

Weather and Climate Summary and Forecast

June 2021 Report

Gregory V. Jones
Linfield University
June 3, 2021

Summary:

- During May, the west coast was near average to warmer than average¹, while the middle of the country was cooler than average, and the eastern seaboard to New England was average to warmer than average.
- May continued the dry spring over most of the west with many locations seeing the driest May on record.
- The spatial extent of drought in the west is now over 96% in some category of drought and over 71% in severe to extreme drought. Additional areas in the PNW, northern Rockies, and west Texas are likely to see drought development further as the summer progresses.
- Extreme heat started off June with a bang but will likely cool to average through mid-month then elevate to moderate to extreme warmth later in the month. The only precipitation events appear to be small frontal passages in the extreme PNW, or some eastside thunderstorms, which no one wants to see right now!
- ENSO-neutral conditions are now in place in the Tropical Pacific and the North Pacific is in the negative phase of the PDO. The result is likely little tropical influence on our summer weather, but coastal zone SSTs from the Gulf of Alaska to Baja will remain cool continuing, for the short-term, the reasonably robust marine layers and the near average temperatures for coastal regions from California northward into Oregon and Washington. However, the summer continues to see the forecast tilt the odds to warmer than average temperatures and remaining seasonally dry.

May continued the fickle spring in the west with wide swings from cool to average to extreme heat. The month ended up largely warmer than average in California, southern Nevada, and the desert southwest (Figure 1). Beyond a few isolated areas, much of Oregon and eastern Washington saw near-average temperatures in May, while western Washington and Idaho were cooler than average. The Rockies and Plains ranged from 1 to 4°F below average for the month and the cool conditions extended south and east bringing a relatively cool May to the rest of the US (not shown). Again, the monthly forecast for May was spot on for precipitation with dry conditions prevailing (<25% of normal for most; Figure 1), with only a few isolated areas in Nevada, Montana, the northern Cascades, and the Front Range seeing above-average precipitation. Most of the rest of the country also saw a relatively dry month, with only the southern Plains, Texas, and the western Gulf Coast seeing wetter than average conditions (not shown).

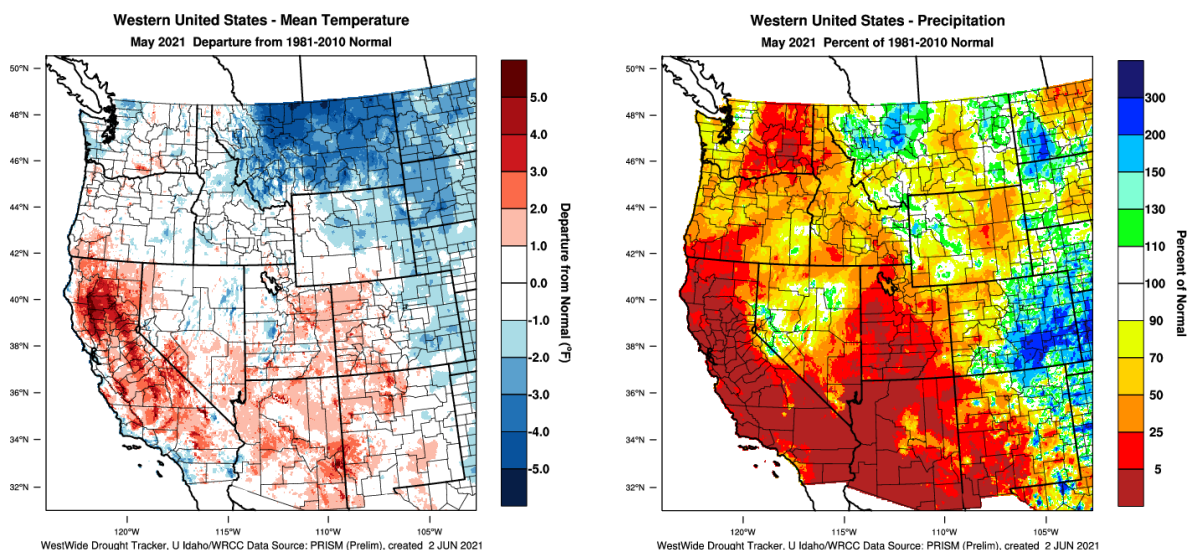


Figure 1 – Western US May 2021 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

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.

Year-to-date the western US continues to run close to average temperatures (Figure 2). Portions of California, the southwest, and central Washington have been slightly warmer than average while the Front Range of the Rockies and plains south into Texas have been cooler than average (1-4°F; Figure 2). The central portion of the country continues to see cooler than average temperatures year to date, while the southeast has been near average and Florida, New England, and the Great Lakes have been warmer than average (not shown). Year-to-date precipitation amounts in the western US continue to reflect the ongoing dry conditions with most areas seeing less than 70% of normal (Figure 2). Portions of western Oregon and Washington, eastern Oregon, northern Nevada, and the Northern Rockies are running closer to average year to date. The dry conditions depicted in Figure 2, also reflect ongoing and projected drought concerns in the west (see Drought section below). Dry conditions year to date are also occurring across the northern Plains, across the Great Lakes, and into New England, while the central portion of the country has largely been near average to wetter than average year to date (not shown).

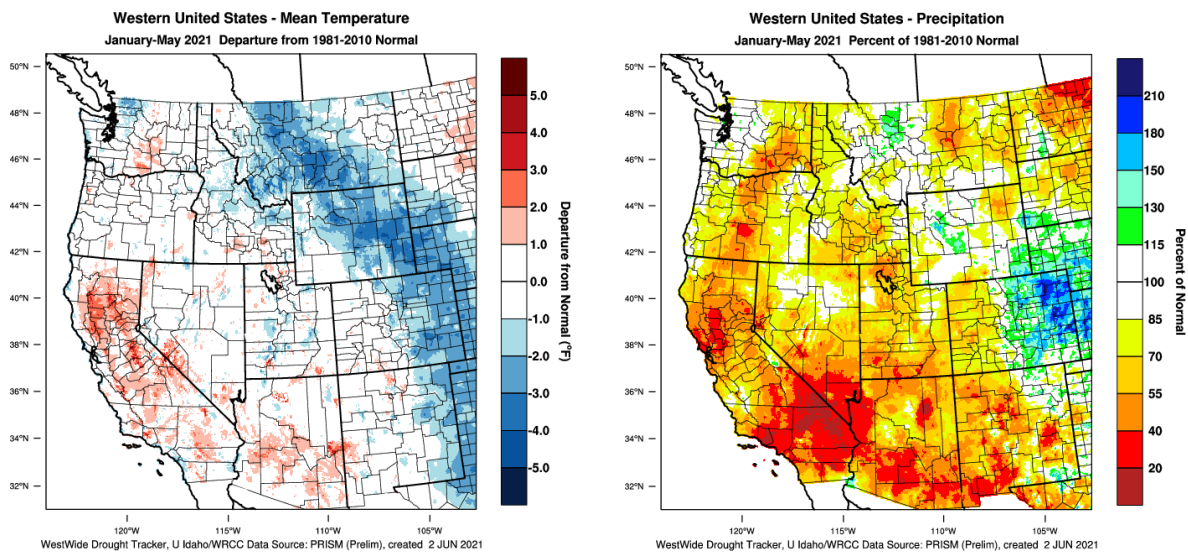


Figure 2 – Western US year to date (January-May 2021) temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

The March through May growing degree-days (GDDs) for the western US shows that accumulations are slightly above average in most of the western regions of California, Oregon, and Washington (Figure 3). However, coastal zones in Washington, Oregon, the Bay Area, and the central to south coast of California have seen a slower start to heat

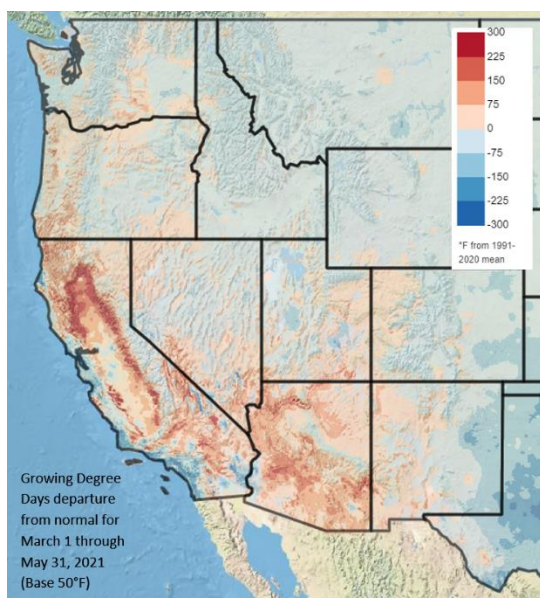


Figure 3 – Western US March through May 2021 growing degree-days (image from Climate Impacts Research Consortium, University of Idaho).

accumulation largely due to the negative PDO (see below) where cooler than average coastal waters during the last few months have kept marine layers and fog prevalent. Interior portions of the PNW have also seen a slower start to heat accumulation, especially eastern Washington, and Idaho.

Early season growing degree-days for four locations that I have tracked for many years in wine regions in Oregon are all substantially above the 1981-2010 normals for the months of April and May (17-64%) and above the average of the last 16 years for the sites (2-20%). Compared to the 2020 vintage, there is a north-south difference in sites with Medford and Roseburg being near average to down by 10% during the same period in 2021, respectively, while McMinnville and Milton-Freewater are running 5 and 11% above the last vintage, respectively (see the Appendix Figure 1 for four locations in Oregon).

Drought Watch – Roughly 45% of the country is currently under some form of drought, with most of it being in the west and there is no relief in sight for the ongoing western US drought (Figure 4). Coupled with a dry winter, the dry spring has continued to increase the region’s drought footprint with the southwest persisting as the epicenter. Drought zones extend from Texas throughout the Rockies and into the northern Plains and across to the west coast. Over 96% of the western US continues in some category of drought with over 70% in severe to exceptional drought

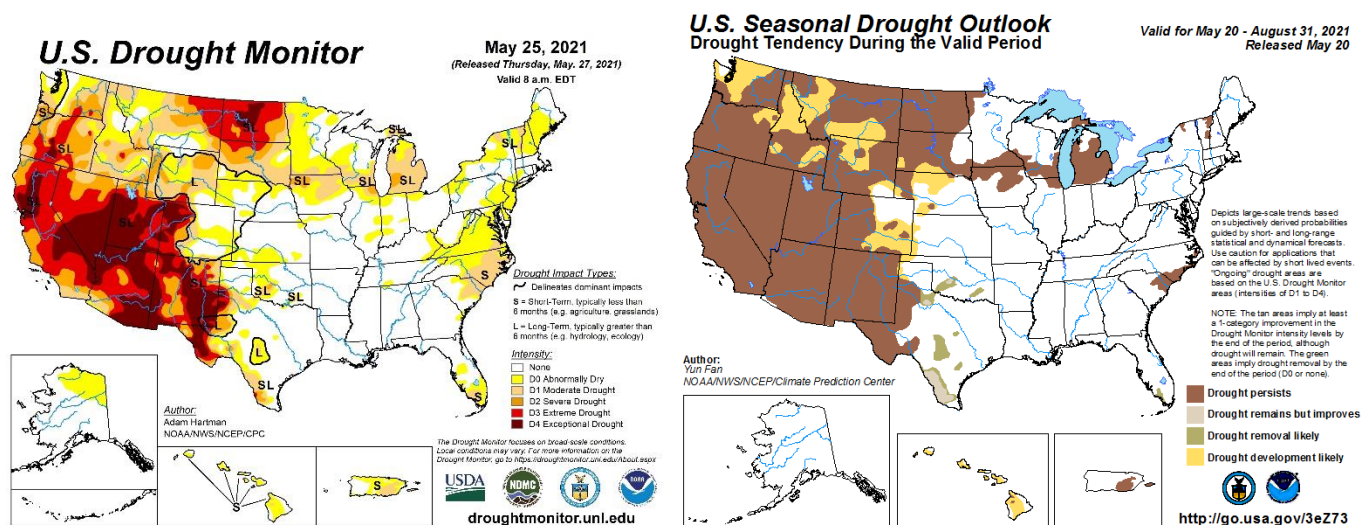


Figure 4 – Current US Drought Monitor and seasonal drought outlook.

conditions. Small portions of the Washington Olympics and Cascades, the Rocky Mountains in Montana, and the Bitterroot Mountains continue to be the only areas of the west that are not currently listed in a drought category. Both the monthly outlook (June) and long-term outlook for the US through August continue the forecasted dry conditions for much of the west with further development expected in the Rockies, Montana, Idaho, and the PNW (Figure 4, right panel). The extremely dry second half of winter and spring has likely pushed the drought concerns into the fall and early winter.

ENSO Watch – As forecast over the last few months, the Tropical Pacific has continued to weaken from La Niña conditions experienced during the winter to neutral (Figure 5). As of mid-May, the Climate Prediction Center (CPC) reported that SSTs in the east-central Pacific have dropped to roughly 0.3°C (0.5°F) below average, with patterns in all key atmospheric variables consistent with continued weakening La Niña conditions. The majority of model forecasts continue to point to the Tropics being ENSO-neutral through boreal summer, therefore all La Niña advisories have ended. The official CPC/IRI outlook and other agency outlooks are consistent with these model forecasts, calling for ENSO-neutral to continue through the summer. ENSO-neutral in summer does not bring much influence on the weather in the western US. There continues to be some chatter about El Niño conditions developing later in the summer or early fall. Too soon to tell, more later ...

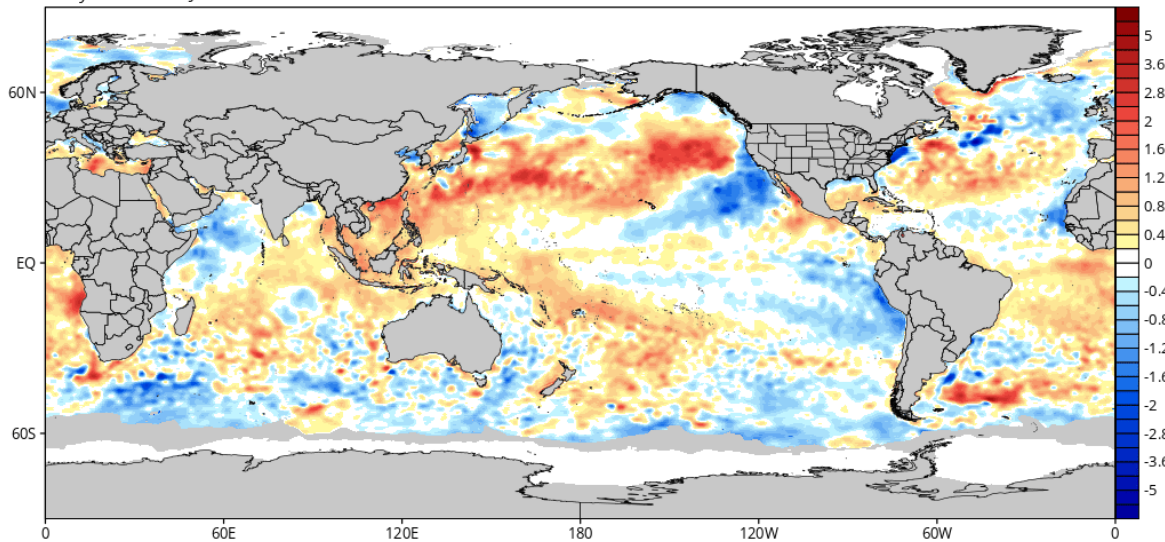


Figure 5 – Global sea surface temperatures (°C) for the period ending June 1, 2021 (image from Tropicaltidbits.com).

North Pacific Watch – The overall pattern of a horseshoe-shaped area of colder than average coastal temperatures in the eastern North Pacific with a core of warmer than average SSTs in the interior North Pacific continues (Figure 5). These conditions have the Pacific Decadal Oscillation in a cold or negative phase, which has been in place for a few months now. The main differences from prior months are the magnitude and spatial extent of the interior area of warm SSTs. Cool surface temperatures remain in the Gulf of Alaska, along the PNW and California coast, and south and southwest out toward Hawaii (Figure 5). Evidence continues to point to the negative PDO having an influence on the relatively cool spring in the western US, especially in the coastal zones and typical marine layer and fog areas where conditions are near average while inland it has been much warmer than average. As the Topics are likely to stay ENSO-neutral, which has less effect on west coast weather, the PDO might continue to play an outsized role until the fall. This would tend to point to continued cool coastal zones, warmer conditions inland, and that the western US will likely remain dry through summer with much of the PNW transitioning back into drought (see above).

Forecast Periods:

Next 5 Days: A scorching end to May and the start of June will give way to more seasonal temperatures by the first weekend in June. There is a slight chance of precipitation, which increases northward into the PNW, with western Washington having the greatest chance of measurable amounts. But do not expect much, if any, elsewhere.

6-10 Day (valid June 7-11): After a warm start to June the second week will likely see near-average to slightly below average temperatures for most of the west coast. These conditions give way to a strong chance for a warmer than average early June over the Rockies, with a strong likelihood of extreme heat across through the Great Lakes and New England. Beyond a drizzle or slightly more in the PNW, the western US is forecast to remain relatively dry, while the Gulf Coast is forecast to see a wet period.

8-14 Day (valid June 9-15): While near-average to cooler than average conditions along the west coast are likely to continue at the start of this period, temperatures in the June 14-19 period are charting to build into the 90s and even triple-digits for many of the normal hotter spots. The central to the northern portion of the country will likely continue to see a major heat event with significantly above-average temperatures from the Plains to New England. The precipitation forecast through mid-month remains on the dry side for the bulk of the western US, except for a slight chance for one or two events in the PNW. The rest of the US is forecast to see near-average precipitation, except the Gulf Coast which is forecast to see a wet mid-June.

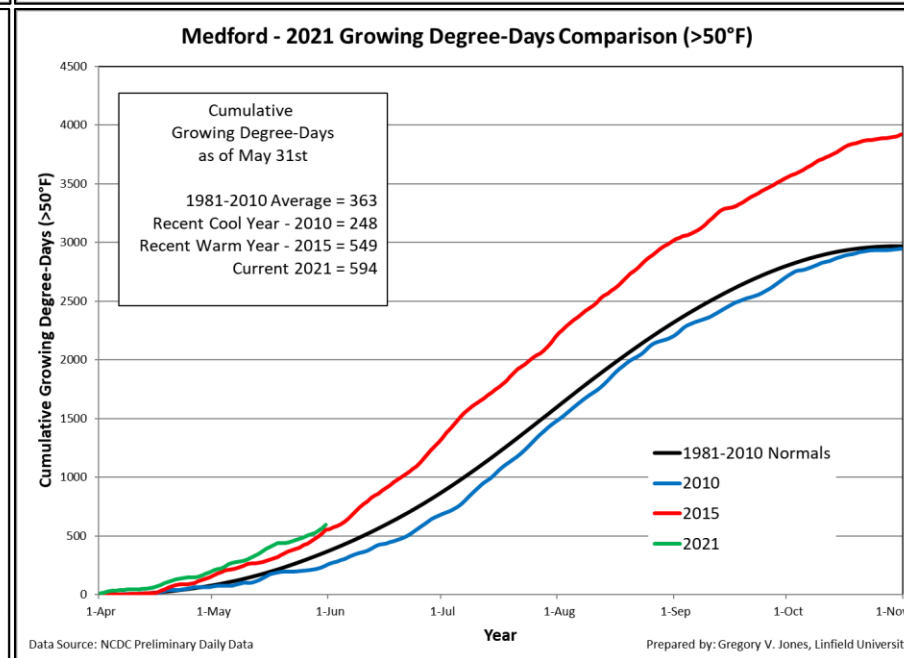
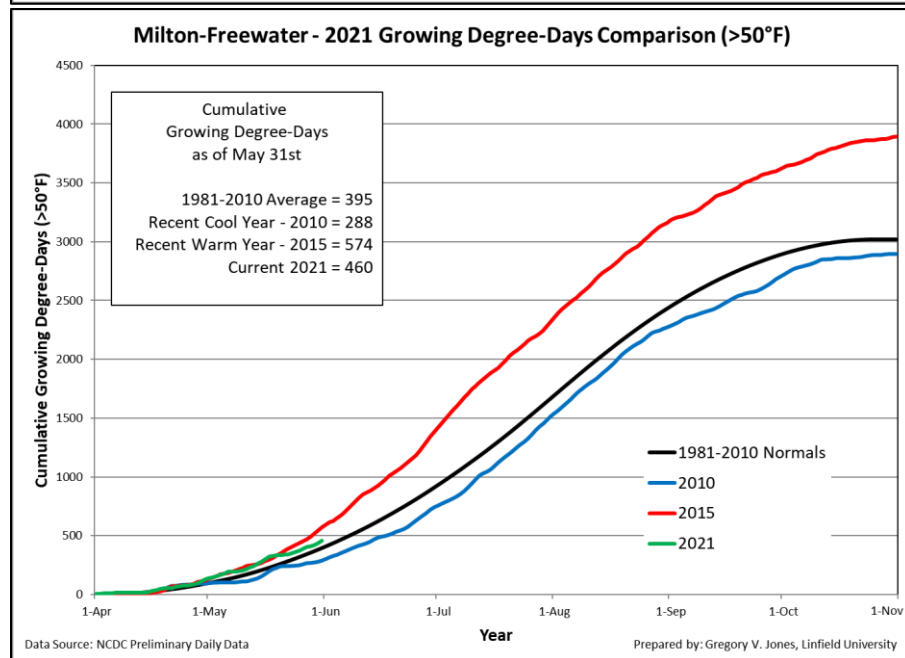
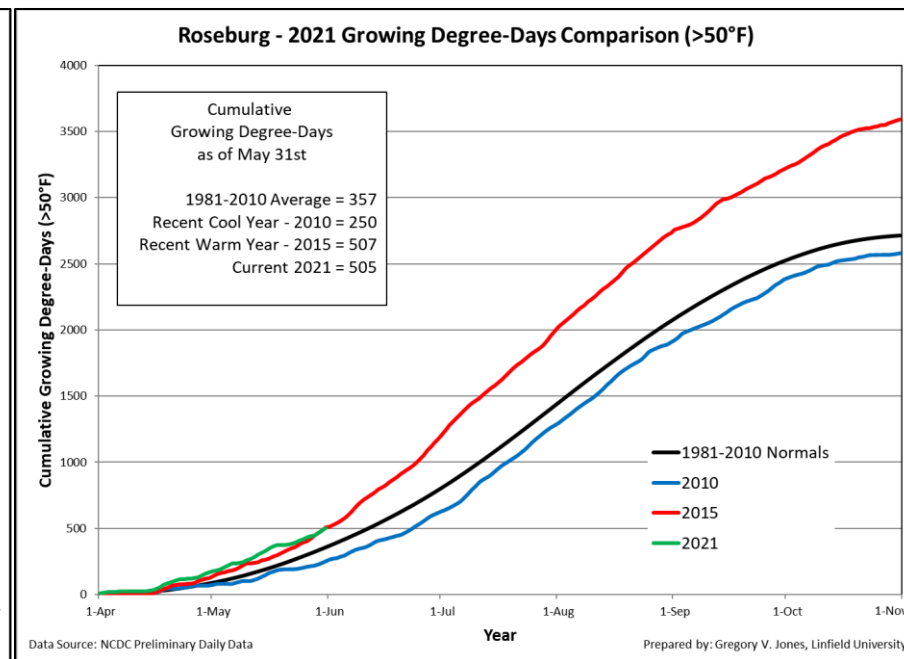
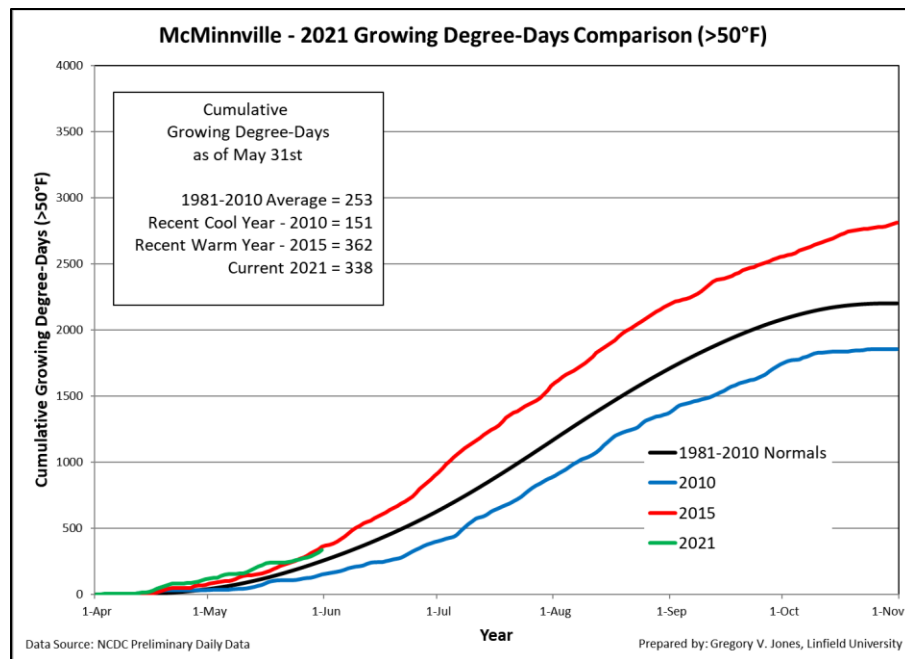
30 Day (valid June 1-30): The western US, across the northern Plains, into the Great Lakes and New England are forecast to see a largely warmer than average month, while the southern Plains and Gulf Coast region is likely to see

below-average temperatures for the month of June (see Appendix Figure 2). For the west coast, cooler than normal ocean temperatures (see above) are expected to maintain a fairly strong marine layer and near average temperatures. Dry conditions are forecast for much of the western US during June, while the Gulf Coast is likely to be wetter than average.

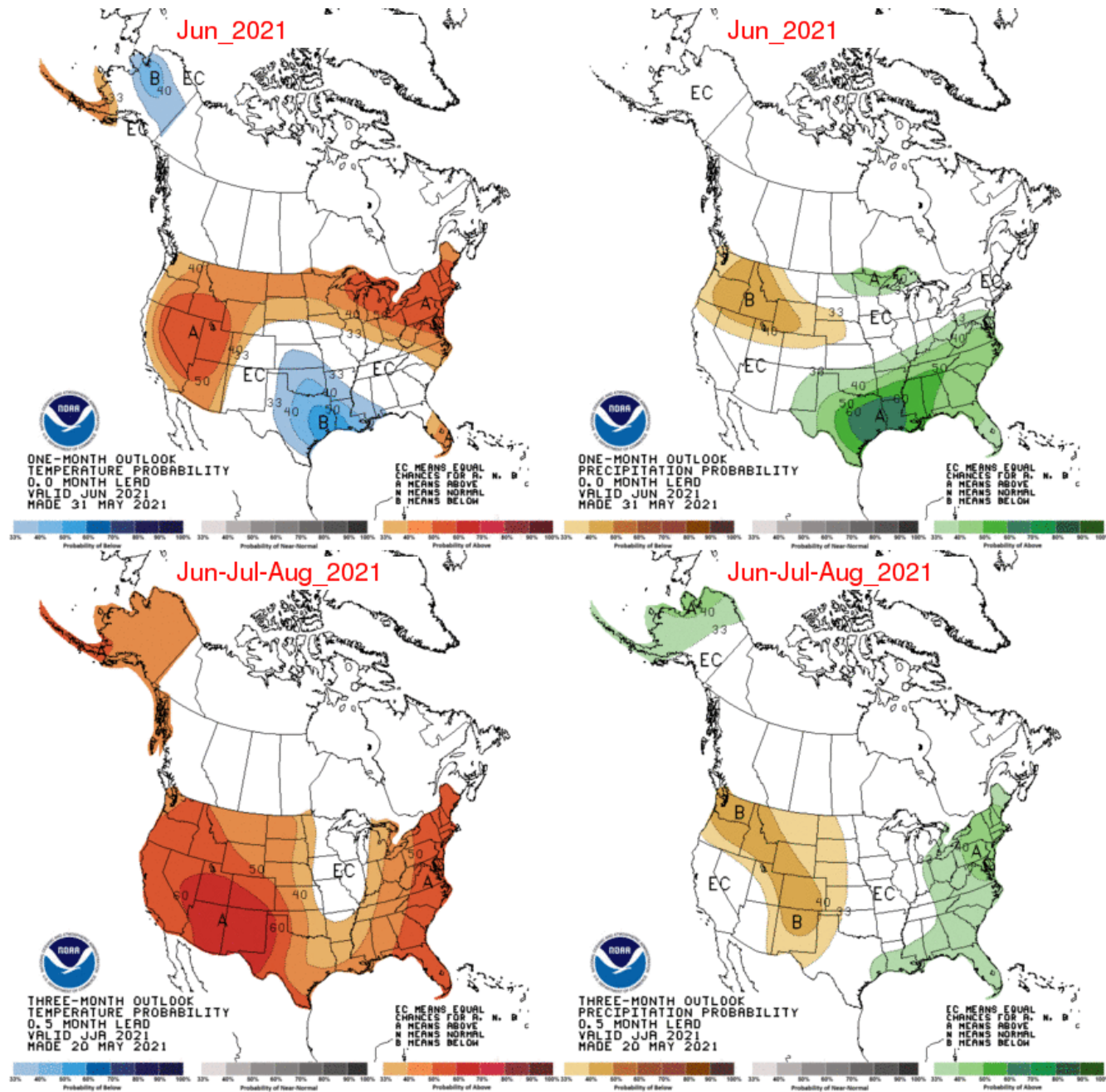
90 Day (valid June-July-August): Following from earlier forecasts, the summer will likely bring warmer than average temperatures to the bulk of the US (see Appendix Figure 2). The precipitation pattern forecast through JJA also continues dry conditions with the bulk of the area from the PNW southeast to Texas likely to be drier than normal. Near-average precipitation is forecast for the Great Plains and Great Lakes south to Texas, while the New England and the eastern seaboard and Gulf Coast are forecast to see above-average precipitation for the season.

Gregory V. Jones, Director
Evenstad Center for Wine Education
Evenstad Chair in Wine Studies
Linfield University
900 SE Baker Street
McMinnville, OR 97128-6894
503-883-2218
gjones@linfield.edu





Appendix Figure 1 – Cumulative growing degree-days (base 50°F, no upper cut-off) for McMinnville, Roseburg, Milton-Freewater, and Medford, Oregon. Comparisons between the current year (2021) and a recent cool year (2010), a recent warm year (2015), and the 1981-2010 climate normals are shown (NCDC preliminary daily data).



Appendix Figure 2 – Temperature (left panel) and precipitation (right panel) outlooks for the month of May (top panel) and May, June, and July (bottom panel) (Climate Prediction Center, climate.gov).