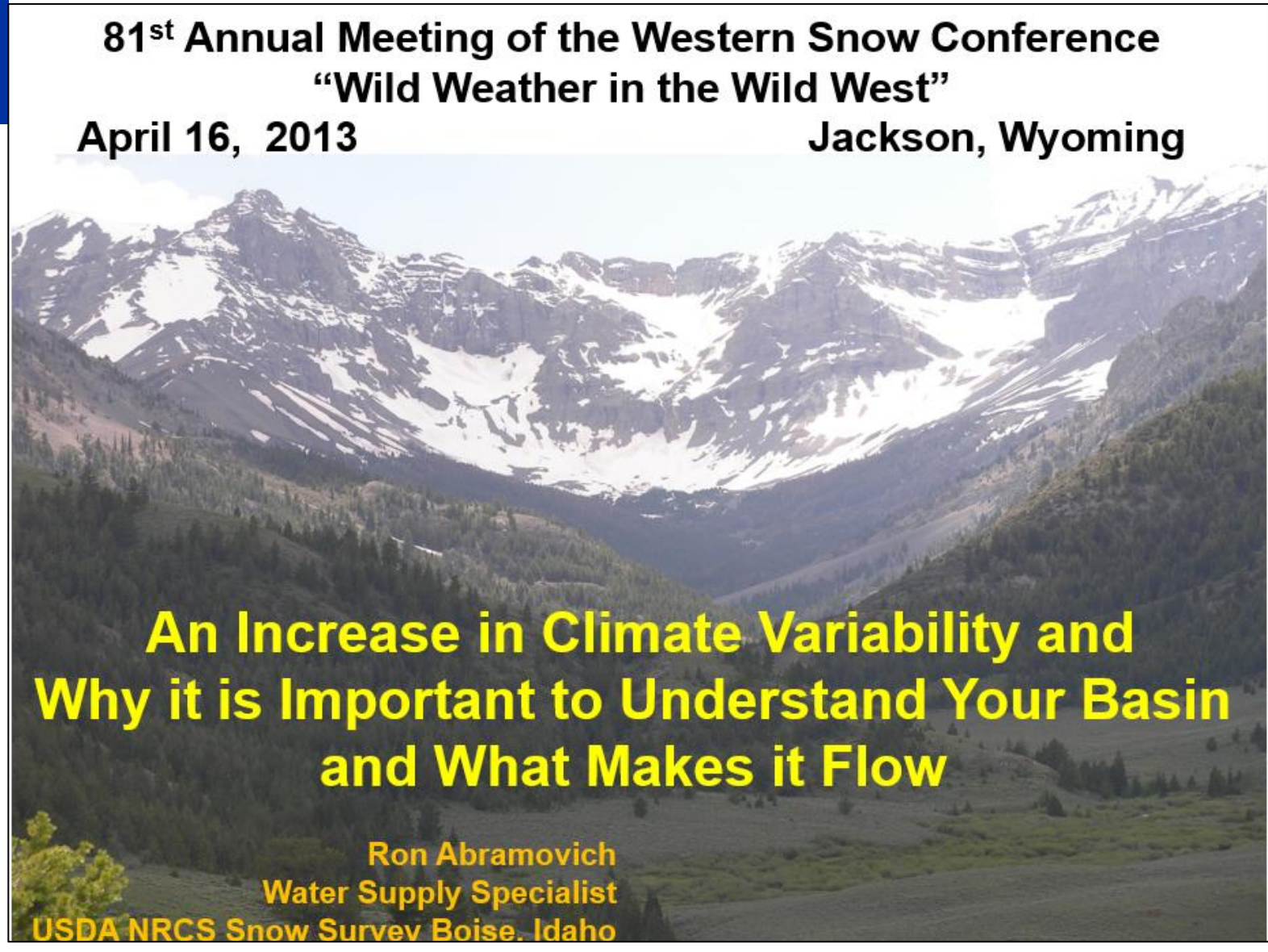
OSHER LIFELONG LEARNING INSTITUTE

The Osher Lifelong Learning Institute at Boise State University is a membership-based lifelong learning program. We offer a wide variety of college-level, non-credit programs designed for intellectually curious adults age 50 and over.

Snow: Idaho's Frozen Liquid Gold (Hybrid) Part I April 22, 2026

This talk & more posted at:
https://snowweatherandflow.blog/

Ron Abramovich
Mostly retired
and still watching
the weather…



Snow: Idaho's Frozen Liquid Gold (Hybrid)

This course will discuss the building of Idaho's mountain snowpack as it reaches its peak in early April and current water supply outlook.

We'll examine the history of snow surveys and the usefulness of water supply information as well as current snow levels and water supply outlook.

We also will explore the importance of understanding your watershed and what makes it flow, current snow levels, water supply outlook, and key snow, flow and weather relationships to watch as our rivers rise.

PLEASE NOTE: *The first session of this course will meet on February 18, and the second session will meet on April 22.*

Presenter: Ron Abramovich, retired Water Supply Specialist, USDA Natural Resources Conservation Service

Dates and time: **Session One:** Wed., Feb. 18, 1:30-3:30 p.m.
Session Two: Wed., Apr. 22, 1:30-3:30 p.m.

Watch a preview of this program here: **Snow: Idaho's Frozen Liquid Gold**

Topics:

- Increase in Climate Variability Leads to Importance to Understand your Basin and What Makes it Flow

- Key Snow 2 Flow Relationships to Watch
  - Snow Covered Area
  - Key Precipitation Thresholds
  - Key Temperature Relationships

- Past Research

- Current Snow Conditions and Water Supply Outlook – how dry is it ?

- 2026-2027 Super El Nino is Brewing

April 13, 2026
18” in 24 Hours
20” in 28 Hours
2.4” of SWE
2” of total precipitation
Temps around 30 F.

Relationships have been around a long time…

June 1806, Nez Perce told Lewis & Clark you can't get over Lolo Pass until the rivers come up for 2 weeks, then the snow at Lola Pass will be melted.

From Vernon Preston book published by the American Meteorological Society
***Lewis & Clark, Weather and Climate Data from the Expedition Journals*, 2006**

June 17, 1806 ***A skier's dream vacation - an expedition's curse - heavy snows in the bitterroots***

The Expedition is forced to retrograde back towards the Weippe Prairie in Idaho as the numerous storms during the winter of 1805-1806 dumped upwards of 10-18 feet of snow. [3, 4, 5]

The party had to request assistance from Nez Perce guides and wait until June 24 to continue their trek over the Lolo Trail.

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Lewis & Clark and crew had an extended stay vacation in Kamiah, Idaho May 14 - June 10, 1806 before returning home.

Deepest snow NRCS measured at Lolo Pass was 10.5 ft deep.

Key is:

Snow falls, accumulates and melts consistent year to year, decade to decade, & century to century (?)

Idaho's Most Popular Snow 2 Flow Relationship:

- **Banner Summit SNOTEL Site melt relationship with timing of MF Salmon River snowmelt peak flow**
  - **Works in high years, low years, and even after all the major fires in the basin**

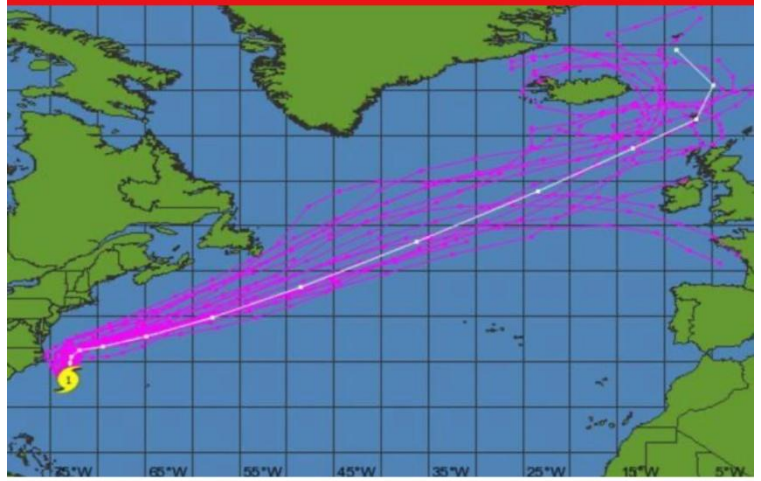
More about this later…

Our weather is always changing to create our climate.

Key is figuring out the driving forces & relationships to make better decisions to mitigate impacts in a changing climate. **And understand what is pushing what?**

⟸**Daily**

September 2023 ⟹



News > Scottish News

STORM WARNING Hurricane Lee path – where is the storm now and how will it affect Scotland's weather?

Lee has been upgraded to a Category 2 storm as it moves across the North Atlantic and forecasters have warned Brits to be prepared for strong winds and heavy rain

Past Research

May Showers over Driggs, Idaho taken from Grand Targhee SNOTEL Site, 9260 ft

USDA Natural Resources Conservation Service
National Water & Climate Center

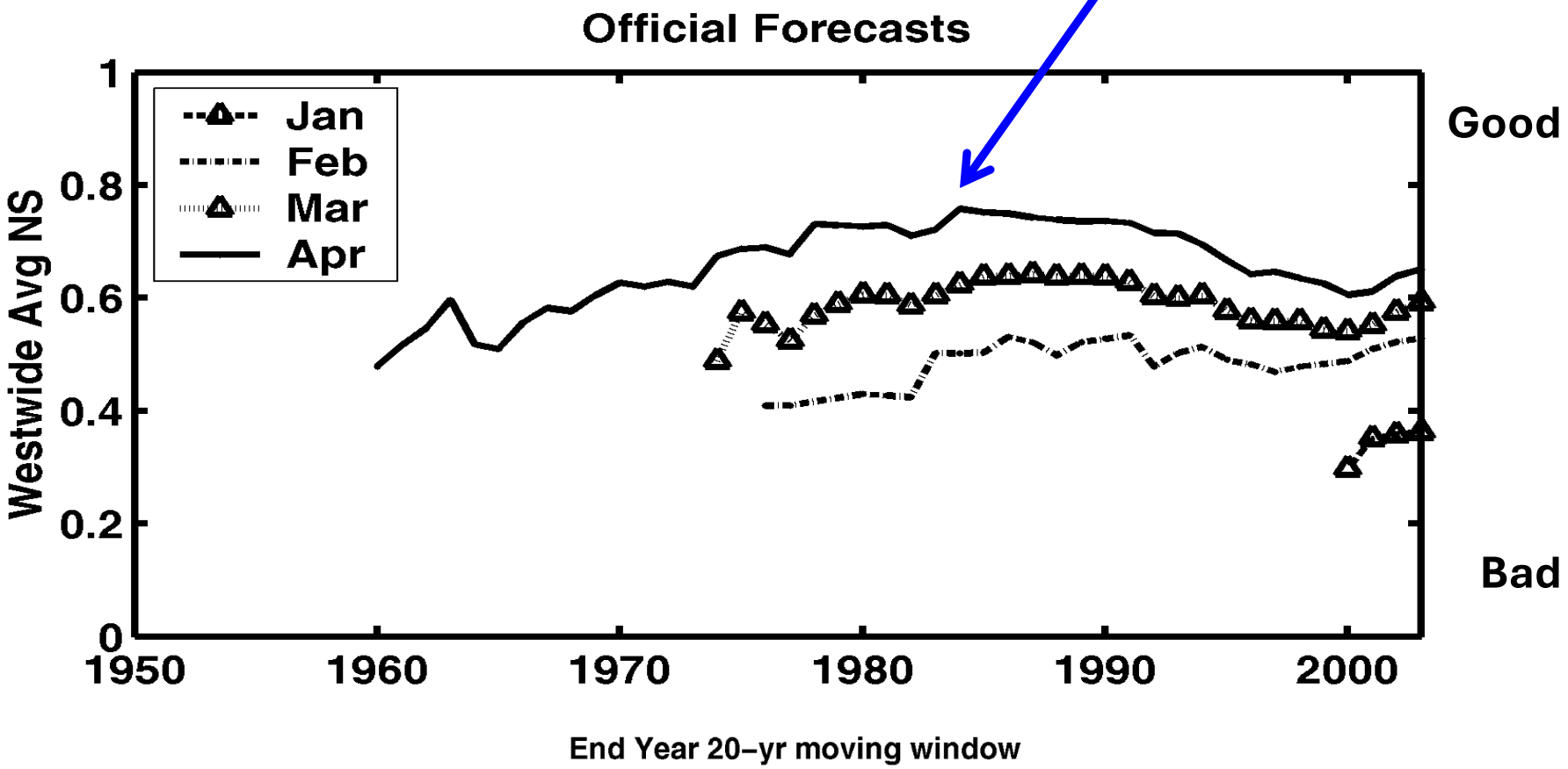
Tom.Pagano@por.usda.gov

Long-term Trends in Water Supply Forecast Skill

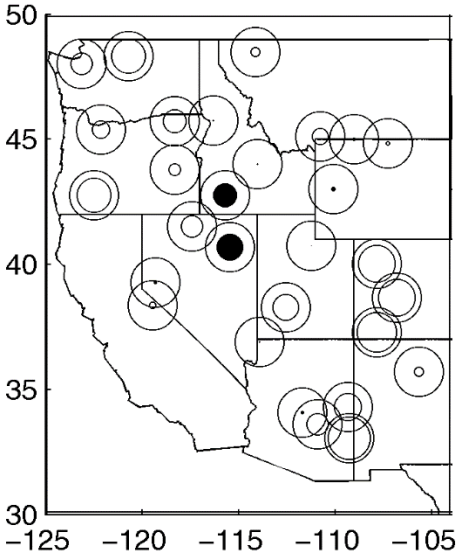
Are there any long-term trends in April 1 water supply forecast skill?

If so, where, when and why?

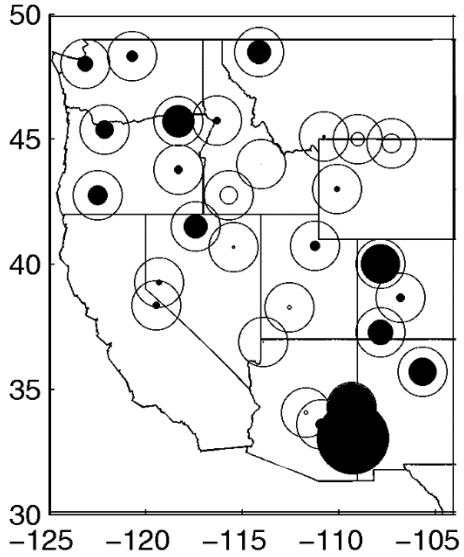
Average skill of all forecasts over 20-yr moving window for the West, as a whole.
April 1 forecast skill peaked around 1985 then slumped afterwards

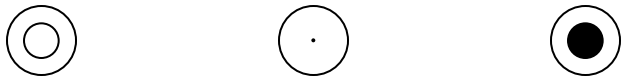


1961-80



1981-00





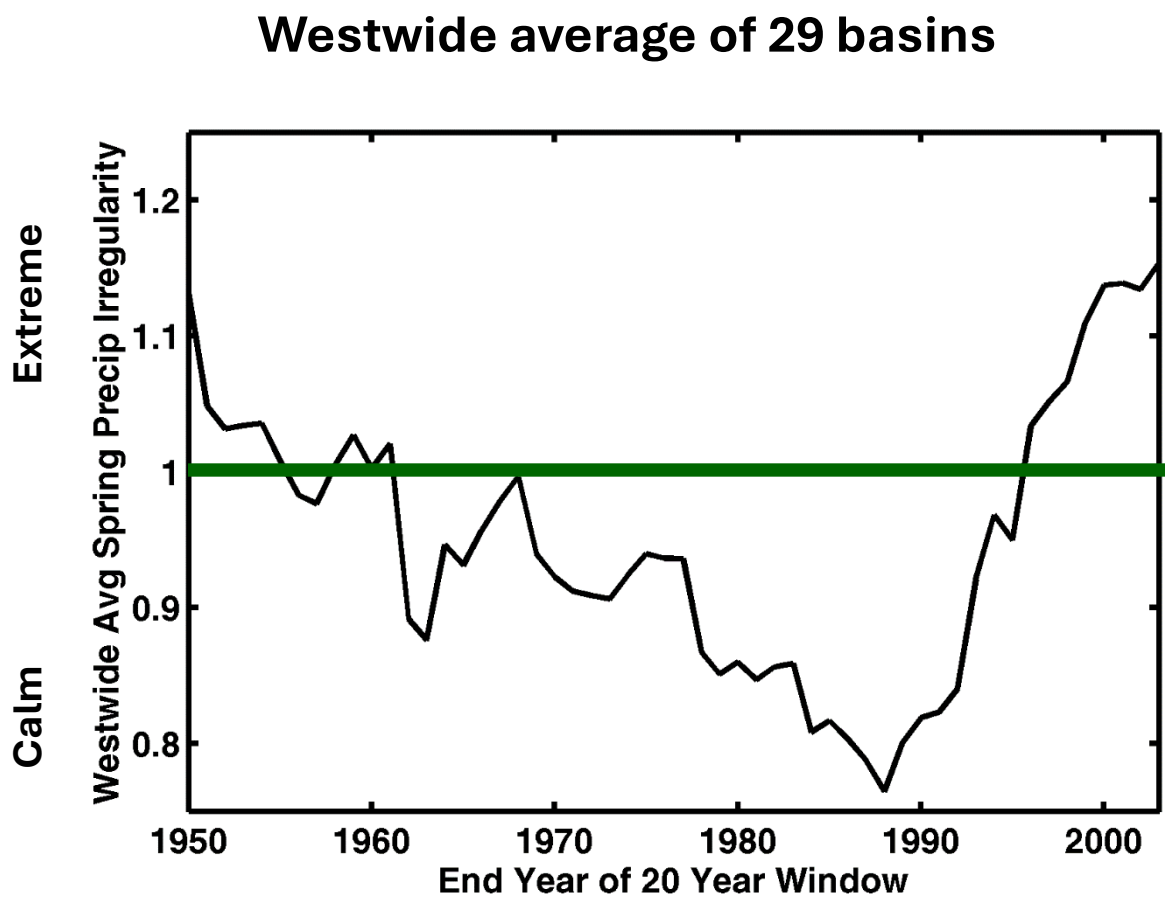
Calm Typical Extreme

Where is spring precipitation more irregular?

Now, especially in PNW and Southwest, whereas before it was very calm

This matches decline in forecast skill

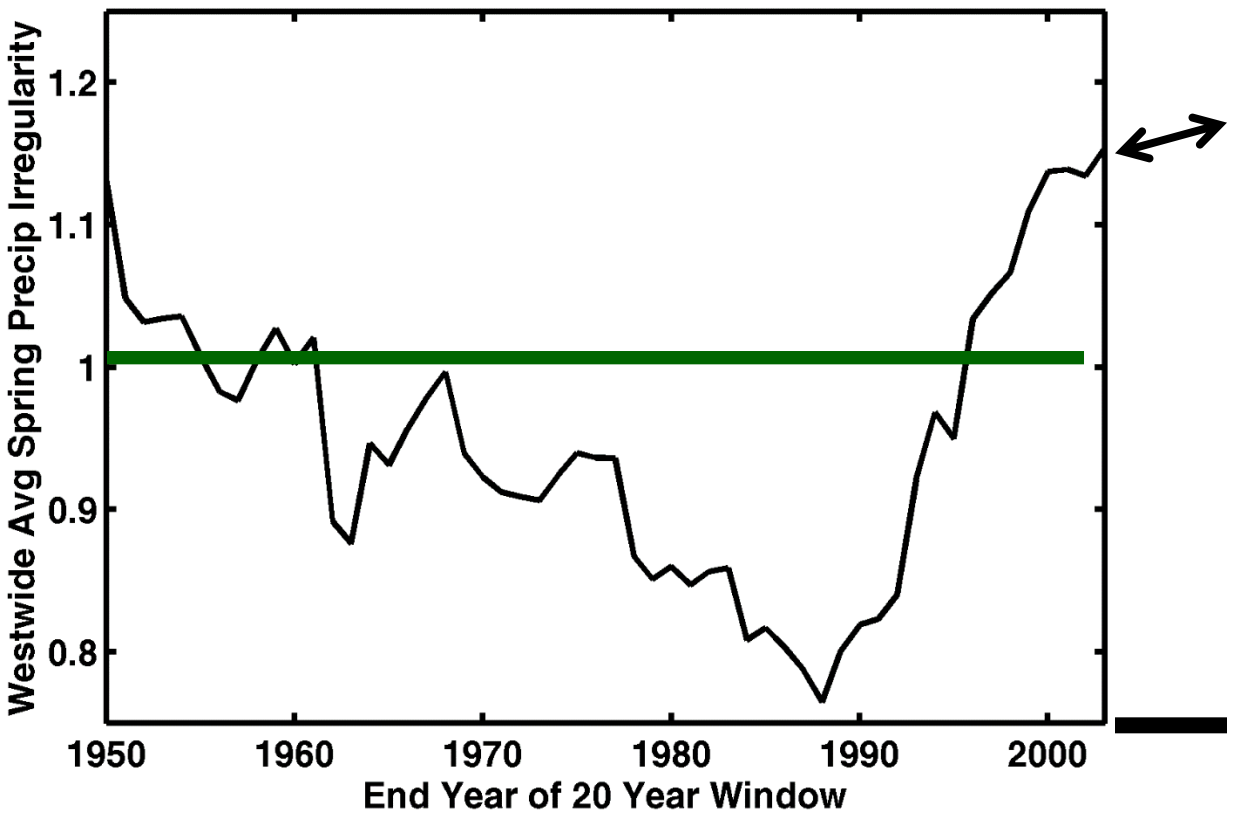
20-year moving window Spring precipitation "irregularity"



More than 1 = more extreme than usual

Less than 1 = Calm, reliably near-normal

The question is:



Will trend continue

or

Return to normal?

Based on events since mid-2000s, it seems like trend is continuing…

Old Timer Relationships
What do you see in the snow?

Hint – it is Not a blue BSU Bronco

It’s the Big Lost White Stallion

And when you see it, means the peak flow has occurred.

Picture taken June 8, 2006

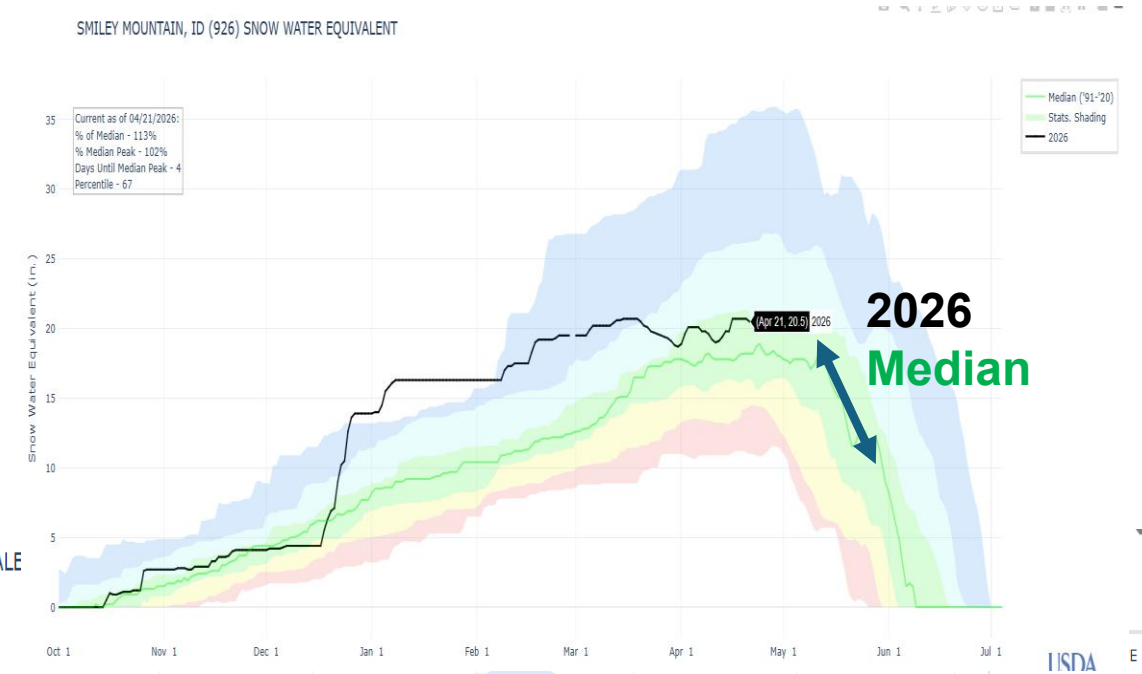
- First day melted out was Lost-Wood Divide and had SWE of 0.0”

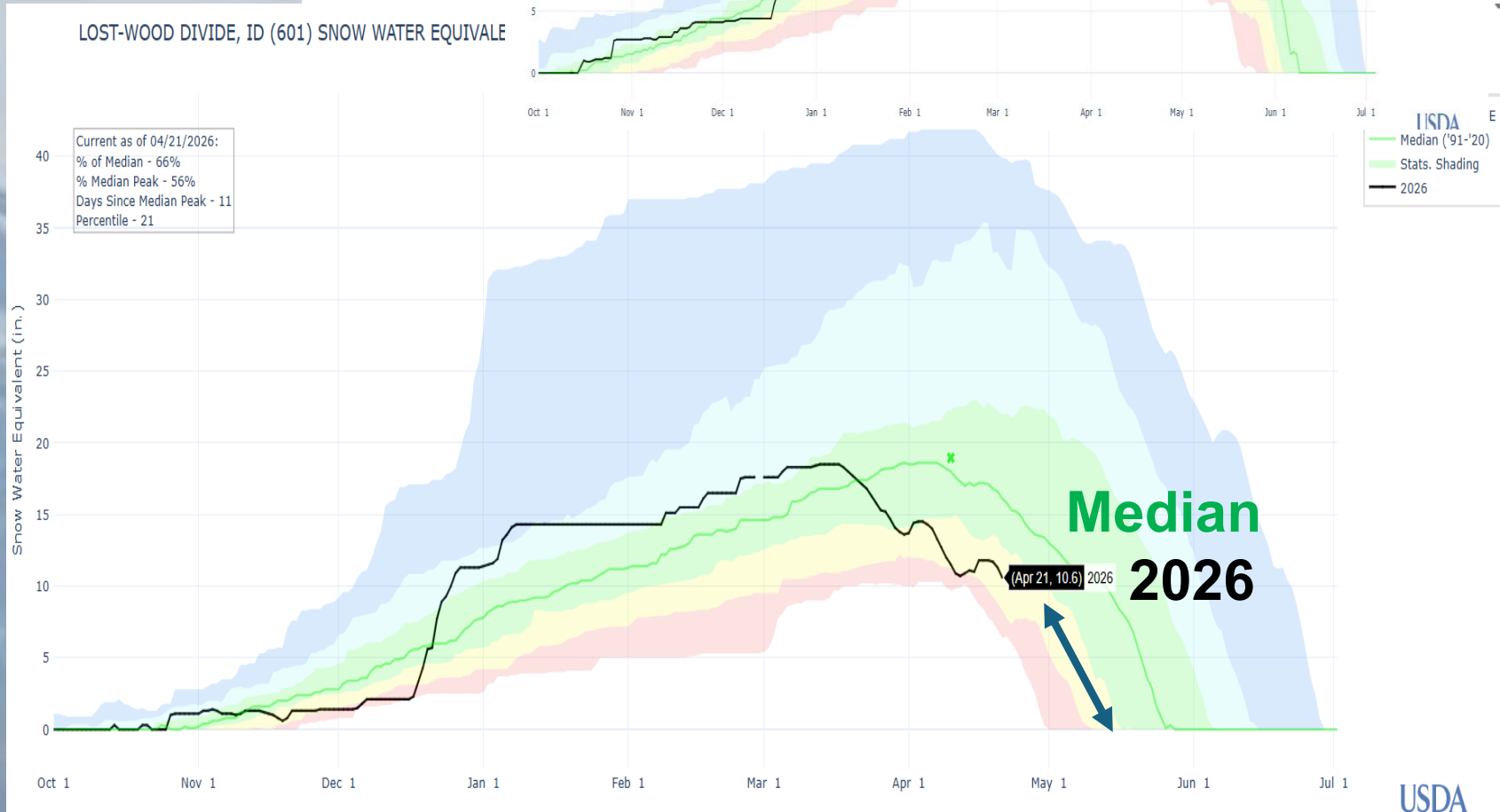
- Snow2 Flow Relationship shows Big Lost River snowmelt peak flow occurs just after melt out.

It’s the Big Lost White Stallion

And when you see it, means the peak flow has

- Snow2Flow Relationship shows Big Lost River snowmelt peak flow occurs just after melt out for Lost Wood-Divide & when Smiley Mountain is half melted.





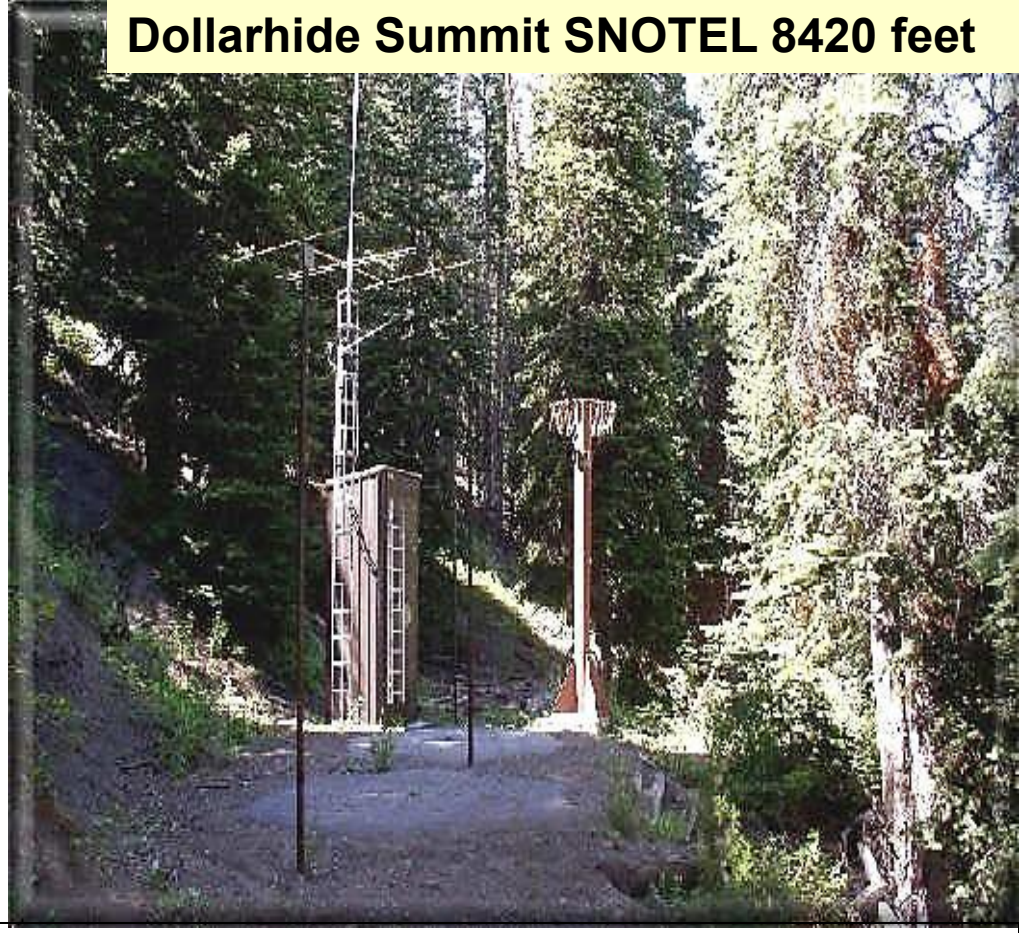
Big Wood Basin Key Indicators

Dollarhide Summit - Key Site represents high snow on north facing slopes.

Point data that represented 160 square miles of the 640 m2 in Big Wood basin / model.

But Burned in 2013

Dollarhide Summit SNOTEL 8420 feet



Key Snow Indicators

Dollarhide Summit - If you have snow on the pillow, you can still have another streamflow increase.

Galena Summit SNOTEL Site --- No Snow No Flood

Big Wood River has never been at flood stage, 4100 cfs, after Galena Summit melts out.

Key Precipitation Relationships:

- **Big Wood Basin: Spring Precipitation -** need **3/4 inch to prime soils** & **1/3 inch the next day** to produce runoff

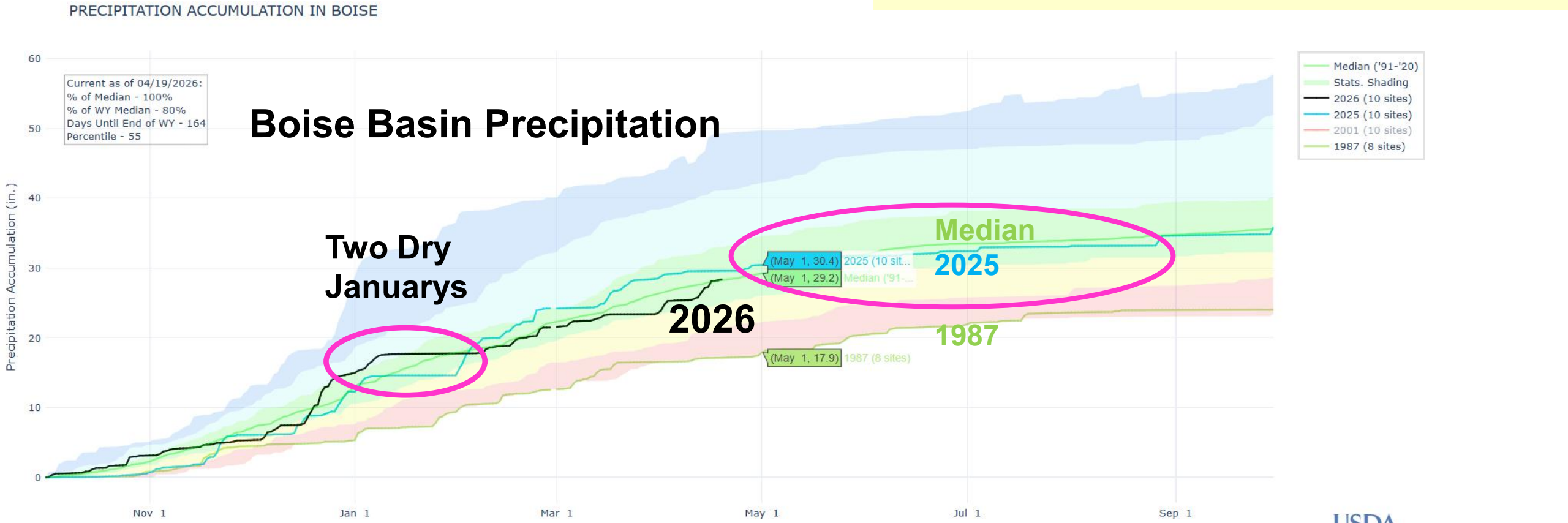
- **Precipitation Trends in Summer & Winter**
  1-2 months of below normal precip in winter
  vs. 2-3 of below normal precip in summer

Idaho Precipitation Concerns

- **Idaho – Winter rain-on-snow events typically happen mid-Nov to mid-Feb below 5,000 feet**

- **Summer - extended period of rain free days has greater influence on fires than low winter snowfall.**

- **Summer Monsoons Aug 2016 => 3-5” fell over the weekend – near Twin Falls**

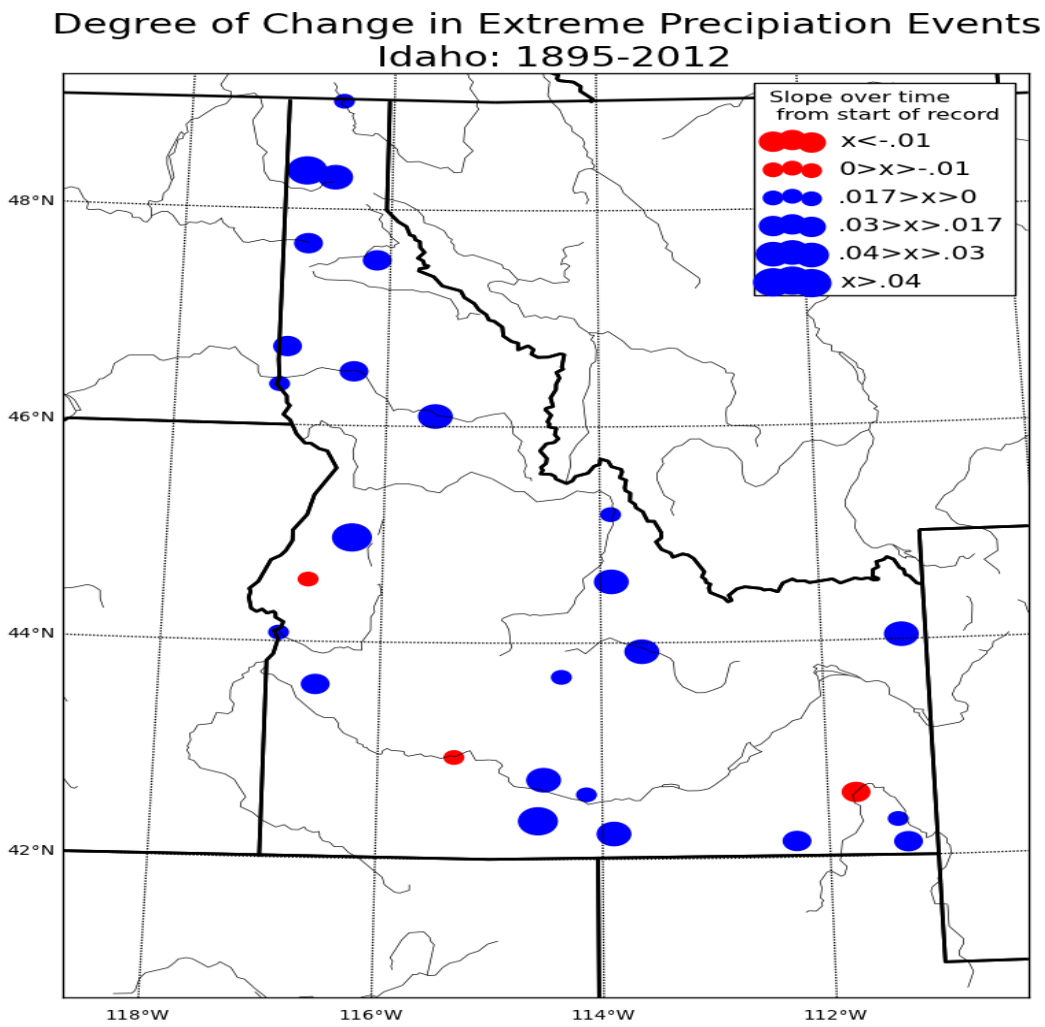


Troy Magney paper – Spatial and Seasonal Changes in Idaho's Max Daily Prec Events: Implications for Ag

Spatial and Seasonal Changes in Idaho's Maximum Daily Precipitation Events

Troy Magney [1 2 4], John Abatzoglou [3], P. Zion Klos [4], Jan Eitel [1 2], Lee Vierling [1 2], Von Walden [3]

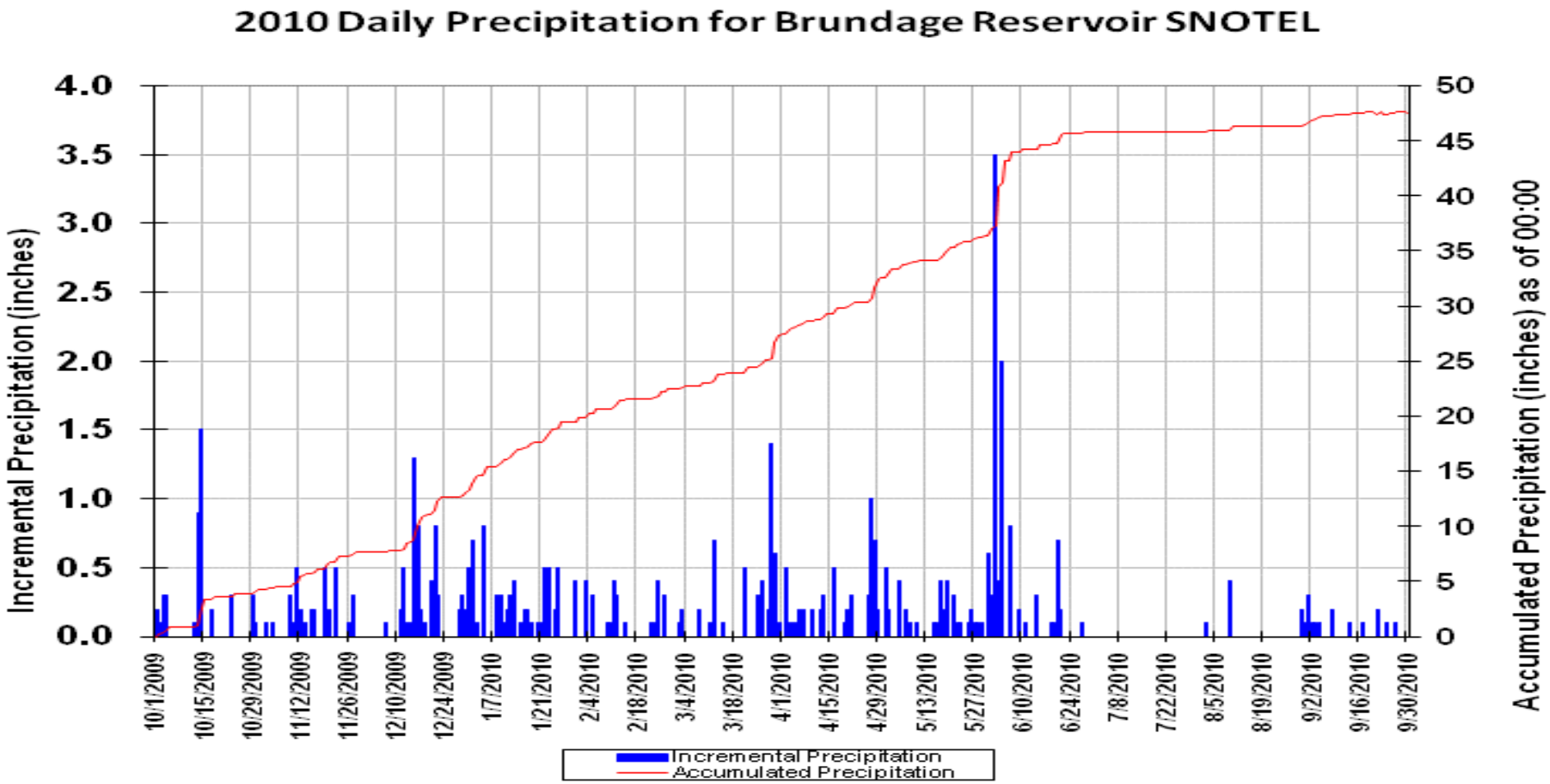
- **Observed warming has led to an intensification of the largest precipitation events, primarily in spring/summer[2]**



Key Precipitation Events:

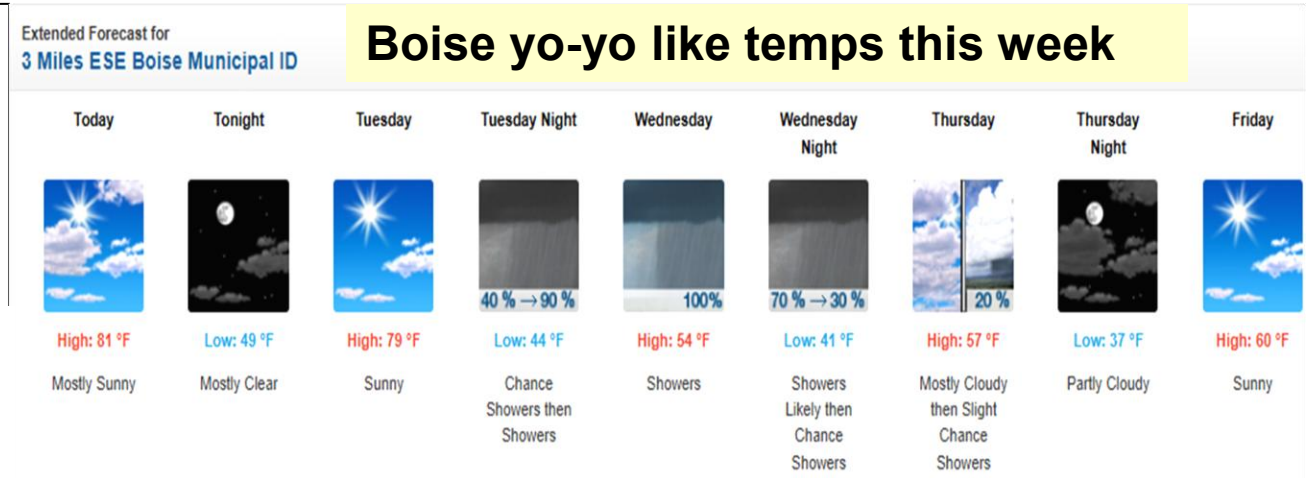
- **Eastern Idaho:** May 2010 ~1.5” in 24 hours with snow on valley floor produced flood event.

- **Payette Basin:** Jan 1997 & May 2010: 3.0+” in 24 hours is Key Indicator for Brundage Reservoir SNOTEL near McCall that led to major flooding when snow present.
  - June 2, 2010 spring event of 3.5” without snow on valley floor did not produce major flood.



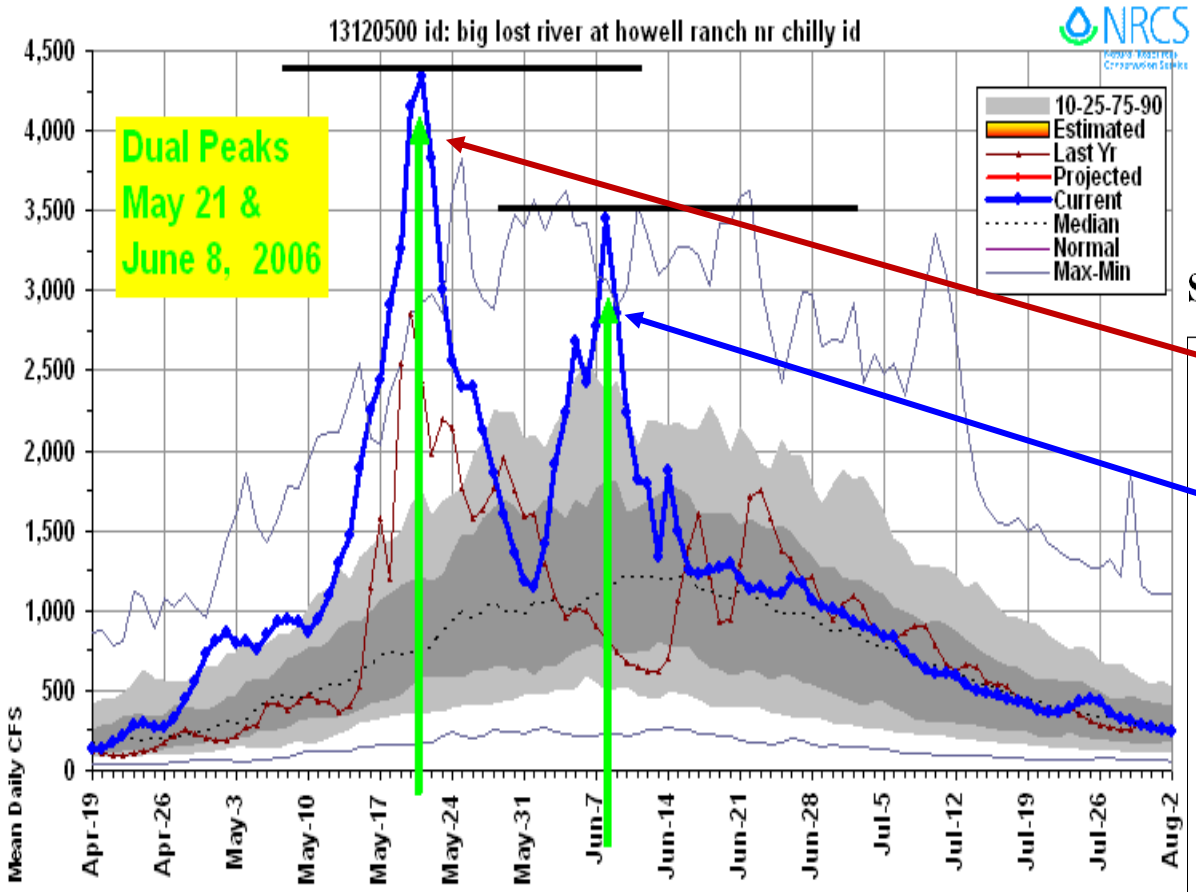
Key Temperature Relationships for Big Wood & Salmon Falls Rivers

- **Trends** - Boise high temperatures of 70-75 degrees F for several (days 5-7 days) days will initiate significant rise in streams.



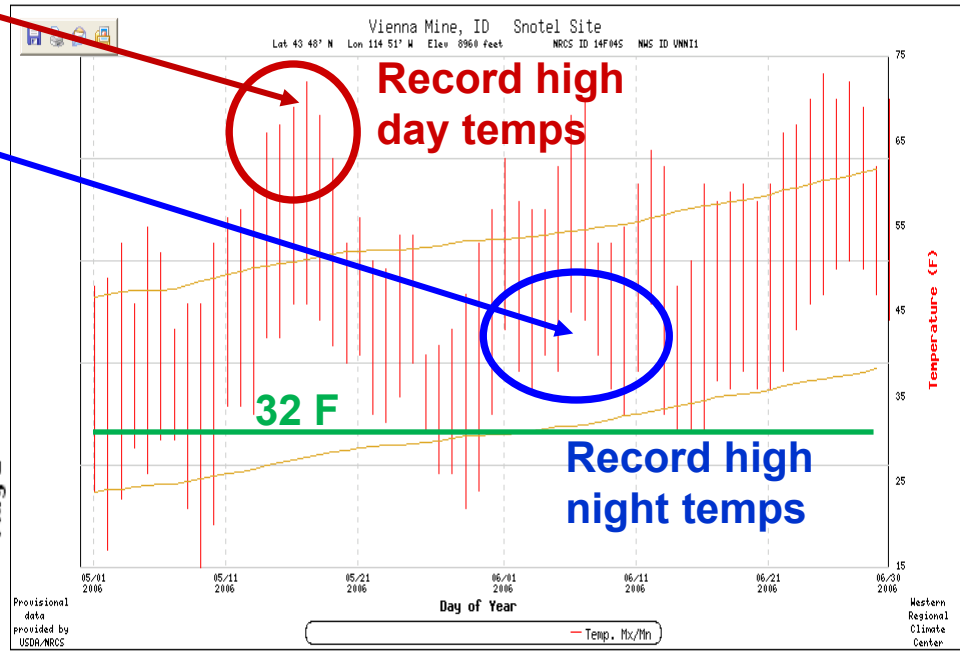
Key Temperature Relationships for Big Wood & Salmon Falls Rivers

- **Trends** - Boise high temperatures of 70-75 degrees F for several (days 5-7 days) days will initiate significant rise in streams.
- **Signs to watch** - record high day/night temps if snow is melting snow 24/7

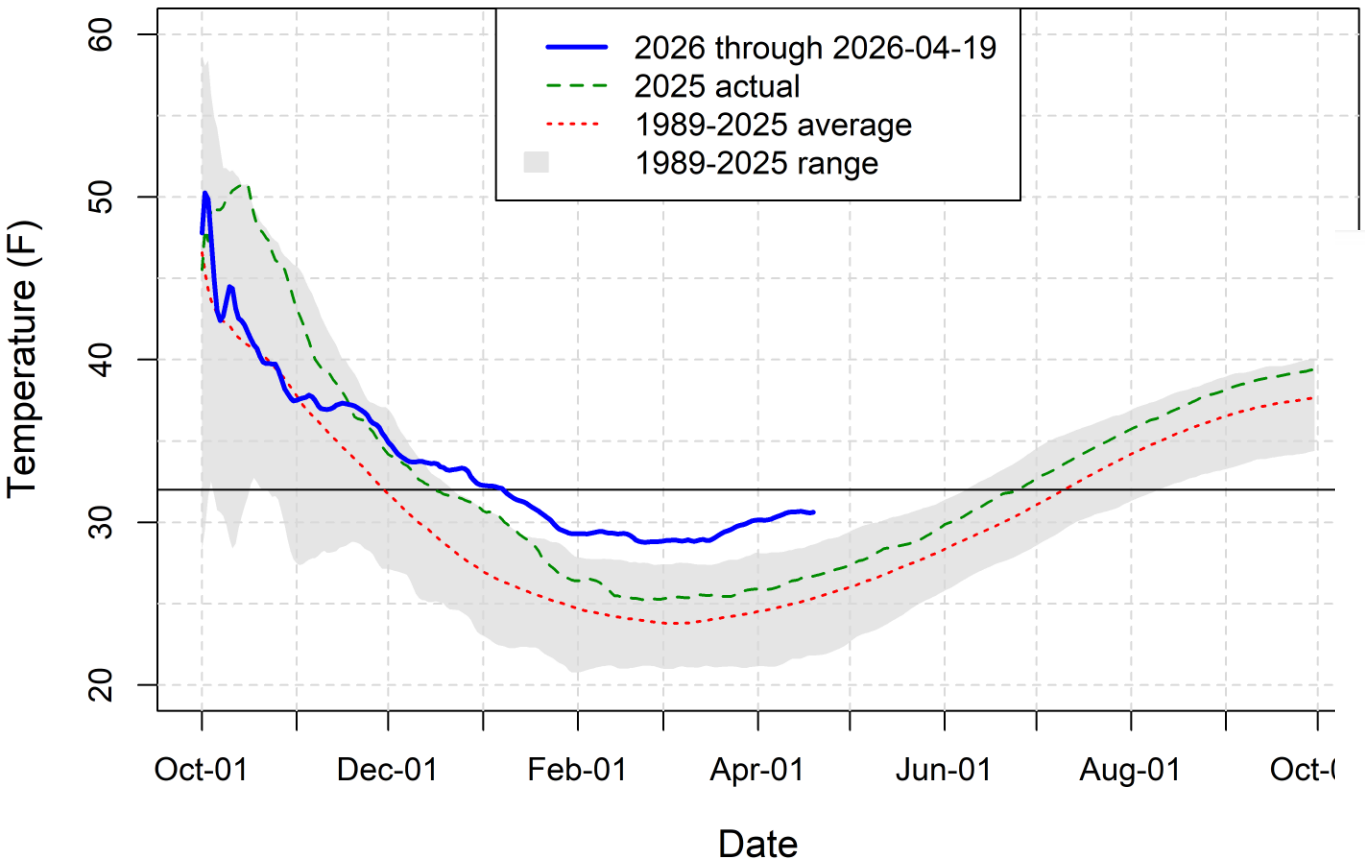


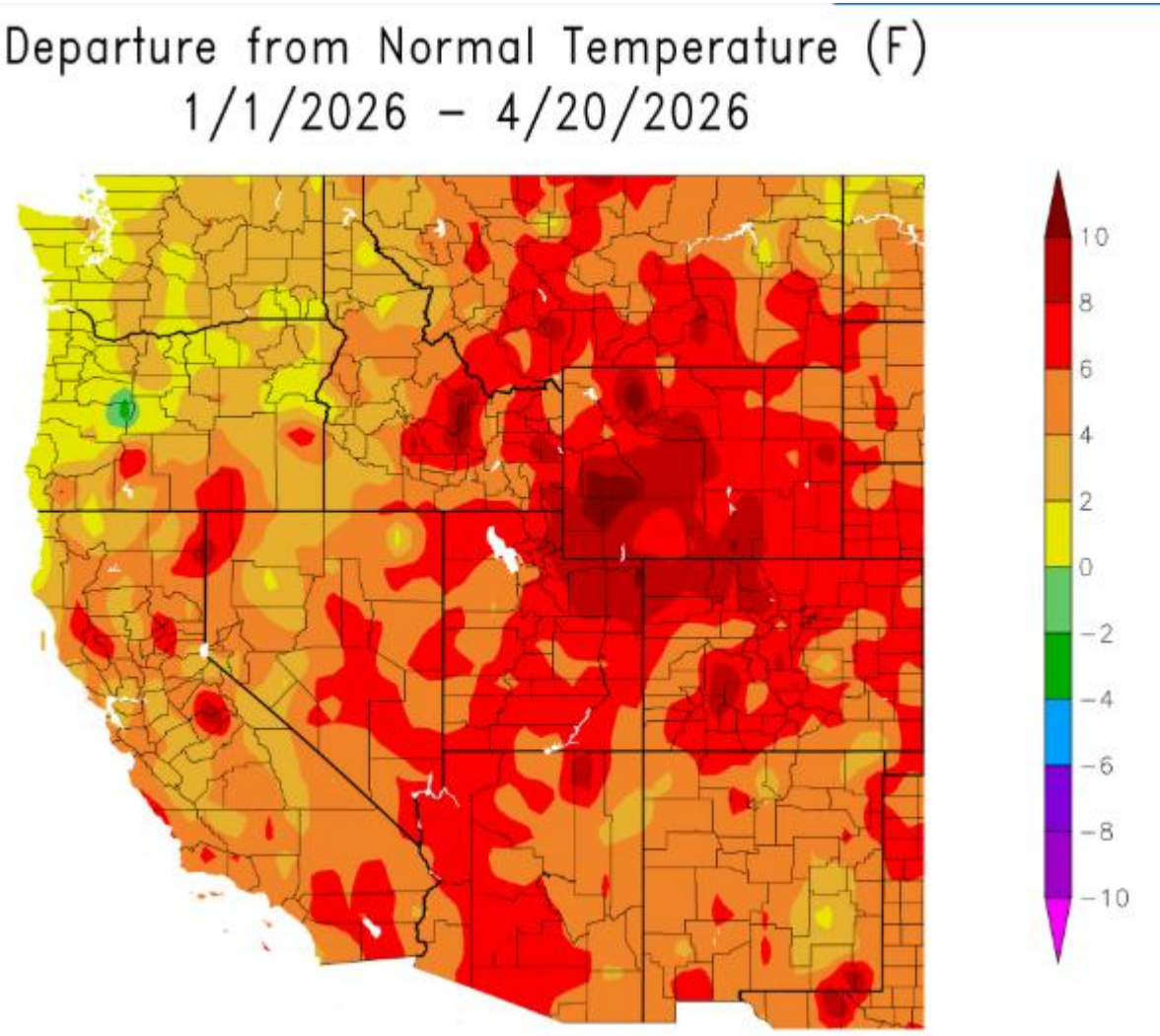
May 2006 record heat was predicted 7-10 days in advance BUT without snow cover, it is a non-event. 2nd peak was from record high night temps.

Snotel Graph 2006 Daily Temps



Henry's Fork Watershed Mean Temperature to Date

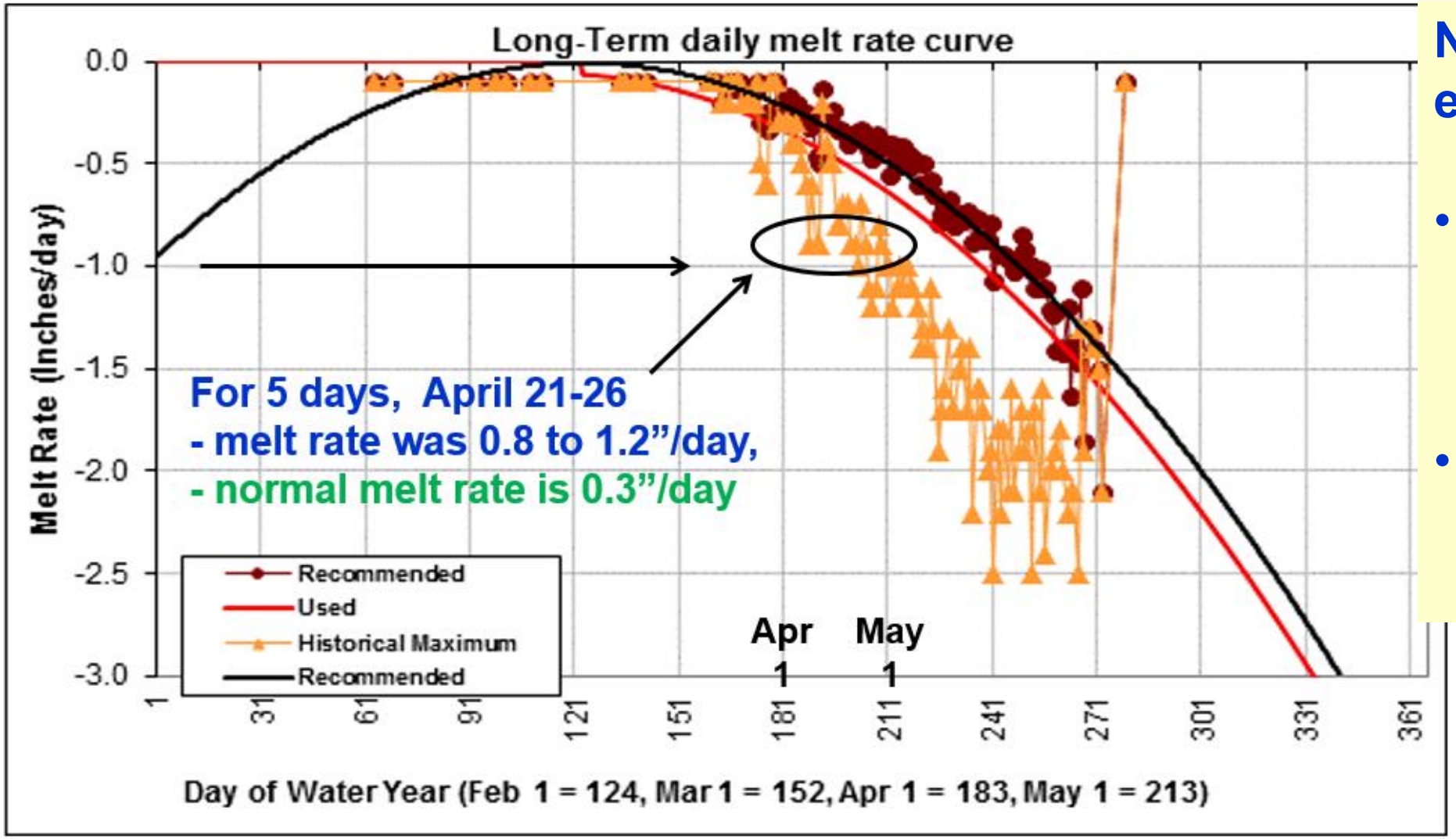




Key Snowmelt Indicators

- Understand snow melt rates for the given day:
  - 1” of RECORD high melt rate in April is different from 1” of melt in May

Jackson Peak SNOTEL Boise Basin 7070 feet



Need to look at when event occurs:

- **If outside snowmelt season - becomes a non-event**
- **If during snowmelt season - what are impacts?**

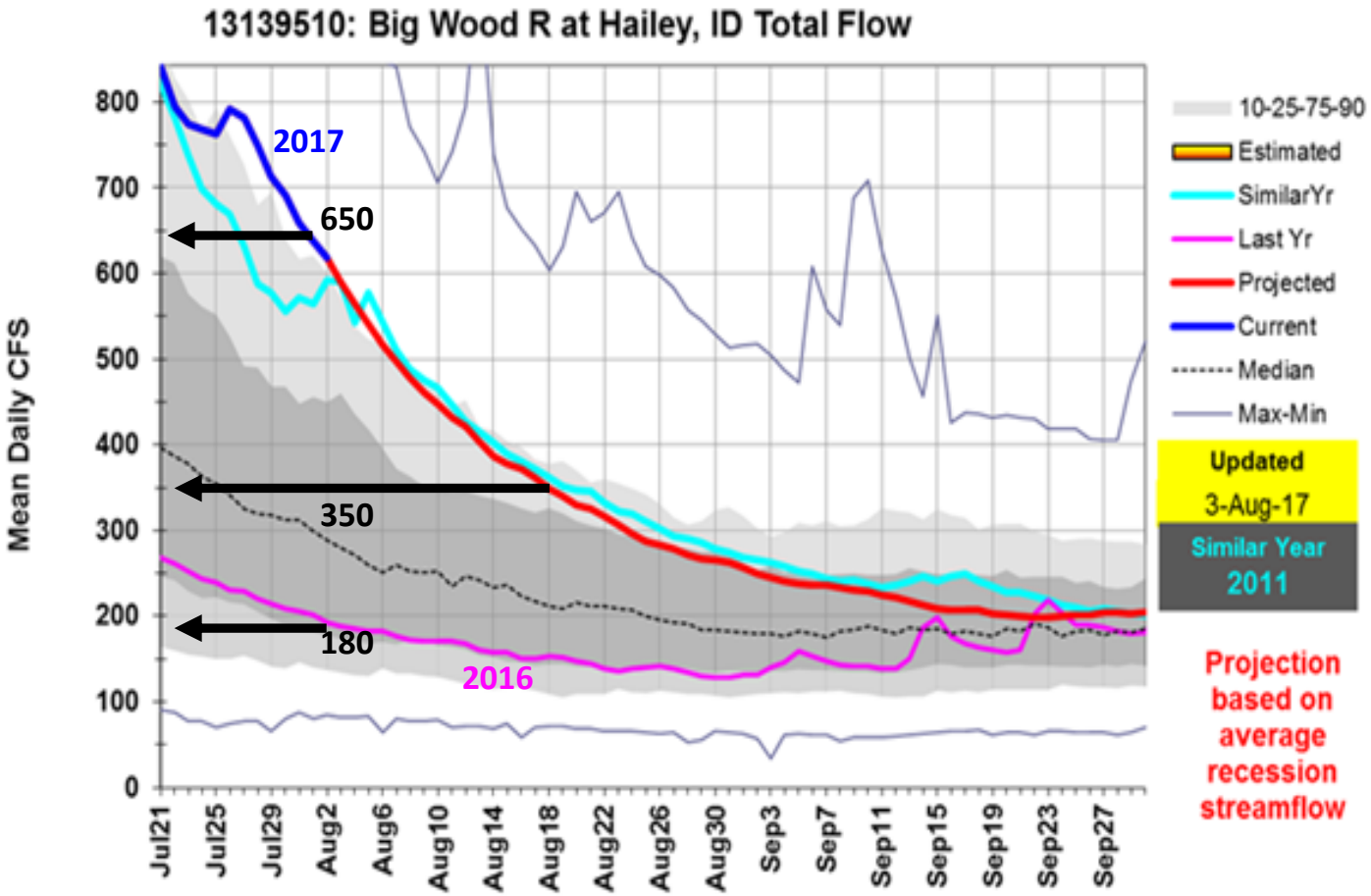
Impacts from Forest Canopy Loss in Watershed

Dollarhide Summit SNOTEL after 2013 Beaver Creek Fire
Higher daily snow melt rates, pushing 2” a day in 2017

Atlanta Summit SNOTEL – melts out after 7 to 14 days earlier after the fire – less water available in later summer months

What are Critical Flow levels that impact users?

Water Right Cutoff Date Prediction provides for wise planning

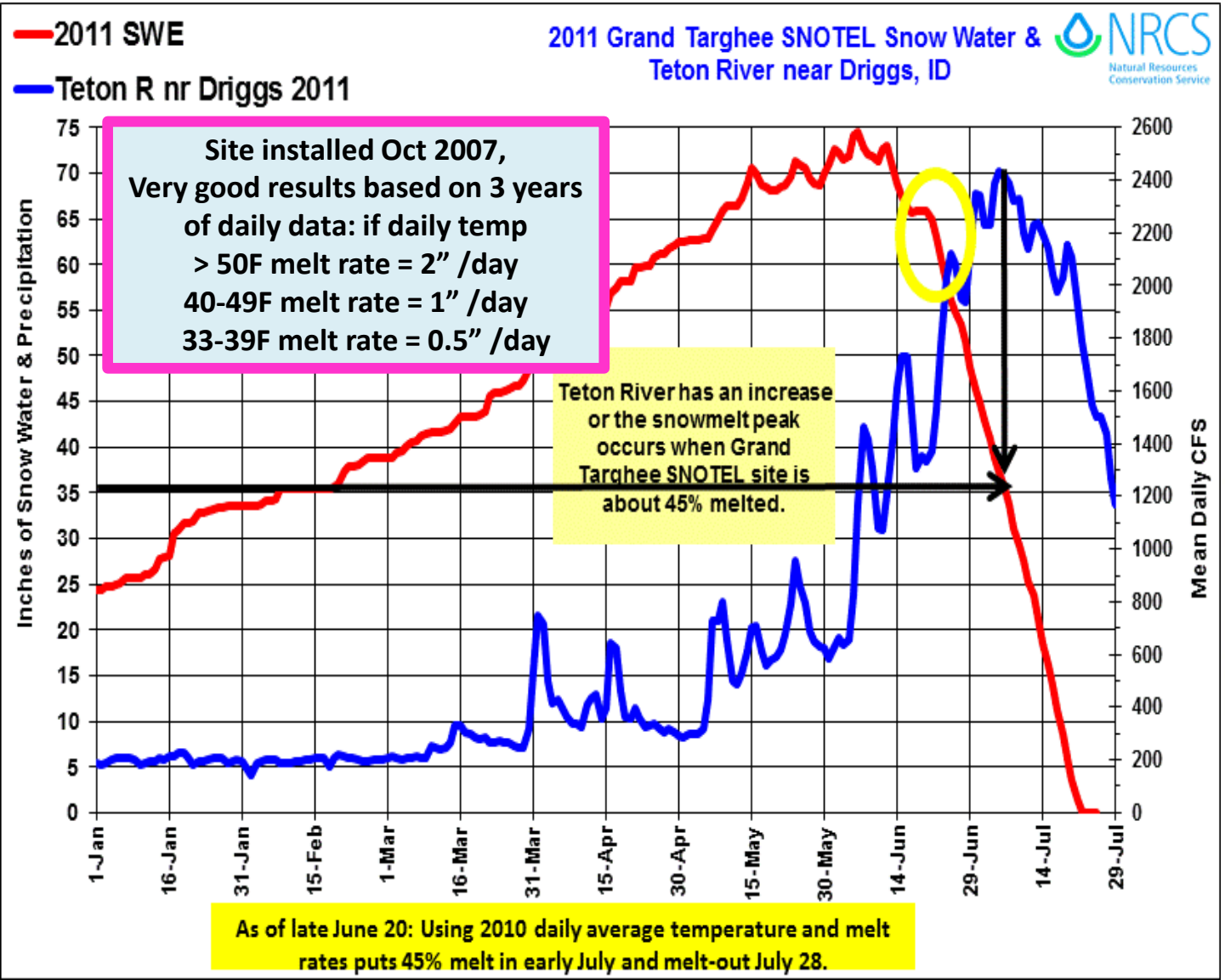


Key is understanding critical flow levels and what happens if they are reached in your basin.

What are impacts?
Has the potential has passed?

Key Snowmelt Indicators:

- Snow 2 Flow Relationship to predict snowmelt peak flows
- Know what the Relationships are telling you AND if the potential for higher flows from snowmelt has past



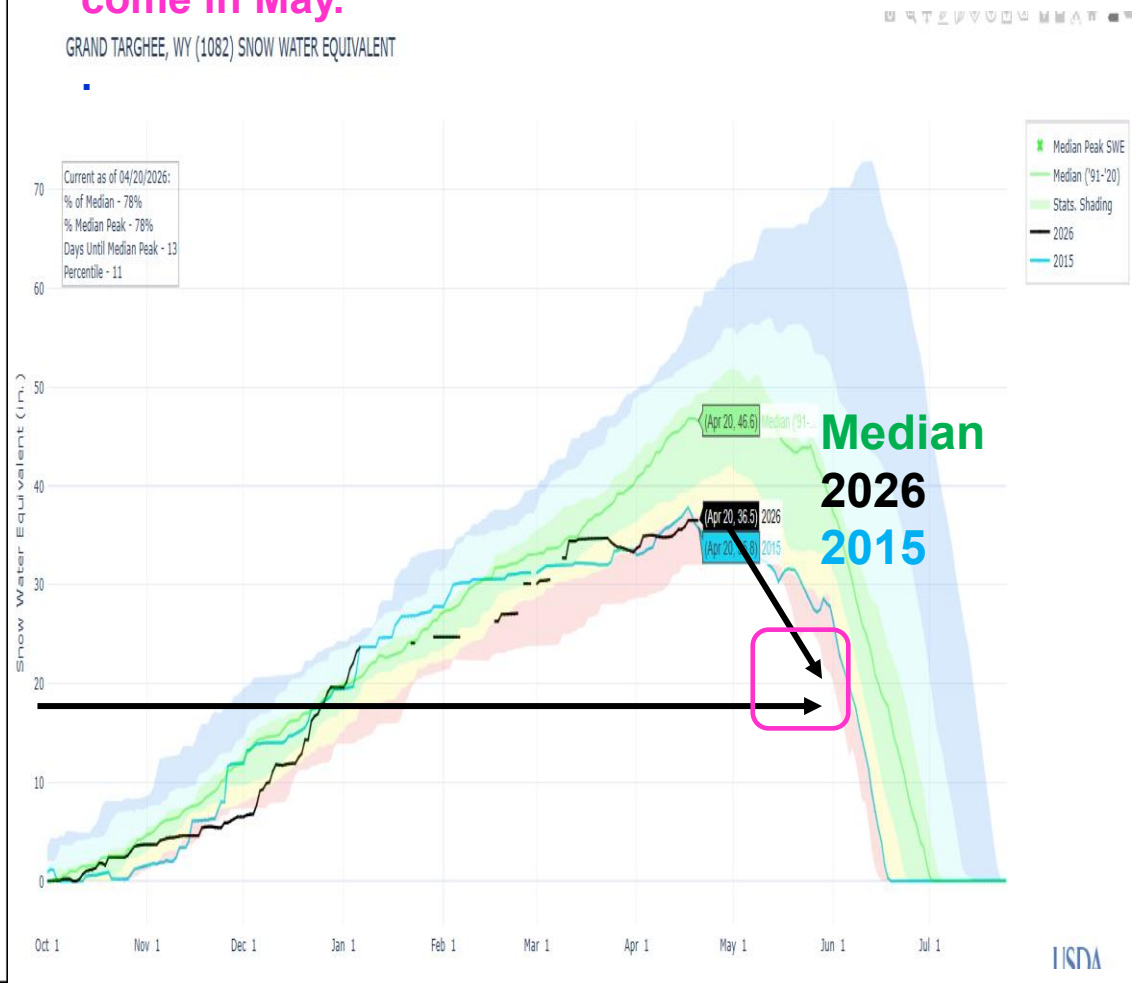
TETON RIVER AND GRAND TARGHEE SNOTEL SITE

On average, peak streamflow for the Teton River above Leigh Creek near Driggs, Idaho occurs when Grand Targhee SNOTEL is 50% melted (half-melt).

2026 Grand Targhee peak SWE ~ 36.5"

50% melted is 18" of SWE remains

Which shows a snowmelt flow increase still to come in May.



Key Basin Indicators to Understand What Makes Your Basin Flow

- Snow Covered Area
- Key Precipitation Thresholds
- Key Temperature Relationships
- Thresholds may not be reached each year, but when they are… what are impacts?

- Engage local knowledge & observations

April 11, 2026 north of Mountain Home

Spring Temperatures Drive Snowmelt

Spring Precipitation is the Wild Card

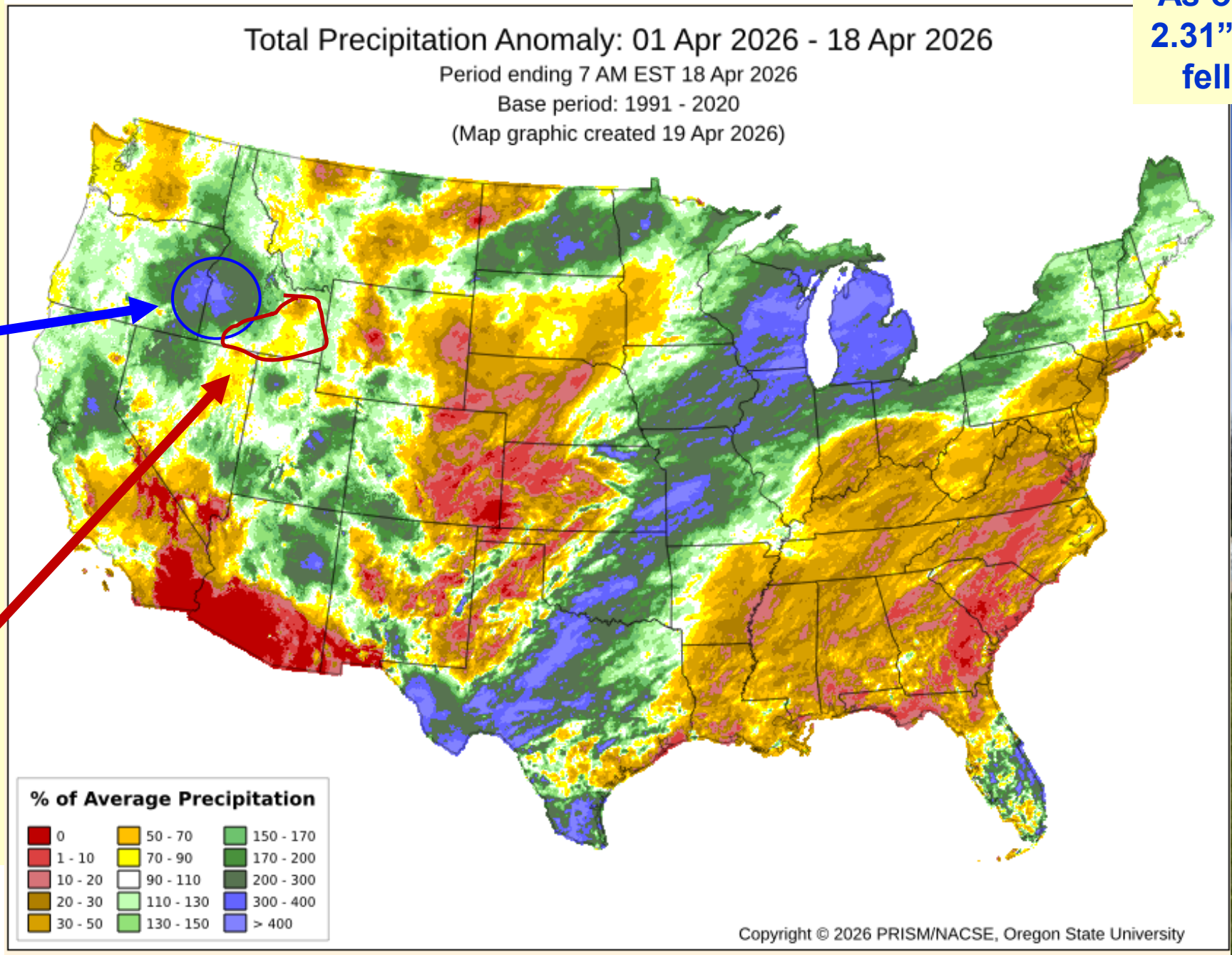
Yesterday

April 2, 2026

April 1-18 Precipitation

As of April 18, these basins have received 100-150% of normal April totals.

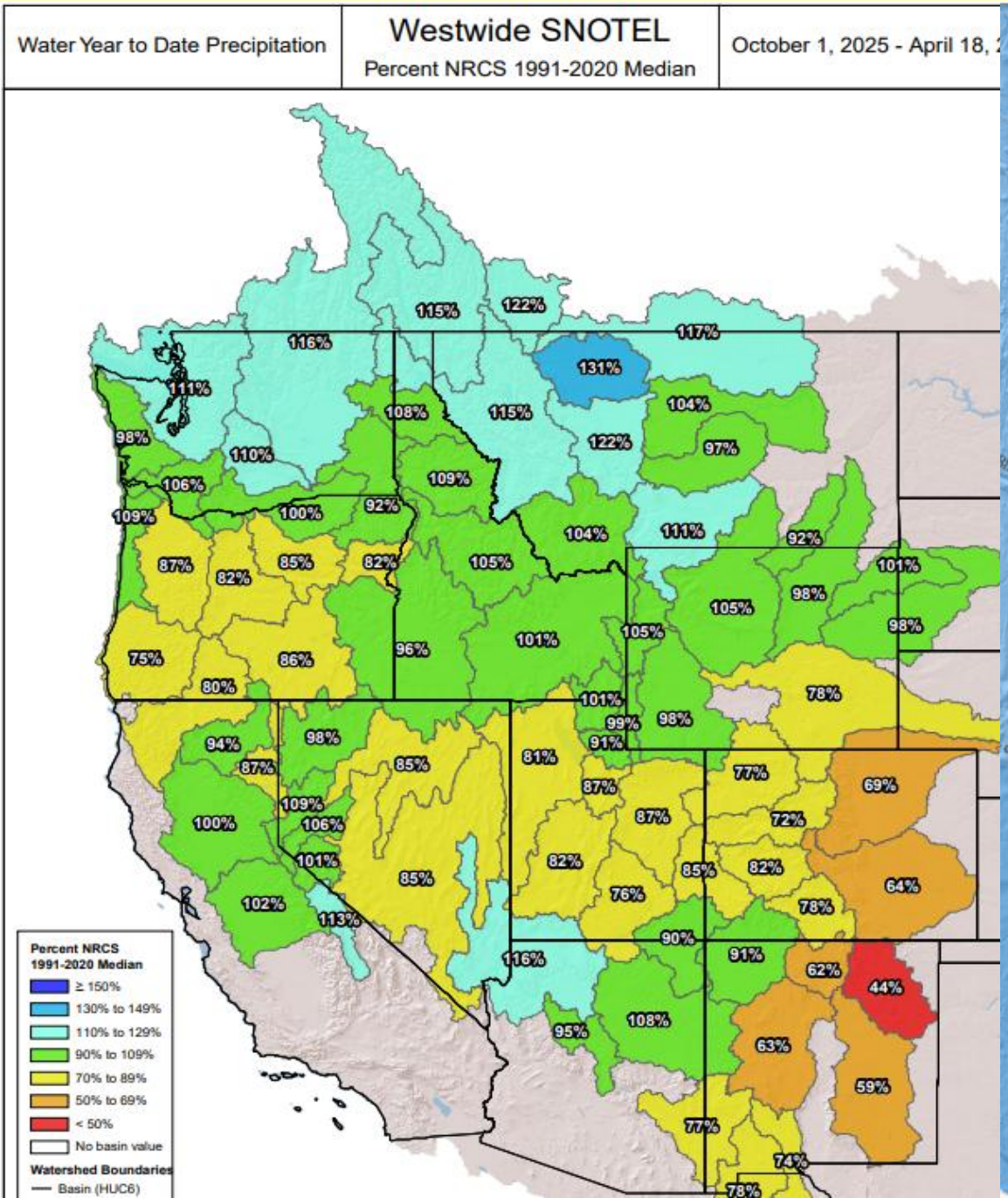
While these basins have only received 40-50% of normal April totals.

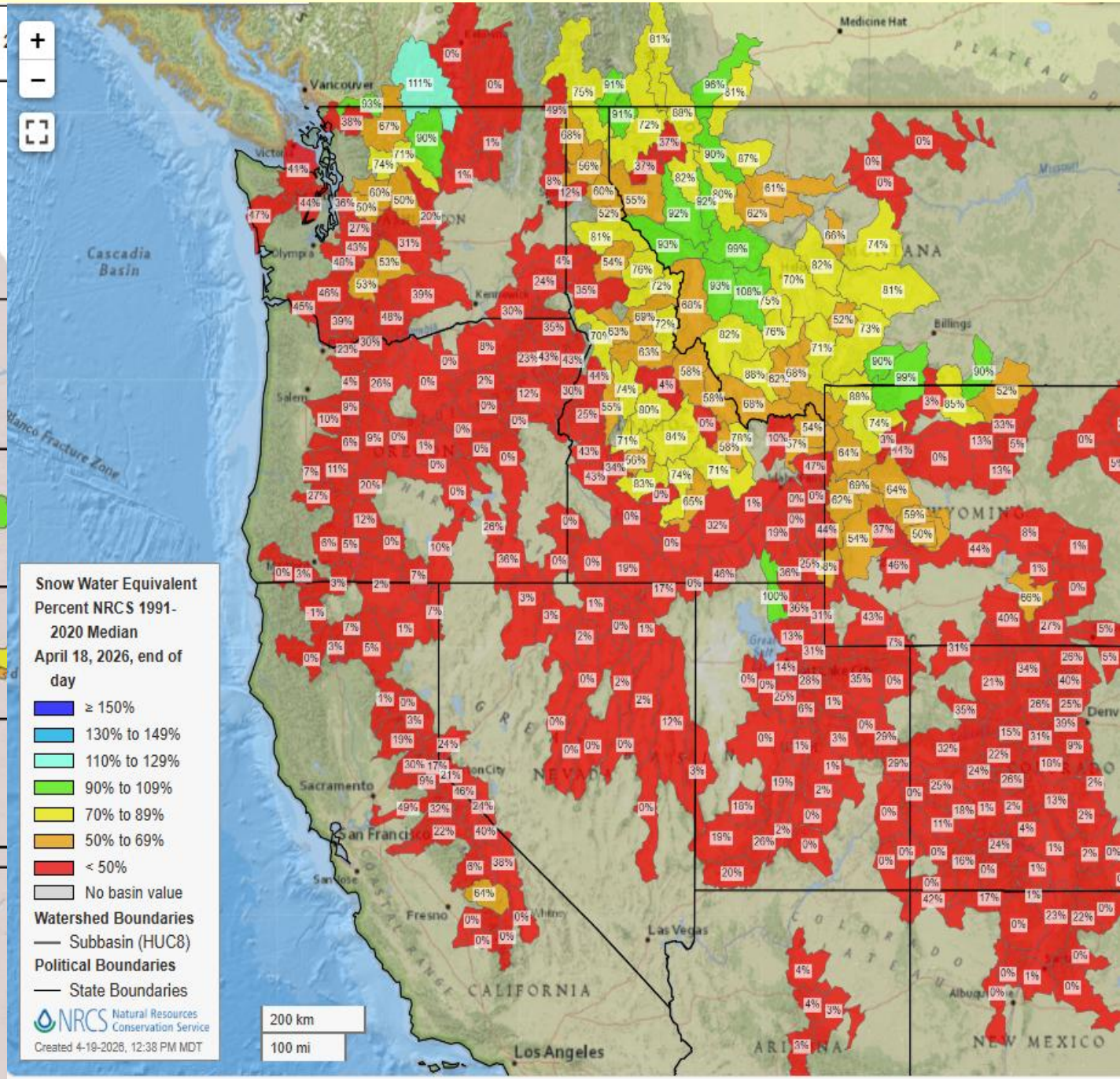


As of Noon April 21: 2.31” in my backyard fell in April so far

Westwide Water Year to Date Precipitation Oct 1 – Apr 18

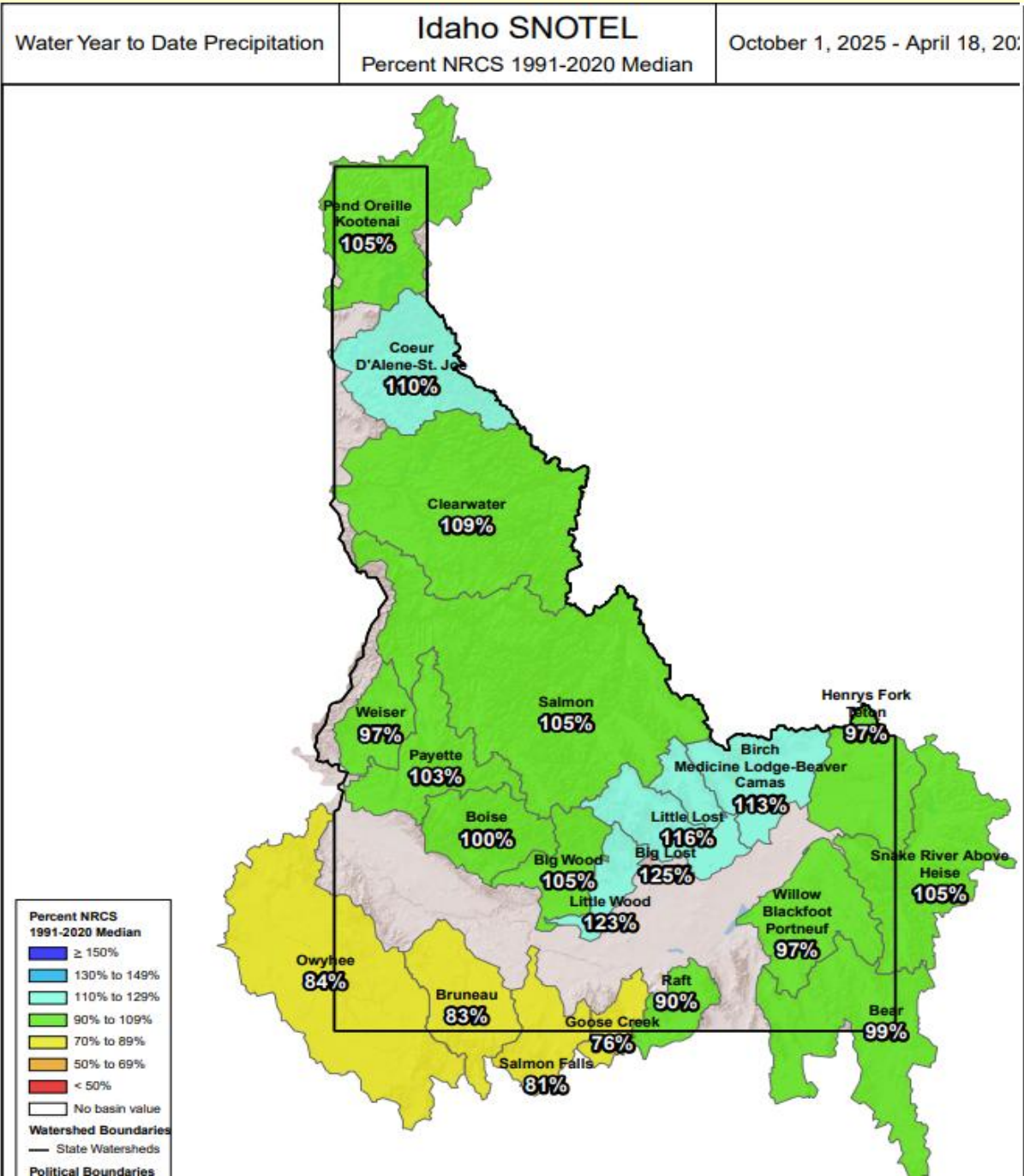
Snowpack April 18, 2026

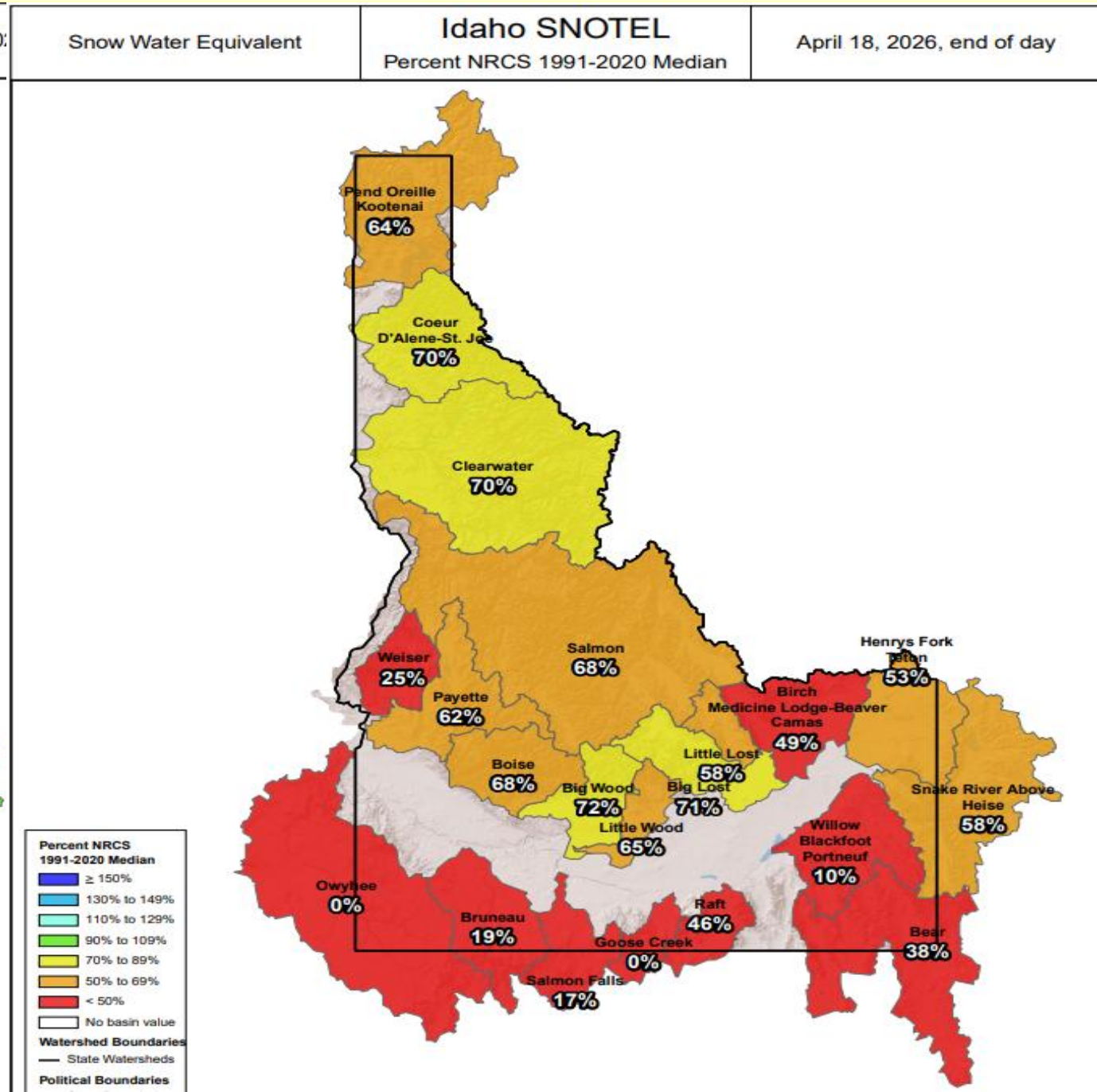




Idaho Water Year to Date Precipitation Oct 1 – April 18

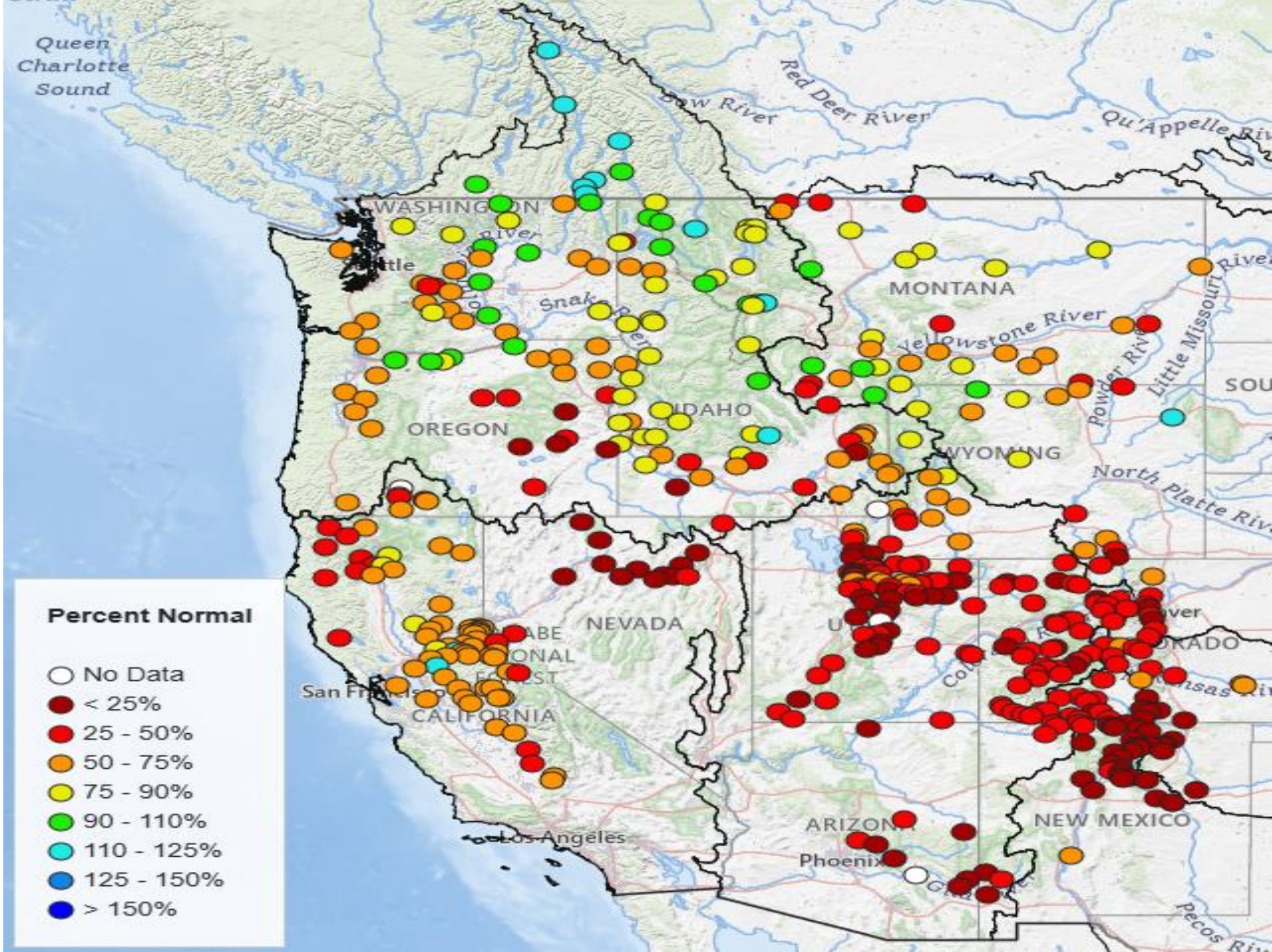
Snowpack Apr 18, 2026





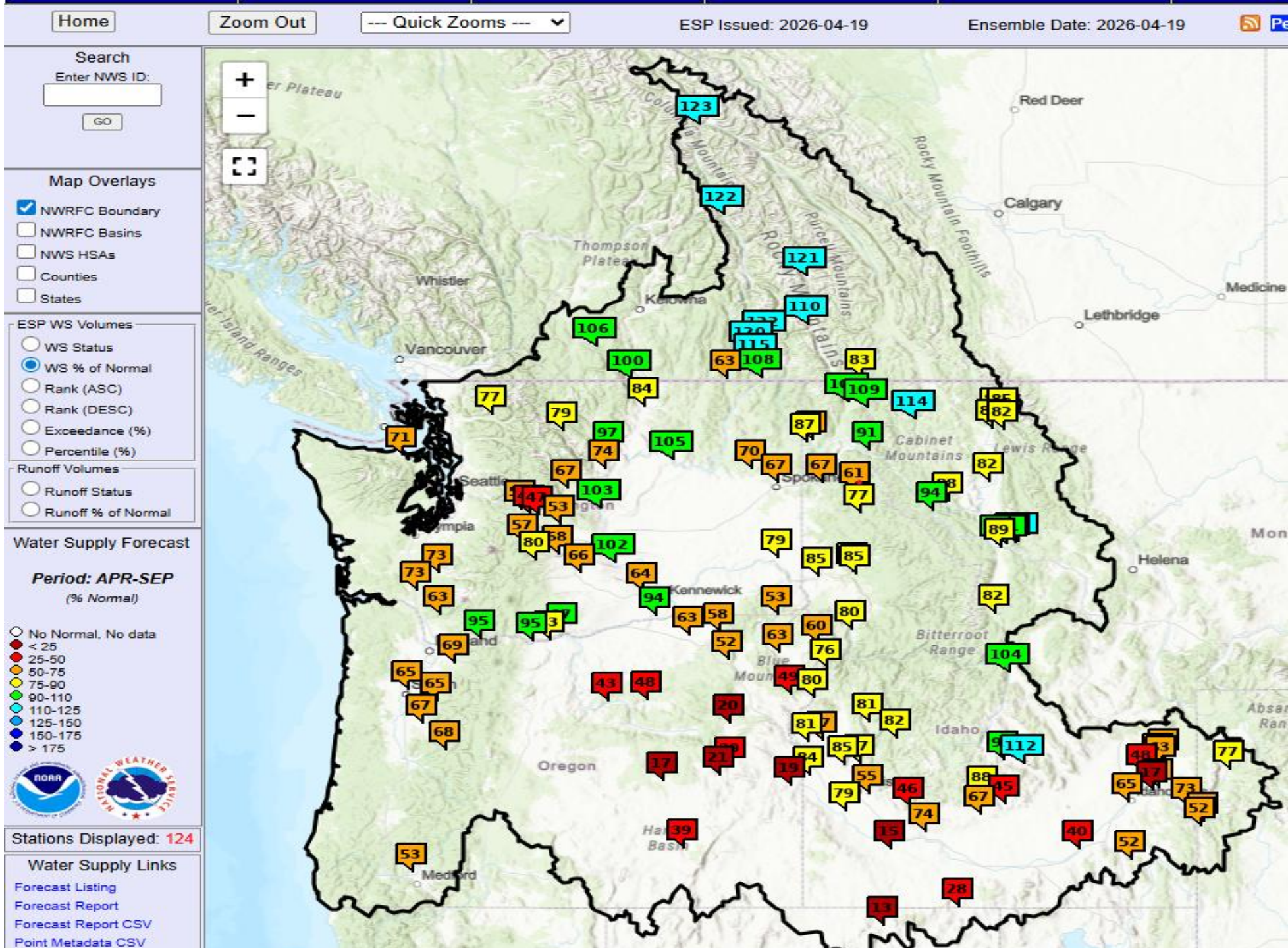
April 19, 2026

Streamflow Forecasts for Apr-Sep as % of Normal



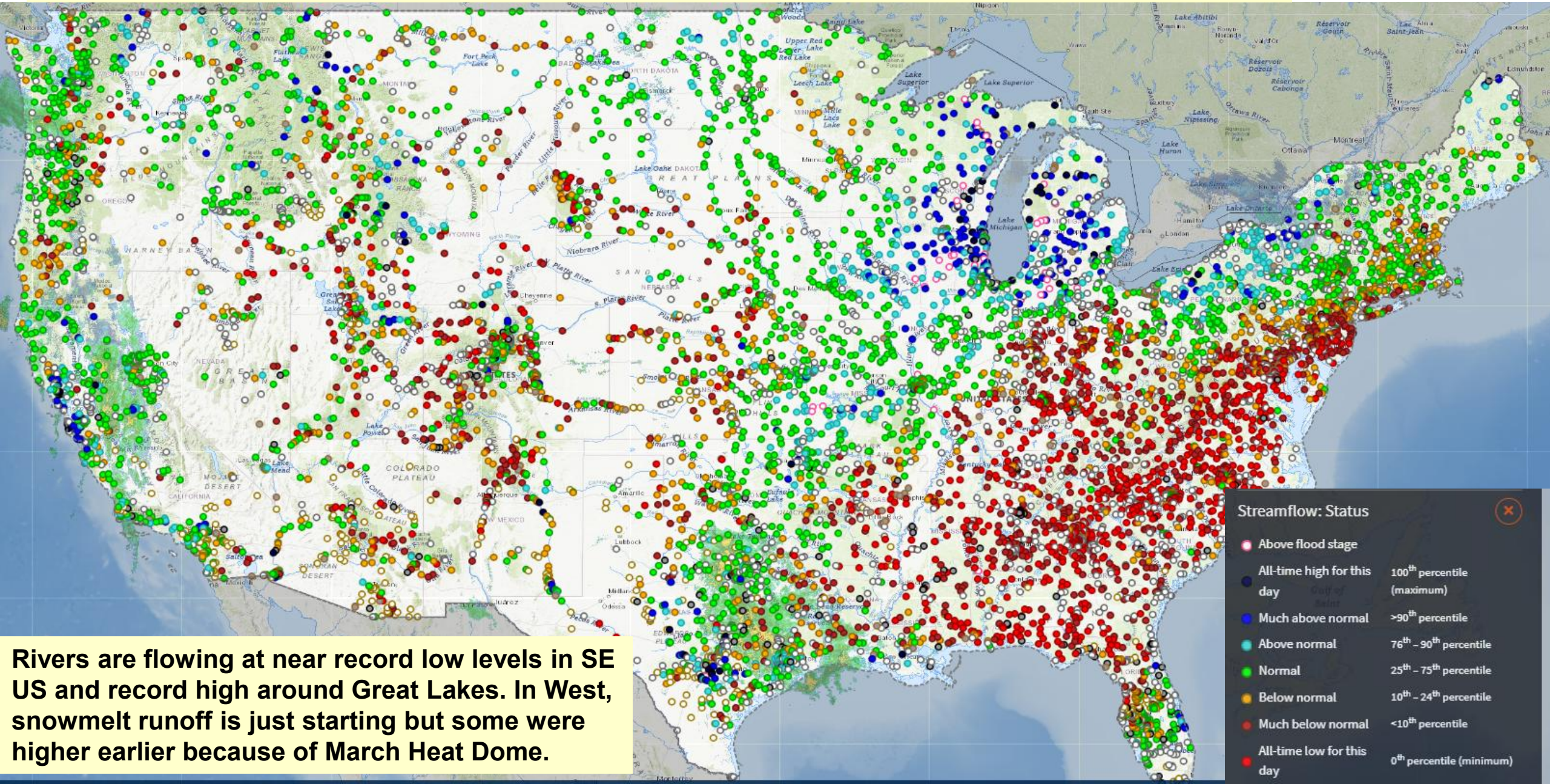
April 19, 2026

Streamflow Forecasts for Apr-Sep as % of Normal

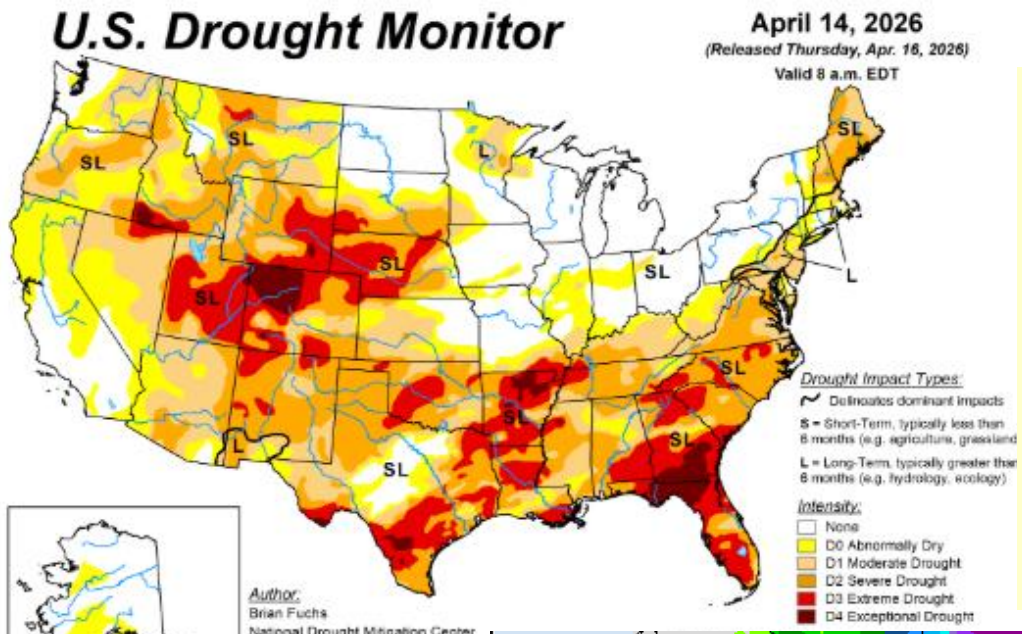


Snapshot of Current River Flow for April 21, 2026

Red Much Below or Record Low --- Blue Much Above Avg --- Black Record High



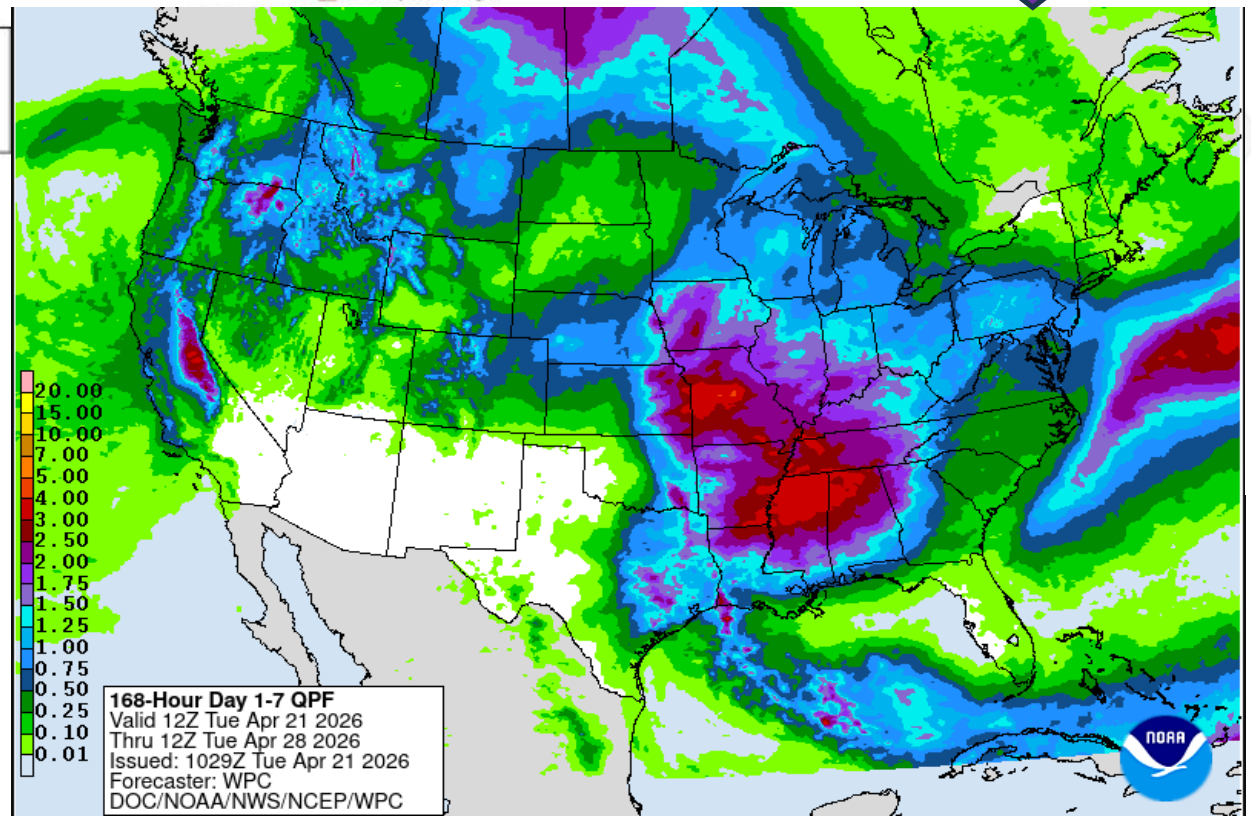
Rivers are flowing at near record low levels in SE US and record high around Great Lakes. In West, snowmelt runoff is just starting but some were higher earlier because of March Heat Dome.



Current Drought Monitor

Snow this week !

7-Day Total Precipitation below



Bogus Basin
6,604 ft • Idaho • United States

Tue 21	Wed 22	Thu 23	Fri 24	Sat 25
0"	10-14"	0-1"	0-1"	0"
59 °F	32 °F	34 °F	32 °F	36 °F
1-2"	5-9"	0"	0-1"	0"
32 °F	28 °F	29 °F	28 °F	33 °F

Brundage
6,650 ft • Idaho • United States

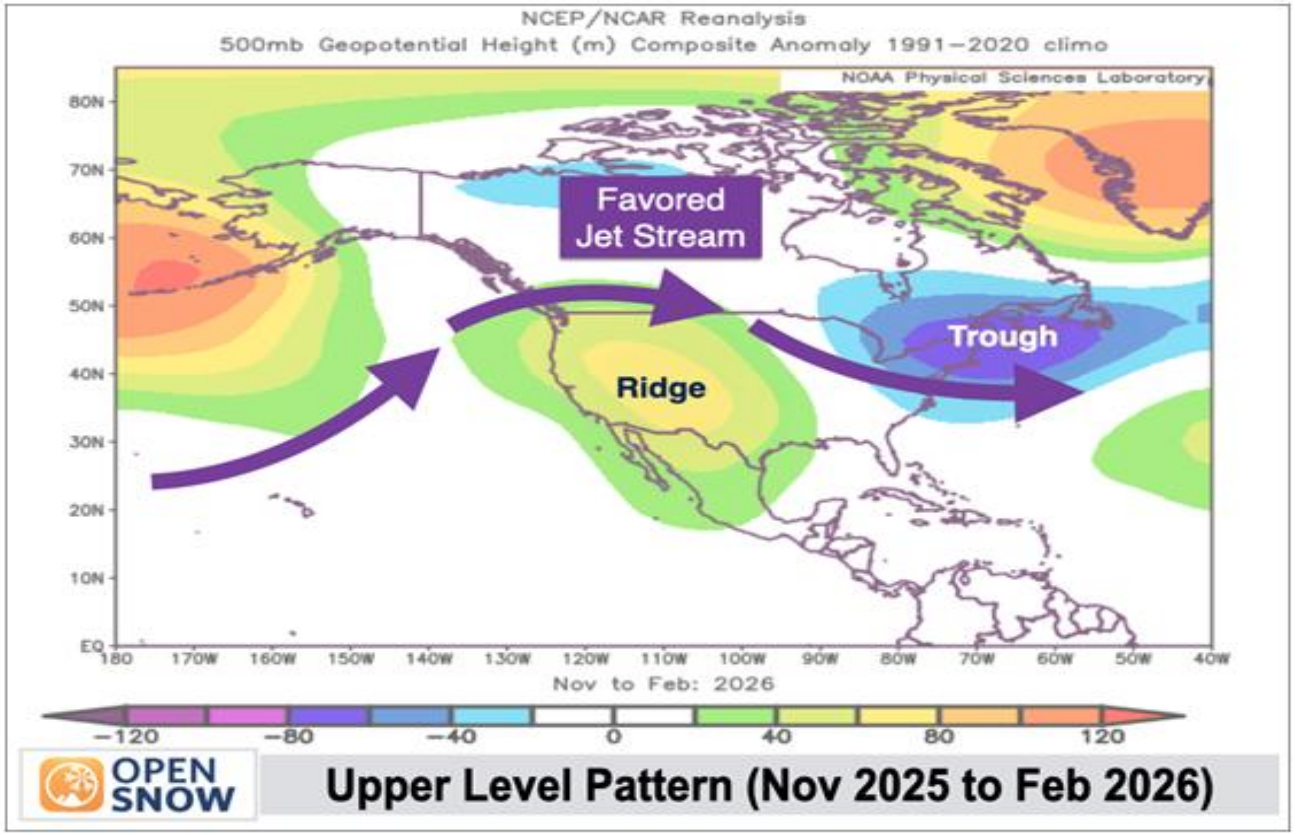
Tue 21	Wed 22	Thu 23	Fri 24	Sat 25
0"	5-9"	1-2"	0-1"	0-1"
57 °F	32 °F	32 °F	30 °F	35 °F
0-1"	4-8"	0-1"	0-1"	0-1"
33 °F	28 °F	24 °F	21 °F	26 °F

Tamarack
6,709 ft • Idaho • United States

Tue 21	Wed 22	Thu 23	Fri 24	Sat 25
0"	5-9"	1-2"	0-1"	0-1"
58 °F	31 °F	32 °F	30 °F	35 °F
0-1"	3-5"	0-1"	0-1"	0"
32 °F	28 °F	25 °F	23 °F	29 °F

Good explanation of how we got here and looks like trend will continue rest of April and into May….

In the map below, brighter colors (green, yellow, red) indicate upper level ridging, and darker colors (blue, purple) indicate upper level troughing. The base period in the map below is November to February, as March reanalysis from NOAA are not available at this time.

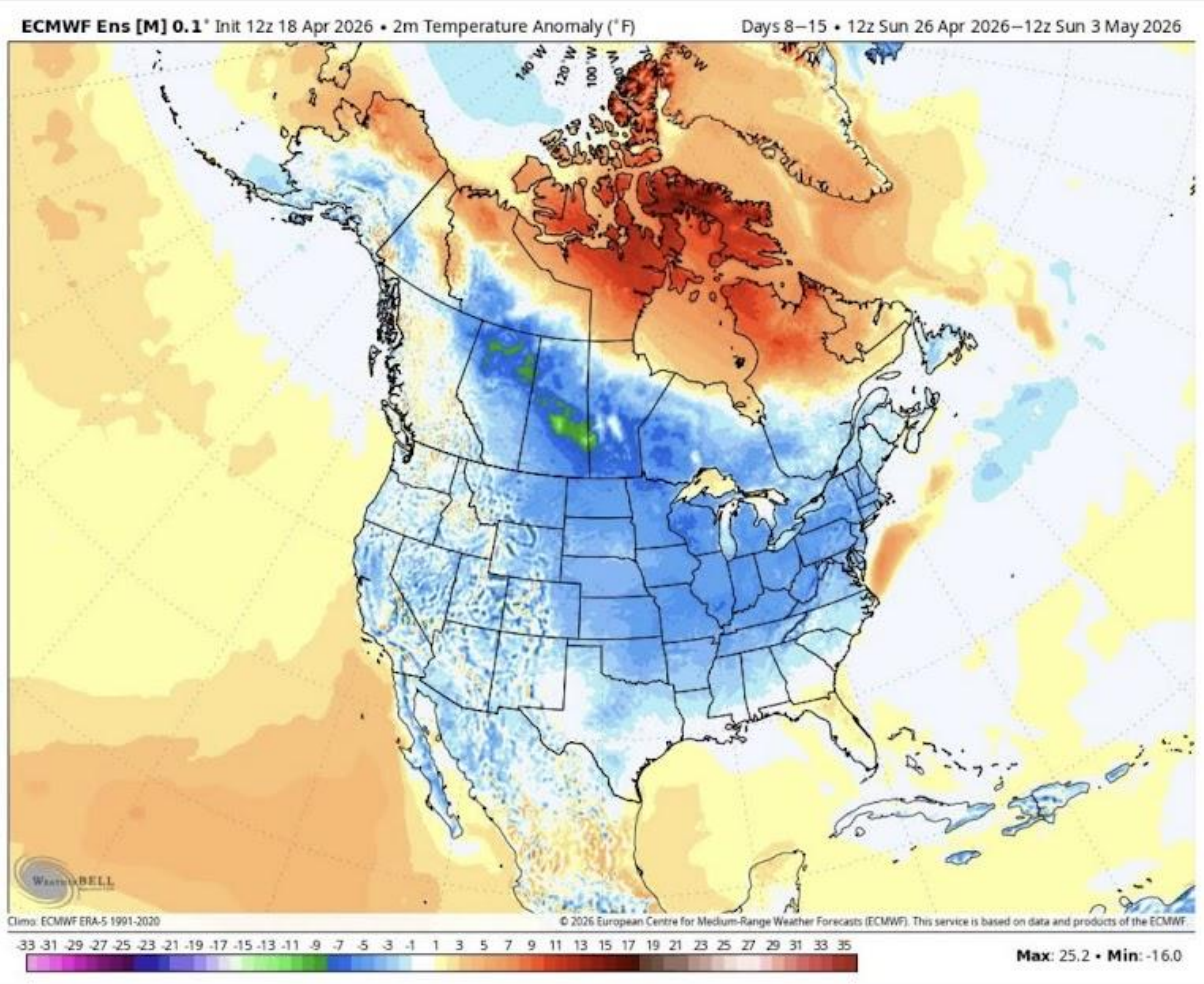


In the West, the average jet stream was along the northern periphery of the ridge across Southern BC and Alberta where more consistent precipitation and snow fell this winter, though occasional dips in the jet stream brough substantial precipitation events to portions of the Western U.S. (warm atmospheric rivers with high snow levels were common).

Meteorologist Eric Sn…

Suggested for you · 3h ·

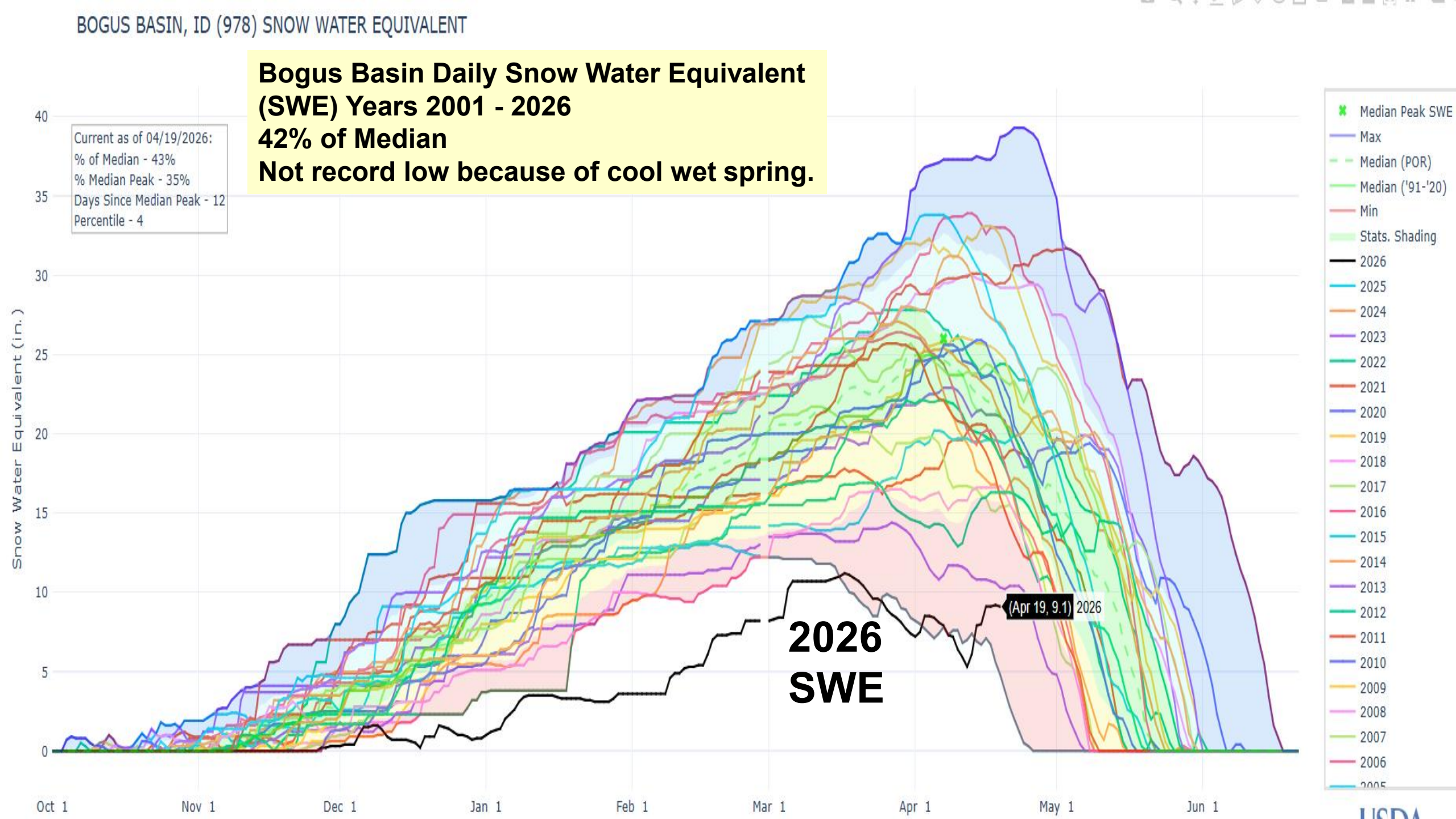
I feel like we're going to have to get used to this. The longer range pattern leans chilly as April gives way to May.



Break for Part II ?

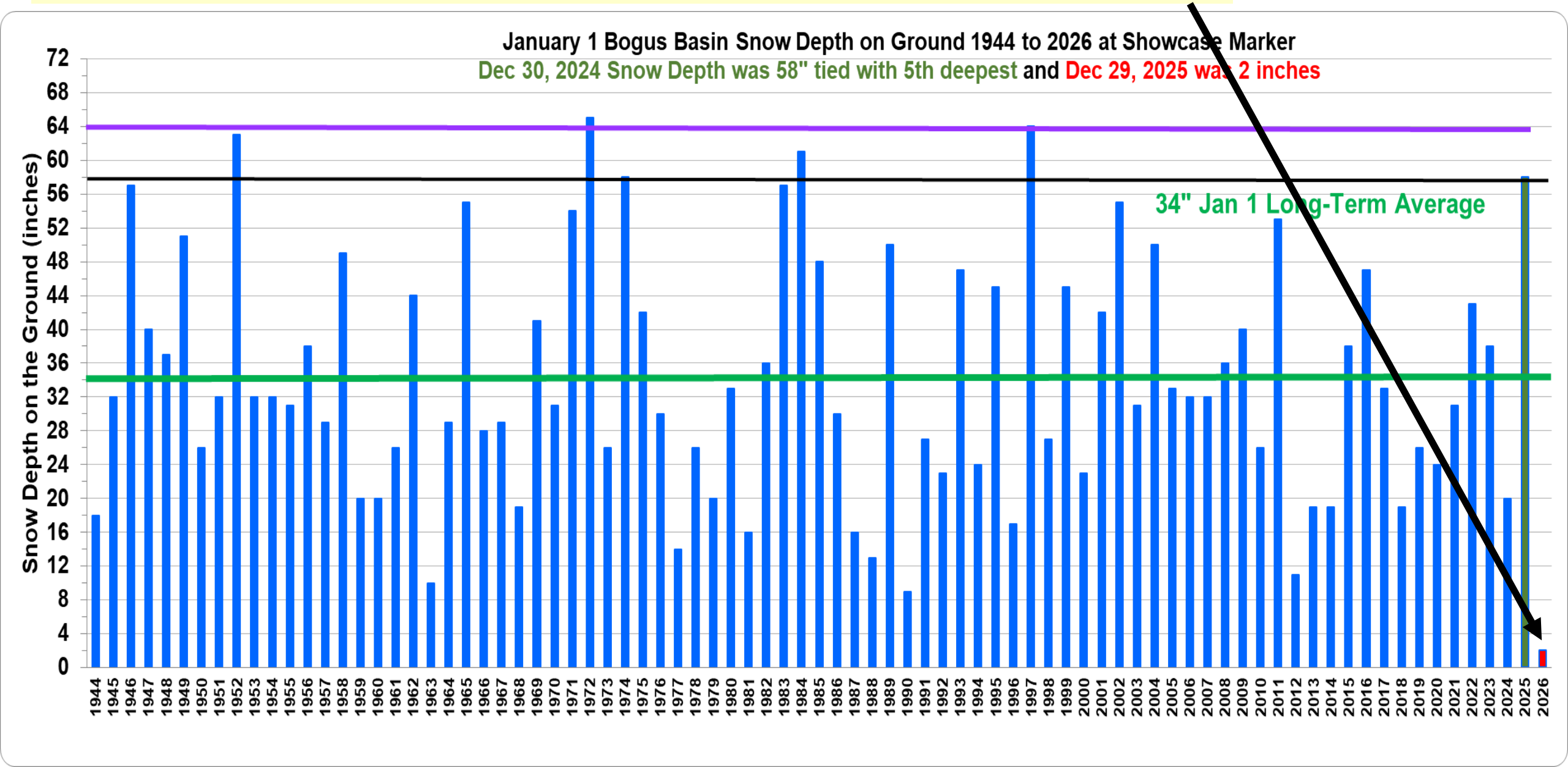
Spring Weather in Boise April 2, 2026

Taken at 7:56PM and 18 minutes later

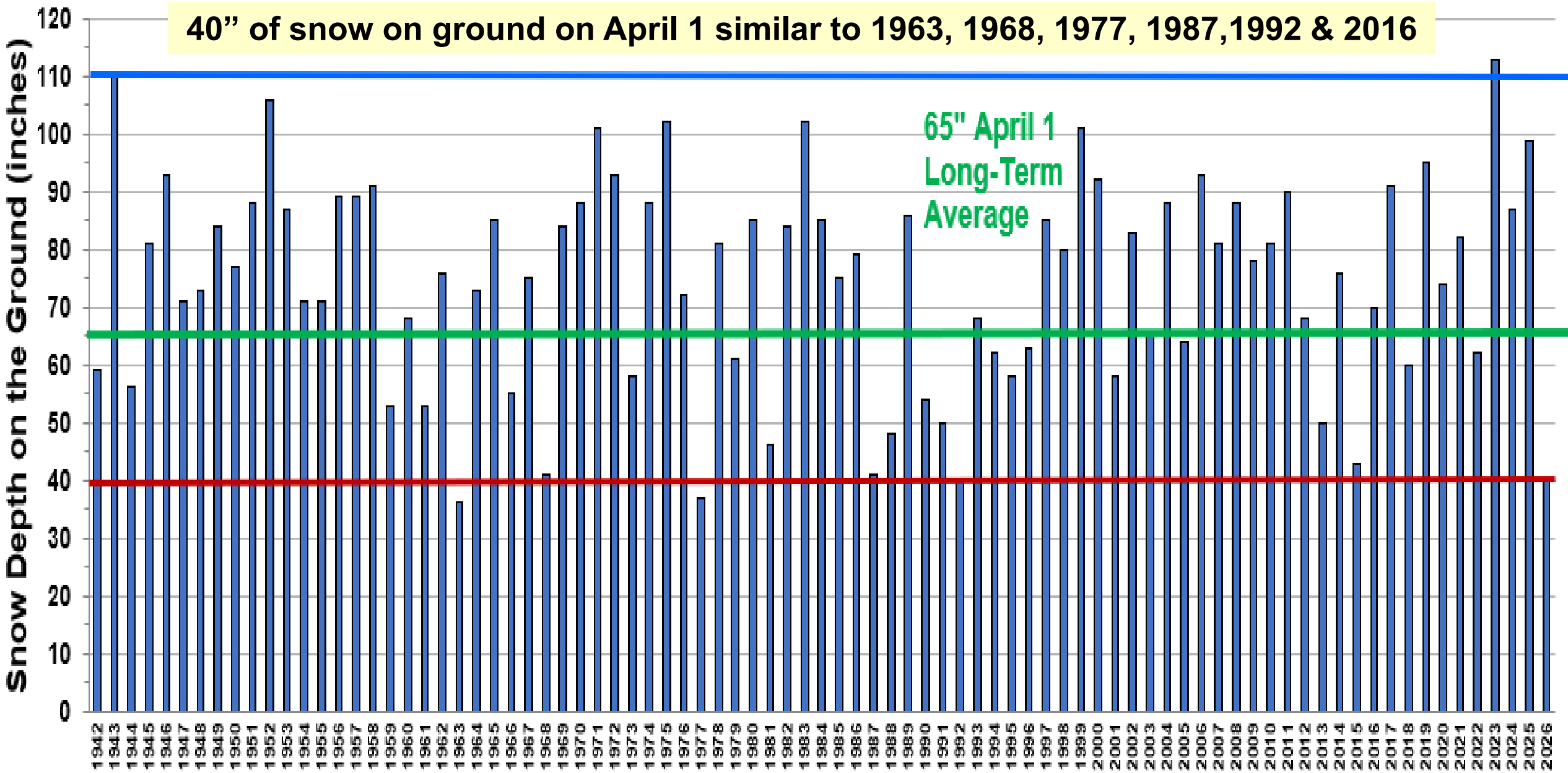

BOGUS BASIN, ID (978) SNOW WATER EQUIVALENT
Bogus Basin Daily Snow Water Equivalent (SWE) Years 2001 - 2026
42% of Median
Not record low because of cool wet spring.
Current as of 04/19/2026:
% of Median - 43%
% Median Peak - 35%
Days Since Median Peak - 12
Percentile - 4
Snow Water Equivalent (in.)
40
35
30
25
20
15
10
5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
(Apr 19, 9.1) 2026
2026 SWE
Median Peak SWE
Max
Median (POR)
Median ('91-'20)
Min
Stats. Shading
2026
2025
2024
2023
2022
2021
2020
2019
2018
2017
2016
2015
2014
2013
2012
2011
2010
2009
2008
2007
2006

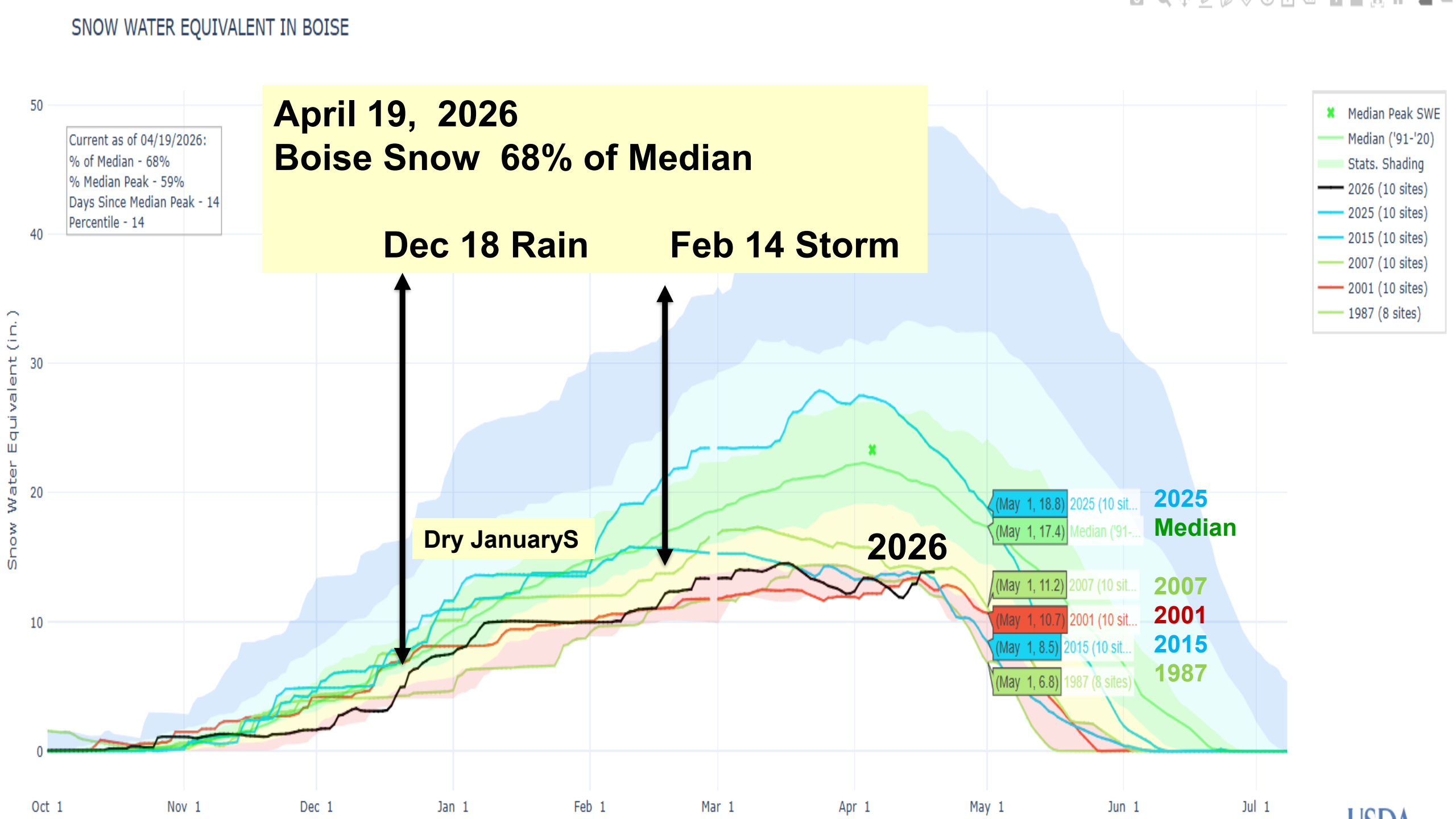
April 2025 - Bogus Basin reached 100” of snow depth for the 8th time since 1942.

What a difference a year makes – Jan 2026 Bogus Basin Snow Depth was 2 Inches



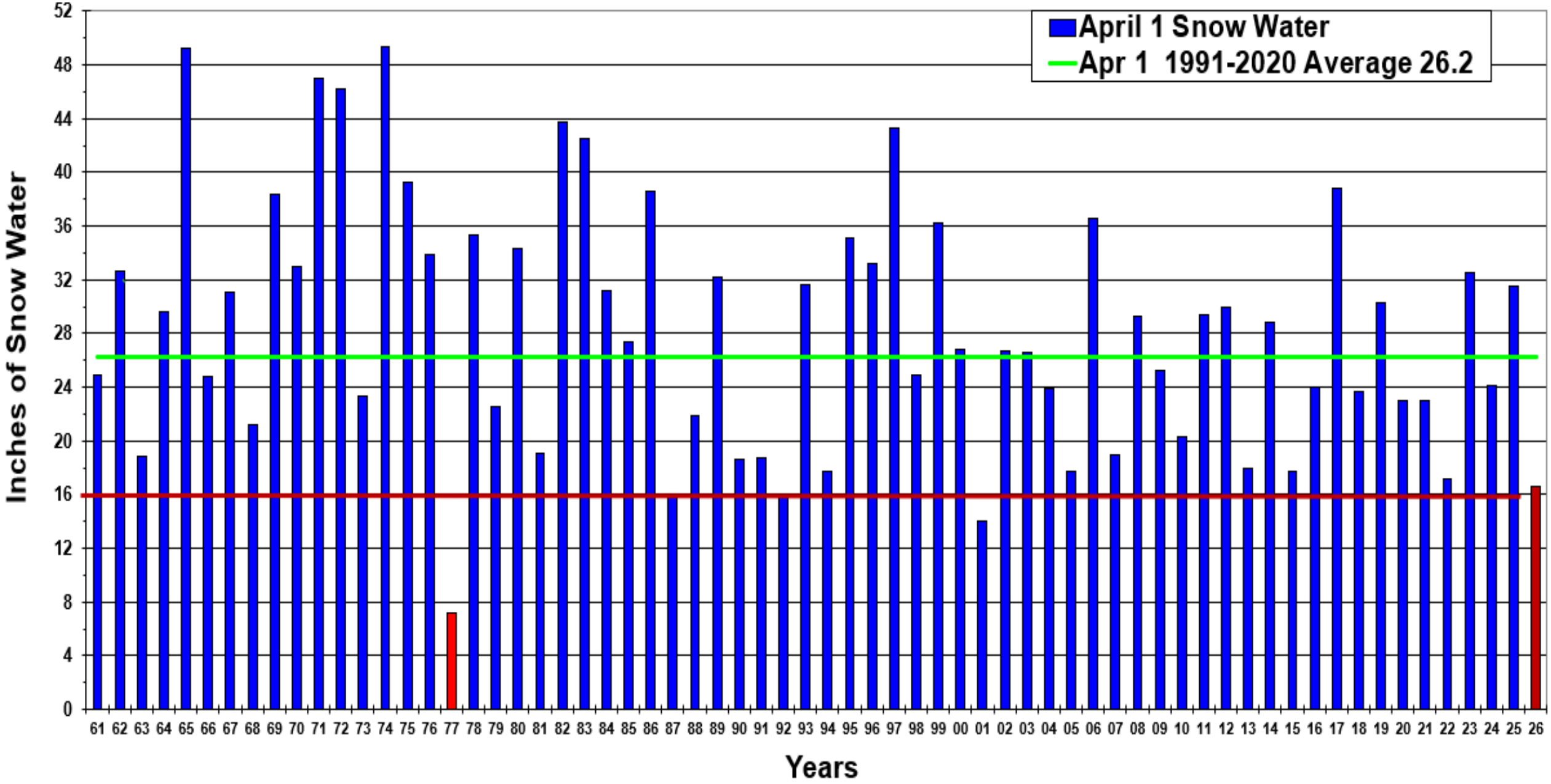
Bogus Basin Maximum Snow Depth on Ground Years 1942 to 2026

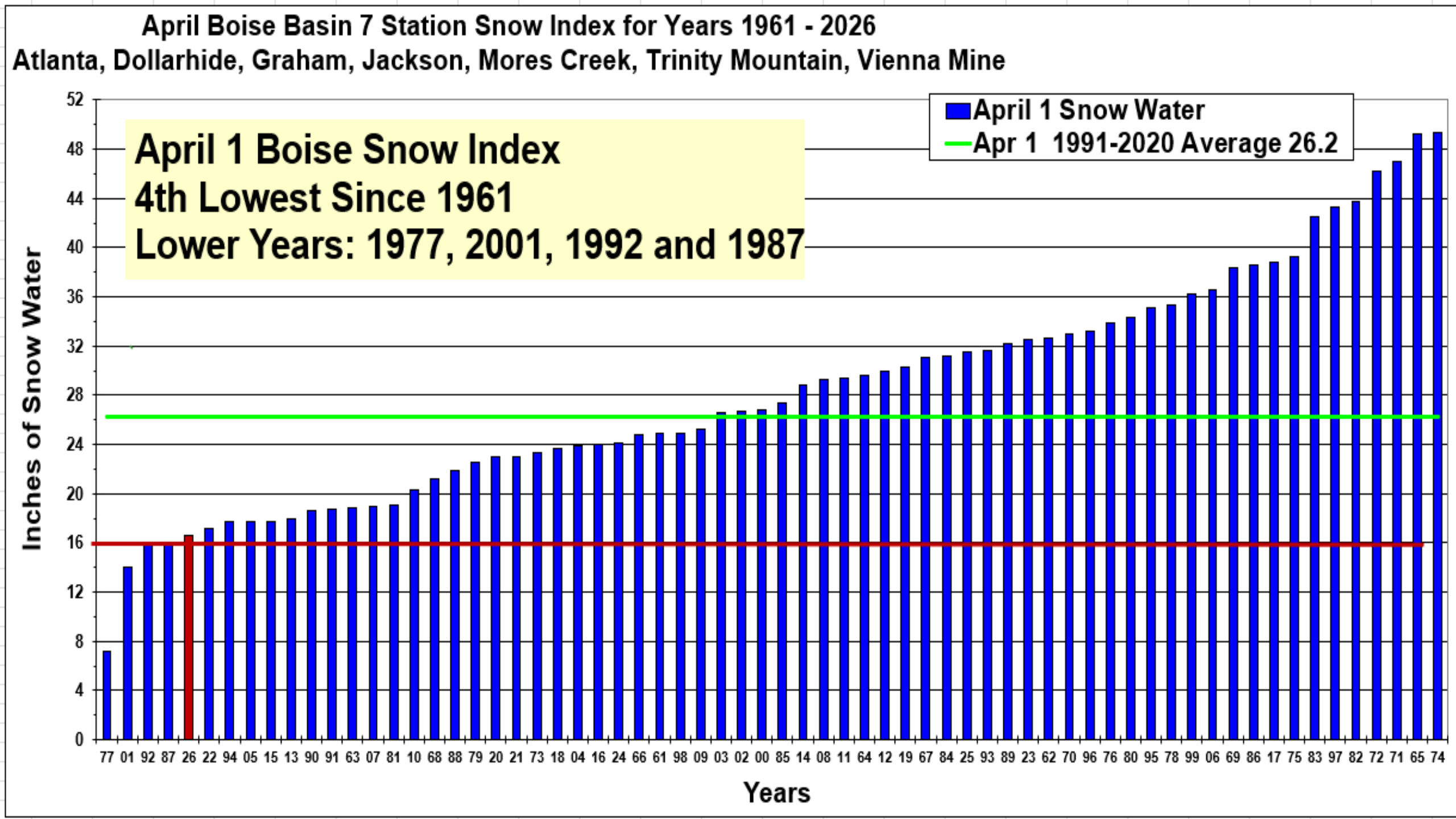



SNOW WATER EQUIVALENT IN BOISE
April 19, 2026
Boise Snow 68% of Median
Dec 18 Rain
Feb 14 Storm
Dry JanuaryS
2026
Current as of 04/19/2026:
% of Median - 68%
% Median Peak - 59%
Days Since Median Peak - 14
Percentile - 14
Median Peak SWE
Median ('91-'20)
Stats. Shading
2026 (10 sites)
2025 (10 sites)
2015 (10 sites)
2007 (10 sites)
2001 (10 sites)
1987 (8 sites)
(May 1, 18.8) 2025 (10 sit...
(May 1, 17.4) Median ('91-...
(May 1, 11.2) 2007 (10 sit...
(May 1, 10.7) 2001 (10 sit...
(May 1, 8.5) 2015 (10 sit...
(May 1, 6.8) 1987 (8 sites)
2025
Median
2007
2001
2015
1987
Snow Water Equivalent (in.)
50
40
30
20
10
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1

April Boise Basin 7 Station Snow Index for Years 1961 - 2026

Atlanta, Dollarhide, Graham, Jackson, Mores Creek, Trinity Mountain, Vienna Mine




April Boise Basin 7 Station Snow Index for Years 1961 - 2026
Atlanta, Dollarhide, Graham, Jackson, Mores Creek, Trinity Mountain, Vienna Mine
April 1 Boise Snow Index
4th Lowest Since 1961
Lower Years: 1977, 2001, 1992 and 1987
April 1 Snow Water
Apr 1 1991-2020 Average 26.2
Inches of Snow Water
0
4
8
12
16
20
24
28
32
36
40
44
48
52
77 01 92 87 26 22 94 05 15 13 90 91 63 07 81 10 68 88 79 20 21 73 18 04 16 24 66 61 98 09 03 02 00 85 14 08 11 64 12 19 67 84 25 93 89 23 62 70 96 76 80 95 78 99 06 69 86 17 75 83 97 82 72 71 65 74
Years

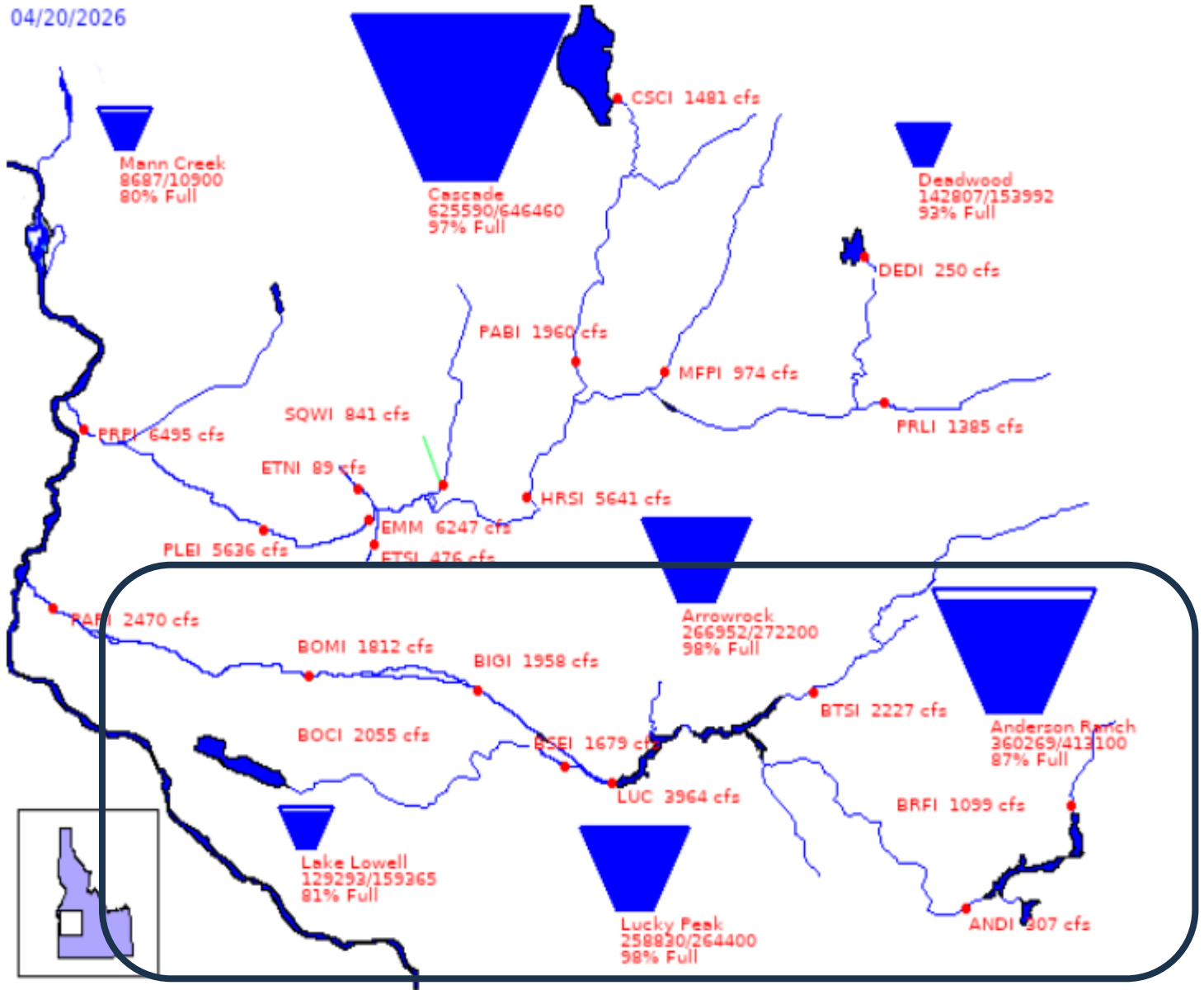
Boise Reservoir System Anderson, Arrowrock and Lucky Peak are 93% Full

Releasing 4530 CFS from Lucky Peak

Diversions above Glenwood 2030 CFS
Glenwood Bridge 2500 CFS

Question is:
Will additional water releases be needed based on remaining snow and future precipitation ??

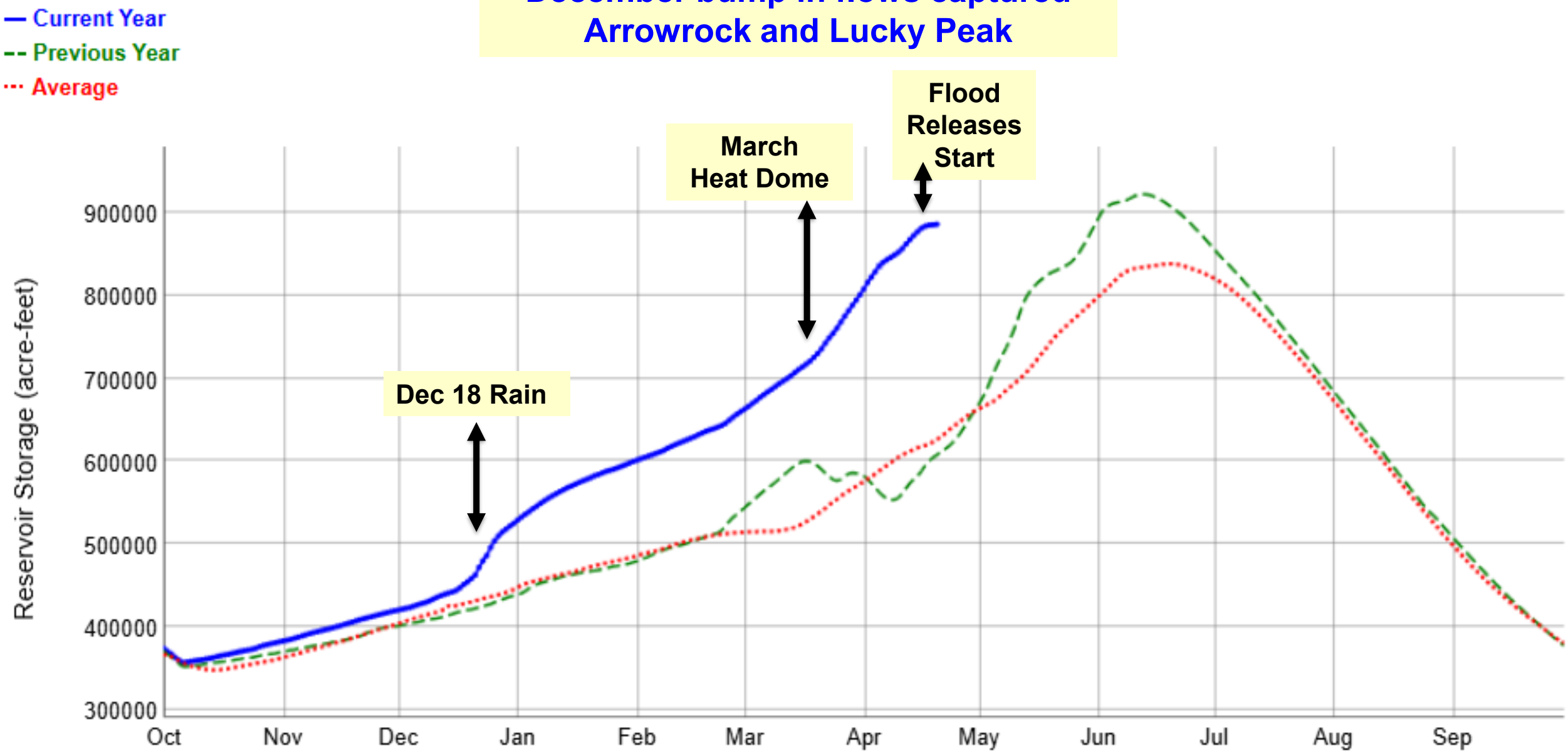
Bureau of Reclamation, Pacific Northwest Region
Major Storage Reservoirs in the Boise & Payette River Basins

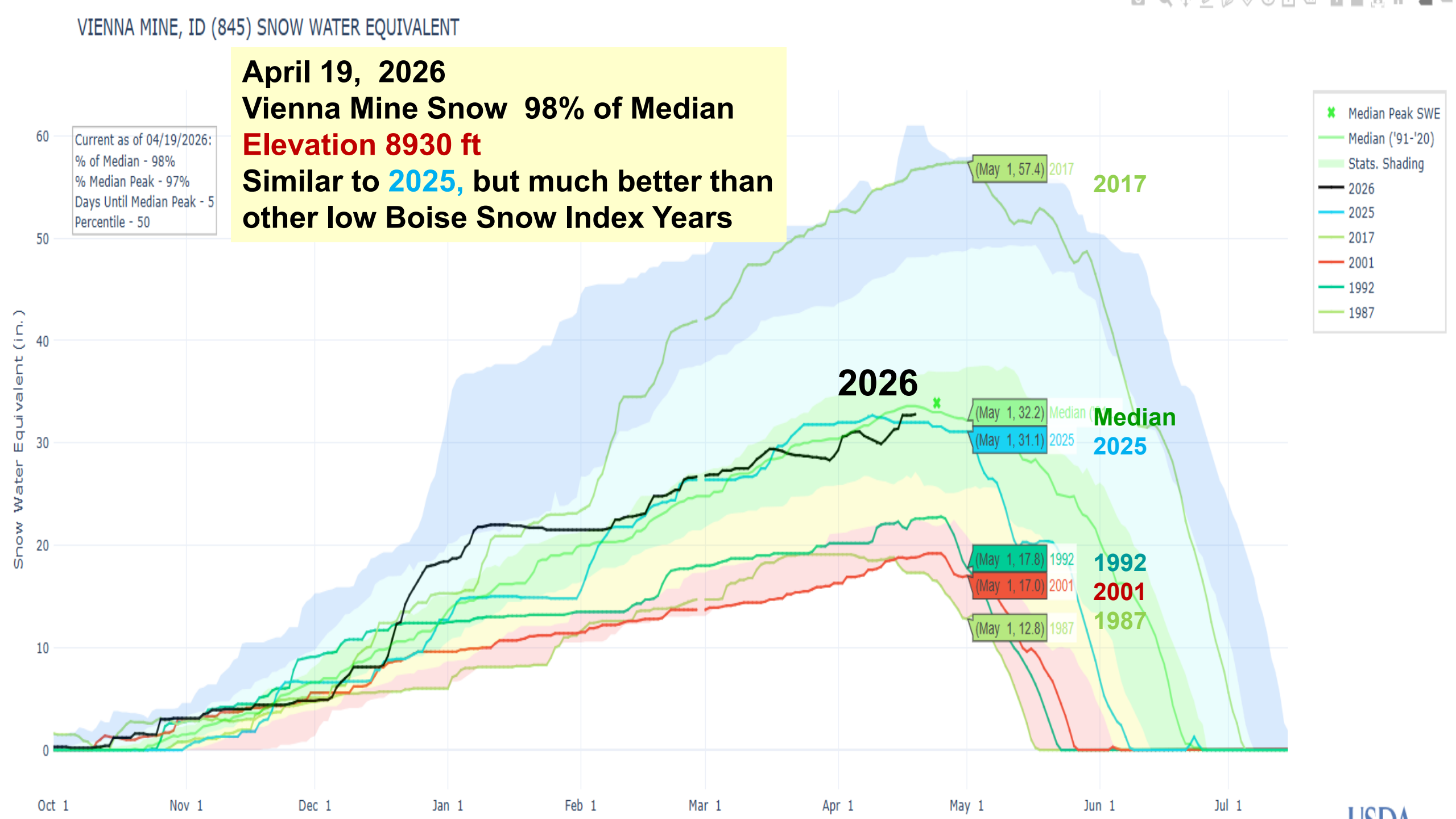


Water Year Graph

Boise River System Reservoir Storage

December bump in flows captured Arrowrock and Lucky Peak




VIENNA MINE, ID (845) SNOW WATER EQUIVALENT
April 19, 2026
Vienna Mine Snow 98% of Median
Elevation 8930 ft
Similar to 2025, but much better than other low Boise Snow Index Years
Current as of 04/19/2026:
% of Median - 98%
% Median Peak - 97%
Days Until Median Peak - 5
Percentile - 50
Median Peak SWE
Median ('91-'20)
Stats. Shading
2026
2025
2017
2001
1992
1987
Snow Water Equivalent (in.)
60
50
40
30
20
10
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
(May 1, 57.4) 2017
(May 1, 32.2) Median (
(May 1, 31.1) 2025
(May 1, 17.8) 1992
(May 1, 17.0) 2001
(May 1, 12.8) 1987
2017
2026
Median
2025
1992
2001
1987

Snow2Flow for SF Boise River

Boise River / West Central Idaho Basins

SF BOISE RIVER AND VIENNA MINE SNOTEL SITE

On average, peak streamflow for the SF Boise River near Featherville, Idaho occurs when Vienna Mine SNOTEL is between **13 and 35%** melted.

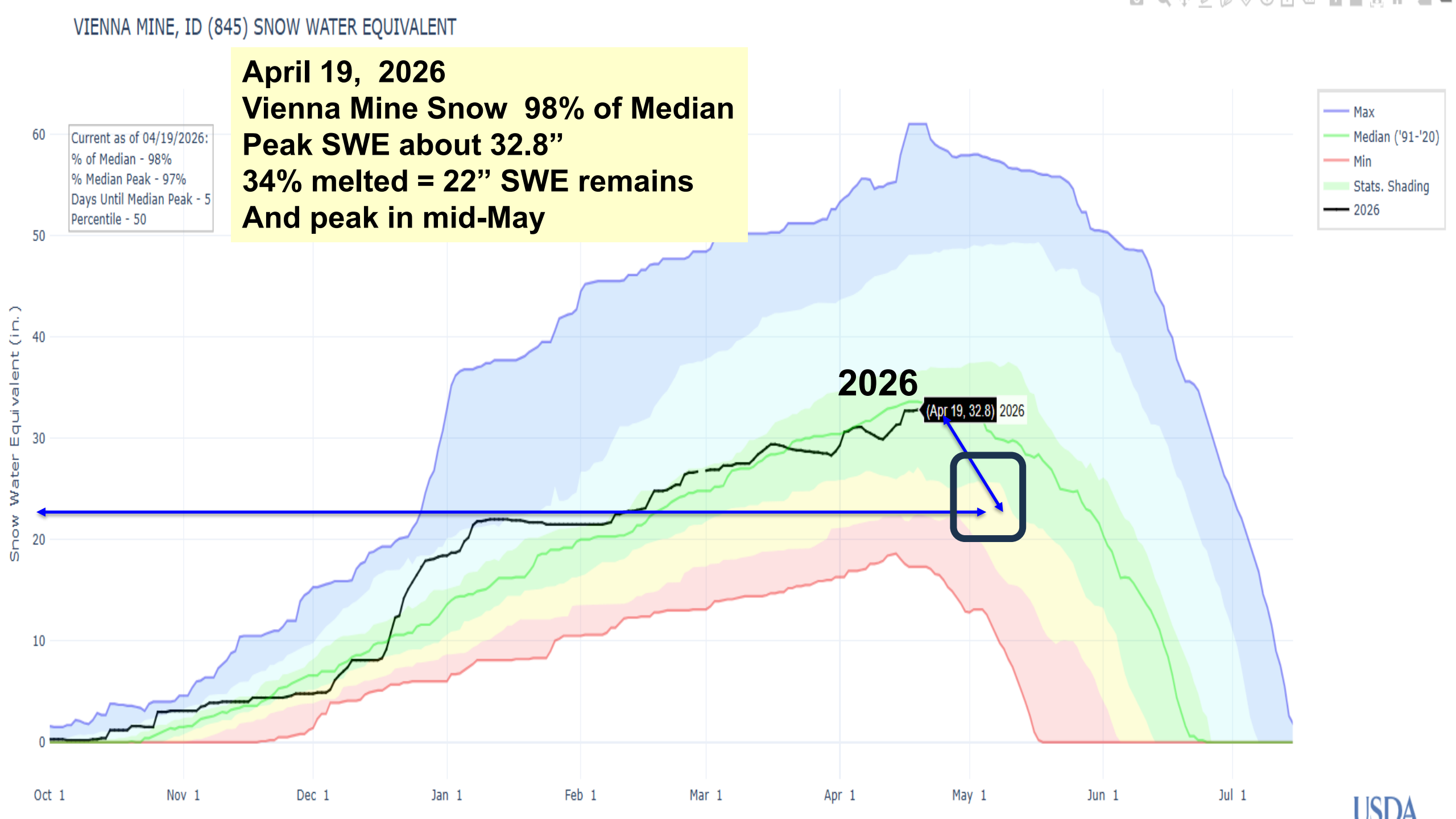
Summary by max SWE magnitude

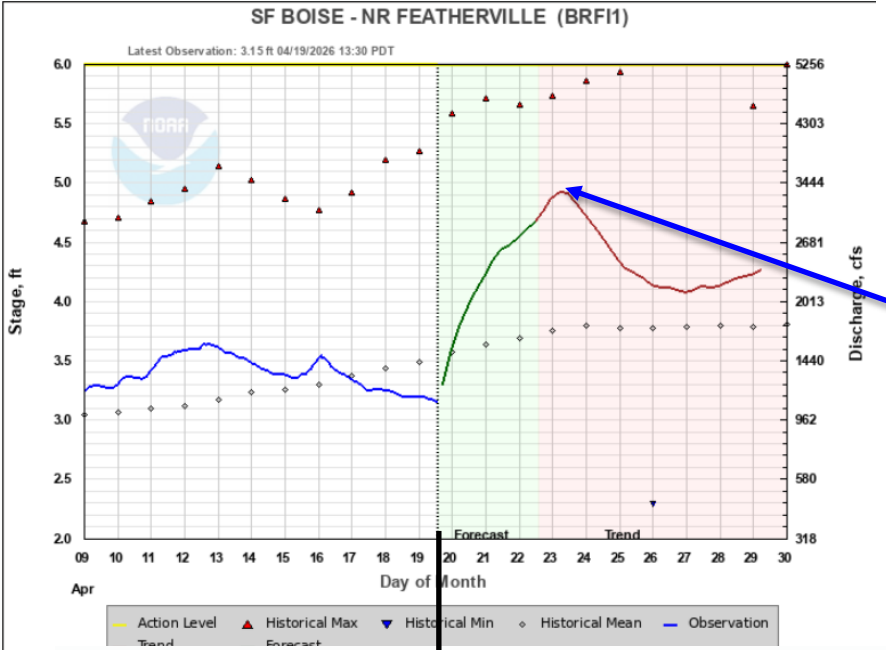
Max SWE Category	Max SWE Magnitude (inches)	Number of Years in Analysis	**Average percent melted at time of peak streamflow**
Below average	<28	8	**35**
Average	27 - 42	17	**34**
Above average	>41	8	**13**

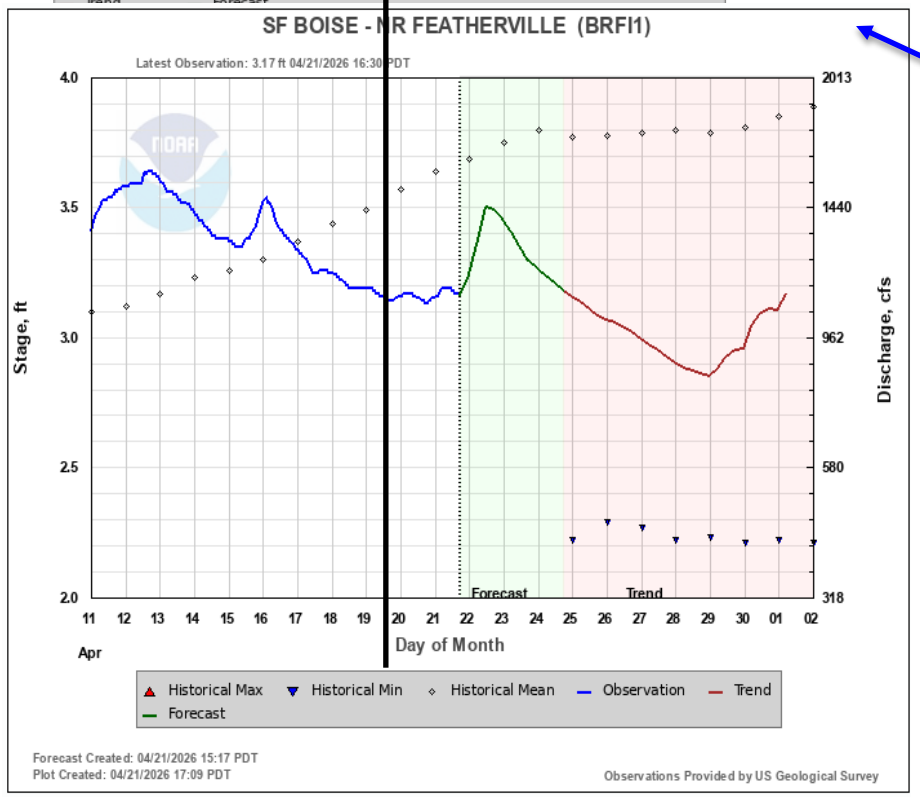
Note - this analysis uses all years available and did not eliminate potential non-snowmelt peaks

The average percent melted for the full 33-year period of record is 29% melted.

2026 Vienna Mine Peak SWE is about 32.8" which indicates snowmelt peak occurs when about 34% melted, or about 22" of SWE remains.


VIENNA MINE, ID (845) SNOW WATER EQUIVALENT
April 19, 2026
Vienna Mine Snow 98% of Median
Peak SWE about 32.8”
34% melted = 22” SWE remains
And peak in mid-May
Current as of 04/19/2026:
% of Median - 98%
% Median Peak - 97%
Days Until Median Peak - 5
Percentile - 50
Max
Median ('91-'20)
Min
Stats. Shading
2026
Snow Water Equivalent (in.)
60
50
40
30
20
10
0
2026
(Apr 19, 32.8) 2026
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
USDA





Northwest River Forecast Center

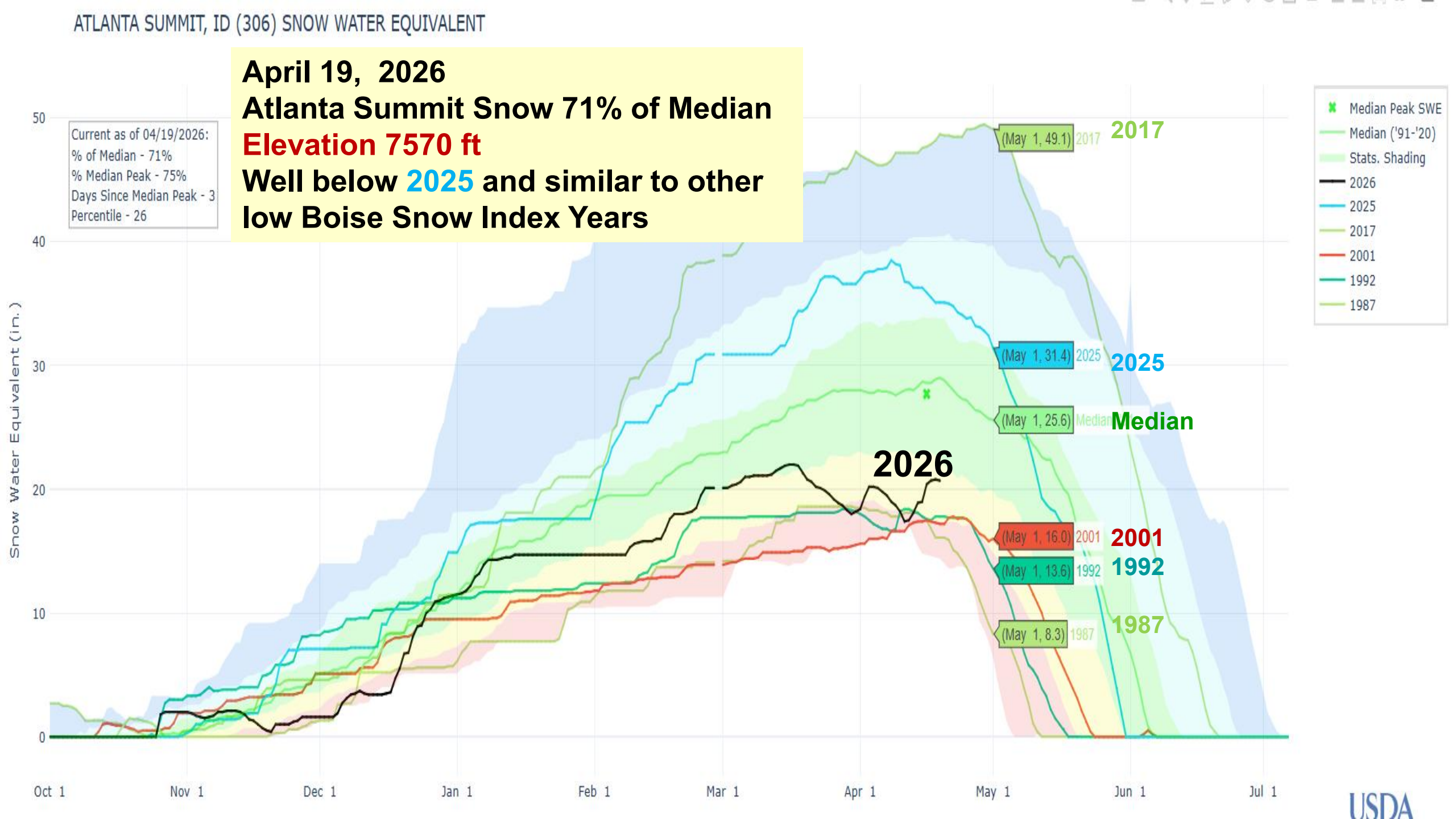
Peak Flow Forecasts

SF BOISE--NR FEATHERVILLE (BRFI1)
Forecasts for Water Year 2026
Ensemble Date: 2026-04-19
Forecast Period: April 19 to August 1

Exceedence Probability	Stage feet	Discharge CFS	Probable Date of Peak
95 %	4.92	3310	2026-04-23
90 %	4.92	3310	2026-04-23
70 %	4.92	3310	2026-04-23
50 %	4.92	3310	2026-04-23
30 %	4.92	3310	2026-04-23
10 %	4.94	3348	2026-05-03
05 %	5.06	3545	2026-05-25

SF BOISE--NR FEATHERVILLE (BRFI1)
Forecasts for Water Year 2026
Ensemble Date: 2026-04-21
Forecast Period: April 21 to August 1

Exceedence Probability	Stage feet	Discharge CFS	Probable Date of Peak
95 %	4.20	2262	2026-05-02
90 %	4.20	2262	2026-05-02
70 %	4.22	2296	2026-05-02
50 %	4.29	2392	2026-05-05
30 %	4.46	2623	2026-05-12
10 %	4.91	3303	2026-05-26
05 %	5.05	3530	2026-06-04


ATLANTA SUMMIT, ID (306) SNOW WATER EQUIVALENT
April 19, 2026
Atlanta Summit Snow 71% of Median
Elevation 7570 ft
Well below 2025 and similar to other low Boise Snow Index Years
Current as of 04/19/2026:
% of Median - 71%
% Median Peak - 75%
Days Since Median Peak - 3
Percentile - 26
Snow Water Equivalent (in.)
50
40
30
20
10
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Median Peak SWE
Median ('91-'20)
Stats. Shading
2026
2025
2017
2001
1992
1987
(May 1, 49.1) 2017
2017
(May 1, 31.4) 2025
2025
(May 1, 25.6) Median
Median
2026
(May 1, 16.0) 2001
2001
(May 1, 13.6) 1992
1992
(May 1, 8.3) 1987
1987
USDA

Snow2Flow for Boise River near Twin Springs

NORTH AND MIDDLE FORKS BOISE RIVERS ATLANTA SUMMIT SNOTEL

On average, peak streamflow for the Boise River near Twin Springs, Idaho occurs when Atlanta Summit SNOTEL is between **22 and 62%** melted.

2026 Atlanta Sumit Peak SWE about 21" which indicates snowmelt peak flow occurs when about 62% melted, or about 8" of SWE remains.

Summary by max SWE magnitude

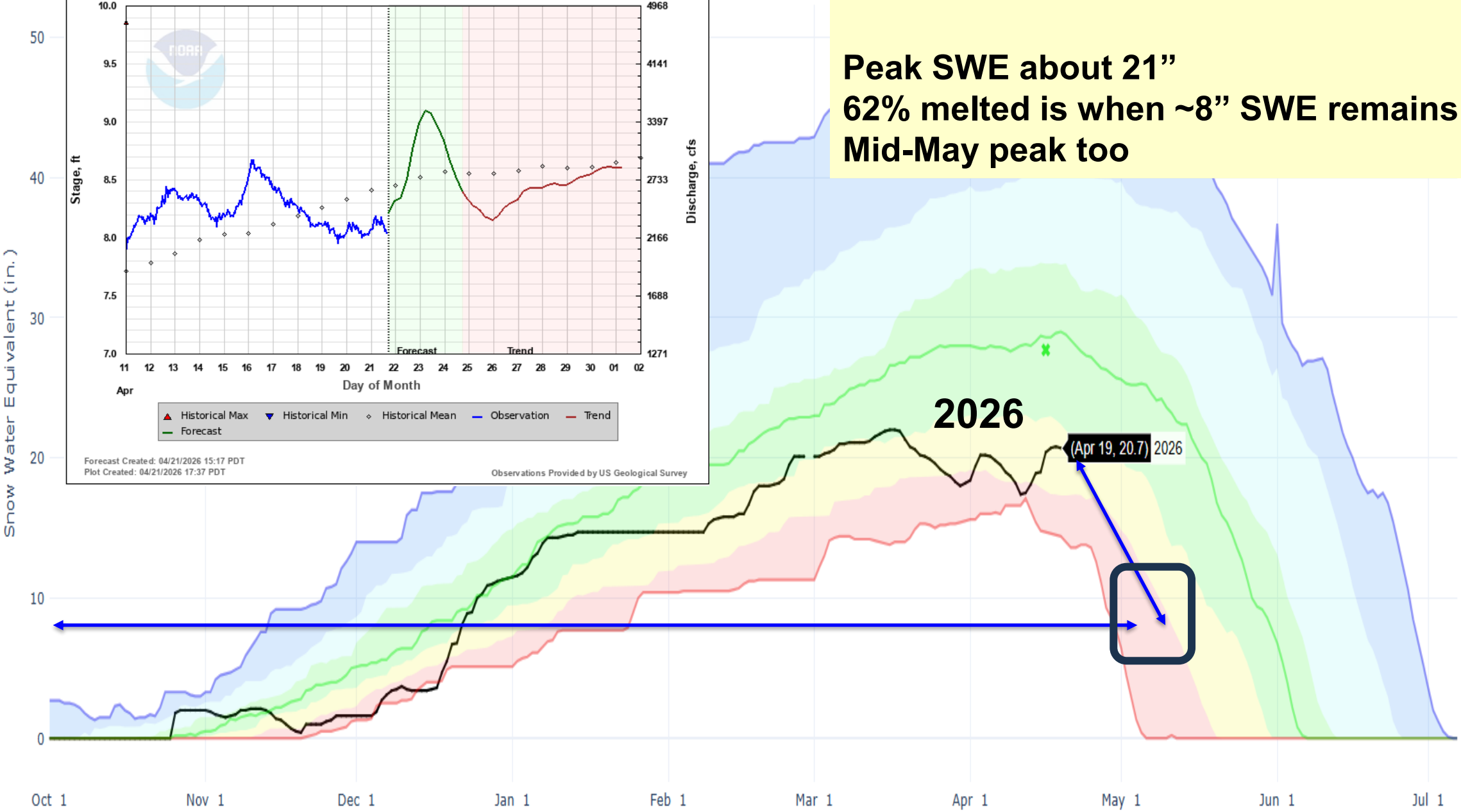
Max SWE Category	Max SWE Magnitude (inches)	Number of Years in Analysis	**Average percent melted at time of peak streamflow**
Below average	<23	8	**62**
Average	22 – 38	17	**43**
Above average	>37	8	**22**

Note - this analysis uses all years available and did not eliminate potential non-snowmelt peaks, however, elimination of non-snowmelt peaks did not change the average percent melted

The average percent melted for the full 33-year period of record is 45% melted.

April 19, 2026
Atlanta Summit Snow 71% of Median

Peak SWE about 21”
62% melted is when ~8” SWE remains
Mid-May peak too

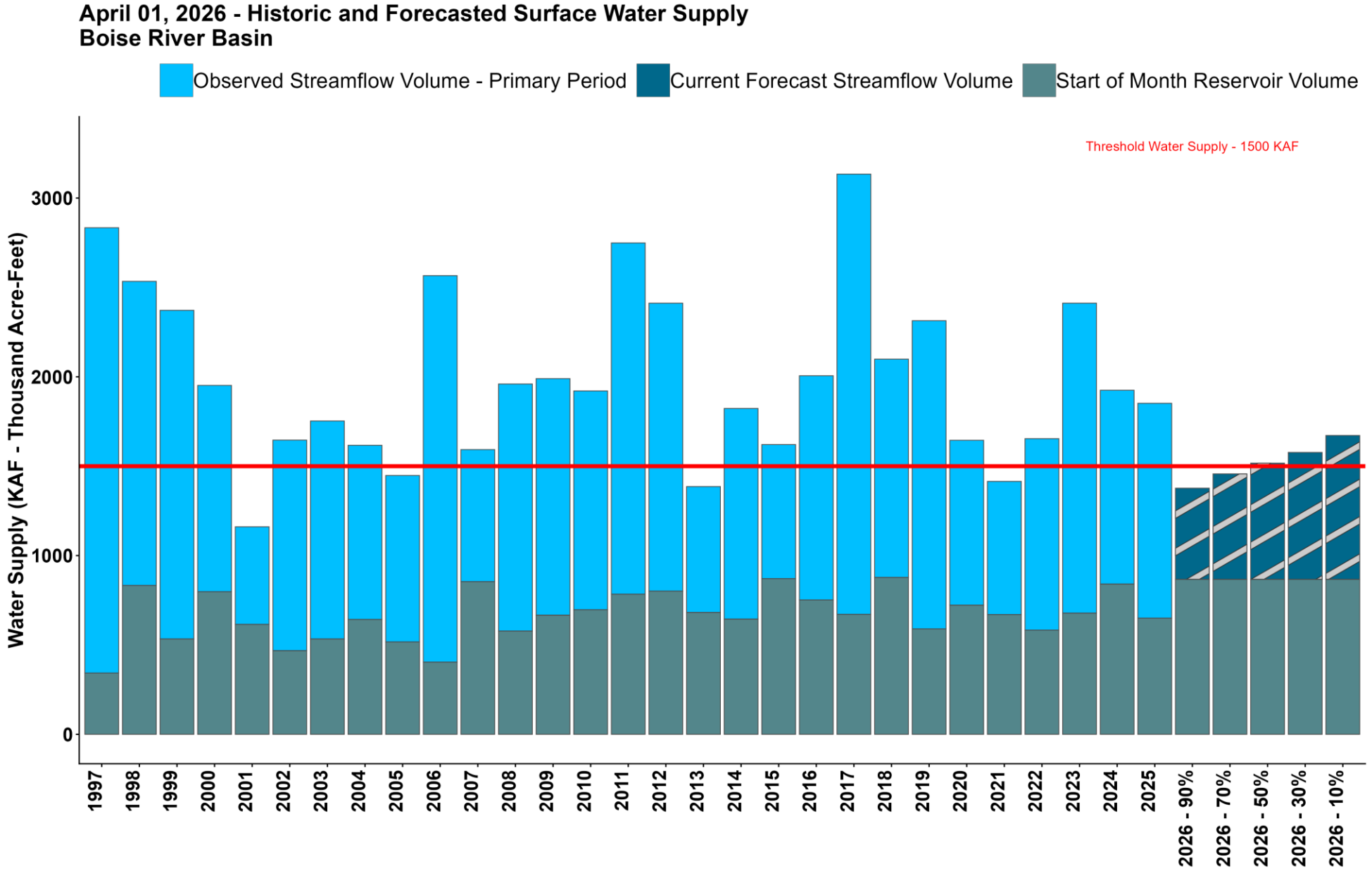


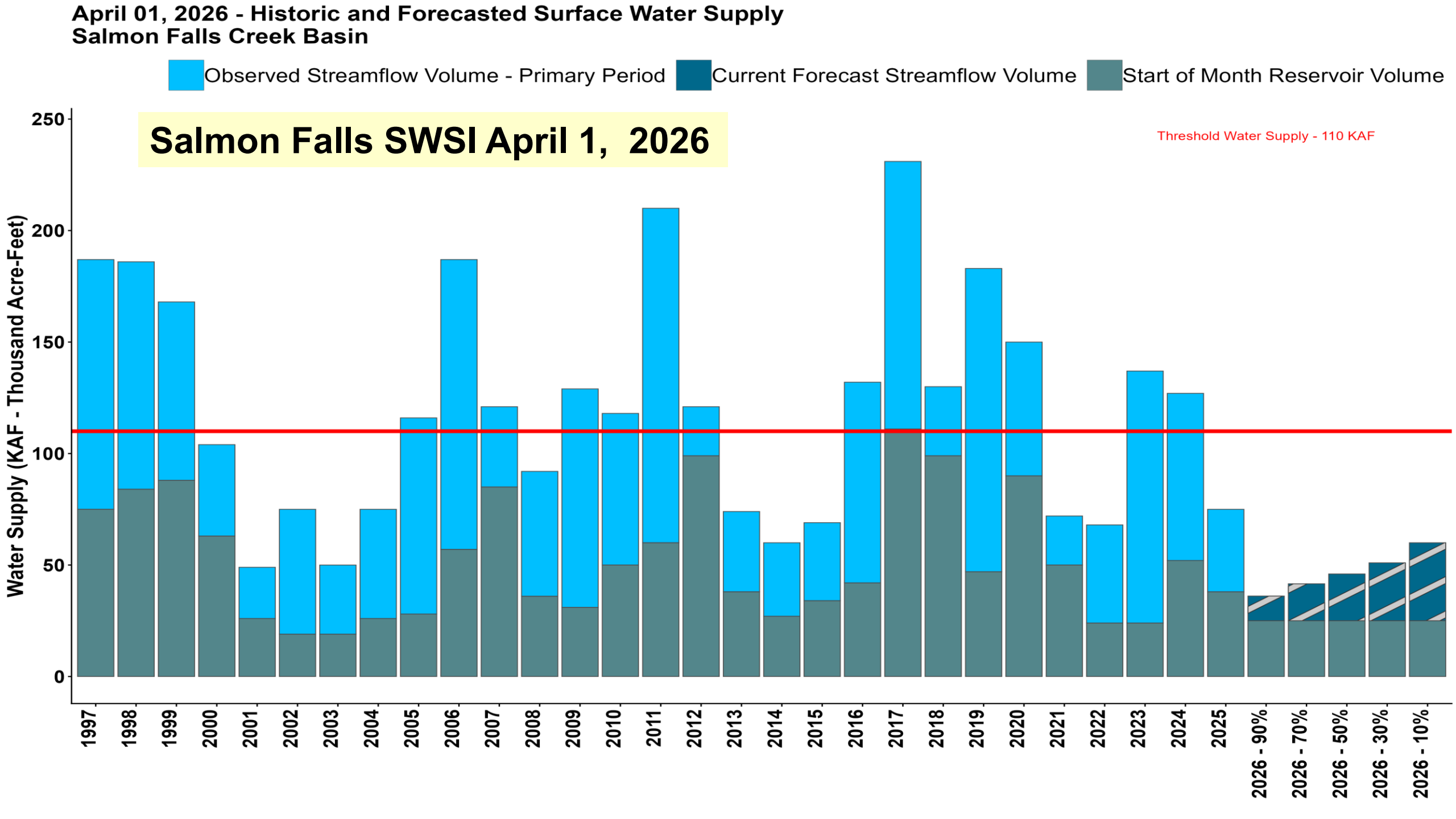
Use of Combined Index:
Reservoir Storage + Forecasted Volume = Surface Water Supply Index (SWSI)

Boise Basin SWSI
April 1

Uses:

- Crop Insurance
- Bank Loans
- Mint Contractors
- Water Banks
- Surplus Water for Recharge
- Cloud Seeding Suspension Criteria




April 01, 2026 - Historic and Forecasted Surface Water Supply
Salmon Falls Creek Basin
Observed Streamflow Volume - Primary Period
Current Forecast Streamflow Volume
Start of Month Reservoir Volume
Salmon Falls SWSI April 1, 2026
Threshold Water Supply - 110 KAF
Water Supply (KAF - Thousand Acre-Feet)
250
200
150
100
50
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026 - 90%
2026 - 70%
2026 - 50%
2026 - 30%
2026 - 10%

Salmon Falls Creek and Pole Creek SNOTEL SITE

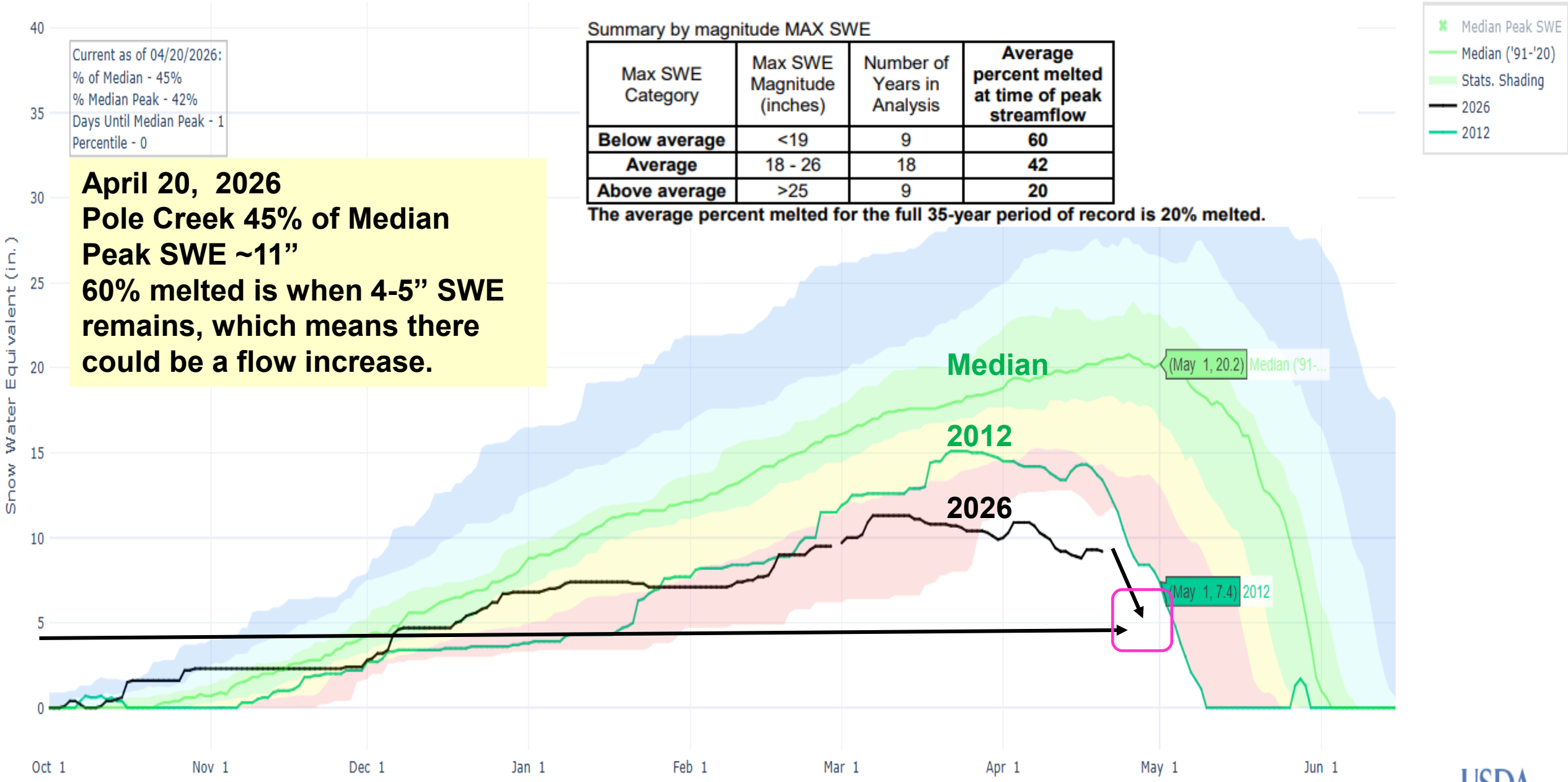
On average, the Salmon Falls Creek near San Jacinto, NV peak streamflow occurs when Pole Creek RS SNOTEL is approximately 20% melted.

POLE CREEK R.S., NV (698) SNOW WATER EQUIVALENT

Summary by magnitude MAX SWE

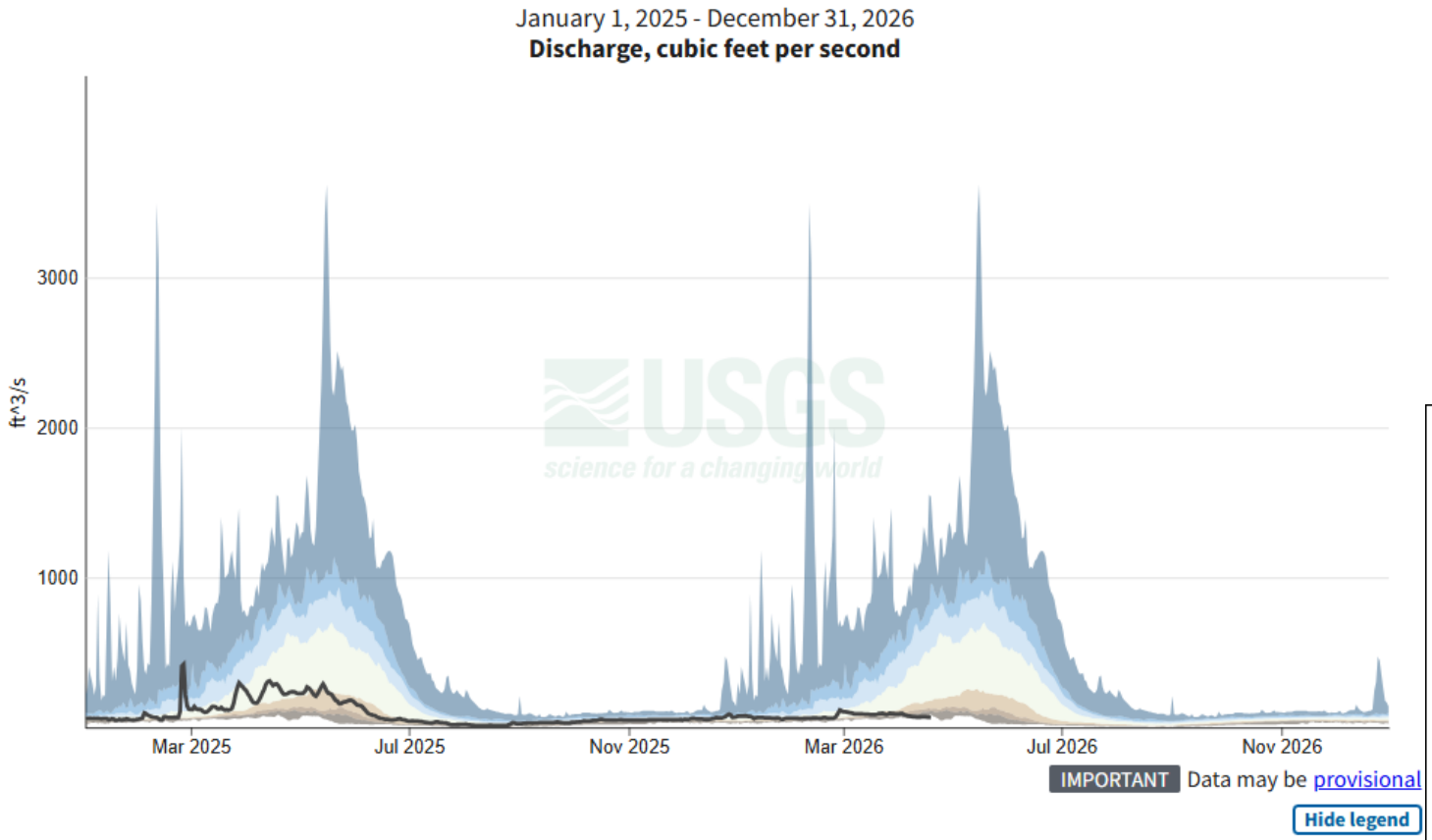
Max SWE Category	Max SWE Magnitude (inches)	Number of Years in Analysis	Average percent melted at time of peak streamflow
Below average	<19	9	**60**
Average	18 - 26	18	**42**
Above average	>25	9	**20**

The average percent melted for the full 35-year period of record is 20% melted.



April 20, 2026
Pole Creek 45% of Median
Peak SWE ~11”
60% melted is when 4-5” SWE remains, which means there could be a flow increase.

Salmon Falls Creek NR San Jacinto NV - USGS-13105000



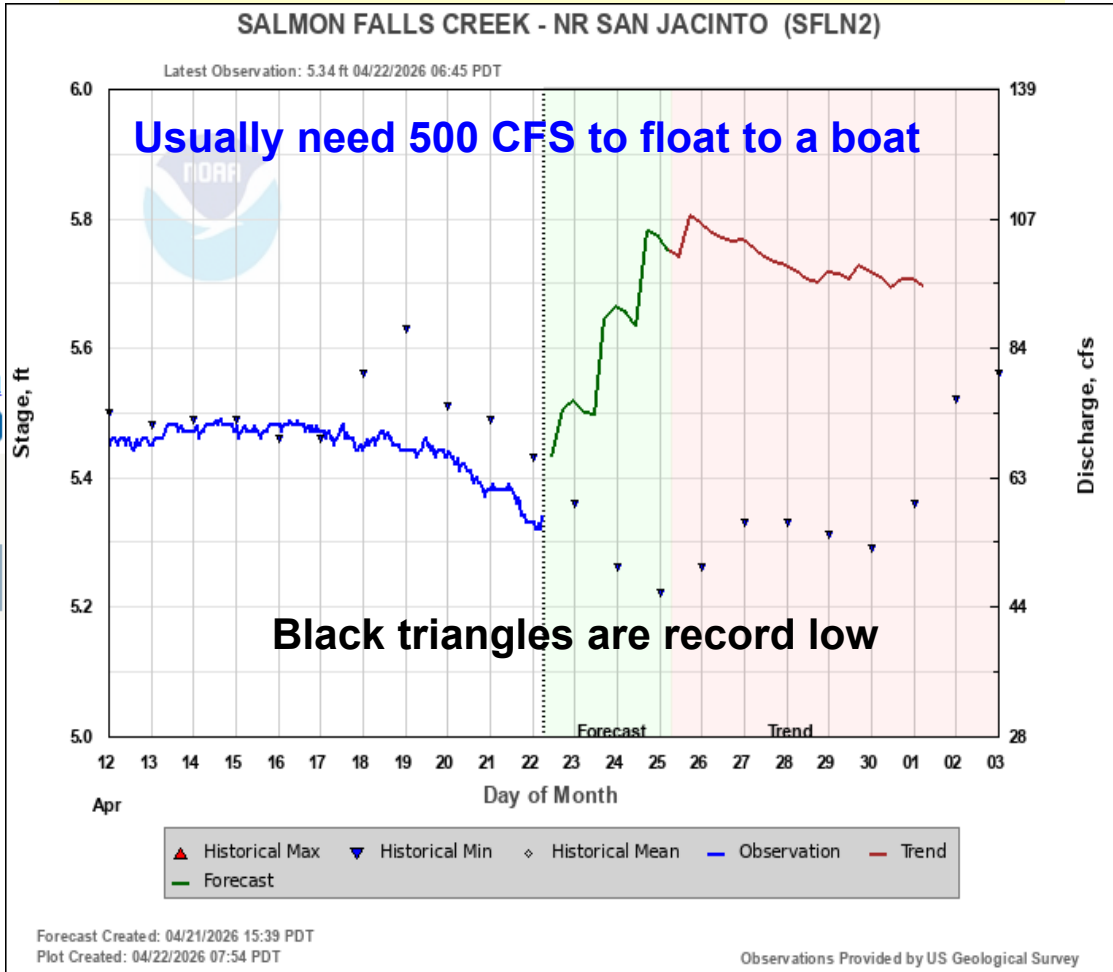
Daily average (mean) for Discharge, cubic feet per second

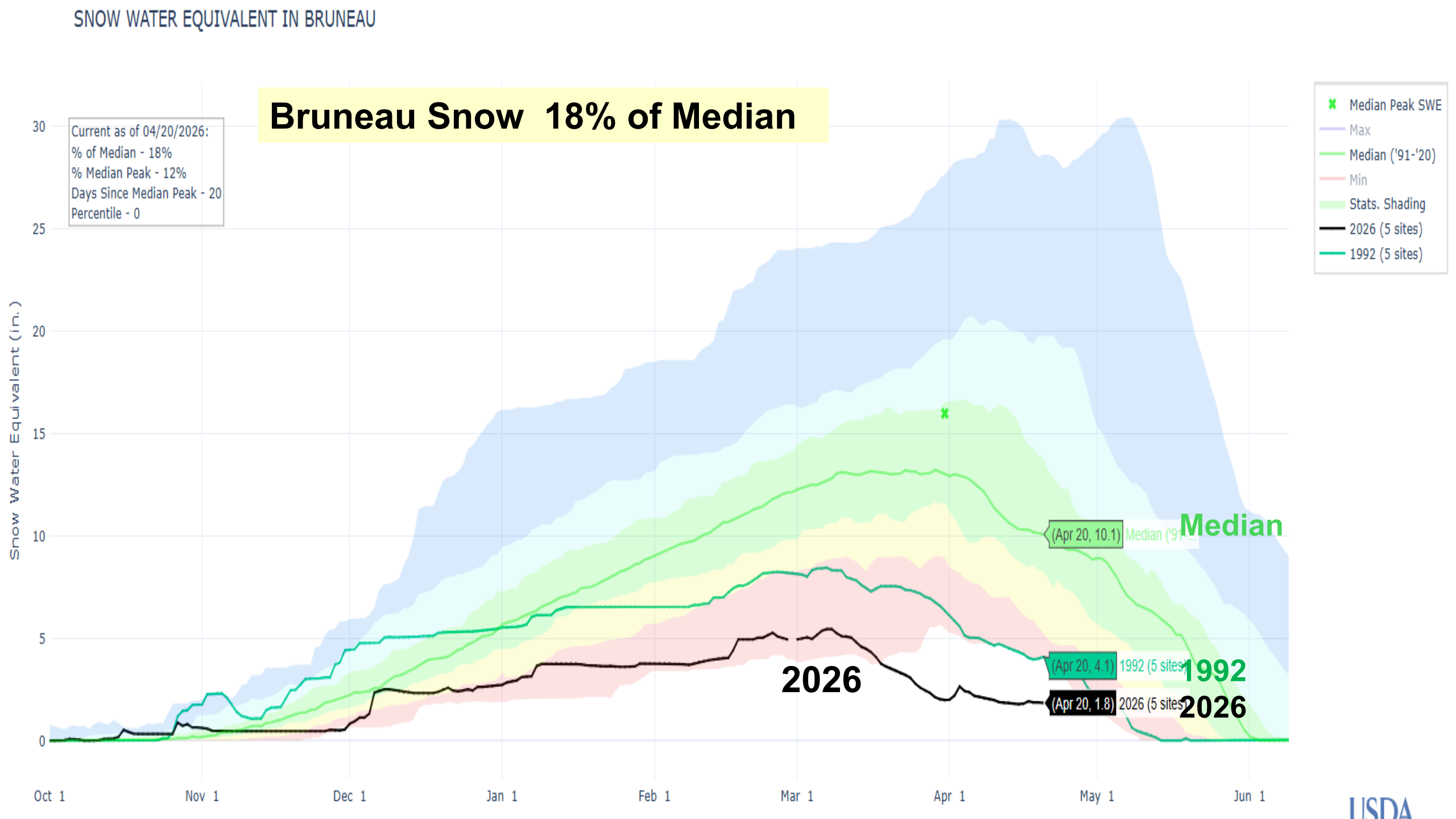
Percentile ranges for daily averages (means) for each day of a year (with comparison to normal)

0-5	5-10	10-25	25-75	75-90	90-95	95-100
Extremely below	Much below	Below normal	Normal	Above normal	Much above	Extremely above

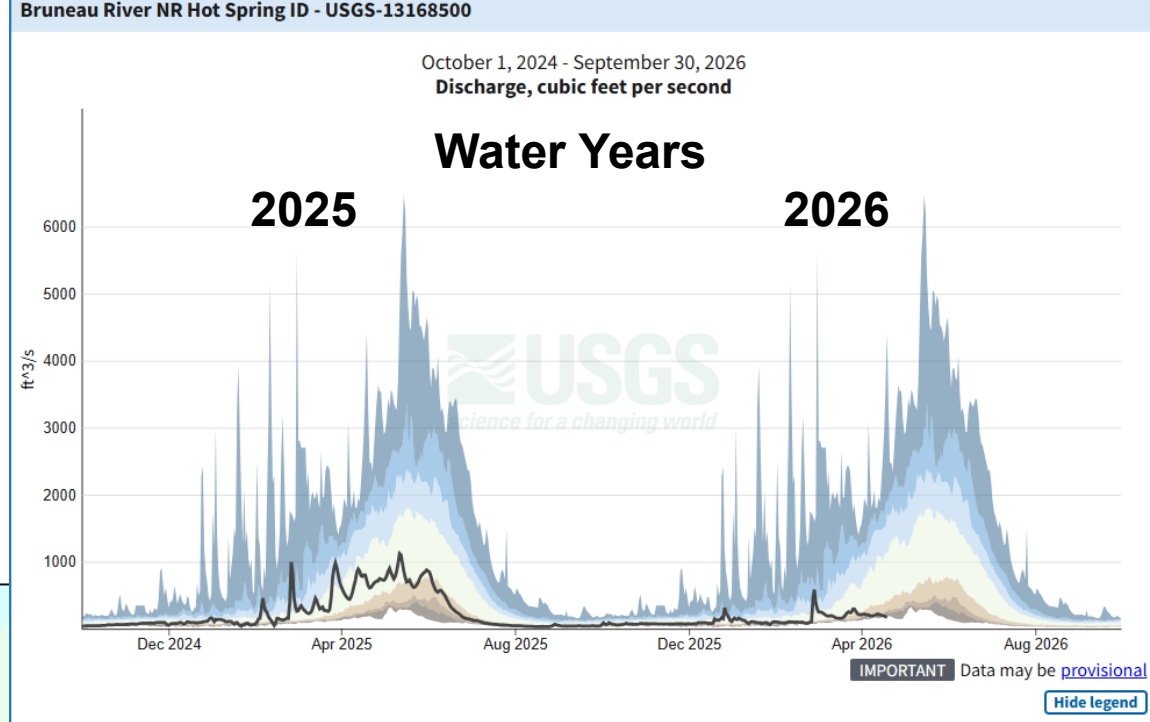
April 19, 2026
Current flow of 50cfs is record low since records starts in1913.

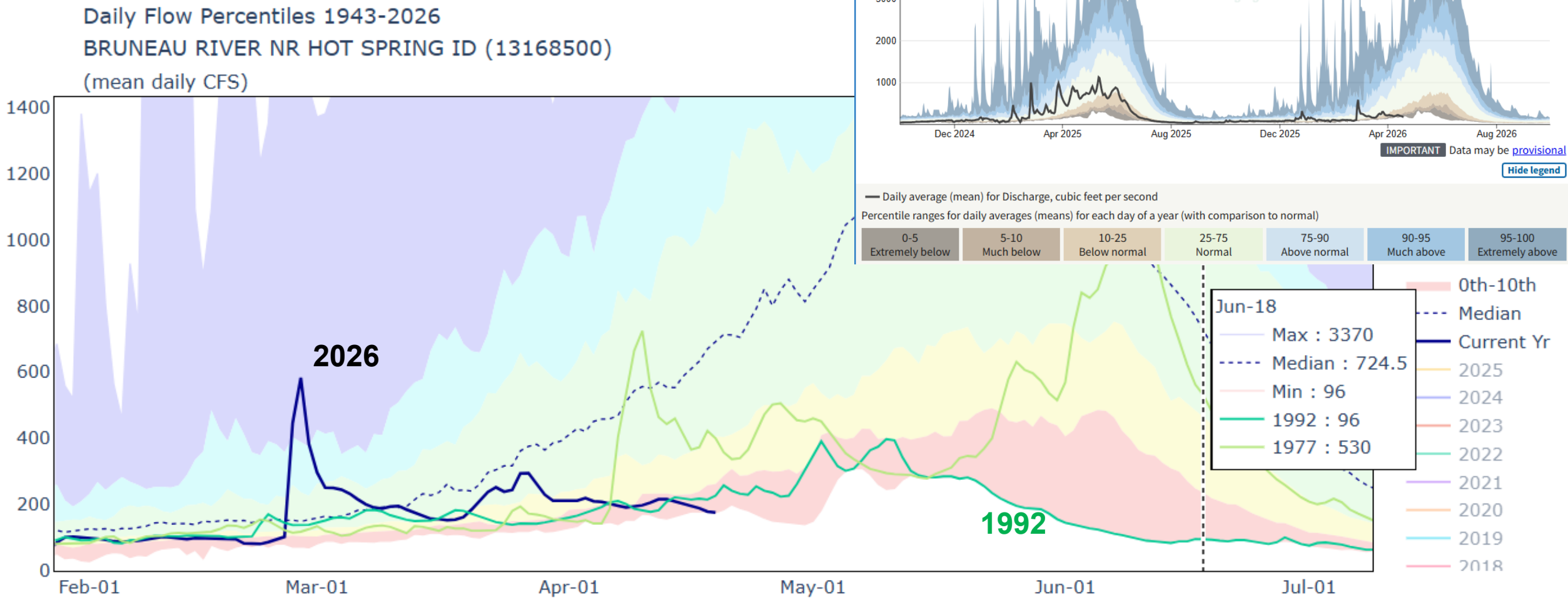
Flow increase could happen from rain and/or snowmelt at Pole Creek but won't be much.

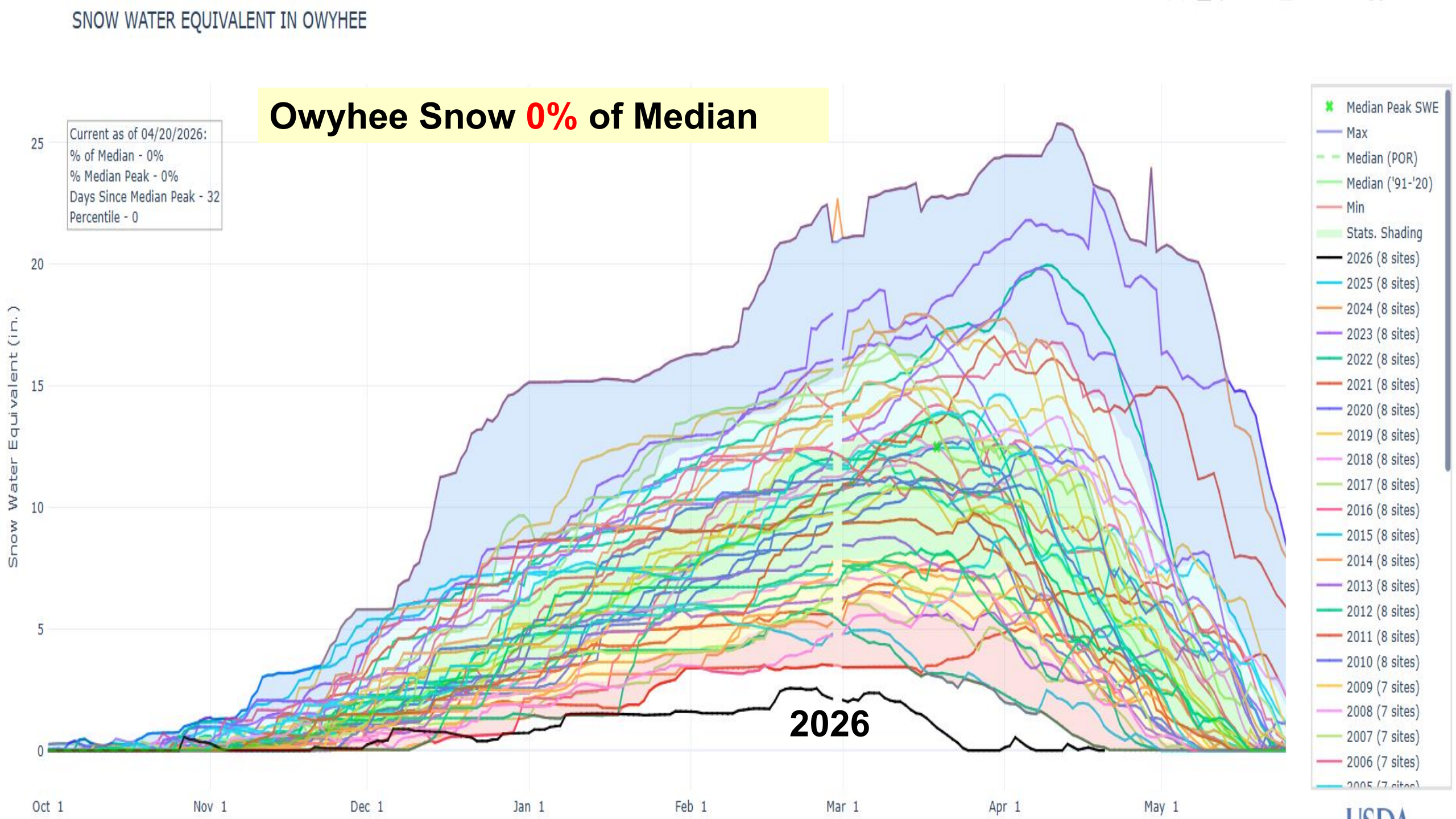



SNOW WATER EQUIVALENT IN BRUNEAU
Bruneau Snow 18% of Median
Current as of 04/20/2026:
% of Median - 18%
% Median Peak - 12%
Days Since Median Peak - 20
Percentile - 0
Median Peak SWE
Max
Median ('91-'20)
Min
Stats. Shading
2026 (5 sites)
1992 (5 sites)
Snow Water Equivalent (in.)
30
25
20
15
10
5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
(Apr 20, 10.1) Median ('91-
Median
(Apr 20, 4.1) 1992 (5 sites)
1992
(Apr 20, 1.8) 2026 (5 sites)
2026
2026

Bruneau River is lowest since records start in 1939. Without spring rains, it might be a year that the Bruneau hardly peaks, similar to 1992.





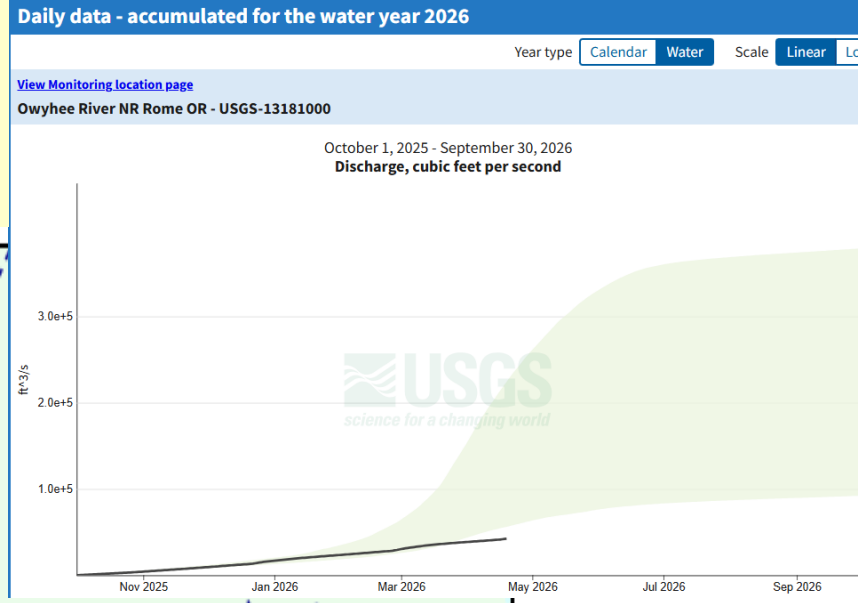

SNOW WATER EQUIVALENT IN OWYHEE
Owyhee Snow 0% of Median
Current as of 04/20/2026:
% of Median - 0%
% Median Peak - 0%
Days Since Median Peak - 32
Percentile - 0
Snow Water Equivalent (in.)
0
5
10
15
20
25
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
2026
Median Peak SWE
Max
Median (POR)
Median ('91-'20)
Min
Stats. Shading
2026 (8 sites)
2025 (8 sites)
2024 (8 sites)
2023 (8 sites)
2022 (8 sites)
2021 (8 sites)
2020 (8 sites)
2019 (8 sites)
2018 (8 sites)
2017 (8 sites)
2016 (8 sites)
2015 (8 sites)
2014 (8 sites)
2013 (8 sites)
2012 (8 sites)
2011 (8 sites)
2010 (8 sites)
2009 (7 sites)
2008 (7 sites)
2007 (7 sites)
2006 (7 sites)

Daily Flow Percentiles 1949-2026

OWYHEE RIVER NR ROME OR (13181000)

(mean daily CFS)

Interesting Water Year 2026 Flow Accumulation shows lowest total flow since records start in 1950



1600
1400
1200
1000
800
600
400
200
0

800 CFS

2025

2026

Apr-21
Max : 19k
Median : 1780
Min : 127
Current Yr : 244
1992 : 127

10th-25th
0th-10th
Median
Current Yr
2025
2024
2023
2022
2021
2020
2019
2018

Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01

From Rob Van Kirk Henrys Fork Foundation April 20, 2026

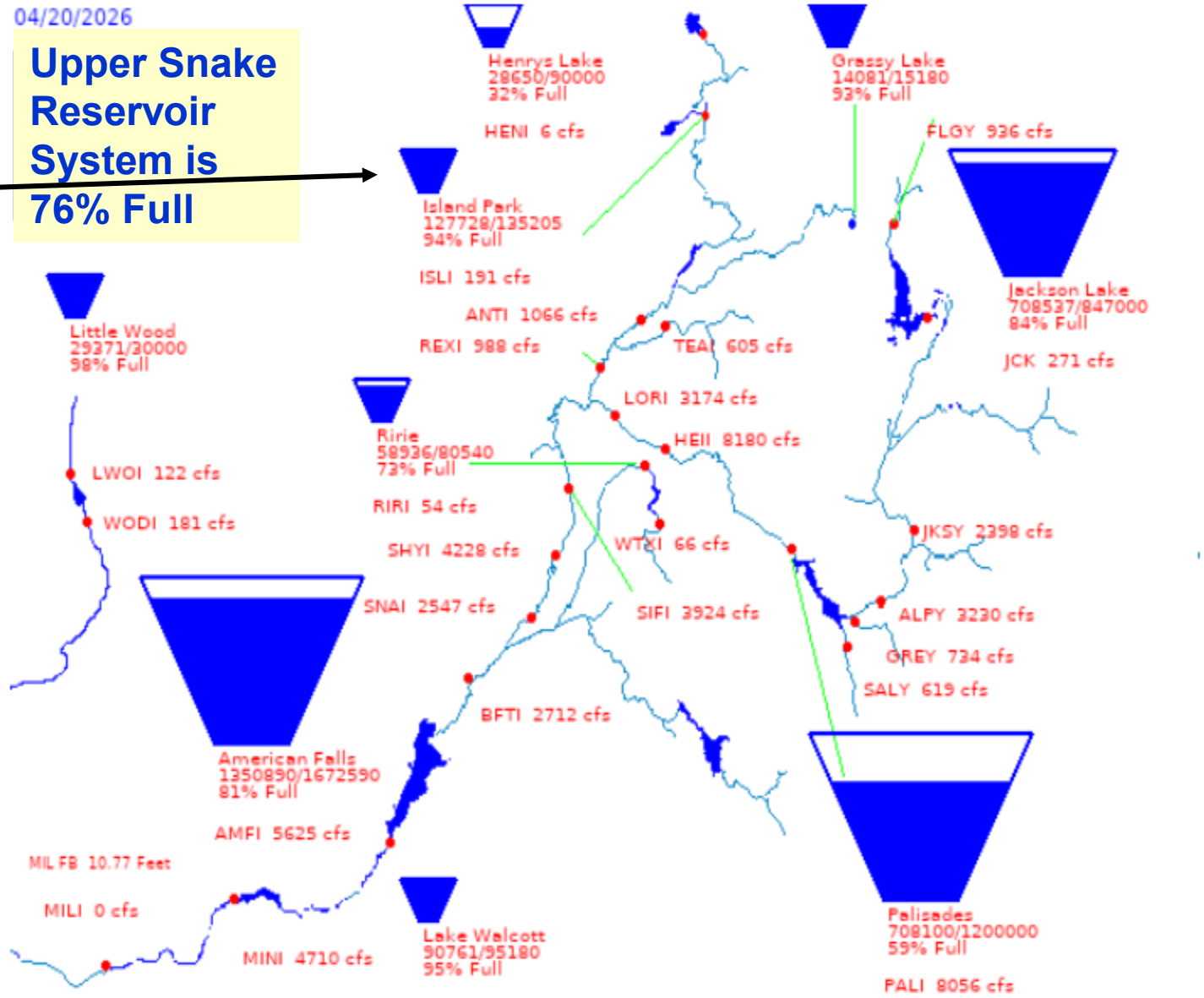
One interesting thing that happened late last week is that Island Park filled to the top of the concrete spillway, at roughly 126,000 ac-ft of volume.

<u>Normally, the reservoir would still be covered with ice</u>, and additional fill would not be possible until ice melted.

However, this year, ice melted on March 31, so the reservoir has continued to fill without need for any outflow adjustments to accommodate the ice constraint.

Bureau of Reclamation, Pacific Northwest Region
Major Storage Reservoirs in the Upper Snake River Basin

Upper Snake Reservoir System is 76% Full

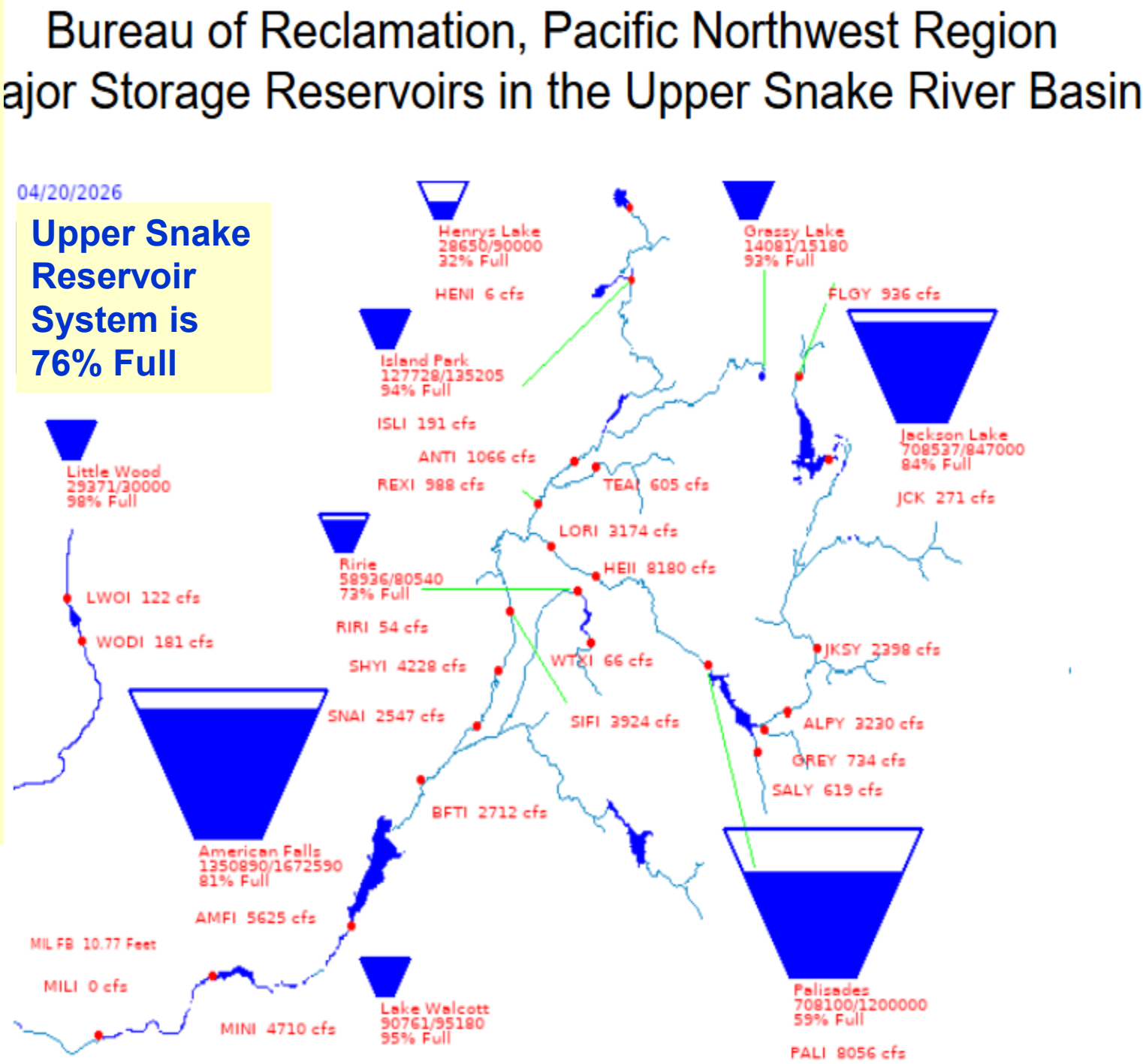


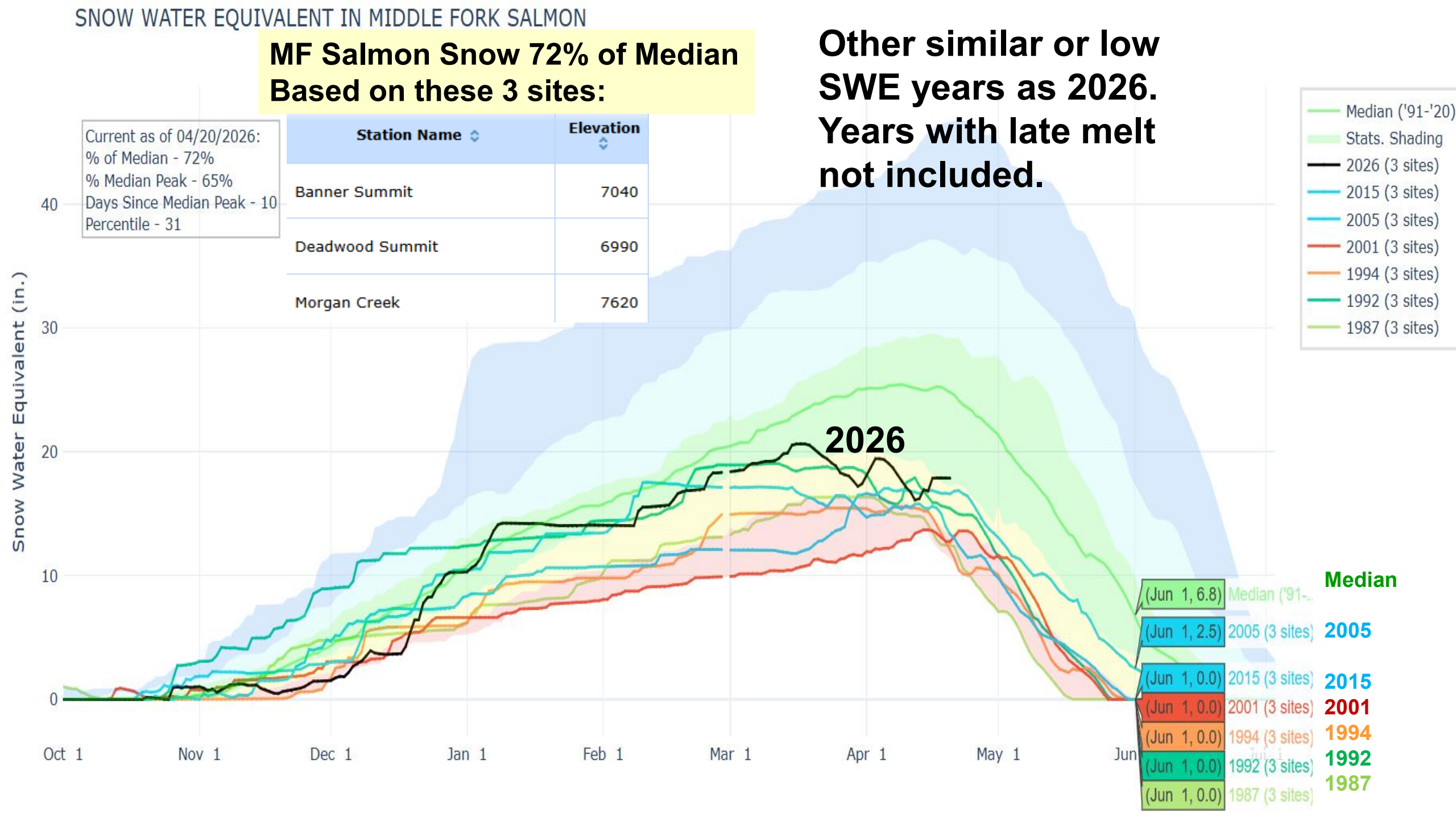
From Rob Van Kirk Henrys Fork Foundation
April 20, 2026

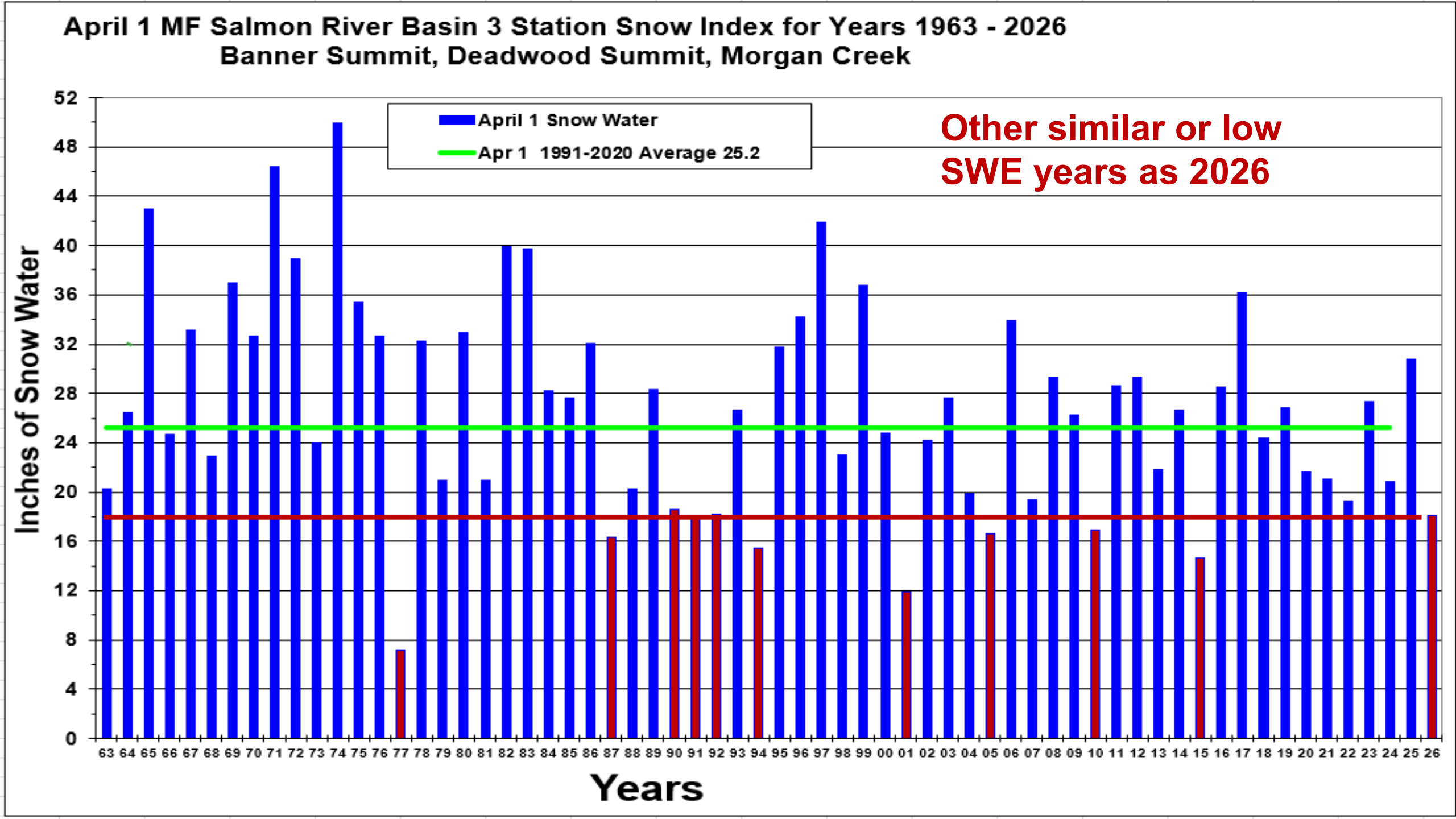
Water quality and aquatic ecology:
Water temperatures rebounded over the weekend, keeping hatch timing at 28 days ahead of average at the watershed scale...

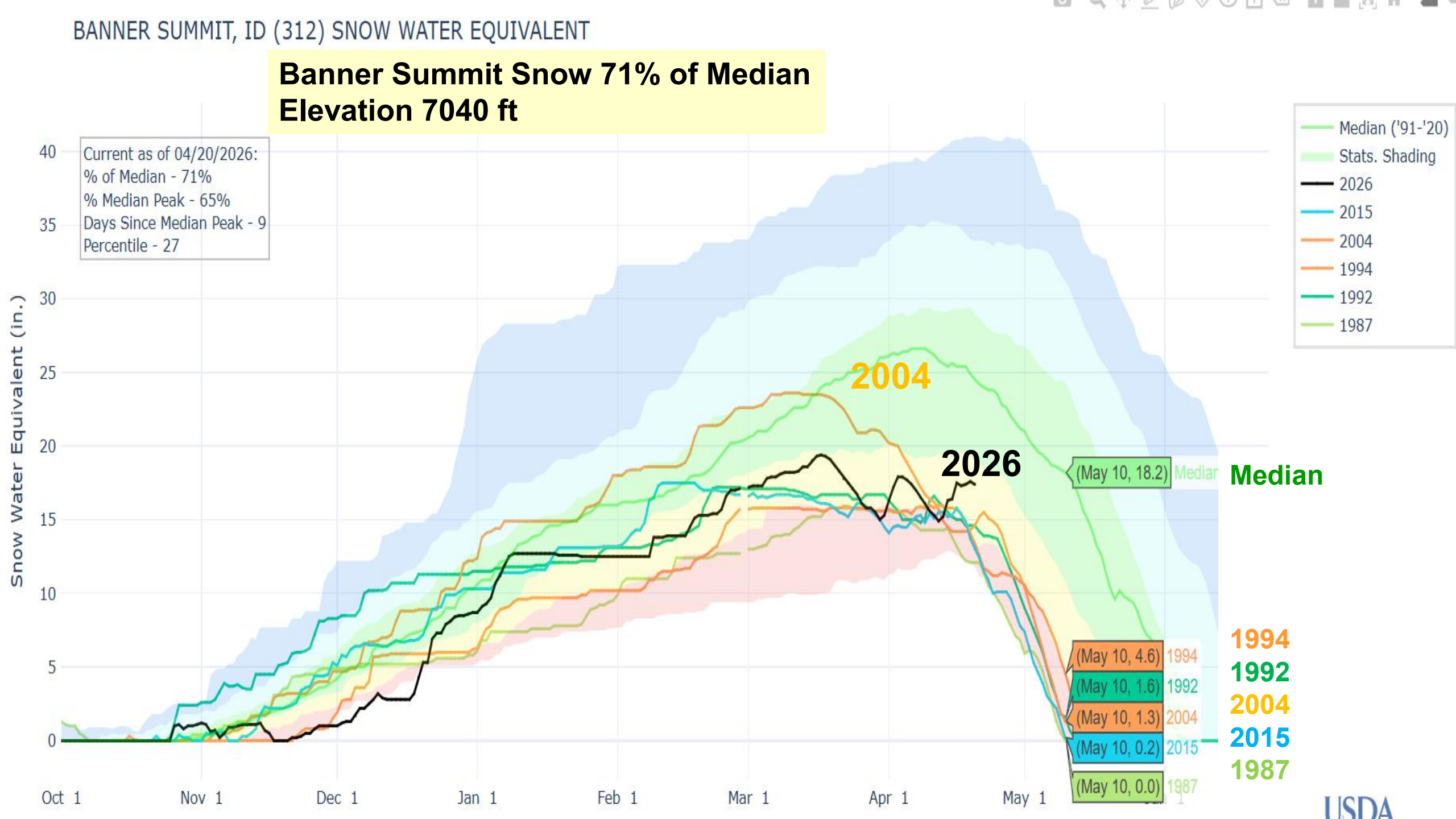
Normally, low-elevation runoff would be happening right now, leading to naturally high turbidity values, but that already happened back in March.

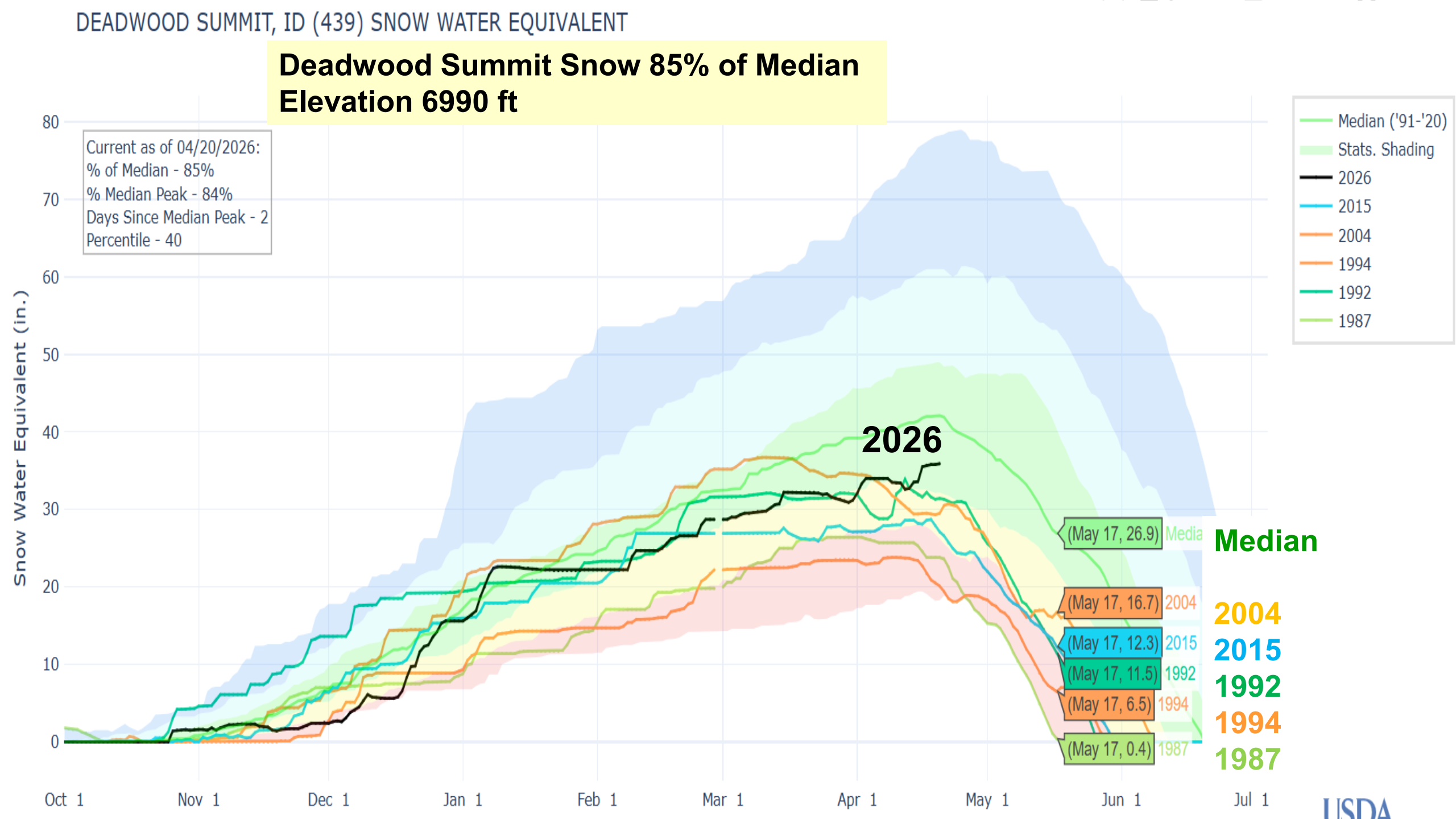
Overall, water quality is good to excellent, although biological and physical processes in Island Park Reservoir are already one month ahead, which will ultimately lead to poor water quality in the outflow one month earlier than usual this summer.

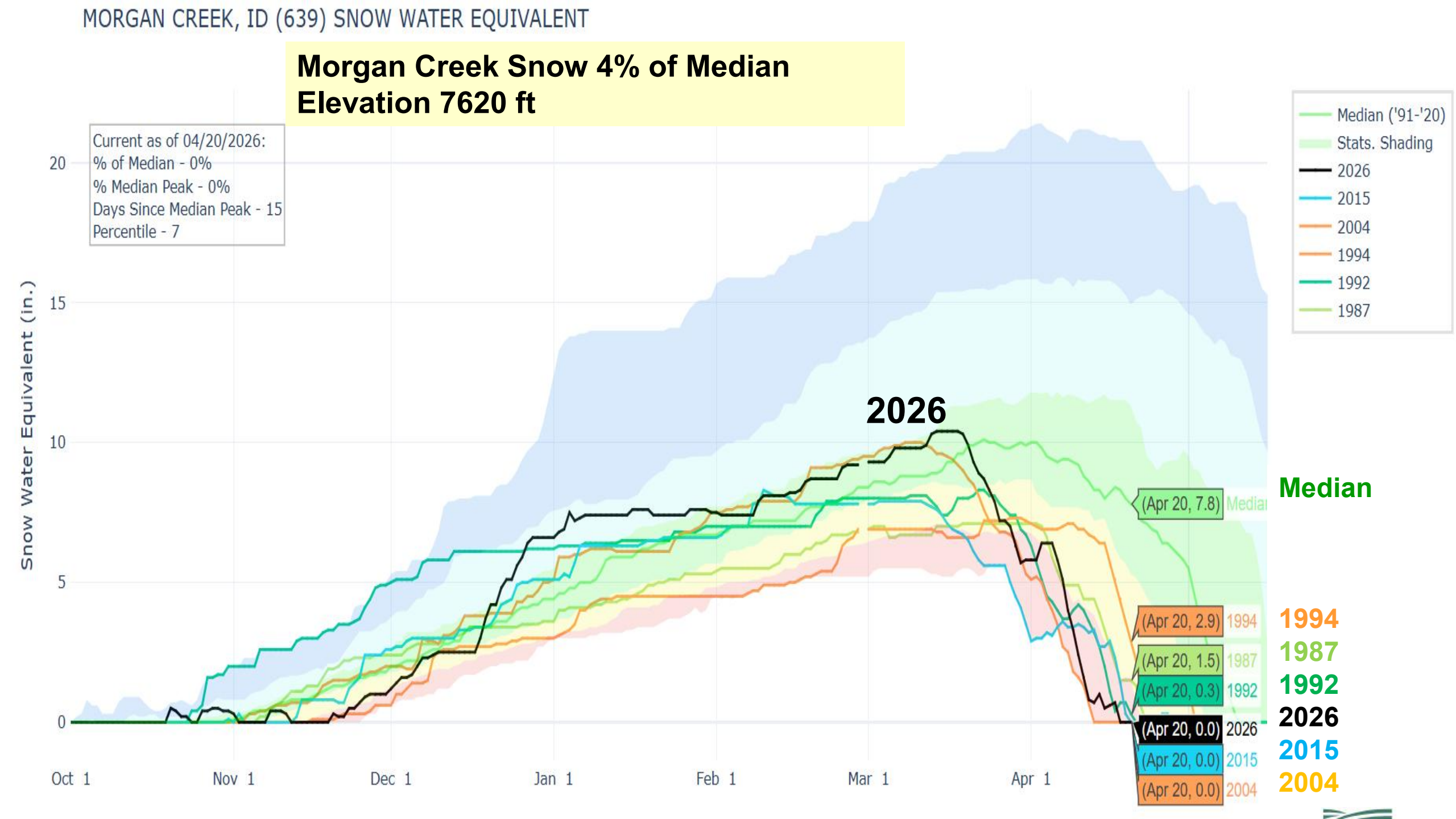


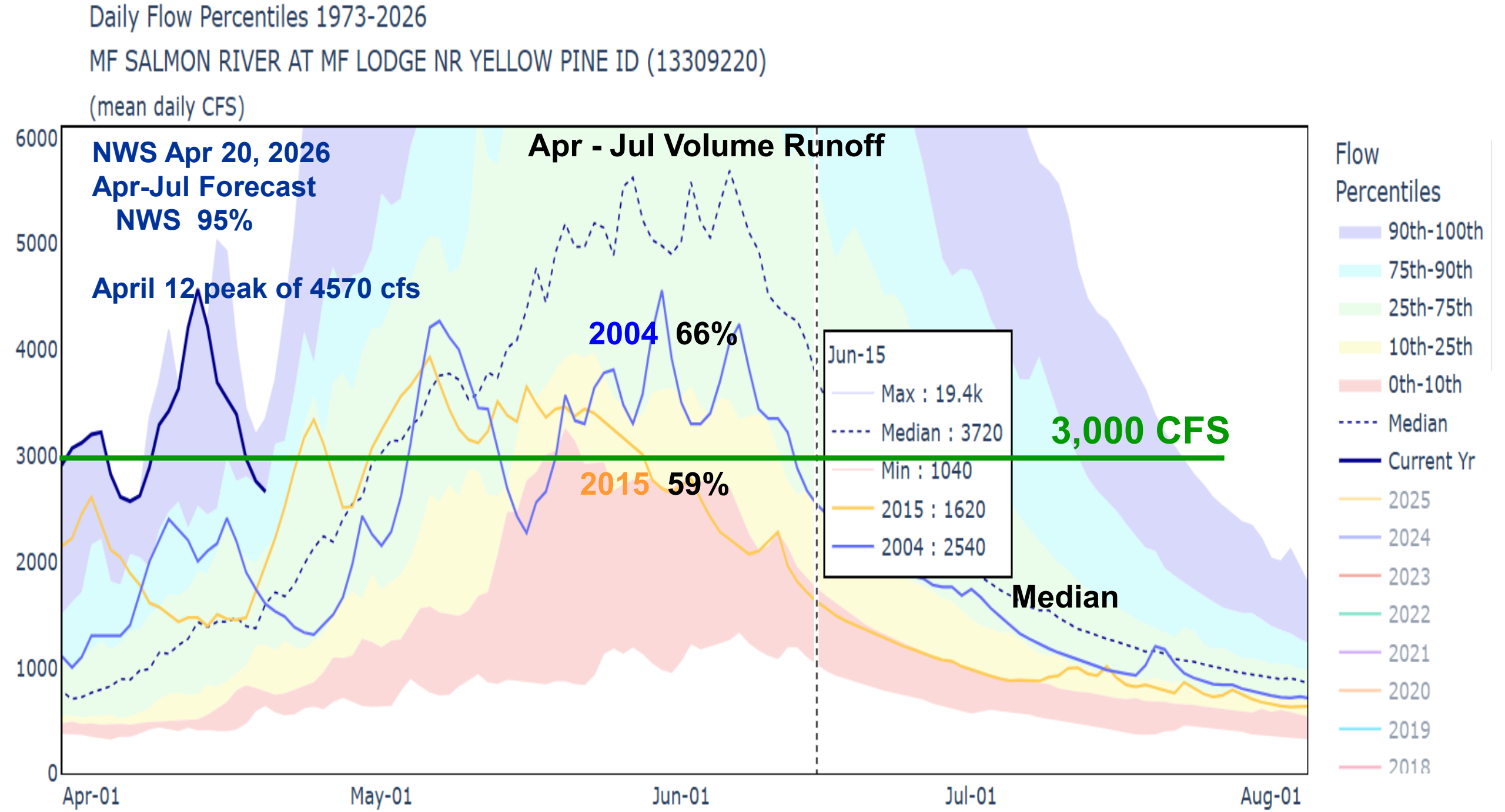

SNOW WATER EQUIVALENT IN MIDDLE FORK SALMON
MF Salmon Snow 72% of Median
Based on these 3 sites:
Other similar or low SWE years as 2026. Years with late melt not included.
Current as of 04/20/2026:
% of Median - 72%
% Median Peak - 65%
Days Since Median Peak - 10
Percentile - 31
Station Name
Elevation
Banner Summit 7040
Deadwood Summit 6990
Morgan Creek 7620
Median ('91-'20)
Stats. Shading
2026 (3 sites)
2015 (3 sites)
2005 (3 sites)
2001 (3 sites)
1994 (3 sites)
1992 (3 sites)
1987 (3 sites)
Snow Water Equivalent (in.)
40
30
20
10
0
2026
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun
(Jun 1, 6.8) Median ('91-..
(Jun 1, 2.5) 2005 (3 sites)
(Jun 1, 0.0) 2015 (3 sites)
(Jun 1, 0.0) 2001 (3 sites)
(Jun 1, 0.0) 1994 (3 sites)
(Jun 1, 0.0) 1992 (3 sites)
(Jun 1, 0.0) 1987 (3 sites)
Median
2005
2015
2001
1994
1992
1987


April 1 MF Salmon River Basin 3 Station Snow Index for Years 1963 - 2026
Banner Summit, Deadwood Summit, Morgan Creek
April 1 Snow Water
Apr 1 1991-2020 Average 25.2
Other similar or low SWE years as 2026
Inches of Snow Water
0
4
8
12
16
20
24
28
32
36
40
44
48
52
63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Years


BANNER SUMMIT, ID (312) SNOW WATER EQUIVALENT
Banner Summit Snow 71% of Median
Elevation 7040 ft
Current as of 04/20/2026:
% of Median - 71%
% Median Peak - 65%
Days Since Median Peak - 9
Percentile - 27
Median ('91-'20)
Stats. Shading
2026
2015
2004
1994
1992
1987
Snow Water Equivalent (in.)
40
35
30
25
20
15
10
5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
2004
2026
(May 10, 18.2) Median
Median
(May 10, 4.6) 1994
(May 10, 1.6) 1992
(May 10, 1.3) 2004
(May 10, 0.2) 2015
(May 10, 0.0) 1987
1994
1992
2004
2015
1987
USDA


DEADWOOD SUMMIT, ID (439) SNOW WATER EQUIVALENT
Deadwood Summit Snow 85% of Median
Elevation 6990 ft
Current as of 04/20/2026:
% of Median - 85%
% Median Peak - 84%
Days Since Median Peak - 2
Percentile - 40
Median ('91-'20)
Stats. Shading
2026
2015
2004
1994
1992
1987
Snow Water Equivalent (in.)
80
70
60
50
40
30
20
10
0
2026
(May 17, 26.9) Media
Median
(May 17, 16.7) 2004
2004
(May 17, 12.3) 2015
2015
(May 17, 11.5) 1992
1992
(May 17, 6.5) 1994
1994
(May 17, 0.4) 1987
1987
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
USDA


MORGAN CREEK, ID (639) SNOW WATER EQUIVALENT
Morgan Creek Snow 4% of Median
Elevation 7620 ft
Current as of 04/20/2026:
% of Median - 0%
% Median Peak - 0%
Days Since Median Peak - 15
Percentile - 7
Median ('91-'20)
Stats. Shading
2026
2015
2004
1994
1992
1987
Snow Water Equivalent (in.)
20
15
10
5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
2026
(Apr 20, 7.8) Median
(Apr 20, 2.9) 1994
(Apr 20, 1.5) 1987
(Apr 20, 0.3) 1992
(Apr 20, 0.0) 2026
(Apr 20, 0.0) 2015
(Apr 20, 0.0) 2004
Median
1994
1987
1992
2026
2015
2004


Daily Flow Percentiles 1973-2026
MF SALMON RIVER AT MF LODGE NR YELLOW PINE ID (13309220)
(mean daily CFS)
NWS Apr 20, 2026
Apr-Jul Forecast
NWS 95%
April 12 peak of 4570 cfs
Apr - Jul Volume Runoff
2004 66%
2015 59%
3,000 CFS
Median
Jun-15
Max : 19.4k
Median : 3720
Min : 1040
2015 : 1620
2004 : 2540
Flow Percentiles
90th-100th
75th-90th
25th-75th
10th-25th
0th-10th
Median
Current Yr
2025
2024
2023
2022
2021
2020
2019
2018
6000
5000
4000
3000
2000
1000
0
Apr-01
May-01
Jun-01
Jul-01
Aug-01

Back 2 Banner
Snow2Flow Relationship with MF Salmon River

Salmon River Basin

MF SALMON RIVER AND BANNER SUMMIT SNOTEL SITE
Discharge Data Years used in analysis: 1981, 1999 - 2016
Gage Height Data Years used in analysis: 1982 -1984, 1986, 1988 -1998

Using combined DISCHARGE and GAGE HEIGHT years, on average, peak streamflow for the MF Salmon at MF Lodge near Yellow Pine Idaho occurs when Banner Summit SNOTEL is between **66 and 90%** melted.

Summary of combined DISCHARGE and GAGE HEIGHT years categorized by max SWE magnitude.

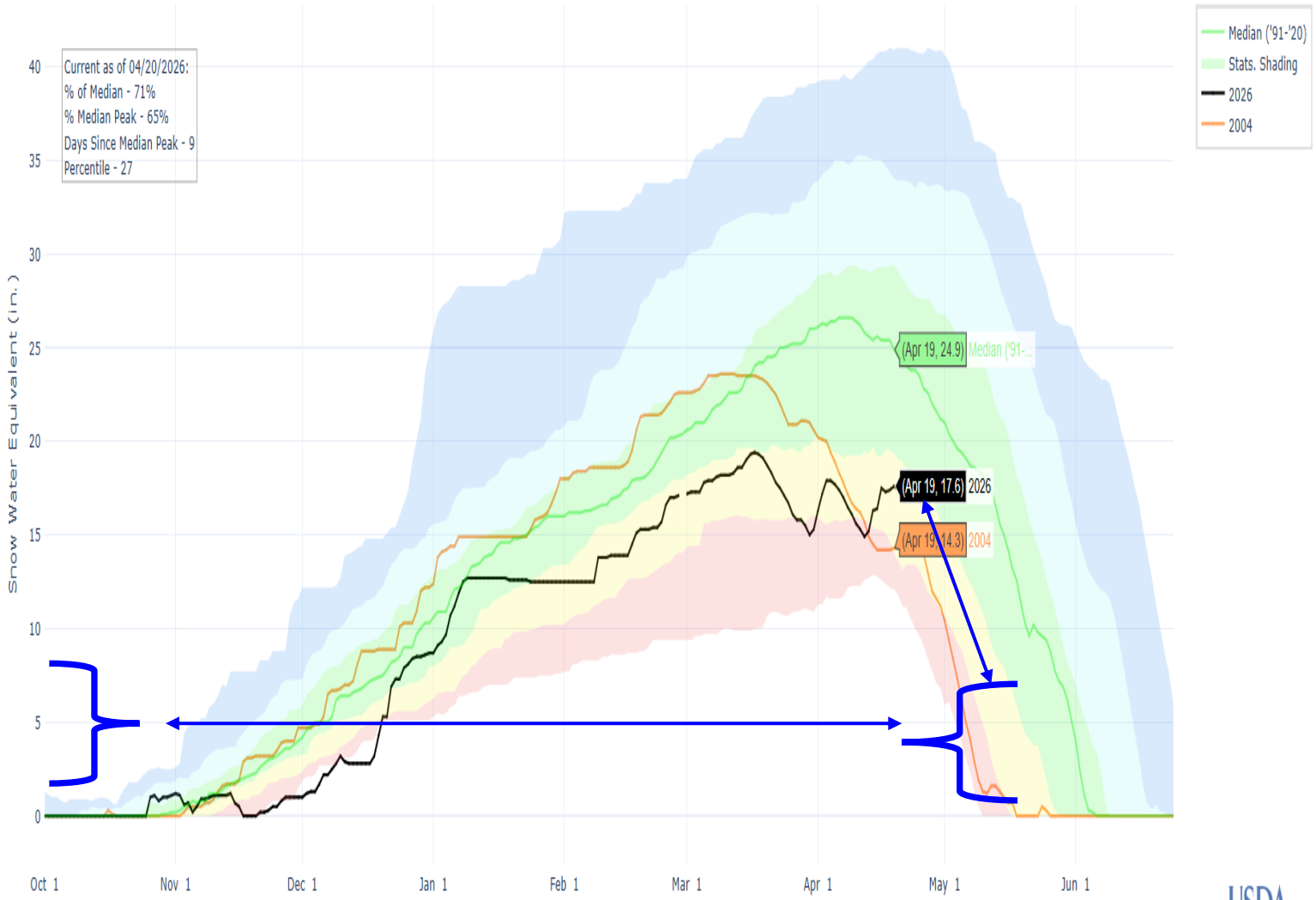
Max SWE Category	Max SWE Magnitude (inches)	Number of Years in Analysis	**Average percent melted at time of peak streamflow**
Below average	<21	9	**90**
Average	20 – 31	16	**61**
Above average	>30	9	**66**

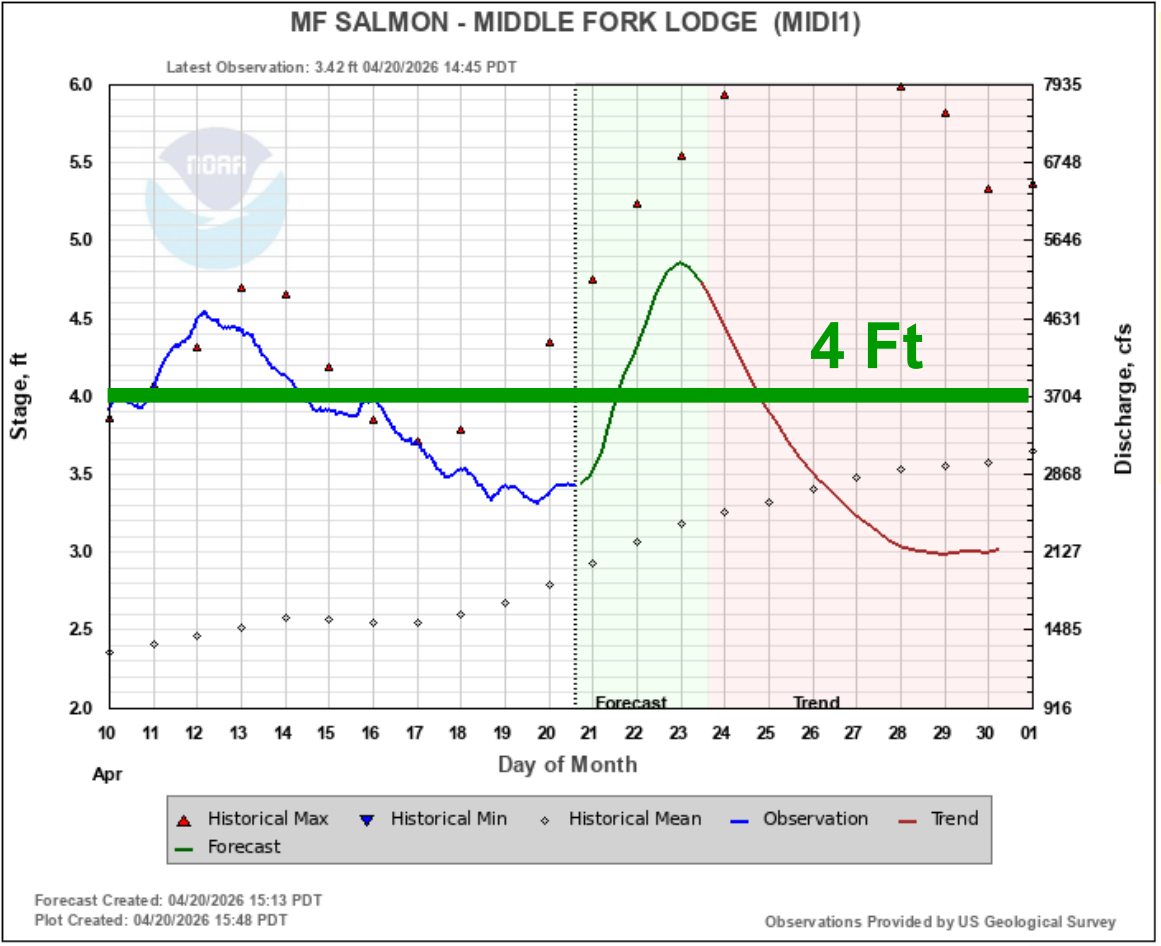
Note - this analysis uses all years available and did not eliminate potential non-snowmelt peaks

Using DISCHARGE ONLY years, on average, peak streamflow for the MF Salmon at MF Lodge near Yellow Pine Idaho occurs when Banner Summit SNOTEL is between **64 and 81%** melted.

With multiple Banner SWE peaks around 18-20", we'll use both 61% and 90% melted analysis to indicate when a MF snowmelt peak may occur. This puts remaining SWE at 8 to 2" of SWE.
This flow increase May or May Not exceed the Apr 12 peak of 4570 cfs.

With future rains, all bets are off.





MF SALMON--MIDDLE FORK LODGE (MIDI1)
Forecasts for Water Year 2026
Ensemble Date: 2026-04-20
Forecast Period: April 20 to August 1

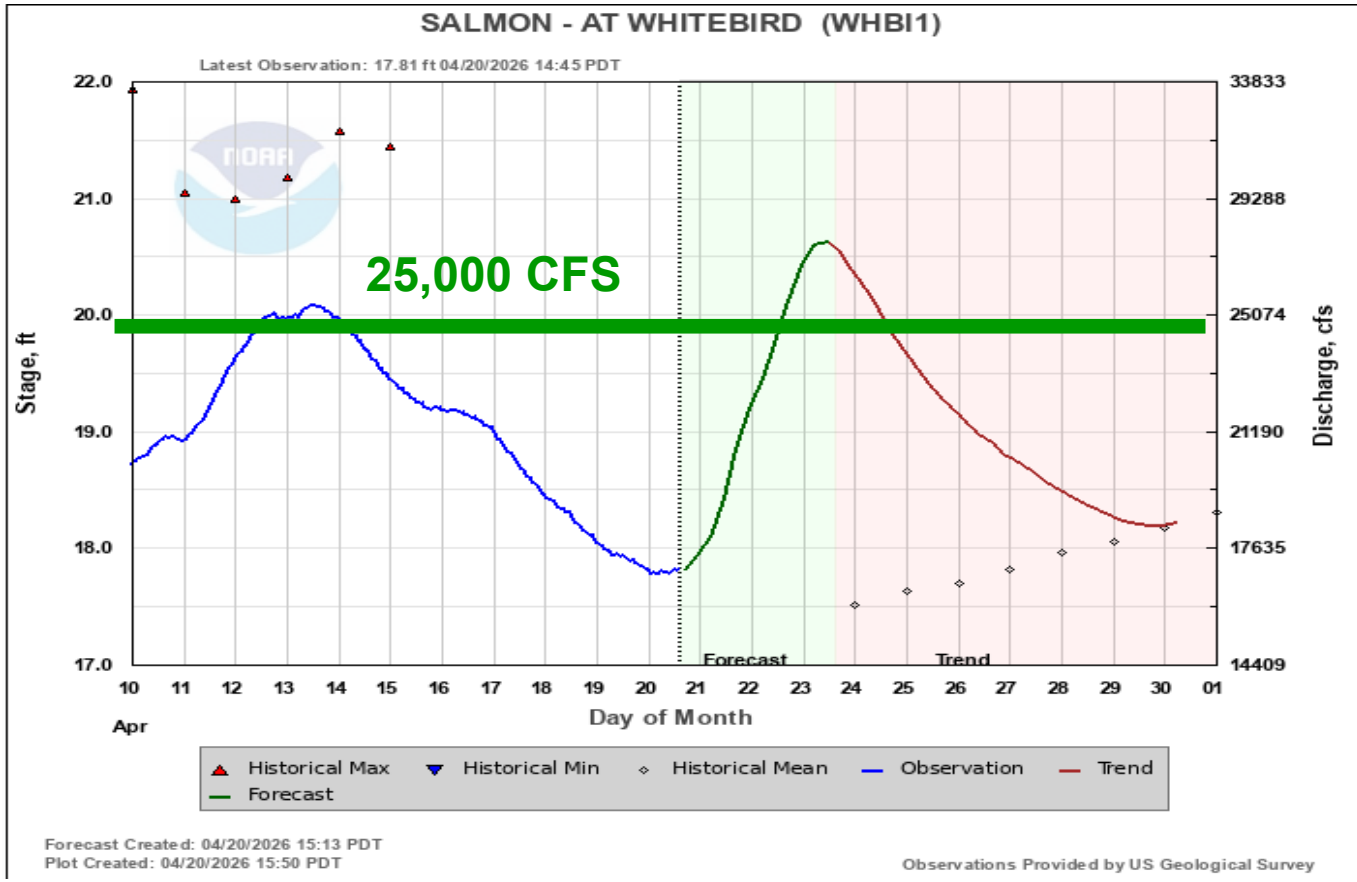
Exceedence Probability	Stage feet	Discharge CFS	Probable Date of Peak
95 %	5.38	6466	2026-05-09
90 %	5.50	6737	2026-05-11
70 %	5.76	7361	2026-05-19
50 %	6.03	8007	2026-05-24
30 %	6.21	8462	2026-05-31
10 %	6.72	9801	2026-06-07
05 %	7.30	11399	2026-06-11

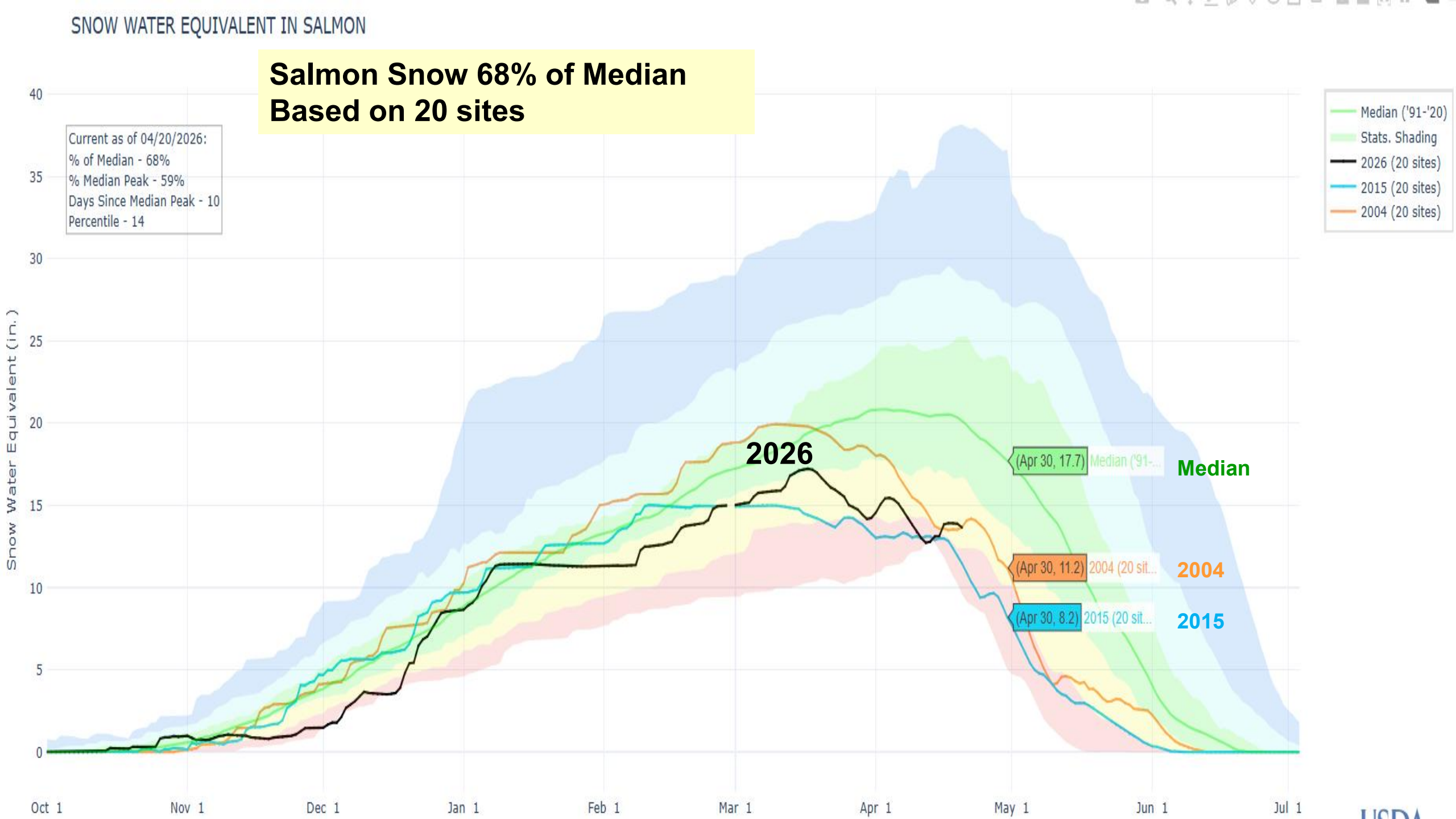
Interesting NWS Peak Flow Analysis with 50% chance of peak on May 24.

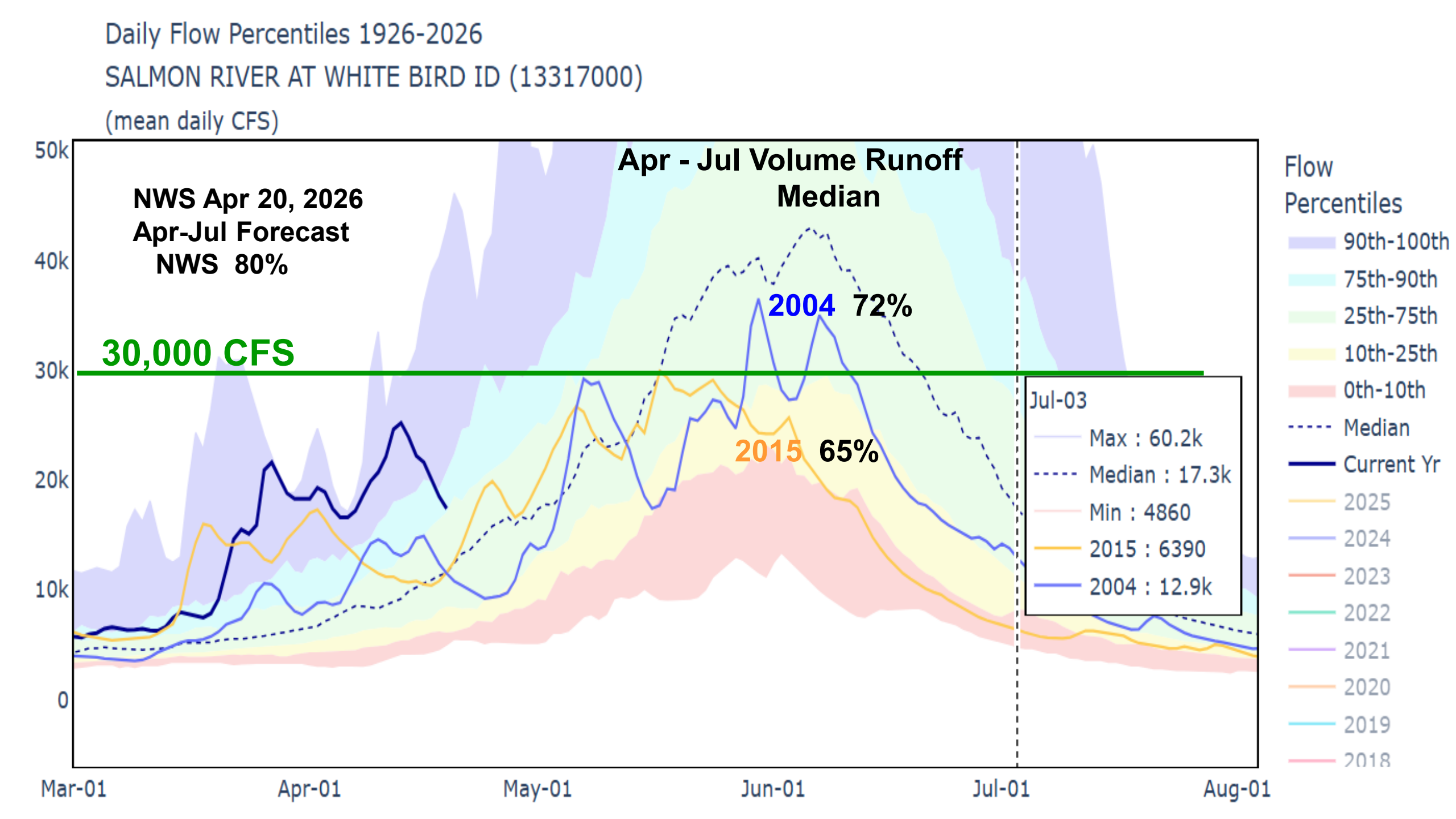
Keep an eye on these as I don't usually watch `em.

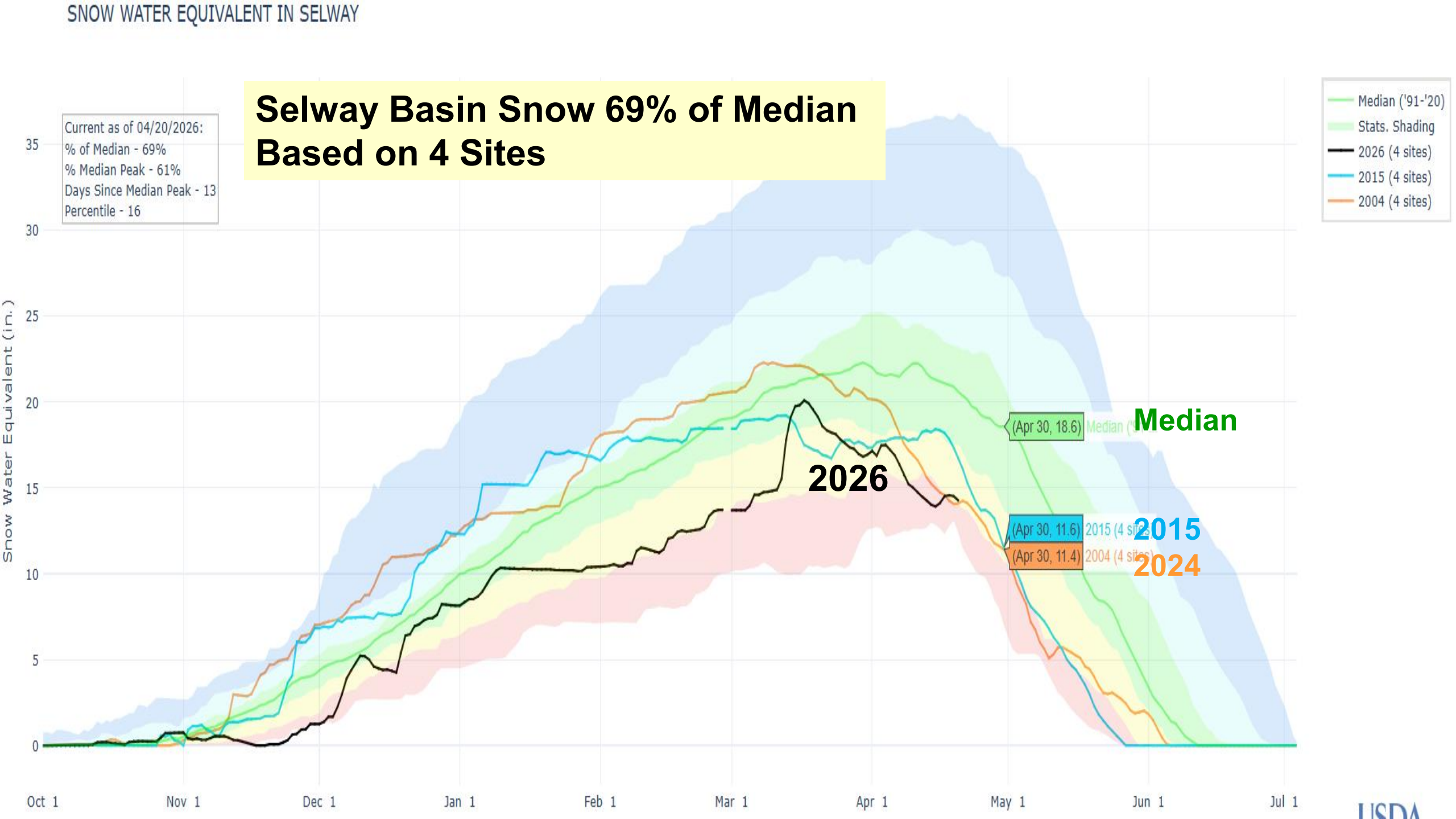
SALMON--AT WHITEBIRD (WHBI1)
Forecasts for Water Year 2026
Ensemble Date: 2026-04-20
Forecast Period: April 20 to August 1

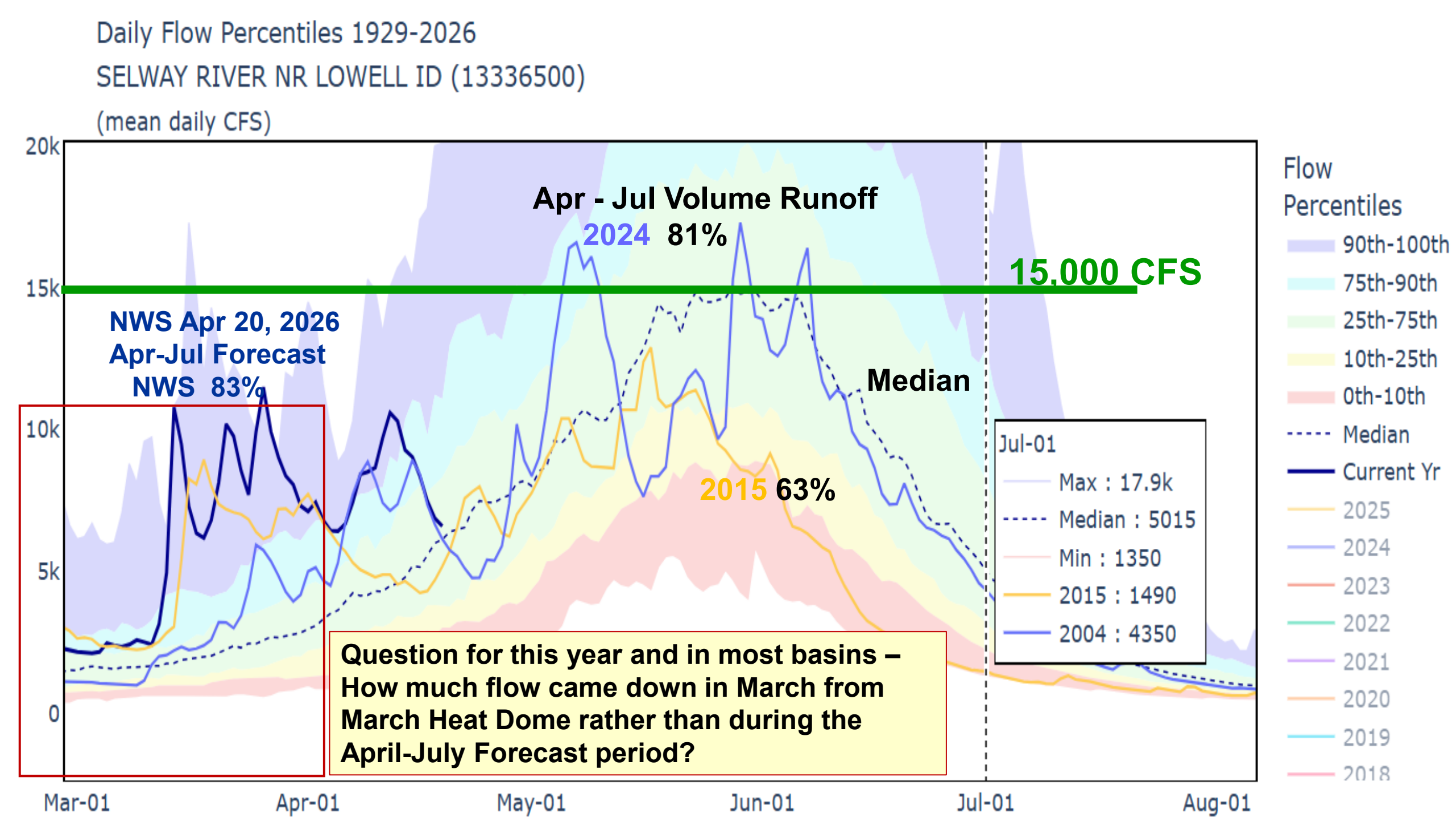
Exceedence Probability	Stage feet	Discharge CFS	Probable Date of Peak
95 %	21.57	31857	2026-05-11
90 %	22.11	34350	2026-05-13
70 %	22.92	38284	2026-05-19
50 %	23.39	40705	2026-05-24
30 %	23.80	42831	2026-05-31
10 %	25.49	52289	2026-06-06
05 %	26.03	55529	2026-06-10

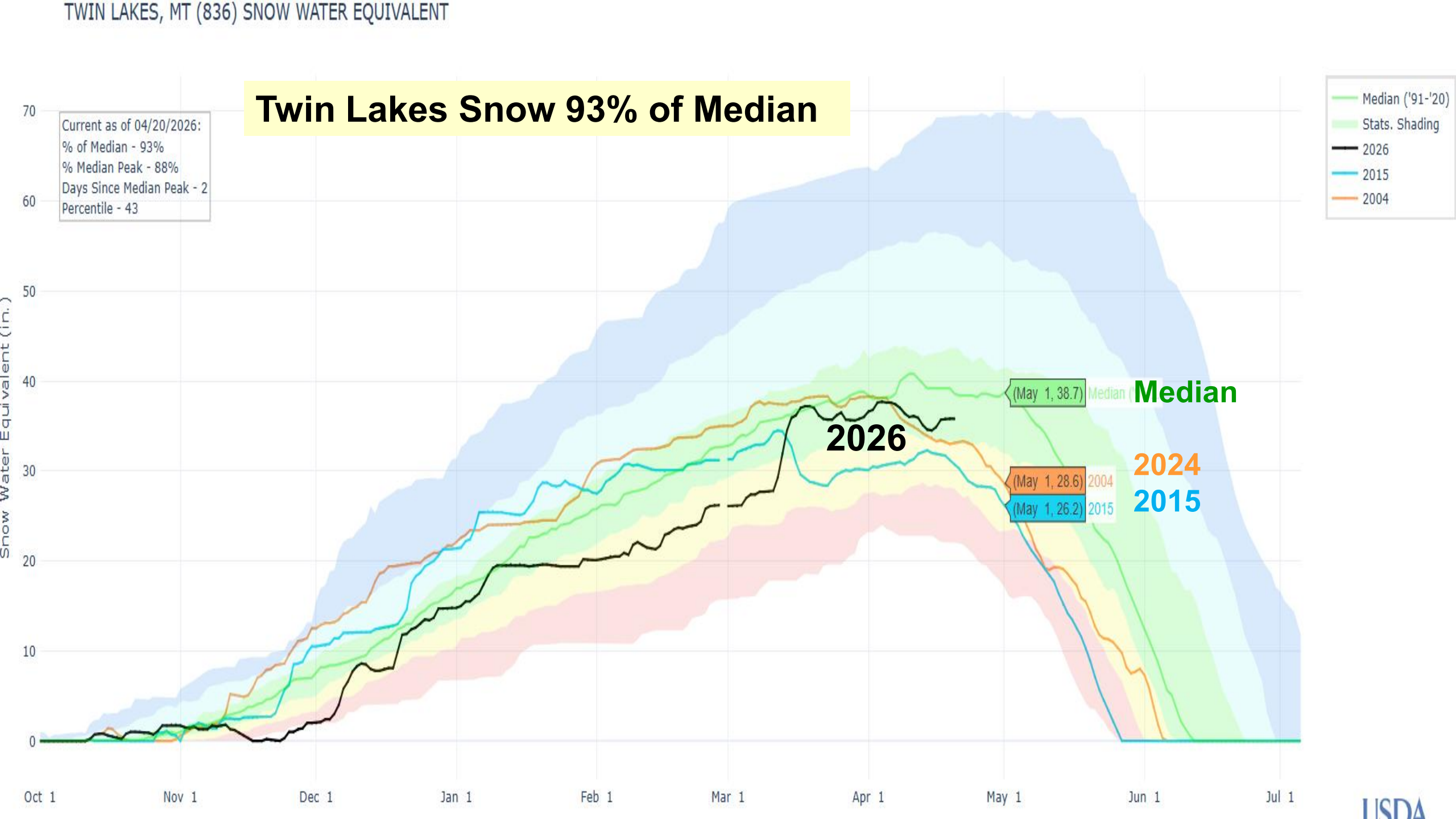



SNOW WATER EQUIVALENT IN SALMON
Salmon Snow 68% of Median
Based on 20 sites
Current as of 04/20/2026:
% of Median - 68%
% Median Peak - 59%
Days Since Median Peak - 10
Percentile - 14
Median ('91-'20)
Stats. Shading
2026 (20 sites)
2015 (20 sites)
2004 (20 sites)
Snow Water Equivalent (in.)
40
35
30
25
20
15
10
5
0
2026
(Apr 30, 17.7) Median ('91-...
Median
(Apr 30, 11.2) 2004 (20 sit...
2004
(Apr 30, 8.2) 2015 (20 sit...
2015
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1


Daily Flow Percentiles 1926-2026
SALMON RIVER AT WHITE BIRD ID (13317000)
(mean daily CFS)
Apr - Jul Volume Runoff
Median
NWS Apr 20, 2026
Apr-Jul Forecast
NWS 80%
30,000 CFS
2004 72%
2015 65%
Jul-03
Max : 60.2k
Median : 17.3k
Min : 4860
2015 : 6390
2004 : 12.9k
Flow
Percentiles
90th-100th
75th-90th
25th-75th
10th-25th
0th-10th
Median
Current Yr
2025
2024
2023
2022
2021
2020
2019
2018
50k
40k
30k
20k
10k
0
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01


SNOW WATER EQUIVALENT IN SELWAY
Selway Basin Snow 69% of Median
Based on 4 Sites
Current as of 04/20/2026:
% of Median - 69%
% Median Peak - 61%
Days Since Median Peak - 13
Percentile - 16
Median ('91-'20)
Stats. Shading
2026 (4 sites)
2015 (4 sites)
2004 (4 sites)
Snow Water Equivalent (in.)
35
30
25
20
15
10
5
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
(Apr 30, 18.6)
Median
2026
(Apr 30, 11.6)
2015
(Apr 30, 11.4)
2004 (4 sites)
2024


Daily Flow Percentiles 1929-2026
SELWAY RIVER NR LOWELL ID (13336500)
(mean daily CFS)
20k
15k
10k
5k
0
Apr - Jul Volume Runoff
2024 81%
15,000 CFS
NWS Apr 20, 2026
Apr-Jul Forecast
NWS 83%
Median
2015 63%
Jul-01
Max : 17.9k
Median : 5015
Min : 1350
2015 : 1490
2004 : 4350
Question for this year and in most basins – How much flow came down in March from March Heat Dome rather than during the April-July Forecast period?
Mar-01
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Flow Percentiles
90th-100th
75th-90th
25th-75th
10th-25th
0th-10th
Median
Current Yr
2025
2024
2023
2022
2021
2020
2019
2018


TWIN LAKES, MT (836) SNOW WATER EQUIVALENT
Twin Lakes Snow 93% of Median
Current as of 04/20/2026:
% of Median - 93%
% Median Peak - 88%
Days Since Median Peak - 2
Percentile - 43
Median ('91-'20)
Stats. Shading
2026
2015
2004
Snow Water Equivalent (in.)
70
60
50
40
30
20
10
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
(May 1, 38.7)
Median
2026
(May 1, 28.6) 2004
(May 1, 26.2) 2015
Median
2024
2015

Clearwater River Basin

Snow2Flow Relationship Twin Lakes and Selway River

SELWAY RIVER AND TWIN LAKES SNOTELSITE

On average, peak streamflow for the Selway River near Lowell, Idaho occurs when Twin Lakes SNOTEL is between **26 and 33%** melted.

Summary of all years by max SWE magnitude

Max SWE Category	Range of Max SWE Magnitude (inches)	Number of Years in Analysis	**Average percent melted at time of peak streamflow**
Below average	<35	11	**33**
Average	34 – 49	25	**33**
Above average	>48	12	**26**

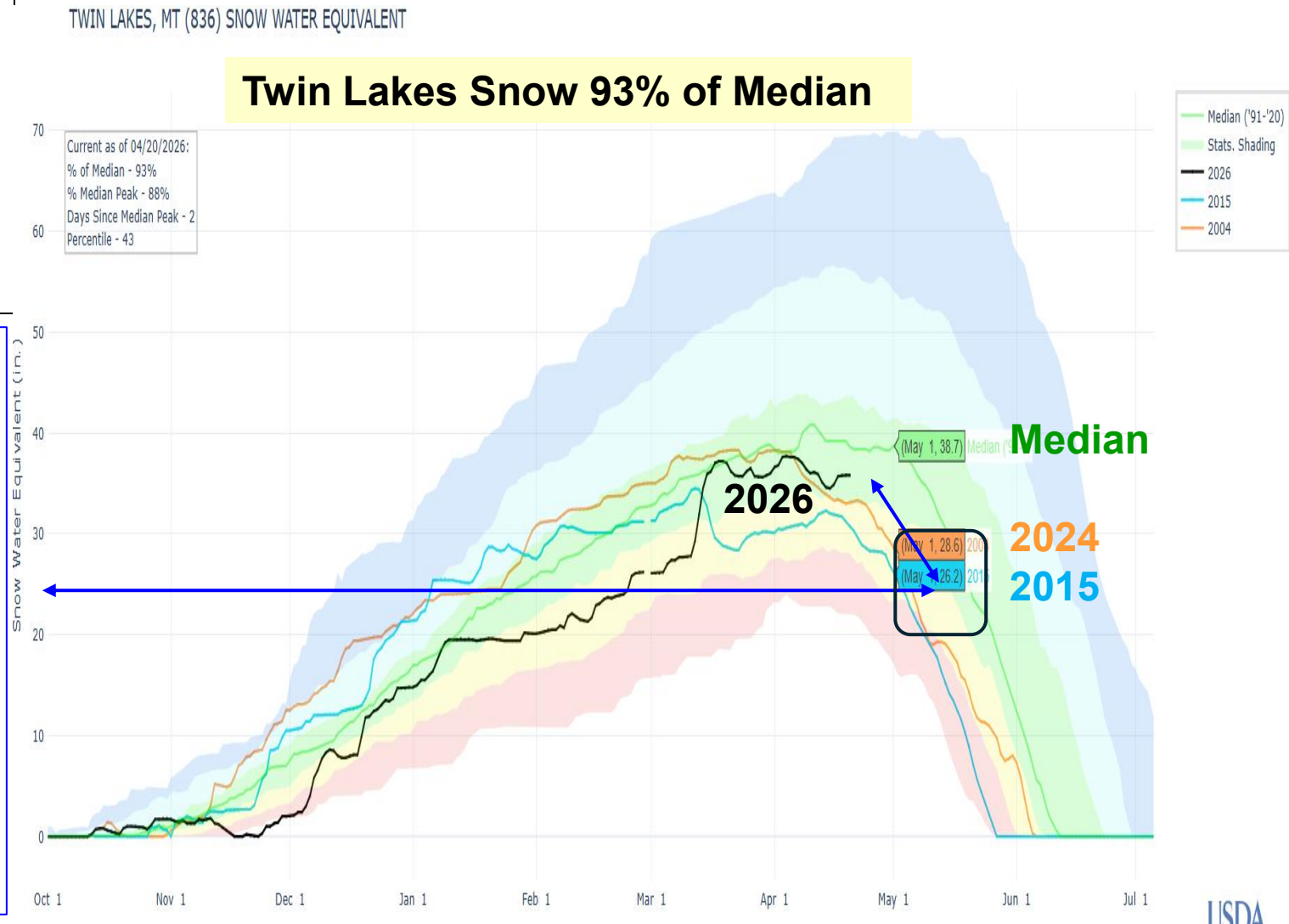
Note - this analysis uses all years available and did not eliminate potential non-snowmelt peaks

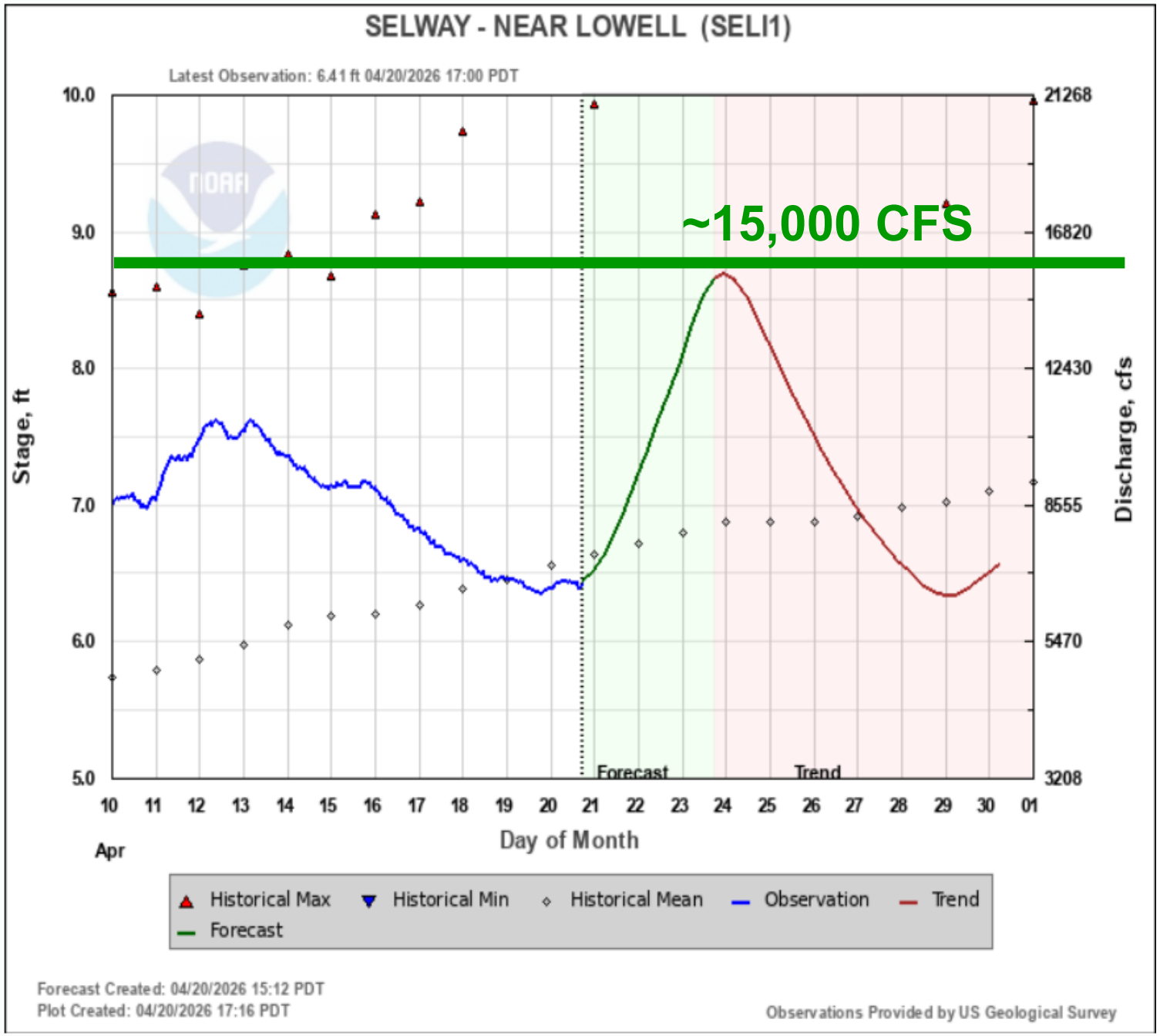
The average percent melted for the full 48-year period of record is 33% melted.

With several SWE peaks around 37”, we’ll use 33% melted analysis to indicate when the Selway snowmelt peak may occur. This puts remaining SWE at about 25” of SWE, maybe mid-May.

Peak could occur earlier with less mid-snow to feed the tributaries and no guarantees future increase will exceed previous peak but is likely with better snow.

Keep in mind these Snow2Flow Relationships are to predicting timing not magnitude of peak – rain is not considered. If it rains, all bets are off.





Interesting NWS Peak Flow Analysis shows 50% chance of mid-May peak.

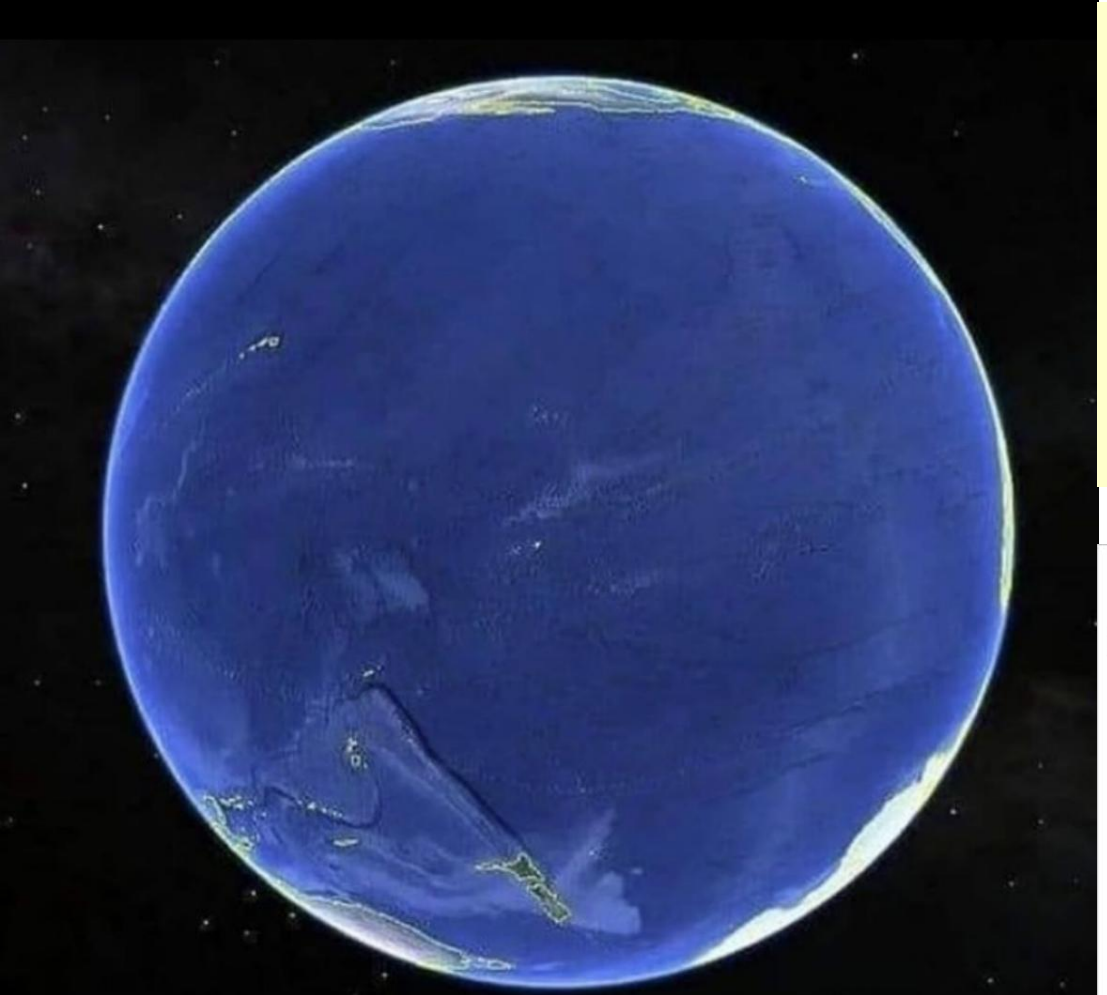
SELWAY--NEAR LOWELL

State: Idaho **County:** IDAHO
Latitude: 46 5' 12" North **Longitude:** 115 30' 46" West
Elevation: 1540 feet
Supporting WFO: Missoula
Action Stage: 13.5' **Flood Stage:** 14' **Moderate Flood Stage:** 16'
Major Flood Stage: 18'

Forecasts are calculated from a forecast time series that approximates flow at a 6 hour time step interval. Observed instantaneous peaks can be higher than model forecast peaks.

SELWAY--NEAR LOWELL (SELI1)
Forecasts for Water Year 2026
Ensemble Date: 2026-04-20
Forecast Period: April 20 to August 1

Exceedence Probability	Stage feet	Discharge CFS	Probable Date of Peak
95 %	8.59	15018	2026-04-24
90 %	8.59	15018	2026-04-24
70 %	8.99	16794	2026-05-10
50 %	9.18	17591	2026-05-17
30 %	9.51	19083	2026-05-22
10 %	10.17	22035	2026-06-03
05 %	10.54	23808	2026-06-06



The Earth is almost never shown like this. This is our planet from the side of the Pacific Ocean.

SOU

Why we study the Pacific Ocean ? It's Huge!
Pacific Ocean view you don't always see.

SOI Correlation Map with spring /summer runoff.
Same relationship can be found with Sea Surface Temps.

Key is – what happens during July-Nov correlates with our winter snowfall and summer streamflow in Western US.

Southern Oscillation Index (SOI) measure of the Pacific Atmosphere

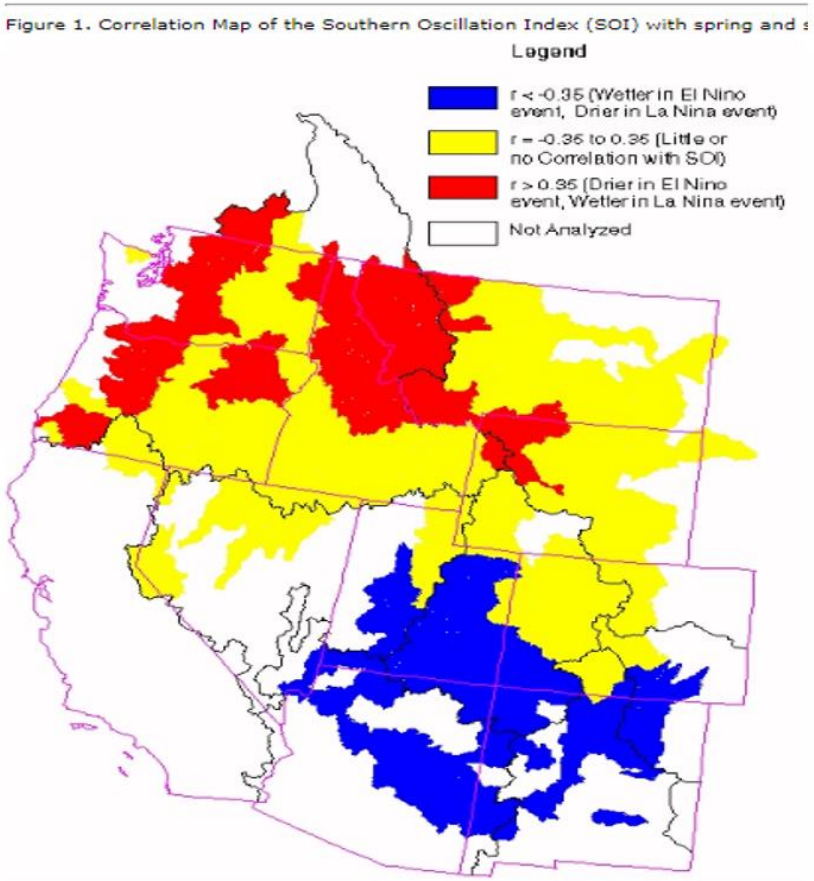
Correlation Map of SOI with Spring-Summer Streamflow

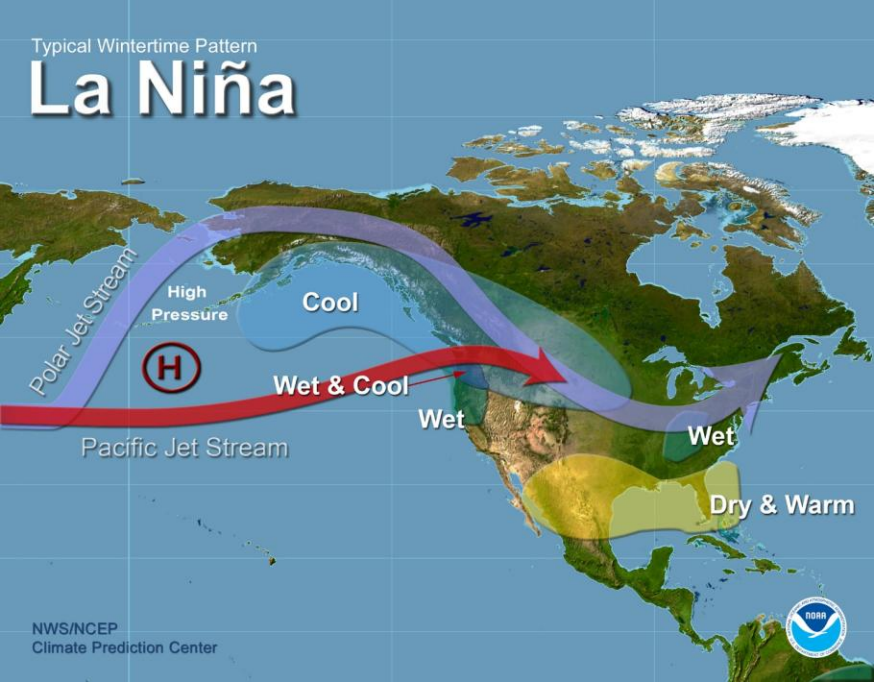
Red wetter in La Nina years.

Blue wetter in El Nino years.

Key is – what happens July-Nov in Pacific correlates with snowfall and summer streamflow in Western US.

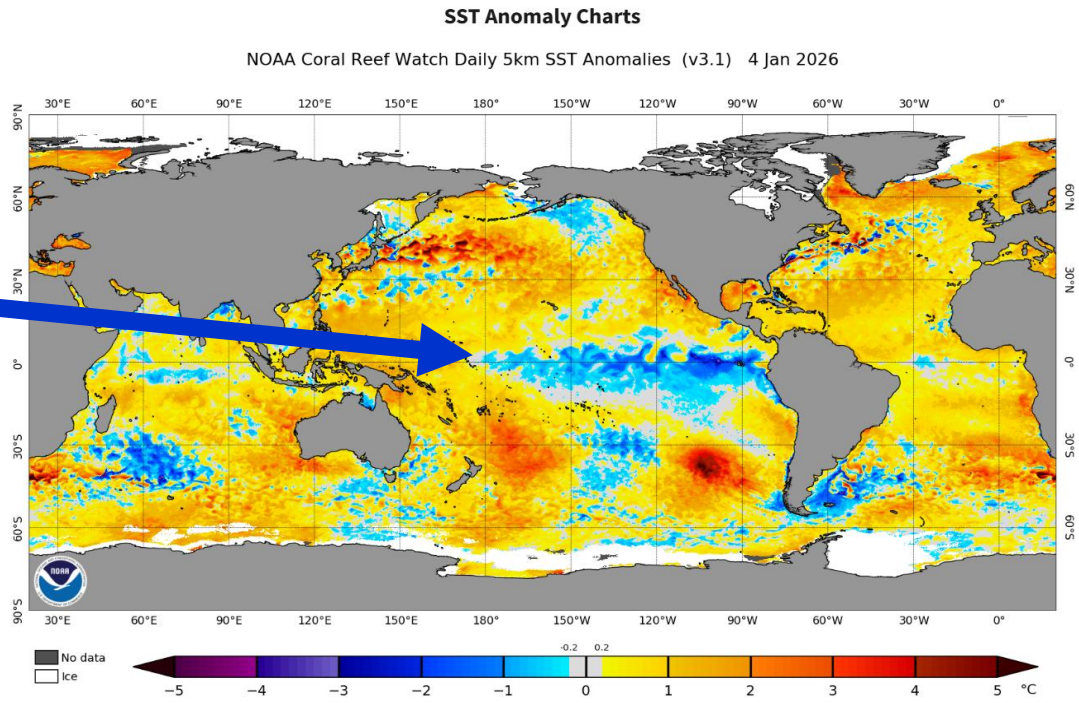
Clearwater Basin has correlation value of 0.67

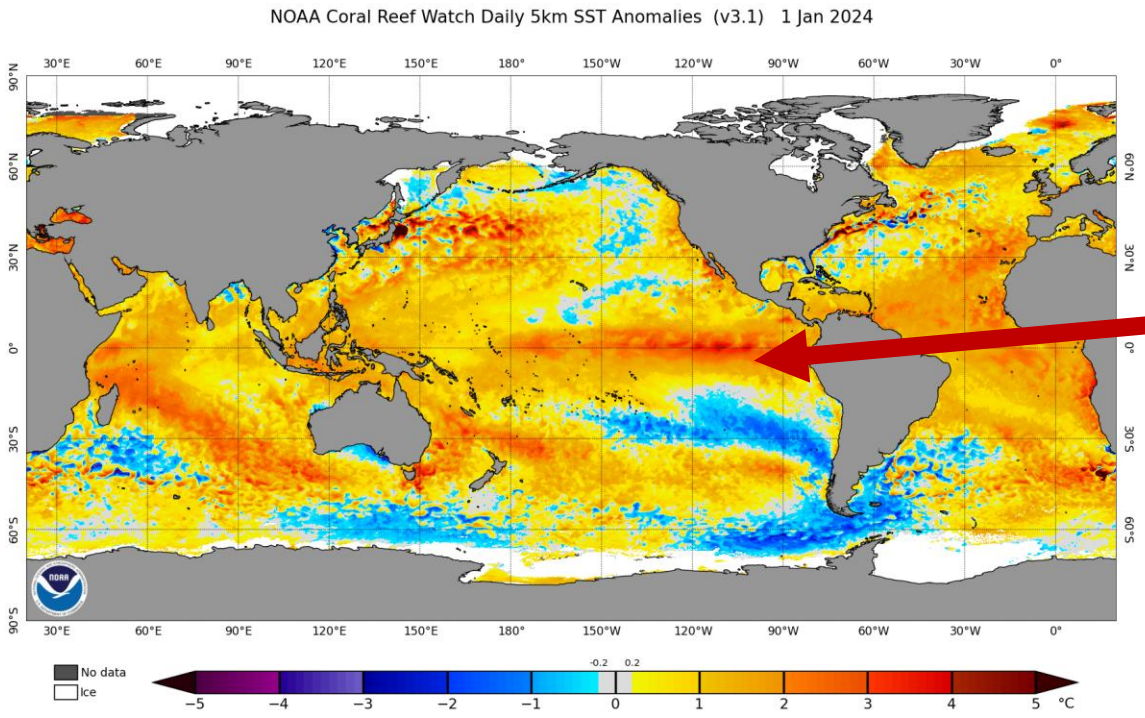




Sea Surface Temperatures

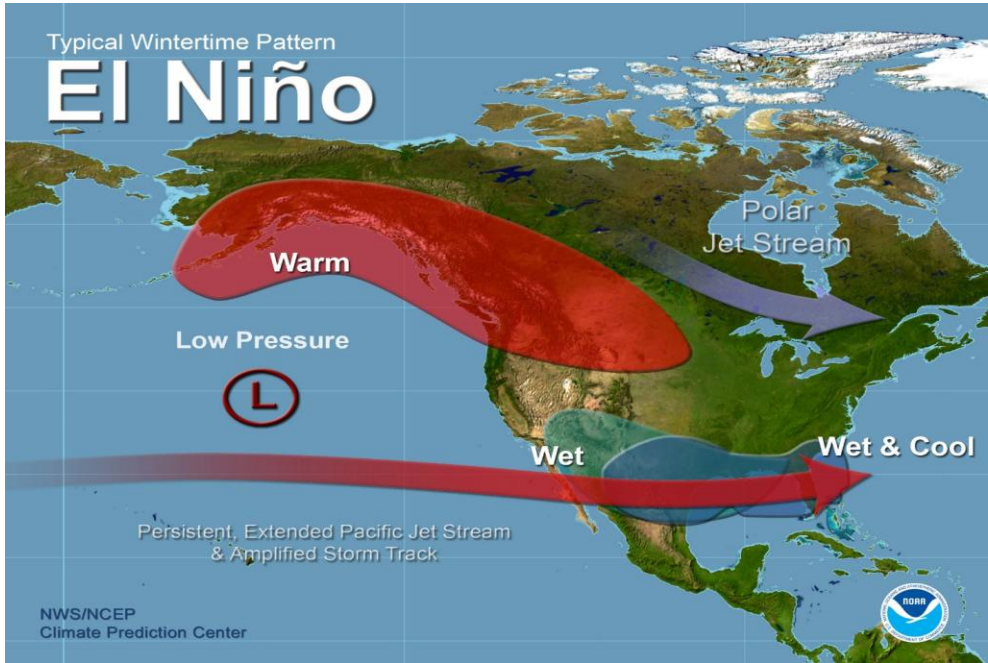
La Nina Conditions Jan 4, 2026





El Nino Conditions Jan 1, 2024

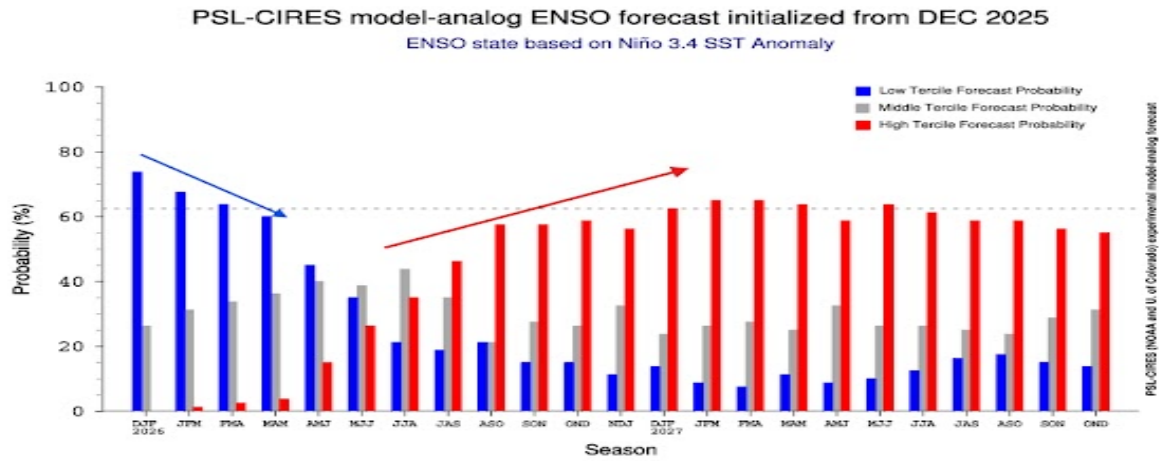
El Nino brewing for 2026-27 Winter



Sep 2025

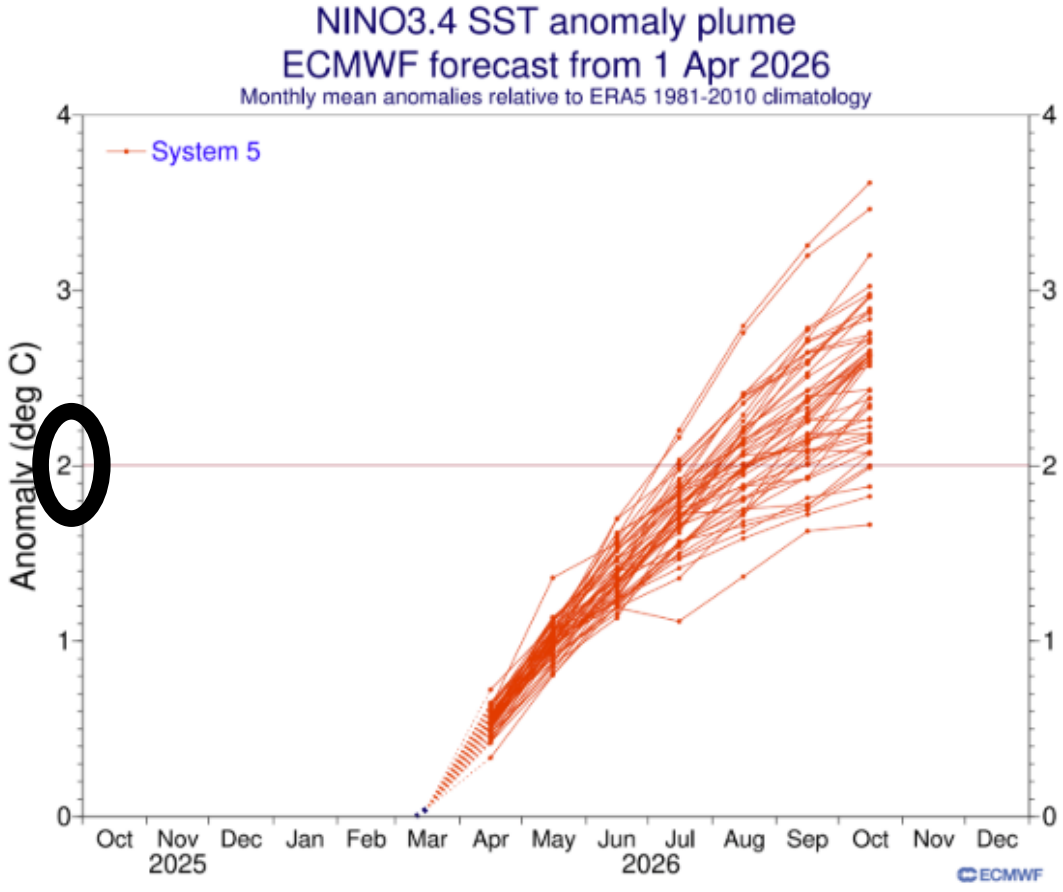
El Nino is setting up for Winter 2026-27. I've never seen them calling this out so early, so must be feeling confident.

The CPC official probabilistic ENSO forecast shows a clear shift into El Niño mode for 2026/2027, giving a full El Niño state by early Fall 2026. This shows the event peaking during Winter, potentially lasting for a second year. You can also see the rapid decline of the current La Niña event.



A Super El Niño is scientifically recognized when sea surface temperature anomalies in the Niño3.4 region exceed a threshold of **+2.0 or higher** above the long-term average. This identifies events of high intensity in which atmospheric coupling is strong enough to shift global weather patterns into a **high-impact state**.

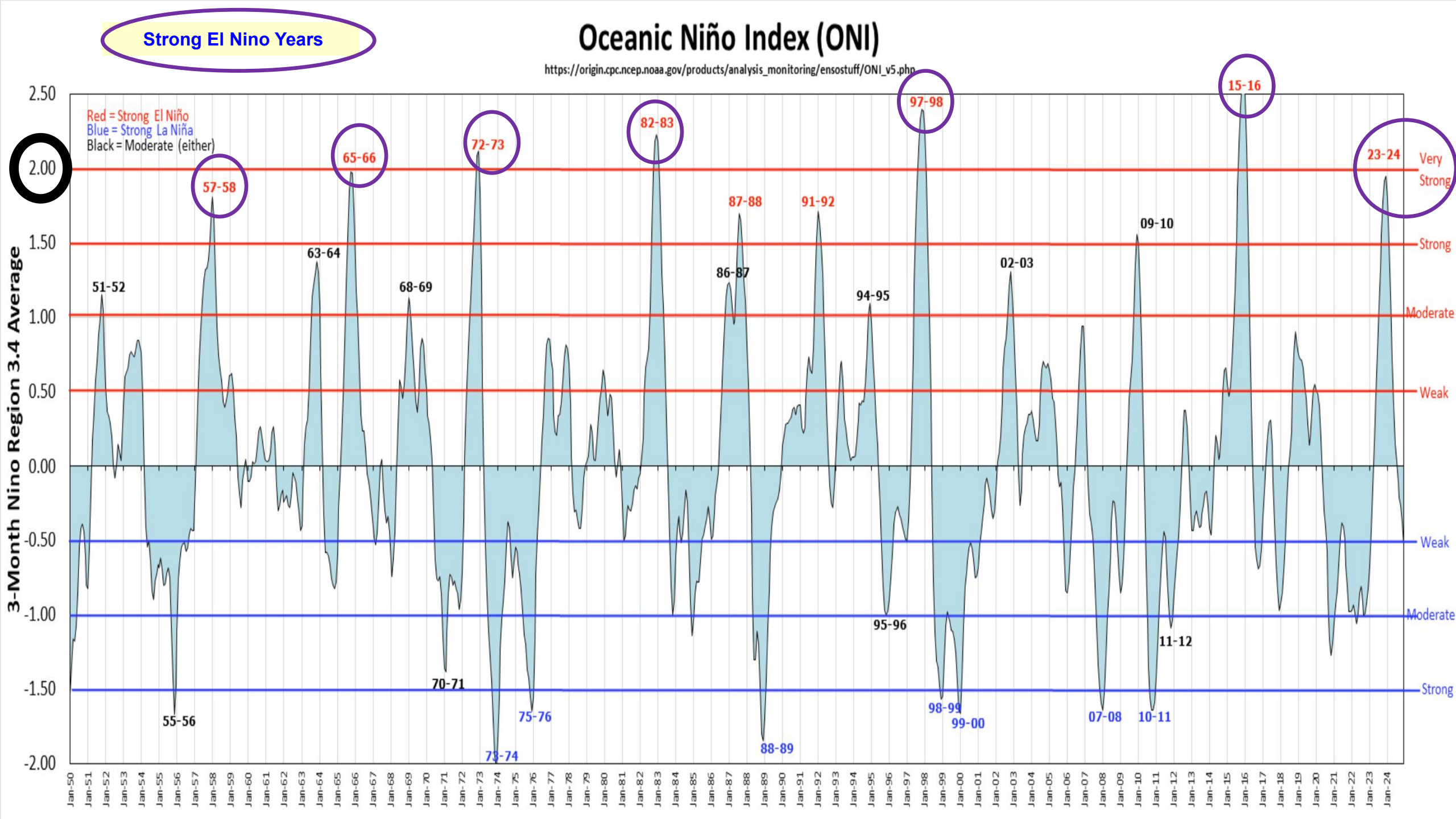
Below is also the latest ECMWF model forecast for the next few months. This also shows a strong El Niño developing into 2026, easily exceeding the +2 degrees threshold and pushing it into the Super event category. Most ensemble members exceed this boundary, aiming even higher for the later peak.



Strong El Nino Years

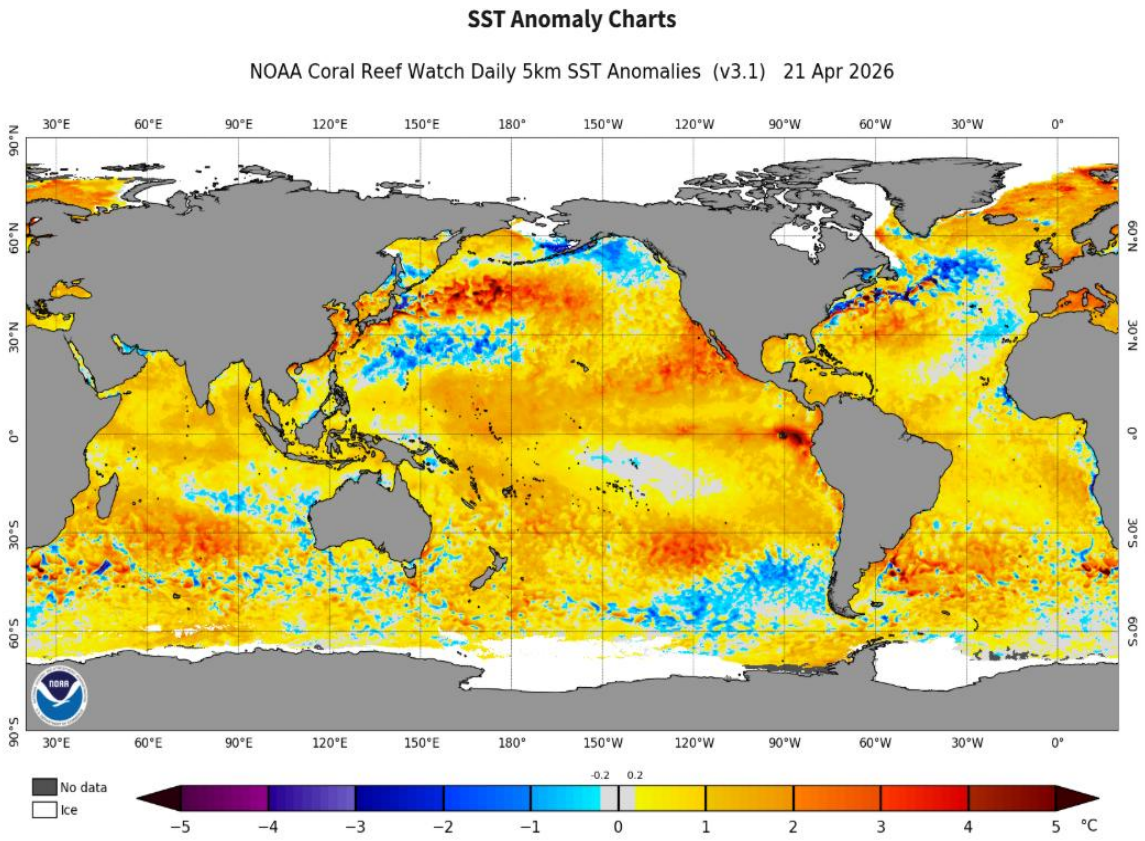
Oceanic Niño Index (ONI)

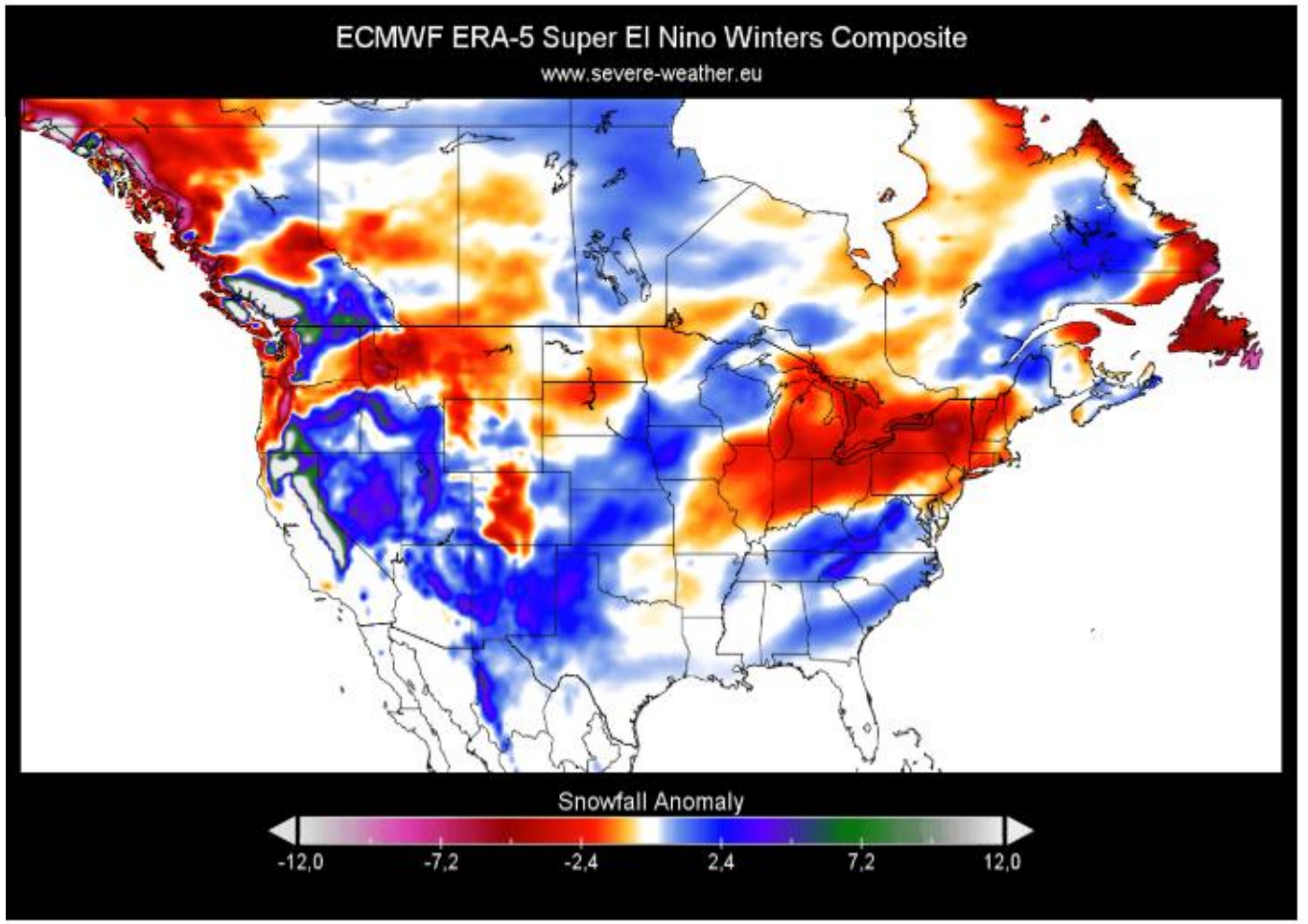
https://origin.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ONI_v5.php



El Niño events happen every few years. But Super events tend to occur once per decade or less. The last three such events were in 2015/16, 1997/98, and 1982/83.

An El Niño event also significantly alters **snowfall patterns**. Below is a snowfall analysis of all recent Super El Niño winters, combining their data to produce an average snowfall pattern for such winters. You can see increased snowfall in the western and southern United States during a Super El Niño, as well as over parts of the Southeast.





Discussions, Questions, Comments, Corrections

15” at SNOTEL Site, 30F

As of 11:26 AM April 22, 2026 3.24” in my backyard fell in April so far

Boise Max April is 3.34” 1912