



## Key Takeaways

### Global Conditions Relevant to Drought

- A weak La Niña developed as of January 2025 and is forecast to persist into early spring 2025.
- La Niña increases the chances for below-average precipitation in southern California and the Southwest U.S. The Madden-Julian Oscillation is currently weak.

### Local and Regional Drought Conditions

- Drought intensified in the Southwest U.S. and southern California due to below-average precipitation and above-average temperatures during the 2024-2025 wet season.
- From October 1, 2024 - February 22, 2025, southern California precipitation was among the lowest and temperatures were among the highest since 1951.

### Subseasonal and Seasonal Outlook Through End of 2024-2025 Wet Season

- The 2024-2025 wet season in southern California will continue through at least mid-March (medium confidence), though precipitation is expected to be below average and temperatures are expected to be above average during March-May (high confidence).

### Water Utilities Sector-Specific Drought Outlook

- Reservoir storage and groundwater levels are expected to be lower in October 2025 compared to February 2025 (high confidence).

### Agriculture Sector-Specific Drought Outlook

- Crop stress, which may reduce agricultural productivity, is expected through spring 2025 in southern California (high confidence), though recent and expected precipitation has been and will be beneficial.

### Public Health Sector-Specific Drought Outlook

- Poor air quality is expected during spring 2025 in southern California due to blowing dust (high confidence).

## About the Outlook

This outlook disseminates sector-specific drought scenarios that are based on tailored monitoring and forecasting information, which will enable users to make proactive decisions ahead of drought. The focus sectors include water utilities, agriculture, and public health in Southern California.

The next outlook will be released on Thursday, April 4, 2025.

### Lines of Evidence

Several perspectives are used to inform sector-specific drought scenarios.

- Observed Conditions: Current state of the region from observations as of February 27, 2025 at 10 a.m. PT.
- Predictions: Expert interpretation of many types of forecasts to anticipate the future.
- End-of-Season Outcomes: Combination of season-to-date observations and similar historical periods to project chances of outcomes.

## Interpreting Scenarios

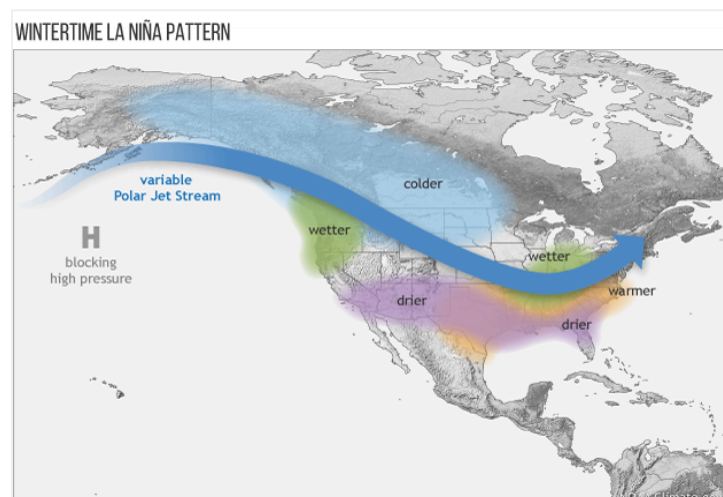
A confidence level for each scenario is provided based on guidance from the IPCC AR5:

- Low confidence indicates little agreement among several sources of evidence.
- Medium confidence indicates modest agreement among several robust sources of evidence.
- High confidence indicates close agreement among several robust sources of evidence.

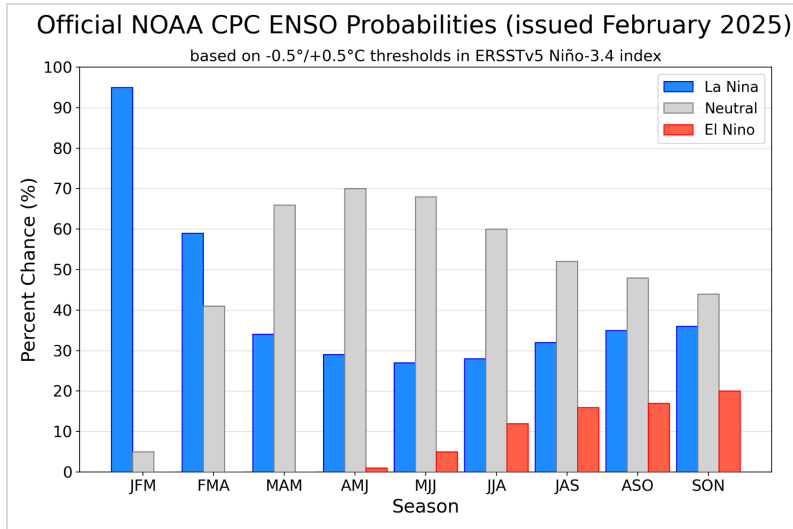
## Global Perspective

La Niña increases chances of below-average precipitation and drought in the Southwest U.S.

- The El Niño-Southern Oscillation, composed of El Niño, La Niña, and neutral phases, is related to weather anomalies that are used to predict conditions months to seasons in the future (Figure 1).
- La Niña increases the chances of below-average precipitation in southern California and the Southwest United States during its October–April wet season (Figure 1).
- A weak La Niña developed as of January 2025 and is forecast to persist into early spring 2025 (Figure 2).



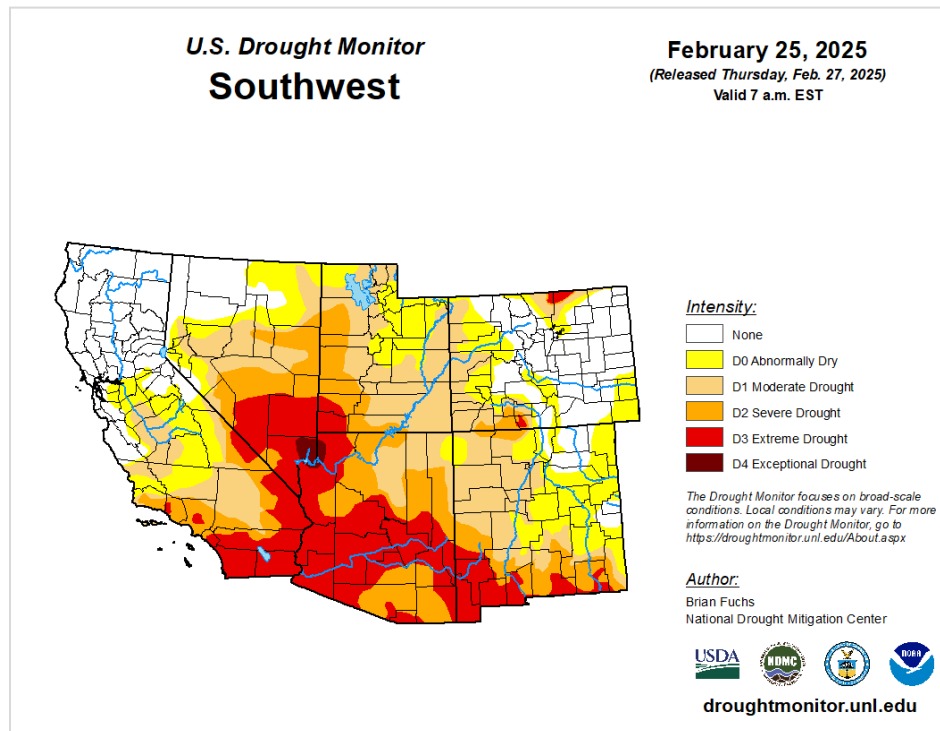
**Figure 1:** Wintertime conditions related to La Niña. Image courtesy of [NOAA climate.gov](https://www.noaa.gov/climate).



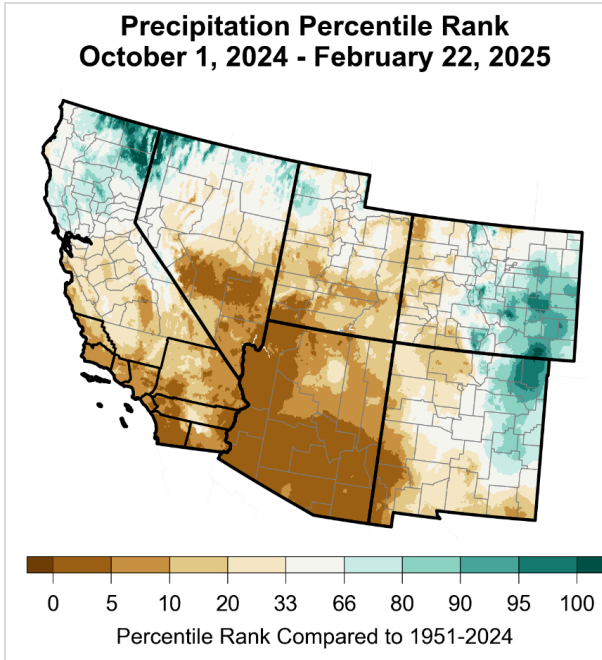
**Figure 2:** Chances of El Niño, La Niña, and neutral El Niño-Southern Oscillation (ENSO) phases for three-month seasons spanning January-March (JFM) 2025 to September-November (SON) 2025 from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Climate Prediction Center (CPC) [February 13, 2025 ENSO Diagnostic Discussion](#). These chances peak with a >95% chance of La Niña development over the winter months.

## Regional Drought Conditions

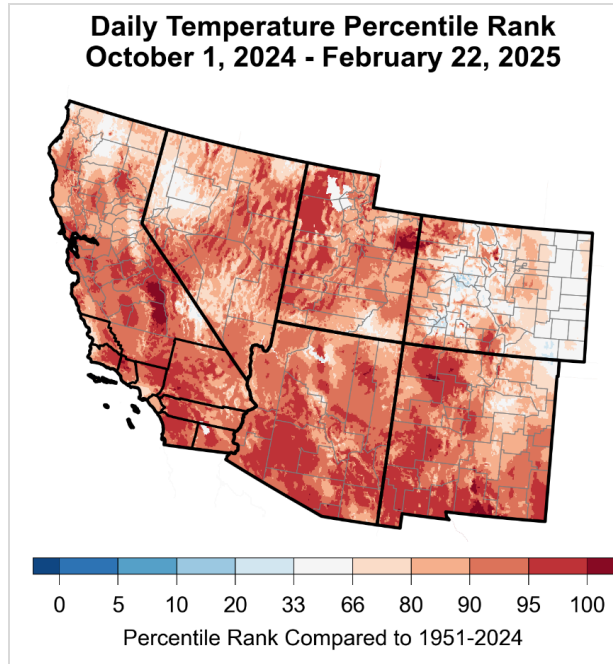
- Moderate to Extreme Drought (D1-D3) continues across the Southwest U.S. and southern California (Figure 3).
- During October 1, 2024 - February 22, 2025, southern California precipitation was among the lowest and temperatures among the highest since 1951 (Figures 4 and 5).



**Figure 3.** U.S. Drought Monitor as of February 25, 2025. Source: [National Drought Mitigation Center](#).



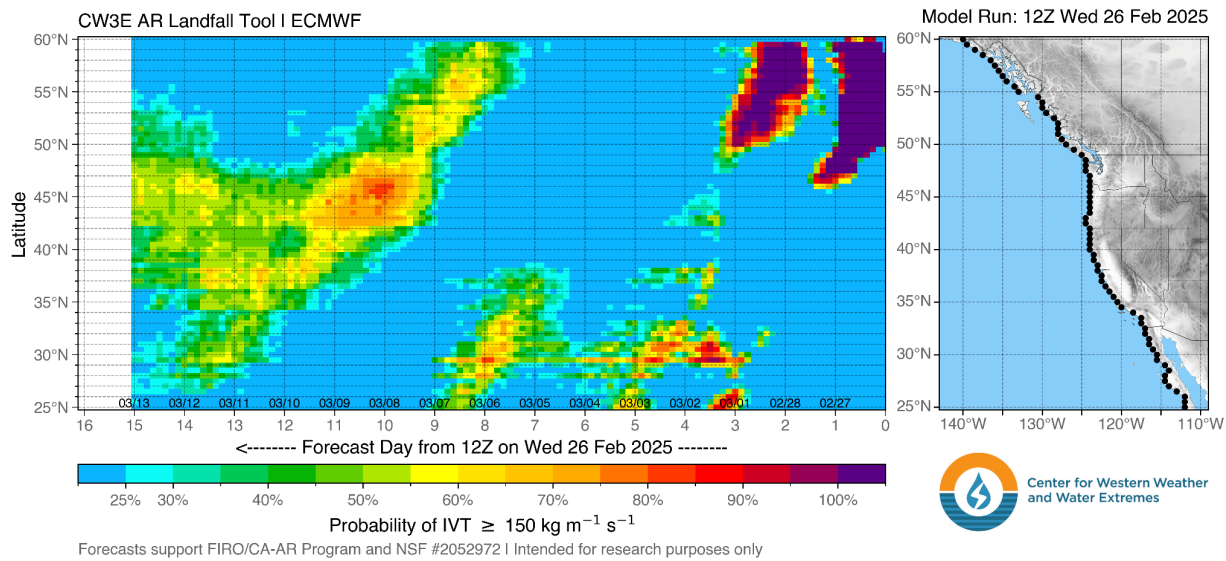
**Figure 4.** October 1, 2024 - February 22, 2025 precipitation percentile rank. Source: NOAA Physical Sciences Laboratory using data from NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) and National Centers for Environmental Information (NCEI).



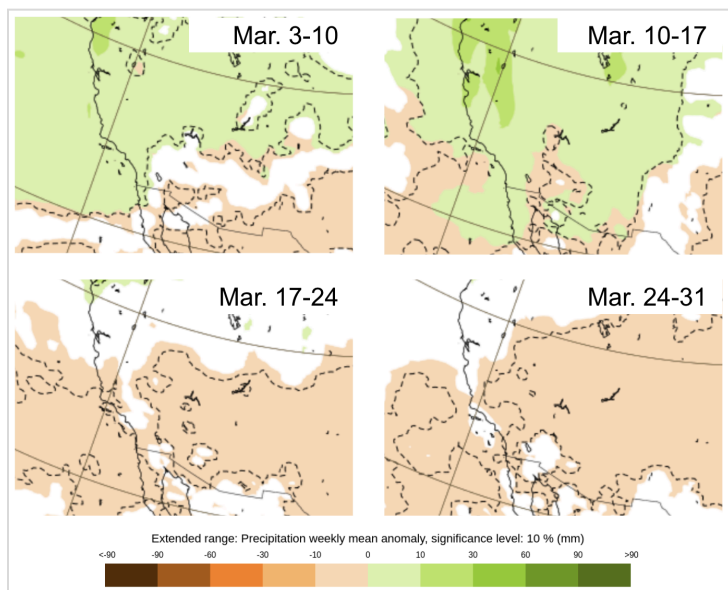
**Figure 5.** October 1, 2024 - February 22, 2025 temperature percentile rank. Source: NOAA Physical Sciences Laboratory using data from NOAA's NESDIS and NCEI.

# Subseasonal and Seasonal Forecasts Relevant to Drought

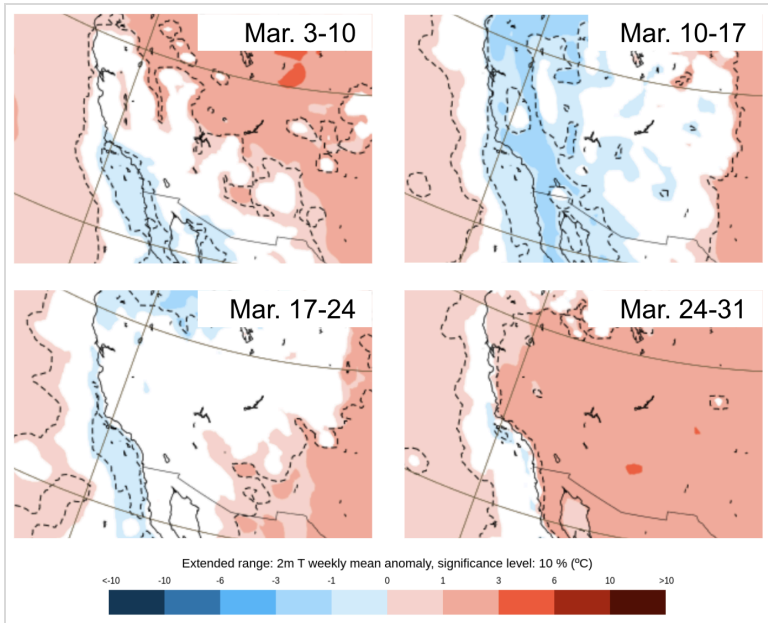
- Forecasts indicate that the 2024-2025 wet season in southern California will continue through March 17, 2025 (Figures 6-7). Temperatures are expected to be average and below-average through March 24, 2025 (Figure 8).
- Forecasts indicate increased chances of below-average precipitation (Figure 9) and above-average temperatures (Figure 10) through May 2025 in the Southwest U.S.
- Drought is expected to persist in the Southwest U.S. through at least the end of May 2025 according to the NOAA/NWS Climate Prediction Center.



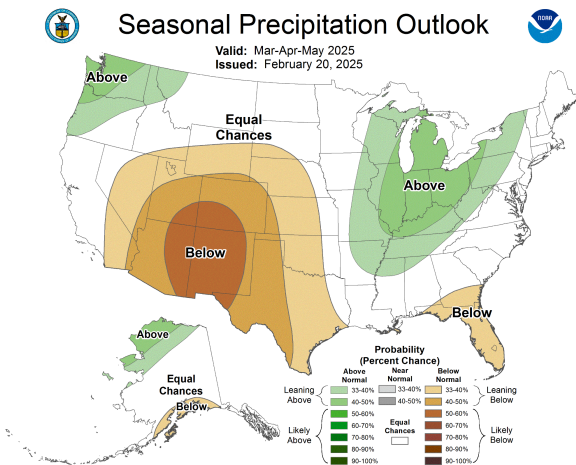
**Figure 6.** Forecast probability of integrated vapor transport exceeding  $150 \text{ kg m}^{-1} \text{ s}^{-1}$  as a function of latitude and lead time from European Centre for Medium-Range Weather Forecasts (ECMWF) made on 26 February 2025 at 12 UTC. The probability Atmospheric River (AR) Landfall Tool displays the likelihood and timing of AR conditions (here, Integrated Vapor Transport  $> 150 \text{ kg/ms}$ ) at each point on the map in a line along the U.S. West Coast or inland derived from the ECMWF model over the next 16 days. Blue and green hues indicate lower probability of atmospheric river activity, while red and purple hues indicate higher probabilities of atmospheric river activity for a given day or latitude in the coming weeks. Analysis and images courtesy of [Center for Western Weather and Water Extremes](#).



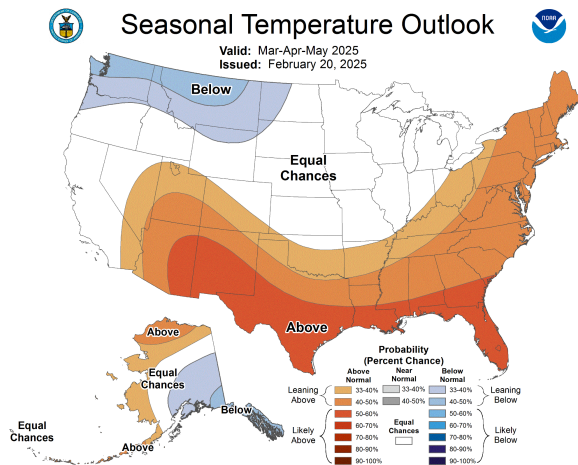
**Figure 7.** 7-day precipitation forecasts in millimeters from the [European Centre for Medium-Range Weather Forecasts](#). Shading indicates forecast confidence at the 10% level and dashed lines indicate forecast confidence at the 1% level.



**Figure 8.** 7-day temperature forecasts in degrees Celsius from the [European Centre for Medium-Range Weather Forecasts](#). Units are mm, shading indicates forecast confidence at the 10% level and dashed lines indicate forecast confidence at the 1% level.



**Figure 9.** Chances of above- (green), below- (brown), and near- (gray) average precipitation valid for March-May 2025 issued on February 20, 2025 by the NOAA NWS Climate Prediction Center.



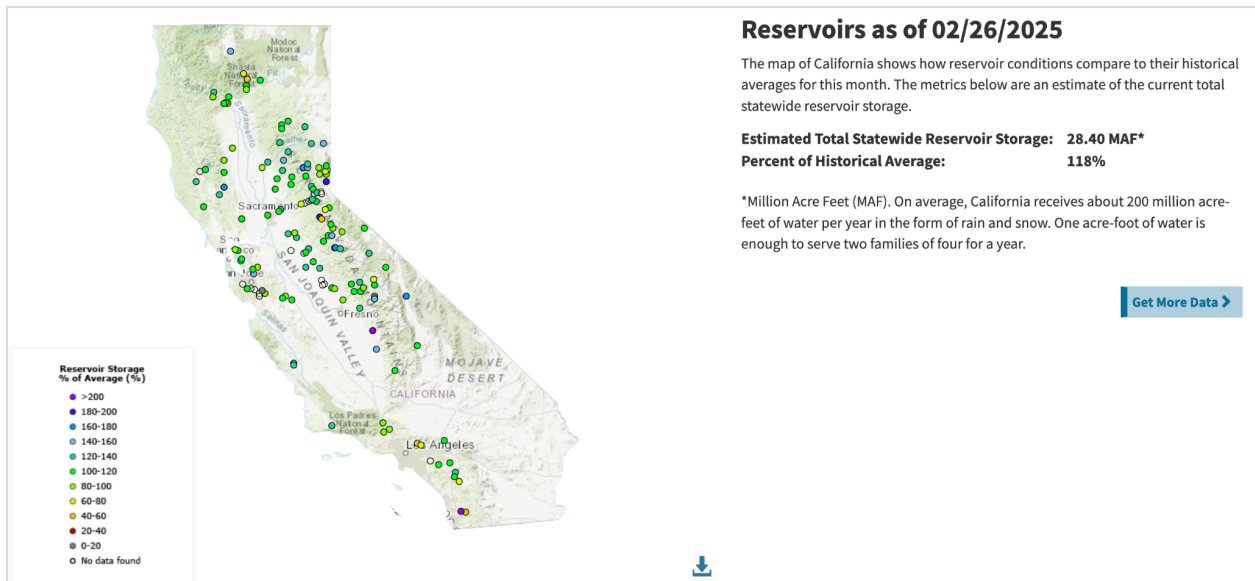
**Figure 10.** Chances of above- (red), below- (blue), and near- (gray) average temperature valid for March-May 2025 issued on February, 2025 by the NOAA NWS Climate Prediction Center.

# Water Utilities Sector-Specific Drought Outlook

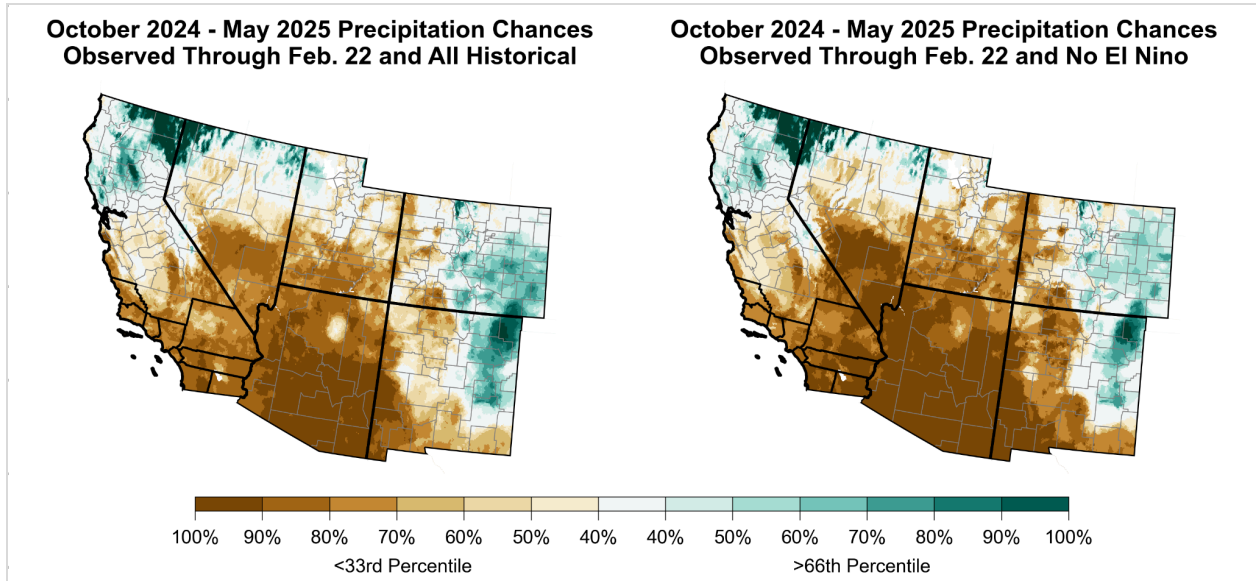
**Reservoir storage and groundwater levels are expected to be lower in October 2025 compared to February 2025 (high confidence).**

## Supporting Evidence:

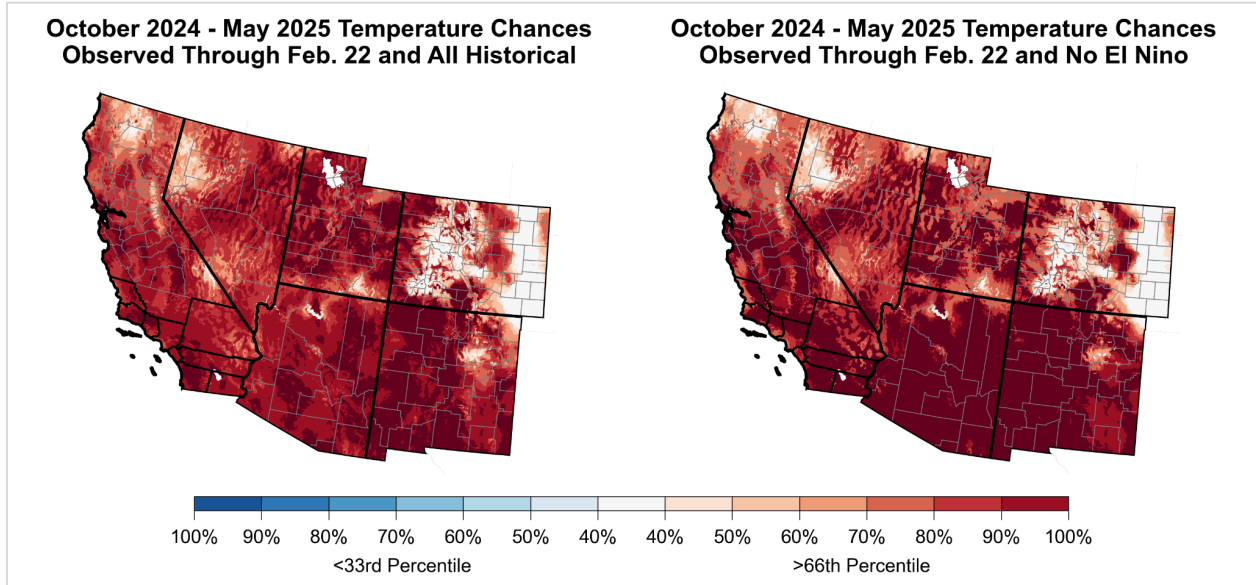
- Though reservoir storage is generally average and above average in southern California (Figure 11), lower reservoir storage is expected in October 2025 due to:
  - Increased chances of below-average precipitation and above-average temperatures in the 2024-2025 wet season (Figure 12-13), and
  - Below-average snow water equivalent in spring 2025.
- Lower groundwater levels due to:
  - Chances of recharge are low through October 2025 due to forecast below-average precipitation in the 2025 wet season amid continued use.
  - Several areas in southern California report low groundwater.



**Figure 11.** Reservoir storage in California as of February 26, 2025 from California Water Watch.



**Figure 12.** Chances of above- (green) and below- (brown) average precipitation in October-May based on observed conditions from October 1, 2024 to February 22, 2025 and historical conditions for the rest of the season. Historical conditions include all years since 1991 (left) and non-El Niño years since 2000 (right) defined by the NOAA NWS Climate Prediction Center. Above- and below-average precipitation are defined by precipitation falling in the lower and upper thirds of potential outcomes. Source: NOAA Physical Sciences Laboratory using data from the NOAA NESDIS NCEI.



**Figure 13.** Chances of above- (red) and below- (blue) average temperature in October-May based on observed conditions from October 1, 2024 to February 22, 2025 and historical conditions for the rest of the season. Historical conditions include all years since 1991 (left) and non-El Niño years since 2000 (right) defined by the NOAA NWS Climate Prediction Center. Above- and below-average precipitation are defined by temperature falling in the lower and upper thirds of potential outcomes. Source: NOAA Physical Sciences Laboratory using data from the NOAA NESDIS NCEI.

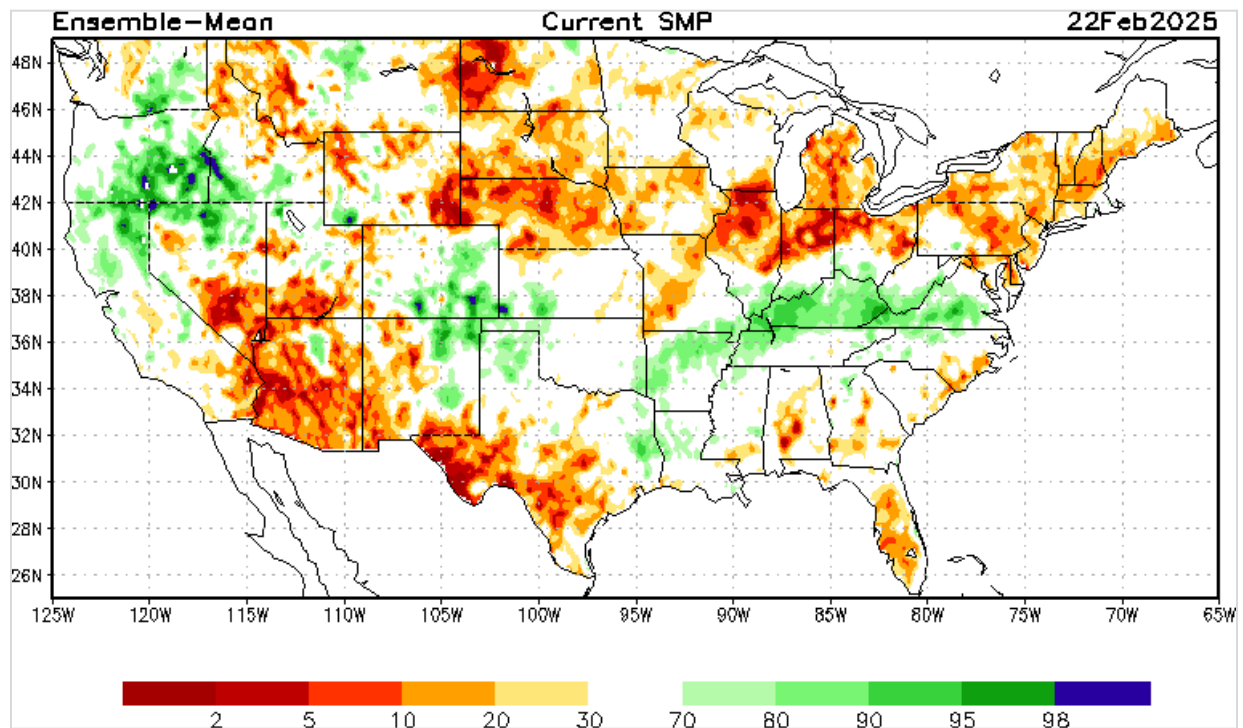


## Agriculture Sector-Specific Drought Outlook

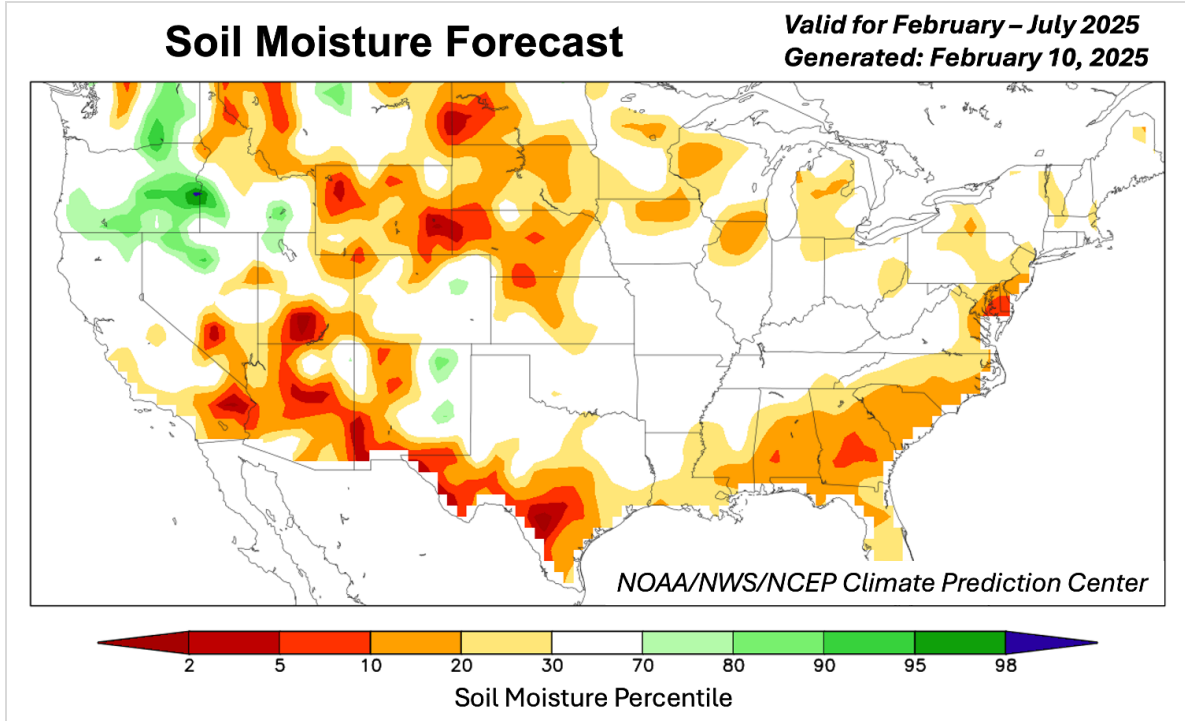
**Crop stress, which may reduce agricultural productivity, is expected through spring 2025 in southern California (high confidence), though recent and expected precipitation was and will be beneficial.**

### Supporting Evidence:

- Current low soil moisture in southern California (Figure 15) is forecast to persist (Figure 15) through at least early summer 2025.
- Below-average precipitation (Figures 9 and 12) and above-average temperatures (Figures 10 and 13) in southern California are most likely in March-May 2025.
- Above-average precipitation was observed in late January and early February and above-average precipitation is expected during March 3-17, 2025 (Figure 7).



**Figure 14.** Estimate of observed soil moisture percentile on February 22, 2025 from the [NOAA Climate Prediction Center](#) based on the North American Land Data Assimilation System (NLDAS) version 2 ensemble average.



**Figure 15.** Forecast soil moisture percentile valid for February-July 2025 issued on February 10, 2024 by the NOAA NWS Climate Prediction Center.

# Public Health Sector-Specific Drought Outlook

**Poor air quality is expected during spring 2025 in southern California due to blowing dust (high confidence).**

## Supporting Evidence:

- Air quality has improved over the past month (Figure 16) as the fire season ended due to precipitation in late January and early February.
- In spring 2025, air quality will likely be reduced by airborne particulates due to above-average wind speeds (Figure 17) blowing over the dry land surface (Figure 15) caused by below-average precipitation during the 2024-2025 wet season (Figure 12).

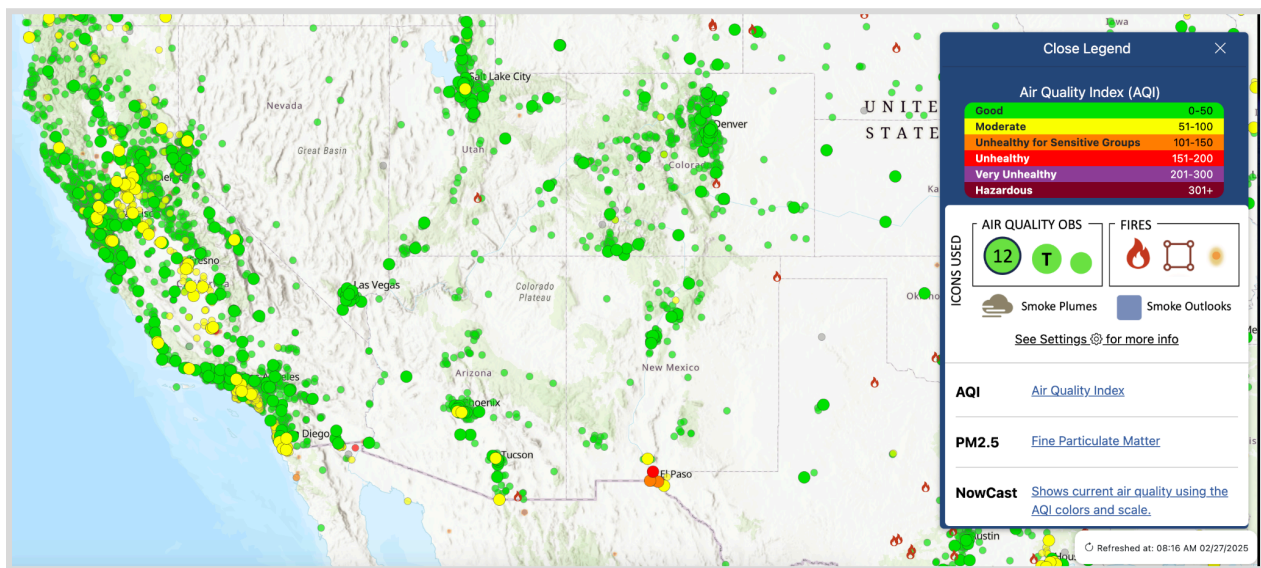


Figure 16. Air quality index and wildfires as of February 27, 2025 from AirNow.

## Chances of Above- and Below-Normal Wind Speeds

C3S multi-system seasonal forecast    ECMWF/Met Office/Météo-France/CMCC/DWD/NCEP/JMA/ECCC  
 Prob(most likely category of 10m wind speed)    MAM 2025  
 Nominal forecast start: 01/02/25  
 Unweighted mean

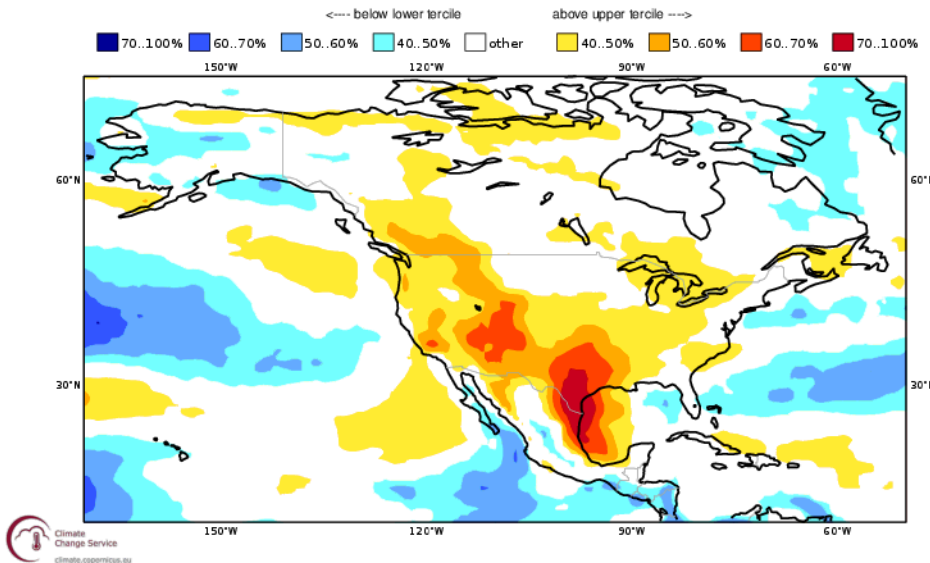


Figure 17. Chances of above- (red) and below- (blue) average wind speed 10 meters above the surface valid for March-May 2025 issued in February 2025 by [Copernicus](https://climate.copernicus.eu).