

## S&T Highlights

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### Director's Office (Denver, Colorado)

*Bill Karsell heads up Research Office.*—Bill Karsell joined our office as Acting Director, Research and Development. Bill came to the Research Office from the Technical Service Center, where he is the Chief, Environmental Resources, and where he has been actively engaged with research activities. (Siegie Potthoff, 303-445-2136)

*Steering Team annual meeting.*—The annual Science and Technology (S&T) Program Steering Team meeting was held in **Fort Collins, Colorado**. The Steering Team consists of about 20 [representatives](#) from Reclamation management, other government agencies, stakeholder organizations, and academia, representing the broad spectrum of Western water issues and perspectives. The Steering Team guides the program by helping establish research priorities, cultivate collaboration, and avoid duplication. The goals of this year's meeting were to update the Steering Team on the past year's developments, present a sample of the ongoing research and development (R&D) projects, and solicit feedback and guidance based on the presentations. More than 20 researchers from across Reclamation briefed the Steering Team on their R&D projects and programs covering all the Focus Areas and almost all the Output Areas in the S&T Program. The primary steering team conclusions are:

1. Many S&T Program efforts are producing relevant solutions and findings that have broad application across Reclamation.
2. Some S&T Program efforts are project specific and have little transferability across Reclamation. More needs to be done to ensure that these efforts are funded by Regional project funds or planning funds and do not encumber Reclamation's investment in R&D.
3. Some S&T Program efforts should be reduced or concluded.
4. The new program practices of having Region and Area office subject matter experts review R&D proposals for relevancy is valuable and necessary.



5. Technology transfer between researchers and end-users is improving but researchers need to concentrate more on communicating the problem their research is addressing and how their research can be put to use to improve Reclamation operations.
6. There should be more engagement between the S&T Program and the Region and Area offices. This would help the broad sharing of program solutions and findings and speed their application into Reclamation operations. This would also cultivate a sharper focus on the most relevant problems that face Reclamation, as water and facility managers would have more opportunity to provide input into the direction of R&D for Reclamation.
7. Consider moving the annual steering team meeting to the Regional offices to help achieve enhanced engagement and communications with those responsible for water and facility management. The steering team meeting would serve two ongoing primary objectives: (1) share emerging solutions and findings, and (2) define the top research questions that the S&T Program should pursue to ensure optimum value for Reclamation into the future.
8. Other suggestions to help achieve more dialogue and input from water and facility managers include organizing a Reclamation-wide technology conference, and having Regional and Area offices request a customized R&D workshop. (Dan Levish, 303-445-3175)

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## Improving Decision Support

*Habitat evaluation using remote sensing in San Joaquin Valley wetlands.*—The use of remote sensing as a tool for inventorying vegetation has great potential to replace traditional time- and labor-intensive methods such as transect surveys. A satellite image provides a snapshot in time that provides real-time assessment capabilities, as well as a historical record of land use and land cover. A project in the **Mid-Pacific Region** to establish a remote sensing methodology for evaluating habitat health in the **San Luis National Wildlife Refuge** consists of: a definition of classification goals, acquisition of images from the satellite, field data collection (ground-truthing), image analysis, and evaluation of the accuracy of classifications. With the help of project personnel and other collaborators to first enumerate the variety of significant vegetation at field sites, and then to identify the exact species, Reclamation personnel developed a portable, compact plant identification guide, including photos, drawings, and text, highlighting identifying characteristics of each species on satellite images. A database was also developed to define the characteristics of plant communities to map. This allowed collection of data efficiently and consistently, eliminating the many problems associated with paper-based logging projects. Individual pixels on satellite images will

be classified according to the plants that they represent, resulting in smoothly classified images, less noisy than a pixel-based product and more analogous to the layout of real vegetation communities. (Tracy Slavin, 916-978-5202; Nigel Quinn, 916-978-5079)

*Hydrologic Database now in use.*—The **Boulder Canyon Operations Office** and the **Upper Colorado Regional Office** have completed the transition to production use of a new version of the Hydrologic Database (HDB). HDB is used to store water data for operations and planning, and allows easy coordination of mainstem **Colorado River** operations between the two offices. Several other offices within Reclamation are also in the process of installing and evaluating HDB, including the **Upper Columbia, Albuquerque, Yuma, Lahontan, and Eastern Colorado Area Offices**. The two largest improvements in HDB are automatic data consistency across time intervals (i.e., hourly, daily, monthly, and yearly) and archives and priorities for different sources of the same data. Producers and consumers of HDB stored data include other area offices within the Upper Colorado Region, federal agencies, state entities, consultants, and the general public through applications that generate web content. Some examples include <http://www.usbr.gov/uc/crsp/GetSiteInfo> <http://www.usbr.gov/uc/water> and <http://www.usbr.gov/lc/region/lcrivops.html>. The capabilities included in the new version of HDB are improving Reclamation's management of water operations by allowing managers and staff to focus on other important issues. (Andrew Gilmore, 801-524-3879)

*Enhanced Modsim capabilities.*—The **Pacific Northwest Region** has developed a methodology, called back-routing, for streamflow routing in Modsim. Back-routing corrects the failure of the program to provide a successful distribution by priority (water rights) in some complex systems. Back-routing has worked successfully on a set of test networks. Further improvements will include provisions for storage accounting, and the ability to solve through confluences, even if the network branches. (Leslie Stillwater, 208-378-5202)

*Web-based water marketing.*—Reclamation, in conjunction with the University of Nebraska at Lincoln and the Economic Research Service is conducting an “experimental economics” approach to water marketing. This approach consists of setting up a [web-based water auction](#) and testing the various types of auction formats. Recently, the research team conducted a mock water auction to test the web-based program. The team discovered some glitches, which are currently being worked out. Eventually, student sessions will test the water auction, followed by irrigators in **Nebraska**. The main purpose of this research is not only to determine a value for irrigation water, but to determine the incentives and disincentives that irrigators have in deciding their participation in a water bank. (Dawn Munger, 303-445-2734)

*Evaluating hydrologic risk and uncertainty.*—The Watershed and River Systems Management Program (WaRSMP) Risk and Uncertainty Analysis team met

by conference call to evaluate issues that WaRSMP team members need the capabilities to address. Types of uncertainty which were deemed critical include forecast uncertainty, and demand uncertainty. Risk issues to be addressed include flood control risks, drought risks, and water quality risks. The potential for a questionnaire on the subject, which might be sent to managers and technical experts in the future, was also discussed. (Don Frevert, 303-445-2473)

*Yakima Fisheries research team.*—The **Yakima** Fisheries research team held a conference call. Good progress is being made on linkage of fishery habitat tools with RiverWare and also on the Range of Variability Analysis (RVA). The possibility of a face-to-face team meeting in January or February was discussed. (Don Frevert, 303-445-2473)

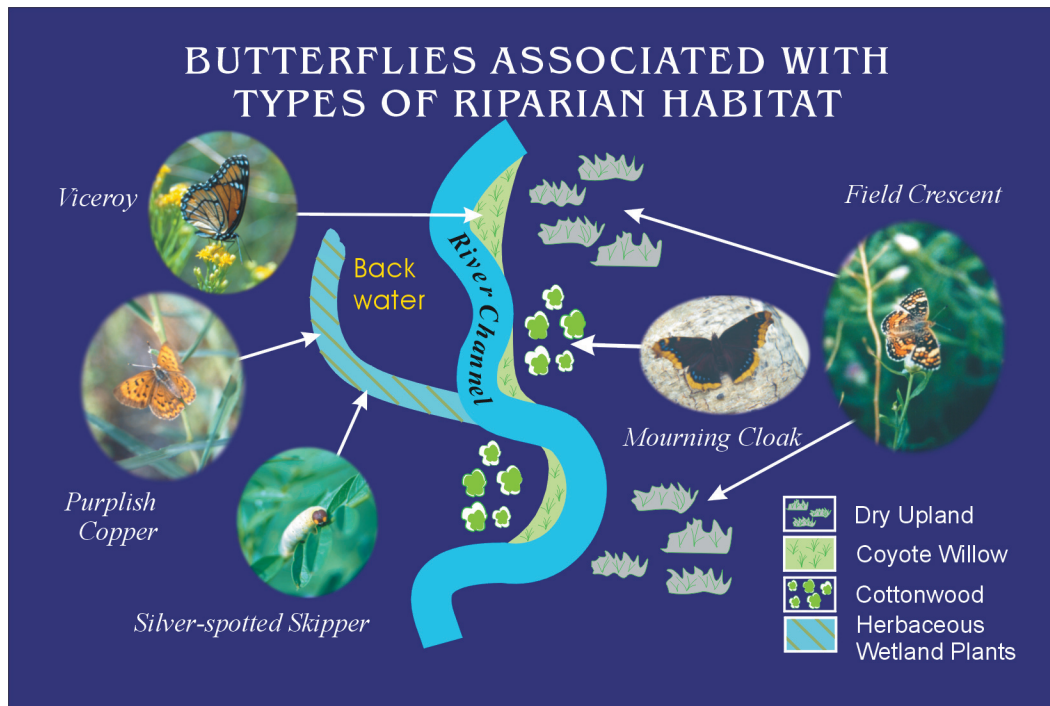
### Upcoming Events

- October                    5: The Yakima Fisheries Research Team will hold their next conference call. (Don Frevert, 303-445-2473)
- 29: The WaRSMP Risk and Uncertainty Team will hold their next conference call. (Don Frevert, 303-445-2473)

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## Improving Water Delivery Reliability

*San Diego River Restoration—study of baseline conditions.*—Reclamation recently completed a field study along the **San Diego River** corridor to determine present environmental conditions and identify potential restoration sites. This waterway has been highly impacted by human activities and further threatened by the spread of numerous invasive plant species. Water flow to the San Diego estuary has likely been considerably reduced over the years because of the infestation of these noxious plants. The information collected will be analyzed and used as a baseline to help determine future changes following long-term restoration efforts. Physical, chemical, and biological data were obtained, and butterfly communities (see the figure below) were examined and quantified along the river channel and riparian zone. Techniques used in this environmental evaluation were recently developed under the S&T Program. Reclamation's **Southern California Area Office** funded this field study with cooperation from the City of San Diego and the San Diego River Park Foundation as well as others. (Denise Hosler, 303-445-2195; S. Mark Nelson, 303-445-2225).



## Improving Water Supply Technologies

*More information available on the Internet.*—The July 2004 *S&T Highlights* included an article on “Slowsand filtration for reducing costs of desalting surface waters .” [Find out more on the Internet.](#) (Chuck Moody 303-445-2258)

*Flow measurement with canal radial gates.*—Reclamation recently assisted the Agricultural Research Service (ARS) with initial tests of a canal radial gate model installed in the ARS hydraulics laboratory in **Phoenix, Arizona**. The tests are the first part of a collaboration between Reclamation, ARS, and the **Salt River Project (SRP)** that will improve the accuracy of flow measurements made at radial gate check structures. In addition to the laboratory testing, which will be used to improve gate calibration algorithms, the project will develop a user-friendly computer program that can be used to create gate rating tables and/or equations. The model radial gate was supplied by SRP and installed in a laboratory flume at ARS’s U.S. Water Conservation Laboratory. The focus of the initial tests was on finding the best techniques for measuring the jet thickness downstream from the gate in free flow, and the pressure in the jet downstream from the gate in submerged flow. These measurements are needed to determine several empirical factors that are important in the gate calibration algorithms. Once the best experimental procedures have been found, ARS technicians will perform the bulk of the model testing. The test results will supplement data collected in 2000 from the same model gate by a student from the Delft University of Technology. Reclamation is expected to begin work on the new computer software in the first quarter of FY05. By enabling accurate flow measurement

using existing gates, this project will reduce the future need for dedicated flow measurement devices, such as weirs, flumes, and acoustic flow meters. (Tony Wahl, 303-445-2155)



A Prandtl tube is used to measure the thickness of the jet on the downstream side of the model radial gate.