Nevada Drought Update - June 2023

Drafted June 5 and 6, 2023
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The wet winter has lingering effects, but drought persists in Clark County.

Current drought conditions in Nevada and across the West

After a wet winter and, in parts of northern Nevada, an unusually wet spring, much of the state is drought-free (Fig. 1). There is still a swath of D0-Abnormally Dy conditions stretching from far northwestern Nevada southeast through Nye, Lincoln and Clark Counties. There are relatively few long-term weather stations in Pershing, Churchill, and northern Washoe Counties, so tracking drought has been challenging there. Any observations from the area will help fine-tune whether D0-Abnormally Dry is warranted in the region. D1-Moderate and D2-Severe Drought remain in southern Nye and Lincoln Counties and in Clark County.

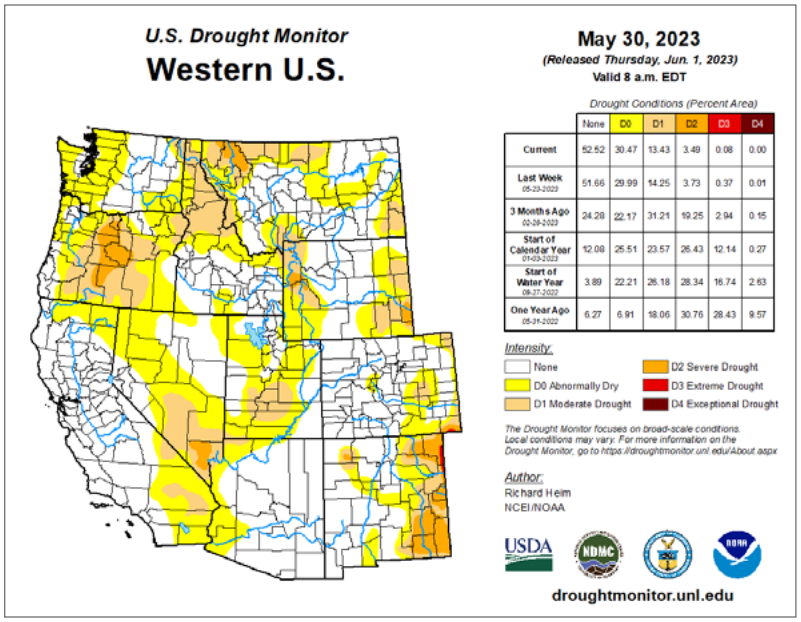

Fig. 1. Drought Monitor map for the western US, released on June 1, 2023, reflecting conditions as of May 30, 2023.

There were few changes in drought over Nevada in the last month (Fig. 2). A longer view shows significant improvements since this time last year, when over 99% of the state was in D2-Severe or deeper drought.

Across the West, drought remains in Oregon, northern Idaho, parts of Montana, and far eastern New Mexico (Fig. 1). Many regions have seen improvements, with much of eastern Colorado experiencing 1-2 class improvements (Fig. 2). Dry conditions in May drove degradations in coastal Washington and Oregon and over Yellowstone National Park in Wyoming and Montana.

Date	5/31/22	2/28/23	4/25/23	5/30/23
None	0.0	0.0	33.4	34.0
Abornmally Dry-D0	0.0	16.5	44.5	45.9
Moderate Drought-D1	0.5	26.0	19.3	17.4
Severe Drought-D2	44.1	51.4	2.8	2.8
Extreme Drought-D3	34.0	6.1	0.0	0.0
Exceptional Drought-D4	21.3	0.0	0.0	0.0

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

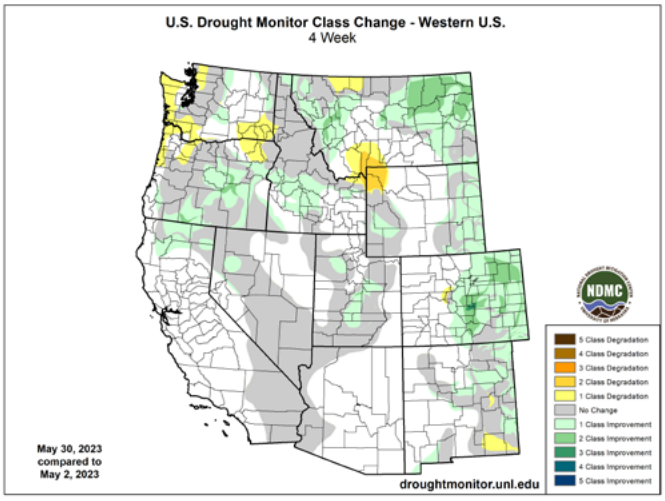

Fig. 2. Drought Monitor change map showing places where drought conditions improved (green) or worsened (yellow to brown) between early and late May 2023.

May Temperature, Precipitation & Snowpack

May proved to be a varied month. In much of northern Nevada, temperatures were 1-3°F above average. However, along the Sierra front and down into parts of central Nye County, temperatures were near normal or even a little cooler than recent May averages (Fig. 3).

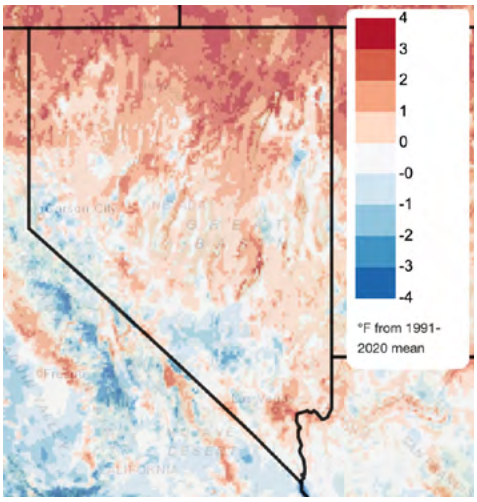

Fig. 3. Difference from average (1991-2020) May temperature (°F) in 2023. ClimateMapper at https://climatetoolbox.org/

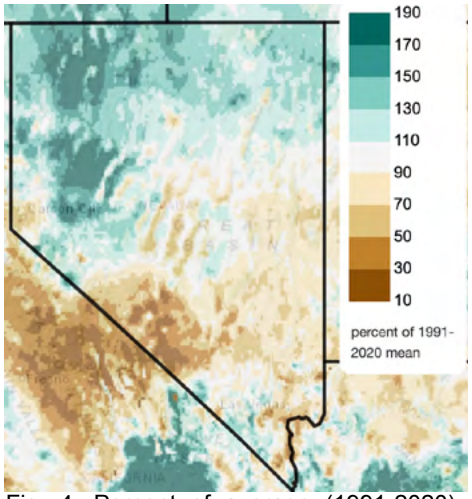

Fig. 4. Percent of average (1991-2020) May precipitation in 2023. ClimateMapper at https://climatetoolbox.org/

Parts of Pershing, Churchill and Humboldt counties received upwards of 190% of the normal May precipitation (Fig. 4). Other parts of northern Nevada were also wetter than normal. In southern Nevada, precipitation ranged from less 10% of the usual paltry May totals in western Nye and Esmeralda Counties to just above normal in parts of Clark and southern Nye Counties.

By late May, there isn't usually enough snow in the Great Basin to track it, so no values are shown for most of Nevada in Figure 5. However, the Sierra Nevada snowpack is still robust by end-of-May standards (Fig. 5). At many stations that normally have no snow by the end of May, there is still a foot or more of water stored in the snowpack (Fig. 6). Snowpack remains above normal in most of the Upper Colorado, as well, boding well for summer runoff into Lakes Powell and Mead. Even the Humboldt, which was not as snowy as other basins this winter, still has above normal snowpack.

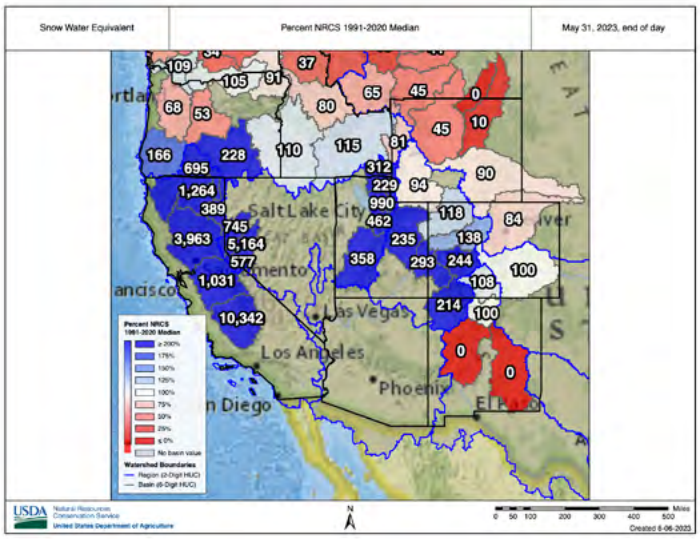

Fig. 5. May 31, 2023 snowpack in the western U.S. Natural Resources Conservation Service.

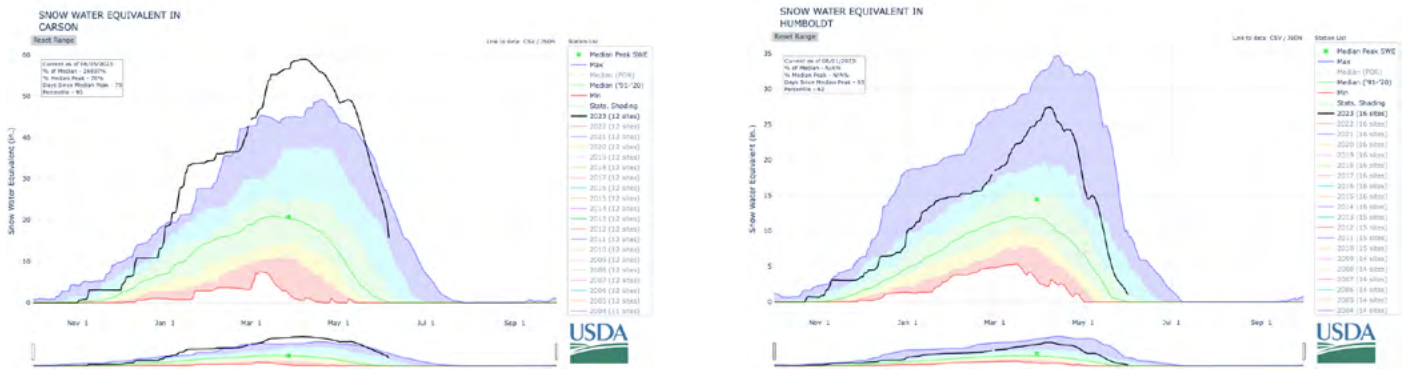

Fig. 6. Snowpack in the Carson and lower Humboldt basins in terms of snow water equivalent. The black line represents current levels and green is the median from 1991 - 2020. Natural Resources Conservation Service.

Soil Moisture

A band of dry top and subsoil soil stretches from Esmeralda county into extreme southern Clark County, indicative of drought conditions in the region. However, soils from Douglas County north into Washoe are much wetter than normal. Far eastern Nevada also has very wet soils, as do north-central parts of the state (Fig. 7).

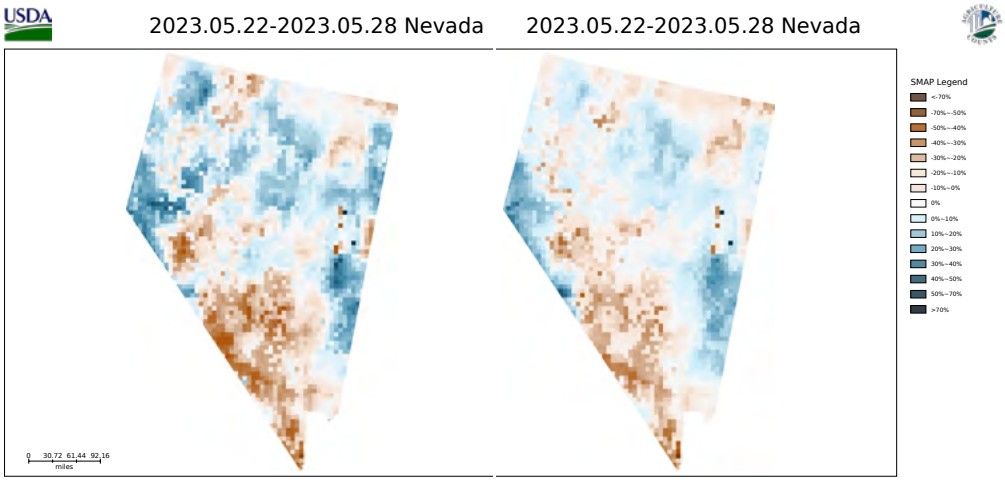

Fig. 7. Topsoil (left) and subsoil (right) moisture anomalies from 9km SMAP for May 22-28, 2023. Maps from Crop-CASMA.

Water Resources

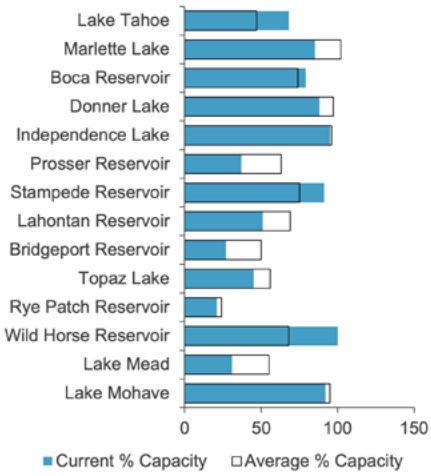

Fig. 8. Current and average percent capacity in Nevada's reservoirs at the end of May 2023. Data from the Natural Resources Conservation Service.

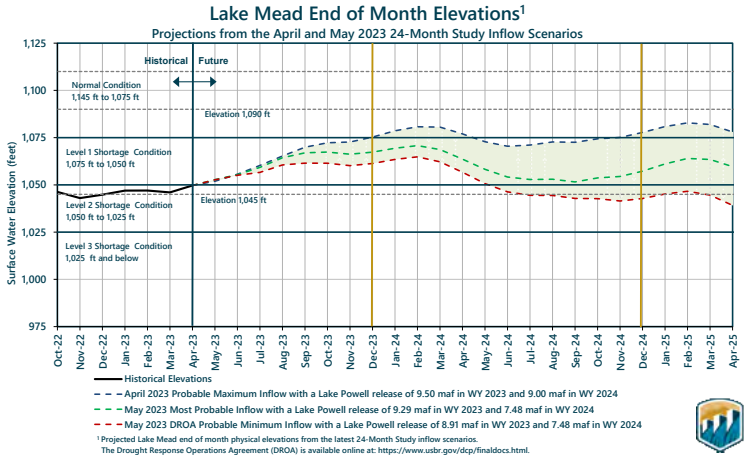

Fig. 9. Projected Lake Mead elevations from the Bureau of Reclamation's April and May 2023 24-month study.

Most Nevada reservoirs are doing quite well, and several are fuller than normal for this time of year (Fig. 8). Even Rye Patch Reservoir, which has been very low for a very long time, is near normal late-May capacity. Lake Mead rose above 1,050', the trigger for Level 2 shortage, during May (Fig. 9). Even pessimistic inflow projections suggest that lake elevations will rise through summer, plateau, and rise again during the winter of 2024.

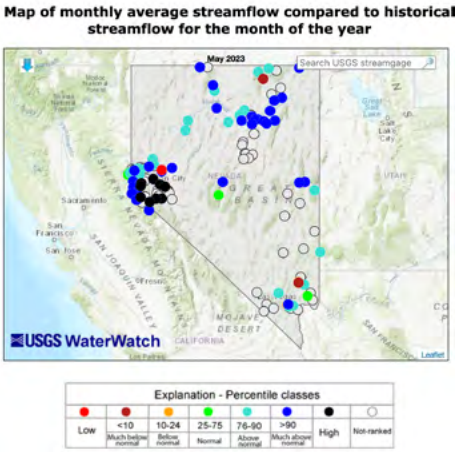

Fig. 10. May average stream flow relative to usual conditions. From USGS Water Watch. More information on percentile classes from the USGS.

Most streams had above-normal or much-above-normal flows during May (Fig. 10). At least one of the low flows is due to management decisions. The Truckee canal (the bright red dot) is currently undergoing lining and repair. These cold, fast flowing rivers and streams (Fig. 11) can be dangerous, so know the risks and take appropriate precautions.

Fig. 11. The Truckee River flowing through downtown Reno on May 25, 2023. Photo by A. Csank.

Looking forward

What does the summer hold for drought? Summer precipitation is predictably unpredictable, with equal chances of a wet, dry, or normal summer (Fig. 12, left). The North American Monsoon, which brings summer storms to far southern Nevada is challenging to forecast weeks in advance. Summer rainfall in the rest of the state comes from spotty thunderstorms. The lack of a large-scale driver for those storms makes seasonal-scale forecasts very difficult.

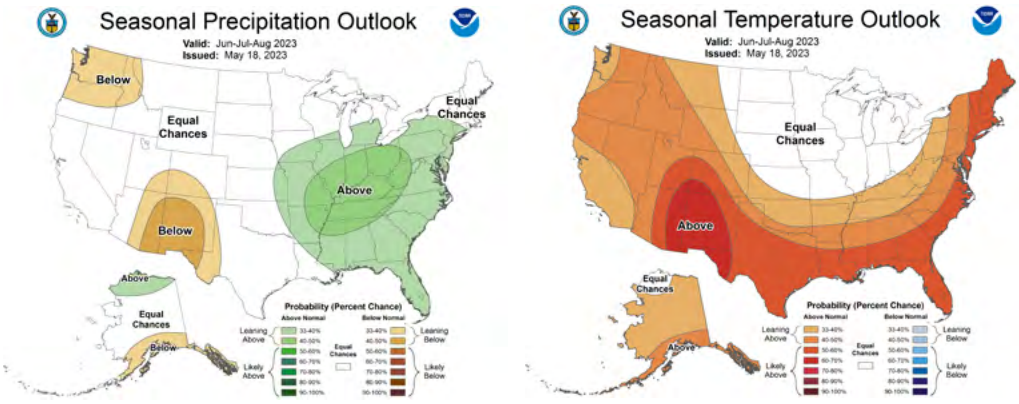

Fig. 12. Precipitation (left) and temperature (right) outlooks for June-August. From the Climate Prediction Center.

The summer temperature outlook favors warmer than normal temperatures this summer (Fig. 12, right). There's a 40 - 50% chance that summer will be warmer than normal. Higher temperatures can increase the atmosphere's demand for moisture. So soils and finer vegetation, such as grasses, herbs and shrubs, could start to dry out quickly as temperatures rise.

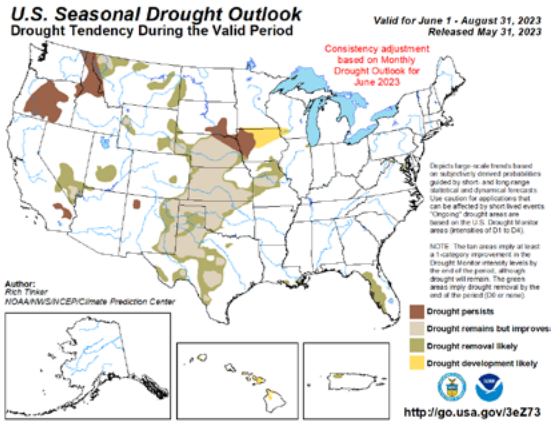

Fig. 13. June-August Drought Outlook. From the Climate Prediction Center.

However, the wet winter and, in some places, a wet spring have resolved drought and, hopefully, provided a buffer against a rapid return to drought. As a result, the small amount of drought remaining in southern Nevada is expected to improve or even resolve. Northern Nevada is expected to remain drought-free (Fig. 13).

Wildfire risk also ramps up in the summer as the springtime vegetation growth start to dry out and become wildfire fuel. However, due to the wet winter and spring, much of Nevada has a normal or below normal fire risk for June. Later in the summer, northwestern Nevada has a higher than normal chance for significant wildfires (Fig. 14). Below normal significant fire risk in the Sierra *may* reduce the risk of smoke this summer (fingers crossed!). Below-normal risk doesn't mean no risk, so it is still important to practice fire safe practices during the spring, summer, and fall months. Ready.gov provides tips and precautions if you find yourself within the reach of a wildfire. Living with Fire provides local information and resources for Nevadans.

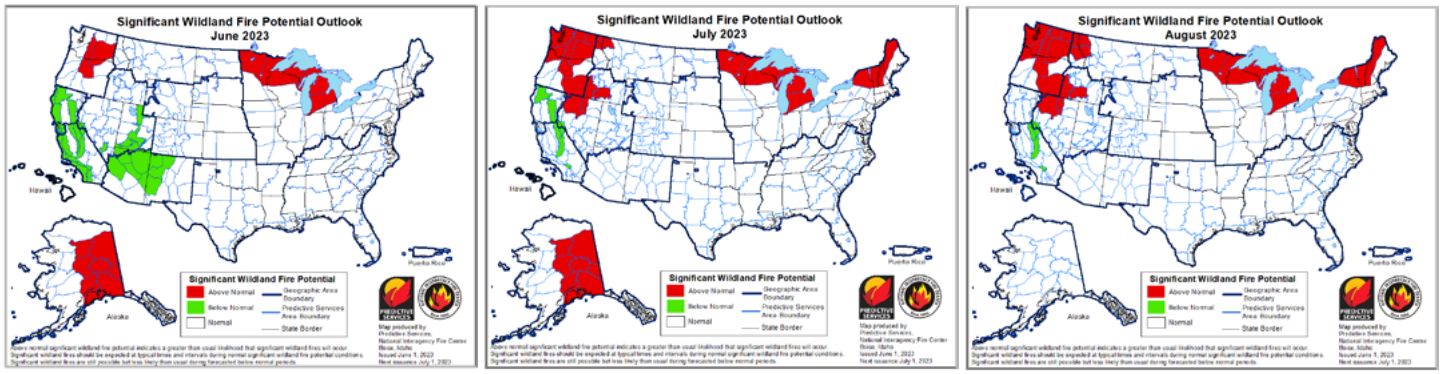

Fig. 14. Significant wildfire potential outlook for June (left), July (middle) and August (right). From the National Interagency Coordination Center.