INTERNATIONAL COURT OF JUSTICE

OBLIGATIONS OF STATES IN RESPECT OF CLIMATE CHANGE

(REQUEST BY THE UNITED NATIONS GENERAL ASSEMBLY FOR AN ADVISORY OPINION)

ANNEXES TO THE WRITTEN STATEMENT OF THE COOK ISLANDS

20 MARCH 2024

LIST OF ANNEXES

A. EXPERT REPORTS

B. WRITTEN TESTIMONIALS

Pacific Community
Communauté du Pacifique

INTERNATIONAL COURT OF JUSTICE

Request for an Advisory Opinion on Obligations of States in respect of Climate Change

Expert Report for the Government of Cook Islands
prepared by the Pacific Community (SPC)

14 March 2024

Acknowledgements

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We acknowledge the scientific and technical support from Pacific Community (SPC) staff, including teams within SPC's Human Rights and Social Development (HRSD) division, Geoscience, Energy and Maritime (GEM) division, Fisheries, Aquaculture and Marine Ecosystems (FAME) division, Land Resources Division (LRD), Climate Change and Environmentally Sustainability (CCES) programme and Corporate Communications Office (CCO).

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I. INTRODUCTION AND EXPERTISE

The Pacific Community (SPC) supports Pacific countries and territories with scientific and technical solutions to address the region's greatest challenge, climate change. SPC is one of the Pacific region's scientific and technical intergovernmental organisations working alongside its Pacific Island country and territory (PICT) members[1] to understand and develop effective solutions to the challenges they face. In this case, SPC's core technical abilities to provide the objective science behind observed impacts of the adverse effects of climate change will help provide further expertise for Cook Islands' state submission.

SPC's mandate and work programme addresses the many facets of climate change and its impacts on the region, including but not limited to marine ecosystems, fisheries,[2] coastal hazards, and human rights protections.[3] Additionally, SPC is the regional lead for the implementation of many climate change mitigation and adaptation programmes, including on sea-level rise as well as loss and damage, and it sustainably manages Pacific maritime zones, ecosystems, and resources from 'ridge to reef' for current and future generations.[4] Its expertise in global and regional analyses of the impacts of climate change on the marine environment led to its inclusion in the advisory opinion proceedings at the International Tribunal for the Law of the Sea in Case No. 31.[5]

SPC is also a consultative and advisory body to participating governments and administration in matters affecting the economic and social development of its members within its scope, and the welfare and advancement of their peoples.[6] SPC sustainably manages social and environmental risks and impacts of all its activities in an inclusive manner, with a people-centred approach to maximise whole-of-society benefits. SPC is committed to openness and transparency, maintaining the highest ethical standards, and, as such, the statements contained in this report are factually correct and materially complete.

II. METHODOLOGY

Cook Islands requested this expert report to include the full scope of climate-related losses and damages experienced, including environmental, human health, socio-economic, and cultural impacts. From this request, several of SPC's largest and most relevant divisions provided the necessary science to put

[1] SPC has 27 members, including 22 PICTs: American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Wallis and Futuna.

[2] Note that, under the United Nations Convention on the Law of the Sea (UNCLOS), fishing is singled out among the legitimate uses of the sea that are negatively affected by pollution ('pollution of the marine environment means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities'), UNCLOS, 10 December 1982, 1833 United Nations Treaties Series (U.N.T.S.) 397 (entered into force 1 November 1994) at Article 1(1)(4).

[3] Article IV, §§ 6-10, of the Canberra Agreement establishing the South Pacific Commission (U.N.T.S., vol. 97, 227).

[4] For the full range of SPC's implementation for mitigation and adaptation programming, *see* Pacific Community Strategic Plan 2022–2031 (available at: https://purl.org/spc/digilib/doc/uzzya).

[5] *See* Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law (Request for an Advisory Opinion submitted to the Tribunal).

[6] See note 3 at para. 6.

together this report, compiled by an international lawyer with a scientific background to ensure proper competencies.[7]

The science captured in this expert report builds upon the best available science, including the Sixth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC).[8] It covers climate impacts that have already been observed as well as those currently occurring, like extreme weather events such as cyclones, changing rainfall patterns and drought, ocean warming, acidification and deoxygenation, and others.

It concludes that (i) Cook Islands has experienced significant harm as a result of anthropogenic climate change, and (ii) future losses and damages are bound to occur, with the extent of future harm depending on actions taken to avert, minimise, and address such losses and damages.

III. CLIMATE CHANGE–RELATED IMPACTS

Small island developing states, due to their geographical circumstances and level of development, are specially affected and particularly vulnerable to the adverse effects of climate change. For Cook Islands, these well-documented harms include, but are not limited to, extreme weather events: sea-level rise; coastal erosion; ocean warming, acidification, and deoxygenation, and adverse effects on pelagic and coastal fisheries; coral reefs and biodiversity; temperature rise; drought and water security; agriculture; and food security.[9] These impacts are described under the progression of time and corresponding increased temperature projections, and where possible, include climate impacts likely to occur at 2.8°C, the level of warming projected to occur if nationally determined contributions (NDCs) submitted under the Paris Agreement are fully implemented.

Changing rainfall patterns, water security, and drought

Annual rainfall has decreased significantly in Rarotonga since 1951. This is attributed to decreases from May to October in the number of wet days and year-to-year variability associated with El Niño–Southern Oscillation (ENSO). For Penrhyn, decade-to-decade variability is evident. Annual rainfall has varied from approximately 1100 to 3000 mm at Rarotonga and from approximately 800 to 4700 mm at Penrhyn (see Figure 1).[10]

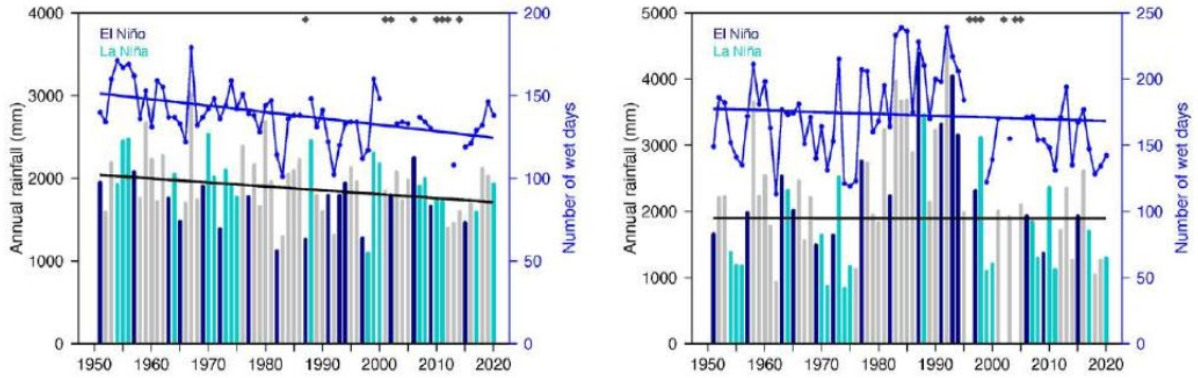
[7] SPC's relevant divisions include Human Rights and Social Development (HRSD), Geoscience Energy and Maritime (GEM), Fisheries, Aquaculture and Marine Ecosystems (FAME), Land Resources Division (LRD), and Climate Change and Environmentally Sustainability (CCES).

[8] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, available at https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf.

[9] *See mainly*, McGree, Simon, Grant Smith, Elise Chandler, Nicholas Herold, Zulfikar Begg, Yuriy Kuleshov, Philip Malsale and Mathilde Rittman, SPC. *Climate Change in the Pacific 2022: Historical and recent variability, extremes and change.* Chapter 16 'Vanuatu'; and Gillett R. and Fong M. 2023. Fisheries in the economies of Pacific Island countries and territories (Benefish Study 4). Noumea, New Caledonia: Pacific Community. 704 p. https://purl.org/spc/digilib/doc/ppizh. SPC also received data on *Coral Reefs* and on *Biodiversity* from experts at the Secretariat of the Pacific Regional Environment Programme (SPREP) in consultation with the Vanuatu government.

[10] McGree et al., *Climate Change in the Pacific 2022* 'Cook Islands', Chapter 2.4 'Rainfall', 21.

Figure 1. Annual rainfall (bar graph) and number of wet days (line graph) at Rarotonga (left) and Penrhyn (right).[11]



For Cook Islands, domestic water sourced from stream catchment is limited and makes the country highly dependent on rainfall. Given this, Cook Islands is highly vulnerable to changing weather patterns and drought. Droughts have varying degrees of impact, and in general, lead to devastating water and food insecurity, fires and, in some PICTs, electricity shortages due to limited water for hydroelectricity.[12]

All water sources in Cook Islands are vulnerable to drought. Approximately 24.4% of households in Cook Islands operate land for agricultural purposes with 49% growing fruit and crop trees (e.g., bananas, taro, papaya, cassava), 43.7% growing flowers, 35.6% growing vegetables and 55% collecting coconuts.[13] The largest number of households in Cook Islands (83.4%), and especially the population in Rarotonga (90.8%), access water through the public water main, while the second most common source is water tanks. Water tanks remain the main source of water supply in outer islands—used by 98.5% of households in the northern islands and 87.2% in the southern islands.[14]

Increased frequency of high-temperature days

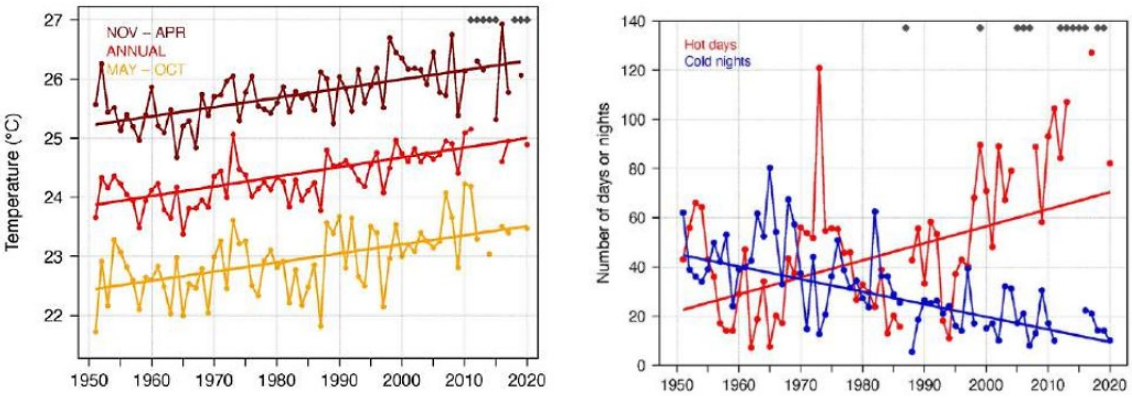
Average annual and seasonal temperatures have increased significantly in Rarotonga with November to April temperatures warming at approximately the same rate as May to October temperatures, indicating that daily minimum temperatures are warming faster than daily maximum temperatures. The number of hot days and warm nights has increased, and the number of cool days and cold nights has decreased (see Graph Comparison 1 below).

It is important to note that there is a significant difference in seasonal temperatures between the Northern and Southern Cook Islands. The position of the Northern Cook Islands (northern group) is close to the equator and results in fairly constant temperatures throughout the year, while in the Southern Cook Islands (southern group), temperatures cool off during the dry season. With all of this, scientists agree that there has been a clear shift towards warmer average monthly temperatures between the

[11] Figure from McGree et al., *Climate Change in the Pacific 2022* 'Cook Islands', Chapter 2.4 'Rainfall', 21. The 'wet days' account for rainfall that is at least 1 mm. Straight lines indicated linear trends for annual rainfall (black) and the number of wet days (blue). Diamonds indicate years with insufficient data for one or both variables.
[12] Clissold, Rachel, Karen E. McNamara, Ross Westoby, and Vaine Wichman. *Local Environment* 2023, vol. 28, no. 5, 645–661, https://doi.org/10.1080/13549839.2023.2169912.
[13] Cook Islands Statistics Office. 2018. *Cook Islands Population Census: Census of Population and Dwellings.* Rarotonga: Cook Islands Statistics Office.
[14] See note 12.

climatology periods of 1961–1990 and 1991–2020, with warmer average air temperatures occurring in all months throughout the year for Rarotonga.[15]

Graph Comparison 1. Average annual November–April and May–October temperatures for Rarotonga and the annual number of hot days and cold nights at Rarotonga.[16]



Extreme weather events

Tropical cyclones usually occur around Cook Islands during the souther hemisphere tropical cyclone season from November to April, but are increasingly occuring outside of that season. Interannual variabliity in the number of tropical cyclones in the Cook Island's exclusive economic zone (EEZ) is large, ranging from zero in some seasons to six in others (1980/81, 1997/98, and 2004/5).

Figure 2. Number of tropical cyclones passing within the Cook Islands EEZ per season with the 11-year average presented as a purple line and considering all years.

Records of tropical cyclones exist from the late 1800s in some countries in the Southwest Pacific, but trends in tropical cyclones have only been presented from 1981/82. Satellite-based observations began in the southwest Pacific in the early 1970s, but consistent coverage and reliable intensity estimates have only been available since the early 1980s. Confidence in tropical cyclone trends is moderate as the definition of a tropical cyclone has changed and satellite observation methods have continued to improve over the last 40 years.

[15] McGree et al., *Climate Change in the Pacific 2022*. 'Cook Islands', Chapter 2.4 'Air Temperature', 23.
[16] McGree et al., *Climate Change in the Pacific 2022*, 'Cook Islands', Chapter 2.5 'Air temperature: Trends', 23-24. Straight lines indicate linear trends. Diamonds indicate years with insufficient data for one or more variables.

Cyclone-related economic losses (e.g., losses to physical assets and production losses) are extremely high in the Pacific region and in Cook Islands where the highly exposed coastlines harbour the majority of the population, infrastructure, and economically important sectors.[17] This susceptibility was prominent when Tropical Cyclone Pat hit Aitutaki in February 2010 destroying 75% of homes on the island (see Picture 1).[18]

Picture 1. Example of damage caused by Tropical Cyclone Pat, February 2010.

Avarua town, the capital of Cook Islands and located on the north shores of Rarotonga island, is the densest residential area in the country and highly vulnerable to the impacts of tropical cyclones. It is the hub of Cook Islands' economy and industry, inclusive of the international airport, main fuel depot, Avatiu port and Harbour, Avarua Harbour, and the majority of government ministries.

In Maps 1–3 below, this portion of the shoreline depicts the socio-economic and environmental consequences of tropical cyclone impacts on coastal zones and nearby infrastructure when extreme wave and storm surges occur, also taking into account climate change effects over time. Blue highlighted areas are places that likely experience flooding in an average scenario; the darker the blue, the deeper the water. Yellow highlighted areas show places likely to experience wave 'overwash'.[19] Orange highlighted areas represent places likely to experience 'overtopping' wave impacts.[20] The red areas are likely to experience the heaviest surge and wave impacts, with the red blocks representing the buildings in the area that are exposed to these hazards and likely to suffer the most damage.

It is important to note when comparing these scenarios that what was once typically a 'one-in-every 20-year event' can be skewed as extreme weather events continue to be unprecedented. For example, between February and March 2005 there was an unprecedented five cyclones that hit Rarotonga within that two-month period, four of which were category 5.[21] Again, the three maps shown below depict the average recurrence intervals (ARIs) for these different scenarios, demonstrating how vulnerable Cook

[17] Clissold et al. *Local Environment* 2023, vol. 28, no. 5, 645–661.
[18] *See* 'Avarua, Rarotonga: Quantifying Asset Exposure to Extreme Events and Climate Change', 12 March 2022, available at https://storymaps.arcgis.com/stories/bbb631b99e044255838ade103e85eded. The damage from Cyclone Pat also resulted in the migration of households and a year-long reconstruction process.
[19] Overwash occurs during intense coastal storms when the combination of storm surge and storm waves overtops the beach crest and topographic high of a barrier island and deposits washover sand, causing erosion.
[20] Wave overtopping is the time-averaged amount of water that is discharged per linear metre by waves over a structure such as a breakwater, revetment or seawall, which has a crest height above still water level; it is the amount of water flowing over a coastal structure.
[21] *See* note 17.

Islands' economic and industrial hub is to extreme weather events, especially as they become more frequent.

Map 1. One-in-20-year average recurrence interval (ARI) for tropical cyclone events on the Avarua to Nikao coastline.[22]

Map 2. One-in-50-year ARI for tropical cyclone events on the Avarua to Nikao coastline.[23]

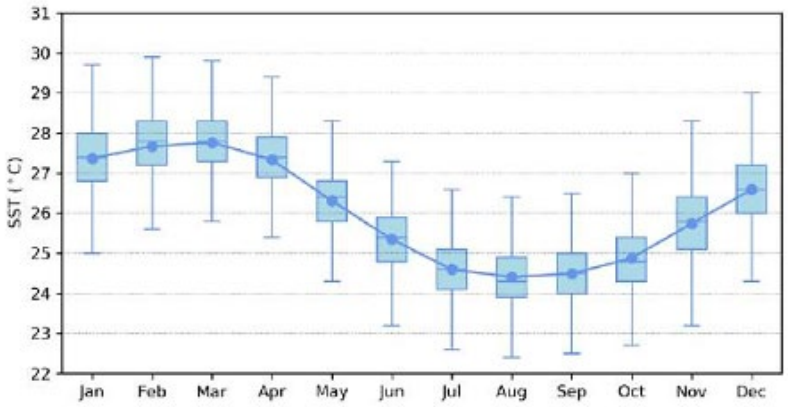
[22] An average recurrence interval (ARI) for tropical cyclone events models the vulnerability relationships that quantify and identify exposure and/or impact levels of different magnitude and intensity scenarios.
[23] This one-in-50-year ARI scenario depicts the damage from extreme wave and storm surges to the coastline for an average cyclone event that would occur once every fifty years.

Map 3. One-in-100-year ARI for tropical cyclone events on the Avarua to Nikao coastline.[24]

Ocean warming, acidification, and deoxygenation

Ocean temperature, as measured by the Rarotonga tide-gauge from 1993 to 2021, reaches on average a maximum of nearly 28°C in February/March but can get as high as 30°C (see Graph 1). Monthly average ocean temperatures in any given year can be up to ±2°C from the 24.5°C average in August and the 28°C average in February and March.

Graph 1. Annual temperatures measured at the Rarotonga tide-gauge.[25]



Sea surface temperature (SST) increased within the Cook Islands EEZ by 0.21°C per decade from 1981 to 2021. From 1981 to 2021, the SST from satellite observations averaged over the Cook Islands EEZ is shown in Graph 2. The data shows a trend of 0.21°C per decade with a 95% confidence interval of ±0.06°C. Finally, given the difference between the northern group (near the Equator) from the southern group, Figure 3 shows the observed and projected SST for the Southern Cook Islands, which shows steady warming and predicts a massive rise in SST in the near future.

[24] This one-in-100-year ARI scenario depicts the damage from extreme wave and storm surges to the coastline for an average cyclone event that would occur once every one hundred years.
[25] McGree et al., *Climate Change in the Pacific 2022,* 'Cook Islands', Chapter 2.7 'Sea surface temperature', 26. Blue dots show the monthly average, and shaded boxes show the middle 50% of hourly observations. Lines show the top and bottom 25% of hourly observations.

Graph 2. Historical sea surface temperature from satellite observations averaged across the Cook Islands EEZ.[26]

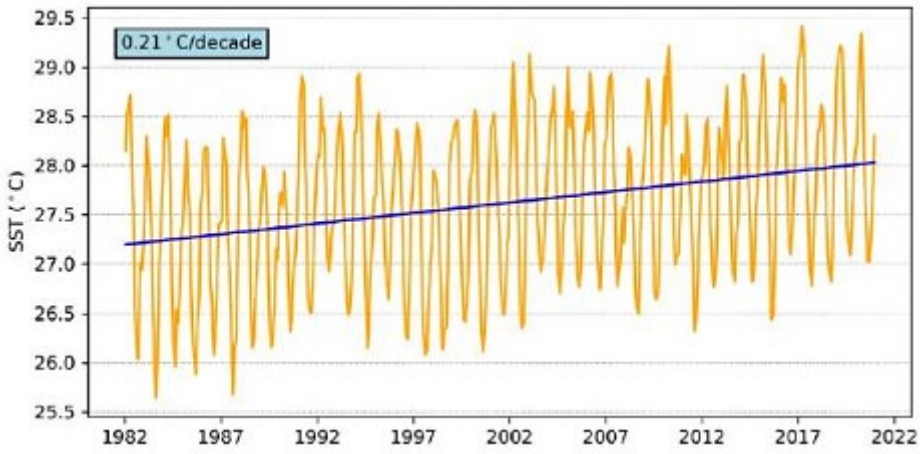
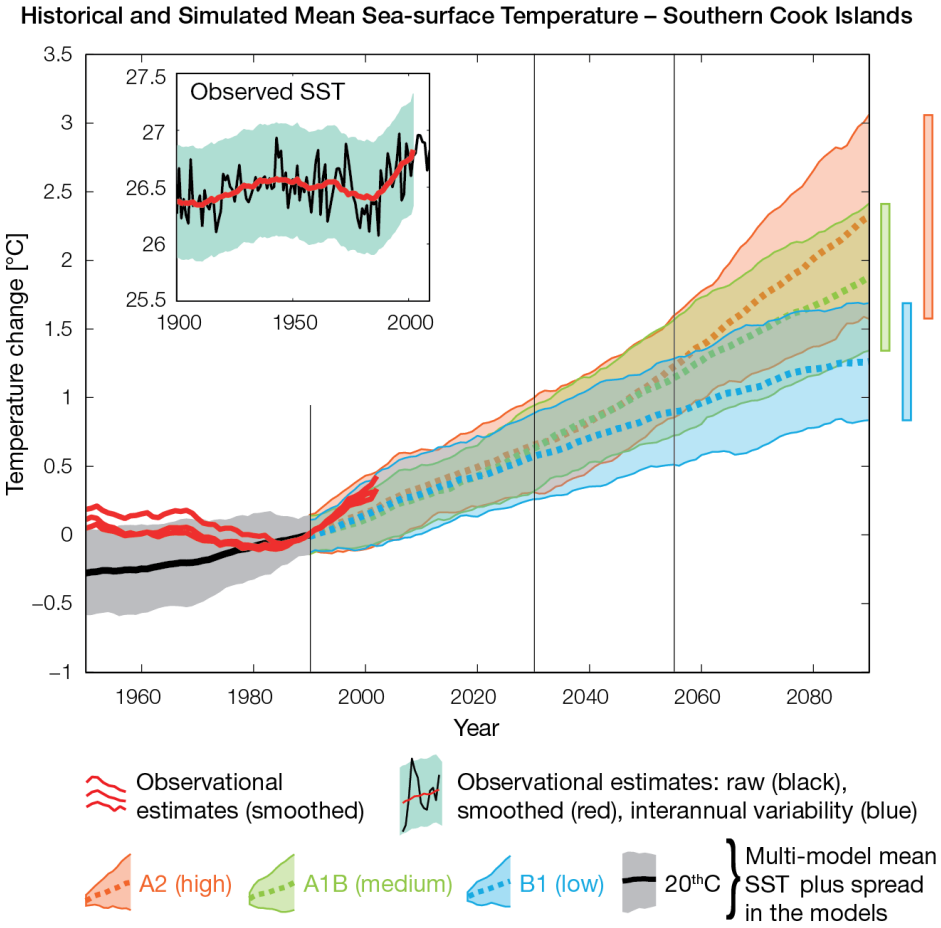


Figure 3. Sea surface temperature observed and projected in the southern Cook Islands.[27]

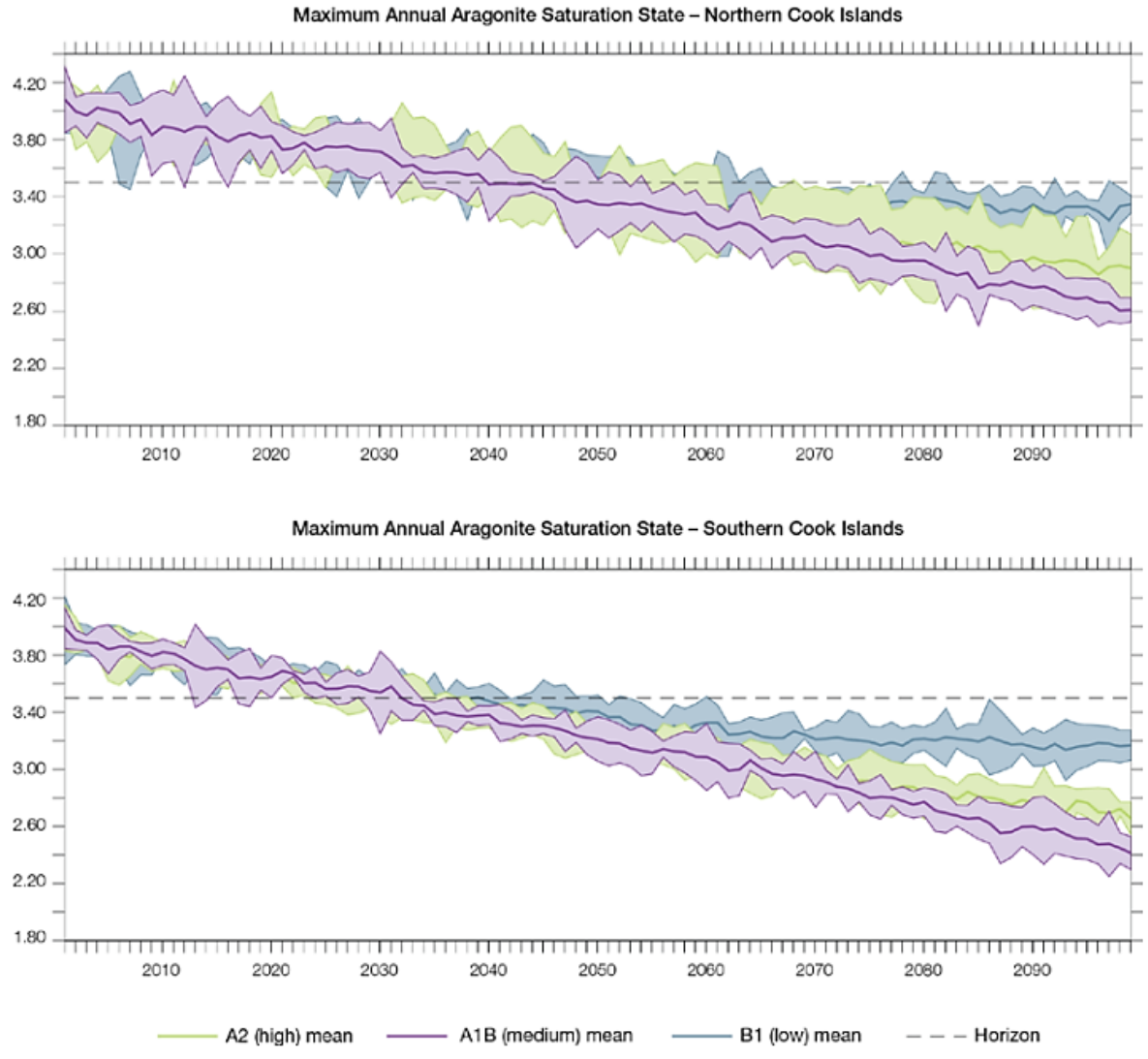


[26] *Ibid*.
[27] Figure from Pacific Climate Change Science, *Chapter 2: Cook Islands*, available at: https://www.pacificclimatechangescience.org/wp-content/uploads/2013/09/Cook-Islands.pdf, 35.

The acidification of the ocean will continue to increase and there is a 'high' confidence in this projection (see Figure 4) as the rate of ocean acidification is primarily driven by the increasing oceanic uptake of carbon dioxide in response to rising atmospheric carbon dioxide concentrations. The annual maximum aragonite saturation state is declining (i.e., getting more acidic). Aragonite saturation states above 4 are optimal for coral growth and the development of healthy reef systems, so the impact of acidification change on reef ecosystem health is likely to compound other stressors, including coral bleaching, storm damage, and fishing pressures.

These multi-model projections of the maximum annual aragonite saturation state in the sea surface waters, and their associated uncertainty (shaded area represents two standard deviations), in the Northern Cook Islands (top) and the Southern Cook Islands (bottom) shows outcomes under the different emissions scenarios. The dashed black line represents an aragonite saturation state of 3.5 (marginal state). These models indicate that the annual maximum aragonite saturation state (measure for ocean acidity) will reach values below 3.5 (extremely marginal, i.e., not ideal for coral growth and healthy marine ecosystems) by about 2050 for the Southern Cook Islands and by about 2065 for the Northern Cook Islands.

Figure 4. Ocean acidification in the Northern and Southern Cook Islands over time.[28]



[28] *Ibid*., 38.

Fisheries and aquaculture

In a 2020 study on the valuation of ecosystem services in Cook Islands, Brander et al. provided the values of subsistence fisheries, commercial fisheries, trochus, pearls, and others (e.g., tourism, recreation, etc.).[29] The report strives to estimate the "total economic value" of an ecosystem service, which includes all of the net benefits humans receive from that ecosystem service (see Table 1 for a data set for small-scale tuna catch). The ecosystem services study concluded that the economic value of subsistence fisheries is worth NZ$3,661,182 per year, commercial fisheries NZ$50,389,917, trochus NZ$55,690, and pearls NZ$300,000.[30]

Table 1. Small-scale tuna trolling line catch in Cook Islands waters.[31]

	Effort	Albacore	Bigeye	Yellowfin	Skipjack	Other	Total
2017	17,302 hrs	0	0	92	4	4	100
2018	17,651 hrs	1	1	87	5	3	97
2019	13,642 hrs	3	1	64	7	2	77
2020	10,890 hrs	0	0	69	5	4	78
2021	13,295 hrs	0	0	44	3	1	48

Source: MMR (2022); Units: tonnes

According to the Ministry of Marine Resources, a total of 61 foreign-flagged vessels were licensed and authorised to operate within the Cook Islands EEZ during 2021: 51 longliners and 10 purse seiners.[32] Using price information from the Forum Fisheries Agency (FFA) and adjusting for in-zone prices (FFA gives delivered prices), the value to fishers of the 4621 t can be determined. The catch is worth NZ$15.7 million.[33]

Pearl farming

In Cook Islands, the most significant type of aquaculture present is pearl farming. The black-lip pearl oyster (*Pinctada margaritifera*) is farmed for black pearl production in Cook Islands and is important for the local mariculture industry and for supporting local livelihoods in fisheries and tourism. Black-lip pearls are the main aquaculture commodity in Cook Islands, with the reported number of saleable pearls produced annually ranging from 37,169 [34] to 56,000 [35]. In 2014, an estimated 50,000 pearls worth US$15.63 per pearl were produced, equalling US$781,250 in value.[36] Pearl production reached a

[29] Brander, Luke, Kelvin Passfield, Kate McKessar, Kate Davey, Victoria Guisado, Florian Eppink, Nicholas Conner, and Hayley Weeks. *Cook Islands Marine Ecosystem Services Valuation* (2021) available at https://environment.gov.ck/wp-content/uploads/2022/06/25.-Cook-Islands-MESV-Report-2021.pdf
[30] Gillett and Fong. *Fisheries in the Economies of Pacific Islands Countries and Territories (Benefish Study 4)*. This study is not independent of the series of Benefish studies as it contains the statement, "The results from Gillett (2016) are used to value subsistence and commercial fisheries in this report". However, both the method of valuation and composition of categories differ between the studies, as do the focus years (2014 vs 2019).
[31] Table found in *Benefish 4*, see note 9, 34. Note the lower numbers in 2021 due to COVID-19; Cook Islands did not experience the pandemic until 2021.
[32] *Ibid.*, 35. Purse seiners are large walls of netting deployed around an entire area or school of fish. The seine has floats along the top line with a lead line threaded through rings along the bottom of the net.
[33] *Ibid*.
[34] Brown, Mark. *Cook Islands Government Budget Estimates 2015/2016: Book 1, Appropriations Bill* (2015).
[35] According to previously reported MMR data in *Fisheries in the Economies of Pacific Islands Countries and Territories*, 32.
[36] Gillett. *Fisheries in the Economies of Pacific Island Countries and Territories* (2016).

maximum in Cook Islands in 1999–2000. At its peak, there were 81 farms with two million shells in the water, accounting for more than 90% of national exports and 20% of gross domestic product.

The production of pearls is already vulnerable to marine heatwaves, ocean acidification, and tropical cyclones. Increasing SST and ocean acidification, and the high possibility of more severe cyclones, are expected to reduce the survival and growth of pearl oyster spat (larvae) in Cook Islands.[37] Ocean acidification is also expected to affect the formation of nacre by pearl oysters, and therefore pearl quality.[38] Additionally, pearl farmers have observed changes in black pearl production and quality, particularly poor spat formation, lower quality (dull) pearls, smaller pearls and a reduction in the production of rare and more valuable varieties (e.g., white pearls).

In a recent study on the historical and projected climate change impacts surrounding the Manihiki Lagoon region, the main pearl farming area in Cook Islands, situated 1200 km northwest from Rarotanga, the effects of high SST and ocean acidification have deleteriously affected spat formation. Spat collection is the process of attaching pearl oyster larvae onto artificial substrates, a common method used in the pearl industry for inexpensive, simple, and sustainable farming. The projected increase in ocean temperatures would likely result in more episodes of water surpassing the 34°C threshold by 2030, potentially affecting the productivity of Manihiki Lagoon pearl farming in the future.[39] This is particularly concerning as marine heatwaves are becoming more frequent in the region over the past decade affecting pearl production. Pearl farming on atolls is also strongly dependent on water quality and renewal, particularly controlled by the wave conditions that impact lagoon circulation, like swells, wave height, and changing ocean currents—all factors that are sensitive to climate change.[40]

Pearl farmers in Cook Islands have been noticing issues with oyster shells being thinner and deformities more common. Climate-related changes in chemistry, namely ocean acidification, can adversely affect shell growth and pearl quality. Moreover, the coral reefs protecting the atoll (lagoon island) are also adversely affected by climate change–related harms to the marine ecosystems, which would compound harms to pearl production.[41] With ocean acidification projected to increase, even under low emissions scenarios, the median aragonite saturation state never falls below 3.5, considered to be marginal conditions, so curbing ocean acidification is of special importance to preventing economic harms to Cook Islands' pearl industry.

Finally, a crude approximation of the annual volumes and values of fishery and aquaculture harvests in 2021 can be made from the MMR data (see Table 2). The Statistics Office of the Ministry of Finance and Economic Management refers to the fishing sector as "fishing and pearls". The official fishing contribution to GDP from 2017 to 2021 is given in Table 3 and demonstrates the importance of this sector to Cook Islands.

[37] Bell, J. D., et al. (2013). "Mixed responses of tropical Pacific fisheries and aquaculture to climate change." *Nature Climate Change* 3(6): 591-599; *see also* Bell, Johann D., Johanna E. Johnson, and Alistair J. Hobday, (eds). Vulnerability of tropical Pacific fisheries and aquaculture to climate change (2011), available at https://purl.org/spc/digilib/doc/en9j3.
[38] Pickering, Timothy D., Ben Ponia, Cathy Hair, Paul C. Southgate, E. Poloczanska, L. D. Patrona, Antoine Teitelbaum et al. "Vulnerability of aquaculture in the tropical Pacific to climate change." Secretariat of the Pacific Community, 2011.
[39] CSIRO and SPREP (2022). 'NextGen' Projections for the Western Tropical Pacific: Climate change projections to inform black pearl production vulnerability in the Cook Islands. Technical report to the Australia-Pacific Climate Partnership for the Next Generation Climate Projections for the Western Tropical Pacific project. Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Secretariat of the Pacific Regional Environment Programme (SPREP), CSIRO Technical Report, Melbourne, Australia. https://doi.org/10.25919/sr2h-8282 (access restricted), 8.
[40] *Ibid*., Figure 5, 7; see also PACCSAP analysis (Australian Bureau of Meteorology and CSIRO, 2014).
[41] *Ibid.*.

Table 2. Summary of fishery and aquaculture harvests in Cook Islands for 2021.[42]

Harvest sector	Volume (t and pcs)	Value (NZ$)
Coastal commercial	150	1,600,000
Coastal subsistence	280	2,300,000
Offshore locally based	100	2,500,000
Offshore foreign-based	4,621	15,700,000
Freshwater	5	41,000
Aquaculture	81,500 pcs	330,500
Total	5,156 t and 81,500 pcs	22,471,500

Table 3. Contribution of fishing (fishing plus pearls) to Cook Islands GDP.[43]

	2017	2018	2019	2020	2021
Fishing (including pearls)	1.5	1.6	2.3	1.2	2.0
GDP at market prices	486.4	524.2	575.4	437.0	463.3
Fishing as a % of GDP	0.3%	0.3%	0.4%	0.3%	0.4%

Source: Cook Islands Statistics Office (unpublished data)

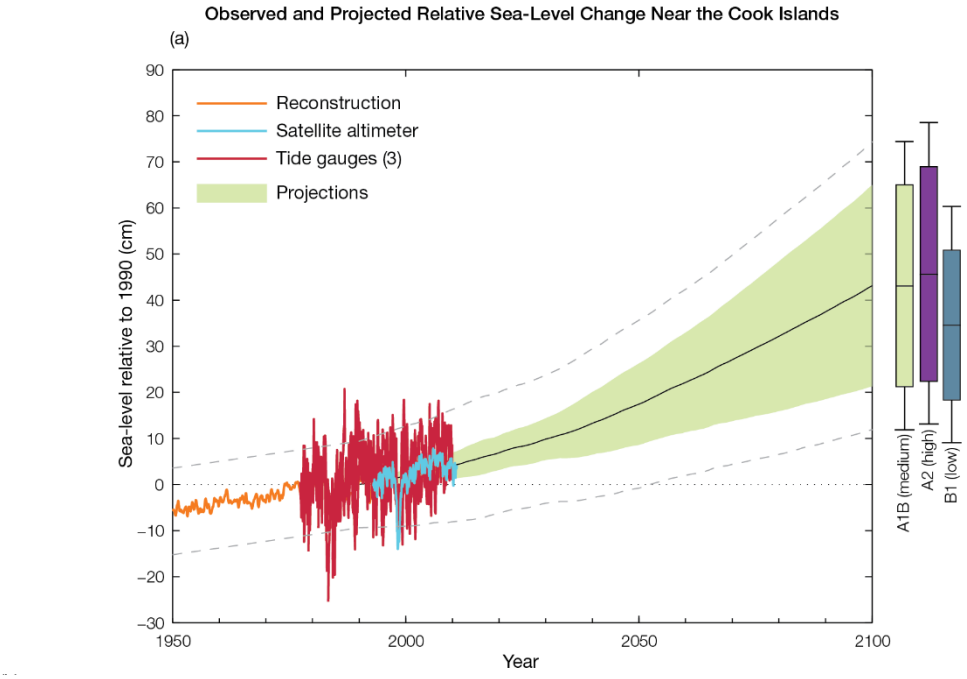
Sea-level rise

Cook Islands experiences a semidiurnal tidal cycle, meaning that two high and two low tides occur per day. The highest predicted tides of the year typically occur in the wet season months from November to April. Peak sea levels typically occur over a significant portion of the year, ranging from October to April. Since approximately 2006, increasingly more hours each year exceed the 2.0 m sea level threshold. This is due to a combination of sea-level rise and minor subsidence (land sinking) occurring at Rarotonga.[44]

Sea levels at Cook Islands, as measured by satellite altimeters since 1993, have risen 2.5–5.5 mm per year across most of the EEZ, with a 95% confidence interval of ±0.4 mm in the south and up to ±0.8 mm in the north. Trend estimates in the south are higher, ranging from 3.5 to 5.5 mm per year, which is larger than the global average of 3.1 ± 0.4 mm per year.[45] This rise is partly linked to a pattern related to climate variability from year to year and decade to decade.

[42] Gillett and Fong, *Benefish Study 4*, 37. Aquaculture is not shown in volumes but in a mixture of units (pieces and tonnes).
[43] *Ibid*., 37.
[44] Brown, N. J., A. Lal. B. Thomas, S. McClusky and J. Dawson, G. Hu and M. Jia. Vertical motion of Pacific Island tide gauges: combined analysis from GNSS and levelling. Geoscience Australia, 2020, http://dx.doi.org/10.11636/Record.2020.003.
[45] Karina von Schuckmann et al. (ed.), Copernicus Marine Service Ocean State Report, Issue 4, Ch 3, s77, 2020, https://doi.org/10.1080/1755876X.2020.1785097.

Figure 5. Sea-level rise observed and projected near Cook Islands.[46]



Food security and human health

Climate change affects food security, which also impacts human health. Additionally, climate change and overall climate variability will have heavy impacts on the agricultural and fishery sectors, threatening food security and the ability of Cook Islanders to produce and access safe and nutritious foods. There has been historical reductions in Cook Islands' food production index due to a decline in both area and yield of major crops like coconuts, roots, and tubers (including cassava and sweet potatoes).[47] This has far-reaching consequences.

Like many other Pacific Islands, fish consumption is high in Cook Islands, so impacts to fisheries due to climate change will also affect the nutritional uptake of healthy proteins in its population's diet. The Cook Islands 2015/16 HIES contains information relevant to fish consumption.[48] The survey indicates that 5.5% of household expenditure on food is for "fish and seafood". This is small compared to the 27.0% expenditure on "meat". In terms of the most important items consumed by households, "fresh/frozen fish" ranks ninth, behind bread/cereals, chicken, canned corned beef, taro, lamb/mutton, eggs, doughnuts and powdered milk.[49]

The increased persistence of ENSO conditions in recent decades, and the apparent intensification of tropical cyclones also wreaks havoc on agricultural sectors, impacting food security. Sea-level rise and saltwater inundation into the freshwater lens impedes crop growth, and the loss of land reduces available farmland for agricultural production, compounding the problem. Lack of rain, soil degradation, and shifting seasons also reduce productivity. Low agricultural yields increase the reliance on imported food, which can often be less nutritious and further impacts human health.

[46] Pacific Climate Change Science, *Chapter 2: Cook Islands*, 39.
[47] Asian Development Bank, *Food Security and Climate Change in the Pacific*, available at: https://www.adb.org/sites/default/files/publication/29078/climate-change-food-security.pdf, 11.
[48] Cook Islands Statistics Office. *Cook Islands 2025–16 Household Income Expenditure Survey (HIES)*, available at https://stats.gov.ck/cook-islands-2015-16-household-income-expenditure-survey-hies/.
[49] Gillett and Fong, *Benefish Study 4*, 46.

IV. CONCLUSION

Climate change is causing significant harm to Pacific Island countries like Cook Islands. This harm materialises in the form of changing rainfall; prolonged droughts; higher air temperatures; extreme weather events; ocean warming, acidification, and deoxygenation; sea-level rise; and other impacts.[50] Cook Islands is already witnessing these impacts, and projections indicate that these impacts are bound to intensify. The extent to which this existential threat materialises will heavily depend on actions taken to curb anthropogenic greenhouse gas emissions—the vast majority of which is generated outside its borders—as well as measures to adapt to climate change and respond to the loss and damage it causes.

[50] *See also* SPC's written submission to the Tribunal for the Law of the Sea, 16 June 2023, available at https://www.itlos.org/fileadmin/itlos/documents/cases/31/written_statements/2/C31-WS-2-5-SPC.pdf.

Request for an Advisory Opinion on Obligations of States in respect of Climate Change

Expert Report for Cook Islands from the Secretariat of the Pacific Regional Environment Programme (SPREP)

Compilation and Authorship by Jessica Rodham and Everett Sioa

18 March 2024

Table of Contents

I. INTRODUCTION

Secretariat of the Pacific Regional Environment Programme (SPREP):

SPREP is the regional organisation established by the Governments and Administrations of the Pacific charged with protecting and managing the environment and national resources of the Pacific. SPREP's mandate is to promote cooperation in the Pacific region and provide assistance in order to protect and improve its environment and to ensure sustainable development for present and future generations[1]. SPREP is guided by its vision for the future: "A resilient Pacific environment, sustaining our livelihoods and natural heritage in harmony with our cultures"[2].

SPREP works to provide our 21 Pacific Island Members with technical advice and support for capacity building for the region's environmental and development priorities. It also promotes sustainable development and cooperation in the region. SPREP is a Member of the Council of Regional Organisations of the Pacific (CROP) and works with its peer CROP agencies to serve the people and governments of the region. With the support of the Secretariat, much progress has been made by SPREP Members to address environmental concerns.

Pacific Island Leaders recognise climate change as the biggest threat facing the region, with serious implications for sustainable development and the environment that has nurtured the Pacific's unique cultures. Climate change is a dynamic, fast-moving area of action, and SPREP is well placed as a leader, coordinator, and implementer for this important issue in its areas of competence and expertise.

Cook Islands:

This submission by SPREP services to provide scientific data to support the submission by the Government of the Cook Islands. Under the State of the Environment Report 2018 of Cook Islands, it highlights Climate Change as the driver that poses the greatest to the Cook Islands environment, particularly in areas vulnerable to extreme weather events like flooding and cyclones.

The effects of climate change and climate variability are being felt in Cook Islands, and elsewhere, as a key driver of environmental change. Geographic location, topography and other factors influence the rate and intensity of changes in climatic conditions. Thus, the level of vulnerability across the Cook Islands can vary.

II. METHODOLOGY

The Cook Islands requested this expert report to supplement scientific and up to date research on biodiversity and coral reef health. This submission draws from reports produced by SPREP as well as other reports that have specific data on Cook Islands. The primary reports used in preparation of the expert report includes: i) Cook Islands State of the Environment Report 2018 ii) Cook Islands Global

[1] SPREP Agreement, 1993 (available at: https://www.sprep.org/governance/agreements-establishing-sprep)
[2] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands, *Cook Islands State of Environment Report 2018* (Secretariat of the Regional Environment Programme, Cook Islands Government, 2018).

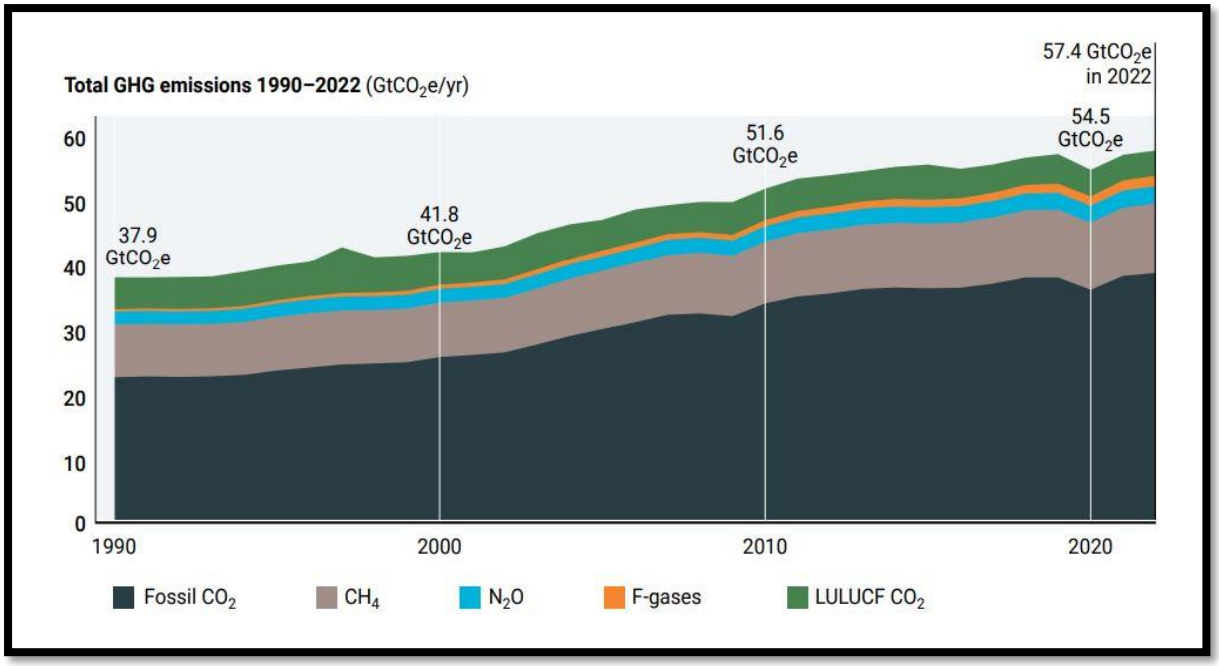
Reef Expedition Final Report and iii) IPCC Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.

The report will aim to provide a summary of climate change impacts on coral reef health and biodiversity in the Cook Islands. The report will draw specific examples on the impacts that climate change has on Cook Islands tourism and its marine mammals.

III. CLIMATE CHANGE-RELATED IMPACTS

Climate change is one driver that poses the greatest threat to the Cook Islands' environment, particularly in areas vulnerable to extreme weather events like flooding and cyclones. Cook Islands is vulnerable to climate change impacts. These can include sea level rise, warming ocean temperatures, ocean acidification and associated adverse impacts to already vulnerable coral reefs, changing migration routes especially for highly migratory species, increased intensity of storm and weather events, and the introduction of invasive species, among others[3].

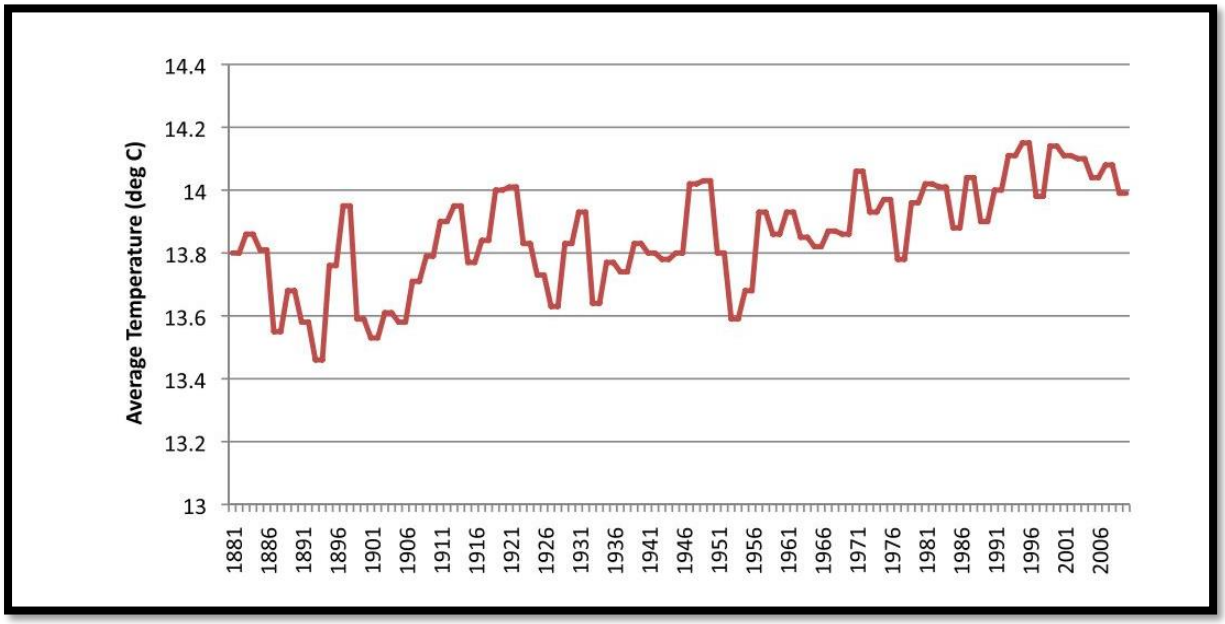
Figure 1 below shows the historical trend for total GHG emissions from 1990-2022[4].



[3] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands, *Cook Islands State of Environment Report 2018* (Secretariat of the Regional Environment Programme, Cook Islands Government, 2018)

[4] United Nations Environment Programme (2023). Executive summary. In Emissions Gap Report 2023: Broken Record – Temperatures hit new highs, yet world fails to cut emissions (again). Nairobi. https://doi.org/10.59117/20.500.11822/43922.

Figure 2 below shows historical average temperatures in the Cook Islands have risen steadily since the late 1800s[5].



Warming oceans due to climate change impacts the coral reefs and coral bleaching events are taking place. Long periods of stress due to warming water can damage coral reefs and bleach whole colonies. Tourism is the largest generator of overseas income in Cook Islands and the largest non-extractive user of reef resources, with most visitors involved in marine activities.

Healthy coral reefs will continue to attract tourists and have major impacts on visitors who consider their reef interactions as part of a genuine environmental experience. Degraded coral reefs can result in a loss of tourism dollars and investment in that sector of the economy.[6]

IV. CLIMATE CHANGE IMPACTS ON CORAL REEF HEALTH

All fifteen of the Islands in Cooks are surrounded by coral reef. There are 136 identified coral species and 650 fish species in the coral reef system. Within these there are 25 threatened coral species, 8 threatened fish species, 3 marine turtle species and 3 threatened whale species[7].

Climate change, particularly warming waters, will have a compounded impact on reefs by increasing the frequency of bleaching events and creating an environment conducive of invasive species outbreaks. The crown of thorns coral species in the Cook Islands is an invasive species that is expected to undergo significant expansion outbreaks if water temperatures rise[8]. In the island of Aitutaki for example, the

[5] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[6] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[7] Marae moana, "Biodiversity," n.d., https://www.maraemoana.gov.ck/biodiversity/.
[8] S Purkis et al., *Global Reef Expedition: Cook Islands. Final Report* (Annapolis: Khaled Bin Sultan Living Oceans Foundation, 2018).

benthic and fish communities surveyed were in significantly worse condition than the islands of Rarotonga and Palmerston due to a COTS outbreak in 2013[9].

Coral reefs are among the most vulnerable ecosystems on the planet to anthropogenic pressures, particularly those influenced by climate change, such as mass coral bleaching events, tropical storms, ocean acidification. Live coral cover is relatively healthy across the southern Cook Islands where reefs usually undergo cyclic declines and recoveries from cyclones and Crown of Thorns Starfish (COTs). While Rarotonga had a large fall in live coral cover over the last decade, coral cover is improving slowly, although shallow inshore reef areas are declining or stable at best.

Figure 3 below provides a timeline of events that have impacted the coral reefs of Cook Islands[10]:

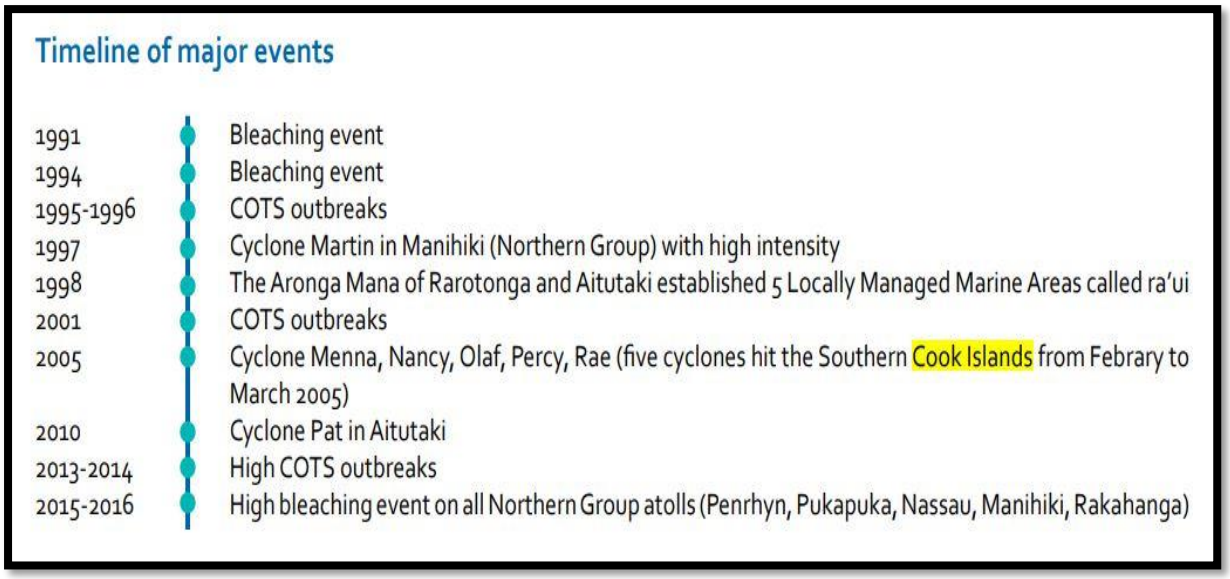


Figure 4 below is a map from the National Oceanic and Atmospheric Administration that depicts the Coral Reef watch as of the 10th of February 2024. It shows that the vast majority of Pacific Island Countries are facing potential bleaching harms to coral reef systems. The Cook Islands is not exempt from this prediction. The Cook Islands EEZ lies between 6-25 degrees south and 155-169 degrees west[11] placing the Cook Islands including the outer islands within the 'Alert level 1 and 2' 'watch and 'warning' classifications under this map. *Figure 5* depicts a closer look at the bleaching alert levels for the Northern Cook Islands. Predictions show high levels of alert for these islands particularly I the 9-12 weel prediction period where the vast majority of the area is identified as 'Alert 2" category[12].

Further to note that predications show this damage is set to worse; a 1.5 increase would further lead to a 70-90% decline[13].

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[9] Purkis et al.
[10] Moritz C, Vii J, Lee Long W, Tamelander J, Thomassin A, Planes S (editors). (2018) Status and Trends of Coral Reefs of the Pacific. Global Coral Reef Monitoring Network, p124
[11] NOAA, "Northern Cook Islands Bleaching Alert Area 25 Feb ", 2024, https://coralreefwatch.noaa.gov/product/vs/gauges/northern_cook_islands.php.
[12] NOAA, "Northern Cook Islands Bleaching Alert Area 25 Feb ", 2024,
[13] IPCC, *Contribution of Working Group Ii to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. D.C. Roberts H.-O. Pörtner, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, and V. Möller S. Löschke, A. Okem, B. Rama, *Climate Change 2022: Impacts, Adaptation and Vulnerability* (Cambridge, UK and New York, NY, USA: Cambridge University Press, 2022).

Figure 4: NOAA Coral Reef Watch 5km Bleaching Alert 10 Feb 2024

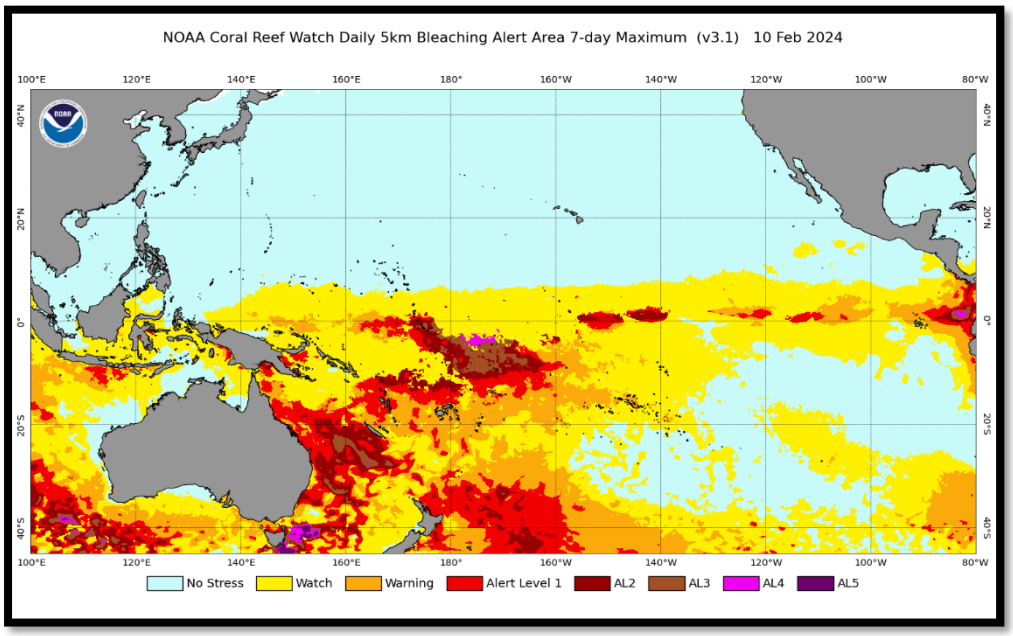
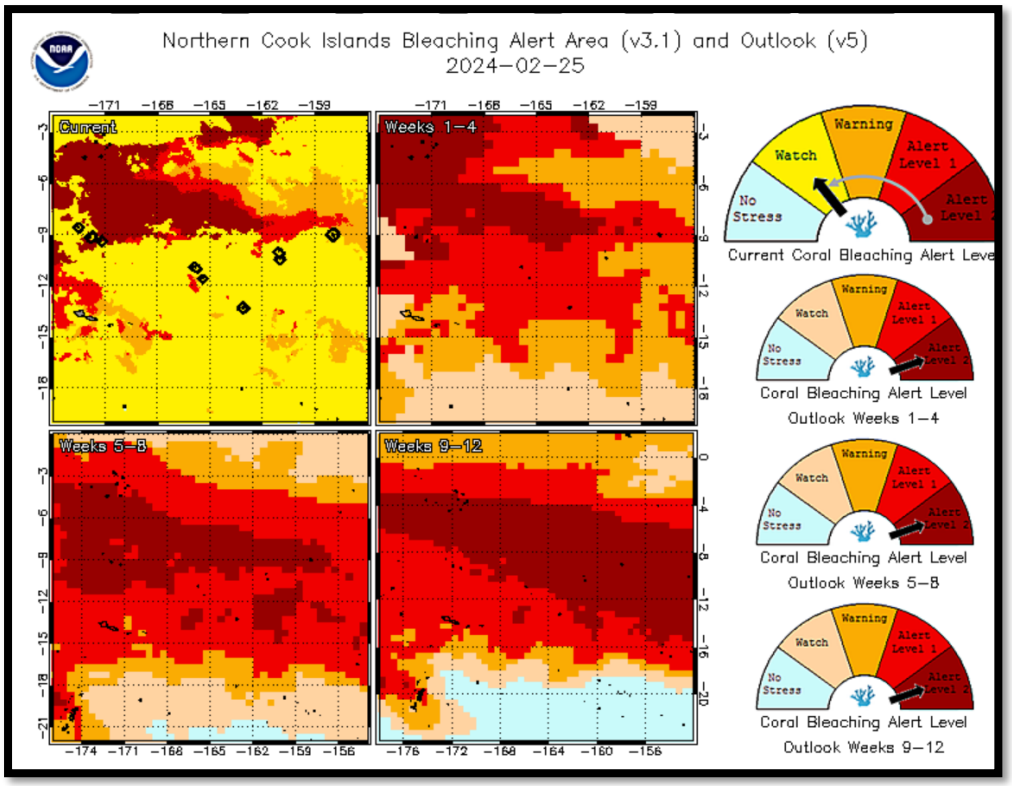


Figure 5: Northern Cook Islands Bleaching Alert Area 25 Feb



Coral Reef and Sustainable Livelihoods

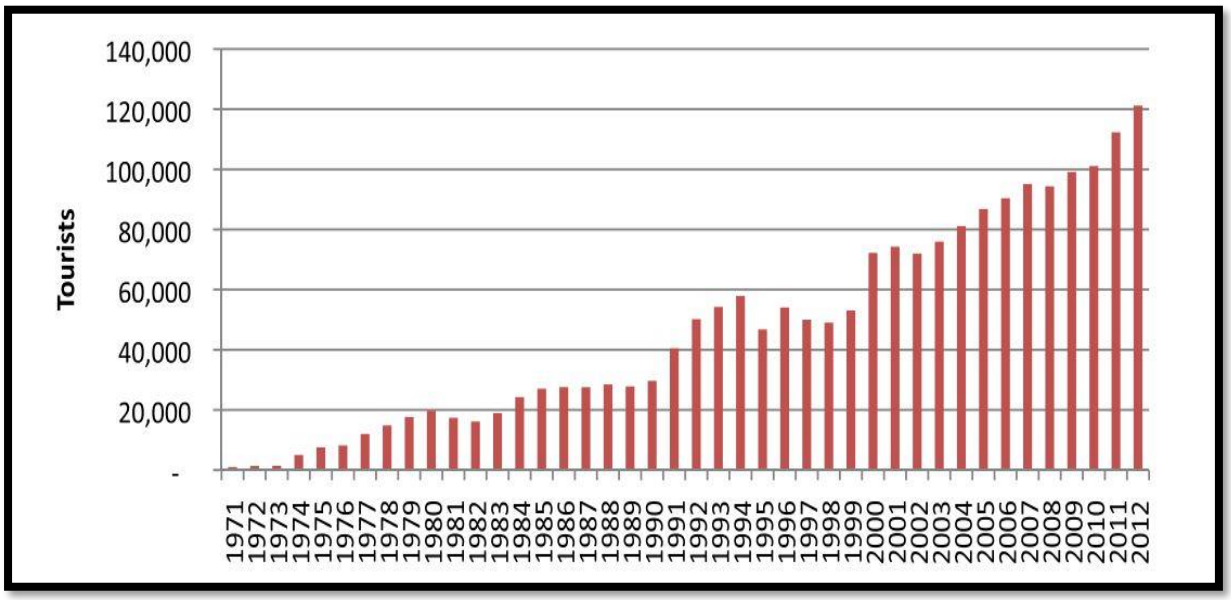
The condition of Cook Islands reefs, particularly in the less populated islands, has a major impact on sustainable livelihoods as many communities rely upon the reefs for food. Poor reef quality and low live coral cover can have negative impacts on biodiversity, result in very few to no shellfish in some areas, an increase in the incidence of ciguatera, and other negative health impacts as locals move from fresh and healthy reef fish diets to imported food.[14]

The National Environment Services of Cooks Islands and other stakeholders are conducting coral reef monitoring in several locations to track coral health, coral bleaching and coral cover. Cook Islands continue to address threats to its coral reefs through ridge to reef programmes. These recognise the links of entire ecosystems from mountains and communities to surrounding reefs and lagoons, and the impacts that land-based activities can have upon coral reefs, particularly from waste, sewage, development, and agriculture.[15]

Coral Reefs and Tourism:

Tourism is the largest driver behind better links to international markets in Cook Islands. Tourist arrivals have grown steadily from around 1500 in 1971 to 121,000 in 2012 (refer to Figure 6 below). The largest period of steady growth began in 1999, when tourist numbers more than doubled from 53,000 to around 121,000 as of 2012.

Figure 6: Tourist arrivals to Cook Islands, 1971 – 2012 (Cook Islands Statistics Office, 2014)



Coral reefs are a major tourist attraction and deliver a substantial amount of money and investment to the country. Cook Islands Tourism has been successful in setting up a lagoon monitoring programme in Aitutaki, and a coral garden project. More emphasis is placed on the role that tourism can play in

[14] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[15] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.

improving coral reefs, such as through tourist taxes or green fees to provide specific money for coral and environmental restoration.

Cook Islands is known for its pristine water and coral reefs which attract tourists, protect coastlines, provide habitat for marine species and provide livelihoods for local communities. Therefore, it is important to keep the impacts (such as climate change impacts) on reefs low and to improve water management and sewage treatment. Available nutrients in the water and changes in the water quality can increase the algae cover. This can change the mix of reef fish, unbalance the reef and reduce resiliency. With the benefits and values coral reefs provide so clearly identified, it is important to redouble efforts to address the impacts from tourism, fishing, thermal stress and ocean acidification.

V. CLIMATE CHANGE IMPACTS ON BIODIVERSITY

The Cook Islands is home to a diverse range of terrestrial and marine species. With an exclusive economic zone of 1,800,000, the Cook Islands is home to a plethora of marine species, 98% of which are native and 1% endemic. Overall, 62% of species, marine and terrestrial, are native and 2% endemic; 38% were introduced pre-, or post-Polynesian context to the Cook Islands. Concerningly, the percentage of endangered species is increasing[16]. A quarter of endemic species are classified as threatened or endangered, including 100% of the 6 endemic bird species[17]. Climate change is a significant factor in the decline in species populations in Small Islands states such as the Cook Islands and the risk of loss will increase with every increment of warming[18].

Key species of concern for the Cook Islands are.

I. The **Kākerōri** (Rarotongan flycatcher, Pomarea dimidiata) which is an endemic species to Rarotonga and was classified as 'critically endangered' under the IUCN classification system in 1989. The Kākerōri is threatened by natural disasters destroying habitats, particularly caused by tropical cyclones. Climate change is leading to higher intensity of tropical cyclones and therefore greater habitat destructionfoo[19].This is despite the CKI taking biodiversity conservation action and having 14 terrestrial conservation sites taking up 6% of total land mass.

II. The **Pa'ua** (Small Giant-Clam) is native to Cook Islands and is nationally and internationally endangered. Traditionally Pau'ua are used for food and medicinal purposes. Currently changes in sea temperatures and nutrient levels to the climate change are threatening the species[20].

Marine Mammals and Tourism:

Turtles and whales are important parts of Cook Islands' marine ecosystems, as iconic, charismatic, and in some cases totem species. They are also highly migratory and vulnerable species of concern, and

[16] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[17] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[18] IPCC.
[19] IPCC.
[20] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands

important symbols of traditional Cook Islands culture. Both whales and turtles attract tourists who want to see these animals in their natural environments and, for some turtle species, to swim with them. Whale watching is a particularly important tourist attraction in Cook Islands during July to October. While there are no dedicated whale watching operators, during the whale season many dive companies and game fishing vessels take tourists for whale watching. The Cook Islands also has land-based whale watching platforms.[21]

The decrease and loss of these species in Cook Islands has negative economic, social and environmental impacts. These include negative impacts to sources of revenue through tourism, particularly ecotourism; a loss of cultural identity, tradition and connection, particularly in some cultures where these animals might be important traditional totem species; and an alteration of natural ecosystems and food webs, especially where turtles and whales play important roles in ecosystem balance and food web dynamics. For example, turtles play an important role as macro herbivores, grazing in marine reef systems, regulating algal and other plant growth, and helping to keep the entire ecosystem in balance.[22]

Turtles:

Four sea turtle species are known to use Cook Islands waters: the green turtle (Chelonia mydas), the hawksbill turtle (Eretmochelys imbricata), the leatherback turtle (Dermochelys coriacea) and the loggerhead turtle (Caretta caretta). The green and loggerhead turtles are found throughout the year. The green turtle is the most common with all life stages observed in Cook Islands.

Primary threats to sea turtles in Cook Islands include pollution, predation, algal blooms, fisheries and impacts from bycatch and climate change impacts. Climate change impacts including warming ocean temperatures, mean sea level rise, and more intense storm events, can result in disrupted and changing migration routes for sea turtles, as well as decreasing and changing food, habitat and nesting areas around the country. *Figure 7* below shows a summary of sea turtles passing through Cook Islands as of October 2012.[23]

[21] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[22] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[23] Secretariat of the Pacific Regional Environment Programme,and National Environment Services Cook Islands.

Flipper-tag returns	Satellite tracking
Green turtle (*Chelonia mydas*) tagged at Scilly Atoll, French Polynesia, was captured in Cook Islands (Balaz, 1995).	Green turtle (*Chelonia mydas*) was tagged (ID 25695) while nesting (November 2000) at Palmerston Atoll, Cook Islands and migrated westward to the south of Fiji (NOAA).
Green turtle (*Chelonia mydas*) tagged at Rangiroa, French Polynesia, was recaptured in Solomon Islands, and may have traversed Cook Islands waters (SPREP, 1993).	Green turtle (*Chelonia mydas*) was tagged (ID 50159) at Tetiaroa, French Polynesia (released 18 November 2010) and migrated to the west of Fiji (NOAA).
Two green turtles (*Chelonia mydas*) tagged at Scilly Atoll, French Polynesia, were found at Palmerston Atoll (Tag #P841, applied 21 June 1993, recaptured 14 October 1994; Tag #S757, applied 1 October 1993, recaptured 11 September 1995. Note: this may include the Balaz 1995 tag).	Green turtle (*Chelonia mydas*) was tagged (ID 53765) at Tetiaroa, French Polynesia (released 14 February 2011) and migrated to the east of Fiji (NOAA).
	Green turtle (*Chelonia mydas*) was tagged (ID 53762) at Tetiaroa, French Polynesia (released 2 March 2011) and migrated to the east of Fiji (NOAA).
	Hawksbill turtle (*Eretmochelys imbricata*) was tagged (ID 60061) while nesting at Tutuila, American Samoa, and migrated southeast toward Aitutaki, Cook Islands (Tagarino et al., 2008).
	Juvenile hawksbill turtle (*Eretmochelys imbricate*) was tagged (ID 60069) at Tutuila, American Samoa, and migrated southeast toward Aitutaki and the eastern atolls, Cook Islands (Tagarino et al., 2008).

Cetaceans and Whales:

On 19 September 2001 Cook Islands declared all of its territorial waters as the Cook Islands Whale Sanctuary (CIWS), with regulations to protect cetaceans within CIWS waters, and prohibitions against killing, injuring or harassment of any whales or other cetaceans within the sanctuary.'[24]

Whale populations are vulnerable to pollution impacts including ingestion and strangulation, entanglement with fishing nets and lines which can lead to injury, stranding and death. Big shipping vessels can be a threat to whales as these cross the migratory routes of whales. Adverse impacts from climate change such as warming ocean temperatures and changing food web dynamics can change migration routes, habitats and breeding and calving grounds.[25]

As provided in *Figure 8* below, it is believed that the humpbacks in Cook Islands are transiting from Antarctic waters in the south and east, and continuing in a west or northwest direction toward Tonga, Samoa and American Samoa to breed and calve before returning to Antarctica at the end of the winter. Given the relatively small numbers of humpback whales in Cook Islands compared to countries such as Tonga, it is believed that while some mating and calving does occur in Cook Islands waters, this is likely opportunistic, and occurs while on the migration west and northwest.[26]

[24] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[25] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.
[26] Secretariat of the Pacific Regional Environment Programme, and National Environment Services Cook Islands.

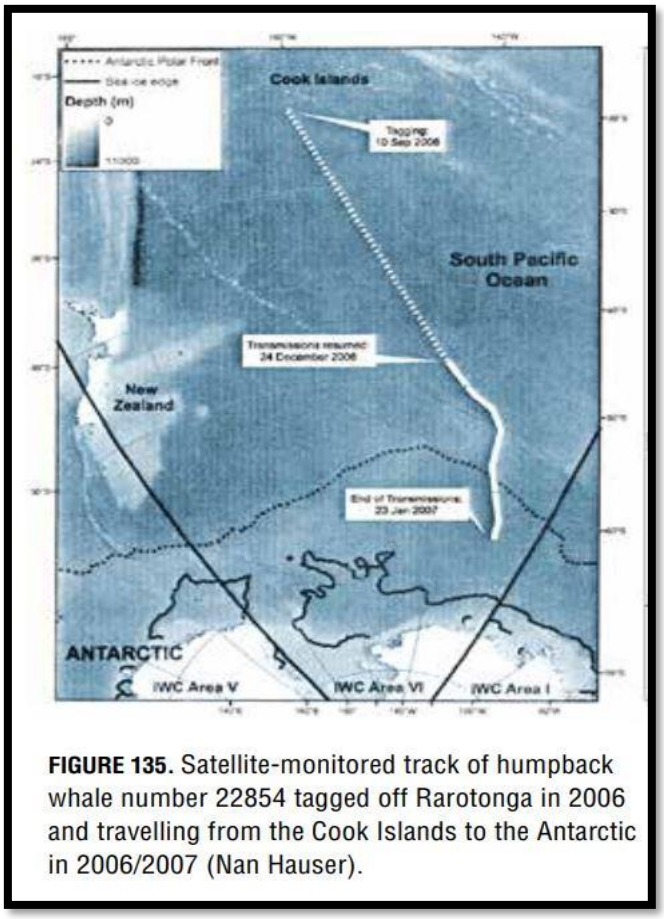


FIGURE 135. Satellite-monitored track of humpback whale number 22854 tagged off Rarotonga in 2006 and travelling from the Cook Islands to the Antarctic in 2006/2007 (Nan Hauser).

VI. CONCLUSION

Climate change is causing significant loss and damage to the coral reef systems and biodiversity in the Cook Islands. Climate Change impacts such as sea level rise, warming ocean temperatures, ocean acidification and associated adverse impacts to already vulnerable coral reefs, changing migration routes, and increased intensity of storm and weather events. Climate Change impacts on Cook Islands coral reefs and biodiversity are bound to intensify unless urgent action is taken to reduce greenhouse gas emissions (vast majority is generated outside of its borders).

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Marae moana. "Biodiversity." n.d. https://www.maraemoana.gov.ck/biodiversity/.

NOAA. "Northern Cook Islands Bleaching Alert Area 25 Feb ", 2024. https://coralreefwatch.noaa.gov/product/vs/gauges/northern_cook_islands.php.

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United Nations Environment Programme (2023). Executive summary. In Emissions Gap Report 2023: Broken Record – Temperatures hit new highs, yet world fails to cut emissions (again). Nairobi. https://doi.org/10.59117/20.500.11822/43922

Knowledge of climate-induced mobility in the Cook Islands

Expert Report by Professor Yvonne Te Ruki Rangi a Tangaroa Underhill-Sem and Dr Christina Newport, both of University of Auckland, Auckland, New Zealand

I. THE SUBJECT MATTER AND OUTLINE OF THIS EXPERT REPORT

1. On 29 March 2023 the General Assembly, by resolution A/RES/77/276, requested from the International Court of Justice an Advisory Opinion on 'the obligations of States in respect of climate change'. The General Assembly put to this esteemed Court the following 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 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?

2. This Expert Report, written pursuant to a request by the Government of the Cook Islands, will address b (ii): how peoples and individuals of the present and future generations are affected by the adverse effects of climate change.

3. This Report takes the view that climate mobility is not desired by communities or the state. However, the adverse physical effects of climate change on communities in the Cook Islands such as coastal erosion, soil salination, and the destructive effects of cyclones, are threaten the habitability of places in the Cook Islands, particularly all coastal areas and low-

lying islands and atolls. In addition, there are tangible and intangible effects on the mental health and wellbeing of communities.

4. This Expert Report will proceed as follows: Section II will provide a brief outline of the qualifications and credentials of the authors. Section III will provide our expert opinion on the impacts of climate change on Cook Islands peoples mental health and wellbeing and capacity to remain in their places.

II. QUALIFICATIONS AND CREDENTIALS

1. Professor Yvonne Underhill is Pacific Development geographer the university of Auckland in New Zealand. She was born and the Cook Islands and her family migrated to New Zealand in the 1960s for better education. Professor Underhill has undertaken research on migration and population mobility in the Cook Islands for over three decades. She has also undertaken research on various dimensions of climate change including climate change and health and a current project on climate induced mobility. This last study is part of a seven country Pacific project focusing on community perspective of climate mobility. Professor Underhill was awarded the Royal Society of New Zealand Metge Medal for excellence in the social sciences in 2022. Professor Underhill has worked in the development field Europe and the Pacific.

2. Dr Christina Newport has a PhD in Development Studies focusing on the policy space is in climate change negotiations. She is a descendant of Ngati Tamāke'u and Ngati Te Tika from Rarotonga, with ties to Aitutaki and Mangaia in the Cook Islands. She resides in Rarotonga with her family. She has worked in government, as a consultant and as an expert with the International Organisation for Migration and its Pacific Climate change and human mobility programme. She has been involved in research on climate change and mental health as well as the current study with Professor Underhill on climate mobility focusing on the Cook Islands.

III. CLIMATE CHANGE MOBILITY AND MENTAL HEALTH AND WELLBEING.

1. Cook Islands people are mobile people. Ancestral stories speak of the movement of people between islands. Stories from living memory are also replete with stories of mobility and migration. However, the oceans between island do not always make travelling between them smooth and gentle. The ocean can also be treacherous especially during the annual cyclone season, which speaks to the considerable skills of early Cook Islands ocean voyagers and their families to both travel and successfully survive on new islands over generations.

2. Cook Islands people are resilient people. Communities have innovated over generations to ensure they continue to thrive. By 2020's some communities are seriously considering the

future of their home land. Current concerns range from the direct and indirect effects on the physical environment upon which they derive their livelihoods and their sense of identity. Increasingly, discussions have turned to the possibilities of having to leave their homes on low-lying islands and shorelines because of coastal erosion caused by both extreme weather events like tropical cyclones as well as slow onset effects like the salination of soils. The idea that they might have to abandon their homes is disruptive and affects the wellbeing of communities and individuals.

3. Our research (Newport et al., 2023; Tiatia et al., 2022) established the links between climate change and mental health and wellbeing in the Cook Islands. This exploratory study engaged with climate change and mental health experts from the Pacific region including the Cook Islands to identify what are these linkages and future research priorities. The study enables better understanding of the way climate change impacts existing mental health challenges, its exacerbating effect on mental health and access to appropriate solutions including policy action.

4. In the Cook Islands, the significance of one's ties to their '*ipukarea'* inherited land, homeland, ancestral home is profound. Contemplating the loss of belonging to one's place, to one's ancestral home is more than a loss of indigenous ties to land sea and sky, it is a loss of deep belonging to one's generations past, present and future. Following the birth of a child, it is customary to bury the placenta on ones inherited land. Thereby maintaining the spiritual ancestral ties between past and future generations to their lands. To be without a connection to one's land, diminishes a fundamental interconnected dimension of holistic wellbeing.

5. Cook Islands people have experienced trauma, anxiety and grief associated with the effects of climate change. Sudden onset events such as the cyclones experienced include the 2010 cyclone Pam that destroyed many buildings and home in the southern group island of Aitutaki, the five consecutive cyclones of 2005 that caused significant damage throughout the Cook Islands and Cyclone Martin which resulted in the loss of lives on the Northern group island of Manihiki.

6. Mental health distress has also resulted from slow onset damage to water and food sources and agricultural areas contaminated or destroyed due to saltwater intrusion as well as drought, heavy rainfall, flooding, and sea level rise. This in turn compromises their ability to apply their traditional knowledge and practices as part and parcel of their day to day living and livelihoods. Climate change impacts can also have a compounding effect on pre-existing mental health conditions and illnesses. Such effects take a toll on individual and community positive and negative ways of coping. This could lead to potential increases in the prevalence of existing and new mental health distress.

7. The ability of communities to remain on their land and/or move is critical for positive mental health and wellbeing for Cook Islands communities at home and those residing further afield.

IV. CONCLUSION

1. Climate mobility is not what Cook Islands people want. They want to stay on their home islands and they want the ability to move between family members. The evidence we have gathered and Christina's experience as a resident of the Cook Islands over the last two decades shows that these views remain. However, increasingly discussion arise around leaving because of climate induced effects. If some communities don't plan to leave, the damage caused to their home islands and the livelihoods they depend on, will mean forced relocation. If this happens, it would be unlikely they could return home. The emotional toll of this dislocation from home and even thinking about it, has traumatic effects over generations. Just because Cook Islands people have demonstrated considerable innovation as mobile people, does not mean that they have an unqualified predisposition to move. Being mobile it's not the same is being a climate migrant forced to move because of the impacts of climate change.

V. DECLARATION BY THE EXPERTS

1. We confirm that all the matters in respect to which we expressed our opinion are within our competence and professional knowledge. We understand that we have an obligation to assist the International Court of Justice with resolving the matters covered by this Expert Report. We have fulfilled our obligation and will continue to do so in future. We confirm that the conclusions in this Expert Report are unbiased, objective and impartial; they were not led by the influence of the proceedings, nor of any participant thereto.

Signed in Avarua, Rarotonga Cook Islands on 10 March 2024

Professor Yvonne Teruki Rangi o Tangaroa Underhill
University of Auckland

Dr Christina Newport

University of Auckland

References

Newport, C., Tiatia-Siau, J., Aimiti Ma'ia'i, Kd., Underhill-Sem, Y., & Woodward, A. (2023). Anchored in pacific protocols – climate change, mental health and wellbeing. *Climate and Development*, 1–11. https://doi.org/10.1080/17565529.2023.2255563

Tiatia, J., Langridge, F., Newport, C., Underhill-Sem, Y., & Woodward, A. (2022). Climate change, mental health and wellbeing: privileging Pacific peoples' perspectives – phase one. *Climate and Development*, 1–12. https://doi.org/10.1080/17565529.2022.2145171

FORMAT OF SUBMISSION

Eileen Anne Story
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15 March 2024

The Registrar
International Court of Justice
Peace Palace
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The Netherlands

Re: Testimony of Eileen Anne Story Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Eileen Anne Story. I was born in 1981 and I am currently 42 years old. I understand that this testimony will be submitted to the International Court of Justice.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I grew up in the village of Nikao, on the island of Rarotonga but my family is from Mauke and Aitutaki, Ngati Kamire and Mgati Nurou. I grew up performing in cultural dances during school and also joined the constitution celebrations dancing competitions. I am currently living in Rarotonga having previously relocated from the outer island of Mauke. I am the Smaller Island States Officer in the Pacific & Regional Division at the Cook Islands Ministry of Foreign Affairs & Immigration.

4. A typical day for me is to go to work, after school activities with my children and caring for our home. I look forward to getting to work and working on making a positive impact for our people.

5. I grew up in Nikao where after school us kids would be climbing trees to pick fruit and playing in the trees building treehouses or hiking up the hill and sliding down till our shorts were coated brown. I value our environment, spending time in nature, for the kids to be immersed in our culture, to enjoy the simple life. Being grounded in our natural

environment gives us a strength and builds the foundation of who we are so we can go out into the world and advocate for our country and livelihood.

6. During my time in Mauke, I have experienced king tides where the sea is reaching further inland than it used to. This has affected shipping schedules to the point we are unable to receive much needed supplies. It has also affected our fisherman as they have been unable to fish as often due to bad weather.

7. Climate change is affecting our livelihoods. There has been a loss of income as fisherman sell their fish, if they can't go fishing then they can't sell their fish and buy supplies for their families. There have been damages to the foreshore around the harbour area. It's also forced us to be more prepared and stock up supplies on the instance that we don't get ships arriving when they should.

8. The changes to our climate are becoming more and more frequent, instead of looking at it as a one off occasion – we need to come together and discuss the possibilities of these events being regular and what changes we need to make to protect the community. The heat has been intense these past few months. Doing outdoor events or sporting activities especially for the kids who have fainted from heat exhaustion, which never used to happen in the past. We need to adapt to the changes and ensure that our children and the community are doing a risk assessment and using preventative measures to ensure the safety of our people.

Signed by: _____ Date: 15 /03 / 2024

FORMAT OF SUBMISSION

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Re: Testimony of Georgina Agnes Elizabeth Tavioni Bamber Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Georgina Agnes Elizabeth Tavioni Bamber. I was born in 1980 and I am currently 43 years old.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am Cook Island Maori and I was born and raised in New Zealand before moving back to the Cook Islands in January 2018 with my husband and three children. I returned to Rarotonga with my mother almost every year while I was growing up, and I maintained a strong connection to my culture through my mother and my family on her side.

4. My vaka is Te au o Tonga, and I come from the village of Takuvaine, Rarotonga, but I currently live in the village of Tupapa, Rarotonga. I also trace my lineage to Mokoero in the outer island of Atiu, where I come from the vaka of Ngati Tangiianui and Ngati Teakatauira.

5. My work involves operations, communication and project coordination through cultural education with a gallery called Gallery Tavioni in Rarotonga.

6. I remember a very different environment in the Cook Islands as I was growing up in the 1980s to 1990s. The roads were narrower, there were more plantations, the beaches were less occupied with houses and accommodation, and more open for local Cook Islanders to use and enjoy. I also remember swimming and bathing often in the creeks where the water flowed stronger than it does now. There were also less cars and more walking around, the island was less congested and there was less property development.

7. I think the increase in development, homes, and accommodation has been due to our economy's reliance on the tourism industry. I think it is dangerous that our economy relies on tourism, and I think we need to be considerate of the impact of tourism on the environment.

8. I understand that traditionally and historically, Cook Islanders would settle further inland, but since the arrival of missionaries and the further effects of tourism, we have settled further along the coast, which I'm positive, is affecting our lagoon life.

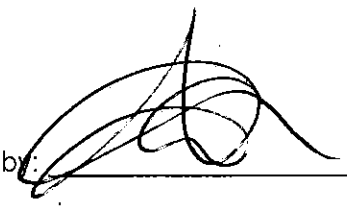
9. I remember the lagoons being clearer and cleaner when I was growing up, and the colour of the corals were not so faded or bleached. There is an area on the south side of the island of Rarotonga called Muri beach, which is the biggest tourist hot spot on the island; the colour is off and I would never swim there. It was not like that when I was growing up.

10. I remember seeing more vaka (traditional canoes) on the beach, and eating more often straight from the lagoon with my mother and other mamas (older women). We would often eat trocus shell and matu rori (sea cucumber). I think this used to be a more important part of the upbringing of older generations like my mother's. Some of those traditional life skills are not a part of everyday life for most families anymore.

11. In 2022, I witnessed severe flooding in Rarotonga brought on by a king tide. I remember not being able to drive home because the king tide had come through the southwestern coast along Papa'aroa and Arorangi. It wiped out a few kilometres along the coastline and came over the road and inland, probably just less than a kilometre. I remember because it came up to just before my Uncle Henry's house. I had never heard of a king tide before then and had not experienced or witnessed one in my years of living and visiting the Cook Islands growing up. I think that event indicated that Cook Islanders need to worry about where we build our homes. It has also made me more worried about lower lying islands such as Tuvalu and other outer islands in the Cook Islands such as Atiu, where my tupuna (ancestors) are from.

12. I am concerned about the fish stocks in the Cook Islands and its impact on Cook Islanders. I have witnessed an increase in the cost of albacore tuna from around $25 a kilo when I first moved here in 2018 to $40 a kilo in 2024. I used to eat fish more regularly and saw more local fishers selling in 2018. I think this must be because we are running out of fish stocks for Cook Islanders, with more fishing licences being granted to foreign vessels, and

perhaps due to the demands of the growing tourism market. I think this has had a huge impact on the livelihood and culture of Cook Islanders. Tuna is a source of food security for Cook Islanders, and it is culturally important. When we lose access to fish we lose the traditional skills that we have developed as a consequence of relying on that food source. Skills such as making ka'a (fishing nets) and vaka (traditional canoes), traditional skills to read the water, saying karakia (prayers) before heading out into the ocean, and so on. If we are no longer using the vaka in our society, then we lose all the culture that is connected to that practice.

Signed by:  Date: 03/2024

FORMAT OF SUBMISSION

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The Registrar
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Re: Testimony of Julianna Onegirl Teremarike Bill Marsters Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Julianna Onegirl Teremarike Marsters. I was born in 2001 and I am currently 22 years old. I understand that this testimony will be submitted to the International Court of Justice.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am from the island of Palmerston, from the Akakainangaro lineage within the island tribe. I was born and raised on Palmerston and I am currently the Biosecurity and Agriculture Officer for the island.

4. A typical day in my life, I go between home and work, I'm usually busy. The highlight of my day is when the young kiddies at preschool pop around to my office and say hi or are looking for something to help with. I also look forward to having a cup of iced coffee.

5. Because Palmerston is quite unique, tradition is very important. For the Cook Islands side, it's very important for us to know the mother tongue as the majority of our population are not speakers of te reo. As for the English side of our family, there is a particular way to dress, how to eat, how to socialise, family hierarchy and learning old English.

6. Growing up in Palmerston everywhere is very different now to what it was, both land and sea. For the sea side, I can remember that it used to be so clear and so blue, with less algae and colorful fish swimming around. The boomie coral heads had pretty colours. Now it's turning into a grave yard sadly. In the lagoon area surround Palmerston, I've noticed over the years, that marine life has really changed as well as, I guess the food chain as well because now we are eating other fish beside parrot fish. Parrot fish plays a major role in the cleaning of the algae off the bommies in the sea and producing sand as well but because of harvesting of the parrot fish for export to Rarotonga, there are not enough parrot fish left to regenerate, and get rid of the algae. Now the algae on the bommies is causing them to look like dead coral heads. On land, in general you can see that each season has a different reaction of both plants and the weather changes but now it's just like popping out of nowhere.

7. I value my immediate family the most because now there are very little of us. Since we're living on an island with 34 people in total. They're important to me because we grew up as a very big family, and now there's only a small number of us in the family that are still on the island. Most people are leaving the island. I believe the next thing I would value would be our way of living, our unique culture. It's important because we do have a unique miss of English and Cook Islands culture.

8. Sea level rise, reason being, 9 years ago there was not much sea things happening but now it has increased to the point where there is a lot of vegetation loss plus, coastal erosion. I've also discovered some season changes as well.

9. Climate change has affected the island. My job is to provide vegetables to the community and also to balance out the proper seedling to use during a particular season but now, the seasons are changing up. It's a bit hard now to describe it. We need to get plants that are suitable for weather changes as well as seasonal changes.

10. A majority of the community people, they are more into the fishing industry and its just our lucky school students, they are learning about climate change global crisis, so their point of view is very different. They haven't lived long enough to see the changes over time but they can see the affect that it's already having now.

11. I don't really know how the Cook Islands in general is affected by climate change, unless I read an article about it or if I am outside of Palmerston. I definitely notice a lot of things have changed for us.

12. From what I view,, we just need to adapt to the changes as best we can and go with the flow. Other people who are older than me, they probably will have a different answer but for me, it will just be about adapting to the situation as there isn't much we can do from our island with limited resources and capacity.

13. I would say there is an urgent need since we are classed as coral atoll, sea level rise is an issues. Seasonal changes is another one because producing our own fruits and vegetables is important and the results of our harvesting have not been as successful as previous year which relates back to the changes of the season and the weather. Sometimes we have to go through a period of no water at all, just sunlight and once upon a time it was the opposite, a lot of rain and significantly less sunlight.

14. I would say that my experience with climate change has affected my life as I was previously a fisherwoman in my dad's business before moving to Government. Marine life is very important to business owners, but there needs to be a balance for the ocean ecosystem to thrive which is not the case right now. On land, I have recently discovered that seasons are not fitting at the right time during the year, its changing.

15. My challenge, with my work and experience, is dealing with plants that are not producing well at its harvesting or maturing date. That can impact on my work as data collection is important, so it makes it more difficult to figure out which plants are better to plant at different times of the year because of seasonal changes.

Signed by:  Date: 15/03/24

FORMAT OF SUBMISSION

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08 March 2024

The Registrar
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Re: Testimony of Rebecca Tina Hosking Ellis Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Rebecca Tina Hosking Ellis, I was born in 1967 and I am 56 years old.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am Cook Islands Maori and I grew up on the island of Rarotonga, in the village of Nikao. I also lived in the outer islands of Manihiki from 1991 to 2003. I worked there as the sole Police Officer for the island of Manihiki and the nearby island of Rakahanga during that 12 year period.

4. I have been a Police Officer for 35 years, and I also spent 4 years working at the Ministry of Internal Affairs as the Manager of Social Policy and Services.

5. I've experienced two serious climate events in my lifetime. The first was Cyclone Sally in 1987, which hit the island of Rarotonga. I was 20 years old and on duty as a Police Officer. I remember the sea level was up to our waists and I remember boulders being thrown from the sea and into the buildings in town, which became badly damaged.

6. My second encounter with a serious climate event was when I was working as the sole Police Officer in Manihiki and Rakahanga, and we were hit by Cyclone Martin in November 1997.

7. Manihiki is a flat and low lying atoll island with a lagoon in the middle of the two populated villages on the island. On one side there is Tauhunu and on the other is Tukao. There is no road connecting the two districts and we travel between them by boat.

8. I remember the weather began with strong winds and tides, but there wasn't a cyclone warning at first. As the weather began to get stronger, I issued warnings to the community to evacuate to the cyclone shelters which were the church Sunday school buildings. I also warned the pearl farmers not to go out to sea to their kaoa (pearl farms).

9. I remember calling the Police station on the main island of Rarotonga when they confirmed that the weather was a cyclone, when the call was cut off. I concluded that the telecom building (which was in the other district of Tauhunu on the other side of the island) had probably been impacted by the weather.

10. The water level continued to rise and come through on to the land as the cyclone grew worse. I ran home to collect by two children, one 7 yr old and one 3 yr old and ran down towards a nearby neighbor's house. The house was unfinished, and did not have any glass windows and doors fixed in yet. I remember as I was running away with my two children, that the waves behind me looked as high as a nearby very tall coconut tree. I ran into the neighbor's house and went into the upstairs attic, which was filled with the women and children that lived in our koutu (neighborhood). The men stayed on the bottom floor of the house and stood behind the walls as the waves crashed through the bottom floor of the house where we all were.

11. I then began to hear nearby crying and screaming and discovered that the people in the Sunday schools that we used as cyclone shelters had been washed out by the waves. Luckily there was a hedge behind the building that caught them all and prevented them from being washed away, but many were injured.

12. Once it was safe enough to move, the community worked together to move to houses that were still dry. We moved slowly and in groups, with some people carrying others that were injured, children, or elderly through the water.

13. We weren't able to contact anyone on any of the outer islands, or in Tauhunu on the other side of Manihiki because communication lines were down. Fortunately, on the following day after we had been hit, we discovered that a visiting pearl farming technician had a satellite phone so we were able to contact Rarotonga. The police organized a plane to fly out with medical aid and police officers. The airport runway was full of heavy debris from the cyclone, so the community worked together to clear the runway within the 4 hour period we had before the plane landed.

14. We then heard from Tauhunu on the other side of the island, and discovered that over 30 people had been dragged out to sea. Some people were found alive on the nearby motu (small islands) but many had died. I recall that some of the bodies of people who had passed were found but around 10 bodies were never found. All the cyclone shelters in Tauhunu were also destroyed. I know some people also tied their boats to trees and stayed in them throughout the cyclone, as the water came over the land.

15. In the aftermath of the cyclone my husband and I sent our children to stay in Rarotonga while we stayed on Manihiki to help with recovery. We lived in a tent for 10 months during that time, while other families built and lived in small shacks. It took my family and especially my children a long time to psychologically recover from the cyclone. I think around 30-40% of the people of Manihiki never returned after they were evacuated, so there was a huge loss of the Manihiki population. I remember coming back to Manihiki during that recovery period after I had visited my family in Rarotonga. I remember the view from the plane where I could see the buildings that had been dragged out to sea, forming sort of a line out from the coast.

16. The cyclone also impacted the pearl industry, which was the main industry in Manihiki and the source of many livelihoods.

17. These days I can also see the weather getting worse and less predictable. We used to have a rainy season and patterns that we could follow, but there aren't predictable weather seasons or patterns anymore.

Signed by: _____ Date: 13/03/2024

FORMAT OF SUBMISSION

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15 March 2024

The Registrar
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The Netherlands

Re: Testimony of Tatryanna Louis Teokotai Ngariki Utanga Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Tatryanna Louis Teokotai Ngariki Utanga. I was born in 1990 and I am currently 33 years old. I understand that this testimony will be submitted to the International Court of Justice.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I hail from the islands of Rarotonga and Mitiaro. I currently live in the village of Ruatonga on Rarotonga. I work as a Foreign Service Officer from the Cook Islands Ministry of Foreign Affairs & Immigration.

4. A typical day involves waking up, preparing for work with a routine makeup and skincare session, heading to work, completing household chores, engaging in exercise or coaching netball, preparing dinner, attending to unfinished work, and finally, retiring for the night. Work and netball are the highlights of my day. I also value my morning routine of getting ready, which sets a positive tone for the day.

5. I am deeply involved in our culture, contributing as a dancer, choreographer, and tutor, particularly during Te Maeva Nui or Te Mire Kapa Season. My passion for cultural activities has been significant since I was 18 years old. I value my friends and family, as

well as the importance of maintaining a healthy and clean environment. Living in the Cook Islands is a privilege, and I take pride in preserving its natural beauty.

6. I grew up in a clean and tidy environment. Environmental stewardship is crucial to my family, as we prioritize cleanliness in our surroundings, including our yards, plantations, and the proper care of our animals. Recycling is ingrained in our daily routine, reflecting our commitment to maintaining a clean and green environment.

7. Personal wellness and appearance are essential to me. I believe in working hard and setting achievable goals to lead a balanced life, both physically and mentally. Additionally, maintaining a high standard of living, not centered on materialism but on personal well-being, is crucial to me.

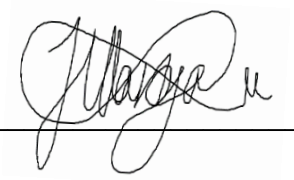
8. I have experienced cyclones at such a young age and that was an intense experience. However I did not relate it to climate change as I was not aware at the time of what that meant. in recent years there have been tsunami warnings and irregular crop cycles or weather patterns that have opened my eyes to the existence of climate change and the climate crisis we currently live in. I find myself very anxious when I hear of approaching weather disasters as I do not know what to expect and how well our country will survive it. I'm also anxious that at any time, an unexpected disaster should strike and I am unable to protect my family.

9. I believe people in my community are increasingly anxious border lining fearful because despite living in a modern world of technology we are still susceptible and vulnerable to climate impacts. We are experiencing sea level rise, irregular weather patterns, and unpredictable seasons due to climate change.

10. A large piece of our land was taken by a flood by the river. We have planted more trees for land protection and implemented better water conservation practices. We need better water reserves to mitigate increasing water shortages on all islands. I am also more cautious about my family's safety, particularly when it comes to water-related activities.

11. Challenges we face include mobilizing communities to be more green, more climate prepared and resilient. Some people are complacent and don't give enough energy to understanding climate change. The return of our expanding tourism industry also does not help at times especially when we experience food and water shortages.

12. Increased awareness and sharing of lived experiences are crucial. Listening to stories and experiences helps outsiders better understand and support communities impacted by climate change.

Signed by:  Date: 15/03/2024

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08 March 2024

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Re: Testimony of Teina Rongo Impacted by the Effects of Climate Change

To Whom It May Concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Teina Rongo, I was born in 1972 and I am 51 years old.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am Cook Islands Māori and I grew up on the island of Rarotonga, in the district of Ruatonga. I also draw my lineage to the northern islands of Manihiki and Rakahanga, and the southern islands of Rarotonga, Atiu, Mauke and Mitiaro.

4. I have a Doctorate in Marine Biology with an emphasis on coral reef ecology, and I have been working in the area of environmental science for decades. I am the Chairperson of a Non-Governmental Organization named Kōrero o te ‘Ōrau (www.korerooteorau.org), which focuses on the wellbeing of our indigenous Cook Islands people and their environment.

5. Our projects aim to revitalize our culture and traditional practices as a solution to the impacts of climate change and other environmental problems. Unfortunately, these traditional skills and practices have been on the decline in the last few decades, which is likely associated with westernization. While this shift is particularly visible today, this loss of our culture and language happened over time. For example, my parents and their parents’ generations were forced to speak English and were punished for speaking our Māori language.

6. Kōrero o te ‘Ōrau runs educational and conservational programs on the islands of Rarotonga, Atiu, and Mangaia, and we take an approach of viewing the environment holistically “from the mountain to the ocean”. Environmental guardianship is an important traditional principle of Cook Islands culture. Historically, our survival and food security relied on the health of our environment, and in turn we knew that it was important to value our environment. However, these principles and values have declined over the last few decades among my people as they become disconnected from the environment.

7. Our projects aim to reconnect people to their ecosystems through traditional practices. We have one project that has been ongoing for the past six years, which is to reforest the Takuva’ine Valley area with ‘ūtū (mountain banana). ‘Ūtū is a plant that used to be farmed in the Takuva’ine Valley when agriculture was the main industry in the Cook Islands. In the last few decades, people have basically abandoned this area and as a result, invasive plants are killing not only the bananas but the native forest as well. We also use this project to educate our kids about the role of the valley and its influence on downstream habitats.

8. We have other educational programs for the children, such as working on the pa’i taro (taro plantation), learning how to fish, and traditional voyaging; these activities help connect our children to their natural environment to foster appreciation.

9. I grew up, like other Cook Islanders of my generation, practicing a traditional and subsistence lifestyle daily. We worked in the wetland area for taro cultivation, dryland for other crops, and we raised pigs and fished for our protein.

10. I have noticed that since my time growing up, many species which we used to rely on have declined. For example, we used to regularly eat a local mussel called kuku which was abundant in the lagoon, but are not around anymore. We used to regularly fish a species of parrotfish we called ‘ūmoemoe that lived in sargassum, a seaweed that also used to be common. The fish was easy to catch with your bare hands in tide pools during low tide, and it was an important food source. The disappearance of this fish is likely connected to changes in rainfall distribution associated with climate change that affected the prominence of sargassum, and therefore the ‘ūmoemoe that lived in it.

11. We used to eat a seasonal marine snail from our lagoon called patito that relied on a type of seaweed as a food source. I recall that hotel owners in the area would push to remove the seaweed out of the lagoon because they were unsightly. The patito are no longer around in the same quantity or with the same predictable patterns.

12. We also used to have a prominent season of fish recruitment that we called ika tauira, which would run between December and February. These juveniles of surgeonfish and rabbitfish would come in large schools numbering in the hundreds of thousands; unfortunately, these are rare occurrences today, and their decline was noticed in the early 1980s.

13. I also see that many traditional plants which would be used by our ta'unga (traditional experts) for medicinal purposes has declined as well, particularly those that would grow in the wetland areas that have gone through major drought events.

14. The outer island of Pukapuka used to have an abundant pā'ua (clam) population that has seen a significant decline, which is likely a result of warmer waters.

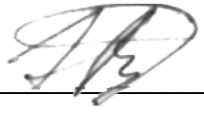
15. I have seen other indicators of environmental degradation such as coral bleaching due to warmer temperatures (which has increased in frequency), and coastal erosion due to sea level rise. The latter is particularly common in the Pā 'Enua (outer islands), especially on the low-lying atolls, where I have observed trees that are now in the sea. Our island environments are surrounded by the ocean and are therefore particularly vulnerable to climate shifts because of changes in ocean temperature and chemistry, severe natural disasters, and sea level rise. We are also susceptible to water security. Our water supply comes from rainwater runoff which are stored in catchment areas or water tanks. Changes in rainfall distribution can impact us greatly.

16. While it is hard to feel the effects of climate change on a shorter time scale because changes are slow, however we can see the changes within our lifetime. At this point, it is more a source of psychological and emotional stress for many people in the Cook Islands who see the loss of important parts of our environment and history.

17. Cyclones in the Pacific are now more severe, but fortunately the island of Rarotonga has not been directly hit by a cyclone for a while. However, if we were to be directly hit, there is a high chance of the loss of lives because our houses are not built to withstand cyclones.

18. I believe that traditional knowledge is important in combatting climate change. This knowledge was developed by people living and adapting to their environments for centuries; they knew the most sustainable way to live in a space they called home. For example, while the pa'i taro (taro patches) provide us food, by using it, we protect this habitat from being developed to maintain the ecosystem service it provides. Wetland areas where taro is planted play a role in soaking up the nutrients from land; by the time runoff water enters the lagoon, the nutrients in the water are removed by the plants that grow in the pa'i taro habitat, thus preventing nutrients from reaching the lagoon and causing problems. Our ocean is already in a compromised state, and we cannot risk adding more stress even in the claim of a potential solution to climate change (e.g., deep sea mining for the green transition).

19. We all have a part to play at the local level, and our organization is trying our best to encourage people to go back to living a subsistence lifestyle as a means to reduce our carbon footprint.

Signed by:  Date: 14 March 2024

FORMAT OF SUBMISSION

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10 March 2024

The Registrar
International Court of Justice
Peace Palace
Carnegieplein 2
2517 KJ The Hague
The Netherlands

Re: Testimony of Liam Ramsay Tuaivi Koka'ua Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Liam Ramsay Tuaivi Koka'ua. I was born in 1990 and I am currently 33 years old. I understand that this testimony will be submitted to the International Court of Justice.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am a Cook Islander, born in Ōtāhuhu, Tāmaki Makaurau (Auckland), New Zealand. I was raised mostly in New Zealand as part of the Cook Islands diaspora in Auckland. My tapere (village) is Pokoinu, in vaka (district) Te-Au-O-Tonga on the island of Rarotonga and I have connections to the outer islands of Palmerston, Rakahanga, Manihiki Tongareva and Mangaia. I returned to Rarotonga as often as I could in my adolescent years before returning to work for NGO Te Ipukarea Society (TIS) for four years.

4. I am currently living in Auckland. I am a museum curator, specifically around Mātāuranga Māori, so Aotearoa Māori and Pacific indigenous knowledge. Using the experiences that I've had back home in the Cook Islands and here in Aotearoa, to inform a natural environment and human impacts gallery that we're creating at the Auckland War Memorial Museum. This exhibition will be a permanent installment for 20 to 30 years with the intention of educating people on what indigenous knowledge is as it relates to the environment and its efficacy in solving current and future environmental problems such as climate change, biodiversity loss, pollution and over extraction of resources.

5. I enjoy researching. Reading from old sources of information and getting close with some of the artifacts that we hold in the museum at the moment. I'm interested in linguistics as well and making connections between indigenous languages of Aotearoa, the Cook Islands, French Polynesia and Hawaii.

    As a youth I would hang out with the elders and ask them to speak te reo to me. My interest with te reo became a passion that led me on a tertiary pathway to better understand Pacific cultures and my role in protecting and preserving it.

6. I was not raised in a cultural household, I guess it's not something we're aware of as children being part of the Cook Islands diaspora in Auckland but when I think back, there were lots of physical things in the house connecting us back home. I just didn't realise it then. Things like the parrotfish that was sent over from Palmerston in the chilly bin, the old necklaces that were mostly like Pārau (pearl oyster) from Manihiki and Tongareva and the Rito hats and stuff like that. There was a connection to a place that was not Auckland. In terms of te reo, my great grandfather would sing his imene tuki every night because he was going deaf, so he wanted to hear his own voice. So, you know, sharing a wall with him, I was always listening but I wasn't taught to engage with my culture. My mother, even my grandmother to an extent, sort of assimilated into New Zealand culture. Going to Rarotonga for the first time as a 13 year old, that's where my journey began, immersing myself more and more into our culture and teaching myself te reo. Eventually studying towards my niche, indigenous knowledge and conservation work.

7. When I'm home, I am an active member of my tribe, Ngāti Makea Ārera of Pokoinu, and you'll find me in the maunga (mountains) looking for different maraes (culturally significant sites) and following my interest in biodiversity particularly with regard to our native plants and birds, as so many of them are used in our cultural wear and for medicine. There's a strong connection between a thriving environment, and a thriving culture I believe.

8. That was sort of the two things (environment and traditional culture), where they intersect, is where I like to work and that was partly influenced by experiences I had with an organisation called Nia Tero, which I went through a leadership programme with. And now I'm currently a board member of that organisation. I came back to Aotearoa in 2019 and did a one-year Master's in Indigenous Studies just to further that interest and looked at traditional resource management practices and I took up for that Master's, so it just sort of reflects where I'm at and with my interests at the moment. I've been here probably five years, looking at going back to Rarotonga in the next couple years, but I've taken those skills, I guess, between conservation and my passion for our culture to work for, I had a project manager role with Gisborne District Council for a large scale forest restoration project, so that was more about climate change mitigation and protecting the city's water source because it was highly erosion prone. And then more recently working for the Auckland Council as a senior Pasifika specialist, assisting the council with the engagement with Pacific communities and implementing the Pacific strategy for Auckland. Obviously we are one of the largest Polynesian populations here in Auckland. And then most recently with the museum job that I've already explained. On a daily basis, I get asked to do the turou's (traditonal welcomes) and the pure's (prayers) and stuff like that, and it sort of keeps my reo maintained, but I still have

plans to go back and immerse myself in reo Māori when I go back, and always challenging myself. And it's hard because as we know, Rarotonga is very tourist-centric and westernized compared to other islands, but something that I'm passionate about, the culture is specific to Rarotonga. I have connections to other islands, but I think Rarotonga is, of course, where my home is, but also I think is most urgent that we need to actually focus on ourselves and keeping ourselves unique or true to our roots and not becoming an amalgamation of the other 14 islands, which is you can see that or you can hear that in the reo as it's spoken on the island today. It's sort of got almost the mixture of all the other islands.

9. Growing up in South Auckland, like many of our people here, we don't really do much to do with the environment. We don't go out for hikes and we're lucky to even have access to the beach or anything like that, so that wasn't part of my upbringing. But I think in a way it actually made me appreciate the natural environment more than most. So coming to Rarotonga, one of the first trips was when I went to Palmerston, I was probably 13, 14, I obviously saw Palmerston at a time that would have been about 20 years ago now, and those memories seem to really stick with me and all my experiences 20 years ago. But you know, obviously I was able to appreciate the, I'd say, the mutual respect or reciprocity that say Palmerston Islanders have with the parrotfish, because you know, they have a lot of ecosystem services that they provide, chewing up the coral, creating the sand, and regulating the coral ecosystem there, but also, the Palmerston Islanders depend on the parrotfish as an income earner, and I was able to see what seemed like an infestation of sharks in the lagoon, but really, you know, understanding that that's a thriving ecosystem when you've got enough of those apex predators there. Trips like that, and then Rarotonga as well, just being able to be a part of the dance groups where, you know, a lot of our materials come from the natural environment, and yeah, just sort of snorkeling a lot as a teenager, but you know, that all started happening as a teenager, not so much as a young kid. Definitely my adult life, and even into my late teens, was when I guess started interviewing the older people about what they remember about their environment when they were growing up. So my sense of what the natural environment is in Rarotonga and the outer islands is very different to most people my age, because I retain all this information that people much older than me have told me. So I'm young, but I am privy to a lot of precious stories and information that's been passed down to me. As an adult, I've spent a lot of my time as a project officer for Te Ipukarea Society, doing bird surveys on Atiu or pandanus surveys in the Makatea on Mauke, and a whole lot of hiking up in the maunga (in Rarotonga) but that's more as an adult. With voyaging, I've spent a lot of time on training sails when I was an executive member of Marumaru Atua (Voyaging Canoe), but I haven't gone on any long voyages or to another island. So again, it's being around voyagers or friends that are voyagers that have sort of given me a bit of feedback from the open ocean. But yeah, you know, we did the Saturday sails when I was there and learnt the ropes but I haven’t gone on a long voyage yet.

10. I value our sovereignty as Cook Islands Maori people in that we have our land, we have access to our land, and our mountains and our lagoons. We're always able to practice subsistence lifestyles when needed. You know, these days, it's more just a bit of a top up to the food that we get from the supermarket. Some more subsistence focused than others, but it's always there for us to fall back on when we need it. And, you know, that's really important that land doesn't get

further privatized, you know, because obviously, we're a communal people and land is tribally owned. Although you might have occupational rights for your lifetime. The land belongs to our tribes, I'd like to keep it that way. I think it's beautiful that we have this shared resources, from the Maunga (mountain) to the Akau (reef), and out to the Moana (ocean) that we are able to draw upon. And I really think all those resources are still relatively untapped. And just in terms of how we could harness the ocean or how we could potentially farm certain marine creatures or grow new crops. And I think, you know, our traditional crops, the genetic diversity of Taro, the Utu, different traditional pre-European crops or Polynesian-introduced crops are one of the things I'm very passionate about. I don't want to see any more varieties of Taro lost, because we think, "oh, it doesn't grow as well as the new ones", you know, because there's a reason why we had those varieties of Taro, maybe they just taste better, maybe they are actually more drought-resistant, or more pest-resistant. We never know. We always need to hold on to that genetic diversity. So I'm always interested in learning about genetic diversity and also the different methods of growing Taro. And for me, I'm quite passionate about the Takuvaine Valley, because that's where we still grow the Taro in the Taro vai or Tarotavari. So the sort of pondfield system of growing Taro, which is only practiced in Takuvaine Valley now.

11. It's important for Takuvaine Valley because it's our own living history book. You've got to go there and experience it. But like the terracing system, you know, the fact that Tupuna (ancestors) built that probably around 1000 years ago, and it's still maintained to this day. It's like, you know, it's like a stonehenge, but it's something that we can actually engage with and get food out of and continue to use, rather than something that we just sit back and admire. So it's like a living breathing part of our history. And I have family connections as well to that area, particularly the Anakitau Valley branch. So, you know, having that connection to the past, connection to the ancestors through knowing the land, knowing the history of the land, and also knowing what traditional agriculture actually looked like in pre-colonial times and how the Takuvaine Valley to continue a little bit on that area is just such a key place in terms of it was the traditional food bowl of the island and something that I believe will actually return to significance for our people in the future as we realize that food security is very important, and we can't continue to depend on imported foods the way that we have been the last few decades.

12. I could say all the secondhand information I've received from the northern group, in terms of changes to the pelagic fisheries and movement of migratory species, the loss or the decrease in size and numbers of certain key fishing species, but that would all be secondhand information really. I hear from our people in Palmerston that parrotfish is also not as abundant as it used to be, but for me to lean into my strengths, I will talk about the island of Rarotonga, This island that I know - that I look into the mountains every day that I'm there, over 20 years of seeing that the invasive plants in particular have really boomed in that time, and as a person who's practiced my own agriculture for subsistence and also for provision to local shops, growing vegetables and stuff like that, invasive plants were really just taking over. There's a lot of the choking vines, mile-a-minute, red passionfruit, and there's a whole lot of them, but this big yam leaf looking thing, I'm not sure the actual names, I just know them by what they look like. Then you've got some of the trees, like the African tulip tree that are going nuts. I try not to use too much chemicals. I hack them right back, dab it with a bit of chemicals, but they still come back, and I know we've got some

biocontrols for that, so I do think climate change is playing a big role in facilitating, I don't know if it's because those plants, we're heading more into what the climate that those plants prefer, wherever they're from. We're getting more tropical, more hotter, more drier, we are already tropical, but maybe more hotter and drier, and that's why they're booming now, but of course in my time in the mountains, I see the same thing, the vines just choking everything, and I'm really concerned about it, because you know, our native trees, mato (*Homalium acuminatum*) is like an endemic tree to Rarotonga, that is an important timber, but, you know, we're the only home for that tree in the world, and it traditionally covered most of the slopes of the island, you know, up until you get to the cloud forest, it's mostly mato, traditionally was mato, and you don't really see it as much from the coast when you look inland, you see a whole ton of African tulip trees, because you see all the orange flowers, you can see all the choking vines, they're bright green, but the mato is, you can see that it's being choked by the vines, and I've come across a few that have already been killed, and then just thinking in the last 10 years, you know, I spent a lot of time in Takuvaine Valley with Auntie Celine Dyer and Colin Rattle, who's been going up there for decades as well, they're getting old, but 10 years ago, they were growing huge areas of taro, and there are taro patches that are up there (overgrown) just in the last December just gone, and they were sort of fit enough to cut tracks back up to those areas, and it's almost impossible to find the plantations that were there, that were being grown 10 years ago, you know, just from those invasive plants again, and they tend to out-compete everything, butterfly ginger as well, causing havoc up there, and it depends on the valley, and some valleys, other invasives (plants) are the problem, so I think the invasives as well as like, not just plants, but insects as well, certain insects that have been around for a long time, just like some of those vines I talked about, they've been around a long time, but they've only just started to boom in the last 10 years or so, so I believe that's climate-related as well, so that's what I talk about. Obviously, we've had some long droughts, even there were some droughts when I was in Raro, and then some pretty severe flooding, you know, that hit the usual areas, I stay pretty close to, like, say, Avatiu, which has always gotten some pretty severe floods, not always, but in the last 10 years or so it has, you know, even I just had an experience back in December when we'd have a pretty dry spout, and then we have this big downpour, and I'd just set some moko (taro shoots) aside one day, I was going to go back and plant them the next day, and then I came back, and it was all washed down the stream, so I was like, oh well, maybe it's my bad for leaving it there, but also it must have been a huge amount of rain, and a short time to be able to wash all that moko down from the little corner of the stream that I put them, and so I think, you know, combination of having these extended dry earth periods, and then you get a heavy rain, and the rain's not going to soak into the soil in time, it's just going to run right over it, and that's why we get some, you know, worse floods now.

13. As a grower of, you know, typical sort of vegetables for consumption in the lower lands, you have that experience, but then also trying to grow taro, the traditional taro vai method, so I've got sort of got these two different lenses of observing climate change, but as I said, those are the changes I've seen is mostly around the flooding or prolonged droughts, and then the invasive bugs and vines, sort of, all of a sudden being much more prevalent than they were.

14. I’ve been going up the Takuvaine valley for about 10 years, I’ve been around Auntie Celine and even her brothers, like Puna Dyer, Tua Dyer, and Colin Rattle, and those people have been

growing up there since about the 60s, they have that record of knowledge and have told me about people who were up there even before that, and what it seems like is that the labour required to clear the taro vai is just becoming a lot more than it ever was, so, you know, we just have these really aggressive plants, and I mean, I've dealt with it, you know, even in the last December, you know, having to dig out the, what we call, Tiare Arikivaine (*Cestrum nocturnum*), it's just a really prevalent weed that was always in Raro, but was never as invasive as it was now, so that was one I forgot, as well as the vines I was talking about. So these are all just so much harder to battle compared to the trees and the weeds that were there 50 years ago, or even 20 years ago, so it's just something I always hear from the people when I'm up there visiting the old guys in there saying, you know, they never had to deal with that, so, you know, these plants have been around for a long time, but they're just exploding now, so that makes it pretty hard, because you already, Takuvaine is pretty inaccessible, you've got to hike up there, you've got to sort of battle with nature, get dirty, and it's fine, but when you're spending most of the time trying to get these really hard woody trees and weeds like the white ginger that sort of like creates all these clusters (of rhizomes) in the ground, it's like you can't really remove it, so it's like we're dealing with different weeds than our tupuna (ancestors) did back in the day, so that's something that I guess it's, in my last 10 years memory, they've always been there, but I do see them more, but then what I'm hearing from those that have been there for 50 plus years is that these plants weren't even a problem back then, and some of them are actually native or Polynesian introduced, which means they've been there for hundreds of years, but they're just becoming a problem now, so yeah, that's how it's affected me. It makes life harder.

15. The immediate community of Anakitao growers, there's not many of them, and you've got the Korero O Te Orau youth that are going up to Anakitao a bit these days, so the community is growing. But yeah, it's just that challenge of trying to practice culture and or particularly agriculture in the same way that we always used to growing taro vai. The thing with taro vai is that you need constant water supply. If the water dries up the taro will go bad. But also if you have significant flooding the terraces can get washed out or the aqueducts will get blocked up. So the little aqueducts that feed the taro vai, they have to be kept clean from too much leaf litter and stuff like that. But more of like floods and stuff, they get washed out. And I think there's been so much of that, that so many taro vai now are being just left and not fixed because people just think it's just too much maintenance now. Even though taro vai should be a more easy method of growing taro than down on the coast. It's actually less work because all you've got to do is set it up and just weed it and you have to weed it less frequently than the Pa'i (raised bed) taro style. But yeah, I think it's when you get these big floods that happen in Takuvaine Valley from time to time, then you sort of have a lot more challenges of growing taro that way. You know, the wider community of Rarotonga, you know, hear concerns from the growers and I'm a part of the, I guess, extended Nikao growers group. So the papa's that have taught me a lot about agriculture, are also been dealing with the changes of climate as well, the same invasive plants that I talked about, the dry periods, the floods, or the heavy rains that knock off all the flowers. I think these are things, just before your tomatoes set fruit or something like that, you get a heavy rain, you lose all your crop. These things have happened from time to time, but I feel like at least in my time as a grower, it's happening maybe every second season, you're just going to lose all of one of your crops. So it's hit and miss really. You might put an investment of time and money into setting up something and

then you lose it. And then it's like, well, that wasn't actually worth the time. And then by the time you might grow something, you might get a good crop and then you can sell that off. But yeah, it's just really unpredictable. And for someone that was just trying to get into farming and even getting organic certification towards the end of my time there, it was like, it shouldn't be this hit-and-miss with agriculture. So yeah, that's sort of what I can say from those that are growing taro in the Takuvaine Valley and also for those growing vegetables in the Pokoinu tapere (village) that I live in. It's just hard to keep growing crops.

16. I guess no doubt the changes that increased temperatures have had on lagoons, we've seen a lot of, not sure what the term is (it is an anoxic event), but you know, we get not enough flow of water into the lagoons. So, Manihiki, I think, had an issue where the fish just died. There wasn't enough oxygen in the lagoons and that's partly due to the heat. Also just the coral bleaching, you can see that in Rarotonga and other islands in the Cook Islands. So there's just excess heat once again. And then fishing, I've heard a lot of the Rarotongan fishing community talking about how it's just harder to get the usual fish that they've always caught and same with outer islands, particularly like tuna. Water's so important. Any prolonged drought, and you sort of see everyone being told to save water. And you know, we get really high rainfall in Rarotonga, so when we're getting told to save water, it's a bit of an alarm bell. But yeah, and then I guess we've, I mentioned the coral, but you know when coral is stressed, even if it's not bleached, if it's not dead, even when it's stressed, I believe that's when the taramea (crown of thorns) start to come up and they start to attack the coral because they know the coral is already stressed. So we have a Taramea outbreak at the moment coupled with the coral bleaching and increased sea temperatures which is being observed right around the Cook Islands.

17. I think that they actually rely on fishing for subsistence. There's a lot of those outer islands. I think even if they don't sell that fish, you know, they've traditionally say you catch tuna to feed the family, well that's meaning a'ai (*Thunnus spp.*), not eels, but you catch a'ai (yellowfin/bigeye tuna) or au'opu (skipjack tuna), varieties of tuna to feed the family, when those have moved your waters and traveled out and they don't come back because the temperature's too hot, you're going to have to supplement your diet from something else. So it's going to be an increased reliance on imported foods, which is actually not going to be good for anyone's health, especially in those outer islands. So, you know, this is what I hear. And, you know, for working in a NGO for that time, heard all those stories, you know, we were active in an anti-purse-seining fishing sort of protest movement, and that was because we were hearing all these stories from the fishermen in the outer islands that were catching these fish, and then the government was getting a new set of purse-seining fishing licenses. Obviously, that's revenue for the country that they decided they needed, but when it's on top of climate change, then that's going to be even harder for the outer island fishermen to rely on. And as I said, there's some things going for the Rarotonga fishermen who I have more contact with, they will say it's getting hard to keep catching fish and the fish are getting smaller. So it could be climate change related. There's no doubt. Also commercial fishing. But, you know, I think it's a combination of the two. So, you know, climate change is having a role. And, yeah, I've talked about agriculture and how, say, you know, I had a lot of problems with, like, pests when I was growing my vegetables as well. So, hard to say, you know, it could be a combination of climate change and other causes.

18. Yeah, probably just say the same for the Takuvaine Valley, getting the washouts and just the amount of time that we're spending on trying to eliminate these foreign trees now. I had to leave my chainsaw with my aunty when I left (December 2023) because there's just so many large African Tulip Trees, you've got to get rid of them or they're just going to keep seeding out and the seeds will just continue to spread. So it's hard work and its time taken away from plantations when you're having to deal with invasive trees. And yeah, flooding, if we can attribute the increased flooding to climate change, which I do think it's a contributing factor, then the damage to those taro patches. I mean, to the terraces, not only are they hard work to fix, but that's part of our cultural heritage that we lose when those terraces get destroyed by the washouts. I mean, I think of one marae we have, Te Ravaki, which is just across from Avatea School inland a bit, and that's been washed out, about half of it's been washed out from the little stream, little tiny stream that flows out to Avatea School. And I think how could half of that marae get washed when it must be hundreds of years old. So firstly, our tupuna wouldn't have built a marae in a place where they thought it would get washed away by a flood. But that's obviously happened in the last probably 50 years or so. So something at work, you know, we're getting worse floods now than before because it's really, you know, something useful to look at where the placement of certain maraes or health sites were in ancient times because they would have been built in safe places. I mean that's part of why we didn't build on the coast, because it's safer from cyclones and stuff like that. But of course we have to build on the coast now just for available land, if anything. But yeah, those are some of the impacts or damages, I'd say, you know, damage to cultural heritage, damage to, or time required to deal with new challenges of invasive trees and invasive pests, I'd say. It's very hard to trace that one, but you know, the prevalence of certain pests that might eat your crop or eat the leaves off your crops, stunting them, stuff like that. So there's got to be some impacts of climate change in relation to pests as well. That's just another thing that's going to take away from the earning potential for farmers across all the islands, but for Rarotonga it's something I've seen.

19. The thing that I am just so passionate about, although it's a hard thing to sell, is that we just need to be a lot more adaptable. We need to be more observant. So it's like experimenting with different crops. And that's why I've talked about the importance of genetic diversity, because some of these old kumara or taro varieties may actually be the ones that are going to be better for us in hotter, drier climates or hotter, wetter climates, or they might be more pest resistant. So it's really just going out there, learning about the different genetic diversity that we have, observing how certain plants grow, even these invasive plants, maybe there's a, you know, obviously the best time to pull most plants out is when they are young but you've got to be able to spot them when they're small. There's probably a lot of different methods, I'm sure a lot of people would resort to chemicals. It's not something I would do but we're all trying to keep control of the land and the invasive species. So observing, it's something our ancestors did. We know we had climate cycles back then. They weren't as drastic as anthropogenic climate change which we're facing now, but the climate did change. So our ancestors were able to adapt to the times, and they had the arapo (lunar calendar), which might tell you the good day to plant or good day to fish, but after maybe 10 years, that night is no longer good for fishing, and it became another night. But they were able to adapt, whereas now I don't think we adapt to arapo or traditional knowledge much. We think the traditional knowledge is always going to stay the same, but actually we will need to change.

So we have to be ready to adapt. Of course, the rate of change is just so much faster than anything our people have even had to go through, but just being observant, being ready to change. Its all trial and error. Maybe you might try planting another type of plant. Like when I was up in Takuvaine Valley, they were planting vetiver grass on the side of the banks to try and stop the erosion, and vetiver is not a native or Polynesian-introduced plant, but we can use certain plants or tools to our advantage just to try and adapt to climate change. But yeah, it's not going to be easy, but survival is, I believe, always going to be intertwined with the ability to grow our own food, fish for our own fish. So we have to keep trying.

20. I have mixed feelings about the need for money, but I think in a way, it would solve a lot in this situation. I think the amount of wealth that's on this planet and in the hands of people that are not really being affected by climate change is quite unfair. We're at the front line, but when you don't want to give up that practice, fishing for those manga (snake-mackerel) or a'ai, all these fish that our ancestors have always caught, you don't want to just throw in the towel one day and say, fishing is too hard. I'll stick to tin fish. That's not something that we ever want to do, not only for our food, but for our cultural value, our being. Same for growing taro, and taro is our big staple crop. It's also a strong cultural value. You can't have a kaikai without taro, but if taro becomes too hard to grow or there's too many obstacles, you know it's just going to flatten, go rotten every time. That's just not... So money can assist with making things easier. Maybe we try and make our taro patches more flood-proof, improve the drainage or improve the road access up to Takuvaine Valley so we can get up there more often to control the weeds. Maybe we need to spend more money sending divers like Kōrero o Te Oro to go and kill those taramea or do more reef monitoring, maybe set up more coral frames (for coral nurseries), whatever different methods can be done because I know maybe we could invest in certain more heat-tolerant coral species and at least we'll still have a living coral reef, but if we sort of let them get the impacts, double impacts of crown of thorns and coral bleaching, then we might not have much of a coral reef left. So stuff like that, you know, with money you could do a lot to mitigate some of those impacts. And for some it might be like, well, if we need to assist, say fishermen in the Outer Islands to keep being able to fish or they need, I think water is obviously the most important thing. If people need water tanks, if they need improved catchments, you know, like roof catchments to get their water, then it's a simple thing. Money can address that and then all hydroponics, the list goes on. But like, you know, the other alternative is that people leave the island and I don't think anyone wants to do that. When you leave the island, especially if you don't want to leave your island, then you take all your hundreds or thousands of years of knowledge from your family away from that context. And a lot of us that have grown up overseas and then gone back to the islands, we know how important that knowledge is, but someone that's just leaving Pukapuka for the first time to go and live in New Zealand might not realize that the knowledge that they have and the connection to the island that they have is actually really valuable in terms of the greater knowledge of not just Cook Islands but of all humanity. You know, there's a lot of traditional knowledge in the islands that could be of benefit to other islands across the Pacific or even other technologies and innovation in science all around the world. But when you just have this massive exodus of Cook Islanders overseas, which is probably the worst case scenario, that's going to be sort of a disaster for everybody. So yeah, I think money can help and more collaboration with scientists, more support for developing the indigenous knowledge that I was talking about. So, you know, whether

people need to be up-skilled with how to record that knowledge or just being able to even get paid just to spend time with elders and hang out with them and learn the techniques of traditional fishing, traditional crops. People don't really put a value on that. They think it's sort of like, as some people would say, it's like backwards knowledge. In this age where we need to strengthen our connection to the land and watch how it adapts to climate change. We need to be out there observing and practicing knowledge all the time.

21. Yes, I guess it's led me to thinking about what my PhD research will be on. I'm concerned about the world and climate change and all the other climate issues we are facing as a species, I realize there are quite a bit of people doing work in the marine area and indigenous knowledge but for me, i want to immerse myself in the mountains and particularly, the valley ecosystem around the Takuvaine Valley for a long period of time. Say, years and just be able to observe the changes that are happening. I want to be able to say for sure, what changes are happening in Rarotonga. A lot of the dialogue at the moment is mostly coming from the outer islands and they might talk about places becoming inundated and the struggle to grow taro but there aren't as many of these complaints from Rarotonga. Data collection at the Takuvaine Valley, having a deep level of observation is something that I feel like I need to do in order to continue to really speak to what is going on on our island. 200 years ago our people would have been doing that because that's how life was. They were much more in tune with the environment, now we're so overstimulated by technology so I feel like I need to do this not only because I want the answers but also because we all need the answers.

22. Speaking generally, with climate change we've had to establish an entire government department to deal with that. That's a lot of resources. We've established a whole lot of climate change mitigation and adaptation projects to try and move with the issue knowing that it's going to be around for a while at least. That's a huge amount of resources and energy that is going into adapting to climate change and then trying to do our part with mitigation and renewable energy. I think it's something that all Cook Islanders are feeling, all our islands and waters, will they ever be the same or will they ever go back to the way they were? That climate anxiety that we are all facing. It's a concern. Another driver could be our Government is going to be looking for ways to support itself financially and probably attempt to build our resilience to climate change. Climate anxiety is causing people in the islands and even outside the islands stress as well. So it's more than just literally trying to grow your vegetables or trying to catch a fish. It's the mental weight of climate change or it's the politics that can pit people against each other because of climate change.

    I think, you know, the world, the funders, the powers that be, the ones that have the ability to stop big oil or the largest emissions-producing corporations in the world. We sort of say, you guys need to stop your carbon emissions. You know, it'd be great if those leaders were able to better understand the plight of Pacific indigenous communities.
    You know, while we may be a minority, numerically, we hold a lot of the world's heritage in our islands, whether you're in Fiji, Cook Islands, Tahiti, Hawaii. There's a lot of unique cultural knowledge, biodiversity in our islands that could all be lost because of climate change. And I think

people need to be more open to listening to what we actually know about our islands and what's happening to them.
And that we actually aren't going to just up and leave and go to another city. You know, we can't just keep running from a rising sea level because it's eventually going to catch up with everyone. So having that platform at COP and at all these decision-making organisations, whether it's the United Nations and stuff like that, people do need to be more concerned with hearing the voices of people that are most affected by climate change. People from small islands, mostly Pacific, of course, we do have other parts of the world as well, low lying areas. Generally, people who are most dependent on the natural environment for their well-being. So farmers in Africa would be able to tell plenty of stories about how climate change is affecting them.
But yeah, for us in the Pacific, I think we continue, we're trying to get our voice across in the global arena, but we need more of a platform there. For people to understand, we actually really have all the solutions to how to live a low impact life. We still retain that connection to the land and it's something that we actually ideally would like to share with the rest of the world.
A lot of the populations and cities and Western countries that have sort of lost their way, that sort of don't feel that connection to the land and they just sort of live these lifestyles of consumerism and convenience. And so actually, everyone's going to have to be a little bit more aligned with indigenous values. And if we're not allowed to continue to live on our islands, then we're not going to have that knowledge that we need to share with the rest of our species in order to get us through this climate change and any other environmental challenges that we face in the future. So there's just so much at stake because there's so much knowledge that could be lost as soon as people stop fishing, planting, listening to the trees, going up into the mountains. Once people stop that, it's going to be very hard to relearn that knowledge because that knowledge took hundreds or if not thousands of years to develop in the first place. So an increased recognition of the value of indigenous knowledge by Western society, by government leaders of those Western countries and increased platform in all the main global gatherings would be great.

23. When it comes to traditional knowledge, the first thing that comes to mind is the rapid changes that are happening to our ecosystems. At the moment, we've talked about marine and terrestrial environments changing in different ways because of climate change. So with a lot of us dropping down to, say, part-time planting or part-time fishing, it means that a lot of our people, there's very few full-time traditional knowledge practitioners, which is obvious, but especially now, so many of us have full-time jobs and then we do the cultural practices on the side or the traditional subsistence as a bit of a top-up to our food and stuff like that.

    So that's the reality of a globalised world we live in. I think if we valued indigenous knowledge more, we'd put the true price on fish, or I guess commercialisation of medicinal knowledge is hard, but if we valued it, we'd probably have more people doing full-time stuff like carving vaka (canoes) or fishing for traditional foods out in the sea. So just to put that into context, I think with climate change, when you're out there all the time, you're able to take in a lot more observations of what's happening around you.

    So even though the environment is changing rapidly, hopefully you're going to be able to keep up with those changes. And of course, we've never been in climate change like this, where the

environment is changing so rapidly. But I do think it's the time that we spend out there, and of course, we're not able to spend a lot of time out there.

And so with climate change, it's like we are going out there maybe a couple of times a week out on the Paʻi taro or whatever, and just everything's changing. There'll be a new bug or every season, the water's acting differently. Either we've had too much rain, too little rain, sporadic rain, heavy downpours, and it's not like as regular as it used to be.

And so a lot of old people, when they talk about their indigenous knowledge or arapo, it's something that they were able to predict with a lot of certainty. Whereas now it's very hard to predict with any certainty what's going to happen. Even the most reliable things like when the mango seasons are for different mangoes, it's very hard for people to say, oh, okay, it's going to be mango season in a couple months, because everything's out of whack.

So I guess it's hard when we're not out there on the ground observing as much as possible. But even if we were, I'm not sure if we'd be able to keep up with these changes that we're seeing. So that's one challenge when it comes to not just the continuation of indigenous knowledge, but even generating new knowledge, because you've got to have a base set of practices that you know are reliable, and then you can tweak them and say, okay, well, maybe I'm going to adapt my planting practices this month and see if it is an improvement from last year's month, and stuff like that.

So that's a challenge, I guess. And with colonialism, the money is quite clearly in the hands of the Western elite. You could say the wealthy countries that have profited off of indigenous communities or tropical resources over the last few hundred years. So they've already been able to, extract that wealth from us. All the Pacific were basically European colonies at one point. So we know that they actually have an obligation to support the reconstruction, rehabilitation of our islands, the revival of our culture, which was obviously affected, depending on the country or island group, more or less by colonisation. But all of us were affected quite badly in one way or another.

So when you think about the obligations of the countries, particularly those European countries or dominant Western powers, they have a lot to do in the Pacific at the moment with climate change, and you know, they're aware of what's happening. You know, they're aware of sea level rise and the storms that are hitting everyone. I don't think the aid or the financial support or the adaptation money is coming through in the way that it should, or even any forms of support, and even just being honest and acknowledging that as world leaders at global platforms, they're not using their voice, and they're not implementing policies in their own countries to mitigate climate change.

We have some form of self-governance, we're in a western dominated world, where the wealth has been taken out, and in many ways continues to be taken out of poor countries, Pacific countries, and other third world countries and the profits are staying in the main emitters, you know, if there was a full admittance from those powers that, you know, they have a responsibility

to help us to survive, just like we helped them to survive and grow into the big powerful nations that they are, then yeah, you know, the colonization didn't stop when they stopped being our prime ministers and presidents, and gave us some level of autonomy. There's an ongoing obligation to assist us to get back to the, you know, we're never going to be like what we were, we're not going to have the strength of indigenous knowledge.

In fact, we might be able to get back to that knowledge, but it's going to look very different because we have modern technology available to us. We just need to have the chance as indigenous peoples of the Cook Islands, in this case, to be able to go back to our marine and terrestrial ecosystems and go back to observing and through that we can start to test our knowledge. We have the framework still, we have the lunar phase, the lunar calendar, we have the seasons, traditional seasons, we have all the certain birds or species that are indicators of seasonality or times to harvest, but a lot of these are out of whack now because of climate change, so we have to be able to spend the time on the land, on the sea, putting these into practice, and so that's something very few of us have the luxury to do.

A lot of us, if we're doing it, it's because we make it the focus of our research through a western institution, but governments of those colonial powers could be supporting us to actually put a lot of our young people back on the land and on the sea and start reviving that knowledge or actually generating new indigenous knowledge, because we are still very connected to our land, we're still, you know, we live on the islands, isolated from these major land masses, but yeah, I guess the flip side of that is we're isolated, we're far away from the the US, Europe, and these emerging global leaders, and so, you know, what's it to them if our way of life is lost or our islands are submerged? That's the problem, and I think it's the sort of taking ownership of the legacy of colonialism and also the neo-colonialism that we're still in currently.

24. I think I might have sort of skirted around that in the last question too, but when, firstly, you know, indigenous knowledge could be the information we've been handed down from our parents or grandparents, even if we're not actively practicing that ourselves, so, and when I say grandparents, could be hundreds or thousands of years old, even in our place names, so all that information that's handed down that can tell us about what certain types of ecosystems should be like, whether, you know, it should be associated with the abundance of a certain plant or whether, you know, a lake should have a certain type of fish in it, because often the names of the places have, even like parts of the lagoons in the northern group, they'll talk about certain fish or landmarks or even wind patterns that are predominant in that area, you know, most of our place names are actually descriptive, so like we already have a lot of indigenous knowledge just part of our way of life and we don't even realise it because, you know, we don't sort of stop to think about it, but the knowledge that comes from the elders as well that can give us a good idea of the way things were or the way things are meant to be, acknowledging that there are natural climate cycles, but right now, you know, they are a really good guide because, as we know, things have changed rapidly in the last few decades because of anthropogenic climate change, so while that's all important, as I've mentioned before, we do need to start actually putting into practice a lot of these things because, you know, the Arapo, as I might have mentioned, is something that was recorded (to paper) maybe 100, 120 years ago. Some people are still using that for root crops and some fishing practices, even the flying fish, but I think we could be applying the Arapo to

many other parts of our daily life, but we need to actually have a record, a long-standing observational record of what are the good days to plant this or fish this or even, you know, to do a lot of work in an office space, compared to days where we're meant to rest, so we need to sync our bodies and our actual practices back in with the lunar phases and something not a lot of us are actually cognizant of on a daily basis is what is the Moon telling us and there's a lot of evidence and that's why a lot of Hawaiians, the Aotearoa Māori, are going back to their lunar calendars because they've started to already recreate or generate a new framework of knowledge around the lunar phases that actually suits them, suits the changing climate, so we need to do that, but again, it's a matter of resourcing, it's a matter of valuing it, but yeah, climate change is going to make it difficult to be able to observe and come up with some general, I guess, predictability of like when the right time because, you know, it can be a great night to, when I say night, you know, it's according to the lunar phase of that day which you won't see until the night, but on that lunar phase might be the great night to plant taro, but the next month if you've got a category 5 cyclone coming you're not going to be planting taro that day anyway, but yeah, I think it's something that we need to be fully investing in and being supported in, collecting what's known and then generating new knowledge through traditional frameworks and also incorporating the best of western scientific monitoring practices as well, so that we can quickly and efficiently corroborate or triangulate the data that we're getting through our traditional observational practices, because yeah, we just need to use all the tools available to us at this stage, but we will never be able to thrive as a people without the revival of those traditional practices and just reconnecting back to the environment which, yeah, we need to be supported to do that.

25. I think the barriers to using Indigenous knowledge in response to climate change would be, partly, what has been lost already. However, in a lot of ways, compared to some Indigenous peoples and settler colonial nations like Hawaii or the United States, we actually have a lot of living, breathing knowledge that we haven't actually lost yet. Part of having all that knowledge, we have a lot of people that come from a long, unbroken line of fishermen or planters of taro. These are the people that know how much we've lost, because we've lost a lot of knowledge as well. There used to be people that can just look at the tiniest little detail, on a leaf of a tree or,, what the fish look like when they pull it up and make more larger statements about, “okay, well, this is going to be a good season”, or “this is going to be a bad season”, or “there's going to be an abundance of fish this year”, all that stuff. That's something that we need to retrain another generation of people with - that really deeper set of knowledge. The challenge is what has been lost.

    Also, I guess, just with the busyness of people's lives, a lot of people do this part time, or even less frequently, they might go up into the mountains and check up on the traditional harvesting sites or look at how the forest has changed. But yeah, we just are not resourced to really undertake a full scale Indigenous knowledge revitalisation at the moment. So that's the major barrier. And yeah, it's not really valued. Again, by the colonial powers, when we talk about funding at the COP meetings, for example, like Indigenous knowledge, it's a very small mention. Funding that goes directly to Indigenous peoples is very small. I don't know what the stats are, but it'd be in the single digits of overall climate funding that would go to Indigenous peoples, probably around one to two percent. So yeah, those are obviously clear areas where we could be supported to bring knowledge that can help us with, you know, help the planet with our adaptation and

eventually mitigation to climate change as well. A lot of important plants, animals, knowledge of the seas, and knowledge of the winds that could help us harness energy and reproduce our reliance on carbon emitting products. And you've kind of, you've definitely answered this question in previous questions already, but just in case you want to build on it a bit more, how can these barriers be overcome? What changes need to happen? I would say firstly, it's the funding once again, just to get funding from, I don't know whether I'll call them, there must be a name for, you know, they're the developed countries anyway, when we talk about climate negotiations, probably beyond the G8, but you know, where the wealth is and get that actually designated for Indigenous knowledge revitalization and observational studies of the environment in various Indigenous communities around the world would be really powerful, particularly in the Pacific, as we are obviously the ones that are most at risk currently. And beyond that, I think with the money coming in, with that recognition by the powers of the world, that our own people (will value it), because some of us don't really value the knowledge or the need to revive that knowledge. And that's part of, because we have been colonized as Pacific Island states. Also, I guess when there's no value, there's, you know, no monetary value attached to it, a lot of people are not going to sort of follow that pathway. And that's understandable because we're all trying to survive. And, you know, even with climate change, we need to prepare for the worst if people need to pack up and go to Aotearoa or Australia, because life's just getting too difficult. And the islands, because of climate change, then, you know, they need that money available. So when the money is attached to Indigenous knowledge, you know, it's a capitalist world that dominates the global economy.

And it's had an influence on the way that a lot of our own people perceive their knowledge. So yeah, that's just sort of like, there's multiple aspects, but probably the easiest way is to pop money into a pool that can support that and ensure that it's equitably spread out to Indigenous communities in the Pacific. And then if there are other islands or communities that have Indigenous peoples that are still, you know, in the similar space where they've got Indigenous knowledge or they're trying to revive it, it's also considered on a need basis and a vulnerability basis.

Some Indigenous communities are thriving, and we can just be spending a lot of time learning from them as well. And I guess that's something that I've been a part of with Nia Tero and other organisations I've been a part of. I think the short answer is to put some money in to support it. Once again, we need to acknowledge the role that colonialism had in taking that away from us as well.

Signed by: L Kohara Date: 15/03/2024

FORMAT OF SUBMISSION

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14 March 2024

The Registrar
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Re: Testimony of Cole Ikurangi Tavioni Bamber Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Cole Ikurangi Tavioni Bamber. I was born in 2008 and I am currently 15 years old. I am a Year 11 student at Tereora College.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I live on the island of Rarotonga, Cook Islands but my family also goes back to the island of Atiu in the Pa Enua (outer islands).

4. My experience with my culture has mostly been through school and family events. School has mostly involved performing arts culture. I have also learned traditional arts and carving skills outside of school with my Uncle. I have also been involved with my traditional culture through family events, for example I went to Atiu a few years ago for a family investiture. Chief Patoro was invested with a traditional title on a marae on my family land, in a traditional ceremony. I also value the Cook Islands Maori language, but I have noticed that our language is almost disappearing and I think it needs to be prioritized more.

5. Sea level rise from climate change can affect the Cook Islands specifically, because it will decrease our landmass. Factors like colonialism have already slowed down the teaching and progressing of our culture. If climate change forces our people from the Pa Enua and

other islands to move because of decreased land mass, it would make this loss of our culture even worse. Especially in the Pa Enua because culture is diverse across our islands; we have different dialects and unique traditions in each island.

6. It can also be dangerous in the Cook Islands when it doesn't rain especially in the Pa Enua because we need water to survive and it is our only water source.

7. I am worried that the Cook Islands might not even be a country in the future if sea levels keep rising. This worries me especially because I see other islands like Kiribati that are already experiencing a loss of their country.

8. I think that we in the Cook Islands, as well as anyone in any country should be trying to reduce waste and consumption and combat climate change as much as possible.

Signed by: CITB Date: 14.3.24

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12 March 2024

The Registrar
International Court of Justice
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Re: Testimony of Imogen Pua Ingram Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Imogen Pua Ingram and I hold the traditional title of *Te Pa Mataiapo* in Matavera, Takitumu District, in Rarotonga. I was invested with my title in 1996 and according to Cook Islands custom I will hold it for my lifetime. I was born in 1951 and I am 72 years old.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I grew up in Rarotonga as a child before and left for secondary school and university education overseas, returning home periodically in the interim. I moved back to live in Rarotonga permanently in 1992.

4. Some years after I moved back to Rarotonga, I acted as president of an environmental non-government organization named Te Ipukarea Society for 3-4 years. In 2005, I formed the organization Island Sustainability Alliance Cook Islands and spent about 15 years working as a community advocate for environmental issues, mostly involving the chemicals and waste cluster of UN Conventions. I have now retired officially but still have some involvement in the environmental and chemical and waste space. Through my work I have been involved in representing non-governmental organizations at negotiations for

the chemical and wastes conventions, in particular the negotiations for the new convention aimed at reducing or eliminating plastics pollution. More recently I have been concerned that delegates representing industry at these negotiations have outnumbered national delegates and NGO representatives. I am troubled because I fear the potential impacts on equitable representation and inclusiveness during the negotiations.

5. I have learned through my work that warming temperatures in the earth and sea due to climate change affect the chemical congeners of ingredients in plastic waste, such as PBDEs, and increase their volatility and toxicity. The impact that this waste has on the environment and natural resources is therefore amplified through the effects of climate change. This is a major issue for the Cook Islands, because although our contribution to the global plastic pollution problem is comparatively small, as fish-eating populations, we are likely to suffer disproportionately through the contamination of fish by endocrine-disrupting chemicals ("EDCs"), which threaten human health and the ability of fish to reproduce, leading to food insecurity. Like many Pacific Islands, a significant part of our GDP is derived from licensing distant fishing nations to fish within our EEZ, so the threat of contamination of fish through EDCs is likely to impact on human health of these distant fishing nations.

6. I have also learned that methane from landfills has an impact many times worse than carbon with regard to greenhouse gases and climate change. Until the 1950's, most waste in the Cook Islands would have been organic. Waste audits indicate levels of hazardous waste mainly from imported goods are also of concern for Small Islands Developing States ("SIDS") like the Cook Islands as we have no capacity to dispose of hazardous waste in an environmentally sound manner. We rely on recognition of the special circumstances of SIDS in the Basel Convention in order to re-export plastics, eWaste containing PBDEs and other hazardous wastes to a developed country for the purpose of environmentally sound disposal.

7. I was invested as a traditional and customary leader with my title as *Te Pa Mataiapo* in 1996. Soon after, I was recruited to the *Koutu Nui*, which is a statutory body of traditional leaders that have been invested with title by custom. In my time as a member of the *Koutu Nui* we have taken a proactive approach to giving our opinions on topical issues with regard to the welfare of our clans. Traditional titles are held for the lifetime of the titleholder, enabling continuity and institutional knowledge, as we remain in these roles while governments change, depending on election results.

8. Traditionally the important issues dealt with by customary leaders involved land distribution, justice, and governance at the level of *tapere (*neighbourhood*)* and *vaka* (district). Nowadays, modern democratic and Westminster systems, such as the Judiciary, Parliament and the Government have taken over these roles. Guardianship of the environment, however, remains an area that has always been traditionally important, and we consider protection of the environment as vital in ensuring that traditional leaders remain relevant in the modern day by contributing their institutional knowledge.

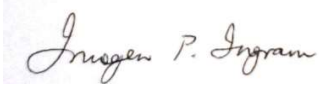
9. The declaring of *ra'ui* ("locally managed conservation area) by traditional leaders is a traditional conservation practice where a ban is placed on the use of a particular resource in a particular area, and they are commonly used to avoid depletion by over- fishing. *Ra'ui* were and are still frequently used in the *Pa Enua* (outer islands), but by 1998 were no longer used on the main island of Rarotonga. At that time, we traditional leaders from the *Koutu Nui* made efforts to revive this practice, and *8 ra'ui* were established. After that, there was interest in other similar Polynesian cultures in replication. French Polynesia implemented a very effective *rahui* system (a similar custom to *ra'ui*). We visited their *rahui* and shared experiences about how *rahui* have evolved to meet modern challenges. Similarly, we are also building a relationship with representatives in Hawaii who are interested in how a coastal community might establish a *rahui* there, building on the knowledge and experiences of the *ra'ui* and *rahui* systems in the Cook Islands and French Polynesia. We all have similar cultural values and principles and are faced with similar environmental issues, and this cultural knowledge interchange is a way to enable our populations to continue with subsistence fishing, by allowing the fish stocks time to build up and fishing in the spillover areas nearby. In this way, families can live off food from the sea, as we always have done.

10. We also have traditional agricultural practices; such as burying *puru* (coconut husk) at the base of the plants to retain water at the base of the plants. We also had a practice of burying decayed vegetable matter wiith the *puru* as a boost to growth, equivalent to composting. Water conservation practices, involving "*ara vai*" (dams and irrigation channels) were used and overseen by traditional leaders.

11. Our traditional practices are closely connected to our environment so they naturally change with the environment. For example, traditional medicine is still practiced today but many plants used in traditional medicine such as "poroiti" cannot be found as easily anymore.

12. We also used to have a very reliable traditional lunar calendar called the "arapo", which we used to plan and plant crops according to. Because of changes in the climate, the *arapo* no longer works with the same predictability and consistency.

13. I have experienced two serious droughts in my lifetime; one in 1992 where there was no rain for about two to three months and one recent drought which lasted from November 2023 to March 2024. Droughts are concerning because our entire national water supply relies on rainfall harvesting. A survey carried out by French Development agency back in 1992 into the possibility of drilling wells found that underground water was likely to have been contaminated by septic tanks.

Signed by:  Date: 14th March 2024

FORMAT OF SUBMISSION

Ngatae Mitaera Teatuakaro Tavioni Teranginui-o-iva
Nikao
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07 March 2024

The Registrar
International Court of Justice
Peace Palace
Carnegieplein 2
2517 KJ The Hague
The Netherlands

Re: Testimony of Ngatae Mitaera Teatuakaro Tavioni Teranginui-o-iva Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Ngatae Mitaera Teatuakaro Tavioni Teranginui-o-iva but I am known by the name Michael Tavioni. I was born on 1 February 1947 and I am 77 years old.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am Cook Island Maori and I was born in the village of Avarua on the island of Rarotonga. I also spent some time living in the outer island of Atiu when I was primary school age, and I spent some time living in New Zealand during secondary school.

4. I carry the traditional title of Ta'unga Tutara, which is given to experts in traditional skills. I have a diploma in Agriculture, a Bachelor of Arts, and a Master of Pacific Studies. I am preparing to study a doctorate degree.

5. When I was younger I spent some time training and working as an Agricultural Officer for the Ministry of Agriculture before becoming a full time artist around 40 years ago. I practice traditional arts such as carving of wood, stone, bone and shell and tapa making. I also do painting, pottery, and write poetry and history. I have many interests in the arts but my main focus is keeping traditional and cultural art alive. I believe that our traditional way of

life and culture are important because they are the source of Cook Islands identity. This includes our traditional and food security skills and the Cook Islands traditional culture of respect for nature and the ocean.

6. Cook Islanders have customary conservational practices such as Ra'ui, which are restrictions on exploitation of certain resources until stocks replenish. We have been practising this custom since before colonization. Nowadays these cultural aspects are being overlooked because people are more concerned with financial security than environmental health and security of natural resources. Through this Cook Islanders are losing traditionally developed food security skills.

7. Taro is a traditional food that has been a food staple throughout Cook Islands history, which we kept with us as we migrated through the Pacific. Taro is important to Cook Islanders culturally and nutritionally, however now I see in the local supermarkets that there is always a steady supply of potatoes and they are cheaper than locally grown produce such as taro. The traditional skill of planting taro is falling away because of this.

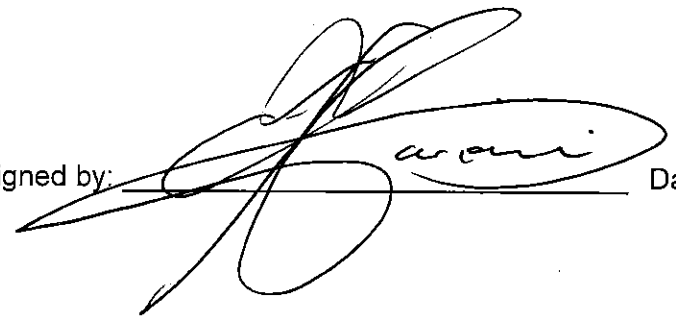
8. To my understanding the Cook Islands has lost about two thirds of our population to emigration to countries with higher wages. This has resulted in a huge loss of Cook Islands culture and national identity.

9. In my lifetime I've experienced two serious tsunamis; one more so than the other. The first was in 1952, where the sea came in about almost one kilometre. I can't remember the second one but it was at least ten years later. I've seen many hurricanes, maybe 10 of them were serious. Cyclones can be more frightening on outer islands such as Manihiki which is an atoll, where the water comes right across the land and over the other side of the island.

10. Large ships are often wrecked on the reef and the diesel and oil leakage can have long term effects. I recall around the 1970s a Japanese ship was wrecked on the outer island of Pukapuka and years after the paua in that area was almost wiped out. There are ships wrecked on just about every island in the Cook Islands. The main environmental change I have witnessed has been pollution and its effect on marine life, particularly in front of the town area and around areas by the beach where there is a lot of tourism accomodation.

11. I feel that we as Cook Islanders are not in control of our own oceans because we financially depend on foreign fishers. I am concerned about the impact foreign fishers are having on the health and ecosystem of our waters. In our custom, we own all the resources in common "from the mountain to the ocean", and we use conservational practices such as Ra'ui to protect them, however I feel that the Cook Islanders are not in control of our own oceans anymore.

12. I feel that Cook Islanders are caught in a global system and I don't know if we can revert back to our traditional way of life. I believe we are not big or influential enough to demand anything from the rest of the world.

Signed by:  Date: 14/3/24

FORMAT OF SUBMISSION

Emma Louisa Papalii
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14 March 2024

The Registrar
International Court of Justice
Peace Palace
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2517 KJ The Hague
The Netherlands

Re: Testimony of Emma Louisa Papalii Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Emma Louisa Papalii. I was born in 2007 and I am currently 16 years old. I understand that this testimony will be submitted to the International Court of Justice.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am a level 2 NCEA student at Tereora College in Rarotonga. I am a national athlete in Shot Put so I train alot and I work part-time as a sales assistant.

4. My typical day starts at home, then to school, then to training and back home. I look forward to catching up with friends, as well as training after school.

5. A cultural tradition that plays a big role in my family and my life, is speaking te reo maori at home and going to church as God also plays a major role in Cook Islands families.

6. Growing up, the environment I have lived in has always made me embrace change and how to counteract, especially during floods with sleepless nights and having to go out into the rain to stop the water from going through the house. I’ve become more resilient and normalised to this routine during periods of heavy rain.

7. I value the ocean and the trees that bear fruits here in Rarotonga.

8. I value the ocean because it provides us with food and as a Pacific islander this was our main source of food. I value the trees that bear fruit not only because it provides us with fruit but also provides us with nutrition for our animals and helps for shade and fresh air.

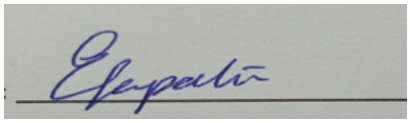
9. A climate event that I experienced that made me aware of the realities of the climate crisis and how serious it is, is beach erosion. As the sea level rises, I have seen how small the beaches here in Rarotonga are becoming. Another experience that I have been through or have seen is on the island of Manihiki. The atoll is becoming narrower due to sea level rise making the island more vulnerable with less land mass. The tides are coming in more frequently and this causes debris from land to be swept out into the ocean, which may also hold chemicals that could be harmful to our marine life and could be supporting climate change.

10. In the community I belong to, in the village of Tutakimoa, the weather pattern has affected us, as flooding is more regular and its eroding the land around our area.

11. Losses that I have seen as a result of climate change is the loss of sand on beaches, and the temperature of the ocean is getting warmer which means when the ocean gets warmer, the oxygen in the ocean starts to die out which is killing our marine life, for example our coral reefs.

12. An urgent need that I think my community has as a result of the impacts we have suffered would be to start planting shrubs to protect our land from erosion and the rising sea levels that's caused by the melting glaciers.

13. Climate change hasn't affected the way I live my life, yet but that doesn't mean it won't later on in life. We need to make those outside of our community better understand that climate change is real. We should say that climate change is like cancer, it doesn't tell you that it's coming and it doesn't tell you how it's going to affect you. No. It will just come and all of sudden you need to figure it out.

Signed by:  Date: 14/3/24

FORMAT OF SUBMISSION

Maddyson Kaylee Spurle-Lowe
Matavera
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14 March 2024

The Registrar
International Court of Justice
Peace Palace
Carnegieplein 2
2517 KJ The Hague
The Netherlands

Re: Testimony of Maddyson Kaylee Spurle-Lowe Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Maddyson Kaylee Spurle-Lowe. I was born in 2008 and I am currently 16 years old. I understand that this testimony will be submitted to the International Court of Justice.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am a student at Tereora College, level 2 NCEA. I am a national representative for oe vaka and I work part-time as a barista at Love Cafe. I am originally from New Zealand, but I moved to Rarotonga when I was 10. Now I live in Matavera and I have connections to Rakahanga and Palmerston through my mama.

4. A typical day starts with me going to school, then training after school for oe vaka and then home to do my homework. The highlight of my day is being able to go paddling with family and friends. My whole family here paddles too.

5. The culture here is very family orientated, even as a wider community. It's a value as a Cook Islander and it wasn't something I was used to growing up in New Zealand. Everyone really looks after each other. Traditions here are well respected, some things are modernised but the core of it is still there and you can feel it amongst our people.

Another thing is that people here grow up with a special connection to the ocean. My love for the ocean started from my mum, and hers started because of my mama who everyone knows practically lives for her oe vaka and the ocean. She is our connection to the Cook Islands.

6. The environment around me gives me a sense of enjoyment. The ocean is very important to me. As a paddler, I appreciate having the ocean where I can freely swim, I can paddle and I can share those experiences with others. And we get to watch the seasonal marine life like dolphins. It's good because I get to share this with my family, they are all paddlers too. All this has given me a deeper appreciation for the ocean, so if I see rubbish or whatever, I'll swim to it or walk to it and dispose of it.
   It's also important as a source of income for my family as my step dad and papa are both fishermen and my mum runs our fishing shop.
   And, this year I appreciated our avocado tree more because usually it would bear really nice avocados during the season but because of the weather, we only got a few this season and they didn't taste as good.

7. I feel like the humidity has been worse, the heat is hotter and more drawn out, especially this year. Now we have to be quite vigilant with ensuring our animals have cool drinking water, because it's just too hot.

8. When we're out on the ocean, I've noticed that the tides are higher and more unpredictable. Climate change has affected my paddling community in that the tides are staying out longer than usual. Now we're carrying our canoes in from a further distance than we used to and the current, when the tide comes back in, has more of a surge power to it. Knocking our boats against the harbor walls or other boats.

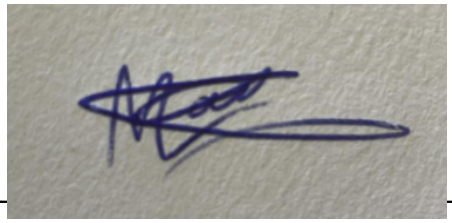
9. In terms of the Cook Islands, I know climate change affects more than the ocean. With the heavy rains we had last year, you could see the plantations and vegetable crops that were impacted. Our food security is in danger on land as well as in the sea.

10. I don't know of any losses but I've heard from my mama and auntys experiences, seeing certain marine animals out of season like whales and blue bottles. Something to do with the El Nino and La Nina. And some off visits from seals as well which is not normal for us at all.

11. My mama and papa's property suffers damage every time we experience heavy rainfall over the last few years. Part of their land has started to recede into the nearby ditch. It's pretty bad. They planted a special type of grass to help strengthen the grip of the soil but I don't think that helped. The rain washed it away before it could do any good. I think my papa is looking at getting these giant rock basket things that act as a kind of sandbag to help secure the edges affected by erosion.
    It would be good if those who have issues like my mama and papa, can get financial support to stop the erosion sooner, rather than later. For the wider community, I'm not

too sure really but I'm sure our environment services would know what to do, but I'm guessing that like most things when you live on a small island, the limitation probably comes down to money.

12. I don't think I have faced any challenges because of climate change, but seeing the little things has opened my eyes a bit more about climate change. I don't think I've lived long enough to experience any significant climate related changes. Honestly, I'm not too sure what to do to help those outside of my community understand the importance of protecting our islands but I do know that I want to keep our islands safe and as clean as possible. To protect them from what climate change does to small places like us because of the pollution of bigger countries. It's not really fair, maybe they can help us. I'm sure there are programmes they can fund that would help.

Signed by:  Date: 15/03/2024

FORMAT OF SUBMISSION

Henry Arapai Herman
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04 March 2024

The Registrar
International Court of Justice
Peace Palace
Carnegieplein 2
2517 KJ The Hague
The Netherlands

Re: Testimony of Henry Arapai Herman Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility, relevance and effectiveness in court.

1. My name is Henry Arapai Herman, and I was born in 1979 and I am currently 44 years old.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am of Cook Islands Maori descent and I was born and raised on the capital island of Rarotonga (population of about 12,000).. I am connected to two outer islands in the Cook Islands, to Manihiki (population of under 200) via my mother and Mangaia (population of about 300) via my father. I moved to New Zealand in 1997 to attend University of Auckland, and moved back to Rarotonga permanently with my family (wife and 4 young children 14-6 years) in 2021. I have a Bachelor of Science in Marine and Aquaculture Science and a Bachelor of Laws. I have utilised my Law degree and have practiced as a lawyer for just under twenty years, and I with my wife are currently owner operators of a local law firm and business consultancy company.

4. Traditional food production was an important part of my childhood and the community livelihood. My family would plant traditional foods and share them with our local community. It was a unique and valuable way of life. We planted food such as pawpaw,

kumara, maniota, taro and noni and we also sometimes exported some of this food, like many others at the time. I recall that agriculture was the primary industry sector in the Cook Islands when I was growing up (30-40 years ago), but that has changed over time. I feel like there is now a higher reliance on imported foods now than what there was 30 years ago and Im not sure exactly why this, but maybe it's a lot hard to grow and produce food due to more severe and/or drier weather or because of a combination of climate change and our small economy being subservient to bigger overseas markets and influence. Either way you look at it our way of life and food security is a major worry now especially when compared to 30-40 years ago.

5. My wife and I are currently developing a concept and strategy to try to address food security in the Cook Islands. We have since September 2023 developed a project proposal named "Kai No Te Ora'anga Tau- Food for Good" which is aimed at developing a grassroots Cook Islands sustainable and circular food ecosystem. This work has involved consulting and communicating with various Cook Islands stakeholders at various grassroots and leadership levels including with our Government and in recent weeks with potential overseas funders.

6. To develop our own unique Cook Islands' circular food ecosystem, I believe we need up to date relevant data and to complete a feasibility study for our specific Cook Islands' context, rather than studies conducted in other Pacific Islands which has different environments (land sizes and gradients and soil qualities), population sizes, and cultural dynamics (different language dialects) and customary practices.

7. In my experience, it is difficult for locally developed projects in the Cook Islands private sector to access climate (change, resilience and adaptation) funding or information on climate funding, because access to the same seems to largely be facilitated through and/or limited by government. I think this is an issue because there is significant long term value to be gained by having projects that are built (with the support of Government) by the community for the community. By having meaningful and genuine consultation with local communities you are able to develop locally inspired projects and plans that are properly contextualized (unique and relevant).

8. In terms of adverse weather events in the Cook Islands, we are particularly vulnerable and fragile to the same. I can recall the recent storm surges and/or king tides in the last 3 years which I don't recall being as bad and as frequent when I was growing up as a child. I also recall Cyclone Sally in 1987 being a massive cyclone to hit the island of Rarotonga. The devastation across the island is still clear in my mind and our island took years to bounce back. Although we in Rarotonga have been lucky to avoid being hit by extreme natural disasters including two cyclones in recent weeks that passed nearby our island, it does seem inevitable that another tropical cyclone of Sally's magnitude or worst, will hit us soon. I am concerned if we are to be directly hit again by a serious natural disaster, due to the quality or lack thereof of the buildings or infrastructure here that the devastation could cripple our Capital Island, our economy and our country.

HH

9. I remember Cyclone Martin in 1997 which hit the island of Manihiki where nineteen (19) lives were lost. Before this the Cook Islands recorded lives lost in natural disasters was under 10 so this was devastating for this small island population. My mother is from Manihiki and was a nurse and flew out after the cyclone hit. I believe that around half the population of Manihiki had migrated overseas after the cyclone. So depopulation is also a huge issue for the Cook Islands and has been on a slow but gradual decline since the 1970's. Manihiki and the other outer islands are particularly vulnerable to natural disasters and water and food security issues due to their isolation, low-lying coral atolls, smaller populations (generally under 500 people) and smaller landmass, higher cost of living, and issues of costly transportation infrastructure. During periods of long dry weather, water security (volume and quality) is a major issue and the consequential impacts on local wholesome food production systems (due to lack of water or quality soil).

10. In my experience climate change or specifically warmer climates can also impact the Cook Islands in relation to health issues. My daughter has allergies that are susceptible to heat fluctuations, pollen and dirt in the air, however I feel as the warmer weather becomes more warmer and more intense for longer periods her allergies in the last two years has intensified which sadly has caused her to miss quite a number of days of school. At is extreme, she in fact ended up in Starship Hospital, Auckland, New Zealand for some weeks and lived in New Zealand with my wife for about three months last year for a rare allergic skin reaction to chicken pox. The economic and social (family separation and education) costs were therefore significant for our family in the Cook Islands.

11. Unless something is done to address climate change then I worry for my children and all future generations in the Cook Islands. As a small island state (15 islands) 15 dots on the world map, given our small size (land and population) we are extremely vulnerable to the varied impacts of climate change whether it is extreme and frequent natural disasters, droughts or pollutants in the air and water.

Signed by: Henry Herman Date: 8 March 2024

FORMAT OF SUBMISSION

Vaine Wichman
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08 March 2024

The Registrar
International Court of Justice
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Carnegieplein 2
2517 KJ The Hague
The Netherlands

Re: Testimony of Vaine Wichman Impacted by the Effects of Climate Change

To whom it may concern,

This testimony has been prepared carefully and accurately to ensure its admissibility and effectiveness in court.

1. My name is Vaine Wichman and I was born in 1961 and am nearly 63 years old. I was born in the village of Titikaveka, on the island of Rarotonga in the Cook Islands, and live in the village of Arorangi now. I grew up in Vaimaanga in Titikaveka. My descent lines are – Ngati Te Tika, Ngati Tamakeu on my mother's side both tribes from Titikaveka. I descend from Kopu Tangata Isaia of Tongareva/Penrhyn Island in the Cook Islands, Rurutu/French Polynesia, and Viggo Rasmussen family Denmark on my father's side.

2. I affirm that this testimony is true and accurate to the best of my knowledge and belief.

3. I am the president of the Cook Islands National Council of Women, a 50 year old national non-governmental organization initially founded to support health-care efforts to control the spread of communicable illnesses, but has since expanded to work with national and international institutions to promote gender equality and visibility. We also aim to strengthen women in governance roles, improve and consolidate women's revenue sources and economic standing, mitigate the impact of climate change, and continue to push to end domestic abuse against women and their families.

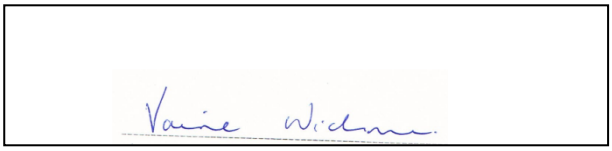
4. Through my work with the Council I have seen that the Cook Islands handicraft sector, which is mainly composed of women has remained on the periphery of mainstream

industries like tourism, agriculture, marine resources. The women who work in this sector rely on the harvesting of raw natural materials to make products of customary and commercial value, such as handicraft produced from pandanus leaves (baskets, mats, toys, roofing, food storage) from processed coconut frond leaves (baskets, hats, jewellry, fine mats, ceremonial dress, clothing, food storage and gift wrapping). Supply and access to the raw materials many Cook Islands women rely on are now being hampered by the impacts of climate change, and as a result I believe that the Cook Islands handicraft sector has been under threat and stress for over the last 10 years. This is an issue as women who work in this sector rely on this revenue, and it very important to their home security and their opportunities in life such as education and community participation options, and decision making.

5. Handicraft production is the main income source of many women who live in the outer islands (Pa Enua) of the Cook Islands, and it is also a way that cultural knowledge stays alive. The handicraft sector has both a formal and informal sector, and informal sector production is often invisible. As a result, women producers are not able to attract resources and support to assist in protecting the raw materials they rely on.

6. This is an equality issue because women's food and handicraft products never appear in the country's national accounts. Despite this, their production is an important fibre connecting the economic and infrastructure development gaps in the islands.

7. I believe that increased participation of women and vulnerable groups in decision making processes, along with training activities, will strengthen local capacities to undertake key initiatives for climate change adaptation. This can be through enhancing food systems resilience, water security and economic recovery. This can also, over time, contribute to change in social, cultural, and gender norms. In addition to helping meet immediate basic needs, livelihood interventions can improve the future prospects of women and girls, and change the way the community treats them when their contribution to economic security is recognized.



Signed by:

___ Date: _____14 March 2024_____