User's Manual for the Climate Risk Atlas for Grenada

V.1.0

Food and Agriculture Organization of the United Nations

Government of Grenada

GREEN CLIMATE FUND

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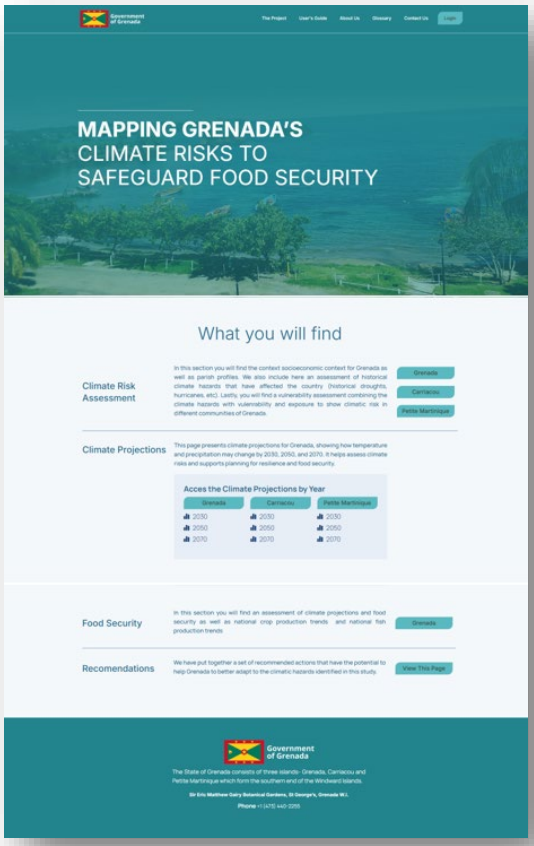
1. Introduction

The Climate Risk Atlas for Grenada is a web-based platform designed to support stakeholders in assessing, planning for, and mitigating climate risks in the agriculture, fisheries and other relevant sectors. It incorporates baseline and projected climate datasets, hazard and vulnerability assessments, and examples of crop suitability maps.



Purpose:

- Support adaptation planning and risk-informed decision-making.

- Enable access to climate data at the national and parish level.

- Provide spatially referenced datasets downloadable for policy, research, and fieldwork use.

2. Accessing and Navigating the Platform

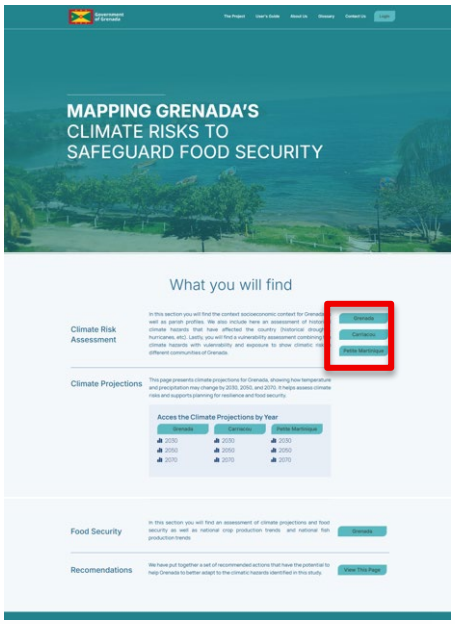
1. Visit: http://grenadaclimateriskatlas.com/

You will find the initial webpage (see figure below). There you will find:

2. Homepage Sections:
   - The project (Introduction to the project)
   - User's Guide (this document for navigation)
   - Glossary (for terms and acronyms)
   - Contact Us (for questions and reaching out to hosting)
3. Overview of Climate Risk Atlas
   - Climate Risk Assessment (focused on historical hazards)
   - Climate Projections (considering mid and high-emission scenarios)
   - Recommendations (how to use the data)
4. Navigation Tips:
   - Use the "Download Data" tab to explore different categories.
   - Use the "Map Viewer" to interact with layers and visualize data by parish or timeframe.
   - Click on any dataset or layer to view metadata, parish coverage, and download options (CSV, GeoTIFF, PDF, or Shapefile).

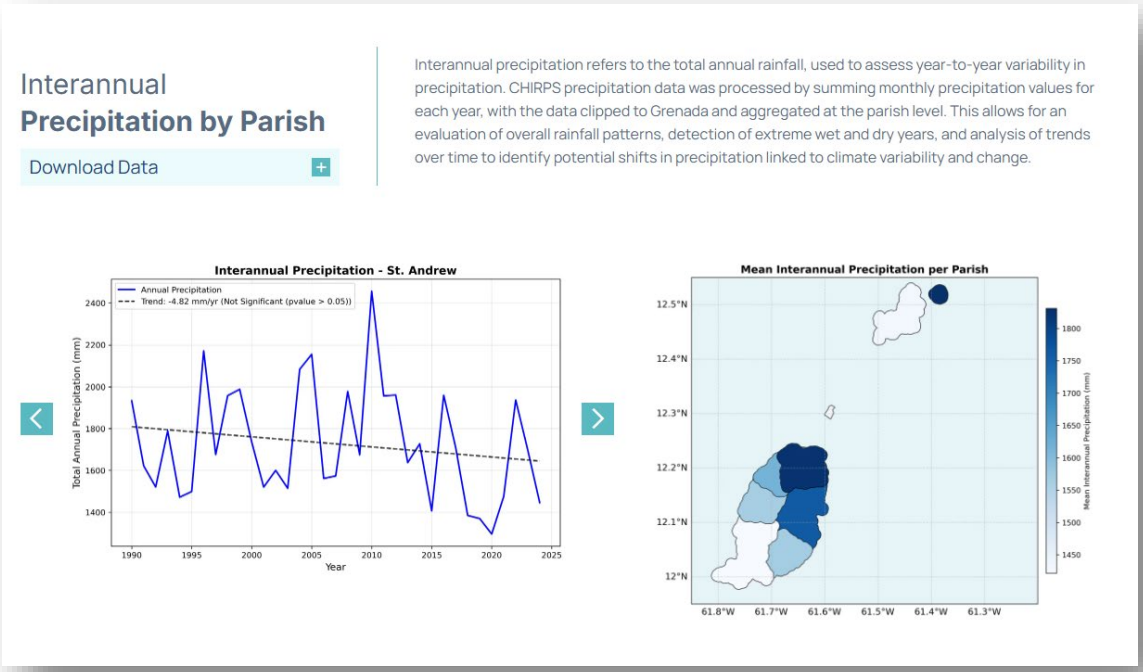
To access the datasets (historical, projections, and climate suitability for crops) you can also scroll through the introduction webpage and find the links to the sections. More on how to navigate this and all the data set in the following sections.

3. Baseline Climate Data (1981–2020*)



Datasets:
- Precipitation Climatology (Annual/Monthly)
- Temperature Climatology (Mean, Max, Min – Annual/Monthly)
- Standardized Precipitation Index (SPI 3 and 12 months)
- Interannual Variability Metrics

How to Use:
1. Go to the Climate Risk tab of the proper region of interest (Grenada, Carriacou or Petite Martinique)
2. Select variables and timeframe (annual/monthly).
3. View on map or download via the panel.



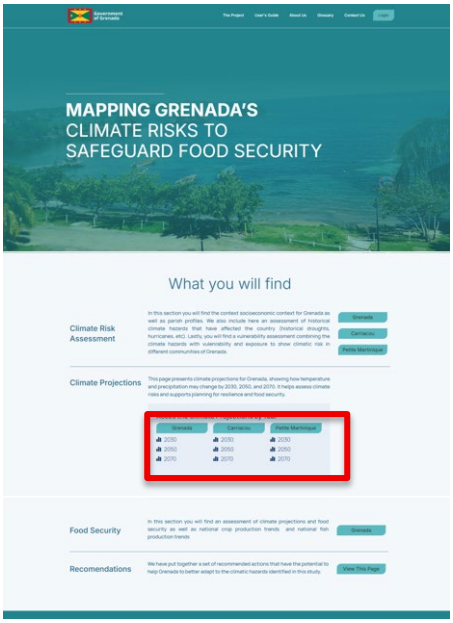
Example Uses:
- Agriculture: Identify rainy season length, drought frequency, and thermal thresholds for crop growth.
- Water Management: Assess dry season intensity and reservoir planning needs.
- Tourism: Inform seasonal risk from heat or rainfall impacts on mobility.
- Health and Urban Planning: Detect heat stress zones and plan cooling interventions.

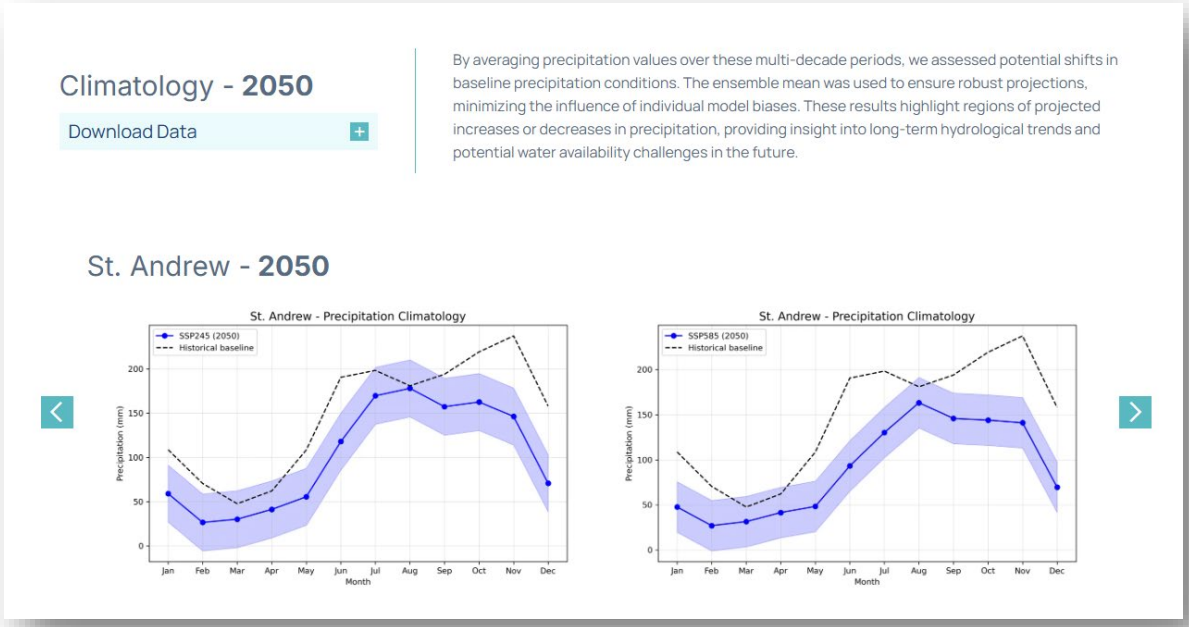
4. Future Climate Projections (2030, 2050, 2070)

Scenarios Available:
- SSP2-4.5 (moderate emissions)
- SSP5-8.5 (high emissions)

Variables:
- Mean, Max, Min Temperatures
- Monthly and Annual Precipitation
- SPI-3 and SPI-12 (future projections)

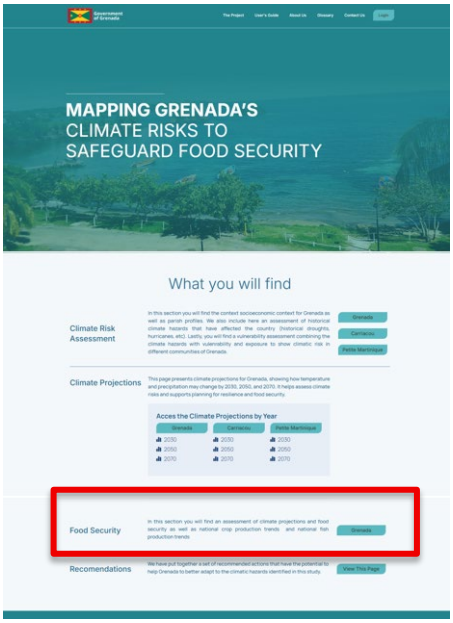
How to Use:
1. Go to the Climate Projections tab of the proper region of interest (Grenada, Carriacou or Petite Martinique)
2. Select variables and timeframe (annual/monthly).
3. View on map or download via the panel.





Example Uses:
- Disaster Risk Management: Use SPI-3 projections to identify future drought risk windows.
- Agro-Investment Planning: Align crop or irrigation investment based on projected rainfall drops.
- Public Health: Prepare for elevated night-time heat stress in urban zones under SSP5-8.5.
-Compare current year-round precipitation and temperature distribution against future potential changes in the variables by parish.

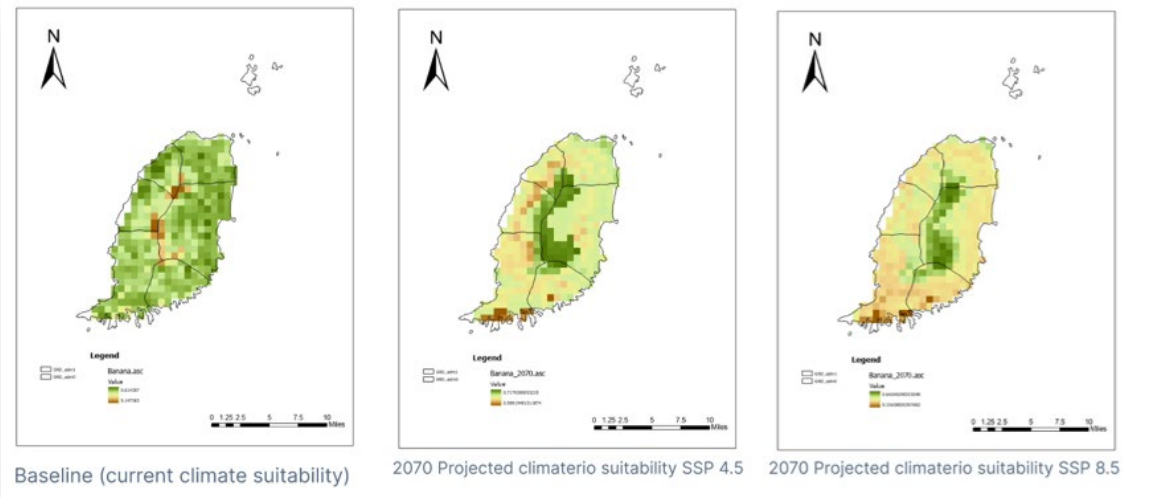
5. Climate Suitability for Crops



Crops Included:
- Bananas (including cocoa, coconut, spices)
- Nutmeg
- Food Crops (e.g., vegetables)
- Grasses (e.g., sugarcane, forage)

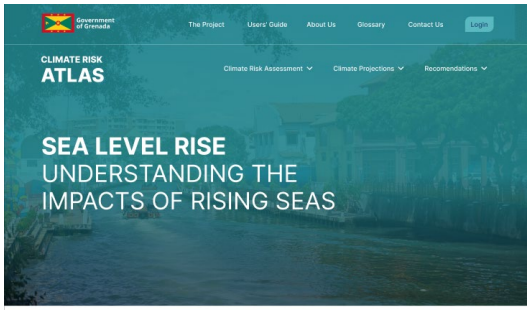
Dataset Types:
- Baseline Suitability (1981–2020)
- Projected Suitability (2030, 2050, 2070 under SSP2-4.5 and SSP5-8.5)

How to Use:
1. Go to Food Security section.
2. Choose crop and projection year.
3. Use scenario selector
4. View suitability maps (SSP2-4.5 or SSP5-8.5) and export as shapefiles or pdfs.



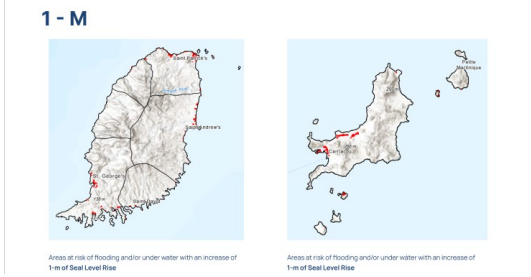
Example Uses:
- Agricultural Planning: Adjust cropping systems based on future reductions in suitability.
- Livelihood Diversification: Guide policies for transitioning agricultural systems.
- Infrastructure Planning: Target irrigation to areas with marginal future suitability.

6. Sea Level Rise Projections at 1 and 2 meters



Scenarios Available:
- 1-meter Sea Level Rise
- 2-meter Sea Level Rise

According to the IPCC 2021[1], which synthesizes the latest observations, paleoclimate reconstructions, and model simulations to evaluate past, present, and projected sea-level changes, the Global Mean Sea Level (GMSL) is rising at an accelerated rate than previously estimated. The Sea Level Rise (SLR) is of particular concern for climate-vulnerable regions such as low-lying coastal cities like the St. George in Grenada.

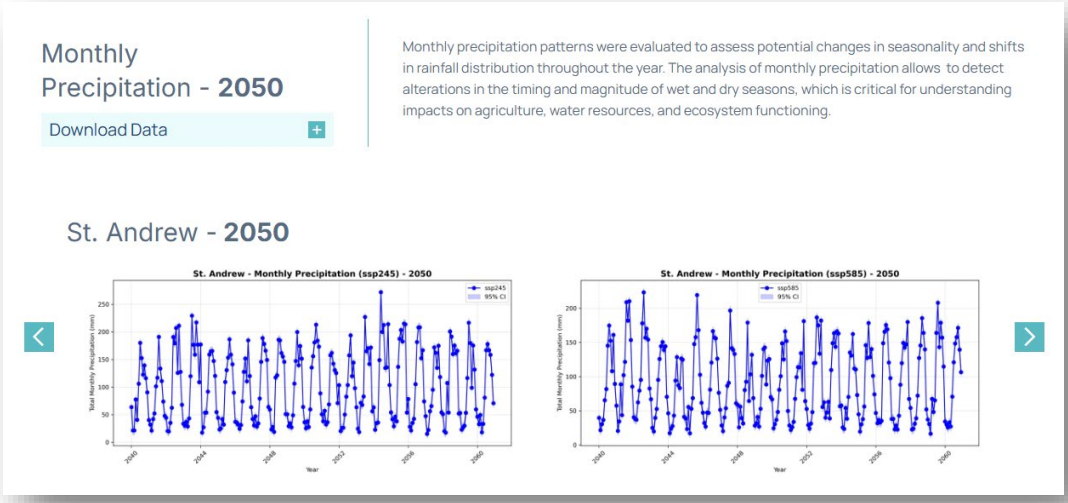


While the future of GMSL and the rate of SLR are a function of greenhouse emission pathways, there is convergence in accepted scenarios. By the end of the century, the central estimate for SLR range could be 1.01 m equally depending on the greenhouse gas emission scenario. The high range estimate suggests a plausible 2-me scenario of SLR. You can download the image files (shapefiles) for these two scenarios to help plan adaptation plans and to mitigate the effect that these potential hazards could have on critical infrastructure (e.g., combustible storage, ports, etc.).

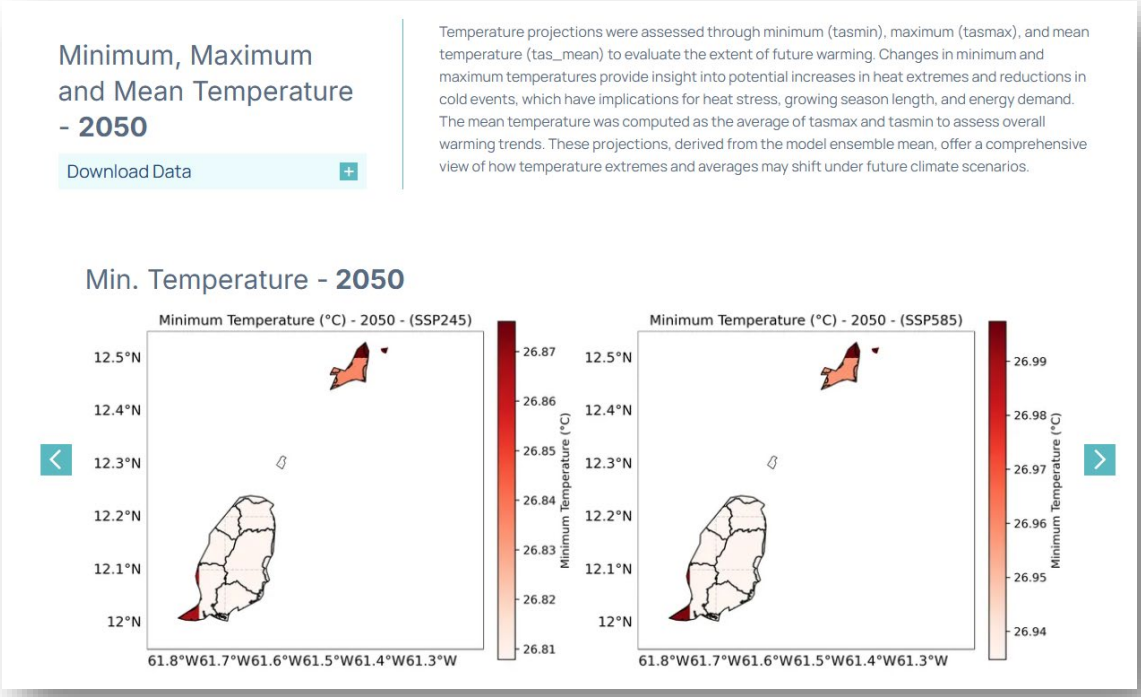
[1,3] Fox-Kemper, B., Hewitt, H. T., Xiao, C., Aðalgeirsdóttir, G., Drijfhout, S. S., Edwards, T. L., Golledge, N. R., Hemer, M., Kopp, R. E., Krinner, G., Mix, A., Notz, D., Nowicki, S., Nurhati, I. S., Ruiz, L., Sallée, J.-B., Slangen, A. B. A., & Yu, Y. (2021). Ocean, cryosphere and sea level change. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 1211–1362). Cambridge University Press. https://doi.org/10.1017/9781009157896.011

7. Downloading Data

Each dataset panel provides a “Download Data” button to export data in various formats:
- CSV: for spreadsheet or statistical analysis.
- GeoTIFF: for GIS-based spatial analysis.
- PNG/PDF: for visualization or report usage.



Information like the one presented in this chart can be downloaded as both CSV or images.



Information like the one presented in this chart can be downloaded only as images.

8. Tips for Applying Data

The information included in the Climate Risk Atlas is extensive. We have produced assesments of Climatic Hazards for Grenada. Including:

- Assessment of historical records
- SPI at 3 and 12 months (historical)
- Evaluation of temperature and precipitation (historical)
- Sea Level Rise Projections (1, 2-meter)
- CMIP6 model evaluation and selection for projected scenarios (4.5 and 8.5) for future projections
- Used these models to derive climate suitability for certain crops

All these datasets can be used in different contexts by different users to achieve valuable information to aid in adaptation to expected climatic changes. It can also be used to mitigate the effects of certain hazards that require short-term actions. We have provided a more comprehensive set of examples in the Climate Atlas Report. Here is an example of some the uses for different datasets that can be found in the Atlas:

Dataset Type	Key Use	Sample Application
Monthly Precip	Crop calendars	Map planting windows for vegetables
Max Temp Proj	Heat risk	Adjust school schedules in hot months
SPI-3 (Future)	Early Warning Systems	Trigger cash support before drought
Crop Suitability	Livelihood planning	Move crop production upslope
Mean Temp	Energy demand	Plan A/C infrastructure for hospitals/hotels

9. Contact & Support

For additional technical support, contact:

Climate Risk Atlas Team

digitaldirector(@)ict.gov.gd