Weather and Climate Summary and Forecast
January 2025 Report

Gregory V. Jones, Ph.D.
January 3, 2025

Summary:

- December was warmer than average[1] over the entire western US and likely helped cement 2024 as one of, if not the warmest years on record in the region, nation, and globally.
- December was wet north and dry south with the divide occurring around the Bay Area.
- Drought conditions have continued to improve in the PNW but have worsened in the southwest.
- A ridge in the west and a trough in the east resulting in the precipitation onslaught in northern California to the PNW likely subsiding into mid-month with temperatures remaining on the mild side. The eastern US is heading into an ice box.
- The forecast for the first month of 2025 is now pointing to the western US likely to see above average temperatures for the month. The January forecast for precipitation continues to show the likelihood of a wetter PNW across the northern states and a drier southern California across the southern states.
- Even though La Niña conditions have been slow to develop and weaker than anticipated, the seasonal forecast is still hanging on to the effects expected from a normal La Niña event. As such, the forecast points to a cooler and wetter winter from northern California into the PNW and cool to near average and dry into southern California and the southwest. My sense is that the strong negative phase of the PDO is having an outsized influence and that we will end up close to the seasonal forecast for the last half of winter.

Past Month and for 2024:

December over the western US was warmer than normal, although much cooler than December 2023. Most of the west was 1-5 degrees above average with portions of the northern Rockies and Plains 10-15 degrees above average (Figure 1). The month was also warmer than average for most of the country with only very isolated areas of coastal and northern New England seeing slightly below normal temperatures (not shown). In terms of precipitation, December was a wet north (100-200% of average) and dry south month (0-50-% of average) due to storm track positions (Figure 1). California north of the Bay Area and into the PNW was much wetter than average, while southern California, the southwest, and portions of the Rockies were much drier than average. For the rest of the country, much of the southeast and the Plains from northern Texas to the Canadian border were drier than average while the lower Mississippi and Ohio river valleys into New England experienced a wetter than average month (not shown).

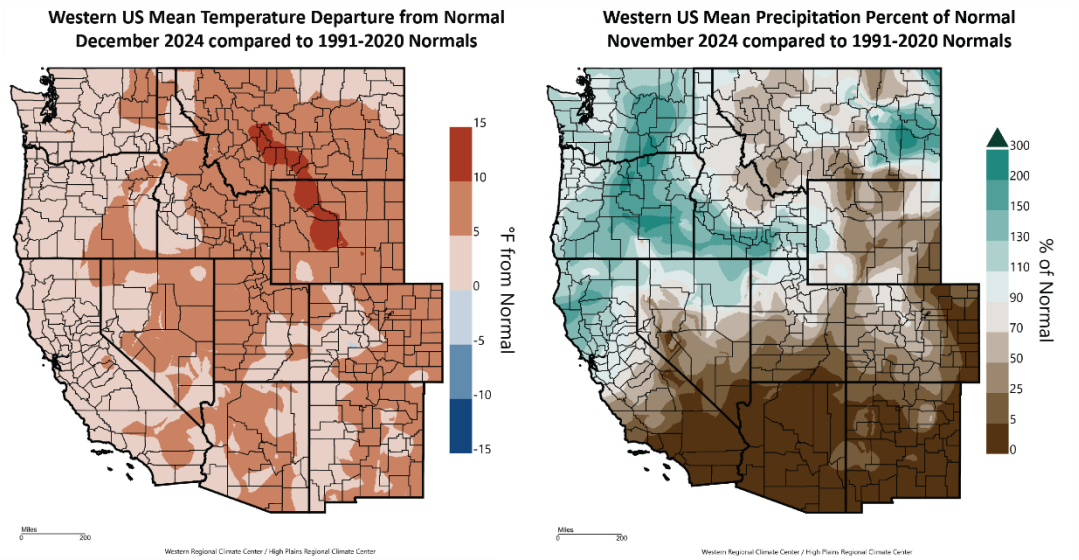

Figure 1 – Western US December 2024 temperature departure from normal (left) and percent of normal precipitation (right; images from Western Regional Climate Center and High Plains Regional Climate Center, 2024)

[1] Note that all references to normal or averages in this report are to the 1991-2020 climate normal for each weather/climate parameter unless stated otherwise. See this website (https://www.climateofwine.com/climate-normals) for more information on climate normal.

By the end of November, the data were indicating a high probability that 2024 will likely go down as one of the warmest years on record globally. With December being exceptionally warm on the global to national to regional scale, it is almost certain that 2024 will be the warmest year on record. The western US ended 2024 warmer than average with the final numbers pointing to 0.5-3.5 degrees above normal (Figure 2). Only small areas along the south coast of California and in north-central Oregon ended up with a cooler year (<0.5 degrees below average). These cooler areas in the west are the exception to the pattern across the rest of the continental US where temperatures ended up 1-6 degrees warmer than average everywhere else during 2024 (not shown). The warmest conditions were experienced across the northern Plains, the Great Lakes, the upper Midwest, and New England (not shown).

Precipitation for the western US in 2024 ended largely near average to above average with values ranging mostly from 90-200% (Figure 2). The areas that had the wettest conditions were over much of coastal to inland California and especially the north and south coast, along with Oregon. The driest regions in 2024 were portions of Washington, Idaho, and Montana along with the southwest which experienced 25-90% of normal precipitation (Figure 2). The rest of the country ended 2024 largely wetter than average, with eastern Texas, the Gulf States, the southeast, and northward into the Great Lakes and New England seeing wettest conditions, while the driest area of the country was southern New Mexico, west Texas, and portions of the central and northern Plains (not shown).

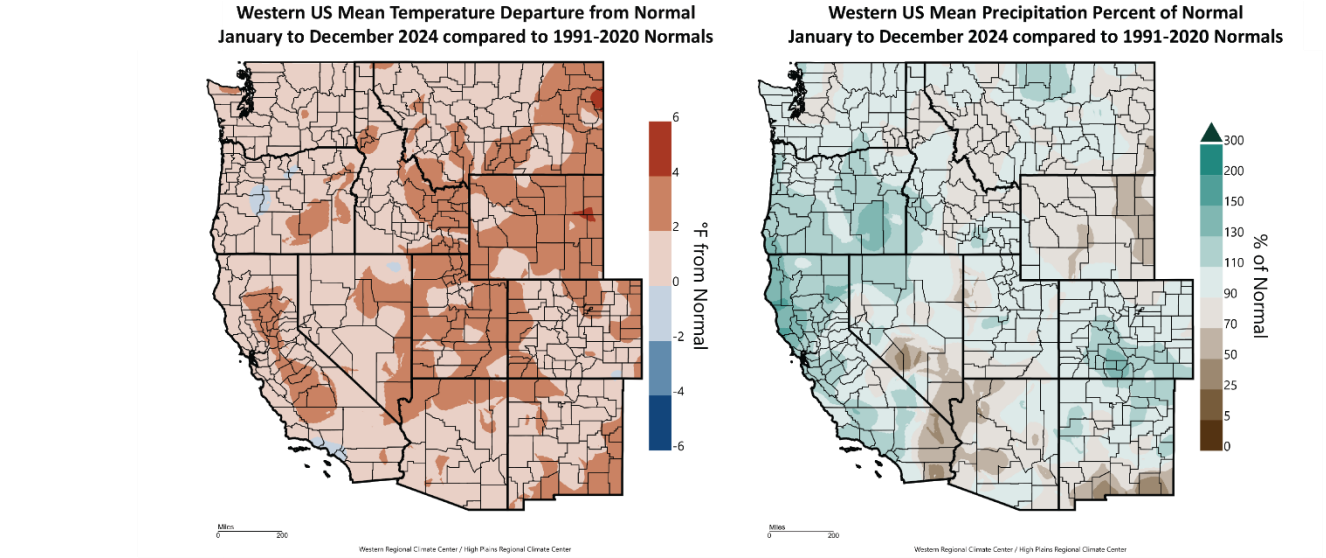

Figure 2 – Western US 2024 (January-December) temperature departure from normal (left) and percent of normal precipitation (right; images from Western Regional Climate Center and High Plains Regional Climate Center, 2024).

Drought Watch – The general pattern of drought in the continental US remains from last month, although some places have improved quite a lot while others have worsened. A relatively wet month in northern California and the PNW lowered the drought area and severity while drier conditions in southern California, the Four Corners, Gulf states, and the upper Midwest resulted in some expansion and/or continuation of drought in the regions (Figure 3). For the continental US, the overall drought footprint depicted in Figure 3 dropped from 87% last month to 67% now with the most extreme drought categories dropping from 28% to 15%. For the western US, the overall drought footprint has dropped to just above 70% but the most extreme categories remain close to 19%. Precipitation in December was enough to lower Washington's drought area to just below 34% of the state with the most extreme categories dropping to zero. Similar to Washington, December precipitation in most of Oregon (Figure 1) lowered the overall drought footprint to just under 30% and the extreme drought categories (severe, extreme, and exceptional) to zero. The mountains of northern Idaho and western Montana remain one of the driest regions in the west. Montana increased to just below 95% of the state in some level of drought with the extreme categories decreasing slightly to just over 27% of the state. Idaho saw a slight improvement with just over 90% in overall drought coverage but with the most extreme drought categories dropping to roughly 5%. December precipitation in California was much above average north and much below average south (Figure 1). The result was a lowering of drought concerns in the north and a significant increase in the south. Overall, however, the drought level in California dropped to just below 60% in some level of drought with roughly 6% in the more extreme drought categories (Figure 3).

The seasonal drought outlook in Figure 3 shows some improvement in some regions while others are likely to have continuing drought concerns. Drought conditions remain and are likely to develop further across the south from the Four Corners region to Texas across the Gulf Coast and into the southeast (Figure 3; left panel). Improving conditions or complete removal from drought is forecast for New England, some of the Great Lakes, and across the PNW and northern Rockies. The northern Plains across the upper Mississippi River valley and the western Great Lakes are forecast to stay in drought over the second half of winter (Figure 3; right panel).

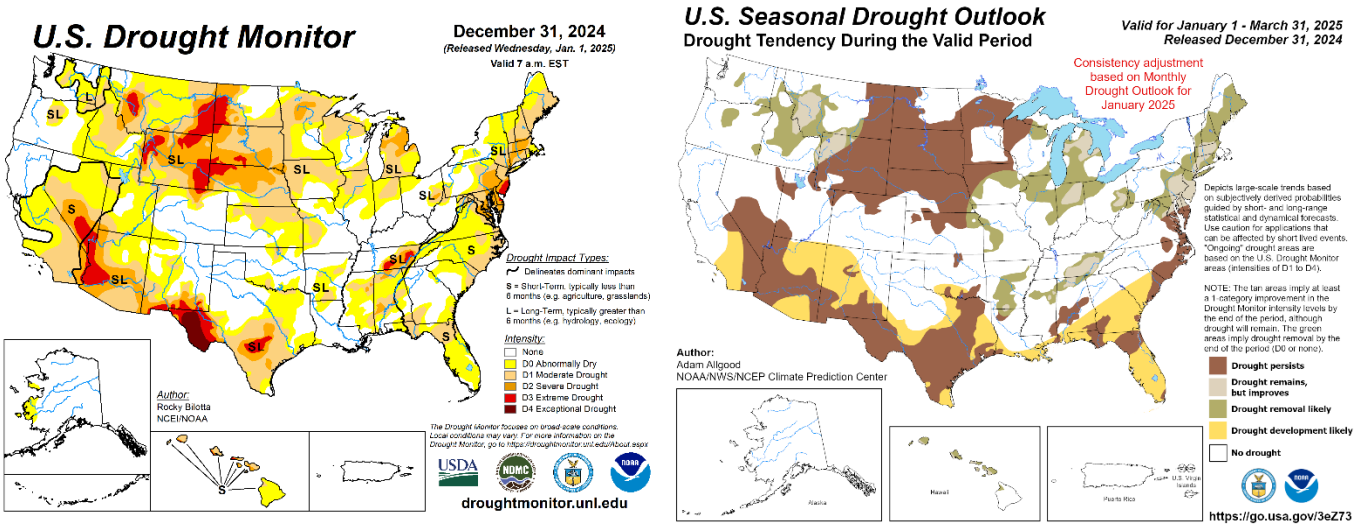

Figure 3 – Current US Drought Monitor and seasonal drought outlook.

ENSO Watch – Sea surface temperatures (SSTs) remain near-to-below average in the central to eastern equatorial Pacific (Figure 4) but continue to hover within ENSO-neutral conditions. The Climate Prediction Center (CPC) is continuing the La Niña watch with current modeling plumes forecasting SSTs remaining near average to below average during the first quarter of 2024. The CPC has a 59% chance of La Niña conditions developing during January but transitioning quickly back into ENSO-neutral by March to May 2025. The official outlook from numerous agencies confirms this forecast with the outlook calling for a weak and likely short duration La Niña during the spring. Even with the more neutral conditions, the conditions so far this month have been more La Niña-like and the seasonal forecast is also holding to a La Niña influence over the next 90 days. The result is that northern California northward into the PNW are likely to see a cooler/wetter winter, while California, Nevada, and the southwest have higher odds of being warmer and drier during the winter (see the 90-day forecast below). However, I still believe that conditions in the North Pacific have had an outsized influence on the conditions so far this winter and are likely to continue to do so into the spring.

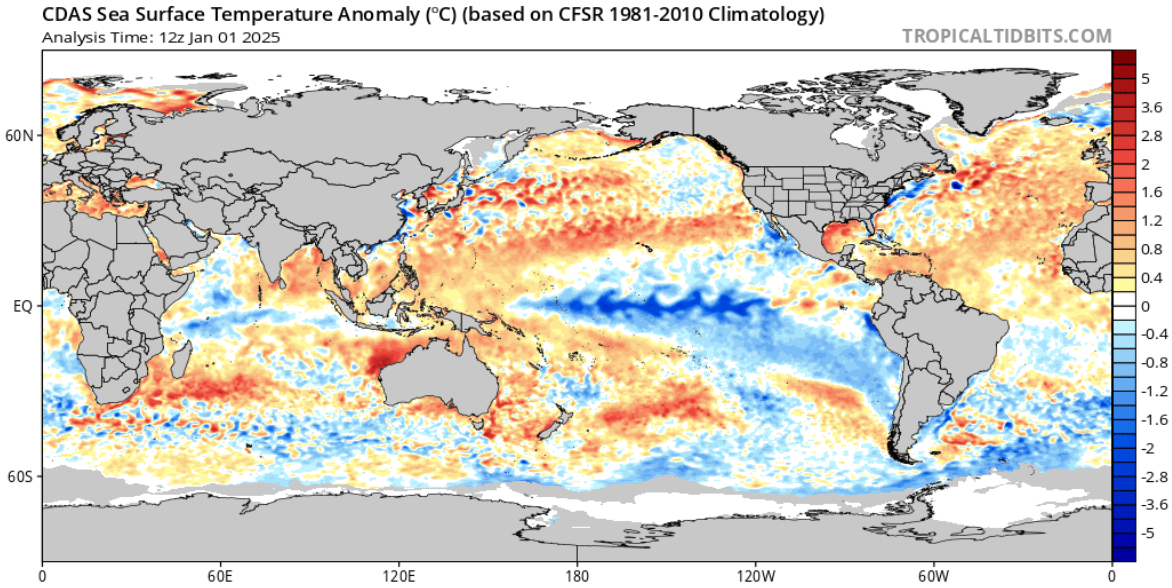

Figure 4 – Global sea surface temperatures (°C) for the period ending January 1, 2025 (image from Tropicaltibits.com).

North Pacific Watch – Not much change in the SST pattern over the North Pacific during the last month. Small shifts include the Bering Sea continuing to warm slightly, the Gulf of Alaska also now warming slightly, and the magnitude of cooling in and around Baja California slightly more than last month (Figure 4). Coastal zones from the Oregon-California border southward have cooled slightly with the typical winter northerly wind field bringing more upwelling this time of year. Otherwise, the majority of the central to western North Pacific remains warmer than average at this time. The pattern in SSTs in the North Pacific continues the long run of the Pacific Decadal Oscillation (PDO) which has been in a strong negative phase since early 2020. During winter, the negative phase of the PDO typically brings warmer than normal conditions for much of the southern and eastern states, while the west coast and the PNW are normally colder than normal. Precipitation is normally mixed over the lower 48, with typically a wetter, snowier winter in the PNW and northern Rockies, and drier conditions across southern regions. Conditions so far this winter have followed what the historical data would indicate.

Forecast Periods:

Next 5 Days: Wet period continues north, and dry period continues south. Off and on again rain for northern California into the PNW, then some drying into the next forecast period. Temperatures will remain warmer than average in the PNW. Mild and dry south of the Bay Area.

6-10 Day (valid January 8-12): A ridge in the west and a trough in the east will keep the western US warmer than average while the eastern US will experience the coldest air of the winter so far. Frigid continental air will cover most of the east with significant wind chill temperatures and freezing conditions into the southeast, Gulf Coast states, and Florida. The ridge in the west should keep most of the region dry with the exception of showers in the far northwest. The ridge will also bring moisture sliding down the east side bringing above average precipitation to the Plains and Great Lakes, which given the cold air in place likely means snow and plenty of it.

8-14 Day (valid January 10-16): The ridge-trough flow over the US continues into mid-month with warmer air over the west and colder air over the east. Temperatures will likely stay above average for the western US, transition to near normal in the Rockies and Plains, and then shift to much below normal in the eastern half of the country. Precipitation will continue to follow this ridge-trough flow, with the western US forecast to see a dry mid-month, eastside sliders keeping the Rockies and Plains wetter than normal, and the coldest air in the east staying mostly dry except along the Great Lakes where lake effect snow will likely continue.

30 Day (valid January 1-31): Not long ago January looked like it might be quite cold in the west, however, the forecast for the first month of 2025 is now pointing to the western US likely to see above average temperatures for the month. Southern Oregon, California, Nevada, and into the southwest have the highest probability of being warmer than average. The middle of the country has equal chances for slightly above to below temperatures with much of the eastern US likely remaining below average for the month (Figure 5). The January forecast for precipitation continues to show the likelihood of a wetter PNW, near average central California, and a high probability for southern California and the southwest remaining dry. The rest of the country is mostly forecast to have equal chances for above to below average precipitation for the month of January, except New England which is likely going to see above average amounts (Figure 5).

90 Day (valid January-February-March): Even though the La Niña has not materialized to the degree it was expected to, the seasonal forecast continues to be dominated by the expected conditions driven by La Niña events (see ENSO Watch above). As such the 90-day forecast maintains a cooler than average northern tier of states (Figure 5) with the greatest probability for below average temperatures from the PNW across to the Plains and western Great Lakes. The seasonal forecast for the southern tier of states is holding to likely seeing above average temperatures that extend into the mid-Atlantic and New England. Precipitation over this period is forecast to also deliver the expected La Niña pattern of a greater probability of being above average across the northern tier of states while the southern tier of states is forecast to experience below average precipitation over the next 90 days (Figure 5). The Ohio River valley and the Great Lakes are expected to see above average precipitation during the second half of winter.

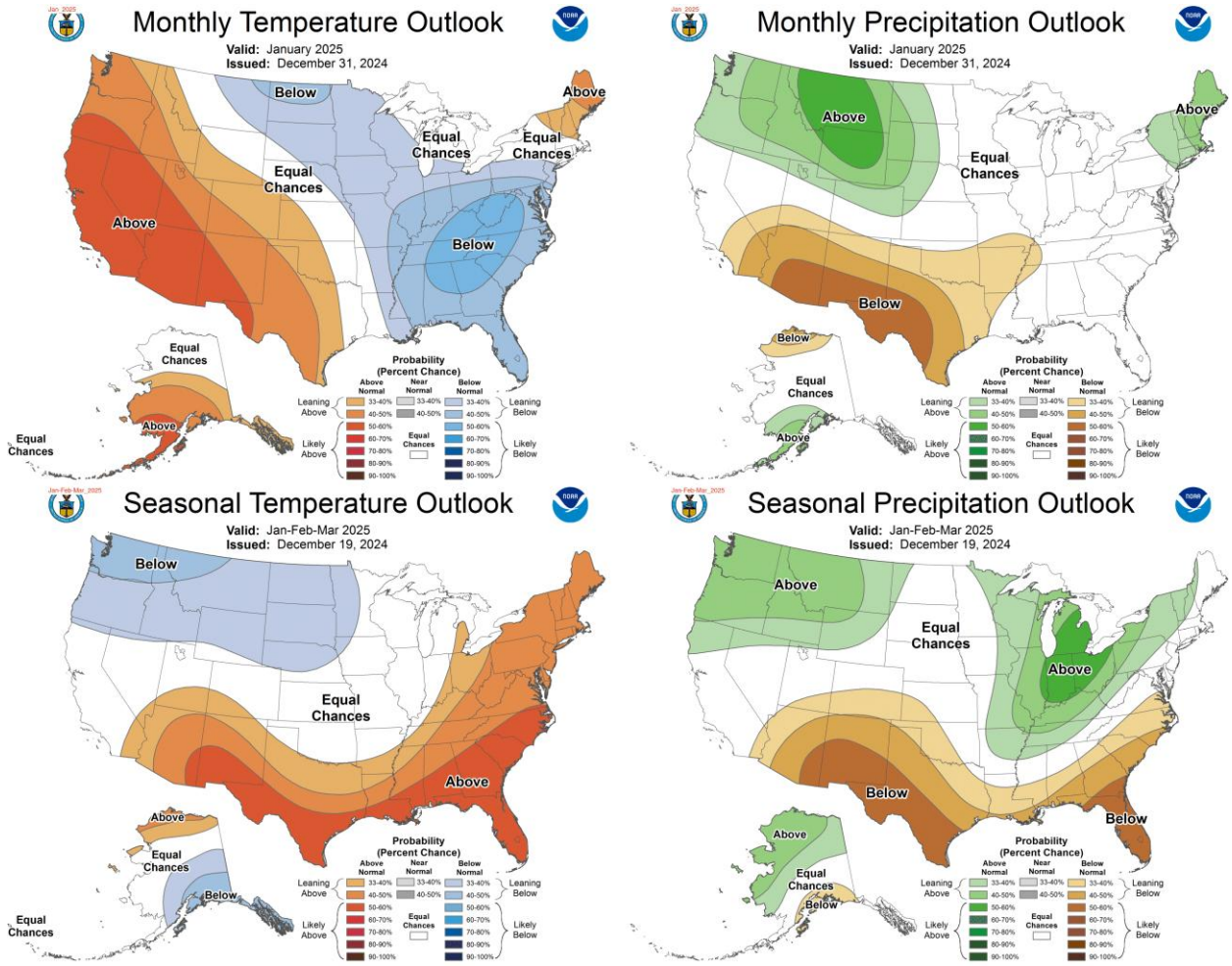

Figure 5 – Temperature (left panel) and precipitation (right panel) outlooks for the month of January (top panel) and January, February, and March (bottom panel) (Climate Prediction Center, climate.gov).

Gregory V. Jones, Ph.D.
CEO, Abacela Vineyards and Winery
TEL: 541-324-9269
EMAIL: greg@abacela.com

Abacela®
AN ICON OF INNOVATION EST. 1995