



Climate Hubs
U.S. DEPARTMENT OF AGRICULTURE

FY20 Annual Report



USDA Climate Hubs Annual Report

October 2019-September 2020

Vision

Robust and healthy agricultural production and natural resources under increasing climate variability and change.

Mission

The mission of the Climate Hubs is to develop and deliver science-based, region-specific information and technologies, with USDA agencies and partners, to agricultural and natural resource managers that enable climate-informed decision-making, and to provide access to assistance to implement those decisions. This is in alignment with the USDA mission to provide leadership on food, agriculture, natural resources, rural development, nutrition, and related issues based on sound public policy, the best available science, and efficient management.

Introduction





The Climate Hubs were highly productive in FY2020, despite a mid-year pivot to virtual outreach due to the ongoing pandemic. The Climate Hubs program leveraged innovative approaches to reach diverse groups of stakeholders to convey climate science and implement technology transfer. Some of these approaches include virtual adaptation demonstration tours, extensive online-course curricula, podcasts, and webinars to reach their stakeholders. 2020 has been a year of extremes; 16 weather/climate disaster events with losses exceeding \$1 billion have already occurred in nine months. This year ties previous records for total year disasters, (16) in 2011 and 2017, and is the 6th year with 10 or more \$1 billion climate or weather disasters according to NOAA's National Center for Environmental Information.¹

Despite all these challenges, the Hub regions continue to ensure their stakeholders are being heard, and provided with relevant, useful information as they work to manage their land in a changing environment. In compliance with the Hub program's foundational documents, a team of Executive Committee members completed the [5-year review](#) in January. The review contains feedback from just over 200 partners and staff to help guide the program over the next five years. Additionally, Hub regions hit hard by hurricanes and tropical storms have published post-disaster best practice and pre-disaster resilience manuals. Interior regions affected by drought are working closely with regional partners to communicate adaptation strategies to minimize damage as the Midwest and Great Plains anticipate a dry winter due to [La Niña conditions](#). The western regions are identifying more sustainable reforestation strategies and water management techniques after the ravaging wildfires that scoured their regions this summer. Finally, the Northern Forest and Northeast regions continue to provide outstanding outreach and education opportunities to various working land managers as they develop plans to manage their land in a changing climate.



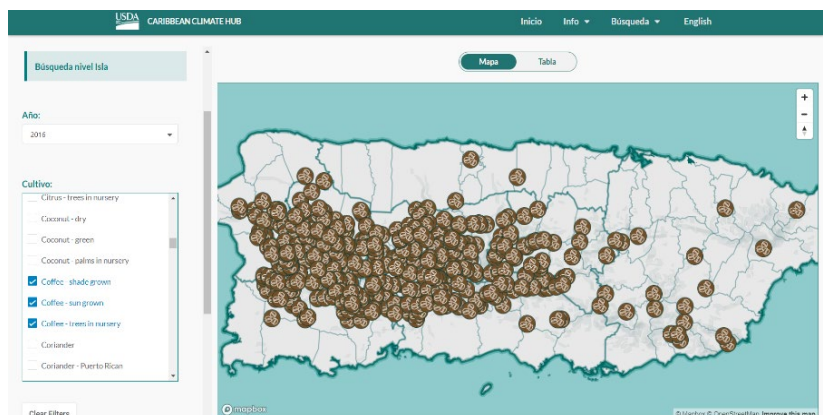
¹ See: <https://www.ncdc.noaa.gov/billions/>

A high-level summary of the year's Hubs accomplishments is provided below:

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|  | <p>The Hubs hosted or participated in 118 in-person or virtual workshops with an estimated 7,813 participants in attendance. There were 145 webinars with 11,903 attendees. Hub employees delivered 214 presentations in FY20 and had 439 engagements with tribes or tribal organizations.</p> |
|  | <p>The Hubs published 62 peer reviewed papers in FY20. Additionally, the Hubs program published hundreds of white papers, pieces of grey literature, two-pagers, infographics, brochures, and/or other communications products.</p> |
|  | <p>The Hubs developed 11 curricula in FY20 with 402 students attending. There were 3 youth outreach events with 156 participants.</p> |
|  | <p>The Hubs website had 67,607 visitors in FY20, and 959 new Twitter followers. Climate Hub website users and user sessions trended upward over the last three quarters of FY20.</p> |

The **California Climate Hub** published a [refereed paper](#) in the journal *Plant Science* reviewing the impacts of extreme heat exposure on perennial specialty crops in California. The paper also evaluates existing adaptive management strategies available to producers, and the knowledge gaps and opportunities for advances in research around crop specific impact and response. To build on this story and highlight the science discussed in the review paper as part of a broader overview of climate change impacts to California agriculture, the Hub then created an accompanying [story map](#) highlighting the impacts of climate change to California agriculture, with a special focus on the impacts of increased temperatures and on specialty crops.

Access to data is a big help in decision making in farming. While there are many environmental and statistical datasets for Puerto Rico, they are often not easily accessible to farmers and land managers. The **Caribbean Climate Hub** developed two bilingual interactive decision tools to explore data: the [Agricultural Statistics Tool](#) and the [Farm Planning Tool](#). Agricultural Statistics provides information on over 100 agricultural products,



displays where they are grown, and provides information on annual production to help farmers, marketers, and researchers plan agricultural business, conduct market studies, and assess trends. For the first time, the general public, land managers, farmers, researchers, teachers and marketers have access to production data in an accessible format. Production can be viewed in a map and table format and is downloadable. The Farm Planning Tool allows users quick access to information on land and climate characteristics for an area of interest. Science-based information is now available to share with advisors, planners, and decision-makers in tropical agriculture and forestry.

In 2018, USDA assembled a team to develop agricultural indicators explaining specific climate-related changes in agriculture. The team includes **Midwest Climate Hub** Director Dennis Today. The team established a process for determining climate change indicators and described 20 indicators in extension-type reports usable for the general public. The [USDA Climate Change Indicators for Agriculture](#) report, released to the public in July 2020, provides national, regional, and local information to support effective decision making by U.S. agricultural producers, resource managers, and other agricultural system stakeholders. This set of 20 indicators identifies high-priority agricultural and climate data products while providing the basis for tracking climate change as it plays out across American working lands, toward devising adaptive operational responses.

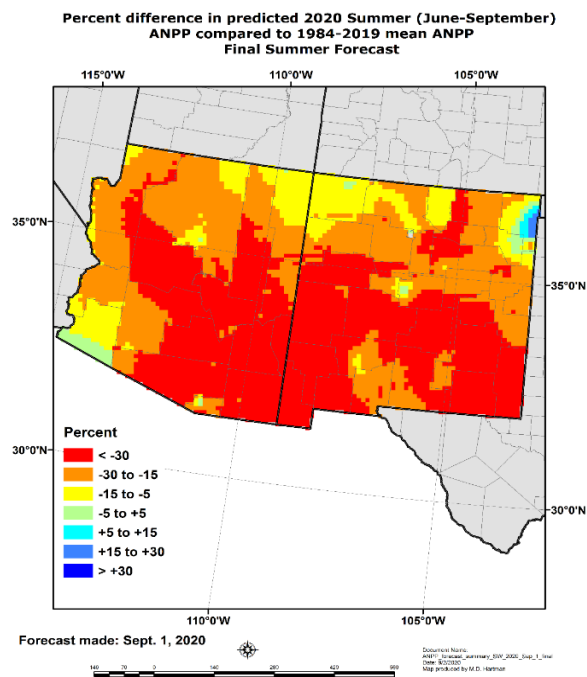


Flood irrigation scene from University of Maryland Ornamental Irrigation Research's virtual tour focused on water management in intensive production spaces like nurseries and greenhouses. Photo credit: Northeast Climate Hub.

The **Northeast Climate Hub** coordinated a two-day regional meeting, “Northeast Specialty Crop Water Symposium,” focused on specialty crops and water use efficiency. The event was funded through USDA-NIFA’s AFRI program. Stakeholders shared experience and research on how climate change is affecting irrigated/rainfed specialty crops in the Northeast and how water-use efficiency practices can be improved. Co-hosted by the University of Vermont, this meeting created opportunities for those working in different specialty crop sectors to learn from one another and from practitioners across the country. [Proceedings from the December 2019 symposium](#) highlight the speakers, presentations and discussions. The compiled proceedings document presents the state of knowledge on water use efficiency for specialty crops in the Northeast accessible to the public to increase collaboration and further research and outreach.

State forestry agencies are often mandated to be at the forefront of landscape-scale conservation, shared stewardship, and climate adaptation and mitigation policy development, even while maintaining minimal staffs that already struggle to deliver core commitments. The **Northern Forests Climate Hub** helped lighten this load in FY20 by assisting 10 states with climate consultation and technical review for their State Forest Action Plans, including structured workshops for MI, NH, CT, and PA. Additionally, the NFCH partnered with the U.S. Climate Alliance and American Forests to facilitate four “Regional Learning Labs” attended by 22 states. The lab exercises designed approaches to increase carbon sequestration, reduce losses, and decrease greenhouse gas emissions. These events help the Hub strengthen partnerships and increase visibility of climate change resources available at the Hub.

“Grass-Cast” is a tool for rangeland managers and ranchers to forecast pounds per acre of grassland vegetation expected during the upcoming growing season. The **Northern Plains** and **Southwest Climate Hubs** coordinate a large team from multiple Federal departments, USDA agencies, and academic institutions, to expand Grass-Cast from the Great Plains to the Southwest in 2020. This year, the team contributed to 10 popular press stories, and delivered 10 presentations that reached more than 800 people. In 2020, the [Grass-Cast website](#) was accessed by 3,156 unique users via 4,692 website sessions—a 73% and 58% increase, respectively, compared to 2019. In addition to increasing awareness of Grass-Cast in the Great Plains and Southwest among stakeholders (rangeland specialists and producers) as well as USDA agencies (ARS, FSA, NRCS), Dept of Interior agencies (BLM, BIA), and Dept of Commerce (NOAA), the expansion of Grass-Cast and accompanying outreach efforts will allow for earlier awareness of potential rangeland forage shortages, which hopefully leads to more proactive and sustainable rangeland livestock/grazing management decisions.



Drought impacts forests, farms and rangelands, is becoming more common due to climate change, and is leading to the desertification of the West. In 2020, much of Oregon is experiencing severe to extreme drought, and portions of Washington and Idaho are also affected by drought. With advanced warning, landowners and managers can prepare for and reduce the effects of drought. The **Northwest Climate Hub** hosted a [2-day online workshop](#) for over 100 participants to share drought information and provide NRCS staff, university extension and technology transfer specialists an opportunity to share knowledge to reduce drought impacts on farms, ranches and forests. Workshop participants learned about the U.S. Drought monitor and how the map is made each week as well as how local experts contribute. The Farm Service Agency presented on how drought affects programs available to farmers and ranchers. Participants shared knowledge on how to communicate about drought, adaptation strategies and signs that drought is starting or ending for forests, farms and ranches. Workshop recordings have been made available online for those not able to attend in person.

Agricultural losses from a single hurricane can exceed one billion dollars, and the risk from hurricane impacts is projected to increase, with slower-moving, higher-category storms producing destructive winds and flooding. Southern farmers, ranchers, and foresters therefore need to minimize their risk and recovery time if they are to remain profitable. To address this threat, and allow producers to remain resilient and productive, in FY20 the **Southeast Climate Hub** developed [commodity guides](#) for 22 of the top economically important agricultural commodities in the Southeast U.S. to help producers prepare for and recover from hurricane events. Farmers, livestock producers, and forest landowners can use these guides to build agricultural resilience to hurricanes and recover more quickly following a hurricane event.

The **Southern Plains Climate Hub** has had a busy year producing [media to communicate with the public about climate change and agriculture](#). The Hub has enjoyed 2,741 podcast downloads, 1,843 blog views, and 2,294 video views in FY20. These interactions with the public increase awareness in the agriculture community of the Hub and its mission; increase outreach to potential stakeholders; and increase networking between the Hub and other agriculture and climate change experts, both individuals and groups, in the Southern Plains region. The SPCH podcast has had discussions with local scientists and

consultants on the issues affecting agriculture in the Southern Plains, while the video series documents soil health practices in use on local farms and ranches, giving the producers' point of view.



[Adaptation Workbook case study of Pope Hilltop Farm](#) in Loyal OK by the Southern Plains Climate Hub. Animal integration is a key component on the Pope farm for diversifying the economics and improving soil health with animal manures. The Popes use a no-till drill to plant their crop.

Drought is an ever-present threat in the west. Multiple institutions and agencies from diverse sectors are working on drought prediction, monitoring, and response. However, aside from coordination with Drought Monitor authors, there has historically been limited interaction and collaboration between agencies. To improve access to drought resources and to support all agencies working with drought, the **Southwest Climate Hub** partnered with National Integrated Drought Information System and the National Drought Mitigation Center to create the [Drought Learning Network](#), with a website coming soon. The DLN now has 66 partners, representing 34+ institutions and agencies. In FY20, the DLN hosted 9 public webinars (reaching >650 stakeholders) and 3 quarterly team meetings. This network will enable stronger regional collaboration on drought projects, increased knowledge of partners' drought resources, reduced replication of efforts, and expanded reach to stakeholders.

A Look Ahead

As you can see, through this brief preview of the top accomplishment in each region, the Climate Hubs have had a highly productive year. Each year since their establishment in 2014, the Climate Hubs network has built on the accomplishments, partnerships, tools, and networks from the previous year to have an ever-broadening ripple effect on building regional climate literacy and resilience. Their accomplishments are a testament to the dedication of the regional staff and their partners. The Climate Hubs will continue to expand their efforts in the coming year as a new U.S. Forest Service lead rotates into the two-year lead role (as is stipulated in the Hubs Charter). Over the past few months, the Climate Hubs program has worked hard to refine and align their strategic goals, outputs, outcomes, and metrics based on the findings of the 5-year review, and feedback from stakeholders and partners. The Climate Hubs program will be a major contributor to the upcoming National Climate Assessment, with many regional directors serving in chapter leadership roles. Finally, the Climate Hubs will continue to expand their efforts to co-produce regionally relevant information and tools in a changing climate.