



CARIBBEAN DROUGHT LEARNING NETWORK

EXPLORATORY MEETING

REPORT

USDA Caribbean Climate Hub



Photo credit: Harry Ramirez, Finca Hacienda la Paz



Photo credit: Wilfredo Batista

OVERVIEW

On June 10th, 2021, 40 climate service providers, government agency leaders, researchers, and extensionists gathered virtually with the USDA Caribbean Climate Hub, National Drought Mitigation Center (NDMC), NOAA's National Integrated Drought Information System (NIDIS) and the National Weather Service (NWS) to explore the possibility of the creation of a Caribbean Drought Learning Network for Puerto Rico and the US Virgin Islands.

The Drought Learning Network (DLN) concept serves as a mechanism to strengthen collaboration and communication in drought research and management. In the Southwest of the United States where drought conditions have been severe, a DLN was recently established by the USDA [Southwest Climate Hub](#). The USDA Caribbean Climate Hub saw the potential benefits for a similar network in the Caribbean, and decided to propose the idea to local agencies, researchers and organizations.

OBJECTIVE

The objectives of the Caribbean Drought Learning Network Exploratory Meeting were to 1) determine interest in developing a Caribbean Drought Learning Network, 2) identify key issues the network might address, and 3) identify interested parties and next steps.



MEETING PARTICIPANTS

Brad Rippey	USDA Meteorologist OCE - Office of the Chief Economist, World Agricultural Outlook Board
Brian A. Fuchs	Monitoring Coordinator - National Drought Mitigation Center
Caiti Steele	Coordinator, USDA Southwest Climate Hub
Carlos Ortíz-Medina	Caribbean Area Office Director, Food and Nutrition Service, USDA
Christopher McDonald	Drought Planning and Policy, NDMC
Cody Knutson	CFWSC San Juan Office, Data Chief USGS - United States Geological Survey
David M. Hernandez	Head of Florida Caribbean Water Science Center USGS - United States Geological Survey
David Sumner	Professor, Department of Agricultural and Biosystems Engineering, UPR-Mayaguez
Eric Harmsen	Coordinator, USDA Caribbean Climate Hub
Eva Holupchinski	Director, Caribbean Green Technology Center, University of Virgin Islands
Gregory Guannel	Research Project Leader, International Institute of Tropical Forestry, US Forest Service.
Grizelle González	Climate Office, UPR Mayagüez
Hector Jimenez	Habitat Restoration Programs Caribbean Coordinator Fish and Wildlife Service
Ivan Llerandi	National Coordinator, USDA Climate Hubs
Julian Reyes	Director, Southeast Climate Adaptation Science Center, USGS
Katherine Smith	Assistant Director & Communications Coordinator NDMC
Kelly Helm Smith	State Plath Health Director, APHIS, USDA
Leyinska Wiscovitch	Caribbean Area Director, NRCS, USDA
Luis Cruz-Arroyo	State Resource Conservationist NRCS Caribbean
Mario Rodriguez	Chief Meteorologist, OCE
Mark Brusberg	Farm Service Agency, USDA
Mark Carlton	Director of NDMC, Extension Specialist, NDMC
Mark Svoboda	Program Specialist Jornada Experimental Range I USDA Southwest Climate Hub
Maude Dinan	Regional Drought Information Coordinator, National Integrated Drought Information System
Meredith Muth	Lead Researcher, USDA Caribbean Climate Hub
Nora Alvarez-Berríos	Senior Service Hydrologist NOAA NWS WFO
Odalys Martínez-Sánchez	Associate Professor, Environmental Health Department UPR-Medical Sciences Campus
Pablo Mendez Lázaro	Ecologist, El Yunque National Forest, Forest Service
Ricardo Santiago Garcia	Research Professor of Applied Climate & Remote Sensing University of Lincoln Nebraska
Tadesse Tsegaye	Distinguished Research Professor, University of Georgia
Thomas Mote	Research Geneticist ARS
Timothy Porch	Education and Outreach Specialist, NDMC
Tonya Bernadt	Rural Sociology Research Specialist, NDMC
Tonya Haigh	Director, USDA Caribbean Climate Hub and Research Ecologist, US Forest Service
William Gould	



DROUGHT IN THE US CARIBBEAN

As reported by meeting participants, drought in the U.S. Caribbean constrains agricultural production, impacts economy and diminishes the quality of life of the general population.

There is a need to build local resilience to drought through mitigation and adaptation practices, education and communication.



Knowledge networks that facilitate peer-to-peer exchanges and sharing of lessons learned can (1) strengthen the individual DEWS components, and (2) connect the components as well!

DROUGHT EARLY WARNING SYSTEMS

Drought Early Warning System (DEWS) is a system where the components strengthen each other. The components include: observation and monitoring, research and applications, communication and outreach, prediction and forecasting, planning and preparedness. Where do you fit into this system, and how could the work of stakeholders in other areas help you in your work?

Drought early warning systems deals with long-term planning and resilience to drought.

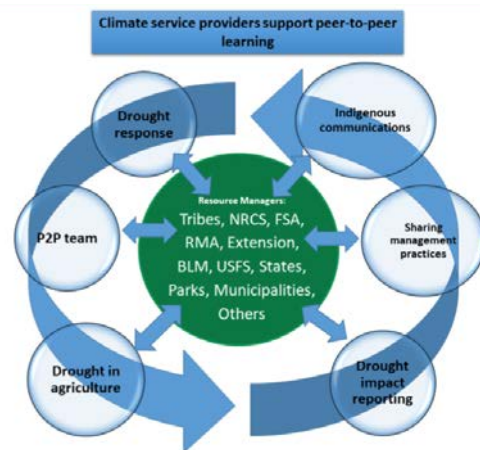


DROUGHT LEARNING NETWORKS



Drought Learning Networks use peer-to-peer learning to address current and future issues by learning from past experiences by:

- Identifying natural themes for working groups;
- Communicating between people doing similar tasks;
- Not reinventing the wheel every time drought becomes an issue;
- Creating new relationships;
- Not prescribing, the DLN will evolve through the direction of participants.



LESSONS LEARNED FROM THE SOUTHWEST DROUGHT LEARNING NETWORK: SHARING MANAGEMENT PRACTICES WORKING GROUP

The Sharing Management Practices working group of the SWDLN communicates lessons learned from past droughts to inform future droughts by showcasing stories happening on the ground through actionable communications. By hiring summer interns, the group has been able to increase the number of case studies written and uploaded into the CCAST Toolbox where practices are shared.

- Collaborative Conservation and Adaptation Strategy Toolbox ([CCAST](#))
 - Online library of case studies on water resource management, actionable science, practitioner-centric technical communications [CCAST Case study dashboard](#)
 - Management toolbox where information is synthesized and easy to access
- Rain or shine podcast episodes [Come Rain or Shine](#)



United States Department of Agriculture
Southwest Climate Hub

POTENTIAL BENEFITS OF A CARIBBEAN DROUGHT LEARNING NETWORK FOR THE NATIONAL WEATHER SERVICE



- Connecting and leveraging drought-related initiative and resources
- Weather Forecast Office
- Since drought is a slow process, frequent analysis is needed
- Network could mean additional data for analysis and robust observations for improved understanding the impacts of rainfall deficits
- Additional data and observations of impacts across PR and USVI
- WFO provides short and long-term forecasts and rainfall data to Puerto Rico drought scientific committee

SURVEY HIGHLIGHTS: DROUGHT-RELATED NEEDS

Information

Forecasting: 1) Drought Early Warning Systems, 2) sector-specific forecasts, 3) inclusion of USVI in NWS Climate Prediction Center's monthly and seasonal drought outlooks.

Conditions: 1) NRCS Soil Climate Analysis Network reopening for PR and USVI, 2) increase rainfall observations, 3) more USGS groundwater sites to assist USDM authors, 4) input from communities on drought forecasts.

Research: 1) Down-scaled projections, 2) drought-resistant crops, 3) historical drought information.

Data needs: 1) Rainfall observations (CoCoRaHS), 2) soil-based sensors (soil and groundwater, 3) Indices to assist with drought monitoring, 4) maps of salinity in aquifers, 5) monitoring ET from crops and wildlife covers, 6) quantifying losses in water distribution systems.

Communication

Preparedness, mitigation, adaptation: 1) On-farm water storage, conservation and accessibility, 2) Partnership of federal agencies and academia in preparedness education, 3) Best practices and incentive, 4) Step-by-step information on drought mitigation and preparation for crops and livestock.

Gaps a CDLN could help fill: 1) Information sharing among government, scientists, decision-makers, advisors, 2) peer-to-peer knowledge sharing, 3) information on USVI and water management, 4) Identifying solutions for greatest drought challenges in US Caribbean (eg. water use and management practices, understand, detect, predict, and measure impact on people livelihoods ecosystems for preventative action).

DROUGHT-RELATED INITIATIVES MENTIONED BY MEETING PARTICIPANTS

- There is a push for salinity monitoring on west coast. USGS recently completed a low flow analysis on the frequency of low flows. This is important for dilution of waste for ecosystems and water supply (David Sumner USGS Caribbean Water Science Center)
- Improving crops for climate change, plant breeding (Tim Porch, TARS Mayagüez)
- Research on improving drought forecasts (Thomas Mote)
- Puerto Rico Climate Office has recently been reactivated (Hector Jimenez, Climate Office, UPR Mayagüez)



Photo credit: Betzaida Ortiz, Finca Atabey Santa Isabel

EXAMPLES OF ENTITIES INVOLVED IN DROUGHT COMMUNICATION IN PUERTO RICO AND THE US VIRGIN ISLANDS



NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

Coordinates Bimonthly drought updates for Puerto Rico and the US Virgin Islands. Multi-agency partnership that coordinates drought monitoring, forecasting, planning, and information.



NATIONAL WEATHER SERVICE

Provides weather, water, and climate data, forecasts and warnings for the protection of life and property and enhancement of the national economy.

- Drought information statements
- Hazardous weather outlook
- Tropical weather outlook



NATIONAL DROUGHT MITIGATION CENTER

Helps people and institutions develop and implement measures to reduce societal vulnerability to drought, stressing preparedness and risk management rather than crisis management.



US DROUGHT MONITOR

Map released every Thursday showing drought areas developed by NOAA, NIDIS, NDMC, and USDA. USDA uses the drought monitor to trigger disaster declarations and eligibility for low-interest loans. The Farm Service Agency uses it to help determine eligibility for their Livestock Forage Program, and local decision-makers use it to trigger drought responses.



US GEOLOGICAL SURVEY

The USGS Caribbean-Florida Water Science Center has an active presence in support of hydrologic research and monitoring across the Florida, Puerto Rico, and the U.S. Virgin Islands region.

- Streamflow / Lake/reservoir
- Groundwater
- Water quality
- Precipitation



CARIBBEAN CLIMATE OUTLOOK FORUM

Development and delivery of early warning systems, real-time seasonal climate forecasts and interpretation.

- SPEI, SPI
- Monthly rainfall
- Precipitation/ Temperature Outlooks



PUERTO RICO DROUGHT COMMITTEE

Advises the Governor of Puerto Rico during drought periods and works with decision-making and public policy issues.

VI DROUGHT TASK FORCE

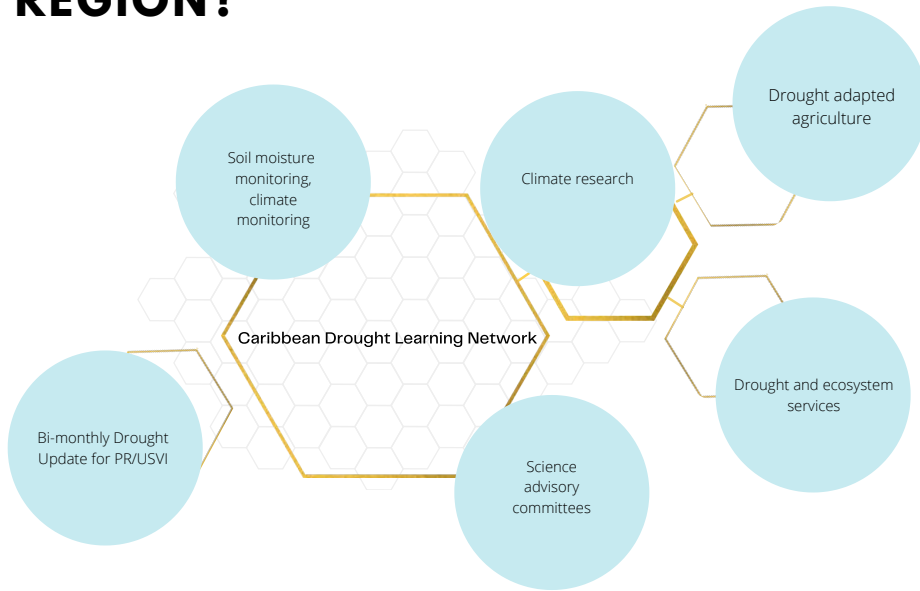
Task force formed by USVI Governor Bryan.



PUERTO RICO AGRICULTURAL WATER MANAGEMENT

Provides links to maps of various soil and water related parameters, which can be used to determine areas affected by drought and how drought conditions may be changing from week to week or month to month. The results were obtained using the water and energy balance model GOES-PRWEB

HOW COULD THE CARIBBEAN DROUGHT LEARNING NETWORK HELP TO IMPROVE DROUGHT-RELATED INITIATIVES IN THE REGION?



“ The Caribbean Drought Learning Network could add continuity over the years as initiatives, research and droughts come and go. ”

– Bill Gould, Director of the USDA Caribbean Climate Hub

HOW COULD THE CARIBBEAN DROUGHT LEARNING NETWORK HELP YOU IN YOUR WORK?

- **Increase** drought condition observation and reporting.
- **Facilitate exchange** of tools, information and input (inc shared communication of scientific information).
- **Facilitate access** to drought information and materials.
- **Educate and communicate** drought adaptation strategies, incorporate public policies.
- **Evaluate** where bilingual information is necessary.
- **Encourage citizens engagement** to feel part of the process by reporting conditions over time.
- **Build trust** in Puerto Rico and USVI (distrust of gov't officials).
- **Help guide agencies and entities** to tailor their work to better meet local needs:
 - Help NRCS determine where funds could be allocated, utilize their direct connection to farmers.
 - Network input could help tailor USGS hydrologic monitoring network to meet needs.
 - Guide the type of metrics and time scales included in climate outlooks.

POTENTIAL FOCUS AREAS THAT COULD EVOLVE INTO WORKING GROUPS

IMPACT
REPORTING/
CITIZEN SCIENCE

DROUGHT
PREDICTION

DROUGHT
COMMUNICATION

RESILIENCE
STRATEGIES



Finca Atabey in Santa Isabel, Puerto Rico
Photo credit: Betzaida Ortíz

NEXT STEPS

- Gather invitees for next meeting and follow up with meeting participants interested in being involved in planning Caribbean Drought Learning Network Kickoff Meeting.
- Aspects of the CDLN to consider during development process: Who are the end users of outcome of CDLN? (ie. Climate service providers, farmers, general public) How can we include a mechanism for users to weigh in on what the DLN produces? Where is bilingual communication necessary?
- Pilot initiative identified: Impact reporting / Citizen science
 - CoCoRaHS rain gauges - meet with Odalys to help determine destinations for additional gauges in US Virgin Islands and Puerto Rico.
 - Potential for in-person meetings Henry Regis Director of CoCoRaHS
 - Promotion of Drought Condition Monitoring Observer Reports (CMOR) <https://survey123.arcgis.com/share/ff127a29aa23413c9cd2d9e8176c4669?>
 - USDA Caribbean Climate Hub to host call with key contacts on condition reporting and rainfall monitoring.
- Forgot to mention something during the meeting? We are still accepting responses on the pre-meeting survey about needs and opportunities that could be helpful in the Caribbean Drought Learning Network: <https://docs.google.com/forms/d/e/1FAIpQLScO1mWptfF-US-PNhr3RpTW5J7A8ejsGADY6koyMCSUG9IQnA/viewform>

NEXT MEETING

The Caribbean Drought Learning Network Kickoff Meeting will take place on Thursday, October 14, 2021 from 9:00 am to 12:00pm.