Monthly Climate Report

NWS Reno

Issued: 04/05/2024

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

Synopsis:

The main highlight of March was the blizzard that continued to bring very heavy Sierra snowfall, strong winds and major travel impacts for the first 3 days of the month, with far western NV also receiving periods of heavy snow. Except for a weak storm on the 11th-12th and a gusty northeast wind event for the Sierra on the 13th-14th, the remainder of the month's first three weeks was relatively quiet with a period of warming for the final few days of the winter season. However, after the spring season began, a colder and wetter pattern returned with a series of weak-moderate strength storms bringing rounds of snow back to the Sierra, periods of gusty winds, and lighter rain and snow for lower elevations through the remainder of the month.

The cold start to March lasted for over a week, before moderating by mid-month. The warmest days of March occurred from the 18th-21st, with daytime highs 8-12 degrees above average. A cold front on the night of the 22nd brought below average temperatures which continued through the remainder of March. The overall result was below average temperatures by around 2-4 degrees in most areas (Figure 1). Precipitation was above average (Figure 2) mainly from the early March blizzard and also the series of late March storms. Areas with the wettest anomalies (at least 200% of average) included much of the Sierra, Lassen County, and far western NV.

The Sierra snowpack finally surpassed season-to-date normals after the early March blizzard. Even though dry and warm conditions arrived for several days, additional storms late in the month brought just enough snowfall to keep the eastern Sierra basins slightly above season-to-date normals (110-120%) at month's end, capping off a solid rally after such a slow start to the winter snowpack.

Weather Events:

The blizzard for the first few days of March hit the Tahoe region the hardest, with multi-day snowfall totals of 4-6 feet down around lake level, and 5-8 feet for higher elevations along the Sierra crest and Carson Range. A few locations even reported totals greater than 9 feet, although the high winds and drifting snow made conditions difficult to obtain accurate snow measurements. Snowfall amounts were less for the higher elevations of Mono County, but 3-5 feet still fell along the crest. Far western NV also received heavy snowfall amounts over the first two nights of the month, with 6-12" across Reno-Sparks and the Carson Valley, while foothill locations received 1-2 feet. Northeast CA also received 6-12" in lower valleys near US-395 including Susanville, with 3-5 feet for higher elevations west of US-395. Prolonged highway closures were common for Sierra routes, including I-80 over Donner Summit which remained closed for up to 3 days. US-395 in Mono County was also closed, as wind-blown snow produced dangerous ground blizzard conditions even after the snowfall ended. Closures also occurred at several Sierra airports, including Truckee, South Lake Tahoe, and also at Mammoth. Lastly, by the morning of the 2nd as many as 24,000 customers were without power in the greater Reno-Carson City area due to the heavy wet snow and strong winds.

The only other snowfall for the first three weeks of March was from a minor storm on the 11th-12th which produced 4-10" of snowfall near the Sierra crest west of Tahoe, but 2" or less east of the crest in the Tahoe basin, and southward along the crest in Mono County. After this weak storm exited, a strong northeast wind event developed over the Sierra. While the strongest gusts occurred west of the crest, a peak gust of 144 mph was reported at the Mammoth Mountain summit. Elsewhere, the winds weren't as strong, but produced brisk and chilly conditions across the region from the 13th-15th.

While most areas then received several days of spring-like weather including highs into the lower 70s for lower elevations, this was only temporary as a cold front passage on the evening/night of the 22nd brought winter back to the region, with 7-16" snowfall near the Sierra crest and 3-8" for the Tahoe basin, and mostly rain for lower elevations. Strong wind gusts were primarily limited to the Sierra, except for a peak downslope gust of 83 mph in Mineral County near Walker Lake. Chilly conditions with additional snow showers brought 2-6" with a few sites up to 10" to the Sierra/Tahoe region during the weekend of the 23rd-24th, and patchy light snowfall lingering into the 25th.

A quick hitting storm on the night of the 27th brought additional snowfall of 5-12" to the higher Sierra elevations, with 2-6" for the Tahoe basin and mostly light rain for lower elevations. Peak wind gusts in the eastern Sierra and western NV were generally 45-55 mph with gusts around 65 mph in a few wind prone areas, and a peak Sierra crest gust of 127 mph. The Easter weekend of the 29th-31st brought a more prolonged and slower moving storm with even more snow for the Sierra, and more widespread rainfall for many lower elevations, with liquid totals generally between 0.50-1.0" across much of western NV. Between 1-2 feet of snow fell across much of the Sierra and parts of the Tahoe basin, with up to 3" across the greater Reno-Carson City-Minden area down through Mineral County, and 3-8" across 2 nights in foothill areas and within heavier snow bands.. With this storm system, Reno International Airport (official station) has finally seen its water year-to-date precipitation go above average for the first time this water year.

Hydrology:

No flooding occurred in March The early March blizzard combined with the more moderate storms later in the month helped finish a pretty amazing recovery for the snowpack in the east side of the Sierra, where most sites and primary basins ended the month, and the typical snow accumulation season, above the median seasonal peaks (Figure 3). Considering that most of these basins were below 50% of normal at the beginning of February, there has been an impressive snowpack recovery in February and March. In northern Nevada, where the snowpack has been above normal most of the season, March added to those basins ending the typical snow accumulation months with well above median conditions ranging from 140 to 190% of median (Figure 3 and 4). Area rivers and streams are generally flowing near to above normal (Figure 5). Mountain soil moisture is near normal in the Sierra, and well above normal in northern Nevada and the Humboldt basin(Figure 6). Water supply forecasts for the April-July period have improved with the March storms and are now generally near average for the eastern Sierra, and well above average for the Humboldt (Figure 7). While these forecasts are quite skillful in early April, spring and early summer weather will dictate if observed volumes end up near the higher or lower range of the forecasts. Major reservoir systems in the region are well above normal with larger later winter and spring gains noted in Rye Patch with high flows on the lower Humboldt. (Figure 8).The normal to slightly above normal eastern Sierra snowpack may lead to Goldilocks conditions of good water supply and minimal snowmelt flooding risk. Flooding risk along the east side of the Sierra could be increased by a cool wet spring holding a relatively large snow covered area into the late spring and early summer, but mid-range outlooks do not currently favor this outcome. Flood risk is more significant along the lower Humboldt where spring streamflows are already elevated and a well above normal snowpack

is just peaking. Fortunately, unlikely last year, the low elevation snowpack is far less extreme, and while prolonged minor to moderate flooding is likely, major flooding is not expected.

Drought Update:

The wetter than normal March has led to continued improvements to the 2023-24' water year precipitation. As of the end of March, most of the Sierra and far western NV varies between 90-130% of average (Figure 9). The inner basins and ranges as well as western Lassen County vary between 70-90% of average. Temperatures still vary between one to three degrees above average, continuing our warm water year (Figure 9). The best news of March was a big relief in the snow drought, which drastically improved the last few months.

The below average precipitation has translated into areas of abnormally dry conditions (D0) for portions of western NV indicated by the US Drought monitor (Figure 10). Other long-term drought indicators such as water storage, soil moisture, and stream flows remain in good conditions, thus there is no introduction of drought to the HSA. Check the drought monitor webpage for any updates.

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
rev.climate@noaa.gov 775-673-8100
https://www.weather.gov/rev/

Photos:

Photo 1: March blizzard brought multiple feet of snow to the Mammoth Mountain area. Photo courtesy of Barbara Coleman Richter via Facebook.

Photo 2: Drifts upwards of 5-6 feet were common with the early March blizzard. Photo courtesy of Joshua Wheeler at Tahoe Donner via Facebook.

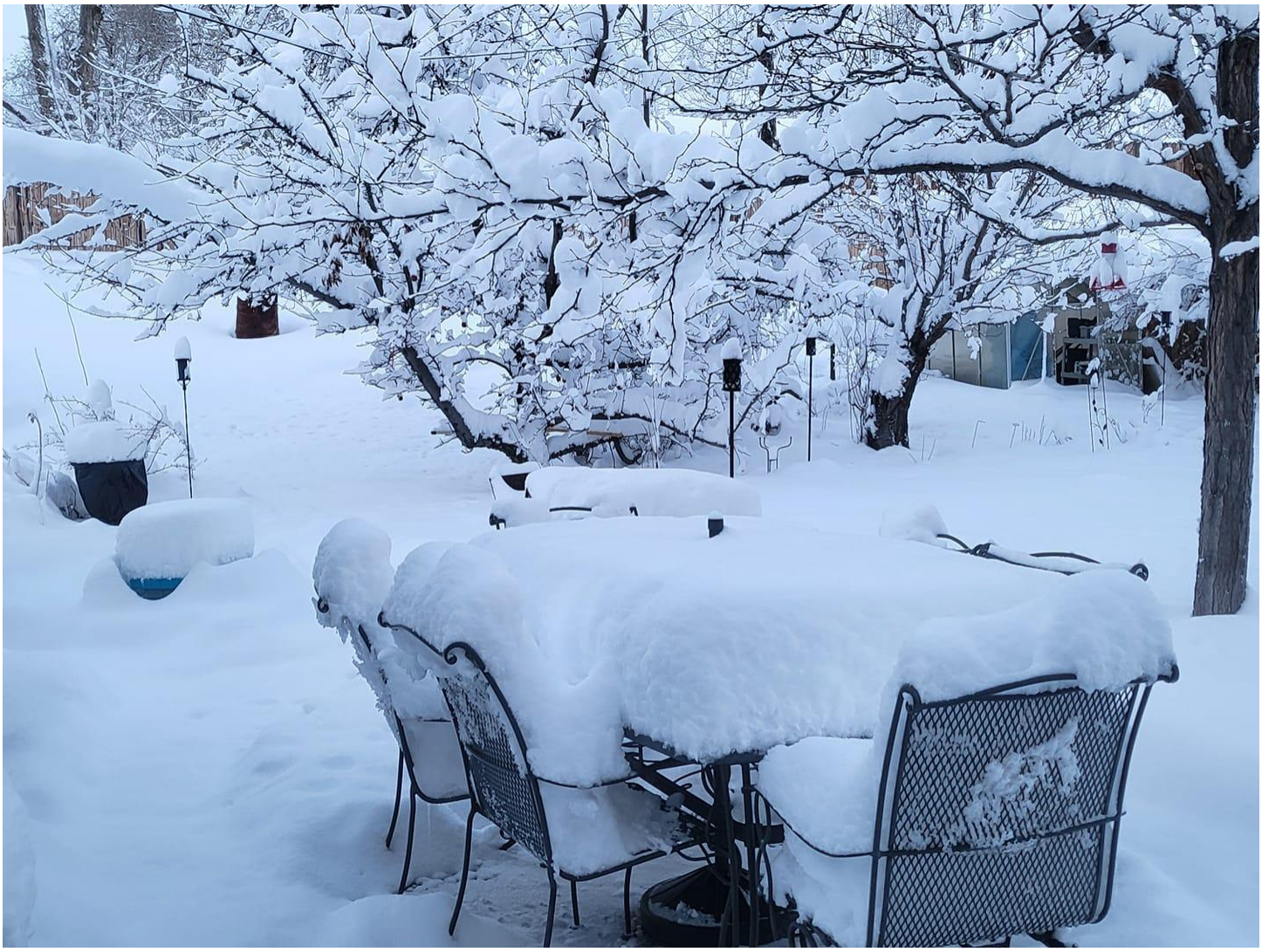


Photo 3: Upwards of 2 feet fell in the Reno-Carson City foothills during the early March blizzard. Photo courtesy of Holly Bromley of Lemmon Valley via Facebook.

Photo 4: Ground blizzard conditions at Mammoth-Yosemite Airport the morning of March 3rd. These conditions persisted most of the day with gusts upwards of 85 mph. Photo courtesy of Mammothsnowman.com

Photo 5: SR-89 near Emerald Bay on March 9th. It took some time to fully dig out the highways in the Lake Tahoe area due to all the snow the prior week. Photo courtesy of Caltrans District 3.

Photo 6: Late month rain/snow pellet showers in the Reno area on March 24th. Photo courtesy of NWS Reno.

Figures:

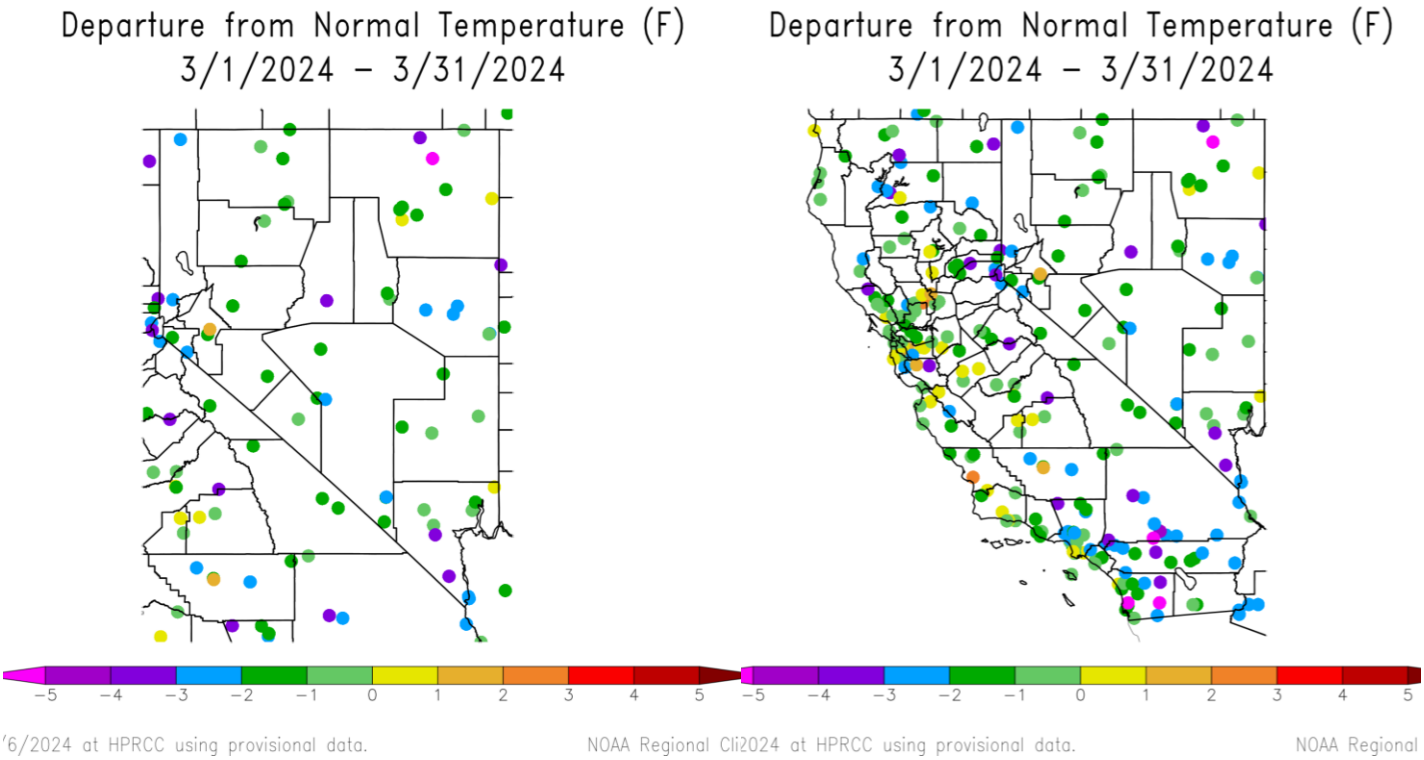


Figure 1: Nevada (left) and California (right) departure from normal temperatures for March 2024. Data courtesy of WestWide Drought Tracker. (HPRCC)

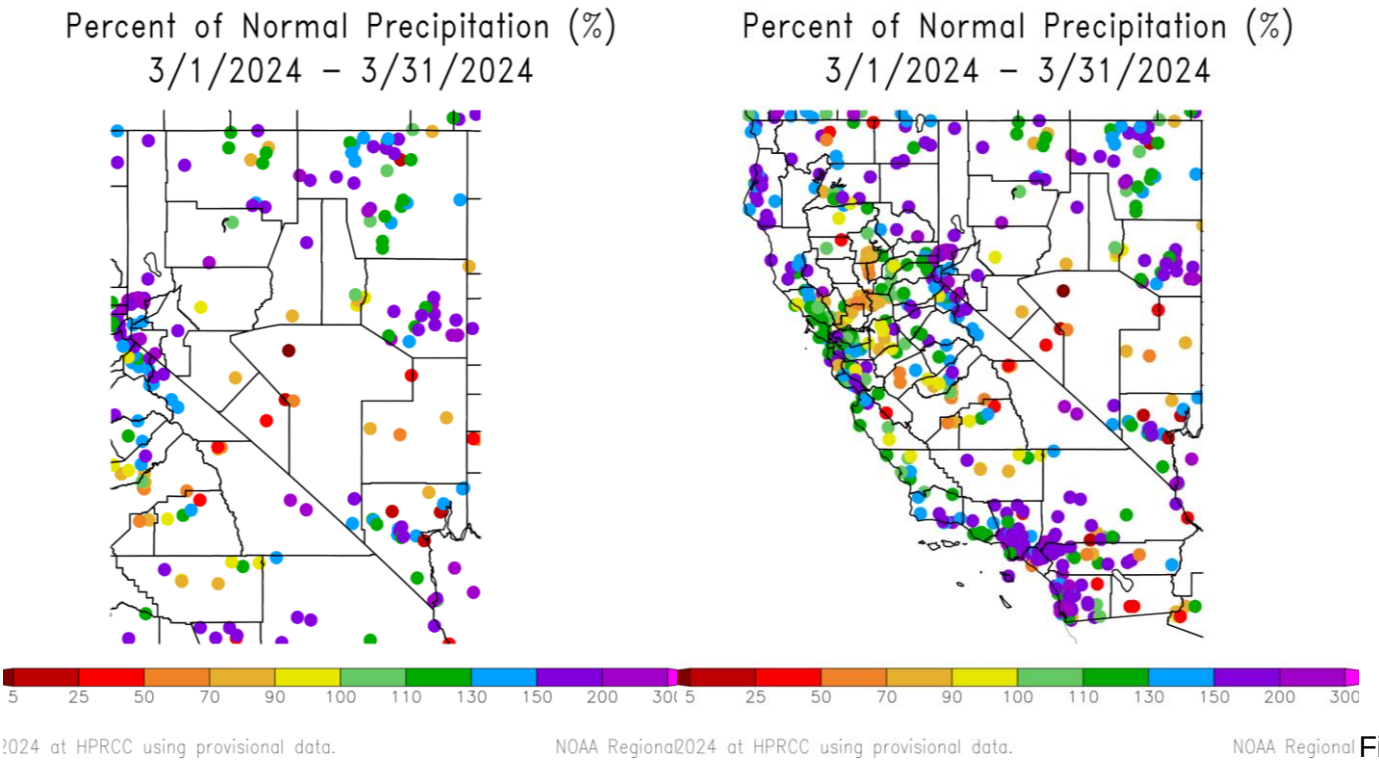
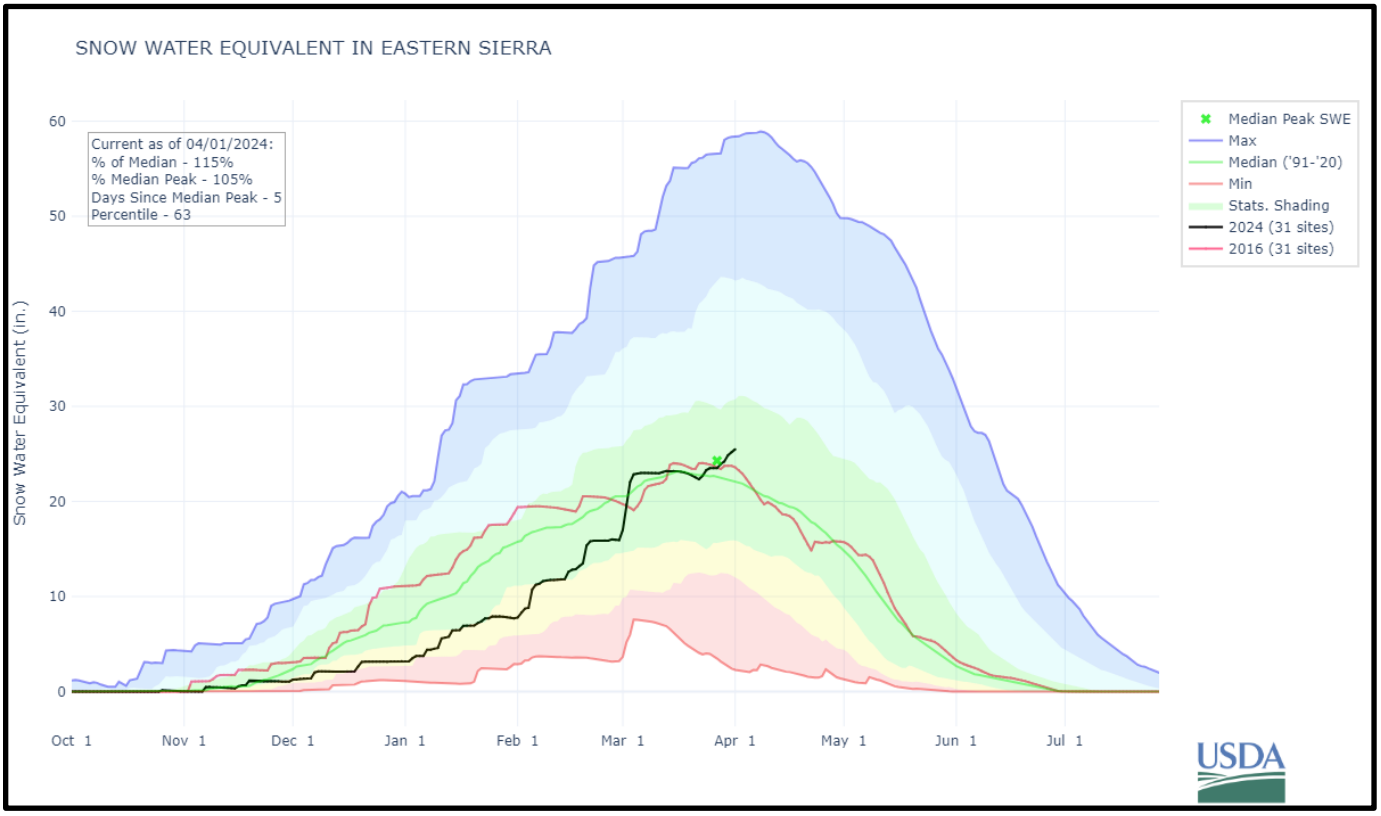


Figure 2: Nevada (left) and California (right) percent of normal precipitation for March 2024. Data courtesy of High Plains Regional Climate Center. (HPRCC)



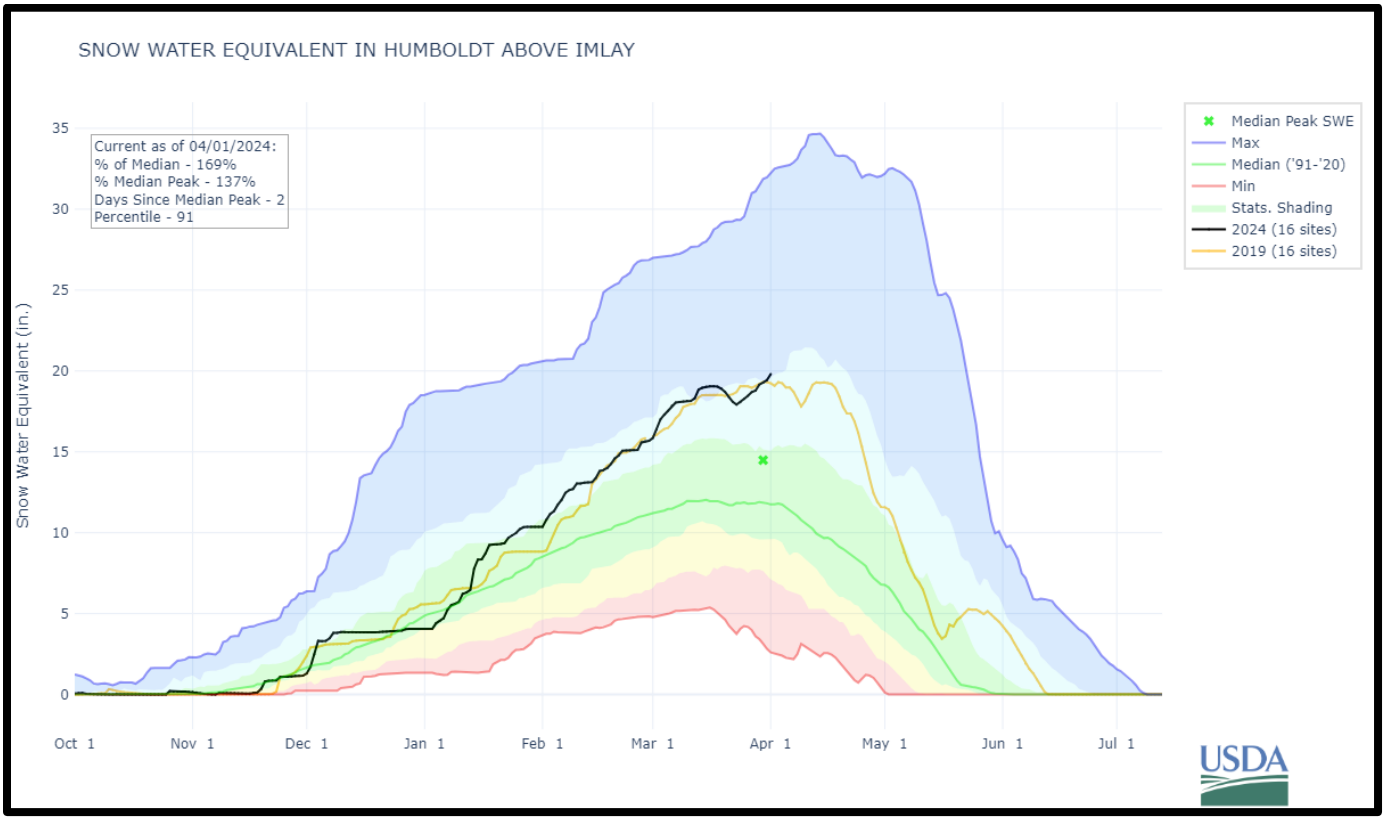


Figure 3: NRCS SNOTEL snow water equivalent (SWE) for the combined Tahoe, Truckee, Carson and Walker basins (upper plot), and Humboldt (lower plot) indicated in black for water year 2024. Most similar recent year snowpack year plotted for reference.

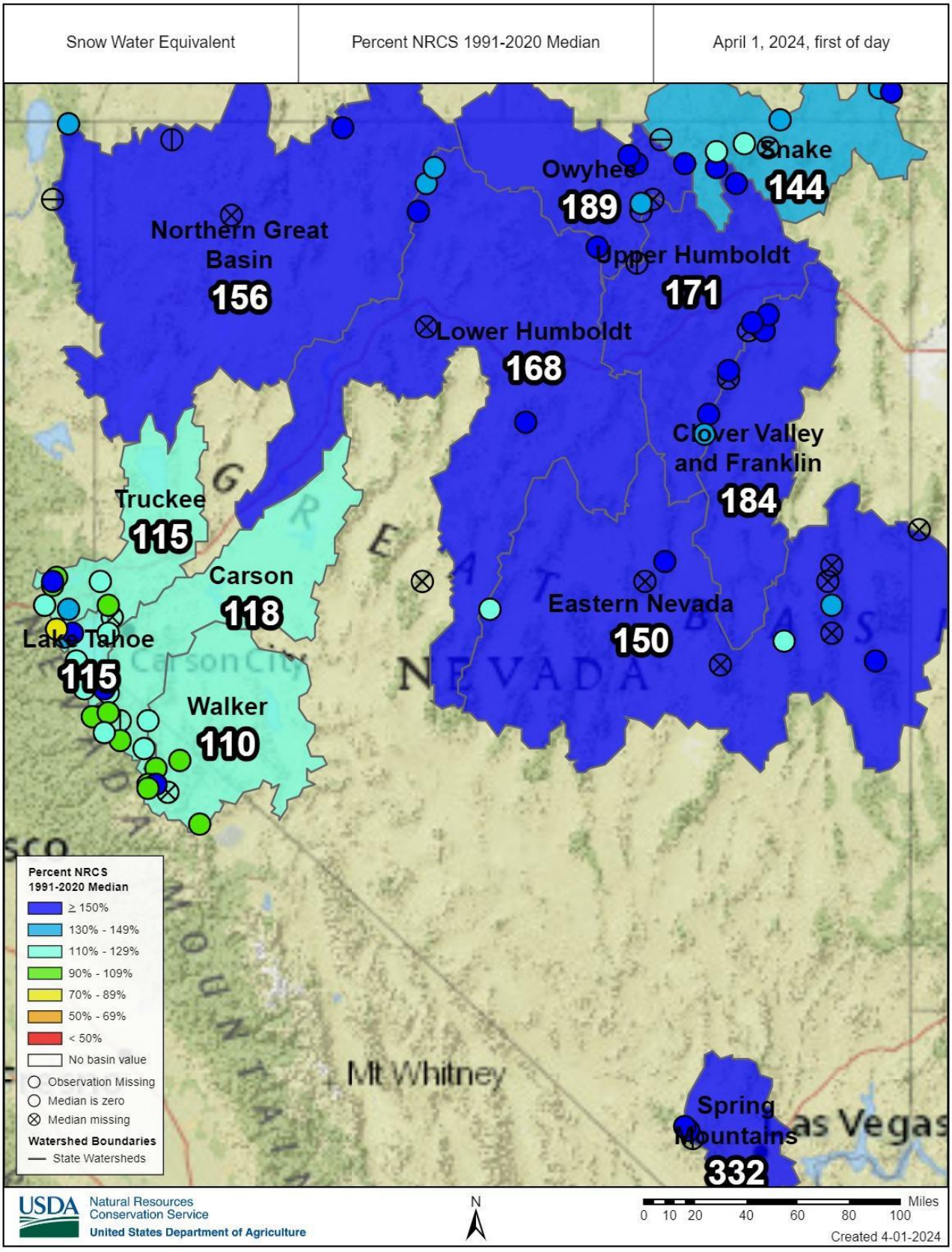


Figure 4: NRCS SNOTEL basin snow water equivalent as percent of median for 04/1/24

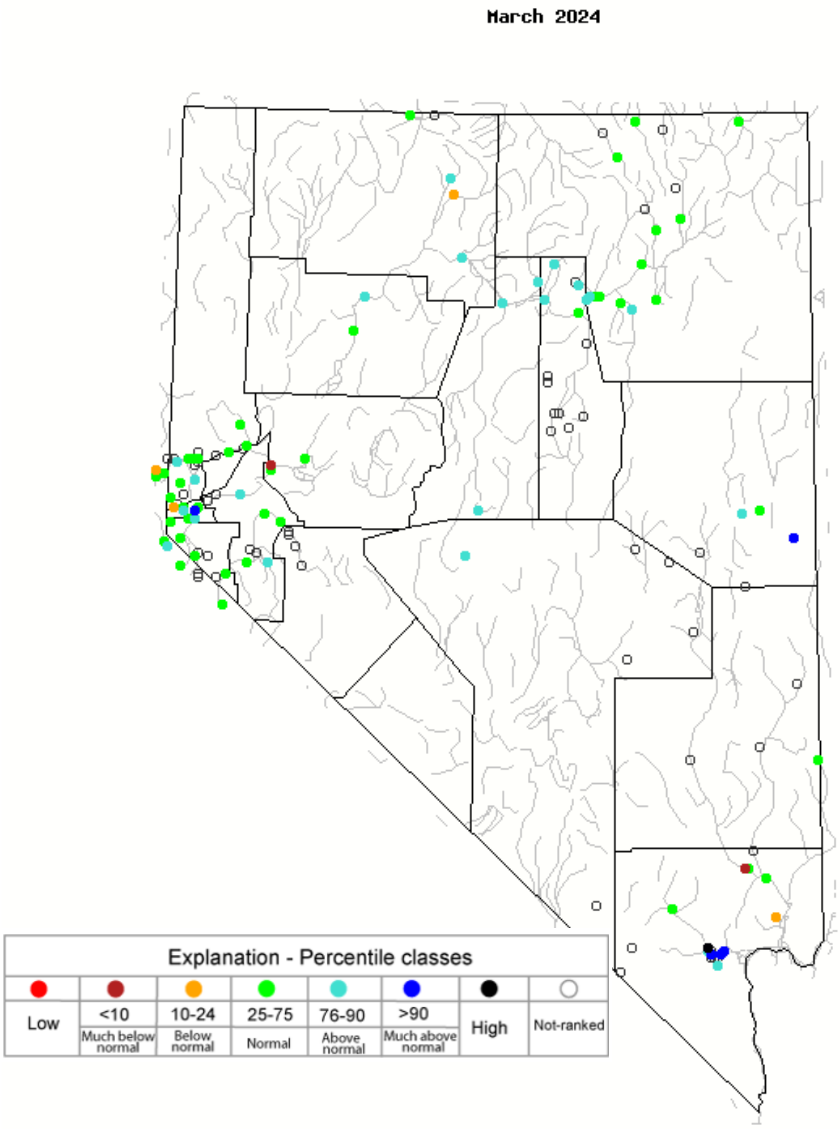


Figure 5: March [Monthly USGS streamflow]

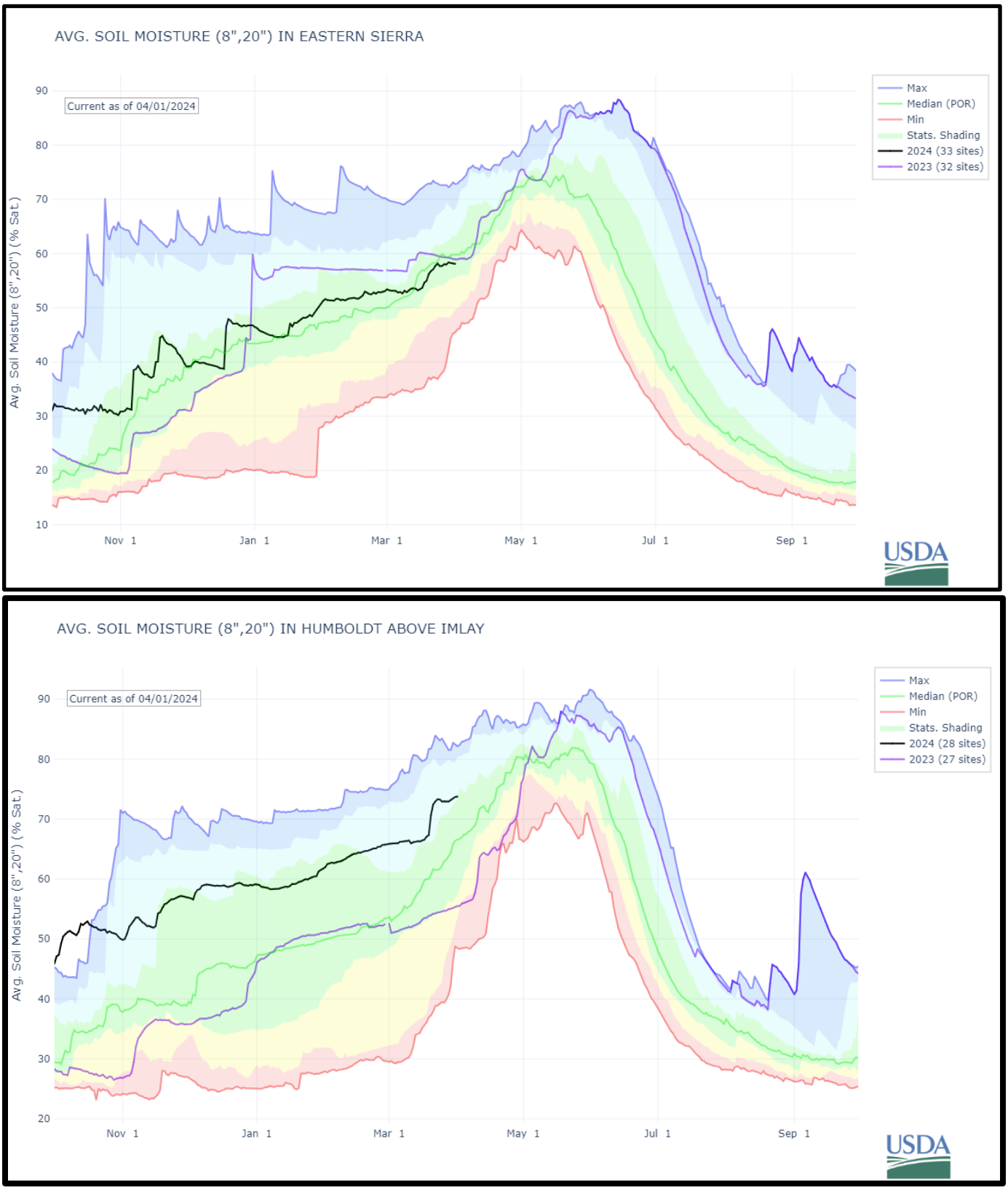


Figure 6: NRCS SNOTEL soil moisture for the combined Tahoe, Truckee, Carson and Walker basins (upper), and Humboldt basin (lower) indicated in dark black for water year 2024. Water year 2023 is plotted in purple for additional perspective.

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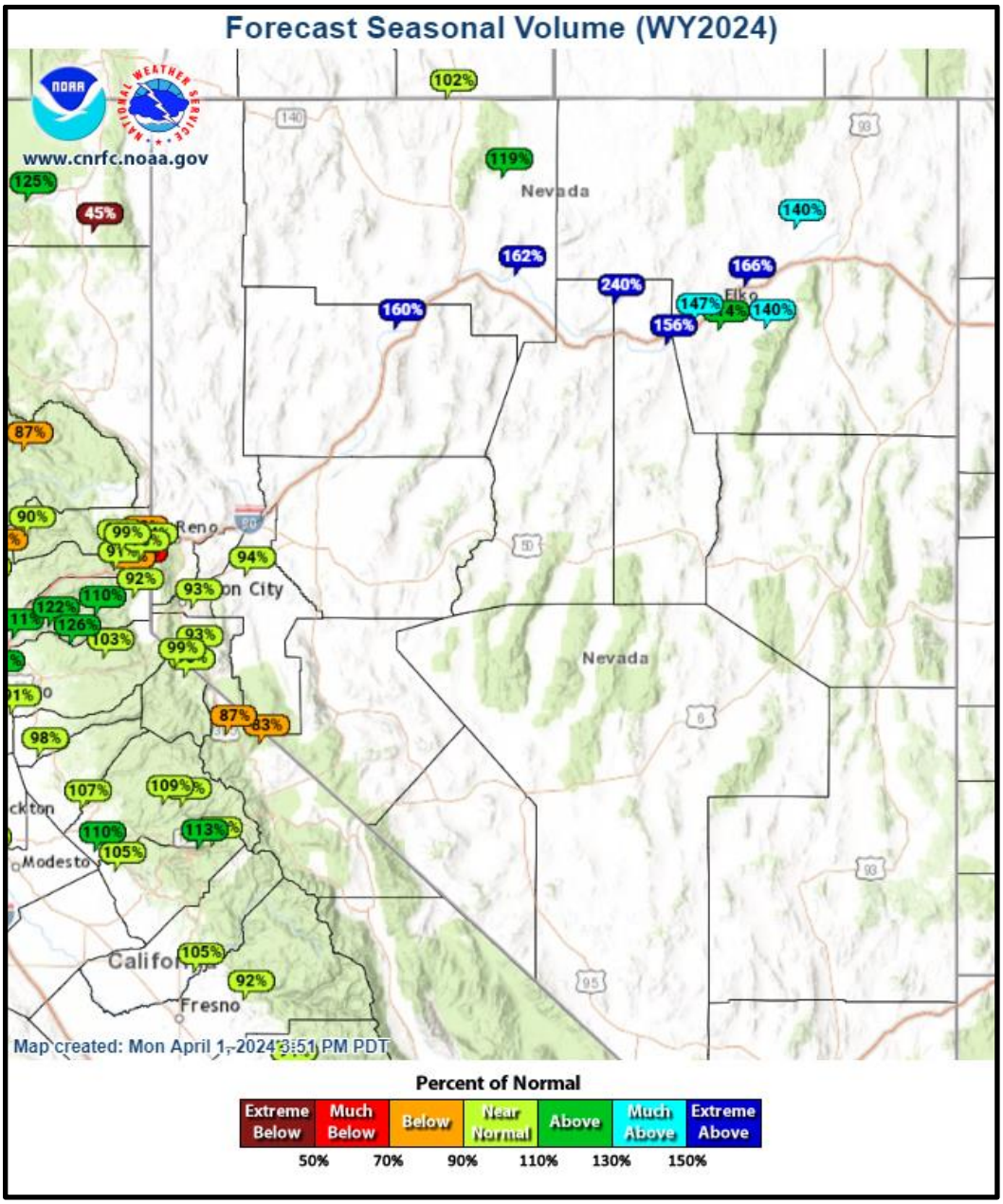

Figure 7. CNRFC median April-July forecasts. While water supply forecasts have considerable skill by early February, a wide range of outcomes are still possible, driven primarily by spring weather. Visit the CNRFC page to view the probabilistic forecasts.

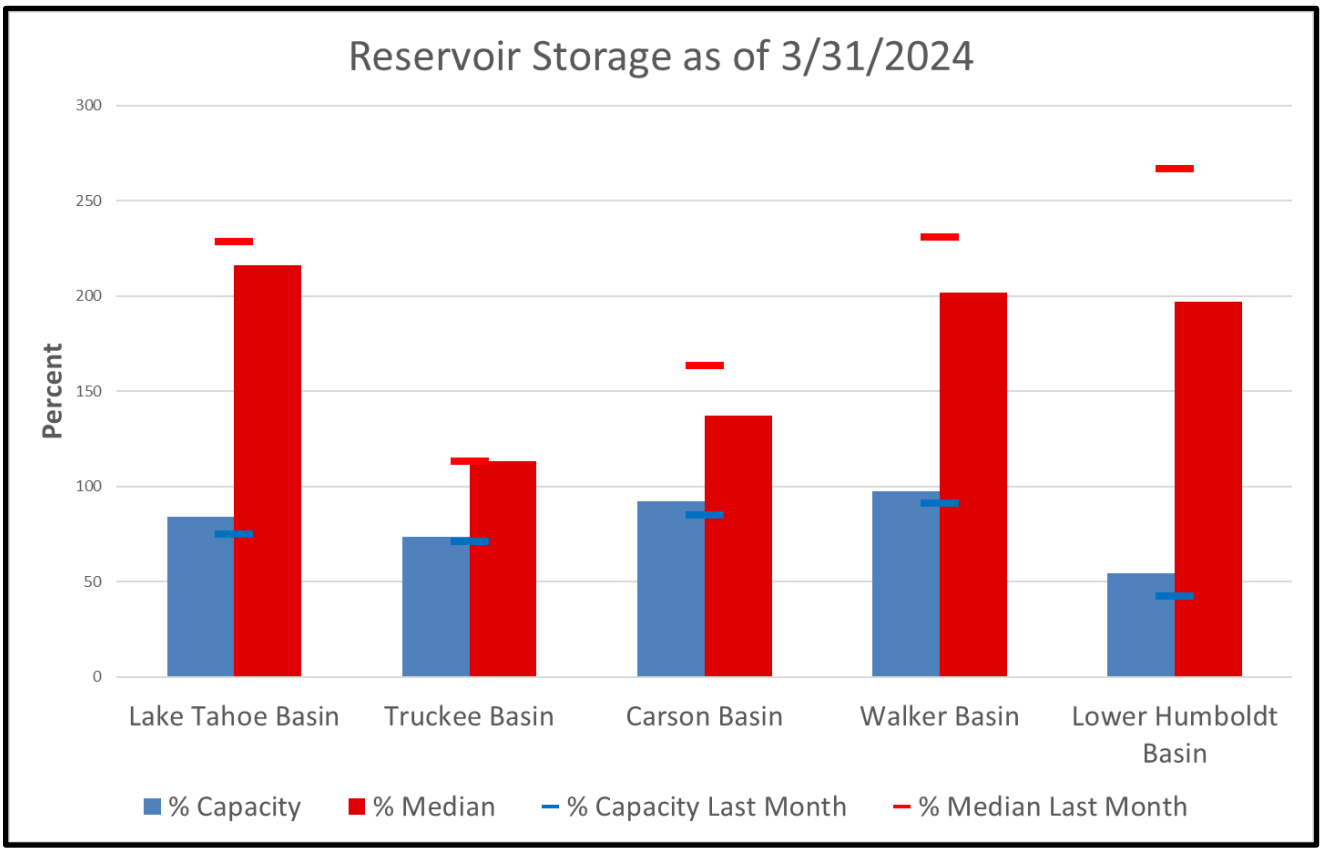

Figure 8: End of month reservoir storage relative to capacity and **median*** for this month and last month. (*note reference was recently update to NRCS 1991-2020 median values)

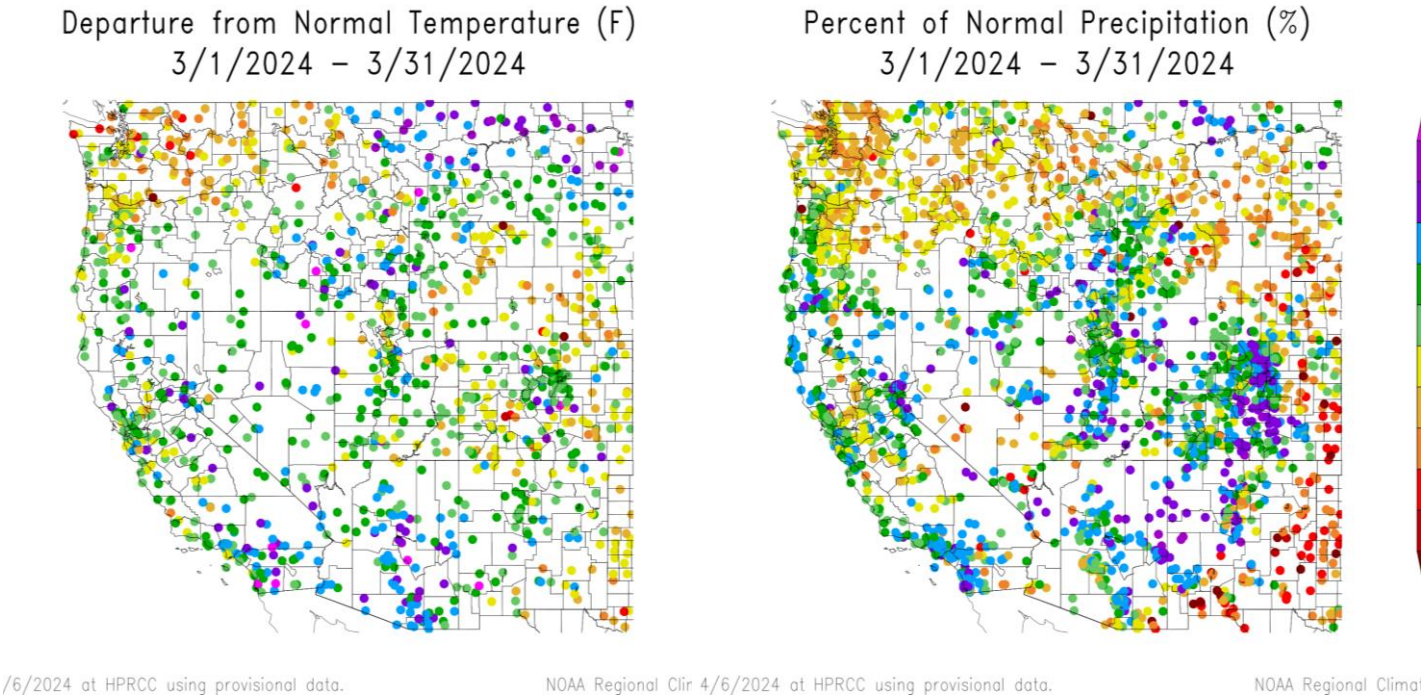

Figure 9: Current 2023-24' water year to date departure from normal temperature (left) and percent of normal precipitation (right). Data courtesy of High Plains Regional Climate Center. (HPRCC)

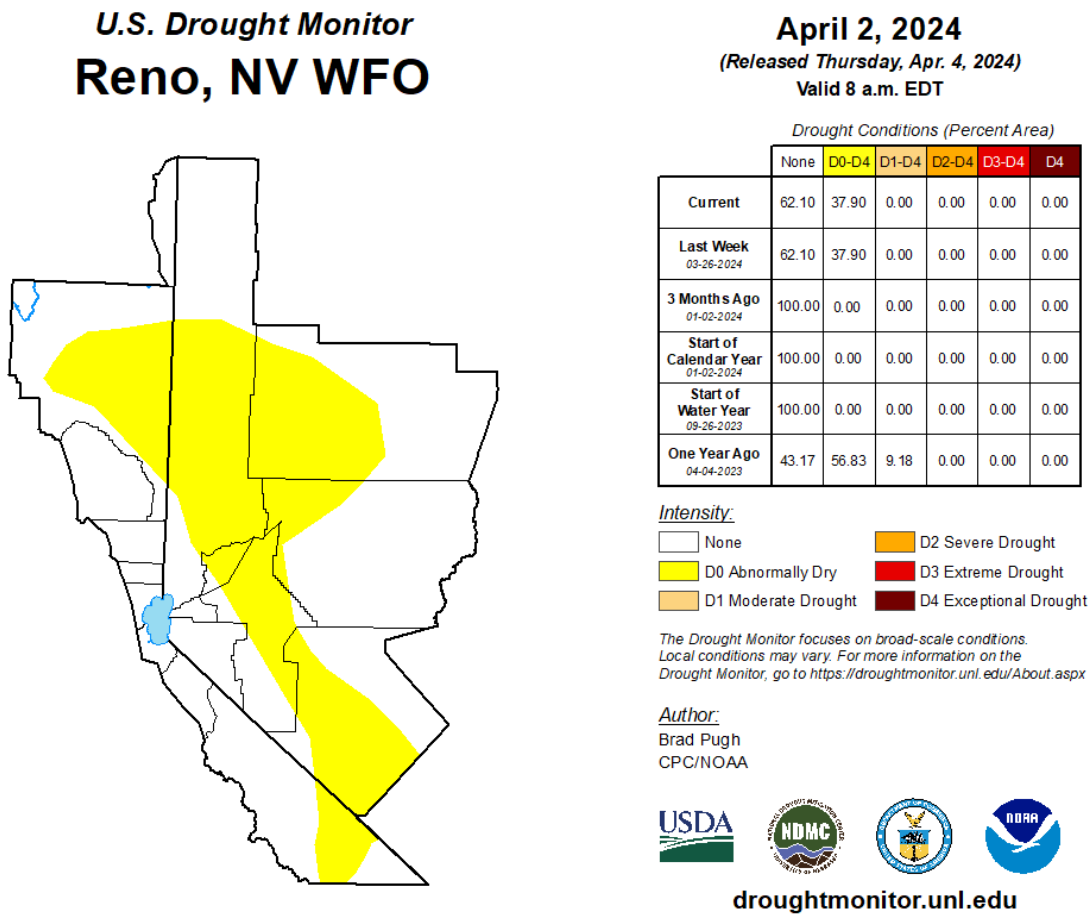

Figure 10: End of March Drought Monitor Status. Abnormally Dry (D0) added to much of the NWS Reno Service area. Check for updates at: Drought Monitor.