

Appendix B

Technical Assistance



Moonrise over Cape Hatteras National Seashore (North Carolina).
NPS/JIM EVANS

SERVICEWIDE

Represented the NPS on the BLM Solar Energy Programmatic Environmental Impact Statement. ▫ Represented the NPS on the Navajo Nation-Hopi Tribe, Hualapai Tribe, Havasupai Tribe, and Yavapai-Apache Nation Indian Federal Water Rights Negotiation and Assessment Teams. ▫ Co-taught a water-related session for University of Denver's Earth Science Program. ▫ Completed 16 station folders for WRB gauges to support water rights efforts in Arizona, Nevada, and Oklahoma. ▫ Converted all water rights dockets to PDF format and uploaded to IRMA for public accessibility. ▫ Served as the co-lead for the NPS Wild and Scenic Rivers (WSR) Program and member of the NPS WSR Steering Committee and Interagency WSR Coordinating Council. ▫ Evaluated water right applications to determine impacts of diversions on park rights in California, Colorado, Hawaii, Montana, Utah, and Wyoming. ▫ Submitted annual reports for Big Hole NB, Bighorn Canyon NRA, Glacier NP, Little Bighorn Battlefield NM, and Yellowstone NP as required by the Montana-United States, NPS Water Rights Compact. ▫ Served as NRSS Project Coordinator for climate change response projects at Theodore Roosevelt and Wind Cave NPs. ▫ Represented NRSS on NPS Dive Control Board. ▫ Worked with DOI Senior Ocean Policy Team and the NPS regions and parks on the implementation of the new National Ocean Policy (EO 13547). ▫ Represented NPS on the Federal Geospatial Data Committee and Coastal Spatial Data Subcommittee to develop the Coastal and Marine Ecological Classification Standard (CMECS) as a national habitat classification for oceans, coasts, and estuaries. ▫ Developed an aquatic invasive species database for Marine and Great Lakes parks and hosted a servicewide

Webinar to demonstrate database functionality. ▫ Developed servicewide Comprehensive Call ocean and coastal resources program funding guidance and approved and funded projects at \$141,000. ▫ Working with the Lands Resources Division and NRSS GIS, developed shoreline maps for 84 ocean and coastal parks. ▫ Worked with USFWS and NOAA National Estuarine Reserves and National Marine Sanctuary staffs to implement the interagency Seamless Network Agreement. ▫ Worked with Russ Wilson, superintendent at CALO on detail to WASO, to develop a framework for Directors Order on ocean and coastal parks. ▫ Worked with GRD and the Lands Resources Division to develop solicitor opinions to deal with park boundary issues for 10 ocean and coastal parks. ▫ Continued development of NPSTORET—a series of Microsoft Access templates/forms for entering and documenting the results of water quality monitoring projects in compliance with the National Water Quality Monitoring Council's guidelines in a format compatible with uploading to modern STORET using the STORET Import Module or Water Quality Exchange (WQX) format. NPSTORET v.1.82 was released adding new functionality and fixing reported bugs. ▫ Updated the website for Vital Signs Water Quality Data Management and Archiving at www.nature.nps.gov/water/vitalsigns/vitalsignsmgt.cfm. ▫ Set up a shared/network installation of Aquatic Informatics' Aquarius Workstation and Aquarius Database for parks, networks, and WRD staff to process, analyze, and report on their continuous water resource (both quantity and quality) data. ▫ Coordinated servicewide review and comment on a draft continuous water resource database schema to be implemented in Aquarius. ▫



St. Johns Bluff, Timucuan Ecological and Historic National Preserve (Florida). NPS/SHAUNA RAY ALLEN

Maintained the WRD's STORET infrastructure, a data entry workstation version of distributed STORET containing NPS production data. ▫ Provided additions and suggestions to EPA regarding characteristics and other aspects of the WQX schema. ▫ Notified other organizations when problems were encountered with their data in the STORET/WQX Data Warehouse and alerted the EPA to issues with the STORET/WQX Data Warehouse retrieval tools. ▫ Produced quarterly Capital Planning and Investment Control reports and the Office of Management and Budget's Exhibit 300-1 documenting WRD's STORET investment. ▫ Prepared a proposal to acquire EarthSoft's EQuIS (Environmental Quality Information System) software as a replacement for the NPS-distributed STORET database that was subsequently approved. ▫ Prepared contracting materials to shepherd the acquisition of EarthSoft's EQuIS system (EQuIS Professional, Enterprise, EDP, and other components) through purchasing. ▫ Maintained a Sharepoint site on the topic of Water Resources Data Management (<http://nrpcsharepoint/wrd/data/default.aspx>) with a subsite of Continuous Data Management (<http://nrpcsharepoint/wrd/data/continuous/default.aspx>). ▫ Represented WRD during NRSS Integrated Resource Management Applications (IRMA) meetings and provided assistance to the IRMA Steering Committee relative to reporting bugs and contributing suggestions for future releases, including coordinating WRD's review of the water resources mock-up page. ▫ Represented WRD during NRSS Information Technology Technical Advisory Group (IT-TAG) meetings. ▫ Handled the Water Operations Branch ADP function, including ordering new computers and other hardware. ▫ Provided consultation to the NPS Conservation and Outdoor Recreation Program on riverine databases. ▫ Updated webpages (<http://science.nature.nps.gov/im/inventory/waterquality/index.cfm> and <http://science.nature.nps.gov/im/inventory/water/index.cfm>) for the Inventory and Monitoring Division to explain the water quality and water resources inventories. ▫ Prepared the 2010

Annual Administrative Reports and Workplans for the water quality and water resources inventories. ▫ Attended EarthSoft's EQuIS Users Group Meeting in Denver during April. ▫ Maintained NPSEDD v.1.10, the NPS Electronic Data Deliverable specification used by parks and networks for contributing water quality data for inclusion in STORET. ▫ Upgraded NPSCol2Row—a data formatting utility used to restructure data files in preparation for STORET or other applications—to v.2.2, extending its capabilities and ensuring it works in Access 2007. The tool is available on the NPS Vital Signs Water Quality Data Management and Archiving website and EPA's STORET Tools website (www.epa.gov/storet/otherapps.html) for anyone to download. ▫ Coordinated the upgrade to Terrain Navigator Pro v.8.71 and troubleshooted issues for NRSS users. ▫ Continued to oversee the development and enhancement of the Hydrographic and Impairment Statistics (HIS) database built on a framework of the National Hydrography Dataset and state 303(d) Clean Water Act listings. Coordinated park review of the database and migration of the HIS database to the internet at www.nature.nps.gov/water/his/. ▫ Maintained and enhanced the software used to quality-assure, compile, and calculate hydrographic statistics in the HIS database. ▫ Provided revisions to the Inventory and Monitoring fact sheets and web pages for the baseline water quality and water body location and classification inventories. ▫ Responded to public water resource inquiries generated by NPS website. ▫ Assisted in the GIS processing and protocol development for the watershed delineation effort in NPScape. ▫ Provided review and comment on the Marine Invasive Species Database front-end. ▫ Provided review, comments, and hydrographic data to the joint Water Resources and Inventory and Monitoring divisions' Natural Resource Preservation Project Draft Solar Programmatic Environmental Impact Statement GIS proposal. ▫ Provided NPS water "fun facts" for Project WET presentation at the Global Water Conference in Bozeman, MT. ▫



**Gathering storm at Pipe Spring
National Monument (Arizona).**
NPS/ERIC SKOPEC

Provided advice and examples to the Inventory and Monitoring Division on how to acquire STORET and NWIS data via web services for use in NPScope analysis of contributing areas. ▫ Set up WRD's Wet-Net mailing lists as a true self-maintaining listserve rather than a series of Lotus Notes email groups. ▫ Coordinated and moderated a water resources inventory and monitoring session at The 2011 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites in New Orleans, LA. ▫ Co-chaired a George Wright Society meeting session (in collaboration with NPS cultural resources) on the topic of cultural and natural resource condition assessments in NPS units. ▫ Coordinated WRD's review and response to the USGS's business case for an enhanced National Elevation Data Program. ▫ Provided ongoing support for a collaborative project with NatureServe, the National Interagency Fire Center, and the NPS Biological Resource Management Division to develop and pilot a set of landscape-scale interpretive products (resource condition narratives and maps) for use in NRCA projects. ▫ Coordinated with regional NRCA leads (and term hires in NER, SER, and IMR) on aspects of overall program and project management to ensure consistency with national guidance; developed updated materials for the NRCA program website. ▫ Ensured that GPRA goals for reporting water information (1a4a, 1a4b, and 1a4c) were taken into consideration, addressed, and given proper weight by networks during the monitoring plan and water/aquatic protocol (narrative) document review process and that WRD's Designated Use and Impairment website (303d listing) had been consulted and compared with other sources (e.g. state) that the network may have also accessed for a listing of impaired water bodies. ▫ Shared new information from water quality instrument vendors and other general monitoring information with networks to keep staff apprised of new technical developments that could enhance their monitoring efforts.

▫ Coordinated with multiple users about their activities in the NRPC water quality lab (WRD, BRMD, ROMN) and kept the lab supplied and maintained. ▫ Participated as a reviewer and regular conference-call participant in the National Water Quality Monitoring Council Methods Board Sensor Workgroup in efforts to advance and foster a broader understanding and consistency of water quality sensor use across the water quality monitoring community. ▫ Worked with the Geologic Resources Division staff in advising Northeast Region development on the possible collateral effects of Marcellus Shale gas development and participated in bi-weekly conference calls. ▫ Continued to stay informed of water quality instrument advances including new sensors for continuous monitors, telemetry system, and other new technological developments and their evaluation through communication with vendors, attendance at locally offered field training seminars, and discussions with USGS research staff and others. ▫ Assisted NPS staff in the evaluation, cost comparison analysis, and procurement of water quality sondes, data analysis software, and monitoring equipment. ▫ Provided and tracked loans of equipment (sondes, flow meters) to various networks as needed/requested to assist in their water component of Vital Signs Monitoring. ▫ Monitored various real-time water quality monitoring sites posted on NWIS that are supported through NPS project funding, and stayed informed about monitoring issues through USGS list-serve email communications. ▫ Participated in Climate Change Response Program meetings related to floodplain management and was project coordinator for Climate Change funded project. ▫ Served as coordinator for NRPC reviews of submissions to the Development Advisory Board. ▫ Member of the Restoration Technical Advisory Group. ▫ Member of the WASO Rivers and Dams workgroup. ▫



Western Arctic caribou crosses the Kobuk River, Kobuk Valley National Park (Alaska). NPS/
GAVIN EMMONS

Reviewed Floodplain Statements of Findings for projects at many parks including Lake Mead NRA (Cottonwood Cove and Katherine Landing DCP/SOF); Overmountain Victory NHT (Headquarters/Visitor Center); Cape Hatteras NS (Off-Road Vehicle Use Plan); Yellowstone NP (Exotic Fish Eradication); Mammoth Cave NP (Green River Ferry Crossing); Badlands NP (South Unit General Management Plan/SOF); Chickasaw NRA (Visitor Center Facilities at Vendome Well area); Mount Rainier NP (Carbon River Access Management Plan); Natchez Trace Parkway (Multi-use Trail Segment 3P16); Congaree NP (Canoe Landing SOF); Ross Lake NRA (General Management Plan SOF); Chesapeake and Ohio Canal NHP (Restoration of Canal Operations at Williamsport); Everglades NP (Tamiami Trail and Gulf Coast Visitor Center); Death Valley NP (Lower Wildrose Road EA/SOF); Yosemite NP (Tenaya Lake Area Plan and Tuolumne River Plan EIS); and Cane River Creole NHP (Bank Erosion Control). □

ALASKA REGION

Alaska Region Maintained partnerships with University of Alaska Fairbanks faculty to investigate shallow lake dynamics in interior Alaska. Faculty collaborators include Dr. Mark Lindberg and Dr. Dave Verbyla. □ Southwest Research Institute reviewed three NSF proposals for Dr. Cynthia Dinwiddie and provided letters of support. □ Collaborate with USFS, FSWCD, and USFWS on *Elodea nuttallii* infestation on Chena Slough, Fairbanks; acquired aerial photography for *Elodea* infestation along Chena Slough; *Elodea* steering committee member. □ Planning committee for Fourth Interagency Conference on Research in the Watersheds. □ Funded development of digital shorelines for eight ocean and coastal parks in Alaska. □

Denali National Park Published final Natural Resource Condition Assessment. □

Katmai National Park & Preserve

Participated on the NPS Resource Management Team regarding the Pebble Mine, a proposed copper and gold mine in southwest Alaska; attended meetings, reviewed study plans, and commented on fisheries resource issues. □ Provided technical review and comments for the Southwest Alaska Salmon Habitat Partnership monitoring strategic plan. □ Reviewed HEC-RAS model and other available data for possible use in a bridge scour analyses. □

Klondike Gold Rush National Historical Park Published final Natural Resource Condition Assessment. □

Lake Clark National Park & Preserve

Drafted proposal and received funding for a project exploring changes in lake trout growth rates relative to changes in the aquatic and terrestrial environment. □ Drafted proposal, received funding, and implemented a radiotelemetry study on the migration of sockeye salmon through the Newhalen River watershed. □ Assisted with logistics and sampling of water quality monitoring in the Chulitna River watershed adjacent to the proposed Pebble Mine. □ Continued to provide technical assistance related to potential impacts to ground and surface waters from the proposed Pebble Project copper-gold-molybdenum mine adjacent to the park. Coordinated with USGS Alaska Water Science Center on their baseline sampling of the Chulitna watershed. □ Drafted proposal, received funding, and implemented a coho salmon escapement project on the Lake Clark coast. □ Provided project oversight, completed data analysis, and wrote an annual report for a monitoring project estimating the number of sockeye salmon returning to Lake Clark. □ Worked cooperatively with the Alaska Department of Fish and Game to coordinate logistics, hiring, and implementation of a sockeye salmon escapement project in the Kuskokwim River drainage in southwest Alaska. □ Coordinated logistics and sampling for a study assessing the feeding ecology of Arctic char in Lower Tazimina Lake. □



Planes on Hardenburg Bay, Lake Clark National Park & Preserve (Alaska). NPS COLLECTION

Sitka National Historic Site Provided guidance regarding protection of instream flows and the validity of non-NPS water rights on the Indian River. □

Yukon–Charley Rivers National Preserve and Gates of the Arctic National Park & Preserve Provided input on objectives for resource condition assessment. □ Provided input on Gates of the Arctic General Management Plan. □ Member of the unit compliance team. □ Member of the aviation working group. □ Assisted with Natural Resource Condition Assessment for YUCH and DENA. □

Arctic Network Served on network technical advisory committees. □ Continued investigating the mechanisms of lake drainage in Kobuk Valley and helped develop a vulnerability model for lake drainage. Maintained contract with ABR Inc. □ Implemented the synoptic sampling portion of the shallow lake monitoring plan in 70 lakes. □ Maintained continuous-data-logger arrays in two lakes. □ Continued cooperative agreement to track changes in lake surface area in Kobuk Valley National Preserve. □ Continued development of interactive geodatabase for observing large scale lake drying and thermokarst events in network parks. □

Central Alaska Network Served on network technical advisory committees. □ Maintained water quality monitoring sondes in six lakes in network parks. □ Implemented the synoptic sampling portion of the shallow lake monitoring plan in 100 lakes in Wrangell–St. Elias NP&P. □

Southwest Alaska Network Reviewed monitoring protocols and annual reports, and provided technical assistance with various fish and water resource projects. □ Planned and facilitated collection of bathymetry data for Upper and Lower Twin Lakes, Upper and Lower Tazimina Lakes, and Lachbuna Lake. □ Coordinated collection of resident fish species from five different lakes for contaminants analyses. □

Provided review and consultation on a draft schema for NPS continuous water resources data management using Aquarius Workstation and the Aquarius Database. □ Provided review and comment on the “Southwest Alaska Freshwater Flow System Monitoring” Protocol Narrative and SOPs. □

INTERMOUNTAIN REGION

Intermountain Region Served as NPS Hydrologist on Intermountain Regional Burned Area Emergency Response (BAER) Team for Horseshoe 2 fire in Coronado National Forest and Chiricahua National Monument. □ Participated on the USGS/NPS Water Quality grant review panel. □ Served as chair of the Biology Committee of the Upper Colorado River Endangered Fish Recovery Program from January 2011 to December 2011. □ Served as Management Committee representative to the Upper Colorado River Endangered Fish Recovery Program from January 2011 to December 2011. □ Served as Program Secretary for the Desert Fishes Council. □ Provided NPS update on conservation actions, discussed annual reports and provided guidance on future efforts for the Three-Species Conservation Agreement and Strategy □ Presented paper at the Desert Fishes Council annual meeting in Moab, Utah, on Grand Canyon National Park Shinumo Creek Humpback Chub Translocation. □ Supported the Intermountain Region Office Deputy FMO with review of a firefighter chemical exposure draft LLR report investigating a chemical exposure incident at a wildland fire. □

Arches National Park (Utah) Prepared Scope of Work for “A Hydrologic Evaluation of Waters of the Entrada and Navajo Aquifers in the Courthouse Wash Area, Arches National Park, Grand County, Utah.” □ Prepared and submitted five water right protests. □ Provided presentation regarding the proposed water rights settlement to Grand County Council, Utah State Engineer, and the Arches superintendent. □



Desert oasis in Big Bend National Park (Texas). NPS/JIM GRAMANN

Provided oversight/consultation to collect spring discharge data. □ Provided continuing advice related to several problematic stream crossings near the Wolfe Ranch area of the park. □

Badlands National Park (South Dakota)

Consulted with park staff regarding completion of floodplain Statement of Findings. □

Bandelier National Park (New Mexico)

Provided advice on best ways to prepare for flooding after very large fires occurred this year; planned trip to park in autumn to get a better idea of conditions and will help in future planning-related activities. □

Bent's Old Fort National Historic Site

(Colorado) Evaluated applications in Water Division 2 to determine impacts of diversions on water rights. □

Big Bend National Park/Rio Grande Wild & Scenic River (Texas)

Consulted with park on groundwater monitoring instrumentation and deployment options; provided park with sensor deployment cable. □ Assisted park staff and WRB in monitoring groundwater inflow to the Rio Grande Wild & Scenic River. □ Participated in gain/loss study to quantify ground water contributions via spring flows to the mainstem of the Rio Grande River. □ Participated in discussions with Rio Grande Science Team to frame instream flow needs and flow requests from the Rio Conchos (in Mexico) to Rio Grande River. □ Reviewed the annual report for the Reconnaissance of Water Chemistry and Spring Flow from a Transborder Aquifer along the Rio Grande River. □ Facilitated the Outstandingly Remarkable Values workshop for the Rio Grande River. □ Consulted with park staff and performed quick analysis of survey information related to the proposed construction of a new, unstaffed visitor contact station/border crossing at Boquillas. □

Bighorn Canyon National Recreation Area (Montana, Wyoming)

Submitted annual report as required by the Montana –

United States, NPS Water Rights Compact. □ Served as NRSS Project Coordinator for arid land springs restoration project. □ Responded to SOL inquiry regarding federal facilities located within navigable streams. □ Responded to enquiry by Senator Baucus about lake level management. □

Big Hole National Battlefield (Montana)

Reviewed applications and filed objections as necessary to protect park water rights. □ Evaluated settlement proposals and coordinated with park, SOL, and other federal agencies to resolve NPS objections to adjudication claims. □ Submitted annual report as required by the Montana–United States, NPS Water Rights Compact. □

Big Thicket National Preserve (Texas)

Participated in Big Thicket Mussel Survey on Neches River in cooperation with the U.S. Fish & Wildlife; identified species types and number of mussel kills from low water levels. □ Provided hydrologic oversight for the Chevron pipe removal project at the preserve, requiring multiple site visits and coordination of multiple stakeholders. □ Uploaded water quality and benthic macroinvertebrate data to STORET from a series of studies conducted from 1976–1981 by Lamar University. □

Black Canyon of the Gunnison National Park (Colorado)

Assisted with data collection and initial development of a hydraulic model to support long-term vegetation monitoring. □ Participated in the design/implementation of a long-term monitoring program to document changes in riparian vegetation as a function of upstream reservoir releases. □ Evaluated applications in Water Division 4 to determine effects of diversions on water rights. □ Provided guidance on the effects and operations of Aspinall Unit on park resources and the decreed water right for the Gunnison River. □

Bryce Canyon National Park (Utah)

Conducted analyses of radius of groundwater travel time to the water-supply wells in the East Creek wellfield. □



The Castle and Sulphur Creek, Capitol Reef National Park (Utah). NPS COLLECTION

Canyonlands and Arches National Parks (Utah) Continued to monitor DOE news releases and communicate with park staff concerning the Moab site groundwater remediation, tailings removal and repository build-out activities, and recent concerns with Colorado River flooding adjacent to pile due to the high snowpack and corresponding spring runoff. Approximately 4.7 million total tons of tailings removal was reached (as of October 2011) despite reductions to a single train per day and reverting back to a five-day work week after Recovery Act funding was expended; additional extraction wells near the source captured higher concentrations of ammonia and uranium to increase plume remediation efficiencies (~180 million gallons site groundwater pumped and treated to date). □

Capitol Reef National Park (Utah) Completed water right change application. □

Chickasaw National Recreation Area (Oklahoma) Assisted in water quality sampling and identified hydrologic issues related to Clean Water Act's Total Maximum Daily Load (303d) process at Chickasaw. □ Represented CHIC and NPS on the Meridian Technical Review Panel. □ Prepared oral and written testimony and exhibits for a public conference on a mine application. □ Prepared comments on the Oklahoma Comprehensive Water Plan. □ Compiled and evaluated hydrologic data collected by the park and nearby mine. □ Prepared standard procedures for transducer operation in monitoring wells. □

Chiricahua National Monument (Arizona) Coordinated planning and installation of an ALERT precipitation gauge in the upper Bonita and Rhyolite Creeks watershed area with state and county early flood warning programs and park resource staff. □

Colorado National Monument (Colorado) Evaluated applications in Water Division 5 to determine effects of diversions on water rights. □ Prepared report summarizing water rights. □

Coronado National Memorial (Arizona) Conducted monitoring of groundwater level to study the adequacy of a new water supply well to meet park requirements. Completed the hydrogeologic analysis and submitted a report with recommendations to park staff. □ Conducted groundwater monitoring at several locations in the park, processed and reported data to park staff. □

Curecanti National Recreation Area (Colorado) Assisted with design and planning for construction of a new well at East Elk Creek. □ Evaluated applications in Water Division 4 to determine impacts of diversions on water rights. □

Devils Tower National Monument (Wyoming) Conducted analyses of groundwater level monitoring data. □ Consulted with park staff regarding completion of floodplain Statement of Findings. □

Dinosaur National Monument (Colorado, Utah) Evaluated applications in Water Division 6 to determine impacts of diversions on water rights. □ Provided leadership in the development of strategies for in-stream flow protection for the Yampa River. □ Provided leadership in the development and implementation of monitoring studies to evaluate near-record high flows on the Green and Yampa Rivers. □

Florissant Fossil Beds National Monument (Colorado) Assisted park staff with evaluation and planning for testing of Sawmill Trail Well. □ Evaluated applications in Water Division 1 to determine impacts of diversions on water rights. □ Obtained Ruling of Due Diligence for proposed water use from the Sawmill Trail Well. □

Fort Bowie National Historic Site (Arizona) Shepherded NPS new source public water supply permit application between contracting officer, contractor, and Arizona Department of Environmental Quality; permit was awarded August 2011. □



A commercial raft trip on the Colorado River, Grand Canyon National Park (Arizona). NPS/
MICHAEL QUINN

Conducted site review and developed water resource sections for proposed Willow Gulch mine road Environmental Assessment. ▫ Developed scope of work and shepherded contracting documents for Southwest Conservation Corps crew to implement erosion control treatments in upper Apache Spring watershed; worked with park staff to develop treatment plans and purchase supplies for project. ▫

Fort Davis National Historic Site (Texas)

Consulted with park staff and region regarding appropriate use of hydrologic models in assessing post-fire treatments. ▫

Fort Union National Monument (New Mexico)

Provided an assessment of the potential for natural gas exploration and hydrofracking to impact park resources. ▫ Published final Natural Resource Condition Assessment. ▫

Gila Cliff Dwellings National Monument (New Mexico)

Selected locations and installed crest stage gauges on the West Fork Gila River and in Cliff Dwellers Canyon; continued support of the West Fork Gila River stream gauge at the pedestrian bridge in the park. ▫

Glacier National Park (Montana)

Conducted a hydrogeological assessment for a new well for the Two Medicine water-supply system; provided advice during the construction and testing of a new well for the Fish Creek Campground; conducted a hydrogeological assessment for the Avalanche Creek Campground water-supply system. ▫ Developed objection policy for applications hydrologically connected to park streams under the Montana Compact. ▫ Reviewed applications and filed objections as necessary to protect park water rights. ▫ Submitted annual report as required by the Montana–United States, NPS Water Rights Compact. ▫

Glen Canyon National Recreation Area (Arizona, Utah) Surveyed springs in Iceberg Canyon for presence of nonnative fish

and native amphibians to determine feasibility and efficacy of treating ponded area in preparation for stocking native endangered bonytail; Glen Canyon is partnering with USGS and USFWS to implement project. ▫ Provided assistance to the NPS Land Resources Division to improve the GIS representation of the park boundary. ▫

Grand Canyon National Park (Arizona)

Removed nonnative fish from Bright Angel Creek by electrofishing, and operated and maintained fish weir to block upstream movement and remove nonnative trout; the project is funded by the Bureau of Reclamation and NPS and conducted in cooperation with the University of Missouri and Grand Canyon Trust. This multi-agency group is working together to restore the native fish community in Bright Angel Creek, with help from many volunteers. ▫ Translocated endangered humpback chub into Shinumo and Havasu creeks; assisted with planning, collection, transportation, and monitoring of humpback chub and fish community in Shinumo and Havasu creeks. ▫ Reviewed the DEIS for proposed mineral withdrawal near Grand Canyon National Park; provided comments to DOI staff. ▫

Grand Teton National Park (Wyoming)

Provided evaluation of well construction and testing at Signal Mountain. ▫ Began investigation of potential impacts of groundwater pumping on streamflow in Pilgrim Creek. ▫ Completed water rights amendment to change point of diversion associated with removal of a low head dam on Spread Creek. ▫ Developed protocols for review of water right activities on the Gros Ventre River. ▫ Prepared summary of Upper Snake River gauging stations and discharge data. ▫ Coordinated the quantification of in-stream flow rights with the USFWS, USFS, BOR, and State of Wyoming for the newly designated Snake Headwaters Wild and Scenic River. ▫ Participated in site visits to boat launch facilities on Snake River. Wrote geomorphic interpretation in combined report done by group. ▫



View of Little Bighorn River from Last Stand Hill, Little Bighorn Battlefield National Monument (Montana). NPS COLLECTION

Grant–Kohrs National Historic Site (Montana) Provided guidance to park on the operation of the Westside Ditch Parshall flume and Clark Fork River pump. □ Provided guidance and equipment to conduct discharge measurements. □

Great Sand Dunes National Park & Preserve (Colorado) Made three presentations to the May 2011 NRAG meeting, Colorado State University, and the San Luis Valley Geology and Hydrology Workshop. □ Provided oversight for data collection, compilation, and quarterly report preparation for 10 monitoring wells. □ Reviewed the Energy Zones proposed for Colorado in the BLM Solar Energy PEIS. □

Guadalupe Mountains National Park (Texas) Assembled and shipped new deployment cables for installation of groundwater sensors; processed groundwater data collected by park staff, updated spreadsheets, and sent results to park and Chihuahuan Desert Network program staff. □ Provided assessment of potential impact of discharge of brine from a desalination plant to the Salt Flats adjacent to the park. □ Continued preparation of a comprehensive assessment of water rights. □

Hovenweep National Monument (Colorado, Utah) Submitted annual water use report to Colorado. □

Little Bighorn Battlefield National Monument (Montana) Submitted annual report as required by the Montana–United States, NPS Water Rights Compact. □ Reviewed Basin 430 Claims and submitted objections as necessary. □ Advised on flood hazard for proposed new visitor center. □

Mesa Verde National Park (Colorado) Initiated wetlands restoration project to rehabilitate an abandoned sewage lagoon. □ Evaluated applications in Water Division 7 to determine impacts of diversions on water rights. □ Advised park staff on the monitoring of the Far View Terrace gasoline

groundwater plume and its cleanup under the Colorado Division of Oil and Public Safety spill remediation reimbursement program. Reviewed and provided comments to state regulatory agencies on Corrective Action Plan (CAP) modifications and semi-annual monitoring documents produced by LUST Program Responsible Party contractor. Past meetings of WRD staff with state Dept. of Labor and Employment (oil section) staff and representatives of ARA-MARK and contractor (Arcadis) have now resulted in a more aggressive and active cleanup approach and further CAP modifications by enhancing plume bioremediation through sulfate addition. This approach is currently being implemented. □ Continued to work with park staff, Denver Service Center contracting office, and PRP contractor (Arcadis) in determining effects (if any) of water pipeline installation “frac outs” on plume monitoring wells and best ways to evaluate any impacts over the course of implementation of the enhanced bioremediation CAP Mod. □

Montezuma Castle National Monument (Arizona) Designed, purchased, programmed, and installed a satellite telemetry system at the Beaver Creek stream gauge at the park; coordinated with NOAA and NWS to activate satellite services and web posting of the data stream from this station. □ Provided guidance to operate, maintain, and manage data for gauges on Beaver and Wet Beaver creeks. □ Quantified instream flow water rights and prepared draft reports to support instream flow applications for Beaver and Wet Beaver creeks. □ Monitored USGS investigation to determine source and flowpaths of groundwater in Montezuma Well. □ Provided cartographic support to the Water Rights Branch in mapping and calculating river mile points along Wet Beaver Creek. □

Natural Bridges National Monument (Utah) Natural Bridges water rights agreement signed in Salt Lake City, UT. □



The gypsum sand of White Sands National Monument (New Mexico). NPS/JAMES HARTE

Organ Pipe Cactus National Monument (Arizona) Assessed causes of pictograph deterioration at Wild Horse Tanks site, identified measures to reduce water-related impacts to the pictographs. Submitted trip report with management recommendations to park resource staff; the recommendations were subsequently acted on by the park. □

Pecos National Historical Park (New Mexico) Prepared water right applications for submission to New Mexico Office of the State Engineer. □

Pipe Spring National Monument (Arizona) Provided technical assistance for ongoing studies of geology and hydrogeology and causes of springflow reduction. □

Rocky Mountain National Park (Colorado) Assisted in planning and constructing new wells at Moraine Park. □ Assisted in reviewing and preparing water rights dockets. □ Evaluated applications in Water Division 1 as required to determine impacts of diversions on water rights. □ Imported the continuous multi-sonde water quality monitoring data collected for the Grand Ditch into Aquarius to serve as a springboard for additional analysis. □ Participated in a Rocky Mountain NP Resource Assessment Workshop to help the park plan near-term workload plans and priorities based on information from their recent NRCA and other sources of scientific data and expertise. □ Continued to support park (Grand Ditch EIS) and network (ROMN) water quality monitoring efforts through installation of water quality monitoring equipment at two sites on the Colorado River. This baseline data will be used in the park's alternatives assessment in selecting a restoration response. The water quality data from one of the sites is also being used by the ROMN to continue a network sentinel monitoring site that WRD assisted in establishing the previous year. □ Travelled to park and hiked area of study by CSU; the work consisted of mapping and dating of debris flows in the Grand Ditch area. □ Provided advice and

design information for the construction of a fence over the Colorado River; the fence needs to prevent animal entry but at the same time not become a screen for debris floating down river. □

Saguaro National Park (Arizona) Provided a groundwater monitoring sensor and deployment assembly to the park for installation in the Rincon Creek drainage. Identified and provided hardware and installation for initiation of monitoring at the Madrona Pack Base Well in Chiminea Creek. Data from these two wells will be used in the analysis of hydrological relationships between shallow and deep aquifers in the Rincon Creek watershed. □

Southeast Arizona Parks Contributed hydrology and water quality sections and supervised agreement execution for the Chiricahua NM, Coronado NM, and Fort Bowie NHS Natural Resource Condition Assessment. □

Tonto National Monument (Arizona) Provided technical support to ongoing study of soil moisture dynamics and groundwater percolation at the unique Hidden Ridge woodland site. □

Tuzigoot National Monument (Arizona) Provided technical review and comments on the Environmental Assessment for the Tavasci Marsh Management and Habitat Enhancement Plan. □

White Sands National Monument (New Mexico) Provided technical assistance in the planning and installation of instrumentation for monitoring water levels at Lake Lucero. □ Provided technical assistance in evaluating hydrogeology and water resources of the park. □ Reviewed the Energy Zones proposed for New Mexico in the BLM Solar Energy PEIS. □ Prepared Scopes of Work for Tularosa Basin water rights inventory, the construction of two groundwater monitoring wells, and a hydrogeologic investigation of the Jarilla Fault. □



Visitor at Artist Point overlooking the Grand Canyon of the Yellowstone, Yellowstone National Park (Montana, Wyoming, Idaho). NPS/JIM GRAMANN

Yellowstone National Park (Wyoming, Montana, Idaho) Reviewed applications and filed objections as necessary to protect park water rights. ▫ Attended Yellowstone Groundwater Area–Technical Oversight Committee Meetings. ▫ Submitted annual reports as required by the Montana–United States, NPS Water Rights Compact. ▫ Reviewed abstracts for water right claims in Idaho. ▫ Modified NPSTORET to better accommodate and report fisheries data and provided troubleshooting for network connectivity issues. ▫ Generated time-series plots of 15-minute turbidity and precipitation data for Mammoth Crystal Springs near Sylvan Pass. ▫ Consulted with park staff in the closure of monitoring sites on Sylvan Pass and the award of a final USGS contract to dismantle monitoring sites and produce a final report of impacts from gravel mining operations on Sylvan Pass. ▫ Coordinated with park staff and MT DEQ on various monitoring activities at the McLaren Tailings site during repository build-out and the initiation of tailings removal; consulted with state on the installation of new monitoring wells to ensure and confirm that groundwater fluctuations posed no potential impacts to tailings in the revised repository design calling for increased repository capacity and deeper tailings placement. ▫ Worked with park and network staff to complete interagency agreements and obtain a continuation of funding of the park gauge on Soda Butte Creek operated by the USGS Montana Science Center; this ensured monitoring of turbidity, specific conductance, and event sampling (ISCO, Inc.) during the McLaren tailings removal and site remediation. FY 2011 was a transition year from baseline monitoring of key water quality parameters (e.g. specific conductance and turbidity) to one of monitoring during actual remediation (initial tailings removal conducted by state) and any loading from the McLaren Tailings site that may occur should a rainfall/runoff event elevate metals in Soda Butte Creek that would be measurable at the park boundary. ▫ Participated in the continued monitoring of USFS cleanup

of the New World Mining district; reviewed document for USFS of reclamation activities and surface water and groundwater monitoring plans designed to achieve restoration goals as discussed in the Final Water Quality Compliance Report for New World (January 2010). ▫

Northern Colorado Plateau Network

Conducted a training for Arches and Northern Colorado Plateau Network staff regarding detailed survey methods and riparian monitoring techniques. ▫ Provided advice and recommendations on the use of special characters and bulk loading station visit pictures in NPSTORET. ▫

Rocky Mountain Network

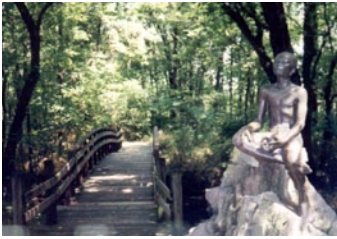
Provided support in installing and configuring NPSTORET. ▫

Southern Colorado Plateau Network

Provided support and recommendations on mapping the network’s water quality data collection to the NPSTORET schema, importing USGS National Water Quality Laboratory data, and entering state water quality standards and criteria. ▫

MIDWEST REGION

Midwest Region Performed GPRA duties for two land health goals. ▫ Prepared briefing document related to nutrient management issues in the Upper Mississippi River Basin for use by MWR Director at the 2011 MNRG meeting. ▫ Coordinated project plans, oversaw project activities, and helped develop contracts, agreements, and purchasing documents for many Great Lakes Restoration Initiative (GLRI) Nearshore Health projects, totaling more than \$2M and affecting all six Great Lakes parks. ▫ Helped coordinate GLRI project “Comprehensive Marine Assessments: Benthic Habitat Mapping”, particularly during summer 2011 mapping activities at SLBE. ▫



Statue of Carver as a boy, George Washington Carver National Monument. NPS/CHRISTOPHER LIGHT

Secured investigator, prepared agreement documents, and made plans for data analysis related to GLRI project “Comprehensive Marine Assessments: Nearshore Ecological Survey.” □ Reviewed work plans, contracts, and draft products related to several GLRI projects including “Implement Recommendations from Watershed Condition Assessments: Develop Spill Response Plans” and “Implement Recommendations from Watershed Condition Assessments: Inventory and Ecological Survey of Coastal Rock Pools.” □ Revised agreement document and assisted with field sampling and analytical work related to GLRI projects “Research Nearshore Lake Michigan Changes: Paleolimnological Study” and “Research Nearshore Lake Michigan Changes: Intensive Food Web Study.” □ Assisted with developing purchase materials for the GLRI project “Research Nearshore Lake Michigan Changes: Purchase Nearshore Monitoring Buoy.” □ Developed a successful proposal to the NPS Air Resources Division to investigate nitrogen deposition histories for Great Lakes Network lakes, using archived sediment core material; prepared related agreement documents. □ Served as one of two NPS points of contact for the Gulf Hypoxia Task Force Coordinating Committee, and provided NPS information for the Annual Reports and Operating Plans. □ Worked with NPS staff, Minnesota Department of Natural Resources staff, and Michigan Technological University to coordinate data analysis and reporting aspects of the multi-park spiny water flea project. □ Supervised term Hydrographic Surveyor that was hired for Great Lakes Restoration Initiative (GLRI) project to map benthic habitat and restoration project sites. □ Worked with parks APIS, GRPO, ISRO, PIRO, and SLBE to further develop projects for Coastal and Fluvial Restoration as part of Great Lake Restoration Initiative. □ Represented Midwest Region for Ocean and Coastal Stewardship program. □ Participated in classroom and underwater training to renew NPS scuba certification. □ Represented NPS at Great Lakes Fishery Commission Lake Superior Technical Committee meetings.

□ Initiated coordination with WRD staff and USFWS Sea Lamprey Control office to develop plans for native lamprey surveys as part of GLRI project in 2012. □ Worked with the EPA to collect data in six Great Lakes parks using National Coastal Assessment protocols (funded by Great Lakes Restoration Initiative). □

Agate Fossil Beds National Monument (Nebraska) Conducted analyses of groundwater monitoring data. □

Buffalo National River (Arkansas) Coordinated with the USGS and state stewards to update the National Hydrography Dataset within the park. □

Cuyahoga Valley National Park (Ohio) Reviewed the results of additional sampling requested by WRD staff to ensure that appropriate due diligence was performed prior to land acquisition by NPS where potential existed for historic dumping of hazardous wastes. Further sampling recommendations were made after completing reviews of Phase I and Phase II site pre-acquisition assessment reports, and these results were favorable toward continuing the acquisition process. □

George Washington Carver National Monument (Missouri) Re-uploaded phosphorus, nitrogen, and coliform data to STORET collected by the Newton County Health Department from 2005–2007 to more accurately portray the results. □ Published final Natural Resource Condition Assessment. □

Grand Portage National Monument (Minnesota) Conducted simple hydraulic modeling assessment of proposed road crossing and provided advice on low-water crossing design. □

Hot Springs National Park (Arkansas) Served as technical expert in Foundations Report workshop, consulted on hydrology related issues. □



Knife River just above the village where Sacagewea lived in 1803, Knife River Indian Villages National Historic Site (North Dakota). NPS/CHRISTOPHER LIGHT

Indiana Dunes National Lakeshore (Indiana) Worked with staff to facilitate a re-do of the Natural Resource Condition Assessment, using funding from Great Lakes Restoration Initiative (GLRI) Project 90; provided review comments for draft full report. ▫ Participated in conference calls and reviewed key background documents for the Indiana Dunes Shoreline Management Plan (e.g., shoreline change analysis and ecological condition analysis) and provided detailed comments on two draft versions of the related EIS. ▫ Reviewed and provided comments on USGS technical report prepared for Indiana Dunes. ▫ Provided baseline water quality data inventory and analysis report data and advised on its use and interpretation. ▫ Reviewed Remedial Investigation documents and worked closely with park staff to provide technical assistance and guidance to management in their dealings with EPA and Responsible Parties. Reviewed and provided comments on the site Human Health Risk Assessment and the site Ecological Risk Assessment to ensure that the Pines CERCLA Remedial Investigation would provide credible data that could better be used to evaluate threats and protect park resources. ▫ Provided a Clean Water Act review as it applied to reissue of a NPDES permit to a local steel mill discharging to a park stream, and advised the park on any technical grounds or basis for challenging the permit renewal under state statutes. ▫ Provided review of the Baseline Environmental Risk Assessment (BERA) for the Bailly Generating Plant RCRA site. ▫

Isle Royale National Park (Michigan) Provided technical and logistical assistance to university cooperators conducting the Isle Royale/Acadia nitrogen critical loads project. ▫ Facilitated the collection of additional sediment cores from two Isle Royale lakes. ▫ Provided technical input related to the selection of ballast water treatment systems for the Ranger III. ▫ Participated in conference calls and assisted superintendent with various ballast water issues. ▫ Worked with staff to finalize revised northern pike regulations for inland lakes of Isle Royale. ▫

Provided opinion and management recommendations regarding response to a potential outbreak of Viral Hemorrhagic Septicemia (a fish disease). ▫ Worked with USFWS and Isle Royale to develop benthic mapping plan for Isle Royale. ▫ Provided comments on document created by superintendent addressed to Michigan Senate Outdoor Recreation and Tourism Committee regarding a bill to amend the state's Natural Resources and Environmental Protection Act. ▫

Knife River Indian Villages National Historic Site (North Dakota) Investigated extent and implications of river erosion at Knife River, developed and implemented an erosion monitoring plan for park staff, and made recommendations to park management on watershed management solutions. ▫ Reviewed and commented on technical memo regarding streambank erosion. ▫

Mississippi National River and Recreation Area (Minnesota) Continued drafting final report on spatial, seasonal, and long-term water quality trends in and near MISS. ▫ Contacted Dr. Robert Hirsch of USGS and plan to use his newly developed trend analysis methods on the MISS data set; incorporated some aspects of this approach into recent presentations for MISS. ▫ Co-presented "Mississippi National River and Recreation Area water quality: Assessing past and monitoring future changes" at the 2011 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites. ▫ Co-presented "The Mississippi River: Water quality trends over 30 years" at the 2011 Mississippi River Forum. ▫ Participated in conference calls about management recommendations for controlling Asian carp migrations into MISS and SACN. ▫

Missouri National Recreational River (Nebraska, South Dakota) Facilitated the Outstandingly Remarkable Values workshop for the Missouri River. ▫ Provided advice to park staff about monitoring constructed sand bars in Missouri River; participated in conference call with other agencies. ▫



Lake Michigan overlook in winter at Sleeping Bear Dunes National Lakeshore (Michigan). NPS/KERRY KELLY

Niobrara National Scenic River (Nebraska, South Dakota) Provided advice to support hydrologic, economic, and fish and wildlife studies to support state-based in-stream flows on the Niobrara River. □ Facilitated the Outstandingly Remarkable Values workshop for the Niobrara River. □

Ozark National Scenic Riverways (Missouri) Investigated potential impacts from a proposed large-scale dairy within the recharge area of Big Spring. □ Uploaded results from the park's long-term water quality monitoring program through 2010 from NPSTORET to STORET. □ Uploaded water quality data to STORET through 2010 from the park's ongoing monitoring of 21 springs. □ Uploaded water quality data to STORET through 2010 from the park's ongoing monitoring of 18 tributaries of the Jacks Fork and Current Rivers. □ Uploaded water quality data to STORET collected by park staff at four locations from 2003–2009 to assess bacteriological impacts associated with weekend river recreational use. □

Pictured Rocks National Lakeshore (Michigan) Provided detailed comments on draft and final reports for the lakeshore vernal pools project, including the biological survey aspects funded by GLRI Project 90. □ Coordinated field sampling for native mussel and fish host investigations. Purchased fisheries field equipment for park's use on project. □ Coordinated with USFWS on placement of additional passive integrated transponder (PIT) antenna at Miner's Creek for brook trout monitoring; assisted USFWS with PIT maintenance. □

Saint Croix National Scenic Riverway (Minnesota, Wisconsin) Provided field and analytical assistance for USGS zebra mussel effects study and climate change effects studies. □ Provided technical assistance related to nuisance algal issues near the Apple River mouth. □ Participated in St. Croix Basin Water Resources Planning Team activities, particularly those of the Monitoring and Assessment Subcommittee. □ Provided

Wild and Scenic River program guidance regarding the St. Croix River Crossing Project. □ Presented “The other nutrient: Nitrogen in Lake St. Croix water and biota” at the October 2010 St. Croix Research Rendezvous. □ Provided comments to park regarding implementation of large wood cover project proposed by state of Wisconsin. □ Began investigation of potential impact of a proposed gravel mining operation adjacent to the park. □

Sleeping Bear Dunes National Lakeshore (Michigan) Helped plan, conduct, and coordinate a large suite of multi-agency studies in SLBE's Lake Michigan waters through GLRI Project 9. □ Provided technical assistance related to year three of the NRPP–NRM botulism project. □ Published “Links between type E botulism outbreaks, lake levels, and surface water temperatures in Lake Michigan, 1963–2008” in Journal of Great Lakes Research. □ Prepared a fact sheet addressing GLRI Project 91 activities entitled “Lake Michigan ecosystem research: 2010 field studies at Sleeping Bear Dunes National Lakeshore.” □ Co-presented “Are we losing our Great Lakes?” at the St. Croix Watershed Research Station spring 2011 Friends Event. □ Contributed to two presentations (“Investigating botulism mechanisms in the Lake Michigan nearshore: Food web structure and oxygen dynamics” and “Botulism type E toxin in northern Lake Michigan”) at the 2011 meeting of the International Association for Great Lakes Research. □ Contributed to an interagency presentation (“Botulism type E toxin in northern Lake Michigan”) at the 2011 State of Lake Michigan Conference. □ Worked with regional aquatic ecologist to assist park with botulism investigations. □ Represented NPS at Glen Lake–Crystal River Technical Committee meetings. □ Provided guidance regarding the Glen Lake Dam structure and gauge installation. □ Obtained bathymetry and historical aerial imagery and created GIS data of historic shorelines in support of dock relocation analysis on North and South Manitou Islands. □



Purple and yellow prairie coneflowers in bloom at Theodore Roosevelt National Park (North Dakota). NPS COLLECTION

Evaluated and reported on the results of nitrate sampling of park springs in conjunction with a CSU Research Associate after conducting field sampling in August 2010; results indicated that nitrate concentrations were insufficiently elevated in this sampling event to link to the operation of a nearby pig farm's disposal activities. This WRD support alleviated the park's immediate concerns with nutrient degradation of their Aral Spring resource. □

Theodore Roosevelt National Park (North Dakota) Served as NRSS Project Coordinator for Climate Change Response project. □ Initiated a USGS study to determine drought stress on cottonwood trees on the Little Missouri River. □ Collected survey data on the Little Missouri River. □ Coordinated with the USGS and state stewards to update the National Hydrography Dataset in two sub-basins covering the park. □

Voyageurs National Park (Minnesota) Helped plan for collection and mercury analysis of additional native crayfish and invasive rusty crayfish from a recently invaded Voyageurs site. □

Wilson's Creek National Battlefield (Missouri) Re-uploaded to STORET miscellaneous benthic macroinvertebrate data collected by park employees as part of a discontinued monitoring program from 1992–1993 in order to correct issues in a previous upload. □

Wind Cave National Park (South Dakota) Reviewed and commented on draft microbiology report. □ Reviewed and summarized discharge measurements collected at Beaver Creek Springs. □ Served as NRSS project coordinator for climate change response project. □

Great Lakes Network Uploaded all water quality data through 2010 from NPSTORET to STORET for eight network parks. □

NATIONAL CAPITAL REGION

National Capital Region The hiring process for an NCR–NER shared Aquatic Ecologist position was completed with the new employee entering on duty on 9 October 2011. Equipment and computers were purchased to establish the aquatic ecology program. Each region will contribute \$25,000 or more to the position, augmenting the WRD base by \$80,000. □ Provided support and advice in the use of NPSTORET, troubleshooting data and coding issues, and retrieving data from the STORET Data Warehouse. □

Rock Creek Park (District of Columbia) Provided hydrologic and hydraulic support to National Capitol Region related to the recent compliance and erosion problems associated with a road-widening project in the park. □

NORTHEAST REGION

Northeast Region Provided input to Federal Chesapeake Bay Watershed Implementation Plan guide. Evaluated list and provided compliance contacts for National Parks within the watershed. Identified training program for National Park staff that will be implemented to assist with Total Maximum Daily Loads (TMDL) compliance in November 2011. □ Completed three-month work detail as Acting Regional Chief, Natural Resource Stewardship and Science. □

Acadia National Park (Maine) Assisted with development and submission of a proposal to develop a hydrologic/hydraulic model for culvert development and wetlands protection at Great Meadows/Sieur du Mont. □ Completed additional analyses of long-term lake water and air quality monitoring data with assistance of the NCBN Quantitative Ecologist. Worked with University of Maine at Orono scientists to examine link between declining water clarity in lakes and changes in sulfur and



Band of horses in a salt marsh at Assateague Island National Seashore (Maryland, Virginia). NPS COLLECTION

dissolved organic carbon. Presented resulting information at The 2011 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites and the International Northeast Air Quality Committee meetings. □ Reviewed NPS-funded research presented by University of Maine as a Masters thesis entitled Effects of Increasing Atmospheric Nitrogen and Dissolved Organic Matter on Phytoplankton in Boreal Lakes with Differing Nutrient Limitation Patterns, by Carmen Daggett. □ Provided written review and consultation for water quality report (2006–2009). □ Assisted park with developing specifications for large scale project to be conducted by USGS. □

Antietam National Battlefield (Maryland) Published final Natural Resource Condition Assessment. □

Appalachian National Scenic Trail (Maine to Georgia) Organized first year progress review of the Appalachian Trail Atmospheric Deposition Study; this study includes more than ten independent researchers with various affiliations and examines effects and potential for recovery of air, soil, water, and vegetation along the entire AT. The study serves as an example for using the Trail as a MEGA-transect to evaluate environmental change across a sensitive corridor that includes most of the eastern states. Collected water and soil samples to support this research. □

Appomattox Court House National Historical Park (Virginia) Provided a written review of the Natural Resource Condition Assessment. □

Assateague Island National Seashore (Maryland, Virginia) Assisted in developing groundwater monitoring protocol. □ Partnered with Assateague Island National Seashore and the state of Maryland to develop a benthic habitat map. □ Uploaded water quality data to STORET from 2003–2006 pilot tests of the Northeast Coastal and Barrier Network’s protocol for monitoring estuarine nutrient enrichment. □

Published final Natural Resource Condition Assessment. □

Blue Ridge Parkway (North Carolina, Virginia) Advised and assisted park in the evaluation of Responsible Party contractor proposed site characterization and mitigation actions related to the Roanoke Valley Resource Authority’s landfill discharges to surface waters and groundwater plume under the park. Consulted and coordinated with park staff on monitoring results from the placement of monitoring well pairs on the parkway and the construction of a remedial water treatment system to address surface water impacts from landfill discharges to surface water. □ Reviewed and provided comments on the Peaks of Otter Cultural Landscape Report. □ Reviewed and provided comments on the Humpback Rocks Cultural Landscape Report. □ Reviewed and provided comments for General Management Plan. □

Boston Harbor Islands National Recreation Area (Massachusetts) Evaluated wetland condition and potential for restoration with NER team; assisted with trip report to describe findings. □ Developed SOPs for intertidal use and protection. □

Cape Cod National Seashore (Massachusetts) Provided review of municipal water supply projects at Wellfleet and Eastham. □ Provided continuing technical assistance for the Herring River restoration project; provided analyses and review of hydrologic monitoring data. □ Funded Woods Hole Oceanographic Institution to investigate the dynamics of anthropogenic nutrient discharges and harmful algal blooms, and to produce tools to assist park managers in developing policy and management for nutrient control and remediation. □

Colonial National Historic Park (Virginia) Contributed technical knowledge on ecosystem ecology and shoreline management via site visit as well as review and comment on COLO Draft York River Shoreline Environmental Assessment. □



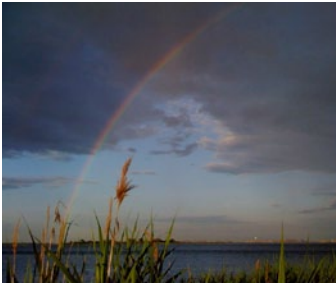
Bald eagle chick in a nest overlooking the Delaware River, Upper Delaware Scenic and Recreational River (New York, Pennsylvania) NPS/SCOTT VAN ARSDALE

Uploaded water quality data to STORET from 2003–2006 pilot tests of the Northeast Coastal and Barrier Network’s protocol for monitoring estuarine nutrient enrichment. ▫

Delaware River (Upper Delaware National Scenic and Recreational River, Delaware Water Gap National Recreation Area, Lower Delaware National Wild and Scenic River) (New Jersey, New York, Pennsylvania) Represented NPS at the Subcommittee for Ecological Flows meeting to evaluate aquatic resource needs for the river. Provided written review of PA/NY recommendations for flows to support aquatic life (primarily non-native trout). Lobbied for inclusion of native populations dependent on water resources of the Delaware River. ▫ Organized discussion of aquatic biota management at The 2011 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites; decided to identify Wild and Scenic River values to focus NPS energy on the most important resources in the basin. Identified opportunity to use Denver Service Center expertise for establishing Outstandingly Remarkable Values along the Delaware River and within discrete park units; this effort will begin spring 2012. ▫ Developed proposal with DEWA and State University of New York College of Environmental Science and Forestry as a CESU partner to evaluate historic flows along the river pre-forest harvesting, pre-dam construction, and modern day. ▫ Provided review and written comment on proposed shale gas production regulations and environmental impact assessments for the Delaware River Basin Commission, NY, and PA. ▫ Participated in a federal implementation team (DBFIT) to provide a forum for federal stakeholders within the Delaware Basin to discuss management issues and present results in a unified manner through the federal representative; initiation of a USGS cumulative impact assessment of shale gas development also resulted from this workshop. ▫ Coordinated NPS WaterSMART initiative comments from park units along the Delaware River; flow needs, water quality, and establishment

of the basin water budget were identified as focal study issues. ▫ Worked with DEWA, UPDE, and USGS to develop a funded proposal to train NPS staff in placement and operation of water quality recorders; these units have been deployed to establish baseline water quality and assess changes associated with basin development. ▫ Provided written comment for determination of direct and adverse effect on Wild and Scenic River system due to proposed stream alteration at Callicoon Creek. ▫

Fire Island National Seashore (New York) Assisted with preparation of a proposal to examine presence of endocrine-disrupting compounds in park groundwater associated with Fire Island septic systems. Identified and coordinated alternate funding from park, region, and USGS sources to begin study with a pilot project. ▫ Trained and coordinated 18 citizen scientists who volunteered 175 hours to complete 40 horseshoe crab spawning surveys and to tag 37 horseshoe crabs for the NRPP-funded project “Assessment of Spawning Horseshoe Crabs within Mid-Atlantic Coastal NPS Units.” ▫ Conducted monthly nekton sampling (April–October) and biannual benthic sampling for NRPP-funded demonstration project for the restoration of bayside sediment transport at Sailors Haven. ▫ Developed and conducted interpretive program “Sampling Like a Scientist” for Junior Ranger Day program. ▫ Developed information on recreational fishery issues to include in the General Management Plan process. ▫ Uploaded water quality data to STORET from 2003–2006 pilot tests of the Northeast Coastal and Barrier Network’s protocol for monitoring estuarine nutrient enrichment. ▫ Uploaded water quality data from seven environmental studies conducted during 1999–2002 to document baseline characteristics in potential offshore sand source or “borrow” areas from a U.S. Army Corps of Engineers database to STORET. ▫ Uploaded benthic macroinvertebrate data to STORET collected in 1998 by the U.S. Army Corps of Engineers to determine impacts of beach nourishment. ▫



Rainbow over Jamaica Bay, Gateway National Recreation Area (New York, New Jersey). NPS/
JOHN LINCOLN HALLOWELL

Fort Necessity National Battlefield (Pennsylvania) Assisted with evaluation of potential impacts from shale gas assessments prescribed for privately owned subsurface resources at request of park staff. □

Gateway National Recreation Area (New Jersey, New York) Implemented ecological monitoring to evaluate restoration of 69 acres of salt marsh at Elders Point East and West, Jamaica Bay. Monitoring parameters include nekton, vegetation, and avian species composition and abundance; above- and below-ground primary production; and macrobenthic infauna and epifauna. □ Conducted baseline monitoring of nekton and vegetation communities at Yellow Bar, Rulers Bar, and Black Wall marshes, Jamaica Bay. Restoration of 80 acres of salt marsh will be completed at these marshes in FY 2012. □ Implemented National Fish and Wildlife Foundation funded project to determine if nitrogen loading has altered marsh function and sediment accretion in Jamaica Bay. □ Contributed technical knowledge on ecosystem ecology and restoration as a member of the multi-agency Planning and Development Team to develop salt marsh restoration design plans for Yellow Bar, Rulers Bar, and Black Wall marsh islands, Jamaica Bay. □ Received Coastal America Spirit Award for exceptional partnering to protect and conserve coastal ecosystems; this award recognized efforts of the multi-agency partnership that worked cooperatively to restore 69 acres (28 ha) of salt marsh at Elders Point East and Elders Point West, Jamaica Bay Unit. □ Authored “Building partnerships to restore an urban marsh ecosystem at Gateway National Recreation Area” for publication in *Park Science*. □ Presented “Jamaica Bay Marsh Island Loss and Restoration” for Herbert Johnson Lecture Series, Brooklyn, NY. □ Uploaded water quality data to STORET from 2003–2006 pilot tests of the Northeast Coastal and Barrier Network’s protocol for monitoring estuarine nutrient enrichment. □

Gettysburg National Military Park (Pennsylvania) Coordinated with the USGS and state stewards to update the National Hydrography Dataset within the park. □

Hopewell Furnace National Historic Site (Pennsylvania) Provided written and verbal reviews of Corps of Engineers hydrologic and hydraulic models designed to evaluate alternatives to reduce flooding of park buildings. □ Provided review of engineering study being conducted by the Corps of creek that runs through park; creek has been manipulated and has a small bridge crossing which complicates the analysis. □

Marsh–Billings–Rockefeller National Historical Park (Vermont) Analyzed discharge records under development for The Pogue; provided comment identifying discrepancies with flow data. □

Morristown National Historical Park (New Jersey) Provided written review of headwater flow and water quality report. □

National Parks of New York Harbor (New Jersey, New York) Contributed technical knowledge on ecosystem ecology and restoration via participation in the National Parks of New York Harbor: A Strategy to Become America’s Premier Urban National Park Planning Charette. □ Worked cooperatively with National Parks of New York Harbor Education Center on a Youth-in-Park application and mentored one YIP participant in July and August 2011. □

Petersburg National Battlefield (Virginia) Produced trip report describing process for evaluating flow changes within park streams potentially impacted by development adjacent to park lands. □

Richmond National Battlefield Park (Virginia) Provided verbal and written assistance with production of a proposal to evaluate stream impairment due to *E. coli* levels. Proposal submitted to USGS/NPS funding source. □



Eel Creek seen from the Sagamore Hill footbridge, Sagamore Hill National Historic Site (New York). NPS COLLECTION

Provided written review of park (2001–2011) water quality report. □ Provided written review of Natural Resource Condition Assessment. □ Assessment of slope stability at Drewry's Bluff. □

Roosevelt–Vanderbilt National Historic Sites (New York) Reviewed Natural Resource Condition Assessment. □

Sagamore Hill National Historic Site (New York) Assisted University of Rhode Island CESU cooperator in presenting a horseshoe crab interpretive program. □

Salem Maritime National Historic Site (Massachusetts) Continued to work with the park and NRSS Environmental Quality Specialist on Derby Wharf Work Plan. □

Saugus Iron Works National Historic Site (Massachusetts) Funded project to monitor *E. coli* in the Saugus River. □

Shenandoah National Park (Virginia) Provided review and comments on the Shenandoah Watershed Study Monitoring Protocol Narrative and SOPs. □ Provided support to the University of Virginia and the USGS on water quality and fisheries-related databases for the park. □

Upper Delaware Scenic and Recreational River (New York, Pennsylvania) Continued to monitor shale gas plays throughout the country and in particular the effects that their development may have on park lands in the northeast where the activity in the expansive Marcellus Shale gas play surrounding UPDE is increasing. Coordinated with GRD staff to support parks in the region in the review and comment on multiple versions and revisions to proposed regulations of the Delaware River Basin Commission and New York State Department of Environmental Protection (Draft & Final Revised New York State Supplemental Generic Environmental Impact Statement) governing gas development. Advised NPS staff on the new threats posed to parks from

the greater infrastructure, water resource demands, and waste disposal issues unique to shale gas plays and the challenges parks will face from this new type of energy development near park boundaries and within their shared watersheds. Participated in EPA Hydraulic Fracturing Experts Workshop on Fate and Transport of fracking fluids, attended a Marcellus Shale Water Management conference and a University of Wyoming Forum addressing water demands and related resource risks posed by hydraulic fracturing. □ Contacted several state oil and gas commission representatives/regulatory bodies, BLM officials, industry representatives, and others to determine status of oil and gas well design measures taken in controlling stray gas migration and if standard well designs are adequate in controlling stray gas migration potential impacts to drinking water supplies. □

Valley Forge National Historical Park (Pennsylvania) Provided written comment on water resource stewardship strategies for planning. □ Provided written review of Natural Resource Condition Assessment. □

Mid–Atlantic Network Provided assistance and recommendations on the use of analytical groups in NPSTORET. □

PACIFIC WEST REGION

Pacific West Region Provided technical assistance for Natural Resource Managers in PWR for reviewing and improving proposals seeking funding for ecological restoration and monitoring projects. □ With Lassen Volcanic Ecologist and Planner, drafted PWR Resource Stewardship Strategy Lessons Learned document. □ Co-taught a Bureau of Land Management class entitled Measuring and Monitoring Plant Populations to increase the quality of government vegetation restoration and monitoring projects in the PWR. □ Served as NPS liaison to National Ocean Policy planning team for water quality and coastal land management practices. □



A salt pool at Badwater, Death Valley National Park (California, Nevada). NPS/ALAN VAN VALKENBURG

With interagency government team, facilitated by USFS Regional Hydrologist, co-authored recommendations to California State Water Plan Update regarding protection of wet meadow habitats. □ With interdisciplinary NPS team, co-drafted cave monitoring framework for the national Inventory and Monitoring Program. □ Prepared and filed Reports of Licensee and Statements of Water Diversion and Use for triennial filings for Death Valley NP, Mojave NP, Whiskeytown NRA, Redwoods NP, Pinnacles NM, Lassen Volcanic NP, and Sequoia and Kings Canyon NPs. □

Cabrillo National Monument (California) Uploaded to STORET relevant fish tissue data collected during 1990, 1993, and 2000 by the California State Water Resources Control Board's Toxic Substances Monitoring Program. □ Uploaded to STORET bacteriological data collected during 2001–2006 from thirteen beaches near the park by the San Diego Chapter of the Surfrider Foundation–Blue Water Task Force. □

Channel Islands National Park (California) Co-led project to design Prisoners Harbor Coastal Lagoon Restoration Project to restore degraded wetland on Santa Cruz Island; project to benefit migratory birds and archeological resources. In FY 2011 completed needed permits, drafted monitoring plan, completed contracting for earthmoving and plant grow-out, completed proposals seeking additional funding; project to be completed FY 2012. □ Completed final project design drawings and participated in excavation for restoration of Prisoners Harbor coastal wetland. □ Completed initial geodetic monumentation work; located and occupied several historic benchmarks with survey-grade GPS to establish precise locations for tidal benchmarks that will facilitate sea level monitoring. □ Uploaded to STORET the 1998 data from the multi-agency Southern California Coastal Bight Project collected near the park. □

Crater Lake National Park (Oregon) Completed draft 2008 Seepage Investigation Report for Annie Creek. □

Death Valley National Park (California) Participated in Amargosa Desert Managers Group meetings, an interagency work group established to discuss water resource concerns in the Amargosa Desert basin—including Devils Hole, a detached unit of Death Valley National Park. □ Reviewed applications and filed objections as necessary to protect park water rights. □ Compiled and archived data from nine groundwater stations in the Furnace Creek Wash area. □ Researched historic Water Master reports and updated historic pumping records for Ash Meadows. □ Compared pumping records and water level observations to USGS regional groundwater flow model simulations. □ Participated in biannual Amargosa Coordination Meetings and coordinated with federal agencies within the Amargosa Desert on solar energy development projects, land disposal issues, and the BLM Las Vegas proposed revision to the RMP. □ Prepared agreement for University of Colorado to develop an earthquake catalog for Devils Hole.

Devils Postpile National Monument (California) NPS Natural Resource Specialist for the joint NPS/USFS General Management Plan team. Team developed management alternatives to protect natural and cultural resources while providing appropriate visitor experiences. Completed floodplain analysis for developed areas and campgrounds in the planning area. Completed “Affected Environment” chapter of EIS in FY 2011. Draft GMP (tentatively) to be released for public review in FY 2012. □ NPS Natural Resource Specialist advisor for the park: assisted park with monitoring invasive plant species in high-value wet meadow habitats, reviewed the draft Natural Resource Condition Assessment, represented the park to the Sierra Nevada Network, and initiated work on a Status of Knowledge inventory of Natural Resource scholarly information. □



June in the high country of Great Basin National Park (Nevada).
NPS/BRYAN PETRYL

Conducted literature search regarding hydrogeologic studies in and adjacent to the park. □ Conducted field reconnaissance of DEPO and Mammoth Mountain area to evaluate water resources, the hydrogeologic setting, and evidence of groundwater–surface water interactions. □ Provided comments for the draft DEPO Natural Resource Condition Assessment. □ Conducted flood-plain analyses in support of on-going General Management Plan. □

Golden Gate National Recreation Area (California) Prepared discharge estimates for Denniston and Saint Vicente creeks at Golden Gate. □

Grand Canyon–Parashant National Monument (Arizona) Provided technical oversight on the implementation of a phased reconnaissance-level study conducted by the USGS to evaluate the water source of Tassi Spring and Pakoon Spring. □

Great Basin National Park (Nevada) Assisted WRD, Great Basin National Park, and Lake Mead National Recreation Area in developing cooperating agency comments to the administrative draft EIS and the draft EIS for the Clark, Lincoln, and White Pine counties groundwater development pipeline project. □ Assisted the WRD in implementing an interagency-supported field program near Great Basin to characterize the potential for impacts to surface water and groundwater resources in and around the park from proposed groundwater development in Snake Valley, Nevada. □ Represented NPS interests on an interagency, hydrologic technical review panel for the stipulated agreement to monitor, manage, and mitigate potential impacts from groundwater withdrawals in Spring Valley, Nevada. □ Reviewed applications and filed objections as necessary to protect park water rights. □ Continued agreement to continuously monitor discharge at Lehman Creek. □ Managed ongoing project by USGS and

the University of Nevada, Reno, to evaluate basin-fill aquifers in Snake Valley, including drilling, sampling, and aquifer testing of two wells southeast of the park, one in the basin-fill aquifer and one in the carbonate-rock aquifer. □ Managed and participated in eight presentations at the annual conference of the Nevada Water Resources Association and at public meetings in Ely and Baker, NV. □ Completed and submitted a statement of purpose, need, and proposed action for hydrogeologic research within GRBA, including the completion of an Environmental Assessment. □ NPS hydrology technical representative on the Spring Valley Stipulated Agreement for withdrawal of NPS protests to Southern Nevada Water Authority (SNWA) water-rights applications. □ Coordinated with SNWA and USGS/UNR on the drilling and installation of two new monitoring wells, and water quality sampling from 35 to 40 selected streams, springs, and wells. □ Coordinated with U.S. Forest Service (USFS) to implement a comprehensive monitoring network. □ Completed a USGS project that published the Snake Valley numerical groundwater flow model to simulate proposed groundwater withdrawals in accordance with pending water rights applications. □ Completed a USGS project that published the results of AMT geophysical surveys in Snake Valley to evaluate range-front faults and their role in connectivity of aquifers. □ Conducted a dye-tracing study to evaluate groundwater flow paths and connectivity of aquifers in the vicinity of the Baker Creek cave system within and adjacent to the park. □ Reviewed regional numerical groundwater flow model of eastern Nevada and western Utah to evaluate the threat of proposed groundwater development. □ Evaluated groundwater models and administrative drafts of the Clark, Lincoln, and White Pine counties Groundwater Development EIS and coordinated with the BLM to resolve NPS concerns; briefed the DOI on NPS concerns. □ Compared results of the EIS groundwater model with the recently completed Snake Valley USGS groundwater model. □



Young monk seals on the beach at Kalaupapa National Historical Park (Hawaii). NPS/BRYAN HARRY

Joshua Tree National Park (California)

Collaborated with park and WRD and PWR personnel to formulate NPS comments to a draft EIS, outlining NPS concerns with potential impacts to the park's groundwater resources and other natural resources associated with a proposed groundwater-pumped storage electrical generation project adjacent to Joshua Tree National Park. □ Assisted WRD and park personnel in developing public scoping comments for draft EISes outlining concerns with potential impacts to the park's groundwater resources and other natural resources related to several fast-track solar energy projects surrounding Joshua Tree National Park. □ Reviewed the Energy Zones proposed for California in the BLM Solar Energy PEIS. □ Evaluated water uses for DOI's high priority solar energy projects proposed near the park, and coordinated water issues with directorate, park, region, and NRSS external energy program manager. □ Provided continuing support of flood study at Black Rock Campground. □

Kaloko-Honokōhau National Historical Park (Hawaii)

Prepared contract for expert services to coordinate water protection strategies with county and state offices. □ Prepared oral and written testimony for Land Use Commission Docket A10-788, Forest City Hawaii Kona, LLC, and Hawaii Housing Finance and Development Corporation. □ Reviewed methods used by Hawaii to determine sustainable yield for the Keauhou Aquifer System and recalculated the yield of selected aquifer systems using new USGS values for groundwater recharge. □ Assisted superintendent in briefing the PWR directorate on plans to request state administrative action to protect groundwater discharge and coastal leakage in KAHO. □ Developed communications plan and talking points for superintendent to aid in discussions with stakeholders regarding a potential water management area designation. □ Assisted superintendent in briefing state and county officials and

other stakeholders regarding NPS efforts to protect groundwater discharge for cultural and natural resources. □ Prepared oral and written testimony for superintendent and attended the public hearing on the Hawaii County Water Use and Development Plan Update. □ Represented NPS at the Workshop on Groundwater Availability in the Keauhou Aquifer System sponsored by the USGS and the Hawaii Commission on Water Resource Management. □ Analyzed water quality and water level monitoring data collected by The Shores at Kohanaiki, the USGS, and the NPS. □ Provided comments on the Kaloko Makai Draft EIS regarding potential groundwater impacts in the park from proposed development. □ Collected and summarized cultural use and extraction of native marine species data for use in legal or administrative proceedings. □

Kaloko-Honokōhau and Kalaupapa National Historical Parks (Hawaii)

Funded a project to examine the response of algae to nutrient inputs, the effects of herbivores on algal growth and coral composition, and the potential to manage herbivores to reduce algal biomass and improve coral reef health. □

Lake Mead National Recreation Area (Nevada, Arizona)

Supplied technical and management oversight on a USGS study being conducted to characterize the source of springs in the Black Canyon area below Lake Mead and evaluate their potential susceptibility to regional groundwater development impacts. □ Implemented groundwater monitoring and management provisions of negotiated settlements with the Southern Nevada Water Authority and Vidler Water Company on NPS protests to water rights applications in Tule Desert Basin and Coyote Spring Valley. □ Assisted WRD in recommending NPS protests to several water rights applications filed by development entities in the vicinity of Lake Mead NRA. □ Provided technical oversight on USGS agreement to operate and maintain stream gauges at Rogers and Blue Point springs in Lake Mead NRA and the Virgin River near Overton, NV. □



Arrowweed Spring in Mojave National Preserve (California).
NPS COLLECTION

Monitored progress on implementation of a Hydrologic Monitoring and Mitigation Program developed as part of the Virgin River Habitat Conservation and Recovery Program to evaluate future groundwater development impacts on surface water and groundwater resources in the Lower Virgin River Basin. □ Provided technical oversight for Lake Mead NRA management regarding an interagency-supported effort to drill and install a groundwater monitoring well within the park to monitor groundwater levels in the regional carbonate-rock aquifer. □ Reviewed applications and filed objections as necessary to protect park water rights. □ Continued continuous monitoring of discharge on the Virgin River near Overton. □ Managed project to develop a numerical groundwater flow model of an area in and adjacent to the park. □ Reviewed the Energy Zones proposed for Nevada in the BLM Solar Energy PEIS. □ Evaluated groundwater models and administrative drafts of the Clark, Lincoln, and White Pine Counties Groundwater Development EIS and coordinated with the BLM to resolve NPS concerns. Briefed the DOI on NPS concerns. □ Coordinated with USGS and state stewards to update the National Hydrography Dataset in three sub-basins covering the park. □

Minidoka National Historic Site (Idaho)

Provided assessment of potential impact of a nearby Concentrated Animal Feeding Operation and assisted park in developing a groundwater monitoring plan. □

Mojave National Preserve (California)

Formulated and submitted scoping comments outlining NPS concerns with potential impacts to Mojave National Preserve's groundwater resources associated with the resurrected Cadiz Valley Water Conservation, Recovery, and Storage Project. Assisted park with development of a management plan for springs and guzzlers. □ Maintained communications with park staff regarding the Mountain Pass Mine groundwater plume while permits were obtained from

BLM for additional delineation in Wheaton Wash; the groundwater plume's mapped extent indicates its presence immediately up gradient from park boundary, and the results from drilling and sampling of two additional wells that MolyCorp must drill should determine fate and extent of the high-TDS groundwater plume. This current activity on BLM lands is under direction of the Lahontan Regional Water Quality Control Board and should determine if park groundwater is likely impacted or if more drilling and sampling will be required.

Mount Rainier National Park (Washington) Due to a surfeit of sediment, the park's rivers are aggrading—that is, river channels are filling in with sediment. This means that for the same size storms, the flood potential is ever-increasing. Additionally, the number of destructive debris flows appears to be rising as a result of global climate change. Some experts (e.g., Gordon Grant, Oregon State University) consider Mount Rainier to be the best example in the United States of catastrophic impacts from climate change. □ Completed the pilot Nisqually Glacier stagnant ice survey where we measured ice velocities on the lower Nisqually Glacier and found over 50% of the glacier is effectively stagnant (non-moving). In the past there was a strong empiric association of stagnant ice and destructive summer glacier outburst floods, or jökulhaups; jökulhaups usually turn into highly erosive and destructive debris flows as they course down glacier-sourced rivers. They can produce flood peaks greatly in excess of floods from precipitation events. □ Identified and mitigated current flood and debris flow hazards. □ Provided technical assistance on engineered logjam placement locations for the Carbon River, and interim barb installation near entrance; engineered logjams provide permanent, superior erosion protection, while minimizing impacts to fish habitat. □



Laundress quarters with the Olympic Mountains and Strait of Juan de Fuca in the background, San Juan Island National Historical Park (Washington). NPS/MIKE VOURI

Initiated a collaborative project with University of Colorado to identify discrete sediment waves from past debris flows in Tahoma Creek and track their movement thorough time in order to predict future hazards to the Tahoma Creek bridge and the Westside road. Techniques employed include multiple aerial LIDAR sets, state-of-the-art terrestrial LIDAR, and field surveys.

- Started a collaborative project with the University of Oregon to extend the known debris flow history for hazard planning; in Kautz Creek watershed, researchers identified and dated previously unknown debris flow events using techniques such as lichenometry, dendrochronology, and carbon-14 analyses. ▫

National Park of American Samoa (American Samoa) Advised superintendent, PWR, and DOI on proposed expansion of Fagatele Bay National Marine Sanctuary and overlay of national park marine area. ▫

North Cascades National Park Complex (Washington) Combined two sources of survey data with a LIDAR model to produce topographic cross sections of the Stehekin River for later use in HEC-RAS. ▫ Consulted with park staff regarding completion of floodplain Statement of Findings. ▫ Coordinated with the USGS and state stewards to update the National Hydrography Dataset in four sub-basins covering the park. ▫

Olympic National Park (Washington) Completed a flood protection study and report for the Elwha River Ranger Station, detailing emergency response plans to preserve historic resources threatened by dam removal related aggradation flooding threats. ▫ In preparation for the Elwha Dam removals, had numerous site visits and meetings with Olympic National Park, Water Resources Division, and the Bureau of Recreation in preparation for the removal of two dams, which started in FY 2011. This is a major and continuing project. ▫ Provided continuing assistance related to the Elwha River Restoration Project; par-

ticipated in Sediment Management Team meetings; wrote PD and was on selection panel for project on-site geomorphologist; traveled to the park two times during the year—first trip was made to inspect conditions on the deltas to see if they were as ready as possible for the start of the project; second trip was made with other members of the sediment management team to participate in project commencement activities. ▫ Provided site assessments for several water-supply systems in the park, including a hydrogeologic assessment of the potential for developing a groundwater source at Kallaloch. ▫

Oregon Caves National Monument (Oregon) Consulted with park regarding request to produce a hydrologic budget for climate change assessment. ▫

Pinnacles National Monument (California) Provided technical assistance for wetlands protection and compliance for Sandy Creek Bridge reconstruction project; wetland delineation completed FY 2011.

- Completed feasibility and scope assessment of potential pond reconstruction site.
- Completed stream stability assessment at two sites within the park.
- Compiled available water wells records for park.
- Reviewed and commented on hydrology related sections of draft General Management Plan.
- Re-uploaded water quality data to STORET from Moore's 1997–2004 study to characterize and quantify stream dynamics, habitat value and vulnerability, and the presence and movement of pollutants in the Chalone Creek watershed to better represent replicate/duplicate samples.
- Finalized long term monitoring plan to track integrity of wetlands and riparian habitats. ▫

Point Reyes National Seashore (California) Completed wetland delineation to assist with planning in the Drake's Estero watershed. ▫ Completed internal review and re-draft of sections of the park General Management Plan, including Introduction, Management Alternatives, Affected Environment chapters. ▫



Fin Dome and Arrowhead Lake in Kings Canyon National Park (California). NPS/GAVIN EMMONS

Provided technical assistance for review of draft Coastal Watershed Assessment. ▫ Partnered with USGS and Moss Landing Marine Laboratories to develop benthic habitat and geologic maps. ▫

San Juan Island National Historical Park (Washington) Partnered with USGS and the University of Washington to develop benthic habitat maps. ▫ Purchased a new Hach-Hydrolab water quality sonde for WRD in conjunction with funds supplied from SAJH to offset a sonde previously supplied by WRD; SAJH elected to retain the loaned WRD sonde for future work after conducting monitoring research at the park over the last two years and was prepared to compensate WRD for its previous investment in that instrument. ▫

Santa Monica Mountains National Recreation Area (California) Uploaded water quality data to STORET from studies conducted in 1977, 1985, and 1990 by the Southern California Coastal Water Research Project. ▫ Uploaded 1994 and 1998 data to STORET from the multi-agency Southern California Coastal Bight Project collected near the park. ▫

Sequoia and Kings Canyon National Parks (California) Assisted with developing a scope of work to assess potential impacts of private septic systems in the Mineral King area. ▫

Yosemite National Park (California) Conducted field assessment regarding restoration of a disturbed site along the Merced River. ▫ Provided on-site advice for treating runoff damage of a recent restoration site. ▫

Klamath Network Provided review and comment on the “Integrated Aquatic Community and Water Quality Monitoring of Wadeable Streams in the Klamath Network” Protocol Narrative and SOPs. ▫

Mojave Desert Network Partnered with WRD to monitor and evaluate potential water resource impacts to network parks

from proposed solar energy development in the region. Efforts included implementing a tracking system for solar projects of concern; reviewing solar energy plans of development to assess potential project water demands; and assisting WRD in formulating NPS response documents to BLM for the solar PEIS. ▫ Assisted personnel from the Mojave Desert Network I&M Program by reviewing a draft spring protocol document outlining methodologies that will aid in the assessment, conservation, and restoration of water resources associated with regionally and locally derived springs in network parks. ▫ Attended the Nevada Water Resources Association annual conference to track new and existing water resource projects, studies, and concerns throughout Nevada. ▫ Attended the Devils Hole Workshop to track new and existing water resource concerns and studies in the Amargosa Desert basin. ▫ Provided comments on MOJN Spring Monitoring Protocols. ▫ Participated in the Water Resources Working Group with MOJN and park staff to facilitate coordination. ▫ Provided review and comment on the “Surface Water Dynamics and Water Quality in Streams and Lakes of the Mojave Desert Network (GRBA and LAKE)” Protocol Narrative and SOPs. ▫ Provided review and comment on the “Surface Water Dynamics and Water Quality of Carbonate and Valley-Fill Aquifer Springs of the Mojave Desert Network” Protocol Narrative and SOPs. ▫

North Coasts and Cascades Network Continued technical assistance and policy guidance to the Federal Lands Highway Division, presented to FLHD staff how climate change (and changing design consideration for park roads) needs to be accounted for in flood repair. Continued to make the case that replacing damaged infrastructure “in-kind” is not technically nor fiscally justifiable. ▫ Provided review and comment on the network’s “Water Quality Monitoring” Protocol Narrative and SOPs. ▫



Yahoo Falls, Big South Fork National River and Recreation Area (Tennessee, Kentucky). NPS/STEVEN SEVEN

Pacific Island Network Uploaded all water quality data through 2010 from NPSTORET to STORET for eight network parks. □

San Francisco Bay Area Network Planned for implementation of monitoring protocol in FY 2012. □ Provided technical assistance for program management (budget formulation) and designing Plant Community Change monitoring protocol. □

Sierra Nevada Network Provided review and guidance on incorporating Aquarius time series processing in Protocol and SOP documents. □

SOUTHEAST REGION

Southeast Region Acted as Regional Goal Contact for FY 2007–2011 and FY 2008–2012 NPS Strategic Plan Goal 1a1H—Land Health—Acres in Condition. □ Represented the NPS at the Gulf of Mexico Alliance meetings and participated as a member on the Habitat Conservation and Restoration Team. □ Continued to develop a sediment budget for restoration in the northern Gulf of Mexico coast. Participated in administering the annual Servicewide Combined Call including projects that resulted in protection and/or restoration of wetland habitat. □ Presented poster on sea level rise impacts to coastal National Park units at The George Wright Society Conference on Parks, Protected Areas, and Cultural Sites in New Orleans, LA. □ Served 50% year-long work detail to Gulf Coast Ecosystem Restoration Task Force in preparation of Gulf of Mexico Restoration Plan: led writing team for Community Resiliency sections, served on Habitat Restoration and Storm Buffers work groups, and served as team lead for Community Resiliency writing for science support document, “Gulf of Mexico Ecosystem Science Assessment and Needs.” □ Planned and facilitated Southeast Natural Resource Leadership Council meeting in Charleston, SC. □ Facilitated quarterly river calls with

NPS units dealing with aquatic resource management issues. □ Completed DOI Motor Boat Operator Certification Training. □ With SERO, planned and convened multidisciplinary workshop on lionfish invasion and completed draft servicewide invasive species response plan for peer review. □ Continued to work with Florida parks, the EPA, and the state of Florida on estuarine water quality standards.

Deepwater Horizon Oil Spill Participated in DWH Oil Spill NRDA activities. □ Co-chaired Submerged Aquatic Vegetation Technical Working Group (TWG). □ Served as NPS lead on Shoreline TWG; trustee co-lead for Beach Subgroup; hosted TWG meetings at Jean Lafitte National Historical Park and Preserve. □ Served on Injury Impact TWG in identifying all response injuries across all TWGs. □ Coordinated with USFWS and WASO to prepare Injury Assessment plans, literature searches, and data collection with the assistance of contractors. □ Participated in Trustee Council–TWG NRDA meeting in Austin, TX. □

Abraham Lincoln Birthplace National Historical Park (Kentucky) Published final Natural Resource Condition Assessment. □

Big South Fork National River and Recreation Area (Kentucky, Tennessee) Reviewed and provided comments on Oil and Gas EIS. □ Assisted park in evaluating potential impacts to aquatic resources associated with the Roberta Landfill. □ Drafted formal determination document regarding potential impacts of Roberta Landfill to the park, and negotiated potential mitigation alternatives. □ Began initial consultation on Huntsville Water Supply project evaluating the effects of water withdrawals on park habitats. □

Blue Ridge Parkway (North Carolina, Virginia) *See Northeast Region*



Purple gallinule at Shark Valley, Everglades National Park (Florida). NPS/ERIN HUGGINS

Buck Island Reef National Monument (Virgin Islands) Partnered with NOAA to develop a benthic habitat map. □

Canaveral National Seashore (Florida) Worked with staff to submit projects for funding related to fisheries management. □ Participated in hydrologic modeling training for a newly developed hydrodynamic model of the Mosquito Lagoon. □ Reviewed Assessment Report—An Assessment of Coastal Water Resources and Watershed Conditions in and Adjacent to Canaveral National Seashore. □

Cane River Creole National Historical Park (Louisiana) Reviewed and provided comments on the Draft Construction Plans for Emergency Stabilization/Erosion Control on the Bank of Cane River Lake. □ Reviewed and provided comments on Draft Wetlands Statement of Findings (WSOF). □

Cape Hatteras National Seashore (North Carolina) Reviewed and provided comments on the Draft Foundation Statement. □

Cape Lookout National Seashore (North Carolina) Provided GIS and remote sensing support (assembled imagery, provided maps, change analysis, etc.) to park staff and Hurricane Irene Incident Management Team. □

Carl Sandburg Home National Historic Site (North Carolina) Provided comments for the Draft Visitor Center review. □ Collaborated with SERO Fisheries Biologist and Threatened and Endangered Species Specialist on wetlands concerns with ponds near the home. □ Reviewed and provided comments for Amphitheater Relocation Design. □ Assisted park staff in determining appropriate management actions for aquatic resources (e.g., Front Lake, Side Lake). This resulted in a Water Resources Issues and Overview Report which will be developed in FY 2012. □

Chattahoochee River National Recreation Area (Georgia) Reviewed and provided comments on the on-going planning for the Willeo Road Multi-Use Trail project which will cross Chattahoochee wetlands. Visited area wetlands sites with natural resources staff. □ Reviewed and provided comments on Resource Stewardship Strategy. □ Reviewed and provided comments on Rogers Bridge Replacement EA. □ Coordinated with park staff on implementation of shoal bass assessment. □ Worked with WRD and park staff to evaluate park authorities relating to shoreline development. This effort led to a workshop slated for FY 2012 to describe the values for which the park was established. □ Assisted park with determination of authority to permit water withdrawals on the Chatahoochee River. □

Chickamauga and Chattanooga National Military Park (Georgia, Tennessee) Reviewed and provided comments on Draft Storm Drainage reconstruction. □ Reviewed and provided comments on Craven House Cultural Landscape Report. □ Reviewed and provided comments on Moccasin Bend WSOF. □

Congaree National Park (South Carolina) Reviewed and provided comments for Ramsar Convention designation as a wetland of international significance. □

Dry Tortugas National Park (Florida) Reviewed and provided comments on Garden Key Cultural Landscape Report. □

Everglades National Park (Florida) Reviewed and provided comments on the Everglades Draft Water Plan. □ Reviewed and provided comments on the Everglades General Management Plan □ Reviewed and provided comments on the Gulf Coast Visitor Center Design Plans □ Reviewed and provided comments on the Shark Valley Visitor Center Plan. □



Alligators at Cypress Swamp, Natchez Trace Parkway (Mississippi, Alabama, Tennessee). NPS COLLECTION

Fort Donelson National Battlefield (Tennessee, Kentucky) Reviewed and provided comments for Cemetery Carriage House Structural Report. ▫ Reviewed and provided comments on Draft Foundation Statement. ▫ Reviewed and provided comments on Cultural Landscape Report. ▫

Fort Pulaski National Monument (Georgia) Reviewed and provided comments on the Cockspur Island Cultural Landscape Report. ▫ Reviewed and provided comments on the Fort Pulaski General Management Plan and EIS. ▫ Reviewed Savannah River Dredging EA for potential impacts to Fort Pulaski for Corps of Engineers. ▫

Great Smoky Mountains National Park (North Carolina, Tennessee) Provided hydrogeological assessment for a new well at Cades Cove. ▫ Uploaded water quality data collected during 2010 by park staff and the University of Tennessee from NPSTORET to STORET. ▫ Uploaded water quality data to STORET from a 2008–2009 University of Tennessee project that collected data from 16 locations in the park to examine the influence of basin characteristics on acidification response. ▫ Uploaded water quality data to STORET from an EPA-funded University of Tennessee project that collected data from six throughfall and stream sites in the park during 2006–2010 to examine the effects of acidification on caged native brook trout. ▫ Uploaded water quality data to STORET collected from four streams during 2003–2005 to assess the potential impacts of the Greenbrier Road widening project. ▫ Uploaded water quality data to STORET collected from two locations on Straight Fork during 2004–2007 to determine water quality impacts from the 2006 Straight Fork bridge replacement project. ▫

Gulf Islands National Seashore (Florida, Mississippi) Reviewed and provided comments for Perdido Key Pass dredging EA. ▫ Reviewed and provided comments for the General Management Plan. ▫ Reviewed and provided comments for the Mississippi District Road Replacement plans. ▫ Reviewed

and provided comments for the MsCIP Barrier Island EIS. ▫ Reviewed and provided comments for the Deepwater Horizon SAV Restoration EA. ▫ Worked with other SERO and WASO staff to prepare a science-based position paper outlining the basis for Stage III Beach Subsurface oil cleaning at Gulf Islands. Prepared drafts of the decision document which was added as an appendix to the Stage III Cleaning Framework Document, coordinating with the superintendent and resource staff. ▫ Co-authored white paper on the implications of beach clean-up activities on natural resources. ▫ Assisted DOI representatives in evaluating potential restoration alternatives associated with the Deepwater Horizon Incident. ▫ Served as a Resource Advisor overseeing night cleanup of oil deposited on beaches. ▫ Reviewed and provided comments on NRCS Gulf of Mexico Initiative which will impact Gulf Islands. ▫ Funded Dauphin Marine Laboratory to measure the impacts of oil on sea-grass beds at GUIs. ▫

Jean Lafitte National Historical Park and Preserve (Louisiana) Assisted staff with development of emergency restoration proposal for the DWH Oil Spill. ▫ Assisted staff in obtaining funding for canal restoration project; visited and reviewed the ongoing project as well as data indicating that hydrology is improving and reverting to a natural regime. ▫

Kings Mountain National Military Park (South Carolina) Conducted stream geomorphology/stability assessment. ▫

Little River Canyon National Preserve (Alabama) Published final Natural Resource Condition Assessment. ▫

Mammoth Cave National Park (Kentucky) Reviewed and provided comments on draft FONSI for Green River Ferry Crossing. ▫



Green turtle with baitfish, Virgin Islands National Park (Virgin Islands). NPS/CAROLINE ROGERS

Natchez Trace Parkway (Mississippi, Alabama, Tennessee) Provided comments and recommendations on the Natchez Trace Multi-Use Trail Segment Wetland and Floodplain SOF which proposed to construct additional trails along the parkway and will impact several acres of wetlands and floodplain habitat. □ Visited and examined Bogue Chitto wetland mitigation site with Natchez Trace staff and contractors. □ Reviewed plans for wetland mitigation and Statement of Work. □ Reviewed and provided comments on Draft Biological Assessment. □ Uploaded water quality data to STORET from the 2007–2009 Level I Water Quality Inventory conducted by the Gulf Coast Network. □

Obed Wild and Scenic River (Tennessee) Assisted park in evaluating instream impacts of the proposed Lake Tansi Water Harvesting project. □ Drafted Section 7 determination in partnership with park staff for the Corps of Engineers. □ Worked with park to determine potential impacts of pesticide use to control the hemlock woolly adelgid invasion. □ Attended the annual meeting of the Cumberland Habitat Conservation Plan Science Advisory Committee. □ Provided comments for the proposed water monitoring agreement with the city of Crossville. □

Salt River Bay National Historical Park & Ecological Preserve (St. Croix, Virgin Islands) Partnered with NOAA to develop a benthic habitat map. □

Shiloh National Military Park (Tennessee, Mississippi) Reviewed and commented on Collection Management Plan. □

Virgin Islands National Park (Virgin Islands) Reviewed and provided comments on Draft General Management Plan. □ Reviewed and provided comments on Little Cruz Bay pier replacement. □ Provided baseline water quality data inventory and analysis report data and advised on discrepancies in data content between legacy STORET and the STORET/WQX Data Warehouse. □

Virgin Islands National Park and Virgin Islands Coral Reef National Monument (Virgin Islands) Funded a project to identify links between VICR and VIIS and among various habitat types by studying the movements of fish species. □

Wekiva Partnership Wild and Scenic River (Florida) Served as agency lead for Wekiva River consultation under Section 7(a) of the Wild and Scenic Rivers Act. Leveraged technical support for visual assessment from MWRO. Helped plan and lead a bridge-design charette with Florida DOT, Federal Highways, and others. Coordinated correspondence with project proponent. Assisted in drafting, reviewing, and finalizing EA for the Wekiva WSR Comprehensive River Management. □

Appalachian Highlands Network Provided review and recommendations on mapping characteristics and how to import network spreadsheets into NPSTORET. □

Cumberland–Piedmont Network Uploaded all water quality data through 2010 from NPSTORET to STORET for fourteen network parks. □

Gulf Coast Network Uploaded all water quality data through 2010 from NPSTORET to STORET for eight network parks. □

Southeast Coast Network Assisted with the import of nutrient and sediment data into NPSTORET. □