

Engaging a Climate Ready Agency

From Dave Cleaves, Forest Service Climate Change Advisor



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This update is designed to inform you about Forest Service activities that are linked to climate change as we all work to bring climate change knowledge into our organizational expectations and actions. Please continue to share the details of your climate change related research, management activities, and communications so that we can learn from each other as we work to connect the strong fibers of this vast organization. (See submission details in the last section of this update.)

If you want to make sure that you continue to receive these updates, please sign up for our climate change [listserv](#)—we'll send an email to announce when a new update is available on the [Climate Change Advisor's website](#). You can also direct partners to this website so they can sign up for the listserv. (It's not the kind of listserv that will flood you with tons of email.) Previous editions of the updates are also posted on the website.

MESSAGE FROM THE CHIEF

CHIEF TIDWELL IS OUR SPECIAL GUEST ESSAYIST THIS MONTH.

The Challenge of Wildland Fire Management in an Era of Climate Change

Tom Tidwell, Chief

Perhaps more than any other single issue, fire has shaped us as an agency. For more than 100 years, we've been suppressing, managing, and studying wildland fire. During that time, we have come a long way in understanding fire's ecological role and our fire management policies have evolved.

Climate is the most important natural shaper of ecosystems. It affects the location and composition of forests and the frequency and extent of wildfires. Across the United States, wildfire seasons have been getting worse, partly under the influence of a changing climate. From 2000 to 2008, at least nine states had record-breaking fires. From 2000 to 2009, almost 28,000 homes, businesses, and outbuildings burned in wildfires.

Researchers have attributed these trends to the earlier snowmelt and drier soils associated with a warming climate. Climate change has also led to milder winter temperatures in the western United States, allowing bark beetles to reproduce faster and spread to new areas. Entire landscapes are being attacked by bark beetles, from low-elevation piñon pine in Arizona to high-elevation whitebark pine in Montana. Our northernmost state, Alaska, has billions of trees killed by the effects of a changing climate.

Landscapes filled with dead and dying trees, particularly in a drought, can fuel enormous fires, releasing stored carbon into the atmosphere. Forests in the United States currently sequester about 13 percent of the carbon dioxide released each year in this country. But some projections show that rising forest mortality and fire season severity could turn our forests into a net carbon source by the middle of the century, contributing to further buildup of greenhouse gases in the atmosphere.

What are we doing to address these problems? Our Cohesive Wildfire Management Strategy has three main goals:

1. First, restoring fire-adapted ecosystems on a landscape scale by reducing fuels and reintroducing fire.

2. Second, building fire-adapted *human* communities.
3. Third, responding appropriately to wildfire, using fires where we can and suppressing them where they threaten lives, homes, and critical natural resources.

Our new cohesive strategy aligns with the U.S. Forest Service's National Roadmap for Responding to Climate Change. The national roadmap is based on climate change *adaptation* and *mitigation*. It charts a course to help ecosystems and communities adapt to the effects of a changing climate, including worsening wildfires, through ecological restoration. It also charts a parallel course for activities to mitigate climate change.

Visiting with firefighters in Arizona on the Wallow fire in June, I heard veteran firefighters say that they had never before observed fire behavior so extreme. Fine fuel moistures were at an unprecedented low of 1%. The nexus of climate change and wildfire gives urgency to our mission to "sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations." In an era of changing climate and worsening wildfires, we face new challenges in ensuring that our forests and grasslands continue to provide a broad range of benefits, including clean air and water, habitat for wildlife, and opportunities for outdoor recreation. And we need to pay extra attention to safety – on the fireline and in everything we do.

HIGHLIGHTS FROM THE SCORECARD

In this section, we feature the accomplishments by National Forests and Grasslands related to one of the Climate Change Scorecard elements.

Element 3 – Guidance, Training, and Plans of Work

The **Willamette National Forest** (R6) has several documents that provide guidance for integrating climate change considerations and activities into operations. The forest's four strategic goals include Caring for Landscape Health and Resiliency with action plans for each objective that integrate climate change into the implementation of the goals. For example, vegetation management principles will be developed using existing knowledge and pertinent science, including social and political, and climate change vulnerability assessments. The Willamette Climate Change Team also has a FY12 program of work that lays out program goals and delivery and performance expectations. Please contact Kathy Bulchis, Climate Change Coordinator on the Willamette National Forest, for more information.

The **San Juan National Forest** (R2) is addressing climate change guidance in the forest plan revision process. The draft Climate Change Vision and Strategy document summarizes the climate related changes that the San Juan Public Lands are already observing, species and habitats that are most at risk, and priority vulnerable ecosystems and species. The vision and strategies for responding to climate change are laid out as desired conditions and objectives. Please contact Kelly Palmer, Climate Change Coordinator on the San Juan National Forest, for more information.

FROM THE WASHINGTON OFFICE

National Climate Assessment

The Forest Service hosted a stakeholder's workshop in Atlanta for the Forestry chapter of the National Climate Assessment (NCA). The chapter co-leads are Dave Peterson (PNW) and Jim Vose (SRS). Toral Patel-Weynand is the Forest Service representative on the Interagency National Climate Assessment workgroup. The NCA will be delivered in 2013, but a number of reports are already available [on-line](#).

MOU with the Chinese State Forestry Administration

The US Forest Service and its counterpart in China, the Chinese State Forestry Administration, have had a long history of cooperation. Both nations have significant conifer and mixed hardwood forest types. The similarity of forests means that the two countries face similar challenges in sustainable management, and research or management practices from one country can be useful for the other. To help direct and maximize cooperation, the two agencies signed a Memorandum of Understanding in April 2000. This June in Beijing, the two sides met to renew their expiring MOU and outline their collaborative projects through 2013. Since many of the projects address the shared challenge of climate change, David Cleaves, FS Climate Change Advisor, served a member of the US delegation.

USDA Report to CEQ's Interagency Adaptation Task Force

In preparation for drafting a high level vulnerability assessment and adaptation plan, CEQ asked agencies to describe how climate change will impact agency mission and operations, steps agencies are taking to manage the effects of climate change, and collaboration with other agencies on these issues. USDA responded on behalf of all its agencies including the Forest Service. Climate change is expected to negatively impact our ability to protect and enhance water resources, reduce risk from catastrophic wildfire, and restore and conserve forests, farms, ranches, and grasslands. USDA is working to ensure that farmers, foresters, ranchers, landowners, resource managers, and policy makers have science-based knowledge and tools to manage climate change risks, challenges, and opportunities. In June, USDA released a [climate change adaptation policy](#) establishing a directive to integrate adaptation planning and actions into USDA programs, policies, and operations.

FROM THE FIELD

Cody Climate Change Conference

On April 29, the [Shoshone National Forest](#) (R2), [RMRS](#), and Western Water Assessment at University of Colorado hosted the Natural Resources and Climate Change Conference in Cody, Wyoming. Topics included climate change impacts to snow, Yellowstone cutthroat trout, and water, and ecosystem and species models and climate change. Human Dimensions Science Program Manager Cindy Swanson spoke on the "Impacts of Climate Change on Public Land, Migration, Recreation and Tourism in the Rocky Mountain West." Attendees included employees from the Shoshone National Forest, BLM, USGS, FWS, state natural resource agencies, local government, local media, consultants, and the general public. Quantitative Ecologist Linda Joyce (ljoyce@fs.fed.us) and Resource Staff Officer Bryan Armel (barmel@fs.fed.us) organized the workshop and can be contacted for more information.

Interagency Stream Temperature Database

RMRS fisheries scientist Dan Isaak, in conjunction with biologists Gwynne Chandler and Dona Horan at the Boise Aquatic Sciences Lab, spearheaded efforts to develop an integrated, interagency database of stream temperature measurements for the Lower Snake Hydrologic region that spans large portions of Idaho, Washington, and Oregon and is dominated by FS lands. Eight state, federal, private, and tribal resource organizations contributed stream temperature measurements. A large majority of the data (87%) was provided by FS biologists and hydrologists. The database will be used by the [National Center for Ecological Analysis and Synthesis \(NCEAS\) working group](#) to develop new types of spatial analyses for stream networks and to better understand how climate change may affect thermal regimes in aquatic ecosystems. The temperature database will become part of a national archive maintained by NCEAS and made available to interested researchers for further study. For

additional information, contact Dan Isaak (disaak@fs.fed.us).

Climate Change in the Great Plains

On August 30, 2011, Region 2 and RMRS are hosting a web conference to present the most recent science findings for Great Plains grasslands and communicate information relevant to implementing the Climate Change Performance Scorecard. Topics will include latest projections, wildlife and fish issues, invasive species, carbon mitigation, partnerships, and findings from local adaptation and monitoring projects. There will also be opportunity to provide input on management needs. Details on login, times, and speakers to be announced. Questions? Contact Paulette Ford plford@fs.fed.us and Deborah Finch dfinch@fs.fed.us.

National Biomass and Carbon Dataset

Scientists at the Woods Hole Research Center have produced a high-resolution “National Biomass and Carbon Dataset for the year 2000” (NBCD2000), the first ever spatially explicit inventory of its kind. The dataset was produced as part of a project funded under NASA’s Terrestrial Ecology Program with additional support from the Landscape Fire and Resource Management Planning Tools Project (LANDFIRE). The project has generated a high-resolution (30 m), year-2000 baseline estimate of basal area-weighted canopy height, aboveground live dry biomass, and standing carbon stock for the conterminous United States. Development of the dataset is based on an empirical modeling approach that combines Forest Inventory and Analysis (FIA) data with high-resolution InSAR data acquired from the 2000 Shuttle Radar Topography Mission and optical remote sensing data acquired from the Landsat ETM+ sensor. For more information, please visit this [website](#) or contact nbcd2000@whrc.org.

RMRS HQ Hosts Latin American Visitors

In April, Research Plant Physiologist Bob Musselman hosted natural resources sustainability professionals from Argentina, Chile, Costa Rica, Dominican Republic, Mexico, Panama, and Peru at RMRS headquarters. The delegates were participating in the International Visitor Leadership Program, Institute of International Education, US State Department. Their goal was to learn about RMRS research in climate change, air quality, and pine beetle mortality. They were particularly interested in how Forest Service research provides information to forest managers on how to respond to climate change, and in insect mortality impacts on forest ecosystems.

Joyce Talks Climate Change

Quantitative Ecologist Linda Joyce spoke on “Adaptation Options for Managing Forests in the Face of Climate Change” at the Society of American Foresters brown bag luncheon on May 3 at the Natural Resources Research Center in Fort Collins. Attendees included representatives from the Colorado State Forest Service, US Forest Service, National Park Service, and the general public.

OTHER EVENTS AND OPPORTUNITIES

Adaptive Management Course

[Adaptive Management: Structured Decision Making for Recurrent Decisions](#) will be held August 8-12 at the National Conservation Training Center in WV. This course builds on the fundamental principles taught in the Introduction to Structured Decision Making course.

Climate Change Vulnerability Assessments Training Course

The National Conservation Training Center will offer this course for a second time August 15-18 in WV. The course is based on the January 2011 "[Scanning the Conservation Horizon – A Guide to Climate Change Vulnerability Assessment](#)," the product of an expert workgroup on climate change vulnerability assessment convened by the National Wildlife Federation in collaboration with FWS. This course guides conservation and resource management practitioners in identifying which species or systems are likely to be most strongly affected by projected changes and understanding why these resources are likely to be vulnerable, including the interaction between climate shifts and existing stressors. For more information and to register, please visit the course [website](#).

Communicating Climate Change Workshop

The National Conservation Training Center (NCTC) will hold a [workshop](#) September 26-30 to present accurate up-to-date science and effective communication techniques in order to train interpreters, public affairs officers, and other federal agency employees to communicate climate change to a public audience. Participant preference will be given to FWS and NPS employees, though participants from outside these agencies, who are able to cover tuition and their own travel to and per diem expenses at the NCTC, will be considered. Register in [DOI Learn](#) and complete the supplemental application by June 15. To receive an electronic version of the supplemental application, contact Susan De Stephanis at susan_destephanis@fws.gov or 304-876-7494.

CLIMATE CHANGE RESOURCE CENTER (CCRC)

Climate Change Assessments

A new series of synthesis papers that focus on [climate change assessments](#) have been published on the CCRC. The papers discuss the basics of climate change impact assessments, vulnerability assessments, and natural resource assessments, in addition to providing accompanying reading and web resources for each of these categories. These web pages are written by subject experts within the Forest Service and represent a great way to start learning more about and accessing examples of current assessments. To submit feedback on this resource or other components of the CCRC, please visit the website or contact the production team at ccrc@fs.fed.us.

RECOMMENDED READING

Ecosystem Vulnerability Assessment and Synthesis: A Report from the Climate Change Response Framework Project in Northern Wisconsin

Chris Swanston, Maria Janowiak, Louis Iverson, Linda Parker, David Mladenoff, Leslie Brandt, Patricia Butler, Matt St. Pierre, Anantha Prasad, Stephen Matthews, Matthew Peters, Dale Higgins, and Avery Dorland

The forests of northern Wisconsin will likely experience dramatic changes over the next 100 years as a result of climate change. This assessment evaluates key forest ecosystem vulnerabilities to climate change across northern Wisconsin under a range of future climate scenarios. Warmer temperatures and shifting precipitation patterns are expected to influence ecosystem drivers and increase stressors, including more frequent disturbances and increased amount or severity of pests and diseases. Identifying vulnerable species and forests can help landowners, managers, regulators, and policymakers establish priorities for management and monitoring.

LINKS

Cal-Adapt

[Cal-Adapt](#) provides access to data and information that has been, and continues to be, produced by the California's scientific and research community offering a view of how climate change might affect California at the local level. You can work with visualization tools, access data, and participate in community-sharing to contribute your own knowledge.

SUBMISSIONS

Please send your submissions on Forest Service climate change related activities to Cathy Dowd: cdowd@fs.fed.us. It's most helpful to have a short description with a web link to more information.

Contact information for the Climate Change Advisor's Office is on our [Intranet](#) site. Here you will also find materials like the National Roadmap for Responding to Climate Change, the Performance Scorecard, and Scorecard guidance.