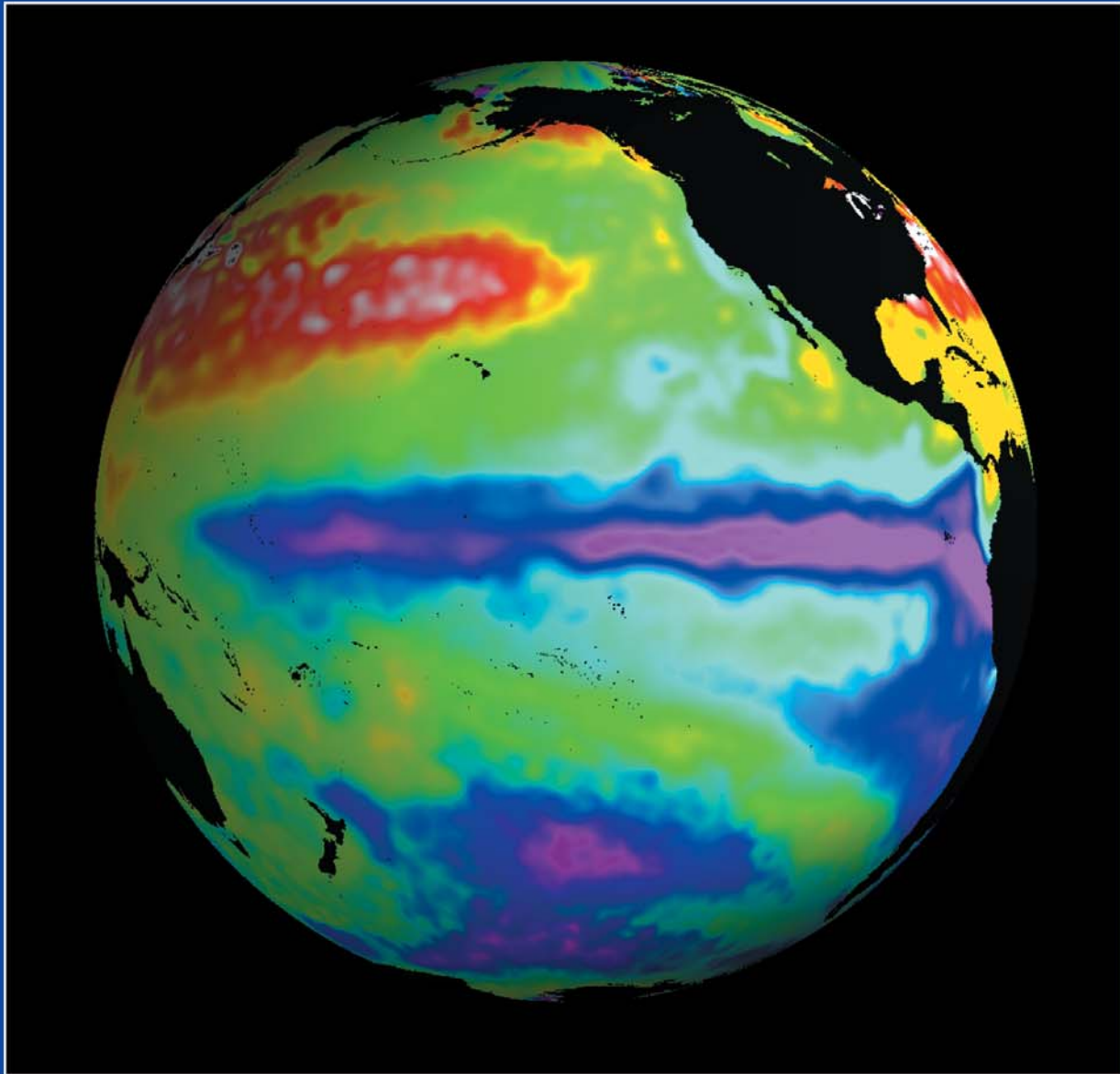


Southwest The Complete Hydrologic Resource
HYDROLOGY

Volume 1/Number 2

July/August 2002



**Climate Variability and
Water Resources Planning**

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Southwest The Complete Hydrologic Resource HYDROLOGY

A bimonthly trade magazine for hydrologists, water managers, and other professionals working with water issues.



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From the Editor

From the Editor

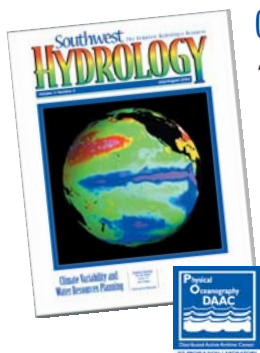
*I'm happy to report that we received a highly enthusiastic response to the premier issue of **Southwest Hydrology**. Emails and phone calls of support, in addition to more than 150 requests to be added to our mailing list, indicate strong interest in this publication.*

*In this issue, **Southwest Hydrology** focuses on climate variability, which is not typically a topic that is integrated into our daily decision-making. However, as more is learned about past climate variability, and as climate prediction techniques improve, it makes sense to incorporate that information into our future planning and investigative efforts. Towards that end, we are considering developing a workshop to address the issues of drought, climate variability, and water resources planning, with the idea of bringing climate researchers together with water resources investigators, planners, and policy-makers. We are currently gauging the support for such a workshop; please let us know if you would be interested in attending.*

*A major goal of **Southwest Hydrology** is to be a magazine produced by all of you, the water professionals of the Southwest, through your contributions of project updates, company news, product announcements, and anything else of interest to our readership. We would like to recognize all the contributors to this issue, listed on the opposite page, and particularly our invited authors whose articles comprise the feature topic.*

As always, I look forward to your comments.

Betsy Woodhouse
Editor



Cover image:

Sea Surface Temperature (SST) Anomaly associated with the La Niña event of 1999. AVHRR Pathfinder SST used with the annual cycle and climatology removed from the data (NASA, NOAA, JPL, U.Miami, RSMAS, PO.DAAC). Image was obtained from the Internet on-line information page (www.podaac.jpl.nasa.gov/) maintained by the NASA Physical Oceanography Distributed Active Archive Center, at the Jet Propulsion Laboratory, California Institute of Technology, June 2002.



Clarification

The caption for the map produced by the USGS that accompanied the article, "Arsenic Removal Strategies for a New, More Stringent Standard" (page 12 of the May/June 2002 issue) was inadvertently omitted. The arsenic concentrations shown on the map represent the concentration in groundwater. As the article focused on removal of arsenic from drinking water, including the map without the caption was potentially misleading.



Climate Variability and Water Resources Planning

“Drought” is all over the headlines these days. But what constitutes a drought? What is “average?” Are we being short-sighted by basing our policies and actions on conditions that have occurred in our lifetime? Whether we react to weather or plan for climate depends not only on how well we understand past climate, but also on how well we can predict future climate. Do agencies and industry incorporate climate variability data in their current operations? Should they? We asked several authorities who work with climate on a daily basis to address these issues.

12 Climate Variability in the Southwest

Robert Merideth

While it’s impossible to predict the precise climate changes in store for the Southwest, it is important to recognize and understand the relationships between the climate and the region’s social, political, economic and environmental conditions.

14 Introduction to Tree-Ring-Based Streamflow Reconstructions

Connie Woodhouse, Ph.D. and David Meko, Ph.D.

Tree growth can be used as a proxy for streamflow because many of the same climatic factors that influence tree growth also influence annual streamflow, particularly precipitation and evapotranspiration.

16 Integrating Climate into Water Policy

Barbara J. Morehouse, Ph.D.

Climate forecasts, judiciously supplied and used, could prove valuable for the implementation of contingency arrangements for allocation of Colorado River water in times of both surplus and shortage.

18 Climate Forecasting Status and Prospects

Kelly T. Redmond, Ph.D.

The general character of upcoming climate is at least partly predictable in certain circumstances. By the same token, it is probably wholly unrealistic to expect that climate can be forecast equally well under all circumstances.

20 Using Paleo-Climate Records to Assess the Current Hydrology of the New Mexico Middle Rio Grande

Karen J. Lewis and Deborah Hathaway

Tree-ring records delineated the optimal period of record for use in modeling and identified how recent conditions compare to the long-term average.

22 How Dry Was My Valley? Using Paleo-Climate Data to Extend the Historical Record

Jeanine Jones, P.E.

The brevity of the historical record masks natural climate variability—a circumstance exacerbated by the twentieth century’s relative climatic stability.

24 Climate Forecasting Can Be Critical to SRP Water-Resource Decision-Makers

Jeffrey P. Lane

The decision to shut off the groundwater pumps in anticipation of the 1997-1998 El Niño resulted in significant financial savings to Salt River Project, the largest water and power provider in the greater Phoenix metropolitan area.

26 Climatic Effects on Groundwater Conditions in the Southwest

Betsy Woodhouse, Ph.D.

The USGS is investigating which climate variations influence groundwater in the Southwest, and how those influences are manifested.

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Printed in the USA by Arizona Lithographers

Published by Woodhouse Press, L.L.C., copyright © 2002

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