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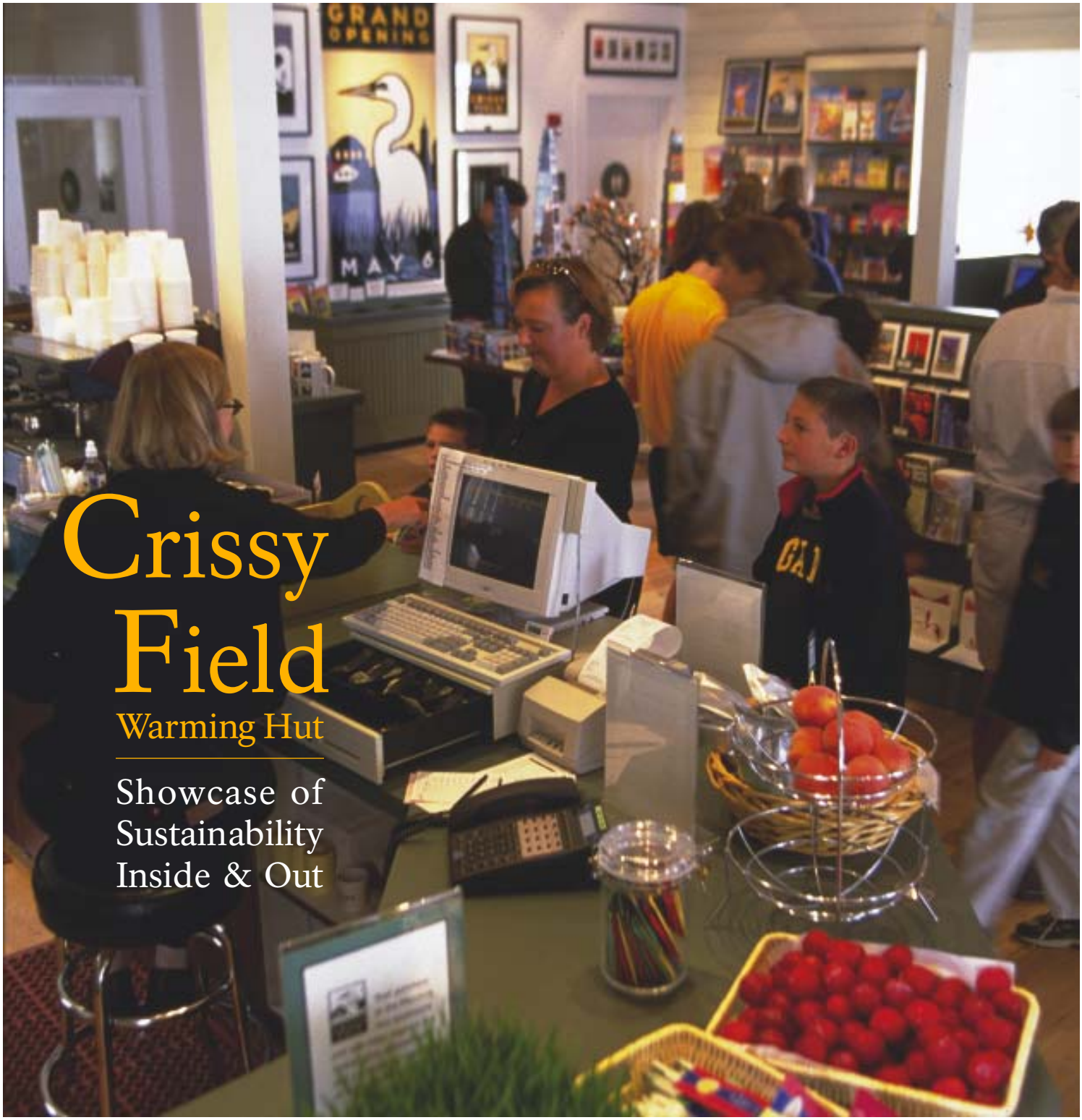
Sustainability news

Spring 2002



Crissy Field Warming Hut

Showcase of Sustainability Inside & Out

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Sustainability News
Spring, 2002
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Features

PHOTO BY CLOVER EARL

PHOTO COURTESY OF MISSOURI BOTANICAL GARDEN

NPS PHOTO

Cover: Visitors attending the Crissy Field Warming Hut grand opening purchase local, organic produce from the "green" menu.

PHOTO BY CHARLOTTE FIORITO

Opposite top: Long used by local fishermen, a fishing pier extends into San Francisco Bay in front of the Crissy Field Warming Hut in Golden Gate National Recreation Area.

Opposite middle: Botanist Peter Raven is a dedicated conservationist and environmental champion.

Opposite bottom: Students construct an energy-efficient building to be installed at the Wonder Lake Ranger Station complex in Alaska's Denali National Park.

National Park Service Environmental Leadership

Welcome to the first edition of *Sustainability News*, a publication dedicated to telling the story of sustainability in the National Park Service. When we recently asked a panel of NPS environmental leaders how to increase the use of sustainable practices and products in our parks, the experts replied that we needed to share our stories about sustainability. The message was clear that throughout the National Park System, there are many stories about environmental solutions to our operational challenges—and to our stewardship mandate.

In this and forthcoming issues, we will feature reports that truly demonstrate the NPS commitment to sustainability. The articles will be as varied as the people and places we help to protect: from alternative transportation systems to composting biosolids, and much more. Most importantly, this publication will provide a means to communicate to one another, and to our visiting public, that we are striving to be environmental leaders. Read on and enjoy.

Shawn Norton, Coordinator
National Park Service
Environmental Leadership Program

If we don't change the direction we are going, we are likely to end up where we are headed.

—ANCIENT CHINESE PROVERB

The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

—NPS MISSION STATEMENT

I am pleased to introduce Sustainability News, a new publication of the National Park Service. This publication highlights the innovations and challenges of the national parks as we strive to integrate sustainable practices into every aspect of park activities and partnerships.

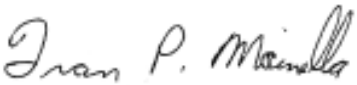
We all understand that national parks exist within a complex global environment unforeseen when the National Park Service was established in 1916. Today, upholding the National Park Service mission of preserving natural and cultural resources and values requires us to do much more than conserve resources and experiences within park boundaries. Our environmental leadership responsibilities compel us to restore park resources, cultivate related stewardship values with the public, and expand associated relationships beyond our original mandate to ensure that these special places endure for this generation—as well as generations to come—to enjoy and appreciate.

In doing so, the National Park Service must continually strive for environmentally sound decision-making that includes comprehensive recycling at parks, energy and water conservation, "green" purchasing and contracting, intelligent transportation management, environmentally compliant solid and hazardous waste management, sustainable planning, design, and construction, improved community outreach, and other key objectives. Involvement by every individual, from park employees and concessioners to park visitors and neighbors, is essential to our success.

In their report titled *Rethinking the National Parks for the 21st Century*, the National Park System Advisory Board said "the National Park System should embrace their mission, as educator, to become a more significant part of America's educational system." Thus we must continually communicate our successes to the public through education and interpretation. Sustainability News is a way for the National Park Service to share information about sustainable living with the visiting public, concessioners, and all individuals, organizations, and potential partners that are interested in our work.

This and future issues contain images and ideas from National Park Service locations throughout the nation. Featured are the endeavors of National Park Service Centers for Environmental Innovation, 20 diverse national parks that have volunteered to serve as models for increasing knowledge of the best environmental, sustainable, and conservation practices and products that advance the agency mission. Outside perspectives from notable experts on the subject of sustainability are also included.

Now, more than ever, the National Park Service role in environmental leadership calls for communication with an audience beyond park boundaries. Our parks are places of natural and cultural constancy that offer opportunities for healing and renewal at a time when such experiences are welcome and needed. Everyone—whether or not they visit a national park—is connected to the water, soils, air, and scenery protected within the National Park System, and everyone shares the responsibility to sustain these resources into the future.



Fran P. Mainella, Director
National Park Service

NPS PHOTOS

Top and bottom: A biodiesel rideshare program jointly financed by Yellowstone National Park and NPS employees reduces fuel consumption and decreases air pollution.

Opposite top: Cooperative efforts help to beautify and restore park environments. Volunteers at Chesapeake and Ohio Canal National Historical Park work to remove vast amounts of flood debris from a picnic area.

Interagency Initiatives

The essence of innovation is to achieve organizational change by doing things in a new or different way. This frequently means working with other agencies to find solutions common to both. Three years ago, when the Department of Energy (DOE) sought places to showcase renewable and conservation energy technology to the public, they approached the Department of the Interior with an idea to use the national parks as demonstration areas. The interagency initiative that emerged is called the "Green Energy Parks Program," and it has enabled hundreds of parks to undertake projects. This has reduced significantly the amount of energy consumed, and it has increased knowledge of green technologies. Both the National Park Service and DOE benefited greatly.

Similarly, when the National Park Service wanted to develop workshops to assist newly designated NPS Centers for Environmental Innovation in becoming greener, the Environmental Protection Agency (EPA) and the National Recreation and Parks Association (NRPA) collaborated with the NPS to create the first "greening workshop." At the initial workshop conducted in March 2002, participants learned how to develop strategic plans for greening NPS master planning, community outreach, transportation design, facilities operation and maintenance, facilities design and construction, concessions operations, and other efforts. Participants also learned how to improve interpretation of such activities to the public.

Leading by Example

These collective efforts only begin to define the character of national parks working toward a sustainable future. Integral to these projects are the endeavors of dedicated staff and partners.

Outstanding environmental leadership involves sustaining partnerships as well as resources. An ambitious recycling program at **Joshua Tree National Park** relies on volunteers that have logged over 4,100 hours and collected more than 68 tons of material. Members of the California and Youth Conservation Corps recently renovated an asphalt nature trail using non-toxic tread composed of organic cactus extract. Workers contributed 4,780 hours and recycled more than 80 tons of asphalt to provide universal access to the desert environment.

Volunteers are just one important element of Joshua Tree's commitment to sustainability. "We are committed to embracing the need to conserve energy, to shifting consumption from peak to non-peak time, to replacing high-energy consumptive equipment with high-efficiency projects, and to exploring new methods of accomplishing park missions through the use of renewable energy. The National Park Service has a deeply embedded conservation ethic and success in implementing renewable energy projects," says superintendent Ernie Quintana.

Every summer this conservation ethic is challenged in July and August as **Yellowstone National Park** transforms into a city with 1.5 million visitors. When the park celebrated its 125th anniversary in 1997, the most important question asked was what can be done to preserve and protect this national treasure for the next 125 years. The result was a movement called "The Greening of Yellowstone," which launched the park's aggressive program to address pollution prevention, waste reduction, alternate fuels, and recycling.

Yellowstone's efforts include a rideshare program initiated by employees that reduces fuel consumption and decreases air pollution from hydrocarbon emissions. More than 40 employees previously commuted to park headquarters individually or in small carpools, some from 50 miles away. The DOE's Idaho Engineering and Environmental Laboratory furnished the park with two surplus coaches to provide transportation at cost to employees. Staff using the rideshare program pay for biodiesel fuel consumption and maintenance on a coach. The program eases parking constraints and improves safety by decreasing traffic. Employees remark that the rideshare program benefits them with cost savings and less stress, especially during winter driving months.

A study is underway at **Blue Ridge Parkway** to determine the feasibility of a mass transit system to shuttle visitors to sites near Asheville, North Carolina, and Roanoke, Virginia. An environmental management policy statement developed by the park's environmental management team provides guidance. Interdisciplinary employee teams also are identifying environmental management objectives at **Santa Monica Mountains National Recreation Area**, **Homestead Na-**

National Park System Centers for Environmental Innovation by Region

Alaska Region
- Denali National Park and Preserve
- Lake Clark National Park and Preserve/Katmai National Park and Preserve

Intermountain Region
- Dinosaur National Monument
- Yellowstone National Park

Midwest Region
- Homestead National Monument of America
- Pictured Rocks National Lakeshore

National Capital Region
- Chesapeake and Ohio Canal National Historical Park
- Prince William Forest Park
- Catoctin Mountain Park

Northeast Region
- Boston National Historical Park
- Assateague Island National Seashore
- Fort McHenry National Monument and Historic Shrine
- Gateway National Recreation Area

Pacific West Region
- Joshua Tree National Park
- Santa Monica Mountains National Recreation Area
- Point Reyes National Seashore
- The Presidio/Golden Gate National Recreation Area

Southeast Region
- Blue Ridge Parkway
- Mammoth Cave National Park
- Big Cypress National Preserve

NPS PHOTO

tional Monument of America, **Denali National Park and Preserve**, and the NPS Denver Service Center Site Design Branch.

Green Teams

Teamwork generates unique approaches and valuable partnerships. In 1996 **Fort McHenry National Monument and Historic Shrine** obtained a recycled building from **Gettysburg National Battlefield** and erected it as a new maintenance headquarters. Fort McHenry later entered into a Green Energy Parks Program contract to involve local business partnerships that donated more than $36,000 to the project. A partnership with the Kentucky Corn Growers Association helped **Mammoth Cave National Park** become the first USDI location with a dedicated E-85 ethanol fueling station. The park's biodiesel vehicles recently received significant publicity when featured in the *Kentucky Soy Update* newsletter.

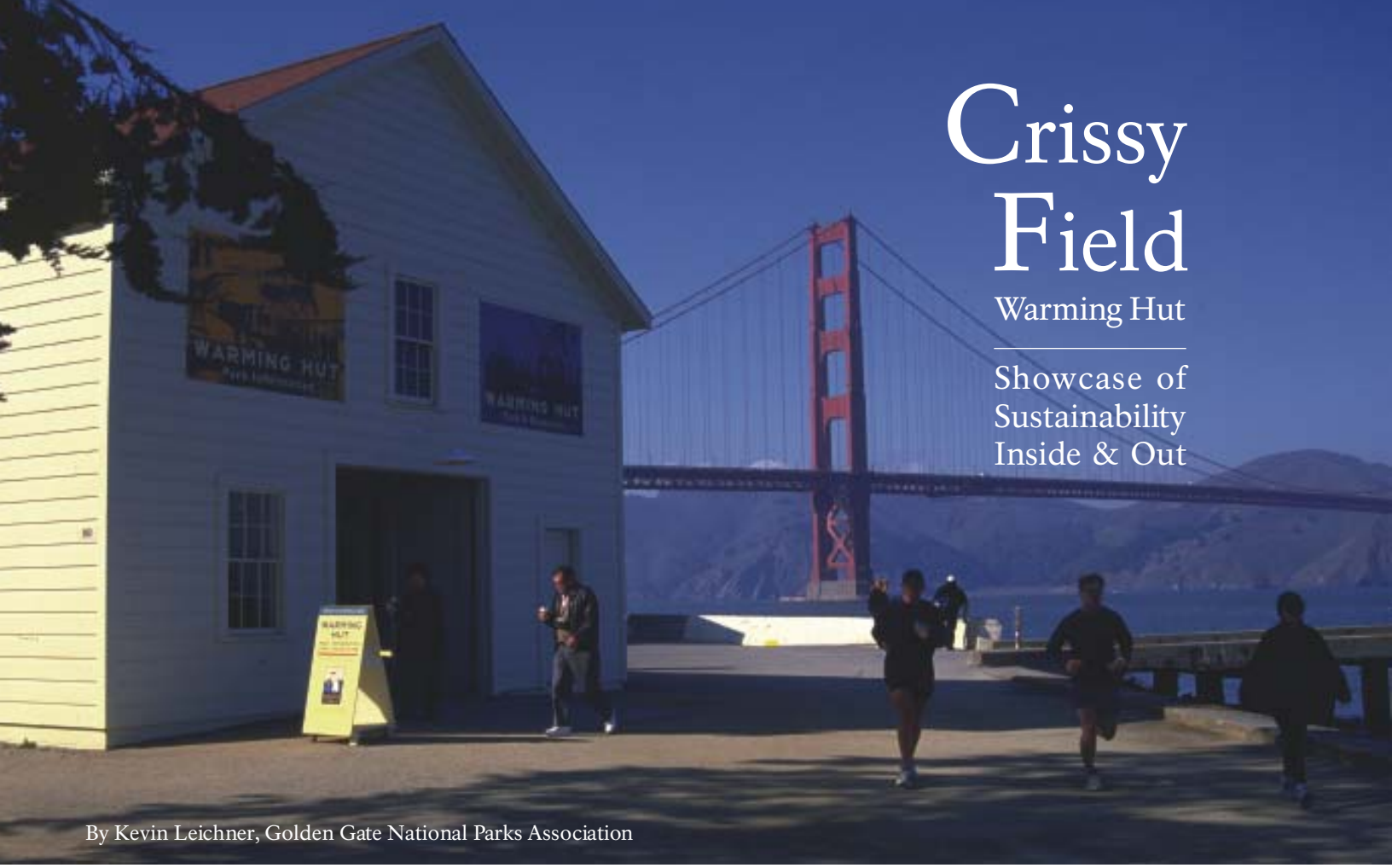
Architects and planners contribute particularly inventive solutions to environmental management. A new lighting system at **Boston National Historical Park** will reduce energy consumption and costs while maintaining security at the Bunker Hill monument. Designs will limit the number of fixtures that operate during off-peak times at the site, which is situated in a densely populated urban area and open 24 hours a day. Improvements at Tom's Cove in **Assateague Island National Seashore** include new mobile restrooms, changing rooms, and rinse showers that incorporate a variety of environmentally sensitive features—and can be removed quickly during severe storms.

While some parks work to achieve technological advances, many succeed by modifying conventional operations. **Dinosaur National Monument** integrates pollution prevention into all aspects of facility management. Don Durbin, facility manager, explains, "There is a basic value in demonstrating the many ways to minimize impacts to others. Pollution prevention is a mindset, an endless stream of opportunities." **Chesapeake and Ohio Canal National Historical Park** and Virginia's **Prince William Forest Park** are designated "Trash-Free" parks. "Take home" bags and recycling containers allow visitors to help keep these areas free of litter.

Big Cypress National Preserve superintendent John J. Donahue states, "The NPS has a core mission mandate to ensure that all visitation that takes place does so in a sustainable manner." The park's sustainable management system for high-impact recreation allows reasonable access in a fragile environment. The plan reduces 23,000 miles of social trails created by off-road vehicles to a managed system of 400 miles of trails, further protecting archeological sites, air, water, soils, wildlife, and endangered species.

Systemwide Sustainability

Many are following the lead of the CEI parks. From recycling natural wood siding at California's **Redwood National Park** to the design and construction of South Carolina's new Liberty Square and **Fort Sumter National Monument** Visitor Center, environmental leadership successes already have become important chapters in each national park story—and now are becoming important parts of our daily lives.



Crissy Field

Warming Hut

Showcase of Sustainability Inside & Out

By Kevin Leichner, Golden Gate National Parks Association

Warming Hut visitors enjoy a sunny winter morning on the Crissy Field promenade in Golden Gate National Recreation Area.

Percolating Change

On a clear, chilly morning, park visitors set out for the Warming Hut, a new destination in California's Golden Gate National Recreation Area. From East Beach, Crissy Field extends in a gentle crescent about one mile long. Dwarfed by the Golden Gate Bridge, the white-clapboarded, red-roofed building stands at the opposite end of the promenade, a shoreline path that is part of the San Francisco Bay Trail. Cyclists and runners, many pushing baby strollers, race past the restored marsh and historic airfield, their breath crystallizing in the cold air. Some visitors huddle on concrete benches alongside the beach, watching boat traffic in San Francisco Bay, and admiring Marin and Mt. Tamalpais. Others are more eager to reach the Warming Hut for a hot cup of coffee.

Barn-style doors open wide to welcome visitors and anglers that cast from the pier. The 2,400-square-foot visitor information center, bookstore, and café buzzes with conversation. Comfortably worn wood furnishings display park guides, junior ranger activity packs, and earth-friendly wares. Customers at the café counter choose food and drink from a slate menu that was once a chalkboard in an Oakland schoolhouse. All are treated to panoramic views of Alcatraz Island through the glass vestibule. Children play on a sustainably harvested fir floor, while a bookstore customer browses literature about Crissy Field. Patrons, seated on a wrap-around bench built from re-milled fir salvaged from the original floor joists, slowly emerge from layers of winter clothes. As the barista prepares a cup of coffee with a smile, I am reminded once again of the teamwork and dedication that made all of this possible.

Collaboration

Excellence in visitor services, information, and interpretation are part of the National Park Service mission to provide enjoyment and education, and to preserve natural and cultural resources. These traditions, coupled with the Secretary of the Interior's Initiative on Environmental Leadership, inspired creation of the Warming Hut as a model of sustainability.

Less than a year was available to design and construct the adaptive reuse of the dilapidated 1909 structure—originally a United States engineer storehouse—in a manner consistent with the Secretary of the Interior's Standards for Historic Preservation. The fast-tracked design-build process occurred during the final months of the overall restoration of Crissy Field, a $34.8 million public campaign to transform a former Army dumping ground and an obsolete airfield

PHOTOS BY CLOVER EARL

Top: Post-industrial waste denim insulation and pressure-treated, arsenic- and chromium-free structural members are visible through the Warming Hut attic hatch.

Bottom: Crissy Field Warming Hut offers an opportunity to escape blustery winds on Crissy Field and savor shade-grown coffees featured on the "green" café menu.

into a new, 100-acre shoreline park. The development of the Warming Hut project was a response to an interpretive need inherent in the Crissy Field project's core interpretive theme of sustainability.

Warming Hut collaborators included professionals from the National Park Service, Golden Gate National Parks Association (GGNPA), the non-profit cooperating organization to Golden Gate National Parks, and many consultants. The team expanded the scope of the project to include a holistic consideration of public education and sustainable design, construction, and operations when they realized the project could become a vehicle for change powered by considerable talent and resources. The group then investigated different definitions of sustainable, or "green" design, and consulted local experts such as Alice Waters, renowned chef and advocate for sustainable agriculture and foods, who provided inspiration to the development of the café menu. A working definition of sustainability evolved to include the following objectives: choose self-perpetuating materials and manufacturing processes, promote economy of use (waste not, want not), favor local resources and select materials derived from renewable resources, and support positive social and economic goals.

Warming Hut project lead architects Marien Coss, GGNPA, and Carrie Strahan, NPS, managed weekly team workshops, oversaw committee and consultant meetings, enforced a goal-driven agenda, and developed ongoing design iterations. While they shared duties, Strahan researched non-toxic, recycled, or reusable materials to satisfy sustainability objectives. Coss found ways to integrate them into the design. The difficulty of balancing preservation needs with sustainability goals became apparent when a product did not perform as desired. According to Strahan, defending material choices during the budget process or facing resistance to an unusual specification was sometimes necessary. "We learned you've got to stick to your guns because once it's in place, you can't go back," she said. The enthusiasm, dedication, and close working relationship between Coss and Strahan encouraged team members (specialists who typically followed different processes and timetables) to make consensus decisions and synchronize their efforts to meet common goals.

Interpretive elements were incorporated into the design, programming, merchandise, and operations at the Warming Hut. Howard Levitt, NPS Chief of Interpretation, and Jon Plutte, GGNPA Media Producer, considered diverse approaches such as leaving sections of the interior exposed to reveal building systems to printing key messages on recycled napkins. They eventually settled on a traditional approach to interpret contextual themes that features story panels and site photographs framed in recycled barn wood. Retail products were selected based on educational value and adherence to sustainability objectives. The team developed a menu that promotes local produce and sustainable farming practices, and the café and bookstore staff is an information and interpretive resource available to Warming Hut visitors.

Welcoming the Public

The Crissy Field Grand Opening occurred on May 6, 2001, a day with no fog and temperatures over 90 degrees. An estimated 75,000 guests, many of whom walked from surrounding neighborhoods, were welcomed to their new park. Visitors to the newly dedicated Crissy Field Center, an impressive, adaptively reused historic structure and programming center nearby, gave positive reviews to the future Warming Hut information center, bookstore, and café offerings. The design team was stationed at the Warming Hut, still under construction. People eagerly peered through the windows and recounted the restoration process—particularly the most dramatic few weeks when the entire structure was raised and the foundation was rebuilt. Guest comments indicated that the Warming Hut could expect repeat visitation, and the visually accessible construction site had kept the design team's work in the public eye.

The promise of success was particularly important to the interpretive mission. Golden Gate National Parks Association staff members Clover Earl, Director of Sales and Interpretive Media, Associate Director of Visitor Center Sales Linda Chalmers, and Associate Director of Retail Development and Marketing Robert Lieber, and Anne Baskerville, a consultant with guest services experience, were charged with bringing interpretive themes to life. It was necessary to balance rich public offerings, visitor education, and affordability with securing funds to reinvest in Crissy Field Center public programming. Offerings were required to reach out to a number of park constituent groups, including tourists, locals, dog owners, children, and the anglers who use the pier in front of the building.

A new challenge then arose: selecting sustainable interpretive merchandise. While some choices may depart from traditional park offerings, the sales items are consistent with the spirit of the Warming Hut. Chalmers discussed the range of products relating to bird enthusiasts. "Because of the interest in the restored marsh,

Collaboration is now one of our principles of sustainability.

we're carrying four bird guides, including *Birds of San Francisco and the Bay Area*, and early learners books for the kids. And then we have a birdhouse kit for ages six and up, as well as a beautiful selection of recycled cards with bird images on watercolor paper, and blank birding journals, also made from recycled paper."

The Warming Hut concept has evolved into a facility that serves the local community, as well as tourists, as a destination that can support a complex interpretive message about environmental, economic, and social sustainability. The space promotes a global consciousness of the impacts of simple, daily actions through what could be called a sustainability aesthetic, which is conveyed by the warmth and comfort of the building, store fixtures, and sales items. The Warming Hut has been successful at attracting a large, local user group, and is especially popular with young people because of the welcoming, homey furnishings, understated fixtures, and earth-toned color palette.

The Future

Strong organizational support made the Warming Hut possible. National Park Service Superintendent Brian O'Neill, GGNPA Executive Director Greg Moore, and Catherine Barner, GGNPA Director of Park Projects, tirelessly promoted the new venture. O'Neill, Moore, and Barner had identified the creation of the Warming Hut as a high priority that would embody the Crissy Field project goals of remediation, recycling, restoration and renewal. Barner, the liaison to NPS leadership, Glen Angell, Crissy Field Construction Manager, and the design team, promoted group morale, mediated difficult situations, and smoothed the approval process.

Collaboration is now one of our principles of sustainability. Use of in-house talent for design, project management, construction, and execution realized tremendous cost savings. The design-build model succeeded because dedicated contractors and suppliers, such as BBI Construction, became members of the team. Regular meetings and clearly defined responsibilities created an exciting atmosphere that all team members have expressed a desire to experience again on the next project. While the process was time-intensive and high-pressured, there is great pride in the final product. Tighter bonds have formed between members of different departments in the NPS and GGNPA who usually do not have an opportunity to work together.

The Warming Hut's success is certain to inspire further innovations. Seated with other park visitors, enjoying sustainably harvested, shade-grown, fair-traded coffee in the Warming Hut café, I remember something that Barner said. "Basing a project on the goals of sustainability, teamwork, and local outreach, we've pushed the envelope of sustainable design, encouraged in-house talent, and cultivated new audiences among regional user groups and young people. We've made this a focal point for the community to increase awareness and support for the park." The next project surely is just around the corner.

PHOTO BY CHARLOTTE RORITO

Warming Hut bookstore products include dynamic children's offerings that introduce youngsters to the park and to sustainability principles. In-house designer Robert Lieber designed the Redwood Stacking Blocks displayed on the table.

How the Warming Hut Meets Sustainability Goals

- Reuse of an existing historic building
- Implementation of a waste prevention program during construction
- Specification of conservation technologies such as compact fluorescent or halogen lighting, low-flow toilets
- Feature of local, organic produce in the café
- Sales of recycled content and socially sustainable merchandise

Sustainable Building Materials and Technologies Used in the Warming Hut

- Wood flooring - cottage grade fir source from a small tree-thinning eco-restoration project on public lands
- Café flooring - marmoleum linoleum from linseed oil, wood flour, rosin binders, and dry pigments fixed to a natural jute backing
- Insulation - 85% post-industrial cotton (denim) treated with Borate
- Paint - low or no emission of Volatile Organic Compounds (VOC)
- Sealant - water-based polyurethane for furniture and floors
- Structural wood members - chromium-free and arsenic-free pressure-treated wood
- Concrete slab - includes 24% fly ash, a power industry waste product
- Pest control - sprayed in place with Timbor, an environmentally-friendly pest-control product
- Retail fixtures - fabricated from sugar pine, a highly renewable resource
- Toilets - low-flow
- Menu board - recycled chalkboard from an Oakland schoolhouse
- Interpretive framing - recycled barn wood
- Cabinetry and casework - certified forest lumber source, formaldehyde-free adhesives
- Café tables and benches - salvaged fir from original floor joists

Breaking New Ground at The Presidio

By Marney Blair, Presidio Trust

PHOTO BY THE PRESIDIO TRUST

A rich compost ecosystem reveals living treasures such as earthworms and baby salamanders.

Bay Area students turn and sift compost piles weekly as participants in the "Here's the Dirt" program.

A great transformation is underway to restore urban habitat at the Presidio of San Francisco. Part of Golden Gate National Recreation Area, the Presidio contains native plant communities, rare animal species, and structures from every major military construction period since 1848. The Presidio Trust manages the park in partnership with the National Park Service.

Challenges to the restoration effort include creating living forests from non-native historic plantation forests, reestablishing the once thriving native plant and animal population, and revitalizing the once majestic historic lawns and "victory gardens." Composting helps accomplish these objectives.

The park annually generates thousands of cubic yards of green debris during the restoration. A valuable resource, this organic matter is no longer viewed as waste. Finished compost product is used to heal and restore the soil—and the plants and organisms on which it depends. The Presidio Trust's composting program achieves three goals:

1. Capture and compost all organic debris to reduce the waste stream, save money, and create a valuable product.
2. Produce the highest quality compost possible to contribute to park restoration.
3. Change the nation's perception of compost and soil regeneration.

Creating and implementing a composting program in a national park presents unique opportunities to shift the public's perception of compost and composting operations. Most people generally recognize compost, and the process of making compost, as a smelly waste reduction process. The Presidio Trust demonstrates that the art of making compost is a regenerative process in which materials once considered "dead" actually are transformed into life-giving substances. Perceptions about compost slowly are changing as youths and adults enjoy hands-on education and field research projects.

Every aspect of making and using compost presents an opportunity for education. Bay Area school children participate each week in sifting, turning, and making compost piles as they participate in a program called "Here's the Dirt" organized by the NPS and the Golden Gate National Parks Association. The mysteries of reproduction and heredity are revealed to participants investigating organisms in the pile. Compost explorers sifting through the rich debris also observe the wonders of ecosystems, diversity, and the cycles of death and rebirth.

Experimentation on innovative uses for compost provides another opportunity for education. For example, 150 gallons of compost "tea" is brewed every week to restore balance to the Presidio Golf Course soil ecosystem. Weekly applications enable a 95-percent reduction of fungicide applications compared to other private San Francisco golf courses. Presidio specialists also work closely with their native plant nursery staff to ensure that soil amendments maintain the integrity of native species and produce only beneficial effects on restoration efforts.

Q&A

Peter Raven, Ph.D.

PHOTO COURTESY OF MISSOURI BOTANICAL GARDEN

"The only reason for embracing sustainability is a desire to share the world's bounty with our families, our fellow citizens, and people all over the world."

Sustainability News: Sustainability is described by scientist Kai Lee as a direction in which we must strive. Will attaining measurable goals automatically establish this new way of thinking?

Raven: Many measurable environmental trends are negative. Over the past 50 years, we have wasted about a fifth of the world's topsoil, lost about the same proportion of agricultural land, cut nearly a third of the forests that existed in 1950 without replacing them, changed the atmosphere's character profoundly, and driven the rate of biological extinction to about 100 or even 1,000 times its normal level. Reversing these trends will make the world a better place with more opportunities for our descendants.

Sustainability News: How can the NPS maximize its environmental leadership role to make sustainability a meaningful part of everyone's lives, whether or not they visit a national park?

Raven: Park visitors are in a receptive mood. The parks can become very positive forces in shaping the common life of America by providing good examples of sustainable management, energy conservation, green architecture and engineering, and interpretative materials about these practices. The parks should be outdoor classrooms in which the values that lead to sustainability can be championed.

Sustainability News: How is the idea of respect fundamental to sustainability?

Raven: The only reason for embracing sustainability is a desire to share the world's bounty with our families, our fellow citizens, and people all over the world. When the human population was much smaller, before the development of crop agriculture, behaviors now viewed as selfish (such as hoarding food) could benefit those who practiced them. In a world with 6.1 billion people, likely to grow by half again before population levels stabilize, and a world in which it seems everyone wants levels of consumption to grow, there is simply not enough room, not enough productivity, for everyone to live at the highest standards of consumption—at least not using available technologies. We need to use the natural productivity of plants and algae, water, and other commodities more efficiently. Only a change in moral perspective, in commonly accepted philosophy, will enable us to do this.

Sustainability News: Emphasis on scientific research is primary to sustain park resources. How can the NPS make such efforts relevant to individuals, communities, and partners?

Raven: The only way is to form effective partnerships with adjacent public lands such as national forests and state parks. It is especially important to forge effective links with private landowners acting voluntarily. Biodiversity, which includes the concept of productive natural communities providing ecosystem services that support human society, can flourish and be sustained only on a regional basis. Most United States land is in private hands, and the management of all our lands as a common enterprise is the only realistic way to preserve what we love about America. Parks can teach ways to do this.

Sustainability News: Funding is often an obstacle to sustainability programs. What is an effective way to ensure collaboration to promote sustainability of natural and cultural resources?

Raven: Laws can be modified to encourage participation by private landowners in such partnerships. People should be rewarded for willing participation in the preservation of endangered and threatened species, rather than punished for problems that may arise. Education is the proper answer, and mutual respect leads to successful partnerships. No government in the world can raise enough money to carry out all the actions that might be thought valuable, but governments can provide guidance and develop laws. For example, tax laws can encourage everyone to participate in developing a sustainable society.

Sustainability News: As steward of the world's finest system of national parks, how can the NPS contribute to global sustainability?

Raven: The NPS should be encouraged and funded to further expand outreach around the world. The case is obvious for protecting migratory species and others that know no boundaries, but by being a good model and a good partner, the NPS can do an even better job of encouraging the development and continuing support of protected lands throughout the world. What a great gift for the United States to give: lessons and models that help to create a more healthy, prosperous, and interesting world for everyone!

One of the world's leading botanists, and a dedicated advocate for conservation and a sustainable environment, Dr. Peter Raven is Director of the Missouri Botanical Garden in St. Louis.

Collaboration | PARTNERSHIPS, COOPERATION, AND COORDINATION

By Elwood Lynn, Denali National Park and Preserve

NPS PHOTOS

Top: School-to-Work students construct new, energy-efficient buildings for Denali's Wonder Lake Ranger Station complex.

Bottom: A truck hauls one of the buildings from the school grounds to Wonder Lake, 100 miles away.

Sustainability Goals Attained

- Conversion of heating and power generation infrastructure from diesel to propane
- Installation of hybrid power system; generator downsized from 30kW to 14 kW and installed in soundproof building; generator run-time reduced from 24 to 4 hours per day by battery bank inverter system; natural quiet is restored
- Installation of energy efficient windows, appliances, and fixtures; electric resistance heaters replaced with propane heaters
- Fully insulated new buildings
- Photovoltaic water-pumping system installed; elimination of three-phase electric pump
- Reduction of fuel consumption by 50% or 2,500 gallons annually; exhaust emissions, CO2, SO2, and NOX reduced by 34 tons, 119 lbs., and 52 lbs. respectively

Alaska's Denali National Park recently faced an almost impossible task: renovating a remote ranger station with inadequate funds. Simultaneously, the local school district, challenged by a shrinking budget, was on the verge of eliminating building and trades shop classes. The solution was a partnership that benefited the park and the school district beyond expectations.

Wonder Lake Ranger Station is located deep in the heart of Denali National Park, 90 miles from park headquarters. Built in 1939 by the Civilian Conservation Corps (CCC), the historic ranger station serves visitors, and additional structures provide temporary housing for park staff.

Frozen soils and extreme low temperatures make Denali's sub-arctic environment a difficult place to construct, operate, and maintain buildings. The ranger station began to sink into the thawing permafrost almost immediately after its completion. Park maintenance crews struggled to protect the ranger station's integrity by separating the original building from its foundation. The basement was allowed to subside, while the upper level was suspended with cribbing and large beams. A thick ice lens below the thawed soils caused the structure to develop an 18-inch list as the ranger station continued to sink.

The building was condemned in 1998, and the park began searching for funding and engineering solutions. A full rehabilitation was required to protect the historic building, correct code deficiencies, and reduce energy consumption. Committed to saving the top half of the ranger station, the national park abandoned the basement because of the permafrost soil problems. New outbuildings were required to relocate basement showers, restrooms, and maintenance operations. Temporary housing, in poor condition, was in need of replacement.

A contractor moved the ranger station off its foundation, removed the basement, filled the excavation with non-frost-susceptible soils, and placed the building at the original site on a new post-and-pad foundation. However, contracting proved to be cost prohibitive with the project site located at the end of a restricted access road more than 200 miles from the closest lumberyard or hardware store. The park quickly recognized that costs would far exceed available funding without a different approach to the rehabilitation. A 1999 Department of Energy SavEnergy audit guided smart energy related decisions. Park day labor crews corrected structural problems, gutted the interior, and installed new wiring and insulation. Historic details were maintained by refurbishing the original windows, doors, and flooring.

At the same time, the national park developed a School-to-Work partnership with the Denali Borough School District. The park provided building materials and a part-time instructor. In return, winter shop classes constructed new, energy-efficient buildings on the school grounds to be transported to Wonder Lake in spring.

Many students were first-time visitors to Denali. Touring the job site allowed them to meet NPS employees in the field and appreciate the unique qualities of the park and the significance of the CCC era. Awareness of energy conservation increased as students learned about the environmental benefits of energy-efficient lighting and appliances, reducing exhaust emissions, and eliminating soil contamination risks by using propane instead of diesel fuel.

"Students at risk" also benefited. The school district allowed these students additional shop class time if they maintained their grades. Several that were ready to drop out stayed in school to participate. Other students changed career paths as they obtained new skills and interests.

Denali's School-to-Work program has grown in strength and scope over the past three years. To date, more than 75 students have worked to construct a shower and laundry facility and two housing units. Journalism, computer, and math classes now participate. The local community has embraced the Denali effort by providing volunteer journeyman-level instruction and donating tools and materials. Several students have started to design homes that include energy-saving techniques used at Denali. Some have gone on to work for the park in seasonal and Student Career Experience Program (SCEP) positions.

As the rehabilitation of the Wonder Lake Ranger Station complex draws to a close, the park and community are ready to plan new projects for the students. All agree that this special partnership is too valuable to allow it to come to an end.

NPS PHOTO

Homestead Partnership Lights Way for Learning

Hundreds of visitors attend evening interpretive and living history programs at Homestead National Monument of America. Until a partnership with the local power company facilitated installation of a photovoltaic lighting system, attendees had to negotiate an unlighted parking area, a significant safety concern identified by park managers.

Limited funding had restricted the park from making lighting improvements, but two lift bucket trucks and volunteer operators from Norris Public Power enabled NPS staff to address the problem. Three 20-foot-high lights, each with its own solar collector and battery bank, were installed in the parking lot. A series of seven bollard lights, operating from one solar collector, significantly improved pedestrian safety along the visitor center sidewalk. A strategically placed solar collection system now illuminates both sides of Homestead's entrance sign west of Beatrice, Nebraska.

Reporters from the Beatrice *Daily Sun* and the Lincoln *Journal Star* documented the cooperative installation. The park, which commemorates the Homestead Act of 1862, now can safely educate visitors about frontier settlers who pioneered the harnessing of free energy from the wind and sun.

Protecting park resources requires a knowledgeable public. Exhibits, media, and publications communicate NPS messages to help make the world outside parks as environmentally sustainable as the area inside parks.

Green Voice

Each national park is unique, yet National Park Service regions share certain environmental concerns and challenges. In the Pacific West Region, environmental leadership is an integrated approach for improving environmental compliance, preventing pollution, and educating others about sustainable practices. *Green Voice* is a publication produced by dedicated Pacific West Region staff to share information about sustainability issues, practices, and resources among NPS areas located in the region. Each issue contains detailed articles describing projects ranging from biodiesel fuel use at **Hawaii Volcanoes National Park** to alternative propulsion for tour boats on **Crater Lake**. Write to Elize VanZandt at elize_vanzandt@nps.gov for a copy of *Green Voice*, or contact Sonya Capek at 206.220.4271 for more information.

Green Purchasing

Leading by example is one of the most effective ways to convey the importance of sustainability. The NPS practices product stewardship by incorporating environmentally preferable requirements in its business practices. Using "green" products reduces external impacts to parks that result from virgin material production. By creating a market for greener products, these goods become more available to the public, helping to lessen the effects of standard products on the environment. Visit the EPA's Environmentally Preferable Purchasing website at www.epa.gov/opptintr/epp for details.

GreenLine

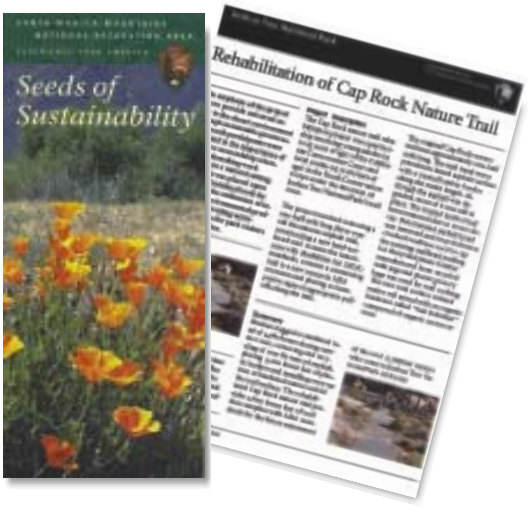
For park concessioners, "greening" means more than using resources efficiently, seeking environmentally preferable products, and minimizing waste. It also means partnering with the NPS and local communities to educate the public about environmental stewardship and "greening" initiatives.

GreenLine, a publication produced by the NPS Concession Program, helps concessioners demonstrate sound environmental management. The biannual newsletter provides concessioners a forum in which the NPS can share information about the Concession Environmental Management Program, current environmental requirements, and Best Management Practices. It also identifies resources available to improve concessioner environmental performance, and it highlights their success stories. The free publication is produced using environmentally preferable materials and is planned for online distribution. Contact the *GreenLine* technical assistance and clearinghouse line at 303.987.6913 or nps_greenline@nps.gov.

Park Publications

A leader in fostering successful partnerships, **Santa Monica Mountains National Recreation Area** distributes an eye-catching publication, *Seeds of Sustainability*, that describes long-term goals and accomplishments to park neighbors. The brochure outlines the park's innovative environmental program and how everyday choices contribute to sustainability.

A publication for visitors to **Joshua Tree National Park's** Cap Rock Nature Trail provides details about sustainable practices used to rehabilitate the area. Produced in-house, the flyer is printed in quantities as needed, or it is available as an electronic document.



NPS sustainability efforts reach for the stars at Chaco Culture National Historical Park

Photo by G.B. Cornucopia, Chaco Culture National Historical Park

A thousand years ago, the Chacoan people planned ceremonial events and agricultural planting according to celestial observations. In this remote, northwest corner of New Mexico, Puebloan descendants continue many of these traditions under clear, dark skies, free from urban light pollution. In 1993 Chaco Culture National Historical Park designated the night sky as a critical resource to be protected.

All park lighting has since been retrofitted to reduce light pollution and enhance night sky viewing. In 1997 a partnership with The Albuquerque Astronomical Society attracted astronomer John Selfick to donate a domed observatory and equipment to the park. Chaco's Night Sky Program is now a successful volunteer project that involves more than 13,000 park visitors each year.

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EVENTS AND OPPORTUNITIES

April 15-19

Facilities Management Conference

Stewardship of Federal Facilities: Meeting Challenges and Sharing Successes is the theme for this San Diego, California, event. View more information at www.nbc.gov/conference/facilities.

April 20

Seeds of Sustainability

Santa Monica Mountains National Recreation Area in Thousand Oaks, California, sponsors this lecture series. Participants discuss how to lower long-term residential maintenance and operating costs to improve quality of life. Contact Ted Hillmer, 805.370.2300, e-mail: t_john_hillmer@nps.gov.

April 22

Earth Day

Celebrate the anniversary of the 1970 birth of the modern environmental movement. Visit www.earthday.net for full details.

May 3-4

National Capital Region Sustainability Fair

This NPS event on the National Mall in Washington, D.C., showcases many of the successful and sustainable innovations incoporated by the National Park System. Contact Kate Richardson, 703.221.2947, e-mail: kate_richardson@nps.gov.

May 13-14

State of the Planet Conference

Leading scientists, opinion-makers, and policy experts gather in New York City to explore the theme: *Science and Sustainability*. Visit www.earthinstitute.columbia.edu/sop2002.

June 2-5

Energy 2002

A national workshop and trade show in Palm Springs, California, features the latest energy-saving strategies and products. Find out more at www.energy2002.ee.doe.gov.

June 7

Sustainable Bathhouse Ribbon Cutting

Assateague Island National Seashore holds a ribbon cutting ceremony at 11:00 a.m. to celebrate completion of the sustainable bathhouse project near Chincoteague, Virginia. Contact Tina Hartz, 410.641.1443 ext. 239, e-mail: tina_hartz@nps.gov.

July 15-17

Greening the Federal Government

View details about this Las Vegas, Nevada, workshop at www.govinst.com/edusched/Courses/Enviro/green_fedgov.

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Send comments, articles, address changes, and information on conferences, training, and publications to Diane T. Liggett, Editor, diane_liggett@nps.gov. Send additional comments to Shawn Norton, Coordinator, Environmental Leadership Program, National Park Service, 1849 C Street NW, Mail Stop 3316, Washington, DC 20240, 202.565.1260, shawn_norton@nps.gov.

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Sustainability News and additional NPS information about "green" practices appears at www.nature.nps.gov/sustainability. Detailed NPS Environmental Leadership information is located on the Internet at www.nps.gov/renew.

National Park Service

The National Park Service is a bureau within the Department of the Interior. We preserve unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. We also cooperate with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

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