

Weather and Climate Summary and Forecast

February 2022 Report

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February 3, 2022

Summary:

- An eastward shift in the North Pacific high-pressure area essentially shut off the faucet for the west. The result was a whiplash from a wet December to near record-breaking dry in January.
- January was largely warmer than average¹ over the west, with the exception being inland valleys in the PNW, where stagnant air led to inversions with cold air at the surface and prolonged fog occurrence.
- While drought concerns were lowered in December, they roared back in January. Over 95% of the west is still in some level of drought, but the good news remains that the most severe to exceptional drought conditions have dropped to ~20%. Chances for drought improvement remain but are disappearing with every dry day.
- The eastward shift of the Pacific high-pressure area in January has the west largely locked into a dry first half of February. The forecast for the second week of February is pointing to colder conditions, but not clear on precipitation at this point but my read of the models says near average north, below average south.
- The second half of winter continues to be strongly influenced by cool SSTs in both the northern and tropical Pacific. The current seasonal forecast is calling for a cool spring for most of the west, with near-average precipitation in the PNW and drier than average south and east.

Past Month and 2021-22 Water Year to Date

January was largely warmer than normal over the western US with most of California, Oregon, western Washington, the southwest, and Rockies near average to above average (Figure 1). A cooler than average month was experienced in the Columbia and Snake River valleys due to stable air and persistent fog. The rest of the country saw temperatures that were near average to well below average with portions of the northern Plains and western Great Lakes seeing temperatures 5-8°F below average for the month (not shown). For precipitation, the big story in the west was how quickly we turned dry. This was caused by the high-pressure ridge, which had been out over the Pacific allowing storms southward along the west coast most of December, moving eastward and staying in place for much of the month. The

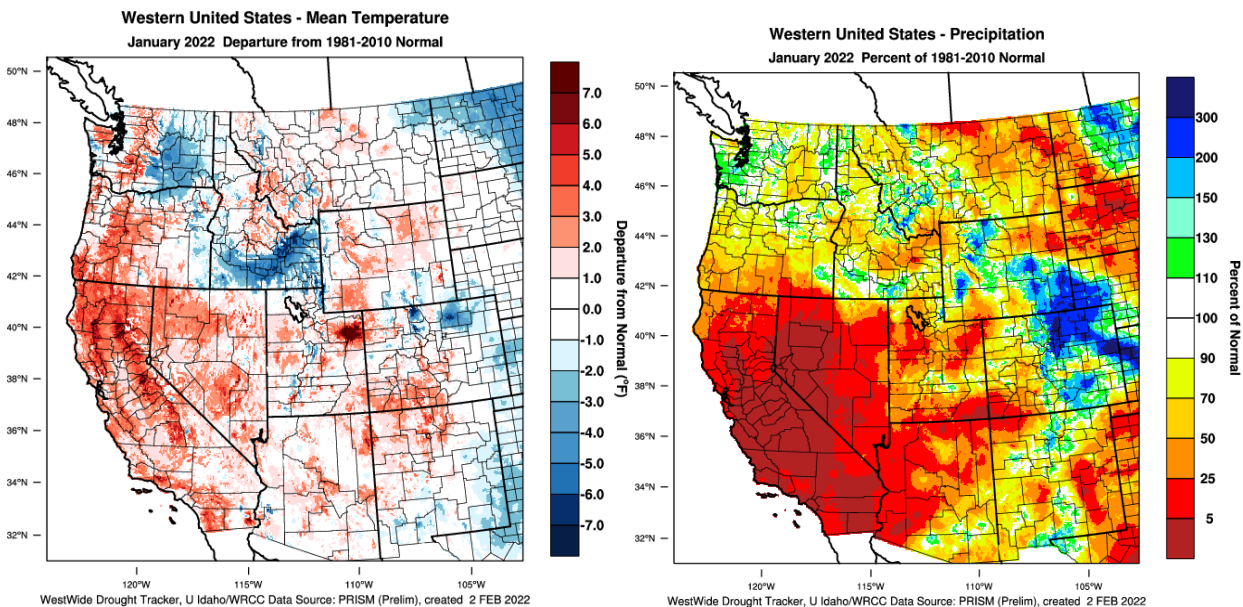


Figure 1 – Western US January 2022 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

¹ Note that all references to normal or averages in this report are to the 1981-2010 climate normal for each weather/climate parameter unless stated otherwise. Also, note that the 1991-2020 climate normals are starting to become available across reporting agencies and will be used in this report when possible.

result was the blocking of storms northward and mostly stagnant airflow, fog, poor air quality and high pollen counts, and dry conditions for much of the west (Figure 1). The rest of the country was mostly dry during January, with only the Front Range, the Ohio River valley, and a small area of the northern Plains seeing a wetter than average month (not shown).

Moving from annual to water year reporting, the period from October through January in the western US has so far seen temperatures mostly above average, although coastal zones and scattered isolated areas are closer to average (Figure 2). The bulk of the rest of the country is also warmer than average for the water year to date, with only the northern Plains experiencing closer to average temperatures for the year (not shown). Precipitation amounts for the water year show the large inputs from the October rains and December snows, especially in the Sierra Nevada mountains, the Great Basin, portions of the Rockies, and to a lesser degree the northern Cascades (Figure 2). Areas of northern California, western and central Oregon, and eastern Washington are running near average to below average for the water year to date. Current snow water equivalents in snow basins in the west are fortunately mostly near average but are rapidly receding due to the lack of additional inputs in late January and are likely to continue falling from near normal values given the forecast for much of February (see Forecast Periods below). Moving out of the Rockies, the northern Plains and portions of the Great Lakes and Ohio River valley is experiencing a wet water year to date, while the southwest across the Gulf Coast to the mid-Atlantic has seen a dry period so far (not shown).

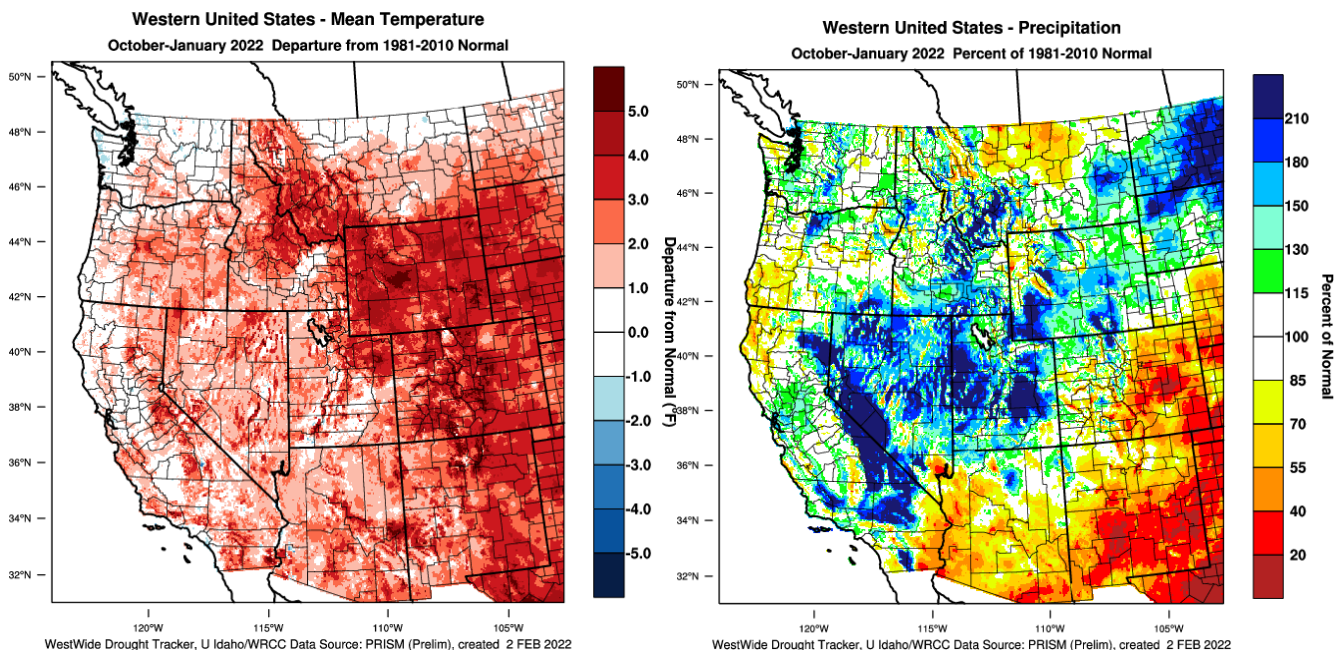


Figure 2 – Western US water year to date (October 2021 to January 2022) temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

Drought Watch – After early month storms brought some much-needed precipitation, January went very, dry pushing much of the west back into the continuing drought conversation. High elevation snowpack in parts of the West, which received a bump from some big storms in December has begun to drift away from the above-normal values. As such drought conditions have inched back for many with the current Drought Monitor depicting over 95% of the west is still in some level of drought (Figure 3). Early winter precipitation has lowered areas with the most extreme drought conditions (extreme and exceptional) from over 50% three months ago to close to 20% today. Drought zones continue to extend across the Rockies, much of the Plains, most of Texas, and the western Great Lakes. Short- and long-term drought indicators from the seasonal outlook (Figure 3, right panel) point to the PNW across to portions of the northern Rockies seeing continued improvement or drought removal through the second half of the winter. However, the outlook continues to show the long-term drought in California, the southwest, Great Basin, and up into the Rockies, while also indicating the likelihood of drought developing further in Texas and the southern Plains. From the Mississippi River eastward the Gulf Coast and coastal zones of the southeast are forecast to see drought conditions develop (Figure 3).

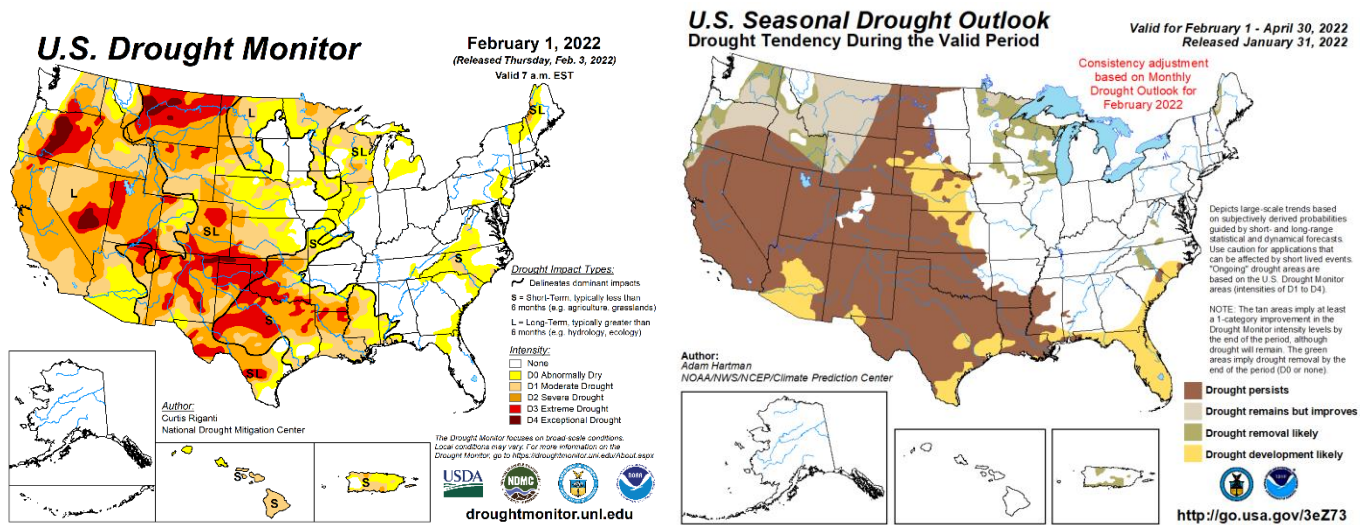


Figure 3 – Current US Drought Monitor and seasonal drought outlook.

ENSO Watch – At the end of January tropical Pacific SSTs in the central-eastern equatorial Pacific remain below normal indicating that La Niña conditions have continued (Figure 4). Following from these cool SSTs, the evolution and current framework of other key oceanic and atmospheric variables are consistent with weak La Niña conditions, and the Climate Prediction Center (CPC) is continuing the La Niña Advisory. Modeling efforts also continue to predict SSTs remaining below average during the second half of winter, and then returning to ENSO-neutral levels during late spring to early summer. The official outlook from numerous agencies confirms this forecast with the outlook calling for a weak La Niña continuing, although the forecast methods vary on the dissipation timing, the probability window is generally from March to May. Even with the weaker La Niña conditions, seasonal model forecasts continue to be influenced, pointing to the PNW likely seeing a cooler/wetter second half of winter, while California is likely to see near average to slightly below average precipitation and temperatures during the second half winter (see the 90-day forecast below).

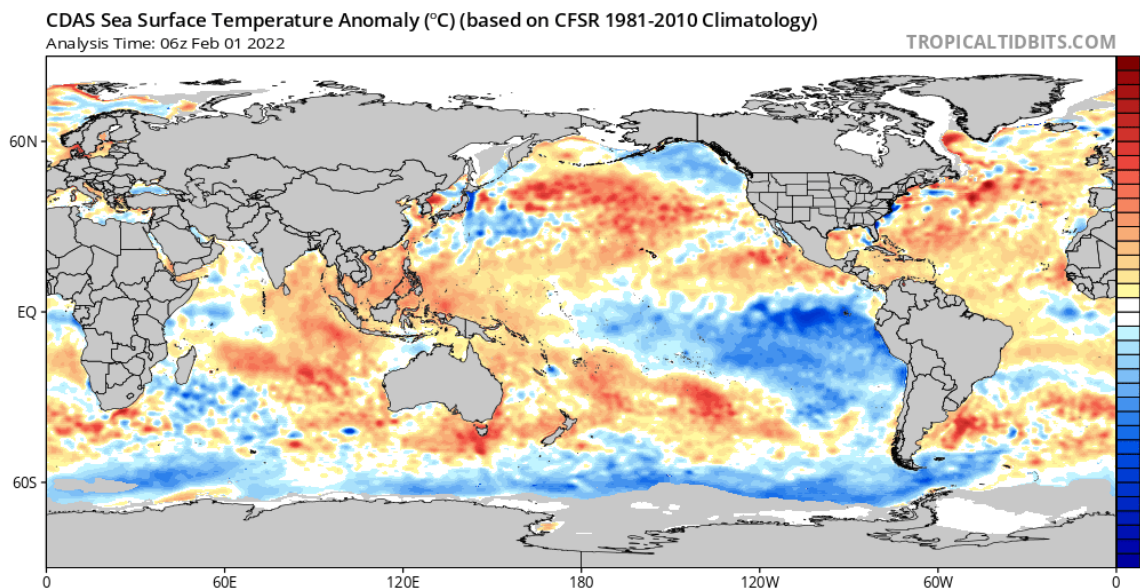


Figure 4 – Global sea surface temperatures ($^{\circ}\text{C}$) for the period ending February 1, 2022 (image from Tropicaltidbits.com).

North Pacific Watch – Following what we have seen for the last six months, the current SST pattern in North Pacific shows a large area in the Gulf of Alaska that continues cooler than average with circulation over the region helping to mix cooler waters to the surface (Figure 4). Warm SSTs still exist over a large area in the central North Pacific, with cooler SSTs occurring southwest from California, and cooler SSTs across the ENSO zone showing a classic La Niña pattern (see above). The Pacific Decadal Oscillation continues to be in one of its strongest negative or cool phases on record. This type of pattern in cooler North Pacific SSTs supports the seasonal forecast showing the tendency for a cooler/wetter

PNW, transitioning to cool and near average precipitation in northern California and to slightly cool and near average to dry overall during the winter in most of California.

Forecast Periods:

Next 5 Days: High pressure continues to dominate the western US. A couple of frontal passages from northern Oregon into British Columbia, but very little precipitation in the forecast. Possible light snow at low elevations in and around the Puget Sound. Enough wind over the next few days to lower the density of fog in most places. Otherwise, cool to average temperatures and dry conditions over most of the west.

6-10 Day (valid February 8-12): Conditions will likely remain influenced by high pressure that has been with us for the last few weeks. The temperature outlook for this period is pointing to likely above-normal conditions for most of the western US with the most likely area being centered on California. Another area of warmer than average conditions is centered in the northern Rockies to northern Plains and across in New England, while New Mexico across Texas and the Gulf Coast to Florida is forecast to see below-average temperatures. Precipitation during this forecast period is likely to be below average across the entire western US. In addition, much of the rest of the country is likely to see a dry start to February with only small portions of the northern Plains, south Texas, Gulf Coast, Florida, and extreme northern New England forecast to see near average precipitation during this forecast period.

8-14 Day (valid February 10-16): Not much change from the previous forecast period with the Pacific high-pressure area holding through mid-month resulting in most of the western US seeing average to above-average temperatures and below-average precipitation. Elsewhere, from the Rockies eastward the bulk of the country is forecast to see near average to below-average temperatures. For precipitation, the northern Plains across to the Great Lakes will likely see above-average conditions while the rest of the country is forecast to see near average to drier than average mid-month conditions.

30 Day (valid February 1-28): It appears that the second half of February will turn cooler than the first half, with the overall month forecast pointing to likely below-average temperatures in the PNW and near average to above-average from Southern Oregon south into California and the southwest (Figure 5). Precipitation for the month is forecast to be near average from northern California into the PNW, while near average to below-average further south into California and the southwest. For the rest of the country, the precipitation forecast calls for the northern tier of states and south in the Ohio and Mississippi valleys to see above average amounts while the rest of the country is forecast to be closer to average. Temperatures are also forecast to remain warmer than average across the south, below-average over the northern Plains, and near average elsewhere (Figure 5).

90 Day (valid February-March-April): The seasonal forecast for the second half of winter, while showing some spatial differences from previous months, continues to show a pattern that reflects the expected influences of La Niña on precipitation and temperatures (Figure 5). Northern California and the PNW across to the northern Plains are expected to see below-average temperatures through April, while just southward of these areas near average temperatures are forecast, which then gives way to the rest of the country likely experiencing a warmer than average FMA period (Figure 5). For precipitation, the pattern of a drier southern tier of states, then equal chances of slightly above to slightly below for the central zone of the country, then above average for the PNW, Great Lakes, and Ohio River valley holds from February through to April (Figure 5).

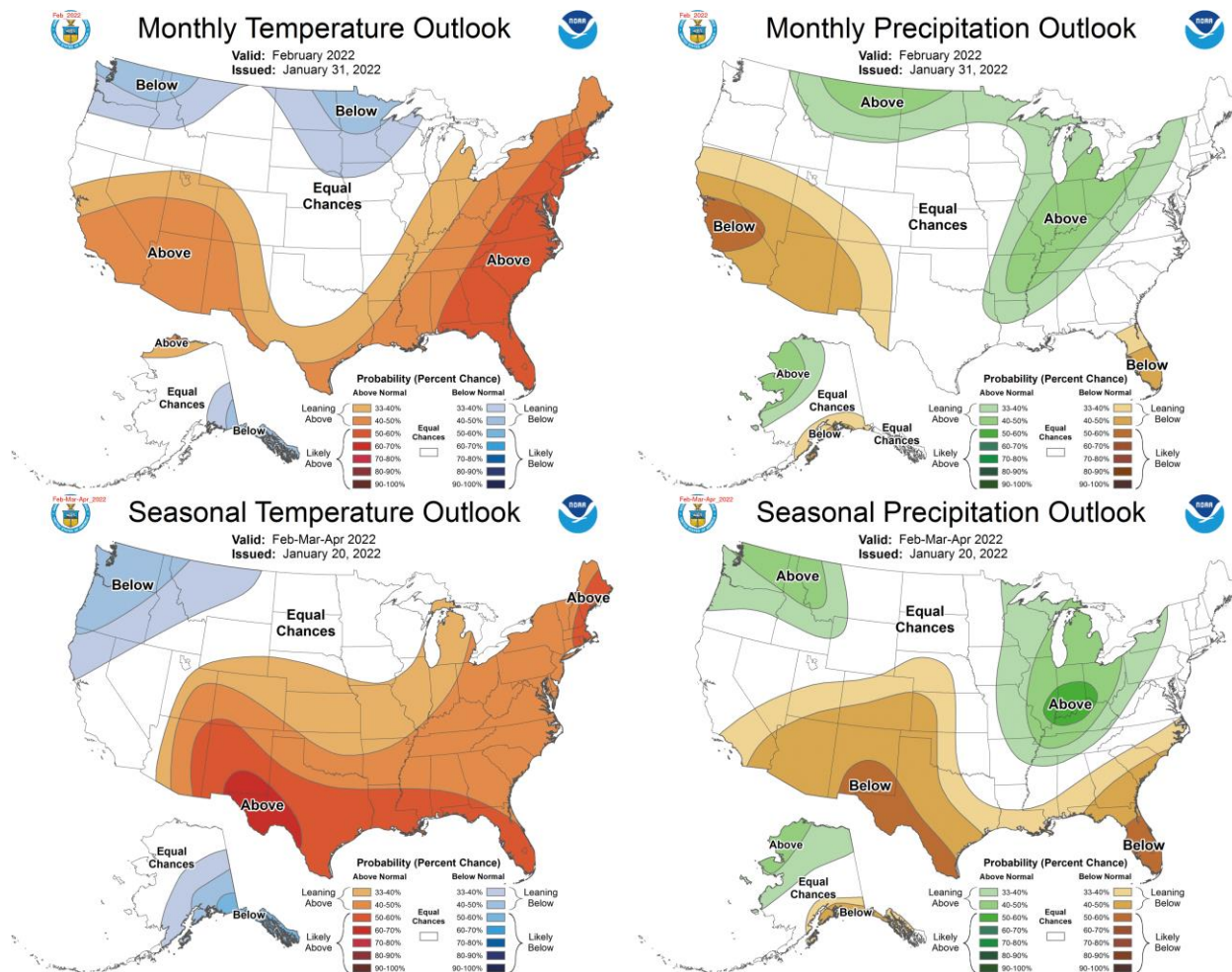


Figure 5 – Temperature (left panel) and precipitation (right panel) outlooks for the month of February (top panel) and February, March, and April (bottom panel) (Climate Prediction Center, climate.gov).

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