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Natural Resources Conservation Service

Montana

Water Supply Outlook Report

March 1, 2023

Photo of the northern Bridger Range on February 24 when the ridge top wind gusted 40-50 mph as the weather transitioned from cold and snowy to warm and sunny. Similar to January, February ended with a large storm that brought several feet of mountain snow across much of Montana. February however had more consistent precipitation than January and snowpack percentages are currently near to well above normal in most river basins. Exceptions are basins along the far western and northwestern border of Montana, where the snowpack is below normal. With one to two months remaining in the typical snowpack accumulation season, water supply forecasts are now available statewide.

For more water supply information, contact:

Eric Larson

Water Supply Specialist

Federal Building

10 East Babcock, Room 443

Bozeman, MT 59715

406-599-9697

eric.larson@usda.gov

https://www.nrcs.usda.gov/wps/portal/wcc/home/quicklinks/states/montana/

Precipitation

After a large late January storm ended several weeks of dry weather, active weather has persisted. There were not many days in February in which it didn't snow somewhere in Montana. In addition to consistent precipitation during the month, two large storms added to the totals. The first occurred around the first week of February and brought one to two inches of precipitation to the upper elevations in northwest Montana. The second and more significant storm occurred about February 18 to 21. Similar to the late January storm, this was the result of a large low-pressure system located over the Hudson Bay in Canada, which directed Arctic air and moisture at Montana from a northwesterly direction. The largest totals accumulated in the Mission and Swan Mountain Ranges, where over 4 inches of precipitation fell. Across the rest of the region, precipitation totals at SNOTEL stations were about two to three inches.

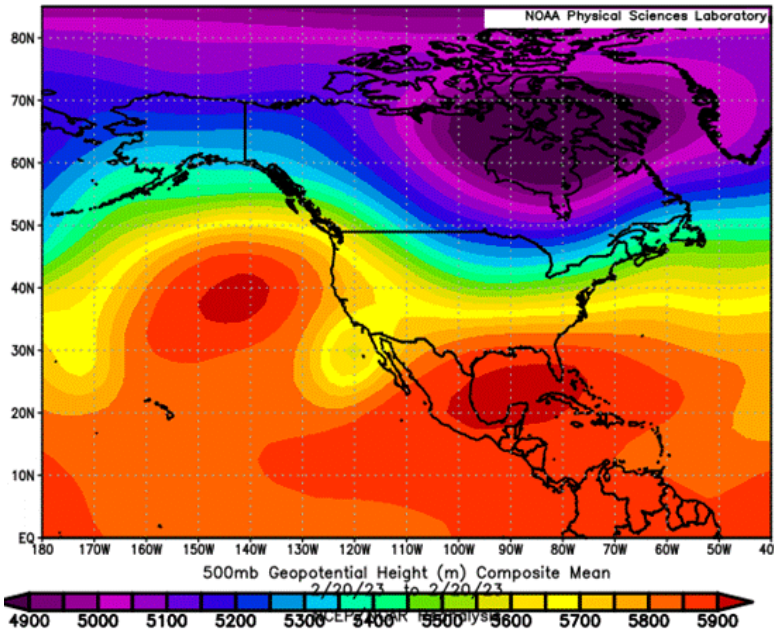


Figure: 500mb atmospheric pressure during the late-February storm that brought significant precipitation to the region. Daily Climate Composites: NOAA Physical Sciences

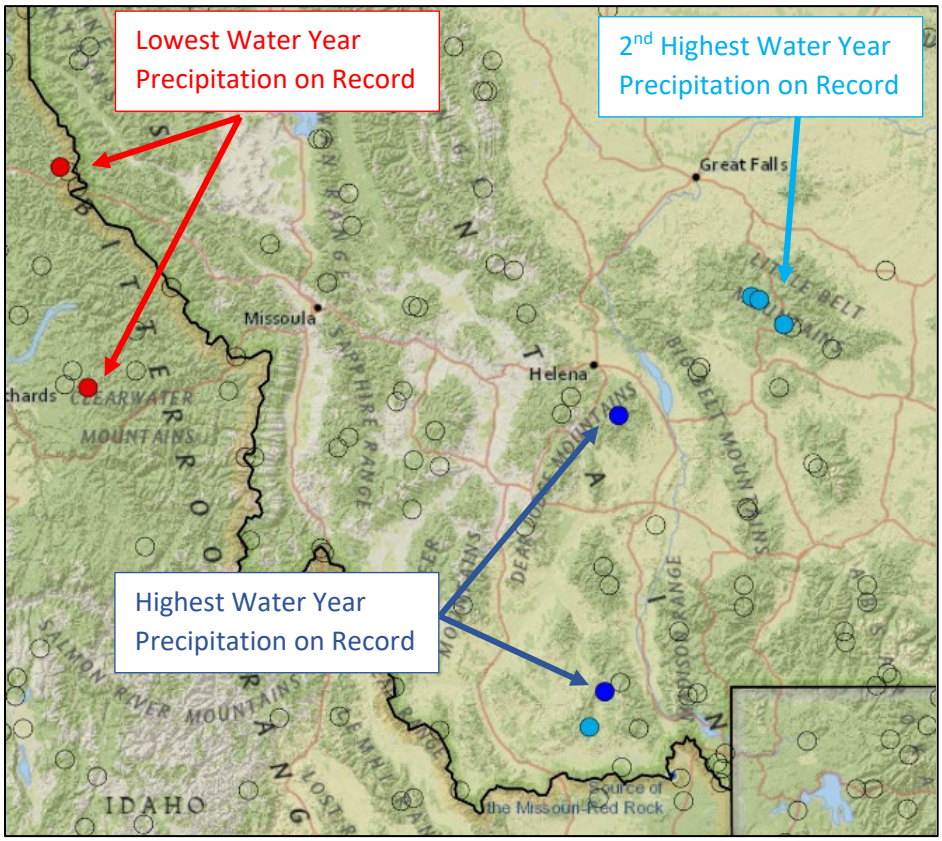
Overall February precipitation was near to well above normal across most of Montana and northern Wyoming. The Smith-Judith-Musselshell River basins received over 150% of normal monthly precipitation, while basins in western Montana, including the region stretching from the Madison River basin to the Kootenai River basin received about 90% to 110% of normal precipitation. All other basins were somewhere between that range, except for the Bitterroot which only received about 80% of normal February precipitation.

Water year precipitation is near to above normal (about 90% to 140%) across most of Montana and northern Wyoming. Several SNOTEL stations in central and southwest Montana are currently reporting near record water year precipitation. This includes three SNOTEL stations in the Little Belt Mountains, Tizer Basin SNOTEL in the Elkhorn Mountains, and two SNOTEL stations near the Gravelly Range. The story has been different in northwest Montana where the Bitterroot, Lower Clark Fork, Kootenai, Flathead, and Saint Mary's have only received about 75% to 90% of normal water year precipitation. In terms of water year deficit, that equals about 4 to 8 inches of precipitation at lower mountain elevations and 10 to 12 inches at upper mountain elevations. It is not likely that will be recovered in next several months, but also not impossible. Ideally these northwestern Montana basins receive above normal precipitation over the next couple months and build on the existing snowpack before spring runoff.

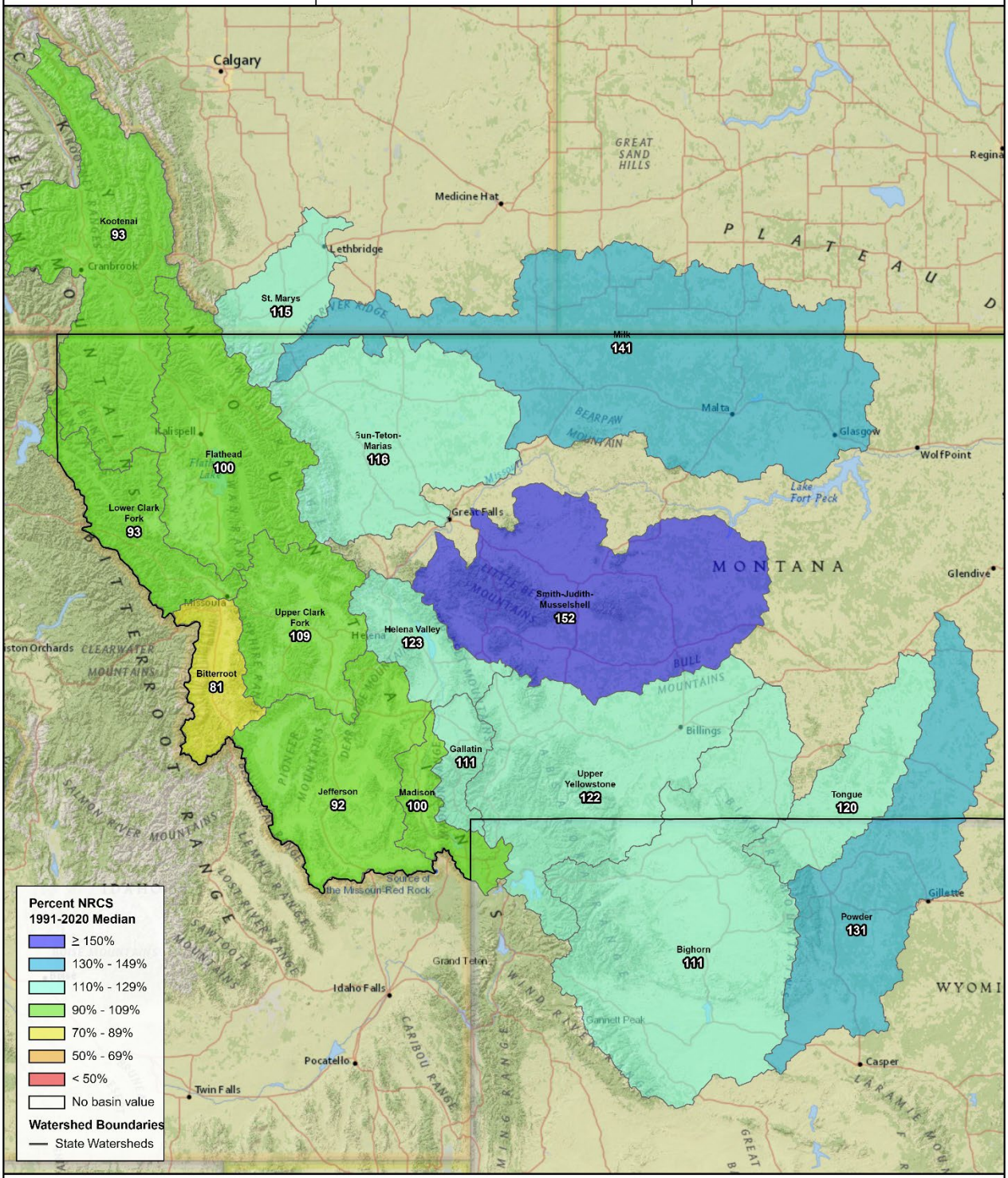
Snow Water Equivalent Accumulation from February 18 through February 21, 2023

SNOTEL	Mountain Range	County	Elevation	Accumulation (Inches)
Noisy Basin	Swan	Flathead	6040	4.7
North Fork Jocko	Mission	Missoula	6330	4.4
Copper Camp	Rocky Mountain Front	Lewis And Clark	6950	3.9
Badger Pass	Rocky Mountain Front	Pondera	6900	3.3
Brackett Creek	Bridger	Gallatin	7320	3.3
Spur Park	Little Belt	Judith Basin	8100	2.8
Deadman Creek	Little Belt	Meagher	6450	2.6
Twin Lakes	Bitterroot	Ravalli	6400	2.6
Onion Park	Little Belt	Meagher	7410	2.4
Stuart Mountain	Rattlesnake	Missoula	7400	2.4
Flattop Mtn.	Lewis	Flathead	6300	2.3
Kraft Creek	Mission	Missoula	4750	2.3
Evening Star	Absaroka	Park	9200	2.2
Moss Peak	Mission	Lake	6780	2.2
Poorman Creek	Cabinet	Lincoln	5100	2.2
Grave Creek	Whitefish	Flathead	4300	2.1
Boulder Mountain	Big Belt	Meagher	7950	2.0
Hoodoo Basin	Bitterroot	Mineral	6050	2.0
Warm Springs	Flint Creek	Granite	7800	2.0

SNOTEL - 2023 Water Year Precipitation Compared to Record - Link



1 month Precipitation	Monthly SNOTEL Precipitation Percent NRCS 1991-2020 Median	February 1, 2023 - February 28, 2023



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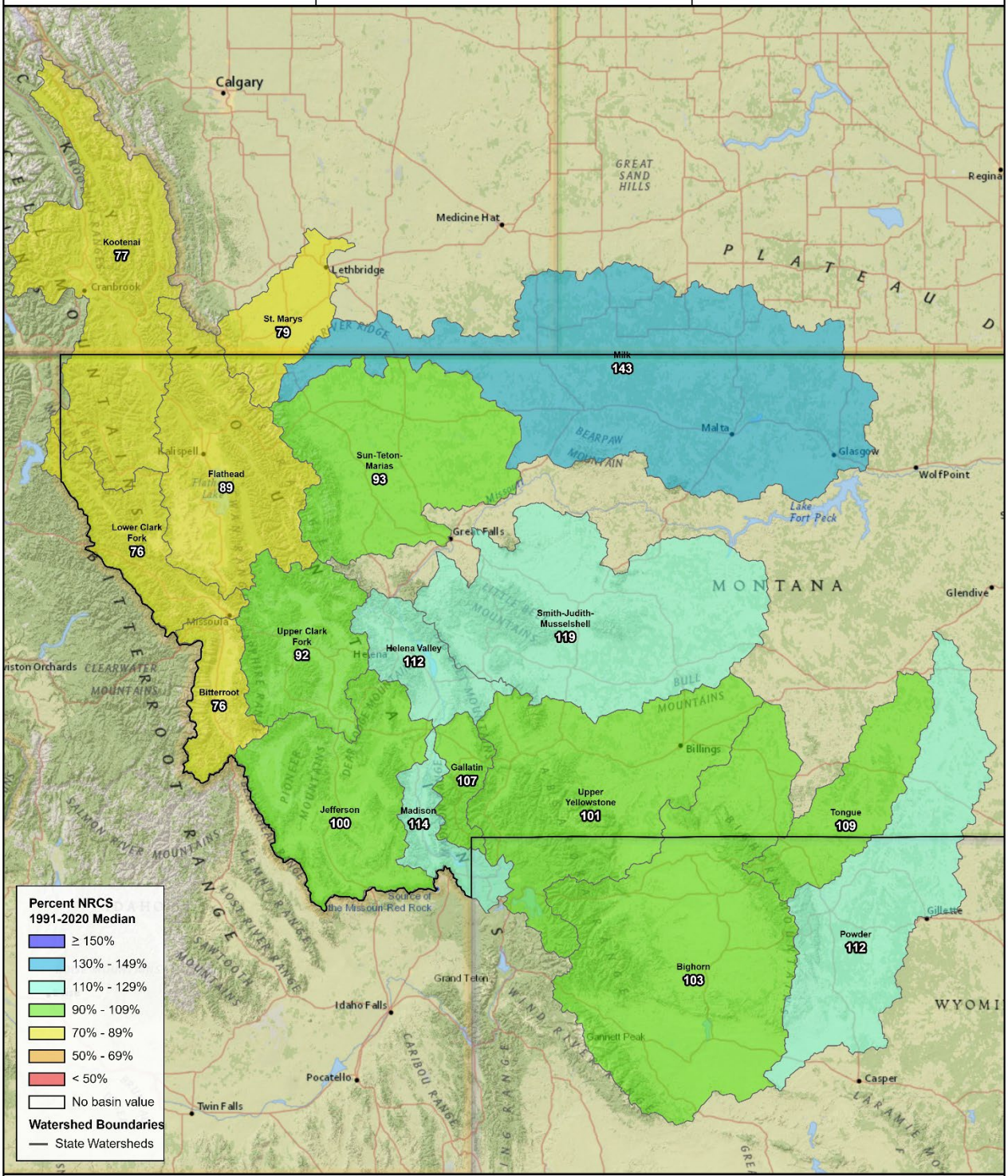
Water Year to Date Precipitation	Water Year SNOTEL Precipitation Percent NRCS 1991-2020 Median	October 1, 2022 - February 28, 2023



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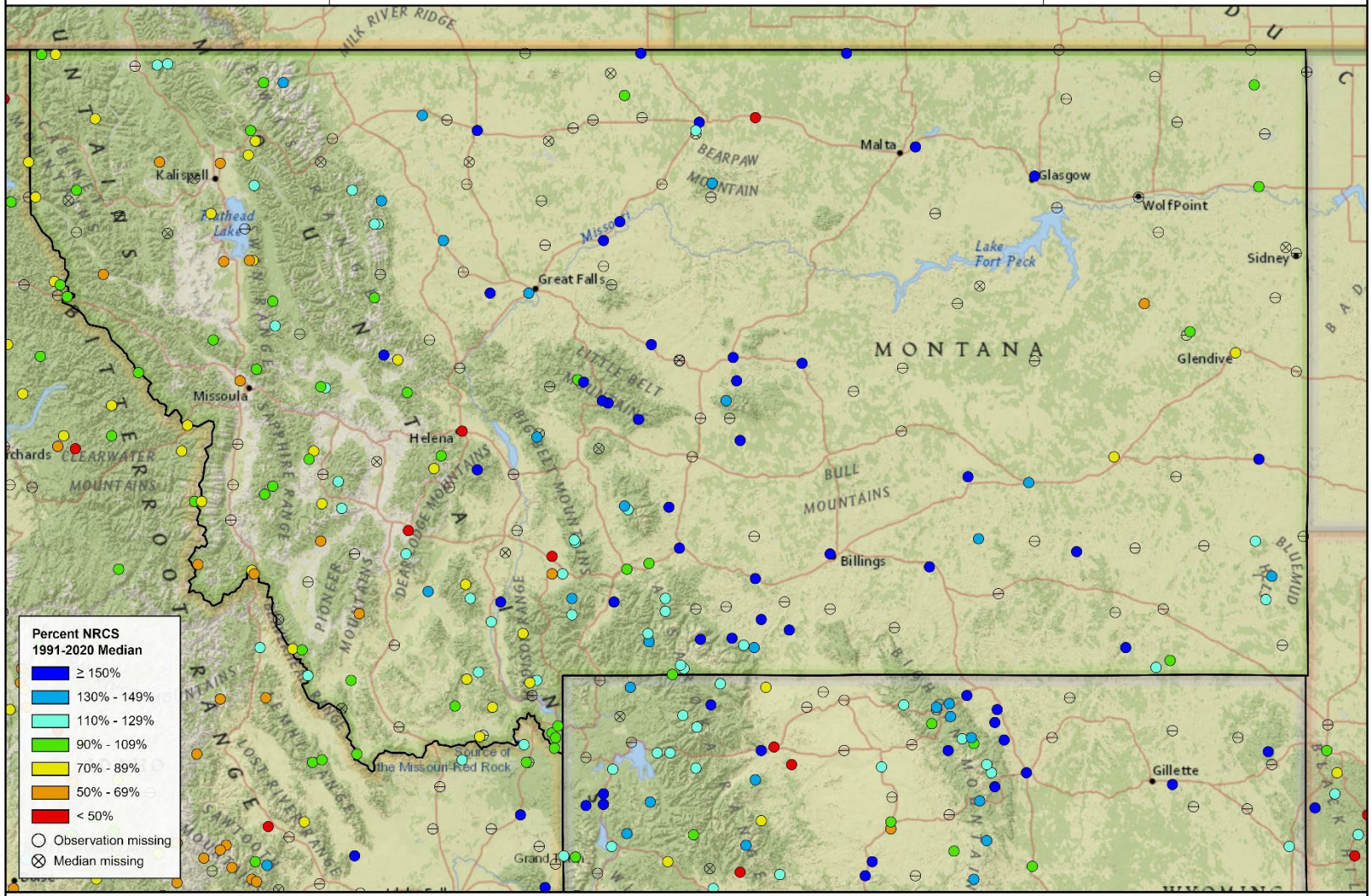
1 month Precipitation	Monthly Precipitation Percent NRCS 1991-2020 Median	February 1, 2023 - February 28, 2023



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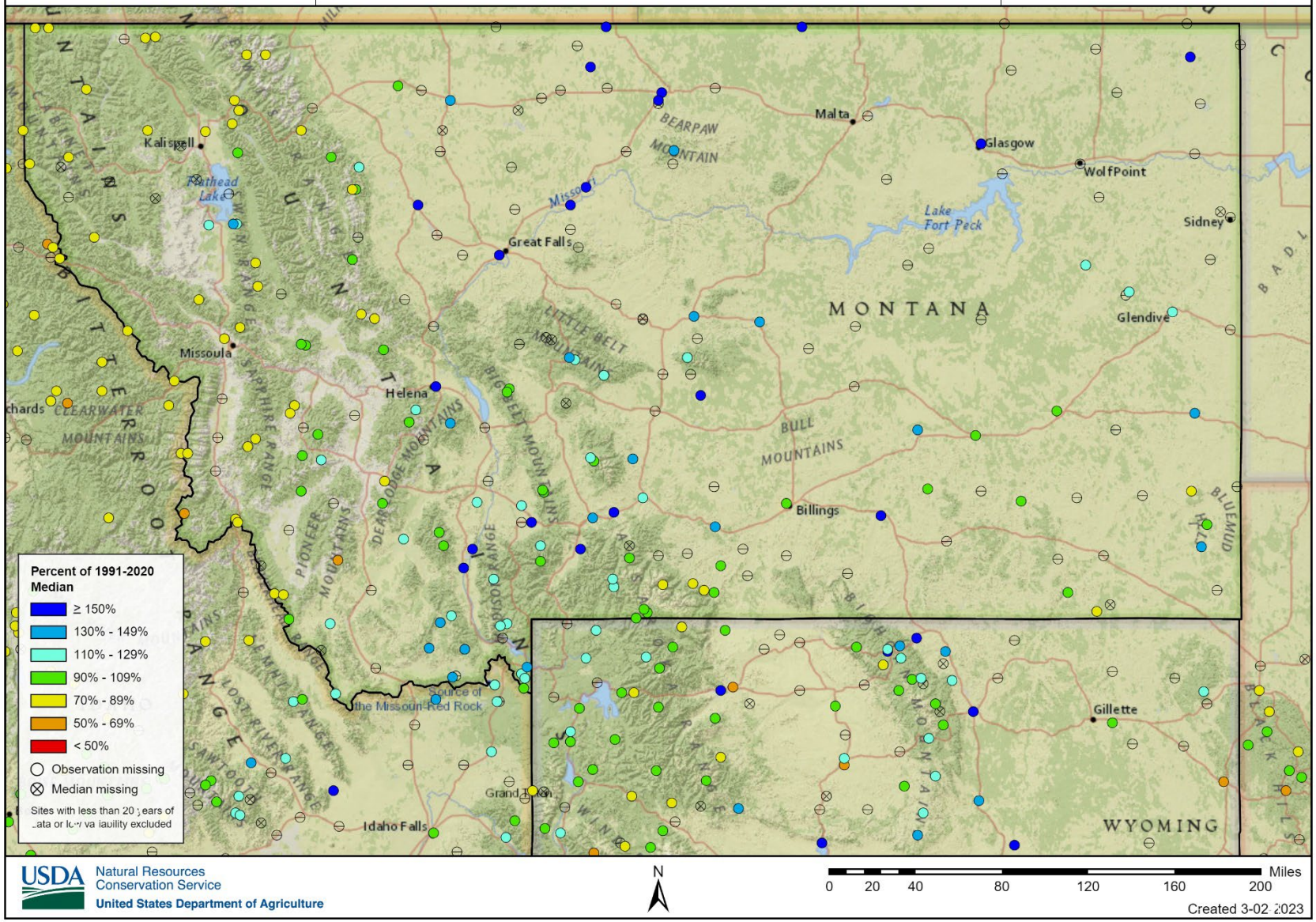
Water Year to Date Precipitation	Water Year Precipitation Percent of 1991-2020 Median	October 1, 2022 - February 28, 2023



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Snowpack

After many Montana river basins experienced a decrease in their snowpack percentage from January 1 to February 1, above normal precipitation during February provided a timely rebound. As of March 1, most snowpack percentages have increased from last month. The Sun-Teton-Marias snowpack made the largest rebound from about 85% of normal on February 1 to about 100% of normal on March 1, which was the result of consistent snowfall and the late February storm that delivered 2 ft to 3 ft of snow to the Rocky Mountain Front. The Flathead River basin made a similar recovery, from about 90% to 100%, after receiving 3 ft to 4 ft of snow in the Mission and Swan Mountain Ranges from the same storm. Snowpack percentages in the Bighorn, Jefferson, Madison, Milk, and Smith-Judith-Musselshell River basins decreased slightly from last month, but still have an above normal snowpack and added to their overall snow water equivalent.

Currently the snowpack is above normal in all basins east of the Continental Divide, except the Saint Mary River basin which is at about 90% of normal for March 1. The Bighorn, Upper Yellowstone, Jefferson, and Sun-Teton-Marias River basins currently have a near normal snowpack. The Madison, Gallatin, Tongue, and Powder River basins currently have a well above normal snowpack, at about 115% to 125%. The Smith-Judith-Musselshell River basin snowpack is also well above normal at nearly 125%. The snowpack at Rocky Boy SNOTEL in the Bears Paw Mountains south Havre is currently over 150% of normal. To put that in perspective, Rocky Boy SNOTEL currently has 7.3 inches of snow water equivalent, which is 2.9 inches more than normal for now. The normal snowpack peak is 5.4 inches, and while that's not a lot of snow compared to other regions in Montana, it is a lot for that area.

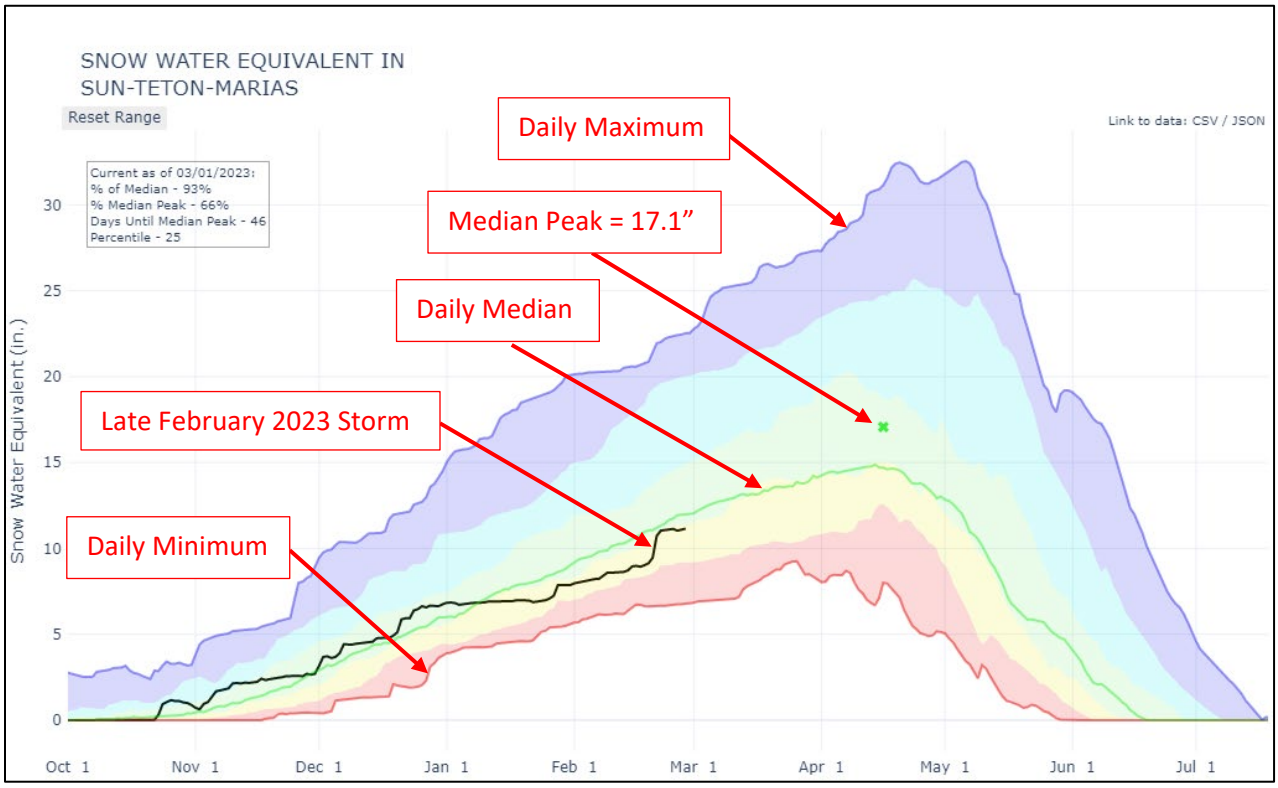
With only one to two months remaining in the typical snowpack accumulation season, the March 1 snowpack provides insight into what spring snowmelt will bring, however there is still time for conditions to change. In terms of water supply, the snowpack across most of Montana in is good condition. Some regions including the Madison, Gallatin, Little Belts, Big Belts, and Bighorn Mountains have accumulated a 2 to 3 inch surplus of snow water equivalent, which will be beneficial if active weather tapers off in the next couple months. However, those regions are still 3 to 6 inches below their normal snowpack peak levels and lack of snowfall during the next couple months could result in a below normal snowpack in the spring, when it matters most. River basins to keep an eye on over the next couple months are the Kootenai, Lower Clark Fork, Bitterroot, and Saint Marys. The basin wide snowpack deficit in these basins currently ranges from 3 to 6 inches of snow water equivalent.

Compared to last year, current snowpack conditions are generally better east of the Continental Divide and worse west of the Continental Divide. Exceptions are the Flathead River basin, which basin wide is slightly better than last year because of the deep snowpack in the Swan and Mission Mountain ranges. The Saint Mary River basin snowpack is currently worse than last year. There are currently only 88 inches of snow at Flattop Mountain SNOTEL in Glacier National Park, while last year on March 1 there were 112 inches of depth. Several SNOTEL stations currently have the most snow water equivalent on record, including Stringer Creek in the Little Belts (22 years of record), Short Creek in the Gravelly Range (35 years), and Tie Creek in the Bighorns (29 years). In more recent history, many highest and lowest snowpack records are currently being set. Stations in the Bears Paw, Boulder, Highland, Centennial, and the northern Bighorns Mountains are currently reporting the highest snow water equivalent in 10 years. Stations in the Pioneer, Beaverhead, Sapphire, southern Whitefish, and northern Flathead Mountains currently have the lowest snow water equivalent in 10 years (see map on page 11).

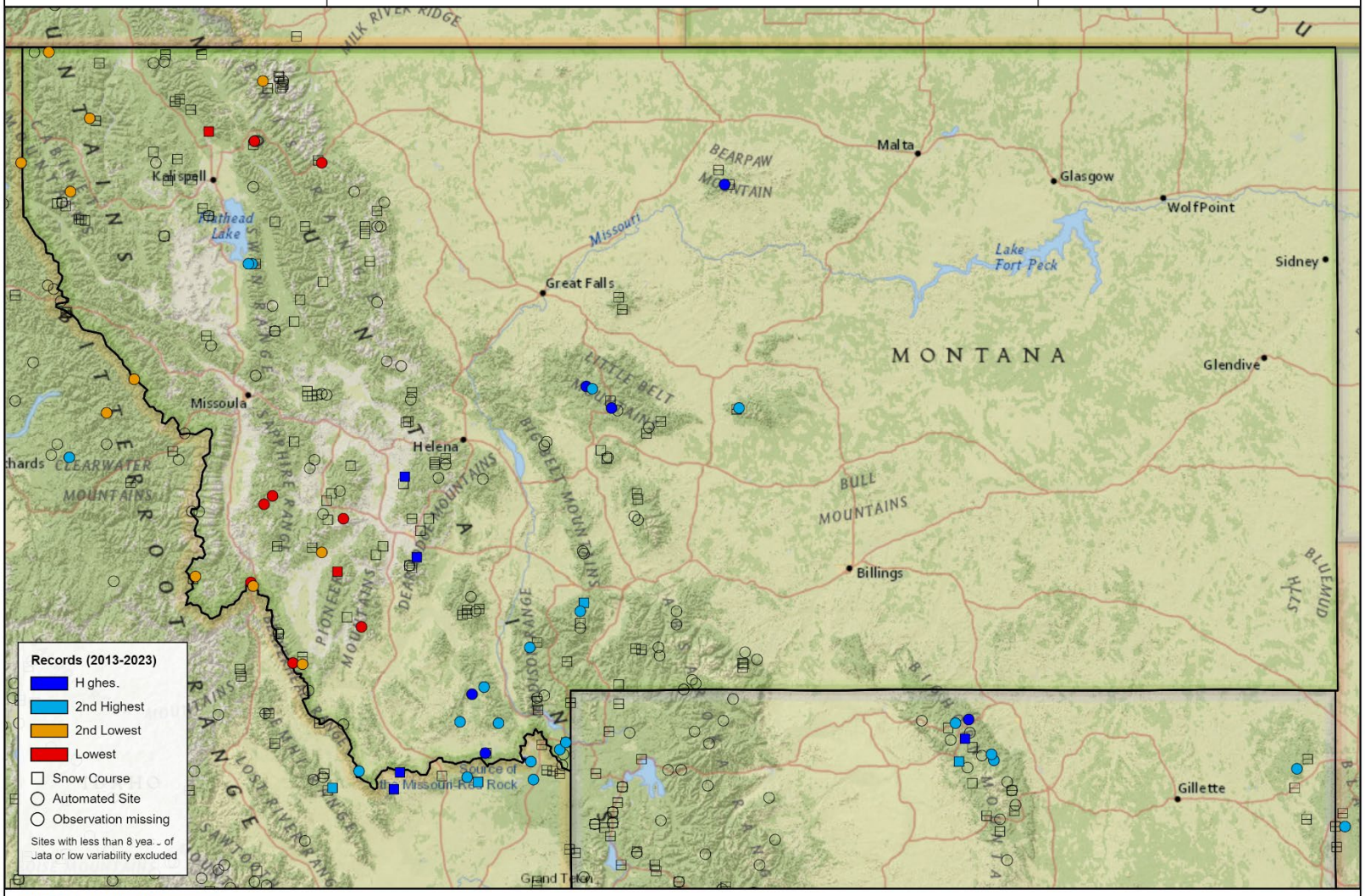
Major Basin Snow Water Equivalent (SWE) Percentage and Peak SWE Information

Basin	Last Year SWE % Normal 3/1/2022	Last Month SWE % Normal 2/1/2023	Current SWE % Normal 3/1/2023	Normal Peak Date -	Normal Peak SWE (inches)	Current SWE (inches)	Remaining SWE to Reach Normal Peak (inches)
Bighorn	87%	115%	109%	April 20	13.9	10.9	3.0
Bitterroot	95%	82%	84%	April 6	21.4	14.9	6.5
Flathead	94%	90%	99%	April 14	26.1	19.5	6.6
Gallatin	79%	109%	113%	April 24	21.9	15.9	6.0
Helena Valley	85%	110%	107%	April 16	13.6	11.1	2.5
Jefferson	83%	105%	103%	April 18	14.9	11.5	3.4
Kootenai	107%	82%	84%	April 8	25.6	17.6	8.0
Lower Clark Fork	100%	86%	88%	April 14	31.2	22.1	9.1
Madison	81%	121%	117%	April 22	21.9	17.6	4.3
Milk	79%	172%	166%	March 26	5.4	7.3	-1.9
Powder	83%	114%	115%	April 14	10.8	8.3	2.5
Smith-Judith-Musselshell	77%	123%	123%	April 16	15.4	14.1	1.3
St. Marys	107%	85%	89%	April 6	29.2	20.8	8.4
Sun-Teton-Marias	101%	86%	101%	April 16	17.1	11.3	5.8
Tongue	93%	108%	115%	April 29	13.5	9.5	4.0
Upper Clark Fork	88%	95%	99%	April 13	15.9	13.3	2.6
Upper Yellowstone	79%	99%	102%	April 23	19.1	14.4	4.7

Sun-Teton-Marias - 2023 Basin Wide Snow Water Equivalent Compared to Record



Snow Water Equivalent	March 1 Snowpack Compared to the Last 10 Years Records (2013-2023)	March 1st, 2023



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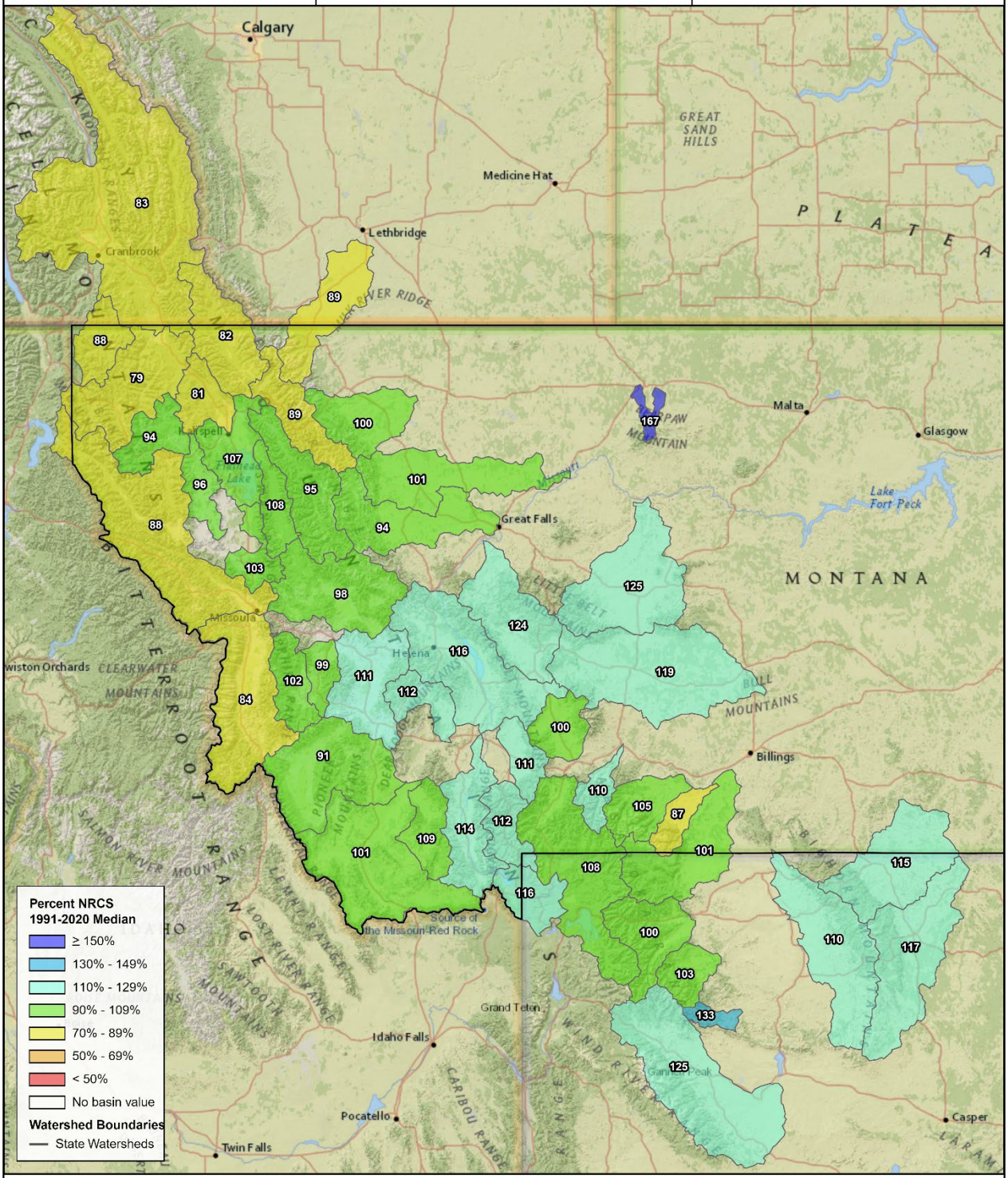
Sub-Basin Snow Water Equivalent – Current Compared to Last Month

River Basin Name	February 1, 2023 SWE % Normal	March 1, 2023 SWE % Normal	SWE % Difference
Bear Paw	172%	167%	-5%
Beaverhead	110%	101%	-9%
Big Hole	88%	91%	+3%
Big Horn	106%	110%	+4%
Bitterroot	82%	84%	+2%
Blackfoot	93%	98%	+5%
Boulder (Jefferson)	108%	112%	+4%
Boulder (Yellowstone)	102%	110%	+8%
Clarks Fork Yellowstone	92%	101%	+9%
Fisher	92%	94%	+2%
Flathead Lake	107%	107%	+0%
Flint	104%	99%	-5%
Gallatin ab Gateway	112%	112%	+0%
Greybull-Wood	105%	103%	-2%
Helena Valley	110%	116%	+6%
Judith	116%	125%	+9%
Kootenai in Canada	85%	83%	-2%
Kootenai in Montana	76%	79%	+3%
Little Bitterroot	77%	96%	+19%
Lower Clark Fork	86%	88%	+2%
Madison ab Hebgen	122%	116%	-6%
Madison bw Hebgen	120%	114%	-6%
Marias	83%	100%	+17%
Middle Fork Flathead	79%	89%	+10%
Musselshell	114%	119%	+5%
North Fork Flathead	77%	82%	+5%
Northern Gallatin	101%	111%	+10%
Owl	156%	133%	-23%
Powder	114%	117%	+3%
Rock (Clark Fork)	100%	102%	+2%
Rock (Yellowstone)	85%	87%	+2%
Ruby	125%	109%	-16%
Shields	88%	100%	+12%
Shoshone	94%	100%	+6%
Smith	116%	124%	+8%
South Fork Flathead	94%	95%	+1%
Southern Flathead	106%	103%	-3%
St. Marys	85%	89%	+4%
Stillwater (Flathead)	74%	81%	+7%
Stillwater (Yellowstone)	101%	105%	+4%
Sun	90%	94%	+4%
Swan	107%	108%	+1%
Teton	94%	101%	+7%
Tongue	108%	115%	+7%
Upper Clark	101%	111%	+10%
Wind	135%	125%	-10%
Yaak	87%	88%	+1%
Yellowstone ab Livingston	105%	108%	+3%

Snow Water Equivalent	Sub-Basin Snow Water Equivalent Percent NRCS 1991-2020 Median	March 1st, 2023



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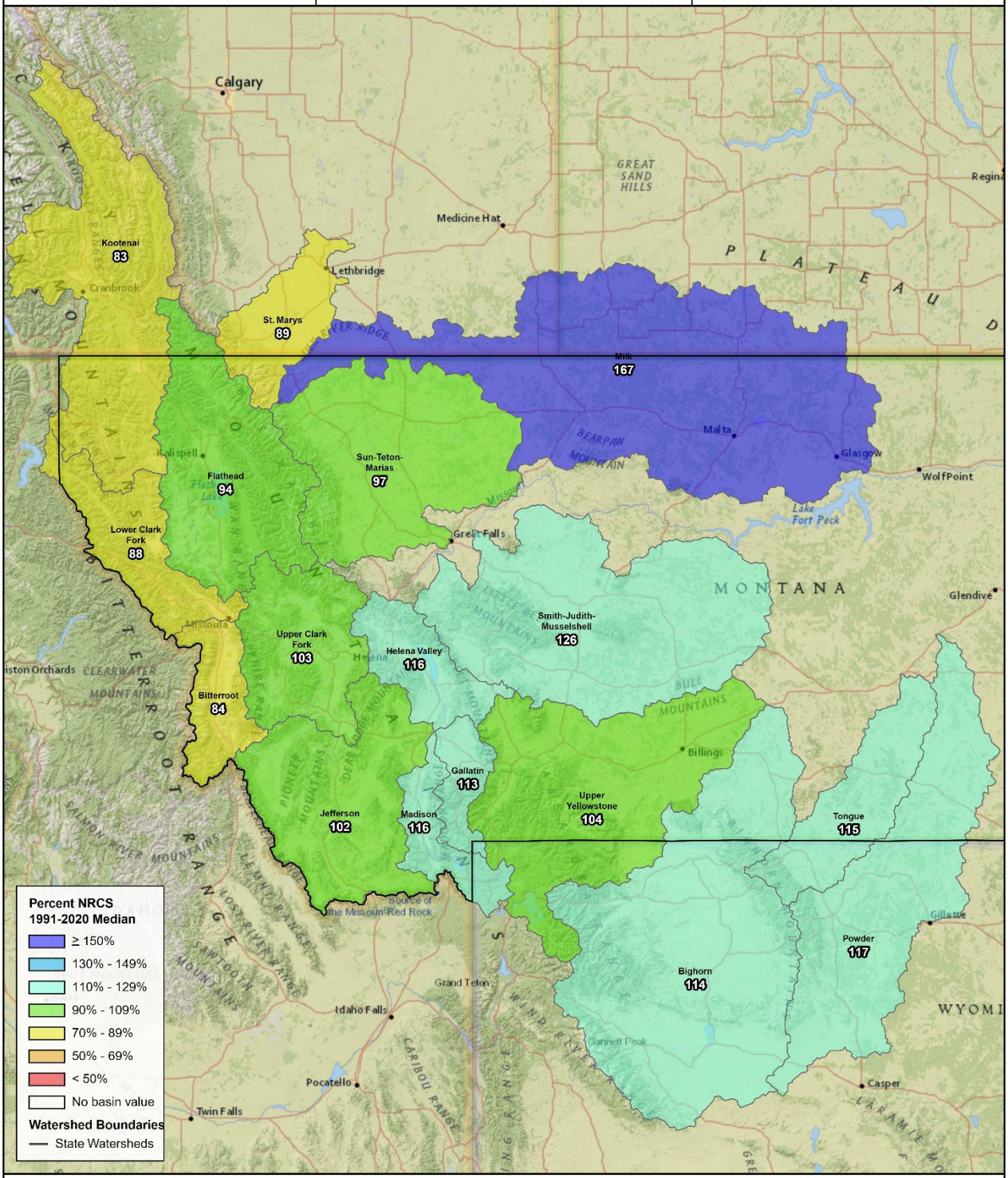
Snow Water Equivalent	Major Basin Snow Water Equivalent Percent NRCS 1991-2020 Median	March 1st, 2023



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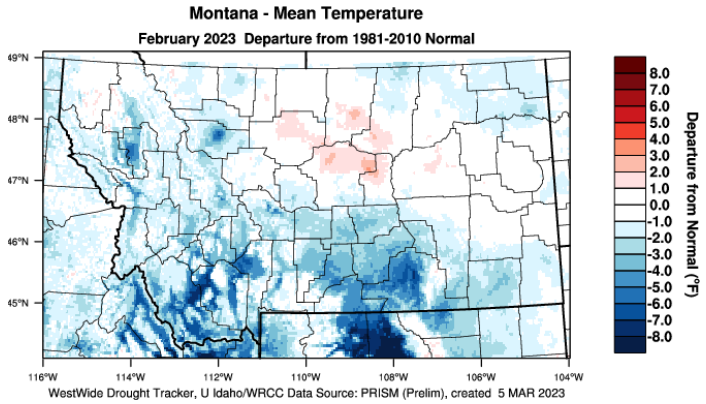
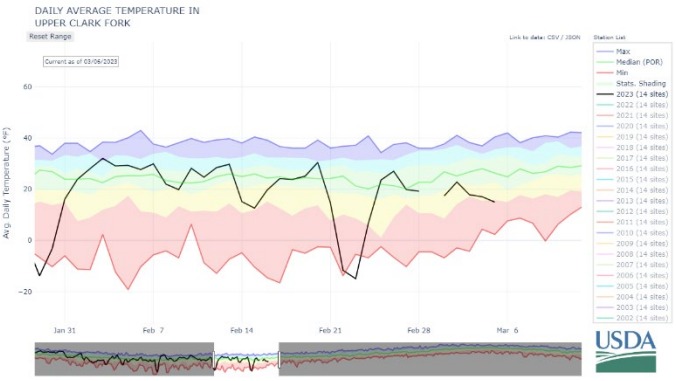
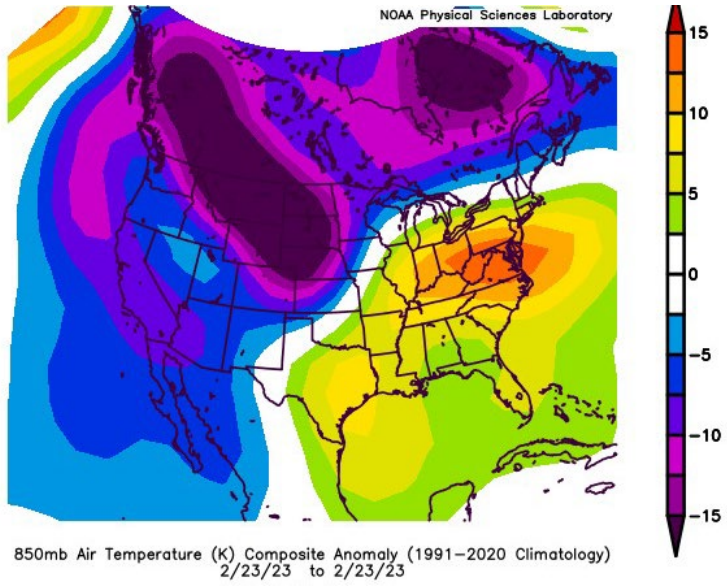
Temperature

February temperatures across Montana were largely near normal, with the notable exception of the cold snap during the February 21-24 period. This blast of Arctic air brought negative temperatures to most of the state accompanied by extremely cold windchills down to -40 and below. Southern and southwest Montana had sufficient colder periods to make the overall mean temperature a few degrees below normal, especially at higher elevations (below, left).





On the right above is a plot of daily average temperatures from the Upper Clark Fork River basin, which includes data from 14 SNOTEL stations. This pattern is similar to what was seen across the state. Below is a plot of temperature anomaly for February 23, 2023 at the peak of the cold snap in Montana, when temperatures were consistently 15 degrees C or more below normal for that day.



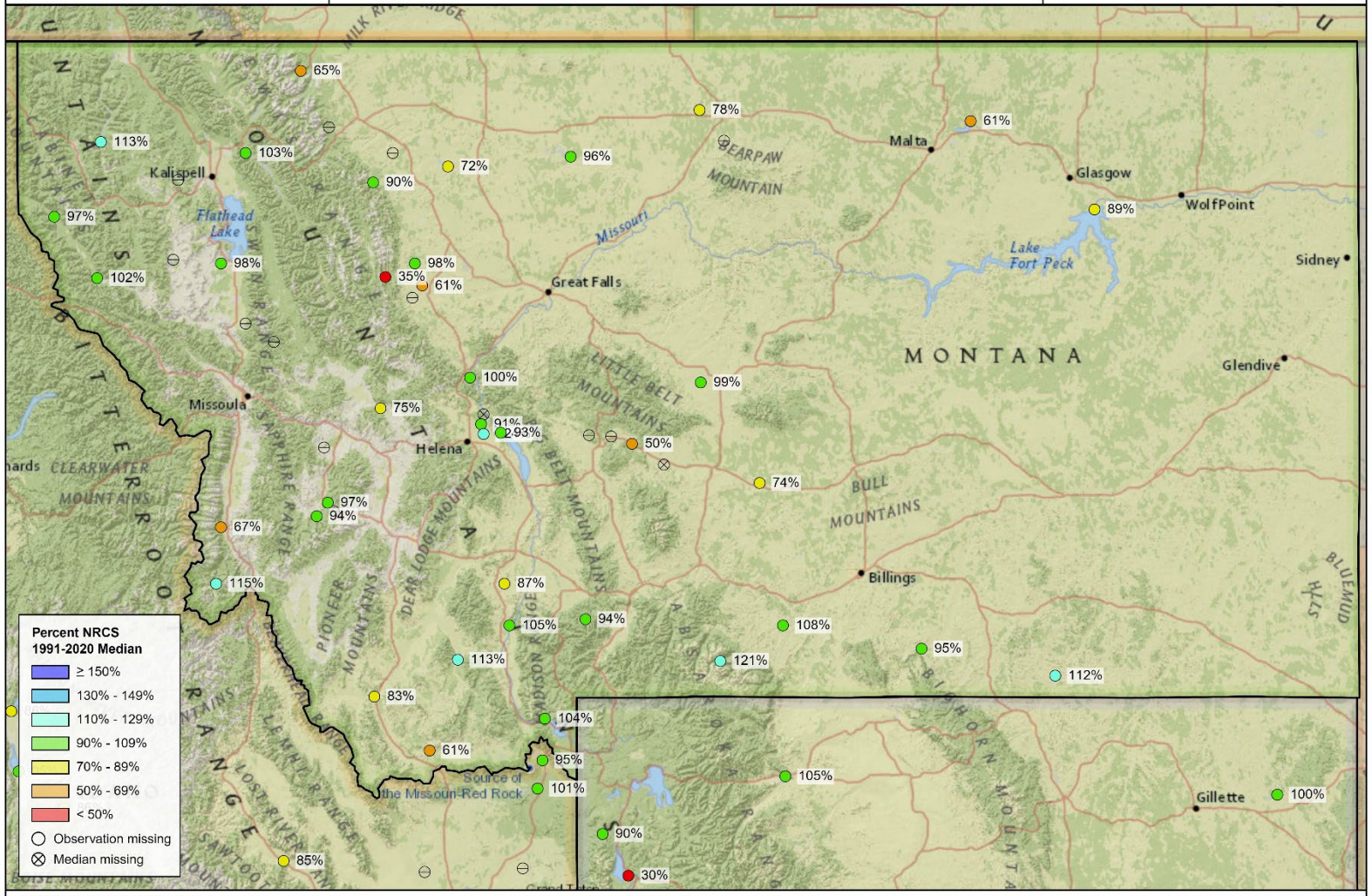
Reservoirs

March 1 reservoir storage levels are similar to last month across Montana. Bair, Gibson, Como, Sherburne, Lima, Nelson, Nelson, and Willow Creek Reservoir are well below normal for this time of year. Helena Valley, Mystic Lake, Painted Rocks, Ruby River, and Tongue River Reservoir are well above normal for this time of year. All other reservoirs are near normal for this time of year.

Reservoir Storage – Current Compared to Last Month and Last Year

Reservoir	% of Median (1991-2020)		
	March 1, 2023	February 1, 2023	March 1, 2022
Ackley Lake	99%	96%	83%
Bair Res	50%	51%	74%
Bighorn Lake	95%	96%	96%
Canyon Ferry Lake	93%	92%	86%
Clark Canyon Res	83%	84%	74%
Cooney Res	108%	108%	113%
Deadman's Basin Res	74%	73%	74%
East Fork Rock Creek Res	94%	98%	96%
Ennis Lake	105%	99%	93%
Flathead Lake	98%	105%	91%
Fort Peck Lake	89%	88%	94%
Fresno Res	78%	75%	62%
Georgetown Lake	97%	96%	95%
Gibson Res	35%	39%	49%
Hebgen Lake	104%	106%	90%
Helena Valley Reservoir	124%	124%	116%
Holter Lake	100%	100%	100%
Hungry Horse Lake	103%	102%	119%
Lake Como	67%	68%	118%
Lake Elwell (Tiber)	96%	98%	100%
Lake Frances	72%	69%	117%
Lake Helena	91%	91%	91%
Lake Koocanusa	113%	106%	74%
Lake Sherburne	65%	63%	170%
Lima Reservoir	61%	60%	69%
Middle Creek Res	94%	95%	94%
Mystic Lake	121%	112%	154%
Nelson Res	61%	61%	63%
Nevada Creek Res	75%	79%	83%
Nilan Reservoir	na	57%	72%
Noxon Rapids Reservoir	97%	97%	100%
Painted Rocks Lake	115%	114%	141%
Pishkun Res	98%	98%	97%
Ruby River Reservoir	113%	121%	91%
Smith River Res	na	na	75%
Swift Res	90%	96%	77%
Thompson Falls Res	102%	103%	102%
Tongue River Res	112%	111%	107%
Willow Creek Res (Harrison)	87%	99%	80%
Willow Creek Res - Augusta	61%	61%	79%

Reservoir Storage	Reservoir Storage Percent NRCS 1991-2020 Median	March 1st, 2023



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Created 3-06-2023

Drought Status

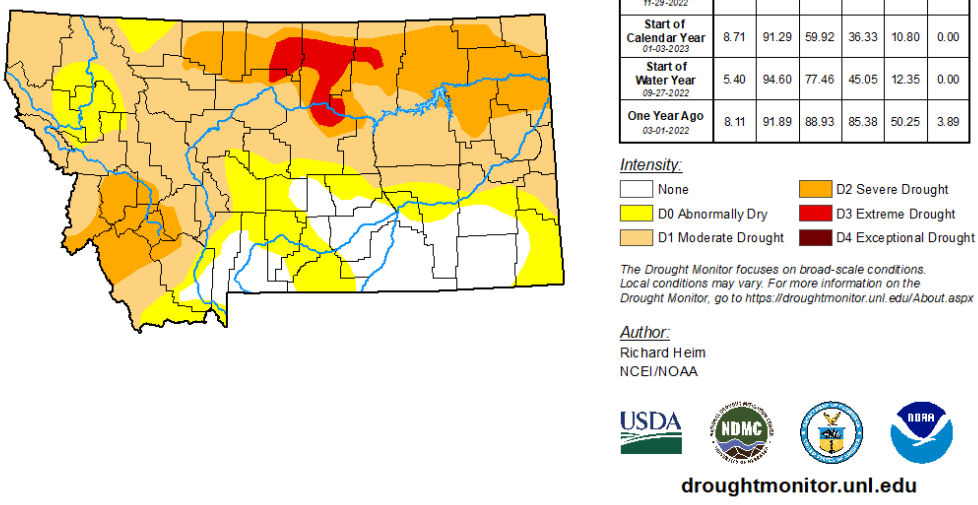
The most recent U.S. Drought Monitor map, released on March 2, 2023, indicates that 85% of Montana is under drought designation. While much of the state is still under drought status, the improvement in designation (D0-D4) has been significant over the last year. Currently only 3% of the state is designated D3 (0% D4), while last year on March 1, 50% of Montana was designated D3-D4 (Extreme-Exceptional Drought).

Drought designation has improved in most of Montana except in the northwest region, where it went from no drought designation to D0-D1 over the last year. Areas of highest drought designation include the entire Hi-Line region, which is designated D2, while parts of Blaine, Hill, Phillips and northern Fergus County are designated D3. Silver Bow, Deer Lodge, Granite, southern Ravalli, and northern Beaverhead are designated D2 (Severe Drought)

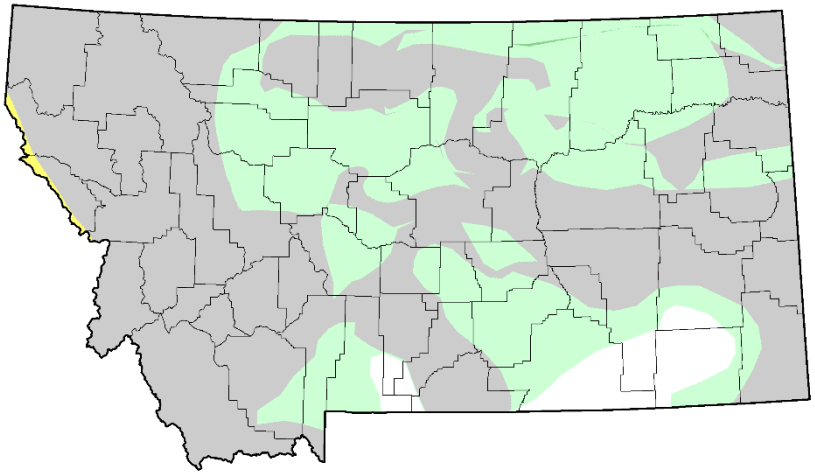
If you want more information about drought conditions or need assistance due to drought, the links below can help you gather information and provide information for contacting appropriate agencies.

Drought Links:

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



U.S. Drought Monitor Class Change - Montana
4 Week

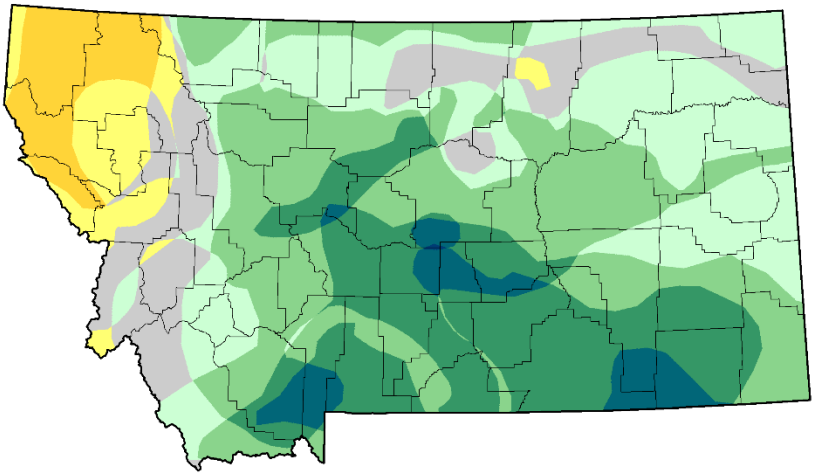


February 28, 2023
compared to
January 31, 2023

droughtmonitor.unl.edu

- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

U.S. Drought Monitor Class Change - Montana
52 Week



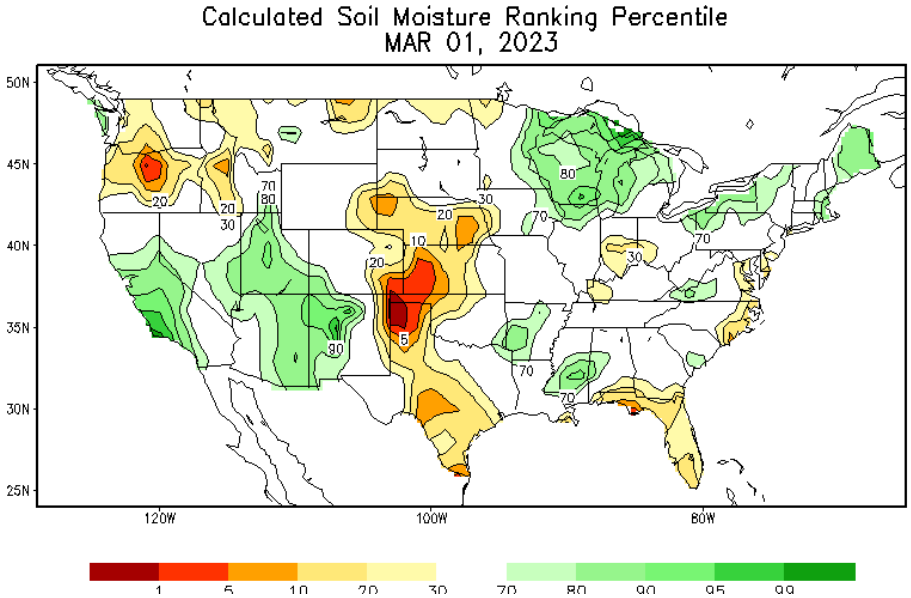
February 28, 2023
compared to
March 1, 2022

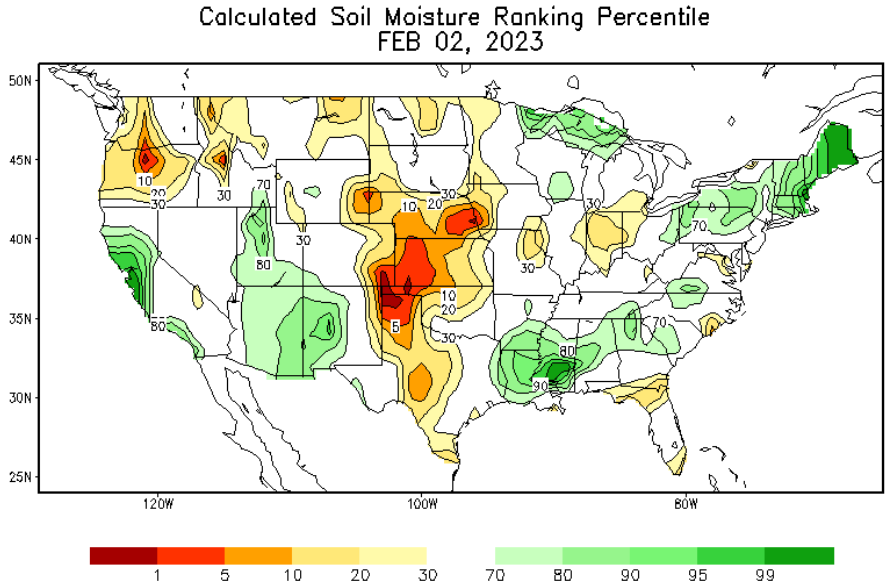
droughtmonitor.unl.edu

- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

Soil Moisture

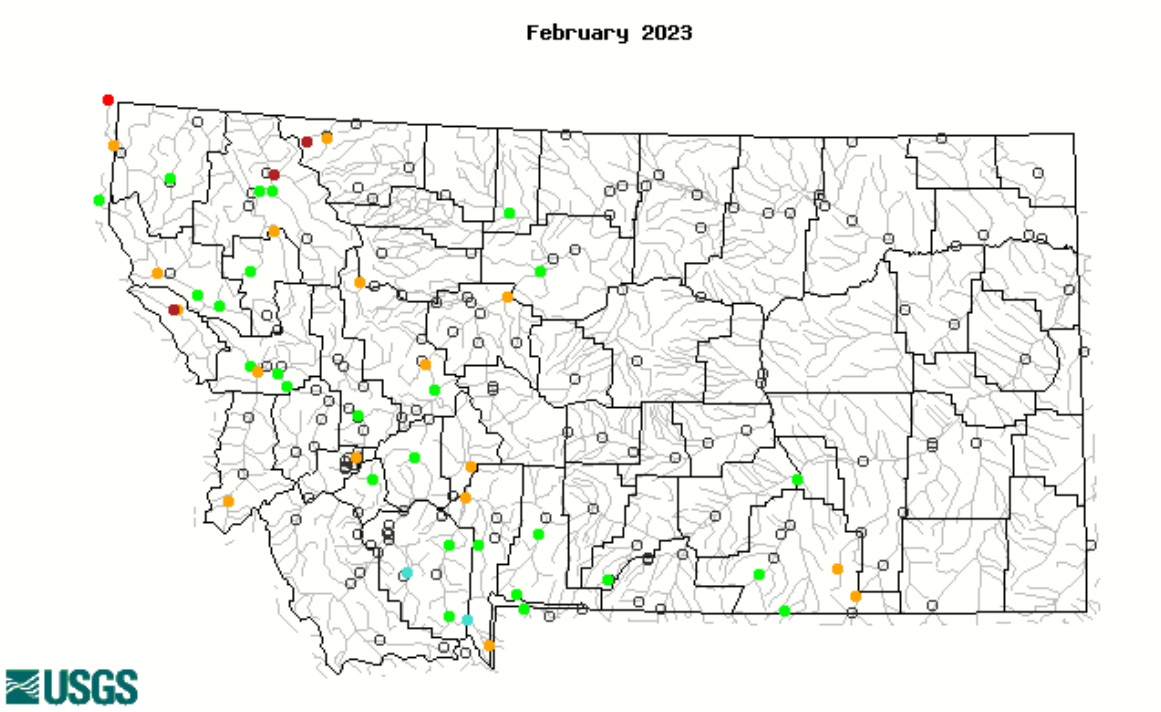
Modeled soil moisture for March 1, 2023, is in the 50th percentile (normal) across most of Montana. Soil moisture percentiles are lowest (below normal) west of the Continental Divide and in northeast Montana. Modeled soil moisture has increased from last month in parts of southcentral and central Montana. Currently soil moisture is modeled as above normal in the Little Belt Mountain region.





Current Streamflows

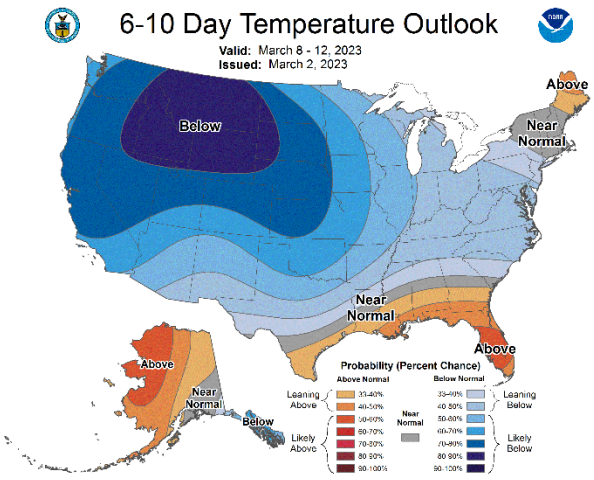
Streamflows in February were mostly normal for this time of year and the hydrographs for many stream gages indicate that streams are still at baseflow levels. Temperatures for February remained below normal in the mountainous areas of Montana which helped stave off progression of the snowpack to active melt. If temperatures continue this trend through March and storm systems continue to bring snow to our mountains, we should not see early surges in streamflows due to snowmelt.

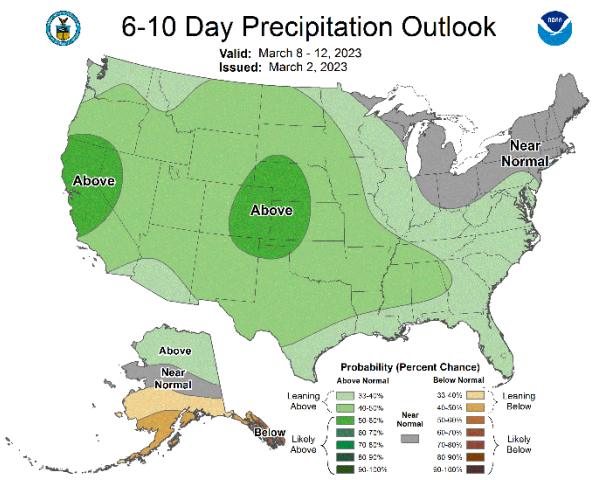


Weather and Climate Outlook

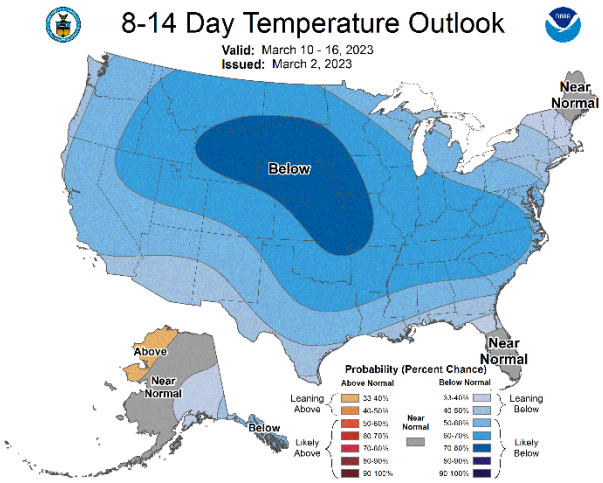
Outlooks from [NOAA's Climate Prediction Center] indicate below normal temperature and above normal precipitation is likely over the next month across Montana. The 3-month outlook also indicates below normal temperatures are likely but indicates equal chances of either above or below normal precipitation.

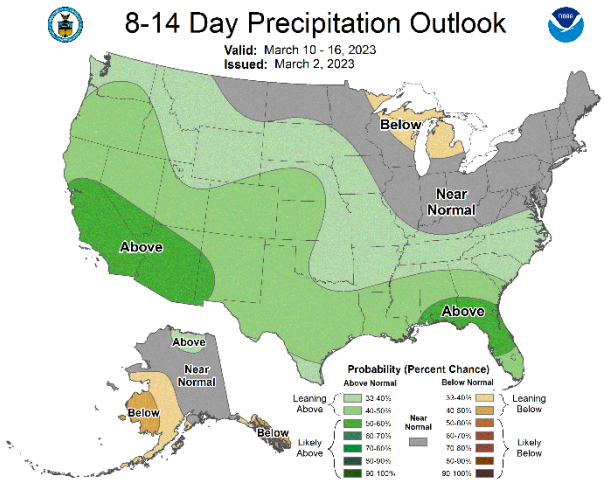
6-10 Day Outlook



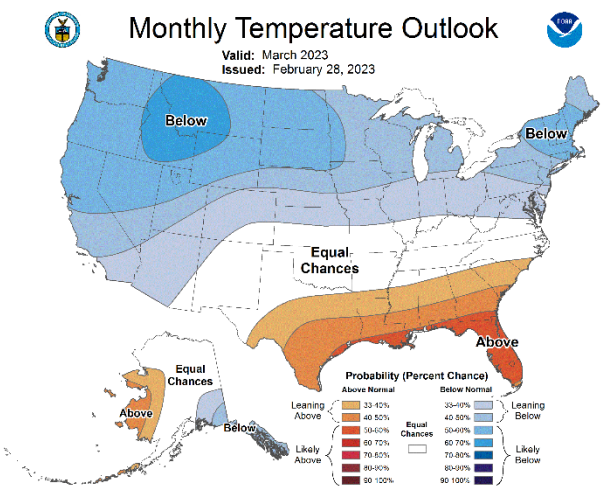


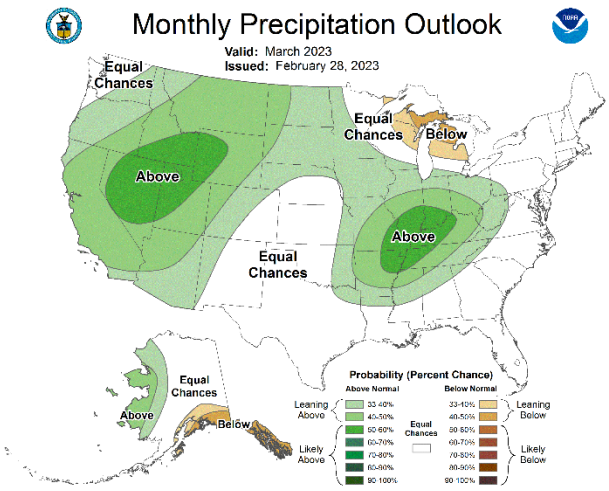
8-14 Day Outlook



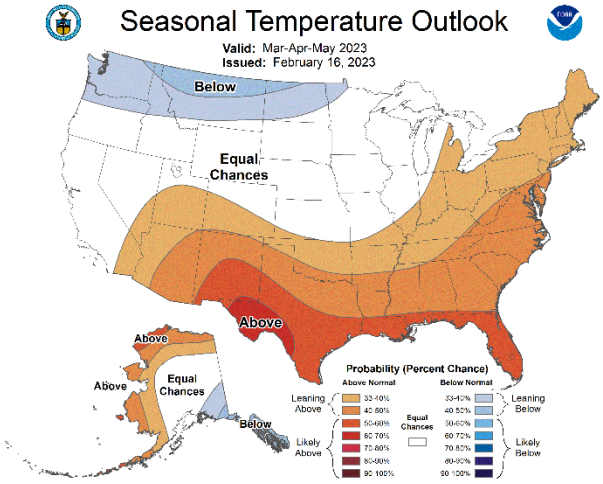


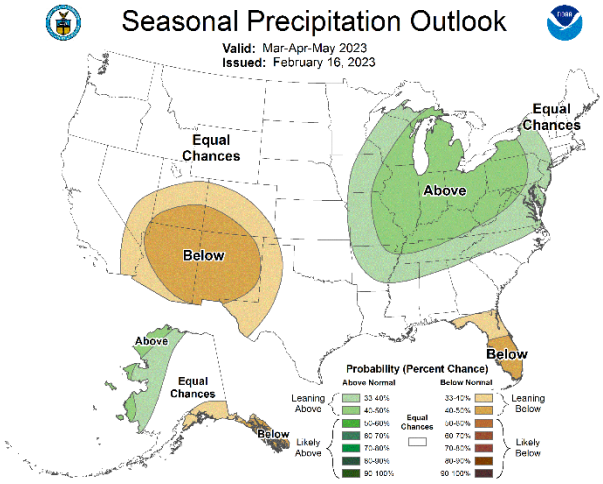
1 Month Outlook





3 Month Outlook





Official Streamflow Forecasts

How Forecasts Are Made

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.

Snowpack measurements are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. At automated stations, snow depth and snow water equivalent as well as precipitation and temperature are monitored on a daily basis. Both monthly and daily data are used to project snowmelt runoff.

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.

Summary - March 1, 2023

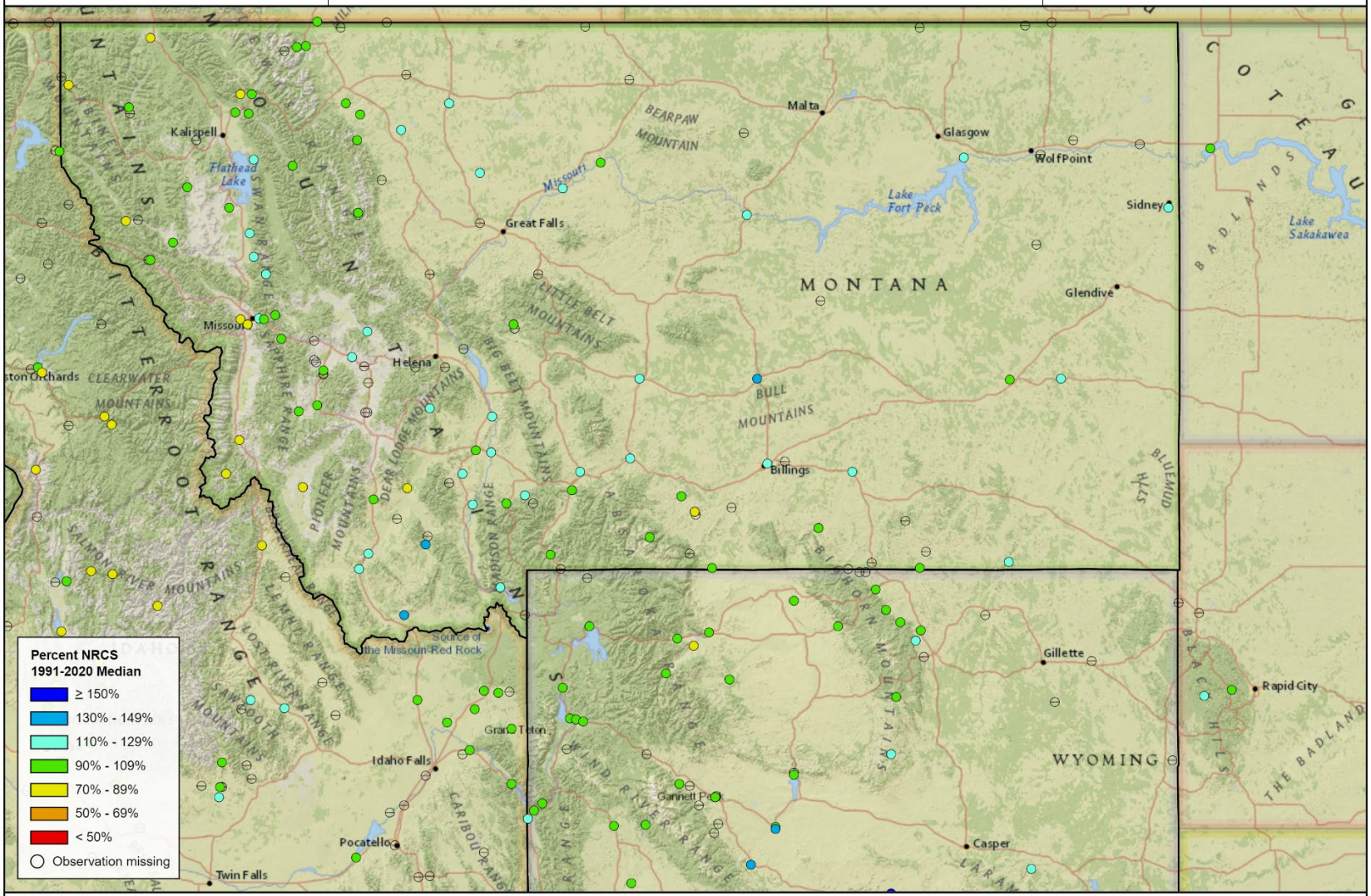
March 1 streamflow forecasts are in line with current water year precipitation and the ensuing snowpack. Most of the 50% exceedance forecasts are within 10% of normal. Exceptions are parts of central Montana (Smith-Judith-Musselshell), southwest Montana (Gallatin and Madison), and northern Wyoming (Wind, Bighorn-Powder-Tongue), which have all had abundant precipitation this water year and are currently forecasted to have above normal streamflows. Alternatively, western Montana along the Idaho border (Big Hole, Bitterroot, Lower Clark Fork) has experienced below normal water year precipitation and streamflows are forecasted to be below normal. There are still several months remaining in mountain snow accumulations season, conditions could change, and therefore some uncertainty exists in the March 1 forecasts.

Forecast Volume,
50% Exceedance Probability

March 1 Streamflow Forecasts

Percent NRCS 1991-2020 Median

April - July, March 1, 2023



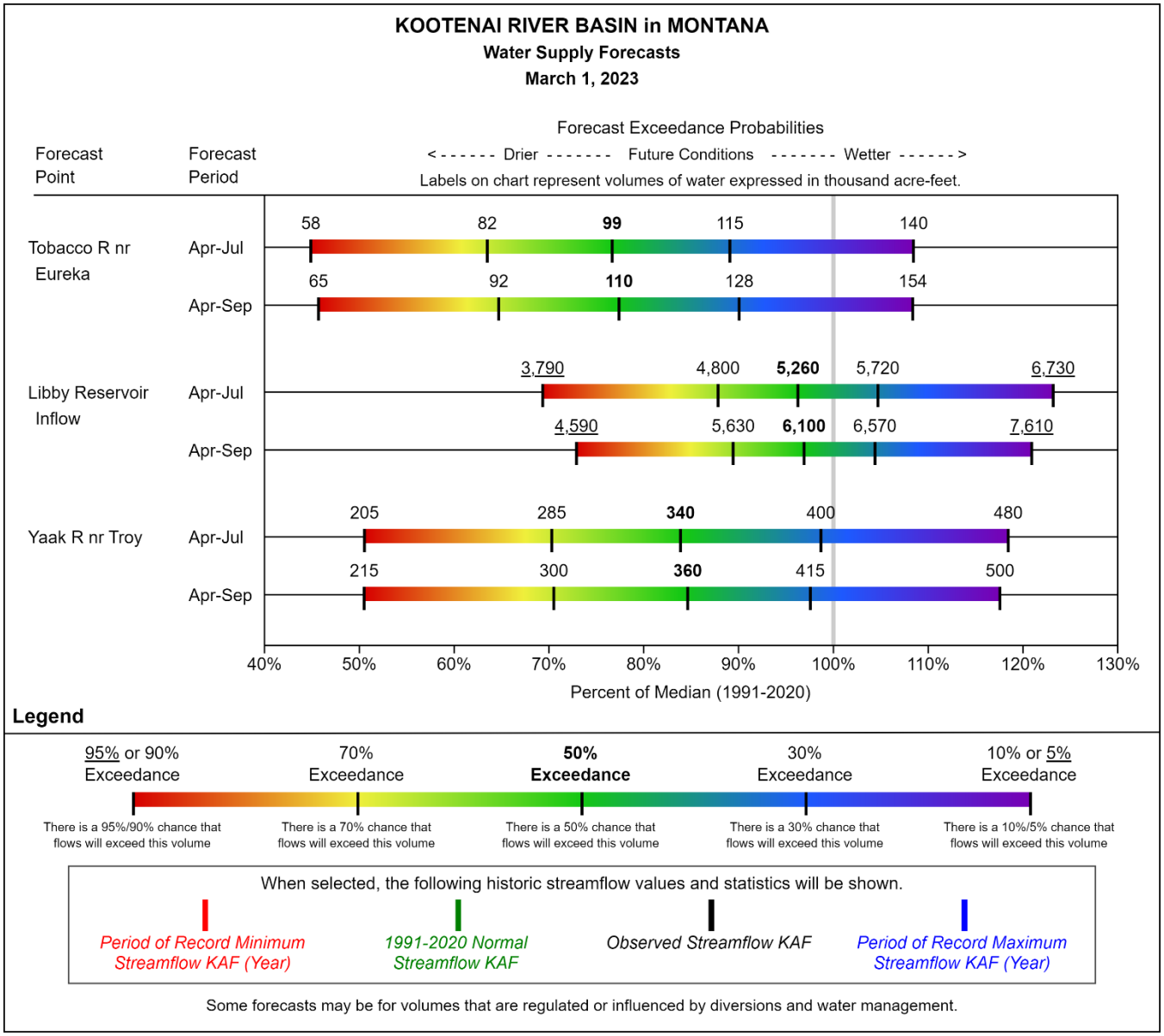
USDA Natural Resources Conservation Service
United States Department of Agriculture

N

0 20 40 80 120 160 200 Miles

Created 3-06-2023

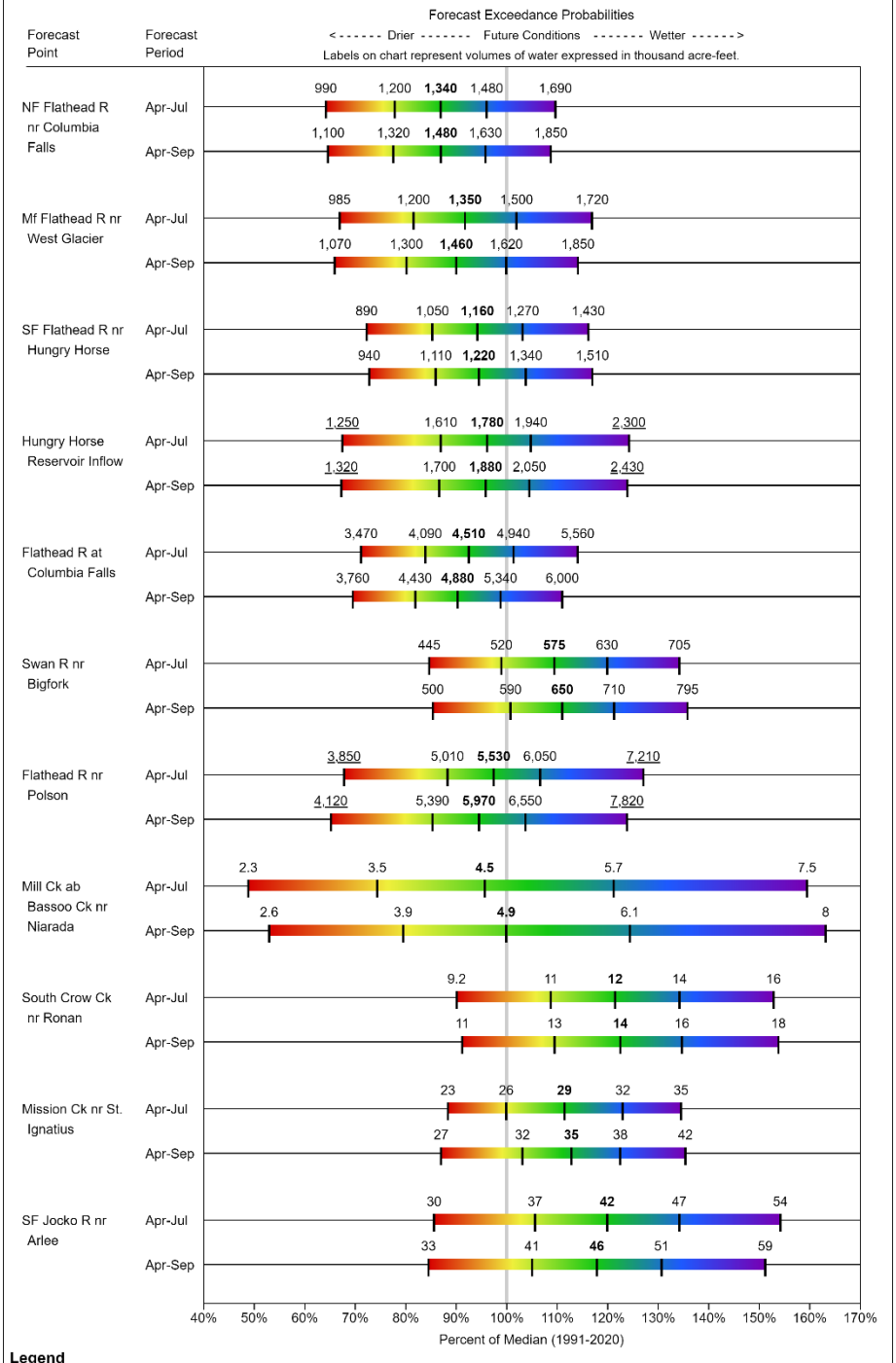
Streamflow Forecast Charts



FLATHEAD RIVER BASIN

Water Supply Forecasts

March 1, 2023



Legend

95% or 90% Exceedance — There is a 95%/90% chance that flows will exceed this volume

70% Exceedance — There is a 70% chance that flows will exceed this volume

50% Exceedance — There is a 50% chance that flows will exceed this volume

30% Exceedance — There is a 30% chance that flows will exceed this volume

10% or 5% Exceedance — There is a 10%/5% chance that flows will exceed this volume

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)

1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

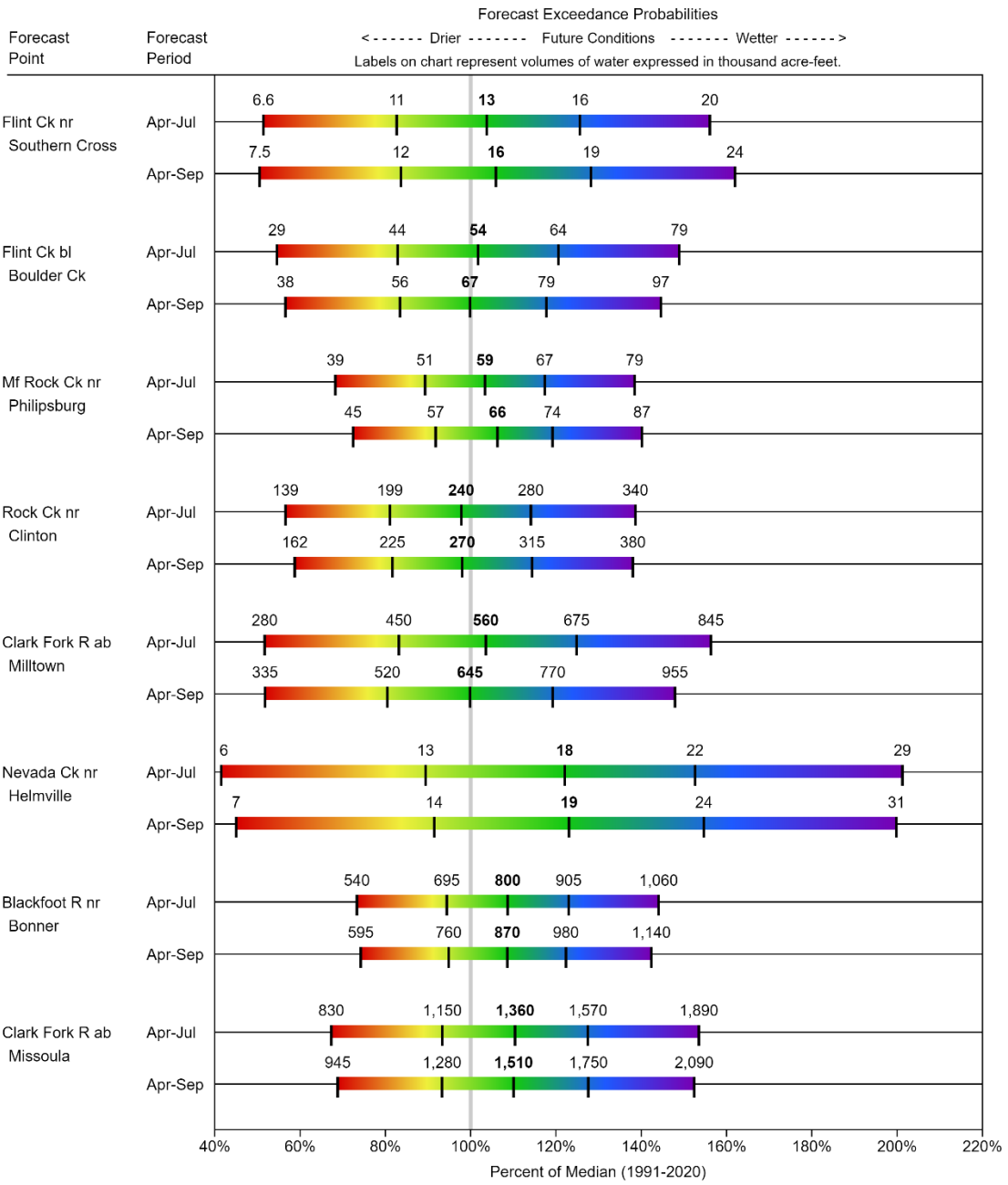
Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

UPPER CLARK FORK RIVER BASIN

Water Supply Forecasts

March 1, 2023



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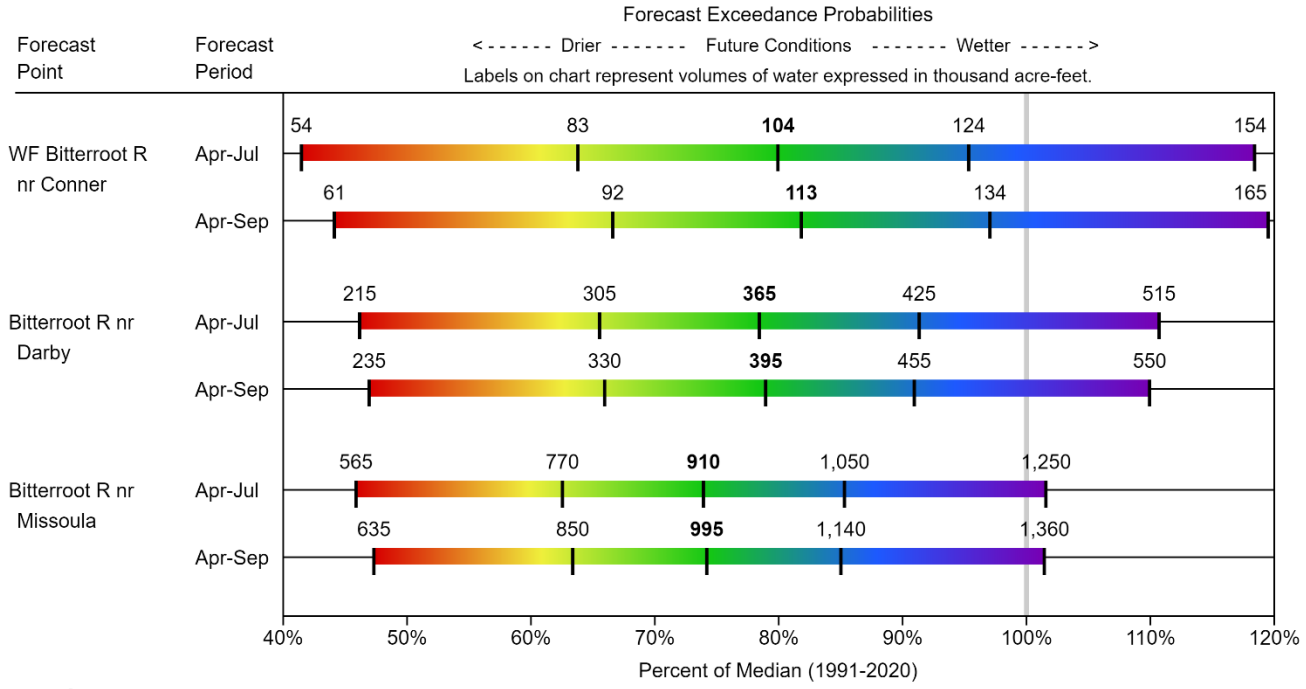
Period of Record Minimum Streamflow KAF (Year) | *1991-2020 Normal Streamflow KAF* | *Observed Streamflow KAF* | *Period of Record Maximum Streamflow KAF (Year)*

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

BITTERROOT RIVER BASIN

Water Supply Forecasts

March 1, 2023



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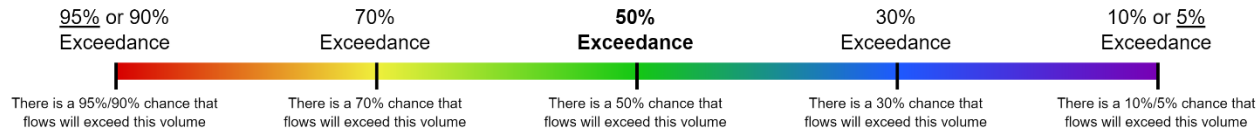

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Period of Record Minimum Streamflow KAF (Year)

1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

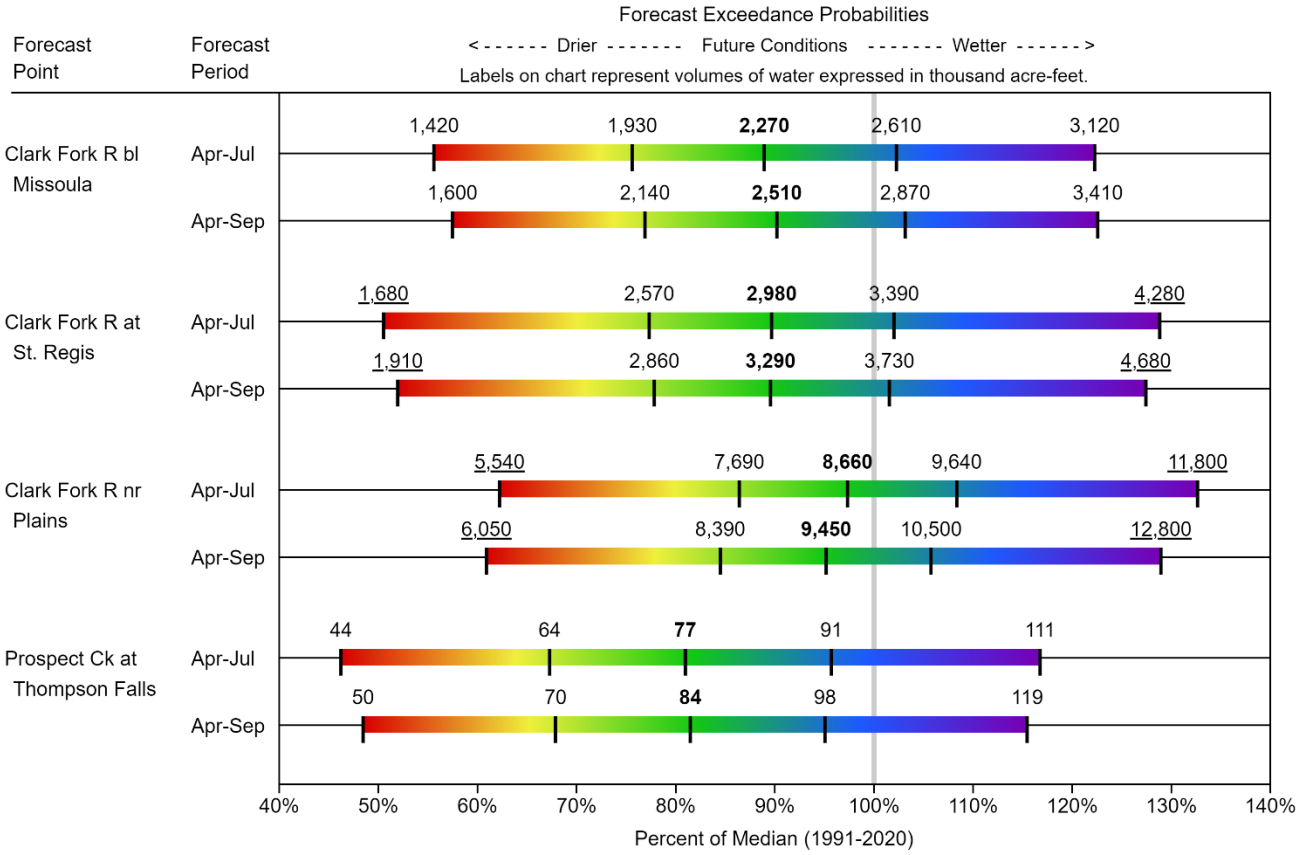
Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

LOWER CLARK FORK RIVER BASIN

Water Supply Forecasts

March 1, 2023



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Period of Record Minimum Streamflow KAF (Year)

1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

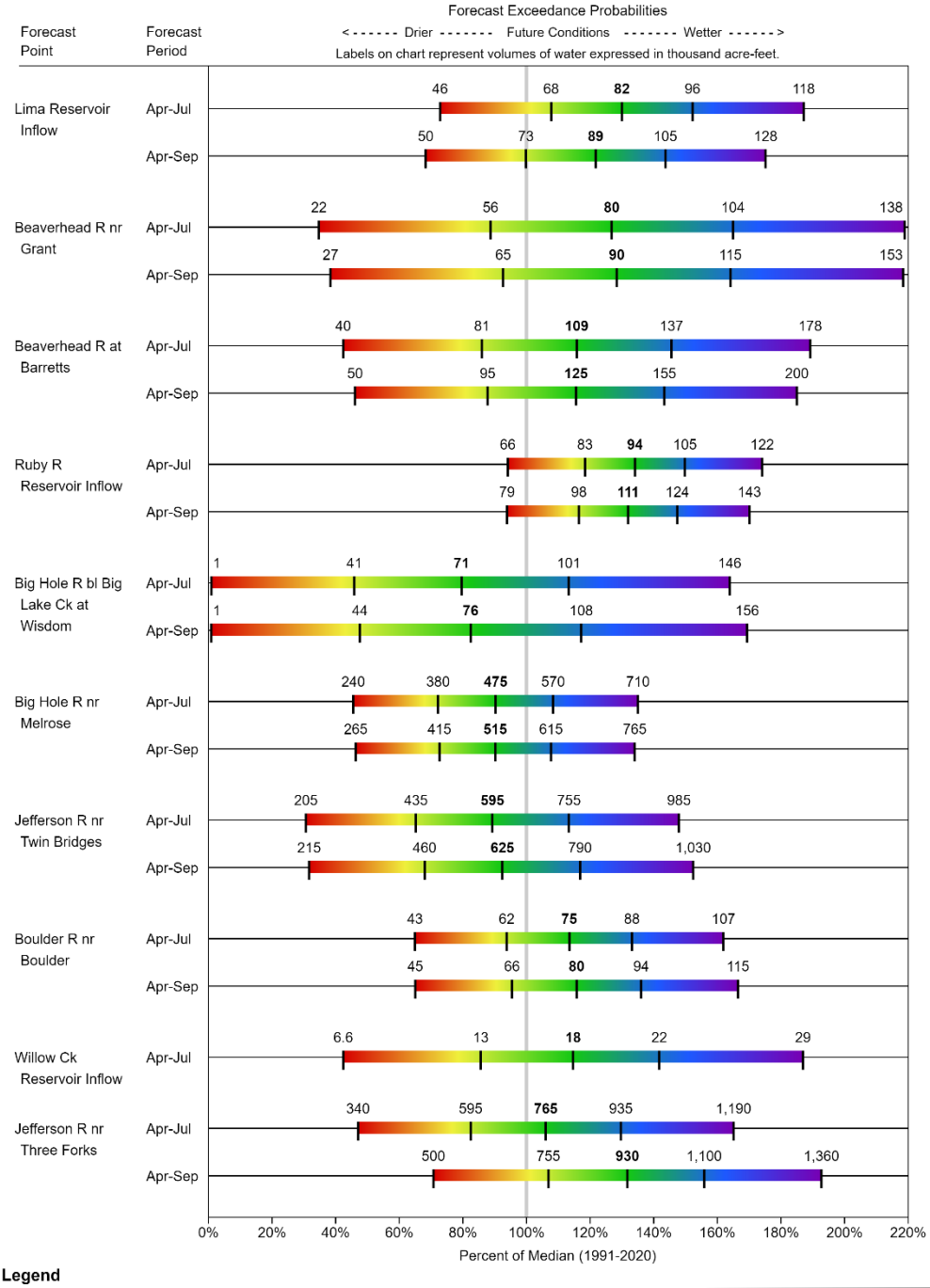
Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

JEFFERSON RIVER BASIN

Water Supply Forecasts

March 1, 2023



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Period of Record Minimum Streamflow KAF (Year)

1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

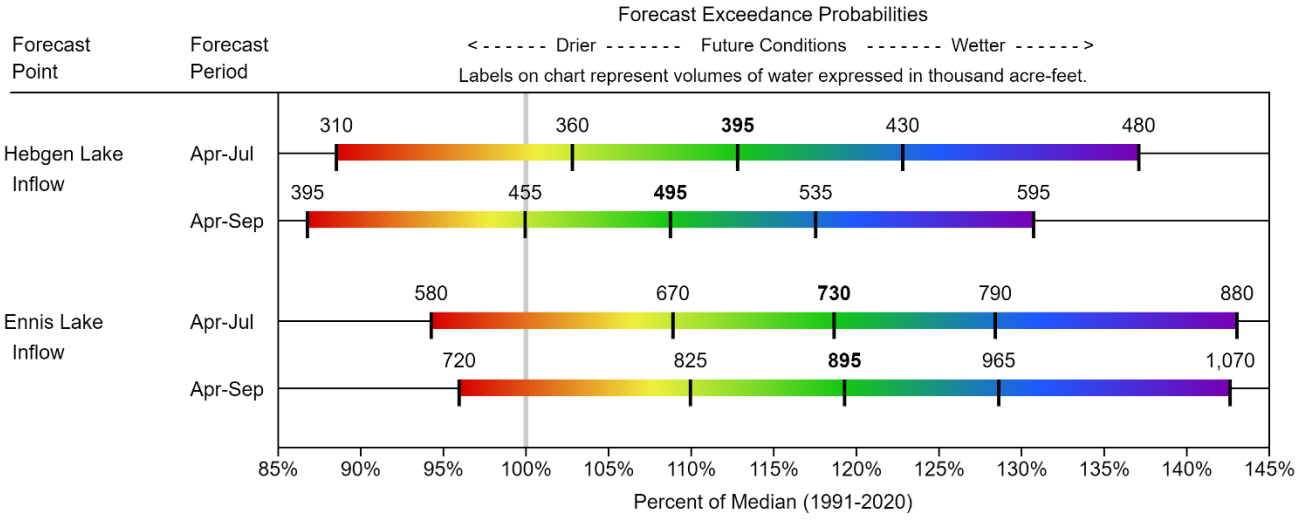
Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

MADISON RIVER BASIN

Water Supply Forecasts

March 1, 2023



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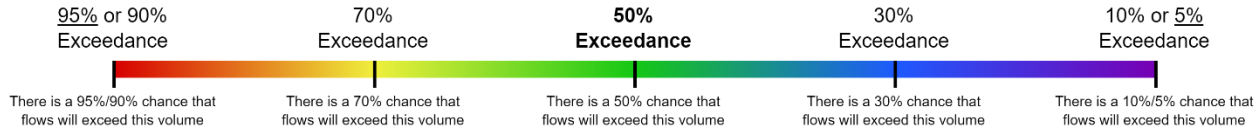


When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)

1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

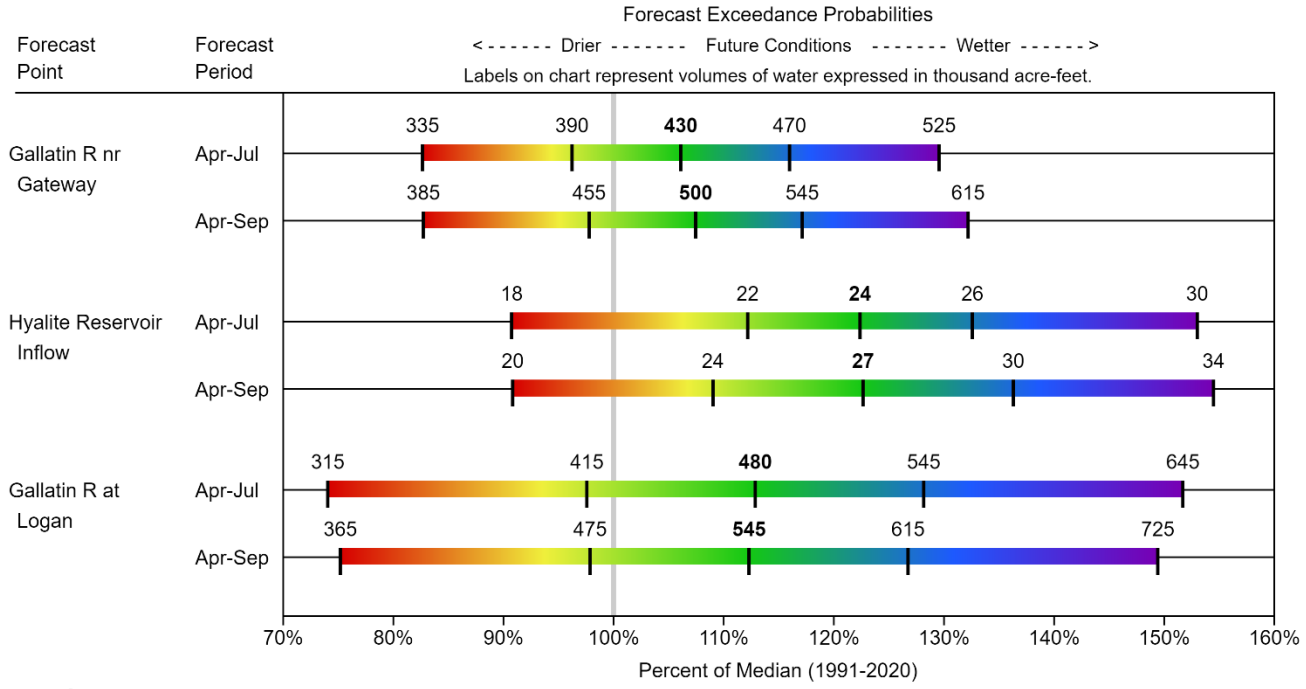
Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

GALLATIN RIVER BASIN

Water Supply Forecasts

March 1, 2023



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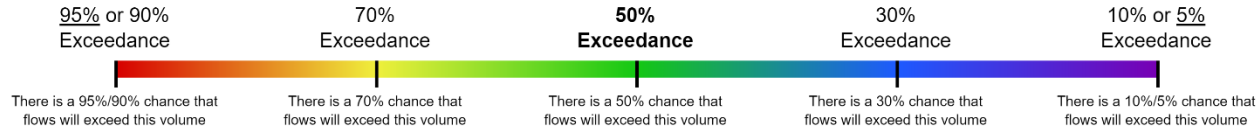

When selected, the following historic streamflow values and statistics will be shown.

Period of Record Minimum Streamflow KAF (Year)

1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum Streamflow KAF (Year)

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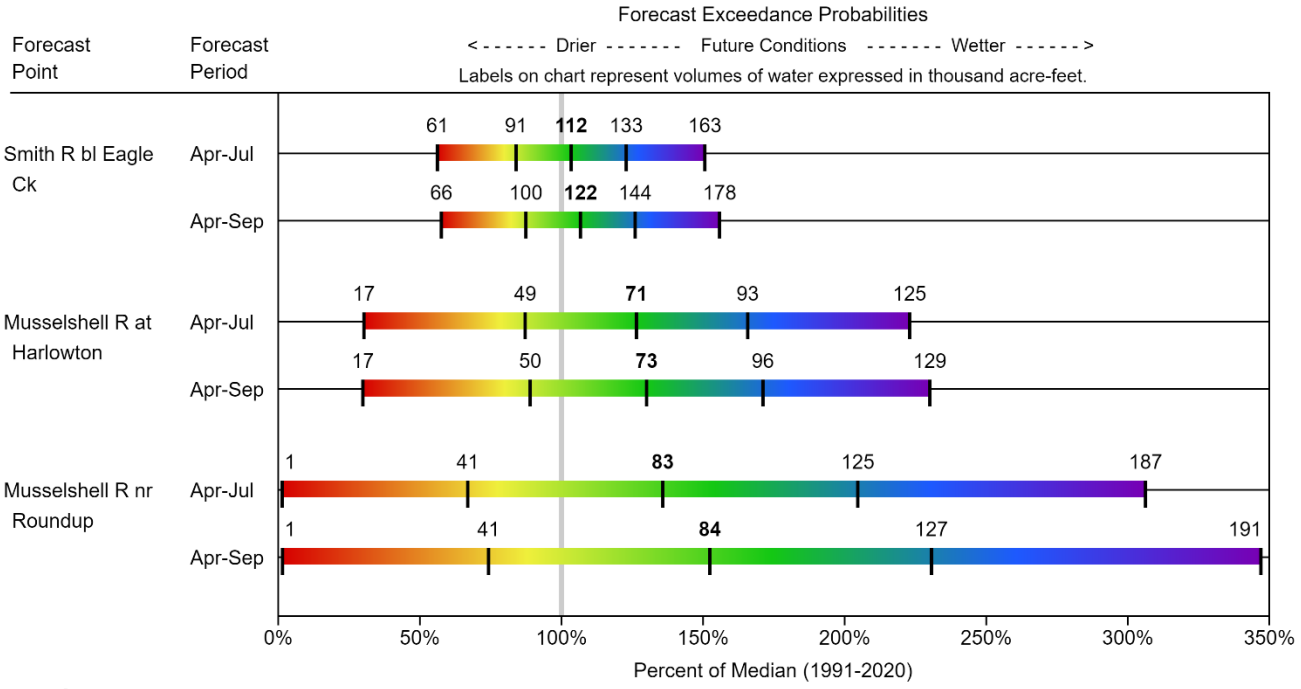
SMITH-JUDITH-MUSSELSHELL

Water Supply Forecasts

March 1, 2023



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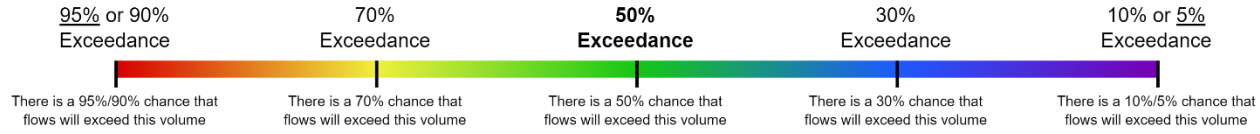

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1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum Streamflow KAF (Year)

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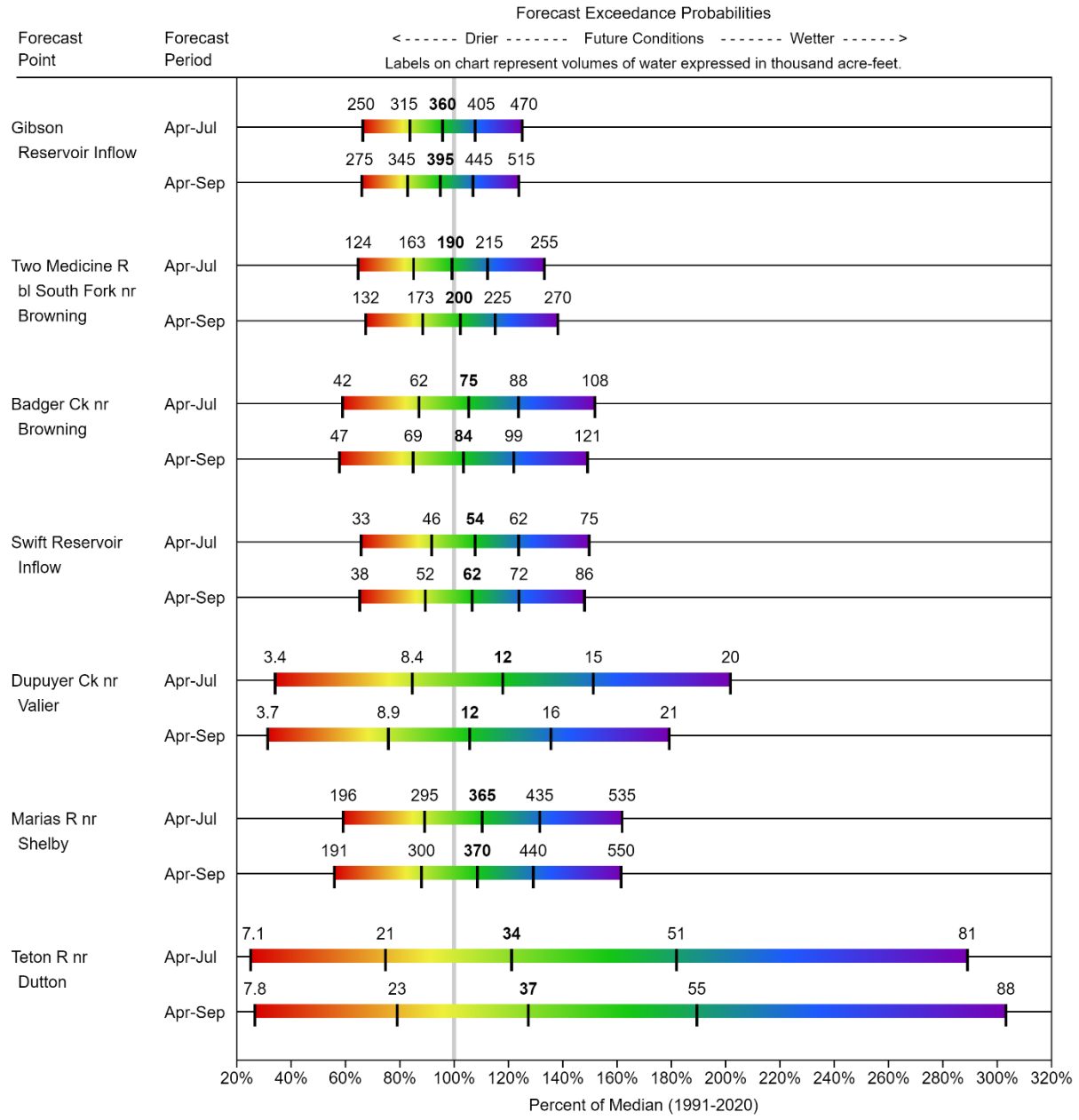
SUN-TETON-MARIAS

Water Supply Forecasts

March 1, 2023



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1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

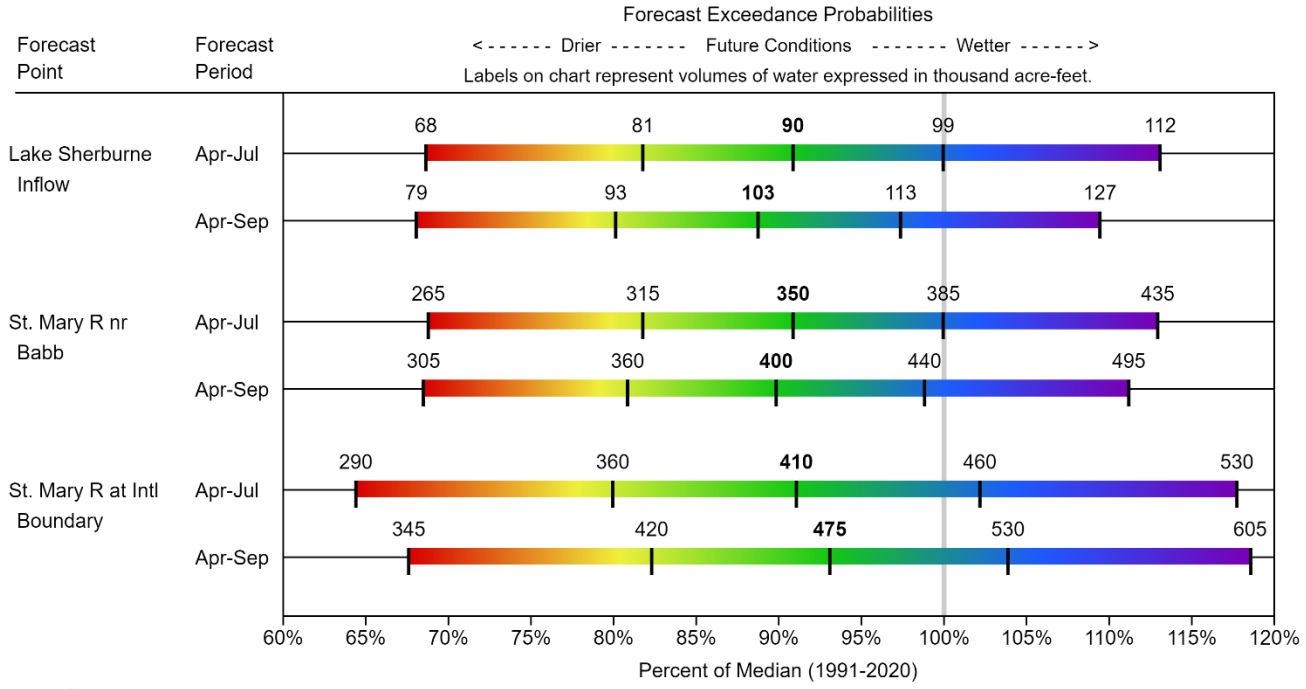
Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

ST. MARY & MILK BASINS

Water Supply Forecasts

March 1, 2023



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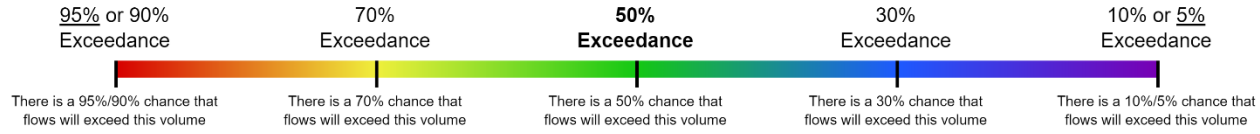

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1991-2020 Normal Streamflow KAF

Observed Streamflow KAF

Period of Record Maximum Streamflow KAF (Year)

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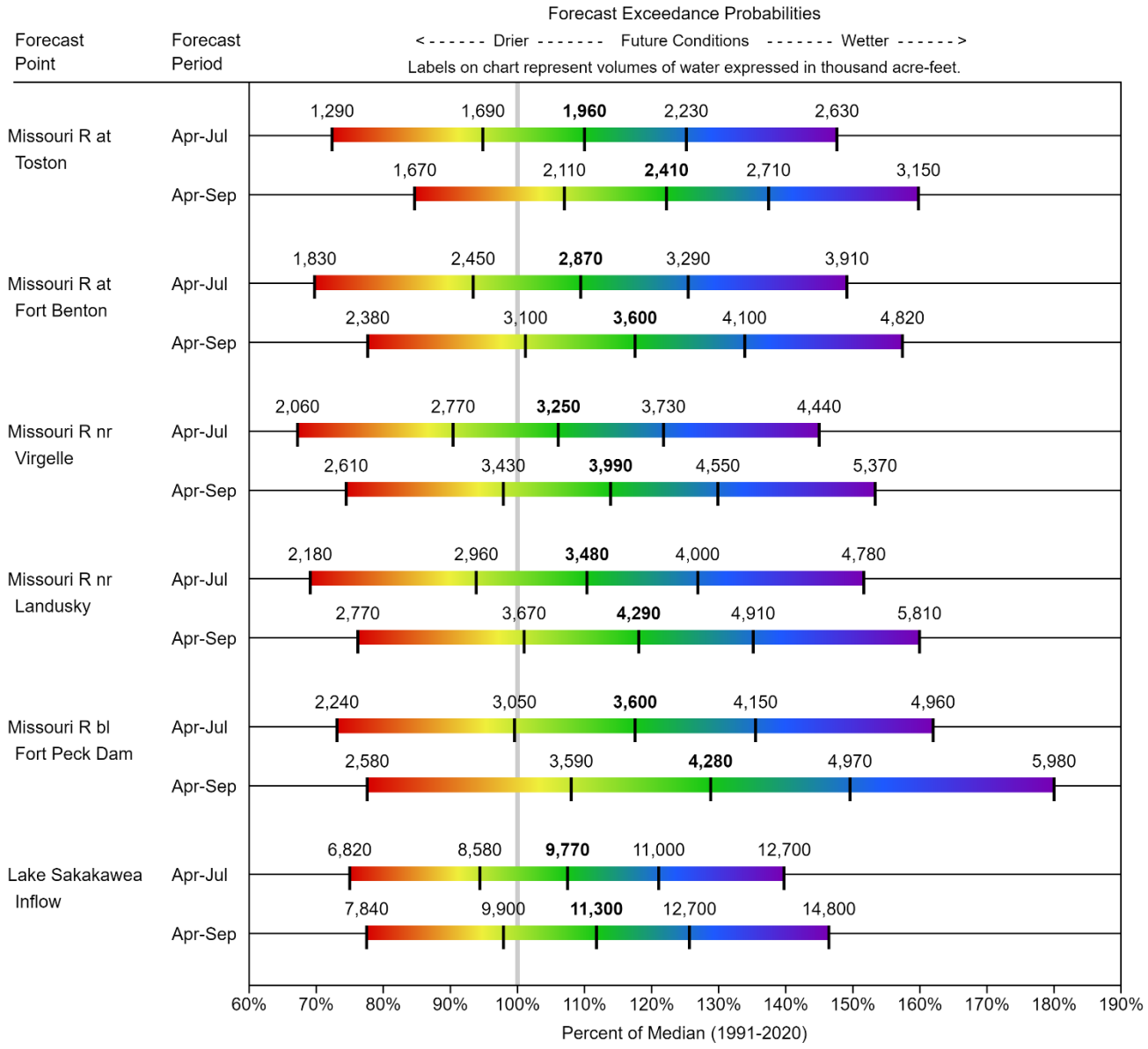
MISSOURI MAINSTEM BASIN

Water Supply Forecasts

March 1, 2023



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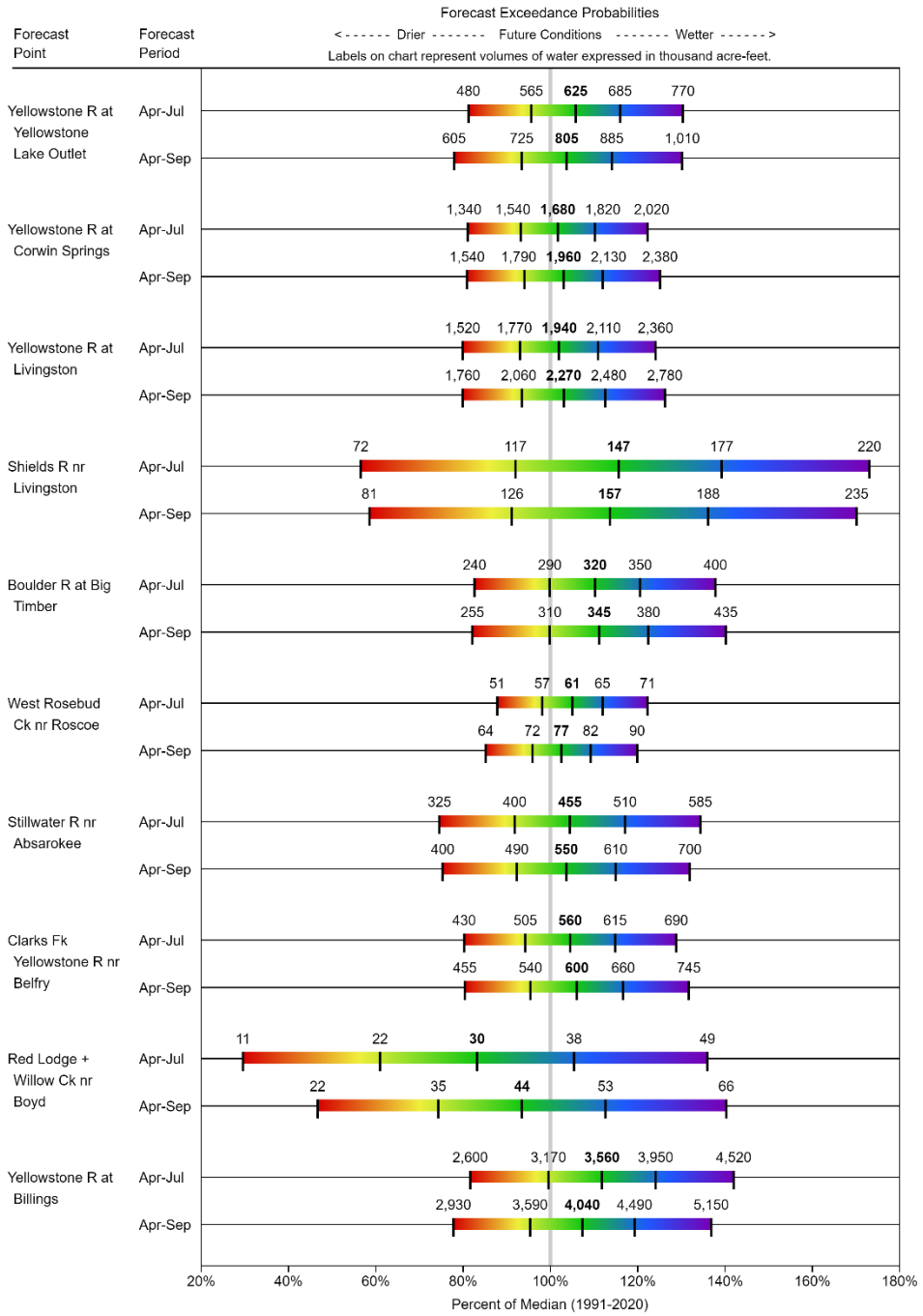
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

UPPER YELLOWSTONE RIVER BASIN

Water Supply Forecasts

March 1, 2023



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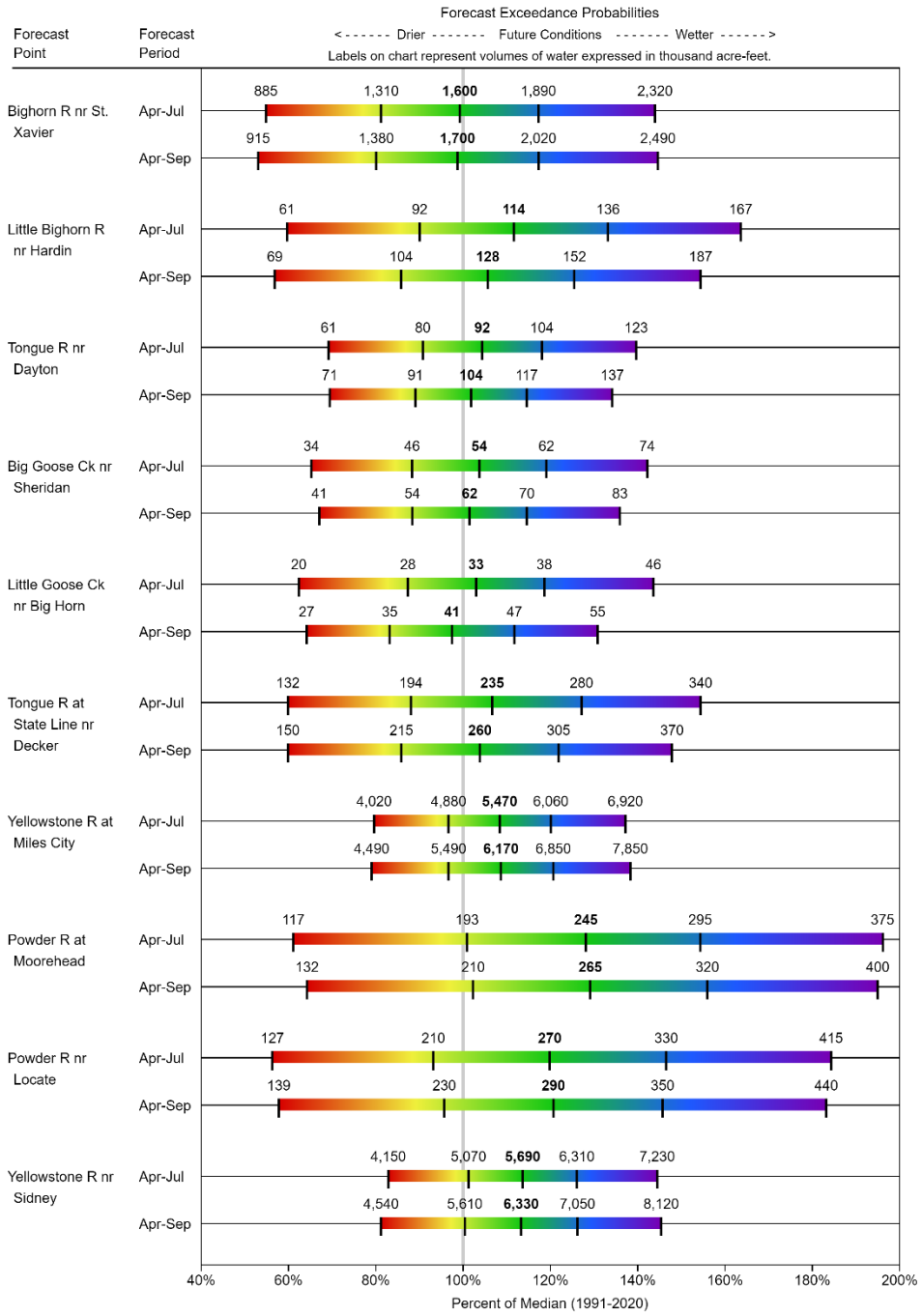
LOWER YELLOWSTONE RIVER BASIN (Wyoming)

Water Supply Forecasts

March 1, 2023



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Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

Water Supply Outlook Report - Webpage Access

The following links will take you to Snow Survey webpages dedicated to Montana's major river basins and a statewide overview. Various water supply related maps are available using the drop-down menus. Hover over and click on points or basins of interest to view data and charts.

Monthly Data - Interactive Web Pages		
Monthly Data - Statewide Overview		
Monthly Statewide Overview		
Monthly Data - River Basin Summaries		
Columbia River Basin	**Missouri River Basin**	**Yellowstone River Basin**
Kootenai	**Jefferson**	**Upper Yellowstone**
Flathead	**Madison**	**Bighorn-Powder-Tongue**
Upper Clark	**Gallatin**	
Bitterroot	**Helena Valley**	
Lower Clark	**Smith-Judith-Musselshell**	
	Sun-Teton	
	St. Mary	
	Milk	

Links and Resources

The following links will take you to the external (non-NRCS) resources used in this report:

Precipitation

- PRISM Climate Group – Oregon State University
- West Wide Drought Tracker
- Montana Climate Office – University of Montana
    - Drought Indicator Dashboard

Temperature

- West Wide Drought Tracker
- NOAA NWS – Climate Offices

Drought Information

- Montana | U.S. Drought Monitor (unl.edu)
- Outlooks | U.S. Drought Monitor (unl.edu)
- Montana | Drought.gov

Soil Moisture

- USDA – National Agricultural Statistics Service – National Crop Progress
- NOAA NWS Climate Prediction Center - Calculated Soil Moisture Ranking Percentiles

Current Streamflow

- USGS WaterWatch -- Streamflow conditions

Weather and Climate Predications

- Climate Prediction Center (noaa.gov)

Issued by:

Terry Cosby

Chief

Natural Resources Conservation Service

U.S. Department of Agriculture

Released by:

Tom Watson

State Conservationist

Natural Resources Conservation Service

Bozeman, Montana

Report Created by:

Montana Snow Survey Staff

10 East Babcock St, Room 443

Bozeman, MT 59715

mt-nrcs-snow@usda.gov

Montana Water Supply Outlook Report

Natural Resources Conservation Service