

# From Floods to a Winter That is Fighting to Catch Up: What's the Outlook for the Carson Basin?

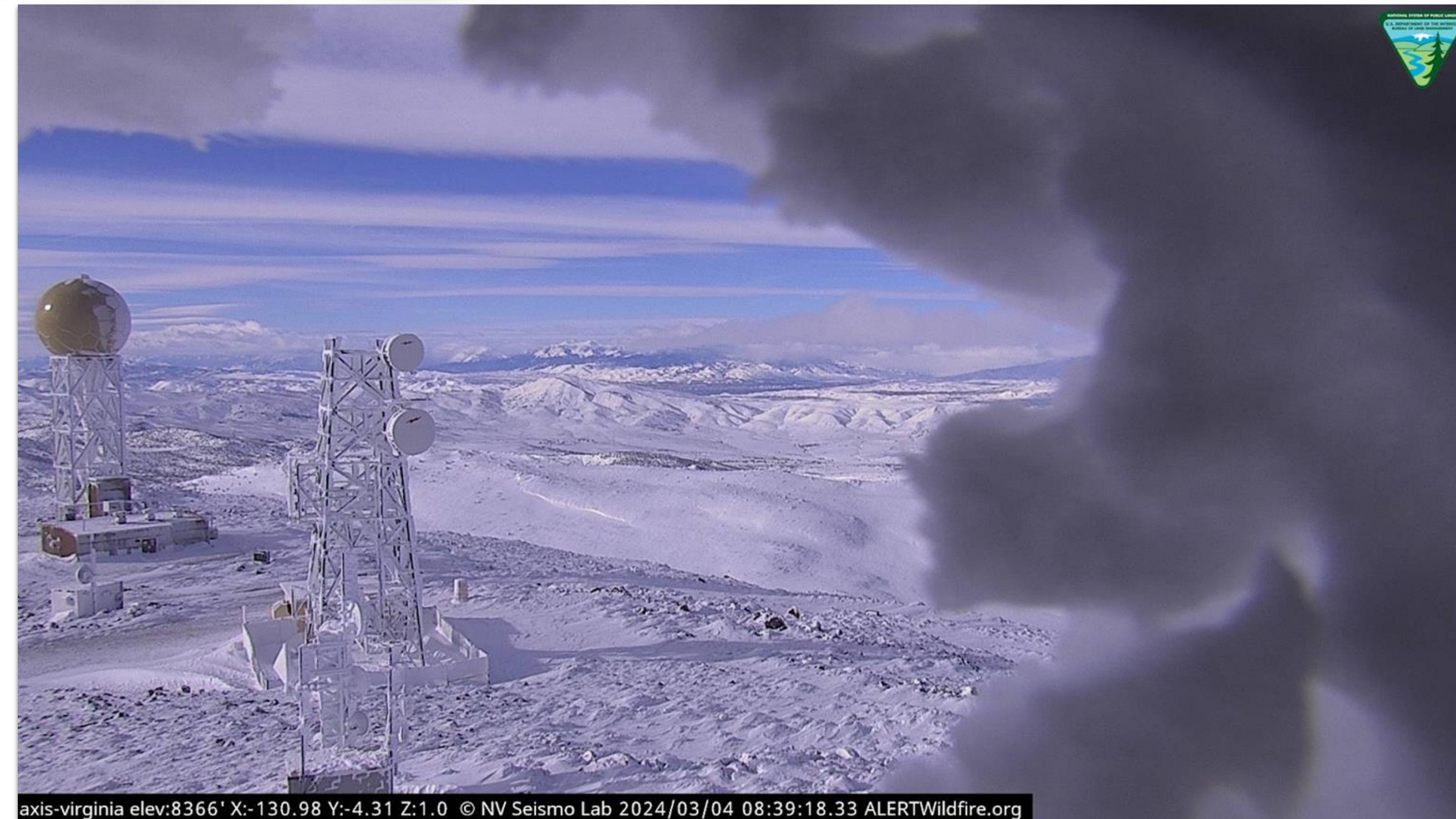
Weather Forecast Office

Reno, NV

Wednesday, March 6

[weather.gov/reno](http://weather.gov/reno)

775-673-8100



## Winter started slow, but our Miracle March Blizzard covered some ground for SWE...and

brought a few problems along the way



Post-storm views from our radar on Virginia Peak: 3/4/24



# WY 2023 Historic for Snow Water Equivalent

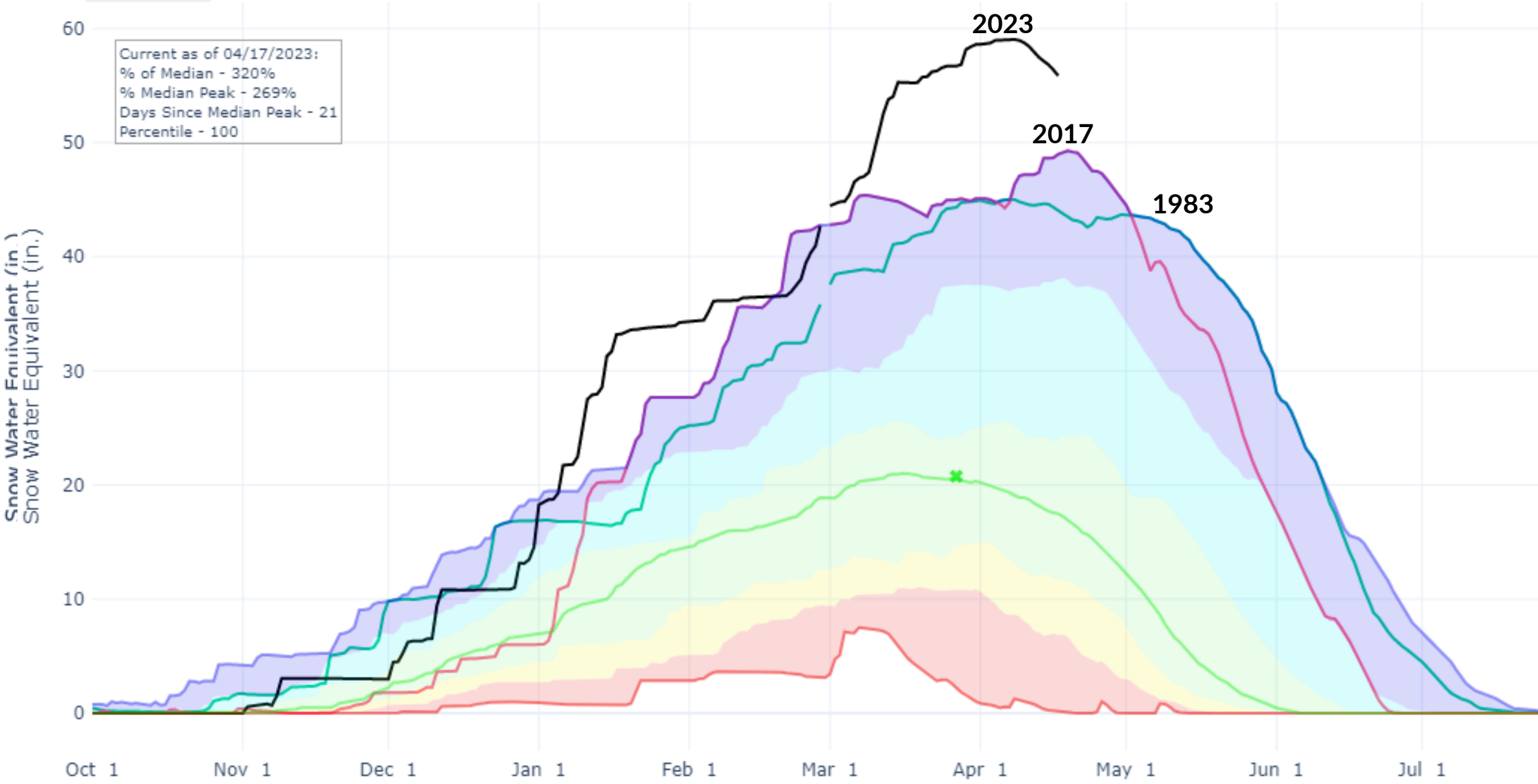
Weather Forecast Office  
Reno, NV  
Wednesday, March 6

## SNOW WATER EQUIVALENT IN CARSON

Reset Range

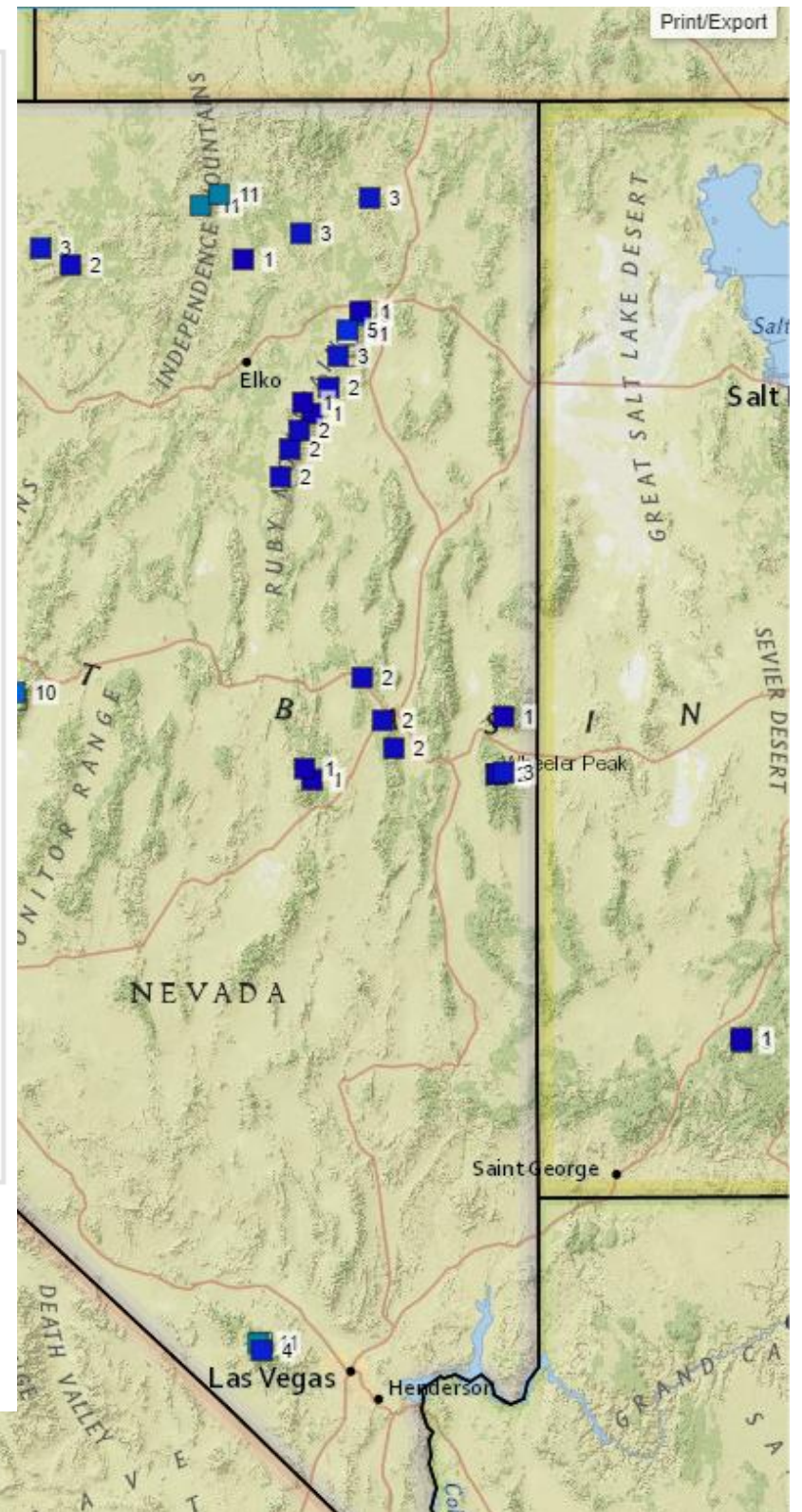
Link to data: CSV / JSON

Station List



Current as of 04/17/2023:  
% of Median - 320%  
% Median Peak - 269%  
Days Since Median Peak - 21  
Percentile - 100

- ✱ Median Peak SWE
- Max
- Median (POR)
- Median ('91-'20)
- Min
- Stats. Shading
- 2023 (12 sites)
- 2022 (12 sites)
- 2021 (12 sites)
- 2020 (12 sites)
- 2019 (12 sites)
- 2018 (12 sites)
- 2017 (12 sites)
- 2016 (12 sites)
- 2015 (12 sites)
- 2014 (12 sites)
- 2013 (12 sites)
- 2012 (12 sites)
- 2011 (12 sites)
- 2010 (12 sites)
- 2009 (12 sites)
- 2008 (12 sites)
- 2007 (12 sites)
- 2006 (12 sites)
- 2005 (12 sites)
- 2004 (11 sites)

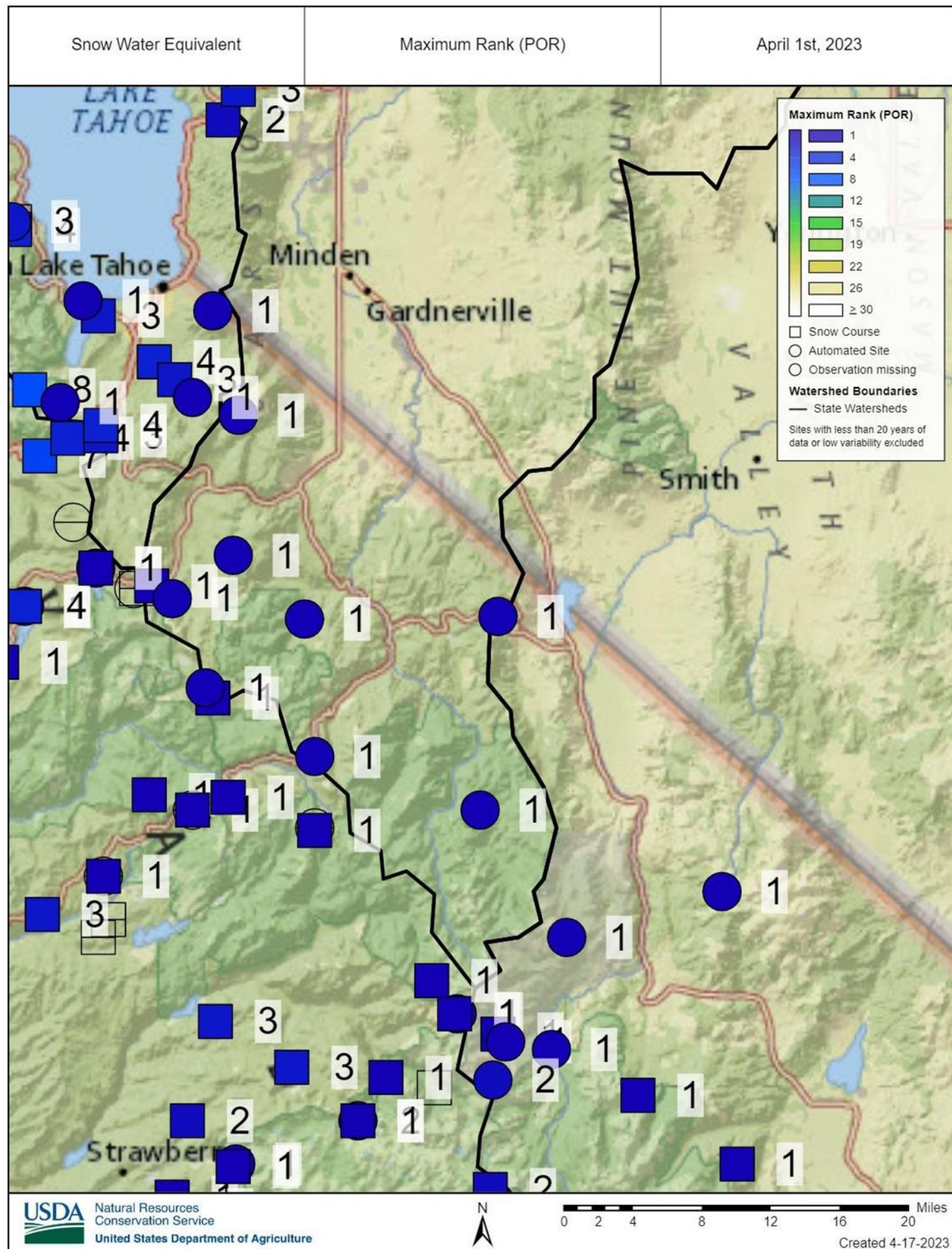


NRCS Natural Resources Conservation Service  
Created 5-30-2023, 10:44 AM PDT

50 km  
50 mi

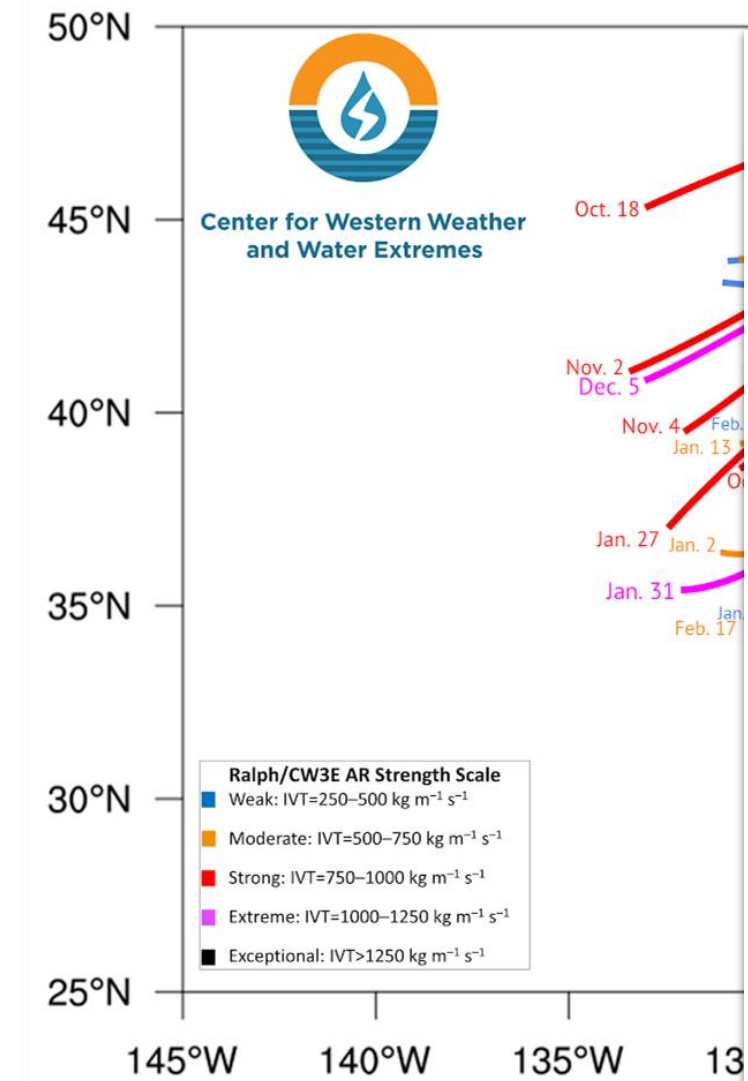


# WY 2023 Historic for Snow Water Equivalent



**April 1 Snow Courses (squares) and SNOTEL (circles) ranked over the period of record. Note all measurements in the Carson Basin were new records!**

- **Blue Lakes highest in 105 years by 13” of SWE! (1952 2nd highest)**
- **Upper Carson Pass highest in 94 years! (Beat 1969 and 1952 by over 8” of SWE)**
- **Poison Flat highest in 65 years - Crushed 1983 record by over 20”! (combined SNOTEL and Snow Course)**

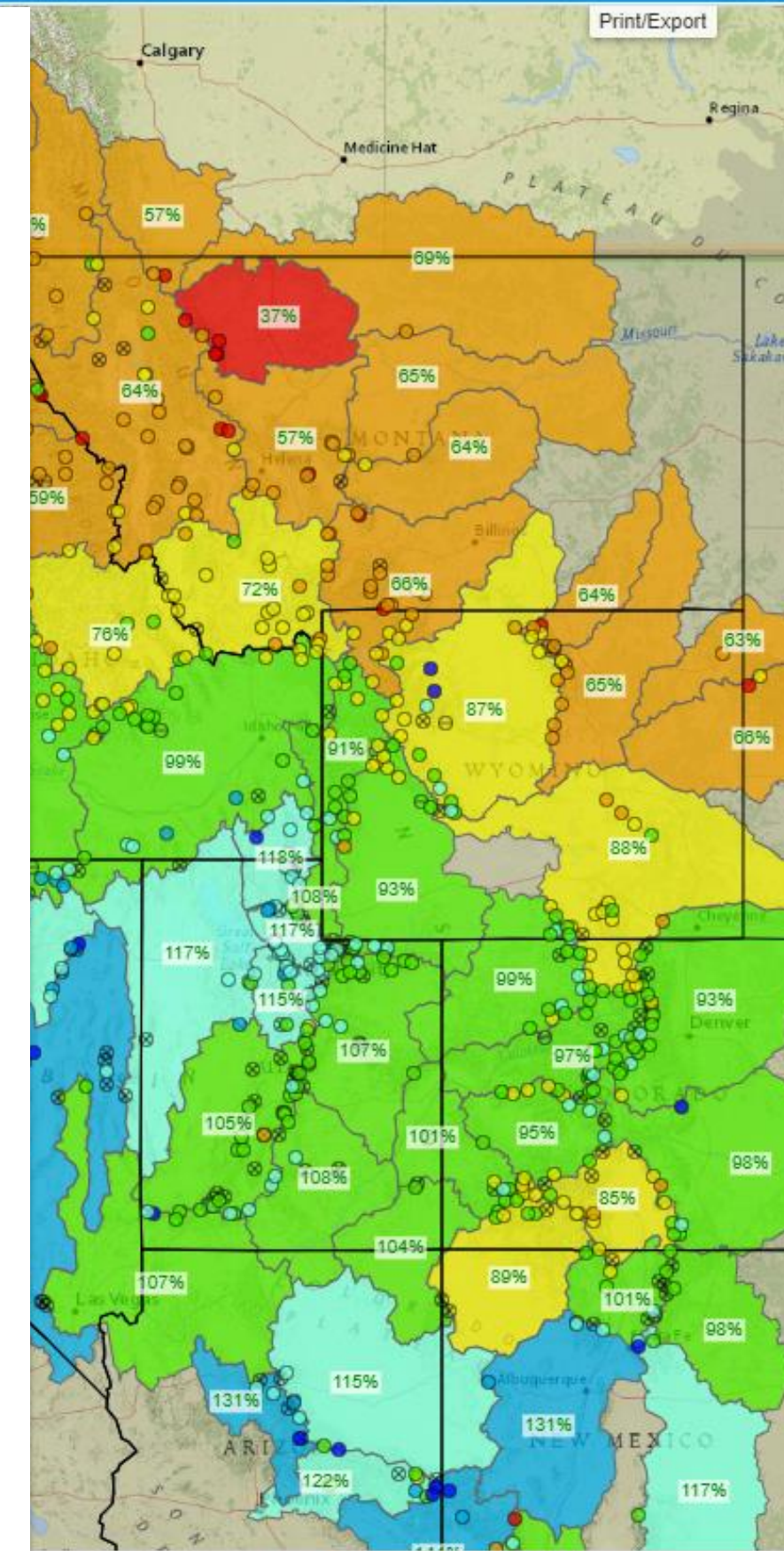


## Nevada Water Supply Outlook Report February 1, 2024

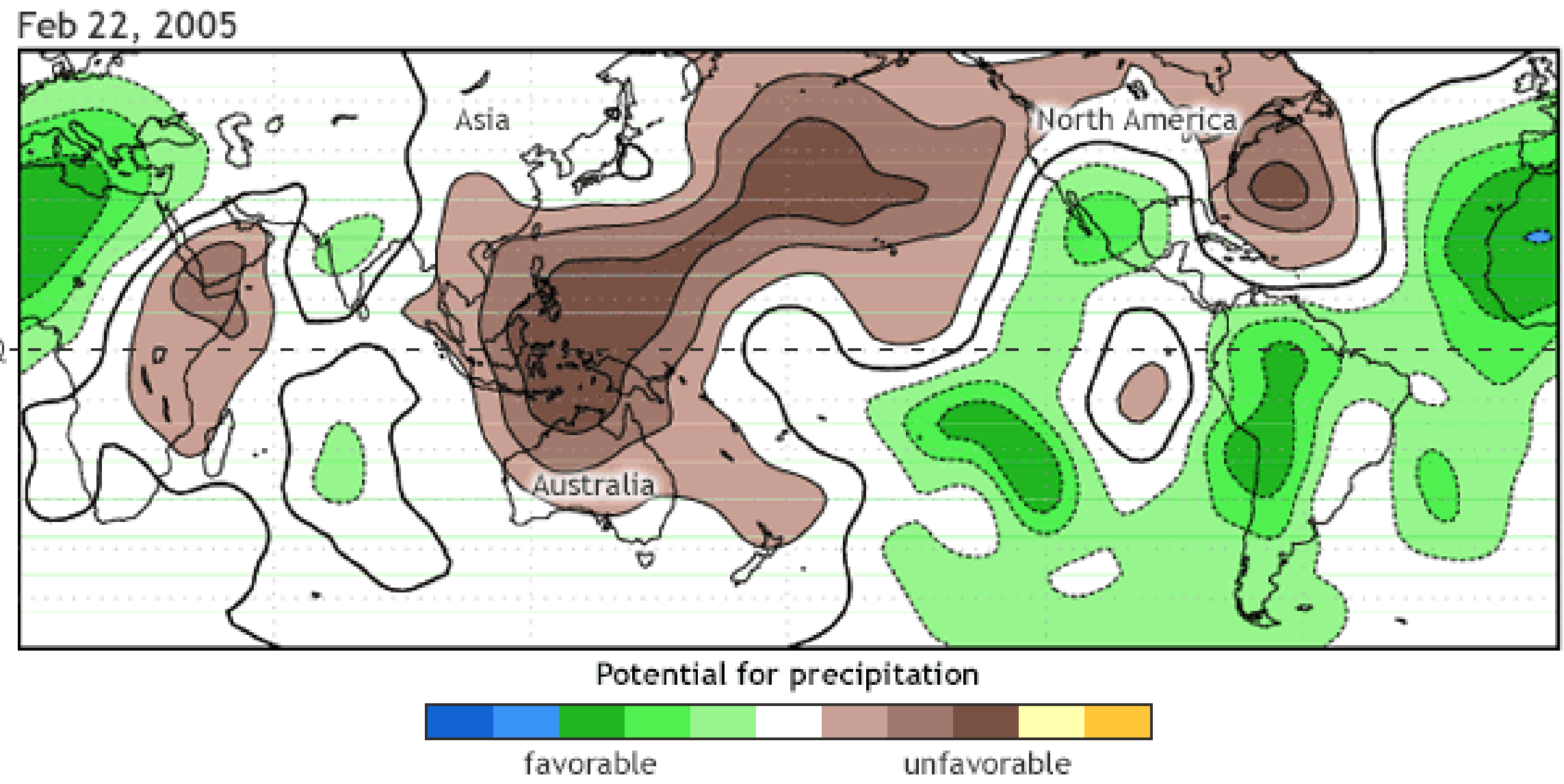


Lamaille Canyon, Ruby Mountains, Nevada on 1/30/2024 Photo Credit: Spencer Donovan

**More snow in the Ruby Mountains than in the Eastern Sierra**



- Weak and fractured jet a leading to ridging building moisture into PacNW and northern/eastern NV and
- Flooding along CA coast below normal for E Sierra spillover.



Above: An animation illustrating the enhanced and suppressed convective phases of the MJO as it moves eastward.

From the Climate.gov ENSO blog

- The MJO, or Madden Julian Oscillation may have played a role.
- While ENSO (El Niño Southern Oscillation) is stationary and will last for several seasons or longer, the MJO is an eastward moving cluster of storms in the tropics that circles the planet every 30-60 days on average.
- The MJO can either overlap with and enhance the effects of El Niño, or it can be destructive and work against the atmospheric pattern, as we saw several instances of early this winter.

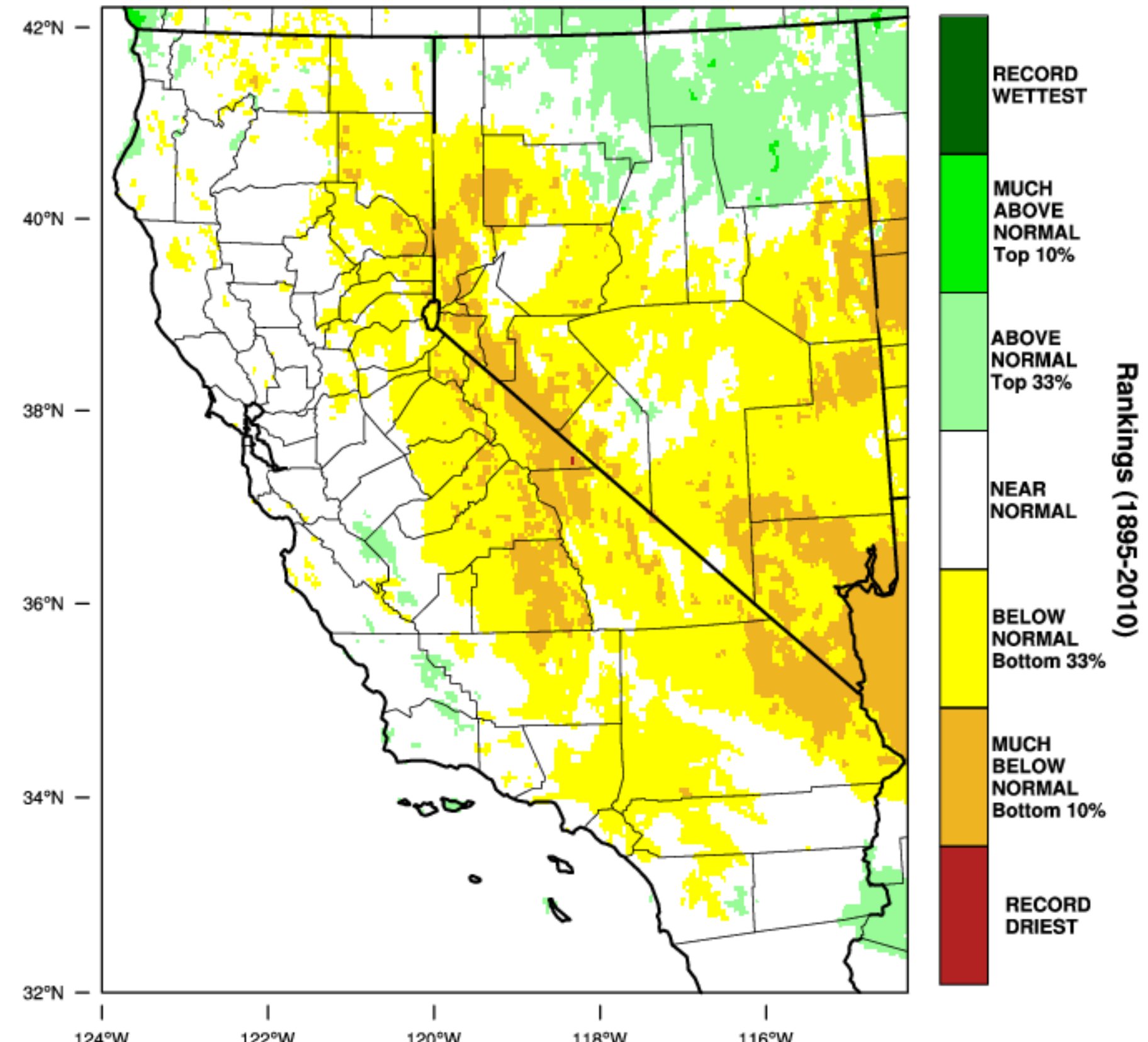
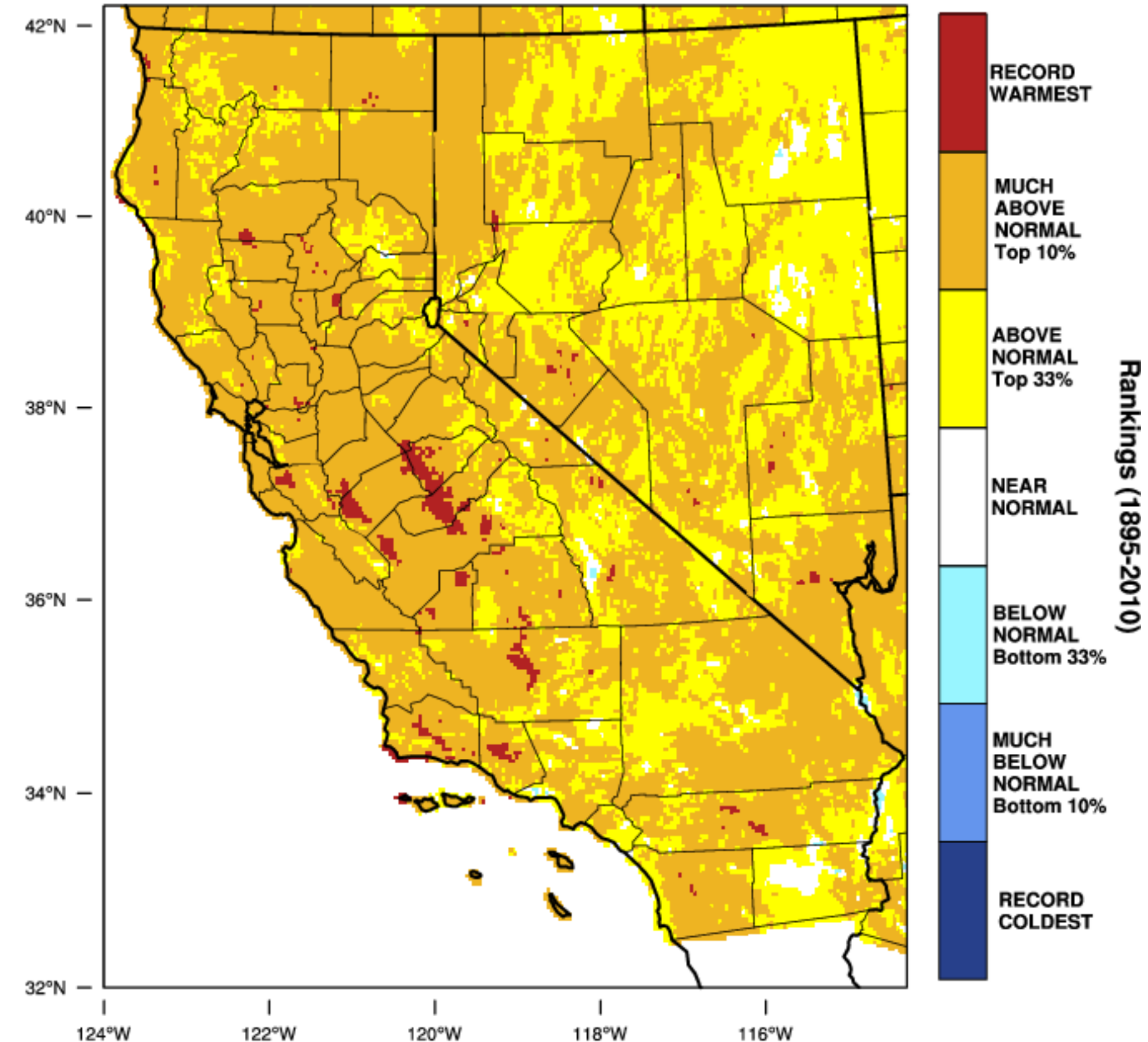


# Rather Warm and Dry Overall Through January

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Reno, NV  
Wednesday, March 6

### California - Mean Temperature October-January 2024 Percentile

### California - Precipitation October-January 2024 Percentile

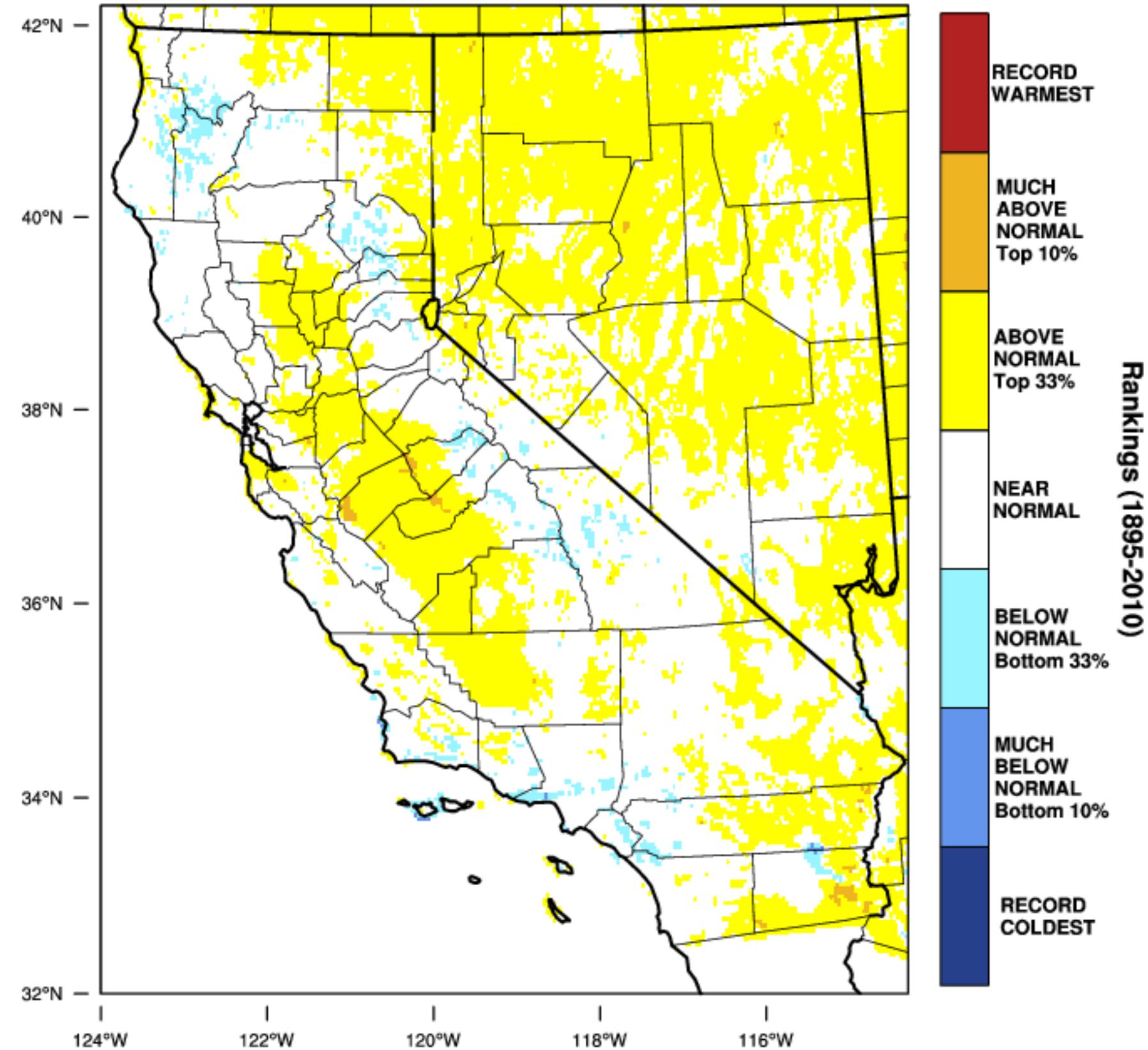




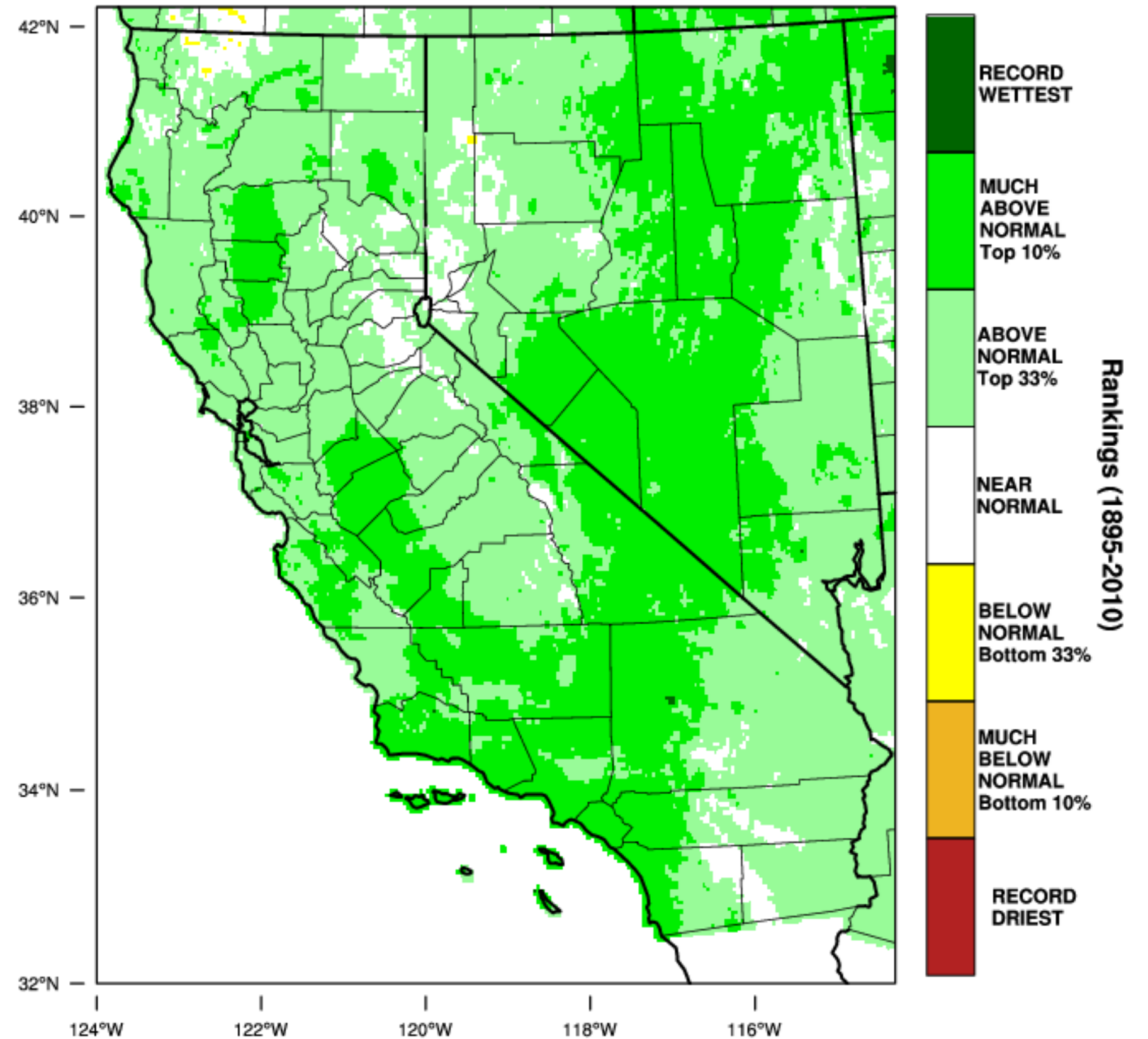
# February Helped!

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### California - Mean Temperature February 2024 Percentile



### California - Precipitation February 2024 Percentile

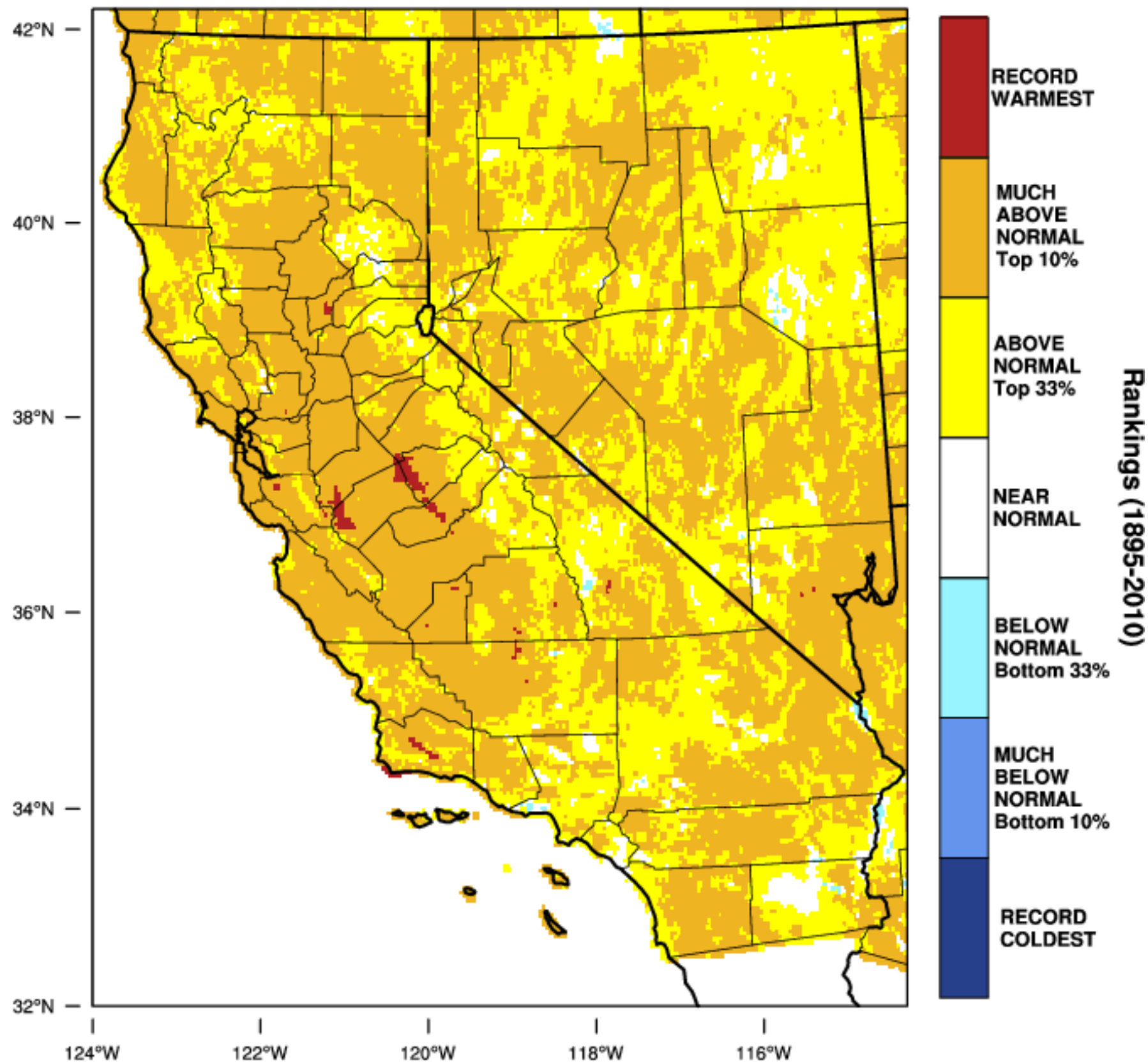




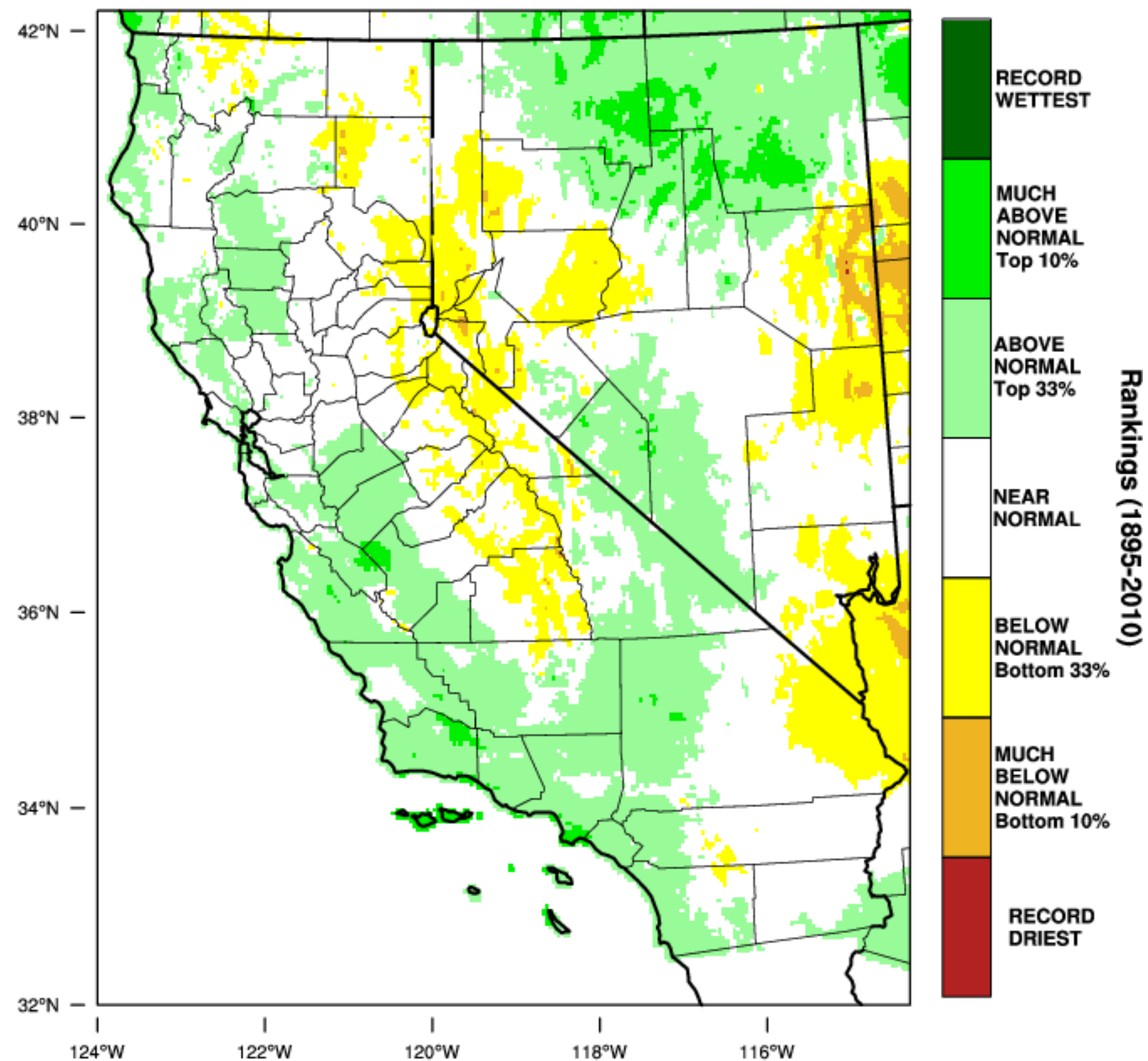
# Where We Stood October-February

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### California - Mean Temperature October-February 2024 Percentile



### California - Precipitation October-February 2024 Percentile



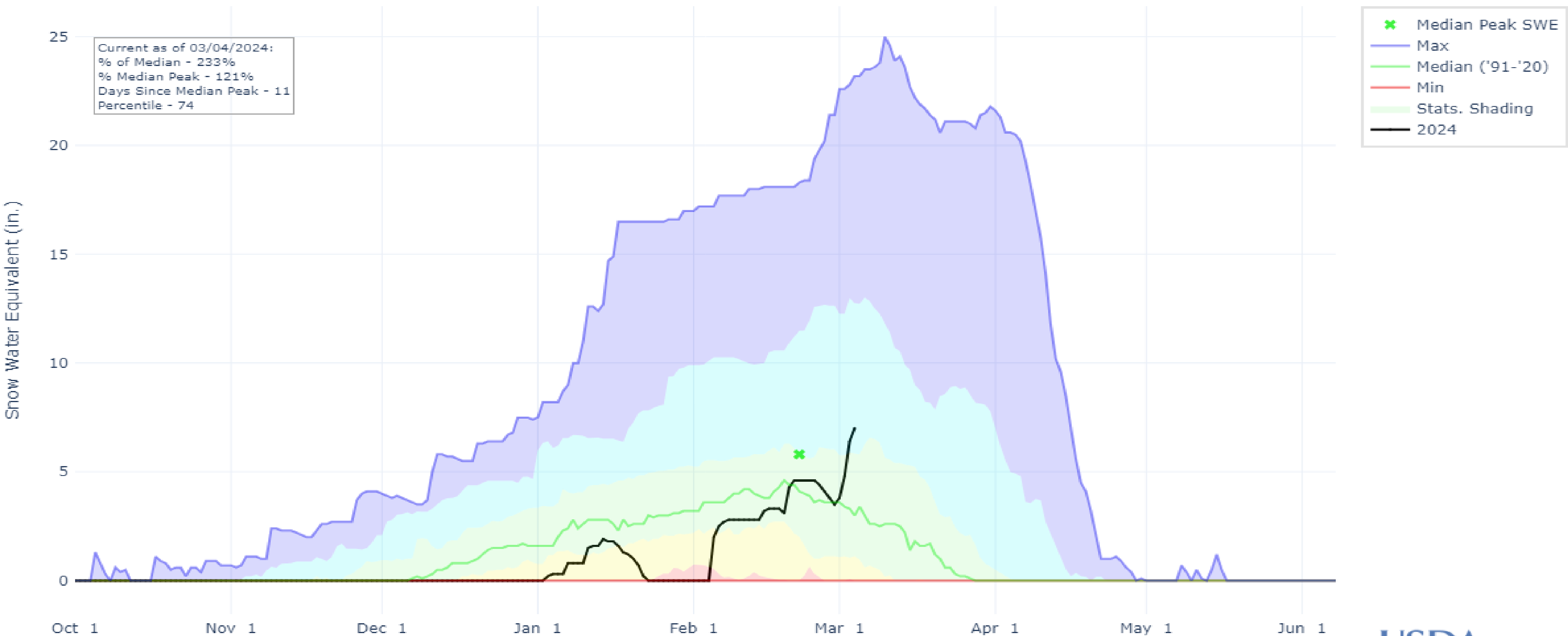




# Then Came The March Blizzard

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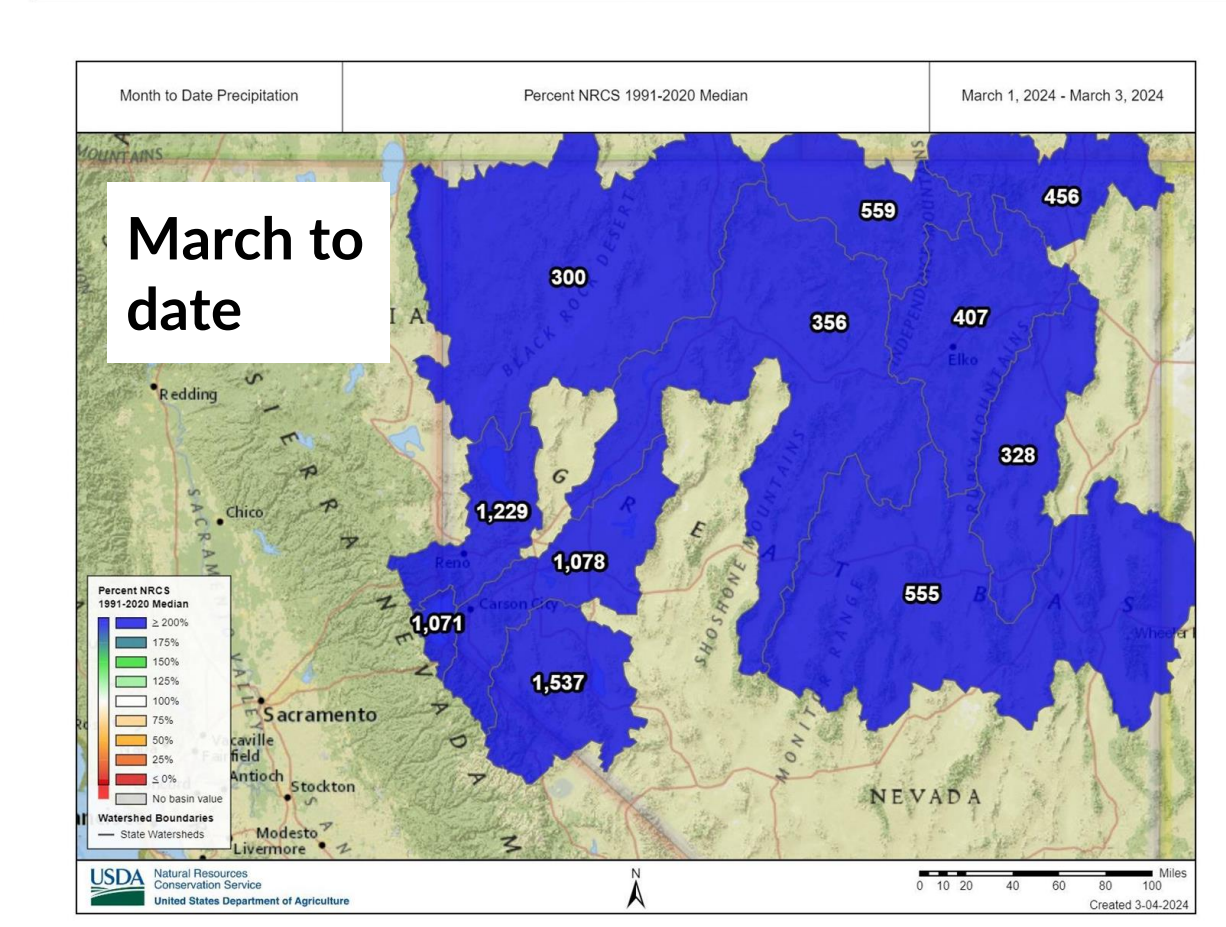
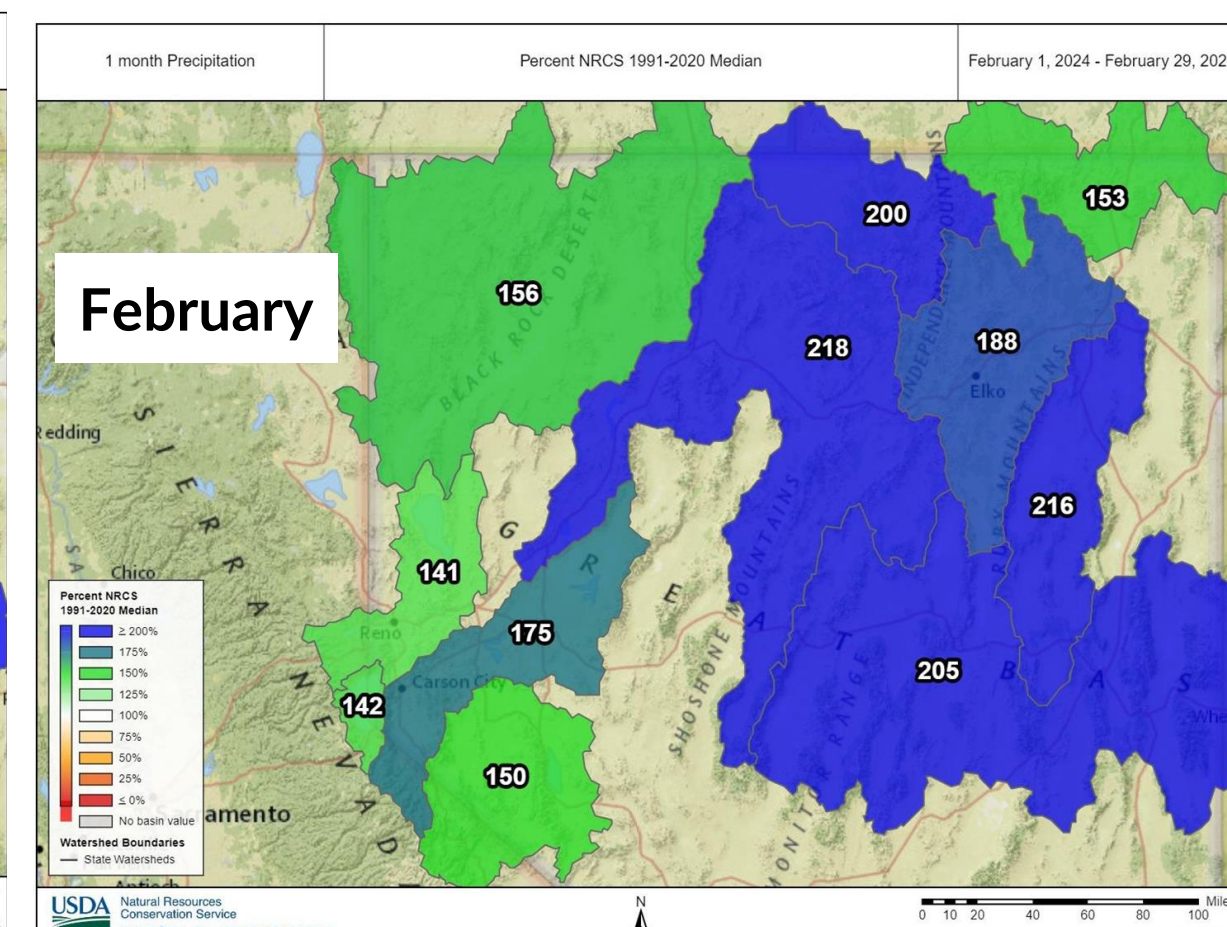
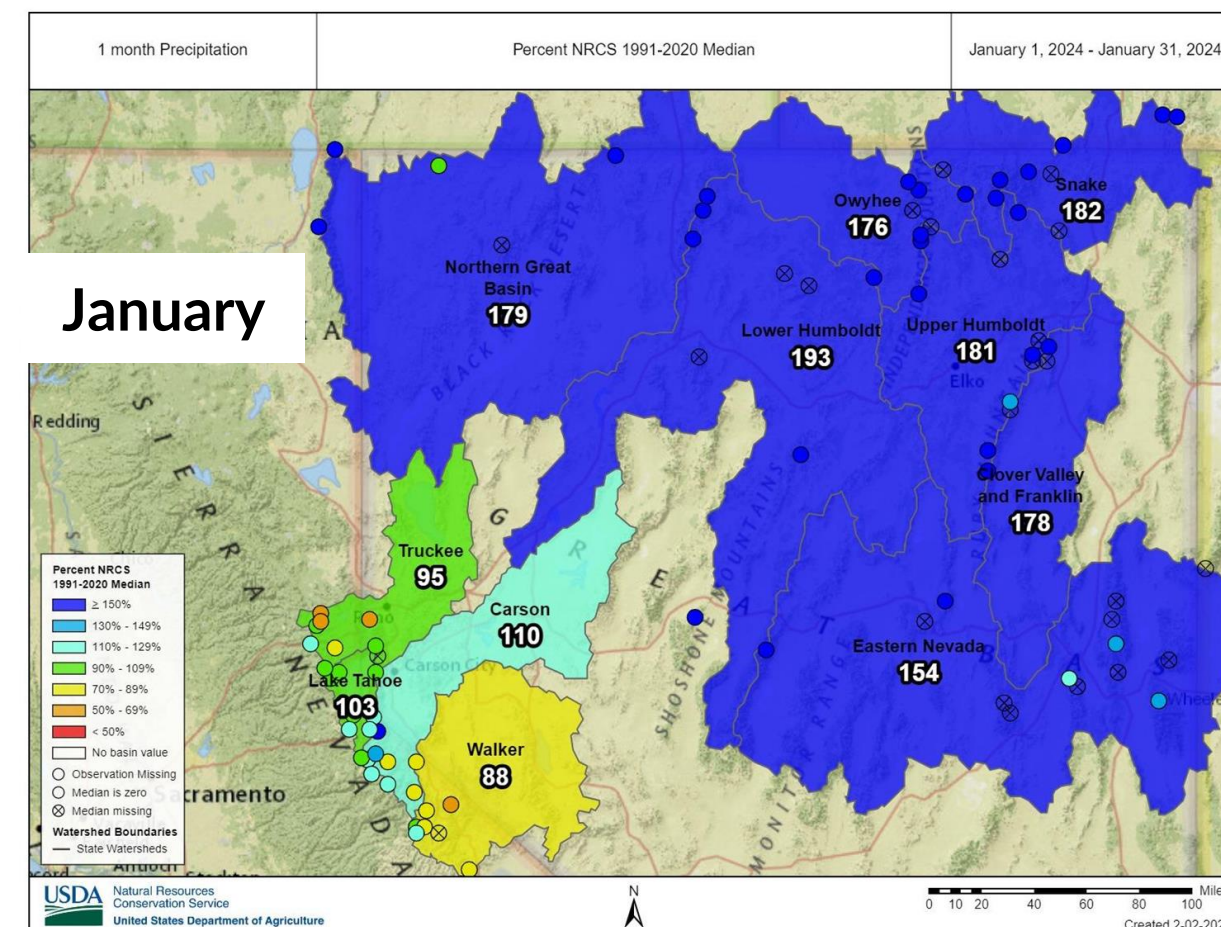
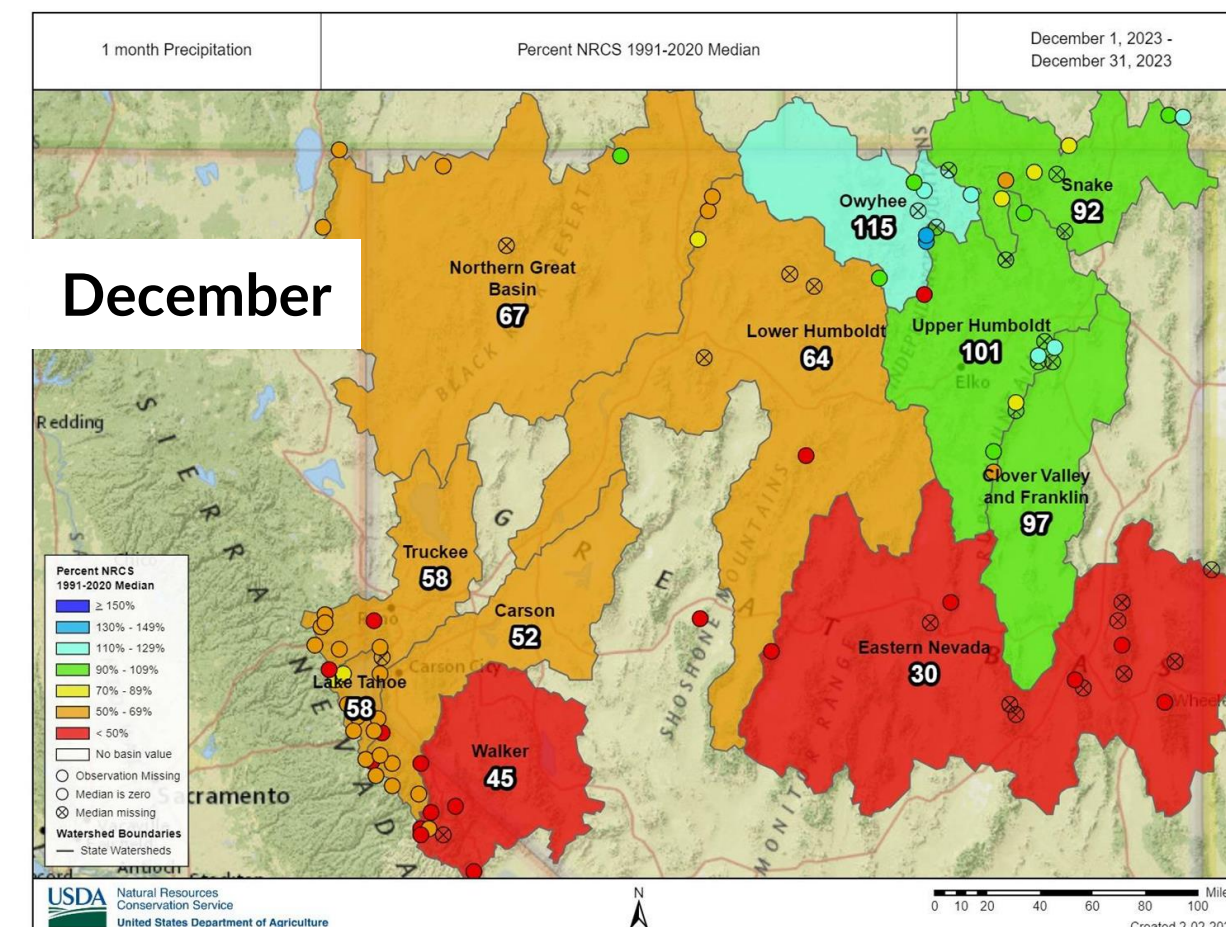
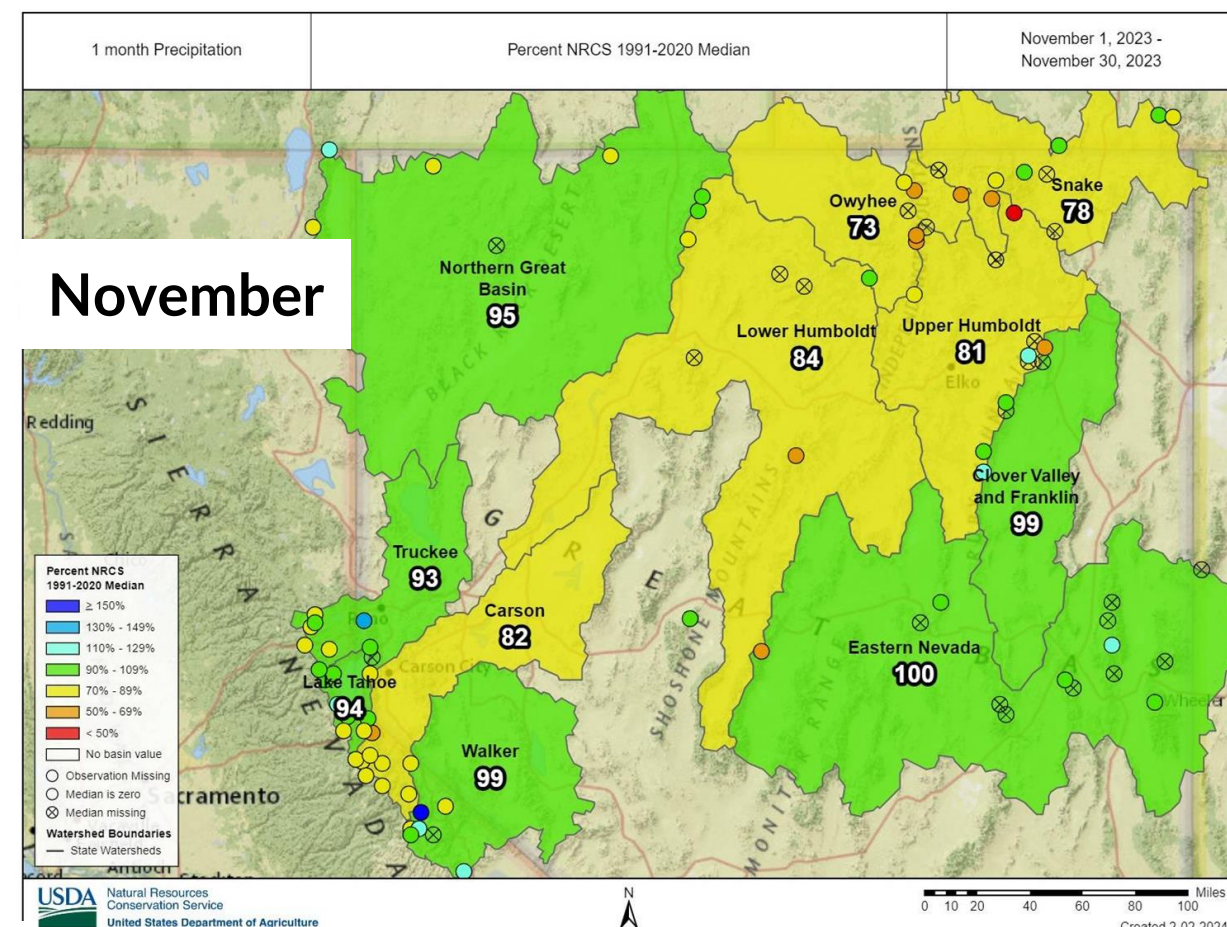
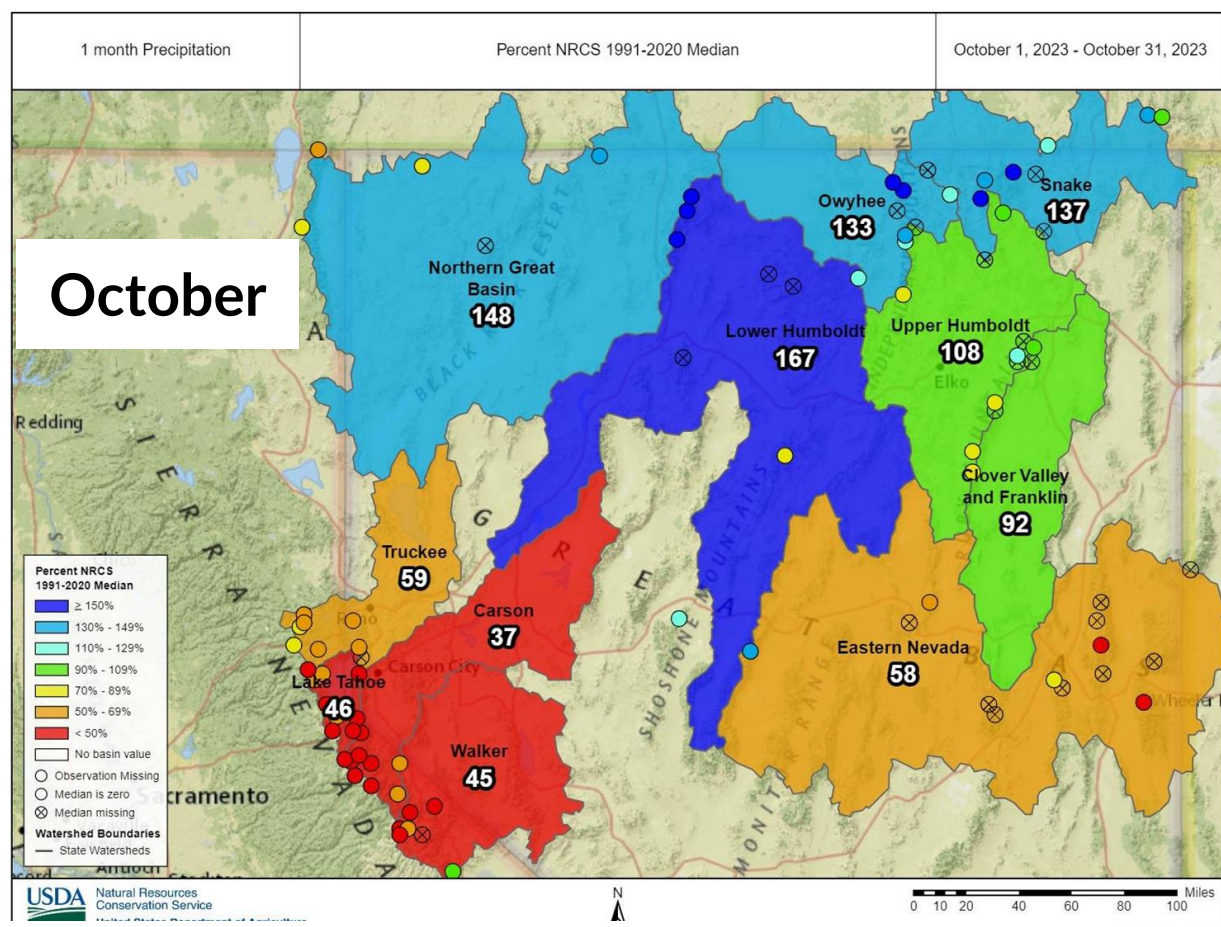
### SPRATT CREEK, CA (778) SNOW WATER EQUIVALENT





# Monthly Mountain Precipitation

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# Why Was This Storm So Different?

- Residence time and colder air mass
- Position of the jet stream and unusually strong low level winds
- Depth and position of the offshore low pressure system
- Pacific moisture feed

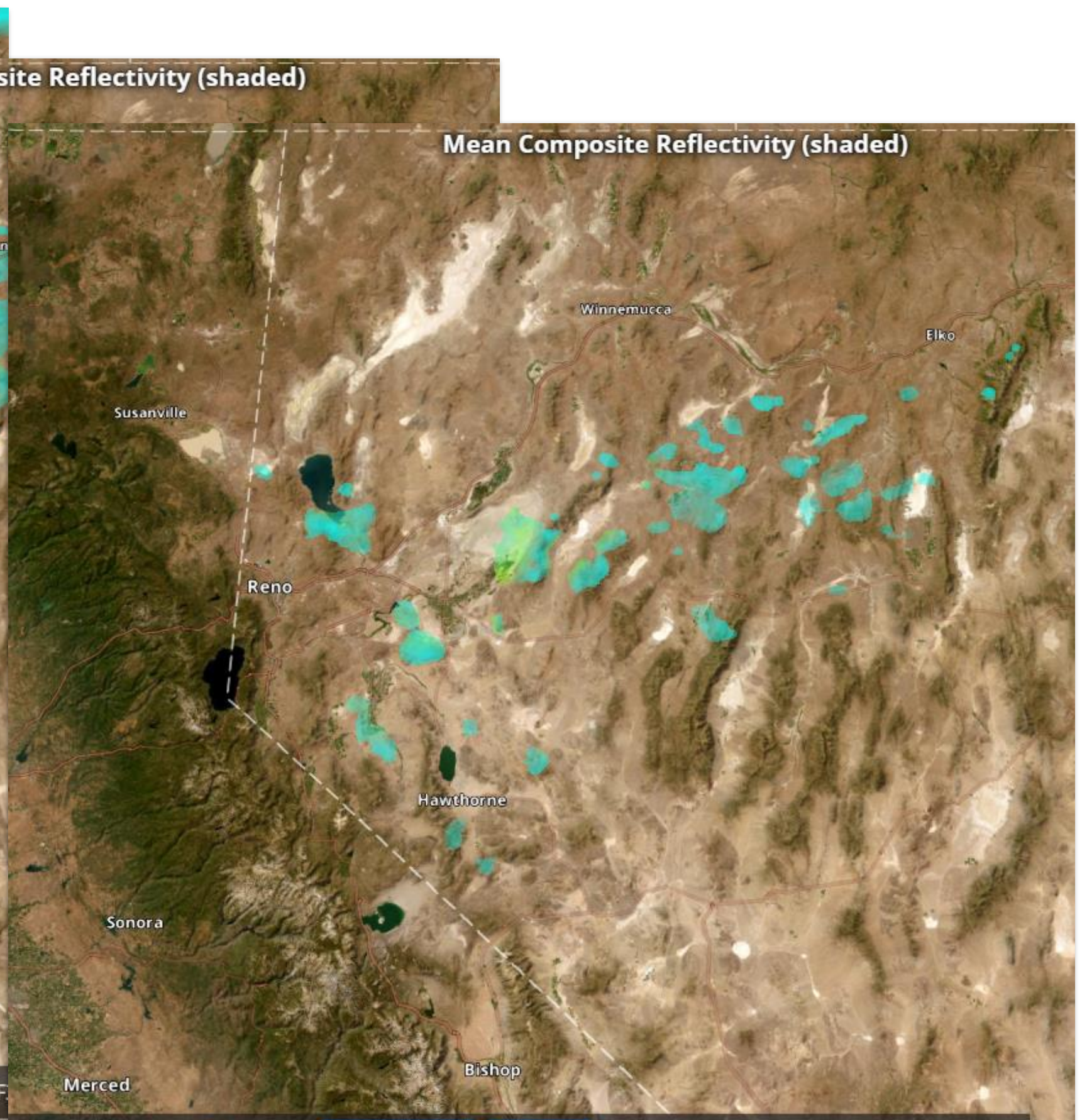
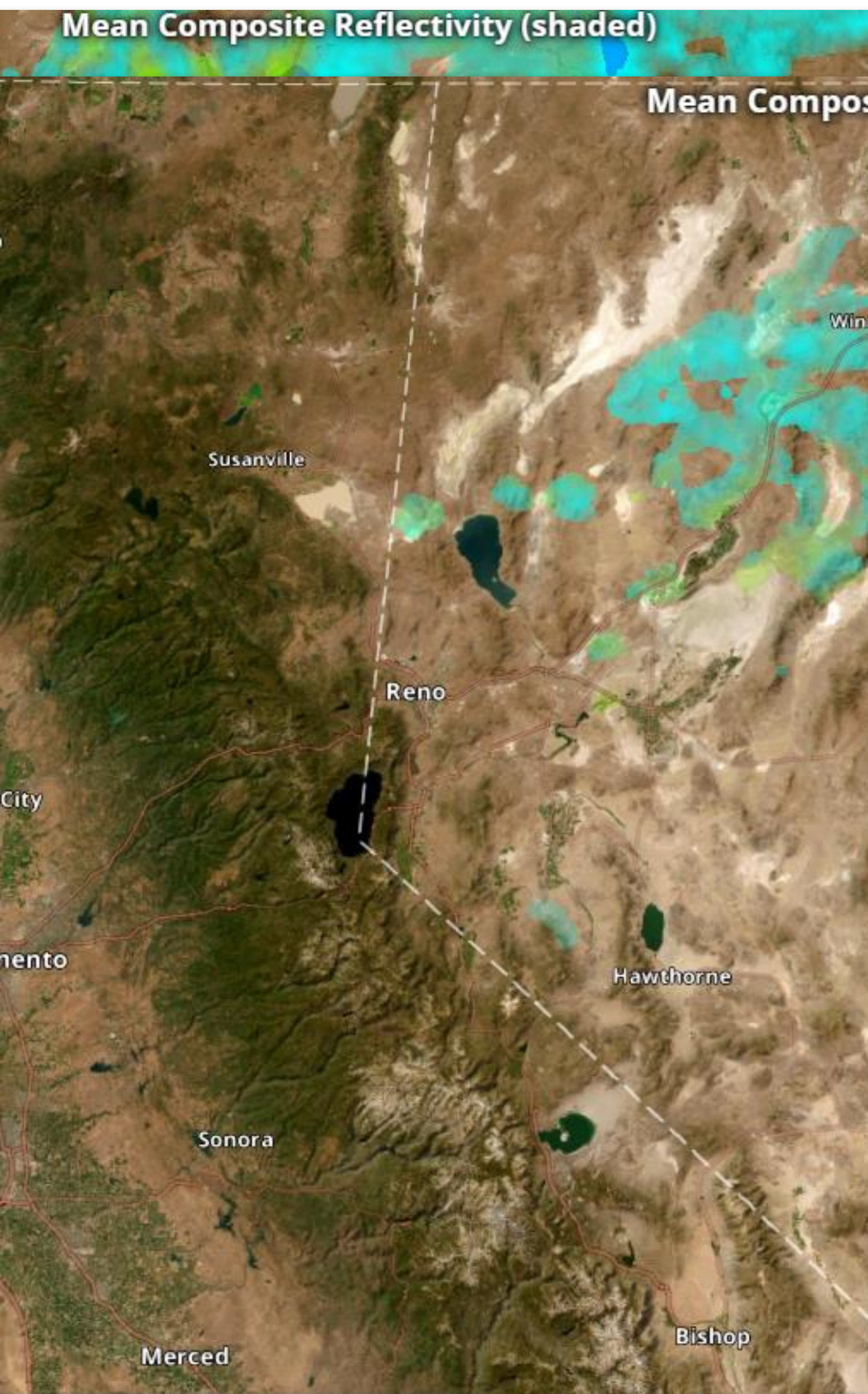


Photo: CHP Gold Run



# Weather Outlooks - Super Near Term

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Wednesday, March 6



F40 - Valid: Thu 08:00 am PST, Mar 7

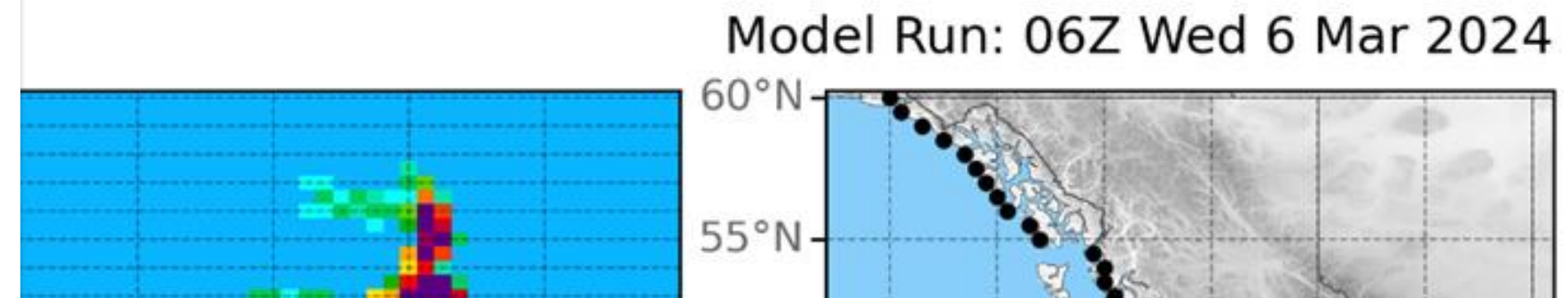
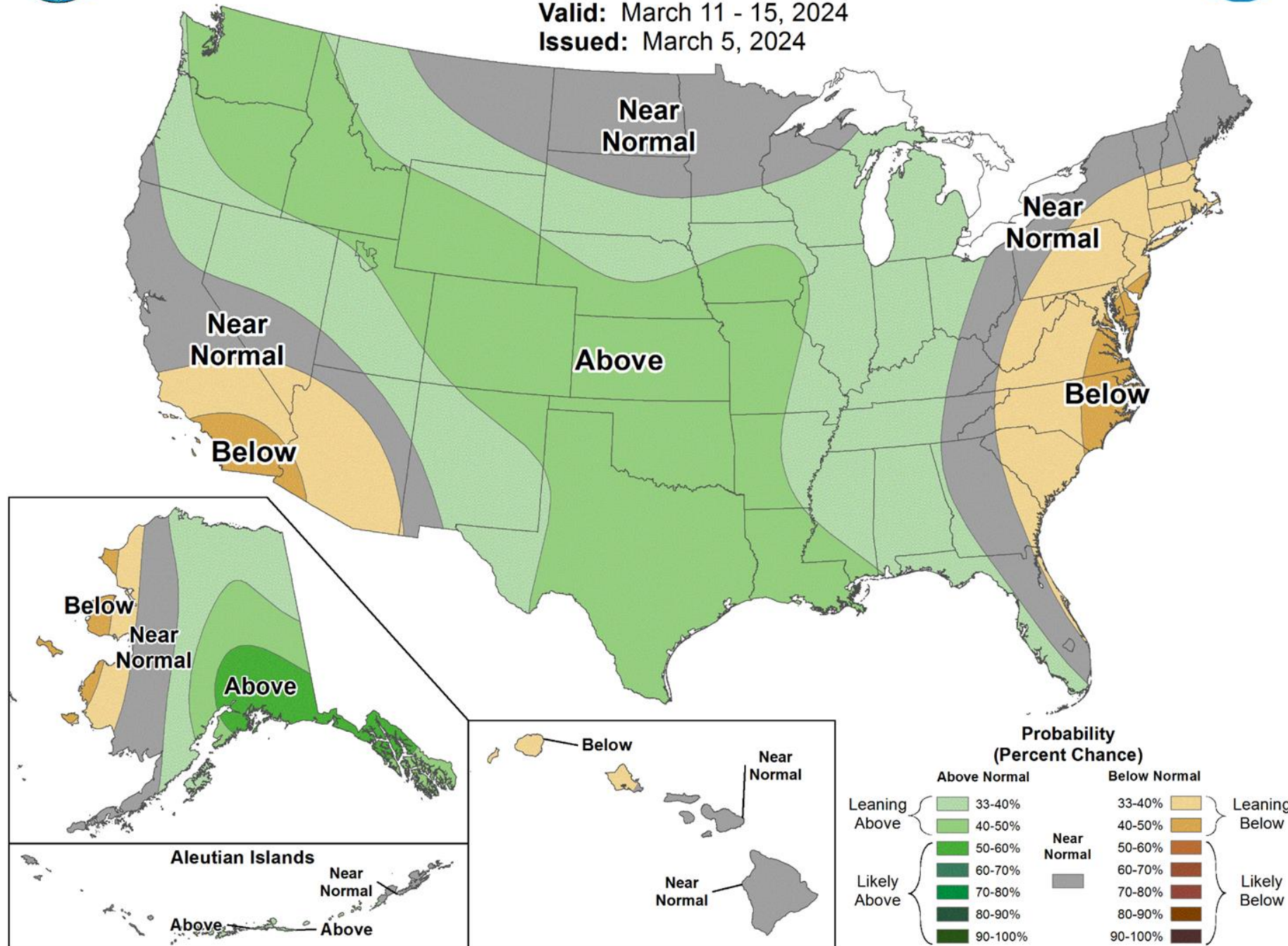


# Weather Outlooks - Near Term

Weather Forecast Office  
Reno, NV  
Wednesday, March 6

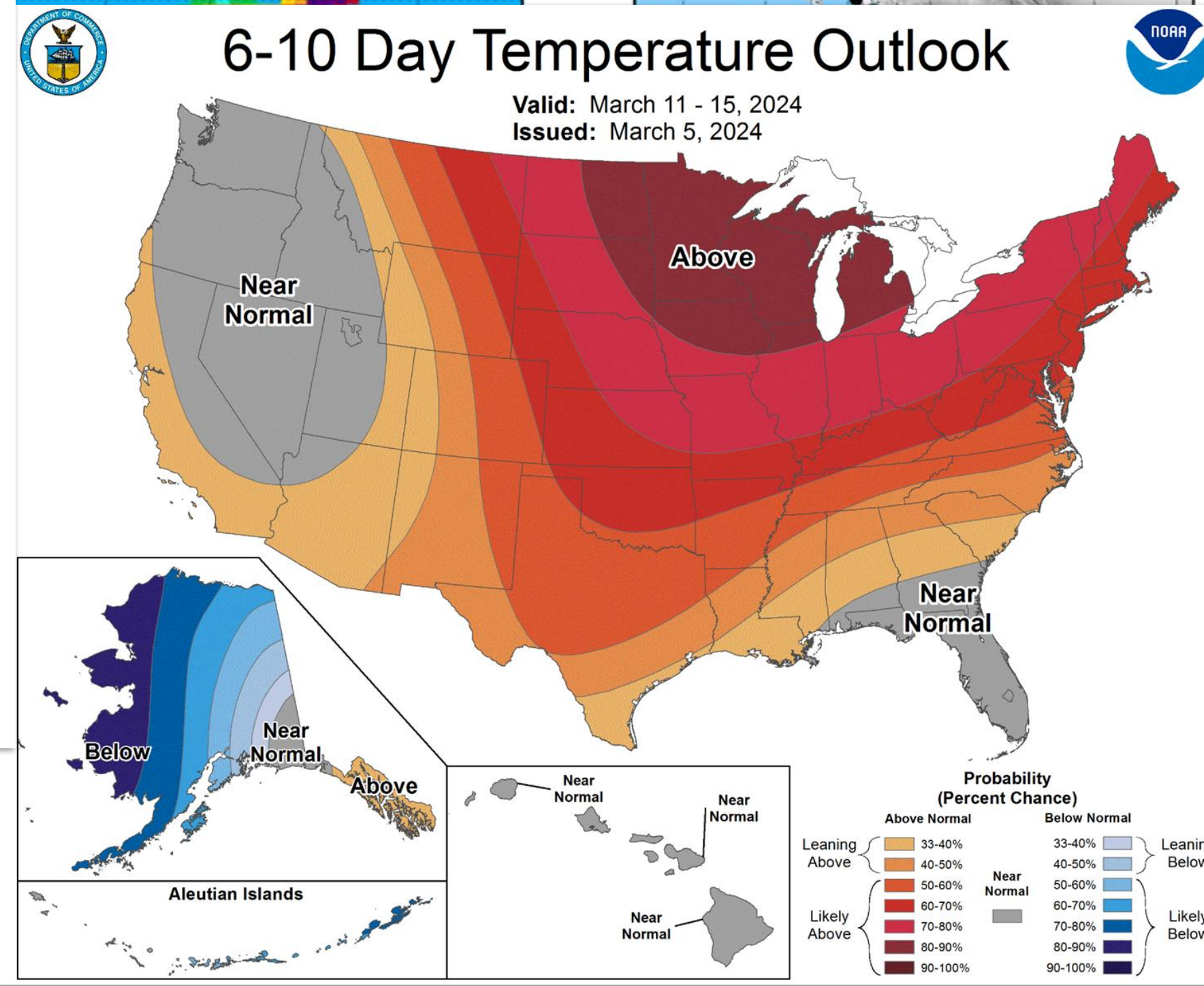
## 6-10 Day Precipitation Outlook

Valid: March 11 - 15, 2024  
Issued: March 5, 2024



## 6-10 Day Temperature Outlook

Valid: March 11 - 15, 2024  
Issued: March 5, 2024



25% 30% 40% 50% 60% 70%

Probability of IVT  $\geq 250 \text{ kg m}^{-1} \text{ s}^{-1}$

Forecasts support FIRO/CA-AR Program and NSF #2052972 | Intended



# Seasonal Outlook - Early Spring

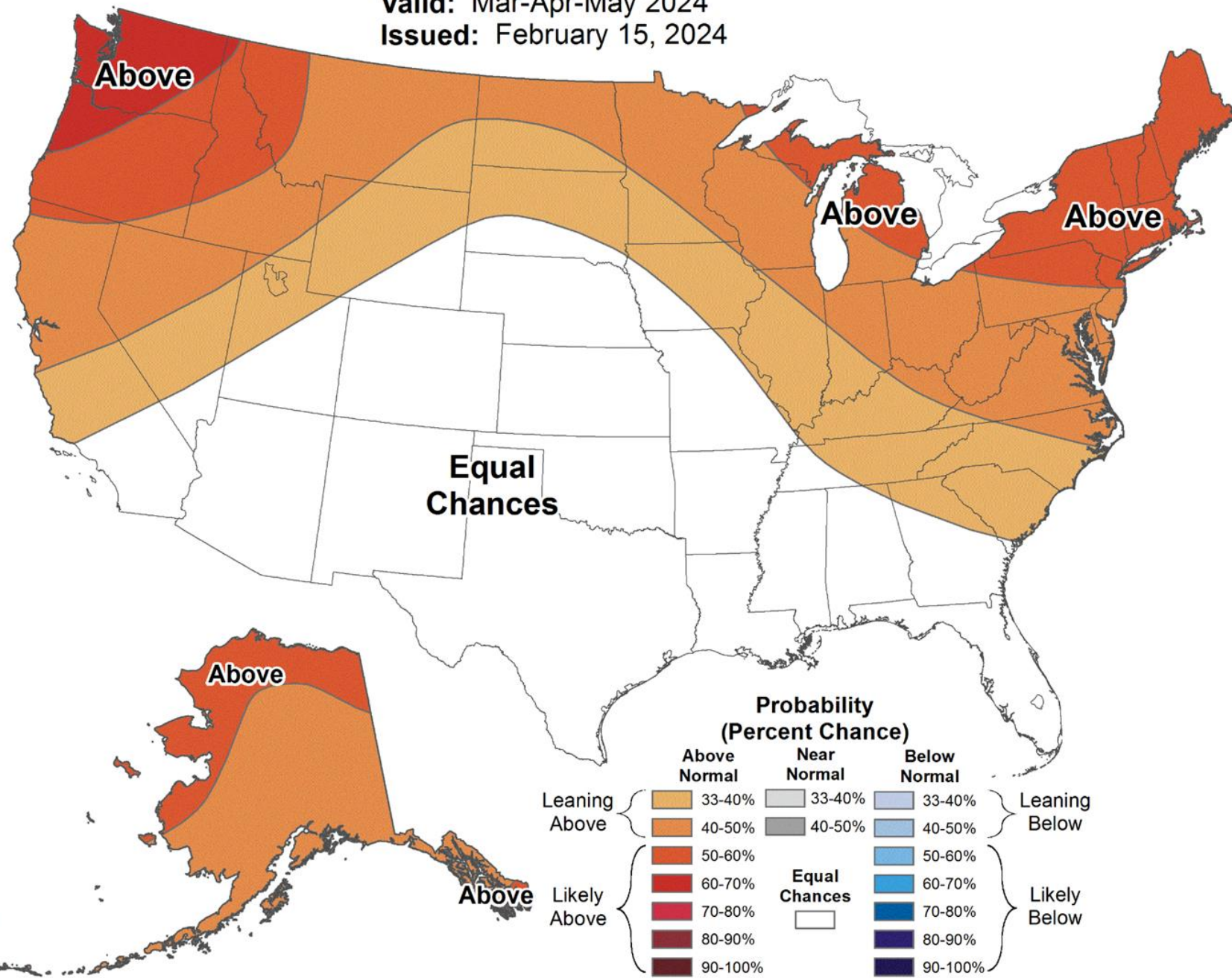
Weather Forecast Office  
Reno, NV  
Wednesday, March 6



## Seasonal Temperature Outlook



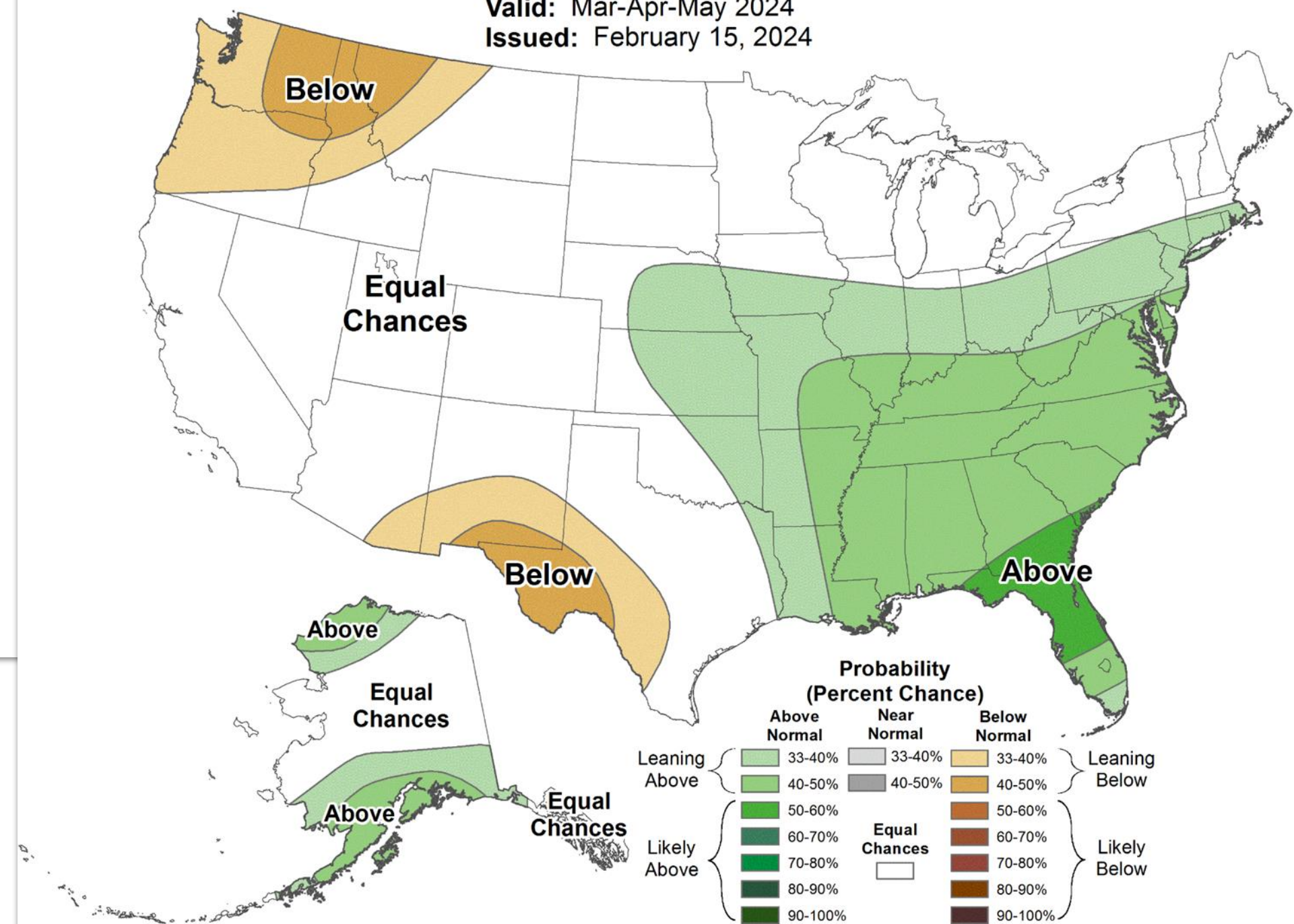
Valid: Mar-Apr-May 2024  
Issued: February 15, 2024



## Seasonal Precipitation Outlook



Valid: Mar-Apr-May 2024  
Issued: February 15, 2024





# Seasonal Outlook - Late Spring/Summer

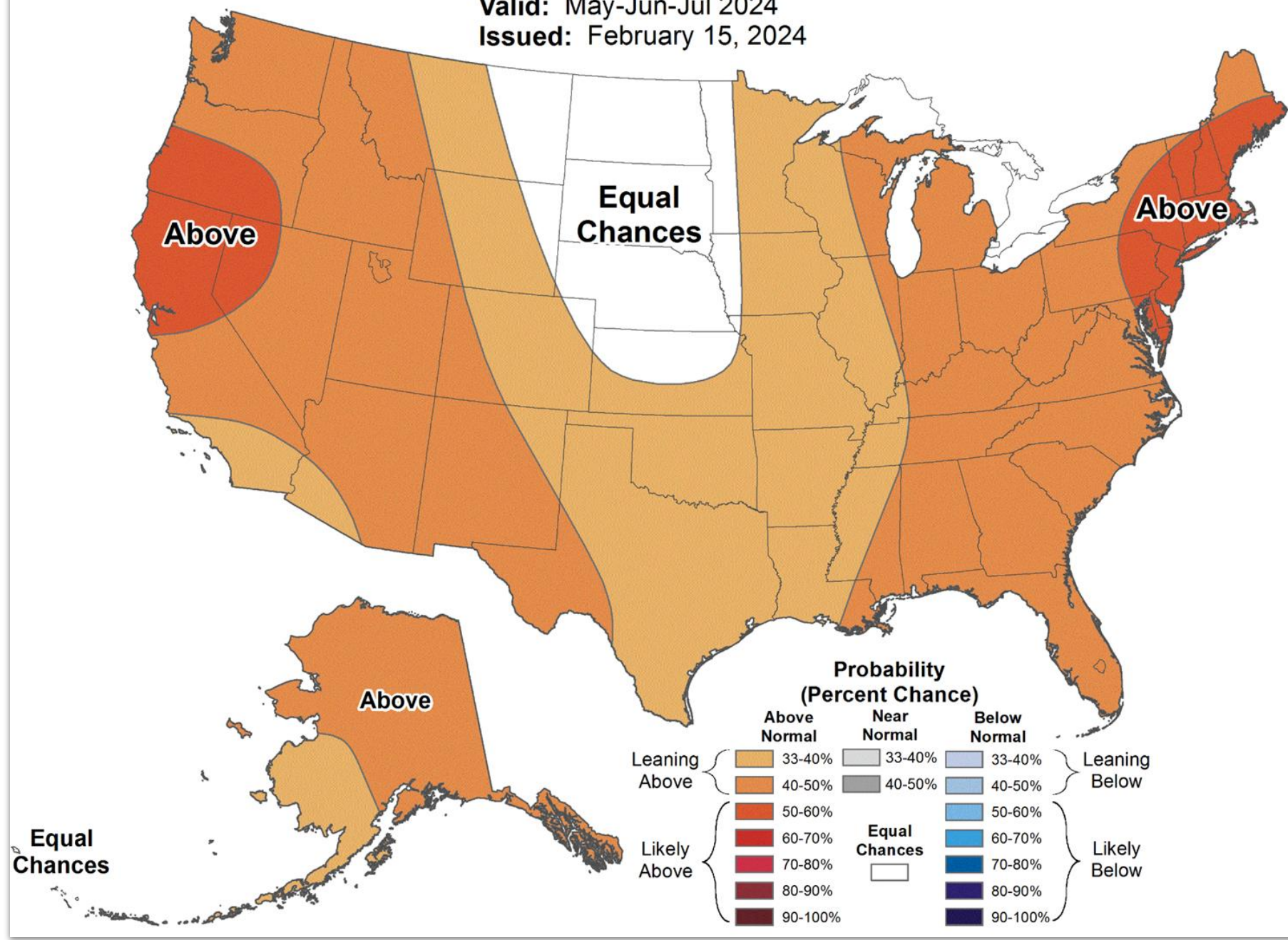
Weather Forecast Office  
Reno, NV  
Wednesday, March 6



## Seasonal Temperature Outlook



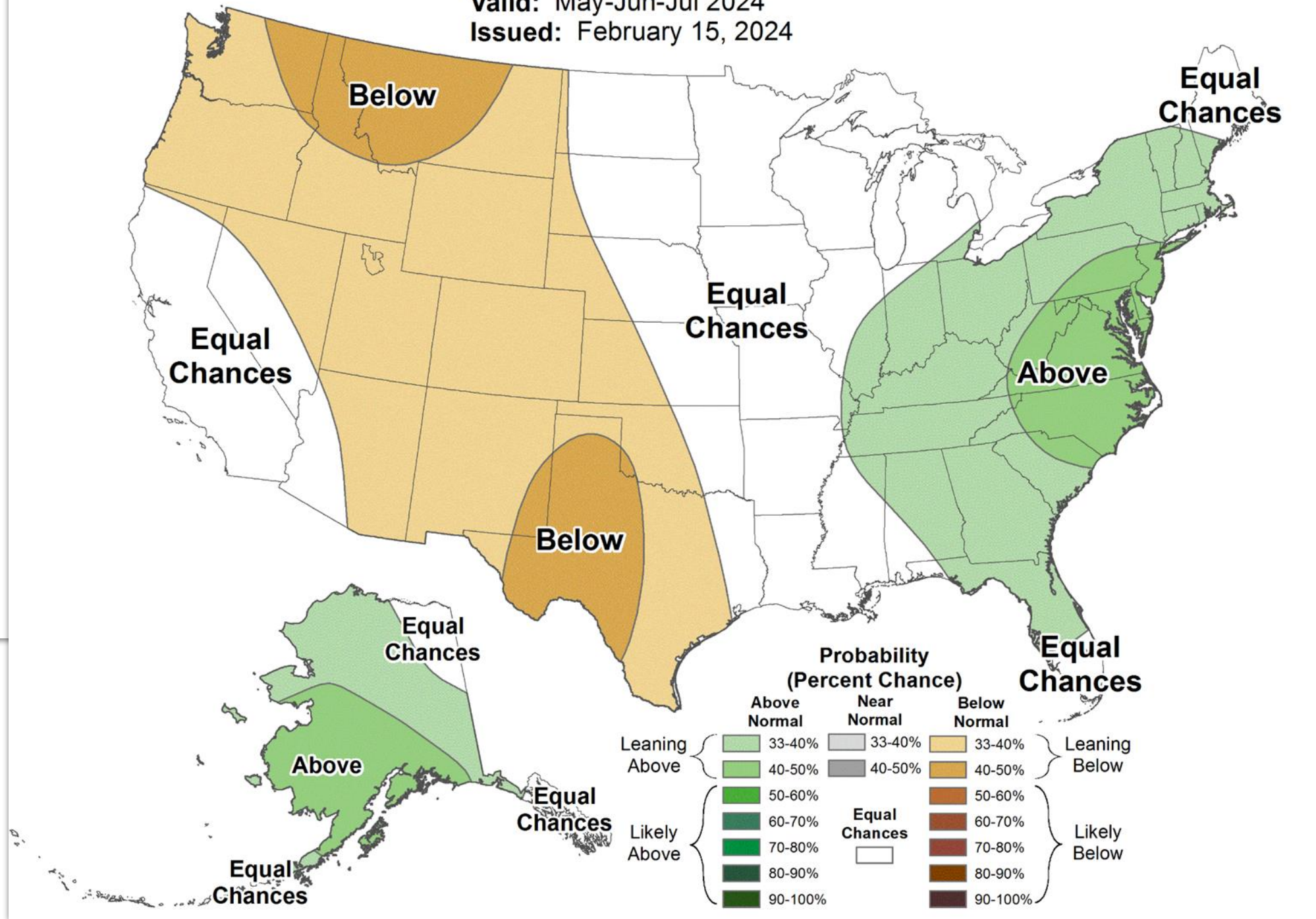
Valid: May-Jun-Jul 2024  
Issued: February 15, 2024



## Seasonal Precipitation Outlook



Valid: May-Jun-Jul 2024  
Issued: February 15, 2024

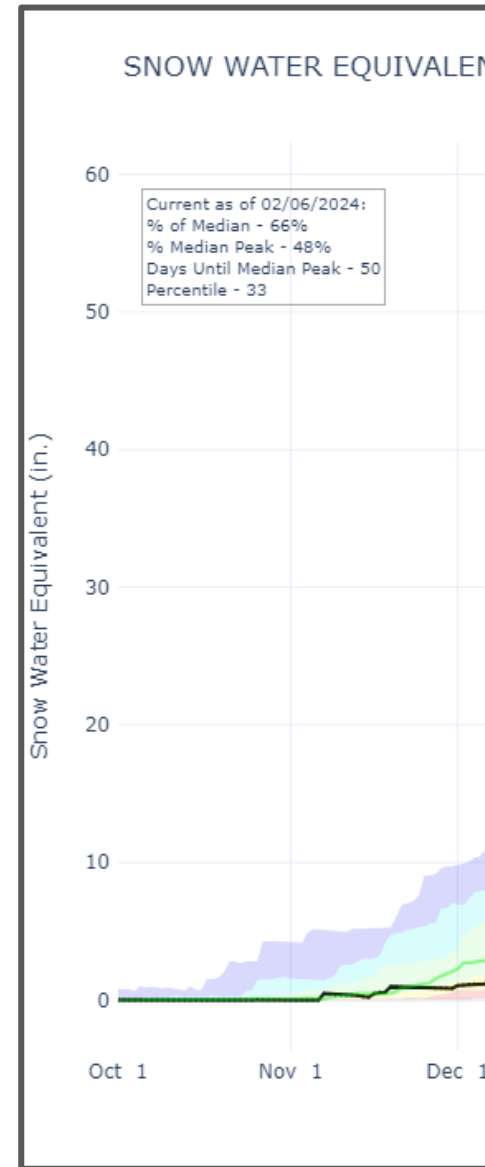
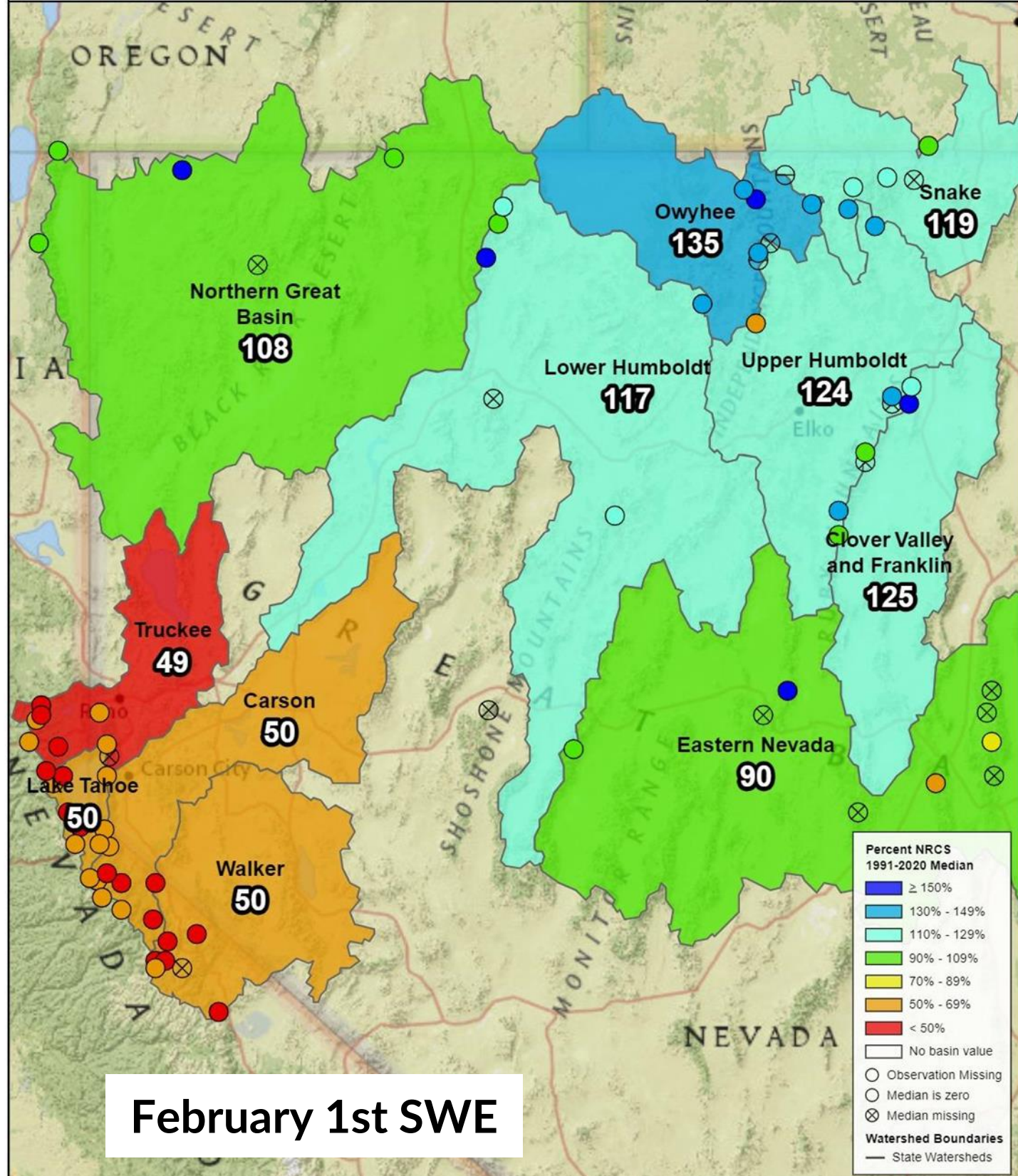




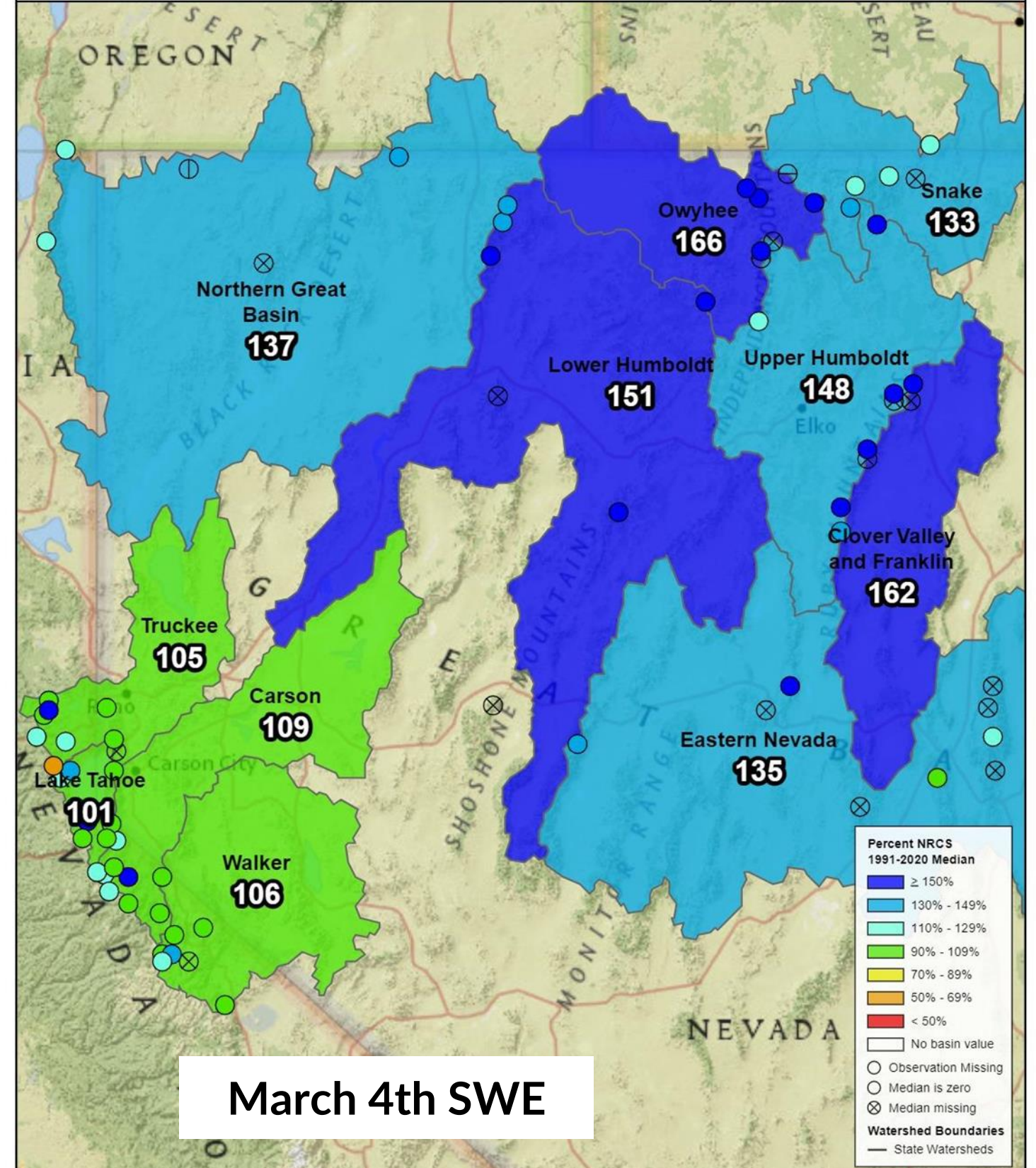
# Hydro Conditions and Outlook

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Wednesday, March 6

Snow Water Equivalent      Percent NRCS 1991-2020 Median      February 1, 2024, first of day



Snow Water Equivalent      Percent NRCS 1991-2020 Median      March 4, 2024, first of day

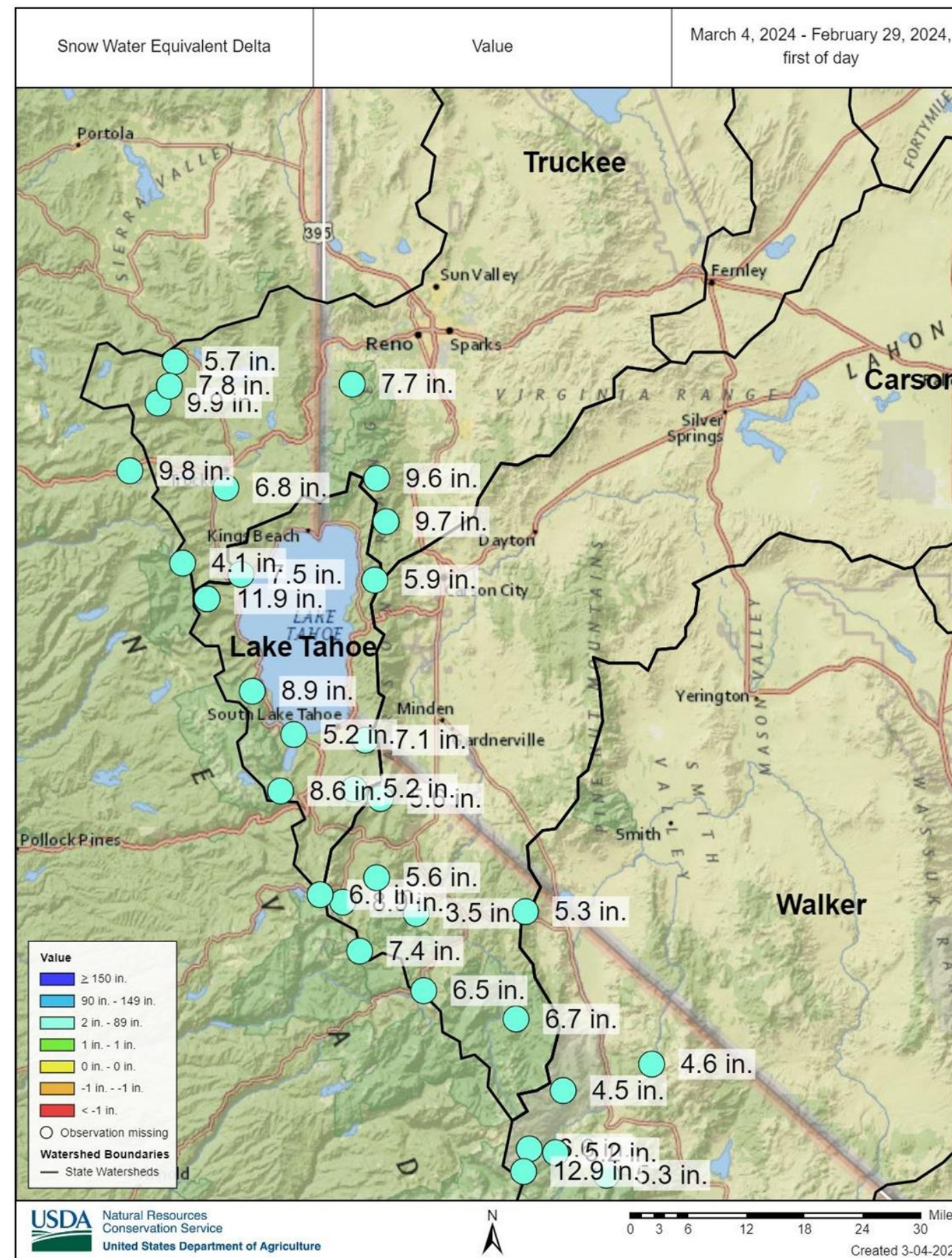
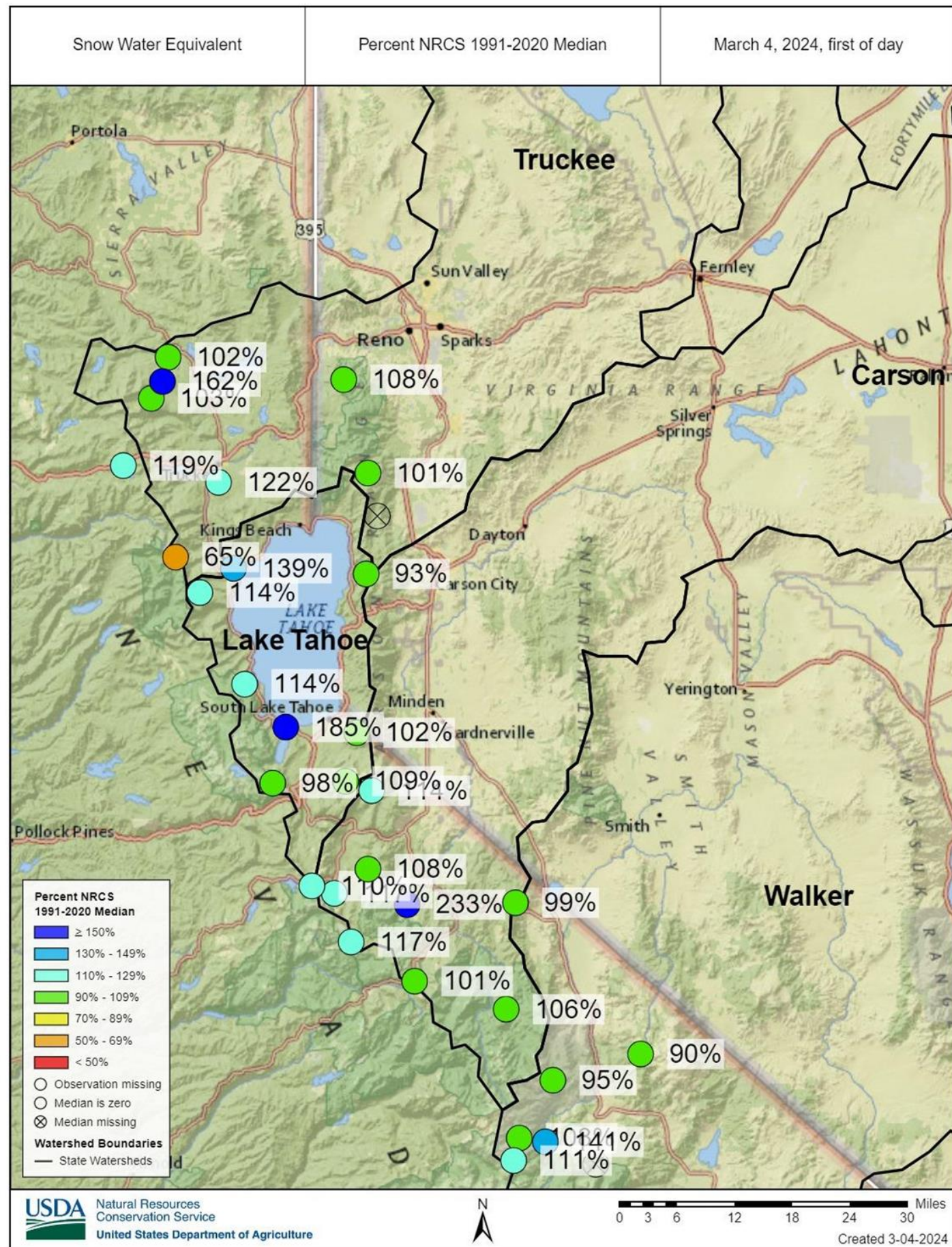






# Regional Snowpack and Storm Totals

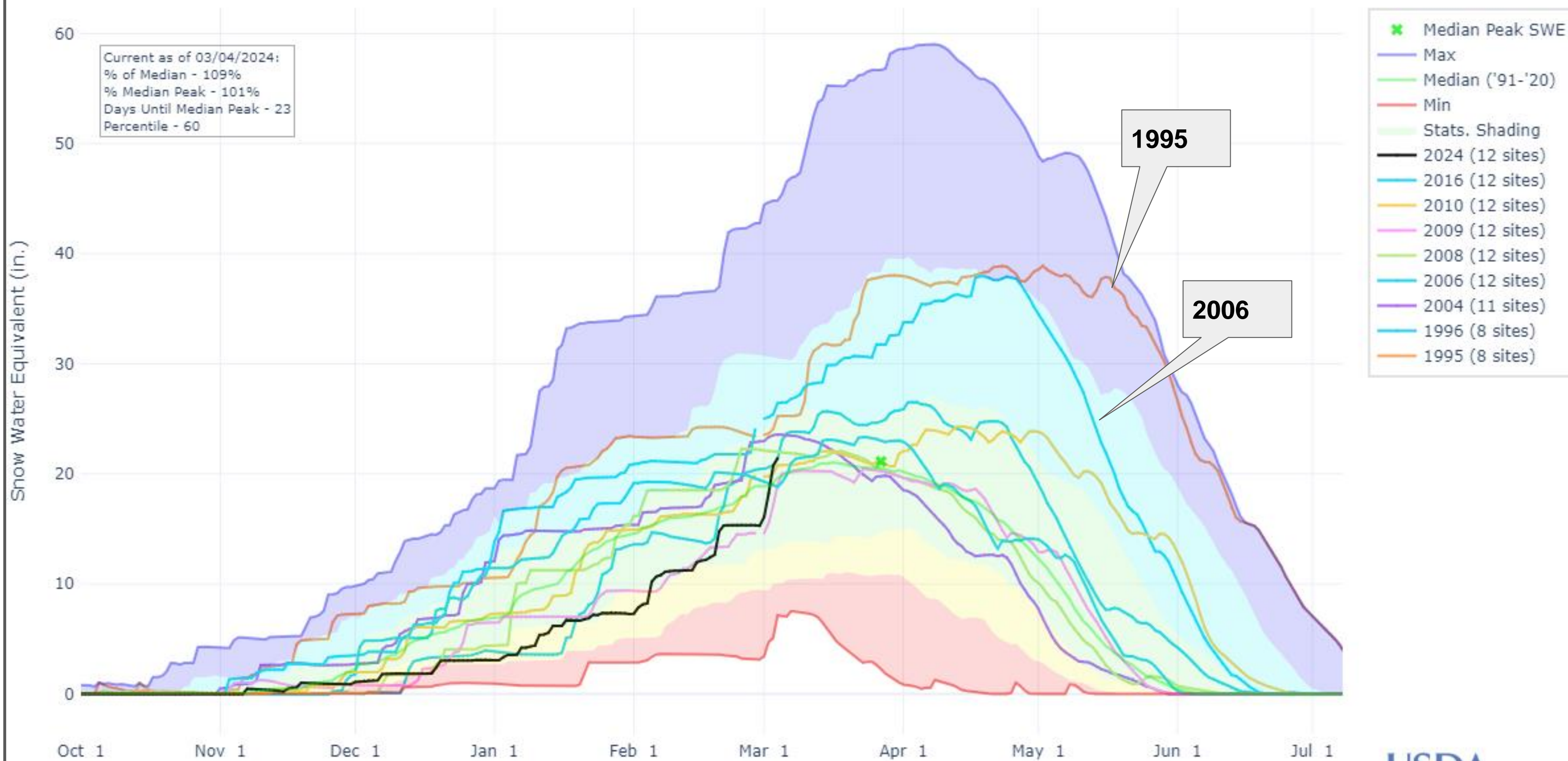
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Reno, NV  
Wednesday, March 6





# Carson Snowpack

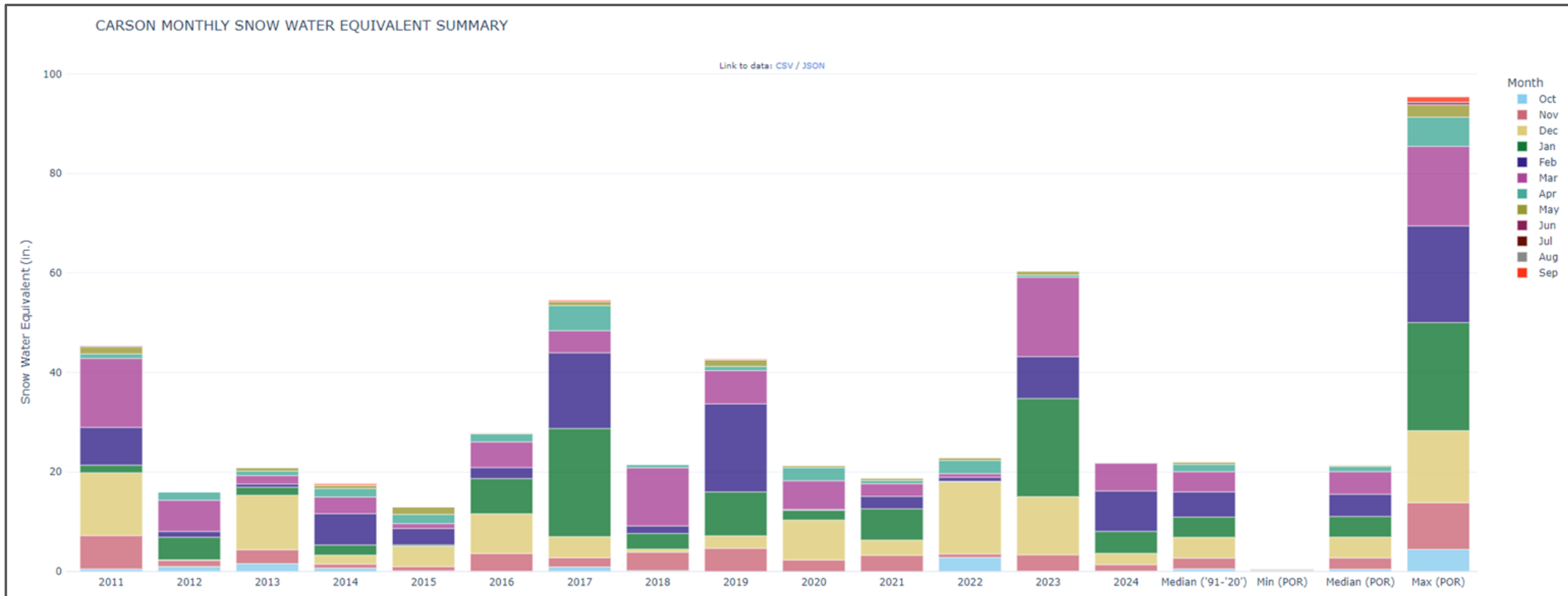
### SNOW WATER EQUIVALENT IN CARSON





# Carson Snowpack- Monthly accumulated SWE gains

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Reno, NV  
Wednesday, March 6





# Snowpack Spatial Comparison

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Reno, NV  
Wednesday, March 6

2/1/2024

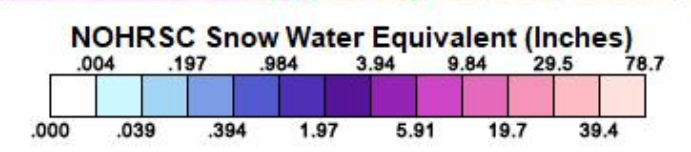
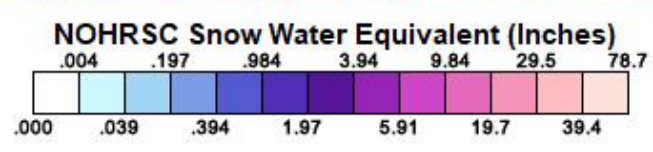
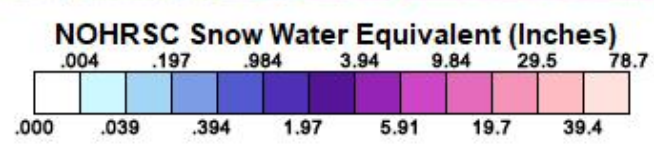
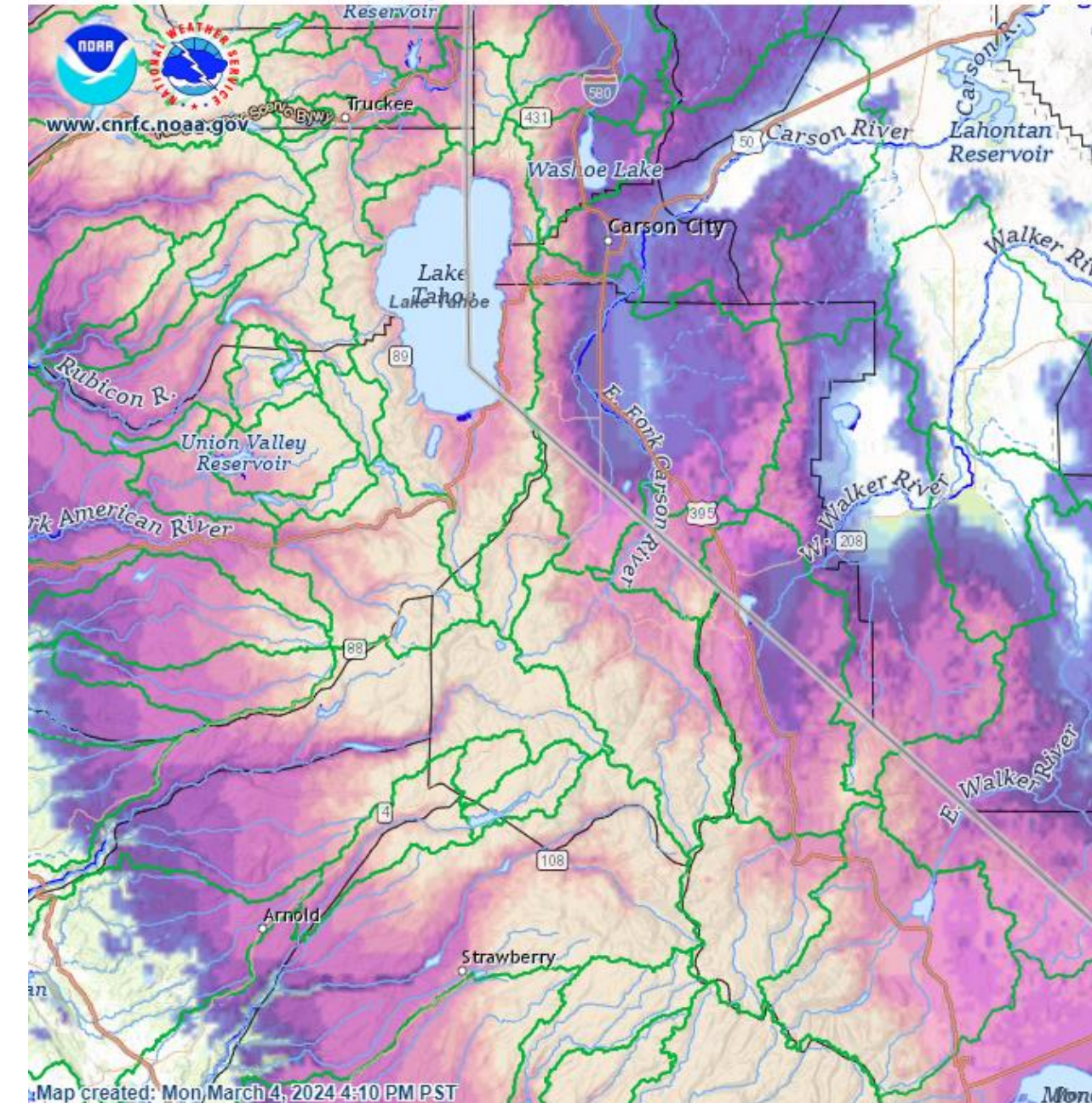
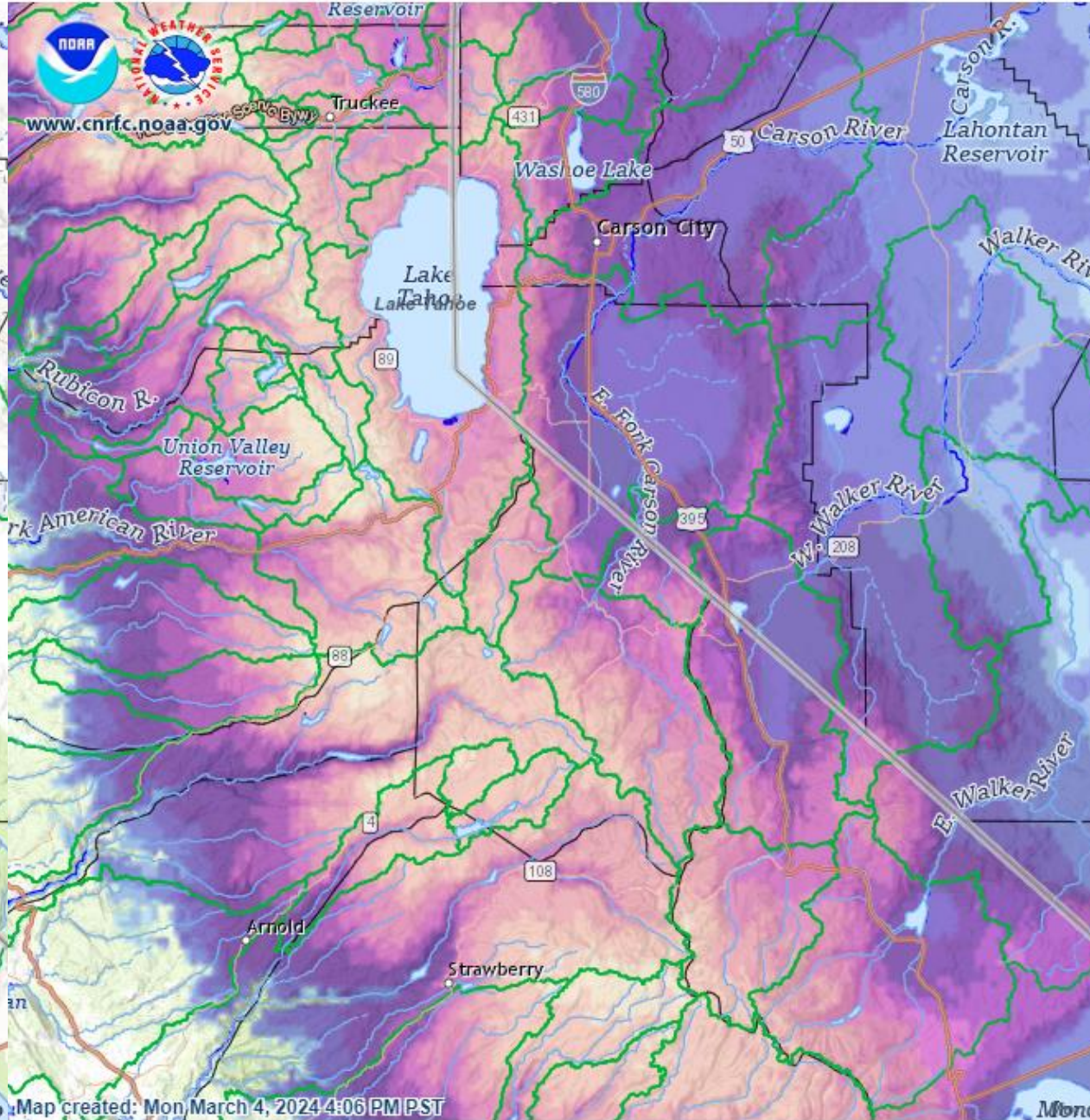
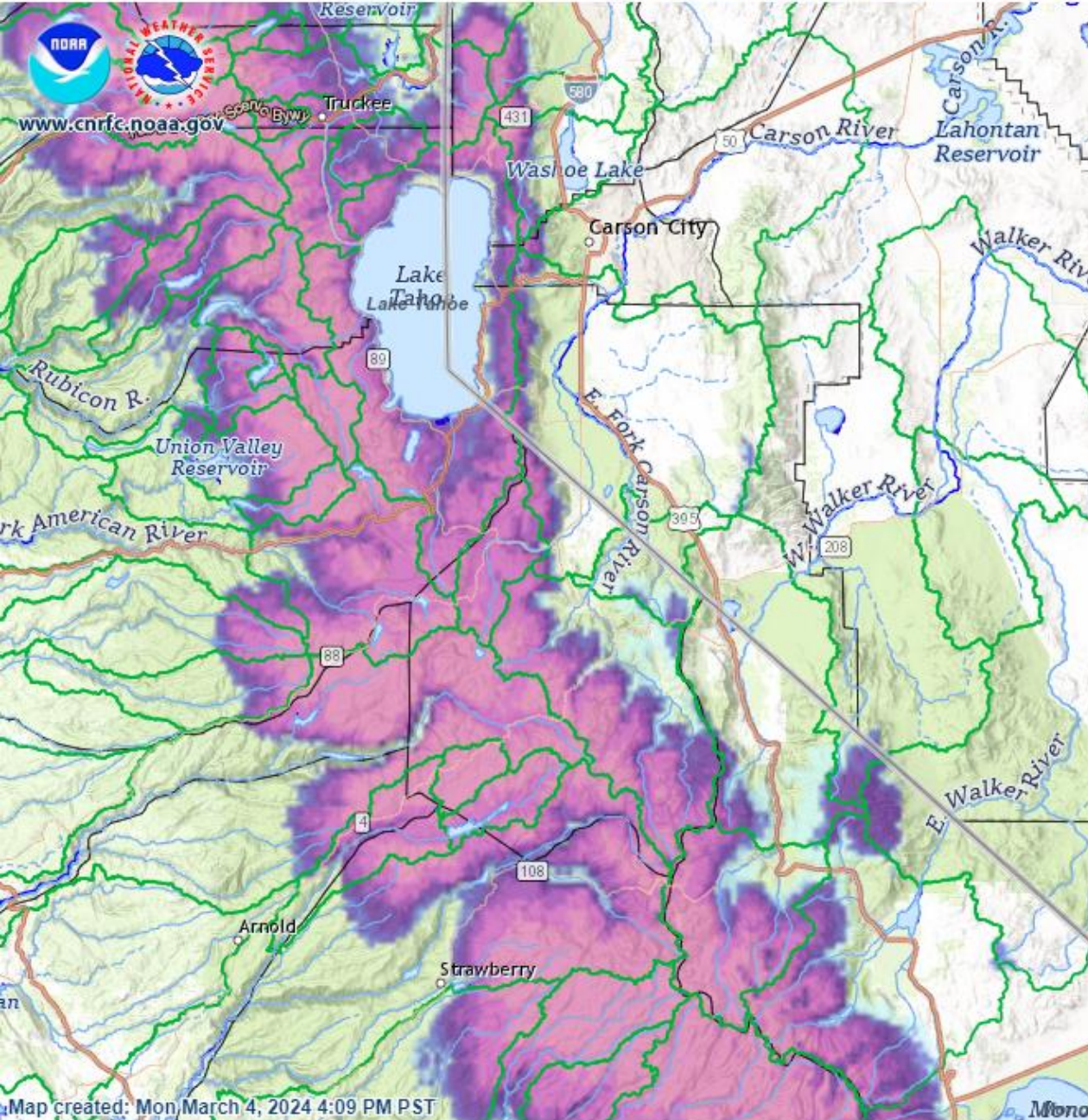
3/4/2024

3/4/2023

Snow Water Equivalent from NOAA's NOHRSC

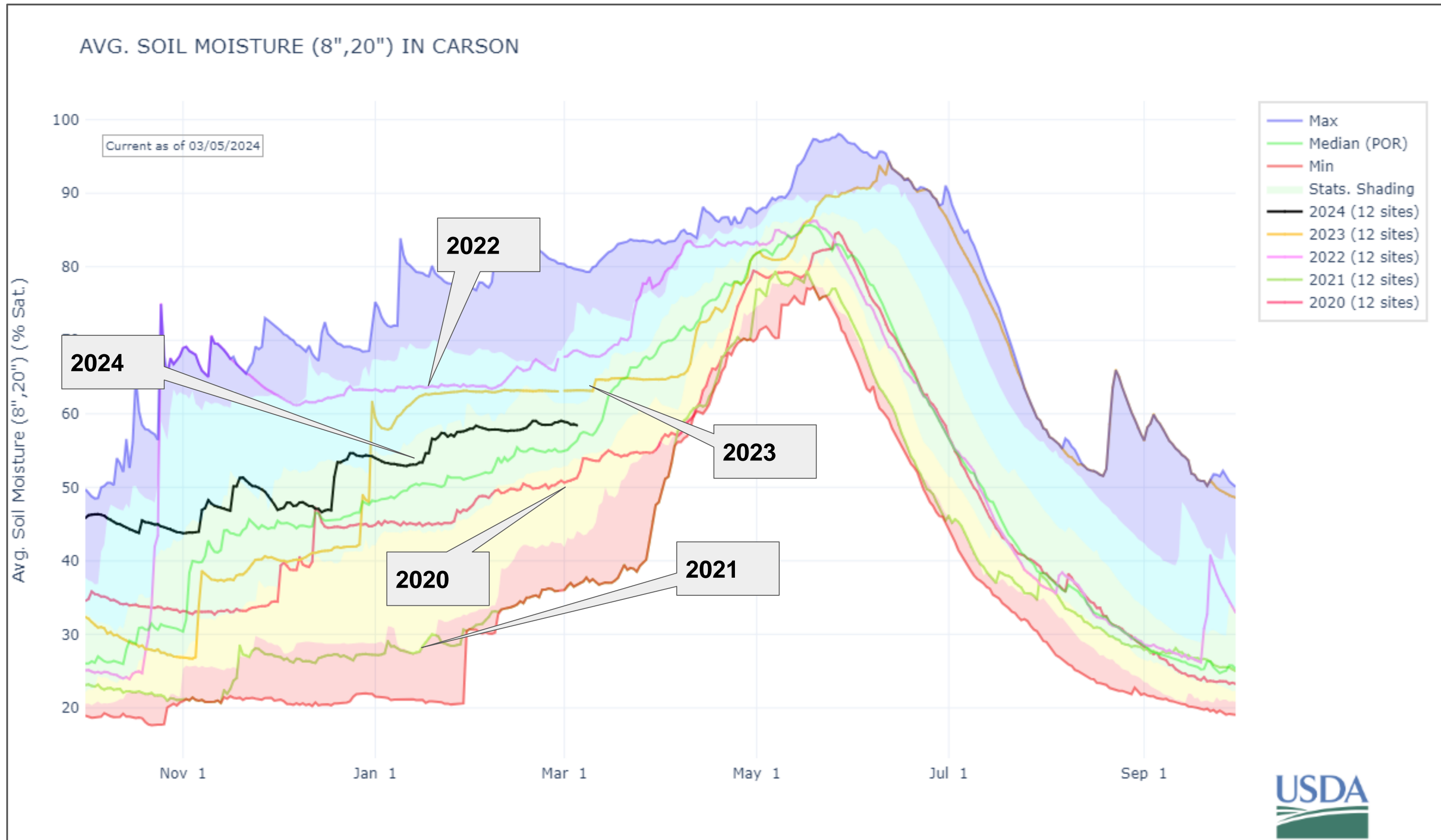
Snow Water Equivalent from NOAA's NOHRSC

Snow Water Equivalent from NOAA's NOHRSC





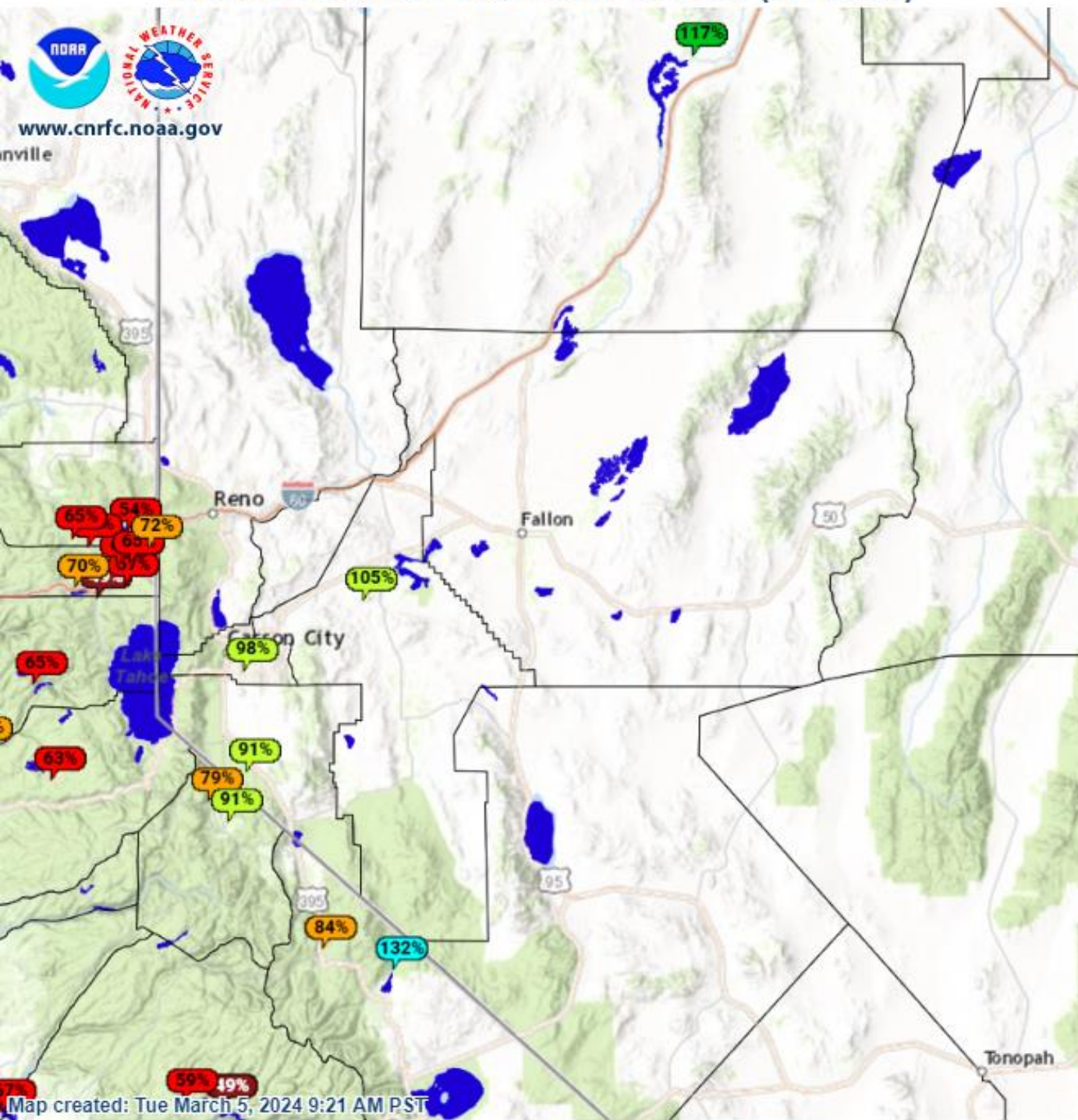
# Carson Soil Moisture (From SNOTEL)



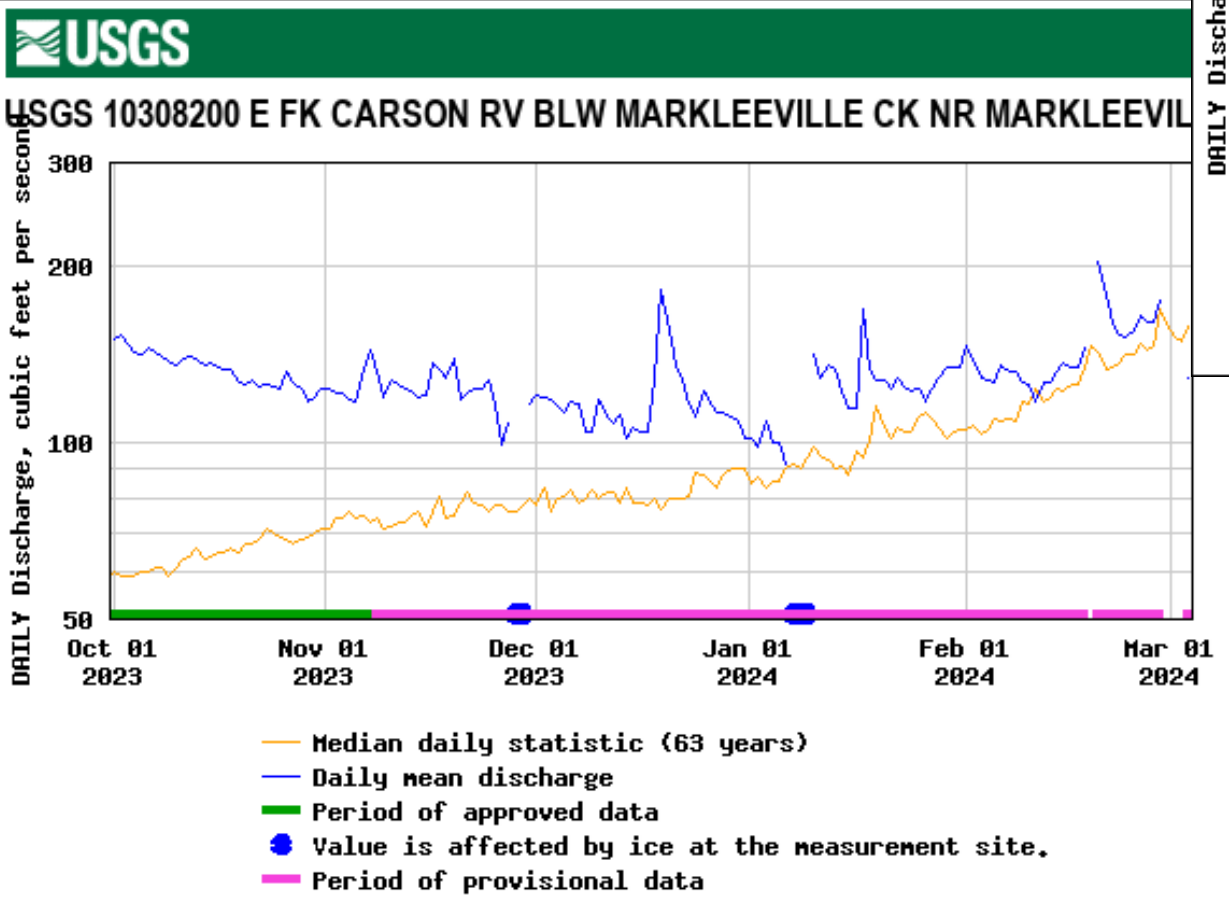
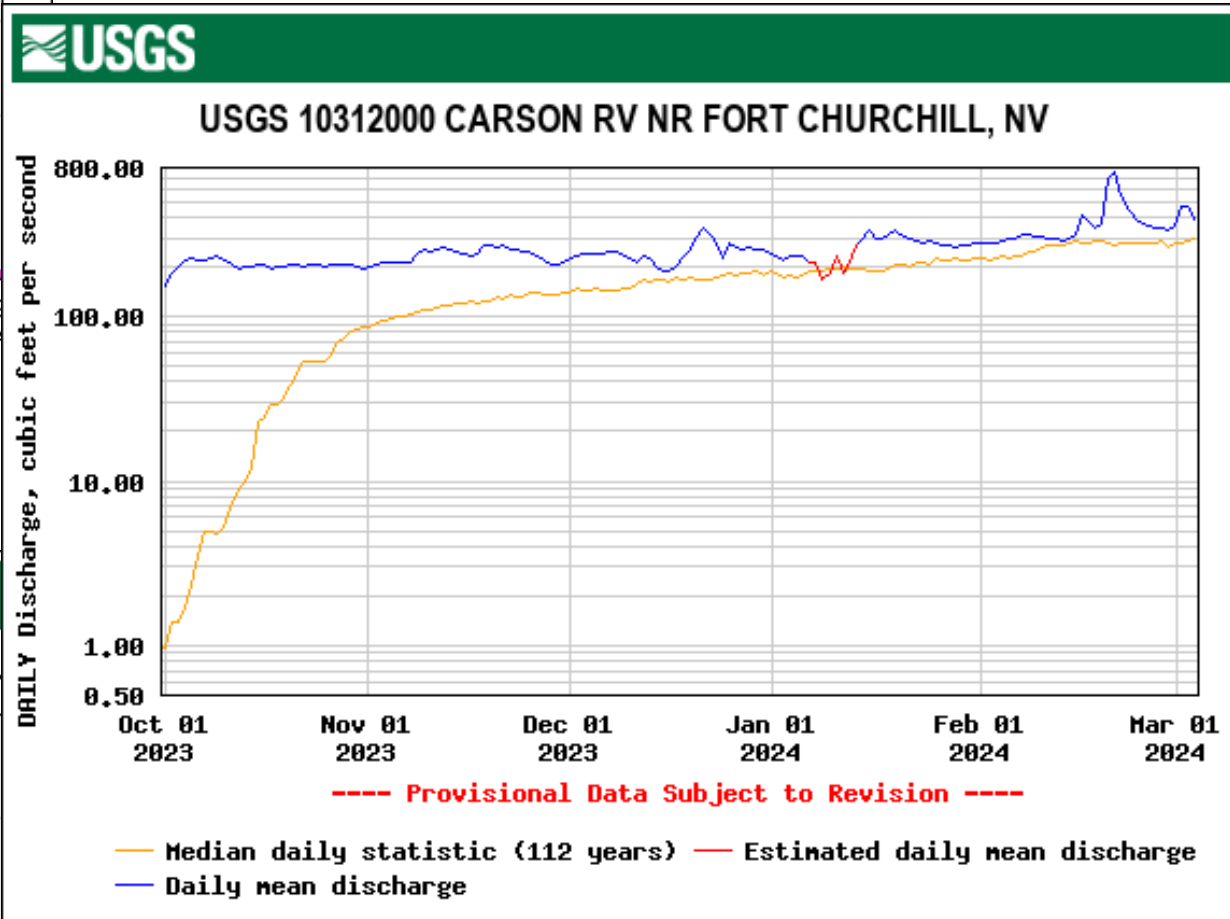
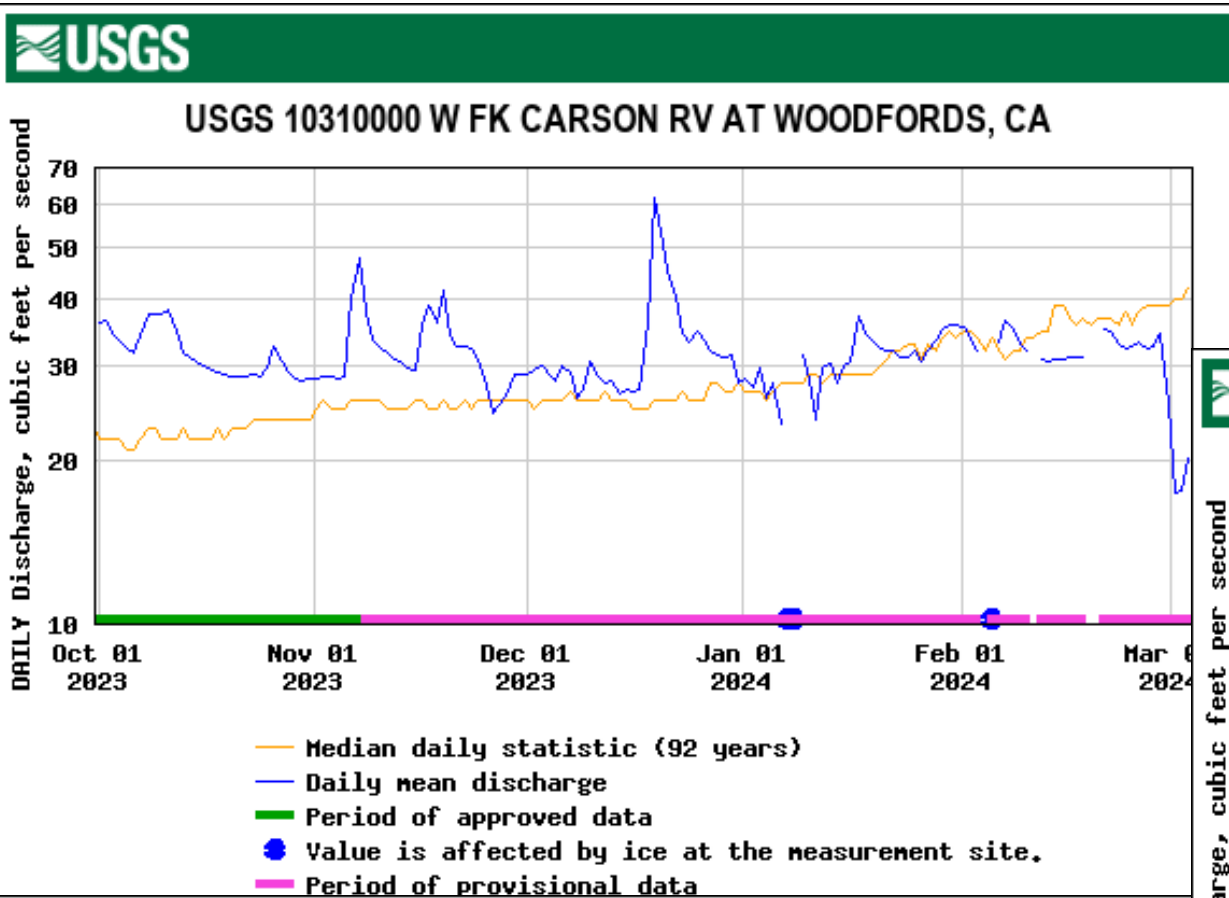


# Observed Streamflows

Observed Water Year Flow To Date (WY2024)



Valid: Mon Mar 4, 2024 at 4:00 AM PST

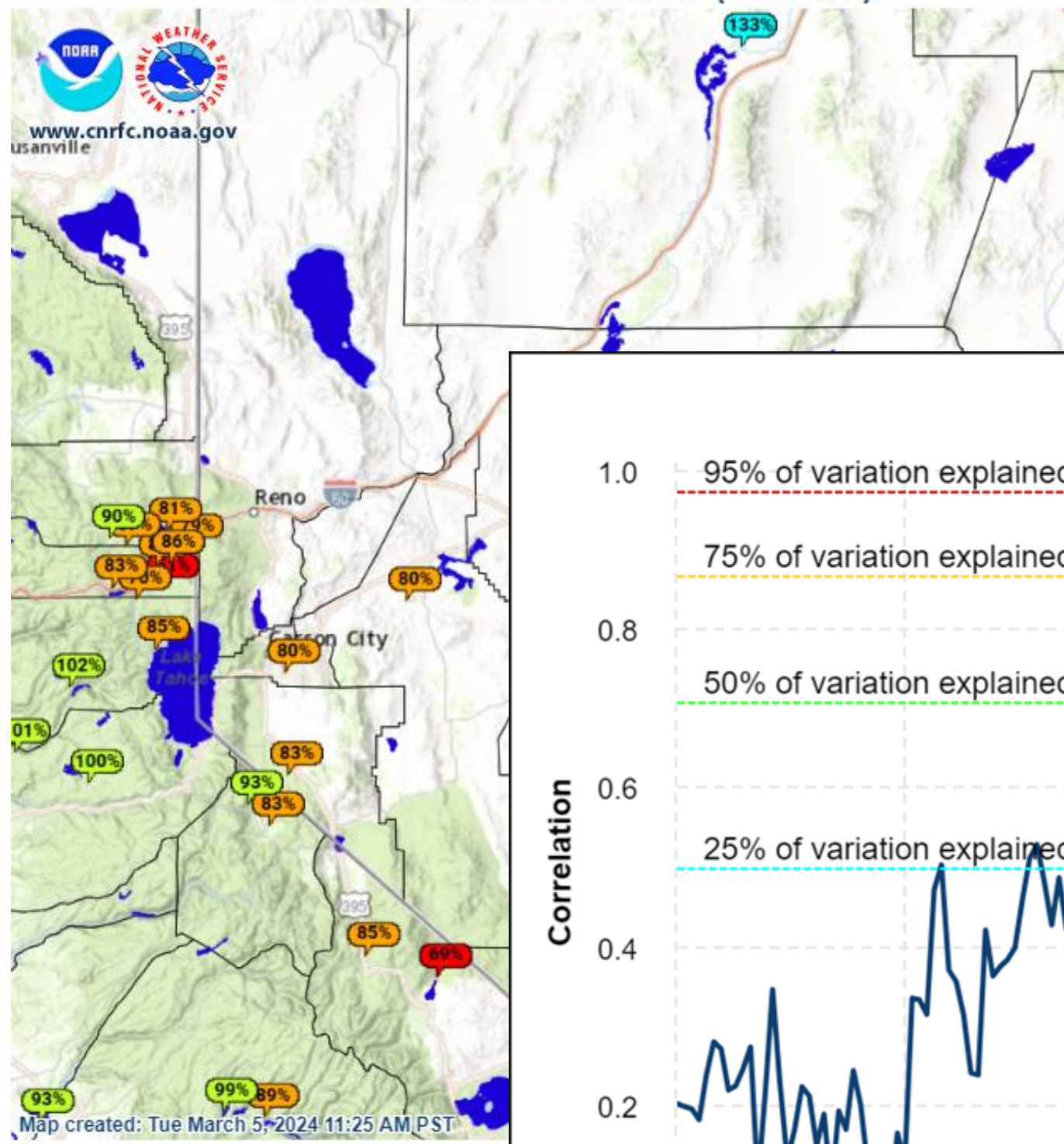




# April-July 2024 Water Supply Forecasts

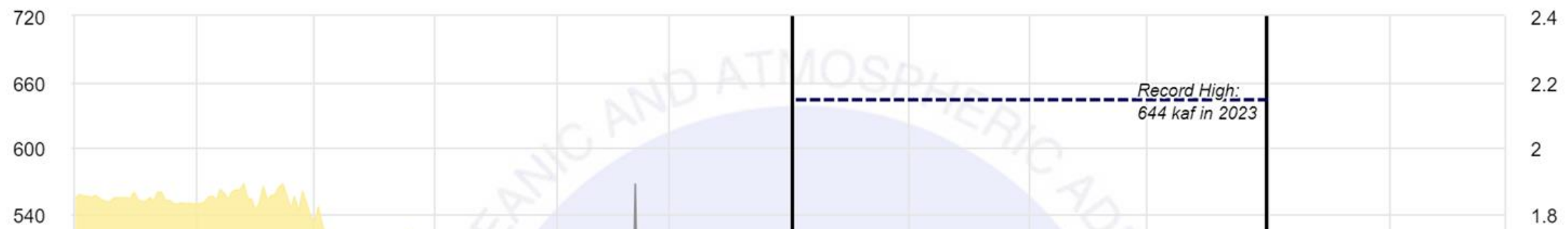
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Reno, NV  
Wednesday, March 6

### Forecast Seasonal Volume (WY2024)

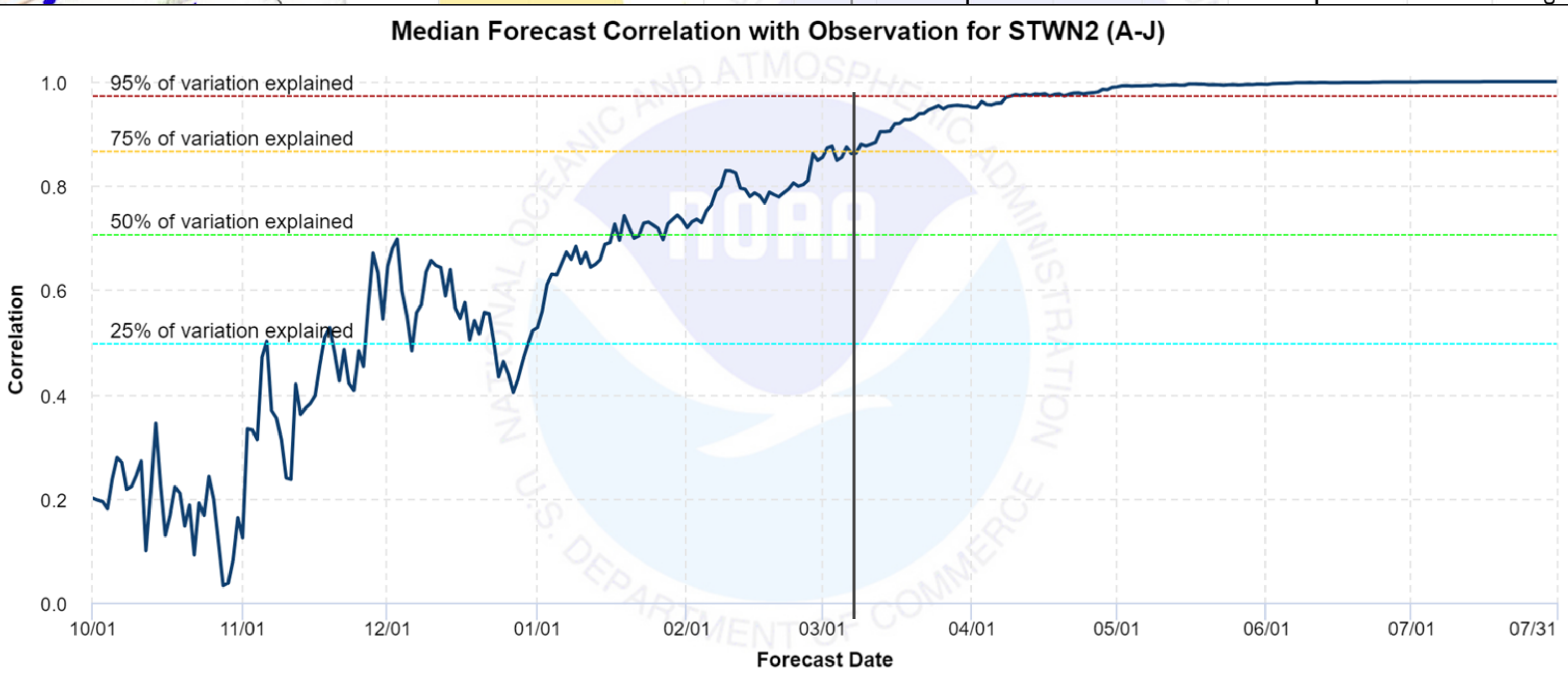


**CARSON - CARSON CITY, NR (STWN2) 03/05/2024**  
Median Forecast: **141 kaf** | **80% of Mean** | **109% of Median**

Created: 03/05/2024 at 09:50 AM PST



### Median Forecast Correlation with Observation for STWN2 (A-J)



|               |            |       |
|---------------|------------|-------|
| Extreme Below | Much Below | Below |
| 50%           | 70%        |       |

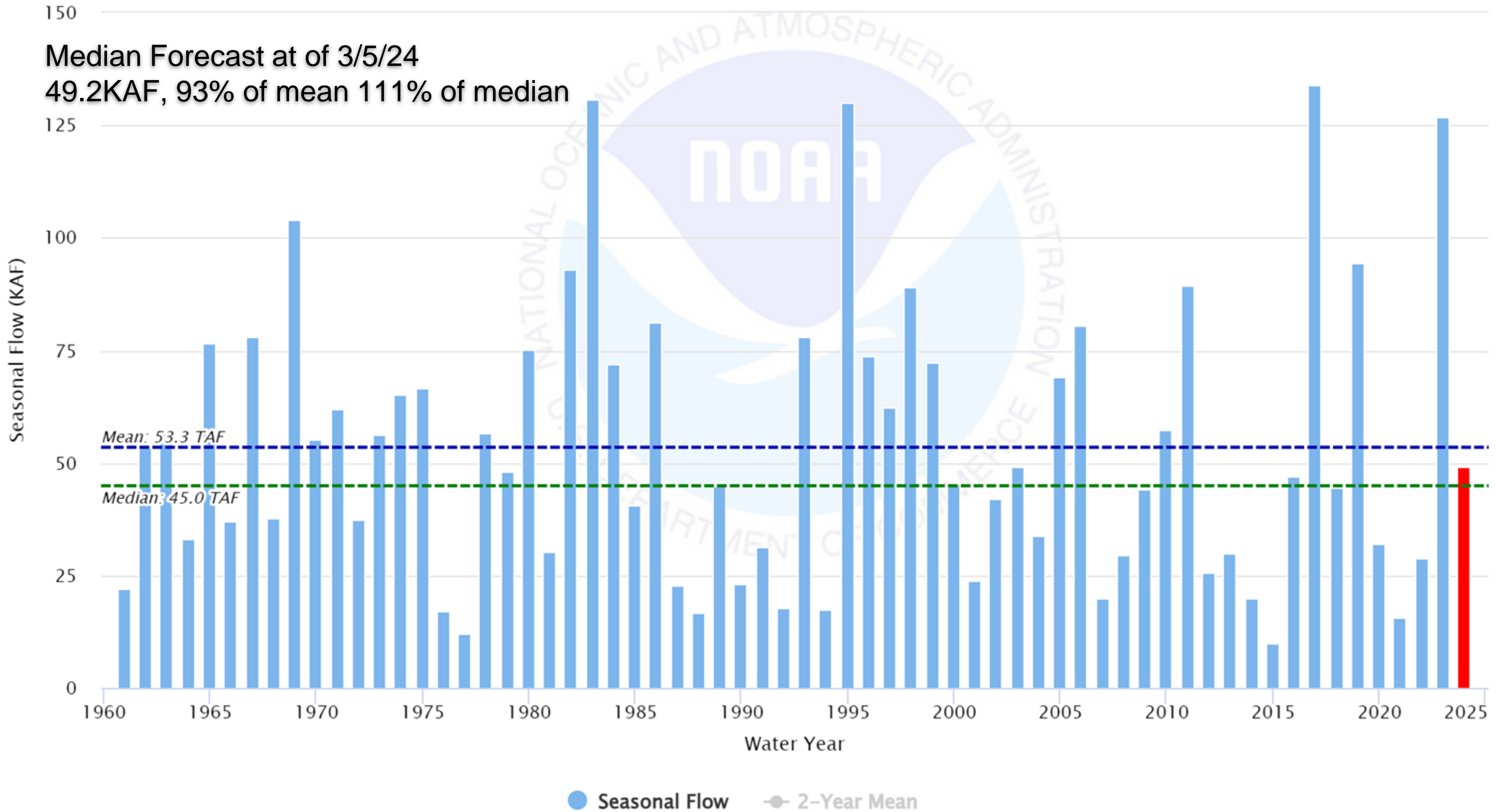


# West Fork of Carson April-July Median Forecast

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Reno, NV  
Wednesday, March 6

### Seasonal (Apr-Jul) Historical Flow for WOOC1

Median Forecast at of 3/5/24  
49.2KAF, 93% of mean 111% of median





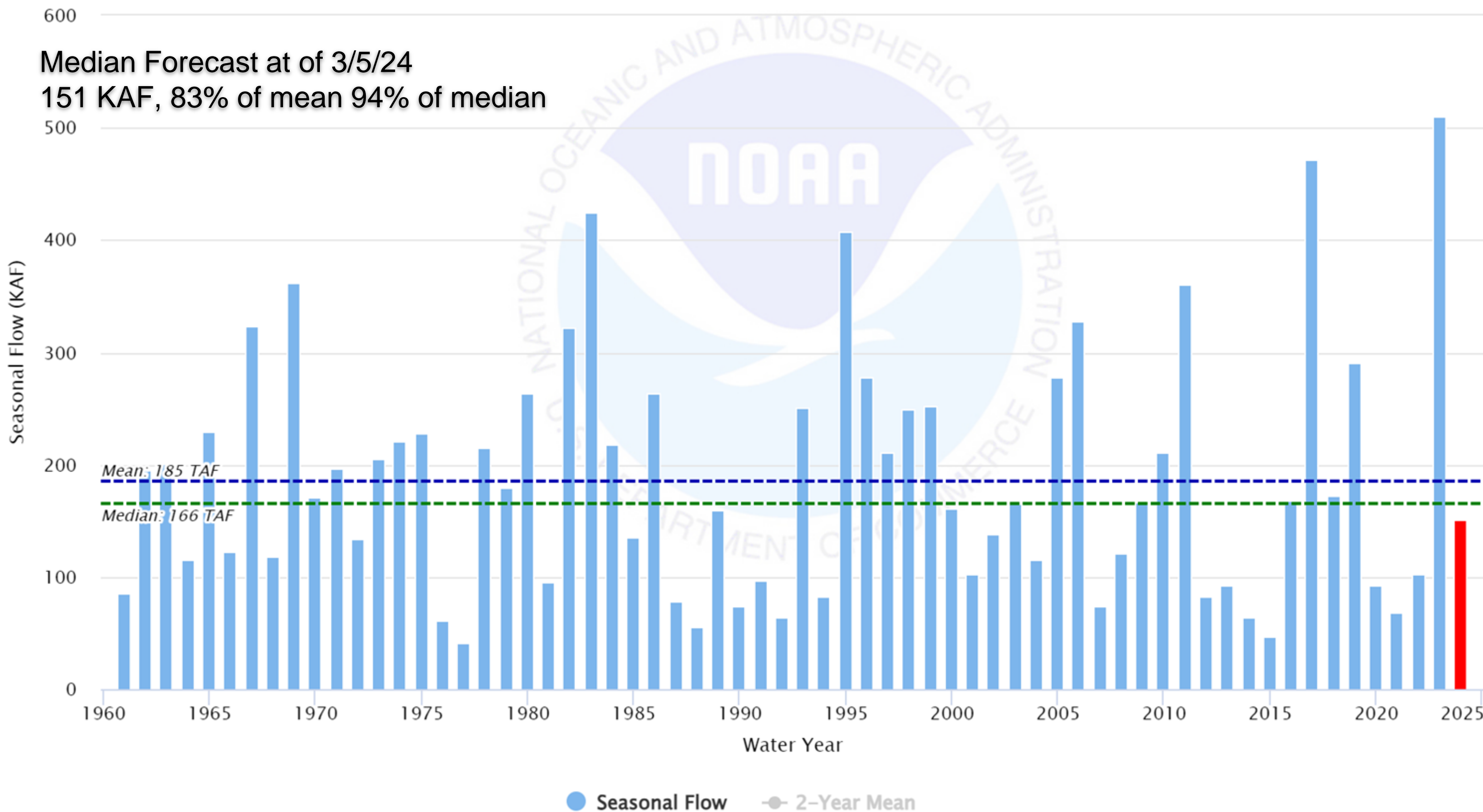


# East Fork of Carson April-July Median Forecast

Weather Forecast Office  
Reno, NV  
Wednesday, March 6

### Seasonal (Apr-Jul) Historical Flow for CEMC1

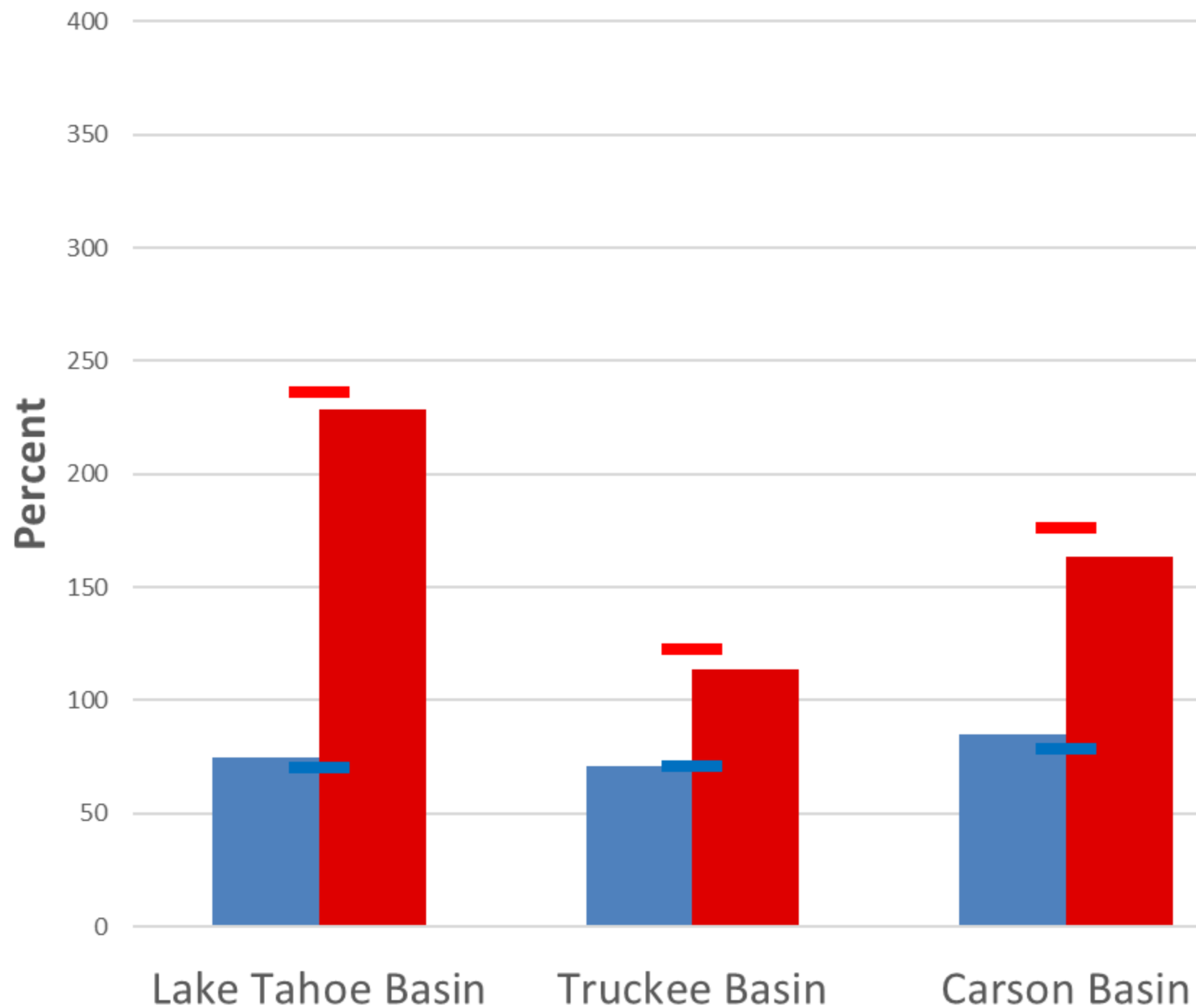
Median Forecast at of 3/5/24  
151 KAF, 83% of mean 94% of median



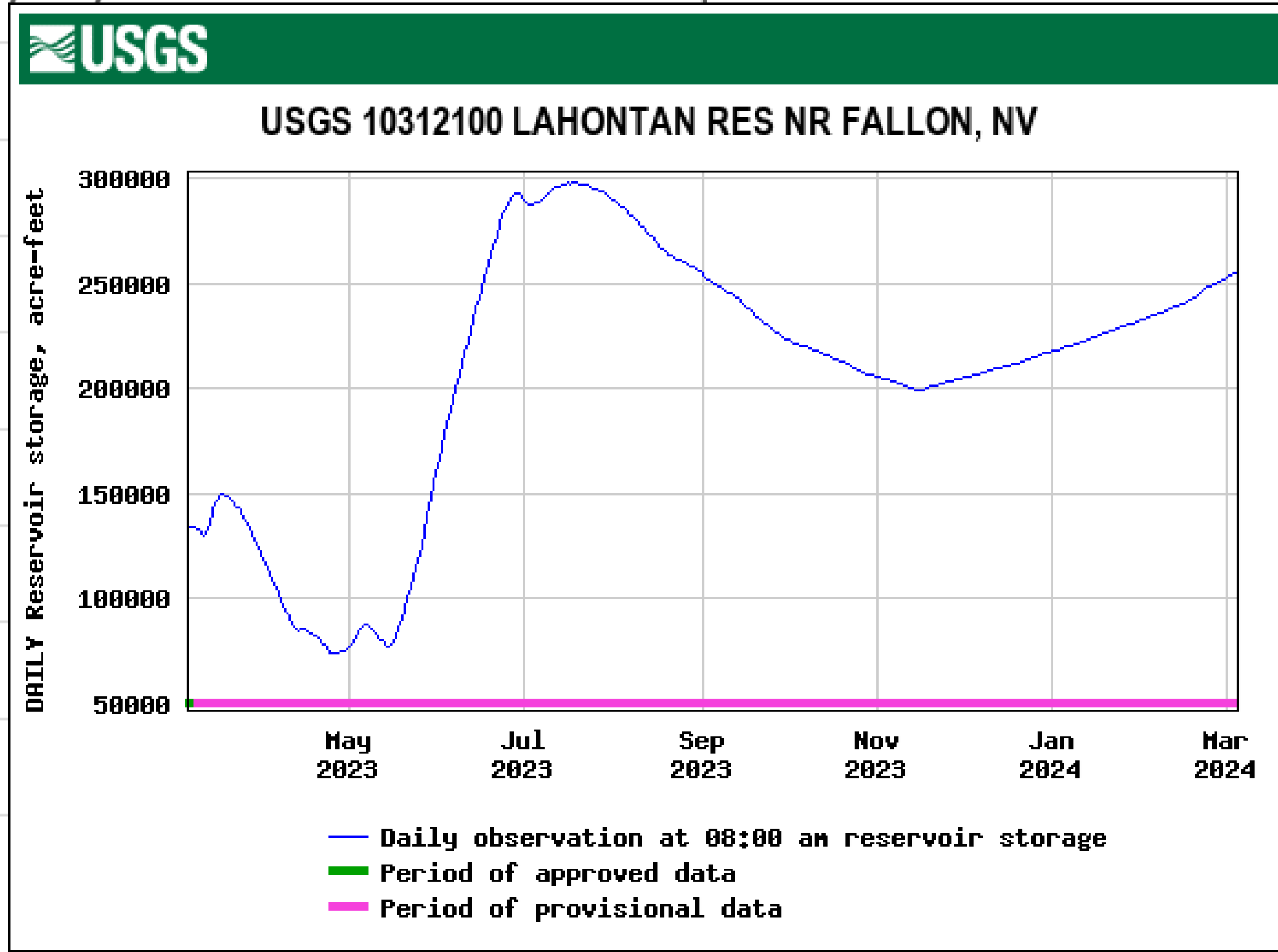


# Reservoir Storage

## Reservoir Storage as of 2/28/2024



■ % Capacity   
 ■ % Median   
 — % Capacity Last Month   
 — % Median Last Month

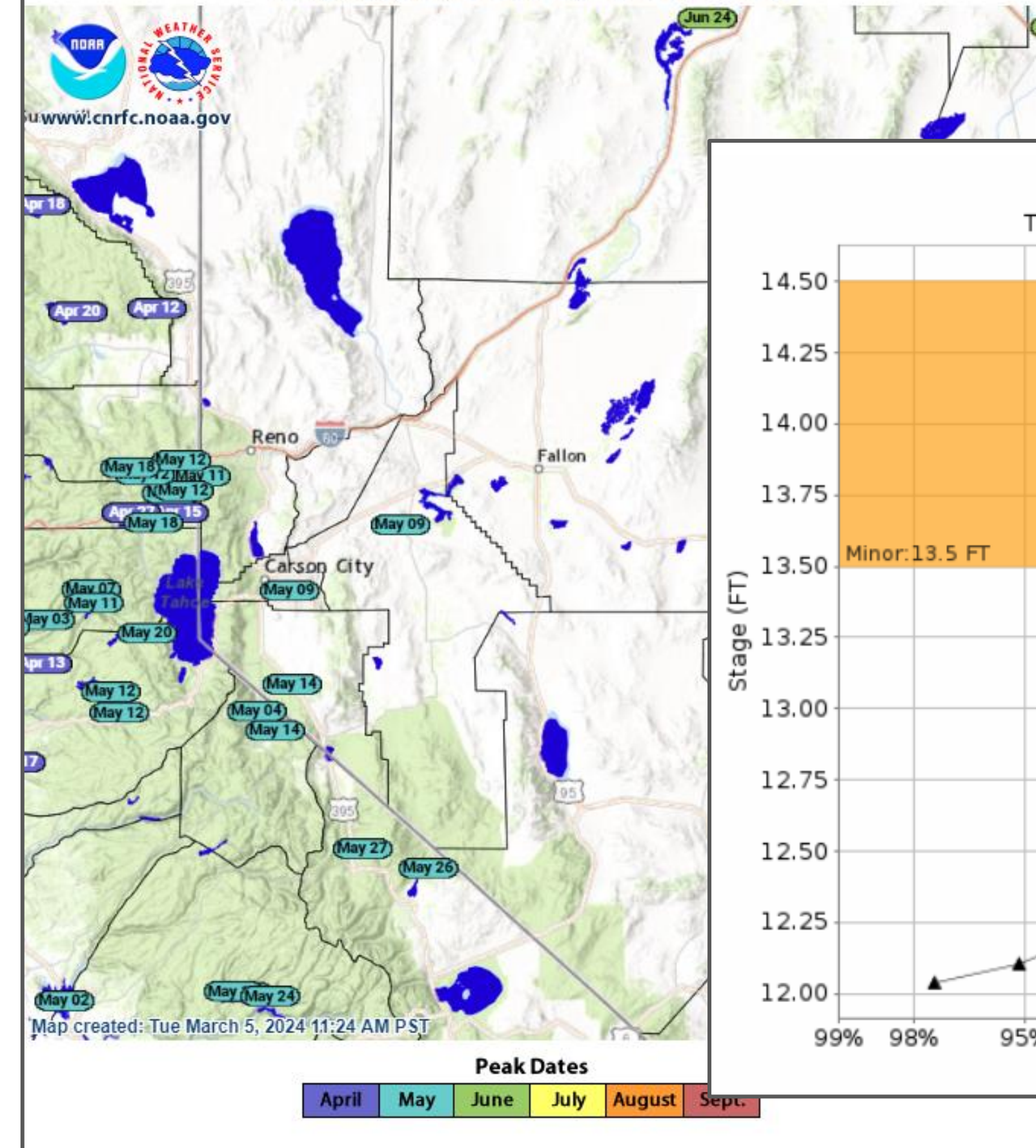




# Runoff timing and Flood Risk

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Wednesday, March 6

## Forecast Date of Peak Flow/Inflow

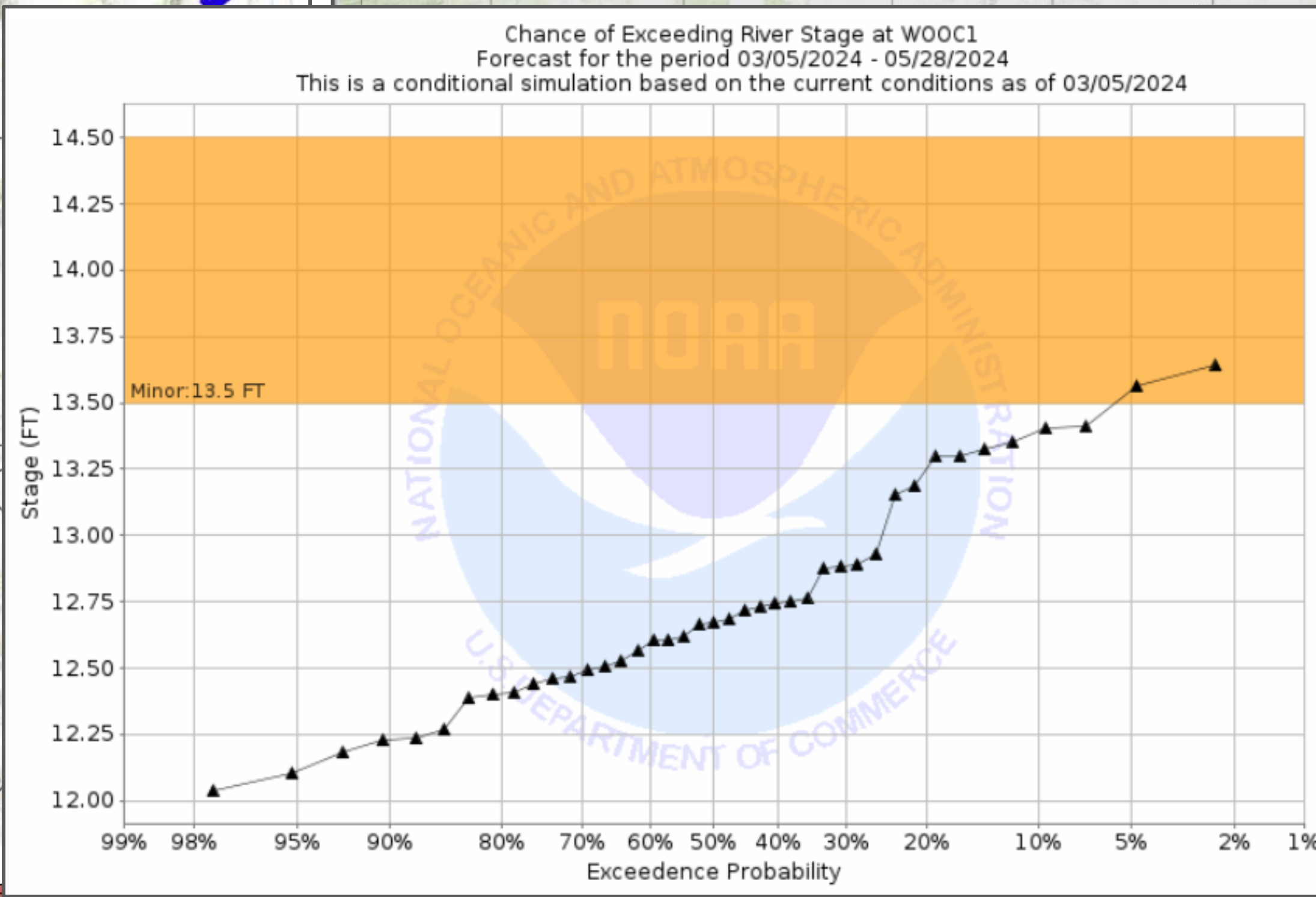


River Observations | River Forecasts | Long-Range Flood Risk | Precipitation | Download

Auto Refresh: OFF

Print this map | Permalink | BOOKMARK |

Greater than: 50% chance of exceeding river flood levels during Mar-Apr-May



- > 50% Major Flooding
- > 50% Moderate Flooding
- > 50% Minor Flooding
- < 50% Chance of Flooding
- Long-Range Flood Risk Not Calculated

Last map update:  
03/05/2024 at 11:38:03 am PST  
03/05/2024 at 19:38:03 UTC

[What is UTC time?](#)  
[Map Help](#)

[Product Description](#)  
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# Contact Info and Any Questions?

Weather Forecast Office  
Reno, NV  
Wednesday, March 6



**Photo: NV  
DOT Reno**

**Plowing Mt  
Rose Highway,  
where 7 FEET  
of snow fell!**

**Tim Bardsley, Senior Service Hydrologist, NWS Reno: [Tim.Bardsley@noaa.gov](mailto:Tim.Bardsley@noaa.gov)**

**Dawn Johnson, Warning Coordination Meteorologist, NWS Reno: [Dawn.Johnson@noaa.gov](mailto:Dawn.Johnson@noaa.gov)**