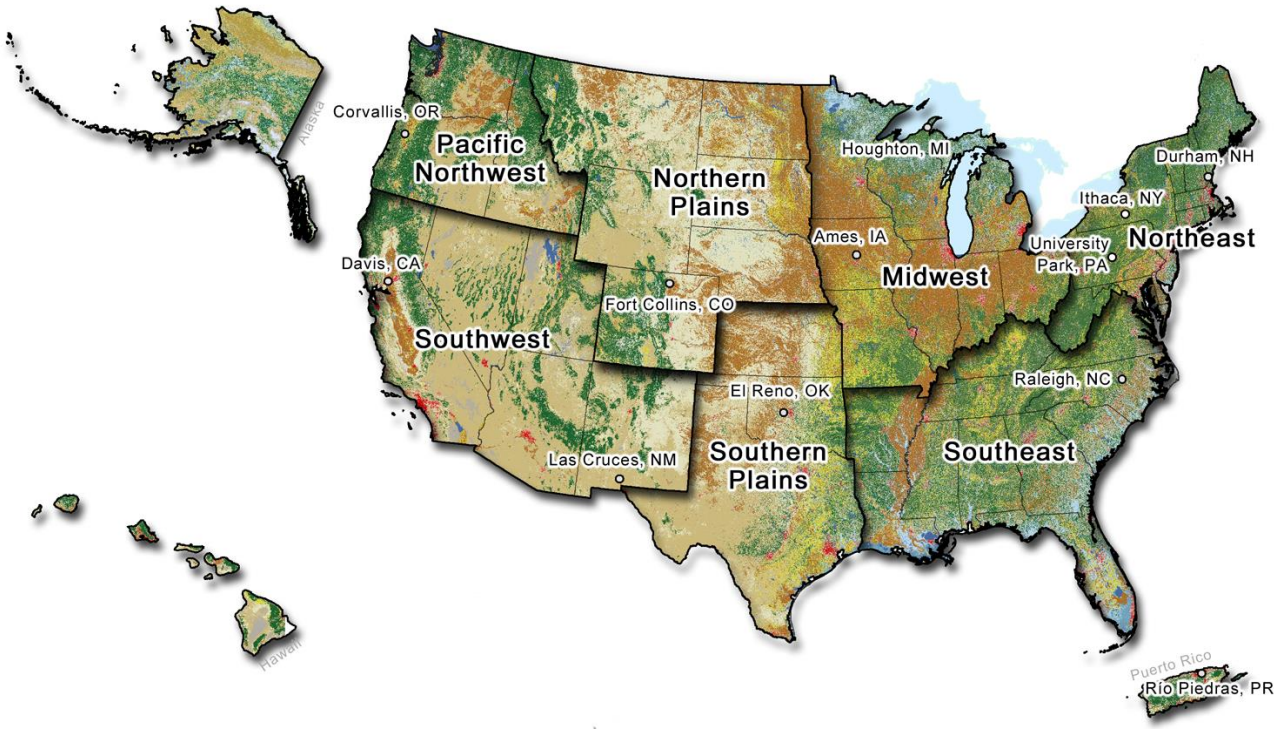
DEPARTMENT OF AGRICULTURE

REGIONAL CLIMATE HUBS

STRATEGIC PLAN



March 23, 2015

USDA Climate Hubs Executive Committee

Contents

I. Introduction

The U.S. Department of Agriculture (USDA) Regional Hubs for Risk Adaption and Mitigation to Climate Change (Climate Hubs) were established to ensure that, in light of increasing weather variability and a changing climate, resource managers (farmers, ranchers and forest landowners) have access to the best science-based information on management practices, decision tools, and short-term and seasonal climate/weather data and trends.

Climate change presents a growing threat to U.S. agricultural production, forest resources, and rural economies. Across the country, farmers, ranchers and forest landowners are experiencing increasing enterprise risks associated with fires, increases in invasive pests, droughts, and floods.

The Climate Hubs[1] will address risk management strategies on a regional basis, aiming to translate science and research, through extension and outreach, into actionable adaptation and mitigation practices for farmers, ranchers and forest landowners. The creation of the Climate Hubs further enhances USDA's long-term commitment to cooperatively assist farmers, ranchers and forest landowners with stewardship and management of natural resources, conservation practices and improvements, and rural economic development.

The Climate Hubs provide value for the three primary agencies (ARS, FS, NRCS) and allows research, development and outreach activities to be better coordinated across all USDA. It allows USDA to be better represented in regional forums. For specific agencies additional benefits include:

ARS – The Hubs provide tech transfer for ARS research, allowing it to provide impact more quickly and more thoroughly to the nation's agricultural sector.

FS – The network provides a coordinated outreach throughout the whole country for the National Forest System. It enables the FS to connect with state and private forest land managers so that an "all lands" approach to planning and activities can be better accomplished.

NRCS – The Hubs will be a source of additional information and expand the reach of NRCS technical information through additional advisors (Extension, certified crop advisors, forestry consultants). It will expand the reach and impact of NRCS programs by providing the information (and demonstrations) of the additional advantages of climate-informed management practices.

The Hub's ultimate "stakeholders" are land managers: farmers, ranchers, and forest landowners (Land Management stakeholders in figure 1 below). While the Hubs will work directly with these stakeholders, the Hubs rely primarily on established USDA networks and partner technology transfer providers to educate and inform farmers and land managers. Within USDA these resources include USDA Service Centers and Forest Service Threat Centers. Other first-level stakeholders are USDA-supported programs (Cooperative Extension), state climatologists, and the private sector (e.g. certified crop advisers and consultants). An overarching objective of the Hubs is to establish two-way communication between the land management stakeholders and

[1] The term "Climate Hubs" refers to the 7 Regional Climate Hubs and the 3 Sub Hubs.

the science/technology providers so that feedback from the land management stakeholders directly influences programs and priorities for the science/technology providers. Ultimately this process results in usable information and tools.

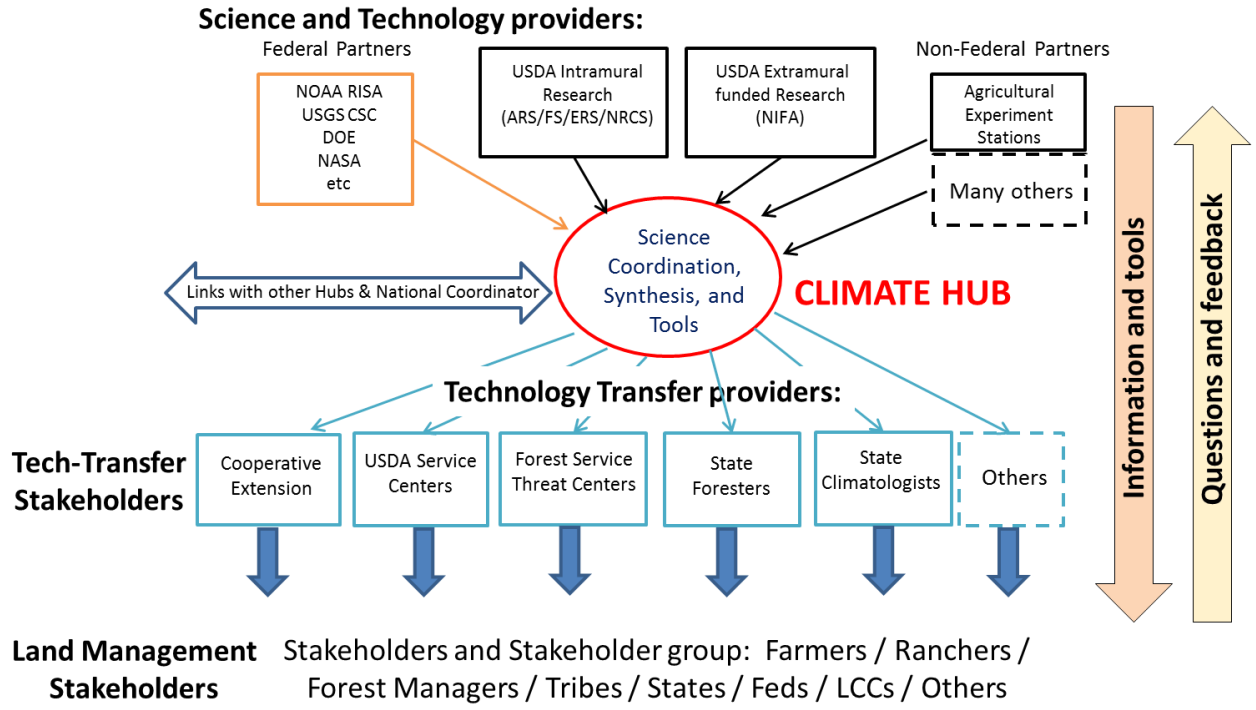


Figure 1: The Climate Hub Network

II. Identity

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 land 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.

Vision

A USDA-led partnership that fosters robust, resilient and healthy natural- and agro-ecosystems under increasing weather variability and a changing climate.

Core Values

Four values guide Hub activities:

1. **Science-driven**—We generate science-based information and technologies with a high standard of quality and impartiality.

2. **Stakeholder-centered**— We actively seek feedback from land management stakeholders to identify gaps and influence programs and priorities for science and technology providers. We seek to improve the success of our public, private, and tribal stakeholders by providing important and timely usable information and tools that meet their current and future needs.
3. **Cooperative**—We strive for cooperation within USDA, across the federal government and among the existing networks to minimize duplication and efficiently provide desired information, management practices, and decision tools to land management stakeholders.
4. **Efficient**— We find the right person, team or organization to do the tasks that need to be done.

III. Climate Hub Assets

USDA

The focus of the Climate Hubs is on management practices, decision tools, synthesis of information, and training that will help land management stakeholders, and their advisors, to evaluate enterprise risks associated with increased weather variability and a changing climate into their management and investment decisions. The primary cooperating agencies from within USDA (Agricultural Research Service (ARS), Forest Service (FS), Natural Resources Conservation Service (NRCS)) provide the personnel, facilities, administrative support, and supervisory structure that the Climate Hubs require. Personnel include Hub and Sub-Hub leaders, co-leaders and staff. The Climate Hub Executive Committee oversees Climate Hub activities. Other USDA agencies are essential to the Climate Hubs' mission, especially those that have extension/outreach capability and those that provide science and services to our land management stakeholders—the farmers, ranchers and forest land owners.

USDA Resources include:

- Scientists and Staff: The primary cooperating agencies (ARS, FS Research and Development, NRCS) employ scientists and their supporting research and administrative staff. Other USDA agencies (Animal and Plant Health Inspection Service - APHIS, Economic Research Service - ERS) provide in-house research as well. The National Institute for Food and Agriculture (NIFA) funds extramural research through its competitive grants and capacity funding.
- USDA Technical Outreach: Technical outreach is provided by NRCS and the Farm Service Agency (FSA) through the USDA Service Centers; FS provides outreach through their Threat Assessment Centers and certain aspects of their Research and Development program. ARS works with farmers through field days and other opportunities.
- USDA program agencies that enable stakeholders to implement climate-informed management practices include the FSA, FS State and Private Forestry, NRCS, the Risk Management Agency (RMA), and Rural Development (RD).

No one USDA agency, nor USDA as a whole, can completely fulfill the mission of the Hubs. Figure 2 illustrates where different agencies provide resources in the process of developing foundational research and moving it to the field.

ARS focuses on foundational and applied research, with efforts in synthesis and development of decision tools.

NRCS provides the majority of USDA technical outreach through administration of their conservation programs and associated technical assistance to assist in mitigation and adaptation strategies. Their emphasis is on conservation of multiple resources; soil, water, air, plants, animals, and energy.

The FS Research & Development deputy area examines climate change impacts on forest, rangeland and urban ecosystems in order to develop management practices for adaptation and mitigation. The research ranges from foundational to applied, including efforts to develop appropriate tools for land managers. FS R&D provides outreach that varies by region, but has limited public outreach. The FS State & Private Forestry deputy area is responsible for extension support and program delivery to non-federal forest owners and works primarily through the State Foresters.

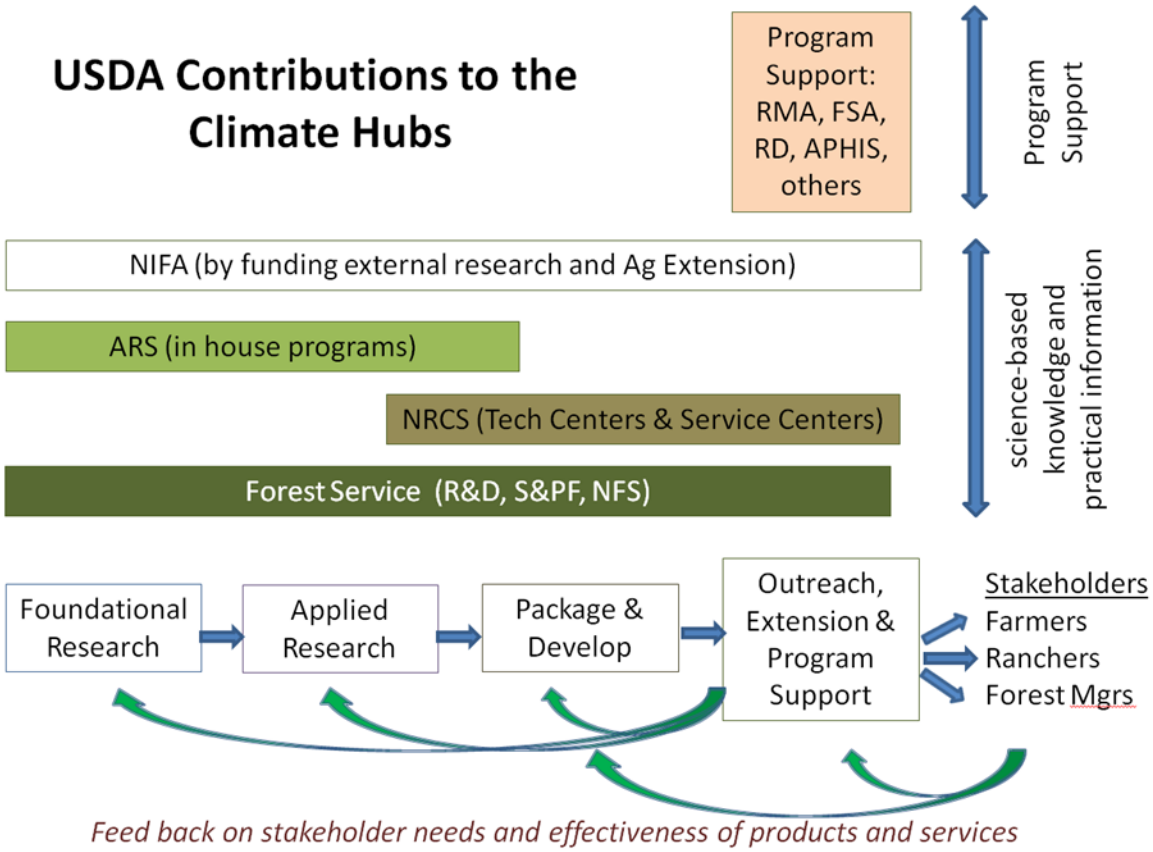


Figure 2: USDA Climate Hub Contributions

Other Federal Research Agencies

Climate research is ongoing in many Federal departments/agencies, especially those 13 that are part of the US Global Change Research Program (USGCRP)[1]. Understanding and minimizing climate risk extends beyond the science capabilities of any one department/agency or the risk management practices of any resource management community. Coordination is a vital part of ensuring that the science capabilities and the risk management practices developed by the various partners and stakeholders support response and preparation in integrated ways.

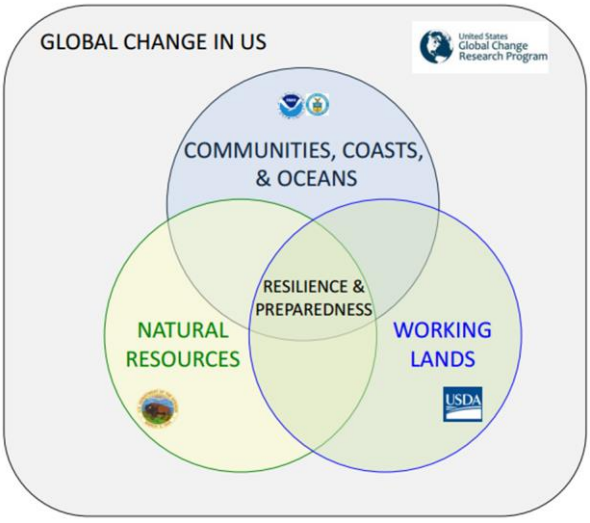


Figure 3: Federal Climate Center Collaboration

The USDA Climate Hubs complement and build on the existing networks of Federal climate science and information centers (Figure 3). These include Climate Science Centers (CSCs) (Dept. of Interior (DOI) US Geological Survey), Landscape Conservation Cooperatives (LCCs) (DOI/Fish and Wildlife Service), Regional Integrated Science and Assessments (RISA) teams (Dept. of Commerce/NOAA), Regional Climate Centers (NOAA), Regional Climate Service Directors (NOAA), the Sea Grant Program (NOAA), regional research facilities and labs. Working with other agencies, the Hubs serve as a regional source of knowledge explicitly for adaptation and mitigation strategies for working lands.

States and other Organizations

The Land Grant institutions in each state support climate change research and applications, and provide outreach through Cooperative Extension. USDA provides funding to these universities through NIFA formula funds and competitive grants. These partners are crucial to the success of the Climate Hubs as they provide critical services of synthesizing and translating information, decision tool development, development of management practices, and outreach to land management stakeholders. Key partners for the Hubs include:

- Cooperative Extension provides one-to-one contact with land-management stakeholders and has been doing outreach and extension for over 100 years. Coop Extension was brought in early in the process of establishing the Climate Hubs since they are a priority partner and trusted by our stakeholders.
- The Agricultural Experiment Stations provide applied science and syntheses—key deliverables for each Regional Climate Hub.
- The Association of Public and Land-grant Universities (APLU) provides the Climate Hubs with access to a number of underserved communities. APLU includes eighteen

[1] http://www.globalchange.gov/

1890 Land Grant colleges/universities and represents six related higher education organizations, including the American Indian Higher Education Consortium, which serves the interests of the nation's thirty-three 1994 Land Grant Universities. Hispanic Serving Institutions and Non-Land Grant Colleges of Agriculture are also represented by APLU.

- States also have climate advisors and State Climatologists who develop agricultural and water polices, regulate water use, and plan for various hazards and emergencies.

IV. Activities / Products

Seven activities/products are associated with accomplishing the Mission of the Climate Hubs. The mix of activities/products associated with any single Regional Climate Hub is a function of the regional needs, information already available and the resources available to the particular Climate Hub. While all seven activities/products contribute to the Mission, available resources can limit the outputs of any given Regional Climate Hub. As more resources become available, more outputs and better outcomes can be expected.

1. **Partnerships / Coordination**: The success of the Climate Hubs in transferring management practices, decision tools and information to land management stakeholders can only be achieved through close coordination with USDA agencies and partner programs. These partnerships are key to establishing two-way communication between land owners and the research community and in establishing coordination within the science community and the tech-transfer community.

   The Climate Hubs provide a regional "venue" for USDA agencies and programs to work together. In order for the Climate Hubs to bring all the relevant USDA resources to our stakeholders, there must be an understanding among the agencies at a regional level of what each agency provides. This understanding can be achieved through regional steering committees and in working on cross-agency documents such as regional vulnerability assessments.
   The Climate Hubs coordinate regional communication of USDA research results/products with other scientists and science organizations within each region. This coordination is not to infer that the Climate Hubs direct USDA research. Climate Hub Leads represent USDA in regional forums; especially those that include other regional federal climate change networks (CSCs, RISAs, LCCs, RCCs, etc.).

   Farmers, ranchers and forest land managers benefit from one-on-one interaction when developing new or modified land management practices. The Climate Hubs will work within a number of existing networks to reach individual land mangers; such as: USDA Service Centers, Cooperative Extension, and USDA research centers (i.e., ARS, FS). These efforts need to be coordinated at both the regional and national levels in order to reach the maximum number of stakeholders.

2. **Research:** The Climate Hubs are a key conduit for: 1) communicating stakeholder needs to research leadership within USDA and other research institutions, 2) identifying research that meets stakeholder needs, and 3) being part of research proposals where the Hub mission can contribute to the success of a proposal. This activity ties in closely with the

Partnerships/Coordination activity in that the Hubs provide connections between researchers and land managers so that research will meet the needs of land owners.

3. **Information synthesis / Tool development:** Information synthesis in the context of the Climate Hubs consists of taking the available science and putting it into a form that can be used by our tech-transfer and land management stakeholders. The first step in this process is a gap analysis to understand the needs of stakeholders and what tools and information services are already available to meet those needs. The Hubs can then focus on finding resources to develop syntheses, important tools and information that will meet the needs of stakeholders. These new tools will be developed by teams/individuals that are best able to accomplish the task. The Climate Hubs will evaluate existing tools that apply climate change to policy and decision making. Tools of sufficient scientific quality and usefulness will be made available to stakeholders via the web and other technologies (e.g., smart phone apps).

4. **Assessments:** The Climate Hubs provide periodic regional assessments of risk and vulnerability to production sectors and rural economies, building on material provided under the National Climate Assessment conducted through the USGCRP. The Hubs will use existing climate change information and assessments to identify primary risks to producers from increasing weather variability and a changing climate. These assessments/syntheses will consist of information on vulnerabilities of primary regional agricultural, ranching, and forestry commodities to climate change effects and will identify mitigation and adaptation strategies.

   The Climate Hubs will use the web and networking opportunities to direct stakeholders to usable regional data and climate forecast services for incorporation into individual and community hazard and climate adaptation planning. These data are generated by federal partners such as NOAA and other appropriate organizations in the public and private sectors, such as the Scripps Institution of Oceanography and the National Center for Atmospheric Research.

5. **Education:** The primary focus for education is to land managers and technology transfer providers. Delivery format can be classes, workshops and/or the web. The Climate Hubs will take advantage of education materials that are currently available and make the most appropriate resources accessible to all our stakeholders. We will develop appropriate curriculum to meet stakeholder needs where resources are not currently available. The Hubs will use the tech-transfer stakeholders, the web and eXtension to deliver these educational resources to as many persons as possible in an effective format.

   To maximize effect, the Climate Hubs will educate USDA and partner technical transfer providers (see Figure 1) on the technologies, practices, and systems that build resilience for natural- and agro-ecosystems with regard to increased weather variability and a changing climate. The Hubs will be more successful if, rather than trying to work directly with each land manager in the region; educate and utilize the existing regional USDA workforces and other tech-transfer partners.

6. **Communication and delivery strategy:** To deliver appropriate information and training, Hubs need to understand their audience/stakeholders and use the most effective methods and

channels to promote two-way communications and information exchange between the research community and their stakeholders. Hubs will need to determine the most efficient ways to communicate and how to best utilize their partners. Wherever possible, Hubs will seek means to support the incorporation of climate change considerations into new and existing tools for stakeholders.

7. **Adaptation and mitigation demonstrations**: Landowners often need to see a new practice in action to be convinced of its effectiveness. Field demonstrations of adaptation and mitigation techniques are therefore a critical "tool". The Hubs will take advantage of existing demonstrations (e.g., Agricultural Experiment Stations, NRCS Conservation Innovation Grants, NEON sites, Experimental Forests, etc.) and work to establish new demonstrations of the most effective techniques.

V. Outcomes

1. USDA climate research is strengthened by collaboration across agencies and regions.
2. Capacities of USDA service agencies and Land Grant institutions are enhanced.
3. Stakeholders are provided useful and usable information, management practices, and decision tools to enable climate-informed decision making to reduce enterprise risk and enhance resiliency of their natural- or agro-ecosystems.
4. Climate resilient production strategies are provided to stakeholders.
5. Land managers use production strategies that result in lower greenhouse gas emissions and/or increased carbon sequestration.
6. Land managers experience improved production, lower greenhouse gas emissions, and greater resilience to climate change effects.
7. Policymakers are better informed about stakeholder needs and concerns.
8. Public and USDA employees are educated about climate risks for agricultural, range, and forested lands.
9. Agricultural and natural resources are better conserved.
10. State and federal agencies, tribes, and communities are better prepared for disasters exacerbated by climate change.
11. Agricultural producers improve food security locally, regionally, and globally.
12. The US rural economy remains environmentally and economically strong and sustainable.

VI. Appendix A: Priority Agenda Enhancing the Climate Resilience of America's Natural Resources—Hub Related Initiatives

Goals

1. Foster climate-resilient lands and waters – Protect important landscapes and develop the science, planning, tools, and practices to sustain and enhance the resilience of the Nation's natural resources.

2. Manage and enhance U.S. carbon sinks – Conserve and restore soils, forests, grasslands, wetlands, and coastal areas that store carbon. Maintain and increase the capacity of these areas to provide vital ecosystem services alongside carbon storage such as clean air and water, wildlife habitat, food, fiber, and recreation

3. Enhance community preparedness and resilience by utilizing and sustaining natural resources – Harness the benefits of nature to protect communities from harm and build innovative 21st century infrastructure that integrates natural systems into community development.

4. Modernize Federal programs, investments, and delivery of services to build resilience and enhance sequestration of biological carbon – Ensure that Federal programs, policies, trainings, and investments consider climate resilience and carbon sequestration, and organize the delivery of Federal science, tools and services to help resource managers, landowners, and communities optimize their natural resource management decisions in a changing climate.

Actions

- Through Regional Climate Hubs, USDA delivers tailored information to help farmers, ranchers, and private forestland owners mitigate and adapt to the impacts of climate change and weather variability and to promote sustainable agriculture/forestry production through development of adaptation responses.
- Within 12 months, each Regional Climate Hub will pursue a set of partnerships with Cooperative Extension university partners and other stakeholders to better understand the local and regional challenges posed by climate change and to develop and deliver guidance on climate resilient management strategies to farmers, ranchers, and other landowners.

With these challenges ahead, the Federal agencies involved in this exercise recognize more investment is needed and would welcome continued dialogue around:

- Innovative financing mechanisms that leverage private sector investment
- Increasing support for existing landscape scale restoration as well as land acquisition and easement programs
- Expanding support through the tax code for retaining working forests
- Reducing wildfire risk and restoring fire-impacted landscapes
- Innovative ways to encourage proven water conservation and efficiency investments
- Building support for regional climate services (CSCs, LCCs, Hubs, RISAs, etc.)
- Increasing state and local climate and natural resources resilience planning and implementation capacity through existing mechanisms like the Fish & Wildlife Service State Wildlife Action Grants, and the Forest Service Cooperative Forestry