



October 2023: Southwest Climate Outlook

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<https://climas.arizona.edu/>

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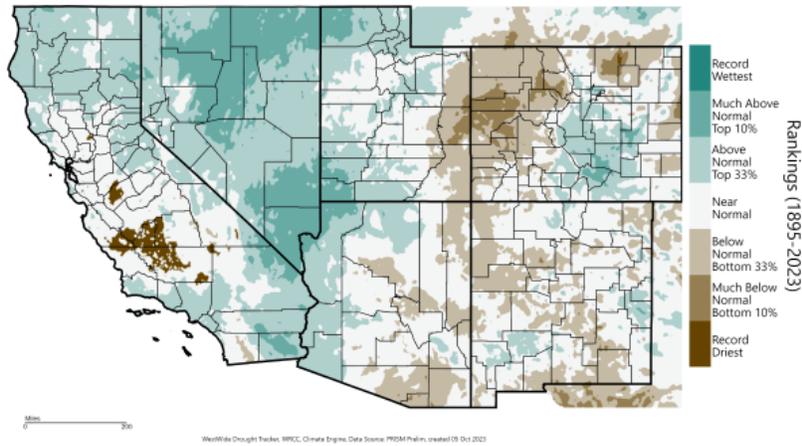
Mexico State Climate office.

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Precipitation and Temperature

September precipitation was near normal or below normal for most of Arizona and New Mexico, but above normal for the westernmost counties in Arizona.

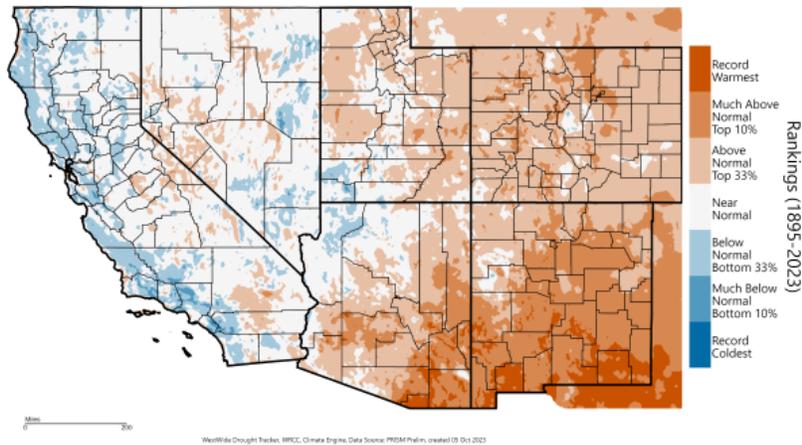
Southwest - Precipitation
September 2023, Percentile



Source: [WestWide Drought Tracker](#)

September temperatures were above normal or much above normal in Arizona and New Mexico, and it was the warmest September on record for some areas of the southern half of the region. Northwestern Arizona was an exception, with temperatures near normal or below normal.

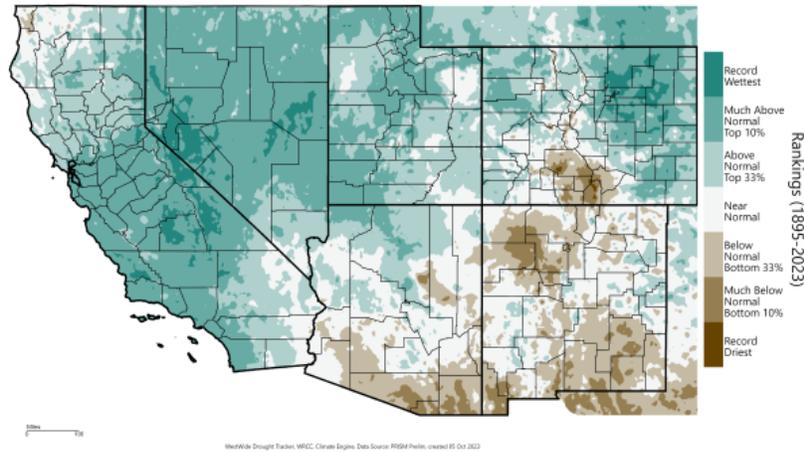
Southwest - Mean Temperature
September 2023, Percentile



Source: [WestWide Drought Tracker](#)

The 2023 Water Year (October 2022 – September 2023) precipitation totals were below normal to much-below normal for large parts of New Mexico and southern Arizona after an unusually dry and late-arriving monsoon. Water Year totals were kept near normal in some parts because of the above-normal precipitation received over last cool season. Northern Arizona had a wetter summer compared to the rest of the region, and so the cool-season surplus there has managed to carry into the annual total.

Southwest - Precipitation
October 2022 - September 2023, Percentile



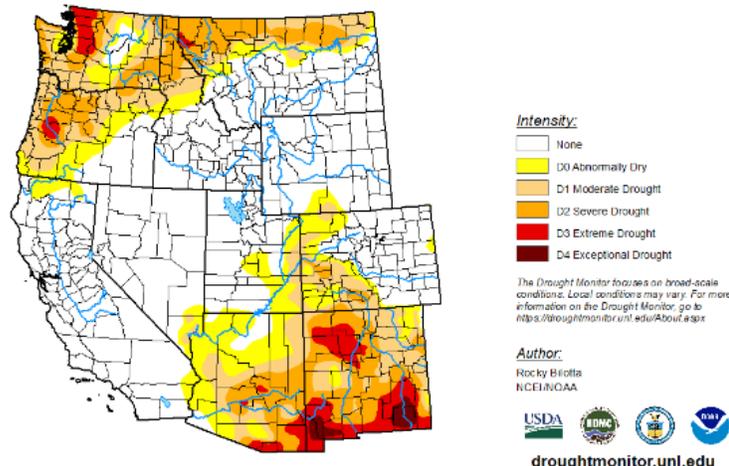
Source: [WestWide Drought Tracker](#)

Drought

Drought conditions in Arizona and New Mexico have not improved over the last month, with moderate drought (D1) conditions or worse spanning 95% of New Mexico and 51% of Arizona. Drought conditions are severe (D2) to extreme (D3) in central and southwestern Arizona, and in areas widespread across New Mexico covering more than two thirds of the state's area. Conditions are most severe in the south, where areas of Eddy, Chaves, Grant, Hidalgo, and Luna Counties have met the criteria of exceptional drought.

U.S. Drought Monitor
West

October 17, 2023
(Released Thursday, Oct. 19, 2023)
Valid 8 a.m. EDT



Source: [U.S. Drought Monitor](#)

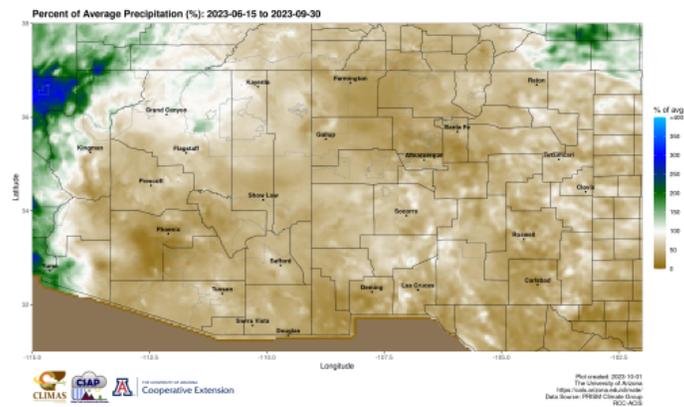
NIDIS Improved and Expanded State Pages on Drought.Gov

Arizona

New Mexico

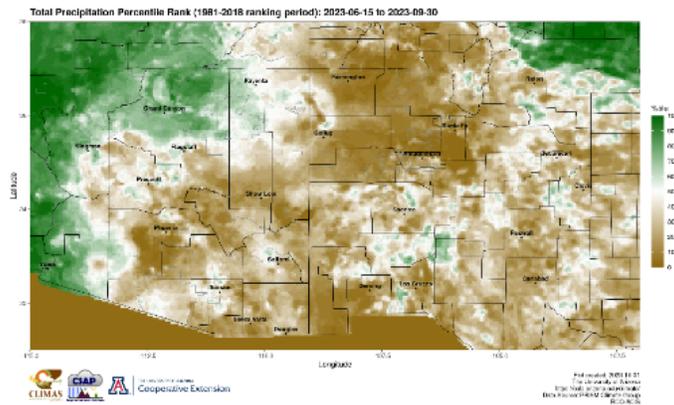
Monsoon

This year's monsoon was a dry one for much of the region, with seasonal totals failing to meet the long-term average across most of Arizona and New Mexico.



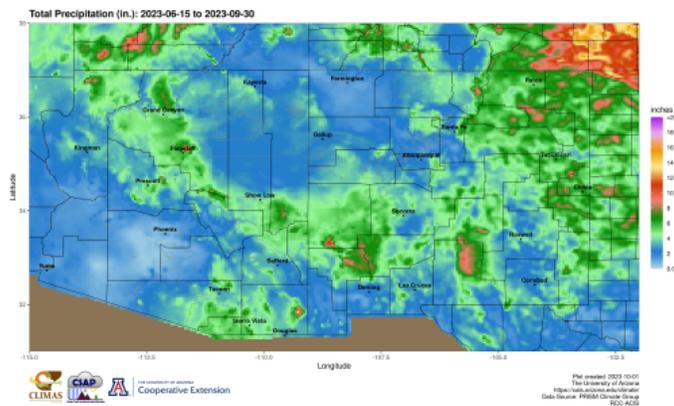
Source: [UA Cooperative Extension / CLIMAS](#)

Measuring the season's totals against the long-term median (50th percentile in the percentile rankings) tells a similar story but shows that if you take this measure as the "normal" monsoon, many locations did not fall so short of normal. However, it is also clear that large areas of Arizona and New Mexico had a monsoon that ranks among the record's driest.



Source: [UA Cooperative Extension / CLIMAS](#)

The map of seasonal totals shows that the spatial variability of amount of monsoon rainfall generally tracks with elevation, but in the plains of eastern New Mexico there are precipitation maxima that trace the paths of particularly strong plains thunderstorms.



Source: [UA Cooperative Extension / CLIMAS](#)

Water Supply

Reservoir levels in Arizona are in better shape than at this time last year, and except for Lakes Powell and Mead, levels are well above the long-term average. New Mexico reservoirs are also in most cases storing more water than they were at this time last year, but with a few exceptions levels are short of their long-term averages, evidence of ongoing long-term hydrological drought conditions—too little supply or too much demand, for too long a time—, as is the case with Lakes Mead and Powell on the Colorado River.

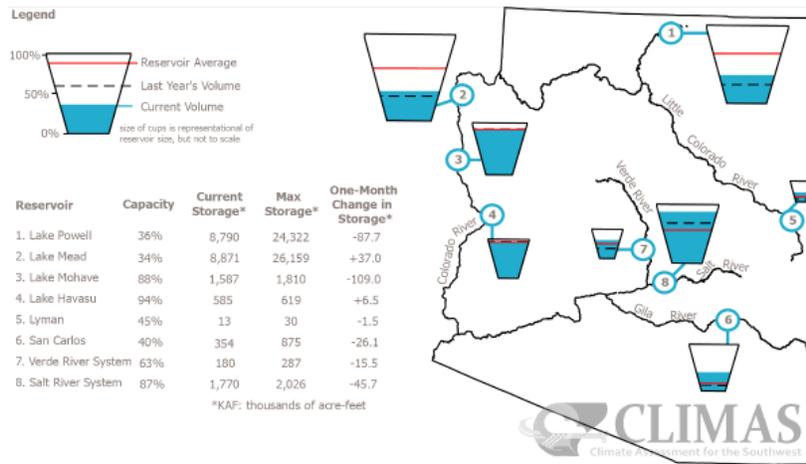


Figure 1. Arizona reservoir volumes for the end of September 2023 as a percent of capacity. The map depicts the average volume and last year's storage for each reservoir. The table also lists current and maximum storage, and change in storage since last month.

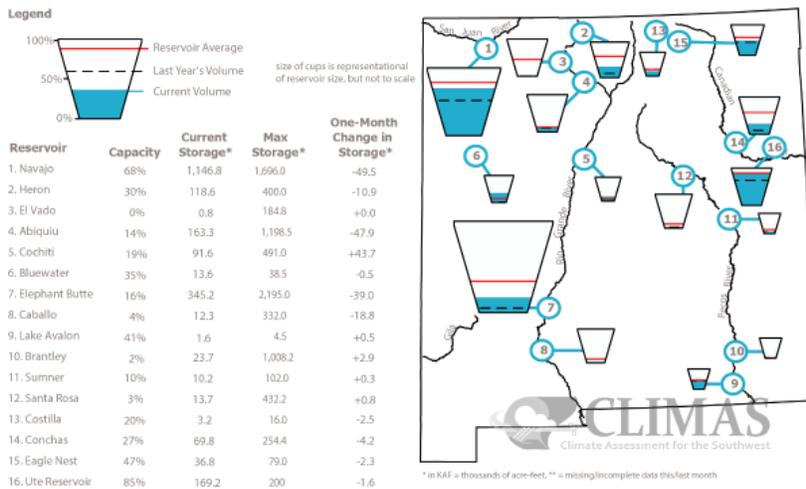


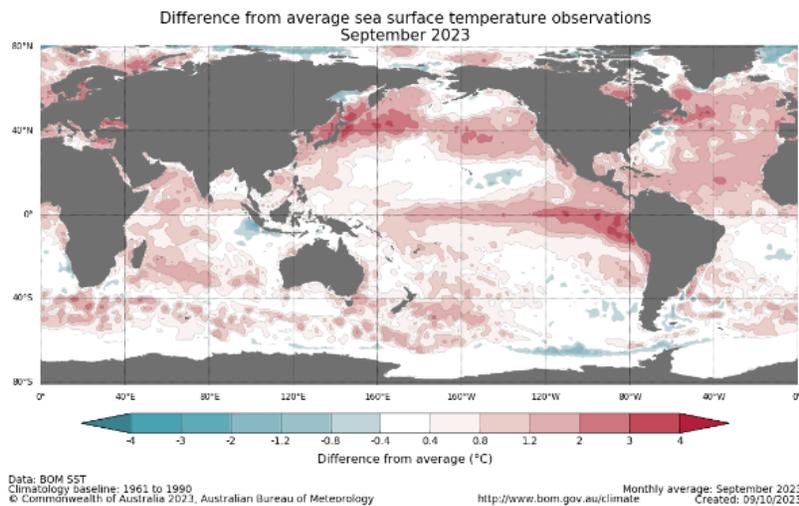
Figure 2. New Mexico reservoir volumes for end of September 2023 as a percent of capacity. The map depicts the average volume and last year's storage for each reservoir. The table also lists current and maximum storage, and change in storage since last month.

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

BOM: New Mexico Dashboard

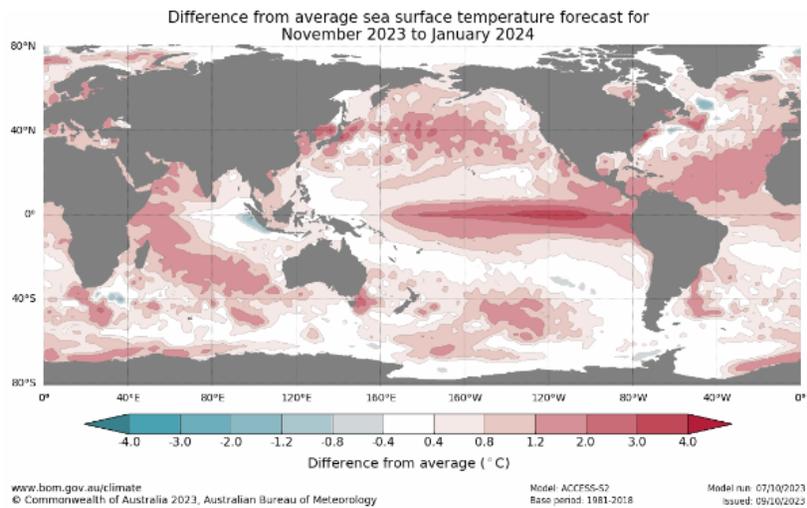
ENSO Tracker

September equatorial sea-surface temperatures (SSTs) were above average across the central and eastern Pacific, with near-normal SSTs in the western equatorial Pacific, in a pattern like that which has persisted over the past several months and is indicative of El Niño conditions



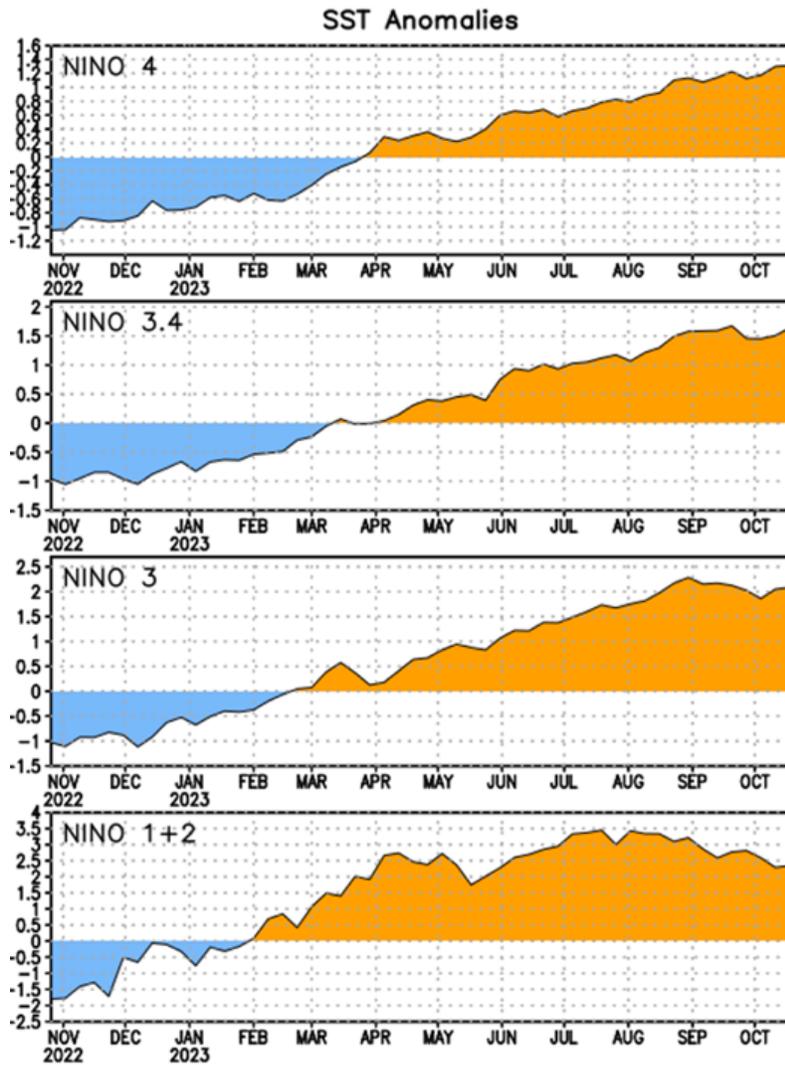
Source: Australian Bureau of Meteorology

The forecast November-January SSTs indicate a continuation of the El Niño SST pattern, and an overall strengthening of SST anomalies in the central pacific, with a maximum centered around 120°W longitude.



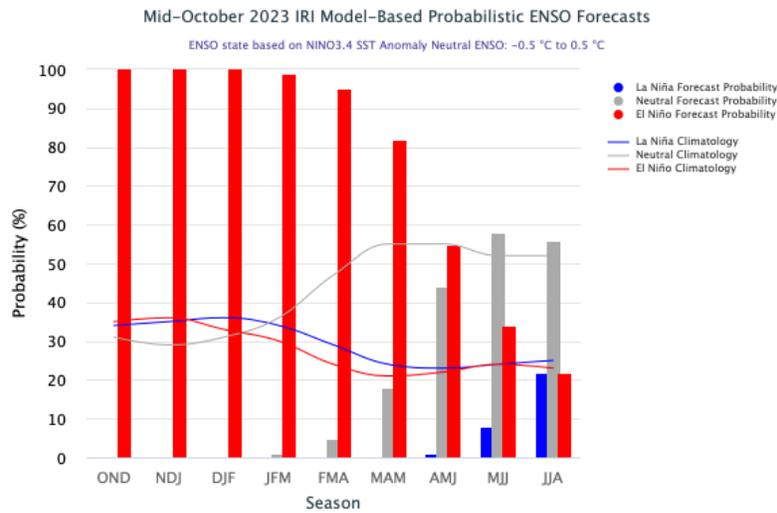
Source: Australian Bureau of Meteorology

SST anomaly weekly time series for individual ENSO diagnostic regions show that warming appears to have peaked in the westernmost Niño 1+2 region (2.3°C most recently after peaking near 3.5°C early August), while the warming trend in the central-Pacific Niño 4 region has remained constant (most recently 1.3°C). Niño 3 and Niño 3.4 have held relatively constant since September with last weekly departures of 2.1°C and 1.6°C, respectively.



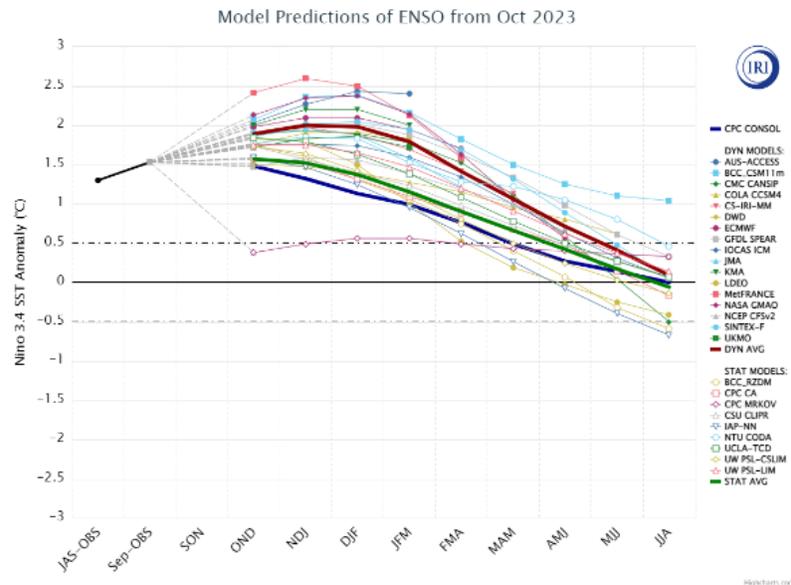
Source: Climate Prediction Center (NOAA)

Model forecasts for ENSO indicate that El Niño will almost certainly persist through the winter and is very likely to remain through the February-March season (>90% probability) with a 75-85% chance of peaking as a ‘strong’ event in the November-January period. By March-July, however, the odds are in favor of a return to an ENSO-neutral state.



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

The decline to ENSO-neutral is predicted with good agreement among individual ENSO forecast models. Before that happens, we can expect El Niño to peak with a Niño 3.4 SST anomaly of 1.5-2.5°C, averaged over the November-January or December-February seasons.

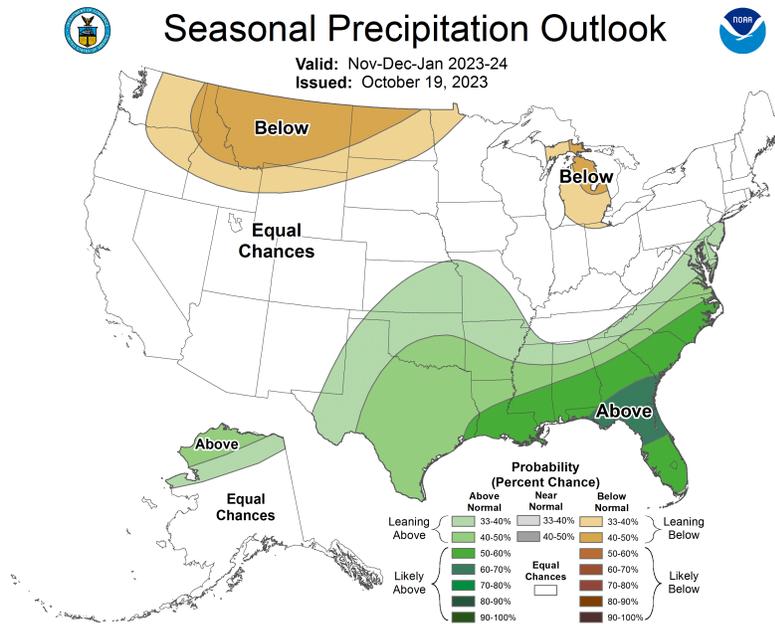


Source: The International Research Institute for Climate and Society,
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Seasonal Forecasts

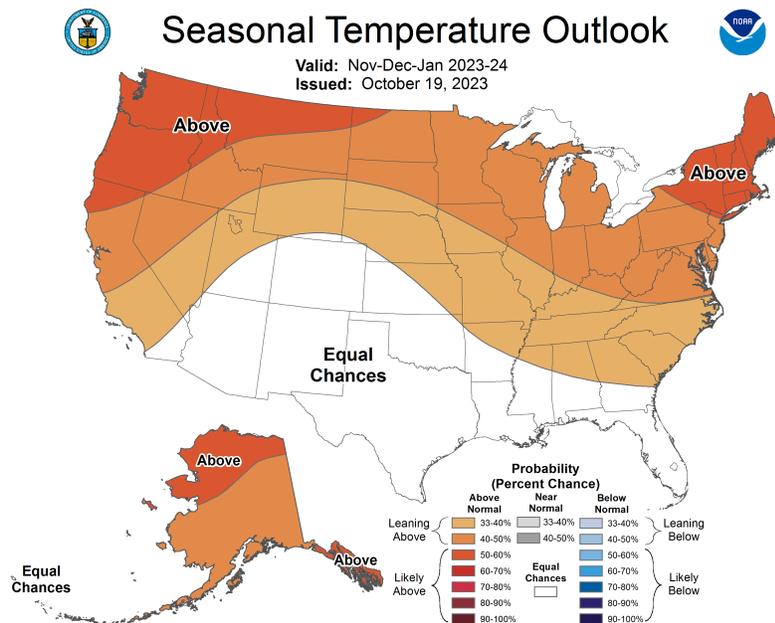
The November-January seasonal outlook for precipitation calls for equal chances of above-normal, near-normal, or

below-normal precipitation in Arizona and New Mexico over the coming months. This high uncertainty arises from disagreement among forecast-model runs for the period, and from the inconsistent impacts of past El Niño events regarding precipitation in these months.



Source: Climate Prediction Center (NOAA)

As with the precipitation outlook, the temperature outlook for November-January calls for equal chances of above-, near-, and below-normal temperatures over that three-month period in Arizona and New Mexico. An important reason for uncertainty here is that there are competing influences on temperature—El Niño has often brought cooler temperatures to the southwest in the cool season, but the background warming trend tends to tip the odds the other direction.



Source: [Climate Prediction Center \(NOAA\)](#)

E&S Fellow Blogs

2023 CLIMAS Environment & Society Graduate Fellows

The [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.

The 2023 Graduate Fellows shared their reflections on their experience on the [CLIMAS blog](#):

[What's going on with the rains](#)



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TALIA ANDERSON

BLOG POST

**“What’s going on
with the rains?”**



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Re-Thinking Land and History: Working
with Navajo Mountain Soil Water Conservation
District Members



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**ENVIRONMENT & SOCIETY
FELLOWS PROGRAM**

MAJERLE LISTER

BLOG POST

**Re-Thinking Land
and History:
Working with
Navajo Mountain
Soil Water
Conservation
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Southwest Climate Podcast

September 2023 - 2023 Monsoon Recap



Goodbye, adios, sayonara - In this month's podcast, the crew is ready to put the 2023 monsoon in the rearview mirror. Zack Guido and Mike Crimmins give this year's monsoon season recap and the only good thing to say is that 'at least it was not 2020' :(They cover what happened in September, review temperature and precipitation as well as the tropical storm season that prevented a full out

non-noon. We also get to hear the results of the Monsoon Madness game winners and take a look forward to a strong-leaning El Niño coming this winter.

Attention! For the first time for the Southwest Climate Podcast we are requesting listeners to send in their questions for a special MailBag episode in December. Try and stump the hosts by sending in your inquiries and postulations at <mailto:uaclimas@gmail.com>.

[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.

Currently Funded CAP/RISA Teams and Expansion Activities



[Learn more about the NOAA CAP program here](#)



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