GRENADA

HEALTH & CLIMATE CHANGE

COUNTRY PROFILE 2020

Small Island Developing States Initiative

World Health Organization

United Nations Framework Convention on Climate Change

Pan American Health Organization
World Health Organization
Americas
PAHO

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"The Government of Grenada and the citizens are taking concrete actions to build Grenada's resilience to climate change events."

— National Climate Change Adaptation Plan, 2017–2021

EXECUTIVE SUMMARY

Despite producing very little greenhouse gas emissions that cause climate change, people living in small island developing States (SIDS) are on the front line of climate change impacts. These countries face a range of acute to long-term risks, including extreme weather events such as floods, droughts and cyclones, increased average temperatures and rising sea levels. Many of these countries already have a high burden of climate-sensitive diseases that may be exacerbated by climate change. Some of the nations at greatest risk are under-resourced and unprotected in the face of escalating climate and pollution threats. In recent years, the voice of the small island nation leaders has become a force in raising the alarm for urgent global action to safeguard populations everywhere, particularly those whose very existence is under threat.

Recognizing the unique and immediate threats faced by small islands, World Health Organization (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 23rd Conference of the Parties (COP23) to the UNFCCC, held in Bonn, Germany, with the vision that by 2030 all health systems in SIDS will be resilient to climate variability and climate change. It is clear, however, that, in order to protect the most vulnerable from climate risks and to gain the health co-benefits of mitigation policies, building resilience must happen in parallel with the reduction of carbon emissions by countries around the world.

The WHO Special Initiative on Climate Change and Health in SIDS aims to provide national health authorities in SIDS with the political, technical and financial support required to better understand and address the effects of climate change on health. 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 October 2018, ministers of health gathered in Grenada to develop a Caribbean 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 WHO UNFCCC health and climate change country profile for Grenada provides a summary of available evidence on climate hazards, health vulnerabilities, health impacts and progress to date in health sector efforts to realize a climate-resilient health system.

KEY RECOMMENDATIONS

1 DEVELOP THE INSTITUTIONAL STRUCTURE FOR LEADERSHIP AND GOVERNANCE OF MULTISECTORAL HEALTH AND CLIMATE CHANGE ACTIONS

Institutional structures for developing and coordinating health co-benefits programmes need to be further developed and formalized between the Ministry of Health and individual ministries of different sectors. Establishing an institutionalized governance mechanism is recommended in the Caribbean Action Plan as essential to ensure integrative, deliberate, and sustainable responses. This should also focus on developing a national health and climate change policy to create a supportive environment for developing and implementing health co-benefit actions.

2 DEVELOP A NATIONAL CURRICULUM TO FACILITATE HEALTH AND CLIMATE CHANGE EDUCATION USING AN ECOLOGICAL APPROACH

Education is essential to understanding climate change impacts and appropriate responses. Educational programmes should be incorporated into schools' curriculum, targeting young children, alongside public education. A national curriculum will ensure that the population is targeted along important demographic lines and at critical points.

3 IMPROVE AND EXPAND RISK SURVEILLANCE AND EARLY WARNING SYSTEMS

Creating a knowledge management mechanism for development will contribute to generating and disseminating information on climate-related hazards and risks for the general population. The District Health Information Software (DHIS-2) should be activated as the data collection platform to facilitate health and climate change cross-analysis and dissemination. The system should include the capability to detect multiple hazards, as well as develop an integrated and advanced warning system for vulnerable areas. Training and system tools should be provided to enable continuous data collection from national, regional, and international sources, including meteorological data, analysis and dissemination.

4 IMPROVE RESILIENCE OF HEALTH SECTOR INFRASTRUCTURE AND OPERATIONS

The SMARTing of health care facilities is important to ensure safe and efficient operation. Expansion of the SMART project to include all facilities across the island, including private facilities, will ensure continuity of health services that are responsive to the immediate needs of the population. Health facilities should be upgraded so they can withstand climate-related events. Greening of the facilities should also be targeted to reduce carbon emissions.

5 ADDRESS BARRIERS TO ACCESSING INTERNATIONAL CLIMATE CHANGE FINANCE TO SUPPORT HEALTH ADAPTATION

Financial and technical resources will be secured to develop the climate change mitigation–adaptation project portfolio and local human resource capacity to design projects. This includes providing training and coaching to craft projects addressing mitigation–adaptation gaps identified in the Climate Risk and Vulnerability Assessment Report. Alignment of the projects with the National Climate Change Policy (2017) is essential to secure governmental and public support.

WHO RESOURCES TO SUPPORT ACTION ON THESE KEY RECOMMENDATIONS:

https://www.who.int/activities/building-capacity-on-climate-change-human-health/toolkit/

BACKGROUND

Grenada is a small tri-island state in the Eastern Caribbean *(1)*. The island lies in the southern belt which has a hurricane season from June to November *(2)*. A mountainous central range stretches from north to south with settlements in the flatter areas and along the coastline. Grenada's economy is primarily driven by tourism while agriculture has declined from being the traditional mainstay *(3)*.

Climatic conditions are significant for the economic and physical well-being of Grenada's population, and vulnerabilities to a changing climate have the potential for both direct and indirect impacts on health *(4)*. While susceptible to long-term climate impacts such as sea level rise and changes in precipitation, Grenada was historically at low risk of tropical storms compared to other Caribbean islands. The need to ensure resilience of the island's infrastructure and health system to extreme weather events became evident with the passages of hurricanes Ivan and Emily in 2004 and 2005, respectively *(5)*. An unprecedented drought in 2010 as well as increasing events of flooding and forest fires highlight the need for affirmative actions for food and nutrition security. The distribution of disease vectors and non-communicable diseases continue to be priority areas for public health *(5)*.

In its Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), the health sector was identified as being particularly vulnerable to the impacts of climate change *(2)*. The health vulnerability and adaptation assessment identified vulnerable groups to the impacts of climate change, including women, children, elderly people and low-income families *(5)*. This has led the Government and people of Grenada to take concrete actions to build health sector resilience to climatic events.

HIGHEST PRIORITY CLIMATE-SENSITIVE HEALTH RISKS FOR GRENADA

Direct effects	
Health impacts of extreme weather events	✔
Heat-related illness	✔
Indirect effects	
Water security and safety (including waterborne diseases)	✔
Food security and safety (including malnutrition and foodborne diseases)	✔
Vector-borne diseases	✔
Air pollution	✔
Allergies	✔
Diffuse effects	
Mental/psychosocial health	✔
Noncommunicable diseases	✔
Mitigation actions to reduce emissions through sustainable procurement	
Mitigation measures to reduce emissions of health facilities	✔
Mitigation measures by coordinating with other sectors	✔

Source: Adapted and updated from the PAHO *Health and Climate Country Survey 2017 (6)*.

CLIMATE HAZARDS RELEVANT FOR HEALTH

Climate hazard projections for Grenada

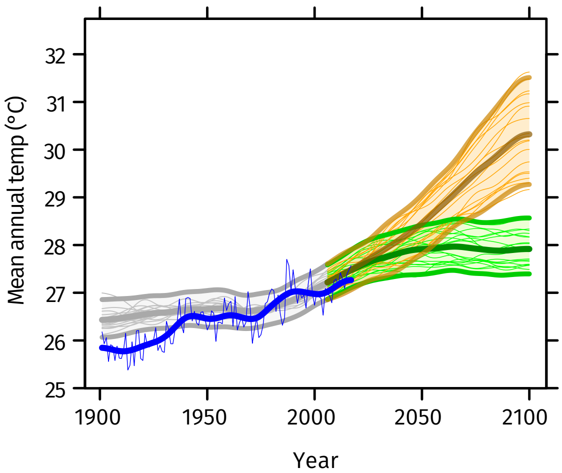
Country-specific projections are outlined up to the year 2100 for climate hazards under a 'business as usual' high emissions scenario compared to projections under a 'two-degree' scenario with rapidly decreasing global emissions (see Figures 1–5).

The climate model projections given 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

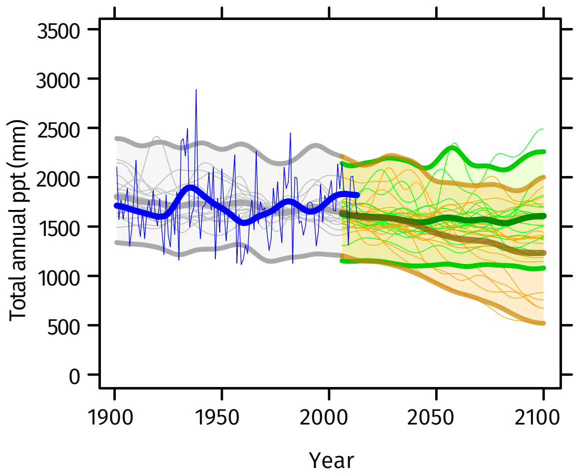
FIGURE 1: Mean annual temperature, 1900–2100



Under a high emissions scenario, the 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. Total annual precipitation is projected to decrease by about 24% on average under a high emissions scenario, although the uncertainty range is large (-55% to +5%). If emissions decrease rapidly there is little projected change on average: a decrease of 6% with an uncertainty range of -22% to +7%.

Decrease in total precipitation

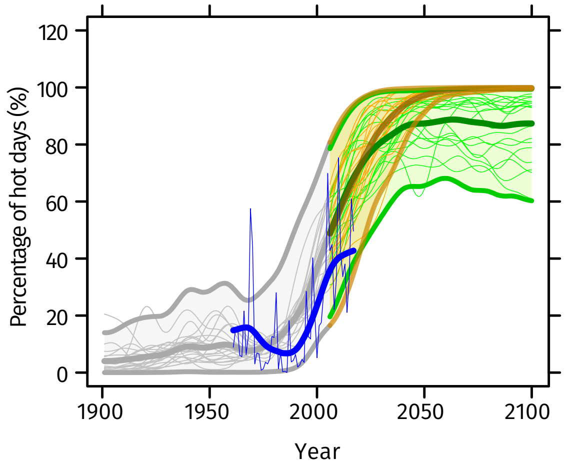
FIGURE 2: Total annual precipitation, 1900–2100



Total annual precipitation is projected to decrease by about 22% on average under a high emissions scenario, although the uncertainty range is large (-52% to +3%). If emissions decrease rapidly there is little projected change on average: a decrease of 5% with an uncertainty range of -15% to +5%. Under a high emissions scenario, the proportion of total annual rainfall from very wet days[e] (about 30% for 1981–2010) could decrease a little by the end-of-century (to around 25% on average with an uncertainty range of about 5% to 45%), with little change if emissions decrease rapidly. Total annual rainfall is projected to decrease.

More high temperature extremes

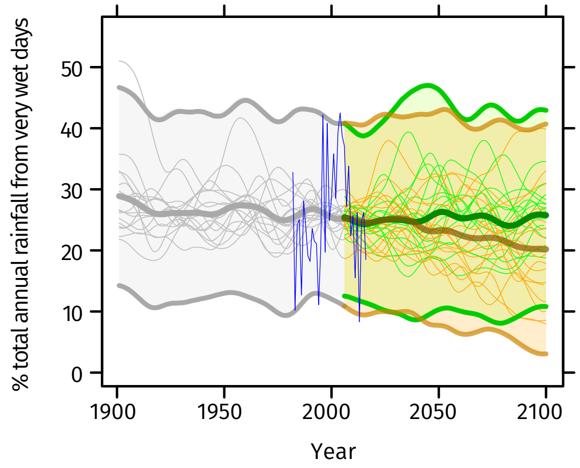
FIGURE 3: Percentage of hot days ('heat stress'), 1900–2100



The percentage of hot days[d] is projected to increase substantially from about 23% of all observed 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, almost 90% of days on average are 'hot'. Note that the models tend to overestimate the observed increase in hot days (about 30% of days on average in 1981–2010 rather than 23%). Similar increases are seen in hot nights (not shown).

Little change in extreme rainfall

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

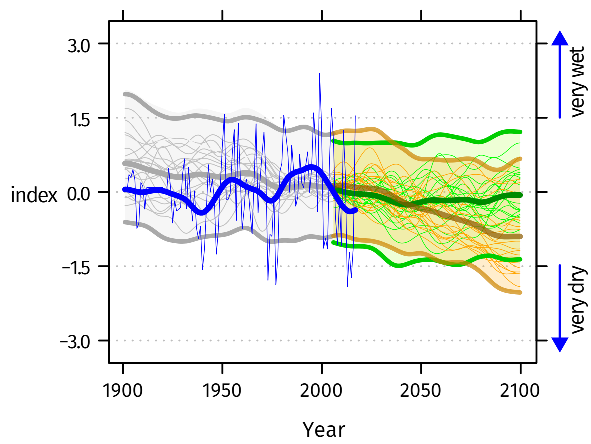


Under a high emissions scenario, the proportion of total annual rainfall from very wet days[e] (about 30% for 1981–2010) could decrease a little by the end-of-century (to around 25% on average with an uncertainty range of about 5% to 45%), with little change if emissions decrease rapidly. Total annual rainfall is projected to decrease (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).

Under a high emissions scenario, SPI12 values are projected to decrease to about -0.8 on average by the end of the century (2071–2100), with a number of models indicating substantially larger decreases and hence more frequent and/or intense drought. Year-to-year variability remains large with wet episodes continuing to occur into the future.[f]



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 and total precipitation is from CRU-TSv3.26. 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 categorize 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

It is anticipated that the total number of tropical cyclones may decrease towards the end of the century. However, it is likely that human-induced warming will make cyclones more intense (an increase in wind speed of 2–11% for a mid-range scenario (i.e. RCP4.5 which lies between RCP2.6 and RCP8.5 – shown on pages 4/5) or about 5% for 2˚C global warming). It is probable that the most intense events (category 4 and 5) will become more frequent (although these projections are particularly sensitive to the spatial resolution of the models). It is also likely that average precipitation rates within 100 km of the storm centre will increase – by a maximum of about 10% per degree of warming. Such increases in rainfall rate would be exacerbated if tropical cyclone translation speeds continue to slow *(7–15)*.[a]

POTENTIAL FUTURE CHANGES IN TROPICAL CYCLONES: A GLOBAL PERSPECTIVE *(7–15)*[a]

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

Increase Decrease

Compared to other Caribbean countries, Grenada was historically at low risk of tropical storms. Since 1955, no major hurricanes affected the island until the passages of hurricanes Ivan and Emily, 10 months apart, in 2004 and 2005, respectively. The total damage from Hurricane Ivan alone was estimated at Eastern Caribbean dollars (XCD) 2.4 billion, twice the value of Grenada's gross domestic product *(16)*. Grenada's location within the Atlantic Ocean's hurricane track could further increase its vulnerability to catastrophic climatic events *(16)*. Hurricane intensity is projected to increase an average 8% for every 1°C rise in the sea surface temperature *(17)*. The official season in Grenada for tropical cyclones is between June and November *(2)*.

Major event	Year	Number of people affected	Financial loss
Rainstorm	1946	15 persons killed, 13 houses washed away	...
Hurricane Janet	1955	120 persons killed, 6000 dwellings totally destroyed	95% of nutmeg and coconut trees were uprooted
Tropical storm	1975	6 casualties	...
Heavy rain	1975	...	US$ 4.7 million in losses
Storm (Hurricane Allen)	1980	...	US$ 5.3 million in losses
Tropical Storm	1990	1000 people affected	