



FOR FUTURE GENERATIONS: YELLOWSTONE GIFTS

THE FIRST STORE DEDICATED TO INTERPRETING
CLIMATE CHANGE IN OUR NATIONAL PARKS.

SCIENCE • ADAPTATION • MITIGATION • COMMUNICATION

Stewardship and Sustainability through Xanterra Parks & Resorts

In the newly remodeled gift shop at Mammoth Hot Springs in Yellowstone, visitors gaze at a 40-foot long mural that includes a quotation from National Park Service Director Jon Jarvis: "Climate change challenges the very foundation of the National Park System and our ability to leave America's natural and cultural heritage unimpaired for future generations." The store, named *For Future Generations: Yellowstone Gifts* is part of a guest and employee education campaign targeted at raising awareness about climate change in the national parks.

By promoting stewardship and encouraging employees and guests to lead more sustainable lives, it will raise awareness of the threats that climate change poses to our national parks. "We want the visitors to know that by recycling an aluminum can, purchasing sustainable products, or turning down the heat, they're not only helping the environment, but they're also supporting the mission of the National Park Service of ensuring that Yellowstone – and all its inhabitants – remain for future generations to enjoy," said Beth Pratt, director of environmental affairs for Xanterra's Yellowstone operations.

The store features a variety of educational displays, including a sustainability scorecard for products that help consumers make informed choices. Other components of the "For Future Generations" campaign include an innovative educational display for guest rooms with a plush animal toy, an educational brochure and website on being a green guest in national parks, and a new employee handbook entitled "Keeping Yellowstone Green." The campaign has been so

successful that Xanterra is launching it at other locations. Additionally, the company received an Environmental Achievement Award from the National Park Service in 2010 for the project.

For Future Generations is an extension of Xanterra's comprehensive environmental program, articulated by the company's 2015 Environmental Vision that relates to energy and water conservation, fossil fuel reduction, sustainable purchasing, green building and greenhouse gas emission reductions. Through its sustainability programs, Xanterra aims to reduce its carbon emissions by 30% from 2000 to 2015. Through 2009, the company has decreased emissions by over 17%.

In its newly released 2011 sustainability report, Xanterra details the array of ambitious environmental initiatives the company has implemented. Renewable energy is key to its environmental goals. "There is no more critical environmental issue in corporate today than weaning ourselves off of fossil fuels to reduce associated greenhouse gas pollution and promote energy independence," said Chris Lane, vice president of environmental affairs for Xanterra. Overall, renewable energy now provides 14% of the company's electricity. At the Grand Canyon Railway, employees converted a historic steam train to run on 100% waste vegetable oil and in Yellowstone the staff engineered equipment to fuel some of the park's historic hotels with the same. The company installed a one megawatt solar photovoltaic system in Death Valley, a 10kW wind turbine at Maumee Bay State Park, and has five more photovoltaic systems at other properties. Contact: BP Pratt@Xanterra.com

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Above: This sign greets visitors as they enter the *For Future Generations* store at Yellowstone NP. Image courtesy of Xanterra Parks & Resorts.

Monthly Climate Change Webinar Series

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

April's presentation will feature Scott Christensen, the Climate Change

Program Director for the Greater Yellowstone Coalition.

His presentation titled, "Climate Change and Greater Yellowstone's Native Trout" will introduce attendees to the climate impacts and ways in which scientists and land managers are responding in the Yellowstone area.

The presentation will provide:

- An overview of the native trout found in the Greater Yellowstone Ecosystem;
- The condition and management status of these fish populations;
- An overview of the observed climate trends for our region;
- An overview of our collaborative research project to map climate change risk to native trout populations; and,
- Recommendations for how to sustain native trout as climate change occurs.

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

<https://www1.gotomeeting.com/register/13609720>



Interpreting Climate Change – Pilot Course, May 17-20, 2011

This course will provide a strategic and practical foundation for interpreters to develop effective, engaging programming related to climate change as a critical resource issue affecting both natural and cultural resources. This is an experimental pilot course and participants will help shape and refine the curriculum through participation in daily focus groups and providing feedback to the instructors. Through this "lab" format, all participants will contribute to the development of this important competency. The course will be held at the Mather Training Center in West Virginia.

Development of course content has been a partnership between the Mather Training Center, the NRSS Office of Outreach and Education, and the CCRP and was initiated by the National Education Council. Registration is open on DOI Learn <http://www.doi.gov/doilearn>

Climate Change Internship at Fire Island NS

During the summer of 2010 George Melendez Wright Climate Change Intern, Monica Patel, embarked on a mission to assess anthropogenic barriers to landform migration on the bayside shoreline of Fire Island National Seashore (FIIS). Funded through the Climate Change Response Program's cooperative agreement with the National Council for Science and the Environment, one of the Internship Program goals involves supporting adapting to and mitigating the effects of climate change on lands administered by NPS.

An aerial view reveals a narrow barrier island stretching 32 miles south of Long Island, New York, known as Fire Island National Seashore. As ephemeral coastal systems, barrier islands are shaped by natural processes and migrate in response to sea level rise. On FIIS the natural process is complicated by the highly developed tracts of private communities within the jurisdictional boundary of the park.

Sea level on the south shore of Long Island is rising and the land is subsiding due to geologic processes, resulting in a relative sea level rise of 0.1 inch per year on average. Residential property



NOAA Coastal Webinar Series Announced

The NOAA Coastal Services Center announced the launch of a Digital Coast Webinar Series. Beginning in April, webinars will be offered the last Thursday of each month, from 2:00 p.m. to 3:00 p.m. Eastern. The webinars will introduce Digital Coast tools and data through demonstrations, case studies and opportunities to engage with field experts and colleagues. The inaugural webinar, *Using Geospatial Techniques to Plan for Climate Change Impacts on Coastal Habitat*, will be held on April 28th. To register or see a list of upcoming webinars, visit:

<http://www.csc.noaa.gov/digitalcoast/training/webinar.html>

owners attempt to convert an ephemeral coastal landform into a static one. In these efforts, coastal-engineered structures are erected to reduce local erosion. On a broader scale, these structures restrict the formation of natural features and sediment to enter the littoral drift system. Natural shoreline processes, which are necessary to maintain equilibrium, are disrupted.

During her summer internship, Monica created a geospatial database of coastal-engineered structures through collecting existing data, rectifying discrepancies, field surveys and utilizing aerial photography to identify additional structures. In addition to the database, she produced a report that included in-depth condition assessment of structures and functionality. The assessment enables the park to prioritize structures that can be removed in a cost-effective manner and minimize impacts on existing infrastructure. Furthermore, the lessons from this project can serve as a

beneficial starting point to continue work for other coastal parks in the Northeast Region. For more information about the George Melendez Wright Internship program: http://ncseonline.org/CampustoCareers/cms.cfm?tid=2233#NPS_Internships

CCRP Featured Staff

Sarah Quinn

We are proud to announce Sarah Quinn as our new Renewable Energy and Climate Change Specialist. While Sarah will work closely with the Climate Change Response



Program, she will be duty-stationed in Denver as a member of the Geologic Resources Division. Previously, Sarah worked for the California State Office of the BLM where she was a renewable energy program and environmental coordinator. In this capacity, she assisted BLM managers to address project-specific compliance issues; interacted with BLM field level staff, applicants, and various stakeholders; and worked directly with the regional Solicitor's Office to resolve legal questions related to processing renewable energy applications. In addition to her renewable energy background, she is an attorney and member of the Colorado Bar and is a Presidential Management Fellow. Prior to attending law school, Sarah received her undergraduate degree in Biology with an emphasis in Restoration Ecology, and worked as a research supervisor on projects within Grand Canyon NP and Great Smoky Mountains NP.

Kevin Adams

Recently, the CCRP has hired Kevin Adams as a Writer/Editor and Web Assistant to help build our communication efforts. He will develop an Intranet site for CCRP and will manage and increase our presence on other various websites including InsideNPS, Share-Point, and the public website. Additionally, Kevin will contribute to CCRP's monthly Newsletter and climate change communication online. Kevin received his Bachelors of Arts from Bellarmine University and is currently studying Environmental Communications at Colorado State University. Kevin previously worked as the Conservation Outreach Coordinator for Colorado Natural Heritage Program, where he managed the growing social media outlets and developed several outreach initiatives, such as CNHP's Service Learning projects for Environmental Communication Undergraduates. His interests include trail restoration, hiking, camping, and white water kayaking.



NSF Climate Change Education Project

The NSF-funded Climate Change Education Partnership team was in South Florida during the week of March 27th to host the second in a series of visits to protected areas throughout the country considered at high risk for impacts from climate change. The team spent the first part of the week conducting site visits at the project's pilot parks and refuges, including Everglades NP, Biscayne NP, Key Deer NWR and Ten Thousand Islands NWR. The focus of the visits was to learn how these protected areas currently communicating about climate change. The team listened to staff members needs for furthering their efforts and conducted surveys to understand the perspective of visitors on this topic.

The week-long trip culminated in a one-day workshop which brought together 90 participants from the parks, refuges, and many of their partners in south Florida, including representatives from Miami Dade county, NOAA, NASA and NGOs, as well as teachers from Universities and k-12 institutions. By bringing people together to collaborate with and inspire each other, the team hopes to achieve their goal of gathering diverse insights and wisdom on how to move forward in

an innovative way on climate change communication. A trip report and workshop summary will be produce and will be available on the partnership website. Future workshops and site visits will be held in Washington DC, the Kenai Fjords Peninsula in Alaska, the Prairie Pothole bioregion in North Dakota, and the Olympic Peninsula in northern Washington.

This project is one of 15 funded through the National Science Foundation Climate Change Education Partnership program, whose goal is to connect climate scientists and communication professionals to develop strategies and techniques for communicating the complexities of this topic with a larger audience, as well as prepare the next generation of scientists and educators.

For more information: <http://www.sites.google.com/site/ccedpartner/>
Or contact: Angie_Richman@nps.gov

Upcoming Events

April 16-18, 2011

Collaborative Adaptive Management Rendezvous, will be held in Keene, NH. This year's meeting will focus on adaptive governance – the decision making context required for effective response to change, and will feature innovative approaches to management of three resource types: fisheries, forestry, and climate change action.

<http://camnet2011.eventbrite.com>

April 19, 2011

Climate Change Impacts on Great Lakes Fishes. The Ohio State University Climate Change Outreach Team presents a webinar session with Professor Stu Ludsin, who will discuss the projected changes to Great Lakes fish, which have great ecological, economic, and cultural importance for the region.

<http://changingclimate.osu.edu/webinars>

April 20-21, 2011

Colorado State University and the NPS Climate Change Response Program will bring together NPS, USFS, USGS, BLM, and university partner representatives in a workshop entitled *Bridging Boundaries: Adaptation Planning for Grasslands & Forests in the Black Hills & Plains* in Rapid City, SD. The objective of the workshop is to build capacity and improve coordination of climate change management and adaptation efforts among land management agencies in southwestern South Dakota and eastern Wyoming. <https://sites.google.com/site/bordercrossing-workshop/>

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Upcoming Events Cont'd

April 30, 2011

The University of Montana, Missoula will be holding the *Climate Change Indigenous Peoples and Adaptation* symposium which is a blend of Indigenous ecological knowledge and the most current voices in climate change research. The discussions will focus on climate change impacts and adaptation strategies, both environmental and cultural, for indigenous communities in the northern hemisphere. <http://indigenouseideas.org>

May 16-18, 2011

Managing for Tomorrow's Forest will be held in Flagstaff, AZ. Uncertainty abounds when it comes to predicting how and how much the climate will change. Fortunately, many of the management activities that promote healthy forests also make forests more resilient to the coming changes. Foresters and resource managers can explore these concepts at this upcoming National Workshop on Climate and Forests.

<http://www.safnet.org/nat-workshop11/index.cfm>

Pacific West – North Cascadia Adaptation Partnership

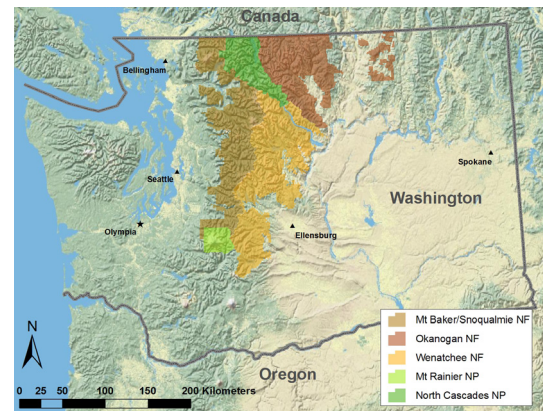
North Cascades National Park Complex and Mount Rainier National Park are working with Mount Baker-Snoqualmie and Okanagan-Wenatchee National Forests to address climate change and protected lands management. The North Cascadia Adaptation Partnership (NCAP) was initiated in the fall of 2010 to address climate adaptation on approximately 6 million acres, straddling the Cascade Mountains, managed by the four federal agencies. The overall project lead is Dr. David L. Peterson of the USFS Pacific Northwest Research Station; co-leaders are Regina Rochefort of North Cascades NP and Crystal Raymond of USFS Pacific Northwest Research Station. NCAP has four primary objectives:

- Synthesize published reports on climate change science to develop an education program for resource managers and stakeholders.
- Assess the vulnerability of natural and cultural resources to a warmer climate.
- Develop science-based adaptation strategies and tactics to increase ecosystem resilience to climate change while maintaining other management objectives.
- Ensure science-based adaptation options are effectively incorporated into relevant planning documents.

Development of adaptation strategies will follow a three stage approach: 1) education, 2) vulnerability assessment, and 3) adaptation. NCAP initiated the first stage, increase awareness of climate change, in February at North Cascades National Park with a workshop for employees and partners. Over 260 attendees heard presentations and discussed climate change with scientists from the NPS, USFS, and the University of Washington's Climate Impacts Group. One more workshop is scheduled in April for Mount Baker-Snoqualmie

National Forest. Dr. Jerry Freilich, NCCN Science Learning Network Coordinator, will be scheduling smaller follow-up workshops for park employees over the summer and fall.

Stage two of the project will assess the vulnerability of cultural and natural resources. Managers and staff from the four agencies will begin to select issues for the vulnerability assessment in March. The NPS began work on this step during Climate Friendly Workshops held within the North Coast and Cascades Network parks in 2009. Issues that were raised at that time included park and forest access (recreation and management), landscape connectivity, high-elevation ecosystems, cold-water fish, and protection of cultural resources. The third and final stage of the project is to incorporate climate change adaptation into current management of federal lands in the North Cascades region. Additional information about the NCAP, climate change resources, and presentations from the workshops are available at: <http://northcascadia.org> Or contact: Regina_Rochefort@nps.gov



Project area for NCAP.

Intermountain Region - Vulnerability of Utah Species

Zion NP, Bryce Canyon NP, and Cedar Breaks NM have recently engaged in a one-year project to provide park-specific climate change modeling and assessment for four important species of concern in Southwestern Utah. The four species: American Pika, Bristlecone Pine, Desert Tortoise, and Shivwits Milk-vetch provide insight into how plants and animals may respond geographically to climate change, even though each species currently are not found in all three of these parks. This specialized assessment that includes potential future climates has the potential to test a variety of approaches to understand species response to climate change and should yield results transferable to other species and parks. Dr. Henry F. Shovic (Shovic Associates, and Montana State University) is the project's lead researcher.

The project will require a finer resolution of climate change modeling than is currently available, and these will be applied to the four individual species. The development of the climate change models will be achieved mainly through the interpretation of satellite imagery (NDVI technique) and the use of spatial modeling (ArcGIS software). Primary model inputs include soils, vegetation, weather, elevation, and species location and habitat data. The future conditions will be based on both projections of future climate and currently observed species distributions. Crucial to the outcome will be the ability to link climate change to physical model parameters. All three parks are providing specialist assistance and GIS support for this project. Contact: Greg_S_Comer@nps.gov



Climate Change Response at Kenai Fjords National Park

Kenai Fjords National Park is no stranger to climate change. Its effects are seen in receding glaciers, freshly exposed land, and washed out roads. So, it's no surprise that the park has engaged with this topic at many levels, researching the effects that are underway, looking for ways to understand what may come next, and seeking out strategies to manage sensitive natural resources in the face of an uncertain future.

Kenai Fjords has created a variety of educational tools and programs to help bring an understanding of climate change to visitors, staff, and the community. In addition to providing climate change-related interpretive programs within the park, Kenai Fjords has established educational partnerships with the local elementary school and the Alaska SeaLife Center. They have even worked with local schools to sponsor student-led home energy efficiency inspections.

Kenai Fjords is also making good use of web-based educational tools and social media. The park has worked collaboratively to create a Web Rangers program focused on climate change, and has also highlighted climate change issues on the park website, Facebook page, Twitter feed, and in their "Field Notes" podcast series.

To encourage reducing carbon footprint, Kenai Fjords leads by example, with electric vehicles, hybrids, and bicycles in their operational fleet; a solar-powered coastal ranger station; and a fuel cell housed at Exit Glacier, a popular tourist destination. The park has also established a "Tour

Green" program, providing carbon offset stickers for visitors who visit the park by tour boat. For 2011 Kenai Fjords will be a participant in the NPS carbon offset program for visitors to the Exit Glacier area.

Climate change research within the park covers a number of issues, including sea level rise and ocean acidification, which then can inform educational programs and management decisions. Partnerships with adjacent Kenai National Wildlife Refuge have allowed the park to further build upon local expertise. In designing facilities, particularly at the rapidly changing Exit Glacier, the effects of climate change must be considered not only in determining flood risk for roads, but also in siting trails and facilities for viewing a shrinking glacier. A redesign of the Nature Center exhibitry explores climate change and its effects to this landmark feature.

At Kenai Fjords, the responsibility for understanding and acting in response to climate change is not merely passed on to the visitor. Park staff are challenged to make changes in their own lives to make a difference as well. The park sponsors an alternative transportation/commute challenge to encourage employees to make efficient transportation choices as they travel to and from work. This is just one way that the park ensures that the responsibility of mitigating climate change, as well as the challenge of adapting to it, is shouldered equally between the park and the community. Contact: Jeff_Mow@nps.gov

(Top) Front view of the carbon offset sticker available at Kenai Fjords NP. (Bottom) Back view of the same sticker.



Your \$2 purchase will offset the CO₂ produced by 150 miles of driving.

What is a carbon footprint?
Your carbon footprint is the amount of greenhouse gas pollution you produce. You can shrink your carbon footprint by reducing your energy consumption and buying offsets.

What is a carbon offset?
A carbon offset is a product that

represents a specific reduction in greenhouse gas emissions. This \$2 offset is equivalent to 150 pounds of carbon dioxide (CO₂) that was NOT emitted into the atmosphere. 150 pounds is the amount of CO₂ produced by driving an average-sized automobile 150 miles.

Where will my dollars go?
This offset is a product of the non-profit Bonneville Environmental Foundation (BEF) in partnership with the National Park Service. BEF's offsets support the production of renewable energy. Your purchase corresponds to the generation of 100 kilowatt-hours of wind and solar power. Learn more at www.b-e-f.org or by calling 1-866-BEF-8247.

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How can I shrink my carbon footprint even further?
Visit www.DoYourPartParks.org to discover ways to reduce your energy consumption. To purchase additional offsets, go to www.b-e-f.org/shop.



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Climate CERTIFIED

Volunteer “Coastodial” Project at Point Reyes NS

According to the Container Recycling Institute, Americans buy over 30 billion single-use water bottles every year with hundreds of millions ending up as litter on the road, beaches, and waterways, posing harm to wildlife and ecosystems. The manufacturing and transporting of new plastic bottles produces more industrial emissions and atmospheric greenhouse gases further contributing to climate change. In an effort to raise public awareness on these issues, Point Reyes National Seashore volunteer Richard James has put together an artistically rendered display of plastic beverage bottles collected along the coast of Point Reyes. His hope was to encourage people to use refillable bottles to help prevent trash from going into the oceans and our environment. James, a photographer of Inverness, CA, collected thousands of plastic beverage bottles over a one year span, trekking 20 miles of Point Reyes coast. Using the bottles and other materials, he constructed five “meta-bottles” and displayed them at various park locations. “What I have learned from

my many hours on the beach is that it does not so much matter how many people pick up the trash that is coming in, 24/7/365 from the sea, more importantly, we all need to stop adding to the mess by making wiser, more sustainable hydration and other purchase choices,” says James.

The five bottles are currently on display in a pasture east of Point Reyes Station, CA on Highway 1 at the corner of Pt. Reyes-Petaluma Road and will be there until May 31 of this year. James has volunteered nearly 500 hours cleaning up the beaches of the Seashore and was also a recipient of the Point Reyes National Seashore Volunteer of the Year Award in 2009. Point Reyes will continue to integrate and encourage volunteer efforts to achieve sustainability and address climate change issues. Many thanks to Richard James for his stewardship efforts! For more information, go to:

www.coastodian.org

Photo courtesy of Richard James.



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.

Submissions are due on the 3rd Friday of every month
Next due: May 20th, 2011

Leigh Welling - Manager
Climate Change Response
Program
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>

Useful Climate Change Resources

A new study by scientists with the U.S. Geological Survey and the University of California, Los Angeles report that drier conditions projected to result from climate change in the Southwest will likely reduce perennial vegetation cover and result in increased dust storm activity in the future. The findings strongly suggest that sustained drought conditions across the Southwest will accelerate loss of grasses and some shrubs and increase the likelihood of dust production on disturbed soil surfaces in the future. The report titled, *Responses of Wind Erosion to Climate-Induced Vegetation Change on the Colorado Plateau*, is available on the CCRP share-point site: <http://nrpcsharepoint/climatechange/Information%20Resource%20Library/Forms/AllItems.aspx>

The January edition of *Nature* magazine has a feature story that profiles the shift in resource management and the National Park Service coming to terms with climate change. Using Yellowstone as an example, the article looks at the option of letting things go or intervening aggressively, and the new conversations that are taking place in order to fulfill our mission.

<http://www.nature.com/news/2011/110112/full/469150a.html>

Are communities in your area hiding their head in the sand when it comes to climate change? An innovative role-playing exercise being tried in Maryland is getting people talking and thinking about climate change. <http://maryland.coastsmart.org/>

The Wisconsin Educational Communications Board has produced a superb interactive website examining nine stories from around the state, from shipping to ice fishing to sugaring. Through personal stories and data, a comprehensive picture of the impact of climate change is created for the public. <http://climatewisconsin.org/>

