September 2024: Southwest Climate Outlook

Stacie Reece
September 30, 2024

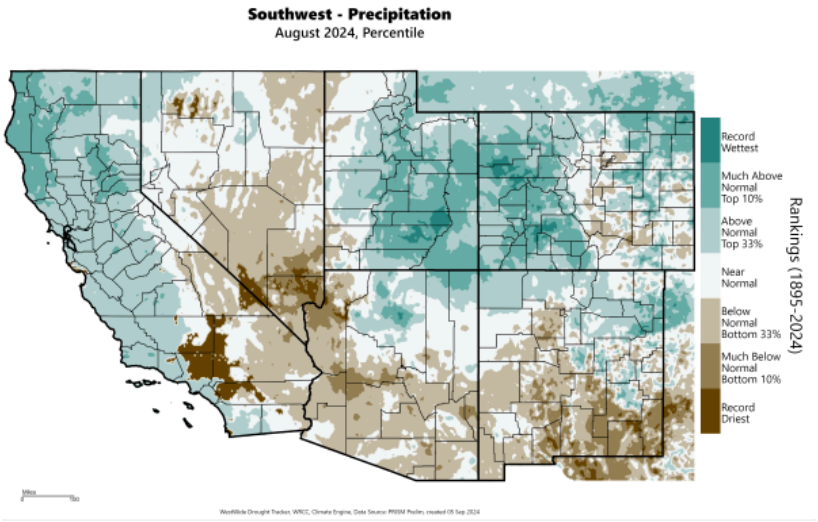
https://climas.arizona.edu/

The Southwest Climate Outlook is published by the Climate Assessment for the Southwest (CLIMAS), with support from University of Arizona Cooperative Extension, and the New Mexico State Climate office.

Questions/Contact: Stacie Reece, sreece@arizona.edu

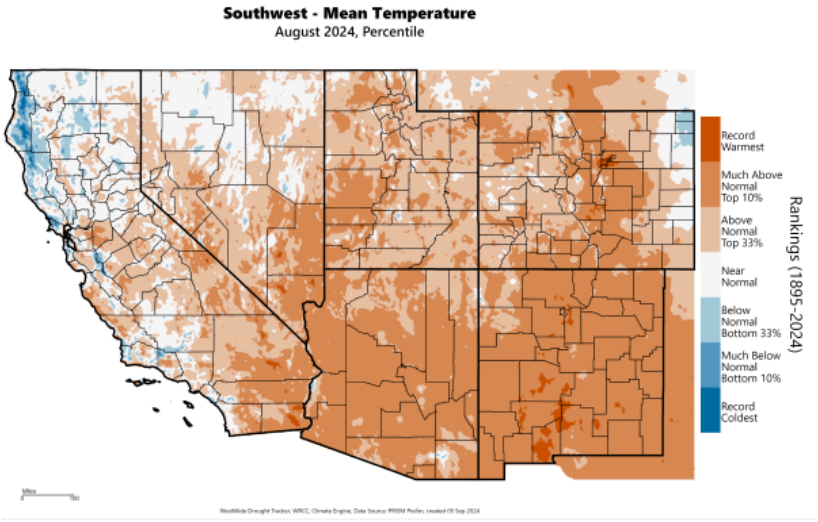
Precipitation and Temperature

Precipitation in August was below normal to much below normal for large parts of the Southwest, from western Arizona, across central and southern Arizona, to central and southern New Mexico. Precipitation was near normal to much above normal for areas of northern Arizona and northern New Mexico.



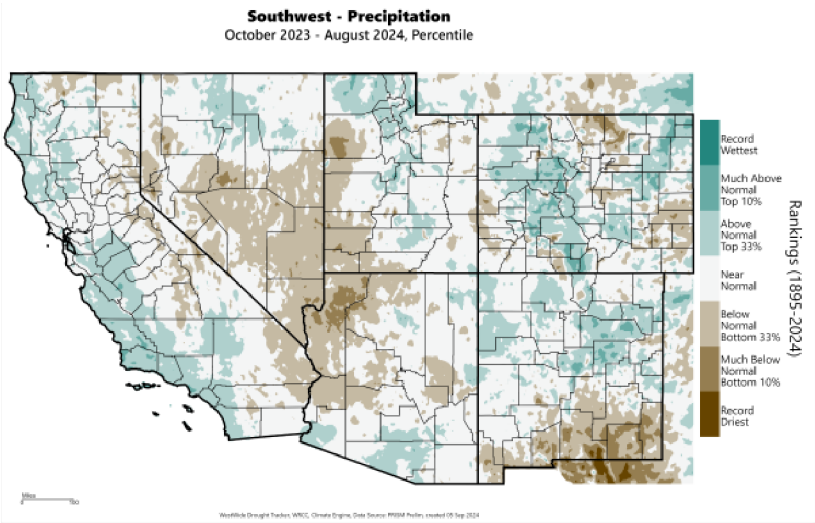
Source: WestWide Drought Tracker

August temperatures were much above normal (ranking in the uppermost 10 percent of past Augusts) across nearly all of Arizona and New Mexico. For some areas of New Mexico this August ranked as the warmest on record.



Source: WestWide Drought Tracker

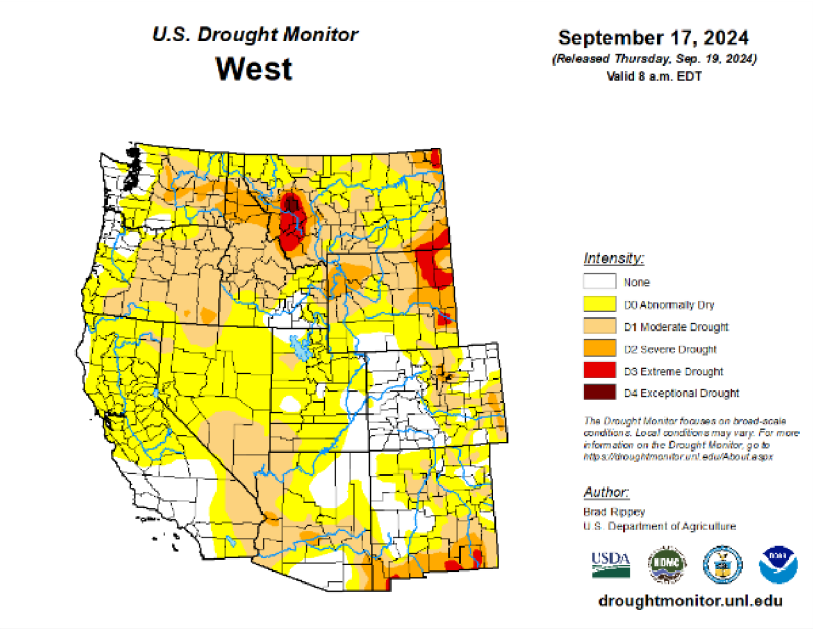
Precipitation totals for the water year (October 2023 – August 2024) range from below normal or much below normal in places including parts of western Arizona and southern New Mexico, to above normal totals across parts of central and northern New Mexico and southern Arizona. A large proportion of the Southwest has seen near normal amounts of precipitation over this water year.



Source: WestWide Drought Tracker

Drought

Moderate to extreme drought conditions are affecting areas of southern New Mexico, with moderate to severe drought extending into areas of central and western Arizona. Moderate drought conditions can also be found in the Middle Rio Grande basin and surrounding areas. About 72% of Arizona and 77% of New Mexico is abnormally dry or in drought—an improvement over last month of about 10% and 5%, respectively.



Source: U.S. Drought Monitor

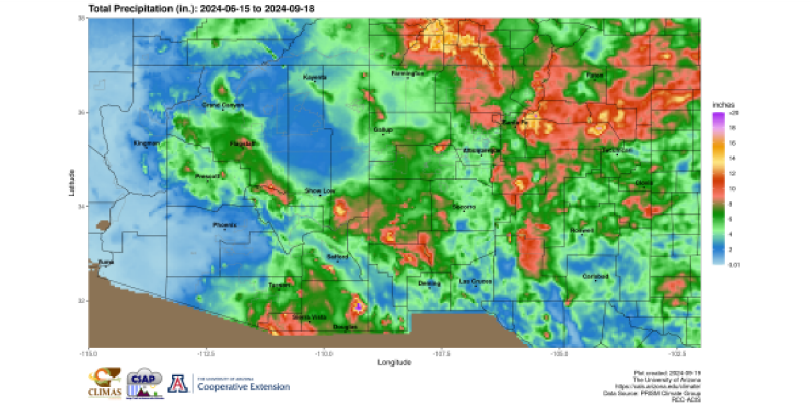
NIDIS Improved and Expanded State Pages on Drought.Gov

Arizona

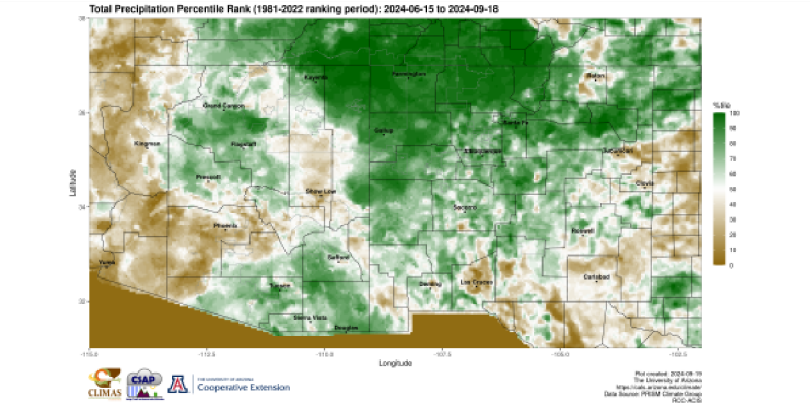
New Mexico

Monsoon

Monsoon rainfall totals (precipitation since June 15) run the gamut of abnormally dry to abnormally wet, with much above normal rainfall totals for large parts of the Colorado Plateau and the mountains of northern New Mexico, near normal to above normal for southeastern Arizona and central New Mexico, and below normal for western Arizona and southern New Mexico.

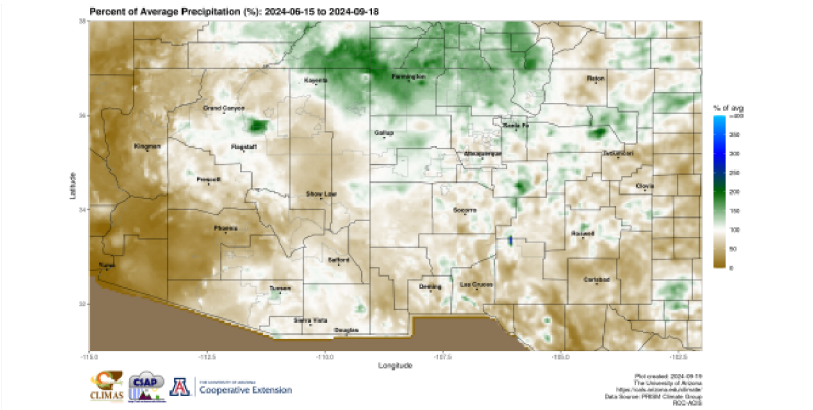


Southwest U.S. Summer Monsoon Season Precipitation Mapping

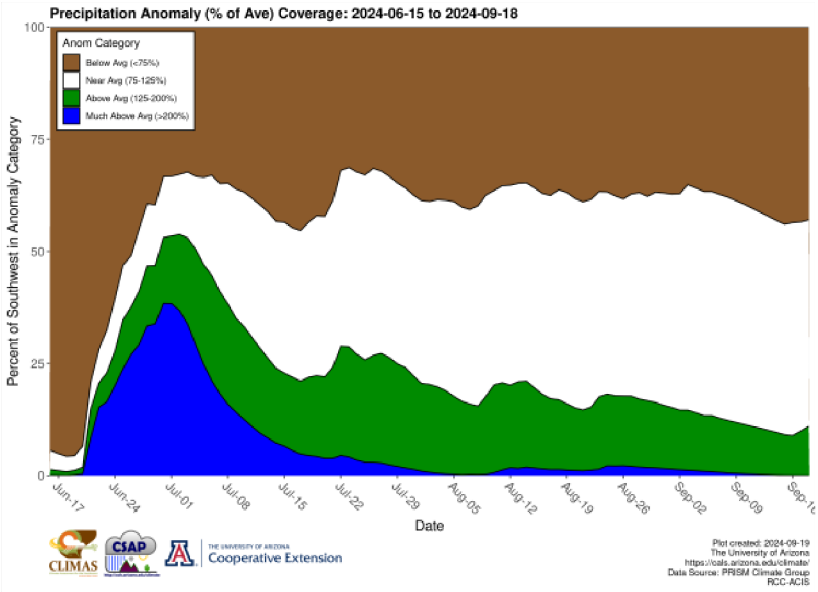


Southwest U.S. Summer Monsoon Season Precipitation Mapping

Expressed as a percent of average, this season's monsoon looks drier. The above percentile rank map shows the season's totals compared to a "normal" of a given location's median rainfall for the same seasonal interval, which is almost always a lower number than average or mean value for the same location—the distribution of precipitation data is skewed. Still, this monsoon was "near average" for more of the region than it was "below average".



Southwest U.S. Summer Monsoon Season Precipitation Mapping

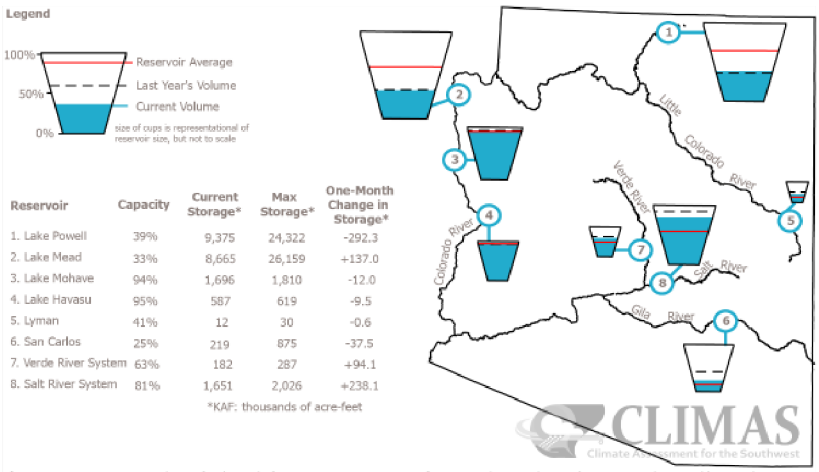


Southwest U.S. Summer Monsoon Season Precipitation Mapping

Water Supply

Many reservoirs across Arizona and New Mexico are holding less water than they were this time last year. Lake Powell and Lake Mead together hold about as much as last year, which is still much below the long-term average storage for those

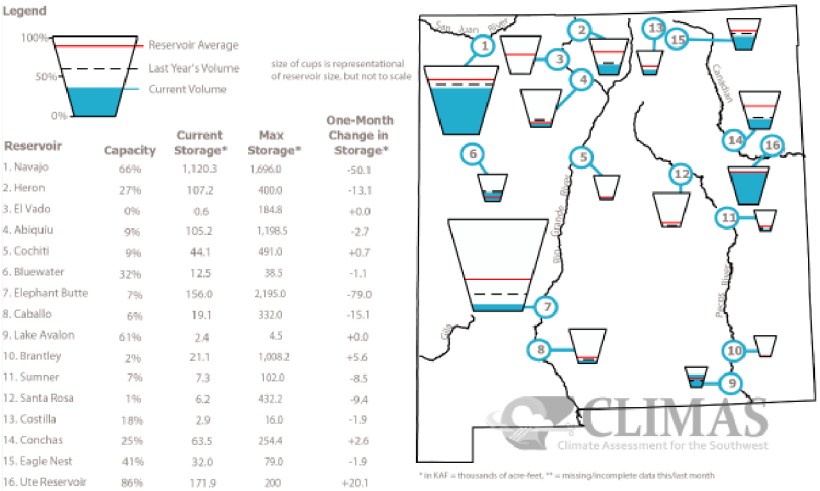
reservoirs. Other Arizona reservoirs are at levels at or above the long-term average. Reservoirs in New Mexico are generally at levels below where they were last year and below long-term average levels.



Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Lake Powell	39%	9,375	24,322	-292.3
2. Lake Mead	33%	8,665	26,159	+137.0
3. Lake Mohave	94%	1,696	1,810	-12.0
4. Lake Havasu	95%	587	619	-9.5
5. Lyman	41%	12	30	-0.6
6. San Carlos	25%	219	875	-37.5
7. Verde River System	63%	182	287	+94.1
8. Salt River System	81%	1,651	2,026	+238.1

*KAF: thousands of acre-feet

Figure 1. Arizona reservoir volumes for the end of August 2024 as a percent of capacity. The map depicts the average volume and last year's storage for each reservoir. The table also lists current and maximum storage, and change in storage since last month.



Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Navajo	66%	1,120.3	1,696.0	-50.1
2. Heron	27%	107.2	400.0	-13.1
3. El Vado	0%	0.6	184.8	+0.0
4. Abiquiu	9%	105.2	1,198.5	-2.7
5. Cochiti	9%	44.1	491.0	+0.7
6. Bluewater	32%	12.5	38.5	-1.1
7. Elephant Butte	7%	156.0	2,195.0	-79.0
8. Caballo	6%	19.1	332.0	-15.1
9. Lake Avalon	61%	2.4	4.5	+0.0
10. Brantley	2%	21.1	1,008.2	+5.6
11. Sumner	7%	7.3	102.0	-8.5
12. Santa Rosa	1%	6.2	432.2	-9.4
13. Costilla	18%	2.9	16.0	-1.9
14. Conchas	25%	63.5	254.4	+2.6
15. Eagle Nest	41%	32.0	79.0	-1.9
16. Ute Reservoir	86%	171.9	200	+20.1

* in KAF = thousands of acre-feet, ** = missing/incomplete data this/last month

Figure 2. New Mexico reservoir volumes for end of August 2024 as a percent of capacity. The map depicts the average volume and last year's storage for each reservoir. The table also lists current and maximum storage, and change in storage since last month.

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 1991–2020 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

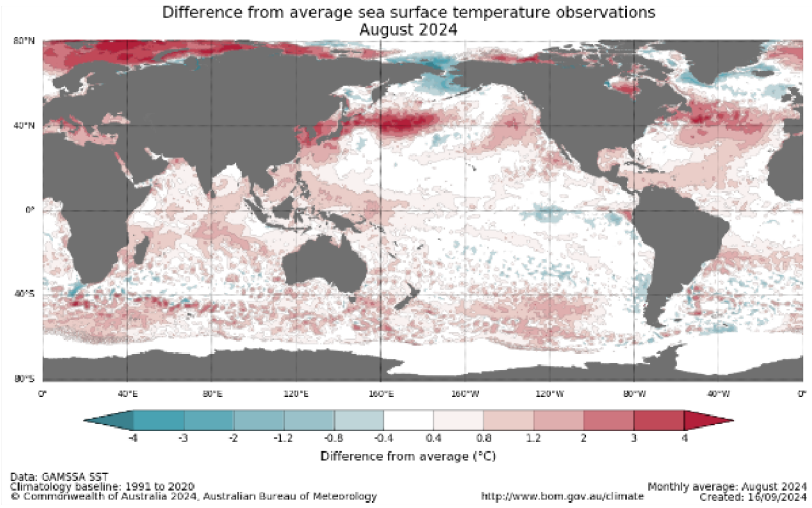
325,851 gallons). On average, 1 acre-foot of water is enough to meet the demands of four people for a year. The last column of the table lists an increase or decrease in storage since last month. A line indicates no change. These data are based on reservoir reports updated monthly by the Natural Resources Conservation Service - National Water and Climate Center (USDA)

.

BOR: New Mexico Dashboard

ENSO Tracker

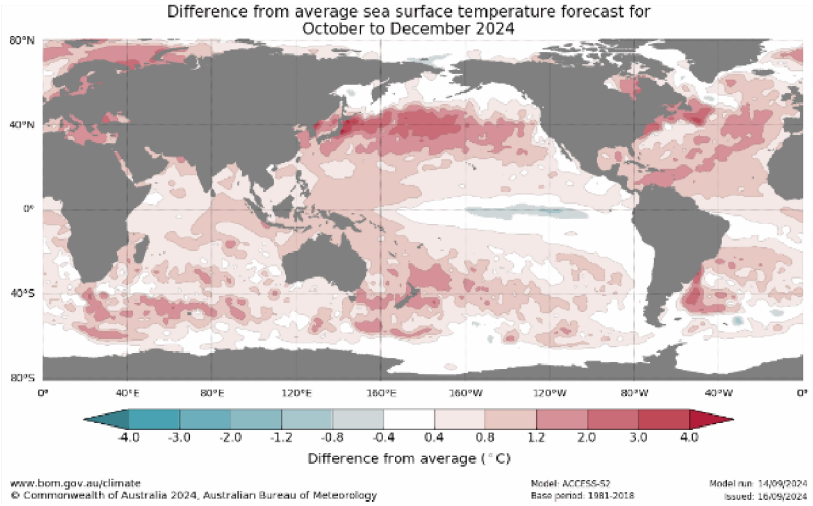
August sea surface temperatures (SSTs) show a La Niña-like pattern of warmer-than-normal SSTs in the western equatorial Pacific, and cooler-than-normal SSTs in the eastern equatorial Pacific. This general pattern has been persistent for several months, following the end of last winter's El Niño, but the cool SST anomalies in the east have not yet been strong enough or extensive enough to qualify as marking the beginning of a La Niña event.



Source: Australian Bureau of Meteorology

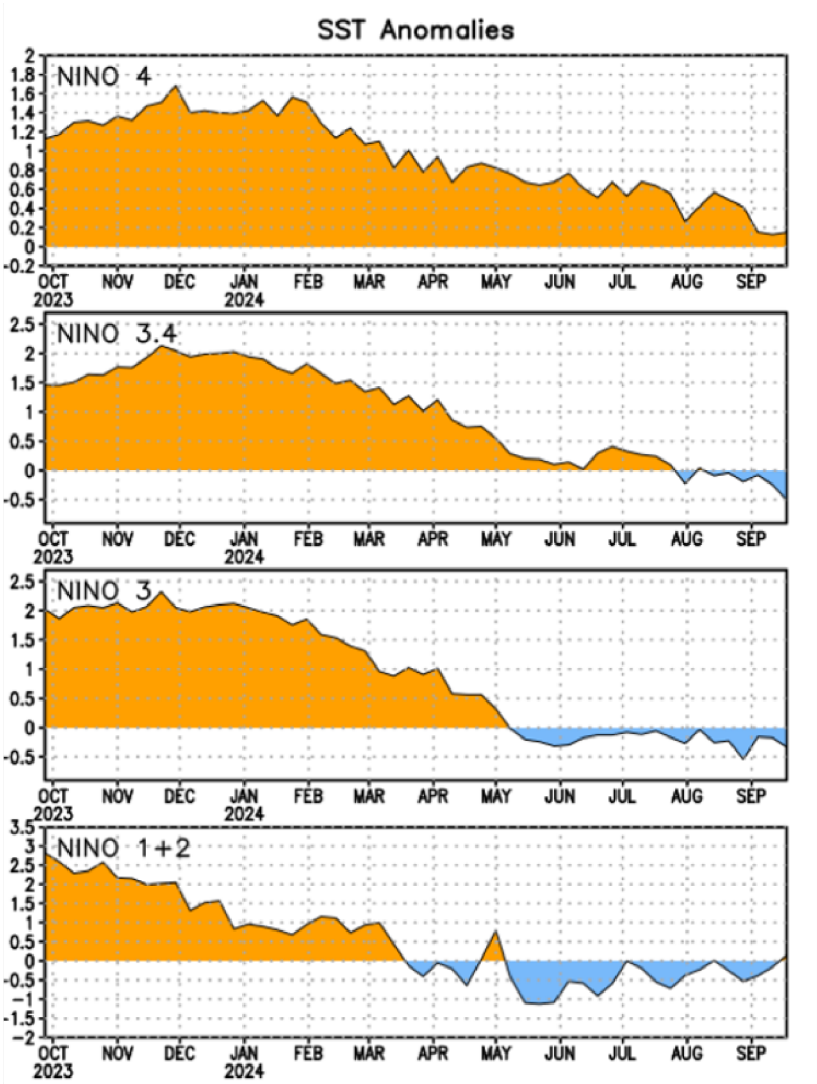
A model forecast of October-December SSTs shows an east-equatorial Pacific cool anomaly that remains weak in magnitude but suggests a growth in its extent along the equator. The forecast also shows a stronger, more extensive warm anomaly in the west, which is a key ingredient for the

atmospheric adjustments that result in La-Niña impacts in North America.



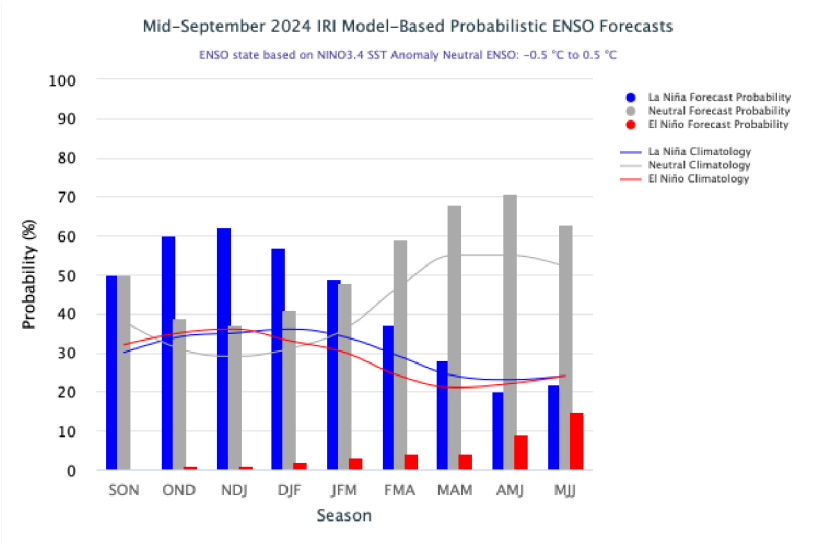
Source: Australian Bureau of Meteorology

SSTs averaged over the main ENSO monitoring region, Nino 3.4, have been in the ENSO-neutral range (within 0.5°C of average) since May, but the most recent weekly data point puts it at –0.5°C, right on the La Niña threshold. SSTs to the east of Nino 3.4, in Nino 3 and Nino 1+2, have been on the cool side of normal since earlier in the spring, but not much cooler, or with much persistence or trend toward cooler temperatures. However, a continuing trend toward cooler Nino 3.4 SSTs is still possible because of cooler water lurking in the subsurface of the eastern Pacific.



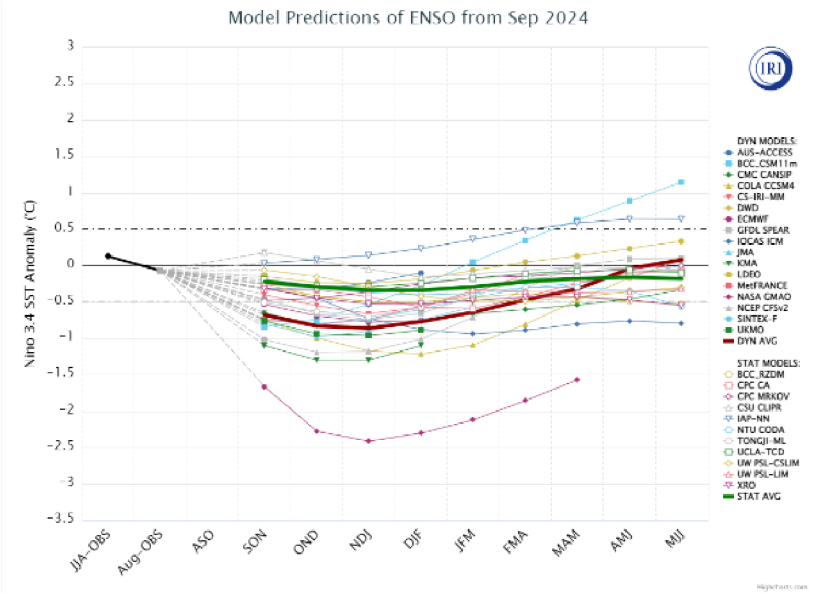
Source: Climate Prediction Center (NOAA)

Looking forward, the overall probability of La Niña as indicated by forecast models favors La Niña conditions for the October – December season through the December – February season, giving around a 60% chance of La Niña versus around a 40% chance of ENSO-neutral conditions. Forecasts are split about evenly between ENSO-neutral and La Niña for the January – March season.



Source: The International Research Institute for Climate and Society, Columbia University Climate School

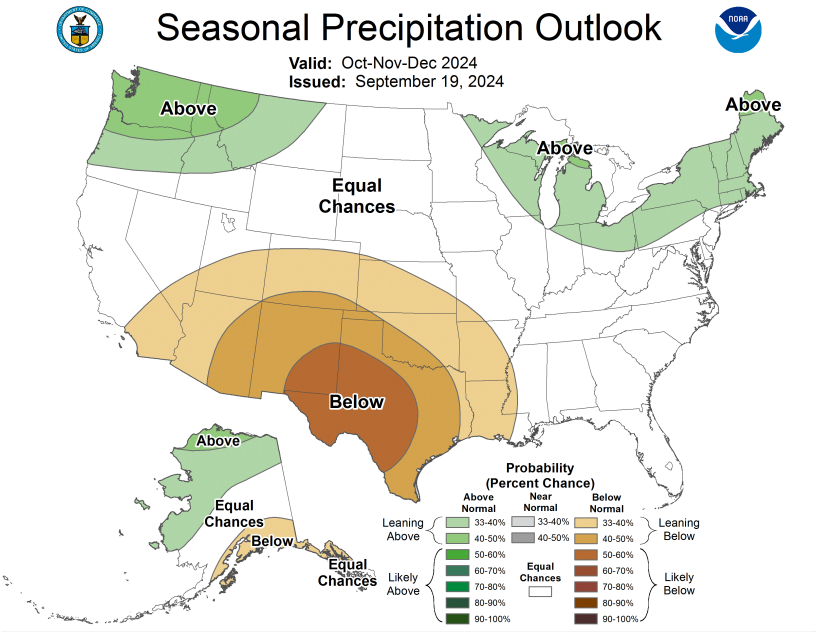
Individual model ENSO forecasts differ depending generally on whether a model is statistically or dynamically driven, with statistical models tending to favor ENSO-neutral conditions and dynamic models tending to favor La Niña. Of the models producing La Niña results, all indicate a weak or moderate La Niña, with seasonal Nina 3.4 SST anomalies no cooler than 1.5°C below average—except for one outlier model which produced a simulated peak cool anomaly nearly 2.5°C below average.



Source: The International Research Institute for Climate and Society, Columbia University Climate School

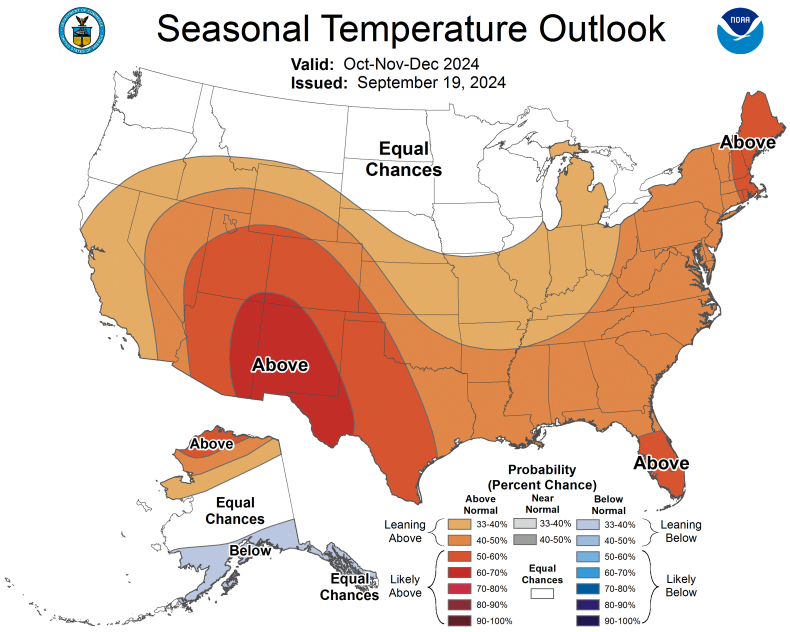
Seasonal Forecasts

The October – December seasonal precipitation forecast favors below normal precipitation for Arizona and New Mexico, with the forecast *leaning* (33% - 50% chance) toward dryer conditions for Arizona and most of New Mexico and indicating—with less uncertainty—*likely* (50% - 60% chance) dryer conditions for an area including southeast New Mexico.



Source: Climate Prediction Center (NOAA)

The October – December seasonal temperature forecast favors above normal temperatures for Arizona and New Mexico. The forecast places both states in the bull's eye of *likely* (50% - 70% chance) warmer-than-normal fall temperatures.

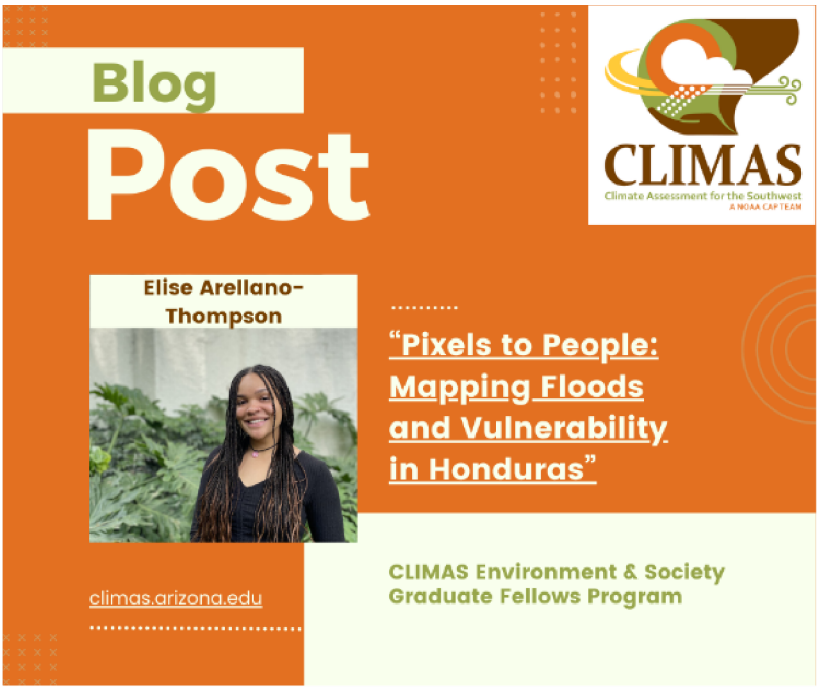


Source: Climate Prediction Center (NOAA)

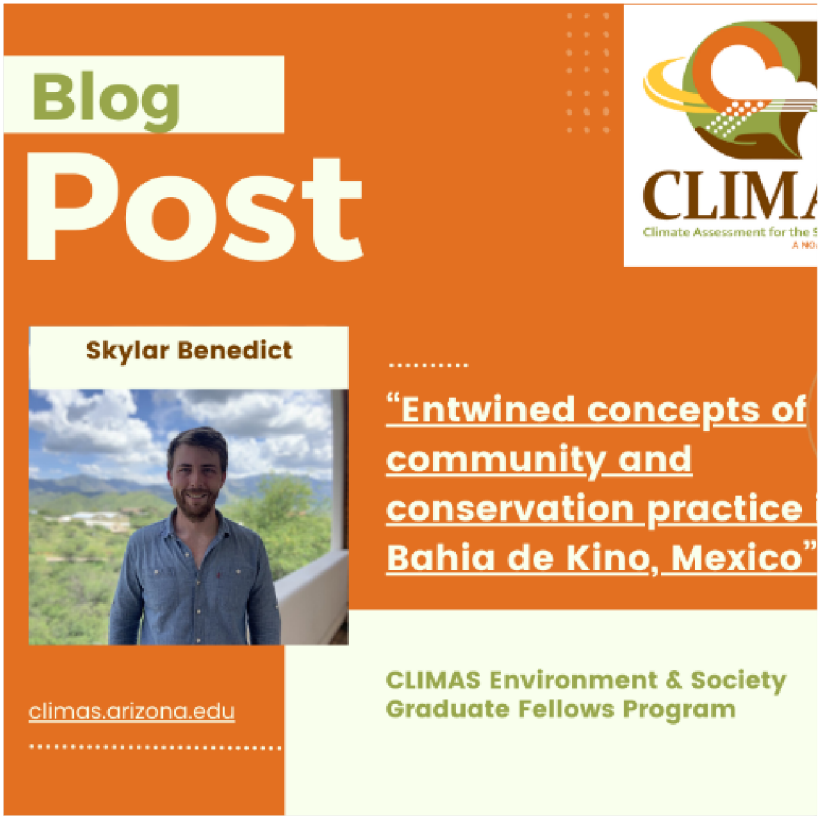
E&S Fellows Blogs

The CLIMAS Environment & Society Fellowship was created in 2013 as a funding opportunity for graduate students to practice use-inspired research and science communication. The Fellowship supports projects that connect social or physical sciences, the environment, and decision-making.

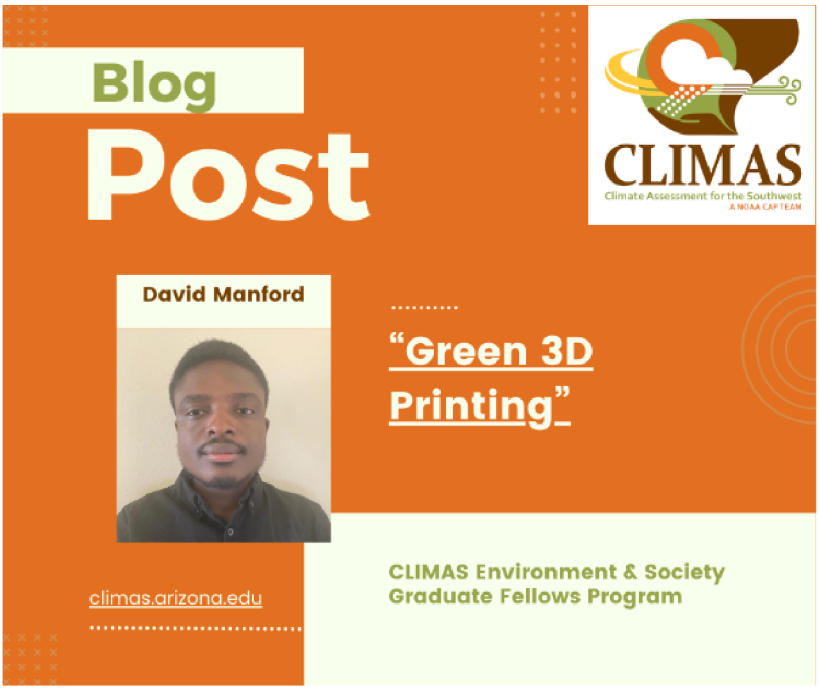
Hear from the current 2024 Graduate Fellows as they reflect on their projects and experience so far this year for the CLIMAS blog (see each post in the links and details below).



Pixels to People: Mapping Floods and Vulnerability in Honduras



Entwined concepts of community and conservation practice in Bahia de Kino, Mexico



Green 3D Printing

Views from Diego's Porch: Water-Monitoring as Environmental Activism in Intag, Ecuador

Southwest Climate Podcast

September 2024 SW Climate Podcast – A Tale of Two Monsoon Halves

Recorded 9/20/2024

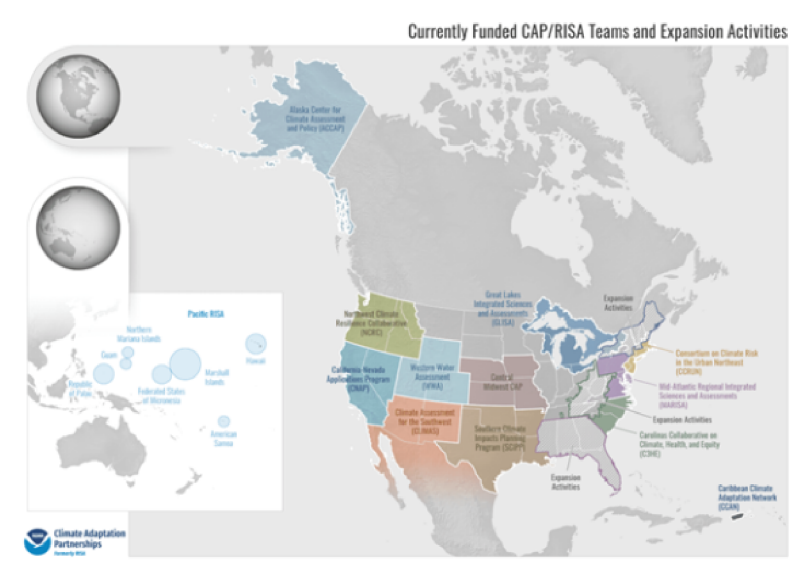
Aired 9/24/2024

In this month's Southwest Climate Podcast hosts Zack 'Generational' Guido and Mike "Dewpoint' Crimmins break down what the heck happened to the second half of the monsoon this year. They unpack the recent Atlantic tropical activity, or lack thereof, as well as any hope for the Pacific to bring some moisture to the Southwest. They end with some coverage of the rest of September and a look into the early winter outlooks. This episode is not without controversy - so download / stream today!

Listen Here

About CLIMAS

The Climate Assessment for the Southwest (CLIMAS) program was established in 1998 as part of the National Oceanic and Atmospheric Administration's Climate Adaptation Partnerships (CAP) Program (formerly known as Regional Integrated Sciences and Assessments, or RISA). CLIMAS—housed at the University of Arizona's Institute of the Environment—is a collaboration between the University of Arizona and New Mexico State University. The CLIMAS team is made up of experts from a variety of social, physical, and natural sciences who work with partners across the Southwest to develop sustainable answers to regional climate challenges.



Learn more about the NOAA CAP program here

Disclaimer

This packet contains official and non-official forecasts, as well as other information. While we make every effort to verify this information, please understand that we do not warrant the accuracy of any of these materials. The user assumes the entire risk related to the use of this data. CLIMAS, and UA Cooperative Extension disclaim any and all warranties, whether expressed or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose. In no event will CLIMAS, UA Cooperative Extension, or The University of Arizona be liable to you or to any third party for any direct, indirect, incidental, consequential, special or exemplary damages or lost profit resulting from any use or misuse of this data.

Southwest Climate Outlook contributors:	Mike Crimmins & Matt Meko