# Snow2Flow Verification for Years 2023, 2024 & 2025

**It's always good to verify forecasts to better understand what works, and why or why not. This provides a better understanding of the relationship, other climate influencers that may have impacted the outcome and when works best.**

**Following is a summary of Snow2Flow relationships used to predict date of peak flows, range of dates, and if the potential for additional snowmelt peaks has past or is decreasing.**

- **Key is Snowmelt – these relationships are based only on Snowmelt. Current / future rain or temperatures are NOT used with these projections. It's helpful to watch and combine current weather observations to better understand what the projections are telling you. And always better to use at least two Snow2Flow Relationships rather than one to produce a range of dates. Also watch projections from NWS to compare results.**

- **Several temperature (cold and hot) graphs are included to illustrate influence on snowmelt and streamflow.**

- **Snow Water Equivalent (SWE) and streamflow graphs are used along with predictions and observed peaks to summarize past three years. Some years had multiple river peaks, which happens often. Snow2Flow Relationships can be used to pick out the snowmelt peak and potential for additional snowmelt streamflow peaks.**

- **2026 SWE is included to show how this year compares to the recent years.**
  **Next post Idaho's Four River Lottery Rivers – Where's the Snow and Flow Going in 2026 ?!**

- **Also included is Verification for Years that Follow Strong El Nino Years and explanation of – What Happened with the 2025 Runoff. This is a good real life learning example about why Five Exceedance Streamflow Volume Forecasts are published and how to use exceedance forecasts.**

**Snow2Flow Relationships were updated by Kara Ferguson in 2018.**

https://scholarworks.boisestate.edu/cgi/viewcontent.cgi?article=2549&context=td

# From Snow to Flow: Exploring Relationships Between SNOTEL Ablation Curves and Peak Streamflow Timing

Kara Jane Ferguson, *Boise State University*

Follow

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**Abstract**
Predictions of peak streamflow timing in snow-dominated river systems are essential for proper water management and recreational availability. This study evaluates historic snow and streamflow data from 14 river basins throughout Idaho to investigate the relationship between snowmelt timing at SNOw TELemetry (SNOTEL) sites and peak streamflow within each basin. The goal is to provide a simple operational tool that estimates the probability of peak streamflow occurring within a certain number of days as ablation progresses from 0 to 100% melted. For individual basins we evaluate meltout levels in increments of 10% from each SNOTEL site and use a probabilistic modeling approach to create cumulative distribution function (CDF) curves which illustrate the probability of peak streamflow occurring within a given number of days from the date at which the SNOTEL site reaches each meltout percentage. Results from the CDF probability model graphs also provide basic information about basin specific anecdotal indices or "rules of thumb" for when peak streamflow will occur based on the average percent meltout at the time of peak streamflow. Compiled historical datasets with summary statistics for 54 SNOTEL-streamgage pairs of multiple snowmelt and streamflow metrics add to the body of knowledge of hydrologic processes for basins throughout Idaho. In addition, our analysis reveals how melt timing has a greater influence on the timing of peak streamflow than does the timing or magnitude of maximum accumulation (max SWE) and how the larger snowpack (magnitude of max SWE) often have few lag days between each meltout percentage and peak streamflow.

**DOI**
https://doi.org/10/18122/td/1426/boisestate

**Recommended Citation**
Ferguson, Kara Jane, "From Snow to Flow: Exploring Relationships Between SNOTEL Ablation Curves and Peak Streamflow Timing" (2018). *Boise State University Theses and Dissertations*. 1426.
https://doi.org/10/18122/td/1426/boisestate

# Snow2Flow Verification Banner Summit & MF Salmon River

**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.

Summary of DISCHARGE ONLY years categorized by max SWE magnitude.

| Max SWE Category | Max SWE Magnitude (inches) | Number of Years in Analysis | **MEDIAN percent melted at time of peak streamflow** |
|---|---|---|---|
| **Below average** | <21 | 5 | **81** |
| **Average** | 20 – 30 | 8 | **71** |
| **Above average** | >29 | 5 | **64** |

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

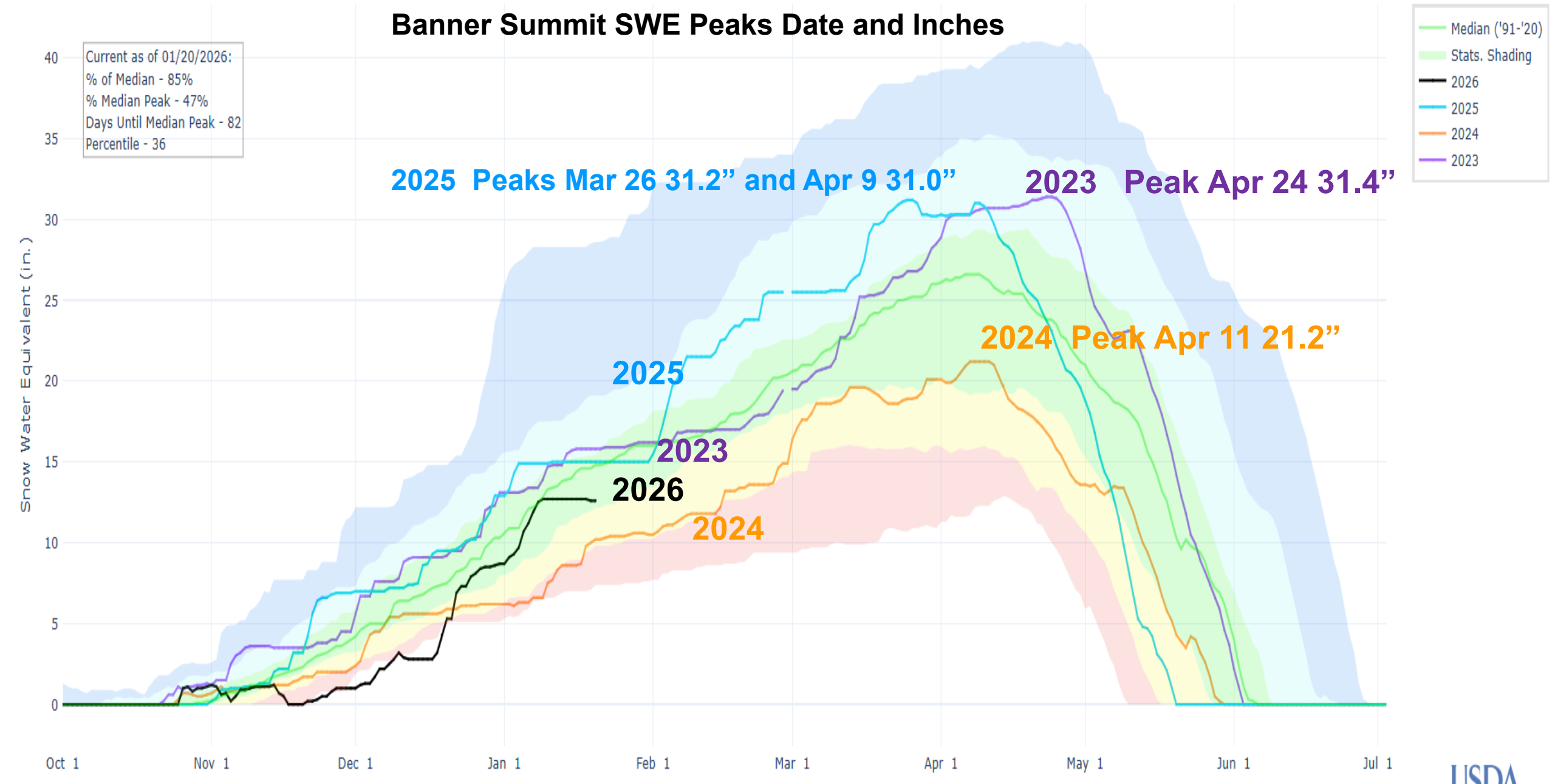
**Peak SWE for all 3 years were in the 20-31” range that shows peak flow occurs when 61% of the SWE is melted.**

**Rivers included are MF Salmon, Selway, Lochsa, Bruneau and Owhyee River.**

**Each river analysis includes Snow2Flow relationship, SWE and river flow graphs, and some additional temp graphs**

BANNER SUMMIT, ID (312) SNOW WATER EQUIVALENT

**Snow2Flow Verification Banner Summit & MF Salmon River**

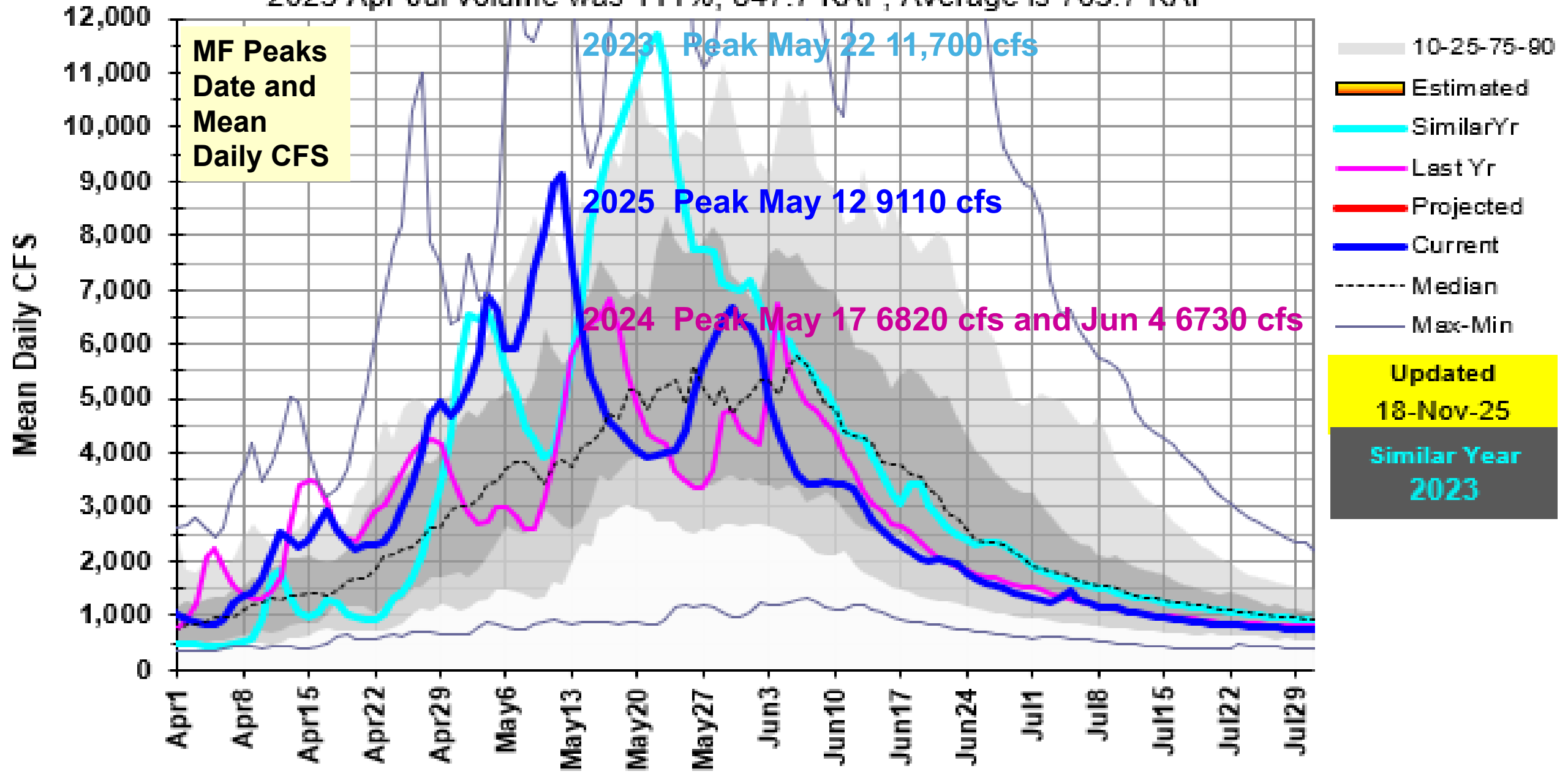



USDA

Snow2Flow Verification Banner
Summit & MF Salmon River

# 13309220: MF Salmon R at MF Lodge near Yellow Pine, ID

2023 Apr-Jul volume was 111%, 847.7 KAF, Average is 763.7 KAF



# Snow2Flow Verification Banner Summit & MF Salmon River

**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 pote

Using DISCHARGE ONLY years, on average, peak streamflow for th
near Yellow Pine Idaho occurs when Banner Summit SNOTEL is betv

Summary of DISCHARGE ONLY years categorized by max SWE ma

| Max SWE Category | Max SWE Magnitude (inches) | Number of Years in Analysis | **MEDIAN percent melted at time of peak streamflow** |
|---|---|---|---|
| **Below average** | <21 | 5 | **81** |
| **Average** | 20 – 30 | 8 | **71** |
| **Above average** | >29 | 5 | **64** |

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

**Peak SWE for all 3 years were in the 20-31" range that shows peak flow occurs when 61% of the SWE is melted.**

## MF Salmon River Snow2 Flow Verification for Years 2023, 24, 25

| Year | Peak SWE | SWE when 61% Melted | Date when 61% Melted | Date of Peak Flow |
|---|---|---|---|---|
| 2025 | 31.0 | 12.1 | May 7/8 | May 12. |
| 2024 | 21.2 | 8.3 | May 15/16 | May 17 and Jun 4 |
| 2023 | 31.4 | 12.2 | May 21/22 | May 22. |

**Peak projection was correct for 2024 and 2023 and 4 days early for 2025.**

**Snow2Flow Verification Twin Lakes & 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** |

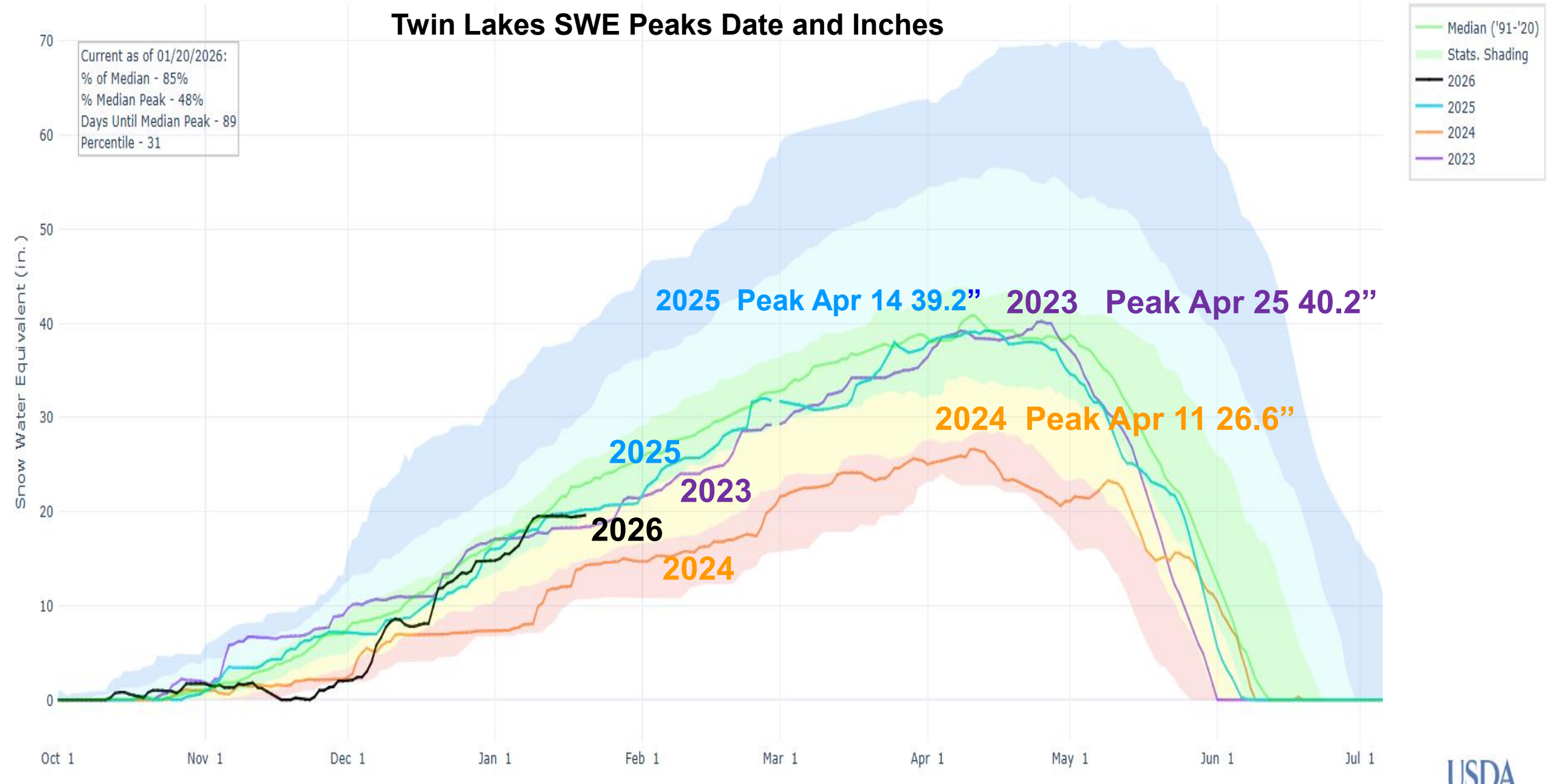
**Peak SWE for these 3 years ranged from 26.6 to 40.2 inches and shows peak flow occurs when 33% of the SWE is melted.**

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.**

TWIN LAKES, MT (836) SNOW WATER EQUIVALENT

**Snow2Flow Verification Twin Lakes & Selway River**

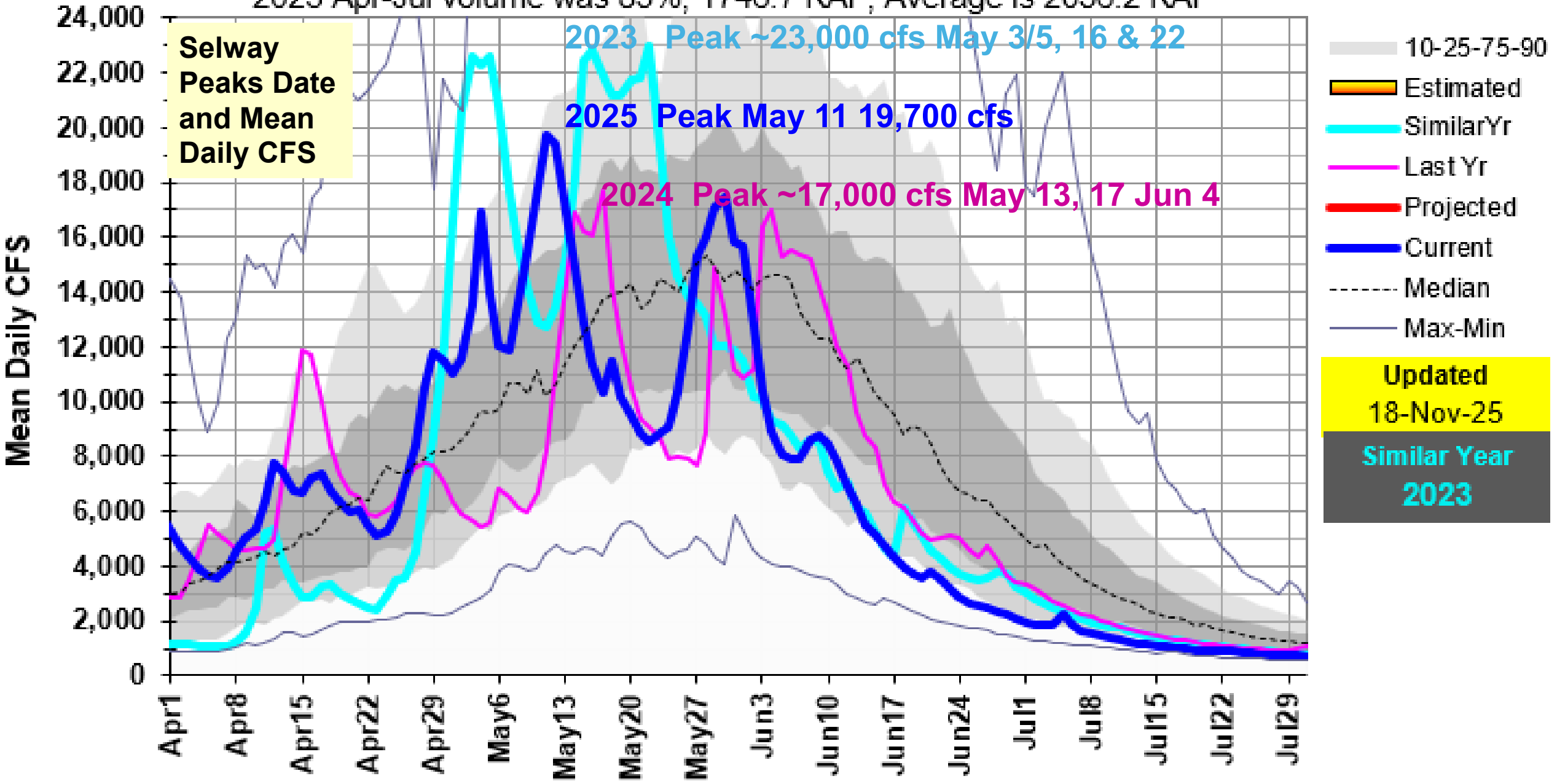



USDA

# 13336500: Selway R near Lowell, ID

**Snow2Flow Verification Twin Lakes & Selway River**

2023 Apr-Jul volume was 85%, 1746.7 KAF, Average is 2056.2 KAF



Clearwater River Basin

# Snow2Flow Verification Twin Lakes & 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.**

**Peak SWE for these 3 years ranged from 26.6 to 40.2 inches and shows peak flow occurs when 33% of the SWE is melted.**

**If you are looking for a good long-term relationship, this one is based on 48 years of Snow2Flow data !!**

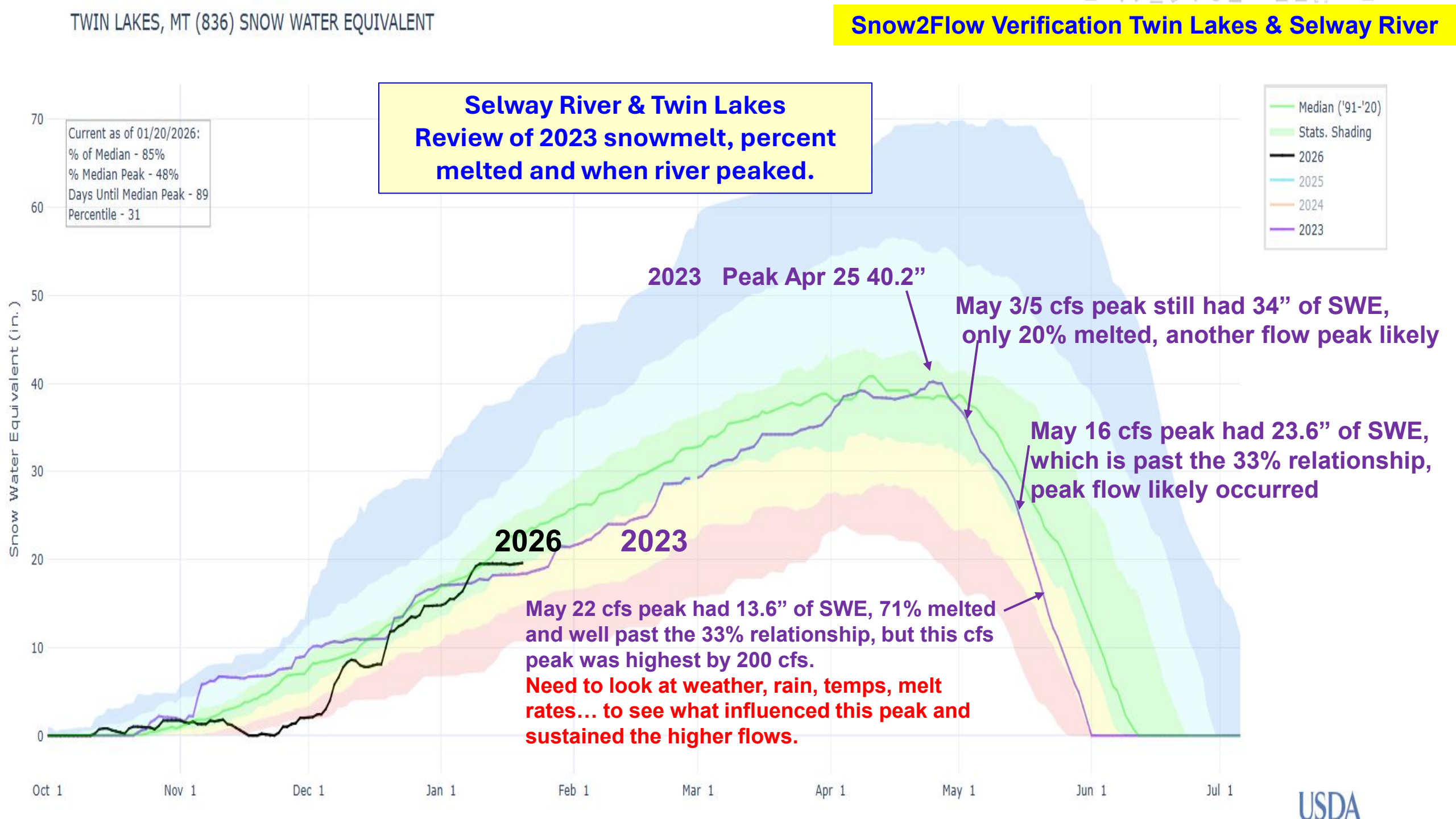
**Selway River Snow2 Flow Verification for Years 2023, 24, 25**

| Year | Peak SWE | SWE when 33% Melted | Date when 33% Melted | Date of Peak Flow |
|---|---|---|---|---|
| 2025 | 39.2 | 26.3 | May 11/12 | May 11. |
| 2024 | 26.6 | 17.8 | May 15/16 | May 14, 17 & Jun 4 with 17th the highest by 700 cfs. |
| 2023 | 40.2 | 26.9 | May 13/14 | May 3/5, 16 & 22 with 22nd being the highest by 200 cfs. |

2023 had 3 peaks all around 23,000 cfs.

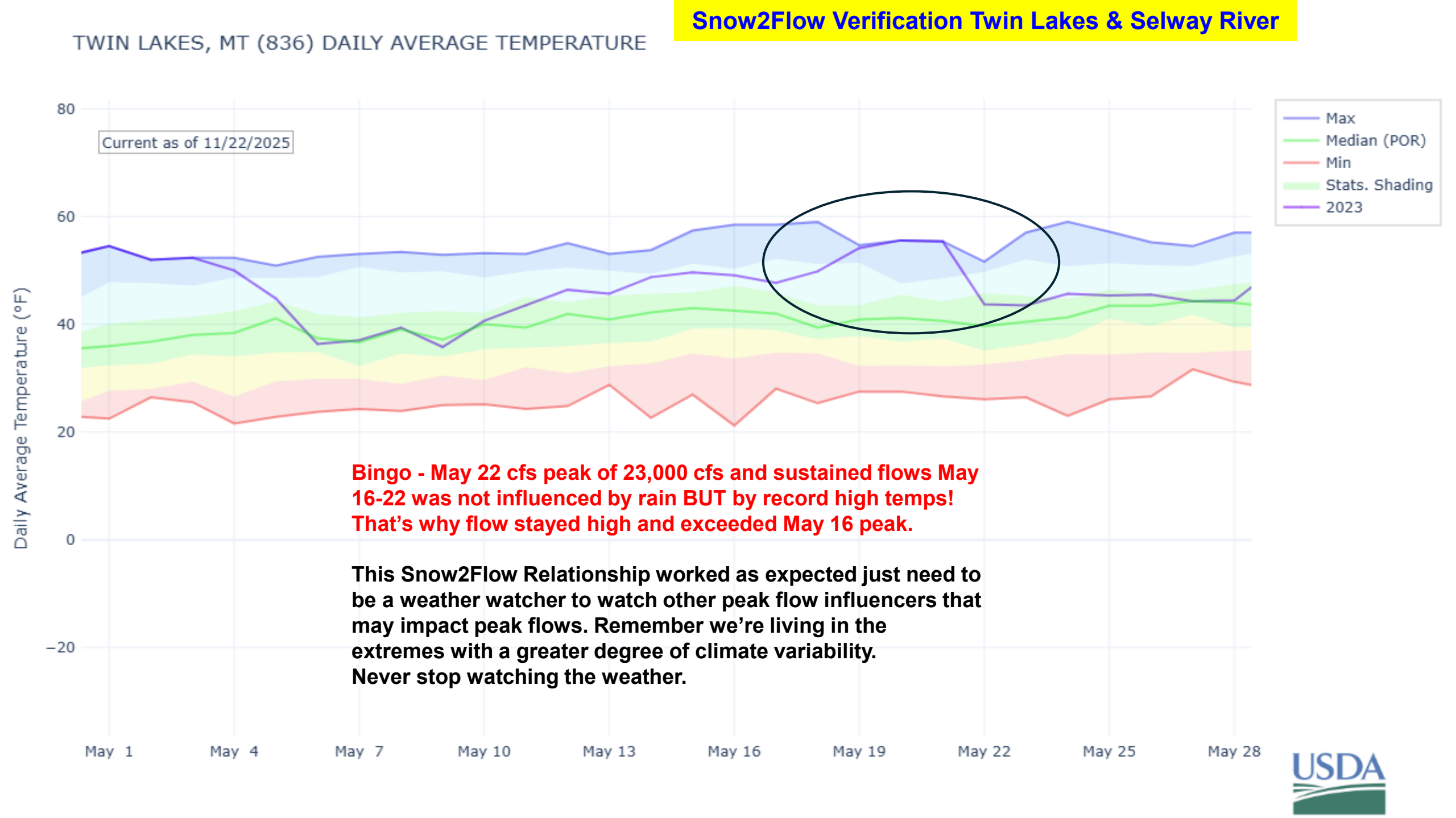
May 15 was projected but was 200 cfs less than May 22 peak.

# Snow2Flow Verification Twin Lakes & Selway River




USDA

# Snow2Flow Verification Twin Lakes & Selway River




**Bingo - May 22 cfs peak of 23,000 cfs and sustained flows May 16-22 was not influenced by rain BUT by record high temps! That's why flow stayed high and exceeded May 16 peak.**

**This Snow2Flow Relationship worked as expected just need to be a weather watcher to watch other peak flow influencers that may impact peak flows. Remember we're living in the extremes with a greater degree of climate variability. Never stop watching the weather.**

USDA

# LOCSHA RIVER AND LOLO PASS SNOTEL

**Snow2Flow Verification Lolo Pass & Lochsa River**

On average, peak streamflow for the Lochsa River near Lowell, Idaho occurs when Lolo Pass SNOTEL is between **55 and 80%** melted.

Summary of years using only "snowmelt peak" and categorized by max SWE magnitude.

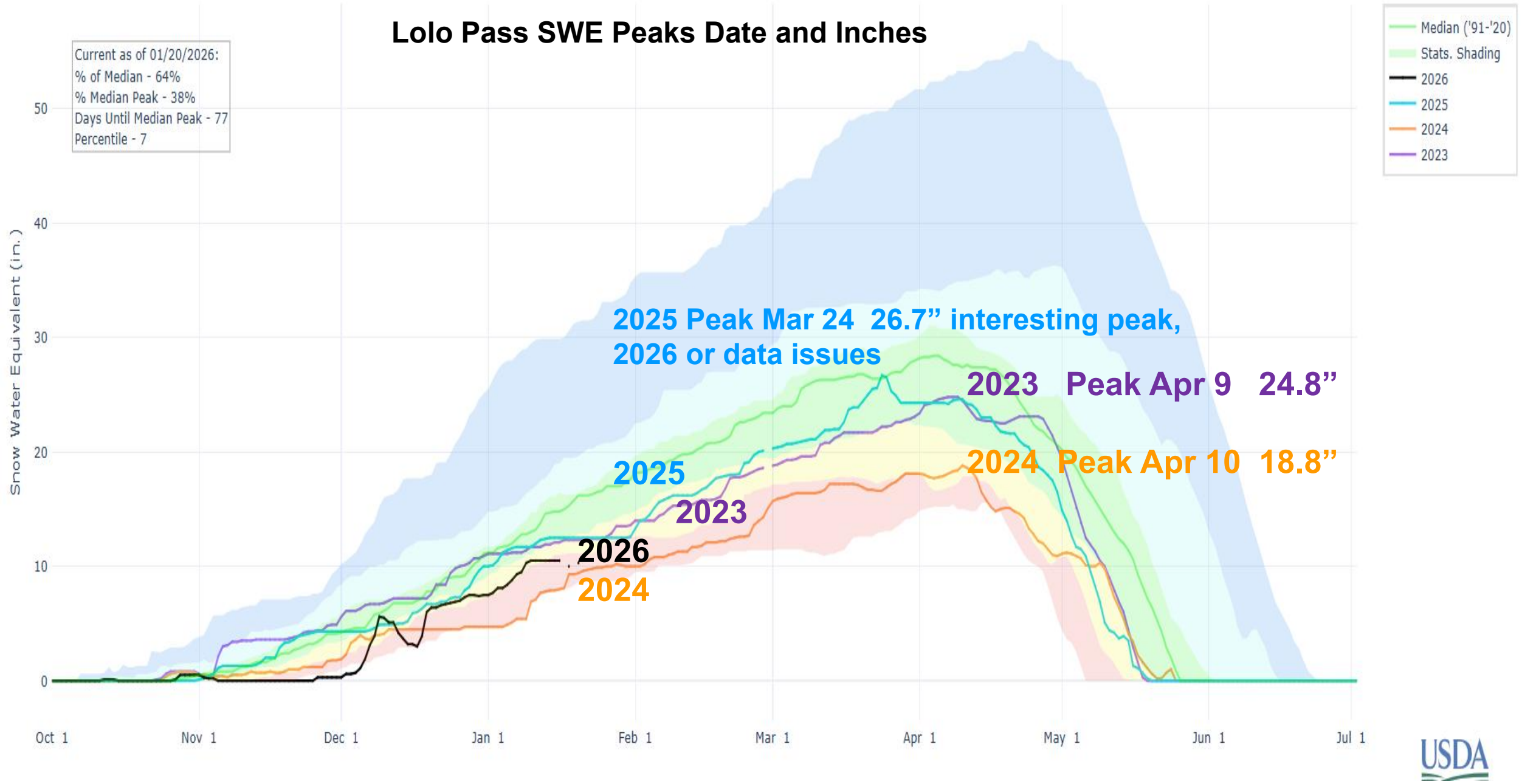
| Max SWE Category | Max SWE Magnitude (inches) | Number of Years in Analysis | **Average percent melted at time of peak streamflow** |
|---|---|---|---|
| **Below average** | <22 | 7 | **78** |
| **Average** | 21 – 34 | 13 | **80** |
| **Above average** | >33 | 7 | **55** |

**Lolo Pass Peak SWE for years 2023-25 ranged from 18.8 to 26.7 inches and this shows peak flow occurs when 78-80% of the SWE is melted. Let's use 79% melted to keep it simple.**

**The average percent melted for the full 32-year period of record is 77% melted.**

LOLO PASS, ID (588) SNOW WATER EQUIVALENT

# Snow2Flow Verification Lolo Pass & Lochsa River

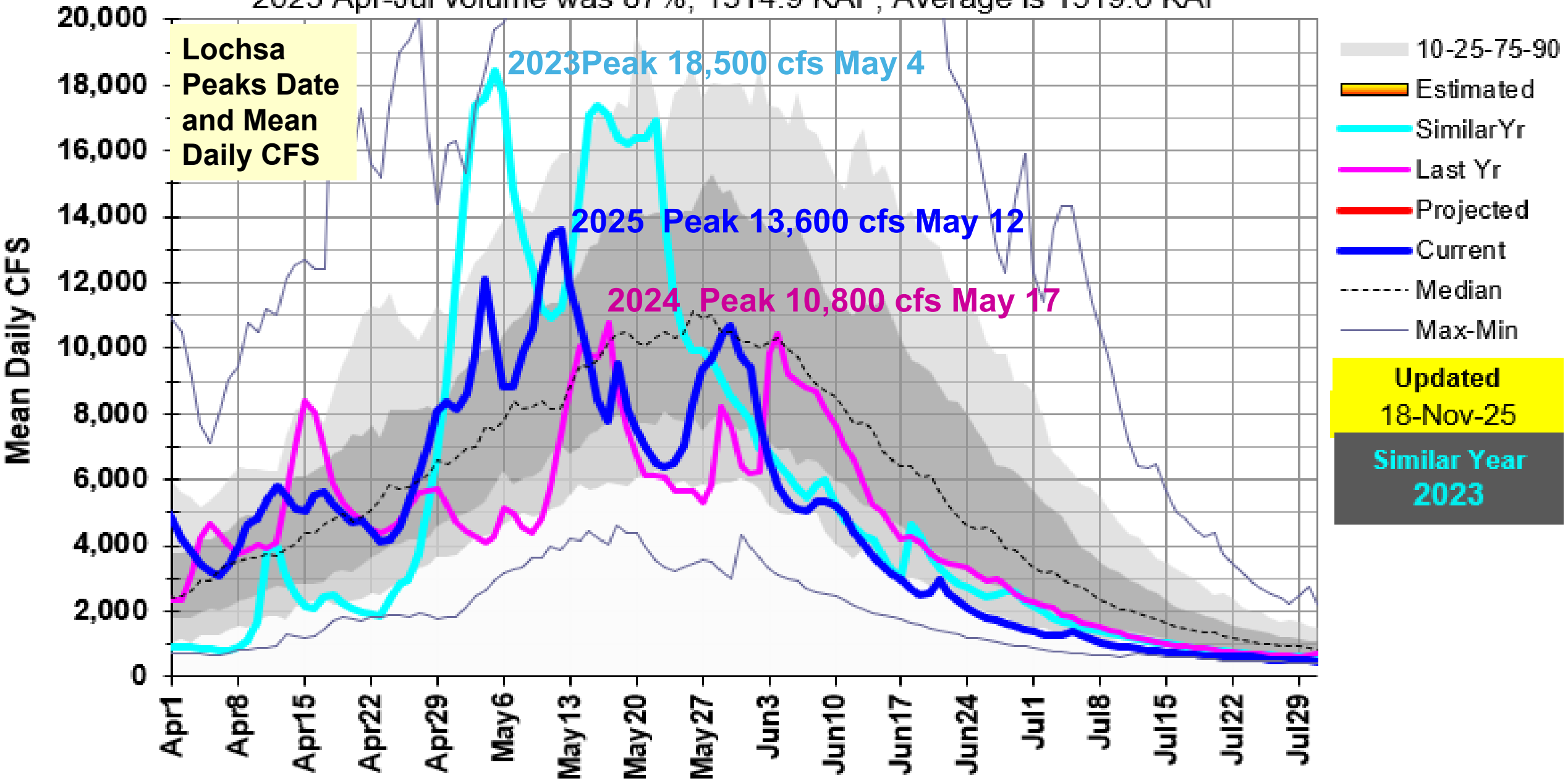



USDA

# 13337000: Lochsa R near Lowell, ID

Snow2Flow Verification Lolo Pass & Lochsa River

2023 Apr-Jul volume was 87%, 1314.9 KAF, Average is 1519.6 KAF



# LOCSHA RIVER AND LOLO PASS SNOTEL

**Snow2Flow Verification Lolo Pass & Lochsa River**

On average, peak streamflow for the Lochsa River near Lowell, Idaho occurs when Lolo Pass SNOTEL is between **55 and 80%** melted.

Summary of years using only "snowmelt peak" and 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** | <22 | 7 | **78** |
| **Average** | 21 – 34 | 13 | **80** |
| **Above average** | >33 | 7 | **55** |

**Lolo Pass Peak SWE for years 2023-25 ranged from 18.8 to 26.7 inches. This shows peak flow occurs when 78-80% of the SWE is melted. Let's use 79% melted to keep it simple.**

**The average percent melted for the full 32-year period**

**Lochsa River Snow2 Flow Verification for Years 2023, 24, 25**

| Year | Peak SWE | SWE when 79% Melted | Date when 79% Melted | Date of Peak Flow |
|---|---|---|---|---|
| 2025 | 26.7 | 5.6 | May 9/10 | May 12. |
| 2024 | 18.8 | 3.9 | May 15/16 | May 17. |
| 2023 | 24.8 | 5.2 | May 14/15 | May 4. |

**Close for 2 out of 3 years**

**2023 peak was earlier in season**

**Bruneau River and Bear Creek SNOTEL Site**

**Snow2Flow Verification Bear Creek & Bruneau River**

**On average, the Bruneau River near Hot Springs, Idaho peak streamflow occurs when Magic Mountain SNOTEL is approximately 66% melted.**

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** | <17 | 9 | **100** |
| **Average** | 16 – 27 | 17 | **64** |
| **Above average** | >26 | 9 | **31** |

**The average percent melted for the full 36-year period of record is 66% melted.**

**Bear Creek Peak SWE for years 2023-25 ranged from 23.6 to 30.4 inches. This shows peak flow occurs when 64% of the SWE is melted in Average years and 31% melted in Above Average years.**

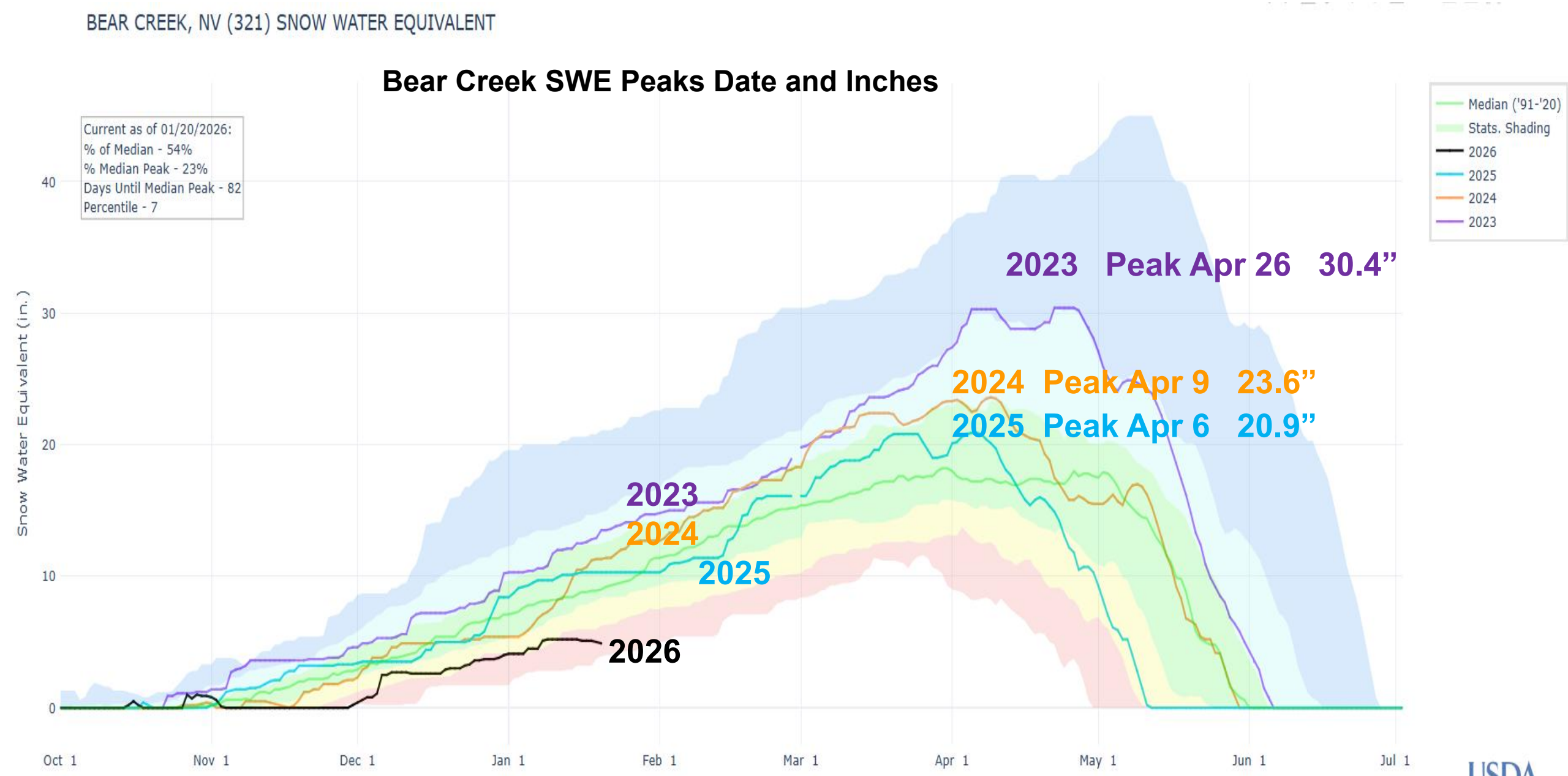
**********

**Bruneau River**

General Observations based on **Bear Creek SNOTEL site**:

- Peak usually occurs somewhere between beginning of melt and half melt of Bear Creek SNOTEL site, except in years with below to well below normal snow when there was no real snowmelt streamflow peak.
- Bruneau River at Hot Springs gage is generally responsive to changes in snow melt rates.
- Minor streamflow peaks can occur due to pre-melt rain events in the basin.
- Magnitude of peak depends upon:
  1) delay of onset of melt,
  2) magnitude of snowpack
- Bear Creek usually needs a peak of about 20 inches of snow water to have an adequate runoff season or wet spring for boating. Average April 1 snow water content is 22.4 inches.

# Snow2Flow Verification Bear Creek & Bruneau River

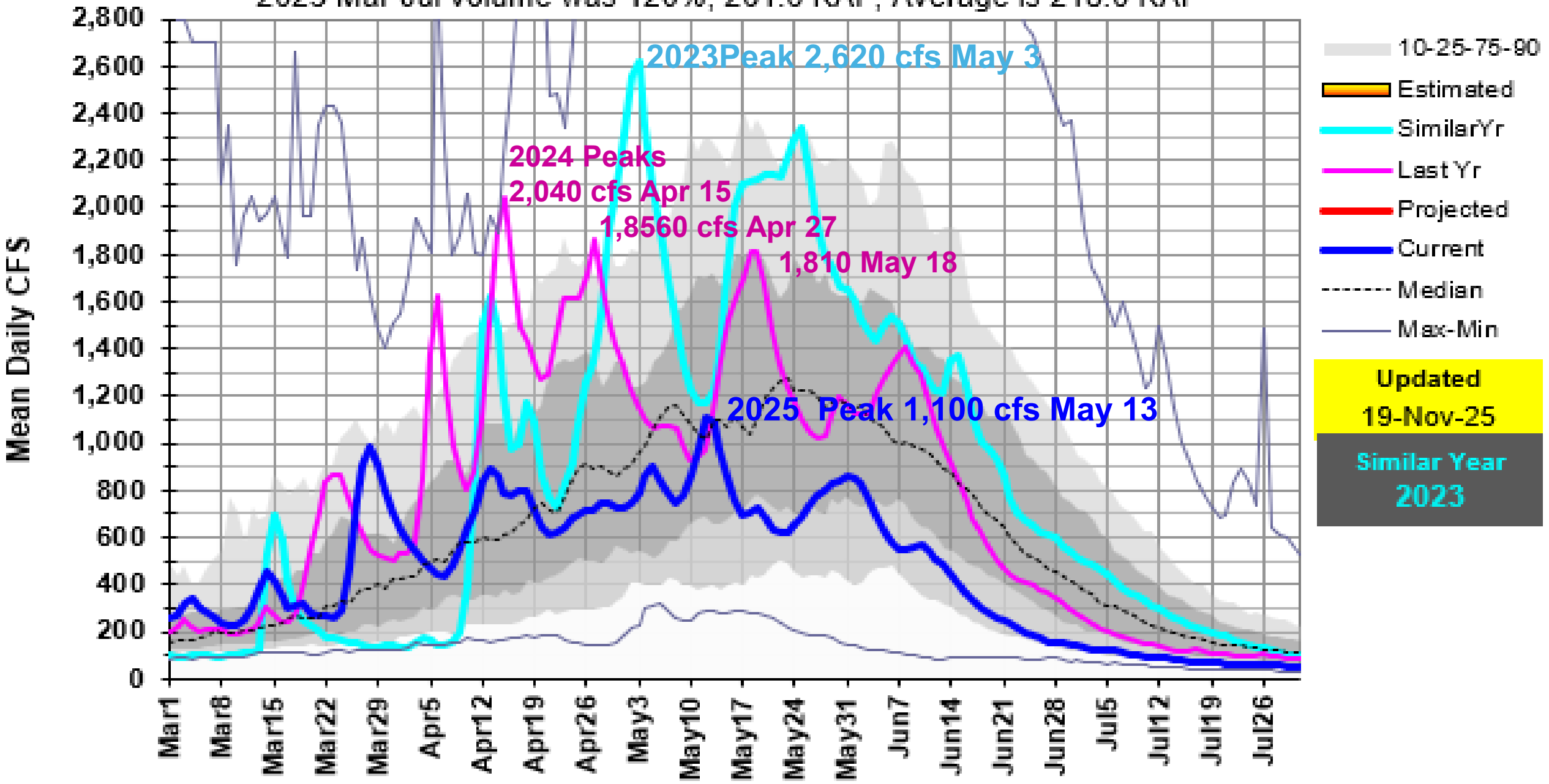



USDA

# 13168500: Bruneau R near Hot Spring, ID

Snow2Flow Verification Bear Creek & Bruneau River

2023 Mar-Jul volume was 120%, 261.6 KAF, Average is 218.0 KAF



## Bruneau River and Bear Creek SNOTEL Site

## Snow2Flow Verification Bear Creek & Bruneau River

**On average, the Bruneau River near Hot Springs, Idaho peak streamflow occurs when Magic Mountain SNOTEL is approximately 66% melted.**

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** | <17 | 9 | **100** |
| **Average** | 16 – 27 | 17 | **64** |
| **Above average** | >26 | 9 | **31** |

**The average percent melted for the full 36-year period of record is 66% melted.**

**Bear Creek Peak SWE for years 2023-25 ranged from 23.6 to 30.4 inches. This shows peak flow occurs when 64% of the SWE is melted in Average years and 31% melted in Above Average years.**

**2024 Snow2Flow projection showed another snowmelt peak was possible after the previous peaks, and it occurred May 18.**

### Bruneau River Snow2 Flow Verification for Years 2023, 24, 25

| Year | Peak SWE | SWE when 64% Melted & 31% | Date when 64% Melted & 31% Melted | Date of Peak Flow |
|---|---|---|---|---|
| 2025 | 20.9 | 7.5 | May 2/3 | May 13. |
| 2024 | 23.6 | 8.5 | May 17/18 | Apr 15 early, May 18 is snowmelt peak |
| 2023 | 30.4 | 21.0 | May 14/15 | May 3. |

**Need to watch weather and flow influencers in this high desert river.**

# Snow2Flow Verification Mud Flat & Owyhee River

## OWYHEE BASIN AND MUD FLAT SNOTEL SITE

**On average, peak streamflow for the Owyhee River near Rome, Oregon occurs when Mud Flat SNOTEL is between 14 and 30% melted.**

The Owyhee basin is heavily influenced by precipitation events which, in many years, are the dominate source of peak streamflow.

For this analysis, only 22 of 32 years were considered snowmelt peaks.
Summary of years using only "snowmelt peak" and 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** | <5 | 4 | **25** |
| **Average** | 5 – 10 | 12 | **30** |
| **Above average** | >9 | 6 | **14** |

**The average percent melted for the full 32-year period of record is 30% melted.**

**Mud Flat Peak SWE for years 2023-25 ranged from 6.2 to 9.2 inches. This analysis shows peak flow occurs when 30% of the SWE is melted.**

**Note: Juniper trees removal around site opened the canopy around the site and changed the way snow accumulates and melts.**

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## OWYHEE BASIN AND SOUTH MTN SNOTEL SITE

**On average, peak streamflow for the Owyhee River near Rome, Oregon occurs when South Mtn SNOTEL is approximately 15% melted.**

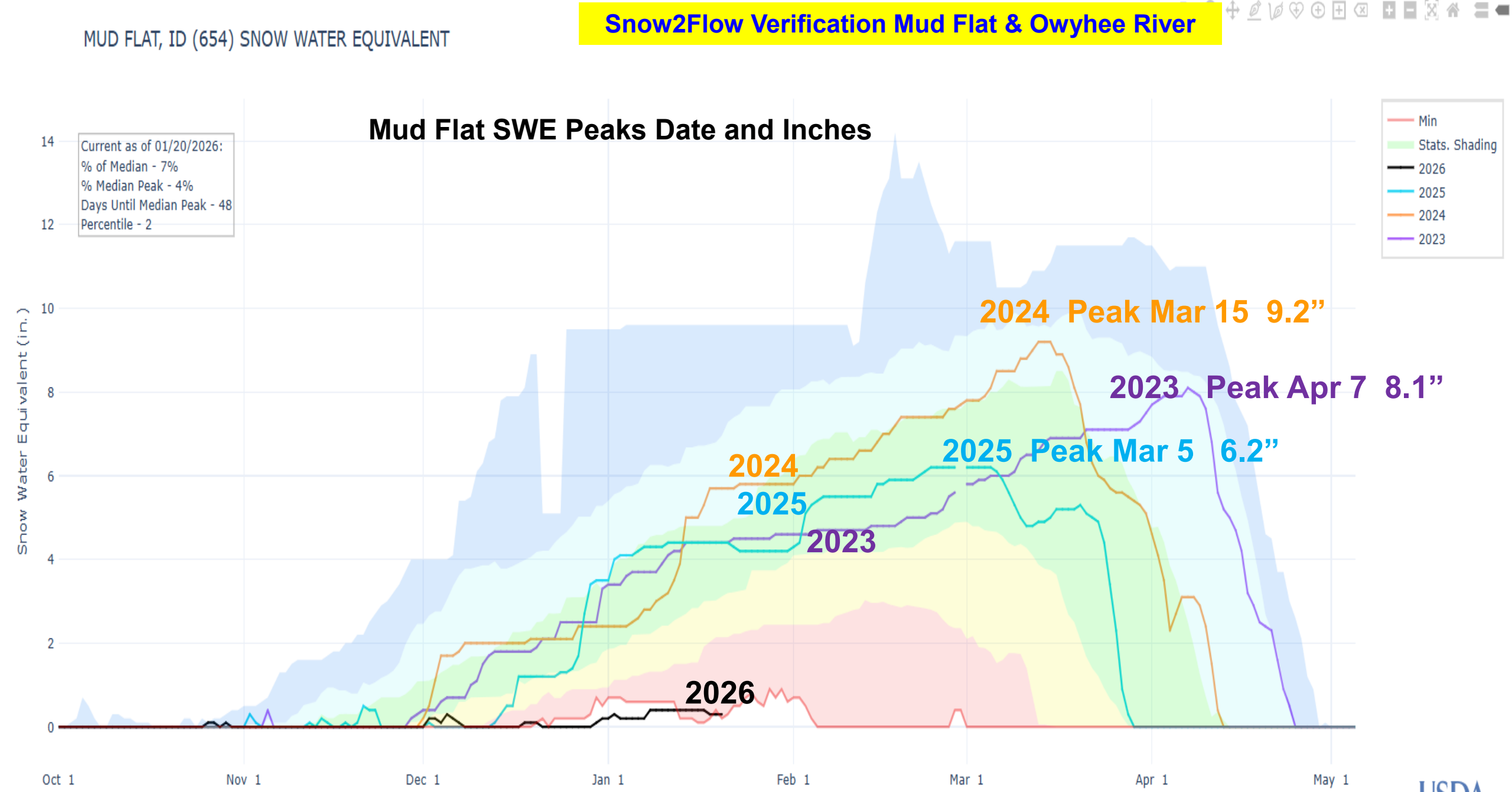
The Owyhee basin is heavily influenced by precipitation events which, in many years, are the dominate source of peak streamflow.

For this analysis, only 17 of 35 years were used to determine the relationship between snowmelt and streamflow. Six of the 17 years, peak streamflow occurred before South Mtn SNOTEL reached max accumulation.

Due to the smaller number of years used in this analysis and the nature of the snowmelt-streamflow relationship, use of averages by peak SWE level is not advised.

Because of the influence of rain on runoff events in the Owyhe Basin, the snowmelt-streamflow relationship between the Owyhee River near Rome stream gage and South Mtn SNOTEL is a weak relationship and should be used with caution.

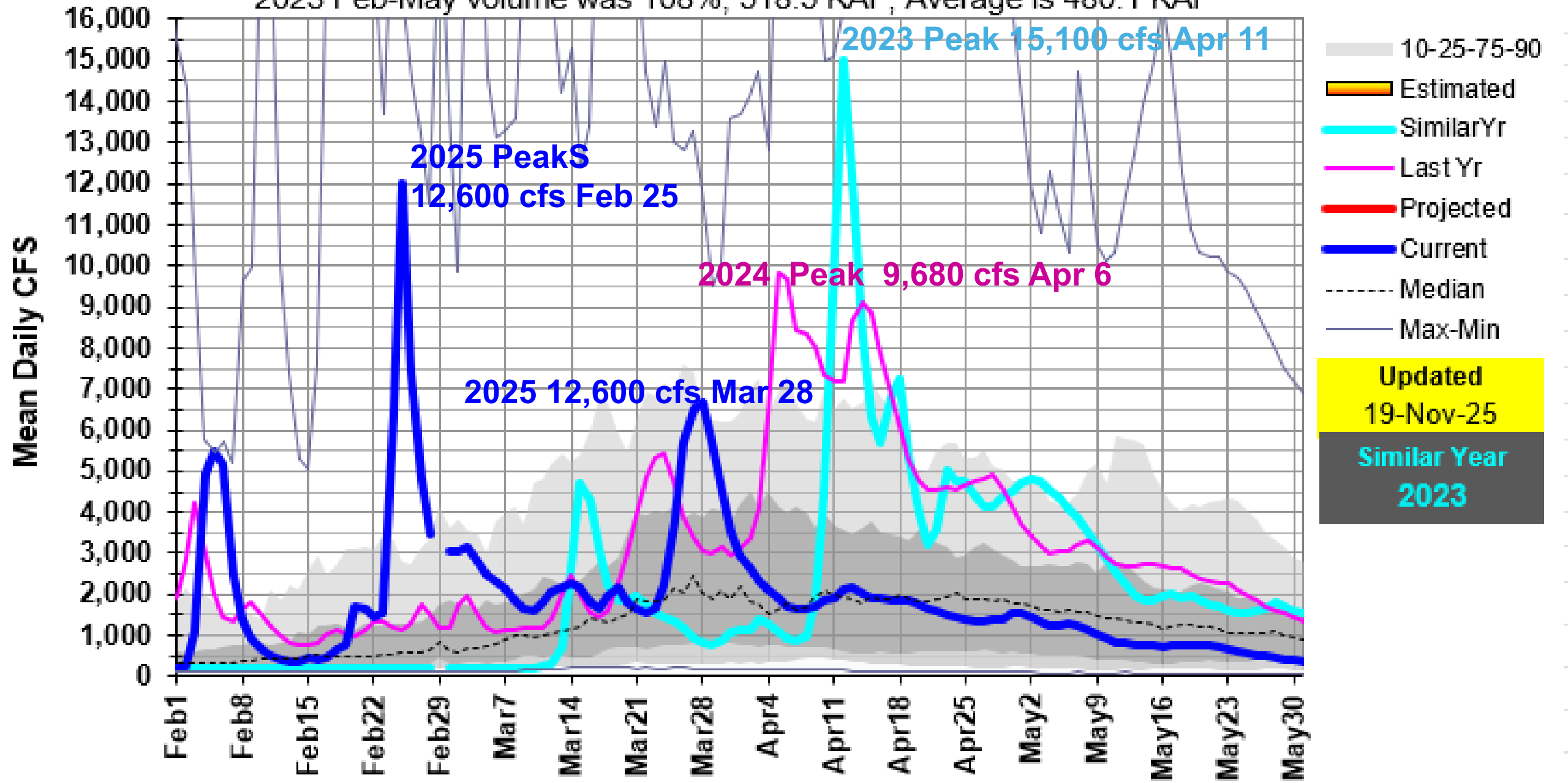
# Snow2Flow Verification Mud Flat & Owyhee River



# 13181000: Owyhee R near Rome, OR

**Snow2Flow Verification Mud Flat & Owyhee River**

2023 Feb-May volume was 108%, 518.5 KAF, Average is 480.1 KAF



# Snow2Flow Verification Mud Flat & Owyhee River

## OWYHEE BASIN AND MUD FLAT SNOTEL SITE

**On average, peak streamflow for the Owyhee River near Rome, Oregon occurs when Mud Flat SNOTEL is between 14 and 30% melted.**

The Owyhee basin is heavily influenced by precipitation events which, in many years, are the dominate source of peak streamflow.

For this analysis, only 22 of 32 years were considered snowmelt peaks.
Summary of years using only "snowmelt peak" and 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** | <5 | 4 | **25** |
| **Average** | 5 – 10 | 12 | **30** |
| **Above average** | >9 | 6 | **14** |

**The average percent melted for the full 32-year period of record is 30% melted.**

**Mud Flat Peak SWE for years 2023-25 ranged from 6.2 to 9.2 inches. This analysis shows peak flow occurs when 30% of the SWE is melted.**

**Note: Juniper trees removal around site opened the canopy around the site and changed the way snow accumulates and melts.**

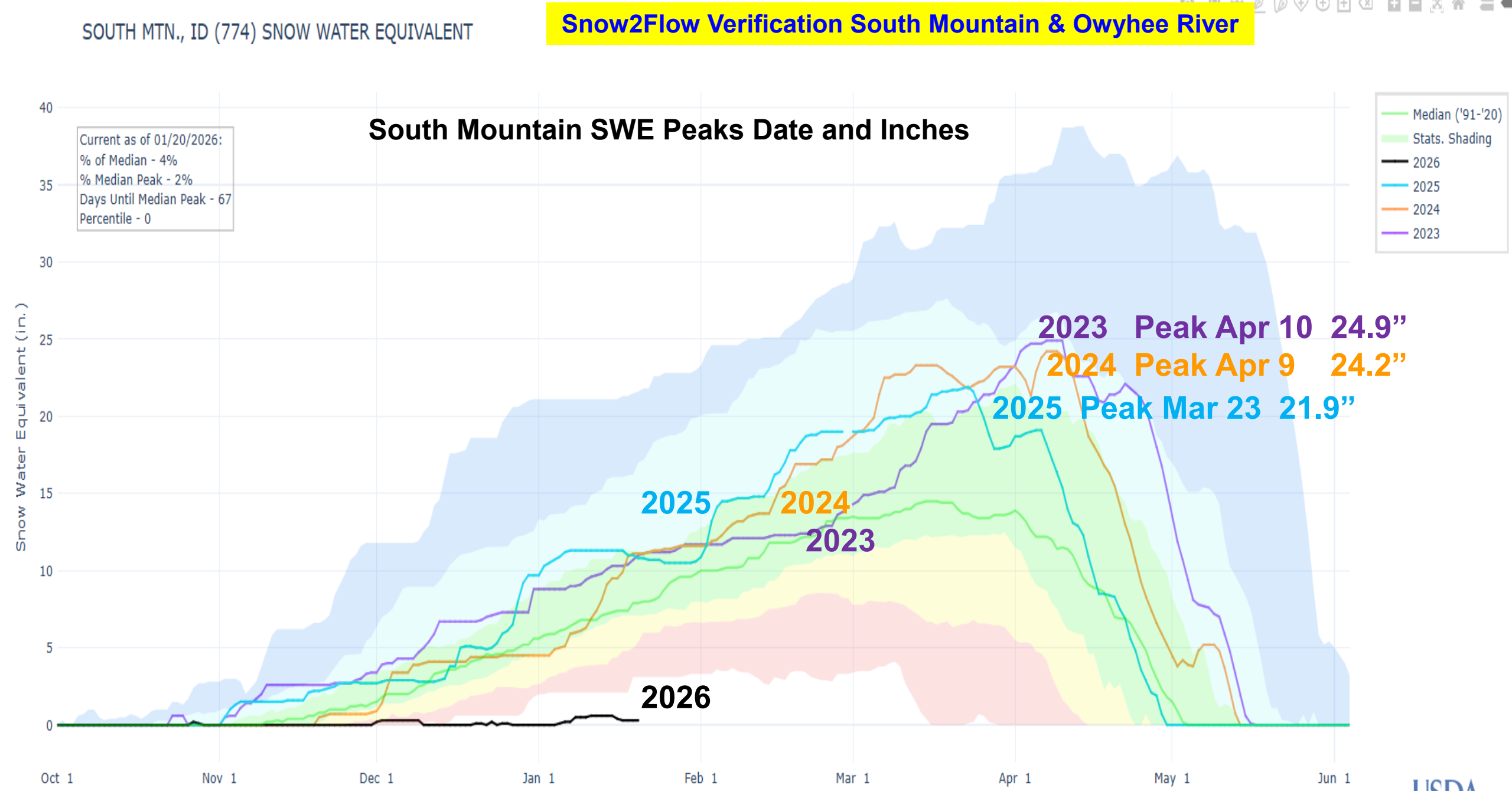
## Mud Flat - Owyhee River Snow2 Flow Verification for Years 2023, 24, 25

| Year | Peak SWE | SWE when 30% Melted | Date when 30% Melted | Date of Peak | |
|---|---|---|---|---|---|
| 2025 | 6.2 | 4.3 | Mar 24. | Mar 28. | |
| 2024 | 9.2 | 6.4 | Mar 21. | Apr 6. | |
| 2023 | 8.1 | 5.7 | Apr 12. | Apr 11. | |

**Need to watch weather and flow influencers in this high desert river.**

**And use both Mud Flat and South Mountain Snow2Flow analysis.**

# Snow2Flow Verification South Mountain & Owyhee River



# Snow2Flow Verification South Mountain & Owyhee River

## OWYHEE BASIN AND SOUTH MTN SNOTEL SITE

**On average, peak streamflow for the Owyhee River near Rome, Oregon occurs when South Mtn SNOTEL is approximately 15% melted.**

The Owyhee basin is heavily influenced by precipitation events which, in many years, are the dominate source of peak streamflow.

For this analysis, only 17 of 35 years were used to determine the relationship between snowmelt and streamflow. Six of the 17 years, peak streamflow occurred before South Mtn SNOTEL reached max accumulation.

Due to the smaller number of years used in this analysis and the nature of the snowmelt-streamflow relationship, use of averages by peak SWE level is not advised.

Because of the influence of rain on runoff events in the Owyhe Basin, the snowmelt-streamflow relationship between the Owyhee River near Rome stream gage and South Mtn SNOTEL is a weak relationship and should be used with caution.

**If you think about this, it makes sense. The peak flow happens soon after the peak SWE with only 15% of the snow melted because there is not much land in the watershed above South Mountain's elevation of 6,650 ft.**

**South Mountain Peak SWE for years 2023-25 ranged from 21.9 to 24.9 inches. Write-up shows peak flow occurs when 15% of the SWE is melted.**

**Did you know the Owyhee basin is bigger than the Weiser, Payette and Boise combined !!!**

**South Mountain - Owyhee River Snow2 Flow Verification for Years 2023, 24, 25**

| Year | Peak SWE | SWE when 15% Melted | Date when 15% Melted | Date of Peak |
|---|---|---|---|---|
| 2025 | 21.9 | 18.6 | Mar 28 & Apr 7 | Feb 25 early, and Mar 28. snowmelt peak |
| 2024 | 24.2 | 20.6 | Apr 14. | Apr 6. |
| 2023 | 24.9 | 21.2 | Apr 25. | Apr 11. |

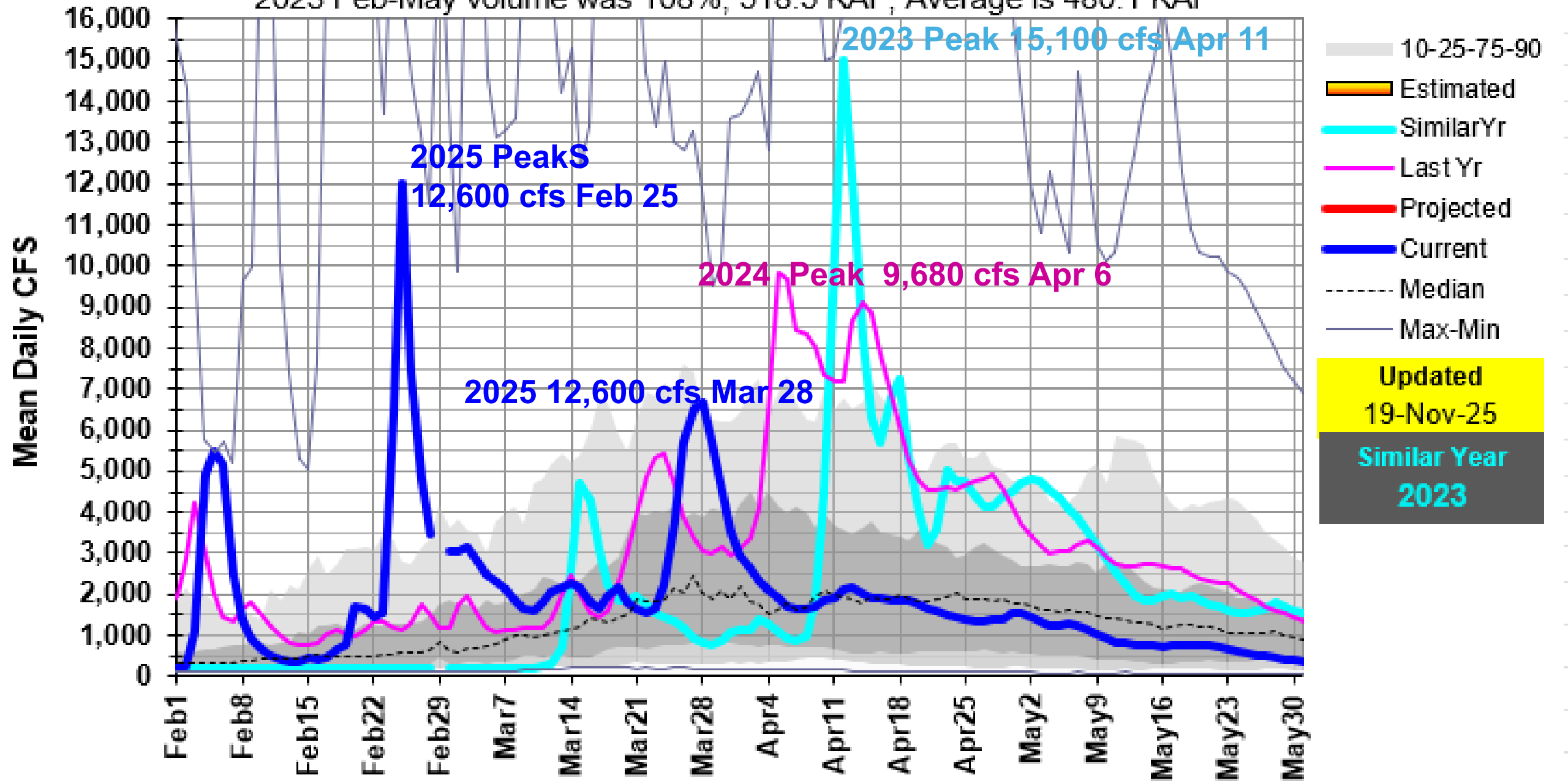
**Need to watch weather and flow influencers in this high desert river.**

**And use both Mud Flat and South Mountain Snow2Flow analysis.**

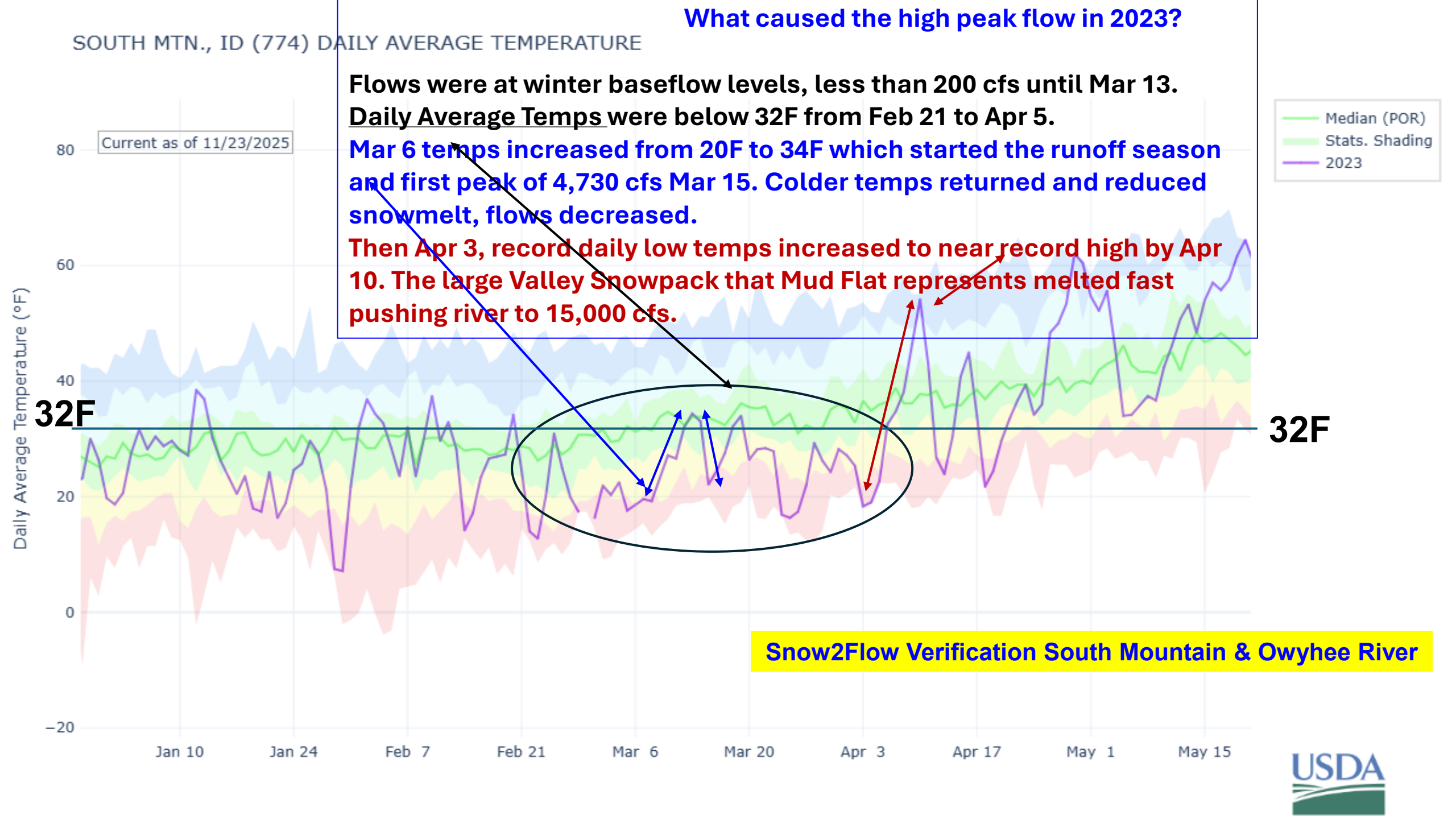
# 13181000: Owyhee R near Rome, OR

**Snow2Flow Verification South Mountain & Owyhee River**

2023 Feb-May volume was 108%, 518.5 KAF, Average is 480.1 KAF



## What caused the high peak flow in 2023?




**Flows were at winter baseflow levels, less than 200 cfs until Mar 13.**

**Daily Average Temps were below 32F from Feb 21 to Apr 5.**

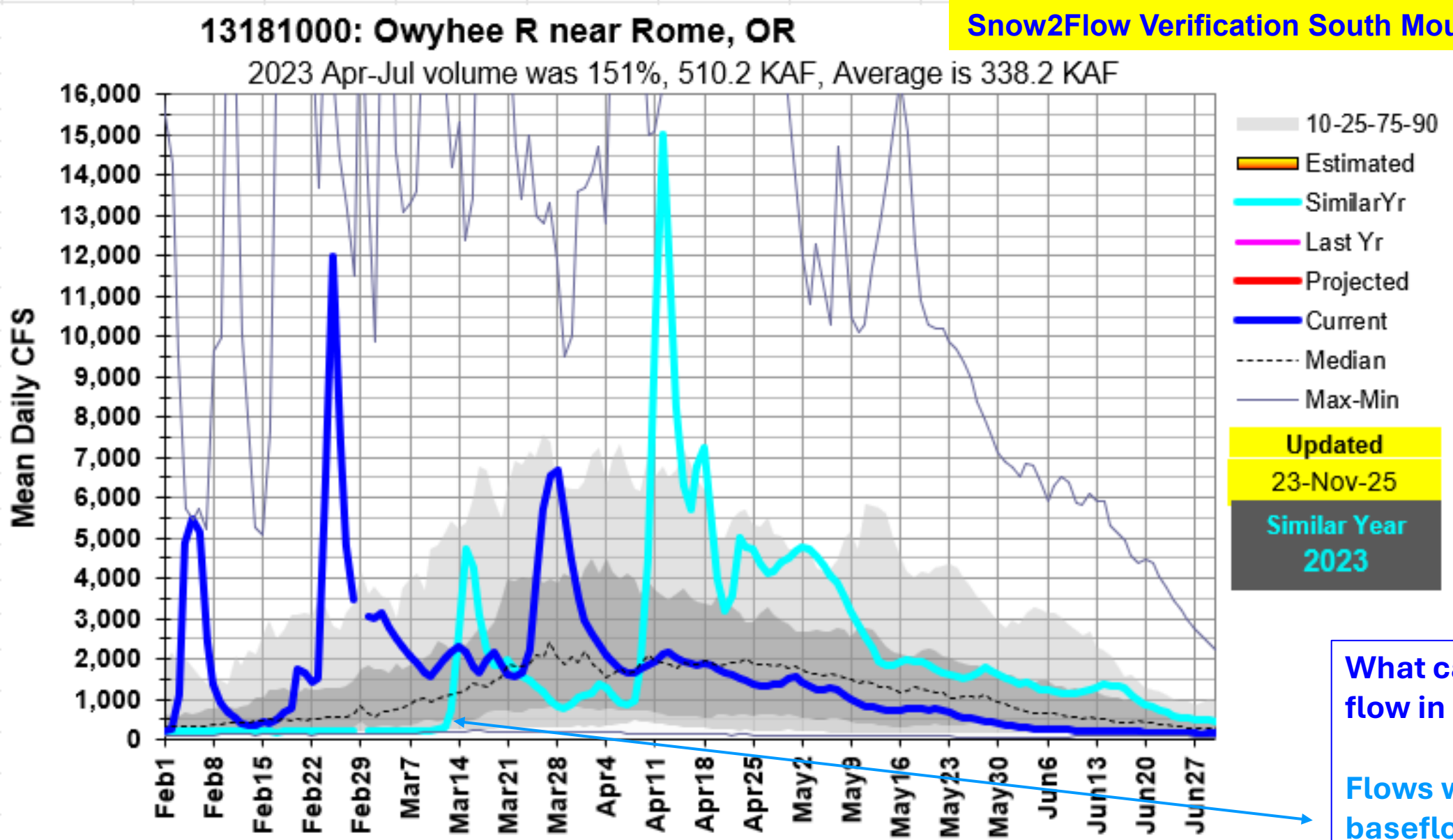
**Mar 6 temps increased from 20F to 34F which started the runoff season and first peak of 4,730 cfs Mar 15. Colder temps returned and reduced snowmelt, flows decreased.**

**Then Apr 3, record daily low temps increased to near record high by Apr 10. The large Valley Snowpack that Mud Flat represents melted fast pushing river to 15,000 cfs.**

**Snow2Flow Verification South Mountain & Owyhee River**

USDA

# Snow2Flow Verification South Mountain & Owyhee River




**What caused the high peak flow in 2023?**

**Flows were at winter baseflow levels, less than 200 cfs until Mar 13.**

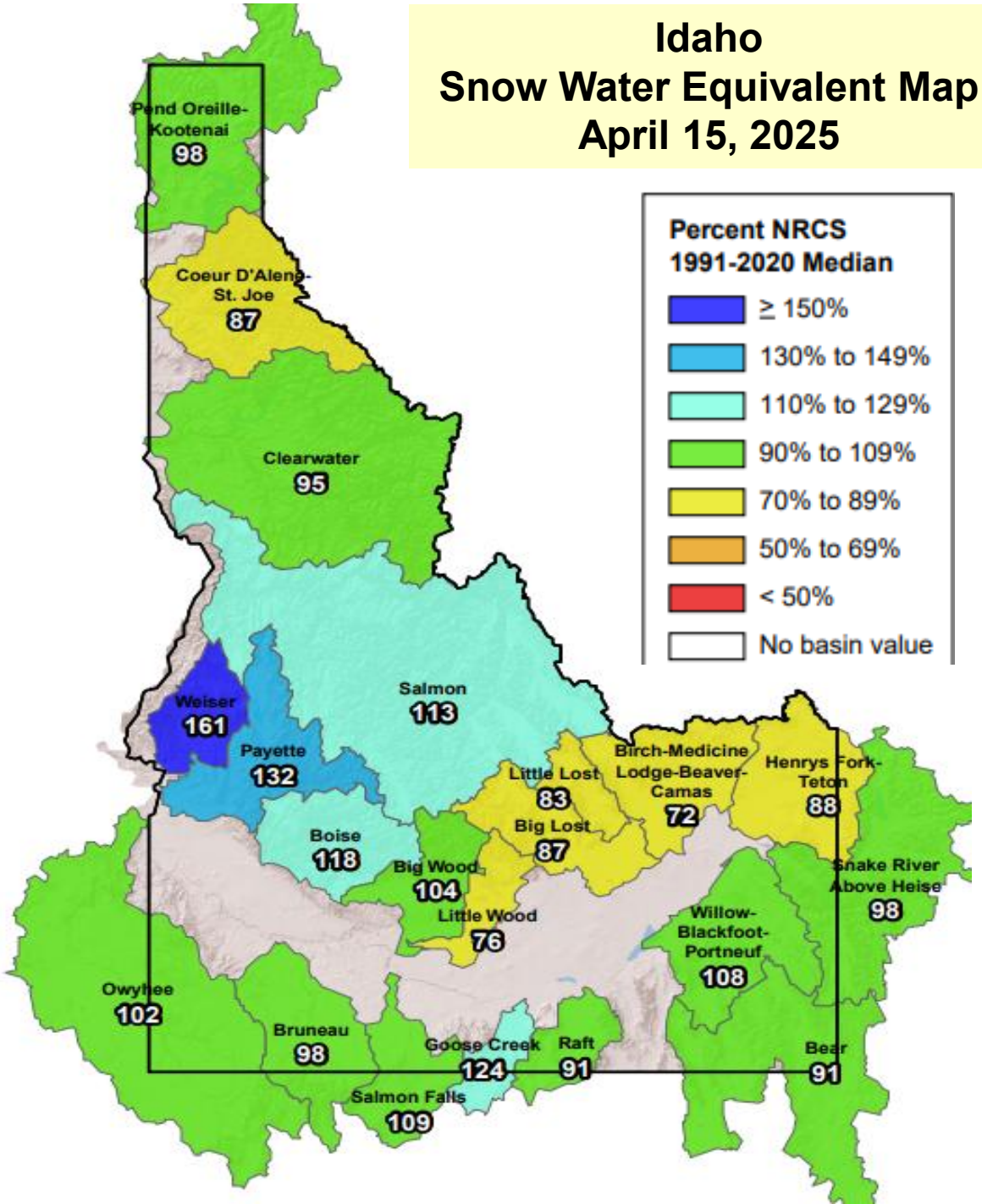
**Recap of 2025 Runoff – What Happened ??**

**1. 2025 April 1 Snowpack – looking good**

**2. Spring Precipitation – what happened**

**3. Summer Precipitation – near normal**

**Following is a review of the Selway River and Owyhee Rivers 2025 Five Exceedance Streamflow Forecasts compared with observed runoff and discussion of impacts of the record dry Spring Precipitation.**



# Years Following Strong El Nino Events.

2025 Runoff updated in Red box

2025 Runoff - only a few basins had near normal runoff, and a few less than 80% of average.

★ 2025 March Forecasts were looking good ! Now we must wait for another strong El Nino year to share again.

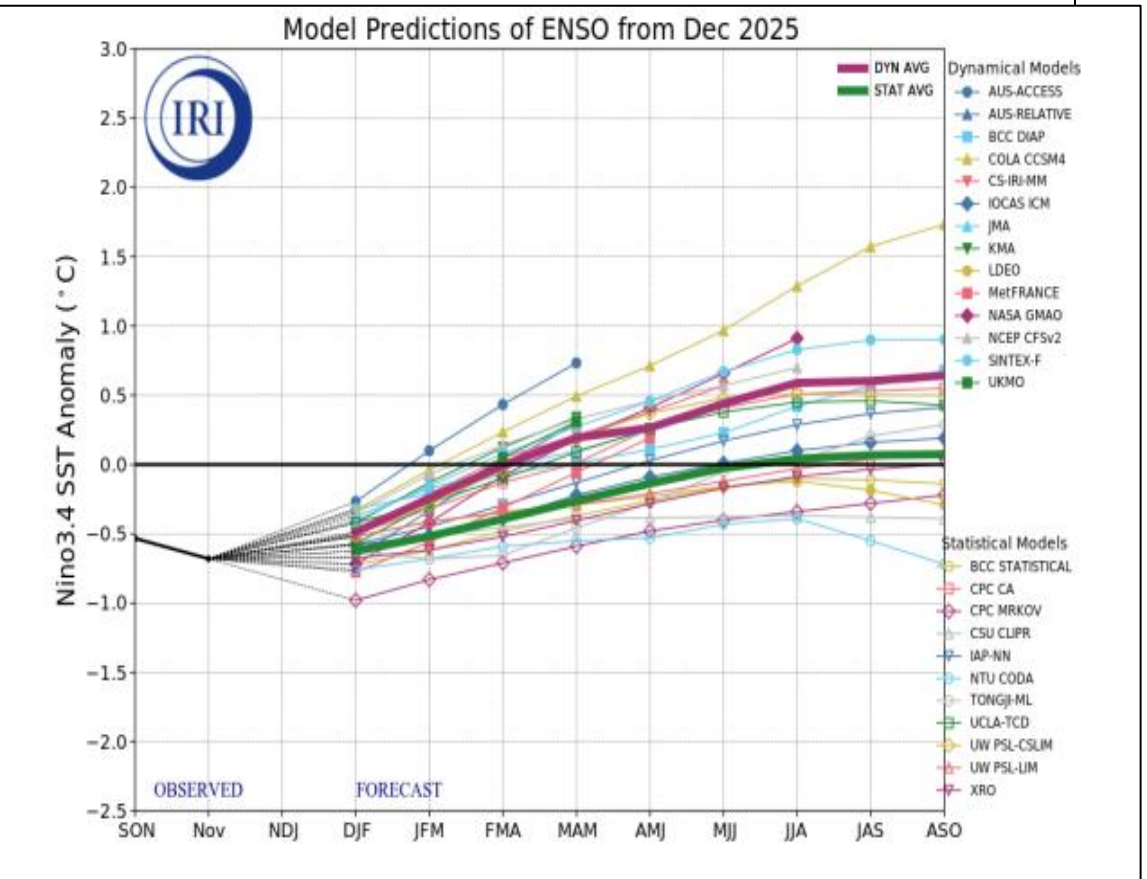
| Strong & Very Strong El Nino Years | Year Following a Strong & Very Strong El Nino Year | | Streamflow as % of 1991 - 2020 Average | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Feb-Sep | Apr-Sep | Apr-Sep | Apr-Sep | Apr-Sep | Apr-Sep | Apr-Sep | Apr-Sep |
| | | | | | Sorted high to low | | | | | |
| Very Strong | | ENSO | Owyhee River below Dam | Bruneau River | Boise R nr Boise | Payette River nr Horseshoe Bend | MF Salmon River at MF Lodge | Salmon River at White Bird | Selway River | Spokane River nr Post Falls |
| 2015-16 | 2017 | LA | 155 | 182 | 184 | 164 | 180 | 148 | 104 | 110 |
| 1982-83 | 1984 | LA | 363 | 343 | 162 | 146 | NA | 144 | 126 | 109 |
| 1997-98 | 1999 | LA | 100 | 116 | 138 | 140 | 121 | 124 | 112 | 126 |
| | | | | | Sorted high to low | | | | | |
| Strong | | | | | | | | | | |
| 1972-73 | 1974 | LA | 120 | 104 | 185 | 188 | 182 | 164 | 145 | 189 |
| 1991-92 | 1993 | N | 165 | 125 | 124 | 128 | NA | 107 | 94 | 114 |
| 1965-66 | 1967 | N | 69 | 93 | 107 | 111 | NA | 119 | 109 | 110 |
| 1987-88 | 1989 | LA | 145 | 103 | 99 | 91 | NA | 78 | 102 | 114 |
| 1957-58 | 1959 | EL | 20 | 50 | 89 | 99 | NA | 101 | 124 | 136 |
| 2023-24 | 2025 | LA | ~100 | 66 | 90 | 101 | 88 | 84 | 80 | ~69 |
| ★ Mar 5 NWS 50% Exceedance Forecast | | | 131% | 121% | 112% | 115% | 117% | 103% | 90% | 83% |
| Mar 1 NRCS 50% Exceedance Forecast | | | 127% | 107% | 117% | 112% | 104% | 90% | 108% | 75% |

| Sorted high to low | Color Code for Streamflow as % of Average |
|---|---|
| | < 80% |
| | 80-110% |
| | 110-150% |
| | > 150% |

# EL NINO 2026 IS COMING

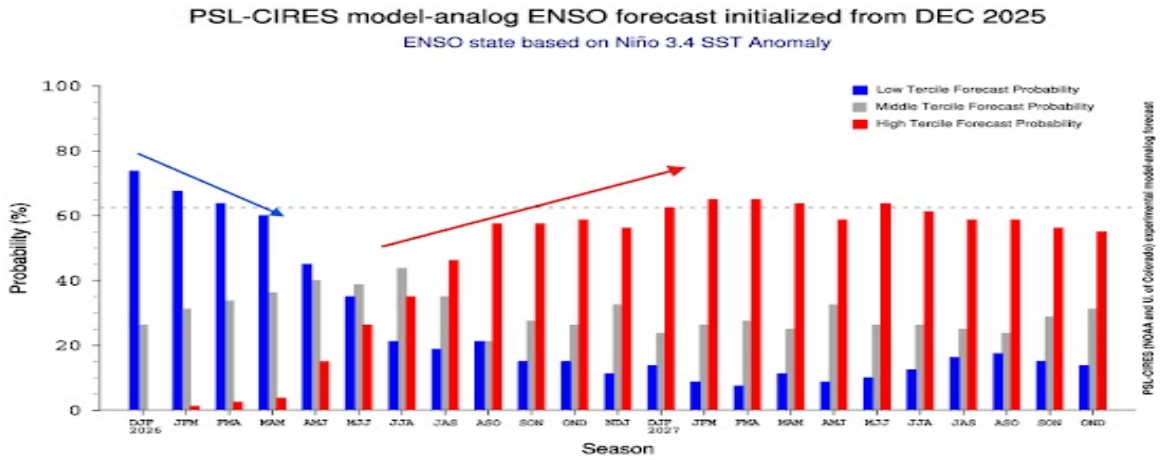
The first hint of a possible El Niño is already visible in the latest extended range ocean forecasts for 2025/2026. These calculations show a rather rapid reversal in the oceans, which is usually fueled by significant global weather changes.

The long-range ensemble forecast below shows the forecast for the main ENSO region. The La Niña conditions (with a value of -0.5 or lower) will begin to dissipate during winter. But the extended forecast shows that most calculations shift into the warm anomalies and are also well above the 0.5 threshold of the El Niño event.




**Sep 2025 - Maybe we'll see an El Nino sooner than later…**
**El Nino is setting up for Winter 2026-27. I've never seen them calling this out so early, so must be feeling confident, and a possible double dip El Nino into 2027-28 !!**

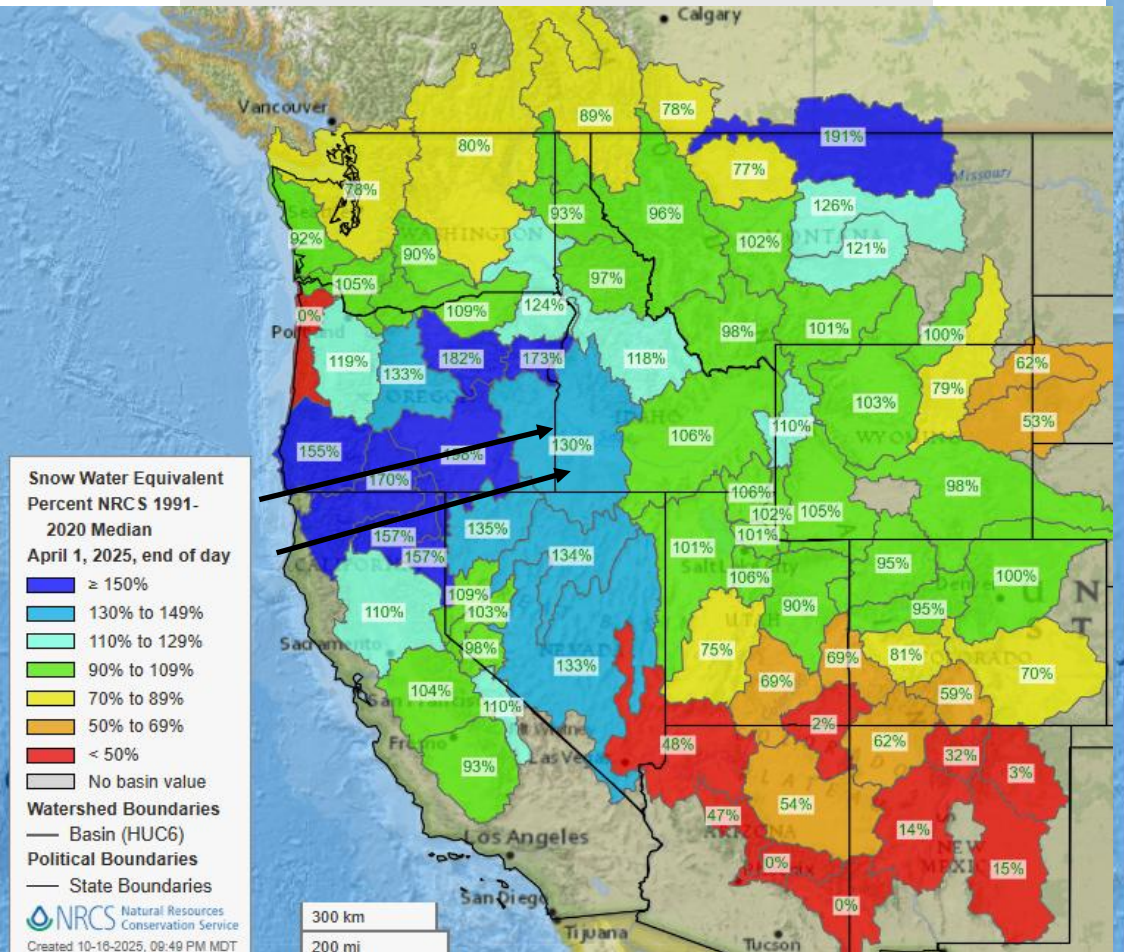
The CPC official probabilistic ENSO forecast shows a clear shift into El Niño mode for 2026/2027, giving a full El Niño state by early Fall 2026. This shows the event peaking during Winter, potentially lasting for a second year. You can also see the rapid decline of the current La Niña event.



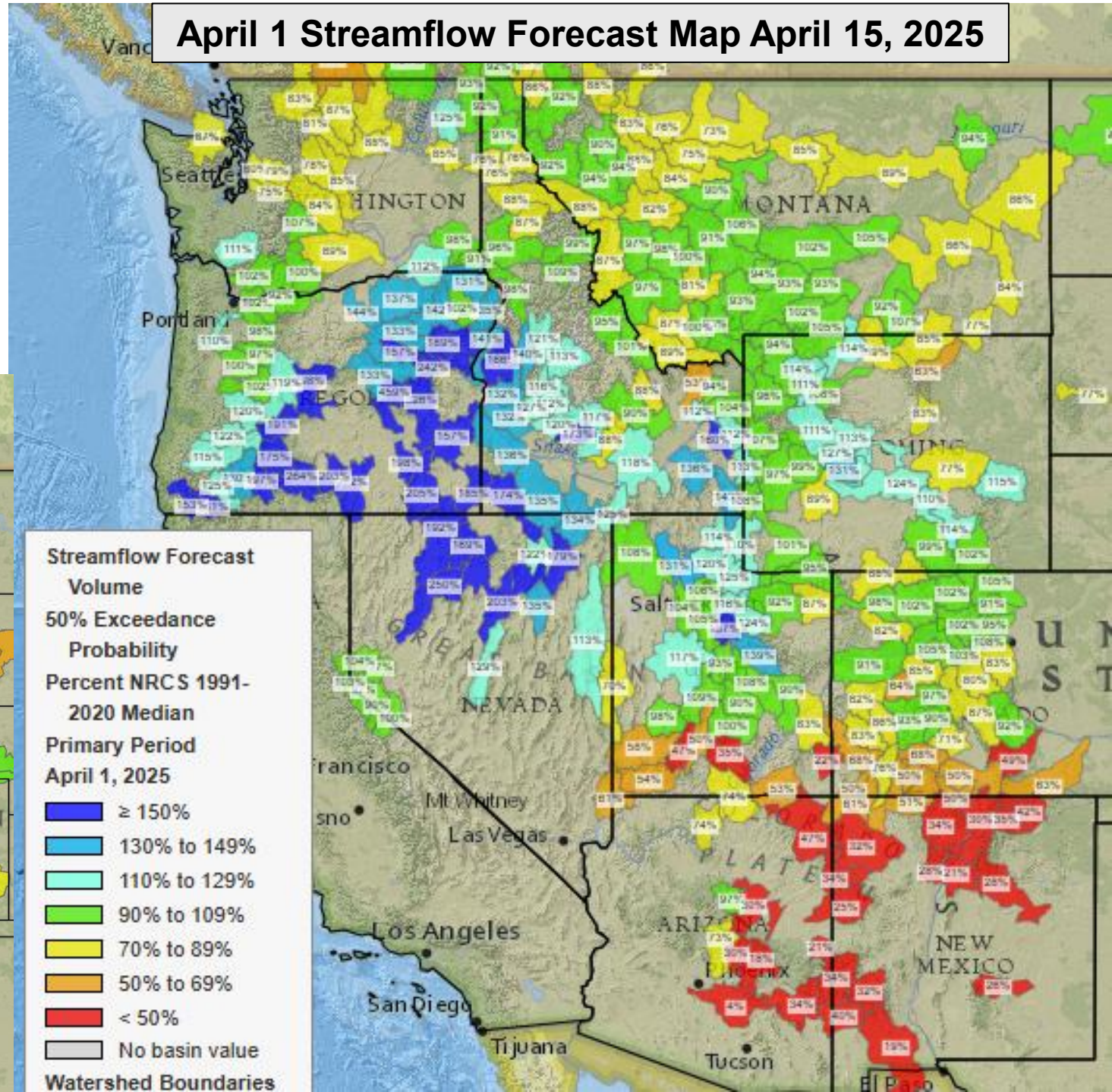
# April 1, 2025 - Water Supply Forecasts were looking promising for PNW

**2025 April 1 snow was near average or better except in the SW US. Best snow was up the Klamath Basin across Oregon to SW Idaho / West Central Idaho.**

## Westwide Snow Water Equivalent Map April 1, 2025

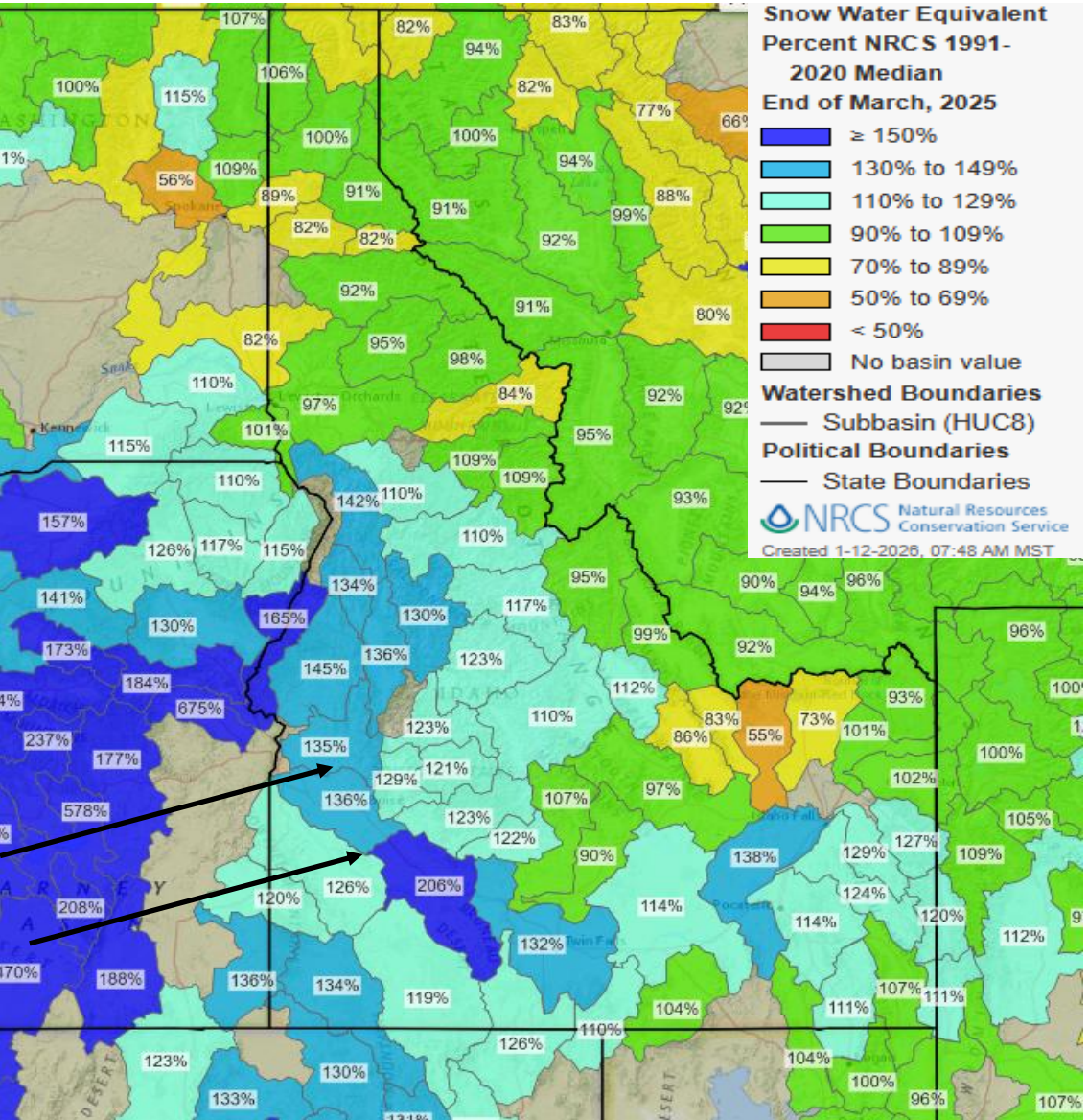


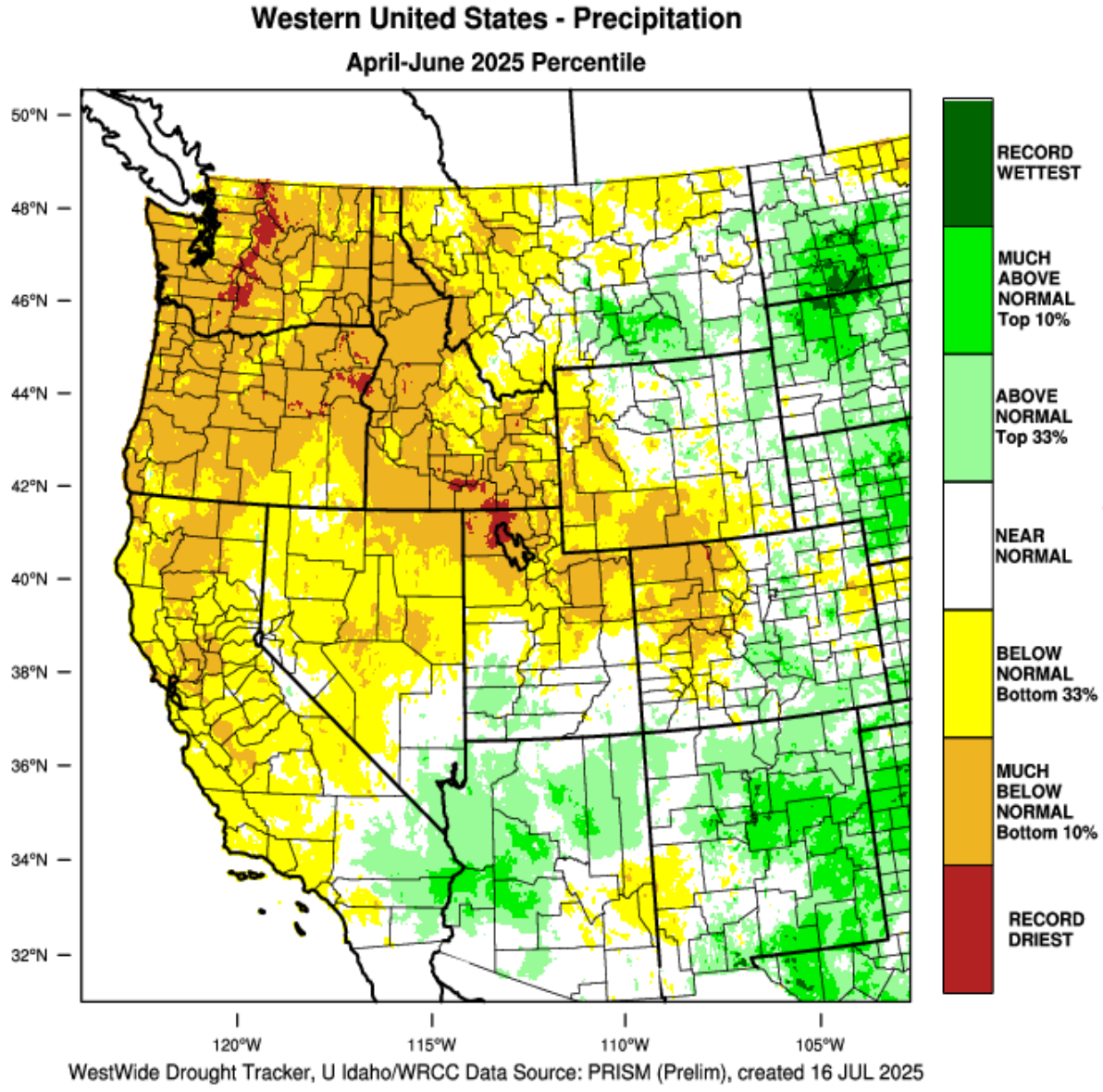

## April 1 Streamflow Forecast Map April 15, 2025



# Good April 1, 2025 Snowpacks
# + Near Record Low Spring Precip
# = Much Less Than Expected Runoff

**Lessons Known – Spring Precipitation can make your break the streamflow runoff forecasts. Apr-Jun precip amounts were Much Below, Bottom 10%, even pushing RECORD DRIEST.**

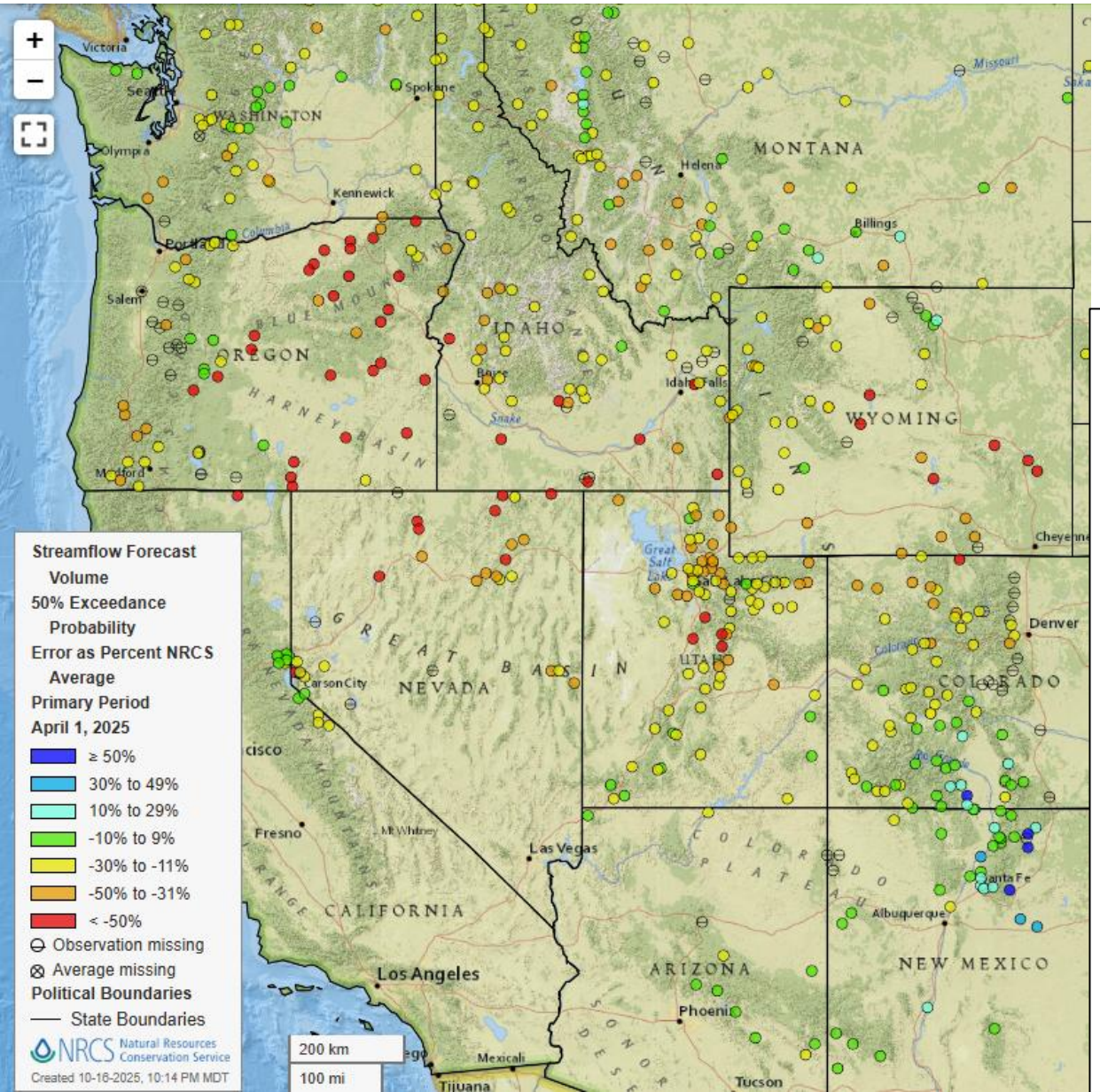


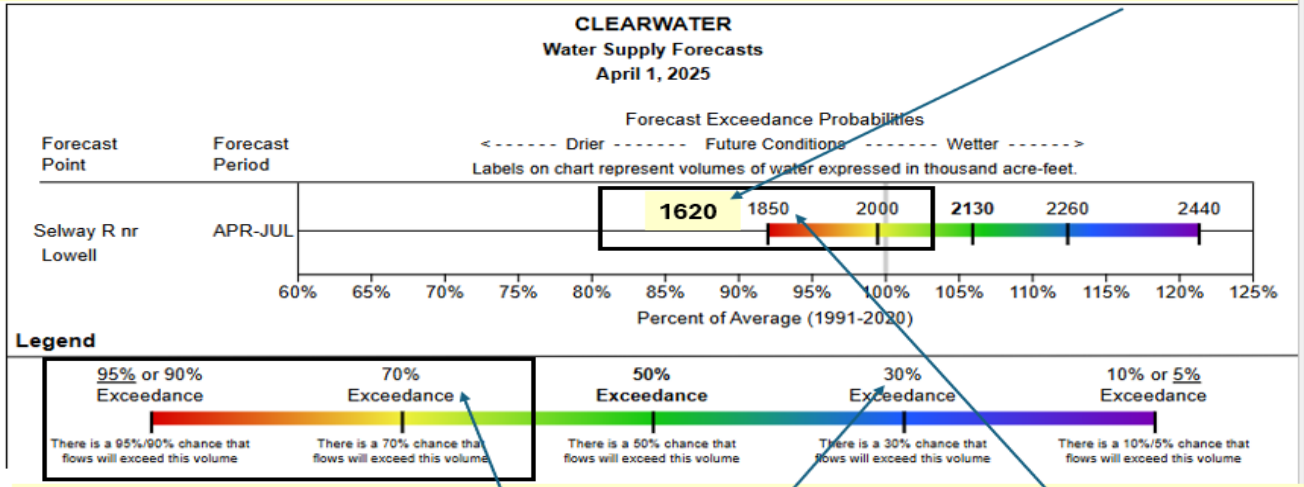
# Lessoned Learned and a Runoff Year to Remember

**Lack of Spring Precipitation, Apr-Jun, pushed runoff forecasts down to the minimum forecast volumes, the 90% Exceedance Levels.**

**Spring precip impacts projected runoff when it is 75 or 125% of normal, but I don't recall a year with near normal snowpacks and record low spring precip like spring of this year.**




**Selway River Runoff Volume Forecasts for Apr-Jul**
**NRCS April 1, 2025** **Table in 1000 Acre-Feet**
**As of June 24, 2025, Selway River Apr-Jul Runoff Volume should be around 1620 KAF**




**Spring precip was only 50-70% of average and resulted in runoff less than the 90% Exceedance Forecast. This is why it's important to adjust the volume you are using in your decision-making process. FYI – it takes normal spring precip for the 50% Exceedance Forecast Range to occur.**

**Lessons learned in the past:**

- **When Apr-Jun spring precip was dry, 75% of average, runoff volumes would be in the 70% Exceedance Forecast Range.**
- **And if Apr-Jul spring precip was wet, 125% of average, runoff volumes would be in the 30% Exceedance Forecast Range.**

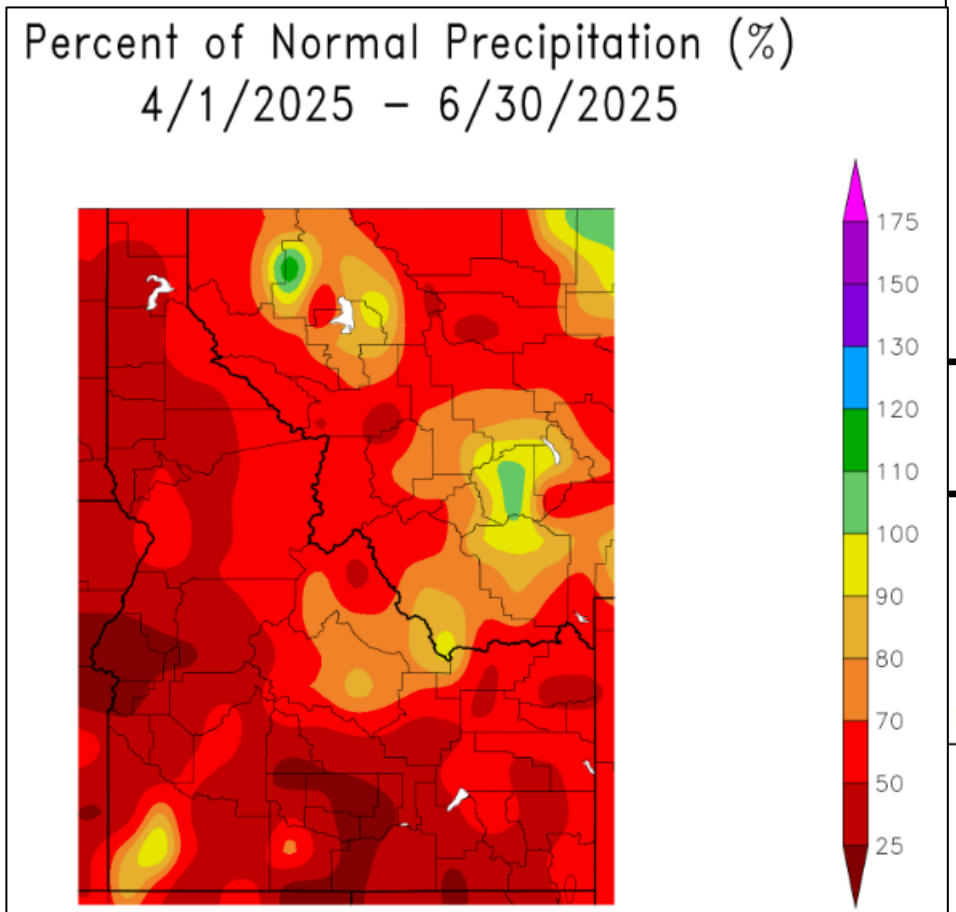
# Lesson Learned about Spring Precipitation - Living with the Extremes

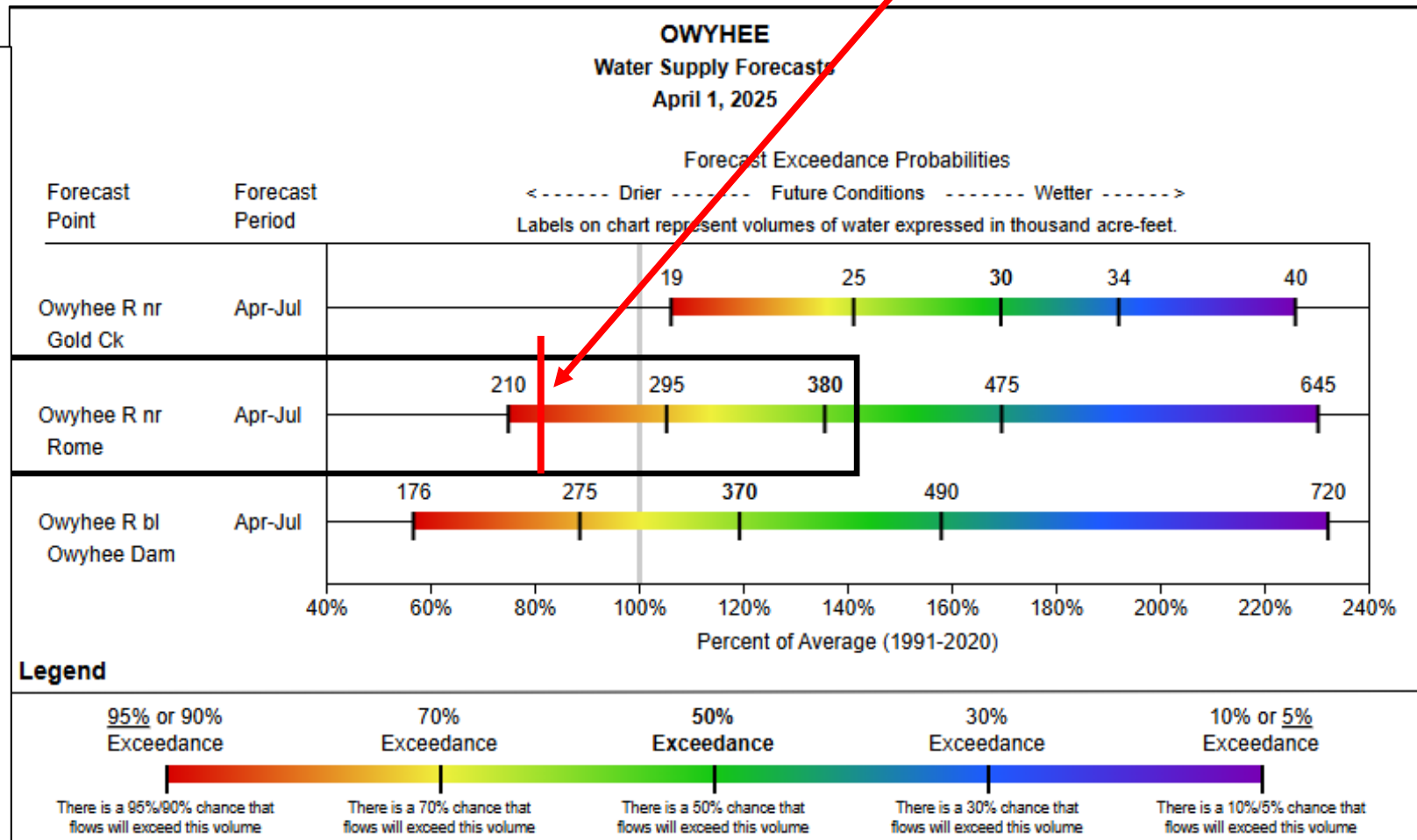
**Owyhee River nr Rome Volume Forecasts for Apr-Jul**
**NRCS April 1, 2025 KAF**

**NRCS Apr-Jul Forecast was for 380 KAF with a Min Forecast of 210 KAF.**

**Observed Runoff was 217 KAF**

**Idaho Apr-Jun precip was only 25 - 90% of average**



**Summer Precipitation**
**Near normal or better in SW Idaho.**

**Helped but too late to benefit spring runoff.**