

Nevada Drought Update - OCTOBER 2021

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Drought continued through September.

Current drought conditions in Nevada and across the West

September brought only modest changes to drought severity and extent. Almost 90% of the western U.S. remains in drought, and another 8% of the region is experiencing D0-Abnormally Dry conditions (Fig. 1).

All of Nevada remains in drought (Fig. 1 & Table 1). Over the last month, however, drought conditions improved a bit along the Elko-White Pine border, where a small area of D4-Exceptional Drought shifted to D3-Extreme drought. The U.S. Drought Monitor also reported a slight lessening in the severity of drought in Clark County. About 5% of the county shifted from D4-Exceptional to D3-Extreme and 3% improved from D3 to D2-Severe Drought.

West-wide, drought conditions improved in Arizona and parts of the Pacific Northwest. Abnormally Dry (D0) conditions developed in eastern Colorado, which was largely drought-free in late August.

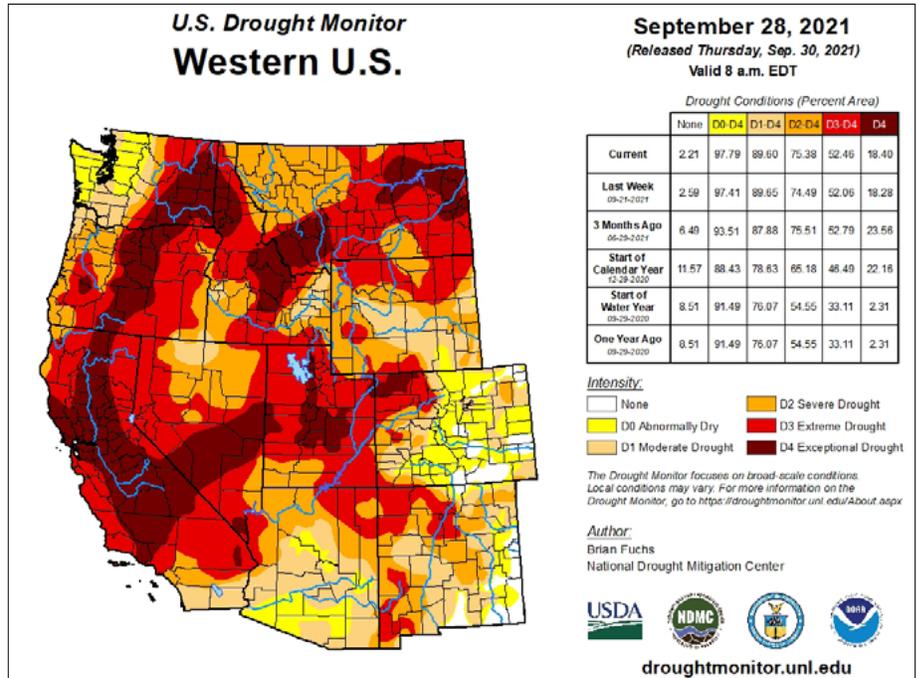


Fig. 1. Drought Monitor map for the western US, released on September 30, 2021, reflecting conditions as of September 28, 2021.

Date	6/29	8/31	9/28
None	0	0	0
Abnormally Dry-D0	0	0	0
Moderate Drought-D1	5.1	4.8	4.8
Severe Drought-D2	18.0	27.4	27.6
Extreme Drought-D3	36.3	41.5	42.6
Exceptional Drought-D4	40.6	26.3	25.0

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

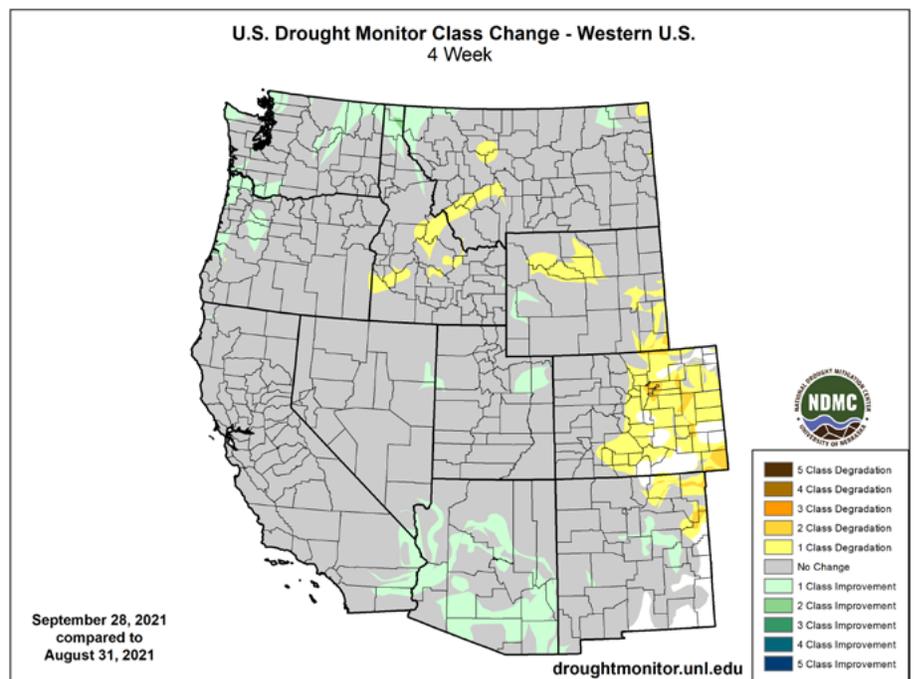


Fig. 2. Drought Monitor change map showing places where drought conditions improved (green) or worsened (yellow to brown) between late September and late August 2021.

September Temperature and Precipitation

After a relatively normal (cool, even, in northeastern Nevada) August, September temperatures were above normal over much of the state (Fig. 3). Higher-than-normal temperatures and clear skies can lead to greater than normal evaporation of surface water and soil moisture.

September is a dry month. Typically, the monsoon is over or at least winding down, and winter-type storms are not yet hitting the region. On average, the northwestern third of Nevada gets less than 5% of its annual precipitation in September. The rest of the state gets between 5 and 10% of the annual total in September. Preliminary figures suggest that much of the state was drier than normal (Fig. 4). But, the generally low expected precipitation means that a dry September is less worrying than a dry January or February. Northwestern Nevada and northeastern California did get decent rain, with stations in the area reporting anywhere from 0.5" to 2+" more precipitation than usual.

Provisional totals for the 2021 water year, which ran from October 1, 2020 - September 30, 2021, confirm that most of Nevada was both really warm and really dry over the past 12 months (Fig. 5).

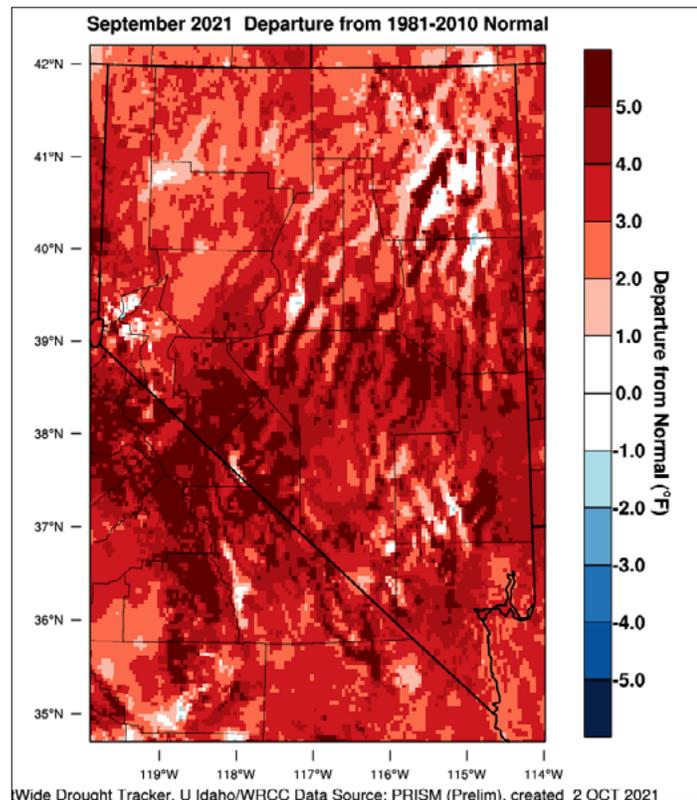


Fig. 3. Difference from average (1981-2010) September temperatures in September 2021 (°F). From the [WestWide Drought Tracker](#).

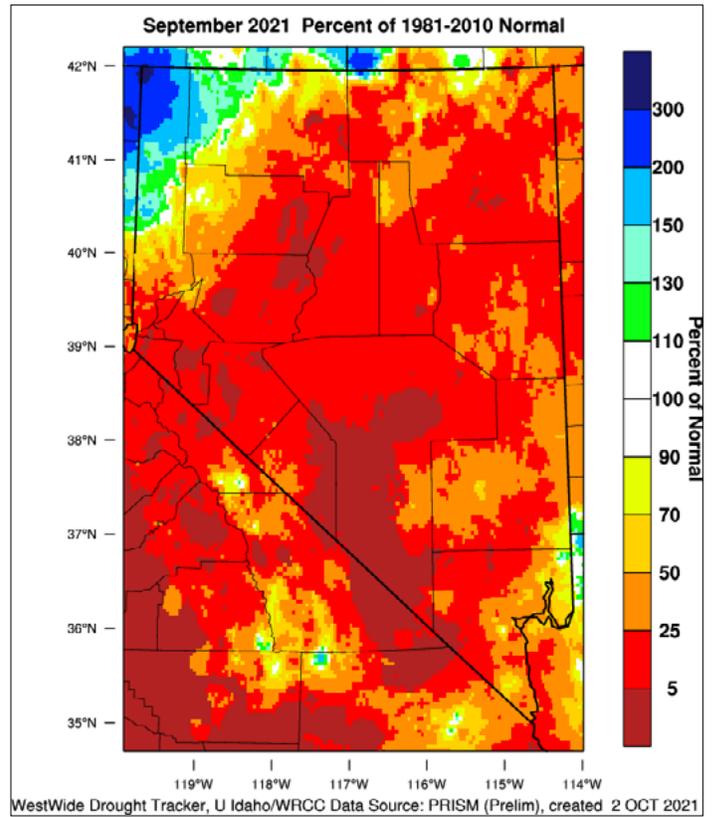


Fig. 4. Percent of average (1981-2010) September precipitation in September 2021. Data: PRISM. From the [WestWide Drought Tracker](#).

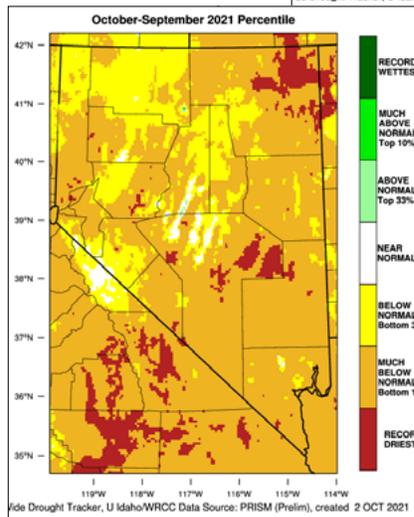
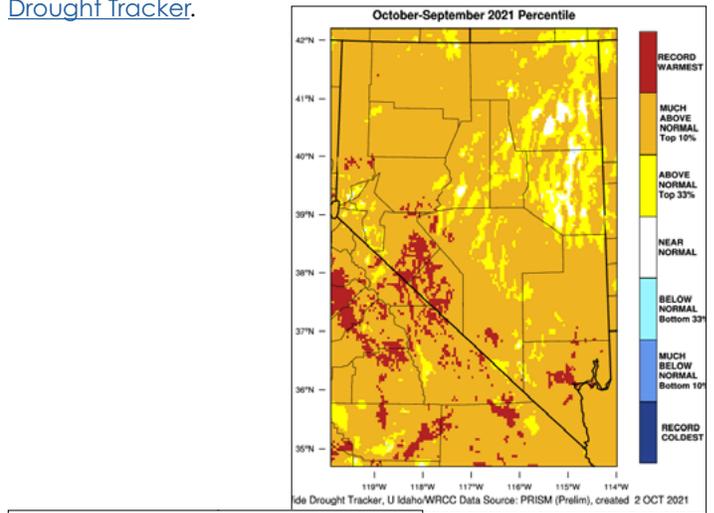


Fig. 5. 2021 water-year temperature (top) and precipitation (left) relative to all years between 1895 and 2010. From the [WestWide Drought Tracker](#).

Water Resources

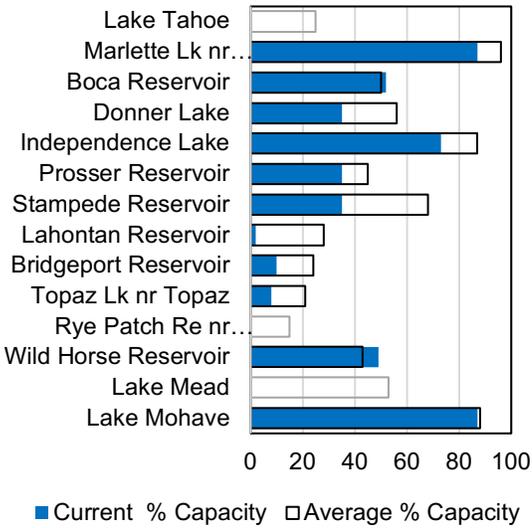


Fig. 6. Current percent capacity in Nevada's reservoirs at the end of September 2021, from the [Natural Resources Conservation Service](#). Data were not available for Lake Tahoe, Rye Patch, or Lake Mead.

Map of monthly average streamflow compared to historical streamflow for the month of the year

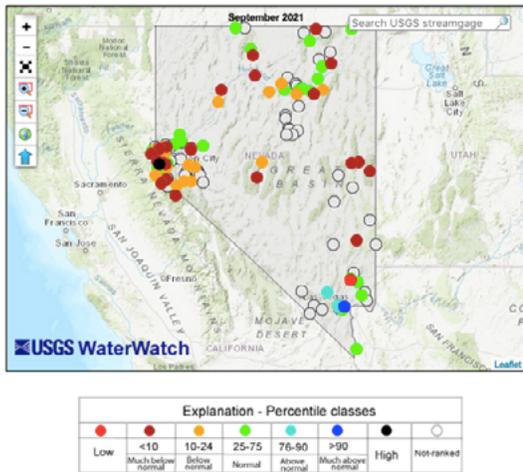


Fig. 7. September average stream flow relative to usual conditions. From [USGS Water Watch](#). There is more information on the [percentile classes](#).

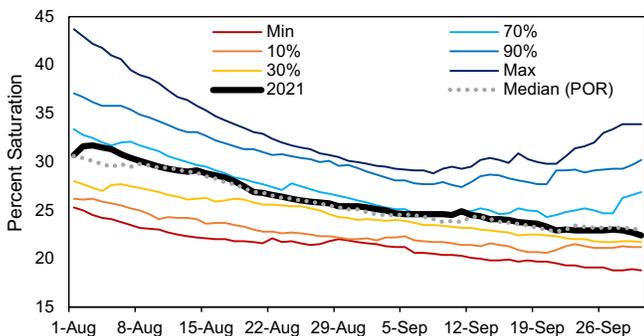


Fig. 8. Soil moisture at SNOTEL stations in Nevada and the eastern Sierra Nevada in August and September 2021. From the [Natural Resources Conservation Service Nevada](#).

Late September average reservoir capacity tends to be relatively low, averaging 50% across all the reservoirs shown in Fig. 6. Some, like Rye Patch Reservoir and Topaz Lake are typically less than a quarter full at the end of September. This year most of our lakes and reservoirs are even lower than normal. Lahontan Reservoir remains at 2% of capacity. Observed values were not available from the NRCS for Lake Tahoe, Lake Mead or Rye patch reservoir. The [Bureau of Reclamation](#) reports a very slightly lower Lake Mead elevation than last month, and the [USGS](#) showed water levels continuing to drop in Lake Tahoe.

Streams in southern Nevada reported normal to relatively high flows for the month of September (Fig. 7). Further north in the state, flows tend to be very low to average.

Throughout August and September, the average soil moisture at SNOTEL stations dropped, but it decreased in line with expected soil drying for this time of year (Fig. 8). On average across Nevada and the eastern Sierra, soil moisture was near the median at these largely mountain weather stations.

Across the state as a whole, surface and subsoil moistures were below normal (Fig. 9) by late September. Wet surface soils in northwestern Nevada reflect rains during September. In eastern Nevada, wetter than normal subsoil is likely due to rains in August.

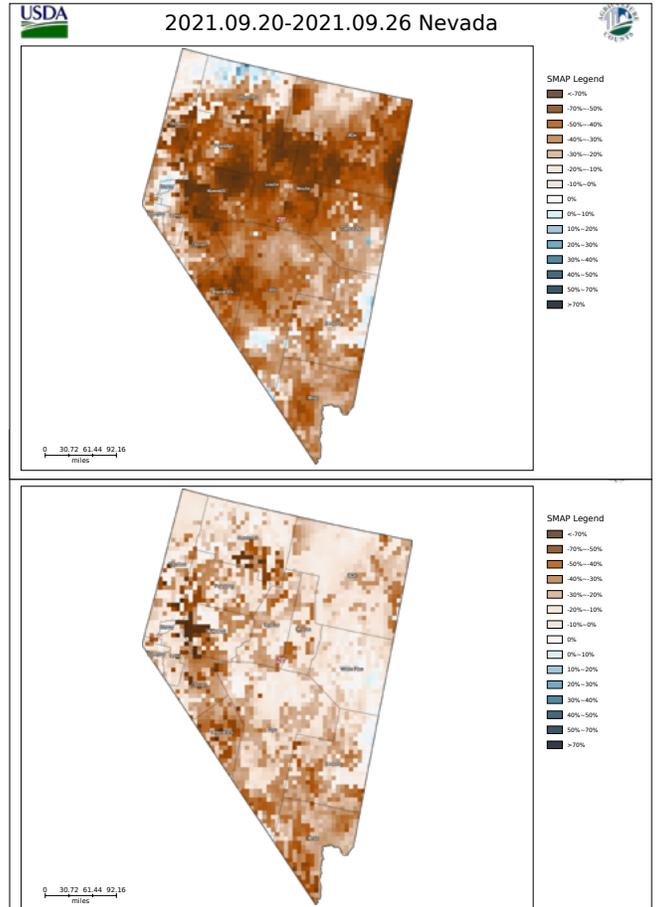


Fig. 9. Soil moisture for the week of September 20-26, 2021 in the NASA SMAP data. Topsoil (top) and subsoil (bottom). From [USDA Crop-CASMA](#).

Vegetation, Fuels and Wildfire

The Mean Condition Vegetation Index, which tracks vegetation health, shows generally normal vegetation condition (Fig. 10). Below-normal index values are becoming apparent along the eastern edge of the state.

Fire danger remains high across much of the state (Fig. 11). Owing to [dry fuels across much of the Great Basin Geographic Area Coordination Center's](#) jurisdiction, any time the weather is conducive to fire (e.g., windy, dry, warm), fire risk can increase. On the other hand, as current fires are brought into greater containment, resource limitations are easing. Since the last monthly drought update, the National Preparedness Level has [dropped from 5 to 3](#), an improvement.

Look-ahead to the 2022 water year

The water-year starts on October 1, about the time we expect a shift from summer-like to winter-type weather systems in the western U.S. As the water year progresses, we expect snow to accumulate in the mountains. We also anticipate storms that bring rain and/or snow to the valleys, wetting up soils. This year, we are starting the water year with generally dry soils and low water levels in our reservoirs, so we are looking at needing a relatively wet winter to "restock" our water supplies.

Last year, October was very dry. According to the [Westwide Drought Tracker](#), most of the state received less than 5% of normal monthly precipitation. The longer dry conditions last into the water year, the wetter the rest of the winter has to be, in order to "top up" our soils, snowpack, and reservoirs. This year, we may be lucky and get a wet start to the water year. As of early October, the [Climate Prediction Center's](#) 6-10 day and 8-14 day outlooks are both suggesting the potential for cooler and wetter than normal conditions in early October.

The outlook for the winter as a whole is less encouraging. There is a [70-80% chance that La Niña conditions](#) will develop this winter. This is not very good news for southern Nevada, where La Niña winters are often dry (the Western Regional Climate Center has a nice [write-up](#) about this). This news has little impact in northern Nevada, where La Niña winters can be wet, dry or in-between.

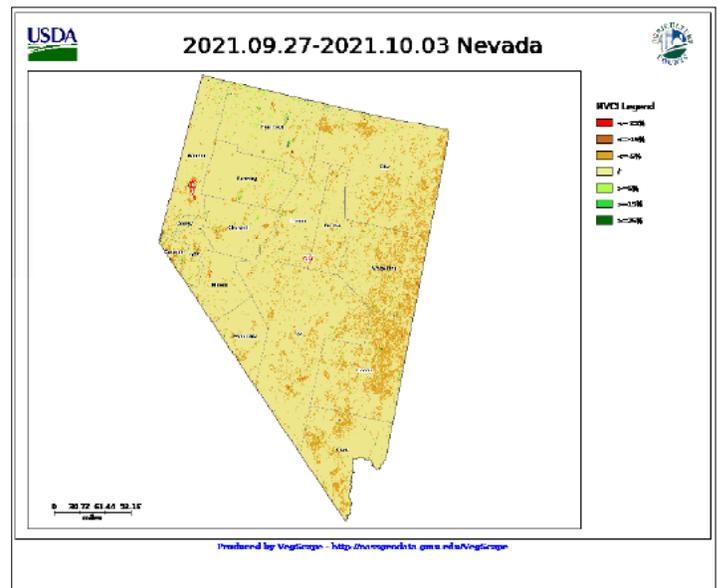


Fig. 10. Mean Vegetation Condition Index for September 27-October 3. Negative values (brown) indicate places where vegetation is less robust than usual; positive values (green) where vegetation is doing better than usual. From [USDA Crop-CASMA](#).

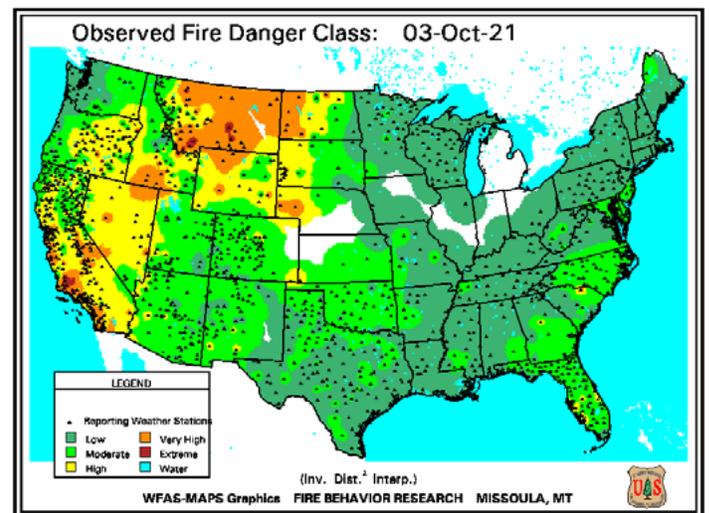


Figure 11. National fire danger rating map for October 3, 2021. From the [US Forest Service Wildland Fire Assessment System](#).

As the water year progresses, be sure to report drought impacts or improvements in your local conditions at livingwithdrought.com