

S&T Highlights

Director's Office (Denver, Colorado)

Continuing Resolution limits funding.—Under the constraints imposed by the Congressional Continuing Resolution (CR), the Science and Technology (S&T) Program is only able to make limited FY05 funding available at this time. We have made ongoing projects with important activities scheduled for October and November a priority to fund during the CR. This CR allocation to ongoing projects is not a commitment to fully fund the projects for the duration of FY05. Continued funding beyond the CR will be based on Congressional budget action and the final evaluation of the relevancy and technical reviews on all proposals submitted to the program. (Siegie Potthoff, 303-445-2136)

Improving Infrastructure Reliability

Power system diagnostics.—The first of a series of special generator parameter research investigations was initiated at **Crystal Powerplant, Curecanti Field Division**, in combination with acceptance tests performed on a generator installed recently by the installation contractor. These parameter tests were conducted online and are of low impact to the generator. The test results will be used to determine if they may replace the traditional high impact (short circuit) acceptance testing methods and ultimately to determine or refine system stability margins in an effort to further reduce the odds of a regional blackout occurring. Testing will continue into October. (Phil Atwater, 303-445-2304)

Improving Decision Support

RiverWare forecasts river systems in the Truckee Basin.—S&T products are starting to come to fruition in the Truckee Basin, where a suite of RiverWare computer models will be used to produce regulated river system forecasts for the basin during the upcoming runoff season. The forecasts will give basin stakeholders a look at the expected streamflows and reservoir water levels for the upcoming year. Two of the three models that make up the system are nearing



completion, and the third is expected to be completed in the coming months. The operation of the entire system of models was recently automated. This will allow local Bureau of Reclamation (Reclamation) employees to review computer-generated forecasts every day during the runoff season, based on the most current water supply information. These models will eventually be reconfigured as planning models to assist with the implementation of basin policy. (Jeff Rieker, 303-445-2484; Don Frevert, 303-445-2473)

The Western Water Information Network.—The Threatened and Endangered Species Locator Research Team met in **Boise, Idaho** to summarize the past year's accomplishments and set future directions. The past year's accomplishments include:

- Full collaboration between the two independent research efforts
- Incorporation of a new research effort between the **Technical Service Center** (TSC) and the **Upper Colorado** (UC) region
- Western Water Information Network (WWIN) map service and database server installed
- Outreach effort initiated with **Pacific Northwest Region** Media Services
- Enterprise Geographic-Information-System-level (GIS) partnerships formed:
 - National Aeronautics and Space Administration (NASA)
 - OhioView Alliance Universities
 - U.S. Geological Survey (USGS) Biological Resources National Biological Information Infrastructure
 - NatureServe
 - Bureau of Land Management (BLM) National Integrated Lands System
- User surveys conducted
- Water supply data inventories, surveys, and acquisitions completed
- Collaboration with the UC Regional Office to create a local GIS application for water supply analysis and decision support

Future directions include:

- Continued focus on Washington, Regional, and Area Manager needs
- Meet Decision Support System and Hydrologic Modelling needs
- Tap technical expertise of the USGS, NASA, OhioView, and others
- Examine the need for a web based water issues pin map application

- Develop WWIN links to Regional and Area Office GIS databases or map services
- Extend outreach activities
- Conduct research on predictors of water use change at the local, basinwide, and 17 state levels
- The TSC will work with the UC Region to understand the dynamics of cooperation between stakeholders with the intent of fostering cooperation in future settings.

The WWIN Threatened and Endangered Species effort is seeking to bring geospatial data related to water supply to the fingertips of decisionmakers in a timely manner. (Doug Clark, 303-445-2271)

Upcoming Events

- October 29: The Watershed and River Systems Management Program Risk and Uncertainty Team will hold their next conference call. (Don Frevert, 303-445-2473)
- November 30: The RiverWare technical team will hold their next meeting at the Center for Advanced Decision Support for Water and Environmental Systems in Boulder. (Don Frevert, 303-445-2473)

Improving Water Delivery Reliability

Modeling selenium contamination in the Delta-Mendota Canal.—The Bureau of Reclamation Office in **Fresno, California** has begun to model selenium contamination in the Delta Mendota Canal. Using S&T funding, a model is being developed using MIKE 11 by the Danish Hydrological Institute with assistance from the Lawrence Berkeley National Laboratory and the San Luis and Delta Mendota Water Authority. Selenium is a naturally occurring trace element that is toxic to fish, amphibians, birds, and mammals. The model will help the operators of the canal to predict the effects of known sources of selenium contamination on water delivered to farms and wildlife refuges in central California. The model will correlate flow and water quality data for the canal with data for known inflows of subsurface ground water and estimated surface water inflows and diversions. The goal is to help Reclamation operate the canal to provide a reliable supply of clean water to customers. This model can be adapted to other canals. (Chris Eacock, 559-487-5133)

Remote Sensing and Vegetation Mapping Project in the North Grassland Water District and San Luis National Wildlife Refuge.—A vegetation map of the North Grassland Water District was created to help quantify and track changes in habitat in seasonal wetlands. The map was created using statistically based classification techniques applied to high resolution, multispectral imagery and corresponding field data. Based on preliminary visual inspection, the map appears to provide accurate coverage of major plant groups. A formal, statistically based accuracy assessment is planned, to help determine whether further refinement of the classification system is advisable. After classification, a portion of the map was further processed using spectrally similar polygons at the landscape scale. The result was a smooth map, where the base unit is a landscape object, rather than a pixel at the resolution of the satellite sensor. Polygons were created from three images taken throughout the growing season. Defining the basic unit of the landscape in this manner takes into account that the boundaries of plant communities are best defined over the life cycle of the plants. The vegetation map, along with a description of the associated methodology, was presented on a poster at a recent CALFED Bay-Delta Program science conference. The title of the poster was *Use of High Resolution Satellite Data for Discrimination of Plant Communities in Seasonal Wetlands*. The poster described a state-of-the-art habitat mapping methodology that is available to assist wetland managers in decisionmaking. Adoption of a habitat monitoring program based on remote sensing techniques would provide an efficient method to evaluate the effects of management decisions. (Tracy Slavin, 916-978-5202; Nigel Quinn, 916-978-5079)

Improving Water Supply Technologies

HydroSphere Workshop.—The **Mid-Pacific Regional Office**, hosted a workshop on HydroSphere Modeling for Conjunctive Simulations of Surface and Subsurface Flow and Transport. The workshop was funded by the S&T Program. The program included lectures and hands-on exercises covering the background, theory, application, and status of fully integrated surface/subsurface modeling technologies, and featured Reclamation's fully integrated flow/transport model, HydroSphere. Researchers from universities, Reclamation, other federal agencies, state agencies, and private consulting firms participated in the conference. HydroSphere is a valuable numerical tool for addressing issues related to water supply, water delivery, and decision support. They include water quality assessments, water supply forecasting, groundwater storage and conjunctive use, and linkage with reservoir and river models as a component in decision support systems for water resource management. (George Matanga, 916-978-5084)

“Lining Ponds to Reduce Selenium Loading” study is complete.—This project involved measuring seepage losses and studying the use of various lining or sealing techniques to reduce seepage loss from ponds that are used for seasonal water storage. As these studies proceeded, the **Gunnison Basin** Selenium Task Force, along with the **Colorado River Basin** Salinity Control Program became interested in the results. The Task Force is now looking to pursue funding to line many of the leaky ponds. Data from this study will be vital to identifying the best of most cost-effective projects to fund. The final report can be accessed at

<http://www.usbr.gov/research/science-and-tech/news/LngPndsSelnmLdgReport.pdf>

(Michael Baker, 970-248-0637)