

# Arizona to release drought plan for public comment

BY JOE GELT

The Governor's Drought Task Force, established about a year ago to develop a management plan for drought-stressed Arizona, will be releasing its plan for public comment in July.

Timing is important to the success of the plan, knowing what to do and when. The drought plan will set various trigger points to indicate when certain actions are to be taken as drought develops, from its early beginnings to a full-scale emergency. Because drought affects multiple sectors in the same location differently, triggers will be in response to the vulnerability of each sector and region rather than to statewide drought stages.

"The focus of the plan is primarily on developing an adequate monitoring system so that we can give people enough up-front notice to enable them to adapt land management practices and personal habits ... to the conditions we are in at the time," explained Governor's Drought Task Force Coordinator Sandy Fabritz of the Arizona Department of Water Resources (ADWR).

Governor Janet Napolitano established the task force by executive order on March 20, 2003, and gave the ADWR lead responsibility.

Fabritz emphasized that drought is not a sudden, unexpected event and that the triggers will enable the state to prepare for a drought.

"We can see it coming," she said. When triggers are hit, sufficient information will be available and local involvement organized to be able to identify impacts and those likely to be affected by them. Appropriate responses can then be implemented.

Droughts are best managed to the extent they are understood, with a lack of

information and a limited understanding creating the cracks that the best-laid plans fall through. To avoid this pitfall the task force is relying heavily on science. Obtaining and applying the latest scientific information, particularly climate data, is key to the plan.

"We are trying to incorporate scientific information into the drought plan in new ways, particularly as it relates to the ability to predict drought conditions in the future," said Kathy Jacobs, a University of Arizona faculty member who initiated the drought plan in 2003 while working for ADWR.

"The task force is clearly taking advantage of research that has been going on nationally and internationally," Jacobs continued. "What we are doing is tying ongoing research to the specific drought plan in Arizona."

The task force also considered the experiences of other states, with drought plans from Montana, Georgia and New Mexico proving especially useful, she said. As of December 2003, 37 states had implemented drought plans (Figure A).

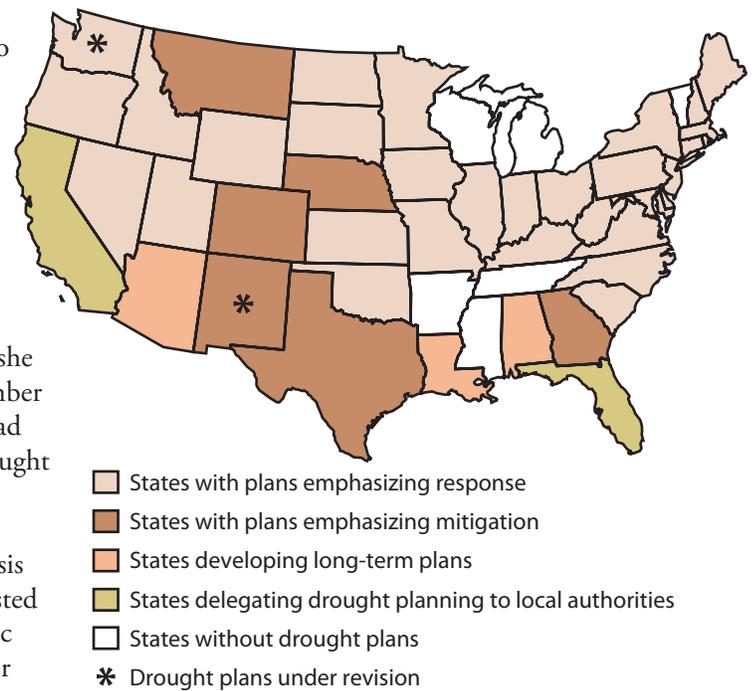
The plan's emphasis on science is boosted by recent scientific developments. For example, scientists now better understand the workings of global atmospheric circulation and its effect on local climate. Other scientific advances include the monitoring of ocean

temperatures to predict future climate conditions. Of further scientific significance, important work is being done by researchers and alumni of the University of Arizona's Laboratory of Tree-Ring Research in identifying long-term climate conditions.

Nor have the social sciences been overlooked in developing the state drought plan. Researchers including anthropologists and geographers from the UA Climate Assessment for the Southwest (CLIMAS) project have studied sources of vulnerability in the municipal, ranching and agricultural sectors. They also have looked at the effectiveness of various strategies for communicating drought-related information.

"Historically," Jacobs said, "the social science contributions to drought plans

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**Figure A.** During the widespread U.S. drought of 1976–77, no state had a formal drought plan, and in 1982, only three states had plans. But as of December 2003, 37 states had drought plans. Arizona was one of four states in the process of developing a plan at the end of 2003 (including Hawaii, not shown on the map). Only seven states did not have formal drought plans (including Alaska, not shown on map). Source: National Drought Mitigation Center, 2003.



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have gotten short shrift. We are doing our best to incorporate that kind of information into the Arizona plan.”

For example, the Arizona drought planning process seeks to respond to the questions: What conditions create vulnerability to drought and what potential adaptive responses can be taken to cope with the effects of drought? This is a different approach than many other states have taken.

The task force realizes that whatever drought plan is devised must be sufficiently flexible to take advantage of the new and more extensive climate information becoming available. Rather than defining a specific drought management plan, therefore, the task force worked to develop a sustainable planning process.

“The process is intended to be ongoing, and we hope to improve the way we do this over time. This is commonly called adaptive management,” Jacobs stated.

Jacobs said that, historically, drought plans often stressed reaction or after-the-fact emergency responses, whereas Arizona’s plan encourages sectors and regions to be more adapted to drought.

“In other words, we figure out what sectors are vulnerable and how they have been affected by drought in the past,” she said. “And then we work out how we can prevent those kinds of impacts in the future.”

Arizona’s drought plan is breaking new ground. In the past, state drought planning focused on identifying water supplies for the major metropolitan areas, then reacting to emergency situations in outlying areas by trucking in water. The proposed plan adopts a broader perspective, with conditions in rural as well as urban areas now considered.

Also the plan includes an evaluation of the dependability of urban area supplies

in the face of severe sustained drought, such as during times when the Salt and Colorado Rivers have reduced flow.

“Our water supplies may not be as secure as we believe they are, so drought planning is essential,” Jacobs said.

The proposed plan’s organizational structure includes a monitoring committee, which Jacobs calls “the heart of the ongoing exercise.”

The committee’s task is to be forever vigilant and on the outlook for any signs portending drought, explained Gregg Garfin, CLIMAS project manager and co-chair of the committee along with Tony Haffer, meteorologist in charge of the National Weather Service Office in Phoenix.

CLIMAS, affiliated with the University of Arizona’s Institute for the Study of Planet Earth, produces the Southwest Climate Outlook packet that contains this newsletter story. The packet includes information and interpretations on precipitation, temperature, reservoir levels, and national drought status, among other features. It is distributed to members of the drought task force and about 1,200 other southwestern decision makers and residents.

The climate information packet production helps meet one of the monitoring committee’s four main goals by conveying information to the government and the general public. In addition, the Arizona Department of Water Resources will be responsible for conveying information to the state’s residents via a website dedicated to drought.

The other goals of the committee are:

- 1) Developing the databases needed to monitor drought in a timely fashion;
- 2) Creating a system for assessing the severity of drought in different parts of

the state at a finer scale than currently available; and

- 3) Designing a set of “drought triggers” that can be tested by comparing them to historic drought impacts.

“This is very experimental,” Garfin said of the plan to design drought triggers. The monitoring committee is adapting a Georgia model that uses a sophisticated statistical approach to combine various types of monitoring data to assess drought stage.

“It’s a model that was developed for a southeastern state, so we have some retooling to do. For instance, winter snowpack is not the same issue for them that it is here in the Southwest,” Garfin said with a smile. “In Georgia, they’re using indicators you can measure continuously. Here, snow is only measured maybe five or six months of the year, but it sets the stage for how a lot of things will play out for the other half of the year.”

The influence of snowpack varies by location throughout the state as well, which is another reason Arizona triggers need to include qualitative measures of subjective observations to support a set of quantitative formulas related to climate conditions.

Ideally, the monitoring committee will develop a set of quantitative formulas that can alert members to a potential problem. With input from local experts and other interested parties, the team can then examine qualitative information, such as ranching conservation district reports and wildlife assessments, to determine whether the warning holds up to scrutiny.

Monitoring committee members plan to test the system initially by “hindcasting” drought stages for historic periods at a regional scale, and then checking if resource managers who were around

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during that time did indeed observe impacts commensurate with those drought stages. They'll also check whether the hindcasted drought stages gave adequate warning of impending drought impacts.

Working with local people is also one of the keys to bringing the information down to a finer scale. The committee is starting at the climate division level, but eventually plans to be able to map drought severity at the county and, later, community level. At the same time, the team is consulting with the developers of a National Integrated Drought Information System so that the various scales will fit into the larger picture.

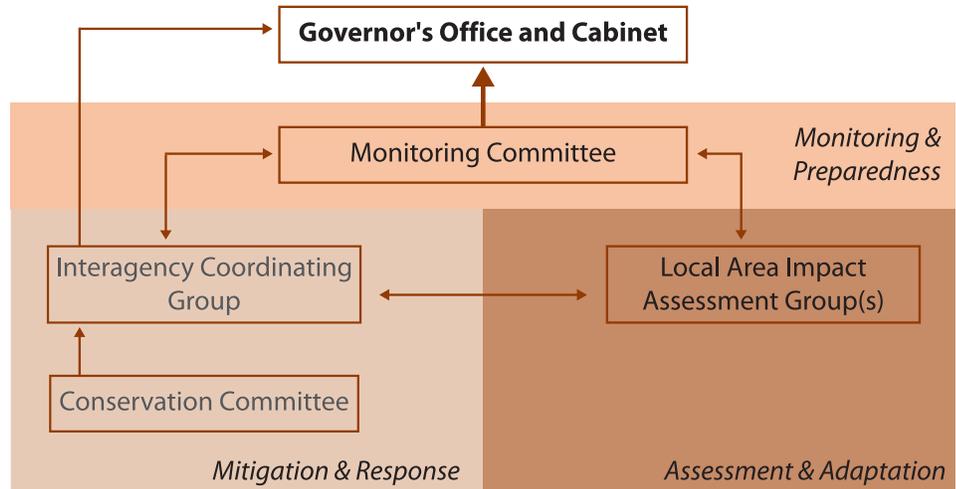
Whether signs of drought are present or not, the committee will meet monthly to review and evaluate present weather and climate conditions and anticipate future developments.

Membership in the monitoring committee consists of experts in their fields, ensuring that the most recent scientific information will be available for review. Along with ADWR and CLIMAS, officials from the National Weather Service, U.S. Geological Survey, the U.S. Department of Agriculture-Natural Resources Conservation Service, the Salt River Project, Arizona State University, and the Arizona Department of Emergency Management also participate.

"These are all people who are very involved either in data collection or weather and climate prediction," Jacobs noted.

Members are not only the "top in their field," but many also belong to the flood warning committee as well, Garfin pointed out. This will help to provide continuity to the climatic and hydrological monitoring "regardless of the hazard at hand," he added.

According to the draft plan, the monitoring committee is to notify the governor at the first signs of drought and



**Figure B.** The Governor's Drought Task Force proposed the above structure to strengthen Arizona's efforts to prepare for drought in the future. A monitoring committee, required to meet monthly from November to April, would be charged with alerting the governor's office to drought conditions. An interagency coordinating group would assess, implement, and develop response options—making recommendations to the governor for resources necessary to provide assistance and implement the plan. Under specified drought conditions, the governor would initiate groups to assess the impacts to local areas.

recommend the declaration of a drought warning or emergency when conditions warrant.

The early drought warning will call into action two other groups created by the drought plan, one consisting of local officials and interested citizens from around the state and another group made up of state and federal agency heads (Figure B). They will meet more regularly as drought conditions build, sharing information and coordinating activities in response to local and statewide conditions.

Conservation has a role in the drought management plan, although a separate and distinct effort is underway to develop a statewide water conservation plan.

"We are trying to make a distinction between long-term conservation practices and short-term drought response options," Fabritz said. "These are two completely different things, although sometimes they overlap."

"We are trying to get information out about the technology of water conservation," she added. "Hopefully com-

munities can then adopt conservation measures to reduce their drought vulnerability."

Public input has been invited as the plan was developed, and will continue to be sought. To sign up for an electronic mailing list to receive information about task force activities and a link to the monthly Southwest Climate Outlook, follow the instructions at this address: <http://www.ispe.arizona.edu/climas/subscribe.html>.

The ADWR also maintains a website to enable people to access materials related to the plan: <http://www.water.az.gov/gdtf/>. The website will list upcoming public workshops on the drought plan, once the draft plan is released for public comment later this summer. The task force expects to have a final version of the drought plan in the fall.

*Joe Gelt is an editor for the Water Resources Research Center at the University of Arizona. Melanie Lenart contributed to the adaptation of this article from its original publication in the April/May issue of Arizona Water Resources.*

