The Southern Oscillation Index's (SOI) Signal of What Might be Expected Soon

It's no guarantee but often when the daily SOI reaches 40 or better, stormy weather follows. I've been checking the SOI daily and now other forecasts are starting to follow. Get ready to enjoy the ride. Let's hope we can still use the past to predict the future cuz I'm still living in the past! It's all about relationships and understanding what is driving what.

Here's a summary of the past - It was Jan 22, 2014, I was at the Idaho Water Users Association annual conference playing on my phone when Kenny Corrock pinged me asking what's up – the Hawaii surfing competition was cancelled because waves were 60+ ft. So, I pinged Jan Curtis, our meteorologist. A few hours later he sent a few slides to me that forced me to change my winter outlook talk.

I remember this as it was my birthday, 0123, (Jan 23) and I nearly pulled an all nightery changing the IWUA talk I was giving on Jan 23. I even impressed Jo Deurbrouck who was visiting by changing my PowerPoint talk basically overnight about the poor Jan 2014 snow levels to an optimistic outlook betting on Jan's observations. Jan nailed it! IWUA invited me back in June to explain what happened in the Winter of 2013-14.

Let's hope a similar pattern arrives as more forecasts are starting to agree with the SOI's November's trend. Following are a few slides about current conditions and what might be expected and slides about the 'Jan 2014 event'.

Stay tuned & get ready to enjoy the ride (no guarantee) but skies are waxed & ready.

Another Signal of What Might be Expected Soon:

Jan 14 2014 daily SOI (Southern Oscillation Index) value was above 50, and the pressure at Darwin was at 998mb for 2nd consecutive day.
Nov 19 & 23 2025 SOI was 38

A reading of a 50 does not occur often, based on 23+ years of record.
Here are FEW times the SOI daily number has been in the mid 40's or above and events that followed:

- **Nov 19 & 23 2025: (38.)** **?????_____**
- **Jan 14/15 2014: (54.90)** **Abundant Moisture Feb/Mar 2014**
- **Dec 25 2011: (49.20)** **Snowstorm/Arctic Blast Jan 14, 2012**
- **Jan 17/18 2011: (50.87, 55.43)** **Snow/Arctic Blast Feb 24, 2011**
- **Dec 22/23 2003: (44.34, 44.34) Snow/Arctic Blast Jan 2, 2004**
- **Dec 4/5 2000: (49.61, 47.14) Modified Arctic air Dec 10-15, 2000**
- **Dec 11/12 1998: (51.02, 49.60) Major Arctic Blast Dec 19, 1998**

It's no fool proof method, but is now showing agreement with models

Another SOI summary and forecast for winer storm threat Dec 18 - Jan 10.

9:20

Mark Margavage's Weather Discu... · Follow
10h ·

🚨 Record Setting SOI Drop 🚨
⚠️ Big Winter Storm Signal ⚠️

The Southern Oscillation Index (SOI) is a key indicator of the strength and phase of the El Niño–Southern Oscillation (ENSO). Sustained strongly positive SOI values (typically 30-day average > +7 or +8) are associated with La Niña conditions, and sustained strongly negative values with El Niño.

This graph shows a very sharp collapse of the SOI from strongly positive (La Niña-like) values around +18 in mid-to-late November 2025 down to slightly positive or near-neutral values by early December 2025.

According to Grok A.I. "This is one of the fastest SOI drops on record."

After a sudden SOI plunge of this magnitude and speed, the most common lag time to the first big Eastern U.S. winter storm or polar vortex disruption-driven cold wave is about 2–3 weeks, with a broader 10–35-day window of elevated risk.

So for the drop shown in this image (finalized ~5 Dec 2025), the highest winter storm threat in the Eastern US is roughly December 18 – January 10, peaking late December to very early January 2026. So Christmas could be extremely Wintery this year!
~Meteorologist Mark Margavage
#winteriscoming

So for the drop shown in this image (finalized ~5 Dec 2025), the highest winter storm threat in the Eastern US is roughly December 18 – January 10, peaking late December to very early January 2026. So Christmas could be extremely Wintery this year!
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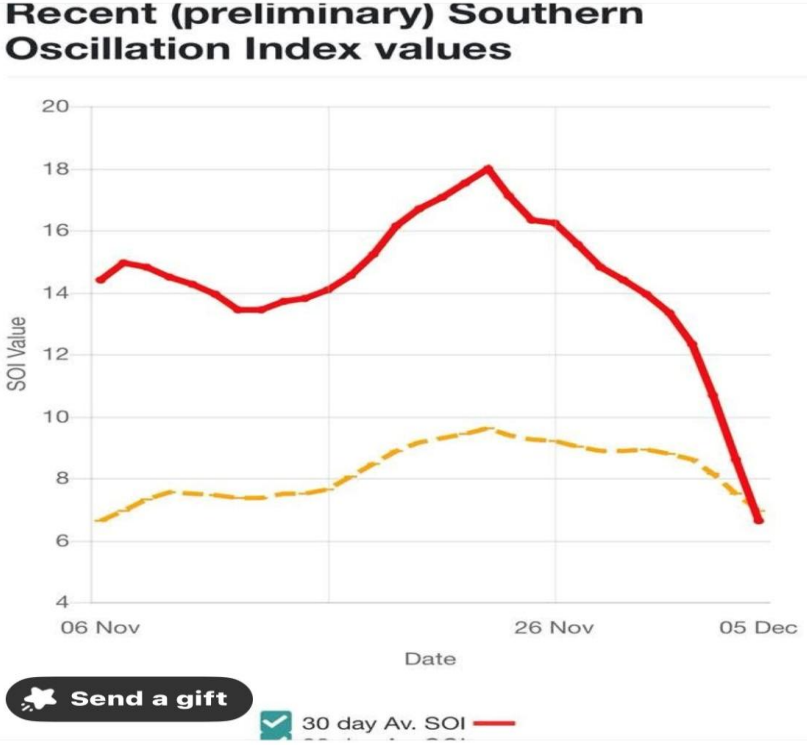
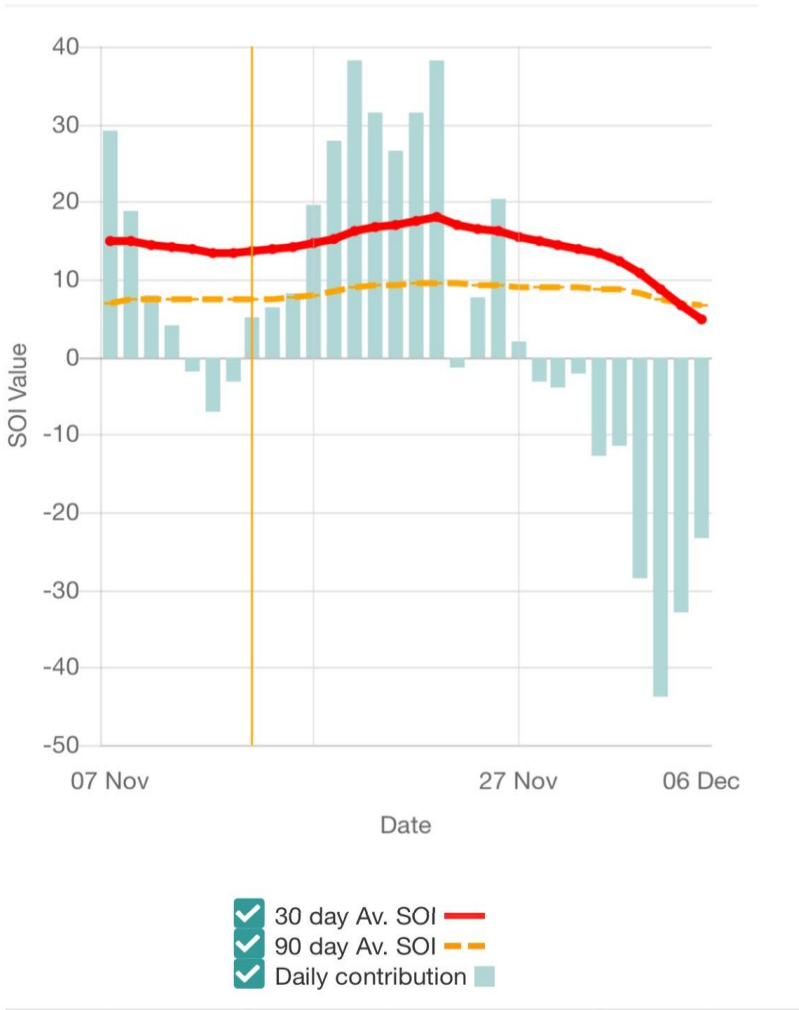
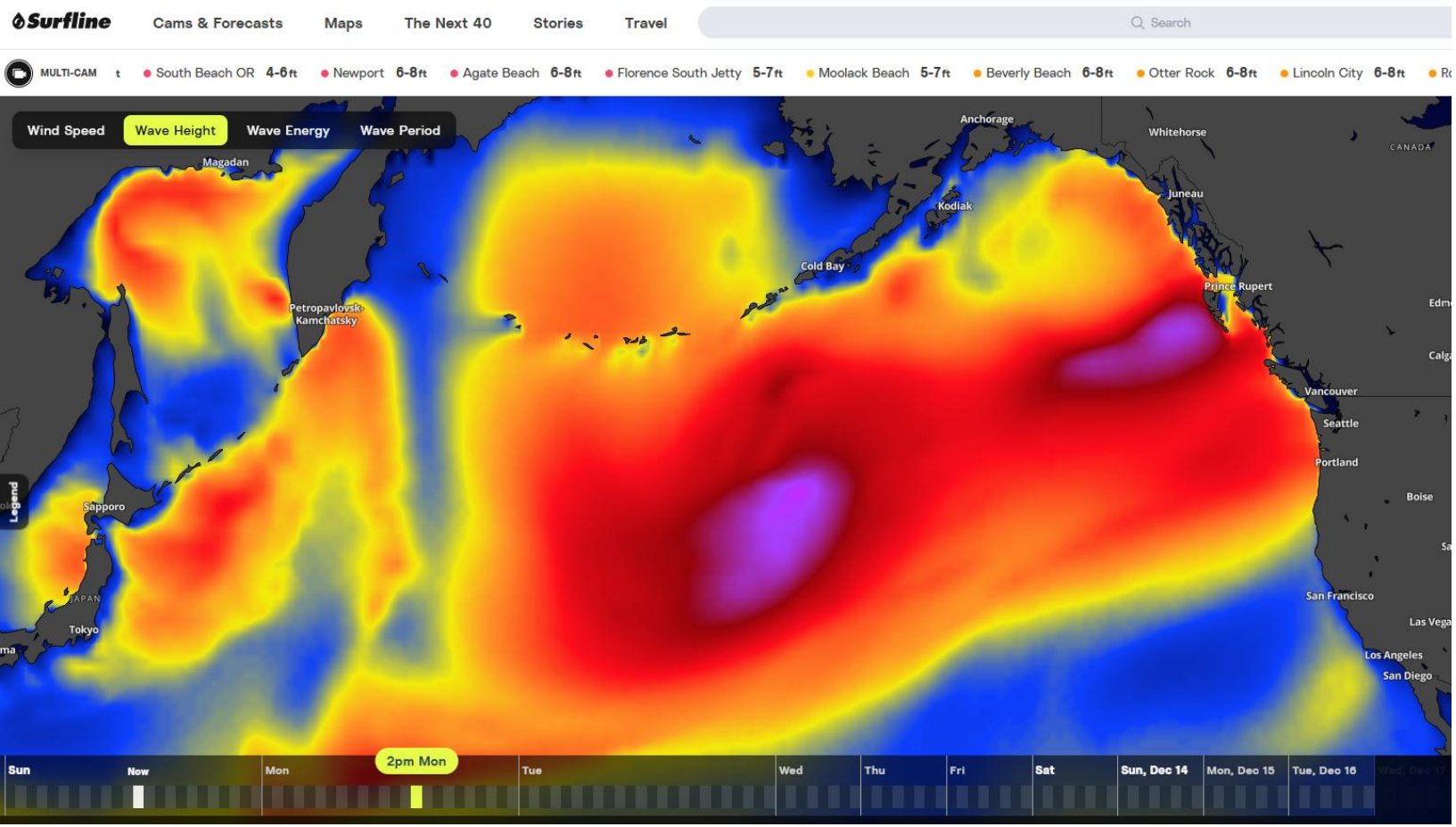




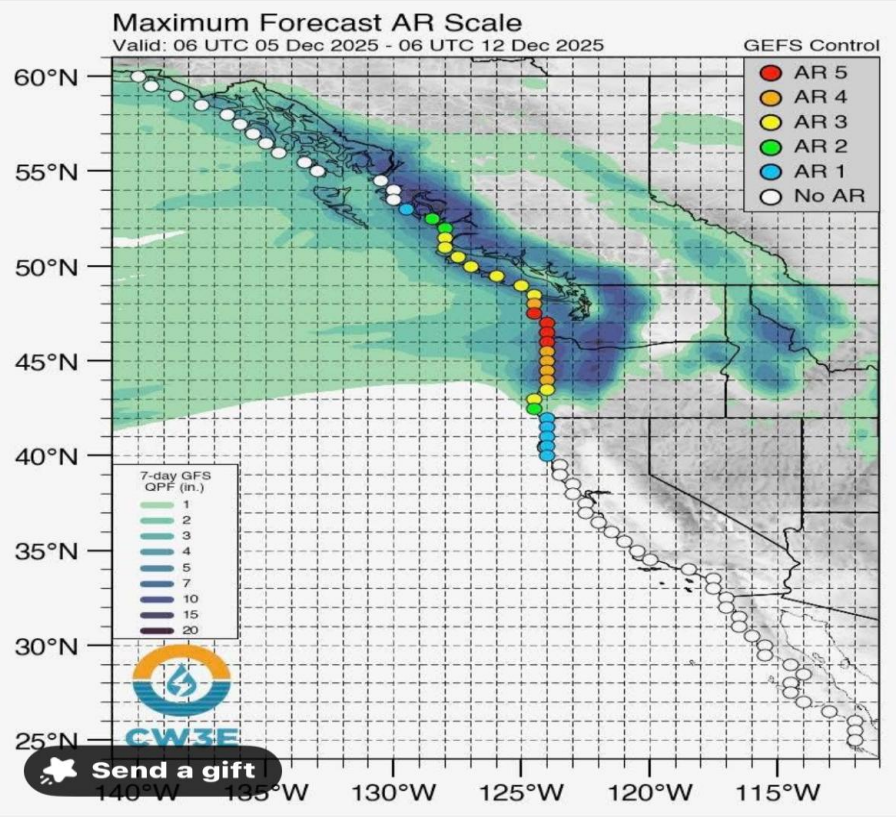
Monday, afternoon Dec 8, afternoon wave heights forecasts for current Atmospheric River and impact zone on West Coast.



10:00

Rainfall totals will, of course, be less in Seattle, Portland, and Vancouver than in the mountains but three days of near constant rain will also produce significant ponding and some urban flooding issues.

Models have consistently shown the core of the atmospheric river aimed at Olympia. Main rain is Monday-Wednesday but we'll have modest rain showers until then.



My Personal Weatherman ··· ×

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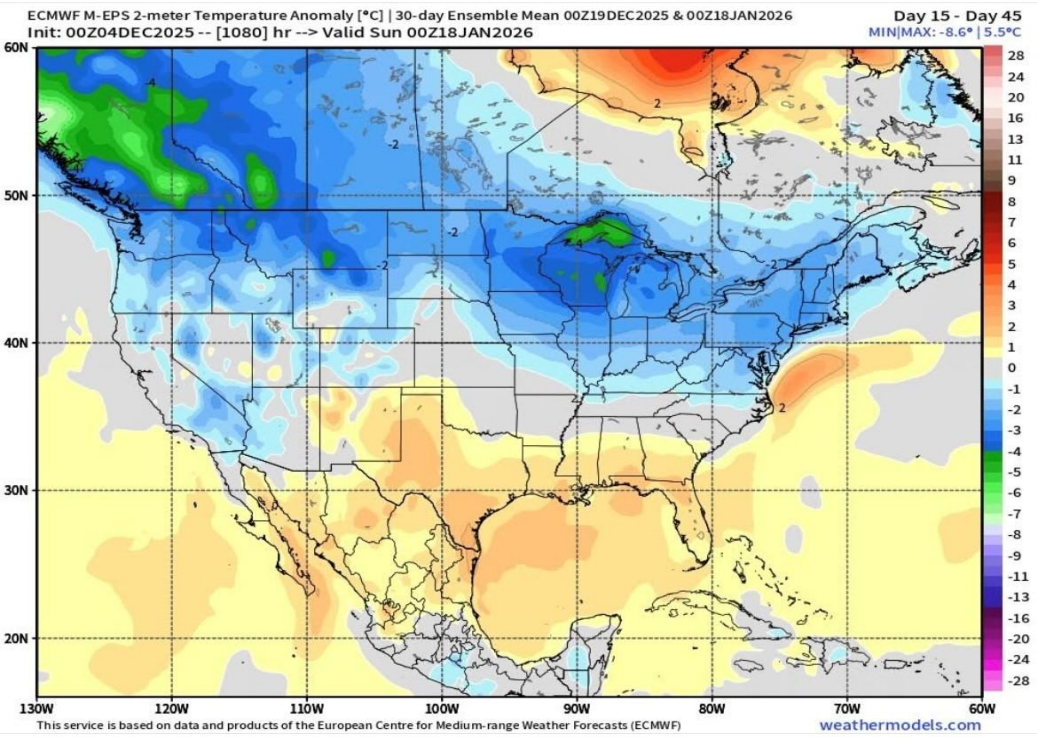
🌬️🥶**No end in sight!! Here's the temperature anomaly map from December 17th to January 17th from the new Euro weeklies ensemble mean to show the general idea. This map doesn't mean there won't be some days with above normal temperatures in the northeast.**🌬️🥶



And now a 30 Day Temperature Map favors colder than normal temps across the Canadian border. Left temperature anomaly map for Dec 17 - Jan 17. Shades of blue/green are below normal temps.

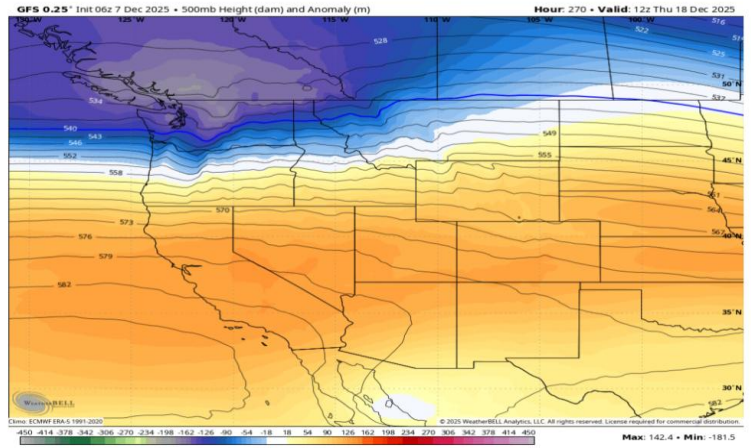
And on right from OpenSnow Dec 7 discussion of possible buckle of Western Ridge around Dec 18.

Looking forward to Dec 18 ! Cheers !!

8:59

Inbox ❄️ **Chase Powd...**

Below: If you are looking for any optimism in the West, the ridge might buckle around December 18th. Models that far out are unreliable. I can't gain much hope just yet. The ensembles are not overly bullish yet either.



A few slides from 2014 talks to provide more details for those that like details…

NRCS - Jan Curtis - Applied Climatologist retired after 41 years with several agencies. Jan always had a wealth of info to share about current weather, outlooks, snowfall patterns, snow accumulation, snowmelt rates, and weather patterns overall.

Lessons learned from Jan:

- **Don't believe the 1st forecast you hear**
- **Wait until you hear the Same or Similar forecast from two or more unrelated sources.**

From 2014 talks

- **Long-range and short-range forecasts are not showing strong signals, the confidence in the forecasts are low….**

- **Persistence is still best forecast and wins in these types of weather patterns -- what you see in your area is what you will continue to have until a different weather pattern sets in.**

Winter 2013-2014 What Happened?

Surf's Up

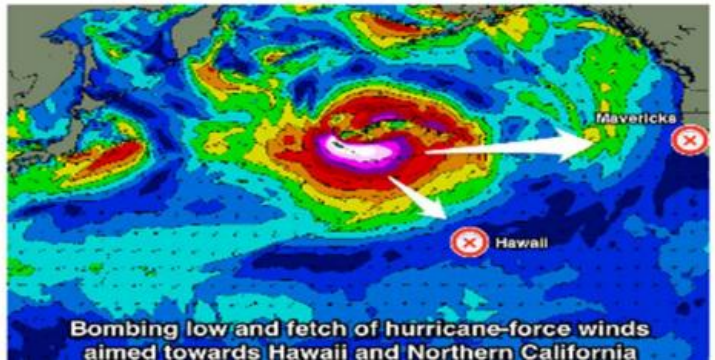
Jan 22, 2014

30-40 (60-80) foot waves & erratic winds cancel Hawaii Surfing Event

Three great barrels from Sunday 19/01 at Peahi.

All eyes on Hawaii as huge storm approaches

A fortnight ago the eyes of the surfing world were on Europe and the 'Hercules' storm that burst out of the North Atlantic Ocean. At the time Hawaii was almost unsurfably small. Since then a series of storms in the North Pacific have wrested attention back to the Hawaiian Islands. The great run of swell will be capped by a beast of a system; a storm that has longtime forecasters cooing with excitement.



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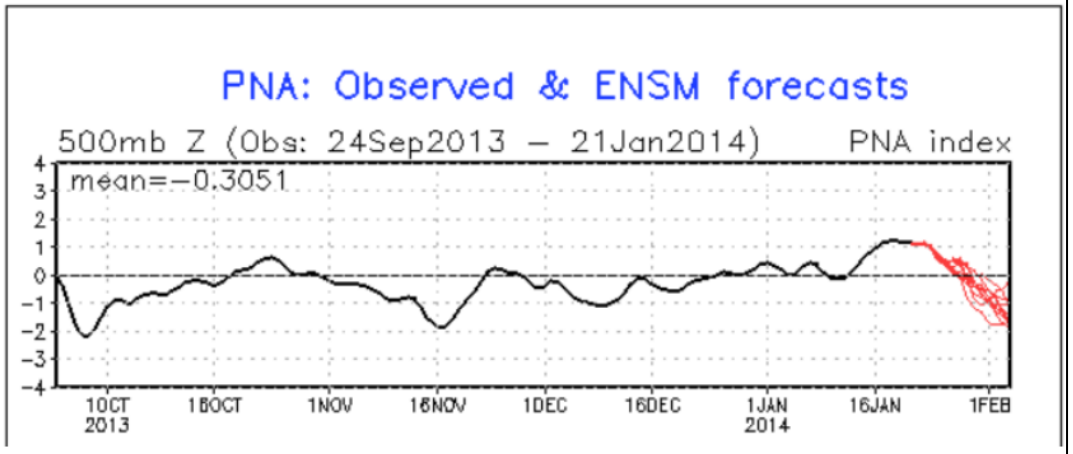
The PNA is getting interestingly negative:

Pacific North American Index is one parameter (index) that helps for moisture in the PAC NW but there are others that are needed too.

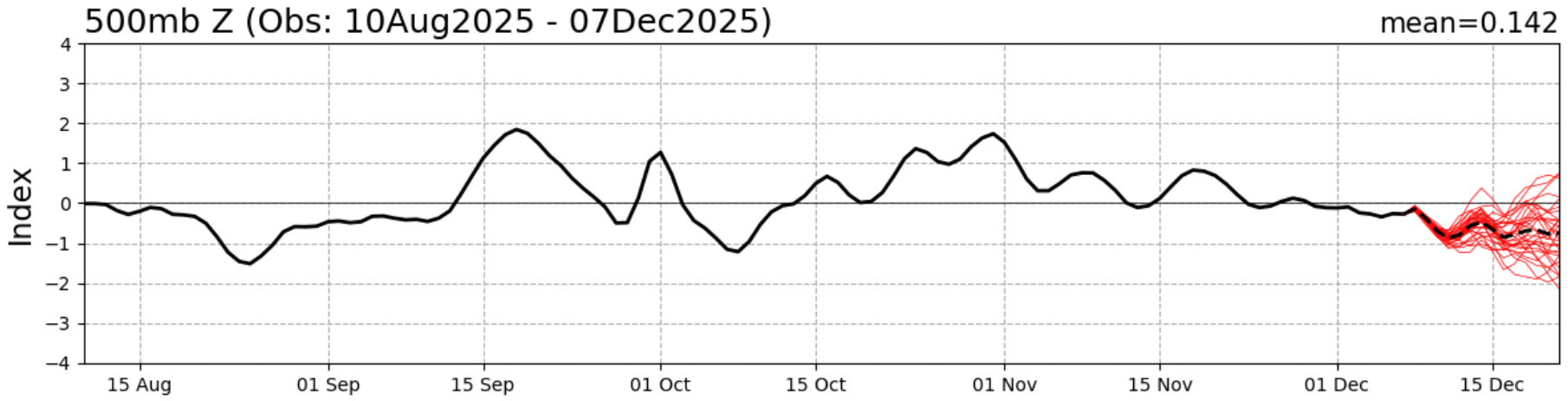


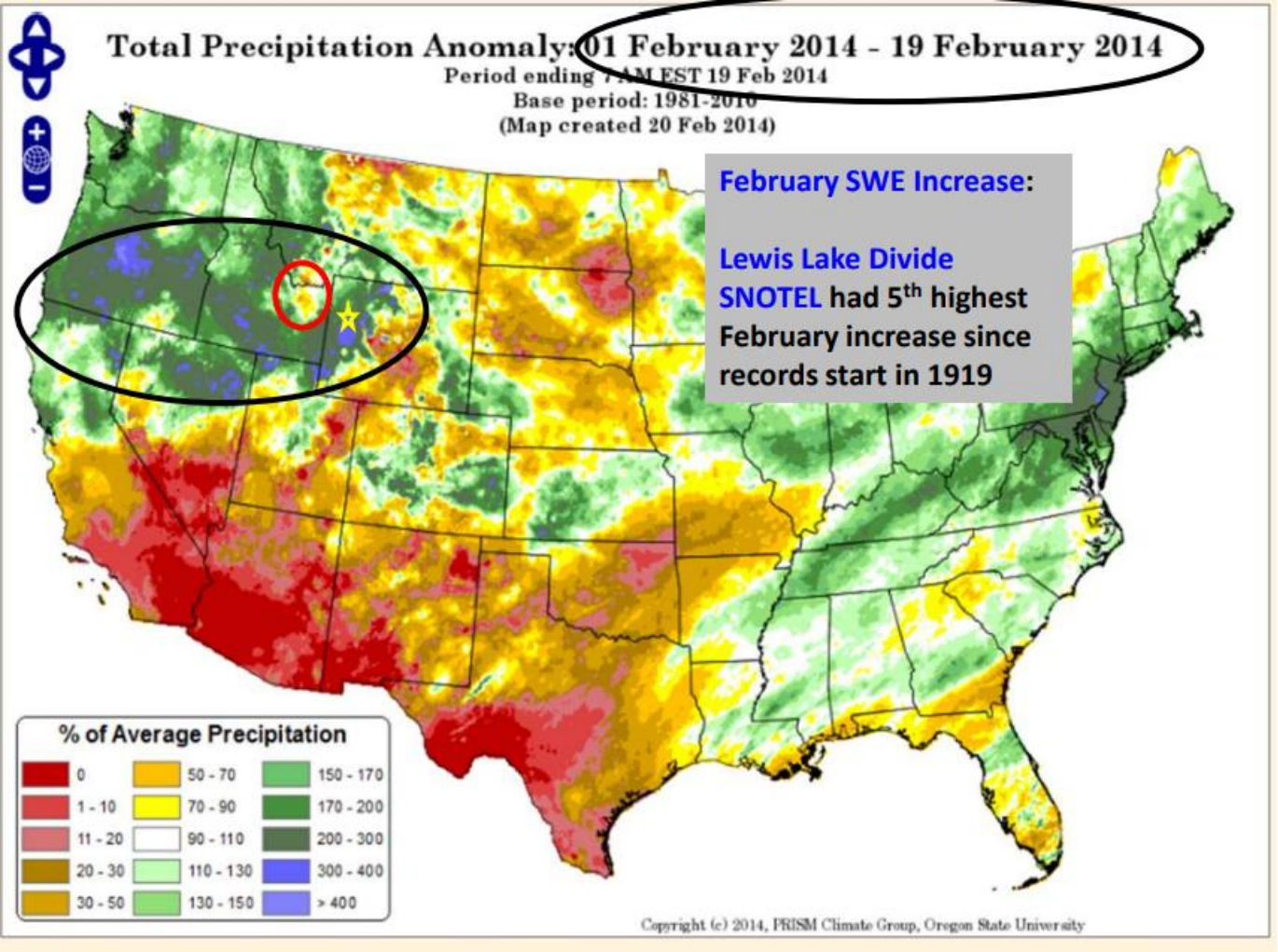
Left - PNA from Jan 2014

Below - Current PNA - keep clinking this link daily and watching to see if negative trend continues which helps with moisture in PNW.

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/pna.shtml

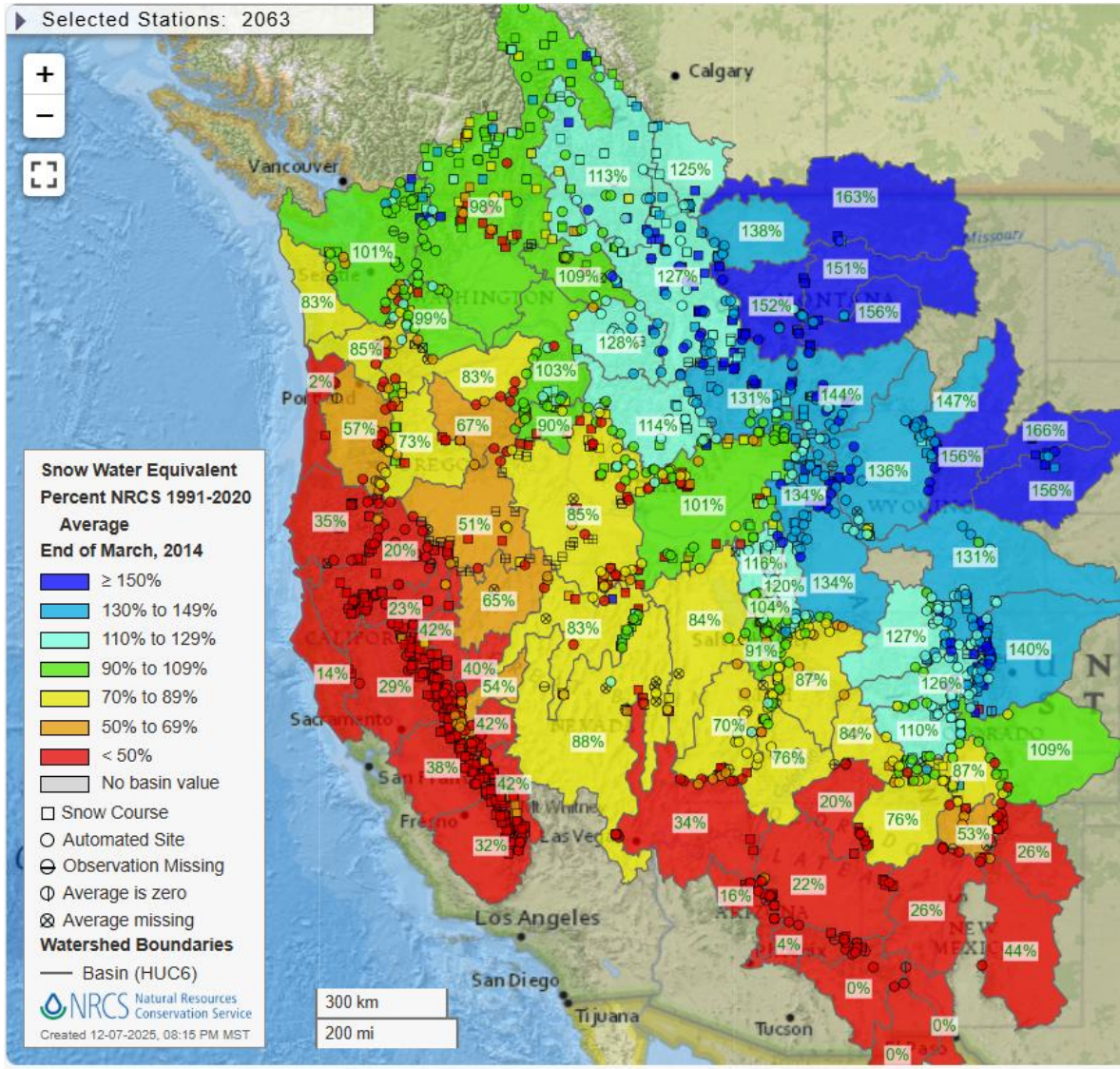
PNA Index: Observed & GEFS Forecasts





Left - February 1-19 2014 Precipitation

Below - April 1, 2014 Snowpack – how the season ended



Seasonal Climate Forecast
Dec. 2025 – Feb. 2026

Issued: November 21, 2025

Contact: ODF Lead Meteorologist Pete Parsons
503-945-7448 or peter.g.parsons@odf.oregon.gov

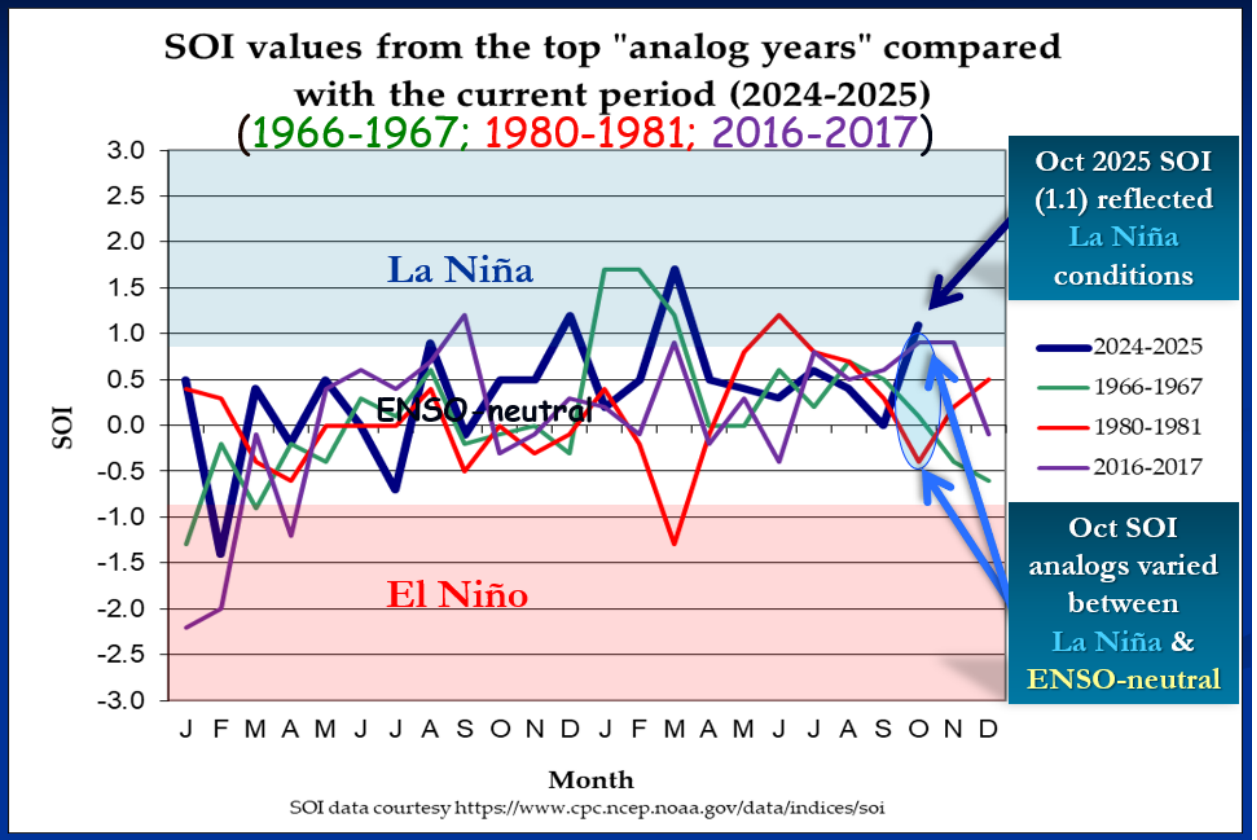
ODA Team: Andy Zimmerman; Jenn Ambrose; Laura Passage
ODF Team: Julie Vondrachek; Kristin Cody; Sherri Pugh; Gary Votaw
S. Prichard

Pete's Nov update shows the analog years remained the same from Oct. Years are 1967-68, 1981-82, 2017-18 with 2001-02 as a runner up.

- This forecast is based on weather that occurred during the (1967-68; 1981-82; 2017-18) analog years. 2001-02 was a "runner-up."

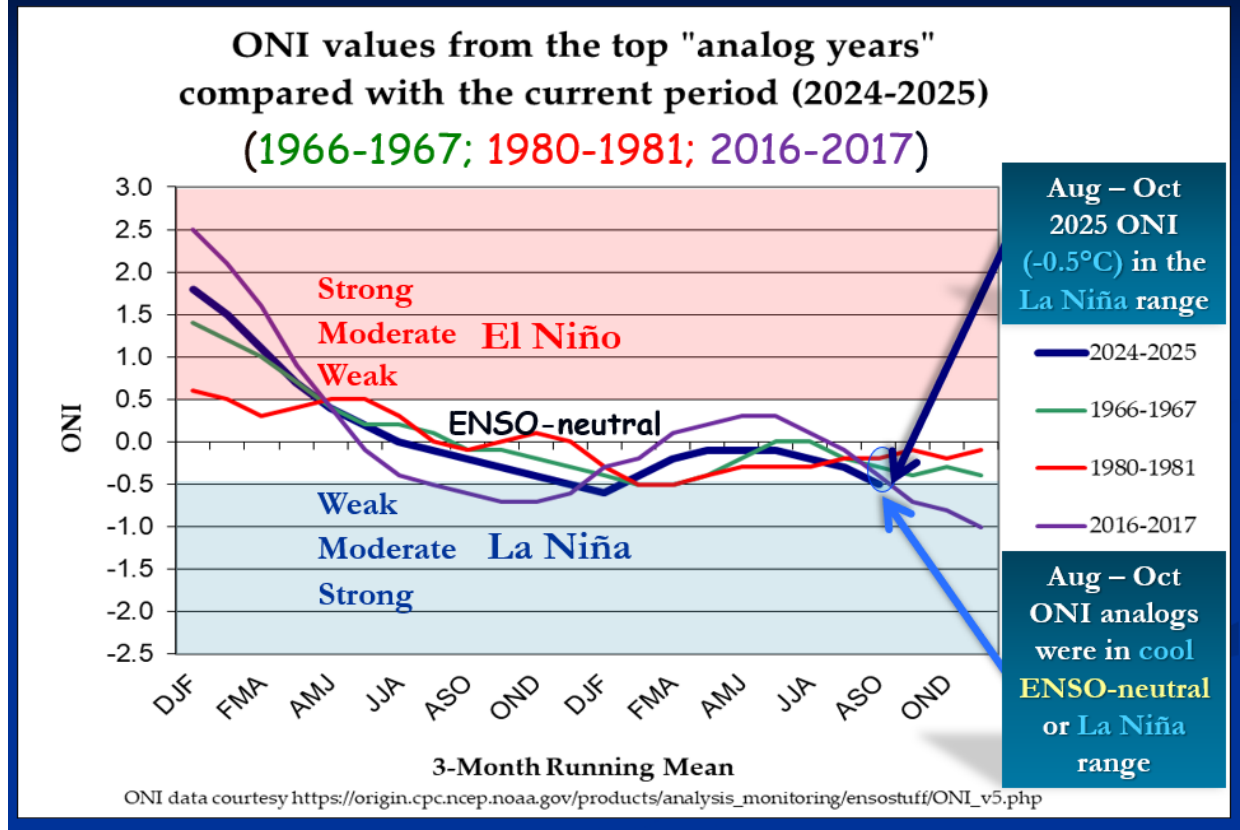
https://www.oregon.gov/oda/natural-resources/pages/weather.aspx?utm_medium=email&utm_source=govdelivery

Southern Oscillation Index (SOI)



SOI data courtesy https://www.cpc.ncep.noaa.gov/data/indices/soi

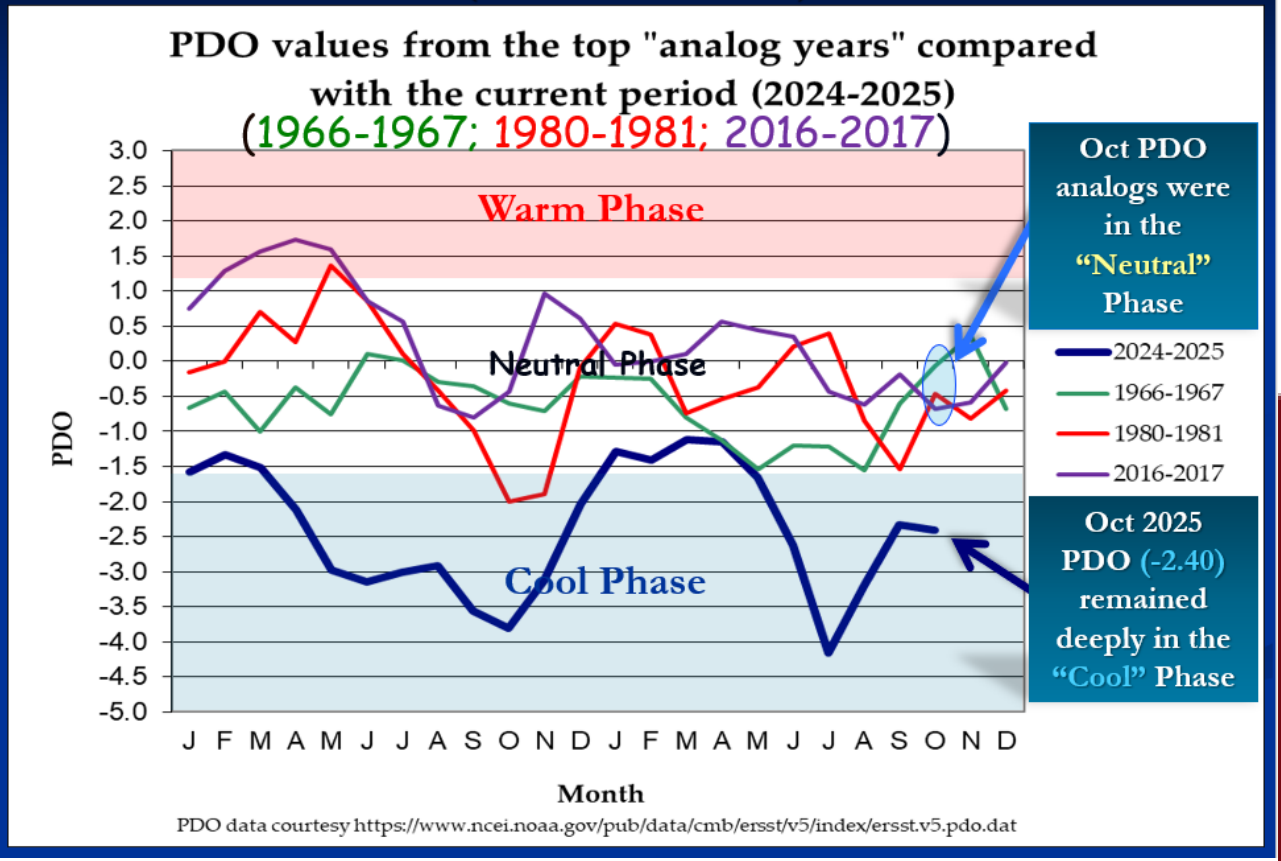
Oceanic Niño Index (ONI)



ONI data courtesy https://origin.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ONI_v5.php

North Pacific Ocean

(Poleward of 20°N Latitude)



PDO data courtesy https://www.ncei.noaa.gov/pub/data/cmb/ersst/v5/index/ersst.v5.pdo.dat

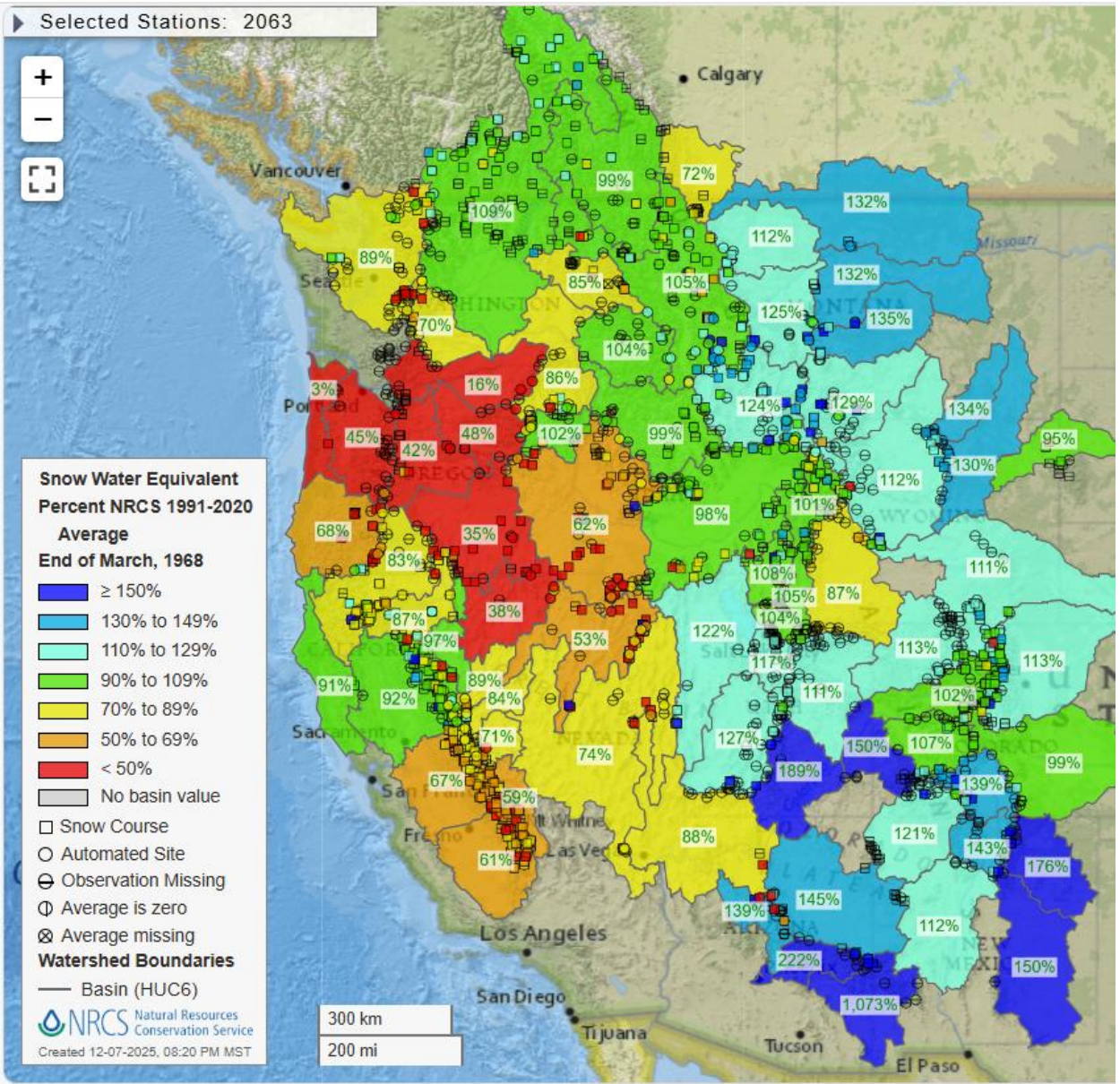
Forecast Highlights

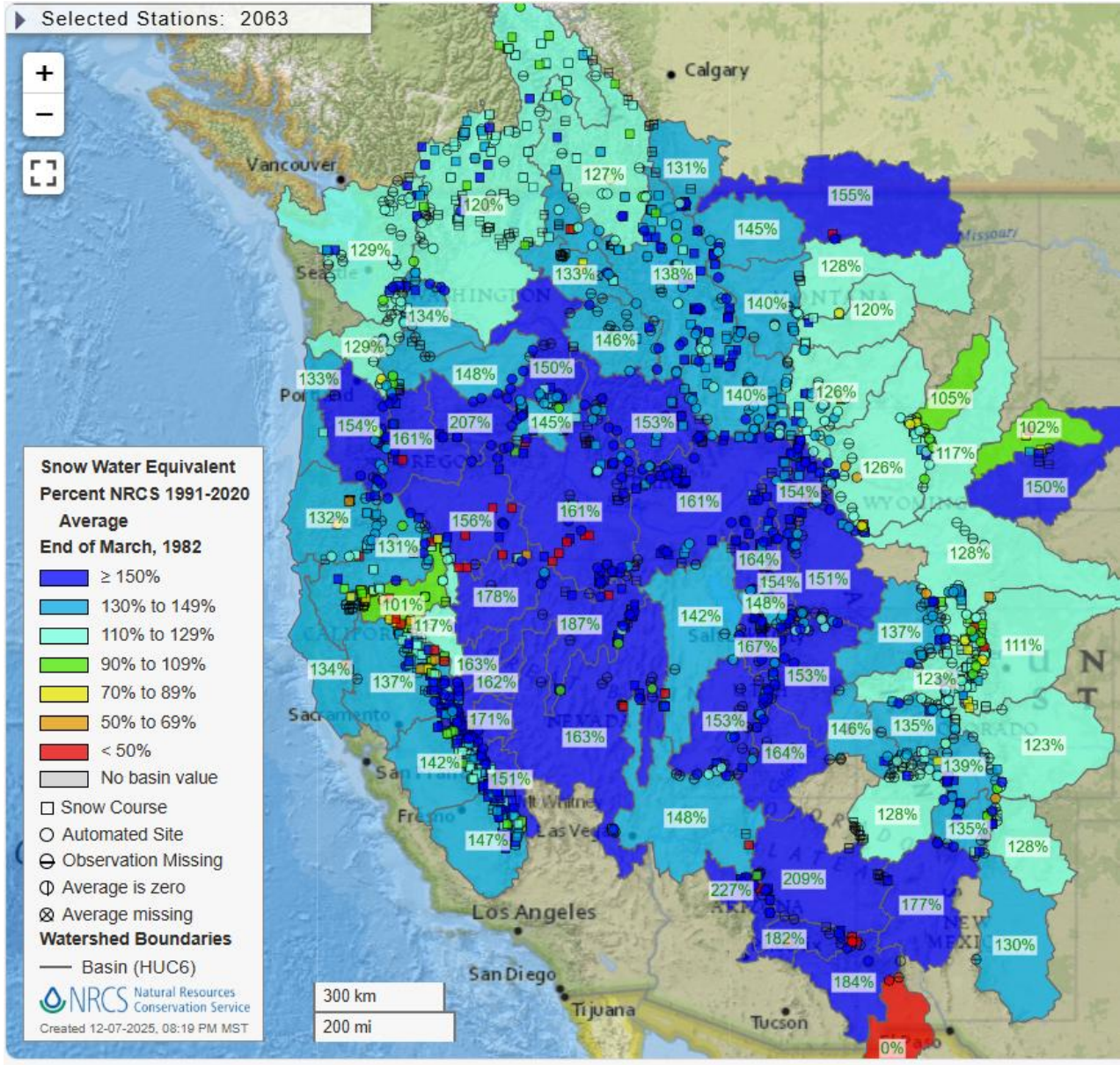
- This forecast is based on weather that occurred during the (1967-68; 1981-82; 2017-18) analog years. 2001-02 was a "runner-up."
- Heightened chances of coastal storminess in December (based on the 1967 analog). Arctic outbreaks are indicated, based on all 3 analog sets.
- Large variation in temperatures among the analogs lowers forecast confidence. Their blend calls for "slightly warmer than average" conditions. However, extremes in either direction are likely, especially for short-time periods.
- Precipitation forecast is difficult, with analogs showing wide-ranging solutions. Their "blend" shows "near-average" rain and mountain snow, but near-to-above mountain and valley snowfall is favored.

Disclaimer: This forecast is not associated with NOAA's Climate Prediction Center (CPC). See "Forecasting Methodology..." at: http://www.oregon.gov/oda/naturalresources/pages/weather.aspx

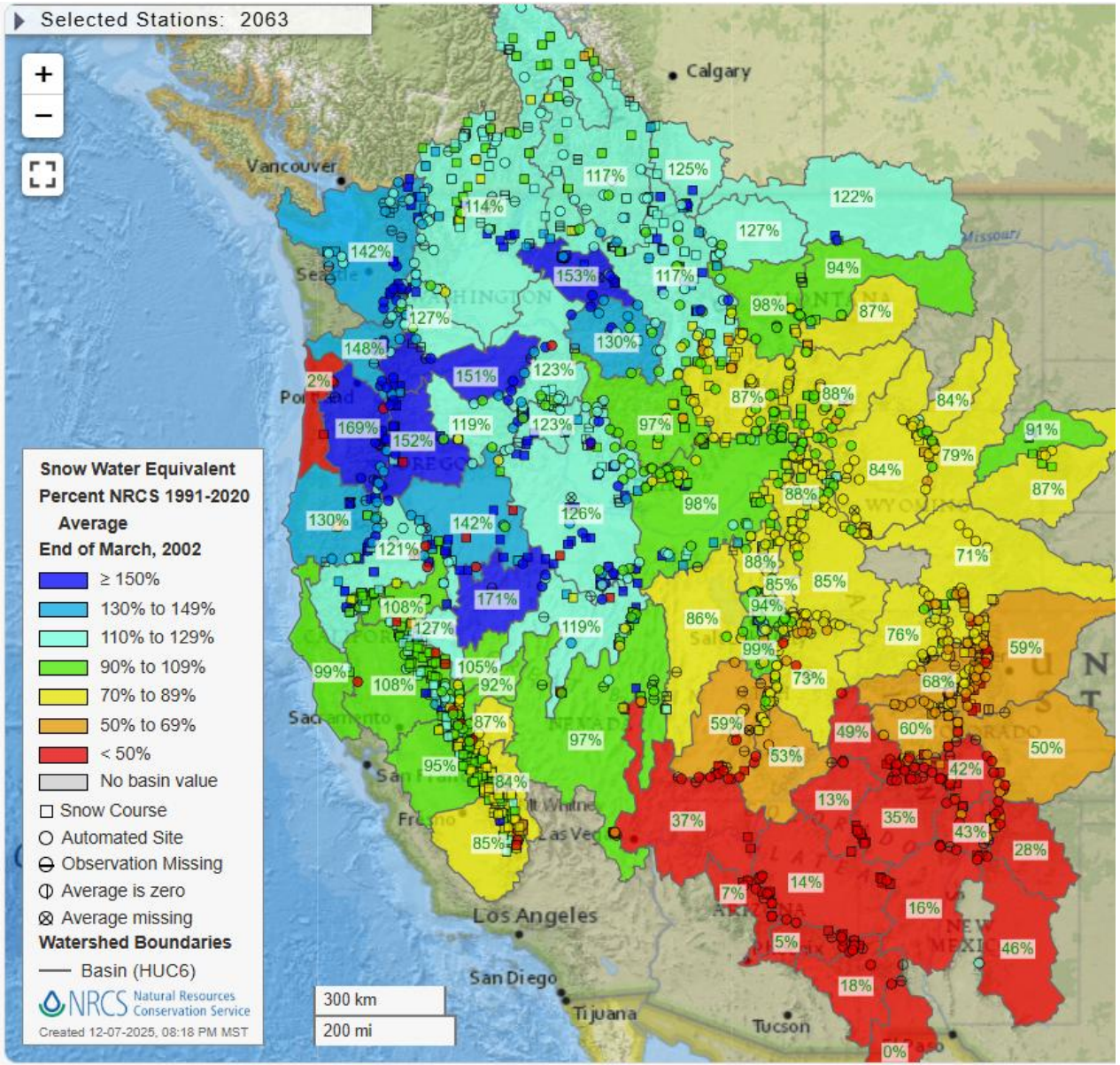
Here's the big picture and how the snowpack % of average was around April 1 for these analog years.

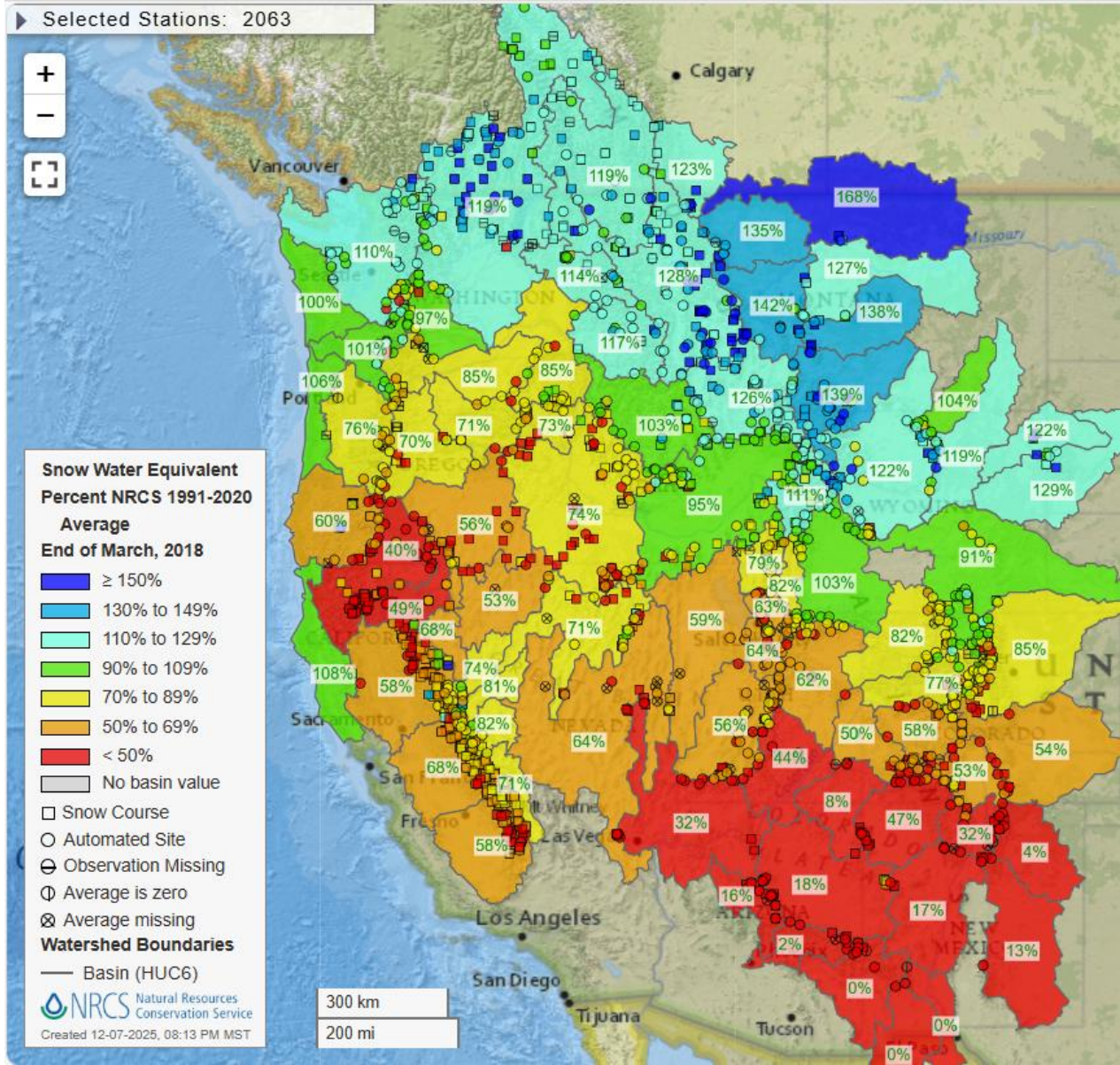
April 1 1968 Snowpack Based on SNOTEL & Snow Course April 1 1982





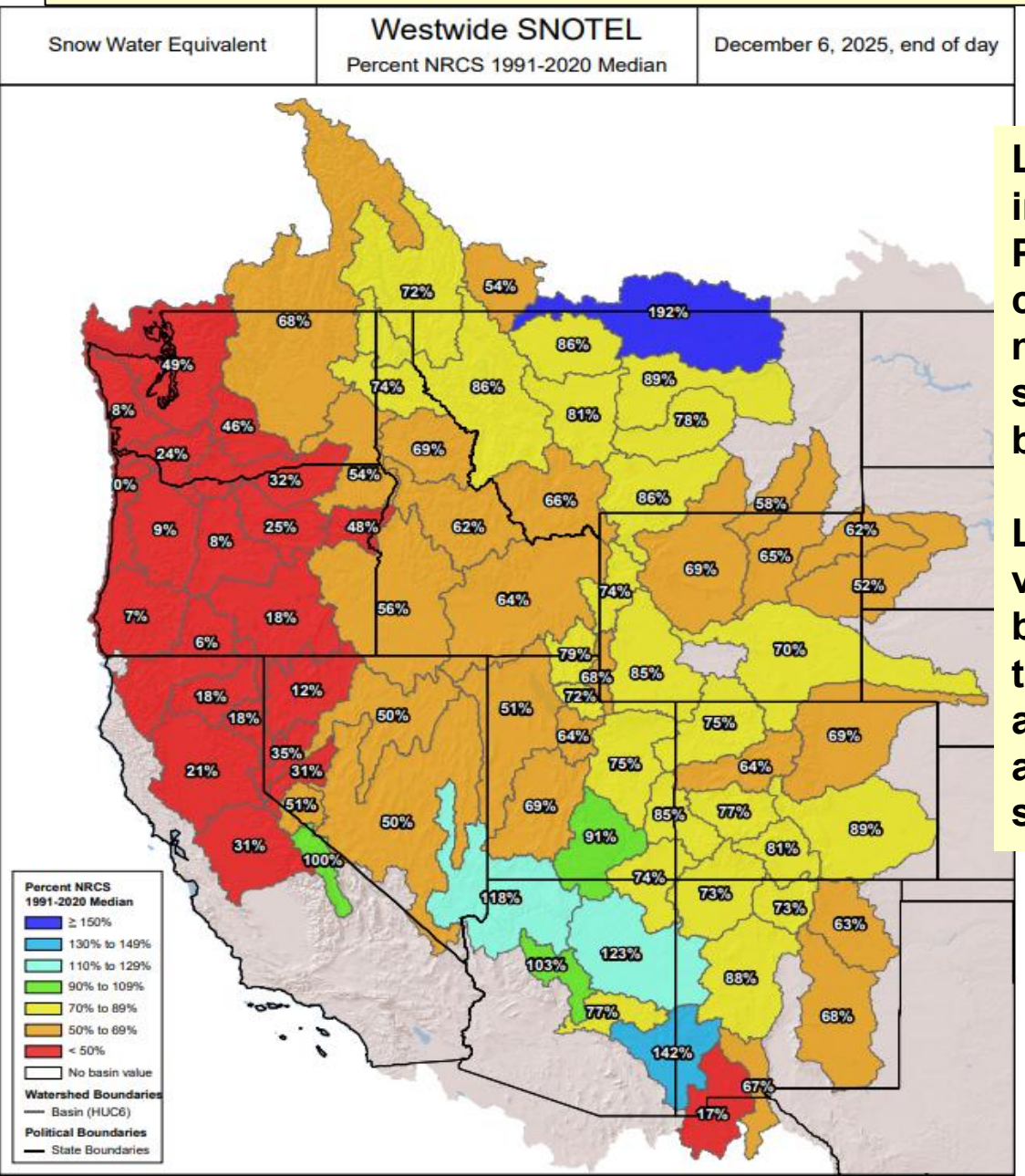
April 1 2002 Snowpack Based on SNOTEL & Snow Course April 1 2018





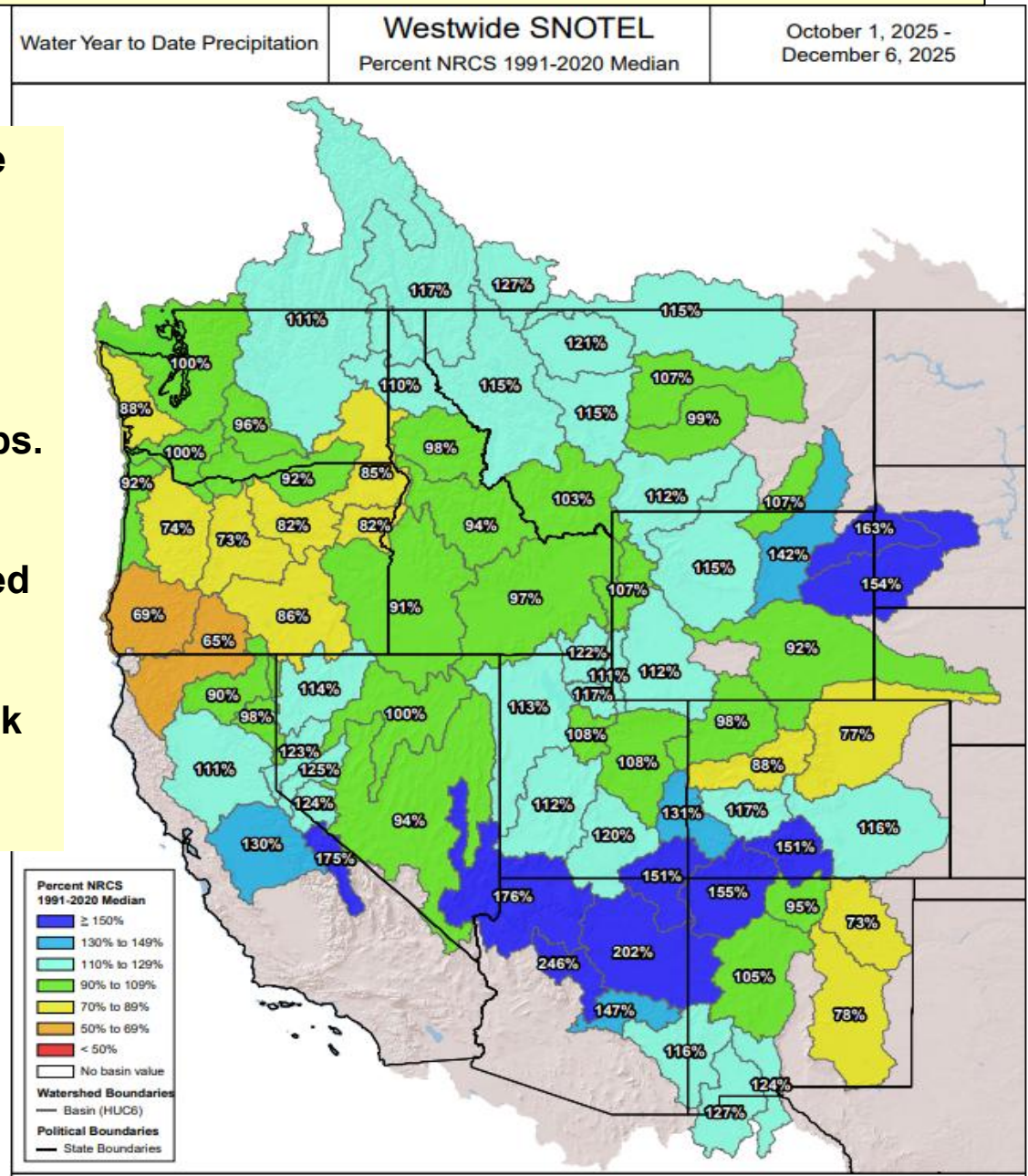
Current Conditions:

Dec 6 2025 Snowpack **Based on SNOTEL** **Dec 6 2026 Water Year to Date Precipitation**

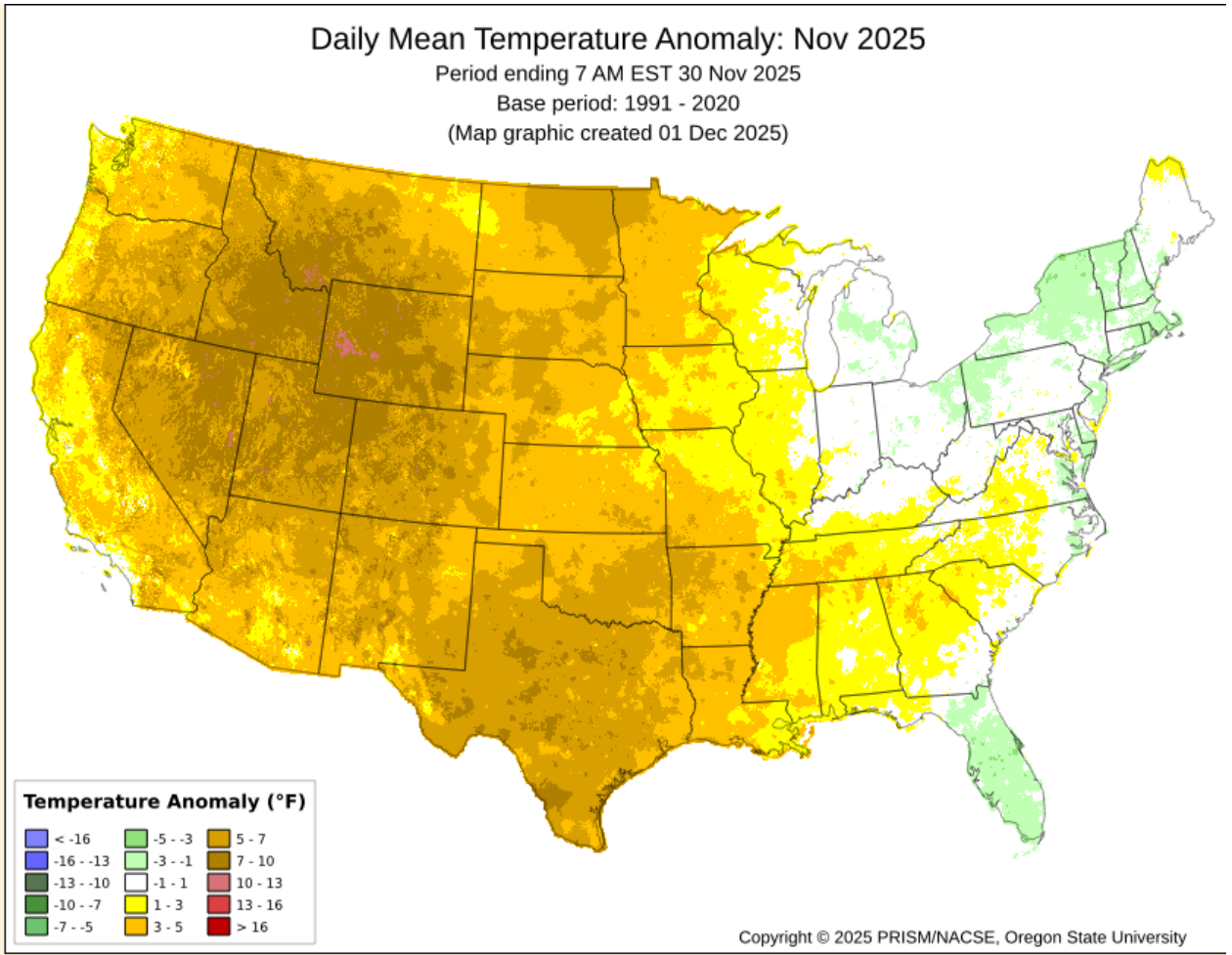


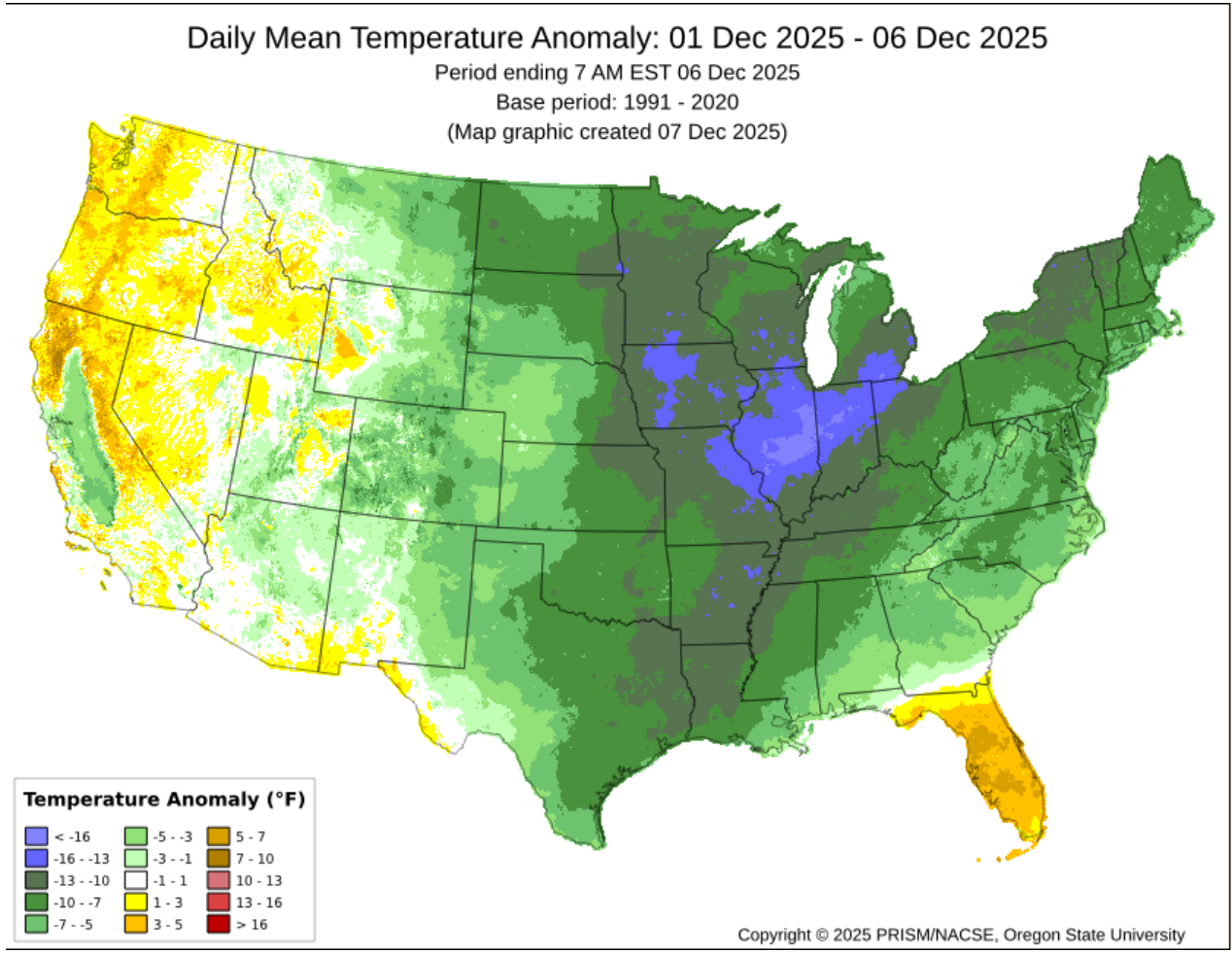
Large difference in Water Year to Precipitation compared to mountain snowpack because of temps.

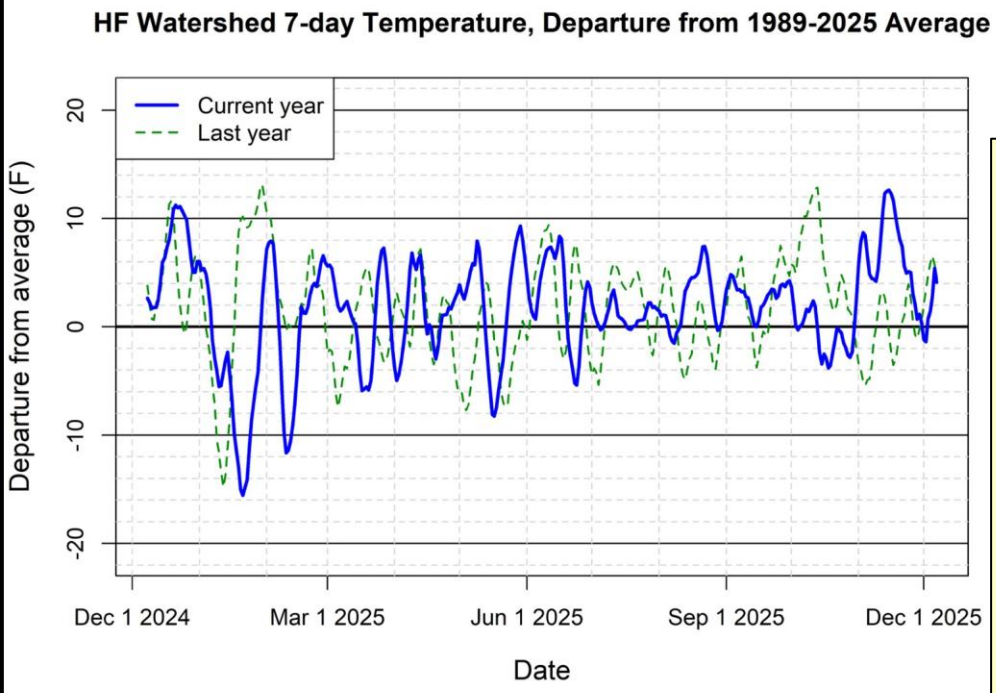
Lower snow values influenced by warmer temperatures, also need to look at elevation of snow sites.



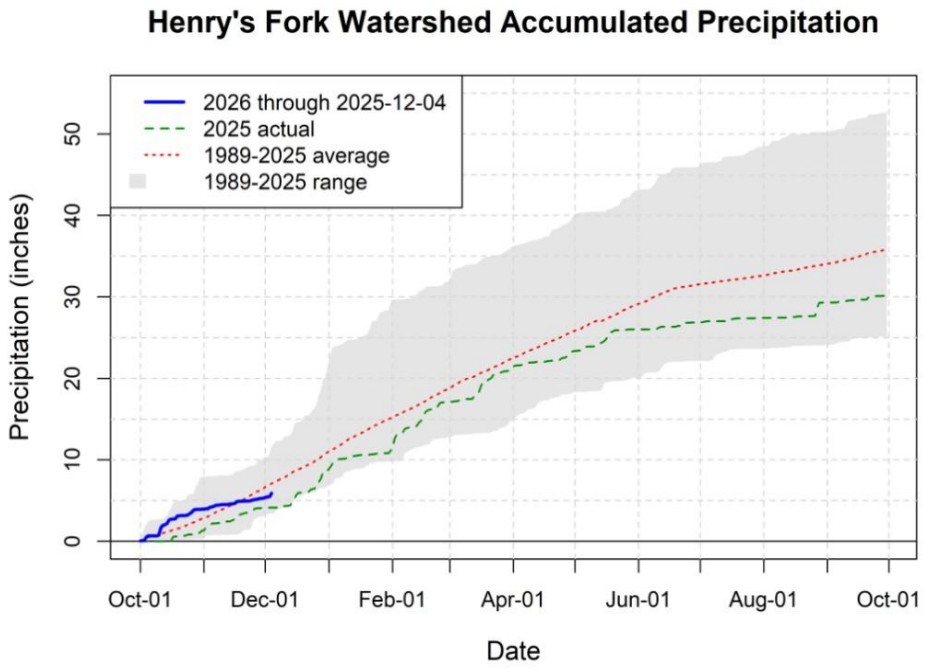
Warm Western Temps for Nov and Dec 1-6

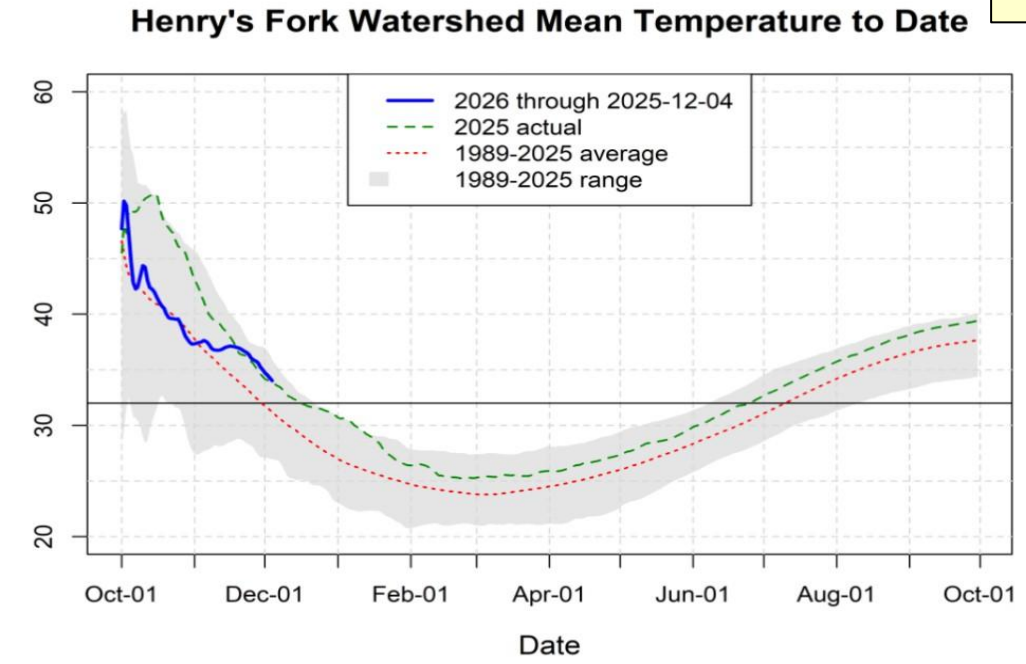


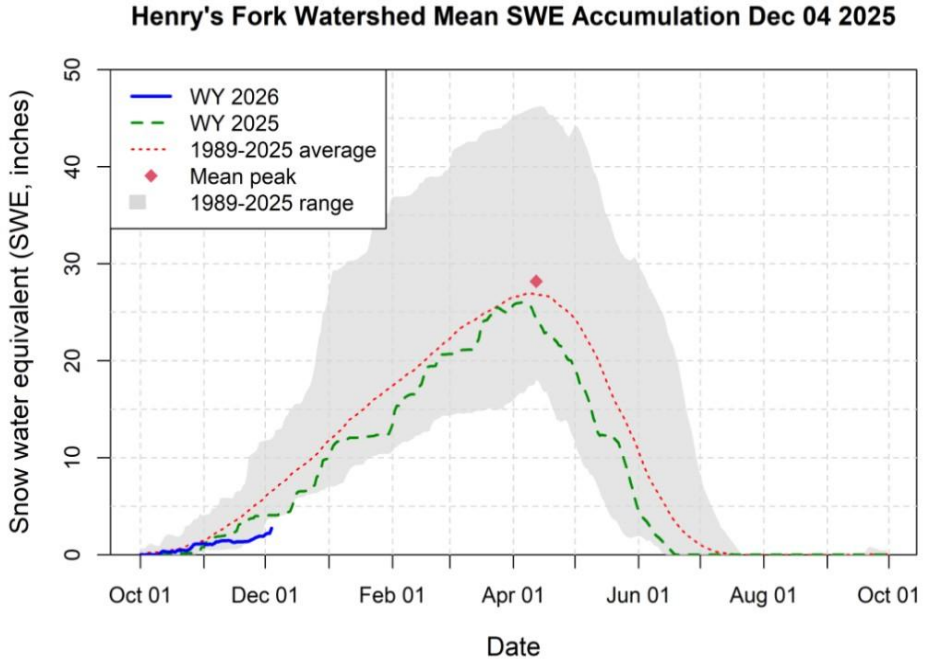


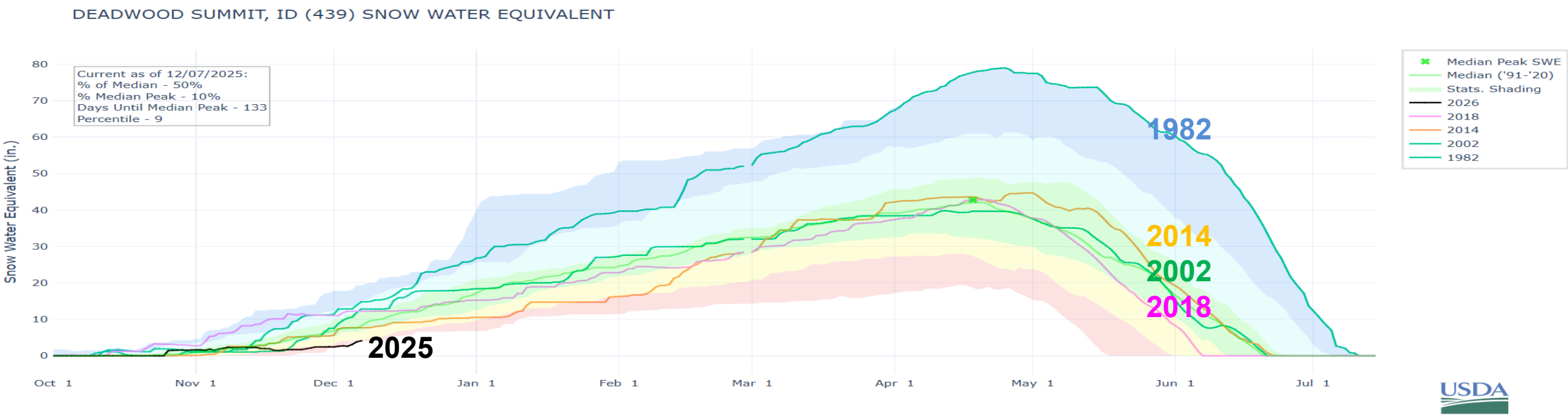


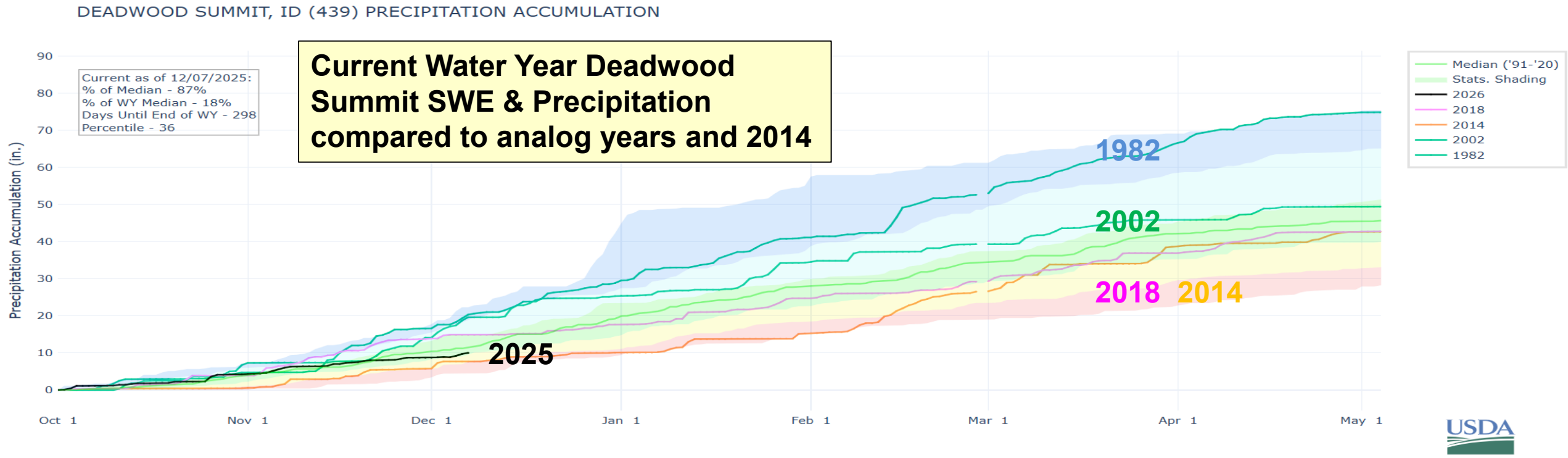
A few slides from the Henrys Fork crew illustrating the warmer than normal temps, currently similar to 2025, and impacts on differences between total precip and SWE levels.



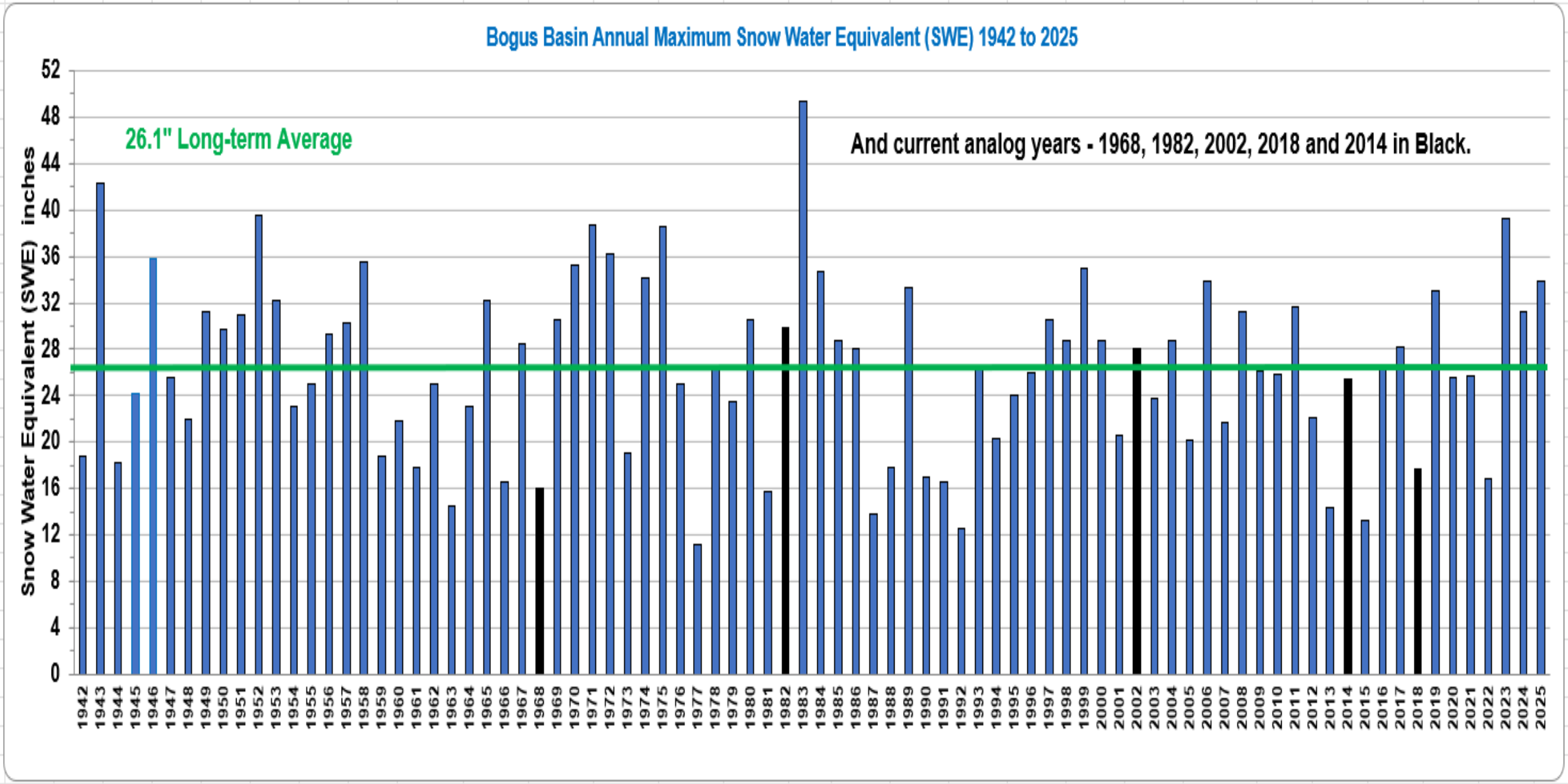





DEADWOOD SUMMIT, ID (439) SNOW WATER EQUIVALENT
Current as of 12/07/2025:
% of Median - 50%
% Median Peak - 10%
Days Until Median Peak - 133
Percentile - 9
Snow Water Equivalent (in.)
Median Peak SWE
Median ('91-'20)
Stats. Shading
2026
2018
2014
2002
1982
1982
2014
2002
2018
2025
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
USDA


DEADWOOD SUMMIT, ID (439) PRECIPITATION ACCUMULATION
Current Water Year Deadwood Summit SWE & Precipitation compared to analog years and 2014
Current as of 12/07/2025:
% of Median - 87%
% of WY Median - 18%
Days Until End of WY - 298
Percentile - 36
Precipitation Accumulation (in.)
Median ('91-'20)
Stats. Shading
2026
2018
2014
2002
1982
1982
2002
2018
2014
2025
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
USDA

Bogus Bonus - Historic SWE and Analog Years.



Bogus Bonus Snow Depth for analog years with daily snow depth data 2025, 2018, 2014 and 2002