

Nevada Drought Update - September 2023

Drafted September 4-8, 2023

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Thanks to August monsoons over southern Nevada, the Silver State has no counties under Drought Watch for the first time since February 2020!

Current drought conditions in Nevada and across the West

Exceeding our expectations, drought conditions have continued to improve over the last month, with the patch of persistent drought in the southern tip of the state dwindling down enough to get Clark County out of [Drought Watch](#), with only 21% of the county in D1-Moderate Drought (Fig. 1).

During August, areas of Nye and Lincoln counties improved up to 2 classes, while that particularly stubborn piece of D0-Abnormally Dry to D1-Moderate Drought clings on for now in parts of Clark and Lincoln counties (Fig. 2).

As we head into September, over 94% of the state is drought-free, which is the largest percentage of zero drought that we've seen in three and a half years. At the end of August last year, over 50% of the state was in D3-Extreme Drought (Table 1).

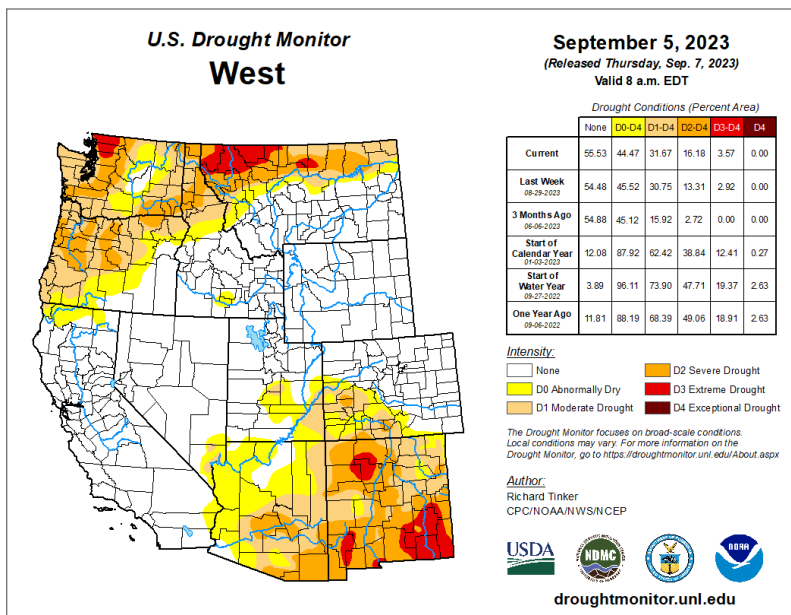


Fig. 1. Drought Monitor map for the western US, released on September 7, 2023, reflecting conditions as of September 5, 2023.

Across the western U.S., some states followed Nevada's trend of improved drought conditions, including parts of California, Utah, Wyoming, and Idaho. The hydrologic Great Basin is almost entirely drought-free, except for a stubborn area of central Utah. Other states were less lucky, with lingering or worsening drought conditions in areas of Oregon, Washington, Montana, Colorado, Arizona, and New Mexico (Fig. 2). Notably, small areas of New Mexico, Washington, and Montana have found themselves in D3-Extreme Drought going into autumn (Fig. 1). themselves in D3-Extreme Drought going into autumn (Fig. 1).

Date	8/30/22	1/3/23	6/6/23	9/5/23
None	0.0	0.0	43.5	94.3
Abornmally Dry-D0	0.0	0.0	36.5	4.1
Moderate Drought-D1	0.48	21.6	17.6	1.6
Severe Drought-D2	47.3	54.01	2.4	0.0
Extreme Drought-D3	52.2	24.45	0.0	0.0
Exceptional Drought-D4	0.0	0.0	0.0	0.0

Table 1. Percent of Nevada in each drought class from the [US Drought Monitor](#).

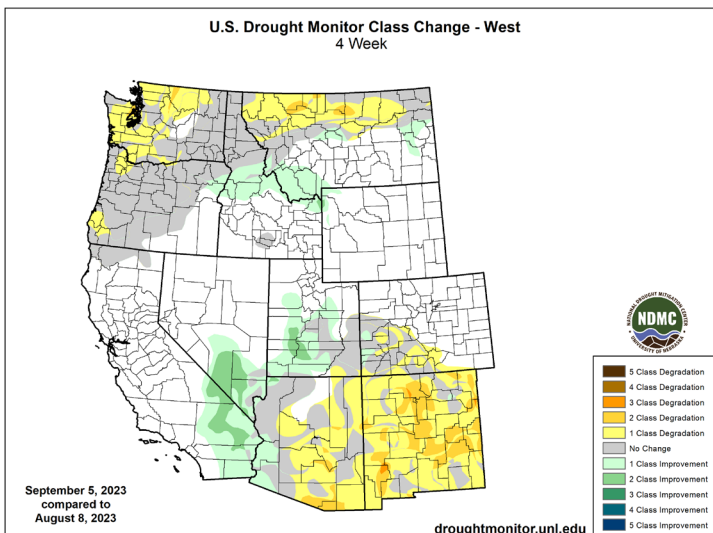


Fig. 2. Drought Monitor change map showing places where drought conditions improved (green) or worsened (yellow to brown) from early August to early September.

August Temperature & Precipitation

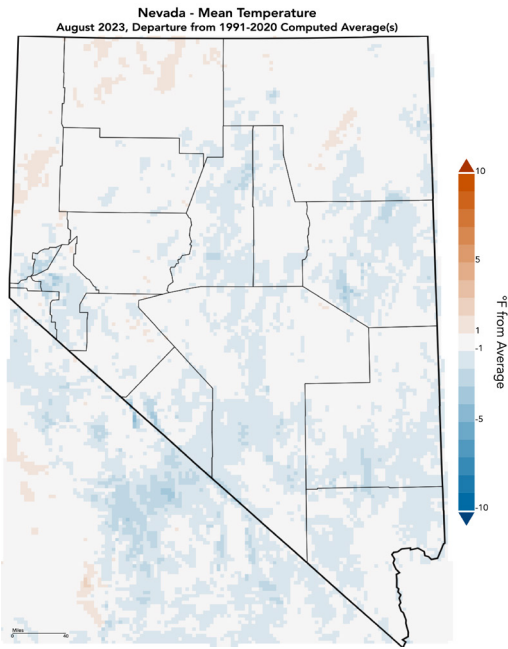


Fig. 3. Difference from average (1991-2020) August temperature (°F) in 2023. Westwide Drought Tracker at <https://wrcc.dri.edu/wwdt/>

Despite a hotter-than-normal July, August brought a return to normal or even cooler-than-normal temperatures over most of Nevada. Large swaths of the state flirted with temperatures 1° to 2°F cooler than normal, with only isolated parts of northern Nevada seeing slightly warmer-than-normal temperatures (Fig. 3).

Consistent with this, August did not generally bring us record-breaking temperatures. For example, Winnemucca and Las Vegas both stayed mostly within their expected temperature ranges. In Las Vegas temperatures trended upward during the last two weeks of the August, though steering clear of record territory (Fig. 4).

The end of the summer also brought above average levels of precipitation to most of the state, with most counties experiencing well above normal precipitation levels for the month. In one of the drier months in the driest state this only amounts to between 0.5 to 3” of rain, but it is still meaningful.

As we mentioned last month, the monsoon season in southern Nevada made a late appearance, but Las Vegas

area residents will agree that when it did arrive, it arrived in dramatic fashion, bringing over an inch of rain on August 25th and signaling [flash flood](#) warnings in parts of Clark County. Abundant precipitation wasn't only isolated to the south, however, as "Burners" faced [heavy rainfall](#) on the Black Rock Desert at the very end of the month into Labor Day weekend, putting a muddy end to their festival experiences.

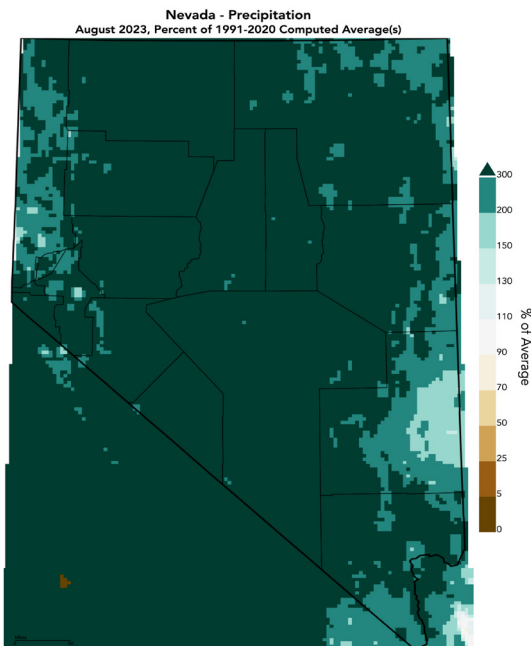


Fig. 5. Percent of average (1991-2020) August precipitation in 2023. Westwide Drought Tracker at <https://wrcc.dri.edu/wwdt/>

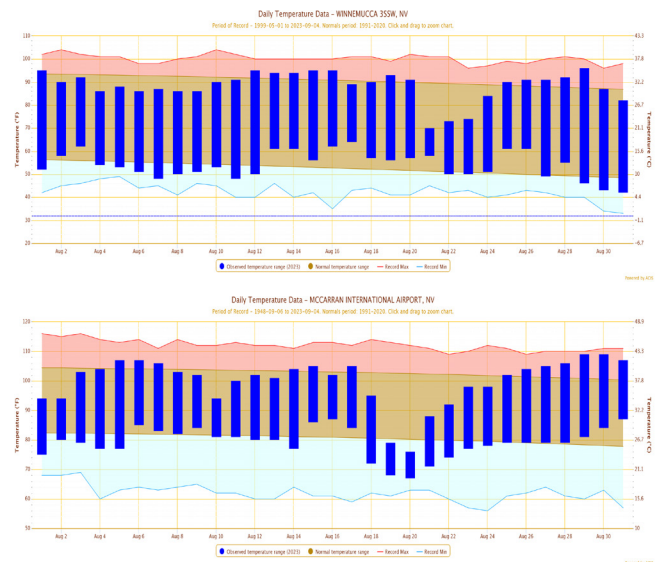


Fig. 4. Daily August high and low temperatures (blue bars) relative to the normal high and low (brown shading) and the record high (red shading) and low (blue shading) temperatures in Winnemucca (top) and Las Vegas (bottom). Plots from <https://scacis.rcc-acis.org/>

Soil Moisture

Unsurprisingly, above average precipitation in August lead to well above average topsoil moisture nearly everywhere in the state (Fig. 6). Compared to the dry map we looked at the end of July, the difference is striking. Subsoil conditions also became more damp, but being more responsive to longer term weather conditions, in a less pronounced way than topsoil moisture (Fig. 6).

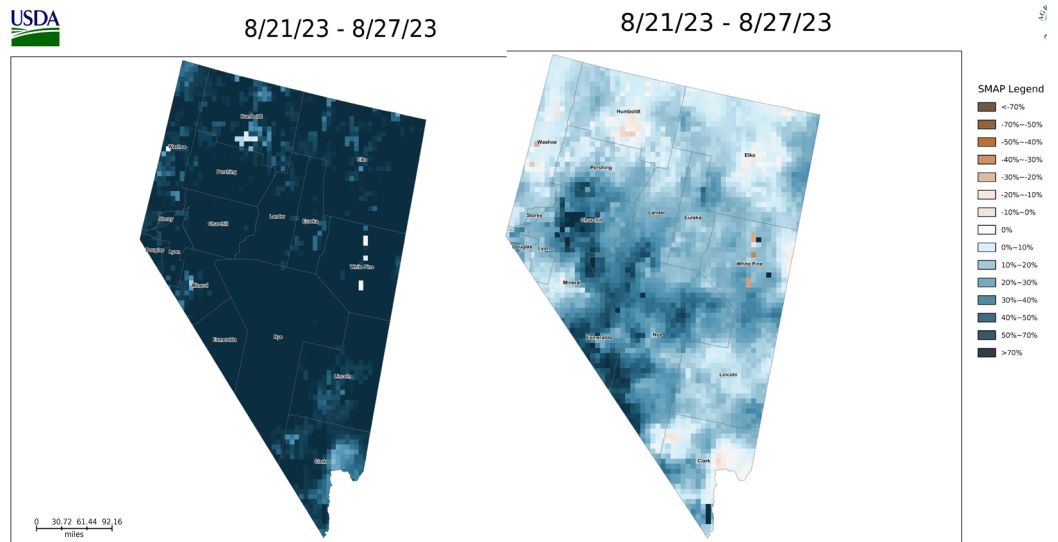
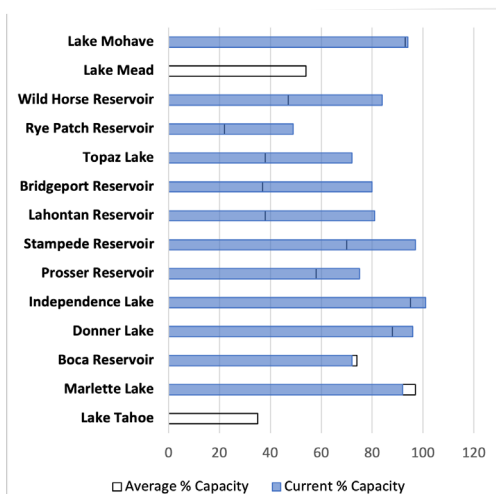


Fig. 6. Topsoil (left) and subsoil (right) moisture anomalies from 9km SMAP for August 21-27, 2023. Maps from [Crop-CASMA](#).

Water Resources



Preliminary data suggests that water levels in most Nevada reservoirs are at or well above their normal capacity (Fig. 7). Notably, data is currently unavailable for Lake Mead and Lake Tahoe in the NRCS update [report](#). The Bureau of Reclamation's Lake Mead 24-month study, however, tells us that despite the slow rise in lake levels over the year, projections don't point toward getting out of that Level 1 Shortage Condition any time soon (Fig. 8). Similar to last month, most stream gauges are reporting normal to much-above-normal flows (Fig. 9), especially near the Sierra Nevada range where many snow patches lingered late into the summer.

Fig. 7. Average and current percent capacity in Nevada's reservoirs at the end of August 2023. Data from the [Natural Resources Conservation Service](#).

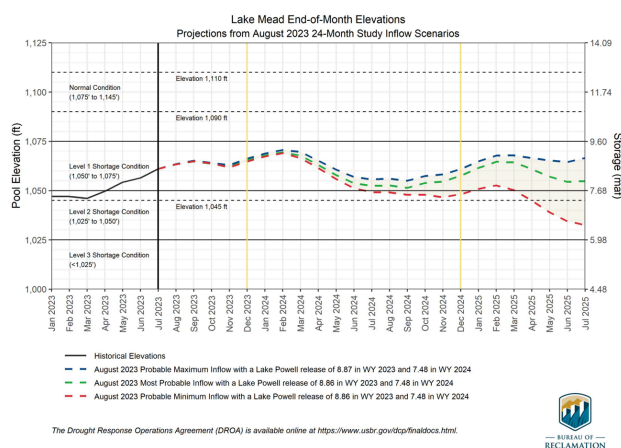
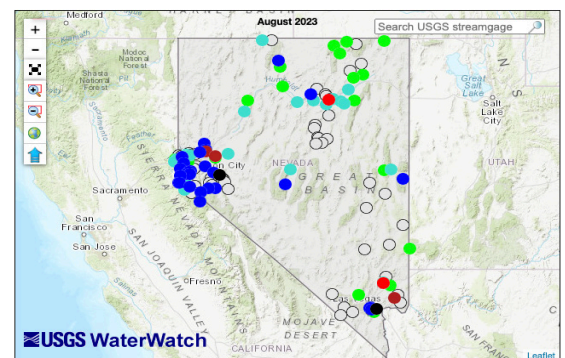


Fig. 8. Projected Lake Mead elevations from the [Bureau of Reclamation's](#) August 2023 24-month study.



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

Fig. 9. August average stream flow relative to usual conditions. From [USGS Water Watch](#). More information on [percentile classes from the USGS](#).

Looking forward

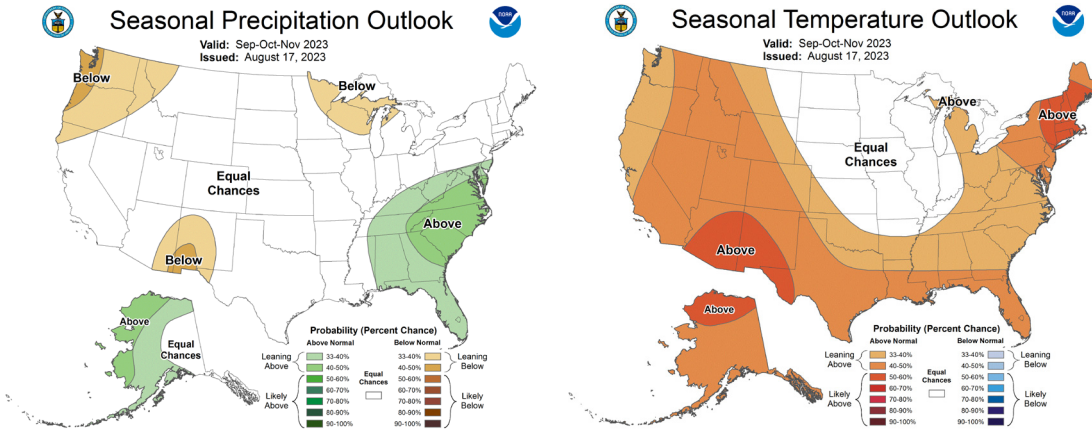


Fig. 10. Precipitation (left) and temperature (right) outlooks for September - November. From the [Climate Prediction Center](#).

The seasonal temperature outlook suggests that temperatures are leaning towards being warmer than normal across most of the western U.S. (Fig. 10). Here in Nevada the outlook gives us a 40-50% chance of being warmer than normal.

The precipitation outlook is largely inconclusive, with equal chances of being above or below normal (Fig. 10).

Last month we said that drought conditions in southern Nevada were unlikely to improve in the coming months, but the updated outlook now indicates that the persistent patch of drought in that corner of the state is likely to dissipate (Fig. 11). Other areas of the west could be less lucky, namely with drought in Oregon, Washington, Colorado, and New Mexico that is expected to persist or develop.

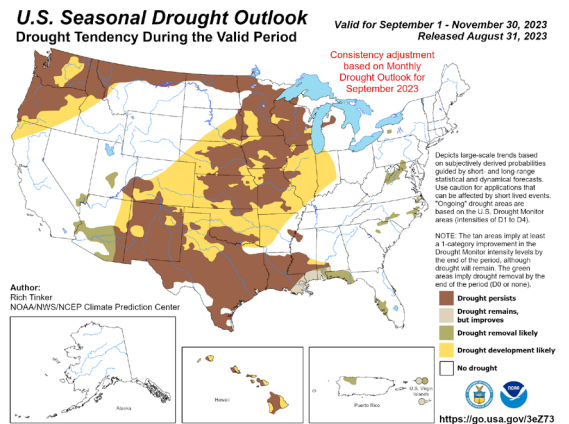


Fig. 11. September - November Drought Outlook. From the [Climate Prediction Center](#).

The fire season has been mostly uneventful in our neck of the woods, but time will tell if we can make it through the fall. The 3-month Wildland Fire Potential outlook looks pretty promising for Nevada, with normal levels of fire potential across the state. With that being said, pay attention to the elevated areas of red in northern California and the Pacific Northwest (Fig. 12). Existing and potential fires in those areas could still affect our state in the form of poor air quality.

Special note: With no county in Nevada currently under drought watch, this will be our last monthly Drought Update until at least one county creeps back into having 50% of its area under a D1 Moderate Drought condition or worse.

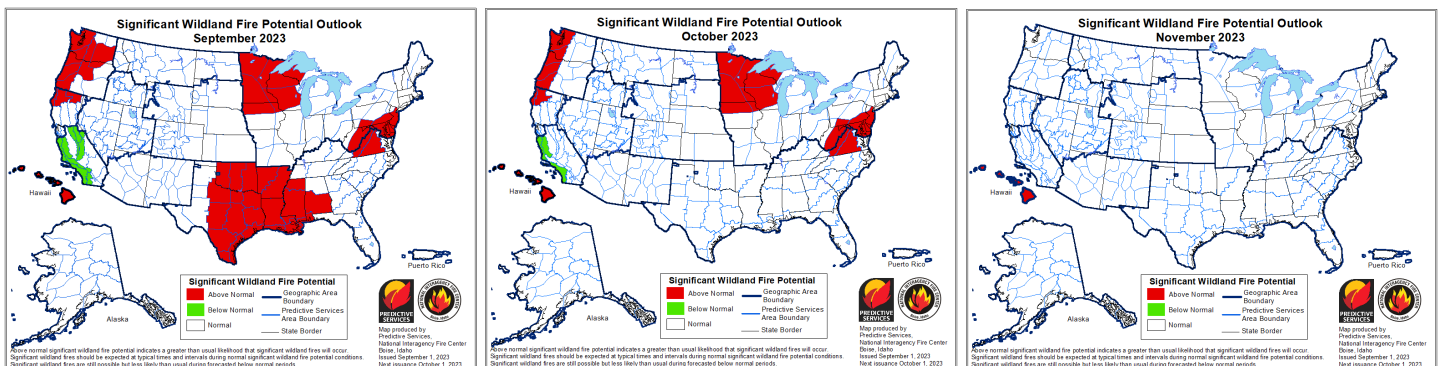


Fig. 12. Significant wildfire potential outlook for September (left), October (middle) and November (right). From the [National Interagency Coordination Center](#).