United States Department of Agriculture
USDA Climate Hubs
1400 Independence Avenue, SW
Washington, D.C. 20250

INFORMATIONAL MEMORANDUM

THROUGH: **David Lytle**, Executive Committee Chair, USDA Climate Hubs
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William Hohenstein, Executive Committee Vice-Chair,
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SUBJECT: USDA Climate Hubs Status Report for the Second Quarter of FY 2023

Accomplishment highlights are presented for Q2 (January-March 2023).

In the second quarter, the Hubs hosted or participated in **85** workshops and webinars and engaged with **14,213** people through capacity-building activities.

The Hubs produced **75** publications in the second quarter.

- **14** peer reviewed publications
- **61** white papers or grey literature products

Highlight

Climate change is increasing global temperatures, altering precipitation patterns, and affecting growing seasons. These changes are also affecting the character of drought with some regions experiencing aridification while others experience humidification. Current methods for assessing drought conditions do not account for the rapid pace of climate change. To address this issue the USDA Climate Hubs and NOAA National Integrated Drought Information System co-hosted a technical working meeting. We brought together over 100 people including services providers, researchers and practitioners to develop various research, data and service needs to better assess drought in various aspects of a changing climate.

Climate Hub Fellows

The Hubs have awarded 13 Climate Hub Fellows across the nation.

The Hubs website had **107,779 users** who viewed **192,736 pageviews**. Our Twitter account featured **21,498 Tweet impressions** demonstrating our heightened social media engagement.

Climate Hub Highlights for FY23 Q2 (January-March 2023)
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

Wildfires are a natural disturbance in western forests, which have recently become more severe, posing significant threats to forests and communities. There are climate-informed actions that land managers can take to increase ecological and community resilience to wildfire. The **California Climate Hub** continues their support of the Science Advisory Panel of the California Wildfire and Forest Resilience Task Force. They developed the Southern California Regional Profile to summarize the socio-ecological context of the Southern California region related to community and ecosystem resilience to wildfire and climate change. State decisionmakers and partners received a new resource to better understand issues and opportunities for increasing ecological and community resilience to wildfire.

Drought is a recurring issue in the Caribbean. Due to local agriculture's heavy reliance on rainfall and limited water storage capacity, drought can quickly affect agricultural production and quality of life. The **Caribbean Climate Hub** continues it work with partners to support the Caribbean Drought Learning Network; a peer-to-peer organization designed for information exchange about Caribbean drought. Together they published highlights of the network's first annual meeting last fall, *Fostering knowledge exchange and collaboration among drought-related initiatives in the Caribbean.* These efforts increased knowledge-sharing and awareness of Caribbean drought research, needs, and initiatives.

In 2020, drought emerged in the Northern Plains following one of the wettest periods on record. Intensifying and persisting into 2022, the drought had multi-billion-dollar impacts on working lands and rural communities. In response, the **Northern Plains Climate Hub** joined a multi-institute team, led by NOAA NIDIS, to document the drought's evolution and impacts. This report increased understanding of the development and impacts of the 2020-2021 Drought in the U.S. Northern Plains and Canadian Prairies, as well as responses and remaining gaps. Also, this project strengthened networks and communication between federal, state, and tribal institutions and across the U.S.-Canada border.

Climate change is challenging California agriculture. Agricultural technical assistance providers (TAPs) play a significant role in supporting producers' efforts to adopt climate-smart management practices. The **California Climate Hub** held four focus group discussions across the state to understand TAP perceptions of climate change, adaptation, and farmer barriers to adopting climate-smart practices. A summary of findings, noted that TAPs most frequently cited extremes and water-related issues as climate-related challenges. Also, key barriers to practice adoption were insufficient monetary support, information and messaging around climate-adaptive practices. Understanding TAP perceptions and needs will inform the development of resources and programming geared towards TAPs (e.g., NIFA extension project).

Climate change is affecting all forests, resulting in a widespread need for information about climate change risks and adaptation to inform timber management. Sustainable Forestry Initiative (SFI) certifies organizations in sustainable timber management, which includes a new objective on "Climate-Smart Forestry". In partnership with SFI, the Climate Hubs shared information on climate change and how it may affect forests as well as facilitated discussions on climate change adaptation. The **Northern Forest Climate Hub** and partners worked with the Maryland Department of Natural Resources Forest Service and Wisconsin County Forest Association. The **Northwest Climate Hub** and partners shared information with private industrial timber companies, Tribal Nations, and state agencies from throughout the Northwest. From these workshops, we developed region-specific climate change risk assessments and adaptation actions to meet the new certification objective.

Technology/tool co-development and support

Nature-based climate solutions are land management actions aimed at increasing carbon uptake and storage or reducing greenhouse gas emissions. Nature-based carbon offset projects have been identified as a climate-smart strategy for compensating forest landowners. However, forest landowners, forest managers, and individuals who advise them often lack an adequate understanding of how and if changing carbon market opportunities align with their financial and management plans. Therefore, the **Northeast, Northern Forests, and Southeast Climate Hubs** partnered with Penn State University to develop the Forest Owner Carbon and Climate Education (FOCCE) program to deliver timely educational and training resources to help forest landowners make important decisions about managing their forest land for carbon (NIFA extension project).

Drought plans are a tool used by local, county, and state agencies and governments before, during, and after droughts to reduce the negative effects. Widespread drought conditions started in Iowa in early 2020 and these conditions still exist today. The **Midwest Climate Hub** served an advisory role for the Iowa Department of Natural Resources and other state agencies as they developed a new state drought plan. This effort is expected to result in a robust coordinated drought response process in Iowa, including plans for adapting to drought in rural municipalities and animal feeding operations.

For decades, scientists, Extension, Tribes, government agencies, and individuals have sought solutions to water scarcity in the southwest. Yet there is no central location for archiving these efforts and making the information more accessible. Therefore, the **Southwest Climate Hub** has been developing a Water Adaptation Techniques Atlas (WATA) which compiles information about responses to southwestern water scarcity, presented in the form of case studies. The Hub presented WATA at the February NIFA Tribal Programs meeting and Southwest Watershed Research Center. Project highlights combine restoration of ecologically and culturally important riparian habitats with aquifer recharge and solar powered desalination for brackish groundwater on the Navajo Nation. WATA improves access to water scarcity solutions in the Southwest.

Land management actions such as prescribed fire and forest harvest can sometimes present tradeoffs between achieving ecological outcomes and increasing carbon storage. The Nature Conservancy (TNC), the **Northern Forests Climate Hub**, and NIACS are partnering on a project to help illustrate and describe these potential tradeoffs. This effort targeted the TNC Meyer Preserve in southeast Wisconsin with a focus on oak savanna and non-forested wetland natural communities present at the Preserve. Using the Adaptation Workbook, technical specialists developed adaptation responses that meet biodiversity goals, while also considering the implications of management actions on carbon storage and sequestration.

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 assist forest land managers in identifying where to plant or source seeds or seedlings, the Seedlot Selection Tool and later a guidebook and video tutorial were developed. To share these resources and the latest science on reforestation, the **Northwest Climate Hub** partnered with the National Forest System and the Office of Sustainability and Climate, co-host an online workshop focused on climate-informed reforestation. Over 70 resource managers were informed of changes in climate that would affect reforestation and how to adjust management to use climate adapted planting materials.

Outreach, convening, and training

Climate change in the Southern Plains is a story of drought and deluge - we expect increasing drying periods with more extreme, intense rainfall. Understanding the risks producers face from weather extremes and changing climate is essential to sustaining resilient agricultural and forestry systems. To enhance climate literacy and awareness of USDA programs to support producers, the **Southern Plains Climate Hub** and partners held the first of a series of four meetings on "Sustainable Farming in a Changing Climate". They also presented at an Urban Burn Workshop. These events focused on historically underserved farmers and ranchers of Oklahoma and Texas, including urban producers. Historically underserved farmers became more familiar with USDA programs that support climate smart agriculture and forestry.

There is an increase concern related to fire, climate change and other stressors on natural and working lands. In response, there has been a recent explosion in decision support tools and systems intended for resource manages to enable climate informed decision making. However, an unintended consequence of this investment has been that forest and natural resource managers are overwhelmed and unsure where and how they can assess, interpret information to inform routine management operations. The **California Climate Hub** staff developed and led a virtual training for US Forest Service staff in the Northern, Southern, Central, and Southern Sierra Zones on use of climate data tools and interpreting their outputs. Attendees practiced applying climate data tools to project climatic changes in their area of interest and consider how those changes impacted natural resources as well as management implementation.

In recent years, Caribbean land managers have grappled with a variety of compounding, climate-related challenges from severe drought to extreme precipitation and hurricanes. While USDA offers technical and financial assistance for resource conservation, climate mitigation and adaptation in agriculture and forestry, stakeholders in the US Caribbean may not be familiar with available assistance. In March, the USDA **Caribbean Climate Hub** launched a series of OneUSDA workshops where USDA agencies, Extension and Conservation Districts promote climate-related management practices and assistances to farmers and landowners. Increased climate literacy, adaptation and mitigation practices and assistances, and connections made with USDA agencies and other entities among forest landowners and farmers. Looking forward, registration is now open for the next Spanish language workshop on 12 May.

Every state has a NRCS State Technical Committee that advises the State Conservationist on technical guidelines necessary to implement the conservation. Together they drive major change towards positive outcomes in agricultural and forested environments. The **Northeast Climate Hub** engaged with and shared information about climate adaptation and mitigation resources with technical committees in Vermont, West Virginia, and Maine. These meetings help to open communication pathways and strengthen relationships across the region. Over 120 participants across three State Technical Committees learned about the mission of the Northeast Climate Hub and engaged in dialogue about ongoing projects.

Montana recently experienced three consecutive years of drought, as well as severe flooding in the Greater Yellowstone Area. Impacts to working lands have included loss of property and infrastructure, wildfire damage, depleted stock water, and grasshopper infestation. In response, the **Northern Plains Climate Hub** organized a 2-day AgroClimate Workshop in partnership with NRCS, Montana State University Extension, Intertribal Agriculture Council, and Montana Association of Conservation Districts. The event convened 90 agricultural and forestry professionals, including 40 NRCS staff, who increased their knowledge of weather and climate resources, as well as climate-smart practices. Participant confidence also grew in using and effectively communicating these concepts.

In Oregon, the average temperature has increased 2.5˚F since 1895; the average annual temperature in the warmest year was 3.9˚F above average in 2015. With this increase in temperature, there is less snowpack and thus less water for irrigation of crops. To improve climate literacy, the NRCS West National Technology Support Center hosted a workshop that focused on climate change information, climate smart mitigation practices, and COMET Tools to support conservation planning for NRCS staff in Oregon. The **Northwest Climate Hub** provided state-specific information on climate change, climate indicators for agriculture and forestry, as well as noted conservation practices that also act as adaptation or mitigation practices. Over 100 NRCS-Oregon staff NRCS-Oregon left with enhanced understanding of climate informed and had the information needed to engage with producers on how to adapt and mitigate climate change.

Southwestern ranchers face a future climate with warmer temperatures, changed precipitation patterns, and in some areas, declining rangeland forage production. Frequent droughts and spatially variable precipitation are also typical of the region. Virtual fencing and remotely monitoring water troughs, rain gauges, and cattle locations, can help producers adapt by providing more flexibility in grazing management and vital information about remote pastures. However, there is limited information in circulation about these technologies. The extension team of the Sustainable Southwest Beef Project, led by the **Southwest Climate Hub**, have developed fact sheets in English and Spanish, a short video, and a slide deck to share information from the project's research into Precision Ranching Technologies and Criollo cattle. These products support raise greater awareness of technologies for grazing management to adapt to changes in climate.