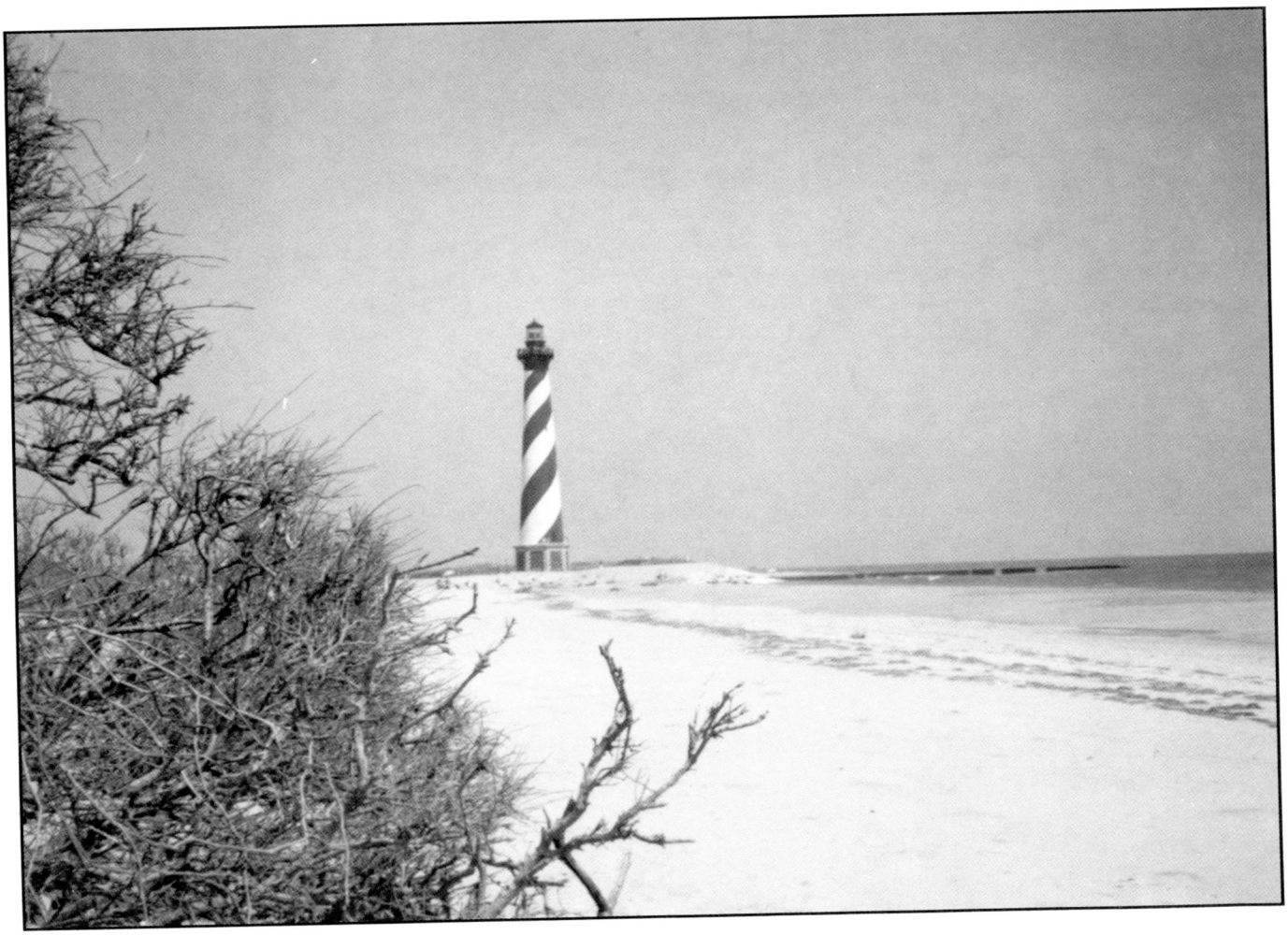
ANNUAL REPORT



1994

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, watershed studies, and aquatic ecology.

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WATER RESOURCES DIVISION

NATIONAL PARK SERVICE
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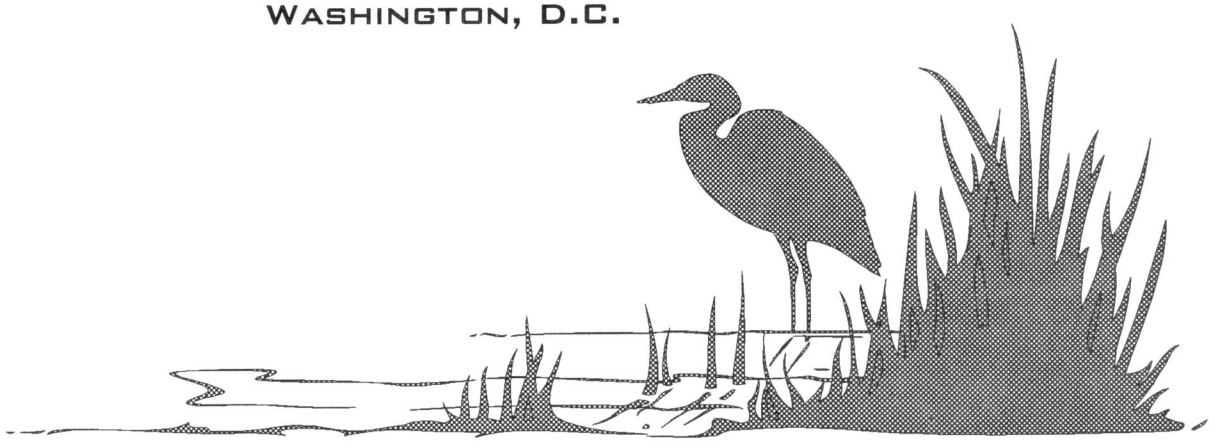


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A Word from the Associate Director, Natural Resources

BY MICHAEL SOUKUP, PH.D.

This Annual Report provides a summary of the significant accomplishments of the Water Resources Division (WRD) of the National Park Service (NPS) in 1994. WRD provides Servicewide leadership for the preservation, protection, and management of water and water-related resources of units of the National Park System. The Division carries out a broad-based water resources program involving a variety of activities, including water rights, water quality, floodplain management, watershed and wetlands protection, planning, policy and legislative analysis, information management, and training. In addition to national program responsibilities, the Division provides day-to-day support to parks, Regions, the Washington Office (WASO), and other NPS organizational units in addressing the myriad of 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 as reflected in this Annual Report. These accomplishments are indicative of the professionalism of the Division and the ability of the Division to work with management and staff of parks, Regions, and WASO to effectively address water resources matters facing NPS. I should note, however, that these accomplishments would not have been possible without the continuing excellent cooperation and support provided by parks, Regions, and WASO. These collective efforts have provided an environment for the high level of success which has been achieved by NPS's Natural Resources Program.

Comments from the Division Chief

By Dan B. Kimball

While 1994 was characterized by a number of significant accomplishments, in many ways it was a year of planning for the transition of the Water Resources Division (WRD) into a restructured National Park Service (NPS). In particular, it has been a time of coping with the inability to fill vacancies in the short-term and the specter of downsizing of NPS central offices over the long-term. As such, 1994 was a year of challenges in terms of providing continued Servicewide water resources leadership and also professional and technical support to parks. As evident in this Annual Report, in 1994 WRD was able to achieve several very important accomplishments in both of these areas. Some examples of significant accomplishments of the Division in 1994 include the following.

- Active participation in the Department of the Interior's working group on reauthorization of the Clean Water Act.
- Development of a risk-based, watershed approach to remediating water quality problems associated with inactive and abandoned mines on Federal lands.
- Major progress in consummating a Reserved Water Rights Compact in the state of Montana for Little Bighorn Battlefield National Monument and Bighorn Canyon National Recreation Area, a favorable court ruling to recognize Federal reserved water rights in Rocky Mountain National Park, and pivotal advancement of negotiated water rights settlements at Zion and Mesa Verde National Parks.
- Establishment of an operating partnership with the U.S. Geological Survey (USGS) to coordinate the long-term water quality needs of units of the National Park System with USGS's National Water Quality Assessment Program.
- Significant progress, with support of NPS's Servicewide Inventory and Monitoring Program, in preparing park-specific water quality data reports.
- Major headway in preparing (or assisting in the preparation of) water resources management plans, scoping reports, and issue overviews for more than 20 parks.
- Involvement in significant water resources issues facing NPS including the development of an adaptive management program for Grand Canyon following completion of the Glen Canyon Dam Environmental Impact Statement; water resources technical reviews of the proposed New World Mine near Yellowstone National Park; technical analyses in support of the restoration of the Elwha River in Olympic National Park; review of final reclamation plans of a uranium mill tailings site upstream of Canyonlands National Park; and various NPS water resources issues associated with the implementation of the North American Free Trade Agreement along the U.S./Mexico border.
- Conducting a training course entitled "Water Resources for Park Managers," providing training in water resources management planning and wetlands protection, and sponsoring a meeting of Park Water Resources Professionals and a workshop on instream flow needs.
- Participation on the Ad Hoc Working Group on Natural Resource Management which was established by NPS Director Kennedy and Assistant Secretary Frampton.

Many of the accomplishments listed above are described in more detail later in this Annual Report.

Consistent with the tradition of WRD, we are dedicated to customer service and to providing professional and technical support of the highest quality. I am extremely proud of the hard work and commitment to these goals demonstrated on a daily basis by the staff and management of WRD. In addition, we will continue to develop and implement new and more innovative, efficient, and cost-effective ways to provide support and services to parks and other NPS organizations in protecting and managing water resources of the National Park System.

Washington Program Coordination Office Highlights

BY WILLIAM H. WALKER, PH.D.
PROGRAM COORDINATOR
AND
SHARON P. KLIWINSKI
ENVIRONMENTAL PROTECTION SPECIALIST

During 1994, the Washington Program Coordination Office was able to increase technical and policy support provided to the Associate Director, Natural Resources and to the Water Resources Division (WRD), while at the same time continuing our participation in several ongoing projects such as the Department of the Interior's Clean Water Act (CWA) reauthorization efforts. We were also involved in planning for the sweeping changes in organization and duties which will result when the reorganization proposed for the National Park Service (NPS) is fully implemented. Aspects of our involvement in task forces or work groups to revamp the NPS training program, to update the Natural Resources Strategic Plan, to devise a strategy for dealing with water quality problems from abandoned mined lands, and our contributions to a variety of new projects are described below or outlined elsewhere in this Annual Report.

The expectations of many for a sweeping environmental agenda in the 103rd Congress, supported by the commitment of a new Democratic administration to conservation issues, went mostly unrealized. In the end, the most significant environmental protection bill enacted by the 103rd Congress was the landmark California Desert Parks Act. The new 104th Congress promises to push through legislation focusing on regulatory and possibly legislative reform of major environmental laws, including the Endangered Species Act, Superfund, the Clean Air Act, and the wetlands provisions of the CWA.

WRD staff in this office continued to represent NPS on the Department's CWA workgroup. One focus of the workgroup was remediation of water quality problems from abandoned mines. An important outcome of this effort was the formulation of a Departmental policy which outlines an innovative, risk-based, watershed approach to this serious environmental problem. An article by Sharon Kliwinski and Gary Rosenlieb, elsewhere in this report, further describes involvement with the Department's abandoned mined lands work group. At the NPS level, we worked closely with the Southeast Region to integrate the Department's goals for such an approach for acid mine drainage remediation into a Natural Resources Preservation Program project at Big South Fork National River and Recreation Area. From a national perspective, the Big South Fork project is as close to a prototype of this newly devised watershed approach as exists to date.

A new role for staff in the Washington Program Coordination Office evolved when we assumed the responsibility for serving as the NPS liaison to the National Water Quality Assessment Program (NAWQA) at the national headquarters of the U.S. Geological Survey (USGS). The objective of this expanding USGS program is to assess the current status of water quality in the nation and monitor changes over time. By forming a cooperative partnership with the USGS and working to establish NAWQA sampling locations in NPS units, our goal is to provide much needed, high quality information about parks' water resources while at the same time facilitating the USGS assessment of national water quality trends. By representing NPS on the NAWQA Advisory Council and also the Interagency Committee on Water Data and the Intergovernmental Task Force on Monitoring Water Quality, we hope to insure that national initiatives focusing on water issues will meet NPS needs. An article by Barry Long, elsewhere in this report, describes in more detail the Division's efforts to implement park-based water quality studies through the NAWQA program.

Another innovative national initiative on water quality resulted when the National Geographic Society and the Conservation Fund brought together national leaders representing public, private, and non-profit organizations in the National Forum on Nonpoint Source Pollution. The goal of the Forum is to cooperatively seek on-the-ground solutions to nonpoint source pollution that balance the economic and environmental needs of the nation. We represented the Service on the Forum's Voluntary Initiatives Workgroup; the Forum s final report and recommendations are due mid-1995.

This year has also seen WRD staff in this office significantly involved in a number of training efforts; many were related to the major restructuring of the overall NPS training program which is underway. At different times during the year, we participated in the group evaluating the draft Servicewide Employee Training and Development Strategy and on the team formed both to define the "essential competencies" which will be required for natural resources personnel in the future and design a new NPS natural resources training curriculum. We also participated on the team which designed the syllabus for the "Fundamentals of Natural Resources for Professionals" course and coordinated the WRD team which put together WRD's "Water Resources for Managers" course.

Planning and Evaluation Branch Highlights

BY MARK FLORA
BRANCH CHIEF

This year has been a productive, though challenging year for the Planning and Evaluation Branch (PEB). During the year, Mark Flora was selected as Branch Chief, replacing Dan Kimball who was selected in 1993 as Chief, Water Resources Division (WRD). In addition, WRD's ability to meet wetlands technical assistance requests was greatly enhanced in 1994 by hiring a new wetlands specialist. Leslie Krueger, formerly with the U.S. Army Corps of Engineers, brings extensive experience to WRD in such areas as 404 permitting, wetlands mitigation banking, and wetlands ecology.

PEB was negatively affected by an inability to fill two key vacancies and was also hampered by the loss of our secretary to the buy-out. However, the Branch was very fortunate in obtaining top-notch temporary support from detailees Norm Henderson (Capitol Reef National Park) who completed the Fort Clatsop National Memorial Water Resources Scoping Report and Sandee Dingman (Denver Service Center) who provided support to both the planning and wetlands programs. In addition, Sean Wheeler, a graduate student at University of Colorado (Denver), offered his services as a VIP and was able to complete the Timucuan Ecological and Historic Preserve Water Resources Issues Overview.

During the year, PEB, working cooperatively with park staff and CPSU cooperators, was able to complete two Water Resources Management Plans (Great Basin National Park and Colonial National Historical Park), two Water Resources Scoping Reports (Fort Clatsop National Memorial and Jewel Cave National Monument), and the Timucuan Ecological and Historic Preserve Water Resources Issues Overview. In addition, PEB has provided NPS units with both funding assistance and technical support for the continuing development of eight additional Water Resources Management Plans (Acadia National Park, Big Bend National Park, Congaree Swamp National Monument, Big Cypress National Preserve, Big South Fork National River and Recreation Area, Saint Croix National Scenic Riverway, Bighorn Canyon National Recreation Area, and Santa Monica Mountains National Recreation Area).

WRD staff, assisted by personnel from Albright Training Center, the National Biological Service, and both the Southwest and Southeast Regional Offices, have also begun or continued work on six water resources "scoping" efforts at Point Reyes National Seashore, Pecos National Historical Park, Biscayne National Park, Chattahoochee River National Recreation Area, Richmond National Historical Park, and Katmai National Park and Preserve.

PEB provided training and/or technical assistance in water resources planning and the development of water-related planning documents for nine NPS units including Bryce Canyon National Park, Curecanti National Recreation Area, Grand Canyon National Park, Minute Man National Historical Park, Saint Gaudens National Historical Park, Saratoga National Historical Park, Saugus Iron Works National Historic Site, Fire Island National Seashore, and Morristown National Historical Park.

It was also a very active year for the Division's Wetlands Program. PEB wetlands staff provided oversight for 17 ongoing wetlands projects during the year and coordinated the proposal development and funding process for 5 new projects scheduled to begin in FY95. Currently funded projects cover a broad range of wetland management, restoration, and inventory needs, including "Kettle Pond Aquatic Macrophyte Assessment" at Cape Cod National Seashore, "Rehabilitation of the Hog Canyon Riparian Area" at Dinosaur National Monument, and "Enhanced Inventory, Mapping, and Digital Data" for wetlands at Blue Ridge Parkway.

Examples of wetlands technical assistance during the year included evaluating effects of grazing on wetlands at Gettysburg National Military Park, identifying wetland restoration opportunities at Fort Clatsop National Memorial, and providing regulatory and technical assistance regarding a housing development which threatens wetlands at Gulf Islands National Seashore.

PEB wetlands staff presented a highly successful field and lecture course entitled "Wetlands Classification, Identification, and Compliance" at Jackson, Wyoming. Students learned the basics of wetland ecology as applied to delineating and mapping wetlands in the field. In an effort to enhance collaboration with scientists in other agencies and universities, PEB

wetlands staff also organized and chaired a 10-paper session on "Wetlands Research and Management in the National Parks" at the 15th Annual Society of Wetland Scientists Conference.

PEB (with the assistance of the Division's other branches) also reviewed approximately 310 proposed rules and regulations, environmental compliance documents (Environmental Impact Statements/Environmental Assessments), and planning documents (General Management Plans, Development Concept Plans, and Resource Management Plans, etc.) during the year. Written comments pertaining to water-related issues were prepared for 115 of the documents which were reviewed.

In 1994, PEB also participated in a number of Departmental and/or Servicewide working groups including representing the NPS on the DOI U.S./Mexico Shared Water Resources Committee and participating in the NPS R-MAP Process Evaluation and R-MAP Implementation Teams.

Do Wetlands Regulations Help Protect Park Resources?

BY JOEL WAGNER
HYDROLOGIST

National Park Service (NPS) employees may have mixed feelings about Federal wetlands regulations. At times, the regulations implementing Section 404 of the Clean Water Act and the NPS guidelines implementing Executive Order 11990 (Protection of Wetlands) seem unnecessarily convoluted just more hurdles which slow progress on needed NPS construction and maintenance projects. At other times, these are the tools of choice for protecting park resources from destruction. So I pose the question: Do wetlands regulations facilitate or hinder the NPS mission?

Section 404 as a Park Resource Protection Tool

Section 404 of the Clean Water Act includes a permit requirement for discharging dredged or fill material into "waters of the United States," including wetlands. More commonly known regulated activities include construction of building pads or road beds in aquatic habitats, but recent court rulings have clarified that mechanized land-clearing and excavation activities are regulated as well. The law applies to Federal agencies, so the NPS must comply with the same permit procedures required of private builders.

In evaluating the adverse impacts of a proposed activity during the permit review process, the U.S. Army Corps of Engineers (COE) must consider both onsite impacts (i.e., the amount and type of habitat directly displaced by the fill) and offsite impacts (e.g., effects of drainage facilities on adjacent property or changes in downstream water quantity or quality). This latter aspect, consideration of offsite impacts, opens the door to NPS input and involvement in COE decisions on permits for projects which, although not on NPS property, may adversely impact NPS resources.

A proposed housing development immediately adjacent to Gulf Islands National Seashore (GUIS) provides a recent illustration of how the 404 permit process can be used as a tool for protecting park resources. In this case, the subdivision design submitted to COE called for a stormwater detention and drainage ditch immediately outside the park boundary. Unfortunately, COE did not contact GUIS regarding this proposal and permitted the developer to proceed with construction during 1994 under the presumption that there would be no unacceptable impacts on NPS resources. The park first learned of the project after observing ditch construction and land-clearing along the GUIS boundary. After consultation with the NPS Water Resources Division (WRD) regarding 404 regulatory procedures and effects of the project on the hydrology of pine savannah wetlands in the park, GUIS convinced the COE to issue a "stop work order" pending evaluation of impacts on this valuable wetland ecosystem.

The "stop work order" created some breathing room, during which WRD conducted ground water drawdown analyses, provided additional policy/regulatory support to GUIS, and installed a network of observation wells to evaluate effects of the proposed development on pine savannah wetland hydrology. WRD is also funding a study, proposed by GUIS, to analyze vegetation, soil, ground water hydrology, endangered species, and water quality components of this wetland ecosystem. GUIS and WRD believe that ultimately, through the 404 permit process, an alternative plan can be negotiated with the developer that assures that park resources will not be degraded.

A word to the wise: contact the appropriate COE regulatory office and assure that the superintendent is notified whenever a regulated activity is proposed in the vicinity of your park.



Photo 1. Monitoring water levels in pine savannah wetlands at Gulf Islands National Seashore. (J. Wagner).

The Role of NPS Wetland Guidance in Park Facilities Planning

Executive Order 11990 (Protection of Wetlands) is the basis for most NPS wetlands policy. The Order recognizes the loss of over 50 percent of the nation's wetland resources, and directs each Federal agency to develop procedures to "... minimize the destruction, loss, or degradation of wetlands, and to preserve ... the natural and beneficial values of wetlands in carrying out the agency's responsibilities." In response, NPS developed the NPS Floodplain Management and Wetlands Protection Guidelines" (45 FR 35916). These guidelines direct NPS managers to avoid actions with the potential for adversely impacting wetlands when there is a practicable alternative, and to preserve, enhance, and minimize degradation of wetlands when no such alternatives exist. If a project will adversely impact wetlands, a Statement of Findings (SOF) must be attached to the Finding of No Significant Impact or final Environmental Impact Statement. This brief document explains why there are no practicable alternatives to the proposed action and outlines mitigating measures to compensate for wetland loss.

The wetlands guidelines recognize the NPS dual mission of providing for enjoyment of the resources, as well as protecting them in perpetuity. That is, they do not say that we absolutely cannot impact wetlands in the course of constructing visitor facilities or that we absolutely must restore all wetlands that have been impacted in the past. Rather, they facilitate a balance in the mission with respect to wetland resources, requiring only that NPS project planners seek locations and designs which avoid or minimize wetland impacts to the extent "practicable," while still meeting project objectives. The guidelines also provide park managers with guiding principles when considering external proposals for activities or facilities in NPS units.

Summary

Clearly, Section 404 of the Clean Water Act and the NPS Wetland Guidelines are tools that facilitate the NPS mission. Still, in cases where proposed NPS projects will have unavoidable, adverse impacts on wetlands, the 404 permitting process and the NPS procedures are a significant piece of the workload for the planning and design process.

One important step in streamlining NPS wetlands compliance procedures occurred in 1994. In response to reports of delays in obtaining required approval signatures for wetlands SOFs, the Director delegated signature authority on SOFs to Regional Directors, with concurrence from the WRD Chief. Early indications are that this change has eased the compliance process.

Another important way to minimize the workload is to gather wetland data early in the park planning process. National Wetland Inventory maps, while not of sufficient scale and accuracy for final compliance purposes, are useful as a first step in eliminating undesirable development sites from consideration. Subsequent steps may include wetland reconnaissance by a knowledgeable NPS employee or obtaining services of a professional wetland delineation contractor. Experience has shown that it is far easier to avoid wetland impacts (and the need for subsequent compliance steps) when adequate data are available at the time that alternatives are being developed.



Photo 2. Portion of drainage/stormwater detention ditch constructed adjacent to Gulf Islands National Seashore before the U.S. Army Corps of Engineers issued a "stop work order." (J. Wagner).

Water Resources Planning at Point Reyes National Seashore

By Thomas R. Bellinger
Hydrologist
(Detailee from Bureau of Reclamation),

Mark Flora
Branch Chief,

William W. Shook
PORE Resources Management Specialist,
and
Karl Striby
PORE Range Conservationist

Point Reyes National Seashore (PORE), located in north-central California, preserves a diverse blend of unique and high value water resources. Prominent features of the seashore include Tomales Bay, Drakes Estero, Estero de Limantour, and Abbotts Lagoon which are considered some of the finest examples of ecologically intact west-coast estuaries. Freshwater resources include several streams, natural and man-made lakes, numerous springs, streams, wetlands, and riparian areas. The protection and maintenance of these valuable resources is essential to the purpose of the national seashore.

PORE is unusual as a unit of the National Park System as it includes both a natural zone (including a significantly-sized wilderness area) and a considerable "pastoral" zone which contains highly intensive dairy and beef cattle operations. The seashore also includes a commercial oyster cultivation operation. In many places, these areas are in immediate proximity to high-value water resource features, creating significant management challenges.

During 1994, the Water Resources Division, in conjunction with PORE, completed a draft PORE Water Resources Management Plan (WRMP). The purposes of this plan include developing a synopsis of water-related management issues, as well as providing park management with an assessment of ongoing water-related inventory, monitoring, resource management, and research activities; and a "blueprint" of recommended actions for addressing water resources issues.

To accomplish this, meetings were held with park staff and local ranchers. Within the course of these meetings, several water-related management concerns were identified. Several of these concerns have become dominant themes within the PORE WRMP including:

- completion of an inventory of water resources, including investigation of land titles and water rights to determine location, status, and ownership of water resources within the national seashore;
- completion and field verification of an inventory and classification of wetland systems within the national seashore and addition of this information to a GIS system;
- initiation of a routine water-quality monitoring program to establish water quality baseline and trends;
- completion of a multi-disciplinary "rapid assessment" of the impacts of pastoral operations upon water-related resources within the national seashore;
- development and implementation of appropriate grazing management measures/management practices to control nonpoint source pollution; and

- development of management strategies for the protection and preservation of the extremely high-value water resource features including Abbotts Lagoon, Drakes Estero, and Estero de Limantour.

The WRMP is currently undergoing an internal review. When released in mid-1995, the WRMP should provide PORE with management guidance for addressing each identified issue and provide the Seashore with an "action plan" for managing its water resources over the next 5 to 7 years.



Photo 3. High altitude, oblique view of Point Reyes National Seashore. (Courtesy of Point Reyes National Seashore).

Water Rights Branch Highlights

BY OWEN R. WILLIAMS
BRANCH CHIEF

Last year, I began my overview by noting the continuing trend of increasing workload for the Water Rights Branch (WRB). This year has been less a year of workload increase than one of continued progress on several fronts coupled with growing concern about our future ability to be effective. There is no surprise in this statement because the concern is shared by the entire Service as we enter a period of dramatic change in government, generally, and the National Park Service (NPS), in particular. We all, in our own ways, are trying to cope with these uncertain times while still, hopefully, effectively protecting park resources. At the same time, we are all trying to conjure up ways "to do more with less" and better serve our many "customers." The good news is that is happening and we believe it will continue to happen as the new NPS evolves in 1995 and beyond.

As was the case last year, NPS has had continued success in protecting its water rights and the resources dependent thereon. Negotiations with the state of Montana to formulate a water rights compact for the remaining two Montana park units having Federal reserved water rights (Little Bighorn Battlefield National Monument and Bighorn Canyon National Recreation Area) progressed positively. (An agreement in principle was developed and approved by the Montana Compact Commission in early FY95.) Similarly, actions to secure a recognition of Federal reserved rights for Rocky Mountain National Park were completed in Colorado's Water Court for Division I. (The court ruled favorably in early FY95.) In addition, positive events during the year hold out the possibility of negotiated settlements of water rights issues at Zion and Mesa Verde National Parks in the near future. Efforts continued in FY94 to develop a water service contract with the Bureau of Reclamation which will satisfy NPS water requirements under its Federal reserved right at Black Canyon of the Gunnison National Monument, while complementing Fish and Wildlife Service endangered species recovery efforts and Bureau of Land Management objectives at its Gunnison Gorge Natural Resource Conservation Area.

We were not so successful in working with the U.S. Senate. WRD efforts to assist Yellowstone National Park and Washington Office Congressional and Legislative Affairs in support of the Old Faithful Protection Act were apparently less effective in the Senate than in the House of Representatives. The bill, which passed the House, died in the Senate; this in spite of the fact that the bill was supported by the three involved governors, and the one party (the Church Universal and Triumphant) who had previously alleged an uncompensated taking of private property were the bill to pass. The defeat of this bill leaves the Yellowstone hydrothermal system at some risk. However, the Montana compact, effective January 30, 1994, does provide significant protection through water rights controls. It seems this is a situation of a glass that is half full or half empty; it's all a matter of perspective.

Another item worthy of note is the first Instream Flow Needs Assessment Workshop for attorneys and technical staff was held in the fall at Estes Park, Colorado. The session was sponsored by the National Biological Service, but its success resulted, in large part, from involvement of WRD in conceptualization, program development, and logistics. The 2-day session, attended by representatives of NPS, U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, Interior Office of the Solicitor, Agriculture Office of General Counsel, and Department of Justice, proved to be of great value and was, by general agreement, long overdue. It is likely the session will be repeated on a regular basis and will serve as an opportunity to strategize and, hopefully, produce a coherent approach to instream flow water rights issues common to Federal land management agencies. If the workshop takes this direction, it will be much like the annual sessions held for many years by the western states Offices of Attorneys General.

I would be remiss if I failed to recognize the progress which has been made this year in numerous studies and field data collection efforts supporting litigation and negotiations in many NPS units around the country. These efforts include studies conducted in California, Colorado, Hawaii, North Carolina, Nevada, Oregon, and Utah. This work, carried out both by contractors and in-house staff, should be of great help in producing sound information that will help protect park water-dependent resources through litigation, negotiation, or administrative actions.

I hope this and other important functions of WRD's Water Rights Branch will continue after NPS's reorganization. That NPS's water rights program is viewed as the model for other agencies was clear to all who attended the above-described workshop; at least that was the feedback given by the attorneys and technical folks in attendance.

The accomplishments described in this Annual Report are the result of the combined labors of a dedicated team of talented professionals. In the current state of diminished NPS FTEs, WRB, like other NPS units, does not, and will not, have its full complement of Federal staff. We, like everyone else, are trying to find new ways of handling a workload which is already beyond the capacity of existing staff. Among the avenues we are pursuing to get the job done, WRB is contracting work to the private sector and academia to be responsive to the demands of litigation, water rights administration, and conflict resolution through negotiation. By these methods, WRB has been able to provide necessary services in a timely manner. How this approach will work in the future, of course, remains to be seen, but we are hopeful there will be no noticeable change in WRB responsiveness to the field or effectiveness in program accomplishment.

As some issues are settled, WRB is able to address others which have not yet "come to a boil." We all attempt to avoid "crisis management" and getting information together before court deadlines expire will be a pleasant experience for all of us, if we can make it happen. For example, the Branch is supporting investigations of potential impacts to water-related resources at Cape Cod National Seashore from nearby ground water withdrawals. Working with park, National Biological Service, and WRD staff, we hope to develop data through research which will help in Regional water allocation decisions which will, in effect, protect NPS water-related resources.

Once again, this has been a productive year for the protection of NPS water rights; I hope 1995 will be the same. I have to note again, as I did last year, the NPS in general, and I in particular, owe a debt of gratitude to the staff of the Water Resources Division. It is because of their professionalism and dedication that the NPS water resources protection program continues to succeed. The following articles describe two water rights issues which are of some consequence. One describes a decision of import related to Rocky Mountain National Park (mentioned above) which was rendered in the water law bellwether state, Colorado. The second article deals with the practical matter of collecting streamflow data in support of litigation and/or negotiations. These articles should provide a little depth and detail and, thereby, help the reader to get a "feel" for some of the activities of this Branch.

As to the future we will all be looking for new ways to get the job done, that's obvious. I strongly encourage field managers to call upon the WRB whenever water rights issues are, or could be, affected by management decisions. As the "new NPS" gives greater authority and autonomy to field units, a close working relationship with this Division will be essential if "train wrecks" are to be avoided. I must admit to feeling some anxiety about the future because of the very human tendency to let those activities slip that appear irrelevant and/or remote, especially those activities, such as water rights, that are problematical in many cases. Having said that, I must hasten to add, assistance from park management and staff has always been available to this Branch and has generally been critical to any NPS success in water rights protection. If field managers are alert to the potential for water rights difficulties and contact us immediately to assist, I believe the NPS will continue its string of water rights successes throughout 1995.

Water Court Grants Reserved Water Rights for Rocky Mountain National Park

BY DAN MCGLOTHLIN
SUPERVISORY HYDROLOGIST

On December 1, 1994, the park superintendent and staff of Rocky Mountain National Park (ROMO) hosted a reception to celebrate a recent Federal reserved water rights decree in Colorado Water Division 1. Among those who attended the reception was Judge Robert A. Behrman who approved the decree giving ROMO the right to all surface and ground waters not appropriated on the date the park was established in 1915. Though it may seem a bit unusual that the presiding judge would attend a celebration in honor of his decision, the occasion marked the importance of the decision and its potential consequence to National Park Service (NPS) claims in other jurisdictions throughout the West. The celebration also marked the end of nearly two decades of uncertainty about the park's reserved rights in Water Division 1.

The court case focused on the United States' claim for Federal reserved water rights, filed on December 30, 1976, pursuant to the McCarran Amendment[1], for all of the unappropriated waters appurtenant to ROMO. NPS claimed the minimum amount necessary to fulfill the purposes for which ROMO was established. Sources included all waters, such as streams, springs, seeps, lakes, and ground water, situated east of the Continental Divide and on lands reserved from the public domain. The objective of the claim was to maintain water sources in their natural state except for present and future diversions required for administrative and visitor uses.

Federal reserved rights are judicially determined rights. In 1991, in anticipation that the ROMO water right claim would be litigated by the Department of Justice (DoJ), the Water Rights Branch (WRB) initiated data collection to provide technical evidence in support of the claim. Also in 1991, Northern Colorado Properties, Inc. (Northern), the owner of a conditional water right to Mirror Lake within the park, filed a motion for summary judgement seeking a determination that their water right was senior to the rights of the United States in ROMO. The existence of the private right inside the park was the result of a boundary change which Congress authorized in 1980 to incorporate national forest lands, which included Mirror Lake, into ROMO.

The United States opposed the action and filed a separate motion for summary judgement asking the court to grant the ROMO claim for reserved rights. If a favorable ruling were obtained from this action, DoJ reasoned that extensive (and costly) preparations for litigation could be avoided. This approach presented little or no risk for NPS and was endorsed by the Regional Director, Rocky Mountain Region; Superintendent, ROMO; and the Water Resources Division. Future options (i.e., litigation and negotiation) would not be foregone if the summary judgement was denied.

In March 1992, DoJ submitted its motion for summary judgement and, at a hearing in November 1992, argued the merits of a reserved right for national park purposes. In this proceeding, DoJ argued that Congress intended to preserve all streams, lakes, and other water features in their natural state when it created ROMO in 1915 (16 U.S.C. 191 and 195). DoJ also argued that these features were to be preserved so that they will be left unimpaired for future generations as Congress intended when it passed the National Park Service Organic Act of 1916 (16 U.S.C. 1). The state of Colorado, Northern Colorado Water Conservancy District, and other objectors to the motion held that Congress had no intention to create a reserved water right for ROMO because the park lies at the headwaters and was protected by administrative prerogative. They also held that, even if Congress intended to create a reserved right for ROMO, a precise quantification of each body of water in the park was needed.

On December 29, 1993, the court ruled in favor of the United States' motion granting the reserved rights at ROMO, for the purpose of preserving "the natural conditions and scenic beauties" of the park. The court analyzed the relevant portions of 16 U.S.C. 195 and 16 U.S.C. 1 and concluded that Congress, in setting aside ROMO, "intended to reserve

[1] In the McCarran Amendment (66 Stat. 560, 43 U.S.C. Sec. 666), the United States gave consent to be joined as "... defendant in any suit (1) for the adjudication of rights to the use of water of a river system or other source, or (2) for the administration of such rights, where it appears that the United States is the owner of or is in the process of acquiring water rights by appropriation under state law ... and the United States is a necessary party to such suit."

all of the unappropriated water in the park for park purposes. Only by doing so can the underlying purposes of the creation of the park be achieved. The fact that the entire flow is needed is sufficient quantification of the right."

In making its decision, the court was clearly influenced by the recent case involving Federal reserved water rights for national forests in Water Division 1. Applying its experience in that case, the court took judicial notice of the fact that stream-flow alteration affects stream channels and "interruption or reduction of natural flows as a result of diversions would be contrary to preservation of the scenic beauties" [of the park]. The court also relied on its experience in the National Forest Service case to show that Congress had made a distinction between the utilitarian purposes of forests and the "nonuse" purposes of parks, which were intended to protect parks "preserved, unimpaired."

Following the decision, DoJ, with assistance from the Office of the Solicitor, ROMO, and WRB staff, submitted a proposed decree for the court's approval. On October 12, 1994, the court approved a decree for ROMO's reserved rights. The document outlines the basis and measure of the rights, including present and future administrative uses, and requirements for reporting planned and actual water use to the Colorado State Engineer and the court.

It may be some time before the impact of this case is fully recognized. However, a few things are apparent already. First, the judge was asked to make his determination based on the law only, because there were no material facts at issue. He was, clearly, influenced by the National Forest Service case concerning the effects of diversions on stream flow and the distinction in purposes of National Forests and National Parks. Even though the United States lost the National Forest Service case, the outcome may have benefitted NPS.

Second, the physical setting of ROMO (i.e., located at the headwaters) likely enhanced the United States' case. As a headwaters park, senior water rights holders downstream are assured of their supplies, because the NPS right is largely non-consumptive. The NPS case is precedent-setting, but only in Colorado Water Division 1. However, this Division is considered to be the bellwether water-law jurisdiction in Colorado and the western United States. The case may influence other states and water users to give more serious consideration to negotiating settlements of NPS's Federal reserved rights claims.

Collecting Streamflow Data What Are Your Options?

BY ANDREW HAUTZINGER
HYDROLOGIST

Water resource information is important to National Park Service (NPS) managers making natural resource decisions, resolving conflicts, and preparing for state water rights adjudications. Streamflow data are often used to support controversial decisions to develop new park facilities, to gain injunctive relief to protect park resources from potentially adverse land use activities and water development, and to prepare the evidence necessary to protect instream flow water rights in general adjudications. In planning for the collection of water resource data, the manager or resource management specialist must establish study objectives and determine the quality and quantity of data to be collected within budget and personnel constraints.

When developing study objectives, the resource management specialist should address questions, such as: "What parameters are to be measured? How will the data be used and analyzed? What accuracy is required? What statistical tests will be used? What should be the frequency and duration of sampling? Is the study site accessible? How much site disturbance is acceptable? What level of resource commitment, both in personnel and equipment, will the study require?"

Once these questions have been answered, the specialist will likely have two options for collecting streamflow data: (1) contracting data collection with a recognized source of expertise such as the U.S. Geological Survey (USGS), or (2) conducting the data collection in-house.

The USGS has an excellent reputation for collecting water resource data which meets rigorous quality assurance standards and is generally well received in a court setting. A national Interagency Agreement exists to encourage cooperative work between the USGS and the NPS. Therefore, the administrative procedure for contracting a stream gage on NPS lands is fairly simple; the resulting contract requires little park assistance in equipment installation, maintenance, or operation. The involvement by NPS will generally be environmental review and approval of gage location and equipment installation.

There can be disadvantages to contracting with the USGS; the most notable of which is the cost of installation and operation. A typical USGS gage costs $10,000 to $15,000 to install. This is a one-time cost and is a function of site accessibility. The annual cost to operate and maintain a gage is generally $7,000 to $13,000. This includes monthly discharge measurements, data reduction, and publication in USGS annual, statewide water resource reports.

The second option is to use in-house staff to install and maintain a stream gage using electronic data logger technology. This technology is fairly inexpensive and reliable. The equipment is highly portable and can be installed in 1 or 2 days with minimal impact upon park resources. For example, NPS's Water Resources Division (WRD) has installed remote stations in 12 parks throughout the western United States as part of water rights-related studies. The typical configuration consists of a data logger (a device that stores data in a non-volatile medium), a pressure-transducer (a sensor, which when placed in the stream generates an electrical signal that indicates pressure levels, i.e., water stage or depth), and finally, a temporary shelter to house the data logger (e.g., a watertight metal "ammo-can" secured to a tree or boulder or buried nearby). While this type of station has frequently been used by WRD to estimate river discharge, data loggers can be used in the collection of a variety of information including temperature, pH, dissolved oxygen, and well water levels.

The primary advantage of collecting streamflow data in-house is cost savings. The cost of installing a remote streamflow gage is typically $2,000 to $2,500, including equipment and labor. Data reduction and publication in annual NPS data reports generally require 2 to 3 weeks per station and costs about $1,900 to $2,500 per year. This results in a savings of $8,000 to $10,000 for installation and an annual savings of roughly $5,000 to $10,000 for operation and maintenance when compared to a USGS station.

The disadvantage of this approach is the commitment of in-house resources (human and equipment). Once the equipment is installed, a rating curve must be developed to convert electronically recorded stage values into estimates of discharge. This requires the measurement of streamflow and stage over a range of flows (using standard USGS methodology). The resulting relationship can be used to develop a rating curve and table for the station. Field data collection will require a staff commitment of 10 to 12 days per year for discharge measurements and equipment maintenance. Field time could increase if the site is remote and difficult to reach. Discharge measure-ments are typically taken weekly or semi-weekly during high runoff seasons and every 4 to 6 weeks the rest of the year.

The following description of a NPS study at the Kalaupapa National Historical Park (KALA), located on the island of Molokai, Hawaii, illustrates the use of both in-house staff and USGS contracts to evaluate the impacts of water diversion. WRD is assisting KALA in determining the impacts of existing surface and ground water diversions from the Waikolu Stream basin on biologic resources. WRD initiated a paired-basin study to determine the impacts (i.e., altered flow regimes) of water diversions in Waikolu on native fish, arthropods and mollusks, including a native goby, *Lentipes concolor*, a candidate for threatened and endangered species listing.

Paired-basin studies (Ponce, et al. 1982) are often used to investigate the impacts of natural or man-induced disturbance or alterations in watersheds. Typically, two watersheds are selected with similar climates and basin characteristics. One basin serves as a control and the other serves as the treatment basin (i.e., water development). This method allows inferences to be made about the impacts of the treatment in the altered basin. For this study, the Waikolu Stream basin, which forms the eastern boundary of the park, is the treatment basin and the Pelekunu Stream basin, just east of Waikolu, was the control basin.

Dr. Gustavo Diaz, from Colorado State University, in cooperation with WRD, is developing a Geographic Information System (GIS) data base, to facilitate the analysis of basin-wide characteristics (i.e., hydrology, geology, climate, soil type, and vegetation). The data base will be used to determine the extent of similarities or differences between Pelekunu and

Waikolu. The resultant information will then be used to evaluate impacts of water diversion in Waikolu on flow regimes, physical habitat, and animals of interest (i.e., populations, diversity, and density).

WRD implemented the streamflow data collection program to define existing and natural flow regimes in Pelekunu and Waikolu. The USGS was contracted to reestablish a gage which was operated during 1968-80 in Pelekunu. The gage is located at an elevation approximately equal to that of the Waikolu diversions. Access to Pelekunu requires a helicopter and NPS does not have the staff to service the gage on a frequent basis. The USGS currently services several gages on Molokai every 6 weeks via helicopter and was willing to install and operate the Pelekunu gage. In addition, the continued operation of the Pelekunu gage by the USGS allows for direct comparison of current data with data gathered from the 1968-80 period. The installation cost of the Pelekunu gage was $15,300. Annual operation and maintenance costs are $13,400.

WRD implemented an in-house data collection program in Waikolu to characterize the water diversions and existing hydrology. While two USGS gages are located in Waikolu, they are not located favorably relative to the diversions (two surface diversions and five wells). Therefore, these stations can not be used to isolate the impacts of water diversion on Waikolu. In addition, the USGS gages are located at elevations which could not be used to compare streamflow in the paired basins.

Access to Waikolu is limited, but can be accomplished without use of a helicopter. Thus, KALA and WRD staff and a contract biologist were available to service and operate the gages. In view of this factor, WRD installed two gages; one above the diversions and one below. Electronic data loggers and pressure transducers were installed at each location for a cost of $2,500. Estimated savings, when compared to contracting the USGS, include $25,000 for installation and $20,000 for annual operating and maintenance costs.

New technology provides the park manager or resource management specialist the opportunity to collect streamflow data at reduced cost. Costs and benefits must be evaluated by the manager to decide if in-house data collection can meet study objectives and be conducted with scarce staff. However, if the availability of staff to operate the gage is in question, the manager should consider the use of the USGS to avoid the risk of losing data due to staff unavailability for servicing the gage at critical times or compiling and publishing data. Other circum-stances, including the potential for controversial decisions and/or litigation, may dictate that NPS contract with USGS for presentation in a court setting where it is expected that the "other side" will impugn the collected data.

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Water Operations Branch Highlights

BY WILLIAM L. JACKSON, PH.D
BRANCH CHIEF

This year was a particularly satisfying one because several major Water Operations Branch (WOB) activities of Servicewide scope and significance began producing results. Our efforts in cooperation with the National Park Service (NPS) Inventory and Monitoring Program to create a Servicewide water quality data base have, as of this writing, resulted in the completion of 23 individual park water quality data inventory and analysis reports. This effort is being coordinated by Dr. Dean Tucker, Branch GIS specialist. We now expect that 60 parks will have completion reports by the end of the 1995 fiscal year. Each customized park report includes a complete water quality data base (on floppy disk) downloaded from the Environmental Protection Agency (EPA)-STORET data base, four other digitized hydrographic data bases, summary data analyses and statistics, screenings of individual water quality records for exceedance of EPA standards, and an evaluation of park water quality data gaps when compared against NPS Inventory and Monitoring Program Level I standards.

This year also marked the initiation of long-term park water quality monitoring studies through the U.S. Geological Survey (USGS) National Water Quality Assessment (NAWQA) Program. This program was created by a Memorandum of Understanding between the NPS and USGS and is described in greater detail in the following article by Barry Long.

With support from NPS Hazardous Materials and Oil Spill Damage Assessment Programs, substantial enhancement of the Contaminants Encyclopedia and its application to addressing aquatic contaminants issues occurred. Over 500 industry-by-industry sections on chemical compounds associated with various industrial categories were added and drafts were completed on general topics such as humic substances, natural variation, de minimis, and risk assessment. The encyclopedia team, under the oversight of Dr. Roy Irwin, supported analysis of over 30 park contaminants issues including interpretation of mercury levels in fish (Acadia National Park), environmental effects of asphalts and road de-icers (Alaska Regional Office and Denver Service Center), and the analysis of total hydrocarbons in ground water (Colonial National Historical Park, Padre Island National Seashore, and National Capital Region).

In addition to programs of Servicewide scope and significance, the Branch continued to provide direct technical support to parks on a wide variety of issues. Four Branch members worked with Olympic National Park and the Bureau of Reclamation to develop technical analyses of sediment impacts and management alternatives for the Environmental Impact Statement being developed for the proposed removal of two hydroelectric dams on the Elwha River. The following article by Gary Smillie, Mike Martin, and Brian Cluer describes in greater detail the nature of our support to that issue. In other dam management-related issues, the Branch assisted Grand Canyon National Park in developing the "adaptive management" program framework for the Glen Canyon Dam Environmental Impact Statement; assisted Dinosaur National Monument in implementing a study of the effects of dam operations on sediment resources; and assisted Glen Canyon National Recreation Area in developing an interagency water quality monitoring program for Lake Powell.

Other examples of technical support to park management issues in 1994 include: ground water and water quality impacts of the proposed New World Mine near Yellowstone National Park; water resources issues associated with stabilization and abandonment of an uranium tailings pile upstream from Canyonlands National Park; an analysis of water supply issues and alternatives for the South Rim of Grand Canyon National Park and the community of Tusayan; assessment of well-field impacts on park ground water tables at Cape Cod and Cape Hatteras National Seashores (in coordination with the Water Rights Branch); analysis of land-use impacts on flooding and channel stability at Russell Cave National Monument; reservoir sedimentation analysis at Bighorn Canyon National Recreation Area; evaluation of channel, water, and riparian resource monitoring needs at Fossil Butte National Monument; Merced River restoration planning and Mirror Lake restoration analysis at Yosemite National Park; and the assessment of acid mine drainage remediation options at Big South Fork National River and Recreation Area. A complete listing of park technical assistance is included elsewhere in this report.

Finally, Branch member Gary Rosenlieb, along with Sharon Kliwinski of WRD's WASO Program Coordination Office, and Bob Higgins of the NPS Mining and Minerals Branch worked very effectively as part of a Department of the Interior working group to draft a proposed general stormwater permit under the Clean Water Act for abandoned mines on Federal

lands. Efforts in 1995 will focus on implementing the permit on a prototype basis with one or more states and coordinating this activity with the Environmental Protection Agency. A summary of this issue is provided in one of the following articles. In all, this has been a very busy and productive year for WOB. I hope it has been a year where our efforts have resulted in meaningful support to the resolution of important park water resources management issues.

National Park Service Coordination with the U.S. Geological Survey National Water Quality Assessment Program

BY BARRY A. LONG
HYDROLOGIST

"The U.S. Geological Survey (USGS) began implementation of the National Water Quality Assessment (NAWQA) Program in 1991 to provide a nationally consistent description of the quality of the Nation's water resources. The long-term goals of the NAWQA Program are to describe the status and trends in the quality of the Nation's ground- and surface-water resources, and to provide a sound understanding of the natural and human factors that affect these resources. To meet these goals, nationally consistent ground- and surface-water quality data and ecological information useful to policy makers and managers...are being collected and analyzed. Factors such as climate, geology, hydrology, land use, and agricultural practices that affect water quality are also being studied along with specific water quality issues that affect large hydrologic regions of the United States. When fully implemented, the NAWQA Program will include a total of 60 study units. The areas covered by these 60 study units are the source of 60 to 70 percent of the Nation's public water supply withdrawn from surface- and ground-waters." (Pugh and Adamski 1993)

Recently, the National Park Service (NPS) initiated efforts to coordinate with the USGS's NAWQA Program to address NPS water issues. In the past, only a few parks participated in the NAWQA Program in response to requests by USGS to conduct monitoring in parks on a case-by-case basis to suit NAWQA objectives. Today, parks and NPS's Water Resources Division (WRD) have begun to focus water quality monitoring in parks as part of the NAWQA Program through participation in study-unit liaison committee meetings and by implementing collaborative, cost-share monitoring studies that address NPS objectives.

WRD's participation stems from its role in developing and/or coordinating Servicewide programs which involve water resources. In the area of Servicewide water quality programs, WRD has been involved in the development of water quality monitoring protocols, a water quality data management system for personal computers, a baseline water quality data inventory and analysis project, and initiatives to coordinate long-term water quality monitoring in parks with other agencies, such as the NAWQA Program.

In January 1994, NPS and USGS signed a formal Memorandum of Understanding to coordinate the integration of NPS units into the NAWQA Program. A NPS-WRD coordination position was established at the USGS National Headquarters in Reston, Virginia, to help implement the agreement. Thus, the framework for developing interagency agreements to cost-share collaborative monitoring was established, and potential roles for each agency partner were identified. NPS will coordinate the identification and planning of its water quality information needs, and USGS will provide the technical capabilities (i.e., technical protocols, sampling design, laboratory analyses, quality assurance and quality control, data management and analysis, and scientific reporting) required to implement long-term monitoring of critical water resources in parks at the field level. NPS will continue to interpret the water quality information for park planning, management, and environmental compliance and regulatory purposes.

During FY95, WRD will initiate efforts with individual NAWQA study units to foster this partnership. We have determined that approximately 205 NPS units (56 percent) are within existing or proposed NAWQA study unit (Figure 1 and Table 1). Three parks (Yellowstone and Rocky Mountain National Parks and Blue Ridge Parkway) are in more than one NAWQA study unit. Thirteen NAWQA monitoring stations have been established in parks so far, and potentially ten more may be established during fiscal year 1995 with WRD cost-share funds tentatively dedicated to the program. NPS intends to fund primarily "issue" related stations, while USGS will fund mostly "reference" stations in parks. Collaborative water quality stations are scheduled to be established in the following NAWQA study units and parks: Upper Colorado River Basin (Rocky Mountain National Park, Curecanti National Recreation Area, Black Canyon of the Gunnison National Monument), South Platte River Basin (Rocky Mountain National Park), San Joaquin-Tulare Basins (Yosemite National Park), Rio Grande Valley (Bandelier National Monument), Upper Snake River Basin (Grand Teton National Park), Upper Mississippi River Basin (Saint Croix National Scenic Riverway), Ozark Plateaus (Ozark National Scenic Riverways), Apalachicola-Chattahoochee-Flint River Basin (Chattahoochee River National Recreation Area), and the Nevada Basin and Range (Lake Mead National Recreation Area).

Since 1992, WRD has annually submitted (albeit unsuccessfully) a $2.5 million budget initiative to permit full implementation of this agreement to meet high-priority water quality monitoring needs in parks. Under the proposed initiative, NPS would identify critical long-term water quality monitoring needs to be addressed by the NAWQA Program. Site specific monitoring objectives and plans would be developed cooperatively between NPS and USGS and implemented through the NAWQA Program. Plans would be geared to addressing management needs as identified in park planning documents. Where possible, NPS staff would assist in monitoring logistics. All data developed under this partnership would be uploaded into standardized, national data bases (such as the USGS's WATSTORE and Environmental Protection Agency's STORET data bases), and would become available to NPS in a form compatible with our own data management systems. Ultimately, WRD intends to use these data, including data obtained from individual parks and the baseline water quality data inventory and analysis project, as the basis for triennial reports on the status of water quality in units of the National Park System.

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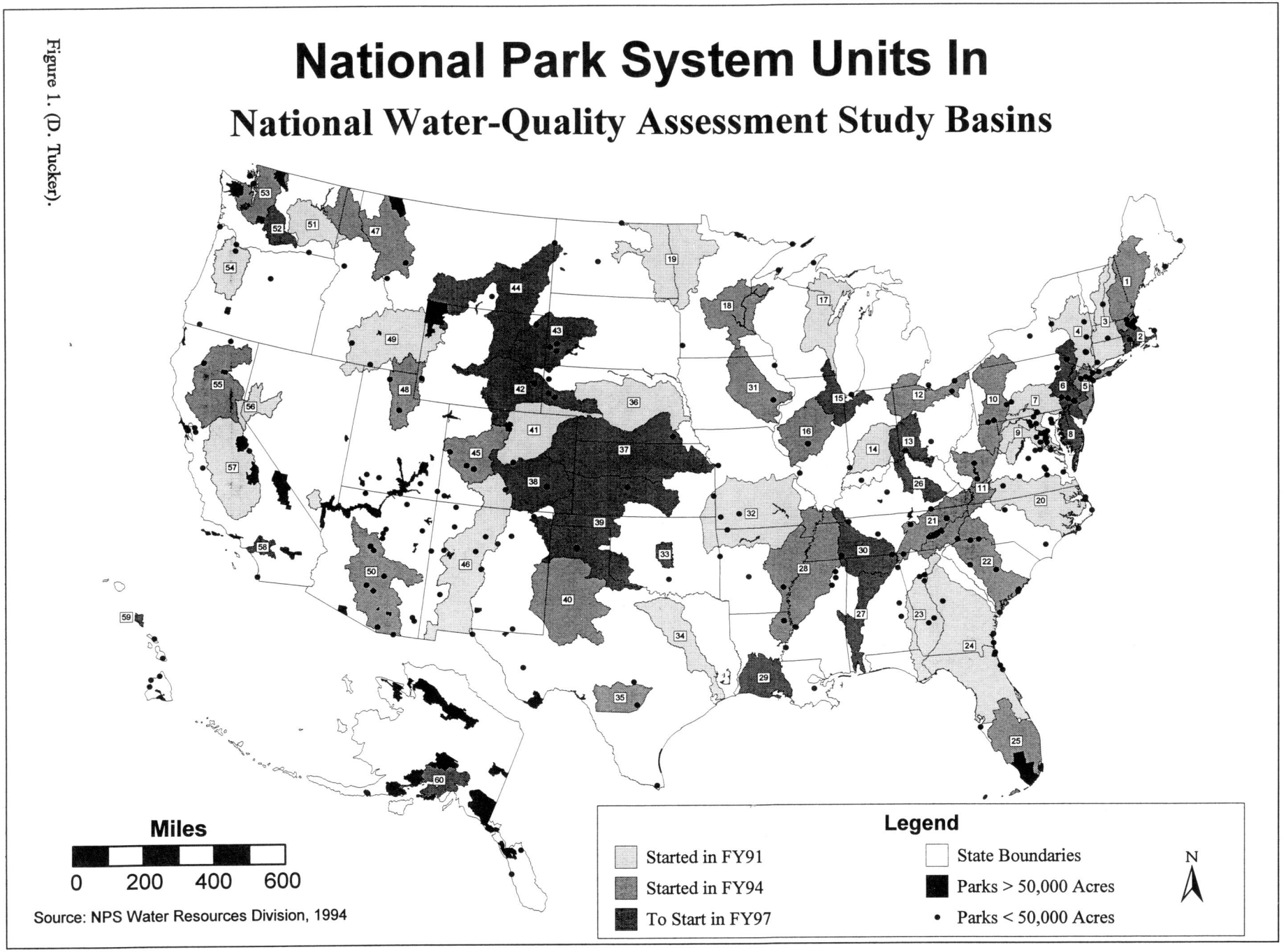


Figure 1. (D. Tucker).

ID	NAWQA Study Units	NPS Units
1	Northern New England Basins	LOWE,MIMA
2	Southeastern New England	SAMA,SAIR,CACO,BOST,BOAF,ADAM,JOFI,ROWI,FRLA,LONG
3	Connecticut Valley	SAGA,SPAR,WEIR
4	Hudson River Basin	SARA,MAVA,VAMA,HOFR,ELRO
5	Long Island and New Jersey Coastal Plain	FIIS,SAHI,GATE,EDIS,FEHA,CACL,GEGR,HAGR,STLI,ELIS,THRB,MORR
6	Delaware River Basin	DEWA,UPDE,HOFU,VAFO,INDE,EDAL,THKO
7	Lower Susquehanna River Basin	ALPO
8	Delmarva Peninsula	ASIS
9	Potomac River Basin	SHEN,BLRI,MANA,HAFE,ANTI,CATO,GETT,EISE,CHOH,PRWI,MONO, GWMP,ROCR,GREE,FRDO,POHE,THST,GEWA,WOTR,CLBA,NACE,NACC
10	Allegheny and Monongahela Basins	ALPO,JOFL,FRHI,FONE
11	Kanawha-New River Basin	NERI,GARI,BLUE,BLRI
12	Lake Erie-Lake Saint Clair Drainage	CUVA,JAGA
13	Great and Little Miami River Basins	WIHO
14	White River Basin	
15	Upper Illinois River Basin	INDU
16	Lower Illinois River Basin	LIHO
17	Western Lake Michigan Drainage	
18	Upper Mississippi River Basin	SACN,LOSA,MISS
19	Red River of the North	
20	Albemarle-Pamlico Drainage	CAHA,CALO,BLRI,FORA,WRBR,BOWA,PETE
21	Upper Tennessee River Basin	GRSM,OBED,BLRI,ANJO,CARL,CUGA,CHCH
22	Santee Basin and Coastal Drainage	COSW,CHPI,FOSU,KIMO,COWP,NISI,BLRI
23	Apalachicola-Chattahoochee-Flint River Basin	KEMO,CHAT,MALU,ANDE,JICA
24	Georgia-Florida Coastal Plain	CANA,FOMA,CASA,FOCA,TIMU,CUIS,FOFR,OCMU,FOPU
25	Southern Florida	EVER,BICY,BISC,DRTO
26	Kentucky River Basin	
27	Mobile River and Tributaries	
28	Mississippi Embayment	VICK,VICC,POPO,ARPO
29	Chicot-Evangeline	
30	Lower Tennessee River Basin	RUCA,SHIL,NATR
31	Eastern Iowa Basins	HEHO
32	Ozark Plateaus	OZAR,BUFF,WICR,GWCA,PERI,FOSC
33	Central Oklahoma Aquifer	
34	Trinity River Basin	BITH
35	South Central Texas	SAAN
36	Central Nebraska Basins	
37	Kansas River Basin	HOME
38	Upper Arkansas River Basin	BEOL
39	Central High Plains	FOLS,LAMR,ALFL
40	Southern High Plains	
41	South Platte River Basin	ROMO,FLFO
42	North Platte River Basin	FOLA,SCBL
43	Cheyenne and Belle Fourche Basins	DETO,MORU,JECA,WICA,BADL
44	Yellowstone Basin	YELL
45	Upper Colorado River Basin	ROMO,CURE,BLCA,COLM
46	Rio Grande Valley	GRSA,BAND,PECO,PETR,ELMA,SAPU
47	Northern Rockies Intermontane Basins	CODA,GRKO,GLAC
48	Great Salt Lake Basins	TICA,FOBU,GOSP
49	Upper Snake River Basin	YELL,JODR,GRTE,CRMO,HAFO,CIRO
50	Central Arizona Basins	TONT,CAGR,MOCA,TUZI,PIMA,SAGU,CORO,TUMA
51	Central Columbia Plateau	CODA
52	Yakima River Basin	
53	Puget Sound Basin	OLYM,NOCA,ROLA,MORA,SAJH,KLSE,EBLA
54	Willamette Basin	
55	Sacramento Basin	LAVO,WHIS
56	Nevada Basin and Range	LAME
57	San Joaquin-Tulare Basins	YOSE,SEKI,DEPO
58	Santa Ana Basin	
59	Oahu	USAR
60	Cook Inlet Basin	LACL,KATM,DENA,KEFJ

Table 1. National Park Service units within U.S. Geological Survey study units. (B. Long).

Elwha River Restoration: Lake Mills Drawdown Experiment Olympic National Park

By Gary M. Smillie
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and
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Hydrologist
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The 1992 Elwha River Fisheries and Ecosystem Restoration Act required the Secretary of Interior to report to Congress on the feasibility of restoring the Elwha River ecosystem. The March 1994, draft report to Congress concluded that complete ecosystem restoration required removal of Elwha and Glines Canyon Dams and that dam removal and ecosystem restoration were both technically and economically feasible. An Environmental Impact Statement (EIS) on dam removal alternatives is required before Congress will consider appropriating funds to acquire and remove the dams and restore the affected ecosystems. Funds were provided from the 1994 National Park Service (NPS) budget to prepare the required EIS and to conduct technical studies in support of the EIS and detailed project planning. NPS has an interest in this project because Glines Canyon Dam, Lake Mills, and much of the Elwha River watershed are located in Olympic National Park (OLYM).

Analyses of the environmental implications of dam removal were conducted previously as part of the Federal Energy Regulatory Commission licensing process. It generally is agreed that an adequate information base exists to address most environmental aspects of dam removal with the exception of sediment management issues. Over the past year, sediment experts from both NPS and Bureau of Reclamation (Reclamation) questioned the adequacy of earlier assessments of sediment impacts associated with dam removal, and of engineering proposals to stabilize sediments in-place. An interagency sediment review committee, with representation from NPS, Reclamation, U.S. Geological Survey, U.S. Army Corps of Engineers, and an engineering consultant to the Lower S'Klallam Tribe, was established to provide technical support to the EIS process on sediment management issues. This committee recommended a drawdown experiment in Lake Mills as an efficient way to acquire the field information needed to more credibly evaluate sediment management alternatives.

The idea behind the Lake Mills drawdown experiment was to lower the reservoir in order to expose delta sediments to river flow. A large sediment delta at the head of Lake Mills has deposited to approximately the elevation of the normal reservoir surface. Under normal operations, Lake Mills is maintained at a nearly constant level year-round because the reservoir is operated as a run-of-the-river hydroelectric generating facility. Though not a common practice, it is possible to lower the surface of Lake Mills approximately 18 feet through the dam's spillway gates. Specific objectives for the drawdown experiment were to:

- Evaluate the effectiveness of river processes in eroding and reworking the delta landform by measuring erosion of the delta sediments by river flow;

- Quantify the particle-size composition and distribution of delta sediments, with an emphasis on the course size component, for use in sediment transport modeling to evaluate sediment management options;

- Support calibration of sediment transport models;
- Monitor effects of delta erosion on downstream water quality; and
- Evaluate delta sediments for water quality constituents of potential concern.

The reservoir drawdown began on April 9, 1994, and was completed on April 15, 1994. Refilling the reservoir commenced on April 24, 1994, and was completed in approximately 2 weeks.

Water Operations Branch (WOB) staff participated in cooperation with other organizations in an intensive field data collection program implemented to address the five study objectives. Specific tasks undertaken by WOB staff included daily topographic surveys of the delta and its rapidly adjusting river channels and time-lapse photography of delta erosion and evolution of associated landforms. Data collected by other contributors included daily measurements of discharge, suspended sediment concentration, and water quality upstream from the delta at two points within the delta and at two locations each downstream from Glines Canyon and Elwha Dams, respectively; daily measurements of bedload transport upstream from the delta and at two locations within the delta; daily bathymetric surveys of the sediment deposition zone downstream from the exposed delta; and delta trenching and sediment particle-size descriptions.

As intended, data gathered during the drawdown experiment is presently being used to develop models of suspended sediment and bed sediment transport and to assist in the evaluation of sediment management alternatives in the project EIS. With the exception of elevated turbidity levels, no water quality problems were identified in association with delta erosion. Even though the experiment occurred under conditions of fairly low discharge compared to normal late-April flows, downcutting occurred rapidly through the sands as the reservoir was lowering. Headcut advancement through the upper portion of the delta was slowed, but not halted, by the presence of a thin cobble armor on the stream bed. After downcutting, the channels continued to widen and work laterally into the delta by meandering and braiding at rates which could be quantified from the repeated topographic surveys. The experiment dramatically demonstrated the ease with which the Elwha River could erode the Lake Mills delta and quickly transform the deltaic deposit into active river channels with characteristic fluvial features such as bars, terraces, and floodplains. These findings reveal that from a technical standpoint, removal of delta material by natural river processes is viable and should be considered in the EIS, along with the more costly alternatives of in-place stabilization and mechanical removal of sediments.

In conclusion, restoration of the Elwha River ecosystem would be regionally important from the standpoint of recovery of an important salmon fishery and nationally significant from the standpoint of being the first case of dismantling obsolete, large-scale dams and restoring affected environments. Furthermore, successful completion of the project would be in the interest of OLYM and consistent with the NPS mission of preserving and restoring natural environments. As such, it is important to the agency that credible, pertinent information be developed for use by decision-makers to permit an accurate and fair evaluation of the project. The role of the Water Resources Division in this process is to ensure that, from the NPS perspective, such information is developed.



Photo 4. Time-lapse camera sequence showing downstream (left) and mid-delta (right) locations at three different dates during experiment on the Elwah River. Left shows existing surface feature during second day of drawdown on April 10. In right, notice dual channel development and incisions as base level reaches its lowest level on April 15. Photos taken on April 21 show rapid response of streams to base level change near the end of the drawdown period. (B. Cluer).

Stormwater Permitting and Remediation of Water Quality Problems Associated with Abandoned Mine Lands

BY SHARON KLIWINSKI
ENVIRONMENTAL PROTECTION SPECIALIST
AND
GARY ROSENLIEB
WATER QUALITY COORDINATOR

Over 145 units of the National Park System contain abandoned mineral land (AML) sites, including over 2,500 abandoned mine sites with over 7,600 hazardous openings and more than 50 abandoned oil and gas wells. It is estimated that 5 to 10 percent of these abandoned sites could pose serious environmental threats to water resources. The Environmental Protection Agency (EPA) estimates that 15 to 20 percent of water quality impairment reported by states is due to mining, and a significant part of that is caused by AML.

The 1987 amendments to the Clean Water Act (CWA) required that stormwater discharges associated with several industrial activities obtain a National Pollutant Discharge Elimination System (NPDES) permit by October 1, 1992. All stormwater discharges from inactive and abandoned mines are required to be permitted under that provision. This has been interpreted by EPA to mean that each AML site would need a separate NPDES permit.

Federal land managers, including the National Park Service (NPS), currently are not in compliance with the stormwater discharge requirements due to the enormity of the AML problem on Federal lands and the lack of resources to address the problem. There are large numbers of AML sites on Federal lands, ranging from small exploration adits to several acre mine and mill sites. The Bureau of Land Management (BLM) estimates there are several hundred thousand sites under its jurisdiction and the U.S. Forest Service (USFS) estimates there are 20,000 to 50,000 sites on its lands. The NPS inventory, showing over 2,500 sites, is considered the most comprehensive among Federal agencies.

Using President Clinton's recommendations in his Clean Water Initiative as a policy framework, the Department of the Interior (DOI) proposed a legislative amendment to the CWA which would allow Federal land mangers to address pollution from abandoned mine lands through a risk-based, watershed approach. The proposed amendment was agreed to by Environmental Protection Agency, the Office of Management and Budget, and the other Federal agencies, and was seen as the official administration position on how Federal land managers would proceed with remediating water quality problems at AML sites. Unfortunately, an amended CWA never made it through the 103rd Congress, and there is not much hope that we will see the administration's legislative proposal enacted. Due to these circumstances, DOI and USFS forged ahead with solidifying Departmental policies that would implement concepts in the proposed legislative amendment. Late in 1994, Secretary Babbitt and Secretary Espy sent a letter to EPA Administrator Carol Browner setting out the two Departments' strategies for addressing water quality problems associated with AML sites.

Coinciding with the Babbitt/Espy letter, an interagency work group has drafted a Federal land managers permit for AML stormwater discharges and is now working with EPA, and soon with the states of Montana and Colorado, to promulgate this type of permit in those states on a prototype-basis. The proposed permit (Figure 2) is consistent with President Clinton's Clean Water Initiative by incorporating a watershed approach which addresses water quality impairment at high priority sites (i.e., not controls at every site); one permit per Federal land manager per state; a 10-year compliance schedule; and pollution reduction to the maximum extent practicable, thus, steering away from expensive best available technology requirements.

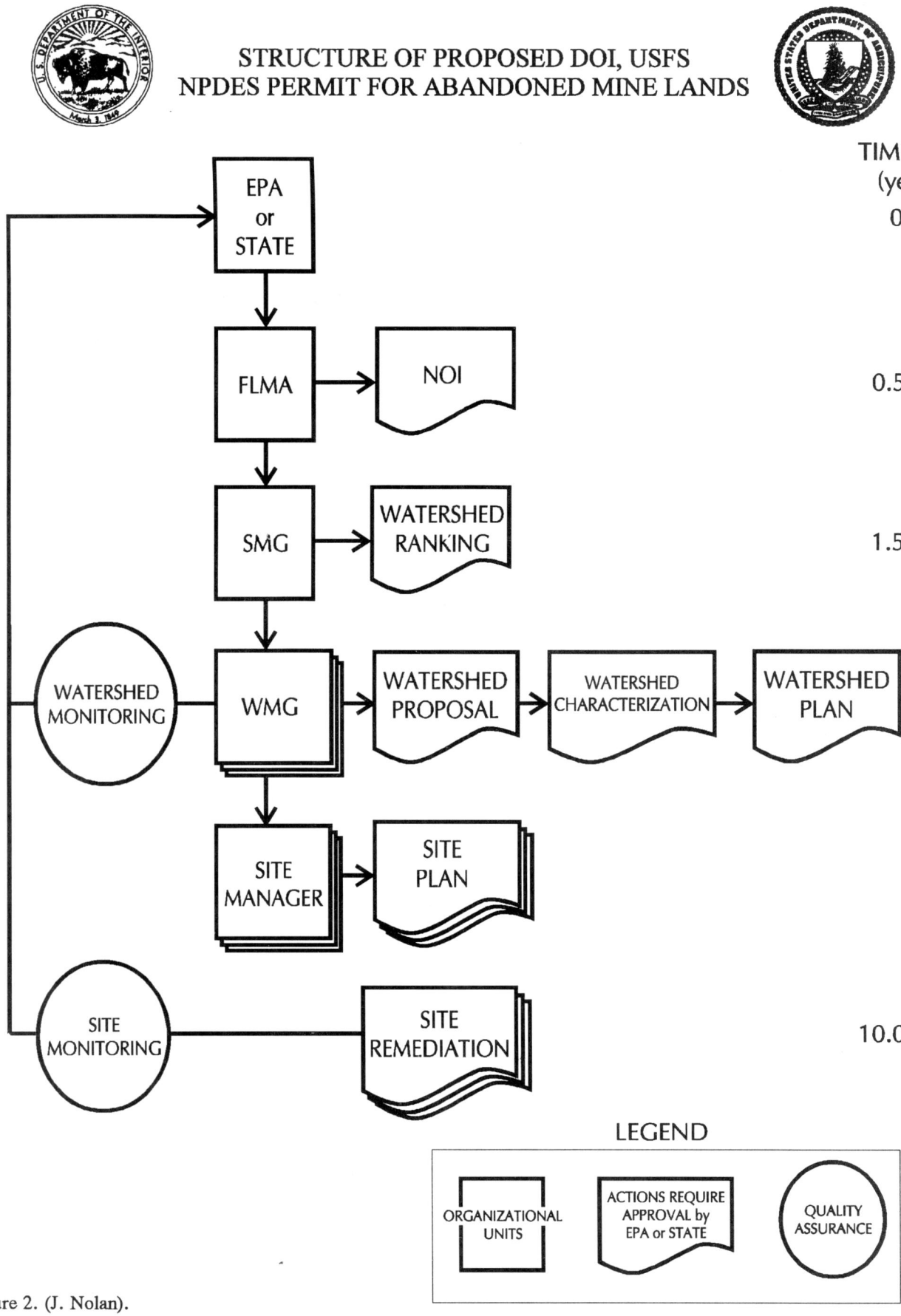


Figure 2. (J. Nolan).

Support Provided to Regions, Parks, And Other National Park Service Organizational Units

ALASKA REGION



Planning and Evaluation Branch

Cape Krusenstern National Monument

- Provided technical review and recommended approval of Wetlands Statement of Findings for construction of Kotlik Lagoon Safety Cabin

Katmai National Park & Preserve

- Provided technical review and recommended approval of Wetlands Statement of Findings for Construction of Maintenance Facilities and Employee Housing at King Salmon
- Provided technical assistance identifying water resources issues in park, evaluated a housing proposal, and reviewed and commented on draft Development Concept Plan for Brooks Camp

Water Operations Branch

Denali National Park and Preserve

- Provided advice on proposed study plan for effects of ROADOYL and EMC2 on park waters
- Provided floodplain information and Floodplain Management Guideline interpretation to Denver Service Center on proposed new climbing center at Talkeetna, Alaska

Lake Clark National Park and Preserve

- Reviewed Johnson Tract Mine Environmental Analysis and general water quality concerns related to proposed mine, haul road, and dock sites
- Provided technical assistance related to proposed disposing of road construction tailings in a floodplain

Wrangell-Saint Elias National Park and Preserve

- Summarized basic hydrogeology and potential threats to drinking water supplies in the McCarthy area
- Performed preliminary floodplain assessment at Chisana townsite
- Provided advice regarding what should be done to mitigate problems associated with several active alluvial fans along the Nebesna Road
- Provided coordination and field advice for Water Resources Division-funded project related to outburst flooding from Kennecott Glacier

Region

- Provided environmental information on road de-icers and dust pallatives, including ROADOYL and EMC2

MID-ATLANTIC REGION



Planning and Evaluation Branch

Assateague Island National Seashore

- Reviewed and commented on Resource Management Plan

Colonial National Historic Park

- ✧ Completed publication of Water Resources Management Plan and associated technical studies
- ✧ Reviewed and commented on General Management Plan

Delaware Water Gap National Recreation Area

- ✧ Provided wetlands-related technical and regulatory advice to Denver Service Center (Eastern Team) regarding Bushkill Access Development Concept Plan; assistance included review and consultation with a contractor on *Wetlands Delineation Report: Delaware Water Gap Bushkill Access*
- ✧ Provided technical assistance in evaluation of position paper on issuance of rights-of-way for sewage lines proposed to cross park lands

Friendship Hill National Historic Site

- ✧ Reviewed and commented on Resource Management Plan

Gettysburg National Military Park

- ✧ Provided technical assistance regarding impacts of grazing on wetlands and riparian areas

New River Gorge National River

- ✧ Reviewed and commented on Resource Management Plan

Richmond National Battlefield Park

- ✧ Provided technical review and comment on draft report *Form and Function of Forested Wetlands, Richmond National Battlefield Park*
- ✧ Reviewed and commented on General Management Plan
- ✧ Reviewed and commented on Resource Management Plan

Valley Forge National Historic Park

- ✧ Reviewed and commented on Development Concept Plan

Water Rights Branch

New River Gorge National River

- ✧ Assisted in review of Resource Management Plan

Reviewed working paper for Bluestone Hydropower Project

Water Operations Branch

Assateague Island National Seashore

- ✧ Provided analysis of study plan for study of contaminated sediments
- ✧ Provided advice on sampling strategy, contractors, lab analyses, and sample containers
- ✧ Uploaded water quality data from 1987-1990 study to STORET

Colonial National Historic Park

- ✧ Reviewed and commented on quarterly reports for Water Resources Division-funded project to investigate water quality of the shallow ground water system and identify possible sources of contamination
- ✧ Assisted park in developing a project proposal to delineate flow systems in the shallow aquifer
- ✧ Provided comments and suggested revisions for the Draft Water Resources Management Plan
- ✧ Provided an analysis of reports prepared by U.S. Navy contractors on ground water contamination of petroleum products; suggested needed analyses and recommended strategies; provided up-to-date guidance on problems with Total Petroleum Hydrocarbon analyses

Delaware Water Gap National Recreation Area

- ✧ Completed modeling to determine location of the floodway/flood-fringe boundary in the Bushkill Access area and submitted application of map revision to Federal Emergency Management Agency
- ✧ Reviewed and evaluated floodplain document submitted by private contractor
- ✧ Completed review of literature and questionnaire regarding Layton landfill and State environmental regulations
- ✧ Advised on water quality/rapid bioassessment protocol standardization options

- ✧ Reviewed study to establish a water quality baseline for nutrients on tributaries to the Delaware River
- ✧ Oversaw 3-year project designed to link a water quality/watershed model (Soil and Water Assessment Technique) with GIS to enable the park and Delaware River Basin Commission to assess the impacts of rapid land development around the park on water quality

Fort Necessity National Battlefield
- ✧ Consulted extensively with Denver Service Center regarding plans to locate a new interpretive center in the floodplain of Meadow Creek; facilitated involvement of Doug Curtis (NCR) as the first test of the "area hydrologist" experiment

New River Gorge National River
- ✧ Provided technical review comments on *Engineering Report for Wastewater Pretreatment at an Oriented Strand Board (O.S.B.) Plant*
- ✧ Provided review and suggestions for revisions on Resource Management Plan
- ✧ Provided contaminants encyclopedia sections on invertebrate monitoring, rapid bioassessment protocols, psuedoreplication, and other experimental design-related sections

Shenandoah National Park
- ✧ Provided advice and recommendations regarding entry of historical water quality data into STORET

Valley Forge National Historic Park
- ✧ Performed a general STORET data retrieval for water quality stations and parameters within a 5-mile radius of the park

Region
- ✧ Provided contaminants encyclopedia sections on recommended oil analyses and labs

MIDWEST REGION



Planning and Evaluation Branch

Fort Larned National Historical Site
- ✧ Reviewed and commented on General Management Plan

George Washington Carver National Monument
- ✧ Reviewed and commented on Resource Management Plan

Grand Portage National Monument
- ✧ Reviewed and commented on Resource Management Plan

Indiana Dunes National Lakeshore
- ✧ Reviewed and commented on Resource Management Plan

Isle Royale National Park
- ✧ Reviewed and commented on Resource Management Plan

Ozark National Scenic Riverways
- ✧ Provided technical review and approval of work plan for completion of a Water Resources Management Plan

Saint Croix National Scenic Riverways

- ✧ Provided technical assistance in support of a Water Resources Division-funded project for a Water Resources Management Plan
- ✧ Reviewed and commented on Resource Management Plan

Voyageurs National Park

- ✧ Provided technical review and recommended approval of the Wetlands Statement of Findings for constructing Route 1

Water Rights Branch

Scotts Bluff National Monument

- ✧ Provided assistance to determine options for use or sale of water rights

Water Operations Branch

Cuyahoga Valley National Recreation Area

Provided extensive review of proposed macroinvertebrate study

Fort Scott National Historic Site

- ✧ Provided technical assistance on several occasions on analyses needed and other contaminants issues at hazardous wastes sites

Herbert Hoover National Historic Site

- ✧ Discussed flood mitigation options with the Superintendent, City Mayor, Soil Conservation Service, and Midwest Region Water Resource Program Manager

Indiana Dunes National Lakeshore

- ✧ Downloaded data memory chips and provided information/consultation on field equipment and flow measurement techniques

Niobrara-Missouri National Scenic Riverways

- ✧ Assisted Denver Service Center (Central Planning Team), Midwest Regional Office, and U.S. Army Corps of Engineers in developing boundary alternatives

Mississippi River Corridor Heritage Comm

- ✧ Provided information on PCBs vs sediments

Missouri National Recreation River

- ✧ Assisted Denver Service Center (Central Planning Team) in assessing flooding and high water caused by high releases from dams operated by the Army Corps of Engineers

Ozark National Scenic Riverways

- ✧ Provided hydrogeological expertise regarding potential impacts of underground mining in areas adjacent to the park

Pictured Rocks National Lakeshore

- ✧ Evaluated production potential of existing well and alternative locations for a new well in Miners Castle area

Saint Croix National Scenic Riverway

- ✧ Provided assistance in assessing shoreline erosion believed to be caused by boat wakes
- ✧ Provided a large-scale digital boundary map derived from Regional land status maps to park GIS coordinator and Midwest Archaeological Center

Voyageurs National Park

- Conducted hydrogeologic evaluation of Whispering Pines area and selection of potential well sites; provided on-site assistance with drilling and well testing; successfully completed a well yielding 60 gpm

Region

- Gave a presentation on water quality and rapid bioassessment issues at a Regional seminar on Great Plains Prairie Parks Inventory and Monitoring Programs

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NATIONAL CAPITAL REGION



Planning and Evaluation Branch

Manassas National Battlefield Park

- Provided wetlands-related technical assistance (site review, contract Scope of Work, Environmental Assessment review) for moving power lines
- Reviewed and commented on Resource Management Plan

National Capital Parks - Central

- Reviewed and commented on Resource Management Plan

National Capital Parks - East

- Reviewed and commented on Resource Management Plan

Prince William Forest Park

- Reviewed and commented on Resource Management Plan

Water Operations Branch

Anacostia Park

- Provided complex rebuttal on ICF Kaiser comments on previous analyses of Anacostia Park contamination

Prince William Forest Park

- Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from five data bases
- Provided interpretive comments on the final report *Groundwater Analysis at the Cabin Creek Pyrite Mine*

Rock Creek Park

- Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from five data bases

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NORTH ATLANTIC REGION



Planning and Evaluation Branch

Acadia National Park

- Worked with park to develop water-related resource management objectives
- Participated in public meetings to discuss water resource issues affecting the park

- ✧ Provided technical review and comment on draft issues and alternatives section of the draft Water Resources Management Plan
- ✧ Provided technical review of draft Somes Sound Hydrological Study conducted by the University of Rhode Island
- ✧ Provided technical review and comment on draft report *The Wetlands of Acadia National Park and Vicinity*
- ✧ Reviewed and commented on Resource Management Plan

Boston Harbor Islands
- ✧ Reviewed and commented on Special Resource Study

Gateway National Recreation Area
- ✧ Reviewed and commented on North Beach Development Concept Plan

Minute Man National Historical Park
- ✧ Reviewed and commented on Resource Management Plan

Saratoga National Historic Park
- ✧ Scoped costs and methods for a parkwide wetland inventory
- ✧ Reviewed and commented on Resource Management Plan

Weir Farm National Historic Site
- ✧ Reviewed and commented on General Management Plan

Multi-Park
- ✧ Participated in development and implementation of North Atlantic Region-sponsored water resources planning workshop convened to assess water resource management issues in seven National Park Service units including Minute Man, Morristown, Salem Maritime, and Saratoga National Historic Parks; Saint-Gaudens and Saugus Iron Works National Historic Sites; and Fire Island National Seashore

Water Rights Branch

Acadia National Park
- ✧ Assisted in scoping for Water Resources Management Plan

Cape Cod National Seashore
- ✧ Reviewed plan of study and conducted field scoping for effects of ground water withdrawal on aquatic resources

Water Operations Branch

Acadia National Park
- ✧ Issued Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from five data bases
- ✧ Provided analysis of mercury data from fish tissues; helped develop strategy for further addressing the problem

Cape Cod National Seashore
- ✧ Continued investigation of potential impact of ground water withdrawals on freshwater discharges to wetlands; prepared final report for the Pamet Aquifer modeling effort (i.e., North Truro Air Base well issue)
- ✧ Assisted in defining a study plan and scope of work for a Water Resources Division-funded project to investigate hydrogeology of kettle ponds
- ✧ Provided coordination between park, Region, local, state, and other Federal agencies in working towards development of an aquifer management plan for the outer cape
- ✧ Assisted in development, review, and comment on a proposal to investigate the ecological effects of alterations to the natural hydrologic system from ground water withdrawals

Ellis Island
- ✧ Provided review and comments on a water quality survey conducted for Denver Service Center

George Washington Memorial Parkway

- ✧ Provided recommendations on proper experimental design, field work protocols including use of fat bags, selection of target species and sites, and laboratory methods to be used in a contaminants studies being planning for the Dyke Marsh area
- ✧ Provided advice on how to carry out biota and sediment sampling in the field, proper experimental design, and recommended laboratories and protocols to be used in park contaminants study

Morristown National Historic Park

- ✧ Completed preliminary assessment report for Cross Estate landfill and submitted final draft to the Environmental Protection Agency
- ✧ Provided technical advice and material regarding accepted procedures for ground water sampling

Saratoga National Historic Park

- ✧ Completed hazardous materials preliminary assessment report for Price Farm dump and submitted final draft to Environmental Protection Agency
- ✧ Installed monitoring wells to evaluate the effects on park resources of raising the operating level of the Hudson River
- ✧ Reviewed plan to change operation of Stillwater Hydropower Project near the park

Statue of Liberty National Monument

- ✧ Reviewed plans and provided advice to Denver Service Center planners regarding floodplain compliance for a walkway to be built to Ellis Island

Region

- ✧ Provided review and suggested revisions on a task directive to investigate feasibility of establishing a park in Boston Harbor

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PACIFIC NORTHWEST REGION



Planning and Evaluation Branch

City of Rocks National Reserve

- ✧ Provided technical review and comment for Comprehensive Management Plan/Development Concept Plan/Environmental Impact Statement and recommended approval of Wetlands Statement of Findings

Coulee Dam National Recreation Area

- ✧ Provided technical review for Wetlands Statement of Findings

Crater Lake National Park

- ✧ Provided technical review and comment for "Wetland Delineation Report: Rim Village, Munson Valley, Mazama Village, and Panhandle Study Areas at Crater Lake National Park"

Ebey's Landing National Historic Reserve

- ✧ Reviewed and commented on Resource Management Plan

Fort Clatsop National Memorial

- ✧ Completed joint publication of park's Water Resources Scoping Report
- ✧ Provided technical assistance by identifying wetland restoration opportunities along the Lewis and Clark River and providing wetland delineation training and regulatory advice to the park's Resource Management Specialist

Lake Chelan National Recreation Area

- ✧ Reviewed and commented on General Management Plan

San Juan Island National Historical Park
- ✧ Reviewed and commented on Resource Management Plan

Water Rights Branch

City of Rocks National Reserve
- ✧ Assisted with comprehensive Resource Management Plan
- ✧ Filed response to a petition by A & B Irrigation District to administer water rights within Snake River Aquifer area
- ✧ Reviewed abstract of water rights in Snake River Basin adjudication

Coulee Dam National Recreation Area
- ✧ Assisted park in preparing protest to water right application that could impact a spring at Fort Spokane

Crater Lake National Park
- ✧ Conducted Klamath adjudication studies
- ✧ Coordinated with Solicitor's Office and Department of Justice attorneys, as well as technical specialists from other agencies, to ensure consistent claims for Federal water rights

Craters of the Moon National Monument
- ✧ Filed a response to a petition by A & B Irrigation District to administer water rights within the Snake River Aquifer area

Fort Clatsop National Monument
- ✧ Assisted with Water Resource Scoping Report

Hagerman Fossil Beds National Monument
- ✧ Assisted with General Management Plan

San Juan Island National Historical Park
- ✧ Continued implementation of action plan to protect water rights and water resources
- ✧ Assisted in responding to a request for a well-protective easement on park lands
- ✧ Reviewed Resource Management Plan

Water Operations Branch

Fort Clatsop National Memorial
- ✧ Performed general STORET retrieval in support of a Water Resources Scoping Report

Hagerman Fossil Beds National Monument
- ✧ Assisted park in developing a NRPP proposal; conducted seepage study of irrigation ditch and holding ponds

Mount Rainier National Park
- ✧ Performed preliminary floodplain reconnaissance of most of the developed areas of the park; instructed a Denver Service Center survey crew on specifications for field survey of flood-hazard sites
- ✧ Provided advice on revisions of proposed study plan for identification and enumeration of plankton samples at the park

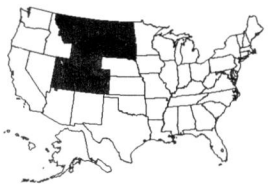
Olympic National Park
- ✧ Calculated sediment stored behind Elwha project dams to verify a consultant's report
- ✧ Participated in detailed survey to evaluate effects of dam removal on fluvial sedimentation
- ✧ Provided consultation and review to the park and Region regarding the potential removal of two dams on the Elwha River; assisted in field measurements made in association with a draw down of Lake Mills; helped select cross sections for survey which will be used to provide information on the river's ability to transport lake-deposited sediments; developed technical analyses of sediment management options for dam-removal Environmental Impact Statement

✧ Responded to a request from the park to provide recommendations on replacing a culvert on Taft Creek near the Hoh River to modify water tables

San Juan Islands National Historical Park
✧ Conducted a well and spring inventory

Region
✧ Provided technical review of Columbia River Ecosystem Assessment Proposal

ROCKY MOUNTAIN REGION



Office of the Division Chief

Yellowstone National Park
✧ Provided Washington support and coordination on efforts to secure passage of the Old Faithful Protection Act

Planning and Evaluation Branch

Bighorn Canyon National Recreation Area
✧ Provided technical assistance in support of Water Resources Division-funded project for a Water Resources Management Plan
✧ Reviewed and commented on Resource Management Plan

Bryce Canyon National Park
✧ Participated in issue scoping workshop for the park's Resource Management Plan; provided project statements for water issues

Canyonlands National Park
✧ Reviewed and commented on Resource Management Plan

Curecanti National Recreation Area
✧ Provided technical support and assistance in the development of a Water Resources Scoping Report

Dinosaur National Monument
✧ Provided technical assistance regarding the relocation of an incised, perennial stream in Hog Canyon onto the surface of the canyon floor; the relocation, which was accomplished in November 1993, is designed to restore wetland functions to the lower part of the canyon and to provide additional habitat for the threatened orchid species *Spiranthes diluvialis*

Florissant Fossil Beds National Monument
✧ Reviewed and commented on Resource Management Plan

Fossil Butte National Monument
✧ Reviewed and commented on Resource Management Plan

Golden Spike National Historic Site
✧ Reviewed and commented on Resource Management Plan

Grand Teton National Park
✧ Provided technical assistance in the review and evaluation of an Environmental Assessment for road materials sources for road building in the park
✧ Reviewed and commented on General Management Plan

Jewel Cave National Monument

- ✧ Completed Water Resources Scoping Report which included an examination of water issues facing the park, recommended actions for addressing them, and prepared project statements for incorporation into Resource Management Plan

Rocky Mountain National Park

- ✧ Identified wetlands and provided regulatory/planning advice regarding location of facilities at Coyote Valley Trail trailhead
- ✧ Prepared a technical and regulatory/policy analysis of the *Glacier Creek Stables Aquatic Ecosystem Assessment Report*, which was prepared by a consultant to a park concessioner
- ✧ Identified and flagged wetlands in the vicinity of proposed developments at Lily Lake to assist project planners in avoiding wetland impacts

Yellowstone National Park

- ✧ Provided technical review and recommended approval of the Wetlands Statement of Findings for construction of Madison Junction/Biscuit Basin Road

Zion National Park

- ✧ Reviewed and commented on Resource Management Plan

Water Rights Branch

Bent's Old Fort National Historic Site

- ✧ Prepared application for finding of reasonable diligence and provided technical support to legal counsel
- ✧ Evaluated State Engineer's rules for reporting ground water use, advised park of compliance requirements, and reviewed notices to State Engineer

Bighorn Canyon National Recreation Area

- ✧ Assisted with Resource Management Plan
- ✧ Negotiated a water rights compact with Montana Reserved Water Rights Compact Commission for adjudication basin 43P

Black Canyon of the Gunnison National Monument

- ✧ Assisted park and Region with negotiations for a contract and in the implementation of interim flow delivery contract
- ✧ Conducted studies to quantify reserved water right
- ✧ Coordinated interim flow releases according to preliminary Aspinall Flow Delivery Contract
- ✧ Reviewed water rights aspect of proposed legislation redesignating the monument as a national park

Canyonlands National Park

- ✧ Monitored progress of water right claim
- ✧ Submitted a Statement of Water User's Claim for well

Capitol Reef National Park

- ✧ Assisted with development of water-supply well
- ✧ Conducted adjudication studies
- ✧ Coordinated with contractor for review of adjudicated water right claims

Colorado National Monument

- ✧ Advised park on status of water rights for two wells

Curecanti National Recreation Area

- ✧ Assisted with Water Resource Scoping Report
- ✧ Reviewed proposed legislation to establish Curecanti National Recreation Area

Florissant Fossil Beds National Monument
- ✧ Obtained permit from the State Engineer for the Visitor Center Well
- ✧ Provided technical review of Water Right Application submitted to water court by Department of Justice
- ✧ Reviewed Resource Management Plan

Glacier National Park
- ✧ Analyzed hydrologic data for use in hyphorheic organism study
- ✧ Implemented reserved water rights compact for Montana adjudication basins 76J, 76LJ, 40T, 40F, 41F, 41M

Glen Canyon National Recreation Area
- ✧ Monitored progress of Colorado River adjudication

Grant-Kohrs Ranch National Historic Site
- ✧ Monitored progress of Montana adjudication for Basin 76G
- ✧ Advised park on actions to protect water-related resources from outside land development

Great Sand Dunes National Monument
- ✧ Assisted with development of research management strategy
- ✧ Funded hydrologic studies and monitoring programs
- ✧ Assisted and advised in proposed hydrologic studies and additional monitoring systems
- ✧ Assembled information for litigation report concerning a change application for Well No. 3

Knife River Indian Village National Historical Site
- ✧ Reviewed Resource Management Plan

Little Bighorn Battlefield National Monument
- ✧ Negotiated a water rights compact with Montana Reserved Water Rights Compact Commission for adjudication basin 43O

Mesa Verde National Park
- ✧ Monitored progress of adjudication for Water Division 7
- ✧ Assisted legal counsel with preparation of draft decree

Pipe Spring National Monument
- ✧ Assisted with request for advice from Office of the Solicitor concerning National Park Service leasing of Kaibab Indian water supply facilities
- ✧ Protested a water right application in Utah which could impact spring flow at the monument

Rocky Mountain National Park
- ✧ Assisted legal counsel with preparation of decree for reserved rights in Water Division 1
- ✧ Conducted adjudication study for Water Division 1
- ✧ Reviewed water right filings prepared by park
- ✧ Evaluated present and future administrative uses and prepared summary for legal counsel
- ✧ Reviewed proposed exchange agreement for Eureka Ditch water right
- ✧ Assisted with review of proposed wilderness legislation
- ✧ Reviewed protest of application for finding of reasonable diligence for Mirror Lake water right
- ✧ Briefed park staff on requirements of Special Directive 78-2; assisted with study of water diversion impacts at Upper Beaver Meadows
- ✧ Assisted with study to determine importance of water/riparian vegetation to visitor experience

Theodore Roosevelt National Park
- ✧ Reviewed Resource Management Plan

Yellowstone National Park
- ✧ Assisted Senate Subcommittee on Mining and Energy in developing technical language for Old Faithful Protection Act

- ✧ Reviewed Chapter 1 of the Environmental Impact Statement for proposed New World Mine
- ✧ Assisted with implementation of monitoring at Reese Creek
- ✧ Continued tracking of non-National Park Service claims and objections in Montana adjudication basin 43B
- ✧ Implemented reserved water rights compact for Montana adjudication basins 43B, 41H and 41F

Zion National Park
- ✧ Conducted technical discussions with the state of Utah as part of negotiations to settle National Park Service reserved water right claims in Virgin River Adjudication
- ✧ Assisted Department of Justice with presentation to the State Engineer, Utah Attorney General's Office, and Washington County Water Conservation District regarding reserved water rights for the park
- ✧ Reviewed, edited, and coordinated delivery of draft study reports
- ✧ Provided status briefings for park management
- ✧ Monitored Virgin River Basin water resource management issues, including participation in Southern Utah Planning Authorities Council and Virgin River Basin Federal Land Managers meetings
- ✧ Prepared report on age and origin of water issuing from springs in Hanging Gardens

Multi-Park
- ✧ Responded to Montana temporary preliminary decrees
- ✧ Reviewed monthly Colorado Water Court resumes
- ✧ Participated in Virgin River Interior Coordinating Committee meetings
- ✧ Attended, presented, and coordinated panel on water rights issues, at the 24th Annual Rocky Mountain Groundwater Conference, regarding water rights, the role of consultants, and models

Water Operations Branch

Arches National Park
- ✧ Reviewed and commented on the park's Resource Management Plan

Bent's Old Fort National Historic Site
- ✧ Reviewed technical assistance request and helped guide park staff in framing hydrologic questions

Big Hole National Battlefield
- ✧ Identified floodplain and other water-related issues that need to be addressed in new General Management Plan

Bighorn Canyon National Recreation Area
- ✧ Attended sediment management meeting with park staff and Bureau of Reclamation personnel; performed estimate of sedimentation rate in the lake

Black Canyon of the Gunnison National Monument
- ✧ Coordinated project to investigate changes in geomorphology of the Black Canyon related to presence of the Aspinall Unit upstream

Canyonlands National Park
- ✧ Provided advice in determining floodplain elevations for numerous back-country camping sites
- ✧ Provided technical review and comment on Moab-Atlas uranium tailings reclamation plan; attended several meetings with Nuclear Regulatory Commission (NRC) staff to identify issues of concern to National Park Service and evaluate NRC's assessment of technical issues
- ✧ Evaluated alternatives for water systems in conjunction with replacing temporary quarters with permanent residences
- ✧ Analyzed water quality data obtained from the park and the state of Utah and prepared a technical report
- ✧ Provided extensive analysis of contractor reports and U.S. Geological Survey plans for using ferric chloride at the Atlas mine tailings site in Moab, Utah; provided contaminants encyclopedia section on ferric chloride and explained hazards of using it
- ✧ Assisted in planning initial stages of aquatic macroinvertebrate biomonitoring studies for the Green and Colorado Rivers
- ✧ Assisted in developing a study plan to address water quality impacts to park waters from visitors

Capitol Reef National Park

- ✧ Initiated and supervised floodplain analysis to be conducted by park hydrologist
- ✧ Provided information summaries from contaminants encyclopedia on contaminants statistics, detection limits, pseudoreplication, encyclopedia summary, and approved labs
- ✧ Reviewed Water Quality Report for 1991

Carlsbad Caverns National Park

- ✧ Reviewed ground water monitoring procedures and recommended changes in water quality monitoring procedures

Curecanti National Recreation Area

- ✧ Investigated channel avulsion of Gunnison River above Blue Mesa Reservoir and prepared briefing paper on preliminary observations
- ✧ Participated in a water resources scoping meeting to review status of water resources, monitoring programs, and emerging issues for planning purposes

Dinosaur National Monument

- ✧ Assisted in implementing riparian area restoration project in Hog Canyon; relocated stream to valley floor; continued assistance with evaluating monitoring data; conducted survey of Hog Canyon and Echo Park
- ✧ Provided evaluation of potential impacts of constructing a leach field at the Split Mountain boat ramp
- ✧ Reviewed and commented on progress report for investigation of riparian vegetation
- ✧ Reviewed and commented on progress report for investigation of geomorphic processes and sediment transport in response to variable flow releases from Flaming Gorge Reservoir

Florissant Fossil Beds National Monument

- ✧ Conducted Hydrolab training in the field

Fossil Butte National Monument

- ✧ Discussed with park staff preparation of a monitoring plan to reduce channel erosion within the monument
- ✧ Assisted in a riparian restoration and monitoring project

Glacier National Park

- ✧ Conducted a site visit of nearly all developed locations in the park and performed a preliminary floodplain assessment of each
- ✧ Provided advice regarding the dewatering of Rose Creek related to the maintenance of the Going-To-The-Sun Highway
- ✧ Reviewed and advised specifications for floodplain study that has been contracted to U.S. Army Corps of Engineers

Glen Canyon National Recreation Area

- ✧ Drafted amendment to Water Resource Division's cooperative agreement with U.S. Geological Survey for implementing fiscal year 1994 work
- ✧ Attended a meeting on Interagency Long-Term Monitoring and Research at Lake Powell; provided written input on draft plan; and prepared draft Memorandum of Agreement to implement the plan
- ✧ Analyzed bacteria water quality data obtained from the park and prepared technical report
- ✧ Coordinated funded study of trace elements in Lake Powell
- ✧ Reviewed operation of Glen Canyon Dam Draft Environmental Impact Statement

Grand Teton National Park

- ✧ Assisted park in obtaining water quality data from U.S. Geological Survey for Snake River at Flagg Ranch National Water Quality Assessment station

Grant-Kohrs Ranch National Historic Site

- ✧ Responded to 27 technical assistance requests related to natural resource damage assessment contaminants issues; arranged for two trips by Bureau of Land Management (BLM) staff to conduct metals analysis on contaminated

soils; assisted in the first round of sampling; summarized initial BLM data, important aspects of previous sampling, and comparative data from the contaminants encyclopedia

Great Sand Dunes National Monument

- ✧ Evaluated potential well sites and prepared drilling specifications for a new well

Jewel Cave National Monument

- ✧ Provided technical and policy guidance for management of karst resources
- ✧ Provided review and suggestions for revision for Water Resources Scoping Report

Natural Bridges National Monument

- ✧ Evaluated potential yield from existing water supply wells and provided recommendations for corrective maintenance on the wells; provided recommendations for scope of work to determine the effects of ground water withdrawals in the park on park resources

Rocky Mountain National Park

- ✧ Continued participation in a program to monitor and evaluate potential changes in long-term snowfall caused by cloud seeding
- ✧ Conducted a site visit to a horse stable located along Glacier Creek to evaluate potential floodplain hazard
- ✧ Reviewed Glacier Creek Stables Aquatic Ecosystem Assessment Report and met with park staff and consultant to develop a response

Yellowstone National Park

- ✧ Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from five data bases
- ✧ Provided analysis of possible hydrogeologic impacts from New World Mine near Cooke City; reviewed fracture flow hydrogeologic studies
- ✧ Acted as the park's technical representative at a New World Mine Task Force meeting which addressed water quality issues
- ✧ Provided contaminants encyclopedia summary on chemical composition and environmental fate of asphaltic materials
- ✧ Provided survey information and advice to park and Federal Highways Administration staff regarding the road crossing area of Tangled Creek
- ✧ Conducted water quality sampling at Bridge Bay Marina and other recreation sites in Yellowstone Lake
- ✧ Assisted Denver Service Center by providing summary of information on asphalt hazards

SOUTHEAST REGION



Office of the Division Chief

Big South Fork National River and Recreation Area

- ✧ Provided policy and technical assistance to Regional and park staff on development of a project plan for remediation of acid mine drainage

Planning and Evaluation Branch

Big Cypress National Preserve

- ✧ Provided technical assistance in support of a Water Resources Division-funded project for a Water Resources Management Plan
- ✧ Assisted park staff in the development of a position description and recruitment of a park hydrologist

Big South Fork National River and Recreation Area

- ✧ Provided technical assistance in support of a Water Resources Division-funded project for a Water Resources Management Plan

Biscayne National Park

- ✧ Participated in the scoping and implementation phase leading towards development of a Water Resources Scoping Report
- ✧ Reviewed and commented on Homestead Air Force Base Disposal Draft Environmental Impact Statement

Charles Pinckney National Historic Site

- ✧ Reviewed and commented on Development Concept Plan

Chattahoochee River National Recreation Area

- ✧ Participated in the scoping and implementation phase leading towards development of a Water Resources Scoping Report
- ✧ Provided technical review and recommended approval of Wetlands Statement of Findings for "Sand and Gravel Dredging - Bull Sluice Reservoir"

Congaree Swamp National Monument

- ✧ Provided oversight, technical assistance, and review support in development of a draft Water Resources Management Plan

Everglades National Park

- ✧ Provided technical review of documents and reports pertaining to nutrient enrichment studies and development of water quality standards
- ✧ Provided technical review and recommended approval of Wetlands Statement of Findings for replacement of main visitor center

Gulf Islands National Seashore

- ✧ Provided technical and regulatory assistance regarding impacts of a proposed, adjacent housing development (Beverly Place Subdivision, Phases I and II) on a pine savannah wetland ecosystem in the park

Natchez Trace Parkway

- ✧ Provided technical review and recommended approval of Wetlands Statement of Findings for highway construction (Project 3P8, Section 3P)

Timucuan Ecological and Historic Preserve

- ✧ Provided oversight and technical support in the completion of a Water Resources Issues Overview
- ✧ Reviewed and commented on General Management Plan

Water Rights Branch

Cape Hatteras National Seashore

- ✧ Assisted in developing data-collection programs with the state of North Carolina and Cape Hatteras Water Association
- ✧ Continued North Carolina State University investigation on relationship of vegetation to the hydrologic system
- ✧ Coordinated (through East Carolina University and the Virginia Institute of Marine Science) studies to monitor/assess potential impacts of water withdrawals on island vegetation
- ✧ Provided technical advice to park staff regarding environmental effects of installing and operating two gages
- ✧ Coordinated (through North Carolina State University) study to determine hydraulic characteristics of the Buxton Works Aquifer

Everglades National Park

- ✧ Reviewed water rights report prepared for the park under contract

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

- ✧ Assisted with responses to water development permits
- ✧ Reviewed proposal for cooperative development of water supply study and Environmental Impact Statement
- ✧ Reviewed draft General Management Plan
- ✧ Reviewed plan of work for Water Resources Management Plan
- ✧ Reviewed proposal for watershed alliance initiative

Water Operations Branch

Big South Fork National River and Recreation Area

- ✧ Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from five data bases
- ✧ In cooperation with an interagency BOM-NPS-USGS team, developed a Request for Proposals to identify, evaluate, and prioritize water quality impacts from, and recommend treatment alternatives for, acid mine drainage

Canaveral National Seashore

- ✧ Provided guidance on restructuring final draft for *Canaveral National Seashore Inventory and Monitoring Report* by Bionetics, Inc.
- ✧ Provided analysis of potential water quality impacts from a proposal by Florida Inland Navigation District to construct a dredge spoil pipeline through the park in order to discharge spoil decant water into Mosquito Lagoon
- ✧ Provided information summaries from contaminants encyclopedia on 15 subjects, including Al, BHC, Cd, Phosphorus Parameters, Silver, Antimony, Chlorophyll A, Cu, Ni, Pb, Cr, Fe, Hg, and various phenols

Cape Hatteras National Seashore

- ✧ Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from five data bases
- ✧ Continued involvement in Buxton Woods wellfield issue; analyzed issues and identified additional study needs; reviewed and commented on proposals from North Carolina Division of Environmental Management and North Carolina State University for additional ground water investigations and monitoring; and assisted in developing a vegetation monitoring plan
- ✧ Conducted additional field investigations of surface water drainage patterns and hydrogeology; conducted aquifer tests at National Park Service wellfields
- ✧ Provided assistance regarding potential for impacts to water quality in the shallow ground water system from septic field leachate; assisted the Region in developing a project proposal to investigate severity of threat and identify resources which may be impacted

Congaree Swamp National Monument

- ✧ Coordinated a Water Resources Division-funded project related to predicting flooding conditions in the park

Great Smoky Mountains National Park

- ✧ Reviewed Environmental Report by Oak Ridge National Laboratories for Foothills Parkway
- ✧ Provided comments on Great Smoky Mountains Environmental Impact Survey and summaries of encyclopedia sections on nutrients

Gulf Islands National Seashore

- ✧ Assisted park staff in identifying water resource issues in the park
- ✧ Prepared report on local hydrogeology and potential threats to the parks water supply wells; prepared proposal to investigate water supply potential of shallow aquifer on Horn Island
- ✧ Assisted park staff in evaluating potential impacts of proposed drainage ditch adjacent to the park boundary on park wetlands

Kennesaw Mountain National Battlefield Park

- ✧ Reviewed Water Resources Interpretive Report and Highlights article

Russell Cave National Monument

- ✧ Completed river survey and hydraulic modeling for channel stability and flood analysis
- ✧ Provided technical input to Regional water resource management coordinator for general stream management plan
- ✧ Assisted in the development of a stream management plan for Dry Creek

San Juan National Historical Site

- ✧ Provided several packets of detailed information on Fuel Oil No. 6 in response to requests related to oil spill

Virgin Islands National Park

- ✧ Provided oversight and review of GIS-based soil erosion modeling project, compiled status report on modeling and gaging efforts, and helped plot final products

Region

- ✧ Provided analysis of Isaac Walton League method for volunteer monitoring of aquatic invertebrates in small parks
- ✧ Performed water quality and quantity data retrievals and summaries for Denver Service Center (Eastern Team) for St. Catherine Creek Watershed near Natchez, Mississippi

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SOUTHWEST REGION



Planning and Evaluation Branch

Big Bend National Park

- ✧ Provided oversight and technical support in development of a draft Water Resources Management Plan
- ✧ Provided review support in evaluation of a report entitled *Binational Study Regarding the Presence of Toxic Substances in the Rio Grande/Rio Bravo and its tributaries Along the Boundary Portion Between the United States and Mexico*
- ✧ Developed a North America Free Trade Agreement-related position paper describing transboundary water-related research and monitoring needs
- ✧ Reviewed and commented on Resource Management Plan

Buffalo National River

- ✧ Reviewed and commented on Resource Management Plan

Chickasaw National Recreation Area

- ✧ Provided technical assistance in developing project statement for water resources planning at the park

Carlsbad Caverns National Park

- ✧ Gave presentation to Denver Service Center planning team regarding wetlands impacts and restoration/protection options at Rattlesnake Springs
- ✧ Reviewed and commented on Resource Management Plan

Padre Island National Seashore

- ✧ Provided technical review and recommended approval of Wetlands Statement of Findings for exploratory drilling by Bright and Company
- ✧ Provided comments on wetland-related issues in draft report *Information Document for Proposed Drilling and Production Operations at Padre Island National Seashore*
- ✧ Reviewed and commented on Bird Island Basin Development Concept Plan

Lyndon B. Johnson National Historical Park

- ✧ Reviewed and commented on Resource Management Plan

Pecos National Historical Park

- ✧ Continued joint development of a Water Resources Scoping Report

Water Rights Branch

Capulin Volcano National Monument

- ✧ Prepared draft summary of water rights and alternative actions to protect rights Carlsbad Caverns National Park
- ✧ Assisted Denver Service Center in scoping water rights issues for General Management Plan
- ✧ Reviewed Resource Management Plan
- ✧ Reviewed and advised park concerning possible effects of a water right application outside the park

Chickasaw National Recreation Area

- ✧ Reviewed draft Resource Management Plan
- ✧ Continued investigating feasibility of repairing or replacing Vendome Well along with Mining and Minerals Branch

Hubbell Trading Post National Historical Site

- ✧ Monitored progress of Little Colorado River adjudication

Pecos National Historic Park

- ✧ Assisted with General Management Plan
- ✧ Assisted with Water Resources Management Plan scoping

San Antonio Missions National Historical Park

- ✧ Summarized water rights and land ownership data for acequia

Sunset Crater Volcano National Monument

- ✧ Monitored progress of Little Colorado River adjudication

Walnut Canyon National Monument

- ✧ Monitored progress of Little Colorado River adjudication
- ✧ Prepared draft report on impacts of upstream reservoirs on riparian vegetation in Walnut Canyon

Wupatki National Monument

- ✧ Monitored progress of Little Colorado River adjudication

Water Operations Branch

Amistad National Recreation Area

- ✧ Provided extensive analysis of report entitled: *Binational Study Regarding the Presence of Toxic Substances in the Rio Grande/Rio Bravo and its tributaries along the boundary portion between the United States and Mexico*

Bandelier National Monument

- ✧ Provided contaminants assistance to do low-cost monitoring work at the park; helped develop study plan
- ✧ Developed Interagency Agreement between National Park Service and U.S. Geological Survey for collaborative water quality monitoring in Rito de los Frijoles as part of the National Water Quality Assessment Program

Big Bend National Park

- ✧ Provided Denver Service Center engineers with information regarding monitoring for seepage at a National Park Service landfill located within the park
- ✧ Prepared a full packet of information on park wells and springs
- ✧ Provided extensive analysis of report entitled: *Binational Study Regarding the Presence of Toxic Substances in the Rio Grande/Rio Bravo and its tributaries along the boundary portion between the United States and Mexico*

Buffalo National River

- ✧ Provided detection limit section from encyclopedia, including a discussion of statistics
- ✧ Reviewed the document entitled "Streambank Erosion/Riparian Restoration"

Carlsbad Caverns National Park

- ✧ Assisted Regional staff with developing Cooperative Agreement and soliciting and revising a proposal from Colorado School of Mines for the Carlsbad Caverns Infiltration Study

Chaco Culture National Park

- ✧ Evaluated arroyo geomorphic processes implications for stabilization of cultural sites

El Morro National Monument

- ✧ Conducted yield and drawdown test on existing well and made recommendations for reducing sand pumping problems

Guadalupe Mountains National Park

- ✧ Compiled and reviewed well construction information and submitted request to Texas Natural Resources Conservation Commission for waiver from additional water quality monitoring

Hot Springs National Park

- ✧ Reviewed technical design for a test well drilling program in support of flood mitigation design alternatives

Jean Lafitte National Historic Park and Preserve

- ✧ Issued a Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from five data bases

Padre Island National Seashore

- ✧ Reviewed and commented on environmental site assessments for oil and gas drilling sites
- ✧ Provided significant support to Southwest Region and park staff in the identification and assessment of hydrocarbon contamination of soil and ground water at non-Federal oil and gas production facilities in the park
- ✧ Conducted initial scoping of appropriate regulatory avenues to address hydrocarbon contamination issue
- ✧ Provided assessment of initial site characterization efforts at Chevron's Shore Facility
- ✧ Provided assessment of initial response, site characterization and remediation efforts by Amoco at South Sprint Facility
- ✧ Provided assessment of a site characterization proposal by American Exploration at Yarborough Pass Facility
- ✧ Acted as park's technical representative at meetings with oil companies to identify and coordinate response, characterization, and remediation activities
- ✧ Provided comments on oil contamination reports; provided copies of encyclopedia sections on recommended oil analyses

Pecos National Historic Park

- ✧ Participated in water resources scoping meeting to review status of water resources, monitoring programs, and emerging issues for planning purposes
- ✧ Provided detailed analyses of fish tissue data; summarized meaning of contaminants concentrations for humans and for predators and recommended options for action

Petroglyphs National Monument

- ✧ Reviewed and revised a letter from the Superintendent requesting certain stormwater provisions from a new development and local flood control district

San Antonio Missions National Historical Park

- ✧ Reviewed and commented on report describing ground water contamination from adjacent Air Force base and possible implications for the park

Multi-Park

- ✧ Coordinated review and provided guidance for completion of final report *Protecting the National Parks in Texas through the enforcement of Water Quality Standards: An Exploratory Analysis*

WESTERN REGION



Planning and Evaluation Branch

Casa Grande National Monument

- ✧ Reviewed and commented on Resource Management Plan

Coronado National Monument

- ✧ Reviewed and commented on Resource Management Plan

Death Valley National Park

- ✧ Reviewed and commented on Resource Management Plan

Golden Gate National Recreation Area

- ✧ Provided technical assistance in evaluating and choosing alternatives for restoring lower Redwood Creek and Big Lagoon (Muir Beach)
- ✧ Provided technical review and comment for draft report *An Evaluation of the Feasibility of Wetland Restoration on the Giacomini Ranch, Marin County*
- ✧ Provided technical review and comment on a Presidio wetland restoration feasibility study

Grand Canyon National Park

- ✧ Provided assistance to General Management Plan team from the park and Denver Service Center to ensure that water resources issues are adequately addressed
- ✧ Participated in a Sustainable Design Workshop intended to improve the incorporation of sustainable design concepts into General Management Plan
- ✧ Provided technical assistance to the park for evaluation of new water supply sources
- ✧ Participated in Resource Management Plan Workshop and provided the park with several draft project statements for water resource issues; reviewed and commented on draft Resource Management Plan

Fort Bowie National Historic Site

- ✧ Reviewed and commented on Resource Management Plan

Great Basin National Park

- ✧ Completed publication of Great Basin National Park Water Resources Management Plan
- ✧ Reviewed and commented on Resource Management Plan

Haleakala National Park

- ✧ Reviewed and commented on General Management Plan

Joshua Tree National Monument

- ✧ Provided technical assistance in evaluation of two proposed projects near the park with water resources and water rights implications

Manzanar National Historic Site

- ✧ Reviewed and commented on General Management Plan

National Park of American Samoa

- ✧ Reviewed and commented on Resource Management Plan

Point Reyes National Seashore
- ✧ Directed the continued development of Water Resources Scoping Report

Pu'uhona O Honaluau National Historical Park
- ✧ Reviewed and commented on Resource Management Plan

Santa Monica Mountains National Recreation Area
- ✧ Provided technical assistance in support of a Water Resources Division-funded project for a Water Resources Management Plan; participated in an Issue Scoping Workshop for the plan
- ✧ Reviewed and commented on Resource Management Plan

Sequoia National Park
- ✧ Provided technical review and comment on report *Delineation of Waters of the United States, Including Wetlands, in the Giant Forest Study Area*

Tonto National Monument
- ✧ Reviewed and commented on Resource Management Plan

Yosemite National Park
- ✧ Assisted park in identifying a cooperator for planned update of the Yosemite National Park Water Resources Management Plan

Water Rights Branch

Casa Grande National Monument
- ✧ Monitored progress of Lower Gila River adjudication

Coronado National Memorial
- ✧ Monitored progress of San Pedro River adjudication

Death Valley National Park
- ✧ Assisted park staff in planning a monitoring program near Saratoga Springs
- ✧ Completed climatic study of region through University of Nevada at Reno
- ✧ Continued gathering existing hydrologic data and investigation of water rights and water use in the area
- ✧ Continued development of project and study plans to protect water rights
- ✧ Continued monitoring of Devil's Hole for detection of crustal movement and barometric pressure effects on water surface elevation
- ✧ Held third annual Devil's Hole workshop in Carson City, Nevada
- ✧ Monitored Devil's Hole pool level
- ✧ Negotiated with Saga Exploration concerning its water right application upgradient from the park
- ✧ Negotiated settlement of Ray Mining and Veterans of Foreign Wars (VFW) protests
- ✧ Prepared for hearings on Las Vegas Valley Water District applications
- ✧ Assisted in monitoring contract to prepare hydrologic conceptual model of Death Valley region
- ✧ Protested nine Nevada Water Right applications
- ✧ Compiled and reviewed monitoring data on U.S. Nevada Gold Search Joint Venture, Department of Energy, Industrial Mining Ventures, and LAC Bullfrog water permits

Fort Bowie National Historic Site
- ✧ Monitored progress of Upper Gila River adjudication
- ✧ Continued negotiation for withdrawal of protests for water right filings for Apache and Mine Tunnel Springs

Golden Gate National Recreation Area
- ✧ Finalized report titled *Redwood Creek Water Rights Assessment Golden Gate National Recreation Area*
- ✧ Reviewed report on effect of wells on the Banducci Tract upon stream flow in Redwood Creek

- ✧ Assisted park and Regional staff and responded to questions from the press concerning water rights for the Banducci tract
- ✧ Assisted park staff with issues relating to a water right application by Muir Beach Community Services District

Grand Canyon National Park
- ✧ Assisted with implementation of South Rim spring monitoring plan
- ✧ Assisted with legal/technical assessment of Canyon Forest Village development proposal
- ✧ Assisted with preparation of General Management Plan
- ✧ Assisted with water rights issues associated with the sale of water to Tusayan
- ✧ Monitored progress of the Little Colorado River adjudication
- ✧ Conducted field scoping session with attorneys from Department of the Interior and the Solicitor's Office regarding claims for the Little Colorado River
- ✧ Provided briefing for Superintendent on Little Colorado River adjudication issues
- ✧ Briefed park staff on requirements of Special Directive 78-2

Great Basin National Park
- ✧ Assisted with Water Resources Management Plan
- ✧ Reviewed report prepared by Desert Research Institute on the chemistry of waters within the park
- ✧ Funded operation of gaging stations on Lehman and Baker Creeks
- ✧ Prepared for hearings on Las Vegas Valley Water District applications

Haleakala National Park
- ✧ Assisted with Resource Management Plan

Joshua Tree National Monument
- ✧ Reviewed proposals for landfill and hydroelectric projects adjacent to park and evaluated impact to water-related resources and rights

Kalaupapa National Historic Park
- ✧ Conducted Waikolu Stream Study
- ✧ Protested state application for withdrawal of ground water and testified at public hearing
- ✧ Prepared Memorandum of Understanding between The Nature Conservancy and National Park Service and coordinated approvals with park and Region
- ✧ Prepared Interagency Agreements with the U.S. Geological Survey for stream gaging and cost sharing

Kaloko-Honokohau National Historic Park
- ✧ Coordinated scoping session for possible ground water study

Lake Mead National Recreation Area
- ✧ Negotiated settlement of National Park Service protest to application by Los Angeles Water and Power
- ✧ Along with other bureaus and legal counsel, obtained settlement agreement with Southern Nevada Water Authority concerning their surface water applications on the Virgin River
- ✧ Prepared for hearing on Las Vegas Valley Water District applications
- ✧ Explored settlement options and conducted hydrologic analyses concerning National Park Service protests to applications by Nevada Cogeneration Associates and Moapa Valley Water District
- ✧ Protested water right applications
- ✧ Reviewed Resource Management Plan

Montezuma Castle National Monument
- ✧ Monitored progress of Verde River adjudication

Organ Pipe Cactus National Monument
- ✧ Provided review of U.S. Geological Survey's hydrology report on the hydrology of Quitobaquito Springs and La Abra Plain
- ✧ Prepared proposal to appraise water rights and water resources of the monument

Petrified Forest National Park
- ✧ Monitored progress of Little Colorado adjudications

Point Reyes National Seashore
- ✧ Assisted with Water Resources Management Plan
- ✧ Assisted with water right issues at Point Reyes Bird Observatory
- ✧ Coordinated state water-use compliance inspections and reporting requirements
- ✧ Continued a water right assessment and inventory
- ✧ Reviewed Giacomini land exchange feasibility report for water right issues

Saguaro National Monument
- ✧ Monitored progress of San Pedro and Santa Cruz River adjudications

Tonto National Monument
- ✧ Monitored progress of Salt River adjudication
- ✧ Prepared comments for Preliminary Upper Salt River Watershed Hydrographic Survey Report
- ✧ Reviewed draft Resource Management Plan

Tuzigoot National Monument
- ✧ Monitored progress of Verde River adjudication

Multi-Park
- ✧ Participated in San Pedro Adjudication Federal Work Group
- ✧ Participated in Virgin River Interior Coordinating Committee meetings
- ✧ Attended Nevada Legislative Committee hearings regarding the revision of Nevada Water Laws
- ✧ Reviewed water right applications for Nevada
- ✧ Submitted Reports of Licensee for California parks
- ✧ Reviewed and provided comments on proposed revisions to Hawaii State Water Code
- ✧ Participated in Native Hawaiian Water Rights Workshop
- ✧ Prepared and submitted comments on the draft Arizona Riparian Protection Program Legislative Report

Water Operations Branch

Channel Islands National Park
- ✧ Provided large-scale digital boundary map derived from Regional land status maps to park GIS coordinator
- ✧ Conducted an assessment of availability of water from an existing well and potential impacts from increased withdrawals

Chiricahua National Monument
- ✧ Completed indirect measurements of previous flood flows and evaluated flood hazard potential for the campground, visitor center, and park housing
- ✧ Assisted in evaluation of the large floods which occurred in August 1993

Death Valley National Park
- ✧ Reviewed spring and ground water monitoring conducted by the Environmental Protection Agency
- ✧ Investigated potential for conducting ground water monitoring to detect tracers emanating from the Nevada Test Site
- ✧ Issued Baseline Water Quality Data Inventory and Analysis Report documenting water quality data retrievals from five data bases
- ✧ Visited the park and provided advice regarding selected means of flood mitigation at several sites; met with park, Regional, and Denver Service Center staff at Scotty's Castle and developed recommendations for managing flood hazard at this facility

Golden Gate National Recreation Area
- ✧ Provided a large-scale digital boundary map derived from Regional land status maps to park GIS coordinator
- ✧ Reviewed and commented on wetlands restoration report

- ✧ Provided literature and consulting sources for proper water, pesticide, and fertilizer management techniques for golf courses
- ✧ Reviewed Presidio Stormwater Management Plan and Lobos Creek Sanitation Survey reports
- ✧ Provided review of ground and surface water quality aspects of the Dames and Moore, Inc., Presidio report

Grand Canyon National Park

- ✧ Reviewed and commented on proposal to develop a ground water supply at a new development south of Tusayan (Canyon Forest Village)
- ✧ Attended meetings with park staff and hydrology consultant to evaluate options for alternative sources of drinking water for the South Rim area
- ✧ Reviewed and commented on proposal for monitoring water quality from springs and investigating possible ground water flow paths
- ✧ Participated in a workshop to update the Resource Management Plan for Grand Canyon; identified and prioritized issues; prepared project statements to address issues
- ✧ Reviewed a U.S. Geological Survey report on water-level fluctuations and tilts in the park and prepared a "Summary of Colleague Review" and a formal letter response
- ✧ Assisted in developing framework for Glen Canyon Dam Environmental Impact Statement Adaptive Management program
- ✧ Assisted in designing a spring monitoring program

Great Basin National Park

- ✧ Provided recommendations to park and Northern Arizona University on water quality data management protocols
- ✧ Reviewed water quality project study plan and assisted park with contract specifications

Hawaii Volcanoes National Park

- ✧ Provided information showing that air concentrations of PAHs can increase to potentially dangerous levels in response to forest fires and asphalt roads burned by lava flows

Kaloko-Honokohau National Historic Park

- ✧ Assisted contractor, park, and Region with implementation study of anchialine ponds
- ✧ Provided field review on a number of contaminants and water quality issues

Lake Mead National Recreation Area

- ✧ Completed field work on Sacatone Spring Restoration Project
- ✧ Evaluated ground water pollution from park sewage ponds
- ✧ Identified a test well drilling site for potable water in Overton Arm area
- ✧ Provided information to park on proposed study of contaminants coming into Lake Mead from the "Big Drain" portion of Las Vegas Bay

Montezuma Castle National Monument

- ✧ Reviewed and coordinated response on U.S. Geological Survey report entitled *Hydrogeology of Water Chemistry of Montezuma Well and Surrounding Area, Yavapai and Coconini Counties, AZ*

Point Reyes National Seashore

- ✧ Provided contaminants encyclopedia sections on statistics, oil labs, oil analyses, detection limits, psuedoreplication, and various other issues
- ✧ Helped select contractors for intertidal monitoring program

Pu'uhonau O Honaunau National Historic Park

- ✧ Provided field assistance on a number of contaminants and water quality issues
- ✧ Provided information on herbicides which may be impacting park ground waters

Puukohola Heiau National Historic Site

- ✧ Reviewed Resource Management Plan

Redwoods National Park

- ✧ Provided advice/consultation to park staff regarding use of HEC-2; selected and marked cross sections to be surveyed for the purpose of floodplain delineation of Prairie Creek along Davison Ranch parcel

Sequoia and Kings Canyon National Park

- ✧ Inspected the conditions of an old sewage lagoon located near a river in the park
- ✧ Reviewed Aquatic Resources Inventory Report

Yosemite National Park

- ✧ Provided advice and guidance on data management issues for maintaining compatibility with national water quality data bases
- ✧ Prepared extensive review comments on the "Merced River Ecosystem Management Plan"
- ✧ Reviewed potential impacts of a proposal to remove a rubble dam at Mirror Lake in the park; evaluated proposals to maintain open meadowlands by hydrologic manipulations
- ✧ Participated on Merced River Restoration Management Plan team
- ✧ Delineated two floodplain boundaries (10- and 25-year recurrence interval) for riparian restoration purposes

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SERVICEWIDE

Office of the Division Chief

- ✧ Served in liaison role with National Water Quality Assessment Program (NAWQA) at U.S. Geological Survey's National Headquarters; represented National Park Service on NAWQA Advisory Council; attended NAWQA senior staff meetings and reported on progress with National Park Service involvement; met with five NAWQA study unit chiefs to discuss National Park Service needs
- ✧ Participated on Ad Hoc Working Group on Natural Resources established by the Director and Assistant Secretary, Fish and Wildlife and Parks
- ✧ Represented the Service on the Department of the Interior's Clean Water Act (CWA) Reauthorization Work Group; reviewed and commented on, and assisted in the development of, CWA legislative proposals
- ✧ Represented Associate Director, Natural Resources as peer reviewer for new Servicewide Employee Training and Development Strategy; co-chaired team to define essential competencies for natural resources personnel and to design natural resources curriculum
- ✧ Served as National Park Service Official Observer to Great Lakes Commission
- ✧ Participated on team to design curriculum of the Fundamentals of Natural Resources for Professionals course; wrote session descriptions
- ✧ Participated on panel to rate applicants for National Park Service advanced manager training
- ✧ Served on an Interdepartmental Work Group on Abandoned Mine Lands (AML) and worked with the Department and other Federal agencies, including Environmental Protection Agency, to develop an administration approach to permitting of AML sites and remediation of water quality problems associated with those sites
- ✧ Coordinated Water Resources Division team to design Water Resources for Managers course
- ✧ Represented National Park Service on the Eastern Mine Drainage Federal Consortium
- ✧ Participated in workgroup which identified high priority areas of need for research on National Park Service aquatic issues
- ✧ Represented Water Resources Division and presented Service policies and priorities in early Department of the Interior meetings on the North American Free Trade Agreement/Mexican border water and air quality issues
- ✧ Reviewed, analyzed, and coordinated development of comments on various proposed legislation such as the Safe Drinking Water Act, National Watershed Registry Bill, and Park Protection Act
- ✧ Met with Congressional staff to discuss needs, benefits, and costs for National Park Service water-quality monitoring program in partnership with the U.S. Geological Survey's (USGS) National Water Quality Assessment Program; briefed USGS staff members, members of the Interagency Committee on Water Data, and others on Water Resources Division functions and opportunities to develop cooperative programs
- ✧ Represented National Park Service on the National Geographic and the Conservation Fund's National Forum on Nonpoint Source Pollution
- ✧ Represented National Park Service on the joint Federal/state/private Intergovernmental Task Force on

Monitoring Water Quality

- ✧ Represented the Associate Director, Natural Resources in the Coastal America Program
- ✧ Served as program coordinator for the National Park Service Marine Debris Monitoring Program
- ✧ Provided National Park Service policy and legislative support to the Department of the Interior on the Gulf of Mexico Program
- ✧ Represented National Park Service on the Interagency Workgroup on Watershed Approach
- ✧ Represented National Park Service at meetings of the Department of Interior Science Board and the Science Board working group
- ✧ Represented Associate Director, Natural Resources on the National Biological Service (NBS) work group which evaluated appropriate roles and functions within NBS for former Fish and Wildlife Service Research Centers
- ✧ Met with Deputy Assistant Secretaries for Fish and Wildlife and Parks and for Water and Science and participated in discussions with National Biological Service officials about National Park Service proposal for research oversight of adaptive management strategies resulting from changes in Glen Canyon Dam operation
- ✧ Represented National Park Service on Interagency Committee on Water Data; participated in meetings of the water quality and ground water subcommittees; reported on National Park Service programs and issues of concern
- ✧ Attended oversight hearing convened by Congressman Vento on Everglades and South Florida issues; attended interagency briefing on South Florida; visited Everglades National Park to discuss water issues
- ✧ Participated in meetings of Regional Chiefs of Science and Resources Management
- ✧ Represented National Park Service at meetings of the Interagency Ecosystem Management Coordinating Group; served on initial steering group to establish natural resources and cultural resources assessment criteria for the Ecoregion Assessment Teams; helped coordinate and man the National Park Service ecosystem management exhibit at the Congressional Research Service Symposium on Ecosystem Management in the Library of Congress

Planning and Evaluation Branch

- ✧ Represented National Park Service on the Department of the Interior-Shared Water Resources Research and Management Committee established to provide technical support and review to the Secretary of the Interior on transboundary water issues
- ✧ Scoped projects; assisted in developing project statements; assisted in developing detailed proposals for funded projects; reviewed final reports for funded projects; and tracked project progress for the Water Resources Division Water Resources Planning Program
- ✧ Scoped projects; assisted in developing project statements; assisted in developing detailed proposals for funded projects; reviewed final reports for funded projects; and tracked project progress for the Water Resources Division Wetlands Program
- ✧ Assisted in the development of water-related biological research priorities and needs for subsequent discussions with the National Biological Service
- ✧ Drafted a memorandum for the Director's signature transferring signature authority on Wetlands Statements of Findings to Regional Directors (with Water Resources Division concurrence) and reiterating Servicewide "no-net-loss of wetlands" policy
- ✧ Developed memorandum to facilitate coordination between Denver Service Center and Water Resources Division regarding obtaining wetland and floodplain data early in the planning process
- ✧ Participated on Natural Resources Strategic Planning committee for the Interpretation of Natural Resources Issues; prepared a report examining status of issue-oriented interpretation in the National Park Service and included recommendations for improvement
- ✧ Participated on team responsible for Servicewide implementation of the Natural Resource Management Assessment Program (NR-MAP); developed strategy for using NR-MAP to develop a natural resources management budget initiative
- ✧ Reviewed and commented on the draft revised NPS-70 Management Guideline for the Design Process
- ✧ Reviewed and commented on proposed revision to National Park Service Guidelines for Resource Management Plans
- ✧ Reviewed and commented on draft revision of National Park Service Regulations for Oil and Gas Operations
- ✧ Developed proposals to revise several of the Management Policies related to water
- ✧ Provided technical review and assembled team for providing technical assistance to the Bulgarian Ministry of Environment regarding restoration of Srebarna Biosphere Reserve
- ✧ Assisted Denver Service Center Western Team staff in developing a handbook on backcountry trail construction

in wetlands
- ✧ Coordinated distribution of 20,000 copies of the brochure *Wetlands in the National Parks*
- ✧ Participated on panel to review proposals submitted to the Challenge Cost Share Fund
- ✧ Organized and presented a training course entitled "Wetlands Classification, Identification, and Compliance" at Jackson, Wyoming
- ✧ Organized and presented a workshop entitled "Water Resources Planning Workshop" for seven National Park Service units in the North Atlantic Region
- ✧ Organized and chaired a 10-paper session on "Wetlands Research and Management in the National Parks" at the 15th Annual Society of Wetland Scientists Conference
- ✧ Participated in the development and presentation of Water Resources Division's "Water Resources for Managers" course
- ✧ Taught session in wetlands management and compliance for a National Park Service training course entitled "Environmental Compliance: Tools for Protecting Parks" (course was conducted by the Environmental Law Institute in conjunction with Washington Office Environmental Quality Division)
- ✧ Presented lecture to the Regional Water Resources Program Managers regarding National Park Service wetlands issues, management, and compliance
- ✧ Prepared a presentation on hydrologic and soil moisture monitoring results for an "Informational Exchange Meeting" on the Federally threatened Ute Lady's-tresses orchid (*Spiranthes diluvialis*)

Water Rights Branch

- ✧ Acquired system for computerizing water rights information contained in National Park Service's dockets and for storing original documents
- ✧ Assisted in the design of, and conducted classroom and field water right sessions about, water rights in a conference for park-based water resource professionals
- ✧ Presented talk to "Planning Beyond Park Boundaries Training" class on water rights protection mechanisms
- ✧ Assisted in the design and conduct of the Instream Flow Conference of Interior and Agriculture Land Management Bureaus and attorneys
- ✧ Developed and presented water right sessions for "Water Resources for Managers" training class
- ✧ Provided comments on the Vento park protection bill
- ✧ Conducted preliminary survey of use of National Park Service water by outside parties

Water Operations Branch

- ✧ Finalized Memorandum of Understanding which established a liaison position in U.S. Geological Survey (USGS) Headquarters and formalized National Water Quality Assessment activates between the USGS and the National Park Service
- ✧ Developed budget initiative for a National Park Service—U.S. Geological Survey Cooperating Agency Water Quality Monitoring Program
- ✧ Developed responses to questions from the House Interior Subcommittee concerning the nature of National Park Service—U.S. Geological Survey Cooperating Agency Water Quality Program with U.S. Geological Survey
- ✧ Developed position description, coordinated advertisement, and evaluated candidate's SF-171 forms for the National Water Quality Assessment Liaison position to be stationed in Reston, Virginia
- ✧ Provided guidance and oversight for initiating a FY95 pilot National Water Quality Assessment Program in parks co-located in National Water Quality Assessment Study Basins
- ✧ Developed conceptual long-range plan for the completion of water quality inventories in National Park Service units which was submitted to the Servicewide Inventory and Monitoring coordinator
- ✧ Coordinated all aspects of Water Resource Division's 3-4 year effort to produce Water Quality Baseline Data Inventory and Analysis Reports for all Inventory & Monitoring parks
- ✧ Determined the euclidean distance from every park headquarters to the "gravity" centroid of each park as well as the perimeter of each park in support of Servicewide R-MAP program for use in workload allocation formulas
- ✧ Maintained and updated a geo-referenced park boundary digital data base for use in GIS-based water resources analyses and queries; provided copies of this data base to other WASO Divisions, as well as groups within the U.S. Geological Survey, Environmental Protection Agency, Census Bureau, and the Nature Conservancy
- ✧ Compiled and integrated a number of hydrographic-related digital data bases into GIS format including: (1) the U.S. Geological Survey (USGS) Hydrologic-Climatic Data Network; (2) USGS Hydrologic Units; (3) USGS

Water Quality Monitoring Station Locations; and (4) USGS 7.5" quadrangle outlines

- ✧ Compiled a map depicting the location of USGS National Water Quality Assessment (NAWQA) basins and national park units to identify parks within NAWQA basins
- ✧ Reviewed and commented on the Draft Statement of Work for the Air Quality Information Management System (AQUIMS) project designed to develop a prototype air quality related values decision-support system for responding effectively, efficiently, and expeditiously to air pollution permit applications in Class I areas
- ✧ Reviewed and commented on the Intergovernmental Task Force on Monitoring Water Quality (ITFM) Second Year Draft Report and Technical Appendices
- ✧ Gave presentations on the joint National Park Service Water Resources Division/Servicewide Inventory and Monitoring Program Baseline Water Quality Data Inventory and Analysis Project at the National Park Service Regional Inventory and Monitoring Coordinator's meeting in St. Paul, Minnesota; Water Resources Course for Park Managers in Denver, Colorado; and the Park Hydrologist Meeting in Fort Collins, Colorado
- ✧ Attended and participated in meetings with the Regional GIS Coordinators and a Data Management Advisory Group for the Servicewide Inventory and Monitoring Program
- ✧ Reviewed and commented on the proposed U.S. Geological Survey/National Park Service Interagency Cooperative Agreement designed to produce a Nationwide Rivers Inventory GIS-compatible data base for the Recreation Resources Assistance Division
- ✧ Wrote software called IDEA to perform an Inventory Data Evaluation and Analysis for each Baseline Water Quality Data Inventory and Analysis Report comparing retrieved park water quality data against the Servicewide Inventory and Monitoring Program "Level I" water quality parameters to determine deficiencies
- ✧ Wrote software called TOCSTAT to automatically compile a table of contents for each Baseline Water Quality Data Inventory and Analysis Report
- ✧ Wrote software called TOSTORET to convert DBASE III+ compatible .DBF files to Environmental Protection Agency STORET format for uploading park water quality datasets to STORET
- ✧ Wrote software called STANDARD to compare water quality datasets with user specified national or state water quality criteria
- ✧ Wrote software to perform numerous data conversions in the course of analyzing water quality datasets
- ✧ Hired, trained, and supervised four Colorado State University student-hourly employees on the data base development project
- ✧ Reviewed and consolidated responses on Bureau of Land Management's Rangeland Reform '94 Environmental Impact Statement.
- ✧ Reviewed report from the Presidential Task Force on Floodplain Management (In reviewing applicable sections involving Federal agencies, the National Park Service Floodplain Management Program was examined to ensure compliance and that the National Park Service has taken a leadership role in applying EO 11988)
- ✧ Reviewed a U.S. Geologic Survey Open-File Report entitled *Water Levels, Temperatures and Tilts in Sandbars - 6.5R, 43.1L and 172.3L Grand Canyon, Arizona*
- ✧ Prepared Assessment for Implementing Recreational and Environmental Water Quality Monitoring Programs in Parks With Significant Water Resources for the Servicewide Concessions and Environmental Task Force
- ✧ Organized the water quality session of the Water Resources Division-sponsored "Water Resources for Park Managers" and provided a lecture on the Clean Water Act
- ✧ Provided Clean Water Act lecture and course materials for "Natural Resources Law" course sponsored by the National Park Service Hazardous Materials Program in San Francisco, California
- ✧ Provided Clean Water Act lecture and course materials for "Planning Beyond Park Boundaries" course sponsored by the Denver Service Center in Estes Park, Colorado
- ✧ Provided review and comments through an interagency forum on the Draft Montana 402 permit for stormwater discharges from inactive mines on Federal lands
- ✧ Participated on an interdepartmental Department of the Interior and Department of Agriculture team which drafted a proposed 402 permit for stormwater discharges from inactive mines, landfills, and oil and gas facilities on Federal lands
- ✧ Reviewed and provided comments on the Bureau of Land Management Notice of Intent to prepare an Environmental Impact Statement on Rangeland Management Policy
- ✧ Evaluated and scored two acid mine drainage project proposals submitted by Big South Fork National River and Recreation Area and Friendship Hill National Historic Site for the Natural Resource Protection Program
- ✧ Completed 3-day training course on performing CERCLIS preliminary assessments and site investigations
- ✧ Assisted in development of the "Area Hydrologist" concept currently being attempted on a trial basis
- ✧ Participated in Colorado River Management Work Group

- ✧ Reviewed report *Sharing the Challenge: Floodplain Management into the 21st Century*
- ✧ Assisted Denver Service Center with planning effort at the U.S. Air Force recreational facility, Farish Memorial Park, located near Woodland Park, Colorado
- ✧ Participated on the Servicewide Inventory and Monitoring Program advisory committee
- ✧ Managed contract and reviewed draft marine/estuarine and lake/riverine water quality protocols for Level I Inventory and Monitoring
- ✧ Provided (by way of handouts and encyclopedia sections) Servicewide guidance on *de minimis* issues, pseudoreplication, and other experimental design issues
- ✧ Provided guidance to multiple parks on how to handle "not detected" values, statistics, recommended lab analyses, interpretation of oil data, metals data interpretation, interactions between various contaminants, recommendations for approved protocols for the collection of fish and aquatic invertebrates, and summaries of endocrine system disrupting contaminants
- ✧ Provided extensive comments on the NOAA draft "Guidance Document for Determination of Injury to Biological Resources Resulting from Incidents Involving Oil"
- ✧ Provided detailed comments to the National Research Council review of the Board on Environmental Studies and Toxicology (BEST) program
- ✧ Taught contaminants session at special training session for park superintendents in Denver, Colorado

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Publications 1994

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Diaz, G.E., and J.D. Salas. 1994. *Regional frequency analysis of peak flows at Zion National Park and vicinity areas, Utah*. Draft. Fort Collins: Engineering Research Center, Colorado State University. Technical Report no. 2.

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Financial Status of the Water Resources Division

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

FY95 base funding for the Water Resources Division (WRD) was $4,744,000. Figure 3 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, Regions, and other NPS organizational units, 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. Tables 1, 2, 3, and 4 list WRD-sponsored projects for FY95.

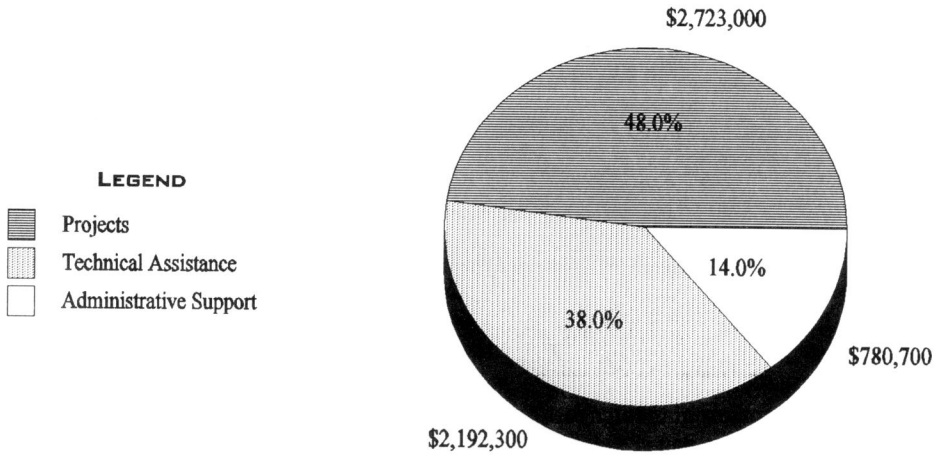


Figure 3. Distribution of WRD Program FY95 Funding.

FY95 WRD PRIORITIZED PROJECTS
GENERAL WATER RESOURCES

Table 1. Continuing Projects

PARK	REGION	CONTINUING PROJECT TITLE	WRD PROJECT COORDINATOR	FUNDING $(000s) FY95	FY96
BLCA	RMR	Study Stream Morphology-Gunnison	Smillie/Wondzell	20.00	
MORA	PNR	Identification and Enumeration of Plankton Samples	Irwin	17.50	
CACA	SWR	Determine Infiltration Rates	Rosenlieb	25.00	
WRST	AR	Hydrology Hazard of Hidden Creek Lake	Smillie	24.00	
NACE	NCR	Monitoring of Last Tidal Marsh in Capital	Wagner	20.00	
COSW	SER	Develop a Flood Decision Support System	Smillie	25.00	
			SUBTOTAL CONTINUING	131.50	0.00

See Appendix 1 for park names.

Table 1. (cont.) New Projects

PARK	REGION	NEW PROJECT TITLE	WRD PROJECT COORDINATOR	FUNDING $(000s) FY95	FY96
BISC	SER	Evaluation of Littoral Benthic Communities Prior to L31E Redirection	Irwin	50.00	0.00
DINO	RMR	Study Sediment Transport on the Green River	Smillie	25.00	25.00
GLCA	RMR	Recovery of Riparian Communities Following Removal of Livestock Grazing	Inglis	18.50	15.00
CANA	SER	Determine Groundwater Flow Characteristics to Mosquito Lagoon	Rosenlieb/Martin	21.00	29.00
ACAD/ CACO	NAR	Evaluate Mercury Contamination	Irwin	25.40	24.60
NOCA	PNR	Resource Baseline Inventory and Monitoring	Rosenlieb	26.00	24.00
CHIC	SWR	Water Resources Management Plan	Sharrow	25.00	25.00
PRWI	NCR	Pyrite Mine Reclamation	Rosenlieb	40.00	0.00
JOTR	WR	Inventory and Monitoring Natural and Historical Water Sources	Inglis	26.40	20.40
OLYM	PNR	Develop Protocols for Biological, Physical, and Chemical Monitoring	Irwin/Rosenlieb	24.80	22.80
CACO	NAR	Revise Water Resources Management Plan	Vice Flora	25.00	25.00
GREE	NCR	Erosion Control and Mechanical Realignment	Rosenlieb	18.00	0.00
CURE	RMR	Develop Water Resources Management Plan	Vice Flora	25.00	25.00
			SUBTOTAL NEW	350.10	235.80
		TOTAL CONTINUING AND NEW PROJECTS		481.60	235.80

See Appendix 1 for park names.

FY95 WATERSHED PROTECTION PROGRAM FUNDING
WATER QUALITY ACTIVITY

Table 2. Continuing Water Quality

PARK	REGION	CONTINUING PROJECT TITLE	WRD PROJECT COORDINATOR	FUNDING $(000s) FY95	FY96
BUFF	SWR	Monitor Rain Events	Rosenlieb	12.50	
MACA	SER	Assess Water Quality Relative to Contaminants Transport	Rosenlieb	13.50	
ASIS	MAR	Inventory Sediment Contaminants	Irwin	16.00	
INDU	MWR	Assessment, Source, Fate of *E. coli*	Rosenlieb	20.00	
GRBA	WR	Monitoring of Surface Water Chemistry	Long	20.00	
CANY	RMR	Colorado River Benthic Characterization	Irwin	20.00	
BAND	SWR	Operate NAWQA Station	Long	6.00	
		SUBTOTAL CONTINUING WATER QUALITY		108.00	0.00

See Appendix 1 for park names.

Table 2. (cont.) New Water Quality

PARK	REGION	NEW PROJECT TITLE	WRD PROJECT COORDINATOR	FUNDING $(000s) FY95	FY96
CHAT	SER	Determine Source and Load of Pollutants to CHAT	Rosenlieb	23.00	17.00
GLCA	RMR	Water Resources Monitoring Equipment Needs	Long	20.35	0.00
KATM	AR	Manage Hazardous and Toxic Materials: Design and Implement Water Monitoring in Areas of High Human Use	Irwin	20.00	20.00
UPDE	MAR	Evaluate Aquatic Biological Parameters in River and Tributaries	Irwin	40.00	0.00
KAHO	WR	Geohydrology and Contamination of the Shallow Fresh-Water Aquifer	Long	25.00	15.00
BUFF	SWR	Develop Aquatic Biomonitoring Program	Irwin	15.00	9.80
FOCL	PNR	Develop Baseline Water Quality Inventory	Rosenlieb	18.50	21.50
PECO	SWR	Water Quality Condition Assessment	Long	25.00	15.00
CAHA	SER	Assess Impacts of Leaching Fields on CAHA Resources	Martin	25.00	15.00
		SUBTOTAL NEW WATER QUALITY		211.85	113.30
		TOTAL CONTINUING AND NEW WATER QUALITY		319.85	113.30

See Appendix 1 for park names.

Table 3. Continuing Wetlands

PARK	REGION	CONTINUING PROJECT TITLE	WRD PROJECT COORDINATOR	FUNDING $(000s) FY95	FY96
BICY	SER	Restore Wetlands within the Loop Road	Wagner	7.00	33.00
BUFF	SWR	Inventory/Map Riparian Zone	Wagner	23.00	0.00
BLRI	SER	Delineation, Mapping, Inventory	Wagner	9.50	0.00
DINO	RMR	Rehab. Hog Canyon Riparian Area	Wagner	21.00	0.00
		SUBTOTAL CONTINUING WETLANDS		60.50	33.00

Table 3. (cont.) New Wetlands

PARK	REGION	NEW PROJECT TITLE	WRD PROJECT COORDINATOR	FUNDING $(000s) FY95	FY96
CACO	NAR	Kettle Pond Aquatic Macrophyte Monitoring	Wagner	20.00	8.20
GUIS	SER	Wetland Delineation, Hydrologic Evaluation, and Vegetation Community Survey	Wagner	25.00	15.00
DINO	RMR	Riparian Study on the Green and Yampa Rivers	Wagner	20.00	20.00
INDU	MWR	Great Marsh Hydrology	Wagner	40.00	0.00
NATR	SER	NWI Data Acquisition	Wagner	40.00	0.00
		SUBTOTAL NEW WETLANDS		145.00	43.20
		TOTAL CONTINUING AND NEW WETLANDS		205.50	76.20

See Appendix 1 for park names.

FY95 WATER RIGHTS PROGRAM

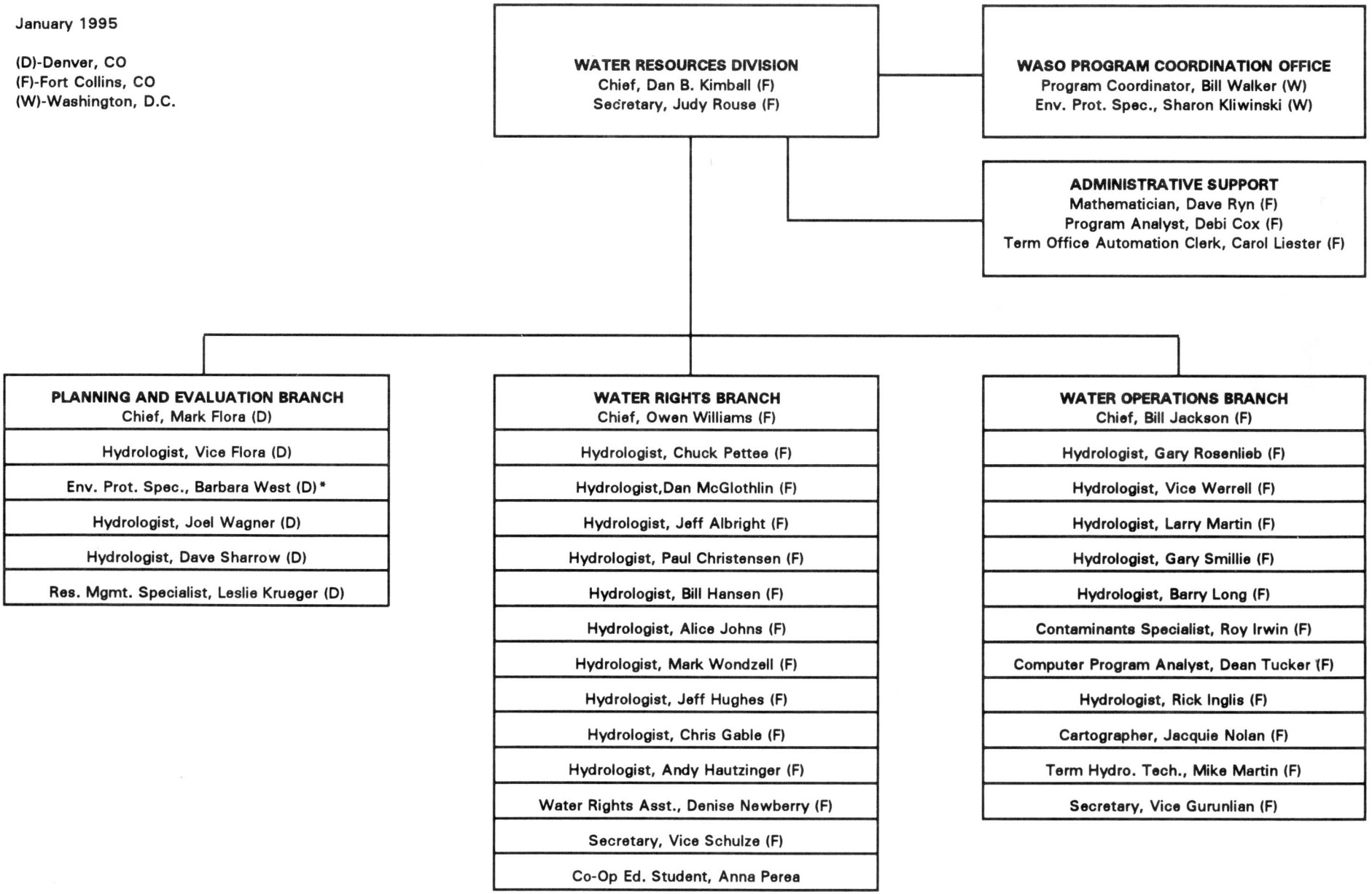
Table 4. Projects Funded through the Water Rights Program

PARK	REGION	PROJECT TITLE	WRD PROJECT COORDINATOR	FUNDING $(000S)
ZION	RMRO	Negotiation/Litigation Preparation	Hansen	83.0
GRCA	WRO	Spring Monitoring	Hansen	42.0
CRLA	PNRO	Departure Analysis Studies	Albright	53.5
DEVA	WRO	Hydrology, Water Rights and Use Studies	Christensen	29.1
BLCA	RMRO	Quantification/Contract Negotiation	Wondzell/Pettee	58.0
DEVA/ LAME/ GRBA	WRO	Preparation for Administrative Hearings for the Las Vegas Valley Water District Water Right Applications	Johns	41.7
ROMO	RMRO	Departure Analysis Data Collection	McGlothlin	3.0
CARE	RMRO	Reserved Right Quantification	Albright	29.5
CAHA	SERO	Vegetation - Ground Water Study	Christensen	63.8
ALL	ALL	Preparation for Dockets Scanning	Albright	51.2
KALA	WRO	Hydrology Study	Hughes	156.3
GRSA	RMRO	Monitoring Program	Christensen	8.0
YELL	RMRO	Implementation of Water Rights Compact	Pettee/Gable	26.4
GRCA	WRO	Departure Analysis Data Collection	Hansen	15.0
ALL	ALL	Historical Research	Williams	35.0
CACO	RMRO	Ground Water Protection	Williams	40.0
COLM	RMRO	Close two wells	Johns	5.0
SAJH	PNRO	Ground Water Studies	Johns	8.3
OBRI	SERO	Surface Water Studies	McGlothlin	25.0
CIRO	PNRO	Quantification of Federal Reserved Rights	Hughes	9.5
GRTE	RMRO	Adjustment of Water Rights	Newberry	1.7
LAME	WRO	Spring Studies	Christensen	50.0
KAHO	WRO	Ground Water Study	Hughes	40.0
		TOTAL WATER RIGHTS PROGRAM		875.0

See Appendix 1 for park names.

January 1995

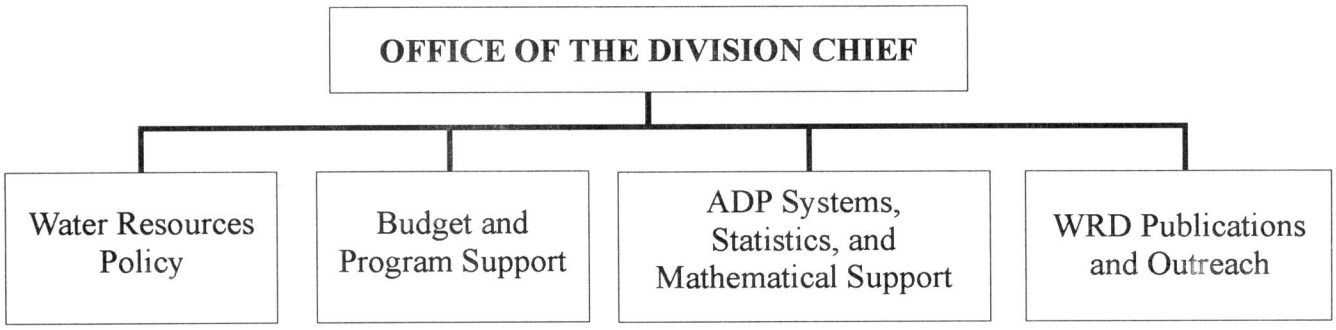
(D)-Denver, CO
(F)-Fort Collins, CO
(W)-Washington, D.C.



*On Detail to Assistant Secretary, Fish and Wildlife and Parks

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 planning and evaluation of complex regulatory issues.

Bill Walker: Water Resources Program Coordinator, PhD in Aquatic Ecology. Specialty areas include natural resources management and aquatic ecosystem management.

Sharon Kliwinski: Water Resources Program Coordinator Assistant, BS in Environmental and Pollution Sciences. Specialty area includes environmental legislation and regulations.

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

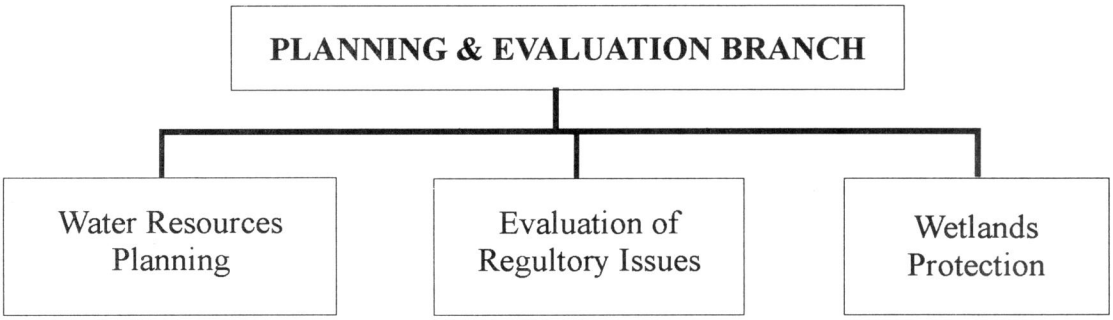
Debi Cox: Program Analyst, BA in Anthropology.

Judy Rouse: Secretary.

Carol Liester: Office Automation Clerk.

Planning and Evaluation Branch

Organization and Staff



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

Barbara West*: Environmental Protection Specialist, MA in Public Administration. Specialty areas include regulatory support and evaluations.

Joel Wagner: Hydrologist, MS in Environmental Science (Water Resources). Specialty areas include wetlands science, management, hydrology, and regulatory issues.

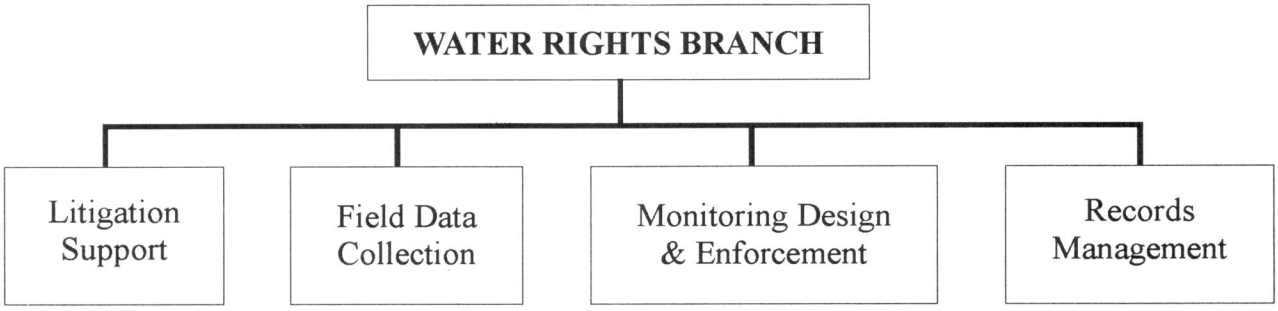
Leslie Krueger: Natural Resource Specialist, BS University of Wisconsin. Specialty areas include wetlands science, management, and regulatory issues.

David Sharrow: Hydrologist, BS in Watershed Science. Specialty areas include water resources management planning, water quantity, and water quality.

*Currently on detail to Assistant Secretary, Fish and Wildlife and Parks

Water Rights Branch

Organization and Staff



Owen Williams: Branch Chief, MS in Watershed Science. Specialty areas include water law, upland watershed management, fluvial geomorphology, and surface water hydrology.

Chuck Pettee: Supervisory Hydrologist, Team Leader, MS in Watershed Science. Specialty areas include water rights, surface water hydrology and hazardous materials.

Dan McGlothlin: Supervisory Hydrologist, Team leader, BS in Watershed Hydrology. Specialty areas include water law, surface water hydrology, and upland watershed management.

Paul Christensen: Hydrologist, MS in Geology. Specialty areas include hydrogeology, ground water hydrology, and ground water modeling.

Bill Hansen: Hydrologist, MS in Hydrology. Specialty areas include water law, surface water hydrology, field methods, and watershed management and rehabilitation.

Alice Johns: Hydrologist, BS in Watershed Sciences. Specialty areas include water law, upland watershed management, fluvial geomorphology and field methods.

Jeff Albright: Hydrologist, MS in Watershed Management. Specialty areas include surface water hydrology, field methods, and instrumentation.

Jeff Hughes: Hydrologist, MS in Watershed Sciences. Specialty areas include surface water hydrology, field methods, and instrumentation.

Mark Wondzell: Hydrologist, MS in Agricultural Engineering. Specialty areas include surface water hydrology, riparian vegetation ecology/management, and field techniques.

Chris Gable: Hydrologist, BS in Watershed Sciences. Specialty areas include surface water hydrology, and water quality control.

Denise Newberry: Water Rights Specialist, MS in Natural Resources Management and Range Science. Specialty areas include NPS law enforcement, and natural resources policy and administration.

Andrew Hautzinger: Hydrologist, BS in Watershed Sciences. Specialty areas include surface water hydrology, field methods, instrumentation, and riparian management.

Research Associates

Anna Perea: Hydrology Student Trainee, Cooperative Education Program, Colorado State University.

Gustavo Diaz: Research Associate, Colorado State University. PhD in Civil Engineering. Speciality areas include Water Resources and Modeling.

Bernadette Berger: Research Associate, Colorado State University. BA in Speech Communication. Specialty areas include computer systems, organizational communication, and telecommunications.

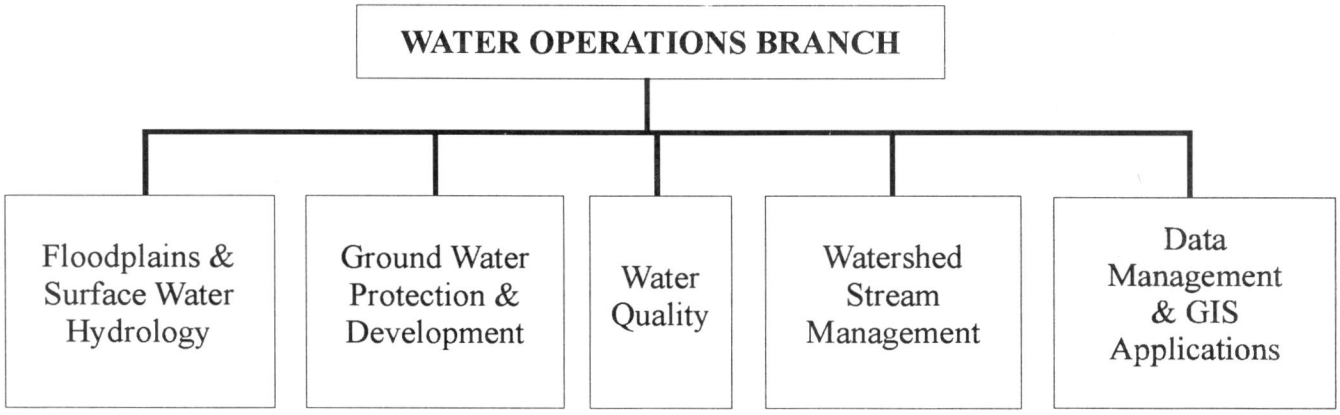
Nancy Stevens: Research Associate, Colorado State University. MEM in Water Resources. Speciality areas include water quality analysis, hydrology, field methods and instrumentation.

Lauren Hamack: Research Associate, Colorado State University. MS in Earth Sciences (Water Resources). Speciality areas include fluvial geomorphology, hydraulics, sediment transport, and computer modeling.

Hilary Renner: Research Associate, Colorado State University. MS in Natural Resource Management. Speciality areas include watershed management, agricultural water management, field methods and arid land hydrology.

Water Operations Branch

Organization and Staff



Bill Jackson: Branch Chief, PhD in Forest Hydrology. Specialty areas include sedimentation processes, fluvial geomorphology, and riparian rehabilitation and management.

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

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

Larry Martin: Hydrologist, MS in Hydrology. Specialty areas include ground water watershed management, riparian management, groundwater modeling, GIS applications in water resources, and hydrologic data analysis.

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

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

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

Jacquie Nolan: Cartographer, MA in International Relations. Specialty areas include map preparation, graphics, and publications. Oversees Division Reference Room (which contains comprehensive water resources files for all NPS units).

Roy Irwin: Senior Contaminants Specialist, PhD in Biology. Specialist in environmental contaminants and biological aspects of water quality (including bio-monitoring).

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

Brian Cluer: Hydrologist, student-coop., detailed from Grand Canyon National Park, PhD (pending) in fluvial geomorphology. Specialty areas include fluvial geomorphology, surface water hydrology, photogrammetry, remote sensing, and sediment transport.

STUDENT ASSISTANTS

Marion Dubler: Assistant Contaminants Specialist/CSU Cooperative Agreement Student Assistant. BS (pending) in PreMed.

Joe Gregson: GIS Computer Programmer, PhD (pending) in Geology.

Scott Grover: Hydrologic Technician, document preparation. BS (pending) in Watershed Science.

Scott Hermsen: Water Quality Specialist, MS (pending) in Analytical Chemistry and Environmental Engineering .

Julie Mattick: Water Quality Specialist, MS in Hydrology.

Lynette Stevens: Assistant Contaminants Specialist/CSU Cooperative Agreement Student Assistant. MS (pending) in Watershed Science.

Mark Van Mouwerik: Assistant Contaminants Specialist/CSU Cooperative Agreement Student Assistant. MS (pending) in Environmental Health.

Awards

Office of the Division Chief

Debi Cox received a Performance Award for her high level of performance and continued support and administrative assistance with the budget, fiscal management, procurement, and contracting, all of which have constantly changing priorities and rules.

Judy Rouse received a Performance Award for her high level of performance and continued leadership in preparation of the Division's Annual Report and the Monthly Activities Report, her commitment to providing necessary training to new support staff, and her support of major Division activities (e.g., training and work plan development).

Planning and Evaluation Branch

Mark Flora received a Performance Award for consistent outstanding levels of performance with respect to overseeing the development of a Water Resources Planning Issues Quick Reference System and displaying initiative and innovation in completion of ongoing projects during a period of personnel shortages.

Joel Wagner received a Quality Step Increase for consistent outstanding levels of performance with respect to his outreach activities pertaining to the NPS Wetlands Management Program. During the year, these efforts included: (1) presentation of a training course on wetlands delineation, classification, management, and compliance, and (2) chairing two sessions on "Wetlands Research and Management in the National Parks" at the Society of Wetland Scientists Annual Conference, where more than 150 wetlands professionals were introduced to NPS wetlands and management efforts.

Water Rights Branch

Alice Johns received a Performance Award for her consistent outstanding levels of performance with respect to preparation for litigation involving Nevada parks.

Paul Christensen received a Performance Award for his work on the Moappa Valley Water District hearing and serving as the COTR on the Stetson Engineers contract in the Las Vegas Valley Water District project.

Denise Newberry was a recipient of the Horace M. Albright Award to pursue research on rangeland use by ungulates, in particular, reindeer, at Bering Land Bridge National Preserve; and for her development of a handbook to be published and distributed to NPS units, which outlines the significance of water in resources management.

Chuck Pettee received a Performance Award for consistent outstanding levels of performance with respect to project management preparatory to litigation or negotiations involving Colorado and Oregon park units.

Dan McGlothlin received a Performance Award for consistent outstanding levels of performance with respect to project management preparatory to litigation or negotiations involving Utah and Hawaii park units.

The following WRD staff received special achievement awards in recognition of their outstanding work performance in the development and successful signing of a reserved water rights compact with the state of Montana: **Jeff Albright, Christine Gable, Bill Hansen, Jeff Hughes, Dan McGlothlin, Denise Newberry, Chuck Pettee, and Owen Williams.**

Water Operations Branch

Roy Irwin received a Performance Award for his high level of performance in helping parks address aquatic contaminants issues.

Bill Jackson received a Special Achievement Award for his outstanding performance related to the development and successful signing of a Memorandum of Understanding between the National Park Service and the U.S. Geological Survey to implement the National Water Quality Assessment Program in units of the National Park System.

Larry Martin received a Performance Award for consistent outstanding levels of performance with respect to his assistance to parks on ground water protection issues.

Michael Martin received a Fast Track Award for participation in a 3-week field experiment to assess erosion processes on the Lake Mills delta on the Elwha River in Olympic National Park.

Gary Rosenlieb received a Special Achievement Award for his outstanding performance related to the development and successful signing of a Memorandum of Understanding between the National Park Service and the U.S. Geological Survey to implement the National Water Quality Assessment Program in units of the National Park System.

Dean Tucker received a Performance Award for consistent outstanding levels of performance with respect to his leadership in developing a servicewide water quality data base and in assisting parks on GIS applications in water resources.

Appendix 1

Referenced Units of the National Park System

Acronymn	Park Name	Region
ACAD	Acadia National Park	North Atlantic
AMIS	Amistad National Recreation Area	Southwest
ARCH	Arches National Park	Rocky Mountain
ASIS	Assateague Island National Seashore	Mid-Atlantic
BAND	Bandelier National Monument	Southwest
BEOL	Bent's Old Fort National Historical Site	Rocky Mountain
BIBE	Big Bend National Park	Southwest
BICA	Bighorn Canyon National Recreation Area	Rocky Mountain
BICY	Big Cypress National Preserve	Southeast
BIHO	Big Hole National Battlefield	Rocky Mountain
BISC	Biscayne National Park	Southeast
BISO	Big South Fork National River and Recreation Area	Southeast
BLCA	Black Canyon of the Gunnison National Monument	Rocky Mountain
BLRI	Blue Ridge Parkway	Southeast
BRCA	Bryce Canyon National Park	Rocky Mountain
BUFF	Buffalo National River	Southwest
CACA	Carlsbad Caverns National Park	Southwest
CACO	Cape Cod National Seashore	North Atlantic
CAGR	Casa Grande National Monument	Western
CAHA	Cape Hatteras National Seashore	Southeast
CAKR	Cape Krusenstern National Monument	Alaska
CANA	Canaveral National Seashore	Southeast
CANY	Canyonlands National Park	Rocky Mountain
CARE	Capitol Reef National Park	Rocky Mountain
CAVO	Capulin Volcano National Monument	Southwest
CHAT	Chattahoochee River National Recreation Area	Southeast
CHCU	Chaco Culture National Historical Park	Southwest
CHIC	Chickasaw National Recreation Area	Southwest
CHIR	Chiricahua National Monument	Western
CHIS	Channel Islands National Park	Western
CHPI	Charles Pickney National Historical Site	Southeast
CIRO	City of Rocks National Reserve	Pacific Northwest
CODA	Coulee Dam National Recreation Area	Pacific Northwest
COLM	Colorado National Monument	Rocky Mountain
COLO	Colonial National Historical Park	Mid-Atlantic
CORO	Coronado National Memorial	Western
COSW	Congaree Swamp National Monument	Southeast
CRLA	Crater Lake National Park	Pacific Northwest
CRMO	Craters of the Moon National Monument	Pacific Northwest
CURE	Curecanti National Recreation Area	Rocky Mountain
CUVA	Cuyahoga Valley National Recreation Area	Midwest
DENA	Denali National Park and Preserve	Alaska

DEVA	Death Valley National Monument	Western
DEWA	Delaware Water Gap National Recreation Area	Mid-Atlantic
DINO	Dinosaur National Monument	Rocky Mountain
EBLA	Ebey's Landing National Historic Reserve	Pacific Northwest
ELIS	Ellis Island	North Atlantic
ELMO	El Morro National Monument	Southwest
EVER	Everglades National Park	Southeast
FIIS	Fire Island National Seashore	North Atlantic
FLFO	Florissant Fossil Beds National Monument	Rocky Mountain
FOBO	Fort Bowie National Historical Site	Western
FOBU	Fossil Butte National Monument	Rocky Mountain
FOCL	Fort Clatsop National Memorial	Pacific Northwest
FOLS	Fort Larned National Historical Site	Midwest
FONE	Fort Necessity National Battlefield	Mid-Atlantic
FOSC	Fort Scott National Historical Site	Midwest
FRHI	Friendship Hill National Historical Site	Mid-Atlantic
GATE	Gateway National Recreation Area	North Atlantic
GETT	Gettysburg National Military Park	Mid-Atlantic
GLAC	Glacier National Park	Rocky Mountain
GLCA	Glen Canyon National Recreation Area	Rocky Mountain
GOGA	Golden Gate National Recreation Area	Western
GOSP	Golden Spike National Historical Site	Rocky Mountain
GRBA	Great Basin National Park	Western
GRCA	Grand Canyon National Park	Western
GREE	Greenbelt Park	National Capital
GRKO	Grant-Kohrs Ranch National Historical Site	Rocky Mountain
GRPO	Grand Portage National Monument	Midwest
GRSA	Great Sand Dunes National Monument	Rocky Mountain
GRSM	Great Smoky Mountains National Park	Southeast
GRTE	Grand Teton National Park	Rocky Mountain
GUIS	Gulf Islands National Seashore	Southeast
GUMO	Guadalupe Mountains National Park	Southwest
GWCA	George Washington Carver National Monument	Midwest
GWMP	George Washington Memorial Parkway	National Capital
HAFO	Hagerman Fossil Beds National Monument	Pacific Northwest
HALE	Haleakala National Park	Western
HAVO	Hawaii Volcanoes National Park	Western
HEHO	Herbert Hoover National Historical Site	Midwest
HOSP	Hot Springs National Park	Southwest
HUTR	Hubbell Trading Post National Historical Site	Southwest
INDU	Indiana Dunes National Lakeshore	Midwest
ISRO	Isle Royale National Park	Midwest
JECA	Jewel Cave National Monument	Rocky Mountain
JELA	Jean Lafitte National Historical Park and Preserve	Southwest
JOTR	Joshua Tree National Monument	Western
KAHO	Kaloko-Honokohau National Historical Park	Western
KALA	Kalaupapa National Historical Park	Western
KATM	Katmai National Park and Preserve	Alaska
KEMO	Kennesaw Mountain National Battlefield Park	Southeast
KNRI	Knife River Indian Village National Historical Site	Rocky Mountain
LACH	Lake Chelan National Recreation Area	Pacific Northwest
LACL	Lake Clark National Park and Preserve	Alaska
LAME	Lake Mead National Recreation Area	Western
LIBI	Little Bighorn Battlefield National Monument	Rocky Mountain
LYJO	Lyndon B. Johnson National Historical Park	Southwest
MACA	Mammoth Cave National Park	Southeast

MANA	Manassas National Battlefield Park	National Capital
MANZ	Manzanar National Historical Site	Western
MEVE	Mesa Verde National Park	Rocky Mountain
MIMA	Minute Man National Historical Park	North Atlantic
MNRR	Missouri National Recreation River	Midwest
MOCA	Montezuma Castle National Monument	Western
MORA	Mount Rainier National Park	Pacific Northwest
MORR	Morristown National Historical Park	North Atlantic
MRCC	Mississippi River Corridor Heritage Comm.	Midwest
NABR	Natural Bridges National Monument	Rocky Mountain
NACE	National Capital Parks - East	National Capital
NASA	National Park of American Samoa	Western
NATR	Natchez Trace Parkway	Southeast
NCRO	National Capital Regional Office	National Capital
NERI	New River Gorge National River	Mid-Atlantic
NIMI	Niobrara-Missouri National Riverways	Midwest
NOCA	North Cascades National Park	Pacific Northwest
OBRI	Obed Wild and Scenic Riverways	Southeast
OLYM	Olympic National Park	Pacific Northwest
ORPI	Organ Pipe Cactus National Monument	Western
OZAR	Ozark National Scenic Riverways	Midwest
PAIS	Padre Island National Seashore	Southwest
PECO	Pecos National Historical Park	Southwest
PEFO	Petrified Forest National Park	Western
PETR	Petroglyph National Monument	Southwest
PIRO	Pictured Rocks National Lakeshore	Midwest
PISP	Pipe Spring National Monument	Rocky Mountain
PORE	Point Reyes National Seashore	Western
PRWI	Prince William Forest Park	National Capital
PUHE	Puukohola Heiau National Historical Site	Western
PUHO	Pu'uhonau O Honaunau National Historical Park	Western
REDW	Redwood National Park	Western
RICH	Richmond National Battlefield Park	Mid-Atlantic
ROCR	Rock Creek Park	National Capital
ROMO	Rocky Mountain National Park	Rocky Mountain
RUCA	Russell Cave National Monument	Southeast
SAAN	San Antonio Missions National Historical Park	Southwest
SACN	Saint Croix National Scenic Riverway	Midwest
SAGA	Saint-Gaudens National Historical Park	North Atlantic
SAGU	Saguaro National Monument	Western
SAIR	Saugus Iron Works National Historical Site	North Atlantic
SAJH	San Juan Island National Historical Park	Pacific Northwest
SAMO	Santa Monica Mountains National Recreation Area	Western
SARA	Saratoga National Historical Park	North Atlantic
SCBL	Scotts Bluff National Monument	Midwest
SEKI	Sequoia and Kings Canyon National Park	Western
SHEN	Shenandoah National Park	Mid-Atlantic
STLI	Statue of Liberty National Monument	North Atlantic
SUCR	Sunset Crater Volcano National Monument	Southwest
THRO	Theodore Roosevelt National Park	Rocky Mountain
TIMU	Timucuan Ecological and Historic Preserve	Southeast
TONT	Tonto National Monument	Western
TUZI	Tuzigoot National Monument	Western
UPDE	Upper Delaware Scenic and Recreation River	Mid-Atlantic
VAFO	Valley Forge National Historical Park	Mid-Atlantic
VIIS	Virgin Islands National Park	Southeast

VOYA	Voyageurs National Park	Midwest
WACA	Walnut Canyon National Monument	Western
WEIR	Weir Farm National Historical Site	North Atlantic
WRST	Wrangell-St. Elias National Park and Preserve	Alaska
WUPA	Wupatki National Monument	Southwest
YELL	Yellowstone National Park	Rocky Mountain
YOSE	Yosemite National Park	Western
ZION	Zion National Park	Rocky Mountain

Appendix 2

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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.

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