



## USDA Regional Climate Hubs: Managing your risk in a changing climate.



# Climate Risks in the Caribbean

## What type of agricultural production is in the Caribbean?

Agriculture and forestry in the Caribbean is diverse, and includes products like coffee, tropical fruits, ornamentals, beans, root crops, livestock, dairy products, and wood for lumber fencing. The people of the Caribbean depend heavily on these products for subsistence, in addition to exporting valuable cash crops. Puerto Rico and the U.S. Virgin Islands, however, import the vast majority of their agricultural products, and local production is below its full potential. Increasing production capacity has the potential to improve food security, the rural standard of living, and territorial economies, as well as providing opportunities to preserve culture.

## How are climate change and weather variability affecting Caribbean producers?

Climate change impacts are not yet widely-felt in the Caribbean. However, sea level rise and a warmer, drier, more variable climate are expected in the future. Climate change is anticipated to affect agriculture and forestry in the Caribbean, and climate change in other regions can also impact Caribbean agriculture. Climate change and weather variability are likely to make prices more volatile, which reduces the incentive to invest in agriculture. These global and local factors influence landowner decisions and farming success. Agriculture and forestry in the Caribbean are experiencing:

- **Impacts to local food production:** Rising energy costs can make local production more costly than importing food and wood products, threatening the viability of local agriculture. Because the population densities in Puerto Rico and the U.S. Virgin Islands are among the highest in the U.S., the limited capacity for agricultural production is important to supply local food.
- **New challenges:** Potential increases in temperature could lead to more wild fires, and spread of invasive pests. Heat stress will have a significant impact on native plants. Important food crops including dry beans (*Phaseolus vulgaris*) suffer reduced yields when day and night temperatures rise above particular thresholds.
- **Ocean-related impacts:** The increase in sea level and alteration of coastal hydrology are critical issues related to a changing climate. Prime agricultural lands and the most populous areas in the Caribbean are predominantly coastal. In addition to rising sea levels, increased incidence of coral bleaching is expected due to higher sea surface temperatures.



Climate change represents a threat to food security in the Caribbean and elsewhere. A coordinated and forward-looking response by the agricultural and forestry community can reduce this threat.

# What is USDA doing about it?

The USDA has established a Southeast Regional Caribbean Climate Sub Hub located in Río Piedras, Puerto Rico. This multi-agency effort is led by Dr. William Gould, Research Ecologist with the U.S. Forest Service International Institute of Tropical Forestry. The Caribbean Climate Sub Hub is one of seven Regional Hubs and three Subsidiary Hubs nationwide. This network of Climate Hubs will work with USDA to deliver science-based knowledge and practical information to farmers, ranchers, and forest landowners that will help them to adapt to climate change and weather variability by coordinating with local and regional partners in federal and state agencies, universities, and the public.

## ***The Hub will provide:***

- Technical support for land managers to respond to drought, heat stress, floods, pests, and changes in growing season.
- Regional assessments and forecasts for hazard and adaptation planning.
- Outreach and education for land managers on ways to mitigate risks and thrive despite change.

## Building on success stories

**Collaborative problem solving:** Federal, Commonwealth and Territorial partners have a long history of collaboration among agencies and with the public on natural resource issues in the region. The USDA Caribbean Climate Hub will be co-located with the Caribbean Landscape Conservation Cooperative and share resources and information related to climate change, including down-scaled climate projections, urban growth models, land cover change scenarios, and hydrologic modeling efforts.

**Useful climate projections:** The U.S. Forest Service, Climate Science Centers, U.S. Fish and Wildlife Service, U.S. Geological Survey and University partners are developing climate projections for the Caribbean at a two-kilometer resolution. This will enable researchers and landowners to better assess potential climate impacts at a local scale.

**Vulnerability assessments:** Hub partners have already linked regional vulnerability assessments and government action. A recent State of the Climate report issued by the Government of Puerto Rico on coastal vulnerabilities has led to concrete executive orders by the Governor of Puerto Rico in response to climate change. These include the development and implementation of an island-wide land use plan, the study of the vulnerability of public infrastructure to climate change, and the assessment of greenhouse gas emissions in order to approach a carbon neutral emissions level. The Caribbean Sub Hub will build on these linkages and expand vulnerability assessments to the agricultural community.

## Need more information?

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