



Key Takeaways

Global Conditions Relevant to Drought

A weak La Niña has 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. A Madden-Julian Oscillation event is in its second and third phases, increasing the chances of a precipitation event in southern California this weekend.

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 to January 12, 2025, southern California experienced the second driest and second warmest such period since 1951. Reservoir levels remain near and above average, though groundwater generally remains low due to decades of pumping.

Water Utilities Sector-Specific Drought Outlook

Reservoir storage and groundwater levels are expected to be lower in October 2025 compared to January 2024 (high confidence).

Agriculture Sector-Specific Drought Outlook

Crop stress, which may reduce agricultural productivity, is expected through spring 2025 in southern California (high confidence).

Public Health Sector-Specific Drought Outlook

Poor air quality is expected during winter and spring 2025 in southern California due to wildfire smoke and 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, February 27, 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 January 23, 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).

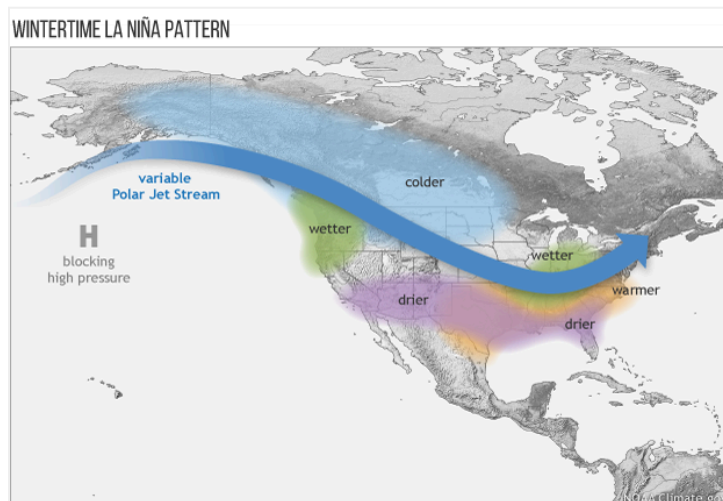


Figure 1: Wintertime conditions related to La Niña. Image courtesy of [NOAA climate.gov](https://climate.gov).

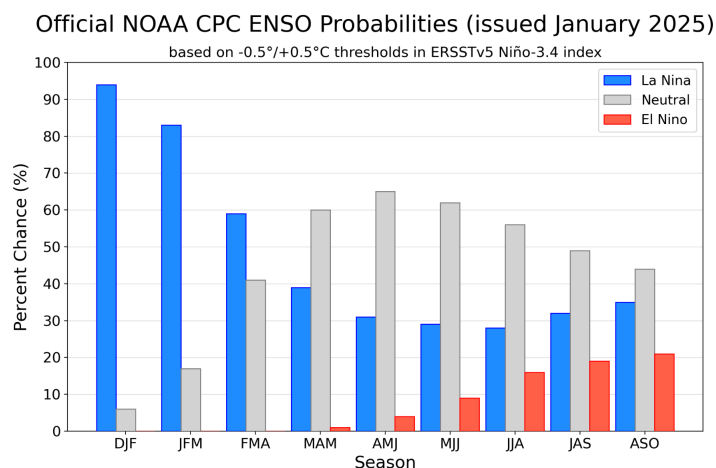


Figure 2: Chances of El Niño, La Niña, and neutral El Niño-Southern Oscillation (ENSO) phases for three-month seasons spanning December-February (DJF) 2025 to August-October (ASO) 2025 from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Climate Prediction Center (CPC) [January 9, 2025 ENSO Diagnostic Discussion](#). These chances peak with a >95% chance of La Niña development over the winter months.

The current and forecast Madden-Julian Oscillation phase increases the chances of precipitation this weekend.

- The Madden-Julian Oscillation (composed of eight phases as it moves through the Indo-Pacific) is related to weather anomalies used to predict conditions in California several weeks in the future.
- A Madden-Julian Oscillation event is in its second and third phases, increasing the chances of a precipitation event in southern California this weekend. (Figure 3).

Madden-Julian Oscillation and mid-latitude impacts

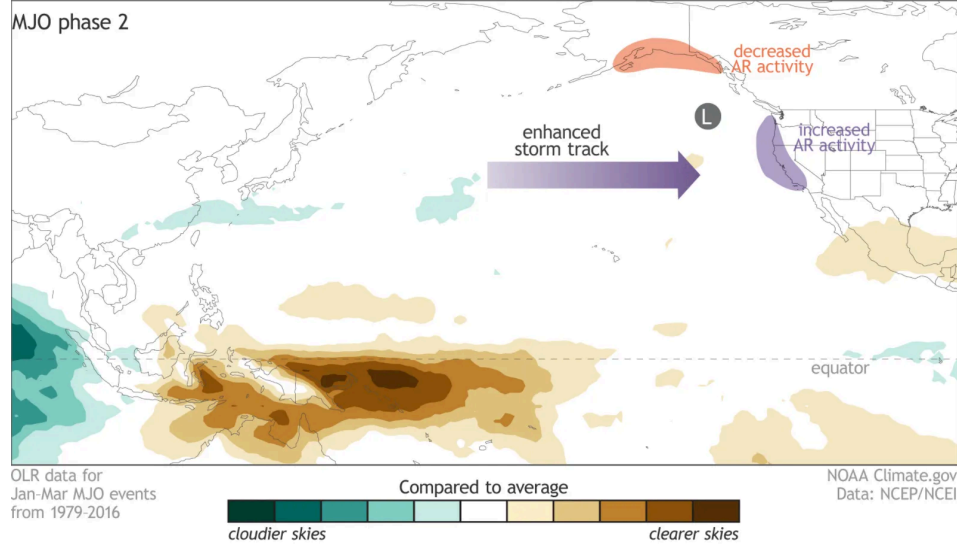


Figure 3. Storm track and atmospheric river activity in North America related to phase 2 of the Madden-Julian Oscillation. Image courtesy of [NOAA climate.gov](https://www.noaa.gov).

Regional Drought Conditions

- Drought continues to intensify across the Southwest U.S. and southern California (Figures 4 and 5).
- During October 1, 2024 - January 12, 2025, southern California precipitation was the second lowest and temperatures were the second highest for such a period since 1951 (Figures 6-8).

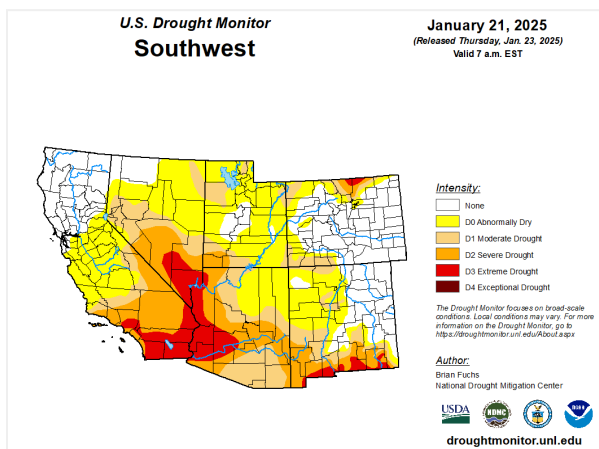


Figure 4. U.S. Drought Monitor as of January 21, 2025. Source: [National Drought Mitigation Center](https://droughtmonitor.unl.edu/).

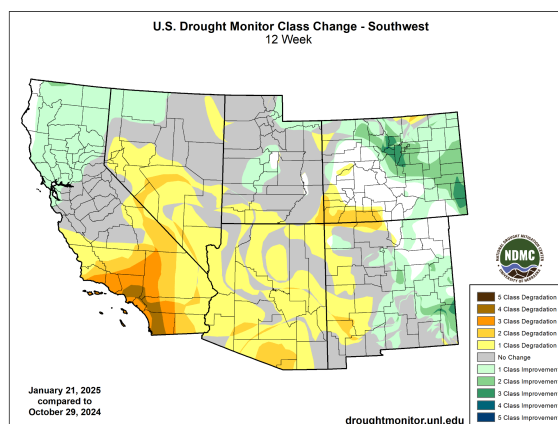


Figure 5. Change in U.S. Drought Monitor classes between October 29, 2024 and January 21, 2025. Source: [National Drought Mitigation Center](https://droughtmonitor.unl.edu/).

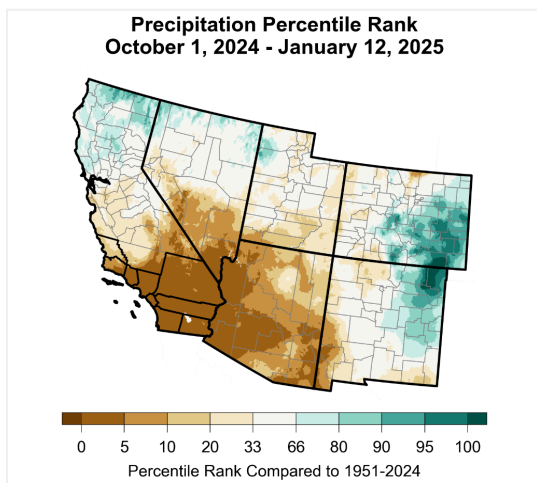


Figure 6. October 1, 2024 - January 12, 2025 precipitation percentile rank. Source: NOAA Physical Sciences Laboratory using data from NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) and National Centers for Environmental Information (NCEI).

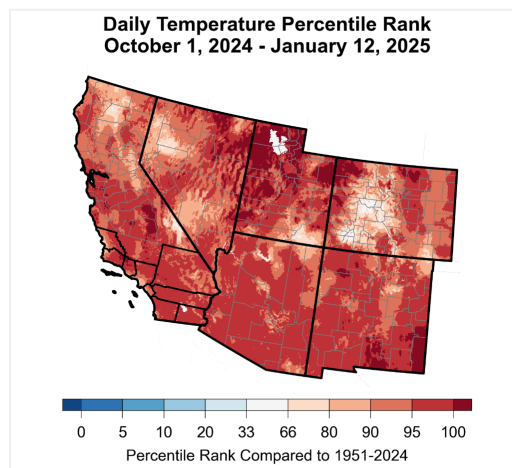


Figure 7. October 1, 2024 - January 12, 2025 temperature percentile rank. Source: NOAA Physical Sciences Laboratory using data from NOAA's NESDIS and NCEI.

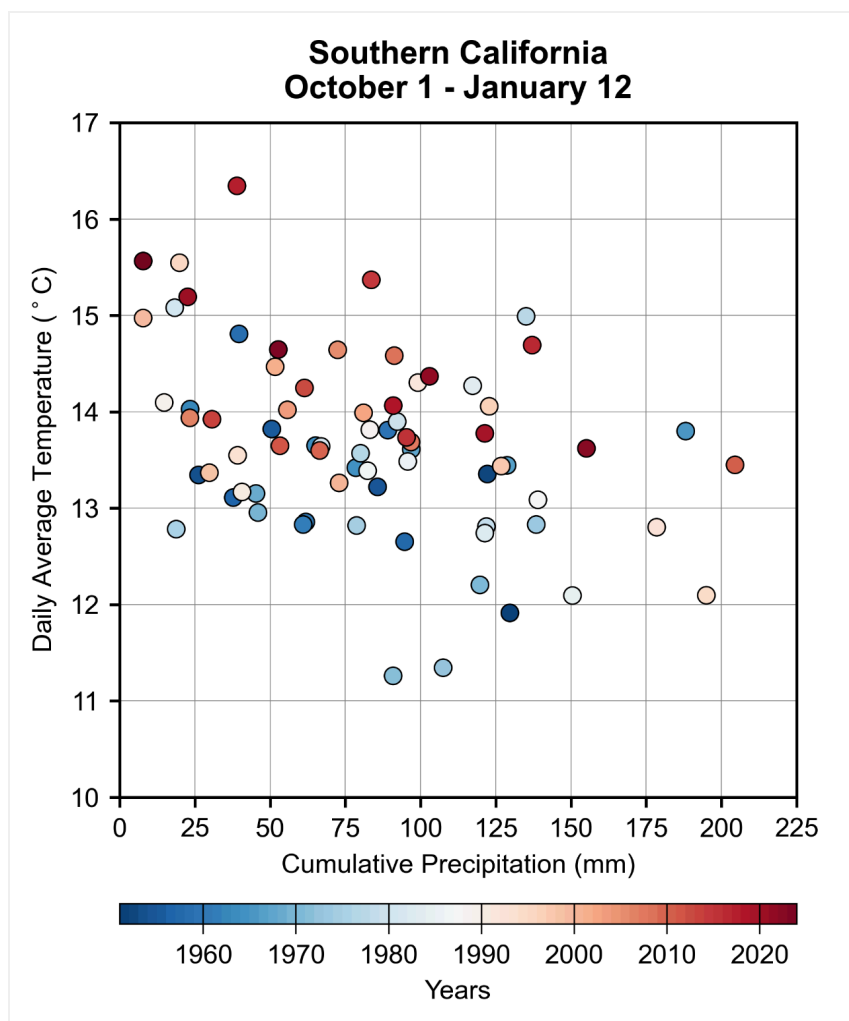


Figure 8. Scatter relationship between average temperature in degrees C and cumulative precipitation during October 1, 2024 - January 12, 2025 over southern California. Source: NOAA Physical Sciences Laboratory using data from NOAA's NESDIS and NCEI.

Regional Drought Forecasts

- Drought is expected to persist in the Southwest U.S. through the end of April 2025 according to the NOAA NWS Climate Prediction Center (Figure 9).
- Forecasts indicate increased chances of below-average precipitation through April 2025 in the Southwest U.S. (Figure 10).
- Forecasts indicate increased chances of above-average temperatures through April 2025 in the Southwest U.S. (Figure 11).

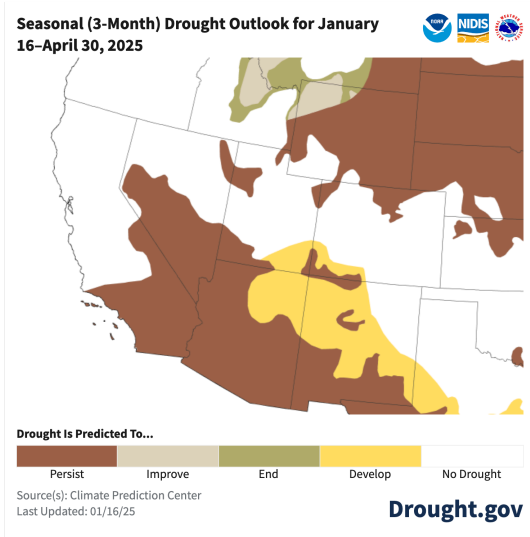


Figure 9. U.S. Seasonal Drought Outlook valid for January 16, 2025–April 30, 2025, issued on January 16, 2025 by the NOAA NWS Climate Prediction Center. Map from drought.gov.

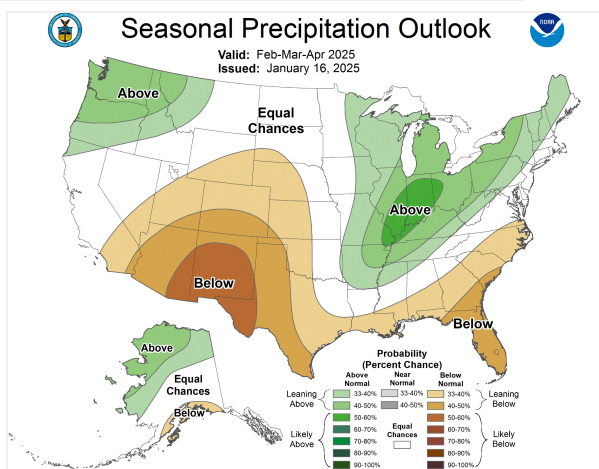


Figure 10. Chances of above- (green), below- (brown), and near- (gray) average precipitation valid for February-April 2025 issued on January 16, 2025 by the NOAA NWS Climate Prediction Center.

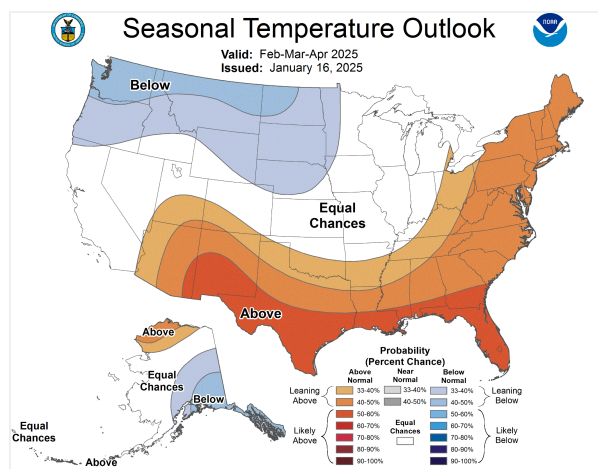


Figure 11. Chances of above- (red), below- (blue), and near- (gray) average temperature valid for February-April 2025 issued on January 16, 2025 by the NOAA NWS Climate Prediction Center.

Water Utilities Sector-Specific Drought Outlook

Reservoir storage and groundwater levels are expected to be lower in October 2025 compared to January 2024 (high confidence).

Supporting Evidence:

- Lower reservoir storage due to:
 - Increased chances of below-average precipitation (Figure 12) and above-average temperatures (Figure 13) in the 2024-2025 wet season, 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 are reporting low groundwater.

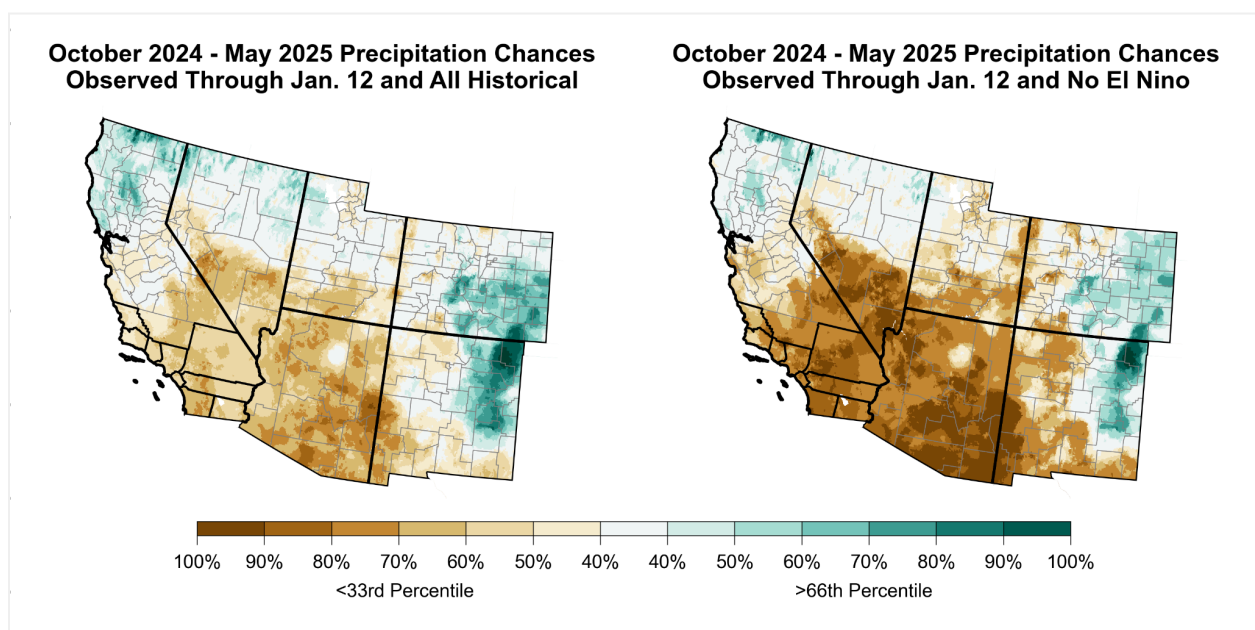


Figure 12. Chances of above- (green) and below- (brown) average precipitation in October-May based on observed conditions from October 1, 2024 to January 12, 2025 and historical conditions for the rest of the season. Historical conditions include all years since 1991 (left) and non-El Niño years since 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.

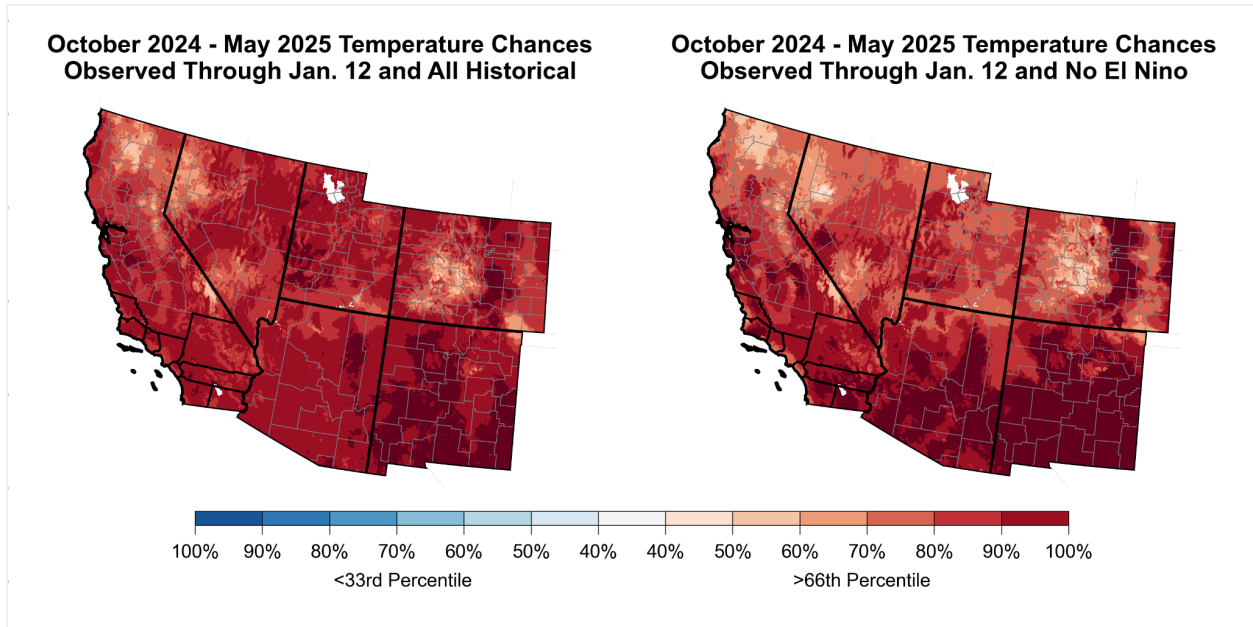


Figure 13. Chances of above- (red) and below- (blue) average temperature in October-May based on observed conditions from October 1, 2024 to January 12, 2025 and historical conditions for the rest of the season. Historical conditions include all years since 1991 (left) and non-El Niño years since 2000 (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).

Supporting Evidence:

- Below-average precipitation in southern California (Figure 12) is most likely due to fewer days with precipitation (Figure 14).
- Above-average seasonal temperatures are most likely in southern California (Figure 13).
- Below-average precipitation and above-average temperatures are expected to lead to low soil moisture by April 2025 (Figure 15).

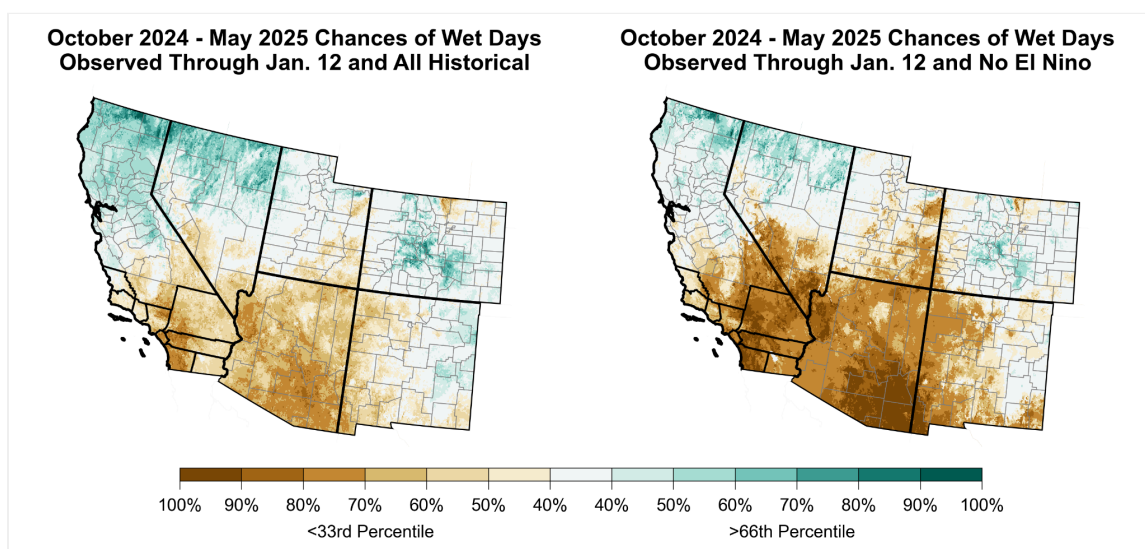


Figure 14. Chances of above- (green) and below- (brown) average days with precipitation in October-May based on observed conditions from October 1, 2024 to January 12, 2025 and historical conditions for the rest of the season. Historical conditions include all years since 1991 (left) and non-El Niño years since 2001 (right) defined by the NOAA NWS Climate Prediction Center. Above- and below-average days with precipitation are defined by such days falling in the lower and upper thirds of potential outcomes. Source: NOAA Physical Sciences Laboratory using data from NOAA's NESDIS and NCEI.

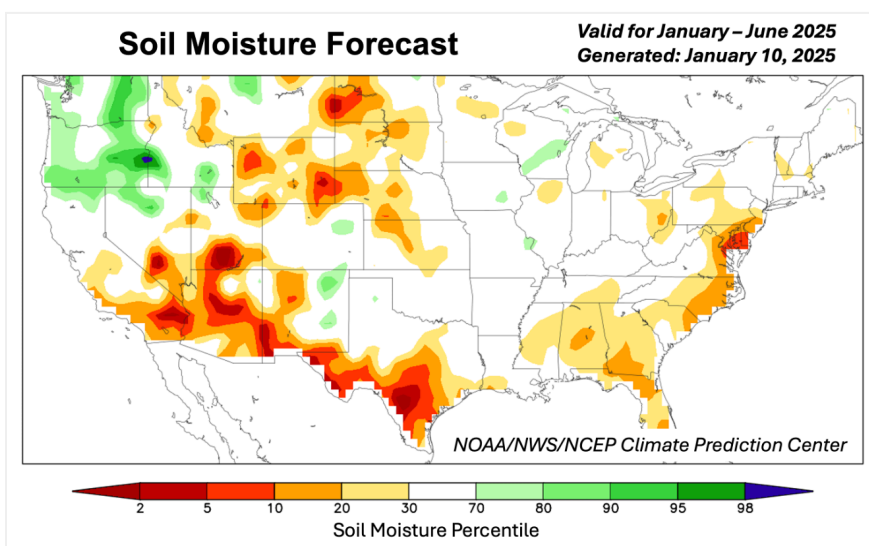


Figure 15. Forecast soil moisture percentile valid for November 2024-April 2025 issued on November 10, 2024 by the NOAA NWS Climate Prediction Center.

Public Health Sector-Specific Drought Outlook

Poor air quality is expected during winter and spring 2025 in southern California due to wildfire smoke and blowing dust (high confidence)

Supporting Evidence:

- In winter and spring 2025, air quality will likely be reduced by smoke from wildfires burning in southern California (Figure 16).
- 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).

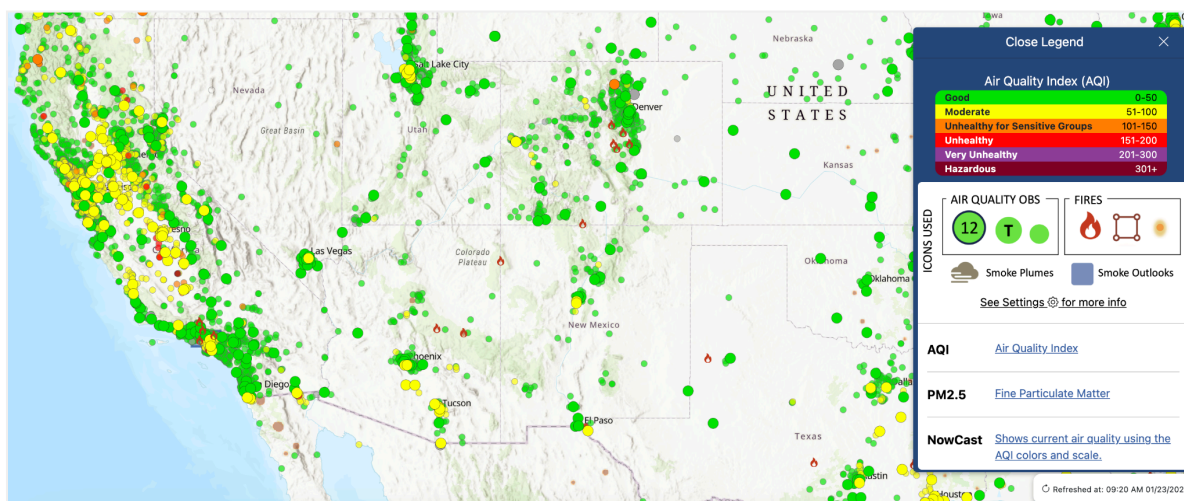


Figure 16. Air quality index and wildfires as of January 23, 2025 from AirNow.

Chances of Above- and Below-Normal Wind Speeds

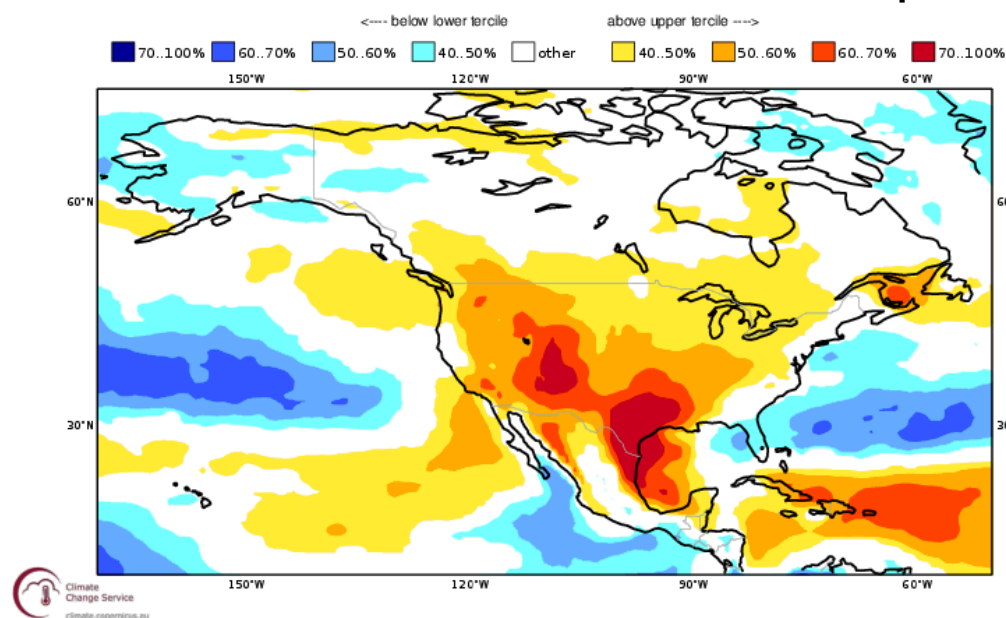


Figure 17. Chances of above- (red) and below- (blue) average wind speed 10 meters above the surface valid for February-April 2025 issued in January 2025 by [Copernicus](#).