

Nevada Drought Update - SEPTEMBER 2021

Drafted September 2 - 7, 2021

Prepared by S. McAfee, State Climatologist, UNR

Reviewed by B. Bishop, NDWR & K.J. Ormerod, UNR

Monsoon rains brought relief, but reservoir levels are low.

Current drought conditions in Nevada and across the West

All of Nevada remains in drought, as does much of the western United States (Fig. 1). However, monsoon rains have led to continuing improvements over the southwestern United States. Rains were heaviest in Arizona and New Mexico, but they extended into western Utah, the Upper Colorado River Basin, and southern and eastern Nevada (Fig. 2). Drought has remained significant or worsened in California and the Pacific Northwest.

Drought conditions continue but have improved recently. Just over 26% of the state was in D4-Exceptional Drought in late August, versus about 40% in early June (Table 1). Eastern Lincoln and Clark counties, previously in D4-Exceptional Drought, have improved to D2-Severe Drought. Drought remains relatively mild in far north-central Nevada, with just under 5% of the state in D1-Moderate Drought. All counties in the state are still experiencing some D3-Extreme Drought.

Date	8/31	8/24	6/1
None	0	0	0
Abnormally Dry-D0	0	0	0
Moderate Drought-D1	4.82	4.83	5.83
Severe Drought-D2	27.37	27.93	18.16
Extreme Drought-D3	41.53	40.41	35.43
Exceptional Drought-D4	26.29	26.83	40.58

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

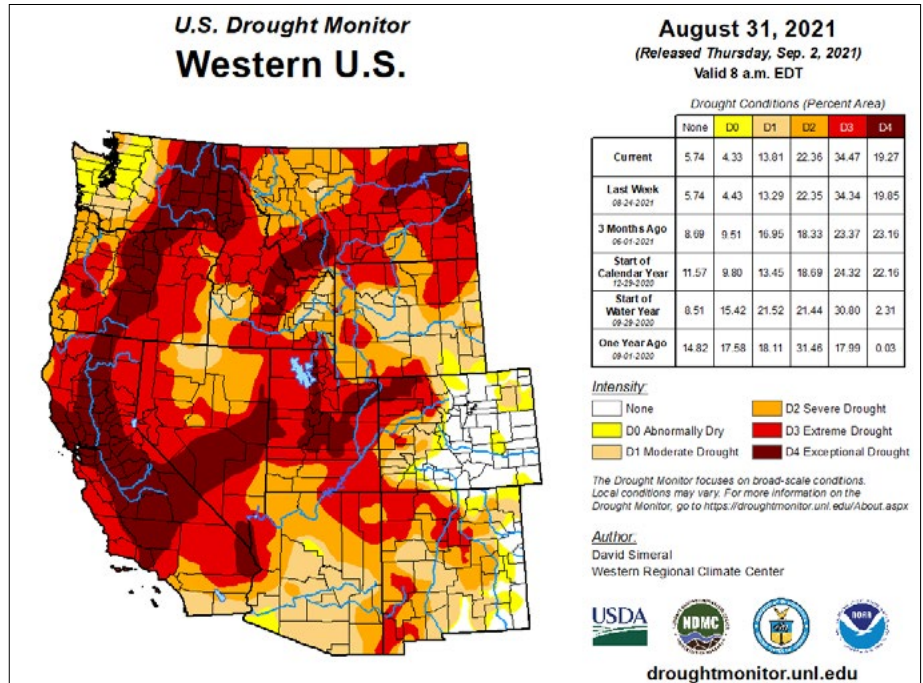


Fig. 1. Drought Monitor map for the western US, released on September 2, 2021, reflecting conditions as of August 31, 2021.

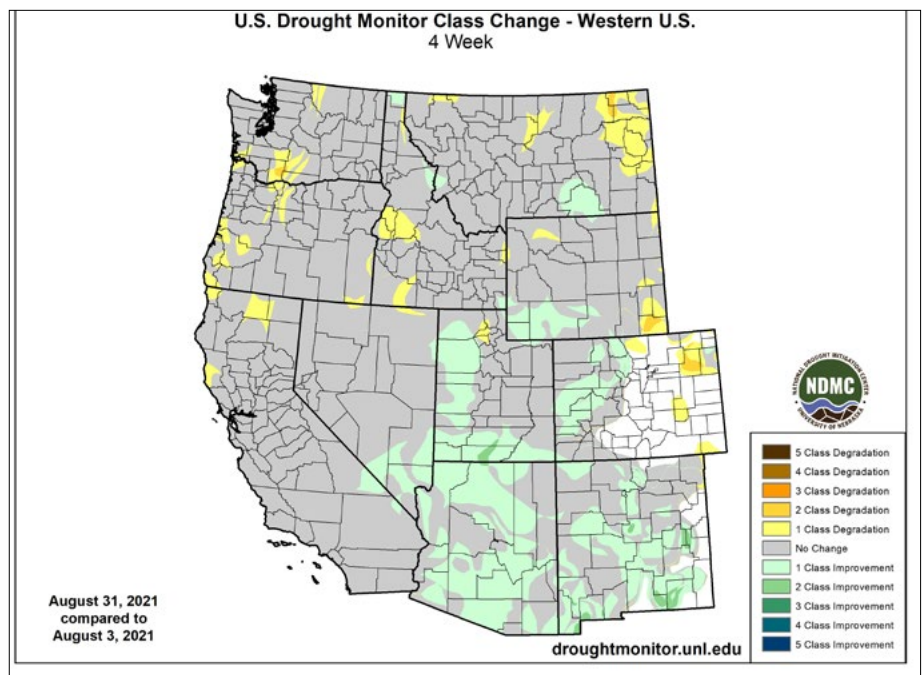


Fig. 2. Drought Monitor change map showing places where drought conditions improved (green) or worsened (yellow to brown) between early and late August 2021.

August Temperature and Precipitation

August temperatures were much closer to typical summer conditions than July temperatures were (Fig. 3). Much of northern Nevada was within 1 °F of the 1981-2010 normal August average temperature. Parts of Elko County, White Pine counties, and scattered areas elsewhere throughout the state experienced August average temperatures below the long-term mean, a relief after June and July. Where temperatures were above normal -- Washoe, Mineral, Esmeralda, Nye, Clark, and White Pine counties -- they were generally more reasonable, within a few degrees Fahrenheit of the long-term August average.

August brought more than normal amounts of rain to large swaths of Elko county, northern Eureka, and parts of Churchill county (Figure 4). Below normal precipitation in northwestern Nevada was disappointing but not alarming, as August is often dry in that part of the state. Although precipitation was below normal in southern Nevada, updated numbers suggest that July precipitation was higher than previously indicated (Fig. 5).

Note -- we draft these updates early in the month, often before climate data from the previous month are entirely complete, so there can be (usually modest) changes later.

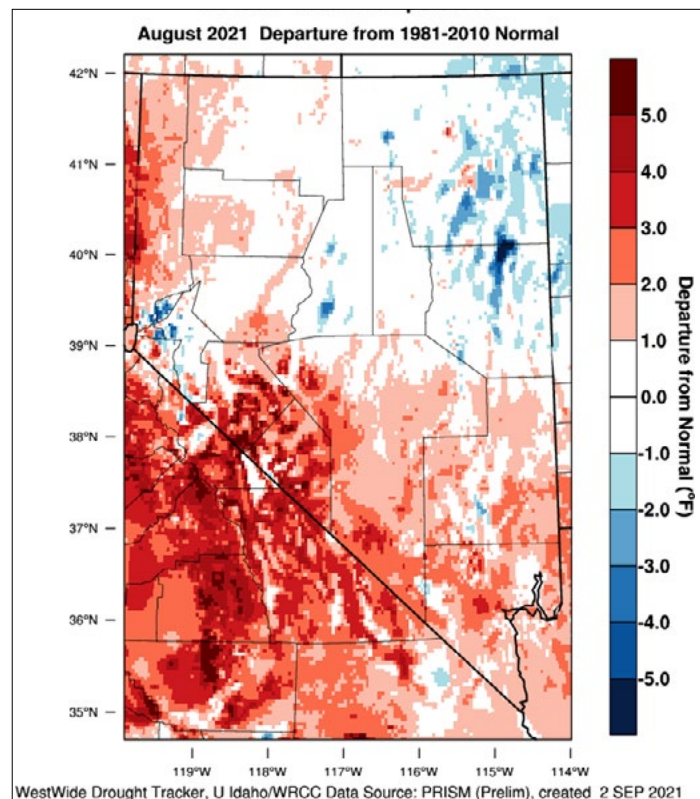


Fig. 3. Difference from average (1981-2010) August temperatures in August 2021 (°F). From the [WestWide Drought Tracker](#).

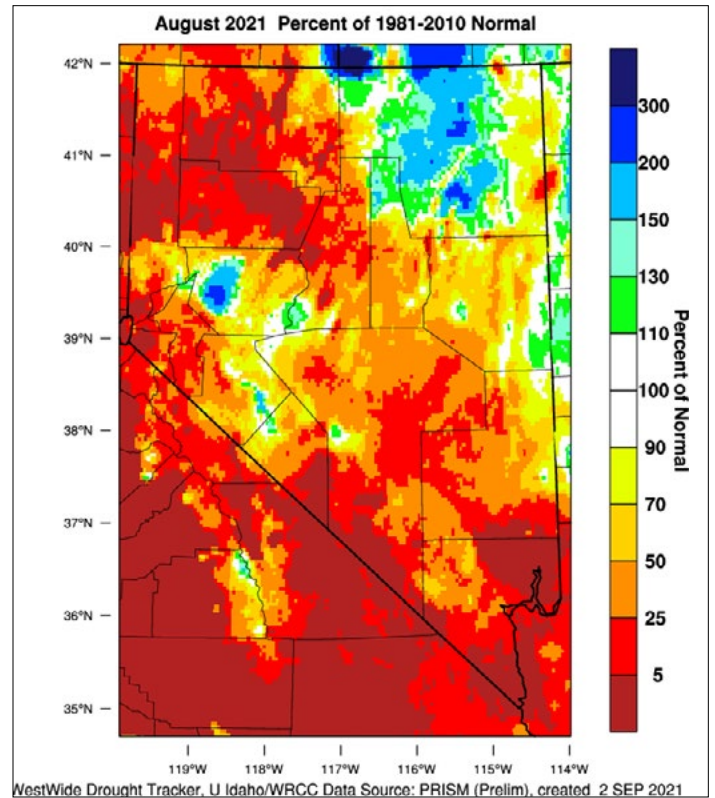


Fig. 4. Percent of average (1981-2010) August precipitation in August 2021. Data: PRISM. From the [WestWide Drought Tracker](#).

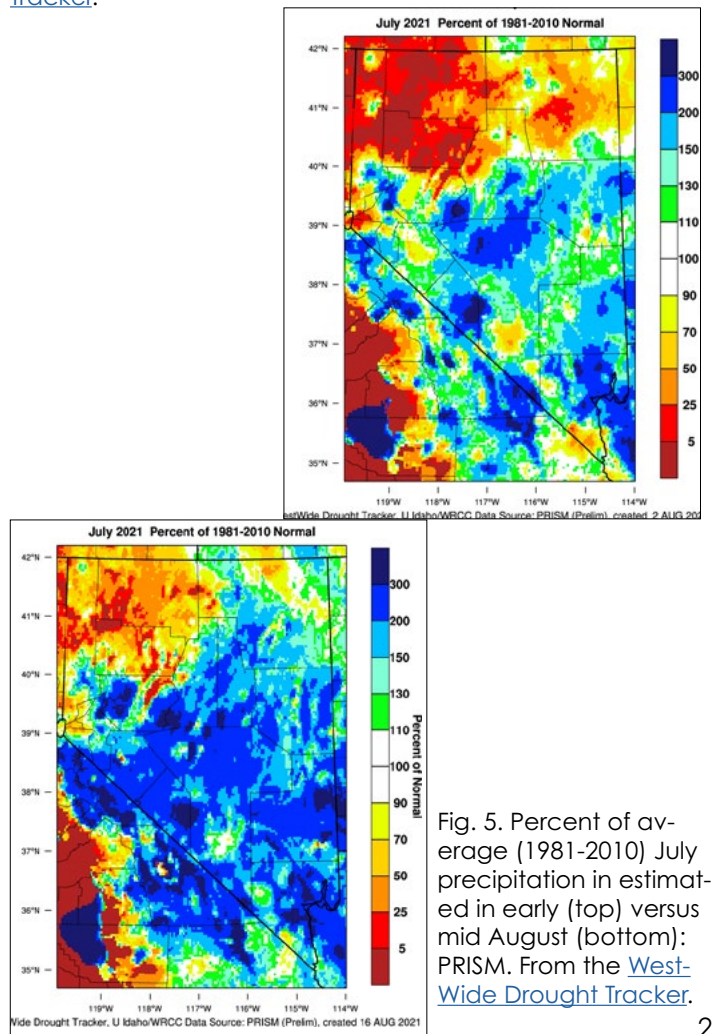


Fig. 5. Percent of average (1981-2010) July precipitation in estimated in early (top) versus mid August (bottom): PRISM. From the [WestWide Drought Tracker](#).

Water Resources

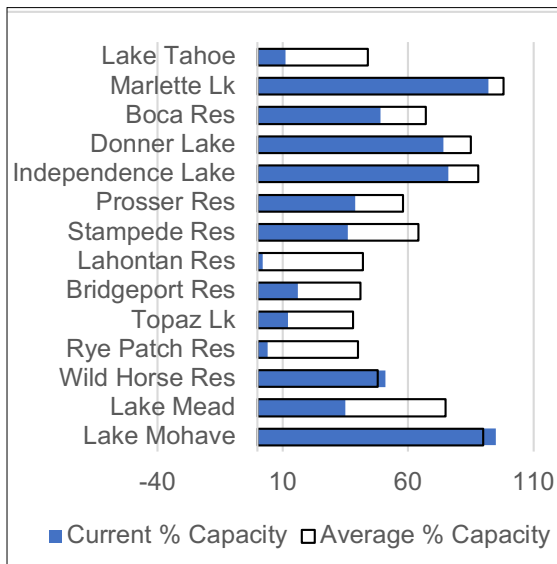


Fig. 6. Current percent capacity in Nevada's reservoirs at the end of August 2021, from the [Natural Resources Conservation Service](#).

With the exception of Wild Horse Reservoir and Lake Mohave, reservoir levels in late August were lower than they would normally be at this time of year (Fig. 6). Lakes and reservoirs in the Truckee River basin are in relatively good shape, with 57 - 87% of average capacity, although Lake Tahoe has only 26% of its usual late August capacity. Of particular note are Lahontan and Rye Patch Reservoirs, which were at 2% and 4% of capacity, respectively. Both are usually around 40% capacity in late August.

Streamflow conditions were varied in August, with a substantial number of stream gages reporting normal streamflow, many indicating lower or much lower than normal flow and a few with higher than normal streamflow (Fig. 7). Gages with above normal flow were mostly, but not exclusively in southern Nevada.

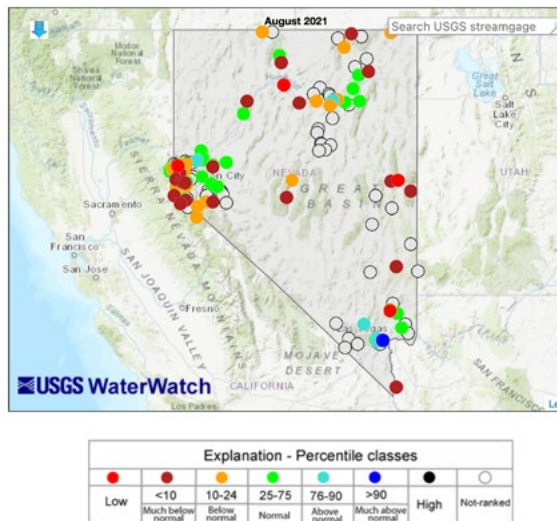


Fig. 7. August average stream flow relative to usual conditions. From [USGS Water Watch](#). There is more information on the [percentile classes](#).

As of late August, mountain soils measured at SNOTEL stations saw moisture increase during July and have been drying since. Region-wide soils are at the average for this time of year (Fig. 8), but there is geographic variability, with above average moisture in some basins (e.g., Snake) and below average in others (e.g., Tahoe). Across the state, topsoils were moderately to very wet in parts of Elko, White Pine, Eureka and Nye counties. In those regions, subsoils are slightly moist to near normal. In other parts of the state, both top and subsoils are very dry or dry (Fig. 9).

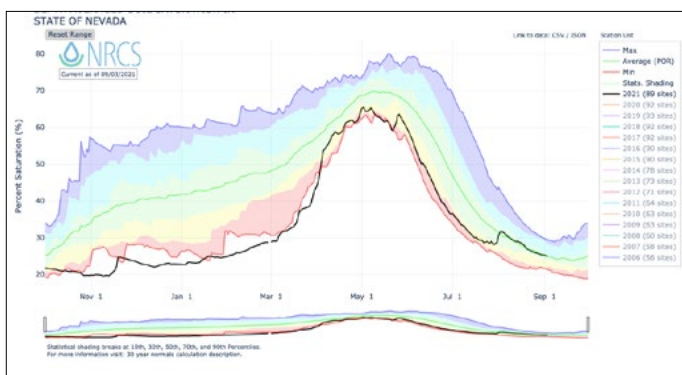


Fig. 8. Soil moisture at SNOTEL stations in Nevada and the eastern Sierra Nevada as of September 3, 2021. From the [Natural Resources Conservation Service Nevada](#).

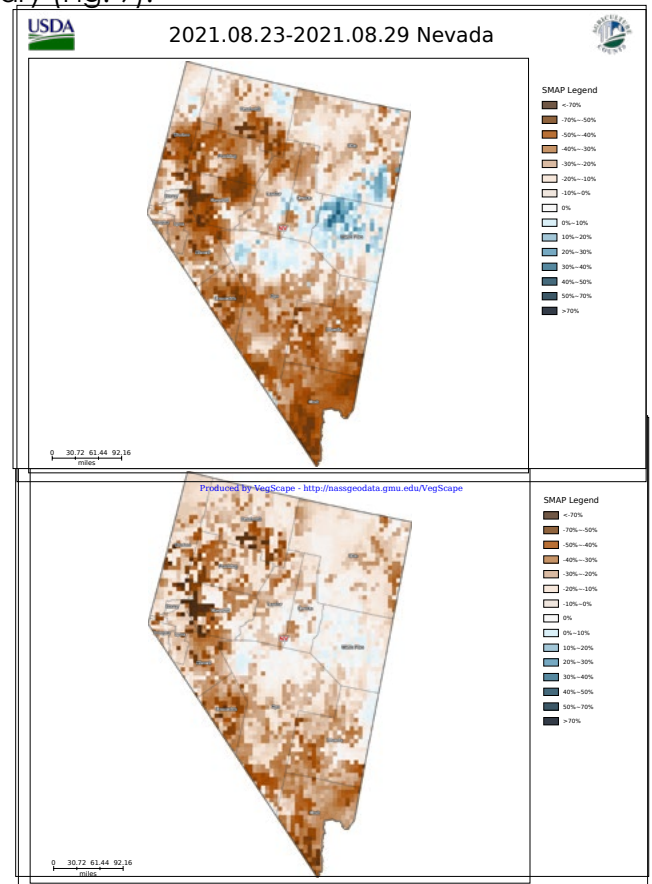


Fig. 9. Soil moisture for the week of August 23-29, 2021 in the NASA SMAP data. Topsoil (top) and subsoil (bottom). From [USDA Crop-CASMA](#).

Vegetation, Fuels and Wildfire

Across most of the state, the Mean Vegetation Condition Index indicates generally normal late August conditions (yellow). Scattered parts of northern Nevada have more vigorous vegetation than might be expected, but the remotely sensed product suggests there are localized areas of less healthy vegetation in southern and far north-western Nevada (Fig. 10).

A serious wildfire season for the western United States is continuing. [NevadaFireInfo](#) reported a wildfire on the Nevada National Security Site. The Southern Bench Fire had burned 21,000 acres and was 0% contained as of the September 2 report. The Tamarack Fire, which ignited in California but spread into Douglas County, was 84% contained as of September 2. Although the Caldor Fire has not burned into Nevada as of early September, it did trigger evacuations in Douglas County. Even more Nevadans were impacted by poor air quality. According to [airnow.gov](#) between August 8 and September 6, Carson City experienced six days when the daily air quality was very unhealthy and another seven when the air quality was unhealthy (Fig. 11). Over that same period, the South Lake Tahoe area had two days when the daily air quality was hazardous (maroon AQI), three with very unhealthy conditions, and seven with unhealthy air quality. All Nevadans should stay aware of emerging wildfires as well as related air quality risks and public safety power shutoffs because fire season persists well into the autumn.

On September 2, almost all of Nevada was in High or Very High fire danger (Fig. 12), meaning that fuels are generally dry enough to ignite easily and fire can spread quickly once started (see detailed [descriptions](#)) of each of the fire danger ratings. Although the [Great Basin Coordination Center](#) is only at Preparedness Level 2 (PL2) out of 5, the nation as a whole is at PL5, which was declared on July 14, according to the [National Interagency Fire Center](#) (NIFC). Also according to [NIFC](#):

- There have been over 43,000 wildfires since the start of the year, and 78 have been considered large fires.
- Over five million acres have already burned this fire season.
- Almost 24,000 people are currently working on wildfire response.

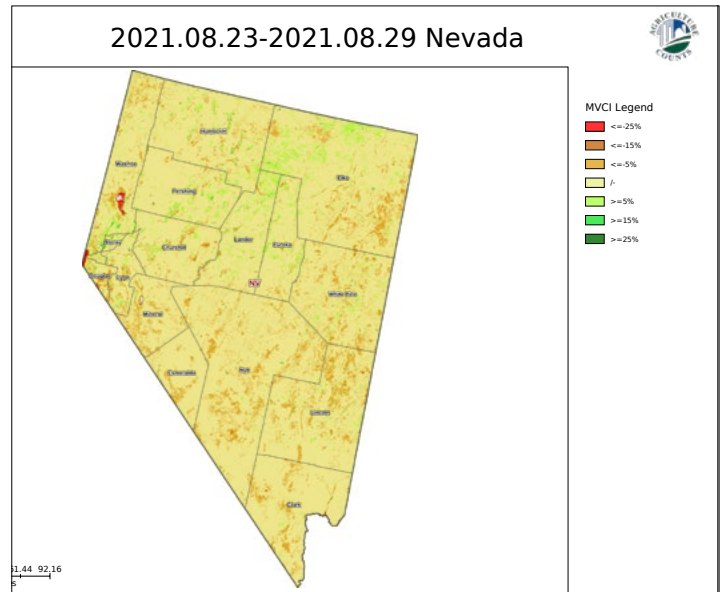


Fig. 10. Mean Vegetation Condition Index for August 23-29. Negative values (brown) indicate places where vegetation is less robust than usual; positive values (green) where vegetation is doing better than usual. From [USDA Crop-CASMA](#).

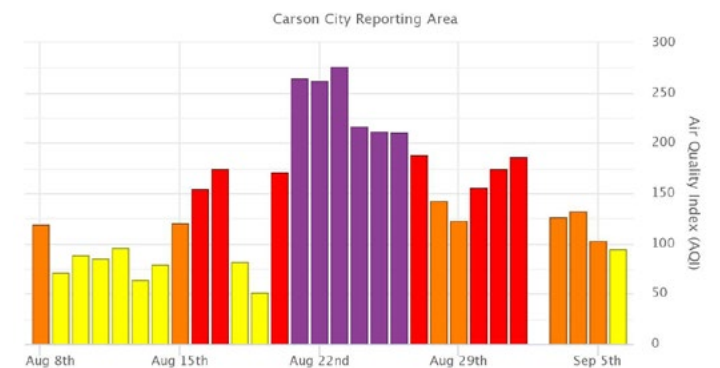


Figure 11. Daily air quality index in Carson City for August 8 - September 6. Yellow indicates that air quality is Moderate, orange - Unhealthy for Sensitive Groups, red - Unhealthy and Purple - Very Unhealthy. From [airnow.gov](#)

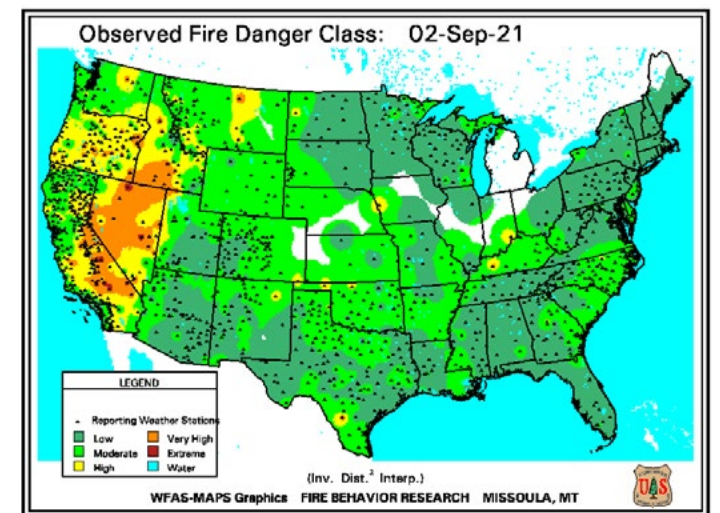


Figure 12. National fire danger rating map for September 2, 2021. From the [US Forest Service Wildland Fire Assessment System](#).