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June Southwest Climate Outlook

Precipitation: In the past 30 days, most of New Mexico and much of northern Arizona recorded well-above-average precipitation (Fig. 1). Climatologically, we are in one of the drier times of year for the Southwest, so this precipitation and humidity (mostly tied to early season Pacific tropical storm activity) helped tamp down fire risk. This respite was short-term however, as water-year observations since October 1 reflect persistent and ongoing drought conditions, with most of the western U.S. recording well-below-average precipitation (Fig. 2). Notable exceptions are New Mexico, Colorado, Wyoming, and Montana, but with most recent precipitation falling on the eastern side of the Continental Divide.

Temperature: Tropical storm activity led to unseasonably mild and pleasant conditions across the Southwest, with temperature anomalies across much of Arizona and New Mexico between 2 and 6 degrees below average during the past 30 days (Fig. 3). But by mid-June, the Southwest had returned to more typical hotter and drier temperature and humidity patterns. These conditions are likely to persist until the monsoon fires up, which may be delayed by El Niño conditions.

Snowpack/Streamflow: At this point in the season (and after a relatively warm winter), snow is absent across much of the West. The recent unseasonably cool and wet conditions led to some anomalous snow water equivalent (SWE) readings in Colorado and Utah (Fig. 4), but it remains to be seen if this will have any long-term effects on water supply or streamflow. Streamflow forecasts reflect generally warm and dry winter conditions, with below-average forecasts across most of the western U.S. (Fig. 5), save for a few locations that saw late-season spikes in storm activity.

Drought & Water Supply: The U.S. Drought Monitor highlights drought conditions across the West, with particularly severe conditions in California and Nevada. Arizona and New Mexico are still grappling with the impacts of years of accumulated drought, and the monitor emphasizes long-term drought conditions across Arizona and western New Mexico.

Wildfire: Mild spring weather, above-average precipitation and above-average relative humidity have reduced wildfire risk in Arizona and New Mexico for most of this wildfire season thus far, but recent elevated temperatures and decreased humidity could change conditions quickly. The current short-term forecast calls for increasingly hotter, drier, and breezy conditions, especially in southern Arizona (Fig. 6). This could increase fire risk across the region, especially given the abundance of fine fuels stemming from above-average tropical storm activity late last fall. In the past week or so, we have already seen a number of lightning ignitions, although to date, fire managers are allowing these to burn to reduce fuel loads, further highlighting the beneficial impact of the extended period of cool and wet late-spring weather.

Precipitation & Temperature Forecasts: The June 18 NOAA-Climate Prediction Center seasonal outlook predicts above-average precipitation for much of the Southwest and most of the Intermountain West this summer, with California, western Nevada, and southwest Arizona as notable exceptions. Temperature forecasts are split, with elevated chances for above-average temperatures along the West Coast and into Arizona (and most of the western U.S.), and increased chances for below-average temperatures in the midwestern U.S. and extending into eastern New Mexico (Fig. 7)

Tweet May SW Climate Outlook

CLICK TO TWEET

Jun2015 @CLIMAS_UA SW Climate Outlook -El Niño strengthens, summer's slow start, southwest climate summary-forecasts http://bit.ly/1CfNMEj

Online Resources

Figures 1&2
NOAA/NWS - Advanced Hydrologic Prediction Service
http://water.weather.gov/precip/

Figure 3
High Plains Regional Climate Center
http://www.hprcc.unl.edu/

Figures 4&5
Natural Resources Conservation Service
http://www.wcc.nrcs.usda.gov/

Figure 6
National Interagency Coordination Center
http://www.nifc.gov/nicc/

Figure 7
NOAA/NWS - Climate Prediction Center
http://www.cpc.ncep.noaa.gov/

June Southwest Climate Outlook

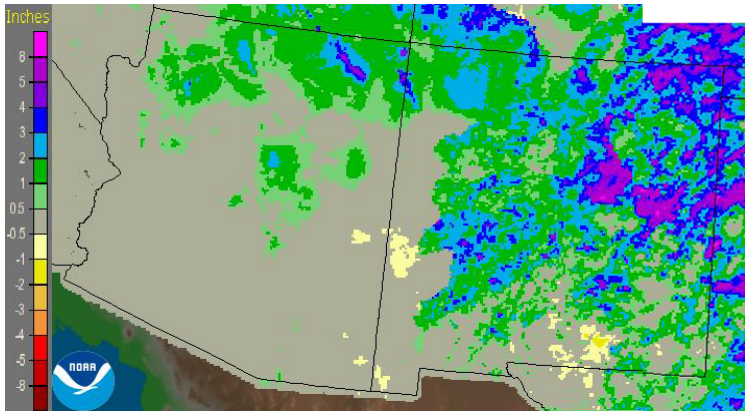

Figure 1: Departure from Normal Precipitation - Past 30 Days

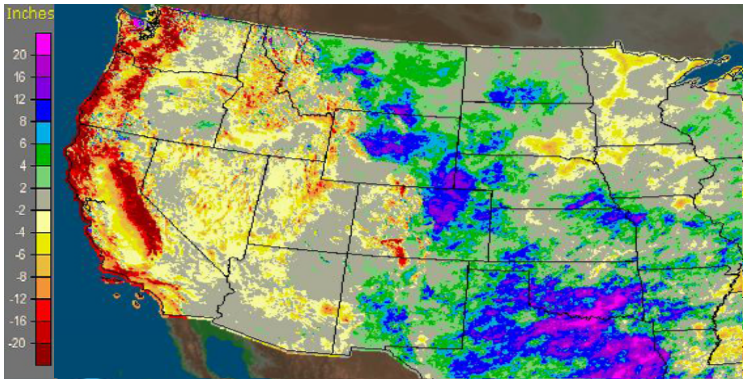

Figure 2: Departure from Normal Precipitation - Since Oct 1

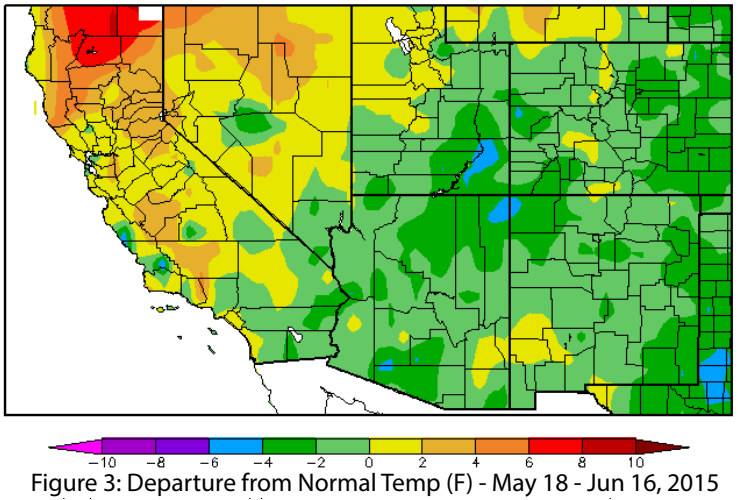

Figure 3: Departure from Normal Temp (F) - May 18 - Jun 16, 2015

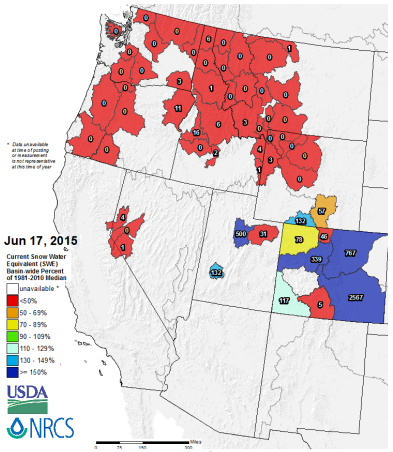

Figure 4: Snow Water Equivalent (SWE) - Jun 17, 2015

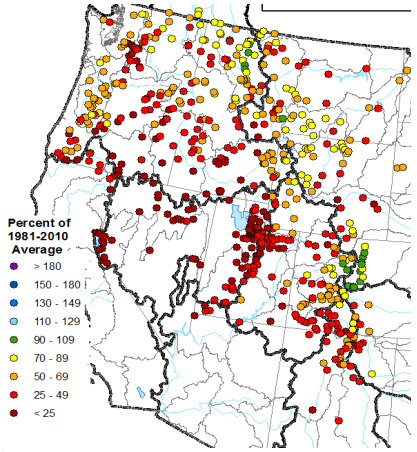

Figure 5: Spring/Summer Streamflow Forecasts - May 1, 2015

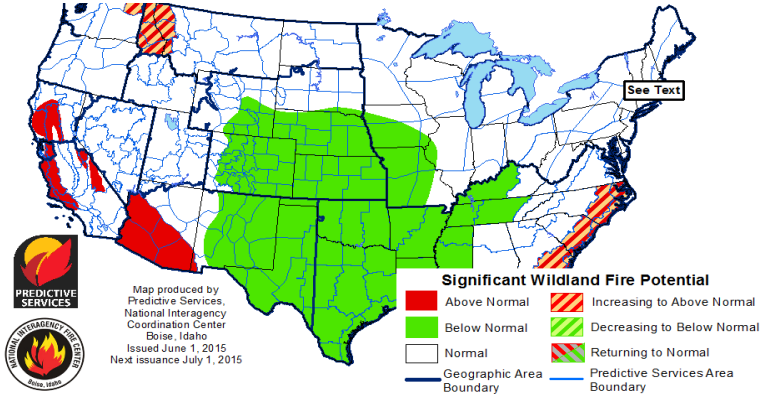

Figure 6: Significant Wildland Fire Potential Outlook - June 2015

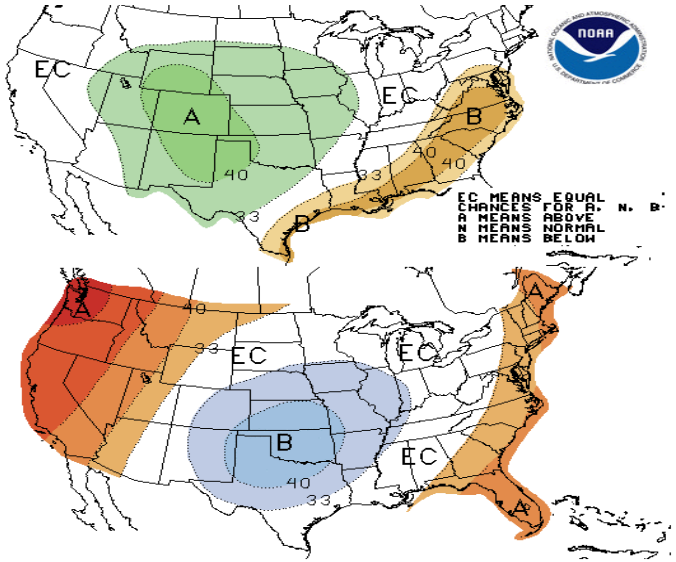

Figure 7: Three-Month Precipitation & Temperature Outlook - Jun 18, 2015

Online Resources

Figure 1
Australian Bureau of Meteorology
http://www.bom.gov.au/climate/enso/index.shtml

Figure 2
NOAA - National Climatic Data Center
http://www.ncdc.noaa.gov/teleconnections/enso/

Figure 3
International Research Institute for Climate and Society
http://iri.columbia.edu/our-expertise/climate/forecasts/enso/

Figure 4
NOAA - Climate Prediction Center
http://www.cpc.ncep.noaa.gov/products/NMME/current/plume.html

2015 El Niño Tracker

El Niño conditions continued for a fourth straight month with no signs of weakening or disorganizing. Forecasts focused on the persistence of sea-surface temperature (SST) anomalies (Figs.1 - 2) along with weakening trade winds, ongoing convective activity, and El Niño-related ocean-atmosphere coupling. Despite the high degree of uncertainty associated with forecasting El Niño this time of year (the so-called spring predictability barrier), the most recent outlooks from various sources offer a consistent cluster of forecasts calling for a clear El Niño signal that is maintained or even strengthening.

On June 9, the Australian Bureau of Meteorology maintained its tracker at official "El Niño" status, identifying persistent SST anomalies, weak trade winds, and ocean-atmospheric coupling as indicators this El Niño event was strong enough to extend through 2015. On June 10, the Japan Meteorological Agency identified strengthening El Niño conditions in the equatorial Pacific, and forecast that the current El Niño conditions were likely to last until winter. On June 11, the NOAA-Climate Prediction Center (CPC) extended its El Niño advisory with a 90 percent chance that El Niño will continue through fall 2015 and an 85 percent chance the event would last through winter 2015-2016. It pointed to the increasingly positive SST anomalies, along with ongoing ocean-atmospheric coupling and dateline convection activity, as indicators of an ongoing and strengthening El Niño event (Fig. 3). On June 18, the International Research Institute for Climate and Society (IRI) and CPC forecasts indicated continued strengthening of El Niño through 2015, with a moderate event during summer and likely stronger in the fall, lasting into early 2016. The North American multi-model ensemble currently shows a moderate event extending through early summer, with potential for a strong event by mid-summer or early fall (Fig. 4).

Last year's vacillating signals and forecasts may have led forecasters to take a more conservative approach when presented with similar conditions earlier this year to avoid repeating the "enthusiastic" forecasts of Spring 2014 that didn't immediately pan out. That said, we appear to be in the midst of an ongoing and strengthening El Niño event. If this event remains on the current trajectory, it could rival our strongest El Niño events of recent memory (1997 in particular), with implications for both Southwest and global communities.

(cont. on next page)

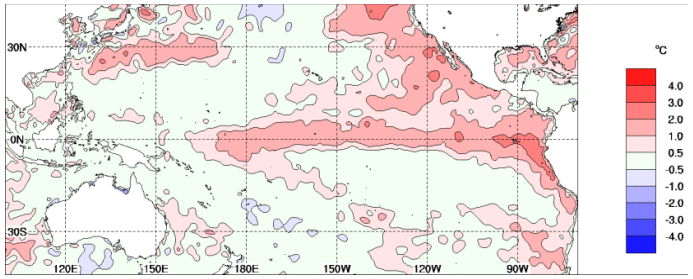

Figure 1: May 2015 Sea Surface Temperature (SST) Anomalies

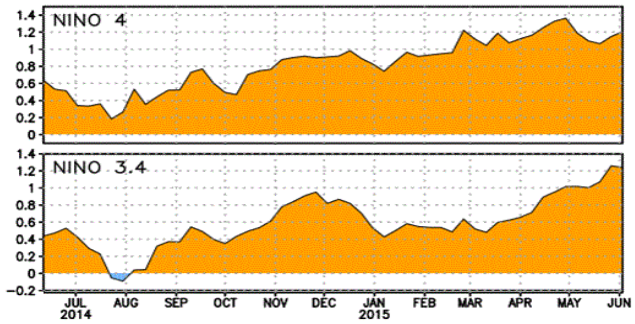

Figure 2: SST Anomalies in Niño Regions 3.4 & 4 (NCDC)

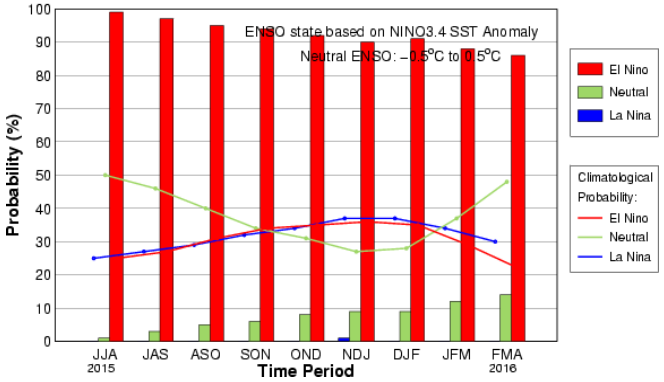

Figure 3: Early-May IRI/CPC Consensus Probabilistic ENSO Forecast

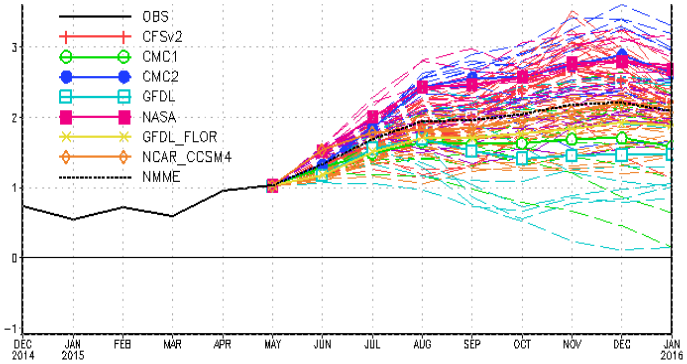

Figure 4: North American Multi-Model Ensemble Forecast for Niño 3.4

Online Resources

Figure 5
NOAA Climate.gov
https://www.climate.gov/

https://www.climate.gov/news-features/blogs/enso/united-states-el-ni%C3%B1o-impacts-0

CLIMAS YouTube Channel

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Podcasts

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www.climas.arizona.edu/media/podcasts

2015 El Niño Tracker (cont.)

The recent above-average precipitation and below-average temperatures in Arizona and New Mexico are exactly the sort of patterns we expect to see under El Niño conditions. In the immediate future, we may see a return of some early season tropical storm activity, as we did with Hurricane Blanca in June. El Niño also points toward a possible delay in the start of the monsoon, which could actually extend the hotter and drier early portion of summer. We could also see a repeat of 2014's above-average eastern Pacific tropical storm season, when conditions favorable to El Niño were thought to be driving increased late-season tropical storm activity in the Southwest. And if El Niño persists into winter 2015-2016, particularly if it remains a moderate-to-strong event, we would likely see patterns of above-average precipitation in the Southwest (Fig. 5).

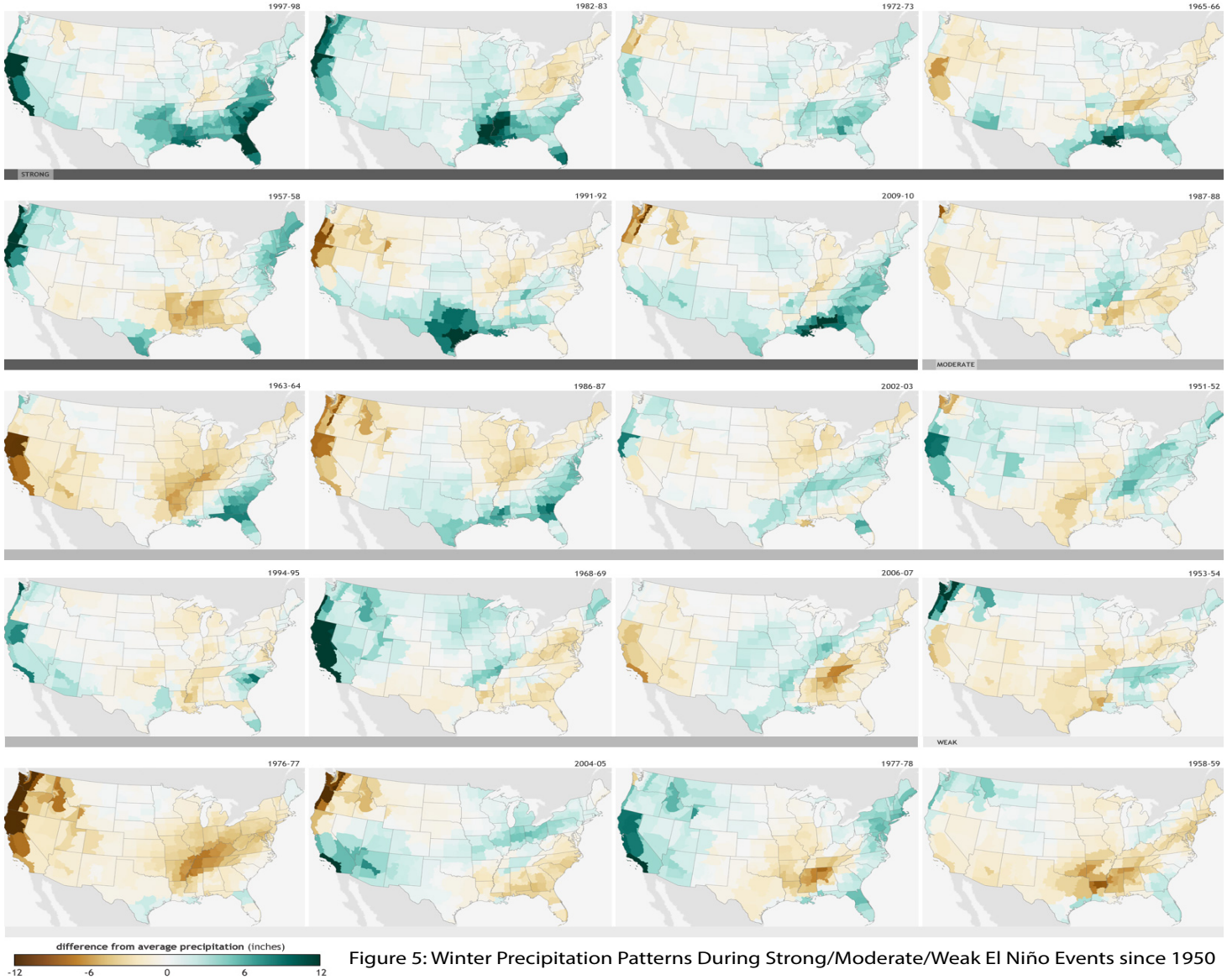


Figure 5: Winter Precipitation Patterns During Strong/Moderate/Weak El Niño Events since 1950

Online Resources

Portions of the information provided in this figure can be accessed at the Natural Resources Conservation Service

Arizona: http://1.usa.gov/19e2BdJ

New Mexico: http://www.wcc.nrcs.usda.gov/cgibin/resv_rpt.pl?state=new_mexico

Updated storage using information found here: http://155.83.192.50/wc/htmlrpts/Abiquiu.html

We are reviewing other storage totals as part of ongoing updates - contact Ben McMahan with any additional information or quesitons.

Notes

The map gives a representation of current storage for reservoirs in Arizona and New Mexico. Reservoir locations are numbered within the blue circles on the map, corresponding to the reservoirs listed in the table. The cup next to each reservoir shows the current storage (blue fill) as a percent of total capacity. Note that while the size of each cup varies with the size of the reservoir, these are representational and not to scale. Each cup also represents last year's storage (dotted line) and the 1981–2010 reservoir average (red line).

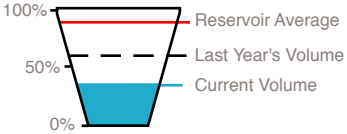
The table details more exactly the current capacity (listed as a percent of maximum storage). Current and maximum storage are given in thousands of acre-feet for each reservoir. One acre-foot is the volume of water sufficient to cover an acre of land to a depth of 1 foot (approximately 325,851 gallons). On average, 1 acre-foot of water is enough to meet the demands of 4 people for a year. The last column of the table lists an increase or decrease in storage since last month. A line indicates no change.

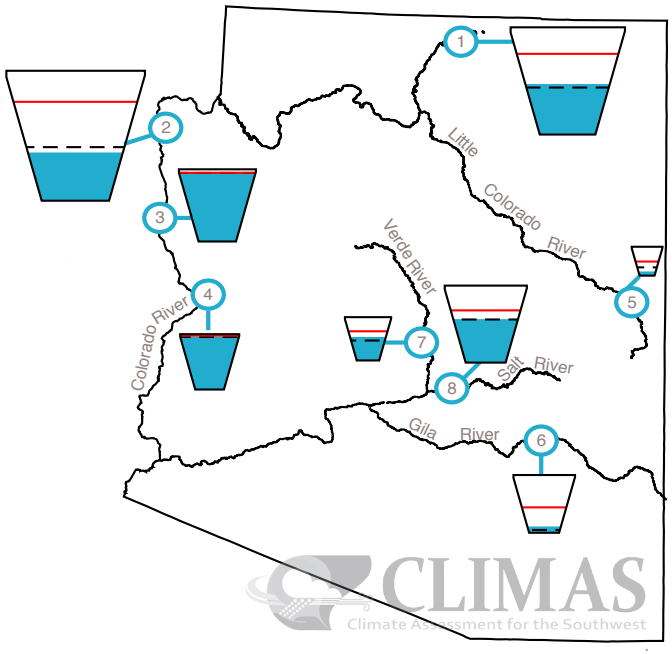
These data are based on reservoir reports updated monthly by the National Water and Climate Center of the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS).

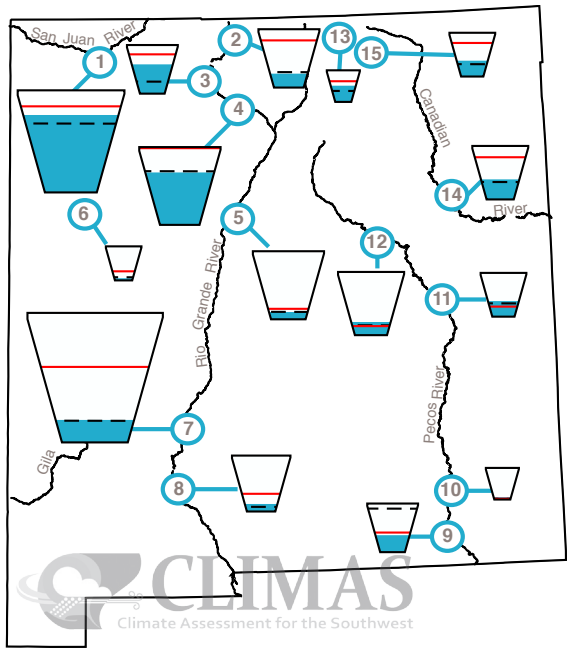
Reservoir Volumes

DATA THROUGH MAY 31, 2015

Data Source: National Water and Climate Center, Natural Resources Conservation Service







Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Lake Powell	47%	11,491.5	24,322.0	645.6
2. Lake Mead	37%	9,729.0	26,159.0	-188.0
3. Lake Mohave	94%	1,707.1	1,810.0	-15.5
4. Lake Havasu	95%	589.7	619.0	5.5
5. Lyman	14%	4.1	30.0	-0.9
6. San Carlos	11%	93.3	875.0	-26.0
7. Verde River System	54%	154.8	287.4	-3.7
8. Salt River System	56%	1,129.5	2,025.8	-25.5

*KAF: thousands of acre-feet

Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Navajo	75%	1,266.5	1,696.0	96.0
2. Heron	24%	95.4	400.0	24.9
3. El Vado	60%	113.5	190.3	51.9
4. Abiquiu	67%	125.4	186.8**	-3.7
5. Cochiti	10%	47.4	491.0	-1.1
6. Bluewater	6%	2.2	38.5	-0.1
7. Elephant Butte	18%	399.5	2,195.0	6.2
8. Caballo	13%	44.3	332.0	9.0
9. Lake Avalon	35%	1.4	4.0	0.0
10. Brantley	8%	79.5	1,008.2	6.0
11. Sumner	35%	35.3	102.0	-0.7
12. Santa Rosa	21%	93.9	438.3	19.5
13. Costilla	51%	8.1	16.0	2.4
14. Conchas	38%	94.7	254.2	19.1
15. Eagle Nest	36%	28.5	79.0	6.1

* in KAF = thousands of acre-feet
**Abiquiu max storage adjusted since last month