

USDA Climate Hubs Update – April, 2015

The USDA Climate Hubs were established to help managers of working lands (farmers, ranchers, and forest landowners) to adapt to the impacts of climate change and weather variability and to promote agriculture/forestry production, sustainability and health. Our role is to develop and deliver science-based, region-specific information and technologies, with the help of USDA agencies and partners, to agricultural and natural resource managers and communities.

Our first year has been about coordination and scoping. It is crucial that we understand all the existing “players” in the game so that we can concentrate on areas and projects that will have the greatest impact on America’s farmers, ranchers and forest land owners. This requires that we coordinate with other research organizations, work closely with Cooperative Extension and the USDA Service Centers to understand their needs, and that we establish a working relationship with those private advisors that work with landowners. These private advisors include the Certified Crop Advisors (CCAs), forestry consultants, and seed and fertilizer dealers. By better understanding the needs of the agricultural community and documenting the currently available resources we can prioritize the gaps in the research-to-field supply value chain and more effectively direct USDA resources to help the Nation’s farmers, ranchers, and forest land owners.

The Hubs’ initial focus has been:

- Establishing the internal “governance” and developing a USDA team to staff the Climate Hubs,
- communicating with our stakeholders and developing networks with our partners,
- completing regional vulnerability assessments, and
- inventorying existing “tools” available to our stakeholders (farmers, ranchers, forest land owners).

National Level Achievements:

The USDA Climate Hubs Strategic Plan was approved by the Executive Committee and is published on the Hubs website. The Strategic Plan identifies seven activities/products associated with accomplishing the mission of the Hubs: 1) partnerships/coordination, 2) research communication, 3) information synthesis and tool development, 4) assessments, 5) education, 6) communication and delivery strategy, and 7) adaptation and mitigation demonstrations. This plan is a living document that the Executive Committee will periodically assess and make course corrections if necessary.

In October the Climate Hubs Website was rolled out. It provides over 110 pages of content, including overall high-level information as well as in-depth region-specific updates and a list of “tools” that can be helpful to land managers. We are currently developing the Climate Hubs “Tool Shed” to allow stakeholders to search over 100 web tools currently available to land managers. This will connect to the Climate Resilience Toolkit, an effort supporting the President’s Climate Action Plan.

In November, a memorandum of understanding was signed by USDA and the Association of Public and Land-grant Universities (APLU) Cooperative Extension and Experiment Station sections to better equip farmers, communities and individuals with information and technology so they can best adapt to climate change and weather variability.

A cooperative agreement with eXtension initiated the establishment of a learning network for agricultural professionals related to climate change and agriculture. The learning network is being piloted in the Southeast in FY15.

The Midwest-and-Northern-Forests regional vulnerability assessment was published in March on the Climate Hub website (<http://www.usda.gov/climatehubs>). This vulnerability assessment provides stakeholders with an introduction to the region, regional climate sensitivities and adaptation strategies for working lands, a greenhouse gas emissions profile with mitigation opportunities, and an overview of how partner USDA agencies are being affected by a changing climate. There will be seven more regional vulnerability assessments published in the coming months including the Northern Plains, Southwest, Northeast, Pacific Northwest, Southeast, Caribbean, and Southern Plains.

The Hubs, along with their NOAA and DOI counterparts (Climate Science Centers, Landscape Conservation Cooperatives, and Regional Integrated Science and Assessment programs (RISAs) and Regional Climate Centers) continue to work together and with the Climate Tools Initiative to meet the climate needs of the Nation and support the Presidents initiatives. Coordination among these networks takes place at the national and regional levels. All the networks are working with the Climate Tools Initiative to ensure that people can connect to the appropriate network to find the answers they need to adapt to a changing climate.

Regional Reports:

Pacific Northwest Hub

- Met with the extension stakeholder engagement strategy committee to determine the best approach for engaging extension faculty in the region regarding the dissemination of current climate science to landowners. In December, an engagement strategy was developed that will inform these outreach efforts. In addition, a team of extension agents and specialists from Oregon State University received funding from the Oregon Forest Resources Institute to produce a series of informational publications and communication materials covering basic climate change questions and concerns of landowners, as was determined by needs assessments completed in the PNW region. These funds will leverage the activities of the Climate Hub.
- Engaged with 11 extension and climate change science specialists to discuss priorities for climate change information and tools. They identified 6 priority areas and organized a 1 ½ day meeting in Portland, OR of 40 research and Extension leaders from Oregon, Washington, and Idaho. The group developed ideas and proposals to integrate research and extension on applied climate change. The meeting was supported by the Idaho Natural Resources Energy Laboratory. Participants are developing at least 3 different collaborative proposals. The purpose is to develop cooperative relationships between extension specialists and scientists for development of useful and usable tools for adaptation to climate change, as well as mitigation.
- The Director provided a presentation and participated in a panel at a 3-day meeting of the Regional Approaches to Climate Change for Pacific Northwest Agriculture (REACCH) CAP project in Moscow, ID. The Hub is in discussion with the REACCH project about developing proposals to expand and continue the work of REACCH.
- The Hub is working with Oregon State University to bring climate information into their web tool AgBiz Logic, a software application to support decision-making by individual farmers.

Southwest Hub

- Hosted six regional workshops on climate change focusing on weather and climate, drought, wildfire and food security in partnership with Cooperative Extension (CE).
- CE county agents told the Hub that they rarely have the time to sift through peer-reviewed journal articles to provide the latest regional climate change information to local farmers, ranchers and foresters. In response, the SW Climate Hub launched our newsletter with a section devoted to summarizing recent climate change research for the Southwest. Past SW climate hub newsletters and a form to sign-up for future newsletters are available here <http://jornada.nmsu.edu/sw-climate-hub/newsletter>.
- The SW Climate Hub, in partnership with Asombro Institute for Science Education, is developed a middle and high school climate change curriculum, and the first unit is focused on the impacts of climate change on the hydrologic cycle. In fall 2014, the climate change module was taught and tested in local schools where it underwent an iterative process of testing and refinement. The unit will be ready for expansion across our 6-state region in summer 2015. Parts of the hydrologic module are available for download at the SW climate hub website (<http://swclimatehub.info>).
- The Southwest Regional Climate Hub successfully co-hosted the 13th Annual Climate Prediction Applications Science Workshop along with NOAA and New Mexico State University in Las Cruces. Southwest Hub principals and associated scientists gave 14 presentations at the workshop (March 22-24, 2015).
- Created mid-century temperature and precipitation projections at the county level for the entire U.S. based upon the downscaled MACA dataset. This resource is being shared with the other hubs and sub-hubs.
- Developed a database of over 700 articles related to climate change and working lands in the region. Those articles are being entered and shared in *JournalMap*, a public, searchable geodatabase. Users can now quickly find research conducted in a specific location in the region. The general Climate Hub collection is viewable on the Collections tab on JournalMap. <https://journalmap.org/usda-southwest-regional-climate-hub/climate-hub>

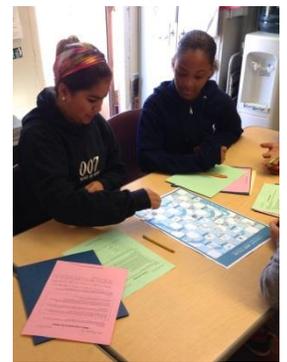


Figure 1- Students play the new Streams and Steam board game to learn about the effects of climate change on the water cycle during a pilot test of the Southwest Regional Climate Hub's Water Cycle Unit in October 2014.

California Sub Hub

- A non-funded specific cooperative agreement was initiated with University of California Cooperative Extension to support of the Climate Hub mission.
- Developing a CA rangelands vulnerability assessment with partners, including the CA Rangelands Conservation Coalition.
- Working with UC Cooperative Extension to update their Forest Management Stewardship Series to include a new chapter on coping with climate change.
- The Sub Hub hosted researchers from Colorado State who are developers of COMET-Farm to give them a tour of farming systems located at UC Davis. They then initiated work with CDFR and researchers from Colorado State to identify data needs and timeline for incorporating California specialty crops into the COMET-FARM greenhouse gas accounting model.

Northern Plains Hub

- A proposal was funded by North Central Climate Center for a large collaborative effort (Colorado State University, National Integrated Drought Information System, National Drought Mitigation

Center, High Plains Regional Climate Center, USDA Northern Plains Regional Climate Hub) for the effort “The Wind River Indian Reservation’s Vulnerability to the Impacts of Drought and the Development of Decision Tools to Support Drought Preparedness”

- Compilation of current recommended tree lists from the 6 states in Northern Plains (MT, WY, CO, ND, SD, and NE) with plans for a research note on the database of trees, synthesizing recommendations on tree list content, and discussing utility of looking across the region for recommendations for tree species with climate change.
- First collaborative meeting of USDA Northern Plains Regional Climate Hub, DOI North Central Climate Science Center and NOAA Western Water Assessment leadership. Outcome products included drafting articles for 1) Science and 2) Frontiers in Ecology and the Environment on Regional Collaborative Climate Partnerships (meeting on November 6 and 7)
- Establishment of joint stakeholder committee between DOI North Central Climate Science Center and USDA North Central Regional Climate Hub.

Southern Plains Hub

- The Hub and NOAA’s Southern Regional Climate Center (SRCC) agreed to work together on subjects of mutual interest including agro-climatologies, near-term outlooks and risks associated with climate change.
- Working with Redlands Community College to create a soil health/climate change adaptation demonstration farm that will serve as a part of both our continuing education/training work for NRCS and partnership personnel while also serving as an outreach tool for farmers and ranchers in the region.
- Participated in 2015 RMA drought workshop planning, and the South Central Climate Science Center Stakeholder Advisory Committee Annual Meeting to evaluate knowledge and technology gaps and research priorities.
- Organized and participated in regional soil health meeting involving individuals from Oklahoma, Kansas and Texas who are working on soil health efforts in partnership with USDA, and began the process of forming regional soil health steering committee and regional soil health producer demonstration committee.
- Met with Oklahoma NRCS and Oklahoma State University representatives about soil health Conservation Innovation Grant (CIG) and partnerships with Hub on Producer outreach and training for producer, USDA Agency employees and partners.

Midwest Hub

- Organized session on USDA (ARS and NIFA) research to address weather and climate extremes on natural resources and crop production as part of the Weather and Climate Extremes, Food Security, and Biodiversity Conference.
- Held stakeholder meeting with specialty crop producers in Michigan and Ohio to discuss the potential impacts of weather and climate on production and the types of tools which need to be developed for decision-making in these production systems.
- Partnerships have been built with the Forest Service (Chris Swanston) and NRCS (Mike Wilson) to evaluate the potential of adapting the Forest Service Adaptation Toolkit to agriculture. The initial training was held in January 2015 with a follow-on in February 2015 and efforts continue to be made to incorporate adaptation strategies/practices into conservation plans. These concepts have been introduced to the different audiences and there is potential acceptance of this type of tool from the producers based on the interactions from the different presentations.

- There have been detailed analyses conducted across the Midwest region on the variation in the meteorological variables since 1895 and the impact of climate changes on workable field days, crop production, and crop insurance. These data are being assembled into various forms to provide a cross-section of the Midwest and where adaptation strategies need to be focused.
- Discussions have been primarily with NRCS on the linkage of conservation plans with adaptation and this has focused on the role of soil organic matter on soil water holding capacity and soil health. The outcome of this is to provide an assessment for potential adaptation strategies for producers to use to offset climate impacts.

Southeast Hub

- The Southeast Hub is leading the production of the national Climate Hubs Tools Database, providing an online, comprehensive, searchable list of spatially and temporally relevant tools for extension and land managers to adapt to climate change and variability. The database is in a Beta testing period, and has reached over 100 tools. This inventory sheds light on gaps in available tools.
- Established SERCH LIGHTS (Lately Identified Geospecific Heightened Threat System; <http://globalchange.ncsu.edu/serch/tools-services/serch-lights/>), an alert subscription service that couples multiple climate-related information sources with potential adaptation actions. The first version focuses on drought, but the system is designed with the flexibility to be adapted to a variety of climate related subjects.
- Staff engaged stakeholders and partners at many large and small meeting across the region and are establishing one-on-one contacts with extension staff throughout the Southeast, focusing on the Land Grant University Cooperative Extension system. These initial contacts are a precursor to working with Coop Extension on specific adaptation strategies and management options to share with land managers.
- A website on the Global Change Forum was established by the Southeast Hub, including news and events, a land management blog, and a general blog (<http://globalchange.ncsu.edu/serch/>). The Southeast Hub feeds this content into its monthly newsletter, which reaches nearly 200 subscribers.

Caribbean Sub Hub

- Established a network of stakeholders (500 members) involved in sustainable agriculture and forestry as a means to better communicate as a group about climate impacts and the future of agriculture in Puerto Rico and the US Virgin Islands.
- First draft of the “Caribbean Agriculture, Forestry and Climate Governance Database” released: <http://caribbeancca.org/>. This is an outreach effort to identify “who is doing what” in the region to (1) identify the interests and capacities of different stakeholders, (2) to build a regional directory and map for the agriculture and forestry community with information about farmers market listings including market locations, directions, product offerings, and more, (3) to create a project database covering climate change adaptation efforts. This is a publically accessible database designed to streamline information sharing across similar interest groups and producers.
- USDA Deputy Secretary Krysta Harden visited Puerto Rico and the Caribbean Climate Sub Hub to talk about climate change, forestry, and agriculture. A roundtable discussion included USDA leaders and the Puerto Rico Secretary of Agriculture and Secretary of the Department of Natural Resources. Harden received a review of the activities of the CCSH in its first year of operation and an overview of the challenges that climate change and other issues present to sustainable forestry and agriculture in the region, and a copy of the Vulnerability Assessment draft.

Northeast Hub

- Held first Northeast Climate Hub/Northern Forests Sub Hub Advisory Committee meeting. The committee is comprised of federal representatives from ARS, FS, FSA, NOAA (Northeast Regional Climate Center), NIFA, NRCS, DOI (Northeast Climate Science Center).
- Continued collaboration via bi-weekly conference calls/web meetings with the 12 state Land Grant Universities (Extension and Experiment Stations) within the Northeast on a number of projects including capacity discovery, vulnerability assessment, stakeholder viewpoints, and website content. Focus for 2015 is to expand collaboration with the University of the District of Columbia, and reach out to the 3 regional 1890 Land Grant Institutions.
- Working with the Northern Forests Sub-hub and Midwest Hub to determine whether a proven method of reaching forest land owners with climate adaptation information (the Climate Change Response Framework and Adaptation Toolkit) can be applied to farmers.
- Provided northeastern agricultural vulnerability information (derived from the NE Hub's vulnerability assessment effort) for backend information to develop a web application tool that can identify the relationship between resource concerns and potential adaptation conservation practices that may help address them.

Northern Forests Sub Hub

- Hosted 13 adaptation workshops, including the highly successful [*Forest Adaptation Planning and Practices workshops*](#), which are active, hands-on trainings to help natural resources managers incorporate climate change considerations into their own real-world forest management projects. These workshops brought together 186 participants – representing the Forest Service, Natural Resource Conservation Service, FWS National Wildlife Refuges, National Park Service, State Agencies, Counties, Municipalities, Park and Forest Preserve Districts, Universities and NGOs. These trainings have produced >25 real world adaptation demonstration projects (<http://forestadaptation.org/demos>). Key collaborators and co-conveners included the Wildlife Conservation Society, Hudson to Housatonic Conservation Initiative, Morton Arboretum, Field Museum, Chicago Wilderness, Shawnee National Forest, Ducks Unlimited, West Virginia Univ., U. Conn., U. Mass., and the NE CSC.
- Published [*Ecosystem Vulnerability Assessment and Synthesis*](#) for the Central Appalachians region. This assessment evaluates the vulnerability of forest ecosystems in the Central Appalachian Broadleaf Forest-Coniferous Forest-Meadow and Eastern Broadleaf Forest Provinces of Ohio, West Virginia, and Maryland for a range of future climates.
- Launched the online **Adaptation Workbook** (www.AdaptationWorkbook.org), a new web-based tool designed to help natural resource professionals integrate climate change adaptation actions into forest planning. This online edition of the Adaptation Workbook, allows users to seamlessly explore content from [*regional climate change vulnerability assessments*](#) and [*adaptation strategies and approaches*](#), all while working at their own pace.
- Currently assisting the Midwest and Northeast Regional Climate Hubs in testing and developing an **agricultural adaptation toolkit** based on the suite of Forest Adaptation Resources that the Northern Institute of Applied Climate Science (NIACS; coordinator of the Sub Hub) developed (www.forestadaptation.org/far). The Hub representatives successfully applied the Adaptation Workbook in an agricultural setting in Nebraska (no-till corn/soybean/wheat). Future work will focus on adapting the approach to include a full suite of adaptation and mitigation conservation practices relevant to agricultural producers.