

S&T Highlights

Improving Decision Support

Improving HYDROSS.—HYDROSS, a monthly water allocation computer model used extensively in the GP region, is undergoing continual improvement. A fiscal year 2003 S&T effort made the model easier to support by upgrading code to the FORTRAN 90 standard, and by eliminating archaic data management processes. The TSC is making several improvements in fiscal year 2004, including (1) adding some diversion and return flow functionality, (2) exploring reservoir storage accounts, (3) making complementary interface changes, (4) enabling the manual assignment of diversion numbers, (5) making the output graphing tool compare multiple scenarios (6), porting the HYDROSS User's Manual to Microsoft Word, (7) refining the help references, and (8) upgrading the report module code to the same FORTRAN 90 standard as the model modules. The Integrated Decision Support Group at Colorado State University has provided assistance with a full peer review and verification of the fiscal year 2003 code upgrade. (Nancy Parker, 303-445-2532)

Teleconnection study.—Reclamation personnel met with hydrologists at the Natural Resources Conservation Service (NRCS) in **Portland, Oregon** to discuss the potential of using climate teleconnections for improving seasonal water supply forecasts. A well-known teleconnection involves summer El Niño/Southern Oscillation conditions and **Pacific Northwest** (PN) winter hydrology. The briefing highlighted Reclamation's findings on teleconnections between natural spring/summer runoff in various

Mid-Pacific and Pacific Northwest basins and earlier climate conditions in the atmospheric pressure structure and/or sea surface temperatures of the North Pacific. The briefing with NRCS forecast producers caps a sequence of summer meetings with peer reviewers at the National Oceanic and Atmospheric Administration's (NOAA) Climate Diagnostic Center, internal forecast producers (PN Region), and external forecast producers (NOAA, National Weather Service, the California Department of Water Resources, and NRCS). Translation of teleconnection information into improved forecasts and operations planning benefits involves forecast producers as key intermediaries. Showing them the forecast value of information and how to integrate teleconnection predictors into their forecasting data streams is an upcoming work objective. Complementary work will be devoted to quantifying Reclamation's benefits and/or impacts from the use of teleconnections-based runoff forecasts in operations plan development. (Levi Brekke, 916-978-5185)

Watershed and River Systems Management Program team charts a course for RiverWare.—The Watershed and River Systems Management Program team held a conference call to prioritize future developmental needs for RiverWare. The group identified a number of key priorities, including aggregation of time series slots, improved output capabilities, better capabilities to deal with large memory problems, and a water rights solver. (Don Frevert 303-445-2473)



Upcoming Events

August 26: The Yakima Fisheries Research Team will hold their next conference call. (Don Frevert 303-445-2473)

Improving Water Delivery Reliability

Steelhead spawning and movement study.—Reclamation completed the second winter of its steelhead spawning and movement study in the upper **Yakima River** basin, **Washington** (steelhead are listed as threatened under the Endangered Species Act of 1973). Yakima River adults were intercepted at Reclamation's Roza Dam and Fish Trap on their way upstream and tagged with a 6-month radiotransmitter. They were then tracked through the reproductive season over hundreds of river miles in the Yakima/Columbia River systems. About 10 percent of the Yakima River steelhead run uses the upper portions of the watershed to spawn, and about half moved high up several tributaries. Following this, they then attempted to return to the ocean, a round trip of over 900 miles. Dam passage and river flows are key to steelhead, and the information learned here is assisting Reclamation with managing Roza Diversion Dam and regulating flows, and assisting the National Marine Fisheries Service with their status review of the species in the middle Columbia River ecological unit. (Cathy Karp, 303-445-2226; Walt Larrick, 509-575-5848)



A steelhead trapped at Roza Dam

New fishway for Grand Valley Diversion Dam.—The **Western Colorado Area Office** completed construction of a new fishway for Grand Valley Diversion Dam located on the **Colorado River** upstream of **Grand Junction, Colorado**. The fishway's baffles are a unique design resulting from fish passage research conducted to improve fishway design for native warm water fish species. Hopefully, razorback suckers, Colorado pike minnow, and many other fish will use the fishway to once again pass upstream of the diversion dam. (Brent Mefford, 303-445-2149)

Improving Water Supply Technologies

Evaporation performance of SolarBee® pond circulator.—Pilot testing to determine if a SolarBee® pond circulator can enhance evaporation at the **Salton Sea** was completed at the end of May 2004. A SolarBee® unit is a water circulation machine that is capable of drawing up to 10,000 gallons of water per minute from below the machine and spreading it across the top of the water surface in a near laminar fashion for continuous surface renewal. This unit is known for greatly accelerating biological and chemical processes that clean up wastewater and freshwater, while running on only a 1/8-horsepower motor driven by solar power. Test results from the Salton Sea show that the unit can increase the rate of evaporation of Sea water by 150 percent during the day, and as much as 170 percent at night. Reclamation can benefit from this device, because it can reduce the size and environmental impacts of evaporation ponds that are often used in irrigation drainage and desalination projects. (Erik Jorgensen, 303-445-3604)



A SolarBee® pond circulator

HydroSphere workshop announced.—The **Mid-Pacific Regional Office** is holding a workshop jointly with the California Water and Environmental Modeling Forum September 28-30, 2004, on Application of HydroSphere for Conjunctive Simulations of Surface and Subsurface Flow and Transport. This workshop presents an introduction to hydrologic cycle modeling using HydroSphere. The material covered provides an understanding of the physical processes governing flow and transport behavior in coupled surface and subsurface environments, and a numerical background for their analysis. Participants are expected to know the basic processes of hydrology, hydrogeology, contaminant transport, and modeling. The workshop is divided between theory lectures and hands-on computer sessions. The [website](#) for the workshop provides the agenda and information for registration. (George Matanga, 916-978-5084)

Slowsand filtration for reducing costs of desalting surface waters.—Desalting can offer “drought-proof” water supplies by converting both seawater and salty inland waters to fresh drinking water. Because reverse osmosis (RO) desalting plants are very sensitive to particulates in their salty feedwater, they require effective prefiltration of water before desalting. Slowsand filtration is a low-tech technology. By gravity, it filters water using 18 to 36 inches of 0.3-mm sand at

a filtration rate of about 7.5 MGD/acre (about 1/25th that of rapid sand filtration). It uses no chemical coagulants. The **City of Yuma, Arizona** effectively used slowsand filtration from about 1900 to 1954 to treat **Colorado River** water. Reclamation has been conducting promising studies of slowsand filtration for both the **Central Arizona Project** and the **Yuma Desalting Plant (YDP)**. CH2M Hill engineers have estimated that, if effective, slowsand filtration at the YDP could reduce total desalting costs by about 30 percent. Reclamation is conducting further tests at the YDP, and expects to have preliminary RO fouling results as early as July 2005. (Chuck Moody, 303-445-2258)



Positioning of tanks to contain pilot slowsand filters at the YDP (July 2004).