misuse of language. It is a line of "wandering perpendiculars" that is totally divorced from its putative origin as a perpendicular to the general direction of the coast.

**E. THE UNITED STATES LINE DOES NOT TAKE ACCOUNT OF THE  
"RELEVANT CIRCUMSTANCES" NOR ACCORD WITH THE "EQUITABLE  
PRINCIPLES" IDENTIFIED IN THE UNITED STATES MEMORIAL**

655. The United States' line relies upon factors and principles that either are irrelevant or, when examined, have no substance. In particular, it does not accord with the "relevant circumstances" or "equitable principles" identified in the United States Memorial. Nothing illustrates this more clearly than the statement by the United States that, "because it borders the Northeast Channel, the adjusted perpendicular  
(36) line can be identified easily by fishermen"<sup>55</sup>. Figure 30 of the United States Memorial shows clearly that the adjusted perpendicular line bears little relationship to the Northeast Channel. In fact, the United States' adjusted perpendicular line makes contact with the Northeast Channel only once, cutting its semi-circular axis at an angle to the west of Browns Bank. Accordingly, the relationship between the Northeast Channel and the United States line is tenuous and accidental.

656. The United States' view that its line of wandering perpendiculars is more readily identifiable than the Canadian equidistance line ignores the true construction of the two lines and betrays a misunderstanding of the way in which navigators locate a position at sea. The Canadian line, drawn on the basis of 11 coastal control points, undergoes five moderate changes of direction. The United States line, by comparison, has no coastal reference points beyond those used to establish the base of the perpendicular, and changes direction nine times, on each occasion by a radical 90°. Moreover, fishermen, like other navigators, determine positions at sea by compass bearings of terrestrial objects and celestial observations, and by more sophisticated navigational aids such as LORAN. As a superficial topographical feature of the seabed, the Northeast Channel has no relevance to the location of positions at sea and to the location of a maritime boundary. The notion that the United States' line of wandering perpendiculars is a "readily observed" boundary is a chimera.

<sup>54</sup> *United States Memorial*, p. 185, para. 303.

<sup>55</sup> *United States Memorial*, p. 5, para. 17. At p. 206, para. 322, the United States asserts again that the Northeast Channel is an "easily observable" boundary.

657. The United States' claim that its line would facilitate conservation and management and minimize international disputes is based on an equal mixture of illusion and legal invention; it makes a virtue of non-cooperation and seeks to benefit from the rejection of a fundamental norm of friendly relations between States. Neither of these alleged equitable principles, it has been shown, has any specific relevance to the delimitation of maritime zones. [See paragraphs 497-538.] In fact, rather than dividing what the United States perceives to be "separate ecological régimes", the "adjusted perpendicular line" cuts through fishing grounds; for Browns Bank and German Bank are not confined to the 50-fathom contour as the United States implies. Nor is it true that "little or no fishing occurs in the Northeast Channel because of the relative scarcity of fish and the difficulties of conducting fishing activities there"<sup>56</sup>. As the *Canadian Memorial* has pointed out<sup>57</sup> Canadian fishermen range over Browns Bank, the Northeast Channel and Georges Bank. Reality simply does not conform with the United States' tidy presentation of ecology.

#### F. THE UNITED STATES CLAIM IS UNFOUNDED IN FACT AND LAW

658. The lack of a legal and factual basis for the United States claim is disclosed by the fundamentally different forms and rationales for the several lines it has adopted since its abandonment of the equidistance line [see *Figure 1*]. Neither the 1976 nor the 1982 line is based upon or bears any relationship to the actual coastal geography in the Gulf of Maine area. The 1976 line, allegedly based on "the deepest water", veered sharply in front of the coast of Maine and appeared to assume that Georges Bank was the natural prolongation or seaward extension of the coast of Massachusetts. The 1982 line, on the other hand, based on the purported direction of the New Brunswick-Maine coasts, appears to rest on the premise that Georges Bank is the seaward extension of the coast of Maine. Nevertheless, the United States Memorial adduces no factual evidence whatever — and, indeed, there is none — in support of its contention that Georges Bank appertains to the coast of Maine. The United States claim thus divorces the applicable law from the relevant facts, an approach completely at odds with the fundamental legal norm of maritime delimitation.

659. The United States' claim also ignores the basic purpose of the rights and jurisdiction in issue in this case and disregards Nova Scotia's vital economic dependence on the Georges Bank fishery. This dependence and the equitable considerations to which it gives rise received unequivocal recognition in the 1979 Agreement on East Coast Fishery Resources. The United States Memorial makes much of United States achievements of the last century while ignoring the conduct of the Parties in the legally relevant period, when the rights and zones now in issue first emerged: in particular, the United States' recognition of and acquiescence in the Canadian equidistance line from 1965 to 1969, and

<sup>56</sup> *United States Memorial*, p. 206, para. 322.

<sup>57</sup> *Canadian Memorial*, pp. 83-84, para. 182.

the negotiation and conclusion of the 1979 Agreement on East Coast Fishery Resources. Further, the United States method and line disregard the fact that Canada and the United States are parties to the 1958 Convention on the Continental Shelf, and that Article 6 of that convention provides a specific rule for the delimitation of the continental shelf that is equally compatible with the delimitation of a 200-mile zone.

660. *The United States, in effect, bases its approach neither on equitable principles nor on relevant circumstances, but rather on a theory of general dominance of the Gulf of Maine area, supported by appeals to history and nature as interpreted by the United States. The result is unbalanced, inequitable and disproportionate. It would neither promote conservation nor minimize disputes. The essential unity of the Gulf of Maine area is such that it is not possible to avoid the need for cooperation. The United States proposal, however, would destroy much of the incentive for such cooperation.*

#### G. THE UNITED STATES MISAPPLIES THE PROPORTIONALITY TEST

661. *The United States seeks to exploit the indeterminate character of the relevant coasts and sea areas — a consequence of the absence of natural geographic features to define them — in an attempt to demonstrate that its “adjusted perpendicular line” produces a proportionate result.*

662. *The United States describes the area in which its proportionality test is applied as:*

“... the area bounded by lines drawn perpendicular to the general direction of the coast at Nantucket Island, Massachusetts and at the Chignecto Isthmus. These lines are extended to a point 200 nautical miles from the respective coasts and then are connected to enclose the area<sup>58</sup>.”

④① The application of the test is represented in Figures 34 and 35 of the United States Memorial. There are several major inconsistencies between the method described in the United States Memorial<sup>59</sup>, the depiction of the method in its Figures 34 and 35, and the actual calculations used to obtain the results.

663. *The perpendicular lines enclosing the “test area” are said to extend “to a point 200 nautical miles from the respective coasts”, but the eastern one extends 288 nautical miles from the mainland coast of Nova Scotia and 384 nautical miles from the point on the Chignecto Isthmus from which it is projected. (Apparently the United States has extended this perpendicular to a point 200 nautical miles from Sable Island, a fact not noted in its Memorial.) Since the perpendicular from Nova Scotia is extended seaward to a point 419 nautical miles from the nearest United States land, while the perpendicular from Nantucket*

<sup>58</sup> *United States Memorial*, p. 192, para. 312.

<sup>59</sup> *United States Memorial*, pp. 192-201, paras. 312-314.

Island is extended seaward to a point only 295 nautical miles from the nearest Canadian land, it can hardly be said that the United States test meets the essential requirement of equity — the comparison of like with like.

664. While the United States ostensibly uses the seaward limit of the 200-mile zones to define the seaward limit of the test area, it nevertheless includes within this area some 14,600 square nautical miles that lie beyond the 200-mile zones of either Party. This is accomplished by drawing a straight line between two points on the 200-mile limits of the Parties. The areas outside the 200-mile limits are, of course, extraneous to the proportionality test in the context of these proceedings.

665. Another inconsistency in the United States' approach is the exclusion from the ratios of the sea area north and east of the point of commencement of the single maritime boundary — the "excluded area" depicted in Figures 34 and 35 of the United States Memorial — and the inclusion of the coastlines facing this area. Because the United States coastline facing the "excluded area" is measured along the sinuosities of the Maine coast, the United States appears to be credited with 102 nautical miles of coast, while the Canadian coastline, being measured by a straight line across the Bay of Fundy, is deemed to be only 29 nautical miles in length. Since this portion of the Maine coast would measure 34 nautical miles if measured by a straight line, this United States procedure again does not conform to the "absolute requirement" of comparing like with like.

666. Another objection to the United States' approach is the manner in which it has enclosed the test area by perpendiculars to what is purported to be the general direction of the coast. Despite the attempt of the United States Memorial to reduce the complexities of geography to a single macrogeographical general direction, there are in fact several general directions of the coast in this area. The United States Memorial itself, for other purposes, has stressed the frequent changes in the direction of the Canadian coast.

667. The general direction of the New England coast west of Nantucket is clearly relevant to the inclination of a perpendicular projected from that point. The direction of this coastline appears to be in the order of 079°, not 054° as is suggested in the United States Memorial. The general direction of the Atlantic-facing coast of southwest Nova Scotia, on the other hand, appears to be in the order of 054° [Figure 7]<sup>60</sup>. In Canada's submission, the coasts of Maine and New Brunswick facing the innermost sector of the Gulf cannot be considered relevant for enclosing the outer area for the purposes of a proportionality test. In any event, the general direction of these coasts, from the head of Casco Bay to the head of Chignecto Bay, appears to be about 065°.

<sup>60</sup> The general direction of the Nova Scotia coast from Cape Sable to Cape Canso is in the order of 061°. It is clearly reasonable to use the Cape Sable to Cape Sambro general direction (054°) to calculate the inclination of the perpendicular from the Canadian coast, only if a comparable length of coast such as New Haven to Cape Cod, or Long Island to Nantucket, (079°) is used to determine the inclination of the perpendicular from the United States coast.



rather than 054° as alleged in the United States Memorial. Finally, if a perpendicular to the macrogeographical general direction of the coast were deemed an appropriate means of laterally defining the test area — another proposition that Canada does not accept — that general direction in fact would be in the order of 067°. [See paragraph 94 and *Figure 6*].<sup>40</sup> The resulting change in the inclination of the perpendiculars enclosing the test area based on the true general directions of the coasts — or on an average of these general directions, that is, 066° — would significantly alter the results of the proportionality test, even if the perpendiculars were projected from the coastal points selected by the United States.

668. Having identified the line of general direction of the coast on the basis of an arbitrary line extending from Cape Ann to the Chignecto Isthmus, the United States — by way of a footnote<sup>61</sup> — excludes from its calculations of coastal lengths the long section of the Canadian coast stretching from the international boundary terminus, around the Bay of Fundy, to Cape St. Marys. Yet the Bay of Fundy unquestionably forms part of the Gulf of Maine, and the United States itself includes it within the relevant area. [See paragraphs 126-130.]

669. *If the proportionality test is to prove anything, the coasts and sea areas included in the calculations must be related to the purposes of the test. The United States Memorial states that:*

“The geographical features whose proportionate or disproportionate effects are to be evaluated in this case include the entire Gulf of Maine, as well as the four-fold change in direction of the Canadian coastline that causes the Nova Scotia peninsula to protrude south of the international boundary. That four-fold change begins at the Chignecto Isthmus<sup>62</sup>.”

Thus, as the United States Memorial recognizes, it is the change in direction of the Canadian coast at the Chignecto Isthmus — the concavity of the Bay of Fundy — that causes Nova Scotia to “protrude”. How is it possible to evaluate the “four-fold change” in coastal direction and the “protrusion” of Nova Scotia beginning at the Chignecto Isthmus *if the very coasts whose effects are to be evaluated are excluded from the calculations?*

670. There are further inconsistencies in the United States’ approach. The change in direction of the Canadian coast at the head of the Bay of Fundy is used by the United States as the rationale for determining the lateral limits of the test area<sup>63</sup>, *but the very coasts which comprise this geographical feature are excluded from the test*. Again, while the United States accepts the necessity of including within the test area the coasts on which are situated the basepoints used to determine the course of the line being tested<sup>64</sup>, *it excludes the coast of New*

<sup>61</sup> *United States Memorial*, p. 201, footnote 1.

<sup>62</sup> *United States Memorial*, p. 192, para. 312.

<sup>40</sup> <sup>63</sup> *United States Memorial*, pp. 192-201, paras. 312-313; p. 199, *Figure 34* and p. 203, *Figure 35*.

<sup>41</sup> <sup>64</sup> *United States Memorial*, p. 201, footnote 2.

*Brunswick that it used as the baseline to determine the inclination of the adjusted perpendicular line.*

671. In yet another inconsistency, the United States, while measuring its own coast "to reflect the sinuosities", nevertheless draws a straight line from the boundary terminus to a point south of Cape St. Marys, thus closing off the Bay of Fundy. Logic and consistency require that, at the very least, the New Brunswick coast also be brought into the equation when the coasts are measured according to their general direction<sup>65</sup>. Contrary to the suggestion made in the United States Memorial, the inclusion of the New Brunswick coast would substantially alter the results of the United States proportionality test. As has already been noted, both Memorials describe the general direction of the coast as running northeastward from Cape Elizabeth (Canadian Memorial) or Cape Ann (United States Memorial) along the coasts of Maine and New Brunswick<sup>66</sup>.

672. In addition to its various internal inconsistencies, the United States proportionality test is open to a more fundamental objection; namely that it is applied to an arbitrarily determined area, selected without reference to geographical or legal criteria. This test area bears no relationship to the Gulf of Maine area as defined in the United States Memorial — that is, the coast extending from Cape Canso to Nantucket Island — or in any geographical or scientific publications known to the Canadian Government. Nor is the test area defined by reference to criteria established in the Special Agreement or in the relevant jurisprudence; for the Court has laid down that, where "it is a question of proportionality, the only absolute requirement of equity is that one should compare like with like<sup>67</sup>". If the area relevant to the delimitation is to include the Atlantic-facing coasts on either side of the entrance points to the Gulf — and the Parties agree that some portion of these coasts forms part of the relevant area — then equivalent coastal segments on either side of the Gulf should be included in the proportionality test. The Gulf of Maine itself constitutes the axis on which the test area must be balanced. The United States test area, on the other hand, is balanced on the false axis of the Northeast Channel, making the Channel equidistant from the perpendiculars forming the eastern and western limits of the area. Indeed, this is the only rationale that emerges from a comparison of the Gulf of Maine area with the United States test area. The United States again has worked backward, defining the test area by reference to its delimitation objectives, rather than working forward and defining the area by reference to the geographical region identified in the Special Agreement. It is obvious that a proportionality test set up by reference to United States desiderata, rather than on the basis of equitable

<sup>65</sup> However, the United States contends that "measuring the respective coastlines in terms of straight lines representing the respective coastal fronts rather than the sinuosities of the coasts would not substantially affect this ratio." *United States Memorial*, pp. 192-201, para. 313.

<sup>66</sup> *United States Memorial*, p. 170, para. 283.

<sup>67</sup> *I.C.J. Reports 1982*, p. 76, para. 104. See also p. 91, para. 130 where the Court stated "... the essential aspect of the criterion of proportionality is simply that one must compare like with like ..."

principles and relevant circumstances, will produce the results required by the authors. Such a test demonstrates nothing but the endless possibilities for defining areas — and varying the results — in an open-ended geographical situation such as the outer area seaward of the Gulf of Maine.

### ***Conclusion***

673. The United States has christened its current claim the “adjusted perpendicular line”. But a perpendicular line can be applied only to essentially straight coasts, and the United States has itself recognized that the manifold changes in direction of the coasts constitute a circumstance of fundamental importance in this case. A method inherently incapable of application between opposite coasts and within coastal concavities cannot be made appropriate through “adjustment”. The United States, however, has chosen to adjust or refashion geography to suit its method, rather than select a method appropriate to the particular geographical situation in the Gulf of Maine area. Ignoring as it does the very existence of the Province of Nova Scotia and the established dependence of its southwestern coastal regions on the resources of *Georges Bank*, the United States’ line produces a manifestly inequitable and unreasonable result.

## CHAPTER II

### THE CANADIAN METHOD AND THE CANADIAN LINE

#### Introduction

674. The particular geographical circumstances of this case call for the determination of a single maritime boundary that takes account of the manifold changes in the general direction of the coasts in the Gulf of Maine area. They also call for a boundary that respects the fundamental principles governing title to the maritime zones to be delimited by the single maritime boundary, as well as the obligations of the Parties under Article 6 of the Convention on the Continental Shelf.

675. The United States seeks to discredit the equidistance principle by characterizing it as one that produces an artificial boundary based on a few coastal features<sup>1</sup>. The method used by Canada combines a mathematically precise, objectively verifiable technique for constructing a line reflecting the *actual* coastal geography, with recognized equitable principles and procedures for adjusting the line to ensure that it respects the *general* configuration of the coasts and takes account of all the relevant circumstances.

676. The boundary produced by the application of this method is an equitable equidistance line. It is a direct emanation of the coastal geography of the Gulf of Maine area and is in accordance with all relevant circumstances pertaining to both the continental shelf and the 200-mile fishing zone. It reflects the overall balance in the relationship of the Parties to the Gulf of Maine area and, in particular, to Georges Bank. It gives appropriate spatial expression to established economic interests, especially the strong Canadian presence in the fishery of Georges Bank and the vital economic dependence of Nova Scotia on that fishery. It is consistent with the position held by Canada throughout the history of the dispute and gives effect to the indicia of equity revealed by the conduct of both Parties. Having regard to all the relevant circumstances, the Canadian line produces an equitable result.

677. There is a fundamental difference between the approaches of the Parties to the determination of the single maritime boundary. The various lines proposed by the United States are based neither on the applicable law nor on the relevant facts, but to a large extent on the purported attributes of the various "methods" by which they have been drawn. Herein lies a fundamental paradox of the United States position: it relies heavily on method while at the same time defying all methodology. The Canadian line, on the other hand, finds its justification not in the fact that it is an application of a particular method, but rather in its reflection of the geographical situation of the Parties in the Gulf of Maine area and in its accordance with relevant factors relating to the physical environment: established economic dependence, the conduct of the Parties and the diplomatic history of the dispute. The

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<sup>1</sup> *United States Memorial*, p. 149, para. 268.

Canadian line rests ultimately upon the fact that, in the particular relevant circumstances of this case, it represents an equitable result in accordance with international law. The equitable character of this result is one that can be objectively determined.

### Section I. The Canadian Method Combines an Objective Technique for Reflecting Coastal Geography with Recognized Procedures for Ensuring an Equitable Result

678. The equitable character of a maritime boundary is ultimately to be judged in terms of the result and not in terms of the method used to effect the delimitation. The result is predominant under the law; the method is the instrument used to arrive at that result within the law. However, "whether under customary law or Article 6, it is never a question either of complete or of no freedom of choice as to method; for the appropriateness — the equitable character — of the method is always a function of the particular geographical situation<sup>2</sup>". Moreover, since an equitable result within the law is to be distinguished from mere apportionment or distributive justice, the equitable character of the result and the appropriateness of the method used to obtain that result must also be a function of the legal framework within which the delimitation is effected.

679. The Canadian boundary has been drawn in accordance with equitable principles and the equidistance method. The particular aptitude of the equidistance method for determining a single maritime boundary in appropriate circumstances has been demonstrated in Part III of this Counter-Memorial.

680. An obvious characteristic of an equidistance line is that, drawn from precise points on the coast, by its very nature and method of construction it faithfully reflects the *actual* configuration of the coast rather than a hypothetical general direction<sup>3</sup>. The equidistance method is thus particularly appropriate for application to complex geographical situations where it accurately takes account of changes in the direction of the relevant coasts. This scientifically verifiable line provides an objective standard against which to evaluate the equitable character of any other line, and against which to assess the reasonable or unreasonable, proportionate or disproportionate, equitable or inequitable effects of particular geographical features or configurations<sup>4</sup>.

<sup>2</sup> *Anglo-French Continental Shelf* award, p. 54, para. 84.

<sup>3</sup> As the Court has recognized, "it is the virtue — though it may also be the weakness — of the equidistance method to take full account of almost all variations in the relevant coastlines." *I.C.J. Reports 1982*, p. 88, para. 126.

<sup>4</sup> The Court held in the *North Sea Continental Shelf* cases that: "It [i.e., equidistance] constitutes a method capable of being employed in almost all circumstances . . . and has the virtue that if necessary, — if for instance, the Parties are unable to enter into negotiations, — any cartographer can *de facto* trace such a boundary on the appropriate maps and charts, and those traced by competent cartographers will for all practical purposes agree.

In short . . . no other method of delimitation has the same combination of practical convenience and *certainty of application*." [*Italics added*]. *I.C.J. Reports 1969*, p. 23, paras. 22-23.

681. The geometric aspect of the drawing of an equidistance line is, however, only the starting point. The process must be complemented by the application of equitable procedures to test the result and, if necessary, to adjust the line to take account of relevant circumstances. Recognized procedures have been developed for adjusting an equidistance line either through the selection of coastal basepoints other than those closest to the proposed line, or by moderating the influence of those basepoints on the construction of the line. The effect of these techniques is wholly or partially to discount incidental coastal features that depart markedly from the general configuration of the coast, in order to produce a line that reflects the overall geographical situation in the relevant area<sup>5</sup>.

## Section II. The Canadian Line Reflects the Geographical Situation in the Gulf of Maine Area

682. As the *United States Memorial* recognizes, the geography of the Gulf of Maine area is characterized by its general complexity and, in particular, by several pronounced changes in the direction of the coast<sup>6</sup>. There are major concave and convex configurations on the coasts of both Parties. Moreover, as was demonstrated in paragraphs 102-113, the relationship of the coasts of Canada and the United States vis-à-vis the area to be delimited is predominantly one of oppositeness. The equidistance or median line is the normal means of effecting an equitable division in a situation where the coasts are opposite<sup>7</sup>.

### A. THE INNER AREA

#### 1. The Course of the Line

683. The coastal fronts of Nova Scotia and of Maine that control most of the course of an equidistance line inside the Gulf, if extended to a point of intersection, would form an approximate right angle. This angle would be bisected by the Canadian line, were it not for the effect of small uninhabited islets, lying well to seaward of the coastal front of Maine, that push the line toward the Canadian coast. The greater part of the line in the inner area is controlled, on the United States side, by basepoints on Mount Desert Rock and Matinicus Rock, which lie respectively 22 nautical miles and 17.75 nautical miles seaward of the mainland coast of Maine. Because the corresponding basepoints on the

<sup>5</sup> This was the procedure used by the Court of Arbitration to abate the disproportionate effects of the Scilly Isles on the course of an equidistance line in the Atlantic region in the *Anglo-French Continental Shelf* award, pp. 116-117, paras. 249-251. A somewhat analogous technique was used by the Court in abating the disproportionate effect of the Kerkennah Islands on a delimitation in the *Tunisia-Libya Continental Shelf* case. *I.C.J. Reports* 1982, p. 89, para. 129.

<sup>6</sup> *United States Memorial*, p. 19, para. 26; pp. 173-174, paras. 286-288.

<sup>7</sup> *I.C.J. Reports* 1969, pp. 36-37, paras. 57-58; *Anglo-French Continental Shelf* award, pp. 54-55, para. 85.

Canadian side lie 6 nautical miles, 7.6 nautical miles and 14.5 nautical miles off the mainland coast of Nova Scotia, the line runs closer to the Canadian landmass than to that of the United States throughout most of the Gulf of Maine. The basepoints on the United States side lie off the coast of *eastern* Maine. Since no basepoints are used on the coast between Matinicus Rock and the Cape Cod Canal, the concave portion of the United States coast forming the northwestern corner of the Gulf — like the corresponding concavity in the northeastern corner of the Gulf formed by the Bay of Fundy — exerts no influence on the course of the line. [See Figures 3 and 32 in the Canadian Memorial.]

## 2. *Non-Encroachment*

684. The fact that the Canadian line inside the Gulf is almost always closer to the mainland coast of Nova Scotia than to that of Maine shows that it avoids cutting off the United States from the sea areas that lie off its coasts<sup>8</sup>. The United States' objection that the Canadian line is inconsistent with the principle of non-encroachment is surprising in view of the line claimed by the United States from 1976 to 1982. This line ran substantially closer to the coast of Maine than the Canadian line throughout practically the whole of the Gulf [Figure 1]. The charge that the Canadian line encroaches on the seaward extension of the coastal front of Maine is therefore inconsistent with the conduct of the United States itself. The new line adopted by the United States, approaching to within 25 nautical miles of the most important port on the southwest coast of Nova Scotia, at a point already 72 nautical miles from the nearest United States land, shows that it is the United States that does violence to the principle of non-encroachment.

## B. THE OUTER AREA

### 1. *The Course of the Line*

685. The course of the Canadian line in the outer area is controlled on the Canadian side by basepoints on low tide elevations in the vicinity of Seal Island, and on the United States side by a basepoint on the Cape Cod Canal. The boundary so produced is virtually a line of constant bearing — the perpendicular bisector of a line joining the basepoints. Because of their strategic location on the threshold of the outer area, the use of basepoints on Cape Cod itself and on Nantucket Island would have an influence on the course of the line and on the division of maritime space that is altogether disproportionate to the geographical importance of these features and to their real links with the area to be delimited.

686. The relationship of the coasts of Canada and the United States to each other, and to the outer area, bears a certain parallel to the

<sup>8</sup> This conclusion is further confirmed by the fact that more than two-thirds of the sea area inside the Gulf is allocated to the United States.

situation of the coasts of France and the United Kingdom vis-à-vis the Atlantic region in the *Anglo-French Continental Shelf* award. In that case, the Court of Arbitration stated that the "pertinent dissimilarity between the two coasts" was that:

"... the coastal frontage [of the United Kingdom] projects further into the Atlantic than that of the French Republic. The greater projection of the United Kingdom coast into the Atlantic region is due in part to the fact that the most westerly point of its mainland is situated almost one degree further to westward than that of the French mainland. But it is also due to the greater extension westwards of the Scilly Isles beyond the United Kingdom mainland than that of Ushant beyond the French mainland. Thus, at its nearest point, Ushant is only about 10 miles and at its most westerly point no more than 14.1 nautical miles from the coast of Finistère; the nearest point of the Scilly Isles, on the other hand, is some 21 nautical miles and their most westerly point some 31 miles distant from Land's End. As a result, even when account is taken of the slight south-westerly trend of the English Channel, the further extension south-westwards of the United Kingdom's coast has a tendency to make it obtrude upon the continental shelf situated to seawards of the more westerly facing coast of the French Republic in that region<sup>9</sup>."

687. In the present case, the southeastern protrusion of the United States coast between Boston and the Cape Cod Canal, away from the general southwestern orientation of the coast (south of Cape Elizabeth), projects the United States coast further into the Atlantic than the Canadian coast, which recedes to the southeast seaward of Yarmouth. Thus, even before the effects of Cape Cod and Nantucket Island are taken into account, the United States is in a favourable position vis-à-vis Canada with respect to the delimitation of the outer area and, in particular, of Georges Bank. Whereas the effect of the Scilly Islands was to extend the coastal front of the United Kingdom beyond its mainland coast by about twice the distance that Ushant projected the coastal front of France beyond its mainland coast<sup>10</sup>, the situation here is even more disadvantageous to Canada. To make use of basepoints on Cape Cod and Nantucket Island would project the United States some 29 nautical miles further toward Georges Bank, beyond the already advantageous coastal front formed by the southeastern protrusion of the Massachusetts coast seaward of Boston<sup>11</sup>. While Seal Island lies some 14.5 nautical miles off the mainland coast of Nova Scotia, it is, in terms of longitude, 9 nautical miles east of Cape Forchu, the westernmost point on the Nova Scotia coast abutting the outer area. Accordingly, the use of Seal

<sup>9</sup> *Anglo-French Continental Shelf* award, p. 111, para. 235.

<sup>10</sup> *Anglo-French Continental Shelf* award, p. 117, para. 251.

<sup>11</sup> This distance is measured from the fulcrum or hinge point of the lines representing the general direction of the United States coasts facing the Gulf of Maine and the Atlantic Ocean as shown in *Figure 7*.



Island as a basepoint merely compensates for the eastward recession of the Canadian coast seaward of Yarmouth<sup>12</sup>.

688. The essentially local features of Cape Cod and Nantucket Island deviate sharply from the general configuration of the coast in the Gulf of Maine area. Given the already favourable position enjoyed by the United States vis-à-vis the delimitation of the outer area, to allow these features to have a decisive impact on the allocation of maritime space in the major resource-bearing area of the region, merely on account of their strategic location at the elbow of one of the coastal wings of the Gulf, would produce a highly disproportionate and inequitable result. [See Figure 33 in the Canadian Memorial.] Such a situation clearly calls for the application of equitable principles or procedures to correct the distortion and abate the inequity. This Canada has done by using a basepoint on the Cape Cod Canal compatible with the general direction of the United States coasts in that area.

## 2. Non-Encroachment

689. The United States Memorial makes much of the fact that the Canadian line extends south of the international boundary terminus to the same latitude as Philadelphia and Boulder, Colorado<sup>13</sup> (cities that lie respectively 720 kilometres and 3,260 kilometres west of the terminal point of the Canadian line). The United States maritime boundary with Cuba, by way of comparison, is on a latitude with central Mexico. The continental shelf boundary in the North Sea between Denmark and the Federal Republic of Germany extends well to the north of the land boundary with Denmark. The boundary indicated by the Court in the *Tunisia-Libya Continental Shelf* case extends well to the north of Libya and of the terminus of the land boundary with Tunisia.

690. There is nothing in law, State practice or logic to suggest that the terminal point of the land boundary between States should be any guide to the point of latitude or longitude to which a maritime boundary can reach. On the contrary, the delimitation of offshore zones will, by definition, extend existing boundaries beyond the land territories of the States concerned. Since the Canadian and United States territories in the Gulf of Maine area are juxtaposed east-west and the boundary between them runs in an essentially north-south direction, it is inevitable that the maritime boundary will extend south of the Canadian landmass. This fact is corroborated by the location of the triangle established in the Special Agreement, by which the Parties agreed that the maritime boundary should terminate well to the south of Canadian land.

<sup>12</sup> Seal Island is an inhabited island lying within the system of baselines formally promulgated by Canada in 1972. Canadian baselines in the relevant area were proclaimed in the *Territorial Sea Geographical Coordinates Order*, P.C. 1972-966, in force 11 May 1972, published in *Canada Gazette*, Part II, Vol. 106, No. 10. See *Canadian Memorial, Annexes*, Vol. II, Annex 25.

<sup>13</sup> *United States Memorial*, p. 192, para. 311.

### C. THE GENERAL CONFIGURATION OF THE COASTS

691. The United States has criticized the equidistance method on the grounds that it takes into account only "a few selected points on the coasts of the States involved" and "fails to take account of other relevant geographical circumstances, such as . . . the general direction of the coast"<sup>14</sup>. Since a strict equidistance line is drawn from the nearest points on the coasts of the Parties, there is a potential risk that the basepoints may not reflect the general configuration of the coasts. Equitable principles require that, in determining the course of an equidistance boundary line, criteria of reasonableness and equity be applied in selecting the basepoints from which the line is drawn. Incidental special features, which depart markedly from the general direction of the coast and have a disproportionate influence on the course of a line, should be discounted. This, of course, is precisely the equitable procedure used by Canada in selecting basepoints other than Cape Cod and Nantucket Island as basepoints for determining the course of the boundary in the outer area.

75 692. In the past the Court has indicated that one method of ensuring that an equidistance line respects the general configuration of the coasts is the construction of straight lines representing coastal fronts<sup>15</sup>. *Figure 50* compares the Canadian line to an equidistance line constructed from straight lines representing coastal fronts. It can be seen that the course of the Canadian line approximates that of an equidistance line drawn from the coastal fronts. It is therefore clear that the basepoints used to draw the Canadian line fairly represent the general configuration of the coasts of the Parties within the relevant outer area.

### Section III. The Canadian Line Takes Account of All the Relevant Circumstances

693. The Canadian line is founded on the applicable law. It respects the legal basis of title to the area to be delimited as well as the basic purpose of the rights and jurisdiction in issue. It observes the principle of equality within the same order and leaves to each Party the areas of the sea that are closest to its coast.

694. Paragraphs 682-692 have shown that the Canadian line, constructed by reference to the coastal configuration within the Gulf of Maine area, respects the relevant geographical circumstances of the area to be delimited. A boundary delimited in accordance with equitable principles, however, must take account of *all* the relevant circumstances. As was demonstrated in detail in Part II of this Counter-Memorial, the relevant non-geographical circumstances of this case also confirm the logic and the equitable character of the Canadian line. The following paragraphs provide a brief recapitulation of the principal evidence for this conclusion.

<sup>14</sup> *United States Memorial*, p. 149, para. 268.

<sup>15</sup> *I.C.J. Reports 1969*, p. 52, para. 98.

695. The Canadian line needs no adjustment in the light of the geology and geomorphology of the Gulf of Maine area. The seabed and subsoil of the area are characterized by an essential unity and continuity; to the extent that there are particular geological and geomorphological affinities between Georges Bank and neighbouring areas, these are predominantly with Canadian areas to the northeast. The various depressions that dot the seabed do not provide any basis in fact or law for a variation in the Canadian line.

696. The Gulf of Maine area is also characterized by an integrated oceanographic system. The fish and invertebrate species of the Gulf of Maine area (including Georges Bank) are predominantly northern in their orientation and extend southwestward from the Scotian Shelf to the Great South Channel-Nantucket Shoals-Cape Cod area. The distribution of most stocks of the 28 commercially important species of the Gulf of Maine area is not affected by the Northeast Channel. To the extent that Georges Bank exhibits some elements of semi-discreteness within the broader oceanographic system of the Gulf of Maine area, its particular affinities are with waters to the northeast. There are no oceanographic or biological factors that would justify a departure from the Canadian line or from the principle that the area is to be delimited in a way that allocates to each Party the maritime space that is closest to it. No single line could accommodate the varied resources of the seabed and water column here in issue.

697. Other relevant circumstances also confirm the logic and equitable character of the Canadian line. Canada is a coastal State on the Gulf of Maine with an important established fishery on Georges Bank that is the mainstay of the regional economy of southwest Nova Scotia. This is a circumstance of great significance, for the Canadian line permits the maintenance of the established links between the living resources of the area to be delimited and the adjacent coasts. A line to the east of the Canadian claim would disrupt these established patterns of resource exploitation that provide the livelihood of many coastal communities and the very foundation of the regional economy. On the other hand, the Canadian line would have minimal effects on the few large ports from which the United States fishery is prosecuted, and virtually no discernible impact on the economy of Massachusetts, which has no dependence on Georges Bank comparable with that of Nova Scotia. Thus, the Canadian line, which divides the area in a way that leaves to each Party the area in which its specific and predominant economic interest lies, is confirmed as an equitable line.

698. A further relevant circumstance is the conduct of the Parties, in particular during the period that led to the development of the contemporary law of the sea and the period associated with the diplomatic history of this boundary dispute, beginning in 1965. The evidence is unequivocal. Canada's conduct throughout has been consistent with its claim. The United States, for its part, has recognized and acquiesced in Canada's exercise of sovereign rights in respect of the mineral resources of eastern Georges Bank from 1964 to 1969 and Canada's use of an equidistance line for this purpose from 1965 to 1969. In the conclusion and signature of the 1979 Agreement on East Coast Fishery

Resources, the United States has also recognized Canada's economic interests in the fishery resources of Georges Bank, its traditional participation in their exploitation, and the potential for bilateral cooperation in their conservation and management. Finally, throughout the history of the International Commission for the Northwest Atlantic Fisheries, from 1949 to 1977, the United States consistently recognized Canada's position as a coastal State in relation to Georges Bank. The relevant conduct of the Parties thus confirms the equitable character of the Canadian line and its conformity with the applicable law.

### **Conclusion**

699. The boundary claimed by Canada complies with the applicable law for the delimitation of a single maritime boundary. It is drawn in a manner that reflects the general configuration of the coasts in the Gulf of Maine area, while discounting the effect of incidental special features through the application of equitable procedures. It is fully consonant with the geological, geomorphological, oceanographic and biological characteristics of the area. It is compatible with the maintenance of the principal established fisheries of the Parties in the relevant area. Drawn in accordance with equitable principles and taking account of all the relevant circumstances, the Canadian line accords with the fundamental norm for the delimitation of a single maritime boundary and represents a result that is equitable for both Parties, as confirmed by the evidence of their conduct.

## CHAPTER III

### TESTS OF EQUITY

#### Introduction

700. The Court has declared that “the result of the application of equitable principles must be equitable” and that “it is . . . the result which is predominant; the principles are subordinate to the goal”. As this is a case of first impression involving a single maritime boundary, the criteria of equity developed in other contexts, the manner of their application and the weight to be attached to them must be adjusted to fit the new legal régime in issue here.

701. The primary test of the equity of the result, deriving from the fundamental norm for the determination of maritime boundaries, is the ascertainment whether the line takes account of all the relevant circumstances. That the Canadian line meets this test in all respects has been demonstrated in Part II and in paragraphs 692-698 of this Counter-Memorial. But there are other factors to consider when assessing equity, some of which have their origin in the régime of the continental shelf and others that are more relevant to the régime of a single maritime boundary applying to both the shelf and the water column.

702. The proportionality test in its several forms has been used to assess the equity of allocations of maritime space in continental shelf delimitations. The criteria it employs relate exclusively to the spatial aspects of geography. This test is therefore appropriate for situations where the existence and location of natural resources is neither known nor readily ascertainable, and where there has been no previous exploitation.

703. The determination of a single maritime boundary, on the other hand, involves not only the division of space and potential mineral resources but also the division of known living resources that are subject to established patterns of exploitation by coastal communities. The equitable character of this new form of division must also be tested, especially where the resources in issue are of vital importance to the economy of adjacent coastal regions. Where the Parties themselves have given precise indications of the division they considered equitable, the result of any proposed boundary must be tested against these indications.

#### **Section I. The Canadian Line Produces a Proportionate Result; The United States Line Does Not**

704. As was explained in paragraph 487, the application of the test of proportionality as an aspect of equity can take at least three different forms. In one form it consists of assessing the reasonable or unreasonable effect of a particular feature on the course of the boundary by reference to the size, configuration or importance of the feature in relation to the maritime space it attracts. In another form it involves the evaluation of the equitable character of the boundary on the basis of

ratios between lengths of coastlines and the offshore areas divided by the boundary. In a third and more general sense, it consists of ascertaining whether the overall result is reasonable or proportionate in relation to all the relevant circumstances.

#### A. PROPORTIONALITY AS A MEASURE OF THE EFFECT OF PARTICULAR FEATURES ON A DELIMITATION

705. This function of proportionality was explained by the Court of Arbitration in the *Anglo-French Continental Shelf* award in the following terms:

“... particular configurations of the coast or individual geographical features may, under certain conditions, distort the course of the boundary, and thus affect the attribution of continental shelf to each State, which would otherwise be indicated by the general configuration of their coast. The concept of ‘proportionality’ merely expresses the criterion or factor by which it may be determined whether such a distortion results in an inequitable delimitation of the continental shelf as between the coastal States concerned. The factor of proportionality may appear in the form of the ratio between the areas of continental shelf to the lengths of the respective coastlines, as in the *North Sea Continental Shelf* cases. But it may also appear, *and more usually does*, as a factor for determining the reasonable or unreasonable — the equitable or inequitable — effects of particular geographical features or configurations upon the course of an equidistance-line boundary!” [Italics added.]

The Court of Arbitration applied the proportionality concept “in appreciating whether the Scilly Isles are to be considered a ‘special circumstance’ having distorting effects on the equidistance boundary”, rather than as a comparison of coastal lengths and shelf areas.

706. In the present case, the criterion of proportionality may be used to evaluate the relative effects on the course of an equidistance line of the very geographical features or configurations alleged by the Parties to have disproportionate and inequitable effects. One method is to compare the land area of the features being tested to the sea area they would attract if their coasts were used in constructing an equidistance line<sup>3</sup>. This sea area is calculated by measuring the area between an equidistance line drawn from basepoints on the feature whose effect is being assessed and an equidistance line drawn from the basepoints that would be used if the feature did not exist.

<sup>1</sup> *Anglo-French Continental Shelf* award, p. 60, para. 100.

<sup>2</sup> *Anglo-French Continental Shelf* award, p. 117, para. 250.

<sup>3</sup> In his separate opinion in the *Tunisia-Libya Continental Shelf* case, Judge *ad hoc* Jiménez de Aréchaga used this method to assess the disproportionate and distorting effect of the Kerkennah Islands on the course of an equidistance line. *I.C.J. Reports* 1982, p. 134, para. 108.

707. The United States has alleged that "the four-fold change in direction of the Canadian coast", which "begins at the Chignecto Isthmus", and "the protrusion of the Nova Scotia peninsula" are geographical features that produce a disproportionate and inequitable effect upon an equidistance line<sup>4</sup>. The land area of the Nova Scotia peninsula is 45,197 square kilometres (13,177 square nautical miles). If Nova Scotia did not exist, the area could be delimited by a hypothetical equidistance line drawn from basepoints on the coast of New Brunswick. The sea area between such a hypothetical equidistance line and a strict equidistance line drawn from the coast of Nova Scotia represents the area which is "lost" to the United States by reason of the "protrusion" of the Nova Scotia peninsula. This sea area comprises 10,960 square nautical miles. The ratio of the land area of the Nova Scotia peninsula to the sea area it attracts within 200 miles of the United States (and of Canada) is 1:0.8<sup>5</sup>.

708. In Canada's submission, Cape Cod and Nantucket Island have a disproportionate and inequitable effect upon the course of an equidistance line boundary. The land area of Cape Cod and Nantucket Island is 1,187 square kilometres (346 square nautical miles). These features attract to the United States a sea area of 2,906 square nautical miles measured between an equidistance line drawn from basepoints on Cape Cod and Nantucket Island and an equidistance line drawn from basepoints on the Cape Cod Canal. The ratio between the land area of these features and the sea area they attract to the United States within 200 miles of Canada (and of the United States) is 1:8.4.

709. These ratios demonstrate that, while the Nova Scotia peninsula has an effect upon the course of an equidistance line boundary that is not disproportionate to its landmass, Cape Cod and Nantucket have an influence altogether disproportionate to their landmass. These conclusions, based on the purely physical criterion of landmass, are confirmed and reinforced by factors of political and economic geography.

710. This test indicates that an equidistance line drawn from basepoints on the coast of Nova Scotia produces a proportionate and reasonable result. It also indicates that any delimitation that gave full weight to Cape Cod and Nantucket Island would produce a disproportionate and unreasonable result, and that these features should accordingly be discounted in establishing an equitable maritime boundary.

#### B. PROPORTIONALITY AS A COMPARISON OF COASTAL LENGTHS AND SEA AREAS

711. Canada's reservations concerning the applicability of this form of proportionality test to the open-ended area seaward of the Gulf of Maine itself have been set out in the Canadian Memorial<sup>6</sup> and in

<sup>4</sup> *United States Memorial*, p. 173, para. 286; p. 192, para. 312.

<sup>5</sup> If the whole of the province of Nova Scotia, including Cape Breton Island, is included in the equation (a land area of 16,174 square nautical miles), the ratio becomes 1:0.7.

<sup>6</sup> *Canadian Memorial*, pp. 153-155, paras. 370-374.

paragraphs 489-493 of this Counter-Memorial. Notwithstanding these reservations, it is of course possible to devise a variety of formulas for the ascertainment of ratios of coastal lengths and sea areas. Although in the nature of the case none of these formulas can be decisive, nonetheless, when the test is applied in a reasonable and consistent manner and in accordance with the criteria established by the Court, it does indicate the proportionate and equitable character of the Canadian line and the disproportionate and inequitable character of the various United States lines.

712. As was explained in paragraphs 69, 74-75, and 141, the Gulf of Maine area includes the coasts on either side of the entrance points to the Gulf that demonstrate established economic links to the resources of Georges Bank. These coasts extend approximately from Lunenburg, Nova Scotia to Newport, Rhode Island. However, in accordance with the "absolute requirement" of comparing like with like in a proportionality test, the coasts included in the test should extend an equal distance along the Atlantic seaboard on either side of the hinge points of the coastal wings or the entrance points to the Gulf.

713. Furthermore, if lines perpendicular to the general direction of the coast are used to enclose the outer area, these lines should be drawn perpendicular to the two coasts that actually border this area or, if these general directions are materially different, to the mean direction of these coasts, again in order to "compare like with like". As has already been indicated, the general directions of the Nova Scotia and New England coasts facing onto the Atlantic are in the order of  $054^\circ$  and  $079^\circ$  respectively, and their mean direction in round figures is  $067^\circ$ . Therefore, the area should be enclosed laterally by lines of bearing of  $157^\circ$ , projected from Lunenburg and from an equivalent point on the New England coast. The line from Lunenburg is also extended northward to provide an eastern limit of the relevant area within the Bay of Fundy. The whole area is then divided into an inner and outer area by a hypothetical line from Cape Sable to Nantucket Island. [See Proportionality Test A, *Figure 51*.]

714. The results indicate that when a proportionality test is applied to a balanced area defined on the basis of relevant geographical and legal criteria, the Canadian line more than meets the test of proportionality while the 1982 United States line produces a highly disproportionate and inequitable result. The United States Northeast Channel line of 1976 also fails to satisfy this proportionality test<sup>7</sup>.

<sup>7</sup> The sea areas as divided by the United States 1976 Northeast Channel line are as follows:

(a) The Inner Area: Canada 8,386 square nautical miles. United States 18,970 square nautical miles. Ratio - Canada:United States 31:69.

(b) The Outer Area: Canada 22,113 square nautical miles. United States 60,430 square nautical miles. Ratio - Canada:United States 27:73.

(c) The Gulf of Maine Area as a Whole: Canada 30,499 square nautical miles, United States 79,400 square nautical miles. Ratio - Canada:United States 28:72.



715. An alternative method of enclosing the area within which a proportionality test might be applied can be inferred from the Special Agreement. The sides of the triangle defined in Article II of that agreement may be used to establish the eastern and southern limits of the relevant area, that is, longitude 65°W and latitude 40°N respectively, and the hypotenuse of the triangle may be used to bound the area to the southeast. The area may be enclosed to the west by longitude 70°30' W, that is, roughly the same distance (half a degree) to the west of Cape Cod and Nantucket Island as 65°W is to the east of Cape Sable<sup>8</sup>. [See (77) Proportionality Test B, *Figure 52*.]

716. Enclosing the test area by means of meridians and parallels is consistent with the method employed by the Court in the *Tunisia-Libya Continental Shelf* case<sup>9</sup>. The use of meridians and parallels is an objective, precise, predictable and widely used geographical technique; unlike perpendiculars to the general direction of the coasts, they are not susceptible to different interpretations. As was noted by the Court, this method has "the advantage of cartographical convenience" and is consistent with "the essential aspect of the criterion of proportionality" that "one must compare like with like"<sup>10</sup>.

717. Once more, the results indicate that the Canadian line divides maritime space in a manner roughly proportionate to the relative lengths of the coasts of the Parties bordering the Gulf of Maine area, while the United States line divides it in a manner altogether disproportionate to the relative lengths of the coasts. The 1976 Northeast Channel line fails to meet this test as well<sup>11</sup>. This conclusion also holds true if the test area is bounded to the southeast by the sides of the terminal triangle, rather than by its hypotenuse<sup>12</sup>. So long as the absolute requirement

<sup>8</sup> The eastern limit also conforms to one of the meridians of longitude used by Bigelow (65°W and 65°30'W) to define the eastern limit of the Gulf of Maine area. He defined the western limit of the Gulf of Maine area by 70°W longitude. H. B. Bigelow: "Physical Oceanography of the Gulf of Maine." *Bulletin of the United States Bureau of Fisheries*, Vol. XL, Part I, 1924, p. 518; *Counter-Memorial, Annexes*, Vol. IV, Annex 13. H. B. Bigelow: "Fishes of the Gulf of Maine." *Bulletin of the United States Bureau of Fisheries*, Vol. XL, Part I, 1924, p. 7; *Counter-Memorial, Annexes*, Vol. IV, Annex 4.

<sup>9</sup> *I.C.J. Reports 1982*, pp. 88-91, paras. 126-130.

<sup>10</sup> *I.C.J. Reports 1982*, p. 91, para. 130.

<sup>11</sup> The sea areas as divided by the United States 1976 Northeast Channel line are: Canada 15,097 square nautical miles, United States 43,877 square nautical miles (ratio 26:74).

<sup>12</sup> If the test area is bounded to the southeast by the *sides* of the terminal triangle, rather than by its *hypotenuse*, the results are:

Total Sea Area: 64,474 square nautical miles.

*Sea Areas divided by the Canadian line:*

Canada 28,450 square nautical miles. United States 36,024 square nautical miles.  
Ratio - Canada:United States 44:56.

*Sea Areas divided by the 1982 United States line:*

Canada 10,377 square nautical miles. United States 54,097 square nautical miles.  
Ratio - Canada:United States 16:84.

*Sea Areas divided by the 1976 United States line:*

Canada 15,453 square nautical miles. United States 49,021 square nautical miles.  
Ratio - Canada:United States 24:76.

of comparing like with like is respected and the test is applied in a reasonable and consistent manner, and within an area defined by reference to the Special Agreement and to recognized geographical and legal criteria, the Canadian line is seen to produce a proportionate and equitable result and the United States line a disproportionate and inequitable result.

718. Proportionality has a more general aspect as a measure of the equity of the result in terms of the full range of geographical and other circumstances relevant to the present case. The area allocated to each Party must be proportionate not only in terms of coastal lengths and the effects of particular coastal configurations; it must also be proportionate in relation to all the relevant circumstances of the case. The following section will assess the equity of the overall result in terms of the most important non-geographical circumstances in this case.

### **Section II. The Canadian Line Is Confirmed as Equitable When Tested Against the Conduct of the Parties; The United States Line Is Not**

719. The importance of the conduct of the Parties as indicia of an equitable result has been discussed in Chapter VI of Part II. The Canadian Memorial and paragraphs 360-380 of this Counter-Memorial have demonstrated that the United States clearly accepted both Canadian jurisdiction with respect to offshore oil and gas permits on Georges Bank from 1964 to 1969 and the use of an equidistance line to delimit the area within which this jurisdiction was exercised. Leaving aside questions related to acquiescence, recognition and estoppel, this conduct clearly provides, at the very least, a useful and legally relevant test against which to evaluate an equitable result in the present case, as is seen in *Figure 53*.

(78)

720. The relevance of the 1979 Agreement on East Coast Fishery Resources as an indication of an equitable result revealed by the conduct of the Parties has also been fully discussed in the Canadian Memorial and in paragraphs 381-391 of this Counter-Memorial. The 1979 agreement is equally relevant in this case as evidence of the established interests of the Parties in the resources of the area to be delimited. In this sense, the agreement provides a *quantifiable* test of the equity of the Canadian and United States claims.

721. The 1979 fisheries agreement established catch "entitlements" or allocations — that is, the proportion of the total "annual permissible commercial catch" allocated to each Party — for some 13 species of particular interest to the Parties in the Gulf of Maine area<sup>13</sup>. The distribution of each of these species within the area can be determined from computer analysis of Canadian and United States research vessel surveys and historical catch data. It is then possible to compute lines

<sup>13</sup> *Canadian Memorial, Annexes*, Vol. I, Annex 20. The catch allocations are contained in Annexes A and B to the agreement.

that divide the biomass of each species in accordance with the allocations contained in the fisheries agreement<sup>14</sup>. Weighting each species in proportion to its potential yield and commercial value permits the computation of a composite line dividing the complex of species in question according to the allocations contained in the agreement<sup>15</sup>. The line that divides these fishery resources in the Gulf of Maine area in accordance with the allocations provided in the 1979 agreement is shown in *Figure 54*. When this line is compared with the boundary lines proposed by Canada and by the United States, it is evident that the Canadian claim is substantially in accordance with the established interests of the Parties, as recognized by them, whereas the United States line is totally out of keeping with these interests.

722. In a prepared statement before a congressional committee, the United States special negotiator, Mr. Lloyd Cutler, stated that the 1979 fisheries agreement made full provision for the established economic interests of the United States. He observed that:

"In the light of the distribution of stocks and the U.S. historical catches, as well as the opportunities for increased fishing which results from the exclusion of third country vessels which formerly engaged in unrestricted fishing in the area, the entitlement shares established by the Agreement are fair and equitably balanced. With one minor exception, each U.S. entitlement to stocks found on Georges Bank exceeds the share of the total catch which the U.S. took over the 1965-77 period . . . The U.S. share for many important stocks covered by the Agreement is similarly enhanced when viewed from the perspective of the ratio of U.S. historical shares to Canadian historical shares. In the case of sixteen stocks, the U.S. share exceeds the historical U.S. share of the combined U.S. and Canadian catch<sup>16</sup>."

The Canadian entitlements in the 1979 Agreement on East Coast Fishery Resources, on the other hand, represented substantially less than the share of the combined Canada-United States catches for many important species taken by Canadian fishermen in the years immediately preceding the agreement.

<sup>14</sup> For a detailed explanation of the methodology used to compute the lines dividing the biomass of these species, as well as to compute a composite line dividing the aggregate fishery resources in the Gulf of Maine area covered by the 1979 agreement, see *Counter-Memorial, Annexes*, Vol. V, Annex 111.

<sup>15</sup> Data for the potential yield and commercial value of the thirteen species is taken from *Draft Environmental Impact Statement on the Agreement between the United States and Canada on East Coast Fishery Resources*. United States Department of State, Washington, Government Printing Office, 1980, pp. 117-118, Table IV. *Counter-Memorial, Annexes*, Vol. V, Annex 110.

<sup>16</sup> Prepared Statement of Lloyd N. Cutler, in United States-Canadian Fishing Agreements: Hearings before the Subcommittee on Fisheries and Wildlife Conservation and the Environment, Committee on Merchant Marine and Fisheries, United States House of Representatives, 96th Congress, 1st Session, 22 June 1979, p. 41. *Canadian Memorial, Annexes*, Vol. II, Annex 44, I, p. 344.

### Conclusion

723. Proportionality is an aspect of equity. The test of proportionality is a function of the result being tested. The result of a continental shelf delimitation is the division of seabed areas and of resources which, if present, are often undetermined. The result of a delimitation of multi-purpose maritime zones is more comprehensive and includes the division of the known living resources of the water column; such a division will affect established patterns of exploitation and, in some cases, may have a critical impact on the economy of adjacent coastal regions. The test of proportionality in the present case must relate to both these results of a delimitation effected by a single maritime boundary. The Canadian line meets this test of proportionality in every sense; the United States line does not.

## CHAPTER IV

AN EQUITABLE RESULT IN THE LIGHT OF THE  
SPECIAL AGREEMENT AND OF THE HISTORY OF  
THE DISPUTE

724. Against a background of protracted, interrelated negotiations on the course of the single maritime boundary and the conservation, management and allocation of fishery resources in the Gulf of Maine area, the Parties have requested the Court to decide, in accordance with the applicable principles and rules of international law, the course of their single maritime boundary in this area, from an agreed starting point to a terminal point to be determined by the Court within the triangle described in the Special Agreement. Following the decision of the Court, either Party may request negotiations directed toward reaching agreement on an extension of the maritime boundary as far seaward as the Parties may consider desirable. Failing agreement, the Special Agreement provides that the seaward extension may be decided by a binding third-party settlement procedure. (This question, however, is not before the Court at the present time.)

725. The "adjusted perpendicular line" now advanced by the United States represents a deliberately disproportionate claim that by its very nature cannot properly be reconciled with the Special Agreement or with the history of the dispute. The artificial nature of this claim is well demonstrated by the fact that the United States, when it first reserved its rights respecting the continental shelf in the Gulf of Maine area in late 1969, expressly did so with reference *only* to Georges Bank. From 1965 to 1969 and, later, from 1969 until September 1982, the United States never questioned the exercise of Canada's continental shelf and fisheries jurisdiction in the area between Georges Bank and the "adjusted perpendicular line". Thus, the United States has acquiesced in and recognized Canada's jurisdiction and sovereign rights in the area first claimed by the United States in 1982, not only in the period when the use of equidistance was accepted by both Parties but throughout the course of the subsequent dispute.

726. The "adjusted perpendicular line", therefore, has appeared out of nowhere, like a *deus ex machina*. It has no roots in fact or law and is evidently designed to bolster an extreme claim — to the whole of Georges Bank — by means of an even more extreme line that encompasses very nearly the whole of the Gulf of Maine area. It suggests a tactical approach that seems scarcely compatible with the most fundamental provision of the Special Agreement: namely, that the single maritime boundary is to be determined "in accordance with the principles and rules of international law applicable in the matter as between the Parties". Even leaving aside this provision of the Special Agreement, the boundary proposed by Canada and the newly concocted "adjusted perpendicular line" offered by the United States — like its predecessor, the Northeast Channel line — are qualitatively different and are not two different versions of the same thing. For neither the United States claim of 1982 nor the Northeast Channel line of 1976 can be regarded even as partisan views of what a reasonable result might be.

727. The contradictions in the position of the United States since 1965 provide further evidence that there is no basis in fact, equity or law for the United States claim. Not only has the United States moved progressively eastward first from an equidistance approach to the Northeast Channel line and now to the "adjusted perpendicular line"; the United States Memorial suggests that these three positions were predated by a "100-fathom depth contour" claim in 1945. What emerges from all of this is an attempt to justify the unjustifiable. But justifying the unjustifiable would make it necessary to refashion geography, reorder nature, revise history, and rewrite the law of maritime boundaries. [See *Figures 55 and 56.*]

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728. The Canadian claim [*Figure 57*], in sharp contrast, is firmly rooted in equity, in law and in reality. It is not only proportionate but conservative. It represents a reasonable and balanced accommodation, within the law, of all the relevant circumstances and of the interests of both Parties, as these may be determined in the light of their own conduct. The Canadian line, moreover, is a "line in being", not an invention for the occasion. Its origins date back at least to 1965, when Canada first used an equidistance line for continental shelf purposes in the Gulf of Maine area, and on Georges Bank in particular. Adjusted in 1977 to correct and compensate for the distorting and disproportionate effect of Cape Cod and Nantucket Island, it has been in place for 18 years. Its equitable character has been established, and its credentials authenticated, by the conduct of the Parties themselves.

## PART V. SUMMARY OF PRINCIPAL CONCLUSIONS

729. The principal conclusions advanced in this Counter-Memorial are set out in the following paragraphs. They develop the principal conclusions set out in the Canadian Memorial, in the light of the present pleadings.

### A. THE APPLICABLE LAW

1. The single maritime boundary between the Parties in the Gulf of Maine area shall be determined on the basis of the applicable law in accordance with equitable principles, taking account of all the relevant circumstances, in order to achieve an equitable result.

2. The law applicable to the determination of the single maritime boundary in the present case includes the following:

- (a) The fundamental norm set out in paragraph 1 above;
- (b) Article 6 of the 1958 Convention on the Continental Shelf;
- (c) The rules concerning the basis of title to the maritime zones to be delimited, including (i) the use of the distance principle as the sole basis of coastal State rights in a 200-mile fishing zone or exclusive economic zone and as a sufficient basis of title in respect of the continental shelf within 200 miles, and (ii) the principle of equality within the same order and the related principle of non-encroachment;
- (d) Criteria relating to the purpose and nature of the sovereign rights and jurisdiction to be exercised in these maritime zones; and
- (e) Such other rules and principles of conventional or customary international law as may be relevant, in particular those concerning acquiescence, recognition and estoppel.

3. In the light of all the foregoing, the following principles will produce an equitable result in view of the relevant circumstances in the present case:

- (a) The principle that the single maritime boundary should leave to each Party those areas of the sea that are closest to its coast, provided that due account is taken of the distorting effects of incidental special features not in keeping with the general configuration of the coast in the relevant area;
- (b) The principle that the single maritime boundary should allow for the maintenance of established patterns of fishing that are of vital importance to coastal communities within the relevant area; and
- (c) The principle that the single maritime boundary should respect the indicia of what the Parties themselves have considered equitable as revealed by their conduct.

### B. THE RELEVANT CIRCUMSTANCES

1. The relevant *geographical* circumstances are limited to those found in the Gulf of Maine area. They include:

- (a) The proximity of Georges Bank to the coasts of Nova Scotia and Massachusetts that abut the outer part of the Gulf of Maine area, in terms of both physical and human geography; and, in particular, the closer proximity to Canada of the area under Canadian claim;
- (b) The overall balance in the configuration, length and predominantly opposite relationship of the coasts of the Parties to each other relative to the area to be delimited; and
- (c) The distorting and disproportionate effect upon the course of an equidistance line of the exceptional protrusion of Cape Cod and Nantucket Island, when superadded to the general protrusion of the coast of Massachusetts.

2. The relevant *geological, geomorphological and oceanographic* circumstances include:

- (a) The essential unity and continuity of the continental shelf of the Atlantic coast of North America, and its particular affinities to the northeast in the Gulf of Maine area;
- (b) The essential unity and continuity of the oceanographic system of the Gulf of Maine area, and its particular affinities to the northeast; and
- (c) The concentration of fishery resources in the waters over Georges Bank, and their particular affinities to the northeast.

3. The relevant *economic* circumstances include:

- (a) The strong Canadian presence in the fishery of Georges Bank and the established and vitally important economic dependence of Canadian coastal communities in the relevant area upon the fishery resources of the Bank; and
- (b) The lack of any comparable dependence on the part of United States coastal communities.

4. The relevant circumstances pertaining to the *conduct of the Parties* include:

- (a) The United States' recognition of and acquiescence in both (i) Canada's exercise of sovereign rights in respect of the mineral resources of Georges Bank from 1964 to 1969, and (ii) Canada's use of an equidistance line for this purpose from 1965 to 1969;
- (b) The offshore oil and gas exploratory permits issued by Canada in respect of the area claimed by Canada, and the absence of any similar instruments issued by the United States with respect to this area;
- (c) The parallel negotiation, conclusion and signature by the Parties of the Special Agreement and the 1979 Agreement on East Coast Fishery Resources, recognizing Canada's traditional participation in the fisheries of Georges Bank, its status as a coastal State in relation thereto, its economic interest in the living resources of the area, and the potential for bilateral cooperation in their conservation and management;
- (d) The United States' recognition of Canada's interests as a coastal



State in relation to Georges Bank under the International Convention for the Northwest Atlantic Fisheries, from 1949 to 1977;

- (e) The regional tradition of cooperation between Canada and the United States in the conservation and management of fishery resources of mutual concern; and
- (f) The conduct of the United States with regard to other maritime boundaries.

### C. THE NATURE OF THE RESULT PURSUANT TO THE UNITED STATES PROPOSAL

1. Neither the 1976 Northeast Channel line nor the 1982 so-called "adjusted perpendicular line" is based on the applicable law, neither is in accordance with equitable principles, and neither takes account of the relevant circumstances; both are founded exclusively on the objective of securing for the United States the whole or the largest possible part of Georges Bank, the principal area in dispute in the present case.

2. Both the Northeast Channel line and the "adjusted perpendicular line" are manifestly inequitable and unreasonable; they would allocate a totally disproportionate part of the area and its resources, including the whole of Georges Bank, to the United States; they encroach upon maritime space appertaining to Canada; and they fail to meet every applicable test for a single maritime boundary.

3. The "adjusted perpendicular line", moreover, is barred by reason of the United States' acquiescence in and recognition of Canada's equidistance claim in the period from 1965 to 1969, as well as its continued acquiescence in and recognition of Canada's claim to the area between Georges Bank and the "adjusted perpendicular line" in the period from 1969 to 1982.

### D. THE NATURE OF THE RESULT PURSUANT TO THE CANADIAN LINE

1. The Canadian line is based on the applicable law and produces a result that is in accordance with equitable principles and takes account of both the geographical and non-geographical relevant circumstances in the Gulf of Maine area, without encroachment upon areas appertaining to the United States.

2. The Canadian line meets every applicable test for a single maritime boundary; it represents an equitable and proportionate result and it reflects in a reasonable way the parity of interest of the Parties in relation to the Gulf of Maine area and to Georges Bank in particular.

3. Canada's application of the equidistance method, adjusted to correct and compensate for the distorting and disproportionate effect of Cape Cod and its offlying islands, is appropriate in the light of all the relevant circumstances; any other method that might be employed to determine the single maritime boundary in the Gulf of Maine area, if applied in accordance with equitable principles, would necessarily produce a similar line.

4. The conduct of the United States from 1965 to 1969 constitutes acquiescence in or recognition of the use of the equidistance method in the Gulf of Maine area and the exercise of Canadian jurisdiction on Georges Bank, and creates an estoppel in favour of Canada; the single maritime boundary to be determined by the Court should be compatible with the rights that vested in Canada during this period.

## PART VI. SUBMISSION

In view of the facts and arguments set out in the Canadian Memorial and in this Counter-Memorial,

*May it please the Court*, rejecting all contrary claims and Submissions set forth in the United States Memorial,

*To declare and adjudge that:*

The course of the single maritime boundary referred to in the Special Agreement concluded by Canada and the United States on 29 March 1979 is defined by geodetic lines connecting the following geographical coordinates of points:

44°11'12"N	67°16'46"W
44°08'51"N	67°16'20"W
43°59'12"N	67°14'34"W
43°49'49"N	67°12'30"W
43°49'29"N	67°12'43"W
43°37'33"N	67°12'24"W
43°03'58"N	67°23'55"W
42°54'44"N	67°28'35"W
42°20'37"N	67°45'36"W
41°56'42"N	67°51'29"W
41°22'07"N	67°29'09"W
40°05'36"N	66°41'59"W

28 June 1983

L. H. Legault, Q.C.  
Agent for the Government  
of Canada

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**ANNEXES TO THE COUNTER-MEMORIAL  
OF CANADA**

**Volume I**

**GEOLOGY, OCEANOGRAPHY AND FISH DISTRIBUTIONS**

## CHAPTER I

### MAJOR ELEMENTS OF THE GEOLOGY AND GEOMORPHOLOGY OF THE GULF OF MAINE AREA

#### Section I. Introduction

1. This chapter describes the geomorphological relationship between Georges Bank and the Scotian Shelf to the northeast. It also describes the physical discontinuities between Georges Bank and the East Coast Shelf to the southwest, off the United States coast.

2. Regarding the geomorphology of the Gulf of Maine area, there is an overall element of continuity in the *fluvial and glacial processes* that produced the physiographic features of the seabed. Glacial effects are evident in the scoured surface of the entire seabed from the Scotian Shelf as far south as the Cape Cod-Nantucket Shoals-Great South Channel area. In the geological history of the Gulf of Maine area, the Great South Channel was a former drainage valley, which was later filled in with sediments. The Northeast Channel exists today as a secondary topographic depression that resulted from these late geological processes.

3. In terms of the *distribution of sediments*, there is also similarity and continuity of sediment type on the seabed from northeast to southwest — off the coast of Nova Scotia down to the Cape Cod-Nantucket Shoals-Great South Channel area. This continuity shows up in the distribution of the different kinds of surface sediments from northeast to southwest. Distributions of sand, mud and gravel show a pattern of overall continuity from the Scotian Shelf across the Northeast Channel and on to Georges Bank.

4. Geomorphological continuity exists in the nature of the surface features or *bedforms* on the seabed of the Gulf of Maine area. These bedforms consist of large sand ridges, sand waves and smaller megaripples. The sand waves found on the southwestern Scotian Shelf and the eastern half of Georges Bank and in the Bay of Fundy are markedly similar. They are the product of strong tidal forces. They are united in a tidally dominated band that covers much of the area from LaHave Bank, across the Northeast Channel and on to Georges Bank. In contrast to the unity of bedforms from the Scotian Shelf to Georges Bank, bedform types exhibit discontinuities in the Great South Channel area.

5. Regarding the *subsurface geology* of the Gulf of Maine area, the major structural elements that underlie Georges Bank include subsurface sedimentary basins where hydrocarbons are normally entrapped. Georges Bank Basin underlies the western part of Georges Bank. The Scotian Basin reaches from the Canadian continental margin southwestward, extending beneath the eastern part of Georges Bank, where it is partially separated from Georges Bank Basin by the Yarmouth Arch.

6. There are several distinct, localized areas of *potential hydrocarbon accumulation* beneath the eastern part of Georges Bank, within the Scotian Basin and in the sedimentary layers above the Yarmouth Arch. Additional hydrocarbon-bearing structures have been identified within Georges Bank Basin beneath western Georges Bank.

## Section II. The Geomorphology of the Gulf of Maine Area

### A. THE PHYSICAL NATURE OF THE ATLANTIC CONTINENTAL MARGIN

7. The continental shelf in the Gulf of Maine area slopes seaward with a gradient that is generally less than 2 metres per kilometre. The shelf terminates at the shelf-break, at a depth of about 200 metres. Below this break lies the continental slope which forms an escarpment-like feature that extends continuously along the Atlantic margin of the North American continent<sup>1</sup>.

8. The seabed of the inner part of the Gulf of Maine area consists largely of ancient metamorphic, igneous and hard sedimentary rocks, covered by only thin patches of more recent sediments. The seabed of the outer part, however, consists of shoals or banks that are the surface expression of the latest phases in the geological evolution of the thick sediments that built the continental margin. This sedimentary wedge reaches a maximum thickness of about 10 kilometres in its seaward part.

9. The sediments that have accumulated since Jurassic times in the maritime and nearshore environment of the continental shelf are now completely submerged in the Gulf of Maine area and in the Scotian Shelf (except for Sable Island). The landward edge of these sediments lies some distance offshore. Between this edge and the shoreline is a rocky platform, eroded by the sea, consisting of uncovered bedrock with only a patchy cover of thin sediments. To the south of New York, differential warping of the continental margin in recent geological time uplifted the inner part of the sedimentary wedge. This emerged region of former continental shelf constitutes the Atlantic Coastal Plain. Offshore this feature remains below sea level and the entire shelf, from Baffin Island southwest to Cape Cod, is sometimes referred to as the submerged Atlantic Coastal Plain or the Atlantic Margin Sedimentary Wedge<sup>2</sup>.

<sup>1</sup> The inclination and morphology of the continental slope are variable. South of Sable Island on the Scotian Shelf and off the Great South Channel on western Georges Bank the slope is incised by numerous deep canyons and its gradient is about 90 metres per kilometre. On both sides of Northeast Channel the surface of the slope is relatively smooth and the gradient is about 50 metres per kilometre. The slope is always steepest in its upper part.

<sup>2</sup> J. C. Maher and E. R. Applin: *Geologic Framework and Petroleum Potential of the Atlantic Coastal Plain and Continental Shelf*. United States Department of the Interior, Geological Survey Professional Paper 659. Washington, U.S. Government Printing Office, 1971.

## B. THE PHYSIOGRAPHIC PROVINCES OF THE ATLANTIC CONTINENTAL SHELF

10. In many parts of the world, continental shelves are broad shallow platforms that surround continents and islands and descend gently seawards to an abrupt steepening of incline at the continental shelf edge. The shelves themselves are normally unglaciated and display only minor relief. The shelf off the eastern coast of the United States is of this character as far north as the Great South Channel area, forming a distinctive physiographic "province", the *East Coast Shelf*<sup>3</sup>. North-eastward from the Great South Channel, however, the entire continental shelf is geomorphologically similar, having been marked by the effects of glacial erosion and deposition, which distinguish it from the unglaciated offshore plain to the southwest. Within this glaciated region, there are additional physiographic provinces. The *Gulf of Maine* province is a roughly rectangular area with an average water depth of 150 metres, divided into numerous basins separated by sills. *Georges Bank* province is a sandy bank that forms a barrier across the seaward side of the Gulf of Maine and is separated from the East Coast Shelf by the Great South Channel and from the Scotian Shelf by the Northeast Channel. The *Scotian Shelf* province consists of a complex of shallow, flat-topped sandy banks cut by channels, and with fairly deep basins on the landward side. There is considerable similarity, in physiographic terms, between Georges Bank and the banks of the Scotian Shelf.

## C. FLUVIAL EROSION AND GLACIATION OF THE ATLANTIC CONTINENTAL SHELF NORTHEAST OF THE GREAT SOUTH CHANNEL AREA

### 1. Fluvial Action and the Creation of Early Drainage Systems

11. Many of the physiographic features of the present shelf are inherited from events of the Pleistocene epoch (about 10,000 to 1.8 million years ago) or earlier [Table 1]. Indeed, as far back as the end of the Cretaceous period (about 65 million years ago), the present Gulf of Maine lay largely above sea level; it consisted of a low-lying area and was traversed by river systems carrying sediment from the interior. Later on, however, the western part of this drainage system was invaded by the sea, leading to the deposition of sediments of probable Eocene age (about 38 to 54 million years ago), which now occur as remnants throughout a belt along the line of the Great South Channel extending from Cape Cod northwards on to Stellwagen Bank and around the northern tip of Wilkinson Basin<sup>4</sup>.

<sup>3</sup> E. Uchupi: *Atlantic Continental Shelf and Slope of the United States — Physiography*. United States Department of the Interior, Geological Survey Professional Paper 529-C. Washington, U.S. Government Printing Office, 1968, pp. C1-C30. See *Canadian Memorial*, p. 38, Figure 13.

<sup>4</sup> R. N. Oldale, E. Uchupi and K. E. Prada: *Sedimentary Framework of the Western Gulf of Maine and the Southeastern Massachusetts Offshore Area*. United States Department of the Interior, Geological Survey Professional Paper 757. Washington, U.S. Government Printing Office, 1973, pp. 1-10.

TABLE 1

GEOLOGICAL AGE		Million Years Ago	GEOLOGICAL EVENTS — GULF OF MAINE AREA	
CENOZOIC	Quaternary	Recent (Holocene)	.002	Nova Scotia-New England margin assumes present form. Glaciers retreat, sea waters rise over Georges Bank and rework surficial sediments.
		Pleistocene	.01	
	Tertiary		1.8	Continental glaciers further scour out Gulf of Maine and Northeast Channel.
		Pliocene		Fluvial erosion carves out Gulf of Maine and removes most of Coastal Plain cover; Northeast and Great South Channels form as water gaps.
		Miocene	5.5	
			22	Shallow marine to non-marine deposition continues on Gulf of Maine Platform and Scotian Shelf.
		Oligocene		Sea level drops; shelf and slope build out; submarine canyons form.
		Eocene	38	
Paleocene	54	Continued marine deposition.		
		65	Renewed subsidence and marine deposition.	
MESOZOIC	Cretaceous	Late Cretaceous		Margin uplifted; LaHave Platform and Gulf of Maine Platform eroded; sea rises and spreads back across area; Dawson Canyon and Wyandot formations deposited; Transverse movements along Kelvin Fault zone result in New England Seamount chain.
		Early Cretaceous	100	
	Jurassic	Late Jurassic	135	Continued development of carbonate bank with back bank Mic Mac formation behind.
			160	Eastern North American margin subsides; Abenaki carbonate bank forms close to the hinge zone. Nova Scotia and New England decouple from NW Africa to form Central Atlantic Ocean; Mohican formation deposited.
		Middle Jurassic		
		Early Jurassic	176	Crust subsides along basement hinge zone; Yarmouth Arch forms; Georges Bank and Scotian Basins expand; shallow salt pan occupying the depression results in Argo formation.
Triassic	192	Tensional crustal forces cause formation of grabens filled by continental sediments, including evaporites and volcanics; Georges Bank and Scotian Basins form.		
PALEOZOIC	Permian	225		
	Carboniferous	280	Continental sediments laid down in Bay of Fundy, Boston Basin.	
	Devonian	345		
	Silurian	395	Acadian granites intrude Appalachian, Avalon and Meguma belts.	
	Ordovician	430	Meguma Seaway closes — Meguma sediments folded and faulted.	
	Cambrian	500	Appalachian (Iapetus) Seaway closes; Appalachian sediments folded, faulted, intruded.	
		570	Deep water sediments laid down in Appalachian and Meguma Seaways.	
PRECAMBRIAN		600-700	Avalon Platform rocks folded and intruded by granite, followed by seafloor spreading.	
		1000	Avalon Platform rocks laid down in shallow sea.	



12. During Pliocene time (about 1.8 to 5.5 million years ago), sea level again dropped, exposing the former continental shelf. The most extensive river system draining the interior of northeastern North America discharged down what is now the Laurentian Channel in the Gulf of St. Lawrence. A much smaller system drained down the site of the present Hudson River. Between these two systems, the Gulf of Maine area was drained by rivers originating in the highlands of New Brunswick, Maine, New Hampshire and Vermont<sup>5</sup>. The western drainage system included the Merrimack and Kennebec rivers and discharged through the Great South Channel. The eastern system included the Penobscot River of Maine, the St. Croix River of Maine and New Brunswick, and the Saint John River of New Brunswick, and drainage from the Bay of Fundy, Minas Basin, Annapolis Valley and other parts of Nova Scotia; it discharged through the ancestral Northeast Channel in about its present site [Figure 1].

## 2. The Onset and Effects of Glaciation

13. During the last 2 million years, extensive glaciers built up in cold, northern mountain areas. Eventually large ice sheets engulfed much of North America and northern Europe. The ice sheets expanded and melted back several times. Each glaciation consisted of several subsidiary stages of advance and retreat. The youngest, or Wisconsinan glacial stage, began about 80,000 years ago. This most recent stage left its imprint in the secondary features that characterize the shelf as far south as the Cape Cod-Nantucket Shoals-Great South Channel area.

14. During the maximum extent of glaciation in North America, the edge of the ice reached the vicinity of Cape Cod, along the Scotian Shelf and across the Laurentian Channel. Throughout the continental area beneath the ice sheet, bedrock was excavated by the moving ice. The eroded débris was later left behind as a blanket of glacial till when the ice eventually melted. It accumulated at the edge of the melting ice sheet as ridges of till, or moraines. The meltwater from the ice carried away finer débris, partly sorting it and depositing gravel and sand in a surrounding belt, known as an outwash plain [Figure 2].

15. A series of glacially excavated basins lies all along the continental shelf in the Gulf of Maine area, from Wilkinson Basin in the western Gulf of Maine to the Scotian Shelf off southwestern Nova Scotia and beyond. The positions of these basins are partly controlled by the former river valleys along which the ice could flow most easily. Wilkinson Basin lies behind the Great South Channel outlet, and it is probable that an ice lobe extended into this area, building the outwash gravels and sands at Cape Cod<sup>6</sup>.

<sup>5</sup> R. N. Oldale and E. Uchupi: *The Glaciated Shelf off Northeastern United States*. United States Department of the Interior, Geological Survey Professional Paper 700-B. Washington, U.S. Government Printing Office, 1970, pp. B167-B173.

<sup>6</sup> J. H. Hartshorn, R. N. Oldale and C. Koteff: "Preliminary Report on the Geology of the Cape Cod National Seashore", in O. C. Farguhar, ed.: *Economic Geology in Massachusetts*. Boston, University of Massachusetts Graduate School, 1967, pp. 49-58.

16. The mass of glacial ice depressed the earth's crust beneath it and for a short distance beyond the ice edge. The ice melted rapidly by comparison with the slow readjustment — the isostatic recovery — of the earth's crust. Consequently, by about 14,000 years ago the rising sea was able to invade the still-depressed coast of Maine, New Brunswick and the Fundy area of Nova Scotia, leaving marine deposits of post-glacial age as far inland as Bingham in Maine, and Fredericton in New Brunswick<sup>7</sup>. The strongly indented coastlines of Maine and New Brunswick, as well as those of Massachusetts and Nova Scotia, resulted from the "drowning" of river valleys that had been formed when sea level was lower. Thus, the whole of the coastal belt from the Cape Cod-Nantucket Shoals-Great South Channel area to Cape Breton Island reflects a common history of fluvial erosion and glacial deposition, and of response to changing sea levels and ice-loading.

### 3. *The Nature of the Channels Flanking Georges Bank*

17. In a recently published interpretation of high-resolution seismic data collected in 1975, United States scientists show that Georges Bank is a compound feature<sup>8</sup>. They have divided it into three areas, on the basis of deposits during the Late Tertiary and Pleistocene eras (about 1.8 million years ago) [Figure 3]. A central area about 60 kilometres wide, that trends across the width of Georges Bank in a north-south direction, is called the Mid-Bank Divide. The other two areas are an eastern wedge and a western wedge of sediments flanking the Mid-Bank Divide. The eastern wedge of sediments is interpreted to be composed of younger Tertiary sediments. They form massive, prograding delta-like structures that thicken to the southeast and construct an eastward extension to the Mid-Bank Divide.

18. The western wedge of sediments has a different geological history. In Pliocene or early Pleistocene time, erosion associated with streams cutting across the shelf in the vicinity of the Great South Channel had removed much of the Tertiary sediment west of the Mid-Bank Divide, making the Great South Channel the major drainage outlet from the Gulf of Maine. During the mid to late Pleistocene, the channel was successively filled by episodic influxes of glacial material. These form the overlapping units, shown in Figure 3, comprising the western wedge that eventually filled the Great South Channel. Prior to the final Pleistocene ice advance, a transgression of the sea resulted in widespread erosion across the top of Georges Bank, erasing the pre-existing morphology. Erosion associated with the last glaciation modified Georges Bank, cutting the Great South Channel and Northeast Channel and incising numerous channels along the bank edge.

<sup>7</sup> D. R. Grant: "Glacial Style and Ice Limits, the Quaternary Stratigraphic Record, and Changes of Land and Ocean Level in the Atlantic Provinces, Canada." *Géographie physique et quaternaire*, vol. 31, n° 3/4, 1977, p. 247-260.

<sup>8</sup> J. M. Aaron, B. Butman, M. H. Bothner and R. E. Sylwester: *Environmental Conditions Relating to Potential Geologic Hazards, U.S. Atlantic Continental Margin*. United States Department of the Interior, Geological Survey Miscellaneous Field Studies Map MF-1193. Washington, U.S. Government Printing Office, 1980.

19. The Great South Channel is now some 80 metres deep and is a broad physiographic feature leading out of Wilkinson Basin and disrupting the patterned distribution of sand ridges and sand waves on the Nantucket Shoals and Little Georges Bank<sup>9</sup> [Figure 4]. The seismic profiles described above show that an equally wide and deeper channel existed beneath the present channel but that it was periodically filled and eroded to varying degrees. At least four former channels are recognized, the deepest lying 60 metres below the present channel floor<sup>10</sup>. A profile across the axis of the Great South Channel clearly shows an inclined surface 10 kilometres west of the axis of the Channel that:

“... may mark the western side slope of this filled trough. After this deeper channel was filled, several others appear to have been cut, and they too were filled in turn<sup>11</sup>.”

The seismic data summarized in Figure 3 show that the southern part of the Great South Channel was formerly at least 180 metres deeper than it is now and functioned as a very broad fluvio-glacial drainage outlet during the Pleistocene<sup>12</sup>. Although the Great South Channel may not have been completely occupied by a glacial tongue, there is an extensive lens (200 by 100 kilometres) of semiconsolidated sediment on the continental slope in the area of Hydrographer Canyon that probably accumulated after being transported through the Great South Channel. This material is more than 800 metres thick at the mouth of the Canyon and thins gradually to the east, west and south.

20. The Northeast Channel has not been filled in as much as the Great South Channel, although some 40 to 60 metres of till and outwash occur on its floor<sup>13</sup>. Whereas the Northeast Channel appears on conventional maps as a superficial but distinct cut in the shelf, this is over-emphasized by the common use of the 200-metre bathymetric contour to delineate the shelf. A 240-metre contour, for example, would give a different visual impression. The only depression in the surface of the Atlantic continental shelf that would then appear is the Laurentian Channel, which is very different in scale from the Northeast Channel. The Laurentian Channel runs 700 kilometres across the shelf into the Gulf of St. Lawrence; it is 100 kilometres wide. The Northeast Channel is 70 kilometres long and is 45 kilometres wide. The sill depth of the Northeast Channel is about 230 metres, compared with 410 metres for the Laurentian Channel.

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<sup>9</sup> E. Uchupi: *Atlantic Continental Shelf and Slope of the United States — Shallow Structure*. United States-Department of the Interior, Geological Survey Professional Paper 529-I. Washington, U.S. Government Printing Office, 1970.

<sup>10</sup> S. T. Knott and H. Hoskins: “Evidence of Pleistocene Events in the Structure of the Continental Shelf off the Northeastern United States.” *Marine Geology*, Vol. 6, 1968, pp. 5-43.

<sup>11</sup> E. Uchupi: *Atlantic Continental Shelf and Slope of the United States — Shallow Structure*.

<sup>12</sup> J. M. Aaron et al.: *Environmental Conditions Relating to Potential Geologic Hazards*.

<sup>13</sup> J. A. Ballard and F. H. Sorensen: “Preglacial Structure of Georges Bank and Northeast Channel, Gulf of Maine.” *American Association of Petroleum Geologists Bulletin*, Vol. 52, 1968, pp. 494-500.

#### D. SIMILARITIES IN THE CONTINENTAL SHELF SEDIMENT IN THE GULF OF MAINE AREA

21. On the Scotian Shelf and Georges Bank, glacial and fluvial outwash sediments are very variable in thickness. They usually form a veneer less than 40 metres thick on the inner parts of the banks<sup>14</sup>, but then thicken rapidly seawards towards the shelf edge. Thickness of up to 200 metres is reported for outer Georges Bank<sup>15</sup>. Similar thickness occurs on the Scotian Shelf although thickness of up to 1,000 metres occurs in buried channels<sup>16</sup>. Thick sediments are absent and Tertiary strata lie a few metres below the seabed in some areas at the shelf edge both on the Scotian Shelf and Georges Bank.

22. *Figures 5, 6 and 7* show the distribution of gravel, sand and mud in the Gulf of Maine area based on data from regional and local studies of the surface sediments on the Atlantic continental shelf<sup>17</sup>. Each of the three figures shows a continuity in the pattern of sediment distribution throughout the Gulf of Maine area from northeast to southwest.

23. On the mud distribution map, the contours outline areas of 80, 50, 20 and 5-percent mud [*Figure 5*]. Nearshore areas, which have poor sample coverage and much topographic irregularity, were not contoured. The 5-percent contour delineates the mud-free areas. It shows the continuity of the broad band of the banks, stretching from Sable Island Bank to the Great South Channel, broken only by a slightly muddier area in the central Scotian Shelf, between LaHave Bank and Emerald Bank. Increasing percentages of mud occur in the areas both landward and seaward of the banks. The 80-percent mud contour includes most of the deeper basins, although Crowell Basin in the Gulf of Maine and southern Roseway Basin on the Scotian Shelf are somewhat less muddy.

<sup>14</sup> Geonautics Ltd.: "A Geophysical Survey of Georges Bank, Georges Basin and Northeast Channel Area of the Gulf of Maine." Geological Survey of Canada, unpublished report; C. L. Amos and K. W. Asprey: "Report on C.S.S. Dawson Cruise 82-040, Sable Island Bank." Geological Survey of Canada, Atlantic Geoscience Centre, Bedford Institute of Oceanography, Internal Report, 1982; L. H. King, B. MacLean and G. B. Fader: "Unconformities on the Scotian Shelf." *Canadian Journal of Earth Sciences*, Vol. 11, No. 1, 1974, pp. 89-100.

<sup>15</sup> S. T. Knott and H. Hoskins: "Evidence of Pleistocene Events in the Structure of the Continental Shelf off the Northeastern United States", pp. 5-43.

<sup>16</sup> C. L. Amos and K. W. Asprey: "Report on C.S.S. Dawson Cruise 82-040, Sable Island Bank"; M. S. Barss, J. B. Bujak and J. L. Williams: *Palynological Zonation and Correlation of 67 Wells, Eastern Canada*. Geological Survey of Canada Paper 78-24, 1978.

<sup>17</sup> L. H. King: "Submarine End Moraines and Associated Deposits on the Scotian Shelf." *Geological Society of America Bulletin*, Vol. 80, 1969, pp. 83-96; D. J. P. Swift, R. A. Young, T. L. Clarke, C. E. Vincent, A. Niedoroda and B. Lesht: "Sediment Transport in the Middle Atlantic Bight of North America: Synopsis of Recent Observations", in S.-D. Nio, R. T. E. Shuttenehl and Tj. C. E. Van Weering, eds.: *Holocene Marine Sedimentation of the North Sea*. International Association of Sedimentologists Special Publication No. 5. Oxford, Blackwell Scientific Publishers, 1981, pp. 361-383; D. J. Stanley and A. B. Cok: "Sediment Transport by Ice on the Nova Scotian Shelf." *Transactions of the National Symposium in Ocean Sciences and Engineering of the Atlantic Shelf*. Philadelphia, Marine Technology Society, 1968, pp. 100-125; J. C. Hathaway: "Data File, Continental Margin Program, Atlantic Coast of United States. Vol. 2, Sample Collection and Analytical Data." Woods Hole Oceanographic Institution, Reference No. 71-75, United States Geological Survey GD-76-015, 1971.

24. On the sand distribution map, contours outline areas of 80, 50 and 20-percent sand [Figure 6]. Sand is abundant on some bank tops, although in other cases gravel predominates. In the basins, sand is generally rare, but it is abundant on the slopes between banks and basins.

25. The gravel distribution map, shows that the gravels of the Scotian Shelf and eastern Gulf of Maine extend onto the northeastern part of Georges Bank, but are separated from the gravel that marks the Great South Channel [Figure 7].

#### E. DISTRIBUTION OF SAND WAVES AND SIMILAR BEDFORMS: CONTINUITY FROM NORTHEAST TO SOUTHWEST

26. There are three types of bedforms (regular ridge-like seabed features) that occur in the Gulf of Maine area. These are large-scale *sand ridges*, somewhat smaller *sand waves* and even smaller *megaripples* [Figure 8]. These three types of wave-like features are all generated as a result of active currents working principally on sand<sup>18</sup>.

27. Large-scale sand ridges occur on the northern part of the East Coast Shelf southwest of the Great South Channel, on Georges Bank and the Scotian Shelf (Sable Island Bank and Banquereau). There is a general continuity in sand ridges throughout this area and those on Georges Bank vary from among the smallest to the largest in size<sup>19</sup>.

28. The sand ridges on the East Coast Shelf and on Sable Island Bank and Banquereau are morphologically similar. They are storm-generated or submerged former near-shore islands<sup>20</sup>. However, studies of waves and currents show that on the shallow banks between western Georges Bank and LaHave Bank on the Scotian Shelf, sand movement is principally the result of tidal currents, not storms<sup>21</sup>. The sand ridges on Georges Bank are the result of these tidal currents and are thus unlike those of either the East Coast Shelf, off the United States coast, or Sable Island Bank, further north off the Canadian coast<sup>22</sup>.

<sup>18</sup> D. Twichell: *Bed Form Distribution and Inferred Sand Transport on Georges Bank*. United States Department of the Interior, Geological Survey Open-File Report 81-764. Washington, U.S. Government Printing Office, 1981.

<sup>19</sup> C. L. Amos and E. L. King: *Sand Waves and Sand Ridges of the Canadian Eastern Seaboard — A Comparison to Global Occurrences*. Dartmouth, Nova Scotia, Atlantic Geoscience Centre, Geological Survey of Canada (in press).

<sup>20</sup> D. J. P. Swift: "Tidal Sand Ridges and Shoal Retreat Massifs." *Marine Geology*, Vol. 18, 1976, pp. 105-134; D. J. P. Swift *et al.*: "Sediment Transport in the Middle Atlantic Bight of North America: Synopsis of Recent Observations", pp. 361-383; C. L. Amos and K. W. Asprey: "Report on C.S.S. Dawson Cruise 82-040, Sable Island Bank."

<sup>21</sup> C. L. Amos and E. L. King: *Sand Waves and Sand Ridges of the Canadian Eastern Seaboard — A Comparison to Global Occurrences*.

<sup>22</sup> B. Butman: "Currents and Sediment Movement on Georges Bank", in G. C. McLeod and J. H. Prescott, eds.: *Georges Bank: Past, Present and Future of a Marine Environment*. Boulder, Colorado, Westview Press, 1982, pp. 31-59.

29. Rather than exhibiting clear distinctions, the sand waves of Georges Bank overlap in terms of both shape and size with those found on Browns Bank and other areas to the northeast, including the Bay of Fundy<sup>23</sup>. There is thus a continuity in sand wave type from northeast to southwest, which is reflected in the fact that sand waves are reported within the Northeast Channel<sup>24</sup>. The sand waves are the product of strong currents, and those on Georges Bank, the Northeast Channel, Browns Bank and the Bay of Fundy are the product of the same strong tidal circulation associated with the Bay of Fundy. The entire area between LaHave Bank to the central part of Georges Bank belongs to the same tidally dominated system. There are fewer sand waves on the East Coast Shelf, in part due to the finer sediment<sup>25</sup>.

30. Seabed sediments tend to move in a northeasterly direction in the area east of a line passing through the Great South Channel, but in a southwesterly direction west of this line<sup>26</sup>. This zone of sediment parting appears to be a response to the different directions of the residual currents on either side of the Great South Channel.

### Section III. Subsurface Geology of the Gulf of Maine-Georges Bank Area

#### A. GEOLOGICAL STRUCTURE OF THE AREA

31. There are two major centres of deposition flanked by three more stable or "platform" areas in the subsurface of Georges Bank. The sediment-filled depression beneath the western part of Georges Bank, originally named the Georges Bank Trough, has been renamed Georges Bank Basin<sup>27</sup>. The southwestern end of the Scotian Basin underlies the eastern part of Georges Bank<sup>28</sup> [Figure 9]. Between the two lies the Yarmouth Arch. The Long Island Platform forms the northwestern limit of Georges Bank Basin<sup>29</sup>, whereas the LaHave Platform forms the northwestern limit of the Scotian Basin<sup>30</sup>.

<sup>23</sup> C. L. Amos and E. L. King: *Sand Waves and Sand Ridges of the Canadian Eastern Seaboard — A Comparison to Global Occurrences*.

<sup>24</sup> Geonautics Ltd.: "A Geophysical Survey of the Georges Bank, Georges Basin and Northeast Channel Area of the Gulf of Maine."

<sup>25</sup> M. H. Bothner, E. C. Spiker, W. M. Ferrebee and D. L. Peeler: *Clay Mineralogy, Trace Metals, and Age of Cored Sediments from the Atlantic Outer Continental Shelf*. United States Department of the Interior, Geological Survey Open File Report 79-842. Washington, U.S. Government Printing Office, 1979.

<sup>26</sup> R. H. Belderson, M. A. Johnson and A. H. Stride: "Bed-Load Partings and Convergences at the Entrance to the White Sea, U.S.S.R., and Between Cape Cod and Georges Bank, U.S.A." *Marine Geology*, Vol. 28, 1978, pp. 65-75.

<sup>27</sup> J. C. Maher and E. R. Applin: *Geologic Framework and Petroleum Potential of the Atlantic Coastal Plain and Continental Shelf*; L. K. Schultz and R. L. Grover: "Geology of Georges Bank Basin." *American Association of Petroleum Geologists Bulletin*, Vol. 58, No. 6, Part 2, 1974, pp. 1159-1168.

<sup>28</sup> J. A. Wade: "Stratigraphy of Georges Bank Basin." *Canadian Journal of Earth Sciences*, Vol. 14, No. 10, 1977, pp. 2274-2283.

<sup>29</sup> L. K. Schultz and R. L. Grover: "Geology of Georges Bank Basin", pp. 1159-1168.

<sup>30</sup> L. F. Jansa and J. A. Wade: "Geology of the Continental Margin off Nova Scotia and Newfoundland", in W. J. M. van der Linden and J. A. Wade, eds.: "Regional Geology", in *Offshore Geology of Eastern Canada*, Vol. 2. Geological Survey of Canada Paper 74-30, 1975, pp. 51-105.

32. *Georges Bank Basin* is an ancient structural depression of about 200 by 90 kilometres in dimension. It was formed about 190 million years ago during the Early Jurassic as a result of tensional forces prior to the drifting apart of North Africa and North America. This basin contains up to 8 kilometres or more of sedimentary rocks of Jurassic to Tertiary age<sup>31</sup>, overlying a folded and block-faulted basement complex composed of igneous and meta-sedimentary rocks, and inset with down-faulted remnants of Triassic sediments and volcanics<sup>32</sup>. The basin had its most rapid period of subsidence during the Early and Middle Jurassic, when up to 4 kilometres of predominantly carbonate rocks were deposited in a shallow, warm epicontinental sea. The carbonate rocks were flanked in a shoreward direction by fine and coarse clastics. During the late Middle Jurassic to Tertiary, an additional 4 kilometres or more of sediments were deposited across the area, consisting primarily of sandstone and shale, with occasional thick intervals of carbonate rocks developed along the ancient shelf edges.

33. The *Yarmouth Arch* and attendant positive elements to the south and east, formed the southern limit of the Scotian Basin during the Late Triassic and Early Jurassic<sup>33</sup>. In late Early and Middle Jurassic time the Arch was gradually submerged as the margin subsided and the Scotian Basin and Georges Bank Basin were fully connected. After the Jurassic, the effects of the two basins were much less distinct and sedimentation was relatively uniform across the entire area. The Yarmouth Arch rises in a northeasterly direction towards southwestern Nova Scotia and has been interpreted to represent the southwestward plunge of the Nova Scotia structural trends<sup>34</sup>. On maps of magnetic anomalies, the Arch is represented as a positive trend that extends from Nova Scotia in a southwesterly direction across the Northeast Channel and beneath Georges Bank<sup>35</sup>.

34. The *Scotian Basin* is the largest subsurface basin on the southeastern continental margin of Canada. It extends in a southwestward direction from the Scotian Shelf to eastern Georges Bank<sup>36</sup>. The Scotian Basin is bounded to the southwest by the Yarmouth Arch, which partially separates it from Georges Bank Basin, and to the northwest by the LaHave Platform [Figure 9].

35. The Scotian Basin contains up to 10 kilometres of sediments beneath eastern Georges Bank and the Northeast Channel, thickening to over 12 kilometres in the vicinity of Sable Island on the outer part of the

<sup>31</sup> J. A. Wade: "Stratigraphy of Georges Bank Basin", pp. 2274-2283.

<sup>32</sup> R. D. Ballard and E. Uchupi: "Triassic Rift Structure in the Gulf of Maine." *American Association of Petroleum Geologists Bulletin*, Vol. 59, No. 7, 1975, pp. 1041-1072.

<sup>33</sup> J. A. Wade: "The Mesozoic-Cenozoic History of the Northeastern Margin of North America." *Proceedings of Tenth Annual Offshore Technology Conference*, Vol. 3, 1978, pp. 1849-1858.

<sup>34</sup> J. A. Wade: "Stratigraphy of Georges Bank Basin", pp. 2274-2283; and "The Mesozoic-Cenozoic History of the Northeastern Margin of North America", pp. 1849-1858.

<sup>35</sup> R. T. Haworth and J. B. McIntyre: *The Gravity and Magnetic Field of Atlantic Offshore Canada*. Geological Survey of Canada Paper 75-9, 1975.

<sup>36</sup> L. F. Jansa and J. A. Wade: "Geology of the Continental Margin off Nova Scotia and Newfoundland", pp. 51-105.

Scotian Shelf. The Scotian Basin sediments form a prism beneath the continental slope and rise, which thins gradually to the southeast to form the thinner layer of sediments covering the distal oceanic basement<sup>37</sup>.

36. The stratigraphy of the Scotian Basin is relatively uniform from the Canadian Atlantic margin off Newfoundland and Nova Scotia southwest to Georges Bank. At its deepest, it contains a basal unit of red sandstones, shales and salt, which are up to 5 kilometres thick. The salt is overlain by carbonates and clastics of the same types and origins as those occurring in Georges Bank Basin. On top of these, in areas of accelerated subsidence or in conjunction with ancient drainage systems, thick deltaic sequences of sandstone and shale were deposited. Northeast of Georges Bank, a sandstone-mudstone unit overlies the whole sequence forming the geomorphic shelf, slope and rise off Nova Scotia<sup>38</sup>.

37. One of the most striking features of the Scotian Basin is a chain of salt domes and ridges that occur mainly beneath the continental slope along the entire length of the basin. Designated the Sedimentary Ridge Province<sup>39</sup>, these salt domes formed as a result of the weight of the thick sequences of overlying sediments that caused the salt to rise vertically in tall columns, some of which reach almost to the seabed. Salt domes are readily detected on reflection seismic records and have long been recognized as prospective sites for the accumulation of oil and gas. Four salt domes of the Sedimentary Ridge Province have been identified beneath eastern Georges Bank and the Northeast Channel at the southwestern end of the Scotian Basin.

#### B. HYDROCARBON PLAYS ON GEORGES BANK

38. Three major structural features, as noted in the foregoing section, exist under Georges Bank: the Scotian Basin, the Yarmouth Arch and Georges Bank Basin. Each is characterized by a different combination of prospects — called “hydrocarbon plays” — that favour the accumulation of oil or gas.

39. The southwestern end of the Scotian Basin, which underlies eastern Georges Bank and the outer part of the Northeast Channel, contains at least four types of hydrocarbon play identified from seismic surveys. These play types are similar to those containing oil and gas in the Sable Island portion of the Basin:

(a) *Salt pillows*: Structures of low relief in which sandstone reservoirs of possible Jurassic and Lower Cretaceous age form gentle anticlines over deep-seated salt deposits. Salt pillows probably contain 76 per cent of the oil and gas that might exist beneath northeast Georges Bank.

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<sup>37</sup> L. F. Jansa and J. A. Wade: “Geology of the Continental Margin off Nova Scotia and Newfoundland”, pp. 51-105.

<sup>38</sup> L. F. Jansa and J. A. Wade: “Geology of the Continental Margin off Nova Scotia and Newfoundland”, pp. 51-105.

<sup>39</sup> L. F. Jansa and J. A. Wade: “Geology of the Continental Margin off Nova Scotia and Newfoundland”, pp. 51-105.



- (b) *Salt domes*: Anticlinal, high-relief structures in which sandstone reservoirs of possible Jurassic and Lower Cretaceous age have been warped upwards by the rising salt. Salt domes probably contain 9 percent of the oil and 7 percent of gas that might exist beneath northeastern Georges Bank.
- (c) *Rollover structures*: Asymmetrical anticlinal structures of low relief on the down-thrown (usually basinal) side of active growth faults. These faults are often caused by salt movement or the presence of overpressured rocks at depth. Rollover structures probably contain 10 percent of the oil and 9 percent of the gas that might exist beneath northeastern Georges Bank.
- (d) *Normal faults*: Fractures which cut the sediments (similar to rollover structures) but with no closure other than that provided by intersection of the fault with dipping strata. Normal faults probably contain 2 percent of the oil and gas that might exist beneath northeastern Georges Bank.

40. The hydrocarbon potential of the Yarmouth Arch is described by only one play, which is related to faulting and basement structures and involves Jurassic sandstone reservoirs overlying gentle highs and relatively small fault blocks. The Yarmouth Arch could contain 3 percent of oil and 6 percent of gas that might exist beneath northeastern Georges Bank.

41. The oil and gas potential of Georges Bank Basin, on the western side of Georges Bank, has been described by the United States Geological Survey<sup>40</sup>. The major oil and gas plays are associated with structural highs, carbonate reefs, facies changes, normal faults and updip porosity wedgements.

- (a) The largest and most important plays described in Georges Bank Basin are *structural highs* associated with draping and differential compaction of sediments over high basement blocks. Drape structures have provided substantial petroleum traps in other parts of the United States. In Georges Bank Basin these drape structures could have provided timely traps for hydrocarbons that may have been generated in Jurassic or Cretaceous rocks.
- (b) *Stratigraphic traps* may occur in carbonate sediments associated with the *Jurassic and Lower Cretaceous reefs*. These reefs are sometimes extremely porous and have potential for oil and gas accumulation especially near the shelf edge.
- (c) *Facies changes* from marine clastics to carbonates or from marginal marine sandstone to shale, in the Jurassic and Cretaceous, may form numerous potential hydrocarbon traps.
- (d) *Normal faults*, adjacent to basement blocks, could provide traps in the lower part of the sedimentary section.

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<sup>40</sup> *Sediments, Structural Framework, Petroleum Potential, Environmental Conditions, and Operational Considerations of the United States North Atlantic Outer Continental Shelf*. United States Department of the Interior, Geological Survey Open File Report 75-353, 1975.

- (e) *Updip porosity wedgeouts* occur where porous reservoir beds pinch out against structural highs thus forming a potential trap for oil and gas. This type of play is also expected to occur in Georges Bank Basin.

42. The total potential recoverable oil and gas resources associated with the plays in Georges Bank Basin, as estimated by the United States Geological Survey<sup>41</sup>, are similar in both quantity and probability of occurrence to those in the Scotian Basin and Yarmouth Arch plays to the east.

#### Section IV. Conclusion

43. The continental shelf in the Gulf of Maine area is part of the single, continuous Atlantic continental margin of North America. However, the Gulf of Maine area, and Georges Bank in particular, exhibit greater geomorphological and geological affinities northeast than southwest. *First*, similar fluvial and glacial processes produced the physiographic features of the seabed from the Scotian Shelf to Nantucket Shoals. The Cape Cod-Nantucket Shoals-Great South Channel area is the southern limit of glaciation on the continental shelf of eastern North America. In recent geological history, this area was drained by two major river systems discharging through the ancestral Northeast Channel and Great South Channel. As a result of fluvial and glacial action, there is a similarity and continuity of sediment type on the seabed from northeast to southwest — off the coast of Nova Scotia to the Cape Cod-Nantucket Shoals-Great South Channel area. *Secondly*, the subsurface geology of the Gulf of Maine area indicates that the Scotian Basin — the major structural feature that underlies the Scotian Shelf — also underlies the Northeast Channel and eastern Georges Bank. Georges Bank Basin underlies the western part of Georges Bank. A third structural feature — the Yarmouth Arch — also underlies part of the Northeast Channel and Georges Bank, trending southwestward from Nova Scotia. All three features contain plays where hydrocarbons may be entrapped. Thus, the Gulf of Maine area exhibits geomorphological continuity from the Scotian Shelf to Nantucket Shoals and contains a system of potential hydrocarbon plays in the deep sedimentary basins that extend from under the Scotian Shelf to under Georges Bank.

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<sup>41</sup> *Sediments, Structural Framework, Petroleum Potential, Environmental Conditions, and Operational Considerations of the United States North Atlantic Outer Continental Shelf*; G. L. Dolton, K. H. Carlson, R. R. Charpentier, A. B. Coury, R. A. Crovelli, S. E. Frezon, A. S. Khan, J. H. Lister, R. H. McMullin, R. S. Pike, R. B. Powers, E. W. Scott and K. L. Varnes: *Estimates of Undiscovered Recoverable Conventional Resources of Oil and Gas in the United States*. United States Department of the Interior, Geological Survey Circular 860, 1981.

## CHAPTER II

### MAJOR ELEMENTS OF THE PHYSICAL OCEANOGRAPHIC RÉGIME OF THE GULF OF MAINE AREA

#### Section I. Introduction

44. This chapter deals with the physical oceanography and the water mass properties of Georges Bank both on a large scale and at a more localized or regional level. Three important factors relating to Georges Bank are brought into focus. *First*, in terms of large-scale oceanographic phenomena, Georges Bank is strongly influenced by factors that have their origins to the northeast, namely, cold water currents from northern Canada, and fresh water from the rivers discharging into the Gulf of St. Lawrence and the Bay of Fundy. *Secondly*, the tidal currents within the entire Gulf of Maine area are part of a single, integrated tidal system. *Thirdly*, within the large and continuous ocean system along the North American Atlantic coast, Georges Bank can be described oceanographically as being partially self-contained — the Georges Bank gyre is the best example. This “self-containedness” implies features that distinguish the waters of Georges Bank from contiguous water masses both to the northeast and to the southwest. The variability of oceanographic forces and the continual process of exchange among the waters of the Gulf of Maine area combine to defy idealized or simplistic portrayals of the oceanography of Georges Bank.

#### Section II. Ocean Currents and Water Characteristics of the Northwest Atlantic

45. In the general surface-layer circulation of the northwest Atlantic, water moves in a southward direction over the continental shelf from Baffin Island to Cape Hatteras, inshore of the warm northward-flowing Gulf Stream [*Figure 10*]. The Labrador and Nova Scotia currents bring cold water of low salinity down from the Canadian north, around Newfoundland, past Nova Scotia and across Georges Bank. As the water moves southward it generally becomes progressively warmer and saltier by the action of the sun and by mixing with offshore water. However, the large discharge of low-salinity water from Hudson Strait and the Gulf of St. Lawrence has a marked freshening influence. Peak discharges of the St. Lawrence River in spring can be traced beyond the Gulf of St. Lawrence to the southern tip of Nova Scotia, and its effects can be detected even within the Gulf of Maine.

46. Offshore between Cape Hatteras and the Grand Banks of Newfoundland, the northeastward-flowing Gulf Stream water (with its high temperature and high salinity) is separated from the southwestward-moving coastal or shelf water (with its low temperature and low salinity) by a complex water mass of intermediate characteristics, known as slope water. Large eddies or Gulf Stream rings, 100 to 200 kilometres in diameter, frequently break off from meanders in the Gulf Stream and are injected into the waters north and south of the Gulf

Stream [Figure 11]. Those eddies to the north of the Gulf Stream can move close to, or even bump against, the continental shelf, at which time their energetic, clockwise rotation causes large volumes of water to be exchanged between the shelf and offshore.

### Section III. Factors Affecting the Currents of the Scotian Shelf and the Gulf of Maine Area

47. The movement of water on the continental shelf is determined by a combination of mechanisms. In the Scotian Shelf-Gulf of Maine area, water movements result from the following factors. *First*, large-scale forces such as the trade winds, the mid-latitude westerlies, seasonal heating and cooling cycles, precipitation and evaporation patterns and freshwater discharge, and the interaction of other processes such as tides with bottom topography, produce what is known as the average circulation [Figure 12]. *Secondly*, offshore forcing caused by the meandering Gulf Stream and the shedding of large energetic warm-core eddies may produce major movement of coastal water offshore in the surface layer and of slope water onshore at greater depths. *Thirdly*, local, short-term gales, which move surface water before them, are capable of producing motion that alters the mean circulation for several days. *Fourthly*, the tide-producing forces that cause the rise and fall of sea level on the shoreline produce important rotary or back-and-forth water movements.

### Section IV. The Pattern of Surface Currents on Georges Bank

48. As shown in Figure 12, the flow of the surface layer southwestward along the Nova Scotia coast splits into two as it approaches the Gulf of Maine area. Part of the offshore component re-circulates around Browns Bank in a clockwise direction<sup>1</sup>, whereas the inshore component moves directly past Cape Sable, joining a generally northwestward flow along the eastern side of the Gulf of Maine. Some of this water crosses the mouth of the Bay of Fundy, and some moves rapidly into that bay on the Nova Scotia side and thence outward on the New Brunswick side before joining the general flow southwestward along the New England coast<sup>2</sup>. Near Cape Cod the flow splits, with part flowing around the Cape by way of the Great South Channel and continuing southwestward, whereas the remainder moves northeastward along the southern side of the Gulf of Maine and onto the northern flank of Georges Bank, where a relatively narrow, high-velocity jet develops<sup>3</sup>.

<sup>1</sup> R. C. Beardsley and P. C. Smith: "The Mean, Seasonal and Subtidal Circulations in the Georges Bank and Gulf of Maine Region." *Third Informal Workshop on the Oceanography of the Gulf of Maine and Adjacent Seas*. Durham, New Hampshire, University of New Hampshire, 2-5 Mar. 1981, pp. 9-16.

<sup>2</sup> D. F. Bumpus and L. M. Lauzier: "Surface Circulation on the Continental Shelf of Eastern North America between Newfoundland and Florida." American Geographical Society, *Serial Atlas of the Marine Environment*, 1965, Folio 7.

<sup>3</sup> B. Magnell, S. Spiegel and R. Scarlet: "The Remarkable Relationship Between the Northeastward Current Jet on the North Side of Georges Bank and Tidal Currents." *Second Informal Workshop on the Oceanography of the Gulf of Maine and Adjacent Seas*. Halifax, Dalhousie University, 14-17 May 1979.

Here again the flow splits, with some moving back towards Nova Scotia and the rest curving southward and thence southwestward along the southern flank of Georges Bank.

49. At the southwestern part of Georges Bank, some of the flow turns northward in the eastern part of the Great South Channel and recirculates around the Bank, whereas the remainder crosses the Great South Channel in its progressive southwestward movement over the shelf. The Nantucket Shoals form a "leaky" boundary between the western Gulf of Maine and the East Coast Shelf. Most of the water flowing south and southwestward over the shoals originates in the western Gulf of Maine and subsequently mixes with Nantucket Sound water and shelf water near the Great South Channel before joining the general southwestward flow over the mid- and outer East Coast Shelf<sup>4</sup>. Although the direction of the mean flow is nearly parallel to the bottom contours throughout much of the Gulf of Maine area, there is a small but significant offshore surface flow along most of the outer edge of the continental shelf throughout the area [Figure 12]. Also, there is a tendency for water to re-circulate around the banks and basins, and thus a single parcel of water may make more than one circuit of the Gulf of Maine or Georges Bank before continuing its southwestward journey.

#### Section V. Differences Between Subsurface and Surface Currents

50. Current speeds generally diminish with depth. In basins, the circulation and source of deep subsurface water usually differ appreciably from those of overlying waters. In those like Emerald Basin and Georges Basin, the deep water originates from offshore, through subsurface penetration of slope water, whereas the upper water layer is part of the southward moving coastal water. Thus, the current pattern in the Gulf of Maine is not static and different pictures emerge depending on seasons and depths. Computations of the mean annual influx into the Gulf of Maine through the Northeast Channel implies a replacement time of about one year for the deep water of the Gulf of Maine.

#### Section VI. The Influence of Freshwater Discharge from Northern Sources

51. On the larger scale, the important freshening influence introduced into the southward-moving shelf water from the Hudson Bay and Gulf of St. Lawrence systems has already been referred to. More locally, freshwater from the rivers emptying into the Gulf of Maine area — the Saint John, Penobscot, Androscoggin, Kennebec and Merrimack — also produces measurable effects well beyond the river mouths. Of these, the Saint John River, which flows into the Bay of Fundy from New Brunswick, is the largest and has a mean annual discharge of about 50 percent

<sup>4</sup> R. Limeburner and R. C. Beardsley: "The Seasonal Hydrography and Circulation Over Nantucket Shoals." *Journal of Marine Research*, Vol. 40, Supplement, 1982, pp. 371-406.

of the combined total river discharge into the Gulf of Maine area<sup>5</sup>. All the rivers have large seasonal variations in discharge, with an annual peak in spring associated with the melting of snow and ice. The Saint John River is not only much larger than the others but also displays a more marked seasonal variation, ranging from a monthly minimum in August to a maximum in May (higher by a factor of about ten), when its discharge exceeds 60 percent of the total for the five rivers. The influx of freshwater not only alters the salinity pattern over a wide area, but also produces important dynamic effects and changes in the intensity of the southwestward flow along the New England coast as far as Cape Cod<sup>6</sup>.

### Section VII. Temperature, Salinity and Water Mass Relationships

52. A plot of temperature (T) against salinity (S) is referred to as a T-S diagram or relationship, and is used to identify various water masses [Figure 13]. The technique is used to illustrate and determine whether the water in any given area has been derived as a result of mixing of two or more "source" water masses; it also reveals the distinctiveness of the water in one area as compared with another. The Gulf Stream, slope water and shelf or coastal water, referred to in paragraphs 45 and 46, are recognized as the three principal water masses of the region [Figure 10]. Although temperature-salinity (T-S) analysis brings out an element of distinctiveness in Georges Bank water, it equally demonstrates its close similarity to Maine surface water and Scotian Shelf water. As Figure 13 shows, there is a very large overlap in the T-S envelopes. This is not surprising because these upper layer waters are all part of the southwestward-moving shelf water. The fact that there is considerable overlap in T-S characteristics with neighbouring waters is indicative of a continuum, in which the water of the continental shelf is progressively modified in its southward journey from the eastern Canadian Arctic to Cape Hatteras.

53. Salinity and temperature vary horizontally, vertically, and with time. For the Scotian Shelf-Gulf of Maine area, important variations occur from week to week, season to season, and year to year. Figure 15 shows the vertical structure and the seasonal change in temperature for selected banks and basins on the continental shelf from the Scotian Shelf to the New England Shelf southwest of Nantucket Shoals. The water column is stratified at all seasons except for shallow areas such as the central part of Georges Bank, Lurcher Shoal off southwest Nova Scotia, parts of the Bay of Fundy, and on Nantucket Shoals,

<sup>5</sup> These comparisons are made from more than 30 years of gauged records. The data on rivers discharging directly into the Gulf of Maine are taken from: United States Department of the Interior, Geological Survey Water Supply Papers Nos. 1301, 1721 and 1901; data for the Saint John River are taken from: Water Survey of Canada, Department of the Environment.

<sup>6</sup> D. F. Bumpus: "Sources of Water Contributed to the Bay of Fundy Surface Circulation." *Journal of the Fisheries Research Board of Canada*, Vol. 17, No. 2, 1960, pp. 181-197; and "A Description of the Circulation on the Continental Shelf of the East Coast of the United States", in B. A. Warmere, ed.: *Progress in Oceanography*. New York, Pergamon Press, 1973, pp. 111-157.

where the intense tidal currents produce vertically well-mixed water from top to bottom at all times of the year. As is evident from *Figure 15*, there is a close similarity in vertical temperature structure between Georges Bank and Browns Bank. For the banks as a whole, their temperature profiles from the surface to a depth of 100 metres correspond closely both in winter and summer.

54. The similarity and coherence between the water characteristics of Georges Bank and those of the shelf waters to the northeast also hold for temperature patterns of the sea surface, both in terms of seasonal variations and long-term annual means [*Figure 14*]. The seasonal patterns for the western Scotian Shelf, Browns Bank, the Gulf of Maine and Georges Bank areas closely resemble each other. The mean annual difference in sea surface temperature between Browns Bank and Georges Bank, as shown in *Figure 14*, is less than 1°C. However, there is a striking temperature difference between the water on the shelf and the offshore slope water, where the mean annual temperature differs significantly by more than 6°C. It is in an offshore direction that a major temperature differential exists, rather than between Georges Bank and waters to the north and northeast.

55. The mean annual temperature of the sea surface is not only comparable throughout the Gulf of Maine area, but also yearly changes are similar over a wide region of the east coast of North America<sup>7</sup>. Although these observed changes are based on surface temperatures, some subsurface temperatures in the Gulf of Maine suggest similar patterns. The existence of these large-scale, long-term patterns is further supported by correlations with the discharge from the St. Lawrence River system, and with the catches of about half of the important commercial fish species in the Gulf of Maine<sup>8</sup>. Thus, Georges Bank may best be viewed, not as a single, isolated system, but rather as a part of a much larger dynamic and interactive system.

### Section VIII. Tides and Tidal Currents

56. The rise and fall of the tide is produced by the passage of a single, very long-period wave past a given point. Seaward of the continental shelf, where the water is deep, the change in water level is slight, but closer to shore, where the water becomes shallower, the rise and fall of the tide become more marked. Passage of the tidal wave is also accompanied locally by a strong backward and forward movement of water known as the tidal current.

57. The nature of the tide throughout the Gulf of Maine area is that of a single-system response to the dominant North Atlantic tide. The tidal currents over Georges Bank are larger than those found on

<sup>7</sup> W. H. Sutcliffe, R. H. Loucks and K. F. Drinkwater: "Coastal Circulation and Physical Oceanography of the Scotian Shelf and the Gulf of Maine." *Journal of the Fisheries Research Board of Canada*, Vol. 33, 1976, pp. 98-115.

<sup>8</sup> W. H. Sutcliffe, K. F. Drinkwater and B. S. Muir: "Correlations of Fish Catch and Environmental Factors in the Gulf of Maine." *Journal of the Fisheries Research Board of Canada*, Vol. 34, 1977, pp. 19-30.

many other banks, owing not only to its topography but also to its being part of the Gulf of Maine-Bay of Fundy tidal system [Figure 16]. This region has a special shape that causes the tidal wave to "resonate" and thereby to become amplified. The natural resonant period of the Gulf of Maine area is about 13 hours, and the period of the dominant tidal wave is 12.4 hours. As a result of the similarity between these two periods, the Bay of Fundy has one of the highest tides in the world. The whole Bay of Fundy-Gulf of Maine-Georges Bank region forms a single tidal system. This has been shown by sea level analysis<sup>9</sup> and by predictive numerical models of how the region would respond to the building of a barrage across the mouth of the Minas Basin, in the upper Bay of Fundy<sup>10</sup>. It is predicted that such a barrage would increase the range of tides at Boston by 30 centimetres, and over Georges Bank by up to 5 centimetres.

58. Further evidence that the Bay of Fundy, Gulf of Maine and Georges Bank are part of the same tidal system has come from investigations concerning the recent sedimentological history of the area. Mathematical modelling of the tides under conditions of altered sea level and bathymetry indicates that the range of the tide in the entire area is very sensitive to changes in depth of water over Georges Bank<sup>11</sup>.

59. Tidal currents interact with seabed topography and with the coastline, and may set up a general motion of water in a persistent direction. This is called *tidal rectification and results in tidal residual currents*. The phenomenon is particularly noticeable around headlands, where the currents may be much stronger in one direction than the other, or where tidally generated eddies may develop. Based on a numerical model for the Georges Bank-Gulf of Maine-Bay of Fundy system, it appears that many of the persistent features of the observed mean flow are caused largely by the action of the tides [Figure 17]. The clockwise gyre on Georges Bank, including the jet along the northern flank, and the gyres on Nantucket Shoals and Browns Bank, all bear a striking similarity to the average circulation pattern [Figure 12].

60. Where strong tidal currents occur in relatively shallow water, bottom friction causes sufficient turbulence to mix the waters from top to bottom at all times of year. Complete vertical mixing has important biological consequences, and occurs separately on Georges Bank, the Lurcher Shoal off southern Nova Scotia, on Nantucket Shoals and in several parts of the Bay of Fundy. *Mathematical modelling studies*<sup>12</sup>, using data on tidal currents and depth of water as inputs, predict accurately the extent of vertically well-mixed waters in the Georges Bank-Gulf of Maine-Bay of Fundy area during summer months [Figure 18].

<sup>9</sup> C. Garrett: "Tidal Resonance in the Bay of Fundy and Gulf of Maine." *Nature*, Vol. 238, 1972, pp. 441-443.

<sup>10</sup> D. A. Greenberg: "A Numerical Model Investigation of Tidal Phenomena in the Bay of Fundy and Gulf of Maine." *Marine Geodesy*, Vol. 2, No. 2, 1979, pp. 161-187.

<sup>11</sup> D. Scott and D. Greenberg: "The Role of Sea Level Change and Tidal Amplification in the Bay of Fundy." (Submitted to *Journal of Earth Sciences*, 1982.)

<sup>12</sup> C. J. R. Garrett, J. R. Keeley and D. A. Greenberg: "Tidal Mixing Versus Thermal Stratification in the Bay of Fundy and Gulf of Maine." *Atmosphere-Ocean*, Vol. 16, No. 4, 1978, pp. 403-423.



The magnitude of the tidal currents, combined with bathymetric features, are therefore the principal parameters defining zones of vertically well-mixed water.

61. In summary, the Georges Bank-Gulf of Maine-Bay of Fundy region constitutes a single integrated tidal system. The tidal currents are the single most important factor controlling circulation and vertical structure on Georges Bank. This point is reinforced by mathematical modelling studies, which suggest that any change in the tidal régime in the upper Bay of Fundy, produced by the building of a barrage, would be reflected in changes in the extent of the zones of well-mixed water on Georges Bank and elsewhere. Conversely, changes in sea level over Georges Bank would produce changes in the tidal régime throughout the Gulf of Maine-Bay of Fundy area, which further emphasizes the fact that tidally the Bay of Fundy, Gulf of Maine and Georges Bank are intimately linked.

### Section IX. Fronts

62. An area where strong horizontal gradients exist in oceanographic characteristics such as temperature or salinity is commonly referred to as a "front". There are two types of fronts commonly present on or near Georges Bank. The most important of these occurs where two water masses in the ocean meet. The southward-moving shelf water is bounded on its seaward side by slope water which is warmer and saltier. The zone where they meet is referred to as the "Shelf-Slope Front". Its position is usually over the continental slope from Cape Hatteras to the Grand Banks, but its location at any given time varies, with onshore-offshore movement, by as much as 200 kilometres. Thus at times it may be positioned up on Georges Bank or Browns Bank, whereas at others it is located well offshore.

63. The second type of front is tidally generated and exists only seasonally. In theory a tidally generated front completely encompasses the shallower part of Georges Bank and is roughly coincident with the location of the 60-metre depth contour<sup>13</sup> [Figure 19]. Thus, only along the northern part of the Bank is the front situated near the Bank's edge. Elsewhere, to the extent that a tidal front can be identified, it is positioned well in from the edge of the Bank and well away from the Northeast Channel. Moreover, in this area the transition from mixed to stratified waters is such a gradual one that it is not normally referred to as a "front" at all.

### Section X. Properties of Self-Containedness Within an Overall Continuum Are Reflected in the Georges Bank Gyre

64. The clockwise surface circulation around Georges Bank is strongest in spring and summer and weakest in winter when it is

<sup>13</sup> J. B. Colton, R. R. Marak, S. E. Nickerson and R. R. Stoddard: *Physical, Chemical and Biological Observations on the Continental Shelf, Nova Scotia to Long Island, 1964-1966*. United States Department of the Interior, Fish and Wildlife Service Data Report, No. 23, 1968.

partially disrupted by offshore surface flow across the Bank [Figure 12]. Similarly, the subsurface flow is clockwise around the Bank, with a persistent northward re-circulation on the eastern side of the Great South Channel<sup>14</sup>. The time taken for water moving along the 60-metre depth contour to circulate around the Bank is estimated to be about two months.

65. The predictive model of the tidally driven residual current displays the major clockwise circulation feature [Figure 17]. This model also predicts clockwise residual circulations on Nantucket Shoals and on Browns Bank — features evident from field observations<sup>15</sup>.

66. The use of satellite-tracked, freely drifting floats confirms the general clockwise circulation on Georges Bank<sup>16</sup>. However, the gyre is not a perfect one, as illustrated through the data from the floats. Of a series of 16 drifting buoys, only one completed a full circuit of the gyre [Figure 20]. The buoys leaked out of the gyre in every direction. The mean "residence time" for buoys on the Bank was about seven weeks<sup>17</sup>, which compares favourably with residence times for drifting buoy experiments on other banks with similar gyres<sup>18</sup>.

67. A totally independent method of assessing the "self-containedness" of Georges Bank is based on calculations of the rate of lateral exchange between water circulating on the Bank and that lying further off. This exchange rate is calculated from temperature distributions across the Bank. If the Bank were a completely self-contained system, the water would heat up during summer at a rate related to the amount of insolation. In fact, it heats up at a much slower rate, which implies that heat is lost laterally off the Bank. However, the rate of lateral heat loss is too great to be explained by simple molecular diffusion, but results rather from the exchange of water between the Bank and the Gulf of Maine and from off the continental shelf. Most of the water over the Bank exchanges with the surrounding water in a time of one to two months<sup>19</sup>.

68. The exchange of water between the Georges Bank gyre and the surrounding area is enhanced by several factors. *First*, strong winds

<sup>14</sup> B. Butman, R. C. Beardsley, B. Magnell, D. Frye, J. A. Vermersch, R. Schlitz, R. Limeburner, W. R. Wright and M. A. Noble: "Recent Observations of the Mean Circulation on Georges Bank." *Journal of Physical Oceanography*, Vol. 12, No. 6, 1982, pp. 569-591.

<sup>15</sup> H. B. Bigelow: "Physical Oceanography of the Gulf of Maine." *Bulletin of the United States Bureau of Fisheries*, Vol. XL, Part II, 1924, pp. 511-1027; R. C. Beardsley and P. C. Smith: "The Mean, Seasonal and Subtidal Circulations in the Georges Bank and Gulf of Maine Region", pp. 9-16.

<sup>16</sup> B. Butman *et al.*: "Recent Observations of the Mean Circulation on Georges Bank", pp. 569-591.

<sup>17</sup> D. Frye: "Residence Time of Waters on Georges Bank." *Transactions of the American Geophysical Union*, Vol. 63, No. 3, Jan. 19, 1982, p. 92.

<sup>18</sup> R. W. Trites, D. J. Lawrence and C. K. Ross: "Special Session on Remote Sensing, September 1981." Dartmouth, Nova Scotia, *Northwest Atlantic Fisheries Organization, Scientific Council Studies*, No. 4, 1982, pp. 85-91.

<sup>19</sup> J. W. Loder, D. G. Wright, C. Garrett and B.-A. Juszko: "Horizontal Exchange on Central Georges Bank." *Canadian Journal of Fisheries and Aquatic Sciences*, Vol. 39, No. 8, 1982, pp. 1130-1137.

blowing from one direction for several days result in on-off bank movements and a net surface water movement over many tens of kilometres. An example of this dominance was observed in the drifts of oil-slicks from the break-up of the *Argo Merchant* on Nantucket Shoals in December 1976. *Secondly*, the warm-core Gulf Stream eddies may, from time to time, interact with Georges Bank, resulting in extraction of surface waters or penetration of warmer, higher-salinity water onto Georges Bank at depth.

69. In summary, the re-circulation associated with the Georges Bank gyre keeps water within the confines of the Bank longer than might otherwise be the case. The gyre, which is roughly coincident with the area where tidal mixing produces nearly homogeneous water vertically, combines with this distinctive water-mass feature to distinguish Georges Bank from the surrounding area. However, the residence time of water on Georges Bank varies greatly, influenced by mechanisms that make the gyre less than perfect in its completeness. These factors are explained in the following section.

#### **Section XI. The Impact of Variability and Exchange on So-Called "Perfect Pictures"**

70. Variability in the circulation pattern is well illustrated through the use of freely drifting floats (containing radio transmitters and tracked by satellite), already referred to in paragraph 66. In recent experiments, floats were released during the course of a 12-month period in the area of Georges Bank and Browns Bank and were tracked for several months [*Figure 20*]. The variability and geographic scale of the departures from the average pattern are striking. Floats moved off and onto Georges Bank in an eddying fashion; from Georges Bank to Browns Bank and vice versa; and at times were rapidly carried offshore under the influence of warm-core Gulf Stream eddies.

71. Maps of sea surface temperature, plotted at about two-week intervals, demonstrate both the rapid changes and the geographic scale of the variability [*Figure 21*]. The resulting temperature patterns reflect the integration of several processes acting together yet independently. For example, the cooler water present on Georges Bank and off southwest Nova Scotia on 16 July 1982 undoubtedly reflects intense vertical mixing induced by the tidal currents; inshore upwelling of cooler subsurface water appears to be a dominant feature along the Nova Scotia and Maine coasts on 2 August 1982; extraction of surface water from Georges Bank by a Gulf Stream meander and eddy, combined with coastal upwelling and tidal mixing all appear to be important in producing the temperature pattern seen on 1 September 1982. The 15 October 1982 map, which shows relatively uniform and cool shelf water bounded on its seaward side by warmer slope water, conforms closely to the schematic water-mass distribution that portrays long-term average conditions [*Figure 10*].

72. Of necessity, diagrams of circulations are idealized portrayals of an actual day-to-day pattern of circulation that varies considerably

and cannot readily be shown in all its complexity in such diagrams. Gales, local freshwater discharge (especially in the spring) and the unpredictable passage of large warm-core Gulf Stream eddies all contribute to local conditions that differ from the mean flow shown by idealized diagrams. Similarly, seasonal cycling of temperature and salinity may be modified by events occurring on a time scale of days to weeks and with a magnitude comparable to the seasonal changes.

## Section XII. Conclusion

73. Georges Bank is part of a physical oceanographic system that extends along the Atlantic coast of North America from northeast to southwest, although it exhibits particular affinities to the northeast. *First*, cold water currents from northern Canada and freshwater from the St. Lawrence River, the Saint John River and smaller rivers draining into the Gulf of Maine affect the temperature and salinity of its water. *Secondly*, tidal currents over Georges Bank are part of a single, integrated Gulf of Maine-Bay of Fundy tidal system that produces some of the strongest tidal currents and highest tides in the world. Nevertheless, the oceanographic system in the Gulf of Maine area is highly variable. Seasonal and even daily changes occur that affect the waters over Georges Bank. For example, a clockwise surface circulation gyre around Georges Bank is strongest in spring and summer and weakest in winter. Although the gyre is not completely self-contained, it is one feature that distinguishes Georges Bank from the surrounding waters. However, the physical oceanography of the Gulf of Maine area involves a continual and complex exchange of waters over Georges Bank with those of the surrounding area that defies rigid or simplistic portrayal.

## CHAPTER III

### MAJOR ELEMENTS OF THE BIOLOGICAL OCEANOGRAPHIC RÉGIME OF THE GULF OF MAINE AREA

#### Section I. Introduction

74. This chapter describes the plankton and benthos of the Gulf of Maine area and brings out the biological links between Georges Bank and contiguous areas. It will be seen that Georges Bank is part of an integrated biological régime — a single ocean system — that extends along the Atlantic coast of North America from northeast to southwest. Georges Bank has biological properties in common with other parts of the Gulf of Maine area and beyond. It exhibits biological affinities with Canadian coastal waters to the northeast, as indicated by the predominantly northern (boreal) orientation of zooplankton, phytoplankton and benthos found on the Bank. However, conclusions regarding the biological oceanographic régime of the Gulf of Maine area must to some extent be qualified, in view of the many variables involved and the inadequacies of sampling techniques.

#### Section II. Broad Features and Factors Controlling the Distribution of Marine Organisms in the Northwest Atlantic

75. Marine plants and animals have wide geographical distributions because their spores, eggs or larvae are distributed by currents. Many occur throughout whole ocean basins and some even globally wherever the environment provides suitable living conditions. For the same reason, the distributional boundaries of species are normally diffuse and can change over time as physical conditions in the oceans adjust to climatic changes in the atmosphere. No species, either plant or animal, is known to have a distribution restricted only to Georges Bank.

76. The oceanographic régime of the Gulf of Maine area is complicated and variable. The opposing currents (the Gulf Stream and the Labrador current) interact and affect the environment of the continental shelf. Only here, and in the case of the Oyashio-Kuroshio current system off Japan, do such cold and warm counter-flowing major currents come in direct contact with each other. Because of this complex interaction, the extent of plant and animal distributions in both regions is compressed and more difficult to analyze than in comparable latitudes on the eastern sides of the same oceans, where environmental changes are more gradual. Even where boundaries between populations can be identified, their locations shift seasonally and annually with changes in the physical environment.

77. On Georges Bank, and on most offshore banks, there are no large seaweeds (macroalgae) attached to the seabed. Plants are represented only by single-celled organisms (microalgae) which make up the phytoplankton (or floating plants). Several groups of microalgae comprise the phytoplankton, ranging in size from small net phytoplankton (about 0.02 to 0.1 millimetres) through nannoplankton (0.001 to

0.02 millimetres) to picoplankton (less than 0.001 millimetres). The most frequently studied groups are the diatoms and dinoflagellates at the larger end of this scale. Zooplankton are larger than phytoplankton, comprising groups of animals ranging from small (0.05 millimetres) to rather large (50 millimetres). The benthos includes not only the larger, more familiar marine animals from worms to large starfish, but also animals small enough to live in the spaces between sand grains.

78. In considering the regional distribution of planktonic organisms in detail, the significance of such information is heavily dependent on the adequacy of the experimental design of the sampling program used to gather the basic data. Both plant and animal plankton are always very unevenly distributed. Phytoplankton exist in patches estimated to range from 10 metres to 100 kilometres spatially and which may persist in time from 10 minutes to 3 weeks. Zooplankton are usually captured with nets made of fine nylon but, because of the enormous range of sizes already described, no single type of net can capture a representative sample of all species present. Even if the perfect sampler existed, the way it is used would also greatly influence the animals caught. Zooplankton are never distributed uniformly in the vertical plane. If, for example, three different water masses overlay one another in an area (e.g., Gulf of Maine in summer), at least three different zooplankton communities could be defined, depending on which of the three water masses was sampled. Zooplankton are also patchily distributed in the horizontal direction. The classic paper by Winsor and Clark<sup>1</sup> on sampling variability of zooplankton in the Georges Bank area showed that two horizontal plankton tows taken one after the other at the same site could differ by more than 100 percent in numbers of the various species caught. In practice, therefore, areas of the size of the Gulf of Maine area have seldom been sampled intensely enough to warrant more than highly tentative and selective conclusions based on broad generalizations.

### Section III. Plant Plankton on Georges Bank Represent the Boreal (Northern) Assemblage

79. The dominant species of phytoplankton found on Georges Bank are representative of the boreal (northern, but not arctic origin) assemblage<sup>2</sup>. Other species whose centres of distribution lie north or south of the Scotian Shelf-Georges Bank-Gulf of Maine area occur seasonally throughout this region, or as sporadic immigrants associated with anomalous influxes of offshore oceanic water. An example of boreal phytoplankton is *Ceratium* (a genus of microalga common on Georges Bank), which occurs throughout the North Atlantic from the Gulf of Maine area to the northeast, as well as over the whole continental shelf of northwest Europe. Although there are several hundred phytoplanktonic species recorded in the Georges Bank area, the bulk of the biomass

<sup>1</sup> C. P. Winsor and G. L. Clarke: "A Statistical Study of Variation in the Catch of Plankton Nets." *Journal of Marine Research*, Vol. 3, No. 1, 1940, pp. 1-34.

<sup>2</sup> See Table 2.

is made up of less than 30 northern species, none of which displays definable regional differences within the Scotian Shelf-Gulf of Maine area [Table 2].

80. The geographic distribution of phytoplankton has been reported recently by O'Reilly and Evans-Zetlin<sup>3</sup> for the continental shelf and slope area northward from Long Island, including Georges Bank and the Gulf of Maine. The ratio of nanoplankton to net plankton varies seasonally. Nanoplankton dominate the entire Gulf of Maine area during the warmer half of the year. During the cool months of the year, the net plankton generally dominate areas such as Georges Bank, off Yarmouth, inshore in the Gulf of Maine and off Long Island. Although the data were highly variable, and sampling was inadequate in many areas, the data suggest that the relative abundances of net plankton to nanoplankton are associated with local oceanographic features and processes (such as upwelling, depth of water column and vertical mixing) and season of the year, rather than with any geographic trend from northeast to southwest. Hence, Georges Bank cannot be isolated from areas to the northeast on the basis of relative abundance of nanoplankton to net plankton.

#### Section IV. Zooplankton on Georges Bank Also Show a Northern Orientation

81. The dominant zooplankton species occurring over Georges Bank are, as with phytoplankton, also members of the boreal assemblage<sup>4</sup> [Figures 22, 23 and 24]. Some of the important Georges Bank copepods (e.g., *Calanus finmarchicus*, *Metridia lucens*, *Temora longicornis* and *Pseudocalanus*) also have transatlantic distributions. Thus the dominant animal plankton species present in the Gulf of Maine area are those with a northern orientation and a wide distribution in the cooler waters of the Atlantic.

82. The northern zooplankton are transported from northeast to southwest along the Atlantic coast by the prevailing continental shelf currents (the Labrador and Nova Scotia currents), becoming expatriate southwest of Georges Bank. Thus, Arctic species such as *Metridia longa*, *Limacina helicina* and *Calanus glacialis* extend from the Canadian coastal waters as far south as Georges Bank [Figure 22]. These species do not reproduce southwest of the Great South Channel. Some large Arctic species such as *Calanus hyperboreus* may sink along with their water mass and be carried southward along the continental slope until they migrate or are transported vertically through upwelling, onto the shelf and into the Gulf of Maine [Figure 23]. Forms preferring more temperate water, such as *Paracalanus parvus* and *Centropages typicus*,

<sup>3</sup> J. E. O'Reilly and C. Evans-Zetlin: *A Comparison of the Abundance (Chlorophyll a) and Size Composition of the Phytoplankton Communities in 20 Subareas of Georges Bank and Surrounding Water*. International Council for the Exploration of the Sea. ICES C.M. 1982/L, 1982, p. 49.

<sup>4</sup> See Table 3.

TABLE 2

**Phytoplanktonic Species Comprising the Bulk of the Biomass in the  
Georges Bank Area**

Genus	Family	Species
<u>DIATOMS</u>	Centric	<i>Thalassiosira nordenskioldii</i> <i>T. gravida</i> <i>Skeletonema costatum</i> <i>Schroderella declicatula</i> <i>Leptocylindrus dancium</i> <i>Lauderia borealis</i> <i>Chaetoceros debilis</i> <i>C. affine</i> <i>C. atlanticus</i> <i>C. decipiens</i> <i>C. sociale</i> <i>C. lascinosum</i> <i>Rhizosolenia alata</i> <i>R. hebetata</i> <i>R. setigera</i> <i>Gunardia flaccida</i>
		Pennales
<u>DINOFLAGELLATES</u>		<i>Gymnodinium sp.</i> <i>Ceratium longipes</i> <i>C. tripos</i> <i>C. fusus</i> <i>Dinophysis norwegica</i> <i>Prorocentrum micans</i>
<u>SILICOFLAGELLATES</u>		<i>Distephanus speculum</i>



have centres of propagation south and west of Georges Bank [Figure 22]. They only become important constituents of the fauna on Georges Bank and further to the northeast as the water warms up in summer.

83. Although the circulation pattern, together with seasonal heating and cooling, are the key physical factors determining the distribution of zooplankton, other oceanic processes may produce significant short-term changes in the species composition within a given area. For example, warm-core Gulf Stream eddies may, from time to time, introduce offshore or subtropical species onto Georges Bank or virtually anywhere else along the regional continental shelf.

84. Variability in the physical environment obscures sharp geographic distributional limits for zooplankton. Nevertheless, the Cape Cod-Nantucket Shoals area is an important transition zone<sup>5</sup>. During the cooler months this zone delineates the southern limit of distribution for many species of northern origin, whereas during the warmer months it marks the northern limits for many species of southern origin. This is particularly marked for the inshore, shallow water, estuarine species [Figure 24] but is seen as well in the distribution of shelf and coastal species [Figure 22].

85. Information on numerical abundance and percentage composition of seven dominant zooplankton species from three locations (northeastern Georges Bank and two on the Scotian Shelf) has been assembled on a seasonal basis in Table 3. During most of the year these seven species make up more than 80 percent of the total zooplankton biomass in each of the three areas. Only during spring, when the shallower waters of Georges Bank contain large numbers of larval bottom invertebrates, do the three sampling areas show any noticeable difference<sup>6</sup>.

#### Section V. Benthic Animals on Georges Bank Are Dominated by Northern Species

86. Benthic animals are less mobile than plankton. They are dispersed only in the larval stages when they enter the planktonic environment in the water column. Normally, their life spent amongst the plankton is less than one month, although very long larval life has been observed in some benthic species, enabling them to be very widely

<sup>5</sup> P. B. Haydon and R. Dolan: "Coastal Marine Fauna and Marine Climates of the Americas." *Journal of Biogeography*, Vol. 3, 1976, pp. 71-81; J. B. Colton, W. G. Smith, A. W. Kendall, P. L. Berrien and M. P. Fahay: "Principal Spawning Areas and Times of Marine Fishes, Cape Sable to Cape Hatteras." *Fishery Bulletin*, Vol. 76, 1976, pp. 911-915.

<sup>6</sup> *Pseudocalanus* complex (two species) of northern origin show the least seasonal and regional variance over the shallow parts of the continental shelf, during the cooler months, at least to the Mid-Atlantic Bight region south of New York. Another northern form, *Calanus finmarchicus*, is common on the banks in spring and summer but in autumn retreats to deep water to overwinter. On a seasonal basis, the species, *Centropages typicus*, becomes important in the shallow water of Georges Bank early in the year, but eventually dominates at all locations in the late summer-early autumn period when the waters on the shelf are warmest.

TABLE 3

Comparison of abundance and percent of the dominant species of the total zooplankton captured by a 333 micrometre mesh size net at four seasons of the year on Georges Bank, southwestern Scotian Shelf (Browns Bank), and the Emerald-Western Bank area of the Scotian Shelf, 1978-1980. (Data from Scotian Shelf ichthyoplankton cruises are on file at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia.)

Season and Number of Cruises	Species	Northeast Georges Bank		Browns Bank		Emerald-Western Bank	
		Weighted Mean No. 2/m <sup>3</sup>	% of Total Number	Weighted Mean No. 2/m <sup>3</sup>	% of Total Number	Weighted Mean No. 2/m <sup>3</sup>	% of Total Number
WINTER 1	<i>Calanus finmarchicus</i>	26	31.0	50	30.6	22	35.4
	<i>Centropages sp.</i>	1	1.2	1	0.9	4	6.7
	<i>Metridia lucens</i>	29	33.9	36	34.3	21	34.1
	<i>Pseudocalanus sp.</i>	10	11.3	35	21.6	11	17.9
	<i>Paracalanus-Clausocalanus</i>	<1	<0.1	<1	0.2	<1	<0.1
	<i>Sagitta elegans</i>	17	20.1	<1	0.2	<1	<0.1
TOTALS	<i>Limnocalanus macrurus</i>	<1	1.0	7	4.2	2	3.9
	<i>Limnocalanus macrurus</i>	85	98.5	165	92.0	61	98.0
SPRING 3	<i>Calanus finmarchicus</i>	172	43.2	498	61.1	995	74.9
	<i>Centropages sp.</i>	5	1.2	3	0.4	<1	<0.1
	<i>Metridia lucens</i>	12	3.1	37	4.5	66	5.2
	<i>Pseudocalanus sp.</i>	67	16.7	132	16.2	130	9.7
	<i>Paracalanus-Clausocalanus</i>	<1	<0.1	2	0.3	2	0.1
	<i>Sagitta elegans</i>	13	3.2	1	0.1	1	0.1
TOTALS	<i>Limnocalanus macrurus</i>	9	2.4	<1	<0.1	14	1.0
	<i>Limnocalanus macrurus</i>	398	69.8	815	82.6	1346	91.0
SUMMER 2	<i>Calanus finmarchicus</i>	80	7.4	600	66.8	363	56.2
	<i>Centropages sp.</i>	601	55.5	16	1.8	171	26.6
	<i>Metridia lucens</i>	4	0.4	32	3.6	21	3.2
	<i>Pseudocalanus sp.</i>	140	12.9	116	13.0	32	5.0
	<i>Paracalanus-Clausocalanus</i>	24	2.2	5	0.5	<1	<0.1
	<i>Sagitta elegans</i>	47	4.3	1	0.1	3	0.5
TOTALS	<i>Limnocalanus macrurus</i>	<1	<0.1	1	0.1	1	0.2
	<i>Limnocalanus macrurus</i>	1083	82.7	898	85.9	644	91.7
AUTUMN 2	<i>Calanus finmarchicus</i>	<1	<0.1	33	6.6	27	4.4
	<i>Centropages sp.</i>	220	60.0	196	39.1	327	53.5
	<i>Metridia lucens</i>	5	1.4	109	21.8	71	11.6
	<i>Pseudocalanus sp.</i>	26	7.1	98	19.5	53	8.6
	<i>Paracalanus-Clausocalanus</i>	18	5.0	41	8.1	36	5.9
	<i>Sagitta elegans</i>	48	13.0	3	0.6	2	0.3
TOTALS	<i>Limnocalanus macrurus</i>	3	0.7	3	0.7	73	12.0
	<i>Limnocalanus macrurus</i>	367	87.2	501	96.4	611	96.3

distributed and in some cases, even trans-oceanic. On the whole, however, distributions of benthic species have more rigid boundaries than plankton in both the vertical and horizontal planes. Recognizable boundaries depend on three principal factors, namely, bottom sediment type and texture, quality of the water at the bottom (e.g., temperature, salinity, illumination, current speed) and available food supplies. Of these factors, sediment texture is of paramount importance in determining the species of benthos found in any area.

87. The existing distribution of surface sediment in the Georges Bank-Gulf of Maine-Scotian Shelf area results from a combination of complex factors and processes. However, the present sediment composition and distributional pattern largely reflects the original distribution of material at the end of the last ice age, modified first by the effects of rising sea level and subsequently through the action of currents. Surficial bottom sediments, analysed on the basis of the percentages of coarse material (gravel) and of fine material (mud), show similarities between sediment texture and bottom currents. Generally, where currents are strongest the sediments are coarser, and where the currents are weakest the sediments are finer.

88. Maps of surficial sediment distribution for gravel, sand and mud, already described in paragraphs 22 to 25 [Figures 5, 6 and 7], show patterns similar to those for strength of tidal current. These patterns of surface sediments are largely continuous from northeast to southwest. Gravel concentrations coincident with high current speed, extend from the eastern part of Georges Bank, through the Northeast Channel on to Browns Bank and north along the Nova Scotia coast into the Bay of Fundy. In these areas, similar kinds and abundances of benthos are associated with similar coarse sand and gravel substrates<sup>7</sup>. For example, dense beds of horse mussels (*Modiolus modiolus*) with the same community composition and biomass can be found in the Bay of Fundy and on Georges Bank where a similar combination of currents and sediments exists<sup>8</sup>. Twenty-four of the 26 genera reported as commonly present in this community on Georges Bank also occur on similar deposits in the Bay of Fundy. A further important example of commercial significance is the sea scallop (*Placopecten magallanicus*), whose concentrations extend from Georges Bank, along the Nova Scotia coast and, following the pattern of coarse sedimentation, into the Bay of Fundy. Correspondingly, macrobenthos are less abundant on both sandy and silty substrates. In parts of the Bay of Fundy, the scarcity of benthos in conditions of sand and silt parallels the situation on Georges Bank. In short, similar species occur on similar deposits and under similar current régimes.

89. This same analysis can be applied to the continental shelf off Nova Scotia and New England, where the distribution of surficial

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<sup>7</sup> R. L. Wigley: "Benthic Fauna of Georges Bank", in *26th North American Wildlife and Natural Resources Conference*, Washington, 1961, pp. 310-317.

<sup>8</sup> D. Peer, D. J. Wildish, A. J. Wilson, J. Hines and M. Dadswell: *Sublittoral Macro-Infauna of the Lower Bay of Fundy*. Canadian Technical Report of Fisheries and Aquatic Sciences, No. 981, 1980.

sediment is known. Gravels resembling those on Georges Bank and dating from the most recent period of glaciation extend across the Northeast Channel along the Scotian Shelf [Figure 7]. These deposits also resemble each other in their organic material contents, and the available evidence suggests that they form a single faunistic unit.

90. Seventy-nine different taxa of benthic invertebrates are listed as common on the banks of the Gulf of Maine area, including Georges Bank and Browns Bank and several smaller banks within the Gulf. The majority of these invertebrates are northern species whose range extends from Labrador to the area southwest of Georges Bank [Figures 25, 26, 27 and 28].

83 84  
85 86

91. These figures show that the inshore area southwest of Cape Cod is a boundary zone between two faunal provinces, the Nova Scotian province to the north and the Virginian province to the south<sup>10</sup>. Georges Bank has a faunal association of species with affinities predominantly to the Nova Scotian province. Those species, whose ranges extend along the coast in a northeasterly direction from Georges Bank, outnumber by about four to one those whose ranges extend in a southwesterly direction from the Bank. Although some of the species of southern origin range northeastward beyond Cape Cod and are found in parts of the Bay of Fundy and even the southern Gulf of St. Lawrence, these species are not distributed continuously but are found only in isolated pockets and in shallow water where bottom summer temperatures exceed 15°C. Likewise, at their southern limit, the species of northern origin tend not to be found in the warmer surface water but rather are confined to the deeper cooler water.

92. The macrobenthos of Georges Bank and the Scotian Shelf banks also has a high degree of species integration within the Gulf of Maine area, which further emphasizes the point that the entire region has a primarily northern orientation [Figures 29 and 30]. The ranges of some of the northern species extend southward to Cape Hatteras, following the southward-moving, cooler, lower-salinity shelf water. However, the southern limit of range for many of the species occurs southwest of Georges Bank in the Cape Cod-Nantucket Shoals-Great South Channel transition zone.

87 88

## Section VI. Factors Affecting the Rate of Growth of Biomass on Georges Bank

93. The general level of productivity in any location at sea depends principally on the level of plant material (microalgae) produced as food for the zooplankton and benthos that are themselves food for

<sup>9</sup> R. L. Wigley: "Benthic Invertebrates of the New England Fishing Banks." *Underwater Naturalist*, Vol. 5, No. 1, 1968, pp. 8-13.

<sup>10</sup> *Final Supplement to Environmental Statement. Proposed 1979 Outer Continental Shelf Oil and Gas Lease Offshore the North Atlantic States.* (OCS Sale No. 42.) Bureau of Land Management, United States Department of the Interior. Washington, U.S. Government Printing Office, 1979, p. 113.

commercial fish. Production of microalgae depends on a sufficient supply of inorganic nutrients for the plants and a sufficient level of sunlight penetrating the water. Plant nutrients can be supplied by upward movement of deep water (upwelling), by diffusion upwards from deep water, by mixing of the water column (winter storms or strong tidal currents), by lateral transport from regions where nutrient levels are higher, and by the decomposition of organic material (regeneration).

94. The seasonal cycle of phytoplanktonic production on Georges Bank is similar to that in other tidally mixed areas or areas where there is continuous lateral or vertical input of nutrients, such as on Lurcher Shoal off southwest Nova Scotia. In such areas the phytoplanktonic biomass increases rapidly in the early spring and remains at relatively high levels throughout much of the summer and into the autumn. On the other hand, in the central Gulf of Maine and on the open Scotian Shelf where the water is vertically stratified, production is generally concentrated within a few weeks in spring and, to a lesser extent, in autumn. Thus, it is the combination of tidal mixing with continuous input of nutrients from deeper waters off Georges Bank that causes the relatively high level of production of plant material that characterizes the Bank and that is the basis of its rich fisheries.

95. Measurements of phytoplanktonic biomass indicate that the spring bloom (March) in the vertically well-mixed central part of Georges Bank reaches concentrations well above those of the surrounding waters [Table 4]. At other seasons, concentrations on the southwestern Scotian Shelf, northeast Georges Bank, central Georges Bank and inshore Long Island are all at comparatively similar levels. The concentration of phytoplanktonic pigment can also be computed using remote sensing imagery from the Coastal Zone Color Scanner (CZCS) carried aboard the Nimbus-7 satellite<sup>11</sup>. Although this technique provides an instantaneous "snapshot" of the entire area, it is as yet an imprecise tool for determining phytoplanktonic concentration in many coastal areas, particularly where there is much suspended sediment or other organic matter<sup>12</sup>.

96. Production rates of phytoplankton, zooplankton, benthos and fish are difficult to determine over broad areas because of the high degree of variability in space and time, and all estimates should be regarded as tentative. However, computations of annual production of phytoplankton and fish do exist for Georges Bank and areas both north-eastward and southwestward from the Bank<sup>13</sup>. The annual primary productions on the central Scotian Shelf, Gulf of Maine, East Coast Shelf

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<sup>11</sup> H. R. Gordon, D. K. Clark, J. L. Muller and W. A. Hovis: "Phytoplankton Pigments from the Nimbus-7 Coastal Zone Color Scanner: Comparisons with Surface Measurements." *Science*, Vol. 210, 1980, pp. 63-66.

<sup>12</sup> B. J. Topliss: "Water Color in Eastern Canadian Inshore Areas", in *Special Session on Remote Sensing*, Sep. 1981. Northwest Atlantic Fisheries Organization, Scientific Council Studies, No. 4, 1982, pp. 63-67.

<sup>13</sup> E. L. Mills: "The Structure and Dynamics of Shelf and Slope Ecosystems off the North East Coast of North America", in K. R. Tenore and B. C. Coull, eds.: *Marine Benthic Dynamics*. Columbia, University of South Carolina Press, 1980, pp. 25-47.

**TABLE 4**  
**Distribution of Chlorophyll *a* as a Measure of Phytoplankton Biomass<sup>3</sup>**

Season	Inshore Long Island	Emerald Bank <sup>1</sup>	South-western Scotian Shelf <sup>1</sup>	Northeast Georges Bank <sup>1</sup>	Northeast Georges Bank <sup>2</sup>	Central Georges Bank <sup>2</sup>
Winter (Jan-Mar)	2.8	0.4	0.3	0.7	2.0	5.2
Spring (April-June)	1.1	0.9	1.8	1.3	2.2	1.7
Summer (July-Sept)	1.1	0.4	0.9	0.6	1.4	1.7
Autumn	1.9	1.3	1.7	1.6	0.8	2.4

<sup>1</sup> Data from Scotian Shelf ichthyoplankton cruises on file at the Bedford Institute of Oceanography, Dartmouth, N.S.

<sup>2</sup> Data taken from J. E. O'Reilly and C. Evans-Zetlin (see footnote 3).

<sup>3</sup> Values are in micrograms per litre of water.

and Mid-Atlantic Bight are all comparable, whereas that for Georges Bank stands at a higher level. The high phytoplankton production on Georges Bank is consistent with high chlorophyll biomass, and this relationship also applies to neighbouring areas [Table 4].

#### Section VII. Oil in the Marine Environment: The Risk to the Nova Scotia Coast

97. Since the grounding of the tanker *Torrey Canyon* in 1967 off the southwest coast of Great Britain, the fate of oil spilled into the sea has been studied intensely. With the development of facilities for offshore oil production and transportation has come a growing concern to assess potential adverse effects on aquatic resources, fishing operations and other coastal amenities<sup>14</sup>. Although there is not yet full agreement

<sup>14</sup> J. H. Vandermeulen, D. E. Buckley, E. M. Levy, B. Long, P. McLaren and P. G. Wells: "Immediate Impact of *AMOCO CADIZ* Environmental Oiling: Oil Behaviour and Burial, and Biological Aspects", in *Publications C.N.E.X.O. Série Actes de Colloques*, n° 6, 1978, pp. 159-174; A. L. Longhurst: *Consultation on the Consequences of Offshore Oil Production on Offshore Fish Stocks and Fishing Operations*. Canadian Technical Report of Fisheries and Aquatic Sciences, No. 1096, 1982; J. H. Vandermeulen, ed.: *Scientific Studies During the Kurdistan Tanker Incident: Proceedings of a Workshop*. Dartmouth, Nova Scotia, Bedford Institute of Oceanography Report Series BI-R-80-3, 1980; *Summary of Physical, Biological, Socio-economic and Other Factors Relevant to Potential of Oil Spills in the Passamaquoddy Region of the Bay of Fundy*. Canadian Technical Report of Fisheries and Marine Service, No. 428. Ottawa, Department of the Environment, 1974; D. J. Scarratt, ed.: *Evaluation of Recent Data Relative to Potential Oil Spills in the Passamaquoddy Area*. Technical Report of Fisheries and Marine Services, No. 901. Ottawa, Department of Fisheries and Environment, 1979.

on the extent of the potential effects on offshore fishery resources and operations, the detrimental effects along coastlines and in the nearshore zone are well documented<sup>15</sup>.

98. Oil, when released into the ocean, is highly mobile, and is carried away from its release site by the combined action of wind, current and turbulence. Most crude oils and petroleum products are lighter than sea water, so their bulk remains at or near the sea surface. A small fraction enters the water column and some may eventually reach the bottom and be trapped in the surficial sediments. Oil reaching the coastline adheres to rocks and sediments and, in sheltered areas, can be trapped and remain there without decomposing for many years<sup>16</sup>.

99. The drift of oil can differ strikingly from the mean surface circulation pattern. The direct effect of wind on the oil, combined with the variability in both wind and ocean currents, is of paramount importance in predicting the movement and spread of oil away from a release site. In open water, such as the North Sea, or over the Scotian Shelf or Georges Bank, oil from a point source spreads out (either as sheen-slicks, patches, lumps or particles) and can encompass an area in the order of 1,000 square nautical miles within one week<sup>17</sup>. Models of oil spill trajectories have been used to predict the potential results should spills occur within the areas of the Outer Continental Shelf (OCS) oil and gas lease sales No. 42 and 52 in the offshore area of the northeastern United States<sup>18</sup>. These results show not only that there is a relatively high probability of oil being transported across much of Georges Bank, but also that the coastlines of southwest Nova Scotia, Bay of Fundy, eastern Maine and southern New England could be polluted from an offshore spill. In terms of threatened coastlines from a hypothetical spill within the area of OCS lease sale No. 42, southwest Nova Scotia and southern New England rank highest.

100. The impact from oil in the marine environment has been of major concern to Canada, with the result that a wide range of programs and activities has been developed over the past 15 years both in terms of

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<sup>15</sup> J. H. Vandermeulen: "Some Conclusions Regarding Long-term Biological Effects of Some Major Oil Spills", in *Philosophical Transactions Royal Society of London, Series B* 297, 1982, pp. 335-351.

<sup>16</sup> J. H. Vandermeulen: "Some Conclusions Regarding Long-Term Biological Effects of Some Major Oil Spills", pp. 335-351.

<sup>17</sup> T. Audunson: "The Fate and Weathering of Surface Oil from the Bravo Blowout." *Marine Environmental Research*, Vol. 3, 1980, pp. 35-61. J. H. Vandermeulen, ed.: *Scientific Studies During the Kurdistan Tanker Incident: Proceedings of a Workshop*.

<sup>18</sup> *Final Environmental Statement. Proposed 1977 Outer Continental Shelf Oil and Gas Lease Sale Offshore the North Atlantic States*, Vol. 2. (OCS Sale No. 42.) United States Department of the Interior, Bureau of Land Management. Washington, U.S. Government Printing Office, 1977, pp. 733-750; *Assessing the Impact of Oil Spills on a Commercial Fishery. Final Interim Report for United States Department of the Interior, Bureau of Land Management, New York Outer Continental Shelf Office*. Department of Ocean Engineering and Graduate School of Oceanography, University of Rhode Island and Applied Science Associates, Inc.; *Final Environment Impact Statement. Proposed 1982 Outer Continental Shelf Oil and Gas Lease Sale Offshore the North Atlantic States*. (OCS Sale No. 52.) United States Department of the Interior, Bureau of Land Management. Washington, U.S. Government Printing Office, 1982.

operational readiness in the event of an accidental spill, as well as on a broad front of scientific investigations. Special teams are assembled to study the environmental impact and to develop new knowledge, not only when accidents occur in Canada<sup>19</sup> (e.g., *Arrow*, Chedabucto Bay, 1970; *Kurdistan*, Cabot Strait, 1979) but also when they occur in other countries<sup>20</sup> (e.g., *Urquiola*, Spain, 1976; *Amoco Cadiz*, France, 1978; *Ixtoc I* Blowout, Mexico, 1979).

101. Assessment of potential impact from future offshore oil production, new proposed transportation routes and shore facilities have been approached on two fronts: *first*, on a site-specific basis<sup>21</sup> (e.g., Beaufort Sea, Grand Banks, Sable Island and the proposed oil refinery at Eastport, Maine); and *secondly*, on a fundamental or generic basis providing a sharp, integrated focus on both national and world oil pollution problems<sup>22</sup> (e.g., research and evaluation regarding the effects of offshore oil production on offshore fish stocks and fishing operations, convening symposia on the recovery potential of oiled northern environments, development of oil spill trajectory modelling, etc.).

102. In summary, Canadian research and experience with respect to oil pollution has been extensive. The ability to reliably predict subsequent movement and dispersion of oil from any given spill site is limited by the accuracy with which winds and currents can be forecast — a science that still remains very imprecise. With respect to the Gulf of Maine area, the variability in wind and currents is such that an oil spill anywhere within the area poses a threat of subsequent oiling to any strip of coastline between Nova Scotia and southern New England.

<sup>19</sup> *Report of the Task Force — Operation Oil to the Minister of Transport (The Arrow Incident). Vol. II, Report of the Scientific Coordination Team.* Information Canada, Ottawa, 1970, Cat. No. T22-2470/2; J. H. Vandermeulen, ed.: *Scientific Studies During the Kurdistan Tanker Incident: Proceedings of a Workshop.*

<sup>20</sup> S. L. Ross, C. W. Ross, F. Lepine and E. K. Langtry: "IXTOC 1 Oil Blowout", in *Oil Spill Technology Newsletter*, Vol. 4. Ottawa, Department of the Environment, 1979, pp. 245-256; B. F. Long, J. H. Vandermeulen and D. E. Buckley: "Les processus de la migration du pétrole échoué dans les estrans sableux: contamination des nappes phréatiques", in *Amoco Cadiz: Fates and Effects of the Oil Spill*, Proceedings of an International Symposium, Nov. 19-22, 1979. Centre océanologique de Bretagne, Brest (France). Centre national pour l'exploitation des océans (CNEXO), 1981, pp. 79-94; J. H. Vandermeulen, et al.: "Immediate Impact of AMOCO CADIZ Environmental Oiling: Oil Behaviour and Burial, and Biological Aspects."

<sup>21</sup> A. R. Milne and R. H. Herlinveaux: *Crude Oil In Cold Water (The Beaufort Sea and the Search for Oil)*. Sidney, British Columbia, Institute of Ocean Sciences, Department of Fisheries and Oceans, 1979; *Summary of Physical, Biological, Socio-economic and Other Factors Relevant to Potential of Oil Spills in the Passamaquoddy Region of the Bay of Fundy*; D. J. Scarratt, ed.: "Evaluation of Recent Data Relative to Potential Oil Spills in the Passamaquoddy Area."

<sup>22</sup> J. H. Vandermeulen: "Introduction to the Symposium on Recovery Potential of Oiled Marine Northern Environments." *Journal of the Fisheries Research Board of Canada*, Vol. 35, No. 5, 1978, pp. 505-508; J. B. Sprague, J. H. Vandermeulen and P. G. Wells, eds.: *Oil and Dispersants in Canadian Seas — Research Appraisal and Recommendations.* Economic and Technical Review Report EPS 3-EC-82-2, Environmental Impact Control Directorate, Department of the Environment. Ottawa, 1982; A. L. Longhurst: *Consultation on the Consequences of Offshore Oil Production on Offshore Fish Stocks and Fishing Operations.* Canadian Technical Report of Fisheries and Aquatic Sciences No. 1096. Ottawa, Department of Fisheries and Oceans, 1982.



### Section VIII. Conclusion

103. As is the case with physical oceanography, Georges Bank is part of a biological oceanographic system that extends along the Atlantic coast of North America from northeast to southwest. The zooplankton, phytoplankton and benthos found on the Bank are predominantly northern species. Hence, Georges Bank cannot be isolated from areas to the northeast on the basis of species distributions. Indeed, a species transition zone between the Nova Scotian and Virginian biogeographic provinces is found southwest of Cape Cod; Georges Bank is entirely to the north of this transition zone. Although the biological oceanographic system of the Gulf of Maine area is highly variable, the production rate for phytoplankton, zooplankton, benthos and fish is higher for Georges Bank than for areas both southwestward and northeastward from the Bank. Finally, models of oil spill trajectories indicate that the southwest coast of Nova Scotia would be particularly threatened by oil pollution on Georges Bank.

## CHAPTER IV

### DISTRIBUTIONS OF COMMERCIAL FISH AND INVERTEBRATE SPECIES IN THE GULF OF MAINE AREA

#### Section I. Introduction

104. Georges Bank, as already noted, has elements of discreteness but it is also clearly an integral part of a larger system with important physical and biological affinities to areas to the northeast. The fisheries biology of the Gulf of Maine area fully supports this conclusion.

105. This chapter considers available information on the distributions, migrations and stock structures of commercially important invertebrate and fish resources in the Gulf of Maine area. The conclusions reached are as follows:

- (a) Fish and invertebrate distributions do not reflect the existence of separate and identifiable "ecological régimes" in the Gulf of Maine area. There are far more instances of fish migrating freely between, and through, so-called "régimes" than of fish being contained within any one of them. Migration and distribution patterns demonstrate the unity of the fish and invertebrate species of the Gulf of Maine with those of the Scotian Shelf to the northeast. This continuity is in contrast to an evident discontinuity to the southwest of Georges Bank, in the vicinity of the Great South Channel, Cape Cod and Nantucket Shoals.
- (b) The list of 16 species mentioned in the United States Memorial is incomplete<sup>1</sup>. There are at least 12 other species of an economic importance comparable to those in the United States list. Thus, a total of 28 species of commercial importance must be considered. Stocks of fully one-half (14) of this total of 28 species span the Northeast Channel. For 12 other species, the Northeast Channel and the so-called "ecological régimes" described in the United States Memorial are not defining features for the respective stock structures. For the two remaining species, mixing between stock areas is minimal.
- (c) The overall groundfish biomass distribution does not suggest or reflect the existence of so-called "ecological régimes", nor does it reveal the Northeast Channel or the line of deepest water in the inner Gulf of Maine Basin as a distributional barrier.

#### Section II. Limits of Distributions of Fish and Invertebrate Species

##### A. BIOGEOGRAPHIC PROVINCES

106. A recent paper by two United States scientists summarizes available knowledge, dating back to the 1830s, on faunal distributions in the coastal waters of eastern North America:

<sup>1</sup> *United States Memorial*, p. 37, Figure 7.

"... along the east coast of the United States and Canada, faunal distribution has been well documented. Five major provinces are generally accepted: The Arctic, Nova Scotian, Virginian, Carolinian, the Caribbean, with separating boundaries at 47°, 41°, 35°, and 30° north latitude respectively<sup>2</sup> . . ."

According to these authors, the dividing line between the Nova Scotian and Virginian provinces is the northern tip of Long Island and the line between the Nova Scotian and Arctic provinces is the southern tip of Newfoundland. Thus, for a century and a half the coastal region spanning Georges Bank and the Scotian Shelf has been accepted as being part of a single biogeographic province.

107. The definition of biogeographic provinces has been based on the distribution of nearshore species. Recent analyses of the composition of continental shelf fish distributions off the east coast of North America by Canadian and United States scientists identify the same transition at the Cape Cod-Nantucket Shoals-Great South Channel area<sup>3</sup>. United States scientists analysed data from research vessel surveys and identified the following areas shown in *Figure 31*:

(a) *The Gulf of Maine*:

"... the oceanic bight bounded by Nantucket Shoals and Cape Cod on the west (longitude 70°W) and Cape Sable on the east (longitude 65°W) including Georges and Browns Banks and water out to the 200-metre contour . . ."

(b) *The Mid-Atlantic Bight*:

"... the area inshore of the continental slope bounded by Cape Cod-Nantucket Shoals to the east (longitude 70°W) and Cape Hatteras to the south (latitude 35°N)."

The authors concluded that:

"The offing of Cape Cod . . . appears to be a definite transition zone (probably thermal) for some northern and southern species of fish and invertebrates, both pelagic and benthic (Colton 1964). The species compositions and abundance of fishes vary markedly between the two regions, with boreal, non-migratory species dominating the Gulf of Maine and warmer water migratory species prevailing in the Middle Atlantic Bight. The bulk or total spawning of many species of fishes is restricted to areas east (e.g. haddock, pollock, redfish) or west (e.g. bluefish, menhaden, anchovies) of Nantucket Shoals,

<sup>2</sup> B. P. Hayden and R. Dolan: "Coastal Marine Fauna and Marine Climates of the Americas." *Journal of Biogeography*, Vol. 3, 1976, pp. 71-81. In defining the separating boundaries between biogeographic province the authors quote sources from the 1830s to the present: Milne-Edwards 1839; Dana 1853; Forbes 1856; Woodward 1856; Packard 1863; Stephenson and Stephenson 1954; Coomans 1962; Hall 1964; and Hazel 1970. The limits of the Nova Scotian biogeographic provinces are shown in the *Canadian Memorial*, p. 54, Figure 21.

<sup>3</sup> J. B. Colton, W. G. Smith, A. W. Kendall, P. L. Berrien and M. P. Fahay: "Principal Spawning Areas and Times of Marine Fishes, Cape Sable to Cape Hatteras." *Fishery Bulletin*, Vol. 76, 1979, pp. 911-915; and analyses of the combined Canadian and United States groundfish research vessel survey data by the Marine Fish Division, Fisheries Research Branch, Scotia-Fundy Region, Department of Fisheries and Oceans, Canada.

although there are exceptions to this general rule (notably yellowtail flounder and silver hake)<sup>4</sup>."

108. A Canadian study offers an interpretation of this ecological transition between the "Gulf of Maine" and the "Middle Atlantic Bight":

"... [an] historically related factor affecting marine ecosystems on a broad scale is evident in the difference between the glaciated and unglaciated areas of the east coast of North America. Comparing regions northeast and southwest of Long Island (roughly the terminal moraine of the Wisconsin ice sheet), it is clear that the northern sector is primarily a drowned continental borderland, most of which is still sinking. Large estuaries are few and commercial production is centered on species like cod, haddock, and flounder that live in cold, rocky, or coarse sand environments. South of Cape Cod, especially south of Long Island, the coastal plain is broad and low, the shelf smooth and temperate, estuaries large and many. The commercial catch of marine animals is composed of far more pelagic estuarine species depending on terrigenous input to the sea<sup>5</sup>."

109. The foregoing scientific studies provide no suggestion that the Northeast Channel is a boundary limiting the distribution of fish species. Rather, the only obvious biogeographic "boundary" is found to the southwest of Georges Bank.

## B. COMMERCIALY IMPORTANT SPECIES

110. Detailed consideration of the distributional ranges of commercial fish and invertebrate species adds strength to these conclusions. Figure 32 illustrates the distributional ranges of important fish and invertebrate species between Cape Hatteras and the northeast edge of the Scotian Shelf<sup>6</sup>. In relation to the relevant area, the Canadian Memorial<sup>7</sup> divides these species into three general categories:

(a) *Widely-distributed species* found in the waters of the continental shelf and slope from the northeast along the Canadian coast to the

<sup>4</sup> J. B. Colton *et al.*: "Principal Spawning Areas and Times of Marine Fishes, Cape Sable to Cape Hatteras" pp. 911-915.

<sup>5</sup> E. L. Mills: "The Structure and Dynamics of Shelf and Slope Ecosystems Off the Northeast Coast of North America", in K. R. Tenore and B. C. Coull, eds.: *Marine Benthic Dynamics*. Columbia, University of South Carolina Press, 1980, pp. 24-47.

<sup>6</sup> The distributional range for each species is defined from ICNAF/NAFO fisheries statistics and the scientific literature, including H. B. Bigelow and W. C. Schroeder: "Fishes of the Gulf of Maine." United States Fish and Wildlife Services, *Fisheries Bulletin*, Vol. 74, 1953; *Draft Environmental Impact Statement on the Agreement between the United States and Canada on East Coast Fishery Resources*. Washington, United States Department of State, April 1980; S. B. Saila and S. D. Pratt: "Chapter 6", in *Coastal and Offshore Environmental Inventory*. Marine Publication Series No. 2, University of Rhode Island, 1973; G. M. Hare: *Atlas of the Major Atlantic Coast Fish and Invertebrate Resources Adjacent to the Canada-United States Boundary Area*. Ottawa, Fishery and Marine Service, Department of Environment, 1977.

<sup>7</sup> *Canadian Memorial*, p. 55, para. 99.

southwest of Georges Bank along the United States coast. Major fishes and invertebrates in this group include shortfin squid, lobster, sea scallops, Atlantic herring, Atlantic mackerel, red hake, silver hake, swordfish, bluefin tuna and yellowtail flounder. A number of these species are highly migratory. These broad-latitude species span all hypothetical "ecological régimes" and the Northeast Channel.

- (b) *Southern species* whose distributions along the North American coast generally do not extend northeast of the Great South Channel-Nantucket Shoals area. Species in this second group, although occasionally observed on Georges Bank and in the Gulf of Maine, do not spawn north of the Great South Channel-Nantucket Shoals area and are generally confined in their range to the southwest of Georges Bank along the United States coast. Major fishes and invertebrates in this group include bay scallop, black sea bass, bluefish, butterfish, menhaden scup, summer flounder and weakfish. (Longfin squid is a southern species distributed somewhat further to the northeast.)
- (c) *Northern species* whose distribution along the North American coast do not extend southwest of the Great South Channel-Nantucket Shoals area. Species in this third group, although occasionally observed south of the Great South Channel-Nantucket Shoals area, are only found in significant concentrations to the northeast of this area, off and along the Canadian coast — that is, on Georges Bank and further north. They do not spawn in significant quantities south of the Great South Channel. Fish in this group include American plaice, argentine, cod, cusk, haddock, halibut, pollock and redfish.

111. A composite two-dimensional representation of the species composition within the three categories reinforces the general conclusion that the Northeast Channel does not represent a significant feature in the distributional limits of commercially important fish and invertebrates. [See Figures 20, 21 and 22 in the Canadian Counter-Memorial.] The Great South Channel-Nantucket Shoals-Cape Cod area, on the other hand, is an important transition zone between northern, cold-water species and southern species of the more temperate waters to the southwest.

112. The commercial significance of the transition zone southwest of Georges Bank is shown in *Figure 33*. Over 95 percent of the average annual commercial catch made in ICNAF/NAFO subdivision 5Ze encompassing Georges Bank during the period from 1962 to 1980 was composed of either northern or widely-distributed species. In contrast, the percentage of such species was only 24 percent in ICNAF/NAFO statistical area 6 further to the southwest, reflecting the overall change in species composition to the southwest<sup>8</sup>.

113. Thus, data on commercial fish catches confirm the view that Georges Bank is part of a larger oceanographic system dominated by species with a northern orientation. The pattern of distribution of species

<sup>8</sup> The catch statistics were summarized by each area using a computer tape of the official catch statistics from NAFO.

does not suggest the existence of so-called "ecologically separate and identifiable régimes", nor the existence of a distributional barrier at the Northeast Channel. To the extent the biogeographic province concept can be extended to cover the continental shelf, the Gulf of Maine area (including Georges Bank and Browns Bank) can be said to form part of the Nova Scotian province.

114. The conclusions drawn from the distributions of fish and invertebrate species are consistent with those derived from the plankton and benthos distributions discussed in Chapter III. In addition, the identification of a transition zone to the southwest of Georges Bank parallels the geomorphological discontinuity produced by glacial erosion and deposition.

### Section III. Stock Structures, Distributions and Migrations

#### A. STOCK STRUCTURES

115. The foregoing account of the distributional ranges of species provides only a partial picture of the relationship between living marine resources found on Georges Bank and their physical environment, both locally over the Bank and more broadly within the environmental continuum of the continental shelf. To gain a fuller understanding, it is necessary to review the dynamics of the individual species — where they spawn, where they aggregate during different seasons and at different times during their life cycle and the extent to which there is intermixing between aggregations — all in relation to the major features of the physical and biological environment.

116. The distribution and migration patterns in the Gulf of Maine area are such that in most cases it is impossible to identify, within an individual species, a discrete aggregation that has an independent existence in a limited geographic area. Seasonal movements on and off the banks, intermingling of progeny in one area from spawnings in other areas, transport of eggs and larvae, and annual changes in abundance in every species result in a seasonally variable mélange of species and life history stages throughout the Gulf of Maine area. Because of these characteristics it is impossible in most cases to draw a single line that would respect stock distributions of any individual species, let alone a single line that would divide stocks of all the species in the Gulf of Maine area.

117. The difficulties of establishing rigid demarcations of stocks were well expressed by a Canadian scientist, who wrote:

"Biological management of fisheries has been built around the concept of the unit stock. At this late stage in development it is difficult to discern that this apparently commonsense notion may be an instance of misplaced concreteness which places artificial constraints on analyses or on management rules and procedures. *In fact the stock is an abstract term applied to provide a rationale for a certain kind of aggregation of catch data. This is not to say that there may*

*or may not be such a thing as a discrete group of fish that may constitute an effective breeding group or stock, but in many cases there is significant uncertainty about the identity of the group from which successive annual catches are made, so that the operational term does not unequivocally refer to an identifiable physical entity. Uncritical usage can obscure the understanding of a number of production features that are relevant to economic considerations<sup>9</sup>.*" (*Italics added.*)

118. From the foregoing it is evident that there is considerable uncertainty with respect to the definition of the term "stock" and, as will be outlined in more detail below, with respect to the application of the stock concept to the fish and invertebrates of the Gulf of Maine area. Any attempt to depict rigid stock demarcations in the area assumes a degree of precision both at the conceptual and biological levels that cannot be supported by available scientific knowledge. Fortunately, the question whether the Northeast Channel represents a "natural division" between commercially important fish and invertebrates can be approached directly by reference to data on fish distributions and migrations, in addition to existing and often imperfect data on stock structures.

## B. STOCK DISTRIBUTIONS AND MIGRATIONS

119. Studies by Canadian and United States scientists on stock distributions and migrations lead to conclusions that contradict the United States theory of "three separate and identifiable ecological régimes" in the Gulf of Maine area<sup>10</sup>. The scientific evidence suggests the following conclusions:

- (a) Most of the commercially important species in the Gulf of Maine region migrate or are dispersed between two and sometimes three of the purported "ecological régimes" at some stage of their life history.
- (b) The Northeast Channel poses no barrier to the vast majority of species in the Gulf of Maine area. For the few species showing stock discontinuities at the Northeast Channel, equally significant discontinuities exist over Georges Bank itself.

120. The United States Memorial recognizes that stocks of at least four species — *mackerel*, *pollock*, *argentine* and *shortfin squid* — move between so-called "ecological régimes" and are not divided by the Northeast Channel<sup>11</sup>. The other 12 species listed in the United States

<sup>9</sup> L. M. Dickie: "Perspectives on Fisheries Biology and Implications for Management." *Journal of the Fisheries Research Board of Canada*, Vol. 36, 1979, pp. 838-844.

<sup>10</sup> Such studies include tagging studies, wherein identifying marks are placed on individual fish and information on movements is obtained through later recapture of the marked fish, studies involving measurements and counts of body parts and analysis of protein chemistry (characteristics which sometimes vary between populations of the same species), as well as studies of relative densities of fish obtained through research vessel surveys or analysis of commercial catch statistics.

<sup>11</sup> *United States Memorial*, p. 37, Figure 7.

Memorial, however, are portrayed in the United States Memorial as being divided into stocks by this channel.

121. There are serious difficulties with this United States depiction of the distributions of fish and invertebrate stocks in the Gulf of Maine area. *First*, it fails to mention 12 other commercially important species<sup>12</sup>, seven of which are migratory. *Secondly*, it is not supported by the scientific evidence with respect to most of the 12 species that are alleged to be divided by the Northeast Channel.

### 1. Seven Migratory Species not Listed in the United States Memorial

122. The seven migratory species not listed in the United States Memorial are: swordfish, bluefin tuna, saury, alewife, American shad, spiny dogfish and Atlantic salmon.

123. *Swordfish* at one time provided an important fishery for Canadian fishermen and may do so again in the future<sup>13</sup> [Figure 34]. Its migratory characteristics are pronounced<sup>14</sup> [Figure 35], but those of *bluefin tuna*<sup>15</sup> are even more so [Figure 36]. Found along the North American coast from Newfoundland to the tropics and further offshore, bluefin tuna are taken in recreational and commercial fisheries in the waters of both Canada and the United States, including the Gulf of St. Lawrence, the inner Gulf of Maine, the outer edges of Georges Bank

<sup>12</sup> To rigorously define the commercially important species on Georges Bank, the overall ICNAF/NAFO catch statistics were used. Within 5Ze (which includes Georges Bank and the Great South Channel) 25 species were taken by all countries combined in excess of 10,000 tons within the 1962 to 1980 time period (i.e., on average in excess of about 500 tons per year). These 25 species are ranked in importance below (by tonnage). They account for over 99 percent of the total specified catch (i.e., that catch identified to species) during this time period. Three other species, which migrate through the Gulf of Maine area, have been considered because of their recreational importance (salmon, bluefin tuna and American shad).

<i>Groundfish</i>	<i>Pelagic</i>	<i>Invertebrate</i>	<i>Recreational</i>
silver hake (3)	Atlantic herring (1)	sea scallop (2)	Atlantic salmon
haddock (5)	mackerel (4)	longfin squid (14)	bluefin tuna
cod (6)	alewife (19)	shortfin squid (15)	American shad
yellowtail flounder (7)	swordfish (20)	Atlantic lobster (17)	
red hake (8)	butterfish (21)		
winter flounder (9)	saury (25)		
pollock (10)			
argentine (11)			
redfish (12)			
spiny dogfish (13)			
American plaice (16)			
witch flounder (18)			
angler (22)			
cusk (23)			
white hake (24)			

<sup>13</sup> *Annual Report and Investigation Summaries*. St. Andrews, New Brunswick, Fisheries Research Board of Canada, Biologic Station, 1960-1961; *Canadian Research Report*, 1963, ICNAF Doc. 36, Serial No. 1331.

<sup>14</sup> S. A. Berkeley: *Atlantic Swordfish Stock Structure Data and Suggestions for its Interpretation*. ICCAT Working Document, SYMP/82/12, 1982.

<sup>15</sup> Bluefin tuna migrations and stock structure are summarized in the 1970 to 1980 ICCAT SCRS reports.



and the Scotian Shelf, and in coastal waters of the United States south of Cape Cod. Geomorphological features are irrelevant to swordfish and bluefin tuna distributions and migratory patterns.

124. *Saury*, an oceanic, pelagic (swimming near the surface) fish, is one of the most abundant species in the northwest Atlantic. It concentrates in offshore waters southwest of Georges Bank in the winter, moving onto the continental shelf (from Georges Bank northward to the Grand Banks off Newfoundland) in the spring. There is no evidence of a stock breakdown within its distributional range<sup>16</sup>. Again, geomorphological features are irrelevant in the distribution of this species.

125. *Alewife* spawn in numerous rivers along the Atlantic seaboard from North Carolina to Newfoundland<sup>17</sup>. The young migrate to sea and intermingle extensively on feeding grounds offshore, crossing the limits of the theorized "ecological régimes".

126. *American shad* support important commercial and recreational fisheries in rivers and estuaries of both the United States and Canada. As shown by extensive tagging experiments, the head of the Bay of Fundy is an important feeding ground for shad, which later spawn in large numbers in rivers from the Gulf of St. Lawrence southward to Florida<sup>18</sup> [Figures 37 and 38].

127. *Atlantic salmon* spawn in the rivers of Canada and the United States that enter the Gulf of Maine. The young migrate to sea and the intermingled stocks carry out immensely long migrations to the open waters of the northwest Atlantic as far as western Greenland<sup>19</sup>. In carrying out their migrations, stocks of American shad, alewife and Atlantic salmon from Canadian and United States rivers intermingle and migrate freely through the purported "ecological régimes".

128. For *spiny dogfish* in the northwest Atlantic there is no evidence for their separation into definable stocks<sup>20</sup>. They range from southern Labrador to North Carolina. Birth of young occurs in the winter months in the Mid-Atlantic Bight region south of the Gulf of Maine area. Most of the population overwinters in this area, although groups of males and immature females do overwinter in pockets of deeper, warmer water as far north as southwest Newfoundland. Migration northward for summer feeding brings large shoals of dogfish into southwest Nova Scotia and Bay of Fundy waters in June, into the Gulf of St. Lawrence in July, and to the east coast of Newfoundland in July and August.

<sup>16</sup> A. A. Nesterov: *Data on Distribution of the Northwest Atlantic Saury*, *Scomberesox sauros* (Walb.), for Evaluation of the Unity of their Population. NAFO SCR Doc. 82/IX/95, 1982.

<sup>17</sup> H. B. Bigelow and W. C. Schroeder: "Fishes of the Gulf of Maine", pp. 101-105.

<sup>18</sup> M. J. Dadswell, G. D. Melvin and P. J. Williams: "Effect of Turbidity on the Temporal and Spatial Utilization of the Inner Bay of Fundy by American Shad (*Alosa sapidissima*) (*Pisces:Clupidae*) and its Relationship to Local Fisheries." *Canadian Journal of Fisheries and Sciences*, Vol. 40, (Supp. 1.1), 1983, pp. 322-330.

<sup>19</sup> R. L. Saunders: "Atlantic Salmon (*Salmo salar*) Stocks and Management Implications in the Canadian Atlantic Provinces and New England, U.S.A." *Canadian Journal of Fisheries and Aquatic Sciences*, Vol. 38, 1981, pp. 1612-1625.

<sup>20</sup> A. C. Jensen: "Life History of the Spiny Dogfish." *Fisheries Bulletin*, Vol. 65, 1966, pp. 527-554.

There are documented cases of transatlantic migrations of spiny dogfish in both directions, indicating some degree of intermingling of east and west Atlantic populations. Dogfish obviously pay little regard to the boundaries of so-called "ecological régimes".

129. In addition to the seven migratory species discussed above, the five other commercially important species omitted from the United States Memorial are *angler*, *butterfish*, *American plaice*, *witch flounder* and *winter flounder*. These species are discussed in the next section in connection with species having similar distributions that are listed in the United States Memorial.

## 2. Species that Are Listed in the United States Memorial and Five Similar Unlisted Species

130. It has already been noted (in paragraph 121) that the United States Memorial recognizes that four out of the 16 listed species move freely across the Northeast Channel. The other listed species, all of which are alleged to be divided into stocks by the Northeast Channel, are the following: cusk, Atlantic lobster, Atlantic herring, longfin squid, silver hake, red hake, white hake, redfish, haddock, cod, yellowtail flounder and sea scallops.

131. Scientific evidence fails to support the view that there are separate stocks of *cusk* or *Atlantic lobster* on each side of the Northeast Channel:

- (a) There is no record of scientific studies of the stock structure of cusk, but results of exploratory research surveys by both Canada and the United States reveal that, as with argentine, the Northeast Channel between Georges Bank and Browns Bank is itself an area of concentration [Figure 39]. Indeed Canadian fishermen carry out longline fisheries for cusk throughout the Northeast Channel. This channel cannot, therefore, be viewed as a stock barrier for this species.
- (b) The same conclusion holds true for Atlantic lobster. The Canadian fishery is carried out on the slopes of both Browns Bank and Georges Bank and in the Northeast Channel<sup>21</sup> [Figure 40]. Tagging experiments indicate clear-cut links between lobsters found in the inshore waters of western Nova Scotia and New Brunswick and those found offshore and the inner Gulf of Maine [Figures 41 and 42]. Recent Canadian studies of annual variations in landings and of larval ecology have led to the hypothesis that lobsters from the Gulf of Maine area are a single unit and are different from three other "clusters" of lobster — those found southwest of Cape Cod, those found northeast of Shelburne County to Cape Breton in Nova Scotia, and those found in the inner part of the Gulf of St. Law-

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<sup>21</sup> A. B. Stasko and R. W. Pyc: *Canadian Offshore Lobster Fishery Trends*. Canadian Atlantic Fisheries Scientific Advisory Committee, Research Document 80/56.

rence<sup>22</sup>. The linkage between the lobster of southwest Nova Scotia with those of the more southwesterly part of the Gulf of Maine is strongly supported by the tagging data.

In addition, one of the species not listed in the United States Memorial — *angler* — has a cross-channel distribution similar to that of cusk and lobster [Figure 43]. In the inner Gulf of Maine, angler are broadly distributed across the basin as far as the mouth of the Bay of Fundy. For all three species, the Northeast Channel clearly does not represent a stock barrier.

132. *Longfin squid* are depicted in the United States Memorial as a single stock that extends almost as far north as the Northeast Channel<sup>23</sup>. This indicates that the Channel itself is not an important feature affecting the stock structure of the species. *Butterfish*, a species not treated in the United States Memorial, has a somewhat similar distribution<sup>24</sup> to longfin squid, and the Northeast Channel does not separate stocks. Both species move freely in and out of the so-called Georges Bank "ecological régime".

133. *Silver hake* overwinter in deeper water off the banks, moving onto the banks for summer feeding and for spawning from spring through autumn. The most recent stock separation study concludes that there are two stocks in the Gulf of Maine area, divided by a line running latitudinally across Georges Bank, bisecting the so-called Georges Bank "ecological régime"<sup>25</sup> [Figure 44].

134. The southern stock of silver hake, when distributed over the shelf, occupies the southern half of Georges Bank and the shelf to the southwest as far as Cape Hatteras. Thus, this stock has its northern boundary well south of the Northeast Channel. The channel therefore does not represent a stock barrier. Moreover, the stock's southern distribution is in no way bounded by any southern limit that could be attributed to a "Georges Bank ecological régime".

<sup>22</sup> The lobster movements from southwest Nova Scotia were taken from A. Campbell: *Movements of Tagged Lobsters Released off Port Maitland, Nova Scotia, 1944-1980*. Canadian Technical Report of Fisheries Aquatic Sciences, 1982, p. 1136. The movements from the Grand Manan tagging experiment were provided by the Canadian Department of Fisheries and Oceans. Two recent publications have supported the hypothesis that lobsters within the Gulf of Maine area form a unit stock: A. Campbell, and R. K. Mohn: *The Quest for Lobster Stock Boundaries in the Canadian Maritimes*. NAFO Scientific Research Document 82/IX/107, 1982; G. C. Harding, K. F. Drinkwater and W. P. Vass: "Factors Influencing the Size of Lobster Stocks along the Atlantic Coast of Nova Scotia, Gulf of St. Lawrence, and Gulf of Maine: a New Synthesis." *Canadian Journal of Fisheries and Aquatic Sciences*, Vol. 40, 1983, pp. 168-184.

<sup>23</sup> *United States Memorial*, p. 37, Figure 7.

<sup>24</sup> S. A. Murawski and G. T. Waring: "A Population Assessment of Butterfish, *Peprilus triacanthus*, in the Northwestern Atlantic Ocean", in *Transactions of the American Fisheries Society*, Vol. 108, 1979, pp. 427-439.

<sup>25</sup> F. P. Almeida: *An analysis of the stock structure of silver hake, Merluccius bilinearis, in NAFO Subareas 5 and 6*. NAFO Scientific Research Document 83/IX/81, 1982.

135. The northern silver hake stock occupies not only the northern part of Georges Bank and the inner part of the Gulf of Maine, but appears also to be distributed along the southwestern slopes of Browns Bank and the more inshore banks off southwest Nova Scotia. Analysis of research vessel survey data<sup>26</sup> indicates that the division between this and the central Scotian Shelf stock is to the east of the Browns Bank area. The biomass distribution is shown in *Figure 45*.

136. The stock structure and migration of *red hake* in the Gulf of Maine area are not well understood. A United States review has identified three stocks: (i) those red hake to the southwest of the Great South Channel; (ii) those on Georges Bank; and (iii) those in the inner Gulf of Maine<sup>27</sup>. The study, however, did not consider red hake on the Scotian Shelf. An earlier Soviet Union synthesis<sup>28</sup> concluded that the stock divisions on Georges Bank parallel silver hake; i.e., the Bank is bisected by a line running from east to west shown in *Figure 44*. This conclusion is supported by the red hake biomass distributions plotted from the research vessel surveys [*Figure 46*]. There is a marked discontinuity along the middle of Georges Bank separating the red hake of southern Georges Bank from those of the inner Gulf of Maine. The observed distribution, as is the case for silver hake, does not reflect the three so-called "ecological régimes" defined in the United States Memorial. The most important distributional discontinuities are on Georges Bank itself. Larval distributions indicate no discontinuities between Browns Bank and Georges Bank. The most marked larval distributional discontinuity on the Scotian Shelf, which could indicate a stock boundary, is to the east of Browns Bank<sup>29</sup>.

137. There have been no scientific studies characterizing the stock structure of *redfish*, *American plaice*, *witch flounder* and *white hake* in the Gulf of Maine area. The research vessel survey data, however, indicate that these species are broadly distributed throughout the inner Gulf of Maine [*Figures 47, 48, 49 and 50*]. These species are not abundant on Georges Bank or Browns Bank nor in the Northeast Channel. They are concentrated in the deep waters of the inner Gulf of Maine where they span the entire basin to the mouth of the Bay of Fundy. The data indicate that the Northeast Channel is an irrelevant feature in the distribution of these species.

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<sup>26</sup> J. J. Hunt: *Age, Growth, and Distribution of Silver Hake, Merluccius bilinearis, on the Scotian Shelf*. ICNAF Selected Papers 1977, 1977, pp. 33-44.

<sup>27</sup> E. D. Anderson: *Comments on the Delineation of Red and Silver Hake Stocks in ICNAF Subarea 5 and Statistical Area 6*. ICNAF Research Document 74/100, 1974; E. W. Bowman: *Seasonal Distribution of Red and Silver Hake in ICNAF Divisions 5Z, 6A, and 6B*. ICNAF Research Document 72/114, 1972.

<sup>28</sup> J. A. Richter: *Results of Research on the Distribution, Age, Growth, and General Mortality of Stocks of Red Hake, Urophycis chuss Walbaum, on Georges Bank and in Adjacent Waters, 1965-1966*. ICNAF Research Document 68/38, 1968.

<sup>29</sup> D. F. Markle, D. A. Methven and L. J. Coates-Markle: "Aspects of Spatial and Temporal Cooccurrence in the Life History Stages of the Sibling Hakes, *Urophycis chuss* (Walbaum 1792) and *Urophycis tenuis* (Mitchell 1815) (Pisces: Gadidae)." *Canadian Journal of Zoology*, Vol. 60, 1982, pp. 2057-2078.

138. Relatively distinct spawning concentrations of *Atlantic herring* have been identified on the northeast edge of Georges Bank, off southwest Nova Scotia, along the coast of Maine, and in the bight of the Gulf of Maine-Cape Cod area<sup>30</sup> [Figure 51]. In addition, other "local" stocks are found off southwest Grand Manan and in the Nantucket Shoals area that maintain their biological integrity. Progeny from these spawning populations migrate freely throughout the Gulf of Maine area and frequently intermingle.

139. Juvenile herring (mainly of one and two years of age) are found in an almost continuous body inshore along the coast of Maine, New Brunswick and Nova Scotia [Figure 52] where they are fished intensively by Canadian and United States fishermen as sardine. Canadian and United States scientists assume that these sardine originate from all three of the major spawning populations shown in Figure 51. Intermingling occurs at other stages of the life history. For example, herring tagged at the entrance to the Bay of Fundy have demonstrated extensive southwest movement into the Gulf of Maine, beyond Cape Cod, and also northward to Cape Breton<sup>31</sup> [Figure 53].

140. Of the commercially exploited species in the Gulf of Maine, *haddock* is perhaps the most studied. There is general agreement in the scientific literature on its stock structure and migrations<sup>32</sup>. Spawning stocks have been identified in the following areas: (i) northeast Georges Bank; (ii) Browns Bank-southwest Nova Scotia; (iii) Bay of Fundy-coastal Gulf of Maine; and (iv) the Cape Cod area. The Bay of Fundy-coastal Gulf of Maine stock migrates seasonally from the Bay of Fundy to Jeffreys Ledge. The first three stocks are considerably more important than the fourth. There is good scientific evidence that these haddock stocks are self-sustaining. However, there is disagreement in the scientific literature on the degree of interchange of haddock between these four stock areas. The tagging results indicate long-distance migrations<sup>33</sup> [Figure 54]. Moreover, largely on the basis of larval distributions and parallels in the strengths of year-classes, it has been hypothesized by United States scientists that Browns Bank contributes to northeast Georges Bank recruitment<sup>34</sup>. If correct, this implies that the production of one stock is dependent, at times, on the other. Finally, portions of

<sup>30</sup> T. D. Iles and M. Sinclair: "Atlantic Herring: Stock Discreteness and Abundance." *Science*, Vol. 215, 1982, pp. 627-633.

<sup>31</sup> W. T. Stobo: *Movements of Herring Tagged in the Bay of Fundy — Update*. ICNAF Research Document 76/48, Series No. 3834, 1976.

<sup>32</sup> M. D. Grosslein: *Haddock Stocks in the ICNAF Convention Area*. ICNAF Selected Papers, 1962, pp. 124-131.

<sup>33</sup> F. D. McCracken: "Studies of Haddock in the Passamaquaddy Bay Region." *Journal of the Fisheries Research Board of Canada*, Vol. 17, 1959, pp. 175-180; and R. G. Halliday and F. D. McCracken: *Movements of Haddock Tagged off Digby, Nova Scotia*. ICNAF Research Bulletin, Vol. 7, pp. 8-14.

<sup>34</sup> J. B. Colton and R. F. Temple: "The Enigma of Georges Bank Spawning." *Limnology and Oceanography*, Vol. 6, 1961, pp. 280-291; M. D. Grosslein and R. C. Hennemuth: "Spawning Stock and Other Factors Related to Recruitment of Haddock on Georges Bank." *Rapport et procès-verbaux des réunions*, vol. 164, 1973, p. 77-88.

Georges Bank and Browns Bank northeast stocks overwinter in the Northeast Channel and are fished there by Canadian fishermen<sup>35</sup> [Figure 55].

141. As is the case for haddock, the *cod* stock structure and migrations have been well studied. The research vessel surveys indicate that this species is broadly distributed throughout the Gulf of Maine area<sup>36</sup> [Figure 56]. This overall distribution is divided into four stock areas: (i) northeast Georges Bank; (ii) Browns Bank and southwest Nova Scotia coastal waters; (iii) the inner Gulf of Maine; and (iv) southern New England and the Great South Channel (see Figure 23 of the Canadian Counter-Memorial). After spring spawning, the cod on northeast Georges Bank are reported to migrate to summer feeding areas that include coastal southwest Nova Scotia waters<sup>37</sup> [Figure 57]. The extensive mixing between cod on eastern Georges Bank and cod on Browns Bank and other coastal waters off southwest Nova Scotia has led to the conclusion that this grouping is relatively independent of cod to the southwest. The limits to movement within Georges Bank itself were explained by a United States scientist as follows:

“... the distribution of fish outlined above is consistent with the physical features of the environment. A line drawn along the 68th meridian separates the offshore and southern Nova Scotia fish from the more inshore groups; this is a line which runs through or close to the important physical barriers of the deep mud bottoms of the central basin of the Gulf of Maine, the extreme shoals of central Georges Bank, and the relatively barren southern edge of the Bank. Only around the narrow northern shelf of the Gulf does this line cross suitable bottom for cod, and all the evidence points to this being the most likely path for what little interchange does take place.”

“... cod on eastern Georges Bank have been shown to migrate to Browns Bank and even further eastward, with only minor movements occurring in the opposite direction, while a southerly migration also occurs from the Great South Channel-Nantucket Shoals area in winter. Larger adults have been shown to move to the north and east permanently<sup>38</sup> ...”

<sup>35</sup> F. D. McCracken: *Cod and Haddock Catches by Maritime Trawlers on the Scotian Shelf and Georges Bank*. Fisheries Research Board of Canada, Technical Report No. 86, 1968; A. C. Kohler: *Cod and Haddock Catches from Georges Bank, the Bay of Fundy, Scotian Shelf, and the Gulf of St. Lawrence by Maritime Otter Trawlers in 1967*. Fisheries Research Board of Canada, Technical Report No. 157, 1969.

<sup>36</sup> W. Templeman: *Divisions of Cod Stocks in the Northwest Atlantic*. ICNAF Selected Papers, 79-123, 1962.

<sup>37</sup> J. P. Wise: “Cod Groups in New England Area.” *Fisheries Bulletin*, Vol. 63, 1962, pp. 189-203. This study leads to the interpretation that, after spawning, cod migrate across the Northeast Channel to summer feeding grounds of Browns Bank and the coastal waters off southwest Nova Scotia.

<sup>38</sup> J. P. Wise: “Cod Groups in New England Area”, pp. 189-203. This cod barrier along longitude 68°W is shown in Figure 23 in the Canadian Counter-Memorial.

142. Thus it is clear that there is a dynamic linkage between cod on eastern Georges Bank and cod on the Scotian Shelf, and that there is a greater stock discontinuity between the cod of eastern and western Georges Bank than between the cod of eastern Georges Bank and the Scotian Shelf. In addition, cod in commercial concentrations are reported within the Northeast Channel, and the channel is actively fished for cod by Canadian fishermen.

143. *Yellowtail flounder* is a species with limited migratory habits. In the Gulf of Maine area, there appear to be four relatively discrete aggregations: (i) on southern Georges Bank; (ii) in the Nantucket Shoals area; (iii) in the Cape Cod area; and (iv) on Browns Bank<sup>39</sup> [Figure 58]. The Georges Bank area supports two distinct yellowtail stocks. One of these, on Nantucket Shoals, extends southwest to the Mid-Atlantic Bight. The other Georges Bank yellowtail stock is concentrated on the southern part of Georges Bank. The stock does not occur in strength on the northern or eastern parts of the Bank. Tagging studies and studies of parasite content indicate only limited movement of yellowtail among the aggregations.

144. Another species of some commercial importance in the Gulf of Maine area is *winter flounder* (which is not listed in the United States Memorial). Little is known of its stock structure in the Gulf of Maine area, but results of research vessel surveys suggest that it is confined to the banks and that there is a discontinuity in its distribution between Georges Bank and the banks fringing western Nova Scotia. No data exist on the extent of interchange between the aggregations in the two areas.

145. *Scallop* aggregations occur in the series of banks fringing southwest Nova Scotia, on the northeast peak and on the southern part of Georges Bank, in the Great South Channel area, and off Long Island<sup>40</sup> [Figure 59]. It is generally acknowledged that such local aggregations are not independent. Eggs and larvae released in the areas of aggregations are carried away from their natal site by the complex currents of the Gulf of Maine area. Thus, recruitment to various beds can come from contiguous areas through drift and dispersion.

#### Section IV. Biomass Distribution

146. References have been made throughout this chapter to the results of research vessel surveys in order to provide estimates of the relative densities of groundfish species in the Gulf of Maine area. On a species-by-species basis, the data show a wide variety of distribution patterns that can be associated with various geomorphological and other oceanographic features. The overall impression is one of great

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<sup>39</sup> F. E. Lux: "Identification of New England Yellowtail Flounder Groups." *Fisheries Bulletin*, Vol. 63, 1963, pp. 1-10.

<sup>40</sup> The scallop aggregations were identified from the Canadian and United States catch statistics by area within the Gulf of Maine area.

complexity that defies geographical categorization into any simplified scheme of separate "ecological régimes". The picture presented is one of continuity of overall resource density rather than of discontinuity. The composite picture presented is well illustrated when the data for all of the groundfish species listed are combined (see Figure 24 of the Canadian Counter-Memorial). There is virtually a continuous distribution of biomass throughout the Gulf of Maine area, with irregular points of high density in the inner Gulf of Maine. The overall biomass distribution does not suggest or reflect the existence of so-called separate "ecological régimes", nor does it reveal the Northeast Channel as a distributional barrier.

### Section V. Conclusion

147. At the level of *species*, studies of the limits of fish distributions provide no support for the contention that three so-called "separate ecological régimes" exist in the Gulf of Maine area. Instead, the data show a continuity in the species structure over broad expanses of the continental shelf from the Scotian Shelf southwestward. To the extent that a discontinuity can be identified, it is a transition zone that embraces the Cape Cod-Great South Channel-Nantucket Shoals area. These findings are consistent with the results of studies of plankton, benthos and inshore fauna, and with geomorphological studies. The fish and invertebrate species of the Gulf of Maine area are continuous with those of the Scotian Shelf, and this area is part of the Nova Scotian biogeographic province. The southern limit of this biogeographic province is coincident with the southern limit of the major effects of the most recent ice sheet.

148. At the level of *stocks*, the review of available scientific evidence on the stock structure and distribution and migration patterns of commercially important fish and invertebrates does not support contentions regarding the existence of so-called separate "ecological régimes" and of a "natural boundary" for stock distributions at the Northeast Channel.

149. The United States Memorial considers only 16 species in carrying out its assessment of stock structure in the Gulf of Maine area. There are another 12 species of equal or of even greater importance, making a total of 28 that must be considered. Very few of these 28 species are distributed in a manner that supports the United States theory of separate "ecological régimes" in the Gulf of Maine area. For the great majority of the species in the area, the Northeast Channel is not an important feature affecting stock distribution. In some cases, stock distribution is continuous across the Northeast Channel. In other cases, there is substantial intermixing across the Channel between semi-discrete aggregations; and in yet other cases, the species are not concentrated on the portions of Georges Bank and the Scotian Shelf adjacent to the Channel, and therefore the Channel itself cannot be significant in their distribution.

150. At the level of *biomass*, the distribution of fishery resources is virtually continuous throughout the Gulf of Maine area.



151. The distributions and migrations of fish and invertebrates in the Gulf of Maine area are so complex that a one-dimensional projection cannot adequately portray the interrelationships between aggregations throughout the region. Nevertheless, in order to provide an objective appraisal of available data on distribution, *Figure 60* shows the limits of known stocks of fish and shellfish in accordance with the method adopted in the United States Memorial. This graphic illustration clearly shows that no single line would provide a "natural boundary".

## GLOSSARY

- Anticline.** A ridge-like structure in which geological strata have been warped upwards and whence they dip in opposite directions.
- Basement complex.** Undifferentiated rock below the oldest identifiable sedimentary rocks with hydrocarbon potential of a region, often metamorphosed. The age varies from place to place.
- Benthos.** The plants and animals on the bottom of the sea.
- Biogeographic province.** A geographic area delineated by a discontinuity in the distribution of major groups of plants or animals.
- Biomass.** The weight of living matter in a given area; e.g., biomass of fish is the living weight of the fish community.
- Circulation.** Resultant or net movement of water in the oceans, where current has been averaged over a relatively long period of time.
- Clastics.** Detrital material consisting of broken (usually small) pieces of older rocks.
- Delta.** The area of sediments created by deposition where streams or rivers enter bodies of water, such as lakes, estuaries or the sea.
- Diapir.** An intrusion of material that domes the overlying cover after it has penetrated lower layers. Salt deposits heavily loaded by thick cover often form diapirs, or "salt domes" and provide good traps for hydrocarbons.
- Differential warping.** The action of twisting and bending of the earth's crust.
- Eddy.** *See* gyre.
- Fault.** Fracture in rock accompanied by lateral or vertical displacement of a block on one side relative to that on the other.
- Fluvioglacial drainage.** The drainage system developed in response to the melting of glacial ice.
- Front.** An area where strong horizontal gradients exist in oceanographic characteristics such as temperature or salinity.
- Genera.** *See* genus.
- Genus (plural genera).** A classification group of a number of species possessing certain common structural characteristics distinct from those of any other group.
- Geomorphological features.** *See* geomorphology.
- Geomorphology.** Earth science concerned with forms of the earth's surface and changes taking place as landforms develop.
- Glacial.** Relating to the existence or activity of ice or ice sheets. The Pleistocene epoch was an unusual period of widespread glaciation.

- Glacial deposits.** Sediments and rock fragments deposited after transport by ice.
- Gravel.** Sedimentary particles more than 2 millimetres in diameter.
- Gyre.** Water moving in a general circular path. Gyres may be stationary geographically (e.g., fixed over a bank or basin), or moving horizontally (e.g., Gulf Stream eddies).
- High-resolution seismic data.** *See* seismic profile.
- High-velocity jet.** Flow concentrated into a distinct current whose velocity is higher than that existing in the surrounding water.
- Hydrocarbon plays.** A group of prospects that favour the accumulation of oil or gas, having common geological characteristics, such as source rock, reservoir, trapping mechanism, structural history, etc.
- Infaua.** Animals living in the sediments of the seabed.
- Isostasy.** The tendency of the earth's crust to maintain a state of near equilibrium by virtue of the fact that the crust is "floating" on a denser substrate (the "mantle") so that loading (e.g., by ice or sediment) results in slow sinking, and offloading (e.g., by melting of ice or erosion) results in the slow rising (**isostatic recovery**).
- Magnetic anomalies.** Irregularities or deviations from the normal magnetic field above the earth's surface.
- Megaripples.** Seabed features resembling giant ripples that occur together in large numbers with a regular spacing. The megaripple crests are either straight or arcuate in plan, typically 0.1 to 1 metre high with a crest spacing of 1 to 20 metres. The crests are transverse to flow and migrate down current.
- Moraine.** The ridge-like dump of coarse debris formed at the edge of a glacier or ice sheet and remaining after the ice dissipates. Moraines are described in relation to their position of formation, hence **end moraine**, **medial moraine**, **lateral moraine**.
- Mud.** Popular name for sediment that is sticky when wet. Scientific usage is for sediment that is finer than sand (63 microns), consisting of silt and clay.
- Outwash.** Stratified glacial debris deposited by meltwater.
- Physiographic province.** An area of the earth's surface exhibiting similar geomorphological structures and features.
- Plankton.** A collective name for all the microscopic and small forms of floating or drifting plants and animals found at various depths in the ocean, including **phytoplankton** (unicellular plants) and **zooplankton** (animals) with relatively weak powers of locomotion.

- Reflection seismic survey.** A geophysical technique for probing the structures of concealed rock formations, analogous to "echo sounding" in navigation. An energy source at the surface sends shock waves in all directions and some of the energy is reflected back to the surface from layers of differing composition. An array of many microphones picks up the return signals at different points and measurement of the travel time locates the points of reflection. See also seismic reflection records.
- Salt dome.** *See* diapir.
- Sand.** Mineral or rock particles, coarser than silt and finer than gravel, ranging from 63 microns to 2 millimetres.
- Sand ridges.** Seabed ridge of sand that forms oblique or parallel to the dominant current, is typically 1 to 30 metres high and 700 to 8,000 metres in width, and can be up to 60 kilometres in length. Sand ridges often have sand waves or megaripples on their sides.
- Sand waves.** Rhythmic linear sand or gravel bodies on the seabed that have a "saw tooth" profile and are oriented transverse to the dominant current. They migrate down current and are characterized by the super-position of smaller megaripples. Most are 1 to 10 metres high and 20 to 200 metres from crest to crest.
- Sedimentary basin.** A feature in which sedimentary rock has accumulated in notable thickness. A somewhat circular or elliptical area in which subsurface strata dip toward a more or less central position and toward which the sedimentary layers commonly thicken.
- Sedimentary wedge.** The wedge-shaped deposit of sedimentary material derived from the adjoining landmass and building the continental shelf, slope and rise.
- Seismic reflection records.** A record of the energy recorded during a seismic survey, usually computer processed to remove noise and enhance primary energy.
- Shelf water.** Water overlying the continental shelf.
- Slope water.** Water with particular temperature-salinity characteristics and generally overlying the area above the continental slope between Cape Hatteras and the Grand Banks.
- Species.** A group of animals or plants (usually a subdivision of a genus) having certain common and permanent characteristics which clearly distinguish it from others.
- Stock.** Relatively discrete populations of given species.
- Tectonic features.** Geological structural features of the earth's crust.
- Temperature-salinity analysis.** Plotting temperature against salinity provides a means by which to identify and define different water masses.

**Till.** Glacially deposited rock débris and clay usually occurring in unstratified deposits.

**Topographic depression.** Area of the earth's surface lying lower than its surroundings.

**Upwelling.** Upward vertical motion of water, often induced by horizontal flow near coast lines on banks.

Volume II

A HISTORY OF THE CANADIAN FISHERIES  
IN THE GEORGES BANK AREA

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[Pages 1-9, 10 (paras. 13-14) not reproduced]

PART I. INTRODUCTION

CHAPTER II. THE ORIGINS OF THE CANADIAN DEEP-SEA AND NEARSHORE FISHERIES: THE EIGHTEENTH AND NINETEENTH CENTURIES

Section II. The Southwest Nova Scotia Fleet and the Georges Bank Fisheries in the Nineteenth Century

15. A student of the Nova Scotia fishery, writing in 1867, confirmed that offshore fisheries were being exploited by Yarmouth and Shelburne county vessels from central Georges Bank to Banquereau, and to the Gulf of St. Lawrence<sup>6</sup>. Describing the importance of the offshore banks to Nova Scotia fishermen, he wrote:

“From the first of April they continue cod-fishing on the various banks which extend from George’s Shoal to Bank Quereau, and in parts of the Bay of Fundy, until about the 10th of June . . . [when] they often proceed to the Gulf of St. Lawrence, and return home about the last of August<sup>7</sup>.”

The size of this fleet is revealed in the reports of the Commander of the Expedition for the Protection of the Fisheries in the Gulf of St. Lawrence. In 1859, Captain Pierre Fortin reported that each year in the Gulf there were some “. . . 250 to 350 fishing schooners from Nova Scotia, and . . . from 200 to 300 . . . from the United States<sup>8</sup> . . .”

16. This, then, was the compass of fishing activity to which vessels from southwest Nova Scotia ports — Yarmouth, Liverpool, Lunenburg, Lockeport, Argyle and Pubnico, among others — committed themselves in the nineteenth century from early spring to late fall. Some vessels of the fleet followed the classic pattern of the seasonal fishery, fishing from Georges Shoal to the Gulf of St. Lawrence. Others (the “home bankers”) directed their efforts primarily to the Cape Sable and southwestern grounds in the Gulf of Maine area.

17. This division is reflected in the large offshore fleets that sailed out of the old port of Pubnico. In 1884, for example, Pubnico’s fleet was composed, in part, of 21 vessels, fishing the Western, Banquereau and Grand banks. Another 30 vessels — the “home bankers”

<sup>5</sup> J. Wilson: “Fisheries.” Report to the Governor of New Brunswick, 17 December 1828, The New Brunswick Museum, D. R. Jack Papers, F1, item No. 12.

<sup>6</sup> T. F. Knight: *Shore And Deep Sea Fisheries Of Nova Scotia*. Halifax, A. Grant, 1867, pp. 5-7.

<sup>7</sup> T. F. Knight: *Shore And Deep Sea Fisheries Of Nova Scotia*, p. 2.

<sup>8</sup> “Annual Report of Pierre Fortin . . .”, *Report Of The Commissioner Of Crown Lands Of Canada, For The Year 1859*. Quebec, Thompson & Co., 1860, Appendix 33, p. 139.

known as the Cape fleet — fished offshore on Cape Sable and the southwestern grounds<sup>9</sup>: Roseway, LaHave, Browns and Georges banks. It was this Cape fleet to which the Collector of Customs and Surveyor of Shipping at Barrington was referring in 1869 when, in response to official enquiries about the fishery in Shelburne county, he wrote: "The greater part of the registered vessels do not fish on our shore grounds, but go to the banks off shore<sup>10</sup>." Vessels from the southwest Nova Scotia port of Westport on Brier Island in the Bay of Fundy also concentrated on the grounds of the Gulf of Maine area. In 1867, it was reported that the "red-tan sails" of the Westport fleet "... are seen from Mount Desert [island] to Cape Sable, and in all weathers<sup>11</sup>...". Both the vessels that followed the season's fisheries from the Gulf of Maine area to the Gulf of St. Lawrence, and the Cape fleet of "home bankers", fished the various grounds of the southwest Nova Scotia area, including Georges Bank, which Thomas Knight described in 1867 as "the most westwardly bank to which our fishermen repair<sup>12</sup>".

18. *The development of the southwestern fleet to a strength of 518 vessels — about 65 percent of Nova Scotia's offshore fleet<sup>13</sup> — in 1884 is reflected in the fisheries then being conducted out of Pubnico. In 1883, for example, more than 60 vessels were making weekly fishing trips from Pubnico to the grounds of the southwest banks and Gulf of Maine area<sup>14</sup>. One section of this fleet was the 20-vessel "flotte Acadienne de Pubnico", which two years later landed more than 1,600,000 cod and employed — in conjunction with its six *paquebots* — some 400 men<sup>15</sup>. The fleet of the tiny port of Tusket Wedge, which was known to have participated in the Georges Bank fisheries in these years, landed some \$50,000.00 worth of dried cod in the summer of 1887<sup>16</sup>.*

19. In the late 1860s or early 1870s, the southwestern fleet's dory schooners were trawling on Georges Bank<sup>17</sup>. Other groundfish expeditions were made to Georges Bank in the mid-1880s by vessels from Halifax, Clark's Harbour, Yarmouth and Tusket Wedge<sup>18</sup>. Yet other vessels

<sup>9</sup> *Liverpool Advance*, 7 May 1884, p. 2.

<sup>10</sup> D. Sargent: "Fifth Report Of The Select Committee On Fisheries, Navigation, etc." *Annual Report Of The Department of Marine and Fisheries, For The Year 1868*. Ottawa, Hunter, Rose & Co., 1869, p. 37.

<sup>11</sup> T. F. Knight: *Shore And Deep Sea Fisheries Of Nova Scotia*, p. 49.

<sup>12</sup> T. F. Knight: *Shore And Deep Sea Fisheries Of Nova Scotia*, p. 4.

<sup>13</sup> See Appendix I.

<sup>14</sup> Letter to the editor, *The Yarmouth Herald*, 10 March 1881, p. 2.

<sup>15</sup> *L'Evangeline*, 22 février 1888, p. 3.

<sup>16</sup> *L'Evangeline*, 25 janvier 1888, p. 2.

<sup>17</sup> *Documents and Proceedings of the Halifax Commission, 1877*. Testimony of James Purcell, British [Canadian] Witness No. 20. United States House of Representatives, 45th Congress, 2nd Session, Executive Document No. 89. Washington, Government Printing Office, 1878, Vol. I, p. 634. See also testimony of John Nicholson, British [Canadian] Witness No. 22, Vol. I, p. 645.

<sup>18</sup> *The Yarmouth Times*, 25 April 1885, p. 3; *The Yarmouth Herald*, 10 March 1886, p. 3; *Fifteenth Annual Report Of The Department Of Marine And Fisheries, Being For The Fiscal Year Ended 30th June, 1882*. Ottawa, MacLean, Roger & Co., 1883, Supplement No. 1, Appendix No. 2, p. 61.



of the southwestern fleet, from Lunenburg, LaHave, Port Medway, Lockeport, Shelburne, Barrington, Pubnico, Yarmouth and Digby, were engaged from the early 1860s to the early 1890s in the spring mackerel fishery, which was known to have exploited Georges Bank during this 30-year span<sup>19</sup>.

### Section III. Digby and the Rise of the Fresh and Winter Fisheries

20. The termination of the fishery clauses of the Treaty of Washington by the United States in 1885 had a decided impact on the established offshore fleets of southwest Nova Scotia, which was not reversed until the turn of the century. The southwestern fleet declined from 461 vessels in 1885 to 335 in 1891 [Appendix I] after the cancellation of the treaty provision that allowed Canadian salt cod to be marketed in the United States. Among the most severely affected were the "home banker" Cape fleet at Pubnico, Yarmouth and Lockeport, which for many years had been among the most active ports in supplying salt fish to markets in the United States. The fishermen of these and other smaller Yarmouth and Shelburne county ports either turned to fishing fresh lobster or "shipped" as crewmen aboard United States fishing schooners.

21. By virtue of the *modus vivendi* privileges granted to the United States by Britain in 1888<sup>20</sup>, United States schooners were able to trans-ship crews in the maritime ports of Canada. The small port of Sandy Point, near Shelburne, alone received 150 United States fishing schooners in 1893, seeking supplies, bait and crews<sup>21</sup>. The extent to which this last privilege became a means of supplying a major part of the New England fishery's requirements for skilled fishing crews and captains is revealed in the sombre figures of the Canadians lost from

<sup>19</sup> *Documents and Proceedings Of The Halifax Commission, 1877*. Testimony of John Nicholson, British [Canadian] Witness No. 22, Vol. I, p. 648; *The Morning Chronicle* (Halifax), 18 March 1892, p. 1; *The Yarmouth Times*, 12 May 1886, p. 3; *The Yarmouth Telegram*, 30 April 1886, p. 3; *The Yarmouth Herald*, 10 June 1885, p. 2; 11 June 1884, p. 2; *The Yarmouth Times*, 14 May 1884, p. 2; *The Yarmouth Herald*, 13 May 1885, p. 3; *The Yarmouth Times*, 16 April 1884, p. 3; 27 May 1885, p. 2; *Documents And Proceedings Of The Halifax Commission, 1877*, United States Affidavit No. 23, Harvey Knowlton & Edward A. Horton, Vol. III, p. 3061; United States Affidavit No. 29, Frederic Gerring, Vol. III, p. 3085; United States Affidavit No. 108, V. Doane Jr. & Co., Vol. III, p. 3178; United States Affidavit No. 79, I. H. Boardman, Vol. III, p. 3147. An attempt to revive the southern branch of this fishery by Canadians can be seen in the 1920 cruise of the *Helen G. McLean*. See *The Shelburne Gazette and Coast Guard*, 17 June 1920, p. 3; *Documents And Proceedings Of The Halifax Commission, 1877*, British [Canadian] Witness No. 77, Josiah Hopkins, Vol. I, p. 1044; G. B. Goode: *The Fisheries And Fishery Industries Of The United States*. Washington, Government Printing Office, 1887, Section V, Vol. I, p. 276; *The Yarmouth Times*, 4 July 1885, p. 2; G. B. Goode, J. W. Collins, R. E. Earl and A. H. Clark: *Materials For A History Of The Mackerel Fishery*, Washington, Government Printing Office, 1883, pp. 82-83.

<sup>20</sup> *Canadian Memorial, Annexes, I*, pp. 193-194, paras. 26-28.

<sup>21</sup> *Twenty-Sixth Annual Report of the Department of Marine and Fisheries, 1893*. Ottawa, S. E. Dawson, 1894, Appendix No. 3, pp. 66-70.

Gloucester vessels in the fifteen years after 1888 [Appendix II]. In 1891, the number of Canadians who lost their lives was more than 50 percent of the total Gloucester losses.

22. While Yarmouth and Shelburne county ports were experiencing a decline, two other southwest Nova Scotia ports were prospering as they began to concentrate in particular branches of the fishery. Lunenburg was fast becoming the major port in the salt cod fishery. At the same time, Digby began to concentrate on the fresh and winter fisheries. From early spring to mid-winter, the fishery focussed its efforts on the grounds of the Gulf of Maine and southwest Nova Scotia areas. It was often called the winter fishery because haddock — the chief species caught by the Digby fleet in these waters — was fished in the winter months. From 1885 to 1910, the Digby fleet and vessels from Yarmouth, Lockeport and Lunenburg fished the Gulf of Maine area and supplied the Boston and New York markets with fresh haddock, halibut and cod<sup>22</sup>. This fleet either shipped its catches by steamer from Yarmouth<sup>23</sup> or sent them direct to Boston in the holds of United States registered fishing vessels that Digby owners had purchased for this purpose<sup>24</sup>. The fish processors of Digby were also renowned in this period for their brands of finnan haddie (a mildly smoke-cured haddock), which were shipped to central and western Canada and to United States markets<sup>25</sup>. This closeness of the port to the major grounds of the Gulf of Maine area, including Georges Bank, where the best sources of haddock were to be found, was the chief reason for the Maritime Fish Corporation's decision to establish a plant in Digby in 1910<sup>26</sup>.

<sup>22</sup> *The Hustler* (Lockeport), 15 November 1895, p. 3; 5 March 1896, p. 3; *Liverpool Advance*, 21 September 1887, p. 2; 1 May 1912, p. 4; *Digby Record*, 10 February 1909, p. 1; *Gloucester Daily Times*, 25 September 1899, p. 4; 29 April 1903, p. 1; *Yarmouth Light*, 29 March 1894, p. 3; 2 May 1895, p. 3; *The Yarmouth Herald*, 29 October 1884, p. 2; 29 September 1891, p. 2; 15 October 1901, p. 2; *The Fishing Gazette*, 26 November 1898, p. 756; 8 July 1899, p. 420; 16 December 1899, p. 798; 24 March 1900, p. 179; 12 October 1900, p. 654; 10 November 1900, p. 707; 22 December 1900, p. 803; *The Yarmouth Telegram*, 15 December 1893, p. 3; 18 October 1901, p. 1; 25 October 1901, p. 1; 1 November 1901, p. 1; 8 November 1901, p. 1; 2 May 1902, p. 1; 23 May 1902, p. 1; 10 October 1902, p. 1; 11 December 1903, p. 1; 7 December 1906, p. 1; 22 May 1908, p. 3; 10 December 1909, p. 1.

<sup>23</sup> *Yarmouth Light*, 8 April 1897, p. 5; *The Yarmouth Telegram*, 7 December 1906, p. 1; 21 December 1906, p. 1; *Liverpool Advance*, 23 June 1886, p. 3.

<sup>24</sup> Letter from D. and O. Sproul, Wholesale Fish Merchants, to A. J. S. Copp, Member of Parliament, 10 March 1902. Public Archives of Canada, RG 23, Vol. 10, File 2; letter from D. and O. Sproul, Wholesale Fish Merchants, to Minister of Marine Fisheries of Canada, 14 November 1905. Public Archives of Canada, RG 23, Vol. 10, File 2; letter from D. Sproule & Co., Wholesale Fish Merchants, to Department of Naval Service, 12 March 1918. Public Archives of Canada, RG 23, Vol. 1296, File 728-4-4[6]; *The Digby Weekly Courier*, 17 March 1893, p. 3; 3 November 1893, p. 3; 4 October 1901, p. 2; 19 June 1903, p. 2; 21 January 1910, p. 2; *The Morning Chronicle* (Halifax), 14 April 1915, p. 8.

<sup>25</sup> *The Digby Weekly Courier*, 1 January 1892; *The Fishing Gazette*, 22 December 1900, p. 803; *The Digby Weekly Courier*, 2 February 1900, p. 1; *Canadian Fisherman*, Vol. III, No. 2, February 1916, pp. 38-39.

<sup>26</sup> R. M. Whynacht: "Maritime Fish Corporation." *Canadian Fisherman*, Vol. IX, No. 7, July 1922, p. 142.

23. As was noted above, the Digby halibut and haddock fleets often made their landings of fresh fish at Yarmouth; its convenient and regular steamship service to Boston was the most expedient way of delivering a valuable but highly perishable cargo. Yarmouth's strategic location helped prompt the revival of its offshore fishery after 1900, when Yarmouth schooners turned their attention to the winter haddock and spring halibut fisheries and were fishing with the Digby fleet<sup>27</sup>. A similar revival had occurred in Lockeport and Pubnico, and these and other ports in southwest Nova Scotia began to turn to the fresh and winter fisheries<sup>28</sup>.

24. As the Cape fleet based on the ports of Yarmouth and Shelburne counties declined after 1885, the focus of the saltfish fishery moved to Lunenburg while the fresh fish fishery shifted to Digby where it grew rapidly from the mid-1880s to 1910 and beyond. The fresh-fish or winter fishery was particularly dependent on the "home banks" of the southwest ports — the Gulf of Maine and southwest Nova Scotia areas — because these grounds were the best sources of haddock<sup>29</sup> and were close enough to the markets served by the fishery for this species (and for fresh halibut and cod) to allow for expedient delivery of its catches. By the end of the period, Digby was joined by other southwest Nova Scotia ports in the year-round exploitation of the fish stocks of the southwest Nova Scotia banks and the Gulf of Maine area.

[Para. 25 of p. 14 and pp. 15-138 not reproduced]

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<sup>27</sup> *The Fishing Gazette*, 24 June 1899, pp. 385 and 386; see also articles entitled "Marine and Shipping" featured in *The Digby Weekly Courier*, January-April, 1908-1909.

<sup>28</sup> *The Morning Chronicle* (Halifax), 8 April 1903. Public Archives of Canada, RG 23, Vol. 343, File 2981.

<sup>29</sup> G. B. Goode: *The Fisheries and Fishery Industries of the United States*, Section V, Vol. I, p. 234; S. F. Baird: "The Sea Fisheries Of Eastern North America." *Report of The Commissioner for 1886*. United States Commission Of Fish And Fisheries. Washington, Government Printing Office, 1889, Part XIV, pp. 87 and 91.

**Appendix I**

THE SOUTHWEST NOVA SCOTIA VESSEL AND BOAT FISHERIES: 1851-1910/11

*[Not reproduced]*

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**Appendix II**

CANADIAN FISHERMEN WHO SERVED ON UNITED STATES VESSELS AND LOST  
THEIR LIVES IN THE GLOUCESTER FISHERIES: 1891-1900 AND 1909-1916

*[Not reproduced]*

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**Glossary**

*[Not reproduced]*

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**Volume III**  
**STATE ACTIVITIES**

**PREFACE**

This Annex is submitted in support of Part II, Chapter VI of the Counter-Memorial Submitted by Canada. Chapter I of this volume deals with the Canadian regulatory system covering the disposition and administration of interests in offshore oil and gas. Chapter II describes Canada's activities with regard to the protection of the marine environment. Chapter III outlines the history of charting in the Gulf of Maine area. Chapter IV reviews Canada-United States cooperation in the defence of North America and the Gulf of Maine area in particular. Chapter V discusses Canadian aids to navigation in the same area. It is not intended to suggest that all the State activities described herein are legally relevant to the determination of the maritime boundary in the Gulf of Maine area. In particular, the object of Chapters III, IV and V is to correct and complete the record of State activities in the Gulf of Maine area as presented in the United States Memorial. All of the documents marked secret or confidential in this Annex have been placed in the public domain by a 1977 Canadian cabinet directive.

This Annex contains 604 pages in text and 52 appendices.

## CHAPTER I

### THE CANADIAN REGULATORY RÉGIME GOVERNING THE DISPOSITION AND ADMINISTRATION OF INTERESTS IN OIL AND GAS

#### Section I. Introduction

1. The following paragraphs outline the history of Canadian oil and gas exploration in the Gulf of Maine-Georges Bank area and explain the provisions of the Canadian regulatory régime respecting oil and gas exploration and exploitation on the continental shelf, with a brief comparison to that of the United States. This chapter will clarify misconceptions created by the United States Memorial, which does not fully report the developments in oil and gas exploration in the Gulf of Maine-Georges Bank area during the 1960s and does not refer to the activities of Canadian permittees and licensees in this area<sup>1</sup>.

#### Section II. History of Canadian Oil and Gas Exploration in the Gulf of Maine-Georges Bank Area

2. During the 1950s, following a surge of activity in oil and gas exploration and development in the Yukon and Northwest Territories, interest increased in the oil and gas potential of Canada's offshore regions. In 1960, pursuant to the *Territorial Lands Act* (1950)<sup>2</sup> and the *Public Lands Grants Act* (1950)<sup>3</sup>, Canada proclaimed the *Canada Oil and Gas Regulations*<sup>4</sup> to govern oil and gas exploration and development on all federal Crown lands that were not within provincial boundaries, including the seabed. These regulations governed the disposition of interests in oil and gas as well as the conduct of activities related to those interests. In 1961, the regulations were amended, primarily to divide those dealing with drilling for oil and gas from those dealing with the disposition and administration of interests in oil and gas. The former group of regulations became the *Canada Oil and Gas Drilling and Production Regulations*<sup>5</sup> whereas the latter became the *Canada Oil and Gas Land Regulations*<sup>6</sup>.

<sup>1</sup> Relevant sections of Canadian legislation referred to in this chapter are reproduced in Appendix 1 of this Volume. Relevant United States legislation is reproduced in Appendix 2 of this Volume.

<sup>2</sup> Statutes of Canada 1950, chap. 22, as amended in Revised Statutes of Canada 1970, chap. T-6, sec. 4. See Appendix 1, Document 1.

<sup>3</sup> Statutes of Canada 1950, chap. 19, as amended in Revised Statutes of Canada 1970, chap. P-29, sec. 4. See Appendix 1, Document 2.

<sup>4</sup> Order in Council P.C. 1960-474, 13 April 1960, published in *Canada Gazette*, Part II, Vol. 94, No. 9, 11 May 1960.

<sup>5</sup> Order in Council P.C. 1961-797, 6 June 1961, published in *Canada Gazette*, Part II, Vol. 95, No. 12, 28 June 1961, as amended by the *Canada Oil and Gas Drilling Regulations*, Order in Council P.C. 1979-25, 18 January 1979, published in *Canada Gazette*, Part II, Vol. 113, No. 3, 14 February 1979.

<sup>6</sup> Order in Council P.C. 1961-797, 6 June 1961, published in *Canada Gazette*, Part II, Vol. 95, No. 12, 28 June 1961. See Appendix 1, Document 3.

3. The regulatory régime established pursuant to the *Canada Oil and Gas Land Regulations* of 1961 governed the issuance by Canada of exploratory permits in the Gulf of Maine-Georges Bank area, commencing in 1964. Under this régime, Canada issued permits in this area up to a line of equidistance controlled by the nearest point of land on each coast, thereby creating exclusive, long-term, vested rights in the area. The 1961 regulations have not been revoked, but they have been amended gradually. In 1977, major amendments were made to provide new oil and gas rights to the industry, as well as to establish certain rights for the state-owned oil company<sup>7</sup>. In 1982, the *Canada Oil and Gas Act*<sup>8</sup> came into force, imposing more changes on the Canada oil and gas régime. Despite these alterations to the regulatory scheme, the exclusive rights created in the Gulf of Maine-Georges Bank area have been maintained.

### Section III. The Canadian Regulatory Régime

4. The following description of the Canadian regulatory régime for the exploration and exploitation of oil and gas is divided into three parts: Part A reviews the régime as it existed from 1961 to 1977; Part B describes the amendments made to the regulations in 1977; and Part C explains the new régime created under the 1982 *Canada Oil and Gas Act*.

#### A. THE CANADA OIL AND GAS LAND REGULATIONS: 1961-1977

5. The regulatory régime established as a result of Canada's 1961 regulations provided for three types of legal instruments dealing with the conduct of activities and interests in oil and gas — exploratory licences, exploratory permits, and oil and gas leases.

##### 1. Exploratory Licences

6. An exploratory licence, issued pursuant to section 24 of the regulations<sup>9</sup>, permitted a licensee to “enter upon and use the surface of any Canada lands [including those under permit or lease] in order to (a) make geological or geophysical examinations; (b) carry out aerial mapping; or (c) investigate the subsurface” (see section 26 of the regulations). (*Italics and bracket added.*) The licensee could, therefore, conduct extensive exploration activities, including drilling a shallow well to 1,000 feet (about 305 metres; see section 27 of the regulations), on any federal Crown lands outside provincial boundaries, and was not restricted to a particular tract of land on the continental shelf or otherwise. A licence did not deal with interests in oil and gas; it merely authorized the holder to conduct certain exploratory activities on all

<sup>7</sup> Order in Council P.C. 1977-2155, 28 July 1977, published in *Canada Gazette*, Part II, Vol. 111, No. 16, 24 August 1977 and Order in Council P.C. 1977-3160, 10 November 1977, published in *Canada Gazette*, Part II, Vol. 111, No. 22, 23 November 1977.

<sup>8</sup> Statutes of Canada 1980-81-82, chap. 81.

<sup>9</sup> The section numbers referred to in paragraphs 6 to 14 inclusive are those that appeared in the 1961 *Canada Oil and Gas Land Regulations*. See Appendix 1, Document 3.

Canadian lands (offshore and otherwise), without granting exclusive or proprietary rights over the lands. A licence was a prerequisite for any exploratory activity, although applications for licences by holders of permits or leases were mere formalities. Every licence expired on the thirty-first day of March next following the date of its issue (see section 24 of the regulations) and thereafter the licensee had no further rights. However, licences could be renewed without restriction.

7. Canada has issued exploratory licences authorizing extensive seismic, gravity and magnetometer exploration in the Gulf of Maine-Georges Bank area. From 1965 to the present day, Canadian licensees have spent millions of dollars on exploratory work to determine the areas conducive to production of oil or gas. These surveys cover several thousand kilometres of seabed in the Gulf of Maine-Georges Bank area<sup>10</sup> [Figures 1, 2 and 3].

## 2. Exploratory Permits

8. Unlike exploratory licences, exploratory *permits* conferred exclusive, long-term rights to a specific tract of land onshore or offshore. Exploratory permits were issued with respect to specified areas pursuant to sections 30 and 32 of the 1961 regulations, provided that those areas were not already under permit or lease and that the appropriate Minister was satisfied certain exploratory work would be carried out over those areas<sup>11</sup>.

9. Every permit was issued for a "grid area" or one-half of a grid area, quadrilaterals delimited by lines of latitude 10 minutes apart and lines of longitude 15 minutes apart, i.e., about 10 by 11 nautical miles (see sections 4 and 5 of the regulations). Each permit in the Gulf of Maine-Georges Bank area covers approximately 38,000 hectares. An exploratory permit gave the holder the exclusive right, subject to obtaining Canadian Government authority and taking out an exploratory licence, to drill an exploratory well more than 305 metres deep on the areas described in the permit. *The permit holder also had the exclusive right to obtain an oil and gas lease for the purposes of producing oil and gas for the area described in the permit* (see section 35 of the regulations).

10. Permits carried with them certain work requirements obliging the permittees to perform exploratory work over the areas described in the permit (see section 45 of the regulations). Work requirements increased progressively, reflecting the incremental nature of expenditures necessary to evaluate the area covered by the permit for drilling locations. Permittees would initially carry out relatively inexpensive

<sup>10</sup> See Appendix 3 for year-by-year illustrations of the surveys conducted in the Gulf of Maine-Georges Bank area from 1965 to 1979.

<sup>11</sup> Until 1966, the Minister of Northern Affairs and National Resources was responsible for offshore mineral resources. On 1 January 1966, the Governor General in Council transferred control and supervision of offshore mineral resources in the areas off the east and west coasts and the Hudson Bay-Hudson Strait region to the Minister of Mines and Technical Surveys. Later in 1966, the Department of Mines and Technical Surveys was renamed the Department of Energy, Mines and Resources.



reconnaissance work (such as aeromagnetic and seagravity surveys) which would be followed by more-expensive detailed geophysical studies, and only in the later stages of exploration would they conduct high-cost drilling operations. A permit for the offshore was valid for six years (see section 36 of the regulations) and could be renewed for a period of one year. The regulations provided for a maximum of six renewals (see section 38) plus a provision for further renewal upon Ministerial consent (see section 40).

11. In 1971, some of the Georges Bank permittees were about to enter a costly phase of exploration required by the regulations. They were reluctant to proceed with the imposed work programs, however, because the United States had reserved its rights in November 1969, in those areas designated in the permits. In order that permittees would not lose their resource rights for failure to meet the work requirements, the Government of Canada, upon the request of the permittees, relieved them from fulfilling further work requirements pending the settlement of the dispute. This was effected by issuing executive orders (called variation orders) pursuant to section 4 of the *Public Lands Grants Act* and section 4 of the *Territorial Lands Act*. These variations orders, which were issued in 1971 and thereafter as each of the Georges Bank permittees approached costly phases of exploration, had the following effects<sup>12</sup>.

- (a) they maintained the permittees' resource rights in the area designated in the permits;
- (b) they relieved the permittees from further work obligations imposed by the regulations;
- (c) they extended the life of each permit so that when the dispute is settled, each permittee would be in the same position as he was when his work program was suspended; and
- (d) upon the settlement of the dispute, each permittee would continue the work program imposed by the regulations as if there had been no interruption in time.

12. Since 1964, Canada has issued a large number of exploratory permits covering some 3 million hectares in the Gulf of Maine-Georges Bank area. The exploratory permits remain outstanding today [*Figure 4*].

### 3. Oil and Gas Leases

13. Permittees who met certain "Canadian participation" requirements were granted oil and gas leases upon application to the Minister (see section 55 of the regulations). A permittee could select up to 50 percent of the area described in the permit for inclusion in a lease (see section 56 of the regulations). A lessee who was the holder of an exploratory licence was empowered to carry out exploratory work and could apply to the Canadian Government for authority to drill deep wells in the area described in the lease. A lessee had the exclusive right to produce any oil, gas or related hydrocarbons from the region described

<sup>12</sup> See Appendix 4 for copies of the relevant variation orders.

therein (see section 59 of the regulations). The term of an oil and gas lease was 21 years (see section 62 of the regulations) and was renewable for successive terms of 21 years if the area under lease was capable of producing oil or gas (see section 63 of the regulations). Also, the lease was reissuable for a term of 21 years upon commencement of commercial exploitation (see section 64 of the regulations).

#### 4. Reporting Requirements

14. There is no support for the suggestion in the United States Memorial that the Canadian regulatory program for the exploration of the continental shelf, established as a result of the 1961 regulations, did not impose careful practices on its users<sup>13</sup>. In fact, the Canadian system ensured greater control over exploratory activity than did the United States system. In Canada, applicants were not only required to meet specified standards to qualify for permission to conduct exploration, but those authorized to do so had to make extensive reports to the Government during various phases of their work programs on the extent and results of their activities (see sections 52 to 54 of the regulations). Thus, the exploration of the continental shelf in the Gulf of Maine-Georges Bank area was carefully monitored to ensure compliance with regulatory requirements. In the United States, on the other hand, those authorized to do exploratory work were not similarly monitored by the United States Government. Prior to 1975, when exploratory work was simply authorized by letter from an official of the United States Department of the Interior, those authorized to perform exploratory work were merely required to inform certain government officials as to proposed work plans and location of the area to be surveyed. Extensive follow-up reporting, confirming detailed results of survey activities, was not required.

#### B. THE CANADA OIL AND GAS LAND REGULATIONS: 1977-1982

15. In August 1977, the regulations were amended primarily for the purpose of providing new oil and gas rights for the industry as well as establishing certain rights for the state-owned oil company. The amendments provided for new instruments, called "exploration agreements", which resembled the exploratory permits in the rights they conferred, but were valid for a period of up to 10 years and were renewable for a term, or terms, not exceeding 10 years in the aggregate. The significant difference between exploratory permits and exploration agreements, however, was that the terms and conditions of the latter instrument were negotiated rather than fixed by regulation (see section 30 of the regulations as amended in 1977)<sup>14</sup>.

16. There were no provisions in the amendments relating to the issuance of exploratory permits and thus no such permits could be issued after August 1977. However, permits already in existence when the amendments were made were not affected. Permittees could continue to

<sup>13</sup> *United States Memorial*, p. 63, para. 100.

<sup>14</sup> Appendix 1, Document 4.

conduct exploration (provided they had exploratory licences) and retained the exclusive option to obtain an oil and gas lease for the area designated in the permit (see sections 34 and 35 of the regulations as amended in 1977). Thus, the existing exploratory permits remained valid until they expired or were converted to leases. Similarly, permits that had been "frozen" pursuant to variation orders remained valid permits whose terms had been extended and whose work requirements had been suspended.

17. The issuance of oil and gas leases continued under the new regulations, but they were available to holders of exploration agreements as well as permittees (see section 54 of the regulations as amended in 1977). The regulations concerning exploratory licences did not change.

### C. THE 1982 CANADA OIL AND GAS ACT

18. The *Canada Oil and Gas Act* came into force on 5 March 1982, creating a new régime for the exploration and exploitation of oil and gas. However, this legislation does not revoke or replace the *Canada Oil and Gas Land Regulations*, unless they are inconsistent with it (see section 62 of the statute)<sup>15</sup>. Section 62 of this legislation provides that:

"All interests provided by the former regulations that are in force when this Act comes into force continue in force . . ."

until the holders of such interests acquire a succeeding interest under the new legislation. Thus the new legislation will gradually replace the old regulatory régime, as it provides for new interests that will succeed the rights that had accrued under the *Canada Oil and Gas Land Regulations*. In this way, accordingly, the rights that had accrued to the Georges Bank permittees will be maintained, despite the creation of a new oil and gas régime.

19. The new legislation provides that current permit holders may either negotiate an exploration agreement with the Minister (of Energy, Mines and Resources in the case of permits in the Gulf of Maine-Georges Bank area), or they may apply for a provisional lease. Negotiations were to take place by 5 September 1982, or within six months from the first anniversary date of the permit following 5 March 1982, whichever was later (see section 63 of the statute). Applications for provisional leases had to be submitted within the same time frame. All the Georges Bank permittees have opted for exploration agreements. Negotiations commenced in June 1982, and are continuing.

20. For the areas described therein, an exploration agreement, negotiated pursuant to the 1982 legislation, confers the right to explore for and the exclusive right to drill for oil or gas, the exclusive right to develop those areas to produce oil or gas, and the exclusive right to apply for a production licence (see section 9 of the statute). Section 27 of the legislation provides that a 25 percent share of the interests provided under the legislation shall be reserved to the Crown. Exploration

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<sup>15</sup> Appendix 1, Document 5.

agreements normally impose work requirements as well as a certain degree of Canadian participation, and may include specific reporting obligations (see section 10 of the statute). Exploration agreements currently under negotiation by the Georges Bank permittees will not impose work programs until the boundary issue has been settled. Hence, these permittees (soon to become holders of exploration agreements) will have all the rights associated with holding an exploration agreement, but will have none of the work obligations normally imposed thereunder. This will effectively replace the necessity of obtaining variation orders that were formerly required to keep the legal interests alive while suspending legal obligations.

21. A provisional lease confers the same rights as an exploration agreement, but it imposes higher rental payments and is for a fixed, non-renewable term of five years (see section 68 of the statute). Provisional leases do not include imposed work programs.

#### D. APPLICABILITY TO THE OFFSHORE

22. In discussing the Canadian regulatory régime for the development of the continental shelf, the United States Memorial is incorrect in saying that the statutory legislation authorizing the issuance of Canadian oil and gas permits applies "on its face only to onshore development"<sup>16</sup>. In fact, the *Public Lands Grants Act* applies to *all* lands and interests belonging to the Crown in right of Canada that are outside provincial boundaries, including lands of which the Government of Canada has the power to dispose, without distinction (see section 2 of that statute)<sup>17</sup>. The applicable regulations made under the authority of this legislation make it clear that the authority to grant permits extends to offshore as well as to onshore lands. Indeed, the expression "lands" is used in this legislation in much the same sense as it is in the title to the United States *Outer Continental Shelf Lands Act*<sup>18</sup>. The Canadian offshore regulations were approved for passage by the Canadian Department of Justice as being within the governing legislation, as required by the former *Regulations Act*<sup>19</sup>, and their applicability to offshore areas has never been questioned in the more than 20 years since they were first enacted, until the submission of the United States Memorial.

### Section IV. Comparison with the Oil and Gas Régime in the United States

#### A. THE UNITED STATES REGULATORY RÉGIME

23. The United States regulatory régime for the exploration and exploitation of the continental shelf was established pursuant to the

<sup>16</sup> *United States Memorial*, p. 63, para. 101.

<sup>17</sup> Appendix 1, Document 2.

<sup>18</sup> Chap. 345, 67 Statutes 462 (1953) codified at 43 United States Code secs. 1331-1343 (1976), as amended in 1978, 43 United States Code secs. 1331-1356 (1976, Supp. III).

<sup>19</sup> Revised Statutes of Canada 1970, chap. R-5. This statute was repealed in 1972 by the *Statutory Instruments Act*, Statutes of Canada 1970-71-72, chap. 38, sec. 34.

*Outer Continental Shelf Lands Act* (see section 11 of that statute)<sup>20</sup> and the regulations entitled *Mineral Deposits in the Outer Continental Shelf*<sup>21</sup>. This régime provides "notices" or "permits" for exploration as well as "leases" for the production of oil and gas. However, the United States offshore oil and gas regulatory régime is markedly different from the Canadian oil and gas régime.

24. Despite the potential confusion in terminology, there is no similarity between the Canadian exploratory permits that were issued for the Gulf of Maine-Georges Bank area and which are still outstanding, and the geophysical survey permits referred to in the United States Memorial<sup>22</sup>. The Canadian permits, first issued off the east coast in 1964, confer exclusive, long-term rights in respect of a specific tract of offshore land, with a potential for the right to produce oil and gas upon conversion to a lease at the option of the permittee. *The Canadian permits are, in practical effect, the equivalent of "leases" under United States legislation.* In fact, the United States permits are similar to Canadian licences, as distinguished from permits, in that both instruments confer temporary rights to conduct geophysical surveys. However, they are different in that Canadian licences cover all lands under federal jurisdiction that are outside provincial boundaries, whereas United States permits cover broad sections of the continental shelf designated in the permit.

25. The permits issued by Canada for the Gulf of Maine-Georges Bank area (which are now being converted into exploration agreements) differ fundamentally from the United States exploration permits referred to in the United States Memorial in the following ways:

- (a) The Canadian permits cover *specific tracts* of land, delimited by lines of longitude 15 minutes apart and lines of latitude 10 minutes apart (about 10 by 11 nautical miles in the Gulf of Maine-Georges Bank area). The United States survey permits pertain to vast areas covering hundreds of square kilometres of continental shelf;
- (b) The Canadian permits confer potential *resource rights* by securing to permittees the exclusive option to convert up to half the area covered by the permit to a long-term oil and gas lease. The United States permits confer no prospect of rights to resources and there are no exclusivity features to United States permits;
- (c) The Canadian permits issued for the Gulf of Maine-Georges Bank area will be succeeded under the new *Canada Oil and Gas Act* by new rights that will remain in effect for a term of several years. The United States permits, in contrast, are *temporary* instruments issued for a program that can be completed in a matter of months. The United States Memorial<sup>23</sup> shows that the work authorized under all

<sup>20</sup> Appendix 2, Document 1.

<sup>21</sup> 43 Code of Federal Regulations, Part 201 (1954, revised as of 1960, 1961) sec. 201.120. Appendix 2, Document 2.

<sup>22</sup> *United States Memorial*, p. 58, para. 93.

<sup>23</sup> *United States Memorial, Documentary Annexes*, Vol. II, Annex 40.

the permits listed has been completed, and these permits accordingly have no continuing validity.

- (d) The areas under Canadian permit are outlined on official maps that are available to the public. These maps have been available ever since they were issued in the early 1960s<sup>24</sup>. Also, the Canadian Government published a "Monthly Oil and Gas Report" announcing the issuance and location of all Canadian permits. The report was distributed to some 400 recipients during the mid-1960s, including the United States Embassy in Ottawa. This periodic oil and gas report is still published today, although in a different form<sup>25</sup>. The exploratory permits referred to by the United States are not correspondingly publicized.

#### B. UNITED STATES ACTIVITIES ON THE EAST COAST CONTINENTAL SHELF

26. The United States Memorial refers to a series of permits issued by the United States for geophysical surveys of extensive areas of the Atlantic continental shelf<sup>26</sup>. It alleges that extensive geophysical data has been collected under United States exploration permits in an undefined area referred to as "the northeastern part of Georges Bank". Copies of these permits were provided to Canada by the Agent of the United States under cover of a letter to the Registrar of the Court dated 20 January 1983. An examination of this documentation confirms that at least seven of the permits were for areas that do not appear to extend into areas claimed by Canada at the time the permit was issued (see permits E4-64, E3-67, E3-75, E6-75, E8-77, E9-77 and E12-78). Three other permits refer to areas that come very close to the demarcation line that may not, in fact, have covered areas within the portion of Georges Bank claimed by Canada at the time the permits were issued (see permits E1-65, E1-70 and E4-78). No specific information was provided as to the location of the survey area for five of the permits (see permits E1-66, E3-68, E4-69, E1-71 and E22-76).

27. Under the United States oil and gas régime, it was only through the purchase of tracts offered for lease that an individual or corporation could obtain the kind of vested rights in respect of lands that were conferred on Canadian permit holders during the 1960s. However, as stated in the United States Memorial, oil and gas leases for tracts on Georges Bank were first offered for sale in 1979, and none of those tracts covered areas claimed by Canada<sup>27</sup>. In fact, no such tracts have ever been offered for sale by the United States for that part of the Gulf of Maine-Georges Bank area claimed by Canada. The only instruments

<sup>24</sup> For an example of these maps see *Canadian Memorial, Annexes*, Vol. III, Annex 3.

<sup>25</sup> See Appendix 5 for a copy of the Canadian Government "Monthly Oil and Gas Report" for May 1964 announcing the issuance and location of Canadian oil and gas permits.

<sup>26</sup> *United States Memorial*, p. 58, para. 93.

<sup>27</sup> *United States Memorial*, p. 60, para. 97.

that conferred continental shelf rights in the disputed area were those issued by Canada.

### **Section V. Conclusion**

28. The foregoing description of the Canadian regulatory régime for the exploration and exploitation of the continental shelf has outlined in detail the régime under which Canadian permits for the exploration of the Gulf of Maine-Georges Bank area were issued, commencing in 1964. Canadian permit holders have not only acquired exclusive rights in the areas described in the permits, but these proprietary rights in the Gulf of Maine-Georges Bank area remain outstanding today. The United States oil and gas régime, on the other hand, has not created any existing rights in the Gulf of Maine-Georges Bank area claimed by Canada.

## CHAPTER II

### PROTECTION OF THE MARINE ENVIRONMENT

#### Section I. Introduction

29. The United States Memorial implies that compared to United States environmental protection legislation, Canada's environmental protection régime is inadequate<sup>1</sup>. These assertions are based upon a misguided understanding of Canadian legislation and the Canadian system. Canada has demonstrated in legislation and practice that its environmental protection régime is both efficient and comprehensive. The régime is based upon a system of checks and balances, operating objectively, and often independently of the Canadian Government. The régime is in accord with international conventions relating to the protection of the marine environment and reflects Canada's commitment to a safe and reliable policy. It reflects Canada's resolve, as a country with one of the longest and also one of the cleanest, coastlines in the world, to protect and preserve the marine environment.

30. Canada has traditionally assumed an active role in international efforts to protect the marine environment: Canada played a leading role in formulating the Stockholm Declaration on the Human Environment; in the drafting of sections dealing with marine protection in the Law of the Sea Convention; and in participating in the United Nation's Environment Programme to promote global understanding or conventions for the control of marine pollution from land-based sources. The following paragraphs describe the Canadian environmental protection régime and its implementation.

#### Section II. The Framework of the Canadian Environmental Protection Régime

31. The evolution of Canada's environmental protection legislation demonstrates its flexibility in adapting to the technological advances of the resource exploitation industry while maintaining its national, and indeed world-wide, concern for environmental protection. The Canadian record speaks for itself: in the course of the many seasons of exploratory drilling for hydrocarbons to date, there has never been an accident causing environmental damage. The explanation for this record of success lies in the thoroughness of Canadian legislative and regulatory requirements.

32. Offshore exploration for hydrocarbons began off Canada's Atlantic coast in the early 1960s. During the initial period of exploration, the responsibility for administering legislation pertaining to the protection of the marine environment lay with the Department of Northern Affairs and National Resources. In 1966, this responsibility was transferred to the newly-created Department of Energy, Mines and Resources. From the outset, the Department of Energy, Mines and

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<sup>1</sup> *United States Memorial*, p. 57, para. 91; p. 63, paras. 100-101.



Resources was actively concerned with the protection of the marine environment. For example, in 1970, owing to potential environmental hazards, the Department forbade a core-drilling program off Canada's east coast proposed by the Scripps Institute<sup>2</sup>. Today, the responsibilities for protection of the marine environment have been distributed amongst various departments of the Government of Canada. In particular, the responsibility for the regulation of offshore oil and gas activities in relation to the environment under the *Canada Oil and Gas Act*<sup>3</sup> and the *Oil and Gas Production and Conservation Act*<sup>4</sup>, has been assigned to the Canada Oil and Gas Lands Administration.

#### A. THE CANADA OIL AND GAS LANDS ADMINISTRATION

33. Canadian regulations impose stringent requirements directed specifically at the protection of the marine environment upon the industry. These regulations are enforced pursuant to the *Canada Oil and Gas Act* and the *Oil and Gas Production and Conservation Act*. The *Oil and Gas Production and Conservation Act*<sup>5</sup> empowers the Chief Conservation Officer to make orders for the commencement, continuation, increase, decrease, cessation or suspension of oil and gas production under specified conditions, as well as to take over the management and control of any work or activity where a spill has occurred. The Act also establishes the liability, without proof of fault or negligence, of the operator of the project for any environmental damage or loss caused by a spill.

34. The Canada Oil and Gas Lands Administration's role in protecting the environment is twofold<sup>6</sup>. *First*, its powers pursuant to the *Oil and Gas Production and Conservation Act* and regulations made thereunder, enable it to control and enforce the conditions upon which specific approvals are granted and to monitor closely the execution of approved projects. The statute and regulations contain extensive provisions for pollution prevention and for remedial measures if pollution occurs. It is expected that the new regulations covering geophysical surveys, production structures, pipelines, diving and production will further enhance the technical safety of oil and gas operations and reduce the risk to the surrounding environment.

35. *Secondly*, the Canada Oil and Gas Lands Administration has the power to include terms and conditions in an exploration agreement that specifically provide for additional environmental work or special protective measures.

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<sup>2</sup> Appendix 6.

<sup>3</sup> Statutes of Canada 1980-81-82, chap. 81. This Act was proclaimed in force on 5 March 1982.

<sup>4</sup> Revised Statutes of Canada 1970, chap. O-4, and Statutes of Canada, 1980-81-82, chap. 81.

<sup>5</sup> Appendix 7.

<sup>6</sup> Appendix 8.

36. The regulations reflect the system of checks and balances built into the Canadian environmental protection régime. For example, where an application for drilling program approval is made, the *Canada Oil and Gas Drilling Regulations*<sup>7</sup> require operators to submit contingency plans for potential emergencies, including oil spills, that could arise during the course of the program. The clearing house for discussion of these plans is the Resource Management Environmental Committee. This is an interdepartmental committee composed of representatives from the Department of the Environment, Department of Transport, the Department of Fisheries and Oceans, the Department of Indian Affairs and Northern Development, and the Department of Energy, Mines and Resources and is chaired by the Canada Oil and Gas Lands Administration. The Committee reflects a coordinated federal approach to fisheries and environmental concerns arising from offshore exploration and development. Should the committee deem that the contingency plan does not meet the necessary environmental protection requirements, the project will not receive drilling program approval.

37. Even as far back as 1969, the Canadian environmental protection régime was recognized for its strict regulations. Prior to the Santa Barbara oil spill, although the United States was leasing offshore areas, the United States system of environmental protection was known to be inadequate. There was agreement amongst knowledgeable industrial circles on this point. In reporting the Santa Barbara oil spill in 1969, the *Financial Post* concluded:

"If the unlucky U.S. oil company working off California's Santa Barbara coast had been drilling under Canadian regulations, there would in all probability have been no destructive leak. Federal supervision of offshore oil exploration and drilling is purposely and purposefully stringent<sup>8</sup>."

#### B. THE ROLE OF OTHER GOVERNMENT DEPARTMENTS

38. A number of other government departments have been delegated responsibilities relating to protection of the marine environment. The Department of Transport is responsible for marine protection under the *Canada Shipping Act*<sup>9</sup>, the *Navigable Waters Protection Act*<sup>10</sup>, the *Territorial Seas and Fishing Zones Act*<sup>11</sup> and the *Transportation of Dangerous Goods Act*<sup>12</sup>.

39. The primary function of the Department of the Environment in relation to offshore drilling has been to provide technical advice on environmental issues to operating departments including the Department

<sup>7</sup> Order in Council P.C. 1979-25, 18 January 1979, published in *Canada Gazette*, Part II, Vol. 113, No. 3, 14 February 1979. See Appendix 9, section 79.

<sup>8</sup> *The Financial Post*, 1 March 1969, pp. 3 and 6. See Appendix 10.

<sup>9</sup> Revised Statutes of Canada 1970, chap. S-9, as amended.

<sup>10</sup> Revised Statutes of Canada 1970, chap. N-19, as amended.

<sup>11</sup> Revised Statutes of Canada 1970, chap. T-7, as amended.

<sup>12</sup> *Statutes of Canada 1980-81-82*, chap. 36, as amended.

of Energy, Mines and Resources, the Department of Indian Affairs and Northern Development and, more recently, to the Canada Oil and Gas Lands Administration. However, its legal mandate<sup>13</sup> extends to all matters concerning the preservation and enhancement of the quality of the natural environment. The Department of the Environment also administers other legislation which directly or indirectly affects the protection of the marine environment including the *Canada Water Act*<sup>14</sup>, the *Environmental Contaminants Act*<sup>15</sup>, the *Clean Air Act*<sup>16</sup>, the *Migratory Birds Convention Act*<sup>17</sup> and the *Canada Wildlife Act*<sup>18</sup>.

40. Pursuant to the *Fisheries Act*<sup>19</sup>, the Department of the Environment, and the Department of Fisheries and Oceans, share certain responsibilities relating to the protection of the aquatic environment. The Department of Fisheries and Oceans administers section 31 of the Act, which is particularly concerned with protection of the fish habitat. The Department of the Environment administers section 33, which covers pollution control<sup>20</sup>.

41. Created in 1971, the Environmental Protection Service is responsible for dealing with environmental problems resulting from new developments, for the control of air and water pollution, and for protection of the environment against spills of oils and hazardous materials. Upon the separation of the Department of the Environment from the Department of Fisheries and Oceans, the Environmental Protection Service assumed responsibility for administering the pollution control provisions of section 33 of the *Fisheries Act*. To date, no incident has occurred in the Atlantic offshore area requiring invocation of the provisions for pollution control.

42. The Environmental Protection Service also administers the *Ocean Dumping Control Act*<sup>21</sup>. Under this Act, dumping at sea is regulated by a permit system and is applicable to a distance of 200 nautical miles offshore. No permits for ocean dumping have ever been issued for the Georges Bank area.

### C. THE ENVIRONMENTAL ASSESSMENT AND REVIEW PROCESS

43. The Government of Canada also draws upon the Environmental Assessment and Review Process for protection of the marine environment. The purpose of this Process is to determine the potential environ-

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<sup>13</sup> *Department of the Environment Act* established under the *Government Organization Act*: Revised Statutes of Canada 1970, chap. 14 (2nd Suppl.), as amended.

<sup>14</sup> Revised Statutes of Canada 1970, chap. 2 (1st Suppl.), as amended.

<sup>15</sup> Statutes of Canada 1974-75-76, chap. 72, as amended.

<sup>16</sup> Statutes of Canada 1970-71-72, chap. 47, as amended.

<sup>17</sup> Revised Statutes of Canada 1970, chap. M-12, as amended.

<sup>18</sup> Statutes of Canada 1973-74, chap. 21, as amended.

<sup>19</sup> Revised Statutes of Canada 1970, chap. F-14, as amended.

<sup>20</sup> Appendix 11.

<sup>21</sup> Statutes of Canada 1974-75-76, chap. 55, as amended.

mental effects of all federal projects, programs and activities in advance. The process was established by a cabinet decision in 1973 and a policy statement by the government in the House of Commons on 14 March 1974. It is administered by a special federal agency, the Federal Environmental Assessment Review Office, which reports direct to the Minister of the Environment.

44. The Environmental Assessment and Review Process applies not only to all federal government departments and agencies but also to extra-governmental projects that require federal financial participation, or access to and use of lands or waters under the jurisdiction of the federal government.

45. Although a majority of coastal provinces have legislation and procedures relating to the assessment and review of environmental impacts, offshore activities are subject to joint federal-provincial review.

46. Since 1974, in accordance with the basic tenets of the Environmental Assessment and Review Process, government agencies responsible for administering federal projects involving federal funds or property have been required to assess the effects on the environment of projects in their early planning stages before any commitments or irrevocable decisions are made. Projects in progress prior to 1974, have been reviewed in detail by technical agencies on a seasonal basis. These reviews have been supplemented by on-site inspections of the projects.

47. In the case of major offshore drilling projects proposed since 1974, the process has been fully implemented. The process requires the initiating government department, usually the Canada Oil and Gas Lands Administration or the Department of Energy, Mines and Resources, to prepare an initial environmental evaluation. The purpose of this preliminary evaluation is to determine whether the project could have significant environmental effects. The initial environmental evaluation includes a description of the project, a description of the current environment and resource use, an outline of the potential environmental impact, proposals to mitigate or prevent the anticipated effect on the environment and an examination of alternate means of accomplishing the project.

48. The Department of the Environment advises the responsible operating agencies of the government on the means of conducting an initial environmental evaluation. To facilitate this advisory service, the Department of the Environment has established special committees known as Regional Screening and Coordinating Committees. Also, the Federal Environmental Assessment Review Office and the Environmental Protection Service have developed a *Guide for Environmental Screening* to assist departments in preparing evaluations.

49. If, as a result of the initial environmental evaluation, the initiating department concludes that a proposed project is likely to have a deleterious effect on the environment, the project is referred to the Minister of the Environment for review by an Environmental Assessment and Review panel.

### *1. The Environmental Assessment and Review Panels*

50. An Environmental Assessment and Review panel, usually consists of three to six members and operates independently of the Canadian Government. Although the panel reports to the Minister of the Environment, the latter does not direct its work, much less its conclusions. In keeping with its independent and impartial character, all panel members are required to make a declaration demonstrating the absence of conflict of interest with the project under review. The uniqueness of the Environmental Assessment and Review panel does not end here, for each panel is specially composed to meet the requirements of the proposed project. Panel members usually possess a special knowledge, expertise or technical competence that enables them to fully comprehend the scope of the proposed project.

51. The panel reviews, although framed by administrative procedure, are conducted on a relatively informal basis to encourage and facilitate maximum public participation. The focus of the review is the Environmental Impact Statement prepared by the agency or corporation proposing to undertake the project (the "proponent"). Guidelines on the content of the Environmental Impact Statement are issued by the panel. Unlike those set by the United States in its review process, these are specific guidelines designed to take account of all the distinctive environmental characteristics of the area in question.

52. Following its completion, the Environmental Impact Statement undergoes a detailed review that includes public hearings conducted by the panel. The panel, after gathering the relevant evidence, submits a report that summarizes the issues, sets forth its conclusions and makes specific recommendations for change and control or cancellation of the project to the Minister of the Environment. The recommendations are transmitted through the Minister of the Environment to the Minister responsible for the project.

53. To date, virtually all recommendations submitted by such panels have been accepted and implemented by the Canadian Government. The 1979 Lancaster Sound Panel Report has resulted in a moratorium on drilling for hydrocarbons. The review of the South Davis Strait Project, conducted by the Eastern Arctic Offshore Drilling Environmental Assessment Panel, resulted in substantial alterations to the proposal in order to encompass the environmental concerns for the region. It has become customary for all major offshore drilling projects to be referred to the Federal Environmental Assessment and Review Office. The assessment of the Mobil Oil Canada Ltd. "Venture" Gas Development in the Sable Island area will take place through the Department of Energy, Mines and Resources. The review panel appointed for this project will be chaired jointly by representatives of the Government of Canada and the Province of Nova Scotia in compliance with the Canada-Nova Scotia Agreement on Offshore Oil and Gas Resource Management and Revenue Sharing. The agreement also makes provision for the establishment of a joint fisheries advisory committee to ensure the protection of the fish habitat and environment.

### Section III. Canada's Tradition and Practice in Protecting the Marine Environment

#### A. THE NORTH

54. Canada has demonstrated that it is committed to a tradition of protecting the marine environment. One can look to Canada's north, where oil and gas activity began, as a case study in orderly development. *The following paragraphs explain Canada's actions in protecting the northern environment and its effective response to one of the most hostile environments in the world.*

55. Canada's resolve to maintain a pollution-free Arctic was enshrined in the *Arctic Waters Pollution Prevention Act*<sup>22</sup>. The primary objective of the Act is to protect the delicate ecological balance of the Canadian Arctic.

56. In Canada's North, the Environmental Assessment and Review Process has been fully used and implemented. Regional environmental studies and Environmental Impact Statements were prepared for the Davis Strait, Lancaster Sound and Beaufort Sea projects. Despite promising geological information in Lancaster Sound, exploration has been completely halted, due to potential hazards to the environment, pending further review by the Environmental Assessment and Review panel. The Southern Davis Strait Project was granted approval after substantial revisions to the planned drilling program which took account of the environmental concerns identified by the Environmental Assessment and Review panel.

57. In the case of the Beaufort Sea Project, cabinet approval for the project, in 1973, was contingent upon the fulfillment of two conditions: *first*, that drilling would not commence before 1976; and *secondly*, that the project would be subject to the findings of the Environmental Assessment and Review Process, which is presently under way. On 8 March 1983, the Beaufort Sea Environmental Assessment and Review panel issued a "deficiency statement" requiring the proponents Dome Petroleum Limited, Esso Resources Canada Limited and Gulf Canada Resources Incorporated to revise their seven-volume Environmental Impact Statement. The panel decision halts public hearings on the Beaufort Sea Project until the proponents properly address the environmental issues, and provide more information on the implications of the project for wildlife, the potential of oil spills and proposed clean-up measures and the social effect of development on the northern regions<sup>23</sup>. The Environmental Assessment and Review Process has also been invoked for the Arctic Pilot Project, which proposes the extraction and liquification of natural gas on Melville Island and its shipment by ice-breaking tanker to a terminus on Canada's east coast. In addition, in 1977, the Department of the Environment initiated the \$7.5 million Arctic Marine Oilspill Program to develop measures with which to counter oil spills in ice-infested waters.

<sup>22</sup> Revised Statutes of Canada 1970, chap. 2 (1st Suppl.), as amended.

<sup>23</sup> Appendix 12.

## B. THE ATLANTIC REGION

### *1. The Environmental Assessment and Review Process in the Atlantic Region*

58. The tradition established in the Canadian North indicates the way in which Canada intends to proceed when such development occurs off the east coast. Indeed, the review process has already begun with the Offshore Labrador Environmental Study Program. In addition, environmental overviews are being prepared for the Grand Banks, Labrador Sea and the Scotian Shelf.

59. Full-scale environmental assessments are scheduled for the "Venture" gas development off Sable Island<sup>24</sup>, and the "Hibernia" oil development off Grand Banks. The Department of Energy, Mines and Resources, having conducted initial environmental evaluations, has referred these projects to the Federal Environmental Assessment and Review Office for review by independent panels. Both panels have been formed and, having issued specific guidelines, are awaiting production of Environmental Impact Statements by the proponent, Mobil Oil Canada Ltd.

### *2. The Baseline Studies Program and Other Studies*

60. Prior to 1979, the Department of the Environment routinely collected "baseline" (i.e., basic data) information including data on weather, ice, air quality, water quality, streamflow, tides, forestry resources, ecological land units and migratory birds (including seabirds).

61. In 1979, the Department of the Environment set up the Baseline Studies Program — an ongoing program with a mandate to undertake mapping of ecologically sensitive areas, studies of seabird colonies, collection of climatological statistics and studies of icebergs, wind and sea. The department has undertaken other studies addressing the need to protect the marine environment off the East Coast. These studies have focused primarily on the requirement to develop procedures for containment and clean-up in the event of an oil spill. With this object in mind, sensitivity maps including data on the patterns of oil-slick dispersal and movements of ice and wind have been drawn up. These activities have resulted in the development of the Canada-United States Coast Guard Marine Pollution Contingency Plan signed by Canada and the United States in June 1974; and the Joint Canada-Denmark Marine Pollution Contingency Plan.

62. In responding quickly and providing advice to the states involved in the *Arrow*, *Argo Merchant* and *Kurdistan* cases (all of which involved the spills of large amounts of oil from a tanker), Canada demonstrated its competence to deal with the crises and hazards presented by oil spills to the marine environment.

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<sup>24</sup> Appendix 13.

63. In 1970, the *Arrow* went down in Chedabucto Bay, Nova Scotia, releasing 6,810,000 litres of bunker oil. The chronic effects of this spill were extensively researched and monitored by Canadian authorities. In the fall of 1976, the *Argo Merchant* went aground off Nantucket releasing thousands of metric tons of oil. The danger of oil pollution to Canadian waters was enhanced by southerly prevailing winds, indeed there were reports of oil seen in the Georges Bank area. Patrols from the Department of National Defence and the Department of the Environment mounted constant surveillance missions for evidence of damage to seabirds. In March 1979, the British tanker *Kurdistan* split in half, some 80 kilometres northeast of Sydney, Nova Scotia, releasing 7,000 metric tons of oil into Cabot Strait. The Department of the Environment advised on appropriate means of handling the crisis which included salvage of part of the ship and the safe disposal of the remains.

#### Section IV. Conclusion

64. Although the Canadian environmental protection régime may not be as complex as that of the United States, it has proven itself to be effective and in some ways superior to the system used by the United States. The fact is that, during the period between the enactment of the *Outer Continental Shelf Lands Act*<sup>25</sup> in 1953 and the Santa Barbara Channel Oil Spill in 1969, the United States environmental protection régime was barely operative. The early situation has been summarized in a United States Congressional report as follows:

“Between the passage of the Outer Continental Shelf Lands Act and 1968, the Interior Department conducted 23 OCS oil and gas lease sales. A total of 1,417 tracts covering 6,411,626 acres were sold for purposes of exploration and development.

Essentially the OCS process was subject to little national scrutiny, although localized impact, particularly in the coastal States bordering the Gulf of Mexico, was the subject of some concern.

A major change occurred when an OCS drilling project in the Santa Barbara Channel was the scene of a major blowout in January 1969. The resulting oil spill damage to the ecology of the Channel raised the OCS issue to national attention<sup>26</sup>.”

65. Although the United States régime was much improved by legislative amendments during the 1970s, there is no evidence to suggest that, today, it is more effective than its Canadian counterpart. In any event, the basic environmental objectives of Canada and the United States are not only similar but also compatible. Both countries have already cooperated fruitfully in developing measures for protection of the marine environment. They have agreed on an East Coast Oil Spill Contingency Plan and — with the International Joint Commission

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<sup>25</sup> *United States Outer Continental Shelf Lands Act* of 1953, chap. 345, 67 Statutes 462 (1953) codified at 43 United States Code secs. 1331-1343 (1976).

<sup>26</sup> Report by the Ad Hoc Committee on the *Outer Continental Shelf Lands Act* Amendments of 1977, H.R. Rep. No. 590, 95th Congress, 1st sess. (1977), reprinted in 1978 *U.S. Cong. & Ad. News* 1450, 1481. Also see Appendix 14.



established under the *Boundary Waters Treaty of 1909* — on a broad range of environmental issues including the water quality of the Great Lakes. These achievements are clear indications that Canada and the United States have similar aims and concerns that provide a solid foundation for cooperative action in protecting the marine environment.

66. In summary, Canada has enacted a substantial body of legislation delegating responsibility for environmental protection to various government departments. These responsibilities complement each other and fit into a system of checks and balances to ensure that no aspect is missed. The planning of oil and gas operations on the Canadian offshore requires careful consideration of the physical environment's effects on operations as well as the potential impact of the operation on the physical, biological and socioeconomic environments. It is important to ensure that such effects are determined in advance, so that preventive action can be taken. The purpose of the system is to ensure that oil and gas operations are subject to environmentally strict but reasonable conditions and that surveillance occurs at all stages of activity.

67. The Environmental Assessment and Review Process complements the regulatory approvals and controls administered by the Canada Oil and Gas Lands Administration on a day-to-day basis. Canada's tradition in the North, one of the most fragile ecological régimes of the world, is clear evidence of its commitment to environmental protection. The special risks of spillage in the production and transportation of hydrocarbons in the marine environment, the fragility of the ecological system and the desire to protect this environment adequately, are the *raison d'être* for Canadian legislation in setting up a régime that, to date, has not failed to achieve its objective.

## CHAPTER III

### CHARTING THE GULF OF MAINE AREA

#### Section I. Introduction

68. Charting the Atlantic coast of North America began during the first centuries of settlement by the colonial powers of Europe — principally Great Britain, France and Holland. In the Gulf of Maine area, Great Britain dominated this activity. From as early as 1717, for example, British naval officers charted the coasts of Nova Scotia and New England from Cape Breton to Long Island. In 1776, Joseph Des-Barres — a remarkable Nova Scotia hydrographer and statesman — published the first scientific surveys of the Gulf of Maine area. After its establishment in 1797, the British Hydrographic Office conducted charting work in the Gulf of Maine area on behalf of Nova Scotia and New Brunswick, and, after 1867, on behalf of Canada. It stationed senior hydrographers in Saint John, New Brunswick, and Halifax, Nova Scotia, many of whom became prominent colonial figures. Their work was of a quality and reliability unmatched by United States hydrographers until the second half of the nineteenth century.

69. The United States Memorial is wrong, therefore, in suggesting that only the United States Government assumed responsibility for charting the Gulf of Maine<sup>1</sup>. In fact, in addition to the work undertaken by Great Britain in the eighteenth century, the British Hydrographic Office led new developments in cartography in this area for much of the nineteenth century. For example, it issued the first chart to show bathymetric contours of Georges Bank in 1834<sup>2</sup>. This chart was produced on the basis of hydrographic work undertaken from Nova Scotia and New Brunswick. It has been updated until modern times and was the official chart used by Canadian fishermen and military navigators on Georges Bank throughout the nineteenth and twentieth centuries until, in 1968, the Canadian Hydrographic Service published Chart 4003 (referred to in the Special Agreement) which is based on the successors of the original 1834 chart.

70. Since its founding in 1904, the Canadian Hydrographic Service has dedicated most of its resources to the charting of previously unknown waters in the Arctic and to the improvement of charts of Atlantic and Pacific coastal waters, including those of the Gulf of Maine area. Nevertheless, the historical record outlined in this chapter shows that Canada, and, prior to 1867, the colonies of Nova Scotia and New Brunswick, have contributed in both colonial and modern times to the surveying and charting of the Gulf of Maine area, including Georges Bank.

<sup>1</sup> *United States Memorial*, p. 67, para. 109.

<sup>2</sup> Thus, contrary to the claim made in the United States Memorial, the 1844 Edmund Blunt chart was not the first to show bathymetric contours of Georges Bank. In fact, United States hydrography generally lagged behind new developments in surveying and mapping until the last half of the nineteenth century. *United States Memorial*, p. 67, para. 108.

## Section II. Charting During the Seventeenth and Eighteenth Centuries

### A. CHARTING BEFORE SOUTHACK

71. The Gulf of Maine area won notoriety among early navigators and cartographers not only because of the dangerous shoal waters on western Georges Bank and Nantucket Shoals, but also because of the force of the tides flowing into and out of the Bay of Fundy. These hazards were rendered even more dangerous by the rudimentary techniques of navigation that existed during the first two centuries of North American settlement. Longitude could not be measured at sea, so mariners sailed to the latitude of the port of destination, and then cautiously approached the coast from far offshore, using a sounding lead to feel the rise of a bank or shoal in time to avert disaster. This was made easier if chart makers could indicate banks and shoals as accurately as possible.

72. Georges Bank, therefore, first appeared on the so-called Velasco Map<sup>3</sup>, drawn sometime around 1610. Contrary to the suggestion in the United States Memorial<sup>4</sup>, Georges Bank was most often perceived in the early charts of the Gulf of Maine area, as an offshore bank, lying either between, or slightly seaward of, the opposite coasts of Nova Scotia and Massachusetts. The Velasco Map illustrates the perceived proximity of Georges Bank to southwest Nova Scotia. The William Alexander Map<sup>5</sup> (*circa* 1623) also depicts Georges Bank separated from Nantucket Shoals to the south and from Browns Bank to the north. It shows Georges Bank as lying mid-way between Nova Scotia and Massachusetts. This map, named after the first governor of Nova Scotia, is remarkably accurate for its day and reflects the symmetry of the opposite coasts in the Gulf of Maine area. In 1677, John Thornton issued a chart in London depicting the juxtaposition of New Scotland and New England<sup>6</sup>. It is interesting to note the prominent representation of the Bay of Fundy on this chart and the depiction of Georges Bank as stretching from Cape Sable to an area seaward to and separate from Cape Cod and Nantucket Shoals. The Herman Moll Map<sup>7</sup>, issued in London in 1715, also depicts Georges Bank stretching from Cape Sable to the vicinity of the Great South Channel, which separates it from Nantucket Shoals. The Henry Popple Map<sup>8</sup>, dating from 1733, more accurately depicts Georges Bank as a detached offshore bank separated from the banks to its north and south by channels. This view of Georges Bank frequently reappeared in French, Dutch and British charts throughout the eighteenth century.

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<sup>3</sup> Appendix 15.

<sup>4</sup> The United States Memorial inaccurately defines Georges Bank as connected across the Great South Channel to Nantucket Shoals. *United States Memorial*, p. 23, paras. 32-33.

<sup>5</sup> Appendix 16.

<sup>6</sup> Appendix 17.

<sup>7</sup> Appendix 18.

<sup>8</sup> Appendix 19.

## B. CHARTING BY SOUTHACK AND DESBARRES

### 1. *The Southack Charts*

73. In 1717, Captain Cyprian Southack, a Royal Navy officer, published a chart of parts of the coasts of New Brunswick, Nova Scotia and New England<sup>9</sup>. By 1734, Southack had published the *New England Coasting Pilot*, which included improved versions of his chart extending from Long Island to Cape Breton in Nova Scotia. As an officer, Southack's career was as closely connected to Nova Scotia as to New England. The United States Memorial is misleading, in referring only to his New England connection<sup>10</sup>. Apparently Southack navigated entirely by compass, lead-line and log-line so that — although his charts display the coast in considerable detail — they are not accurate. Such “dead reckoning” navigation would give poor results in the Gulf of Maine area because of the strong tidal currents, especially in the Bay of Fundy. Georges Bank, however, is depicted as lying mid-way between, and seaward of, Cape Sable and Cape Cod. The Great South Channel — called on Southack's charts the South Channel — is clearly indicated as separating Georges Bank from the Nantucket Shoals. Southack's charts identify the Gulf of Maine as the “Sea of Nova Scotia” and the “Sea of New England”, which meet over “St. Georges Bank”. The United States Memorial is wrong, therefore, in saying that the Gulf of Maine is labelled the Sea of New England in Southack's chart<sup>11</sup>.

### 2. *The DesBarres Charts*

74. In 1776, Nova Scotia's Joseph DesBarres (1721-1824) published a chart entitled *The Coast of New England*. Although this chart was surveyed and drawn for the Royal Navy, DesBarres was allowed to publish it privately as a bonus for his work. It represents the first scientific survey of the Gulf of Maine, including Georges Bank, and was a vast improvement on the work of Southack. DesBarres was a trained surveyor and could take astronomic observations to obtain geographic positions. By 1769, he had completed charts of Sable Island, the eastern coast of Nova Scotia, Chedabucto Bay, Richmond Island and the Gut of Canso. His major work was the *Atlantic Neptune*, which was published in 1777, 1780, 1781 and 1784. It consisted of five books: Book I, “Coast and Harbours of Nova Scotia”; Book II, “Coast and Harbours of New England”; Book III, “Charts of the Saint Lawrence”; Book IV, “Coast of North America South of New York”; and Book V, “Various Views of the North American Coast<sup>12</sup>”. In 1778, DesBarres published a book of sailing directions entitled *Nautical Remarks and Observations on the Coast and Harbours of Nova Scotia*. The *Atlantic Neptune* was so reliable that it was still quoted as the source of some of the features on

<sup>9</sup> The Southack chart is reproduced in the *United States Memorial, Documentary Annexes*, Vol. II, Annex 23.

<sup>10</sup> *United States Memorial*, p. 64, para. 105.

<sup>11</sup> *United States Memorial, Documentary Annexes*, Vol. II, Annex 23.

<sup>12</sup> Appendix 20.

charts drawn almost 100 years after it first appeared<sup>13</sup>. DesBarres' contribution to the charting of the Gulf of Maine area remained unmatched for more than 30 years until the British Hydrographic Office undertook new surveys of the area in the 1830s on behalf of Nova Scotia and New Brunswick.

75. DesBarres was born in 1721, probably either in Paris or in Basle, but as a young man he moved to England and entered the British service<sup>14</sup>. In 1752 and 1753, he attended the Royal Military Academy at Woolwich, near London, and in 1756, he was commissioned in the Royal American Regiment. He began charting in Canada during the winter of 1758, when he worked on large-scale charts of the Saint Lawrence River. After the fall of Québec, he worked on maps of the city and vicinity. He moved to Nova Scotia in 1764, and obtained a commission from the Admiralty to make charts of the waters off Nova Scotia. He became a major landowner and public figure in Nova Scotia and New Brunswick and, in 1784, he was appointed governor of Cape Breton. In 1805, at the age of 83, he was appointed lieutenant-governor of what is now the Canadian Maritime Province of Prince Edward Island, where he died in 1824 at the age of 103.

### C. CHARTING AT THE END OF THE EIGHTEENTH CENTURY

76. The United Kingdom established the British Hydrographic Office on 12 August 1795. Previously, British charts had been issued in a haphazard manner, and surveys had tended to be semi-official in character despite the fact that those engaged in such work — for example, Southack and DesBarres — were employed and paid by the Admiralty. After 1795, the British Hydrographic Office became responsible for the provision of charts for Great Britain and its colonies, such as Nova Scotia and New Brunswick. This enormous task required data from all reliable sources. The Hydrographer of the Navy enlisted the services of all sailing masters of the Royal Navy to obtain information with which to augment or amend existing charts. The result was that British charts gradually increased in number and improved in authority, and a reliable system was established for keeping them up to date. Publishers of private charts continued to operate, however, and were given free access to the data and publications of the British Hydrographic Office.

77. In contrast, for many years after American independence in 1776, the only charts produced in the United States were from the drawing offices of private publishers. American publishers had access to the British Hydrographic Office surveys, as did their British counterparts. It was the policy of the Hydrographic Office to improve the availability of reliable charts without regard to their national origins. However, United States publishers issued unreliable charts of the Gulf of Maine area even

<sup>13</sup> During the 1830s and 1840s, the United States private chart publisher, Edmund Blunt, frequently referred to DesBarres' work in his correspondence with Admiral Beaufort of the British Hydrographic Office. Appendix 21.

<sup>14</sup> G. N. Evans: *Uncommon Obdurate, The Several Public Careers of J. F. W. DesBarres*. Toronto, University of Toronto Press, 1969.

after the DesBarres charts were generally available. In 1797, the publishing house of Edmund Blunt issued the chart by Captain Paul Pinkham referred to in the United States Memorial, entitled *A Chart of Georges Bank*<sup>15</sup>. It is in error by almost a full degree of longitude. Such an error in field astronomy — almost 50 nautical miles — was unusual by that time, and the chart would have been highly dangerous for use by anyone approaching Georges Bank from the open sea. (In the 1790s, junior surveyors of the Hudson's Bay Company were taking observations for longitude in western Canada to within a probable error of less than 9 kilometres.) The earlier Southack charts were drawn before these new techniques were available, but DesBarres' surveys made in the 1770s, more than 20 years before the Pinkham Chart, were significantly more reliable. Pinkham may have used a local datum from which to calculate longitude, but this would not render the chart any safer to mariners unfamiliar with its convention. His publisher, Edmund Blunt, corresponded regularly with Admiral Beaufort of the British Hydrographic Office and therefore should have been aware that techniques for measuring longitude existed<sup>16</sup>.

78. A comparison of the longitude of Cape Cod on the Pinkham and British charts of that date indicates the gravity of Pinkham's error. Cape Cod is traversed by longitude 70°W, not 69°W as on the Pinkham Chart. The Aaron Arrowsmith Chart<sup>17</sup>, published in London three years after the Pinkham Chart, was much more reliable. It is entitled *A Chart of Part of North America from Cape Hatteras to Cape Canso* and credits the new information it contains to the surveys of Captain Vinicombe-Penrose of the Royal Navy, conducted between 1795 and 1798. A note on the chart indicates that lunar distance tables were used to check the chronometers used on the survey. Pinkham either did not check the readings he took for his chart, or did not know of the existence of lunar distance tables.

### Section III. The Nineteenth Century

#### A. CHARTING BY HURD AND LOCKWOOD

79. By the beginning of the nineteenth century, the captains of the new, larger sailing ships were aware of flaws even in the charts of the Gulf of Maine area produced by British hydrographers. Through new position-fixing techniques, they were able to plot their position at sea within a probable accuracy of about ten nautical miles. This advance was useless, however, without equally precise charts. The British Hydrographic Office, therefore, assigned Captain Thomas Hurd of the Royal Navy to survey the entrance to the Bay of Fundy as a start in the general improvement of the charting of the Gulf of Maine area. Hurd's work was hampered at first by the Napoleonic Wars and then was interrupted completely by the War of 1812, during which all available

<sup>15</sup> *United States Memorial*, p. 65, Figure 12.

<sup>16</sup> Appendix 21.

<sup>17</sup> Appendix 22.

resources in British North America were devoted to repelling the American invasion of Canada.

80. In the spring of 1816, Anthony Lockwood, who lived in Nova Scotia and was a senior hydrographer in the British service, resumed the work. Lockwood's efforts resulted in a greatly improved set of large-scale charts and sailing directions for the entire Nova Scotia and New Brunswick coasts, including Georges Bank. The Nova Scotia shore was depicted on 12 charts. Lockwood's survey of the Bay of Fundy and the south coast of New Brunswick was covered on a two-sheet chart published in 1824, entitled *A Chart of Grand Manan, Passamaquody Bay etc. in the Bay of Fundy, principally taken from a survey by Captain Thomas Hurd RN with corrections by Anty Lockwood, Master RN and Surveyor General of New Brunswick*. In 1824, the British Admiralty also issued a chart based on Hurd's survey entitled *A Chart of the Bay of Fundy*<sup>18</sup>. It, and a chart entitled *A Chart of Part of the Coast of Nova Scotia*<sup>19</sup> issued in 1829 and based on Lockwood's surveys, illustrate the high degree of proficiency obtained by Nova Scotia and New Brunswick hydrographers. The soundings are well indicated and sailing directions are included on the face of the charts.

#### B. THE USE OF CHARTS BY FISHERMEN

81. There is no doubt that the Lockwood charts and sailing directions assisted fishermen working on the various banks in the Gulf of Maine area. Fishermen relied on the compass and lead-line as their main instruments for navigation that, together with their inborn ability to estimate hull-speed, were adequate for sailing to the fishing banks in the Gulf of Maine area. However, they did need good coastal charts with which to run for shelter in the case of sudden storms, and this was exactly what the Hurd and Lockwood charts and sailing directions provided<sup>20</sup>. Early hydrographers concentrated on the near-shore navigational hazards for this reason. In colonial Canada, they surveyed harbour approaches and the entrance to the Bay of Fundy, known for its strong tides. In the United States, they charted the shoal areas in the vicinity of the Great South Channel approaches to Boston Harbour. Deep-sea charts of offshore areas such as Georges Bank, did not appear until after the near-shore work was sufficient to ensure safe navigation in these more dangerous waters. And it was the British Hydrographic Office, using hydrographers based in Nova Scotia and New Brunswick, that issued the first authoritative chart of Georges Bank.

#### C. SHEET V AND ITS SUCCESSORS

82. In 1832, Admiral Beaufort, Director of the British Hydrographic Office, decided to publish five small-scale deep-sea charts of the

<sup>18</sup> Appendix 23.

<sup>19</sup> Appendix 24.

<sup>20</sup> Appendix 25.

coastal waters from Newfoundland to New York entitled *North America, East Coast*. The first edition of the most southerly of these, Sheet V<sup>21</sup>, appeared in 1834 following the survey work of the *HMS Blossom* and using the earlier work of Lockwood, Hurd and DesBarres. It is now considered to be the first modern chart of the Gulf of Maine area, including Georges Bank, for its design broke with the past. Gone were the long and relatively useless compass direction lines that were a feature on older charts such as those produced by Pinkham and published by Blunt in the United States. Those lines purported to give mariners bearings but actually did little more than clutter up the face of the chart. In their place, submarine contours appeared for the first time, drawn with a dot-and-dash coding that allowed navigators to see at a glance the depth indicated by the contour. This contouring system is still in use today on the charts produced by Canada, the United Kingdom and the United States.

83. Sheet V was updated periodically following its initial publication, and was reissued with corrections in 1838 and given the number 268. A third edition appeared in 1849 and, in 1861, a new chart was issued combining 268 and 257, a chart of more northerly waters. The new chart was given the number 2670 and the name *Halifax to the Delaware*<sup>22</sup>, and was reissued with corrections in May 1862, December 1863, November 1864 and August 1872. The August 1872 version was reissued with small corrections in November 1872, February, April, June, July and August 1873. In 1895, a new edition appeared. Major corrections were added in January 1908, April 1913, October 1917, January 1928, December 1932, April 1935, October 1937, December 1942, April 1944, April 1955, October 1966 and April 1974. Another new edition was published in March 1976, with major corrections added in February 1981. Thus, right through to modern times, the British Hydrographic Office has reissued and updated Sheet V and its successors, largely on the basis of the work of hydrographers who were, or became, Canadian residents<sup>23</sup>. Indeed, Sheet V has been widely used by civil and military navigators throughout Canadian history. In every respect, it can be considered not only the most authoritative chart of the Gulf of Maine area — unequalled by United States charts until the late nineteenth century — but also the official Canadian chart of the Gulf of Maine area, including Georges Bank, until the Canadian Hydrographic Service issued Chart 4003 in 1968. The British Hydrographic Office remained the Hydrographic Service of Canada until 1904, when the Canadian Hydrographic Service was established, and even after that date its charts continued to have an official status in Canada.

84. The discovery of Cultivator Shoal on western Georges Bank is an interesting example of the British Hydrographic Office's expertise

<sup>21</sup> Appendix 26 reproduces Sheet V from the *North America, East Coast* series and shows the extent of British charting in the Gulf of Maine area in 1834 carried out on behalf of Nova Scotia and New Brunswick.

<sup>22</sup> Appendix 27.

<sup>23</sup> In the last half of the nineteenth century, the British Hydrographic Office also exchanged data with the United States Coast Survey for the *North America, East Coast* series, particularly for the waters south of the Gulf of Maine area.



and its efficient system for keeping the *North America, East Coast* series up-to-date. The location of the shoal was suspected for many years before it was surveyed, and on an early version of Sheet V it was called "Clarkes Bank (position doubtful)". Because it normally has 6 metres of water over it, Cultivator Shoal was not a danger to shipping until larger ships began navigating in the Gulf of Maine area in the nineteenth century. In 1865, an American ship hit the shoal *en route* from Liverpool to New York. In June 1865, the United States sent a ship to find and survey this hazard, and the United States Navy issued a small chart showing the shoal and giving its position. By August 1865 — within two months of that survey — the British Hydrographic Office took steps to show Cultivator Shoal as a correction to Chart 2670, and by 1867 it was depicted on a new edition of the chart. By contrast, the United States Coast Survey (the American equivalent to the British Hydrographic Office) had no such system for up-dating charts, and consequently Cultivator Shoal was not shown on its charts until 1873, eight years after its discovery and appearance on British charts.

#### D. THE SURVEYS OF OWEN AND SHORTLAND

85. Although the Lockwood charts of the coastline of Nova Scotia and New Brunswick were an improvement on the DesBarres charts, they were not equal to those being issued by the Hydrographic Office for the British Isles. Thus, Captain William Fitzwilliam Owen, a senior hydrographer in the British service who was a resident and prominent public figure in what is now Canada, proposed a new survey of the Gulf of Maine area. In 1838, Owen was elected to the legislative assembly of New Brunswick and became a cabinet minister. He corresponded with Admiral Beaufort of the British Hydrographic Office to initiate the survey<sup>24</sup>, and in October 1842, succeeded in having the hydrographic ship *Columbia* assigned to the work. The British Hydrographic Office also established a permanent hydrographic station in Saint John, New Brunswick. This was the beginning of a surveying enterprise that was to continue in the Gulf of Maine area for the next 25 years. Owen, however, because of his age, was soon succeeded in 1847 by P. Frederick Shortland, who in turn was replaced by A. P. Scott in 1865. Scott finished the survey in 1867, the year New Brunswick and Nova Scotia, together with Ontario and Québec, formed the Canadian federation.

#### E. THE UNITED STATES COAST SURVEY

86. The United States was slow to organize its own equivalent to the British Hydrographic Office. A false start was made in 1816, but funds lasted only one year<sup>25</sup>. Thus, the United States Memorial is

<sup>24</sup> Appendix 28.

<sup>25</sup> *Centennial Celebration of the United States Coast and Geodetic Survey, April 5 and 6, 1916*. U.S. Coast and Geodetic Survey, Department of Commerce. Washington, Government Printing Office, 1916.

misleading in suggesting that the United States has had a permanent equivalent to the British Hydrographic Office since Thomas Jefferson merely proposed such an "agency" in 1807<sup>26</sup>. In fact, it was not until 1832 that the United States Coast Survey was permanently established. Its first superintendent, F. R. Hassler, was an excellent geodesist but an inexperienced hydrographer. He installed a coastal triangulation system before work was started on chart publication. Because of this concentration on onshore surveying, the Survey did not publish its first chart until 1844. Its early charting program gave priority to the harbours and approaches to New York and Philadelphia, then the major United States harbours in the Gulf of Maine. In 1851, large-scale charts were published for Boston and Nantucket harbours. A small-scale chart (1:200,000) was also drawn of Nantucket Shoals, but little work was done on offshore areas. Indeed, the first United States chart that approximated the coverage of the British Sheet V in the Gulf of Maine area was published in 1858, but its soundings did not extend east of longitude 68°W toward the western extremity of Georges Bank<sup>27</sup>. The chart itself extends 2° further east, but this area was left blank despite the fact that Georges Shoal, the most dangerous impediment to navigation in the Gulf of Maine area, is located there. It was not until 1864 that the United States Coast Survey issued its first chart of the whole of Georges Bank. The 1834 British Sheet V — and its successors — was therefore the only official general navigational chart depicting the dangerous Georges Shoal for more than 30 years.

#### Section IV. Private Chart Publishers in the Nineteenth Century

87. Throughout the nineteenth century, private chart publishers borrowed from government agencies for the production and sale of charts. Admiral Beaufort of the British Hydrographic Office willingly helped both British and American chart publishers. In 1835, he explained his policy to the Lords Commissioners of the Admiralty, when he stated:

*"The true object of all Government Surveys is the general benefit of all mariners, and not merely the improvement of Charts for HM ships.*

*I have therefore always freely imparted every species of information to every seaman, pilot or chart maker who has applied for it with permission to use it in any way towards any way he pleased; and I presume that their Lordships will readily comply with (this) request<sup>28</sup>."*

This policy accounts for the quick appearance of private charts after the publication of official charts carrying new information. For example, the invaluable British Sheet V, which gave an excellent depiction of the

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<sup>26</sup> *United States Memorial*, p. 70, para. 121.

<sup>27</sup> Appendix 29.

<sup>28</sup> United Kingdom, Hydrographic Office, *Extracts 1831-1837*, p. 190. Taunton, Hydrographic Office, 1835.

Gulf of Maine in 1834, was quickly followed by a much larger chart published in London in 1835 by J. W. Norie, entitled *Coast of North America From Cape Canso to Halifax and from thence to Philadelphia*<sup>29</sup>. United States chart makers also adopted the new style of charting introduced by the *North America, East Coast* series, especially the British Sheet V of the Gulf of Maine area.

### Section V. The Twentieth-Century Charting of the Gulf of Maine Area

88. By the first decade of the twentieth century, the Gulf of Maine area had been completely surveyed. All banks, shoals and reefs covered by less than 20 metres of water had been carefully charted. Throughout the Gulf, enough soundings had been taken to delineate the underwater terrain with enough accuracy for navigation. The British Hydrographic Office disseminated this information throughout the world, and, as a result, France, Germany and other countries published charts of the Gulf.

89. In 1904, Canada took over responsibility from the British Hydrographic Office for charting the waters off its shores; and by 1911, the Canadian Hydrographic Service was conducting most of this work. Canada, however, has the longest coastline in the world and most of it still remained uncharted in 1911. Thus the Canadian Hydrographic Service did not immediately publish its own charts of the offshore areas that were already adequately surveyed. Excellent British-Canadian charts already existed for the Gulf of Maine area and they retained their official status in Canada even after 1904. Moreover, two world wars stretched the Canadian Hydrographic Service's resources to the breaking point. After World War II, all possible efforts were made to survey the Arctic Ocean. As a result, it was not until 1968 that the Canadian Hydrographic Service issued Chart 4003 of the central Gulf of Maine area<sup>30</sup>. Its *raison d'être* was to provide seamen with a small-scale chart coordinated in symbols, colours, sounding patterns, etc., with the large-scale charts of harbour approaches already published by the Canadian Hydrographic Service, and so facilitate the changeover from deep-sea to harbour charts<sup>31</sup>. Chart 4003 is in every respect the successor of the original 1834 British-Canadian Sheet V of the Gulf of Maine area. The United States Memorial<sup>32</sup> is misleading, therefore, in suggesting that no Canadian chart of the Gulf of Maine existed before 1968. Besides preparing the numerous large-scale charts of harbour approaches, Canadian and colonial hydrographers in the British service — Southack, DesBarres, Hurd, Lockwood and Owen — contributed at every step to the modern charting history of the Gulf of Maine area, including Georges Bank.

<sup>29</sup> Appendix 30.

<sup>30</sup> Chart 4003 was deposited with the Registrar of the Court with the *Canadian Memorial* on 27 September 1981.

<sup>31</sup> The Canadian Hydrographic Service also issued a fisheries chart, Chart 8005, to assist fishermen on Georges Bank. This chart has been deposited with the Registrar of the Court.

<sup>32</sup> *United States Memorial*, p. 68, para. 113.

## Section VI. Thematic Maps and Charts of the Gulf of Maine Area

90. In 1920, Canada published a map that shows the distances from Canadian and United States ports to the fishing areas on Georges and other banks<sup>33</sup>. This map, which illustrates the proximity of Georges Bank to Canadian fishing ports, was reprinted with some changes in 1932. The Canadian Royal Commission investigating the fisheries of the Maritime Provinces published a similar chart of the principal fishing grounds off the Atlantic coast of Canada in 1928<sup>34</sup>. And, in 1929, the British publisher, Albert Close, issued a chart entitled *The Fishermen's and Yachtsmen's Chart, Cape Cod to Newfoundland*<sup>35</sup>. It was printed in Canada by the Mortimer Company, and contained data from "the Fisheries Departments of the U.S., Canadian and French Govts". In 1936, another version of the chart was published under the title *Close's Haddock, Cod and Halibut Chart of the Gulf of St Lawrence, Banks of Nova Scotia and Newfoundland*. This latter chart contains even more information on the bottom conditions of Georges Bank, gathered from Nova Scotia, Newfoundland and Gloucester skippers. The Close Chart was reprinted in 1950. The Canadian Hydrographic Service has also commenced publication of a series of natural resources maps of the seabed of Canada's continental shelf, including the Gulf of Maine area<sup>36</sup>. Several maps have been issued for the Gulf of Maine area covering Georges Bank.

## Section VII. Conclusion

91. During the eighteenth and nineteenth centuries, the Royal Navy and the British Hydrographic Office — on behalf of the British Empire, including Canada — completely charted the Gulf of Maine area, and produced the first reliable charts of the navigational hazards on Georges Bank. From the first half of the nineteenth century, the British Hydrographic Office used professional hydrographers in Nova Scotia and New Brunswick to carry out its responsibility for charting the Canadian coast and its offshore waters.

92. In 1834, the British Hydrographic Office issued the first chart of Georges Bank using modern symbolization — Sheet V in the *North America, East Coast* series. More than 30 years passed before the United States issued an equivalent chart in 1864. The British Hydrographic Office — acting on behalf of Canada — maintained an establishment at Saint John, New Brunswick, from 1842 until 1867, and issued revisions of Sheet V periodically through 1981. It also provided hydrographic services for all of Canada until 1904, and thereafter Canada continued to use existing British charts for civil and military navigation. Despite pressing needs to survey frontier areas in the Arctic and elsewhere, the Canadian Hydrographic Service issued two deep-sea charts of the Gulf of Maine area and Georges Bank in the 1960s, as well

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<sup>33</sup> Appendix 31.

<sup>34</sup> Appendix 32.

<sup>35</sup> Appendix 33.

<sup>36</sup> Appendix 34.

as numerous large-scale charts of coastal approaches and harbours of New Brunswick and Nova Scotia from as early as the 1920s.

93. In the United States, official charting virtually started from scratch in 1832. It was *not* until 1864 that official government deep-sea charts of the Gulf of Maine were published. Furthermore, the United States charts were beneficiaries, to some extent, of the British-Canadian charts that had gone before. Even though the United States Coast Survey made new soundings in the Gulf of Maine between 1857 and 1873, its work merely elaborated that done for the British-Canadian Sheet V and its successors. In sum, Canada — in its own right and through Great Britain acting on behalf of Canada — has made major contributions to charting the Gulf of Maine area from the time of earliest colonial settlement in North America to the present.

## CHAPTER IV

### COOPERATION IN DEFENCE

#### Section I. Introduction

94. Canada and the United States have cooperated in the defence of North America since becoming allies during World War II. In carrying out their commitment to joint defence, the two countries have divided the continent and its adjacent waters into numerous zones, areas and regions. The common feature of all these divisions has been the allocation of defence responsibilities between the two countries solely on the basis of operational considerations. In no instance during the history of defence cooperation between Canada and the United States has the allocation of operational control been motivated by considerations of sovereignty or sovereign rights. In fact, Canadian and United States military authorities cooperated as equals during World War II. They regularly made decisions or allocated responsibilities that in peacetime would be decided only after debate by political authorities. They were motivated by the desire to defeat a common enemy through the most efficient use of available resources, and it is unreasonable now to invest their actions with legal or political significance. Nevertheless, history records that Canada has played a major role in the defence of the northwest Atlantic, including the Gulf of Maine-Georges Bank area.

95. Thus, from 1939 to 1945, Canada's contribution to the war far exceeded the limited role described in the United States Memorial<sup>1</sup>. In fact, Canadian vessels and aircraft were engaged in operations throughout the North Atlantic and the Caribbean during the war. The United States also operated in the North Atlantic from the summer of 1941. The Pacific war, however, diverted so much of its naval strength that it was short of vessels in the Atlantic. In April 1943, therefore, the United States relinquished all responsibility for trade convoys on the northern routes between North America and Europe. Canadian and British vessels took on sole responsibility for trade convoys between North America and the United Kingdom, and frequently crossed the Gulf of Maine and Georges Bank. Canadian aircraft based in Yarmouth, Nova Scotia regularly patrolled this area, providing coverage of shipping on Georges Bank. Canada was also responsible for providing "situation reports" of enemy presence in the area north of latitude 40°N and west of longitude 32°W, which includes all of the Gulf of Maine area.

96. After the war, the pattern of cooperation established by Canadian and United States military authorities from 1941 to 1945 continued. Today, under the aegis of NATO, Canada still conducts anti-submarine patrols in the northwest Atlantic, including parts of the Gulf of Maine area. Canada and the United States are parties to the North American Air Defence Agreement (NORAD), which has established a unified structure of command covering the entire continent, including coastal waters. The establishment of defence zones has been without

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<sup>1</sup> *United States Memorial*, pp. 73-74, paras. 131-132.

regard to considerations of sovereignty, and indeed several NORAD operational zones cut across national boundaries. During international crises, Canadian and United States military authorities have extended this type of cooperation and have coordinated plans for the defence of the continent. Canada, for instance, patrolled the Gulf of Maine-Georges Bank area during the international missile crisis in 1962. Thus, the defence arrangements of Canada and the United States since World War II have been based solely on the operational requirements of allied military forces, and provide no indication of either country's territorial or jurisdictional aspirations. This practice of cooperation belies the allegation of the United States Memorial that the United States has alone contributed to the defence in the Gulf of Maine area.

## Section II. World War II

97. Canada and the United States became formal allies during World War II, when they issued the Ogdensburg Declaration in August 1940<sup>2</sup>. Although Canada had entered the conflict in 1939, the United States remained uninvolved until the end of 1941, principally because of opposition to the war in the United States Congress. The agreement committed each country to the joint defence of North America in the event of an attack or invasion by a foreign power.

98. The Ogdensburg Declaration established a Canada-United States Permanent Joint Board on Defence to "consider in the broad sense the defence of the north half of the Western Hemisphere". The jurisdiction of the board permitted joint action by Canadian and United States forces in the Pacific and Atlantic oceans. It drafted a joint defence plan — Basic Defence Plan 1 — that provided for full consultation between Canada and the United States on matters of war policy<sup>4</sup>. The plan allocated tasks and responsibilities between forces should the situation arise that the United Kingdom fell to the Axis Powers. According to an official historian of the United States Department of Defense, Colonel Stanley W. Dziuban, the division of responsibility was "not inhibited by considerations of national sovereignty or by historic U.S. and Canadian psychological attitudes"<sup>5</sup>. Canada, for example, agreed to control shipping in the North Atlantic, as the Royal Canadian Navy had already handled this task since 1939. Canada also agreed to conduct air patrols in the approaches to Newfoundland, the Maritime Provinces and Québec. The United States proposed to defend the sea approaches to its territory. These operational responsibilities were obviously intended to overlap and for this reason, the plan did not divide command authority (as distinct from operational authority). This was left to the military members of the Permanent Joint Board on Defence. On 15 April 1941, the Canadian service members of the board accepted an American proposal that command would be vested with the Chief of Staff of the

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<sup>2</sup> Appendix 35, Documents 1 and 2, and Appendix 36.

<sup>3</sup> Appendix 35, Document 1.

<sup>4</sup> Appendix 37, Document 1.

<sup>5</sup> Appendix 38.

United States Army, but only in the event of an attack on North America and subject to prior consultation with the Canadian Chief of Staff<sup>6</sup>. Their agreement illustrates that questions of national sovereignty had no relevance under the threat of an attack on North America.

99. The negotiation of Basic Defence Plan 1 was complicated, however, by the fact that the Permanent Joint Board on Defence was *working simultaneously on a second plan intended to meet the situation in which Canada and the United States would be partners in war to defeat the Axis Powers and not merely to defend North America from enemy attack*. This was known as Basic Defence Plan 2 or ABC-22, and led to the most serious differences of opinion between Canada and the United States during the war years. Canada's pre-eminent military historian, C. P. Stacey, writes:

"The American view, naturally enough, was that Canada should, as part of the new plan, concede the strategic direction of her forces to the United States in the same manner as the service members had agreed should apply to Plan No. 1. As put forward by the U.S. service members, the draft of ABC-22 provided for American strategic direction of all forces in Newfoundland, the Maritime Provinces, the Gaspé peninsula and British Columbia. Although the Canadians apparently were not told, the American intention was evidently to incorporate these areas into the United States Northeast and Western Defence Commands. The Defence Commands would of course be commanded by American officers, although under them the Maritime and British Columbia areas would be commanded by Canadian officers, as would Newfoundland until such time as United States forces there outnumbered Canadian forces. Canadian strategic control of naval forces would be limited to 'coastal and inshore patrol vessels and aircraft in the inshore waters of Canada and Newfoundland'. This was particularly resented by the Royal Canadian Navy, which made the points, among others, that it would not be able to move a vessel from one coast to the other without U.S. authority, and that the British Admiralty had always recognized that Canada possessed strategic control in her coastal areas<sup>7</sup>."

100. The Canadian section of the Permanent Joint Board on Defence, and the political authorities to whom it reported, were not at first willing to accept the American proposals for Basic Defence Plan 2. However, the Cabinet War Committee in Ottawa finally approved a revised plan on 15 October 1941, after several months of negotiations. Although Basic Defence Plan 2 still provided for unity of command if circumstances required, it added the proviso that the assignment of an area to one country could not be construed as restricting the forces of the other country from extending operations into that area<sup>8</sup>. Thus, the revised plan did not limit Canadian operations in any manner. Moreover, considering its proposal to incorporate the Maritime Provinces and Newfoundland into the United States Northeast Command, the United

<sup>6</sup> Appendix 37, Document 1.

<sup>7</sup> Appendix 37, Document 1.

<sup>8</sup> Appendix 37, Document 1.



States clearly did not view the defence zones that could be established under Basic Plan 2 to be expressions of a dominant national interest in the Gulf of Maine area or elsewhere.

101. During much of 1941, Canada and the United Kingdom defended the North Atlantic sea-lanes without American assistance. But after September 1941, an Anglo-American agreement gave the United States a more active role in selecting the routes for trade convoys in the western Atlantic. In early 1942, however, a submarine offensive on the eastern seaboard of North America resulted in such a loss of shipping that it became necessary for Canadian vessels to escort convoys between Boston and Halifax. To direct the routes and diversions of these convoys, the United States proposed using the so-called "CHOP" line — illustrated in the United States Memorial<sup>9</sup> — to forecast the time at which ships would change from the operational control of Canadian naval authorities in Halifax to United States authorities in New York. The "CHOP" line was little more than a point at which ships would change radio frequency from one operational authority to another for the purpose of receiving routing directions, weather forecasts, etc. It was not a change of command line, and it did not in any way restrict the movement of naval vessels from either country. The United States Navy did not have enough vessels at that time to escort convoys off its own Atlantic coast, let alone off Nova Scotia on the western side of the "CHOP" line. Consequently, escort groups of Canadian and British warships based in Halifax provided the protection for merchant shipping between Halifax and Boston from March until September 1942, and these convoys travelled across the Gulf of Maine. Canadian vessels also escorted convoys between Halifax and New York, traversing the Gulf of Maine area, and between New York and the United Kingdom, passing close to the Nova Scotia coast. Each of these convoys crossed Georges Bank *en route*. Canada also deployed eight vessels to protect convoys between Halifax and the Caribbean that frequently crossed the Gulf of Maine area<sup>10</sup>.

102. At no time during the war did the Canadian convoy escorts or aircraft report to United States authorities upon crossing the "CHOP" line, or when entering the United States "coastal zone". "Coastal zones" and the Gulf of Maine "CHOP" line were insignificant features of the war effort, and the Battle of the Atlantic was characterized by broad cooperation and joint defence effort on the part of Canada, the United States and the United Kingdom. Thus, the United States Memorial is in error in claiming that the United States "took responsibility" for the control and routing of ships crossing the Atlantic with war supplies for United Kingdom on the western side of the "CHOP" line "from 1940 to 1945"<sup>11</sup>. Furthermore, the "CHOP" line illustrated in the United States Memorial was in effect only after June 1942 — not from 1940 to 1945. It was never used as a "division of

<sup>9</sup> *United States Memorial*, p. 77, Figure 13.

<sup>10</sup> Appendix 39, Documents 1 to 3.

<sup>11</sup> *United States Memorial*, pp. 73-74, paras. 131-132.

defense responsibility", contrary to the assertion of the United States Memorial<sup>12</sup>.

103. From early 1942, Canada was responsible for reporting enemy shipping activity north of latitude 40°N and west of longitude 32°W<sup>13</sup>. All of the Gulf of Maine and Georges Bank was in the Canadian area although the United States also surveyed enemy activity in this area. Efficient control of the convoys demanded this extension of Canadian operational responsibility well beyond the "CHOP" line. Furthermore, the Atlantic Convoy Conference of March 1943 decided that the United States Navy should withdraw entirely from Atlantic trade convoy escort activity on the northern routes. On 14 March 1943, the Commander-in-Chief of the United States Fleet informed Canadian and British authorities of his decision. He said:

"I concur in the proposal that Great Britain and Canada take charge of the North Atlantic trade convoys (HX, SC, ON convoys) and in the detailed recommendations for implementing the proposal. I suggest that BX convoys are considered part of the HX-SC-ON systems. I suggest that the Admiralty and the Canadian Naval Staff Headquarters inform me when they are ready to effect the recommended shift of command. I will then propose the exact time when command is to pass to Commander in Chief, Canadian Northwest Atlantic Command<sup>14</sup> . . ."

From the end of March 1943, therefore, Canadian and British escort groups commanded by the Canadian Northwest Atlantic Command in Halifax escorted all convoys between New York and Great Britain, and between Boston and Halifax. This division of responsibilities stayed in force for the remainder of the war.

104. In the air, Canada also defended shipping in the Gulf of Maine area from enemy attack. From April 1943 to the end of the war, the Royal Canadian Air Force patrolled the region north of latitude 40°N and west of longitude 32°W. Two Canadian squadrons had already provided aerial sweeps and convoy escort services in the Gulf of Maine area on a daily basis between June and December 1942. In both cases, the patrols were flown from Yarmouth, Nova Scotia, and show a pattern of complete coverage over the Gulf of Maine area, including Georges Bank<sup>15</sup>. When added to the impressive contribution of the Royal Canadian Navy to convoy escort duty throughout the northwest Atlantic, the Canadian presence in the defence of the Gulf of Maine area, including Georges Bank, is incontestable.

### Section III. Joint Canada-United States Defence Since 1945

105. Both Canada and the United States, in planning for the postwar period, recognized a continuing need for mutual support<sup>16</sup>.

②<sup>12</sup> *United States Memorial*, p. 77, Figure 14.

<sup>13</sup> *Canadian Counter-Memorial*, Figure 37, illustrates the Canadian reporting area.

<sup>14</sup> Appendix 40, Document 1.

<sup>15</sup> *Canadian Counter-Memorial*, Figure 37, also illustrates the flight paths of Canadian patrols in the Gulf of Maine area.

<sup>16</sup> Appendix 40.

Nevertheless, at its thirty-sixth meeting, the Permanent Joint Board on Defence declared that military activities are conducted without prejudice to the sovereignty of either country:

“Military projects, tests or exercises, agreed to by both countries, whether jointly conducted or not, are without prejudice to the sovereignty of either country, confer no permanent rights or status upon either country, and give only such temporary rights or status as are agreed upon by the appropriate authorities of the two countries in authorizing the projects, tests or exercises<sup>17</sup>.”

106. On 13 February 1947, *The New York Times* published a statement by the Canadian and United States governments that “In the interest of efficiency and economy each government has decided that its national defense establishment shall, to the extent authorized by law, continue to collaborate for peacetime joint security purposes<sup>18</sup>”. Canada and the United States decided that the North American continent should be considered as a single strategic entity for air and sea defence. Thus, in 1958, they signed the North American Air Defence Agreement (NORAD), which treats the continent as a single coordinated unit for air defence<sup>19</sup>. The NORAD commander is responsible to the military chiefs and governments of both countries. The agreement also authorizes crossing international boundaries to meet operational requirements so that Canada and the United States can “develop and maintain their individual and collective capacity to resist air attack on their territories in North America in mutual self-defence<sup>20</sup>”.

107. Several NORAD air defence zones cross the international boundary<sup>21</sup>. The coastal air defence identification zones illustrated in the United States Memorial<sup>22</sup> — CADIZ and ADIZ — on the Atlantic Coast are similar to these NORAD operational zones and they do not in any way reflect the Parties’ view or agreement as to the extent of their military obligations on the continent, let alone of their aspirations for an expanded zone of maritime jurisdiction. Indeed, the air defence zones in the Pacific and in the Beaufort Sea diverge radically from the United States maritime boundary claims in these areas.

108. After the end of the war, Canada and the United States adopted maritime defence arrangements similar to those adopted for air defence. Naval operations since 1947 have borne no relation to questions of sovereignty. For example, on 24 October 1962, the United States began a naval blockade of Cuba. With the diversion of United States naval forces to the Caribbean, Canadian ships, including the aircraft carrier *HMCS Bonaventure*, were ordered to return to Halifax. On 26 October 1962, following discussions between the armed forces of both countries, ships of the Canadian Atlantic Command began patrols off

<sup>17</sup> Appendix 41.

<sup>18</sup> Appendix 43.

<sup>19</sup> Appendix 44, Document 1.

<sup>20</sup> Appendix 44, Document 1.

<sup>21</sup> Appendix 44, Document 3.

<sup>22</sup> *United States Memorial*, p. 79, Figure 15.

the eastern seaboard of Canada and the United States. One destroyer escort group was ordered to the Georges Bank area. In cooperation with aircraft of Canada's Maritime Air Command, intensive patrolling continued until 11 November 1962, with at least three destroyer escorts being rotated into the Georges Bank region<sup>23</sup>.

#### Section IV. Conclusion

109. Canada and the United States have cooperated in the defence of North America since World War II, with Canada assuming an important role in the defence of the Gulf of Maine area during the war. Canadian naval vessels protected shipping on Georges Bank from 1939 to 1945, and in 1962, during the international missile crisis, Canadian warships were also sent to patrol the Gulf of Maine area, including Georges Bank. Their presence resulted from the most efficient use of resources available to Canadian and United States military authorities. Indeed, a tradition of mutual support has characterized military activity in the Gulf of Maine area since Canada and the United States joined forces to defeat a common enemy during the war. It is inconceivable that either country ever considered the operational zones required for this purpose to have been determined with regard to frontiers or maritime boundaries. The United States Memorial has, therefore, misrepresented the fundamental nature of the defence relationship of the Parties in suggesting the contrary, and in denigrating Canada's major contribution to the security of North America, particularly during World War II.

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<sup>23</sup> *Canadian Counter-Memorial*, Figure 38, illustrates the disposition of Canadian naval vessels in the Northwest Atlantic during the 1962 international missile crisis.

## CHAPTER V

### AIDS TO NAVIGATION IN THE GULF OF MAINE AREA

#### Section I. Introduction

110. Traditionally, States provide aids to navigation for commercial and humanitarian reasons. In the Gulf of Maine area, Canada — besides its contribution to defence and charting — provides a number of aids to navigation alone and in cooperation with the United States. The bilateral agreements concerning systems for position-fixing and search and rescue referred to in the United States Memorial<sup>1</sup> show that neither country has ever viewed these matters as indicating the extent of national jurisdiction. Thus, the United States Memorial misconstrues these activities in suggesting that operational agreements related to the provision of navigational aids in the Gulf of Maine area bear some significance for the determination of maritime boundaries. Moreover, it incorrectly alleges that the United States alone provides these services in the Gulf of Maine area.

#### Section II. Radio Aids

##### A. DECCA AND LORAN POSITION-FIXING SYSTEMS

111. The DECCA system for position-fixing at sea was operated exclusively by Canada in the northwest Atlantic and provided good coverage of the whole of Georges Bank during the day, and part of the Bank at night, including the eastern half which is most heavily used by Canadian fishermen. The United States Memorial is wrong when it says DECCA coverage *did not extend to Georges Bank*<sup>2</sup>. Indeed, in the 1960s the Canadian Hydrographic Service issued two charts indicating DECCA coverage extended to Georges Bank<sup>3</sup>. From World War II until 1980 when DECCA transmission ended, all Canadian military vessels and many offshore fishing vessels were equipped with DECCA receiving equipment.

112. Canada has also contributed funds for the operation of LORAN-A position-fixing systems stations in Greenland, Norway, the United Kingdom and Portugal, because of its NATO obligations and to provide a uniform system throughout the North Atlantic for commercial navigation. The United States has done this as well, and has promoted conversion to the newer and more reliable LORAN-C system worldwide. Hence, Canada and the United States agreed, by an exchange of notes in 1964, to establish a LORAN-C position-fixing system in the northwest Atlantic<sup>4</sup>.

<sup>1</sup> *United States Memorial*, p. 65, para. 119, and p. 73, para. 129.

<sup>2</sup> *United States Memorial*, p. 69, para. 116.

<sup>3</sup> Two charts depicting DECCA coverage in the Gulf of Maine area have been deposited with the Registrar.

<sup>4</sup> *United States Memorial, Documentary Annexes*, Vol. II, Annex 31.

113. In the Gulf of Maine area, LORAN-C coverage is provided by two chains or frequencies, one of which is transmitted from stations exclusively in the United States and the other from stations located in both Canada and the United States. The latter chain is more reliable in the Gulf of Maine area and the Canadian authorities have consequently recommended that navigators use it when fishing on Georges Bank<sup>5</sup>. Canada established the LORAN-C system in the Gulf of Maine area and in the waters further north, to phase out the older DECCA and LORAN-A systems which had been in use since World War II. LORAN-C currently covers the entire North Atlantic Ocean, the Mediterranean Sea and most of the Pacific Ocean.

#### B. OTHER BEACONS AND RADAR

114. Canada operates a number of low- and medium-frequency radio beacons for maritime and aerial navigation in the Gulf of Maine area. Their coverage extends to Georges Bank, and they are used by those navigators on the Bank not equipped with more expensive LORAN receivers. The Canadian Department of National Defence also operates a radar installation at Barrington, near Cape Sable. Its coverage includes all of Georges Bank and the information it gathers is shared with the flight control centre in Moncton, New Brunswick. The International Civil Aviation Organization (ICAO) Moncton flight information region is the entry point to North America for most transatlantic flights. Moncton flight controllers, using the information gathered at Barrington, order traffic separation schemes for aircraft throughout, and considerably beyond, the Gulf of Maine area.

#### C. WEATHER FORECASTING

115. The Government of Canada prepares marine weather forecasts for the entire Atlantic coast of Canada. Georges Bank is a specific area for which meteorological information is collected and broadcast daily<sup>6</sup>. The Canadian Department of the Environment, which is responsible for weather forecasting, operates stations in Yarmouth and Cape Sable that provide weather forecasts for Canadians fishing on Georges Bank.

116. The need for international cooperation in meteorology has long been recognized. Canada and the United States began to exchange "weather intelligence" as early as 1872<sup>7</sup>. In its Twelfth Annual Report, the meteorological Office of the Government of Canada identified the need for Canada to "take her part in the great international work now going on of charting the meteorological conditions prevalent over the Atlantic and in the general development of ocean meteorology<sup>8</sup>". In

<sup>5</sup> Appendix 45.

<sup>6</sup> Appendix 46.

<sup>7</sup> Appendix 47.

<sup>8</sup> Appendix 48.

1947, Canada and the United States signed the Convention of the World Meteorological Organization<sup>9</sup>. This specialized agency of the United Nations exists to facilitate worldwide cooperation in the provision of meteorological services. It is clearly inconsistent with its goals for member States to suggest that the application of meteorology to aviation, shipping and other human activities should have any significance for the determination of maritime boundaries or be evidence of a predominant interest of a State in an area for which it provides forecasting services.

### Section III. Search and Rescue Activities

117. Canada and the United States have agreed since 1949 to coordinate search and rescue activities off their Atlantic and Pacific coasts. The agreement of 25 October 1974, currently in force, divides operational zones purely on the basis of convenience and efficiency<sup>10</sup>, stipulating that either party may initiate or coordinate air and marine search and rescue operations without regard to such zones. For these reasons then, the agreement uses the ICAO air search and rescue regions on the Atlantic and Pacific coasts of North America as the basis for coordinated air and maritime emergency services.

118. The ICAO regions used for these purposes were established solely on the basis of operational considerations. The ICAO policy for search and rescue regions has nothing to do with national boundaries or with the sovereignty of States<sup>11</sup>. ICAO has called for such regions to be coincident with ICAO flight information regions, which are established on the basis of technical and operational requirements concerning the volume and patterns of traffic, rather than on the basis of an obligation to respect national boundaries. Due recognition is given by ICAO to the fact that any State that delegates to another the responsibility for providing services for air traffic services (ATS) does so without derogation of its sovereignty. The ICAO Assembly has resolved that:

“... the boundaries of ATS airspaces, whether over States’ territories or over the high seas, shall be established on the basis of technical and operational considerations with the aim of ensuring optimum efficiency and economy for both providers and users of the services;”

and declared that:

“... the approval by the Council of regional air navigation agreements relating to the provision by a State of air traffic services within airspace over the high seas does not imply recognition of sovereignty of that State over the airspace concerned<sup>12</sup>.”

119. This preoccupation with operational considerations is evidenced by the three search and rescue agreements between Canada and

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<sup>9</sup> Appendix 49.

<sup>10</sup> The Canada-United States and Search Rescue Agreement of 25 October 1974 is reproduced in the *United States Memorial, Documentary Annexes*, Vol. II, Annex 35.

<sup>11</sup> Appendix 50.

<sup>12</sup> Appendix 51.

the United States referred to in the United States Memorial. In all three, the parties reserved the right to initiate rescue operations in the regions of the other. The United States Memorial cites 54 such incidents attended to by the United States Coast Guard in the ICAO Halifax search and rescue region in the Gulf of Maine area<sup>13</sup>. Between January 1975 and June 1982, the Canadian Armed Forces responded to over 170 search and rescue incidents outside the Halifax search and rescue region, principally on the Canadian fishing grounds of Georges Bank<sup>14</sup>.

120. Flight information and search and rescue exist to promote safety, efficiency and regularity in international air navigation. The question of sovereignty in airspace, waters or underlying seabed is not affected by the boundaries between flight information and search and rescue regions. For example, the ICAO search and rescue regions in the Gulf of Mexico<sup>15</sup>, do not correspond with the maritime boundaries negotiated by the United States and Mexico and by the United States and Cuba. The same lack of coincidence between ICAO operational zones and maritime boundaries occurs over the North Sea<sup>16</sup>. The boundary between the Edinburgh and Karup search and rescue regions runs north-south along longitude 5°E, and that between the Plymouth and Valkenburg search and rescue regions runs northeast-southwest from a point seaward of the estuary of the River Thames. These facts indicate that search and rescue regions are agreed to by countries without regard to the delimitation of zones of maritime jurisdiction. In the 1957 search and rescue agreement referred to in the United States Memorial<sup>17</sup>, the United States assumed responsibility for areas comprising ICAO's Vancouver and Gander regions — two areas to which no United States claim could possibly be contemplated. The very suggestion that the allocation of search and rescue responsibilities might have implications for the delimitation of a single maritime boundary contradicts recent trends toward international cooperation in search and rescue. The 1979 International Convention on Maritime Search and Rescue requires countries to establish, whenever necessary, search and rescue regions, but stipulates that "the delimitation of search and rescue regions is not related to and shall not prejudice the delimitation of any boundary between States<sup>18</sup>".

#### Section IV. Conclusion

121. The provision of aids to navigation in the Gulf of Maine area cannot have any significance for the determination of a maritime boundary. *First*, both Canada and the United States have operated radio

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<sup>13</sup> *United States Memorial*, p. 73, note 5.

<sup>14</sup> *Canadian Counter-Memorial*, Figure 36.

68 <sup>15</sup> *Canadian Counter-Memorial*, Figure 35.

<sup>16</sup> *Canadian Counter-Memorial*, Figure 34, insets A and B.

<sup>17</sup> *United States Memorial*, p. 73, para. 129, and *Documentary Annexes*, Vol. II, Annex 35.

<sup>18</sup> Appendix 52.



position-fixing systems, beacons, radar and weather services that overlap and extend throughout the disputed area. *Secondly*, Canada and the United States have established — as in the case of defence — a pattern of cooperation in the provision of navigational services in the Gulf of Maine area. The zones and regions established for such purposes have been designed by the Parties purely for humanitarian and commercial reasons. The United States Memorial, therefore, misconstrues the significance of the aids to navigation provided by States. Moreover, it incorrectly implies that only the United States operates navigational aids in the Gulf of Maine area. In fact, this chapter shows that Canada provides vital humanitarian and commercial aids to navigation in the Gulf of Maine area, including services that extend to and cover Georges Bank.

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## DOCUMENTARY APPENDICES

## DOCUMENTARY APPENDICES TO CHAPTER I

THE CANADIAN REGULATORY RÉGIME GOVERNING THE DISPOSITION AND  
ADMINISTRATION OF INTERESTS IN OIL AND GAS

## Appendix 1

CANADIAN LEGISLATION RELEVANT TO THE REGULATORY RÉGIME GOVERNING THE  
DISPOSITION AND ADMINISTRATION OF INTERESTS IN OIL AND GAS

Document 1: Excerpt from the Territorial Lands Act, *Revised Statutes of  
Canada 1970*, Chap. T-6, Sec. 4

Document 2: Excerpts from the Public Lands Grants Act, *Revised Statutes of  
Canada 1970*, Chap. P-29

Document 3: Excerpts from the Canada Oil and Gas Land Regulations,  
Order in Council P.C. 1961-797, 6 June 1961, Published in *Canada Gazette*,  
Part II, Vol. 95, No. 12, 28 June 1961

Document 4: Excerpts from the Canada Oil and Gas Land Regulations,  
Order in Council P.C. 1977-2155, 28 July 1977, Published in *Canada Gazette*,  
Part II, Vol. 111, No. 16, 24 August 1977, and Order in Council P.C. 1977-3160,  
10 November 1977, Published in *Canada Gazette*, Part II, Vol. 111, No. 22,  
23 November 1977

Document 5: Excerpts from the Canada Oil and Gas Act, *Statutes of Canada  
1980-81-82*, Chap. 81 (In Force 5 March 1982)

[Not reproduced]

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## Appendix 2

UNITED STATES LEGISLATION RELEVANT TO THE REGULATORY RÉGIME GOVERNING  
THE DISPOSITION AND ADMINISTRATION OF INTERESTS IN OIL AND GAS

Document 1: Excerpt from the Outer Continental Shelf Lands Act, 43 *United  
States Code*, Secs. 1331-1356 (1976, Supp. III)

Document 2: Excerpt from the Regulations Entitled "Mineral Deposits in the  
Outer Continental Shelf", 43 *Code of Federal Regulations*, Part 201

[Not reproduced]

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**Appendix 3**

**MAPS ILLUSTRATING SEISMIC SURVEYS CONDUCTED BY CANADIAN LICENSEES AND  
PERMITTEES IN THE GULF OF MAINE-GEORGES BANK AREA, 1965-1979**

*[Not reproduced]*

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**Appendix 4**

**VARIATION ORDERS FOR CANADIAN PERMITS COVERING AREAS WHERE THE UNITED  
STATES RESERVED ITS RIGHTS IN NOVEMBER 1969**

*[Not reproduced]*

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**Appendix 5**

**COPY OF THE CANADIAN GOVERNMENT "MONTHLY OIL AND GAS REPORT" FOR  
MAY 1964 ANNOUNCING THE ISSUANCE AND LOCATION OF CANADIAN OIL AND GAS  
PERMITS**

**DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES**

**NORTHERN ADMINISTRATION BRANCH**

**RESOURCES DIVISION**

**MONTHLY OIL AND GAS REPORT  
MAY, 1964**

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	—	Permits Cancelled or Surrendered
	—	Permits Converted to Lease
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## MONTHLY OIL AND GAS REPORT

Summary of Activity for the month ending May 31, 1964

CANADA OIL AND GAS PERMITS

		Number	Acreage
Issued	N.W.T. Mainland	6	312,816
	Yukon Mainland	Nil	Nil
	Arctic Islands	21	1,026,797
	Water	37	3,200,685
Cancelled or Surrendered	N.W.T. Mainland	2	56,914
	Yukon Mainland	16	515,357
	Arctic Islands	Nil	Nil
	Water	Nil	Nil
Cancelled or Surrendered (Part Permits)	N.W.T. Mainland	1	28,332
	Yukon Mainland	Nil	Nil
	Arctic Islands	Nil	Nil
	Water	Nil	Nil

Total Number of Permits and Leases in effect as of  
the 31st of May, 1964

Permits	N.W.T. Mainland	958	45,643,370
	Yukon Mainland	337	13,702,091
	Arctic Islands	1,010	45,427,504
	Water	876	72,101,120
<b>TOTAL</b>		<b>3,181</b>	<b>176,874,085</b>
Leases	N.W.T. Mainland	46	213,008
	Yukon Mainland	3	13,220
	Arctic Islands	Nil	Nil
	Water	Nil	Nil
<b>TOTAL</b>		<b>49</b>	<b>226,228</b>
<b>GRAND TOTAL</b>			<b>177,100,313</b>

## 1. Oil and Gas Permits Issued — Arctic Islands — 21

1,026,797 acres

Permit No.	Location	Date of Issue	Permittee	Acreage	Initial Term
A 1333	77°20' 117°00'	7-5-64	Petropar Canada Limited	56,666	6 yrs.
A 1334	77°10' 117°00'	"	"	57,392	"
A 1335	77°10' 118°00'	"	"	57,392	"
A 1336	77°00' 116°30'	"	"	58,120	"
A 1337	77°00' 117°00'	"	"	58,120	"
A 1338	77°00' 117°30'	"	"	58,120	"
A 1339	77°00' 118°00'	"	"	58,120	"
A 1340	77°00' 118°30'	"	"	58,120	"
A 1341	77°00' 119°00'E	"	"	29,060	"
A 1342	76°50' 116°00'	"	"	58,846	"
A 1343	76°50' 116°30'S	"	"	29,514	"
A 1344	76°50' 117°00'S	"	"	29,514	"
A 1345	76°50' 117°30'E	"	"	29,423	"
A 1346	76°50' 118°30'	"	"	58,846	"
A 1347	76°40' 116°00'N	"	"	29,695	"
A 1348	76°40' 116°30'N	"	"	29,695	"
A 1349	76°40' 117°00'	"	"	59,571	"
A 1350	76°40' 117°30'	"	"	59,571	"
A 1351	76°30' 117°00'	"	"	60,296	"
A 1352	76°30' 117°30'	"	"	60,296	"
A 1353	76°20' 117°00'N	"	"	30,420	"

2. Oil and Gas Permits Issued — N.W.T. Mainland — 6 312,816 acres

Permit No.	Location	Date of Issue	Permittee	Acreage	Initial Term
3858	66°00' 128°15'	1-5-64	The Atlantic Refining Co.	52,306	4 yrs.
3859	66°00' 128°30'	"	"	52,306	"
3860	66°00' 128°45'	"	"	52,306	"
3861	66°10' 128°15'	"	"	51,966	"
3862	66°10' 128°30'	"	"	51,966	"
3863	66°10' 128°45'	"	"	51,966	"

3. Oil and Gas Permits Issued — Yukon Mainland — Nil

4. Oil and Gas Permits Issued — Coastal Waters — 37 3,200,685 acres

Permit No.	Location	Date of Issue	Permittee	Acreage	Initial Term
W906	46°10' 54°15'	7-5-64	Petropar Canada Limited	88,522	6 yrs.
W 907	46°10' 54°30'	"	"	88,522	"
W 908	46°00' 54°00'	"	"	88,786	"
W 909	46°00' 54°15'	"	"	88,786	"
W 910	46°00' 54°30'	"	"	88,786	"
W 911	46°00' 54°45'	"	"	88,786	"
W 912	45°50' 54°00'	"	"	89,048	"
W 913	45°50' 54°15'	"	"	89,048	"
W 914	45°50' 54°30'	"	"	89,048	"
W 915	45°50' 54°45'	"	"	89,048	"
W 916	45°40' 54°00'	"	"	89,310	"
W 917	45°40' 54°15'	"	"	89,310	"
W 918	45°40' 54°30'	"	"	89,310	"
W 919	45°40' 54°45'	"	"	89,310	"
W 920	45°30' 54°00'	"	"	89,571	"
W 921	45°30' 54°15'	"	"	89,571	"
W 922	45°30' 54°30'	"	"	89,571	"
W 923	45°30' 54°45'	"	"	89,571	"
W 924	45°20' 54°15'	"	"	89,832	"
W 925	45°20' 54°30'	"	"	89,832	"
W 926	45°20' 54°45'	"	"	89,832	"
W 927	45°10' 54°15'	"	"	90,092	"
W 928	41°20' 66°15'	20-5-64	Texaco Exploration Company	95,844	"
W 929	41°30' 66°15'	"	"	95,602	"
W 930	41°40' 66°00'	"	"	95,360	"
W 931	41°40' 66°15'	"	"	95,360	"
W 932	41°40' 66°30'	"	"	95,360	"
W 933	41°50' 65°45'W	"	"	47,559	"
W 934	41°50' 66°00'	"	"	95,118	"
W 935	41°50' 66°15'	"	"	95,118	"
W 936	41°50' 66°30'	"	"	95,118	"
W 937	42°00' 65°45'W	"	"	47,437	"
W 938	42°00' 66°00'	"	"	94,875	"
W 939	42°00' 66°15'	"	"	94,875	"
W 940	42°00' 66°30'	"	"	94,875	"
W 941	42°10' 66°00'S	"	"	47,346	"
W 942	42°10' 66°15'S	"	"	47,346	"

5. Oil and Gas Permits Cancelled or Surrendered — N.W.T. Mainland — 2  
3209 and 3210 56,914 acres

6. Part Oil and Gas Permits Cancelled or Surrendered — N.W.T. Mainland — 1  
west half of 3207 28,332 acres

7. Oil and Gas Permits Cancelled or Surrendered — Yukon Mainland — 16  
1104, 1106, 1109, 1110, 1127, 1129, 1130, 1131, 1146, 1147, 1148  
south-halves of 1326 to 1330 incl. 515,357 acres

8. Part Oil and Gas Permits Cancelled or Surrendered — Yukon Mainland — Nil

9. Oil and Gas Permits Cancelled or Surrendered — Arctic Islands — Nil

## 10. Part Oil and Gas Permits Cancelled or Surrendered — Arctic Islands — Nil

## 11. Oil and Gas Permits Cancelled or Surrendered — Coastal Waters — Nil

## 12. Part Oil and Gas Permits Cancelled or Surrendered — Coastal Waters — Nil

## 13. Oil and Gas Permits Converted to lease

## 14. Oil and Gas Permits Transferred

Permit No.	Transferor	Transferee	Date of Registration
A1094, A1096 and A1095	J. M. Coyne	Pembina Pipe Line Ltd.	11-5-64
A1056 to A1061 and A1027 to A1052 incl.	J. Ross Tolmie	Pembina Pipe Line Ltd.	11-5-64

## 15. Drilling Authorities Issued — Nil

## 16. Drilling Activity

Name of Well	Date Spudded	Class.	Status	K.B.	Depth	Remarks
Socony Mobil — W.M. Whitestone Y.T. N-26	7-4-64	Wildcat	Drilling	Grd. 2268'	6492'	
Socony Mobil — W.M. Molar Y.T. P-34	29-3-64	Wildcat	Drilling	Grd. 2622'	3747'	Waiting on water supply
Lobitos et al Cornwallis Central Dome M-32		Location				Cancelled location

## 17. Wells Released from Confidential Status

1. Pan Am. A-1 N Island R. 0-12. Geol. Miss ? Banff 2335?; Exshaw 2530; Ketcho 2552; Tetcho 3285; Trout River 3545; Redknife 3778; Jean Marie mbr 4195; Fort Simpson 4245; black shale 5965; Slave Point 6005; Watt Mountain 6180; Sulphur Point 6185; Pine Point 6250; Chinchaga 6785; sandstone 6835.

## 18. Reports Released from Confidential Statute — None

## 19. Drilling Statistics 1964

Well Name	Spudded	Completed	Status	Total Depth
Atlantic et al Arctic Circle Ontario H-34	20-12-63	1-4-64	D & A	13,370
B.A. — Tex Arrowhead B-76	12-1-64	11-3-64	D & A	9,805
Calstan Tathlina Lake C-39	7-2-64	24-2-64	D & A	3,216
Calstan Tathlina Lake K-10	27-2-64	13-3-64	D & A	2,799
Canada Southern et al N. Beaver R. Y.T. 1-27	24-3-64	14-4-64	Suspended Gas Well	14,495
Dom. Explorers et al Bathurst Caledonian J-34	24-9-63	19-2-64	D & A	10,000
H.B.-Pan Am S. Island R.M.-41	3-2-64	23-3-64	Suspended Gas Well	8,185
I.O.E. Triad Ebbutt D-50	16-1-64	18-3-64	D & A	4,094
I.O.E. Triad Ebbutt J-70	20-3-64	8-4-64	D & A	2,711
Pan Am-Shell Kakisa H-36	15-1-64	2-2-64	D & A	2,500
Pan Am-Shell Kakisa I-44	3-2-64	27-2-64	D & A	2,572

## 19. Drilling Statistics 1964 (Cont'd)

Well Name	Spudded	Completed	Status	Total Depth
Pan Am-Shell Kakisa F-35	4-3-64	30-3-64	D & A	2,395
Pan-Am Shell Kakisa L-19	1-4-64	14-4-64	D & A	2,436
Shell Ochre River I-15	11-12-63	28-1-64	D & A	4,883
Shell Blackwater Lake G-52	9-2-64	24-3-64	D & A	6,500
Socony Mobil — W.M. Blackie No. 1 Y.T. M-59	11-12-63	27-3-64	Suspended	6,338
Number of wells drilled in 1964 — 16				
Total footage drilled in 1964 — 96,299'				

## 20. Production — Norman Wells, N.W.T.

	OIL Gross Barrels	BASE STOCK (Naphtha Injected)	GAS (MCF.)	GAS FLARED
April, 1964	60,202	Nil	81,810	79,593
TOTAL TO DATE	262,935	35,300	305,867	292,627

FEDERAL LANDS IN THE PROVINCES

Soldier Settlement Boards, Department of National Defence,  
Department of Transport and Department of Agriculture  
under the Administration of this Department

## 1. Summary of Oil and Gas Lease Activity for the Month Ending May 31st, 1964

	Ontario	Manitoba	Saskatchewan	Alberta
Active Beginning of Month	9	23	44	105
Acreage	1,096.87	3,044.20	6,904.47	14,250.53
Issued	Nil	Nil	Nil	Nil
Acreage	Nil	Nil	Nil	Nil
Lapsed, Surrendered or Cancelled	Nil	Nil	Nil	3
Acreage	Nil	Nil	Nil	480
Active End of Month	9	23	44	12
Acreage	1,096.87	3,044.20	6,904.47	13,770.53

## 2. Oil and Gas Leases Issued — Nil

## 3. Oil and Gas Leases Surrendered, Cancelled or Lapsed 614, 615 and 616

## 4. Oil and Gas Leases Transferred

Lease No.	Transferor	Transferee	Date of Registration
603	American Liberty Oil Co.	Turtle Creek Petroleum Ltd.	26-5-64

## 5. Summary of Gas Lease Activity for the Month Ending May 31st, 1964

	Manitoba	Saskatchewan	Alberta
Active Beginning of Month	Nil	Nil	8
Acreage	Nil	Nil	1,883.11
Issued	Nil	Nil	Nil
Surrendered or Cancelled	Nil	Nil	Nil
Active End of Month	Nil	Nil	8
Acreage	Nil	Nil	Nil



## 6. Summary of Oil Lease Activity for the Month Ending May 31st, 1964

	Manitoba	Saskatchewan	Alberta
Active Beginning of Month	Nil	Nil	6
Acceage	Nil	Nil	1,224.83
Issued	Nil	Nil	Nil
Surrendered or Cancelled	Nil	Nil	Nil
Acceage	Nil	Nil	Nil
Active End of Month	Nil	Nil	6
Acceage	Nil	Nil	1,224.83

## 7. Production — Drilling and Production Covered in Provincial Reports

## 8. Royalty

Location	Units and Wells	February, 1964
		Amount
Manitoba	8 (final)	\$ 451.83
Saskatchewan	14 (final)	7,603.30
Alberta	20 (prelim)	7,892.39
		<b>March, 1964</b>
Manitoba	8 (final)	\$ 445.25
Saskatchewan	15 (final)	7,625.59
Alberta	17 (prelim)	8,814.64
		<b>April, 1964</b>
Manitoba	6 (prelim)	\$ 409.66
Saskatchewan	10 (prelim)	3,858.43
Alberta	11 (prelim)	3,218.96

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DOCUMENTARY APPENDICES TO CHAPTER II  
PROTECTION OF THE MARINE ENVIRONMENT

**Appendix 6**

LETTERS OF 17 APRIL 1970 AND 8 MAY 1970, FROM D. G. CROSBY, CHIEF, RESOURCE ADMINISTRATION DIVISION, DEPARTMENT OF ENERGY, MINES AND RESOURCES TO DR. M. N. A. PETERSON, CHIEF SCIENTIST, DEEPSEA DRILLING PROJECT, SCRIPPS INSTITUTE OF OCEANOGRAPHY

*[Not reproduced]*

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**Appendix 7**

EXTRACTS FROM THE OIL AND GAS PRODUCTION AND CONSERVATION ACT, REVISED STATUTES OF CANADA 1970, CHAP. O-4, AND STATUTES OF CANADA 1980-81-82, CHAP. 81

*[Not reproduced]*

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**Appendix 8**

CHART ILLUSTRATING THE TYPICAL CANADA OIL AND GAS LANDS ADMINISTRATION (COGLA) APPROVALS PROCESS FOR A FIXED HYDROCARBON SYSTEM

*[Not reproduced]*

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**Appendix 9**

EXCERPTS FROM THE CANADA OIL AND GAS DRILLING REGULATIONS, ORDER IN COUNCIL P.C. 1979-25, 18 JANUARY 1979, PUBLISHED IN *CANADA GAZETTE*, PART II, VOL. 113, NO. 3, 14 FEBRUARY 1979

*[Not reproduced]*

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**Appendix 10**

EXCERPTS FROM *THE FINANCIAL POST*, 1 MARCH 1969, PAGE 3, "SEABED OIL DISASTER UNLIKELY IN CANADA", AND PAGE 6, THE EDITORIAL PAGE, "HOW TO PROTECT A BEACH"

*[Not reproduced]*

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**Appendix 11**

EXCERPTS FROM THE FISHERIES ACT, *REVISED STATUTES OF CANADA 1970*, CHAP. F-14, AS AMENDED

*[Not reproduced]*

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**Appendix 12**

DOCUMENTS RELATING TO THE ENVIRONMENTAL ASSESSMENT AND REVIEW OF THE BEAUFORT SEA PROJECT

Document 1: Excerpts from *The Ottawa Citizen*, 9 March 1983, Page 1, "Oil Firms Ordered to Provide Details on Beaufort Plan", and Page 10, "Native, Environmental Groups Pleased with Beaufort Delay"

Document 2: A Statement of Deficiencies on the Environmental Impact Statement for Hydrocarbon Development in the Beaufort Sea-Mackenzie Delta Region

*[Not reproduced]*

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**Appendix 13****DOCUMENTS RELATING TO THE ENVIRONMENTAL ASSESSMENT AND REVIEW OF THE  
SABLE ISLAND PROJECT**

**Document 1: Letter of 21 September 1982 from The Honourable Jean Chrétien, Minister of Energy, Mines and Resources Canada, to The Honourable John Roberts, Minister of the Environment, Referring the Sable Island Project to the Environmental Assessment and Review Process**

**Document 2: Draft Guidelines for the Preparation of an Environmental Impact Statement for Gas Production on the Scotian Shelf in the Sable Island Area, Issued by the Sable Island Environmental Assessment Panel**

*[Not reproduced]*

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**Appendix 14**

**G. MIRON, "THE OUTER CONTINENTAL SHELF - MANAGING (OR MISMANAGING) ITS RESOURCES", *JOURNAL OF MARITIME LAW AND COMMERCE*, VOL. 2, 1971, PP. 267-277 EXCERPTED**

*[Not reproduced]*

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DOCUMENTARY APPENDICES TO CHAPTER III  
CHARTING THE GULF OF MAINE AREA

**Appendix 15**

THE VELASCO MAP, 1610, PUBLIC ARCHIVES OF CANADA, NATIONAL MAP  
COLLECTION, NMC 14038

*[Not reproduced]*

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**Appendix 16**

THE WILLIAM ALEXANDER MAP, 1623, PUBLIC ARCHIVES OF CANADA, NATIONAL  
MAP COLLECTION, NMC 15589, ORIGINAL IN THE LANDE COLLECTION, NATIONAL  
LIBRARY OF CANADA

*[Not reproduced]*

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**Appendix 17**

THE JOHN THORNTON MAP, 1677, PUBLIC ARCHIVES OF CANADA, NATIONAL MAP  
COLLECTION, NMC 6608

“A Chart of the Sea Coast of New Found Land, New Scotland, New England,  
New York, New Jersey, with Virginia and Maryland”

*[Not reproduced]*

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**Appendix 18**

THE HERMAN MOLL MAP, 1715, PUBLIC ARCHIVES OF CANADA, NATIONAL MAP COLLECTION, C-42085

"A New and Exact Map of the Dominions of the King of Great Britain on ye continent of North America Containing Newfoundland, New Scotland, New England, New York, New Jersey, Pensilvania, Maryland, Virginia and Carolina According to the Newest and Most Exact Observations by Herman Moll, Geographer"

*[Not reproduced]*

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**Appendix 19**

THE HENRY POPPLE MAP, 1733, PUBLIC ARCHIVES OF CANADA, NATIONAL MAP COLLECTION, C-118235

Part of "A map of the British Empire in America with the French and Spanish settlements adjacent thereto"

*[Not reproduced]*

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**Appendix 20**

THE DESBARRES CHART OF PART OF THE COAST OF NOVA SCOTIA, 1778, PUBLIC ARCHIVES OF CANADA, NATIONAL MAP COLLECTION, C-118237

Part of "The Coast of Nova Scotia, New England, New-York, Jersey, The Gulph and River of St. Lawrence. The islands of Newfoundland, Cape Breton, St. John, Antecosty, Sable & c. - and soundings thereof . . . 26 nautical miles to the inch. . . of the Atlantic Neptune . . ., by Joseph F. W. DesBarres"

*[Not reproduced]*

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**Appendix 21**

CORRESPONDENCE BETWEEN THE UNITED STATES CHART PUBLISHER EDMUND BLUNT AND ADMIRAL BEAUFORT OF THE BRITISH HYDROGRAPHIC OFFICE, 1832-1839

*[Not reproduced]*

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**Appendix 22**

THE AARON ARROWSMITH CHART, 1800, PUBLIC ARCHIVES OF CANADA, NATIONAL MAP COLLECTION, C-118228

"A Chart of Part of North America from Cape Hatteras to Cape Canso. Containing the Soundings and Set of the Gulf Stream its extent with that of the different Banks and Shoals laid down by a well regulated Timepiece, assisted by the Lunar distances. The Other Observations and remarks were made by Cap. 't Charles Vinicomb Penroze, when he Commanded his Majestys Ships Resolution and Cleopatra on that Station in the Years 1795 6 7 and 1798: and from which I gratuitously received the Manuscript with permission to Publish it for the information of those who may Navigate that part of the Coast"

*[Not reproduced]*

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**Appendix 23**

THE HURD CHART OF THE BAY OF FUNDY, 1824, BRITISH HYDROGRAPHIC OFFICE, 1824, PUBLIC ARCHIVES OF CANADA, NATIONAL MAP COLLECTION, NMC-24856

*[Not reproduced]*

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**Appendix 24**

THE LOCKWOOD CHART OF PART OF THE COAST OF NOVA SCOTIA, 1829, BRITISH HYDROGRAPHIC OFFICE, 1829, PUBLIC ARCHIVES OF CANADA, NATIONAL MAP COLLECTION, NMC-24855

*[Not reproduced]*

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**Appendix 25**

LOCKWOOD'S DESCRIPTION OF THE COAST OF NOVA SCOTIA, 1818, PUBLIC ARCHIVES OF CANADA, PACI-1045

Excerpts from Anthony Lockwood, *A Brief Description of Nova Scotia with Plates of the Principal Harbors; Including a Particular Account of the Island of Grand Manan*

*[Not reproduced]*

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**Appendix 26**

THE BRITISH-CANADIAN DEEP-SEA CHART OF THE GULF OF MAINE AREA, INCLUDING GEORGES BANK, 1834

Document 1: "North America, East Coast: Sheet V", British Hydrographic Office, 1834, Public Archives of Canada, National Map Collection, NMC-19995

Note: This chart is the most southerly of the series of five charts entitled "North America, East Coast". It was the first official chart of Georges Bank after the DesBarres Chart of 1778, and, with its successors, was used by Canadian navigators in the Gulf of Maine area until the 1960s.

Document 2: *Status of British-Canadian Charting in the Gulf of Maine Area, 1834*, Ottawa, Department of Energy, Mines and Resources, 1982

*[Not reproduced]*

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**Appendix 27**

THE BRITISH-CANADIAN DEEP-SEA CHART OF THE GULF OF MAINE AREA,  
INCLUDING GEORGES BANK, 1861, BRITISH HYDROGRAPHIC OFFICE, 1861, PUBLIC  
ARCHIVES OF CANADA, NATIONAL MAP COLLECTION, NMC-19995  
"North America, East Coast: Chart 2670, Halifax to the Delaware"

*[Not reproduced]*

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**Appendix 28**

CORRESPONDENCE BETWEEN THE NEW BRUNSWICK HYDROGRAPHER AND  
STATESMAN WILLIAM FITZWILLIAM OWEN AND ADMIRAL BEAUFORT OF THE BRITISH  
HYDROGRAPHIC OFFICE CONCERNING NEW SURVEYS IN THE GULF OF MAINE AREA,  
1842-1847

*[Not reproduced]*

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**Appendix 29**

THE UNITED STATES COAST SURVEY CHART NO. 2, 1858, SURVEY OF THE COAST OF  
THE UNITED STATES, 1858  
"General Chart of the Coast No. 2 from Cape Ann and Jeffries Bank to Gay  
Head and Davis' Bank"

*[Not reproduced]*

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**Appendix 30**

THE NORIE CHART, 1835, J. W. NORIE, 1835

"A Chart of the Coast of North America from Cape Canso to Halifax and from Thence to Philadelphia"

*[Not reproduced]*

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**Appendix 31**

THE PRINCIPAL CANADIAN FISHING BANKS, 1920 AND 1932, OTTAWA,  
DEPARTMENT OF THE INTERIOR, 1920, PUBLIC ARCHIVES OF CANADA, NATIONAL  
MAP COLLECTION, NMC-20682

Note: The 1932 edition of this map is illustrated.

"Map of the Atlantic Coast of Canada Showing Inshore and Deep Sea Fisheries with Distances from Principal Fishing Ports to Banks and Transportation Lines"

*[Not reproduced]*

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**Appendix 32**

THE ROYAL COMMISSION MAP OF PRINCIPAL CANADIAN FISHING BANKS, 1928  
"Map of the Atlantic Coast of Canada Showing Principal Fishing Banks, 1928"  
This chart is contained in the report of the Royal Commission on Investigating  
the Fisheries of the Maritime Provinces and the Magdalen Islands, 1928.  
Ottawa, Fisheries Branch, Marine and Fisheries Department, 1928.

*[Not reproduced]*

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**Appendix 33****THE CLOSE CHART, 1929**

"The Fishermen's and Yachtsmen's Chart, Cape Cod to Newfoundland. Reproduced from the latest British, United States and French Navy Charts. Fishing Banks Information from the Fisheries Depts. of the U.S., Canadian and French Govts. Rough Grounds Marked by Gloucester, Nova Scotia and Newfoundland Skippers." London, Albert Close, 1929. Printed by the Mortimer Company Limited, Ottawa.

*[Not reproduced]*

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**Appendix 34**

**INDEX OF CANADIAN HYDROGRAPHIC SERVICE NATURAL RESOURCE MAPS OF THE GULF OF MAINE AREA, 1980, OTTAWA, CANADIAN HYDROGRAPHIC SERVICE, 1980**

*[Not reproduced]*

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DOCUMENTARY APPENDICES TO CHAPTER IV  
COOPERATION IN DEFENCE

**Appendix 35**

THE CANADA-UNITED STATES COMMITMENT TO JOINT DEFENCE OF  
NORTH AMERICA, 1940

Document 1: Ogdensburg Declaration, 17 August 1940 (Excerpt from David R. Murray, ed., *Documents on Canadian External Relations*, Vol. 8, 1939-1941, Part II, Ottawa, Department of External Affairs, 1976, pp. 139-140)

Document 2: Letter from the Canadian Prime Minister, W. L. Mackenzie King, to the British Dominions Secretary, Winston Churchill, Dated 18 August 1941, concerning the Significance of the Ogdensburg Declaration of Joint Canada-United States Defence to the British-Canadian War Effort (Excerpt from David R. Murray, ed., *Documents on Canadian External Relations*, Vol. 8, 1939-1941, Part II, Ottawa, Department of External Affairs, 1976, pp. 134-138)

[Not reproduced]

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**Appendix 36**

THE CANADA-UNITED STATES MILITARY ALLIANCE OF WORLD WAR II (EXCERPT FROM C. P. STACEY, "TWENTY-ONE YEARS OF CANADIAN-AMERICAN MILITARY COOPERATION", IN D. DEENER, ED., *CANADIAN-UNITED STATES TREATY RELATIONS*, COLLEGE HILL, NORTH CAROLINA, DUKE UNIVERSITY PRESS, 1963, PP. 103-104)

[Not reproduced]

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**Appendix 37****THE CANADA-UNITED STATES JOINT DEFENCE PLANS, 1940-1942**

Document 1: Excerpt from C. P. Stacey, *Arms, Men and Governments, The War Policies of Canada, 1939-1945*, Ottawa, Department of National Defence, 1971, pp. 349-354

Document 2: Exchange of Correspondence Dated 2 and 3 May 1941, between the Canadian and United States Chairmen of the Permanent Joint Board on Defence concerning Command Arrangements Proposed for Basic Defence Plan No. 2 (Excerpt from David R. Murray, ed., *Documents on Canadian External Relations*, Vol. 8, 1939-1941, Part II, Ottawa, Department of External Affairs, 1976, pp. 204-205)

*[Not reproduced]*

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**Appendix 38**

THE CANADA-UNITED STATES JOINT COMMAND STRUCTURE ON THE HIGH SEAS, 1942 (EXCERPT FROM COL. STANLEY W. DZIUBAN, *MILITARY RELATIONS BETWEEN THE UNITED STATES AND CANADA, 1939-1945*, WASHINGTON, OFFICE OF THE CHIEF OF MILITARY HISTORY, UNITED STATES DEPARTMENT OF THE ARMY, 1959, p. 110)

*[Not reproduced]*

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**Appendix 39****THE DEFENCE OF NORTH ATLANTIC CONVOYS, 1942-1943**

Document 1: "Rearrangement Convoys East Coast of North America", Secretary to the Canadian Naval Board, Ottawa, to the Commanding Officer Atlantic Coast, Halifax, 3 August 1942, Ottawa, Public Archives of Canada, Record Group 24, Vol. 11,968

Document 2: Letter from the Chief of Naval Staff, Royal Canadian Navy, Ottawa, to the Commander-in-Chief United States Fleet, Washington, 1 December 1942, Ottawa, Public Archives of Canada, Record Group 24, Vol. 11,976

Document 3: "Strategic and Tactical Control of Naval Forces Operating in the Western Atlantic Area", Director of Operations Division, Royal Canadian Navy, to Chief of Naval Staff, Ottawa, 2 December 1942, Ottawa, Public Archives of Canada, Record Group 24, Vol. 11,969

*[Not reproduced]*

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**Appendix 40****THE UNITED STATES RELINQUISHMENT OF NORTH ATLANTIC TRADE CONVOY OPERATIONAL CONTROL, 1943**

Document 1: "Anti-Submarine Measures in the Atlantic — Recommendations Concerning", Commander-in-Chief United States Fleet, Memorandum of 14 March 1943, Ottawa, Directorate of History, Department of National Defence, File DHist 181.003(D5027)

Document 2: "Message on Revised Convoy Arrangements", Commander-in-Chief United States Fleet, Relinquishing Control of New York Convoy Escorts to the Canadian Atlantic Command, Halifax, 2220 GMT, 15 April 1943, Public Archives of Canada, Record Group 24, Vol. 11,127

*[Not reproduced]*

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**Appendix 41**

THE CANADA-UNITED STATES BASIC SECURITY PLAN, 1946 (EXCERPT FROM JAMES EAYRS, "IN DEFENCE OF CANADA", IN *PEACEMAKING AND DETERRENCE*, VOL. III, TORONTO, UNIVERSITY OF TORONTO PRESS, 1972, PP. 381-388)

*[Not reproduced]*

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**Appendix 42**

## THE CANADA-UNITED STATES JOINT DEFENCE POLICY, 1946

Document 1: The 36th Recommendation of the Permanent Joint Board on Defence, 20 November 1946

Document 2: Excerpt from C. P. Stacey, "Twenty-One Years of Canadian-American Military Cooperation, 1940-1961", in D. Deener, Ed., *Canadian-United States Treaty Relations*, College Hill, North Carolina, Duke University Press, 1963, pp. 112-113

*[Not reproduced]*

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**Appendix 43**

POST-WAR CO-OPERATION IN DEFENCE (EXCERPTS FROM *THE NEW YORK TIMES*, 13 FEBRUARY 1947, PP. 1 AND 17)

*[Not reproduced]*

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**Appendix 44**

THE NORTH AMERICAN AIR DEFENCE AGREEMENTS (NORAD), 1958 AND 1981

Document 1: Agreement between the Government of Canada and the Government of the United States of America concerning the Organization and Operation of the North American Air Defence Command (NORAD), 12 May 1958, *CANADA TREATY SERIES*, 1958, No. 9

Document 2: Exchange of Notes between the Government of Canada and the Government of the United States of America Constituting an Agreement concerning the Organization and Operation of the North American Aerospace Defence Command (NORAD), 11 March 1981, Signed at Ottawa, 11 March 1981, Entered into Force, 11 March 1981, with Effect from 12 May 1981

Document 3: North American Air Defence Zones

*[Not reproduced]*

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DOCUMENTARY APPENDICES TO CHAPTER V  
AIDS TO NAVIGATION IN THE GULF OF MAINE AREA

**Appendix 45**

THE LORAN-C POSITION-FIXING SYSTEM IN THE GULF OF MAINE AREA (EXCERPT  
FROM *NOTES ON THE USE OF LORAN-C CHARTS*, OTTAWA, CANADIAN  
HYDROGRAPHIC SERVICE, DEPARTMENT OF FISHERIES AND OCEANS, 1982)

*[Not reproduced]*

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**Appendix 46**

CANADIAN MARINE WEATHER FORECASTING REGIONS IN THE GULF OF MAINE  
AREA (EXCERPTS FROM *RADIO AIDS TO MARINE NAVIGATION*, OTTAWA, CANADIAN  
COAST GUARD, TELECOMMUNICATIONS AND ELECTRONICS BRANCH, DEPARTMENT  
OF TRANSPORT, 1982)

*[Not reproduced]*

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**Appendix 47**

CANADA-UNITED STATES EXCHANGE OF METEOROLOGICAL INFORMATION  
(EXCERPT FROM SECOND REPORT OF THE METEOROLOGICAL OFFICE OF CANADA,  
JANUARY 1873)

*[Not reproduced]*

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**Appendix 48**

WEATHER FORECASTING OVER THE HIGH SEAS (EXCERPT FROM TWELFTH ANNUAL REPORT OF THE CANADIAN METEOROLOGICAL SERVICE, TORONTO, JANUARY 1883)

*[Not reproduced]*

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**Appendix 49**

EXCERPTS FROM THE CONVENTION OF THE WORLD METEOROLOGICAL ORGANIZATION, WASHINGTON, 11 OCTOBER 1947, *CANADA TREATY SERIES*, 1947, No. 34

*[Not reproduced]*

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**Appendix 50**

EXCERPTS FROM THE CONVENTION ON INTERNATIONAL CIVIL AVIATION, ICAO Doc. 7300/6, SIXTH EDITION, 1980

*[Not reproduced]*

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**Appendix 51****INTERNATIONAL CIVIL AVIATION ORGANIZATION SEARCH AND RESCUE PROVISIONS**

**Document 1: Excerpts from the Resolutions Adopted by the 23rd Assembly of the International Civil Aviation Organization, Montreal, 16 September 1980-6 October 1980**

**Document 2: Excerpts from the Standards and Recommended Practices, Search and Rescue, Annex 12 to the Convention on International Civil Aviation, Sixth Edition, 1975**

**Document 3: Excerpts from the International Standards and Recommended Practices, Air Traffic Control Service, Flight Information Service, Alerting Service, Air Traffic Services, Annex 11 to the Convention on International Civil Aviation, Seventh Edition, 1978**

*[Not reproduced]*

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**Appendix 52****EXCERPTS FROM THE INTERNATIONAL CONVENTION ON MARITIME SEARCH AND RESCUE, SIGNED AT HAMBURG, 27 APRIL 1979**

*[Not reproduced]*

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**CERTIFICATION**

I, the undersigned, L. H. Legault, Q.C., Agent for Canada, hereby certify that the copy of each document attached as a Documentary Appendix in Volume III of the Annexes to the Counter-Memorial Submitted by Canada is an accurate copy, whether prepared by photographic means or by transcription. -

*(Signed)* L. H. LEGAULT, Q.C.

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## Annex 1

DOCUMENTS RELATING TO THE ESTABLISHMENT OF AN EXCLUSIVE ECONOMIC ZONE  
BY THE UNITED STATES (DOCUMENTS 1 TO 4)

Document 1: Proclamation No. 5030, "Exclusive Economic Zone of the United States of America", 10 March 1983

Document 2: Statement by the President, 10 March 1983

Document 3: Fact Sheet, "United States Oceans Policy", 10 March 1983

Document 4: Sketch Map Showing Outlines of Exclusive Economic Zone of the United States, 10 March 1983

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DOCUMENT 1: PROCLAMATION NO. 5030, EXCLUSIVE ECONOMIC ZONE OF THE UNITED STATES OF AMERICA, 10 MARCH 1983

THE WHITE HOUSE  
Office of the Press Secretary

MARCH 10, 1983

EMBARGOED FOR RELEASE AT 4:00 PM EST

*Exclusive Economic Zone of the United States of America*  
by the President of the United States of America

A PROCLAMATION

WHEREAS the Government of the United States of America desires to facilitate the wise development and use of the oceans consistent with international law;

WHEREAS international law recognizes that, in a zone beyond its territory and adjacent to its territorial sea, known as the Exclusive Economic Zone, a coastal State may assert certain sovereign rights over natural resources and related jurisdiction; and

WHEREAS the establishment of an Exclusive Economic Zone by the United States will advance the development of ocean resources and promote the protection of the marine environment, while not affecting other lawful uses of the zone, including the freedoms of navigation and overflight, by other States;

NOW, THEREFORE, I, RONALD REAGAN, by the authority vested in me as President by the Constitution and laws of the United States of America, do hereby proclaim the sovereign rights and jurisdiction of the United States of America and confirm also the rights and freedoms of all States within an Exclusive Economic Zone, as described herein.

The Exclusive Economic Zone of the United States is a zone contiguous to the territorial sea, including zones contiguous to the territorial sea of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands (to the extent consistent with the Covenant and the United Nations Trusteeship Agreement), and United States overseas territories and possessions. The Exclusive Economic Zone extends to a distance 200 nautical

miles from the baseline from which the breadth of the territorial sea is measured. In cases where the maritime boundary with a neighboring State remains to be determined, the boundary of the Exclusive Economic Zone shall be determined by the United States and other State concerned in accordance with equitable principles.

Within the Exclusive Economic Zone, the United States has, to the extent permitted by international law, (a) sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources, both living and non-living, of the seabed and subsoil and the superjacent waters and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds; and (b) jurisdiction with regard to the establishment and use of artificial islands, and installations and structures having economic purposes, and the protection and preservation of the marine environment.

This Proclamation does not change existing United States policies concerning the continental shelf, marine mammals and fisheries, including highly migratory species of tuna which are not subject to United States jurisdiction and require international agreements for effective management.

The United States will exercise these sovereign rights and jurisdiction in accordance with the rules of international law.

Without prejudice to the sovereign rights and jurisdiction of the United States, the Exclusive Economic Zone remains an area beyond the territory and territorial sea of the United States in which all States enjoy the high seas freedoms of navigation, overflight, the laying of submarine cables and pipelines, and other internationally lawful uses of the sea.

IN WITNESS WHEREOF, I have hereunto set my hand this tenth day of March, in the year of our Lord nineteen hundred and eighty-three, and of the Independence of the United States of America the two hundred and seventh.

RONALD REAGAN

DOCUMENT 2: STATEMENT BY THE PRESIDENT, 10 MARCH 1983

THE WHITE HOUSE  
Office of the Press Secretary

March 10, 1983

EMBARGOED FOR RELEASE AT 4:00 PM EST

STATEMENT BY THE PRESIDENT

The United States has long been a leader in developing customary and conventional law of the sea. Our objectives have consistently been to provide a legal order that will, among other things, facilitate peaceful, international uses of the oceans and provide for equitable and effective management and conservation of marine resources. The United States also recognizes that all nations have an interest in these issues.

Last July I announced that the United States will not sign the United Nations Law of the Sea Convention that was opened for signature on December 10. We have taken this step because several major problems in the Convention's deep seabed mining provisions are contrary to the interests and principles of industrialized nations and would not help attain the aspirations of developing countries.

The United States does not stand alone in those concerns. Some important allies and friends have not signed the Convention. Even some signatory States have raised concerns about these problems.

However, the Convention also contains provisions with respect to traditional uses of the oceans which generally confirm existing maritime law and practice and fairly balance the interests of all States.

Today I am announcing three decisions to promote and protect the oceans interests of the United States in a manner consistent with those fair and balanced results in the Convention and international law.

First, the United States is prepared to accept and act in accordance with the balance of interests relating to traditional uses of the oceans – such as navigation and overflight. In this respect, the United States will recognize the rights of other States in the waters off their coasts, as reflected in the Convention, so long as the rights and freedoms of the United States and others under international law are recognized by such coastal States.

Second, the United States will exercise and assert its navigation and overflight rights and freedoms on a worldwide basis in a manner that is consistent with the balance of interests reflected in the Convention. The United States will not, however, acquiesce in unilateral acts of other States designed to restrict the rights and freedoms of the international community in navigation and overflight and other related high seas uses.

Third, I am proclaiming today an Exclusive Economic Zone in which the United States will exercise sovereign rights in living and non-living resources within 200 nautical miles of its coast. This will provide United States jurisdiction for mineral resources out to 200 nautical miles that are not on the continental shelf. Recently discovered deposits there could be an important future source of strategic minerals.

Within this Zone all nations will continue to enjoy the high seas rights and freedoms that are not resource-related, including the freedoms of navigation and overflight. My Proclamation does not change existing United States policies concerning the continental shelf, marine mammals and fisheries, including highly migratory species of tuna which are not subject to United States jurisdiction. The United States will continue efforts to achieve international agreements for the effective management of these species. The Proclamation also reinforces this government's policy of promoting the United States fishing industry.

While international law provides for a right of jurisdiction over marine scientific research within such a zone, the Proclamation does not assert this right. I have elected not to do so because of the United States interest in encouraging marine scientific research and avoiding any unnecessary burdens. The United States will nevertheless recognize the right of other coastal States to exercise jurisdiction over marine scientific research within 200 nautical miles of their coasts, if that jurisdiction is exercised reasonably in a manner consistent with international law.

The Exclusive Economic Zone established today will also enable the United States to take limited additional steps to protect the marine environment. In this connection, the United States will continue to work through the International Maritime Organization and other appropriate international organizations to develop uniform international measures for the protection of the marine environment while imposing no unreasonable burdens on commercial shipping.

The policy decisions I am announcing today will not affect the application of existing United States law concerning the high seas or existing authorities of any United States government agency.

In addition to the above policy steps, the United States will continue to work with other countries to develop a regime, free of unnecessary political and economic restraints, for mining deep seabed minerals beyond national jurisdiction. Deep seabed mining remains a lawful exercise of the freedom of the high seas open to all nations. The United States will continue to allow its firms to explore for and, when the market permits, exploit these resources.

The Administration looks forward to working with the Congress on legislation to implement these new policies.

DOCUMENT 3: FACT SHEET, UNITED STATES OCEANS POLICY, 10 MARCH 1983

THE WHITE HOUSE  
Office of the Press Secretary

MARCH 10, 1983

EMBARGOED FOR RELEASE AT 4:00 PM EST

FACT SHEET

UNITED STATES OCEANS POLICY

Today the President announced new guidelines for U.S. oceans policy and proclaimed an Exclusive Economic Zone (EEZ) for the United States. This follows his consideration of a senior interagency review of these matters.

The EEZ Proclamation confirms U.S. sovereign rights and control over the living and non-living natural resources of the seabed, subsoil and superjacent waters beyond the territorial sea but within 200 nautical miles of the United States coasts. This will include, in particular, new rights over all minerals (such as nodules and sulphide deposits) in the zone that are not on the continental shelf but are within 200 nautical miles. Deposits of polymetallic sulphides and cobalt/manganese crusts in these areas have only been recently discovered and are years away from being commercially recoverable. But they could be a major future source of strategic and other minerals important to the U.S. economy and security.

The EEZ applies to waters adjacent to the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands (consistent with the Covenant and UN Trusteeship Agreement), and United States overseas territories and possessions. The total area encompassed by the EEZ has been estimated to exceed two million square nautical miles.

The President's statement makes clear that the proclamation does not change existing policies with respect to the outer continental shelf and fisheries within the U.S. zone.

Since President Truman proclaimed U.S. jurisdiction and control over the adjacent continental shelf in 1945, the U.S. has asserted sovereign rights for the purpose of exploration and exploitation of the resources of the continental shelf. Fundamental supplementary legislation, the Outer Continental Shelf Lands Act, was passed by Congress in 1953. The President's proclamation today incorporates existing jurisdiction over the continental shelf.

Since 1976 the United States has exercised management and conservation authority over fisheries resources (with the exception of highly migratory species of tuna) within 200 nautical miles of the coasts, under the Magnuson Fishery Conservation and Management Act. The U.S. neither recognizes nor asserts jurisdiction over highly migratory species of tuna. Such species are best managed by international agreements with concerned countries. In addition to

confirming the United States sovereign rights over mineral deposits beyond the continental shelf but within 200 nautical miles, the Proclamation bolsters U.S. authority over the living resources of the zone.

The United States has also exercised certain other types of jurisdiction beyond the territorial sea in accordance with international law. This includes, for example, jurisdiction relating to pollution control under the Clean Water Act of 1977 and other laws.

The President has decided not to assert jurisdiction over marine scientific research in the U.S. EEZ. This is consistent with the U.S. interest in promoting maximum freedom for such research. The Department of State will take steps to facilitate access by U.S. scientists to foreign EEZ's under reasonable conditions.

The concept of the EEZ is already recognized in international law and the President's Proclamation is consistent with existing international law. Over 50 countries have proclaimed some form of EEZ; some of these are consistent with international law and others are not.

The concept of an EEZ was developed further in the recently concluded Law of the Sea negotiations and is reflected in that Convention. The EEZ is a maritime area in which the coastal state may exercise certain limited powers as recognized under international law. The EEZ is not the same as the concept of the territorial sea, and is beyond the territorial jurisdiction of any coastal state.

The President's proclamation confirms that, without prejudice to the rights and jurisdiction of the United States in its EEZ, all nations will continue to enjoy non-resource related freedoms of the high seas beyond the U.S. territorial sea and within the U.S. EEZ. This means that the freedom of navigation and overflight and other internationally lawful uses of the sea will remain the same within the zone as they are beyond it.

The President has also established clear guidelines for United States oceans policy by stating that the United States is prepared to accept and act in accordance with international law as reflected in the results of the Law of the Sea Convention that relate to traditional uses of the oceans, such as navigation and overflight. The United States is willing to respect the maritime claims of others, including economic zones, that are consistent with international law as reflected in the Convention, if U.S. rights and freedoms in such areas under international law are respected by the coastal state.

The President has not changed the breadth of the United States territorial sea. It remains at 3 nautical miles. The United States will respect only those territorial sea claims of others in excess of 3 nautical miles, to a maximum of 12 nautical miles, which accord to the U.S. its full rights under international law in the territorial sea.

Unimpeded commercial and military navigation and overflight are critical to the national interest of the United States. The United States will continue to act to ensure the retention of the necessary rights and freedoms.

By proclaiming today a U.S. EEZ and announcing other oceans policy guidelines, the President has demonstrated his commitment to the protection and promotion of U.S. maritime interests in a manner consistent with international law.

END

DOCUMENT 4: SKETCH MAP SHOWING OUTLINES OF EXCLUSIVE ECONOMIC ZONE OF THE UNITED STATES, 10 MARCH 1983

*[Not reproduced]*

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## Annex 2

CANADIAN DIPLOMATIC NOTE NO. 160 OF 26 APRIL 1983 (WITHOUT ATTACHMENT)

CANADIAN EMBASSY      AMBASSADE DU CANADA

*Note No. 160*

The Embassy of Canada presents its compliments to the Department of State and has the honour to refer to President Reagan's Proclamation on the Exclusive Economic Zone of the United States of America, issued on March 10, 1983.

The State Department will recall that the Canadian authorities expressed certain views and raised certain questions regarding a draft version of President Reagan's Proclamation that was made available to a number of Governments in early January for comment by them. Canada's views and queries were set out in an Aide-Mémoire of January 14, 1983 (copy attached for ease of reference). In that communication, the Canadian authorities undertook to provide substantive comments on the draft United States Proclamation and Oceans Policy Statement, in the light of a full understanding of their purport and, in particular, their basis in international law.

The Canadian authorities regret that it has not been possible to obtain the information requested in the Aide-Mémoire of January 14. In the circumstances they do not propose to comment in detail on the Proclamation, Statement and Oceans Policy Fact Sheet issued by the President on March 10. The Canadian authorities, however, must note with concern that the Proclamation and related documents on a number of important points differ substantially from the provisions of the 1982 Convention on the Law of the Sea, and differ as well from certain principles of customary international law. The Government of Canada therefore formally reserves all its rights with regard to the matters treated in all these documents.

The Canadian authorities have taken special note of the Proclamation's provisions regarding the determination of the boundaries between the economic zone of the United States and the economic zone or corresponding zone of neighbouring States. The Canadian authorities wish to stress that these provisions cannot affect the rights of such neighbouring States and, further, cannot affect the obligations and the rules and principles binding upon the United States under customary international law or under the 1958 Convention on the Continental Shelf, to which Canada and the United States remain parties. In this connection, the Canadian authorities reaffirm at this time the position of the Government of Canada on the outstanding maritime boundaries with the United States as communicated to the United States on many occasions.

The Canadian authorities have also taken special note of the Proclamation's provisions regarding highly migratory species of tuna and wish to stress that such species, under both customary international law and the 1982 Convention on the Law of the Sea, are subject to the sovereign rights of the coastal State within the 200-mile economic zone or fishing zone. Canada, of course, is prepared to cooperate with neighbouring coastal States with regard to the conservation and management of these and other species that migrate through and between the zones of several States.

The above-noted comments on particular aspects of the United States Proclamation and related documents should not be construed as limiting the comprehensive reservation of all of Canada's rights in relation to all matters treated therein.

The Embassy of Canada avails itself of this opportunity to renew to the Department of State the assurances of its highest consideration.

Washington, D.C.  
April 26, 1983

B. H. DICKSON

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**Annex 3**

EXCERPT FROM G. KAECKENBEECK, *INTERNATIONAL RIVERS*, GROTIUS SOCIETY PUBLICATIONS, NO. 1, LONDON, SWEET AND MAXWELL LIMITED, 1918, P. 32

*[Not reproduced]*

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**Annex 4**

EXCERPT FROM H. B. BIGELOW, "FISHES OF THE GULF OF MAINE", *BULLETIN OF THE UNITED STATES BUREAU OF FISHERIES*, VOL. XL, PART I, 1924, P. 7

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**Annex 5**

EXCERPT FROM R. HARTSHORNE, "THE NATURE OF GEOGRAPHY: A CRITICAL SURVEY OF CURRENT THOUGHT IN THE LIGHT OF THE PAST", *ANNALS OF THE ASSOCIATION OF AMERICAN GEOGRAPHERS*, VOL. XXIX, NOS. 3 AND 4, 1939, PP. 296-302

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**Annex 6**

R. HODGSON AND E. J. COOPER, "THE TECHNICAL DELIMITATION OF A MODERN EQUIDISTANT BOUNDARY", *OCEAN DEVELOPMENT AND INTERNATIONAL LAW JOURNAL*, VOL. 3, 1976, PP. 361-388

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**Annex 7**

EXCERPT FROM F. P. SHEPARD AND H. R. WANLESS, *OUR CHANGING COASTLINES*,  
NEW YORK, MCGRAW-HILL, 1971, p. 7

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**Annex 8**

EXCERPT FROM L. H. KING AND B. MACLEAN, *GEOLOGY OF THE SCOTIAN SHELF*,  
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**Annex 9**

EXCERPT FROM G. B. FADER, L. H. KING AND B. MACLEAN, *SURFICIAL GEOLOGY  
OF THE EASTERN GULF OF MAINE AND BAY OF FUNDY*, GEOLOGICAL SURVEY OF  
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**Annex 10**

EXCERPT FROM C. J. R. GARRETT, "TIDAL INFLUENCES ON THE PHYSICAL  
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**Annex 11**

EXCERPT FROM R. E. SHERIDAN, "ATLANTIC CONTINENTAL MARGIN OF NORTH AMERICA", IN C. A. BURK AND C. L. DRAKE, EDs., *THE GEOLOGY OF CONTINENTAL MARGINS*, NEW YORK, SPRINGER-VERLAG, 1974, PP. 396-397

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**Annex 12**

EXCERPTS FROM E. UCHUPI, *ATLANTIC CONTINENTAL SHELF AND SLOPE OF THE UNITED STATES — PHYSIOGRAPHY*, UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY PROFESSIONAL PAPER 529-C, WASHINGTON, GOVERNMENT PRINTING OFFICE, 1968, PP. C3 AND C5

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**Annex 13**

EXCERPT FROM H. B. BIGELOW, "PHYSICAL OCEANOGRAPHY OF THE GULF OF MAINE", *BULLETIN OF THE UNITED STATES BUREAU OF FISHERIES*, VOL. XL, PART II, 1924, PP. 518 AND 519

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**Annex 14**

EXCERPT FROM *FINAL ENVIRONMENTAL STATEMENT, PROPOSED 1977 OUTER CONTINENTAL SHELF OIL AND GAS LEASE SALE OFFSHORE THE NORTH ATLANTIC STATES*, VOL. 1, OCS SALE No. 42, UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT, WASHINGTON, GOVERNMENT PRINTING OFFICE, 1977, P. 345

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**Annex 15**

EXCERPT FROM L. M. DICKIE, "PERSPECTIVES ON FISHERIES BIOLOGY AND IMPLICATIONS FOR MANAGEMENT", *JOURNAL OF THE FISHERIES RESEARCH BOARD OF CANADA*, VOL. 36, 1979, P. 839

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**Annex 16**

EXCERPT FROM J. P. WISE AND A. C. JENSEN, "STOCKS OF THE IMPORTANT COMMERCIAL SPECIES OF FISH OF THE ICNAF CONVENTION AREA", ICNAF ANNUAL MEETING — 30 MAY-1 JUNE 1960, SERIAL NO. 743 (D.C. 3), DOCUMENT NO. 25, P. 1

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**Annex 17**

EXCERPT FROM J. P. WISE, "COD GROUPS IN THE NEW ENGLAND AREA", *FISHERY BULLETIN*, VOL. 63, NO. 1, 1963, P. 201

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**Annex 18**

*SPECIAL COMMISSION MEETING ON HERRING, JANUARY-FEBRUARY 1972, CONSERVATION OF HERRING, MEMORANDUM BY THE UNITED STATES, ICNAF SERIAL NO. 2680, SPEC. MTG. COMM. DOC. 72/1*

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**Annex 19**

*SPECIAL COMMISSION MEETING ON HERRING, JANUARY-FEBRUARY 1972, CONSERVATION OF HERRING, MEMORANDUM BY CANADA, ICNAF SERIAL No. 2685, SPEC. MTG. COMM. DOC. 72/2*

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**Annex 20**

EXCERPTS FROM *FISHERY MANAGEMENT PLAN, FINAL ENVIRONMENTAL IMPACT STATEMENT, REGULATORY IMPACT REVIEW FOR ATLANTIC SEA SCALLOPS (PLACOPECTEN MAGELLANICUS)*, PREPARED BY NEW ENGLAND FISHERY MANAGEMENT COUNCIL IN CONSULTATION WITH MID-ATLANTIC FISHERY MANAGEMENT COUNCIL AND SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL, JANUARY 1982, P. 6, AND TABLE 333.3, P. 60

*[Not reproduced]*

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**Annex 21**

EXCERPTS FROM *DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE AGREEMENT BETWEEN THE UNITED STATES AND CANADA ON EAST COAST FISHERY RESOURCES*, WASHINGTON, UNITED STATES DEPARTMENT OF STATE, APRIL 1980, PP. 103 AND 109

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**Annex 22**

EXCERPT FROM M. D. GROSSLEIN AND S. H. CLARK, *DISTRIBUTION OF SELECTED FISH SPECIES AND STATUS OF MAJOR FISHERIES IN THE NORTHWEST ATLANTIC*, TECHNICAL REFERENCE DOCUMENT FOR BILATERAL NEGOTIATIONS BETWEEN THE UNITED STATES AND CANADA, JULY 1976, UNITED STATES NATIONAL MARINE FISHERIES SERVICE, NORTHEAST FISHERIES CENTER, WOODS HOLE, MASSACHUSETTS, LABORATORY REFERENCE NO. 76-12, 1976, P. 53

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**Annex 23**

EXCERPT FROM *INTERIM FISHERY MANAGEMENT PLAN FOR ATLANTIC GROUND FISH*, SAUGUS, MASSACHUSETTS, NEW ENGLAND FISHERY MANAGEMENT COUNCIL, 30 SEPTEMBER 1981, p. 1

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**Annex 24**

EXCERPT FROM *CALENDAR YEAR 1981, REPORT ON THE IMPLEMENTATION OF THE MAGNUSON FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976*, UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE FISHERIES SERVICE, WASHINGTON, GOVERNMENT PRINTING OFFICE, 1982, p. 75

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**Annex 25**

EXCERPT FROM *PACIFIC FISHERMAN*, MAY 1957, pp. 13-14

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**Annex 26**

EXCERPT FROM *THE FISHERMEN'S NEWS*, OCTOBER 1978

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**Annex 27**

D. L. MCKERNAN, "SCIENCE AND POLITICS IN NATIONAL FISHERY MANAGEMENT",  
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**Annex 28**

EXCERPT FROM NORTHWEST ATLANTIC FISHERIES ORGANIZATION, *STATISTICAL  
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**Annex 29**

STATISTICS RESPECTING LICENSED VESSELS IN SOUTHWEST NOVA SCOTIA

*[Not reproduced]*

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**Annex 30**

STATISTICS RESPECTING VESSELS LESS THAN 14 METRES IN LENGTH AND WHICH  
DISPLACE LESS THAN 25.5 GROSS REGISTERED TONS IN FISHERIES DISTRICT 32

*[Not reproduced]*

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**Annex 31**

D. RUSSELL, "REBEL WATERS", *BOSTON MAGAZINE*, DECEMBER 1981

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**Annex 32**

EXCERPTS FROM S. SEDGEWICK, C. COLLINS AND S. OLSEN, *COMMERCIAL FISHING FACILITIES NEEDS IN RHODE ISLAND*, COASTAL RESOURCES CENTER, UNIVERSITY OF RHODE ISLAND, MARINA TECHNICAL REPORT 80, 1980, PP. 2, 11 AND 20

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**Annex 33**

CANADIAN CATCH STATISTICS, 1979-1982

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**Annex 34**

STATISTICS RESPECTING THE OFFSHORE FISHERY OF THE SMALL-VESSEL FLEET OF  
SOUTHWEST NOVA SCOTIA

*[Not reproduced]*

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**Annex 35**

STATISTICS RESPECTING UNITED STATES LANDINGS  
(Source: National Marine Fisheries Service, Data Management and Statistics  
Division.)

*[Not reproduced]*

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**Annex 36**

STATISTICS ON AVERAGE EMPLOYMENT INCOME IN NOVA SCOTIA AND MASSACHUSETTS, 1980 (DOCUMENTS 1 TO 3)

Document 1: Excerpt from Revenue Canada, *1982 Taxation Statistics Analyzing 1980 T1 Individual Returns and Miscellaneous Statistics*, Table 5, Ottawa, Department of National Revenue 1982, pp. 102-103

Document 2: Revenue Canada, Unpublished Data, 1980

Document 3: Excerpt from United States Department of Labor, *News*, Washington, Bureau of Labor Statistics, USDL 82-460, 13 December 1982, p. 5

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**Annex 37**

EXCERPT FROM S. OLSEN, ED., *FISHING AND PETROLEUM INTERACTIONS ON GEORGES BANK*, ENERGY PROGRAM TECHNICAL REPORT 77-1, BOSTON, NEW ENGLAND REGIONAL COMMISSION, 1977, p. 94

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**Annex 38**

EXCERPT FROM *MASSACHUSETTS FISHERIES: A REPORT OF THE 200 MILE FISHERIES WORK GROUP*, BOSTON, COMMONWEALTH OF MASSACHUSETTS, 1977, pp. 1-24

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**Annex 39**

EXCERPTS FROM *FISH, FRESH, CHILLED OR FROZEN, WHETHER OR NOT WHOLE, BUT NOT OTHERWISE PREPARED OR PRESERVED, FROM CANADA*, UNITED STATES INTERNATIONAL TRADE COMMISSION, USITC PUBLICATION 1066, MAY 1980, PP. 1 AND A1-A7

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**Annex 40**

EXCERPT FROM COMPTROLLER GENERAL OF THE UNITED STATES, REPORT TO THE CONGRESS, *THE U.S. FISHING INDUSTRY - PRESENT CONDITION AND FUTURE OF MARINE FISHERIES*, UNITED STATES GENERAL ACCOUNTING OFFICE, 1976, COVER PAGE

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**Annex 41**

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**Annex 42**

EXCERPT FROM *ANNUAL STATISTICAL REVIEW OF CANADIAN FISHERIES, 1955-1976*, VOL. 9, OTTAWA, DEPARTMENT OF FISHERIES AND OCEANS, TABLE 15, p. 49

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**Annex 43**

EXCERPT FROM W. L. LISCOM, ED., *THE ENERGY DECADE, 1970-1980. A STATISTICAL AND GEOGRAPHY CHRONICLE*, CAMBRIDGE, BALLINGER PUBLISHING COMPANY, 1982, p. 415

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**Annex 44**

R. V. GUIDO AND M. F. MORRONE, "THE MICHELIN DECISION: A POSSIBLE NEW DIRECTION FOR U.S. COUNTERVAILING DUTY LAW", IN J. H. JACKSON, ED., *LEGAL PROBLEMS OF INTERNATIONAL ECONOMIC RELATIONS, CASES, MATERIALS AND TEXT ON THE NATIONAL AND INTERNATIONAL REGULATION OF TRANSNATIONAL ECONOMIC RELATIONS*, ST. PAUL, UNIVERSITY OF MICHIGAN, 1977, PP. 789-801

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**Annex 45**

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**Annex 46**

EXCERPT FROM *ANNUAL STATISTICAL REVIEW OF CANADIAN FISHERIES, 1978*, VOL. 11, OTTAWA, DEPARTMENT OF FISHERIES AND OCEANS, TABLE 22, P. 41

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**Annex 47**

EXCERPT FROM DOMINION BUREAU OF STATISTICS, *FISHERIES STATISTICS OF CANADA (1958) - NOVA SCOTIA*, INDUSTRY AND MERCHANDIZING DIVISION, OCTOBER 1960, TABLE 4, PP. D18-D31

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**Annex 48**

EXCERPTS FROM *DIGBY COUNTY STATISTICAL PROFILE; QUEENS COUNTY STATISTICAL PROFILE; LUNENBURG COUNTY STATISTICAL PROFILE; YARMOUTH COUNTY STATISTICAL PROFILE; SHELBURNE COUNTY STATISTICAL PROFILE*, NOVA SCOTIA DEPARTMENT OF DEVELOPMENT, TABLE 18, P. 28

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**Annex 49**

EXCERPT FROM A. McDONALD, J. ROWLAND AND R. FITZGERALD, *EMPLOYMENT AND THE MASSACHUSETTS FISHING INDUSTRY*, BOSTON, LABOR AREA RESEARCH DEPARTMENT, MASSACHUSETTS DIVISION OF EMPLOYMENT SECURITY, UNDATED, P. 2

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**Annex 50**

EXCERPT FROM *ANNUAL STATISTICAL REVIEW OF CANADIAN FISHERIES, 1978*, VOL. 11, OTTAWA, DEPARTMENT OF FISHERIES AND OCEANS, TABLE 16, P. 34

*[Not reproduced]*

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**Annex 51**

MANUFACTURERS BY ACTIVITY IN DIGBY, LUNENBURG AND RIVERPORT  
(Source: Nova Scotia Department of Development, *Nova Scotia Directory of Manufacturers, 1979-1980*, Halifax 1980.)

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**Annex 52****STATISTICS ON TOTAL MANUFACTURING IN BOSTON AND NEW BEDFORD  
(DOCUMENTS 1 AND 2)**

Document 1: Excerpt from Bureau of Labor Statistics, *Employment and Earnings, States and Areas, 1939-78*, Washington, United States Department of Labor, November 1979, Bulletin 1370-13, pp. 271-275

Document 2: Excerpt from L. J. Smith and S. J. Peterson, *The New England Fishing Industry: A Basis for Management*, Massachusetts, Woods Hole Oceanographic Institution, 1977, pp. 29-30 and 49

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**Annex 53**

EXCERPT FROM R. N. MCPHERSON, *GLOUCESTER RESOURCE STUDY*, BOSTON, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, 1973, p. 108

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**Annex 54**

EXCERPTS FROM *NOVA SCOTIA DIRECTORY OF MANUFACTURERS, 1979-1980*, HALIFAX, DEPARTMENT OF DEVELOPMENT, STATISTICAL SERVICES BRANCH, MARCH 1980, PP. TAN 5-6, 14-19

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**Annex 55**

EXCERPT FROM *THE LABOUR FORCE, 1981*, STATISTICS CANADA, CATALOGUE 71-001, DECEMBER 1981, TABLE 110, p. 135

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**Annex 56**

EXCERPT FROM *COST AND EARNINGS OF SELECTED FISHING ENTERPRISES, NOVA SCOTIA, 1981*, HALIFAX, DEPARTMENT OF FISHERIES AND OCEANS, ECONOMICS BRANCH, SEPTEMBER 1982, P. 30, TABLE 13C

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**Annex 57**

LETTER FROM C. A. O'CONNOR, UNITED STATES CONSUL AT YARMOUTH, NOVA SCOTIA, TO W. W. ROCKHILL, UNITED STATES ASSISTANT SECRETARY OF STATE, 10 MARCH 1897, *DISPATCHES FROM UNITED STATES CONSULS IN YARMOUTH, NOVA SCOTIA*, VOL. 2, WASHINGTON, DEPARTMENT OF STATE, 1899, NO. 51

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**Annex 58**

EXCERPTS FROM *DOCUMENTS AND PROCEEDINGS OF THE HALIFAX COMMISSION, 1877*, VOL. I, PP. 1075 AND 1080; VOL. II, PP. 2047-2049

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**Annex 59**

"BOSTON FISH BUREAU", *THE DIGBY WEEKLY COURIER*, 2 OCTOBER 1885, P. 12

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**Annex 60**

EXCERPTS FROM E. A. ACKERMAN, *NEW ENGLAND'S FISHING INDUSTRY*, CHICAGO, UNIVERSITY OF CHICAGO PRESS, 1941, PP. 4, 5 AND 141

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**Annex 61**

EXCERPT FROM E. W. SAGER AND L. R. FISCHER, "ATLANTIC CANADA AND THE AGE OF SAIL REVISITED", *CANADIAN HISTORICAL REVIEW*, VOL. LXIII, NO. 2, 1982, PP. 125-150

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**Annex 62**

EXCERPT FROM C. ISHAM, *THE FISHERY QUESTION*, NEW YORK, G. P. PUTNAM'S SONS, 1887, P. 76

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**Annex 63**

EXCERPT FROM T. F. KNIGHT, *SHORE AND DEEP SEA FISHERIES OF NOVA SCOTIA*, HALIFAX, A. GRANT, 1867, PP. 1-6

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**Annex 64**

LETTER TO THE EDITOR OF *THE YARMOUTH HERALD*, 10 MARCH 1881

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**Annex 65**

EXCERPT FROM *DOCUMENTS AND PROCEEDINGS OF THE HALIFAX COMMISSION*,  
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**Annex 66**

EXCERPT FROM *REPORT OF THE UNITED STATES COMMISSIONER OF FISHERIES FOR  
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**Annex 67**

EXCERPTS FROM ICNAF, SUMMARY REPORT (MINUTES), PANEL, SUBAREA 4,  
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**Annex 68**

EXCERPTS FROM "TEST SCALLOP FISHERY ON OFFSHORE BANKS", *FISHERIES NEWS BULLETIN*, VOL. XI, NO. 124, FEBRUARY 1940, PP. 2 AND 4

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**Annex 69**

EXCERPT FROM P. SHEA, "SWORDFISH SLEIGH RIDE", *MAINE COAST FISHERMAN*, JULY 1958, P. 21

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**Annex 70**

EXCERPTS FROM T. AMIRO, M. MACDONALD-MACKENZIE AND J. (CLINE) NEWELL, *A SEA TRAGEDY WOOD'S HARBOUR 1950*, YARMOUTH, SENTINEL PRINTING LTD., 1977, PP. 14, 27 AND 63

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**Annex 71**

EXCERPT FROM H. A. PERRY, *IN AND AROUND OLD BARRINGTON*, YARMOUTH, LESCARBOT PRINTING LIMITED, 1979, PP. 22-26

*[Not reproduced]*

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**CERTIFICATION**

I, the undersigned, L. H. Legault, Q.C., Agent for Canada, hereby certify that the copy of each document attached as a Documentary Annex in Volume IV of the Annexes to the Counter-Memorial Submitted by Canada is an accurate copy, whether prepared by photographic means or by transcription.

(Signed) L. H. LEGAULT, Q.C.

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**Volume V**  
**DOCUMENTS**  
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**Annex 72**

EXCERPT FROM *OILWEEK*, 25 MAY 1964, PP. 21-22

*[Not reproduced]*

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**Annex 73**

SELECTED UNITED STATES EXPLORATION PERMITS (DOCUMENTS 1 TO 6)

Document 1: Permit E6-75

Document 2: Permit E3-67

Document 3: Permit E3-68

Document 4: Permit E4-64

Document 5: Permit E1-66

Document 6: Permit E4-69

*[Not reproduced]*

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**Annex 74**

DOCUMENTS RELATING TO HUMBLE OIL SEISMIC PROGRAM, 1966  
(DOCUMENTS 1 AND 2)

Document 1: Letter of 28 September 1966 from Chevron Standard Limited to the Chief, Resource Management Division, Department of Northern Affairs and National Resources

Document 2: Sketch Map Illustrating Seismic Program Carried Out by Humble Oil in 1966 Attached

*[Not reproduced]*

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**Annex 75**

EXCERPTS FROM *DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE AGREEMENT BETWEEN THE UNITED STATES AND CANADA ON EAST COAST FISHERY RESOURCES*, WASHINGTON, UNITED STATES DEPARTMENT OF STATE, APRIL 1980, PP. 7 AND 116-124

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**Annex 76**

PREPARED STATEMENT OF THOMAS A. NORRIS, REPRESENTING THE BOSTON FISHING INDUSTRY, IN *UNITED STATES-CANADIAN FISHING AGREEMENTS: HEARINGS BEFORE THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT, COMMITTEE ON MERCHANT MARINE AND FISHERIES, UNITED STATES HOUSE OF REPRESENTATIVES, 96TH CONGRESS, 1ST SESSION, 22 JUNE 1979*, PP. 158-160

*[Not reproduced]*

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**Annex 77**

STATEMENTS OF A PANEL CONSISTING OF GORDON MURPHY, PRESIDENT, NATIONAL FISHERIES INSTITUTE; DAVID BERGSON, REPRESENTING THE MAINE REDFISH FISHERMEN; AND JAMES L. WARREN, EXECUTIVE DIRECTOR, MAINE SARDINE COUNCIL, IN *UNITED STATES-CANADIAN FISHING AGREEMENTS: HEARINGS BEFORE THE SUBCOMMITTEE ON FISHERIES AND WILDLIFE CONSERVATION AND THE ENVIRONMENT, COMMITTEE ON MERCHANT MARINE AND FISHERIES, UNITED STATES HOUSE OF REPRESENTATIVES, 96TH CONGRESS, 1ST SESSION, 22 JUNE 1979*, PP. 147-157

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**Annex 78**

STATEMENTS OF NORMAN H. OLSEN, JR., NEW ENGLAND FISHERIES MANAGEMENT COUNCIL, IN MARITIME BOUNDARY SETTLEMENT TREATY AND EAST COAST FISHERY RESOURCES AGREEMENT: HEARINGS BEFORE THE COMMITTEE ON FOREIGN RELATIONS, UNITED STATES SENATE, 96TH CONGRESS, 2ND SESSION, 15-17 APRIL 1980, PP. 62-71 AND 80-81

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**Annex 79**

EXCERPTS FROM MINUTES OF THE NEW ENGLAND REGIONAL FISHERY MANAGEMENT COUNCIL, 25-30 JUNE 1980, P. 35

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**Annex 80**

EXCERPT FROM F. BARRY, "THE ADMINISTRATION OF THE OUTER CONTINENTAL SHELF LANDS ACT", *NATURAL RESOURCES JOURNAL*, VOL. 1, 1968, PP. 46-47

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**Annex 81**

MINUTES OF THE TWENTY-THIRD MEETING, 23-25 SEPTEMBER 1936, EXECUTIVE SESSIONS, ITEM NOS. 2 AND 14, NORTH AMERICAN COUNCIL ON FISHERY INVESTIGATIONS, PROCEEDINGS, 1934-1936, No. 3, OTTAWA, KING'S PRINTER, 1939

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**Annex 82**

FINAL ACT OF THE INTERNATIONAL FISHERIES CONFERENCE, LONDON,  
22 OCTOBER 1943, ANNEX II AND RESOLUTION No. 2

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**Annex 83**

EXCERPT FROM ANNUAL REPORT OF THE DEPARTMENT OF FISHERIES FOR THE YEAR  
1931-1932, p. 31

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**Annex 84**

EXCERPT FROM *PROPOSED INTERNATIONAL CONVENTION FOR THE NORTHWEST  
ATLANTIC FISHERIES, BACKGROUND OF THE PROPOSED CONVENTION FOR THE  
NORTHWEST ATLANTIC*, PREPARED BY THE UNITED STATES, FEBRUARY 1948

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**Annex 85**

LETTER No. 6 OF 7 JANUARY 1949 FROM JULIAN F. HARRINGTON, AMERICAN  
MINISTER, TO THE SECRETARY OF STATE FOR EXTERNAL AFFAIRS

*[Not reproduced]*

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**Annex 86**

NOTES OF A MEETING HELD AT ST. JOHN'S, NEWFOUNDLAND, ON 14-16 JUNE 1948,  
BETWEEN REPRESENTATIVES OF NEWFOUNDLAND, CANADA, AND THE UNITED  
STATES

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**Annex 87**

EXCERPT FROM MINUTES OF THE SEVENTEENTH MEETING OF NACFI,  
6-7 NOVEMBER 1930, P. 4

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**Annex 88**

EXCERPT FROM G. A. ROUNSEFELL, *DEVELOPMENT OF FISHERY STATISTICS IN THE  
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WILDLIFE SERVICE, SCIENTIFIC REPORT NO. 47, 1948, P. 8

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**Annex 89**

NACFI AND ICNAF STATISTICAL AREAS (DOCUMENTS 1 AND 2)

Document 1: NACFI Chart No. 1 (Statistical Areas, Atlantic Coast of North  
America)

Document 2: Map of ICNAF and ICES Statistical Areas from *ICNAF  
Statistical Bulletin*, Vol. 16, 1966 (1968)

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**Annex 90**

EXCERPTS FROM NORTH AMERICAN COUNCIL ON FISHERY INVESTIGATIONS,  
PROCEEDINGS, 1921-1930, NO. 1, OTTAWA, KING'S PRINTER, 1932, PP. 24-26

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**Annex 91**

EXCERPT FROM J. A. GULLAND, *THE MANAGEMENT OF MARINE FISHERIES*,  
BRISTOL, SCIENTECHNICA (PUBLISHERS) LTD., 1974, P. 177

*[Not reproduced]*

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**Annex 92**

ICNAF REPORT OF THE MEETING OF PANEL 5, 2 JUNE 1959, PROCEEDINGS NO. 10,  
SERIAL NO. 649 (B. PROC. C/59)

*[Not reproduced]*

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**Annex 93**

SELECTED ICNAF DOCUMENTS 1951-1952 (DOCUMENTS 1 AND 2)

Document 1: ICNAF, Report by the Chairman of the First Annual Meeting,  
April 1951, pp. 7-8

Document 2: ICNAF, Second Annual Report for the Year 1951-52, pp. 13-15

*[Not reproduced]*

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**Annex 94**

ICNAF, TWENTY-SECOND ANNUAL MEETING, JUNE 1972, COMMISSIONERS'  
DOCUMENT 72/19

*[Not reproduced]*

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**Annex 95**

SELECTED ICNAF DOCUMENTS 1970-1971 (DOCUMENTS 1 TO 3)

Document 1: ICNAF, Twenty-first Annual Meeting, June 1971, Proceedings  
No. 6

Document 2: ICNAF, Twentieth Annual Meeting, June 1970, Commissioners'  
Document No. 70/23

Document 3: ICNAF, Twenty-first Annual Meeting, June 1971, Proceedings  
No. 11, Appendix I

*[Not reproduced]*

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**Annex 96**

LETTER OF 17 FEBRUARY 1970 FROM REAR ADMIRAL R. Y. EDWARDS, UNITED  
STATES COAST GUARD, CHIEF, OFFICE OF PUBLIC AND INTERNATIONAL AFFAIRS,  
TO R. N. GORDON, REGIONAL DIRECTOR OF THE CANADIAN DEPARTMENT OF  
FISHERIES AND FORESTRY, HALIFAX

*[Not reproduced]*

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**Annex 97**

ICNAF SCHEME OF INTERNATIONAL JOINT ENFORCEMENT, ICNAF, TWENTIETH  
ANNUAL MEETING, JUNE 1970, PROCEEDINGS NO. 15, APPENDIX I

*[Not reproduced]*

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**Annex 98**

## SELECTED ICNAF DOCUMENTS 1961-1963 (DOCUMENTS 1 TO 3)

Document 1: ICNAF, Eleventh Annual Meeting, June 1961, Proceedings No. 5  
(Revised)

Document 2: ICNAF, Twelfth Annual Meeting, June 1962, Proceedings No. 3

Document 3: ICNAF, Thirteenth Annual Meeting, June 1963, Proceedings  
No. 10

*[Not reproduced]*

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**Annex 99**

LETTER OF 16 AUGUST 1976 FROM D. E. RUSS, SPECIAL AGENT IN CHARGE, UNITED STATES DEPARTMENT OF COMMERCE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE FISHERIES SERVICE, LAW ENFORCEMENT AND MARINE MAMMAL PROTECTION DIVISION, TO R. COLLIE, CHIEF, CONSERVATION AND PROTECTION BRANCH, DEPARTMENT OF THE ENVIRONMENT, FISHERIES SERVICES, HALIFAX

*[Not reproduced]*

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**Annex 100**

LIST OF SELECTED CANADIAN SEA SCALLOP REGULATIONS APPLICABLE TO  
NAFO SUB-AREA 5

*[Not reproduced]*

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**Annex 101**

LIST OF SELECTED CANADIAN FISHERY REGULATIONS

*[Not reproduced]*

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**Annex 102**

EXCERPTS FROM *A LEGISLATIVE HISTORY OF THE FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976*, UNITED STATES CONGRESS COMMITTEE PRINT, 94TH CONGRESS, 2ND SESSION, OCTOBER 1976, PP. 670, 684-685 AND 1080

*[Not reproduced]*

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**Annex 103**

EXCERPT FROM *ENCYCLOPAEDIA BRITANNICA*, ELEVENTH EDITION, VOL. XVII, P. 648

*[Not reproduced]*

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**Annex 104**

EXCERPT FROM *NEW ENCYCLOPAEDIA BRITANNICA*, VOL. IX, 1974, P. 1014

*[Not reproduced]*

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**Annex 105**

EXCERPT FROM ASIAN-AFRICAN LEGAL CONSULTATIVE COMMITTEE, REPORT OF THE THIRTEENTH SESSION HELD IN LAGOS FROM 18 TO 25 JANUARY 1972, PP. 155-160

*[Not reproduced]*

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**Annex 106**

"SUMMARY INFORMATION ON MARINE FISHERY BODIES", PREPARED BY  
J. E. CARROZ, SECRETARY GENERAL, FAO WORLD CONFERENCE ON  
FISHERIES MANAGEMENT AND DEVELOPMENT 1982

*[Not reproduced]*

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**Annex 107**

EXCERPTS FROM S. W. BOGGS, *INTERNATIONAL BOUNDARIES*, NEW YORK,  
COLUMBIA UNIVERSITY PRESS, 1940, PP. 22-23 AND 188-190

*[Not reproduced]*

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**Annex 108**

S.W. BOGGS, "PROBLEMS OF WATER BOUNDARY DEFINITIONS: MEDIAN LINES AND  
INTERNATIONAL BOUNDARIES THROUGH TERRITORIAL WATERS", *GEOGRAPHICAL  
REVIEW*, VOL. 27, 1937, PP. 445-456

*[Not reproduced]*

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**Annex 109**

M. B. FELDMAN AND D. COLSON, "THE MARITIME BOUNDARIES OF THE UNITED  
STATES", *AMERICAN JOURNAL OF INTERNATIONAL LAW*, VOL. 75, NO. 4, 1981,  
PP. 729-763

*[Not reproduced]*

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**Annex 110**

**EXCERPTS FROM *DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE AGREEMENT BETWEEN THE UNITED STATES AND CANADA ON EAST COAST FISHERY RESOURCES*, WASHINGTON, DEPARTMENT OF STATE, APRIL 1980, PP. 117-118, TABLE IV**

TABLE IV. US-CANADA AGREEMENT ON EAST COAST FISHERY RESOURCES  
(Illustration of possible value to the United States and Canada of their respective shares of stocks covered by the Agreement in terms of potential annual average long-term sustainable catch levels\* and 1978 ex-vessel values\*\*)

<i>Stocks primarily in undisputed Canadian zone</i>	<i>Potential annual long-term sustainable catch levels*</i>		<i>Agreement percentage share</i>		<i>Value of Agreement share in terms of potential annual long-term sustainable catch levels and 1978 average US ex-vessel prices</i>	
	<i>Quantity (Metric tons)</i>	<i>Value at US average 1978 prices (1,000 US\$)</i>	<i>US</i>	<i>Canada</i>	<i>US (1,000 US\$)</i>	<i>Canada (1,000 US\$)</i>
<i>Stocks and areas</i>						
Herring 4WX (adults) <sup>1</sup>	97,000	12,901	0	100	0	12,901
White hake 4VWX	8,000	2,752	6.0	94.0	165	2,587
Illex squid 3 + 4	120,000	26,160	0	100	0	26,160
Cod 4VsW	7,000	3,829	1.4	98.6	54	3,775
Cod 4X (offshore) <sup>2</sup>	4,000	1,984	7.5	92.5	149	1,835
Haddock 4VW	28,000	19,796	10.0	90.0	1,980	17,816
Haddock 4X	26,000	18,382	10.0	90.0	1,838	16,544
Redfish 4VWX	20,000	7,560	35.0	65.0	2,646	4,914
Redfish 4RST	16,000	6,048	3	3	0	6,048
Redfish 3-0	20,000	7,560	4	4	227	7,333
Other groundfish 3 + 4 <sup>5</sup>	167,327	68,939	1.0	99.0	689	68,250
<b>TOTAL</b>	<b>513,327</b>	<b>175,911</b>			<b>7,748</b>	<b>168,163</b>
<i>Stocks primarily in undisputed US zone</i>	<i>Potential annual long-term sustainable catch levels*</i>		<i>Agreement percentage share</i>		<i>Value of Agreement share in terms of potential annual long-term sustainable catch levels and 1978 average US ex-vessel prices</i>	
	<i>Quantity (Metric tons)</i>	<i>Value at US average 1978 prices (1,000 US\$)</i>	<i>US</i>	<i>Canada</i>	<i>US (1,000 US\$)</i>	<i>Canada (1,000 US\$)</i>
<i>Stocks and areas</i>						
Herring 5Y (adults) <sup>1</sup>	16,000	2,128	100	0	2,128	0
Illex squid 5 + 6	30,000	6,540	100	0	6,540	0
Cod 5Y	8,000	4,376	98.4	1.6	4,306	70
Loligo squid 5Z + 6	44,000	46,288	91.0	9.0	42,122	4,166
<b>TOTAL</b>	<b>98,000</b>	<b>59,332</b>			<b>55,096</b>	<b>4,236</b>



TABLE IV (continued)

Stocks ranging significantly into or across the boundary region	Potential annual long-term sustainable catch levels*		Value at US average 1978 prices (1,000 US\$)		Agreement percentage share	Value of Agreement share in terms of potential annual long-term sustainable catch levels and 1978 average US ex-vessel prices	
	Quantity (Metric tons)	1978 prices (1,000 US\$)	US	Canada		US (1,000 US\$)	Canada (1,000 US\$)
<i>Stocks and areas</i>							
Scallops 5Ze	10,000	55,900	26.65	73.35	14,897	41,003	
Mackerel 3, 4	210,000	122,640	60.0	40.0	73,584	49,056	
Mackerel 5, 6							
Pollock 4VWX + 5	42,000	15,624	25.6	74.4	4,000	11,624	
Cusk 5Ze	1,000	402	34	66	137	265	
Lobster 5Ze	2,000	8,170	6	6	7,124	1,046	
Herring 5Z + 6	120,000	15,960	766.66	33.337	10,640	5,320	
Cod 5Z	35,000	19,145	83.0	17.0	15,890	3,255	
Haddock 5	50,000	35,350	79.0	21.0	27,926	7,424	
Silver Hake 5Ze	55,000	16,280	90.0	10.0	14,652	1,628	
Red Hake 5Ze	15,000	3,630	90.0	10.0	3,267	363	
Argentine 4VWX + 5	17,000	7,004	25.0	75.0	1,751	5,253	
White Hake 5	3,000	1,032	94.0	6.0	970	62	
Redfish 5	15,000	5,670	99.0	1.0	5,613	57	
Other groundfish 5 + 6 <sup>8</sup>	50,042	20,617	99.0	1.0	20,411	206	
TOTAL	625,042	327,424			200,862	126,562	

**Annex 111**

**COMPUTER ANALYSIS LINE DIVIDING FISH AND INVERTEBRATE SPECIES IN THE  
GULF OF MAINE AREA IN ACCORDANCE WITH THE ALLOCATIONS IN THE  
1979 AGREEMENT ON EAST COAST FISHERY RESOURCES**

COMPUTER ANALYSIS LINE DIVIDING FISH AND  
INVERTEBRATE SPECIES IN THE GULF OF MAINE AREA IN  
ACCORDANCE WITH THE ALLOCATIONS IN THE  
1979 AGREEMENT ON EAST COAST FISHERY RESOURCES

*Introduction*

1. The 1979 Agreement on East Coast Fishery Resources established quasi-permanent entitlements or allocations for 13 species of fish and invertebrates in the Gulf of Maine area<sup>1</sup>. The series of computer programs described in paragraphs 3 to 12 of this Annex determine a single line that would divide the biomass of these 13 species within the area in accordance with the "annual permissible commercial catch" entitlements set out in the agreement.

2. Research vessel and commercial fishing data were analysed to estimate the relative distributions in the Gulf of Maine area of the 13 fish and invertebrate species. On the basis of these estimates, a line was computed for each species that would divide the total biomass of that species on the basis of the percentage allocations established in the agreement. In order to achieve a composite result, a single line dividing this complex of 13 species was computed by weighting each species according to its long-term sustainable catch levels and relative commercial value, using for this purpose the data set out in the *Environmental Impact Statement* issued by the United States Department of State in respect of the 1979 fisheries agreement. This composite line is shown in *Figure 15* of this Annex.

Phase I: COMPUTER ANALYSIS LINES DIVIDING EACH SPECIES IN  
ACCORDANCE WITH THE ALLOCATIONS ESTABLISHED IN THE  
1979 AGREEMENT ON EAST COAST FISHERY RESOURCES

3. The first computer program extracts data from a S2K data base on the Cyber 171 computer at the Bedford Institute of Oceanography. For each of the 12 fish species the data extracted represent the distribution of the biomass arrayed in ten-minute squares for the relevant management areas and for the relevant time period. The relevant management areas are those established in the agreement for each of the various species. The relevant time period, 1968-1980, selected for ten of the species, is the period during which Canada and the United States used similar methodologies for research vessel surveys. For argentine and pollock, Canadian surveys began only in 1970 and therefore the time period used for these species is 1970-1980. In order to obtain as complete a picture as possible, data are used from every survey undertaken. The density of the biomass for each species is defined as the catch rate corrected for the distance towed by the survey vessel.

4. Because the bottom trawls used in the research surveys produce very poor samples for scallops (the 13th species under consideration),

<sup>1</sup> These species are described as "stocks ranging significantly into or across the boundary region". Draft Environmental Impact Statement on the Agreement Between the United States and Canada on East Coast Fishery Resources. Washington, United States Department of State, April 1980, p. 118.

their distribution for the purposes of this analysis is determined from commercial scallop catch statistics. Accurate catch statistics for scallops have been accumulated since 1957; accordingly the entire statistical series from 1957 to 1980 is used to define scallop distribution. Density for scallops is defined as the total Canadian and United States catch within each ten-minute square.

5. *Table 1* shows the thirteen species and the management units and time periods used as inputs in the computer program.

6. The *second computer program* aggregates the data extracted from the data base for each species and calculates an average for the appropriate time period. Every survey tow was included in calculating the average, even if that tow contained no catch for one or more of the species of interest in a given ten-minute square.

7. The *third computer program* is the heart of the first phase, that is, the determination of lines corresponding to the agreed allocations for each species. It uses the average biomass in a ten-minute square for a given species as input data. It is assumed for this program that each square is homogenous in terms of the density of the biomass. Thus, there is no finer resolution at this stage than the ten-minute squares. A series of trial lines is projected through the area, and the proportion of each species on the Canadian side of each trial line is calculated. *Figure 1* shows these trial lines. The directions of the trial lines are based on the Canadian claim, with four trial lines on either side.

8. If a ten-minute square falls completely on one side or another of a trial line, the total biomass found within that square is tallied to that side. If a ten-minute square is cut by a trial line, it is assumed that the fraction of the biomass on either side of the line is proportionate to the number of corners on either side. Consider, for example, a trial line going through a square so that it intersects one corner, has one corner on the United States side, and the remaining two corners on the Canadian side. In this case the biomass within that square would be allocated two-thirds to Canada and one-third to the United States. This approximation will be generally unbiased and should not significantly colour the results<sup>2</sup>.

9. A *fourth computer program* produces plots of the trial lines based on the calculations of the proportions of the biomass for each species located on the Canadian side of the trial lines as determined in the third computer program. When a management area for a given species (for example, argentine in 4VWX+5) extends outside the area shown in the plots, the total management area is used in the calculations, even though it is not displayed. Also the percentages are shown rounded to

<sup>2</sup> The basis for deciding on which side of the trial boundary a corner of a ten-minute square is found is the geometric fact that a point inside a closed boundary will subtend an angle of 360° while a point outside will subtend an angle of 0° (if the angles are signed). As this method requires closed boundaries, two points are added to each of the boundaries to make them closed. These points are high in the Gulf of St. Lawrence (50°W, 60°W) and far offshore (40°N, 50°W) so as not to influence the results.

the nearest percent, although they are accurate to one-tenth of a percent in all calculations.

10. The above programs complete the determination of the resource distribution in relation to trial lines. A *fifth computer program* finds the "target line" for each species, that is the line dividing the biomass of that species, in accordance with the percentage allocations established in the 1979 fishery agreement. The "target line" for each species is found by linearly interpolating between pairs of trial lines. For example, if the fishery agreement provided to Canada a 10 percent allocation of a given species, and if the proportion of the biomass on the Canadian side of trial line +2 is 8 percent, and the proportion on the Canadian side of trial line +1 is 16 percent, the location of the "target line" would be placed one-quarter of the way between trial lines +2 and +1. Linear interpolation implicitly assumes the resource distribution is homogenous between trial lines. In order to avoid extrapolation outside the trial lines, it was assumed that 100 percent of the resource lies between the northeastern limit of the relevant management area for each species (see *Table 1*) and a line placed at a standard distance southwest of trial line -4 (in effect a hypothetical trial line -5). This assumption biases the positioning of the composite line to the northeast<sup>3</sup>, that is, *towards* the Canadian coast and to the disadvantage of Canada. The "target lines" dividing each species in accordance with the allocations set out in the fisheries agreement are shown in red in *Figures 2 through 14* of this Annex. Where the "target line" fell outside the trial lines to the southwest, it was drawn only one trial line to the southwest of trial -4 (i.e., hypothetical line -5).

11. The sole exception to the distribution of percentage shares is mackerel. In the fishery agreement, Canada is allocated a 40 per cent share of the mackerel in NAFO subareas 3, 4, 5 and 6. It is assumed that the mackerel in these subareas is composed of two components of approximately equal size. One of the components feeds and spawns exclusively in Canadian waters outside the Gulf of Maine area for half the year. Therefore, 25 percent of the stock over a year (50 percent of the total stock for 50 percent of the year) can only be fished by Canadian fishermen and will be fished outside the Gulf of Maine area. Thus, Canada would be allocated 15 percent (40 percent minus this 25 percent) of the remaining 75 percent of the stock in the Gulf of Maine area. Twenty percent (that is 15/75) of the remaining stock is thus the target used for the proportion of the Canadian allocation to be taken in the Gulf of Maine area. It should also be noted that, consistent with these assumptions, the economic value used for weighting this species relative to the other species covered in the agreement (see the following paragraph) is \$U.S.92 million, that is 75 percent of the total value of \$U.S.122.64 million given in the United States *Environmental Impact Statement*.

<sup>3</sup> No species considered in this analysis are constrained to the northeast by this assumption. However, the distributional range of herring, pollock and cusk extends southwest of this constraining line.

Phase II. THE COMPUTATION OF A COMPOSITE LINE DIVIDING THE COMPLEX OF SPECIES IN ACCORDANCE WITH THE ALLOCATIONS ESTABLISHED IN THE 1979 AGREEMENT ON EAST COAST FISHERY RESOURCES

12. Once the "target lines" were found for each species, they were weighted by the value of the long-term sustainable catch levels set out in the *Environmental Impact Statement* on the 1979 fisheries agreement issued by the United States Department of State. See *Table 1*. This procedure assigns each species a weight or relative value directly based upon its economic resource value. It produces the composite line by simultaneously minimizing the total distance squared between the individually weighted "target lines". This line is approximately 20 percent of the way from the Canadian boundary claim toward trial line +1. See *Figure 15*.

13. The composite line would allocate 35.1 percent of the value of these 13 fish and invertebrate resources to Canada. This compares with the estimate of 38.3 percent share for Canada arrived at in the United States *Environmental Impact Statement*.

TABLE 1

Species	Management Area <sup>1</sup>	Time Period Examined	Canadian Share <sup>2</sup> (%)	Value <sup>3</sup> (\$US millions)
1. Scallop	5Z(e)	1957-1980	73.4	55.9
2. Cod	5Z	1968-1980	17.0	19.1
3. Haddock	5	1968-1980	21.0	35.3
4. Mackerel	3, 4, 5, 6	1968-1980	20.0	92.0
5. Herring	5Z, 6	1968-1980	33.3	16.0
6. Red Hake	5Z(e)	1968-1980	10.0	3.6
7. Silver Hake	5Z(e)	1968-1980	10.0	16.3
8. White Hake	5	1968-1980	6.0	1.0
9. Pollock	4VWX, 5	1970-1980	74.4	15.6
10. Redfish	5	1968-1980	1.0	5.7
11. Cusk	5Z(e)	1968-1980	66.0	0.0
12. Argentine	4VWX, 5	1970-1980	75.0	7.0
13. Other Groundfish	5,6	1968-1980	1.0	20.6

<sup>1</sup> Management areas were determined in the 1979 Agreement on East Coast Fishery Resources.

<sup>2</sup> Percentage shares of each species were established for Canada and for the United States in the same agreement.

<sup>3</sup> "Value" is the value of the long-term sustainable catch level estimated in the United States Department of State *Environmental Impact Statement* on the 1979 agreement. Values were calculated using 1978 United States average ex-vessel prices. See Annex 110.

**CERTIFICATION**

I, the undersigned, L. H. Legault, Q.C., Agent for Canada, hereby certify that the copy of each document attached as a Documentary Annex in Volume V of the Annexes to the Counter-Memorial Submitted by Canada is an accurate copy, whether prepared by photographic means or by transcription.

*(Signed)* L. H. LEGAULT, Q.C.

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