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May Southwest Climate Outlook

Precipitation: An active jet stream has brought several moisture-starved storms into the Southwest in the last 30 days, delivering windy conditions but little rain. While dry conditions are normal during this time of year, most of the Southwest has received less than 50 percent of average precipitation since April 15.

Temperature: Temperatures in the last 30 days were mostly below average in Arizona and New Mexico except in southwest Arizona, where temperatures were above average. Below-average temperatures across the Southwest were caused in part by several moisture-starved storms wafting in from colder, northern regions.

Snowpack: Snowpacks have melted in nearly all of Arizona and New Mexico. In the Colorado portion of the Upper Colorado River Basin, several storms—the same ones that delivered windy conditions to the Southwest—boosted snowpacks; that area has also received above-average precipitation since January 1. On the other hand, below-average snowpacks are present in the Rio Grande headwaters; precipitation there has been mostly below average since January 1.

Water Supply: Total reservoir storage decreased by about 380,600 acre-feet in Arizona in April; Lake Mead fell by about 648,000 acre-feet. Storage stands at 44 percent of capacity in Arizona and is lower than it was one year ago. In New Mexico, storage increased by 50,300 acre-feet in April. Storage is at 24 percent of capacity and is greater than it was one year ago.

Drought: Drought conditions intensified in some regions of Arizona and New Mexico. Moderate drought expanded in southwest Arizona and severe drought expanded in central New Mexico. In northeastern New Mexico, extreme drought deteriorated into exceptional drought. Compared to one year ago, drought conditions are similar in Arizona and less intense in New Mexico.

ENSO: Sea surface temperatures and atmospheric conditions continue to indicate the likelihood that an El Niño event will form. There is greater than a 60 percent chance that an El Niño will develop during the summer.

Precipitation Forecasts: The NOAA-Climate Prediction Center (CPC) is calling for slightly increased chances for above-average precipitation across the Four Corners region during the June–August period. While many dynamical models simulate increased precipitation in the monsoon region, El Niño in the past has been associated with weaker early monsoon activity. These mixed signals cause greater uncertainty in the monsoon region.

Temperature Forecasts: The CPC forecasts high chances for above-average temperatures in the Southwest during the June–August period based on many different signals, including dynamical models and temperature trends.

Fire Forecasts: Above-normal fire potential for the May–June period is focused on central and southeast Arizona and southwest New Mexico west of the Continental Divide. This forecast is based on the presence of drought conditions, the availability of dry fine fuels, the heightened potential for warm and dry conditions, and lightning strikes.

Tweet May's SW Climate Snapshot

CLICK TO TWEET

It is not a question of if but when will El Niño arrive and what will be its strength. More on ENSO and SW climate @ http://bit.ly/1nPNmRQ

Online Resources

Figure 1.
International Research Institute for Climate and Society
http://iridl.ldeo.columbia.edu/maproom/ENSO/#tabs-4

Figure 2.
International Research Institute for Climate and Society

http://iri.columbia.edu/wp-content/uploads/2014/05/quick_look_composite_may142.pdf

El Niño Watch

A strong pulse of warm water traversed the equatorial Pacific Ocean from west to east during the last several months, setting in motion the emergence of a possible El Niño event. Consequently, the NOAA Climate Prediction Center (NOAA-CPC) issued an El Niño Watch in March. El Niño events are characterized by unusually warm sea surface water from the middle Pacific Ocean (near the International Date Line) to South America. Very warm water has emerged this spring along the coast of Peru and into the Pacific Ocean along the equator (Figure 1). The timing and pattern of these warm waters resembles conditions in 1997, a year in which El Niño became one of the strongest on record. NASA recently released satellite images that showed similarities in sea surface height anomalies between this May and those of May 1997; height anomalies are related to sea surface temperatures (http://1.usa.gov/QMZwfE). While it is too early to estimate the strength of this year's nascent El Niño, wind conditions suggest it will continue to strengthen. Near the surface around the equator, winds typically blow westward, pushing warm water towards Indonesia. Recent observations indicate these winds have weakened and at times even reversed direction. These changes can help reinforce the pooling of warm water in the eastern Pacific by enabling the warm water in the west to move east. The slackened winds give rise to the belief that it's not a question of if, but when an official El Niño will be declared.

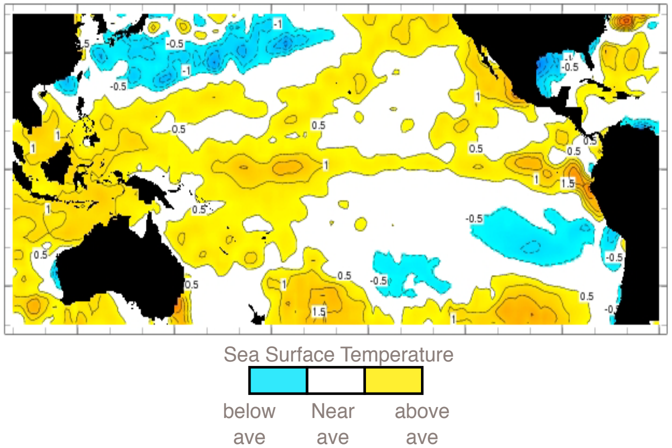


Figure 1. Sea surface temperature anomalies during May 4-10, 2014.

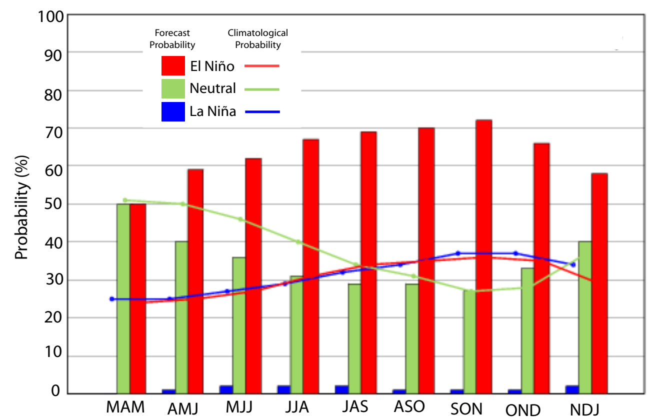


Figure 2. Seasonal probablities for ENSO phases. ENSO states based on Nino 3.4 sea surface temperature anomalies, with El Niño anomalies greater than 0.5 degrees C and La Niña anomalies less than -0.5 C.

For an El Niño event to be designated official, SSTs in the mid-Pacific Ocean along the equator need to remain above average for several consecutive months. According to the ENSO forecast issued by the NOAA-CPC and International Research Institute for Climate and Society (IRI) in mid-May, chances for an El Niño event occurring in coming months rises sharply, from 48 percent in the May–July period to 69 percent in the September–November period (Figure 2). The chance of a La Niña event returning during this time is very small, and neutral conditions also look unlikely. Even though El Niño seems a near lock, climate model simulations in May struggle to determine the short-term evolution of El Niño. Nonetheless, confidence is growing that at least a weak to moderate event is very likely to persist through the 2014–2015 winter. Moreover, there are hints that this event could become strong, similar to 1997–1998.

The speed and eventual strength of the burgeoning El Niño event will influence the impact on the Southwest in coming months. If the event quickly gains strength and persists through the winter, changes in weather patterns across Arizona and New Mexico may include the weakening of the monsoon ridge and a delay in monsoon precipitation; enhanced late summer and early fall tropical storm activity in the eastern Pacific Ocean, which increases the risk of storms striking land and drenching the Southwest; and increased winter storm activity starting in December and persisting through February or March.

Online Resources

Portions of the information provided in this figure can be accessed at NRCS

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

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

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 1971–2000 reservoir average (red line).

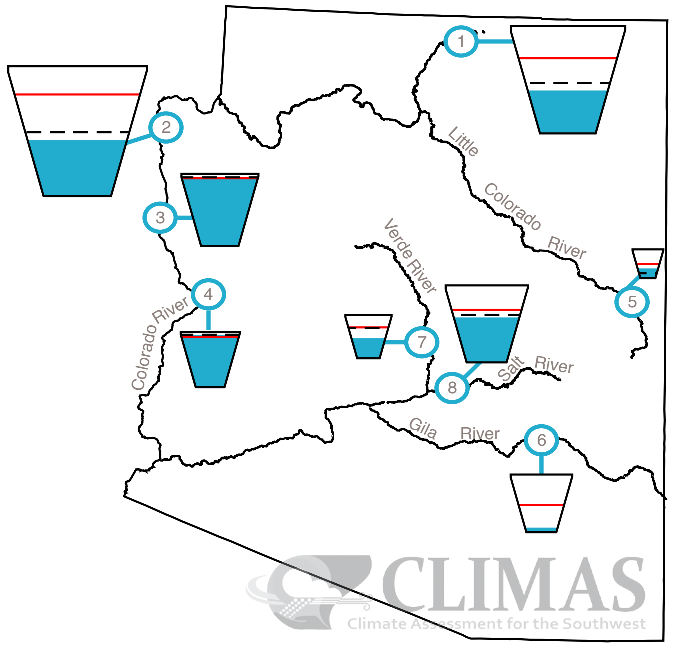
The table details more exactly the current capacity (listed as a percent of maximum storage). Current and maximum storage are given in thousands of acre-feet for each reservoir. One acre-foot is the volume of water sufficient to cover an acre of land to a depth of 1 foot (approximately 325,851 gallons).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

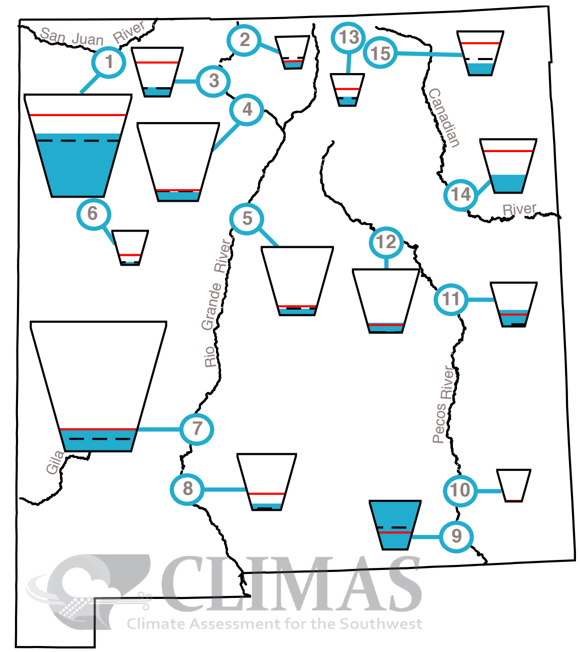
These data are based on reservoir reports updated monthly by the National Water and Climate Center of the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS).

Reservoir Volumes

DATA THROUGH APRIL 30, 2014

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





Reservoir Name	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Lake Powell	40%	9,756.0	24,322.0	260.0
2. Lake Mead	43%	11,240.0	26,159.0	-648.0
3. Lake Mohave	94%	1,695.8	1,810.0	35.0
4. Lake Havasu	94%	582.8	619.0	20.7
5. Lyman	34%	10.1	30.0	-0.4
6. San Carlos	8%	68.6	875.0	-28.0
7. Verde River System	46%	131.5	287.4	-10.3
8. Salt River System	58%	1,168.3	2,025.8	-9.6

*thousands of acre-feet

Reservoir Name	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Navajo	62%	1,052.7	1,696.0	956.9
2. Heron	23%	90.9	400.0	7.0
3. El Vado	19%	35.7	190.3	33.2
4. Abiquiu	12%	146.9	1,192.8	-4.8
5. Cochiti	10%	49.9	491.0	1.2
6. Bluewater	9%	3.5	38.5	-0.2
7. Elephant Butte	17%	363.6	2,195.0	2.3
8. Caballo	12%	38.7	332.0	-1.2
9. Lake Avalon	105%	4.2	4.0	2.8
10. Brantley	2%	16.7	1,008.2	-15.6
11. Sumner	38%	38.4	102.0	-3.6
12. Santa Rosa	16%	71.9	438.3	23.9
13. Costilla	29%	4.6	16.0	0.7
14. Conchas	34%	85.2	254.2	-4.6
15. Eagle Nest	27%	21.5	79.0	0.4

NA–value not available

* thousands of acre-feet