CARIBBEAN CLIMATE SUB HUB
for Tropical Forestry and Agriculture

"No challenge poses a greater threat to future generations than climate change."

~President Obama~
2015 State of the Union Address

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 products. 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 standard of living and the economy, as well as providing opportunities to preserve culture.

Mission and Vision

Climate change has been deemed one of the greatest challenges facing agriculture, food security, and human development in the 21st century. The Caribbean region has been identified as being particularly vulnerable to the threats that climate change poses. These challenges require a fresh, adaptive approach that transcends traditional institutional and disciplinary boundaries. ***We at the Caribbean Climate Sub Hub (CCSH) are committed to enhancing and furthering the vitality of working lands in the Caribbean by building the tools and platforms that will enable a new level of cooperation and collaboration in the region.*** The CCSH is uniquely positioned to both model and facilitate such an approach to effect positive change within working lands with lasting implications for improving quality of life in Puerto Rico and the US Virgin Islands. Crafting the unique solutions and strategies required by the islands' distinctive socio-ecological systems will enable the USDA to become a leader in integrative, adaptive, and reflective management across a diverse array of values and interests. The models, prototypes, and success stories built in the US Caribbean will not only serve as an example to other islands states, they have the potential to help shift the land management paradigm toward one that works to simultaneously promote sustainable development and quality of life through integrated landscape level management.

How are climate change and weather variability affecting Caribbean producers?

Accelerated sea level rise and a warmer, drier, more variable climate are expected in the future. Climate change is anticipated to affect agriculture and forestry, but climate change in other regions also has an impact in Caribbean food and agriculture production. 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. Shifting precipitation patterns are expected to exacerbate current problems of water shortages and soil erosion. As population and water demands have increased, Puerto Rico and the Virgin Islands have both recently experienced severe droughts that leave farmers competing for the necessary water resources. Agriculture and forestry in the Caribbean are currently experiencing:

Weather-related impacts

Higher temperatures could lead to more invasive species. Important food crops, including dry beans (*Phaseolus vulgaris*), suffer reduced yields when temperatures rise above particular thresholds. 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.

Ocean-related impacts

Since human population and the prime agricultural lands are predominantly coastal, the increase in sea level and alteration of coastal hydrology are critical issues. Caribbean islands are susceptible to hurricanes and have a lengthy recovery time. Also, increased incidence of coral bleaching is expected due to higher sea surface temperatures.

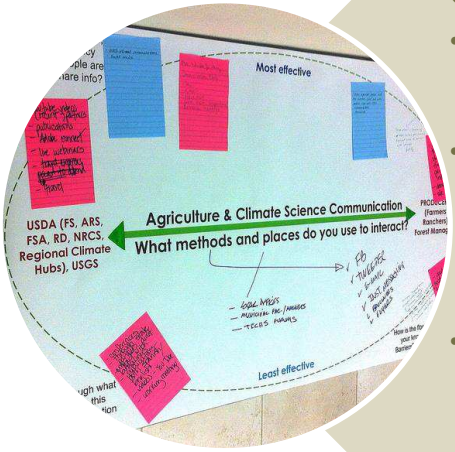
Socio-economic challenges

Rising energy costs can make local production more costly than importing food and wood products, threatening the viability of local agriculture. Population densities in Puerto Rico and the US Virgin Islands are among the highest in the US, thus the limited capacity for agricultural production is critical to supply local food.

Work of the Caribbean Climate Sub Hub

Research, Information Synthesis & Data Sharing

- **Accomplishments:** Preliminary assessment completed: "Vulnerability and adaptation to expected climate change impacts on Agriculture and Forestry in the US Caribbean"; conducted stakeholder analysis to assess how organizations and practininers are addressing climate vulnerabilities within working lands in the region.
- **NEXT STEPS:** Documentation of adaptation strategies: identification of local successes in sustainable land management practices that farmers, ranchers and landowners in Puerto Rico and the U.S. Virgin Islands could adopt to build climate change resilience. Launch of data sharing platform "Caribbean Agriculture, Forestry & Climate Governance Database".
- **GOALS:** Establish the Caribbean Atlas for planning and data sharing for resource managers and planners in the region in collaboration with the Caribbean Landscape Conservation Cooperative; take NIFA results to producers; develop a cropping system specific analysis of climate change vulnerability; provide opportunities for student assistantships through land grant and underserved universities.



Communication, Outreach & Capacity Building

- **Accomplishments:** Performed advisor level survey and interviews to assess information gaps and target appropriate intervention points; launched web and social media sites, delivered webinars and three roundtable meetings with USDA collaborators (i.e. Extension, local and federal agencies, organizations, universites, researchers, NGOs).
- **NEXT STEPS**: Contribute to the educational efforts of Agricultural Extension Services related to climate change and potential effects on working lands in the Caribbean. Develop outreach project: "Sustainable Land Management Practices for Climate Resilience in Tropical Forestry and Agriculture", aiming to deliver climate services, educational resources and as a reference tool for practitioners through written documents and short videos. Deliver workshop in fall 2015: "Climate Change Options and Opportunities for Agriculture and Forestry in the Caribbean: Implementing the USDA Greenhouse Gas Mitigation Strategy".
- **GOALS:** Promote successful adaptations through our Governance Database ; coordinate site visits for Agricultural Advisors from different regions to observe model adaptationpractices. Provide small grants for producers to become involved in farm-based climate mitigation and adaptation projects in which the CCSH would assist with project planning and support, alignment with USDA partner programs, and the documentation of best practices to be shared with others as examples of what works on local farms.

Building Partnerships & Networks

- **Accomplishments:** The CCSH represented USDA in national and regional forums (LCCs, CSCs, RISAs, DRNA); established a network of 500 people and organizations involved in sustainable agriculture and forestry to better communicate as a group about climate impacts and the future of agriculture in the region. USDA Deputy Secretary Krysta Harden visited Puerto Rico and the CCSH in January 2015 to engage with partners in the region.
- **NEXT STEPS:** Enter into cooperative agreements with the University of Puerto Rico and the University of the Virgin Islands to facilitate collaborative region specific climate change research with USDA partners such as the Tropical Agriculture Research Station, International Institute of Tropical Forestry, NIFA, and others.
- **GOALS:** Deliver workshops to link science with management, provide downscaling climate data that fits PR and USVI research needs. With financial support, we aim to develop educational materials and modern decision support tools for farmers and forest managers to allow them access to the latest science, climate and adaptation information available.

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