

# Weather and Climate Summary and Forecast November 2024 Report

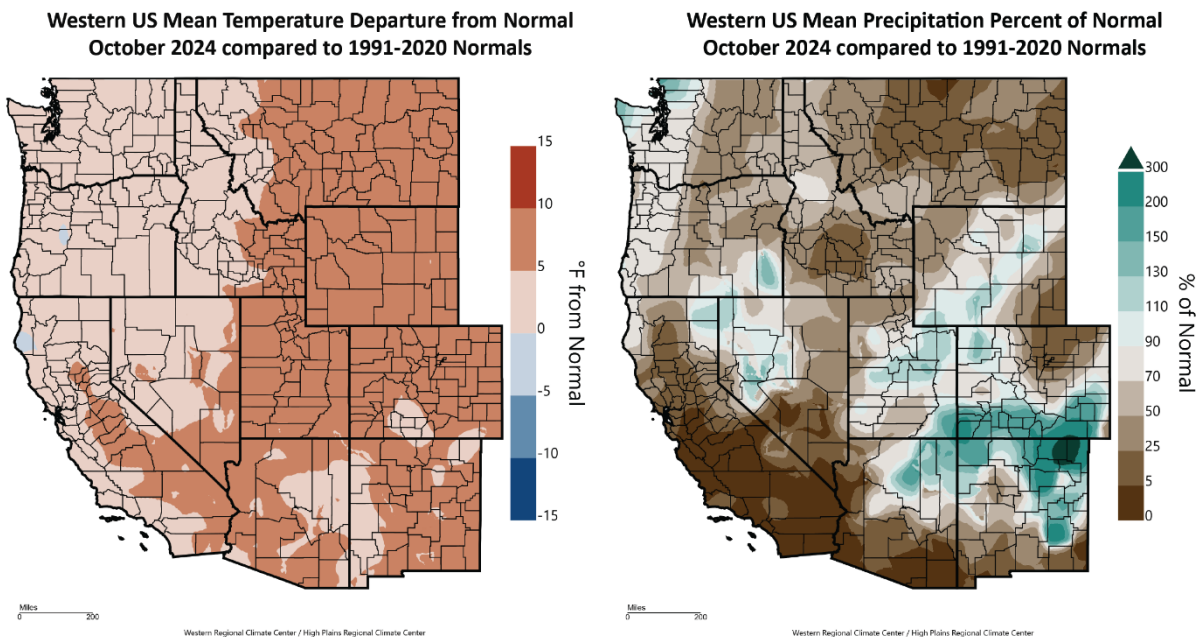
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November 3, 2024

## Summary:

- A relatively mild October turned seasonal late in the month with temperatures ending up moderately warmer than average<sup>1</sup> for most in the west, especially in the desert southwest and the Rockies.
- In general, October was dry over the west, with the far PNW seeing fronts dropping out of the Gulf of Alaska bringing some rain late in the month. Inland regions in the Basin and Four Corners also received some rain during the month while most of California had 50% or less of normal rainfall.
- For the 2024 vintage, growing degree-day accumulations ended higher than average over most of the west, except along coastal zones and within a few mountain-valley areas.
- A reasonably active storm train continues out of the Gulf of Alaska bringing pretty typical November weather for many. Most of the action is pointed to the northern coastal and inland areas of Washington, dipping south into Oregon and Northern California. Off and on again rain for much of the west through the end of November, except southern California and the southwest where drier conditions are likely.
- The seasonal outlook continues to point to a mild to cool and wet November, followed by what looks like a stormy, cold, and wet December and January.
- The Climate Prediction Center (CPC) is favoring La Niña conditions developing in September-November (60% chance) and is expecting it to persist through January to March 2025. However, the overall sentiment is that this La Niña will likely be a weak event with a short duration. With the PDO in a strong negative phase and a likely weak La Niña, I am leaning the odds more to average or below average temperatures and wetter with decent snowpack development, especially in the PNW.

## Past Month and Year to Date:

October continued a run of very nice conditions to end the 2024 vintage. Generally mild to warm temperatures and not much precipitation until late in October made for a vintage with little to no pressure to pick until the fruit was showing its best flavors and acidity. Overall, October 2024 was largely warmer than normal over the western US (Figure 1). The warmest conditions were seen across the south and southwest into the Rockies and northern Plains while the inland



**Figure 1** – Western US October 2024 temperature departure from normal (left) and percent of normal precipitation (right; images from Western Regional Climate Center, 2024: ACIS Climate Maps)

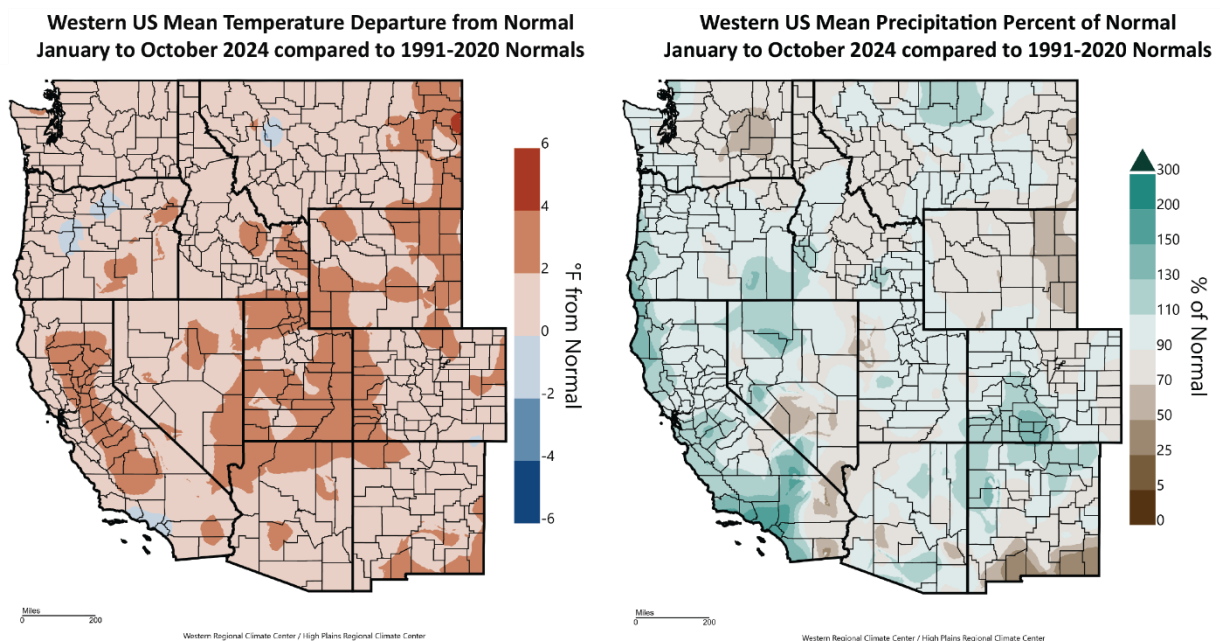
<sup>1</sup> Note that all references to normal or averages in this report are to the 1991-2020 climate normal for each weather/climate parameter unless stated otherwise. See this website (<https://www.climateofwine.com/climate-normals>) for more information on climate normal.

PNW ended up closer to average. The Plains south to Texas experienced the warmest conditions in October with temperatures 3-8 degrees above average, while the eastern US had record breaking temperatures late in the month (not shown).

The western US experienced a relatively dry October 2024 with much of the region seeing less than 90% of normal and a significant area of California and the southwest seeing 5% or less of average (Figure 1). Wetter than average areas included the far western areas of the PNW, portions of the Great Basin, and the Four Corners region. Precipitation across the rest of the country was dominated by amounts received from Hurricane Milton where some areas saw 200 to 500% of normal amounts. Otherwise, the eastern portion of the US saw between 10 and 50% of normal precipitation for the month of October (not shown).

The relatively warm and dry October did not alter the year-to-date temperature differences over the western US much. The region continues to see a warmer than normal 2024 with the majority of the west averaging 0.5-4.5 degrees above normal (Figure 2). Some areas continue to run slightly cooler than average, including portions of the south coast of California, north-central Oregon, and a small area of Montana where temperatures 0.5-1.5 degrees below average have been experienced (Figure 2). These cooler areas in the west are the exception to the pattern across the rest of the continental US where temperatures remain 2-6 degrees warmer than average year-to-date (not shown). The warmest conditions continue to be seen across the northern Plains, the Great Lakes, the upper Midwest, and New England.

Again, not much change from a dry October with the year-to-date precipitation for the western US largely remaining near average to above average with values ranging from 90-200% (Figure 2). The areas that have seen the wettest conditions have been over much of coastal to inland California and especially the south coast, along with the Four Corners region. Most of Oregon and the Great Basin have seen 90-130% of average precipitation so far this year. The driest regions have been across much of eastern Washington and the northern Rockies of Montana and Idaho, which have experienced 50-90% of normal precipitation (Figure 2). The rest of the country has seen a largely wetter than average year-to-date, with eastern Texas, the Gulf States, the southeast, and northward into the Great Lakes and New England seeing the greatest departures, while the driest area of the country remains southern New Mexico, west Texas, and portions of the central and northern Plains (not shown).

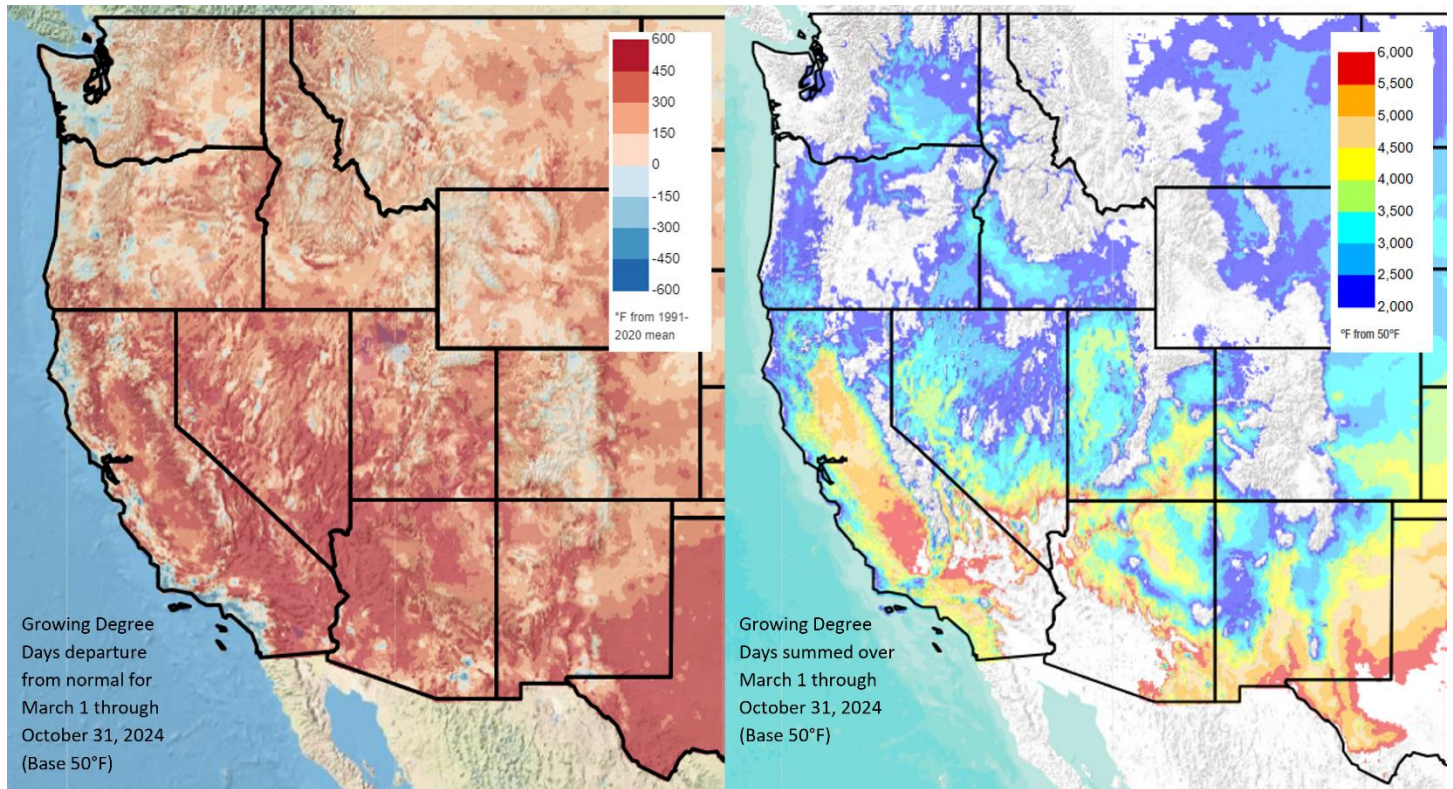


**Figure 2** – Western US year-to-date (January 1 through October 31, 2024) temperature departure from normal (left) and percent of normal precipitation (right; images from Western Regional Climate Center, 2024: ACIS Climate Maps).

### Heat Accumulation:

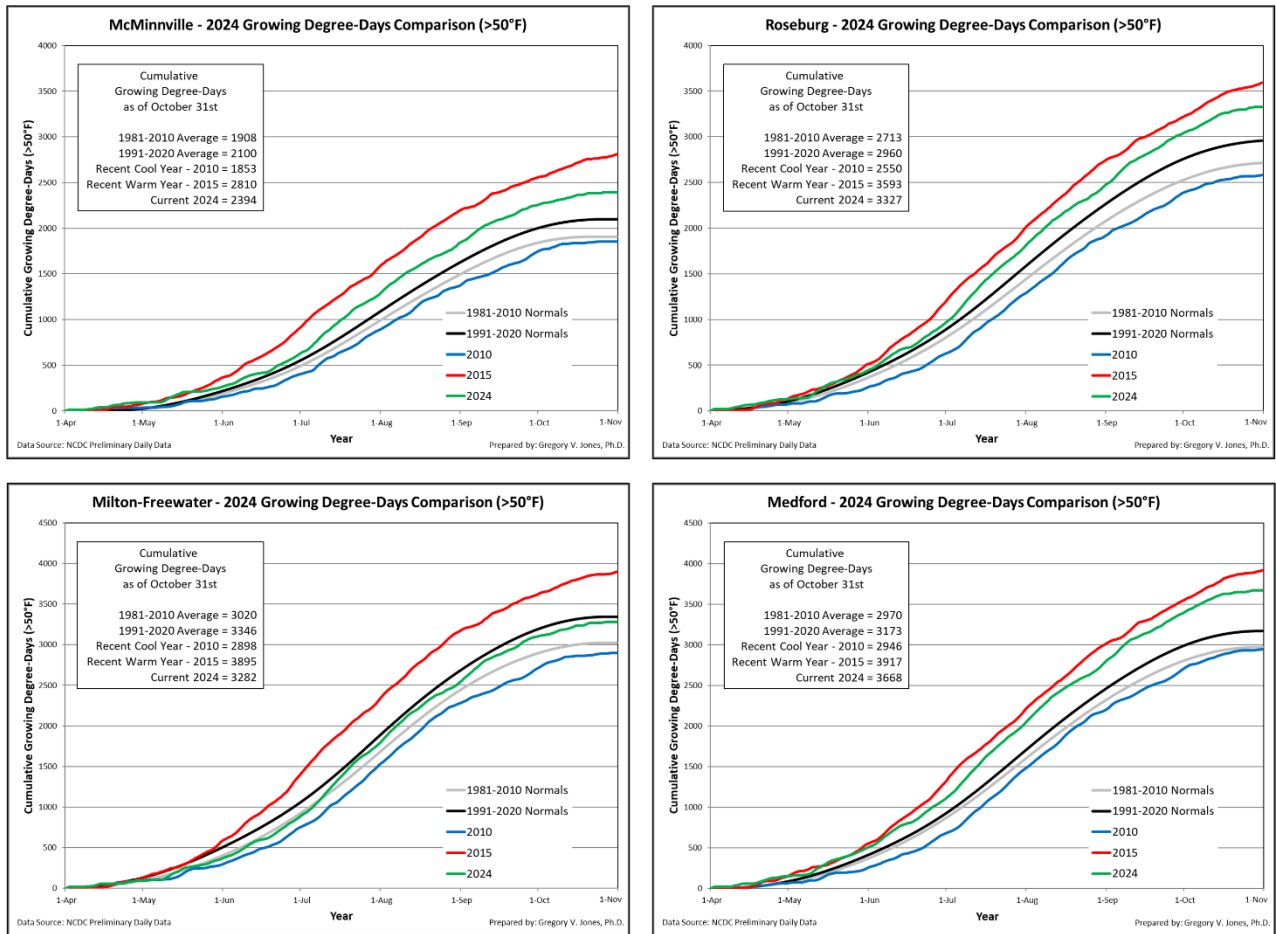
With the end of the growing season, we can now look at the final growing degree-day departures and totals over the western US. March through October heat accumulation departures show that the vast majority of the western US ended the vintage above the 1991-2020 climate normals (Figure 3; left image). Averaged over the entire western US, growing

degree-days ended roughly 5-20% above average. Interesting patterns for slightly below average locations include coastal zones in California, Oregon, southeastern Washington, and scattered valleys and mountainous areas, especially in portions of inland northern California and Oregon where smoke from fires lowered accumulations by 5-10% for portions of the growing season. Total growing degree-day amounts for the western US show the expected pattern of higher accumulation in the warmer regions of the Central Valley and southern portions of California and regions in the southwest. GDDs range from 4500 to 6000 or more during March through October (Figure 3; right image). Intermediate GDD accumulations between 2500 to 4000 occurred in the western valleys of Oregon, eastern Washington and Oregon regions, and the Snake River Valley and Lewiston regions of Idaho. Portions of the Willamette Valley and Puget Sound and valley extensions in many regions saw GDD values between 2000 to 2500.



**Figure 3** – Western US March through October 2024 growing degree-day departures from the 1991-2020 climate normal (left panel) and total growing degree-days summed during the same time period (right panel) (images from Climate Impacts Research Consortium, University of Idaho). Note that in the right panel areas with GDD less than 2000 or greater than 6000 are not shown.

Examining the end of season growing degree days for stations in the four main wine regions in Oregon in Figure 4 reveal the relatively warm growing season with the Willamette, Umpqua, and Rogue valleys seeing GDD 9-25% above the 1981-2010 climate normals and 12-14% above the 1991-2020 climate normals, while eastern Oregon ended up 9% above the 1981-2010 climate normals but 2% below the 1991-2020 climate normal (Figure 4). These locations ended up right at the average of the last 15 years (Milton-Freewater) to just over 9% above average (Roseburg). Compared to the 2023 vintage, 2024 GDDs at these four locations ended up 1-9% below (in order of % below, McMinnville, Milton-Freewater, Medford, and Roseburg).



**Figure 4** – Cumulative growing degree-days (base 50°F, no upper cut-off) for McMinnville, Roseburg, Milton-Freewater, and Medford, Oregon. Comparisons between the current year (2024) and a recent cool year (2010), a recent warm year (2015), and both the 1981-2010 and 1991-2020 climate normals are shown (NCDC preliminary daily data).

**Drought Watch** – Even with large precipitation inputs from hurricanes Helene and Milton, the broader circulation dynamics across the US brought a significant increase in dryness and therefore drought conditions. While Florida and portions of the mountainous areas of the southern Appalachian show no drought, the majority of the country is in various short to long term drought categories. The dominant drought regions across the US include portions of the PNW across into the northern Rockies, the northern Plains and Great Lakes, New Mexico, Texas and the southern Plains, and the Ohio River valley and central Appalachian mountains. As a result of the broader dry pattern over the past few months, the overall drought footprint for the continental US increased significantly in October to over 87% of the country in drought with the most extreme drought categories rising to nearly 28%. For the western US, the overall drought footprint increased during October to close to 85% with the most extreme categories increasing to nearly 19% of the region. While the latter part of October was relatively wet in the PNW, broader dry conditions have continued. Washington saw a slight increase in its drought footprint to close to 79% of the state in some level of drought with over 9% of the state in moderate to extreme drought. Oregon remained close to 90% of the state in the overall drought footprint, although the most extreme drought categories have dropped off the map. The mountains of northern Idaho and western Montana remain the driest region in the west. Montana remains just above 85% of the state in some level of drought with the extreme categories increasing significantly to nearly 36% of the state. Idaho has risen slightly to nearly 92% of the state now in some level of drought and risen to nearly 14% in moderate to extreme drought. California also continues to see its drought footprint increase, with nearly 75% of the state in some level of drought and just over 4% of the state moving into the more extreme categories (Figure 5).

The seasonal drought outlook considers the drought developments over the US in the last 60-90 days (see above) and the seasonal forecast (see below). As such the next 90 days adds some broader areas of concern. Namely, the Climate Prediction Center is forecasting that drought conditions are expected to persist over significant portions of the northern Rockies and Plains, the southwest, and across the southern states into Gulf states where a broad area of the

country is anticipated to see drought develop (Figure 5; right panel). Areas of the PNW remain in the forecast as likely to see conditions improve or be completely removed from drought as we move into the first half of winter. Areas of the mid-south into the Great Lakes, portions of the Ohio River valley, and the east are also forecast to see continued improvement or altogether removal from drought.

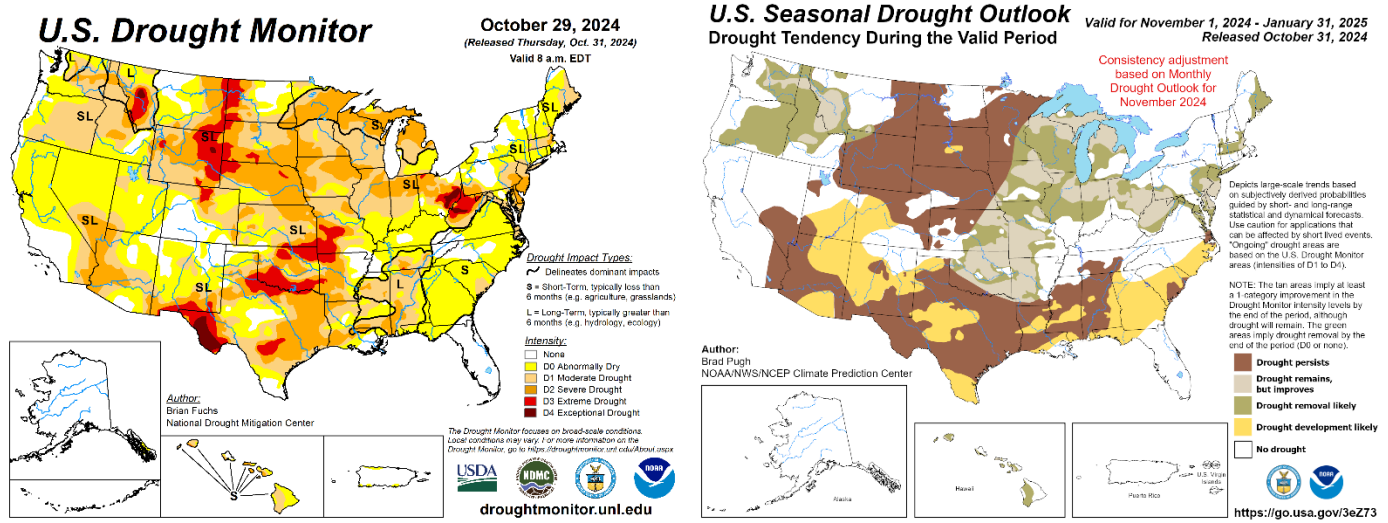


Figure 5 – Current US Drought Monitor and seasonal drought outlook.

**ENSO Watch** – The current end of October update indicates that ENSO neutral conditions persist in the western equatorial Pacific (Figure 6). Equatorial sea surface temperatures (SSTs) are near average to below average in the central and eastern portions of the Pacific Ocean. Moderate upwelling continues off South America and extends across the Pacific driven by strengthening trade winds. Similar to past months, oceanic and atmospheric drivers are all showing signs of La Niña development. Current predictions from NOAA and the Climate Prediction Center (CPC) have La Niña conditions favored for the September-November 2024 period (60% chance) and are expecting it to persist through January to March 2025. Not much change in the overall sentiment that this La Niña will likely be a weak event with a short duration. A weak La Niña often indicates that it would be less likely to result in conventional winter impacts over the western US and throughout the Pacific region, though predictable signals could still influence drought forecast guidance over the short term. After the slow start to this La Niña appeared to have resulted in a relatively quiet hurricane season, strong systems severely impacted the US with Helene and Milton causing widespread damage in the southeast and Florida. Hurricane season continues to the end of November, with hints at conditions conducive to more storms developing.

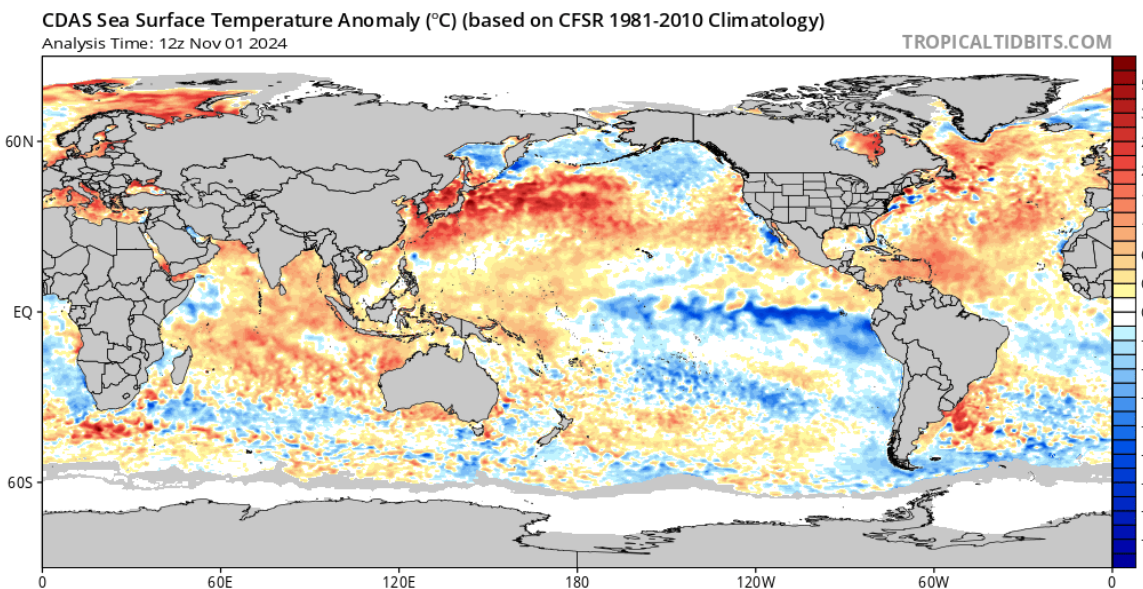


Figure 6 – Global sea surface temperatures (°C) for the period ending November 1, 2024 (image from Tropicaltibits.com).

**North Pacific Watch** – The general pattern in SSTs over the North Pacific is nearly the same as last month. Small shifts include the Bering Sea continuing to warm slightly, the Gulf of Alaska cooling slightly, and the magnitude of cooling in and around Baja California slightly less (Figure 6). 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 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 and is at its greatest negative value since this negative pattern developed. 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.

#### **Forecast Periods:**

**Next 5 Days:** Reasonably active storm train moving out of the Gulf of Alaska bringing pretty typical November weather for most. Most of the action is pointed to the northern coastal and inland areas of Washington, dipping south into Oregon and Northern California. Rain and mountain snows are likely in the northern Cascades and Sierra mountains with temperatures near average to below average. Central to southern California will not likely see much rain from these low pressure areas and temperatures will likely remain seasonal.

**6-10 Day (valid November 7-11):** A decent chance for a little warming to start this forecast period as a ridge builds. Conditions look to break down later in the forecast period, with more rain and mountain snow from northern California into the PNW. A cooler period over the desert southwest, while the eastern 2/3<sup>rd</sup> of the country is likely to continue to see above average temperatures, especially in the southeast and Florida. The northern tier of states is likely to stay relatively dry for this time of year, especially in New England. The wettest portion of the country is likely to be the panhandle region and southern Plains.

**8-14 Day (valid November 9-15):** Typical November pattern picks up into mid-month with low pressure areas dipping south bringing off and on again rain to the west coast. More rain and wind likely the further north along the western states, but everyone should get in on some precipitation during this forecast period. Temperatures are likely seasonal, but cold enough to help to build snowpacks. The eastern 2/3<sup>rd</sup> of the country continues to be forecast to see temperatures above average for this time of year. This results from the broad troughing pattern in the west and ridging in the east. Precipitation is widely forecast for much of the country, except New England and the extreme southwest which are forecast to remain dry into mid-month.

**30 Day (valid November 1-30):** The general temperature forecast framework for the country, cooler in the west and warmer in the east remains in the outlook (Figure 7). While the western US has equal chances in this temperature outlook, I am leaning the odds more to average or below average given everything else I am seeing. The eastern US does look to continue the quite warm fall with most of the eastern 2/3<sup>rd</sup> of the county forecast for above average temperatures. No dominant precipitation variation is forecast for around the country in November. Some indication of a higher likelihood for a wetter month in the inland PNW, the southern Plains into the western Great Lakes, and the possibility of dry conditions for portions of the east coast (Figure 7), otherwise equal chances for the rest of the country.

**90 Day (November-December-January):** The seasonal outlook continues to point to a mild to cool and wet November, followed by what looks like a stormy, cold, and wet December and January. Spread over the three month forecast, the map in Figure 7 indicates that portions of California into the PNW and across to the Great Lakes have equal chances of above to below normal temperatures. However, with the Tropical Pacific appearing to head into a La Niña, I would tilt the odds to cooler than normal. Much of the rest of the country is forecast for a warmer than normal mid-winter period, especially in the southwest and Texas. In terms of precipitation, besides the PNW and upper Great Lakes, the bulk of the northern portion of the US has equal chances for above to below normal amounts, while the warmer forecast for the southern tier of states appears to be associated with a good chance for a drier than normal mid-winter (Figure 7).

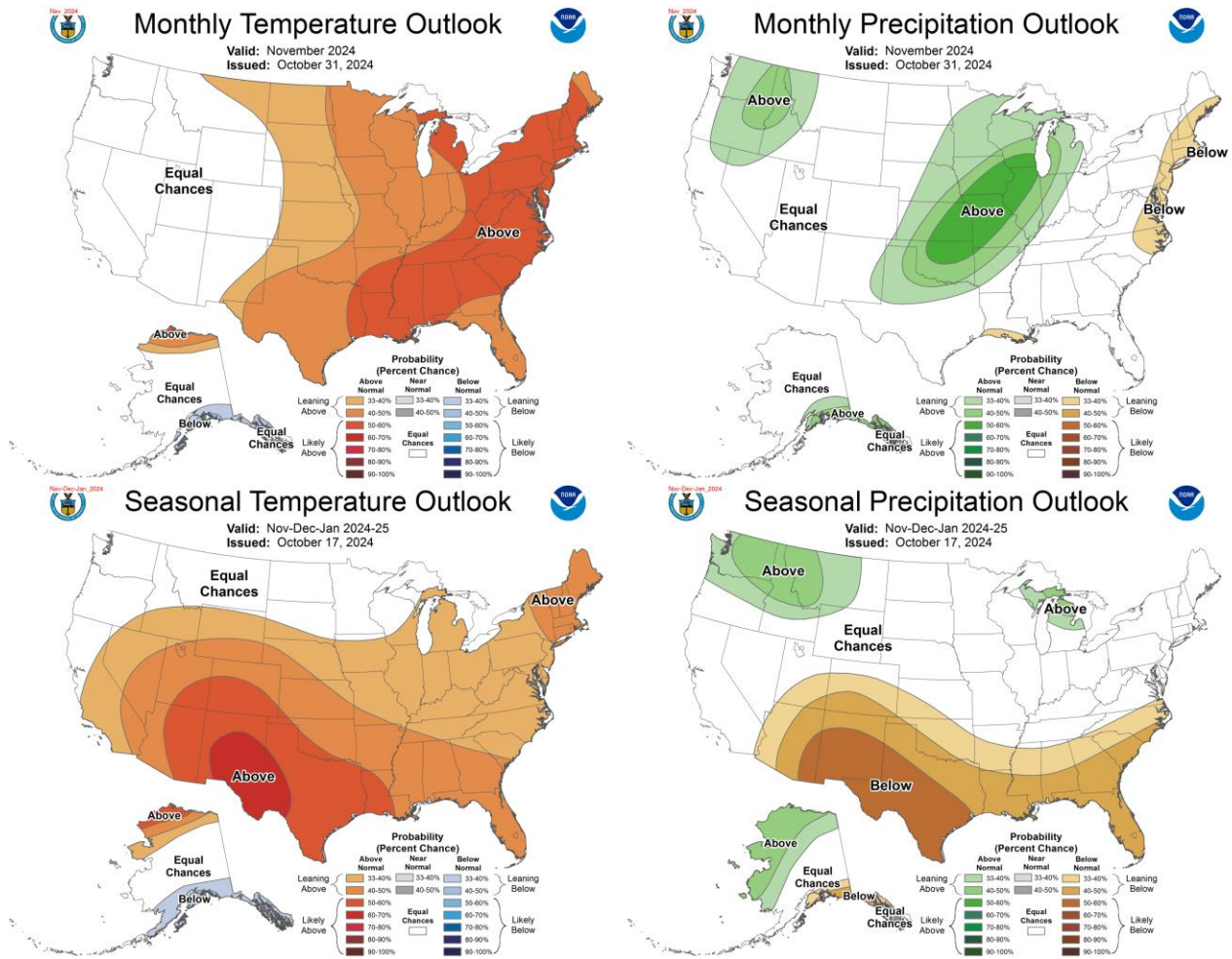


Figure 7 – Temperature (left panel) and precipitation (right panel) outlooks for the month of October (top panel) and October, November, and December (bottom panel) (Climate Prediction Center, climate.gov).

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