



Looking Forward- Spring & Summer Outlook

Weather Forecast Office
Reno, NV
Tuesday, April 11

My Mental
State Before
Winter 2023

After
Winter
2023

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Key Points Up Front

Weather Forecast Office

Reno, NV

Tuesday, April 11

Window is rapidly closing on a “soft landing” from this once in a generation & career snowpack.

Flooding of some nature is almost inevitable in Nevada & Eastern Sierra.



Key Points Up Front

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Tuesday, April 11

We really needed March & April to be warmer than it was to more gradually peel off low & mid elevation snow, while sun angle & duration are less vs May/June.



Magnitude of snowpack combined with delayed melt means we'll have big snowpack in place into the heat season.

Odds now favor prolonged high flows on streams and rivers, and at least minor flooding for many areas, May through July.



Key Points Up Front

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Reno, NV

Tuesday, April 11

Some river & stream basins have much higher chances of more impactful flooding.

Keeping an eye on the Walker, Carson, and Humboldt, especially if freakout scenarios of unusual heat and/or heavy rainfall occur.



Unusual and unpredictable impacts can occur with little to no warning.

Examples: Big landslides & flooding in areas not accustomed to it.



Key Points Up Front

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Reno, NV

Tuesday, April 11

Next couple weeks will be critical for low elevation snow melt and potential flooding in unusual places.

Rises from yesterday's warmth were pretty impressive.

If we can get through the next couple weeks, we will settle more into the expected flooding impact areas, but certainly not to eliminate a few later surprises.

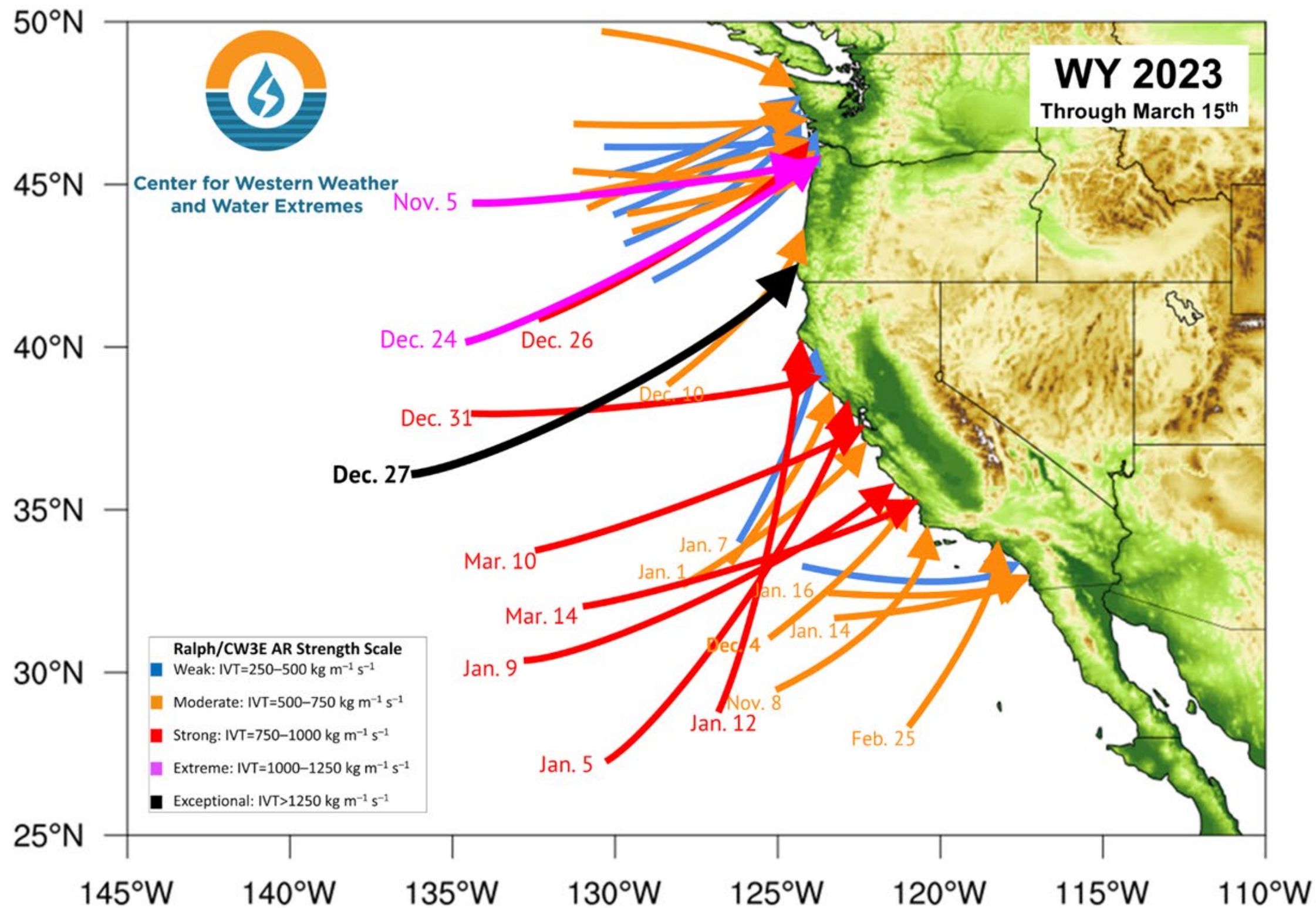


Anticipate severely delayed mountain summer recreation and road openings, but also a big delay in mountain fire season.

However Nevada fires could be more active than normal mid-late summer, which is typical when we exit a drought.



Winter 2022-23- Wet & Prolonged Cold

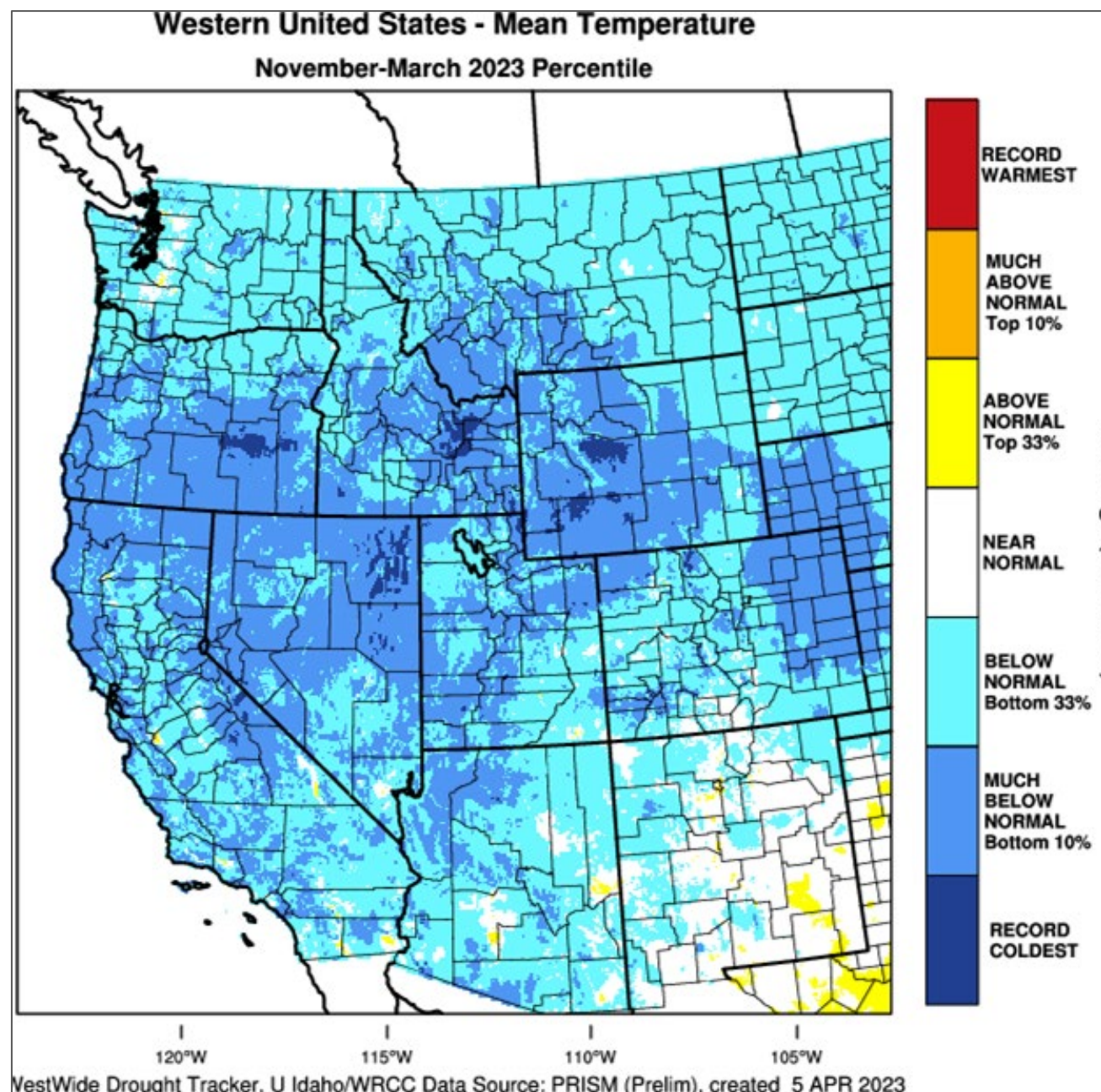
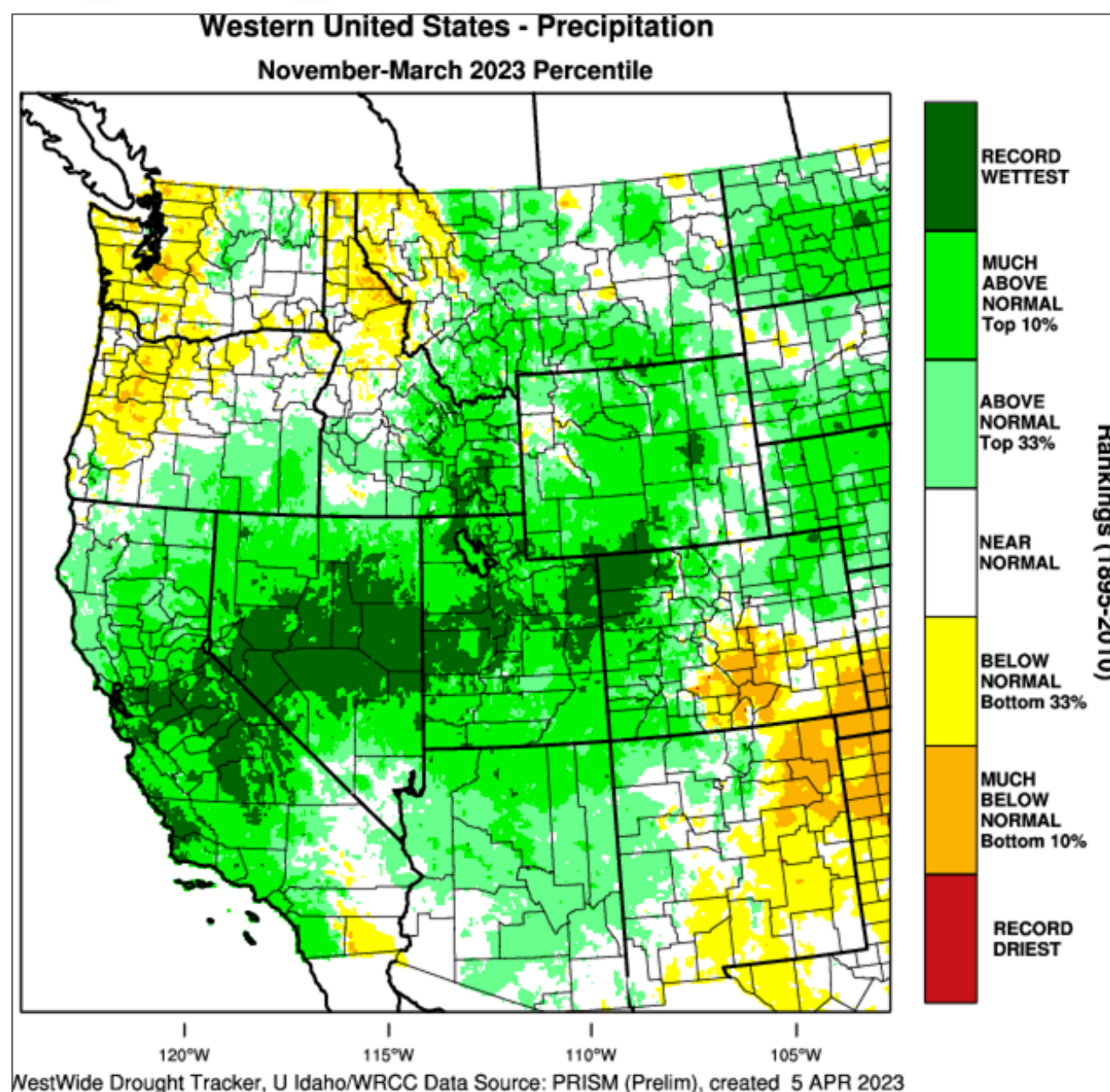


Several strong to extreme atmospheric rivers made landfall into California. These heavy precipitation storms combined with no rain shadow & colder than normal temperatures led to a historic snowpack.



Winter 2022-23- Wet & Prolonged Cold

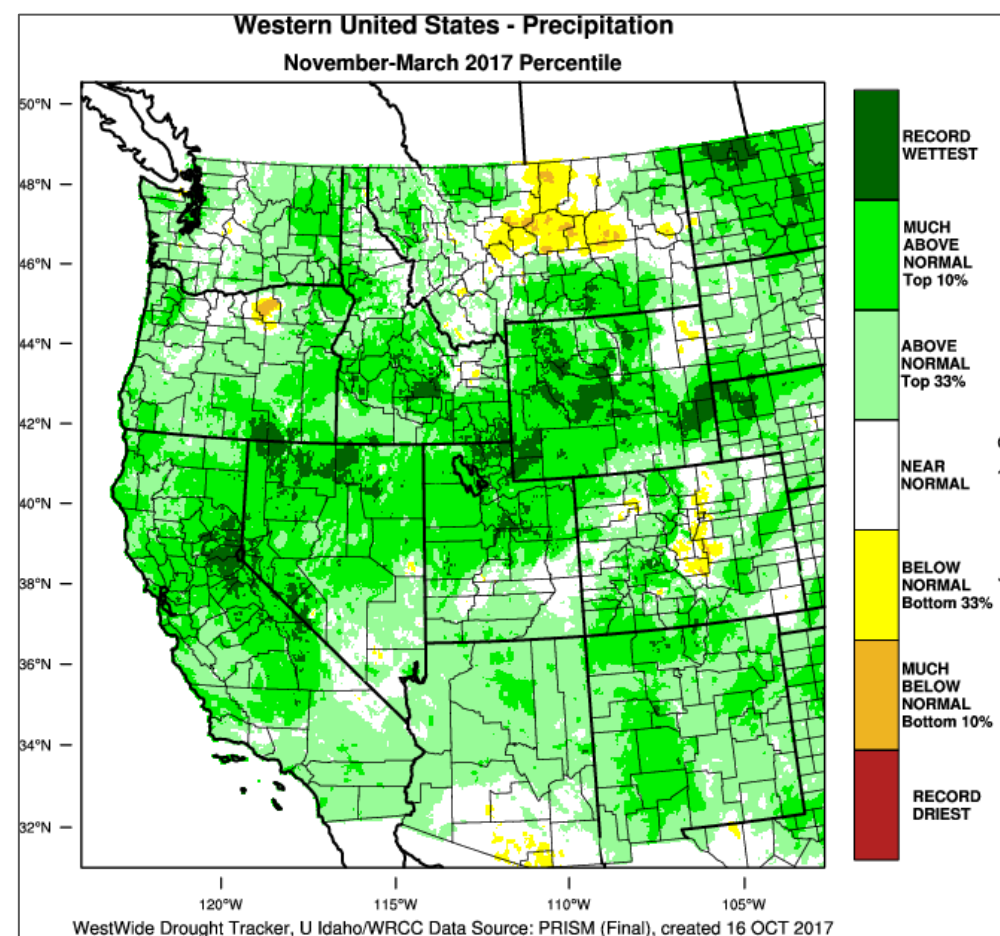
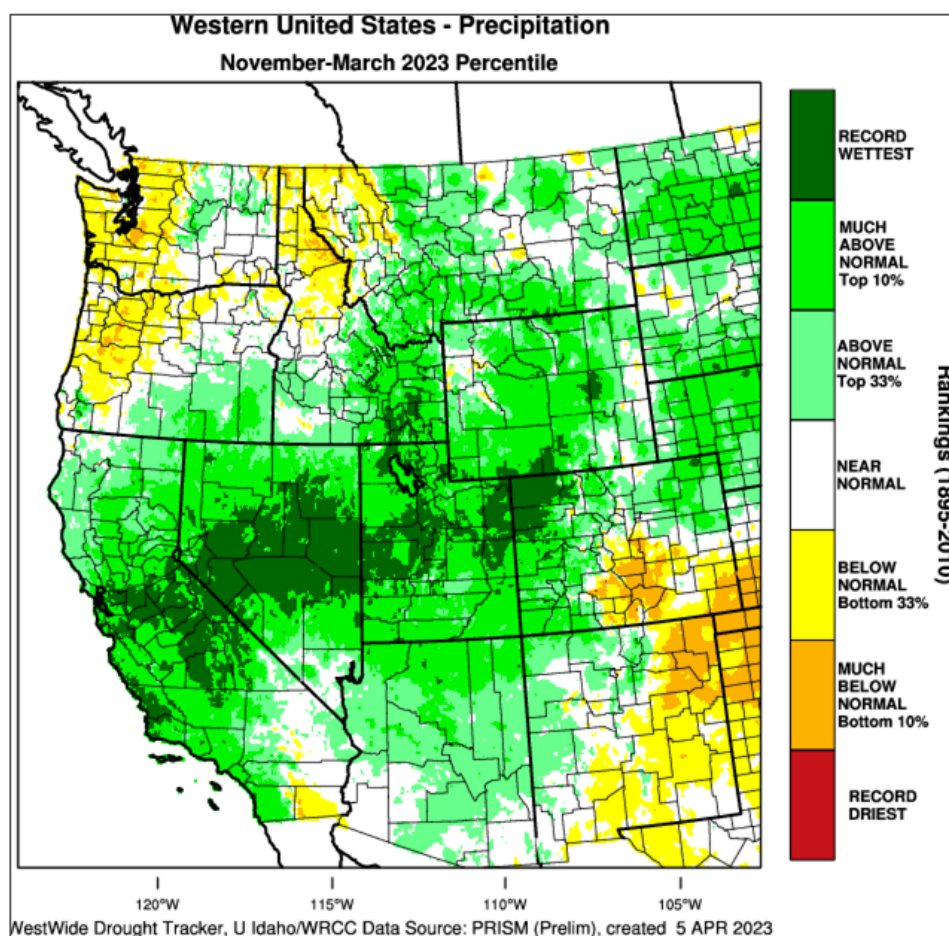
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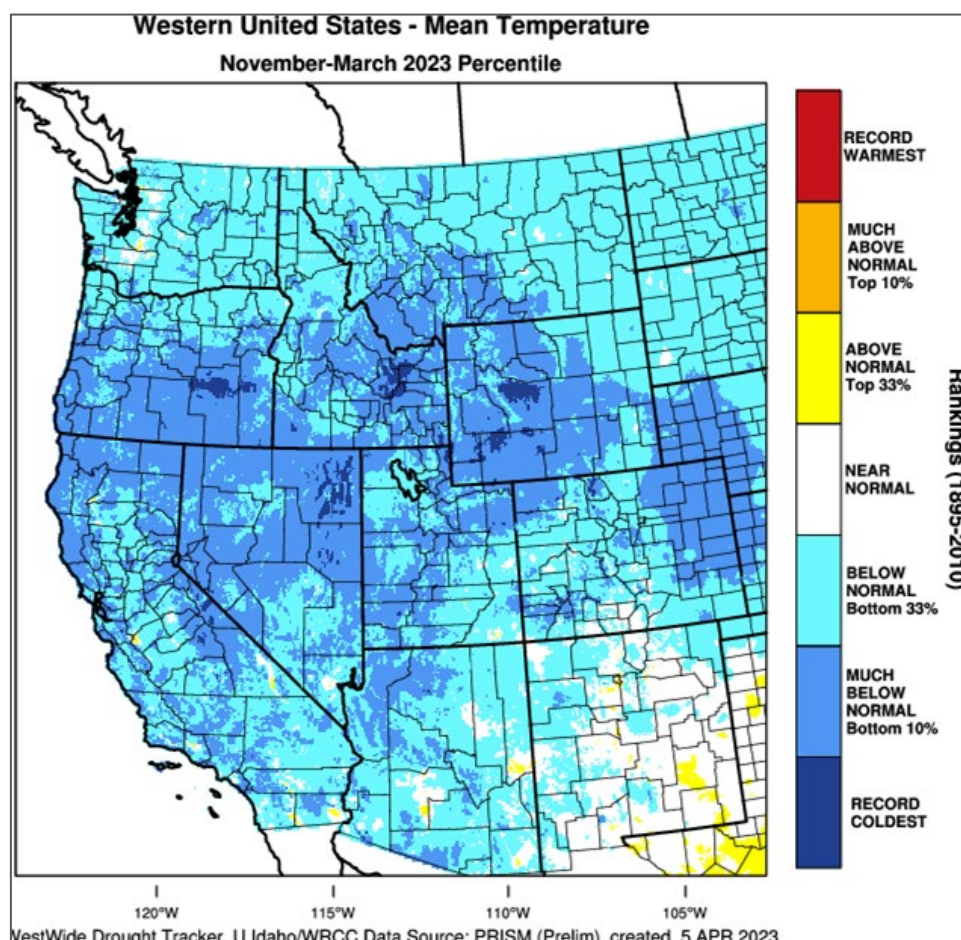
**Number of days
with high temp
of 65+ at Reno
11/1 - 4/5.
First time in
recorded history
since 1894!**



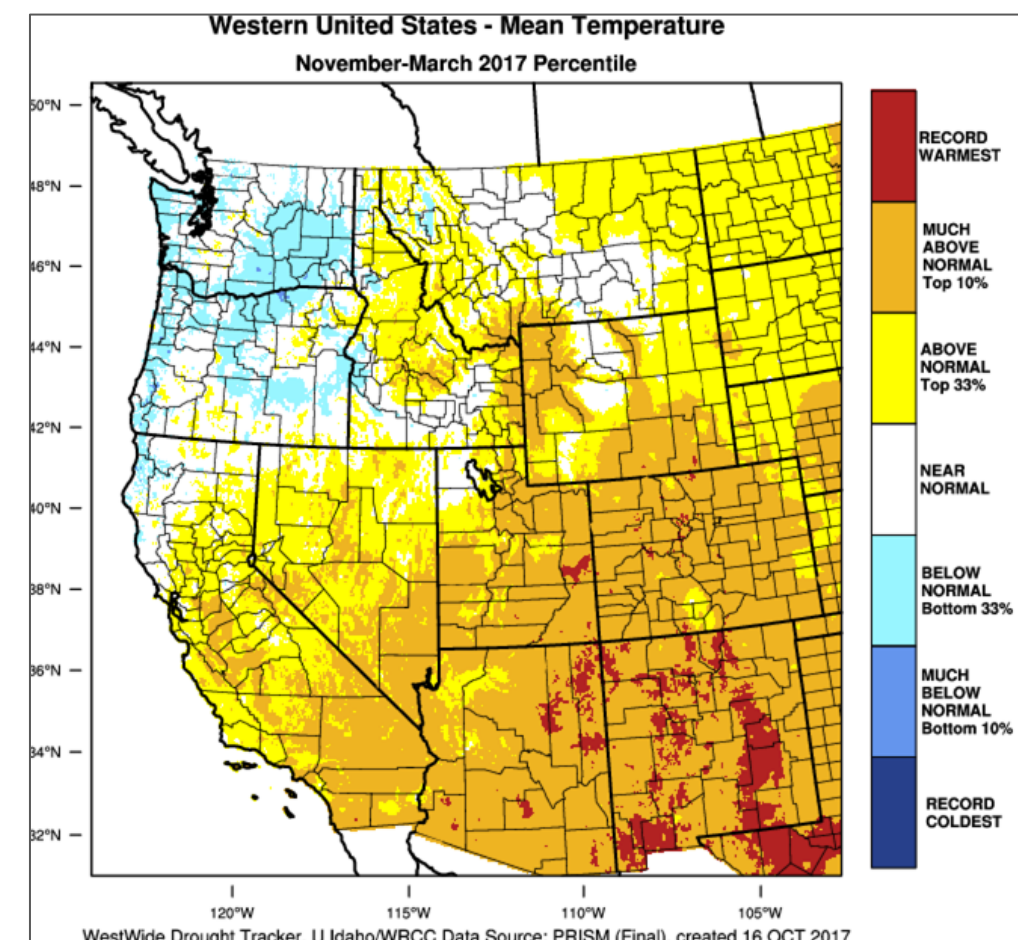
Two Super Wet Years: 2023 vs 2017

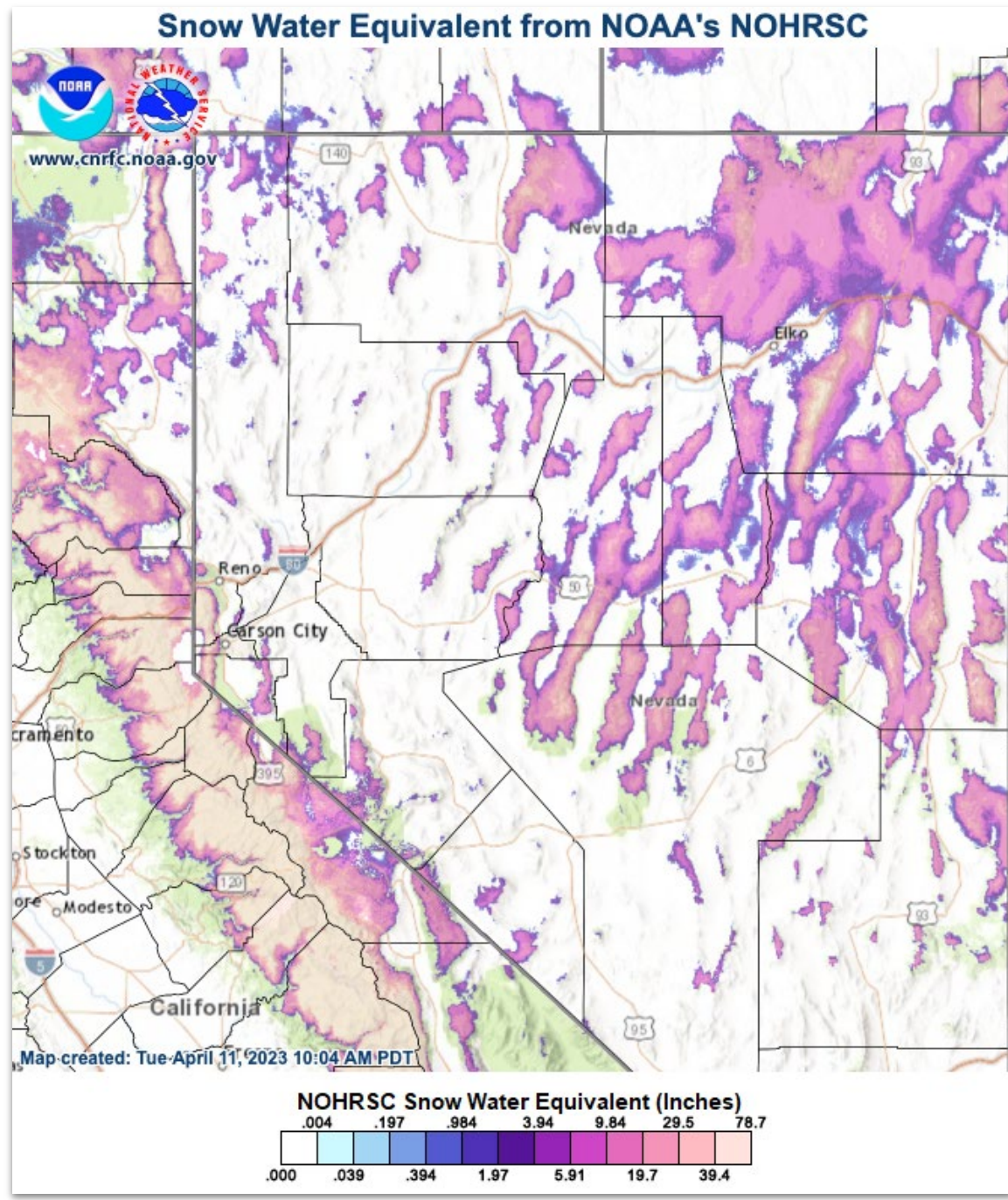


2023

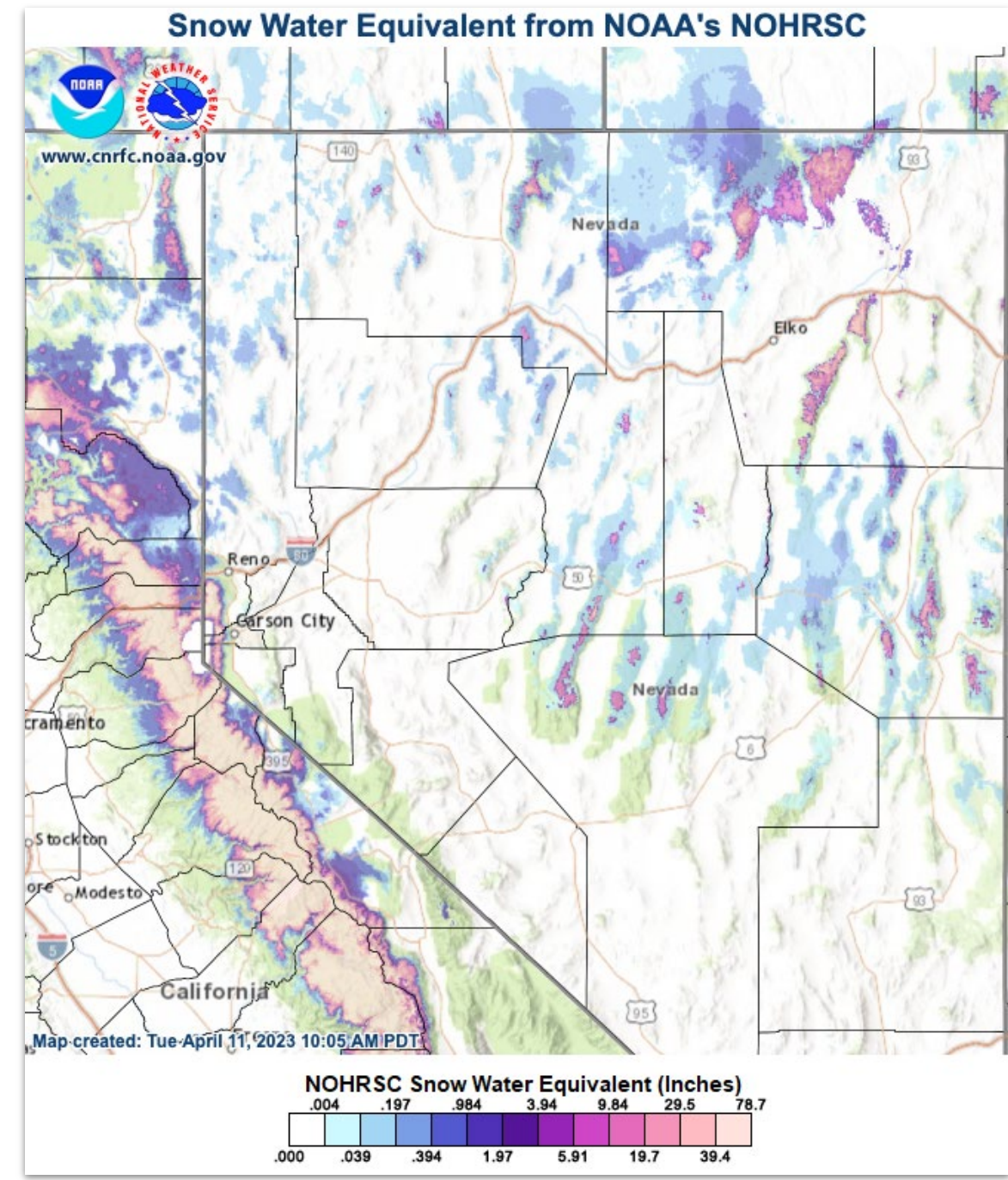


2017





April 10, 2023



April 10, 2017

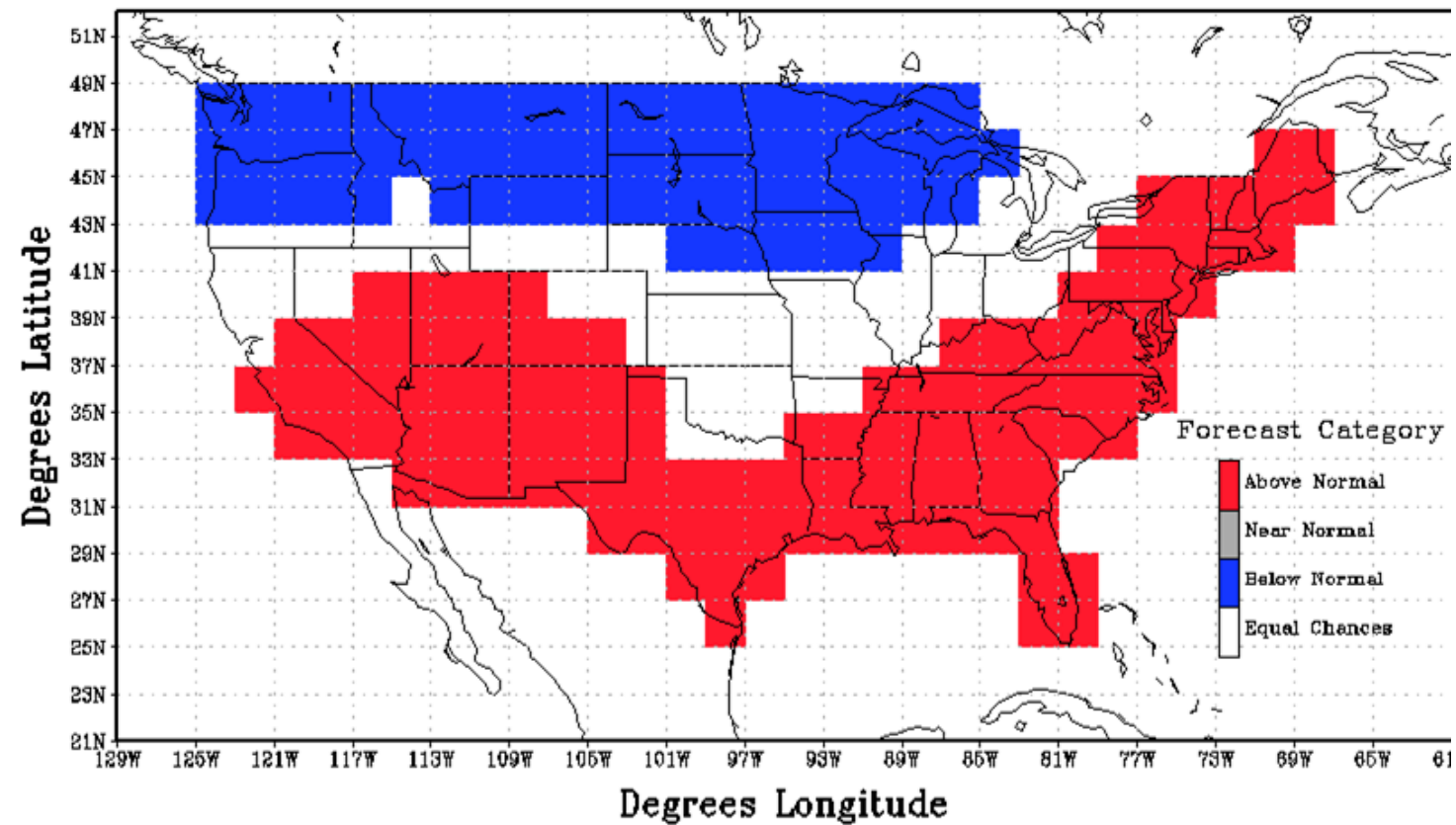
- Unusual amounts of snow persisting in unsampled elevations below most SNOTELs.
- Ups to odds of abnormal flows on smaller streams and creeks, and rises on terminal lakes.
- Introduces a large “known unknown” into streamflow forecasts.
- ASO flights have suggested way more snow in low elevations than water models earlier estimated.
- Most recent RFC models have attempted to factor this in.



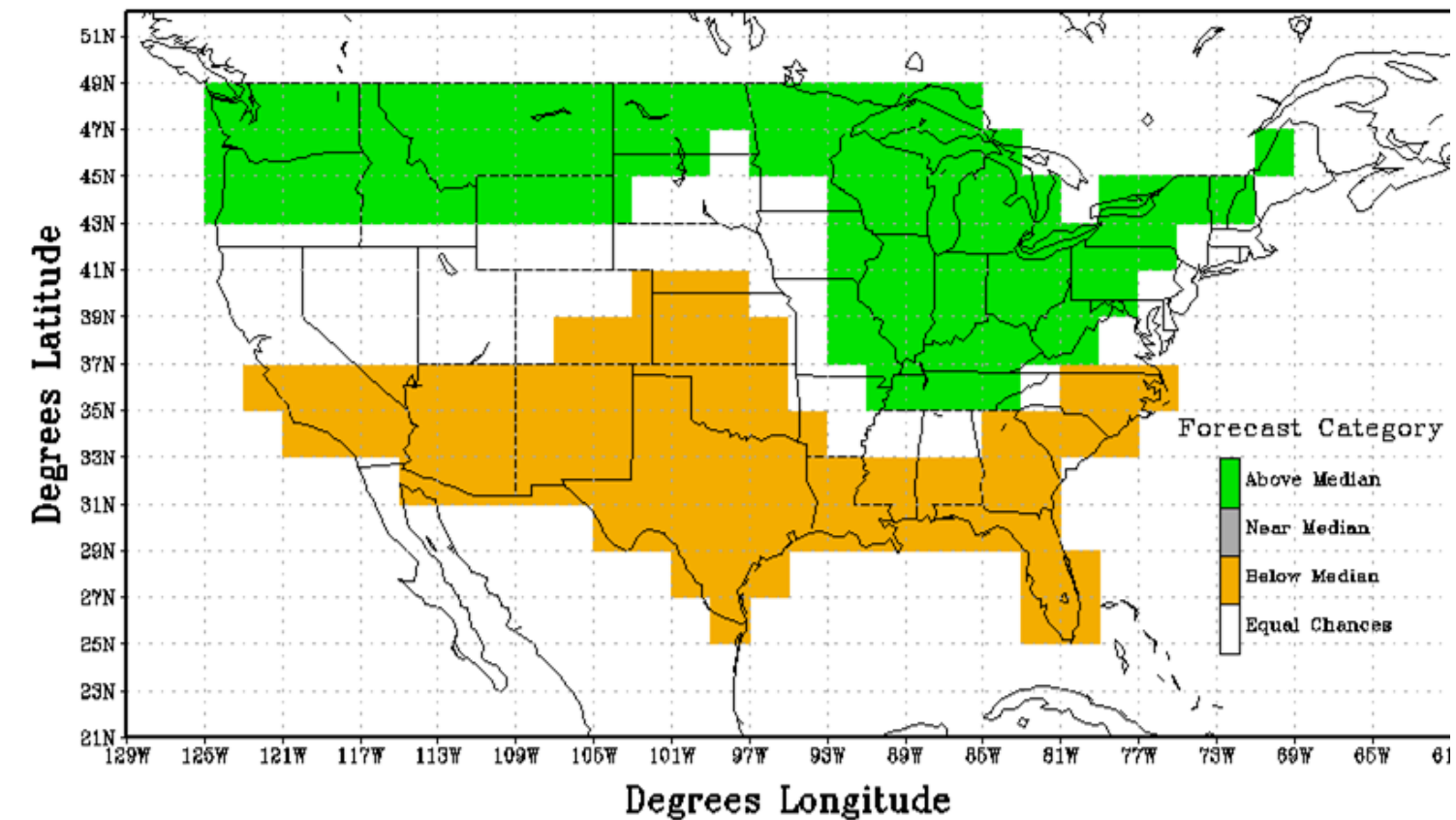
Massive Climate Anomaly How Did Forecasts Do?

Weather Forecast Office
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Categorical Temperature Official Forecast
Issued: Nov 2022 Valid: Dec-Jan-Feb 2022-23

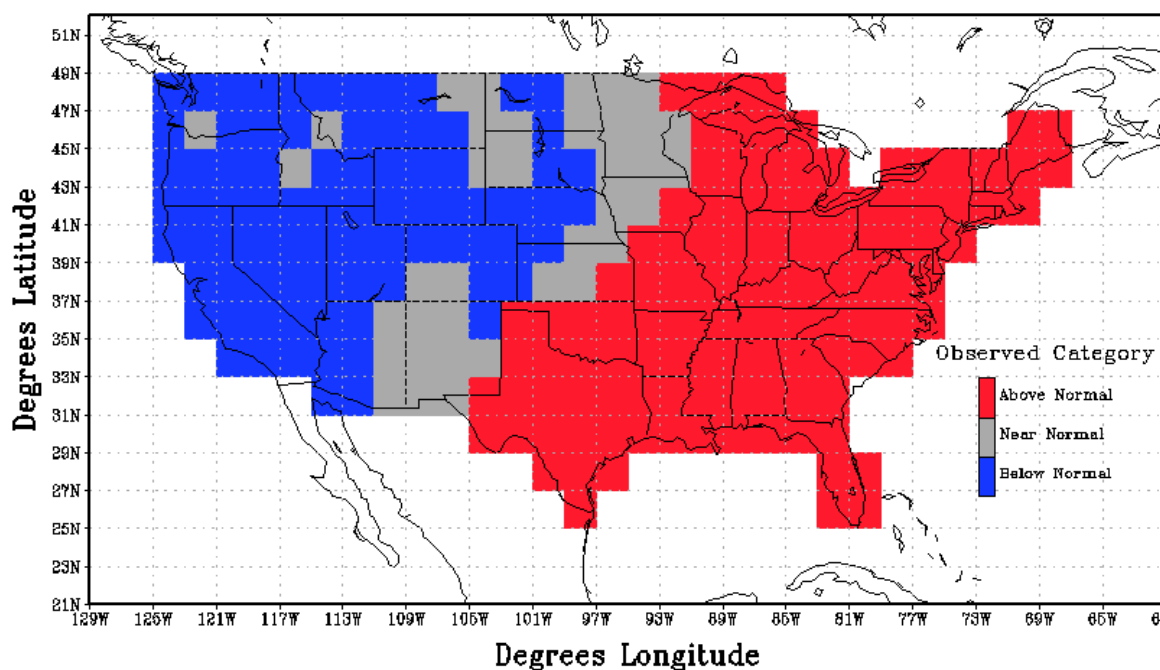


Categorical Precipitation Official Forecast
Issued: Nov 2022 Valid: Dec-Jan-Feb 2022-23

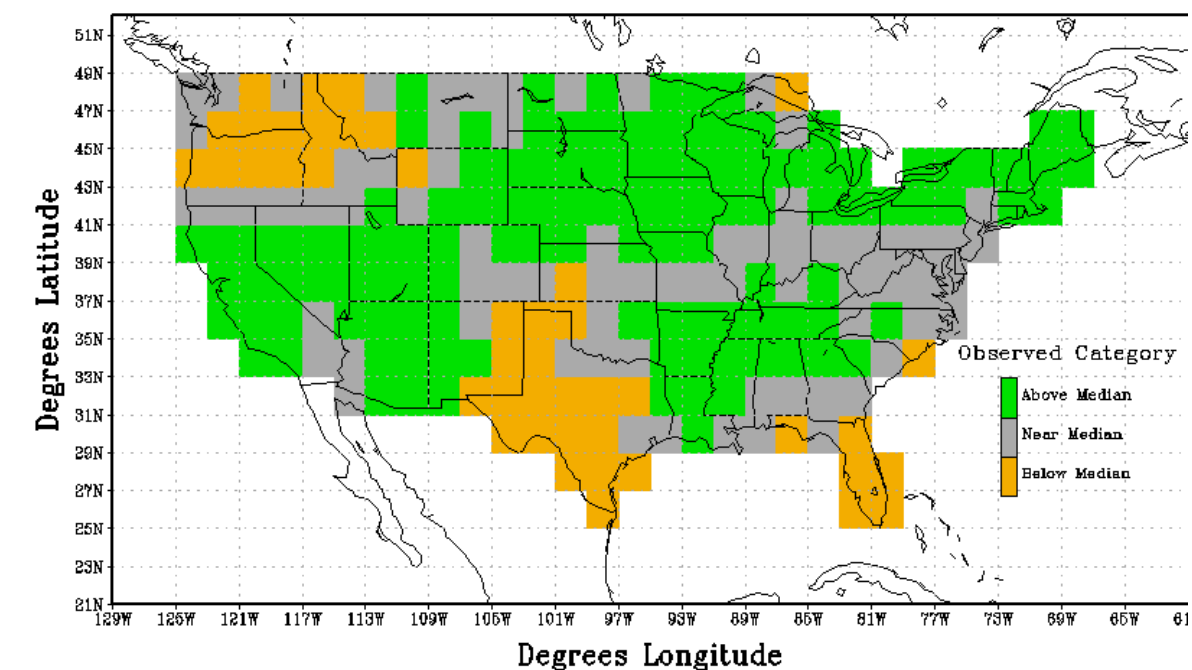


How it started.

Categorical Temperature Observations
Valid: Dec-Jan-Feb 2022-23

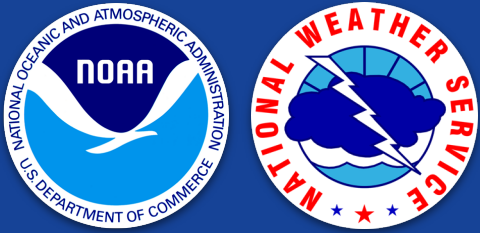


Categorical Precipitation Observations
Valid: Dec-Jan-Feb 2022-23

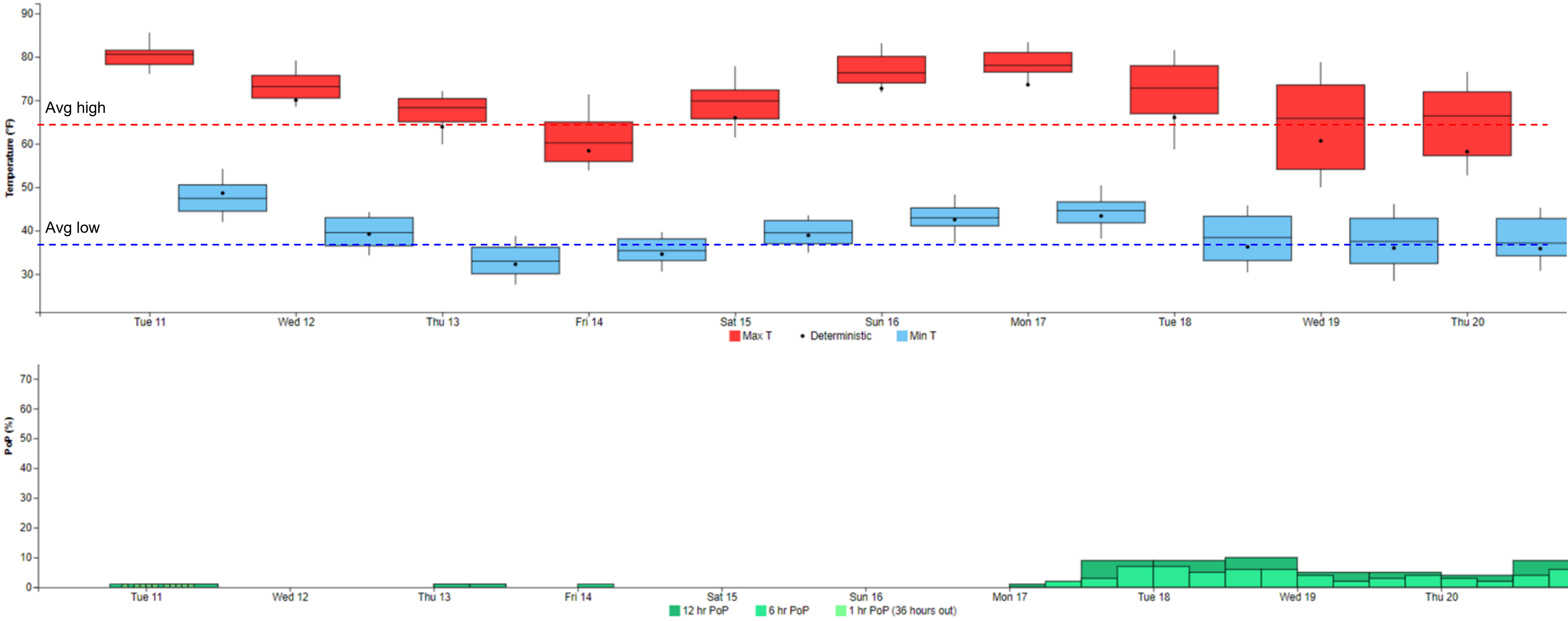


How it's going.

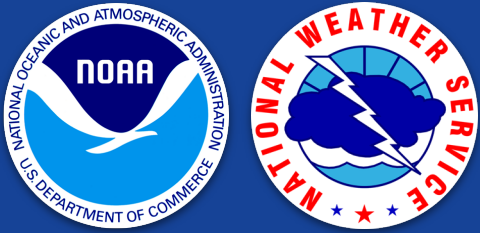
Seasonal forecasts: too good to ignore, but not good enough to



Next 7-10 Days: Dry With Up & Down Temps



Forecast guidance for Reno, as of 4/10. The swings in temperatures & no big rain events are a good thing to more gradually melt of snowpack at the lower elevations and edges.



Week Two: No Big Warmups Anticipated

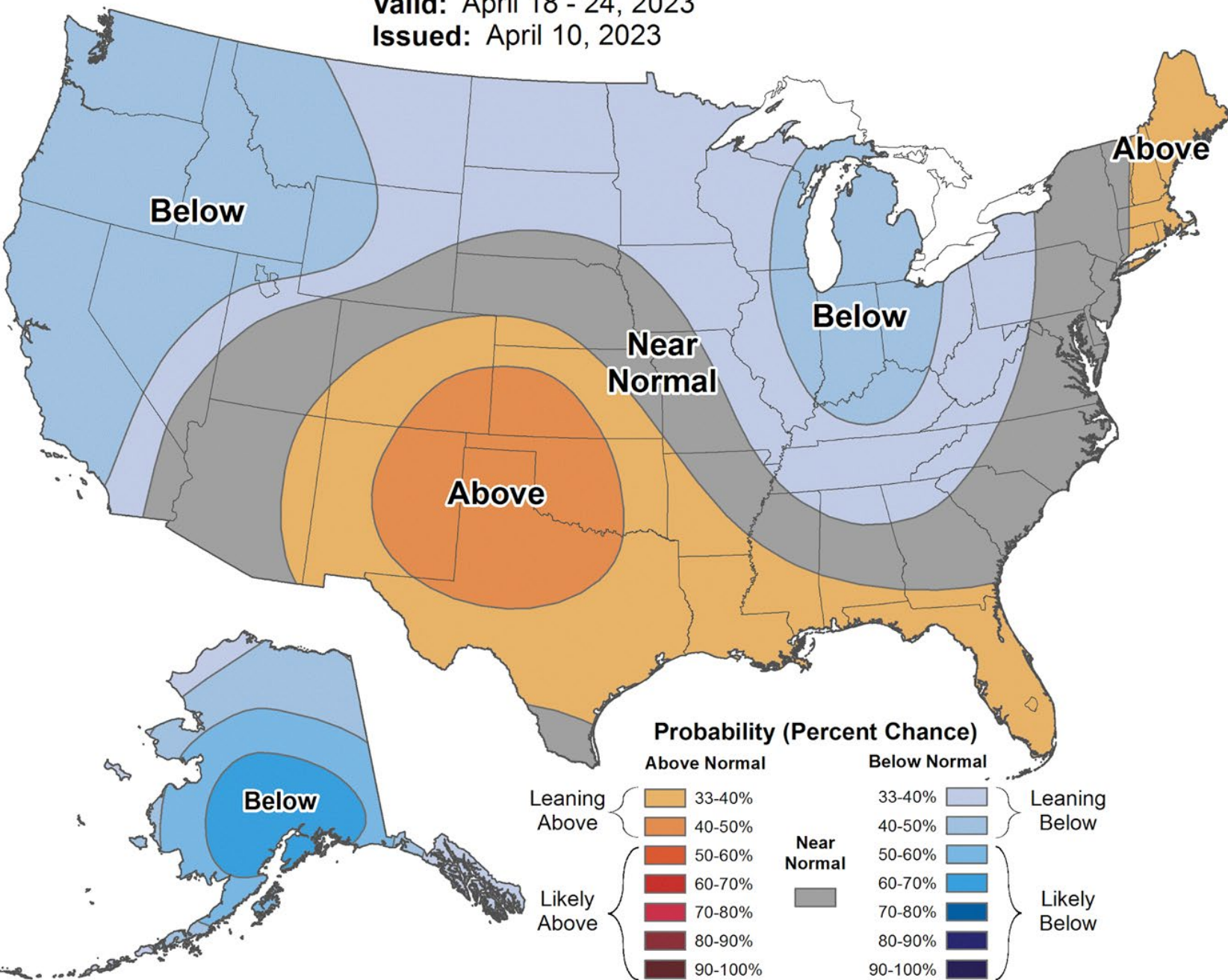
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Reno, NV
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8-14 Day Temperature Outlook



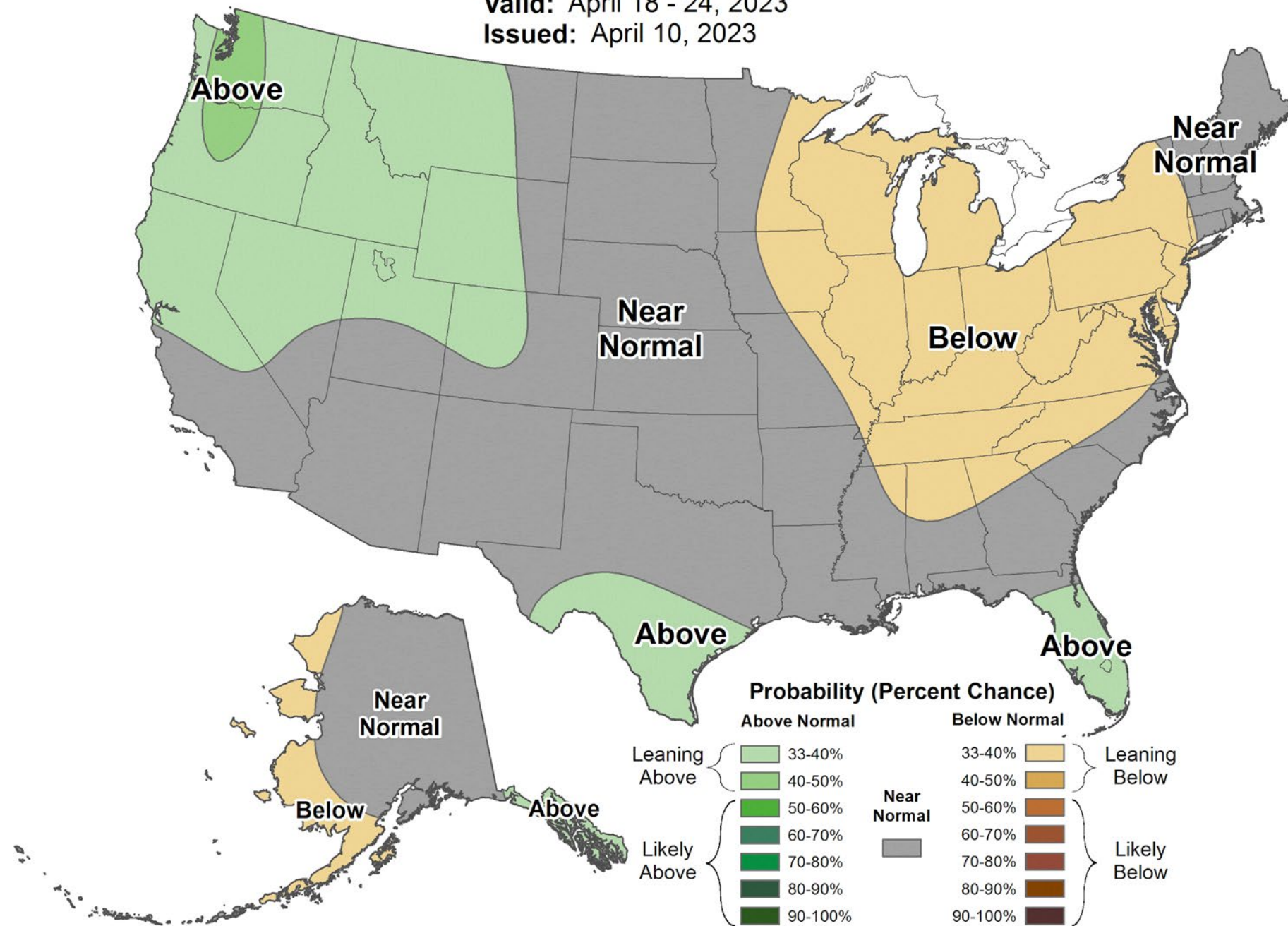
Valid: April 18 - 24, 2023
Issued: April 10, 2023



8-14 Day Precipitation Outlook



Valid: April 18 - 24, 2023
Issued: April 10, 2023



Week two outlook leans near to below normal on temps, with nebulous precipitation chances.
Likely continues trend of more gradual melt of snowpack.



Next 12 Weeks: Atmospheric Rivers?

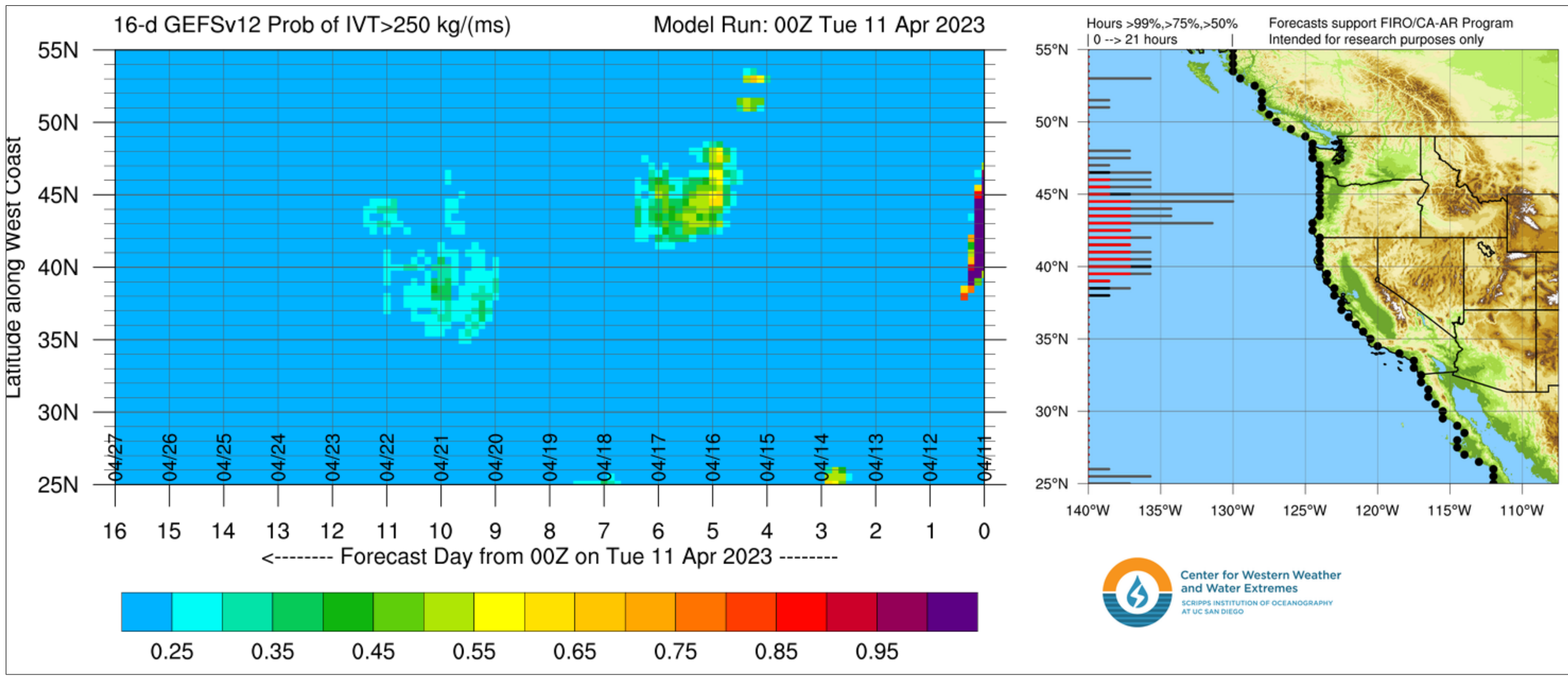


Chart shows probability of atmospheric river making landfall at various latitudes and out to 16 days.

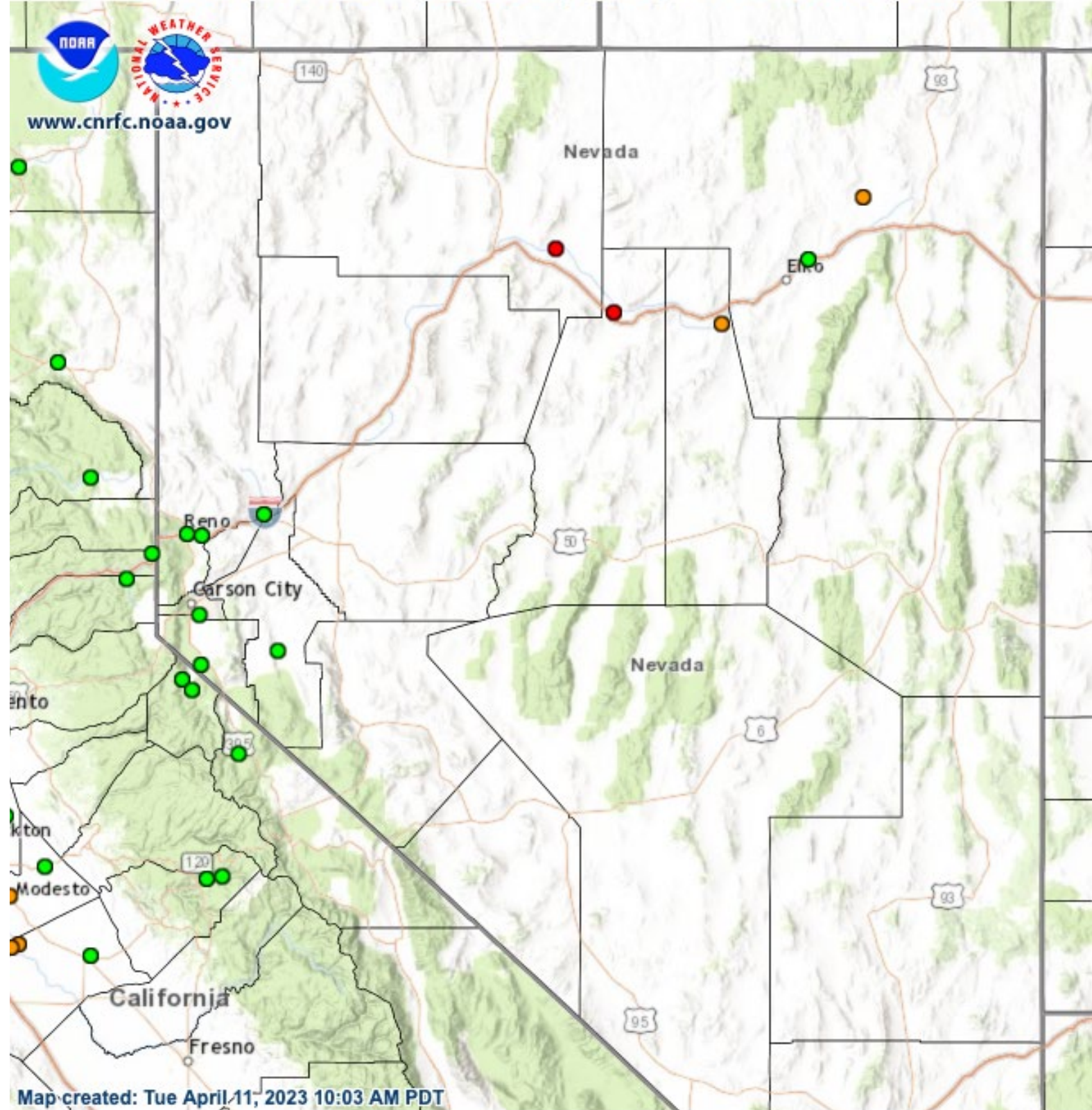
Most storms remaining north of our region. Some hints of a wetter storm around 4/20 -21 but mixed confidence this far out.



Ensemble River Forecasts: Next 10 Days

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Reno, NV
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Ensemble River Forecast (10-day 10% Exceedance)

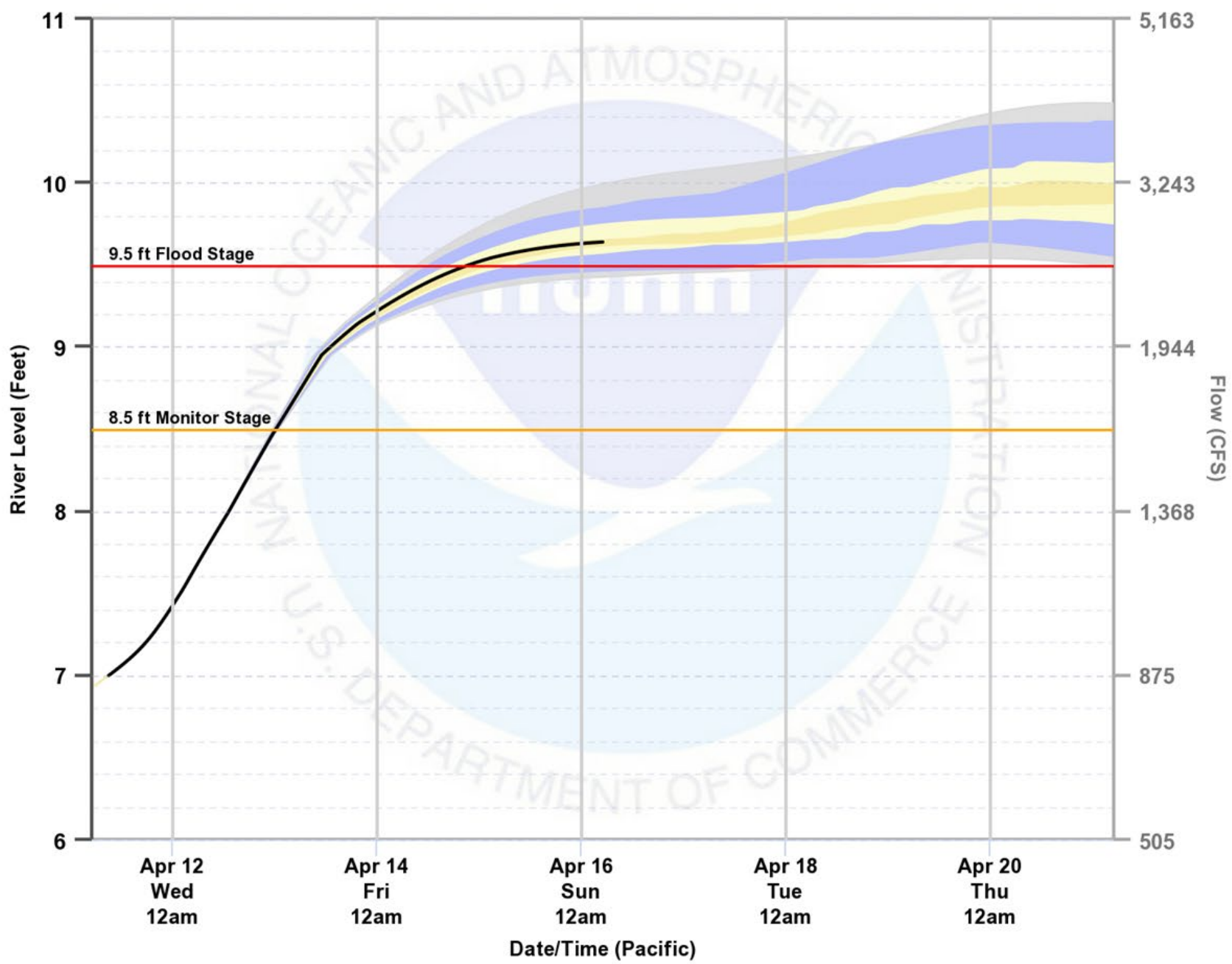


 No Monitor or Flood Stage Available
 83 Normal Conditions
 7 Above Monitor Stage
 2 Above Flood Stage
 0 Above Danger Stage

The number inside each circle above represents the number of gages with forecast conditions inside that category.

Hourly River Level Probabilities HUMBOLDT RIVER - BATTLE MOUNTAIN (HBMN2)

Created: 04/11/2023 at 9:30 AM PDT

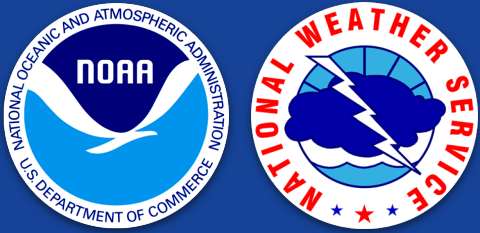


Chance of River Level Exceedance (Feet)	
Forecast Period: 04/11/2023 5 am - 04/21/2023 5 am	
Max	10.48
5%	10.40
10%	10.35
25%	10.13
50%	9.93
75%	9.78
90%	9.69
95%	9.58
Min	9.54

Flood Stage 9.5 ft > 98%

- Official Forecast (Deterministic)
- Ensemble Mean
- Model Traces
- Hourly Probabilities**
- 0-5% chance
- 5-25% chance
- 25-40% chance
- 40-60% chance

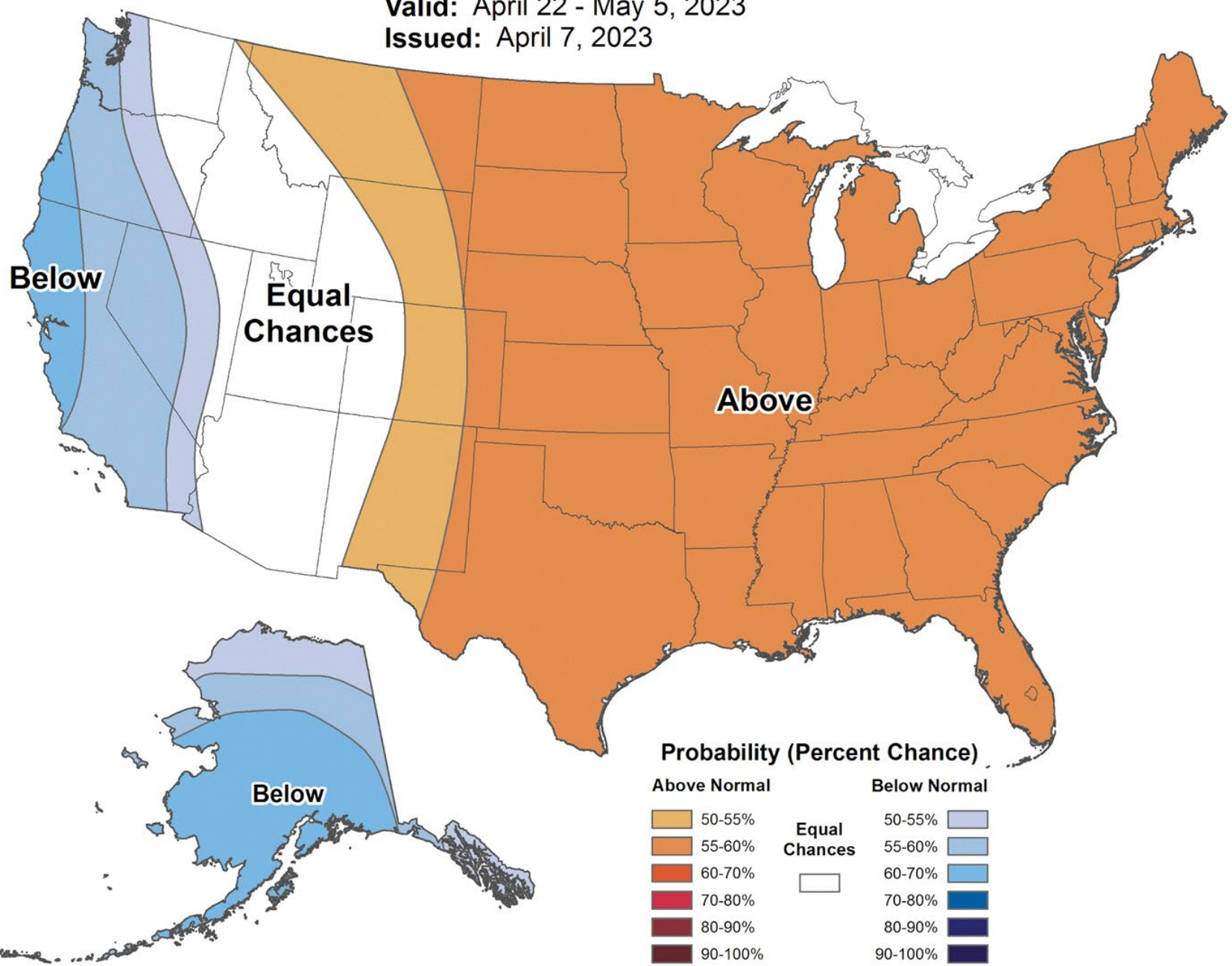
While higher flows are likely on most streams & rivers, the greatest risk of flooding through April 20th is along the Humboldt. [[HEFS](#)]



Balance of April: Week-4 Outlook

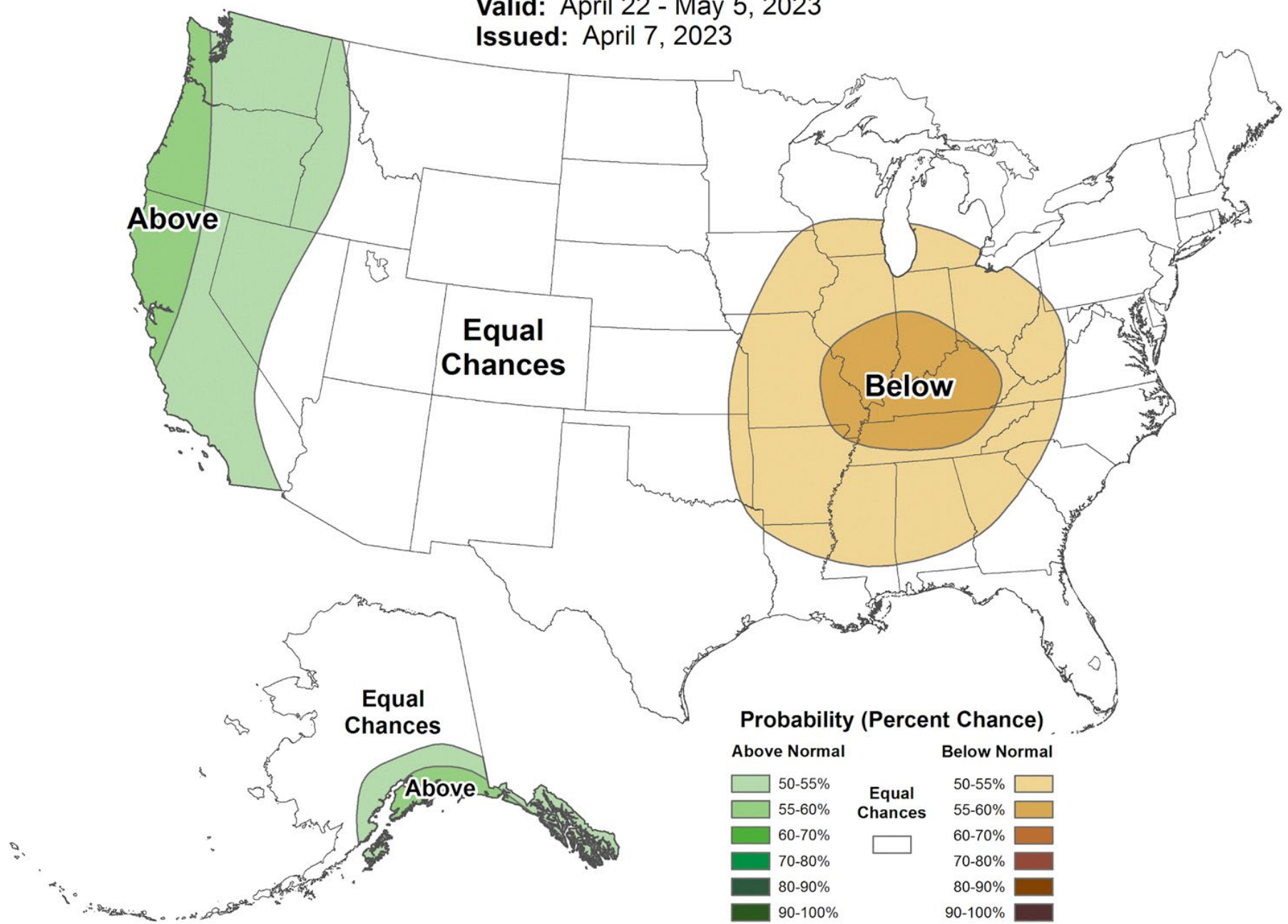
Weeks 3-4 Temperature Outlook

Valid: April 22 - May 5, 2023
Issued: April 7, 2023



Weeks 3-4 Precipitation Outlook

Valid: April 22 - May 5, 2023
Issued: April 7, 2023



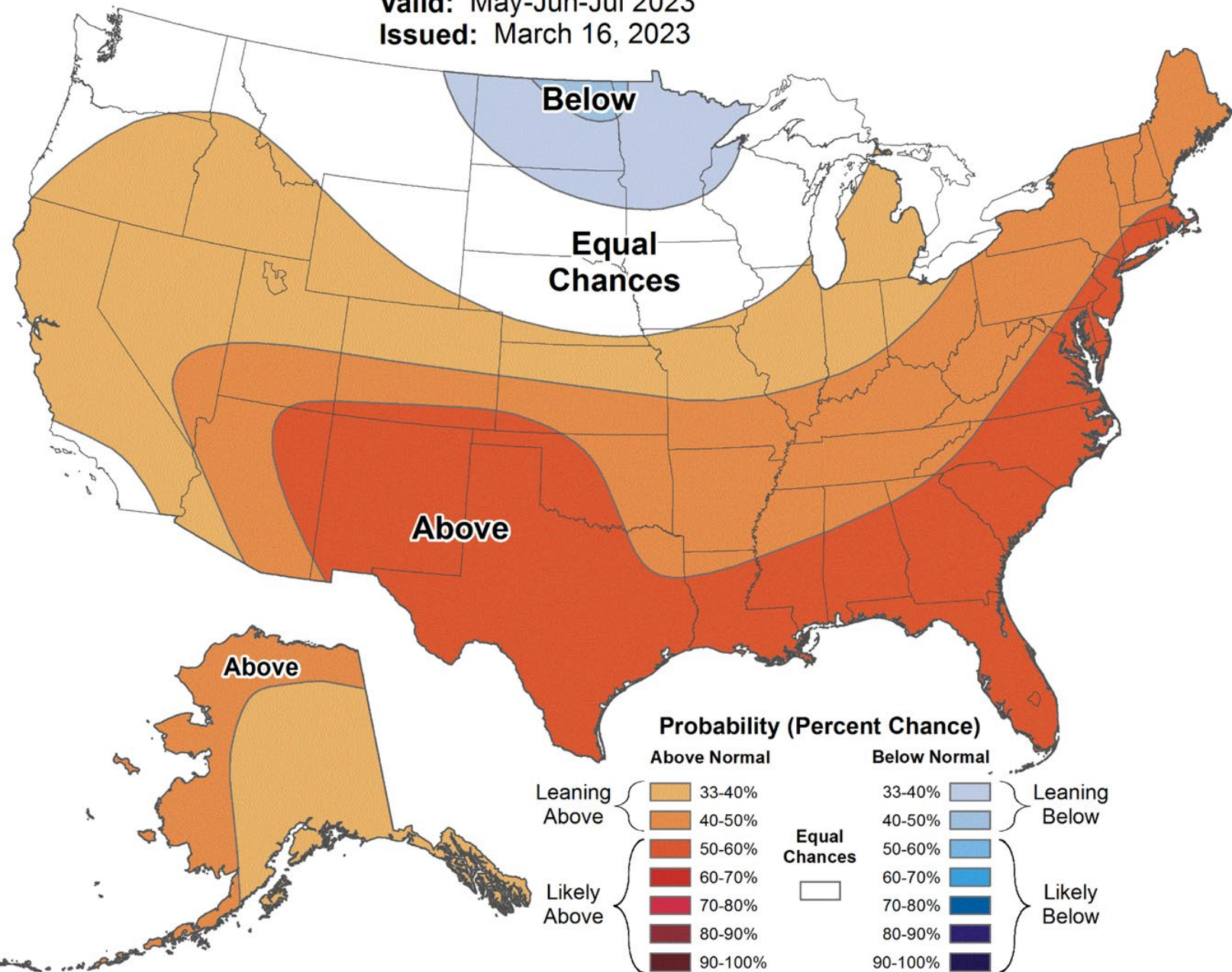
Storm door remains at least slightly open into late April and early May.
Leaning of near to below normal temps = snowpack melt remains slow.



Seasonal Temperature Outlook



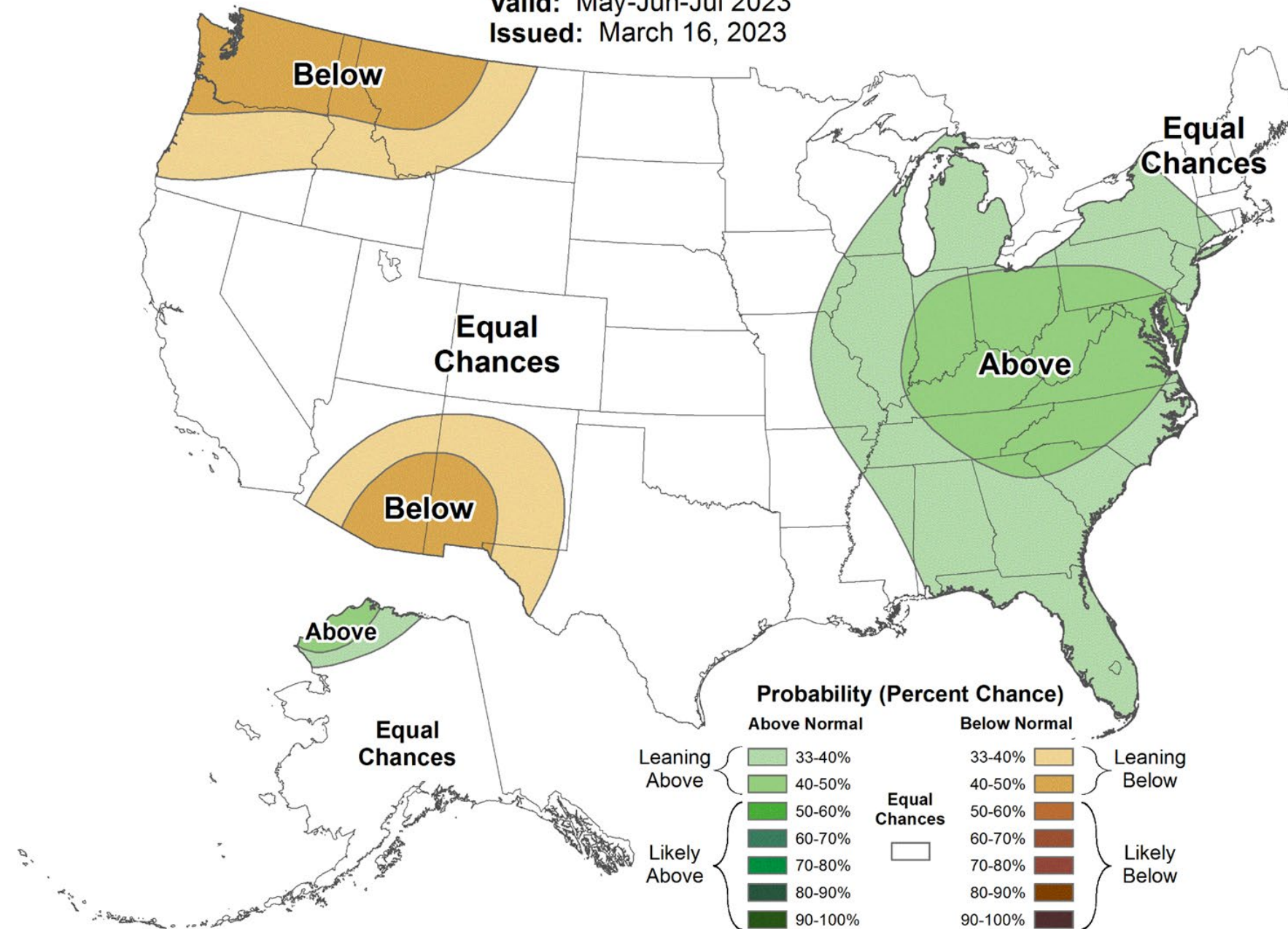
Valid: May-Jun-Jul 2023
Issued: March 16, 2023



Seasonal Precipitation Outlook



Valid: May-Jun-Jul 2023
Issued: March 16, 2023



Precip: No favored outcome. Some signs the monsoon may be less active than last year.

Temps: Leaning above normal but not a high confidence scenario.

Good news for snowmelt as that keeps the door open to a more gradual melt scenario.



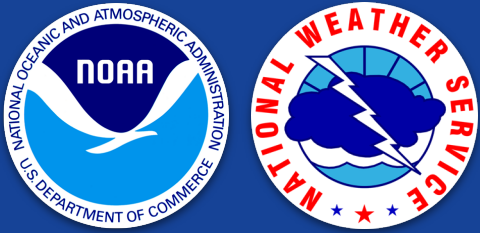
Tim's Flood Freakout Matrix Updated April 4

Flood Stages	Action	Minor	Moderate	Major
Pit River nr Canby	High Probability	Moderate Probability	Low Probability	Unlikely
Susan at Susanville	Low Probability	Unlikely	Unlikely	Unlikely
Middle Fork of the Feather nr Portola	Moderate Probability	Unlikely	Unlikely	Unlikely
Truckee Reno	Moderate Probability	Unlikely	Unlikely	Unlikely
Truckee Vista	Moderate Probability	Low Probability	Unlikely	Unlikely
West fork of Carson Woodfords	Very High Probability	High Probability	Low Probability	Unlikely
East Fork of Carson Gardnerville	High Probability	Moderate Probability	Unlikely	Unlikely
Carson nr Carson City	High Probability	Low Probability	Unlikely	Unlikely
Douglas County Small Creeks and Streams*	Very High Probability	Moderate Probability	Low Probability	Unlikely
West Walker Blw Little Walker	Very High Probability	Very High Probability	High Probability	Low Probability
Walker River nr. Mason	Very High Probability	Very High Probability	Moderate Probability	Unlikely
Lower Humboldt nr Imlay	Very High Probability	Very High Probability	High Probability	Moderate Probability
Mono County Small Streams*	Very High Probability	Very High Probability	High Probability	Moderate Probability

Matrix is primarily based on spring and early summer snowmelt flood potential. Heavy spring rains can be a wildcard.

***No defined flood stages and impacts on Douglas and Mono county small streams.**

Unlikely
Low Probability
Moderate Probability
High Probability
Very High Probability



Drought- Don't Let the Door Hit You on the Way Out!

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U.S. Drought Monitor

April '23

100%

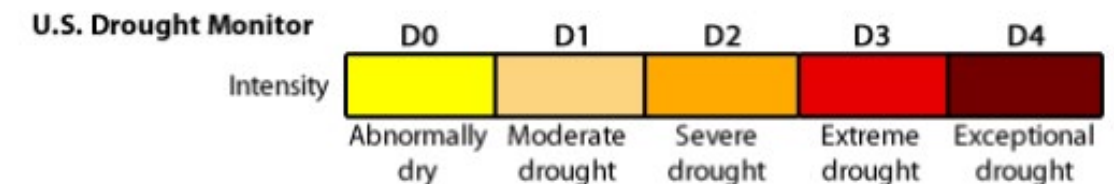
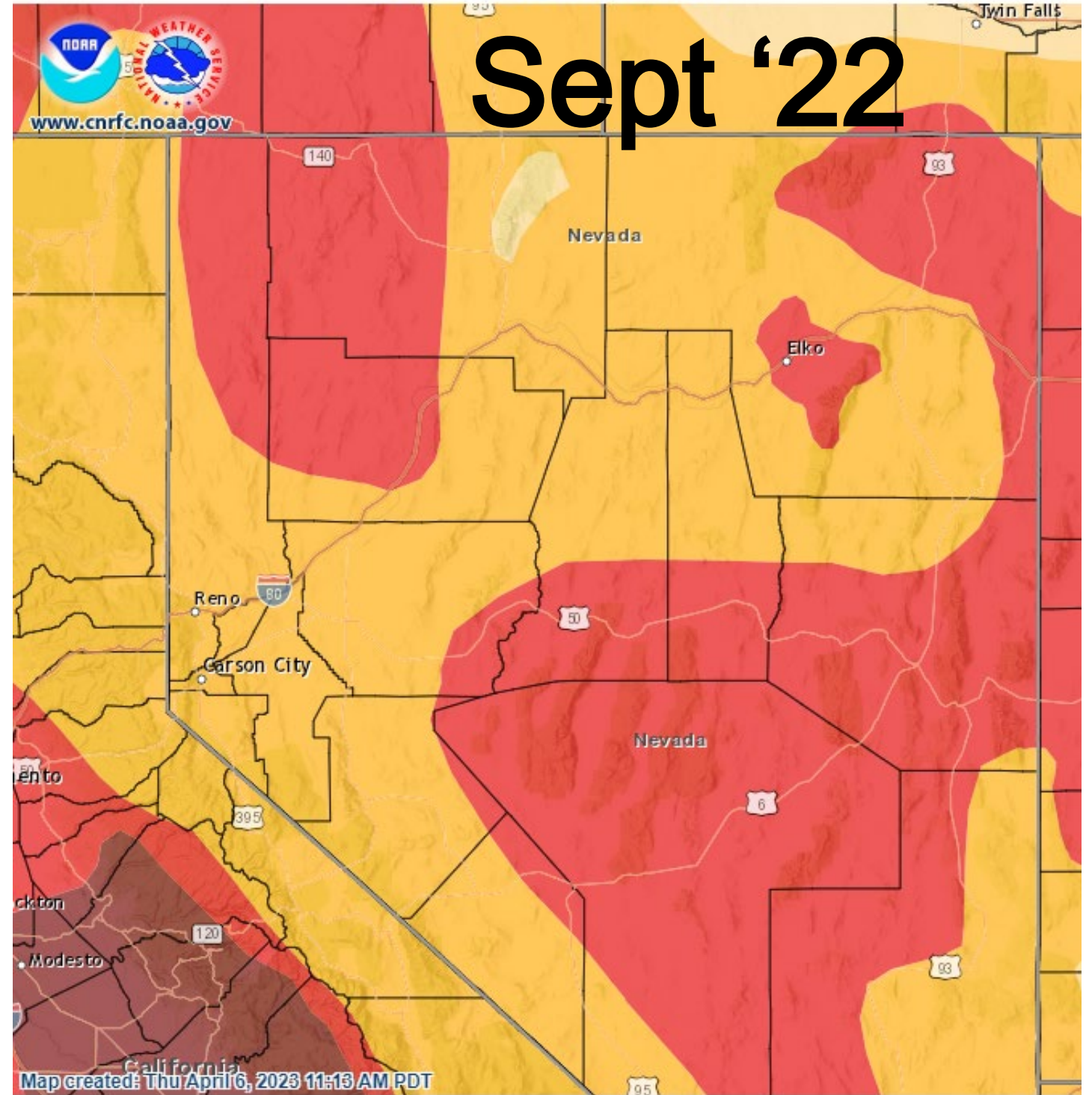
Portion of the Great Basin under D1+ drought status at start of this water year.

25%

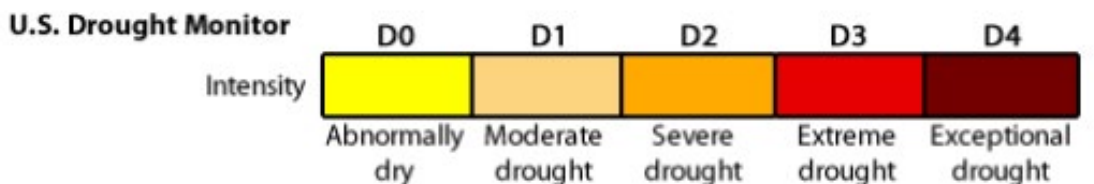
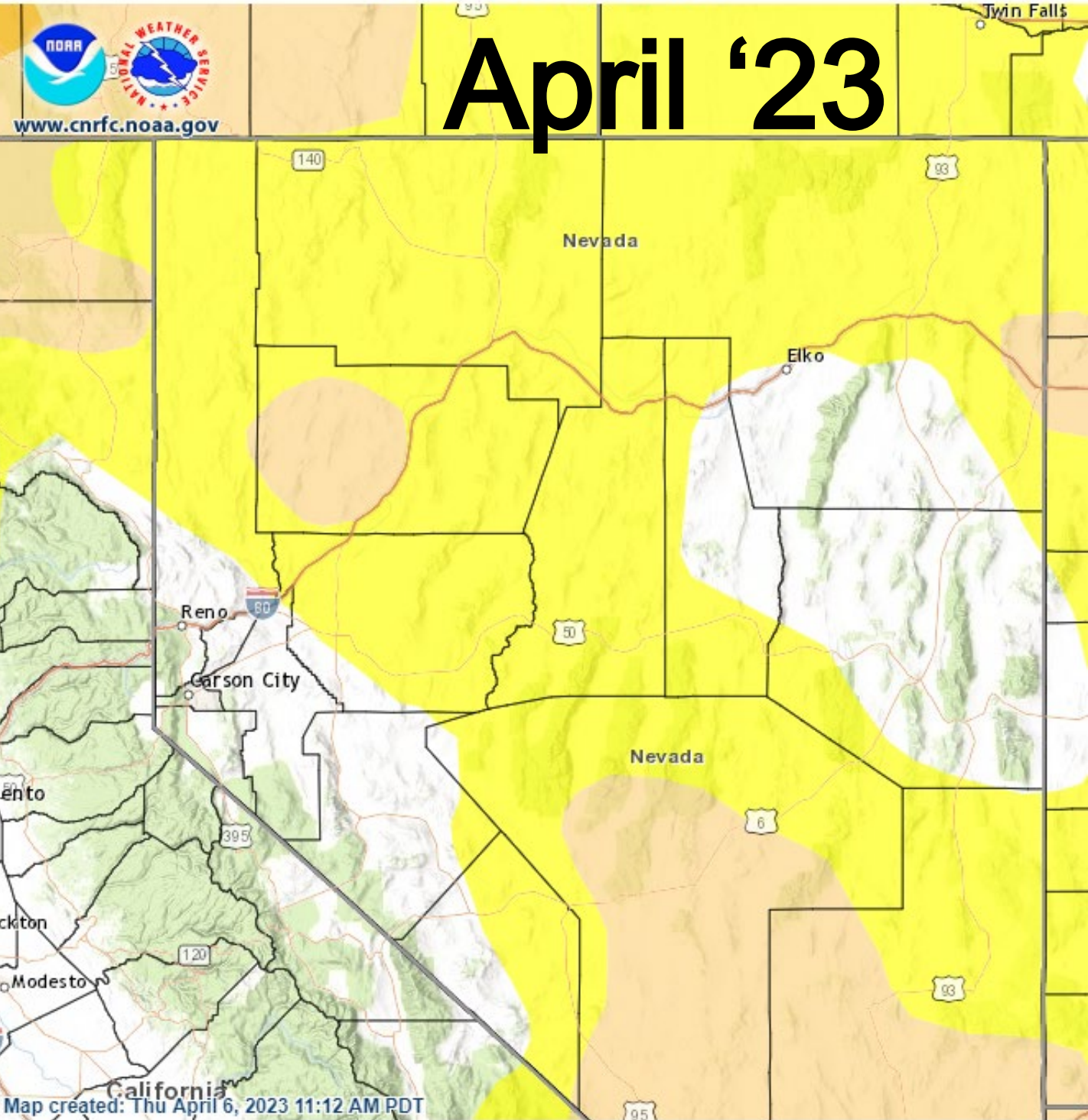
Portion of the Great Basin under D1+ drought status right now.

U.S. Drought Monitor

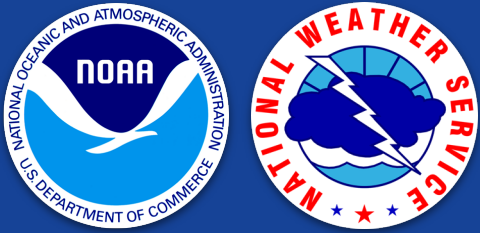
Sept '22



The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC-UNL.

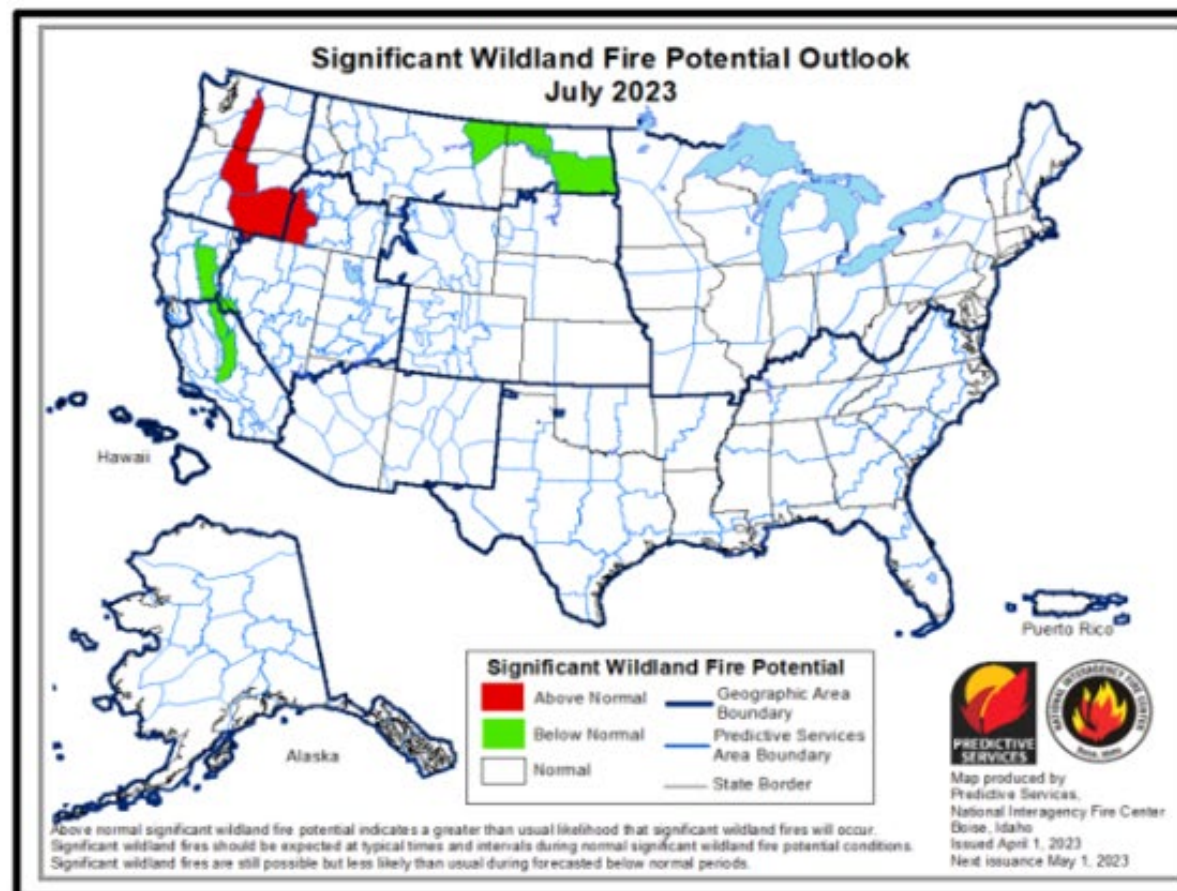
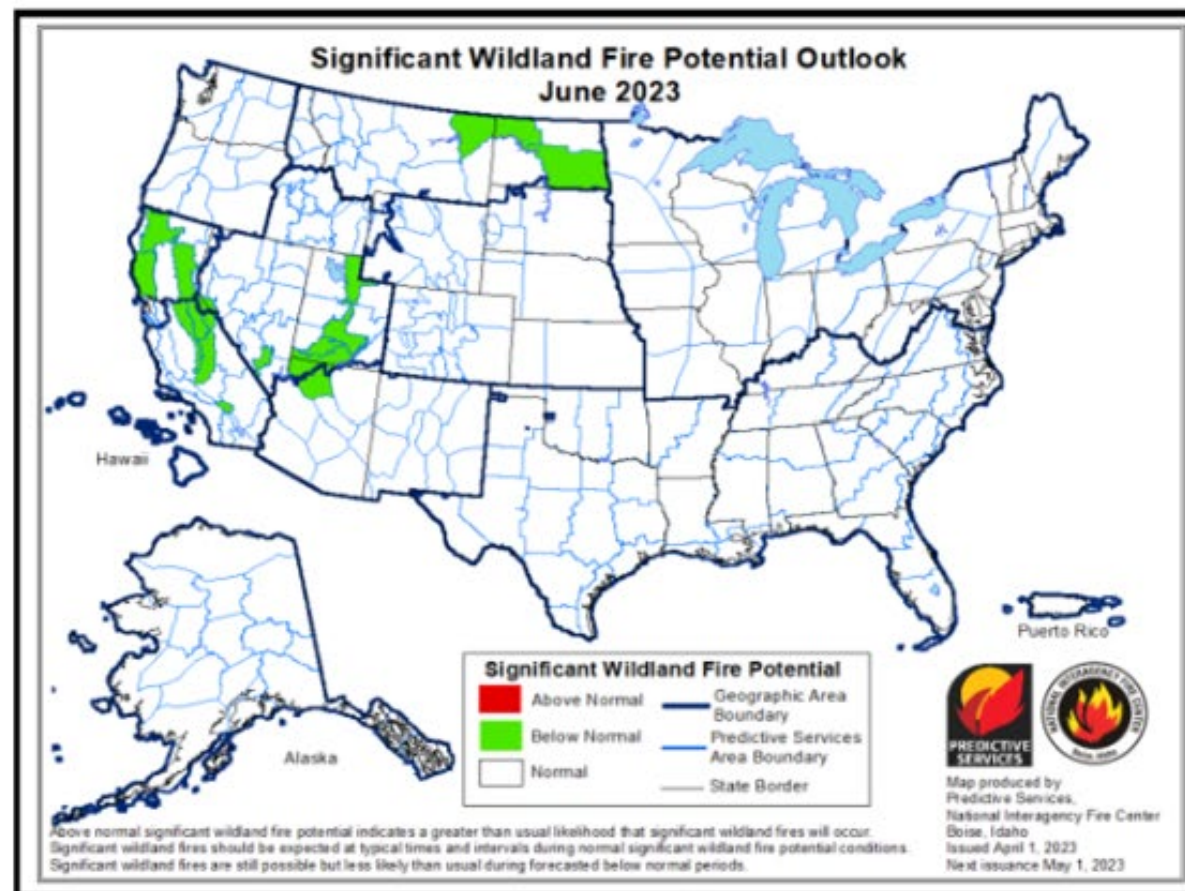
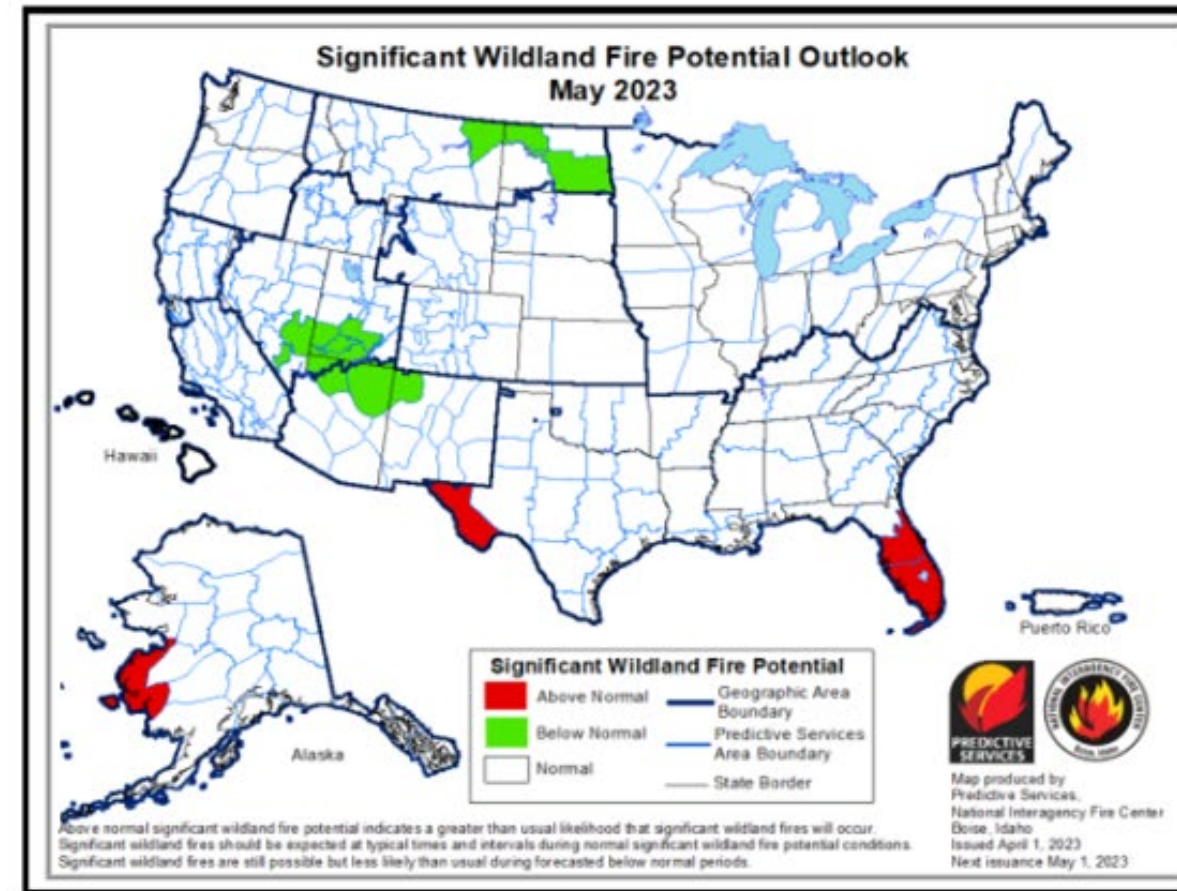
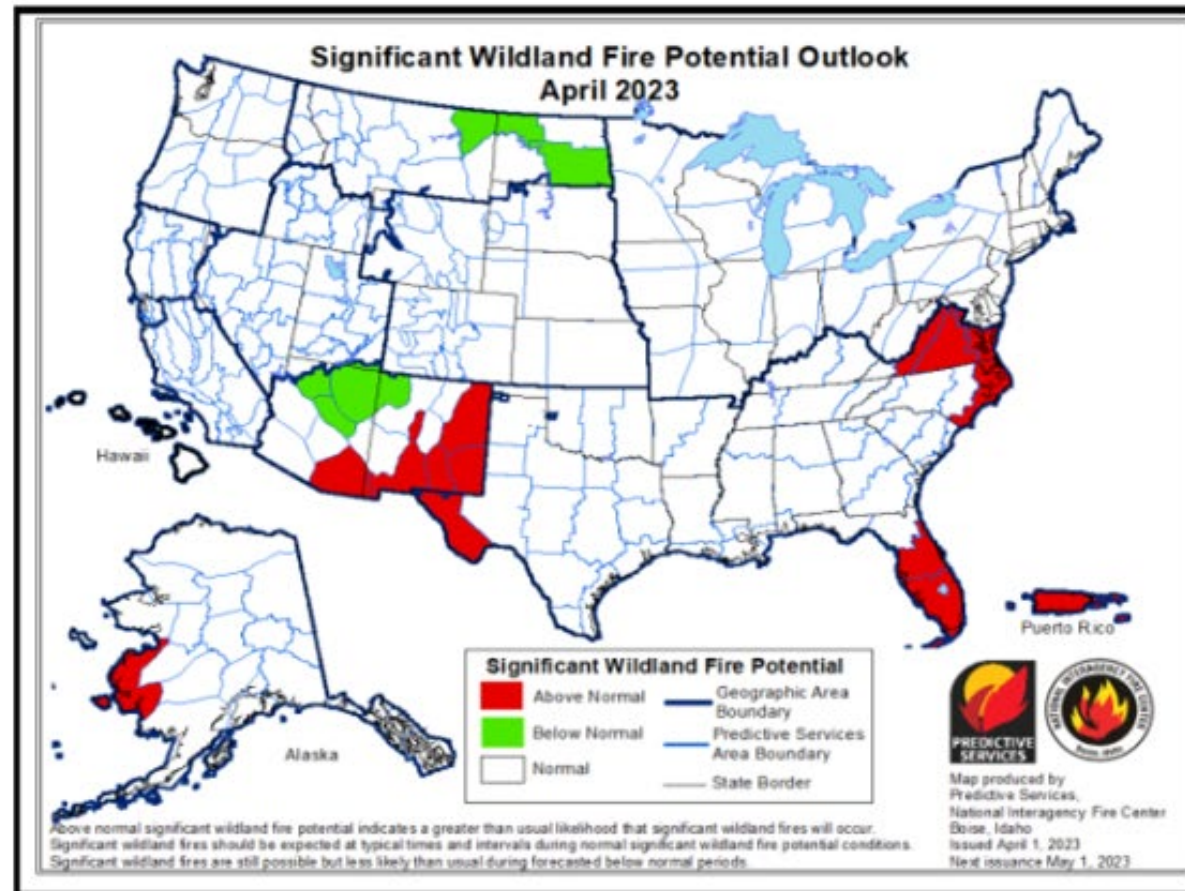


The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC-UNL.



Official Predictive Services Outlook through July

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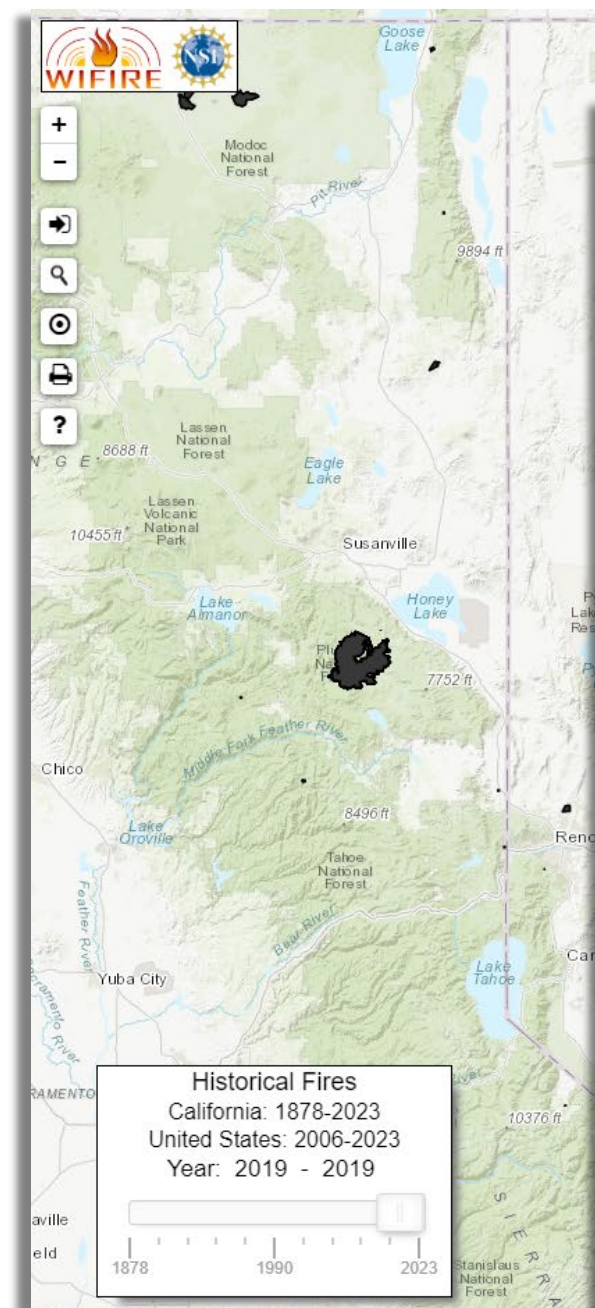
- First time in many years that we have green “below normal” in the Sierra!!!
- Delayed start in mountains for sure, but TBD on activity late summer & autumn.
- Note that Great Basin is “near normal”. If we end up with a hotter June -July, a quick ramp up in fire activity is possible.
- Oregon-Washington is probably where things will take off the soonest this summer: less winter precip, continued drought.



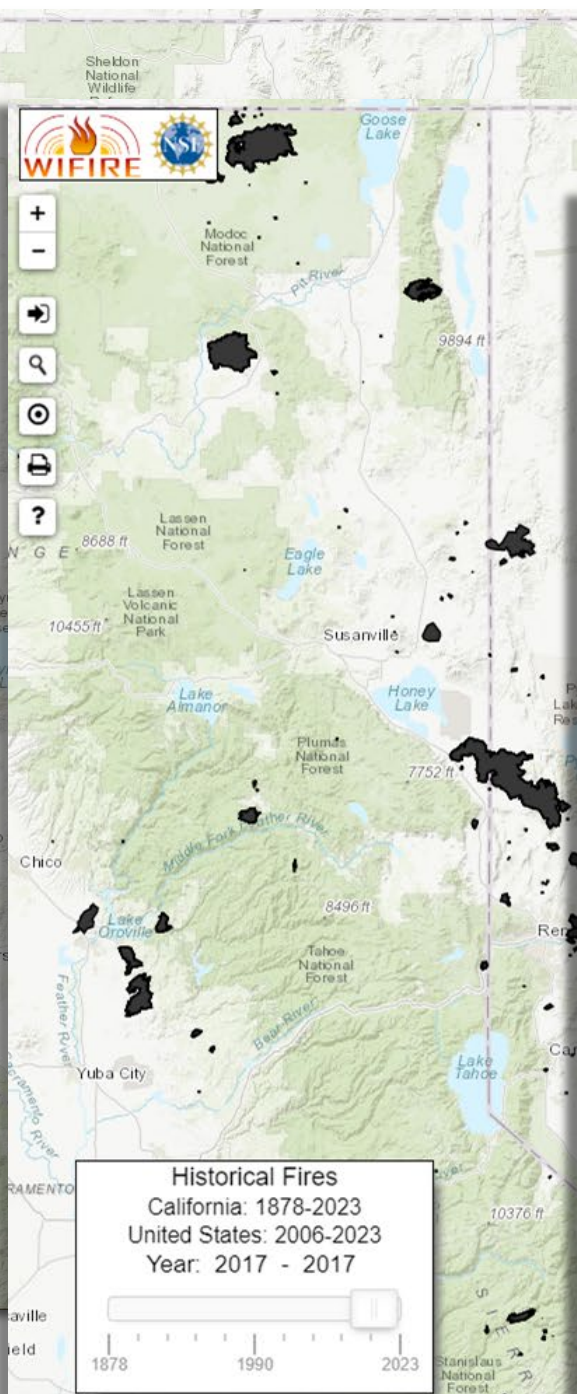
What Have Other Recent Big Snow Years Done?

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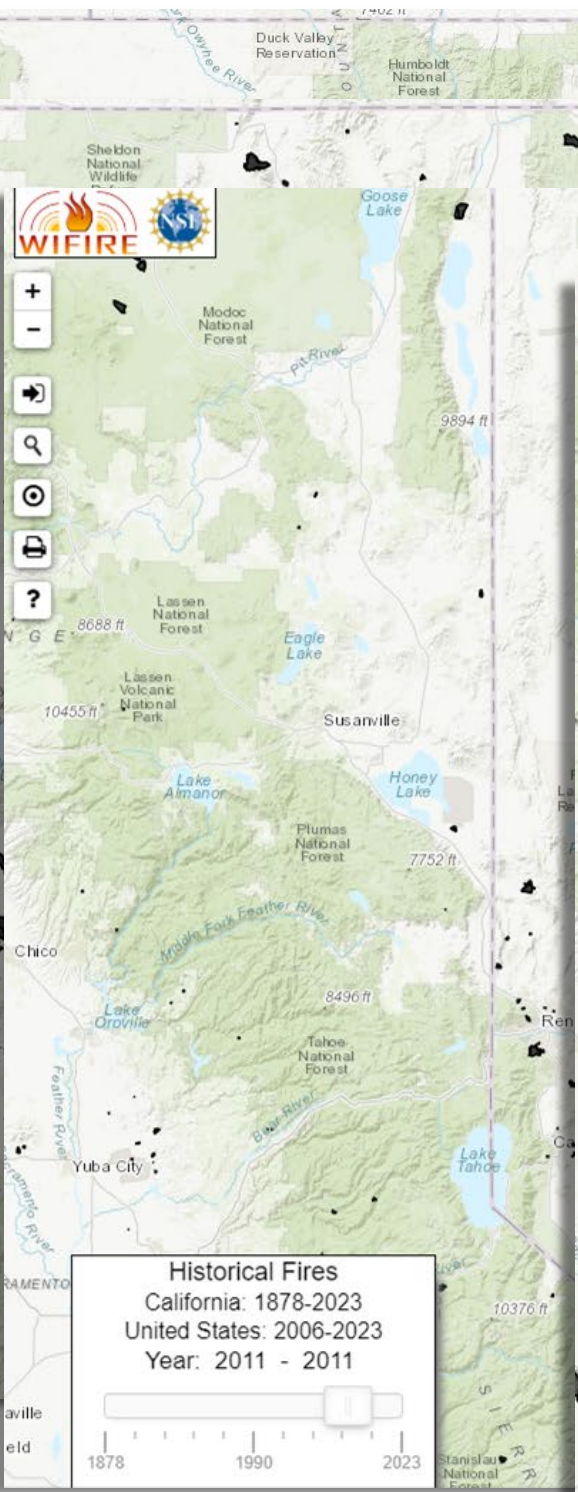
Maps: firemap.sdsc.edu



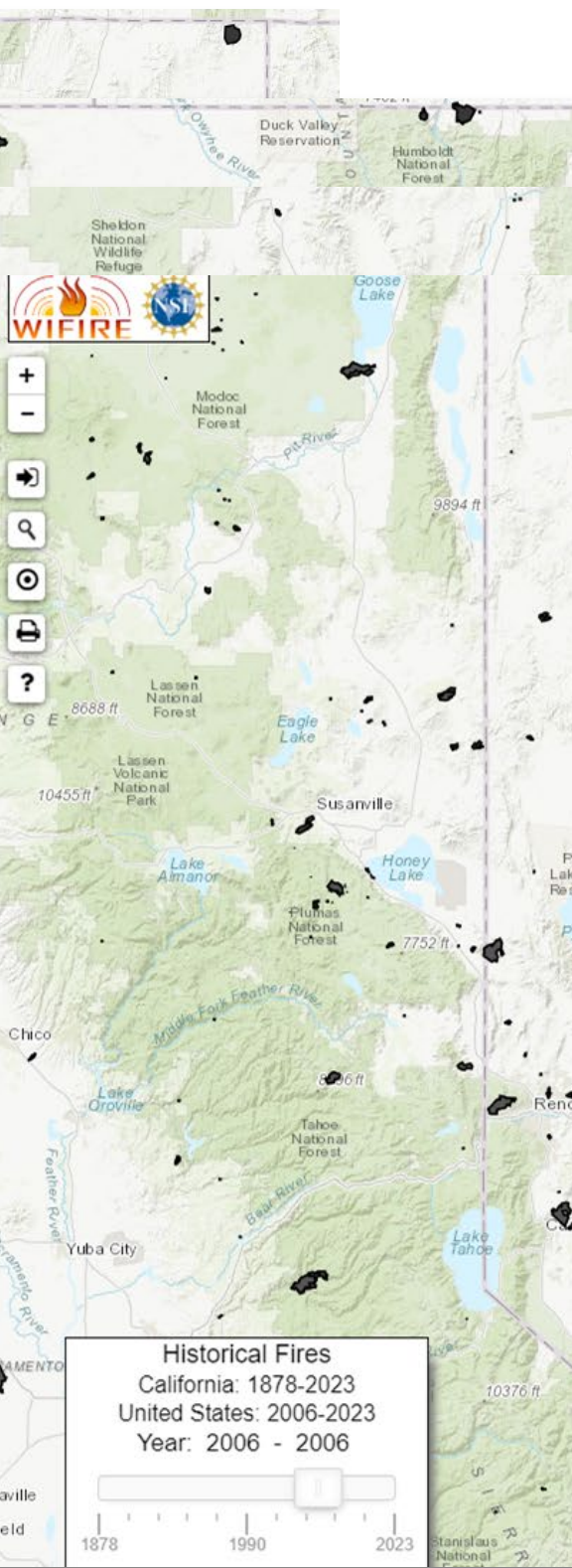
2019



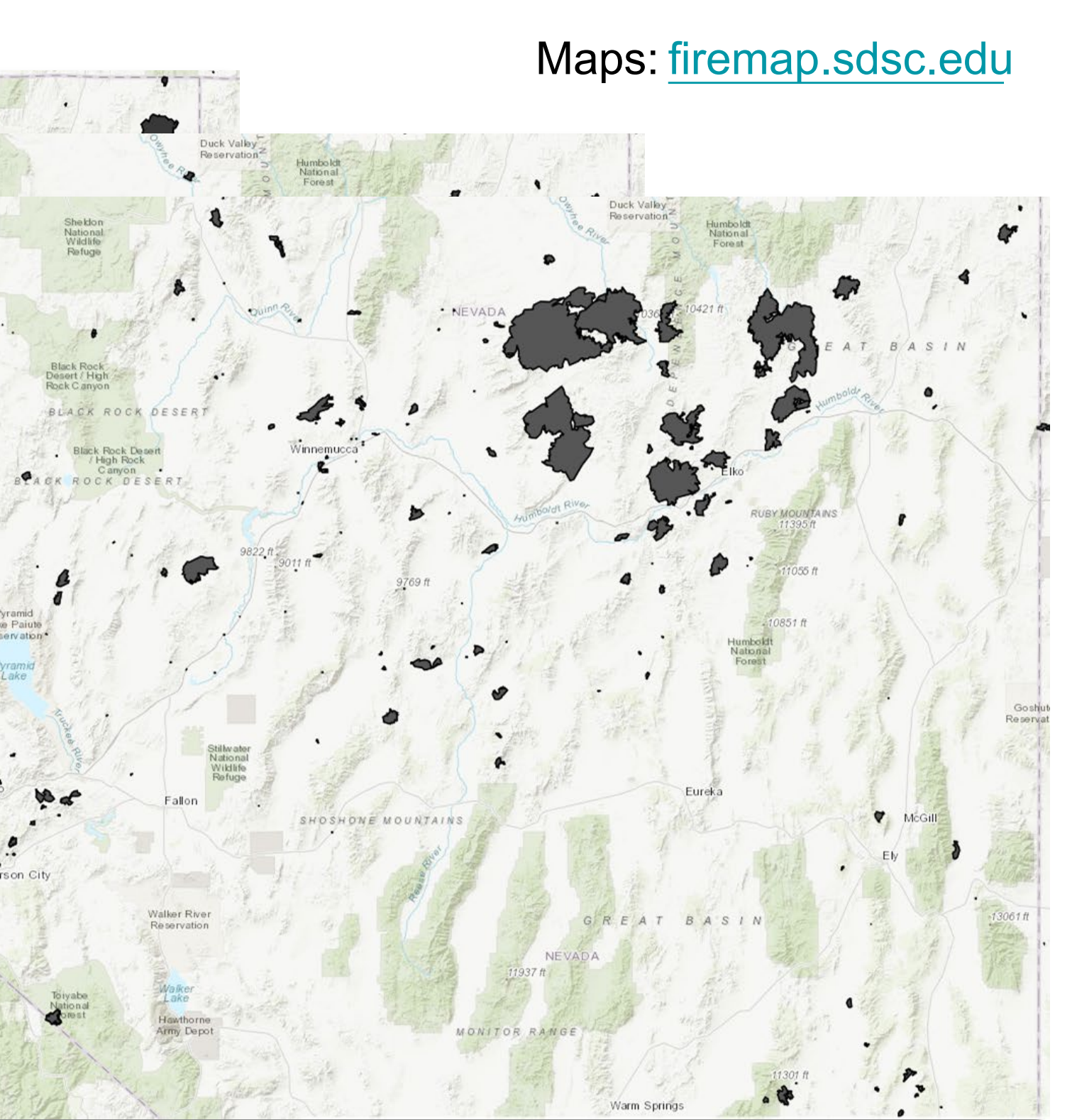
2017



2011



2006



Mountain fire activity normally limited and/or delayed following big snow winters. Drought tree kill adds a huge wildcard.



That's a Wrap!

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Tuesday, April 11

