United States Department of Agriculture
USDA Climate Hubs
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Washington, D.C. 20250

INFORMATIONAL MEMORANDUM

THROUGH: **Linda Heath**, Executive Committee Chair, USDA Climate Hubs
Acting Deputy Chief, USFS Research and Development

LINDA HEATH Digitally signed by LINDA HEATH Date: 2023.03.20 22:51:15 -04'00'

William Hohenstein, Executive Committee Vice-Chair, USDA Climate Hubs
Director, Office of Energy and Environmental Policy

WILLIAM HOHENSTEIN Digitally signed by WILLIAM HOHENSTEIN Date: 2023.03.07 10:14:45 -05'00'

FROM: **William Gould**, National Lead, USDA Climate Hubs
U.S. Forest Service

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Julian Reyes, National Coordinator, USDA Climate Hubs
Office of Energy and Environmental Policy

SUBJECT: USDA Climate Hubs Status Report for the First Quarter of FY 2023

Accomplishment highlights are presented for Q1 (October-December 2022).

In the first quarter, the Hubs hosted or participated in **62** workshops and webinars with an estimated **6,028** participants and views. Hub staff gave **72** presentations at meetings.

The Hubs produced **52** publications in the first quarter.

- **11** peer reviewed publications
- **41** white papers or grey literature products

Highlight ~ In support of USDA's Action Plan for Climate Adaptation and Resilience, the Climate Hubs have a role to build climate literacy within the USDA workforce. The **Northern Plains Climate Hub** collaborated with OCE, ERS, and FS to co-design and co-present a webinar titled *Bringing People into Climate Science* during the final installment in USDA's Climate, Agriculture, and Forest Science Webinar Series. Over 400 USDA staff attended, gaining social science insights about drivers of adoption of climate-smart agriculture practices, and how the impacts of climate change ripple across global markets.

The Hubs website had **18,933 users** for **16,345 non-bounced sessions** (meaning that users interacted with webpage elements and/or spent measurable time on the site). Our Twitter account featured **19,115 Tweet impressions** demonstrating our heightened social media engagement.

Climate Hub Highlights for FY23 Q1 (October-December 2022)
The following accomplishments provide a snapshot of the USDA Climate Hubs' work and are organized into three workstreams: (1) *Science and data synthesis*, (2) *Technology/tool co-development and support*, and (3) *Outreach, convening, and training*.

Science and data synthesis
Climate change is likely to bring an expanded range of vector-borne livestock diseases such as Vesicular stomatitis (VS). The **Southwest Climate Hub** provided geospatial analyses to better understand how climate, landscape, and other factors might affect the distribution of livestock vector disease in a peer-reviewed paper in Ecosphere. The authors found that hotspots of monthly VS concentrations were closer to flowing water and agricultural land across the western United States. These results could support early warning and mitigation efforts to reduce the incidence of VS.

U.S. rangelands host ~600,000 active oil and gas wells, as well as several thousand orphaned wells that have not yet been restored ecologically. Without restoration, well-sites can worsen the spread of invasive plant species and negatively affect other ecosystem services. Yet, rangelands can also be difficult to restore, so science-based approaches are essential. The **Northern Plains Climate Hub** conducted a review of scientific research on rangelands restoration after oil and gas development, including the effectiveness and costs of techniques, as well as potential future research directions.

Though each climate disaster brings setbacks and loss to agricultural producers and forest landowners, each extreme event also offers important lessons about climate resilience. After Hurricanes Irma and Maria devastated Puerto Rico and the U.S. Virgin Islands (USVI) in 2017, the **Caribbean Climate Hub** launched a post-hurricane assessment to understand the factors that help explain the capacities of farmers, forest landowners and communities to adapt to hurricanes. The paper, *READY OR NOT? Hurricane preparedness, response, and recovery of farms, forests, and rural communities in the U.S. Caribbean*, features findings from focus group discussions and in-depth interviews with 152 farmers, forest owners, and agriculture and forest experts in Puerto Rico and the USVI.

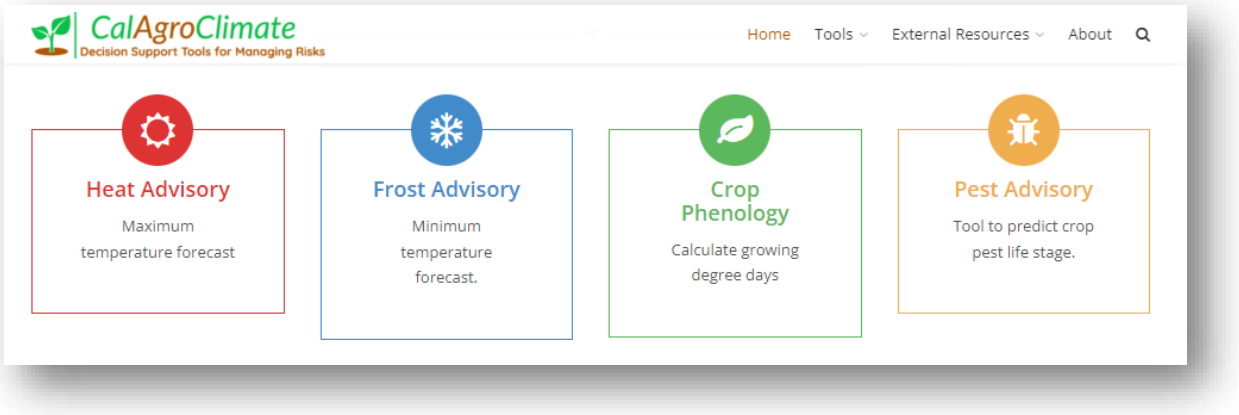
Producers in the southeast U.S. need updated management guidance based on sound, peer-reviewed science to remain resilient and productive in the face of climate change and variability. The **Southeast Climate Hub** published three peer-reviewed papers to advance the science around agricultural land management in the Southeast and help producers make climate-informed decisions:

- Farming with forages can reconnect crop and livestock operations to enhance circularity and foster ecosystem services [*Grass and Forage Science*],
- Soil-test biological activity associates with soil aggregation characteristics under different land uses in North Carolina [*Soil Science of America Journal*], and
- Adjusting the N fertilizer factor based on soil health as indicated by soil-test biological activity [*Agricultural & Environmental Letters*].

Farmers in the Northeast are increasingly installing irrigation systems on their farms to deal with inconsistent summer precipitation patterns. However, many farmers lack experience with irrigation and require information about how to make their systems most water efficient. In collaboration with the **Northeast Climate Hub**, researchers at the University of Maine and University of Vermont created factsheets describing the use of soil moisture meters. These factsheets will increase farmer awareness of soil moisture meters for implementing efficient, water-saving irrigation systems.

Technology/tool co-development and support
After large wildland fires, reforestation is required on National Forest System lands. Recent drought and changes in climate have left forest land managers wondering what to plant that will survive now and into the future to meet their management goals. To assist forest land managers in identifying where to plant or source seeds or seedlings, the Seedlot Selection Tool was developed. The **Northwest Climate Hub** partnered with the National Forest System to develop a video tutorial for the Seedlot Selection Tool that works through two scenarios to help land managers make climate-informed decisions.

California producers need crop-specific information and resources to support and guide risk management decisions in the face of increasingly variable weather and a changing climate. In response, the **California Climate Hub** partnered with scientists at UC ANR and UC Merced to develop a one-stop-shop of web-based decision support tools and informational resources. Launched in November 2022 CalAgroClimate translates high resolution gridded weather data and forecast information into user-friendly decision-support tools designed to provide crop specific information for managing risks.



The Adaptation Workbook continues to be applied across the U.S. and in different sectors.

- A workshop series hosted by the **Northern Forests Climate Hub**, NIACS and American Forests provided direct training for urban and community forestry professionals in the greater Boston region to assist in the integration of climate change vulnerability considerations and adaptation in local planning projects. Participants were introduced to - and used - the 'Boston Region: Tree Species Vulnerability Assessment' publication and the Climate and Health Adaptation Menu resources co-developed by NIACS, American Forests and regional partners.
- The **Southwest Climate Hub** organized and hosted a workshop where resource specialists, managers, and researchers from the Rio Grande National Forest worked together using the Adaptation Workbook to determine which climate impacts are of greatest concern to them, and identify management opportunities for adaptation.

Outreach, convening, and training

The **Caribbean Climate Hub** shares many of its products, activities, and resources via online media. However, some farmers and rural communities do not have reliable access to the internet and may not be aware of the Hub or have easy access to its resources. For that reason, sharing tools an information at in-person events helps reach underserved communities. Recently, the Hub shared resources at the 45th Annual Meeting of the Puerto Rican Society of Agricultural Sciences in rural Coamo, Puerto Rico, reaching about 70 agricultural professionals.

The **Southeast Climate Hub** delivered six presentations to share research findings and climate-smart resources to help producers, technical service providers, and natural resource professionals make climate-informed decisions and improve productivity and resilience to threats on working lands in the Southeast. Diverse audiences and stakeholders were reached including: 35 silviculturists learned how they can contribute to the Updated Silvics of North American Project, 20 Nature Conservancy preserve managers and staff learned how climate change and variability are impacting the lands they manage, and about available tools to help them make climate informed decisions, 40 Florida producers and commodity group leaders learned about the hurricane preparation and recovery commodities guides coproduced by the SE Climate Hub and subject matter expects in the region, 100 farmers, extension agents and industry representatives learned about the benefits of healthy soils and using fescue as a pasture crop, and 160

farmers, extension agents, and industry representatives learned how grassland management impacts soil carbon including 80 underserved forest landowners.

Climate change impacts such as rising temperatures, increasing water scarcity, prolonged drought, and more frequent and destructive wildfires are occurring in the American Southwest where there are huge disparities in the ability of communities to adapt to climate change. The **Southwest Climate Hub** joined the Southwest and South Central Climate Adaptation Science Centers and Southwest Decision Resources to plan and host the Southwest Adaptation Forum (SWAF) in Albuquerque, NM. With over 140 attendees, SWAF provided a platform for sharing and discussing advances in adaptation practice in the Southwest as well as encouraging necessary conversations around environmental and climate justice.

The National Adaptation Forum is a bi-annual convening for adaptation professionals to innovate, network, and focus on established and emerging climate adaptation issues of the day. The Forum provides opportunities for professional development through training sessions, facilitated presentations and panels, and formal and informal networking sessions. At the 2022 Forum, the **Caribbean, Northern Forests, Northwest, and Southwest Climate Hubs** delivered presentations and facilitated workshops collectively reaching over 500 people. Specifically, the Caribbean Climate Hub presented on post-disaster adaptation lessons from rural communities in Puerto Rico. The National Office delivered two oral presentations and held a booth.

Multimedia

The **Southern Plains Climate Hub** posted 11 blogs with 381 downloads and covered topics like extreme weather and drought. The Hub also recorded six podcasts with 350 downloads and guest speakers included the Executive Director of the Kansas Association of Conservation Districts, Acting NRCS State Conservationist for Oklahoma, and the Assistant State Climatologist for Kansas.

Drought

The **Midwest Climate Hub** worked with the National Integrated Drought Information System and additional partners to plan and hold the Midwest/Missouri River Basin Drought Early Warning System Regional Meeting in Omaha, NE. This meeting provided opportunities for developing partnerships and hearing about drought prediction and adaptation efforts in the Missouri River Basin and Midwest.

Over the past 20 years, drought has caused millions of dollars' worth of losses to ranching and agriculture in Hawai'i. In October 2022, nearly all land area of the Hawai'ian Islands was experiencing some level of short- or long-term drought. To improve collaboration with U.S. Drought Monitor authors and increase support for impacts reporting, the **Southwest Climate Hub** partnered with the National Drought Mitigation Center (NDMC) to hold four workshops on each of the four largest islands reaching 120 people. As a result of the workshops the Hub and the NDMC have a better understanding of drought information needs in Hawai'i and of ways to improve communication and collaboration.

Agriculture is growing in Alaska, a land of extremes. In 2022, a large snowpack melted late, delaying planting and grazing, and was followed by minimal precipitation for half of the growing season and record-breaking rains the other half. These precipitation extremes and increased operational costs were detrimental. To increase resilience to weather extremes including drought, the **Northwest Climate Hub** co-hosted two workshops to build peer-to-peer learning and share information on drought, the U.S. Drought Monitor, and climate adaptation options. Participants included producers and staff from NRCS,

FSA, and cooperative extension. The Hub successfully secured an FSA representative to present on FSA disaster assistance programs.

Climate literacy
The **Midwest Climate Hub** conducted a webinar with FSA staff in Iowa. The webinar--which focused on climate change, impacts, and resources for Iowa agriculture – was a culmination of a recently established collaboration with Iowa FSA leadership. Approximately 170 attendees attended the live webinar and the recording was made available to Iowa FSA staff.

NRCS staff serve an important role in providing education and technical support to agricultural producers. At the NRCS Northeast Regional Climate Town Hall, NRCS co-lead for the **Northeast Climate Hub** delivered regionally-specific climate change information generated by the Hub to NRCS service providers and field staff to improve their knowledge level of both climate change and climate smart agriculture practices. 140 NRCS staff participated and gained information on climate change in the Northeast, and regionally appropriate climate smart agricultural practices, which will help them assist the producers and landowners they work with.

Tribal engagement
The **Northern Forests Climate Hub**, NIACS, and Tribal partners collaborated to encourage the use of the Tribal Forest Protection Act (TFPA) to advance tribal climate adaptation priorities. In a workshop, Tribes and their associated National Forests identified mutual climate adaptation priorities and developed projects that Tribes can initiate through the TFPA. Participants considered projects related to promoting regeneration of culturally important trees and understory medicinal plants, the indigenous use of prescribed fire, and more. This workshop was attended by 65 people from the Keweenaw Bay Indian Community, Lac Vieux Desert Band of Lake Superior Chippewa, and the Ottawa National Forest. The workshop series was funded by FS R&D Northern Research Station.