



I & M Activities Contribute to NPS Climate Change Science Component

The “stewardship science” component of the NPS Climate Change Response Program is a multidisciplinary, multi-scale effort to inform natural and cultural resource management, facilities management, and education activities. The science component includes the analysis and synthesis of existing information, research, inventory and monitoring activities, and the delivery of scientific data and information to park managers and partners to support decision-making, planning, and science literacy and education. The NPS Inventory and Monitoring Program is contributing to the greater climate change effort, and several critical activities are already underway.

Natural resource inventories

The I&M Program has developed and delivered 89% of the initial 2,928 basic natural resource inventory datasets to the 270+ parks with significant natural resources. The soil and vegetation inventories are particularly relevant to climate change because we can calculate how much carbon is or could be sequestered (stored) in soils and vegetation. The high-quality biodiversity data collected and compiled through the species inventories will be invaluable for vulnerability analyses and discussions of migration corridors and assisted migration of species that are taking place among federal and state agencies.

Vital Signs monitoring

Most of the high-priority vital signs selected

for monitoring were later identified by the DOI Climate Change Task Force as key resources likely to be affected by climate change. Each network has developed a climate change monitoring brief, which are available at: <http://science.nature.nps.gov/im/climate/index.cfm>. To fit within the available budget, however, sample sizes were limited and some sites could only be sampled infrequently (e.g. once every 5 years). Additional funding initiated in FY2010, as part of the climate change response program, is enhancing existing monitoring and data management/synthesis/delivery efforts in 94 parks that were deemed to be particularly vulnerable to climate change effects (i.e., high latitude, high elevation, coastal/marine areas, and arid lands parks). NPS is an active participant in interagency climate change monitoring and research programs including the National Phenology Network and Climate Reference Network, and is coordinating monitoring with other agencies and partners. The new US Fish and Wildlife Service I&M Program will be co-locating its national staff with our staff in Fort Collins, CO, and will be teaming up with the NPS on inventories, monitoring, and data systems development.

Data Management and Delivery

Each network has developed a detailed plan for managing, analyzing, and reporting monitoring results via a suite of integrated information

Left: Stephen T. Mather overlooking Grinnell Glacier in Glacier National Park in 1920. **Right:** David Restivo followed in Mather's footsteps in 2005. Notice the change in Grinnell Glacier over this 85 year period. Photo courtesy Mather Training Center Archives and David Restivo.

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Monthly Climate Change Webinar Series

2nd Thursday of every month
2:00 pm - 3:30 pm EDT

Next Webinar: June 10th, 2010

June's presentation will feature Mr. Robert Griffin, an Environmental Archaeologist with NASA's Marshall Space Flight Center in Huntsville, Alabama.

His presentation titled, "Ancient Cultures and Climate Change" will explore the application of remote sensing to the reconstruction of the complex dynamics among ancient humans, climate, and the environment. He will look at how natural climate change contributed to the collapse of ancient civilizations as well as how pre-Industrial societies could have unintentionally altered their climate.

Follow this link to register for this month's webinar:
<https://www1.gotomeeting.com/register/328151033>

More Information

This newsletter is a monthly forum to share the latest news relating to NPS efforts to manage our parks in a changing climate.

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Climate Change Response Program

Scenario Planning for Climate Change Training

This instructor-led course is intended to give an overall understanding of the Scenario Planning process as it is applied to protected area's management and climate change. The scenarios can be used as a tool to inform other planning processes in order to protect natural and cultural resources affected by climate change. Course participants will walk through the scenario building process for two landscape scale case studies, develop climate drivers, uncertainties and impacts utilizing bioregional literature synthesis, create scenarios and narratives for the future using the framework and process learned in the course and begin a dialogue about how this process can inform future planning at the park level for better management decision making.

This course is most appropriate for, but is not limited to, natural and cultural resource managers, regional planners, Washington Office planners, other DOI bureaus land managers and resource conservation employees, as well as scientists, communications, literacy and education experts. Participants can self-nominate with supervisory approval and will be notified of selection 6 weeks prior to the workshop chosen. A diverse cross-section of natural and cultural resource managers, upper managers, scientists, planners and other DOI participants will inform the selection criteria. Once notified of selection, participants will be given further guidance on pre-course work material. Those interested should choose from one of the workshops below and register in DOI Learn:

- **Great Lakes and Atlantic Coast Workshop:** covers case studies from the Great Lakes and Atlantic Coasts, held October 5th – 7th, 2010 location TBD
- **Urban Landscapes and Eastern Forests Workshop:** special emphasis on cultural resources for Urban Landscape and Eastern Forests case studies, held December 7th – 9th, 2010 in Washington, D.C.
- **Western Mountains, Pacific Islands, and Arid Lands Workshop:** covers case studies from the Pacific Islands, Arid Lands and Western Mountains, held February 8th – 10th, 2011 in Denver, Colorado.

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Working Group Update - Science

Several Working Groups have been established to help the CCRP address climate change servicewide. Representatives from parks, regions and national programs are participating in these Working Groups whose focus are Policy, Planning, Science, Mitigation, Communication and Adaptation.

Science

The Workgroup reviews products and guidance documents on an as needed basis, such as the new guidebook currently being developed on how to interpret and use vulnerability assessments and the carbon storage methodology being developed by the USGS. Workgroup members may be called upon to represent the NPS at science and modeling meetings and also participate in proposal reviews, such as the National Climate Change and Wildlife Science Center projects. A fundamental task recently accomplished was to include climate change science goals and objectives in the draft NPS Climate Change Response Strategy that aligned with the emerging NPS science initiative being led by the NPS Science Advisor to the Director.

For more information on the six Working Groups, go to <http://nrpcsharepoint/climatechange>
For more information on the Science Working Group, Contact: John_Gross@nps.gov

Cat Hawkins Hoffman

The climate change response program is pleased to announce Cat Hawkins Hoffman as our new National Adaptation Coordinator. Cat will begin her new role in early July. The climate change adaptation program will help parks assess the vulnerability of park resources to climate change, and develop response strategies necessary to meet park purposes and the NPS mission.

These strategies will link with monitoring efforts and will enhance collaboration across parks and with partners in other DOI bureaus, federal and state agencies, tribes, and academia.



Job Opportunity

Climate Change - CESU / RLC
Coordinator GS-13/14 stationed in
Washington DC, applications due **June 18th, 2010.**

This position is listed at:
<http://www.usajobs.com>

I & M Activities *Cont'd*

products. All 32 NPS I&M networks have cataloged and evaluated historic datasets collected within parks. In many parks, effects of climate change are already documented via reports, photographs, range assessments, and scientific surveys. The NPS is developing an integrated online data and information discovery and delivery system using industry and DOI standards and “best practices”, to more effectively deliver climate change-related data and information to parks, partners, the scientific community, and the general public.

Data Integration and Synthesis

The NPS I&M Program has developed interagency agreements with USGS and NASA, and these three agencies are funding a number of projects that involve the integration and synthesis of park

data to address climate change and other high-priority issues and information needs. The NPScape landscape dynamics project has compiled and organized approximately four terabytes (4 million megabytes) of landscape-scale data that is being shared with partners to address landscape-scale issues, and a suite of approximately 1,900 landscape-scale datasets, maps, and other products have been produced and delivered to each of the 270+ I&M parks.

Next month’s newsletter will feature an article describing NPS efforts to identify natural resources, cultural resources, and infrastructure that are most vulnerable to the effects of rapid climate change and to understand why they are particularly vulnerable.

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Climate Friendly Parks Update

Pacific West Region Completes Final Network-Based Climate Friendly Parks Workshop

In May, the Pacific West Region (PWR) completed the final of five regional Climate Friendly Park workshops. The most recent workshop focused on the Pacific Islands Network, and was hosted by Haleakala National Park. The Network based Workshops have engaged over 40 of the PWR’s parks in the Climate Friendly Parks Program and the Region aims to have all its parks certified as Climate Friendly Parks by the end of the fiscal year.

With the broad support from superintendents, park division chiefs, park and regional staff, and the invaluable commitment of Student Conservation Association interns, the Pacific West Region now has forty-four parks actively engaged in the CFP process. When all parks have completed their action plans, the Pacific West Region will have over fifty CFP Member parks, tripling the program’s number from the beginning of FY2010. For more information, go to: <http://www.nps.gov/climatefriendlyparks>, Contact: Julia_Corby@nps.gov Or Matt_Rose@nps.gov

Climate Change Response Program *Cont'd*

Natural Resource Advisory Group (NRAG)

On May 12th and 13th the CCRP hosted a two day webinar for the annual NRAG meeting. This webinar gave an update about the CCRP program and engaged the resource management leadership to provide input. Over the course of the two days each program element was reported upon, from I&M, adaptation, vulnerability assessments, education and communication, social science and youth involvement with our internship and fellowship programs. Many of the presentations are available at: <http://nrpcsharepoint/NRAG1/Forms/AllItems.aspx>

National Education Council (NEC)

On May 18th the CCRP and the NRPC Office of Outreach and Education gave a presentation to the NEC about the role of interpretation and education in communicating climate change.

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Yellow-bellied Marmot in the Snowy Range, WY. Photo courtesy of Elliot Dale.



Upcoming Workshops & Meetings

MTNCLIM Mountain Climate Research Conference will take place in Blue River, OR on June 7-10, 2010.

<http://www.fs.fed.us/psw/mtnclim>

The USGS hosts its 3rd ecological modeling conference in Denver, CO on June 7-11, 2010.

<http://geology.usgs.gov/modeling2010/index.shtml>

The USGS and the Florida Fish and Wildlife Conservation Commission will host a free Webinar Short Course on Adaptive Management of Natural Resources on June 7-11, 2010.

<http://www.fort.usgs.gov/brd-science/AdaptiveManagement-Course.htm>

Oregon Climate Change Research Institute will host “The Pacific Northwest Climate Science Conference,” in Portland, OR on June 15-16, 2010.

<http://occri.net/>

The Ecological Society of America hosts its 95th annual meeting, “Global Warming: The legacy of our past, the challenge for our future,” in Pittsburgh, PA on August 1-6, 2010.

<http://www.esa.org/pittsburgh/>

The Wildlife Society hosts its 17th annual conference in Snowbird, UT on October 2-6, 2010.

<http://www.wildlifesociety.org/>

The Greater Yellowstone Climate Change Workshop will be held at Mammoth Hot Springs Hotel, Yellowstone NP on October 11-13, 2010.

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Yosemite National Park

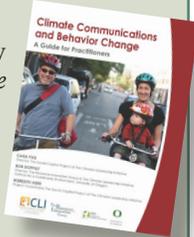
The park installed the largest grid-connected photovoltaic system in the NPS. An InsideNPS article highlighting this effort can be found at:

<http://inside.nps.gov/index.cfm?handler=viewnpsnewsarticle&type=Announcements&id=9126>

Useful Resources Related to Climate Change

A new handbook from the University of Oregon, *Climate Communications and Behavior Change: A Guide for Practitioners*

<http://climlead.uoregon.edu/node/156>



Wondering what others are doing to address climate change in the Pacific Islands? Visit the Pacific Islands Climate Change Virtual Library. This growing library provides access to basic climate science resources as well as guidebooks, local and state plans, case studies, climate strategies, tools, and risk and vulnerability assessments. <http://piccos.soest.hawaii.edu/piccp/joomla>

The Rocky Mountain Climate Organization publishes a monthly email newsletter with information about news and developments on climate disruption and its impacts and on climate action in the West. You can sign up for their newsletter by visiting their website at: http://www.rockymountainclimate.org/newsletter_1.htm

An interesting map illustrating local impacts of global warming. <http://www.climatehotmap.org/>



Whitman Mission National Historical Site (WHMI)

WHMI is piloting the use of 99% Biodiesel (B-99) in the Park's John Deere diesel gator for service and maintenance operations. The Park has been testing B-99 in the gator for several weeks, and it is working great. In addition, WHMI has recently begun working with GSA to use biobased oil and biodiesel fuel in their General Services Administration (GSA) leased diesel and E85 gasoline vehicles. The park is also piloting B99 as heating fuel oil in lieu of the B50 they currently use for all their mobile equipment and heating system applications.

Bruce Hancock, Chief of Maintenance at the Park, collaborated with a local business to get biobased oil available for their vehicles during servicing. Once a local service shop agreed to carry and service the vehicles with biobased oil, GSA contacted the US Forest Service, the Army Corps of Engineers and Bonneville Power Administration fleet managers in the area to alert them to the local availability of biobased lubricants. By simply making a few calls, Bruce and WHMI effectively pioneered the availability of biobased lubricants in the community, and as a result hundreds of federal vehicles in the Walla Walla Washington area will now be serviced with biobased lubricants.

Bruce's advice to other NPS fleet managers, "Get on the phone and talk to the local businesses, other federal agencies as well as your local GSA fleet manager". By going the extra mile, Bruce and WHMI have managed to make an impact far beyond having just their two GSA vehicles serviced with biobased oils.

For more information on biodiesel performance or biobased lubricants contact: Bruce_Hancock@nps.gov



WHMI Maintenance Worker Merton Heidenrich with the John Deere Gator. Note the Powered by Biodiesel and No Idle stickers in back window to gator.

Sierra Nevada: Impacts of Fire Management on Carbon Stocks

Three Sierra Nevada national parks plan to assess the impacts of fire management on carbon stocks. Yosemite National Park and Sequoia and Kings Canyon National Parks—through collaborations with the U.S. Geological Survey, Western Ecological Research Center, and university partners—have initiated research to quantify and understand both the short- and long-term effects of fire on forest carbon stocks. This understanding will allow regulators and land management agencies to develop sustainable and effective fire management strategies to weigh long-term effects against shorter-term objectives.

The 2010 climate-related project aims to gather quantitative data on the amount and persistence of carbon in places where pre-settlement fire regimes have been restored versus areas where they have not yet been restored, and to create project-scale maps of park carbon stocks, including areas at risk from fire.

Sierra Nevada parks use fire as an important land management tool to decrease hazardous fuel loads, improve habitat, and promote healthy ecosystems. Combustion during fires, however, turns the carbon in biomass into greenhouse gases, while subsequent forest re-growth will take some or all of those greenhouse gases back out of the atmosphere as part of a typical fire cycle. Because large trees contain exponentially more carbon than small trees, it is thought that fire regimes that select for large trees over small trees may make carbon storage more "efficient" on a per acre basis.

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Indiana Dunes National Lakeshore

Will host guest speaker, Keith Cherkauer, an assistant professor of agricultural and biological engineering at Purdue University, for a public program about his research on the hydrological impacts of projected future climate change in the Lake Michigan Region. This presentation will be held at the Dorothy Buell Memorial Visitor Center on Friday June 25th at 7:30 pm CDT. To read a related article by Mr. Cherkauer, go to: <http://www.purdue.edu/newsroom/research/2010/100216CherkauerWarming.html>

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