

# Montana Water Supply Outlook Report

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January 1, 2025



Pictured is Soda Butte Creek near Cooke City, Montana. Since mid-December, snowfall has nearly doubled the snowpack at SNOTEL stations near Cooke City. While much of Montana received significant snowfall during the last couple of weeks in December, most snowpack percentages remain below normal. Recent active weather provided a much-needed shift from the warm and dry conditions experienced in October and November. However, it is still too early to predict the impact on spring runoff. Although conditions are notably better than at this time last year, much of Montana remains below average for precipitation this season. (Photo: Eric Larson 1/5/2025)

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# Statewide Overview

## Summary

Following a slow start to the snowpack accumulation season, snowy weather during the last week of December and first week of January has drastically improved snowpack conditions. The largest snowfall accumulations occurred in western and northwest Montana, while northern Wyoming basins benefited less from the late-December storms. Despite recent improvements, snowpack percentages remain slightly below normal across most of Montana. The exceptions are northwest Montana and the Bears Paw Mountains which have a slightly above normal snowpack. For the rest of the state, the lack of snowfall during October and November created a deficit that will require sustained snowfall to overcome.

Regardless of the region, there is still a significant portion of winter ahead, and snowpack conditions can change substantially between now and when they are most critical. In Montana, the mountain snowpack generally peaks in April, and conditions at that time will provide a more accurate indicator of the upcoming spring snowmelt season. Currently, SNOTEL stations in northwest Montana report snow water equivalent values 1-4 inches above normal, while stations across the rest of Montana are about 1-4 inches below normal. A few significant storms could quickly improve deficit areas, while a lack of snowfall over the next month could result in below-normal snowpack percentages statewide.

While the recent improvement in snowpack conditions is encouraging, there is potential that last year's well below normal snowpack will have implications for the upcoming runoff season. A below-normal snowpack during the previous season can result in reduced soil moisture and low streamflow levels leading into the current season. In such cases, as the snow melts in the spring, the soil may absorb much of the water, potentially reducing available surface water. Although September 2024 brought above-normal precipitation to part of Montana, drought conditions persisted leading into this winter and remain a concern. Normal to above-normal snowpack conditions this winter will be necessary to offset the recent dry conditions.

The following table shows recent years of January 1 snowpack percentages for Montana's major basins. While snowpack levels are currently better than this time last year, they are not as high as they were on January 1, 2023. During 2023, the snowpack remained near or above normal for most of the season but melted out rapidly during May. Last year, snowpack conditions stayed well below normal for the season.

**Three Years of January 1<sup>st</sup> Snowpack Percentages (91-20 Median)**

	Jan. 1, 2023	Jan. 1, 2024	Jan. 1, 2025
Bear Paw	159	41	136
Bighorn	108	75	69
Bitterroot	100	50	91
Flathead	117	53	105
Gallatin	123	54	93
Jefferson	112	51	75
Kootenai	106	62	117
Lower Clark Fork	113	47	112
Madison	136	54	84
Powder	113	51	60
Smith-Judith-Musselshell	119	49	91
St. Mary	111	51	94
Sun-Teton-Marias	121	26	70
Tongue	103	66	65
Upper Clark Fork	103	36	72
Upper Missouri	115	33	67
Upper Yellowstone	111	55	72

# Statewide Overview

## Precipitation

The 2025 water year got off to a dry start in the mountains of Montana and northern Wyoming with minimal precipitation recorded across the region from October 1-15. Moisture arrived in mid-October, but abnormally warm temperatures meant it fell primarily as rain or a mix of rain and snow, even at upper elevations. For most basins, the first snow at all elevations occurred from October 27 – November 6. SNOTEL sites in the Cabinet and Purcell Mountains and east to Glacier National Park received 1-5 inches of precipitation from this storm. Noisy Basin SNOTEL just northwest of Flathead Lake in the Swan Range received 5.5 inches of precipitation totaling around 30 inches of snow. East of the Continental Divide storm totals were lower, and basins saw precipitation totals about 1-2 inches. The most snowfall received east of the Continental Divide was in the Little Belts with SNOTEL stations reporting 10-22 inches of snow over that 10 day period.

Precipitation during November was near normal in southwest Montana and slightly above normal in northwest Montana. Drier conditions persisted in basins along the Rocky Mountain Front and the Upper Yellowstone, Bighorn, Powder, and Tongue River basins, with those areas receiving about 70-75% of median precipitation. A lack of active weather patterns for most of December resulted in most mountainous areas receiving below normal precipitation for the month. The exceptions were the mountains in the Smith-Judith-Musselshell basin which received 110% of median precipitation in December and Kootenai Basin which received 100% of median.

The tide began to turn just before the New Year with a true winter system bringing much needed snow to Montana and northeast Wyoming. Upper elevations in northwest Montana received 2-6 inches of precipitation or 10-36 inches of snow. For the rest of Montana and the Absaroka Mountains in Wyoming totals were 1-2 inches of precipitation or 5-15 inches of snow. The Wind River and Big Horn Mountains in Wyoming didn't benefit as much from this storm receiving less than an inch of precipitation in the Winds and tenths of inches in the Big Horns. Water year precipitation currently ranges from 70-95% of median west of the Continental Divide and from 60-80% of median east of the Divide.

### December - Highest Total Accumulated Precipitation - SNOTEL/SNOLITE

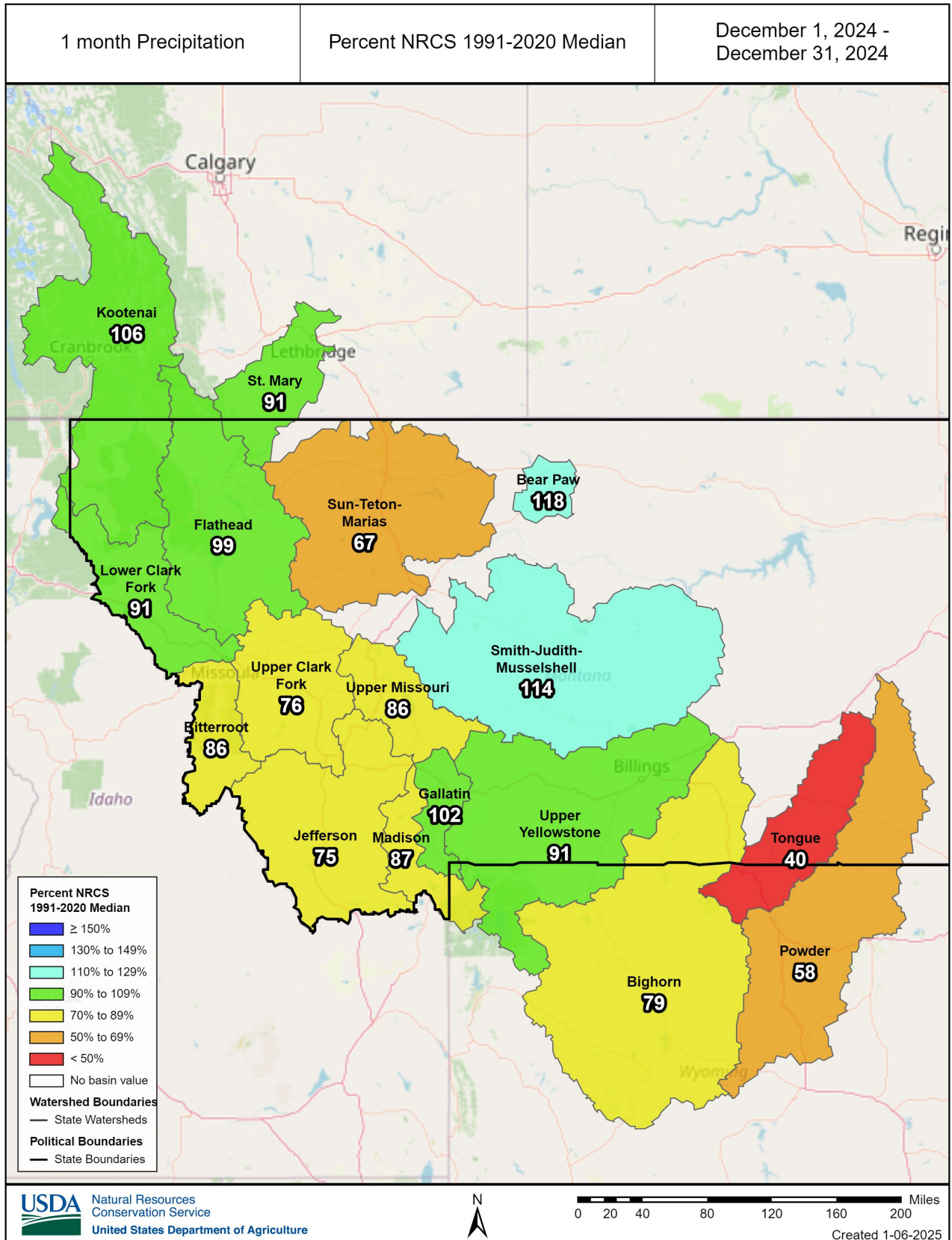
Station	Precipitation (Inches)	Median (Inches)	Elevation	Basin
Bear Mountain	11.9	11.4	5400	Kootenai, Lower Clark Fork
Noisy Basin	9.3	8.1	6040	Flathead
Flattop Mtn.	8.6	8.8	6300	Flathead, St. Mary
Stahl Peak	8.5	6.3	6030	Kootenai, Flathead
Twin Lakes	8.4	8.4	6400	Bitterroot

### December - Lowest Total Accumulated Precipitation- SNOTEL/SNOLITE

Station	Precipitation (Inches)	Median (Inches)	Elevation	Basin
Burnt Mtn	0.1	1.3	5880	Upper Yellowstone
Timber Creek	0.1	0.6	7950	Bighorn
Cole Creek	0.2	1.2	7850	Upper Yellowstone
Hansen Sawmill	0.2	1.0	8360	Powder
Owl Creek	0.2	0.8	8975	Bighorn

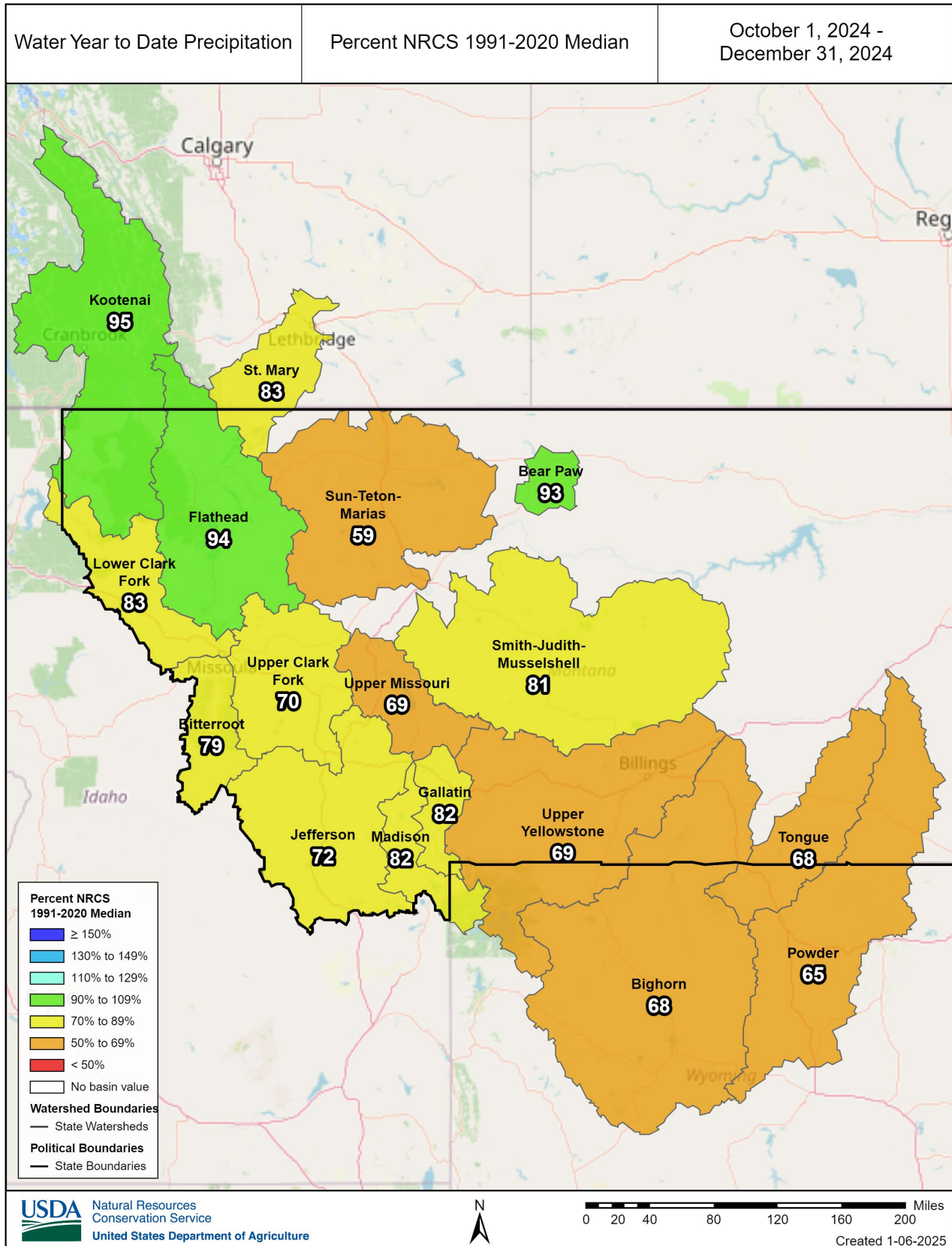
# Statewide Overview

## Precipitation (Continued)



# Statewide Overview

## Precipitation (Continued)



# Statewide Overview

## Snowpack

As of January 1, 2025, Montana’s seasonal snowpack ranges from 60% of median in the Powder River basin to 136% of median in the Bear Paw River basin. There is wide variability in snowpack conditions across the state. This season’s snowpack began accumulating in late October to mid-November. Snowpack accumulation began later than normal in southwest Montana and around normal in northwest Montana. The northwest continued to accumulate snow, while accumulation across the rest of the state stalled. Recent storms helped some basins recover, while others have yet to make up the snowpack deficit. Snowpack in Montana doesn’t typically peak until April, leaving 3-4 months of snowpack accumulation remaining to recover snowpack deficits.

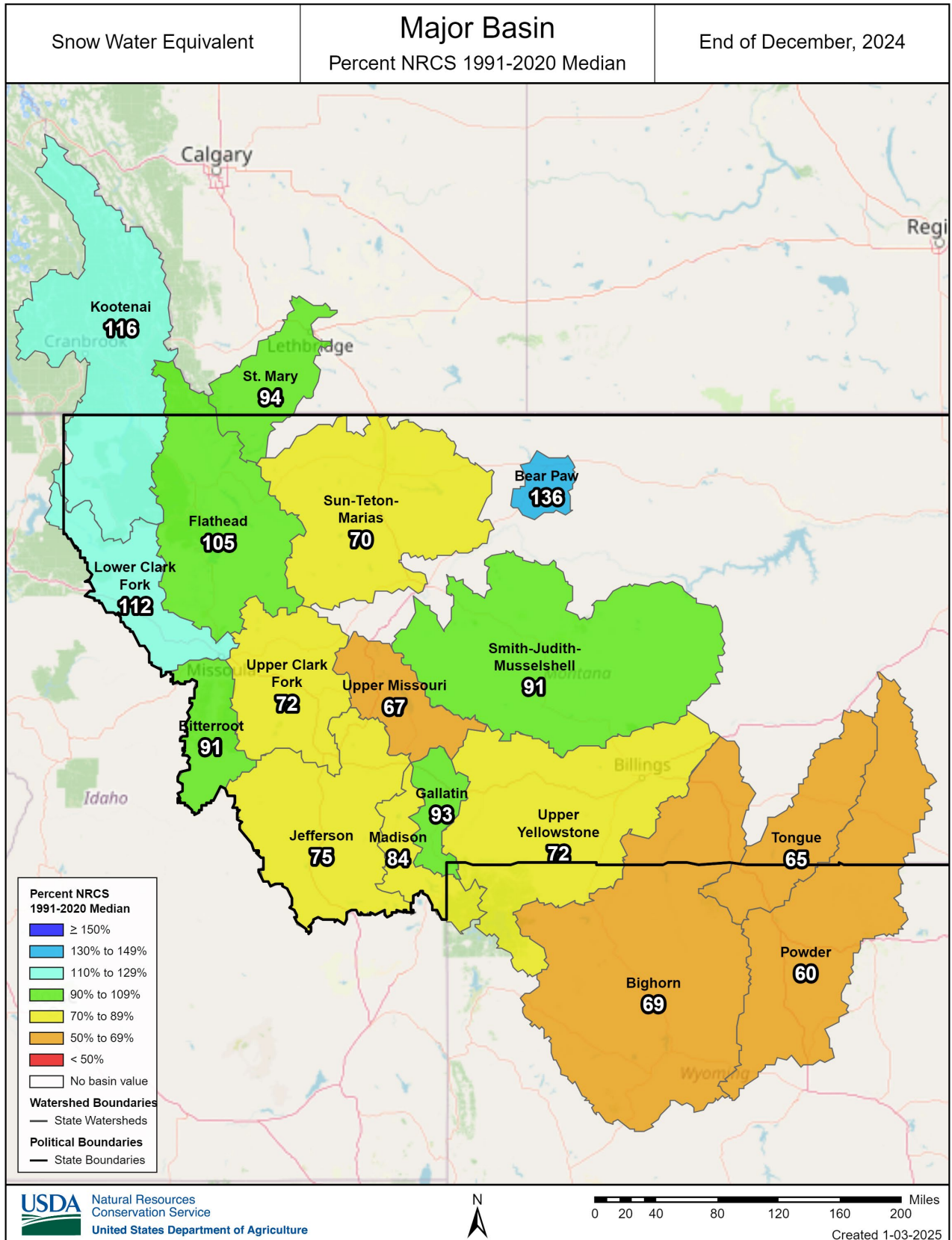
Northwest regions had a strong start to the season recording 105-116% of median snowpack in the Kootenai, Flathead, and Lower Clark Fork River basins. The Bitterroot and St. Mary River basins range from 90-95% of median snowpack. In north central Montana, the Bear Paw Mountains have well above normal snowpack at 136% of median. Maximum snow depths in northwest Montana are around 40-70” of snow with 12-20” of snow water equivalent. Noisy Basin SNOTEL in the northern Swan Range has a whopping 92” of snow and 24.5” of SWE, setting the January 1 record for snow depth. Southwest and central regions of Montana started out slow but made recent gains with late December storms. The Smith-Judith-Musselshell and Gallatin River basins reached 91-93% of median snowpack by January 1. Other regions across Montana started slow and have yet to catch up, recording 60-75% of median snowpack. The snowpack at many SNOTEL sites in these regions remains 1-4 inches of snow water equivalent below median. Looking at years with similar deficits, such as 2005 and 2019, reaching normal snowpack conditions this year is possible with favorable conditions. The northern Wyoming basins draining into eastern Montana have a larger snowpack deficit, similar to 2016 or 2003, that will be more difficult to recover from, however plenty of time remains to make gains.

### Water Year 2025 - Major Basin - Snowpack Percent of Normal ('91-'20)

Basin	Nov 1	Dec 1	Jan 1	Feb 1	Mar 1	Apr 1	May 1	Jun 1
Kootenai	56	127	117	-	-	-	-	-
Flathead	51	124	105	-	-	-	-	-
Upper Clark Fork	38	83	72	-	-	-	-	-
Bitterroot	74	99	91	-	-	-	-	-
Lower Clark Fork	55	134	112	-	-	-	-	-
Jefferson	44	81	75	-	-	-	-	-
Madison	55	88	84	-	-	-	-	-
Gallatin	53	85	93	-	-	-	-	-
Upper Missouri	-	67	67	-	-	-	-	-
Smith-Judith-Musselshell	2	86	91	-	-	-	-	-
Sun-Teton-Marias	25	81	70	-	-	-	-	-
St. Mary	50	106	94	-	-	-	-	-
Upper Yellowstone	41	62	72	-	-	-	-	-
Bighorn	54	65	69	-	-	-	-	-
Powder	54	65	60	-	-	-	-	-
Tongue	80	81	65	-	-	-	-	-
Bear Paw	-	222	136	-	-	-	-	-

# Statewide Overview

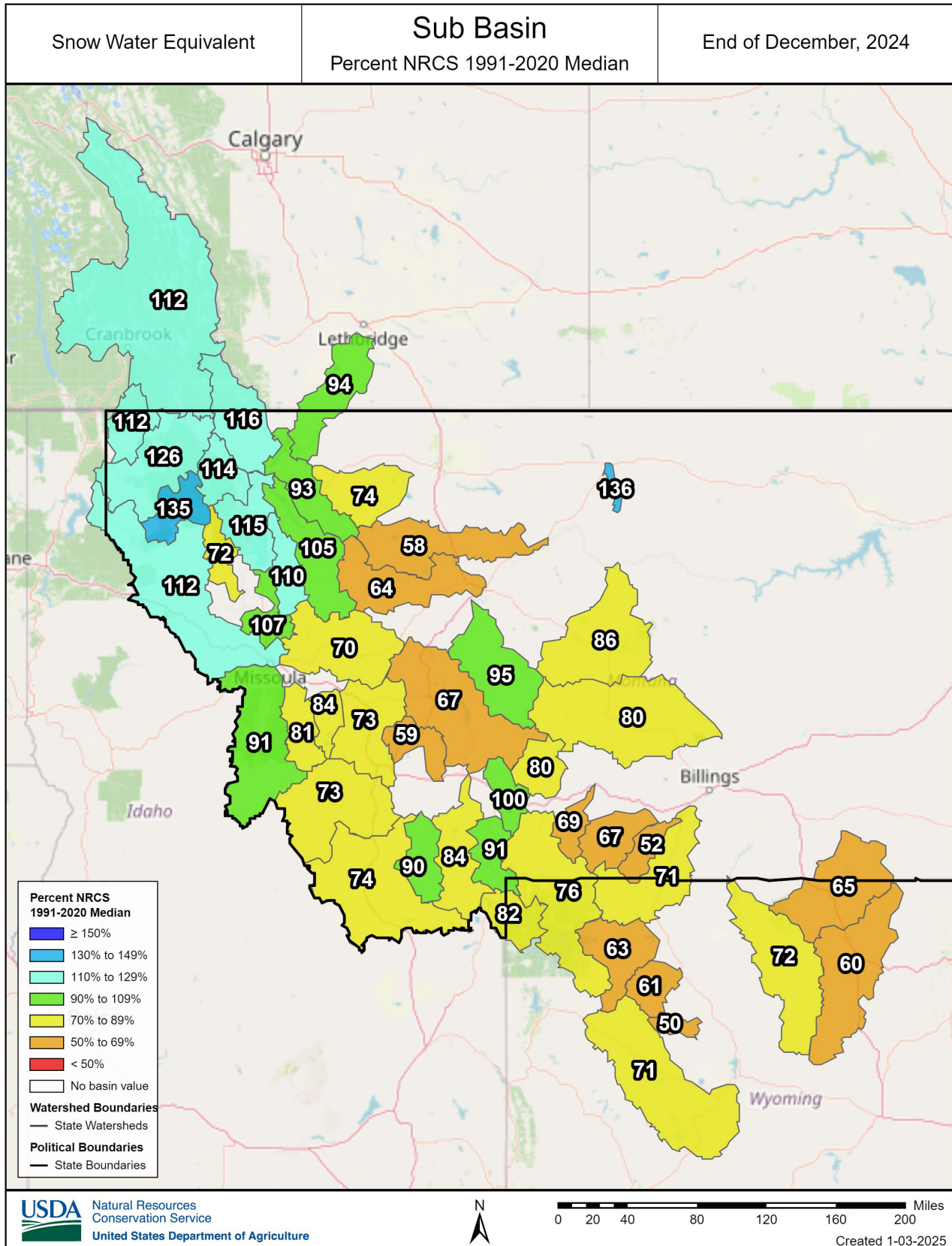
## Snowpack (Continued)





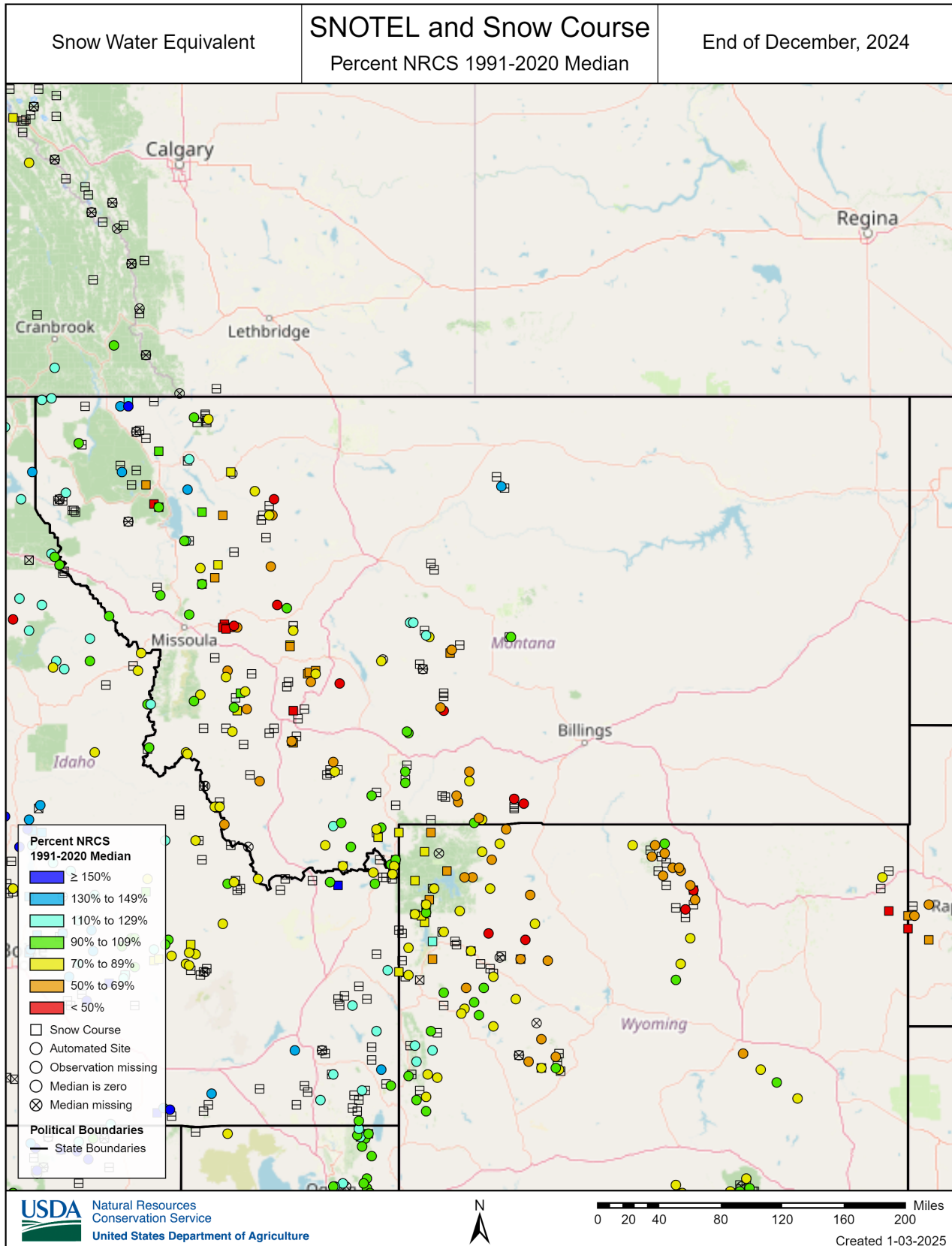
# Statewide Overview

## Snowpack (Continued)



# Statewide Overview

## Snowpack (Continued)



# Statewide Overview

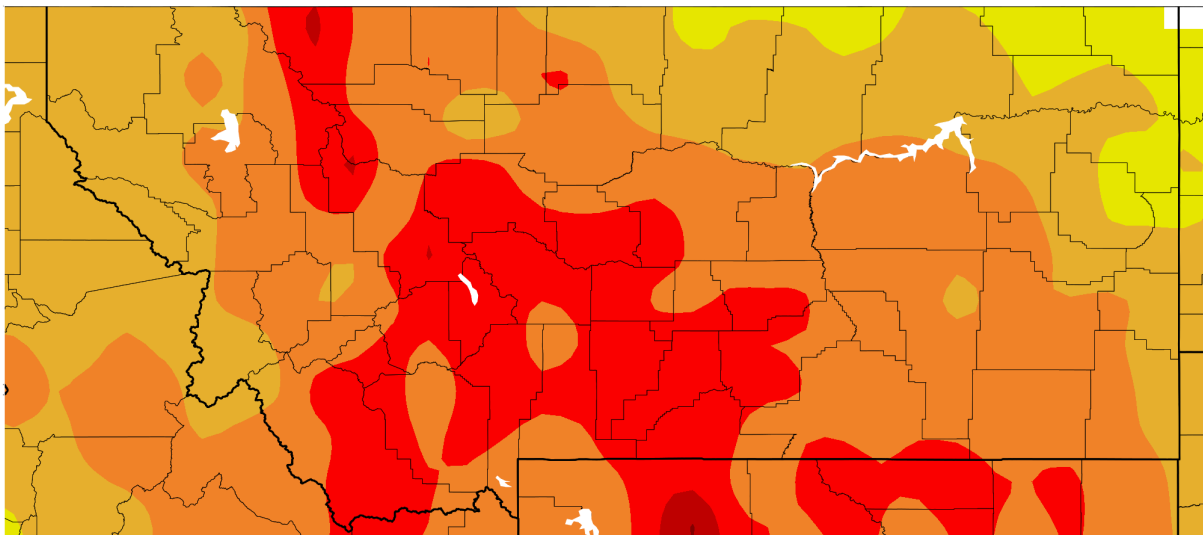
## Temperature

Temperatures in Montana were above average from October 1 to December 31. In most of the state, temperatures ranged from 3-5 °F above normal. Some areas were as high as 5-7 °F above normal and the northeast portion of the state was 1-3 °F above normal.

Temperatures in December were also above normal across the state. The northeast part of the state had temperatures nearest to normal at 0-3 °F above normal. Most of the state had temperatures 6-9 °F above normal. On the western side of the state, temperatures reached 9-12 °F above normal in some areas. A few localized areas, such as a portion of Glacier National Park near the Canadian border, had temperatures up to 12-15 °F above normal.

Daily average temperatures for Montana SNOTEL sites, show the trend of mostly above normal temperatures in December, except for a select few periods of near to slightly below normal temperatures. Near normal temperature periods were December 8-11 and December 29-January 1. Around December 7 and December 21, temperatures were up to 10-15 °F above normal. The trend of above normal daily average temperatures continued into January at the start of the New Year.

### Departure from Normal Temperature (F) 12/1/2024 – 12/31/2024



Generated 1/2/2025 at HPRCC using provisional data.

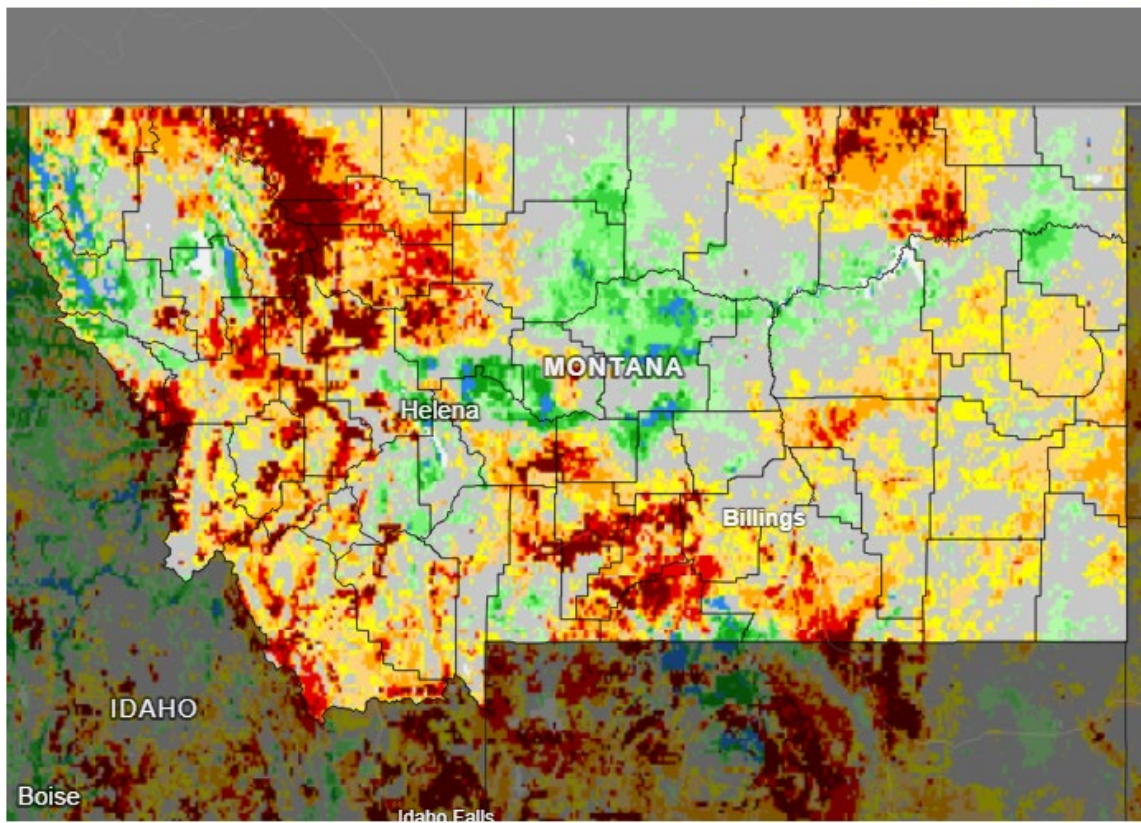
NOAA Regional Climate Centers

# Statewide Overview

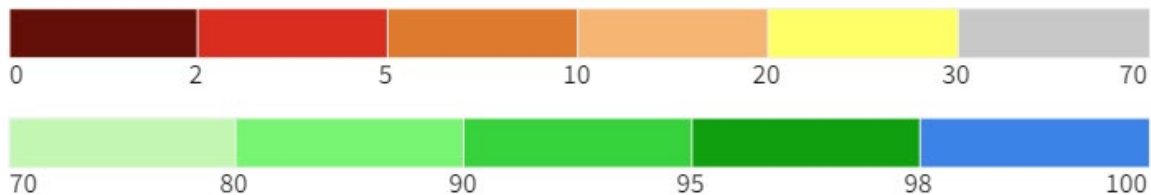
## Soil Moisture

Soil moisture in the top 0-100 cm varies across the state. A significant portion of the state has soil moisture percentiles as low as 0-2%. Other scattered areas have near normal soil moisture percentiles at 30-70%. Isolated areas, such as the central portion of the state and the far northwest, have above normal soil moisture percentiles in the ranges of 80-100%. There is a lot of soil moisture variability across the state as we enter the New Year. Future snow accumulations will affect soil moisture, increases in soil moisture will be necessary to recover levels to near normal in most locations.

NASA SPoRT-LIS 0-100 cm Soil Moisture Percentile



0-100 cm Soil Moisture Percentile



Source(s): NASA  
Data Valid: 01/03/25

**Drought.gov**

# Statewide Overview

## Drought Monitor

The U.S. Drought Monitor map, released on Wednesday, January 1, 2025, classifies 54% of Montana as D1 (moderate drought) to D3 (extreme drought). This is an increase from the start of the water year on October 1, and a significant increase from this time last year, when only 21% of Montana classified as such. Notable shifts from October 1 include an easing of drought conditions across western Montana and an increase in severity across much of central and southeast Montana. Since October 1, Powder River, Carter, Fallon, Custer, Prairie, Wibaux, Dawson and Richland Counties all experienced a 1-2 class degradation to primarily D3. Further West, Powell and surrounding counties improved from D4 (exceptional drought) to D3, while most of Lincoln and Flathead counties saw the removal of drought conditions all together. With regional shifts, 94% of Montana remains abnormally dry (D0). A stark increase from 61% this time last year, and a reflection of the lingering effects of last year's low snowpack.

### U.S. Drought Monitor Montana

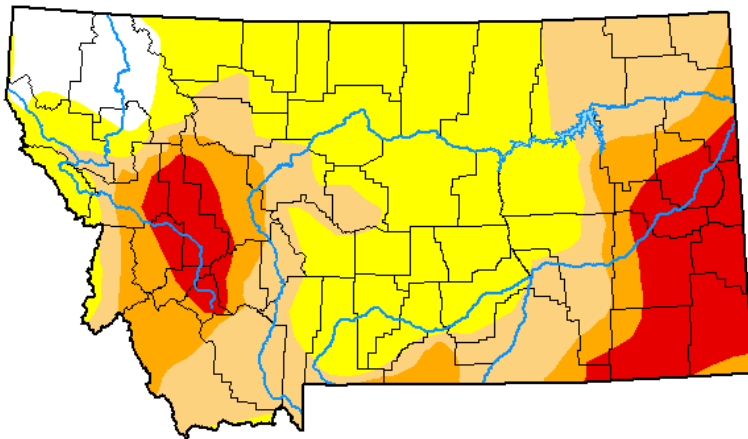
**December 31, 2024**

(Released Wednesday, Jan. 1, 2025)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	5.53	94.47	54.22	27.25	13.79	0.00
<b>Last Week</b> <i>12-24-2024</i>	5.52	94.48	55.40	27.62	13.79	0.00
<b>3 Months Ago</b> <i>10-01-2024</i>	15.18	84.82	42.24	21.05	9.44	0.90
<b>Start of Calendar Year</b> <i>01-02-2024</i>	39.20	60.80	21.30	2.68	0.00	0.00
<b>Start of Water Year</b> <i>10-01-2024</i>	15.18	84.82	42.24	21.05	9.44	0.90
<b>One Year Ago</b> <i>01-02-2024</i>	39.20	60.80	21.30	2.68	0.00	0.00



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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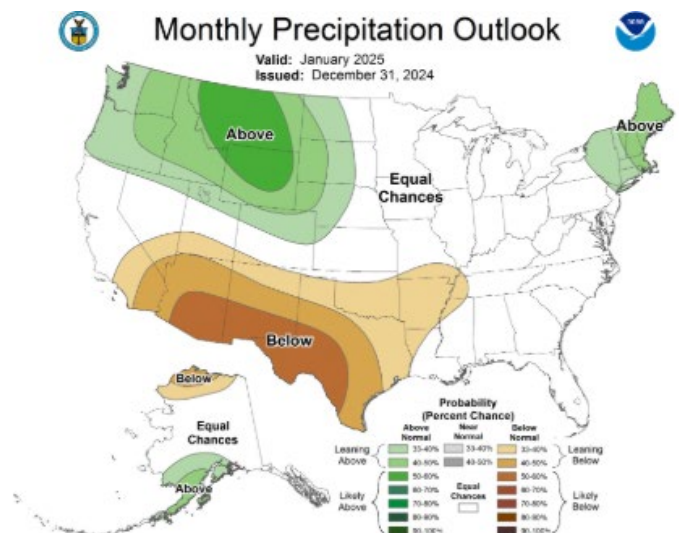
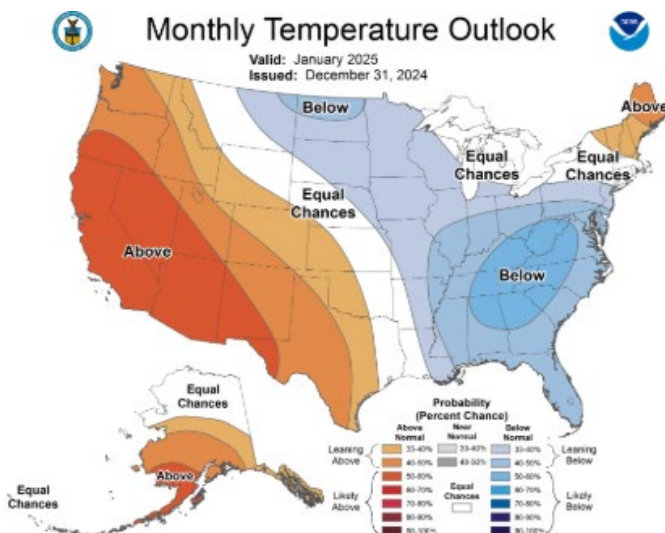
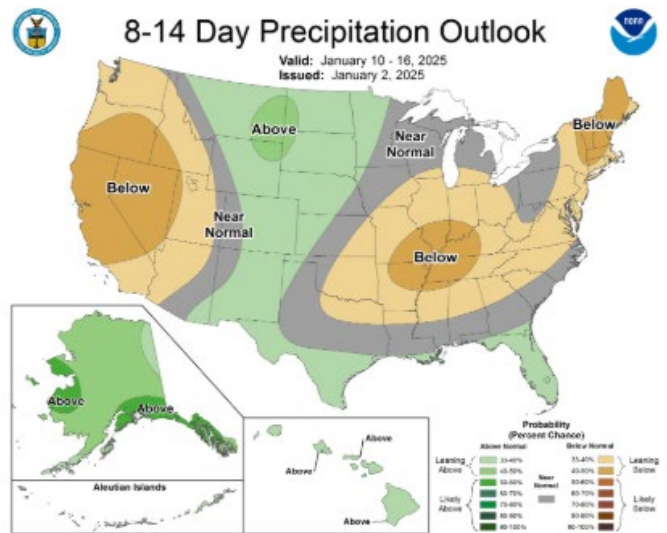
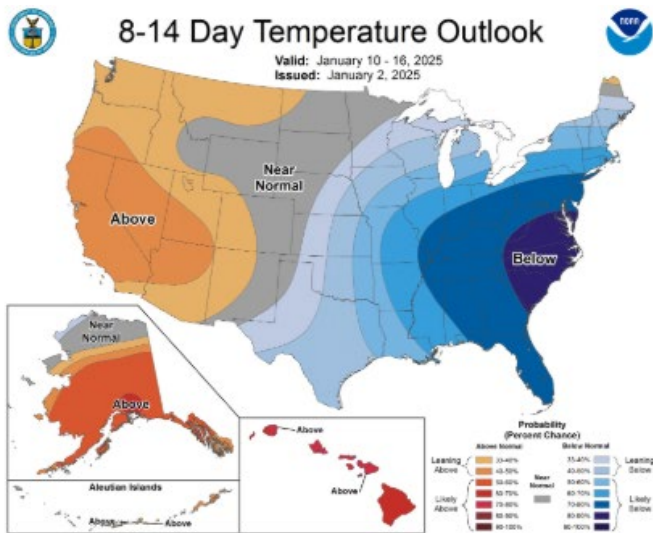


[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

# Statewide Overview

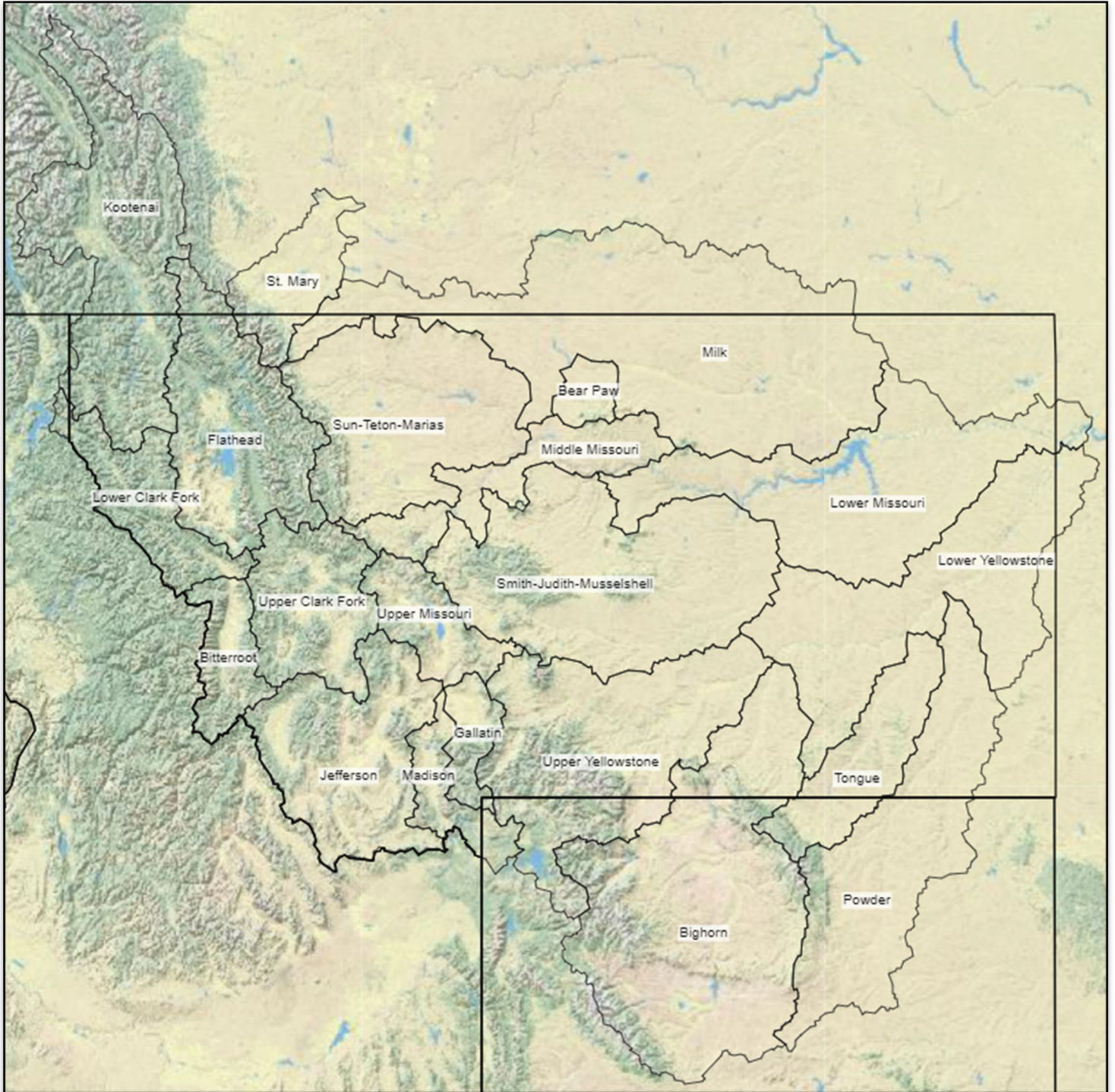
## Weather Outlook

The NOAA Climate Prediction Center's 8-14 day outlook predicts slightly above normal temperatures for most of the state with near normal temps along the southern border for the week of January 10-16. During the same period, NOAA indicates near normal precipitation for Montana's most western reaches and slightly above normal precipitation for the rest of the state. NOAA's January 1-month outlook indicates equal chances of above or below normal temperatures for central Montana, while leaning above normal along the west and below normal in the northeast corner. There are above normal chances of precipitation in Montana for January. Above normal precipitation and near normal temperatures could help bolster our snowpack across much of the state as we move deeper into winter.



# Basin Overview

## Montana River Basin Definitions

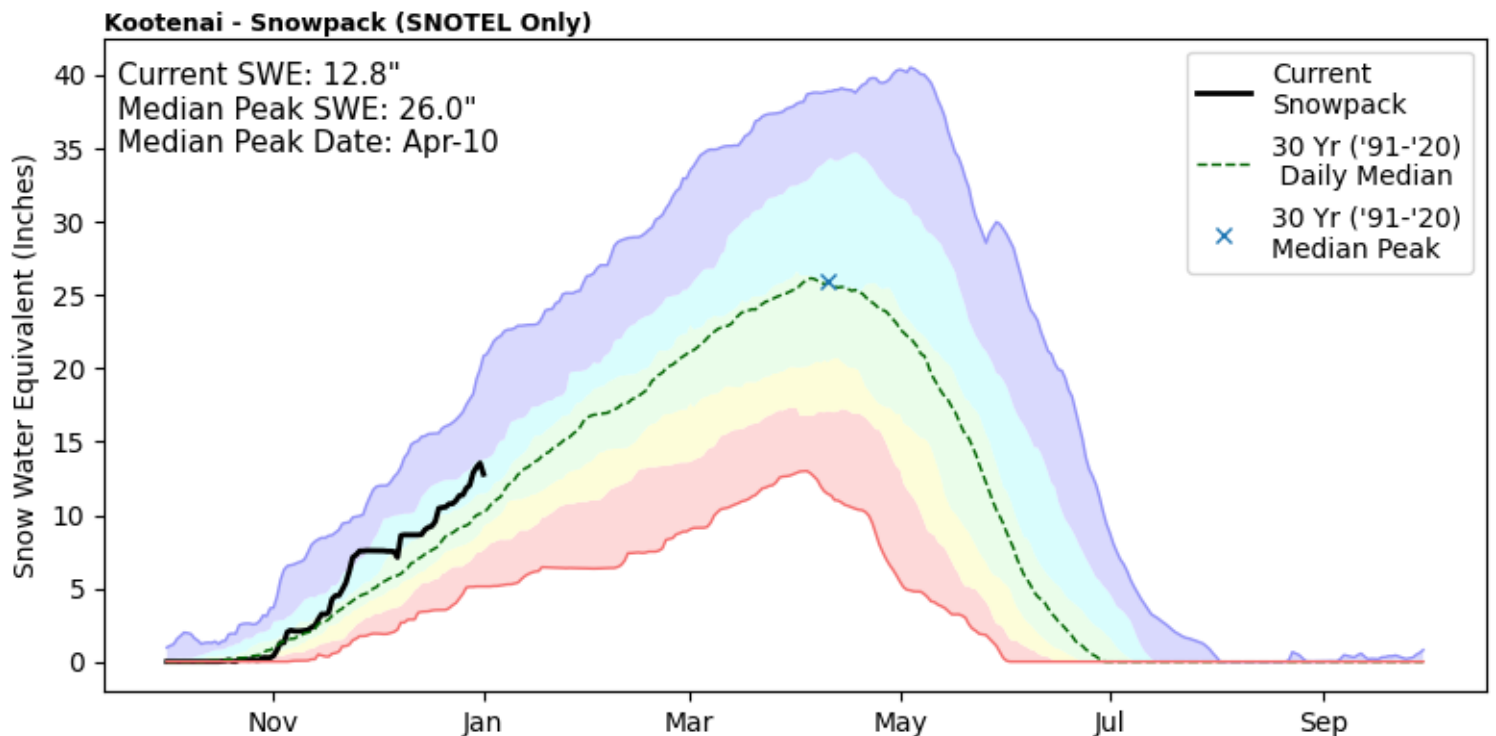
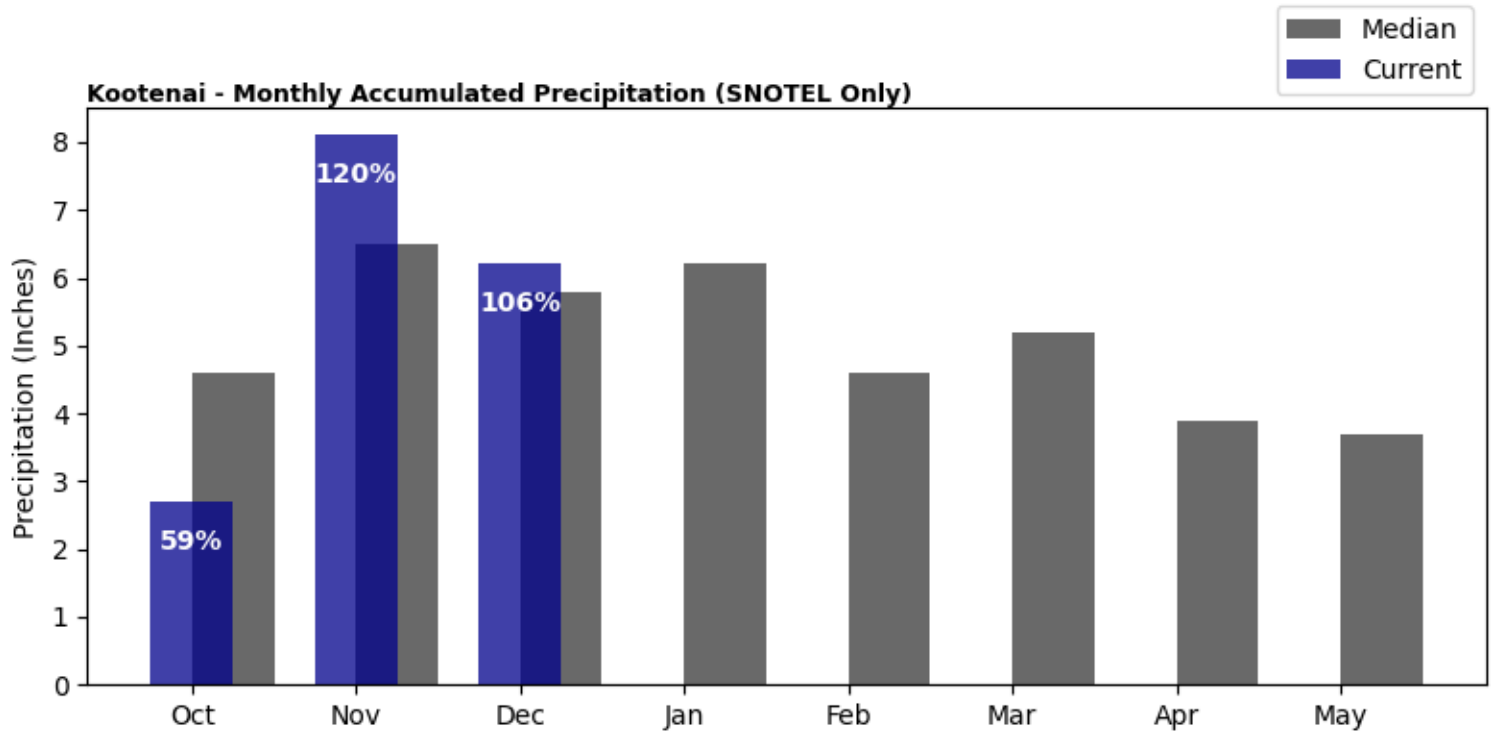


The following basin overview sections only include basins that have SNOTEL sites. For example, there is no basin overview for the Lower Yellowstone, because there are no SNOTEL sites associated with that basin. Water supply information for basins not included in the following sections can be found at <https://nwcc-apps.sc.egov.usda.gov/>

# Basin Overview

## Kootenai

Precipitation in December was above normal at 106%, which brings the seasonal accumulation (October-December) to 95% of median. The snowpack in the Kootenai is above normal at 117% of median, compared to 62% at this time last year.

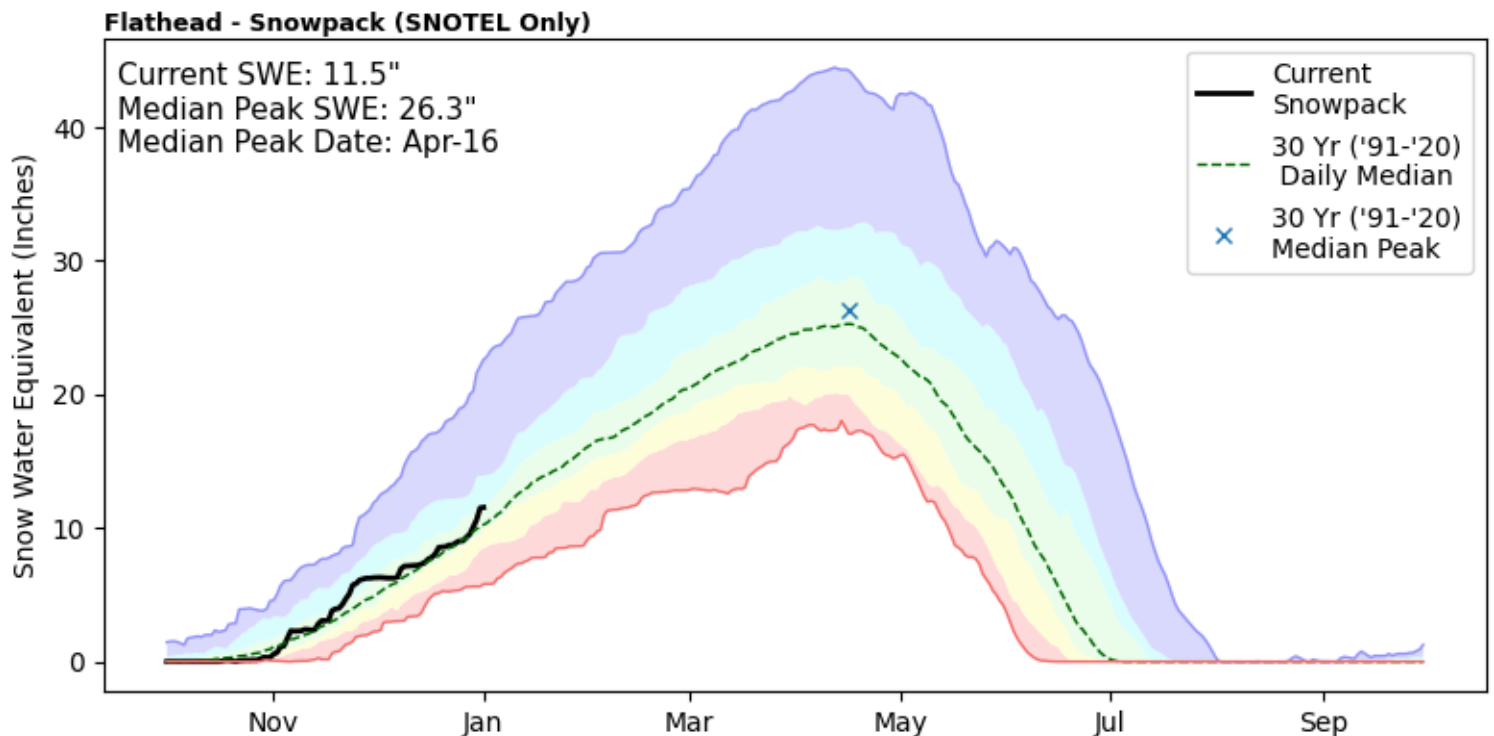
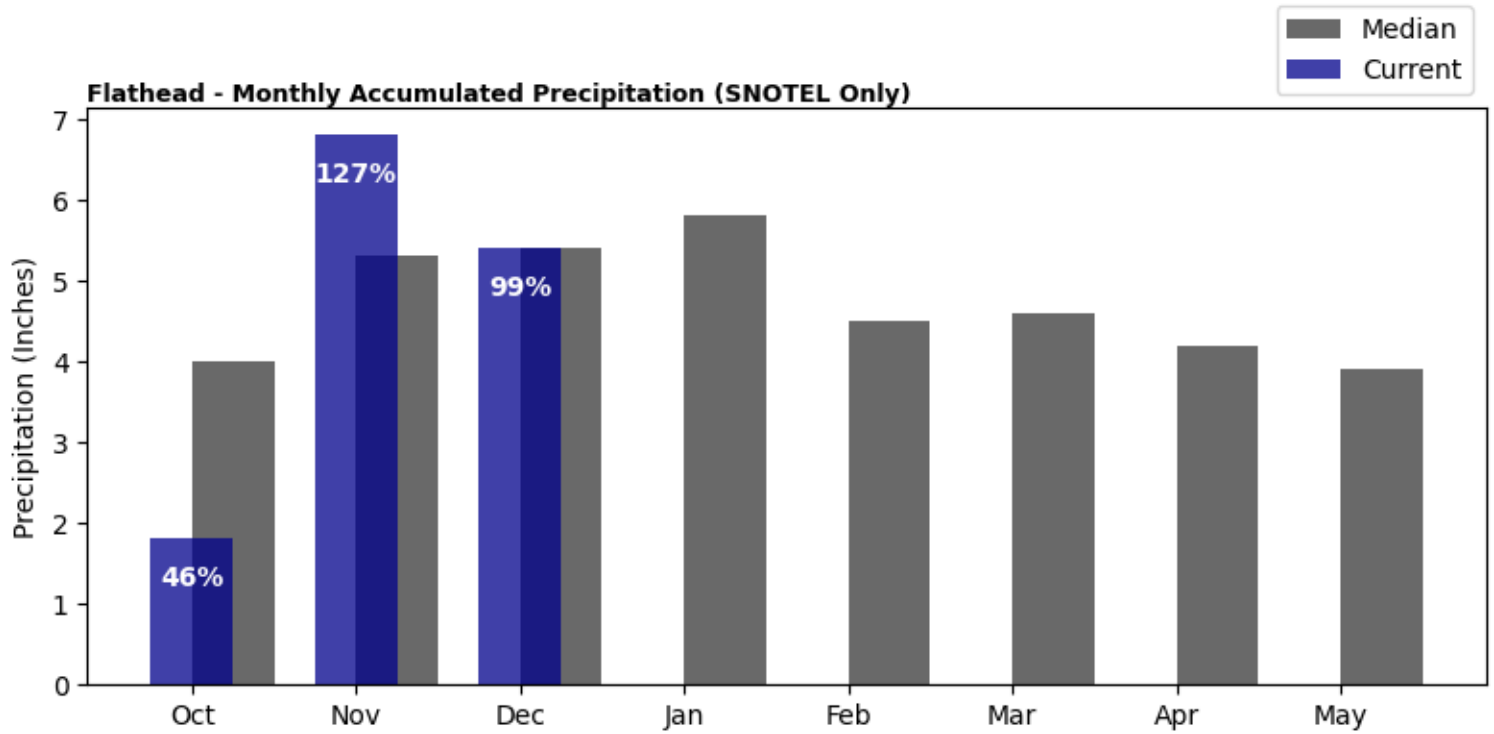




# Basin Overview

## Flathead

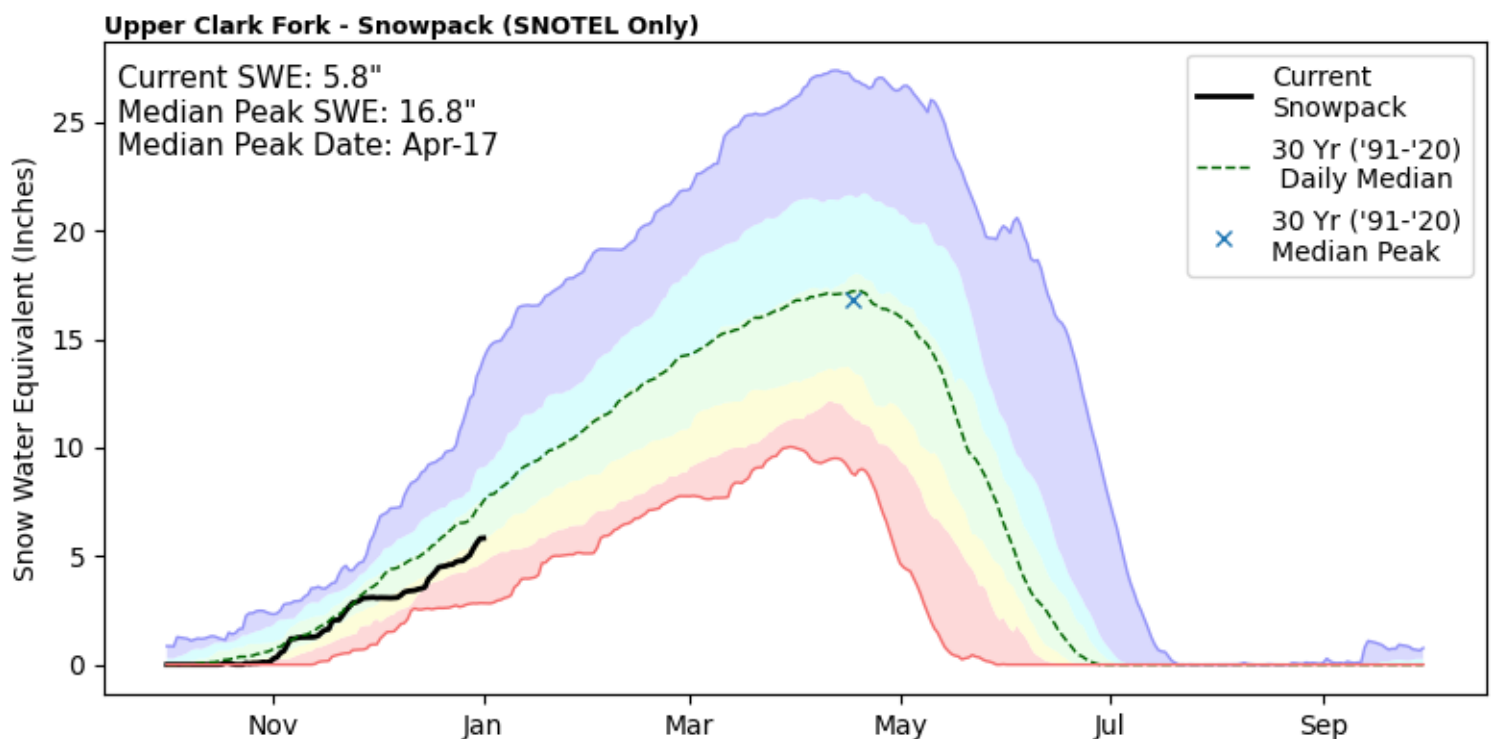
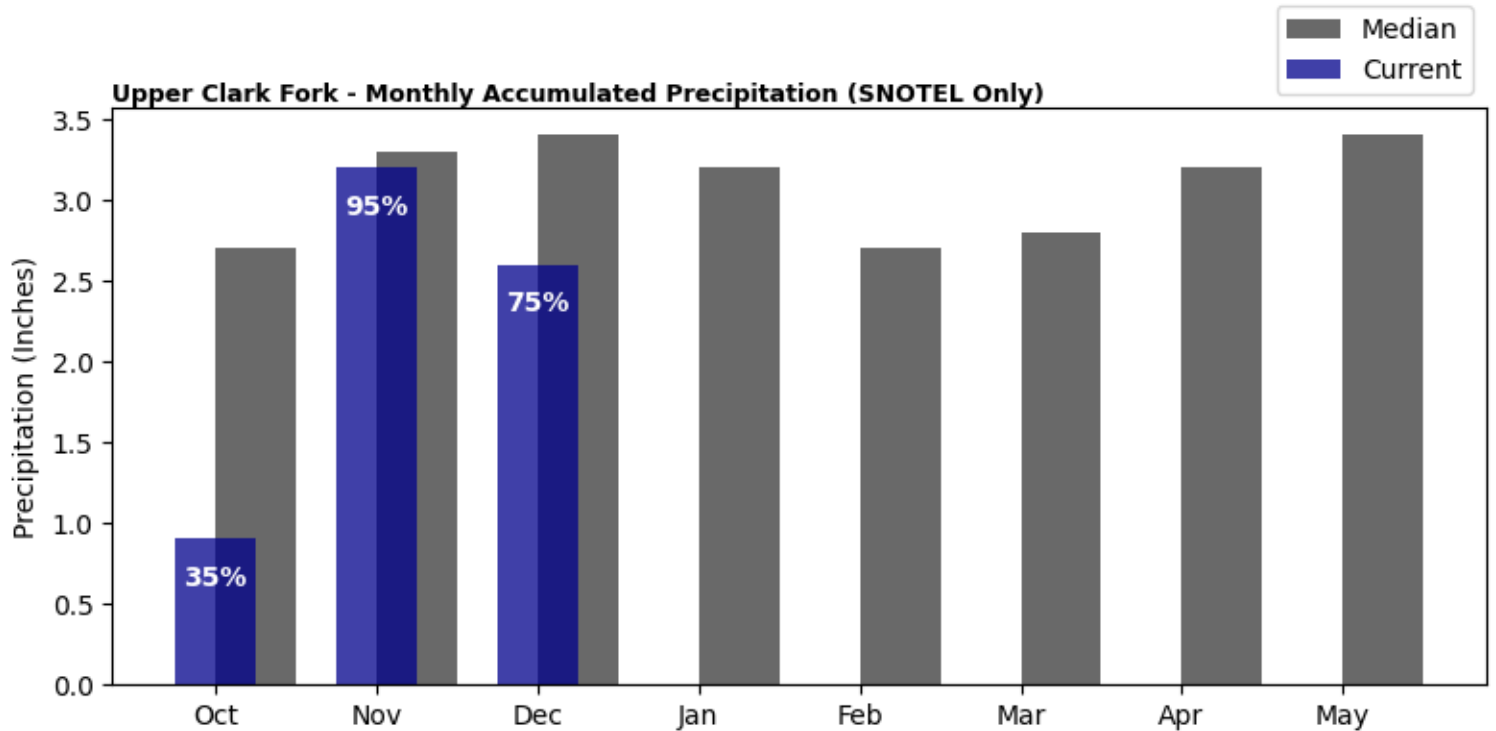
Precipitation in December was near normal at 99%, which brings the seasonal accumulation (October-December) to 94% of median. The snowpack in the Flathead is above normal at 105% of median, compared to 53% at this time last year.



# Basin Overview

## Upper Clark Fork

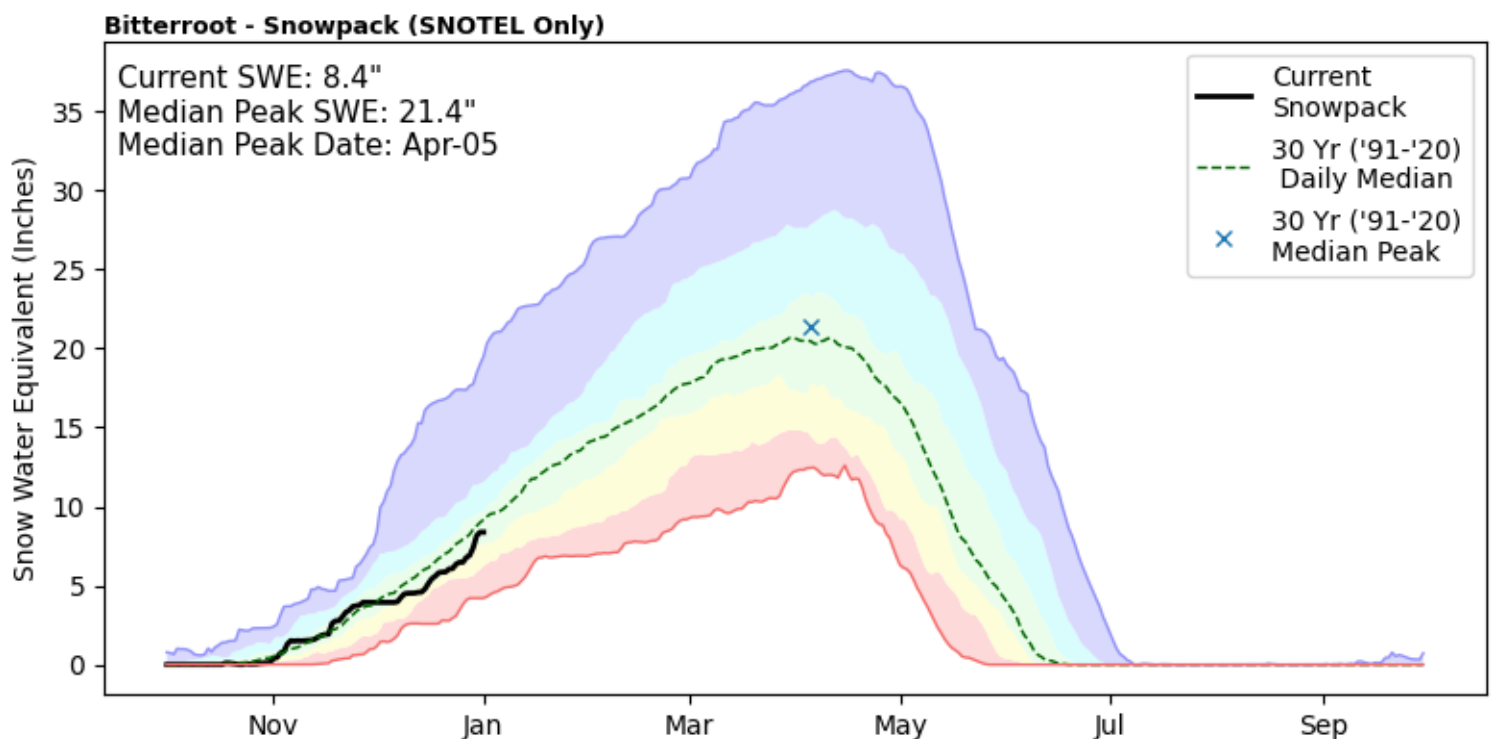
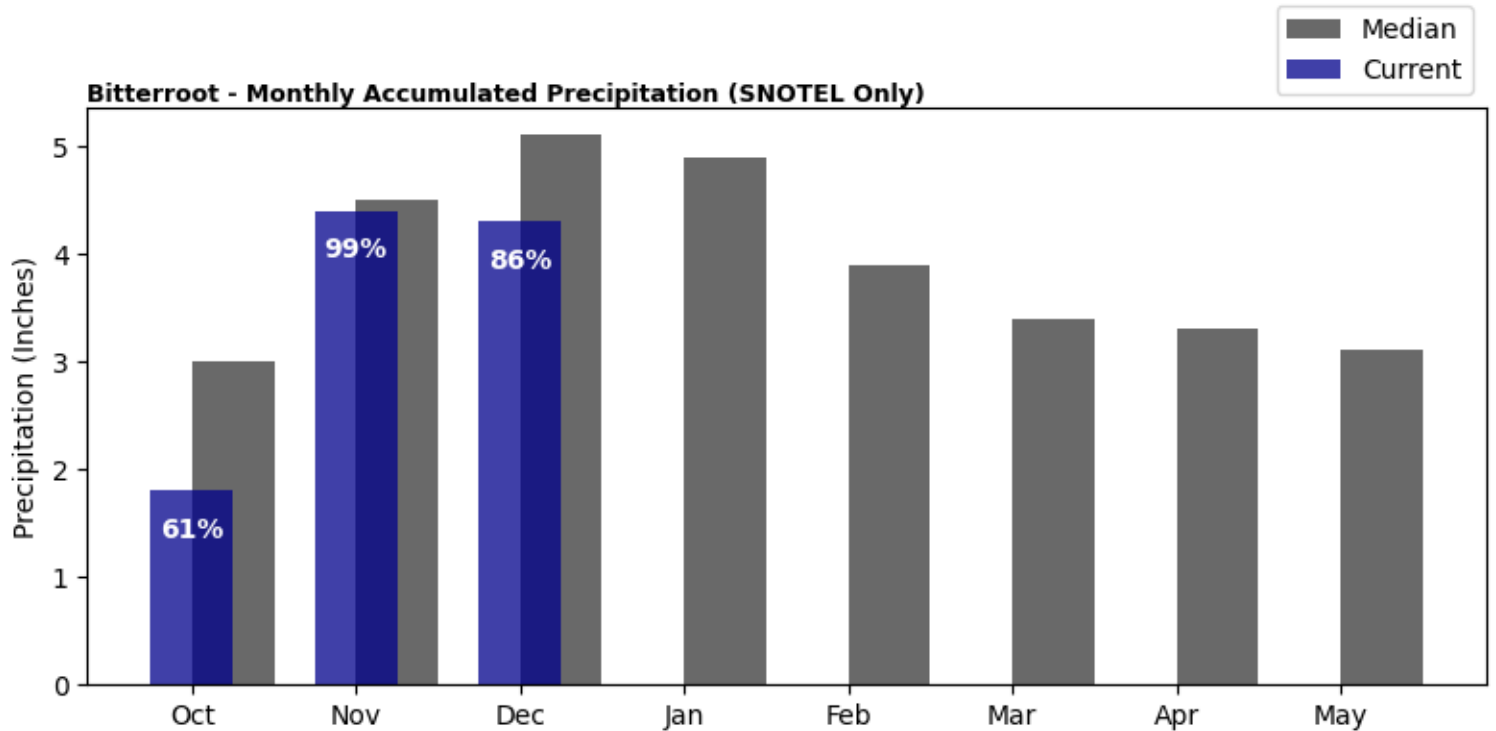
Precipitation in December was well below normal at 76%, which brings the seasonal accumulation (October-December) to 70% of median. The snowpack in the Upper Clark Fork is well below normal at 72% of median, compared to 36% at this time last year.



# Basin Overview

## Bitterroot

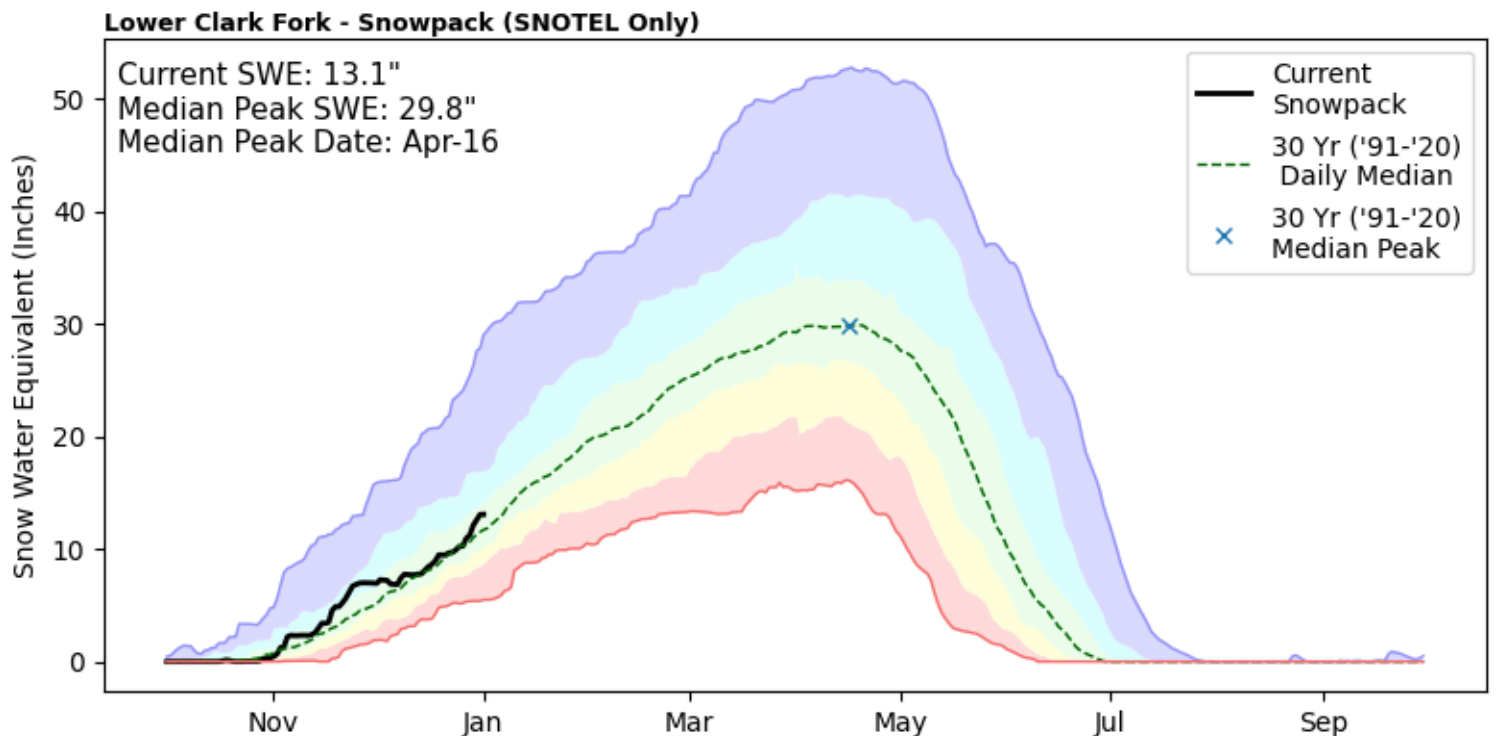
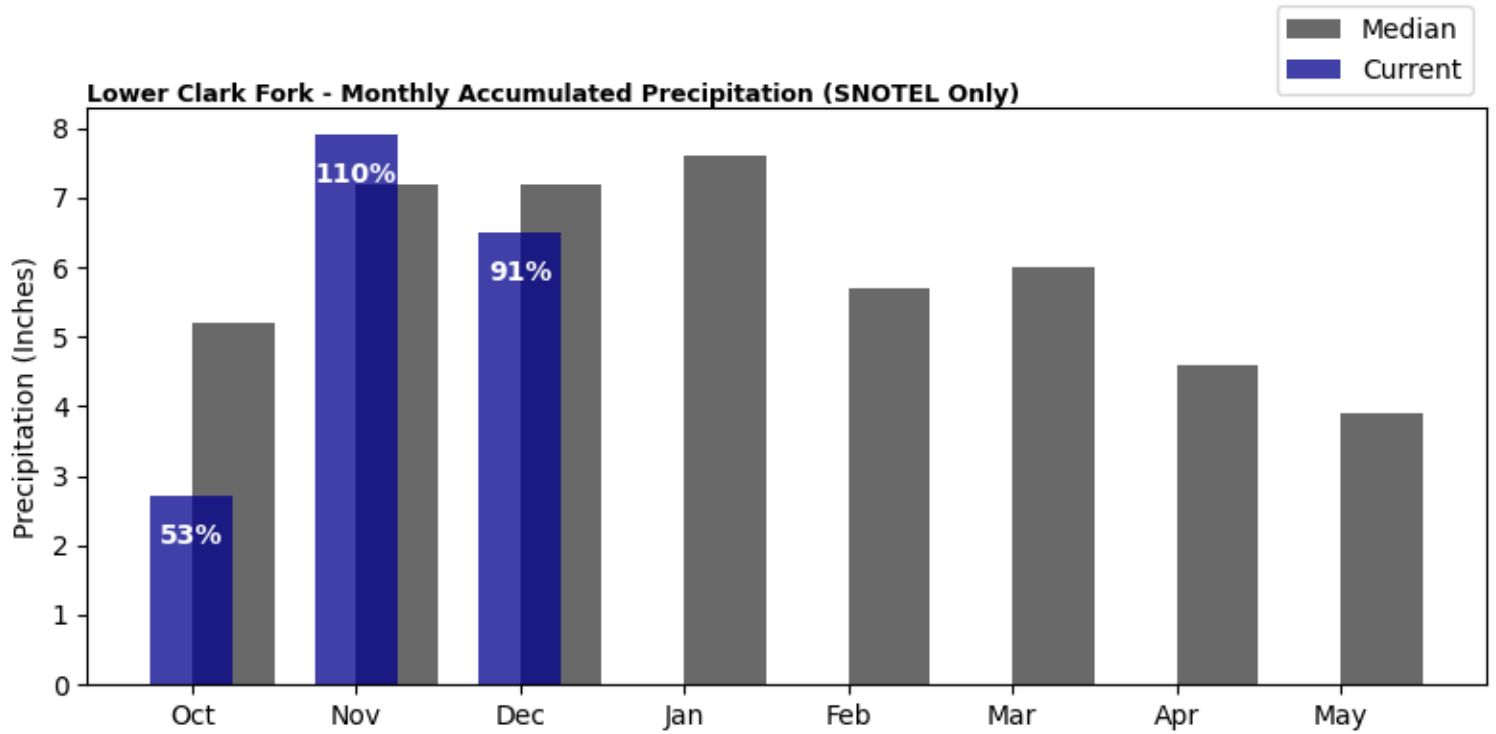
Precipitation in December was below normal at 86%, which brings the seasonal accumulation (October-December) to 79% of median. The snowpack in the Bitterroot is below normal at 91% of median, compared to 50% at this time last year.



# Basin Overview

## Lower Clark Fork

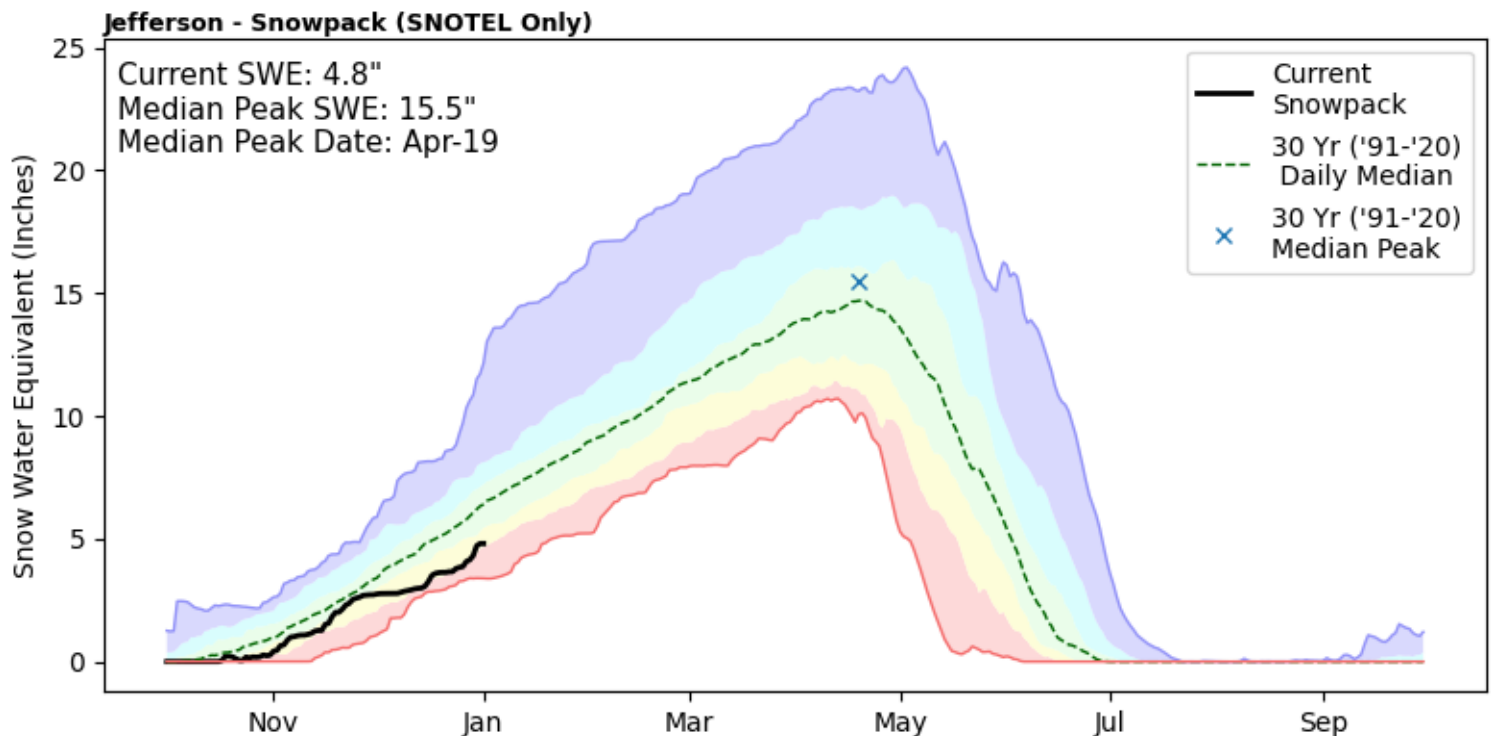
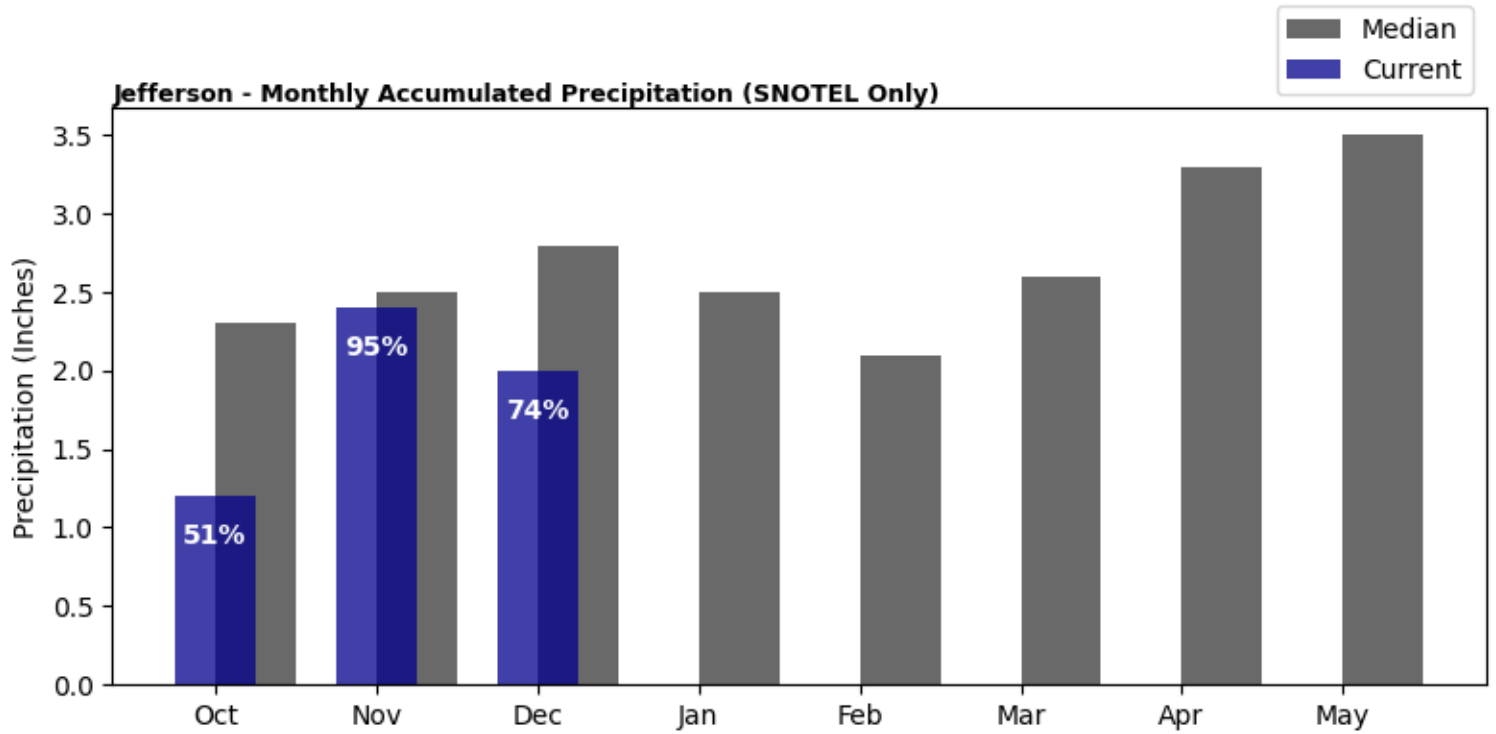
Precipitation in December was below normal at 91%, which brings the seasonal accumulation (October-December) to 83% of median. The snowpack in the Lower Clark Fork is above normal at 112% of median, compared to 47% at this time last year.



# Basin Overview

## Jefferson

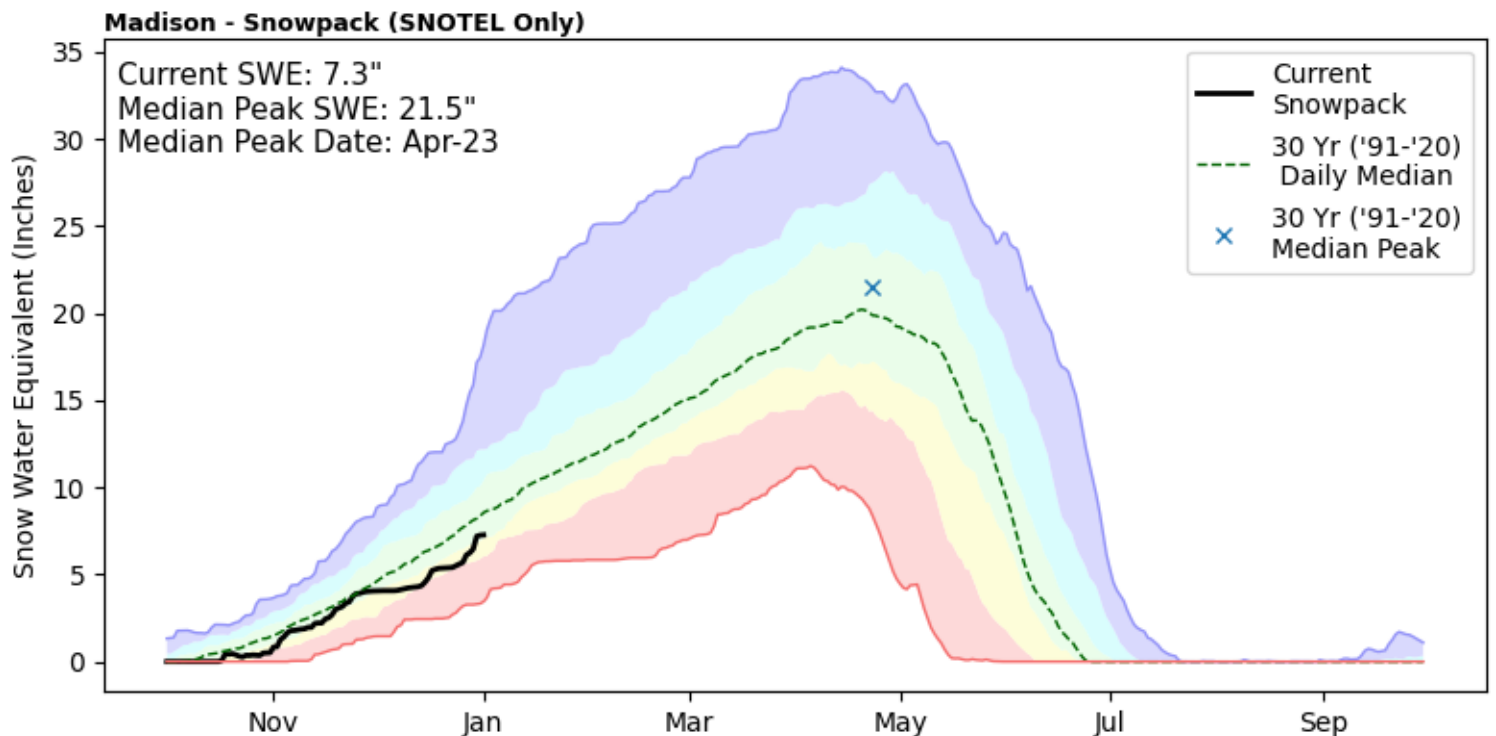
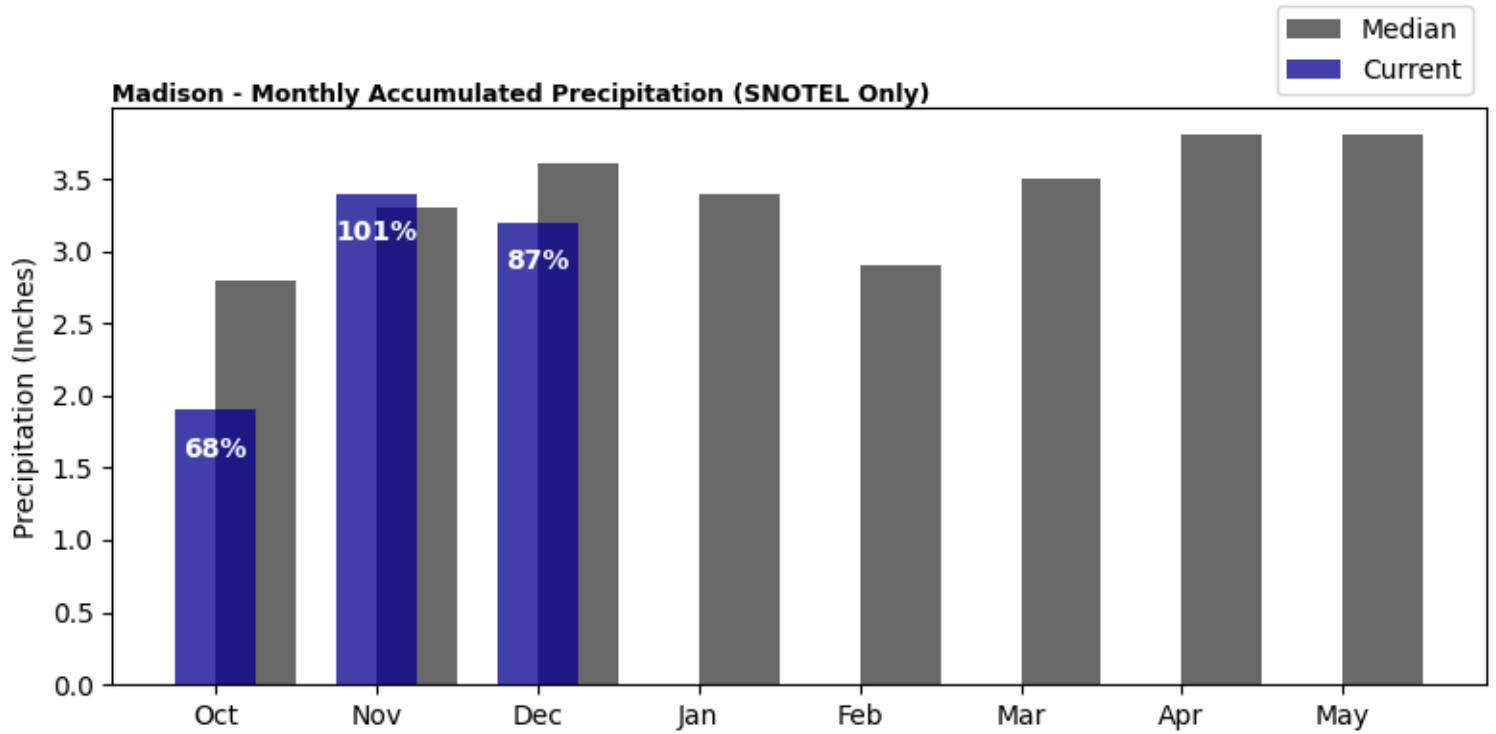
Precipitation in December was well below normal at 75%, which brings the seasonal accumulation (October-December) to 72% of median. The snowpack in the Jefferson is well below normal at 75% of median, compared to 51% at this time last year.



# Basin Overview

## Madison

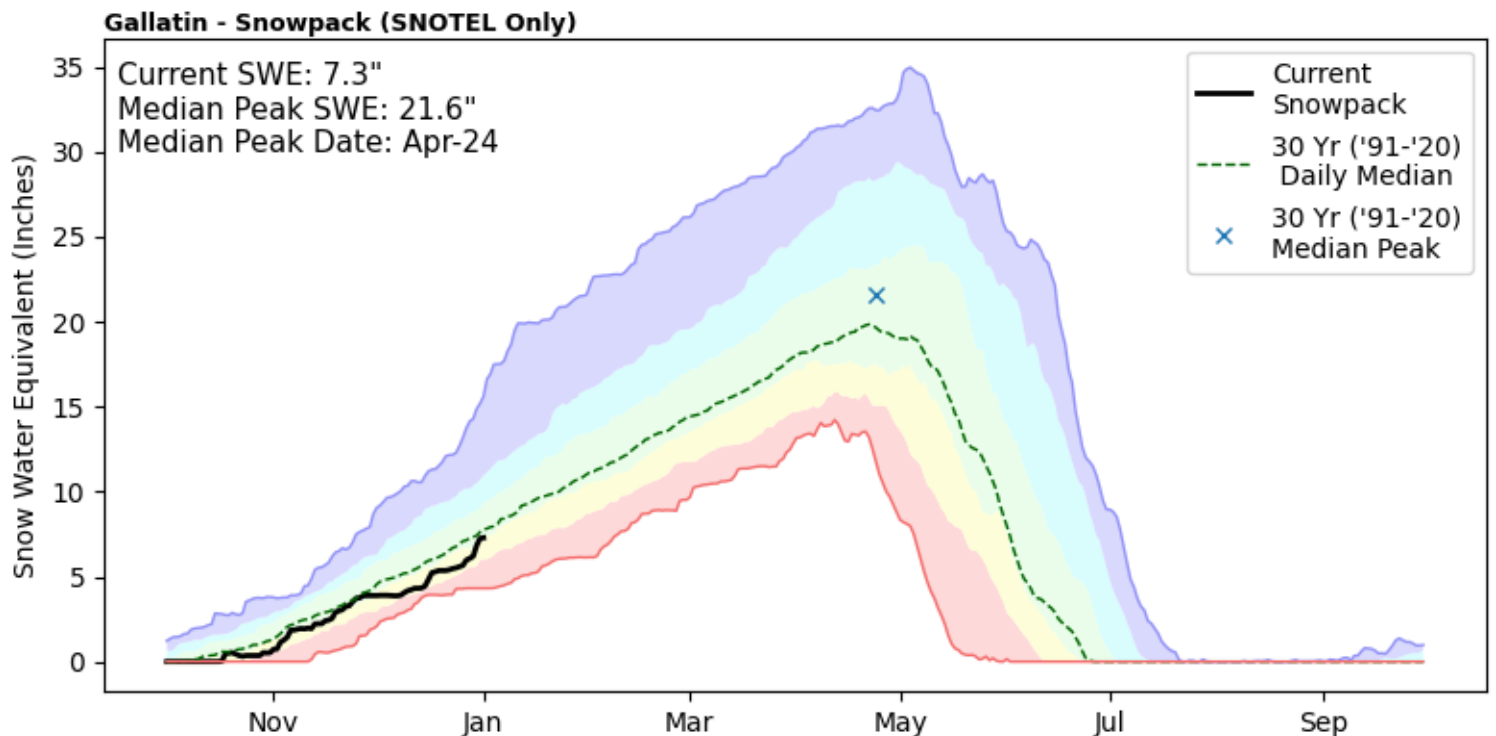
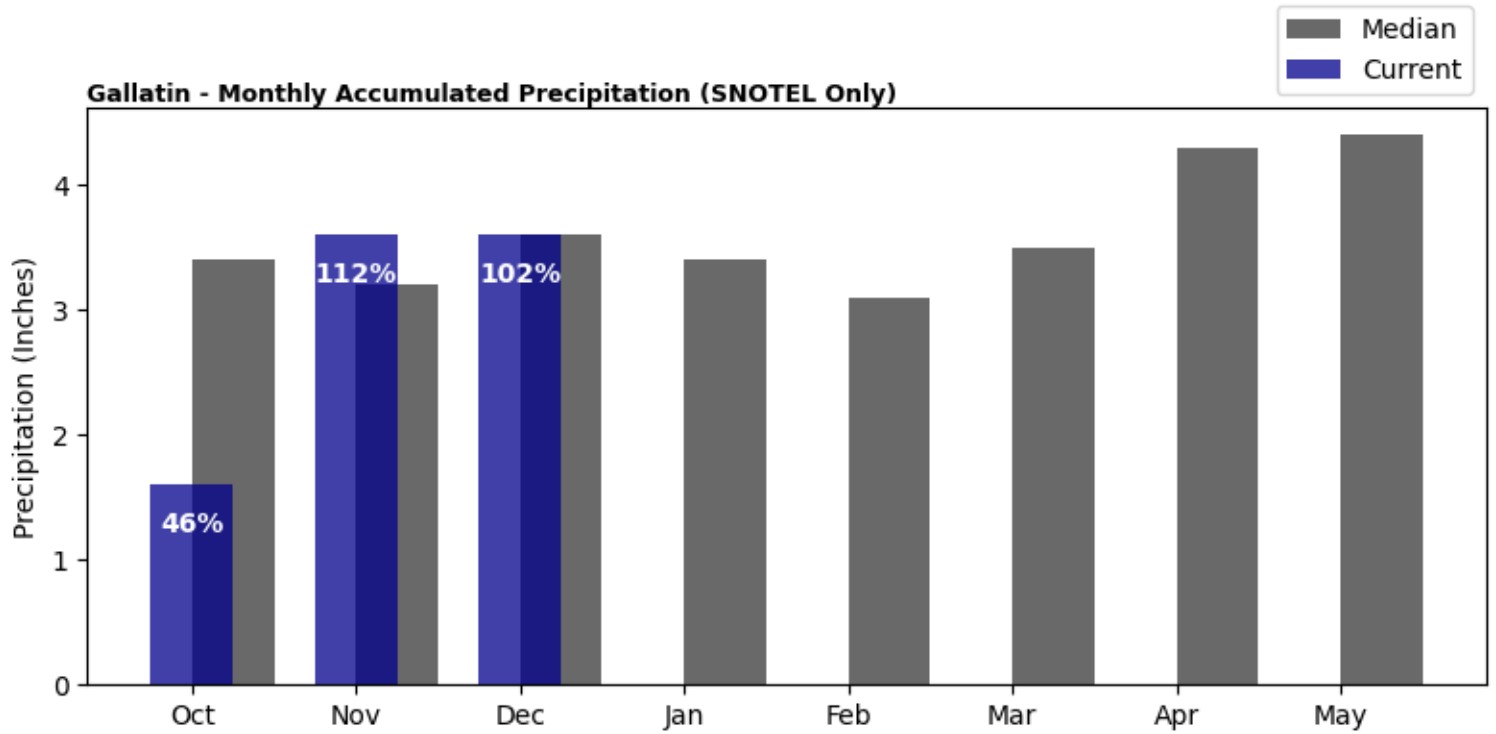
Precipitation in December was below normal at 87%, which brings the seasonal accumulation (October-December) to 82% of median. The snowpack in the Madison is below normal at 84% of median, compared to 54% at this time last year.



# Basin Overview

## Gallatin

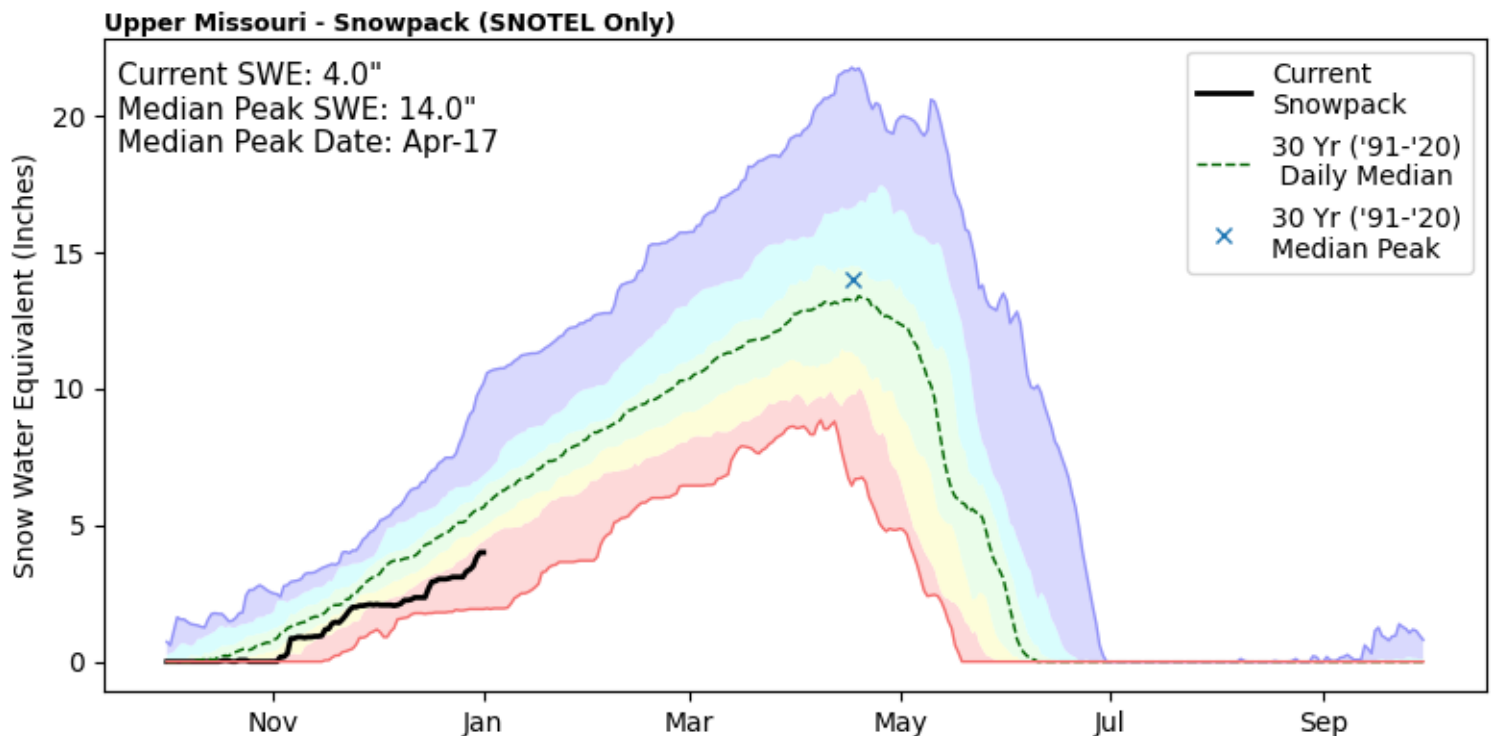
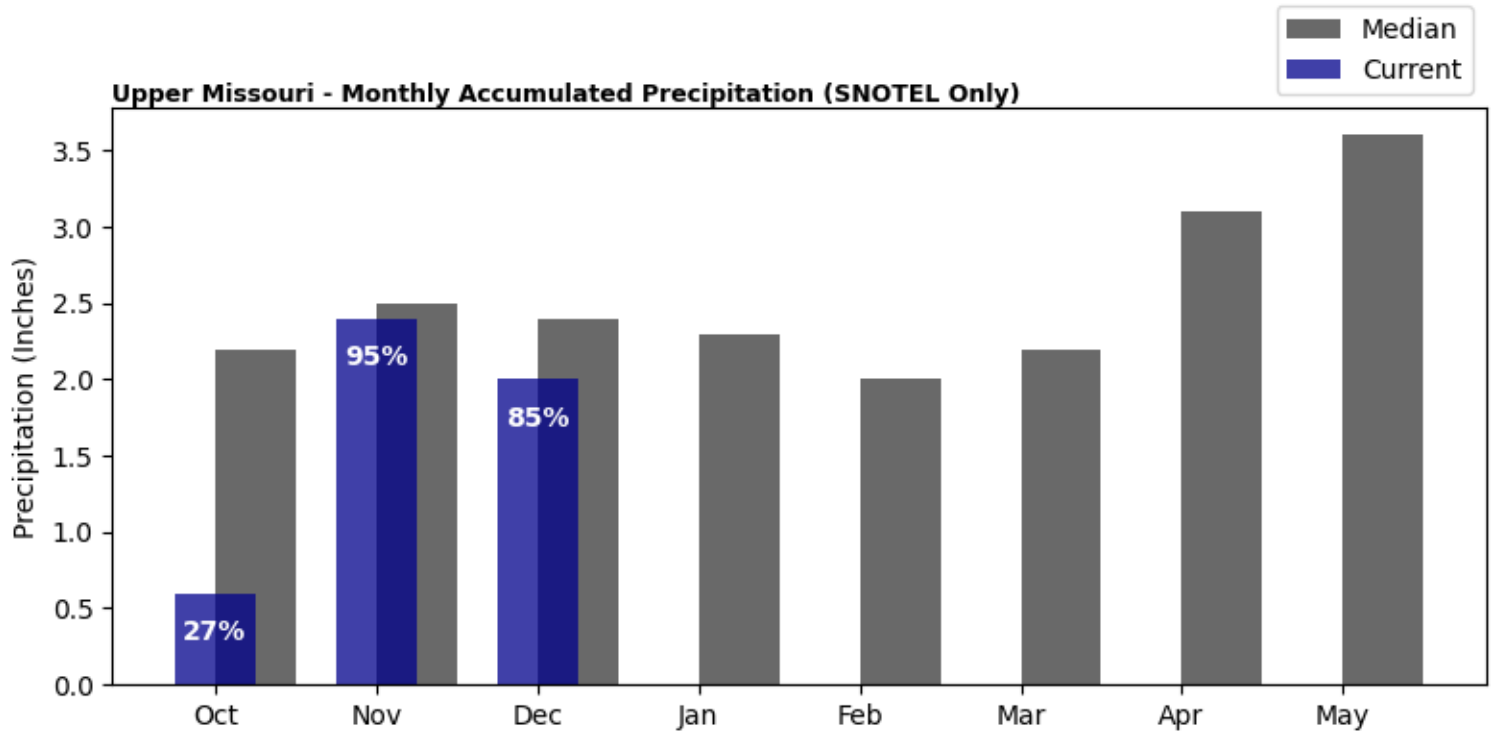
Precipitation in December was near normal at 102%, which brings the seasonal accumulation (October-December) to 82% of median. The snowpack in the Gallatin is below normal at 93% of median, compared to 54% at this time last year.



# Basin Overview

## Upper Missouri

Precipitation in December was below normal at 86%, which brings the seasonal accumulation (October-December) to 69% of median. The snowpack in the Upper Missouri is well below normal at 67% of median, compared to 33% at this time last year.

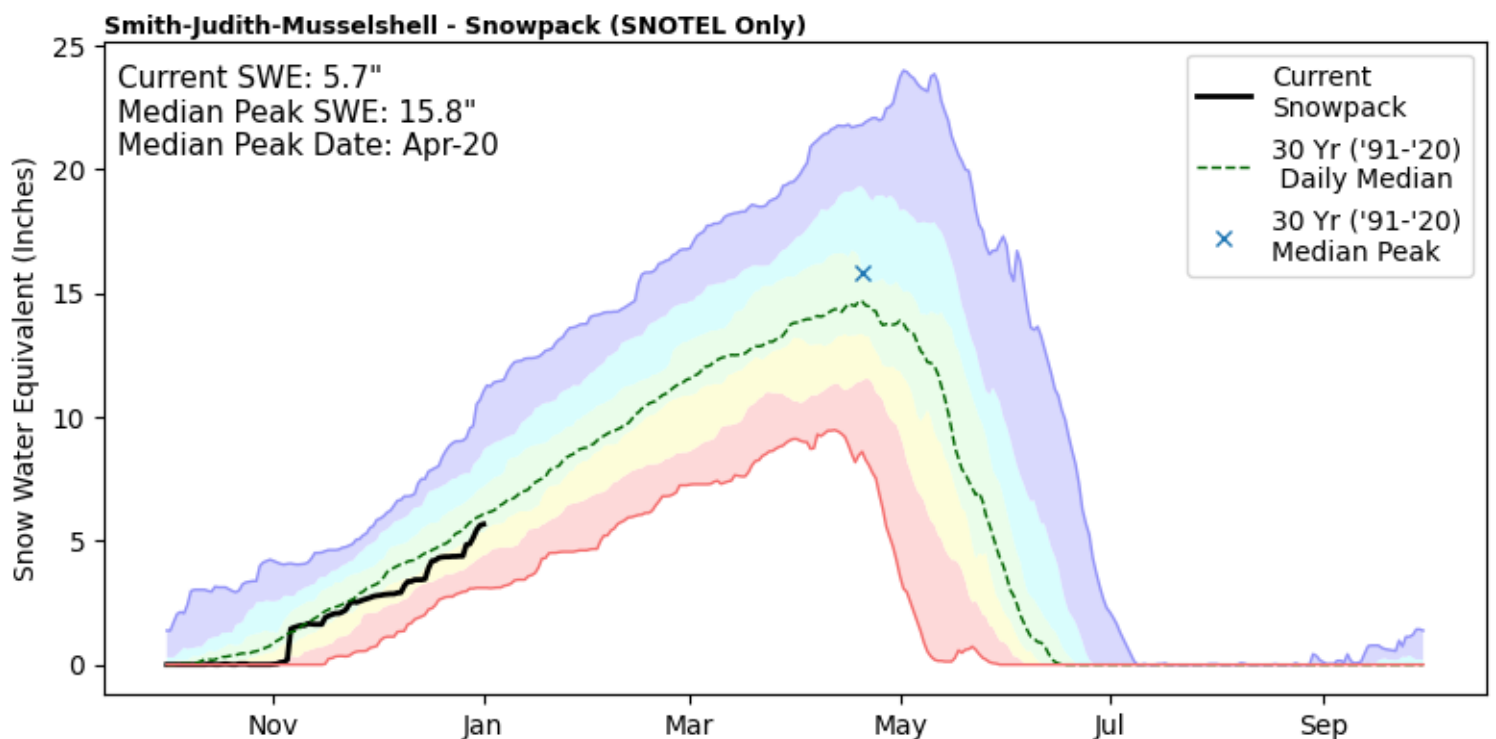
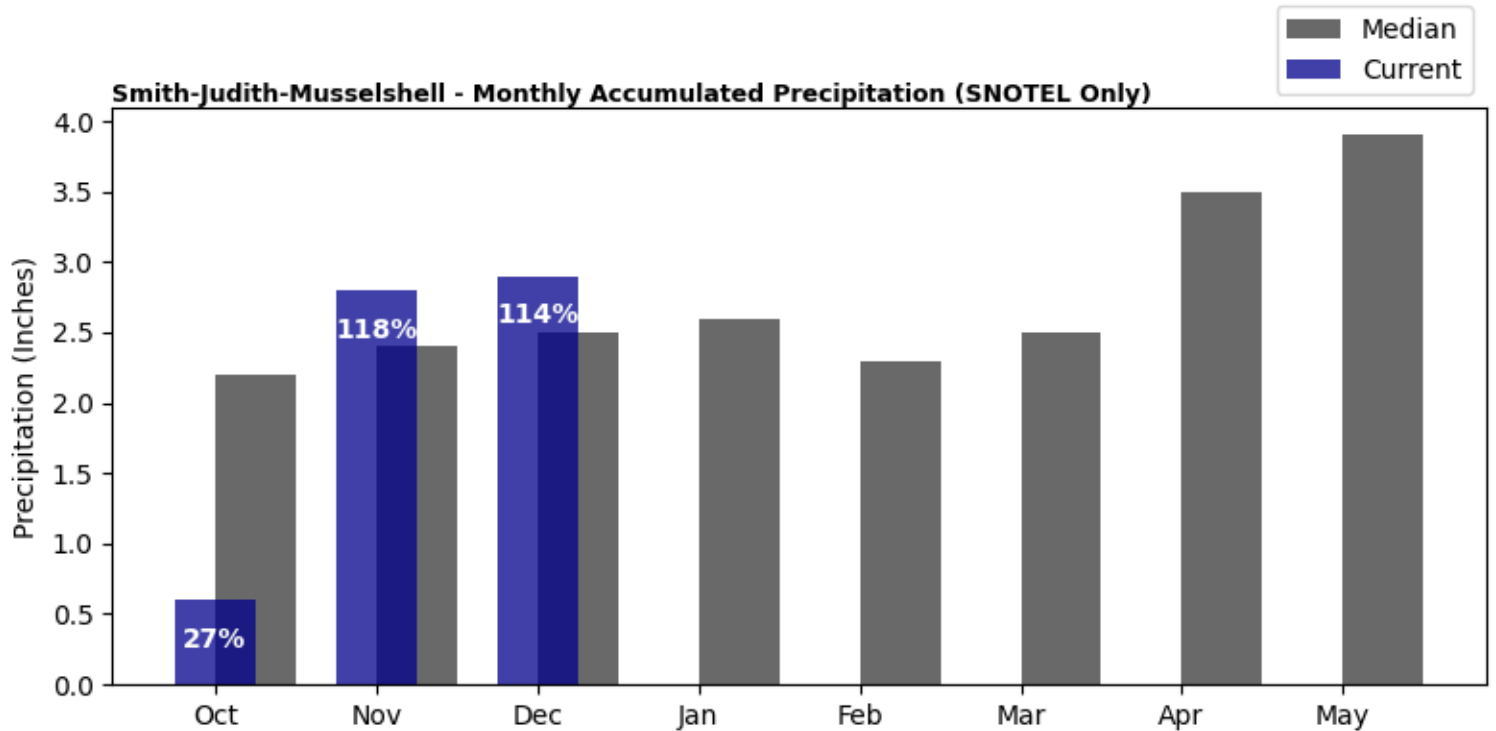




# Basin Overview

## Smith-Judith-Musselshell

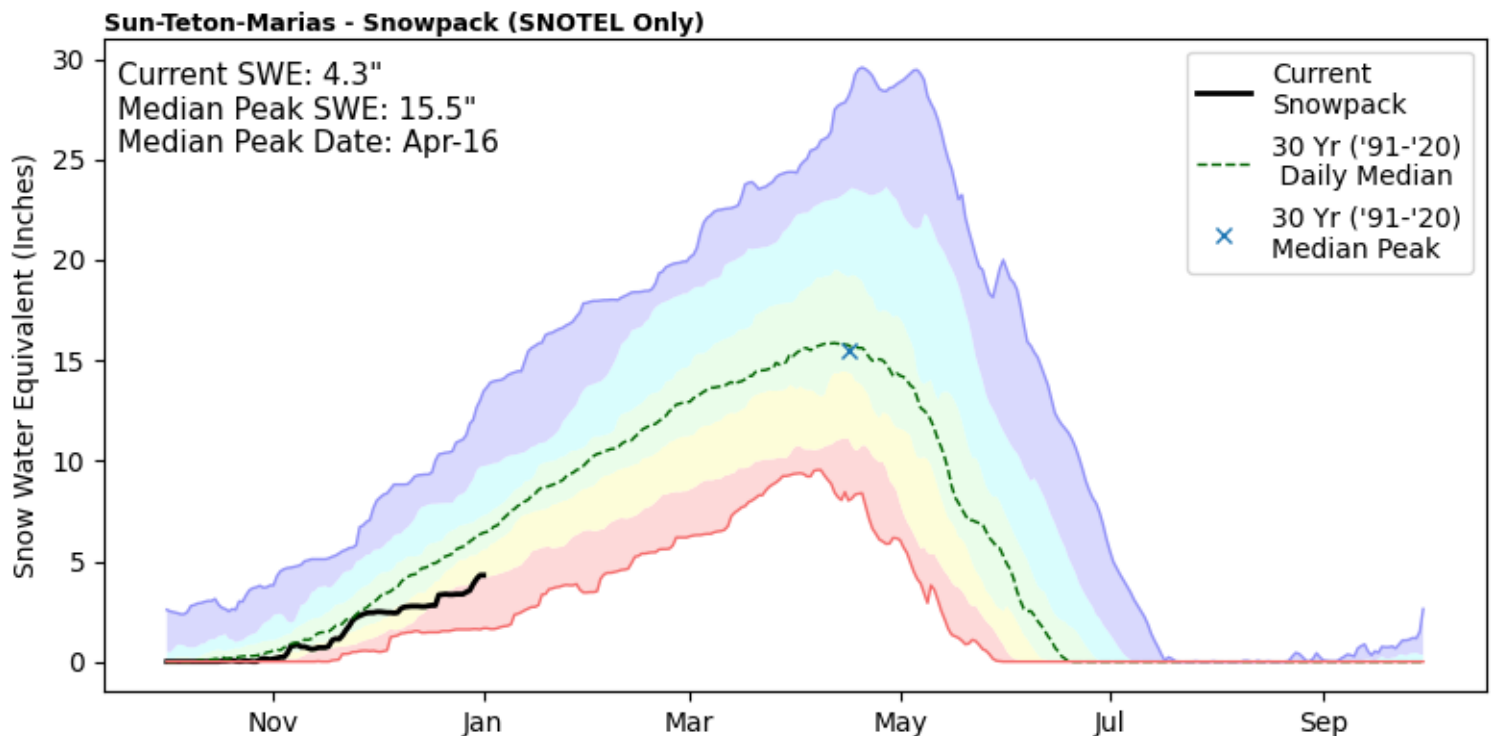
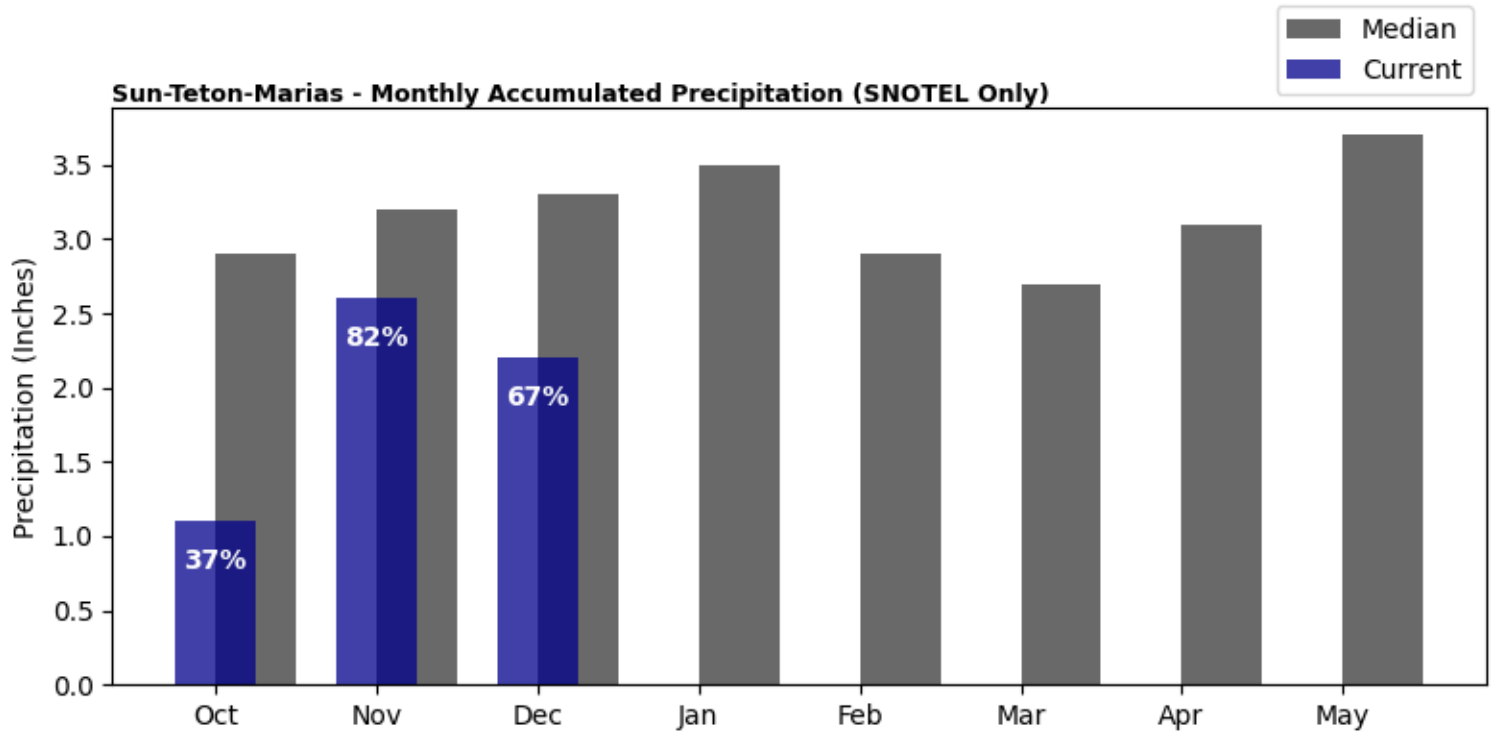
Precipitation in December was above normal at 114%, which brings the seasonal accumulation (October-December) to 81% of median. The snowpack in the Smith-Judith-Musselshell is below normal at 91% of median, compared to 49% at this time last year.



# Basin Overview

## Sun-Teton-Marias

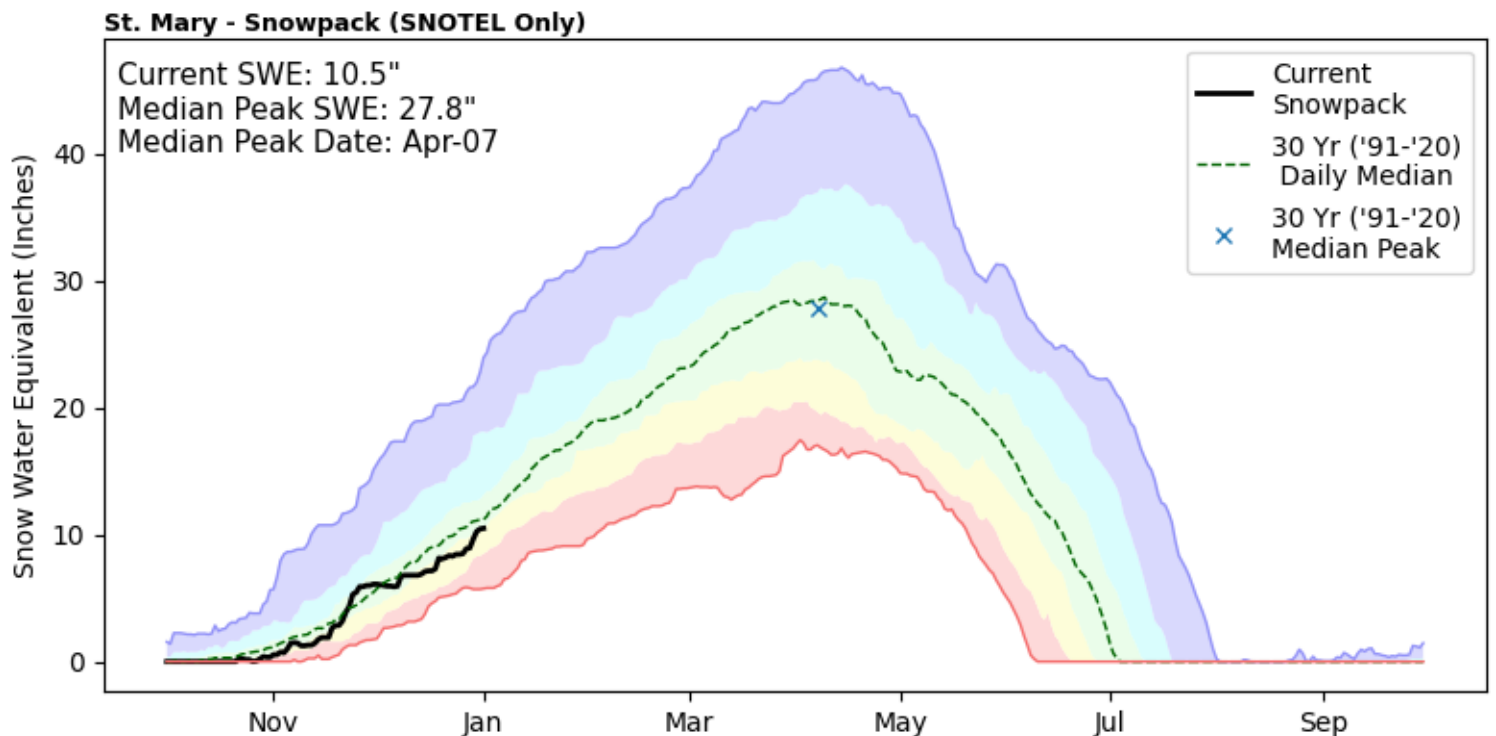
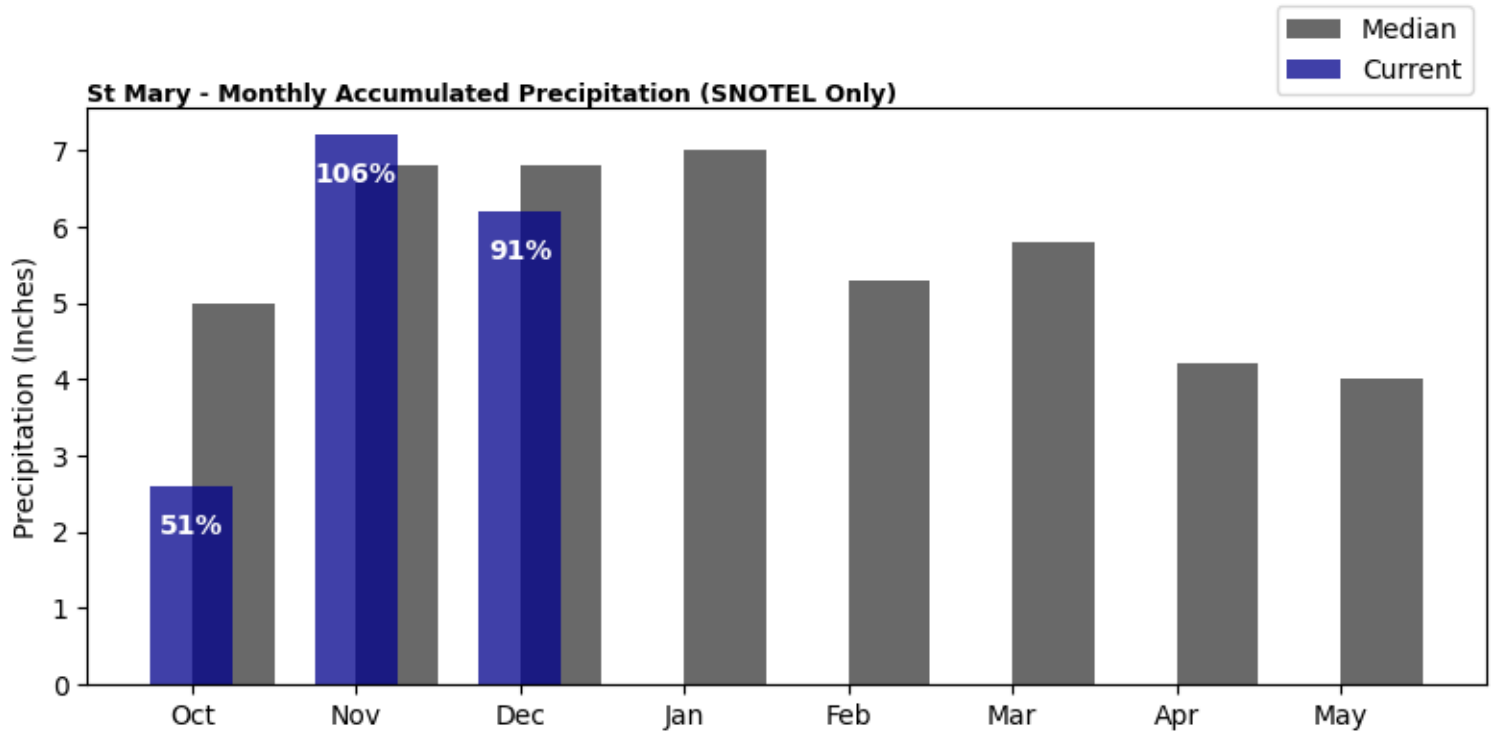
Precipitation in December was well below normal at 67%, which brings the seasonal accumulation (October-December) to 59% of median. The snowpack in the Sun-Teton-Marias is well below normal at 70% of median, compared to 26% at this time last year.



# Basin Overview

## St. Mary

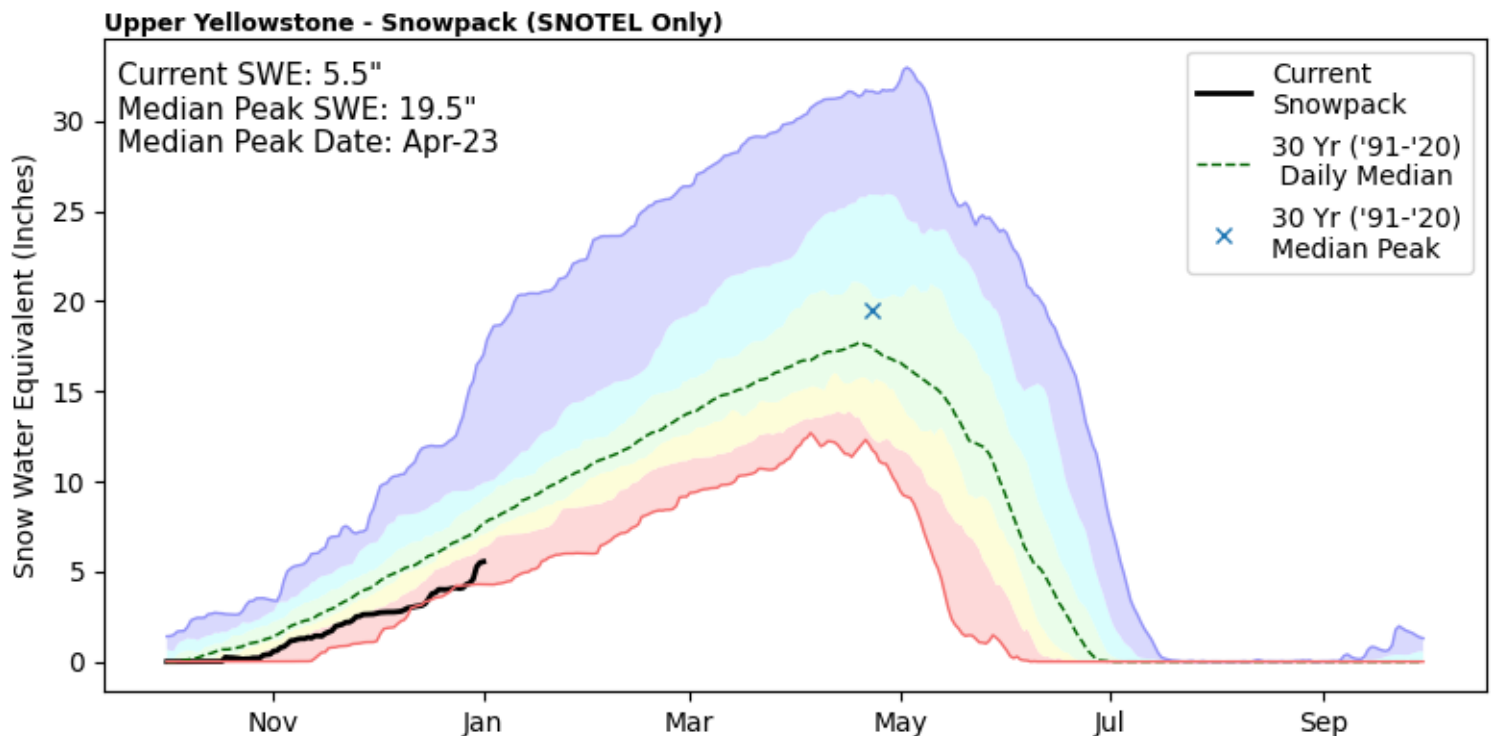
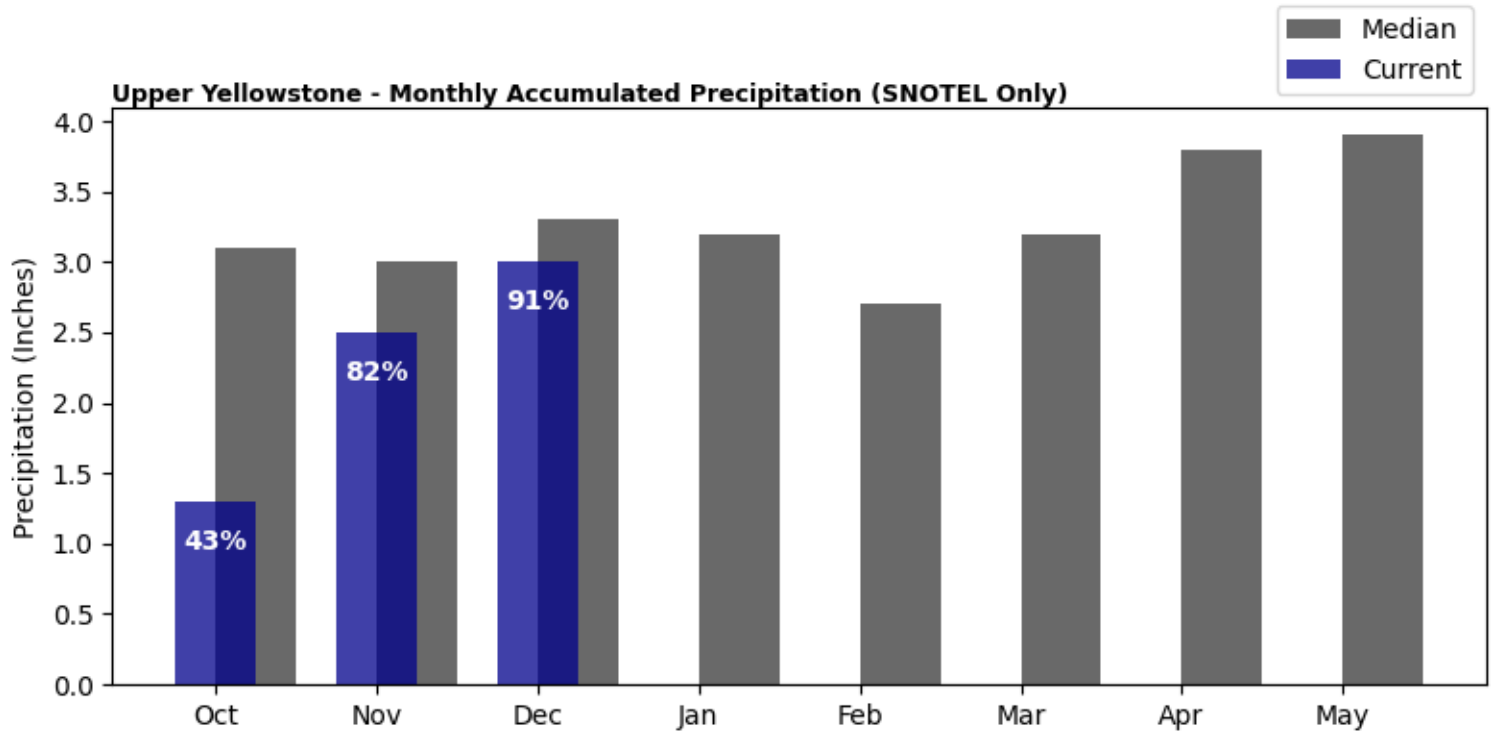
Precipitation in December was below normal at 91%, which brings the seasonal accumulation (October-December) to 83% of median. The snowpack in the St. Mary is below normal at 94% of median, compared to 51% at this time last year.



# Basin Overview

## Upper Yellowstone

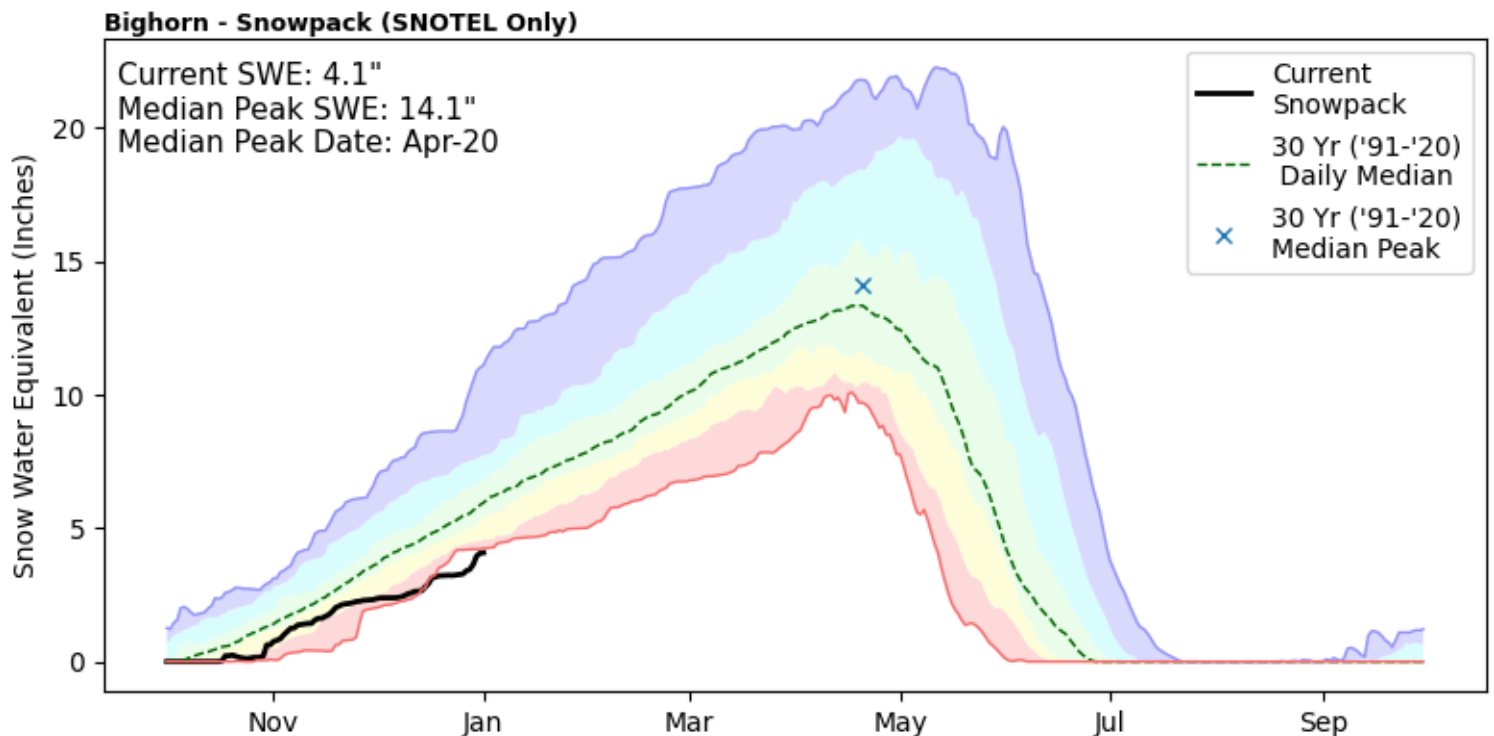
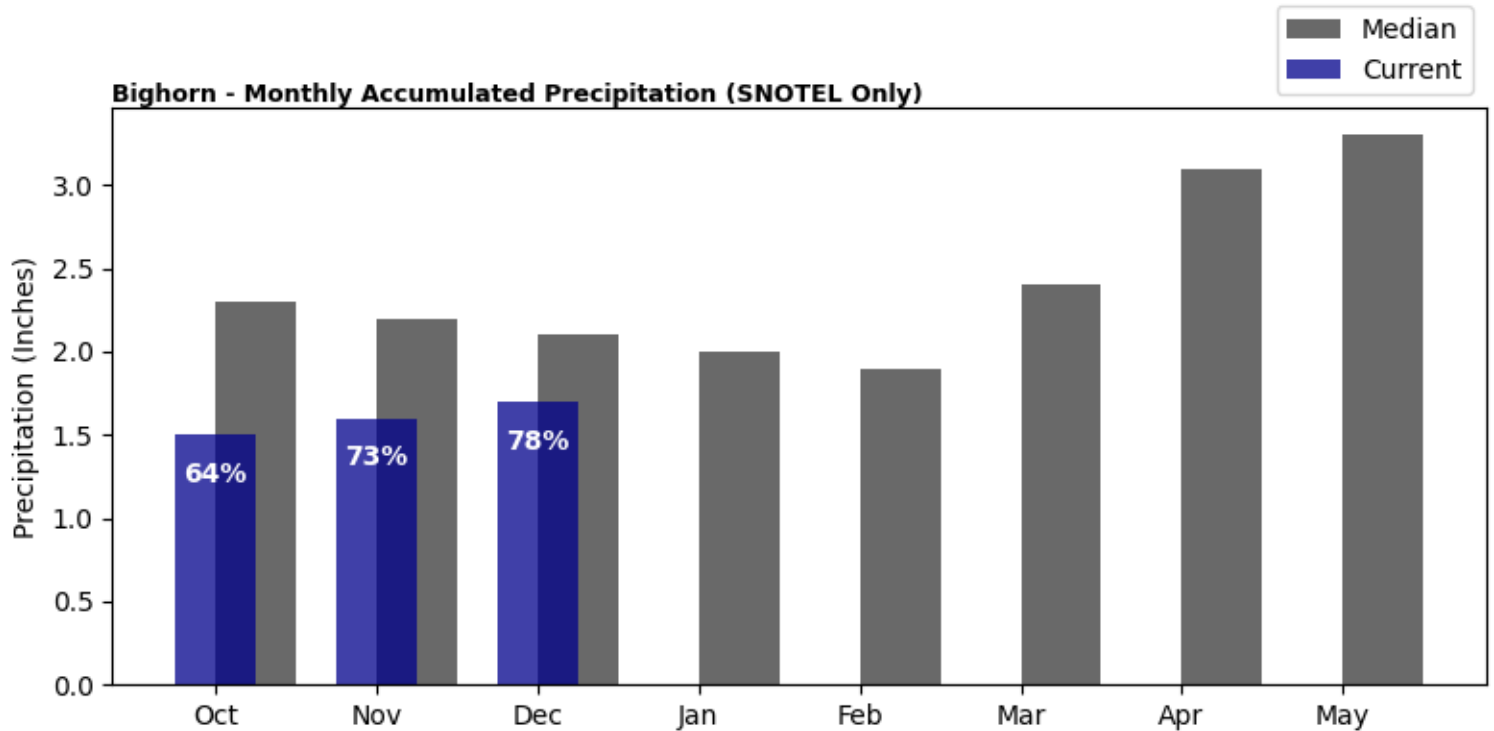
Precipitation in December was below normal at 91%, which brings the seasonal accumulation (October-December) to 69% of median. The snowpack in the Upper Yellowstone is well below normal at 72% of median, compared to 55% at this time last year.



# Basin Overview

## Bighorn

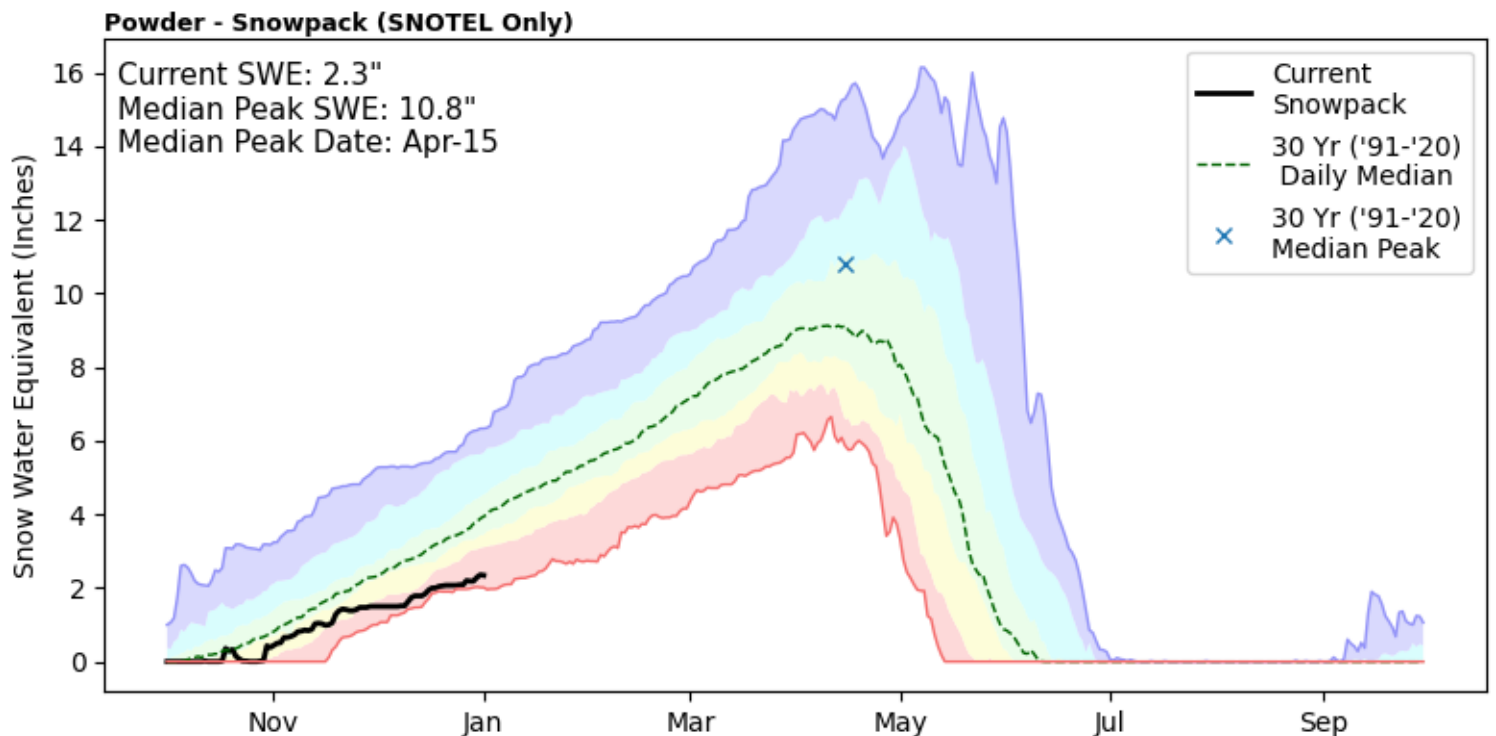
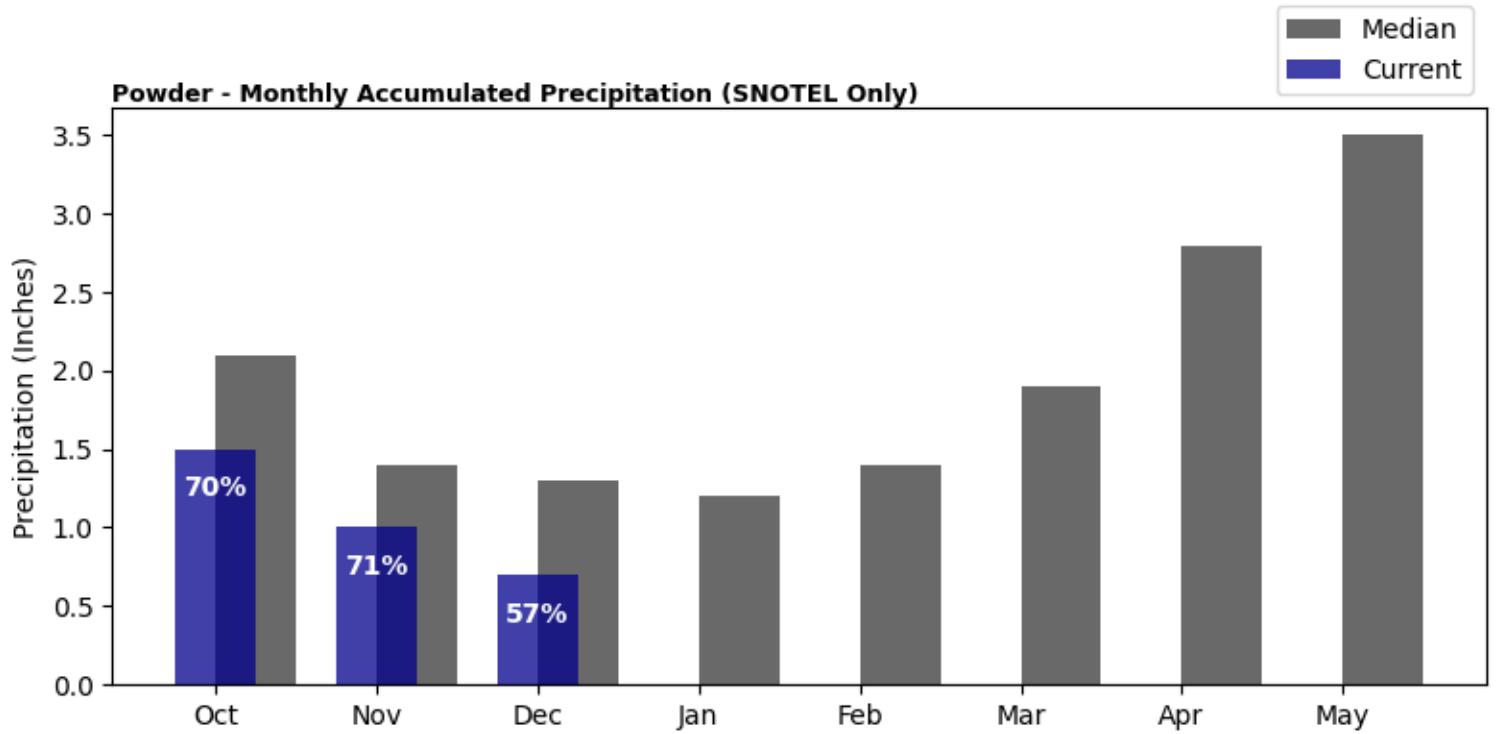
Precipitation in December was well below normal at 79%, which brings the seasonal accumulation (October-December) to 68% of median. The snowpack in the Bighorn is well below normal at 69% of median, compared to 75% at this time last year.



# Basin Overview

## Powder

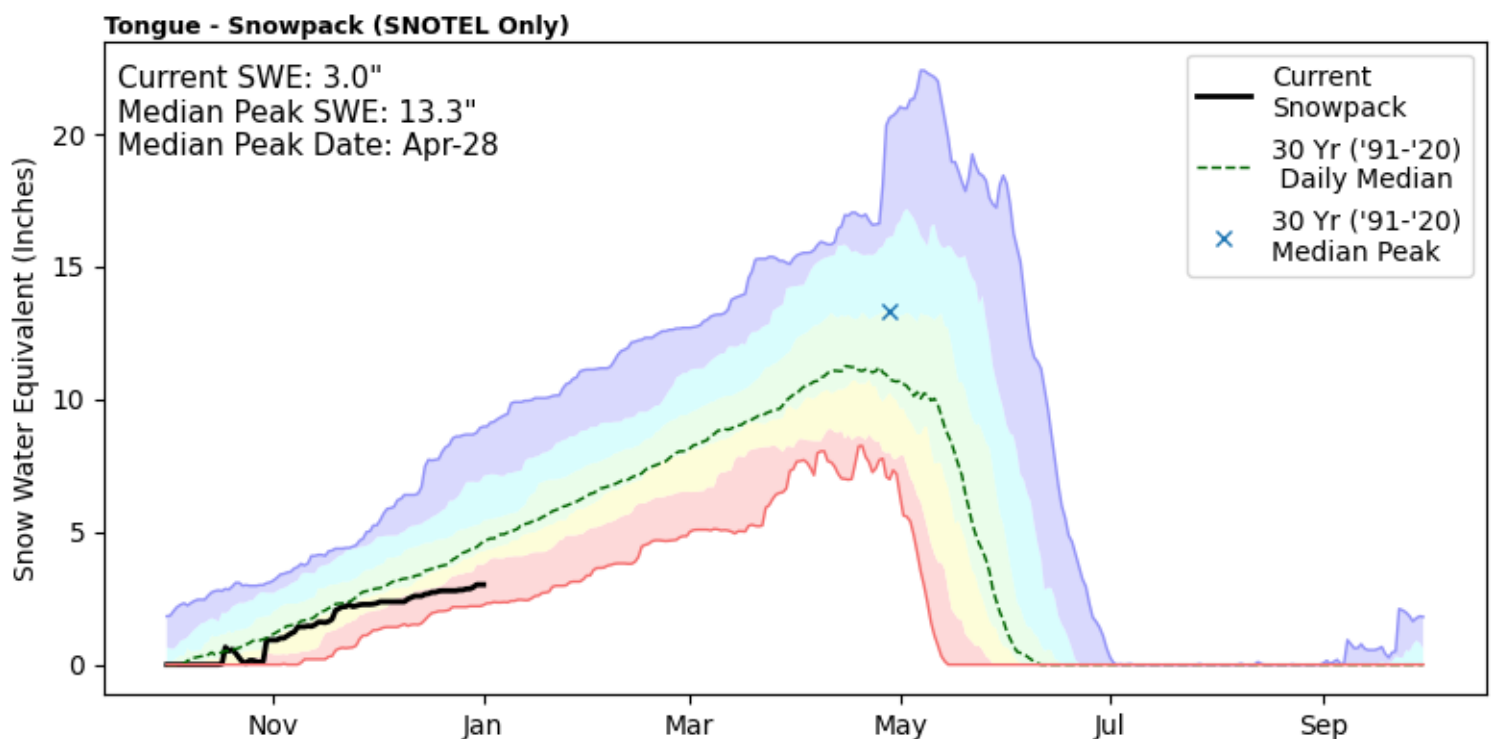
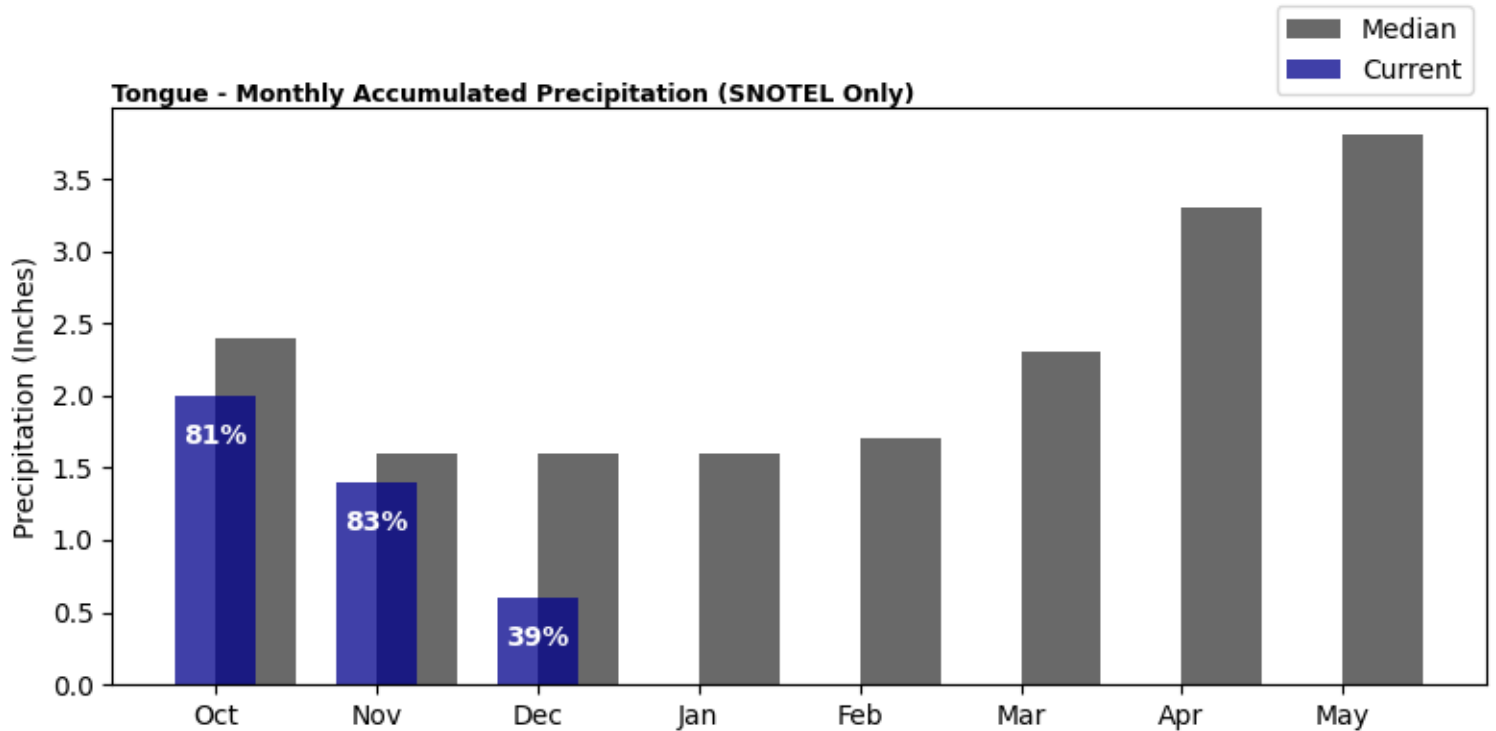
Precipitation in December was well below normal at 58%, which brings the seasonal accumulation (October-December) to 65% of median. The snowpack in the Powder is well below normal at 60% of median, compared to 51% at this time last year.



# Basin Overview

## Tongue

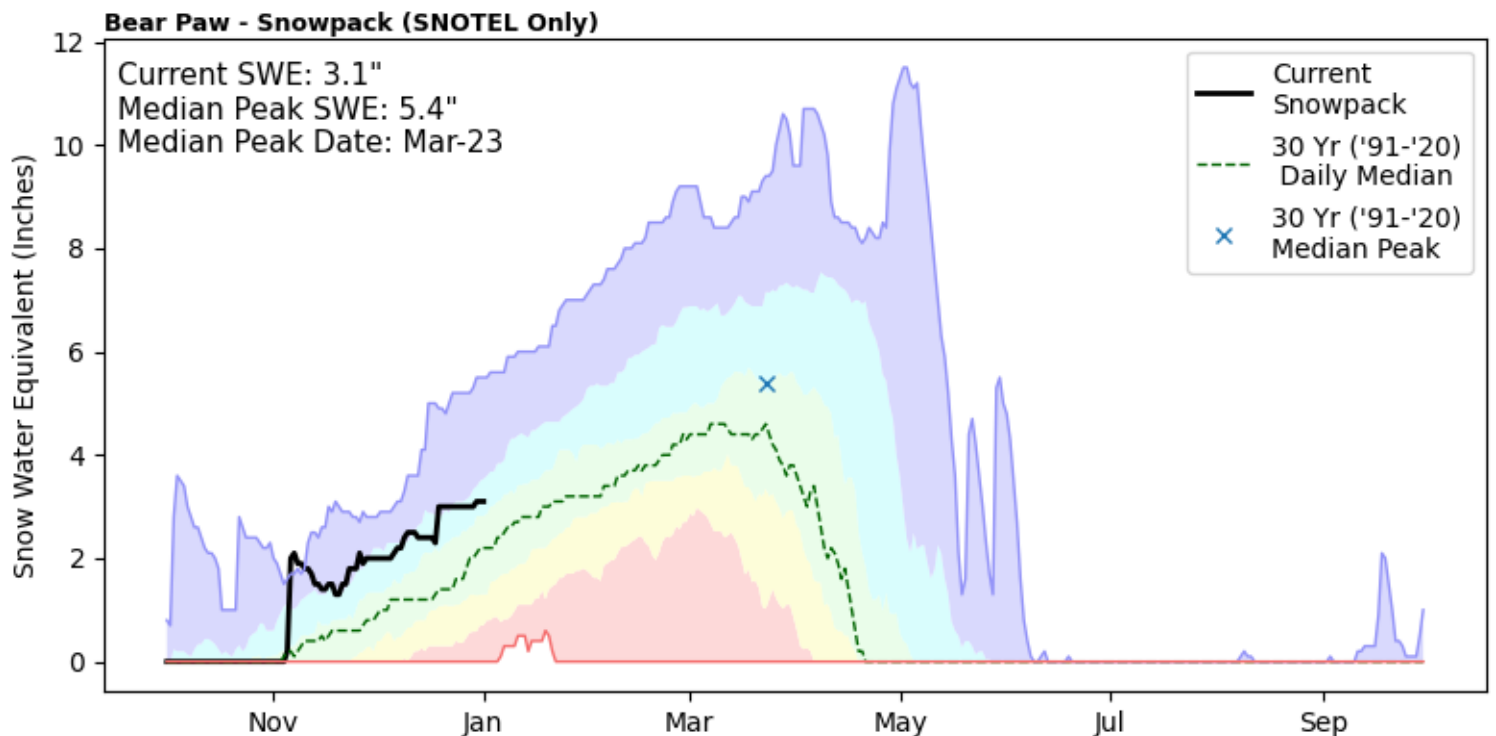
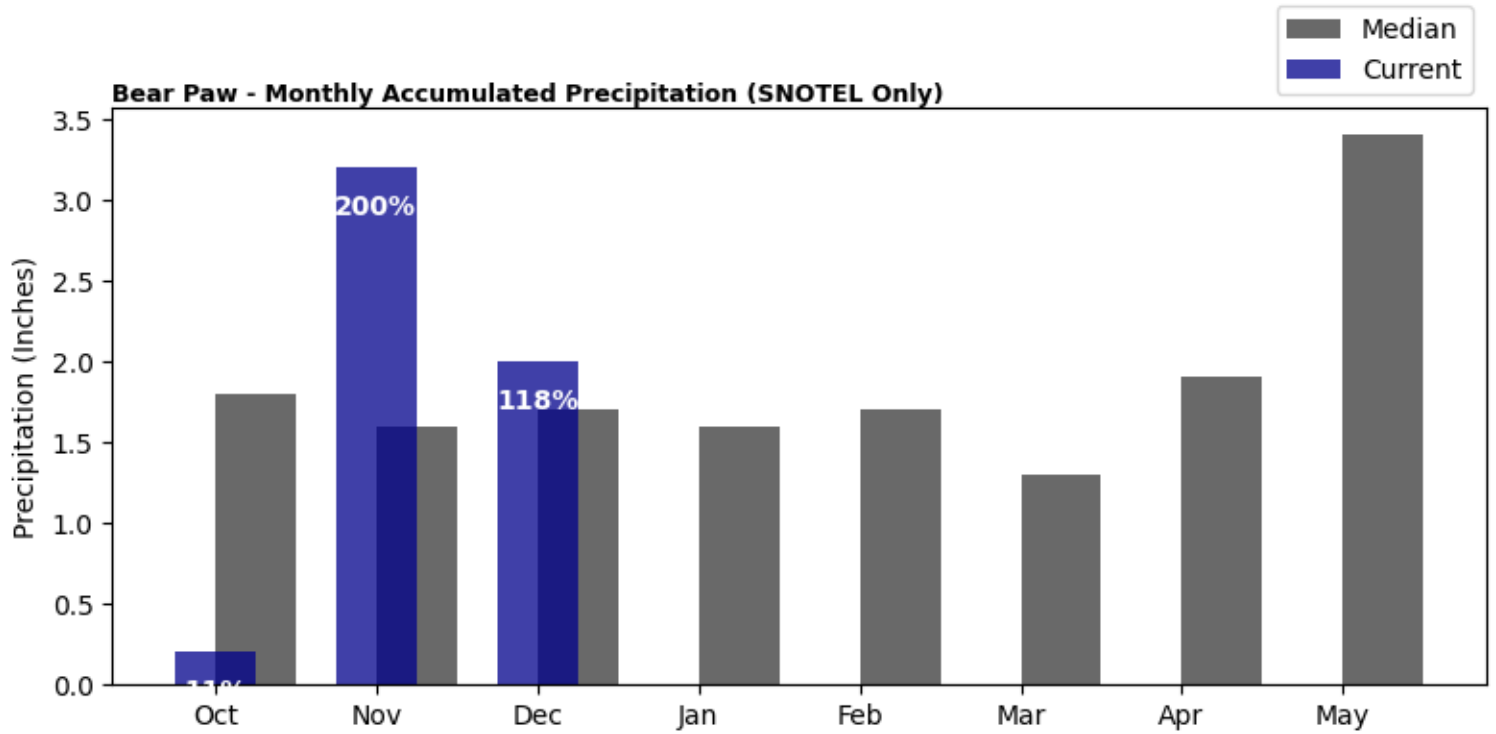
Precipitation in December was well below normal at 40%, which brings the seasonal accumulation (October-December) to 68% of median. The snowpack in the Tongue is well below normal at 65% of median, compared to 66% at this time last year.



# Basin Overview

## Bear Paw

Precipitation in December was above normal at 118%, which brings the seasonal accumulation (October-December) to 93% of median. The snowpack in the Bear Paw is well above normal at 136% of median, compared to 41% at this time last year.





# Appendix

## Water Supply Forecast Information

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts.

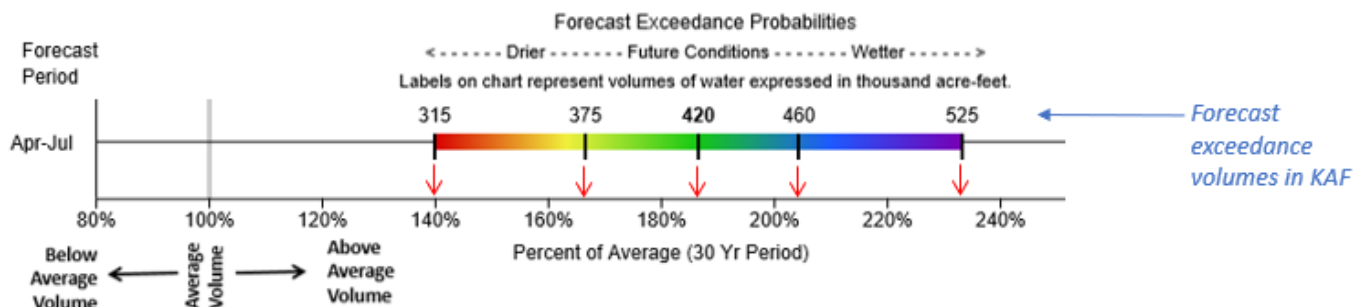
Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions in the coming months; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known, and the additional forecasts will move closer to the most probable forecasts.

### Interpreting Water Supply Forecast Charts

Typically, the Natural Resources Conservation Service (NRCS) has presented streamflow forecasts as a table format showing the five exceedance probabilities compared to the 30-year average as follows:

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast							
Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
APR-JUL	315	375	420	187%	460	525	225

The Forecast Chart provides a visual alternative to the table. The forecast range is represented by a colored bar. Vertical lines on the bar signify the five forecast exceedances. Below is an example. The numbers above the forecast bar are the five exceedance probability volumes in thousand acre-feet (KAF). Each exceedance forecasts percent of median can be estimated by looking at the horizontal axis. The gray line centered above 100% on the horizontal axis represents the 1991-2020 historical median streamflow for the forecast period.



In the example, the entire forecast bar is shifted right of the gray line indicating a forecast for above normal streamflow. The 50% exceedance is represented by the black line in the green portion of the colored bar. This represents a forecast volume of 420KAF which is ~185% of average. If drier than normal future conditions occur the 70% exceedance forecast may be more likely (375KAF or ~165% of average). If future conditions turn wetter than normal, the 30% exceedance forecast may be more likely (460KAF or ~205% of average). Water users are encouraged to consider the range of forecast exceedances instead of relying solely only on the 50% forecast.

# Appendix

## Monitoring Station Overview

### SNOTEL

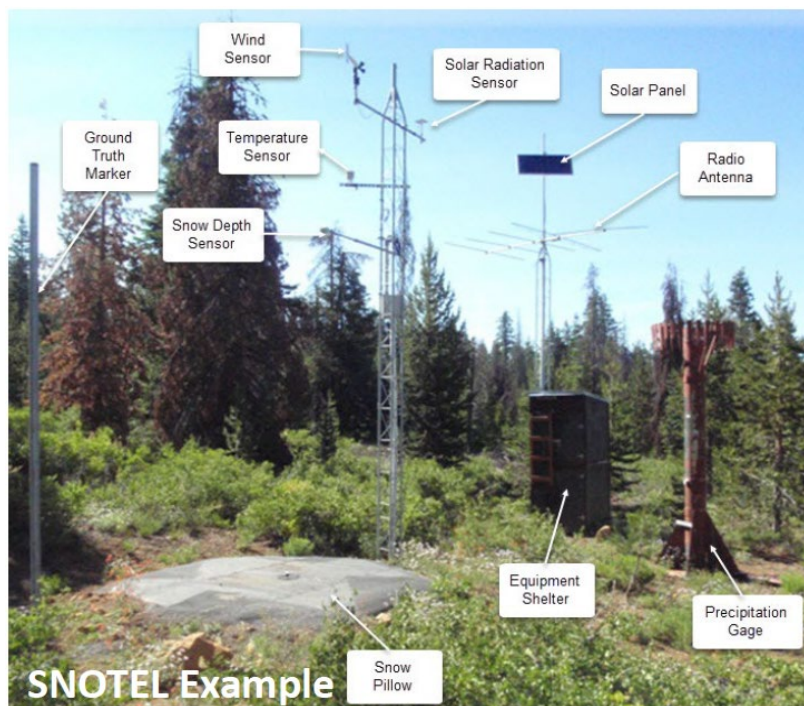
The NRCS operates an extensive, automated data collection network called SNOTEL (short for Snow Telemetry). SNOTEL sites are designed to operate unattended in remote mountain locations. Data are collected and transmitted hourly and available on the internet. Daily data (midnight values) are quality checked by NRCS hydrologists on at least a weekly basis. SNOTEL sites provide snowpack water content data via a pressure-sensing snow pillow. Other data include snow depth, water year precipitation accumulation, air temperature with daily maximums, minimums, and averages. The earliest NRCS SNOTEL sites have data back to the mid-1970s.

### Snow Course

Snow courses are measurement transects where snow tubes are used by snow surveyors during the winter season to determine the depth and water content of the snowpack. Hollow snow tubes are used to vertically core the snowpack. The tubes are then weighed to determine the water content of the snow. Generally, snow courses are situated in meadows or forest openings protected from the wind. A snow course measurement is the average of a number of sample points, typically 5 or 10. Snow courses are measured on a monthly basis typically between January 1 and June 1. Snow courses provide a longer record than SNOTEL. The earliest snow courses in the Montana have data back to the 1920s.

### Snow Water Equivalent (SWE)

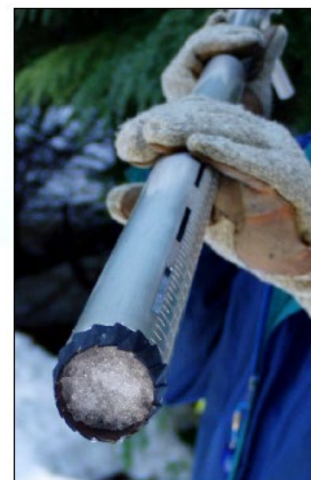
Sometimes also called snow water content, this is the amount of water contained within the snowpack. It can be thought of as the depth of water (in inches) that would result if you melted the snowpack. For example, if a snowpack containing 12 inches of SWE melted instantaneously, there would be a puddle of water 12 inches deep on the ground.



SWE measurements made by snow pillows or snow tubes rely on the fact that water weighs the same whether it is liquid or frozen.



Weight of frozen water = Weight of liquid water



Snow core inside snow tubes

# Appendix

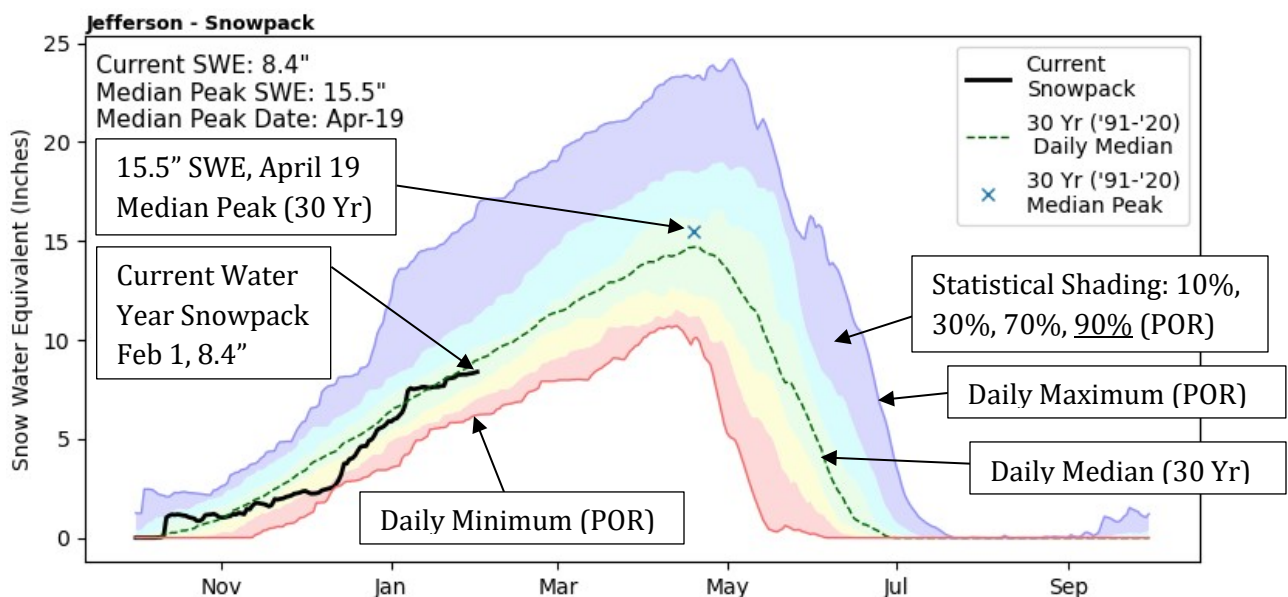
## Additional Information

### Climatic and Hydrologic Normals

The Snow Survey and Water Supply Forecasting (SSWSF) normals are site-specific measures of central tendency (either the median or average) for a data type, such as snow water equivalent (SWE). The statistics are calculated over a 30-year period and updated each decade, in agreement with World Meteorological Organization (WMO) standards. This 30-year reference period was chosen to characterize the current hydroclimatology at each station. The most recent medians and averages have been updated to include data for the water years 1991-2020. The National Water and Climate Center (NWCC) also provides medians and averages for the 1981-2010 and 1971-2000 reference periods for stations with sufficient data. The normals available from the NWCC include the median and average for SWE, snow depth (snow courses only), precipitation, volumetric streamflow, and reservoir storage. Values are calculated from data collected by NRCS-managed stations and external agencies such as the U.S. Geological Survey (USGS), National Weather Service (NWS), state agencies, and private organizations. Normal is calculated for various durations including daily, month-to-date, semi-monthly, monthly, seasonal, and annual based on the data type. More information is available here: <https://www.nrcs.usda.gov/resources/data-and-reports/climatic-and-hydrologic-normals>

### Interpreting Snowpack Charts

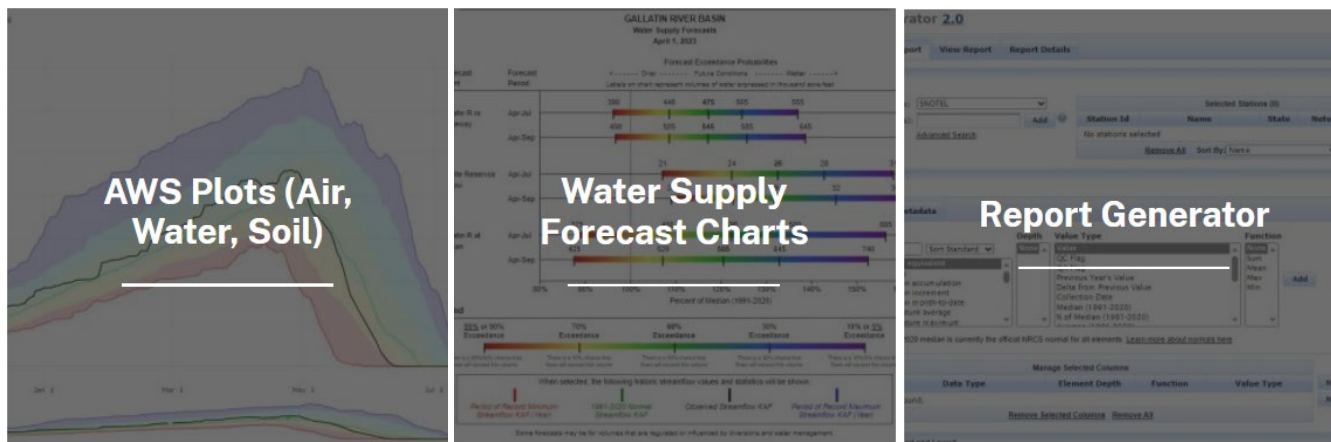
Snowpack charts displayed in this report are created using daily (midnight) snow water equivalent (SWE) values at SNOTEL sites determined to represent the basin. Snow Course data is not included. Plotted lines are the average of each SNOTEL's individual values. For example, the "Current Snowpack" on January 1<sup>st</sup> is the average all SNOTEL SWE values in that basin for that day. The "30 Yr. ('91-'20) Daily Median" is the average of each SNOTEL's median SWE value for a given day. The upper and lower extent (blue/red lines) show the maximum/minimum daily SWE values, which is determined using the "Current Snowpack" SWE value for all days in the period of record (POR). Snowpack peak SWE dates differ from season to season, as a result the high point on the "30 Yr. ('91-'20) Daily Median" line is not the true median peak SWE. The point "X" is plotted by calculating the median peak date and median peak value independently. Similar charts with other basin definitions are available here: <https://nwcc-apps.sc.egov.usda.gov/basin-plots/#mt>



# Appendix

## Links and Resources

### Products and Reports (click image)



### Interactive Map Predefined Links

#### Snow

- Snow Water Equivalent > Daily > Percent of 1991-2020 Median > [Stations](#) | [Basins](#)
- Snow Water Equivalent > End of Previous Month (SNOTEL and Snow Course) > Percent of 1991-2020 Median > [Stations](#) | [Basins](#)
- Snow Depth > Daily > [Stations](#)
- Snow Density > End of Previous Month (SNOTEL and Snow Course) > [Stations](#)

#### Precipitation

- Month-to-Date > Daily > [Stations](#)
- Water Year-to-Date > Daily > Percent of 1991-2020 Median > [Stations](#) | [Basins](#)
- Previous Month > Percent of 1991-2020 Median > [Stations](#) | [Basins](#)
- Previous 3 Months > Percent of 1991-2020 Average > [Stations](#) | [Basins](#)

#### Streamflow

- Observed (Adjusted Volume) > Previous Month > Percent of 1991-2020 Median > [Stations](#) | [Basins](#)
- Forecast (Adjusted Volume) > Most Recent (Available March 1 through June 1) > Percent of 1991-2020 Median > [Stations](#) | [Basins](#)

#### Reservoir Storage

- End of Previous Month > Percent of 1991-2020 Median > [Stations](#)

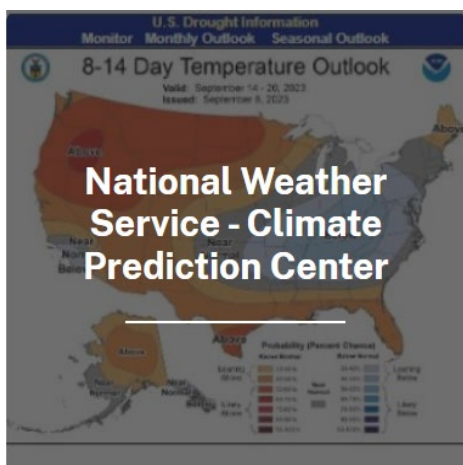
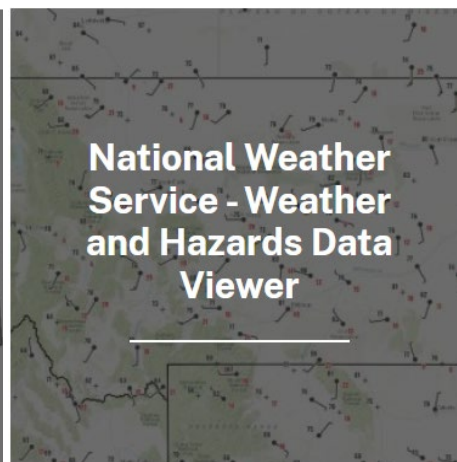
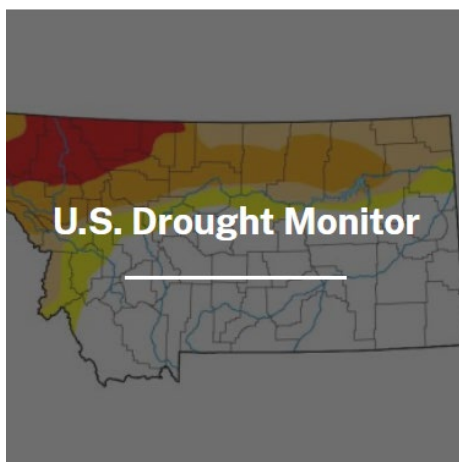
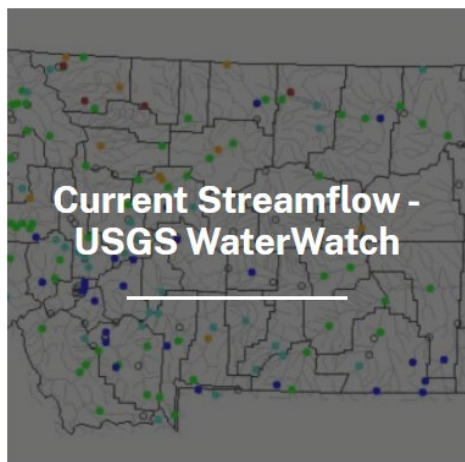
#### Other

- Snow Water Equivalent > Daily > Compared to POR > [Stations](#)
- Snow Water Equivalent > End of Previous Month (SNOTEL and Snow Course) > Percentile > [Stations](#)
- Water Year-to-Date Precipitation > Daily > Compared to POR > [Stations](#)

# Appendix

## Links and Resources (Continued)

### External Agencies (click image)



### Additional Drought Information

- [U.S. Drought Monitor](#)
- [National Integrated Drought System \(Drought.gov\)](#)
- [USDA Drought Portal \(News and Resources\)](#)
- [Farm Services Agency Montana \(Information on Programs and Deadlines\)](#)
- [Farm Services Agency Disaster Assistance Programs](#)
- [Montana Department of Natural Resources and Conservation Drought Management](#)

### Snow Survey Program FAQ

[Frequently Asked Snow Survey Questions - Montana | Natural Resources Conservation Service \(usda.gov\)](#)

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<https://www.nrcs.usda.gov/montana/snow-survey>



**Montana  
Water Supply Outlook  
Report**

**Natural Resources Conservation Service**

