United States Department of Agriculture

USDA Climate Hubs
1400 Independence Avenue, SW
Washington, D.C. 20250

INFORMATIONAL MEMORANDUM

THROUGH: Alexander Friend
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Climate Hub Executive Committee Chair

William Hohenstein
Director, Office of Energy and Environmental Policy

FROM: Georgia Basso
National Lead, USDA Climate Hubs

Julian Reyes
National Coordinator, USDA Climate Hubs

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

The Climate Hubs had a highly productive third quarter (April -June 2021). Accomplishment highlights are presented in the table below:

	In the third quarter, the Hubs hosted or participated in **103** virtual workshops and webinars with an estimated **8,600** participants and views. Hub staff gave **86** presentations at meetings.
	The Hubs published **64** papers in the third quarter. ▪ 13 peer reviewed publications ▪ 51 white papers or grey literature products
	Highlight ~ The Northern Plains and Caribbean Climate Hub directors, Drs. Dannele Peck and Bill Gould, were featured in an ARS Facebook live event which was watched by over **1,000 participants** in June 2021. A trailer developed by the Office of Communications featured a 1-minute introduction to the Climate Hubs provided by the National Climate Hub Coordinator. It was collectively viewed almost **5,000 times**.
	The Hubs website had 28,500 users over 37,000 sessions in the third quarter, an **increase of about 22%** over the previous quarter. 95.8% were new users. Our Twitter account **quadrupled** its new follower count over the previous quarter demonstrating our heightened social media engagement.

These highlights represent only a few of the many Hub activities over the last quarter, and a more detailed regional report is provided below. An appendix of published peer-reviewed articles and papers is included for Q3.

Regional Highlights
The following accomplishments provide a snapshot into the USDA Climate Hubs' work during the third quarter of FY21 (April-June), 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
The archipelago of Puerto Rico is a Global Diversity Hotspot for birds. Over 350 species rely on Puerto Rico's terrestrial and marine habitats to live, winter, and breed. However, climate change, introduced species, and habitat loss/degradation increasingly threaten avian biodiversity. The Puerto Rico Breeding Bird Atlas, co-authored by the **Caribbean Climate Hub**, serves as a baseline for future comparisons of avian responses to changes in land use and climate on Puerto Rico. Chapter 3 of the Atlas focuses on climate change implications for birds breeding in Puerto Rico. The Atlas project is the largest citizen scientist effort to date in the Caribbean.

Healthier soils benefit agricultural producers and society. Soil health is a key element in enhancing agricultural production, environmental sustainability, and food system resilience. Increased yields and reduced risk are motivators for implementing soil health practices. Public environmental benefits, such as carbon sequestration, could also play a role in management decisions. The **Northeast Climate Hub** improved understanding of costs and benefits of various soil management practices in their peer-reviewed research article ("Economic dimensions of soil health practices that sequester carbon: Promising research directions") published in the Journal of Soil and Water Conservation. This effort also highlights the significant involvement of the Northeast Hub's ARS and NRCS co-leads.

Rising sea levels and intense storms along the mid-Atlantic and southern New England coasts are damaging coastal forests. These are important mechanisms driving coastal forest dieback according to a recent scientific literature review and interviews with leading experts. Rutgers University partnered with the **Northeast Climate Hub** to publish a report synthesizing the state of knowledge on how climate change is impacting these coastal forests. To better enable climate-smart decision-making, this synthesis identifies key knowledge gaps as well as potential management approaches. The research is also provided in an easy-to-access factsheet.

Technology/tool co-development and support
There has been a sharp increase in climate-linked stressors and disturbances across California forests in the last decade. The **California Climate Hub** presented at the UC Davis Climate Adaptation Research Seminar Series on lessons learned in the years since the last epic drought with special attention to forested ecosystems and the services they provide. The presentation gave an overview of various management resources and tools that have been developed to respond to post-disturbance events like wildfires, and presented a conceptual framework outlining a comprehensive, climate-informed approach for revegetation and reforestation statewide. The information presented in this seminar is meant to spur conversation and effort on ensuring that preparedness and post-disturbance response are commensurate with the anticipated climate change-mediated increase in drought and fire intensity and duration.

The **Northern Forests Climate Hub** and Northern Institute of Applied Climate Science (NIACS) collaborated with American Forests, among others, to develop a suite of resources to help urban foresters and others working in urban green spaces promote the human health and climate benefits of urban forests while minimizing climate change risks, such as extreme heat and more frequent and extreme weather events. A new report published by U.S. Forest Service, Climate Adaptation Actions for Urban Forests and Human Health, offers a menu of climate adaptation strategies for urban forests. An associated Climate & Health Action Guide is also available through the Vibrant Cities Lab.

The **Northern Forests Climate Hub** and NIACS worked with partners to develop climate-smart practices for landowner incentive programs. A set of carbon-focused forestry practices was developed for the Family Forest Carbon Program (FFCP) in New England and the Great Lakes states. An additional set of climate adaptation and resilience practices is in development for a landowner incentive program in western Massachusetts to complement the FFCP that is already underway. The practice development process includes scientist and land manager feedback, and is a model for national efforts to create climate-smart incentive programs.

Wyoming is seeing one of its driest water-years on record, and many people are looking for resources and assistance. But this information is distributed across numerous websites, making it hard to find. Therefore, the Wyoming Conditions Monitoring Team (WCMT)—led by the **Northern Plains Climate Hub**—collaborated with the Wyoming Governor's Office to create the Wyoming Drought Information and Resources website. This new website includes WCMT's monthly webinars, which reached 360 viewers this quarter. These webinars, combined with e-newsletter reminders from seven USDA Farm Service Agency (FSA) offices in Wyoming, have increased on-the-ground drought reporting ten-fold.

The rain-soaked, dense forests of the western Cascade Range in Oregon and Washington are iconic, known for their evergreen, wet conditions and infrequent wildfires. As the climate becomes warmer and drier, however, west-side forests are experiencing longer fire seasons, larger burns, and increased wildfire risk. Supported by the **Northwest Climate Hub**, this story map provides information about the expected effects of climate change on west-side forests in Oregon and Washington and how the West-Side Fire Research Initiative is working to provide needed information and tools to managers and decision makers. The Northwest Climate Hub director, Jessica Halofsky, is also featured and describes projected future changes in rainfall in the Pacific Northwest.

A major challenge for the Noninsured Crop Disaster Assistance Program (NAP) through FSA is determining loss. This task is particularly difficult over the native forage of western rangelands, where NAP payments require assessment of a 50% loss in expected animal unit days (AUD). However, states approach this estimation of forage loss and calculating AUD loss differently. Therefore, the **Southwest and Northern Plains Climate Hubs** brought together over 40 FSA personnel and partners from five states (AZ, NV, NM, UT, CO) to discuss how they assess forage loss for NAP. Experts also presented on the Rangeland Analysis Program, Fuelcast, and Grass-Cast, and how these can inform loss estimates.

Outreach, convening, and training

In 2020, the Creek Fire on the Sierra National Forest burned nearly 380,000 acres - an unprecedented fire event that created a complex and massive need for restoration action. The **California Climate Hub** facilitated two workshops to gather input from USFS employees on the affected National Forest's districts (Bass Lake and High Sierra Ranger Districts) about restoration priorities. The workshop leveraged over 40 employees' expertise and familiarity with the affected areas to help guide restoration efforts.

Drought poses a significant challenge to land managers in the U.S. Caribbean. While many entities work to monitor, research and communicate about Caribbean drought, no overarching framework exists to facilitate knowledge-sharing among them. By establishing a Caribbean Drought Learning Network (CDLN), peer-to-peer communication will better leverage existing knowledge and initiatives. In June of 2021, the **Caribbean Climate Hub** held an exploratory meeting in collaboration with NOAA, NIDIS and NDMC for local/regional agency leaders and climate service providers. Meeting participants agreed that a CDLN would be beneficial, and a network kick-off meeting was scheduled for October 2021.

Drought conditions worsened across the Midwest and Northern Plains during the spring of 2021 causing large agricultural impacts. In response to increased information demands and the severity of impacts, the **Midwest Climate Hub** and partners provided timely and authoritative impact information, shared

outlook assessments, and highlighted relevant and local recovery resources. This work highlights the importance of regional coordination and collaboration among various entities including the National Weather Service, NIDIS, cooperative extension, state climatologists, and NOAA regional climate centers.

The effects of climate change are increasingly being felt in our own backyards, and students around the country are eager to learn about climate science and change, and better understand causes, effects, and potential solutions. With the help of Skype a Scientist—an organization that matches classrooms around the world with scientists—two **Northern Plains Climate Hub** postdocs visited virtually with 45 inquisitive fifth-graders in Philadelphia, PA, and Palm Beach, FL. They answered students' questions about how climate change affects agriculture, how scientists study climate change in grasslands, and what it's like being a Climate Hub scientist.

Drought is widespread throughout the west and conditions have worsened in the Northwest after the region experienced record-breaking high temperatures that resulted in loss of life and other widespread impacts. The **Northwest Climate Hub** continues to work with state and federal partners to communicate current and projected future climate conditions via the Pacific Northwest Drought Early Warning System (DEWS) bi-monthly webinar and drought status updates. As of July 15th, the April and June DEWS webinars have been collectively viewed at least 3000 times. The Hub shares resilience and recovery resources via drought.gov, newsletters to federal and state agencies, and continues to support multi-state drought coordination.

Outreach and education are critical for sharing the most up-to-date science and hearing stakeholder feedback. The **Southeast Climate Hub** delivered seven presentations to USDA field staff, extension agents, landowners, and the general public to support productive and resilient landscapes. Among these efforts, the Hub reached 75 scientists and natural resource professionals at the USFS Southern Research Station sharing resources about soil salinization on coastal working lands. Over 100 staff at the Daniel Boone National Forest learned about the carbon cycle and carbon sequestration. At the 2nd World Conference on Integrated Crop-Livestock-Forestry Systems, 1300 registrants learned about the potential of integrated systems use in North America. The Hub also reached 35 extension and natural resource professionals on how soil biological activity can be tied to improved soil health.

The **Southern Plains Climate Hub** continues to increase their outreach and engagement with partners and stakeholders using social media including: publishing 10 blogs on regenerative agriculture and climate-smart agriculture with 250 downloads; recording eight podcasts with 1100 downloads; representing the Hub at the Oklahoma FFA State Science Fair reaching more than 350 students; and presenting to an agricultural policy class at Oklahoma State University. Moreover, the Hub facilitated an Oklahoma City Earth Day outreach event by running a rainfall simulator and conducting a soil and water demonstration project.

Engaging teachers to include climate change in their teaching plans remains an ongoing challenge. To address this, the **Southwest Climate Hub** has partnered with the Asombro Institute since 2014, producing peer-reviewed, student- and teacher-tested climate and agriculture K-12 curricula. The Asombro Institute and the Hub produced four workshops for 6th - 12th grade science and agriculture teachers to show how they can help their students learn about the latest climate science and to promote students' high-level thinking about climate change. Participants practiced classroom activities that engage students in experiments, games, and more, based on current Hub research.