



SCIENCE • ADAPTATION • MITIGATION • COMMUNICATION

Training Provides Staff with New Tools for Coastal Adaptation

In May, participants including park superintendents, planners, facility managers, and cultural and natural resource managers attended a four-day training on coastal adaptation strategies hosted by Rob Young and colleagues from the Program for the Study of Developed Shorelines at Western Carolina University, North Carolina. The training began with an introductory coastal inundation short course presented by Matt Pendleton and Dave Betenbaugh of the NOAA Coastal Geospatial Services Division in order to acquaint participants with tools available from NOAA. As part of this short course, Janet Cakir and Amanda Babson (NPS staff based with the North Atlantic and South Atlantic Landscape Conservation Cooperatives) presented issue and application examples from the NPS Northeast and Southeast Regions.

Prior to arriving at the training, participants contributed a suite of coastal adaptation case studies to identify concerns for cultural resources, natural resources, planning, and facilities and to identify challenges, potential strategies and decision support tools for adaptation in the coastal zone. Participants presented their case studies which sparked engaging discussions on topics such as how to protect Fort Jefferson in Dry Tortugas from rising sea levels, designing and constructing a revetment at Cockspur Lighthouse at Fort Pulaski, restoring the Giocamini wetlands at Point Reyes, the cultural impacts of climate change at

Olympic, summer sea ice extent in the Chukchi Sea in Alaska, archaeological impacts of erosion at Bering Land Bridge and Cape Krusenstern, rehabilitating historic stream crossings at Acadia, mobile visitor facilities in response to shoreline erosion at Assateague Island, designing mobile visitor facilities at Flamingo in Everglades, access via road and ferry to Fort Pickens at Gulf Islands, the protection of shell middens and mounds at Canaveral, the Mississippi Coastal Improvement Plan, and relocation of the Cape Hatteras lighthouse.

The training included a superintendents' panel discussion with Dan Kimball, (EVER/DRTO); Pat Kenney, (CALO); Trish Kicklighter, (ASIS); and Frank Hays, (WEAR) who discussed the current challenges, successes, and failures of adaptation strategies currently utilized by many parks. Support staff from various national programs gave presentations as well. Cat Hawkins Hoffman, (CCRP); Shawn Norton, (SOCC); and Marcy Rockman, (CR) provided an overview of current theory, policy and practices regarding climate change adaptation for natural and cultural resources and facilities and Rebecca Beavers (GRD) led a session on coastal engineering as adaptation, using examples of previous and ongoing adaptation strategies in coastal parks to evaluate their effectiveness both financially and environmentally.

Continued on Page 2

In this Issue

National Updates

Coastal Adaptation.....	1
Green Parks Plan.....	2
Monthly Webinar	2
Renewable Energy Team.....	3
Climate Friendly Parks.....	3

Regional Highlights

Northern Institute of Applied Climate Science.....	4
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Happening in the Parks

Rocky Mountain BioBlitz.....	4
Empowering YOSE Visitors ...	5
Around the 'Net.....	5
Glacier Workshop	6

Servicewide Policy Memo	6
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Above: The Atlantic coast in Acadia National Park.

Monthly Climate Change Webinar Series

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

Next Webinar: Sept 13, 2012
The Intergovernmental Panel on Climate Change and the U.S. National Park Service

Dr. Patrick Gonzalez, Climate Change Scientist with the National Park Service Climate Change Response Program, will discuss the latest from the Intergovernmental Panel on Climate Change, upcoming reports, and what it all means for the NPS.

Follow this link to register for the September webinar:
<https://www1.gotomeeting.com/register/458514889>

Upcoming Webinar

October 11, 2012
The Paleoclimate at Olympic NP: Changing Forest Composition and Forest Fire

This webinar will feature Dr. Dan Gavin, Associate Professor in the Department of Geography, University of Oregon. Dr. Gavin will discuss his research on changing forest composition and forest fire, and climate records themselves, on the Olympic Peninsula over the past 14,000 years.

Follow this link to register for the October webinar:
<https://www1.gotomeeting.com/register/132397696>

Coastal Adaptation Training *Cont'd*

In addition to NPS staff presentations, the training offered a chance to learn from our partners. David Easterling from NOAA's National Climatic Data Center provided climate science context, presenting information from his work as part of the forthcoming Fifth IPCC Report and the U.S. Global Change Research Program National Climate Assessment Report. Relating "lessons learned" on a larger scale, Denise Reed from the University of New Orleans discussed her involvement in the effort to rebuild New Orleans following Hurricane Katrina in 2005. Rob Young and colleague Katie Peek gave a presentation regarding their efforts currently underway to identify park assets vulnerable to sea level rise.

Lastly, attendees participated in breakout sessions throughout the training to discuss adaptation strategies, emphasizing ways to prioritize resources and assets, resolve conflicts, and strengthen adaptation guidelines. Rob Young will incorporate information from these discussions in a *Coastal Adaptation Strategies Handbook* (under development) designed to present practical options for sea level rise adaptation and illustrated by case studies. All coastal park units are encouraged to send additional case examples. If interested, please contact: Rebecca_Beavers@nps.gov or Cat_Hawkins_Hoffman@nps.gov

Green Parks Plan – Going Forward



The *Green Parks Plan* (GPP), released in April, outlines NPS's sustainability vision and sets ambitious goals, encouraging staff to take advantage of green opportunities whenever possible. The Director recently discussed the GPP and the importance of advancing sustainability in NPS operations during Flat Hat Chat #28. In this chat the Director highlights the formal release of the GPP on the National Mall on April 19th. The Director called upon all NPS employees to act as agents of change to support this sustainability movement in all aspects of operations – drive less, buy less, conserve more, and share best practices. The Flat Hat Chat can be accessed at: <http://inside.nps.gov/index.cfm?handler=directorvideos>

The GPP consists of nine strategic goals listed below, within which several performance objectives establish specific targets for NPS operations. Examples include: reducing Scope 1 and 2 greenhouse gas emissions by 35 percent; reducing building energy intensity by 35 percent; and diverting 50 percent of solid waste generated from landfills.

Improve Environmental Performance

The NPS will meet and exceed the requirements of all applicable environmental laws

Be Climate Friendly and Climate Ready

The NPS will reduce GHG emission and adapt facilities at risk from climate change

Be Energy Smart

The NPS will improve facility energy performance and increase reliance on renewable energy

Be Water Wise

The NPS will improve facility water use efficiency

Green Our Rides

The NPS will transform our fleet and adopt greener transportation methods

Buy Green and Reduce, Reuse, Recycle

The NPS will purchase environmentally friendly products and increase waste diversion and recycling

Preserve Outdoor Values

The NPS will minimize the impact of facility operations on the external environment

Adopt Best Practices

The NPS will adopt sustainable best practices in all facility operations

Foster Sustainability Beyond Our Boundaries

The NPS will engage visitors about sustainability and invite their participation.

To support advancing GPP goals, a companion *Toolkit of Opportunities* is available covering each strategic goal category. Each toolkit contains helpful tips and advice that NPS staff can implement, learn more about, or see another park's successful idea. The toolkit further explains each goal and provides links to key resources and references to assist in each specific topic area. The toolkit can be accessed at: <http://greenparksplaninside.nps.gov/toolkit/index.html>

Additional sustainability success stories are available at: <http://www.nps.gov/sustainability/parks/index.html>

The GPP is available at: <http://greenparksplaninside.nps.gov>

Introducing the NPS Renewable Energy Team



Zach Church

Zach is on a year-long detail in the Pacific West Regional Office, San Francisco, to serve as the Region's Renewable Energy Coordinator. Zach is responsible for leading NPS participation on state-wide and regional

renewable energy planning and policy initiatives, including California's Desert Renewable Energy Conservation Plan, to help ensure that projects are sited and designed to maximize public benefit and minimize impacts to park resources. He has a Master in Public Policy degree from Harvard and a bachelor's degree from the University of California at Berkeley. Zach_Church@nps.gov

Mark Meyer

Previously a landscape architect from the private sector, Mark joined the NPS renewable energy team as a visual resource specialist. He is duty stationed in Lakewood, CO as part of the Air Resources Division. He will help managers in parks, regions and the Washington Office elevate attention to and foster the protection of shared scenic views that extend beyond the boundaries of NPS managed areas from utility-scale renewable energy development on adjacent lands. Mark has a B.S. in Landscape Architecture/Urban Planning from Arizona State University (ASU) and Master's Degree in Natural Science from ASU.

Mark_E_Meyer@nps.gov



Bryan Faehner

Bryan is the renewable energy specialist for the Southeast Regional Office Planning and Compliance Division. He will be working extensively on a range of renewable and conventional energy projects in the southeast, primarily

proposed by external agencies and applicants, including solar, offshore wind, hydropower, nuclear, oil and gas development, and electricity transmission projects. Originally from Maryland, Bryan holds a B.S. in Environmental Science and Policy from the University of Maryland and an M.S. in Environmental Studies from the University of Montana. Bryan_Faehner@nps.gov



Lara Rozzell

Lara is the renewable energy specialist working for the Intermountain Regional Office in Lakewood, CO. She is responsible for assisting park units and National Historic Trails within the Region in addressing potential cross-boundary impacts from renewable energy and transmission development. She earned a B.S. in Biology from the University of Nevada, Reno, focusing on plant interactions and on environmental policy and law. She completed an M.S. in Ecology, researching plant community recovery at volcanic Mt. Saint Helens and in an Oregon clearcut area.

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Amee Howard

Amee is the newest member of the NPS renewable energy team and joins the Pacific West Regional Office as a renewable energy specialist. Amee is duty stationed at Lake Mead National Recreation Area, but will be responsible for serving all regional park units. Her duties include tracking project proposals, working directly with parks to respond to development siting concerns, assisting on regional planning and policy initiatives, and representing the NPS on interagency working groups. Amee holds a B.S. in Natural Sciences with minors in Geology and Environmental Studies from the University of Alaska Anchorage.

Amee_Howard@nps.gov

The Northeast Regional Office in Boston is now in the process of hiring one additional member of the renewable energy team. Once hired, this person will be responsible for helping the Northeast Region park units engage on issues related to cross-boundary impacts from energy development and transmission infrastructure, and will help lead NPS participation on related statewide and regional planning initiatives.



The Climate Friendly Parks (CFP) Program – a voluntary program providing parks with learning opportunities, helpful tools and many resources focused on understanding climate change and sustainability – was quite active over the past few months!

In April, the Sustainable Operations & Climate Change (SOCC) branch – with the help of several park and region representatives – facilitated three CFP workshops in the Midwest (MWR) and Intermountain (IMR) Regions.

In addition to the recent workshops and action planning sessions, the CFP Program would like to welcome two new member parks and congratulate them on their accomplishments and dedication as they continue moving the National Park Service in a sustainable direction!

Great Smoky Mountains

Great Smoky Mountains National Park in the Southeast Region has committed to reducing their greenhouse gas emissions from park operations to 16% below 2006 levels by 2020.

Prince William Forest Park

Prince William Forest Park in the National Capital Region has committed to increase climate change education and outreach as well as several greenhouse gas reduction strategies.

The CFP Program would like to congratulate all parks – both current and potential CFP members – on your efforts and success! For more information about the CFP program, please visit the Climate Friendly Parks website: <http://www.nps.gov/climatefriendlyparks>



News in Brief

Rocky Mountain BioBlitz

Climate change was a major topic this August at the 2012 BioBlitz in Rocky Mountain National Park. CCRP staff hosted a climate change booth at the Biodiversity Festival to provide information on the latest NPS climate science, impacts, adaptation response, and communication efforts occurring in national parks across the country. School groups of all ages learned about ocean acidification through an activity that allowed students to use their breath to observe how carbon dioxide increases the acidity of water, and what that means for the ocean and America's national parks. Leigh Welling, Chief of CCRP, also facilitated an "Ask an Expert" session on climate change to provide the public with an opportunity to ask complex questions about this topic. CCRP staff learned a lot from their first attendance at a BioBlitz event, and look forward to engaging the public about climate change at the BioBlitz in New Orleans in May 2013.

The Northern Institute of Applied Climate Science

Land managers and conservation professionals are increasingly being asked to consider the effects of their work on carbon sequestration, to develop climate change adaptation plans, or to incorporate current climate change information into their work. National Park Service staff who could use a partner in any of these areas might be interested to learn more about the Northern Institute of Applied Climate Science (NIACS; <http://www.nrs.fs.fed.us/niacs/>).

NIACS is a collaborative effort among the U.S. Forest Service Northern Research Station, Forest Service Eastern Region, Forest Service Northeastern Area (State and Private Forestry), Michigan Technological University, the National Council for Air and Stream Improvement, and the Trust for Public Land. They work throughout the Great Lakes region and around the country to develop synthesis products, foster communication, and pursue science in the focus areas of climate change, carbon science and management, and bioenergy. The staff of 11 is mostly based in Houghton, Michigan, at the Northern Research Station office on the Michigan Technological University campus. Other staff members are located in Minnesota and California.

As a regional, multi-institutional entity, NIACS endeavors to bridge the gap between carbon and climate science research and the information and management needs of land owners and managers, policymakers, and the public. Their work often enhances communication and collaboration between land managers, policy-makers, and scientists.

Beginning with efforts in northern Wisconsin in 2008, NIACS has been a leader in bringing climate change considerations into forest management through the Climate Change Response Framework. The Framework is an integrated set of tools, partnerships, and actions to support "climate smart" conservation and forest management. The four major components of the Framework are:

Vulnerability Assessments – identifying vulnerable species and forests to help landowners, managers, regulators, and policymakers establish priorities for management and monitoring

Science and Management Partnerships – engaging researchers, land managers, planners and conservationists on climate change issues and creating opportunities for these stakeholders to interact

Adaptation Resources – locally-relevant adaptation strategies and approaches and an adaptation workbook that land managers can use to incorporate climate change considerations into forest management

Demonstration Projects – on-the-ground efforts to test climate adaptation approaches to forest management and build working relationships

NIACS is leading several expansions of the Framework process around the eastern US, in three regional landscapes: the Northwoods, the Central Hardwoods, and Central Appalachians. In 2011, the Institute released the *Ecosystem Vulnerability Assessment and Synthesis: A Report from the Climate Change Response Framework Project in Northern Wisconsin*. The report documents how the forests of northern Wisconsin will likely experience dramatic changes over the next 100 years as a result of climate change and evaluates key forest ecosystem vulnerabilities to climate change across northern Wisconsin under a range of future climate scenarios.

NIACS is currently working on similar assessments in each of the regional landscapes mentioned above. NIACS welcomes NPS participation in the Framework projects. NPS managers anticipate this work will lead to better management of terrestrial and aquatic resources found in parks like the Apostle Islands, Pictured Rocks, and Sleeping Bear Dunes National Lakeshores as well as Isle Royale National Park.

For more information: <http://nrs.fs.fed.us/niacs>
Contact: sdhandler@fs.fed.us

Padding the St. Croix National Scenic Riverway near Siren, WI.



Empowering Yosemite Visitors to Make a Difference

Can you imagine what would happen if one of North America's most iconic falls went dry in spring? This is a scenario that is becoming increasingly realistic as climate change takes its toll on Yosemite Falls in Yosemite National Park. As the years go on, scientists project that the Sierra Nevada's snow-capped mountain reservoirs will shrink as the region receives less snow and more rain. Hoping to slow or reverse this process, a group of park interpreters working for Delaware North Companies (DNC) strive to connect visitors to Yosemite Falls. This connection gives the audience a chance to grasp this growing problem, as well as something tangible to do.

To spread the word, DNC's Interpretation Department established an informal interpretation program that is able to reach a large and diverse audience through a series of four stations along one of the most frequently visited trails in the park below Lower Yosemite Fall. Visitors have the option of stopping by one or all of these stations depending on their interest. The program provokes Yosemite's visitors by encouraging them to make connections between Yosemite Falls and their own lives. The discussion inspires them to take action in order to keep the falls flowing.

Each of the stations has a take home message about climate change and/or energy conservation. Station A explores the source of the water, focusing on watersheds protected within the park boundaries. Located next to a small, scale model of Yosemite Falls, Station A provides a tangible representation of the watershed above the Falls, emphasizing how the source of this watershed is almost entirely frozen, with the park's snow-capped mountains acting as a reservoir. The watershed above the Falls is mostly granite, resulting in Yosemite Falls drying up each year as snow melt decreases. Due to this reliance on snow, the Falls depend on a stable climate with cool temperatures maintained in the high country. If temperatures continue to rise over time, a growing percentage of the park's snowfall could become rainfall, shortening the season of Yosemite Falls' flow.

Station B explores Yosemite Falls through the seasons and invites visitors to play a game, arranging pictures of Yosemite Falls in times of runoff and when dry. The images visibly emphasize that although there is a massive waterfall in spring and early summer, it is also a finite resource. Extra pictures of the Falls without water display how a visit to the park might be different without Yosemite Falls in a future, warmer climate.

Station C focuses on where the water is goes when it leaves the park. While visitors explore the literal path the water takes beyond park boundaries, they also come to understand the water's down-



stream uses. Many are aware of downstream uses for drinking water, public and industrial applications, but are surprised to learn that California's Central Valley depends on the water for growing more than half the nation's fruits, vegetables and nuts. National and even international visitors interact with and/or depend on Yosemite Falls' water regularly!

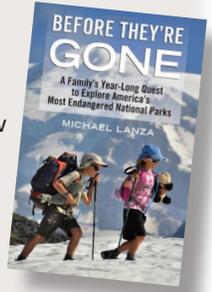
Station D, entitled What You Can Do, takes the message home for the visitor. The DNC staff makes it clear that each of us has an impact on the future of Yosemite Falls, and we are able to influence this by being more environmentally conscious. Program leaders guide visitors to explore possible solutions, encouraging actions to positively impact the global climate. Suggested ideas range from small, local actions to large-scale ones. Some visitors pledge to carry a refillable water bottle during their visit, some commit to make changes at home, and a few vow to get politically involved on a national scale. Each visitor gets to share ideas for the next group of participants.

The success of this program empowers parents and children to take the proper steps towards a more sustainable future. Having engaging stations along a popular trail allows interpretive naturalists to reach very diverse groups, who ordinarily may not participate in a program. Busy trails like the Lower Yosemite Fall trail can be more than an overcrowded walkway – they are an opportunity for advocacy, change, and action!

Contact: Paul_Ollig@nps.gov

Around the 'Net

This interview with author Michael Lanza explores his new book, *Before They're Gone: A Family's Year-Long Quest to Explore America's Most Endangered National Parks*.

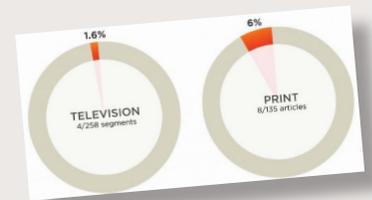


<http://grist.org/climate-change/hot-on-the-trail-exploring-parks-threatened-by-climate-change/>



This ten-minute video describes the ice patch archeology project that combined

the efforts of Glacier National Park, the Confederated Salish and Kootenai Tribes, and the Blackfoot Nation. <http://youtu.be/ifmdf2RHsK8>



In media coverage of this summer's wildfires, how often did various media outlets mention the fires in context of climate change? Find a detailed breakdown here:

<http://thinkprogress.org/climate/2012/07/05/510719/study-media-avoid-climate-context-in-wildfire-coverage/>

Communicating Climate Change Workshop in Glacier

This past June, the Crown of the Continent Research Learning Center (CCRLC) partnered with the Climate Change Response Program (CCRP) to host a workshop on communicating climate change. Supported by the Crown of the Continent Ecosystem Education Consortium, Angie Richman (CCRP's Communication Specialist), traveled to Glacier National Park to train interpretive and communication staff on this challenging topic. Many park staff already discuss the apparent changes seen within Glacier with visitors on a daily basis, but this sensitive topic can cause even the most seasoned communicators to look for help. Assisted by Paul Ollig, Deputy Chief of Interpretation at Yosemite, Angie provided 40 park and partner communicators with creative tools and techniques to use in place-based climate change communication.

The workshop, normally given in a multi-day experience, was consolidated into one day in order to allow busy, summer seasonal staff to attend. The day began with a quick introduction followed by a series of world café discussions in which participants were able to converse, brainstorm, and connect with other communicators. A brief science panel followed, providing an opportunity to ask questions and learn about the importance of research and education on this sometimes

daunting topic. Afternoon presentations and small group discussions allowed participants to learn more about techniques to address controversial topics, varied perspectives, and how to meet audience needs.

At the end of the workshop, climate change communicators discussed what was already being done at their site to communicate climate change and considered additional opportunities that might be developed. Throughout the day, attendees related how helpful it was to confer with other climate change communicators and to think of new ways to communicate this often precarious topic. One Glacier interpreter exclaimed, "This is the best training I have attended so far in my interpretive career, and I believe it may be one of the most important as I continue in this field." In the next few months, staff at the CCRLC will create a video of the workshop to share with park staff in Glacier and the staff at the Climate Change Response Program. We thank Angie, Paul, and the researchers on the science panel for making this workshop a great success, and hope others can experience this inspiring and dynamic workshop in the near future.

Contact: Melissa_Sladek@nps.gov



Photos of Acadia, St. Croix, Yosemite, and Glacier courtesy Matt Holly.

More Information

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

Dr. Leigh Welling
Climate Change Response
Chief

Leigh_Welling@nps.gov

Comments, Submissions:
Angie_Richman@nps.gov

The Climate Change Response Program can be found on the web at: <http://www.nps.gov/climatechange>

Reminder: Climate Change Policy Memo Released March 2012

Earlier this year, Director Jarvis released a policy memo to address the influence of climate change on NPS guiding principles for natural resource management. The memo discusses how we consider *impairment* when the causes of climate change impacts are not under managers' control and also emphasizes that traditional approaches to maintain *natural conditions* remain as viable management strategies that are consistent with our need to adapt to climate change. You can read the policy memo here: <http://www.nps.gov/policy/MPandCC.pdf>