



CLIMAS Update

News from the Climate Assessment for the Southwest Project

Integrating science, policy, and community

THE UNIVERSITY OF ARIZONA

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The American Geophysical Union will hold its 2002 annual meeting Dec. 6–10 in San Francisco. The Atmospheric Sciences section will present sessions on polar air chemistry, transport of Asian emissions, and aerosols/clouds and chemistry. More info at: <http://www.agu.org/meetings/fm02top.html>.

The American Anthropological Association's annual meeting will be held in New Orleans this year, November 20–24.

NOAA's 27th Climate Diagnostics and Prediction Workshop will be held October 21–25 at the George Mason University, Fairfax, Virginia. See <http://www.cpc.ncep.noaa.gov/products/outreach/CDW27.html> for more information.

The American Meteorological Society will hold its 83rd annual meeting February 9–13, 2003, at the Long Beach Convention Center in Long Beach, California. See <http://www.ametsoc.org/AMS/> for more information.

CLIMAS Mission

CLIMAS was established to assess the impacts of climate variability and longer-term climate change on human and natural systems in the Southwest. Our mission is to improve the ability of the region to respond sufficiently and appropriately to climatic events and climate changes.

Initiative provides drought, El Niño information to Southwest stakeholders

Severe to extreme drought conditions have been developing in the Southwestern United States over the past four years, with dire effects for some locations and sectors. A weak El Niño has developed in the equatorial Pacific, bringing some hope of relief, but its potential effects on the Southwest are, as yet, uncertain.

In order to help stakeholders cope with this situation, CLIMAS recently launched the END InSight Initiative. Working with various agencies, we are monitoring drought conditions in the Southwest and tracking the progress of the El Niño event forecasted for fall 2002–summer 2003. The project is providing stakeholders with up-to-date, comprehensive climate information, while helping the research community develop a better understanding of how to enhance the utility and usability of forecasts and other scientific data products.

The development and experimental design of climate information, based on user-identified needs, is central to the CLIMAS mission. Through carrying out integrated physical-social science research on how to best assist stakeholders in coping with stressful climatic situations, we are developing an improved set of products and methods for using climate science to mitigate against human and environmental losses.

The Project

We have invited a group of about 35 stakeholders from throughout Arizona and New Mexico to participate in the yearlong project to improve the use and usability of climate information. Participants include fire, land and water managers; journalists, reporters and science writers; farmers, ranchers, and agricultural extension agents; tribal authorities; and specialists involved in environmental quality, conserva-

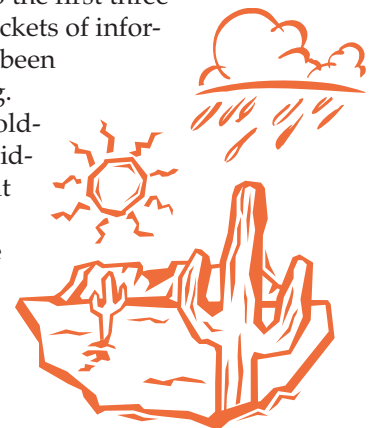
tion and restoration, wildlife management, the energy sector, and border issues.

The project incorporates insights from previous research on the use of El Niño information by decision makers, including a pilot project conducted by NOAA in California during the 1997–98 El Niño. The information gathered during the course of this project will be translated into a series of articles, reports, scholarly papers, and web pages designed to increase public understanding of climate and its impacts in the Southwest, and to encourage new research and development activities that result in better climate information and forecasts.

In July, we began sending participants monthly packets of climate information. The packets include background explanations of weather and climate phenomena, summaries of recent conditions, long-range forecasts, and historical information regarding the effects of past droughts and El Niño events. A survey is sent along with each packet, so that participants can tell us whether the materials are usable and understandable, and advise us about how the information might be improved.

Initial Reactions

Response to the first three monthly packets of information has been outstanding. Our stakeholders are providing excellent feedback through the surveys, and sharing other comments with us as well.



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CLIMAS Revamps Web Site

This summer, ISPE graphic designer Shoshana Mayden, in conjunction with our core office, developed a new web site for the CLIMAS project. The site features enhanced organization, content about CLIMAS research projects, and annotated links to hydroclimate and climate impacts web pages. Our new site includes a keyword search function, and our web links database can be searched by a variety of methods, making it far easier to use than the A-Z list of links on the old web pages.

Following guidelines proposed by Tamara Wilson, who developed a soup-to-nuts report on web product

development and testing for CLIMAS, our team conducted three web site usability surveys between summer 2001 and spring 2002. Then, in June 2002, Shoshana Mayden and Gregg Garfin administered hands-on heuristic evaluations of the web site to a small sample of CLIMAS and SAHRA stakeholders.

Based on the excellent suggestions of these stakeholders we were able to improve web site navigation, legibility, and usefulness. We encourage you to check out our snazzy new web site and to send us suggestions for improvements to the pages!



Check out the new site at:
<http://www.ispe.arizona.edu/climas/>

What We've Been Up To...

Barbara Morehouse was an invited speaker at the International Workshop on Regional Integrated Assessment of Climate Impacts, which took place September 16-20 in Castelvecchio Pascoli, Italy. Her presentation on climate variability, vulnerability, and adaptation in the U.S. Southwest was included in a session entitled "Enabling Interdisciplinary Work."

Gregg Garfin presented a talk entitled "Long-Term Climatic Patterns in the Southwest" at a meeting on grazing resource management during extended drought. The meeting took place June 19 in Pinetop, AZ and was sponsored by Navajo County Cooperative Extension. Garfin's talk was

well received and resulted in new CLIMAS partnerships with Cooperative Extension and better relationships with the Arizona State Land Department. The afternoon session, however, was interrupted by the rapid expansion of the Rodeo fire, which started the previous afternoon.

New CLIMAS team member Bonnie Colby, who is a UA professor of Agricultural and Resource Economics, has recently given three presentations on her CLIMAS-related work:

- At the Natural Resources Law Center conference on "Allocating and Managing Water for a Sustainable Future," she spoke about the role of economic incentives in

designing effective intergovernmental water allocation agreements,

- She discussed the economic benefits of restoring stream flows and riparian corridors in arid regions at the International Congress of Resource and Environmental Economists,
- At the American Society of Civil Engineers conference (co-sponsored with the Universities Council on Water Research), she spoke on improving the economic and financial aspects of federal-state-tribal water settlements.

Congratulations to David Brown for winning a first place award in the 2002 Air and Waste Management Association (Grand Canyon Section) Scholarship competition!

Significant progress has been made in the development of the CLIMAS forecast assessment tool, which was created in response to stakeholder difficulties in using seasonal climate and water supply forecasts. The customizable tool, accessible over the Internet, is being developed in partnership with several research programs: the Hydrologic Data and Information System (HyDIS) funded by NASA and Raytheon Corp.,

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Submissions and Publication Information

CLIMAS Update is published quarterly and welcomes the submission of items of interest. The editorial staff reserves the right to select and edit copy submitted for publication. All material in the newsletter may be reproduced, provided CLIMAS is acknowledged as the source. The newsletter is provided through the support of the National Oceanic and Atmospheric Administration (NOAA).

Deadline for next issue: December 1, 2002
Send to: Rebecca Carter at rhcarter@email.arizona.edu
Newsletters are archived at: <http://www.ispe.arizona.edu/climas/pubs.html>

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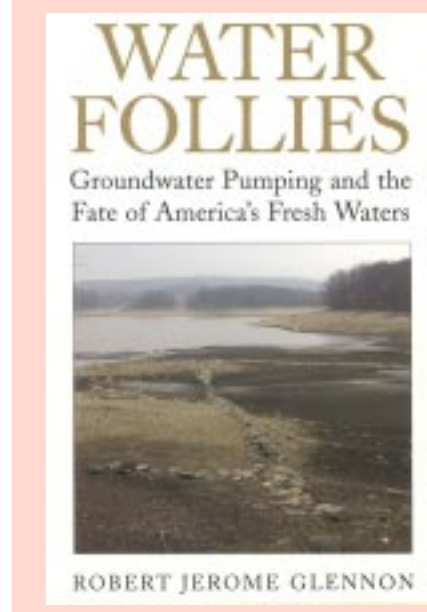
What We've Been Up To... (continued)

the NOAA-funded GEWEX Americas Prediction Project (GAPP), and the NSF Science and Technology Center for the Sustainability of Semi-Arid Hydrology and Riparian Areas (SAHRA). The prototype has been demonstrated in nearly a dozen venues over the past several months—some of the most notable being Southwestern Arizona Ag Day & Trade Show in Willcox, AZ, NOAA's Climate Diagnostics Center in Boulder, and for Senate staffers and other federal personnel at the Dirksen Senate Office Building in Washington, DC. The tool will be available to a wider audience in the near future.

At the request of the National Inter-agency Fire Center (NIFC), Holly Hartmann taught an extended workshop on climate forecasts. The participants were meteorologists at NIFC's eleven Geographic Area Coordination Centers. Topics included the role of forecasters in supporting resource management decisions, use of historical climatological data, climate forecast interpretation, and evaluation of forecast skill. Subsequently, some NIFC personnel made use of the CLIMAS forecast assessment web tool during the active summer fire season.

To assist with the development of a map showing the relative social and economic vulnerability of the Southwest to climate variability, the CLIMAS vulnerability assessment team has been awarded a GIS Assistance Grant. The competitive grant, sponsored by the UA's Center for Applied Spatial Analysis and the Social and Behavioral Sciences Institute, provides 10 hours per week of GIS assistance for one semester. Mourad Jahed, an anthropology graduate student, has been selected to complete this portion of the vulnerability mapping project.

In August, Barbara Morehouse and Gregg Garfin traveled to the offices of the Salt River Project (SRP) in Phoenix to attend a lecture by Kelly Redmond of the Desert Research Institute. As part of the CLIMAS END Initiative,



Morehouse will, with the cooperation of SRP, study SRP decision-making and changes in Phoenix-area water issues during the drought and El Niño.

Andrew Comrie and David Brown discussed "Development and analysis of fine-scale gridded climate data for Arizona and New Mexico" at the 13th American Meteorological Society Conference on Applied Climatology, May 13–16, in Portland, OR.

Kristie Franz gave presentations on making forecast verification more meaningful at the National Center for Atmospheric Research Forecast Verification Workshop in Boulder, Colorado, which took place July 30–August 1, and at the National Weather Service Statistical Hydrology Workshop in Portland, Oregon, September 16–20.

At the recommendation of Western Regional Climatologist Kelly Redmond, CLIMAS core office scientist Gregg Garfin is now a contributor to the U.S. Drought Monitor. Garfin's comments to this chronicle of national drought status are frequently informed by reports from Arizona Cooperative Extension specialists. CLIMAS alumnus Tom Pagano also contributes to this national effort.

Several CLIMAS team members will be attending the Climate Prediction Assessments Workshop "Research and

Hot off the press...

University of Arizona law professor and occasional CLIMAS consultant Robert Jerome Glennon has recently published *Water Follies: Groundwater Pumping and the Fate of America's Fresh Waters*. The book, available from Island Press, uses the depletion of the Santa Cruz River as a bridge to address the much wider issue of groundwater depletion. *Water Follies* is unique in its emphasis as it explores the complex issue of groundwater use by focusing on the human needs, desires, and policies that have led to increasingly widespread environmental degradation.

Applications on Use and Impacts," October 28–30, 2002 in Washington, DC. Nan Schmidt and Rebecca Carter will discuss the END InSight Initiative, while Marcela Vásquez-León will highlight the vulnerability mapping project. The National Weather Service Climate Services Division, in conjunction with the NOAA Office of Global Programs and the NOAA Climate Observations and Services Programs, is hosting the workshop.

CLIMAS researchers Gregg Garfin and Andrew Comrie recently attended a drought workshop at the field station for the Sevilleta Long-Term Ecological Research (LTER) near Albuquerque, New Mexico. The interdisciplinary workshop, which focused on the climatology, hydrology, biotic responses and feedback of drought, took place Sept. 17–19. The workshop was supported by an NSF planning award to develop a biocomplexity research project dealing with drought impacts.

CLIMAS climate forecast assessment activities were featured as the cover article in the May issue of the *Bulletin of the American Meteorological Society*, with the tagline "Unleashing the power of seasonal forecasts." The article is titled: "Confidence Builders: evaluating seasonal climate forecasts from user perspectives;" and was authored by Holly Hartmann, Tom Pagano, Soroosh Sorooshian, and Roger Bales.





END InSight (continued)

One concern several of our participants shared is that the information available to them is not spatially specific enough to accurately assess current conditions on their land; nor are the forecasts fine-grained enough to help them make decisions based on what conditions are expected to be like over the next few months. We have taken this response to our colleagues at the Western Regional Climate Center and NOAA's Climate Prediction Center, and are working with them to improve the information that we provide.

Another benefit of the project is that it is fostering closer relations with other organizations that have a stake in climate and weather information and forecasting. For example, the research we conducted for a background piece on tropical storms led us to work more closely with the Tucson and Albuquerque National Weather Service Offices.

Under the auspices of the END InSight Initiative, CLIMAS staff scientist Gregg Garfin has also been in close contact with county extension offices and land management agencies, taking note of the feedback they are providing about conditions in their particular areas, and keeping them abreast of expected changes in the forecasts.

Media Interactions

In conjunction with SAHRA, the NSF-Science and Technology Center at the University of Arizona, we are holding occasional press briefings in Phoenix, Albuquerque, and Tucson. These briefings bring representatives of the media together with a variety of climatology, meteorology, and hydrology experts, to exchange information and answer questions. This provides members of the media with regionally relevant insight, analysis, and synthesis of recent conditions, forecasts, the drought, and range, fire, and, agricultural conditions.

The results of the first three press meetings, held July 22 in Tucson, August 26 in Phoenix, and September 26 in Albuquerque, were very encouraging. After hearing brief presentations from local experts regarding El Niño and drought forecasts for the coming months, the media learned about new tools for predicting drought impacts and the prospects of the monsoon ending the current drought. At each meeting, members of the press engaged in a lively question and answer period with the presenters.

After the July briefing, panel participants and CLIMAS principal investigators Soroosh Sorooshian, a University of Arizona (UA) hydrologist, and Andrew Comrie, a UA climatologist,

were interviewed individually for reports that aired on local news programs. Comrie's remarks regarding the depth of the ongoing drought, and the slim probability that even above-average monsoon rainfall could end it, were widely quoted in Arizona newspapers.

Outreach

While the END Initiative focuses on a small group of stakeholders, we hope the information we are gathering will be beneficial for a much wider audience. The same climate information included in the monthly END packets is available to the public through CLIMAS' Southwest Climate Outlook at <http://www.ispe.arizona.edu/climas/forecasts/>. We also plan to begin sending out monthly highlights of climate forecasts, conditions, and events to legislators and other interested parties in early 2003.

In addition, we are developing a database and archive of recent newspaper reports regarding weather and climate in the Southwest, gleaned from news sources all over the region. This will provide a valuable and lasting resource in tracing the progression of the public awareness and discourse about drought and El Niño. It will allow us to identify the effects of these phenomena on different geographical areas, sectors, and communities.