



Monthly Climate Report

NWS Reno

Issued: 03/23/2023

Includes previous Drought update (DGT) and Hydro Report (E5)



Synopsis:

February finished with below average temperatures (Figure.1) and mostly above average precipitation south of Plumas county (Figure. 2). However, because of the cold temperatures, snowfall finished above average across the Sierra, northeast California, and western Nevada. With the continued well above average water year precipitation (Figure 3) and snow water equivalent, much of the Sierra and western Nevada experienced pronounced improvements to the drought.

Weather Events:

February 2023 started off with the continued cold temperatures and calm weather. Temperatures quickly warmed back to average area-wide by the 3rd and 4th, with low to mid 50s in western Nevada and low 40s in the Sierra below 7,000 feet. This was followed by the first strong storm from the 4th to 5th, which prompted winter storm warnings in the high Sierra and northeast California, as well as wind advisories for western Nevada. Snowfall totals in the northern and central Sierra were 1 to 3 feet above 7,000 feet, and 6 to 12 inches at Lake Tahoe and northeast California. Snow was accompanied by strong winds along the ridges in the Sierra, with numerous reports of gusts between 100-120 mph. Most of the precipitation during this storm in western Nevada fell as rain, with some minor snow accumulations (Trace-2”).

We then dried out and returned to slightly above average temperatures from the 6th through the 10th. Reno reached 63 degrees on the 10th, which was the first 60 degree day since early November. It didn't last long as a tricky to forecast snow band setup in western Nevada on the 11th. Between 1 and 4 inches of snow fell in the region, with Reno receiving 2.8 inches. After the snow cleared, we once again dried out and warmed up from the 12th to the 14th. Temperatures warmed back above average into the upper 50s to low 60s in western Nevada and 40s in the lower Sierra. These warm temperatures didn't last long as we boomeranged from a quick taste of spring back into winter. A strong, but relatively dry cold front impacted the region on the 14th, prompting wind advisories throughout the region. A gust of 127 mph was reported at the top of Mammoth Mountain, while wind prone areas in western Nevada had gusts upwards of 65 mph. Temperatures across the area remained well below average for the 2nd half of the month, except for a brief warmup around the 20th when Reno reached 62 degrees.

From the 21st through the end of the month, we entered an extended period of very snowy (understatement), cold, and windy weather that had extreme impacts area-wide. Snowfall totals over this 8-day period ranged from 8 to 12 feet for higher Sierra elevations, 3 to 8 feet around the Tahoe basin, and 1 to 4 feet for northeast California. For western Nevada, several inches to near 1.5 feet of snow fell during this same time period, except lesser amounts for the Basin and Range.

Most notably of the several snow storms was the blizzard that impacted the area from the 27th onward into March. Extreme snowfall totals fell in the Sierra (3-day totals between 4-7.5 feet), which resulted in multi-day highway closures. Several ski resorts, local governments, and schools all closed. An avalanche in Olympic Valley buried an apartment complex in 25 feet of snow (2 out of 3 floors) with other avalanches reported in Mono County. The multi-day road closure also led to some empty grocery shelves in Reno.

Hydrology:

Generally cold conditions, especially during storms, kept February precipitation as snow, and inhibited melt even in low elevation valleys. Major late February storms helped continue to build the record to near record snowpack (Figure 4). As of March 1st, snowpack throughout the state is well above normal with the Walker Basin leading the pack with record conditions to date (Figure 5). Most SNOTEL sites in the Sierra have far exceeded their typical seasonal peak snow water equivalent (SWE), and many are at record or near record SWE to date (Figure 6). Streamflows in February and the water year to date have been mostly near normal in areas draining the Sierra, but still well below normal along the Humboldt with no high flow events during the month due to cold temperatures (Figure 7). Some stream gages have been impacted by ice due to the persistent cold and snow. Reservoir storage in February saw little change in Rye Patch and the Truckee system, but had modest increases in Lake Tahoe, Lahontan and the Walker system (Figure 8). Water supply outlooks are well above normal to near record throughout the region thanks to the very large snowpack at all elevations. The current snowpack conditions, including extensive low elevation snow, leads to heightened snowmelt flood risk as we head into spring, especially in the Carson, Walker, and Humboldt basin as well as in mountain creek and streams most notably in Mono county where snowpack conditions are most extreme.

Drought/Climate Update:

For the first time since February 18th, 2020 there is a small area of no drought in the HSA (Figure 9). This comes after three consecutive years of well below average precipitation, record setting temperatures, and extreme drought impacts across the Sierra, northeast California, and western Nevada. And after reading the hydrology section above, there is no question that drought improvements are due to the record to near record amounts of rain and snow since the start of the water year.

The [Standard Precipitation Index](#) (SPI) for the water year is above well above 2 for a considerable portion of the region, with lower values of 0.5-1.5 in far northwest Nevada. Even the [12 month SPI](#) is well above 2 for a good portion of the southern half of the HSA and 0.5-1.5 for the remainder of the HSA. This is an excellent recovery for precipitation deficits. Wet weather has helped increase soil moisture, which was critically low after the dry conditions and well above average spring-fall temperatures. We've seen record amounts of snowfall throughout the HSA and we have retained the snowpack since November due to the well below average temperatures. This will be an immense amount of help for area reservoirs, aiding in long-term water storage.

Areas of severe (D2) drought still exist in northwestern Nevada, which also had the worst initial drought conditions. In addition to the re-introduction of D-nada in the central Sierra, areas of moderate drought improved to abnormally dry. Since the start of the water year, portions of the Sierra and western Nevada have seen as much as two to three class improvements to the drought status (Figure 10).

Additional Information on Drought and Climate:

[Report Drought conditions here](#)

[Nevada statewide Drought update](#)

[NV Living with Drought](#)

[Drought Monitor](#)

[New Drought.gov](#)

[California Nevada Drought Early Warning System](#)

[NOAA CPC Drought page-](#)

[CNAP Drought tracker](#)

[California Nevada River Forecast Center](#)

[WRCC Drought Tracker](#)

[WRCC Enso page](#)

[WRCC Monthly Climate Summaries](#)

[Evaporative Demand Drought Index](#)

[US Seasonal Drought Outlook](#)

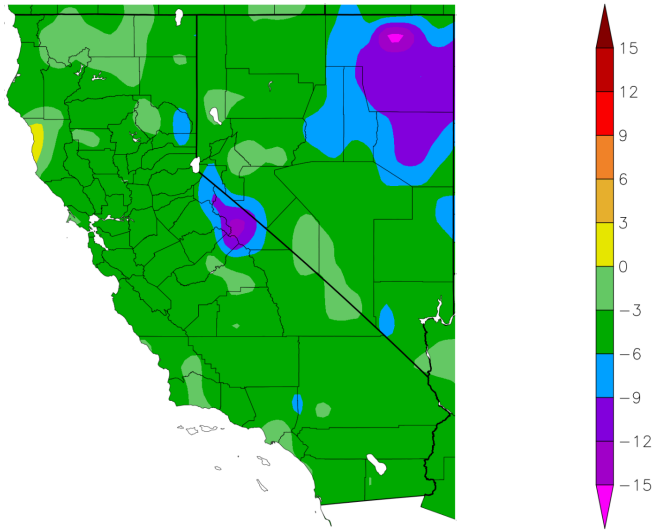
Contact NWS Reno Climate Team

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<https://www.weather.gov/rev/>

Figures.

Departure from Normal Temperature (F)
2/1/2023 - 2/28/2023

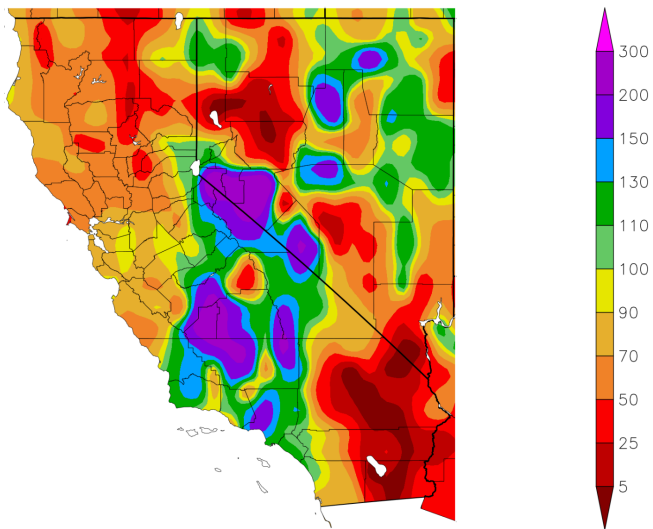


Generated 3/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Figure 1. Average temperatures in February were several degrees colder than normal across a majority of the region. ([HPRCC](#))

Percent of Normal Precipitation (%)
2/1/2023 - 2/28/2023

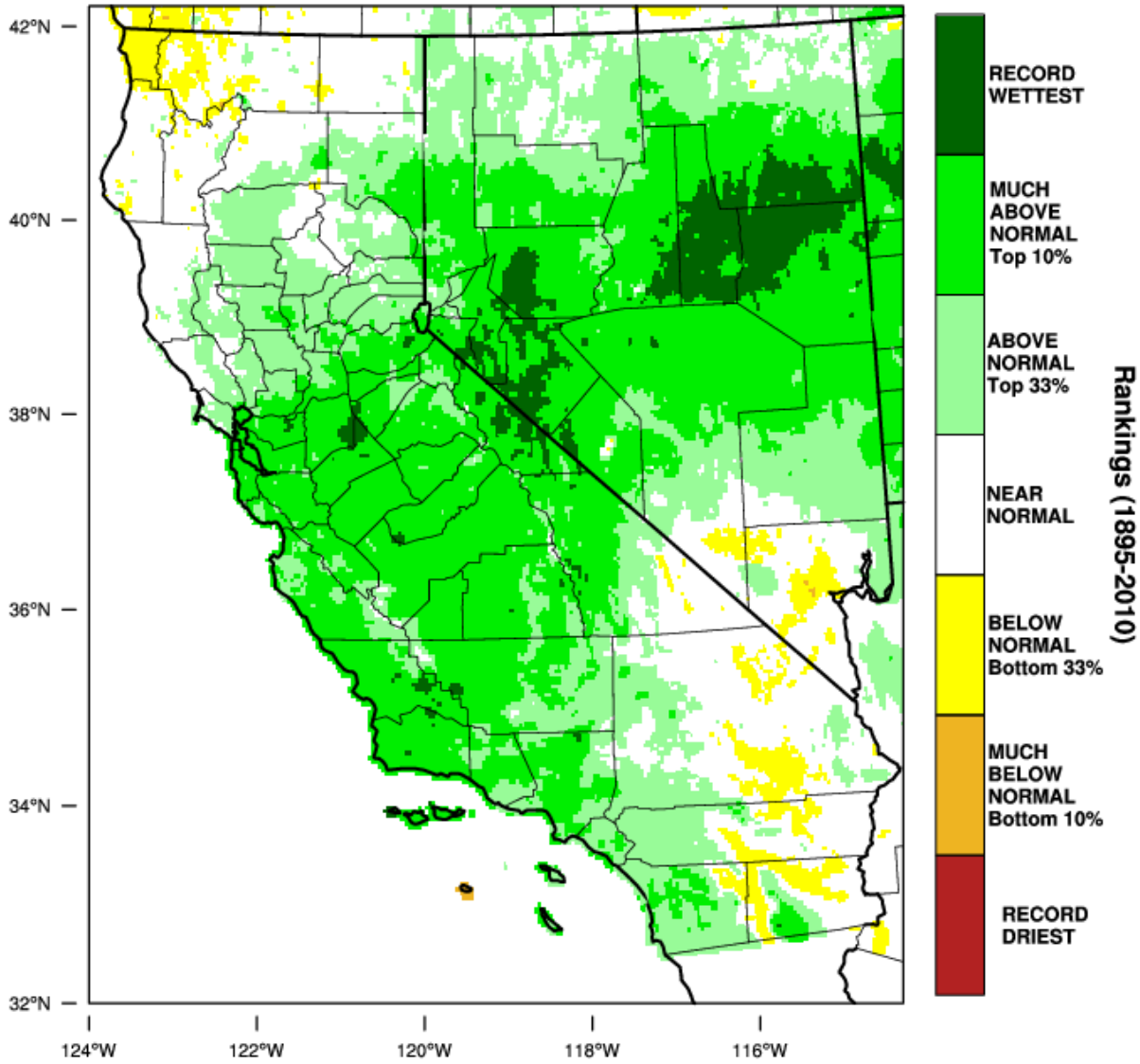


Generated 3/20/2023 at HPRCC using provisional data.

NOAA Regional Climate Centers

Figure 2. Most of the area experienced below average precipitation in February, with an exception of Mono and Mineral counties. ([HPRCC](#))

California - Precipitation October-February 2023 Percentile



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 2 MAR 2023

Figure 3. For the water year to date, a majority of our region received 150-250% of normal precipitation. This led to many locations across the Eastern Sierra and far western Nevada observing their record wettest water year to date. Generally, nearly the entire forecast area is above-normal. ([WWD](#))

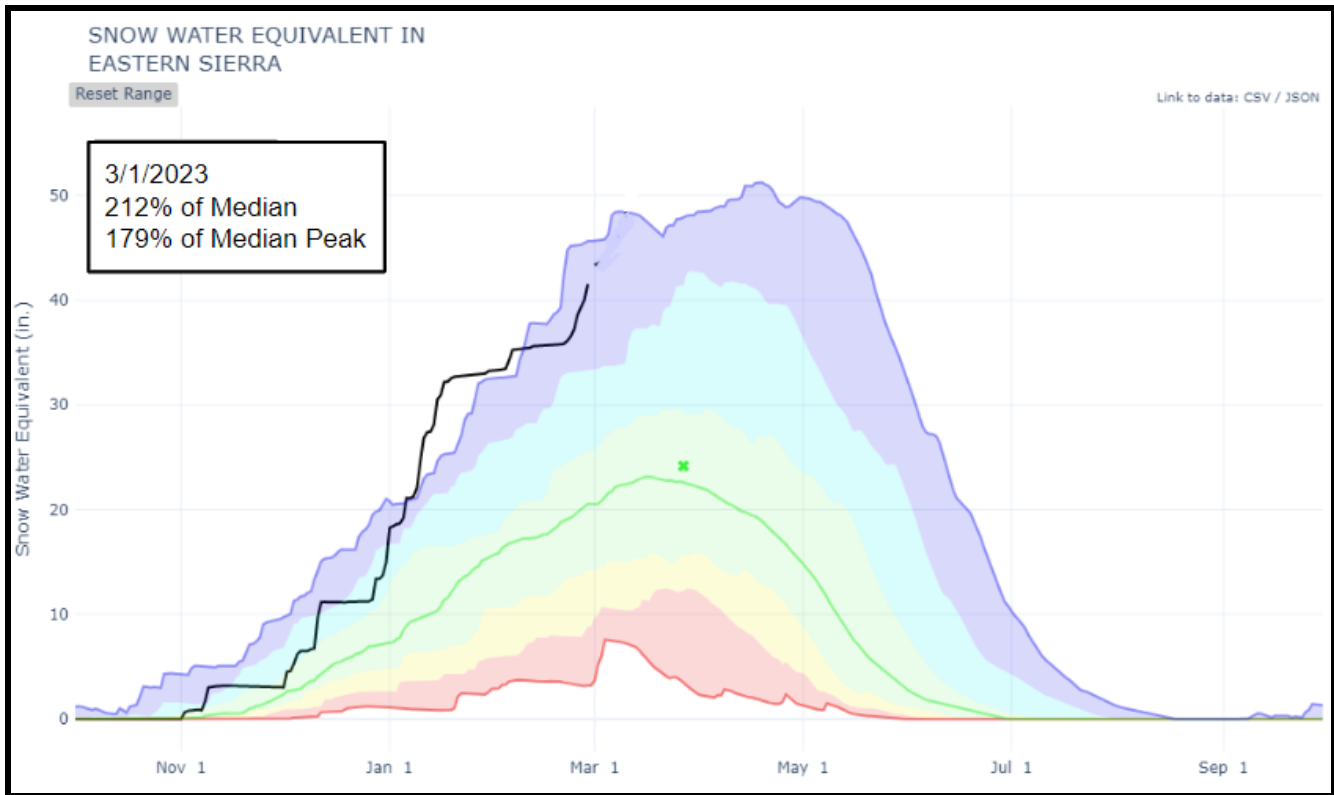


Figure 4. Snow water equivalent for Eastern Sierra watersheds (Tahoe, Truckee, Carson and Walker). Black line represents the water year 2022-2023. As of March 1st, this area was 212% of median and 179% of the median peak. The Carson was near record, and the Walker slightly above record at that time. ([NRCS](#))

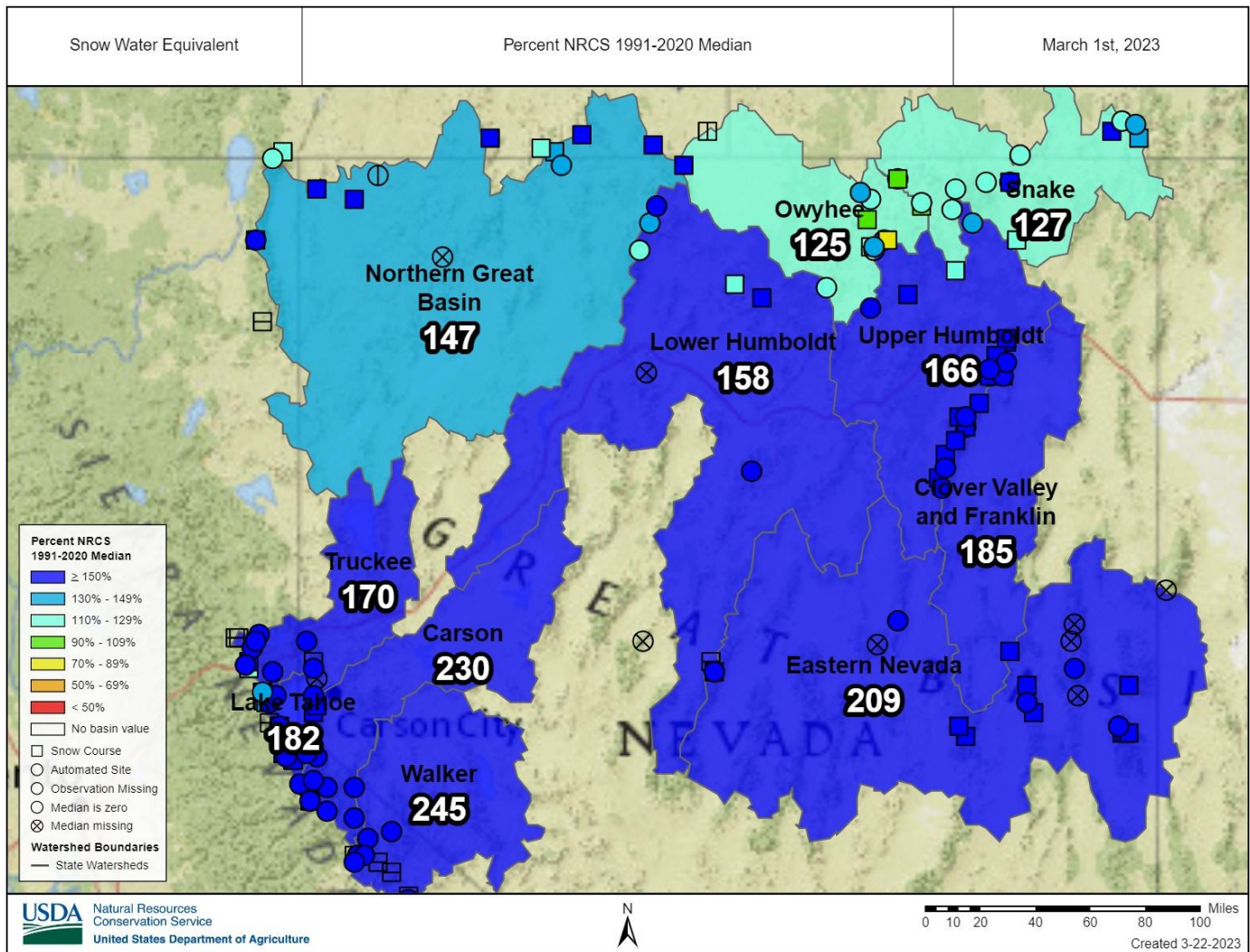


Figure 5. [SNOTEL snowpack](#) % of median as of February March 1, 2023.

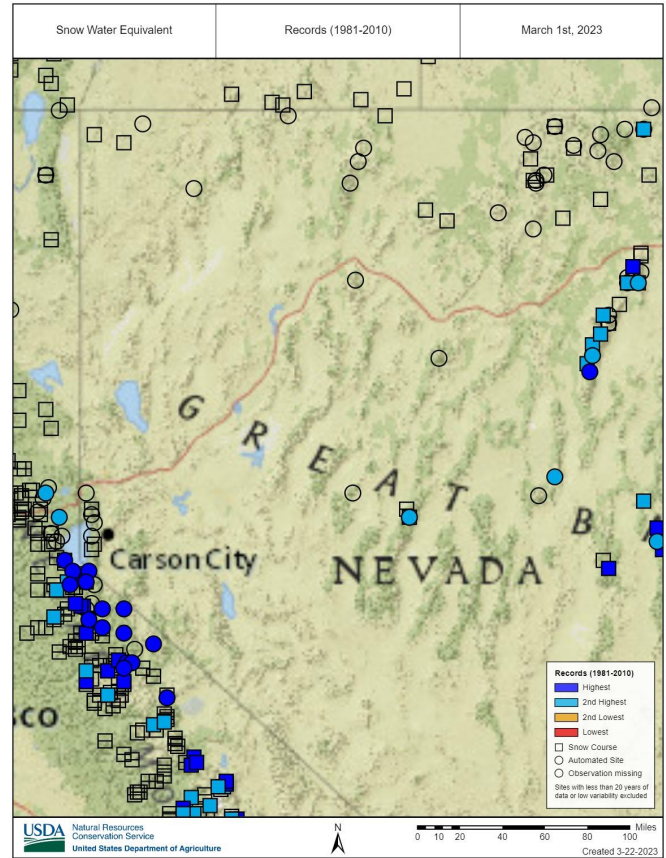
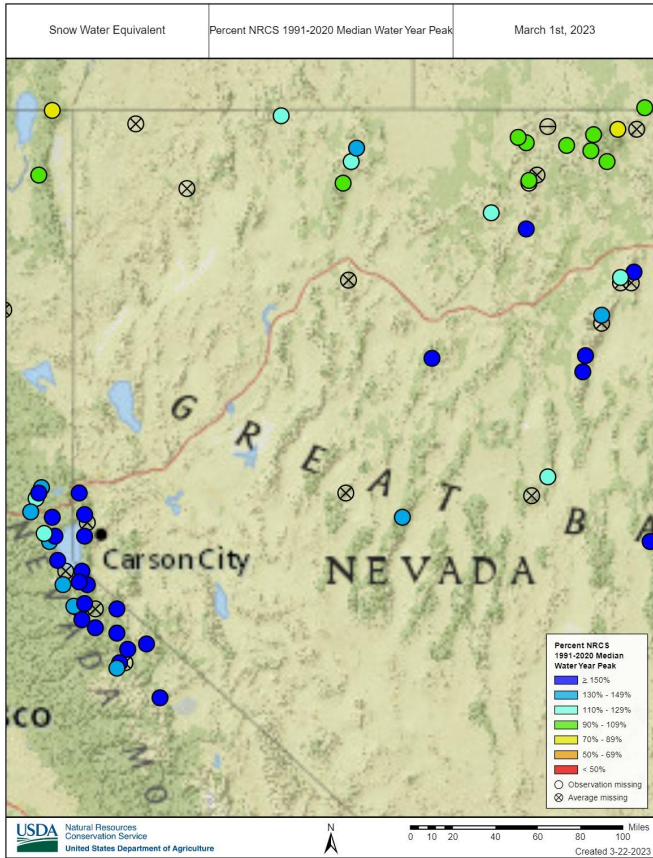


Figure 6. End of February SNOTEL % of median peak snow water equivalent (SWE) on left, and end of January record and near record SNOTEL and snow course SWE on right. ([Link](#))

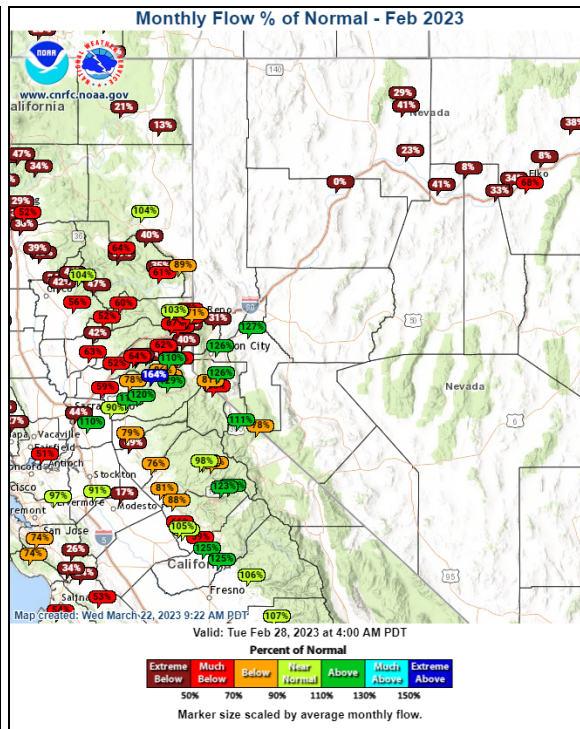
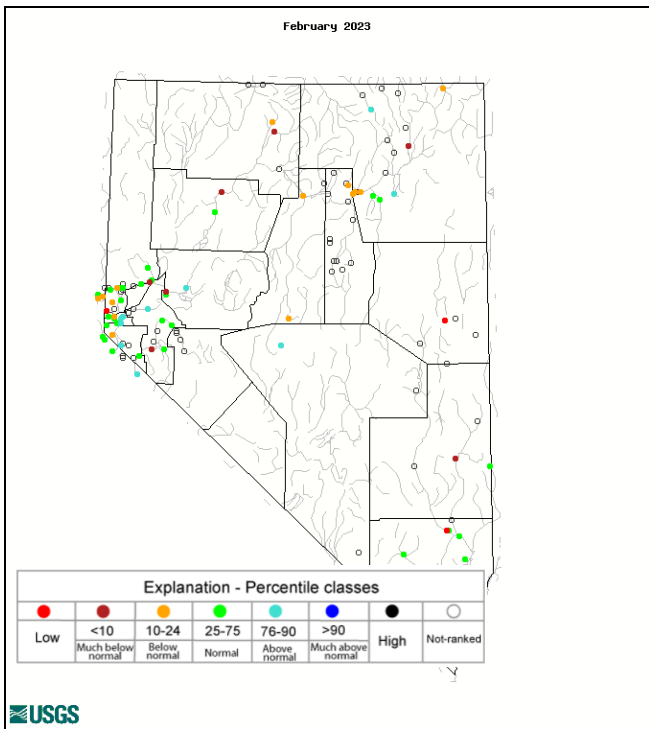


Figure 7: February monthly [USGS streamflow](#) on the left, and [CNRFC water year observed flow to date](#) on right.

Reservoir Storage as of 2/28/2022

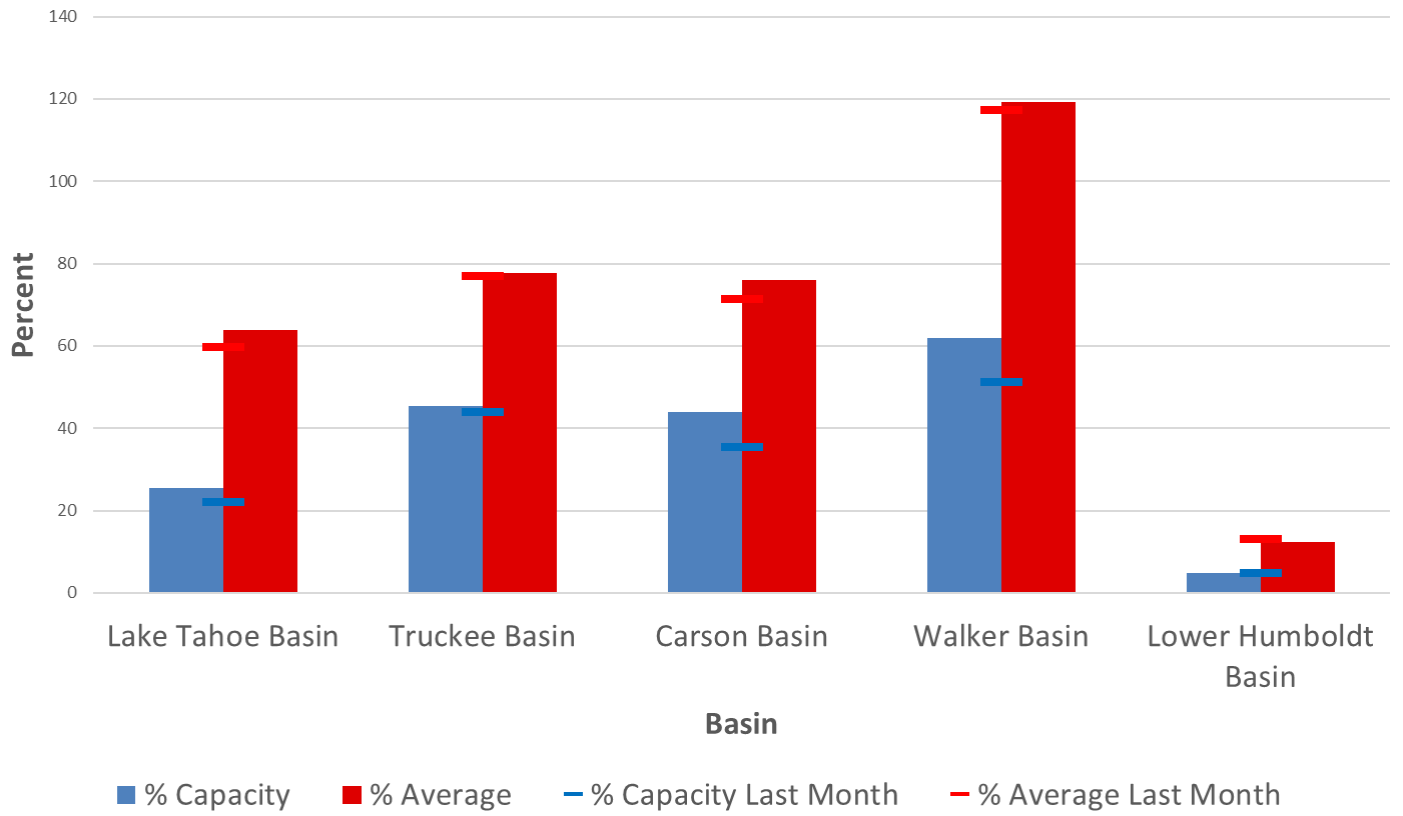
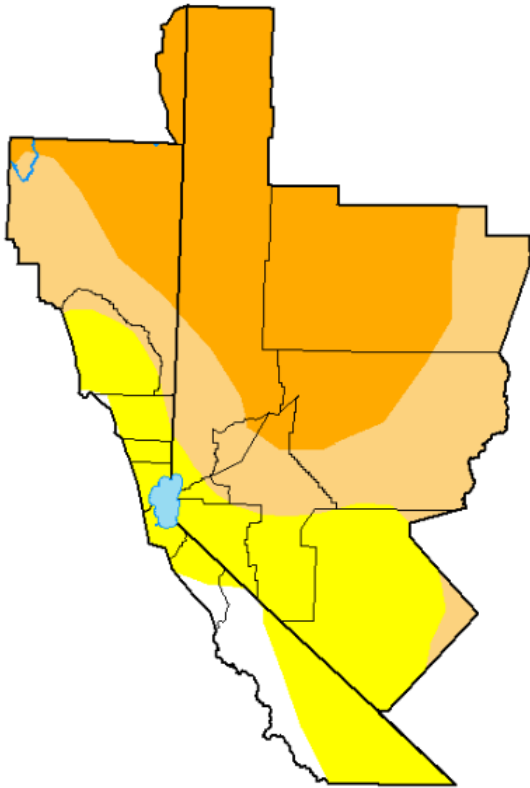


Figure 8: End of February Reservoir storage % of capacity and % of average

U.S. Drought Monitor Reno, NV WFO

February 28, 2023
(Released Thursday, Mar. 2, 2023)
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	3.61	96.39	69.01	40.75	0.00	0.00
Last Week <i>02-21-2023</i>	0.00	100.00	84.78	40.75	0.00	0.00
3 Months Ago <i>11-29-2022</i>	0.00	100.00	100.00	100.00	19.04	0.00
Start of Calendar Year <i>01-03-2023</i>	0.00	100.00	100.00	60.41	16.14	0.00
Start of Water Year <i>09-27-2022</i>	0.00	100.00	100.00	100.00	19.04	0.00
One Year Ago <i>03-01-2022</i>	0.00	100.00	100.00	100.00	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

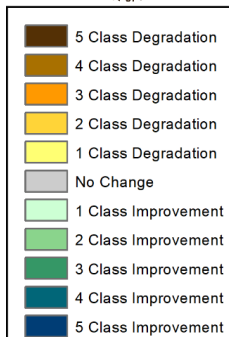
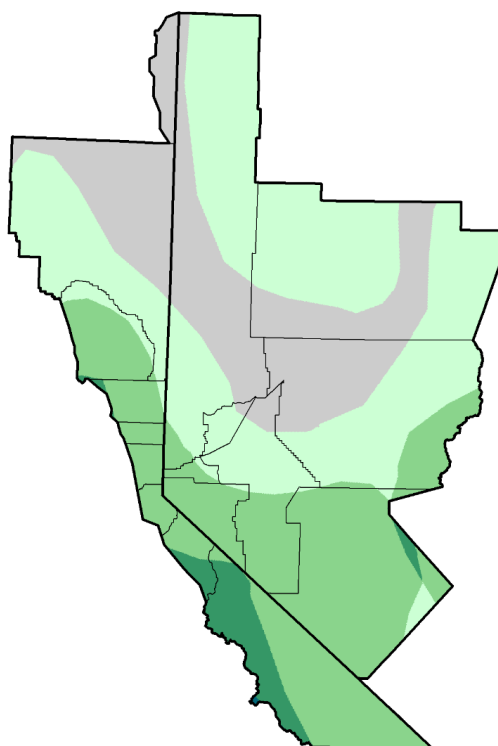
Richard Heim
NCEI/NOAA



droughtmonitor.unl.edu

Figure 9. End of February Drought Monitor Status for NWS Reno Service area. ([Drought Monitor](https://droughtmonitor.unl.edu))

U.S. Drought Monitor Class Change - Reno, NV WFO
Start of Water Year



February 28, 2023
compared to
September 27, 2022

droughtmonitor.unl.edu

Figure 10. Changes in drought categories since the start of the water year, Oct. 1, 2022, shows two to three class improvements for most of the Sierra, and one to two class improvements for much of northwestern Nevada. ([Drought Monitor](#))