



# Monthly Climate Report

NWS Reno

Issued: 02/09/2023

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



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## Synopsis:

Two words can summarize this month: cold and wet (Figures 1 and 2). Unlike the previous winter, when a wet December transitioned abruptly to a record-dry January, the stormy pattern that closed out 2022 continued through the first three weeks of January 2023 (Figure 3). This extended active pattern brought near-record season-to-date snowfall to the Sierra and several rounds of rain and snow to western Nevada, along with periods of strong winds. By January 19th, seasonal snowfall totals for higher elevation Sierra sites had reached the 300-400 inch range, which is close to their full season averages. Temperatures for the entire month were several degrees below average due to several storms featuring low snow levels, as well as extensive snow cover and generally light winds for a majority of the month.

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## Weather Events:

After the major New Year's Eve storm wrapped up early on the first day of the new year, a weaker storm quickly followed on the 2nd-3rd and brought light Sierra snowfall up to 4", and around 1" to the Reno area. However, across parts of west-central Nevada, enhanced snow bands formed with 4-7" of snowfall from Fernley to Fallon.

A medium-strength storm brought 1-2 feet of snow to higher Sierra elevations from the 4th-6th, with 4-10" of snow below 7000 feet across the Tahoe Basin and slightly higher amounts in Mono County. Northeast California received 2-5" of snowfall, and western Nevada valleys generally received less than 1".

A weaker and quicker-hitting system on the 7th-8th brought 5-10" snow for higher Sierra elevations, 2-5" below 7000 feet across the Tahoe Basin, and a light rain-snow mix to western Nevada valleys. Shadowing across western Nevada allowed strong winds to develop during the early morning hours on the 8th, including a 98 mph gust at Galena Creek Bridge and a 78 mph gust at Walker Lake.

A series of stronger storms impacted the region during the third week of January, with the first being a relatively long-duration atmospheric river from the 9th-11th. This storm brought heavy Sierra snowfall with accumulations ranging from 3-6 feet in the Sierra, with the heaviest snowfall occurring in Mono County over the 3-day period. This heavy, unrelenting snow in Mono County forced a prolonged closure of US-395 from Bridgeport to Bishop from 10 AM January 9th to 5 PM January 11th. Heavy rain in the Tahoe Basin on the 9th changed to heavy snow below 7000 ft, leading to snowfall totals between 8-20" through the 11th. Over 2 feet of snowfall was observed in parts of northeast California above 5000 feet. Western Nevada mainly received rain on the 9th, with rainfall between 0.75-2" across much of Douglas, Carson City, southern Washoe, Mineral, Lyon counties. This amount of rain led to a major rockfall and subsequent extended road closure on SR-208 in Wilson Canyon (Figure 4), with other reports of ponding and poor drainage flooding on I-80 at Lockwood, Geiger Grade at Toll Rd, and US-395 south of Reno along with Steamboat Creek spilling over Towne Road.

The changeover to snow in western Nevada arrived during the morning commute on the 10th, leading to many traffic incidents, including a 19-car pile-up at the Galena Bridge on I-580.

We saw a brief break in major storms with light Sierra snowfall (up to 4") on the 12th. This was followed by moderate Sierra snowfall on the 13th, with snowfall totals 10-20" near the Sierra crest and 4-10" for the Carson Range and the Tahoe Basin below 7000 feet.

An intense two-part storm continued this train of Pacific storms between the period of the 14th-16th. This storm brought heavy snowfall to the Sierra on the 14th with 2 to 3½ feet of accumulations in higher elevations, 15-30" for the California side of the Tahoe Basin below 7000 feet, and 8-16" on the Nevada side of the Tahoe Basin. Main Sierra travel routes (I-80, US-50) were closed for much of the day. Precipitation started as rain for western Nevada on the 14th with rain totals around 0.25" for Reno-Carson, and up to 0.75" for Minden. This rainfall was sufficient for Reno to surpass the average water year precipitation of 7.35 inches as of 4 PM on January 14th. The second, colder part of this storm arrived the night of the 15th through the 16th, with more significant travel impacts for western Nevada valleys/foothills due to 4-8" of snowfall across Reno-Carson metro areas and parts of Lyon/Mineral counties, and up to around 1 foot for Douglas County. Mono County and the Tahoe Basin saw an additional foot of snow accumulation from this second part of the storm.

One last colder and quick-moving storm wrapped up the active storm cycle during the overnight/early morning hours of the 18th-19th, producing 4-10" snowfall across much of the Sierra and Tahoe Basin, and 1-3" for northeast California and around the Reno-Sparks area.

A dry weather pattern finally returned during the day of the 19th and continued through the 28th as a blocking pattern set up over the north Pacific. A couple of weak waves brushing through the region brought periods of gusty east-northeast ridge winds. While just outside of our area of responsibility, sustained wind of 150 mph with a gust of 191 mph was observed at the Kirkwood Chair 6 weather station on January 22nd during this period of east-northeast winds. Sustained winds above 100 mph started on the afternoon of January 22nd and persisted for nearly 24 hours. Kirkwood Operations shared a photo on January 24th of wind damage to the Chair 6 lift (Figure 5).

While the blocking pattern continued to block incoming Pacific storms, an inside slider brought an additional round of snow on the 29th. The cold, easterly flow with this system allowed western Nevada and northeast California to receive the most snowfall, with 1-4" of snowfall in the greater Reno-Carson-Minden areas, and 1-3" in northeast California. As this system moved out of the region on the 30th, northeasterly flow prevailed. When coupled with clear skies and fresh snow cover, this enabled widespread bitter cold temperatures to impact the region on the 30th-31st, with some areas observing their coldest low temperatures in the last 5-10 years. In fact, the Reno Airport reported a low of 4 degrees on January 30th and 31st, which was the coldest low at that location since December 10, 2013.

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## Hydrology:

The first three weeks of January were incredible months for building snowpack and improving water supply conditions. By mid-January, watersheds draining the Sierra into western Nevada had already met or exceeded their median peak snow water equivalent (SWE) typically reached in late March or early April. By early February these basins were over 140% of their median peak, and over 200% of the median snowpack to date (Figure 6). The snowpack in this area is at- or near-record for early February, with somewhat larger snowpacks in the Carson and Walker basins than for the Tahoe and Truckee watersheds. All major watersheds in and contributing to the state of Nevada have well above normal snowpack conditions (Figure 7).

Figure 8 shows February 1st percent (%) of median peak SWE at SNOTEL sites, as well as record and near-record SNOTEL and snow course measurements on that date. Snowpack conditions in the Humboldt basin are the best for early February since 1997. Observed streamflows in January and water year volume-to-date were near-normal to above-normal in most of the area. One exception includes the lower Humboldt, where water has yet to return to the Imlay gage above Rye Patch Reservoir (Figure 9). High flows and some minor flooding were observed on January 9th, including out-of-bank flows on Steamboat Creek, and ponding in several poor drainage areas. Reservoir storage conditions improved significantly in the Tahoe, Truckee, Carson and Walker basins during January, with only the Walker Basin exceeding average storage conditions (Figure 10).

With the well above normal snowpack conditions, [water supply outlooks](#) are near- to well above-average for most of the area. The potential for spring snowmelt flooding will be dependent on future additions to the snowpack along with spring and summer weather conditions. While we can never rule out the potential for a warm and wet late winter or early spring atmospheric river storm leading to flooding, a storm of this nature is unlikely over the next two weeks or more. Later in the spring, concerning scenarios include a potential multi-day April or May rain event during snowmelt or a prolonged heat wave in May or June. Areas in the NWS Reno service area with elevated concern for spring and summer snowmelt flooding include the East and West forks of the Carson, the Walker River, Mono County small streams, and the lower Humboldt.

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## **Drought/Climate Update:**

With the onslaught of atmospheric river events from late December into mid-January, it is no surprise that several areas had one category improvements to the drought status (Figure 11). The entire central and northern Sierra improved from severe (D2) to moderate (D1) drought. Improvements also occurred in western NV, particularly south of Interstate 80 and southern Washoe County. These areas additionally improved from severe (D2) to moderate (D1) drought (Figure 12). Precipitation in these areas is now between 150% to 250% of average for the water year (Figure 13). This has improved streamflows, caused slight increases in reservoir and Lake Tahoe water levels, and improved soil moisture.

On the other hand, drought conditions did not improve for portions of Lassen and Modoc counties which remain in severe (D2) drought status. Additionally, severe to extreme (D3) drought conditions continue for northwest NV, particularly north of Interstate 80 and northern Washoe County. Precipitation for these areas is between 50-80% of average for the water year. Soil moisture and streamflows remain below average in these regions.

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## **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](mailto:rev.climate@noaa.gov) 775-673-8100

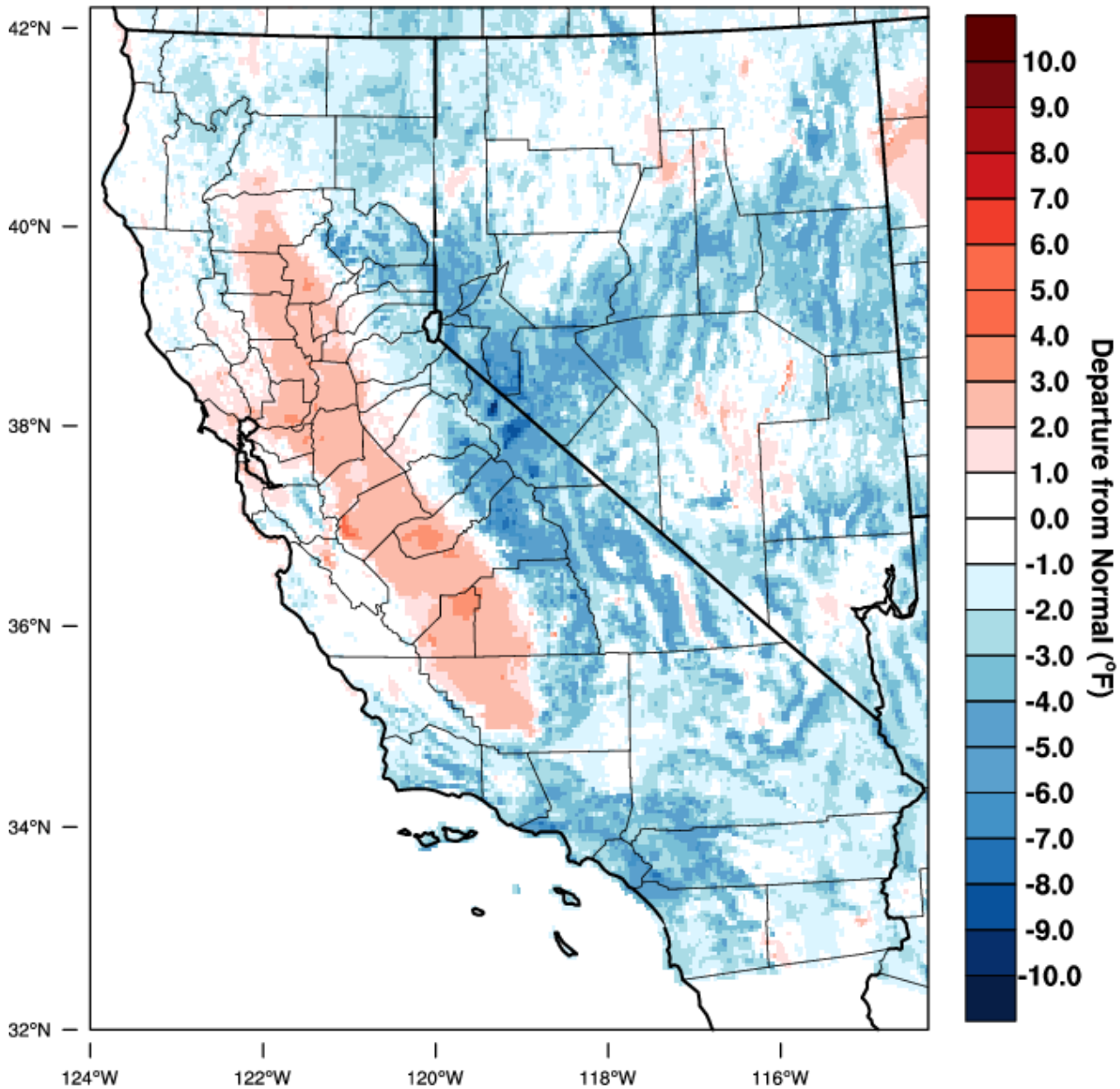
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## **Figures.**

## California - Mean Temperature

January 2023 Departure from 1981-2010 Normal

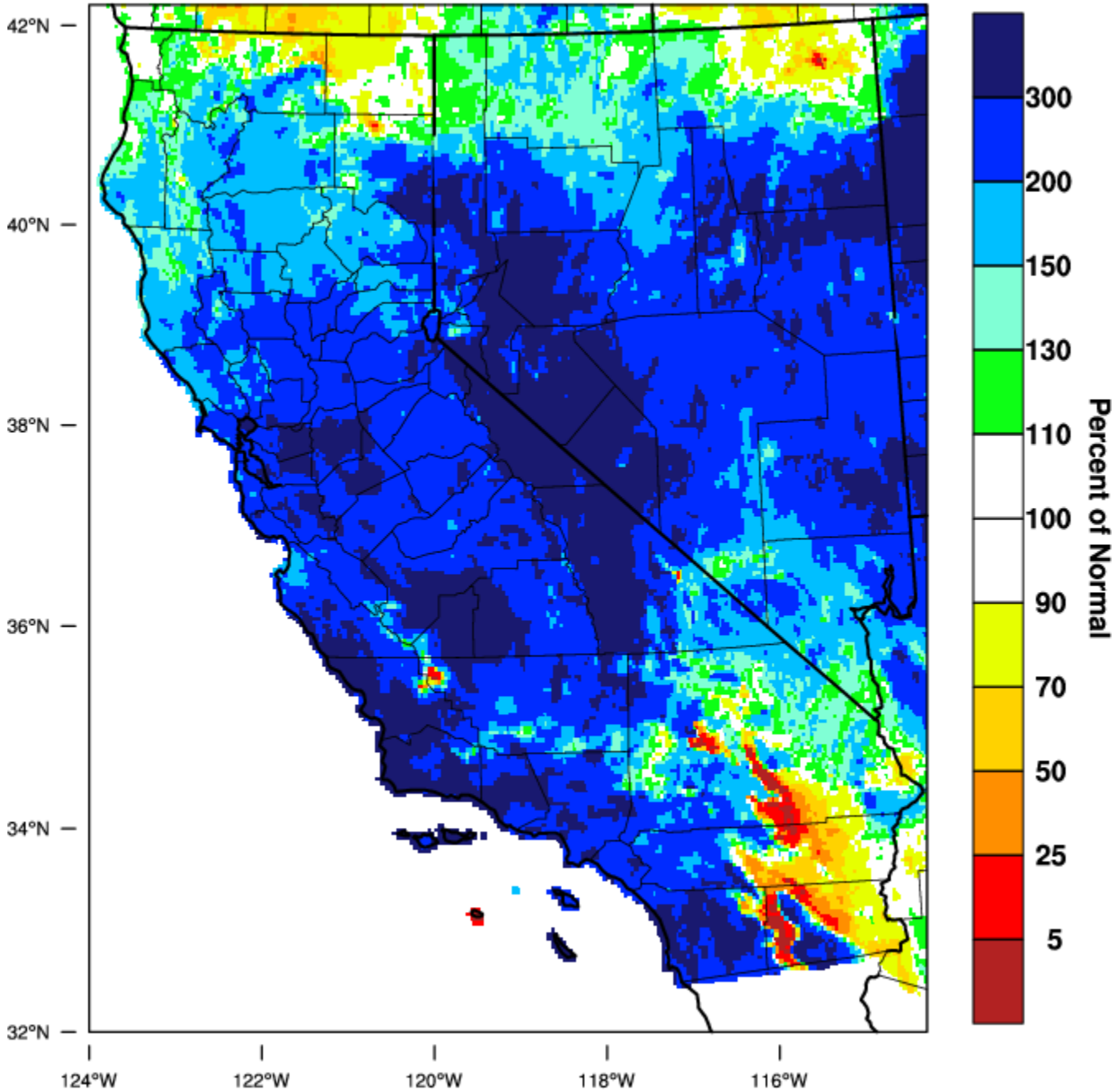


WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 5 FEB 2023

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

## California - Precipitation

January 2023 Percent of 1981-2010 Normal



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 5 FEB 2023

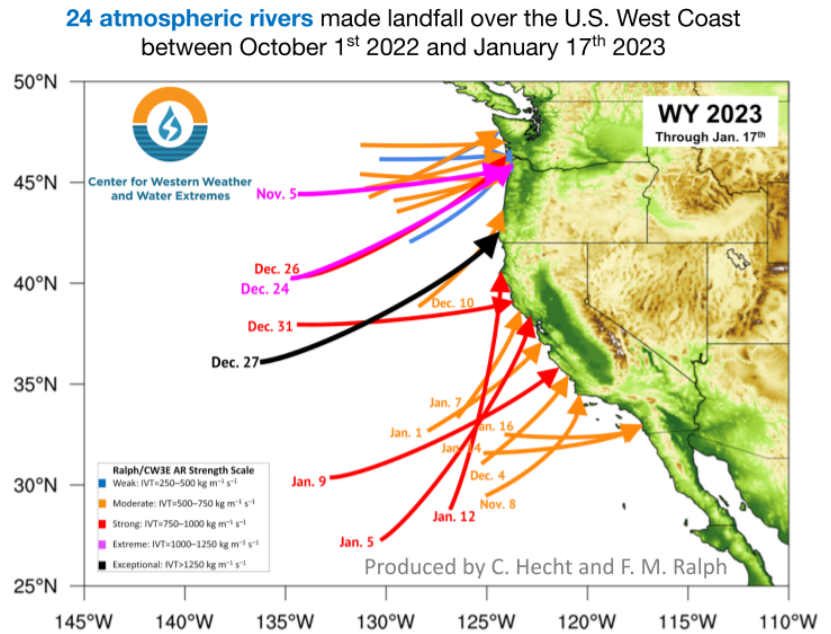
Figure 2. Nearly the entire region saw precipitation anomalies between 200-300% in January, with an exception of extreme northeastern California and northwestern Nevada. ([VWDT](#))

## Water Year 2023 Through January 17<sup>th</sup>

Breakdown by Strength	
Strength	Number of ARs
Weak	3
Moderate	13
Strong	5
Extreme	2
Exceptional	1
<b>Total</b>	<b>24</b>

Breakdown by Region	
Region	Times Impacted
Washington	18
Oregon	20
N. California	17
C. California	15
S. California	10



\*Arrows are placed on the map where each AR was strongest over the coast

Figure 3. Arrows represent the atmospheric rivers that made landfall from Oct. 1, 2022 to Jan. 17, 2023. The map shows the date and the angle in which they made landfall. ([CW3E Scripps](#))



Figure 4. Wilson Canyon Rockslide over SR-208. Road closed for clean-up and repair on January 10th, still closed as of February 3rd. Photo credit: Yerington Mason Fire Protection District.



Figure 5. Wind damage to Chair 6 at Kirkwood Mountain Resort. Photo courtesy of [Kirkwood Mountain Operations](#).

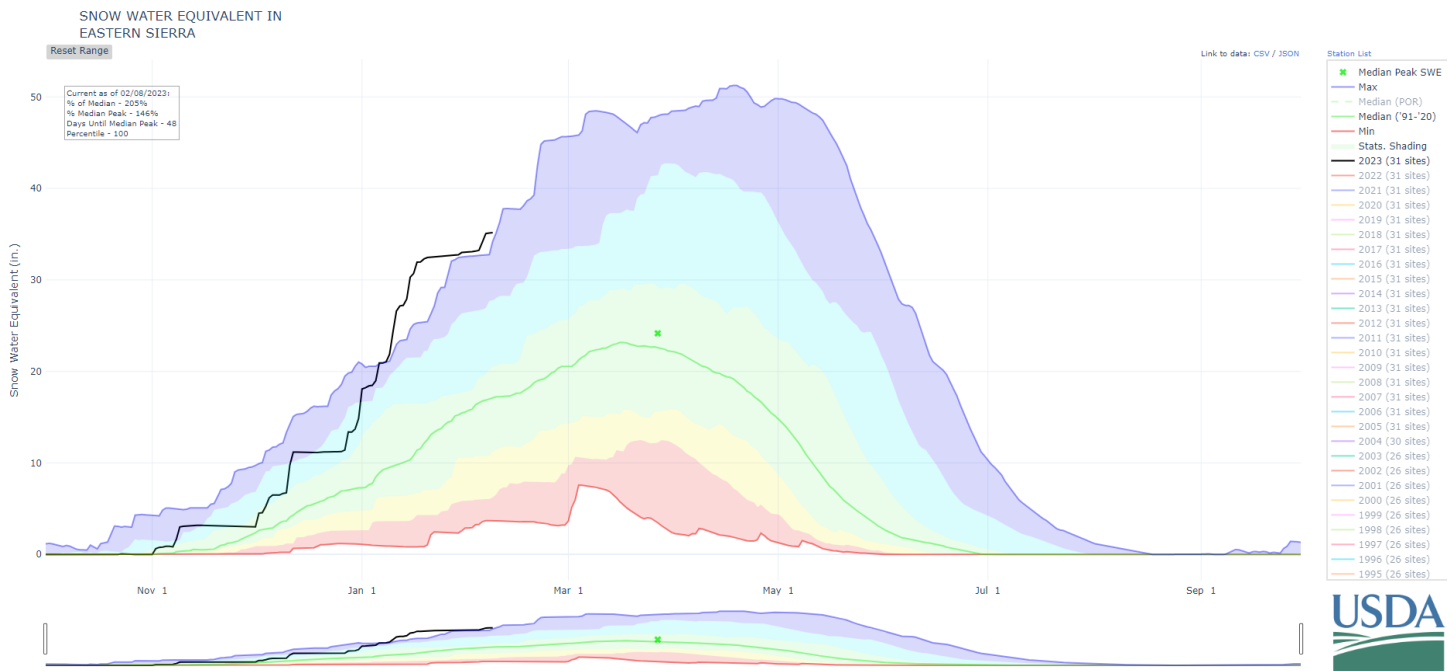


Figure 6. Snow water equivalent for Eastern Sierra watersheds (Tahoe, Truckee, Carson and Walker). Black line represents the water year 2022-2023. Median peak was reached on January 10th; the typical median peak occurs on March 27th. As of January 31st, the Eastern Sierra was 212% of normal. ([NRCS](#))

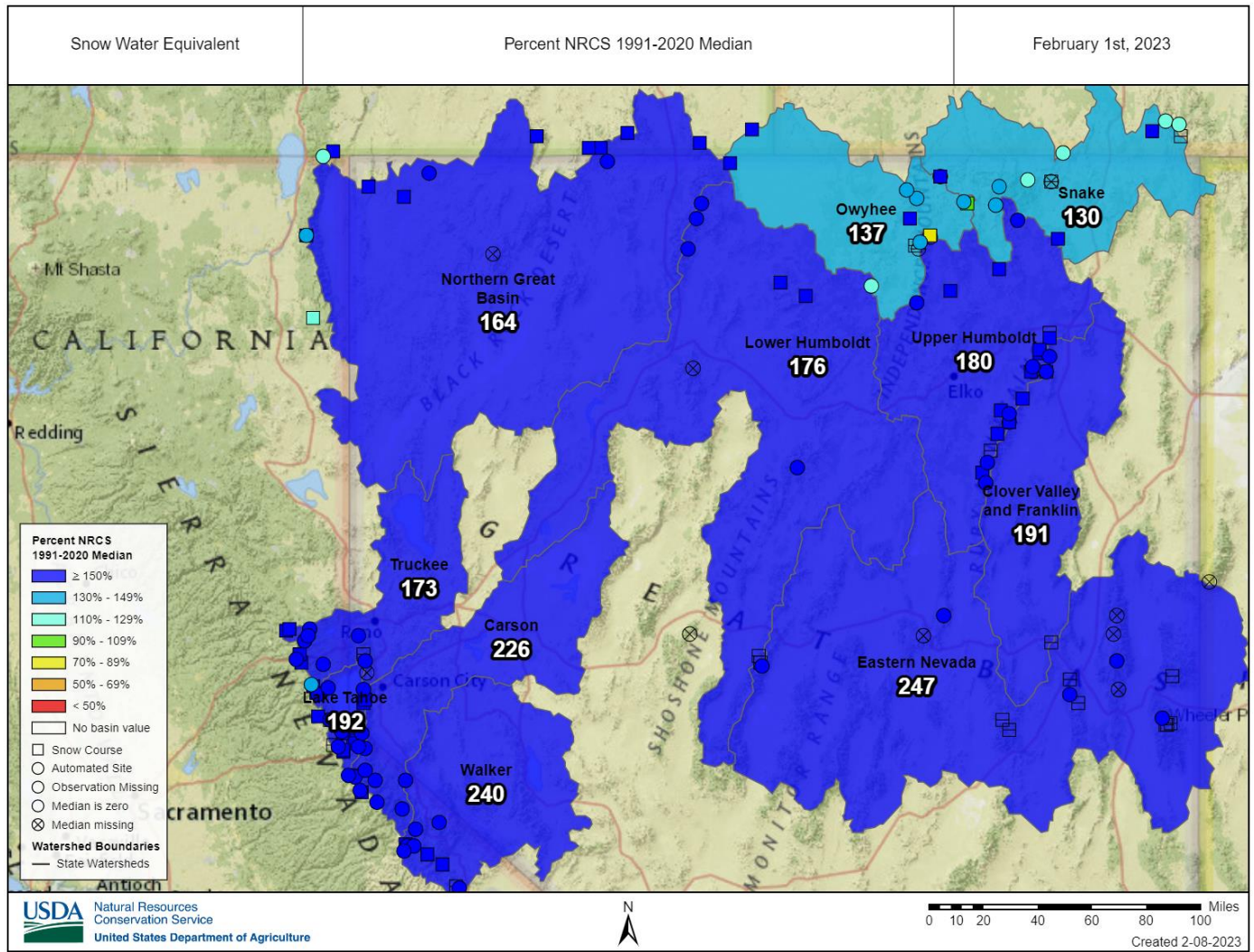


Figure 7. [SNOTEL snowpack](#) % of median as of February 1, 2023.

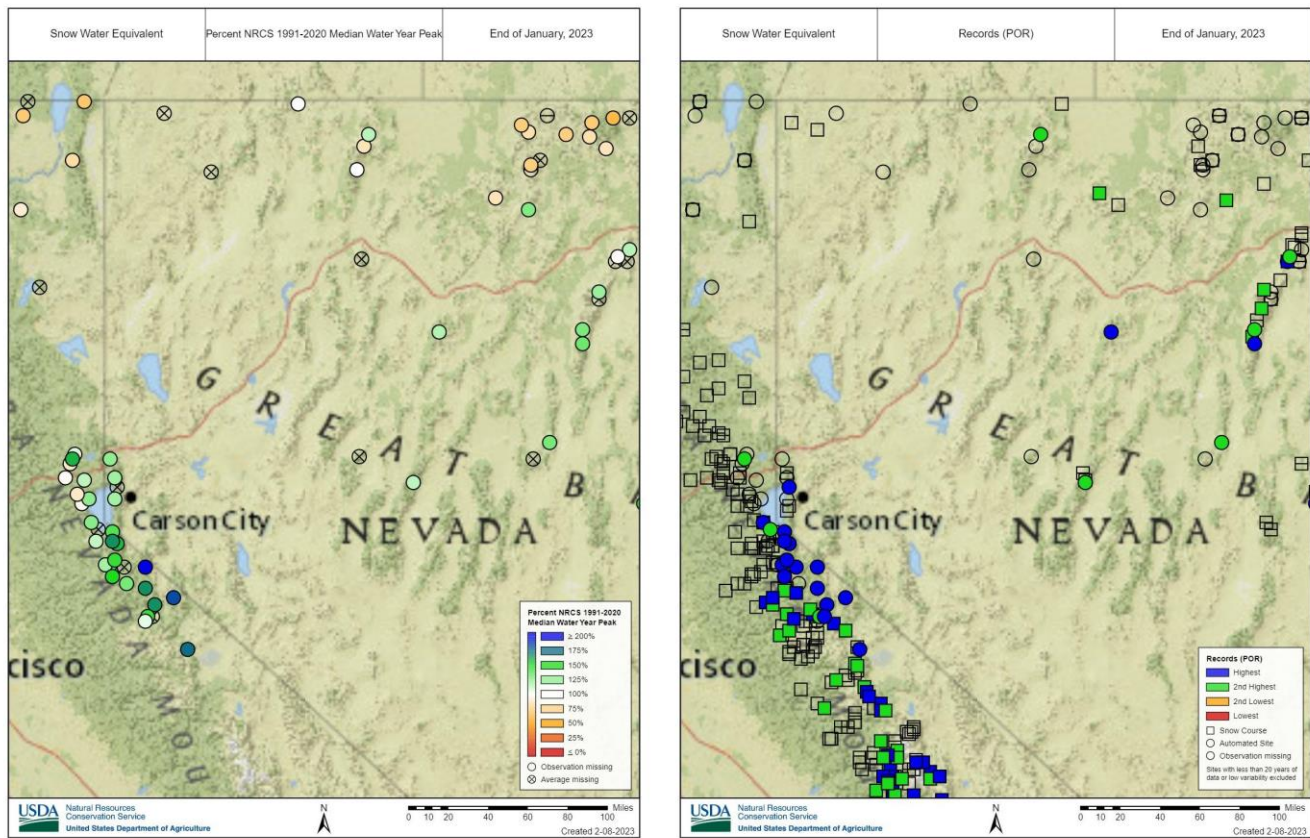


Figure 8. End of January SNOTEL % of median peak snow water equivalent (SWE) on left, and end of January record and near record SNOTEL and snow course SWE on right. ([Link](#))

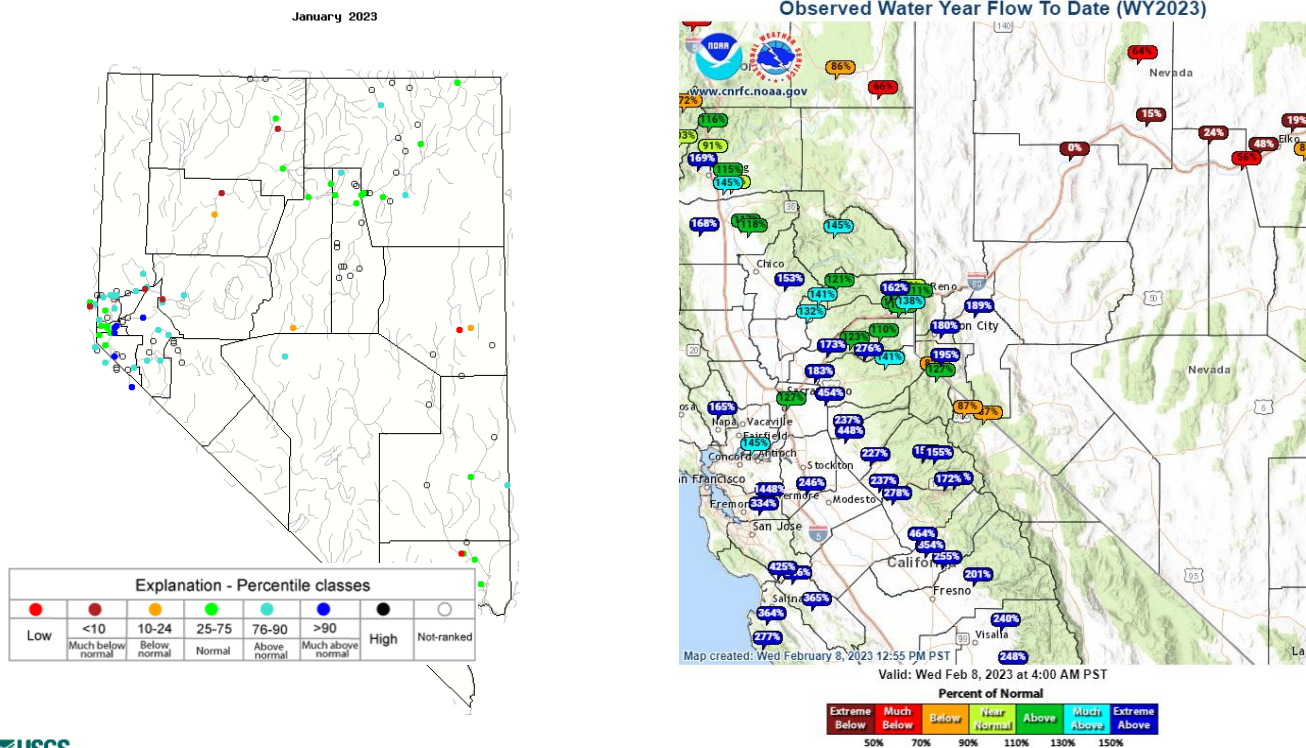


Figure 9: December monthly [USGS streamflow](#) on the left, and [CNRFC water year observed flow to date](#) on right.

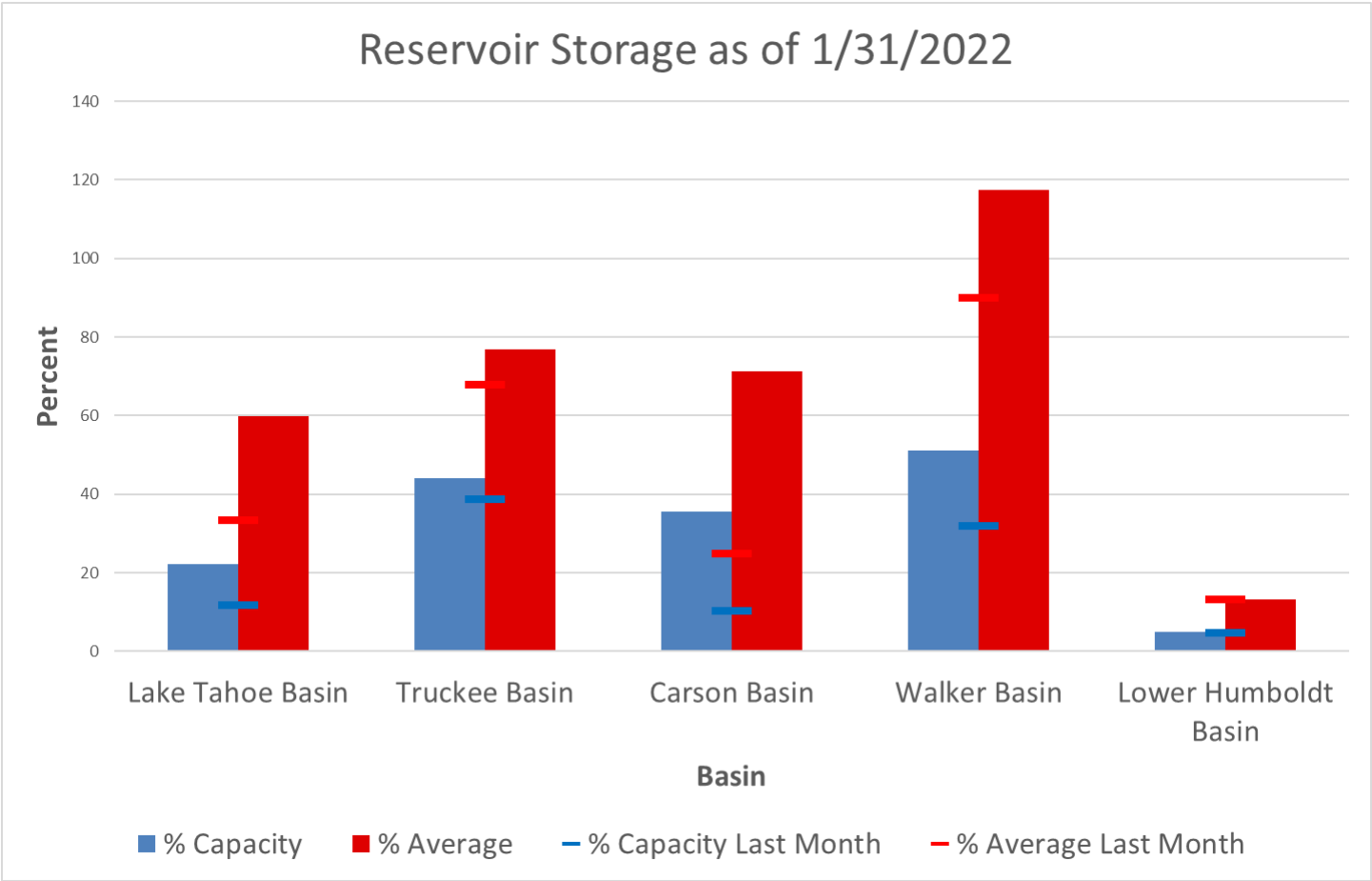


Figure 10: End of January Reservoir storage % of capacity and % of average

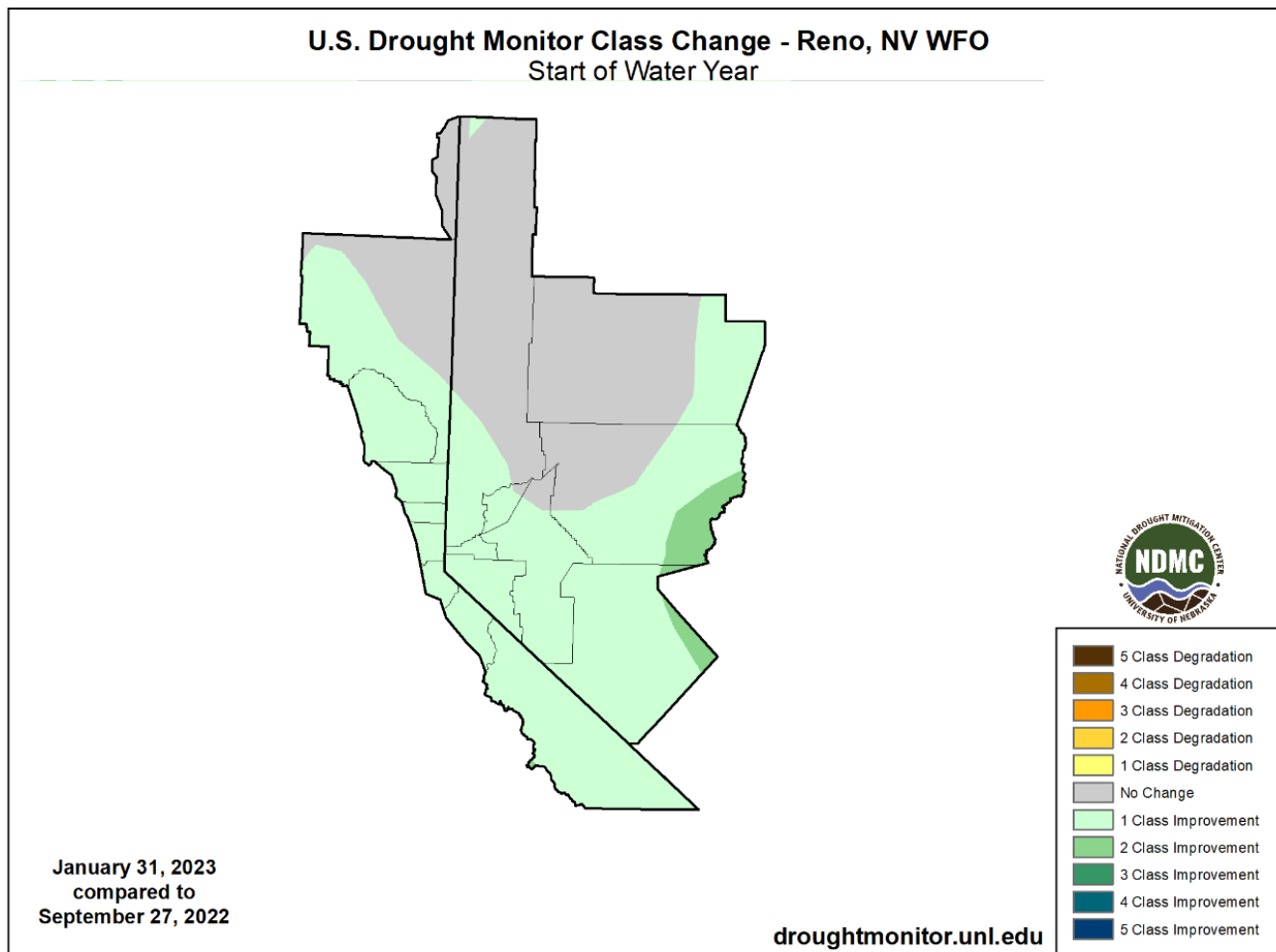
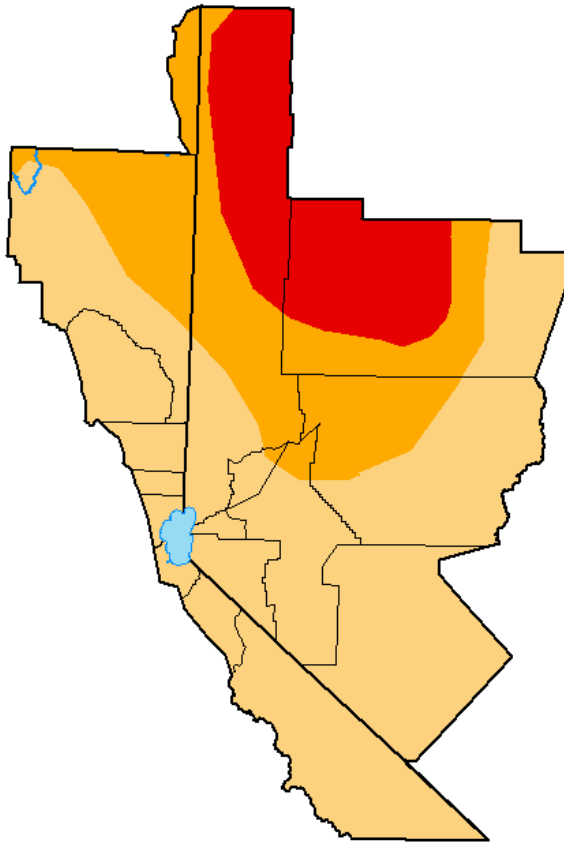


Figure 11. Changes in drought categories since the start of the water year, Oct. 1, 2022, shows one class improvement for the Sierra and much of western Nevada. Far northwestern Nevada and northeastern California have seen no change in drought status. ([Drought Monitor](https://droughtmonitor.unl.edu))

# U.S. Drought Monitor Reno, NV WFO

**January 31, 2023**  
(Released Thursday, Feb. 2, 2023)  
Valid 7 a.m. EST



*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	0.00	100.00	100.00	40.59	16.02	0.00
<b>Last Week</b> <i>01-24-2023</i>	0.00	100.00	100.00	40.59	16.02	0.00
<b>3 Months Ago</b> <i>11-01-2022</i>	0.00	100.00	100.00	100.00	19.04	0.00
<b>Start of Calendar Year</b> <i>01-03-2023</i>	0.00	100.00	100.00	60.41	16.14	0.00
<b>Start of Water Year</b> <i>09-27-2022</i>	0.00	100.00	100.00	100.00	19.04	0.00
<b>One Year Ago</b> <i>02-01-2022</i>	0.00	100.00	100.00	18.79	0.00	0.00

## Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate 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:

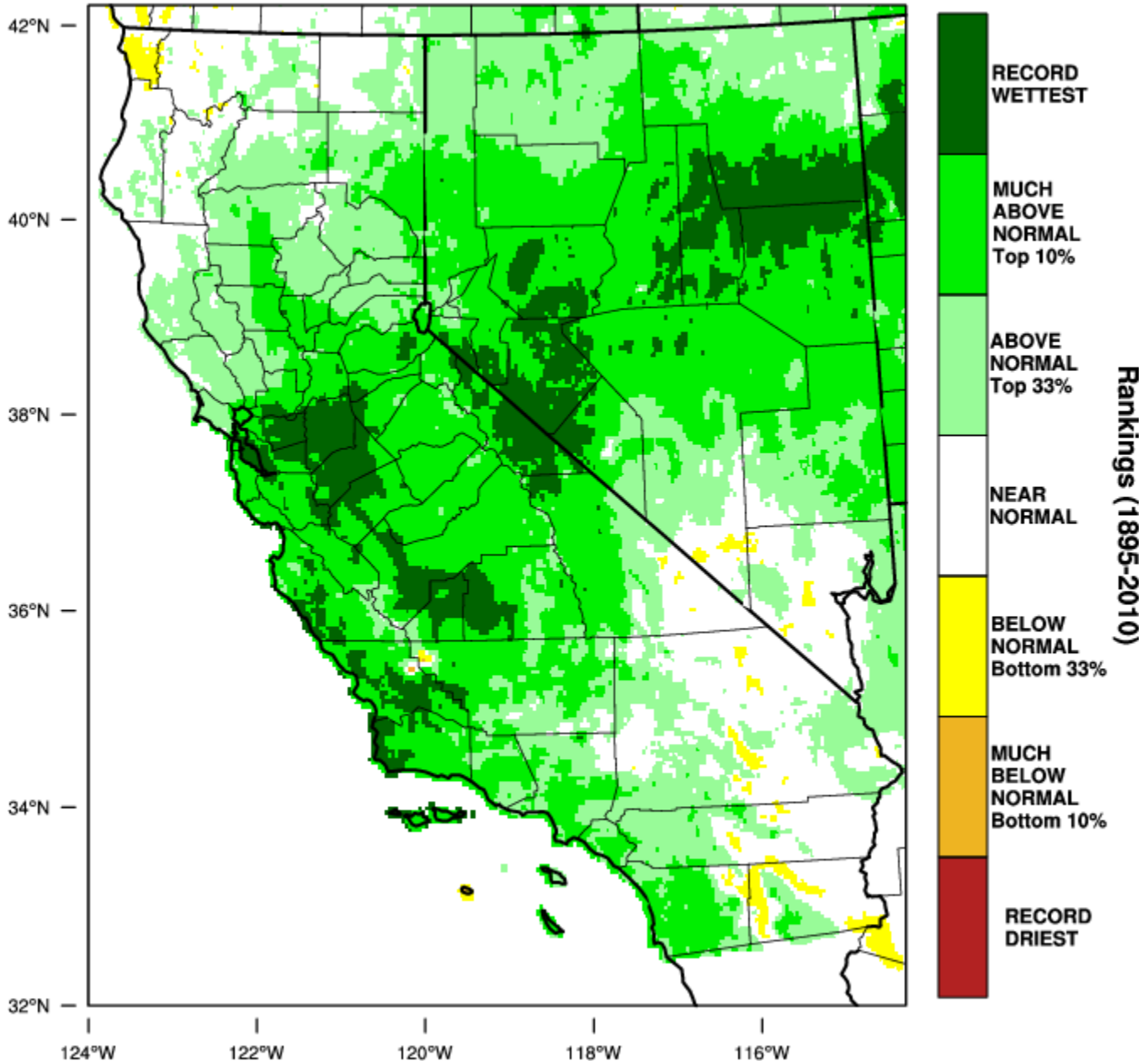
Rocky Bilotta  
NCEI/NOAA



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

Figure 12. End of January Drought Monitor Status for NWS Reno Service area. ([Drought Monitor](https://droughtmonitor.unl.edu))

# California - Precipitation October-January 2023 Percentile



WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 5 FEB 2023

Figure 13. 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. ([WWDT](#))