Weather and Climate Summary and Forecast
June 2022 Report

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June 6, 2022

Summary:

- The coldest spring since 2010 continued in May for the PNW, while California and the southwest were warmer than average[1]. Plant growth is delayed throughout the PNW and closer to average or ahead of average for areas southward into California.
- The wet spring continued in May for much of the PNW, but unfortunately, already dry regions southward remained dry during the month, adding to the ongoing drought concerns. 93% of the west is currently in some level of drought, with the most severe to exceptional drought conditions rising to 44% of the western states.
- Most everywhere will see a warmup in the short-term, with a few dry days for the PNW and continued dry into California and the southwest.
- Mid-month is expected to bring warm temperatures south and east, while the PNW and northern tier of states will stay closer to average or slightly cooler than average. The PNW will likely still be in play for rain until later in the month.
- The heart of the summer is forecast to see warmer than average conditions over most of the west and the country. The cool June forecast for the PNW, will likely keep the region closer to average temperatures. The summer's seasonally dry period will likely be just that for most, dry.

Past Month and 2022 Year to Date

Continued cold north and warm south for the month of May. The winter-like circulation stayed with us largely throughout May bringing the second cooler than average month for the northern states in the western US with between 2-7 degrees below average temperatures (Figure 1). Warmer than average temperatures for the month were seen from central to southern California and across the southwest. The PNW, northern Rockies, and northern Plains were the coldest portions of the country in May with the rest seeing temperatures above normal with Texas experiencing 4-8 degrees above average (not shown). May saw numerous low-pressure areas spin out of the Gulf of Alaska bringing additional moisture to most areas in the PNW with 150-300% of normal (Figure 1). Unfortunately, these systems did not dip far enough south to bring much, if any, moisture to the driest areas of the west. A dry month was also seen across the south to Texas and the mid-Gulf region, while the central and northern Plains, the Ohio River valley, and the mid-Atlantic experienced a wetter than average month (not shown).

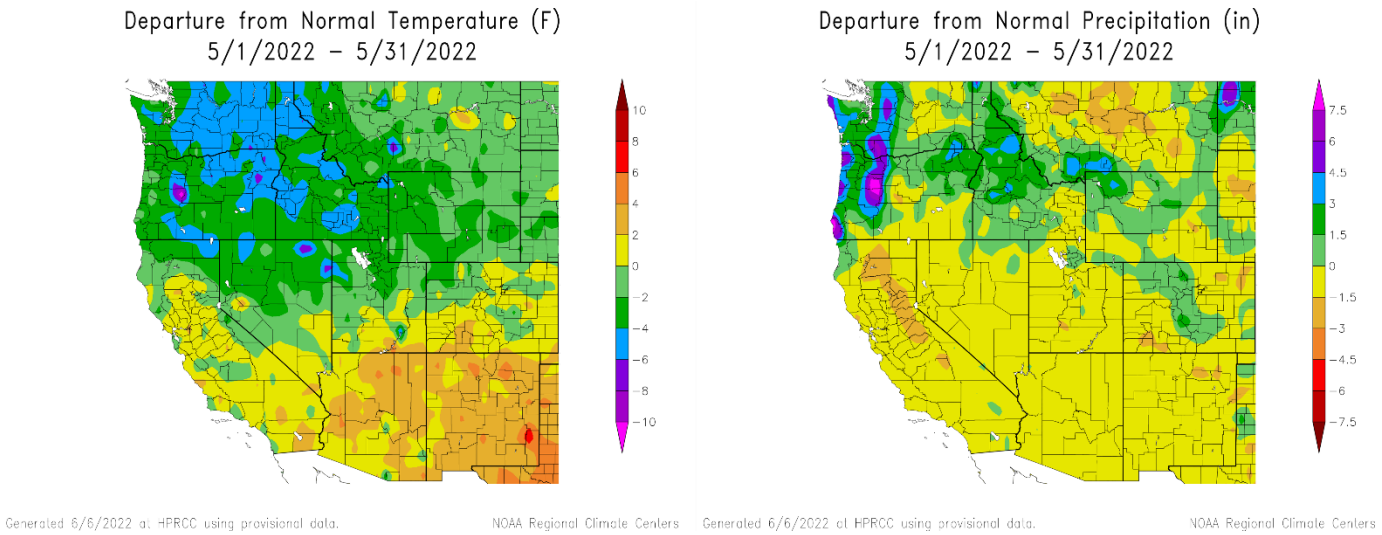

Figure 1 – Western US May 2022 temperature departure from normal (left) and departure from normal precipitation (right; images from the High Plains Regional Climate Center, NOAA).

[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.

The cold spring has moved year-to-date temperatures across the western US to largely cooler than average while most of California and some of the southwest remains warmer than average for the year (Figure 2). The coldest conditions year-to-date have been seen in the inland PNW with eastern Washington, eastern Oregon, the Snake River Valley, and most of Idaho seeing 4-8 degrees below average for the year. The colder conditions year-to-date extend into the Rockies, the Plains, and Great Lakes southward to the southern Plains and portions of Texas, while the southeast and eastern seaboard have been warmer than average (not shown). Year-to-date precipitation amounts remain substantially below average for most areas of the western US, although the relatively wet April and May helped lower the deficits for some areas in the PNW (Figure 2). Continuing the downward trend in precipitation year-to-date, the vast majority of California, Nevada, and the southwest are currently 60% or less for the year with many regions dropping to 20% or less. For the rest of the country, year-to-date precipitation is running below average across the south to Texas and the western Gulf, over much of the southeast, and the Great Lakes, while the northern Plains and central Ohio and Mississippi river valleys up into New England are mostly wetter than average year-to-date (not shown).

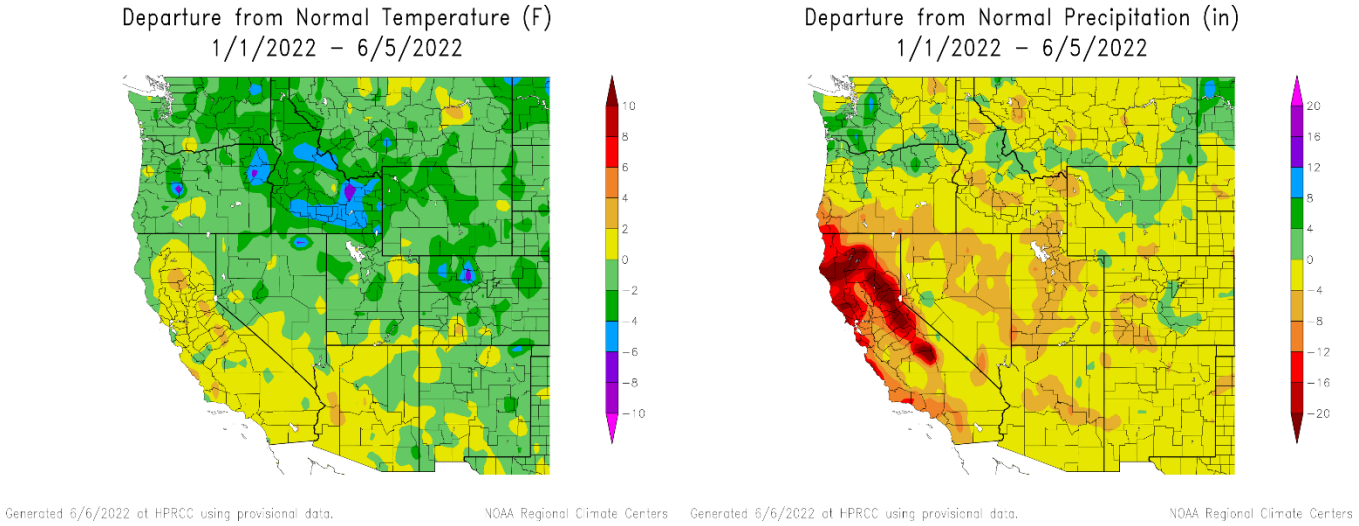

Figure 2 – Western US year to date (January-June 5, 2022) temperature departure from normal (left) and departure from normal precipitation (right; images from the High Plains Regional Climate Center, NOAA).

Growing degree-days (GDDs) over the western US for March through May (Figure 3) show the broad pattern of a cooler spring in northern areas, even extending into the Great Basin and Rockies, and warm spring in central to southern California and across to Texas. Areas in California are running near average to 150-300 GDD ahead of normal for the period. However, from northern California into every region in the PNW, GDDs are significantly below what is normal for this time of year (50-300 GDD). Converting the mapped data in Figure 3 to days ahead or days behind normal finds that the warmer areas in California are 6-24 days ahead of normal accumulation amounts while wine regions in western Oregon, eastern Washington and Oregon, and the Snake River Valley are 5-22 days behind the normal accumulation by the end of May (not shown).

Heat accumulation (GDD) amounts for four locations that I have tracked for many years in wine regions in Oregon are all substantially below both the 1981-2010 and 1991-2020 climate normals for the months of April and May. Each of these locations is tracking at or slightly above the 2010 vintage, the coolest year since 2000, with the greatest deviation from average being seen in eastern Oregon (Figure 4).

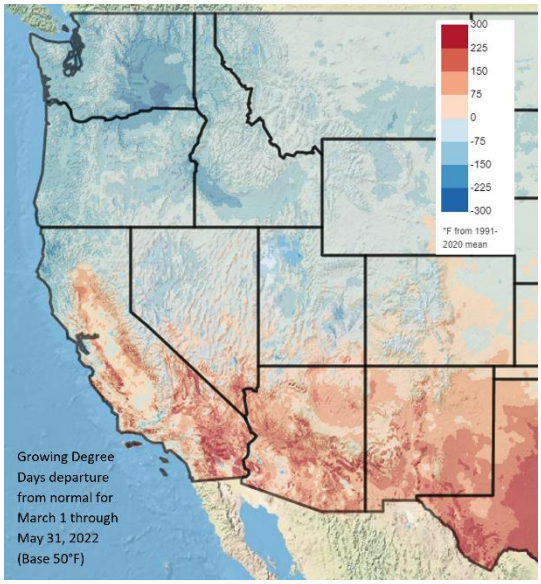

Figure 3 – Western US March through May 2022 growing degree-days (image from Climate Impacts Research Consortium, University of Idaho).

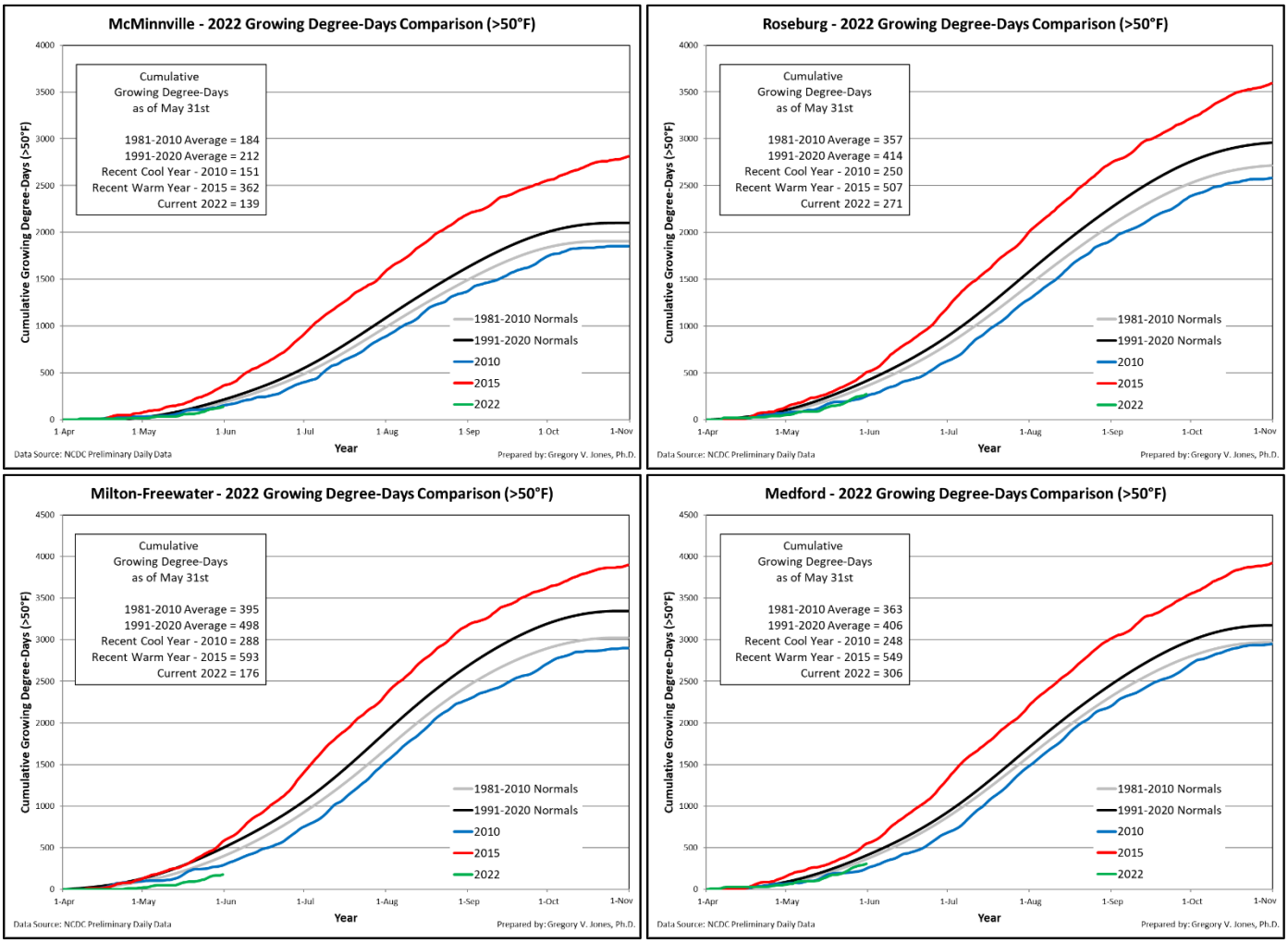

Figure 4 – Cumulative growing degree-days (base 50°F, no upper cut-off) for McMinnville, Roseburg, Milton-Freewater, and Medford, Oregon. Comparisons between the current year (2022) and a recent cool year (2010), a recent warm year (2015), and both the 1981-2010 and 1991-2020 climate normals are shown (NCDC preliminary daily data).

Drought Watch – Continued cool and wet conditions in the PNW have lowered drought concerns in the region, although the rest of the western US continues in the throes of a prolonged drought (Figure 5). Roughly 50% of Washington is in

some level of drought, but no areas in the state remain in the most extreme drought categories. While Oregon has seen improvements in the northwest and northern portions of the state, over 80% of the state is still in some level of drought and much of the eastern and southern portions of the state are still in extreme categories (>45%). California has not seen much long-term improvement with 100% of the state in some level of drought and nearly 60% in the most extreme drought conditions (extreme and exceptional). Drought zones also continue to extend across the Rockies, portions of the Plains, and most of Texas. The seasonal drought outlook (Figure 5, right panel) continues to show both short and long-term drought issues for much of the west. However, portions of western Washington, northwest Oregon, northern Idaho, and western Montana have been removed from the outlook. In addition, the outlook points to drought improvement and or removal for areas of the desert southwest where monsoon rains are anticipated (Figure 5). The eastern half of the country appears to be moving into summer largely free from drought, especially with an active tropical storm season forecast.

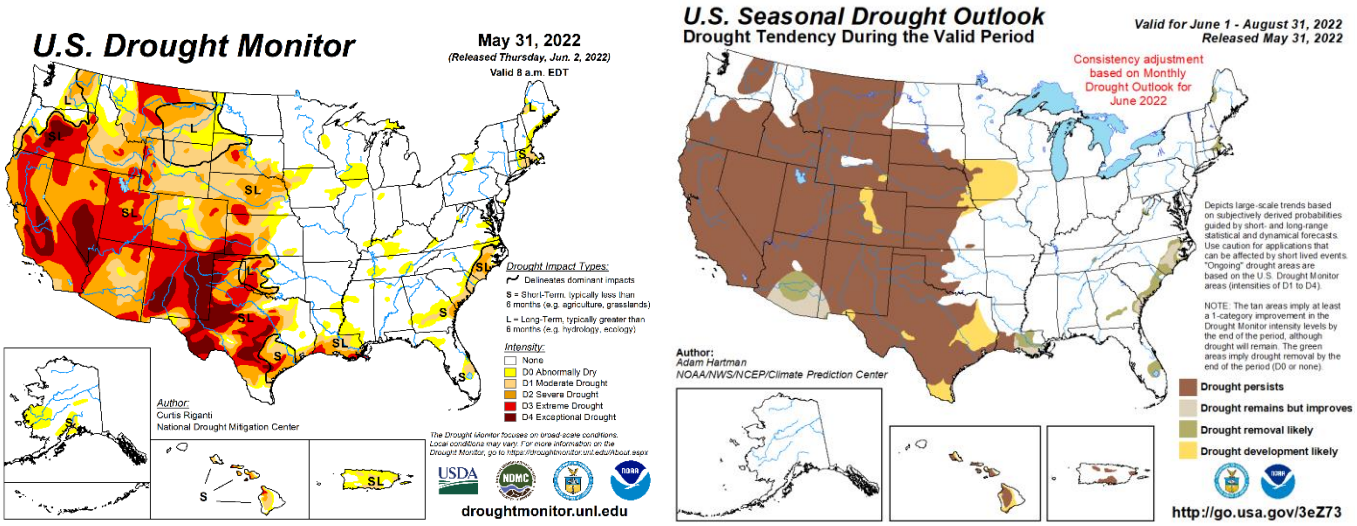

Figure 5 – Current US Drought Monitor and seasonal drought outlook.

ENSO Watch – Well the forecast for the La Niña to give way to neutral conditions by now has not materialized. In fact, the tropical Pacific SSTs in the central-eastern equatorial Pacific have remained below average and even strengthened slightly over the last month. As such La Niña is still with us (Figure 6), and the Climate Prediction Center (CPC) is continuing the La Niña Advisory into June and has even extended this into the end of summer. Numerous other oceanic and atmospheric variables are consistent with the observed La Niña conditions and most models continue to predict SSTs to remain below average in a moderate to weak La Niña. The official outlook from numerous agencies confirms this forecast with the outlook calling for moderate to weak La Niña to continue, although the two main forecast methods vary when it might dissipate or even reemerge into the fall. However, now the forecasts favor La Niña conditions strengthening into next fall and early winter. Seasonal model forecasts continue to be influenced by La Niña conditions, pointing to the PNW likely seeing a cool/wet June and early summer, while California is likely to see near average to below-average precipitation and moderately warmer temperatures during this time with the entire western US transitioning to closer to average or warmer than average temperatures and dry to near average precipitation (see the 90-day forecast below).

North Pacific Watch – Adding to the influence on the PNW spring and now early summer cool temperatures from La Niña (see above), the North Pacific continues to exhibit strong negative values in the Pacific Decadal Oscillation (PDO). The northern basin is showing very warm water out over the central to western North Pacific and cooler SSTs in portions of the Gulf of Alaska and south along the western US (Figure 7). Historically when the tropic and northern Pacific basins are in unison with La Niña and negative PDO, the PNW and northern California experience cooler and wetter springs, while areas to the south and east are warmer and drier. It appears from the June and the 90-day forecast into summer that these conditions will likely continue to be the case for the western US (see below).

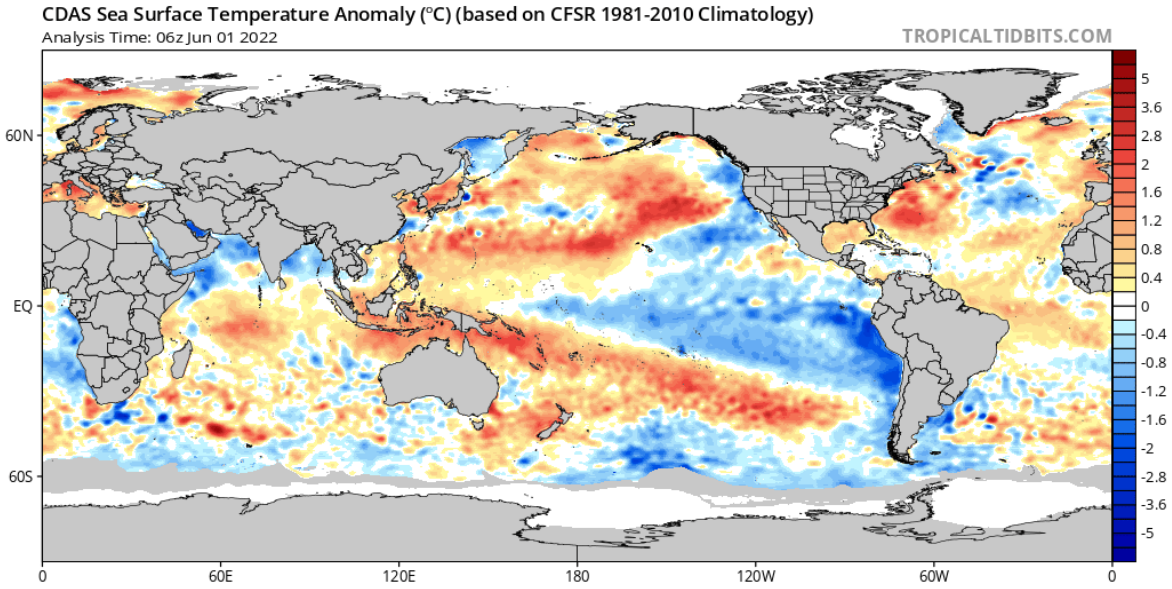

Figure 6– Global sea surface temperatures (°C) for the period ending June 1, 2022 (image from Tropicaltibits.com).

Forecast Periods:

Next 5 Days: After another punch of cool, wet conditions to start the month in the PNW and northern California, conditions will warm to seasonal averages over these areas. Central to southern California and the desert southwest will remain warm and dry over the next five days.

6-10 Day (valid June 10-14): Moving into the second week of June, the west appears to be headed for a warm-up with the desert southwest likely to see the warmest conditions. The warmth extends northward into the Rockies, California, and the southern portions of the PNW before giving way to close to average temperatures in western and northern Washington. While the west warms, the east is forecast to see below-average temperatures, except for the Gulf Coast, Florida, and the southeast which have a slight chance of being warmer than average. The chance for a couple of frontal passages increases the odds of above-normal precipitation in Washington and northern Oregon, with the rest of the west likely to remain dry. Along with the cooler conditions forecast for the east is a greater chance of above-average precipitation during this period.

8-14 Day (valid June 13-19): The third week of June is forecast to bring below-average temperatures to much of the PNW and northern California with near normal to warmer than normal temperatures for the rest of the western US. For the rest of the country, the northern tier of states is forecast to see near-normal temperatures while the central and southern portion of the county is forecast to have a warmer than average mid-month. In terms of precipitation, the forecast for this period is calling for above-average precipitation from the PNW across to the Great Lakes, within the monsoon area of the desert southwest, while the rest of the country is forecast for near normal to below-average precipitation during this period.

30 Day (valid June 1-30): The monthly temperature outlook for June (Figure 7) is continuing to show the typical temperature pattern that comes from the combined influence of La Niña and the negative phase of the PDO (see above). However, the pattern of cooler than average conditions across the northern portion of the country while warmer across the south is much more common during the winter months, not the start of summer. Similarly, the precipitation forecast for June is hinting at a wetter than average month in the PNW (Figure 7). Above-average precipitation is also forecast for Florida and the southeast due to early-season tropical activity. The dry conditions over portions of the west are likely to continue in June.

90 Day (valid June-July-August): The 90-day forecast into the heart of summer is tilting the odds to a warmer than average period, especially for the Rockies, Four Corners, and Great Basin (Figure 7). The cooler June forecast for the

PNW (see above) is keeping the region likely closer to average temperatures for the summer. The rest of the country is likely to see a warmer than average summer. The seasonal precipitation outlook is hinting to a drier than average summer from Texas north into the Plains and across to the PNW (Figure 7). The southwest is forecast to have equal chances of being slightly above to slightly below, mostly due to the anticipated increase in monsoonal flow during this three-month period. For the rest of the country, the Mississippi and Ohio river valleys will likely be closer to average while the anticipated increased tropical cyclone activity this summer hints at the Gulf, Florida, southeast, and mid-Atlantic seeing above-average precipitation over the next 90 days.

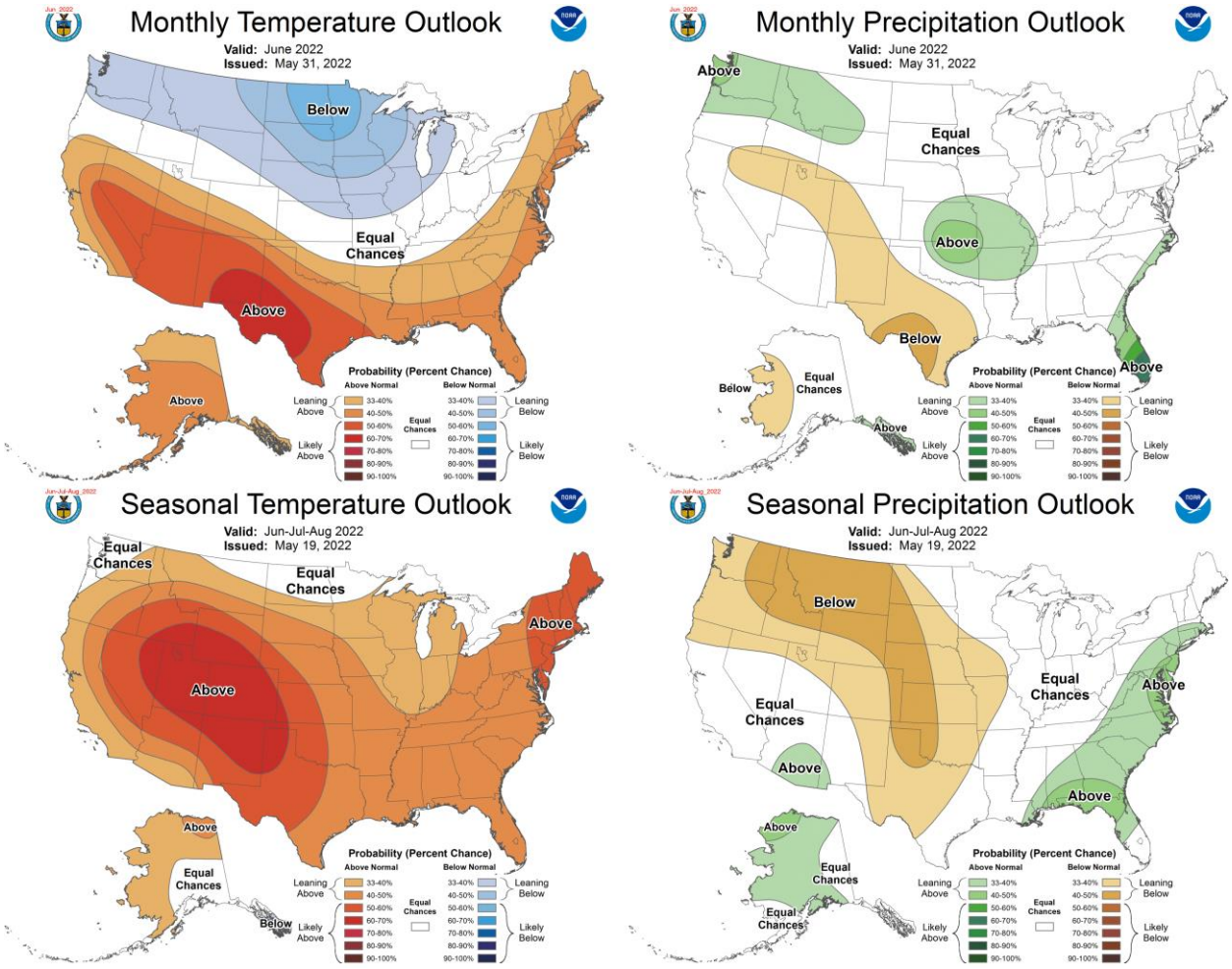

Figure 7 – Temperature (left panel) and precipitation (right panel) outlooks for the month of June (top panel) and June, July, and August (bottom panel) (Climate Prediction Center, climate.gov).

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