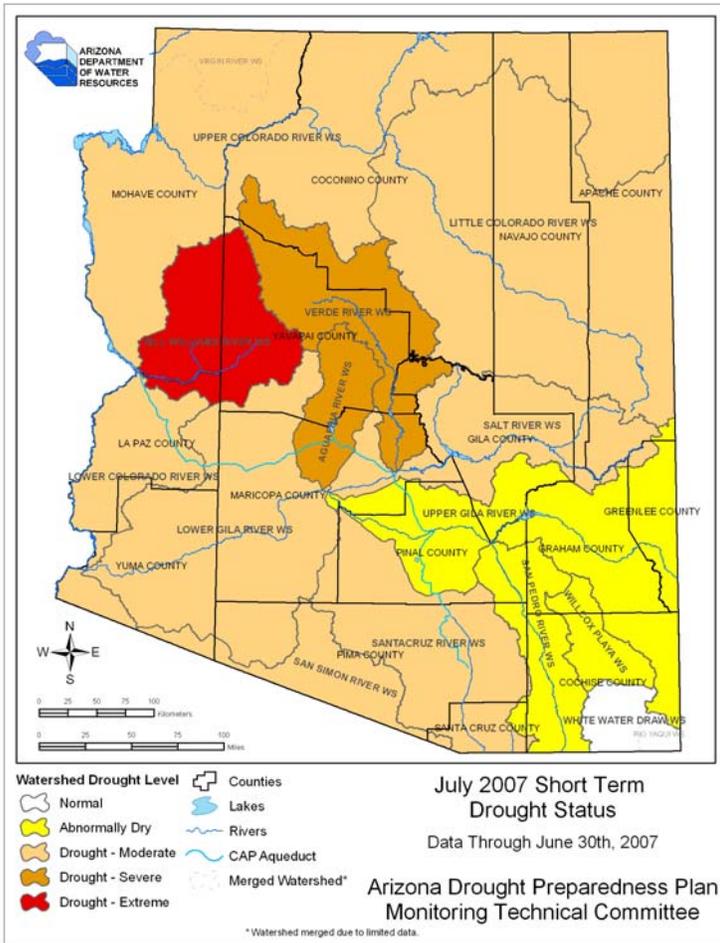


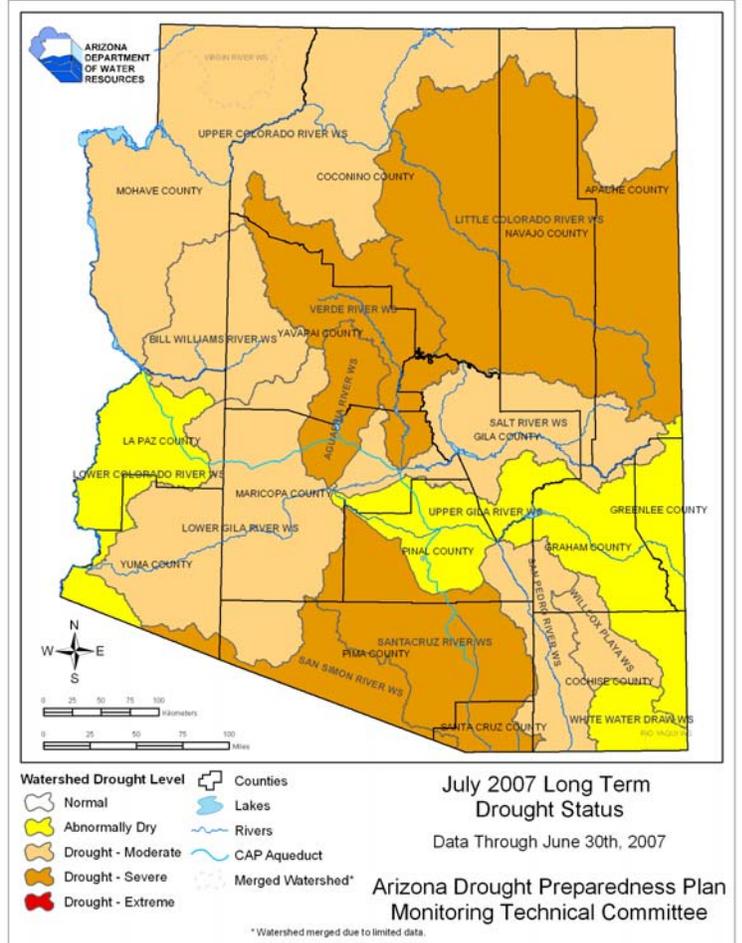
# Arizona Drought Monitor Report

## July 2007

### Short-term Drought Status



### Long-term Drought Status



#### Short-term Update

The short-term drought status has changed for the Bill Williams and Agua Fria watersheds, while the rest of the state is unchanged. Conditions in the Bill Williams and Agua Fria worsened by one drought category. This northwest part of the state had few winter or spring storms, and almost no moisture to generate precipitation. In the southeastern part of the state, some improvements occurred in the eastern portion of the Willcox Playa watershed due to moisture flows in from New Mexico, but not enough to warrant upgrading the watershed from abnormally dry.

#### Long-term Update

The long-term drought status is unchanged from last month. The past four years have had only two wet periods - the winter of 2004-05, and the summer monsoon of 2006, which mostly affected the southeastern quarter of the state. When combined with three very dry years, 2003-04, 2005-06, and 2006-07, the result is large soil moisture deficits and reduced streamflow. Local impacts include die-off of established trees and large bushes.



# Drought Reporter



## Impact Reports from Yavapai County

Drought monitors report that many dirt tanks are dry, and ranchers are hauling water from wells to temporary or permanent troughs throughout their ranches. Many springs are beginning to dry and flows in rivers are below normal or have no flow at all (e.g. Santa Maria River and Kirkland Creek).

Range vegetation is still adequate but is beginning to show stress from lack of moisture, especially brush and trees. Ranchers may have to reduce livestock numbers in the fall if the monsoon rains are late or below normal. A few ranchers have already started to reduce numbers.

Conditions are extremely dry in the Prescott National Forest. Many grasses are dried out, except adjacent to the streambed of Banning Creek, which is muddy in some spots and completely dry in others. The pond on Banning Creek is very low and stagnant. Drought monitors notice a marked absence of insects, as well as a scarcity of larger birds, such as Steller's jays, acorn woodpeckers and flickers.

Residents in downtown Prescott report that even their low water use, drought tolerant landscaping has needed supplemental watering this year and some has died off. They make comparisons to the very dry year of 2002. Under normal conditions, watering was rarely needed, but the reporters feel that they will need to supplement watering with a gray water system even during the winter months now. These Prescott residents have also noted that many deciduous trees in their neighborhood, from cottonwoods to maples, are showing signs of stress, and leaves are already starting to change colors.

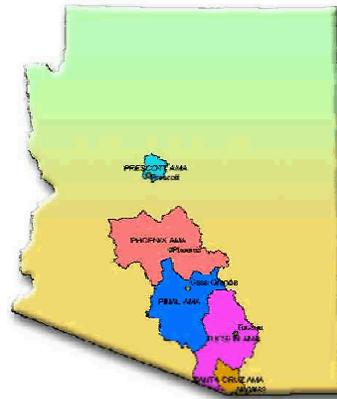
## Governor Requests Disaster Designation

Governor Napolitano sent a request on July 24th to the US Department of Agriculture requesting a determination for a drought disaster designation. The disaster designation request will trigger a county-by-county review of the situation to determine which counties qualify. The Governor states in her letter that she has received consistent reports on adverse impacts to farms, ranches, wildlife, forests and rangeland, and points out that Arizona is entering its second decade of drought.

When a county is designated as a primary or contiguous drought disaster area, farmers and ranchers who have suffered losses due to drought may apply for low-interest emergency loans. Last year, the same request was made to the USDA and resulted in the designation of 14 of 15 counties. However, since contiguous counties to those designated are also included, agricultural producers in all counties were eligible for federal assistance last year.

## Water adequacy bill

As Arizona enters its second decade of drought, more and more rural Arizonans have been questioning the ability of developers to build houses and provide water without a determination of adequate water supply.



*Counties and municipalities outside of Arizona's active management areas have had no authority to deny subdivision developers lacking an adequate water supply.*

Senate Bill 1575, passed by the Arizona legislature this year, helps to address those concerns. It will allow counties and municipalities outside of active management areas to adopt laws requiring new subdivision developers to obtain a determination of a 100-year adequate water supply from ADWR. Within the state's active management areas, developers are already required to demonstrate a 100-year water supply before building.

As an incentive for counties and municipalities to adopt the new water adequacy requirements, the bill makes water providers located in these areas eligible for grants and low-interest loans to fund water development projects. This funding will come from the Water Supply Development Revolving Fund, which was created in a companion bill (House Bill 2692).

ADWR Director Herb Guenther, in his June 14th column in *The Verde Independent*, issued a call to action for Arizona's rural citizens. "There is one step left in this process, and it requires action by rural citizens. I encourage you to tell county elected officials to embrace this new authority available to them. Ask them to enact the new adequacy authority to protect your water supply."

## Conservation Tips of the Month

- ✦ Use a broom instead of a hose to clean driveways, sidewalks, streets and parking areas.
- ✦ Equip swimming pools, fountains, ponds and other ornamental water features with re-circulating pumps.
- ✦ Reduce evaporation by using covers on swimming pools and spas.

# Reservoir Storage



USDA NRCS Dr. Ken Dewey, High Plains Regional Climate Center

# Vegetation Health



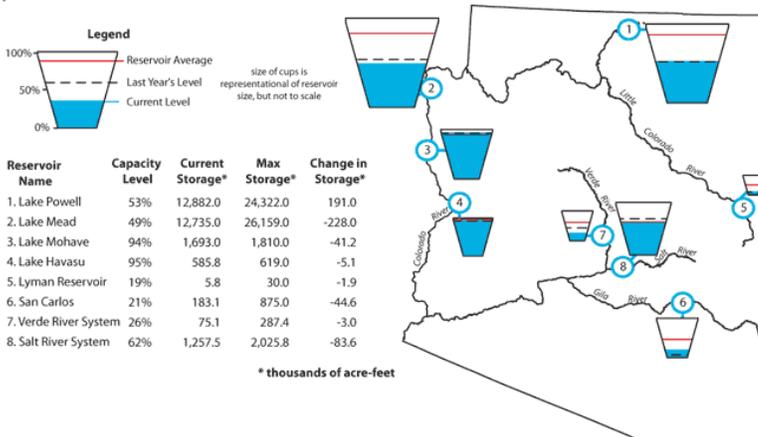
Jeff Severson

## Arizona Reservoir Status

Reservoir conditions have changed very little since last month across Arizona. Signals are mixed with respect to changes in storage with large reservoirs on the Colorado River. Lake Mead is up to 53 percent from 52 percent from last month, while Lake Powell fell from 50 percent to 49 percent of total storage. Tom Ryan of the Bureau of Reclamation noted that inflow to Lake Powell was below-average over the past month but was slightly exceeding forecasted amounts.

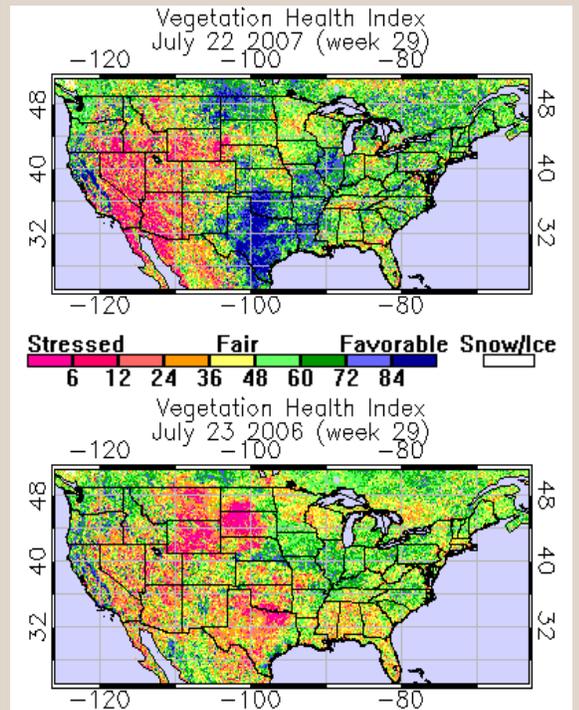
Total water year projections through September indicate that inflows will be about 70 percent of average for October 2006 through September 2007. Heavy localized storms in October 2006 boosted overall water year inflows to Lake Powell by raising the reservoir level by 6.2 feet, according to Ryan. Smaller reservoirs across the rest of Arizona saw declines from May to June. Both the Salt River System and the San Carlos Reservoir saw significant drops of 4 to 5 percent of total storage.

Arizona reservoir levels for June 2007 as a percent of capacity. The map depicts the average level and last year's storage for each reservoir, while the table also lists current and maximum storage levels.



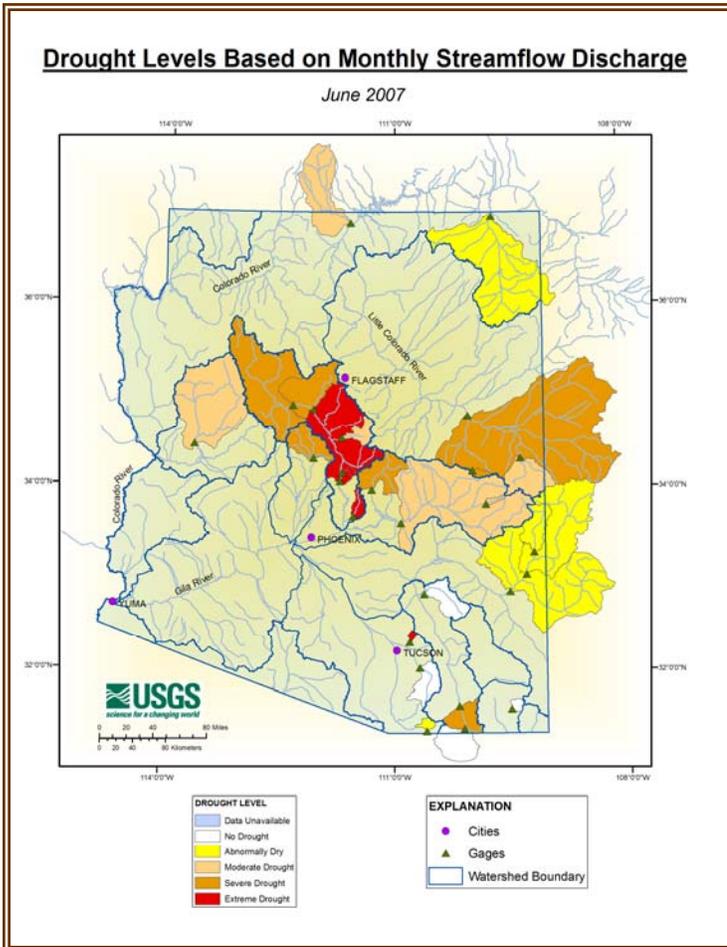
Photos by the National Park Service

The satellite-derived vegetation health index for July 22, 2007 (top) shows much of the state in very stressed condition, in comparison to a 20-year average. Contrasting this year with 2006 (bottom), shows the impact of multiple years of exceedingly low winter precipitation, little summer precipitation, and a late start to the 2007 monsoon season on western Arizona. The Mogollon Rim and parts of southeastern Arizona are faring a little better than the rest of the state. Fire potential is still above normal for Arizona, due to low fuel moisture – especially in grasses and shrubs; however, monsoon humidity and moisture is expected to reduce fire potential as the summer season progresses.



Images are obtained from the NOAA National Environmental Satellite, Data and Information Service (NESDIS).

# Mountain Streamflow and Precipitation



## June Streamflow

June streamflow volumes on major streams were well below the 30-year median. Representative streamflow is shown in the table below (NRCS from USGS data).

Water body	June Runoff in Acre Feet	% of Median
Salt River near Roosevelt	7,434	46%
Tonto Creek	36	5%
Verde River at Horseshoe Dam	4,083	52%
Combined Inflow to Salt River Project (SRP) reservoir system	11,553	46%
Little Colorado River above Lyman Lake	77	26%
Gila River to San Carlos Reservoir	1330	70%

## Mountain Precipitation

Data from Natural Resources Conservation Service (NRCS) snow telemetry (SNOTEL) sites show that precipitation for June was 51 percent of average over the Salt River basin, 8 percent of average over the Verde River basin, and 43 percent of average over the San Francisco-Upper Gila River basin. The Little Colorado River basin received 32 percent of average precipitation in June.

Cumulative precipitation for the water year (Oct. 1-June 30) remains below average in all basins, ranging from 45 percent to 79 percent of average (see table at right).

Watershed	Percent (%) of 30-Yr. Average Water Year Precipitation October 1 - June 30
Salt River Basin	64%
Verde River Basin	45%
Little Colorado River Basin	61%
San Francisco-Upper Gila River Basin	79%
<b>Other Points of Interest</b>	
Central Mogollon Rim	61%
Grand Canyon	64%

# Temperature and Precipitation



**June** - June was a dry month, as is normally the case, except for the southeast corner which received above-average rainfall due to moisture moving southwest from New Mexico. Temperatures across the state were well above average, with Gila county temperatures in the 95<sup>th</sup> percentile.

**3-month period** - Precipitation was well below average for April through June, as there was little moisture for the spring frontal systems to work on. The dry conditions contributed to higher temperatures during the three month period, with all climate divisions above the 79<sup>th</sup> percentile.

**6-month period** - The 6-month precipitation map reflects the dry winter and spring, with only the southeastern watersheds above the 28<sup>th</sup> percentile. Temperatures were below the 85<sup>th</sup> percentile in the north and west, and above the 88<sup>th</sup> percentile in the central and southeastern climate divisions.

**12-month period** - This period reflects both the past winter and last year's monsoon. For all areas of the state except the southeast, the entire 12-month period was exceptionally dry. The southeast watersheds received above-average rainfall during the 2006 monsoon season, bringing flooding to many locations, including Tucson. Temperatures were above the 79<sup>th</sup> percentile everywhere in the state.

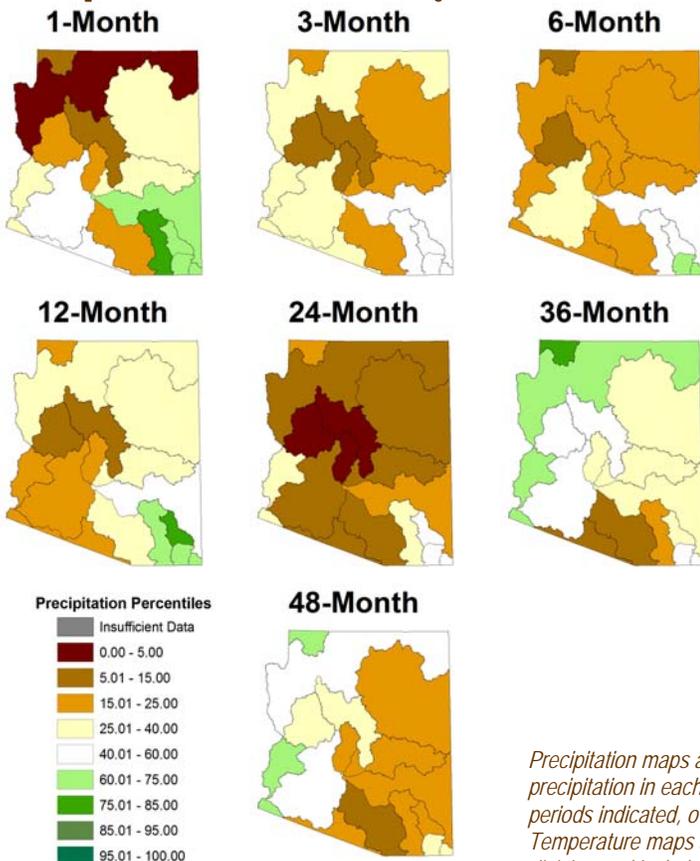
**2-year period** - The two consecutive years of extreme dryness are reflected in precipitation percentiles for this period. The only watersheds above the 29<sup>th</sup> percentile are Willcox Playa and White Water Draw, which received much needed rainfall during the 2006 monsoon. The entire state was very warm during the past 24 months, with the southeast and south central climate divisions having average temperatures above the 96<sup>th</sup> percentile.

**3-year period** - The 36-month precipitation pattern is very different from the 24-month period due to the wet 2004-2005 winter. The temperature pattern is hotter, with all watersheds above the 74<sup>th</sup> percentile, and six of the seven watersheds above the 86<sup>th</sup> percentile.

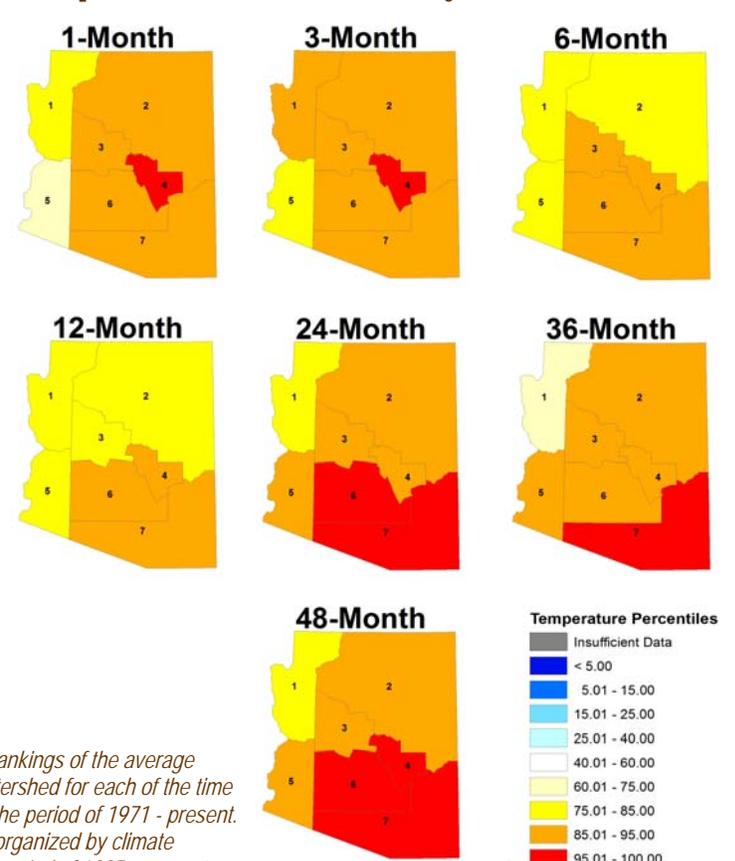
**4-year period** - The 48-month map shows that three of the past four years have been extremely dry throughout most of Arizona, with only the Virgin and Lower Colorado River watersheds above the 51<sup>st</sup> percentile. Most of the eastern watersheds are below the 24<sup>th</sup> percentile. Again, the 4-year dry period is accompanied by temperatures well above average across the state, with the southeast climate divisions above the 96<sup>th</sup> percentile. The combination of high temperatures and dry conditions has increased the evaporative demand for moisture, drying out the soil and stressing the vegetation.

For more information, visit <http://www.public.asu.edu/~aunj/Update.html>.

## Precipitation Percentiles by Watershed



## Temperature Percentiles by Climate Division



*Precipitation maps are rankings of the average precipitation in each watershed for each of the time periods indicated, over the period of 1971 - present. Temperature maps are organized by climate division and include the period of 1895 - present.*

# Weather Outlook



*Arizona Drought Monitor Report*  
Produced by the Arizona State Drought Monitoring Technical Committee

Co-chairs:  
Gregg Garfin, University of Arizona – Institute for the Study of Planet Earth  
Tony Haffer, National Weather Service

Mike Crimmins, Extension Specialist,  
University of Arizona Cooperative Extension

Charlie Ester, Salt River Project

Larry Martinez, Natural Resources Conservation Service

Ron Ridgway, Arizona Division of Emergency Management

Nancy Selover, State Climatologist  
Arizona State University

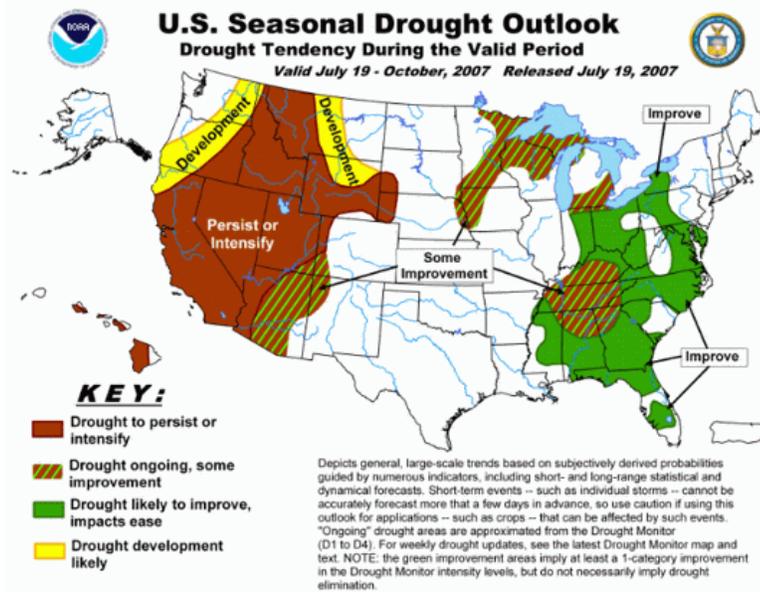
Chris Smith, U.S. Geological Survey

Coordinator: Susan Craig, Arizona Department of Water Resources  
Computer Support: Andy Fisher, Arizona Department of Water Resources



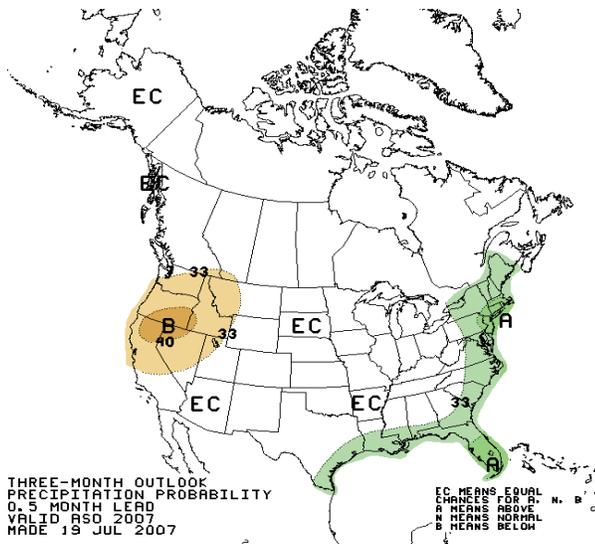
## Drought Outlook

The NOAA Climate Prediction Center's Seasonal Drought Outlook indicates portions of the state may see some improvement in drought conditions resulting from rainfall in localized thunderstorms.



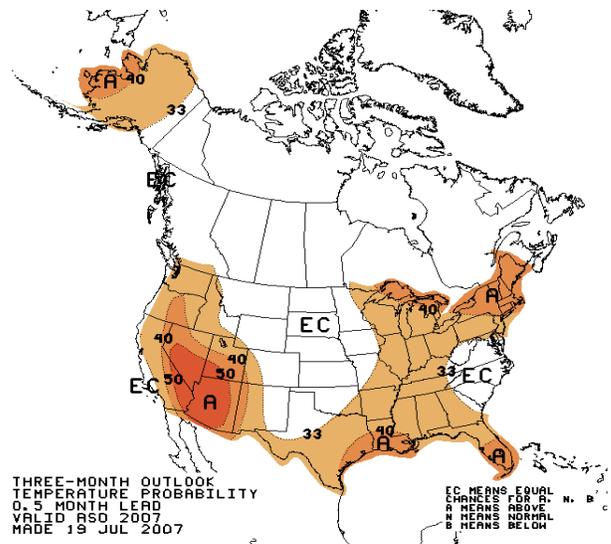
Also see the most current Southwest Climate Outlook - [www.ispe.arizona.edu/climas/forecasts/swoutlook.html](http://www.ispe.arizona.edu/climas/forecasts/swoutlook.html)  
For additional weather information from the Office of the State Climatologist for Arizona - <http://geography.asu.edu/azclimate>

## August to October Weather Outlooks



### Precipitation

Equal likelihood of above-average, average, or below-average conditions across the state during the 90-day period



### Temperature

High level of confidence temperatures will be above average across the entire state