

# RESEARCH AND NATURAL RESOURCES HIGHLIGHTS

## September 2002

### Director's Office (Washington, DC and Denver, Colorado)

Held two breakout sessions to receive input from water resources managers on needs and priorities for decision support for water and river management. Output from these sessions has been provided to the sponsors of the River Management Conference so that it can be made more widely available. We also plan to post the information on the S&T web site. (Shannon Cunniff, 202-513-0682)

Met with **El Paso Water Utilities District** on possible BR participation in a Water Resources Learning Center at their planned Desalination plant. Meeting focused on developing a vision for the center, educational objectives and theme areas. Other BR participants included representatives of El Paso field division, Albuquerque Area Office, and TSC. (Shannon Cunniff, 202-513-0682)

Attended the first meeting of the National Research Council's Water Science and Technology Board's new committee that is charged by Congress to look into water resources research investments. Questions the committee will be tackling include coordination of research and whether the investment is sufficient to keep ahead of demands on water resources. This effort will touch upon issues and activities of S&T program, Security and Dam Safety, Yuma Desalting Plant, and Office of Policy. We will be leading coordination of requests for information to the Bureau of Reclamation on its research investments. A request for 5 -10 years of data along with a definition of "research" and "water resources" is expected from the committee next month. (Shannon Cunniff, 202-513-0682 and Chuck Hennig 303-445-2134)

Started developing a strategic plan for Cooperative Ecosystem Studies Units at the Executive Council meeting. (Shannon Cunniff, 202-513-0682)

Briefed GP region and Montana Area office staff on the S&T program's new business practices and accomplishments. (Shannon Cunniff, 202-513-0682)

Participated in the American Water Resources Association-hosted Dialogue on Water Policy. Findings from this meeting will be broadly shared with other interest groups and Congress. (Shannon Cunniff, 202-513-0682)

Research project proposals were submitted to our office. The proposals were distributed to review teams, who all did a wonderful job of squeezing in the time required to read and rank the proposals. The Output Champions provided this office with scoring summaries, and these results are currently being weighed. See [www.usbr.gov/research](http://www.usbr.gov/research) for additional details. (Siegie Potthoff, 303-445-2136).

Participated in the Performance Institute Conference on R&D Performance Measures for Federal R&D programs. Good information and perspectives provided by CMB and other federal agencies on methods to implement meaningful performance measures consistent with administration policies and objectives. (Chuck Hennig, 303-445-2134)

## Upcoming Events

### October

- 1**      **Brief OMB on Tularosa Desalination Research Facility Study**
- 10**     **Meeting on Technology Transfer support by Navy and DOI solicitor (Shannon Cunniff)**
- 10**     **Water Resources Research Coordination Committee Meeting (Shannon Cunniff)**
- 10**     **USGS/BR science and research coordination (Chuck Hennig)**
- 17**     **Briefing for Desalination Coalition on BR research (Shannon Cunniff)**
- 18**     **Briefing on S&T program to National Research Council Board on Earth Sciences and Resources (Chuck Hennig)**
- 24**     **California CESU site visit (Michael Tansey)**
- 24**     **Briefing to Western Coalition of Arid States on S&T program (Chuck Hennig)**
- 31**     **Presentation on S&T Program strategic plan at Performance Institute Conference/workshop (Chuck Hennig)**

## Improving Infrastructure Reliability

The Materials Engineering and Research Laboratory signed an agreement with **Metropolitan Water District of Southern California** (MWD) for protective coatings related work. MWD has one of the best coatings testing facilities in the country. Work will include exchanging test data, testing newly developed products, and providing coating training classes for Reclamation personnel. The agreement will help ensure that Reclamation continues to use the best products and practices to meet protective coatings needs. (Kurt VonFay 303-445-2399)

The contract for fabrication of the **Mason Dam** flow deflector has been awarded. The deflector is scheduled for installation by the **Baker Valley Irrigation District**, in partnership with the **Snake River Area office**, during the week of Oct 21<sup>st</sup> following repairs to the basin floor. The purpose of the deflector is to mitigate hydraulic conditions near the end of the basin that can cause materials to be carried into the basin, thereby resulting in abrasion damage. A field evaluation of deflector performance after installation is complete. The scour problem plagues many Reclamation stilling basins and requires expensive, repeated repairs. (Leslie Hanna 303-445-2146, Karl Ames 208-334-1870)

High-Voltage Generation (Powerformer™) - This research effort concluded in FY02 that conversion from medium-voltage to high-voltage generation is technically feasible and promises to be economically advantageous. Subsequently, the **Central Valley Operations Office** staff held meetings with the power customers and obtained agreement to fund installation of the technology on Folsom Unit 1 (demonstration and deployment). Final technical specifications have been provided by the TSC to the **MP Region** where the specifications will be coordinated and issued. It is expected that specifications issue will take place in the fall of 2002. (Gary Osburn, 303-445-2297 / Lori Rux, 303-445-2307)

Hydro-Plant Condition Monitoring (Battery Cell Equalizer Module) - Developed and lab tested an electronic circuit to equalize/balance the cell voltages of large, multi-cell batteries, such as are used in Reclamation facilities. This equalization process keeps the cells at peak performance, extends the useful life of the battery, and also indicates when a cell voltage is out of tolerance, signaling that the cell is beginning to fail. The cost to monitor a 60-cell battery is estimated to be about \$3,000. Rival systems cost over \$10,000. Fifty-eight circuit boards have been prepared, tested, and adjusted for installation at **Mt. Elbert** Switchyard in October. Michael Messaros has been contacted to explore patent issues in anticipation that this technology will be transferred to the private sector. (Jim DeHaan, 303-445-2305)

Ramp Tester Cooperative Research and Development Agreement - Began laboratory testing of the prototype ramped voltage test set manufactured by Adwel. A thorough preliminary evaluation of the instrument operation, software interface, and test set performance is being done to ensure there are no safety or accuracy issues that require correction before the unit is taken to the field for validation. (Lori Rux, 303-445-2307)

High-Voltage Insulation - Completed all laboratory experiments on the stator winding coils manufactured with deliberate insulation defects. Specific defects were chosen to represent the types of insulation problems typically encountered during manufacture or as a result of aging, including internal contamination, overheating, loose groundwall tapes, and reduced tapes layers. The test data are being analyzed to evaluate the effectiveness of several test methods in detecting the different types of insulation defects. Insulation resistance, polarization index, and recovery voltage index measurements have been analyzed and documented. (Lori Rux, 303-445-2307)

Stator Winding Fault Detector - The winding fault detector has demonstrated the capability of pinpointing the location of electrical faults in the stator windings of large rotating machines. Reclamation currently experiences approximately five insulation failures a year. This device has the potential of saving upwards of \$50,000 per failure. Redesigned probe is being built in the shops. Easy-to-use, stand-alone software with a graphical user interface (GUI) is about 75 percent complete. The start of laboratory testing has been moved to October/November 2002. Technology transfer of the prototype is part of this study. (Phil Atwater, 303-445-2304)

Modular SCADA - The modular SCADA research funding will not continue into FY2003. The research that was completed under this effort has resulted in SCADA concepts that are being used in both the **Lower Colorado and Mid-Pacific Regions**. Both of these regions now employ open access, modular concepts which provide cost savings from increased flexibility and the ability to employ modular improvements. (Steve Stitt, 303-445-2316)

ISO Operational Constraints - As a result of evaluations of the 2002 data from the **Central Valley Operations Office**, modifications to the reporting methods were initiated. Monthly data will be available during FY2003. A proposal for FY2003 work titled "**Operational and Environmental Constraints and their Impact on Ancillary Services**" was completed. During October ancillary services data from Hoover Power plant will be obtained for the past year and analysis will be performed. (Steve Stitt, 303-445-2316)

Optimization Improvement - A report on the standard flow modeling methods was initiated during September. Work to develop new curves for **Grand Coulee**, based on the concepts developed under this effort, was initiated and will be funded by **Bonneville Power Administration**. A proposal for FY2003 work titled "Optimization Improvements to Increase

Energy Production and Extend Equipment Life” was completed. Work to develop concepts for on-line unit performance testing will be initiated during October. (Steve Stitt, 303-445-2316)

Life Extension - **GP Region and Eastern Colorado Area Office** staff are collecting data to support the draft proposal for a Life Extension assessment at **Mt. Elbert Power plant** which would be a pilot of the methodology developed under this research project. It is possible that the actual assessment will be funded in part by the **Western States Power Corporation**. Teams have been formed with other power utilities to continue development of equipment condition assessment tools. These will be used as a baseline for current equipment conditions that affects Life Extension risk assessment. Throughout FY03, we will continue to refine these proposals and tools. Life Extension seeks to enhance reliability and dependability by providing decision-making tools to facility management for maintenance and/or system replacement. (Gary Osburn, 303-445-2297)

### **Improving Decision Support**

WaRSMP team members met with Dr. Jose D. Salas of Colorado State University on September 6 at CADSWES in Boulder. Dr. Salas presented recent improvements to the Stochastic Analysis Modeling and Simulation (SAMS) program. Discussions focused on how SAMS can best be deployed for decision making on the **Colorado River System**. (Don Frevert, Terry Fulp)

Participated in the annual River Systems Management Workshop in Billings, MT. Posters presented included Using Land Data Assimilation Products to Improve Streamflow Forecasts and Demonstration of Water Resources Management Applications of GCIP Research Products - both of which were jointly authored with NASA (Dave Matthews, Curt Hartzell)

Reviewed progress on deployment of the AWARDS-ET Toolbox, RiverWare and MMS technology on the **Columbia Basin Project in Washington**. USGS is in the process of committing funding for FY 2003 which will enable MMS deployment within the **Crab Creek watershed**. An extensive set of cropping data for the 2000 and 2001 seasons has been obtained which should be valuable in deployment of the AWARDS - ET Toolbox technology. (Don Frevert)

Jon Medina attended the South Platte Basin Integrated Assessment Workshop. Attendees included representatives from USGS, EPA, NOAA, NCWCD, USFS, CU, CSU, and Colorado Supreme Court Justice Greg Hobbs. The central theme surrounded the need for integration of research, practice and implementation tactics. Scoped was the possibility of multi-agency development of integration tools and methods of implementation. It is apparent that many products and tools scientists develop are under utilized often because of inadequate communication with users. Scientists must recognize that decision-making is increasingly complex and will require integrated information that incorporates feedback from decision-makers and stakeholders. Workshop discussion recognized that increasing climatic variability, population, and land-use challenges are intensifying the need for improved information and predictive capacity that includes ecosystem response in different change scenarios. Future science must forecast through frameworks that integrate the important influences. Reclamation's **Riverware** decision support system could be enhanced to offer a viable integration tool. There appears a role here for Reclamation S&T research (Jon Medina, 303-445-2488).

## Upcoming Events

### October

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| <b>4</b>     | Conference call for WaRSMP team members to review and evaluate modeling options for the <b>Yakima</b> Fisheries effort. (Don Frevert) |
| <b>22-23</b> | Meeting of the Interagency WaRSMP Steering Committee at the USGS District Office in <b>Carson City, NV</b> . (Don Frevert)            |
| <b>22</b>    | The annual report of the Technical Review Panel should be available on or about this date (Don Frevert)                               |

## Improving Water Supply Technologies

Attended the 2002 WateReuse Association Annual Symposium in Orlando, FL. Speakers included Mike Gabaldon, USBR, Eric Saperstien, ENS Resources, and George Dunlop, USCOE. Besides representing USBR at various Foundation and Association meetings, the technical sessions were excellent. (Kevin Price, Manager, 303-445-2260.)

## Improving Water Delivery Reliability

Efforts are continuing in the **Lower Rio Grande** along the U.S. and Mexico border to control extensive infestations of hydrilla and water hyacinth. These invasive species are impacting water flow and water deliveries. (Fred Nibling, 303-445-2202)

An herbicide screening study is being completed to evaluate the effectiveness of using diquat, glyphosate, and copper compounds to control the invasive giant salvinia near **Blythe, CA**. (Denise Hosler, D-8220, 303-445-2195).

## Regional Reports

Artificial Den Study; **Bakersfield, California**. The 34 artificial dens in Bakersfield continue to be monitored. In September, kit foxes visited 14 of the dens. A radio collared kit fox was tracked to one of the dens. At one location, it appears that kit foxes have attempted to create a new, earthen entrance to a chambered den. Red foxes are visiting dens at 2 locations intermittently. Efforts will be initiated to exclude red foxes from the dens. Camera stations and a video monitoring system will be used in a further effort to monitor use of the dens. An annual report of activities for FY2002 was completed. (Rosalie Faubion, 559-487-5138)