New Online Bay-Delta Science Journal Debuts

The California Bay-Delta Authority announced on Oct. 3 the debut of a new electronic journal dedicated to Bay-Delta science and research, *San Francisco Estuary and Watershed Science*. The journal will provide an electronic forum for scientific discussion and peer-reviewed research about the San Francisco Bay, the Sacramento-San Joaquin River Delta, and upstream watersheds. It features original research findings, reviews, techniques, and comments on the science and ecology of the bay delta.

The goal of the journal is to make peer-reviewed research available to the broadest audience possible and provide an outlet for researchers to share their work with policymakers who need scientific information for management decisions.

"We encourage all readers to access this dynamic new forum for receiving relevant, high-quality science information," said Managing Editor Lauren D. Buffaloe. "We especially invite regional researchers to consider publishing in this new journal."

The journal is a collaborative project of the San Francisco Bay-Delta Science Consortium, the California Bay-Delta Authority Science Program, the California Digital Library, the University of California, Davis, and the John Muir Institute of the Environment.

The publication is available at repositories.cdlib.org/jmie/sfews.

Satellites Provide Data to Estimate Rainfall at Global and Regional Scales

Yang Hong, Ph.D. *and* ***W. James Shuttleworth, Ph.D.*** *– Department of Hydrology and Water Resources, University of Arizona, and* ***Kuolin Hsu, Ph.D.*** *and* ***Soroosh Sorooshian, Ph.D.*** *– Department of Civil and Environmental Engineering, University of California, Irvine*

Precipitation is one of the most critical input variables in hydrometeorological modeling, yet obtaining high-quality rainfall measurements is a challenge in arid and semi-arid regions. In the southwestern United States, where large areas are covered by mountains, precipitation measurements from ground-based measurements such as rain gauges and radars are rather limited. However, over the past few decades, many satellite-based algorithms have been developed to improve measurements of global hydrologic variables. Advancements in observation sensors, sampling strategies, and data-merging techniques have improved spatial and temporal precipitation observations.

In order to estimate rainfall using radar and satellite observations along with other information sources, a satellite-based rainfall estimation system, PERSIANN (Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks) was developed at the University of Arizona with funding from the National Science Foundation and the National Aeronautics and Space Administration. PERSIANN produces rainfall data every 30 minutes based on the cloud-top infrared brightness temperatures and temperature variations observed from multiple geostationary satellites. The PERSIANN model parameters are constantly adjusted using rain-rate measurements from passive microwave imagers on low-orbital satellites. Currently, near-real-time, 6-hourly 0.25 degree by 0.25 degree (about 25 km by 25 km) rainfall estimates are available through the Hydrologic Data Information System (HyDIS). The quality of PERSIANN rainfall estimates is evaluated using ground validation data from the Florida peninsula (for rainfall over land) and Kwajalein Island (for rainfall over the ocean). Correlation coefficients of daily rainfall range from about 0.68 to 0.72. PERSIANN data are available for March 2000 to the present. Precipitation data at various temporal resolutions, from hourly to monthly, can be viewed and downloaded through HyDIS: hydis2.hwr.arizona.edu/synergy/dailyprecip/.

In an attempt to provide even finer temporal and spatial rainfall estimates, the PERSIANN-CCS (Cloud Classification System) was developed to process information obtained from cloud patches to estimate rainfall at hourly 0.04 degree by 0.04 degree (about 4 km by 4 km) scales. In this model, cloud types are defined according to the features of a cloud patch (a group of connected cloud pixels built by a convective cell) and a cloud-rainfall relation is calculated individually for different cloud types. Rainfall estimates are ultimately produced based on the features of the cloud patch, cloud brightness temperatures, and the cloud-rainfall relation.

PERSIANN-CCS is trained with ground-based gauge/radar rainfall measurements from the continental United States. However, it can be automatically adapted to other climates using available rainfall observation data from those locations. Thus, relationships of the classification cloud type and rainfall distribution are constantly updated.

Validation results for PERSIANN-CCS have demonstrated that the system can provide seamless high spatial/temporal resolution of precipitation data for large portions of the Southwest and northern Mexico. PERSIANN-CCS rainfall data are available from February 2002 to the present. To request data, send email to Dan Braithwaite at dank@hwr.arizona.edu.

For more information, visit www2.hwr.arizona.edu/persiann, hydis2.hwr.arizona.edu/precip/, or www.sahra.arizona.edu.

Deep Well in California Desert Provides New Basin Data

A new well drilled to 1,760 feet near Victorville, about 40 miles north of San Bernardino, California, hit bedrock, reported *The San Bernardino County Sun*, allowing the limits of the underlying basin at last to be defined. Previous wells drilled by regional water districts and private landowners have not extended deeper than about 1,200 feet, said Lance Echkart, senior hydrologist with the Mojave Water Agency, according to the article.

The $250,000 drilling operation was funded by a grant from the California Department of Water Resources, reported *The Sun*. Once the well was completed, arsenic and other water quality sampling, as well as pressure testing was to occur at 11 discrete intervals, in order to find

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the best locations for a high-quality and sustainable water supply.

In addition to supplying water for the Mojave Water Agency, the information gained about the bottom of the basin and the types of deposits above it will allow the agency to better estimate how much water from the nearby California Aqueduct might be recharged in the area, thereby replenishing the basin, said the newspaper.

The Mojave Water Agency has released 1,600 acre-feet of aqueduct water into a holding pond over the past year, *The Sun* reported. The pond is expected to be expanded into a 100-acre basin, ultimately recharging up to 13,000 acre-feet annually.

The Mojave Water Agency is one of 29 authorities in the San Bernardino area that contract with California's State Water Project to acquire rights to water flowing through the 400-mile aqueduct that originates in Northern California. In Victor Valley alone, customers consume 12,000 acre-feet more water per year than nature provides, said Randy Hill, general manager of the Victor Valley Water District, according to *The Sun*. The paper reported that Kirby Brill, general manager of the Mojave Water Agency, said he expects the agency will buy about 21,000 acre-feet of aqueduct water this year, approximately double what it bought last year.

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