INTERNATIONAL COURT OF JUSTICE

OBLIGATIONS OF STATES IN RESPECT OF CLIMATE CHANGE
(REQUEST FOR ADVISORY OPINION)

WRITTEN STATEMENT OF TUVALU

22 MARCH 2024

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I. Introduction

A. Procedural Background

1. Tuvalu submits this Written Statement on the request of the United Nations General Assembly for an advisory opinion on the obligations of States in respect of climate change ("Request") in accordance with the Order of 20 April 2023, wherein the Court determined that "the United Nations and its Member States are considered likely to be able to furnish information on the questions submitted to the Court for an advisory opinion and may do so within the time-limits fixed" by the Court[1]. On 4 August 2023, the Court extended to 22 January 2024 the time-limit within which all written statements on the questions may be presented to the Court[2]. On 15 December 2023, the Court further extended the time-limit for written statements to 22 March 2024[3].

2. The Request is set out in Resolution 77/276, adopted by consensus on 29 March 2023 following support from 131 co-sponsors, including Tuvalu[4]. It poses the following legal questions:

> Having particular regard to the Charter of the United Nations, the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the United Nations Framework Convention on Climate Change, the Paris Agreement, the United Nations Convention on the Law of the Sea, the duty of due diligence, the rights recognized in the Universal Declaration of Human Rights, the principle of prevention of significant harm to the environment and the duty to protect and preserve the marine environment,
>
> (a) What are the obligations of States under international law to ensure the protection of the climate system and other parts of the environment from anthropogenic emissions of greenhouse gases for States and for present and future generations;
>
> (b) What are the legal consequences under these obligations for States where they, by their acts and omissions, have

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1 *Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Order of 20 April 2023, ¶ 1.

2 *Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Order of 4 August 2023, p. 3.

3 *Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Order of 15 December 2023, p. 4.

4 United Nations General Assembly, draft resolution 77/L.58, Request for an Advisory Opinion of the International Court of Justice on the Obligations of States in Respect of Climate Change, document A/77/L.58 (1 March 2023) (Dossier No. 1), p. 1. To ensure that this Written Statement is "as concise as possible" in accordance with the Court's Practice Direction II, Tuvalu has not annexed documents that are readily accessible online. *Cf.* Rules of Court, Art. 50(2) (providing that parties need not deposit whole copies of annexed documents in the Registry if they have been "published" and are "readily available").

caused significant harm to the climate system and other parts of the environment, with respect to:

(i) States, including, in particular, small island developing States, which due to their geographical circumstances and level of development, are injured or specially affected by or are particularly vulnerable to the adverse effects of climate change?

(ii) Peoples and individuals of the present and future generations affected by the adverse effects of climate change?

B. PRELIMINARY STATEMENT

3. Tuvalu, a small island developing State with a population of about 11,000[5], comprises nine reef islands in the South Pacific Ocean. It is a nation of the ocean: Tuvalu's land territory covers just 26 square kilometres with 24 kilometres of coastline, but its exclusive economic zone spans 900,000 square kilometres[6].

4. The identity of the people of Tuvalu is based fundamentally on the existence and vitality of *fenua*, a concept that is difficult to translate into the Court's official languages. *Fenua* at its heart refers simultaneously to the Tuvaluan people's land, environment, identity, customs, community, and family; in short, the living essence of their being. Their spiritual traditions, cultural identity, and continued existence are inseparable from their ancestral territories and sacred natural heritage. The fundamental rights of peoples to self-determination and subsistence under international law must account for this inextricable relationship between the islands and the experience of Tuvaluans as an Indigenous people.

5. The prolonged failure of major polluters to mitigate greenhouse gas ("GHG") emissions is the cause of irreversible harm and poses an existential threat to Tuvalu and its people. The average land elevation on Tuvalu is just 1.55 metres above the mean high tide line[7]. Rising sea levels due to climate change are projected to submerge Tuvalu's existing land territory within the next two to three decades, with much of the land and critical infrastructure sitting below high tide by 2050[8]. Other climate impacts—such as warming, flooding, and ocean acidification—make life on Tuvalu increasingly unsustainable. This means that Tuvaluans under 25 years of age, who make up one third of the population[9], will see the disappearance of their homeland in their lifetimes, and that, without rapid and

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5 Government of Tuvalu, Tuvalu Population and Housing Mini-Census 2017 Report (2017), p. 6.

6 *See* Flanders Marine Institute, Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones, "Tuvalu" (2023).

7 M. Wandres et al., "A National-Scale Coastal Flood Hazard Assessment for the Atoll Nation of Tuvalu", *Earth's Future* (forthcoming 2023) (Annex 1), pp. 4, 14.

8 National Aeronautics and Space Administration ("NASA"), Technical Report, N-SLCT-2023-01, Assessment of Sea Level Rise and Associated Impacts for Tuvalu (June 2023), p. 1; Government of Tuvalu, National Statement at 77th Session of the United Nations General Assembly (23 September 2022), ¶ 12.

9 Government of Tuvalu, Tuvalu Population and Housing Mini-Census 2017 Report (2017), p. 3 (showing that 32 percent of the population was under 15 years old in 2017).

dramatic mitigation of GHG emissions, future generations will never set foot on the land of their ancestors.

6. Climate change devastates all aspects of Tuvaluans' lives: their homes, customs, economy, livelihood, infrastructure, food and water, and way of life. Climate change thus imperils their constitution as a sovereign people. It also destroys the diversity and richness of civilizations and cultures that constitute the common heritage of humankind. Immediately after Tuvalu's national general elections held in January 2024, Tuvalu made clear in its Statement of Priorities for the New Government:

> Climate change and the impacts of sea level rise remain the single greatest and existential threat to the livelihood, security, and wellbeing of the people of Tuvalu. They continue to be paramount and top priorities of the new government. Addressing climate change and mitigating the effects of rising sea levels are of utmost importance for the new government.[10]

7. Tuvalu is championing the call for mitigation of GHG emissions and adaptation measures in the context of the discussions taking place under the auspices of the Paris Agreement. In particular, Tuvalu has called for a just energy transition, with the ultimate aim of eradicating the use of fossil fuels. Since the 27th Conference of the Parties ("COP27") of the United Nations Framework Convention on Climate Change ("UNFCCC") in 2022, Tuvalu has joined Vanuatu and other nations in calling for a fossil-fuels non-proliferation treaty to guide a just transition away from fossil fuels[11]. Tuvalu has led the way in these efforts, pledging in its nationally determined contributions to reduce its emissions to zero by 2030[12]. On a global scale, such diplomatic efforts have made progress, but they are not enough.

8. International law is not and cannot be silent in the face of catastrophic harm directly caused by the conduct of the major polluters. Well-established rules and principles of international law impose a straightforward duty on such States to take immediate and radical action to eliminate the threats that their pollution is causing to small island States, to compensate those States for the losses and damages they have already suffered, and to help them adapt to the consequences of their emissions. This duty flows from States' obligations to respect the nonderogable rights of the peoples of small island States, including the rights to self-determination and means of subsistence; as well as States' additional international human rights obligations and obligations under international environmental law.

9. As a people already suffering the adverse effects of climate change, Tuvalu's ability to maintain *fenua*—its culture and values, its islands, and its constitution as a sovereign people with the fundamental right to self-determination—has been undermined by the harmful conduct that inspired the Request. It is in that context that Tuvalu thus provides its submissions on the legal questions therein, focusing its attention on the international obligations that Tuvalu submits States have breached by their acts or omissions, and by which they have caused significant harm to the climate system and other parts of the environment.

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[10] Government of Tuvalu, Statement of Priorities for the New Government of Tuvalu after the National General Elections on 26 January 2024 (28 February 2024), p. 1.

[11] Government of Tuvalu, Statement at COP27 (November 2022); Government of Tuvalu, National Statement at 78th Session of the United Nations General Assembly (22 September 2023).

[12] Government of Tuvalu, Updated Nationally Determined Contribution (November 2022), p. 6.

10. Tuvalu's Written Statement is divided into five chapters, including this introduction. Chapter II provides the relevant factual background, focusing on scientific consensus around climate change and its effects. Chapter III addresses part (a) of the Request regarding States' international obligations in respect of climate change. Chapter IV addresses part (b) of the Request regarding the legal consequences for States that have breached those obligations. Chapter V in turn presents Tuvalu's conclusions.

11. Given the breadth of the Request for an advisory opinion and the number of written statements expected from States and international organizations in these proceedings, Tuvalu focuses on issues at the core of the existential threats it faces as a result of climate change, in the hope that it will be of assistance to the Court. Tuvalu reserves its right to address the written statements of other States and international organizations, or any legal or factual issues relevant to these proceedings, in subsequent submissions to the Court.

12. Tuvalu makes this submission to address the distinct factual circumstances and legal obligations specific to Tuvalu, but it also endorses the written statement in these proceedings of the Commission of Small Island States on Climate Change and International Law ("COSIS"), which addresses, more broadly, the deleterious impacts of climate change on small island developing States. COSIS is represented by two Co-Chairs, who are elected from the COSIS Member States by majority votes every two years[13]. Tuvalu presently holds one of the Co-Chair positions, with Antigua and Barbuda holding the other[14]. COSIS will be submitting a written statement in the present advisory proceedings before the Court, pursuant to its authorization given in June 2023[15] and the mandate from the Commission's nine Member States to "promote and contribute" to the definition of rules and principles of international law concerning climate change[16].

[13] Agreement for the Establishment of the Commission of Small Island States on Climate Change and International Law, *United Nations Treaty Series*, Vol. 3447 (No. 56940) (31 October 2021) ("COSIS Agreement"), Art. 3(3).

[14] Tuvalu's two-year mandate as Co-Chair of COSIS was renewed in October 2023. COSIS, 2023 Annual Report (31 October 2023), p. 3. In its role as Co-Chair, Tuvalu sits on COSIS's Committee on Strategy, Management, and Outreach, and so is actively involved in COSIS's planning and activities. *Id*., p. 7.

[15] *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Order of 19 June 2023, p. 1.

[16] COSIS Agreement, Art. 1(3).

II. Factual Background

14. This Chapter provides the factual background relevant to Tuvalu's legal submissions. It describes Tuvalu, its people, and their global leadership on the climate crisis (Section A); the impacts and risks of catastrophic harm to Tuvalu arising from climate change (Section B); Tuvalu's efforts to adapt to those impacts and risks (Section C); and why limiting average global temperature rise to within 1.5ºC reduces the risk of such catastrophic harm (Section D).

A. Tuvalu, Its People, and Their Global Leadership on the Climate Crisis

1. The People of Tuvalu and Fenua

15. Tuvalu is a Pacific nation comprising eight islands: Nanumea, Nanumaga, Niutao, Nui, Vaitupu, Nukufetau, Funafuti, and Nukulaelae[17]. Six of the islands are atolls, ring-shaped islands made of sedimentary rock and coral surrounding a lagoon[18]. The other two are reef islands with no lagoon. The atoll of Funafuti is the largest island at 2.4 square kilometres of land area and around 6,000 inhabitants, just over half of Tuvalu's population; Nukulaelae is the smallest at 1.82 square kilometres with around 300 residents. The country's name, which means "eight standing together", signifies a unified sovereignty, stable alliance, and physical place[19]. It also evokes the people of Tuvalu. Their collective identity and belonging are inseparable from the islands and the risks and changes they face.

16. In 1892, Tuvalu (then known as the Ellice Islands) became a British protectorate together with Kiribati (then known as the Gilbert Islands), and then part of the Ellice and Gilbert Islands colony in 1916[20]. The union between the two island groups was unstable because of different cultures and practices, as well as imposed colonial policies in the respective island communities. In 1974, as Tuvalu prepared for political independence, Tuvaluans voted unanimously for, and achieved, separation from Kiribati[21]. On 1 October 1978, Tuvalu gained independence[22], and it became the 189th member of the United Nations on 5 September 2000[23]. This historic process affirmed Tuvaluans' identity as comprising a distinct nation and sovereign people exercising their right to self-determination. Tuvalu's independence reinforced the conviction that the islands were specifically bestowed on the Tuvaluan people by God, and that it was their God-given right and responsibility to protect and inhabit it as such, and to protect its sacred natural heritage in perpetuity.

17. The foundation of Tuvaluan society includes the strength of its traditional practices and cultural values, the collective efforts of family, village, and island community that provide a robust support mechanism. The Constitution embodies these aspects and emphasizes their importance in fortifying social institutions and customs. Tuvaluans largely

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17 Another island, Niulakita, comes under the direct control of Niutao.

18 *See* IPCC, Working Group II, "Chapter 15: Small Islands", *Sixth Assessment Report: Impacts, Adaptation and Vulnerability* (2022), p. 2051.

19 T. O'Brien, "Genesis" in *Tuvalu: A History* (H. Laracy ed. 1983) (Annex 2), p. 16.

20 N. Teo, "Colonial Rule" in *Tuvalu: A History* (H. Laracy ed. 1983) (Annex 2), pp. 128, 131.

21 T. Isala, "Secession and Independence" in *Tuvalu: A History* (H. Laracy ed. 1983) (Annex 2), p. 164.

22 *Id*., p. 176.

23 United Nations General Assembly, resolution 55/1, Admission of Tuvalu to Membership in the United Nations, document A/RES/55/1 (5 September 2000).

see not only their wealth but also their identity, rooted in—and inseparable from—the land[24]. Central to Tuvaluan culture and way of life is the concept of *fenua*, a term that typically transcends tangible or literal definition but perhaps can best be described as a worldview that presumes an Indigenous sense of the sacred and mystical intertwined with island life.

18. *Fenua* constitutes a web of relationships and interconnections that at once subsumes and creates identity. It comprises all that is visible and invisible, tangible and intangible. It can be defined by the relationships between the people of a place; the land and sea, and their non-human inhabitants; past, present, and future generations; weather patterns and various climates; and the cultures and traditions that make up the fabric of a peoples' collective and individual identity. It is where the ancestors are born—a Tuvaluan's first home. It is also where their bones are laid to rest. *Fenua* is a cosmological principle in which the human-creation relationship is the primary relationship that defines interpersonal ones. It is holistic and at odds with the omnipresent anthropocentric relationality that permits exploitation of the earth's resources at the expense of the wellbeing of the collective.

19. The island and islander are one, and the connection between the two entities constitutes a spiritual and reciprocal bond reliant on the other's physical existence; the bond shapes nearly every aspect of a Tuvaluan's individual and collective identity. Likewise, land and culture are inextricably linked, and being forced to migrate to another's land or to another country due to climate change threatens the continued identity and culture of a people. Lina Peleiti, a mother and grandmother from Nui and Funafuti, eloquently describes the relationship between Tuvaluan people and their land[25].

2. Tuvalu's Global Leadership on the Climate Crisis

20. Tuvalu's cultural and moral values of good-neighbourliness, shared ownership, and common responsibility have been fundamental to Tuvalu's leadership in its foreign affairs and international climate negotiations. From the very beginning of the climate crisis, Tuvalu warned that, although Tuvalu and other small island States will be the most immediately and intensely impacted, the effects of climate change will eventually touch every corner of the globe. Climate change is a universal issue; so, too, is responsibility for it.

21. Tuvalu is actively involved on the global stage to combat climate change and its devastating effects, despite its negligible contributions of GHG emissions. Since Tuvalu became a member of the United Nations in 2000, it has had an active role in climate advocacy at the United Nations. Tuvalu's Governor-General asked the General Assembly in 2002:

> [W]here does the international community think the Tuvalu people are to hide from the onslaught of sea-level rise? . . . . We want the islands of Tuvalu and our nation to remain permanently and not be submerged as a result of greed and uncontrolled consumption of industrialized countries.[26]

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[24] *See, e.g.*, L. Samuelu, "Land", *Tuvalu: A History* (H. Laracy ed. 1983) (Annex 2), p. 35 ("Tuvaluans value their land above any other of their possessions.").

[25] Ms. Peleiti is one of five native Tuvaluans providing video testimony as to the impacts of climate change on their islands. Her video is available at https://bit.ly/TuvaluElder.

[26] United Nations General Assembly, Verbatim Record of the 57th Session, Address by The Right Honourable Sir Tomasi Puapua, Governor General of Tuvalu, document A/57/PV.7 (14 September 2002), p. 3.

Then–Prime Minister Kausea Natano reiterated this message two decades later at the 78th session of the General Assembly in September 2023:

> As a country whose physical existence, lives and livelihoods are at stake, Tuvalu cannot afford to take the back seat and spectate while others maneuver their own interest in our multilateral process to address climate change, particularly sea-level rise.[27]

22. Tuvalu has further underscored the urgency of the climate crisis at the annual Conferences of the Parties ("COPs") of the UNFCCC and other United Nations initiatives. At the 28th and most recent COP ("COP28") in December 2023, then–Prime Minister Natano said:

> Every year, Tuvalu and other small island nations come to COP meetings to remind the world, especially the biggest emitters of greenhouse gases, of our relentless suffering. How many more COP meetings do we need to drive home to you this message of our loss and anguish? As a nation we have come to the shocking realization that we now exist to mitigate and adapt to the effects of climate change.[28]

23. At the regional and island level, Tuvalu participates actively on climate issues with the Pacific Community, the Alliance of Small Island States ("AOSIS"), and the Pacific Islands Forum ("PIF"). Tuvalu further supports its strong regional presence through its activities with the South Pacific Applied Geoscience Commission, the South Pacific Tourism Organization, the Pacific Regional Environment Programme, the Rising Nations Initiative, and the Unlocking Blue Prosperity Coalition. Tuvalu also participates in the Pacific Island Forum Fisheries Agency and the Western and Central Pacific Fisheries Commission.

24. In 2021, Tuvalu co-founded COSIS with Antigua and Barbuda to "promote and contribute to the definition, implementation, and progressive development of rules and principles of international law concerning climate change"[29]. Last year, as Co-Chair of the Commission, Tuvalu helped lead the effort to request an advisory opinion on climate change from the International Tribunal for Law of the Sea ("ITLOS"), captioned *Request for an Advisory Opinion Submitted by the Commission of Small Island States on Climate Change and International Law* (Case No. 31). At the hearing held in September 2023, then–Prime Minister Natano described the irreversible impacts of climate change for many island States, including Tuvalu, noting that "[r]emaining silent is not an option" and urging world leaders "to recognize the critical urgency of the climate change crisis"[30].

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27 United Nations General Assembly, Verbatim Record of the 78th Session, Statement by the Honourable Kausea Natano (22 September 2023), ¶ 20.

28 Government of Tuvalu, Statement at COP28 (5 December 2023).

29 COSIS Agreement, Art. 1(3).

30 ITLOS, *Request for an Advisory Opinion Submitted by the Commission of Small Island States on Climate Change and International Law*, Case No. 31, COSIS Oral Statement, Verbatim Record of 11 September 2023 (morning), document ITLOS/PV.23/C31/1/Rev.1, pp. 10, 14.

B. IMPACTS OF CLIMATE CHANGE ON TUVALU

25. Tuvalu and its people are already suffering the devastating impacts of climate change. The country ranks second behind Dominica among States that sustained the greatest average losses per unit of gross domestic product due to climate change in the first two decades of the 21st century[31]. Tuvalu is one of the most vulnerable States to climate change, but its experience is also a harbinger of the climate futures that States around the world face without rapid and dramatic reductions in emissions.

26. Tuvalu refers to the written statement of COSIS in these proceedings, including its two annexed expert reports, regarding the science of climate change and its global consequences. The submissions of COSIS and Tuvalu draw on the most recent findings of the Intergovernmental Panel on Climate Change ("IPCC"), which reflect the global scientific consensus on climate change. The IPCC, which currently has 195 Member States, is the United Nations body responsible for evaluating the science related to climate change[32]. Those findings make clear that anthropogenic GHG emissions cause global warming, which is pushing the planet to a breaking point[33].

27. Climate impacts on Tuvalu are manifold, striking at the core of livelihoods, culture, and identity. Specifically, climate change is changing the physics and chemistry of Tuvalu's terrestrial, marine, and atmospheric environment, leading to profound harm to the islands and the people, flora, and fauna that live in and around them.

1. Changes to the Physics and Chemistry of Tuvalu's Environment

28. Projections from the Government's Climate Change Department, the IPCC, and the United States National Aeronautics and Space Administration ("NASA") show that climate change is changing the physics and chemistry of Tuvalu's terrestrial, marine, and atmospheric environment in at least four critical ways: sea-level rise, changes to weather patterns, increased atmospheric and ocean temperatures, and ocean acidification.

29. *First*, the ocean is rising. Sea levels have risen around Tuvalu by 0.15 metres over the past 30 years—an average rate of around five millimetres per year since 1993, or over 40 percent above the global average[34]. This rate of sea-level rise, coupled with Tuvalu's average elevation of only 1.55 metres above mean sea level, makes Tuvalu "highly vulnerable to wave driven flooding", according to one recent peer-reviewed study[35]. Spring high tides, sometimes called "king tides", often cause inundation in Tuvalu even without wave activity as

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[31] GermanWatch, Global Climate Risk Index 2021—Who Suffers Most from Extreme Weather Events?: Weather-Related Loss Events in 2019 and 2000–2019 (2021), p. 49.

[32] IPCC, "History of the IPCC", https://www.ipcc.ch/about/history; IPCC, "Structure of the IPCC", https://www.ipcc.ch/about/structure.

[33] *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), Chapter II.

[34] *See* NASA, Technical Report, N-SLCT-2023-01, Assessment of Sea Level Rise and Associated Impacts for Tuvalu (June 2023), p. 1; *see also* M. Wandres et al., "A National-Scale Coastal Flood Hazard Assessment for the Atoll Nation of Tuvalu", *Earth's Future* (forthcoming 2024) (Annex 1), p. 10.

[35] M. Wandres et al., "A National-Scale Coastal Flood Hazard Assessment for the Atoll Nation of Tuvalu", *Earth's Future* (forthcoming 2024) (Annex 1), pp. 4, 14.

"marine water percolates through the porous limestone" that supports the islands[36]. In other words, Tuvalu is sinking from the ground up.

30. Projections for future sea-level rise are dire. NASA, in a June 2023 report conducted in collaboration with the Government and the United Nations, calculated these figures using historical tide readings and NASA's satellite imagery[37]. NASA warns that Tuvalu's rate of sea-level rise "will increase in the future, potentially more than doubling by 2100"[38]. Nearly 90 percent of the atoll areas on Nukufetau, Nukulaelae, and Funafuti, are projected to be flooded on average once every five years under any emissions pathway by 2100, assuming no adaptation[39].

31. The table below from the NASA report shows "[e]xceedance probabilities for specific amounts of future sea-level rise based on IPCC warming level-based global mean sea level projections"—that is, likely sea-level rise at various degrees of global warming[40]. It shows that the risk of severe flooding is already high at an average global temperature rise of 1.5ºC, with the risks increasing dramatically at higher average temperatures.

Exceedance Probabilities for Sea-Level Rise on Tuvalu[41]

Global Mean Surface Air Temperature 2081-2100	1.5°C	2.0°C	3.0°C	4.0°C	5.0°C	Low Confidence Process, Low Emissions	Low Confidence Processes Very High Emissions
Probability of > 0.1 m in 2050	>99%	>99%	>99%	>99%	>99%	98%	>99%
Probability of > 0.2 m in 2050	40%	49%	54%	72%	94%	49%	77%
Probability of > 0.3 m in 2050	3%	7%	8%	10%	20%	19%	39%
Probability of > 0.4 m in 2100	58%	81%	97%	>99%	>99%	49%	98%
Probability of > 0.5 m in 2100	36%	50%	82%	96%	>99%	49%	96%
Probability of > 0.6 m in 2100	15%	32%	50%	76%	97%	36%	88%
Probability of > 0.7 m in 2100	6%	15%	35%	49%	78%	24%	59%
Probability of > 1 m in 2100	<1%	2%	5%	9%	22%	7%	49%

32. Multiple studies have shown that coastal inundation on atolls like Tuvalu is often a "compound event" in which "waves, tides, and sea level anomalies all interact non-linearly to generate extreme total water levels"[42]. Dr. Shobha Maharaj—Lead Author of the chapter on small islands in the IPCC's 2022 report on impacts, adaptation, and vulnerability—confirms

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36 *See id*., p. 5.

37 NASA, Technical Report, N-SLCT-2023-01, Assessment of Sea Level Rise and Associated Impacts for Tuvalu (June 2023), p. 1.

38 *Id*.

39 M. Wandres et al., "A National-Scale Coastal Flood Hazard Assessment for the Atoll Nation of Tuvalu", *Earth's Future* (forthcoming 2024) (Annex 1), p. 4.

40 NASA, Technical Report, N-SLCT-2023-01, Assessment of Sea Level Rise and Associated Impacts for Tuvalu (June 2023), p. 9.

41 *Id*.

42 R. Hoeke et al., "Severe Flooding in the Atoll Nations of Tuvalu and Kiribati Triggered by a Distant Tropical Cyclone Pam", *Frontiers in Marine Science*, Vol. 7 (2021), p. 5 (citing references).

in an expert report submitted with COSIS's written statement that "[c]ompound events . . . pose especially high risks to small islands"[43]. The IPCC identifies these trends based in the tropical Pacific more generally, finding in 2022 that "even a 5–10 cm additional [sea-level rise] (expected for ~2030–2050) will double flooding frequency" in the tropical Pacific[44].

33. Highly localized scientific data underscore these effects for Tuvalu. Since June 2023, oceanographers from the Government and the Secretariat of the Pacific Community ("SPC") have developed a state-of-the-art online dashboard that provides interactive access to hazard and risk modelling of sea-level rise, storm waves, and shoreline changes affecting Tuvalu's coastline[45]. The dashboard reflects data collected by satellites using light detection and ranging ("LiDAR") technology, which measures elevation with high accuracy to under 10 centimetres and high spatial resolution with light from a pulsed laser, as well as data from Government sources and the IPCC[46]. It shows bathymetry (seafloor depth) and topography (land elevation), inundation hazard layers, shoreline change, and future risks to Tuvalu's communities due to sea-level rise and storm waves. The data behind the dashboard are conservative: they do not account for other climate change impacts, such as increased wave action due to loss of coral reefs or change in storm patterns.

34. Tuvalu and SPC have developed a physical three-dimensional model of these data. A video demonstration of the model highlights projected effects of sea-level rise[47].

35. The data demonstrate that even seemingly small increments of sea-level rise make Tuvalu exponentially more vulnerable to flooding during spring high tides and extreme weather events, with devastating consequences for Tuvalu's population. The screenshot below from the dashboard for Funafuti shows the differences in predicted inundation on average once every five years with no sea-level rise versus sea-level rise of 34 centimetres, assuming no adaptation. According to the NASA table above, sea-level rise of 40 centimetres or more is 97 percent likely at 3ºC of global warming. That finding is striking given that 2.6ºC of warming reflects the upper end of combined pledges under the Paris Agreement following COP27[48]. These data thus confirm the existential threat posed by sea-level rise attributable to climate change should States continue at current rates of GHG emissions.

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43 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), Annex 2, Expert Report of Shobha Maharaj, D.Phil. (Oxon.), on Impacts of Climate Change on Small Island States, ¶ 21 (citing IPCC, Working Group II, "Chapter 15: Small Islands", *Sixth Assessment Report: Impacts, Adaptation and Vulnerability* (2022), pp. 2045, 2052).

44 IPCC, Working Group II, "Chapter 15: Small Islands", *Sixth Assessment Report: Impacts, Adaptation and Vulnerability* (2022), pp. 2053–2055.

45 United Nations Development Programme, Tuvalu Launches World-Class Coastal Hazard Modelling Tool in the Face of Growing Climate Impacts (23 July 2023); Tuvalu Coastal Adaptation Project, Dashboard (Risk), https://opm.gem.spc.int/tcap/risk. User-friendly dashboards for Funafuti and Nanumea are available at https://landscapeknowledge.net/funafuti-map and https://landscapeknowledge.net/nanumea-map.

46 M. Wandres et al., "A National-Scale Coastal Flood Hazard Assessment for the Atoll Nation of Tuvalu", *Earth's Future* (forthcoming 2024) (Annex 1), pp. 7, 12.

47 The demonstration is available at https://bit.ly/Tuvalu3DModel. The presenters are Naomi Maheu, Ministry of Foreign Affairs, Labour, and Trade; Faatupu Simeti, Climate Change Department; and Vaiaoga Vaisaueri Lamieko, a youth climate change activist.

48 *See* UNFCCC Secretariat, Technical Dialogue of the First Global Stocktake: Synthesis Report by the Co-Facilitators on the Technical Dialogue, document FCCC/SB/2023/9 (8 September 2023), ¶ 78.

Inundation on Funafuti on Average Once Every Five Years[49]

No sea-level rise *34 centimetres of sea-level rise (~2ºC)*

36. *Second*, climate change is changing global weather patterns, which in turn intensify storms and wave activity. The IPCC has found that the excess heat in the ocean and atmosphere has changed ocean and air currents, making tropical cyclones more severe[50]. This will render Tuvalu more vulnerable to tropical cyclones during El Niño periods, as it experienced with Tropical Cyclone Pam in 2015, the strongest cyclone on record to make landfall in the South Pacific[51].

37. *Third*, Tuvalu faces increases in mean and high annual temperatures, both on land and in its surrounding waters. Global climate models project that, by 2030, average surface air temperature in Tuvalu will increase by 1ºC above 1995 levels, and that temperatures on extremely hot days will increase by around 0.5ºC[52]. Average sea-surface temperature around Tuvalu is rising by about 0.22ºC per decade, almost 70 percent higher than the global average since 1900[53]. As the atmosphere warms and the ocean absorbs more heat, the marine environment will experience associated negative consequences such as heat stress and ocean deoxygenation[54].

38. *Finally*, Tuvalu faces high risks associated with ocean acidification. The ocean water in the lagoons of Tuvalu's atolls and in its vast exclusive economic zone is becoming more acidic in line with global trends as a result of the ocean's absorption of atmospheric carbon dioxide. Without significant reductions in current emissions, the Funafuti lagoon will become

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49 Screenshot taken from https://landscapeknowledge.net/funafuti-map. For scale, Funafuti spans about 900 metres at its widest point.

50 IPCC, Working Group I, "Summary for Policymakers", *Sixth Assessment Report: The Physical Science Basis* (2021) (Dossier No. 75), pp. 8–9, 15–16, 25; IPCC, "Chapter 6: Extremes, Abrupt Changes and Managing Risks", *Special Report on the Ocean and Cryosphere* (2019), pp. 591–593.

51 Government of Tuvalu, National Climate Change Policy 2021–2030 (2021), pp. 2, 23.

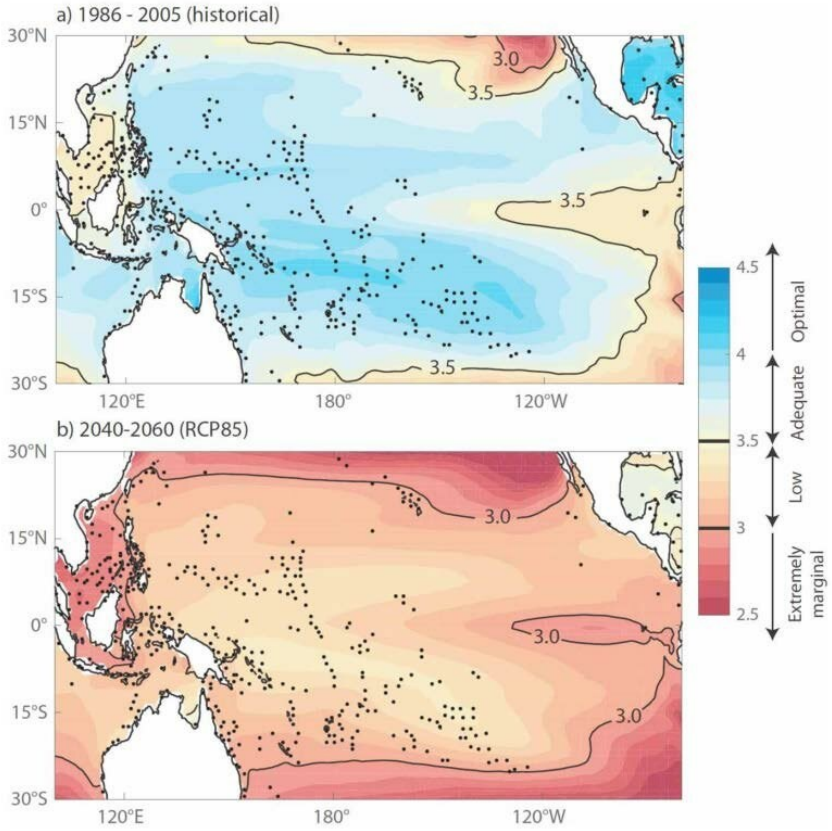
52 *Id*., pp. 1–2.

53 *See* Secretariat of the Pacific Community, Climate Change in the Pacific 2022: Historical and Recent Variability, Extremes and Change (2022), p. 193.

54 *See* IPCC, Working Group I, "Summary for Policymakers", *Sixth Assessment Report: The Physical Science Basis* (2021) (Dossier No. 75), p. 21.

too acidic to sustain corals not long after 2030[55]. The graphic below shows historical and projected decreases in aragonite saturation—which declines as the ocean grows more acidic—in the South Pacific through 2060. Aragonite saturation of 3.5, shown in yellow, begins to harm marine life[56].

Historical and Projected Aragonite Saturation in the South Pacific, 1986–2005 and 2040–2060[57]



2. Harm to the Tuvaluan People and Their Environment

39. These physical and chemical changes cause profound and cross-cutting harms to the Tuvaluan people and their environment. Together, they present an existential threat to life on the islands. Dr. Sarah Cooley—Coordinating Lead Author of the oceans chapter of the IPCC's 2022 report on impacts, adaptation, and vulnerability—explains that climate change is putting "homelands and histories" of people like Tuvaluans "at risk": she cites to the IPCC, which concluded with high confidence that the "vulnerability of communities in small islands, especially those relying on coral reef systems for livelihoods, may exceed adaptation limits well before 2100 even for a low GHG emission pathway"[58].

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55 Government of Tuvalu, National Climate Change Policy 2021–2030 (2021), p. 2.

56 *Id*.

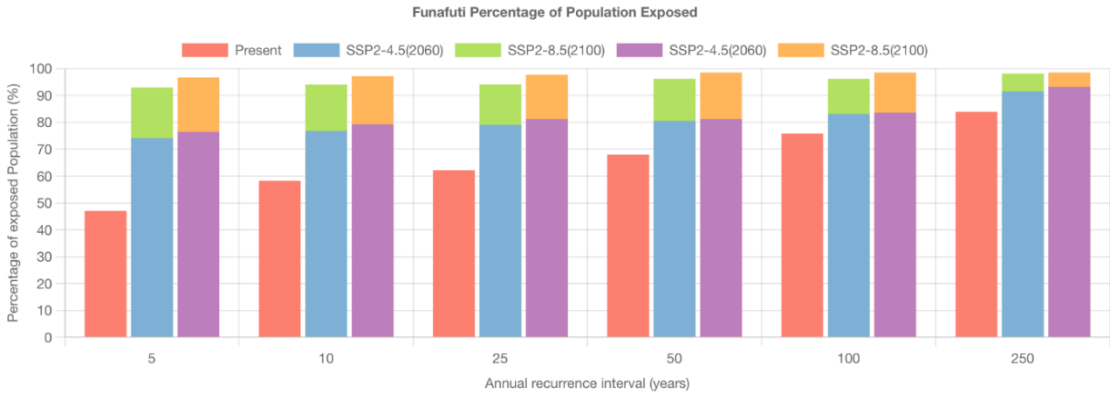
57 Secretariat of the Pacific Regional Environment Programme ("SPREP"), Pacific Islands Ocean Acidification Vulnerability Assessment (2015), p. 9.

58 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), Annex 1, Expert Report of Sarah R. Cooley, Ph.D., on Impacts of Anthropogenic Greenhouse Gas Emissions on the Marine Environment and Affected Communities

40. Sea-level rise has made life much more difficult on Tuvalu's islands, where more than 95 percent of infrastructure lies in low-elevation coastal zones[59]. NASA concludes that, because most of Tuvalu's land territory sits at low elevation, "much of the land plus critical infrastructure will sit below the level of the current high tide by 2050"[60]. Funafuti is regularly inundated even today, including as recently as February 2024. That inundation postponed elections for the country's Prime Minister, delaying the formation of a new Government by more than one month[61].

41. The screenshot below from the Government-SPC coastal mapping dashboard shows the percentage of Funafuti's population exposed to future inundation events under various IPCC emissions scenarios, again assuming no adaptation. The red bar on the leftmost graph shows that, even today, *nearly half of Funafuti's population is at risk of submergence on average every five years*—with risks only growing from there. The oceanographers who built the dashboard rightly conclude that these data demonstrate phenomena that "threaten[] the habitability of Tuvalu"[62].

Percentage of Funafuti's Population Exposed to Inundation Events Under Given Future Emissions Scenarios[63]



42. Tuvalu's coastal infrastructure is particularly vulnerable during tropical cyclones, which occur on average eight times per decade and are increasing in intensity[64]. In 2015,

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(22 March 2024), ¶ 58 (quoting IPCC, Working Group II, "Chapter 15: Small Islands", *Sixth Assessment Report: Impacts, Adaptation and Vulnerability* (2022), p. 2046).

59 IPCC, Working Group II, "Chapter 15: Small Islands", *Sixth Assessment Report: Impacts, Adaptation and Vulnerability* (2022), p. 2064.

60 NASA, Technical Report, N-SLCT-2023-01, Assessment of Sea Level Rise and Associated Impacts for Tuvalu (June 2023), p. 1.

61 "King Tide Threatens Pacific Island Nation of Tuvalu", *Sky News Australia* (14 February 2024); Government of Tuvalu, Statement of Priorities for the New Government of Tuvalu after the National General Elections on 26 January 2024 (28 February 2024), p. 1.

62 M. Wandres et al., "A National-Scale Coastal Flood Hazard Assessment for the Atoll Nation of Tuvalu", *Earth's Future* (forthcoming 2024) (Annex 1), p. 44. Sea-level rise has already claimed precious land in Tuvalu. Tomasi Kaitu, a magistrate judge in Funafuti, addresses a case in his court arising out of a boundary dispute that arose after seawater permanently submerged 20 percent of a landowner's property at the northern tip of Fogafele, Funafuti's main islet. The video is available at https://bit.ly/TuvaluLand.

63 TCAP Dashboard (Risk), SPC Ocean Prediction and Monitoring Portal, https://opm.gem.spc.int/tcap/risk.

64 Government of Tuvalu, National Climate Change Policy 2021-2030 (2021), pp. 23, 26; IPCC, Working Group II, "Chapter 15: Small Islands", *Sixth Assessment Report: Impacts, Adaptation and Vulnerability* (2022), p. 2045.

Tropical Cyclone Pam displaced half of Tuvalu's population[65]. The storm destroyed critical infrastructure, including health centres, schools, roads, farmlands, power and sanitation facilities, and other public utilities[66]. Estimates placed the cost to rebuild in Tuvalu after Tropical Cyclone Pam at over 30 percent of gross domestic product[67]. On Nui, 98 percent of households were affected, with the entire settlement flooded from both the lagoon and ocean sides[68]. The harm has been long-lasting and some cannot be undone. Most of the pulaka pits—critical and traditional sources of food—on Nui were flooded for weeks[69]; ancestral graves were overturned; and two islets in Funafuti remain completely submerged[70].

43. The burden of tropical cyclones and sea-level rise do not fall evenly on all Tuvaluans. For example, low-income households suffered close to 80 percent of losses and damages after Tropical Cyclone Pam[71], and persons with disabilities are disproportionately negatively impacted, especially during the more frequent inundations and flooding[72]. UN WOMEN has concluded that the "impact of climate change affects rural women disproportionately due to their reliance on natural resources for their income and food source"[73].

44. The physical and chemical changes caused by global warming threaten Tuvalu's interconnected and critical terrestrial, coastal, and marine environments, displacing or killing native flora and fauna. Tuvalu is exceptionally biodiverse, with more than 1,453 marine species[74], including 600 species of fish, as well as approximately 362 species of indigenous plants[75]. As of 2020, the International Union for the Conversation of Nature has reported that 118 species in Tuvalu are threatened, including due to risks to the integrity of Tuvalu's coastline[76]. Species living in Tuvalu's exclusive economic zone suffer from ocean warming, deoxygenation, and acidification, as Dr. Maharaj confirms[77].

45. Tuvalu's coral reefs are highly susceptible to bleaching and death due to rising ocean temperatures and acidification. Government data show that, under a long-term mean increase in average sea-surface temperature of 1°C above the average from 1982 to 1999, severe

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65 *See* SPREP, Tuvalu State of the Environment Report (2022), p. 92.

66 World Health Organization, A Story from Tuvalu: 1.5 to Stay Alive, (10 December 2015); Government of Tuvalu, Tropical Cyclone Pam Recovery: Vulnerability Reduction Plan (19 May 2015), pp. 14–16.

67 International Monetary Fund, Tuvalu: Staff Report for the 2023 Article IV Consultation—Debt Sustainability Analysis (21 July 2023).

68 R. Hoeke et al., "Severe Flooding in the Atoll Nations of Tuvalu and Kiribati Triggered by a Distant Tropical Cyclone Pam", *Frontiers in Marine Science*, Vol. 7 (2021), p. 4.

69 Government of Tuvalu and SPC, Managing Coastal Aquifers in Selected Pacific Small Island Developing States Project: Groundwater Investigation in Nui, Tuvalu (2023), p. 10.

70 Government of Tuvalu, National Climate Change Policy 2021–2030 (2021), p. 23.

71 T. Taupo & I. Noy, Disaster Impact on Households in Tuvalu (6 June 2016), p. 15.

72 Ioane Hawaii testifies to the difficulty that persons with disabilities in Tuvalu have in getting to safety during inundations and flooding given that the few multistory buildings in Tuvalu are not accessible. His video is available at https://bit.ly/TuvaluPWD.

73 UN WOMEN, Gender Equality Brief for Tuvalu (2022), p. 12.

74 Government of Tuvalu, Tuvalu Second National Communication to the UNFCCC (2022), p. viii.

75 SPREP, Tuvalu State of the Environment Report (2022), p. 77.

76 *Id*., pp. 77, 79.

77 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), Annex 2, Expert Report of Shobha Maharaj, D.Phil. (Oxon.), on Impacts of Climate Change on Small Island States, § III.C.4.ii.

bleaching risk events will last for 2.6 months and the average interval between two such events will be under 16 months, limiting the opportunity for recovery[78]. The danger grows exponentially with more warming: at an average sea-surface temperature of 1.5°C, severe bleaching risk events will last *5.8 months* and recur *6.8 months* later—twice the bleaching and half the recovery[79].

46. Government data show that, as of 2021, 30 percent of a critical coral reef around Niutao had suffered bleaching[80]; the situation is even worse in some areas, such as Funafuti's shallow southern lagoon, where 90 percent of corals had died by 2018[81]. The photographs below taken by the Government's Fisheries Department in March 2024 show bleached corals in that lagoon. Government-SPC projections "suggest that coral reefs of Tuvalu will be vulnerable to actual dissolution as they will have trouble producing the calcium carbonate needed to build their skeletons" due to ocean acidification at current emissions levels[82].

Bleached Corals in Funafuti's Southern Lagoon (March 2024)

47. Any decline in coral populations will have a devastating effect on the ecosystems of which they form an integral part. Coral loss in Tuvalu has led to declines in lagoon fish stocks dependent on coral habitats[83]. Coral bleaching and death, as well as the loss of seagrass meadows and other marine flora, also make islands like Tuvalu more vulnerable to wave strikes without natural barriers to blunt them[84]. Furthermore, ocean warming is causing blooms of sargassum, a pelagic seaweed that is toxic to Tuvalu's native flora and fauna[85].

48. Tuvalu is among the small island States that show the largest anticipated decrease in fish stocks by the end of the century, with some estimates predicting that it could experience more than 50 percent decline in minimum catch potential for some species by 2100 relative to

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78 Government of Tuvalu, National Climate Change Policy 2021–2030 (2021), p. 2.

79 *Id*.

80 Government of Tuvalu, Tuvalu Ridge to Reef Project, Biodiversity Rapid Assessment Program (2021), p. 49.

81 Reef Resilience Network, Coral Restoration for Climate Change Adaptation in the South Pacific, (30 November 2020).

82 B. Moore et al., Monitoring the Vulnerability and Adaptation of Coastal Fisheries to Climate Change: Funafuti Atoll (Tuvalu), Assessment Report No. 2 (April–May 2013), p. 19.

83 *Id*.

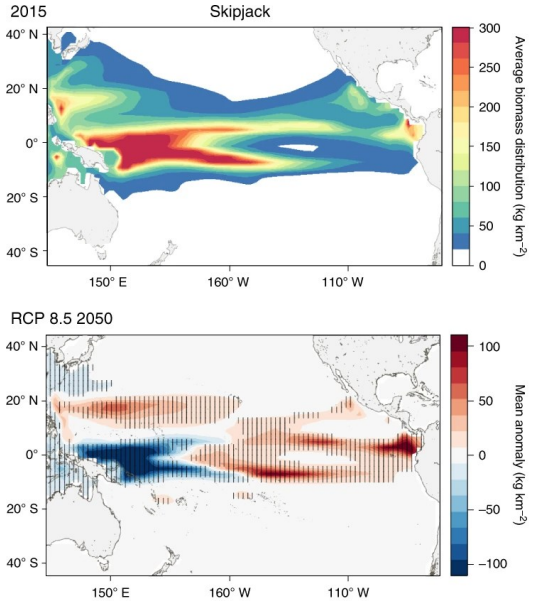
84 IPCC, Working Group II, "Chapter 15: Small Islands", *Climate Change 2022: Impacts, Adaptation and Vulnerability* (2022), p. 2059.

85 *Id*., p. 2057; SPREP, Tuvalu State of the Environment Report (2022), p. 36.

1980–2000[86]. This would have devastating impacts on Tuvaluans' subsistence and economy. The majority of Tuvaluans depend on subsistence fishing as their source of livelihood, and fishing accounts for nearly half of national exports[87]. Even if Tuvalu's islands remain above water by the end of the century, the depletion of marine biodiversity and abundance would render it incredibly difficult—if not impossible—to sustain the current livelihoods of their inhabitants.

49. Declines in tuna stocks are particularly worrying. Tuna is a staple of the traditional Tuvaluan diet, and access fees for tuna fishing accounted for over half of Government revenues in 2015[88]. A high-emissions scenario, however, is predicted to systematically drive large numbers of tuna out of Tuvalu's exclusive economic zone. The chart below by SPC oceanographers shows 2015 distributions of skipjack tuna as compared with biomass loss in a high-emissions scenario in 2050, representing as much as a 30 percent drop.

Projected Effects of Climate Change on the Distribution of Skipjack Tuna in the Pacific Ocean[89]



50. These stresses on Tuvalu's natural environment threaten water and food security on its islands. Sea-level rise causes saltwater intrusion into freshwater lenses and agricultural lands, rendering them unusable and deepening dependence on rainwater[90]. Tuvaluans now import many foods, like taro or cassava, that once grew locally[91].

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86 IPCC, Working Group II, "Chapter 15: Small Islands", *Climate Change 2022: Impacts, Adaptation and Vulnerability* (2022), p. 2066.

87 SPREP, Tuvalu State of the Environment Report (2022), pp. 32, 74.

88 J. Bell, "Pathways to Sustaining Tuna-Dependent Pacific Island Economies During Climate Change", *Nature Sustainability*, Vol. 4, p. 900 (2021) at 901.

89 *Id*., p. 903.

90 SPREP, Tuvalu State of the Environment Report (2022), p. 36. Itaia Lausavene, a local farmer, addresses stresses on Tuvalu's agriculture and associated impacts on culture and food security in a video available at https://bit.ly/TuvaluFarmer. In a separate video available at https://bit.ly/TuvaluCulture, two young Tuvaluans describe the impact of climate change on the food and culture of their generation.

91 *Id*., p. 32.

51. Declining fish stocks have altered Tuvaluans' diets. An SPC survey conducted from 2004 to 2005 found that Tuvaluans consumed fish at four times the rate of the regional average, including fresh fish 5.6 times per week[92]; in 2021, by contrast, the World Bank found that up to 80 percent of food consumed in Funafuti—such as meat, rice, and dried noodles—was imported[93]. Imported rice and sugar today make up over half of Tuvaluans' food consumption, roughly the proportion that local fish once occupied in their diets[94].

52. Climate change has a profound impact on Tuvaluans' health beyond food and water insecurity. As a result of coral bleaching due to ocean warming, Tuvaluans are suffering higher incidents of ciguatera fish poisoning, a foodborne illness caused by toxic algae that grow on degraded coral reefs and can contaminate reef fish[95]. The Government identified a high likelihood of fish poisoning in the Funafuti lagoon in the fourth quarter of 2023[96]. Furthermore, with limited access to healthcare facilities, Tuvaluans are at particular risk of climate-sensitive diseases such as dengue fever, diarrheal illnesses, skin infections, and heart disease[97]. These risks multiply during extreme weather events that damage healthcare infrastructure, increase exposure to vector- and water-borne diseases, and harm nutrition levels[98]. More generally, Tuvaluans are suffering mentally and spiritually in the face of existential risks to their way of life[99].

53. Taken as a whole, these compounded impacts of climate change make it increasingly difficult for the Tuvaluan people to continue to live on the islands that they have called home for around two millennia[100].

C. TUVALU'S ADAPTATION TO CLIMATE CHANGE

54. Tuvaluans are fighting for their lives to address the increasing pace of climate change impacts that their islands face by taking steps to preserve their land and environment as an imperative to continuing existence.

(a) In 2019, the Government adopted the Climate Change Resilience Act, a comprehensive regime designed, "to the greatest extent possible", to "guarantee the security of the people of Tuvalu from the impacts of climate

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92 B. Moore et al., Monitoring the Vulnerability and Adaptation of Coastal Fisheries to Climate Change: Funafuti Atoll (Tuvalu), Assessment Report No. 2 (April–May 2013), p. 22.

93 World Bank Group, Climate Risk Country Profile: Tuvalu (2021), p. 13; SPREP, Tuvalu State of the Environment Report (2022), p. 32.

94 International Organization for Migration, Powering Past the Pandemic: Bolstering Tuvalu's Socioeconomic Resilience in a COVID-19 World (2021), p. 6; SPREP, Tuvalu State of the Environment Report (2022), p. 32.

95 *See* IPCC, Working Group II, "Chapter 15: Small Islands", *Climate Change 2022: Impacts, Adaptation and Vulnerability* (2022), p. 2064.

96 Government of Tuvalu, Ministry of Fisheries and Trade, Ciguatera Fish Poisoning Monitoring Program Report Card (2023), p. 2.

97 Government of Tuvalu, National Climate Change Policy 2021–2030 (2021), p. 11.

98 *Id*.

99 IPCC, Working Group II, "Chapter 15: Small Islands", *Climate Change 2022: Impacts, Adaptation and Vulnerability* (2022), p. 2065.

100 *See* T. O'Brien, "Genesis", *Tuvalu: A History* (H. Laracy ed. 1983) (Annex 2), p. 16.

change" and "to ensure their sustainability and to maintain national sovereignty"[101].

(b) In 2020, the Government adopted the National Strategy for Sustainable Development 2021–2030 seeking, in part, a "degree of security not only from climate change but also disaster by increasing our adaptive capacity through increased level of financing from global climate funding sources and high-tech innovative development measures"[102].

(c) The Government built on that goal the following year by adopting its National Climate Change Policy 2021–2030 to further "respond to the needs of our people"[103].

(d) In September 2023, Tuvalu amended its Constitution to commit to "[p]rotecting and conserving its land area, territorial waters and airspace", "retaining its Statehood", and "[r]esponding to climate change, which threatens the security and survival of its people and its land"[104]. The Constitution further recognizes that Tuvalu's declared baseline coordinates "shall remain unchanged, notwithstanding any regression of the low water mark or changes in geographical features of coasts or islands, due to sea-level rise or other causes, until and unless otherwise prescribed by an Act of Parliament"[105].

55. A cornerstone of Tuvalu's adaptation planning is the Tuvalu Coastal Adaptation Project ("TCAP"). Launched in 2017, TCAP is a comprehensive land reclamation initiative to address the significant challenges that climate change and sea-level rise pose to Tuvalu's islands, including submergence.[106] The Project's main objective is to reduce the exposure of Tuvalu to coastal hazards of sea-level rise and intensifying storm events. To do so, TCAP has focused on protecting 2,780 metres of high-value, vulnerable coastline on Funafuti, Nanumanga, and Nanumea with barriers, vegetation, and beach replenishment[107].

56. TCAP already provides critical protection to Funafuti. The Government-SPC coastal mapping dashboard mentioned above shows that 7.3 hectares of reclaimed land built on the atoll's lagoon side shields it from inundations, meaningfully reducing projected impacts of even 100-year inundation events. The screenshots below show projected inundation once every five years at 34 centimetres of sea-level rise with no adaptation, as compared with inundation under the same parameters but with the land reclamation shown in yellow. As explained in the video demonstration, these data prove the meaningful impact that high-quality, hyper-localized data can have in adaptation planning.

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101 Climate Change Resilience Act 2019, Part II.6(g).

102 Government of Tuvalu, National Strategy for Sustainable Development 2021–2030 (2020), p. 4.

103 Government of Tuvalu, National Climate Change Policy 2021–2030 (2021), p. 1.

104 Constitution of Tuvalu, Division I, § 2(5).

105 *Id*., Art. 2(3).

106 *See* S. Brown et al., "Pathways to Sustain Atolls Under Rising Sea Levels Through Land Claim and Island Raising", *Environmental Research: Climate* (16 February 2023); L. Saddington, "The Chronopolitics of Climate Change Adaptation: Land Reclamation in Tuvalu" in *Territory, Politics, Governance* (5 June 2022).

107 TCAP, https://tcap.tv/; United Nations Development Programme ("UNDP"), Concept Design Report: Tuvalu Coastal Adaptation Project (21 May 2021).

Inundation on Funafuti Once Every Five Years with Adaptation

No adaptation *With land reclamation*

57. The most ambitious of Tuvalu's adaptation plans is to raise the elevation of its most vulnerable coasts by a maximum of around 5.75 metres, which would place them around 2.4 metres above the current high-tide line[108]. It is thus projected to remain above the worst-case scenarios for sea-level rise by 2100[109]. This plan—named the Long-Term Adaptation Plan ("L-TAP"), or *Te Lafiga o Tuvalu* (Tuvalu's Refuge)—envisions 3.6 square kilometres of raised land on Funafuti, along with gradual relocation of people and critical infrastructure to higher ground[110]. The Government and the Green Climate Fund have committed US$2.9 million and US$36 million to the project, respectively[111]. These contributions, however, are far from the estimated US$1.3 billion needed to finish L-TAP, equal to roughly 2,000 times gross domestic product[112]. The renderings below show the design for L-TAP once completed on Funafuti.

108 TCAP, Coastal Construction Designs to Benefit Three Target Islands in Tuvalu (30 August 2021).

109 *Id*.

110 TCAP, Tuvalu Unveils Long-Term Adaptation Plan at COP27, a Vision for a Safe, Climate-Resilient Future (14 November 2022).

111 TCAP, About TCAP, https://tcap.tv/about-tcap.

112 *See* International Monetary Fund, Tuvalu: Staff Report for the 2023 Article IV Consultation—Informational Annex, Statement by the Executive Director and the Advisor to Executive Director on Tuvalu (10 July 2023), p. 2, fn. 3.

Renderings of the L-TAP Project on Funafuti[113]

58. Even as Tuvalu takes steps to preserve its very right to exist and protect its people from the existential threat posed by climate change, TCAP and L-TAP cannot currently address the full spectrum of the expected negative climate impacts on Tuvalu in perpetuity. The design report for the Funafuti L-TAP project notes that it was "designed to account for current worst-case scenario Sea Level Rise predictions to 2100", meaning that the "design life of this structure is 80 years"[114]—that is, within the possible lifetimes of some Tuvaluans. NASA's calculations noted above show that the risks of sea-level rise will increase significantly by that time if average global temperature rise does not hold at or below 1.5ºC.

59. Accordingly, the Government of Tuvalu is also undertaking disaster planning measures, including by attempting to address the possibility of the worst-case scenarios of displacement of Tuvaluans due to climate change. For example, in November 2023, the Government took the necessary step of signing a treaty with Australia to establish the Falepili Union, which would permit annually 280 Tuvaluans displaced by climate change to be granted visas to live, work, and study in Australia[115]. To be clear, for Tuvalu and its people,

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113 TCAP, https://tcap.tv; UNDP, Te Lafiga o Tuvalu – Tuvalu's Long Term Adaptation Plan (2022), https://www.youtube.com/watch?v=Gp14MhdaSTs.

114 UNDP, Funafuti Detailed Design Report: Tuvalu Coastal Adaptation Project (12 March 2021), p. 3.

115 *See* Australia-Tuvalu Falepili Union Treaty, Art. 3.

displacement is not an acceptable response to the climate crisis as a matter of either law or policy. The prerogative and "priority of the Tuvaluan people is to stay and to continue living on their God-given land", as Tuvalu explained at COP28[116]. To that end, the Falepili Union treaty recognizes "the desire of Tuvalu's people to continue to live in their territory where possible" and commits Australia and Tuvalu to, first and foremost, "work together to help the citizens of Tuvalu to stay in their homes with safety and dignity, including by promoting Tuvalu's adaptation interests" and "provid[ing] assistance to Tuvalu" in this endeavour[117]. If Tuvaluans were to be displaced, they would suffer a loss of place, property, identity, culture, way of life, traditions, and more represented by *fenua*, particularly as Tuvaluans' unique culture and traditions require maintaining the intimate connection with their land.

60. The Government is taking steps to raise and safeguard the significant funds necessary to ensure the survival and welfare of Tuvalu and its people. In 2015, the Government established the Tuvalu Climate Change and Survival Fund to "[p]rovide immediate vital services to the people of Tuvalu in combating the devastating impact of climate change and natural disasters" and "[a]llow the Government and the people of Tuvalu to respond to future climate change impacts and natural disasters in a coordinated, effective and timely manner"[118]. The Survival Fund had a balance of around US$3.3 million at year-end 2020[119]. In addition, the Tuvalu Trust Fund, a sovereign wealth fund created in 1987 by the governments of Tuvalu, Australia, New Zealand, and the United Kingdom, seeks in part to "enhance the capacity of the Government to receive and effectively utilize external capital development and technical assistance" and "enable the Government to meet Long-term maintenance and operating costs of social and economic infrastructure and services"[120]. The Fund had a market value of around US$125 million at year-end 2022[121].

D. Reduction of Harm to Tuvalu by Limiting GHG Emissions and Transitioning Away from Fossil Fuels to Keep Global Warming Within 1.5ºC

61. Tuvalu cannot mitigate the myriad negative effects of climate change without drastic and rapid reductions in GHG emissions in line with a global phaseout of fossil fuels. The IPCC has found that "[e]very increment of global warming will intensify multiple and concurrent hazards"[122], which for Tuvalu include tropical cyclones, ocean acidification, the collapse of coral reefs and associated ecosystems, catastrophic harm to terrestrial and coastal environments, food and water insecurity, and more, as described above. The IPCC has concluded with high confidence: "The vulnerability of communities in small islands, especially those relying on coral reef systems for livelihoods, may exceed adaptation limits well before 2100 even for a low greenhouse gas emissions pathway."[123]

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116 Government of Tuvalu, Statement at COP28 (5 December 2023).

117 Australia-Tuvalu Falepili Union Treaty, Arts. 2(2), 2(3), 3(3).

118 Tuvalu, Climate Change and Disaster Survival Fund Act 2015, Art. 7.

119 International Monetary Fund, Tuvalu: Staff Report for the 2023 Article IV Consultation—Debt Sustainability Analysis (21 July 2023), p. 9.

120 Agreement Concerning an International Trust Fund for Tuvalu (1987), Art. 2.

121 International Monetary Fund, Tuvalu: Staff Report for the 2023 Article IV Consultation—Debt Sustainability Analysis (21 July 2023), p. 9.

122 IPCC, "Summary for Policymakers", *Sixth Assessment Synthesis Report* (2023) (Dossier No. 78), p. 12.

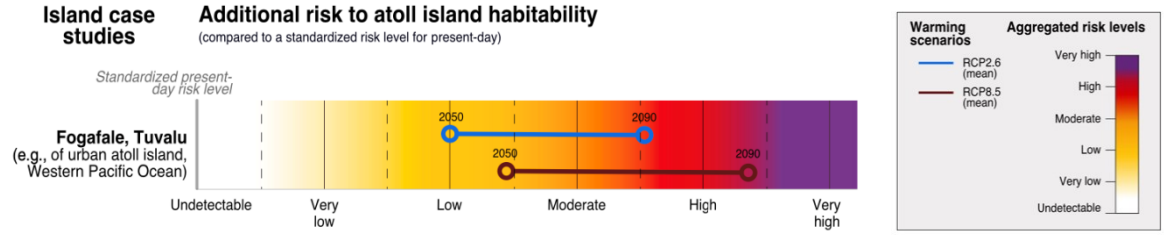
123 IPCC, Working Group II, "Chapter 15: Small Islands", *Climate Change 2022: Impacts, Adaptation and Vulnerability* (2022), p. 2046.

62. For Tuvalu, the formula is simple: "1.5 to stay alive"[124]. The data from the Government, the IPCC, and NASA cited above show that limiting average global temperature rise to 1.5ºC is a matter of Tuvalu's survival. That imperative could not be more urgent given that the average temperature in 2023, the hottest year in recorded history, was already 1.45ºC above pre-industrial levels, with every single day at least 1ºC above those levels[125].

63. The Government is committed to finding innovative solutions to ensure Tuvalu's continued habitability, but the cost and feasibility of future innovations become more challenging as global temperatures increase. As noted above, the risks of sea-level rise increase dramatically with every increment of warming, making it more difficult for programs like TCAP and L-TAP to keep up. Simply put, the faster the world warms, the less time Tuvalu will have to adapt.

64. Beyond sea-level rise, a 2020 peer-reviewed study shows the increased risks with greater warming across five recognized pillars of habitability—land, freshwater supply, food supply, settlements and infrastructure, and economic activities—on select Pacific atolls, including Funafuti. The graphic below shows that risks of habitability move from moderate to very high by 2090 under a "very stringent" emissions pathway as compared to one where emissions continue to rise throughout the 21st century[126].

Additional Risk to Habitability on Funafuti Above a "Very Stringent" Emissions Pathway[127]



65. The IPCC has confirmed that the risks of catastrophic effects of climate change move from moderate to high at average global temperature rise above 1.5ºC[128]. The IPCC has found that "unique and threatened systems" in particular, such as coral reefs, are at "risk from climate change at current temperatures, with increasing numbers of systems at potential risk of severe consequences at global warming of 1.6°C above pre-industrial levels"[129].

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124 AOSIS, A 1.5 Degree Limit Must Be a Part of the Paris Agreement—for the Sake of Present and Future Generations (8 June 2015).

125 Copernicus Climate Change Service, The 2023 Annual Climate Summary: Global Climate Highlights 2023 (9 January 2024); World Meteorological Organization, WMO Confirms that 2023 Smashes Global Temperature Record (12 January 2024).

126 V. Duvat et al., "Risks to Future Atoll Habitability from Climate-Driven Environmental Changes", *WIREs Climate Change*, Vol. 12, No. 3 (May/June 2021), pp. 4, 16.

127 *Id*., p. 16.

128 IPCC, "Summary for Policymakers", *Sixth Assessment Synthesis Report* (2023) (Dossier No. 78), p. 15; IPCC, "Chapter 3: Impacts of 1.5°C Global Warming on Natural and Human Systems", *Special Report: Global Warming of 1.5°C* (2018), p. 254, fig. 3.21.

129 IPCC, "Chapter 3: Impacts of 1.5°C of Global Warming on Natural and Human Systems", *Special Report: Global Warming of 1.5ºC* (2018), p. 253.

66. The IPCC has concluded that *limiting* global warming to within 1.5ºC, by contrast, will reduce the risks of harm associated with even greater increases in average global temperature affecting the ocean and marine cryosphere. The IPCC is confident that limiting global warming to 1.5°C compared to 2°C will

> reduce increases in ocean temperature as well as associated . . . decreases in ocean oxygen levels. . . . Consequently, limiting global warming to 1.5°C is projected to reduce risks to marine biodiversity, fisheries, and ecosystems, and their functions and services to humans, as illustrated by recent changes to Arctic sea ice and warm-water coral reef ecosystems (*high confidence*)[130].

67. The IPCC has reached a similar conclusion with respect to ocean acidification. The Panel has high confidence that the

> level of ocean acidification due to increasing CO_2 concentrations associated with global warming of 1.5°C is projected to amplify the adverse effects of warming, and even further at 2°C, impacting the growth, development, calcification, survival, and thus abundance of a broad range of species, for example, from algae to fish[131].

Conversely, the IPCC is confident that limiting global warming to within 1.5°C will reduce the level of acidification as compared to 2.0ºC and, as a consequence, will diminish the "risks to marine biodiversity, fisheries, and ecosystems" associated with ocean acidification[132].

68. At COP28, the States Parties to the Paris Agreement stressed that "the impacts of climate change will be much lower at the temperature increase of 1.5°C compared with 2°C"[133] and, consequently, "*emphasize*[*d*] the need for urgent action and support to keep the 1.5°C goal within reach and to address the climate crisis in this critical decade"[134] and "[*c*]*ommit*[*ted*]" to "accelerate action in this critical decade on the basis of the best available science"[135]. States Parties thus recognized "the need for deep, rapid and sustained reductions in greenhouse gas emissions in line with 1.5°C pathways" and called on all States Parties to, among other efforts, "[t]ransition[] away from fossil fuels in energy systems, in a just, orderly and equitable manner, accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science"[136].

69. Nevertheless, as Dr. Maharaj testifies, States "have never reached a specific, binding agreement for how to achieve . . . urgently needed emissions reductions despite consistently

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130 *Id*., "Summary for Policymakers" (Dossier No. 72), p. 8.

131 *Id*., p. 9.

132 *Id*., p. 8.

133 COP28, Outcome of the First Global Stocktake, decision -/CMA.5 (Advance Unedited Version) (13 December 2023), ¶ 4.

134 *Id*, p. 2, ¶ 5.

135 *Id*., ¶ 6.

136 *Id*., ¶ 28(d).

endorsing the science behind them"[137]. Tuvaluan delegates to successive COPs have noted the failure of States to effectively mitigate GHG emissions, including Grace Malie, a delegate attending COP28 on behalf of Tuvaluan youth[138].

* * *

70. Tuvalu is on the front lines of climate change and its effects, in particular sea-level rise. Tuvalu and its people are already suffering catastrophic harms on their land, infrastructure, and marine and terrestrial ecosystems. These harms are on track to worsen, especially with global warming above 1.5°C, threatening the very survival of Tuvalu's islands. Continued habitability requires rapid and dramatic reductions in GHG emissions that can give Tuvalu time to adapt to climate change.

[137] *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), Annex 2, Expert Report of Shobha Maharaj, D.Phil. (Oxon.), on Impacts of Climate Change on Small Island States, ¶ 117.

[138] Ms. Malie describes her experience at COP28 in a video available at https://bit.ly/TuvaluYouth.

III. Obligations of States Under International Law in Respect of Climate Change

71. The existential threats that Tuvalu and other small island States face from climate change give rise to a range of obligations of States under international law.

72. In answering part (a) of the Request regarding States' international obligations to ensure the protection of the climate system and other parts of the environment from GHG emissions, Tuvalu focuses on three categories of obligations that are particularly salient to its situation. This Chapter first addresses States obligations' to respect the nonderogable rights of peoples (Section A) and to promote, protect, and respect human rights (Section B). As part of these obligations, States must as a necessary but not sufficient requirement take, individually and collectively, all measures necessary to limit average global temperature rise to within 1.5ºC of pre-industrial levels and to support small island States like Tuvalu in adapting to the already devastating effects of warming at that level (Section C).

73. Tuvalu also endorses COSIS's submissions with respect to States' obligations to, *inter alia*, prevent significant transboundary environmental harm, protect and preserve the marine environment, and cooperate internationally in fulfilling those obligations, but does not repeat them here[139].

A. Respect for the Nonderogable Rights of Peoples

74. International law accords peoples with certain nonderogable rights, which States are obligated to respect. These include the obligations to respect (*1*) the right of peoples to self-determination and (*2*) the right of peoples to subsistence.

1. Respect for Peoples' Right to Self-Determination

75. International law accords "peoples" certain nonderogable rights under international law. Most important among these is the right to self-determination, by virtue of which a people is entitled to "freely determine its political status and freely pursue its economic, social and cultural development"[140]. Respect for this right, reflected in Articles 1(2) and 55 of the United Nations Charter, is a peremptory norm of general international law[141]. As explained in the Vienna Convention on the Law of Treaties, a peremptory norm is one which is "accepted and recognized by the international community of States as a whole as a norm from which no derogation is permitted and which can be modified only by a subsequent norm of general international law having the same character"[142]. As such, States must comply with the

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139 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § III.

140 International Covenant on Civil and Political Rights, *United Nations Treaty Series*, Vol. 999, p. 171 (1966) (Dossier No. 49) ("ICCPR"), Art. 1.

141 *See, e.g.*, Articles on Responsibility of States for Internationally Wrongful Acts, with Commentaries *Yearbook of the International Law Commission*, 2001, Vol. II (Part Two), p. 107 ("ARSIWA"), Commentary to Art. 26, ¶ 5; ILC, Draft Conclusions on Identification and Legal Consequences of Peremptory Norms of General International Law (*Jus Cogens*), with Commentaries, document A/77/10 (2022), Conclusions 17, 23, Annex; *see also Case Concerning East Timor (Portugal* v. *Australia)*, *Judgment*, *I.C.J. Reports 1995*, p. 90, ¶ 29.

142 Vienna Convention on the Law of Treaties, *United Nations Treaty Series*, Vol. 1155, p. 331 (1969) ("VCLT"), Art. 53; *see also* ILC, Draft Conclusions on Identification and Legal Consequences of Peremptory Norms of General International Law (*Jus Cogens*), with Commentaries, document A/77/10 (2022), Conclusion 4.

nonderogable obligation to respect and promote the realization of the right of self-determination of Tuvalu and the Tuvaluan people in the context of climate change.

76. The obligation to respect the right of self-determination entails positive obligations for States. As the Court has observed, "the principle of self-determination of peoples has been enshrined in the United Nations Charter and reaffirmed by the General Assembly" in the Declaration on Principles of International Law Concerning Friendly Relations and Cooperation Among States in Accordance with the Charter of the United Nations ("Friendly Relations Declaration"), and furthermore,

> Article 1 common to the International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil and Political Rights reaffirms the right of all peoples to self-determination, and lays upon the States parties the obligation to *promote the realization of that right* and to *respect* it, in conformity with the provisions of the United Nations Charter[143].

77. Indigenous peoples in particular are entitled to exercise their right to self-determination. Article 3 of the United Nations Declaration on the Rights of Indigenous Peoples ("UNDRIP")—reaffirming the relevant provisions of the International Covenant on Civil and Political Rights ("ICCPR") and the International Covenant on Economic, Social, and Cultural Rights ("ICESCR")—provides that "Indigenous peoples have the right to self-determination," and that, "[b]y virtue of that right," they are entitled to "freely determine their political status and freely pursue their economic, social and cultural development."[144] UNDRIP thus recognizes that the right to self-determination, including in relation to the pursuit of these important rights to development, and the related rights it protects, "constitute the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world"[145].

78. International law recognizes that the rights of the people constituting the population of a State are directly linked to the territorial integrity of that State. The Court has underscored in particular the link between self-determination and territorial integrity, given that peoples "are entitled to exercise their right to self-determination in relation to their territory as a whole" and that the "the right to self-determination of peoples" includes "respect for the

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[143] *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory*, *Advisory Opinion*, *I.C.J. Reports 2004*, p. 198 ("*Wall* Advisory Opinion"), ¶ 88 (citing United Nations General Assembly, resolution 2625 (XXV), Declaration on Principles of International Law concerning Friendly Relations and Cooperation among States in accordance with the Charter of the United Nations, document A/RES/2625(XXV) (24 October 1970) ("Friendly Relations Declaration"), p. 123 ("Every state has the duty to refrain from any forcible action which deprives peoples referred to [in the resolution] . . . of their right to self-determination."), and United Nations Charter, Arts. 1(2), 53); *see also* S. Oeter, "Self-Determination" in *The Charter of the United Nations: A Commentary* (B. Simma et al. eds., 3rd ed. 2012), Vol. I (Annex 3), p. 316 ("[I]t is beyond doubt that self-determination, as a purpose and principle of the UN Charter, constitutes a legally binding norm for all member States of the United Nations.").

[144] United Nations General Assembly, resolution 61/295, United Nations Declaration of the Rights of Indigenous Peoples, document A/RES/61/295 (13 September 2007) ("UNDRIP"), Art. 3.

[145] *Id*., Art. 43.

national unity and territorial integrity of a State or country"[146]. The Court has thus found that displacement of a people against their will violates their right to self-determination[147]. In *Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965*, for instance, the Court determined that the United Kingdom breached its customary obligation to respect the self-determination of the former inhabitants of the Chagos Archipelago when it removed the Chagossian people against their "free and genuine expression of . . . will"[148].

79. Relatedly, the General Assembly has recognized that the "inalienable right . . . to self-government and independence" includes a right against forcible displacement[149]. The General Assembly applied that right against the former Administering Authority in Nauru, which had rendered large portions of the territory uninhabitable as a result of phosphate mining. Finding that the now-independent Nauruan people had a right to refuse resettlement, the General Assembly recommended that the Authority "take immediate steps, irrespective of the cost involved, towards restoring the island of Nauru for habitation by the Nauruan people as a sovereign nation"[150].

80. Other United Nations bodies have also applied the right to self-determination in the context of climate change. The United Nations Human Rights Council emphasized in 2022 that "the adverse effects of climate change have a range of implications, both direct and indirect, that can increase with greater global warming, for the effective enjoyment of human rights, including . . . the *right to self-determination*"[151]. The Council agreed in particular that "the displacement of indigenous peoples and the potential loss of their traditional lands, territories and resources threaten their cultural survival, traditional livelihoods and right to self-determination"[152]. Similarly, the Co-Chairs of the Study Group on Sea-Level Rise in Relation to International Law of the International Law Commission ("ILC") have concluded that land inundation stemming from sea-level rise puts the right to self-determination, including of Indigenous peoples, "at risk"[153].

81. Of particular relevance in the context of climate change is the "obligation to promote the realization" of the right to self-determination and to "respect" the right. It is difficult to imagine a more profound obstacle to the realization of the right to determine the political status of a people and "freely to pursue their economic, social and cultural development", to use the words of Article 1(1) common to the ICCPR and the ICESCR and Article 3 of

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146 *Legal Consequences of the Separation of the Chagos Archipelago from Mauritius in 1965*, *Advisory Opinion*, *I.C.J. Reports 2019*, p. 95 ("*Chagos* Advisory Opinion"), ¶¶ 155, 160 (citation and internal quotation marks omitted).

147 *Wall* Advisory Opinion, ¶ 122; *Chagos* Advisory Opinion, ¶¶ 172, 174, 177.

148 *Chagos* Advisory Opinion, ¶ 172; *see also Wall* Advisory Opinion, ¶ 122.

149 United Nations General Assembly, resolution 2111 (XX), Question of the Trust Territory of Nauru, document A/RES/2111(XX) (21 December 1965), ¶ 1.

150 United Nations General Assembly, resolution 2226 (XXI), Question of the Trust Territory of Nauru, document A/RES/2226(XXI) (20 December 1966), ¶ 3.

151 United Nations Human Rights Council, resolution 50/9, Human Rights and Climate Change, document A/HRC/RES/50/9 (14 July 2022) (Dossier No. 275), Preamble (emphasis added).

152 United Nations Human Rights Council, Resolution 38/21, Addressing Human Rights Protection Gaps in the Context of Migration and Displacement of Persons across International Borders Resulting from the Adverse Effects of Climate Change and Supporting the Adaptation and Mitigation Plans of Developing Countries to Bridge the Protection Gaps, A/HRC/RES/38/21 (23 April 2018), ¶ 19.

153 ILC, P. Galvão Teles & J. Ruda Santolaria, Co-Chairs of the Study Group on Sea-Level Rise in Relation to International Law, Second Issues Paper, document A/CN.4/752 (19 April 2022), ¶ 252(j).

UNDRIP, than uncertainty as to whether all or part of the State and its maritime zones will continue to exist, and for how long. That is the situation that Tuvalu faces. It is asserted unequivocally in common Article 1(2) that "in no case may a people be deprived of its own means of subsistence", but it is less clear how this important principle is to be fulfilled in the present context.

82. The practical necessity for answers to questions such as those noted above entails consideration of the nature of the legal obligations placed on States. The question of substantive legal obligations regarding the actual emission of GHGs is addressed in Section III.C below and in Section III of COSIS's written statement. The remainder of this Subsection is concerned with the concomitant procedural obligations, such as ensuring respect for rights of access to information and to judicial determinations of justiciable questions.

83. The right of each State to self-determination necessarily entails a right to plan for that future; and the right to plan entails a right of access to basic information concerning the main factors that will decisively affect the State's future.

84. The necessity of respecting these rights is critical when seen from the Government's perspective, and the measures it is taking to guarantee Tuvalu's survival. The Government has been significantly engaged in planning to construct coastal defences around the perimeter of Tuvalu's islands to reclaim land in some areas and maintain its current low-water line in others. This is a long-term project which entails both the amortization of present costs and the commitment of maintenance resources in the future; and it is necessary that planning start now—as, indeed, it has[154]. The cost-benefit analysis of possible configurations of such a scheme depend on predictions of future developments. Among them will be the rate and scale of sea-level rise, which will in turn depend on predictions concerning the degree of compliance by States with obligations relating to GHG emissions.

85. At the most basic and literal level there can of course be no absolute legal right to accurate predictions concerning physical developments such as future GHG concentrations and the pace of sea-level rise: either predictions exist or they do not; and their accuracy cannot be definitively known until the time to which the predictions relate. There are, however, legal duties to make such predictions that do exist available to interested States; examples can be found in Articles 198, 200, 205, and 206 of the United Nations Convention on the Law of the Sea ("UNCLOS")[155]. There are also duties to assist States in making and evaluating such predictions; Articles 202 and 203 of UNCLOS are examples.

86. Such predictions will have to make assumptions concerning the degree of States' compliance with legal obligations relating to GHG emissions. Axiomatic as the principle of *pacta sunt servanda* might be, there is every reason to fear that not all States will comply with all of their obligations relating to GHG emissions within the relevant timelines[156]. Uncertainty about compliance with these obligations is thus a further impediment to the exercise of the right of self-determination by especially vulnerable States such as Tuvalu.

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154 *See* § II.C above.

155 *See, e.g.*, UNCLOS, *United Nations Treaty Series*, Vol. 1833, p. 3 (1982) (Dossier No. 45), Arts. 198, 200, 205, 206.

156 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § II.B.4 (addressing the closing window on the Earth's remaining carbon budget).

87. To take one example, if a State is committed to a legally binding, phased reduction in emissions of GHGs so as to reach a target of an 80 percent reduction in, say, 30 years, the State might argue in certain circumstances that it is entitled to defer reductions in the early years of the period and increase the rate of reduction in later years to still reach the 80 percent target on time[157]. But other States might take the view that any such deferral is a breach of the legally binding obligation. They may point out that deferral of reductions produces an irreversible acceleration in the rate of global warming, ice melting, and sea-level rise in the early years, which cannot be balanced by accelerated reductions later. To the extent that deferral is incompatible with the agreed plan, it is accordingly a breach of the obligation.

88. Tuvalu considers that two observations about the nature of the legal obligations imposed by virtue of the right of self-determination follow from these considerations. First, the application in good faith of legal obligations relating to GHG emissions must be accompanied by the public disclosure of any such departures from the agreed path and explanations of what (if any) remedial steps the departing State intends to take to restore the progressive implementation of obligations as previously agreed and what its best assessment of the impact of its measures will be. Only in this way can other States form a view on how the future is likely to unfold and effectively exercise their right to self-determination. And this, to repeat the point, is an existential necessity for Tuvalu.

89. The second observation also follows from the fact that departures from agreed paths that progressively address the climate change crisis necessarily jeopardize the achievement of the agreed goals. The means and the end are inextricably connected. Tuvalu submits that where there are obligations of this character, so that abandonment of the agreed path is in itself a breach of the obligation, there is at play a principle of non-regression. The Court may not be in a position in these proceedings to offer definitive, specific advice on this question in relation to any specific legal duty concerning GHGs. What it can do, however, is acknowledge the general principle: if a State bound by a legal obligation to pursue an agreed progressive path relating to the control of GHG emissions, it may not revoke or abandon national measures that implement that obligation unless and to the extent that it has put in place compensating or balancing measures that will safeguard progress along the agreed path. Tuvalu invites the Court to acknowledge this principle in its advisory opinion.

90. Turning to a different source of uncertainty, the effective exercise of the right of self-determination will also depend on predictions concerning the long-term legal effects of the reclamation and maintenance works. For example, does an island's entitlement to the resources of its territorial sea (which may be different from an entitlement to a territorial sea *tout court*, because rights over resources are at least arguably legally distinct from the question of the persistence of sovereignty and full jurisdiction over the territorial sea) persist if only an artificially maintained area of rock remains above the high-water mark? Is the answer different if only a stone or metal structure remains above the high-water mark? Does an island which can at present sustain human habitation or economic life of its own retain its entitlement to an exclusive economic zone and continental shelf at a time when it does not in fact sustain human habitation or economic life of its own because its residents have all left?

91. The observations set out above in relation to obligations arising in the context of climate change are inferred in the present context from the right under customary international

[157] This is in some respects similar to the argument of "approximate application" of treaties, which the Court declined to apply in the *Gabčíkovo-Nagymaros* case. *See Gabčíkovo-Nagymaros Project (Hungary/Slovakia)*, *Judgment*, *I.C.J. Reports 1997*, p. 7 ("*Gabčíkovo-Nagymaros* Judgment"), ¶¶ 73–77.

law to realize the principle of self-determination; but in the case of treaty obligations, the conclusions also follow from a consideration of the customary law of treaties. Article 60(3) of the Vienna Convention on the Law of Treaties defines a material breach of a treaty as "(a) a repudiation of the treaty not sanctioned by the present Convention; or (b) the violation of a provision essential to the accomplishment of the object or purpose of the treaty".

92. Departures from agreed paths toward the progressive amelioration of the climate change crisis are material breaches of the instruments that set them out. There can be no doubt that Tuvalu and other States that share its extreme vulnerability to the effects of climate change caused by GHGs are States that are specially affected by material breaches of treaty obligations relating to GHG emissions, and accordingly are entitled to suspend the treaty in the event of such breaches under the rule reflected in Article 60(3) of the Vienna Convention. Furthermore, the materiality of the alleged breach, and the decision to suspend, are plainly justiciable questions. If it is to be possible to realize the right to self-determination, States must be able to obtain decisions on such legal questions, and to obtain them now. They have a right to such decisions as a part of their right to self-determination. The same is true of questions relating to other matters, including those mentioned above, such as the legal effects of coastal defence works in the context of maritime entitlements.

93. The Court can also properly indicate when rendering its advice in the present proceedings that any future decisions, including those of the Court, in the context of climate change must be taken with due regard to the right of each State to the certainty that is necessary for the effective exercise of its right to self-determination. In addition, by making it clear that what might be called the "right to know" is an aspect of the right of self-determination under international law, all States can understand the framework within which international concerns relating to climate change must be addressed.

2. Respect for Peoples' Right to Subsistence

94. As mentioned above, international law entitles peoples, including Indigenous peoples, to the preservation of their own means of subsistence. Article 1(2) common to the ICCPR and the ICESCR enshrines peoples' nonderogable right in this regard: "In no case may a people be deprived of its own means of subsistence."[158] The right is mirrored in Article 20(1) of UNDRIP, which provides that "Indigenous peoples have the right to maintain and develop their political, economic and social systems or institutions, to be secure in the enjoyment of their own means of subsistence and development, and to engage freely in all their traditional and other economic activities"[159]. The categorical language of Article 1(2) common to the ICCPR and the ICESCR "entails corresponding duties for all States and the international community", in the words of the United Nations Human Rights Committee[160].

95. The right is both inextricably linked to the right to self-determination contained in Article 1(1) common to the ICCPR and the ICESCR and distinct from it. This makes good sense: denial of a people's own means of subsistence necessarily threatens their future as a

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158 ICCPR, Art. 1(2); ICESCR, *United Nations Treaty Series*, Vol. 993, p. 3 (1966) (Dossier No. 52) ("ICESCR"), Art. 1(2).

159 UNDRIP, Art. 20(1).

160 United Nations Human Rights Committee, General Comment No. 12: Article 1 (Right to Self-Determination), document HRI/GEN/1/Rev.1 (13 March 1984), ¶ 5.

people[161]. The Human Rights Committee's General Comment No. 12, for example, clarifies that the deprivation of a people's right to freely dispose of natural wealth and resources can be linked to the "economic content of the right of self-determination"[162]. The context of climate change aptly demonstrates this link. Climate change has already caused the collapse of local ecosystems and the destruction of essential infrastructure in Tuvalu, which implicates the Tuvaluan people's means of subsistence and right to freely dispose of natural wealth and resources, as set out in Section II.B above.

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96. The Court is asked to advise on the obligations of States under international law to ensure the protection of the climate system and other parts of the environment from anthropogenic GHG emissions for States and for present and future generations. That question is not exhausted simply by consideration of obligations not to pollute the seas or the atmosphere, but also extends to other obligations, like the obligation to respect human rights. These nonderogable obligations of States to respect the collective rights to self-determination and subsistence fall squarely within part (a) of the question.

97. The obligation under international law to *ensure* the protection of the environment, including the climate system, from anthropogenic GHG emissions is forward-looking. It is an obligation to ensure—to make certain—that the environment is protected both for States and for present and future generations. Fulfilment of that obligation plainly entails a determination of the criteria according to which it can be decided, now and at any time in the future, if the environment has been adequately protected. It also entails predictions about the state of the environment if current legal obligations, such as emissions standards and planned reductions, are maintained; and that in turn requires the making of assumptions as to the degree of present and future compliance with current obligations. These requirements flow from the Request; but they are also implicit in fundamental principles of the international legal system, and notably in peoples' right to self-determination and subsistence. At current rates of warming, the deleterious effect of climate change on Tuvaluans' exercise of those rights will only become more entrenched and severe.

B. PROMOTION OF, PROTECTION OF, AND RESPECT FOR INTERNATIONAL HUMAN RIGHTS

98. International law requires that States promote, protect, and respect human rights, including against climate change and its effects. Failing to ensure the protection of the climate

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[161] For example, in *Gulf of Maine*, a Chamber of the Court implicitly recognized the link between the means of subsistence and the potential catastrophic consequences for a people when it adjudicated the maritime boundary between the United States and Canada so as to avoid "catastrophic repercussions for the livelihood and economic well-being of the population of the countries concerned." *Delimitation of the Maritime Boundary in the Gulf of Maine Area (Canada / United States)*, *Judgment*, *I.C.J. Reports 1984*, p. 246, ¶ 237; *see also Delimitation of Maritime Areas (Canada / France)*, Decision of 10 June 1992, *Reports of International Arbitral Awards*, Vol. XXI, p. 265 at ¶ 84; *cf. Mixed Claims Commission (Germany / Venezuela)*, *Faber*, *Reports of International Arbitral Awards*, Vol. X, p. 357 (1903) at 444 ("When a river constitutes the only way of communication, indispensable for the subsistence of another nation, or part of it, its use can not be entirely prohibited.").

[162] United Nations Human Rights Committee, General Comment No. 12: Article 1 (Right to Self-Determination), document HRI/GEN/1/Rev.1 (13 March 1984), ¶ 5 ("[A] particular aspect of the economic content of the right of self-determination [is] . . . the right of peoples, for their own ends, freely to 'dispose of their natural wealth and resources without prejudice to any obligations arising out of international economic cooperation, based upon the principle of mutual benefit, and international law. . . .'" (quoting ICCPR, Art. 1(2)).

system and other parts of the environment from GHG emissions will undermine manifold human rights protected under international law. As the Human Rights Council has recognized, rights implicated by climate change include those to life, adequate food, the enjoyment of the highest attainable standard of physical and mental health, adequate housing, safe drinking water and sanitation, work, and development[163]. Rights to a healthy environment, cultural life, home and family life, property, and livelihood, as well as the rights of children, among others, are also implicated[164].

99. These rights are protected under international conventions with broad membership bases and, in many cases, form part of customary international law. For instance, the right to life is enshrined in countless international instruments, including the Universal Declaration of Human Rights[165] and the ICCPR[166], and a customary international law right to life is widely recognized as "the supreme right from which no derogation is permitted"[167]. In *Teitiota* v. *New Zealand*, the Human Rights Committee held that sea-level rise threatens the habitability and security of inhabitants on Kiribati, and so created a risk of impairment to the right to life, as enshrined under Article 6 of the ICCPR[168]. The Committee has also found that the failure to adequately protect members of an Indigenous group against the adverse impacts of climate change violated their rights to freedom from arbitrary interference with their private life, family, and home and to enjoy their culture under Articles 17 and 27, respectively, of the ICCPR[169].

100. The rights to health, food, and water are also protected in the Universal Declaration of Human Rights[170] and the ICESCR[171], among other international instruments[172]. In referring the present question to the Court, the General Assembly "[*e*]*mphasiz*[*ed*]" the importance of the Universal Declaration of Human Rights, the ICCPR, the ICESCR, and the Convention on the Rights of the Child to "the conduct of States over time in relation to activities that

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163 United Nations Human Rights Council, resolution 50/9, Human Rights and Climate Change, document A/HRC/RES/50/9 (14 July 2022) (Dossier No. 275), Preamble.

164 *See, e.g.*, ILC, P. Galvão Teles & J. Ruda Santolaria, Co-Chairs of the Study Group on Sea-Level Rise in Relation to International Law, Second Issues Paper, document A/CN.4/752 (19 April 2022), ¶¶ 246–254.

165 United Nations General Assembly, resolution 217 (III), Universal Declaration of Human Rights, document A/RES/217(III) (10 December 1948) (Dossier No. 257) ("UDHR"), Art. 3.

166 ICCPR, Art. 6(1).

167 United Nations Human Rights Committee, General Comment No. 6: The Right to Life, document HR/GEN/1/Rev.1 (29 July 1994), ¶ 1; *see also* United Nations Human Rights Committee, General Comment No. 36: Article 6, Right to Life, document CCPR/C/GC/36 (3 September 2019) (Dossier No. 299), ¶ 2.

168 United Nations Human Rights Committee, Views Adopted Concerning Communication No. 2728/2016, *Teitiota* v. *New Zealand*, document CCPR/C/127/D/2728/2016 (7 January 2020), ¶ 9.11.

169 United Nations Human Rights Committee, Views Adopted Concerning Communication No. 3624/2019, *Billy et al.* v. *Australia*, document CCPR/C/135/D/3624/2019 (18 September 2023), ¶¶ 8.12, 8.14.

170 UDHR, Art. 25(1).

171 ICESCR, Art. 11.

172 *See e.g.*, Convention on the Elimination of All Forms of Discrimination Against Women, *United Nations Treaty Series*, Vol. 1249, p. 13 (1979) (Dossier No. 65) ("CEDAW"), Preamble, Arts. 12(2), 14; Convention on the Rights of the Child, *United Nations Treaty Series*, Vol. 1577, p. 3 (1989) (Dossier No. 57), Arts. 24, 27; *see also, e.g.*, United Nations General Assembly, Resolution 64/292, The Human Right to Water and Sanitation, document A/RES/64/292 (3 August 2010).

contribute to climate change and its adverse effects"[173]. Furthermore, the General Assembly recently "[r]ecognize[d] the right to a clean, healthy and sustainable environment as a human right"[174], which the Inter-American Court of Human Rights has heralded as a "universal value . . . and fundamental right for the existence of humankind"[175].

101. Although the nature of States' obligations *vis-á-vis* specific human rights varies by the source of the implicated right, the Human Rights Council has recognized that, in general, "the human rights obligations and responsibilities as enshrined in the relevant international human rights instruments provide roles for States . . . to promote, protect and respect, as would be appropriate, human rights . . . when taking action to address the adverse effects of climate change"[176]. The ICCPR, for example, requires States Parties to "respect and to ensure to all individuals within its territory and subject to its jurisdiction the rights recognized in the present Covenant"[177]. For the right to life in particular, the Human Rights Committee has found "an obligation to respect and to ensure the rights under article 6" of the ICCPR[178]. The ICESCR further obliges States Parties to "take steps, individually and through international assistance and co-operation, especially economic and technical, to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized in the present Covenant by all appropriate means"[179].

102. States' obligations to promote, protect, and respect the human rights implicated by climate change may also apply to non-citizens living extraterritorially. As the Inter-American Court of Human Rights has explained, States must comply with their customary obligation to avoid transboundary environmental harm so as to not "affect the human rights of individuals outside their territory"[180]. Furthermore, the United Nations Committee on Economic, Social, and Cultural Rights has determined that, in respect of the ICESCR, States Parties owe their duties to "respect, protect and fulfil all human rights . . . not only to their own populations, but also to populations outside their territories"[181]. As the Committee found, this obligation is consistent with Articles 55 and 56 of the United Nations Charter, in which Member States

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173 United Nations General Assembly, Resolution 77/276, Request for an Advisory Opinion of the International Court of Justice on the Obligations of States in Respect of Climate Change, document A/RES/77/276 (29 March 2023) (Dossier No. 2).

174 United Nations General Assembly, Resolution 76/300, The Human Right to a Clean, Healthy, and Sustainable Environment, document A/RES/76/300 (28 July 2022) (Dossier No. 260), ¶ 1.

175 Inter-American Court of Human Rights, *Indigenous Communities of the Lhaka Honhat [Our Land] Association* v. *Argentina*, *Judgment (Merits, Reparations, and Costs)* (6 February 2020), ¶ 203; *see also* Inter-American Court of Human Rights, *The Environment and Human Rights*, *Advisory Opinion OC-23/17* (15 November 2017), ¶ 59.

176 United Nations Human Rights Council, Resolution 50/9, Human Rights and Climate Change, document A/HRC/RES/50/9 (7 July 2022) (Dossier No. 275), Preamble.

177 ICCPR, Art. 2(1).

178 United Nations Human Rights Committee, General Comment No. 36 on Article 6: Right to Life, document CCPR/C/GC/36 (30 October 2018), ¶ 63.

179 ICESCR, Art. 2(1); *see also* United Nations Committee on Economic, Social, and Cultural Rights, General Comment No. 3: The Nature of States Parties' Obligations, document E/1991/23, Annex III (14 December 1990), ¶ 9 (explaining that the "progressive realization" of the treaty rights "imposes an obligation [on States Parties] to move as expeditiously and effectively as possible toward that goal").

180 Inter-American Court of Human Rights, *The Environment and Human Rights*, *Advisory Opinion OC-23/17* (15 November 2017), ¶ 101.

181 United Nations Committee on Economic, Social, and Cultural Rights, Climate Change and the International Covenant on Economic, Social, and Cultural Rights, document E/C.12/2018/1 (31 October 2018), ¶ 5.

pledge to "take joint and separate action" to achieve, among other goals, "universal respect for, and observance of, human rights and fundamental freedoms for all"[182].

103. States must cooperate to fulfil their obligations with respect to climate change. This is both a general obligation of the international law applicable to human rights[183] and an implication of climate change being "a common concern of mankind"[184]. In that context, the Human Rights Council has urged States to "strengthen and implement policies aimed at enhancing international cooperation based on human rights . . . despite the adverse effects of climate change"[185]. Tuvalu endorses COSIS's submissions on the duty to cooperate under international human rights law[186].

104. Climate change and its effects on Tuvalu clearly implicate each of the above-mentioned human rights and States' obligations to promote, protect, and respect them. As set out in Chapter II above, the loss of land territory due to sea-level rise cuts to the heart of Tuvaluans' culture, livelihood, and sense of place—as reflected in *fenua*, the fundamental basis for Tuvaluans' enjoyment of their human rights. Sea-level rise worsens saltwater intrusion into critical farmland and contaminates freshwater aquifers, undermining Tuvaluans' access to food and water. Sea-level rise also destroys or threatens critical coastal infrastructure such as schools, health centres, and other public utilities, which endangers Tuvaluans' health, property, and livelihoods. Ocean warming, deoxygenation, and acidification harms marine life that supports Tuvaluans' economy and staple diets. Atmospheric warming and sea-level rise threaten Tuvalu's terrestrial and coastal ecosystems, too. Climate change is increasing the intensity and frequency of extreme weather events like tropical storms which, combined with sea-level rise, increase flooding across Tuvalu's islands, destroying homes and ecosystems.

C. Minimum Requirement to Limit Global Warming to 1.5ºC

105. All of States' obligations discussed in this section coalesce around a single core requirement in respect of climate change, which is necessary but not sufficient to address the issue: to limit average global temperature rise to within 1.5ºC of pre-industrial levels, including by achieving a just transition away from the use of fossil fuels[187].

106. This is because the irrefutable scientific consensus described in Section II.D shows that warming above that level—including temperature overshoot scenarios—will dramatically increase the risk of harm to each of the rights and interests that the obligations described in this Section seek to protect, even at 2ºC. This will endanger the sustainability of adaptation

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182 *Id.*

183 *See, e.g.*, United Nations Charter, Art. 1(3) (calling for "international co-operation . . . in promoting and encouraging respect for human rights and for fundamental freedoms"); UDHR, Preamble (pledging to "achieve, in co-operation with the United Nations, the promotion of universal respect for and observation of human rights and fundamental freedoms"); Friendly Relations Declaration, p. 123 ("States shall co-operate in the promotion of universal respect for, and observance of, human rights and fundamental freedoms for all . . . ."); ICESCR, Arts. 2(1), 11(2), 15(4), 22–23.

184 Paris Agreement, *United Nations Treaty Series*, Vol. 3156, p. 79 (2015) (Dossier No. 16) ("Paris Agreement"), Preamble.

185 United Nations Human Rights Council, Resolution 50/9, Human Rights and Climate Change, document A/HRC/RES/50/9 (14 July 2022) (Dossier No. 275), ¶ 11.

186 *Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § III.C.

187 Tuvalu endorses COSIS's submissions in this respect. *See id.*, § III.B.3.

projects such as L-TAP, which is built only to account for sea-level predictions and only until 2100[188]. Furthermore, the IPCC is confident that limiting global warming to 1.5°C compared to 2°C will "reduce risks to marine biodiversity, fisheries, and ecosystems, and their functions and services to humans" associated with increasing ocean temperature, deoxygenation, and acidification[189]. The IPCC has reached a similar conclusion with respect to ocean acidification. As noted above, the Intergovernmental Panel has high confidence that the "level of ocean acidification due to increasing CO_2 concentrations associated with global warming of 1.5°C is projected to amplify the adverse effects of warming, and even further at 2°C"[190].

107. Conversely, the IPCC is confident that limiting global warming to within 1.5°C will significantly reduce the risk of acidification as compared with 2.0ºC and, as a consequence, will diminish the "risks to marine biodiversity, fisheries, and ecosystems" associated with ocean acidification[191].

108. The international community has recognized the objective basis provided by the agreed science with respect to this threshold. States Parties agreed in the Paris Agreement to "pursu[e] efforts to limit the temperature increase to 1.5ºC above pre-industrial levels, *recognizing that this would significantly reduce the risks and impacts of climate change*"[192]. States Parties to the UNFCCC reiterated the basis for this 1.5ºC threshold at COP27[193], as did the General Assembly as recently as December 2022[194]. At COP28, States Parties to the Paris Agreement likewise emphasized the necessity of the 1.5ºC threshold[195]. The Human Rights Council, too, has "[*s*]*tress*[*ed*]" the importance of the Paris Agreement standard on the basis "that this would *significantly reduce the risks and impact of climate change*"[196].

109. Tuvalu supports the submissions of COSIS that the objective basis that this international consensus establishes necessarily informs the interpretations of the relevant obligations under international law, including as a matter of international environmental

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188 *See* § II.C above (citing UNDP, Concept Design Report: Tuvalu Coastal Adaptation Project (21 May 2021), p. 14).

189 *See* § II.D above (citing IPCC, "Summary for Policymakers", *Special Report: Global Warming of 1.5ºC* (2018) (Dossier No. 72), p. 8).

190 *See id*. (citing IPCC, "Summary for Policymakers", *Special Report: Global Warming of 1.5ºC* (2018) (Dossier No. 72), p. 9).

191 *See id*. (citing IPCC, "Summary for Policymakers", *Special Report: Global Warming of 1.5ºC* (2018) (Dossier No. 72), p. 8).

192 *See* Paris Agreement, Art. 2(1)(a) (emphasis added).

193 COP27, decision 21/CP.27, document FCCC/CP/2022/10/Add.2 (2023), ¶ 7 (reiterating that "the impacts of climate change will be much lower at the temperature increase of 1.5ºC compared with 2ºC and *acknowledges* that limiting the global average temperature increase to 1.5ºC above pre-industrial levels with no or limited overshoot would avoid increasingly severe climate change impacts, stressing that the severity of impacts will be reduced with every increment of warming"); COP27, decision 21/CP.27, document FCCC/CP/2022/10/Add.2 (2023), p. 40, ¶ 8 ("[L]imiting global warming to 1.5ºC requires rapid, deep and sustained reductions in global greenhouse gas emissions, including reducing global carbon dioxide . . . .").

194 United Nations General Assembly, resolution 77/165, Protection of Global Climate for Present and Future Generations of Humankind, document A/RES/77/165 (14 December 2022) (Dossier No. 135), ¶ 4.

195 *See* § II.D above (citing COP28, Outcome of the First Global Stocktake, decision -/CMA.5 (Advance Unedited Version) (13 December 2023), ¶ 4 ("[*u*]*nderscor*[*ing*] impacts of climate change will be much lower at the temperature increase of 1.5C compared with 2C and *resolv*[*ing*] to pursue efforts to limit the temperature increase to 1.5C")).

196 United Nations Human Rights Council, resolution 50/9, Human Rights and Climate Change, document A/HRC/RES/50/9 (14 July 2022) (Dossier No. 275), Preamble (second emphasis added).

law[197], as well as the obligations with respect to the rights of self-determination, subsistence, and international human rights to life, food, water, health, housing, work, culture, home, property, and livelihood for present and future generations delineated above[198]. Tuvalu also supports the submissions of COSIS with respect to the principle of common but differentiated responsibilities[199].

110. It is critical to emphasize that the requirement to limit global warming to 1.5ºC is necessary but not sufficient for States to comply with their international obligations. It does not displace but rather supplements their other obligations with respect to climate change, including to cooperate and to promote, protect, and respect human rights. Therefore, staying within the 1.5ºC threshold does not *per se* satisfy States' other obligations, such as to assist small island developing States with mitigation and adaptation measures, or to protect and preserve rare or fragile ecosystems and the habitat of depleted, threatened, or endangered species and other forms of marine life.

* * *

111. Taken together, States' legal obligations under international law, individually and collectively, require them to take all measures necessary to, urgently and at a minimum:

(a) Limit global warming to 1.5ºC as means to:

(i) Mitigate the high risk of submergence of Tuvalu's land territory by sea-level rise;

(ii) Mitigate the high risk of more severe storm surges that pose existential threats to Tuvalu, its people, its land, natural resources and infrastructure; and

(iii) Mitigate the high risk of atmospheric and ocean warming, as well as ocean deoxygenation and acidification, which are causing irreparable harm to the coastal, marine, and terrestrial environments that support life on Tuvalu;

(b) Cooperate globally to provide necessary financial, technical, and logistical support to facilitate the effectiveness of the mitigation and adaptation measures taken by small island developing States and other specially affected States; and

(c) Promote, protect, and respect the rights of all persons, including children and persons displaced by climate change, such as the rights to life, food, health, housing, water, work, development, a healthy environment, cultural life, home and family life, property, and livelihood.

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197 *Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § III.B.

198 *Id*., § III.C.2.

199 *See id*., § III.C.3.

IV. Legal Consequences of Breaches of Obligations in Respect of Climate Change

112. This Chapter addresses part (b) of the Request: the legal consequences under the obligations set out in Chapter III above for States where they, by their acts and omissions, have caused significant harm to the climate system and other parts of the environment. Tuvalu fully endorses COSIS's response to part (b) in these proceedings[200] and focuses here on several points particularly relevant to the harms that it has suffered and will continue to suffer from climate change. Specifically, it considers State responsibility for internationally wrongful acts (Section A), the invocation of that responsibility (Section B), and the obligation to remedy their breach (Section C).

A. Responsibility for Internationally Wrongful Acts

113. Article 1 of the ILC's Articles on Responsibility of States for Internationally Wrongful Acts ("ARSIWA") sets out the basic principle that "[e]very internationally wrongful act of a State entails the responsibility of that State". A "wrongful act" arises from conduct that is attributable to the State under international law and that constitutes a breach of an international obligation[201].

114. In the context of climate change, the failure of a State, whether acting individually or collectively, to meet the obligations set out in Chapter III above, by, for example, failing to take all measures necessary to limit global warming to 1.5ºC, is clearly attributable to that State under Articles 2 and 4 of the ARSIWA.

115. Further, State responsibility extends to violations of international obligations arising out of GHG emissions by non-State actors. The Court has observed in previous cases that actions of non-State actors can give rise to international responsibility. In *Armed Activities in the Territory of the Congo*, the Court determined that, as an occupying power of the district of Ituri in the Democratic Republic of the Congo, Uganda had a duty of vigilance to prevent violations of human rights and international humanitarian law by other actors in the occupied territory, including rebel groups acting on their own account[202]. Given this duty of vigilance, the Court concluded that Uganda's responsibility was engaged "by its failure . . . to take measures to . . . ensure respect for human rights and international humanitarian law in Ituri district"[203]. In the reparations phase, the Court held that it was for Uganda to establish "that a particular injury alleged by the DRC in Ituri was not caused by Uganda's failure to meet its obligations as an occupying Power", and that, "[i]n the absence of evidence to that effect, it may be concluded that Uganda owes reparation in relation to such injury"[204].

116. The Court also noted in *Armed Activities in the Territory of the Congo* that a State has an "obligation to take appropriate measures to prevent the looting, plundering and exploitation of natural resources in the occupied territory [by] private persons" in a territory it

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200 *Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), Chapter IV.

201 ARSIWA, Art. 2.

202 *Armed Activities on the Territory of the Congo (Democratic Republic of the Conga* v. *Uganda)*, *Judgment (Merits)*, *I.C.J. Reports 2005*, p. 168, ¶ 179.

203 *Armed Activities on the Territory of the Congo (Democratic Republic of the Conga* v. *Uganda)*, *Judgment (Reparations)*, *I.C.J. Reports 2022*, p. 13 ("*DRC* v. *Uganda* Reparations Judgment"), ¶ 78.

204 *Id*.

controls[205]. Likewise, in *Pulp Mills*, the Court held that a State is internationally responsible where it fails to act diligently to "avoid activities which take place in its territory, or in any area under its jurisdiction, causing significant damage to the environment of another State", regardless of whether violations stem from the conduct of "public [or] private operators"[206].

117. In the context of climate change, States thus are responsible for violations of their international obligations, including those set out in Chapter III above, arising out of GHG emissions from areas within their jurisdiction or control, including by non-State actors, that result in significant harm to the climate system and other parts of the environment. States must accordingly regulate the harmful conduct of corporations and persons on their territory that causes harm to other States and their people.

118. For example, the United Nations Guiding Principles on Business and Human Rights, not only set out guidelines for non-State actors including multinational enterprises, but also specifically recognize that States must take measures to enforce those guidelines. The Guiding Principles provide, for instance, that "States must protect against human rights abuse within their territory and/or jurisdiction by third parties, including business enterprises"[207]. The Organisation for Economic Co-Operation and Development ("OECD") has also recommended that its members and certain non-members actively promote the OECD's Guidelines for Multinational Enterprises on Responsible Business Conduct and its Due Diligence Guidance for Responsible Supply Chains, which is aimed at "ensuring that they respect human rights, avoid contributing to conflict and successfully contribute to sustainable development"[208]. The International Labour Organization's Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy likewise recommends that States "promote good social practice . . . among multinational enterprises operating in their territories"[209].

B. Invocation of Responsibility

119. A range of States may have a legal interest in invoking responsibility for the breach of obligations with respect to GHG emissions. Article 41 of the ARSIWA provides:

> A State is entitled as an injured State to invoke the responsibility of another State if the obligation breached is owed to:
>
> (a) that State individually; or

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[205] *DRC* v. *Uganda* Reparations Judgment, ¶ 79; *see also* United Nations Human Rights Committee, General Comment No. 31 on The Nature of the General Legal Obligation Imposed on States Parties to the Covenant, document CCPR/C/21/Rev.1/Add.13 (26 May 2004), ¶ 8 (finding responsibility implicated where States are "permitting or failing to take appropriate measures or to exercise due diligence to prevent, punish, investigate or redress the harm caused by such acts by private persons or entities").

[206] *Pulp Mills on the River Uruguay (Argentina* v. *Uruguay)*, *Judgment*, *I.C.J. Reports 2010*, p. 14, ¶¶ 101, 197.

[207] United Nations, Guiding Principles on Business and Human Rights, Principle 1.

[208] Organisation for Economic Co-Operation and Development ("OECD"), Recommendation of the Council on Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (17 July 2012), p. 3; OECD, Guidelines for Multinational Enterprises on Responsible Business Conduct (8 June 2023).

[209] International Labour Organization ("ILO"), Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy (24 March 2023), ¶ 12.

(b) a group of States including that State, or the international community as a whole, and the breach of the obligation:

(i) specially affects that State; or

(ii) is of such a character as radically to change the position of all the other States to which the obligation is owed with respect to the further performance of the obligation.

120. Taking these in order, Tuvalu meets the definition of "an injured State" to which the obligations with respect to GHG emissions are owed individually; as part of a group of States, such as small island developing States; and, for certain of the obligations, as part of the international community as a whole. Tuvalu is also a *specially affected* State: as set out in Chapter II above, the breach of the obligations specially affects Tuvalu and other small island States which are suffering, and will continue to suffer, disproportionately from the effects of climate change. Moreover, States other than the injured State are entitled to invoke the responsibility of another State for breaches of obligations owed to the international community as a whole, as well as obligations owed to a group of States on an *erga omnes partes* basis, as set out in Article 48 of the ARSIWA.

121. The fact that GHG emissions result in significant harm to multiple States does not prevent the invocation of State responsibility. Article 46 of the ARSIWA provides that, where multiple States are "injured by the same internationally wrongful act, each injured State may separately invoke the responsibility of the State which has committed the internationally wrongful act".

122. Similarly, a plurality of responsible States does not prevent invocation. The rules governing the invocation of responsibility in these circumstances differ depending on whether a State has suffered the violation of what can be considered the "same" internationally wrongful act to which multiple States have contributed, or whether a State has suffered multiple, "different" wrongful acts[210].

123. In the former case, Article 47 of the ARSIWA provides:

1. Where several States are responsible for the same internationally wrongful act, the responsibility of each State may be invoked in relation to that act.

2. Paragraph 1:

(a) does not permit any injured State to recover, by way of compensation, more than the damage it has suffered;

(b) is without prejudice to any right of recourse against the other responsible States.

Article 47 been referred to in the context of climate change by the United Nations Committee on the Rights of the Child. In the five *Sacchi* cases concerning the legal implications of

[210] ARSIWA, Commentary to Art. 47, ¶ 8.

climate change, the Committee referred to the commentary on Article 47, and concluded that "the collective nature of the causation of climate change does not absolve the State party of its individual responsibility that may derive from the harm that the emissions originating within its territory may cause to children, whatever their location"[211]. In the context of climate change, the violation of several obligations of States may be considered to result in the "same" wrongful act, including violations of obligations to cooperate, as COSIS explains in these proceedings[212]. Where States commit the "same" wrongful act, any State entitled to invoke the responsibility of a breaching State may do so for the full extent of the breach[213].

124. In cases of "different" wrongful acts, the injured State may invoke the responsibility of the multiple responsible States separately. The ILC in its commentary to Article 47 wrote that, in such cases, "the responsibility of each participating State is determined individually, on the basis of its own conduct and by reference to its own international obligations"[214].

125. Small island States may therefore invoke the responsibility of multiple States that breach their obligations, including those set out in Chapter III above, where those States commit the same internationally wrongful acts by failing to limit their GHG emissions. Because the obligations of States to limit their GHG emissions require affirmative action on the part of States, Tuvalu need only establish that a State has failed to appropriately limit its GHGs to invoke the responsibility of that State, even absent a link between the emissions of any State and the precise effect of such emissions on Tuvalu[215].

C. LEGAL CONSEQUENCES

126. States that violate their obligations incur a number of remedial consequences. These include obligations to:

(a) Perform their breached obligations[216];

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[211] United Nations Committee on the Rights of the Child, Decision Adopted in Respect of Communication No. 104/2019, *Sacchi et al.* v. *Argentina*, document CRC/C/88/D/104/2019 (22 September 2021), ¶ 10.10 ("[The] collective nature of the causation of climate change does not absolve the State party of its individual responsibility that may derive from the harm that the emissions originating within its territory may cause to children, whatever their location."). See also identical decisions regarding Brazil (document CRC/C/88/D/105/2019, ¶ 10.10); France (document CRC/C/88/D/106/2019, ¶ 10.10); Germany (document CRC/C/88/D/107/2019, ¶ 9.10); and Turkey (document CRC/C/88/D/108/2019, ¶ 9.10).

[212] *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § IV.B.2.

[213] *See DRC* v. *Uganda* Reparations Judgment, ¶ 98.

[214] ARSIWA, Commentary to Art. 47, ¶ 8.

[215] *See e.g.*, United Nations Committee on the Rights of the Child, Decision Adopted in Respect of Communication No. 104/2019, *Sacchi et al.* v. *Argentina*, document CRC/C/88/D/104/2019 (22 September 2021), ¶ 10.10 ("[The] collective nature of the causation of climate change does not absolve the State party of its individual responsibility that may derive from the harm that the emissions originating within its territory may cause to children, whatever their location."); *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina* v. *Serbia and Montenegro)*, *Judgment*, *I.C.J. Reports 2007*, p. 43, ¶¶ 450, 462 (finding liability, notwithstanding that there was no "proven . . . causal nexus between the Respondent's violation of its obligation of prevention and the damage resulting from the genocide at Srebrenica").

[216] ARSIWA, Art. 29; *Gabčíkovo-Nagymaros* Judgment, ¶ 114 ("The Court is of the view . . . that although it has found that both Hungary and Czechoslovakia failed to comply with their obligations under the 1977 Treaty, this reciprocal wrongful conduct did not bring the Treaty to an end nor justify its termination.").

(b) Cease any breaches that are ongoing[217];

(c) Offer appropriate assurances of non-repetition[218];

(d) Make full reparation for injuries caused[219]; and

(e) Cooperate to put an end to any ongoing violations of peremptory norms of international law[220].

127. Cessation and performance of obligations are critical in the context of climate change because massive quantities of GHGs continue to emit from activities conducted on States' territory, well in excess of what is required to limit average global temperature rise to within 1.5ºC of pre-industrial levels[221]. Assurances and guarantees of non-repetition are also warranted in these circumstances because the failure of States to limit GHG emissions from their territory is systemic and is expected to continue in the future[222].

128. Reparation is also essential. Article 31 of the ARSIWA, entitled "Reparation", provides:

> 1. The responsible State is under an obligation to make full reparation for the injury caused by the internationally wrongful act.
>
> 2. Injury includes any damage, whether material or moral, caused by the internationally wrongful act of a State.

129. Article 24 sets out the forms of reparation:

> Full reparation for the injury caused by the internationally wrongful act shall take the form of restitution, compensation and satisfaction, either singly or in combination, in accordance with the provisions of this chapter.

130. Further, echoing the Permanent Court of International Justice in *Factory at Chorzów*[223], the ILC has explained that restitution "comes first among the forms of reparation" because it "most closely conforms to the general principle that the responsible

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217 ARSIWA, Art. 30(a); *Jurisdictional Immunities of the State (Germany* v. *Italy: Greece intervening)*, *Judgment*, *I.C.J. Reports 2012*, p. 99, ¶ 137 ("According to general international law on the responsibility of States for internationally wrongful acts, as expressed in this respect by Article 30(a) of the International Law Commission's Articles on the subject, the State responsible for an internationally wrongful act is under an obligation to cease that act, if it is continuing.").

218 ARSIWA, Art. 30(b).

219 *Id.*, Art. 31; *DRC* v. *Uganda* Reparations Judgment, ¶ 70 ("[ARSIWA] Article 31 . . . reflects customary international law").

220 ARSIWA, Art. 41(1).

221 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § II.D.

222 *See* J. Crawford, *State Responsibility: The General Part* (2013) (Annex 4), p. 476.

223 *Factory at Chorzów*, *Judgment No. 13 (Merits)*, *1928*, *P.C.I.J.*, *Series A*, *No. 17*, p. 4 ("*Factory at Chorzów* Judgment") at 47.

State is bound to wipe out the legal and material consequences of its wrongful act by re-establishing the situation that would exist if that act had not been committed"[224].

131. As COSIS sets out in its written statement in these proceedings, each of the components of reparation must be assessed with reference to the principles of causation and remoteness that establish the scope of the damage for which the responsible State or States must make full reparation[225]. The ARSIWA do not set out a specific standard or test of causation. The ILC's commentary to Article 31 explains that "the subject-matter of reparation is, globally, the injury resulting from and ascribable to the wrongful act, rather than any and all consequences flowing from an internationally wrongful act"[226].

132. The requisite link between the wrongful act and the injury triggering the obligation of reparation has been described as "direct", "proximate", "foreseeable", and "consequential", or simply not too "remote", "speculative", or "uncertain"[227]. The most commonly used formulation is "proximate cause", as measured by whether the consequences flowing from the wrongful act can and should be considered normal and foreseeable[228].

133. As Section II.B above explains, GHG emissions directly cause a multitude of harms to Tuvalu. Accordingly, in application of the above principles, Tuvalu asks the Court to opine that the breach of obligations with respect to climate change incurs a number of legal consequences, including secondary obligations of performance, cessation with assurances of non-repetition, and full reparation including compensation for loss and damages with respect to climate change and assistance with adaptation to global warming.

134. The duty to cease and not to repeat the violations of the breach of obligations with respect to climate change is recognized in Articles 29 to 30 of the ARSIWA[229]. A finding of breach of a legal obligation does not extinguish the obligation to fulfil that obligation. An order for cessation of the breach makes explicit the legal obligations of the responsible State that arise automatically from the breach of international law.

135. Article 35 of the ARSIWA sets out the first form of reparation available to an injured State—restitution:

> A State responsible for an internationally wrongful act is
> under an obligation to make restitution, that is, to re-establish

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224 ARSIWA, Commentary to Art. 35, ¶ 3.

225 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § IV.C.3.

226 ARSIWA, Commentary to Art. 31, ¶ 9.

227 *See* S. Wittich, "Compensation", *Max Planck Encyclopedia of International Law* (2008), ¶ 17.

228 *See, e.g.*, *Mixed Claims Commission (United States / Germany)*, Administrative Decision No. II, *Reports of International Arbitral Awards*, Vol. VII, p. 1 (1 November 1923) at 29–30; B. Cheng, *General Principles of Law as applied by International Courts and Tribunals* (1953), p. 244 (citing *Execution of German-Portuguese Arbitral Award of 30 June 1930 (Germany / Portugal)*, Award, *Reports of International Arbitral Awards*, Vol. III, p. 1371 (16 February 1933)).

the situation which existed before the wrongful act was committed, provided and to the extent that restitution:

(a) is not materially impossible;

(b) does not involve a burden out of all proportion to the benefit deriving from restitution instead of compensation.

136. As stated in Section II.B above, Tuvalu faces the complete submergence of its territory in a short period of time. In this regard, Tuvalu emphasises the importance of adaptation to climate change. Adaptation is a "broad concept" that involves various responses to climate change—both physical and biological. Examples include "terrestrial and marine habitat restoration, and ecosystem management tools such as assisted species relocation and coral gardening"[230]. Land reclamation—"a net gain of land from the sea, wetlands, or other bodies of water through human intervention"[231]—has a long and successful track-record as an adaptation response to coastal impacts in areas where there are dense coastal populations[232]. It is a way of re-establishing the situation that existed before the wrongful act was committed.

137. For Tuvalu, land reclamation is a vital adaptation measure: as sea levels rise, reclamation is needed to "cope with more frequent and larger floods and ultimately migration to another [higher] island"[233]. Largescale land reclamation projects assist islands in buying time and space to adapt to climate change, serving as adaptive measures "in their own right"[234]. By increasing the habitable landmass and creating a new space for agricultural production, land reclamation is a form of adaptation to adjust to rising sea levels, declining agricultural productivity, and environmental degradation[235]. Land reclamation also has the potential to dissipate waves and act as artificial barriers[236]. Tuvalu has begun to embark on L-TAP, its own ambitious land reclamation project, as described in Section II.C above.

138. Land reclamation is a form of restitution, a way of re-establishing the situation that existed before the wrongful act was committed by returning lost territory and protecting vulnerable land. The ILC makes clear that "[r]estitution may take the form of *material restoration* or return of *territory*"[237]. While the ILC was referring to situations of annexation or occupation in its reference to "return of territory", this rule is applicable to climate change

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230 IPCC, "Summary for Policymakers", *Special Report on the Ocean and Cryosphere in a Changing Climate* (2019) (Dossier No. 74), p. 30.

231 L. Saddington, "The Chronopolitics of Climate Change Adaptation: Land Reclamation in Tuvalu" in *Territory, Politics, Governance* (5 June 2022), p. 7.

232 IPCC, "Summary for Policymakers", *Special Report on the Ocean and Cryosphere in a Changing Climate* (2019) (Dossier No. 74), p. 16.

233 S. Brown et al., "Pathways to Sustain Atolls Under Rising Sea Levels Through Land Claim and Island Raising", *Environmental Research: Climate* (16 February 2023), p. 13.

234 L. Saddington, "The Chronopolitics of Climate Change Adaptation: Land Reclamation in Tuvalu" in *Territory, Politics, Governance* (5 June 2022), p. 2.

235 *Id*., p. 7.

236 S. Brown et al., "Pathways to Sustain Atolls Under Rising Sea Levels Through Land Claim and Island Raising", *Environmental Research: Climate* (16 February 2023), p. 20.

237 ARSIWA, Commentary to Art. 35, ¶ 5 (emphases added).

by analogy[238]. Land reclamation is not materially impossible, as shown by the land reclamation efforts such as L-TAP already underway. As the ILC notes, restitution is "not impossible merely on grounds of legal or practical difficulties, even though the responsible State may have to make special efforts to overcome these"[239]. Given the central importance of land to the rights of States' peoples to self-determination, subsistence, and more, and the critical importance of the environment as "living space"[240], restitution does not involve a burden out of all proportion to the benefit deriving from it.

139. As part of States' obligations to provide restitution for the breaches of the above-mentioned duties, States are therefore required to assist with measures necessary to restore what has been lost to Tuvalu as a result of climate change. Moreover, for any continuing or future breaches of the above-mentioned obligations, States must also provide the assistance necessary to end the continuing breaches or prevent breaches of the obligation in the first place. Otherwise, States will continue to be in breach or will commit a fresh breach of their international obligations. Taking land loss and reclamation as an example, States must, for example, fund and otherwise assist with the land reclamation efforts needed to re-establish the loss of land small island States like Tuvalu will face as a result of climate change. States must also assist in land reclamation efforts where those efforts would end any continuing breaches or prevent breaches of obligations.

140. The ILC notes that "restitution" "has a broad meaning, encompassing any action that needs to be taken by the responsible State to restore the situation resulting from its internationally wrongful act"[241]. It can therefore encompass the technological developments that permit loss or threatened land and coasts to be restored. With such measures, a submerged island would no longer be permanently lost to a people.

141. Insofar as "damage is not made good by restitution", Article 36(1) provides that a State is "under an obligation to compensate for the damage caused" by the internationally wrongful act. Article 36(2) refers to compensation covering "any financially assessable damage", including for both material and moral damages[242]. That is the case here. In the context of climate change, however, States' remedial obligations are not exhausted by restitution alone. Many of the harms caused by climate change cannot be made good by restitution, for example, the irreparable loss of life and essential ecosystems.

142. Accordingly, compensation is required to address the nature of the harms caused by climate change, including with respect to the conduct of third parties[243]. When envisioning the

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238 The ILC's comment to the ARSIWA does not mention land reclamation *per se*, but it refers to the "material restoration or return of territory" as a form of restitution. *Id*., ¶ 5.

239 *Id*., ¶ 8.

240 *Cf. Legality of the Threat or Use of Nuclear Weapons*, *Advisory Opinion*, *I.C.J. Reports 1996*, p. 226, ¶ 29.

241 ARSIWA, Commentary to Art. 35, ¶ 5.

242 ARSIWA, Art. 31(2); *see Mixed Claims Commission (Germany / United States)*, *Lusitania Cases*, Opinion, *Reports of International Arbitral Awards*, Vol. VII, p. 40 (1 November 1923) ("That one injured is, under the rules of international law, entitled to be compensated for any injury inflicted in mental suffering, injury to his feelings, humiliation, shame, degradation, loss of social position or injury to his credit or to his reputation, there can be no doubt, and such compensation should be commensurate to the injury. Such damages are very real, and the mere fact that they are difficult to measure or estimate by money standards makes them none the less real and affords no reason why the injured person should not be compensated therefore as compensatory damages.").

243 *DRC* v. *Uganda* Reparations Judgment, ¶ 78.

type of damage that a State must compensate under Article 36 of the ARSIWA, the ILC expressly acknowledged the costs associated with pollution:

> Damage to the State as such might arise out of the shooting down of its aircraft or the sinking of its ships, attacks on its diplomatic premises and personnel, damage caused to other public property, *the costs incurred in responding to pollution damage*, or incidental damage arising, for example, out of the need to pay pensions and medical expenses for officials injured as the result of a wrongful act. Such a list cannot be comprehensive and the categories of compensable injuries suffered by States are not closed.[244]

143. The ILC gives the example of Canada's claim for compensation for expenses incurred in "locating, recovering, removing and testing radioactive debris and cleaning up affected areas" following the crash of the Soviet Cosmos 954 satellite in Canada in 1978[245]. The ILC also notes that compensation claims for pollution costs have been handled by the United Nations Compensation Commission when assessing Iraq's liability under international law "for any direct loss, damage—including environmental damage and the depletion of natural resources . . . as a result of its unlawful invasion and occupation of Kuwait"[246]. The Compensation Commission's Governing Council decision 7 specifies various heads of damage encompassed by "environmental damage and the depletion of natural resources"[247].

144. This obligation to pay compensation for breaches of States' obligations in relation to climate change is juridically determinable[248]. The Court has previously awarded compensation for breaches of obligations discussed in this Written Statement, including in cases involving human rights violations and environmental harm[249]. Although compensation

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244 ARSIWA, Commentary to Art. 36, ¶ 8.

245 *Id*., ¶ 13; Protocol in Respect of the Claim for Damages Caused by the Satellite "Cosmos 954" (Canada / Union of Soviet Socialist Republics), *United Nations Treaty Series*, Vol. 1470, p. 269 (2 April 1981).

246 ARSIWA, Commentary to Art. 36, ¶ 14; United Nations Security Council, Resolution 687, document S/RES/687 (3 April 1991), ¶ 16.

247 United Nations Compensation Commission, Governing Council, Decision 7, Criteria for Additional Categories of Claims, document S/AC.26/1991/7/Rev.1 (16 March 1992), ¶ 35.

248 *See Factory at Chorzów* Judgment, p. 47 (defining reparation as including "payment of a sum corresponding to the value which a restitution in kind would bear; the award, if need be, of damages for loss sustained which would not be covered by restitution in kind or payment in place of it—*such are the principles which would serve to determine the amount of compensation due for an act contrary to international law*" (emphasis added)); *DRC* v. *Uganda* Reparations Judgment, ¶ 106.

249 *See, e.g.*, *DRC* v. *Uganda* Reparations Judgment, ¶¶ 65, 409 (awarding compensation for violations of human rights and humanitarian law); *Ahmadou Sadio Diallo (Guinea* v. *Democratic Republic of the Congo)*, *Judgment (Compensation)*, *I.C.J. Reports* 2012, p. 324, ¶¶ 13, 56 (awarding compensation for violations of the ICCPR and the African Charter on Human and Peoples' Rights); *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica* v. *Nicaragua)*, *Judgment (Compensation)*, *I.C.J. Reports 2018*, p. 15, ¶ 42 ("[D]amage to the environment, and the consequent impairment or loss of the ability of the environment to provide goods and services, is compensable under international law. Such compensation may include indemnification for the impairment or loss of environmental goods and services in the period prior to recovery and payment for the restoration of the damaged environment.").

for environmental damage may be difficult to quantify, the ILC has confirmed that such compensation is "no less real and compensable than damage to property"[250]:

> In cases where compensation has been awarded or agreed following an internationally wrongful act that causes or threatens environmental damage, payments have been directed to reimbursing the injured State for expenses reasonably incurred in preventing or remedying pollution, or to providing compensation for a reduction in the value of polluted property. However, environmental damage will often extend beyond that which can be readily quantified in terms of clean-up costs or property devaluation. Damage to such environmental values (bio-diversity, amenity, etc.—sometimes referred to as "non- use values") is, as a matter of principle, no less real and compensable than damage to property, though it may be difficult to quantify.[251]

145. Where polluting States have an obligation to compensate for their breaches, this obligation does not disappear but instead increases with time, both if the harm caused increases, and with the passage of time through the mechanism of interest. As the ILC in its commentary to Article 14 explains: "In many cases of internationally wrongful acts, their consequences may be prolonged . . . [and] the prolongation of such effects will be relevant, for example, in determining the amount of compensation payable."[252] The Court has also consistently awarded post-judgment interest on the amount of compensation owed[253].

146. Compensation is therefore a legal consequence of the breach of obligations regarding climate change. If compensation is due for the costs incurred in responding to pollution damage, it is also due for the damage to all aspects of people's lives: their homes, customs, economy, livelihood, infrastructure, and food and water security—the way of life that defines them. It is due for the damage inflicted on the enjoyment of the right to self-determination and, in Tuvalu's case, the ability to maintain *fenua*.

147. Satisfaction is also appropriate to account for moral damage to the State. In *Corfu Channel*, for example, the Court explained that satisfaction in the form of a declaration of wrongfulness was warranted in light of the violation of territorial sovereignty suffered by Albania, which the Court explained was "an essential foundation of international relations"[254].

148. Finally, as a consequence of the peremptory status of the obligation to respect the right of self-determination[255] and certain other obligations implicated in the context of climate

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250 ARSIWA, Commentary to Art. 36, ¶ 15.

251 *Id*., ¶¶ 13–14.

252 ARSIWA, Commentary to Art. 14, ¶ 6.

253 *DRC* v. *Uganda* Reparations Judgment, ¶ 402 ("[C]onsistent with its practice, the Court decides that, should payment be delayed, post-judgment interest shall be paid.").

254 *Corfu Channel (United Kingdom* v. *Albania)*, *Judgment*, *I.C.J. Reports 1949*, p. 4 at 35.

255 *See Chagos* Advisory Opinion, ¶ 180 ("Since respect for the right to self-determination is an obligation *erga omnes*, all States have a legal interest in protecting that right . . . . The Court considers that . . . all Member States must co-operate with the United Nations to put those modalities into effect."); *Wall* Advisory Opinion", ¶ 159; *Legal Consequences for States of the Continued Presence of South Africa in Namibia*

change, all States must cooperate to put an end to any ongoing violations of such rights, including through the United Nations[256]. In the context of climate change, the obligation to cooperate to put an end to ongoing violations means that States must work multilaterally to reduce GHG emissions as quickly as necessary in line with the best available science, including in the ways that COSIS sets out in its written statement in these proceedings[257]. Such cooperation must take place in the context of existing international organizations and frameworks with relevant mandates in relation to the protection of the environment and the rights implicated by climate change, as well as through any necessary new mechanisms.

149. All States must also refrain from recognizing the consequences resulting from violations on the part of States to limit GHG emissions[258]. Importantly for States like Tuvalu whose very survival is threatened by climate change, this means that all States must recognize the perpetual sovereignty of small island States as well as the permanence of their maritime boundaries and their entitlements to natural resources[259]. Just as States are prohibited from recognizing violations of territorial integrity, sovereignty, and the principle of self-determination resulting from inter-State conflicts and illegal boundary changes under this obligation[260], all States must equally respect the enduring sovereignty of States like Tuvalu even in the face of submergence of land territory.

V. Conclusions

150. In response to the Request, and for the reasons set out in this Written Statement, Tuvalu submits that—

(a) The failure of a State or group of States to ensure the protection of the climate system and other parts of the environment from the impacts of anthropogenic GHG emissions, including by necessary and appropriate measures for mitigation and adaptation, constitutes a breach of their international legal obligations—including to (*1*) respect peoples' right to self-determination and subsistence, (*2*) prevent significant transboundary environmental harm and protect and preserve the marine environment, and (*3*) promote, protect, and respect international human rights; and

(b) Where a State or multiple States, by their acts or omissions, breach obligation(s) under subparagraph (a) above by causing significant harm to the climate system and other parts of the environment:

(i) Each State is responsible for any such breaches attributable to it under international law; and, in the case of multiple breaching States

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(South West Africa) Notwithstanding Security Council Resolution 276 (1970), *Advisory Opinion*, *I.C.J. Reports 1971*, p. 16 ("*Namibia* Advisory Opinion"), ¶ 127.

256 ARSIWA, Art. 41(1) ("States shall cooperate to bring to an end through lawful means any serious breach [of a peremptory norm of international law].").

257 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § III.C.

258 ARSIWA, Art. 41(2) ("No State shall recognize as lawful a situation created by a serious breach [of a peremptory norm of international law], nor render aid or assistance in maintaining that situation.").

259 *See Obligations of States in Respect of Climate Change (Request for an Advisory Opinion)*, Written Statement of COSIS (22 March 2024), § III.A.

260 *See Wall* Advisory Opinion, ¶ 159; *Namibia* Advisory Opinion, ¶¶ 119, 126.

responsible for the same internationally wrongful act, States entitled to invoke the responsibility of a breaching State may do so for the full extent of the breach;

(ii) Injured States specially affected by any such breaches, including small island developing States, may invoke the responsibility of the breaching State(s) for any breach of an obligation owed to (*1*) the injured State individually or (*2*) a group of States, including that specially affected State;

(iii) Any State may invoke the responsibility of the breaching State(s) for failure to comply with obligations owed to the international community as a whole;

(iv) The breaching State(s) must (*1*) continue to perform the breached obligation, (*2*) cease any continuing breaches and offer appropriate assurances and guarantees of non-repetition, and (*3*) make full reparation—including restitution, compensation, and/or satisfaction—for the injury caused to the injured State by the internationally wrongful act, including for any damage, whether material or moral, caused by such act; and

(v) All States must (*1*) refrain from recognizing or aiding or assisting in the continuation of a situation resulting from any breach amounting to a serious breach of a peremptory norm of international law, and (*2*) cooperate to bring an end to that breach, including through frameworks supplied under multilateral environmental conventions and international organizations, such as the United Nations.

(*Signed*)

Hon. Feleti Penitala Teo
Prime Minister of Tuvalu

CERTIFICATION

I certify that:

1. All Annexes are true copies of the documents referred to; and

2. The number of pages of original Annexes attached to this Written Statement does not exceed 750 in total.

(*Signed*)

Catherine Amirfar
Counsel to Tuvalu

LIST OF ANNEXES

Annex 1

M. Wandres et al., "A National-Scale Coastal Flood Hazard Assessment for the Atoll Nation of Tuvalu", *Earth's Future* (forthcoming 2023) (excerpts)

A national-scale coastal flood hazard assessment for the atoll nation of Tuvalu

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Abstract

Atoll nations such as Tuvalu are considered to be amongst those most vulnerable to the effects of climate change. Here we present a national-scale coastal flood hazard assessment for Tuvalu based on high-resolution Light Detection and Ranging (LiDAR) topography and bathymetry. We follow a fully probabilistic approach, considering sea level anomalies, tides, and extreme wave conditions from a mixed climate (i.e., from distant extra-tropical storms and local tropical cyclones). Nearshore processes such as wave setup and runup are also accounted for. Hazard maps were calculated for the present sea level, as well as for sea level rise projections corresponding to different shared socioeconomic pathways (SSP2 4.5 and SSP5 8.5) and time horizons (2060 and 2100).

With a mean elevation of 1.55 m above mean sea level (1.37 m above mean high water spring) >25% of land area is inundated once every five years and >50% of land area floods once every 100 years nationally. Results indicate that present day 1-in-50 year floods (>45% of land area flooded) will occur more than once every five years by 2060 (annual exceedance probability >20%), even under the moderate SSP2 4.5 sea level rise projections. Results of this study highlight the pressing need for ambitious and large-scale adaptation solutions which are commensurate with projected sea level rise and marine hazard impacts. The methodologies presented in this paper can easily be applied to other low-lying islands in the tropical Pacific, where mixed climates (i.e., regular and TC conditions) and non-linear nearshore processes dominate extreme water levels and flooding.

Plain language summary

Low-lying atoll nations such as Tuvalu are widely recognised to be amongst those most impacted by the effects of climate change. To make informed adaptation decisions, accurate baseline data (i.e., topography and bathymetry) and marine hazard information are fundamental. In this paper we present a national-scale coastal flood hazard assessment for Tuvalu based on state-of-the art high-resolution baseline data and statistical and numerical models. We considered the present-day sea levels and sea level rise projections corresponding to different climate change scenarios. Under present-day sea levels >25% of Tuvalu's land area floods once every five years and >50% of land area floods once every 100 years. Our results indicate a significant increase in severity and frequency of extreme coastal flooding due to climate change with present-day 1-in-50-year floods occurring more than once every five years by 2060. This study highlights the pressing need for ambitious and large-scale adaptation solutions. The methodology presented here is suitable to be used in other Pacific Island locations.

51

52 Key points

53 • We present a probabilistic flood hazard assessment of Tuvalu considering tides, sea
54 level anomalies, storm surges, and waves from a mixed climate (i.e., generated by
55 tropical and extratropical storms)
56 • A mean elevation of 1.55m above MSL makes Tuvalu highly vulnerable to wave
57 driven flooding with >25% of land area inundated once every 5 years
58 • Present day 1-in-50 year floods (>45% of land area flooded) will occur more than
59 once every five years by 2060 due to sea level rise

1. Introduction

Small Island States are widely recognised to be amongst those most impacted by the effects of climate change (Mycoo et al., 2022). Recent studies project a significant increase in the frequency and extent of coastal flooding in the tropical Pacific (Shope et al., 2016; Vitousek et al., 2017), posing a strong risk to the habitability of many atolls and low-lying reef islands over the coming decades (Storlazzi et al., 2018). This is particularly the case when considering other risk factors such as freshwater or land-based food supply (Duvat et al., 2021). A detailed localised understanding of the coastal inundation hazard of atolls is therefore critical for targeted adaptation and resource prioritisation. The island nation of Tuvalu is one of the few countries in the world that consists exclusively of low-lying atolls and reef islands. As such, the country and Tuvaluan People are particularly vulnerable to coastal flooding (Duvat et al., 2021; Taupo et al., 2018). For example, in 2015 most of Tuvalu's islands were severely impacted by large waves, generated by distant-source tropical cyclone (TC) Pam (Hoeke et al., 2021). In 2018, a large swell generated by an extra-tropical low-pressure system in the Southern Ocean and Tasman Sea caused extensive flooding in some of Tuvalu's southern islands (Tuvalu Meteorological Service, 2018). Additionally, to large waves generated by distant storms, Tuvalu also experiences direct hits from TCs (such as TC Bebe in 1972) and associated extreme wave and water level conditions (e.g., Maragos et al., 1973). Apart from relatively frequent wave-driven inundation events, many low-lying areas in Tuvalu regularly flood during spring tides as marine water percolates through the porous limestone and temporarily fills depressions at the surface (Patel, 2006; Yamano et al., 2007).

Coastal inundation in fringing-reef environments often occurs as a compound event, where waves, tides, and sea level anomalies all interact non-linearly to generate extreme total water levels (TWLs) and flooding (e.g., Becker et al., 2014; Ford et al., 2018; Hoeke et al., 2013; Wandres et al., 2020).

There are two important wave-driven mechanisms that contribute to nearshore water levels on reef-mediated shores such as the islands of Tuvalu (e.g., Beetham et al., 2016). Waves dissipate as they break on the reef edge and the excess momentum flux in the water column causes a steady elevation of the mean still water surface (e.g., Becker et al., 2014). On reef-fronted islands, this effect (called wave setup) has been found to reach up to one third of the incident offshore wave heights (Munk & Sargent, 1948; Tait, 1972; Vetter et al., 2010). The dissipation of swell groups also generates infragravity (IG) waves (bore-like uprush of individual waves onto the beach), which can significantly contribute to the total runup, which can be defined as the sum of wave setup, IG waves, and waves in the sea and swell frequency bands (Baldock, 2012; Pomeroy et al., 2012; van Dongeren et al., 2013; Beetham et al., 2016). Wave setup and IG waves are strongly modulated by the offshore water level conditions (i.e., tides and sea level anomalies; Beetham et al. 2016).

The multivariate nature of wave-driven flooding makes the determination of wave driven inundation intensity and likelihood challenging. Hoeke et al. (2021) recently investigated nearshore extreme TWLs in Tuvalu over a 40-year period using an empirical equation by Merrifield et al. (2014). The methodology allowed to assign a probability to historical flood events such as the severe inundation from distant tropical cyclone (TC) Pam in 2015. While this is useful in terms of risk knowledge and community awareness, the methodology does not (and was not intended to) provide actionable hazard information such as flood depth and extent. Process-based numerical models such as XBeach (Roelvink et al., 2009) or SWASH (Zijlema et al., 2011) have been shown to accurately resolve the nonlinear processes associated with reef-fronted flooding (e.g., Buckley et al., 2014; Quataert et al., 2015; Storlazzi et al., 2018). However, these models are computationally expensive, making their usage over large areas difficult and time consuming. To address this, Pearson et al. (2017) developed a Bayesian-based system to assess wave-driven flooding on reef-fronted coasts by creating a large synthetic

database of XBeach simulations. Rueda et al. (2019) expanded on the work by applying an interpolation technique to efficiently obtain runup estimations for infinite combinations of reef-morphologies and oceanographic forcings. More recently, Liu et al. (2023) developed an explicit wave-runup formula based on Pearson et al.'s (2017) database. However, the synthetic database of simulations only includes waves smaller than 5 m, making it unsuitable for areas with TCs (i.e., where wave heights are exceeding 5 m).

Other studies investigating exceedance probabilities of extreme TWLs in areas of TCs indicated some issues in estimating return intervals for rare extreme TWLs using conventional methods such as Generalized Extreme Value (GEV) distribution. Firstly, the infrequency of TCs often fails to capture TC-driven extreme TWLs of longer return periods, particularly when basing the extreme value analysis on short observation periods (e.g., Haigh et al., 2014; O'Grady et al., 2019). Secondly, in areas where TCs and distant-storms (along with tides and atmospheric variability) modulate TWLs, the mixed nature of the extreme value distributions require special consideration (O'Grady et al., 2022).

Here we present a novel, comprehensive approach to assess probabilistic inundation hazard in reef-fronted islands, accounting for all relevant drivers of coastal inundation, i.e., waves generated by tropical cyclones, extra-tropical storms, tides, and sea level anomalies. Nearshore processes such as wave setup and runup (e.g., IG wave motions) are also accounted for. The hazard assessment is based on state-of-the-art Light Detection and Ranging (LiDAR) bathymetry and topography data.

Tuvalu's National Strategy for Sustainable Development 2021-2030 ('Te Kete') sets out the nation's high-level strategic plan to achieve "a peaceful, resilient and prosperous Tuvalu" (Government of Tuvalu, 2020). National outcome 4 of Te Kete is focused on increased climate change and disaster resilience. The coastal hazard information presented in this paper are fundamental for Tuvalu to make science-informed adaptation decisions.

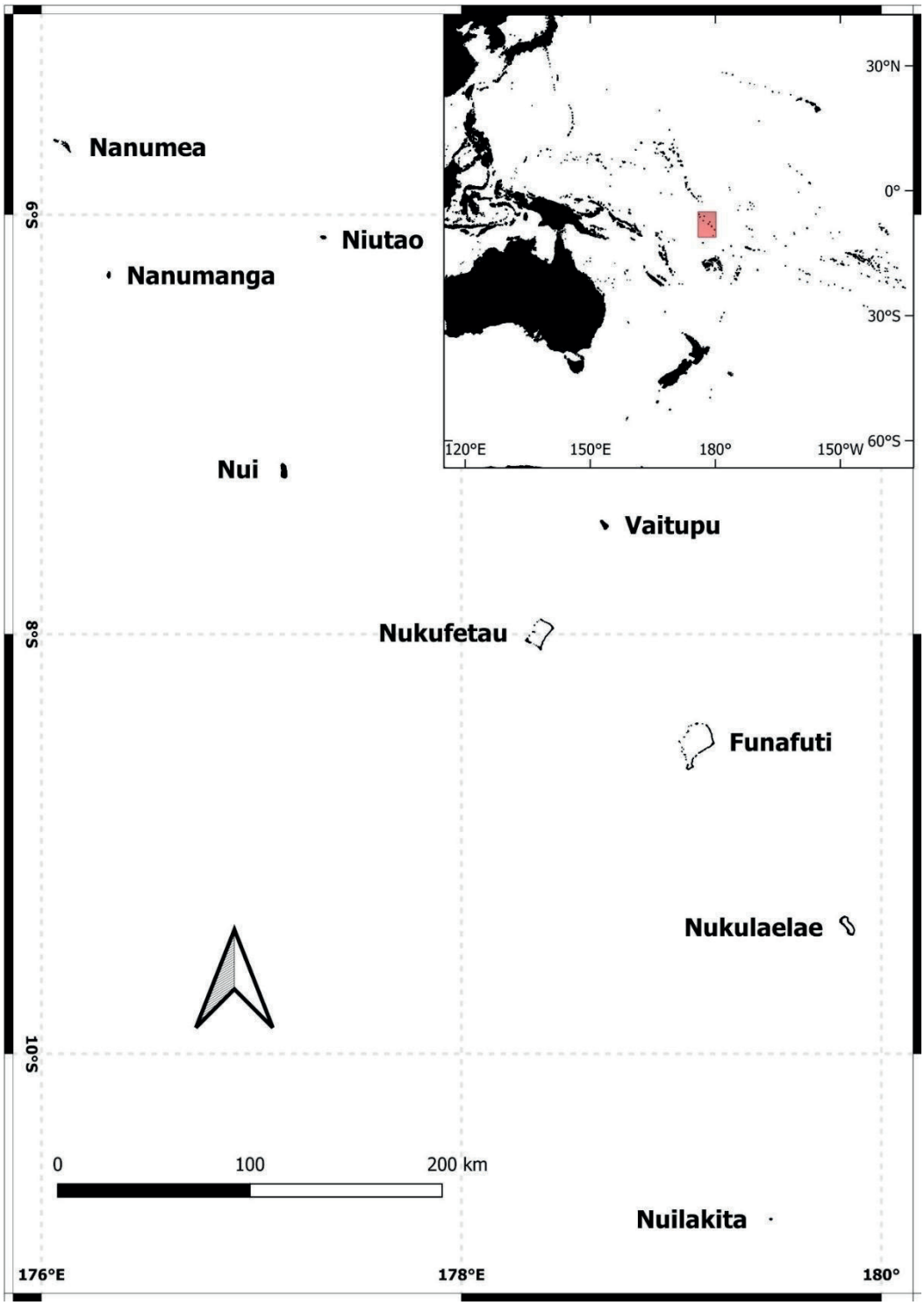
141 The paper is structured as follows: Section 2 describes the study site and the
142 oceanographic conditions of Tuvalu. The underlying data are described in Section 3. The
143 methodology to derive extreme offshore ocean conditions is outlined in Section 4 and the
144 inundation modelling approach is described in Section 5. Results are presented in
145 Section 6 and discussed in Section 7.

2. Study site

Tuvalu consists of nine atolls and low-lying reef islands (Figure 1). The country has a population of 10,645 people according to a 2017 census (Government of Tuvalu, 2017), with the majority living in the capital atoll of Funafuti and with the entire population living a few meters from the coastline (Andrew et al., 2019). Like other coral reef islands, Tuvalu's islands consist of unconsolidated and/or poorly lithified carbonate sand and gravel deposits on top of coral reef platforms (Webb & Kench, 2010). Five of the islands are classified as true atolls (Nanumea, Nui, Nukufetau, Funafuti, and Nukulaelae), meaning they have an essentially continuous rim of reef at or near the surface of the sea which surrounds a deeper lagoon. Three of the islands are classified as table reefs (Nanumaga, Niutao, and Niulakita), meaning they have a continuous land margin that completely encircles a shallow enclosed lagoon(s) or pond(s). Vaitupu possesses both characteristics of a table reef and atoll thus does not strictly conform to either definition, in that its two small lagoons are almost completely enclosed by land (Mclean and Hosking, 1991). Tuvalu's islands are all low-lying and while various values for land area and mean elevation can be found in the literature and online, no high-resolution country-scale topographic survey had been performed prior to this study.

Few studies have investigated Tuvalu's wave climate (e.g., Barstow & Haug, 1994; Bosserelle et al., 2015b; Durrant et al., 2014), however, these studies were based on either relatively coarse global wave hindcasts or short term in-situ observations. More recently, Wandres et al. (2023) developed a 44-year (1979-2022) high-resolution wave hindcast of Tuvalu. The authors identified three main wave sources: mid-latitude storms in the Southern Ocean and in the North Pacific, easterly trade winds, and tropical cyclones. It was found that Tuvalu's wave climate is closely linked to large-scale climate modes such as the El Niño Southern Oscillation (ENSO), Pacific Decadal Oscillation (PDO), and Arctic and Antarctic Oscillation (AO and AAO).

Funafuti has a maximum tidal range of 2.4 m (Ritman et al., 2022). Sea level rise trends in Tuvalu based on tide gauge records between 1993 and 2008 were estimated to be 5.9 mm/year with negligible impact from vertical land movement (Aung et al., 2009). More recently, the Guidance for Managing Sea Level Rise Infrastructure Risk in Pacific Island Countries report analysed rates of sea level rise from tide gauges across the Pacific and found a rate of 4.84 mm/year in Tuvalu (PRIF, 2021). Other recent studies investigating SLR in the South Pacific over longer time periods found similar trends. For example, a recent study deriving sea level trends from satellite altimetry estimated an increase in sea level in Tuvalu of 13±7 cm (~4.82 mm/year) between 1993 and 2020 (Marra et al., 2022).



181

182 *Figure 1: Map of Tuvalu and its nine atolls.*

3. Data

3.1. Bathymetry and topography

Most islands in the Pacific region have no established vertical reference datum and in turn no locally referenced mean sea level. Without mapping the topography and referencing it to the sea level, accurately assessing coastal hazards and the long-term impacts of sea level rise on low-lying communities is impossible.

Light Detection and Ranging (LiDAR) is a remote sensing method that uses light in the form of a pulsed laser to measure variable distances to the Earth. LiDAR surveys provide accurate (horizontal and vertical errors < 10cm) and high-resolution point cloud data that can be interpolated onto digital elevation models (DEMs). Due to their high cost, LiDAR surveys generally only focus on densely populated or otherwise high-priority areas. Through the Tuvalu Coastal Adaptation Project (TCAP), the United Nations Development Programme (UNDP) contracted Fugro to collect nationwide airborne LiDAR topography and bathymetry data (FUGRO, 2019).

The initial data collection was reduced to the Geodetic Reference System 1980 (GRS80) ellipsoid. Strategic benchmarks on all nine atolls were occupied and linked to temporary tide gauges by the Tuvalu Lands and Survey Department and the Pacific Community (SPC) to reduce the final data to a local reference datum (MSL).

LiDAR data were seamlessly blended with multi-beam bathymetry data previously collected by SPC (formerly SOPAC; Krüger, 2008). The multi-beam data covered water depths of ~10 m up to ~2000 m around all of Tuvalu's nine atolls. Beyond the areas of in-situ bathymetric data, the General Bathymetric Chart of the Oceans (GEBCO) was used.

Tables 1 & 2 display the maximum and mean elevation above MSL for all islands and the entire country obtained from the LiDAR DEM. Mean elevations were calculated using two different methods: 1) the average elevation of the areas above mean sea level (MSL); 2) the

208 average elevation of all areas above mean high water spring tide (MHWS). These two
209 methods were used as some sandbanks and reefs might be exposed at mid-tide, therefore
210 being included in (1). The 2nd method therefore gives a better estimate of Tuvalu's
211 inhabitable land area.

212 The highest points in Tuvalu are in Nanumaga and Nukulaelae (both ~10.5 m above MSL;
213 Table 1). However, these points are results of anthropogenic activities through dredging of
214 pulaka (swamp taro) pits. On most other atolls, the highest points were also the results of
215 human intervention. The highest natural points in Tuvalu are in Niulakita and Nanumaga
216 (both approximately 6.5 m above MSL) and in both cases these elevations are associated
217 with the ocean-side storm berm landforms of the islands. Across all nine islands, the most
218 elevated naturally occurring land is consistently associated with these oceanside nearshore
219 storm berm features, which accreted due to the deposition of carbonate sediment during
220 inundation events (Mclean and Hosking, 1991).

221 *Table 1: Maximum elevation of Tuvalu's islands derived from the LiDAR DEM. Description of the points were*
222 *obtained from the Government of Tuvalu Lands and Survey Department.*

Island Name	Max. elevation	Point description
Funafuti	6.93 m	The highest point is located near Queen Elisabeth Park which is a pile of sand that was used for leveling the surface of the reclaimed land on the main islet before Pacific Island Forum meeting 2019.
Nanumea	6.71 m	The highest point is located on Lakena islet, a pulaka pit (swamp taro) farming area for locals, thus the point is likely man-made.
Nanumaga	10.48 m	The three highest points are all situated near pulaka pits. They are related to spoil mounds from pulaka pit excavations.
Nukulaelae	10.48 m	The highest point is located on Fagaua islet near a pulaka pit. Thus, it is most likely a result of human activity.
Vaitupu	7.68 m	The two highest points to the north side of the island are situated in the densest area of pulaka pits. They both are likely man-made. Another similarly high point to the south of the island is part of the village, thus it could be a natural or man-made point.
Nukufetau	5.81 m	The highest point in Nukufetau is on Fale Islet. The islet is the farming area for locals with pulaka pits and a piggery farm. Thus, the highest point of the island is man-made.
Niulakita	6.54 m	The highest point in Niulakita seems to be the natural storm berm with no apparent structures or pulaka pits nearby.
Nui	8.37 m	The highest points on Fenuatapu (Mainland) and Meang islet are the results of

		human intervention. Both are located near pulaka pits.
Niutao	8.67 m	The highest point in Niutao is a result of human intervention (pulaka pit).

Overall, Tuvalu has a land area of 38.69 km^2 above MSL and a mean elevation of 1.55 m above MSL (Table 2). Keeping in mind the tidal range is approximately 2 m this means large areas of Tuvalu are exposed to high tides. A better estimate of the habitable area is therefore to use MHWS as a reference datum. Across all of Tuvalu, 25.33 km^2 of land area are above MHWS. Funafuti, the most populous atoll of Tuvalu, has a maximum elevation of 6.93 m above MSL and a mean elevation of 1.48 m above MSL (1.12 m above MHWS). The atolls of Nukulaelae, Nukufetau, and Nui also have mean elevations <1.2 m above MHWS with median elevations <1.1 m. We compared the statistics obtained from the LiDAR survey to another commonly used topographic dataset, i.e., the Shuttle Radar Topography Mission (SRTM; Farr et al., 2007) dataset. In the SRTM dataset, the mean elevation above MSL in Tuvalu is overestimated by 7.65 m (>590%) while the maximum elevation is overestimated by 16.52 m (>250%). This highlights the inadequacy of coarse global datasets for coastal hazard assessments in low-lying small island nations and the need to invest in accurate baseline data.

Table 2: Mean and median elevation and land area of Tuvalu's islands calculated from LiDAR topography data. Mean and median elevations and land area are provided in reference to mean sea level (MSL) and mean high water spring (MHWS).

Island Name	Mean elevation above MSL (m)	Median elevation above MSL (m)	Mean elevation above MHWS (m)	Median elevation above MHWS (m)	Land area above MSL (km^2)	Land area above MHWS (km^2)
Funafuti	1.48	1.52	1.12	1.08	3.98	2.85
Nanumaga	2.52	2.35	1.96	1.64	2.83	2.48
Nanumea	1.96	1.98	1.33	1.22	3.94	3.46
Niulakita	3.26	3.47	2.75	2.86	0.46	0.42
Niutao	2.44	2.64	2.2	2.17	2.4	1.87
Nui	0.97	0.56	1.17	1.09	10.87	4.25

Nukufetau	1.44	1.53	1.06	1.01	4.34	3.11
Nukulaelae	1.15	1.13	1.06	1.03	3.52	1.91
Vaitupu	1.75	1.75	1.32	1.17	6.36	4.98
All	**1.55**	**1.54**	**1.37**	**1.21**	**38.69**	**25.33**

3.2. Wave hindcast

Wave data were obtained by performing a 44-year (1979-2022) hindcast of the wave conditions in Tuvalu using the unstructured version of the third-generation wave model Simulating Waves Nearshore (UnSWAN; Booji et al., 1996). The model is a Eulerian formulation of the discrete wave action balance equation (Booij et al., 1999). The computational mesh was generated using OceanMesh2D, a MATLAB based software package for two-dimensional unstructured mesh generation (Roberts et al., 2019). The spatial resolution of the flexible mesh ranged from 20 km offshore to 300 m around the atolls and in shallow waters. The grid domain covered the area between 11.5˚S and 4.5˚S and between 175.5˚E and 178.5˚W (12949 nodes/25269 elements).

The model was forced with 1-hourly 10 m surface winds and 1-hourly 2D wave spectra from the European Centre for Medium-Range Weather Forecasts (ECMWF) Reanalysis v5 (ERA5) (Copernicus Climate Change Service (C3S), 2017). A more detailed description of the model setup and validation is provided in Wandres et al. (2023).

3.3. Offshore water levels

3.3.1. Astronomical tides

Tides around Tuvalu's nine islands were obtained from the well-established global tide model TPXO8 (Egbert & Erofeeva, 2002). Tidal elevations were extracted using the Tide Model Driver (TMD) MATLAB software package (https://github.com/EarthAndSpaceResearch/TMD_Matlab_Toolbox_v2.5) for the time period corresponding to that of the wave hindcast (1979 to 2022). A previous study by

7. Discussion and Conclusion

This paper presents a novel and comprehensive methodology to address coastal inundation hazard in reef-fronted islands in the tropical Pacific across a wide range of scales. Here, we apply the methodology to the atoll nation of Tuvalu, leveraging on recently collected LiDAR topography and bathymetry data. Our methodology accounts for tides, mean sea level anomalies, and storm surges, along with a mixed climate (e.g., cyclone and non-cyclone wave conditions). Shallow water processes such as wave breaking and wave transformation across the reef flats are also considered. Hazard maps (inundation extent and depths) for different return periods were calculated for the present sea level and future SLR scenarios according to the latest IPCC Assessment Report (AR6). Results indicate that Tuvalu is highly susceptible to coastal inundation, with >25% of the nation flooded once every 5 years. Present day 1-in-50 year floods (>45% of the nation flooded) will occur more than once every five years by 2060, even under the moderate SSP2 4.5 sea level rise projections thus threatening the habitability of Tuvalu.

Previous studies on coastal hazards in the tropical Pacific have often focussed on a single hazard such as waves generated by distant storms (Hoeke et al., 2013; Wandres et al., 2020), local tropical cyclones (Maragos et al., 1973), or storm surges (McInnes et al., 2014) and over small areas like a single beach or island (e.g., Storlazzi et al., 2018). Other studies have used empirical equations to estimate nearshore total water levels, and applied these regionally or globally (e.g., Vitousek et al., 2017; Vousdoukas et al., 2023 2018, 2017), potentially missing some important physical processes (e.g., wave setup and IG waves). The methodology presented here can be efficiently applied across large areas in a mixed climate (regular and TC conditions) while maintaining a high spatial resolution and while resolving all necessary physical processes.

760 Recently, O'Grady et al. (2022) highlighted the need for special consideration when
761 investigating extreme water levels in areas of mixed climates (i.e., in areas where the
762 extreme water levels are driven by both cyclone and non-cyclone ocean conditions). The
763 authors developed a formulation to account for two distinct extreme value distributions of
764 TWL in a single mixed climate. However, to resolve non-linear wave transformation
765 processes and translate TWL nearshore to coastal inundation in mixed-climate
766 environments, a different approach is required. Here we present an alternative
767 framework to estimate extreme water levels and coastal flooding in a mixed climate
768 environment by treating the tropical cyclone and the regular climate independently. We
769 performed Monte-Carlo simulations based on a non-parametric kernel density function
770 combined with the simulation of thousands of years of extreme TC ocean conditions
771 based on the STORM database (Bloemendaal et al., 2020). This method allowed us to
772 explicitly map the multivariate drivers (wave conditions and offshore water levels) to the
773 extreme nearshore TWL and flooding. We demonstrate that higher return interval floods
774 are dominated by local tropical cyclones in the southern islands of Tuvalu (Figure 9a).
775 More frequent events in the southern islands are dominated by distant-source swell
776 events ($T_p \geq \sim 13s$). In the northern group, most occurring inundation (i.e., ARIs $\leq$ 100
777 years) is dominated by distant-source swells.

778 Changes in wave climate were not considered in this study as changes in waves are
779 expected to only have minimal effects on inundation levels compared with changes in
780 sea levels. However, as global warming continues, the frequency of tropical cyclones is
781 anticipated to decrease while the intensity of tropical cyclones will increase (e.g.,
782 Knutson et al., 2010; Portner et al., 2019). Whether this will significantly alter the coastal
783 flood hazard in Tuvalu remains subject to further study. Similarly, there is some
784 discussion about the extent to which vertical accretion of coral reefs and reef islands will
785 be able to keep up with sea level rise. Some evidence suggests that so far islands have
786 not experienced any net erosion despite increased sea levels over recent decades

(Duvat, 2018; Beetham et al., 2017; Kench et al., 2019; Webb & Kench, 2010). There is some doubt, however, that reef accretion rates will be able to keep up with accelerated rates of SLR, particularly if coral health degrades (Perry et al., 2018).

In general, the susceptibility of an atoll or reef island to coastal flooding largely depends on its bathymetry and topography. In extremely low-lying islands, a small increase in MSL leads to the inundation of most of the island's surface. Examples are Nukufetau, Nukulaelae, or Funafuti, where > 89% of the atoll areas are projected to be flooded once every 5 years by 2100, irrespective of the climate change projection (Figure 12). On higher islands like Niulakita on the other hand, the flooded area increases approximately linearly with SLR. This becomes important when prioritising adaptation measures for the different islands over the coming decades since higher islands are already naturally less vulnerable than lower lying atolls.

The methodology presented here can easily be upscaled to other islands in the Pacific region, where accurate baseline data are available. Unfortunately, many islands in the Pacific region have no established vertical reference datum and have never been properly surveyed. Freely available topographic data such as SRTM (Farr et al., 2007) have large uncertainties in low-lying islands making them inadequate for actionable inundation hazard assessments. The collection of high-resolution baseline data in low-lying areas should therefore be prioritised by donors and decision makers.

In line with other studies (Mycoo et al., 2022; Vitousek et al., 2017), our results indicate a significant increase in severity and frequency of extreme floods due to climate change, which will threaten the habitability of low-lying islands and atolls over the coming decades particularly, when considering the already limited access to freshwater resources or farmland (Duvat et al., 2021; Storlazzi et al., 2018; Nakada et al., 2012). In addition, a study by Taupo et al. (2018) found that poorer households in Tuvalu are more likely to reside in lower-lying areas closer to the coastline, exacerbating the risk to an already vulnerable group. The present study is therefore particularly important, allowing

814 decision-makers to put policies and strategies into place to cope with the effect of sea
815 level rise and coastal flooding on Tuvalu's population and key infrastructure. To that end,
816 and to support Tuvalu's National Strategy for Sustainable Development (with regard to
817 climate change and disaster resilience) the hazard information produced here, has
818 already informed land reclamation and coastal adaptation initiatives that are currently
819 underway in Tuvalu. Additionally, we created a graphical user interface that allows
820 Tuvalu Government staff to navigate between different inundation scenarios and climate
821 change projections and investigate the effect of various scenarios on the community and
822 infrastructure. The system was deployed at the Tuvalu Government and is accessible
823 through the intranet. A copy of the system is maintained by SPC (see Open Research
824 section).

825 Work is currently underway to translate the hazard data into risk information for
826 population and infrastructure. This will enhance the actionability of the hazard products
827 and in turn optimise their use within the Government of Tuvalu's decision-making
828 process.

Annex 2

Tuvalu: A History (H. Laracy ed. 1983) (excerpts)

TUVALU

A HISTORY

Cover note: The front cover depicts the Tuvalu coat of arms, and the back cover the flag of Tuvalu.

The official description of the coat of arms from the Royal College of Heralds is as follows:

The Arms of Tuvalu, 1976

Per fess Azure and Or in chief upon Grass issuant a representation of an Ellice Maneapa or meeting house all proper and in base four Barrulets wavy Azure a Bordure Or charged with Banana Leaves and Mitre Sea Shells placed alternately proper together with the Motto:

TUVALU MO TE ATUA

A translation of the motto is "Tuvalu is for God".

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According to the evidence of linguists, who can work out how old a language is, and hence for how long people have been speaking it, the language of Tuvalu—and hence the settlement of the country—goes back about two thousand years. The traditional stories and genealogies, however, mostly go back only about 300 years. The oldest, those from Nanumea, go back 700 years. It seems, therefore, that the stories we have today came to us not from our very earliest ancestors, but from later arrivals in Tuvalu.

Where did our ancestors come from? Most of them came from Samoa, possibily by way of Tokelau, while others came from Tonga and Uvea (Wallis Island). These settlers were all Polynesians. In the northern islands, however, particularly in Nui, many people are also descendants of Micronesians from Kiribati. A likely indication of Tuvalu's links with Tokelau (and there are others) is found on Nanumea in the use there of the term *hauai* to describe the mythical beings Pai and Vau. *Hauai* is not a Tuvaluan word but was probably introduced from Tokelau, where it means 'women ogres' or 'female cannibal spirits'.

And where did the Polynesians come from? According to recent research by archaeologists, they are derived from the so-called Lapita people who came from South-East Asia and spread through Melanesia, from the eastern islands off the coast of New Guinea to New Caledonia, about 5000 years ago. Little is yet known about these people, who were but one of many groups populating Melanesia, apart from the facts that they produced pottery ornamented with distinctive tooth-shaped designs, and that they were very capable sailors. The name Lapita comes from a place in New Caledonia where a large deposit of their pottery was found. About 3,500 years ago some of the Lapita people went from Vanuatu to Fiji, and from there to Tonga and Samoa. We know this because some of their pottery has been found among the remains of the earliest settlers in those islands. Later, the people in Fiji were joined by other settlers from Vanuatu, but those in Tonga and Samoa were left alone to evolve in their own way. There they developed the particular set of physical, social and linguistic features which marked them out as Polynesians. And from there they set out to settle the islands to the north, south and east, eventually coming to Tuvalu. Linguists can trace the movements of the Polynesian people by showing the relationships between their languages. Linguistic research also supports the findings of the archaeologists by relating the Polynesian languages to the vast family of Austronesian languages spoken in Melanesia.

Exactly why our ancestors began coming to Tuvalu about 2000 years

4

LAND

Laloniu Samuelu

Tuvaluans value their land above any other of their possessions. When the *palagi* arrived they brought with them western forms of wealth: money, knives, axes, lamps, cooking pots and so on. The new tools made life in the islands easier and more comfortable—or so it seemed to the people. Consequently, our traditional implements gradually gave way to those of the *palagi*. But not all economic values changed. For instance, money, which enabled the *palagi* to put a price on anything, could not buy Tuvaluan land.

When money was introduced our people quickly learned the use of it, although they never came to equate its value with that of land. Why this was the case is easily explained. Tuvaluans viewed their pieces of land and *pulaka* pits not simply as economic assets to be bought and sold, but as the possessions which secured for them a recognised status in the community. It was status that really mattered. This is still the case, especially in the rural areas. Among people living a typically Tuvaluan way of life money is unmistakably second to land in their scale of values.

Tuvaluans may be divided into two loose economic categories. *Vakaluga* is used to describe those who own many pieces of land and *pulaka* pits. Those who possess few are called *vakalalo*. The distinction is not rigid and a *vakalalo* can become a *vakaluga*, and *vice versa*. Moreover, mere possession counts for little. No matter how much a *vakaluga* holds, his real worth is measured by the productivity of his labour. Some *vakaluga* could be very lazy, so that they produce less than a *vakalalo*. Such a person could lose his high status, and it could only be restored if his sons grew up to be industrious men.

Pulaka pits are considered differently from pieces of land. A person might be rich in both *pulaka* and coconuts or only in one of them, but

The nation claiming a 'sphere of influence' was not committed to administering the area it claimed. Nor, however, were powers who were not party to the agreement obliged to respect it. Thus, the Anglo-German agreement of 1886 could not stop American traders from coming to Kiribati in 1891 in order to recruit people for work on plantations in Guatemala. To prevent the Americans from developing their interests in the area, and possibly establishing a political presence there, thereby complicating the arrangement made between the two other great powers, Germany asked Britain to assert a firm claim to Kiribati. The alternative would have been for Germany to take the group but Britain was unwilling to allow that for fear of upsetting the Australians, who did not wish to see the extension of German rule in the Pacific.

Accordingly, in May 1892 Captain E. H. M. Davis of HMS *Royalist* declared a protectorate over Kiribati. After that, *en route* to Fiji, he visited Tuvalu to investigate affairs there, and to land two men whom he was deporting from Tarawa on the ground of being troublemakers. Their names were Tentonanibia, who was landed at Niutao, and Tentababani, who was left on Funafuti, where he promised to teach the people to grow *pulaka* the way it was done in Kiribati. Also at Funafuti, Davis took aboard the Jamaican trader Charles Bernard and his family and transported them to Nukulaelae, where he picked up and deported to his homeland a Tongan named Lutello. Lutello was a former missionary in the Pelew Islands who had caused trouble on Nukulaelae by displacing the true chief, Lapana. At each island, Davis noted in his report, the people asked him to hoist the British flag, but as he had no orders to do so he was unable to oblige them.

Even so, their wish was soon granted. Rather than leave some other power the opportunity to take Tuvalu, Britain shortly afterwards decided to tidy up the political map of the area. In September 1892, therefore, Captain Gibson of HMS *Curacao* was sent to claim Tuvalu. Everywhere, he reported, the people were still willing to accept British rule. Here is his account of what happened at Niutoa, which was much the same as what happened elsewhere:

> I arrived off this Island about 10.30 a.m. and some canoes at once came off to the ship. I landed and, with Mr Buckland, an English trader here, visited the King and the Missionary. I explained to the King that the object of my visit was to declare a British Protectorate. He expressed his willingness to the act, and summoned a meeting of the people in the official House. I there told the people that I had come to declare a British Protectorate. After a considerable

> received a salary of five dollars per annum from his subjects (that is, one tenth of what is considered necessary for the pastor), and he had a fair amount of coconut and taro land, but less than some of his subjects. Since the island has been under British protection the king is a nominal king only, an ornamental, but not very expensive, head of a nice little republic.

In contrast to the weak position of Elia was that of Opetaia who, she went on, 'is the real ruler of the island, in that he is responsible to the Commissioner and is responsible for the enforcing of all laws! His authority', she commented:

> is greatly strengthened by the vague terror that his people have of the supernatural powers of the missionary, and by the wholesome respect for law inspired by the British Commissioner and the big guns of the British warships.

Besides being the magistrate, Opetaia had been chosen as sub-chief by the people and was also a deacon of the church.

The second Resident Commissioner of the Gilbert and Ellice Islands, from 1896 to 1908, was William Telfer Campbell. A strict man, he attempted to introduce flogging as a punishment for drunkenness and for assault, but the High Commissioner refused to approve this harsh proposal. Yet Campbell made his mark on affairs in other ways. He set up land registers and introduced a land tax which remains today as an important source of income for local authorities. He encouraged the people to form large villages (as the missionaries had already done), and to adopt reef latrines and a standard house design, one feature of which was a separate kitchen. He also formed a police force composed largely of Tuvaluans but led by Fijian sergeants and *palagi* officers. This was based first at Tarawa and later at Banaba, to where the government headquarters of the then Gilbert and Ellice Islands Protectorate were shifted in 1908.

In 1917, the year after the conversion of the Gilbert and Ellice from a protectorate to a colony, the government issued a revised set of laws. In these it recognised the extent to which the position of High Chief had been eroded, and so abolished the office. The government also sought to reduce the power of the church over local administration—a cause which had been especially dear to Campbell—by restricting the number of *kaupule* and police to one or two per village and by making all appointments subject to approval of the Resident Commissioner. Island regulations were to be issued only with the approval of a District Officer, who was also empowered to review sentences of the Native

noticeable and more disturbing to them with each constitutional advancement, and that such things would have a serious effect on them when Kiribati and Tuvalu were left to themselves after independence.

On the future economic development of Tuvalu, people on all the islands agreed on one point: that the British government should continue to provide the cash for it. Somehow the islanders were convinced that despite the tough conditions governing separation, Britain would be unwilling to dump them. But when asked what they would do if it did, some islanders replied that the Russians would be willing to help and, if necessary, would be invited into Tuvalu.

The UN Mission should have been convinced by the end of their visit to Tuvalu of the overwhelming support by the people for separation. Never did they encounter opposition to the separatists' crusade. The debates and discussions they listened to would have convinced them that separation was already a forgone conclusion. Even the people of Nukulaelae, who had hitherto always opposed separation, surprised the UN Mission when they announced that they had misunderstood separation and all its implications in the past, and they would now support it and vote for it.

Accounts of the referendum administrator's meetings on the islands not visited by the UN Mission mirrored those on the other six islands. People complained about the conditions of separation; and in spite of these showed unfailing support for it. The result of the referendum showed that 92% of those who voted favoured separation; 7% were against it; and 1% of the votes were declared invalid. As was required under the conditions governing separation, the GEIC government's consent was necessary to allow separation to take place. The Council of Ministers agreed to support the result of the referendum and thus allow the Tuvalu people to fulfil their wishes and aspirations. This decision was subsequently supported unanimously by the House of Assembly.

Post Referendum Changes

A number of changes occurred after the House of Assembly voted in December 1974 in favour of separation. First, the Ellice Committee was established that month; second, one of the two Tuvalu members of the Council of Ministers gave up his ministerial job to become adviser on Tuvalu affairs to the Chief Minister; third, there was the Ellice Separation Conference in March 1975; fourth came the constitutional amendments of July 1975; and last, there was the separation of the Ellice Islands from the Gilbert Islands, to form the separate British dependency of Tuvalu on 1 October 1975. The Ellice Committee was

well. The civil service was taken away from the Commissioner and became the responsibility of a Public Service Commission. In other ways, too, the Chief Minister successfully strengthened his own position. Whereas previously only the Commissioner could summon and preside over meetings of the cabinet, now it was the Chief Minister; whereas previously the Commissioner was required to decide, after consultation with the Chief Minister, the business of cabinet, now the Chief Minister decided on his own. Thus, as the Chief Minister was given more constitutional powers, Her Majesty's Commissioner became more of a ceremonial head of government.

On 1 October 1978 Tuvalu gained political independence from Britain. The Independence Constitution of Tuvalu, enacted by the Tuvalu Independence Order 1978, provides for a Westminister-style parliamentary democracy with the British monarch as Head of State and represented locally by a Governor-General who must be a Tuvalu citizen. The Governor-General is appointed and removed from office by the British monarch acting in accordance with the advice of the Prime Minister, tendered after the latter has consulted the Members of Parliament. In performing his duties the Governor-General can either act in his own deliberate judgement (e.g. if the office of Prime Minister is vacant and no person has been elected to that office within such period as the Governor-General may consider reasonable, he may dissolve parliament); or, he may act in accordance with the advice of a Minister; or in accordance with the advice of, or after consultation with, the Public Service Commission.

Tuvalu has a 12 member unicameral parliament elected directly by the people. Four of the islands—Funafuti, Nanumea, Niutao and Vaitupu—are each represented by two members; the other islands—Nanumaga, Nui, Nukufetau and Nukulaelae—each have one representative. Parliament is presided over by a Speaker elected by Members of Parliament from among those of their members who are not members of the cabinet. The normal life of parliament is four years. The minimum voting age is 18 years.

The cabinet consists of the Prime Minister and up to four other ministers. The Prime Minister is elected by Members of Parliament from amongst themselves; other ministers are appointed and removed from office by the Governor-General in accordance with the advice of the Prime Minister. The Prime Minister may be removed from office by a vote of no confidence in him in Parliament. He presides over meetings of cabinet and as such also determines what business cabinet may consider at any of its meetings.

Tuvalu has not, however, taken the same progressive strides in its

Annex 3

S. Oeter, "Self-Determination", in *The Charter of the United Nations: A Commentary* (B. Simma et al. eds., 3rd ed. 2012), Vol. I (excerpt)

The Charter of the United Nations

A Commentary

THIRD EDITION

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oscillating between the basic purpose of the Organization and fundamental legal principle.[5] In most writings on '*ius cogens*' it is even mentioned as one of the few norms of international law of a peremptory character.[6] Article 2 (4) of the Charter corroborates such a reading when it prohibits any use of force 'inconsistent with the Purposes of the United Nations Charter'. Accordingly, it is beyond doubt that self-determination, as a purpose and principle of the UN Charter, constitutes a legally binding norm for all member States of the United Nations, as has been confirmed by a series of resolutions of the GA and SC, but also the jurisprudence of the ICJ, and State practice in the process of decolonization as well as in the cases of creation of new States in Europe after 1990.[7] Although Art. 1 (2), due to its programmatic character, cannot define in detail the content and scope of a right to self-determination, it sets forth beyond dispute that it forms part of the law of the Charter and is binding upon all members of the UN. Convincing arguments may be made also for the claim that State practice subsequent to the adoption of the Charter has transformed self-determination into a principle of customary international law, too.[8]

2 Self-determination is also explicitly mentioned in Art. 55 of the Charter. Article 55 gives some hints as to the operational measures to be taken by the UN in order to give more substance to the purpose of peaceful and friendly relations among nations 'based on respect for the principle of equal rights and self-determination of peoples'. Article 55 states that friendly relations among nations (in a normative perspective inextricably linked with self-determination) should be promoted by trying to achieve higher standards of living for peoples; solutions of international economic, social, and health problems; international cultural and educational cooperation; and universal respect for human rights and fundamental freedoms. Art. 55 is of a declaratory character concerning the principle of self-determination—it does not guarantee it, but it presupposes its existence.[9] Interestingly enough, there is no further explicit mention of self-determination in the text of the Charter, not even in Chapter XI which played a decisive role in UN practice concerning self-determination during the process of decolonization.[10]

[5] See also Doehring (n 2) 49, para 3.

[6] See only HG Espiell, 'Self-Determination and Jus Cogens' in A Cassese (ed), *UN Law/Fundamental Rights* (Sijhoff & Noorthoff 1979) 167–73; A Cassese, *Self-Determination of Peoples* (CUP 1995) 133–36; EA Laing, 'The Norm of Self-Determination' (1991) 22 Calif W Intl LJ 209, 248–52; D Turp, 'Le droit de sécession en droit international public' (1982) 20 Can YB Intl L 24, 28–29; D Raić, *Statehod and the Law of Self-Determination* (Kluwer 2002) 218–19; U Saxer, *Die internationale Steuerung der Selbstbestimmung und der Staatsentstehung* (Springer 2010) 213–15.

[7] Doehring (n 2) 49, para 1.

[8] ibid.

[9] Doehring (n 2) 49, para 2.

[10] ibid, para 4.

Annex 4

J. Crawford, *State Responsibility: The General Part* (2013) (excerpt)

State Responsibility

The General Part

James Crawford

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This is not merely an issue of classification, but an issue with practical consequences. If assurances and guarantees of non-repetition are purely a form of satisfaction they would only be available to the extent an injury cannot be made good by restitution or compensation.[108] If that were the case, a state other than an injured state would also not be able to seek assurances and guarantees of non-repetition in the collective interest.[109]

14.4.3 *Appropriate assurances and guarantees*

Whether assurances and guarantees of non-repetition are required will depend on the character of the obligation and of the breach and on whether there is a real risk of repetition.[110] This calls for a case-by-case analysis. The distinction between assurances of non-repetition and guarantees of non-repetition is that assurances are normally given verbally, whereas guarantees involve something more, such as the taking of preventive measures.[111] The commentary gives examples of assurances and guarantees of non-repetition sought in diplomatic practice from the turn of the twentieth century.[112]

In *LaGrand* the Court stated that where a foreign national was not advised of their rights under Article 36 and was 'subjected to prolonged detention or sentenced to severe penalties', as occurred with the individuals in question, an apology would not be sufficient.[113] The Court considered that the programme undertaken by the United States met Germany's request for a general assurance of non-repetition. In so holding, the Court suggests that what is required is the use of 'best efforts' to avoid repetition, as opposed to an assurance or guarantee that no violation will ever occur again: the 'programme in question certainly cannot provide an assurance that there will never again be a failure by the United States to observe the obligation of notification under Article 36 of the Vienna Convention. But no State could give such a guarantee and Germany does not seek it.'[114] In *Avena*, before reaffirming its conclusion in *LaGrand*, the Court observed:

> While it is a matter of concern that, even in the wake of the *LaGrand* Judgment, there remain a substantial number of cases of failure to carry out the obligation to furnish consular information to Mexican nationals, the Court notes that the United States has been making considerable efforts to ensure that its law

[108] ARSIWA, Art. 37(1). [109] ARSIWA, Art. 48(2); Barbier (2010), 556–7.
[110] ARSIWA Commentary, Art. 30, §13. [111] ARSIWA Commentary, Art. 30, §12.
[112] ARSIWA Commentary, Art. 30, §§12–3. [113] *LaGrand*, ICJ Rep. 2001, p. 466, 512.
[114] Ibid., 513.