August 2024: Southwest Climate Outlook

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August 29, 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.

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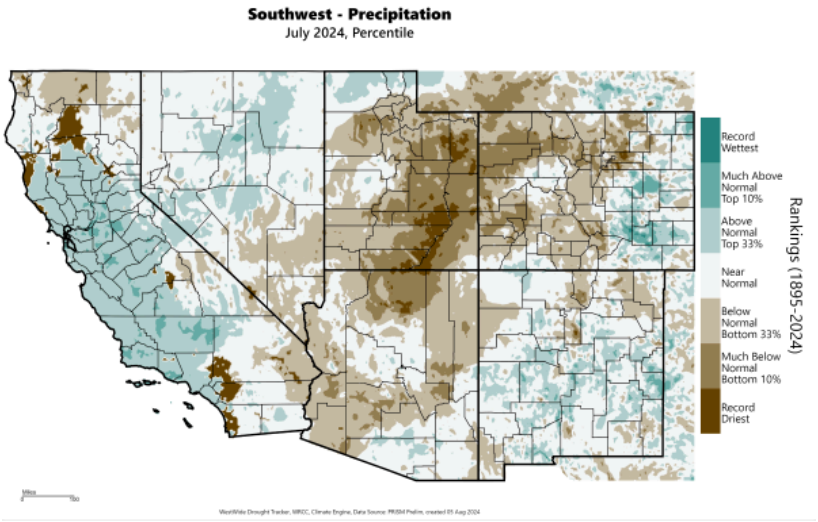
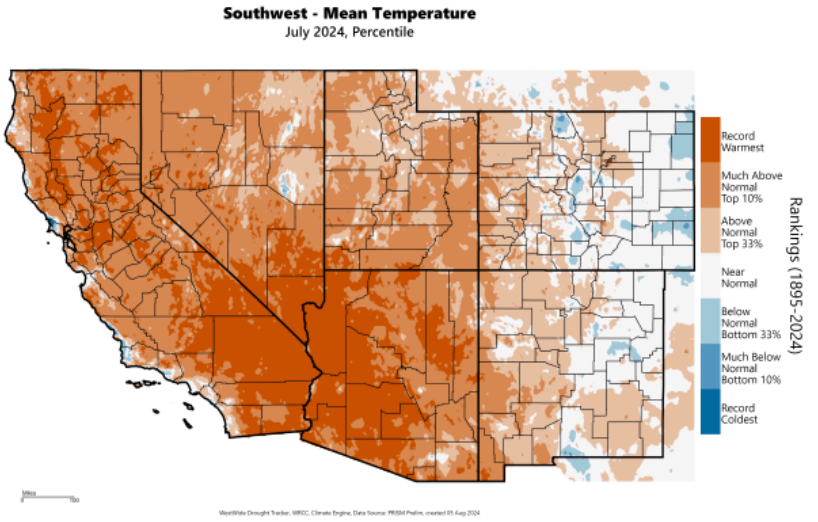
Precipitation and Temperature

Precipitation in July was near normal to below normal across much of Arizona, and near normal to above normal across much of New Mexico.



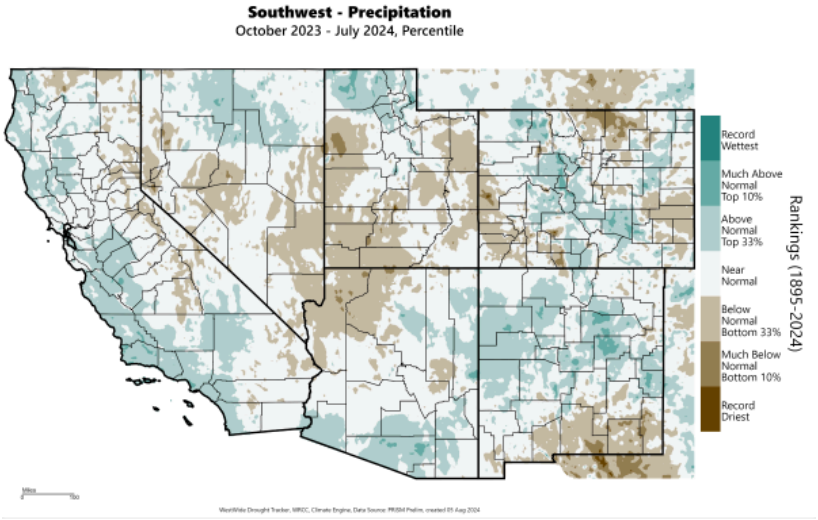
Source: WestWide Drought Tracker

July temperatures were much above normal or record warmest in Arizona, above normal across much of New Mexico, and near normal in northeast New Mexico.



Source: WestWide Drought Tracker

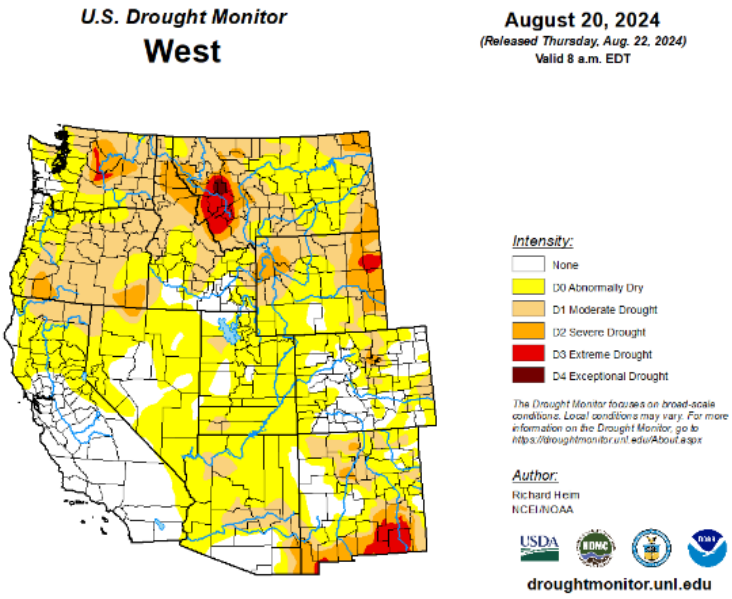
Water year (October 2023 –July 2024) precipitation totals range from below normal in northwest Arizona and southern New Mexico to above normal in southern Arizona and much of the rest of New Mexico. In many areas precipitation totals for the water year are near normal.



Source: WestWide Drought Tracker

Drought

About 80% of Arizona and New Mexico is abnormally dry or affected by drought conditions. Compared to last month, there has been a small contraction of drought or abnormally dry conditions in New Mexico, and an expansion of abnormally dry conditions in Arizona. Severe (D2) to extreme (D3) drought conditions are found across southern New Mexico, with moderate (D1) drought conditions extending into southeastern and central Arizona. Moderate to severe drought also affects northern New Mexico, in areas including the Rio Grande north from Albuquerque, the Jemez Mountains, and the Rio Chama.



Source: U.S. Drought Monitor

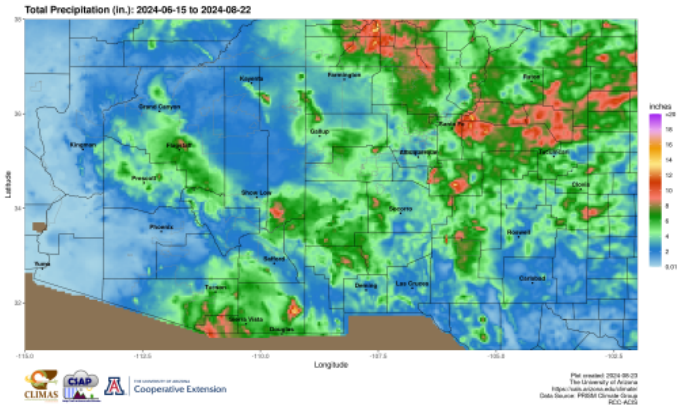
NIDIS Improved and Expanded State Pages on Drought.Gov

Arizona

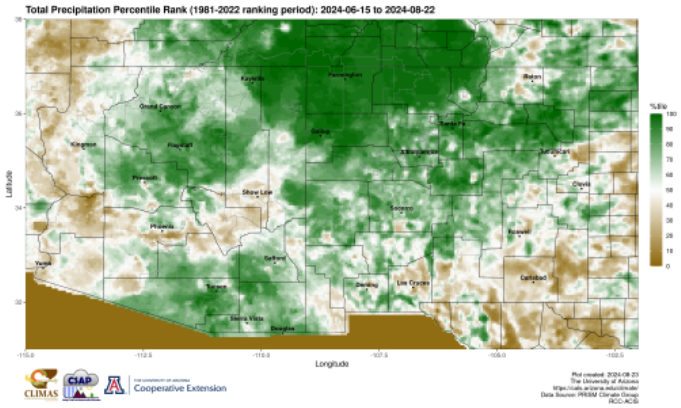
New Mexico

Monsoon

Monsoon precipitation has been above normal for much of northern, central, and western New Mexico; it has been above normal for large parts of southern and northern Arizona. Areas where monsoon precipitation has been below normal include southern New Mexico, western Arizona, and much of the Salt River basin in central to eastern Arizona.



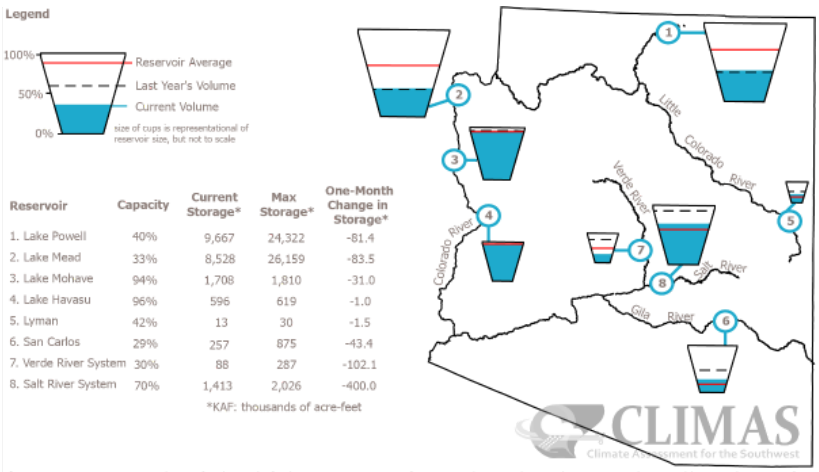
Southwest U.S. Summer Monsoon Season Precipitation Mapping



Southwest U.S. Summer Monsoon Season Precipitation Mapping

Water Supply

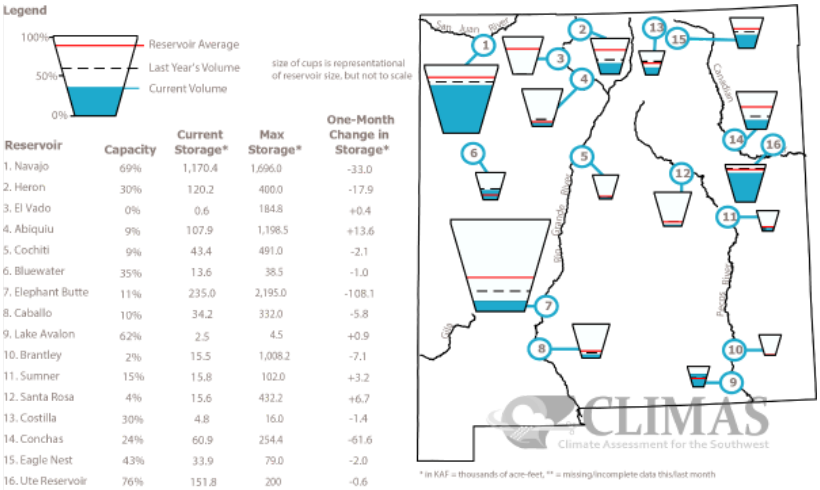
Many reservoirs across Arizona and New Mexico are holding less water than they were this time last year. In New Mexico, reservoir levels are generally also lower than long-term average levels. In Arizona, Lyman Lake, San Carlos Lake, and Salt River system reservoirs are storing volumes greater than the long-term average, but below last year's levels. Lake Powell and Lake Mead hold amounts near to above last year's amounts but remain much below long-term average levels.



Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Lake Powell	40%	9,667	24,322	-81.4
2. Lake Mead	33%	8,528	26,159	-83.5
3. Lake Mohave	94%	1,708	1,810	-31.0
4. Lake Havasu	96%	596	619	-1.0
5. Lyman	42%	13	30	-1.5
6. San Carlos	29%	257	875	-43.4
7. Verde River System	30%	88	287	-102.1
8. Salt River System	70%	1,413	2,026	-400.0

*KAF: thousands of acre-feet

Figure 1. Arizona reservoir volumes for the end of July 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	69%	1,170.4	1,696.0	-33.0
2. Heron	30%	120.2	400.0	-17.9
3. El Vado	0%	0.6	184.8	+0.4
4. Abiquiu	9%	107.9	1,198.5	+13.6
5. Cochiti	9%	43.4	491.0	-2.1
6. Bluewater	35%	13.6	38.5	-1.0
7. Elephant Butte	11%	235.0	2,195.0	-108.1
8. Caballo	10%	34.2	332.0	-5.8
9. Lake Avalon	62%	2.5	4.5	+0.9
10. Brantley	2%	15.5	1,008.2	-7.1
11. Sumner	15%	15.8	102.0	+3.2
12. Santa Rosa	4%	15.6	432.2	+6.7
13. Costilla	30%	4.8	16.0	-1.4
14. Conchas	24%	60.9	254.4	-61.6
15. Eagle Nest	43%	33.9	79.0	-2.0
16. Ute Reservoir	76%	151.8	200	-0.6

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

Figure 2. New Mexico reservoir volumes for end of July 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)

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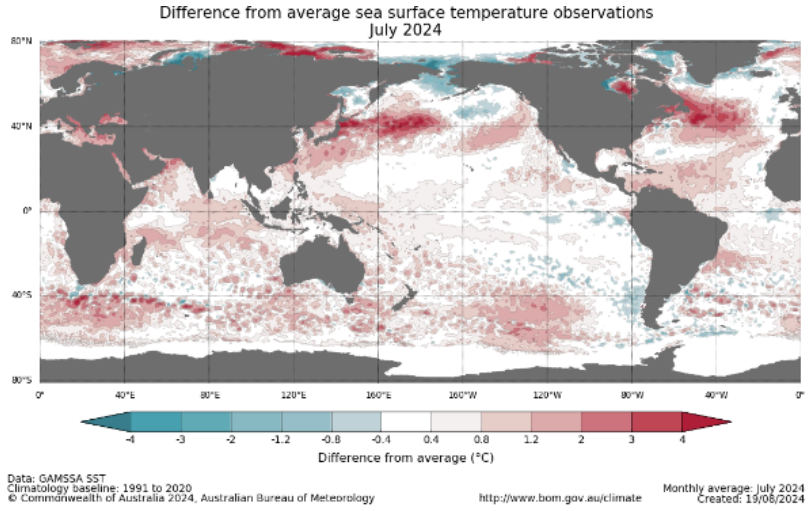
BOR: New Mexico Dashboard

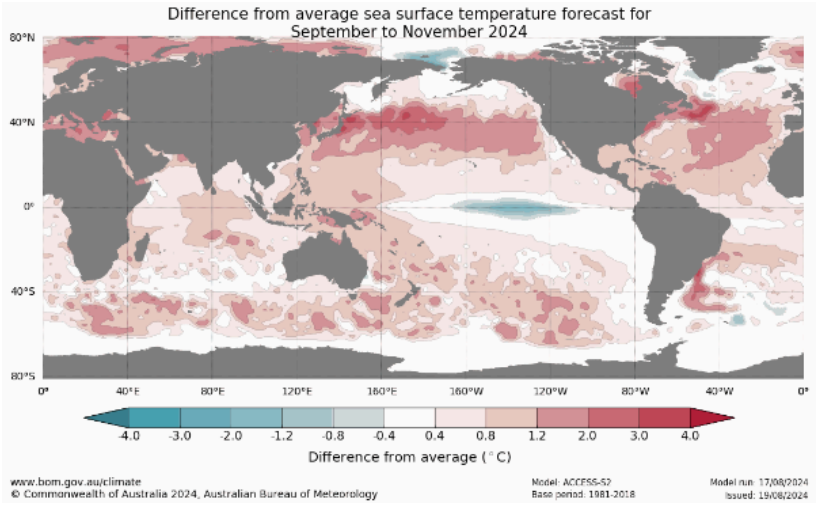
ENSO Tracker

Equatorial Pacific sea surface temperatures have been warmer than average in the west, and near average in the east, with some areas of cooler than average SSTs hinting at the long-predicted, possibly still coming La Niña.



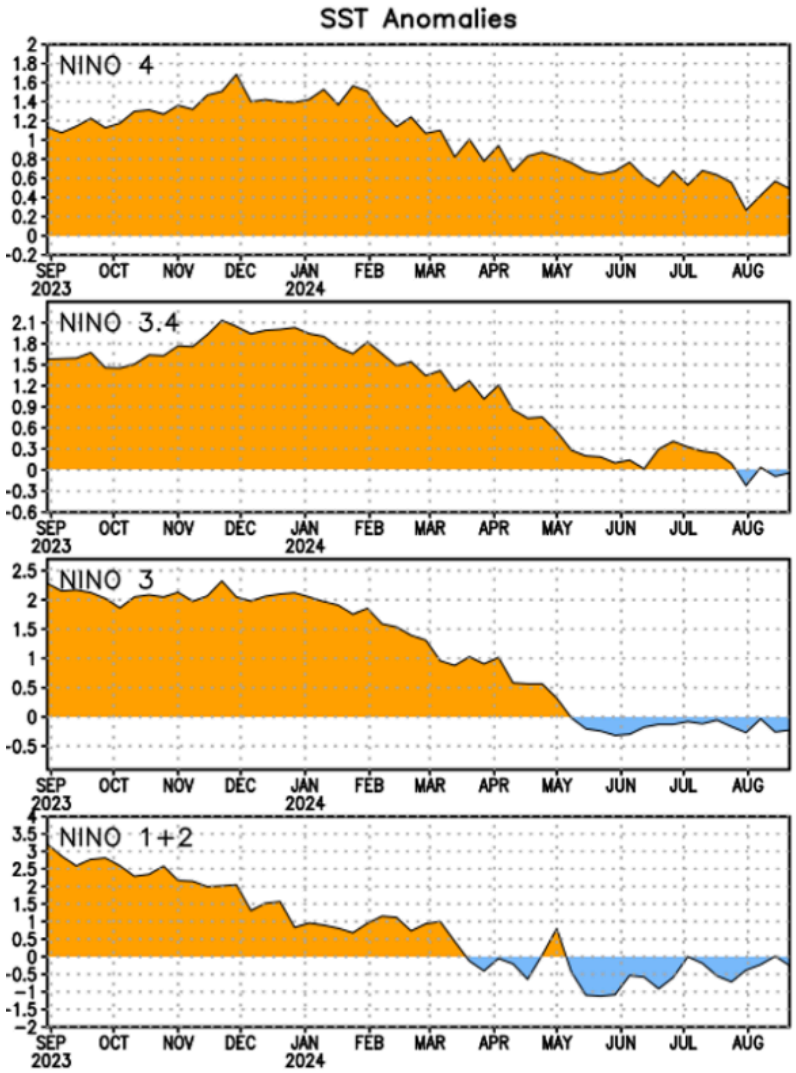
Source: Australian Bureau of Meteorology

SST anomalies for the September – November season, in a forecast simulation by the Australian ACCESS model, follow a La Niña pattern along the equator—warmer than normal in the west and cooler than normal in the east, with the cool anomaly extending between longitudes 100°W and 170°W. The cool region aligns well with the Nino 3.4 monitoring region, which spans 120°W to 170°W, so if this prediction were to verify, the oceanic criteria for La Niña will likely be met. However, this prediction is the result of only one simulation (or model run) of one model, and so it represents an outcome that is possible but not necessarily probable. To say whether La Niña is likely, or very likely, we would need to see agreement between different models, and also among the multiple simulations run by each model.



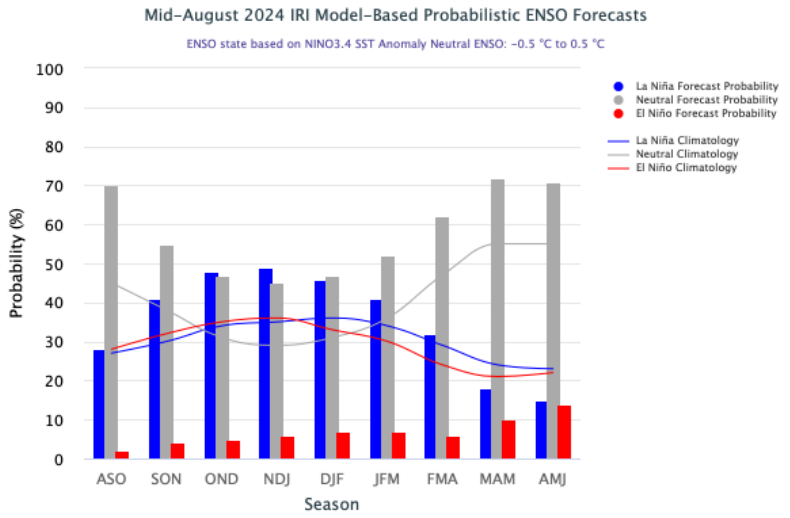
Source: Australian Bureau of Meteorology

Weekly SST anomalies for the four ENSO monitoring regions have trended downward since their respective peaks associated with the most recent El Niño, but in recent months the trend has been reduced or absent. Eastern Pacific regions Nino 1+2 and Nino 3 have been on the cool side of average for several months. Nino 3.4, the monitoring region used to classify ENSO events, has been cooler than average for about the past month, but has remained within 0.5°C of average—neutral ENSO temperatures.



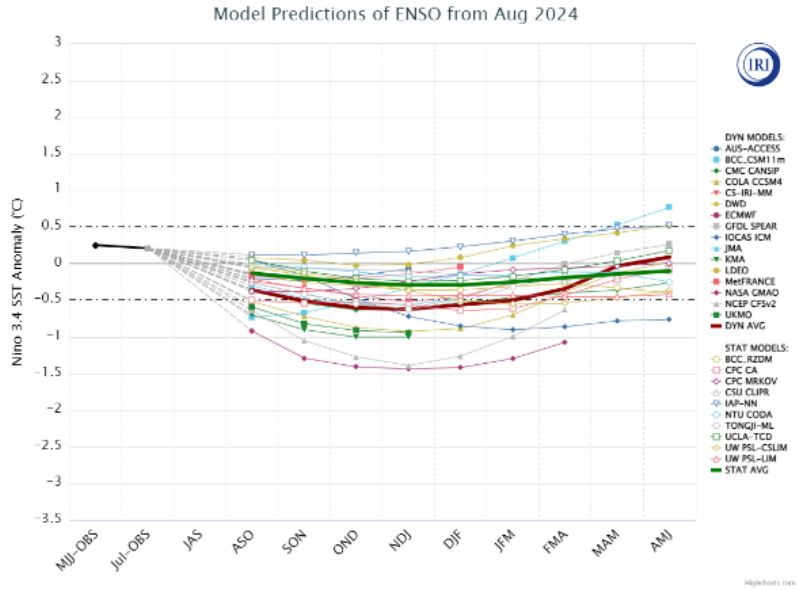
Source: Climate Prediction Center (NOAA)

ENSO forecast models do not strongly favor development of La Niña this fall, rather they suggest near equal chances of ENSO-neutral and La Niña conditions for October – February. Past months' probabilistic forecasts had given better odds of La Niña. ENSO-neutral is strongly favored for spring 2025, but a neutral state in spring is twice as likely as El Niño or La Niña in any given year, going by past events, as indicated by the lines labeled "Climatology"—the frequency of each ENSO state for all past seasons.



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

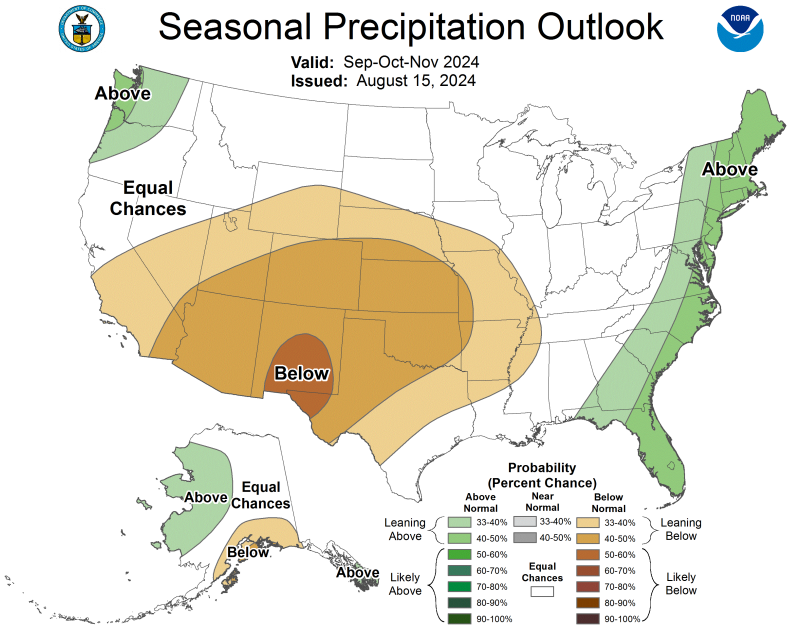
The spread of forecasts from individual models includes models which predict an ENSO-neutral Pacific through to next year, models that predict a weak La Niña (Nino 3.4 SSTs 0.5°C – 1°C below average) beginning as early as the August – September season, and models that predict a moderate La Niña (Nino 3.4 SSTs 1°C – 1.5°C below average). No models predict El Niño or a strong La Niña (Nino 3.4 SSTs at least 1.5°C below average).



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

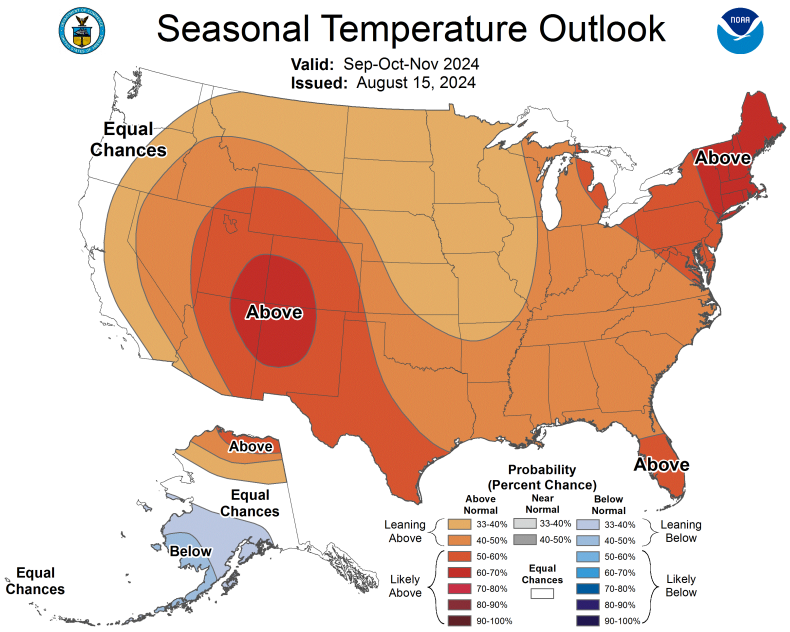
Seasonal Forecasts

The September – November seasonal precipitation forecast has the odds leaning toward lower-than-normal precipitation for Arizona and New Mexico (40 – 50% probability seasonal precipitation is lower than normal; 50 – 60% chance precipitation is either near normal or above normal). The forecast assigns a higher likelihood of below normal precipitation to an area including central and southern New Mexico (50 – 60% probability of below normal precipitation, 40 – 50% chance of either near normal or above normal precipitation).



Source: Climate Prediction Center (NOAA)

The September – November seasonal temperature forecast indicates above normal temperatures are likely for New Mexico and Arizona, with the bull's eye of greatest likelihood centered on the Colorado Plateau, where the forecast indicates a 60 – 70% chance of above normal temperatures for the season. The forecast is more uncertain for western Arizona, but still leans toward above normal temperatures.



Source: Climate Prediction Center (NOAA)

Wildfire

Above normal potential for significant wildland fire is expected for areas of Arizona and New Mexico, including the Colorado Plateau, and the mountains of northern, central, and southeastern New Mexico. Monsoon rainfall and humidity act to limit summer wildfire activity in the Southwest. Monsoonal moisture often persists into September, but on average it is less dependable than in July and August; September is the month when dry air returns to the Southwest. The expected above-normal temperatures and below-normal precipitation, together with existing drought and abnormally dry conditions, mean more favorable conditions for fire are likely.

Source: National Interagency Coordination Center

Public Health Corner

> *Welcome to the Public Health Corner, a quarterly section in the Southwest Climate Outlook dedicated to exploring the intersection between climate change and public health in Arizona and New Mexico!*

Extreme heat is a global health emergency. In last year's Public Health Corner, we talked about the importance of taking proactive steps to protect ourselves and our communities against extreme heat. To better support Arizona through extreme heat, the Governor's Office released an Executive Order on Extreme Heat Planning and Preparedness in August 2023. As part of that executive order, our partners at the Arizona Department of Health Services (ADHS), through the Building Resilience Against Climate Effects grant, held the Arizona Heat Planning Summit in October 2023 to help inform planning efforts. CLIMAS (Heidi Brown, Ladd Keith, Stacie Reece) supported the Southern Arizona Heat Summit held in February 2024 that supported state planning efforts and led to the City of Tucson's newly adopted Heat Action Roadmap. The Governor's office then released Arizona's Extreme Heat

Preparedness Plan in March 2024 which was co-authored by CLIMAS researcher Dr. Ladd Keith. As part of the plan, ADHS released their Recommendations and Findings for the Arizona Extreme Heat Preparedness Plan in March 2024. At the recent press conference for **Arizona Heat Awareness Week** (May 6-10, 2024) convened by Arizona Governor Katie Hobbs in collaboration with ADHS and many city, state, and community partners, CLIMAS researcher **Dr. Heidi Brown represented the University of Arizona** and spoke about the collaborative research programs currently led and coordinated by the UArizona to prepare and protect communities from extreme heat. New Mexico hosted its first virtual Extreme Heat Health & Resiliency Summit in July 2024, hosted by Healthy Climate New Mexico with support of CLIMAS team member Dr. Dave DuBois.

The Southwest Urban Corridor Integrated Field Laboratory (SW-IFL) Intensive Observation Period (IOP) Campaign was conducted this summer and included multiple data collection activities throughout the Arizona urban corridor to improve our understanding of extreme heat and associated environmental and societal stressors. Brookhaven National Lab's mobile observatories collected atmospheric research data from land and building surfaces to answer questions related to extreme heat and air quality. The mobile observatories travelled through the Phoenix metro valley from June 3-26 and the Tucson area from June 28 - July 2.

Want to see the latest trends for heat-related illnesses (HRI) in your state? You can now see near real-time emergency department visits for HRI in Arizona and New Mexico through each states' Environmental Public Health Tracking dashboards.

Join us next quarter in the Public Health Corner as we explore the health impacts of climate change in Arizona and New Mexico, and discover ways we can all work together to create a healthier and more resilient future.

Monsoon Fantasy Forecasts

Can you believe we are already over halfway through the monsoon season?!

September forecasts must be entered by August 31 at 11:59PM.

Check the Dashboard Page to make sure you've submitted predictions for ALL FIVE Southwest cities in play, and then head over to the Leaderboard to see how this season's players stack up. May the best weather watcher win!

Make your September Forecast Now!

Southwest Climate Podcast

August 2024 SW Climate Podcast – Monsoon Morphology

Recorded 8/16//2024

Aired 8/20/2024

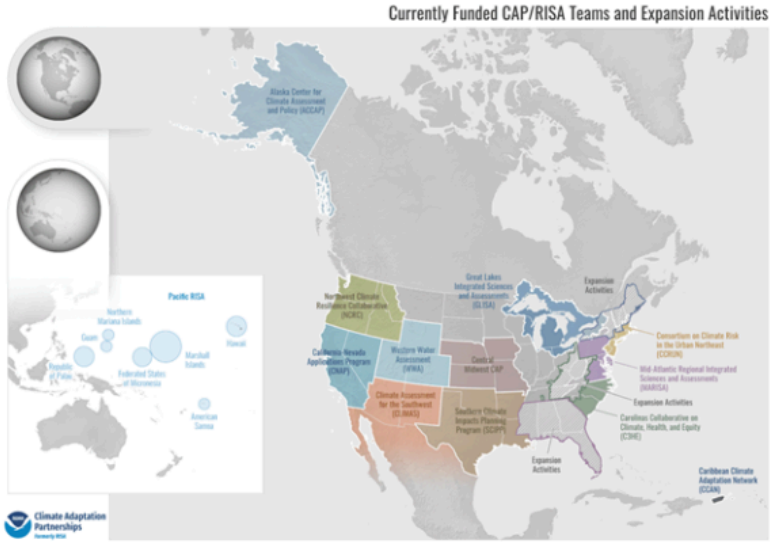
Now that we are over halfway through the 2024 monsoon season, this month's Southwest Climate Podcast hosts Zack Guido and Mike Crimmins don their chef hats and lay out the main ingredients of the monsoon. They give a recap of recent rain events, answer the question of whether or not the characteristics of convective storm dynamics have changed, and offer their thoughts on what is on the horizon for

September. Great timing as 8/31 is your last chance to join in the Southwest Monsoon Fantasy Forecasts game this year!

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

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