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Weather and Climate Summary and Forecast August 2020 Report

Gregory V. Jones
Linfield University
August 3, 2020

Summary:

- July started relatively cool for many but ramped later in the month. The month ended up average to cooler than average in the PNW and the central coast south through California, while northern California, southern Oregon, Nevada, and the southwest were warmer than average.
- The western US was seasonally dry during July, with only some isolated thunderstorms inland and a weak start to the monsoon season in the southeast bringing any measurable precipitation.
- Drought concerns are forecast to remain in place or develop further for much of the west.
- Seasonal temperatures for the majority of the western US over the next 5-15 days with mostly onshore flow. No rain to speak of for the west, except maybe a sprinkle for northern Oregon and NW Washington. Warmer second half of month likely over the west, but low to an average chance of extreme heat.
- The forecast for August through October points to the likelihood of a warmer than average period for much of the western US. The overall precipitation outlook is pointing to near average conditions, although with little insight at this point for the onset of fall rain events.

The broad pattern for the July forecast held true with a relatively cool PNW and warmer conditions southward (Figure 1). The month started off relatively cool everywhere across the west but ramped up mid-month with the warmest temperatures of the year for many locations later in the month. The PNW was near normal to below normal for the month, with portions of Southern Oregon into Northern California and Nevada seeing a warmer than average July. The desert southwest saw the warmest conditions over the western US while Idaho and Montana saw the coolest conditions. The forecast for a warmer month from the Plains into the Great Lakes held true, with many areas seeing temperatures 3-5°F warmer than normal for the month, while the southeast and Gulf Coast experienced a near average to slightly below average month (not shown). July in the western US was seasonally dry with few locations receiving any precipitation (Figure 1). The exception was for some monsoonal moisture coming into the Four Corners region, but for the most part, it was not enough to break the drought pattern (see more on droughts below). For the rest of the country, the central to northern Plains experienced a wetter than average month while the eastern third of the country was near average to drier than average (not shown).

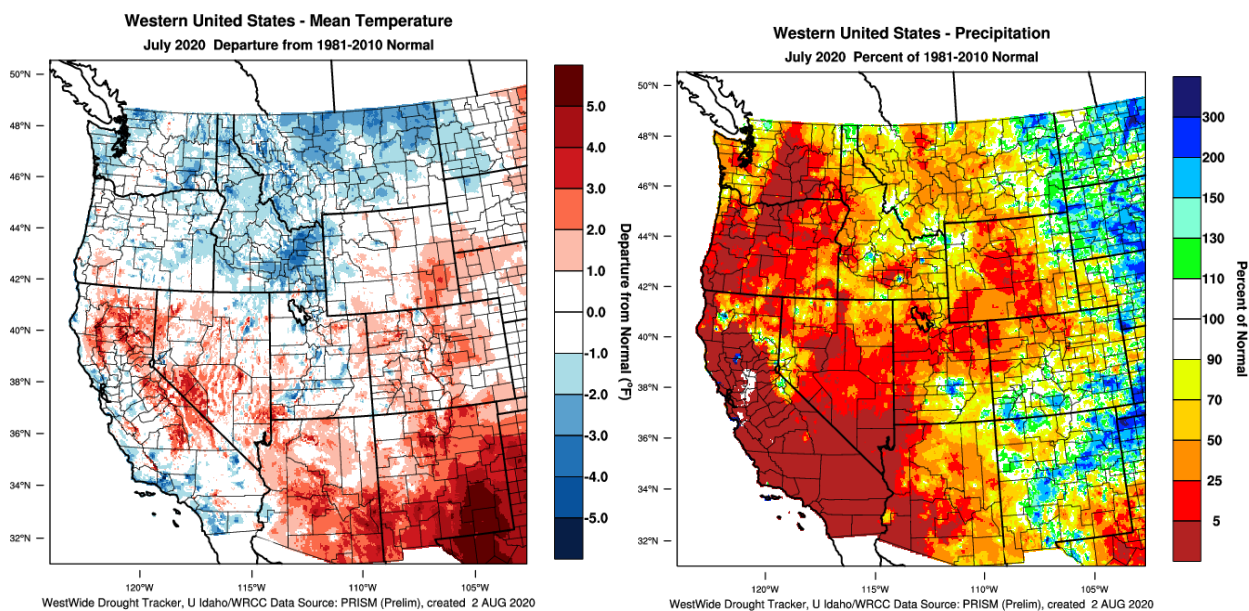


Figure 1 – Western US July 2020 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

Year to date temperatures in the western US are running largely near average to above average. Temperatures in 2020 have been warm in central to northern California, Nevada, and the southwest while areas in southern California are near average to cooler than average (Figure 2). Washington and Oregon continue to show prominent spatial differences with the western portion of the states near average to slightly warmer than average while the central portion of the states are mostly warmer than average, and the far eastern portion of the states cooler than average. We continue to see cool conditions in the northern Rockies and into the Plains and very warm conditions in the Four Corners region. The northern Rockies, northern Cascades in Washington, and northern to central Plains are the only areas of the country running colder than average (1-2°F below normal) while Texas, the Gulf Coast states and the eastern third of the US have been seeing temperatures 1-3°F above normal (not shown). Precipitation amounts during the first half of the year have also been mixed across the western US with most of California, the eastside of the Cascades, and the bulk of the Great Basin and Four Corners region running 20-70% of average rainfall (Figure 2). Portions of western Oregon are closer to average year to date, while western and eastern Washington, the Blue Mountains of Oregon, much of Idaho, and the California-Arizona border have seen 115-250% of average rainfall. The relatively dry first half of 2020 continues to add to longer-term drought concerns for much of this area (see Drought section below). The majority of the eastern third of the country has seen wetter than average conditions since the first of the year, while dry conditions have been seen from the Panhandle region into the Plains and in northern New England (not shown).

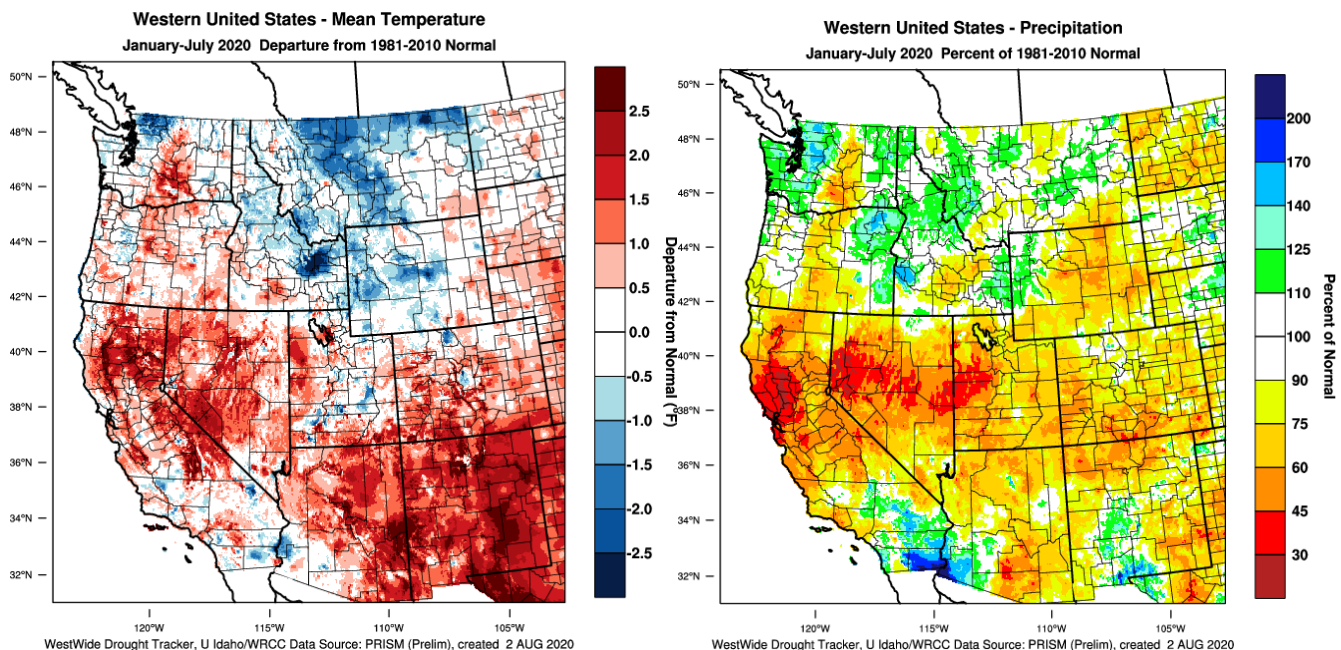


Figure 2 – Western US year to date (January-July) temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

Growing degree-days (GDD) from March through July for the western US shows the vintage so far is largely running near normal to above normal (Figure 3). GDD amounts over most of California, Oregon, and Washington are currently 5-10% above normal or running 4-16 days ahead of average for this time of the season. However, some areas are slightly behind in heat accumulation with eastern Washington, eastern Oregon, and Idaho 5-10% down or about one week behind. In California, the Bay Area continues to show near average to slightly above average heat accumulation while isolated inland areas of Southern California remain below average.

Heat accumulation (GDD) amounts for four locations in Oregon reflect the broader regional patterns seen in Figure 3. Medford, Roseburg, and McMinnville are running above the 1981-2010 normals for the months' March through July (4 to 21%), while eastern Oregon (Milton-Freewater and the Walla Walla region) is right at the long-term average (see Appendix Figure 1). Similarly, compared to the average of the 2004-2019 period for the sites, Medford and Rosburg are 4 and 9% up, respectively, while McMinnville is 2% below average, and Milton-Freewater is 10% down. Compared to 2019, Medford is 2% up, Roseburg is 1% down, McMinnville is 5% down, and Milton-Freewater is 12% below values seen in 2019 (see Appendix Figure 1 for four locations in Oregon).

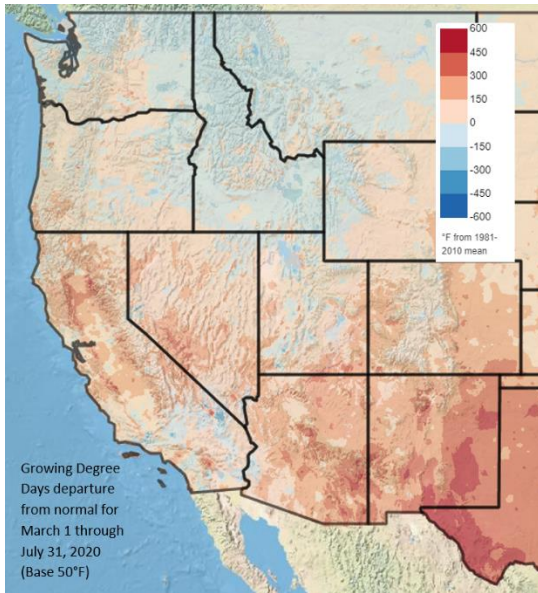


Figure 3 – Western US March through July 2020 growing degree-days (image from Climate Impacts Research Consortium, University of Idaho).

Drought Watch – The relatively warm yet dry July (Figure 1) enhanced evapotranspiration and increased drought conditions over much of the western US (Figure 4). What little monsoon rains have occurred in the southwest have not dampened drought concerns in the Four Corners region, and the lack of precipitation elsewhere in the west has clearly furthered drought conditions elsewhere. During July, portions of the Gulf Coast region had enough precipitation to lower drought concerns, but the rest of the eastern US saw lower than average precipitation and have entered into short term drought in many areas. The longer-term outlook for the US through October continues to show the forecasted dry conditions for much of northern California, Oregon, and central Washington with drought development and/or persistence through summer and into fall. The Four Corners region will also likely remain dry, while additional areas in the Rockies, Plains, New Mexico, Texas, and the panhandle region will likely continue to see drought conditions develop further (Figure 4, right panel).

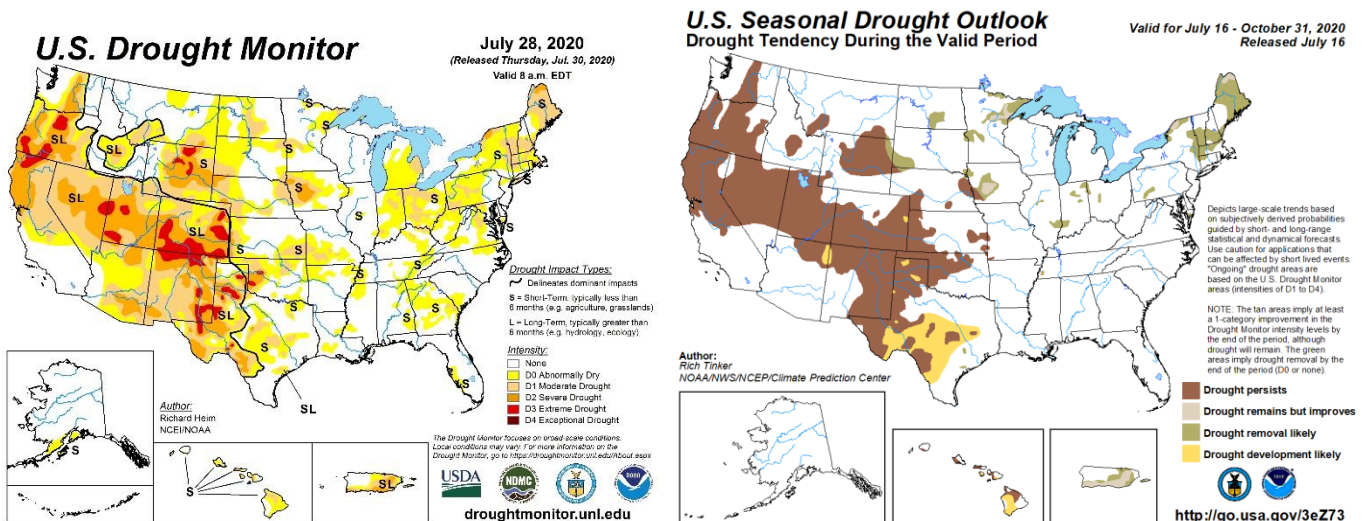


Figure 4 – Current US Drought Monitor and seasonal drought outlook.

ENSO Watch – The tropical Pacific continues to show signs of La Niña (cold event) developments (Figure 5) although this is concurring with extreme warmth in the North Pacific (see below). In mid-July, the Climate Prediction Center (CPC) report indicated that SSTs in the east-central Pacific are in the cool-neutral range, near the La Niña threshold. Patterns in atmospheric variables are also indicating mostly neutral to weak La Niña conditions. Most model forecasts hover near or just short of the borderline of weak La Niña SST conditions through fall, becoming slightly weaker

beginning in early winter. The official CPC/IRI outlook and other agencies outlooks are consistent with these model forecasts, calling for a likely continuation of ENSO-neutral in summer, with a 55% chance of La Niña for fall and a 50% chance through winter. As such a La Niña watch has been posted. The move into La Niña conditions in the fall might mean an early onset of precipitation from northern California north into the PNW. At least over the short term, the current conditions along with the changes in the North Pacific (see below) are keeping the average conditions in place (see forecast periods below and Appendix Figure 2).

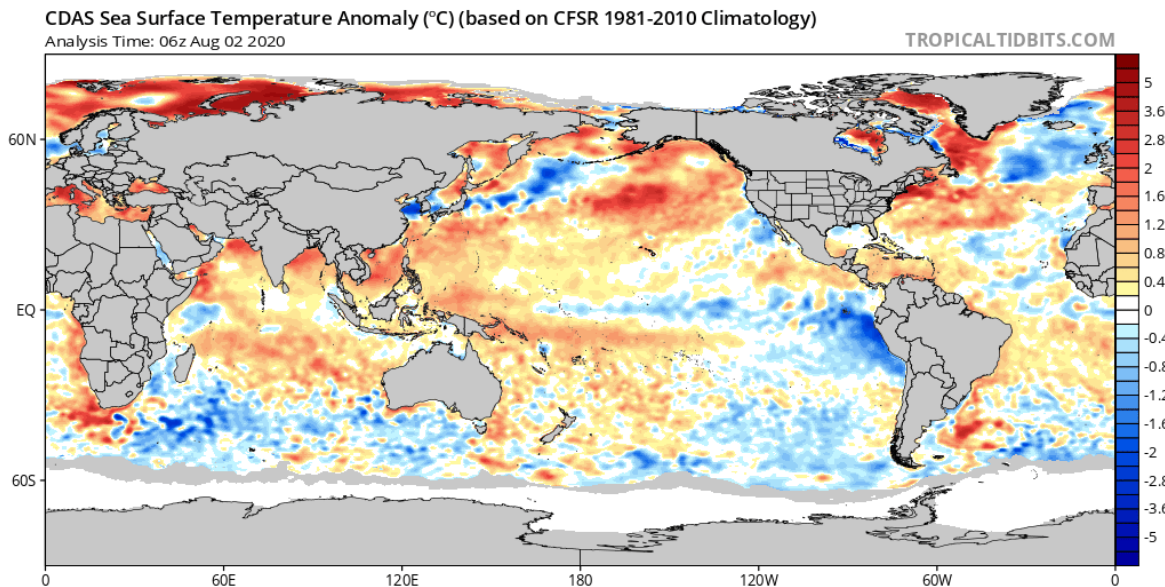


Figure 5 – Global sea surface temperatures (°C) for the period ending August 2, 2020 (image from TropicalTidbits.com).

North Pacific Watch – Not much change in the overall pattern in the North Pacific with a large portion of the central North Pacific remaining quite warm, running 2-3°F above average (Figure 5). Some cooling in the coastal zone waters from central California to Baja California now extends further southwest. This is likely to continue tamping down temperatures over southern California. Elevated humidity and higher nighttime temperatures are still in play, and given the state of the North Pacific warmth, will likely continue into the fall. The Pacific Decadal Oscillation (PDO) continues in a moderate negative phase which continues to approach conditions seen during 2008-2012. Current forecasts for North Pacific SSTs show continued warmth which suggests the potential for enhanced ridging into the fall with drier than average conditions into October. However, this flies in the face of some models showing enhanced troughing developing in late August heading into September. So, forecasts are mixed for the time being.

Forecast Periods:

Next 5 Days: Recent warmer than average conditions will give way to seasonal temperature over the next five days. A trough will dip southward knocking temperatures down about 10 degrees with a slight chance of showers from northern Oregon into the Puget Sound and British Columbia. Onshore flow will keep temperatures near average for many from northern California to Canada with warmer conditions the further south one heads.

6-10 Day (valid August 8-12): The onshore flow will likely continue through the early portion of this forecast period bringing seasonal temperatures from the central coast of California north into British Columbia and the PNW. The inland PNW and portions of the Great Basin will likely see slightly cooler than average temperatures while the desert SW will likely continue warmer than average. Precipitation over the western US is forecast to be below average during this forecast period, which is normally dry to begin with. The rest of the country is forecast to remain warm during this period with dry conditions extending across the middle of the country while the Great Lakes and mid-Atlantic are forecast to see a wet period.

8-14 Day (valid August 10-16): Relatively consistent pattern holding for both temperature and precipitation heading into mid-month. The onshore flow is likely to subside some, bringing temperatures above average but the broad

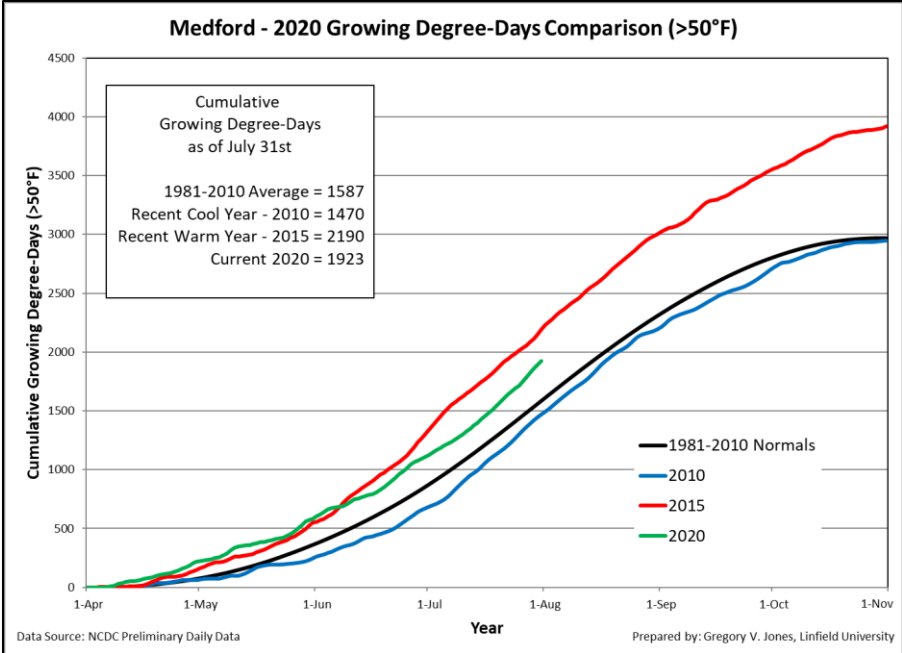
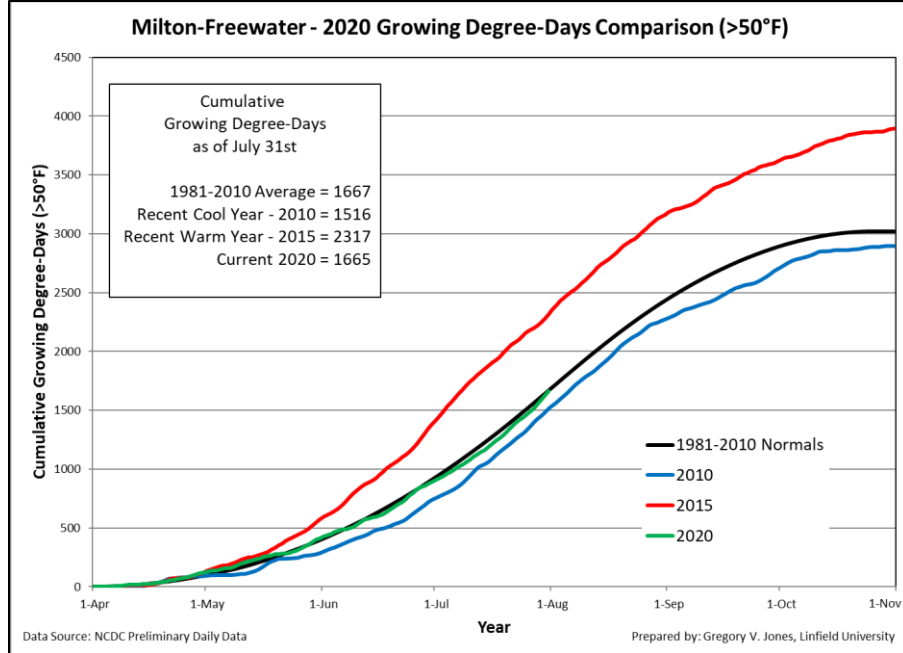
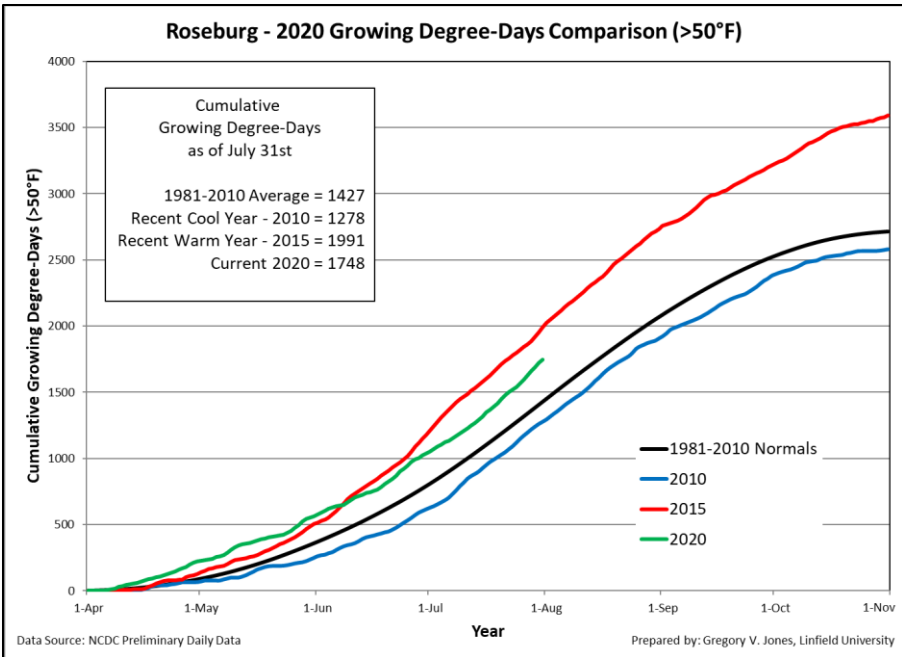
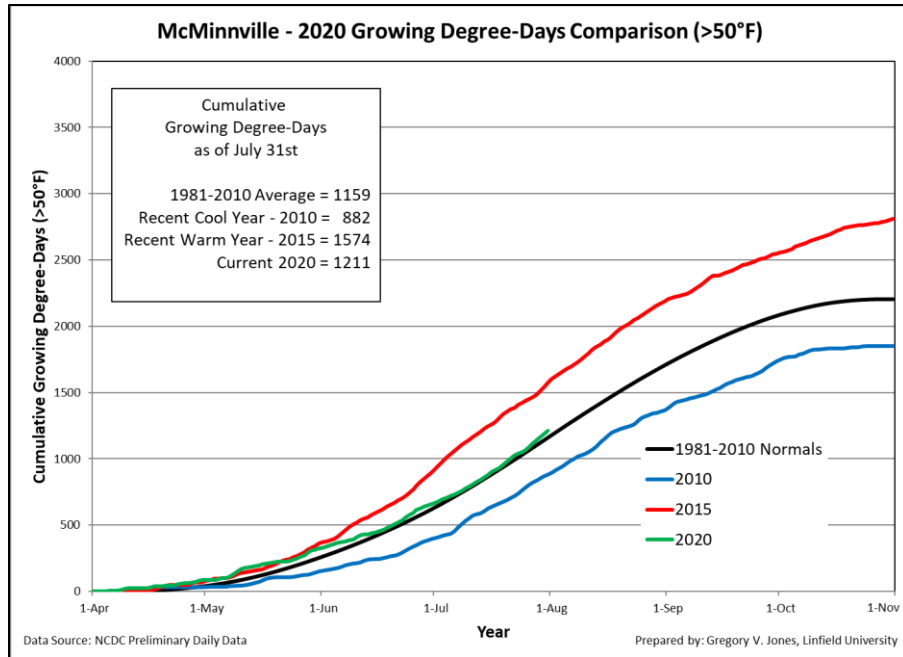
pattern is not likely to change much from the previous forecast period. The precipitation forecast remains seasonally dry into mid-month over the western US. The warm August is likely to continue for the rest of the US, while the southeast is forecast to see above-average precipitation through mid-month.

30 Day (valid August 1-31): The August forecast is currently pointing to the western US likely ending up warmer than average and near average to below average in precipitation. There is some model output suggesting a circulation change over the North Pacific which could lower the confidence for an overall warmer August, but it is too soon to tell how this flip will play out. For the rest of the country, the central US is expected to flip from a warm first half of the month to average to slightly cooler than average overall while the eastern seaboard and New England is forecast to see a warmer than average month. Precipitation for August is forecast to be near average for much of the eastern half of the country, except coastal areas from Florida into New England where tropical moisture is forecast to make it a wetter than average August.

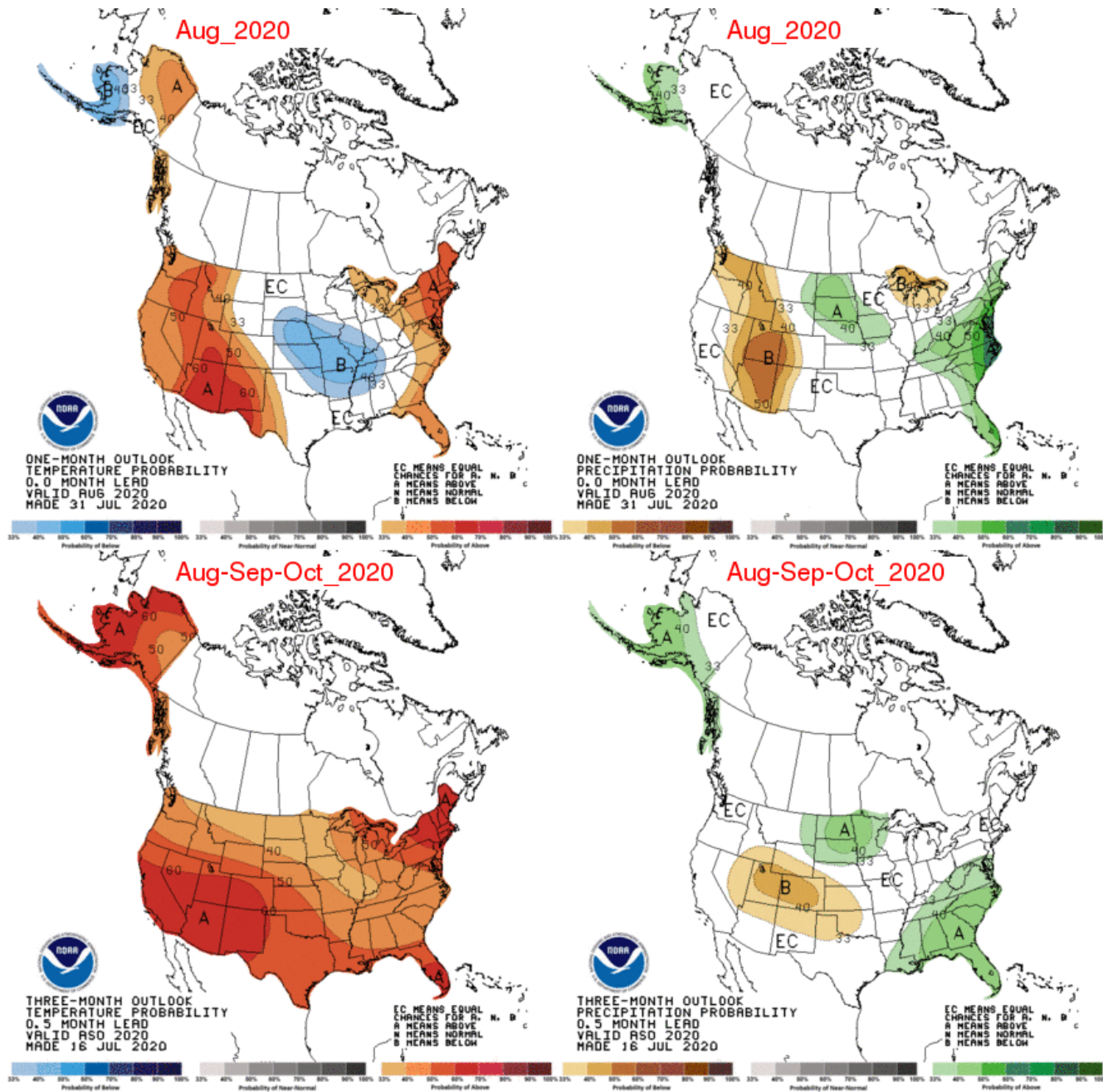
90 Day (valid August-September-October): The three-month outlook for the end of summer and into the start of fall continues to indicate that the bulk of the country will likely see a warmer than the average period (see Appendix Figure 2). The only area of the country that will likely be closer to average is the central Mississippi River valley into the Northern Plains. The 90-day outlook for precipitation continues to indicate that the western US is likely to remain near average which would indicate a dry first half of the 90 day period and seasonal thereafter. This continues to be reflected in the US Drought Monitor and US Seasonal Drought Outlook in Figure 4 above. For the eastern US, the Gulf Coast and Southeast are forecast to see wetter than average conditions through October which is largely driven by an expected active tropical system season.

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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 (2020) 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 August (top panel) and August, September, and October (bottom panel) (Climate Prediction Center, climate.gov).