

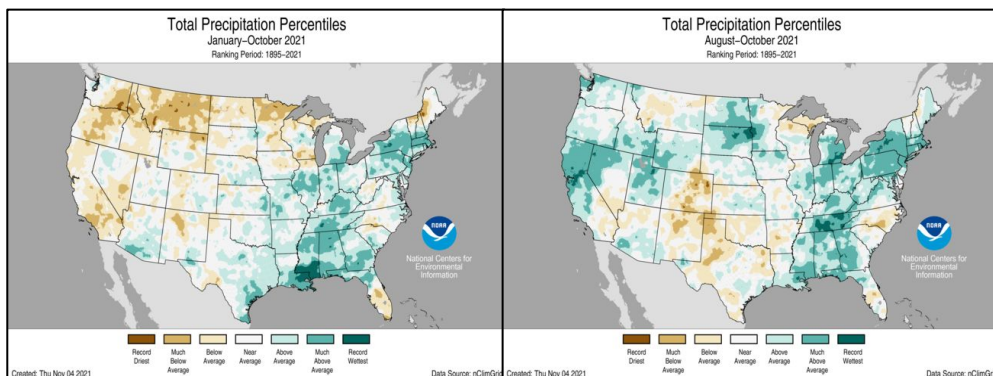
Winter Outlook: Drought Conditions to Continue or Worsen Across Much of the Western U.S., with Increasing Wetness Around the Pacific Northwest

Fall 2021: Widespread Drought Conditions Continue

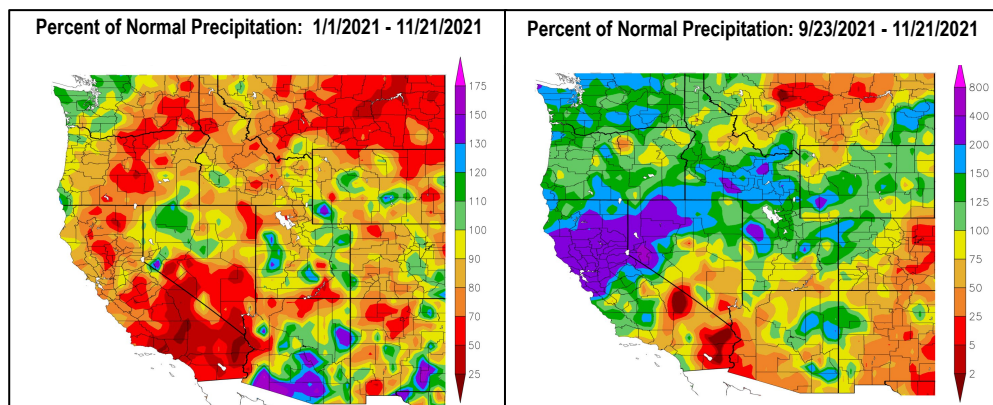
Dry conditions during the late summer and fall of 2020 led to a dry start to 2021. Through the winter, spring, and summer months, drought conditions worsened across the northwestern U.S. due to limited rainfall and several stretches of excessive summer heat. However, drought conditions improved over the summer across parts of the central and southern Rockies and the southwestern U.S. due to the active monsoon season. From September through mid-November, drought conditions improved across the far Pacific Northwest but worsened across portions of Montana and the central and southern Rockies. Despite these periods of improved drought conditions from beneficial rainfall events, these events unfortunately do not come close to ending the overall drought conditions noted across the region.

Drought Conditions and the Winter 2021-2022 Outlook

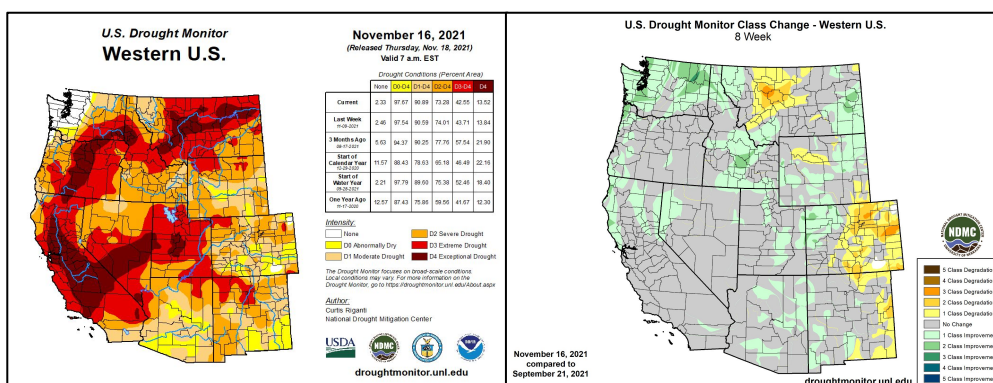
The mid-November U.S. Drought Monitor update notes that 97% of the western U.S. is experiencing some degree of drought conditions, with 42% of the region in extreme or exceptional drought. La Niña conditions have developed and are expected to continue through this winter. La Niña, which is defined by much cooler ocean temperatures in the central and eastern tropical Pacific Ocean, will likely affect temperature and precipitation through the winter season. The December outlook and the long-range outlook (see next page) favor wetter than normal conditions across the Pacific Northwest and warmer and drier conditions across the southwestern U.S. The long-range outlook also favors cooler conditions across the Pacific Northwest and northern Rockies for mid to late winter. These outlooks support the potential for improved drought conditions in the northwestern U.S. with persistent or worsening drought conditions across the central and southern Rockies and southwestern U.S. through the winter.



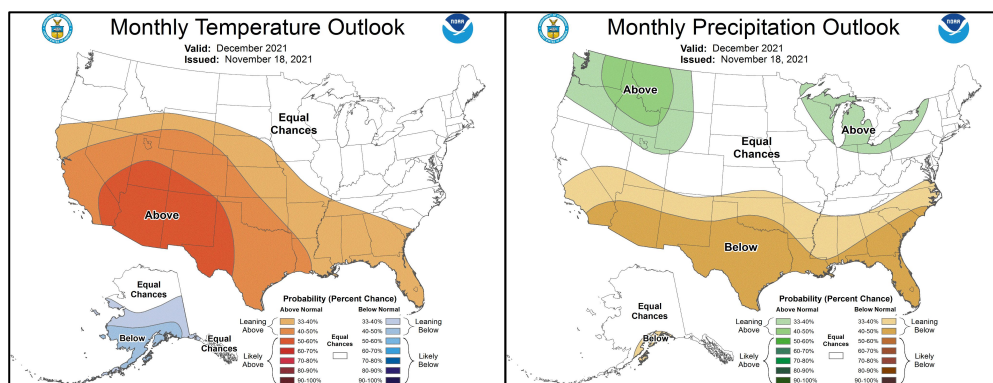
ABOVE: Total Precipitation Percentiles (Source: [NCEI](#))



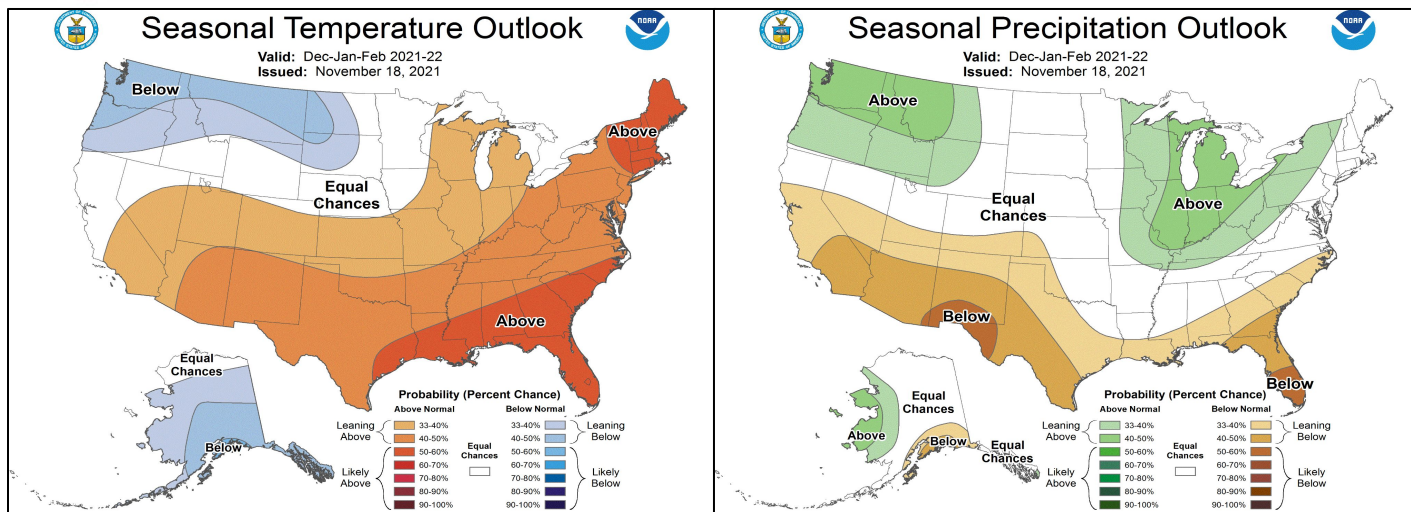
ABOVE: Percent of Normal Precipitation (Source: [HPRCC](#))



LEFT: U.S. Drought Monitor as of November 16, 2021 (Source: [U.S. Drought Monitor](#))
RIGHT: Change in U.S. Drought Monitor since Sept. 21, 2021 (Source: [U.S. Drought Monitor](#))



ABOVE: Temperature and Precipitation Outlooks for December 2021 (Source: [CPC](#))



ABOVE: Temperature and Precipitation Outlooks for the 3-month period of December 2021 through February 2022 (Source: [CPC](#))

Ongoing Impacts

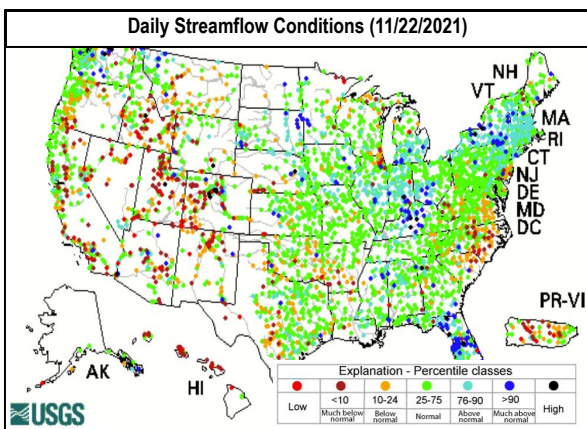
Many streamflow gauges around the Rockies and across the southwestern U.S. are showing rivers and creeks running below to much below normal for this time of year. An exception to this is along the West Coast where rivers and streams have been running above normal due to a few strong storm systems in the fall, including a strong atmospheric river event in late October. While these recent storms have helped to improve drought conditions in some areas, several normal to above-normal rain/snow events over multiple seasons will be needed in order to see significant improvement to these drought conditions. Improved soil moisture from these rainfall events ultimately will aid in maximizing runoff from this winter's snowpack. However, there still are concerns over how much total snowpack there may be this winter based on the winter precipitation outlook.

Persistent or worsening drought conditions will likely continue to contribute to:

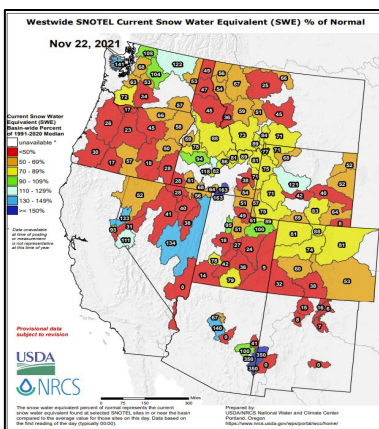
- Stress on water resources for communities
- Short supply of feed sources
- Out of season fire danger concerns

Potential Winter Season Concerns:

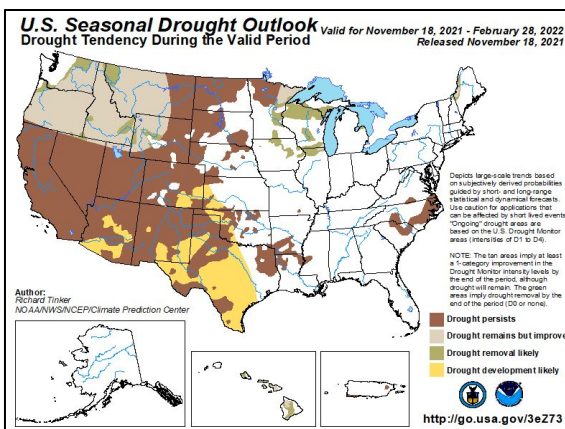
As noted in the winter precipitation outlook, the effects of La Niña could result in less snow across the central and southern Rockies and the southwest U.S. this winter, which may lead to worsening drought conditions heading into the spring.



ABOVE: Daily Streamflow Conditions across the U.S. as of Nov. 22, 2021 (Source: [USGS](#))



ABOVE: Snow Water Equivalent % of Normal: Nov. 22, 2021 (Source: [USDA](#))



ABOVE: U.S. Seasonal Drought Outlook through February 28, 2022 (Source: [CPC](#))

For more information visit:

Local Forecast – [weather.gov](#)

Long-Range Outlooks – [cpc.ncep.noaa.gov](#)

River Forecasts – [water.weather.gov/ahps/forecasts.php](#)

Weather & Climate Data – [ncei.noaa.gov](#)

Fire Outlook – [nifc.gov/nicc](#)

Drought Information – [drought.gov](#)

Agricultural Outlook – [usda.gov/oce/ag-outlook-forum](#)

Streamflow Data - <https://waterwatch.usgs.gov/index.php?id=ww>

