

The following information was obtained from several sources including internet research and, most notably, the document titled, "Climate Change Adaptation: What Federal Agencies are Doing." November 2010. A report by the Pew Center on Global Climate Change. www.pewclimate.org

Interagency Climate Change Adaptation Task Force

In the spring of 2009, the White House Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA) initiated the Interagency Climate Change Adaptation Task Force (ICCATF), which includes representatives from more than 20 Federal Agencies. When the President signed the Executive Order on Federal Leadership in Environmental, Energy, and Economic Performance on October 5, 2009, he called on the ICCATF to develop, within one year, recommendations on how the policies and practices of Federal agencies can be made compatible with and reinforce a national climate change adaptation strategy. The Task Force formed multiple workgroups to consider the capabilities of the Federal Government to respond to the impacts of climate change on select sectors, institutions, and agency responsibilities, and conducted numerous listening sessions and public outreach events with a wide range of stakeholders. The ICCATF released an Interim Progress Report in March 2010. In October 2010, the Task Force released its report to the President on the Task Force's recommendations to advance a national approach to adaptation.

<http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation>

Intergovernmental Panel on Climate Change

The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established by the [United Nations Environment Programme \(UNEP\)](#) and the [World Meteorological Organization \(WMO\)](#) to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts.

The IPCC is a scientific body. It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. It does not conduct any research nor does it monitor climate related data or parameters.

<http://www.ipcc.ch/index.htm>

USDA Strategy

USDA Strategic Plan for 2010-2015. The USDA strategic plan includes a number of goals related to climate change. For example, the Plan sets a departmental goal to "Ensure our national forests and private working lands are conserved, restored, and made more resilient to climate change, while enhancing our water resources." <http://www.ocfo.usda.gov/usdasp/sp2010/sp2010.pdf>

FS Strategy

USDA Forest Service Climate Change and Wilderness Briefing Paper (2010). (existing pdf)

Forest Service Strategic Framework for Responding to Climate Change (October 2008). This document provides a strategic framework for the Forest Service to guide current and future actions to meet the challenge of climate change. It incorporates the actions included in Chief Gail Kimbell's letter to the National Leadership Council of February 15, 2008.

(existing document)

Roadmap for Responding to Climate Change (July 2010). In order to guide the Forest Service in achieving its goal of making the nation's national forests and private working lands more resilient to climate change, the agency developed a Roadmap that will integrate land management, science,

outreach, and sustainable operations. The focus will be on three types of initiatives: (1) assessing current risks, vulnerabilities, policies, and gaps in knowledge; (2) engaging partners in seeking solutions and learning from as well as educating the public and employees on climate change issues; and (3) managing for resilience, in ecosystems as well as human communities, through adaptation, mitigation, and sustainable consumption strategies. The Forest Service has also developed a Performance Scorecard to measure its progress in moving toward these goals. The scorecard will address agency capacity, partnerships, adaptation, and mitigation. It includes development of capacity to incorporate climate change adaptation into the Forest Service operations.

<http://www.fs.fed.us/climatechange/pdf/roadmap.pdf>

http://www.fs.fed.us/climatechange/pdf/performance_scorecard_final.pdf

A new vision for the U.S. Forest Service (August 2009). In August 2009 Secretary Vilsack outlined a new vision for the Forest Service based on restoration to combat the threats of fire, drought, pests, and disease. Through ecological restoration, the key functions and processes of healthy ecosystems are repaired to make them better adapted to the stresses exacerbated by climate change. This vision includes an “all lands” approach that does not stop at the boundary of a national forest or grassland, but calls for the integration of forest restoration efforts across property boundaries. The Forest Service and other USDA agencies will continue to expand efforts to work with partners to sustain the entire matrix of federal, state, tribal, county, municipal, and private forests and grasslands.

<http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=2009/08/0382.xml>

Climate Change Advisor's Office. The Climate Change Advisor was appointed by the Chief to lead Forest Service efforts to manage forests and watersheds in the face of climate change, represent the agency in climate change matters with partners, and coordinate climate change activities and communication within the agency. The Climate Change Advisor's Office is working to bring climate change knowledge into agency planning and actions, and improve the agency's response to climate change through existing national programs and not to create a separate program. The Climate Change Advisor's Office oversees the development and implementation of the National Roadmap and Scorecard. *Engaging a Climate Ready Agency* is an internal newsletter published by the Office monthly.

<http://www.fs.fed.us/climatechange/climate-update.shtml>

Forest Service Global Change Research Strategy 2009-2019 (February 2009). Objective: In keeping with the research goals of the U.S. Climate Change Science Program, the Research and Development agenda of the Forest Service, U.S. Department of Agriculture (USDA), helps define climate change policy and develop best management practices for forests (both rural and urban) and grasslands. These actions are taken to sustain ecosystem health, adjust management for ecosystem services (“adaptation”), and increase carbon sequestration (“mitigation”), all under changing climate conditions.
(existing document)

FS Tools and Resources

Climate Change and Wilderness Briefing Paper. This paper was developed by the Chief's Wilderness Advisory Group in 2009. It describes potential effects to wilderness and benefits to wilderness relative to climate change. The paper outlines potential goals, strategies, and needs for stewardship of wilderness on the national forests.

<http://www.wilderness.net/NWPS/documents/FS/Chiefs-Brief-climate.pdf>

Climate Change Resource Center. A joint project of the Forest Service Research Stations and the Environmental Threat Assessment Centers, this clearinghouse was developed to provide Forest Service resource managers and decision makers with information and tools to address climate change mitigation and adaptation in planning and project implementations. The site provides climate change science information and an overview of adaptation management options. The Tools section provides access to USFS tools such as the Forest Vegetation Simulator, Stream Temperature Modeling, Fish Xing,

and the Climate Change Tree and Bird Atlases, as well as other non-agency climate projection and climate impact tools. There is also an extensive library of annotated bibliographies for publications on global climate change, climate variability, climate models, and climate effects.

<http://www.fs.fed.us/ccrc/>

Template for Assessing Climate Change Impacts and Management Options (TACCIMO). TACCIMO is a web-based assessment and reporting tool designed to integrate the most current climate change science with forest planning to meet the needs of a variety of users. TACCIMO is a collaborative effort between the USDA Forest Service EFETAC researchers and Southern Region planners and resource managers. TACCIMO fits within the National Environmental Policy Act (NEPA) process and can be used in land management plan revision, environmental assessments, environmental impact statements, and reasonable alternatives. <http://www.forestthreats.org/tools/taccimo>

MAPSS Global Vegetation Model. The MAPSS model is a landscape- to global-scale vegetation distribution model providing simulations under both stable and changing climates. Model output from MAPSS has been used in the Intergovernmental Panel on Climate Change's (IPCC) regional and global assessments of climate change impacts on vegetation. <http://www.fs.fed.us/pnw/mdr/mapss/>

Climate Change Tree Atlas. The Tree Atlas is an online spatial database providing an assessment of the current status and potential future suitable habitat of 134 tree species in the eastern United States. Based on U.S. Forest Service inventory data with environmental variables to generate models of current suitable habitat for each species, the Atlas uses three climate models (HADCM3, PCM & GFDL) and two emission scenarios (A1FI and B1) to model potential future habitat distributions.

http://nrs.fs.fed.us/atlas/tree/tree_atlas.html

Climate Change Bird Atlas. The Bird Atlas is an online spatial database providing an assessment of the current and projected future status of 147 bird species in the eastern United States. The Bird Atlases uses the same climate models and emission scenarios as the Climate Change Tree Atlas to model potential future habitat. <http://nrs.fs.fed.us/atlas/bird/index.html>

Adapting to Climate Change—A Short Course for Land Managers. <http://www.fs.fed.us/ccrc/hjar/>

Research Stations. U.S. Forest Service Research Stations provide national coverage for regional research, scientific information and tools that can be used by managers and policymakers to address climate change impacts to forests and rangelands. Research on the possible impacts of climate change on forests in the United States and the development of adaptation strategies has been carried out at the U.S. Forest Service for the last 20 years. Since then, assessments of climate change, its impacts and subsequent consequences to natural resource management have been the focus of continuous research efforts. Considerable effort is being put into understanding how vegetation, water, and wildlife are expected to respond to a changing climate so that adaptive management strategies can be developed. Forest Service Research also contributes to the research goals of the U.S. Climate Change Science Program. <http://www.fs.fed.us/research/climate/>

The Northern Institute of Applied Climate Science (NIACS). NIACS is a collaborative effort among the U.S. Forest Service Northern Research Station, U.S. Forest Service Eastern Region, U.S. Forest Service Northeastern Area State and Private Forestry, universities, and the forest industry to provide ecological, economic and social information that can be used to facilitate the development and implementation of forest carbon management and climate adaptation. Adaptation-related projects conducted by NIACS include climate change training programs for forest managers and the development of a Climate Change Response Framework for the Chequamegon-Nicolet National Forest.

<http://www.nrs.fs.fed.us/niacs/>

Environmental Threat Assessment Centers. Two centers were created to predict, detect, and assess existing and potential environmental threats to forests across the United States and to develop and share information and tools to support policy and management decisions: the Western Wildlands Environmental Threat Assessment Center (WWETAC) and the Eastern Forest Environmental Threat

Assessment Center (EFETAC). <http://www.fs.fed.us/wwetac/wwetac.html> and <http://www.forestthreats.org/>

DOI Strategy

Climate Change Website. The site provides a summary of department level climate change actions, both mitigation and adaptation, and access to updates on key initiatives such as the Landscape Conservation Cooperatives (LCCs) and Climate Science Centers (CSC).

<http://www.doi.gov/whatwedo/climate/strategy/index.cfm>

DOI Tools and Resources

DOI Adaptive Management Technical Guide. This guide was issued in March 2007 and provides technical guidance for using adaptive management in decision making. The guide includes case studies, such as the Bureau of Reclamation's management of Glen Canyon Dam and the FWS' determination of annual waterfowl harvests, to demonstrate how adaptive management can be applied.

<http://www.doi.gov/initiatives/AdaptiveManagement/TechGuide.pdf>

DOI Climate Science Centers. DOI is working with USGS to broaden the current USGS Wildlife and Climate Center scope to include an additional 8 regional DOI centers. These centers will provide climate change impact data and tools to support Department managers and other partners responsible for managing the Department's land, water, fish and wildlife, and cultural heritage resources. Basic climate change impact science will be provided by the CSCs to the Landscape Conservation Cooperatives (LCCs) within their respective regions, based primarily on the priorities defined by the LCCs, including physical and biological research, ecological forecasting, and multi-scale modeling.

<http://www.doi.gov/whatwedo/climate/strategy/CSC-Map.cfm>

Landscape Conservation Cooperatives (LCCs). The 22 LCCs will cover the continental U.S., Pacific Islands, and parts of Mexico and Canada. LCCs are intended to be the applied-science and adaptive management arm of the department; a self-directed partnership of land, water, wildlife and cultural resource managers and interested public and private organizations. The goal is for the LCCs to be supported by bureaus and offices that pool their resources in order to support a more integrated resource management approach, on both public and private lands, to support climate change mitigation and adaptation efforts within and across landscapes.

<http://www.doi.gov/whatwedo/climate/strategy/LCC-Map.cfm>

MOUs

<http://www.noaa.gov/climateresources/resources/doidocclimatemoufinal.pdf>

BLM Strategy

Climate Change: BLM's Response. The BLM is undertaking two connected initiatives to understand, anticipate, and respond to the effects of climate change on the public lands. These initiatives are Rapid Ecoregional Assessments (REAs), which are currently being prepared, and a proposed landscape approach for managing public lands, which is under development and presented here for public consideration. <http://www.blm.gov/wo/st/en/prog/more/climatechange/intro.html>

Rapid Ecoregional Assessments (REAs). Climate change and other widespread environmental influences are affecting the western landscapes that are managed, in part, by the Bureau of Land Management (BLM). In response, the BLM in 2010 has launched seven Rapid Ecoregional Assessments (REAs) to improve the understanding of the existing condition of these landscapes, and how conditions may be altered by ongoing environmental changes and land use demands.

<http://www.blm.gov/wo/st/en/prog/more/climatechange/reas.html>

Landscape Approach. The BLM recognizes that the public lands are facing increasingly complex and widespread environmental challenges that transcend traditional management boundaries. These challenges include managing wildfire, controlling weeds and insect outbreaks, providing for energy development and urban growth, and addressing pervasive impacts from the effects of climate change. The BLM is developing a landscape-scale management approach to better understand these challenges and support balanced stewardship of the diverse natural resources of the public lands.

<http://www.blm.gov/wo/st/en/prog/more/climatechange/landscapeapproach.html>

Regional Strategic Plans. BLM is organized into 10 regions comprised of 17 western states, not including eastern states for mining and minerals management. The Oregon-Washington region has a strategic plan that incorporates climate change mitigation and adaptation.

http://www.blm.gov/or/news/files/2015_SPOT.pdf

FWS Strategy

The U.S. Fish and Wildlife Service climate change strategy, titled “Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change,” establishes a basic framework within which the Service will work as part of the larger conservation community to help ensure the sustainability of fish, wildlife, plants and habitats in the face of accelerating climate change. The plan is implemented through a dynamic action plan that details specific steps the Service will take during the next five years to implement the Strategic Plan.

<http://www.fws.gov/home/climatechange/strategy.html>

http://training.fws.gov/branchsites/lkm/climate_change/index.html

National Fish and Wildlife Climate Adaptation Strategy (September 2010). The Service has defined the Strategy as a collaborative framework (among major conservation interests such as local governments, states, tribes, conservation organizations, federal agencies, and industry and private landowners) that “identifies and defines principles and methods to maintain key terrestrial, freshwater and marine ecosystems and functions needed to sustain fish, wildlife and plant resources in the face of accelerating climate change.” <http://www.fws.gov/nfwcas.html>

Fish and Wildlife Service Strategic Plan for Climate Change (September 2009). The U.S. Fish and Wildlife Service's proposed Strategic Plan for Climate Change identifies key goals and objectives for the agency centered around three areas: adaptation, mitigation, and engagement.¹¹⁷ An appendix, “Action Plan for Climate Change,” details the specific actions the Service will take during the next five years to achieve each of the goals and objectives.¹¹⁸ Key adaptation goals included not only efforts to create the CSCs and LCCs described above that are now broader than FWS efforts, but also: development of a National Fish and Wildlife Adaptation Strategy over a 5 year period (see above), conducting habitat vulnerability assessments, and incorporating climate change into agency activities and decisions.

<http://www.fws.gov/home/climatechange/pdf/CCdraftActionPlan92209.pdf>

FWS Tools and Resources

National and Regional Climate Change Websites. The Service maintains a Climate Change website with access to six regional climate change sites, resources and information, as well as updates on the Service's climate change and adaptation strategies, and links to other Service and non-Service resources.¹¹⁹ Regional sites include: Alaska, Midwest, Northeast, Pacific, Southeast and Southwest covering 40 states; providing regional impacts, resources and FWS related updates and activities.

<http://www.fws.gov/home/climatechange/>

Climate Change Learning Center (CCLC). The agency's National Conservation Training Center (NCTC) is in the process of modifying training opportunities for FWS staff to increase their knowledge of climate science and climate change as it relates to resource management; providing new landscape-scale approaches to planning, design, delivery, monitoring and research, as well as new tools for managers. A

Climate Change Learning Center webpage provides information on upcoming and archived webinars, courses, workshops and other training opportunities offered through the NCTC.

http://training.fws.gov/CSP/Resources/CSP_Climate_Change_Series/index.htm

Sea Level Affecting Marshes Model (SLAMM). SLAMM-View is a browser-based application that allows the public to view simulations of sea level rise from the SLAMM model output, and helps people understand the potential impacts of climate change on sea levels. The Service is able to determine potential effects of sea level rise on coastal National Wildlife Refuges and use results to help develop refuge and landscape scale adaptation strategies and revising refuge conservation plans.

<http://www.fws.gov/slam/>

Wildlife Response to Environmental Arctic Change (November 2008). Report from the Wildlife Response to Environmental Arctic Change (WildREACH): Predicting Future Habitats of Arctic Alaska Workshop. The Service convened a Wildlife Response to Environmental Arctic Change (WildREACH) workshop on 17–18 November 2008 in Fairbanks, Alaska. Our goal was to identify the priority research, modeling, and synthesis activities necessary to advance our understanding of the effects of climate change on birds, fish, and mammals of arctic Alaska, focusing on terrestrial and freshwater systems. (existing pdf)

Putting Knowledge into Action: Tapping the Institutional Knowledge of U.S. Fish and Wildlife Service Regions 2 and 8 to Address Climate Change (August 2008). A synthesis of World Café discussion sessions during the FWS, USGS, and University of Arizona Sponsored Climate Change Workshop. During this two-day event, the Climate Assessment for the Southwest (CLIMAS) facilitated four discussion sessions with participants divided into small groups. More than 200 people from 34 organizations participated in these sessions; more than 65 percent of these participants represented the Fish and Wildlife Service's regions 2 and 8.

(existing pdf)

NPS Strategy

Climate Change Response Strategy. The NPS released its Climate Change Response Strategy in September 2010. The Strategy details long and short-term actions in three major areas: mitigation, adaptation, and public communication. To support this effort, the NPS has hired a Climate Change Coordinator, created six ad-hoc working groups – Legal & Policy; Planning; Science; Resource Stewardship; Greenhouse Gas Emission & Sustainable Operations, and Communication – to explore key goals and strategic actions that need to be addressed at park, regional, and national levels; and has held a series of regional and interagency workshops to explore climate change impacts and coping strategies and to develop action plans. http://www.nature.nps.gov/climatechange/docs/NPS_CCRS.pdf

Adaptation and Scenario Planning. One of four Climate Change Response Program areas, Adaptation and Scenario Planning describes the approach the NPS plans to take going forward to help manage uncertainty around future climate and potential impacts to the nation's parks. Adaptation goals are provided with recommended management actions by the Service, including "Incorporate climate change consideration and responses in all levels of the NPS planning framework".

<http://www.nature.nps.gov/climatechange/adaptationplanning.cfm>

NPS Tools and Resources

Climate Change Response Program. To preserve the future health of parks in the face of global climate change, National Park Service (NPS) leadership created the Climate Change Response Program (CCRP) led by a Climate Change Response Steering Committee representing parks, regions, managers, and subject-matter experts. The CCRP site currently provides basic science information as it pertains to parks. Information on the effects of climate change, called Impact Briefs for 32 U.S. regions, is available on the Program's site and are based on NPS defined "eco-regions". The site also details what the Service

is doing to respond to climate change in terms of policy and planning, as well as around four new programmatic areas: science, adaptation, mitigation and education. Specifically, the NPS acknowledges the need to move to a systems-based management approach that will require significant cooperation cross jurisdictional boundaries, a greater emphasis on partnerships and multi-agency collaboration, and increased use of interdisciplinary teams. <http://www.nature.nps.gov/climatechange/index.cfm>

Inventory and Monitoring Program (I&M). To facilitate collaboration, information sharing, and economies of scale in inventory and monitoring, the NPS has organized more than 270 parks with significant natural resources into 32 eco-regional networks to conduct expanded inventory and monitoring activities. Two primary goals of the program are to 1) inventory the natural resources under National Park Service stewardship to determine their nature and status and 2) to monitor park ecosystems to better understand their dynamic nature and condition and provide reference points for comparisons with other, altered environments. The Program also makes data collected into useable information through analysis, synthesis, and modeling.

<http://science.nature.nps.gov/im/networks.cfm>

<http://science.nature.nps.gov/im/index.cfm>

STATEMENT OF JONATHAN B. JARVIS, REGIONAL DIRECTOR, PACIFIC WEST REGION, NATIONAL PARK SERVICE, DEPARTMENT OF THE INTERIOR BEFORE THE HOUSE COMMITTEE ON NATURAL RESOURCES, SUBCOMMITTEE ON NATIONAL PARKS, FORESTS AND PUBLIC LANDS ON THE IMPACTS OF CLIMATE CHANGE ON AMERICA'S NATIONAL PARKS (April 2009).

(existing doc)

NPS Intranet Resources

“Some Guidelines for Helping Natural Resources Adapt to Climate Change,” (Baron, J. S., et al., IHDP Update 2.2008, pp 46-52) a publication of the International Human Dimensions Programme on Global Environmental Change, is available at

<http://inside.nps.gov/regions/custommenu.cfm?lv=2&rgn=277&id=7395>

The first in a new series of climate change talking points from the NPS Natural Resource Program Center, “Understanding the Science: Talking Points - Western Mountains and Forests” is available at

<http://nrpcsharepoint/climatechange/communication/Bioregional%20Talking%20Points/western%20mountains%20forests.pdf>

EPA Strategies

National Water Program Strategy. The strategy identifies impacts of concern to water programs in the United States, defines goals and objectives to respond to such impacts, and provides specific actions in the areas of mitigation, adaptation, research, education, and program management. Adaptation proposed actions are aligned with five key areas: Drinking water, Water quality and effluent standards; Watershed protection; Adapting the National Pollutant Discharge Elimination System program; Water infrastructure; and Wetlands protection. Annual Implementation Progress Reports and related adaptation products are posted as they become available.

<http://water.epa.gov/scitech/climatechange/strategy.cfm>

http://www.epa.gov/ow/climatechange/docs/NWP_CC_2009_Key_Actions_Status_Report_Full_Report.pdf

Regional Climate Change Efforts. EPA maintains regional offices across the United States organized within 10 defined regions, with most regions taking action or providing adaptation-related resources and developing regional resiliency. A number of EPA regions have developed specific adaptation strategies and initiatives. For example, Region 1 is working with the EPA-funded New England Environmental Finance Center to develop tools for coastal communities to identify sea-level rise and

coastal storm vulnerabilities to make informed adaptation planning and zoning decisions. In addition, Region 8 completed their *Climate Change Strategic Plan* in 2008, setting adaptation goals for the regional office. Information on EPA Regional adaptation activities are summarized in a highlights document available online.

http://water.epa.gov/scitech/climatechange/upload/Region_Highlights_Fact_Sheet.pdf

EPA Tools and Resources

Climate Ready Estuaries Program. The Climate Ready Estuaries (CRE) program is a partnership between EPA and the National Estuary Programs (NEPs) to address climate change in coastal areas. Climate Ready Estuaries is supporting NEPs and coastal communities in becoming “climate ready” by providing tools and assistance to: assess climate change vulnerabilities, engage and educate stakeholders, develop and implement adaptation strategies, and share lessons learned with other coastal managers.

<http://www.epa.gov/cre/>

Global Change Impacts and Adaptation Program. Situated in the EPA’s Office of Research and Development (ORD), this Global Change Research Program is a stakeholder-oriented research and assessment program that addresses the potential consequences climate variability and change on air and water quality, aquatic ecosystems, human health, and socioeconomic systems in the United States. EPA uses the results of these studies to investigate adaptation options to improve society's ability to effectively respond to the risks and opportunities presented by global change, and to develop decision support tools for resource managers coping with a changing climate.

<http://www.epa.gov/ncea/global/index.htm>

Water Resources Adaptation Program (WRAP). Through this new program, launched by the EPA in the summer 2010, scientists and engineers investigate the potential effects of climate change on the nation’s watersheds and water infrastructure. Based on the results of these investigations, practical and effective adaptation solutions are being developed. The program’s research is also a part of the Drinking Water Research Program and the Global Change Research Program in EPA’s Office of Research and Development. The research supports EPA’s Sustainable Water Infrastructure Initiative to ensure our nation’s water infrastructure meets future needs of demographic and economic development. WRAP researchers collaborate with academic institutions, water utilities, and other internal and external stakeholders. <http://www.epa.gov/nrmrl/wswrd/wqm/wrap/index.html>

Climate Change Website. The EPA developed and maintains a website synthesizing educational information and links to EPA and non-EPA publications and resources for climate change adaptation science, U.S. policy, U.S. regions, and sectors impacted by climate change including Health, Agriculture and Food Supply, Forests, Ecosystems and Biodiversity, Coastal Zones and Sea Level Rise, Water Resources, Energy Production and Use, and Public Lands and Recreation. The site also includes an adaptation page. <http://www.epa.gov/climatechange/>

<http://www.epa.gov/climatechange/effects/adaptation.html>

Climate Change Indicators in the United States (April 2010). Focused primarily on the United States, this report presents 24 indicators, each describing trends related to the causes and effects of climate change, in order to support monitoring, evaluation and policy development. Included are indicators such as U.S. and global temperatures, precipitation, drought, heat waves, sea level, snowpack, and growing seasons. Other federal agencies contributing to this report include CDC, NOAA and USGS.

http://www.epa.gov/climatechange/indicators/pdfs/ClimateIndicators_full.pdf

NRCS Tools and Resources

Inventory Observations and Monitoring Networks. NRCS has responsibility for a number of surveys and monitoring networks all of which are integral to climate change activities: National Resources Inventory (NRI), a statistical survey of land use and natural resource conditions and trends on U.S. non-Federal

lands; Web Soil Survey, soil maps and data produced by the NRCS and its National Cooperative Soil Survey for the United States; and SNOwpack TELEmetry (SNOTEL). NRCS installs, operates, and maintains an extensive, automated system designed to collect snowpack and related climatic data in the Western United States and Alaska. These products are used for forecasting and management of water supplies. The Soil Climate Analysis Network (SCAN) consists of automated remote sites which collect soil moisture and soil temperature data along with precipitation, wind, and solar radiation data. This data is used for the management and prediction of climatic issues affecting our natural resources.

<http://www.nrcs.usda.gov/technical/NRI/>

<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

<http://www.wcc.nrcs.usda.gov/products.html>

NOAA Tools and Resources

Climate and Societal Interactions (CSI) Program. CSI provides national leadership in developing interdisciplinary science, services, and assessments for application in climate-sensitive sectors and regions. The Regional Integrated Sciences and Assessments (RISA) teams are regional, university-based research groups that analyze the impacts of climate variability and change on resource management, planning, and policy decisions in key sectors. CSI-Water and CSI-Coasts support research to understand and reduce vulnerability to climate change and inform decision-making for water and coasts.

http://www.climate.noaa.gov/cpo_pa/risa/

NOAA Climate Services Portal. The NOAA Climate Services portal is currently in its prototype phase, with the goal of becoming the “go-to” website for climate data, products, and services for all users. The portal will enhance access to climate data and services, timely articles and information, educational resources, and tools. In addition to fostering inter and intra-agency collaboration, the site is intended to better support decision-making at all scales. <http://www.climate.gov/#climateWatch>

Coastal Climate Adaptation Resources Website. A database of adaptation resources is available by category, such as adaptation plans, case studies and vulnerability assessments, or by state. Visitors have the opportunity to share resources and dialog on these issues.

<http://collaborate.csc.noaa.gov/climateadaptation/default.aspx>

Coastal Services Center (CSC). CSC was created to bring information, technology and services to coastal resource managers across the United States. CSC’s efforts include understanding needs and providing the data, tools, and training to make coastal information useful to end users through communication, visualization, and ongoing dialogue. To foster collaboration and interaction at all scales, CSC has a strong local-to-regional presence, based in the Southeast and including staff in the Northeast, Mid-Atlantic, Gulf of Mexico, West Coast, Great Lakes, and Hawaii. <http://www.csc.noaa.gov/>

National Weather Service (NWS) Climate Services. Although NWS Climate Prediction Center (CPC) has primary operational responsibilities at short climate timescales (weeks, months, seasons) in support of the NWS preparedness and response mission, the CPC also has capabilities to provide climate information for the intermediate timescales (e.g. seasons, years, decades) at which preparedness and adaptation meet or overlap. This includes activities to link seasonal and decadal modeling and prediction (e.g. frequency and intensity of droughts and floods) and efforts to develop prediction techniques for regional climate information across timescales. <http://www.cpc.noaa.gov/>

USGS Tools and Resources

GAP Analysis Program. The Gap Analysis Program (GAP) national land cover viewer displays data on the vegetation and land use patterns of the continental United States. The map depicts the extent of forests, grasslands, wetlands and other habitats from coast to coast. The national map contains 551 Ecological Systems containing 39 land use classes and is searchable by state and region at three different levels of detail using 8, 43 or 590 classification categories. The map can be used to support large-scale planning at

federal and state agencies, helping them to see where large tracts of diverse ecosystems still exist so they can work to preserve whole habitats, rather than just single species.

<http://www.gap.uidaho.edu/landcoverviewer.html>

National Climate Change and Wildlife Science Center (NCCWSC). USGS established a National Climate Change and Wildlife Science Center to understand fish and wildlife responses to changing climate and to test and validate related adaptation decisions by land managers and other stakeholders. As part of the new DOI Climate Change strategy, USGS is taking the lead for the Department on the selection of host institutions for the DOI Regional Climate Science Centers. The National Climate Change and Wildlife Science Center (NCCWSC) will provide the initial staffing and startup capabilities to these centers. The NCCWSC science agenda will focus on the linkage of global climate information with fundamental ecological knowledge, and the application of this understanding to the particular species, habitats, and ecosystems present in each region. <http://nccwsc.usgs.gov/>

United States Global Change Research Program Overview

The Global Change Research Act (GCRA) of 1990 established the interagency U.S. Global Change Research Program (USGCRP) “to understand, assess, predict, and respond to human-induced and natural processes of global change.”

Global Change Website. The site contains general information about and links to USGCRP publications such as the latest regional and sectoral impact assessments, and reports on extreme weather and abrupt climate change. Other recent news and events are also maintained on this site.

<http://www.globalchange.gov/>

Synthesis and Assessment Products. Between 2001 and 2008, 21 reports known as Synthesis and Assessment Products (SAPs) were completed under what was called the U.S. Climate Change Science Program (CCSP). Of these 21 reports, the following were related to climate change adaptation:

SAP 4.4 – Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources (June 2008) – Lead Agency: EPA.

<http://www.climatescience.gov/Library/sap/sap4-4/final-report/default.htm>

Climate Change Wildlife and Wildlands. This toolkit is designed for classroom teachers and informal educators in parks, refuges, forest lands, nature centers, zoos, aquariums, science centers, etc., and is aimed at the middle school grade level. The U.S. Environmental Protection Agency, in partnership with six other federal agencies (National Park Service, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, USDA/Forest Service, Bureau of Land Management), developed the kit to aid educators in teaching how climate change is affecting our nation’s wildlife and public lands, and how everyone can become “climate stewards.”

<http://www.globalchange.gov/resources/educators/toolkit>

Miscellaneous Resources

Cole, David N. and Laurie Yung. 2010. **Beyond naturalness: Rethinking park and wilderness stewardship in an era of rapid change.** Washington DC: Island Press. 287 p. This book explores the concept of naturalness in relation to park and wilderness stewardship. Increasingly, in a world of ubiquitous human impact, wilderness stewards are faced with the dilemma of watching as parks and wilderness are impacted or intervening to mitigate impact. The book concludes that naturalness does not provide adequate guidance for making decisions about where, when and how to intervene in ecosystems. It explores concepts that might provide better guidance and discusses opportunities and challenges involved in improving stewardship. The book has 15 chapters and is available from [Island Press](#)

Two Climate Change Films available: Montana State University, Natural History Film program, produced two climate change videos through the Rocky Mountains CESU agreement with NPS cooperators in the

Pacific Northwest. The two 15 minute films, "Cascading Effects" and "Rising Tide" were presented during the poster session at the George Wright Society in Portland, OR. To see these videos, go to <http://www.lifeonterra.com>, and search under the "Archives" button. For more information, contact Regina Rochefort at regina_rochefort@nps.gov

A Dialogue...Wilderness and Climate Change: Impacts, Challenges, and Opportunities

On Thursday, August 13th, 2009 the Interagency Wilderness Policy Council (IWPC) hosted a one-day dialogue in Washington between government and non-governmental professionals to discuss the role of Wilderness in understanding the impacts, challenges, and opportunities presented by climate change. The meeting focused on increasing knowledge related to climate change and its effect on wilderness, identification of policy issues, opportunities for future collaboration and coordination, and priority research needs. Scientists, field managers, and non-profit partners addressed both the impacts of climate change on our National Wilderness Preservation System and the role protected areas can play in adaptation and mitigation.

<http://www.wilderness.net/index.cfm?fuse=climatechange>