United States Department of Agriculture

USDA Climate Hubs
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INFORMATIONAL MEMORANDUM

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SUBJECT: USDA Climate Hubs Status Report for the Second Quarter of FY 2021

The Climate Hubs have had a highly productive second quarter; some highlights of their accomplishments (January-March 2021) are presented in the table below:

	In the last quarter, the Hubs hosted or participated in **88** virtual workshops and/or webinars with an estimated **4802** participants in attendance. Hub staff gave **73** presentations at other meetings.
	The Hubs published **51** papers in the second quarter of 2021. ▪ 16 peer reviewed publications ▪ 35 white papers
	Highlight ~ The Northeast Climate Hub's NRCS liaison, Elizabeth Marks, reached **over 930 NRCS employees in 12 states**. She created a training called *Climate Change Trends and What Farmers Can Do to be Resilient to Them*. The Hubs are a resource to NRCS staff as farmers engage in conservation planning for climate change.
	The Hubs website had 24,000 users over 31,000 sessions in the second quarter of FY21, an increase of about 5% over the previous quarter. 86.5% were new users.

These metrics highlights represent only a few of the many Hub activities over the last quarter, a more detailed regional report is provided below. An appendix of published peer-reviewed articles and papers included for Q1 and Q2.

Regional Highlights
The following accomplishments provide a snapshot into the USDA Climate Hubs' work during the second quarter of FY21 (January-March), 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
Emerging and continuing threats to California's forests, including severe wildfires, insects, and drought, require investments in forest health. However, limited resources and millions of acres in need of restoration treatments create a challenge for prioritizing landscapes. The **California Climate Hub** co-led and coordinated the Forest Management Task Force Science Advisory Panel, which produced a report outlining science-based considerations for identifying priorities for forest health investments. The report was provided to CAL FIRE and the Forest Management Task Force as the state organizes a financial and policy response.

Climate change has major implications for agricultural production in the Caribbean. Farmers need ways to ensure agricultural productivity minimizes environmental impact and builds climate resilience. However, practical information on climate adaptation in tropical agriculture is sparse. The **Caribbean Climate Hub** developed resource guides on climate adaptation in tropical agriculture, and recently translated them into Spanish. These Spanish language guides include resources on managing and conserving agricultural soils, as well as managing water use, pest control, and crop diversity.

Forest carbon sequestration can be greatly influenced by both biophysical factors and land management. However, enhancing forest carbon sequestration can come with significant trade-offs. Therefore, evaluating costs and benefits and considering impacts to ecosystems is critical. **The Northeast Climate Hub** contributed to a peer-reviewed research article titled "Opportunities for forest sector emissions reductions: a state-level analysis" showing the impact of management options on forest carbon sequestration in Vermont. Researchers modeled management scenarios for reducing net carbon emissions. Feasible strategies included increasing longer-lived wood products and bioenergy, extending rotations, and reducing deforestation.

Rangelands, grazed by wildlife and livestock, cover about 30% of the United States. Thus, effects of climate change can vary widely by region. Because of these diverse impacts, the **Northwest, Southwest, and Northern Plains Climate Hubs** joined forces at the Society for Range Management annual meeting in a panel discussion that brought together land managers, ranchers, and scientists to address rangeland challenges. The cross-regional collaboration provided perspectives on climate adaptation in rangelands, as well as advances in wild harvest and protein production on public lands. The Hubs also presented on the potential of U.S. public lands to serve as food systems, and offered a workshop on map-based tools for sustainable and profitable rangeland management.

Technology/tool co-development and support
Provisional Ecological Site Descriptions (ESDs) were recently delineated for Puerto Rico and the U.S. Virgin Islands through a collaboration between NRCS-Caribbean and the **Caribbean Climate Hub**. ESDs provide land managers information for evaluating land-use suitability, capability, and ability to sustain productivity, factors that drive landscape resilience to extreme weather and climate change. The Hub and NRCS initiated fieldwork campaigns to document current vegetation composition and structure for an ESD Vegetation Inventory. The inventory improves state-and-transition models in the NRCS tool, Ecosystem Dynamics Interpretive Tool (EDIT), an online platform for sharing ESDs and land management knowledge. In addition, the new vegetation data will provide information to landowners on opportunities to maximize carbon sequestration and adaptation potential to extreme events, and maintain other forest and agricultural benefits.

Chemical drift issues in agriculture have become increasingly prominent over the last several years creating problems for row crops, specialty crops and homeowners. Taking a coordinating role, the **Midwest Climate Hub** convened weather station network operators, weed scientists, extension, and federal and state regulators to discuss availability of data on temperature inversion and other information for use in drift education, decision-making and planning. Over three days,70 people discussed chemical drift and how to optimize use of available data. As follow up, the group plans to develop in-field monitoring protocols and test in-field measurements with extension staff.

With much of the American West in extreme to exceptional drought – and the spring growing season in full swing – rangeland managers are busy assessing conditions and anticipating how much or little grass livestock might have. At the 2021 Society for Range Management meeting, the **Northern Plains Climate Hub** participated in a two-day workshop on advanced technologies for rangeland monitoring and forecasting providing two presentations on Grass-Cast, engaging with over 190 participants. Grass-Cast helps producers in the Great Plains assess how much grass will be available for livestock to grazing during the upcoming summer. Those interested in learning more about Grass-Cast and other climate tools and information were able to visit the USDA Climate Hubs' virtual tradeshow booth, co-hosted by the Northern Plains and Southwest Hubs, in partnership with NRCS.

The sagebrush biome has provided important natural resources to inhabitants of the American West since before Euro-American settlement. However, sagebrush now occupies less than 55% of its historical extent and more than 350 plant and animal species are under conservation concern. The **Northwest Climate Hub** contributed to the Sagebrush Conservation Strategy which provides an overview and assessment of the challenges facing land managers and landowners in conserving sagebrush ecosystems, including restoration, communication, adaptive management, and monitoring in a changing climate. In less than two weeks since its release, the document has been downloaded over 400 times.

Coastal forests and farmlands in parts of the Southeastern United States are negatively affected by saltwater intrusion and soil salinization due to sea-level rise, storms, tides, droughts, and water resources management. Elevated salinity levels cause crop yield declines, coastal forest loss, increases in salt-tolerant invasive species, eutrophication, and marsh migration. Therefore, the **Southeast Climate Hub** developed the *Identification, Mitigation, and Adaptation to Salinization on Working Lands in the U.S. Southeast* manual to help producers assess the current and projected salinization stage on their land and consider adaptation and mitigation options, if possible, for maintaining productivity.

Outreach, convening, and training

Drought is a perennial challenge for California forests, agriculture, and rangelands. Partnering with the NIDIS California-Nevada DEWS team, the **California Climate Hub** facilitated a session on climate and drought impacts on regional rangelands during the March Climate & Drought Outlook Webinar. The webinar reached approximately 200 attendees during the live session, and an additional 100+ through the webinar's recording posted on YouTube. The session provided regional rangeland stakeholders and the general public with information on where and how drought is developing and having the greatest impact on forage and subsequently livestock operations. These webinars empower participants to use this information and additional drought resources to improve decision making.

Natural climate solutions are management actions that increase carbon storage or avoid greenhouse gas emissions across forests or agricultural lands. Many states lack understanding of which solutions work for them. Researchers from the University of Maine investigated methods to quantify the benefits and costs of different natural climate solutions for both the forestry and the agriculture sector. The **Northeast Climate Hub** helped the research team explore opportunities to achieve state-level climate change mitigation goals. The Hub engaged stakeholders on this research by sharing reports, fact sheets, and

sponsoring two webinars. 273 participants learned about the economic and environmental benefits, costs, and mitigation potential of natural climate solutions.

The **Northern Forests Climate Hub** and Northern Institute of Applied Climate Science (NIACS) are helping National Forests (NF) incorporate indigenous values and perspectives into their land management decisions. A series of four roundtable discussions brought together natural resources staff from the Superior NF, three tribes, and two tribal commissions, among others. These roundtables were designed to ensure that tribal values and concerns are reflected in the forthcoming Assisted Migration Plan from the Superior NF. Additionally, the Hub and NIACS facilitated a training for the Chippewa NF and the Leech Lake Band of Ojibwe to learn about new adaptation menus, including the Tribal Adaptation Menu, and discuss future collaborative efforts.

Widespread drought continues to impact producers and ranchers in the Northern Plains. As Wyoming faces a second potential year of drought, the Wyoming Conditions Monitoring Team—a state, federal, and tribal partnership started by the **Northern Plains Climate Hub** in 2020 – held 4 virtual outreach events recently including the inaugural Wyoming Conditions and Outlooks webinar. This team has reached nearly 200 individuals over the four virtual events. In addition, the NRCS liaison, Julie Elliott, has shared drought planning resources and USDA program information engaging with ranchers in Colorado. As part of the Colorado Drought Advisors Team, Julie was recently a panelist for a drought webinar organized by two local conservation district reaching 230 people.

The **Southern Plains Climate Hub** continued to share climate-smart practices and build climate awareness with regional partners and stakeholders including the Oklahoma Wheat Growers, as well as national partners such as the National Association of Conservation Districts and National Farmers Union. The Hub has also engaged stakeholders through diverse media: six blog posts featuring topics on the economics of soil health and the February cold snap in the Southern Plains; five podcasts featuring ARS staff, NOAA partners, and state and local officials; and two videos including one on prescribed fire and another on a CRP demonstration project.

Blowing dust and dust storms are a serious concern in the Southwest and Southern Plains impacting human and animal health, agriculture, transport, and water resources. Furthermore, the average number of dust storms in the Southwest has increased from 20 per year to 48 per year since the 1990s. To address this issue, the **Southwest Climate Hub** convened a workshop hosting health, agricultural, and environmental professionals from eleven states and three countries. Participants learned about dust mitigation options for the agricultural sector, current NRCS air quality priorities, evolving emissions indicators and models, and current measurement networks. Workshop engagement activities facilitated collaborative discussion of a cross-section of regional priorities for further exploration.

Hawai'i faces a future climate with warmer temperatures, changed precipitation patterns, and increasing pressure on water resources. Many of these climate threats are superimposed on existing problems, such as extreme ecosystem transformation by invasive species. However, natural resource managers in Hawai'i have had limited access to climate adaptation training. Partnering with the **Northern Forests Climate Hub**, NIACS, the USFS, the Pacific Islands Climate Adaptation Science Center (PI-CASC), the State of Hawai'i and University of Hawai'i, the **Southwest Climate Hub** delivered an eight (8)-week Adaptation Planning and Practices workshop for natural resource and conservation professionals who manage a diverse array of natural environments in Hawai'i.