



August 2023: Southwest Climate Outlook

Stacie Reece
August 31, 2023



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

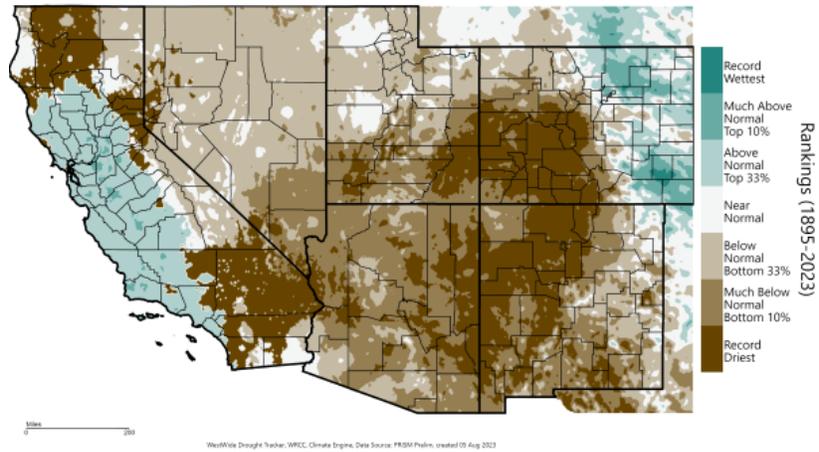
The Southwest Climate Outlook is published by the Climate Assessment for the Southwest (CLIMAS), with support from University of Arizona Cooperative Extension, and the New Mexico State Climate office.

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Precipitation and Temperature

July precipitation was below normal or much-below normal for nearly all of Arizona and New Mexico, with many places recording the driest July on record.

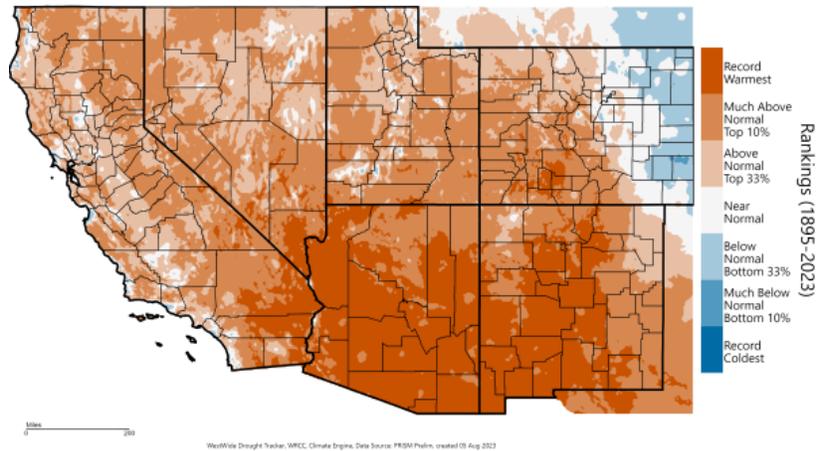
Southwest - Precipitation
July 2023, Percentile



Source: [WestWide Drought Tracker](#)

July temperatures were much-above normal or record-warmest for nearly all of Arizona and New Mexico.

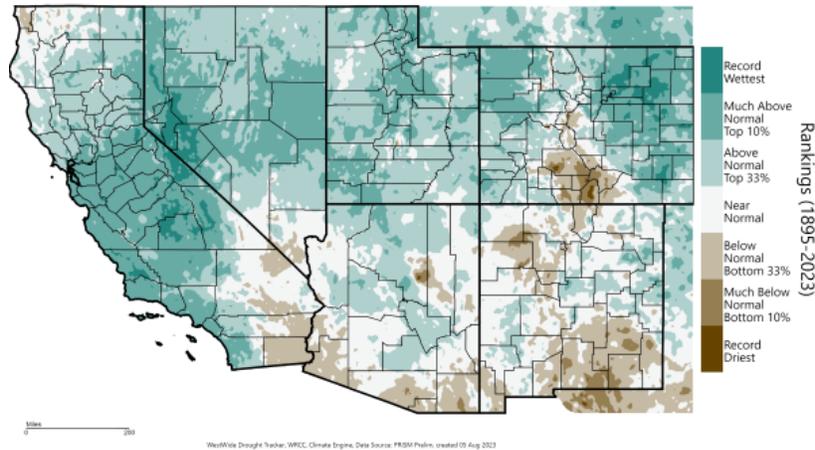
Southwest - Mean Temperature
July 2023, Percentile



Source: [WestWide Drought Tracker](#)

Water year (October 2022 – July 2023) precipitation totals vary from below normal to above normal, reflecting the competing effects of the relatively wet cool season and the relatively dry monsoon season; much of the area of Arizona and New Mexico is near normal or above normal, but some areas of the Colorado Plateau, the Rio Grande Valley, and southern parts of the NM-AZ region have fallen behind normal water-year precipitation.

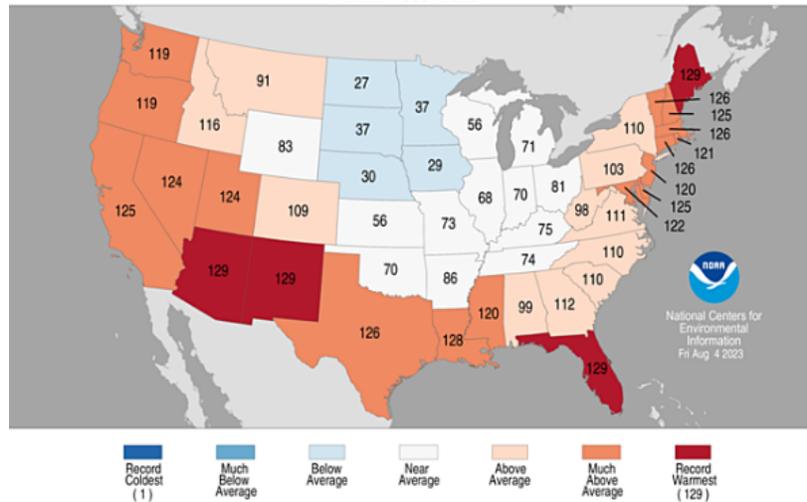
Southwest - Precipitation
October 2022 - July 2023, Percentile



Source: [WestWide Drought Tracker](#)

July Temperature Records: Record heat was often in the news this summer, and not without reason—this July was officially the hottest on record for Arizona and New Mexico, and other states, too.

Statewide Average Temperature Ranks
July 2023
Period: 1895–2023

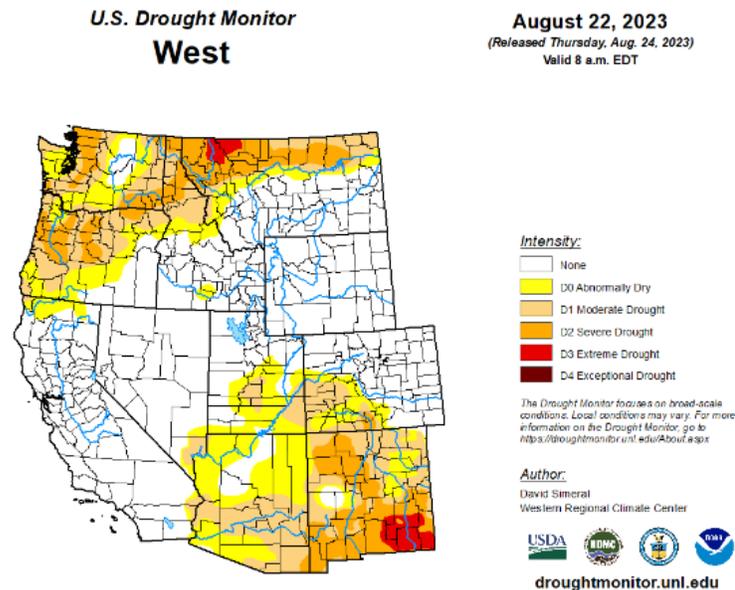


Source: [National Centers for Environmental Information \(NOAA\)](#)

Drought

Drought conditions have worsened following delayed, lackluster monsoon-season rainfall across Arizona and New Mexico. About 10% of New Mexico, in the southeastern part of

the state, is now affected by extreme (D3) drought conditions. Another 76% of New Mexico is now affected by moderate (33% D1) or severe (43% D2) drought. Most of Arizona is affected by abnormally dry conditions (51% D0), and another 37% has been classified under moderate (D1) drought conditions.



Source: [U.S. Drought Monitor](https://droughtmonitor.unl.edu)

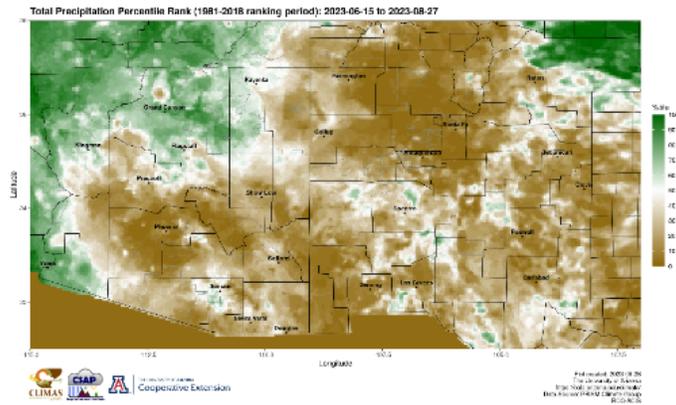
NIDIS Improved and Expanded State Pages on Drought.Gov

Arizona

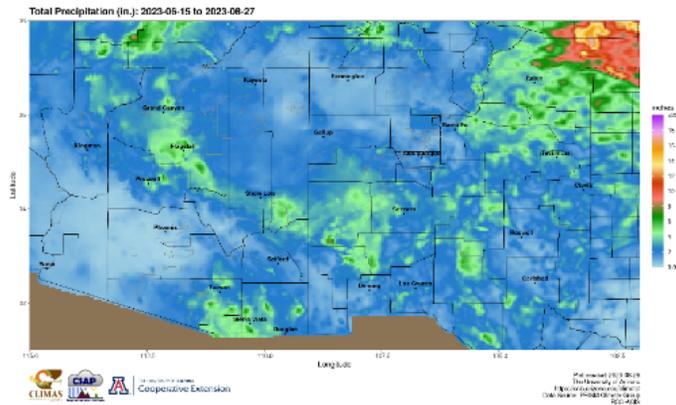
New Mexico

Monsoon

Monsoon precipitation to date (June 15 – Aug 27) has been broadly below normal—much below normal in the case of the Phoenix area and north-central New Mexico. Northern Arizona and the Lower Colorado River Valley are among the exceptions where this monsoon has been wetter than normal—thanks in large part to the remnants of Tropical Storm Hilary.



Source: UA Cooperative Extension / CLIMAS



Source: UA Cooperative Extension / CLIMAS

Water Supply

Reservoirs in Arizona are all above last year's levels—Lakes Mead and Powell remain far below long-term average level. Verde and Salt River reservoirs saw significant increases over last month's levels. New Mexico reservoirs vary from levels near long-term average (Navajo, Ute, Costilla) to far-below average (Elephant Butte, El Vado, Heron). Still, New Mexico reservoirs are in better shape this year than at this time last year.

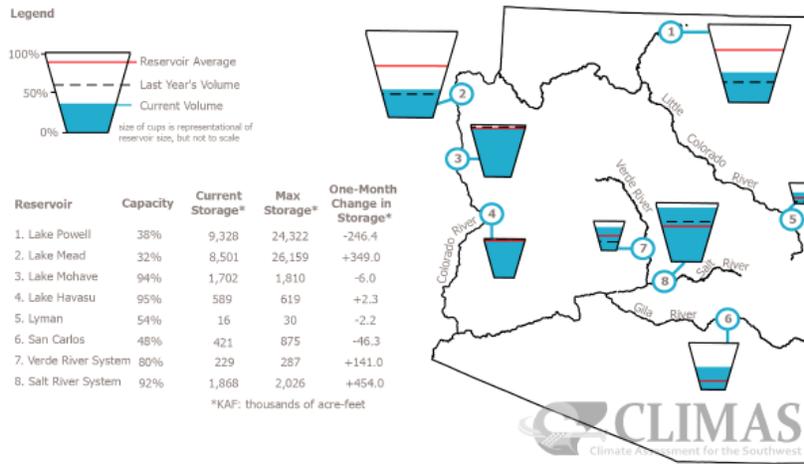


Figure 1. Arizona reservoir volumes for the end of July 2023 as a percent of capacity. The map depicts the average volume and last year's storage for each reservoir. The table also lists current and maximum storage, and change in storage since last month.

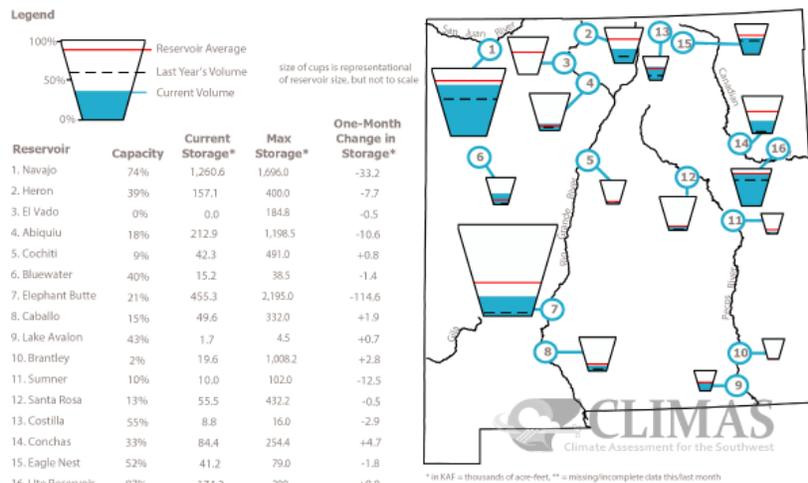


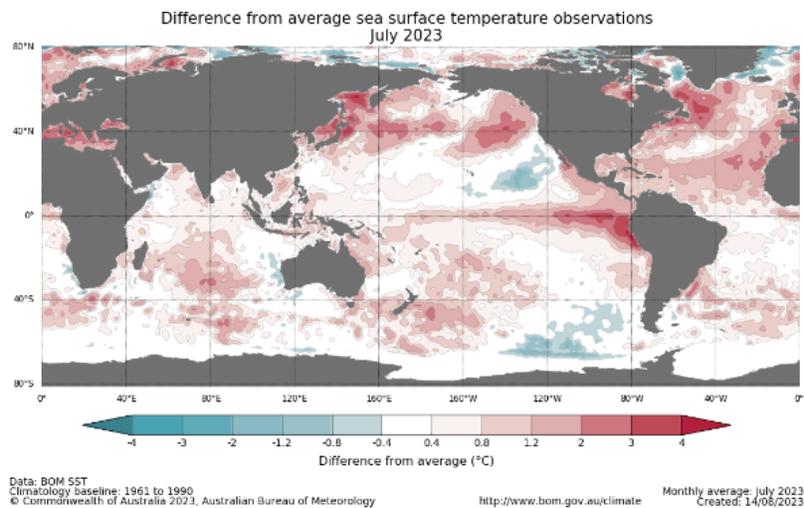
Figure 2. New Mexico reservoir volumes for end of July 2023 as a percent of capacity. The map depicts the average volume and last year's storage for each reservoir. The table also lists current and maximum storage, and change in storage since last month.

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

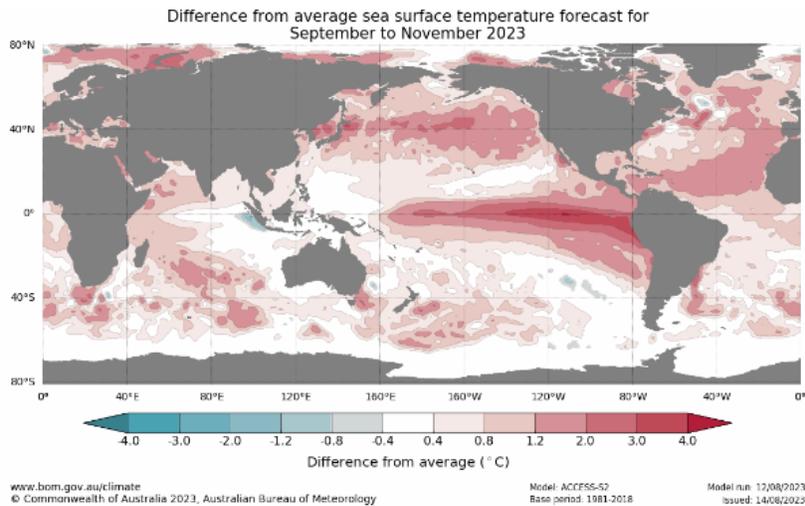
ENSO Tracker

Equatorial sea-surface temperatures (SSTs) are above average, with the magnitude of SST anomalies increasing west-to-east, in a pattern that has persisted for the past several months as an ongoing progression of El Niño conditions.



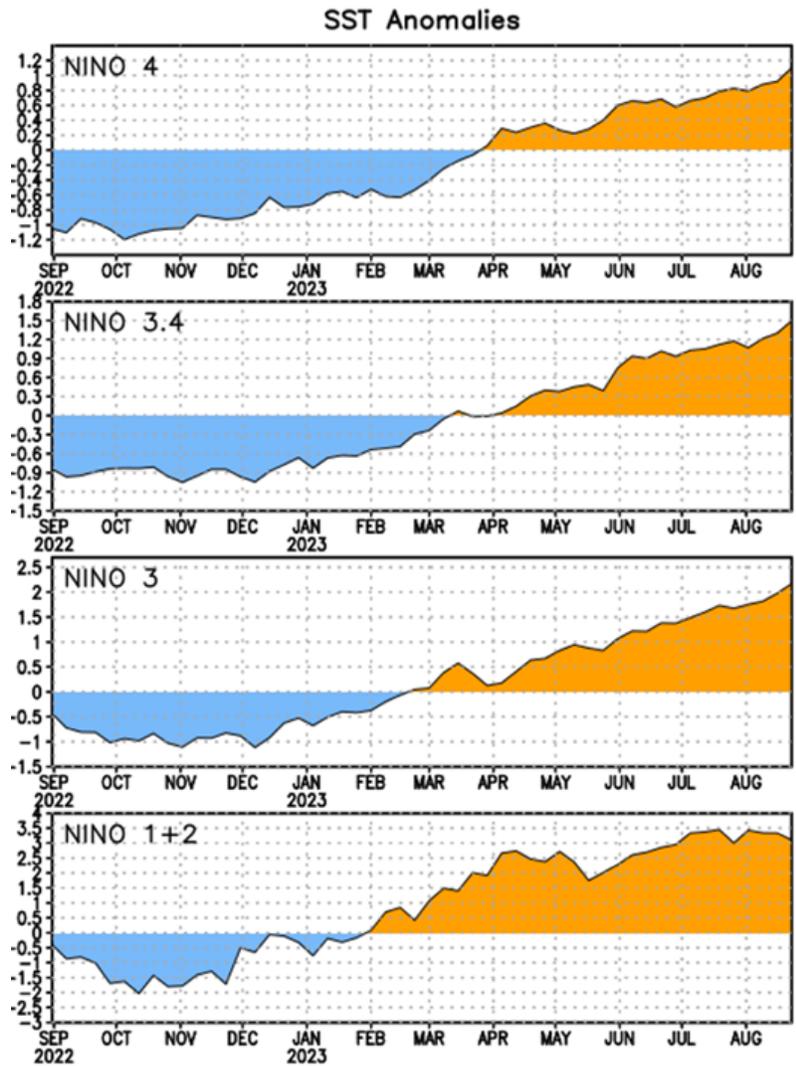
Source: Australian Bureau of Meteorology

Forecast September – November SST anomalies indicate a continuation of the recent pattern, as well as a steepening of the west-to-east gradient with SSTs in the western Pacific near normal. Such a pattern is closer to what we have seen with past El Niño episodes, which typically feature cooler-than-normal SSTs in the western Pacific along with the warmer-than-normal SSTs in the eastern or central Pacific.



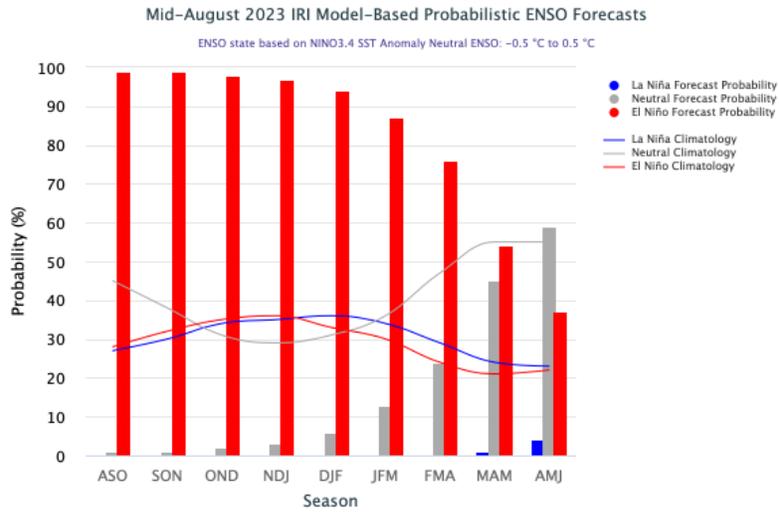
Source: Australian Bureau of Meteorology

Warming in the main ENSO diagnostic regions began in February in the Niño 1+2 region in the far east of the basin, and while anomalies appear to have plateaued there at around 3°C, SSTs in the Niño 3 region just to the west of there, and in the Niño 4 region in the central Pacific, have continued to steadily rise through August. The last weekly SST departure for the Niño 3.4 region, which straddles regions 3 and 4, was 1.5°C—the threshold value for a “strong El Niño”, but only if SSTs remain elevated above that level for several months.



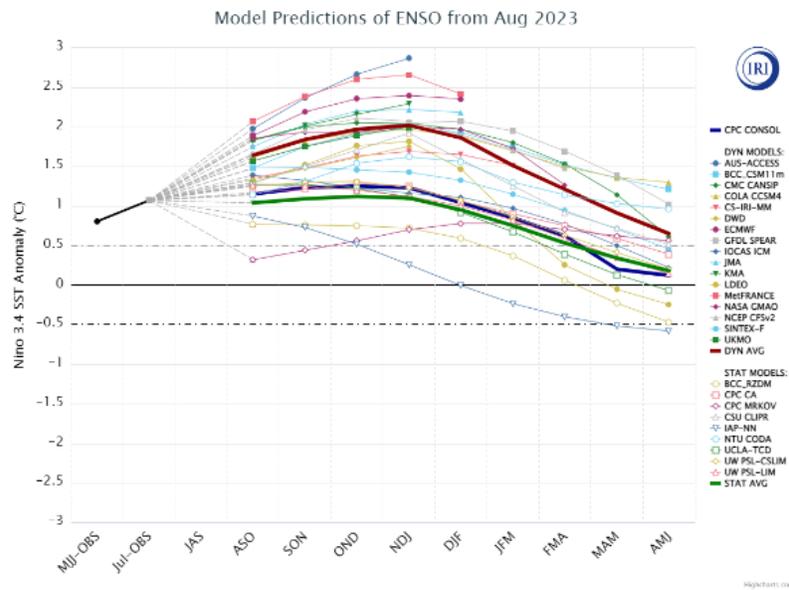
Source: Climate Prediction Center (NOAA)

ENSO forecast models indicate a high likelihood (probability > 90%) of El Niño conditions persisting through February 2024, but beyond that forecasts become much less certain—the March-April-May forecasts give near 50-50 odds of El Niño vs ENSO-neutral conditions, and the April-May-June forecast falls back to favoring ENSO-neutral with odds in line with the climatology (based on past years, the system more often than not returns to an ENSO-neutral state).



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

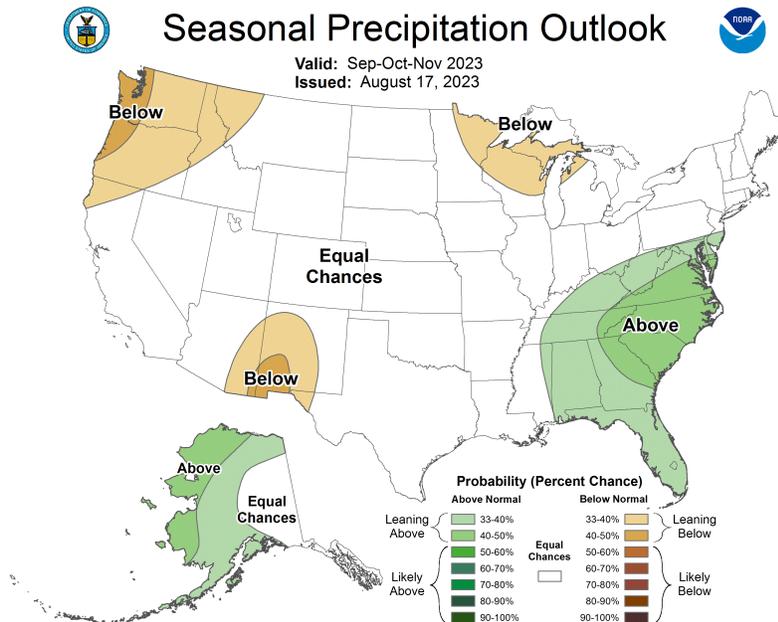
Among the models used to make ENSO forecasts, there is little disagreement, although dynamical models have consistently indicated a stronger El Niño than statistical models have. There also appears to be good agreement among models about a peak in SST anomalies occurring sometime this coming winter, followed by a decline toward ENSO-neutral, as reflected in the probabilistic forecast summary. CPC gives 2-in-3 odds of a strong El Niño event occurring in November-January.



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

Seasonal Forecasts

The September-November seasonal precipitation outlook from NOAA-CPC leans toward lower-than-normal precipitation for parts of Arizona and New Mexico, which forecasters explain as consistent with persistence of a weaker-than-normal monsoon.



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

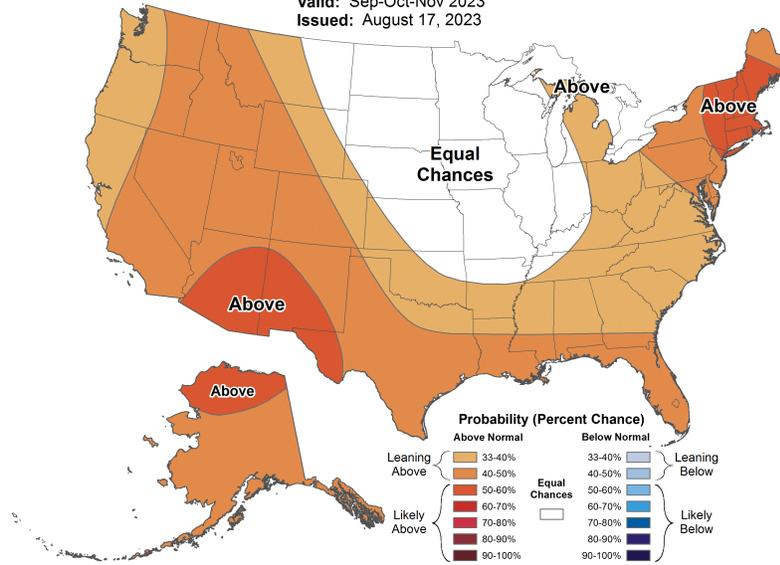
The temperature outlook for September-November indicates warmer-than-normal temperatures are likely in Arizona and New Mexico, citing decadal trends—based on past years, temperatures are more-likely-than-not to be warmer than the long-term average of the years that came before.



Seasonal Temperature Outlook



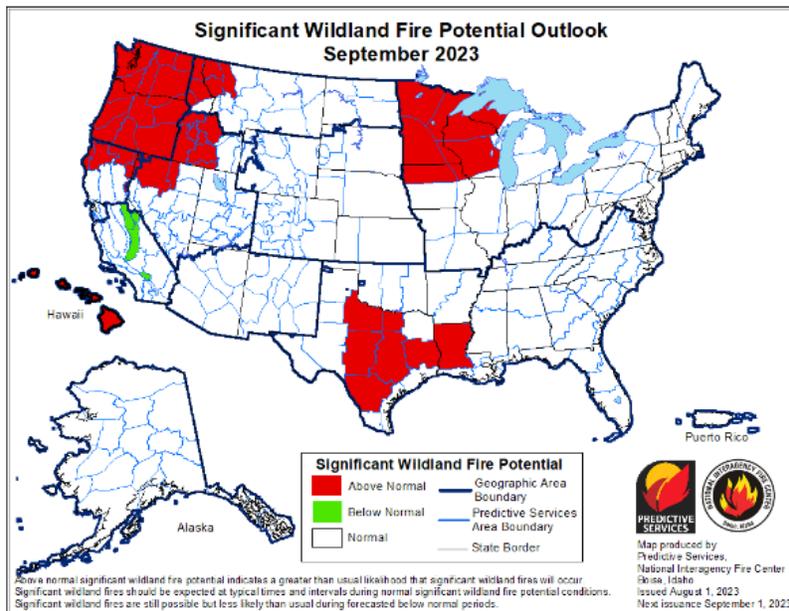
Valid: Sep-Oct-Nov 2023
Issued: August 17, 2023



Source: [Climate Prediction Center \(NOAA\)](https://www.cpc.ncep.noaa.gov)

Wildfire

The National Interagency Fire Center (NIFC) expects normal potential for significant wildland fire in September for the Southwest region. However, the text version of the NIFC outlook mentions the potential for some areas to be added to the above-normal significant fire potential category because of weak monsoon activity and prolonged heat.



Source: National Interagency Fire Center - Predictive Services

Southwest Coordination Center

Public Health Corner

Welcome to the Public Health Corner, a new quarterly section in the Southwest Climate Outlook dedicated to exploring the intersection between climate change and public health in Arizona and New Mexico! In this section, we will dive into the various health impacts of climate change that are affecting our communities and explore strategies to mitigate and adapt to these challenges.

This quarter we focus on the impacts of wildfire on health in Arizona and New Mexico. Fires can emit particulate matter and gaseous compounds which contribute to poor air quality. Smoke from wildfires pose numerous health risks including exacerbation of chronic respiratory conditions like asthma or Chronic Obstructive Pulmonary Disease (COPD). You can

review local air quality reports by using the US [Air Quality Index](#) website, and most weather applications on phones integrate this data into daily weather as well. The [National Significant Wildland Fire Potential Outlook](#) identifies areas with above, below, and near normal significant fire potential using the most recent weather, climate, and fuels data available. The US Department of Health and Human Services identified above normal wildland fire potential in portions of central Arizona and parts of west-central New Mexico for August 2023.

CLIMAS researchers have been exploring the effect of wildfire for many years through various projects. Most recently, in Spring 2023, CLIMAS researchers engaged in an Indigenous-led workshop series exploring tribal perspectives on fire with the goal of supporting tribal and pueblo natural resource and fire programs in Arizona and New Mexico. You can read more about this workshop series via the [Southwest Tribal Fire and Climate Resilience](#) website. CLIMAS researchers are also exploring the effect of prescribed fire, a forest management strategy, and how it affects our health. Are you interested in learning more about wildfires and their impact on our health? Check out the US Environmental Protection Agency's [Smoke-Ready Toolbox](#).

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.

[Arizona EPHT Explorer](#)

[New Mexico EPH Tracking](#)

Southwest Climate Podcast

July 2023 - A Puzzling Monsoon



Zack Guido and Mike Crimmins bring you the July '23 edition of the Southwest Climate Podcast to tease out what the heck is happening with this year's monsoon. They cover some of the record-breaking heat in July, look back at the historical record of past monsoons to find an analog to this year, weigh in on whether any or all can be attributed to the El Niño flex, and lay out their predictions for the Monsoon Fantasy game. They may not

have any definitive answers, but at least you'll get an insightful look at this summer's puzzling monsoon.

[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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**Southwest Climate Outlook
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