

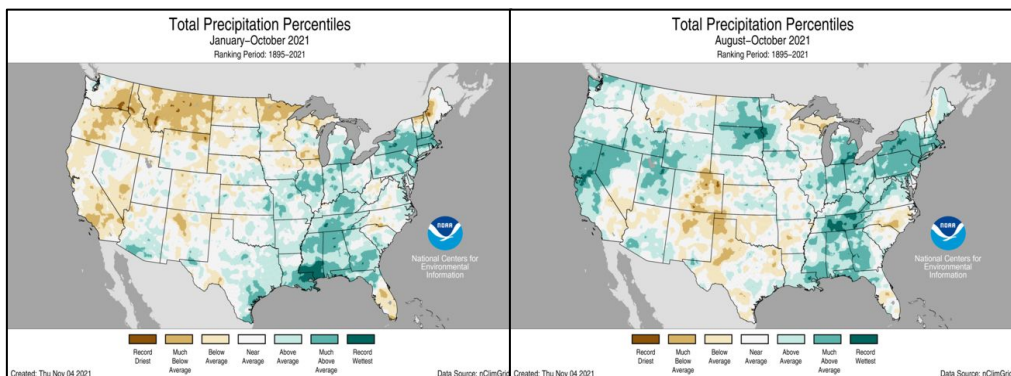
Winter Outlook: Drought Conditions to Continue or Worsen Across Parts of the Northern and Central Plains, with Increasing Wetness Around the Great Lakes

Fall 2021: Areas of Improved and Worsened Drought

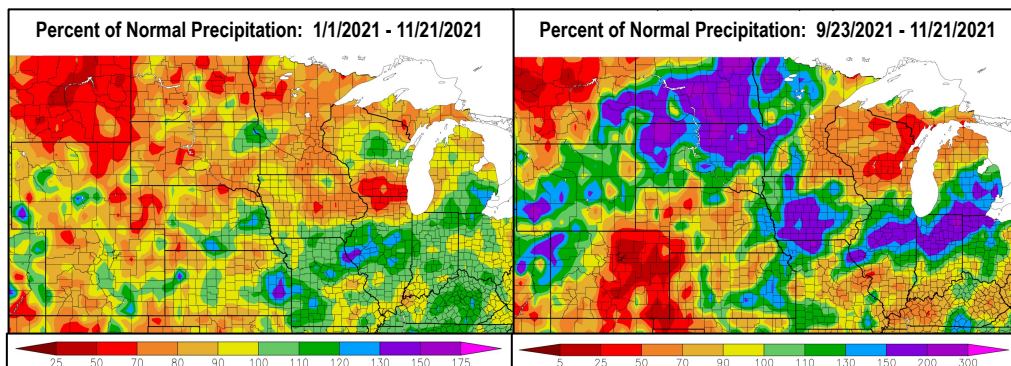
Dry conditions during the late summer and fall of 2020 led to a dry start to 2021. Through the winter, spring, and summer months, drought conditions worsened most notably across the Northern Plains, particularly due to the combination of limited rainfall and several stretches of excessive summer heat. From September through mid-November, increased rainfall across the Northern Plains led to improved drought conditions. However, portions of Wisconsin and Upper Michigan along with a few areas in the High Plains have seen worsening drought conditions through the fall season.

Drought Conditions and the Winter 2021-2022 Outlook

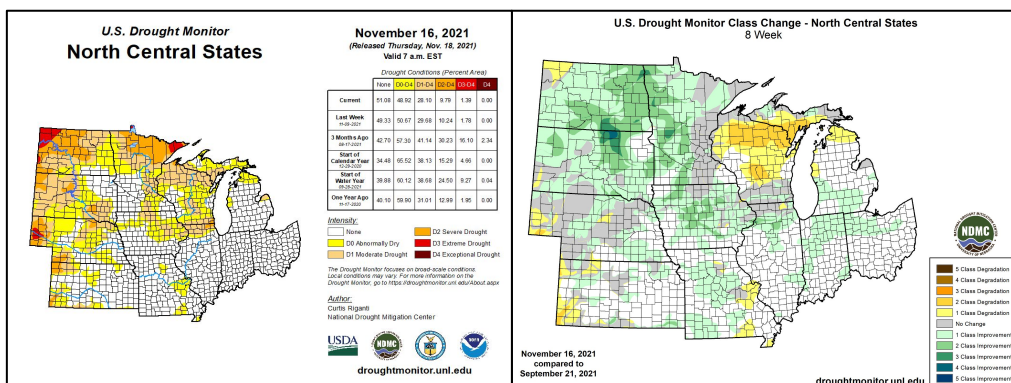
The mid-November U.S. Drought Monitor update notes that 49% of the north central U.S. is experiencing some degree of drought conditions, with about 10% of the region experiencing severe, extreme, or exceptional drought. La Niña conditions have developed and are expected to continue through this winter. 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 favors slightly higher chances for wetter than normal conditions around the Great Lakes region and warmer conditions across the Central Plains. The long-range outlook (see next page) favors increased chances for cooler conditions across the Northern Plains and warmer conditions across the Central Plains and Great Lakes region. Additionally, wetter than normal conditions are favored across the Great Lakes region. These outlooks support the potential for improved drought conditions around portions of the Great Lakes region with persistent or worsening drought conditions across parts of the Northern and High Plains through this winter.



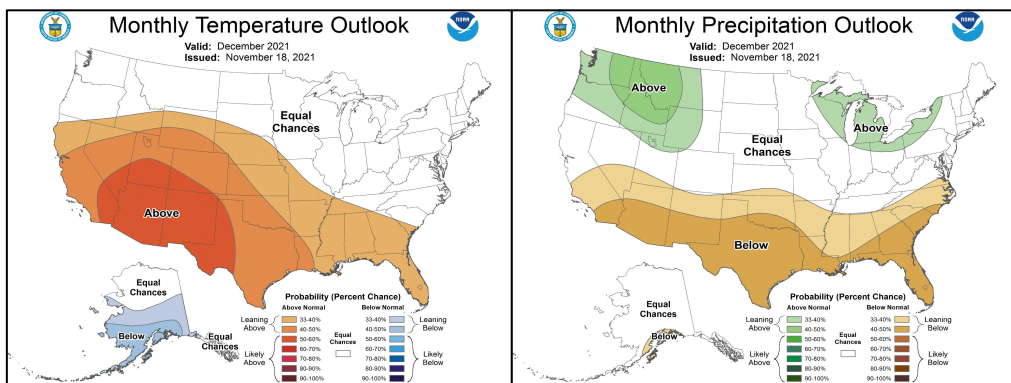
ABOVE: Total Precipitation Percentiles (Source: [NCEI](#))



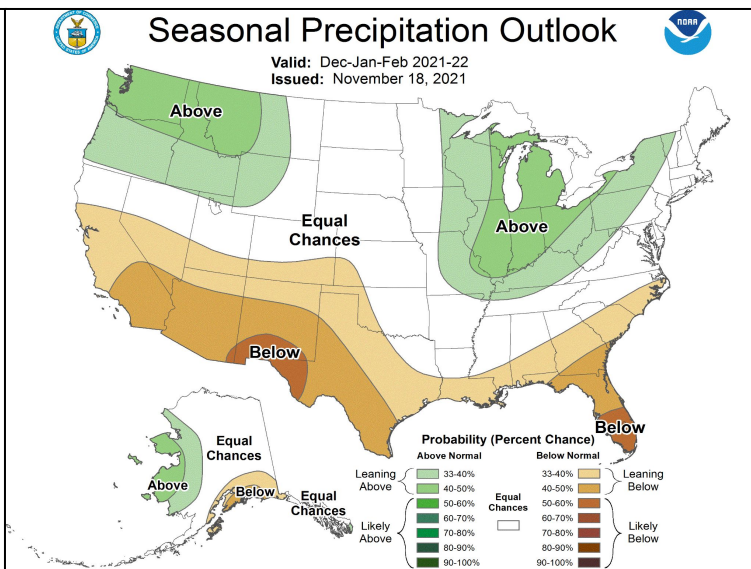
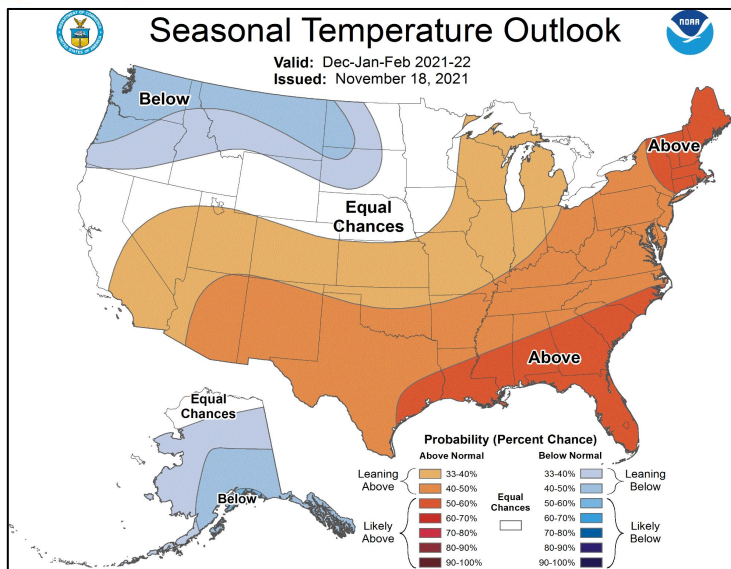
ABOVE: Percent of Normal Precipitation (Source: [HPRCC](#))



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](#))



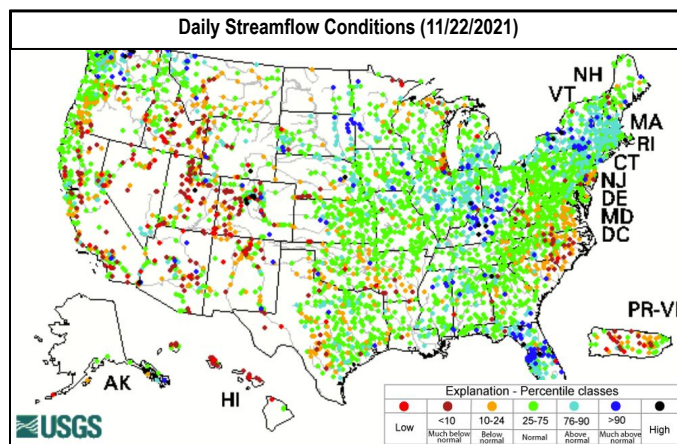
ABOVE: Temperature and Precipitation Outlooks for December 2021 (Source: [CPC](#))



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 lower Great Lakes are showing rivers and creeks running above normal for this time of year due to beneficial rainfall during the fall. In contrast, streamflow gauges across portions of the central High Plains, the Northern Plains, and the upper Great Lakes are showing rivers and creeks running below to much below normal for this time of year. Despite some short-term rain events helping to replenish near-surface soil moisture, deeper subsoils are still very dry in many locations due to long-term dryness over the past year. Given these conditions, it likely will require persistent normal to above-normal rain and snow events over multiple seasons to see improvement in drought conditions, particularly across portions of the Northern Plains and High Plains.



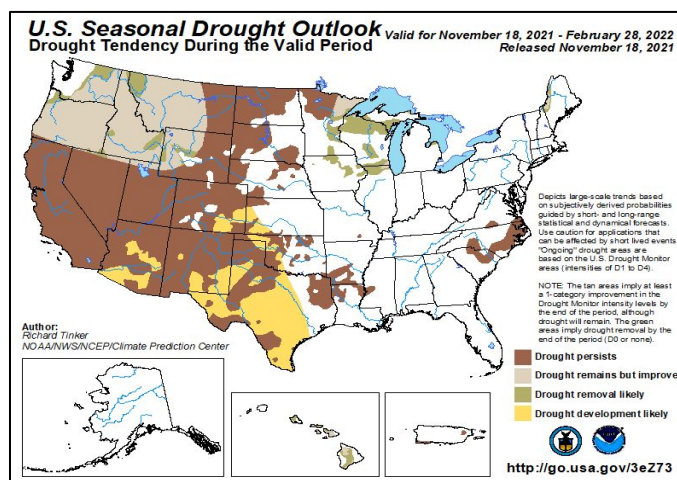
ABOVE: Daily Streamflow Conditions across the U.S. (Source: [USGS](#))

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

- Low water quantity and poor quality in stock ponds.
- Short supply of feed sources.
- Localized out of season fire danger concerns.

Potential Winter Season Concerns:

- Lake effect snow events may linger longer into the winter season due to how warm the lakes are starting off.
- Combination of increased wetness across the lower Great Lakes this fall and slightly higher chances for wetter-than-normal conditions in that region this winter (due to La Niña) could lead to continued wet soils into the spring, which could delay spring planting.



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>

