

Nevada Drought Update - NOVEMBER 2021

Drafted November 3-4, 2021

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Heavy rain and snow in the north improved conditions, but drought is not over yet.

Current drought conditions in Nevada and across the West

Drought is still widespread in the western U.S. Just over 90% of the region is in drought and only about 2.5% of the area is not experiencing drought or D0-Abnormally Dry conditions (Fig. 1). Drought is no longer a problem in western Washington, but drought expanded and/or deepened in Montana and eastern Colorado (Fig. 2).

Rain over the last month led to improvements in drought conditions in northwestern Nevada. Much of northern Nevada is now in D2-Severe Drought instead of D3-Extreme Drought. Northern Elko and Humboldt Counties are still the least impacted, with D1-Moderate Drought.

However, the entire state is still in drought (Figs. 1-2 & Table 1). D4-Exceptional Drought remains in southern Nevada. The state has had some D4 drought for over a year. Every county, except Storey and Carson City, has some D3-Extreme Drought.

Date	7/27	9/28	11/2
None	0	0	0
Abornmally Dry-D0	0	0	0
Moderate Drought-D1	5.1	4.8	4.8
Severe Drought-D2	16.3	27.6	38.4
Extreme Drought-D3	46.3	42.6	31.8
Exceptional Drought-D4	32.3	25.0	25.0

Table 1. Percent of Nevada in each drought class from the [US Drought Monitor](https://droughtmonitor.unl.edu/).

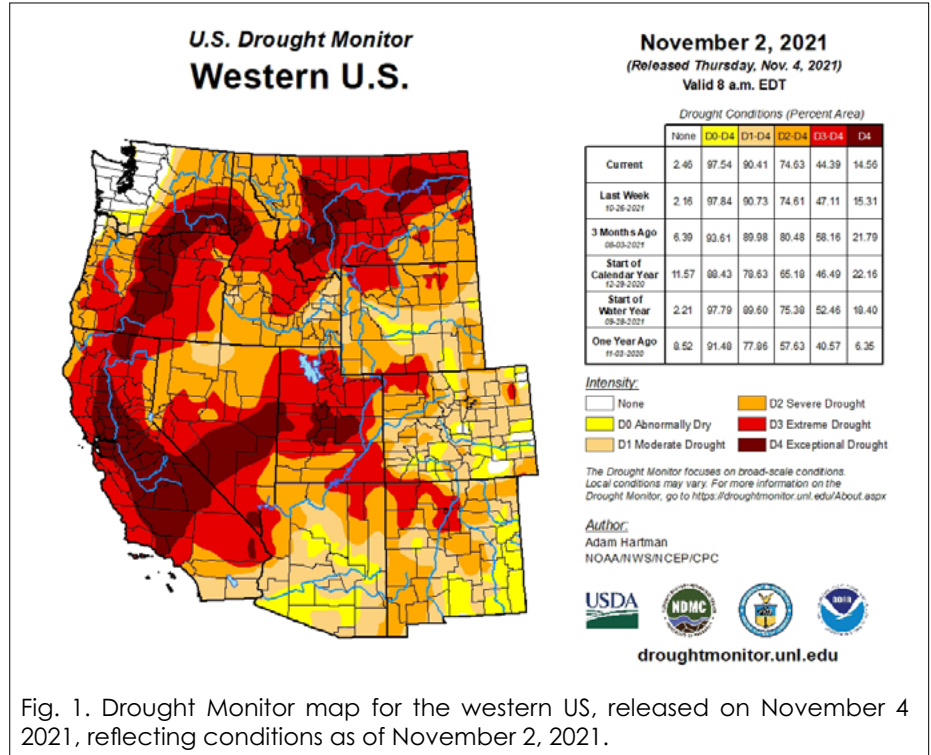


Fig. 1. Drought Monitor map for the western US, released on November 4 2021, reflecting conditions as of November 2, 2021.

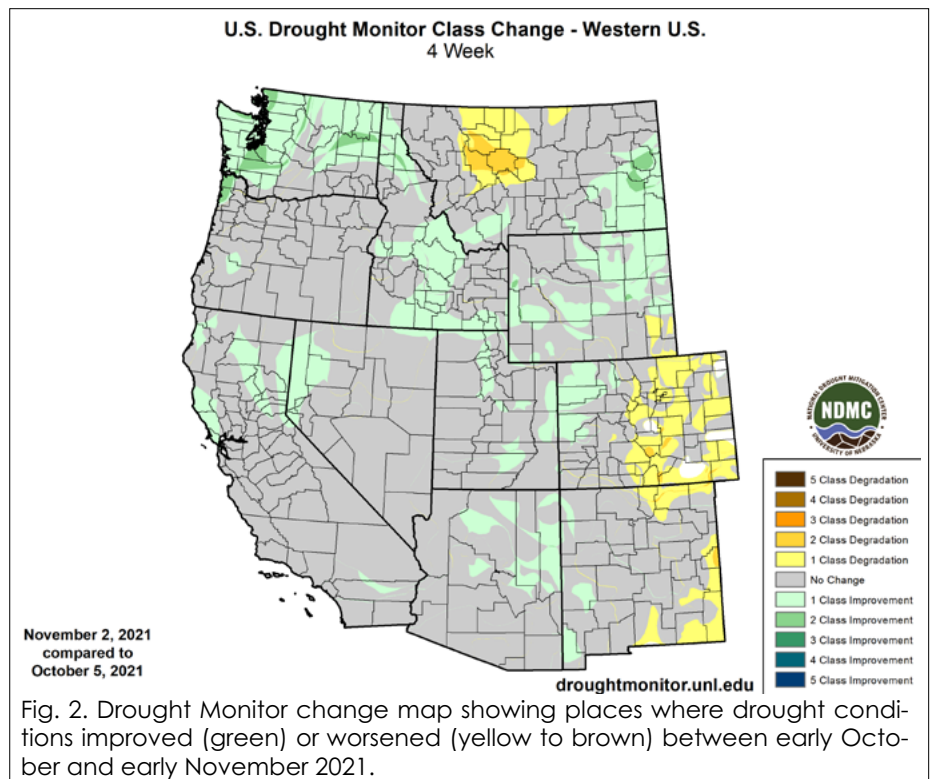


Fig. 2. Drought Monitor change map showing places where drought conditions improved (green) or worsened (yellow to brown) between early October and early November 2021.

October Temperature and Precipitation

October (sometimes) marks the start of the winter rainy season. This year most of the state experienced a cooler than normal October. The biggest temperature anomalies were in the southern part of the state (Fig. 3). Much of the state also received above normal precipitation, owing to several small storms and an exceptionally wet early season atmospheric river. Most of the precipitation from this storm fell over northern Nevada. By the end of the month, parts of the state had received more than three times the expected October precipitation (Fig. 4). Only parts of Clark county were dry, with less than half of the expected monthly precipitation. Very different than last October when most of the state got less than 5% of the usual rainfall.

So why aren't we out of drought?

SC-ACIS lists 64 weather stations in Nevada with complete rainfall records for 2021.

- 56 of those stations had above normal normal rainfall in October.
- Of those 56 stations, 37 have still had less than normal precipitation since January 1.

In many places, a lot of rain and snow fell in October. It just wasn't enough to make up for months of missed storms.

October also brought early season snow to part of California, Nevada, and the Upper Colorado River Basin, the main source of water for the Colorado River. Snowpack is measured as the snow water equivalent (SWE) --

the water content of the snow. It is still early in the season, and the snowpack is small. However, the October 2021 snowpack in Nevada and the eastern Sierra is well above normal (Fig. 5). Looking back to 1981, only 16 years have even had a measurable snowpack across the region. The Upper Colorado snowpack is also in decent shape, with slightly above normal snow.

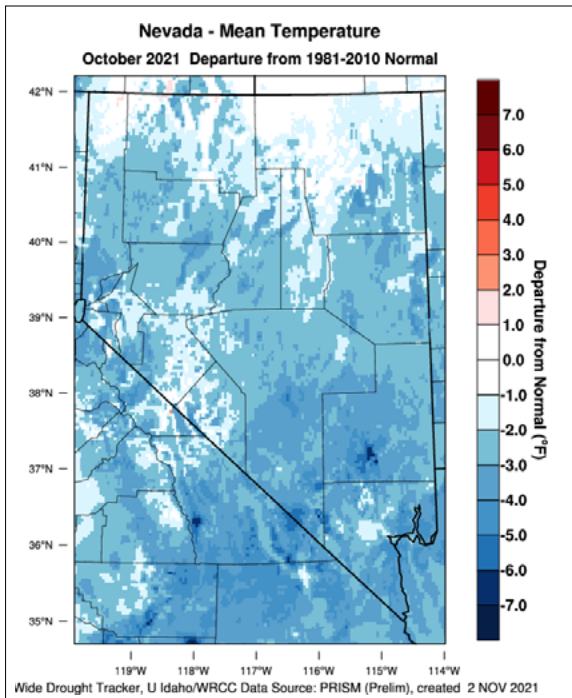


Fig. 3. Difference from average (1981-2010) October temperature (°F) in October 2021. Data: PRISM. From the [WestWide Drought Tracker](#).

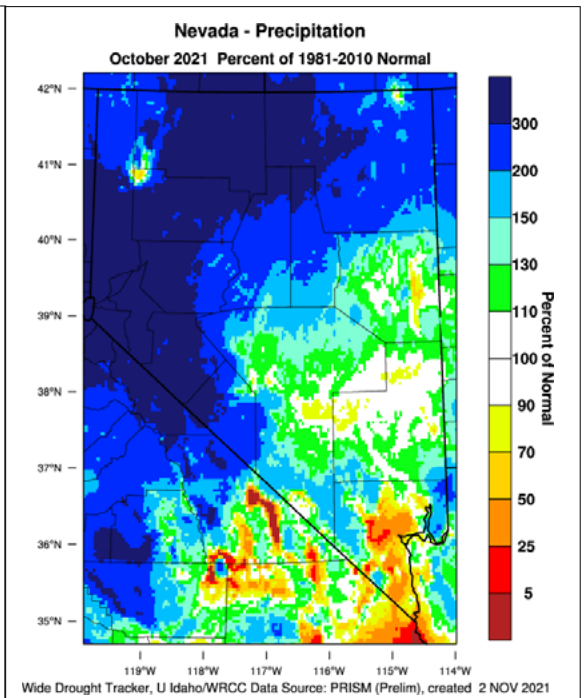


Fig. 4. Percent of average (1981-2010) October precipitation in October 2021. Data: PRISM. From the [WestWide Drought Tracker](#).

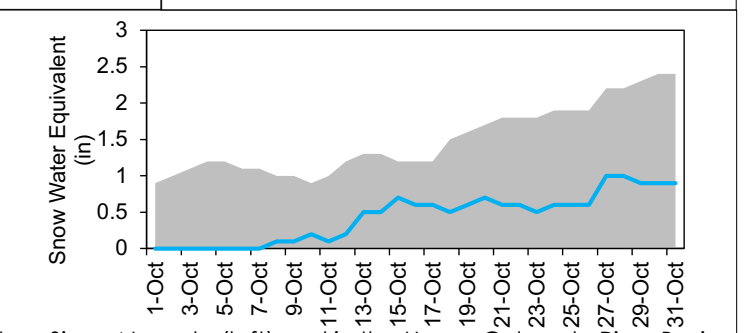
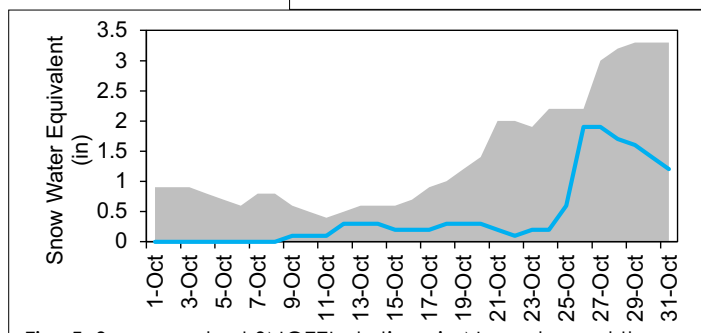


Fig. 5. Snowpack at SNOTEL stations in Nevada and the eastern Sierra Nevada (left) and in the Upper Colorado River Basin (right) in October 2021. Gray shading shows the maximum snowpack since the early 1980s. The blue line shows October 2021 snowpack. Data from the [Natural Resources Conservation Service Nevada](#).

Water Resources

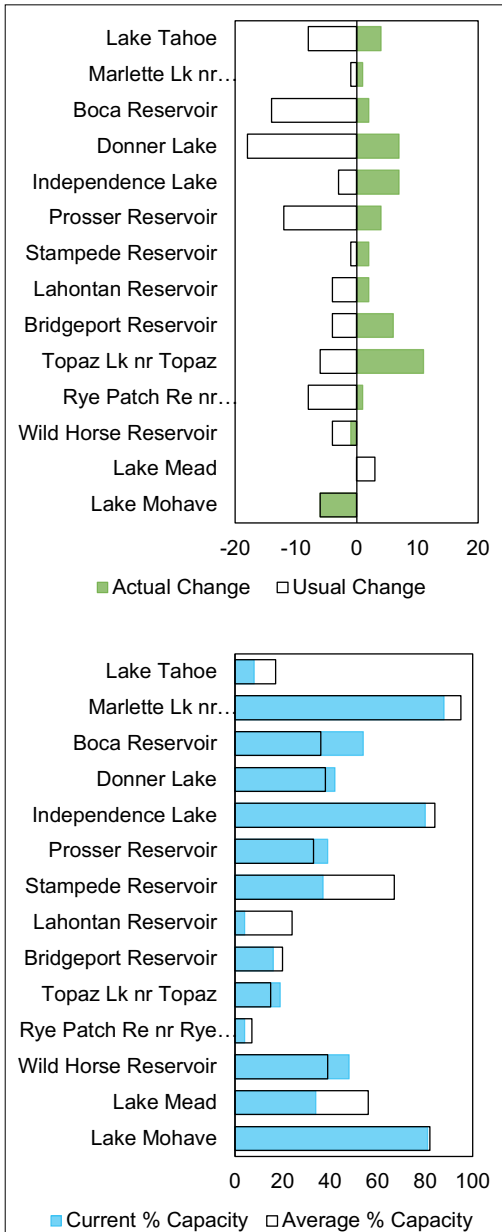


Fig. 6. Change in percent capacity from late September to late October relative to the usual change in capacity (top). Current percent capacity in Nevada's reservoirs at the end of October 2021 (bottom). Data from the [Natural Resources Conservation Service](#).

After a remarkably wet early season storm, water levels rose in many reservoirs, particularly in northern Nevada. This was especially good news because, in most of the state's reservoirs, average water levels drop between September and October (Fig. 6). About half of the state's reservoirs are now near or even above normal capacity for the end of October. Lahontan Reservoir remains particularly low.

Lake Mead's elevation dropped less than a foot to 1,066.8 feet, almost 70 feet lower than its 1991 - 2020 average elevation (Fig. 8). Unlike most other Nevada reservoirs, average water levels do increase in Lake Mead from September to October, but only slightly. Small drops in water level during October have not been unusual in the past 30 years.

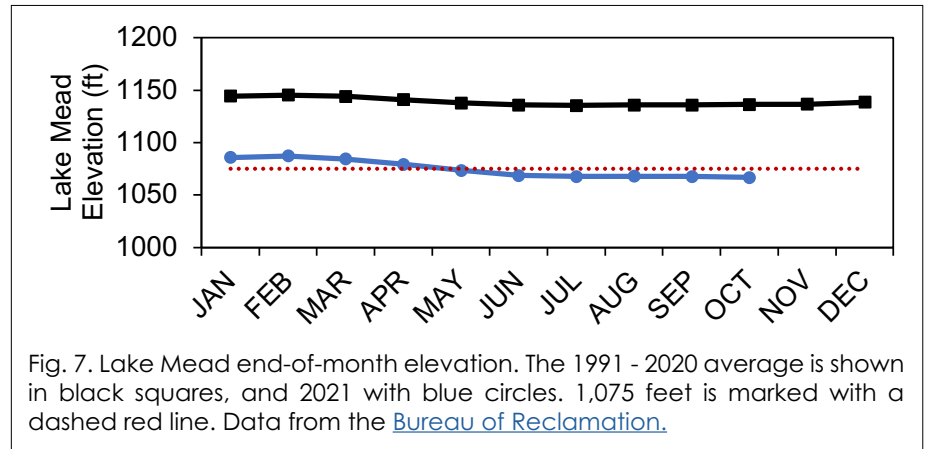


Fig. 7. Lake Mead end-of-month elevation. The 1991 - 2020 average is shown in black squares, and 2021 with blue circles. 1,075 feet is marked with a dashed red line. Data from the [Bureau of Reclamation](#).

Rainfall drove normal to above normal streamflow in many locations, although flooding was limited (Fig. 8). One of the few benefits of the recent drought was that soils, streams and reservoirs had plenty of capacity to handle the rain. Some areas did have low monthly average flows, however. A number of much below average flows were recorded in the Walker basin.

Whether we get rain or snow in the winter can influence water availability in the summer.

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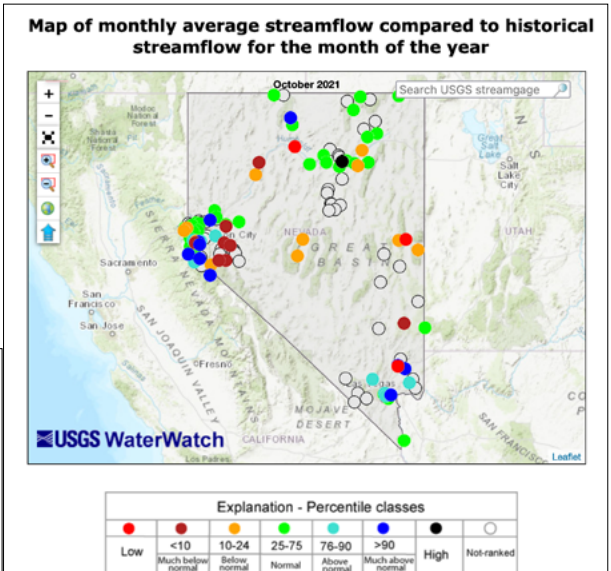


Fig. 8. October average stream flow relative to usual conditions. From [USGS Water Watch](#). There is more information on the [percentile classes](#).

Soils, Vegetation and Wildfire

Recent rain and snow wetted soils. Regional average soil moisture at SNOTEL stations is now near the period-of-record maximum (Fig. 9). Remotely sensed products show surface soils are much wetter than normal in the northern part of the state and drier than normal in the south (Fig. 10). Deeper soils are unusually wet in northwestern Nevada, but slightly wet or dry in the rest of the state.

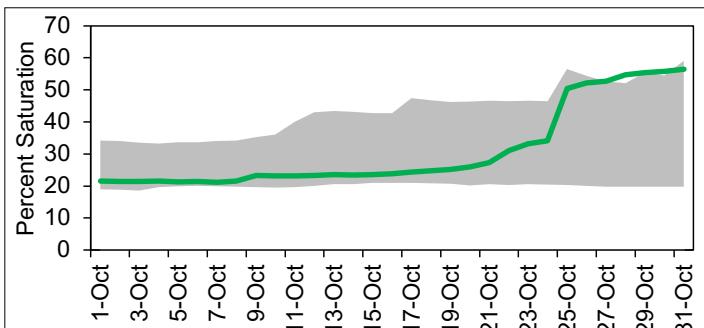


Fig. 9. Soil moisture at SNOTEL stations in Nevada and the eastern Sierra Nevada in October 2021. Gray shading marks the period of record (WY2006-2021) minimum and maximum. The green line shows 2021. From the [Natural Resources Conservation Service Nevada](#).

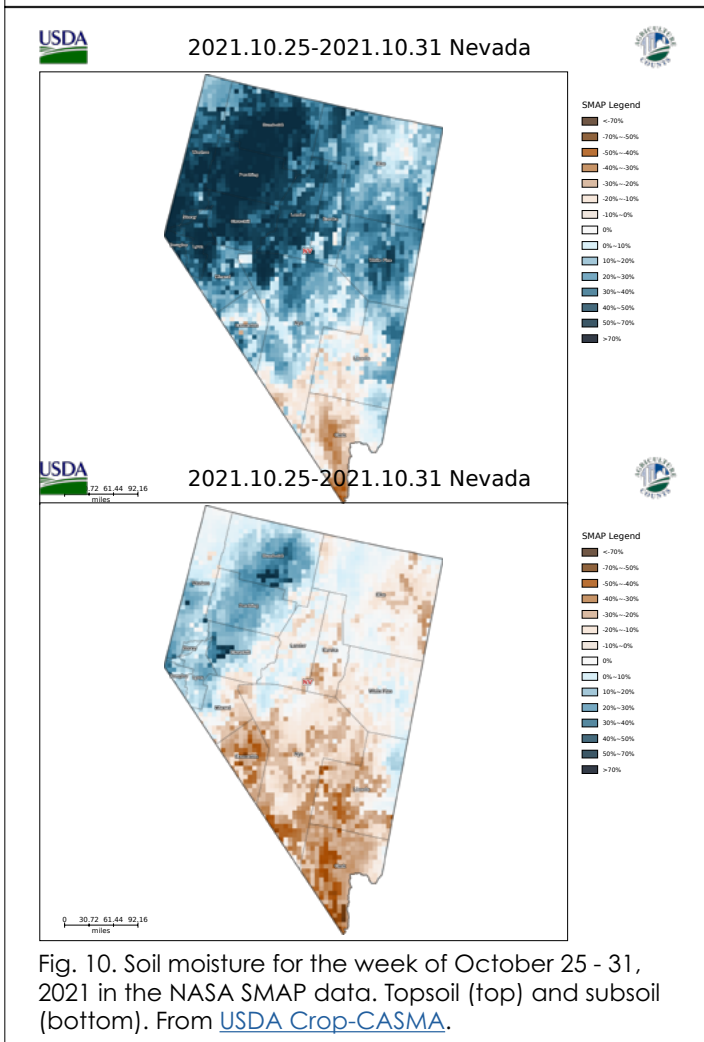


Fig. 10. Soil moisture for the week of October 25 - 31, 2021 in the NASA SMAP data. Topsoil (top) and subsoil (bottom). From [USDA Crop-CASMA](#).

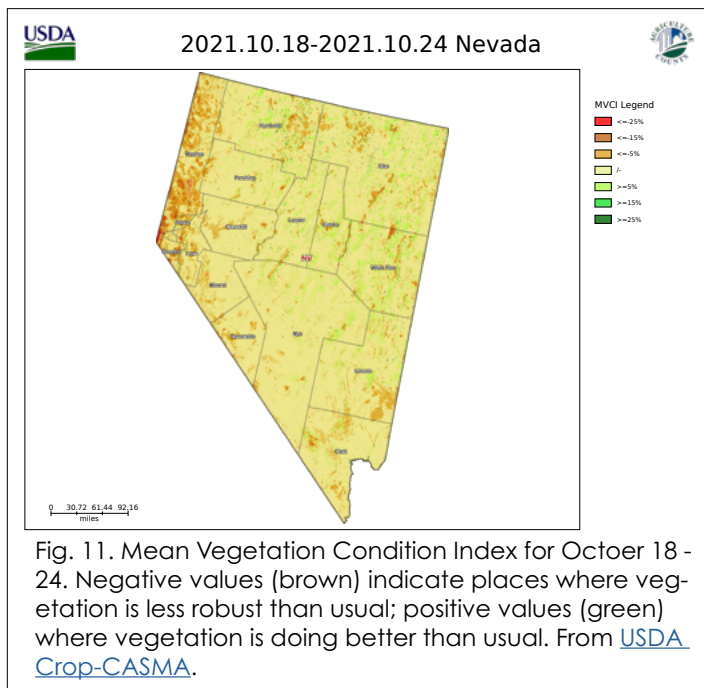


Fig. 11. Mean Vegetation Condition Index for October 18 - 24. Negative values (brown) indicate places where vegetation is less robust than usual; positive values (green) where vegetation is doing better than usual. From [USDA Crop-CASMA](#).

The Mean Condition Vegetation Index, which tracks vegetation health, shows generally normal vegetation growth (Fig. 11). Some apparently below normal vegetation growth may be due to snow cover.

Fire danger has finally started to drop (Fig. 12) now that rains have increased fuel moisture and temperatures have cooled. Preparedness Levels in the Great Basin and nationally have dropped to 1, the category used when there are sufficient fire management responses to respond to most events. This doesn't mean there is no fire risk. Fires have burned near Reno in November, and southern California fires have burned into the holidays.

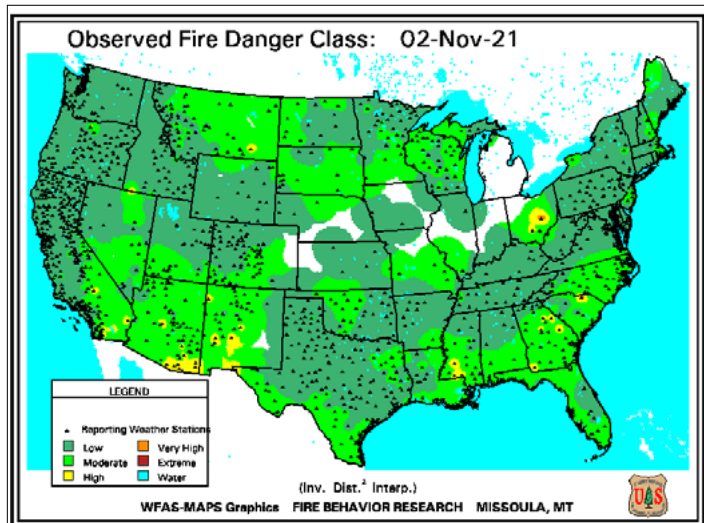


Figure 12. National fire danger rating map for November 2, 2021. From the [U.S. Forest Service Wildland Fire Assessment System](#).