



RESEARCH HIGHLIGHTS



DIRECTOR'S OFFICE (WASHINGTON, DC AND DENVER, COLORADO)

The Reclamation Research Steering Team meeting was held in **Fort Collins, Colorado**. Comprised of water managers from the private sector, other government agencies, and Reclamation offices, the team assists the Research Office in identifying research priorities and recommending improvements to the Science and Technology (S&T) Program to more effectively and efficiently meet the research and development (R&D) needs of our program stakeholders. Members participated in a scenario-building session based on the approaches discussed in the book, *The Art of the Long View* by Peter Schwartz. The team developed scenarios on the most significant issues that will affect water management over the next 10 to 50 years. Results of the meeting will be published next month. (Chuck Hennig, 303-445-2134, Siegie Potthoff, 303-445-2136)



Some Steering Committee Meeting participants attend an optional tour of Horsetooth Dam and Reservoir.

Bill Smith, system designer and programmer for the S&T Proposal and Contract Management (PropC) system, was presented with an award at the Steering Team meeting in **Fort Collins, Colorado**, for his considerable talents and efforts in getting the PropC system on line. (Siegie Potthoff, 303-445-2136)



Shannon Cunniff explains how the scenario-building session will work at the annual Science and Technology Steering Team Meeting.



Chuck Hennig Presents Bill Smith with an award for his work on the S&T Proposal and Contract Management (PropC) system.

Mike Roluti presented Shannon Cunniff and Chuck Hennig with the **Technical Service Center (TSC) Director's Circle Award for Leadership**. (Siegie Potthoff, 303-445-2136)



Mike Roluti, Director TSC, presents Shannon Cunniff and Chuck Hennig with the TSC Director's Circle Award for Leadership.

Dan Levis, from the Technical Service Center Flood Hydrology Group was detailed to the Research Office for 90 days as a Project Manager to develop and implement online workflow processes for the S&T Program using web-enabled data bases. Please join us in welcoming Dan to our office. (Siegie Potthoff, 303-445-2136)



The PropC Team; left to right, Dan Levis, Bill Smith, Siegie Potthoff, and Chuck Hennig.

IMPROVING INFRASTRUCTURE RELIABILITY

The price proposal to be submitted from Alstom Power for high-voltage generation (Powerformer™) has been delayed at least until spring 2004. Therefore, the recent solicitation was canceled. **Folsom** Unit 1 will be kept available as a potential high-voltage generation application for at least 1 or 2 more years. Research activities will be delayed until installation of the Powerformer™ is imminent. High-voltage generation promises to reduce maintenance costs and environmental risks while improving efficiency and reliability. (George Girgis, 303-445-2310)

With the addition of new staff, research has resumed on doubly fed machines. Literature search and document review has been started. A strategic plan has been initiated, and discussions with past researchers and design staff have taken place. This research is being conducted in concert with the **Mt. Elbert** Powerplant rehabilitation project. The doubly fed machine, if proven viable, would be an option for increasing efficiency at Mt. Elbert. (Gary Cawthorne, 303-445-2817)

For operational and environmental constraints and their impact on ancillary services, the basic laboratory prototype developed last month as part of study efforts to create tools for predicting powerplant energy-related ancillary service production was improved to provide a 24-hour scheduled regulation up and down limit. The limit will provide regulation upper and lower ranges that will ensure that powerplant water release constraints are met, while providing power system energy regulation services. During July, the prototype will be further expanded to provide a moving hourly limit that can be adjusted based on the amount of

regulation used under actual operations. The 24-hour scheduled limits, previously developed, will be further modified to shape limits according to estimated bid prices. Work will continue to develop a display system that can be used for demonstration purposes. (Steve Stitt, 303-445-2316)

For optimization improvements to increase energy production and extend equipment life, during June, additional laboratory testing was performed on the powerplant generator unit monitoring system proposed for first installation at **Hoover** Powerplant. A laboratory system was developed to automatically create new unit flow models based on new performance test data. This system will speed the process of creating new flow models in the future. During July, the testing process for the performance monitoring system will be completed. The laboratory flow model development system will be used as a basis to create an online scheme for flow model updates. The online scheme will be the basis for future systems that will automatically test units and update their flow characteristics. (Steve Stitt, 303-445-2316)

For power system stability, specialized instrumentation was investigated for measuring machine torque angle and internal frequency during excitation system commissioning at **Mt. Elbert** Powerplant. These instruments will help determine the optimum tuning for voltage regulators and power system stabilizers. (J. C. Agee, 303-445-2309)

Most of the parts for the generator rotor turning gear for **Green Mountain** Powerplant were delivered in June. Depending on Green Mountain staff workload, assembly will start in July or August. The rotor turning gear provides a safe alternative to the potentially dangerous manual method of rotating a generator rotor used by many facilities, and brings us into compliance with hazardous-energy-related safety regulations. (Roger Cline, 303-445-2293)

IMPROVING DECISION SUPPORT

The Sediment Monitoring Instrument and Analysis Research Workshop, will be held September 9-11, 2003, at the U.S. Geological Survey **Flagstaff** Field Center. The Workshop, sponsored by the Federal Interagency Subcommittee on Sedimentation, will draw representatives from government, academia, and the private sector with interest/expertise in advanced technologies and analytical techniques for measuring physical and transport characteristics of fluvial sediment by means that are quantifiably accurate, more informative, less expensive, and/or safer to obtain compared with more traditional methods. Those interested in participating should register by July 21, 2003. The workshop's home page is <http://water.usgs.gov/osw/techniques/sediment/sedsurrogate2003workshop.html>. (Christi Young, 303-445-2561)

Reclamation Watershed and River Systems Management Program (WaRSMP) team members participated with representatives from the Tennessee Valley Authority (TVA), the U.S. Army Corps of Engineers, the Center for Advanced Decision Support for Water and Environmental Systems, and several private firms at the 2003 RiverWare User's Group meeting in **Boulder, Colorado**. Much of the program focused on S&T-funded enhancements to RiverWare, including expanded and improved engineering methods, improved accounting capabilities, and data management interfaces. Additional RiverWare enhancements supported by partnering organizations, such as the improved optimization capabilities being supported by TVA, were also discussed. The meeting closed with a discussion on future priorities for RiverWare enhancements. The present and future improvements to RiverWare



RiverWare Annual Users meeting in **Boulder, Colorado** June 18, 2003.

with all users through two general releases each year. RiverWare helps Reclamation managers and technical experts in **Upper and Lower Colorado Regions and Upper Columbia, Albuquerque and Lahonton Basins Area Offices** make better and more informed reservoir management decisions. (Don Frevert, 303-445-2473)

UPCOMING EVENTS

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| August 20-22 | Riverware training: Introduction to Simulation Modeling at the University of Colorado at Boulder . More information is available at http://cadswes.colorado.edu/riverware/training . |
| September 9-11 | Sediment Monitoring Instrumentation and Analysis Workshop at the U.S. Geological Survey Flagstaff Field Center |
| October 15-16 | The WaRSMP Technical Review Panel will meet in Denver to review progress and evaluate future priorities for the program. (Don Frevert, 303-445-2473) |

IMPROVING WATER SUPPLY TECHNOLOGIES

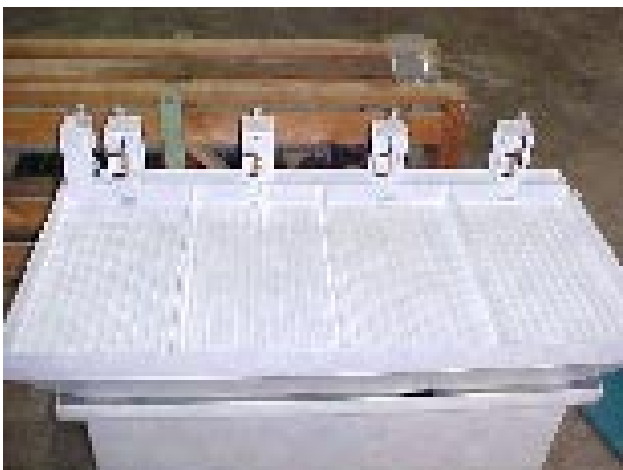
For automated farm turnout/continuous flow measurement (AFT/CFM), a site visit was scheduled to the Pioneer Irrigation Canal, which diverts water from the **Republican River** for irrigation of lands in **eastern Colorado and western Nebraska**. The purpose of the trip is to identify candidate locations for flow measurement field demonstration sites. This effort is being undertaken in cooperation with Reclamation's **Nebraska-Kansas Area Office (NKAO)**. Science and Technology Program funds will be utilized to include a CFM unit as part of one of the demonstration sites. Site visits to the Belle Fourche and Angostura irrigation districts in **South Dakota** are also scheduled under an agreement with Reclamation's **Dakota Area Office (DKAO)**. The focus of these visits is identification of canal modernization opportunities in the respective district's delivery systems. In planned subsequent activities, demonstration flow control and flow measurement sites will include CFM installations and possibly an AFT installation. (Tom Gill, 303-445-2201)

For water measurement structures that also allow fish passage, flow measuring and fish passage properties of a flat-bottomed Venturi flume operating in subcritical flow conditions is being examined. In work done earlier this year, a preliminary investigation was carried out using three-dimensional numerical modeling software (FLOW 3D). Construction of a physical model (shown) was recently completed. In initial planned tests, flow measurement accuracy with the Venturi flume will be compared with the accuracy of a ramp flume installed downstream in the model. Measurements obtained through both structures will be compared with



measurements from meters installed in the laboratory pipe system supplying flow to the model. (Tom Gill, 303-445-2201)

For development of automated delivery systems compatible with improved efficiency application of irrigation water, construction of the mechanical components of a microscale demonstration model (shown) has been completed. Development of control components is progressing. Circuit boards for controlling gate operating motors have been designed and sent out for production. Current efforts include development of the control system logic. (Tom Gill, 303-445-2201)



IMPROVING WATER DELIVERY TECHNOLOGIES

The Management Practice Study II, titled “County Land Use Impacts on Irrigation Districts” will be presenting a revised, updated final report to Science and Technology in September, 2003, with many new materials from the three Rocky Mountain regional workshops organized and conducted by the principal investigators in 2001-2002. The project recently has been requested to conduct additional workshops in **Utah** in the Fall of 2003, by Weber County Storm Water Management and the Utah Stormwater and Floodplain Managers Association. Requests for additional workshops have been formally made by the **Mid-Pacific Regional Office in Sacramento, California**. Two professional papers were presented at the Second International Conference on Irrigation and Drainage, “Water for a Sustainable World,” **Scottsdale, Arizona**, May, 12-14, 2003. They are titled “Urbanization of Irrigation Systems,” and “Urban Water Issues: Secondary Water System Design Considerations for Landscape Irrigation.” The papers can be obtained through the U.S. Committee on Irrigation and Drainage. The first article is an overview of the research project and its findings, while the second article addresses the fact that several irrigation districts under Reclamation projects are providing pressurized raw irrigation water for residential lawns and gardens, and many other districts are considering doing so. The paper on secondary water supply presents important strategies that affect the continued viability of irrigation districts, ensuring the continuation of agricultural production under these systems as they are gradually urbanized. (Thayne Coulter, 303-445-2706)

REGIONAL REPORT

The **Upper Colorado Region** funds for Incorporation of Real Time ET Monitoring into URGWOM (\$25,000) have been transferred to U.S. Geological Survey, and they have already installed a number of groundwater monitoring wells in the **Albuquerque** reach that are critical to understanding evapotranspiration (ET) and incorporating it into the URGWOM model. These funds represent a huge leveraging of S&T dollars, with the project budget at over \$300,000 for 2003. The project will help to better characterize the interaction between surface water and ground water along the **Rio Grande**, so that a proper modeling of the partition between loss to ground water and loss to evaporation and transpiration can be made.

The project will result in more accurate water operations through improvements to the Upper Rio Grande Water Operations Model and the ET Toolbox. (Steve Bowser, 505-462-3592)

For its food web on tamarisk study, the **Lower Colorado Region** has begun collecting insects on tamarisk in 2003. Approximately 1,000 insects have been collected and preserved. Cooperators have been lined up to help identify the specimens collected. Sampling will continue through mid-August. The purpose of this study is to quantify the food web supported by tamarisk. This will improve Reclamation's understanding of the value of tamarisk to wildlife, including endangered species such as the southwestern willow flycatcher. (William Wiesenborn, 702-293-8699)