



SCIENCE • ADAPTATION • MITIGATION • COMMUNICATION

## Climate Change Training — Earth<sub>2</sub>Sky IV

Just like how two hydrogen atoms combined with one oxygen atom make water, Earth to Sky (E<sub>2</sub>S) is a combined partnership between the National Park Service, NASA earth scientists, U.S. Fish & Wildlife Service and Cleveland Metroparks Zoo; whose resilient bond contributes to the success in communicating climate change throughout all of our agencies.

During four days in February, more than 50 people from across the country gathered at Mather Training Center in West Virginia to plug into the power of NASA earth science resources. Participants fed off the creative atmosphere of collaboration to develop new interpretive techniques and materials to help visitors understand the impacts of climate change to national parks and wildlife refuges.

This was the fourth Earth to Sky workshop since 2004 which have produced over 200 graduates. The course schedule featured instructors from NASA, the NPS and U.S. Fish & Wildlife Service. The partnership's newest member is the Cleveland Metroparks Zoo and the class included the zoo's conservation coordinator. New partnerships have been added with each version of the course and facilitators hope to include others like the USGS, BLM, US Forest Service, NOAA and others so that it's truly a collaborative, government-wide effort.

NASA workshop leader, Anita Davis, said the Earth to Sky partnership was born from NASA's desire to take advantage of the "awesome skill levels and talent, the capability park rangers have to connect with the public. Earth to Sky is about sharing our information resources with your ability to reach people."

Davis, the education and outreach coordinator for the Landsat mission at Sigma Space Corporation at NASA Goddard Space Flight Center in Greenbelt, MD, said there are nearly 10,000 scientists, engineers, educators and managers at Goddard, in suburban Washington, D.C., who collect data – thermal images, visual images, water and air temperatures, gravity measurements and more – from 30 earth-observing satellites that circle the globe. The science generated by NASA is pertinent in understanding our changing climate. Virtually all of that information is available to the public through NASA outreach programs and a variety of on-line locations that begin at [www.nasa.gov](http://www.nasa.gov).

One of the highlights for the week was a site visit to the Goddard Space Flight Center. The class experienced a presentation of "Science on a Sphere" by Goddard's Chief Scientist James Gavin, received a tour of the facility and a presentation on the importance and delicacy of interpreting

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Above: Great Horned Owl fledgling.  
Photo courtesy of Jacquie Tinker.

## George Melendez Wright Internships and Research Opportunities

### Climate Change Internship

The Climate Change Response Program (CCRP) is soliciting project proposals for the 2010 summer season for the newly created George Melendez Wright Student Internship Program. All NPS units (parks and central offices) will be considered for the internships. Proposals are due by **March 10<sup>th</sup>**. For more information, go to: <http://inside.nps.gov/index.cfm?handler=viewnpsnewsarticle&type=Announcements&id=8714>

### Climate Change Research Opportunity

The CCRP is now accepting applications for the George Melendez Wright Climate Change Fellowship. The goals of this student fellowship program are to support new and innovative research on climate change impacts to protected areas and to increase the use of scientific knowledge toward resource management. Proposals are due by **March 15<sup>th</sup>**. For more information, go to: <http://inside.nps.gov/index.cfm?handler=viewnpsnewsarticle&type=Announcements&id=8679>

*The Climate Change Response Program is an agency wide program established to foster communication, provide guidance, scientific information, and recommendations that support stewardship actions to protect our natural and cultural heritage from the detrimental impacts of global climate change.*

## Working Group Highlight — Adaptation

*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.*

### Adaptation

The Adaptation Workgroup, co-chaired by Dan Odess of the Cultural Resource Directorate and Tom Olliff with the Greater Yellowstone I&M Network, has been primarily focused over the last six months on drafting and editing the Adaptation sections of the Draft NPS Climate Change Response Strategy. In January 2010, Cat Hawkins-Hoffman from Olympic National Park joined the group and has been focused on: (1) establishing contacts with NPS staff who are, or will be contacts (even interim) with each of the FWS LCC's, and also touching base with the FWS leads towards establishing routine communications regarding their meetings, conference calls, and other organizing activities; (2) working with Jeff

Mow of Kenai Fjords National Park in examining policy sideboards and how these guide direction for adaptation, and (3) meeting with I&M staff for initial discussions regarding integration of monitoring activities with adaptation actions.

March 1, the current leadership of the Adaptation Workgroup will convene to set future direction. Initial tasks will be to: (1) refresh the working group with additional members from a wide geographic reach and across several levels of expertise, especially recruiting members who have been active in LCCs at the local level; (2) establish a contact list and develop draft guidance for NPS involvement in LCCs; and (3) draft an Adaptation Implementation Plan that tiers from the NPS Climate Change Response Strategy and integrates into implementation plans being developed for Mitigation (Sustainable Park Operations); Science; and Communications.

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

## Earth<sub>2</sub>Sky IV Cont'd

controversy by NPS Training Manager David Larsen. The day's events ended with a panel discussion where NPS Director Jon Jarvis addressed the class and called NASA's information resources an "amazing opportunity," and used the E<sub>2</sub>S partnership to illustrate the need for multi-agency collaboration on climate change.

The level of enthusiasm and innovation increased throughout the course of the week as participants developed an atmosphere of sharing success stories, lessons learned, and freely giving of interpretive products already developed for anyone to use. The real gift of the course was the feeling that each participant is now part of a network of collaborators they can call on to further the success in communicating this critical issue.

"About 75 percent of the graduates are National Park Service interpreters – and the course graduates have a *big impact* when they get back to their home parks and wildlife refuges," said John Morris, Interpretive Specialist for the Alaska Region and one of the course leaders. "Participants use what they learn here, including the wealth of NASA data and NASA contacts, to help develop ranger programs, podcasts, posters – just about any interpretive media that can be used to address climate change impacts in our national parks and wildlife refuges."

So what's the *big impact*? The interpretive materials have been used to make 2.5 million visitor contacts so far, and just like water is an essential element to the survival of all life, partnerships like E<sub>2</sub>S are an essential element in communicating climate change within our agency. For more information, go to: <http://earthtosky.org>



NASA Goddard's Chief Scientist, James Gavin, presenting "Science on a Sphere" for the Earth to Sky participants. Photo courtesy of Jeffrey G. Olson.

## Climate Change Steering Committee

A year after its creation, the NPS Climate Change Response Steering Committee met in Miami, FL January 26-28<sup>th</sup> to share progress to date for NPS and its partners and to explore opportunities for collaboration. NPS Director Jon Jarvis set the tone for the meeting on the first day as he shared with the committee his vision for climate change response in our agency. His message focused on placed-based science, the unique role the NPS can play in protecting cultural resources and in communicating climate change, and the importance of modeling best practices. The first day also engaged representatives from FWS, USGS, BLM, NOAA, BOR, and EPA in a discussion regarding strategies for collaboration in Landscape Conservation Cooperatives (LCCs), Climate Science Centers (CSCs), and other arenas. The remaining two days focused on NPS specific strategies and actions, including linking climate change response to the NPS Science Initiative, identifying communication techniques and key messages, discussing the challenges of climate change policy, and identifying the next steps for the implementation of the CCR Strategy.

### CCR Strategy Document

A primary effort of the steering committee over this past year has been to lead development of a servicewide Climate Change Response Strategy.

## CCRP Featured Staff

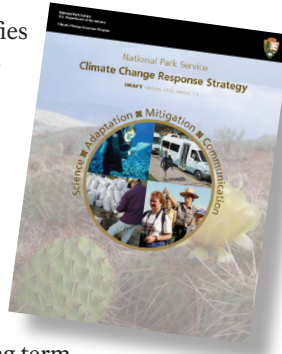


### Melanie Graham

The development of a new program requires a go-to person charged with a wide variety of duties that ensure the efficient completion of tasks and projects relating to administration, policy,

and communication. Melanie Graham began this role as an intern in 2009, and is now welcomed to the NPS as the first permanent employee for the CCRP as the Climate Change Assistant. She works to ensure smooth communication between different elements of the program, the CCR Steering Committee and Workgroups, the Climate Change Coordinator, and NPS staff. Melanie recently received her Master of Arts in cultural anthropology from Colorado State University, and in the future hopes to further ethnographic work exploring the impacts of climate change to indigenous peoples and others with close ties to the lands NPS manages.

This strategy identifies goals and objectives to guide our future actions under four integrated components: science, adaptation, mitigation and communication. An implementation plan will be developed that will define short and long term actions that the NPS will take to meet our mission in the face of climate change.



The draft strategy is now available for internal review on the internal Planning Environment Public Comments site (PEPC) at <https://pepc.nps.gov>, project 30304. Please submit comments through PEPC. Comments are due by **March 19<sup>th</sup>**.

If you have any questions or do not have access to PEPC; Contact: [Melanie\\_Graham@nps.gov](mailto:Melanie_Graham@nps.gov)

For more information about the steering committee, go to: <http://nrpcsharepoint/climatechange/CCR%20Steering%20Committee/Forms/AllItems.aspx>

### Shelly Clubb

The Climate Change Response Program has hired Shelly Clubb, a Project Manager from the WASO, Environmental Quality Division, for a one-year detail. Shelly will help the CCRP develop the program's requirements, schedule, deliverables and funding obligations over the next 2 and 5 year time horizons. She is working with the different Climate Change Program Elements, such as I&M, Adaptation, Education, Staffing and Communication to develop links between work tasks and funding needs. Shelly will help facilitate the Servicewide Comprehensive Call panel for CCRP projects being funded in FY 10, 11 and 12. In addition, she will work with the Scenario Planning group who are tasked with developing workshops, training and guidance to the field on climate-related Scenario Planning.



## Monthly Climate Change Webinar Series

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

**Next Webinar: March 11<sup>th</sup>, 2010**

March's presentation will feature Dr. Paul Bunje, the Executive Director of the UCLA Center for Climate Change Solutions, where he works to bridge the gap between research science and decision makers to help society respond and adapt to the challenges of climate change.

His presentation titled, *The Educational Role of Parks in Educating the Public about Solutions to Climate Change*, will discuss the critical role national parks can play in educating the public about the solutions to climate change -- both how to mitigate the extent of climate change through reducing greenhouse gas emissions, and in adapting to a changing environment.

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

<https://www1.gotomeeting.com/register/357527696>

## Job Opportunities

Climate Change Landscape Ecologist GS-13/14, applications due **March 5<sup>th</sup>**

Climate Change Response Program GS-14/15 Program Manager, applications due **March 12<sup>th</sup>**

Both positions are listed at: <http://www.usajobs.com>

## Upcoming Workshops & Meetings

Fourth Annual Collaborative Adaptive Management (CAM-Net) Rendezvous in Tucson, AZ on March 7-9, 2010.

<http://www.adaptivemanagement.net/rendezvous/2010-schedule>

Crown of the Continent Climate Change Scenario Planning Workshop, in Whitefish, MT on March 8-11, 2010.

[Melanie\\_Graham@nps.gov](mailto:Melanie_Graham@nps.gov)

USGS Office of Global Change will host "Understanding the Past, Informing Decisions for the Future," in Denver, CO on March 9-11, 2010.

<http://geology.usgs.gov/global-change2010/>

The Arctic Research Consortium of the U.S. (ARCUS) is hosting "The State of the Arctic Conference: "At the Forefront of Global Change", in Miami, FL on March 16-19, 2010.

<http://soa.arcus.org/about>

Mid-Atlantic Climate Change Workshop NER, in Cambridge, MD on March 23-25, 2010.

[David\\_W\\_Reynolds@nps.gov](mailto:David_W_Reynolds@nps.gov)  
[Holly\\_Salazar@nps.gov](mailto:Holly_Salazar@nps.gov)

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/>

## Climate Friendly Parks

The Pacific West Region held its third of five planned network-level Climate Friendly Parks Workshops on February 9th and 10th in Seattle for the North Coast Cascades and Upper Columbia Basin Networks. The Network based workshops focus on introducing the parks involved to the Climate Friendly Parks Program, as well building networks between parks to foster collaborative actions and information sharing. The first day of the workshop included presentations on the impacts of climate change as well as presentations by each park on actions they are taking to become more sustainable and mitigate climate change. The

second day of the workshop focused on reviewing potential sustainability actions for implementation in the parks, and tailoring these actions into a preliminary Climate Friendly Parks Action Plan. For more information, go to: <http://www.nps.gov/climatefriendlyparks/> Contact: [Matt\\_Rose@nps.gov](mailto:Matt_Rose@nps.gov)



## Intermountain Region

The Intermountain Region recently launched a sustainability intranet site to serve as an information hub where employees can find NPS, national, and international sustainability information. A virtual meeting place where parks can share their best sustainability practices, relevant news, potential projects, as well as hear updated information

from IMR and WASO. Portions of this website will be continually updated, while other pages will remain constant. You can find a downloadable draft of the IMR sustainability strategy which is now available for comment.

This website can be found at: [http://imr.nps.gov/comm-ps/ps\\_sustain.html](http://imr.nps.gov/comm-ps/ps_sustain.html)

## National Capital Region Internship

The National Capital Region is seeking applicants for Climate Change Communication Internships. The focus of this internship program is to assist national parks in the NCR to describe and communicate climate change complexity. The internships offer opportunities to gain skills and

experience in the synthesis, interpretation, and development of science communication products and messages, and disseminate ideas and knowledge about climate change and its effects on national parks. Applications are due April 16<sup>th</sup>, 2010. Contact: [Giselle\\_Mora-Bourgeois@nps.gov](mailto:Giselle_Mora-Bourgeois@nps.gov)

## Useful Resources Related to Climate Change:

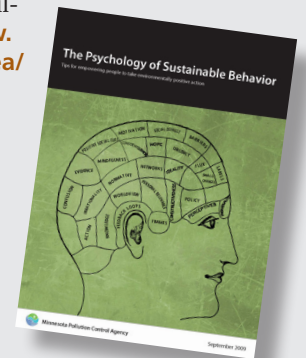
The Short List: The Most Effective Actions U.S. Households Can Take to Curb Climate Change. The Full article available at: <http://www.environmentmagazine.org/Archives/Back%20issues/September-October%202008/gardner-stern-full.html>

The 'Alaska Center for Climate Assessment and Policy' offers monthly climate change focused teleconferences over the internet. Forthcoming topics include hydropower planning and ocean acidification. Archives of previous teleconferences are also available. Available at: <http://www.uaf.edu/accap/>

An interesting article that addresses why the Northeast has been getting so much snow. Pew Center Climate Compass Blog: "It's so cold! What happened to global warming?" Available at: <http://www.pewclimate.org/blog/gulledgej/update-it%E2%80%99s-so-cold-what-happened-global-warming>

Interesting new study from George Mason University: Center for Climate Change Communication - Global Warming's Six Americas, released in January 2010. Available at: [http://www.climatechangecommunication.org/resources\\_reports.cfm](http://www.climatechangecommunication.org/resources_reports.cfm)

The Psychology of Sustainable Behavior: Tips for empowering people to take environmentally positive action. Available at: <http://www.pca.state.mn.us/oea/ee/psychology.cfm>



## NPS Study of Coral Reefs

The journal *Coral Reefs* recently published an article by Miller et al. (2009) "Coral disease following massive bleaching in 2005 causes 60% decline in coral cover on reefs in the US Virgin Islands." Stress on corals, such as increased water temperature, disturbs the symbiotic relationship with coral protozoa, causes bleaching of the coral surface. Bleaching is the largest threat to Caribbean corals. At six sites monitored by the South Florida-Caribbean I & M Network, 90% of coral cover was bleached after an unusually warm seawater episode in 2005. Recovery from the bleaching was halted by an secondary period of disease despite normal seawater temperatures in 2006,



causing additional mortality. This study by the NPS and USGS indicates that bleaching effects can be complex, and underscores the critical link with climate. These extensive losses are alarming as they can undo centuries of reef formation. Future research should focus on whether the surviving coral colonies are more or less resistant to environmental stress and warming. A fact sheet on the study is available at: [http://www.nature.nps.gov/water/Marine/CRTF\\_Fact\\_Sheet1-1a.pdf](http://www.nature.nps.gov/water/Marine/CRTF_Fact_Sheet1-1a.pdf) Contact: [William\\_J\\_Miller@nps.gov](mailto:William_J_Miller@nps.gov)

## Citizen Science in Olympic NP

The Washington National Park Fund is helping Olympic NP get a citizen science program off the ground to monitor marmot populations that park scientists have studied in the past. The Olympic Marmot is an endemic species with a declining population, climate change may be a factor, and they are also on the "favorite snack" menu for coyotes. For more information, go to: <http://wnpf.org> and follow the link for "Backpack for Marmots"

## Yosemite Fire Science Symposium

Yosemite's 3rd Biennial Fire Science Symposium on April 27-28 will pass recent fire ecology research results to land managers throughout the Sierra Nevada. Fire's presence or lack of presence has often been intertwined with changes in climate. The symposium's theme: adaptive management—understanding that strategies can change to include better fire information. Space is limited for this free event at The Ahwahnee in Yosemite Valley. Contact: [Leland\\_Tarnay@nps.gov](mailto:Leland_Tarnay@nps.gov)

## Beat Back Buffelgrass in Saguaro National Park

On February 6th, Saguaro National Park participated in the annual Beat Back Buffelgrass Day. This event is a joint effort between park staff and hundreds of volunteers who remove thousands of Buffelgrass plants within the park and other public lands. Saguaro National Park was identified as one of 50 National Parks in peril due to threats of climate change (Rocky Mountain Climate Change Organization and Natural Resources Defense Council 2009) because of the threat of invasive buffelgrass. Buffelgrass, an introduced African grass threatens the icon species, the saguaro, directly by competition for resources and crowding out of native plant species. But more detrimental to the saguaro and Sonoran Desert ecosystem is fire; many of the Sonoran Desert species did not evolve with fire and will die as a result of burning. Buffelgrass fuels hotter, more intense and more frequent fires than historically known. Contact: [Dana\\_Backer@nps.gov](mailto:Dana_Backer@nps.gov)



The native Saguaro Cacti is being choked out by invasive Buffelgrass. Photo courtesy of Dana Backer.

## Upcoming Workshops & Meetings Continued

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)

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)

## 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

office: (970) 225-3513

[Leigh\\_Welling@nps.gov](mailto:Leigh_Welling@nps.gov)

Comments, Submissions:

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

The photos above show a time series at Tektite Reef showing from Right to Left; a bleached portion of the reef, September 2005; heavily affected by coral disease, November 2005; and near-total mortality with surviving portion still pale, January 2006. Photos courtesy of William J Miller.