



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 U.S. Caribbean is diverse, and includes products like coffee, tropical fruits, ornamentals, beans, root crops, livestock, dairy products, and various wood products. The people of the Caribbean depend heavily on these products for subsistence, in addition to exporting as valuable cash crops. However, Puerto Rico and the U.S. Virgin Islands import the majority of their agricultural products (85% and 97% respectively), and local production is well below its full potential. Increasing production capacity has the potential to improve food security, the standard of living and the economy, as well as providing opportunities to preserve the region's unique culture.

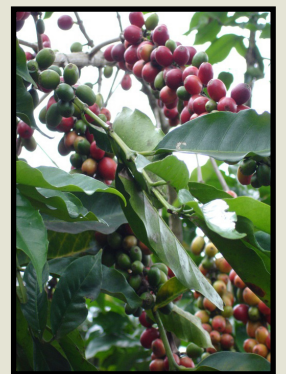
How are climate change and weather variability affecting Caribbean producers?

Regional climate models project accelerating sea level rise and a warmer, drier and more variable climate, with frequent droughts and intense storm events. It is projected that variable rainfall patterns will aggravate current problems of water scarcity and soil erosion. Recently, Puerto Rico and the U.S. Virgin Islands experienced devastating hurricanes as well as extreme droughts followed by heavy rain events that severely affected livestock and agriculture. In addition, climate changes in other regions of the world have an impact on food supply and food security in the Caribbean, for instance, given an increase in the costs of food production and the price of food. These global and local factors influence the decisions regarding the use and management of agricultural and forest lands. The challenges and effects of climate change and weather variability in the U.S. Caribbean include:

- **Changes in rainfall and temperature:** Higher temperatures could cause a drop in the yield of crops and drastic changes in the schedule of agricultural production as the result of the intensification of droughts. The 2014 drought costs to Puerto Rico's agriculture industry were estimated at \$20 million and affected about 4,000 farmers; 50% of the coffee farms and 28% of livestock farms were affected. In 2017, Hurricane Irma devastated crops in St. Thomas and St. John, while Hurricane María damaged most of St. Croix's production and destroyed more than 80 percent of Puerto Rico's crop value, inducing over \$780 million in losses. Among the most impacted sectors were plantain, banana, and coffee crops. The poultry, dairy and livestock sectors suffered losses in animals, infrastructure and feed.

- **Sea level rise:** The rise in sea level and salt water intrusion are affecting coastal populations, aquifers and prime agricultural lands located in the coastal plains. The Caribbean islands are susceptible to hurricanes and have a longer recovery period. Food security is subject to local productivity, to the effects of extreme weather events, to the logistics of maritime transportation, and to the stability of global markets.

- **Socio-economic challenges:** Rising energy costs could make local production costs higher than the costs of importing food and timber, threatening the viability of local agriculture. Population density, levels of unemployment and poverty of Puerto Rico and the Virgin Islands are among the highest in the US, therefore the limited capacity of agricultural production is essential to supply local foods.



What is USDA doing about it?

The USDA has established the **Caribbean Climate Hub**, located at the Forest Service International Institute of Tropical Forestry in San Juan, Puerto Rico. The Caribbean Hub is one of ten Regional Hubs nationwide – a network of Climate Change Hubs that will work with USDA to deliver information and guidance on technologies and risk management practices at regional and local scales—which will help with everyday decisions on the farm, ranch, and forestlands.

The Hub will provide:

- **Science, syntheses, and assessments** to create and share new knowledge addressing climate change.
- **Tools and technical support** for agricultural land and forest managers to respond to drought, heat stress, floods, pests, and changes in growing season in Puerto Rico and the US Virgin Islands.
- **Outreach and education** for farmers, ranchers, forest managers and advisers on ways to build resilience to extreme weather events.

Building on success stories

Research, Information Synthesis & Data Sharing

ACHIEVEMENTS: The Caribbean Climate Hub developed two tools to explore data, the Agricultural Statistics Tool and the Farm Planning Tool. *Agricultural Statistics* provides information on over 100 agricultural products, displays where they are grown, and provides information on annual production to help farmers, marketers, and researchers plan agricultural business, conduct market studies, and assess trends. *The Farm Planning Tool* allows users quick access to information on land and climate characteristics for an area of interest. Hub team members have authored and co-authored a variety of publications focused on climate change, drought and hurricanes in the Caribbean region, available on their local [website](#). **ONGOING RESEARCH:** Understanding the effects of Hurricanes Irma and Maria on agriculture, forestry, and rural communities in Puerto Rico and the U.S. Virgin Islands. Land cover change in agricultural landscapes following Hurricanes Irma and María, Characterizing agrodiversity hotspots based on Puerto Rico census data.

Education, Communication & Scientific Dissemination

ACHIEVEMENTS: After hurricanes Irma and Maria in 2017, the Caribbean Hub held a series of capacity-building workshops in post-disaster wood management focused on tree-cutting, milling and the development of high quality wood products to help build capacity and local markets for wood and wood products. The workshops were part of the ADAPTA project which aims to create climate change resilience and reduce the effects of extreme events, while increasing the productivity and sustainability of agricultural and forestry lands. The transformation process of salvaged wood to high quality wood products was captured in a video series and published on the Caribbean Hub YouTube Channel. The Hub also offered webinars and workshops to present strategies for drought adaptation and mitigation practices with participation from USDA agencies, agricultural extension, research stations, and universities. The Caribbean Hub presented online demonstrations of new decision-making tools and created a series of podcasts on post-hurricane wood rescue, agriculture and climate change with the collaboration of the Agricultural Experimental Station Library and the University of Puerto Rico.

Creating Partnerships & Collaboration Networks

ACHIEVEMENTS: The Caribbean Hub represented USDA in national and regional forums and served as a connector between agencies and organizations working with climate change and agriculture in Central America and the Caribbean with the purpose of exchanging knowledge and practical information. The Caribbean Hub initiated the establishment of a Caribbean Drought Learning Network that will link climate researchers and service providers with advisors, managers, and producers in tropical forestry and agriculture. The network purpose is to share information, experiences, and needs in preparing for, responding to, and recovering from drought in order to reduce the cost of drought and minimize the effects on services derived from farms, forests, that support surrounding communities. The Caribbean Hub has grown their network and is now delivering climate services and educational resources for professionals to over 2,000 subscribers.

Need more information?

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