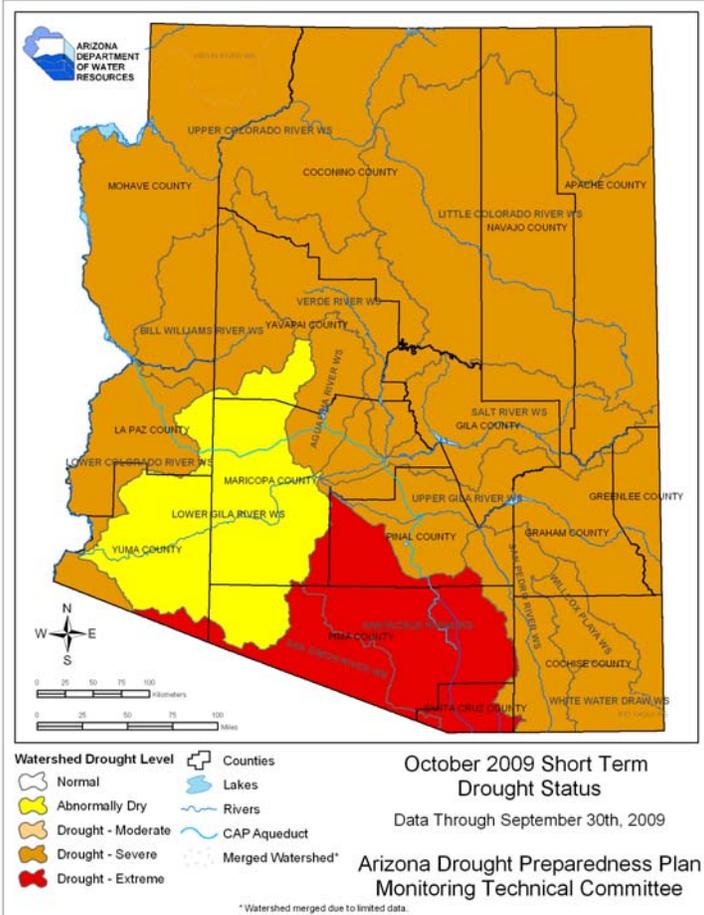


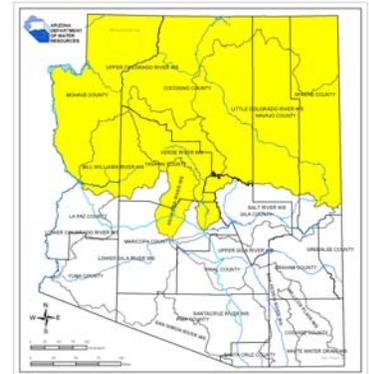
Arizona Drought Monitor Report

October 2009



Short-term drought

Short-term conditions continue to be very dry as precipitation was well below average in both September and October. The monsoon did not bring improvements as anticipated. The few storms in September brought little relief. Twelve watersheds are in severe drought, and two are in extreme drought. Vegetation statewide is very stressed, water hauling has increased as stock ponds are dry, and ranchers are reducing their herds due to poor forage and the high cost of supplemental feed. Forecasts still predict a moderate El Niño, but the effects may not be seen for another couple of months.



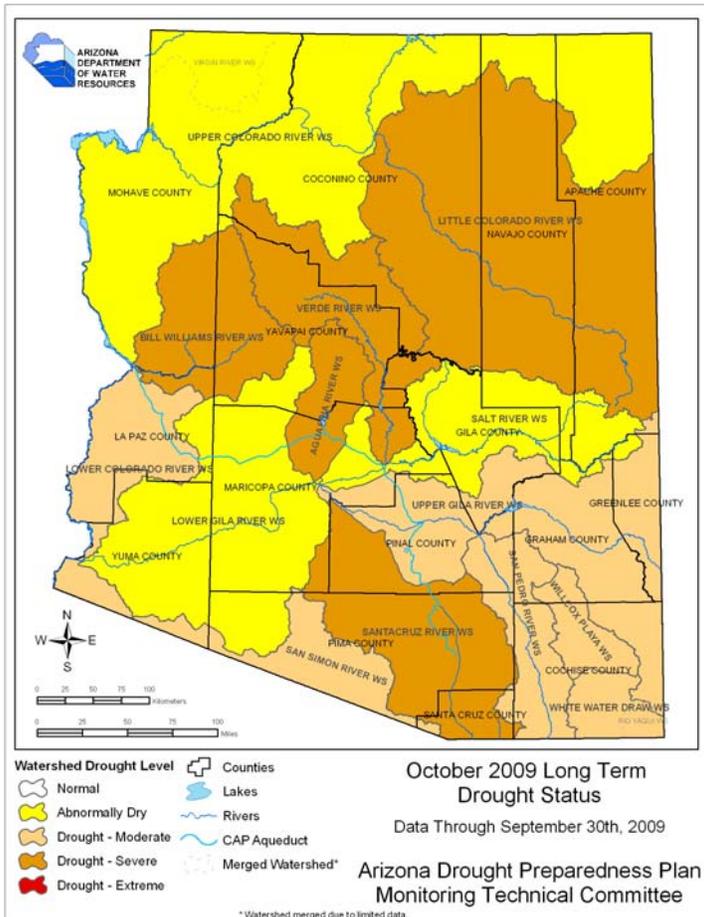
October 2008 short-term drought conditions.

Long-term drought

The summer season was significantly drier than average, resulting in no improvements to the long term drought situation. Eight watersheds dropped to a worse condition, mostly in the eastern half of the state, as the monsoon was shifted eastward into New Mexico. Three watersheds dropped from moderate to severe drought and five watersheds dropped from abnormally dry to moderate drought. Seven watersheds are unchanged from the spring. The long-term dryness is having adverse impacts on forest health, wildlife habitat and groundwater recharge. The effects of the past 12 months of drier than normal conditions are unlikely to be reversed unless precipitation statewide during the next year is significantly above the long term average.



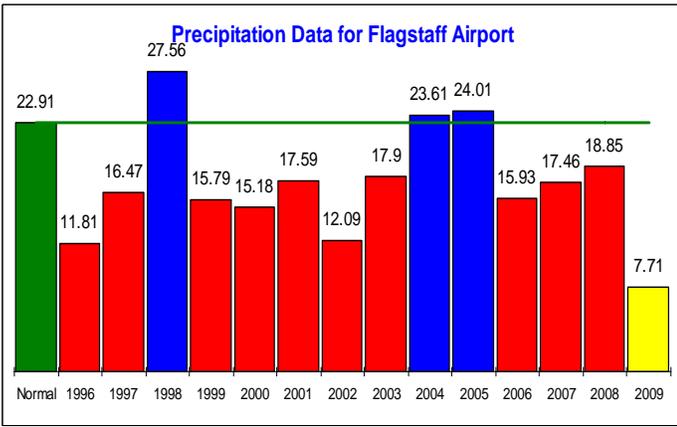
October 2008 long-term drought conditions.



Short- and long-term drought conditions are much worse than they have been in recent years. During the 2009 water year, precipitation was below 70% of average for most of the state. Nearly half of the state is currently in severe drought. Investments to import and store water, such as the Salt River Project and Central Arizona Project, substantially buffer urban areas from water shortages. Although urban water supplies are not threatened by drought currently, the impacts to rural areas of the state are more significant. Many parts of the state are still suffering from long-term precipitation deficits, which affect vegetation health, wildlife and livestock, water supplies and range and pasture conditions.

These maps refer to an integrated assessment of moisture status that includes consideration of precipitation, streamflow, vegetation, ecosystem health, rangeland status, and other measures of drought. They are not intended to portray the status of the state's water supplies. For an explanation of how these maps are produced, visit:

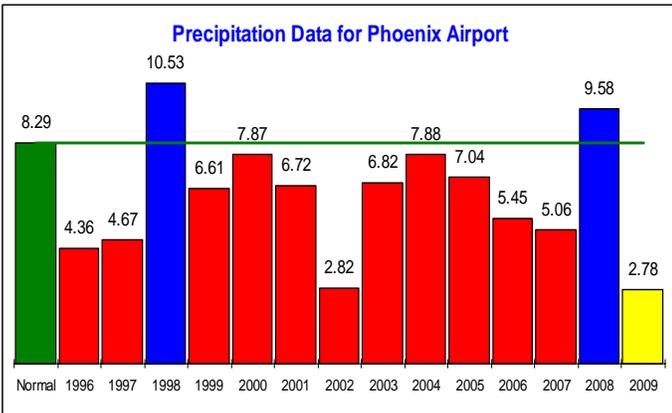
www.azwater.gov/azdwr/statewideplanning/drought/droughtstatus.htm



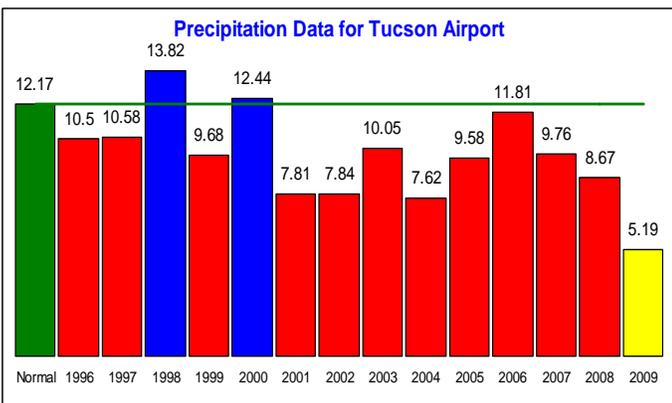
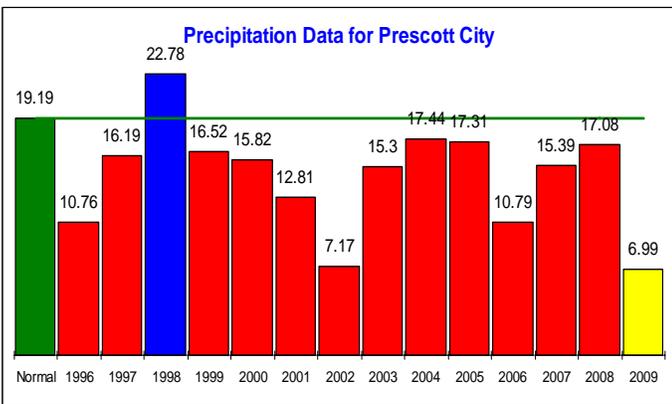
Precipitation

The graphs of annual precipitation to the left show the wet and dry years over the past 14 years. The cities shown are still between one third and one half of their annual precipitation. Over the past 14 years, Flagstaff has had three years with above average precipitation, while Phoenix and Tucson have had two years that were wetter than average. Prescott has had only one year above average.

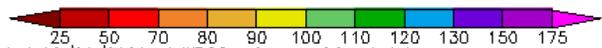
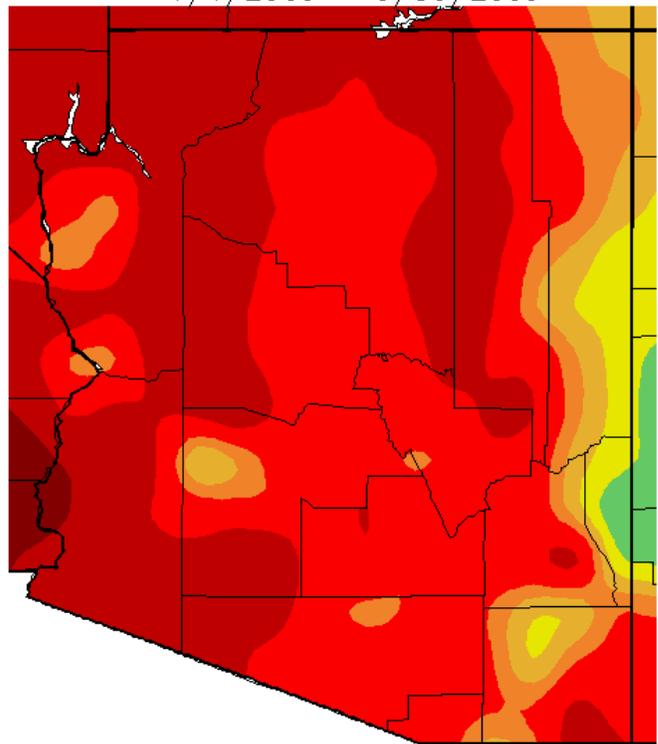
The graphic below shows that the wettest locations in the state are along the eastern border. These areas only received near average precipitation even at the highest elevations.



For more climate information, visit the Arizona State Climate Office at <http://azclimate.asu.edu/>.



Percent of Average Precipitation (%)
1/1/2009 – 9/30/2009



Generated 10/01/2009 at WRCC using provisional data.
NOAA Regional Climate Centers

Annual precipitation totals compared to normal (green bar and line) from weather stations in Flagstaff, Phoenix, Prescott and Tucson. 2009 data from January to September. Resource - <http://www.wrh.noaa.gov/psr/DroughtPage.php?wfo=psr&data=ALLDATA>

Mountain Precipitation

Based on data from mountain monitoring sites, precipitation during September ranged from a low of 61% of average in the Verde River Basin to a high of 113% of average in the Salt River Basin. Cumulative precipitation for Water Year 2009 (October 1, 2008 through September 30, 2009) is shown on the graphic to the right. Precipitation totals for the year are below normal in all of the state's major river basins, ranging from 79% to 89% of the 30-year average.

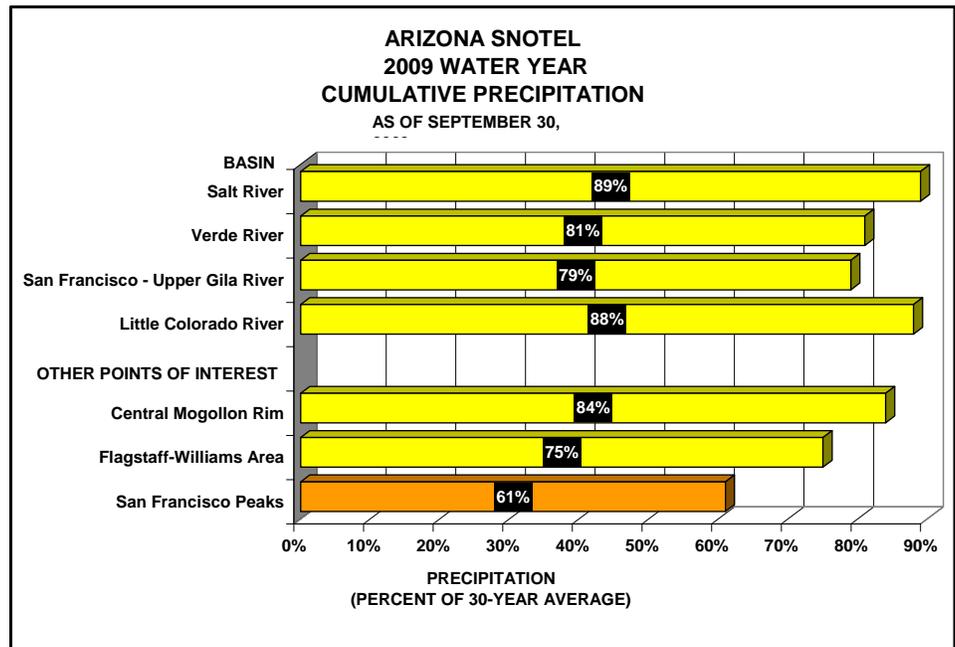
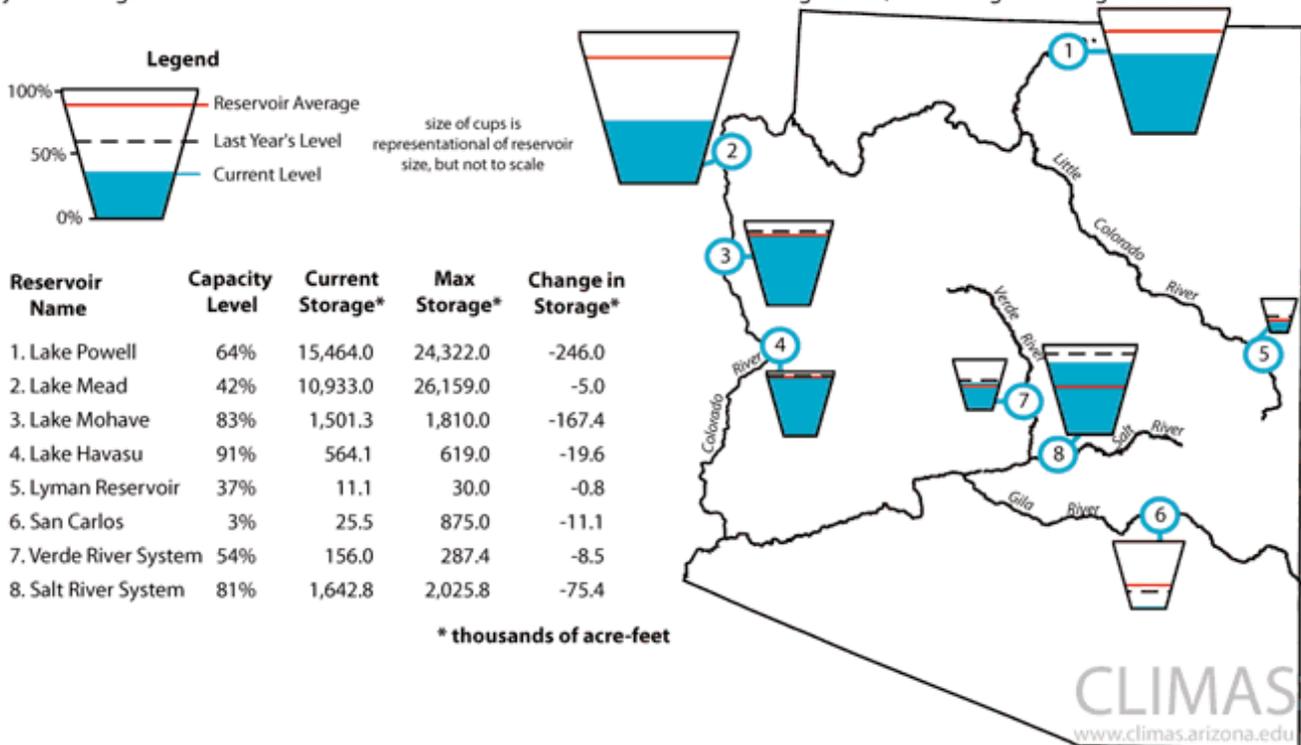


Figure 6. Arizona reservoir levels for September 2009 as a percent of capacity. The map depicts the average level and last year's storage for each reservoir. The table also lists current and maximum storage levels, and change in storage since last month.

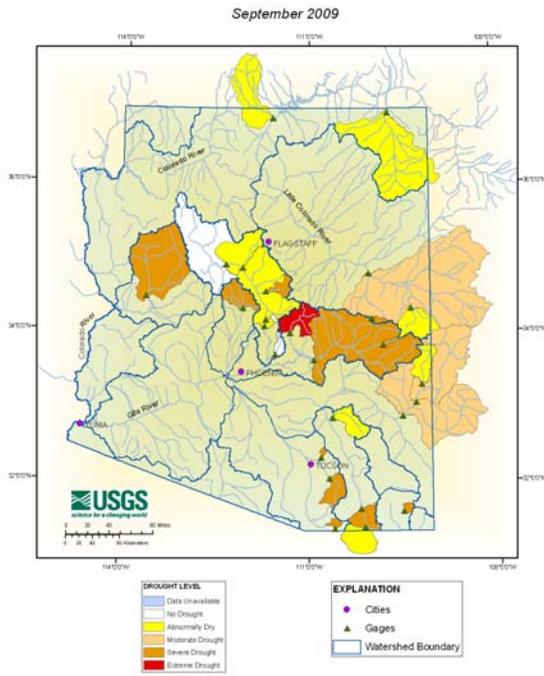


Reservoir Status

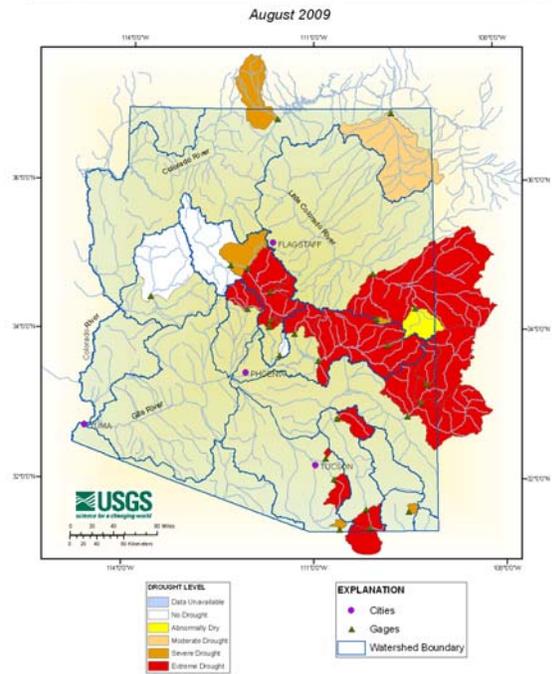
Water storage in Lake Powell dropped 246,000 acre-feet in September to 64% of capacity. The level of Lake Mead declined slightly to about 1,094 feet above sea level, lowering it to within 18 feet of the first stage of water allocation reductions. Water levels in all eight Arizona reservoirs declined during September. San Carlos Reservoir currently holds only 3% of its capacity - a level not experienced since 2004. Although storage in the Salt and Verde river basin systems declined in September, they are still well above average.

In water-related news, Mesa, Arizona, has asked 350 homeowners associations and 200 apartment communities to conserve water by limiting or eliminating lawn overseeding, which means sowing seed over existing grass in order to fill in the bare patches (abc15.com, October 3). City officials estimate that voluntary overseeding reductions can save approximately 40 million gallons of water, enough to serve 1,700 homes.

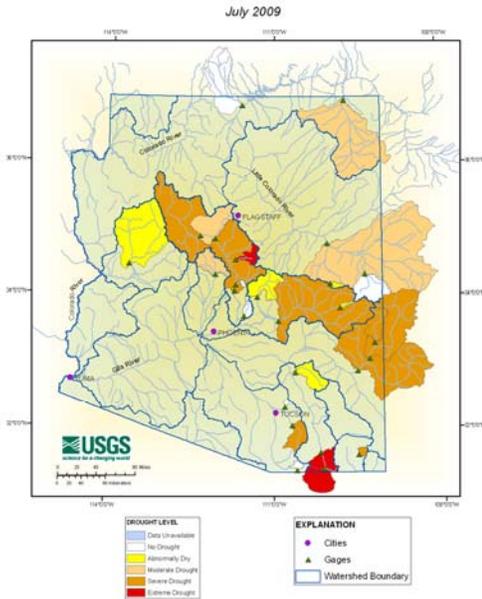
Drought Levels Based on Monthly Streamflow Discharge



Drought Levels Based on Monthly Streamflow Discharge



Drought Levels Based on Monthly Streamflow Discharge



Water body	Sept Runoff in Acre Feet	% of Median
Salt River near Roosevelt	9,342	50%
Tonto Creek above Gun Creek near Roosevelt	0	0%
Verde River at Horseshoe Dam	8,717	64%
Combined Inflow to Salt River Project (SRP) reservoir system	18,059	53%
Little Colorado River above Lyman Lake	116	23%
Gila River to San Carlos Reservoir	0	0%

Streamflow Observed at USGS Streamflow-Gaging Stations

Streamflow

Due to a weak monsoon season, July and August drought levels (based on streamflow) increased throughout the state with some basins increasing by three drought levels. Average drought level for the quarter is *severe drought*. Unseasonal precipitation at the end of August and the beginning of September helped to reduce some drought related impacts, but in general, streamflow is still below normal and inflow to reservoirs continues to be affected.

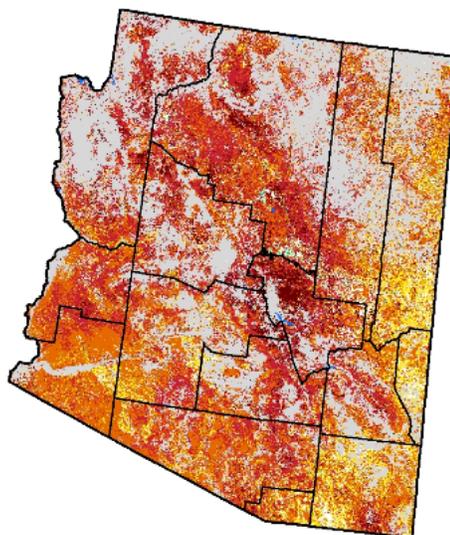
Vegetation Health

A new drought evaluation tool, VegDRI - Vegetation Drought Response Index - is being introduced this month*. VegDRI combines precipitation-based drought indicators, such as 36-week Standardized Precipitation Index with satellite based vegetation status data. This combination allows for an improved evaluation of vegetation health related to drought, as opposed to insect pests, disease and other non-climate factors.

As the map demonstrates, there is extensive drought stress across the state. This relates to below average summer precipitation, in combination with a dry and relatively windy autumn. The winter 2008-09 precipitation "tap" shut off relatively early in the winter. A record warm and dry March also contributed to stress on vegetation in the all-important period of initial growth spurt among perennial vegetation, such as trees and shrubs. Vegetation stress is greatest along the Mogollon Rim in northern Gila County, southern Coconino County, stretching into northern Mohave County. VegDRI also records severe and extreme vegetation drought status in parts of Pima and Cochise counties. Vegetation status is not expected to improve greatly during the more senescent fall and winter seasons.

Vegetation Drought Response Index Complete: Arizona

November 2, 2009



Vegetation Condition



* VegDRI is a national product, produced by a partnership of USGS, USDA Risk Management, National Drought Mitigation Center, and the High Plains Regional Climate Center. http://drought.unl.edu/vegdiri/VegDRI_State.htm?AZ



AZ DroughtWatch

Arizona's Drought Impact Reporting System

Get Involved with Arizona DroughtWatch

AZ DroughtWatch is an internet reporting tool designed to collect and display timely observations of drought impacts across Arizona. Local drought impact group members, agency field experts, and local volunteers can contribute impact information through the survey on a monthly basis. These observations are invaluable in properly monitoring and characterizing drought across Arizona's complex landscape. Information collected through AZ DroughtWatch will be used by:

- Local communities to monitor conditions in support of drought mitigation plans and to guide longer-term risk assessment
- State Drought Monitoring Technical Committee in the production of monthly drought status maps
- National Drought Mitigation Center in the development of the weekly National Drought Monitor

If you are interested in learning more or would like to contribute impact reports go to azdroughtwatch.org.



NEW DroughtWatch Impact Summary (August - October 2009)

Exceptionally dry conditions this past summer and fall have led to a rapid worsening in short-term drought conditions and widespread impacts on agricultural production and local water resources. Drought impacts around the state include:

Ranching

- Lack of forage
- Herd reduction/sell off

Livestock

- Lower calf numbers
- Protein supplements needs
- Increased forage toxicity

For more information, visit azdrought-watch.org and click on 'Detailed Impact Reports'.

Water resources

- Unusually low or dry perennial ponds and streams
- Water hauling to support livestock and agriculture

Crop lands

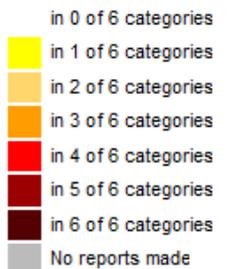
- Reduced productivity
- Increased soil erosion

Ecosystems

- Unusual plant stress
- Mortality
- Changes in phenology

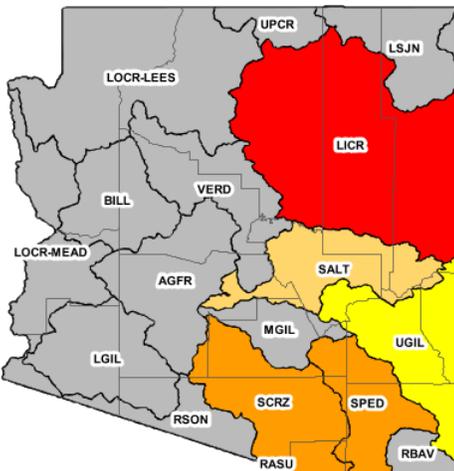
- Over 170 impacts were reported through 28 different impact reports.
- Most reports came from eastern Arizona where less than 50% of average precipitation fell during this three month period.
- The ranching and livestock production impact category recorded the most observations (68 impacts), accounting for almost 40% of total impacts.
- Over 40 water resource impacts accounted for close to 25% of total impacts.

Impacts Reported



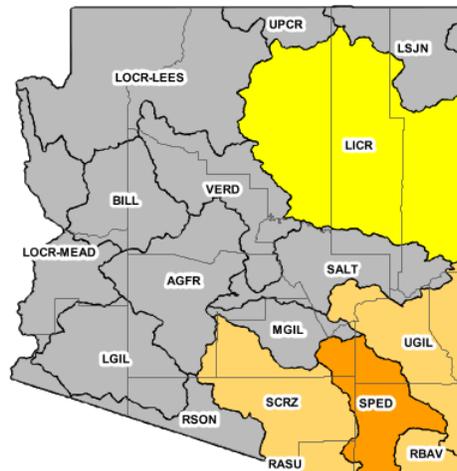
August 2009

Total Impacts: 30
Total Surveys Submitted: 11



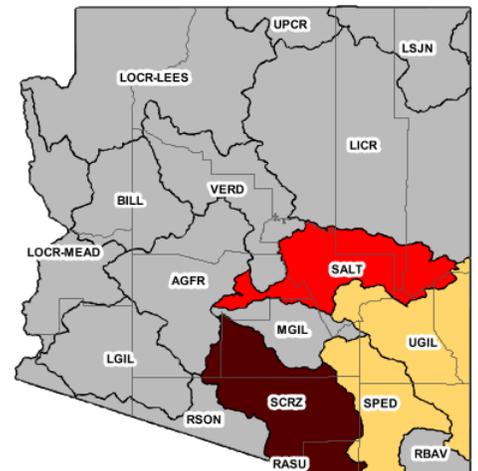
September 2009

Total Impacts: 30
Total Surveys Submitted: 9



October 2009

Total Impacts: 113 (98 in Santa Cruz WS)
Total Surveys Submitted: 8



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

Co Chairs:

Nancy Selover, State Climatologist
Arizona State University

Gary Woodall, National Weather Service

Mike Crimmins, Extension Specialist,
University of Arizona Cooperative Extension

Gregg Garfin, University of Arizona –
Institute for the Study of Planet Earth

Dino DeSimone, Natural Resources
Conservation Service

Charlie Ester, Salt River Project

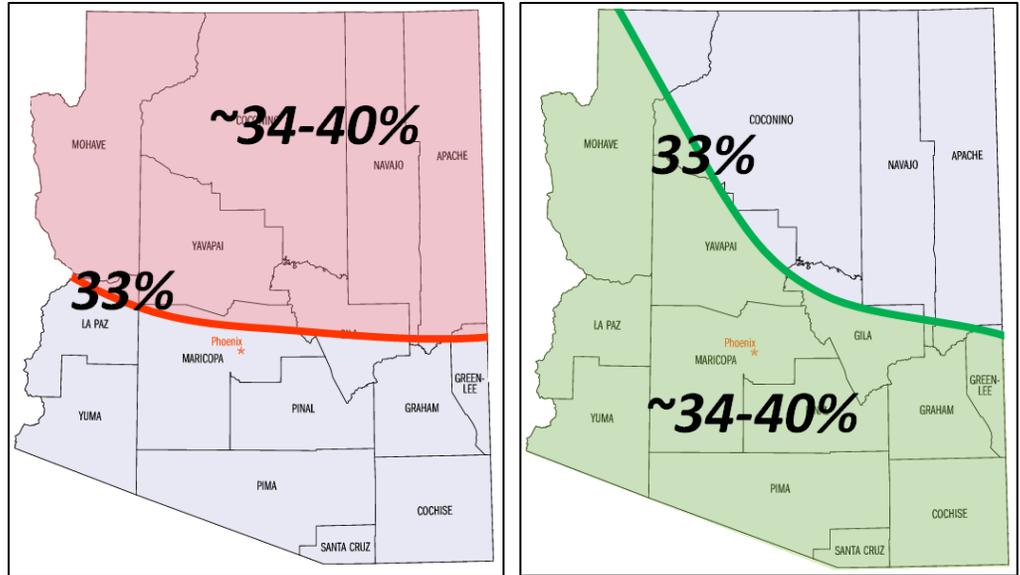
Ron Ridgway, Arizona Division of Emer-
gency Management

Chris Smith, U.S. Geological Survey

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

For more information visit
http://www.azwater.gov/azdwr/statewide_planning/drought/droughtstatus.htm

Three-month Temperature and Precipitation Outlook



The CPC Temperature Outlook (above left) for January through March indicates an increased probability for the mean temperature during the 90-day period to be above normal (33-40%) across the northern half of the state. The CPC Precipitation Outlook (above right) for the same time period indicates an enhanced probability for above normal precipitation across the southern half as well as northwest Arizona.

El Niño Advisory in Effect...

El Niño conditions currently in place will continue to strengthen and are expected to last through the Northern Hemisphere Winter 2009-2010. For Arizona, past El Niño events have tended to result in slightly below normal temperatures and above average precipitation during the winter months.

Drought Outlook - The NOAA CPC Drought Outlook, released October 15, 2009, forecasts that some improvements are likely in the drought status across Arizona through January 2010.

