



SCIENCE • ADAPTATION • MITIGATION • COMMUNICATION

## Climate Change Scenario Planning Workshop

Managers today must make decisions within an environment of irreducible uncertainty. In contrast to traditional adaptive management approaches, scenario planning challenges us to think strategically about several possible futures so that management decisions can accommodate the great uncertainty in which we now manage our resources. Scenarios are not forecasts, predictions, or speculations. They are stories about our future environment.

The NPS Climate Change Response Program and the Glacier National Park Fund sponsored a Climate Change Scenario Planning Workshop in Whitefish, Montana on March 9 and 10th. Hosted by Glacier National Park and the Crown Manager's Partnership (CMP), a regional organization made up of federal, state, provincial and tribal nations from Montana, British Columbia and Alberta, the workshop brought together more than 60 managers and scientists. The goals of the workshop were to: 1) document a structured process for assessing impacts of climate change on natural and cultural resources and infrastructure that is oriented toward management responsibilities; and 2) provide a planning tool that can help inform managers of potential short and long range adaptive strategies, research needs and educational opportunities.

A series of web seminars were conducted prior to the workshop with CMP managers and subject

matter experts to review regional and downscaled climate change information, and identify potential climate drivers and subsequent impacts to natural and cultural resources and infrastructure in the Crown of the Continent. Of the infinite number of future scenarios plausible for this region, three scenarios were selected to introduce managers to this planning tool. A range of summer moisture and rate of warming – major climate change drivers that are both highly uncertain and highly uncontrollable – were used to build narratives of the future in 2020, 2050, and 2100. Managers were then challenged to explore adaptive decisions that make sense in both the short and long term. Management options were also considered within a larger context in which societal and leadership support varied greatly.

This workshop differed in scope and complexity from previous NPS efforts, and attempted to take a multi-jurisdictional approach to a very complex issue. Results will include a report on the efforts made to prepare for the workshop and a report on the proceedings and wrap-up, which will be made available to others interested in scenario planning. The NPS, the Climate Change Response Program and our partners will continue to explore the many different approaches to scenario planning in the hopes that managers will benefit from this tool as we move into an uncertain future.

Contact: [Jack\\_Potter@nps.gov](mailto:Jack_Potter@nps.gov),  
Or [Melanie\\_Graham@nps.gov](mailto:Melanie_Graham@nps.gov)

**Above: With the threat of Buffleglass and increased wildfires park managers are developing strategies based on different scenarios to protect the Saguaro Cactus. NPS Photo.**

### In this Issue

Scenario Planning Workshop...	1
National Program Updates	
Internships Funded .....	2
Featured Staff .....	2
Monthly Webinar .....	2
National Program <i>Cont'd</i>	
Working Group Highlight	
Policy .....	3
Facility Mgmt. Update.....	3
Upcoming Workshops.....	3
Happening in the Parks	
Biscayne NP .....	4
Yosemite NP .....	4
Indiana Dunes NS.....	4
Useful Resources.....	4

## Monthly Climate Change Webinar Series

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

**Next Webinar: April 8<sup>th</sup>, 2010**

April's presentation will feature Dr. Robert Bindshadler. His career spanned more than 30 years at NASA where he retired in 2010 as the Chief Scientist of NASA's Hydrospheric and Biospheric Sciences Laboratory. He maintains an active interest in glaciers and ice sheets and has led 15 Antarctic field expeditions to study dynamics of the West Antarctic ice sheet.

His presentation titled, *Waking Giants: Ice Sheets in a Warming World*, will be a discussion on: "Warmer temperatures, less ice, higher sea level: that's the easy part. But everyone wants to know how much higher and how soon." He will discuss what we know, what we don't (and why), what we think we know (and why) and what our best estimates are for the future.

Follow this link to register for this month's webinar:

<https://www1.gotomeeting.com/register/205164704>

## COMING SOON...

The Climate Change Response Program's public web site will be launched in late April.

You will be able to find us at: <http://www.nps.gov/climatechange>

## George Melendez Wright Internship Program

The Climate Change Response Program is proud to announce the 2010 George Melendez Wright Climate Change Summer Internship Program. NPS's partner, the National Council for Science and the Environment (NCSE), will recruit several high caliber students to work in parks, regional, and WASO offices on climate change related issues. Out of 37 excellent, highly competitive proposals, we are pleased to announce that 13 of them will be funded by the NPS Climate Change Response Program in 2010:

- **Acadia NP** – developing a curriculum based climate change education program and podcast
- **Colorado NM** – monitoring spring and seep ecosystems and rare plants to help in management decisions and adaptation scenarios
- **Crater Lake NP** – designing and building a photovoltaic array to showcase sustainable energy throughout the park
- **Denver Service Center** – developing a database to insure the adaptability of native grass seeds for revegetation in parks
- **Devils Postpile NM** – monitoring lodgepole pines, meadows, cold air pooling, and water flow in the San Joaquin River Valley to build a framework for the park's adaptation strategies
- **Fire Island NS** – mapping human created barrier impacts to coastal landform (dunes, marshes) adaptation to sea level rise
- **Great Smoky Mountains NP** – developing education products for a high school audience including a movie, citizen science field lesson, and an interactive on-line activity
- **National Capitol Region** – engaging urban youth to address climate change in their communities
- **Rocky Mountain NP** – collecting data in alpine environments to inform ecological monitoring in this fragile ecosystem
- **Russell Cave NM** – comparing prehistoric climate change in the archaeological record to current forecasts
- **South Florida / Caribbean Network** – monitoring mangrove and colonial bird nesting to assess threat of sea level rise
- **Voyageurs NP** – investigating the temperature tolerance of moose and compare it to existing habitat temperatures in order to estimate their sensitivity to climate change
- **WASO - Wilderness Stewardship Division** – conducting GIS analysis to evaluate resilience and ecological value of wilderness areas under climate change model predictions

## CCRP Featured Staff

### Elliot Dale

The CCRP is pleased to host Elliot Dale as their new climate change intern. Working as a Geoscientist-In-the-Park, Elliot has joined the program for a six month internship in the Ft. Collins, CO office. Elliot's main project is to help create and coordinate the newly developed George Melendez Wright Climate Change Internship and Fellowship programs. The overall goal of these programs is to foster youth involvement in climate change activities within the parks. Additionally, Elliot offers invaluable assistance to the CCRP's daily operational tasks. Elliot earned a BS in Environmental Studies from Emory University and hopes to continue his education at Colorado State

University in the fall of this year. His personal climate change interests lie in greenhouse gas mitigation through the use of alternative energy and general energy efficiency practices.



### Angie Richman

The CCRP has hired Angie Richman as the Communications Specialist for the program. Over the past 12 years Angie has worked in 9 different National Park units and a regional office. She is trained as a front line interpreter but also applies her background in science to resource management objectives. Angie is tasked with formulating a program web page, continuing the monthly newsletter and webinar, developing climate change training programs, and leading the creation of a communication plan for climate change. Angie hopes to help increase climate science literacy among park interpreters and develop communication products that play to the strength of park staff and of the power of the visitor experience. Other key tasks include working with the Communications Workgroup and building connections throughout the service.



## Working Group Highlight — Policy

*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.*

### Policy

The Policy Workgroup has recently reformed and identified goals for 2010. They are to develop a framework to address the policy issue implications of managing for climate change and to provide interim guidance that will be useful for managers in the field. To that end, the Workgroup

will (1) draft broad field guidance that tiers from the draft NPS Climate Change Response Strategy and outlines next steps, (2) develop a mechanism to deliver guidance to field managers, (3) collect and communicate case studies of management decisions in the field related to climate change policy, and (4) begin work to analyze management decisions to implement a service-wide culture change that embraces conservation in NPS operations.

For more information on the six Working Groups, go to <http://nrpcsharepoint/climatechange>  
Contact: [Jeff\\_Mow@nps.gov](mailto:Jeff_Mow@nps.gov)

## Workshop Summary

The interagency workshop, “Adapting to Climate Change in the Mid-Atlantic” was held on March 23<sup>rd</sup>-25<sup>th</sup> in Cambridge, Maryland. It was cosponsored by six federal agencies, including the National Capital and the Northeast Regions of the NPS, Northeast Region of the USFWS, the Eastern Region of the USGS, US Forest Service’s Eastern Region and Northeastern Area, NOAA’s Office of National Marine Sanctuaries, and the Minerals Management Service. The three-day workshop was kicked-off by departmental and agency leaders, including Kit Batten, Science Advisor to the DOI Deputy Secretary, USGS Director Marcia McNutt and NPS Director Jon Jarvis. The main focus was on assessment techniques available for managers to determine the best tools for adaptation strategies at the regional,

state or local level. Concurrent sessions were held on a variety of issues for both coastal/marine areas and terrestrial/forest areas. Breakout sessions continued on the human and natural resource dimensions of adaptation to climate change. The workshop concluded with an interagency panel on collaborative adaptation opportunities, including presentations on Landscape Conservation Cooperatives (LCCs), Cooperative Ecosystem Study Units (CESUs), National and Regional DOI Climate Science Centers, Climate Smart Marine Sanctuaries, Inventory & Monitoring Networks and the Climate Effects Network. For more information or conference proceedings, go to: <http://www.fws.gov/northeast/climatechange/conference/ccmidatlantic.html>

## Park Facility Management Division Update

Using funds from the American Recovery and Reinvestment Act of 2009, the National Park Service is currently conducting energy and water audits in the 55 park units which are the largest consumers of energy and water resources. The purpose of these audits is to comprehensively assess energy and water consumption in these parks and to identify and prioritize greenhouse gas (GHG) emissions reduction and water conservation measures. This group includes some of the largest and most recognizable National Parks, including Yellowstone, Yosemite, Denali, Great Smoky Mountains, Statue of Liberty, Mount Rushmore, and the National Mall and Memorials Park.

Collectively, the top 55 parks account for greater than 75 percent of all energy and water consumed by the National Park Service. Final audit results will provide each park with a set of projects or individual improvements that they can implement to reduce GHG emissions and improve water efficiency. The National Park Service expects that

this effort will ultimately result in a significant overall reduction in GHG emissions and water consumption across the agency, resulting in a smaller carbon footprint and financial savings.  
Contact: [Julia\\_Corby@nps.gov](mailto:Julia_Corby@nps.gov)



## Upcoming Workshops & Meetings

I&M will host two workshops this spring that will focus on monitoring ecological response to climate change. Arid Lands Parks, in Tucson, AZ on April 6-8, 2010 and High Elevation Parks in Bozeman, MT on May 4-6, 2010.

[http://www.greateryellowstonescience.org/CC\\_workshops](http://www.greateryellowstonescience.org/CC_workshops)

Great Basin / Mojave Desert Climate Change Workshop at University of Nevada, in Las Vegas, NV on April 20-22, 2010.

<http://www.wr.usgs.gov/workshops/>

Department of the Interior hosts its Conference on the Environment in Portland, OR on April 26-30, 2010.

<http://www.doi.gov/greening/conference>

NatureServe Conservation Conference 2010: Biodiversity without Boundaries in Austin, TX on April 26-30, 2010.

[http://cheetah.natureserve.org/visitLocal/conferences/conferences\\_home.jsp](http://cheetah.natureserve.org/visitLocal/conferences/conferences_home.jsp)

“Planning for climate change using a green infrastructure approach” at the NCTC in Shepherdstown, WV on April 26-28, 2010.

[http://www.conservationfund.org/course/gi\\_climate\\_change](http://www.conservationfund.org/course/gi_climate_change)

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

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

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

[Glenn\\_Plumb@nps.gov](mailto:Glenn_Plumb@nps.gov)

## Climate 911! in BiscayneNP

Climate 911! is a series of interactive skits being performed at Biscayne National Park as part of the monthly Family Fun Fest series. One example of these skits takes place in a dispatch center that sends superheroes out to respond to climate emergencies in National Parks. The series is an outgrowth of the NASA/NPS Earth to Sky partnership. Summaries of the first two skits (more are coming) are posted as 3-5 minute movies on YouTube at the following links:

Episode 1: [http://www.youtube.com/watch?v=qwex\\_c-sqRQ](http://www.youtube.com/watch?v=qwex_c-sqRQ)

Episode 2: <http://www.youtube.com/watch?v=A83XWcOEBNA>

Contact: [Gary\\_Bremen@nps.gov](mailto:Gary_Bremen@nps.gov)

## Yosemite NP to Study Sky-island Flora

In 2010-2012, Yosemite National Park staff will be conducting a botanical inventory of the park's sky-island floras. These specialized plant communities occupy dry, cold plateaus at the crest of the Sierra Nevada from Yosemite south to Sequoia-Kings Canyon. The plants of these sites are highly vulnerable to the drying and warming predicted by many climate forecast models. Data gathered from this project will assist park managers in planning for resource protection. This project is funded by The Yosemite Fund. Contact: [Alison\\_Colwell@nps.gov](mailto:Alison_Colwell@nps.gov), Or [Niki\\_Nicholas@nps.gov](mailto:Niki_Nicholas@nps.gov)

## 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.

Leigh Welling - Coordinator  
Climate Change Response Program  
[Leigh\\_Welling@nps.gov](mailto:Leigh_Welling@nps.gov)

Comments, Submissions:  
[Angie\\_Richman@nps.gov](mailto:Angie_Richman@nps.gov)

**Indiana Dunes National Lakeshore** National Park Service U.S. Department of the Interior

## Can a Sugar Maple Grove Move?

**Projected Sugar Maple Migration\***

■ Sugar Maple present range

■ Sugar Maple range migration according to Goddard Institute for Space Studies

■ Sugar Maple range migration according to Geophysical Fluid Dynamics Laboratory

**Climate Change and Warming Temperatures**

As the temperature rises it causes adverse effects on the maple sugaring process. Warmer temperatures, caused by climate change, compel sugar maple trees to migrate to more favorable climates. The maple sugaring season has been starting earlier than it did 40 years ago and the duration has decreased by 10%.

Can trees really migrate? Yes they can, groves can have a migration rate of 60 miles or more per century. Sugar maple trees drop seeds that are blown by the winds or carried off by animals. If the seeds land in a viable climate, the tree will thrive and grow. This process is repeated until the seeds eventually reach a climate that does not have the correct precipitation and temperature.

Do you think trees can migrate fast enough to keep up with the climate change? What can we do today to slow down global warming?

- Use alternative fuels
- Recycle
- Use earth friendly products

\*Zelenski and Davis, The Potential Effects of Global Climate Change on the United States, United States Environmental Protection Agency, 1998

Indiana Dunes National Lakeshore presented a program on "maple sugar time" this past month. The program was presented to over 1,400 general public and 900 school children. It addressed the predicted migration of maple sugar trees due to climate change. They now have an interpretive wayside on this topic. Courtesy of Jeff Manuszak, creator / designer of the wayside.

## Useful Resources Related to Climate Change

A new video lecture series on climate change and fish provides excellent information on the potential climate effects on fish and aquatic habitats in the Western U.S. Available at: [http://www.fs.fed.us/ccrc/video/olympic\\_climate\\_change.shtml](http://www.fs.fed.us/ccrc/video/olympic_climate_change.shtml)

Michigan State University's Bioeconomy and Global Climate Change Distinguished Lecture Series features renowned speakers. Videos of their presentations and full papers are available at: <http://www.espp.msu.edu/climate-change/lecture.php>

"National Parks and Climate Change" blog Available at: <http://americasbestidea.blogspot.com/>

Good article on the economics of climate change. Available at: [http://dakotaday.com/index.php?option=com\\_content&view=article&id=110:can-we-afford-to-address-climate-change-&catid=16:economic-policy-perspective&Itemid=19](http://dakotaday.com/index.php?option=com_content&view=article&id=110:can-we-afford-to-address-climate-change-&catid=16:economic-policy-perspective&Itemid=19)

Interesting new study discussing the localized impacts of CO<sub>2</sub> emissions and the associated health effects within urban areas. Available at:

<http://www.grist.org/article/2010-03-17-if-it-does-matter-where-co2-is-released-cities-are-in-trouble>

A short article exploring why scientists may be having a hard time getting support for climate change. Available at: <http://nrpcsharepoint/climatechange/communication/Education%20Resources/Their%20Own%20Worst%20Enemies.doc>

"Lights out for Climate Change" On March 27<sup>th</sup> over 100 countries were encouraged to turn off lights to heighten awareness of climate change; read more at: <http://www.msnbc.msn.com/id/36018807/ns/travel-tips/>

"A New Climate for Conservation - Nature, Carbon and Climate Change in British Columbia" Available at: [http://www.y2y.net/data/1/rec\\_docs/726\\_New-Climate\\_Report\\_reduced.pdf](http://www.y2y.net/data/1/rec_docs/726_New-Climate_Report_reduced.pdf)

