



## National Research Learning Centers Overview

All Research Learning Centers, as a part of the "Natural Resource Challenge," seek to expand the scope and effectiveness of research towards effective science-based management of the National Parks. An additional benefit gained through this expansion of research is the dissemination of resulting information and the strengthening of partnerships. Research Learning Centers exist to benefit and coordinate all of these facets for the entire network to which the Center belongs.



A researcher listens for the signal from a radio-collared black bear in Kenai Fjords National Park. This project, which looked at bear-human interactions, required collaboration between the University of Alaska, the U.S. Geological Survey, and Kenai Fjords National Park. This partnership resulted directly from Research Learning Center efforts and funding. Results will be incorporated into new backcountry and bear management plans.

## SCIENCE

Research Learning Centers provide a variety of infrastructure resources for researchers. These include matching funds, suggested research emphasis areas, computer information systems, office space, low-cost housing, and access to extensive biological and cultural datasets.

## EDUCATION

Learners from diverse backgrounds are provided opportunities to collaborate directly with researchers or engage in a variety of research-related educational programs. Neighboring communities, students, educators, and the public also have access to research data, resource issues, and science-based management decisions.

## PARTNERSHIPS

The National Park Service can not accomplish a task of this magnitude alone. A wide spectrum of partners associated with each Center provide a critical role in maximizing resources, leveraging expertise toward common preservation goals, and ensuring parks have information to make science-based decisions.

# Expanding Scope and Effectiveness of Science

## Science for Decision-Making Today at the Continental Divide Research and Learning Center

As urban areas creep nearer to Rocky Mountain National Park, park managers are concerned about the possibility of wildfire spreading from park shrublands to nearby communities. Prescribed burns can be used to reduce fuel loads, but there is also a need to preserve the shrublands as habitat for elk and certain species of birds.

A Research Learning Center partnership with the University of Northern Colorado led to a graduate student study of the interaction between fire, herbivores such as elk, shrub communities, and bird habitat. Findings unequivocally demonstrated that in shrublands that were both burned and heavily browsed, shrubs did not recover their former vigor. Bird habitat was compromised or eliminated. Results from this study were presented to park staff in a Research Learning Center forum. Within hours, park fire managers began consultation to develop plans for managing the Wildland Urban Interface without using prescribed burns in shrublands. In this case, the communication of solid research data had an almost immediate effect on conservation policy.



Research on shrub communities can translate directly into decisions concerning the Wildland Urban Interface.

## Linking Archeology, Climate Change, and Cultural Rediscovery at the Ocean Alaska Science and Learning Center

The Ocean Alaska Science and Learning Center joined forces with the Smithsonian Arctic Studies Center, the Pratt Museum, and Alaska Natives from the villages of Port Graham and Nanwalek to investigate ancient Alutiiq culture. The project placed Alutiiq students and elders side by side with scientists on an archeological dig. Contemporary oral histories were also used in interpreting the dig site.

Additionally, Smithsonian scientists plan to conduct isotope analysis on animal remains found at the site to help reconstruct ancient climate and shed light on both past and current climate change. So far, this collaboration has spawned an outreach program aimed at middle and high school students, an interpretive talk for the general public, several seminars delivered by the principal investigator, and a twenty minute video aimed at a general audience. It has also improved communication and cooperation between Kenai Fjords National Park and Port Graham Native Corporation, a major inholder of land within the park's boundaries.

## Land Use Patterns and their Effect on Invasive Plant Distribution at the Atlantic Learning Center

Cape Cod's landscape has been profoundly influenced by human activities of the past and present. In order to manage this ecosystem appropriately, it is critical to understand how these land use changes



High school student Katrina Dupree works alongside her mother at an archeological dig in Kenai Fjords National Park. They are both descendants of the villagers who once lived at this ancient coastal site.

have shaped current community structure. The Atlantic Learning Center began a partnership with Dr. Betsy VonHolle, a National Park Ecological Research Fellow, to study which land use practices have encouraged the spread of invasive species and communicate these findings to park staff for prioritized management efforts. This collaborative effort with a researcher and the Learning Center's provision of infrastructure and technical support exemplify the kind of connection between research and decision making relevant to all National Parks.

## Looking for Fish at the Old-Growth Bottomland Forest Research and Education Center

Over the past three years, persistent dry conditions have allowed researchers and "citizen scientists" to get a glimpse of Congaree Swamp National Monument's fishery community as it responded to the natural stress of a five-year drought. More recently, extensive flooding will



Researcher and citizen scientist teams document fish community structure and fluctuations after the natural stress of a five-year drought.

allow researchers to investigate the fish community's response to the flooding. This should improve scientists' ability to separate natural from human-caused effects on the fish community. Some of these possible threats include agricultural and highway run-off, point source discharges, public fishing, and the pattern of flow releases from a major upstream hydroelectric station. Additionally, this information will be valuable for future population monitoring projects and the long-term condition assessment of Conagree Swamp National Monument water resources.

## Ant Bio-Quest at the Schoodic Education and Research Center

Acadia National Park's Schoodic Education and Research Center (SERC) was host and co-sponsor of the 2003 Acadian Entomological Society meeting. The focus of this gathering of entomologists from the northern Atlantic region was on invasive species. One of Acadia's most unwanted foreign visitors is the European red fire ant (*Myrmica rubra*) and a special session was organized to help the National Park Service learn more about the impacts of this species on native ant fauna of the park.

Renowned myrmecologists from Canada and England and other entomologists participated in a daylong collecting quest of ants in the park. From the mountaintops to the intertidal zone, the diversity of ants was sampled using a variety of techniques.

Collected specimens will be identified by staff at the California Academy of Sciences and Univerite du Quebec a Chicoutimi.

The park will receive an ant species list and mounted specimens. These data will allow for assessments of past and future changes in the ant diversity at the park and serve as a valuable reference for ongoing studies into the ecology, impact, and management of *M. rubra* at Acadia. Initial identification indicates that this quest recorded at least two new species records for the State of Maine.



The Acadian Entomological Society helped the National Park Service learn more about the impact of invasive ant species.

## Jamaica Bay Institute Resources Library

The Jamaica Bay Institute offers a place where park employees, researchers, students and the community can access a comprehensive catalogue of information

relating to the natural and cultural history of Jamaica Bay. This reference collection contains over 2,500 documents and 35,000 color images. This library collection and the services provided continue to grow through generous donations, the support of volunteers, and partnership development.

## Reading the Weave at the North Coast and Cascades Research Learning Center

Olympic National Park has acquired a substantial Native American basketry collection over time through donations to the park, but many of them have remained in storage. Through a North Coast and Cascades Learning Network grant, the park anthropologist is now working with the coastal tribes to identify each basket's tribal origin, dates, family or individual weaver, and materials. Once identification is complete, the full collection will be made accessible to the public on a University of Washington virtual museum website. Pieces from the collection will also be displayed at park visitor centers, now with the history and background that tie these pieces to their tribal heritage.

Other projects initiated by the Network include a restoration research project, citizen stream monitoring projects, an "Interpreting Natural and Cultural Resources" training, student and teacher research internship opportunities, distribution of seed money, and a teacher in residence program.



Maggie Kelly, Quinault weaver, Olympic National Park

Jacilee Wray

# Increasing Public Understanding and Participation towards Science for Parks

## The Crown of the Continent Research Learning Center Hosts International Environmental Change Workshop

Nineteen K-12 teachers from Bulgaria, Italy, and Switzerland as well as the states of Maine, Arizona, Massachusetts, Texas, and New Jersey traveled to Glacier National Park to explore first-hand how environmental change can be interpreted from glaciers and the land surface. The workshop was co-sponsored by the Crown of the Continent Research Learning Center and the Wright Center for Innovative Science Education at Tufts University in Boston. Activities included classroom presentations of ice core temperature data, use of remote sensing and GIS to monitor glacial changes, and a 10-mile hike to Grinnell Glacier. Participants worked together in teams to develop strategies for teaching about climate and environmental change in classroom settings.

## Great Lakes Institute at the Great Lakes Research and Education Center

The Great Lakes Institute, a five-day workshop, attracted thirty-eight teachers for hands-on activities to increase their awareness of current issues facing Lake Michigan and the entire Great Lakes Region. The workshop pulled together professionals from many agencies, including the Lake Michigan Federation, Indiana Department of Natural Resources, Environmental Protection Agency, and the Illinois-Indiana Sea Grant College Program, to share scientific information

and teaching strategies. Teachers worked directly with researchers and resource professionals on activities like freshwater mussel and water quality sampling with the aim of bringing these issues more effectively to students.

## Expanding Research Capacity through Citizen Science at the Appalachian Highlands Science Learning Center

The Appalachian Highlands Science Learning Center strives to incorporate local community members as assistants for researchers working in parks. One program, funded for three years by the Burroughs Wellcome Fund, will place twelve students from local schools in the field each summer, working on projects such as a grassy bald restoration project on the Blue Ridge Parkway.

Another team of Appalachian Highlands researchers is looking at how ozone affects particular plant species. To assist in this effort, the Learning Center staff has been training park interpreters throughout the network in how to recognize and rate visible symptoms that appear on plant leaves. To expand this even further, 16 partnerships have been developed to set up ozone biological monitoring gardens throughout the local community where school students collect data on genetically similar plants. The gardens assist the researchers in comparing plants at various elevations.

In 2003, 28 different researchers working on 18 different projects in Great Smoky Mountains National Park provided equipment, protocols, and time to work with the students as they collected data that assists both the researchers and the network parks.



Two of the Appalachian Highlands high school interns collect data in an ozone bio-monitoring garden.

# Facilitating Partnerships

## Expanding Research Capacity through the Pacific Coast Science and Learning Center

To increase the amount of matching dollars supporting research, the Pacific Coast Science and Learning Center has created two annual funding sources, "Coastal Research Grants" and "Tomales Bay Biodiversity Grants." Funding for these programs are supported through the Mead Foundation, the Cox Family Fund, and National Park Service funds. Successful proposals addressed the relationship of the project to park information needs, future management decisions, potential educational outreach, and leveraged partnerships. Over \$30,000 was distributed to 17 researchers on a wide variety of coastal and marine science research projects. These small grants leveraged \$78,000 in matching funds and in-kind costs. Overall, the Pacific Coast Science and Learning Center leveraged \$280,000 of research and educational programs in 2003.

Many researchers who received these Learning Center grants also requested field assistants through the Center's high school internship program. This summer, 16 high school students were hired either as research assistants or participated in a

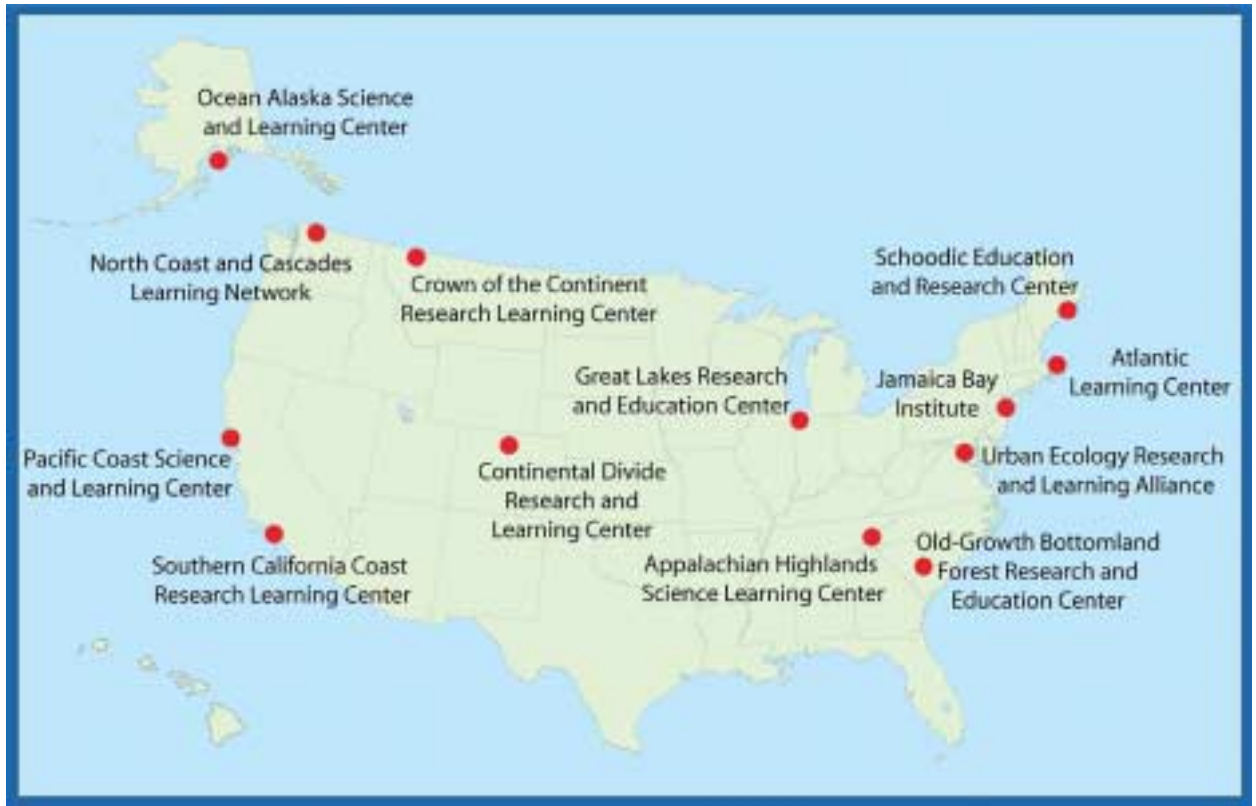
week long "Summer Science Seminar." Research assistants contributed to a specific project, received field-based training, and documented their experiences in a learning journal format. Summer Science Seminar participants are invited to become assistant researchers for the "Tomales Bay Biodiversity Inventory," a partnership that seeks to identify all species of life in a specific marine habitat. Seminar participants spend a week at Point Reyes National Seashore, participate in a multitude of research projects, including an inventory of nearshore fishes and algae, removal of nonnative plants, and interact with researchers who share career advice.



Researchers, community members, students, and educators all work together to discover species of life in the "Tomales Bay Biodiversity Partnership."

# National Research Learning Centers

## CURRENT



Currently, thirteen Research Learning Centers (on the map above) have been dispersed across "Inventory & Monitoring Networks" and funded through the Natural Resource Challenge. It is hoped and envisioned that an additional eighteen Research Learning Centers (listed below) will address gaps in ecological networks not yet represented.

## ENVISIONED

Canyon Country Learning Center

Center of Research and Learning

Center for Place-Based Learning and Research

Crater Lake National Park Science and Learning Center

Cumberland Piedmont Network Learning Center

Denali Science and Learning Center

Desert Science and Heritage Center

Eastern Rivers and Mountains Learning Center

Greater Yellowstone Learning Center

Jamestown Center: Early American Sites Network

Jemez Mountains Learning Center

Leeper House Learning Center

Midwest Center for Environmental and Cultural Research

Ozark Highlands Learning Center

Pacific Island Parks' Learning Center

Sierra Nevada Learning Center

Sonoran Desert Research Center

Southern Colorado Plateau Learning Center

This publication was produced by members of the National Research Learning Center Advisory Group, September 2003

**Jim Pfeiffenberger,**  
Ocean Alaska Science and Learning Center

**Susan Sachs,**  
Appalachian Highlands Science Learning Center

**Christie Denzel Anastasia,**  
Pacific Coast Science and Learning Center

**Special Thanks to:**

**Don Neubacher,**  
Point Reyes National Seashore

**John Dell'Osso,**  
Point Reyes National Seashore

**Lynne Murdock,**  
Natural Resource Information Division