TUVALU

HEALTH & CLIMATE CHANGE

COUNTRY PROFILE 2020

Small Island Developing States Initiative

World Health Organization

United Nations
Framework Convention on
Climate Change

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Acknowledgements

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"If we save Tuvalu, we save the world"

Enele Sosene Sopoaga, former Prime Minister of Tuvalu

WHO / YOSHI SHIMIZU

EXECUTIVE SUMMARY

Despite producing very little greenhouse gas emissions that cause climate change, people living in small island developing States (SIDS) are at the front line of climate change impacts. Tuvalu, one of the least developed SIDS, is already seeing the devastating effects of climate change on its communities every day – from worsening extreme weather events, to increased spread of infectious diseases, to occupational health risks. Tuvalu faces a range of acute to long-term risks, including extreme weather events such as floods, droughts and cyclones and slower onset events like increased average temperatures and rising sea levels.

Like many other SIDS, Tuvalu already has a high burden of communicable and noncommunicable diseases that are exacerbated by climate change. As is often the case, the nation is among those at greatest risk as it is under-resourced and unprotected in the face of escalating climate and pollution threats. In recent years, Tuvalu's voice as one of the most vulnerable small island nations, has become a force on the global stage in raising the alarm for urgent global action to safeguard populations everywhere, particularly as its very existence is under threat.

Recognizing the unique and immediate threats faced by small islands, WHO has responded by introducing the WHO Special Initiative on Climate Change and Health in Small Island Developing States (SIDS). The initiative was launched in November 2017 in collaboration with the United Nations Framework Convention on Climate Change (UNFCCC) and the Fijian Presidency of the COP23 in Bonn Germany, with the vision that by 2030 all health systems in SIDS will be resilient to climate variability and climate change. A global action plan has been developed by WHO that outlines four pillars of action for achieving the vision of the initiative: empowerment of health leaders to engage nationally and internationally; evidence to build the investment case implementation to strengthen climate resilience; and resources to facilitate access to climate finance.

In March 2018, Ministers of Health and senior health officials from across the Pacific gathered in Fiji to develop a Pacific Action Plan to outline the implementation of the SIDS initiative locally and to identify national and regional indicators of progress. As part of the regional action plan, small island nations have committed to developing a WHO UNFCCC health and climate change country profile to present evidence and monitor progress on health and climate change.

This health and climate change country profile for Tuvalu, developed with WHO as part of a common shared commitment to the UNFCCC, provides a summary of available evidence on climate hazards, health vulnerabilities, health impacts and progress to date in the health sector's efforts to realize a climate-resilient health system.

KEY RECOMMENDATIONS

1 STRENGTHEN IMPLEMENTATION OF POLICY AND PLANS

Finalize and implement the National Health and Climate Change Plan 2020–2024.

2 ASSESS HEALTH VULNERABILITY, IMPACTS AND ADAPTIVE CAPACITY TO CLIMATE CHANGE

Complete a national assessment of health vulnerability, impacts and adaptive capacity in Tuvalu. Ensure results of the assessment are used to inform policy prioritization and allocation of resources.

3 STRENGTHEN INTEGRATED RISK SURVEILLANCE AND EARLY WARNING SYSTEMS

Integrate heat stress (see page 9) into existing monitoring systems and develop health sector response plans for climate-related events.

4 TAKE ACTION TO ADDRESS BARRIERS TO ACCESSING CLIMATE FINANCE

In Tuvalu, the main barriers have been identified as a lack of information on climate financing opportunities, a lack of connection by health actors to climate change processes and a lack of capacity to prepare country proposals.

5 BUILD CLIMATE RESILIENCE OF HEALTHCARE FACILITIES

Apply measures to prevent the potentially devastating impacts of climate change on health service provision, including: conducting hazard assessments; climate-informed planning and costing; strengthening structural safety; contingency planning for essential systems (electricity, heating, cooling, ventilation, water supply, sanitation services, waste management and communications). A commitment towards low-emission, sustainable practices to improve system stability, promote a healing environment and to mitigate climate change impacts can also be taken.

BACKGROUND

Tuvalu is a sovereign state located in the South Pacific Ocean with a land mass of 26 square kilometres across a group of nine coral atolls and a mean elevation of 2m above sea level *(1)*. Considered one of the smallest and most remote countries on Earth, Tuvalu is both a small island developing state and a least-developed country.

Disasters continue to pose a threat to the Tuvaluan way of life. When Cyclone Pam hit Tuvalu in 2015, around 45% of the population were affected as the country suffered from substantial losses amounting to US$ 10.3 million, equivalent to 26.9% of its GDP *(2)*. All of Tuvalu's atolls experience spring tides and tropical cyclones often with flooding damaging agriculture and infrastructure. Tropical cyclones affect Tuvalu mainly between November and April and are most frequent in El Niño years and least frequent in La Niña years *(3)*.

Climate data indicates that Tuvalu is already experiencing increasing temperatures, sea level rise and ocean acidification consistent with climate change *(3)*. The key health vulnerabilities sensitive to the effects of climate change in Tuvalu include diarrhoeal disease (due to contaminated food and/or water), respiratory disease (infective and obstructive), compromized food security (with impacts on nutrition and noncommunicable diseases (NCDs)), vector-borne diseases, mental health/psychological problems, injuries and deaths from extreme weather events, fish poisoning (ciguatera) and skin infections/infestations *(4)*. Heat stress (see page 9) is increasingly being recognized as a key health threat due to climate change in Tuvalu.

HIGHEST PRIORITY CLIMATE-SENSITIVE HEALTH RISKS FOR TUVALU

Direct effects	
Health impacts of extreme weather events	✔
Heat-related illness (see page 9)	✔
Indirect effects	
Water security and safety (including waterborne diseases)	✔
Food security and safety (including malnutrition and foodborne diseases)	✔
Vector-borne diseases	✔
Zoonoses	
Respiratory illness	✔
Disorders of the eyes, ears, skin and other body systems	✔
Diffuse effects	
Disorders of mental/psychosocial health[1]	✔
Noncommunicable diseases	✔
Health systems problems	✔
Population pressures	✔

Source: Adapted and updated from reference *(4)*.

CLIMATE HAZARDS RELEVANT FOR HEALTH

Climate hazard projections for Tuvalu

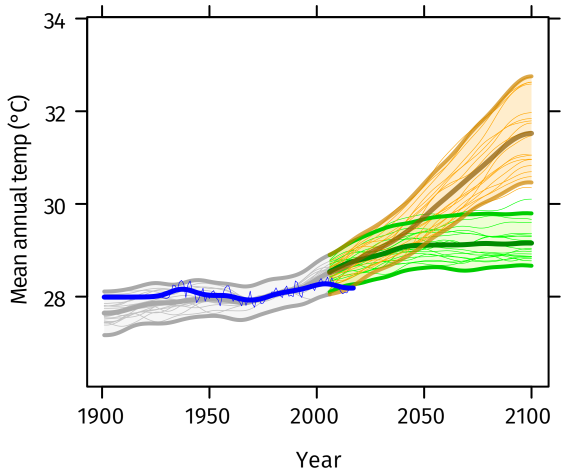
Country-specific projections are outlined up to the year 2100 for climate hazards under a 'business as usual' high emissions scenario compared to projections under a 'two-degree' scenario with rapidly decreasing global emissions (see Figures 1–5).

The climate model projections below present climate hazards under a high emissions scenario, Representative Concentration Pathway 8.5 (RCP8.5 – in orange) and a low emissions scenario (RCP2.6 – in green).[a] The text describes the projected changes averaged across about 20 global climate models (thick line). The figures[b] also show each model individually as well as the 90% model range (shaded) as a measure of uncertainty and the annual and smoothed observed record (in blue).[c] In the following text the present-day baseline refers to the 30-year average for 1981–2010 and the end-of-century refers to the 30-year average for 2071–2100.

Modelling uncertainties associated with the relatively coarse spatial scale of the models compared with that of small island states are not explicitly represented. There are also issues associated with the availability and representativeness of observed data for such locations.

Rising temperature

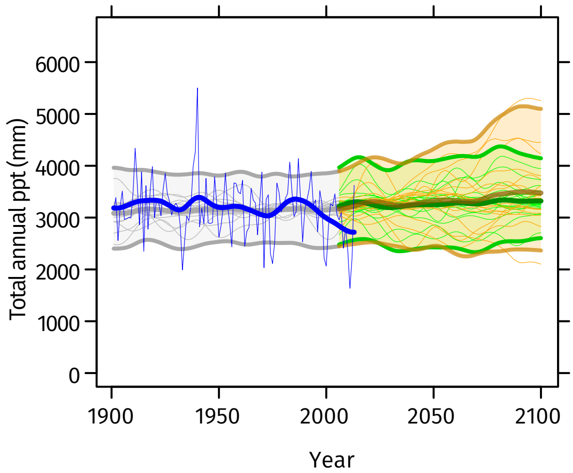
FIGURE 1: Mean annual temperature, 1900–2100



Under a high emissions scenario, mean annual temperature is projected to rise by about 2.9°C on average by the end-of-century (i.e. 2071–2100 compared with 1981–2010). If emissions decrease rapidly, the temperature rise is limited to about 0.9°C.

Small increase in total precipitation

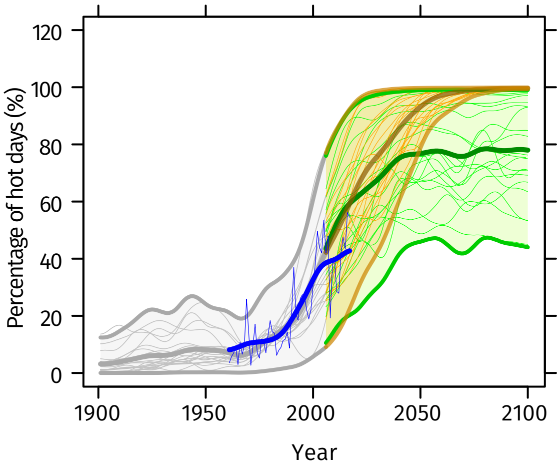
FIGURE 2: Total annual precipitation, 1900–2100



Total annual precipitation is projected to increase by about 9% on average under a high emissions scenario, although the uncertainty range is large (-15% to +48%). If emissions decrease rapidly the increase is smaller: 5% on average with an uncertainty range of -6% to +20%.

More high temperature extremes

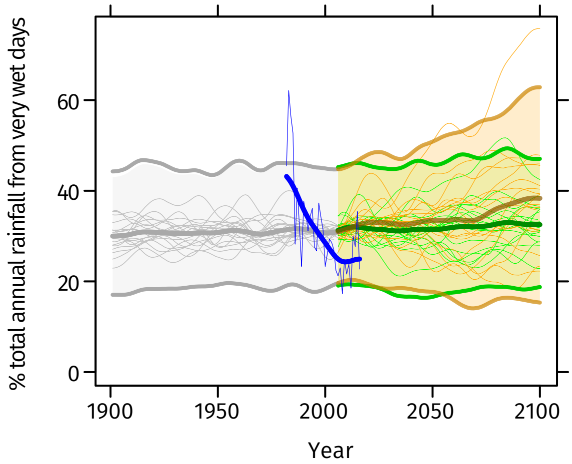
FIGURE 3: Percentage of hot days ('heat stress'), 1900–2100



The percentage of hot days[d] is projected to increase substantially from about 25% of all days on average in 1981–2010 (10% in 1961–1990). Under a high emissions scenario, almost 100% of days on average are defined as 'hot' by the end-of-century. If emissions decrease rapidly, about 75% of days on average are 'hot'. Note that for the last few years the models tend to over-estimate the observed increase in hot days. Similar increases are seen in hot nights[d] (not shown).

Small increase in extreme rainfall

FIGURE 4: Contribution to total annual rainfall from very wet days ('extreme rainfall' and 'flood risk'), 1900–2100

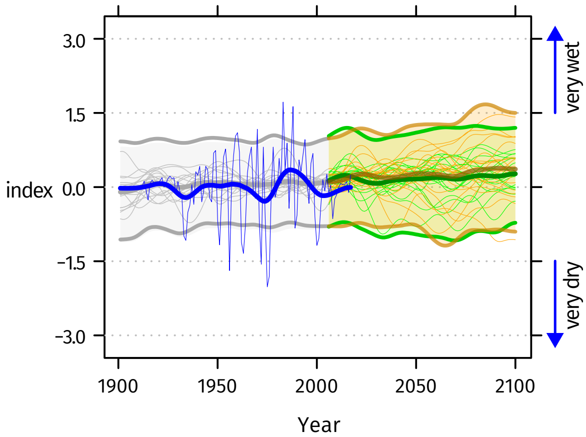


Under a high emissions scenario, the proportion of total annual rainfall from very wet days[e] (about 30% for 1981–2010) could increase a little by the end-of-century (to almost 40% of days on average with an uncertainty range of about 15% to 60%), with little change if emissions decrease rapidly. These projected changes are accompanied by small projected increases in total annual rainfall (see Figure 2).

FIGURE 5: Standardized Precipitation Index ('drought'), 1900–2100

The Standardized Precipitation Index (SPI) is a widely used drought index which expresses rainfall deficits/excesses over timescales ranging from 1 to 36 months (here 12 months, i.e., SPI12).[f] It shows how at the same time extremely dry and extremely wet conditions, relative to the average local conditions, change in frequency and/or intensity.

Under a high emissions scenario, SPI12 values are projected to increase to about 0.4 on average by the end of the century (2071–2100), with a number of models indicating substantially larger increases and hence more frequent and/or intense wet episodes. Year-to-year variability remains large with dry episodes continuing to occur into the future.



NOTES

[a] Model projections are from CMIP5 for RCP8.5 (high emissions) and RCP2.6 (low emissions). Model anomalies are added to the historical mean and smoothed.

[b] Analysis by the Climatic Research Unit, University of East Anglia, 2018.

[c] Observed historical record of mean temperature is from CRU-TSv3.26 and total precipitation is from GPCC. Observed historical records of extremes are from JRA55 for temperature and from GPCC-FDD for precipitation.

[d] A 'hot day' ('hot night') is a day when maximum (minimum) temperature exceeds the 90th percentile threshold for that time of the year.

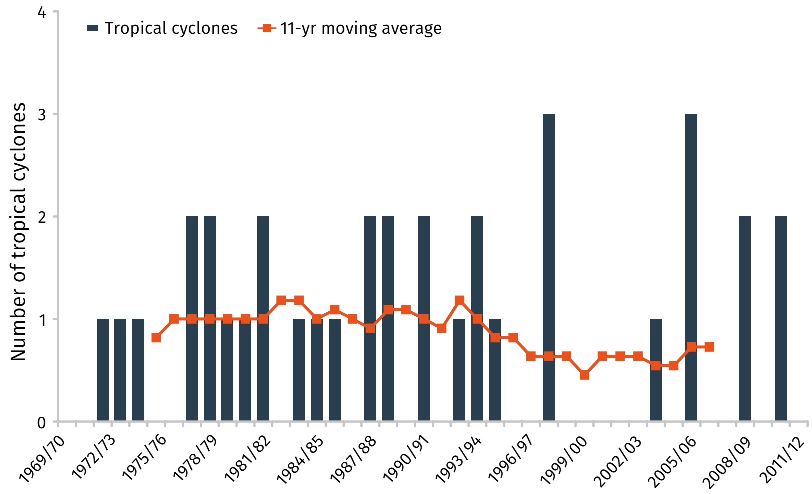
[e] The proportion (%) of annual rainfall totals that falls during very wet days, defined as days that are at least as wet as the historically 5% wettest of all days.

[f] SPI is unitless but can be used to categorise different severities of drought(wet): above +2.0 extremely wet; +2.0 to +1.5 severely wet; +1.5 to +1.0 moderately wet; +1.0 to +0.5 slightly wet; +0.5 to -0.5 near normal conditions; -0.5 to -1.0 slight drought; -1.0 to -1.5 moderate drought; -1.5 to -2.0 severe drought; below -2.0 extreme drought.

Tropical cyclones

Tropical cyclones affect Tuvalu mainly between November and April. An average of eight cyclones per decade developed within or crossed the Tuvalu Exclusive Economic Zone (EEZ) between the 1969/70 and 2010/11 cyclone seasons (see Figure 6). Tropical cyclones were most frequent in El Niño years and least frequent in La Niña years *(3)*.

FIGURE 6: Time series of the observed number of tropical cyclones developing within and crossing the Tuvalu EEZ per season. The 11-year moving average is in orange.



Source: Australian Bureau of Meteorology and CSIRO. Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports, 2014 *(3)*.

POTENTIAL FUTURE CHANGES IN TROPICAL CYCLONES: A GLOBAL PERSPECTIVE *(5–12)*[a]

Decrease	Increase	Increase	Increase
Total number	**Intensity**	**Frequency of category 4 and 5 events**	**Average precipitation rates near storm centre**

Increase Decrease

Sea level rise

Sea level rise is one of the most significant threats to low lying areas on small islands and atolls. Research indicates that global mean sea level rise rates are almost certainly accelerating as a result of climate change. The relatively long response times to global warming mean that sea level will continue to rise for