Nevada Drought Update - August 2021

Drafted July 30 – August 3, 2021
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Recent rain in southern Nevada has improved conditions, but the drought is not over.

Current drought conditions in Nevada and across the West

Despite recent widespread rain across the Southwest and southern Nevada, the state and the West are still experiencing drought (Fig. 1, Table 1). The good news is that rain in late June and July led to improvements in Lincoln, Clark and a small part of Nye counties. On the July 27 Drought Monitor map, those areas shifted from D4-Exceptional Drought to D3-Extreme Drought. The bad news is that over 32% of the state is still in D4-Exceptional Drought and another 46% is in D3-Extreme Drought. Moreover, very little of the West is not in drought (Fig. 1). There is D4-Exceptional Drought in every western state except Wyoming, and over 94% of the western US is experiencing abnormally dry (D0) or drought conditions. Although monsoon rains in the Southwest led to substantial improvements, drought conditions worsened in California, Wyoming, Montana, Idaho and the Pacific Northwest (Fig. 2).

Date	***7/27***	***7/20***	***4/27***
None	0	0	0
Abornmally Dry-D0	0	0	0
Moderate Drought-D1	5.11	5.11	8.15
Severe Drought-D2	16.31	16.61	17.37
Extreme Drought-D3	46.30	37.64	34.33
Exceptional Drought-D4	32.27	40.63	40.15

Table 1. Percent of Nevada in each drought class from the US Drought Monitor.

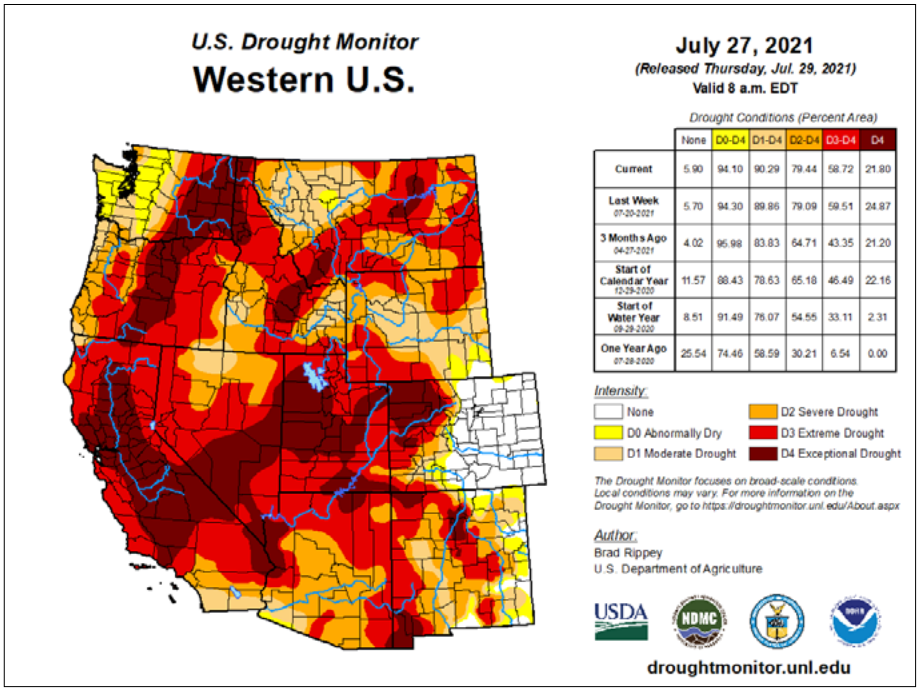

Fig. 1. Drought Monitor map for the western US, released on July 29, 2021, reflecting conditions as of July 27, 2021.

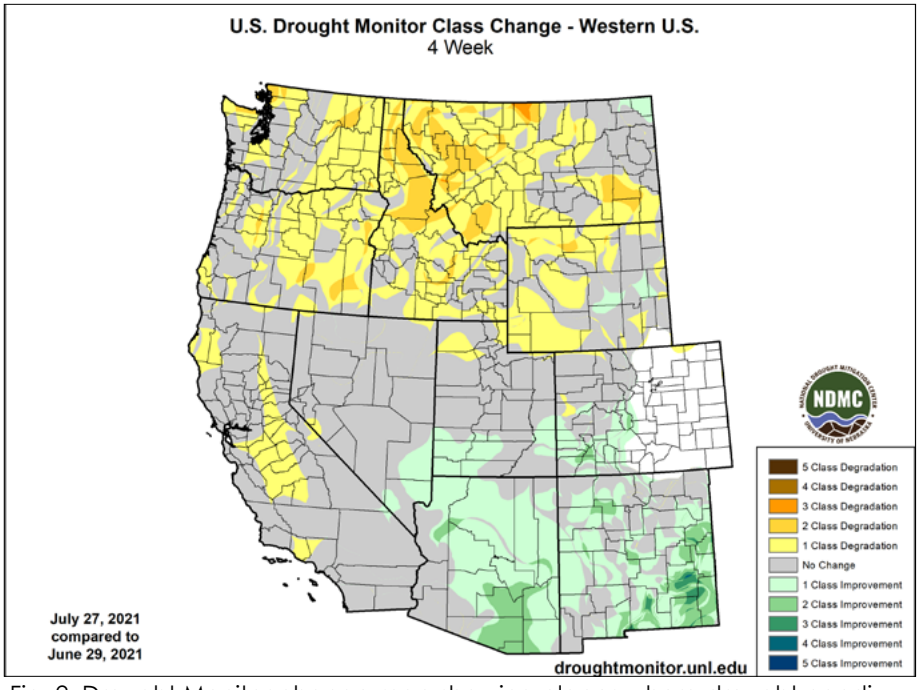

Fig. 2. Drought Monitor change map showing places where drought conditions improved (green) or worsened (yellow to brown) between early and late July 2021.

July Temperature and Precipitation

Much of the state experienced warmer than normal July temperatures. The relatively warmest temperatures, more than 6°F above 1981 – 2010 average July temperatures, were in northwestern and north central Nevada. In southern Nevada, temperatures were cooler, often within a degree or two of normal. (Fig. 3).

Thunderstorms in July -- late July in particular -- dropped heavy precipitation in southern Nevada, with widespread rainfall in excess of 2" and much higher amounts locally; as a result, rainfall was above normal (Fig. 4). These heavy storms probably benefited local ecosystems and parched landscaping, and according to the recent National Significant Wildland Fire Potential Outlook, reduced fire risk. Unfortunately, they led to flooding[1], but haven't yet made up for the very dry conditions that have plagued southern Nevada since the spring of 2020. Taking a longer perspective will help demonstrate why. Since the start of the 2020 water year on October 1, 2019, McCarran International Airport has gotten 5.7" (most of that, 4.3", fell between mid-November 2019 and late April 2020), but they would normally get 7.71" over 22 months, meaning that the airport is about 2" or 26% shy of the expected total[2].

Northeastern and central Nevada got less rain than southern Nevada, but still saw reasonable amounts, with many areas getting between 0.25 and 1" in July. Most of northwestern Nevada was not so lucky. Humboldt, Pershing and northern Washoe county got less than 0.1". From southern Washoe south through Esmeralda counties, rain has come from predictably spotty thunderstorms.

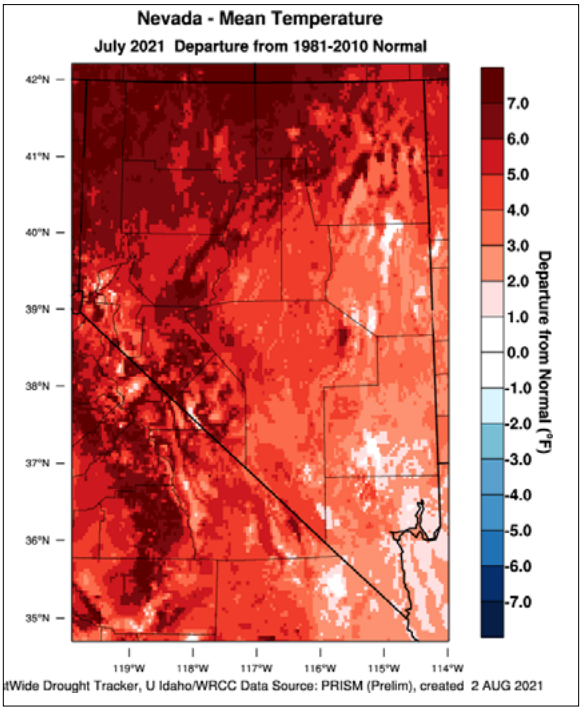

Fig. 3. Difference from average (1981-2010) July temperatures in July 2021 (°F). From the WestWide Drought Tracker.

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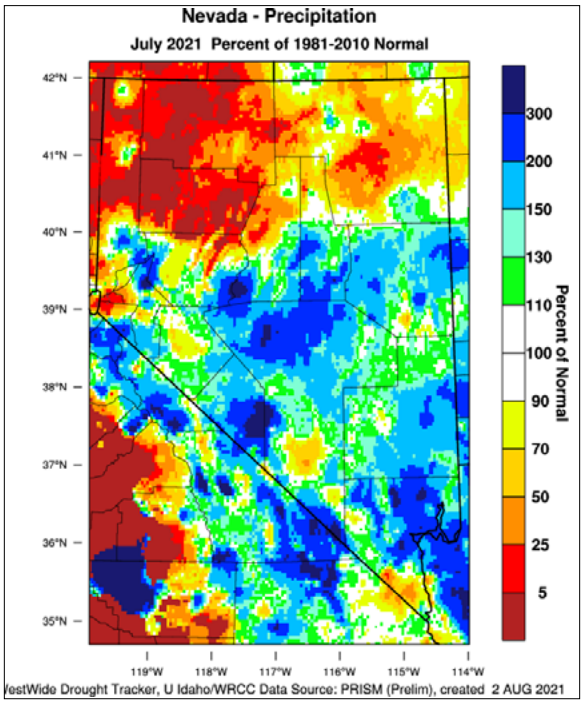

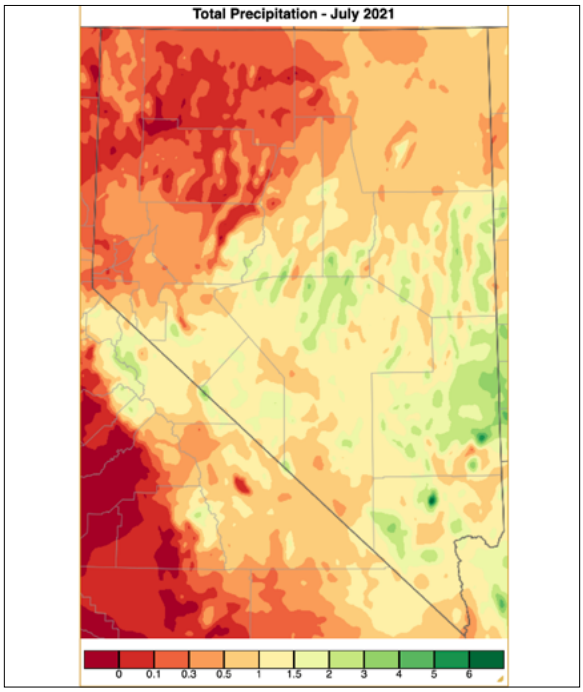

Fig. 4. Percent of average (1981-2010) July precipitation in July 2021 (top) and July 2021 total precipitation (inches, bottom). Data: PRISM. From the WestWide Drought Tracker & SC-ACIS.

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1 Sources: Las Vegas Sun & Las Vegas Review Journal.

2 Precipitation totals are also quite variable. Overton has gotten a little over an inch more rain than would be expected during the last 22 months. In Nye county, where March 2020 wasn't quite so wet, Tonopah has gotten 5.72" when the average is 12.98". The Tonopah Airport weather station (not that far from the Tonopah COOP station) has gotten 5.33", when they would normally get 8.72" over those same 22 months. Data from SC-ACIS.

Water Resources

Reservoirs levels remain largely lower than normal for this time of year. Several reservoirs, including Lake Tahoe, Topaz Lake, the Lahontan, Bridgeport and Rye Patch Reservoirs, and Lake Mead are at less than half their usual capacity for late July (Fig. 5). Reservoir levels reflect both water supply and management actions.

Streamflow is below or much below normal at many gaging stations in the state (Fig. 6), and several stream gages are reporting their lowest ever July flows. Conversely, intense storms caused flooding in southern Nevada and two gages have reported their highest ever July flows.

Owing to recent rains, topsoils are wet across much of the state, particularly central and southern parts of the state. Subsoils are dry. (Fig. 7). Soil moisture measured at SNOTEL stations, which are located mostly in the mountains, remained very low, but there has been a recent uptick in soil moisture such that late July av-erage soil moisture at these stations approached normal (Fig. 8).

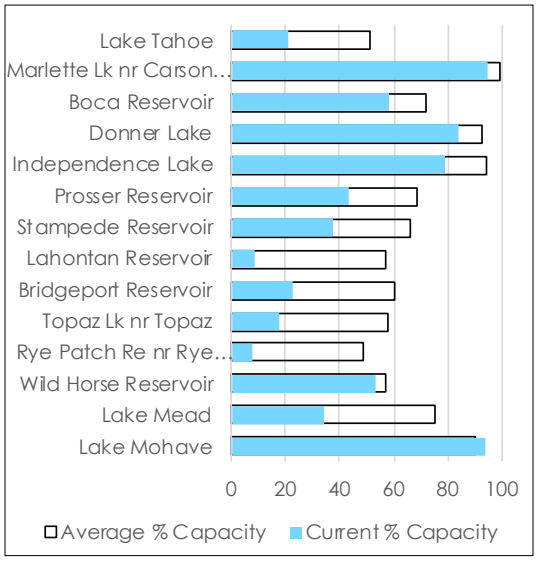

Fig. 5. Current percent capacity in Nevada's reservoirs at the end of July 2021. from the Natural Resources Conservation Service.

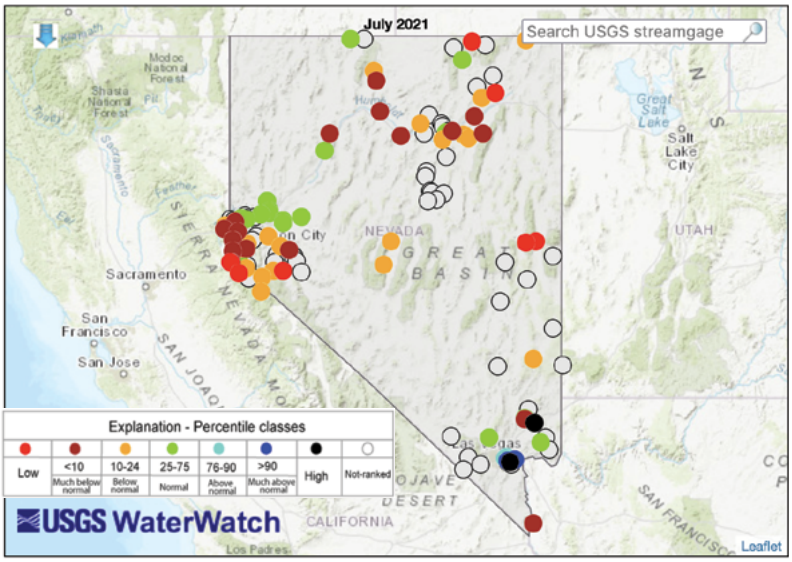

Fig. 6. July average stream flow relative to usual conditions. From USGS Water Watch. There is more information on the percentile classes.

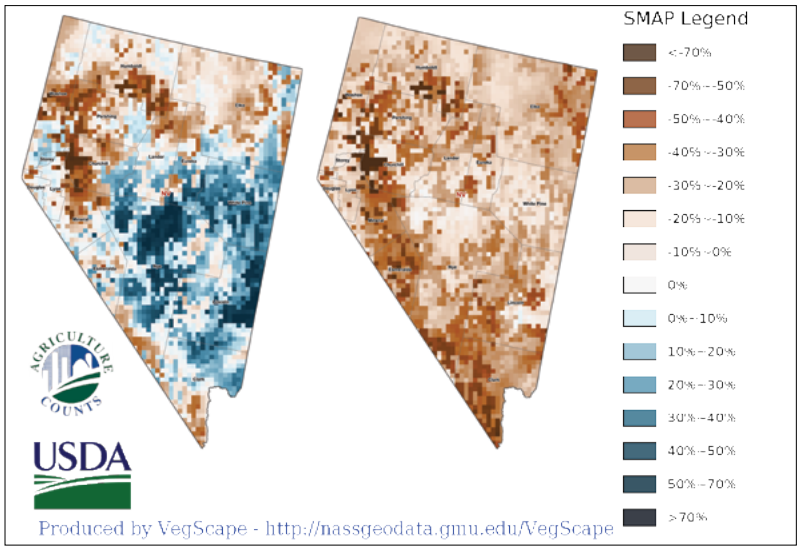

Fig. 7. Soil moisture for the week of July 18 – 25, 2021 in the NASA SMAP data. Topsoil (left) and subsoil (right). From USDA Crop-CAS-MA.

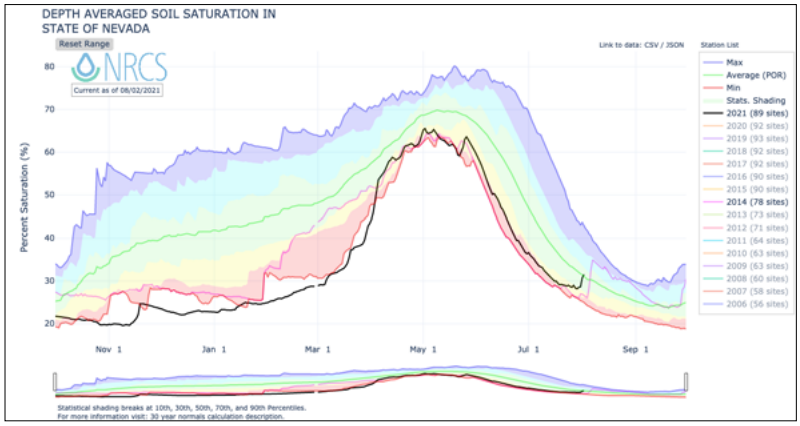

Fig. 8. Soil moisture at SNOTEL stations in Nevada and the eastern Sierra Nevada as of August 2, 2021. From the Natural Resources Conservation Service Nevada.

Vegetation, Fuels and Wildfire

The Mean Vegetation Condition Index for late July shows large areas of vegetation experiencing normal conditions (yellow), with moderate areas of stressed vegetation, particularly in northwestern Nevada and in some higher elevation areas (Figure 9).

Numerous fires burned in Nevada during late June and July. As of August 2, however, NevadaFireInfo indicates that most are out or at least contained. While any fire can be devastating to those who experience it, Nevada has been mostly spared from the largest fires, which seem to be burning in more heavily forested regions, as can be seen by checking out fire information on sites like InciWeb or the National Fire Situational Awareness map. The Tamarack Fire, now at over 68,000 acres, burned into Douglas county, in late July, causing evacuations and road closures. Nevada was im-pacted by significant smoke from the Tamarack Fire and from the Dixie Fire and Beckwourth Complex, both burning in California.

The fire risk over much of Nevada was greatly reduced by recent rains. As of August 2, the majority of Nevada was in the Moderate or even Low fire danger categories. Western Nevada, however, remains in High fire danger (Figure 10). The Wildland Fire Assessment System provides detailed descriptions of each of the fire danger ratings. Although the fire danger in much of Nevada is lower now, wildland firefighting resources are being stretched thin nationally. The Great Basin Coordination Center is reporting Preparedness Level 3 (PL3) out of 5. National fire suppression resources are at PL5. The National Interagency Fire Center describes PL5 as, "*This is the highest level of wildland fire activity. Several geographic areas are experiencing large, complex wildland fire incidents, which have the potential to exhaust national wildland firefighting resources. At least 80% of the country's IMT's and wildland firefighting personnel are committed to wildland fire incidents. At this level, all fire-qualified federal employees become available for wildfire response.*"[3]

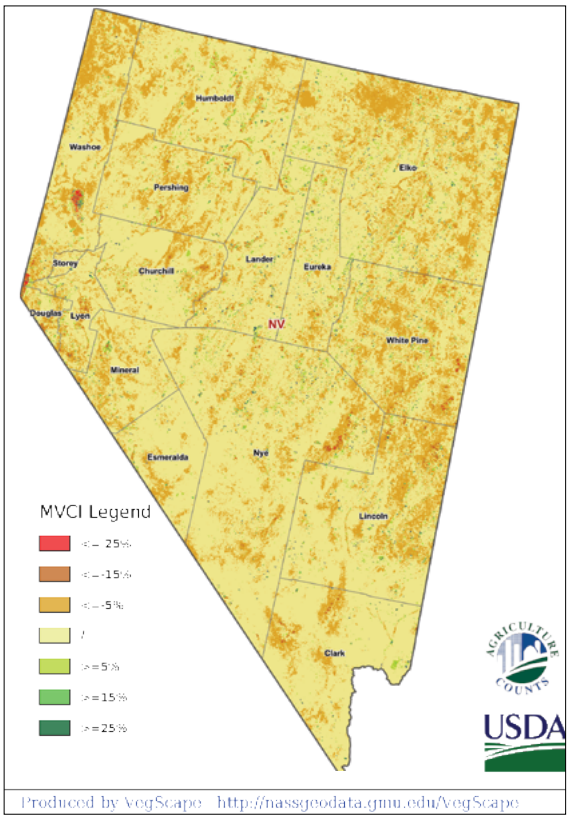

Fig. 9. Mean Vegetation Condition Index for July 26 - August 1. Negative values (brown) indicate places where vegetation is less robust than usual; positive values (green) where vegetation is doing better than usual. From USDA Crop-CASMA.

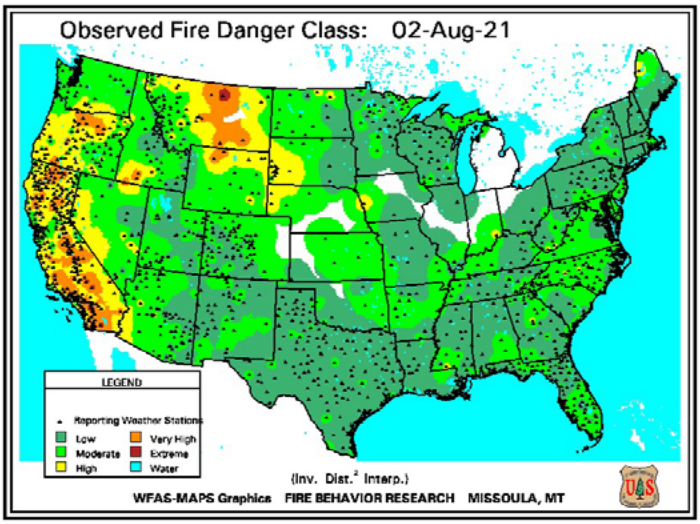

Figure 10. National fire danger rating map for August 2, 2021. From the US Forest Service Wildland Fire Assessment System.

Recent rains have helped, but they have not ended the drought, and there are indications that dry conditions may return in the fall, setting the stage for another year of drought.

3 Source: https://www.nifc.gov/sites/default/files/2020-09/National_Preparedness_Levels.pdf. IMT – Incident Management Team