

Nevada Drought Update - April 2023

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There were dramatic reductions in drought across much of Nevada. Much of the state is now drought-free and potentially at risk for flooding. Drought lingers in far southern Nevada.

Current drought conditions in Nevada and across the West

Until March all of Nevada had been in some sort of drought or at least Abnormally Dry (D0) since October 2020. This winter has brought much needed precipitation (and then some) to the region. Areas of western Nevada adjacent to the central Sierra Nevada and parts of Elko, White Pine and Humboldt Counties emerged from March with no drought or Abnormally Dry conditions on the US Drought Monitor map (Fig. 1). Nye, Lincoln, and Clark Counties are still in a Drought Watch per state guidelines. Across the rest of the state, conditions are still improving with a one-class drought improvements over much of the state and two-class improvements in areas of western, northeastern, and southern Nevada. As of March 28, 2023, only 5% of the state is classified as D2-Severe Drought, a substantial decrease from just a month ago when 51.35% of the state was D2-Severe Drought (Table 1).

In the western US, D4-Exceptional Drought and D3-Extreme Drought remain only in eastern Oregon and in far eastern Wyoming, Colorado and New Mexico. That deep drought in the east is the western edge of significant drought centered over Kansas and Oklahoma. Moderate to Severe drought remain in northern Idaho and Montana, as well. Due to record-setting rain and snowfall, there were widespread one or two drought class improvements over California. Most of the coast, Central Valley, central and southern Sierra are not in drought (Fig. 1).

Date	3/29/22	12/27/22	2/28/23	3/28/23
None	0.0	0.0	0.0	17.3
Abnormally Dry-D0	0.0	0.0	16.5	33.8
Moderate Drought-D1	0.0	0.5	26.0	43.9
Severe Drought-D2	64.2	75.1	51.4	5.0
Extreme Drought-D3	28.3	24.5	6.1	0.0
Exceptional Drought-D4	7.5	0.0	0.0	0.0

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

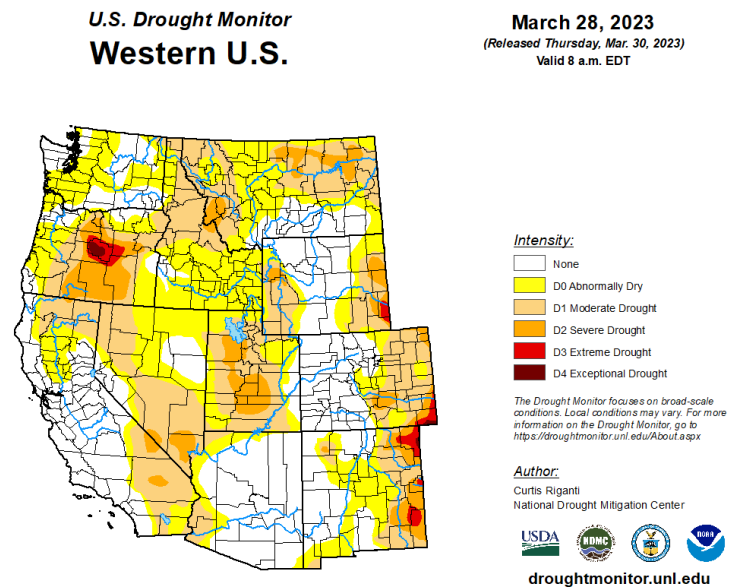


Fig. 1. Drought Monitor map for the western US, released on March 30, 2023, reflecting conditions as of March 28, 2023.

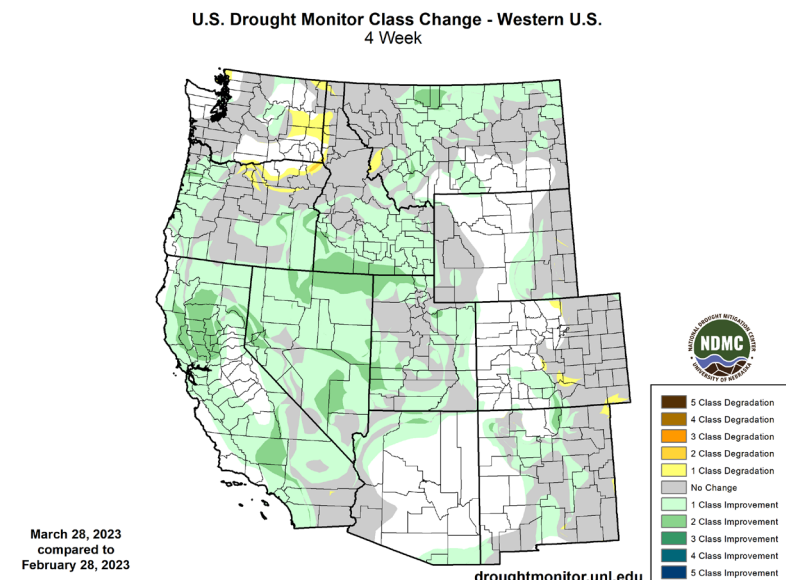


Fig. 2. Drought Monitor change map showing places where drought conditions improved (green) or worsened (yellow to brown) between late February and late March 2023.

March Temperature, Precipitation & Snowpack

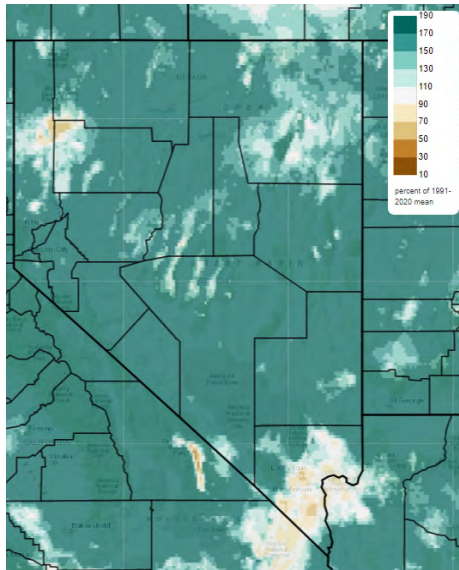


Fig. 3. Percent of average (1991-2020) March precipitation in 2023. ClimateMapper at <https://climatetoolbox.org/>

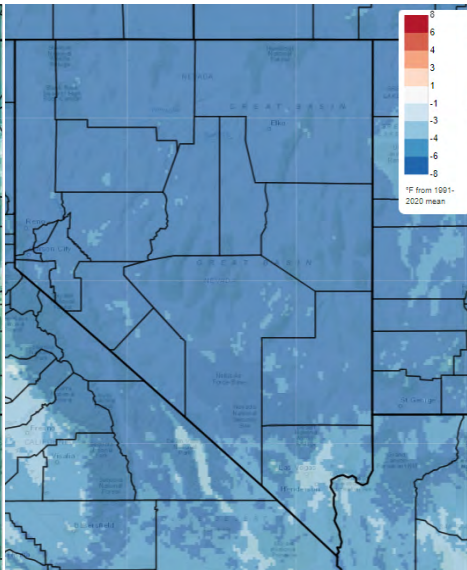


Fig. 4. Difference from average (1991-2020) March temperature (°F) in 2023. ClimateMapper at <https://climatetoolbox.org/>

March delivered vast amounts of precipitation across the state in a series of [atmospheric rivers](#). Areas up and down the state received precipitation amounts approaching 200% of usual for March (Fig. 3). Parts of Elko County saw precipitation amounts that were closer to what is typically observed, while northern Pershing County and Clark County were somewhat drier than normal.

In what has seemed like an endless winter, March also brought colder than normal temperatures statewide (Fig. 4). Much of the state was 4° - 8°F cooler than normal. The Las Vegas area was slightly cooler than normal.

Snowpack in the Great Basin and much of the Sierra were at least 220% of usual for this time of year (Fig. 5). A notable outlier located in the Sierras is the Mono-Owens basin, which has recorded a snowpack nearly 400% of its normal snowpack.

Snowpack in the Upper Colorado, which feeds Lakes Powell and Mead, is also above normal. By late March, it was the highest since 1986 (which is as far back as the Natural Resources Conservation Service Interactive charts so). As of late March, snowpack ranged from 119% of normal in the north to over 500% of normal in the Lower San Juan watershed of southern Utah. The overall basin snowpack was at 158% of normal at the end of the month.

In the Walker River basin, there is about 60 inches of water stored in the snowpack, about 10 inches more than previously recorded by SNOTEL stations in the basin. Further east in the Lower Humboldt basin, the snowpack is not record-breaking, but it is still about twice the usual for this time of year and in the top 5%. Perhaps more critical, the snowpack wasn't yet showing substantial melt, which normally starts in late March (Fig. 6).

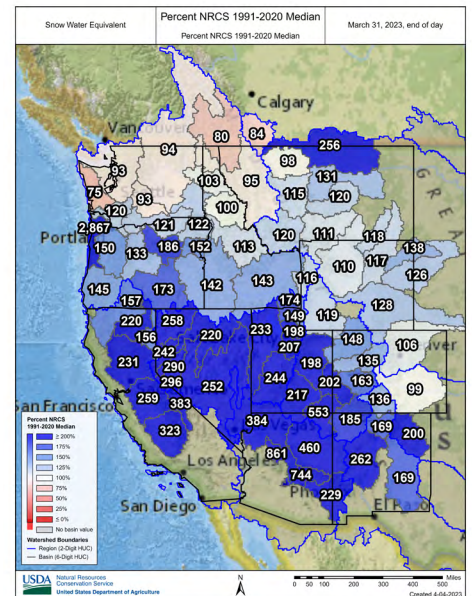
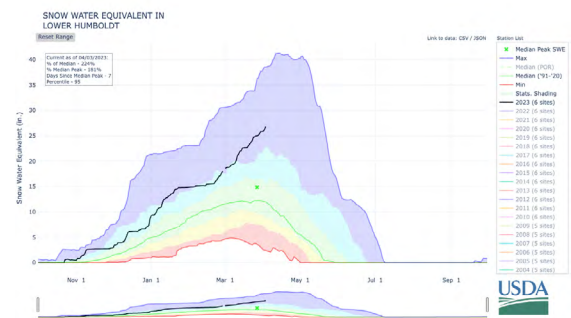
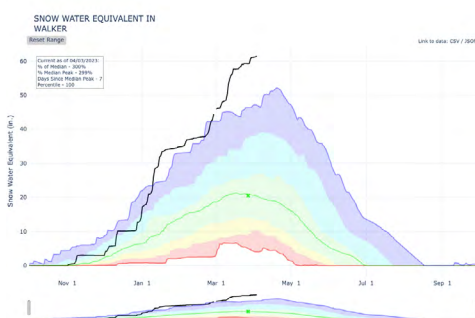


Fig. 5. March 31, 2023 snowpack in the western U.S. [Natural Resources Conservation Service](#).

Fig. 6. Snowpack in the Walker and lower Humboldt basins in terms of snow water equivalent. Black line represents current levels, green is the median from 1991 - 2020, and red line is the minimum. [Natural Resources Conservation Service](#).



Soil Moisture

The heavy precipitation has led to much wetter than normal top soils and wet subsoils throughout much of the Sierras, southeastern and central Nevada. Both surface and subsoils are drier than normal across the northernmost part of the state. Although subsoils are wet in southern Nevada, subsoils remain drier than normal from Clark County through western Nye County (Fig. 7).



2023.03.20-2023.03.26 Nevada 2023.03.20-2023.03.26 Nevada

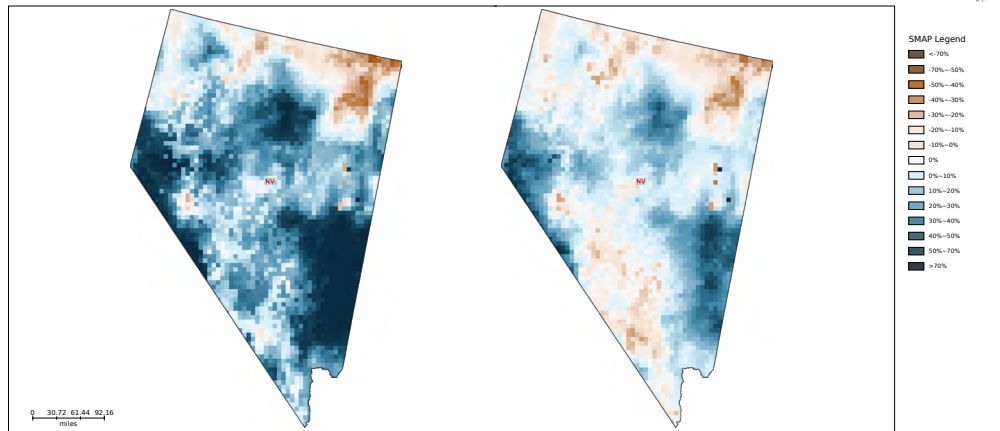


Fig. 7. Topsoil (left) and subsoil (right) moisture anomalies from 9km SMAP for March 20-26, 2023. Maps from [Crop-CASMA](#).

Water Resources

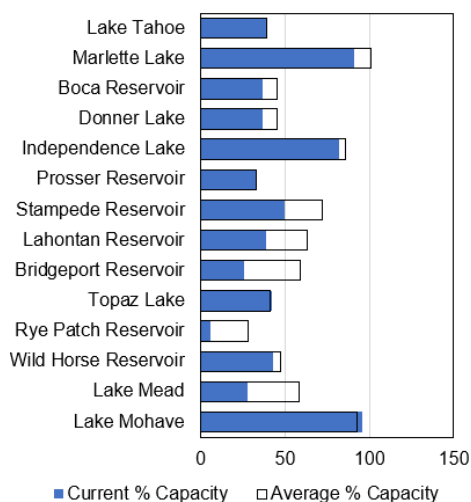


Fig. 8. Current and average percent capacity in Nevada's reservoirs at the end of March 2023. Data from the [Natural Resources Conservation Service](#).

Water levels for many reservoirs throughout the Sierras are near or above normal for March. Boca Reservoir in particular is at 134% of its usual March amount. Rye Patch Reservoir is still low at 6% capacity, just 22% of its normal amount at this time (Fig. 8). Some reservoirs may be below normal to have space when the record snowpack melts in the coming weeks and months or to accommodate other planned water storage.

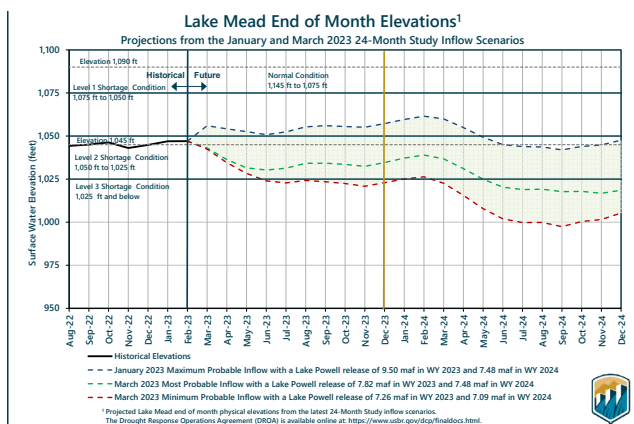
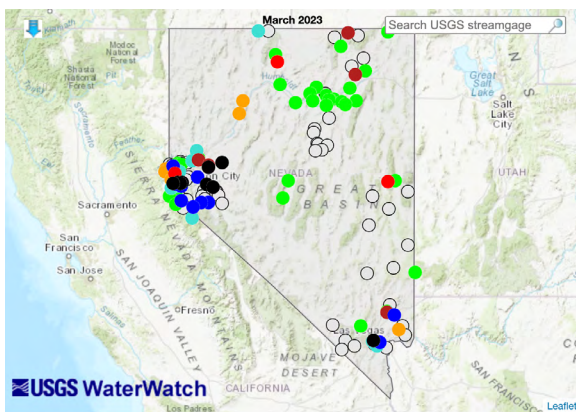


Fig. 9. Projected Lake Mead elevations from the [Bureau of Reclamation's](#) March 24-month study.

Lake Mead dropped almost a foot from 1047.02 feet at the end of February to 1046.03 in late March and is at 28% capacity. Forecasts for probable inflows have Lake Mead dropping to a low of 1,030 feet during the middle of summer 2023 (Fig. 9). Under maximum probable inflow, Lake Mead's elevation could top 1,050 feet this spring and summer.



Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	Not-ranked

Fig. 10. March average stream flow relative to usual conditions. From [USGS Water Watch](#). More information on [percentile classes from the USGS](#).

Many of the streams in western Nevada reported above-normal flows, with many gauges seeing record highs (Fig. 10). Up north, amounts were around average, with a select few reporting much below normal streamflow. Flows in the South were variable, with record highs and unusual lows observed.

Looking forward

This winter has been exceptionally wet over much of the state. In places rain and snowfall were record-breaking. However, large parts of already dry Clark County and southern Nye County got only near-normal precipitation. (Fig. 11).

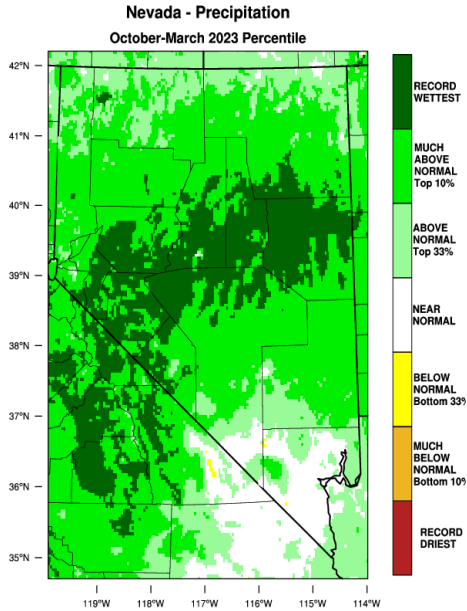


Fig. 11. October 2022 - March 2023 precipitation ranks. PRISM from Westwide Drought Tracker <https://wrcc.dri.edu/wwdt/>.

As anticipated, the [Climate Prediction Center](#) announced that the La Niña is over. ENSO-neutral conditions will prevail into early summer 2023, with increasing odds of El Niño developing by fall.

The chance of higher than normal precipitation remains slightly elevated over northern Nevada through April. There is also a slight indication that southern Nevada could be drier than normal (Fig. 12). Continuing into the spring, the outlook suggests reasonable chances of cooler than normal temperatures but does not provide much information about precipitation, except in far southern Nevada, where there are slightly elevated chances of a drier than normal spring (Fig. 13).

Southern Nevada is likely to remain in drought through June. Resolution of the remaining drought in the rest of the state is likely (Fig. 14).

Currently, the [National Interagency Coordination Center](#) indicates normal or below normal chances of major wildfires in the coming months, though spring is not a major fire season in Nevada, anyway. However, wet winters can mean lots of grass and high fire risk at lower elevations.

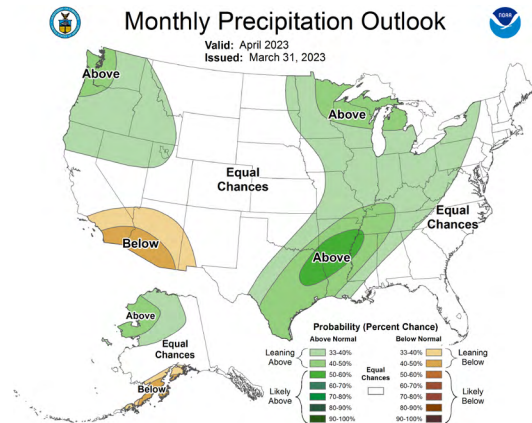


Fig. 12. April precipitation outlook. From the [Climate Prediction Center](#).

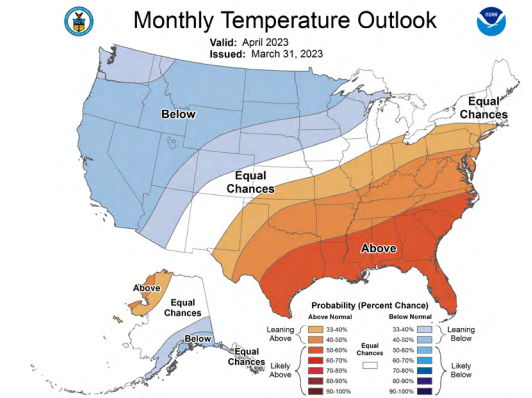
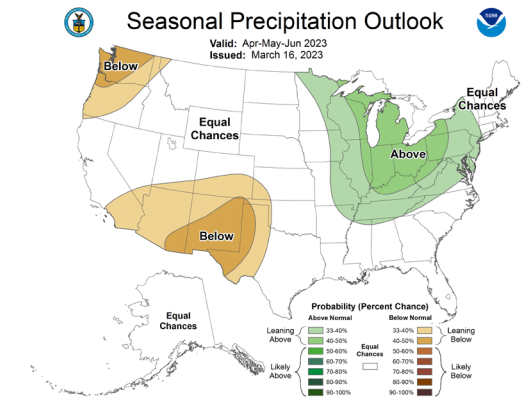


Fig. 13. Precipitation (top) and temperature (bottom) outlooks for April-June. From the [Climate Prediction Center](#).

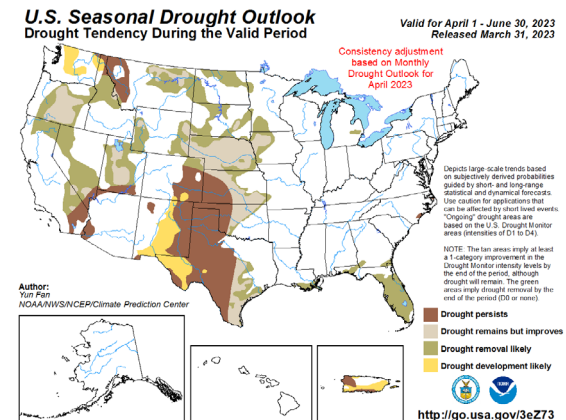


Fig. 14. April-June Drought Outlook. From the [Climate Prediction Center](#).