

National Park Service
U.S. Department of the Interior

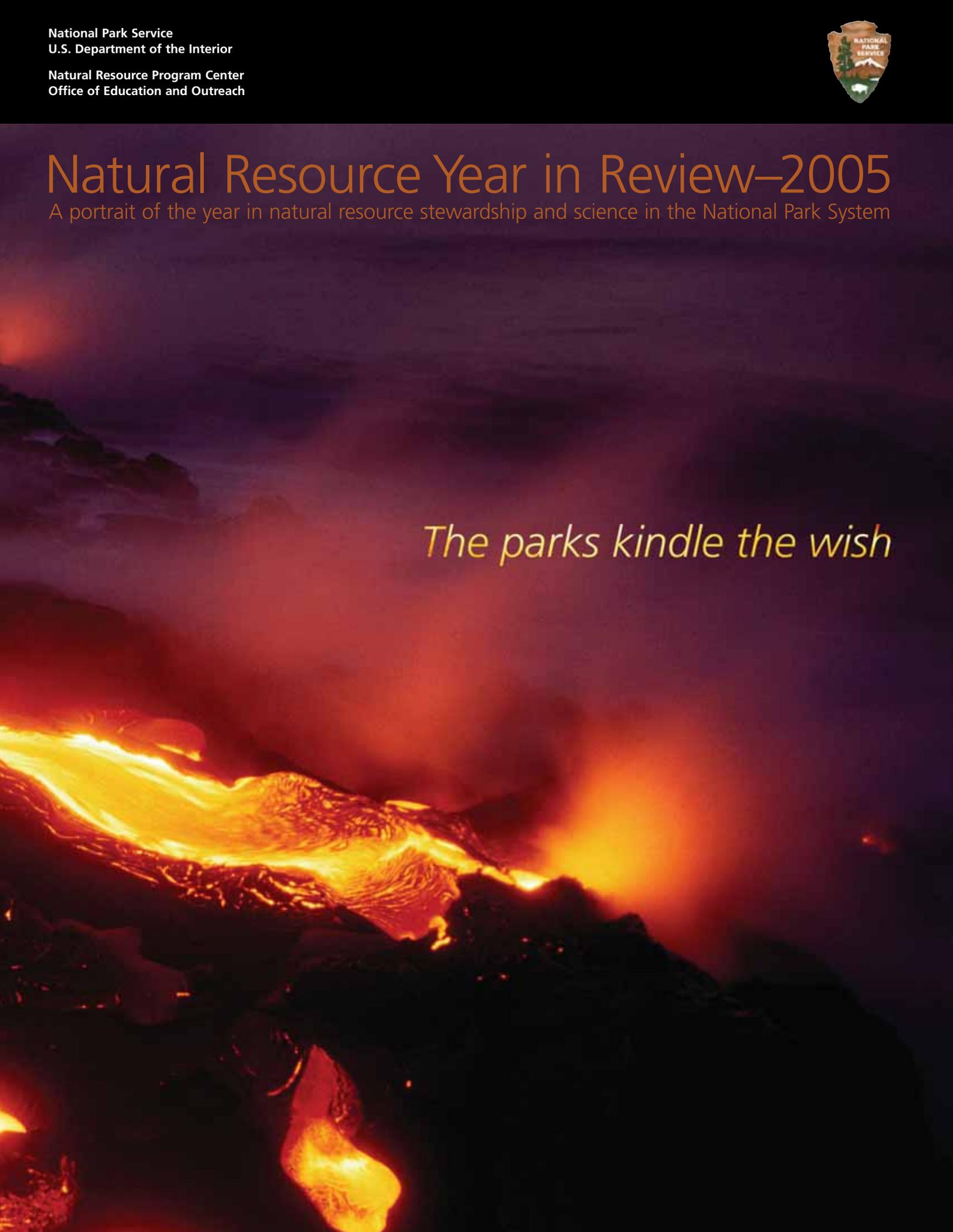
Natural Resource Program Center
Office of Education and Outreach



Natural Resource Year in Review—2005

A portrait of the year in natural resource stewardship and science in the National Park System

The parks kindle the wish



to discover the world in which we live



and to sample the world of our forebears



and the places and things that bridge the gulf



of time that separates us from our past...



*Our National Parks are places
to be experienced with all one's senses.*

—Dwight F. Rettie



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National Park Service

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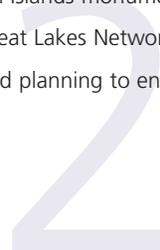
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The Year 2005 in Review

By Michael Soukup

EACH YEAR IN REVIEW attempts to characterize the year from the perspective of natural resource events in national park units. For 2005 we begin with hurricanes and devote our lead article (see facing page) to summarizing their effects on park natural resources. However, my impression of 2005 was shaped at the World Wilderness Congress in Anchorage in September where the hallways were buzzing with concern over new estimates of polar ice cap melting and its impact on polar regions, indigenous people, national parks, and polar bears—and other issues. Talk of “tipping points” began to show up in the press. I was reminded of what J.R. McNeil wrote in *Something New Under the Sun* (W.W. Norton, 2000): “What Machiavelli said of affairs of state is doubly true of affairs of global ecology and society. It is nearly impossible to see what is happening until it is inconveniently late to do much about it.”

There have been many ... surprises and reasons for encouragement about the sustainability of nature and biodiversity.

Amid the many advances we report for national park resources—the result of hard work by NPS staff, our partners, and volunteers—there was also a sense of urgency in developing our role as educators. Many of us in the National Park Service believe that planet Earth needs an Organic Act like the one that directs society’s relationships, activities, and management in national parks: providing for enjoyment but first taking care to “conserve the scenery and the natural and historic objects and the wild life therein.” It would seem that those who work at this daily would have lessons to share with park visitors and the public at large about enjoying our natural heritage, sustaining our quality of life, and protecting the future of this nation (and perhaps the planet).

Those lessons are being brought to light in national parks by a combination of focused resource management programs and research. For example, there are many restoration projects that are making our national park resources healthier. Our park inventories and monitoring networks are finding, tracking, and reporting on resources and their condition. The All Taxa Biodiversity Inventory, begun in Great Smoky Mountains National Park with volunteers and private contributions, is spreading to other national and state parks. It is a recent example of responsible environmental leadership emerging from a park that has national implications. Early research on the role of fire in forest dynamics, barrier island dynamics, and monitoring (at Channel Islands National Park) is another example of environmental knowledge needed and provided by the National Park Service that benefited not



only park managers but also the public at large. Along the way, there have been many other surprises and reasons for encouragement about the sustainability of nature and biodiversity. One absolutely spectacular example of the contribution that protected areas make to society occurred this year in a national

wildlife refuge: apparent discovery of a small population of the ivory-billed woodpecker! Similarly, the investment in air quality monitoring in the national parks, which began about 20 years ago, is now producing results and helping shape federal and state air quality management programs around the country.

In August I was honored to testify at Senator Akaka’s field hearing at Hawai’i Volcanoes National Park on the NPS program for managing invasive nonnative plants. I had an opportunity to listen as state and private groups testified on the key role this park had played in raising awareness and addressing the problems that exotic plants and animals were causing for native Hawaiian fauna and flora. For the first time I fully realized the broad impact parks can have on shaping reasonable approaches to issues that will affect the quality of life in their local communities and regions. Harnessing the potential of national parks for teaching practical stewardship skills and science can provide important benefits to this and future generations. Though such benefits may not be explicit in the Organic Act, they are logical and legitimate outcomes that bode well for the nation’s natural heritage and future.

The year closed with intense discussions in political circles, in Congress, and in the press about whether there was a need to change the National Park Service’s management policies and perhaps the Organic Act itself. At the same time, discussions started here in Washington about planning the centennial (in 2016) of the Organic Act and the National Park Service. While the anniversary is a decade off, I believe the record, and the American public, will speak for keeping the National Park System on its present track because the Organic Act and the National Park Service are serving well and in ways that could not have been foreseen in 1916.

A handwritten signature in black ink, appearing to read "Michael Soukup".

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Impacts to national parks from 2005 hurricane season coming to light: A preliminary overview

By Rebecca Beavers and Jeff Selleck*

TROPICAL STORMS AND HURRICANES in the Atlantic Ocean were extraordinarily active, destructive, and costly in 2005. A record 27 named storms, which included 15 hurricanes, 7 of them major, killed more than 1,200 people with thousands more displaced or unaccounted for, and caused more than \$200 billion in damage in the United States. An unprecedented three hurricanes reached category 5 of the Saffir-Simpson hurricane scale with sustained winds of more than 155 mph (249 km/h). In addition, storm surge from Hurricane Katrina (estimated in the 30- to 35-foot [9.2–10.7 m] range at Waveland, Mississippi, northeast of New Orleans) was the highest ever recorded in the Western Hemisphere and contributed greatly to the damage caused by the massive storm. Among the affected areas are national park units along the Atlantic and Gulf of Mexico coast from North Carolina to Texas. Though no NPS staff were killed, the severe storms had tremendous human costs and catastrophically impacted both natural and cultural park resources and infrastructure, particularly at Cape Lookout (North Carolina), Gulf Islands (Florida and Mississippi), and Canaveral (Florida) National Seashores; Everglades, Dry Tortugas, and Biscayne National Parks and Big Cypress National Preserve (Florida); Jean Lafitte National Historical Park and Preserve and New Orleans Jazz National Historical Park (Louisiana); and Big Thicket National Preserve (Texas).

In August and September, Hurricanes Katrina and Rita made landfall near parks along the coast of the Gulf of Mexico. Preliminary surveys indicate the storms introduced salts to freshwater environments and also toppled native canopy trees. In contrast, Chinese tallow—an exotic tree species—and the nonnative nutria—a rodent—

survived. Barataria Preserve in Jean Lafitte National Historical Park and Preserve experienced a pulse of highly saline water following Rita. Salinity stress and long-term damage to the unique freshwater marsh there may follow. Storm surge from Katrina had already “accordioned” the distinctive, thin-mat floating marsh, resulting in lateral compression folds and retreat of the marsh by about 200 feet (61 m) along a 1-mile (1.6 km) stretch of shoreline in one day, or the equivalent of marsh normally lost to erosion in 10 years. Scientists concluded that compression of Louisiana marshes after Hurricane Andrew in 1992 contributed to a shift in species dominance, and a similar impact may result from Katrina. In Texas at Big Thicket National Preserve, forest canopy damage was extensive, and at Padre Island National Seashore tons of hurricane-transported debris drifted ashore, requiring extensive cleanup by the park hazardous materials team.

The Florida unit of Gulf Islands National Seashore was still recovering from Hurricane Ivan (2004) when Hurricanes Cindy, Dennis, Katrina, and Rita plus Tropical Storm Arlene affected the park. Major portions of the 15 miles (24 km) of park roads on Santa Rosa Island that Ivan had washed out were under repair in 2005 when a series of storms destroyed the roads again. These roads were the primary means of public access to the popular park beaches and historic Fort Pickens near Pensacola, and whether to rebuild them—given the degree of natural erosion on the barrier island and unpredictable encroachment—has become the subject of controversy and public debate. At the request of the NPS Development Advisory Board, Gulf Islands managers will evaluate the feasibility of interim measures for visitor access that are compatible with natural barrier island



Natural Resource Management Specialist Riley Hoggard of Gulf Islands National Seashore surveys Santa Rosa Island road, claimed by the Gulf of Mexico in a series of brutal hurricanes and tropical storms in 2005. The asphalt route had provided the only automobile access to the popular park beaches and historic Fort Pickens, located near Pensacola Beach, Florida (seen in background). Managers now face the difficulty of reestablishing park access in a way that accommodates ongoing natural processes of barrier island erosion and accretion.

SEVERE STORMS AFFECTING COASTAL UNITS OF THE NATIONAL PARK SYSTEM IN 2005

Storm	Date and Place of Landfall	Wind Speed and Classification at Time of Landfall	Primarily Affected Park(s)	Primary Resource Damage/Change(s)
<i>Atlantic Ocean</i>				
Cindy	6 July; Grand Isle, LA, and near Ansley, MS	75 mph; category 1 hurricane	Gulf Islands (FL)	Access road damaged
Dennis	10 July; Santa Rosa Island, FL	121 mph; category 3 hurricane	Gulf Islands (FL) Dry Tortugas	Access road destroyed Key breached, channel deepened
Katrina	29 August; Buras, LA	127 mph; category 3 hurricane	Everglades (25 August)	Trees defoliated and blown over; significant sediment deposition and major erosion; concessions facilities and housing damaged; vehicles destroyed; campground closed
			Gulf Islands (MS)	Barrier islands breached and truncated; extensive erosion and vegetation damage, including trees; wildlife likely impacted; Fort Massachusetts damaged; visitor center heavily damaged; voluminous debris accumulation
			Jean Lafitte	Floating marsh torn and compressed; trees damaged; Chinese tallow invasion expected; massive shoreline erosion; visitor center damaged; employees displaced
Ophelia	15 September; offshore of Cape Lookout, NC	86 mph; category 1 hurricane	Cape Lookout	Barrier island breached, creating inlet
Rita	24 September; Texas-Louisiana border	121 mph; category 3 hurricane	Big Thicket	Enormous amount of tree loss blocking trails and roads; high fuel load anticipated for 2006 fire season; headquarters damaged
			Jean Lafitte	Saltwater intrusion of marsh, swamp, and forest; trees damaged and lost; changes in vegetation expected
			Padre Island	Gulf debris washed ashore
Wilma	24 October; Cape Romano, FL	121 mph; category 3 hurricane	Big Cypress	Road and culverts damaged; nonnative plant invasions expected; roosting trees for endangered woodpecker damaged
			Biscayne	Bay partially emptied; corals damaged
			Canaveral	Beach erosion; around 1,000 (of 3,600) sea turtle nests lost
			Everglades	Mangrove defoliation
<i>Pacific Ocean</i>				
Olaf	16 February; Samoan archipelago	Category 5 cyclone	National Park of American Samoa	Trees broken and blown down; birds, fruit bats, and coral reefs likely impacted

processes. At the Mississippi unit of Gulf Islands, Katrina’s 17- to 35-foot (5.2–10.7 m) storm surge and 130 mph (209 km/h) winds flowed over the park, redistributing barrier island sands, removing much of the park unit’s vegetation, denuding trees, submerging part of East Ship Island, and truncating Horn Island. Despite these storm impacts, the abundance of nutria tracks observed after the hurricane suggests that active management of this nonnative species will be required to allow native vegetation to recover.

Farther south in Florida in late October, Hurricane Wilma unleashed its storm surge in excess of 13 feet (4 m), damaging a more extensive area of coastal mangroves in Everglades National Park than had been harmed by Hurricane Andrew 13 years earlier and Katrina this year. The defoliation was so severe that researcher Thomas J. Smith (USGS Florida Integrated Science Center, St. Petersburg) expects that the mangroves will continue to die for months to come after the storm. Also hit was Big Cypress National Preserve, which sustained widespread, though not severe, damage to infrastructure and natural and cultural resources. In particular, Loop Road was

devastated and culverts that aid freshwater sheet flow throughout the watershed need repair.

After striking these parks, Wilma moved east across southern Florida to Biscayne National Park and Canaveral National Seashore. Biscayne staff observed that over about a three-hour period, winds nearly emptied shallow Biscayne Bay, which took an estimated 10 hours to fill up following the storm. Farther from shore, branching corals were flattened and boulder corals were displaced; however, whether coral mortality can be attributed to the storm is unclear because corals were suffering from widespread bleaching, a sign of stress, before any of the 2005 storms hit. Regarding cultural resources, post-storm reconnaissance by Dr. David Conlin of the NPS Submerged Resources Center indicates that known shipwrecks at Biscayne were minimally impacted and that a covering of fine sediment observed on one shipwreck can even help protect these submerged cultural resources. At Canaveral National Seashore approximately 1,000 of 3,600 sea turtle nests were lost to erosion, and several sections of the coast were washed over or experienced 3–5 feet (1–1.5 m) of dune erosion.

Many of the major storms in 2005 passed over or near Dry Tortugas National Park, southwest of the Everglades. Impacts to coral reef resources, though not documented, are sure to have occurred, as notable changes to park geography have been observed. In particular, some keys or islands gained elevation as a result of the storms while others eroded. For example, East Key was breached briefly, and in July, Hurricane Dennis reopened a channel between Bush and Garden Keys, which was later made deeper by Katrina, Rita, and Wilma. The ramifications of storm surge and saltwater inundation of the mangroves and other vegetation on the Keys will not be known until nesting colonies of birds return in 2006. The frigate bird colony on the south end of Long Key had only 25 nests in 2005, a reduction from previous seasons of 130 nests. Sooty and Noddy terns that nest on Bush Key also experienced lower numbers of nesters in 2005.

Though Hurricane Ophelia never made landfall in North Carolina, the mid-September storm dumped 10 inches of rainfall driven by 90 mph (145 km/h) winds, opening a new inlet three-fourths of a mile (2.4 km) south of New Drum Inlet at Cape Lookout National Seashore. The hurricane also significantly widened Old Drum Inlet, which had been almost closed, and storm surge washed over the national seashore. Though dramatic, these changes do not pose a management issue related to park access. Unlike Gulf Islands National Seashore, Cape Lookout does not maintain a paved access road on the barrier island. Thus natural processes of erosion and accretion associated with severe storms cause only minor changes in visitor access.

A primary impact of the 2005 hurricane season was the number and severity of storms, causing catastrophic loss of life and property and associated human suffering. In response the National Park Service deployed emergency management teams to coordinate shelter and other emergency services in support of dislocated park staffs and area residents in the hurricane-affected areas, and to assess damage to infrastructure and park resources. The NPS incident management teams gave tirelessly of their time to locate employees, establish alternative housing and office space for park employees, and reestablish park operations.

Assessment of resource impacts, both natural and cultural, varied in approach and priority. Tasked with emergency support of parks, the national incident management team hired contractors to assist the Katrina-affected park units with initial resource assessments and emergency stabilization, and resource advisors were requested by parks to guide these efforts. Natural resource issues may not have had a high priority at primarily historical or other parks depending on the need for employee assistance, facility damage, or other circumstances. Longer-term assistance at the most heavily impacted parks emerged as the National Park Service collaborated with the US Geological Survey, NASA, and other agencies and partners, particularly through the cooperative ecosystem studies unit network, to develop strategies for assessing damage to park natural resources. These methods will

help improve coordination in compiling scientific information following severe storms in the future. As a result of the collaboration, the National Park Service and its partners have begun to discern the most obvious resource impacts and compile a basic overview of the effects of the 2005 storm season.

Nonetheless, the next hurricane season is approaching and the National Park Service must plan for the assessment and protection of natural resources through monitoring and immediate post-event data collection. These activities need to become a natural part of the incident management structure in response to severe storms. Models for this are the cultural resource disaster team, established following Hurricane Isabel in 2003, and the Burned Area Emergency Rehabilitation team, which responds primarily to wildfires. Ready to go when a park faces resource damage, these teams work within the incident management structure and are efficient in assisting parks with resource stabilization and recovery. Another need is improved interagency coordination for information sharing, including identifying which agencies will study particular storm impacts and planning for access to the data. The CESU network is ideally suited to a role in coordinating data collection, analysis, and peer review by expert scientists. These actions will help the National Park Service prepare for large-scale future storms and more effectively employ science in understanding, protecting, and restoring invaluable park resources. ■

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Year at a Glance—2005

january

The state engineer acknowledges that pumping in four basins northwest of Las Vegas, Nevada, may ultimately result in lowered water levels and decreased spring discharge in Devils Hole at Death Valley National Park (California and Nevada) and Ash Meadows National Wildlife Refuge, which preserve the endangered Devils Hole pupfish (*Cyprinodon diabolis*). The state engineer reduces the Southern Nevada Water Authority's request by half and requires the water authority to monitor its pumping and mitigate impacts.

The Natural Resource Program Center assembles its first “coastal team” of natural resource specialists to focus on projects and technical assistance needs at national lakeshores and seashores. The team approach improves collaboration among the Biological Resource Management, Environmental Quality, Geologic Resources, and Water Resources Divisions.

In conjunction with the Air Resources Division, Dr. Robert Kohut of Boyce Thompson Institute completes ozone risk assessments for 32 vital signs networks and the Appalachian and Natchez Trace National Scenic Trails. Based on ozone exposures and environmental conditions, the assessments evaluate a park's risk of ozone injury to sensitive plant species and enable resource managers to make informed decisions regarding the need to monitor the impacts of ozone on plants.

The NPS Environmental Response, Damage Assessment, and Restoration Program publishes the *Damage Assessment and Restoration Handbook*, which provides guidance to park managers on the process of assessing and restoring resources injured by pollution, vessel groundings, and other means. The handbook focuses on the Park System Resource Protection Act (16 USC 19jj), which authorizes the National Park Service to seek civil damages from responsible parties, including the costs of response, assessments, and restoration, and to retain recovered costs for use by affected parks and program offices.

february

Abigail Miller, deputy associate director of Natural Resource Stewardship and Science, retires after nearly 33 years of federal service. Since 1995, Miller has worked on behalf of the programs and people that support the NPS natural resource stewardship mission. Her achievements are highlighted by the successful implementation of the Natural Resource Challenge, including the Inventory and Monitoring Program, and shepherding natural resources accountability and performance management.

The Secretary of the Interior honors the Park Flight Migratory Bird Program with the “2004 Secretary's Four C's Award” for communication, consultation, and cooperation in the service of conservation. The award recognizes the program's exceptional contribution to collaborative, place-based community and citizen stewardship.

Restructuring of the Natural Resource Program Center is completed. A center director now manages five divisions and three offices: Air Resources, Biological Resource Management, Environmental Quality, Geologic Resources, and Water Resources Divisions; and the Offices of Inventory, Monitoring, and Evaluation; Natural Resource Information Systems; and Education and Outreach.

march

Mike Soukup, associate director of Natural Resource Stewardship and Science, presents the 2004 Director's Awards for Natural Resources at the George Wright Society conference in Philadelphia. The winners are two park superintendents, two natural resource managers, a researcher, a facility manager, and the recently retired deputy associate director of Natural Resource Stewardship and Science (see profiles starting on page 119).

After a year of testing by staffs at 28 pilot parks, the Environmental Quality Division launches the Service-wide Planning, Environment, and Public Comment (PEPC) system. This online collaborative tool (at <http://parkplanning.nps.gov/publicHome.cfm>) tracks NPS management projects and compliance with laws to protect resources and supports public communication efforts through comment analysis and response.

The Inventory and Monitoring Program cosponsors an international meeting about using remotely sensed imagery for monitoring national parks. Other meeting cosponsors are Parks Canada, NASA, the Canadian Center for Remote Sensing, and the Canadian Space Agency. This meeting formally commences collaboration on this issue between Parks Canada and the National Park Service and results in a series of short summary papers on key topics.

The strategic planning review meeting of the Air Tour Management Plan (ATMP) results in positive outcomes for the National Park Service, including agreements with the Federal Aviation Administration (FAA) about how sound will be monitored in parks, what constitutes an acceptable decibel level of variance or margin of error in monitoring, the process for NPS input on upcoming ATMP schedules, FAA use of the "precautionary principle" for determinations when the amount of data necessary is not available, and FY 2005–2007 goals for the ATMP program.

With the assistance of the Natural Sound Program, staff at Grand Canyon National Park deploys two acoustic monitoring systems and will set up three additional systems to help expedite the collection of ambient sound data for use in the dispute resolution process concerning overflights at Grand Canyon.

Investigators complete an emissions study of snowmobiles and snow coaches in Yellowstone National Park (Montana and Wyoming). The four-stroke snowmobile engines are cleaner for carbon monoxide and smoke than the two-stroke engines. The snow coaches have a broader range of emission rates, with the cleanest being the 2001 vehicles. Park staff will use these air quality and emissions data to update the Yellowstone winter-use plan.

april

The Geographic Information Systems (GIS) Division and the Natural Resource (NR) and GIS Program launch NR and GIS Data Store at <http://science.nature.nps.gov/nrdata>, an intranet-based data and metadata management system. The more than 20,000 records span a wide range of data types, including natural resources, park boundaries, base, GIS layer standards, and natural resource database table standards. Automated posting of geospatial data from Data Store to the federal Geospatial One-Stop meets the Department of the Interior data distribution mandates and broadens the audience of potential data users.

Negotiations with the final responsible party—American Premier Underwriters Company, representing the Penn Central Corporation—result in a consent decree for \$500,000 in natural resource damages for the United States at Valley Forge National Historical Park (Pennsylvania). The settlement history of this case began in 1996 after investigators detected polychlorinated biphenyls in a residential area adjacent to the corporation’s Paoli Rail Yards facility; they subsequently detected contamination in the Valley Creek watershed, in both sediments and fish tissue, which prompted a fish consumption advisory.

During the largest floods in several decades at Delaware Water Gap National Recreation Area (Pennsylvania and New Jersey), streamflows cause widespread damage to natural and cultural resources and park infrastructure. Shortly after the flood, a team from the Natural Resource Program Center travels to the park to assist managers in developing an action plan for remediation. Wherever possible the team recommends not interfering with natural fluvial processes, thereby promoting the beneficial effects of flood disturbance for aquatic and riparian habitats.

The Air Resources Division deploys portable ozone monitoring systems at new locations: Assateague and Padre Island National Seashores, Dinosaur National Monument, and units in the Cumberland-Piedmont Network. A total of 12 systems are in park units, with 2 being used for data quality assurance.

The Biological Resource Management Division distributes nearly \$430,000 to 10 parks to control forest insects and diseases. These funds are transferred annually from the USDA Forest Service, most of which are allocated to the control of hemlock woolly adelgids (*Adelges tsugae*). In addition, several parks receive funds for treatment of various species of bark beetles.

may

The Water Resources Division publishes coastal water resources and watershed condition assessments on Cumberland Island (Georgia) and Gulf Islands (Florida and Mississippi) National Seashores. Three more assessments follow in August, on Timucuan Ecological and Historic Preserve (Florida), and in December, on Fort Pulaski National Monument (Georgia), and Kaloko-Honokōhau National Historical Park (Hawaii). The assessments are produced in conjunction with the Universities of Georgia, Florida, and Hawaii and summarize the condition of these parks’ coastal resources, including water quality, habitat, and invasive species, and also give an overview of resource stressors.

The National Park Service teams up with the US Environmental Protection Agency (EPA) to characterize the extent of contamination from abandoned uranium mines in the Canyonlands area of Utah. The cooperative study between the Geologic Resources Division and the EPA determines the extent and environmental implications of migration of radionuclides and metals from 79 abandoned mine sites in National Park System units in the state.

During two days of fieldwork at Colorado National Monument, geologic team members, including Geologic Resources Division personnel, collect location data on known high-risk rockfall sites, inspect the monument’s campground and 23 miles (37 km) of Rim Rock Drive, check selected drainage culverts for protective grating, and develop an outline for the park geologic hazards management plan. Park leadership is taking a proactive approach to better management of the natural process of erosion, which forms both the monument’s beautiful vistas and its hazardous landslides and rockfalls.

Seven NPS staff members representing parks, the Washington Office, and cooperative ecosystem studies units participate in the World Conservation Union (IUCN) bison species survival commission meeting. The National Park Service manages most of the identified genetically pure plains bison herds in North America. During the meeting, participants, including representatives from Native American tribes and the Canadian, Mexican, and US governments, draft a conservation action plan for North American bison.

june

The Natural Resource and Geographic Information Systems (GIS) Program releases the NPS Metadata Tools & Editor v1.0, a Web-based intranet application for editing metadata related to national parks. The application is the recommended authoring tool for metadata that will be published on the Natural Resource and GIS Data Store system.

july

The Natural Sounds Program enters into a cooperative agreement with the Department of Natural Resource Recreation and Tourism at Colorado State University to collaborate on acoustic issues and visitor experience resource protection (VERP) planning. The partnership will facilitate the creation of an instrument prototype, data collection, and preparation of findings that contribute to the understanding of visitor-experience standards for natural sound conditions in national park settings.

In order to better respond to the introduction and establishment of harmful nonnative snakes and other reptiles in southern Florida, the National Park Service, in cooperation with the US Fish and Wildlife Service and the South Florida Water Management District, conducts a workshop about cooperatively managing these invasive species. A cadre of experts from academia and federal, state, tribal, and nongovernmental agencies participate in this first-time event.

august

Researchers identify chronic wasting disease in a two-year-old white-tailed buck in Hampshire County, West Virginia—the first known occurrence in this area. The Biological Resource Management Division is working closely with natural resource managers in the Northeast and National Capital Regions to prepare park staffs in these areas to respond to this threat to their deer populations.

During the joint meeting of the western regional and Mississippi River panels on aquatic nuisance species, Water Resources Division staff member John Wullschleger is elected to the executive committee of the western regional panel. This is the first time the National Park Service has been formally represented on this statutorily created panel.

The US Geological Survey, Rocky Mountain National Park, and the Geologic Resources Division (GRD) share the Blue Pencil award given by the National Association of Government Communicators for the book *Roadside Geologic Exploration Around Estes Park, Colorado*. The book presents an illustrated series of self-guided roadside earth science topics in and around the park. It was written by USGS research geologist Jim Cole and published by the Association of Earth Science Editors with GRD funding. The book, sold in park visitor centers, has proven popular.

Four knowledge centers of the Views of the National Parks Web site (<http://www2.nature.nps.gov/views/>) are selected as online resources for the Digital Library for Earth Systems (DLESE): Cave and Karst, Coastal Geology, Glaciers, and Volcanoes. DLESE is dedicated to the collection, enhancement, and distribution of materials for teaching and learning about Earth systems and serves as the geoscience node in the National Science Digital Library.

Management policies of the National Park Service are being updated. An internal review of the draft results in the October public release of the proposed policy changes.

september

The Secretary of Energy announces he will approve the final record of decision for remediating uranium mill tailings at Moab, Utah. The decision clears the way for the removal of 11.9 million tons of radioactive tailings, mostly by rail, from the banks of the Colorado River followed by groundwater remediation, benefiting Arches and Canyonlands National Parks and other park units downriver.

In a lawsuit brought by the Sierra Club, a federal district court agrees with the National Park Service that its nonfederal oil and gas regulations are limited in scope and address only activities occurring within park boundaries. Nonetheless the court allows the plaintiff to pursue challenges to the NPS application of the regulations related to directional drilling operations at Big Thicket National Preserve, Texas. The Geologic Resources Division provides support to the Office of the Solicitor and Department of Justice in the litigation.

october

The Gulf Coast Cooperative Ecosystem Studies Unit (CESU) puts together a disaster team to assess and evaluate resource damage to parks following Hurricanes Katrina and Rita. Working as part of the incident management system, the CESU team gathers post-storm data on inundation of employee residences, contaminants, and resource damage.

Since their inception in 1999, CESUs have managed approximately 3,500 projects valued at more than \$100 million, benefiting the National Park System, regional offices, and national programs. Also, the National Park Service has funded research coordinator positions at host universities for 12 of the 17 CESUs.

The National Park Service releases for public comment a proposed update of NPS management policies.

november

Managers from 11 national parks and their cooperating associations commit matching funds to the Geologic Resources Division for placements of GeoScientists-in-the-Parks (GIP) during FY 2006. This is the highest funding in the 10-year history of the GIP program.

The National Park Service and Federal Aviation Administration (FAA) complete a draft implementation plan for the development of air tour management plans in the National Park System. This plan is the culmination of several years' work.

The National Association for Interpretation (NAI) and the National Park Service sign a formal agreement that paves the way for a comprehensive evaluation of nature centers across the country—including those in national parks—by NPS, NAI, and Colorado State University staffs. The agreement also formalizes the task of developing and presenting natural resources training for NPS resource managers and interpreters using a new NAI facility in Fort Collins, Colorado.

The National Park Service, the US Fish and Wildlife Service, and Southern Nevada Water Authority agree on a plan to monitor the effects of groundwater pumping in basins up-gradient from Devils Hole—a detached unit of Death Valley National Park in Nevada, which is habitat for the endangered pupfish (*Cyprinodon diabolis*)—and Ash Meadows National Wildlife Refuge. Two aspects of this agreement are new to NPS water rights settlements: federal funding from the sale of BLM lands will be used to establish some monitoring sites, and groundwater flow modeling will be used to predict the potential for impacts to Devils Hole's water level, allowing the parties to implement mitigation measures before changes in groundwater flow occur that could affect pupfish.

The National Parks Conservation Association and the National Audubon Society petition the Office of Surface Mining (OSM) to designate a large area adjacent to Big South Fork National River and Recreation Area (Tennessee) as unsuitable for surface coal mining. The petition is based on the need to protect the park watershed, the prevalence of steep slopes and the ineffectiveness of reclamation in such areas, and the presence of endangered species. (In January 2006, OSM, responsible for implementing the Surface Mining Control and Reclamation Act of 1977, finds the petition deficient.)

december

As an outcome of discussions with the National Park Service, the EPA, and environmental groups, Arizona Public Service—operator of the Four Corners power plant, which is a significant contributor to visibility impairment at National Park System units on the Colorado Plateau and the largest source of nitrogen oxides in the country—succeeds in increasing the efficiency of reduction technology for sulfur dioxide (SO₂) emissions. The test program results in an 88% total removal rate and a reduction of more than 20,000 tons of SO₂ pollution per year.

In response to a provision of the Energy Policy Act of 2005, the Bureau of Land Management (BLM) announces plans to develop a programmatic environmental impact statement to evaluate impacts associated with oil shale and tar sands development in Utah, Colorado, and Wyoming. Given the proximity of these energy resources to multiple units of the National Park System in the West, staff experts at the Natural Resource Program Center begin to identify issues of concern by reviewing the NPS administrative record dating to the early 1980s, when the BLM undertook a similar initiative to lease federal land for such development.

The Geologic Resources Division works closely with the NPS Office of Legislation and the parks to evaluate the implications of proposed amendments to the Mining Law of 1872 contained in the Budget Reconciliation Act of 2005. As proposed, the changes would significantly facilitate the ability of individuals and corporations to obtain ownership of mineral lands, including mining claims in national parks. The controversial mining provisions were dropped from the legislation because of the outcry of a broad array of groups and congressional opposition in both houses of Congress.