RESEARCH AND NATURAL RESOURCES HIGHLIGHTS
February 2002
Director's Office (Washington DC and Denver CO)

Don Ralston, our Technology Transfer liaison, has announced his retirement effective April 2. We will miss Don's legal and policy expertise and hope to perfect the Vulcan mind meld before he leaves.

Held Science and Technology (S&T) Program Annual Formulation Meeting in Denver on February 4 and 5. The meeting implemented strategic planning, goal setting, and performance measures for the S&T Program that will support ongoing Department and Reclamation strategic planning efforts. The meeting also laid the groundwork for Program improvements that will ensure efforts are focused at Reclamation priorities using the best resources and actively engaging our end users, resource managers, and stakeholders

Supported the Department's effort to provide standards for the ethical conduct of scientific activities. Standards have been drafted by an interagency committee that involved scientists and human resources staff and are being reviewed by the Department. The method of implementation is also under discussion. (Don Ralston, 202-513-0683; Sheila Venson)

The Renewable National Resources Foundation (RNRF) presented its Outstanding Achievement Award for 2001 to Reclamation and the other 14 agencies involved in development of "Stream Corridor Restoration: Principles, Processes, and Practices". RNRF is a private foundation that fosters partnerships among scientific, governmental, educational, and professional organizations to promote better management and conservation of renewable resources. Hard copies and CD copies of this book are available for the asking. (Shannon Cunniff, 202-513-0682)

Initiated discussions with Portland Cement Association regarding joint research interests and possible partnering in research endeavors. A detailed discussion involving researchers is scheduled for April 30. (Shannon Cunniff, 202-513-0682)

Reclamation and the National Park Service met to define goals, needs, and opportunities to address water, energy, and telecommunication needs for Alcatraz Island. Reclamation representatives included folks from the **Mid-Pacific Regional Office**, the **Temecula Area Office**, the **Office of Policy**, and the **Water Technology Engineering Research Group** of the **Technical Service Center**. Academic, Federal and state agency, and private sector experts in water supply, wastewater management, and water treatment technologies were brought together and facilitated by the Golden Gate National Parks Association to evaluate constraints and opportunities. This group agreed to continue to be called upon to provide technical input on these issues to the Golden Gate National Recreation Area and the Association as plans for alternative uses of the island's many structures are developed. A memorandum of agreement was also proposed to formalize a technical assistance relationship between the National Park Service and Reclamation. (Shannon Cunniff 202-513-0682, Bob Jurenka, Rick Martin, Patricia Roberson)

Upcoming Events

March

4	Federal Agency Water Resources Research Directors' Coordination Meeting, Washington DC (Shannon Cunniff, 202-513-0682)
5	National Institutes for Water Resources Annual Meeting. (Chuck Hennig, 303-4452134)
6	Briefing Commissioner on new Technology Transfer efforts (Shannon Cunniff, 202-513-0682)
14- 15	Briefings on Watershed and River Systems Management Program (Shannon Cunniff (202-513-0682), Don Frevert)

May

29-30	Science and Technology Program Steering Committee Meeting, Denver, Colorado (Siegie Potthoff, 303-445-2136)

Improving Infrastructure Reliability

Dr. David Harris was presented with the Meritorious Service Award on March 7. Dr. Harris distinguished himself in countless ways during his career and is widely respected throughout research communities in the public and private sectors as well as within Colorado's academic community. Dr. Harris has dedicated much of his career to the pursuit of new technologies and is the S&T Program theme manager for infrastructure research. Dr. Harris helped create numerous initiatives to develop predictive tools to assess and monitor the condition of structures, investigate new materials, and significantly extend the life cycle of Reclamation's aging structures. His research work is also extremely valuable to Reclamation's Dam Safety Program and includes development of state-of-the-art testing of concrete for nonlinear structural analyses of dams, seismic testing of thin arch concrete dam models, and development of new methods to enhance soil foundations. Dr. Harris' work in developing improved material properties assessments, applications of new materials, and creative model testing of dams helps Reclamation continue to ensure the safety and performance of its structures in an era of ever increasing pressure to reduce facility operating costs.

The Life Extension research team met with staff from the **Eastern Colorado Area Office** to discuss the potential for conducting a life extension assessment at Mt. Elbert Pumped- Storage Powerplant in Colorado. This plant is aging and has become vital to the local power system. A study that looks at the entire power train and results in economically justified alternatives for rehabilitation is desired. **Eastern Colorado Area Office** managers will meet with Western Area

Power Administration and power customers soon to discuss this idea. Life Extension seeks to enhance reliability and dependability by providing decisionmaking tools to facility management for maintenance and/or system replacement. (Gary Osburn, 303-445-2297)

A draft Statement of Work was prepared with Dr. Sen and Dr. Simoes of the Colorado School of Mines for completing the development of our stator winding fault detector equipment. The winding fault detector has demonstrated the capability of pinpointing the location of electrical faults in the stator windings of large rotating machines. Reclamation facilities experience approximately five insulation failures a year. This device can save upwards of $50,000 per failure. Technology transfer of the prototype will be sought as part of this study. (Phil Atwater, 303-445-2304).

Met with personnel from Adwel International, Ltd, as part of the Cooperative Research and Development Agreement to commercialize our ramped high-voltage, direct-current test set. Field tests of a stator winding were conducted on unit 3 at Folsom Powerplant to demonstrate how testing and analysis are performed. (Lori Rux, 303-445-2307)

Prepared and submitted a technical paper for presentation at the Electrical Insulation Association INSUCON 2002 Conference. The paper is entitled “Assessing the Condition of Rotating Machine Stator Winding Insulation Using the Ramped Direct High-Voltage Method” and was co-authored with David Bertenshaw of Adwel International, Ltd. (Lori Rux, 303-445-2307)

A field demonstration of an electronic Wedge Tightness Detection (WTD) system was conducted on unit 3 at **Folsom Powerplant**. The system was developed by Adwel International, Ltd., and provides improved monitoring of the tightness of the stator slot wedges. The instrument provided objective electronic analysis of wedge tightness, minimizing the subjectivity of the typical wedge “tapping” assessment method. This project was co-funded by Power Program Services. (Lori Rux, 303-445-2307)

Upcoming Events
March

22 Powerformer™ Demonstration Funding Meetings with customers to refine the funding timelines, establish commitments by both Reclamation (to offset the appropriations) and customers (to provide the offsetting funds), as well as to determine the form of the commitments. Customer action is anticipated at the March 22 meeting. The **Central Valley Operations Office** has developed three potential timelines for installation that would allow the Powerformer™ to be installed as early as June of 2003 or as late as February 2004. Procurement for the Powerformer™ will be administered from the Sacramento office, with technical support from the TSC in Denver. The TSC has been commissioned to develop the specifications, and the Sacramento office is proceeding with CBD notification. (Gary Osburn, 303-445-2297)

27-28 Meeting at **Hoover Dam** with the Corps of Engineers, Hydro Quebec, and BPA to discuss technical details and plan the next steps in condition assessment development. Detailed transformer and turbine runner condition assessment tools have been reviewed, and a similar tool for generator condition assessment is being developed.(Gary Osburn, 303-445-2297)

Improving Decision Support

Met with the Interstate Weather Modification Council to discuss needs for and scope of Reclamation's participation in funding weather modification research. The Council's ability to receive and manage disbursement of funds for research projects was explored. The Council subsequently determined it did not have this capacity. Therefore, we are now exploring other means to conduct this program. Criteria for successful proposals are being developed. Funding this program this fiscal year is uncertain due to new agency priorities. Stakeholders indicated their intent to seek a Congressional earmark in FY03. (Shannon Cunniff (202-513-0682), Dave Matthews, Don Moomaw, Gerry Kelso).

Reclamation's WaRSMP Team Members met on February 27 to review progress on the **Columbia Basin Project** new start and to prioritize tasks for the coming months. Top priorities include interactions between RiverWare and the AWARDS-ET Toolbox program, the USGS Modular Modeling System (MMS), improved forecasting methods and GIS technologies (Don Frevert, 303-445-2473)

Reclamation's WaRSMP co-principal investigator met on February 26 with experts from Colorado State University and an outside consultant to review progress and plan future developments on the SAMS (Stochastic Analysis, Modeling and Simulation) program. SAMS will be used in association with RiverWare and other WaRSMP tools to improve reservoir and

river system management capabilities in Reclamation. (Don Frevert, 303-445-2473)

Began investigating numerous image processing algorithms meant to isolate the unique reflectance signature of chlorophyll-a using AVIRIS (Airborne Visible and Infrared Imaging Spectrometer) imagery of **Owyhee Reservoir** in eastern Oregon. These algorithms will allow for greater definition of such things soil moisture and water quality. (Dave Eckhardt, 303-445-2273)

Performed a search for the most recent data, programs, and processes to help to more precisely identify features on the ground from satellite imagery, particularly features such as sewage treatment plants and fresh water plants located in the vicinity of Reclamation facilities. Finding such software will allow Reclamation scientists to save money by quickly and reliably identifying different features on the ground. (Ron Miller, 303-445-2279)

A spectral library (a catalog of the signatures in the electromagnetic spectrum that are unique to a substance) has been created by Dr. Ed Holroyd and placed on a web site (www.rsgis.do.usbr.gov/html/index.htm) for future access. It contains over 4600 individual measurements by a Field Spectrometer - Full Range, built by Analytical Spectral Devices, Inc., over a spectral range of 350 to 2500 nm. (near ultraviolet to short wave infrared). Data are individually accessible as text files via subject links and combined as graphics. Subjects include minerals, soils, rocks, fossils, plants (especially with special flower or leaf colors), man-made objects, water, clouds, snow, sky, and other targets of opportunity. The spectrometer is available upon request for measurements of other subjects.(Ed Holroyd, 303-445-2276, eholroyd@do.usbr.gov)

Upcoming Activities

March

12 Members of Reclamation's WaRSMP team are scheduled to meet with Reclamation and **International Water and Boundary Commission (IBWC)** water resources specialists in El Paso on March 12 to discuss the potential for development of a RiverWare based decision support system for the **Lower Rio Grande basin** with enhanced capabilities for groundwater modeling. Meeting expenses will be covered by the El Paso field office. The effort would ultimately involve cooperation with the Republic of Mexico. RiverWare is currently the primary reservoir management tool for the Upper Rio Grande Water Operations Modeling (URGWOM) effort. (Don Frevert, 303-445-2473)

18-21 Reclamation WaRSMP team members will hold a 4-day work session in Boulder, Colorado, from March 18-21 to debug and implement RiverWare rules for the **Truckee River Operational Forecast (TROF)** effort. (Don Frevert, 303-445-2473)

April

2-3 Members of the Reclamation and USGS WaRSMP teams will meet in **Reno, Nevada,** to review progress on development and implementation of WaRSMP technologies and to plan activities for the next 6 to 12 months. Other partnering organizations and interested parties from offices not currently involved in the WaRSMP program will also be invited. (Don Frevert, 303-445-2473)

Improving Water Delivery Reliability

Completed internal and consultant peer review of the proposed Pilot Oxygenation System for **Upper Klamath Lake**. Due to escalating costs and many uncertainties identified through these reviews, planned next steps are being carefully considered. (Chuck Hennig, 303-445-2134; Bob Davis, 514-883-6935)

Great Plains Region

Reclamation has taken the finals steps in joining the **Great Plains Cooperative Ecosystem Study Unit (GPCESU)** hosted by the University of Nebraska at Lincoln. Joining the GPCESU will allow Reclamation access to a variety of technical expertise related to ecosystems in the

Great Plains Region. CESUs are partnerships providing for cooperative agreements with colleges and universities with Federal and State agencies for the purpose of conducting multi-disciplinary research. It is anticipated that Reclamation will be a full-fledge member of the GPCESU in March 2002. Contact with and operating procedures for interfacing with the GPCESU is through Larry Rossow, Great Plains Regional Office, Billings, Montana. Reclamation has plans to join the Pacific Northwest CESU (host - University of Washington) within the next few months and is a member of the Colorado Plateau CESU (host - Northern Arizona State University). (Don Ralston, 202-513-0683)