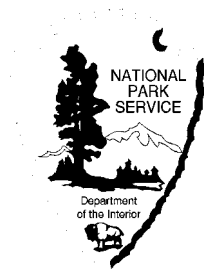




*1999 Annual Report
Water Resources Division
National Park Service*



The National Park Service Water Resources Division is responsible for providing water resources management policy and guidelines, planning, technical assistance, training, and operational support to units of the National Park System. Program areas include water rights, water resources planning, regulatory guidance and review, hydrology, water quality, watershed management, groundwater, fishery management, and aquatic ecology.

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1999 ANNUAL REPORT

WATER RESOURCES DIVISION

Natural Resources Report NPS/NRWRD/NRR-00/09

July 2000

United States Department of the Interior
National Park Service
Washington, D.C.

TABLE OF CONTENTS

A Word from the Associate Director, Natural Resource Stewardship & Science 1

Comments from the Division Chief 1

Washington Program Coordination Office Highlights 2

Planning and Evaluation Branch Highlights 3

Water Resources Management Plan for Cape Cod National Seashore 4

Water Resources Management in Katmai National Park and Preserve 5

Rehabilitating a Wetland-Riparian Ecosystem on the Lower Glorieta Creek Floodplain,
Pecos National Historical Park 6

A Marine Biological Survey is Completed at War-In-The-Pacific 8

Water Operations Branch Highlights 9

Riparian Restoration at Channel Islands National Park & Blue Ridge Parkway -
Focus of Water Quality Project 10

Flood Study for Fort Davis National Historic Site 11

Wellhead Protection Planning 12

New Water Quality Partnership with the U.S. Geological Survey 12

Watershed Condition Assessment for John Muir National Historical Site 13

Personal Watercraft and Water Quality 14

NPS Servicewide Water Quality Data Archive Dramatically Expands 15

Water Rights Branch Highlights 15

Updated Guidelines for the Sale or Lease of Water 16

Lost the Dog to Oliver Lee 17

Update on the Status of the Water Rights Docket Project 18

Unequal Protection: America's National Rivers 18

Support Provided to Regions, Parks, and Other NPS Organizational Units 21

Publications/Contributions 73

Water Resources Division Financial Status and Sponsored Projects 79

Organization and Staff 86

Awards 93

Credits

A Word from the Associate Director, Natural Resource Stewardship & Science: Mike Soukup, Ph.D.

This Annual Report provides a summary of the accomplishments of the Water Resources Division (WRD) of the National Park Service (NPS) in 1999. WRD provides servicewide technical assistance and advice with respect to the preservation, protection, and management of water and aquatic resources of units of the National Park System. The Division carries out a broad-based water resources program involving leadership in a variety of activities in the areas of water rights; water quality; floodplain management; ground water analysis; watershed and wetlands protection; water resources management planning; fisheries management; policy, legislative, and regulatory analysis; information management; and training. The Division's workplan is developed from an annual call to the field to identify park needs which in turn determines WRD priorities. In addition to national program responsibilities, the Division provides day-to-day support to parks, support offices, regional offices, and the Washington Office (WASO) in addressing water resources issues and concerns facing NPS. The Division is located in Fort Collins, Colorado, with additional offices in Denver, Colorado, and Washington, D.C.

I am extremely pleased with the accomplishments of WRD reflected in this Annual Report. These accomplishments are indicative of the professionalism of the Division and the ability of the Division to work cooperatively with management and staff of parks, support offices, regional offices, and WASO to address water resource issues in parks. I believe WRD provides a model for cost effective centralized support for parks that do not have the range of technical expertise they need. Identifying, requesting, and providing technical support from a centralized program requires consummate professionalism at all levels of NPS. This collective effort has created the environment necessary to begin to match the level of technical expertise to the magnitude of water-related issues facing national parks in a changing landscape.

Comments from the Division Chief: Dan Kimball

The past year was one in which the Water Resources Division (WRD) of the National Park Service (NPS) endeavored to provide the highest level of support possible to parks in addressing a wide variety of water and aquatic resource-related issues. This also was a year in which we worked as diligently as possible with Washington, Regional and Park leadership to support the Director's Natural Resource Challenge. We see this initiative as an unprecedented opportunity to increase our ability as an agency to address natural resource management issues, including water resources. As of this writing, the Administration's FY2001 budget proposal includes significant increases to support water quality monitoring and water rights projects in parks—two important needs identified in the Natural Resource Challenge. Examples of significant WRD accomplishments in 1999 include:

- Completion of water resource management plans for Cape Cod National Seashore, Bandelier National Monument, Canyonlands National Park, and Arches National Park.
- Implementation of on-the-ground riparian, wetland, and stream restoration at Glorieta Creek in Pecos National Historical Park.
- Participation on the National Coral Reef Task Force to develop a National Plan of Action to Conserve Coral Reefs.
- Significant assistance on native fish management issues at Dinosaur National Monument and Canyonlands National Park.
- Implementation of 35 park-based water quality monitoring and assessment projects through our Clean Water Action Plan partnership with the U.S. Geological Survey.

-Provided 60 additional parks with a complete inventory and analysis of all available and applicable water quality data. (This brings to 191 the total number of parks with completed water quality databases.)

- Provided significant assistance to Yosemite National Park (Valley Plan and Merced Wild and Scenic River Plan); Lake Mead National Recreation Area (contaminants); Biscayne National Park (contaminants); Cape Cod National Seashore (ground water protection); Big South Fork National Recreation Area (mined land reclamation); San Antonio Missions (contaminants); Golden Gate National Recreation Area (ground water-surface water interactions); Arches and Canyonlands National Parks (uranium mill tailings reclamation); and John Muir National Historical Site (watershed condition analysis).

- Continued assistance on dam operations and water rights protection issues at Dinosaur National Monument and Black Canyon of the Gunnison National Park.

- Continued assistance to Grand Canyon National Park on water supply and South Rim ground water protection issues.

- Developed Director's Order-35 on the sale or lease of park water.

- Continued coordination of NPS participation in the President's Clean Water Action Plan and the development of the Unified Federal Policy for Watershed Management.

- Significant participation in a natural resource management course titled "Natural Resources Law for Superintendents."

The Division's efforts continue to be greatly enhanced by the vigilance of park resource management staff in recognizing water resource issues and then contacting the Division for assistance. Our efforts are also supported by key staff in Regional and Support Offices and by Park-based water/aquatic resource specialists.

WRD will strive to remain focused on our principal mission, providing technical support to the parks. We will continue to function in budget and policy arenas at the national level to insure that we are fully aware of, and appropriately influence, emerging programs and opportunities. Finally, we will endeavor to foster partnerships, and develop and implement new and more innovative ways to support parks in preserving, protecting, and managing water and aquatic resources of the National Park System. Please always feel free to contact me if you need assistance or have suggestions as to how we might better operate to support Park water resource management needs.

Washington Program Coordination Office Highlights

By Sharon Kliwinski, Washington Liaison

Throughout the year, the Washington office continued to emphasize support to the Associate Director and NPS Directorate on water and natural resource issues national in scope.

Coordination of NPS activities under the President's Clean Water Action Plan continues to be a major effort of the Washington Program Coordination Office. The Office is participating in the development of the Plan's Unified Federal Policy for watershed management. This Policy will provide a framework to enhance watershed management for the protection of water quality and the health of aquatic ecosystems on Federal lands. The Policy will be finalized in 2000.

The Washington office provided major assistance the development and presentation of the Natural Resource Law and Policy course that was held in the Washington area in September. The course, which is aimed at superintendents and senior resource managers, focuses on the mandates and tools available to NPS for natural resource protection.

And looking to the future, the Washington office is gearing up for the National Park Service's move out the Main Interior Building which is scheduled for February 2001. The Main Interior will undergo extensive renovation and all NPS staff are planning to relocate to 1800 G St. NW.

Planning and Evaluation Branch Highlights

by Mark Flora, Chief

I am pleased to report on a highly rewarding and productive year for the Water Resources Division Planning and Evaluation Branch (PEB). During the year, PEB, working cooperatively with park staff and other agency cooperators, was able to assist in the completion of water resource management plans for Cape Cod National Seashore, Bandelier National Monument, Canyonlands National Park, and Arches National Park. In addition, water resources scoping reports were published for Mojave National Preserve, Katmai National Park and Preserve, and Washita Battlefield National Historic Site. A water resources issues overview was also completed for Olympic National Park. New water resources management planning efforts began at Canaveral National Seashore, Richmond National Battlefield Park, Voyageurs National Park, Katmai National Park and Preserve, Lake Clark National Park and Preserve, Pictured Rocks National Lakeshore, and Amistad National Recreation Area. WRD also provided funding support and technical assistance for continuing efforts to complete water resources planning activities at 10 other park units. A complete list of PEB's technical assistance activities is included in this report.

PEB's capacity to provide park-specific support continues to be enhanced through the WRD's Hydrological Affiliates Program. Through this program of cooperative resource sharing, WRD was able to support efforts by David Mott (Buffalo National River) to develop a water resources management plan for Bandelier National Monument, Jon Reidel (North Cascades National Park) to develop a water resources scoping report for Hagerman Fossil Beds National Monument, and Carol Purchase (Big Bend National Park) to develop a water resources scoping report for Amistad National Recreation Area. This program continues to be a win-win situation for the parks and WRD while it also provides expanded opportunities for the affiliates.

It was also a productive year for PEB's Wetlands Program. Staff approved study plans and funding for restoration projects and wetland inventory projects. PEB staff worked closely with parks on a broad range of wetland technical assistance projects during the year. Most significant was the progress made on the Glorieta Creek project at Pecos National Historical Park. During FY99, a final design was completed and a contractor was selected for this five-acre riparian wetland rehabilitation. The plan calls for removing deteriorating levees and dams and reshaping the site into a complex of ponds, wet meadows, willow thickets, and cottonwood galleries. Other examples of wetland technical assistance are listed later in this report.

Service-wide activities were also an important Wetlands Program component in FY99. Accomplishments in this area include: 1) revising the wetland management section of the NPS Natural Resources Management Guideline (Director's Order 77) and adding a section on wetland restoration guidance; 2) preparing a "Sample Scope of Work" and a "Supplemental Information" document to guide preparation or review of wetland delineation contracts for NPS units; and 3) preparing NPS comments on proposed changes to the Clean Water Act Section 404 Nationwide Permit regulations.

In FY99, there was a greatly increased focus on marine resources by PEB's Fisheries Program due to a very active Presidential initiative on ocean resources and the implementation of Executive Order 13085 calling for increased protection of our nation's coral reefs. Fisheries Program staff took the lead on coordinating NPS participation in a National Coral Reef Task Force program involving several working groups which have developed a National Plan of Action to Conserve Coral Reefs. A draft of the National Action Plan was completed and presented at a Coral Reef Task Force meeting. A \$1.6 million increase in coral reef park base budgets was obtained in FY00, and Fisheries Program staff is assisting these parks in the implementation of a coordinated increased monitoring, assessment, and protection program.

Technical assistance with the management of aquatic biological resources and fishery issues was provided to 17 parks during the year. High priority issues continue to be obtaining basic inventory and abundance data for aquatic or marine biological resources, restoration of displaced native species or habitat, assessment and understanding the impact of non-natives or altered habitat, assessing and managing harvest, and working successfully with states in establishing cooperative fishery management plans. Considerable effort was expended in assisting Colorado River parks deal with endangered fish issues, especially as related to operations at Flaming Gorge and Glen Canyon Dams. The Fisheries Affiliates Program continues to be an important element of the Fisheries Program. Through this program, WRD was able to provide assistance to Great Basin National Park with an evaluation of the reintroduction of Bonneville Cutthroat trout and assistance to War-in-the-Pacific National Historical Park. A complete list of assistance activities to individual parks is provided later in his report.

The need for interagency cooperative fishery management plans for many NPS areas remains high. During 1999, the lack of a cooperative fisheries management plan has led to a contentious stocking issue at Acadia National Park and a yet unresolved proposal by the state to introduce additional non-native fish species into one or more park lakes. The development of a cooperative management plan has been found to greatly improve working relationships with states and provide a better understanding of the long-term management goals with respect to park fishery resources.

Water Resources Management Plan for Cape Cod National Seashore

by David Vana-Miller, Planning Program Leader

Cape Cod National Seashore is unusual in the National Park System in that it was established after the area had been settled for more than 300 years; therefore, the opportunity to set aside wilderness or to assume responsibility for a large private holding was not an option. In creating a viable water resource management plan, park management must deal with the many jurisdictions including those of the six outer Cape towns and the State.



In 1981, the first Water Resources Management Plan was developed for Cape Cod National Seashore. Its intent was to: 1) describe the state of water-related information available at that time; 2) encourage a spirit of cooperation between the NPS and local municipalities and residents; and 3) clearly articulate water resource management goals for the National Seashore. Eighteen years later, the 1999 WRMP attempts to update these goals with new information to create an action plan for public involvement in the protection of the Cape's freshwater resources. The action plan provides a complex matrix of information gathering and implementation of programs that enhance NPS's operation of the National Seashore; informs and encourages agencies and municipalities to also improve their practices as they relate to National Seashore water resources; and informs and encourages the general public, residents and visitors to take an active part in the protection of these resources. In particular, the water resources management program develops: 1) a cooperative forum among the local government agencies and the NPS for water management decisions; 2) a community extension program that involves the public in education, research, and planning; 3) data management that improves

the accessibility of information regarding water resources; and 4) a research program that increases knowledge of the water resources on the National Seashore.

The Water Resources Management Plan for Cape Cod National Seashore was a joint effort by researchers

at the Water Resources Research Center of the University of Massachusetts and staff of Cape Cod National Seashore and the Water Resources Division. This comprehensive document analyses six major water resource issues: ground water withdrawal impacts; non-point source pollution; confirmed and potential contamination sites; cultural impacts on great pond water quality and biota; park infrastructure management; and ecological impacts from tidal restriction. A total of 56 project statements address these issues.

Water Resources Management in Katmai National Park and Preserve

by Don Weeks, Hydrologist



The priority water resource issues for units of the National Park System in the lower 48 states typically result from human-induced disturbances that impact park aquatic environments. Management of these water-related problems has evolved into a style that is often referred to as “reactive management.” In Alaska, where natural environments are, for the most part, pristine, a basic understanding of hydrologic and biologic processes is the priority issue. With its large landmass, low population, and limited resource development, relatively little is known about Alaska’s water resources. For example, in 1995,

Alaska had an average of one stream gaging station per 8,395 mi², compared to an average of one gage per 335 mi² in the lower 48. For management to be most effective, collection and analysis of baseline information are needed so that Alaska parks can better understand the natural processes of their aquatic systems and ultimately differentiate between natural versus man-impacted environments.

To begin the process toward a better understanding of its water resources in Alaska, Katmai National Park and Preserve (KATM), a 3.6 million-acre NPS unit, requested technical assistance from the Water Resources Division in 1998. The objective was to produce a Water Resources Scoping Report that provides NPS management with an overview of the park’s diverse environments, existing water-related information and issues that pertain to KATM, while also identifying some of the information needs that will better assist park management in providing a greater level of water resource protection. The 1999 Water Resources Scoping Report identifies and discusses 15 priority issues that KATM is currently challenged to address. These issues ranged from broad *Baseline Inventory and Monitoring* and *Coordination* needs to more specific issues such as *Brooks Camp Wastewater Management* and *Alagnak Wild River Bank Erosion by Boat Traffic*. Based on the environmental and political complexity of these issues, a recommendation to produce a more comprehensive Water Resources Management Plan was presented in the report. KATM is now working on this more comprehensive product that addresses water-related issues through the development of an “action plan” via project statements.



Rehabilitating a Wetland-Riparian Ecosystem on the Lower Glorieta Creek Floodplain, Pecos National Historical Park

by Joel Wagner, Wetland Program Leader, NPS; David Cooper, Research Scientist, Colorado State University; Scott Woods, Research Assistant, Colorado State University



Reservoirs along lower Glorieta Creek impound water and interfere with natural stream and riparian processes.

Prior to park designation in 1990, the floodplain and terraces along much of lower Glorieta Creek below Highway 63 were mined for sand and gravel. Once mining ended in the mid-1980s, ranchers bulldozed the remaining spoil material into a series of levees and dams, creating two reservoirs on 5.6 acres. These reservoirs soon became a threat to the ecology of Glorieta Creek. Floodwaters periodically swept thousands of fish from the creek into the reservoirs, where they were trapped and later died as the ponds dried. Flooding also caused several breaches of the progressively weakening structures, washing sediment into the creek. While ranching and 1850s era Hispanic farming are primary cultural themes represented in the immediate area, the NPS

determined that the reservoirs were incidental to these activities and that their removal would not diminish the resources for which the park was established. These factors led park managers to seek technical assistance and funding to create a more stable, functional wetland-riparian ecosystem in this highly disturbed landscape.

Planning and design for rehabilitating the wetland-riparian ecosystem was a cooperative effort between the Park, the Water Resources Division, Colorado State University (CSU), the Tierra y Montes Soil and Water Conservation District, and the NPS Intermountain Region. In the early phases, we monitored surface and ground water levels, created existing condition topographic and water table maps, completed biological inventories, and began environmental and cultural compliance work. In the summer of 1999, the environmental assessment for the project was approved and CSU researchers prepared the final grading plan. The plan called for removing the levees and dams and reshaping the site into a complex of ponds, wet meadows, willow thickets, and cottonwood galleries. Although portions of the site would be planted with native species to stabilize soils and promote rapid revegetation, we designed the ecosystem to be self-perpetuating, with revegetation largely from natural seed sources and processes.



Reservoirs are being removed and the floodplain is being reshaped to create a functional wetland-riparian ecosystem.

We based the final grading plan specifications on a thorough knowledge of site hydrology obtained through a network of 21 wells and staff gages, and on our understanding of plant community-soil-hydrology relationships in nearby reference communities. We selected mid-summer 1999 (pre-monsoon season) water levels as the basis for the overall design, and created a water table contour map from these data to represent the “average” design grade elevations. However, the plan specified that we wanted the contractor to create a rough, undulating surface with relief of up to 6 inches above and below the average grade shown on the plan. This would create a variety of microhabitats that would allow a diversity of wetland plants to establish where conditions are favorable. The design also called for a number

of pond and mound features throughout much of the site. Mounds were to be created approximately 1-2 feet above and ponds were to be excavated approximately 2-3 feet below the surrounding grade. We designed these features to increase the range of habitat types on the floodplain, including open water habitats surrounded by pond-edge vegetation in the deepest portions, cottonwood galleries on the upper mounds, and a variety of willow and herbaceous wetland communities in between.

With funding and assistance from the Water Resources Division, the NPS Geologic Resources Division, the Tierra y Montes Soil and Water Conservation District and the Park, earthmoving began in October 1999. A critical step was stationing the CSU research assistant (Scott Woods) on site to supervise the entire earthmoving phase. Most contractors are experienced in creating smooth surfaces needed for roads or parking lots, but may not know how to interpret the degree of undulation or “roughness” called for in this wetland-riparian design. Scott interpreted these details for the contractors, checked elevations, and identified questions that had to be addressed by the full project team during our weekly site visits. By mid-November, the contractors had completed this phase, moving over 30,000 cubic yards of soil to a designated disposal mound in the process. In early December, we seeded upland areas with native grasses and installed biodegradable erosion control blankets on portions of the disposal mound with slopes of 3:1 or greater.

In March, 2000, we will plant 1000 rooted native willow and cottonwood cuttings that we collected from the surrounding area, and in May we will plant thousands of native herbaceous wetland plants (e.g., sedges, rushes, and bulrushes) grown from seed at a local nursery. Park staff have begun a program of weed and exotic plant control, and will continue treatments as necessary. Follow-up monitoring of water levels and plant establishment and survival is also planned for the 2000 growing season. Over the longer term, we envision a trail on the edge of the project area for public enjoyment and interpretation of the cultural landscape, the wetland rehabilitation process, and the waterfowl, songbirds, muskrats, deer, and other wildlife that we anticipate will thrive there.

A Marine Biological Survey Is Completed At War-in-the-Pacific

by Jim Tilmant, Fisheries Program Leader

War-in-the-Pacific National Historic Park (WAPA) is located on the island of Guam and contains seven discontinuous units. The purpose of the Park is “to commemorate the bravery and sacrifice of those participating in the campaigns of the Pacific Theater of World War II and to conserve and interpret outstanding natural, scenic, and historic values on the island of Guam.” Two of the Park’s largest units are submerged areas containing significant tropical coral reef and coastal marine resources. A major part of Guam’s coral reefs and beaches fall within these Park areas. They constitute a prime resource of the island by containing a portion of the only natural lagoon-barrier reef system on Guam, one of the two prime mangrove swamps, and some of the most extensive seagrass communities, as well as limestone and volcanic intertidal reef flats.

Only a limited amount of biological survey work had previously been done in the Park’s marine areas. This consisted largely of a single biological survey by University of Guam investigators within a portion of what is now the Agat unit in the mid-1970’s. Park concern for impacts from local fishing activities, increasing recreational use, and increasing sedimentation and pollution from upland runoff within coastal developed areas made a baseline survey and documentation of reef conditions a high priority. In addition, fishery harvest data collected by the Guam Government’s Coastal Management Program has recently shown that fishing hours are steadily increasing while estimated total harvest is declining annually. The Park has also been negotiating with the Government of Guam for complete NPS management authority over the submerged natural resources within the Park units, and an understanding of the current condition and impacts to these resources is necessary for successful negotiation.

To address these concerns, WRD has funded a study over the past two years to provide a baseline inventory and assessment of the marine resources within the two submerged units of the park. The study was completed this year. Underwater field survey work was contracted to Dr. Steve Amesbury of the University of Guam, Marine Laboratory. Dr. Amesbury’s survey was designed to provide a qualitative and quantitative assessment of fish, coral, and marine plants throughout the marine habitats of the Park. A less complete assessment of marine macroinvertebrates was also included. Four fish transects surveyed in 1974 were resurveyed using the same methods to determine whether any significant changes in the fish communities had occurred over the intervening years. In addition to Dr. Amesbury’s work, digital

orthophoto imagery in stereo paired, color infrared and panchromatic photography for WAPA's reef areas was obtained. The Pacific Island Support Office is processing this data into GIS layers for the park.

The results of this study have provided a baseline documentation of diversity, abundance, and distribution of marine plants, coral and fish within the park marine units. In addition, up to 191 species of macroinvertebrates were documented to occur within the park marine waters (although many additional species are likely to be found with further macroinvertebrate studies).

A comparison of the current study results to those of the 1974-77 surveys showed some differences in marine plant abundance and a slightly lower overall fish species diversity but higher fish abundance. Algal density within some areas of the reef appears to have changed, which may be due to nutrient inputs and water quality changes. However, on the whole, comparison of the 1974 and 1999 data for the Agat unit does not suggest there have been major changes in the fish, marine plant, or coral communities over the intervening years and that the Park's marine resources remain in a relatively healthy condition.

Water Operations Branch Highlights

by William L. Jackson, PhD, Chief

The Water Operations Branch (WOB) strengthened its program of National leadership in the areas of floodplain management and water quality inventory, monitoring, and data management in FY99 . In addition, the Branch continued its program of senior-level technical assistance in the areas of water quality/aquatic contaminants and hydrology (surface and ground water).

WOB facilitated 35 park-based water quality monitoring and assessment projects through our Clean Water Action Plan partnership with the U.S. Geological Survey, 30 Level I water quality inventory projects in partnership with the NPS Servicewide Inventory and Monitoring Program, and 18 water quality restoration and hydrology projects through the NPS Natural Resources Program Unified Project Call. The Branch drafted a Director's Order (pending) on floodplain management. It was involved in redrafting sections on water quality management and floodplain management for the NPS Management Policies Manual, and drafting or re-drafting sections on floodplain management, water quality management and aquatic resources restoration for the NPS Natural Resources Management Manual (NPS-77). Lastly, and possibly most importantly, WOB assisted roughly 65 parks on hydrology and water quality issues. A complete listing of WOB's FY99 accomplishments by Region and Park is provided elsewhere in this report. Following are some examples of significant FY99 Branch accomplishments:

- Provided 60 parks with a complete inventory and analysis of all available park water quality data and uploaded those data into the EPA national water quality database. This brings to 191 the total number of parks with complete water quality inventory and analysis reports and databases. The NPS servicewide water quality database now includes over 2.5 million water quality observations at over 17,000 sampling locations.
- Drafted literature reviews on potential aquatic resource contamination issues associated with the operation of snowmobiles and personal watercraft in National Parks.
- Assisted in drafting oil and gas management plans and Environmental Impact Statements for Padre Island National Seashore, Big Thicket National Preserve, and Lake Meredith National Recreation Area.
- Continued high levels of assistance to Yosemite National Park (Valley Implementation Planning), Lake Mead National Recreation Area (contaminants issues), Biscayne National Park (contaminants issues), Cape Cod National Seashore (ground water protection issues), Big South Fork National Recreation Area (mine land reclamation issues), Grand Teton National Park (river processes), San Antonio Missions National Historical Site (contaminants and land acquisition), and Golden Gate National Recreation Area (ground water-surface water interactions).
- Developed a watershed model, and assessment of watershed conditions and flood management alternatives for John Muir National Historical Site.
- Assisted Bighorn Canyon National Recreation Area in evaluating lake level management issues associated with the implementation of the Crow Tribe water rights compact.

These and the many other activities summarized in this report and the articles that follow reflect the wide range of issues that find their way to WOB, and the breadth of the staff's expertise. As we begin FY00, we are being directed by the NPS strategic planning effort to direct a larger proportion of our program resources to support servicewide strategic goals. Our challenge will be to do this without significantly impacting our program of park-specific technical support. As always, we seek and value your input, and we'll continue to strive to be a readily accessible service program to parks.

Riparian Restoration at Channel Islands National Park and Blue Ridge Parkway -- Focus of Water Quality Program

by Gary Rosenlieb, Hydrologist

Blue Ridge Parkway by Bambi Teague, Bob Cherry, and Tom Davis, Resource Management Specialists,
Channel Islands National Park by Steve Ortega, Resource Management Specialist

In 1998, the Water Quality Program of the Water Operations Branch began focusing competitive funds on restoration and protection projects that would improve park water quality. Projects undertaken in Channel Islands National Park and the Blue Ridge Parkway have produced some noteworthy results.

In 1999, the Water Resources Division provided funding to Blue Ridge Parkway for the protection and restoration of riparian areas within agricultural leases on the Parkway. The primary goal of this project is to reduce sedimentation to the parkway's waterbodies by excluding cattle from streams and wetlands and by reestablishing woody and herbaceous vegetation on eroded stream banks. Under the direction of Resource Management Specialist Bambi Teague, restoration activities were initiated on five streams, including the construction of a one-quarter mile, riparian cattle enclosure on Greene Creek and bank stabilization and revegetation on Sims Creek. Work that will be completed in 2000 includes the establishment of stream-profile transects and the continued collection of stream invertebrate information.

At Channel Islands National Park, Resource Management Specialist Steve Ortega continues to monitor plots in Quemada Creek that were established to test the concept of planting small islands of native vegetation within selected channel reaches that will then colonize adjacent riparian areas. The Quemada Creek Watershed was subject to decades of continuous grazing by cattle, resulting in the almost complete removal of herbaceous and woody riparian vegetation, excessive erosion and sedimentation, and elevated levels of fecal coliform bacteria. Beginning in 1998, native vegetation consisting of Arroyo Willow, Seep Willow, sedges, rushes, and saltgrass were planted in three vegetative islands along the stream bottoms. Monitoring information collected thus far reveals that mortality among the reintroduced plants is less than expected and natural recovery of the native species is occurring.

Flood Study for Fort Davis National Historic Site

by Michael Martin, Hydrologist

Fort Davis National Historic Site (FODA), in the Davis Mountains of west Texas, is located at the outlet of a small (0.6 square miles), bedrock watershed at an elevation of about 5000 feet. Intense thunderstorms, characteristic of this region, are capable of producing high-magnitude runoff events, and, given the small size of the watershed and the rapid runoff rate of the bedrock, the fort location is susceptible to flash flooding. The fort was originally an Army post (established in the late 1800's) and is located on an alluvial fan directly below the fan-head valley. Numerous distributary channels downstream of the fort are visible on aerial photographs. Due to the fort's setting, flooding was a regular phenomenon, and the Army constructed a series of canals and levees for protection. Low-to-moderate flows were, and continue to be, effectively diverted around the grounds via two ditches. The existing configuration of ditches and levees, however, is not sufficient to protect the grounds from higher magnitude floods. Current Park staff has observed a number of



Photograph taken on the lower portion of the fan, looking downstream of the main channel that conveys runoff south of the Fort grounds. Note headquarters and administration building in left-center of photo.

large runoff events in recent years. Of particular note was an event observed in the late summer of 1990. During this storm the entire ditch-levee-channel system was overwhelmed by floodwaters. Debris-laden floodwaters spilled onto the fort grounds, eroding historic building foundations and depositing sediment in historic structures.

Occupation of a floodplain in a flash-flood-prone area constitutes a Class III action in reference to the National Park Service Floodplain Management Guidelines (National Park Service, 1993), with the regulatory floodplain defined as the area inundated by an extreme flood. Floods of this magnitude are exceptionally rare and not useful as a practical structural design standard. However, knowledge of the conditions associated with the worst-case flood can be useful for planning purposes and human safety. The magnitude of this extreme flood (as well as a suite of lower magnitude floods, such as the 100-year event) was estimated using statistical and graphical methods developed by the USGS (Schroeder and Massey, 1977; Crippen and Bue, 1977). Subsequently, the hydraulic capacities of ditches in FODA were estimated using the U. S. Army Corps of Engineers computer model HEC-RAS. This model uses channel geometry and roughness data to predict water surface elevations and flow velocities for specified discharges. Knowing the flow capacities and associated flood frequencies of the ditch-levee system permitted estimation of the recurrence interval of over-bank flow at various locations in the park. This information allowed quantification of the level of flood protection provided by the existing system and development of options for improving the management of floodwaters in and around FODA.

Wellhead Protection Planning

by Larry Martin, Hydrologist

Wellhead protection plans provide protection for a water supply well, wellfield, or spring from contamination by identifying the area (a wellhead protection area) that contributes groundwater to the well, wellfield, or spring. Wellhead protection (or source water protection) plans are mandated by EPA through the 1986 amendments to the Safe Drinking Water Act and are required or strongly recommended by state regulatory agencies for existing public water supply wells. Wellhead protection plans include: delineating the source area and travel times for groundwater flowing to a well, identifying potential contaminants within the source area, developing a management plan to minimize the potential for contamination of the aquifer (especially within the source area of a water supply well), and developing a contingency plan if contamination does occur. WRD has provided professional hydrogeologic services to several parks to prepare wellhead protection plans

Park facilities, rather than external sources, are often the biggest threat to water supply wells in a park. Because water supply and distribution systems are operated out of the maintenance division at a park, wells are often located in proximity to maintenance facilities. These facilities may include fuel storage tanks and various degreasers and chemicals commonly used in maintenance shops. Improper use and storage of herbicides and pesticides can be a source of groundwater contamination. Septic leachfields are another common source of contaminants in a park. Larger parks often have public gas stations, which can be potential contaminant sources. In addition to reducing the potential for contamination of public water supplies, wellhead protection plans can be used to identify potential natural resource impacts from pumping groundwater.

WRD staff has completed wellhead protection plans for Capitol Reef National Park, Golden Spike National Historic Site, and Bryce Canyon National Park. WRD staff also provided oversight for preparation of wellhead protection plans for 18 public water supply wells at Grand Teton National Park. We plan to prepare wellhead protection plans for parks comprising the Southeast Utah Group (Arches National Park, Canyonlands National Park, Natural Bridges National Monument, and Hovenweep National Monument) in 2000. Potential threats to drinking water supplies at these parks include: oil and gas operations, abandoned landfills, uranium tailings, abandoned and potential mining operations, and park maintenance facilities.

New Water Quality Partnership with the U.S. Geological Survey

by Barry A. Long, Hydrologist

A water quality assessment and monitoring partnership between the National Park Service (NPS) and the U.S. Geological Survey (USGS) was initiated in fiscal year 1999. The partnership stems from a pilot collaboration between the two agencies between 1995 and 1998. The impetus for funding the partnership comes from the Clean Water Action Plan. The primary objective of the partnership is to establish complementary working relationships among park and USGS Water Resources Division staff to better focus collaborative project activities on pertinent water quality issues in parks. The rationale for utilizing the USGS to address NPS needs is because of their expertise, infrastructure, and standardized protocols for water quality monitoring. During the year, 35 projects in 32 national parks were implemented. Also, 12 new projects and 28 continuing projects were selected for funding in fiscal year 2000. Already, NPS has received a technical report, titled "Semivolatile organic compounds in streambed sediment from the Richland Creek basin, Arkansas, 1999," for a partnership project implemented at Buffalo National River this year. In addition, NPS has received several reports and other products for the pilot projects. Currently, NPS is working to expand the partnership and may utilize the partnership to address national water quality goals in the future.



Examples of other projects funded this year include: the occurrence of organochlorines and semi-volatile compounds at water intake facilities at Lake Mead National Recreation Area, forested watershed nitrogen cycling and estuarine nitrogen loading at Acadia National Park, human impacts on water quality and riparian habitats along the Alagnak Wild and Scenic River, microbial contamination in the Chattahoochee River National Recreation Area, investigation of Abbott's Lagoon trophic condition and biologic distribution at Point Reyes National Seashore, and effects of changing atmospheric deposition on chemistry of lakes in the Intermountain and Pacific West Regions. The types of products being received by NPS include professional reports, interpretation materials, water quality monitoring plans, data compilations, computer models, and instrument installations.

Watershed Condition Assessment for John Muir National Historical Site

by Richard Inglis, Hydrologist



During the 1998 El Niño rainstorm events, localized flooding occurred along several streets downstream from John Muir National Historic Site (JOMU). Some of the affected residents believe that conditions or activities on Park lands may have exacerbated flooding in their neighborhoods. The Water Operations Branch was requested to assist with the flooding issue by conducting an assessment of the condition of the watershed above the flooded area. The purpose of the assessment is to guide JOMU to the best combination of land management practices to improve watershed conditions and reduce flooding downstream, if possible, while adhering to Park management philosophies.

How much flooding historically occurred from this watershed is not known; however, many changes to the area around JOMU have taken place in recent years. Changes prior to NPS ownership, such as the construction of fire roads and the introduction of exotic plant species, influence watershed runoff and the magnitude of floods. It is the intent of JOMU management to restore the landscape as much as possible to that of the 1880's when John Muir lived in the area. This assessment examined watershed features, determined factors of concern, and analyzed those

factors affecting watershed runoff and downstream flooding. The principal analytic tool is a computer model (TR-55) that predicts the amount of peak flows from inputs of precipitation and land use factors derived from a GIS package in Arcview. The factors considered in the model include vegetative cover, stream channel condition, and the presence of man-made ponds. The assessment documented the effects of land uses on watershed runoff and suggested opportunities for reducing flooding by improving watershed conditions. Variables of greatest concern at JOMU include vegetation and channel conditions and the presence or absence of ponds.

Flooding will occur in the downstream neighborhood under current conditions with any flows above about 20 –50 cubic feet per second (cfs). The results of the study indicate peak flow under baseline conditions for a 10-year storm is 182 cfs. Reductions in peak flows up to 12% can be achieved by improving watershed conditions consistent with Park responsibilities. These reductions, however, will not significantly reduce flooding downstream. The largest reduction of flooding indicated by the model resulted from the scenario that included a large detention basin. However, NPS management policies and mandates would not permit this sort of development within the boundary of JOMU. Addressing necessary channel modifications or flood proofing actions for the flood prone neighborhood so that floods can be conveyed without impacting private properties will be addressed through the local planning group, the homeowners involved, and the county flood control district.

Personal Watercraft and Water Quality

by Mark VanMouwerik, Contaminants Specialist and Matt Hagemann, Hydrologist



emissions.

Personal watercraft (PWC), commonly known as “jet skis,” are found in National Park units across the country. Most PWC—and most outboard-engine motorboats as well—use a conventional two-stroke engine which can discharge up to 30% of its fuel unburned directly into the water. PWC have been found to discharge more unburned fuel to water than outboard (two-stroke) motorboats due to differences in design and operation. One study comparing these two types of watercraft found that PWC, while representing only one-third of the watercraft observed, emitted 80% of the total watercraft hydrocarbon

In 1999, Water Operations Branch staff researched this issue and produced a report titled “Water Quality Concerns Related to Personal Watercraft Usage.” Research included a review of current literature—journal articles, government documents, grey literature, information from websites—and personal communication with leaders in the industry, regulatory, and scientific research fields. Conclusions of the report are:

- The pollutants of greatest concern are methyl tertiary butyl ether, or MTBE (an oxygenate added to gasoline), and polycyclic aromatic hydrocarbons, or PAHs (by-products of the combustion process). Concentrations of MTBE in lakes and reservoirs with heavy PWC use have been observed to exceed state human-health standards and thresholds for taste and odor. Aquatic ecologic communities do not appear to be threatened by observed concentrations of MTBE, but more research is needed to reinforce this conclusion.
- PAH concentrations in lakes and reservoirs with high motorboat activity have been found at levels dangerous to aquatic organisms. Surprisingly low concentrations (parts-per-trillion range) can cause adverse effects. Also, at observed concentrations, PAHs may pose a risk to human health in lakes and reservoirs that serve as drinking water supplies or where fish from those water bodies are eaten.
- Direct-injection two-stroke engines are now becoming available for PWCs. Because this new technology allows more complete combustion, the discharge of unburned fuel—and of MTBE, if used—would be significantly reduced. However, since PAHs are not present in unburned fuel but rather are by-products of combustion, it is unclear how this technology would affect PAH inputs into water.

NPS Servicewide Water Quality Data Archive Dramatically Expands

by Dean Tucker, Computer Technician

The National Park Service (NPS) Water Resources Division (WRD) has been archiving water quality data collected in or near National Park units in the Environmental Protection Agency's (EPA) Storage and Retrieval (STORET) national water quality database for the last three years. These data have been derived from published and unpublished reports; current and historical databases contributed by park personnel; records from the Water Resources Division's files; and a myriad of other sources. At the close of 1999, the database included over 2.5 million observations from nearly 17,500 water quality monitoring stations in or near 191 national park units. These NPS water quality monitoring stations comprise approximately 2 percent of the 850,000 water quality monitoring stations currently in STORET.

STORET, an interagency water quality database created by the EPA, houses a diverse array of data contributed by the U.S. Geological Survey, states, various EPA programs, and other governmental entities. STORET is used extensively to support national and state programs governed by the Clean Water Act, such as State 305(b) water-quality assessment reports, 303(d) lists of impaired water bodies for total maximum daily load (TMDL) development, National Pollutant Discharge Elimination System permits, and other water quality related activities. The database is also used by academics and consultants to prepare environmental assessments, impact statements, and other reports. STORET has been adopted as the NPS's servicewide archive for physical, chemical, biological, and other aquatic sampling results. Among the reasons the NPS adopted STORET as a servicewide archive include: sharing information with other government agencies and the public (STORET is a publicly accessible database available on the Internet), preserving NPS's investment in water quality monitoring data by affording an off-site backup, and establishing an historical water quality baseline for parks.

STORET, the EPA's oldest and largest database, has recently been completely modernized to incorporate a diverse array of new capabilities and an entirely new architecture and interface. To upload water quality data into the new STORET National Data Warehouse, agencies must already have the data entered into a local copy of STORET. The Water Resources Division is currently running the new STORET for Servicewide use. Data in NPS's STORET node will be uploaded to the STORET National Data Warehouse on a weekly basis. If you are aware of water quality data that have been collected in or near a National Park unit and would like to assure that these data are permanently archived in STORET, please contact Dean Tucker with WRD at (970) 225-3516. For additional information on the new STORET, please visit the STORET web site at [HTTP://WWW.EPA.GOV/OWOW/STORET](http://www.epa.gov/owow/storet).

Water Rights Branch Highlights

by Chuck Pettee, Chief

The year 1999 was another busy one for the Water Rights Branch. We are continuously striving to balance our reactive and proactive work. The NPS protection mandate means we often have to be prepared to react to water development proposals or adjudication lawsuits. Our proactive efforts center around areas having longstanding adjudications or where there is a pattern of water development near park water-related resources. In these situations, we try to work with the development advocates and regulatory authorities to methodically provide for protection of park resources. I am pleased to report that we made steady progress in many areas and anticipate completion of several negotiated settlement agreements that resolve longstanding issues in the near future.

This year Office of the Solicitor and WRB staff worked with White Sands National Monument and the U.S. Air Force to transfer water rights from the park to Holloman Air Force Base (HAFB). The Dog Canyon area was set aside, in part, to provide a source of water for the park. Recently, the park has relied on neighboring HAFB wells for its water needs while the Dog Canyon area is valuable to the State of New Mexico for its historic resources. The

transfer of water rights ensures the continued availability of water for both the park and HAFB while the land was transferred to the State for use as a State Park (see story below.)

The NPS is undertaking a major effort to overhaul its entire system of documenting policy as well as the policies themselves. WRB's role was to revise the format and refine Special Directive 78-2. The directive, issued in 1970 to implement the authority to sell or lease park water, was converted into the new Director's Order series format. This policy is now found in Director's Order #35.

The number and complexity of the water rights issues that parks face is ever increasing. Yet the budget and personnel resources we have available to assist parks has not changed since 1991. We find ourselves losing ground to inflation, and in some cases, we are not able to financially afford studies necessary to protect park water rights and water-related resources. We have been working on a number of fronts to secure adequate budget increases but none have yet come to fruition. One of these fronts is through the re-invigorated US Geological Survey (USGS). Because of their cadre of technical expertise in geology, biology, and hydrology, WRB has for many years contracted for work to describe surface and ground water flow systems as well as the relationship between water and park biologic resources. The USGS is promoting a budget increase for Fiscal Year 2001, that is dedicated to developing science for Department of the Interior priorities. This budget would support USGS staff salaries and support. NPS has asked the USGS to earmark \$1.5 million for work on NPS water rights issues. Additionally, we hope to benefit from increased water rights project funding as a result of the Natural Resource Challenge.

We are thankful for the availability and professionalism of park management and staff and appreciate their critical role in the NPS water rights program. We continue to encourage field managers to call upon the WRB whenever water rights issues are, or could be, affected by management decisions or proposals by park neighbors.

Updated Guidelines for the Sale or Lease of Water

By Chuck Pettee, Chief

In its 1916 "Organic Act," the NPS is mandated to protect resources in designated park system areas and also provide for the enjoyment of the same by the public. Over the years, Congress has clearly weighed in on this issue. Protecting cultural or natural resources has always been the purpose for creating park units, and yet there are also laws that authorize the construction of facilities such as visitor centers, campgrounds, etc. to enhance the visitor's experience. In 1953, and again in 1970, Congress authorized activities to "facilitate the management" and "improve the administration" of the park system. Activities authorized in 1953, included the development of utility services and facilities within the park system. The 1970 Act, Public Law 91-383, included conditional authorization for the sale or lease of services, resources or water that could be used in areas adjacent to parks. While the 1970 Act conditioned its authorization on, among other factors, the benefit to the park, it wasn't until 1976 that Congress clarified its intent with regard to the protection and development of park resources. In 1976, Public Law 94-458 amended the 1970 Act to require that "such activity does not jeopardize or unduly interfere with the primary natural or historic resources of the area." Additionally, the Solicitor's Office provided legal guidance that this authorization was incidental to the NPS's primary commitment of resource protection.

This series of law and legal opinion was incorporated into NPS policy in Special Directive 78-2, dated March 30, 1978. As a part of the current NPS effort to update its policies, the Water Rights Branch has been the lead for reviewing and updating the Special Directive, and incorporating it into the new Director's Order series as Director's Order #35.

The updated policy clarifies a number of issues such as the relationship between the sale or lease authorization and rights-of-way permits, compliance with the requirements of the National Environmental Policy Act, establishing charges for the services, resources, or water, and the reimbursement of implementation costs. Another important clarification in the new policy is to include specific reference to environmental considerations for any potential reasonable alternatives to the use of park services, resources, or water. For example, the hydrologic setting in and around some parks may lead hydrologists to conclude that the use of water from sources outside of the park may be more damaging to park resources than use of water from within the park. The new Director's Order requires that

such regional environmental factors are considered in determining the feasibility of an alternative. Director's Order #35 can be found on the NPS website at www.nps.gov/refdesk/DOrders/index.htm.

Lost the Dog to Oliver Lee

By William R. Hansen, Hydrologist

In 1978, Public Law 95-625 (92 Stat. 3475) amended the boundaries of White Sands National Monument (White Sands) and authorized a land exchange between the National Park Service (NPS) and the State of New Mexico (State). Section 303(b)(1) provided that the lands deleted from any area pursuant to Section 301 could be exchanged for non-Federal lands within the revised boundaries of White Sands. The 440-acre Dog Canyon Tract was originally purchased by the NPS in the 1940's to secure a water right for 200-miners inches. The water right was appropriated in 1893 by Oliver Lee and was acquired by the NPS to provide water for domestic purposes at White Sands. The State owned lands within the revised boundaries of White Sands and was willing to exchange its lands for the Dog Canyon Tract, which would become part of the Oliver Lee Memorial State Park. In 1983, NPS and the State entered into a memorandum of agreement to consummate the exchange, subject to a reservation of a small parcel of land and the water rights attached to the Dog Canyon Tract.

Since 1956, White Sands has received water service from Holloman Air Force Base (Holloman). The Air Force had a long-standing interest in developing the water rights associated with the Dog Canyon Tract as a source of water for Holloman. Due to the joint interests of the NPS and Holloman, a Letter of Transfer (Letter) was finalized in December 1998 to protect water rights on the Dog Canyon Tract for future use by the United States.

The Letter transferred all water rights and property interests, rights, permits, licenses, easements and appurtenances acquired by NPS on the Dog Canyon Tract to the Air Force in consideration of assurances from the Air Force to continue water service indefinitely to White Sands. The Letter also grants the right of first refusal and agrees to reassign the Dog Canyon water rights and associated easements to NPS in the event Holloman closes as a military installation. This agreement allows the NPS and the State to consummate the land exchange as authorized. The Dog Canyon Tract is now owned by Oliver Lee Memorial State Park.

Update on the Status of the Water Rights Docket Project

By Jeff Albright, Hydrologist

The Water Rights Branch is completing the first phase of a long-term project (the Docket Project) to convert paper water right records, known as the docket files, into an electronic format. The docket files are maintained by the branch and contain supporting documentation for water rights of the entire National Park Service system. Included in the docket files are originally signed legal documents and other records that cannot be easily replaced if they become lost or damaged. Because of the legal significance of the docket files, and the fact that many of the original documents are deteriorating with age and use, a backup filing system was deemed important. Objectives of the Docket Project are:

1. to provide for multi-user access to water rights documentation;
2. to serve as a legally defensible system for storing and retrieving water right documents (i.e., copies reproduced from the backup system could be used in legal proceedings); and
3. to readily allow for addition of new documents, as well as facilitate future development of electronic data bases to assist document retrieval and utilization.

As presently developed, the backup filing system involves electronic scanning of original paper documents, indexing and cataloging of each scanned document (e.g., title and date of document, folder name and section of folder it was stored in), and archiving of scanned image files to CD-ROM disks. Users can view and print scanned images via file browsing software. To date, approximately 40,000 documents have been scanned into the system. Additional documents need to be scanned and software is still being refined to add flexibility for end users, but the

system appears to meet the objectives outlined above. A second phase for the Docket Project is anticipated. That phase will include publication of CD-ROM disks that could be distributed to individual park units. Each park unit would receive the disk(s) containing scanned documents for their water rights. Disks with updated water rights information would then be distributed to park units on an as-needed basis.

Unequal Protection: America's National Rivers

by Peter Fahmy, Solicitor, Department of the Interior

In 1968, Congress enacted the Wild and Scenic Rivers Act, establishing the National Wild and Scenic Rivers System. Its objective was to preserve for present and future generations a variety of free-flowing rivers throughout the nation. In order to achieve this objective, section 7(a) of the Act provided that the Federal Energy Regulatory Commission is prohibited from licensing any project works on or affecting a designated Wild and Scenic River, and no other federal agency may assist in the construction of a water resources project that would have a direct and adverse effect on the values for which the river was designated. The legislation also mandated that a water resources project could not be constructed either upstream or downstream of the designated river corridor or on tributaries if such construction would unreasonably diminish the values for which the river was designated.

Although the Wild and Scenic Rivers Act provided for extensive protection of the free-flowing character of the designated rivers, the Act's protection of the river corridor through the acquisition of fee title to riparian lands was limited to no more than an average of 100 acres per mile. This restriction had the effect of eliminating use of the Act as a means of river protection in those instances where Congressional proponents of river protection anticipated the acquisition of large tracts of adjacent riparian lands and thereby, gave rise to the creation of National Rivers as a statutory vehicle to achieve these purposes. Currently, there are four National River areas, the Buffalo National River, the Big South Fork National River and Recreation Area, the Mississippi National River and Recreation Area, and the New River Gorge National River, and one quasi-National River area, the Little River Canyon National Preserve, in the National Park System.

In many respects, the legislation establishing National Rivers on the Big South Fork of the Cumberland, Buffalo, Little, and New Rivers has borrowed from the statutory provisions of the Wild and Scenic Rivers Act, perhaps most importantly the Act's prohibition on incompatible water resources projects.¹ By incorporating this prohibition verbatim, Congress clearly intended that these National Rivers be afforded equal protection from incompatible water resources projects as that provided to Wild and Scenic Rivers. However, a review of the regulations and policies of those federal agencies charged with regulating or assisting in the construction and/or operation of water resources projects, such as the Federal Energy Regulatory Commission, the Army Corps of Engineers, the Bureau of Reclamation, and the Rural Utilities Service, reveals that although these agencies are aware of the protections that exist for Wild and Scenic Rivers, none of these agencies' regulations and policies fully recognize the protections that exist for these National Rivers. For instance, although the Corps of Engineers' regulations regarding the issuance of Section 404 permits expressly subjects permit issuance to section 7(a) of the Wild and Scenic Rivers Act, nowhere in these regulations is reference made to the various statutes designating these National Rivers, which contain section 7(a) type prohibitions on incompatible water resources projects. Another example is contained in the Rural Utilities Service's "A Guide for Preparing the Environmental Report for Water and Waste Projects." Although the Guide lists the Wild and Scenic Rivers Act as one of the federal environmental statutes that may be applicable to proposed projects for which an environmental report is being prepared, the Guide fails to cite any of the statutes establishing these National Rivers.

In order to remedy this unfortunate oversight, the Office of the Solicitor is working with the Water Rights Branch and other offices of the National Park Service to make these agencies aware of the statutorily-mandated protections that exist for these National Rivers. It is the hope of the National Park Service that once these agencies become aware of these federal mandates that they will amend their regulations and policies in order to ensure that these National Rivers have the equal protection to which they are entitled.

¹

¹ Although the legislation establishing the Mississippi National River and Recreation Area does not contain a prohibition on incompatible water resources projects, it does provide for review by the Secretary of the Interior of all proposed federal actions within the Area to ascertain the compatibility of the proposed federal action with the Area's management plan.

**SUPPORT PROVIDED TO REGIONS, PARKS, AND
OTHER NATIONAL PARK SERVICE
ORGANIZATIONAL UNITS**



ALASKA REGION

Advised regional staff regarding the effects of the ANILCA NEPA exemption on wetland compliance for inholder access roads.

Began work on a mitigation banking document that would allow Alaskan parks to restore wetlands and subsequently use those “credits” as NPS Director's Order #77-1 mandated compensation for projects impacting NPS wetlands.

Planning and Evaluation Branch

Denali National Park and Preserve

* Provided technical review and comments on a wetland Statement of Findings for “Northface Corner Gravel Excavation.” Certified the technical adequacy of the wetland analyses and consistency with Director’s Order #77-1: Wetland Protection.

*Provided technical review and comments on the draft wetland Statement of Findings for “Construction of Access to Spruce #4 Inholding in Kantishna.”

*Provided technical review and comments on the draft wetland Statement of Findings for “Primrose Pullout Improvements.”

*Provided technical review and comments on the draft wetland Statement of Findings for “Toklat Borrow Processing Site/Toklat River Excavation Site.”

*Reviewed and commented on the EA and provided technical review and comments on the wetland Statement of Findings for the expansion of maintenance operations near park headquarters. Certified the technical adequacy of the wetland analyses and consistency with Director’s Order #77-1: Wetland Protection.

Gates of the Arctic National Park and Preserve

*Final hard-copy maps were received from the USFWS’s National Wetland Inventory program for the WRD funded project titled “NWI Mapping for the Upper Kobuk River Watershed.”

Glacier Bay National Park and Preserve

*Provided technical review and comments on a wetland Statement of Findings for “Bartlett Cove Dock Rehabilitation.” Certified the technical adequacy of the wetland analyses and consistency with Director’s Order #77-1: Wetland Protection.

*Assisted in developing a scope of work for a wetland delineation contract (entrance road project).

*Participated in a scoping and planning meeting for the development of an overall Fisheries Management Plan.

Katmai National Park and Preserve

*Completed Katmai National Park and Preserve Water Resources Scoping Report (NPS/NRWRD/NRTR-99/226) and assisted Park staff in preparation of a project statement for a water resources management plan.

*Met with Park staff concerning fisheries management issues and the possible development of an interagency cooperative fisheries management plan.

Lake Clark National Park and Preserve

*Initiated the development of a Water Resources Scoping Report.

*Met with Park resource management staff to discuss park fishery issues and visited Park sockeye salmon study sites and discussed these with BRD and Park staff.

Wrangell-St. Elias National Park and Preserve

*Advised Park staff regarding preparation of a wetland Statement of Findings for mining in the Gold Hill Mining District.

Water Operations Branch

Alagnak Wild River

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Denali NP & Preserve

*Assisted USGS with field sampling on Costello Creek partnership project.

Gates of the Arctic NP & Preserve

*Reviewed water quality inventory and monitoring report.

Katmai NP & Preserve

*Provided detailed analysis and technical comments on Report Entitled “Baseline Hydrocarbon Study: Katmai NP, Final Report.”

*Reviewed water resources scoping report.

*Assisted USGS with field sampling on Alagnak River partnership project.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Lake Clark NP & Preserve

*Reviewed progress report for a water quality assessment of Lake Clark.

*Assisted USGS with field sampling on Johnson River and Tlikikila River partnership projects.

Water Rights Branch

Sitka National Historical Park

*Continued cooperative data collection program with Sheldon Jackson College to investigate streamflow and diversions on Indian River.

*Provided funding to Park to support water rights investigations by Park staff on Indian River.

Multi-Park

*Provided briefing to the Alaska regional office and superintendents about water rights issues in Alaska.

INTERMOUNTAIN REGION

COLORADO PLATEAU CLUSTER

Planning and Evaluation Branch

Canyonlands and Arches National Parks

*Assisted in project oversight and completion of the Canyonlands NP/Arches NP Water Resources Management Plan, completed through the Water Resources Division's "Hydrological Affiliates" program.

Dinosaur National Monument

*Provided technical review and comments on the draft report "Ute Ladies'-tresses Orchid (*Spiranthes diluvialis* Sheviak) Inventory, Dinosaur National Monument and Browns Park National Wildlife Refuge, 1998."

*Provided assistance in dealing with Flaming George Dam water releases and endangered fish species issues. Assistance included a review of the Colorado River Endangered Species recovery program committee's flow recommendation report and a review of the U.S. Fish and Wildlife Service's "Sufficient Progress" report.

*Provided comments regarding Colorado 404 regional permit conditions for the Corps' Nationwide Permit Program.

Grand Canyon National Park

*Provided a review and comments to the Park concerning the Bureau of Reclamation's EIS for proposed modifications to Glen Canyon Dam to allow control of downstream temperatures.

Mesa Verde National Park

*Provided technical review and comment on a proposal to inventory wetlands and riparian areas.

Zion National Park

*Reviewed and provided comments on a draft EA for the Shunes Creek stream diversion reconstruction. The project was also evaluated for compliance with Director's Order #77-1: Wetland Protection and a determination was made that a wetland Statement of Findings would be required.

*Finalized the task order for the FY99/00 WRD-funded project titled "Inventory Wetlands and Riparian Vegetation." Assisted the Park in preparing a study plan and locating a contractor.

*Reviewed and provided comments on an EA for the Scenic Drive Sentinel Slide Area Stabilization. The project was also evaluated for compliance with Director's Order #77-1: Wetland Protection, and a determination was made that a wetland Statement of Findings would not be required.

Water Operations Branch

Arches National Park

*Reviewed draft Water Resources Management Plan.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Bryce Canyon National Park

*Prepared final report for wellhead protection plan.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Canyon de Chelly National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Canyonlands National Park

*Provided continuing assistance to the Park in assessing potential effects of leachate from the Atlas Mine tailings on endangered fish in the Colorado River. Provided information about failed expectations at the Shattuck site in Denver, another radioactive site where the solution was to cap the pile and leave it in place.

*Investigated reports of a diminished/altered discharge at Mantle Springs.

*Reviewed draft Water Resources Management Plan.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Capitol Reef National Park

*Archived data in STORET from the park's water quality monitoring program that ran from 1987 through 1994 and encompassed 45 monitoring stations.

Cedar Breaks National Monument

*Advised on feasibility of constructing a water supply well to replace the spring source.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Chaco Culture National Historic Park

*Assisted with groundwater monitoring plan for Chaco Wash.

*Worked with Park staff to establish and survey permanent baseline cross sections to monitor channel condition at Chaco Wash. Thirteen locations were selected for long-term protection of resource values of archeology, infrastructure, riparian and recreational as well as geomorphic processes.

*Participated in a meeting to discuss the erosion risk to Pueblo del Arroyo and possible protection measures.

Colorado National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Dinosaur National Monument

*Reviewed the detailed study plan for a USGS project to study a potential upward trend in pH in the Green River. Actively helped the park and USGS staff focus project planning and developed a quality assurance project plan for this project.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

El Malpais National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Fossil Butte National Monument

*Assisted with a potential hazardous material site assessment at an old petroleum well by researching files, mapping the site, taking photographs, and documenting recommendations in a trip report.

*Provided technical assistance in implementing the Chicken Creek Watershed Restoration Plan with the Park successfully removing the fifth of five dams and reconstructing a stable and naturally functioning channel.

Glen Canyon National Recreation Area

*Attended Interagency Long-Term Monitoring and Research meeting at Lake Powell.

*Attended interagency meeting related to the strategic plan for addressing human health issues at Lake Powell. Served on the Technical Advisory Committee tasked with developing bacteria water quality monitoring guidelines and protocols.

*Attended DOI Conference on the Environment and displayed Lake Powell beach monitoring poster for the park.

*Participated in development of project to assess water quality in side canyons of Lake Powell, and carried out preliminary field sampling.

Golden Spike National Historical Site

*Prepared wellhead protection plan.

*Uploaded data from the Utah Department of Natural Resources, data from Thiokol Propulsion and Utah Department of Environmental Quality, and data from the U.S. Geological Survey National Geochemical Data Base: National Uranium Resource Evaluation Program to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Grand Canyon National Park

*Reviewed Grand Canyon Monitoring and Research Center water quality monitoring plan.

*Reviewed and commented on proposal to develop a groundwater supply for a new development south of Tusayan (Canyon Forest Village).

*Reviewed three sediment transport related research proposals for the Grand Canyon Monitoring and Research Center.

Hovenweep National Monument

*Uploaded park-collected monitoring data; jointly collected data from the U.S. Geological Survey, U.S. Fish and Wildlife Service, Bureau of Reclamation, and Bureau of Indian Affairs; and data from the U.S. Geological Survey National Geochemical Data Base: National Uranium Resource Evaluation Program to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Mesa Verde National Park

*Prepared a project proposal for hydrogeologic assessment of Park springs.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Natural Bridges National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Navajo National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Petrified Forest National Park

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Pipe Spring National Monument

*Investigated hydrogeology related to springflow reduction.

*Coordinated WRD-funded geophysical investigations and aquifer study by USGS to investigate water level declines in the aquifer supplying the springs. Provided an alternative work plan when access to original study area was denied.

*Contributed to the Tunnel Spring advisory team in addressing options for restoring flow to the historic springs.

Yucca House National Monument

*Uploaded park-collected domestic water supply data for Ismay Spring; jointly collected data from the USGS, Fish and Wildlife Service, Bureau of Reclamation, and Bureau of Indian Affairs; and data from the USGS National Geochemical Data Base: National Uranium Resource Evaluation Program to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Zion National Park

*Prepared an assessment of well on Roaring 20s Property.

*Provided design specifications for hydraulic structures associated with the new bus maintenance facility in Sammy's Canyon. Provided review and consultation on the hydraulic analysis and design of various aspects of the road reconstruction project at the site of the recent landslide. Provided hydrologic input for the new General Management Plan.

Water Rights Branch

Aztec Ruins National Monument

*Initiated quantification of water rights for the San Juan Basin Adjudication.

*Assisted Park in evaluating water rights associated with land acquisitions.

Bryce Canyon National Park

*Finalized report estimating Park existing and future consumptive uses.

Canyonlands National Park

*Installed and maintained a stream gage on the Green River to assist hydraulic modelling efforts.

*Calibrated reach length 2-dimensional hydraulics model for the Green River in the Fort Bottom area.

*Provided funding and staff support to the USGS-BRD for a riparian vegetation study in the Fort Bottom area on the Green River.

*Provided funding and staff support for the development of a flow routing model for evaluating Green River flow scenarios.

*Coordinated a meeting for regional and WRD staff and the USFWS regarding flow recommendations and management of Green River.

*Attended BoR's working group meetings for Flaming Gorge Dam.

*Attended USFWS biology committee meetings and commented on Green River flow recommendations.

*Participated in a agency scoping meeting/field trip for BoR's EIS on Flaming Gorge Dam.

*Assisted BoR in preparing a videotape on park resources affected by Flaming Gorge Dam.

*Prepared Hydrologist's Report on Green River floodplain inundation modeling.

*Coordinated a training course on the use of a flow routing model developed for the Green River.

Cedar Breaks National Monument

*Revised draft Federal reserved water rights settlement.

*Assisted Park in filing change application for Blowhard and Twin Springs.

Chaco Culture National Historical Park

*Continued surface and ground water investigations on Chaco Wash to develop evidence for the San Juan adjudication.

*Installed, maintained, and trained Park staff in the operation of surface water and ground water data collection sites.

*Provided a briefing to Park staff and management about filing of water rights claims in the San Juan Adjudication and coordinated water rights strategy sessions with the Park, SOL and DoJ.

*Completed Park-wide surface water source inventory.

Colorado National Monument

*Reviewed Colorado water right resumes for Water Division 5 to determine if protests were necessary to protect Park water rights and resources.

*Assisted the Park in discussions related to the future of the Town of Fruita's water pipeline.

Dinosaur National Monument

*Reviewed Colorado water right resumes for Water Division 6 to determine if protests were necessary to protect Park water rights and resources.

*Maintained a stream gage on the Green River to assist hydraulic modelling efforts.

*Calibrated reach length 2-dimensional hydraulics model for the Green River in the Island Park area.

*Repeated channel surveying and flow field measurements for Island Park during high flow event.

*Assisted Park with site photography and observations during a high flow event.

*Provided funding and staff support for a cottonwood regeneration study in Island Park area.

*Contracted with USFWS to complete an endangered fish utilization study for Island Park area.

*Provided funding and staff support for the development of a flow routing model for evaluating Green River flow scenarios.

*Coordinated a meeting for regional and WRD staff and the FWS regarding flow recommendations and management of the Green River.

*Provided training to interpretive staff about geomorphology of the Yampa River.

*Attended USFWS biology committee meetings and commented on Green River flow recommendations.

*Attended Yampa River Basin water resources meetings.

*Cooperated with USGS in the development and testing of experimental sediment scour/fill measurement technology to support endangered fish spawning studies on the Green River.

*Reviewed and commented on physical habitat and endangered fish studies conducted by the USGS-BRD.

*Assisted BoR in preparing a videotape on Park resources affected by Flaming Gorge Dam.

*Prepared Hydrologist's Report on Green River floodplain inundation modeling.

*Coordinated a training course on the use of a flow routing model developed for the Green River.

Glen Canyon National Recreation Area

*Assisted Park in securing water rights for the Lone Rock area.

Grand Canyon National Park

*Participated in settlement discussions and status conferences for the Little Colorado River Adjudication.

*Revised draft stipulations with State Parties to resolve water rights in the Little Colorado River Adjudication.

*Reviewed water covenants for Canyon Forest Village.

*Attended North Central Arizona Water Supply Study Group meetings.

*Briefed Park staff and management, the SOL, and DoJ on water right issues.

*Assisted Park in developing and continuing the spring monitoring program on the South Rim.

*Provided assistance to the Park in coordinating water resource and water rights issues with the Grand Canyon Trust and the Havasupai Tribe.

*Provided contract administration of USGS studies to finalize a geohydrology report and bibliography for the C-Aquifer.

*Processed topographic survey data and produced a topographic mesh for a 2km reach of the Little Colorado River.

*Produced and calibrated a 2-dimensional flow model for a riparian vegetation study on the Little Colorado River.

Hovenweep National Monument

*Revised draft Federal reserved water rights settlement with the State of Utah.

*Reviewed Colorado water right resumes for Water Division 7 to determine if protests were necessary to protect Park water rights and resources.

Hubble Trading Post National Historic Site

*Participated in settlement discussions and status conferences for the LCR Adjudication.

*Revised draft stipulations with State Parties to resolve water rights in the LCR Adjudication.

*Provided funding to USGS to continue a well monitoring program designed to monitor water levels and protect water rights in the LCR basin.

*Assisted Park in reviewing documents to join the Ganado Water Users Association.

Mesa Verde National Park

*Reviewed Colorado water right resumes for Water Division 7 to determine if protests were necessary to protect decreed water rights.

*Assisted Park in preparing annual water use reports for the Water Commissioner.

Petrified Forest National Park

*Participated in settlement discussions and status conferences for the Little Colorado River Adjudication.

*Revised draft stipulations with State Parties to resolve water rights in the Little Colorado River Adjudication.

*Provided contract administration of USGS studies to finalize a geohydrology report and bibliography for the C-Aquifer.

*Filed an amended water rights claim in the Little Colorado River Adjudication.

*Provided funding to USGS to continue a well monitoring program designed to monitor water levels and protect water rights in the LCR Basin.

Pipe Spring National Monument

*Assisted with request for information concerning the water use agreement between the NPS, local cattlemen, and the Kaibab Indian Tribe.

*Evaluated water right implications of decline in spring discharge.

*Evaluated water right applications near Park to determine impacts of diversions on Park water rights.

Rainbow Bridge National Monument

*Prepared draft water rights settlement agreement with the State of Utah to recognize Federal reserved water rights.

*Assisted park in coordinating Tribal review of the proposed water rights settlement.

Sunset Crater Volcano National Monument

*Participated in settlement discussions and status conferences for the Little Colorado River Adjudication.

*Revised draft stipulations with State Parties to resolve water rights in the Little Colorado River Adjudication.

*Provided contract administration of USGS studies to finalize a geohydrology report and bibliography for the C-Aquifer.

*Filed an amended water rights claim in the Little Colorado River Adjudication.

*Provided funding to the USGS to continue a well monitoring program designed to monitor water levels and protect water rights in the Little Colorado River Basin.

Timpanagos Cave National Monument

*Prepared draft settlement agreement with the State of Utah for Federal reserved and state appropriative water rights.

*Coordinated review by Forest Service of draft water rights settlement agreement.

Tumacacori National Historic Park

*Assisted in identifying water rights issues associated with the restoration of flows in the Santa Cruz River.

Walnut Canyon National Monument

*Participated in settlement discussions and status conferences for the Little Colorado River Adjudication.

*Revised draft stipulations with State Parties to resolve water rights in the Little Colorado River Adjudication.

*Provided contract administration of USGS studies to finalize a geohydrology report and bibliography for the C-Aquifer.

*Provided funding for the crest-stage gaging program with the City of Flagstaff to determine the frequency and magnitude of high flows in the Park.

*Provided funding to the USGS to continue a well monitoring program designed to monitor water levels and protect water rights in the Little Colorado River Basin.

*Filed an amended water rights claim in the Little Colorado River Adjudication.

*Provided assistance to the Park, the SOL, and DoJ in settlement discussions with the City of Flagstaff to resolve water rights issues in the Little Colorado River Adjudication

*Coordinated with the Forest Service in the preparation of water rights abstracts and settlement language for a water rights agreement between the United States and the City of Flagstaff.

*Assisted Park and the Regional Lands Office in evaluating land exchange proposals by Warren Smith.

White Sands National Monument

*Assisted Park, Region, and the SOL in finalizing land transfer and water rights protection agreements with the State of New Mexico and White Sands Air Force Base to protect the water supply from Dog Canyon.

Wupatki National Monument

*Participated in settlement discussions and status conferences for the Little Colorado River Adjudication.

*Revised draft stipulations with State Parties to resolve water rights in the Little Colorado River Adjudication.

*Provided contract administration of USGS studies to finalize a geohydrology report and bibliography for the C-Aquifer.

*Provided funding to the USGS to continue a well monitoring program designed to monitor water levels and protect water rights in the Little Colorado River Basin.

*Filed an amended water rights claim in the Little Colorado River Adjudication.

*Filed water rights applications for Peshlaki and Heiser Springs.

Zion National Park

*Assisted Park in preparing a EA to assess the impacts of the modification of an existing diversion structure on Shunes Creek.

*Assisted Park in evaluating water rights applications to determine consistency with the Zion Water Rights Agreement and to evaluate impacts of diversions on Park water rights.

*Evaluated Lee land exchange proposal for water rights implications.

ROCKY MOUNTAIN CLUSTER

Planning and Evaluation Branch

Grand Teton National Park/John D. Rockefeller, Jr. Memorial Parkway

*Continued work on a reclamation design for the Snake River Gravel Pit. Analyzed hydrology and vegetation data collected in 1997–1998, installed 12 new wells, and recommended experiments to assess natural willow establishment in areas with extreme water table fluctuations.

Rocky Mountain National Park

*Met with USFWS fishery biologist and Park staff to discuss long-term fishery management goals and fishery resource information needs.

*Provided assistance with Clean Water Act permit information on a project neighboring the Park.

*Visited the McGraw Ranch site to assess wetland impacts to a historic barn and wetland compliance for burying a utility line on the ranch.

Yellowstone National Park

*Provided technical review and comments on a wetland Statement of Findings for “Madison Junction/Norris Junction Road Improvement.” Certified technical adequacy of wetland analyses and consistency with Director’s Order #77-1: Wetland Protection.

*Final maps and digital data were received from the USFWS’s National Wetland Inventory program for a WRD-funded project.

*Participated in a discussion on the New World Mine Repository Site Evaluation Report.

*Provided assistance to the Park on road widening to the Old Faithful Sewage Treatment Plant. The project was evaluated for compliance with Director’s Order #77-1: Wetland Protection. A determination was made that a wetland Statement of Findings would not be required.

*The Bison Capture Facility project was evaluated for compliance with Director’s Order #77-1: Wetland Protection. More information will be needed before a determination on the need for a wetland Statement of Findings can be made.

Water Operations Branch

Bent’s Old Fort National Historic Site

*Facilitated the completion of a geomorphic map of the Arkansas River floodplain within and adjacent to the Park.

Bighorn Canyon National Recreation Area

*Toured a portion of the Park and discussed with Park staff the potential implications of a new water compact between the State of Montana and the Crow Indian Tribe. Met with Bureau of Reclamation staff responsible for operation of Bighorn Lake and requested information useful to understand possible impacts to NPS operations.

Devil's Tower National Monument

*Oversaw compilation and preliminary analysis of groundwater and river stage data (2 years) in support of a riparian restoration project.

Florissant Fossil Beds National Monument

*Assisted Park staff and a graduate student in development of a dam removal matrix encompassing natural resource and other park values. Contributed techniques for evaluation of erosion risks related to the decision to retain or deactivate dams.

Glacier National Park

*Provided information for the new General Management Plan. Assisted staff in formulating a strategy to evaluate potential impacts to floodplains by inholders located along the North Fork Flathead River. Set up a survey to be used in a hydraulic modeling study.

Great Sand Dunes National Monument

*Provided oversight to a WRD-funded project to determine the cause of disappearance of interdunal wetlands.

Grand Teton National Park

*Evaluated baseline hydrogeology for restoration of Snake River gravel pit.

*Conducted geomorphic assessment of Ditch Creek and its associated landforms, and presented management options in two technical reports.

*Evaluated the functionality of the Savage Irrigation Ditch and potential interaction with the nearby Gros Ventre River. Produced a technical report detailing observations and possible options for continued/alternate irrigation practices.

*Coordinated with Park staff and Bureau of Reclamation representatives in designing bank stabilization for the Moose area on the Snake River.

*Monitored groundwater at sewage lagoons (project oversight).

*Completed reports for wellhead protection planning (project oversight).

*Evaluated sedimentation issues on Emma Matilda Creek.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Grant-Kohrs Ranch National Historic Site

*Inspected erosion and water pumping sites on the Clark Fork River.

*Prepared on-site assessment and recommendations for preventing further damage to an irrigation pump from low flows in the river channel. Also evaluated feasibility of the City of Deer Lodge of rerouting floodwater to a creek flowing through the historic portion of the Park.

Rocky Mountain National Park

*Assisted in developing a monitoring plan to observe potential effects from prescribed burning on the west side of the Park. Provided advice to Park staff regarding the accumulation of sediments in Lake Grandby.

*Trained Park staff on use of turbidity meter for water quality monitoring of proposed prescribed burn areas.

*Advised on availability of water from existing wells at McGraw Ranch.

*Assisted with developing project proposal to study willow decline in four meadows by contributing expertise on hydrologic and geomorphic processes.

*Prepared draft sediment monitoring plan for prescribed burns in the Park to address concerns of sedimentation of downstream reservoirs. Designed a stepwise approach in sampling methodology and selected sites to include reference watersheds.

*Evaluated Colorado River streambank erosion issues associated with private development bordering the Park.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Yellowstone National Park

*Advised Park on erosion problems on an island in Lake Yellowstone. Inspected flooding and geomorphology issues at several locations in the Park. Provided advice regarding drainage associated with reconstruction of several sections of road.

*Provided technical review of a proposal to study Redox Processes controlling Arsenic mobility in hyporheic zone of rivers by Dr. Johnnie Moore of the University of Montana, and a proposal by Peter Whiting et al. of Case Western Reserve in Cleveland to trace fine sediments transport in Soda Butte Creek and the Lamar River.

*Assisted in reviewing snowmobile hazards to the environment.

*Conducted technical review and provided comments on the construction of a waste rock repository for the New World Mining District restoration program.

*Conducted floodplain survey of Slough Creek and, through numeric modeling, assessed the flood-hazard potential of an existing campground.

Water Rights Branch

Bent's Old Fort National Historic Site

*Evaluated water rights applications filed in Water Division 2 to determine impact of diversions or changes on Park water rights.

Big Hole National Battlefield

*Initiated the construction and installation of a stream gage on the North Fork Big Hole River.

*Submitted water use report for Park as required by the Montana Water Rights Compact

Bighorn Canyon National Recreation Area

*Submitted water use report for Park as required by the Montana Water Rights Compact

Black Canyon of the Gunnison National Park

*Evaluated water rights applications in Water Division 4 to determine impact of diversions or changes on Park water rights.

*Assisted Park and Region with negotiations for the quantification of a reserved water right.

*Participated in the Aspinall Unit Operations meetings.

*Conducted briefings for Department of Interior and Regional Office management personnel.

*Participated in meetings with DOJ and SOL attorneys and other Federal agencies in an effort to develop a consistent Department of Interior position on the Park's water right.

*Conducted hydrologic analyses in support of the USFWS's flow recommendations for endangered fish species on the Gunnison River.

*Developed computer programs for statistically analyzing pre- and post-dam flows through the canyon.

*Refined the 1-dimensional hydraulic model for the Warner Point study reach at the request of USGS contractors.

Florissant Fossil Beds National Monument

*Evaluated water rights applications in Water Division 1 to determine impact of diversions or changes on Park water rights.

*Researched water rights located within the Park.

Glacier National Park

*Evaluated non-NPS water-right applications to determine impacts on Park water rights pursuant to the Montana Water Rights Compact.

*Submitted water use report for Park as required by the Montana Water Rights Compact.

Grant-Kohrs Ranch National Historic Site

*Evaluated water right application (ARCO) and assisted Park in responding to the State of Montana.

*Obtained information on new well and established docket for Park water right.

Great Sand Dunes National Monument

*Assisted DoJ, SOL, USFWS, and Park staff in developing technical strategy to prepare to respond to Stockman's proposed water development.

*Assisted Park in the continuation of studies in the Sand Creek area and western portion of Park.

*Evaluated water rights applications in Water Diversion 3 to determine impact of diversions or changes on decreed water rights.

Little Big Horn Battlefield National Monument

*Initiated the construction and installation of a stream gage on the Little Bighorn River.

*Submitted water use report for Park as required by the Montana Water Rights Compact.

Rocky Mountain National Park

*Evaluated water rights applications in Water Divisions 1 and 5 to determine impacts of diversions or changes on Park water rights.

*Evaluated draft water rights appraisal for Lily Lake.

Yellowstone National Park

*Evaluated non-NPS water right applications to determine impacts on Park rights pursuant to the Montana Water Rights Compact.

*Attended Yellowstone Controlled Groundwater Technical Oversight Committee meeting and the Yellowstone Federal Interagency Science Conference.

*Coordinated with the USFS on water rights implications of the Phase II land transfer between the USFS and the Church Universal and Triumphant.

*Assisted Park in retrofitting fish screens used in water diversion structures on Reese Creek.

*Continued support for investigations by the USGS and Montana Bureau of Mines and Geology to describe the hydrogeologic system of the Soda Butte Creek drainage upstream from the park boundary.

*Evaluated USGS research proposal on the hydrothermal system within Yellowstone Controlled Groundwater Area.

*Presented talk to field tour of Yellowstone Controlled Groundwater Area sponsored by the American Water Resources Association.

*Submitted water use report for Park as required by the Montana Water Rights Compact.

*Collected streamflow and water quality data for Soda Butte Creek in support of the Water Rights Compact.

SOUTHWEST CLUSTER

Planning and Evaluation Branch

Amistad National Recreation Area

*Assisted in preparing wetland compliance documentation for a new boat ramp and parking facility.

*Met with Park staff on fishery issues and to view one of the many large recreational fishing tournaments held annually. Provided assistance with an assessment of fish mortality and later provided recommendations on actions that could be taken to reduce fishing tournament impacts.

Bandelier National Monument

*Provided technical assistance and technical review of the Bandelier National Monument Water Resources Management Plan -- underway via the WRD "Hydrologic Affiliates" program.

Bent's Old Fort National Historic Site

*Provided assistance concerning NPS wetland compliance and Clean Water Act permit information for a road maintenance project, including berm removal and recontouring.

Big Bend National Park

*Approved the investigator's annual report & transferred second year funds for the WRD funded project titled "Restore Endangered Big Bend Mosquitofish Habitat."

Big Thicket National Preserve

*Participated in development of the Oil and Gas EIS/Management Plan, attended scoping meetings, assisted in the identification of sensitive resource areas, assisted in alternatives development, and provided evaluation of the affected environment and environmental consequences.

Carlsbad Caverns National Park

*Continued to provide wetlands compliance information for a waterline construction project near Rattlesnake Springs.

*Provided Clean Water Act Section 404 and NPS wetland compliance information to the Park on various projects, including a mitigation site on a neighboring ranch, water withdrawals, and cottonwood replacement.

Chiricahua National Monument

*Reviewed and commented on a draft GMP/EA.

El Malpais National Monument

*Reviewed the RMP amendment/EIS from BLM.

Fort Davis National Historic Site

*Provided assistance to the Region concerning wetland compliance for the GMP.

Guadalupe Mountains National Park

*Developed a cooperatively funded student position with the Fisheries Coop Unit at Colorado State University and initiated a project to evaluate the rainbow trout population within McKittrick Creek.

*Met with Park resource management staff to make preliminary field observations and discuss the development of the cooperative student project. The focus of this project will be to help evaluate the potential removal of exotic rainbow trout from McKittrick Creek for the purposes of establishing native Rio Grande cutthroat trout.

*Visited Manzanita Spring and McKittrick Canyon and discussed wetland compliance issues, including restoration of a stock pond to a historic scene, and water quality and fisheries concerns.

Lake Meredith National Recreation Area

*Met with Park staff concerning recreational fishing issues and provided technical assistance in evaluating endangered Arkansas River shiner habitat within the Park.

*Conducted a review analysis of the State fishery harvest data and provided recommendations to the Park regarding fisheries issues and Arkansas River Shiner studies.

*Continued to provide Clean Water Act Section 404 guidance on a neighboring landowner's violation below Sanford Dam.

Padre Island National Seashore

*Provided recommendations for improvements at Bird Island Basin, including alignment and compliance for a proposed boat ramp access road, low-impact visitor access to Laguna Madre, and restoration of water exchange between Laguna Madre and adjacent wind-tidal flats.

*Continued to participate in development of the Oil & Gas EIS/Minerals Management Plan; reviewed and commented on drafts and provided assistance on wetlands sections.

*Provided assistance with NPS wetland compliance for a 3D seismic proposal designed to obtain information on oil and gas reserves in the Park.

Palo Alto Battlefield National Historic Site

*Developed a technical approach for restoring "resaca" wetlands within the core battlefield. Prepared a project statement for the first phase of restoration and located qualified researchers for implementation.

Pecos National Historical Park

*Completed the final design for the Glorieta Creek floodplain restoration and selected a contractor for project implementation (with Colorado State University and Park staff).

Petrified Forest National Park

*Provided assistance with NPS wetland & floodplain compliance and Clean Water Act Section 404 compliance for a bridge replacement project.

Saguaro National Park

*Provided assistance to the park concerning wetland/floodplain NPS compliance, Clean Water Act Section 404 compliance, and National Wetland Inventory classification for preparation of their GMP amendment/EA for park expansion.

White Sands National Monument

*Participated in discussions with the Park on the feasibility of restoration at Garten Pond.

Water Operations Branch

Alibates Flint Quarries National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Bandelier National Monument

*Provided advice on detailed project planning and development of a quality assurance project plan for follow on work related to the previous study entitled "Ecological, Hydrological, and Geochemical Effects of the Dome Fire on the Capulin Watershed, Bandelier National Monument, New Mexico."

*Reviewed study plan for evaluation of watershed treatment methods for stabilizing areas that have recently burned.

*Reviewed draft Water Resources Management Plan.

Big Thicket National Preserve

*Completed a technical section, Affected Environment – Water Resources, for the Oil and Gas Management Plan/ Environmental Impact Statement.

*Provided review comments for all relative sections of the draft EIS document.

Capulin Volcano National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Carlsbad Cavern National Park

*Provided some ideas and contacts from NASA on options for disposal of human waste in deep parts of Lechuguilla Cave. Discussed options with experts from University of New Mexico.

Chiricahua National Monument

*Advised on constructing monitoring wells.

*Traveled to Park and provided advice regarding flood hazard and the preparation of Floodplain Statement of Findings.

Coronado National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Fort Bowie National Historic Site

*Advised Park on location for a new water supply well.

*Assisted Park staff in interpretation of erosion control study prepared by the Bureau of Reclamation. Assisted in the development of certain details related to the implementation of the plan.

Fort Davis National Historic Site

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

*Assessed flood-hazard potential of the alluvial fan location, and evaluated function and adequacy of previous mitigation measures through numeric modeling. Produced a technical report describing the system and presenting options for flood mitigation.

Guadalupe Mountains National Park

*Advised on iron bacteria problem in Pine Springs water supply well.

Lyndon B. Johnson National Historical Park

*Identified factors controlling observed bank erosion on the Pedernales River, and predicted likelihood of continued bank loss. Detailed observations, conclusions, and recommendations in a technical report.

*Uploaded Park-collected water quality data (1996-1998) from two stations in the Pedernales River, monitored as part of the Colorado River Watch Network, to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Lake Meredith National Recreation Area

*Responded to a small spill of contaminated water at an oil well by recommending a sampling plan.

*Responded to a natural gas pipeline rupture by interpreting soil sample data and recommending further sampling.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Padre Island National Seashore

*Provided information on recent findings on phyto-remediation of total petroleum hydrocarbon contamination of soils.

*Provided continued assistance for the redemption of Yarborough Pass mercury and oil contamination.

*Provided technical review and comments for a proposal to remediate petroleum contamination site at the Chevron on-shore facility.

*Provided input into Director's Statement of Findings upholding IMR Regional Director's decision to reject an appeal by Louis Dreyfus Corporation.

*Provided technical assistance in responding to a spill of fluids from a gas operation.

*WRD staff submitted the report "Guideline for the Detection and Quantification of Contamination at Oil and Gas Operations" as part of the Padre Island National Seashore Oil and Gas Management Plan / EIS.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Palo Alto Battlefield National Historic Site

*Uploaded data from a joint U.S. Geological Survey, U.S. Fish & Wildlife Service, and U.S. Bureau of Reclamation effort to assess water quality, bottom sediment, and biota associated with irrigation drainage in the Lower Rio Grande Valley to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Pecos National Historical Park

*Determined elevation of groundwater wells and staff gages for use in water table analysis, and established survey control for planned earthwork. Translated and rectified two survey data sets to common coordinates and datum for use in Autocad Design.

Petroglyph National Monument

*Advised Park staff on resource response to recent flooding and provided suggestions for repair/relocation of facilities. Also provided suggestions for managing storm water that flows through the park and into residential areas downstream.

*Consulted with Park staff on storm erosion by providing advice based on experience from previous site visits and urban stormwater assessments completed for Albuquerque flood control authorities. Arranged for an on-site assessment of erosion damage.

*Provided an evaluation of runoff and erosion effects of severe summer storms.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

San Antonio Missions National Historic Site

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Saguaro National Park

*Provided oversight to a WRD-funded project to evaluate the impact of declining water tables on Park water supply well, Avra Valley.

*Evaluated the impact of declining water tables on Park resources.

Tumacacori National Historical Park

*Assessed the flood-hazard potential of a proposed maintenance facility, and, estimated flood frequencies using historic flood data. Presented literature review and conclusions in a technical report.

*Inspected several cultural sites and advised Park staff on susceptibility to erosion and flooding.

Tuzigoot National Monument

*Assisted the Park in finalizing an Environmental Audit for the acquisition of Tavasci Marsh.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Walnut Canyon National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

White Sands National Monument

*Conducted elevational survey of monitoring wells within the monument and performed water table gradient calculations to support subsurface contaminant transport assessment.

Water Rights Branch

Carlsbad Caverns National Park

*Initiated investigations to determine the dependence of cave resources on Capitan Aquifer.

*Conducted a field review of water-related resource attributes with DoJ to evaluate the NPS need for filing claims in the Pecos River Stream System Adjudication.

Pecos National Historical Park

*Initiated quantification of water resources and water rights associated with acquired properties.

Washita Battlefield National Historic Site

*Completed water rights analysis for the Water Resources Scoping Report.

MIDWEST REGION

GREAT LAKES CLUSTER

Office of the Division Chief

*Served as the official NPS observer to the Great Lakes Commission.

Planning and Evaluation Branch

Cuyahoga Valley National Recreation Area

*Advised Park staff and a consultant regarding methods for evaluating the condition of Park wetlands and identifying opportunities for restoring degraded wetlands.

Pictured Rocks National Lakeshore

*Conducted an overview of water resources and water resource issues; organized and conducted a water resources scoping workshop with Park staff.

Sleeping Bear Dunes National Lakeshore

*Provided technical assistance in support of the development of a water resources scoping report. Several issues were discussed including wetland assessment needs, dredging impacts, fish hatchery effluent impacts, and a proposed fish-egg take station – all of these are prioritized issues in the scoping report.

*Continued oversight of USGS-BRD work on a WRD-funded project (zooplankton IBI).

Voyageurs National Park

*Completed Voyageurs National Park Water Resources Scoping Report (NPS/NRWRS/NRTR-98-201); prepared project statement for Water Resources Management Plan which successfully competed for FY00 funding.

Water Operations Branch

Apostle Islands National Lakeshore

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Cuyahoga Valley National Recreation Area

*Provided Park, Bureau of Reclamation, and Facilities Management Division staff with detailed technical comments on the draft Ecological Risk Assessment (ERA) for the Kregci Dump Superfund Site. Participated in several conference calls and planning sessions related to the site.

Grand Portage National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

*Advised Park on alternative sites for a water supply well.

Isle Royale National Park

*Continued to serve as project officer and provide technical assistance for WRD-funded study entitled "Investigation of Processes Influencing Elevated Fish Mercury Levels in Isle Royale National Park."

*Served as project officer for WRD-funded study entitled "A survey of unionid mussels in the aquatic systems of two National Park Service units." Actively helped focus the project design. Served as moderator of small group that developed the quality assurance project plan and helped write plan.

*Reviewed the final report for a WRD-funded study on zooplankton populations in backcountry lakes (title: "Enumeration of Zooplankton Samples, Isle Royale National Park").

*Provided information on the effects of motorboats on hydrocarbon water pollution.

Indiana Dunes National Lakeshore

*Reviewed the final report for WRD-funded bioassessment study of Grand Calumet Lagoon. Advised Park staff and Biological Resource Division (USGS) on various contaminant and QA/QC issues.

*Reviewed a draft report on an ecological and contaminants assessment of the Grand Calumet Lagoons.

Lincoln Boyhood National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Pictured Rocks National Lakeshore

*Served as project officer for WRD-funded study entitled "A survey of unionid mussels in the aquatic systems of two National Park Service units." Actively helped find experts from the region to focus project design and develop a quality assurance project plan for the project. Moderated small-group planning session to develop QA/QC for the project.

Sleeping Bear Dunes National Lakeshore

*Provided information on confidence intervals and other statistical topics.

*Inspected conditions associated with a Park river affected by operation of a small dam. Looked at several other areas in the Park with impacts to geomorphology and water quality.

St. Croix National Scenic Riverway

*Served as WRD project officer on the project to investigate "The effect of cranberry operations on water quality, nutrient levels, macroinvertebrate communities and community tolerance, and pesticide levels of the St. Croix National Scenic Riverway." Reviewed and provided detailed comments on the final report.

*Reviewed progress report for project to monitor sediment and nutrient discharges from tributaries to the St. Croix River.

*Advised on reconstruction of water supply well.

Voyageurs National Park

*Provided Park with information on phosphorus in lakes.

Water Rights Branch

Voyageurs National Park

*Provided comments to Park staff on Water Resources Scoping Report.

GREAT PLAINS CLUSTER

Planning and Evaluation Branch

Buffalo National River

*Provided WRD oversight for Water Resources Management Plan.

*Provided assistance with Clean Water Act Section 401 requirements related to the proposed Bear Creek Reservoir and reviewed the addendum to the Corps of Engineers Section 404 permit application.

Ozark National Scenic Riverway

*Reviewed the draft final report for the WRD-funded project titled "Vegetation Dynamics of the Riparian Corridor, Jacks Fork and Current Rivers."

Saint Croix National Scenic Riverway

*Provided assistance on Clean Water Act Section 404 permit procedures for a proposed dock.

Theodore Roosevelt National Park

*Assisted in the oversight and completion of a Water Resources Management Plan for the Park.

Water Operations Branch

Badlands National Park

*Facilitated a loan of water quality monitoring instrumentation.

Buffalo National River

*Provided a detailed technical review of report entitled “A two year seasonal comparison of the macroinvertebrate community.”

*Provided oversight to a WRD-funded project to delineate karst hydrogeology of the Crooked Creek watershed.

*Provided location information for the Park's water quality monitoring stations and Arc/Info coverages from the Baseline Water Quality Report to the USGS.

Effigy Mounds National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Fort Union Trading Post National Historic Site

*Provided an assessment of bank erosion on the Missouri River and potential for restoration of historic riparian tree cover. Met with U.S. Army Corps of Engineers onsite to discuss designs for river stabilization.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Herbert Hoover National Historic Site

*Advised Park staff on installation of a USGS gauging station inside the Park to monitor flooding impacts.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Homestead National Monument of America

*Provided comments on RMP Project Statements to create stream buffer zones to allow for flooding and some bank erosion while protecting cultural resources.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Hot Springs National Park

*Evaluated potential impact of landfill adjacent to the park.

Jewel Cave National Park

*Advised park on various contaminant issues, including options for disposal of human waste in deep parts of the cave.

*Uploaded a variety of park-collected and other water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Mount Rushmore National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Ozark National Scenic Riverway

*Evaluated potential impacts of proposed lead mining in the watershed of the Park.

Pipestone National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Scotts Bluff National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Tallgrass Prairie National Preserve

*Reviewed USGS invertebrate monitoring protocol proposed for the Park.

Theodore Roosevelt National Park

*Helped review the draft Water Resources Management Plan for the Park.

Wilson's Creek National Battlefield

*Reviewed and provided the Park with detailed comments on report entitled "Response to Review Comments on document entitled "Macroinvertebrate Biomonitoring Protocol for Five Prairie Streams."

Wind Cave National Park

*Toured the cave and advised the Park on various contaminant issues of concern at points along the way.

NATIONAL CAPITAL REGION

NATIONAL CAPITAL CLUSTER

Planning and Evaluation Branch

Provided information to the Region on wetland training opportunities.

Chesapeake and Ohio Canal National Historic Park

*Assisted the Park in developing a technical assistance request to WRD for a water resources scoping report; met with Park staff to explain the water resources planning process.

George Washington Memorial Parkway

*Provided wetland points-of-contact to the Region for the proposed Dike Marsh restoration.

Water Operations Branch

Greenbelt Park

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Monocacy National Battlefield

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

National Capital Parks-Central

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

National Capital Parks-East

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Kennilworth Gardens

*Assisted Park and Region staff in determining the best approach to dealing with a large pile of fill material placed on NPS land near the Anacostia River. Slope stability, drainage, and water quality problems are all of concern.

*Provided Park and Facilities Management Division Hazmat group with detailed technical comments on statement of work for completion of investigative and remedial assessment activities at 1900 Anacostia Drive.

*Provided interpretation of soil chemistry data for a natural area restoration project.

NORTHEAST REGION

ALLEGHENY CLUSTER

Planning and Evaluation Branch

Allegheny Portage Railroad National Historic Site

*Provided assistance to the Region on the need for a wetland Statement of Findings at the Park.

New River Gorge National River/Gauley River National Recreation Area/Bluestone National Scenic River

*Coordinated WRD and Park review of the draft Water Resources Management Plan.

Water Operations Branch

Allegheny Portage Railroad National Historic Site

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Harpers Ferry National Historical Park

*Assisted in the development of a project statement regarding flooding of the historic district.

Johnstown Flood National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

New River Gorge National River

*Provided information on environmental hazards of road salt vs. various other deicers.

*Conducted review and provided comments on draft Water Resources Management Plan.

*Reviewed an underground coal mining permit application and commented on possible impacts to Glade Creek, a stream that flows into New River Gorge National River.

Water Rights Branch

New River Gorge National River

*Provided comments on a draft Water Resources Management Plan for New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River.

CHESAPEAKE CLUSTER

Planning and Evaluation Branch

Assateague Island National Seashore

*Reviewed the study plan for the WRD-funded project titled “Develop Submerged Aquatic Vegetation Monitoring Plan.”

Colonial National Historical Park

*Provided technical review and comment on a proposal by the Virginia Natural Heritage Program to inventory and characterize the Park’s “sinkhole” wetlands.

Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park

*Provided technical review and comment on a proposal by the National Wetland Research Center to map wetlands on newly acquired lands.

*Provided review and comment on a Project Agreement for the Park GMP amendment and EIS.

Petersburg National Battlefield

*Reviewed and commented on the draft GMP/EIS, and assisted in revising sections addressing effects of alternatives on wetlands and riparian areas.

Richmond National Battlefield Park

*Provided technical review and comment on a proposal by the National Wetland Research Center to map wetlands on newly acquired lands.

*Assisted in the initiation of a Water Resources Management Plan.

Water Operations Branch

Colonial National Historical Park

*Reviewed long-term water quality monitoring plan and provided information on QA/QC.

*Reviewed and commented on a report titled "Macrobenthic and Chemical Analysis of Papermill Creek."

Delaware Water Gap National Recreation Area

*Coordinated WRD funding for several multi-year stream restoration and dam deactivation projects. Procedures for deactivation are being documented as well as applying appropriate restoration designs suited to stream types.

Eisenhower National Historical Site

*Reviewed a grant proposal for water quality and aquatic life habitat studies in Marsh Creek.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park

*Inspected conditions associated with a small creek where it is planned to remove riparian vegetation. Provided advice to Park staff on the likely implications of this activity.

*Uploaded Park-collected data (1993-1996) from 10 locations; phosphorus data from wetlands collected by George Mason University; and data from the U.S. Geological Survey National Geochemical Data Base: National Uranium Resource Evaluation Program to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Gettysburg National Military Park

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Richmond National Battlefield Park

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

*Provided detailed technical analysis on the meaning of a set of sediment data to Park staff.

Shenandoah National Park

*Developed Knowledge, Skills, and Abilities Statement for a water resources specialist.

*Finalized stabilization structure plans for Hogcamp Branch and placed construction stakes marking planned excavation.

Upper Delaware National Scenic & Recreational River

*Provided assistance to Park staff with a regional pipeline construction EIS regarding proposed methods of stream crossings by the pipeline.

Valley Forge National Historical Park

*Consulted with Park staff in evaluating a restoration plan submitted by Pennsylvania Department of Transportation for Valley Creek. Reviewed the design and mitigation requirements from other sources to be incorporated as a Park restoration project.

*Served as project coordinator for a bank stabilization project.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

NEW ENGLAND CLUSTER

Planning and Evaluation Branch

Acadia National Park

*Provided technical assistance with a fish stocking issue.

Cape Cod National Seashore

*Approved the final study plan for the WRD-funded project “Topographic Survey and Hydrodynamic Modeling for Estuarine Habitat Restoration at Herring River, Wellfleet.”

*Assisted in the review and completion of a Water Resources Management Plan for the Park.

Fire Island National Seashore

*Reviewed and approved the study plan for the mapping of salt marsh and submerged aquatic vegetation portion of the WRD-funded project titled “Monitoring Estuarine Wetland Habitats.”

Morristown National Historical Park

*Assisted Park staff in obtaining training and onsite assistance in delineating and mapping wetlands.

Saratoga National Historic Park

*Continued development of a Water Resources Management Plan for the Park.

*Provided assistance on NPS wetland compliance and Clean Water Act permit requirements for a 9-mile road project in the Park.

Water Operations Branch

Acadia National Park

*Provided detailed technical comments on the final reports for a mercury study.

*Participated in field sampling for two NPS-USGS Water Quality Partnership projects assessing nutrient enrichment in creeks and estuaries.

Cape Cod National Seashore

*Provided statistical and contaminants review of a report on mercury contamination.

*Evaluated impacts of groundwater withdrawals by Provincetown from the North Truro Air Base.

*Provided oversight to a WRD-funded project to evaluate ecological impacts of groundwater withdrawals on aquatic resources at Cape Cod.

*Provided oversight to a WRD-funded project to evaluate eutrophication trends in the past 500 years in kettle pond sediments.

Fire Island National Seashore

*Provided summary information on the pesticide methoprene.

Gateway National Recreation Area

*Provided information on the effects on amphibians of aldosid (5% methoprene) and tememphos (abate 4E) pesticides.

*Uploaded data from 1997 and 1998 Water Quality Sampling Programs to STORET.

Saint-Gaudens National Historic Site

*Uploaded park-collected data from current and historic water quality monitoring efforts and data from the USGS National Geochemical Data Base: National Uranium Resource Evaluation Program to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Saratoga National Historical Park

*Reviewed and commented on a compilation of yearly PCB data.

Water Rights Branch

Cape Cod National Seashore

*Monitored progress of ongoing work to address effects of groundwater withdrawals on aquatic resources.

*Monitored progress of study of freshwater fauna in kettle ponds and vernal pools.

PACIFIC WEST REGION

COLUMBIA CASCADES CLUSTER

Planning and Evaluation Branch

Columbia Cascades System Support Office

*Participated in an NPS-BRD interagency workshop on NPS fishery research needs for the Pacific Northwest and Western Region areas.

Mount Rainier National Park

*Reviewed and commented on a draft project statement calling for a revision of the 1987 Water Resources Management Plan.

Olympic National Park

*Completed a Water Resources Issues Overview.

*Participated in a long-term ecological monitoring workshop held by Park and Regional staff to help develop a long-term monitoring program. Visited the Elwah River dams proposed to be removed to reestablish access to salmon spawning habitat and discussed several Park fishery issues including habitat restoration projects, subsistence fisheries, stocking activities, salmon stock management, and marine resources management.

Water Operations Branch

City of Rocks National Reserve

*Advised Park on construction of water supply wells.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Craters of the Moon National Monument

*Provided technical assistance and a trip report to Park staff regarding water resource programs with specific concerns related to a stream corridor assessment and an evaluation of the Park's water supply system.

Ebey's Landing National Historical Reserve

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Fort Clatsop National Memorial

*Provided summary on zinc and ideas about potential sources of zinc found in stormwater runoff water.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Mount Rainier National Park

*Served as project officer on a new WRD-funded project to survey freshwater mollusks. Provided study design and QA/QC comments on the initial plan.

*Advised Park on locations for new water supply wells to replace surface water sources.

Nez Perce National Historical Park

*Advised Park on reconstruction of a water supply well at Kamiah and location for a new well at White Bird.

North Cascades National Park

*Served as WRD project officer on project entitled: "Development of Stream Benthic Macroinvertebrate Biomonitoring Protocols for North Cascades National Park Service Complex and Adjacent USFS Lands." Reviewed initial project plan and provided QA/QC and other comments.

*Advised Park on technical fate and effects aspect of an oil spill.

*Reviewed and commented on the latest report on the hydrocarbon-contaminated soil piles and groundwater at the Hozomeen Campground site at North Cascades National Park Complex (Ross Lake NRA).

Olympic National Park

*Provided assistance to Park on lakeshore erosion and permitting activities.

*Provided recommendation for dealing with an eroding bluff at a lodge/ restaurant facility. Provided advice regarding several areas in the west side of the Park that are unstable fluvial systems.

*Participated with an advisory team on water quality scoping within the park and developing regulations to control lakeshore development.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

San Juan Island National Historical Park

*Assisted NPS oil spill/natural resource damage assessment contact Rick Dawson in helping Park staff focus ideas on how to carry out studies and plan in anticipation of possible oil spills.

*Reviewed hydrogeologic conditions and past test well drilling and provided information and analysis to Park.

Water Rights Branch

Crater Lake National Park

*Participated in Alternative Dispute Resolution (ADR) negotiations with local stakeholders regarding the Park's 21 Klamath Basin Adjudication Federal reserved water right claims. Alternative settlement options were discussed and conceptual settlement proposals were developed.

*Participated as a member of the Klamath Basin ADR Hydrology Subcommittee. This entailed working with other members to develop methodology for determining water availability within the Klamath Basin.

*Reviewed water right claims of non-Federal parties in the Klamath Basin Adjudication and prepared a summary of the claims of interest to the NPS.

*Evaluated the reliability of the Park's Annie Creek water supply by comparing estimates of the Creek's natural flow to the diversion rates allowed by water rights on the Creek.

*Prepared 21 amended federal reserved water right claims to include additional mapping and information needs required by the State of Oregon.

Whitman Mission National Historic Site

*Assisted the Park in resolving the Doan Creek diversion issue.

PACIFIC/GREAT BASIN CLUSTER

Planning and Evaluation Branch

Channel Islands National Park

*Assisted Park staff with wetland compliance issues for a sewage treatment facility at Scorpion Ranch.

*Reviewed and commented on the EA and floodplain Statement of Findings for the placement of a leachfield and septic tanks in Scorpion Valley for a sewage disposal system.

Death Valley National Park

*Advised Park staff regarding preparation of wetland compliance documentation for the Texas Spring Tunnel water system rehabilitation.

*Wrote a memorandum to the Park regarding NPS wetland compliance and Corps of Engineers Section 404 permitting requirements for dredging work in the Furnace Creek infiltration gallery.

*Provided information to the Park regarding NPS wetland compliance for groundwater monitoring.

Golden Gate National Recreation Area

*Provided information on wetland mapping and wetland functional assessment.

Lassen Volcanic National Park

*Provided initial technical assistance regarding restoration of Drakesbad Meadow and other disturbed wetland sites.

Mojave National Preserve

*Assisted in the completion of the Mojave National Preserve Water Resources Scoping Report (NPS/NRWRD/NRTR-99/225).

Redwood National Park

*Co-authored with Park staff two draft journal articles: "An Empirical Model of Groundwater Levels on a Floodplain in Northwestern California," and "Application of a Water Table Model in Delineating Jurisdictional Wetlands on a Floodplain in Northwestern California."

*Provided assistance on NPS wetland compliance and Clean Water Act Section 404 permit requirements for the parking lot relocation at Fern Canyon. Also provided information on wetland classification in the area.

Santa Monica Mountains National Recreation Area

*Approved the final study plan for the WRD-funded project "Restoration of Lower Zuma Creek and Lagoon."

Whiskeytown-Shasta-Trinity National Recreation Area

*Provided information on NPS wetland compliance, National Wetland Inventory mapping and the Cowardin classification system, restoration funding sources, and example WRD project statements.

Yosemite National Park

*Provided information on NPS wetland compliance during preparation of the draft EIS for the Yosemite Valley Plan.

Water Operations Branch

Channel Islands National Park

*Informed Park staff of methods necessary to determine if soils contaminated by diesel fuel components (PAHs, alkyl PAHs, and Benzene/Toluene/Ethyl Benzene/Xylene) have been effectively bio-remediated.

*Assisted with the establishment of transects for the monitoring of channel geomorphology in Old Ranch Canyon, Santa Rosa Island.

*Provided advice to Park staff related to the construction of new sewage facilities in the greater floodplain of Scorpion Creek on Santa Cruz Island.

*Conducted a stream channel survey on Quamada Creek, Santa Rosa Island, and produced a technical report displaying geomorphic data.

*Participated in the Santa Cruz Island Resource Management Planning workshop.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Death Valley National Park

*Assisted Park staff in contracting a study of the feasibility of placing a plug in Gower Gulch to terminate the unnatural diversion of floodwaters in Furnace Creek Wash. Directed involvement of Bureau of Reclamation engineers who conducted the investigation and reviewed the final report.

*Advised on alternative sources of potable water for the Furnace Creek area.

Eugene O'Neill National Historic Site

*Uploaded spring water quality data collected by WRD staff to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Golden Gate National Recreation Area

*Reviewed screening risk Assessment for use of the product "Confront," a product which is a combination of Triclopyr (3,5,6-trichloro-2-pyridinyl)oxy]acetic acid) and CLOPYRALID (also know as 3,6-Dichloropyridine-2-carboxylic acid, 3,6-Dichloropicolinic acid, 3,6-DCP and C₆H₃Cl₂NO₂ / (C₅H₂N)Cl₂COOH, CAS # 1702-17-6).

*Served as WRD technical contact for contaminants and biomonitoring issues on a new project entitled "Water Quality Mitigation Actions at GOGA Stables." Provided technical comments on associated water quality monitoring plan.

*Provided Park staff with guidance on QA/QC planning, EPA Ecological Risk Assessment Guidance documents, and use of the average deviation statistical measure of variability.

*Reviewed water quality sampling and analysis plan.

*Conducted aquifer test at Muir Beach municipal well site and prepared a completion report.

*Reviewed a feasibility proposal to dispose dredge material near Redwood Creek and, at the same time, restore the channel.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Great Basin National Park

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

John Muir National Historic Site

*Provided extensive assistance to Park management regarding assessment of watershed conditions in the park. Attended meetings of the Alhambra Creek Watershed Planning Group to further address flooding issues near the Park. Collected and interpreted detailed field and GIS information on watershed cover, channel dimensions and stability, reservoirs, land use history and geomorphology. Interpreted this information for modeling runoff/rainfall relationships to predict flooding from various land management scenarios. Published a draft technical report and submitted an abstract for a ASCE watershed conference.

Joshua Tree National Park

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Lake Mead National Recreation Area

*Coordinated review and interpretation of mercury concentrations in fish fillets from Lake Mead game fish.

*Met with operators of large Las Vegas sewage treatment plants and contacted national POTW researchers to determine treatability of estradiol and ethinyl estradiols.

*Oversaw literature review, outline construction, and draft composition of the Oil and Gas Management Plan/EIS.

Lassen Volcanic National Park

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Lava Beds National Monument

Provided information on the environmental effects of various road deicers.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Mojave National Preserve

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Pinnacles National Monument

*Reviewed and commented on proposed channel geomorphology study and restoration project submitted for WRD funding.

*Assisted in the development of a study plan to address flood related issues.

*Assisted in detailed planning for a WRD-funded project to study aquatic invertebrate fauna and water quantity and quality issues in the Travertine and Nevares Springs complex. Visited site and advised Park on technical issues at the site. Solicited ideas from colleagues around the country doing similar work. Moderated small-group QA/QC planning session and helped develop quality assurance project plan.

Point Reyes National Seashore

*Reviewed progress report for project to document impacts of grazing, agriculture, and recreation on key water resources.

*Performed a geomorphic assessment of Bear Valley Creek to identify cause of increased flooding near Park Headquarters. Produced a technical report detailing observations, conclusions, and recommendations.

*Coordinated WRD funded project “Land Use Change and Watershed Response” which involves calibrating a sediment model with over 20 years of monitoring data and land use activities.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

*Served as co-chair of the Eoho-Steelhead restoration project technical advisory committee.

Redwood National & State Parks

*Provided QA/QC guidance on turbidity monitoring in the Park.

Santa Monica Mountains National Recreation Area

*Reviewed and commented on a quarterly groundwater monitoring report at the Calabasas Landfill.

Whiskeytown-Shasta-Trinity National Recreation Area

*Assisted in project proposal for WRD funding on a watershed restoration project involving road outcropping and sediment reduction.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Yosemite National Park

*Advised Park on potential water supply well locations in the White Wolf area.

*Assisted Park staff and Denver Service Center staff in the ongoing planning process related to flood reconstruction and implementation of the Park’s GMP. Advised Park staff on numerous issues including removal of a small dam, stability of the Merced River in El Portal area, and hydraulic considerations associated with road redesign.

Water Rights Branch

Death Valley National Park

- *Continued development of project and study plans to protect water rights.
- *Coordinated investigations with other entities at the eighth annual Devil's Hole workshop.
- *Monitored Devil's Hole pool level and discharge of Nevares, Texas, and Travertine springs.
- *Evaluated 22 Nevada Water Right Applications and protested four.
- *Compiled and exchanged monitoring data with Department of Energy and Barrick Bullfrog in accordance with established conditions of water permits.
- *Evaluated water rights language in proposed legislation for Timbisha Shoshone Reservation.
- *Continued multi-year USGS study of evapotranspiration at Death Valley saltpan and prepared task order.
- *Assisted DoJ with preparation of memorandum of understanding among Federal agencies that manage lands in the Death Valley Region.
- *Prepared funding initiatives to expand NPS's technical investigations in the Death Valley groundwater system.
- *Monitored progress of the USGS Death Valley regional groundwater flow model project, and prepared task order.
- *Prepared and implemented contract for expert hydrogeology assistance in overseeing the USGS Death Valley groundwater flow model project.
- *Prepared and implemented a contract to examine possible causes for water level decline at Devils Hole.
- *Prepared a task order for USGS to review statistical analyses used by other investigators to explain possible causes for water level decline at Devils Hole.
- *Participated in USGS Technical Exchange on the Death Valley ground-water flow model project.
- *Continued work on Park water uses data report.
- *Conducted field reconnaissance for additional studies for determining spring discharge and field orientation for team staff on DEVA water right issues.
- *Provided Park with data in response to a request from Nye County, NV, on Park water rights and water uses.
- *Provided comments on draft GMP and prepared responses to public comments.

Golden Gate National Recreation Area

- *Assisted in negotiations with Muir Beach Community Services District concerning their water rights application on Redwood Creek.
- *Assisted with the implementation of an aquifer test to determine the hydrologic connectivity between Muir Beach's groundwater pumping and streamflow in Redwood Creek.

*Determined the status of water rights held at Stinson Beach.

*Initiated data collection effort on Easkoot Creek to assist in evaluation of steelhead habitat.

*Reviewed, commented on, and advised Park managers on stream restoration plan for Redwood Creek.

Great Basin National Park

*Evaluated 15 Nevada Water Right Applications and protested 13.

Joshua Tree National Park

*Provided water rights comments to Park staff on backcountry management plan.

Lake Mead National Recreation Area

*Submitted annual report to Moapa Valley Water District regarding Rogers Spring as required by monitoring plan.

*Approved final report of findings for the investigation by Desert Research Institute of the origin and flowpaths of water issuing from selected springs.

*Completed additional field reconnaissance of the Muddy River area and Rogers-Bluepoint Springs area.

*Installed a flume to replace deteriorated weir at Rogers Spring.

*Provided funding to USGS to continue monitoring Rogers Spring discharge and to install a discharge gaging station at Blue Point Spring.

*Evaluated 56 Nevada Water Right Applications and protested 34.

Mojave National Preserve

*Evaluated potential water rights issues and provided comments to Park staff on draft Water Resources Scoping Document.

*Reviewed water rights claims for lands transferred from BLM administration and obtained a change in ownership for these rights to NPS.

*Reviewed the EIR/EIS for the proposed Cadiz project to withdraw groundwater from the Fenner basin.

Multi-Park

*Reviewed notices of water rights applications near California park units.

*Submitted Reports of Licensee and Progress Reports for California parks.

*Completed draft maps of selected California parks outlining the area of concern for new water right applications.

PACIFIC ISLAND CLUSTER

Planning and Evaluation Branch

Kaloko-Honokohau National Historic Park

*Conducted a general survey of offshore coral reef areas for potential future administration by the Park.

Kalaupapa National Historic Park

*Met with Park resources management staff on local fisheries issues and marine resources protection activities; conducted a general survey of offshore coral reef resources within Park waters to gain a better understanding of the nature and condition of coral reefs within this area; and met with park staff to discuss potential actions under the Departmental FY2000 coral reef funding initiative.

National Park of American Samoa

*Provided technical assistance on the landfill near Park boundaries on the island of Ofu.

War-in-the-Pacific National Historic Park

*Served as the Contracting Officer's Technical Representative on a WRD-funded assessment of coral reef resource health and distribution by the University of Guam.

*Provided support for a Park representative to attend the Pacific Island Coral Reef Mapping Implementation Planning meeting in Honolulu and assisted Pacific Island Parks with this initiative. (Hydrologic Affiliates Program)

Water Operations Branch

Haleakala National Park

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Kaloko-Honokohau National Historical Park

*Advised Park, Region, and USGS on the meaning of PAHs data analyzed by Texas A & M University.

*Evaluated potential impacts from wastewater discharges on Aimakapa Pond and anchialine pools near a proposed visitor center. Developed analysis model and produced a technical report for DSC and the Park.

*Reviewed draft USGS groundwater assessment report for a WRD-funded study at Park.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Pu'u'honua O Honaunau National Historical Park

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Puukohola Heiau National Historic Site

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Water Rights Branch

Kaloko-Honokohau National Historical Park

*Completed a groundwater modeling study with USGS to determine effects of proposed groundwater withdrawals on Park water resources.

Multi-Park

*Reviewed well applications for potential impacts to Park water resources.

SOUTHEAST REGION

APPALACHIAN CLUSTER

Water Operations Branch

Abraham Lincoln Birthplace National Historic Site

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Big South Fork National River & National Recreation Area

*Served on the Technical Evaluation Committee for Architectural and Engineering Design Services for a contaminated mine drainage remediation project.

*Consulted with Park and other resource professionals with recognition and study of a problem with horse crossing impacts on rare aquatic species in the Big South Fork River.

Chickamauga & Chattanooga National Military Park

*Uploaded water quality data from a 1994 assessment of the ecological resources of selected caves in the Lookout Mountain Unit and data from the USGS National Geochemical Data Base: National Uranium Resource Evaluation Program to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Cowpens National Battlefield

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Little River Canyon National Preserve

*Advised Park staff on nutrients levels vs. endangered pitcher plants.

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Obed Wild and Scenic River

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Russell Cave National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Water Rights Branch

Blue Ridge Parkway

*Initiated discussions with the town of Blowing Rock to evaluate the potential for authorizing the use of a reservoir on the Moses T. Cone estate.

Obed Wild and Scenic River/Big South Fork National River and Recreation Area

*Evaluated proposal to divert and store water from the New River by the Huntsville Utility District and provided comments on the project to the U.S. Corps of Engineers.

*Assisted Park in responding to a request by McCreary County Utility District to divert water from Lake Cumberland, located within Park boundaries.

*Briefed Park staff on water right protection strategies for both Parks.

*Reviewed a proposal by the USGS to study historic stream flow parameters for Obed Wild and Scenic River.

*Provided funding to USGS for streamflow monitoring at Daddy's Creek and Obed River.

ATLANTIC COAST CLUSTER

Planning and Evaluation Branch

Chattahoochee River National Recreation Area

*Provided a technical review of the draft of the Water Resources Management Plan and coordinated WRD and Park comments on this draft.

*Provided a review and comment on the Corps of Engineers Environmental Impact Statement for potential water management strategies within the Chattahoochee-Apalchicola-Flint River Basin.

Dry Tortugas National Park

*Provided input to the General Management Planning process and assistance in the evaluation and recommendations for one or more no-take protected areas within the park.

Moore's Creek National Battlefield

*Analyzed hydrologic data and documented initial effects of restoring wetland hydrology in a historic pine savannah wetland; worked with The Nature Conservancy and EPA-Atlanta to update prescribed fire recommendations.

*Approved the final study plan for the WRD-funded project "Establish Vegetation Plots to Guide Savannah Wetland Restoration."

Water Operations Branch

Canaveral National Seashore

*Informed Park staff and PEB staff of potential perchlorate contamination issues that might involve the park.

Cape Hatteras National Seashore

*Provided oversight of project to investigate potential for impacts to water quality in the shallow ground water system from septic field leachate.

*Initiated surface water flow monitoring at Jennette Sedge and Cape Point areas.

Chattahoochee River National Recreation Area

*Commented on the draft Water Resource Management Plan with respect to hydrology, water quality, wetlands, and riparian subjects.

Congaree Swamp National Monument

*Assisted Park in determining the likely impacts related to a new development planned along the Congaree River upstream from the Park.

*Reviewed USGS Invertebrate Biomonitoring Proposal and provided Park with detailed technical comments and recommendations.

*Reviewed USGS report for collaborative NPS/NAWQA water quality study of Park streams.

Cumberland Island National Seashore

*Assisted USGS in water quality field inventory funded by the Servicewide Inventory and Monitoring Program.

Fort Pulaski National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Fort Sumter National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Kennesaw Mountain National Battlefield Park

*Uploaded 1998 data from cooperative Park sampling effort at four stations in the Park to STORET.

Ocmulgee National Monument

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Timucuan Ecological and Historic Preserve

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Water Rights Branch

Cape Hatteras National Seashore

*Continued North Carolina State University investigation to describe spatial and temporal variations of water table.

GULF COAST CLUSTER

Planning and Evaluation Branch

Big Cypress National Preserve

*Visited Park to introduce new hydrologist to several federal and state agencies and ongoing watershed efforts.

*Reviewed and commented on Draft Recreational ORV Management Plan/Supplemental EIS.

*Provided assistance to the DSC with Clean Water Act Section 404 requirements concerning ORV use.

*Participated in a scoping meeting to initiate an Oil and Gas EIS/Management Plan.

Canaveral National Seashore

*Provided technical assistance, review, and oversight for the Water Resources Management Plan, including presentation at WRMP Issues Scoping meeting.

Jean Lafitte National Historical Park and Preserve

*Reviewed and commented on the EA and provided technical review and comments on the wetland Statement of Findings for the expansion of the maintenance yard in the Barataria Unit. Certified the technical adequacy of the wetland analyses and consistency with Director's Order #77-1: Wetland Protection.

Natchez Trace Parkway

*Reviewed and commented on scopes of work and consultant bids for the 3P4/3P9 Road Project. The scope of work was for conducting a wetland delineation and preparing a wetland Statement of Findings. Reviewed and commented on the wetland delineation report for the project. Provided technical review and comments on a wetland Statement of Findings for the "3P4/3P9 Road Project." Certified the technical adequacy of the wetland analyses and consistency with Director's Order #77-1: Wetland Protection.

*Reviewed and commented on the wetland delineation report for two projects, "I-55 Connector and Purple Creek crossing (3P3)" and "Old Agency Road (3P13)." Provided technical review and comments on a wetland Statement of Findings for the "I-55 Connector and Purple Creek Crossing Project (3P3)." Certified the technical adequacy of the wetland analyses and consistency with Director's Order #77-1: Wetland Protection.

*Provided technical review and comments on a wetland Statement of Findings for the Palmetto Road Project (3D26). Certified the technical adequacy of the wetland analyses and consistency with Director's Order #77-1: Wetland Protection.

*Provided wetlands technical review on the Four Bridges Environmental Assessment.

Shiloh National Military Park

*Provided assistance on the need for a wetland Statement of Findings for bank restoration along the Tennessee River.

Water Operations Branch

Biscayne National Park

*Represented the Park at various technical meetings discussing contamination impacting Biscayne Bay. Represented the Park in interagency ecological risk assessment meetings related to contamination in Military Canal. Proposed a way of looking at things that was finally accepted by the Air Force and led to an accelerated effort to cleanup the contamination rather than continuing to study it.

*Advised Park and Dade County contractors on technical aspects of the proposals of Dade County to remediate ammonia contamination of groundwater entering Biscayne Bay from municipal landfills.

*Uploaded a variety of water quality data to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Buck Island Reef National Monument

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

De Soto National Monument

*Attended an interagency meeting on mercury issues and summarized the results for Park staff.

*Set up a short-term stormwater water quality monitoring program. A site visit was also conducted to help train Park staff.

Everglades National Park

*Represented Park at State of Florida meeting on effects of mercury on wading birds. Provided an analysis of technical issues and conclusions from the meeting.

*Alerted Park to potential issue of perchlorate contamination.

*Assisted Park with contaminant issues potentially important to the Everglades by reviewing, analyzing, and commenting on the Supplemental EIS for Homestead Air Force Base Conversion.

Salt River Bay National Historical Park and Ecological Preserve

*Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from six Environmental Protection Agency databases.

Natchez Trace Parkway

*Uploaded data from a 1987 sediment lead study in the Tennessee River; data from the Mississippi Lignite Mining Company's 1998 permit application for the Red Hills Mine; and data from the USGS National Geochemical Data Base: National Uranium Resource Evaluation Program to STORET in preparation for producing a Baseline Water Quality Data Inventory and Analysis Report.

Virgin Islands National Park

*Assisted with equipment and data management supporting field research on the contribution of sediments from road erosion to marine environments. Produced a trip report summarizing research objectives and accomplishments; reinforced contacts with the University of the Virgin Islands in developing partnerships; assisted with an educational tour of study areas for the public; and measured sediment traps.

*Revised and updated USGS-Biological Resources Division and Park-collected (1988-1998) water quality data in STORET.

SERVICEWIDE

*Completed and published “Director’s Order #77-1: Wetland Protection” and “Procedural Manual #77-1: Wetland Protection.”

*Revised, reprinted, and distributed 87,000 copies of the brochure “Wetlands in the National Parks” to NPS units for use in wetland interpretive and educational programs.

*Presented a paper titled “Meeting NPS Wetland Protection Objectives in Cultural Landscapes” at the Tenth Meeting of the George Wright Society (Asheville, NC).

*Developed a proposal to obtain fee demonstration money to “Restore High-Priority Wetlands, Streams, and Riparian Ecosystems in NPS Units.”

*Represented the NPS on the Interagency Committee for Defining and Tracking Wetlands Gains and Losses.

*Revised the wetland management section and water/aquatic resources/fisheries section to the NPS Natural Resources Management Guideline (DO-77).

*Provided review and comment on the “Disturbed Lands Management” and “Grazing Management” sections of the draft revised NPS Natural Resources Management Guideline (DO-77).

*Provided review and comment on the draft Director’s Order #12 Level 3 handbook.

*Served as co-chair and technical member of the Natural Resources Challenge Water Resources Action Plan Team.

*Evaluated the NPS backlog of wetland, stream, and riparian restoration projects (based on analysis of PMIS entries).

*Served as chair for Nominations Panel at George Wright Society Conference in March 1999, which selected a recipient for the 1999 Director’s Award for Natural Resource Management, and the Trish Patterson Student Conservation Association Award for Natural Resource Management in a Small Park.

*Participated in the Natural Resources Challenge Program Element #4: Resource Planning.

*Participated with other NPS Natural Resource staff (including NRID, ARD, GRD) to evaluate natural resources' role in Fire Programs with the National Interagency Fire Center.

*Organized and chaired a concurrent session at the 1999 George Wright Society meeting entitled “National Park Service’s Water Resources Planning Program: you want a plan or have a plan – now what?”

*Authored article entitled “Recurrent Themes of Water Resources Management Plans” for the 1999 Natural Resources Year in Review.

*Reviewed and commented on the Servicewide review draft of the Handbook for DO #12 - Environmental Planning.

*Coordinated NPS participation on the national Coral Reef Task Force working groups formed as a result of the first Task Force meeting at Biscayne National Park in October, 1998. Participated on two of the working groups.

*At the request of Dr. Bill Brown, the Secretary of Interior's Science Advisor, took the lead and coordinated the development of a document entitled "Guide to the Management of Coral Reef Protected Areas" as a product of the Ecosystem Science and Conservation working-group.

*In conjunction with the WASO Solicitor's Office developed a discussion paper entitled: *Legislative Provisions Applicable to the Level of Protection Afforded National Park Coral Reef Areas.*

*Coordinated NPS input to a national interagency report on progress toward accomplishing the goals of the National Oceans Conference that was held in June 1998

*Provided a briefing paper for the Director concerning the Coral Reef Task Force and NPS and coral reef management activities in preparation for his possible attendance at the November Coral Reef Task Force meeting.

*Attended a joint meeting between the National Recreational Fisheries Council and the Sportfishing and Boating Partnership Council to discuss agency progress in the implementation of Executive Order 12962 (enhancement of recreational fishing opportunities).

*Visited the offices of the American Sportfishing Association to discuss potential National Park Service projects for funding through the Association's Fish America Foundation grants or other conservation programs.

*Attended the annual meeting of the American Fisheries Society and participated in a Symposium on the effects of aquaculture on natural systems. A paper entitled "*Management of Non-indigenous Fish in the U.S. National Park System*" was presented at the Symposium.

*Reviewed two Federal Register notices (Vol. 64, No. 54, 3/22/99) regarding Corps of Engineers activities. One concerned scoping meetings for the Nationwide Permit Program Programmatic EIS and the other on Regulatory Guidance Letters.

*Reviewed a Federal Register notice (Vol. 64, No. 89, 5/10/99) regarding revisions to the Clean Water Act regulatory definition of "discharge of dredged material."

*Reviewed a Federal Register notice (Vol. 64, No. 66, 4/7/99) regarding Federal Highways Administration/ Department of Transportation wetland mitigation.

*Reviewed and prepared the NPS comments for the Federal Register notice (Vol. 64, No. 139, 7/21/99) on Corps of Engineers Section 404 Nationwide Permits.

*Provided advice and consultation to Denver Service Center, Regional and Support Offices, and Parks on interpretation of floodplain management policy and procedures.

*Submitted Draft Director's Order and Procedural Manual for Floodplain Management.

*Prepared a literature review paper on "Potential Water Quality Concerns Related to Snowmobile Usage."

*Prepared a literature review paper on "Water Quality Concerns Related to Personal Watercraft Usage."

*Provided significant written revisions to NPS-77, Freshwater Resources Management Section.

*Authored water quality sections for NPS-77 Livestock Management Policies and Operations Handbook.

*Coordinated project and funding calls for the initiation of Level 1 water quality inventories for the following park units: Capulin Volcano National Monument, Colorado National Monument, Navajo National Monument, Grand Portage National Monument, Scott's Bluff National Monument, Tallgrass Prairie National Preserve, Saint-Gaudens National Historic Site, CITR, Devils Postpile National Monument, Lava Beds National Monument, Cowpens National Battlefield, Fort Matanzas National Monument, and Stones River National Battlefield.

*Supported the implementation of NPS's Strategic Plan by: 1) leading goal-development workgroup at the Servicewide Strategic Planning Workshop; 2) developing a new water quality goal for Servicewide review; 3) developing new technical guidance for reporting performance relative to the goal; 4) reviewing fiscal plans and expenditures for the goal; and 5) developing a new aquatic resource condition goal and technical guidance.

*Conducted review and provided comment on draft Director's Order #25 - Land Protection.

*Developed study plan development guidelines for WRD funded water resources investigations and watershed restoration projects.

*Redrafted Colorado State Agreement entitled "Development of Environmental Contaminants Summary and Environmental Impact Statement material and coordination of basic water quality inventories."

*Continued to represent the NPS's interests before the State of Wyoming Total Maximum Daily Load Implementation Advisory Board.

*Acquired materials and references on the use of bioengineering for stream channel restoration for use by NPS aquatic professionals.

*Assisted with developing property management policy for WRD particularly how to integrate equipment with agency guidelines.

*Represented NPS interests in the development of the Colorado River Annual Operating Plan.

*Coordinated all aspects of the joint WRD - Servicewide Inventory and Monitoring Program's effort to produce Baseline Water Quality Data Inventory and Analysis Reports for all I&M parks. To date, the project has issued 185 Baseline Water Quality Data Inventory and Analysis Reports and generated a database of "new" NPS data in STORET totaling 17,477 stations and 2,543,143 water quality observations from 191 national park units.

*Maintained and updated a geo-referenced park boundary digital database for use in GIS-based water resources analyses and queries; provided copies of this database to other WASO Divisions, as well as groups within the NPS, USGS, EPA, Census Bureau, and the private sector; posted copies of the database on the NPS GIS Web Site to better service requests for the data.

*Compiled and integrated a number of hydrographic-related digital databases into GIS format including: (1) the USGS Hydrologic-Climatic Data Network; (2) USGS Hydrologic Units; (3) USGS Water Quality Monitoring Station Locations; (4) USGS 7.5" quadrangle outlines; (5) EPA/Corps of Engineers Water Impoundments; (6) Superfund Site Locations; (7) Landfill Locations; and (8) U.C.- Santa Barbara "Managed Areas Database."

*Updated the National Park Units in National Water Quality Assessment (NAWQA) basins GIS database and provided a variety of cartographic and slide products to document which parks lie within which NAWQA basins.

*Represented the National Park Service on the Interagency Watershed Network GIS Action Team for EPA Region 8.

*Responded to water resource inquiries from the general public generated by NPS Internet Web Site.

*Presented “Fundamentals of the Clean Water Act” lectures to two “Natural Resources Law for Superintendents” courses.

*Presented a paper (co-authored with park staff) titled “Dam removal and channel restoration at Fossil Butte National Monument” at the American Water Resource Association Conference, “Science Into Policy: Water in the Public Realm and Wildland Hydrology,” held June 30-July 2, 1999, in Bozeman, Montana.

*Prepared a paper and gave a presentation titled, “Making science relevant to policy from the land managers’ perspective” at the American Water Resource Association Conference, Science Into Policy: Water in the Public Realm and Wildland Hydrology,” held June 30-July 2, 1999, in Bozeman, Montana.

*Presented “Guideline for the Detection and Quantification of Contamination at Oil and Gas Operations” at a Service-wide Nonfederal Oil and Gas Production Operations and Compliance workshop.

*Reviewer for the U.S. Fish and Wildlife Service’s “Trinity River Flow Evaluation Study.”

*Participated in periodic meetings with other federal agencies to coordinate water rights issues.

*Developed and participated in the pilot training session “Expert Witness Preparation for Water Rights Proceedings”.

*Developed and maintained data bases for managing information on NPS reviews of water rights applications and protests.

*Continued efforts to computerize Servicewide water rights records.

*Prepared draft Director’s Order #35 on the sale and lease of water to update Special Directive 78-2.

PUBLICATIONS/CONTRIBUTIONS

Planning & Evaluation Branch

- Amesbury, S.S., D. Ginsburg, T. Rongo, L. Kirkendale and J. Starmer. 1999. *War-in-the-Pacific National Historic Park marine biological survey*. A report to the National Park Service. Univ. Guam Marine Lab. Tech. Report Series. 7pp. + tables, graphs & Appendices.
- Cooper, David, J., D. M. Merritt, D.C. Andersen, and R.A. Chimner. 1999. *Factors controlling the establishment of fremont cottonwood seedlings on the Upper Green River, USA. Regulated Rivers: Res. Mgmt.* 15: 419-440.
- Cudlip, L.C., K. Berghoff, and D. Vana-Miller. 1999. *Water resources management plan, Arches National Park and Canyonlands National Park*. National Park Service, Moab, Utah and Western State College, Gunnison, CO. 153 pp.
- Godfrey, Paul J, K. Galluzzo, N. Price, J. Portnoy, M. Reynolds, and D. Vana-Miller. 1999. *Water resources management plan*. Massachusetts Water Resources Center and University of Massachusetts, Amherst, MA and Cape Cod National Seashore, Wellfleet, Massachusetts. 252 pp.
- Hibbard, W.A. and D.P. Weeks. 1999. *Water resources management plan, Big Cypress National Preserve: a contribution toward effective NPS management* (publ. abstract). The George Wright Society Biennial Conference, March 22-26, 1999. The George Wright Society, Inc. Asheville, NC. pp. 53-54.
- Holmes, R.E. 1998. *San Juan Island National Historical Park wetland inventory*. San Juan Island National Historical Park. Friday Harbor, WA
- Hudson, L., J. Reed, M. Schmitz, B. Simpson, S. Kunkle, and D. Cooper. 1999. *Environmental assessment: rehabilitation of mining-disturbed land in the riparian area of Glorieta Creek*. Filed at Pecos National Historical Park, New Mexico. 20 pp.
- Jennings, Sue. 1998. *Needs in the management of native freshwater mussels in the national park system*. Technical Report NPS/NRWRD/NRTR-97-147. Fort Collins, CO. 35 pp.
- Lyon, J. and C.L. Sagers. 1998. *Structure of herbaceous plant assemblages in a forested riparian landscape*. Plant Ecology 138:1-16. (OZAR)
- Muldavin, E., R. Wallace, and M. Bradley. 1997. *Final report: riparian/wetlands vegetation assessment for the reservoir removal and floodplain restoration project on Glorieta Creek, Pecos National Historical Park*. New Mexico Natural Heritage Program, University of New Mexico, Albuquerque, NM. 19 pp.
- National Park Service. 1999. Director's Order #77-1: *Wetland Protection*. Department of the Interior, National Park Service, Washington, DC.
- National Park Service. 1999. Procedural Manual #77-1: *Wetland Protection*. Technical Report NPS/NRWRD/NRTR-98/203. Fort Collins, CO. 32 pp.

- National Park Service. 1999. *Water Resources Scoping Report*. Mojave National Preserve. Technical Report NPS/NRWRD/NRTR-99/225. Fort Collins, CO. 116 pp.
- Reber, J, M. Flora, and J. Harte. 1999. *Water Resources Scoping Report*. Washita Battlefield National Historic Site, Oklahoma. Technical Report NPS/NRWRD/NRTR-99-235. Fort Collins, CO. 26 pp.
- Thompson, A.J. 1998. *Vegetation classification and ecological characteristics of an old-growth bottomland hardwood forest in the southeastern U.S.* M.S. Thesis, University of Georgia School of Forest Resources, Athens, GA.
- Tilmant, J.T. 1999. Management of non-indigenous fish in the U.S. National Park system. Paper presented at the 129th Annual Meeting of The American Fisheries Society, Charlotte, N.C., 18pp.
- Tilmant, J.T. 1999. Discussion of legislative provisions applicable to the level of protection afforded National Park coral reef areas. NPS unpublished memo. 5pp.
- Tilmant, J.T. and C. Soiseth. 1999. Commercial fishing issues in Glacier Bay resolved through legislation. pgs: 1-2. In: J. Selleck (ed.) NPS Natural Resource Year in Review, 1998.
- Tilmant, J. T. 1999. New perspective on marine resources: President mandates coral reef protection. pg. 11. In: J. Selleck (ed.) NPS Natural Resource Year in Review, 1998.
- Weeks, D.P. and R.J. Andrascik. 1998. *Water resources scoping report*. Voyageurs National Park, Minnesota, Technical Report NPS/NRWRD/NRTR-98/201 Fort Collins, CO. 51 pp.
- Weeks, D. P., 1999. *Water Resources Scoping Report*. Katmai National Park and Preserve, Alaska. Technical Report NPS/NRWRD/NRTR-99/226. Denver, CO. 61 pp.

Water Operations Branch

- Kyte, Clayton R., Santucci, Vincent L., and Inglis, Richard R., Jr. 1999. *Dam removal and channel restoration at Fossil Butte National Monument*. Proceedings, American Water Resources Association, Science Into Policy: Water in the Public Realm and Wildland Hydrology Conference, June 1999, Bozeman, Montana.
- Long, Barry. 1999. *Making science relevant to policy from the land managers' perspective*. Proceedings, American Water Resources Association, Science Into Policy: Water in the Public Realm and Wildland Hydrology Conference, June 1999, Bozeman, Montana.
- Martin, Larry. April, 1999. *Drinking water source protection plan: Golden Spike National Historic Site*. Fort Collins, Colo. 34pp.
- Marzolf, G. Richard, W.L. Jackson, and T.J. Randle. 1999. *Flood releases from dams as management tools: Interactions between science and management*. American Geophysical Union. Geophysical Monograph 110. pp 359-367.
- National Park Service, 1999. *Baseline water quality data inventory and analysis: Abraham Lincoln Birthplace National Historic Site*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/204.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Allegheny Portage Railroad National Historic Site*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/205.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Apostle Islands National Lakeshore*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/188.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Bryce Canyon National Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/227.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Buck Island Reef National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/206.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Canyon de Chelly National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/228.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Capulin Volcano National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/207.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Cedar Breaks National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/208.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Channel Islands National Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/202.

National Park Service. 1999. *Baseline water quality data inventory and analysis: City of Rocks National Reserve*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/209.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Colorado National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/210.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Cowpens National Battlefield*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/211.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Fort Davis National Historic Site*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/237.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Fort Matanzas National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/171.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Fort Union Trading Post National Historic Site*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/231.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Gettysburg National Military Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/199.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Grand Portage National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/195.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Greenbelt Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/212.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Haleakala National Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/184.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Herbert Hoover National Historic Site*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/233.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Homestead National Monument of America*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/213.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Johnstown Flood National Memorial*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/205.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Lassen Volcanic National Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/244.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Lava Beds National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/214.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Lincoln Boyhood National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/215.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Little River Canyon National Preserve*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/216.

National Park Service. 1999. *Baseline water quality data inventory and analysis: National Capital Parks Central*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/217.

National Park Service. 1999. *Baseline water quality data inventory and analysis: National Capital Parks East*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/218.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Navajo National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/196.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Obed Wild and Scenic River*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/200.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Olympic National Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/197.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Petrified Forest National Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/240.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Petroglyph National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/219.

National Park Service. 1999. *Baseline water quality data inventory and analysis: Pipe Spring National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/220.

- National Park Service. 1999. *Baseline water quality data inventory and analysis: Pipestone National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/198.
- National Park Service. 1999. *Baseline water quality data inventory and analysis: Pu'uhonua o Honaunau National Historical Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/192.
- National Park Service. 1999. *Baseline water quality data inventory and analysis: Richmond National Battlefield Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/241.
- National Park Service. 1999. *Baseline water quality data inventory and analysis: Russell Cave National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/221.
- National Park Service. 1999. *Baseline water quality data inventory and analysis: San Antonio Missions National Historical Park*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/222.
- National Park Service. 1999. *Baseline water quality data inventory and analysis: Scotts Bluff National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/201.
- National Park Service. 1999. *Baseline water quality data inventory and analysis: Timpanogas Cave National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/194.
- National Park Service. 1999. *Baseline water quality data inventory and analysis: Tuzigoot National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/223.
- National Park Service. 1999. *Baseline water quality data inventory and analysis: Walnut Canyon National Monument*. Fort Collins, CO: Technical Report NPS/NRWRD/NRTR-99/224.

Water Rights Branch

- Carpenter, M.C., and Cluer, B.L., 1999. *Buried sensor measures erosion and deposition in spawning beds and sandbars*. U.S. Department of Interior, National Park Service, Natural Resources Report NPS/NRWRD/NRR-99/08, pg.17-18.
- Cluer, B.L., 1999. *Doppler technology applied to large river studies*. U.S. Department Of Interior, National Park Service, Natural Resource Year in Review, 1998, pg.52.
- Cluer, B.L., 1999. *Green river channel; flood flow mapping and modeling*. Professional Surveyor, v.19, n.2, pg.8-14.
- Cluer, B.L., *accepted for publication*. *Mapping river channels and velocity fields for environmental analysis*. In: P.T. Bobrowsky, ed., *Geoenvironmental Mapping: Method, Theory And Practice*, special volume of The International Union Of Geological Sciences.
- Cluer, B.L., and Hammack, L.A., 1999. *Hydraulic Analysis of Green River Flows in Dinosaur and Canyonlands National Park Units, Utah: Preliminary Results*. NPS/WRD/WRB/Hydrologists Report, 15p.
- Dexter, L.R., and B.L.Cluer, 1999. *Cyclic erosion of sandbars along the Colorado river, Grand Canyon, Arizona*. *Annals, American Association of Geographers*, 89(2), pg.238-266.

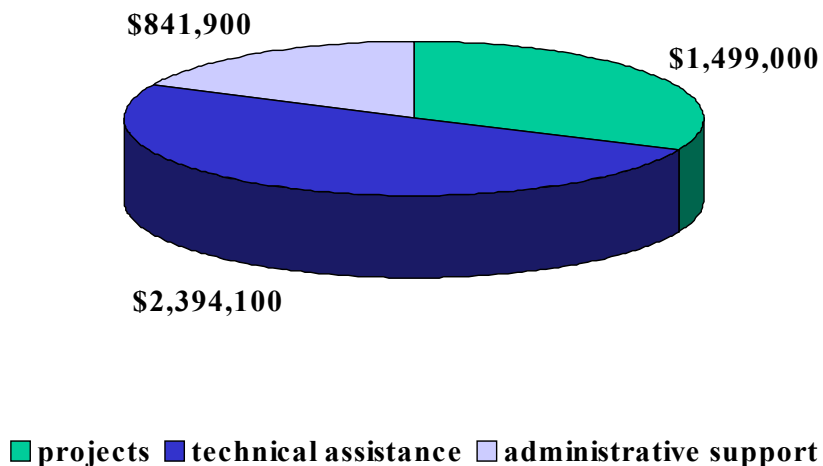
- Elliott, J.E. and L.A. Hammack, 1999. Geomorphic and Sedimentologic Characteristics of Alluvial Reaches in the Black Canyon of the Gunnison National Monument, Colorado. USGS-WRIR 99-4082, 67p.
- Friedman, J.M. and G.T. Auble, 1999. *Mortality of riparian box elder from sediment mobilization and extended inundation*. Regulated Rivers: Research & Management, 15: pg.463-476.
- Hammack, L.A. and B.L. Cluer, 1999. Data Collection and High-Flow Modeling of the Green River in Dinosaur N.M. and Canyonlands N.P., Utah. Draft WRD-WRB Progress Report. 33p.
- Metesh, J., English, A., Lonn, J., Kendy, E. and C. Parrett, 1999. Hydrogeology of the Upper Soda Butte Creek Basin, Montana, With Sections on Climate and Streamflow. Montana Bureau of Mines and Geology, Report of Investigation 7. 66p.
- Oki, D., Tribble, G.W., Souza, W.R., and E.L. Bolke, 1999. *Groundwater resources in Kaloko-Honokohau National Historical Park, Island of Hawaii, Hawaii*. Draft. U.S. Geological Survey WRIR, Honolulu, HI. 65p.

Water Resources Division Financial Status and Sponsored Projects

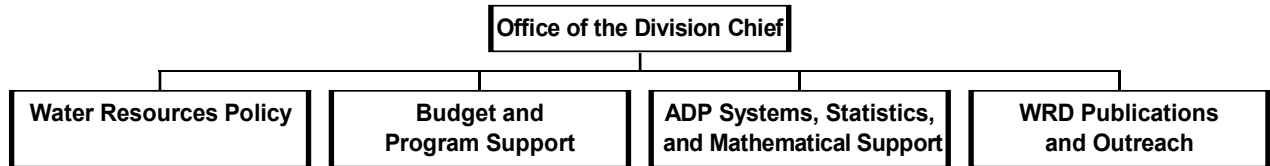
By Dan B. Kimball, Division Chief
and Debi Cox, Program Analyst

FY2000 base funding for the Water Resources Division (WRD) was \$4,735,000. The figure below illustrates the distribution of total WRD funds among technical assistance, project, and administrative support costs. Technical assistance, which is predominately day-to-day operational support to the parks includes staff salaries, travel, and associated expenses. Administrative support includes program management costs, administrative support, equipment, and supplies and materials Divisionwide. The projects category includes funds supporting WRD-sponsored projects in the areas of general water resources, water quality, wetlands protection, and water rights.

Distribution of WRD FY2000 Funding



OFFICE OF THE DIVISION CHIEF ORGANIZATION AND STAFF



Dan Kimball: Division Chief, MS in Water Resources Administration. Specialty areas include water and natural resources management, administration, and planning and the evaluation of natural resource development projects.

Sharon Kliwinski: Water Resources Washington Liaison, BS in Environmental and Pollution Sciences. Specialty area includes environmental legislation and regulations; natural resource policy issues; and mining laws, policies, and programs.

Dave Ryn: Mathematician, MS in Mathematics. Specialty areas include computer and statistical technology.

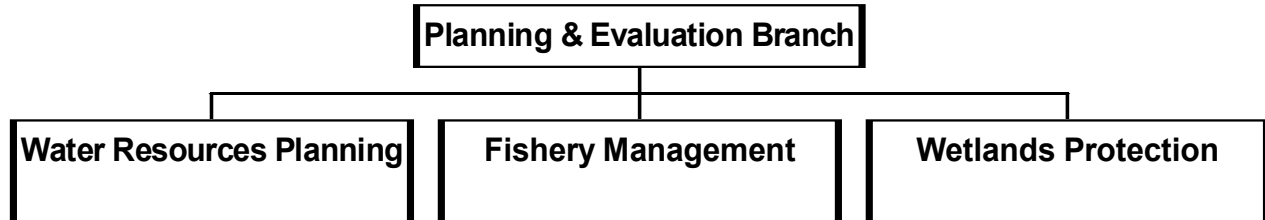
Debi Cox: Program Analyst, BA in Anthropology.

Patty Hennessy: Secretary, BBA in Management.

Carol Liester: Purchasing Assistant.

PLANNING AND EVALUATION BRANCH

ORGANIZATION AND STAFF



Mark Flora: Branch Chief, MS in Environmental Science (Water Resources). Specialty areas include water resources management planning, water quality, and watershed management.

Joel Wagner: Wetlands Protection Program Team Leader, MS in Environmental Science (Water Resources). Specialty areas include wetlands science, hydrology, restoration, and regulatory issues.

Leslie Krueger: Natural Resource Specialist, BS in Water Resources. Specialty areas include wetlands science, management, and regulatory issues.

Jim Tilmant: Fishery Management Program Team Leader, MS in Wildlife and Fisheries. Specialty areas include aquatic and marine resources management, fish biology, and population dynamics.

David Vana-Miller: Water Resources Planning Program Team Leader, MS in Marine Biology. Specialty areas include water resources planning, aquatic and marine resources management, and water quality.

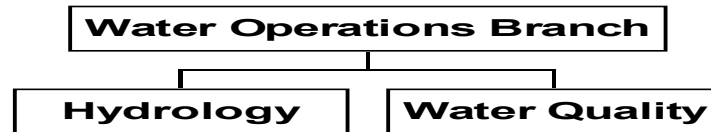
Don Weeks: Hydrologist, MS in Geology (emphasis in hydrogeology). Specialty areas include water resources management planning, water quantity, and water quality.

John Wullschleger: Fishery Biologist, BS in Zoology, MS in Fish & Wildlife Biology. Specialty areas include effects of regulation on river ecosystems, freshwater and marine invertebrates, intertidal ecology, and fish and benthic invertebrate sampling methods.

Lael Wagner: Secretary

WATER OPERATIONS BRANCH

ORGANIZATION AND STAFF



Bill Jackson: Branch Chief, Ph.D. in Hydrology. Specialty areas include sedimentation processes, fluvial geomorphology, and river rehabilitation and management.

Gary Rosenlieb: Water Quality Program Leader, MS in Water Resources. Specialty areas include water quality (chemistry and microbiology), groundwater quality, and hazardous materials management.

Gary Smillie: Hydrology Program Leader, Hydrologist/Hydraulic Engineer, MS in Civil Engineering. Specialty areas include flood-frequency analysis, open-channel hydraulics, floodplain management, and sediment transport.

Matt Hagemann: Hydrologist, MS in Geology. Specialty areas include transport of groundwater contaminants, groundwater monitoring, groundwater cleanup, and application and interpretation of environmental regulations and policy.

Rick Inglis: Hydrologist, BS in Watershed Science. Specialty areas include field hydrologic data collection using automated recorders, watershed management, ground water monitoring, and data analysis.

Roy Irwin: Senior Contaminants Specialist, Ph.D. in Biology. Specialty areas include environmental contaminants and biological aspects of water quality (including bio monitoring).

Barry Long: Hydrologist, BS in Watershed Sciences, MS in Forest Hydrology. Specialty areas include physical-chemical aspects of water quality.

Larry Martin: Hydrogeologist, MS in Hydrology. Specialty areas include hydrogeology, groundwater surface water interaction, well siting, drinking water source protection, and aquifer testing.

Michael Martin: Hydrologist, BS in Environmental Geology, MS in Watershed Science. Specialty areas include geochemistry, water quality, geomorphology, flood analysis, and tropical aquaculture.

Dean Tucker: Computer Programmer-Analyst, Ph.D. in Forestry. Specialty areas include data management, computer graphics, and water resources applications in GIS.

Mike Matz: Research Associate, MS in Civil Engineering. Specialty areas include water quality planning and management, inventory and monitoring, and data analysis.

Mark VanMouwerik: Contaminants Specialist/Research Associate, BS in Biology, MS in Environmental Health. Specialty areas include environmental fate and toxic effects of contaminants, contaminants data interpretation, and wastewater treatment.

Pat Wiese: Secretary and Bibliographic Database Manager, BS in Biology.

STUDENT ASSISTANTS

Brett Atkinson: Water Quality Data Analyst, BS Candidate in Computer Science (2002), MS in Forest Hydrology (1993), BS in Watershed Science (1989).

Clint Bassett: Water Quality Data Analyst/Report Writer, BS Candidate in Watershed Science (2000), BA Candidate in Public Relations (2000).

Amy Benton: Water Quality Data Analyst/Report Writer, BS Candidate in Watershed Science (2002), BS in Business Administration (1991).

Ronda Burns: Water Quality Data Analyst, MS Candidate in Civil Engineering (2000), BS in Civil Engineering (1995), BA in Spanish (1995).

Valdete Celaj: GIS Cartographer, MS Candidate in Civil Engineering (2000), BS in Civil Engineering (1993).

Elizabeth Eisenhauer: GIS Cartographer, MS Candidate in Geology, BS in Geology (1988).

Cara Ellis: Water Quality Data Analyst, BS Candidate in Watershed Science (2002).

Bill Folsom: GIS Cartographer, MS Candidate in Forestry (2002), BS in Natural Resources Management (1999).

Jeff Ketcham: GIS Cartographer, BS Candidate in Computer Information Systems (1999).

Sarah Linn: Floodplain Analyst and EIS Writer, BS in Environmental Geology (1999).

Kelli O'Connor: Water Quality Data Analyst, MS Candidate in Civil Engineering (2000), BS in English (1993), BA in Chemistry (1993).

Nancy O'Keeffe: Water Quality Data Analyst, MS Candidate in Soil Science (2000), BS in Wildlife Biology (1997), BA in Social Science (1984).

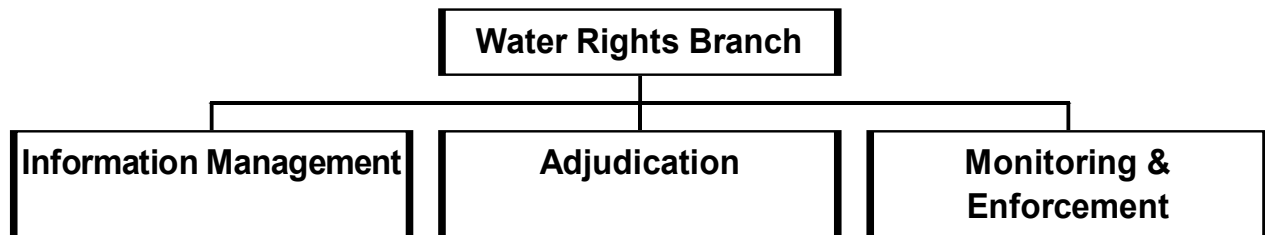
Scott Ratchford: GIS Cartographer, MS Candidate in Ecology (2002), BS in Economics (1987).

Melanie Schnier: Water Quality Data Analyst, BS Candidate in Civil Engineering (2001).

Paul Sorek: Water Quality Data Analyst, MS Candidate in Watershed Science (2001), BA in Geology (1995).

WATER RIGHTS BRANCH

ORGANIZATION AND STAFF



Chuck Pettee: Branch Chief, Supervisory Hydrologist, MS in Watershed Science. Specialty areas include water rights, surface water hydrology and hazardous materials.

Jeff Albright: Supervisory Hydrologist, Information Management Program Leader, MS in Watershed Management. Specialty areas include surface water hydrology, field methods, and instrumentation.

Bill Hansen: Supervisory Hydrologist, Adjudication Program Leader, MS in Hydrology. Specialty areas include water law, surface water hydrology, field methods, and watershed management and rehabilitation.

Dan McGlothlin: Supervisory Hydrologist, Monitoring and Enforcement Program Leader, BS in Watershed Hydrology. Specialty areas include water rights law and administration and water resources policy.

Henrique Barreto: Hydrologist, BS in Computer Science, MS in Geography. Specialty areas include fluvial geomorphology, surface water hydrology, data analysis, and instrumentation.

Brian Cluer: Hydrologist, Ph.D. in Earth Resources. Specialty areas include fluvial geomorphology, surface water hydrology, hydraulics and sediment transport processes, two-dimensional flow modeling, remote sensing of fluvial processes, and monitoring changes in fluvial systems.

Chris Gable: Hydrologist, BS in Watershed Sciences. Specialty areas include surface water hydrology, water quality control, field methods, instrumentation, and data analysis.

Jim Harte: Hydrologist, BS in Forestry/Watershed Sciences. Specialty areas include surface water hydrology, sediment transport, and watershed management.

Jeff Hughes: Hydrologist, MS in Watershed Sciences. Specialty areas include water rights, surface water hydrology, and field methods.

Eric Moser: Hydrologist, MS in Physical Sciences. Specialty areas include surface water hydrology, field methods, and data analysis.

Ron Thomasson: Hydrologist, BS in Civil Engineering. Specialty areas include surface water hydrology, hydraulics, field methods, water rights, and data analysis.

Brad Gillies: Research Associate: Colorado State University, BS in Watershed Science. Specialty areas include field methods and data analysis.

Lauren Hammack: Research Associate; Colorado State University, MS in Earth Sciences (Watershed Science). Specialty areas include fluvial geomorphology, surface water hydrology, hydraulics, sediment transport, field methods, and data analysis.

Flora Romero: Secretary.

STUDENT ASSISTANTS

Michelle da Luz: Student Research Technician, Colorado State University, Monitoring and Enforcement Group.

Eric Lord: Student Research Technician, Colorado State University, Monitoring and Enforcement Group.

Marlene Meirath: Student Research Technician, Colorado State University, Information Management Group.

Jeremey Lawrence: Student Research Technician, Colorado State University, Information Management Group.

David Curtice: Student Research Technician, Colorado State University, Information Management Group.

Nick Mazour: Data Specialist Intern, Colorado State University, Information Management Group

Ted Shannon: Applications Programmer, Colorado State University, Information Management Group.

VOLUNTEER

Jennifer "Rose" Wallick: Colorado State University

AWARDS

Office of the Division Chief

Patty Hennessy received a "STAR" award for her work for the division on the annual report. Many positive comments have been received with respect to this report, and these comments, in part, are due to Patty's initiative, commitment, and dedication in preparing this report and assuring that it is of exceptionally high quality.

Sharon Kliwinski received a "STAR" award for her work in coordinating the two sessions of the Natural Resources Law and Policy for Superintendents course. The very positive response to this course was, in large measure, due to Sharon's initiative, commitment, and dedication to this course.

Debi Cox, Patty Hennessy, Carol Liester, and Dave Ryn received "On-the-Spot" awards for their effort and hard work towards the Natural Resources Stewardship and Science Y2K remediation. Because of the extra effort and hard work, Y2K replacement hardware and software was in place before December 31, 1999, leading to a smooth transition for the directorate.

Planning and Evaluation Branch

Don Weeks received a Quality Step Increase in recognition of his supervision of the Chickasaw National Recreation Area WRMP and the Arches National Park/Canyonlands National Park WRMP, and preparation of the Voyageurs National Park WRSR.

Water Operations Branch

Bill Jackson received a "STAR" award for his initiative, commitment, and dedication to developing water quality goals for the NPS in response to the Government Performance and Results Act (GPRA).

Matt Hagemann received an "On-the-Spot" award in recognition of the creative approach he identified and facilitated that helped San Antonio Missions NHP absolve itself of contamination liability issues and helped the transfer of Air Force base property to NPS to proceed.

Rick Inglis received an "On-the-Spot" award in recognition of the special level of effort and professional excellence he provided to the analysis of watershed conditions and downstream flooding at John Muir National Historic Site.

Barry Long received a "STAR" award in recognition of his significant role in developing a new \$2.5 million water quality monitoring and assessment program in the NPS to be implemented in partnership with the U.S. Geological Survey as part of the Federal Clean Water Action Program.

Larry Martin received an "On-the-Spot" award in recognition of his contributions to helping resolve spring flow decline issues at Pipe Springs National Monument and the special level of

initiative demonstrated in completing wellhead protection plans for Bryce Canyon National Park and Golden Spike National Historic Site.

Gary Rosenlieb received a "STAR" award for his initiative, commitment, and dedication to developing water quality goals for the NPS in response to the Government Performance and Results Act (GPRA).

Gary Smillie received a "STAR" award for his high level of outstanding performance in support of an extremely wide variety of park water resource management issues.

Dean Tucker received an "On-the-Spot" award for his effort and hard work towards the Natural Resources Stewardship and Science Y2K remediation. Because of the extra effort and hard work, Y2K replacement hardware and software was in place before December 31, 1999, leading to a smooth transition for the directorate.

Water Rights Branch

Jeff Hughes received a Quality Step Increase for his dedication and hard work in making certain NPS water rights are protected. Jeff maintained a high level of energy and enthusiasm during a period of reorganization and staff vacancies and has always maintained positive, collaborative working relationships with all branch personnel and legal counsel.

Eric Moser received an "On-the-Spot" award for his effort and hard work towards the Natural Resources Stewardship and Science Y2K remediation. Because of the extra effort and hard work, Y2K replacement hardware and software was in place before December 31, 1999, leading to a smooth transition for the directorate.

Ron Thomasson received a "STAR" award in recognition of his outstanding effort and commitment in preparing amended water rights claims for Crater Lake National Park, which met the deadlines in the Klamath Basin Adjudication in Oregon.

CREDITS

PHOTOGRAPHS

Cover Photo, Cumberland Island National Seashore, Barry Long

Title page, Acadia National Park, Barry Long

Cape Cod National Seashore, Dave Vana-Miller - page 5

Katmai National Park & Preserve, Don Weeks - page 5

Bear, Katmai National Park & Preserve, Don Weeks - page 6

Reservoirs, Pecos National Historical Park, Joel Wagner - page 6

Construction work, Pecos National Historical Park, Joel Wagner - page 7

Greene Creek, Blue Ridge Parkway, Bob Cherry - page 10

Quemada Creek, Santa Rosa Island, CHIS, Gary Rosenlieb - page 11

Runoff Channel, Fort Davis National Historic Site, Mike Martin - page 11

Sampling, Lake Mead National Recreation Area, Barry Long - page 13

Flooding, John Muir National Historical Site, Rick Inglis - page 13

Jet Ski, Mark VanMouwerik - page 14

Lake Mead National Recreation Area, Barry Long - page 21

Sampling, Barry Long - inside back cover

Chief Editor Dan Kimball

Editorial Assistant Patty Hennessy



As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The Department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

June 2000

