January 2025: Southwest Climate Outlook

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January 30, 2025

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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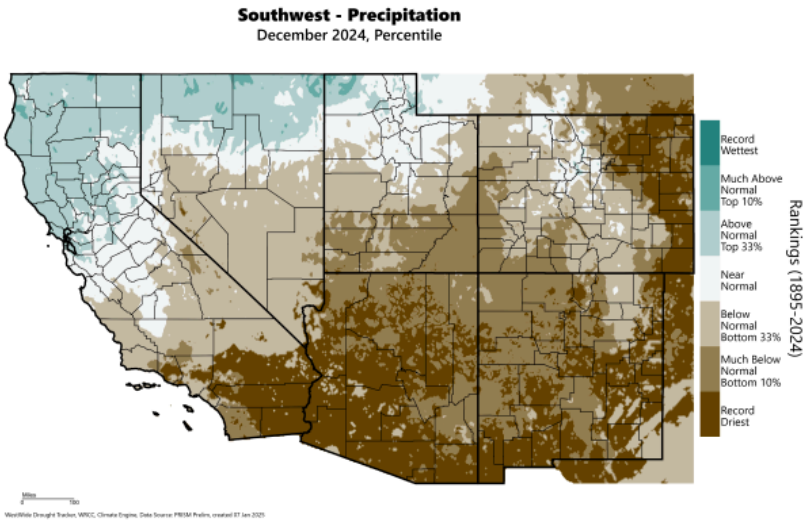
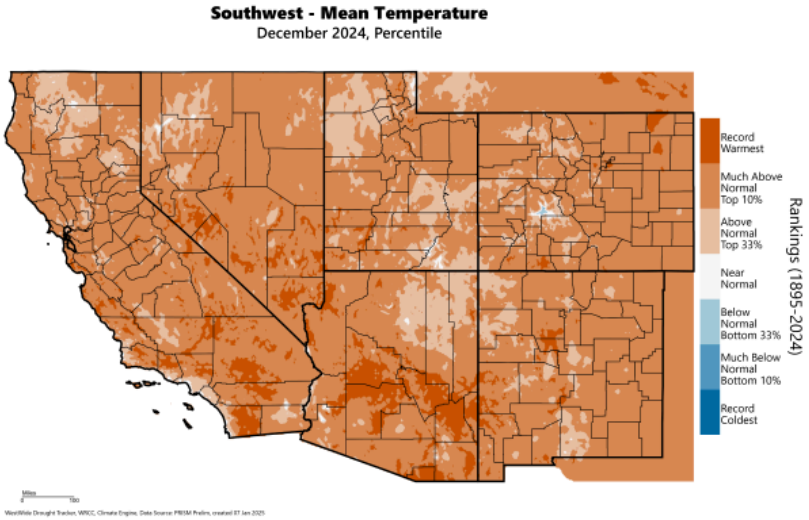
Precipitation and Temperature

December precipitation ranked as the driest on record for much of Arizona and New Mexico, and wherever it wasn't record-dry, precipitation was below normal or much-below normal.



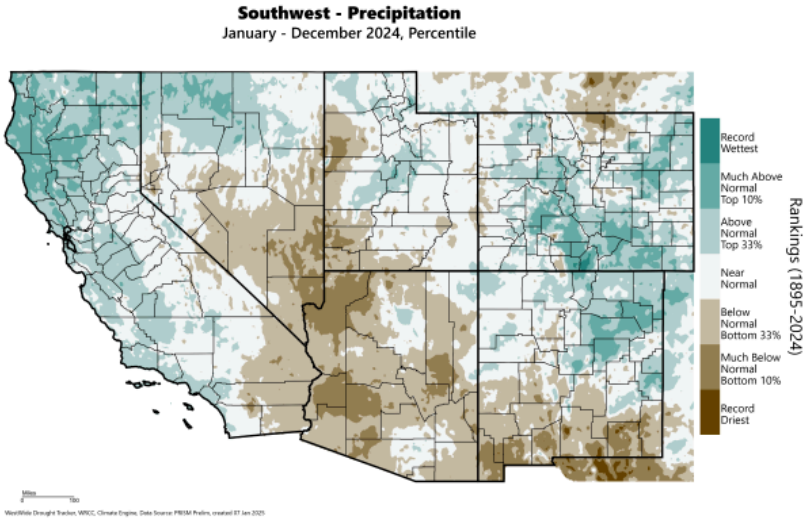
Source: WestWide Drought Tracker

December temperatures were warmer than normal across Arizona and New Mexico, in most places ranking among the warmest 10% of Decembers on record. Many areas had the warmest December on record, including large parts of central and southern Arizona.



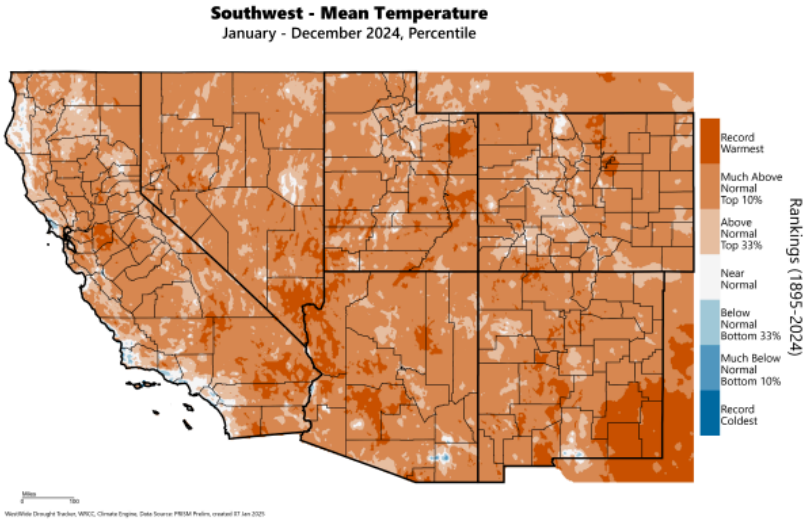
Source: WestWide Drought Tracker

Precipitation totals for the 2024 calendar year were generally below normal or much-below normal for Arizona and southern New Mexico, but above normal for the northeastern quarter of New Mexico.



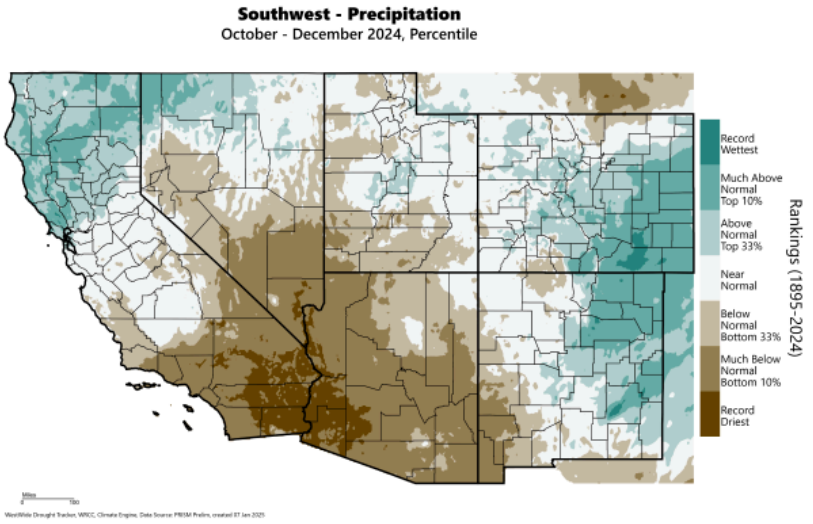
Source: WestWide Drought Tracker

Temperature averaged over the 2024 calendar year was much-above normal, ranking among the warmest 10% of years on record, just about everywhere in Arizona and New Mexico. In many places it was the warmest year on record.



Source: WestWide Drought Tracker

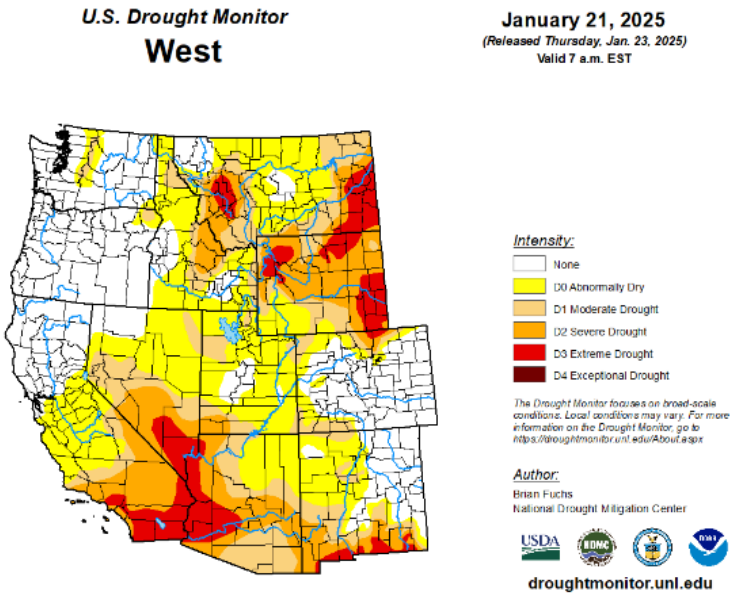
Precipitation totaled for October – December shows widespread much-below normal totals across Arizona and southwest New Mexico. In southwest Arizona it was the driest October – December season on record. Seasonal precipitation totals in eastern New Mexico were above normal or much-above normal, despite the very dry December.



Source: WestWide Drought Tracker

Drought

Drought or abnormally dry conditions continue to affect large parts of the Southwest, with 100% of Arizona and near two-thirds of New Mexico now classified under pre-drought (D0 Abnormally Dry) or drought status (D1 Moderate Drought – D3 Extreme Drought). The worst-affected areas are in southern New Mexico and western Arizona, but moderate to severe drought conditions extend across northern, central, and southern Arizona, as well as eastern New Mexico.



Source: U.S. Drought Monitor

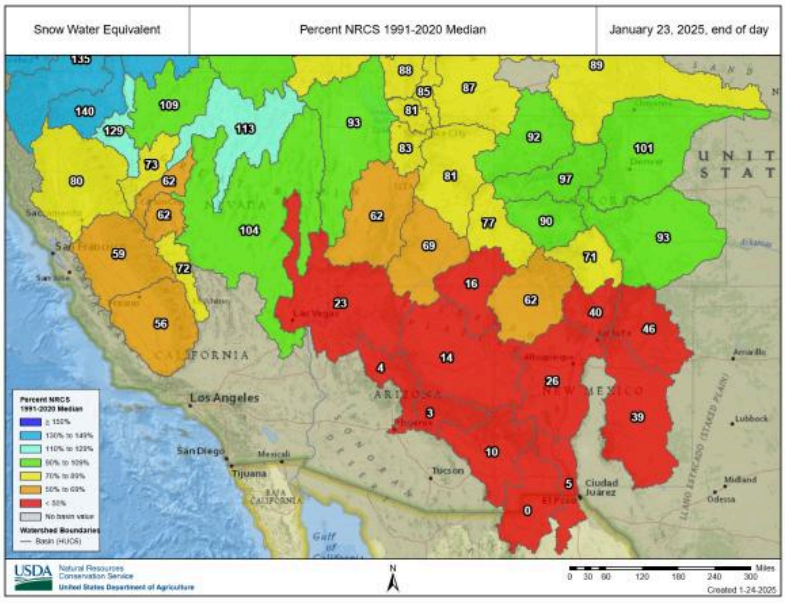
NIDIS Improved and Expanded State Pages on Drought.Gov

Arizona

New Mexico

Snowpack & Streamflow

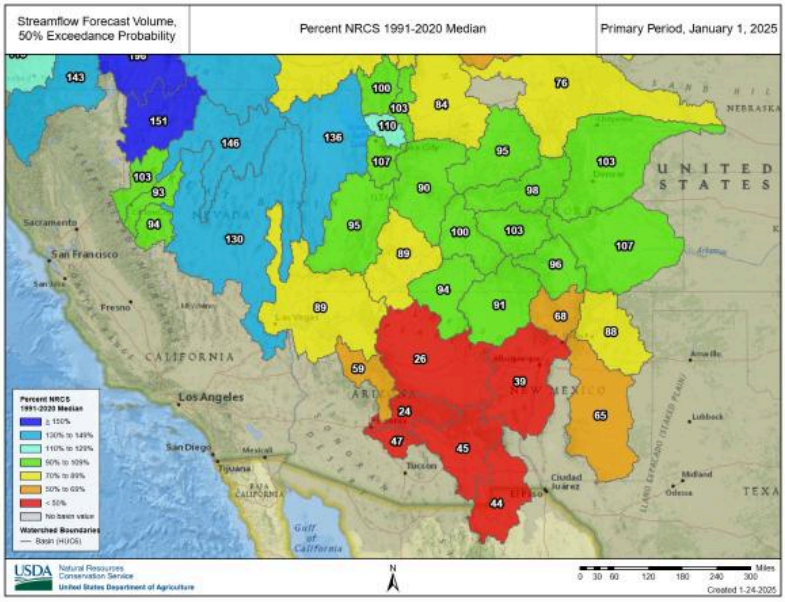
Snowpack in the Southwest ranges from much-below normal in the mountains of Arizona and New Mexico to near normal in areas of the Rockies further north in Colorado. Basin-average snow water equivalent (SWE) for the Upper Basin of the Colorado River is 83% of normal as of January 28. For Lower Basin SWE, that figure is 19% of normal. Rio Grande total-basin SWE is at 54% of normal, but the Rio Grande headwaters basin SWE is 70% of normal.



USDA-NRCS: National Water and Climate Center

Forecasts of spring streamflow, based in part on current snowpack, follow a pattern similar to snowpack, calling for much-below normal expected streamflow for most basins in

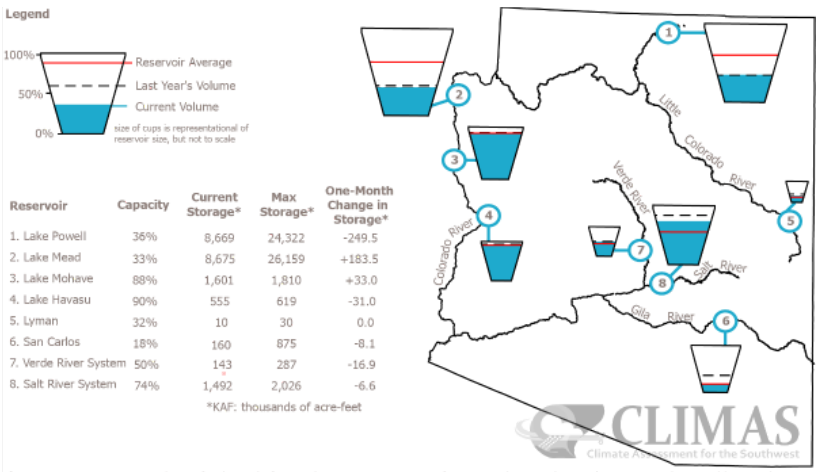
Arizona and New Mexico, but predicting near normal flows for basins of the San Juan River, the Rio Grande headwaters, and many tributaries of the Colorado River in the Upper Basin. Basin-average forecast streamflow for the Upper Basin of the Colorado River is 94% of normal per the January 1 forecast; 83% for the Lower Basin. The Rio Grande basin-average forecast is for 78% of normal streamflow.



USDA-NRCS: National Water and Climate Center

Water Supply

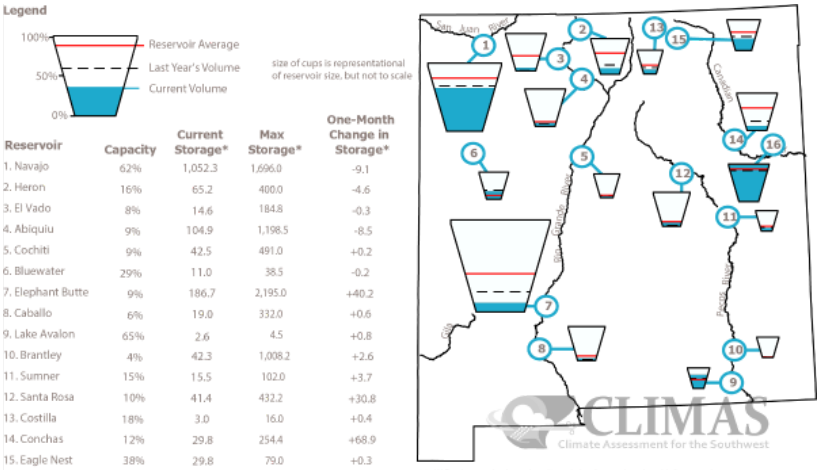
Water storage in Lake Powell and Lake Mead is close to last year's levels, showing neither significant decline nor recovery, but that's still far short of long-term average levels. Other major Arizona reservoirs are near or above average levels. New Mexico reservoir storage is generally below average levels and below last year's levels, with a few exceptions.



Reservoir	Capacity	Current Storage*	Max Storage*	One-Month Change in Storage*
1. Lake Powell	36%	8,669	24,322	-249.5
2. Lake Mead	33%	8,675	26,159	+183.5
3. Lake Mohave	88%	1,601	1,810	+33.0
4. Lake Havasu	90%	555	619	-31.0
5. Lyman	32%	10	30	0.0
6. San Carlos	18%	160	875	-8.1
7. Verde River System	50%	143	287	-16.9
8. Salt River System	74%	1,492	2,026	-6.6

*KAF: thousands of acre-feet

Figure 1. Arizona reservoir volumes for the end of December 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	62%	1,052.3	1,696.0	-9.1
2. Heron	16%	65.2	400.0	-4.6
3. El Vado	8%	14.6	184.8	-0.3
4. Abiquiu	9%	104.9	1,198.5	-8.5
5. Cochiti	9%	42.5	491.0	+0.2
6. Bluewater	29%	11.0	38.5	-0.2
7. Elephant Butte	9%	186.7	2,195.0	+40.2
8. Caballo	6%	19.0	332.0	+0.6
9. Lake Avalon	65%	2.6	4.5	+0.8
10. Brantley	4%	42.3	1,008.2	+2.6
11. Sumner	15%	15.5	102.0	+3.7
12. Santa Rosa	10%	41.4	432.2	+30.8
13. Costilla	18%	3.0	16.0	+0.4
14. Conchas	12%	29.8	254.4	+68.9
15. Eagle Nest	38%	29.8	79.0	+0.3
16. Ute Reservoir	95%	190.3	200	-0.4

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

Figure 2. New Mexico reservoir volumes for end of December 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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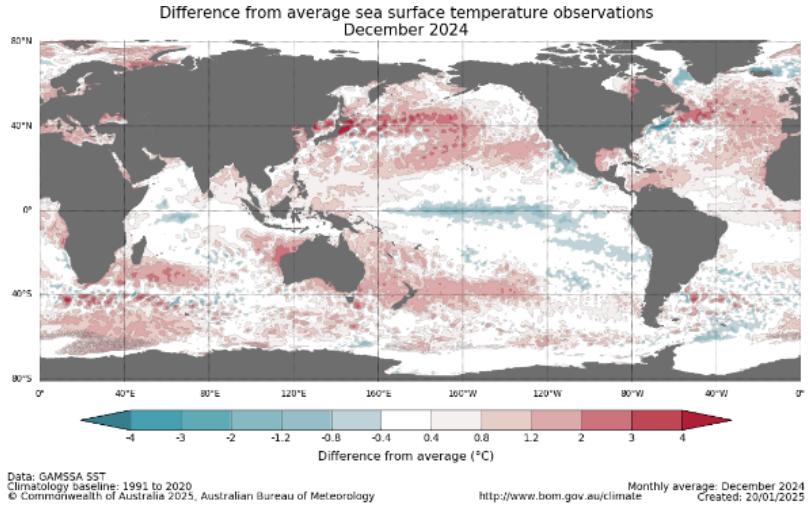
BOR: New Mexico Dashboard

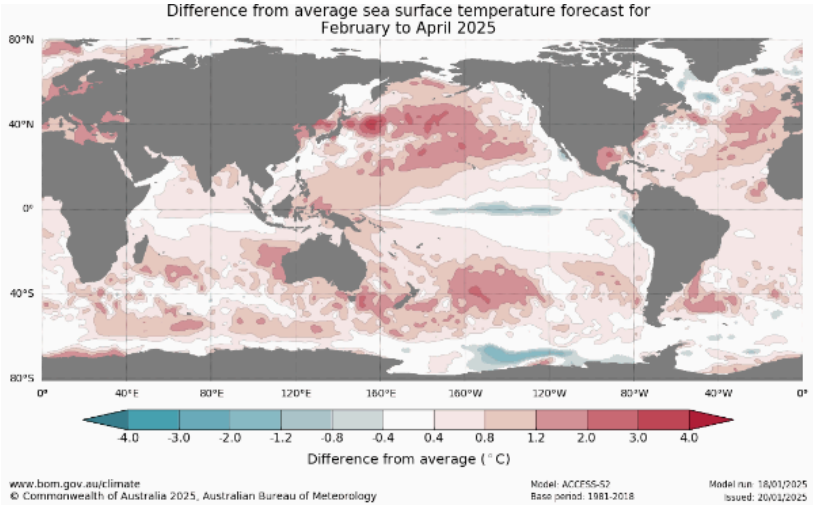
ENSO Tracker

December sea-surface temperatures (SSTs) show cooler-than-average SSTs along the equator in the east-central Pacific, cool enough and extensive enough to indicate La Niña conditions. Also consistent with La Niña: the warmer-than-average SSTs in the western equatorial Pacific.



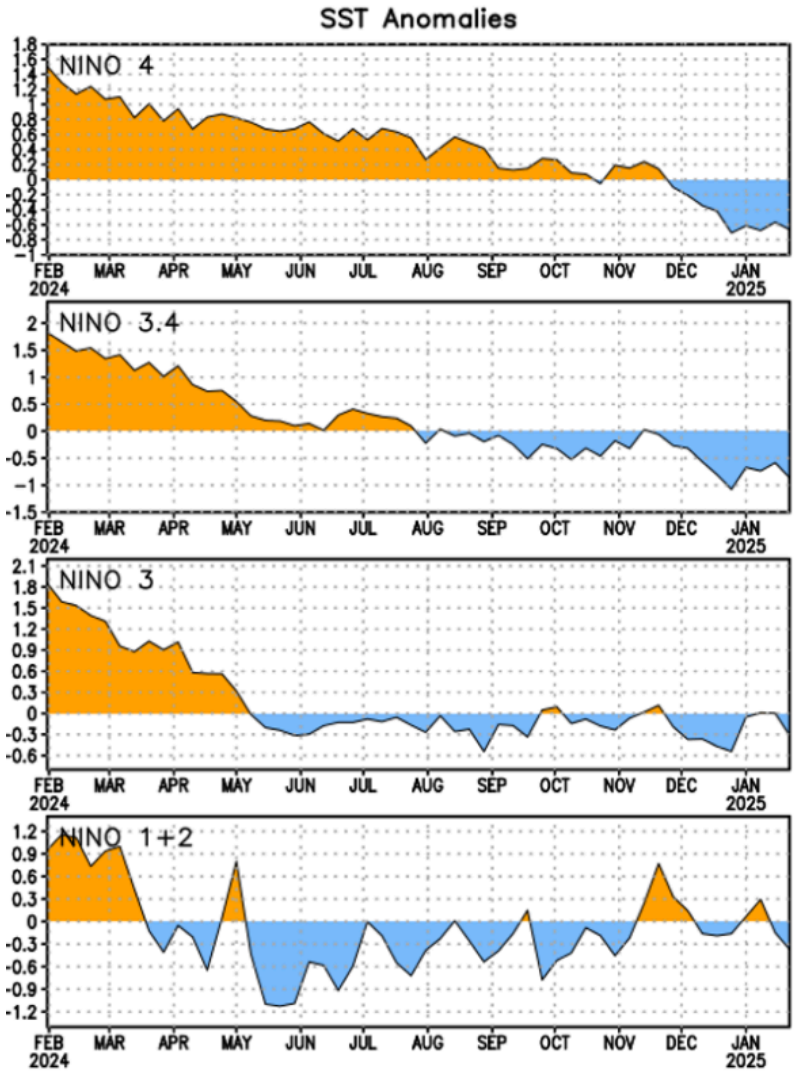
Source: Australian Bureau of Meteorology

Forecast SSTs for February – April from the ACCESS-S2 dynamical forecast model show a similar pattern to the December observed SST pattern, but with a diminished cooler-than-normal region that would no longer meet La Niña SST criteria—one possibility among many represented in different model forecasts.



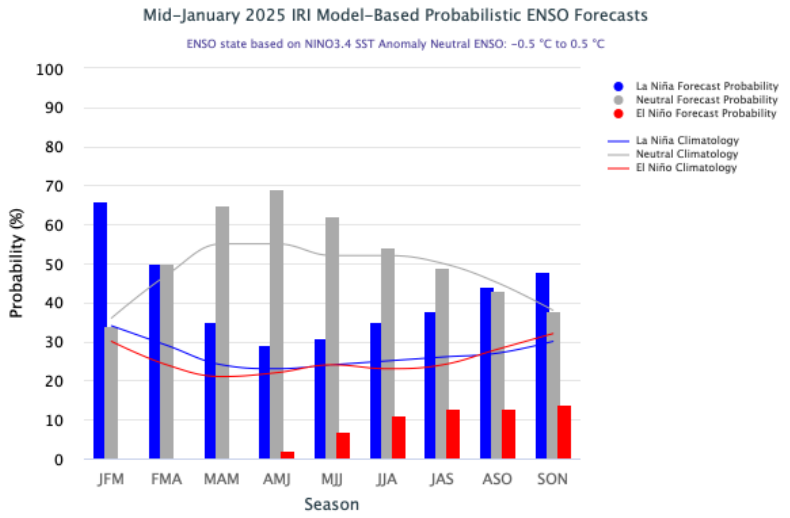
Source: Australian Bureau of Meteorology

SSTs have reflected La Niña conditions since mid-December when the weekly Nino 3.4 region-average SST anomalies (difference from average, SSTAs) began measuring -0.5°C or cooler. The most recent weekly Nino 3.4 SSTA was –0.9°C as of January 27.



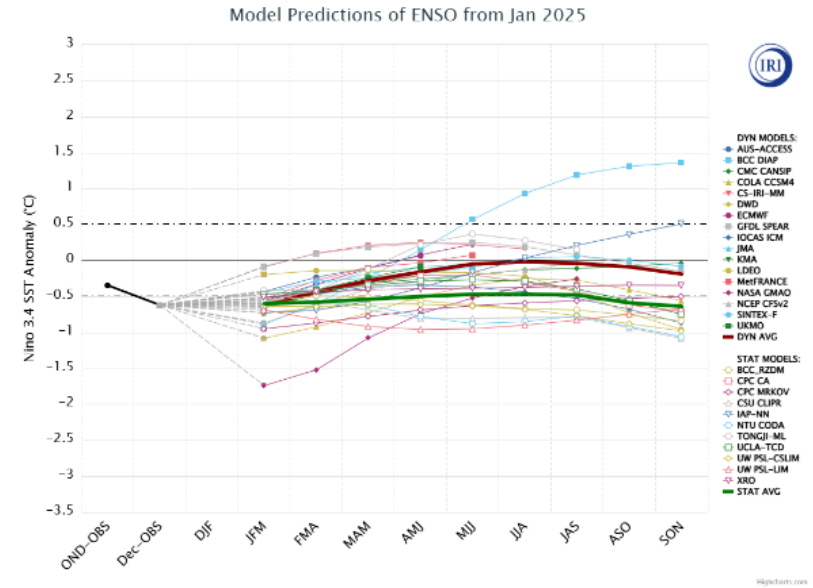
Source: Climate Prediction Center (NOAA)

ENSO forecast models generally favor persisting La Niña conditions through the January – March seasonal timeframe, with the probabilistic forecast giving 65% chance of La Niña versus 33% chance of ENSO-neutral SSTs for the Nino 3.4 region seasonal average. For the February – April seasonal timeframe, forecasts are split down the middle, giving 50-50 odds of La Niña versus ENSO-neutral SSTs. Forecasts favor ENSO-neutral in subsequent prediction windows.



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

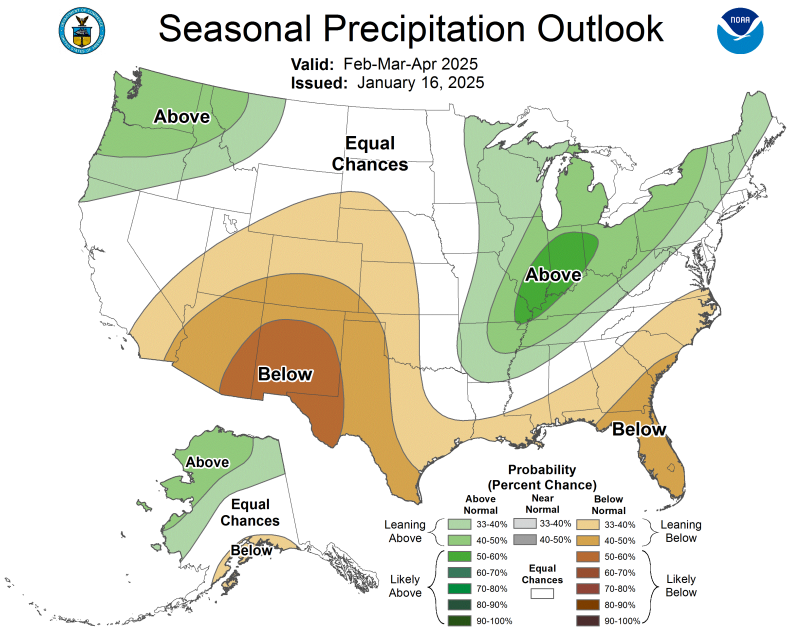
Individual model forecasts predict January – March seasonal average Nino 3.4 SSTAs ranging from around 0°C (ENSO-neutral) to near -1°C (moderate La Niña), with one outlier model predicting a much cooler –1.75°C (strong La Niña). The spread of values is similar in subsequent prediction windows, but the distribution of individual models shifts to favor ENSO-neutral conditions.



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

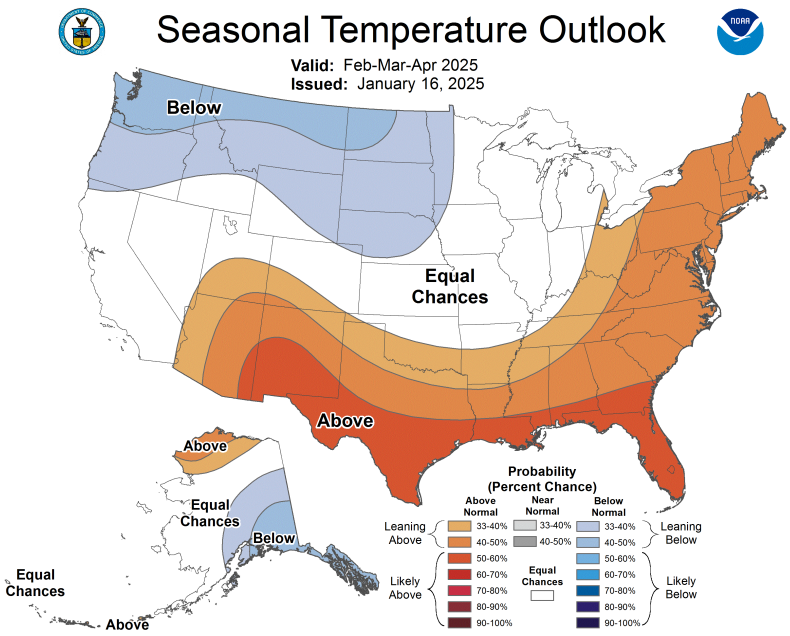
Seasonal Forecasts

The February – April seasonal precipitation forecast predicts a *likely* (50%-60%) chance of below normal precipitation for an area that includes southeastern Arizona and much of New Mexico. The forecast leans (40%-50% chance) toward below normal precipitation for a larger area that includes the remaining parts of Arizona and New Mexico.



Source: Climate Prediction Center (NOAA)

The February – April seasonal temperature forecast predicts a *likely* (50%-60%) chance of above normal temperatures for an area that includes southern New Mexico and part of southeastern Arizona. The forecast leans (30%-50% chance) toward above normal temperatures for a larger area that includes the remaining parts of Arizona and New Mexico.



Source: Climate Prediction Center (NOAA)

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! In the Public Health Corner, we will dive into various ways in which climate influences our SW communities' health and explore strategies to mitigate and adapt to these challenges.*

With the recent news of the devastating wildfires in Los Angeles earlier this year, this quarter we focus on the impacts of wildfire on health in Arizona and New Mexico. Well established are the effects of smoke from wildfires exacerbating chronic respiratory conditions. The US Air Quality Index website has local conditions, and most weather applications on phones integrate air quality into daily weather

as well. However, smoke from wildfires occurring at the wildland-urban interface, which often burn structures, have been shown to emit toxic organic compounds. There is still a lot to learn about the health effects of what burns during a fire.

One health effect that may be strongly influenced by what burned is cardiovascular health. Studies looking into whether cardiovascular hospital visits increase during fires have shown inconsistent results – leaving the question, does wildfire influence cardiovascular health? Since we last updated you on CLIMAS wildfire projects in August 2023, CLIMAS researchers have been researching whether the effect of wildfire on cardiovascular health depends on *what burns*. Preliminary results identify a greater risk of certain cardiovascular health conditions when fires burn peat or industrial areas compared to natural sources (e.g. forest, brush, vegetation). To help health departments respond to the increasing likelihood of regional wildfire activity, CLIMAS researchers met with health department, fire, and emergency management partners in Arizona and New Mexico. These conversations revealed best practices including: the importance of clear and consistent messaging, the roles as trusted community partners connecting people to resources rather than providers of 'stuff', and cross-sectoral collaboration and flexibility to support capacity. Keep an eye out for these publications in 2025.

Wondering what you can do to be sure you're prepared if a wildfire happened in your area? The International Association of Fire Chiefs manage the Ready, Set Go program to help residents prepare for wildfire – Check out the Arizona and New Mexico specific websites for Ready, Set Go!

Join us next quarter in the Public Health Corner as we dive into another climate associated health impact in Arizona and New Mexico, and discover ways we can all work together to create a healthier and more resilient future.

ArcGIS maps to use:

- https://gis.azdhs.gov/ephtexplorer/
  - for age adjusted rates per 100K asthma ED visits (most recent is 2022)

- https://nmtracking.doh.nm.gov/dataportal/query/result/ed/EDAsthma/AgeRateAsthma.html

E&S Fellows

The Climate Assessment for the Southwest (CLIMAS) program is now accepting applications for the 2025 Environment & Society Graduate Fellowship Program. This Fellowship supports University of Arizona graduate students from any degree-granting program whose work involves collaborative environmental research. It provides an opportunity for graduate students to develop their knowledge, training, and experience in applied environmental science and communication. Types of projects supported include dissertation or thesis fieldwork, novel research outputs (such as videos, research briefs, community databases, or artwork), and other kinds of education and outreach activities.

Up to four fellowships of $5,000 each will be awarded for projects occurring between May 2025 – May 2026. Applications are due March 3, 2025. For more information visit https://climas.arizona.edu/es-fellowship/application or contact Gigi Owen (gigi@arizona.edu) with any questions.

Southwest Climate Podcast

December 2024 SW Climate Podcast – Relatively Speaking

Recorded 12/06/2024

Aired 12/10/2024

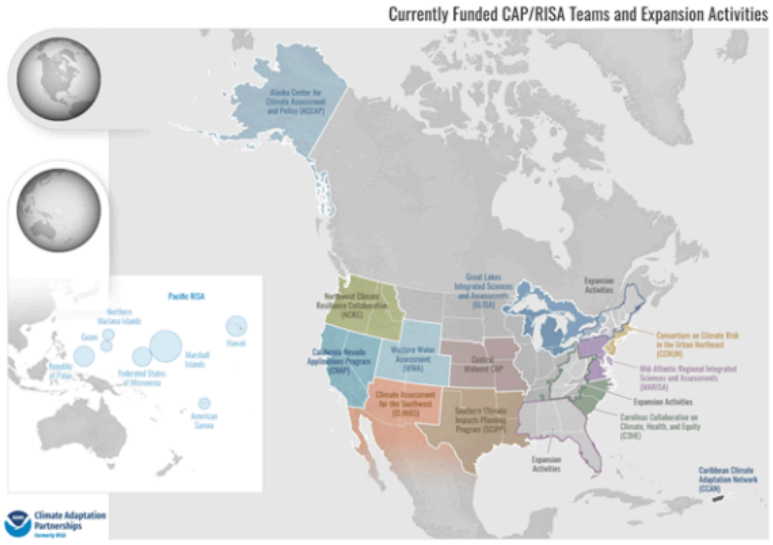
In this month's episode of the Southwest Climate Podcast hosts Zack Guido and Mike Crimmins slow-roll into the winter season. They look back on 2024 followed by what happened in November and why - including the Atmospheric River event on the west coast. They dive into a recent paper that interrogates the expected intensification of cool season

precipitation in the west. And close out with a teaser look at the La Niña outlook and precipitation forecast with a highlight of the Relative Oceanic Niño Index (RONI).

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

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