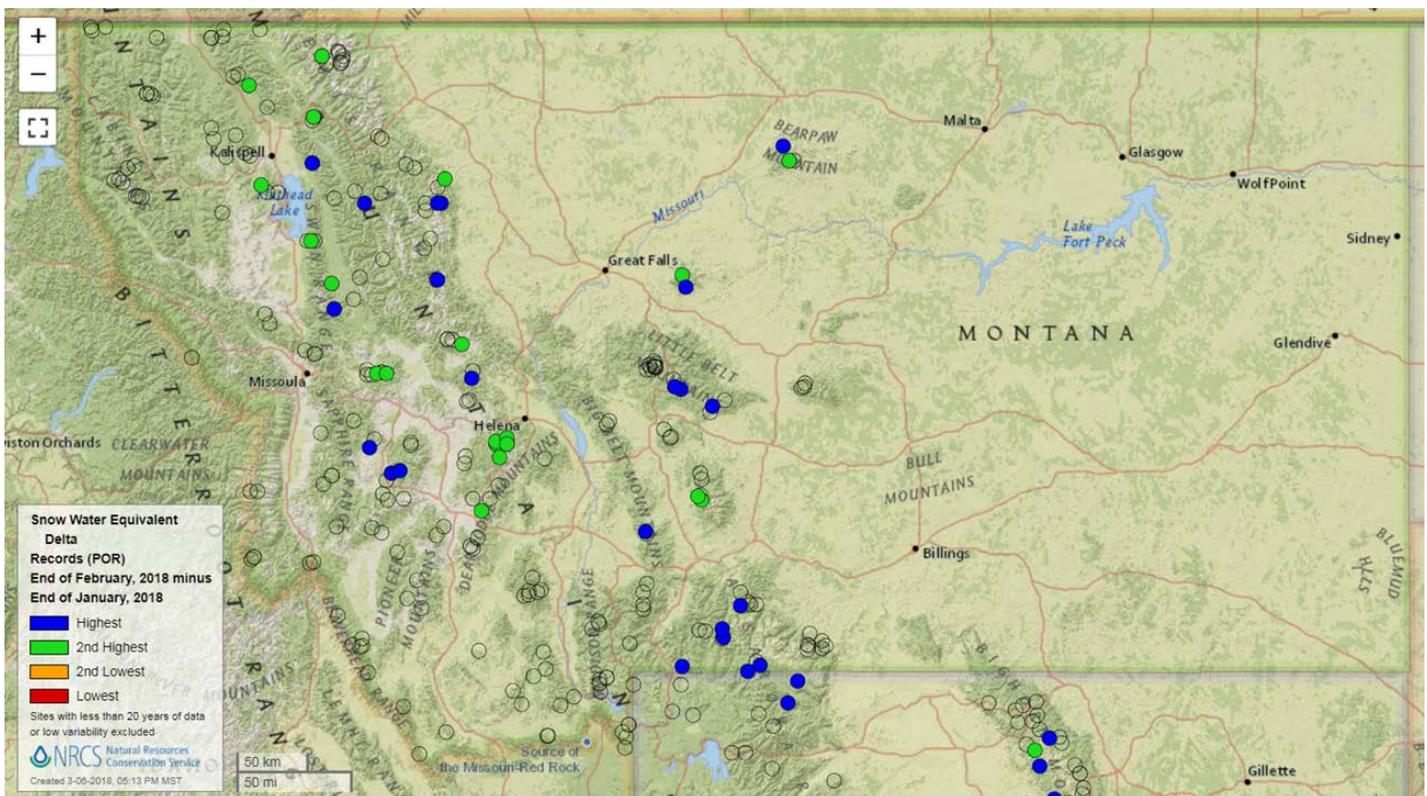


Montana

Water Supply Outlook Report

March 1st, 2018



“FEBRU-BURIED” is the best word we could come up with to describe monthly snowfall across the state of Montana for February. 25 snowpack measurement locations set new monthly records, and 21 sites came up just short and were second highest on record. Snowfall during February built on strong early season snowpack totals, which resulted in snowpack percentiles for March 1st that were well above normal across the state of Montana. Streamflow prospects for the spring and summer months reflect the well above normal snowpack and are well above average for the April 1st through July 31st period. With cold and wet conditions forecasted to persist into spring, a close eye will be kept on the snowpack for potential implications for the runoff this spring and summer.

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Montana Water Supply Outlook Report as of March 1st, 2018

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. Streamflow forecasts are coordinated by Natural Resources Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data 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. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. 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; 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 forecast.

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Snowpack – Overview

What a year! While out surveying over the last week in the Big Hole and Beaverhead River basins our survey team began to notice that we were ducking under significantly more snow loaded branches than we usually do when accessing the snow courses and SNOTEL sites. We wondered why. Then it clicked, there is a LOT more snow on the ground this year, and we were way further up in the trees! That’s a good problem to have compared to most of the other western states where record-low snowpack conditions seem to be more common.

There are a lot of impressive stats to cite this month. 25 SNOTEL sites set new records for February snowfall totals, and 21 sites were the second highest recorded. Measurement locations along the Divide experienced the highest increases in Snow Water Equivalent (SWE), with most records occurring in the Upper Clark, Sun-Teton-Marias, Upper Missouri and Yellowstone River basins. For March 1st, 15 measurement locations are the highest on record and 12 sites are the second highest on record. Many measurement locations across the state have already exceeded the normal peak snow water for the year due to the above normal snowfall this winter. Above normal snowpack totals in almost all river basins indicates that there should be more than adequate water for irrigation in most river basins, barring anomalously dry or warm conditions occur before spring runoff and during the summer months.

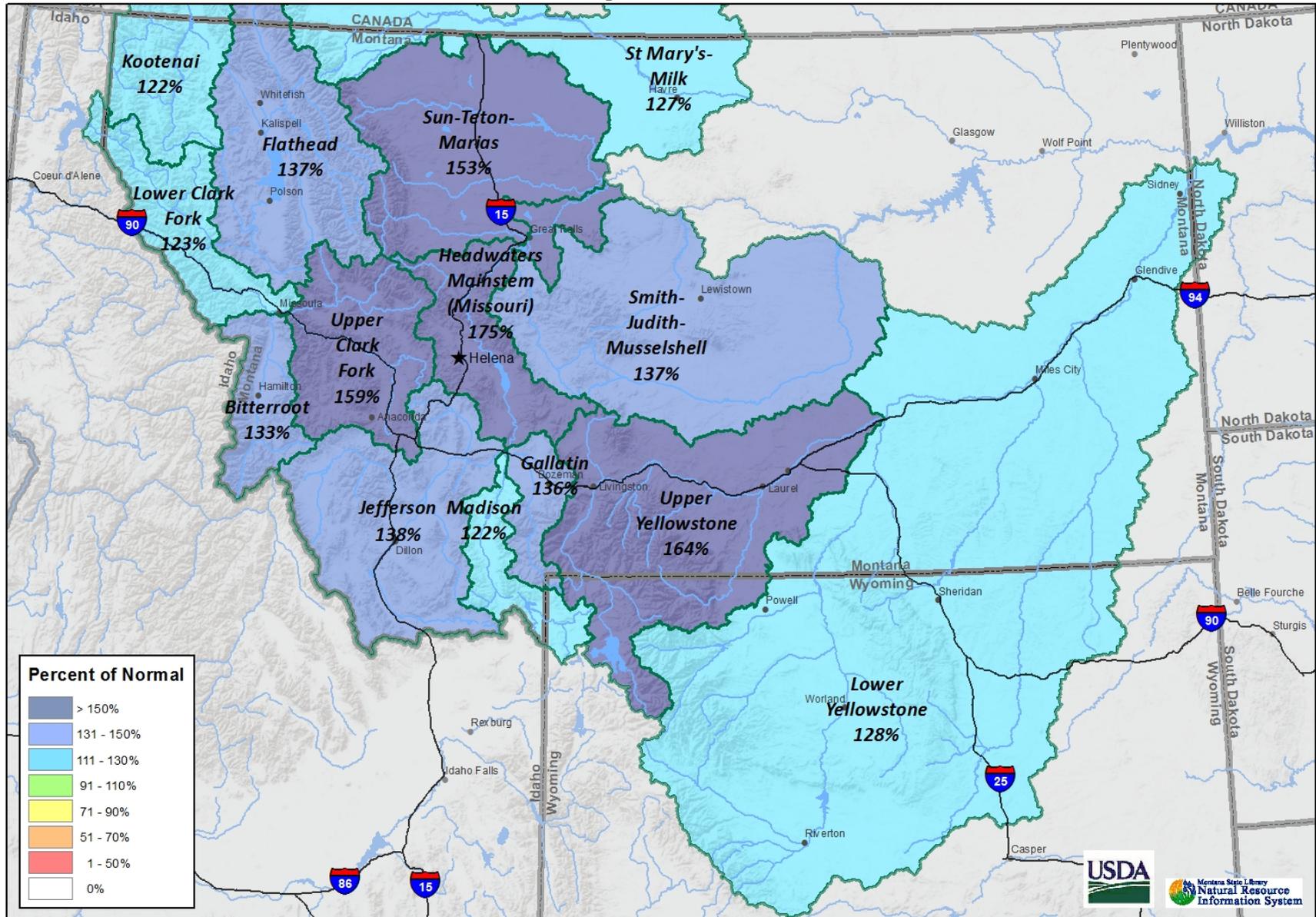
Is there potential for too much of a good thing? Absolutely. There is some growing concern that the abundant snowfall this winter could become a problem as we enter spring and summer. As we transition into the more typical spring storm patterns basins east of the Divide are climatologically favored during March through May with regards to precipitation. If we continue to build on the record snowpacks in some areas, the spring weather will be critical in managing the timing and volumes of water in the rivers during runoff. On April 1st we should have a better handle on where the basins stand and will know if the persistent wet weather patterns have relented, or will persist through spring. Please read the streamflow volumes section of this report for more insight and information.

Snow Water Equivalent

3/1/2018	% Normal	% of Last Year
Columbia River Basin	138	142
Kootnenai in Montana	122	126
Flathead in Montana	137	141
Upper Clark Fork	159	167
Bitterroot	133	134
Lower Clark Fork	123	126
Missouri River Basin	136	136
Jefferson	138	134
Madison	122	108
Gallatin	136	139
Headwaters Mainstem	175	175
Smith-Judith-Musselshell	137	178
Sun-Teton-Marias	153	137
St. Mary-Milk	127	134
Yellowstone River Basin	145	104
Upper Yellowstone	164	130
Lower Yellowstone	128	85

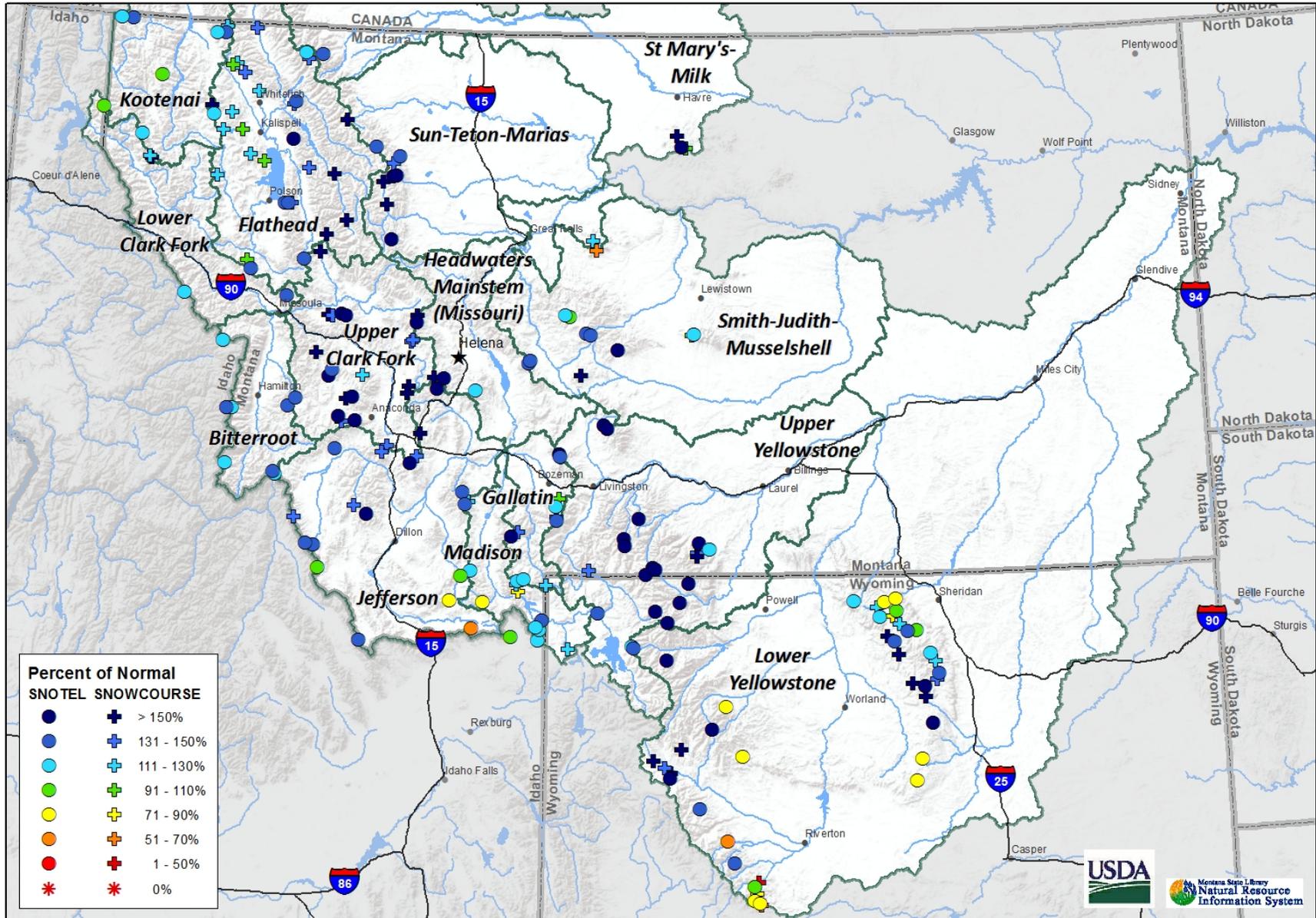
West of Divide	138	142
East of Divide	139	117
<i>Montana State-Wide</i>	140	139

Montana Data Collection Office
 Current Snow Water Equivalent
 Basin Percentage of Normal - March 1, 2018

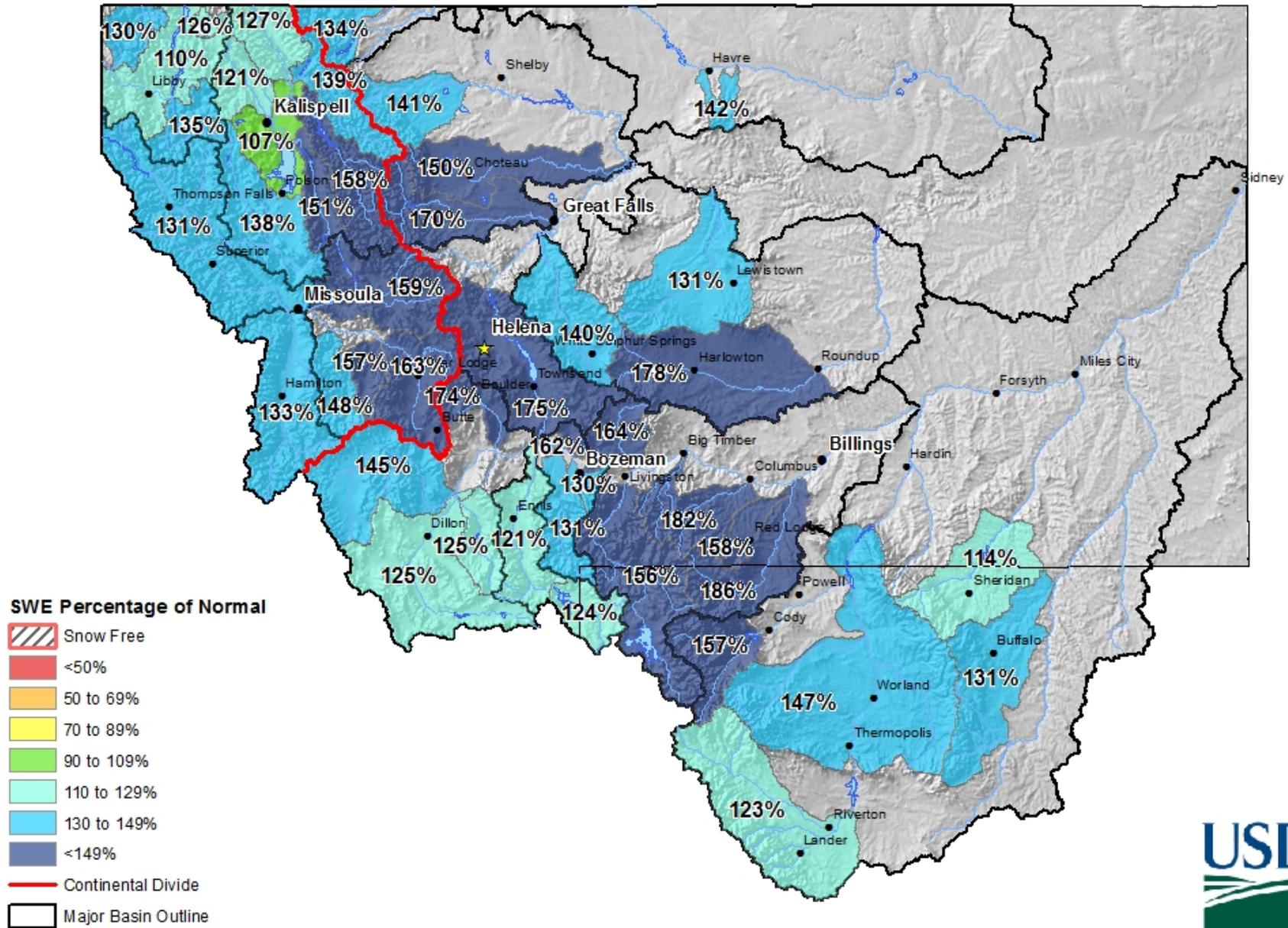


Note: Data includes SNOTEL and Snow course Measurements on March 1, 2018

Montana Data Collection Office
 Current Snow Water Equivalent
 March 1, 2018



Montana Data Collection Office
 Sub-Basin Snow Water Equivalent - March 1st, 2018



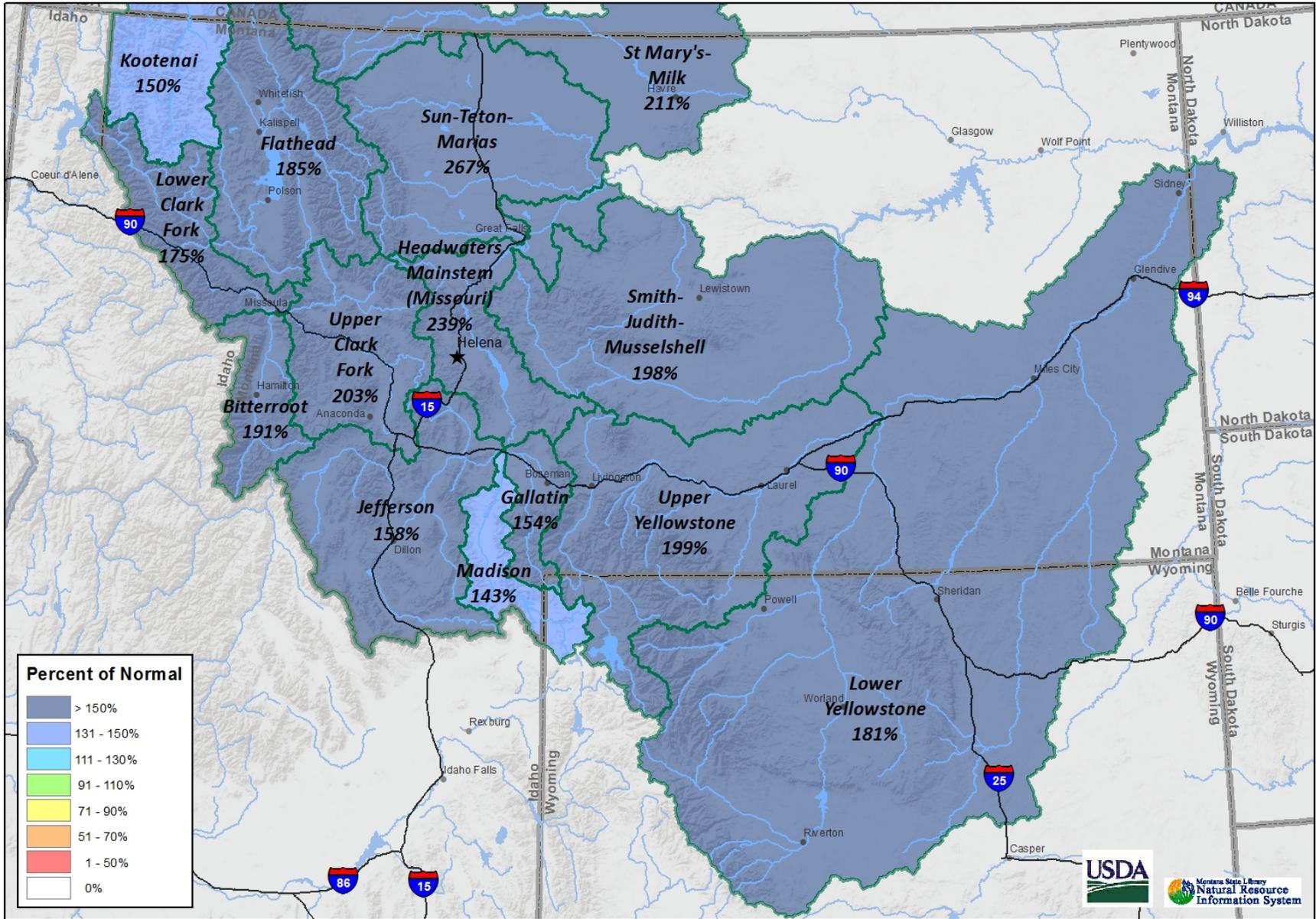
Precipitation - Overview

Precipitation was well above average for February across the state of Montana. For the water year, precipitation is also above average across the state in most basins, except one. The very southern portion of southwest Montana has water year precipitation totals that are below average. This may be happening for a few reasons: This year most of the water year precipitation has fallen in the form of snow, and snowpack totals in those regions are also below normal. Storm patterns have not favored this region which needs strong southwest flow (storms approaching from the southwest). Either way, totals are below normal for this date. A few water users have asked how this year's snowpack totals can be so high compared to last year's snowpack, and yet water year precipitation is lower. The answer is simple. Last year October and November brought an abundance of precipitation, only it was in the liquid form. There was a mix of precipitation forms last year, this year we are predominantly measuring snowfall.

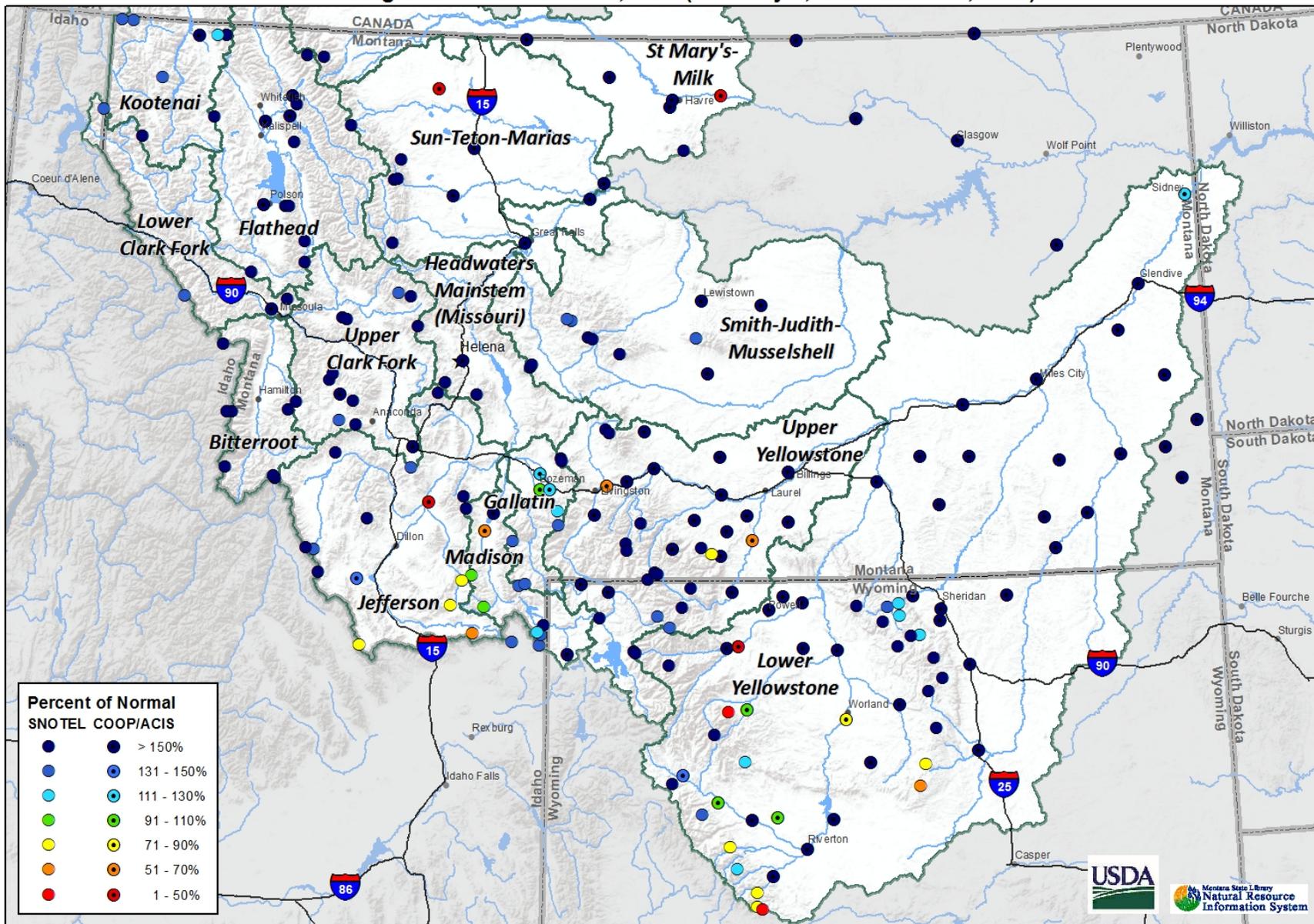
Precipitation

3/1/2018	Monthly % Avg	Water Year % Avg	WY % of Last Year
Columbia River Basin	184	128	107
Kootenai in Montana	150	117	89
Flathead in Montana	185	132	105
Upper Clark Fork	203	135	125
Bitterroot	191	122	116
Lower Clark Fork	175	123	100
Missouri River Basin	179	121	92
Jefferson	158	109	90
Madison	143	112	78
Gallatin	154	126	98
Headwaters Mainstem	239	143	122
Smith-Judith-Musselshell	198	123	112
Sun-Teton-Marias	267	147	113
St. Mary-Milk	211	133	87
Yellowstone River Basin	192	128	88
Upper Yellowstone	199	145	99
Lower Yellowstone	181	113	76
West of Divide	184	128	107
East of Divide	186	125	91
<i>Montana State-Wide</i>	192	129	101

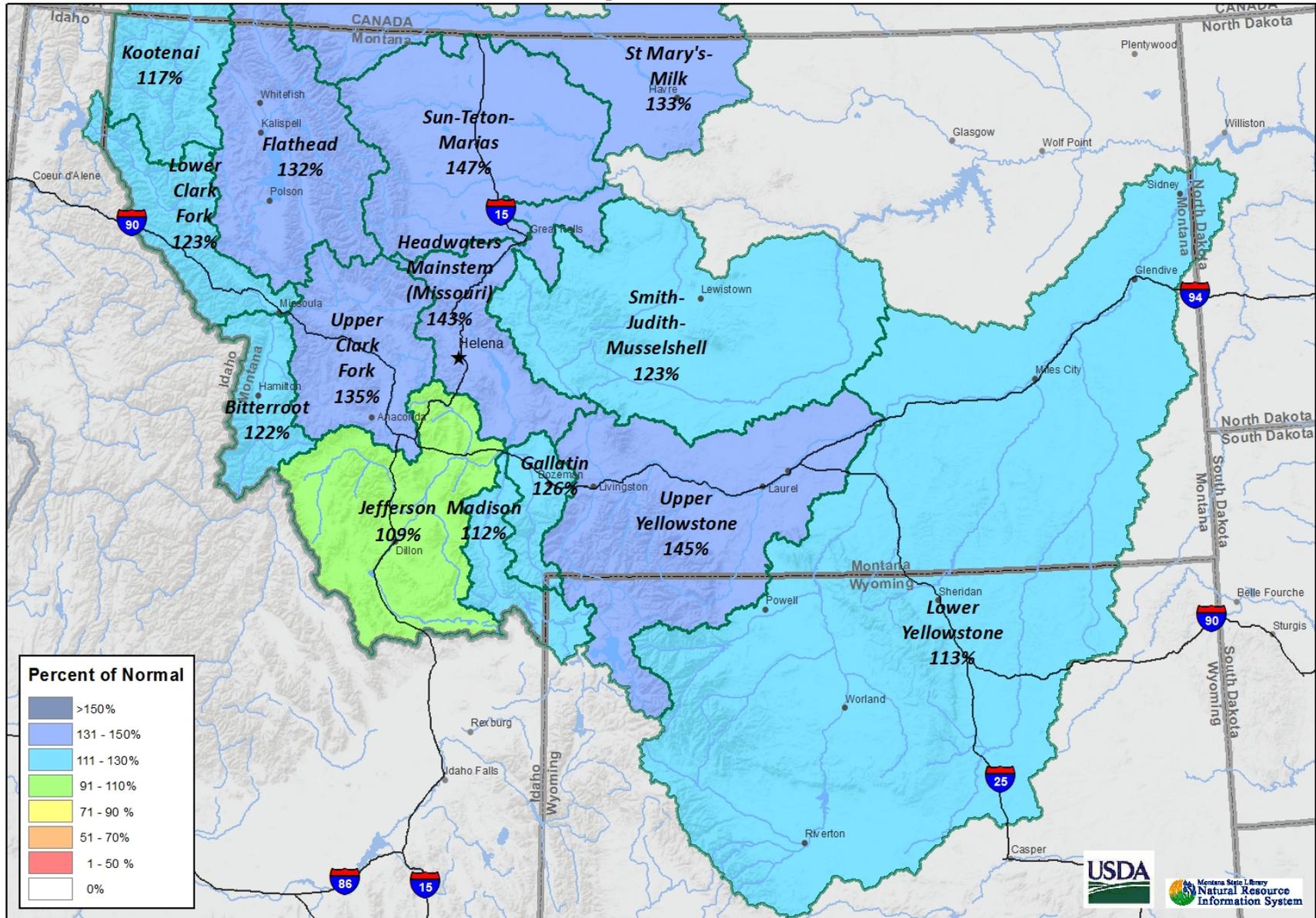
**Montana Data Collection Office
 Monthly Precipitation
 Basin Percentage of Normal - March 1, 2018 (February 1, 2018 - March 1, 2018)**



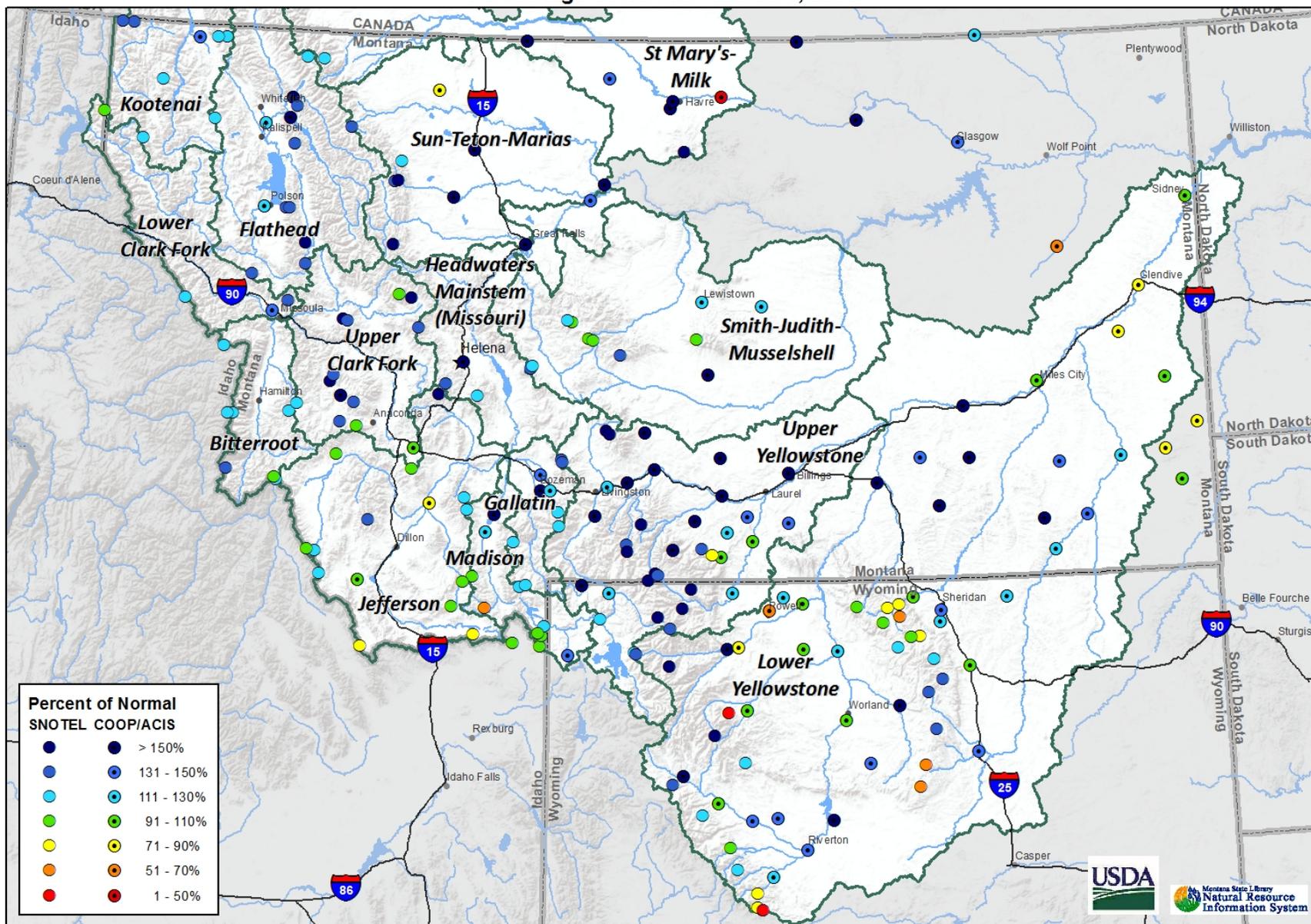
Montana Data Collection Office
 Monthly Precipitation
 Percentage of Normal - March 1, 2018 (February 1, 2018 - March 1, 2018)



Montana Data Collection Office
 Water Year to Date Precipitation
 Basin Percentage of Normal - March 1, 2018



Montana Data Collection Office
 Water Year to Date Precipitation
 Percentage of Normal - March 1, 2018



Reservoirs - Overview

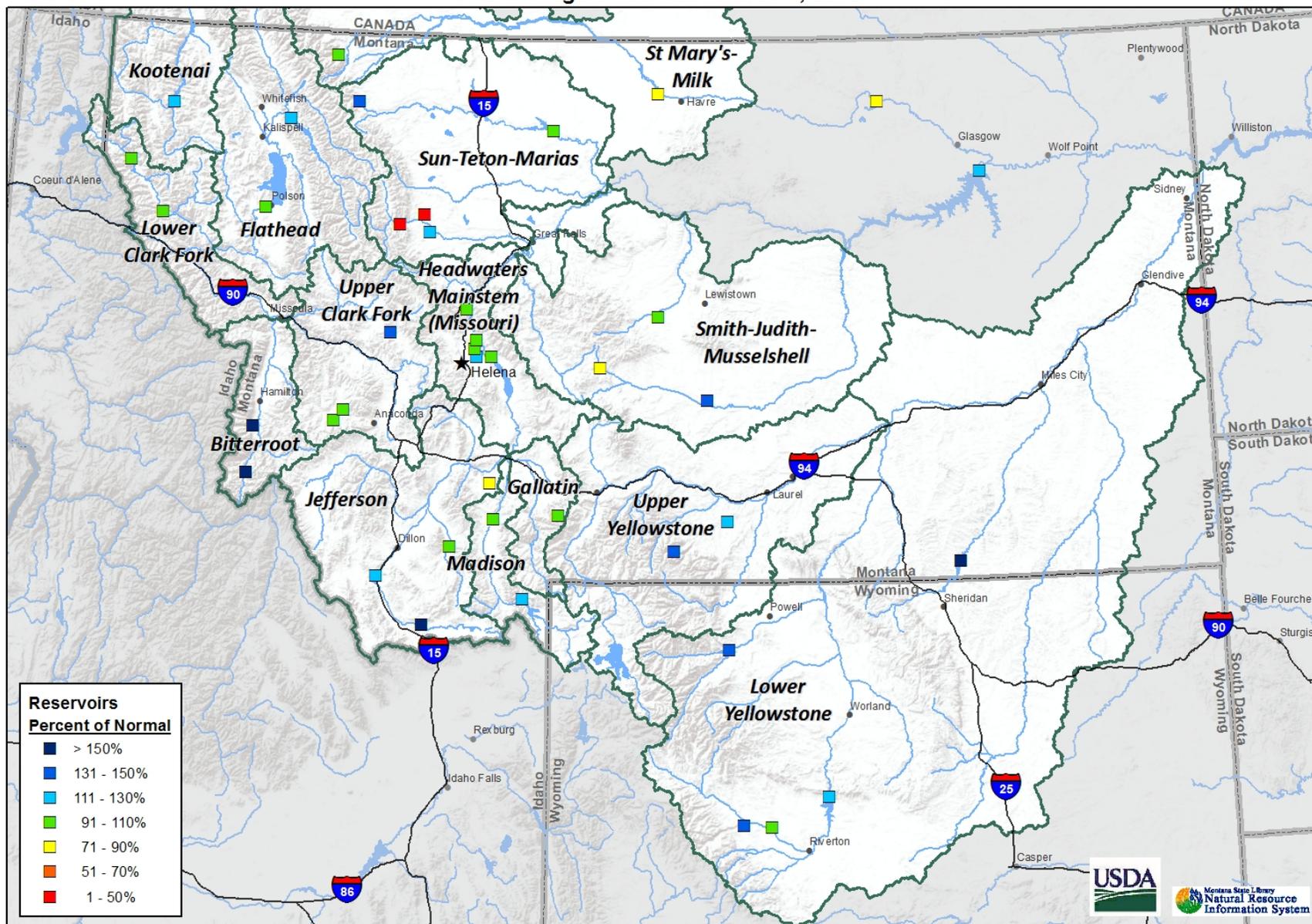
Overall, reservoir storage across the state is near to above average for March 1st. Only two reservoirs in the state are well below average for this time. Both Gibson (25%) and Pishkun (24%) are very low for this date, but abundant snowpack above these reservoirs should help them to fill before irrigation water is needed from them this summer. Snowpack across the state is above normal this year, but the snow season is far from over. A lot can change, but for now streamflow forecasts and reservoir inflows look to be above average during the April 1st – July 31st period.

Please view the individual basin reports for detailed reservoir content information.

Reservoir Storage

<i>3/1/2018</i>	<i>% Average</i>	<i>% Capacity</i>	<i>% Last Year</i>
Columbia River Basin	116	59	93
Kootnenai in Montana	117	51	91
Flathead in Montana	115	66	92
Upper Clark Fork	106	74	105
Bitterroot	186	52	120
Lower Clark Fork	101	95	104
Missouri River Basin	113	76	98
Jefferson	129	63	139
Madison	111	81	102
Gallatin	102	54	104
Headwaters Mainstem	117	79	99
Smith-Judith-Musselshell	133	76	115
Sun-Teton-Marias	99	51	96
St. Mary-Milk	91	37	76
Yellowstone River Basin	101	57	86
Upper Yellowstone	119	51	92
Lower Yellowstone	100	58	86
West of Divide	116	59	93
East of Divide	113	75	98
<i>Montana State-Wide</i>	113	70	96

Montana Data Collection Office
 Reservoir Levels
 Percentage of Normal - March 1, 2018



Streamflow - Overview

Abundant snowfall this year has most rivers and streams across the state looking at excellent prospects for runoff this spring. Almost all forecasts issued on March 1st are average to well above average for the April 1st – July 31st period. Great news for irrigators and water users across the state. Only one area in southwest Montana has forecasts that would be below average, the lack of precipitation and snowpack in the Centennial Range along the southern border with Idaho has resulted in low inflow forecasts for Lima and Clark Canyon Reservoirs.

Other regions may have an entirely different problem this spring once runoff begins. Two, in particular, have a snowpack that is record setting for March 1st and already well above the normal snowpack peak we typically experience in April or early May. The Upper Clark Fork River basin along the Divide and headwaters of the Yellowstone and Clark’s Fork of the Yellowstone are areas to watch this spring regarding timing and volumes. The median for Clark’s Fork at Belfry, MT is above the record flows experienced for that gage for the April 1st – July 31st period.

There is still plenty of time for conditions to change before runoff occurs and two more months where snow typically continues to accumulate. For now, streamflow prospects look to be above average in most, but not all locations across the state of Montana.

<i>River Basin</i>	APR-JUL 50 % Exceedance Forecasts		
	Highest Point Forecast*	Lowest Point Forecast**	Basin Avg Forecast***
<i>Columbia River Basin</i>	196%	107%	133%
Kootenai River Basin	122%	110%	118%
Flathead River Basin	155%	112%	132%
Upper Clark Fork	196%	148%	163%
Bitterroot River Basin	130%	114%	122%
Lower Clark Fork	141%	107%	129%
<i>Missouri River Basin</i>	217%	74%	126%
Jefferson	157%	74%	116%
Madison	112%	109%	110%
Gallatin	135%	120%	126%
Headwaters Mainstem	136%	128%	132%
Smith Judith Musselshell	217%	119%	153%
Sun Teton Marias	142%	107%	127%
St Mary	120%	116%	118%
<i>Yellowstone River Basin</i>	194%	83%	134%
Upper Yellowstone	194%	116%	152%
Lower Yellowstone	161%	83%	115%

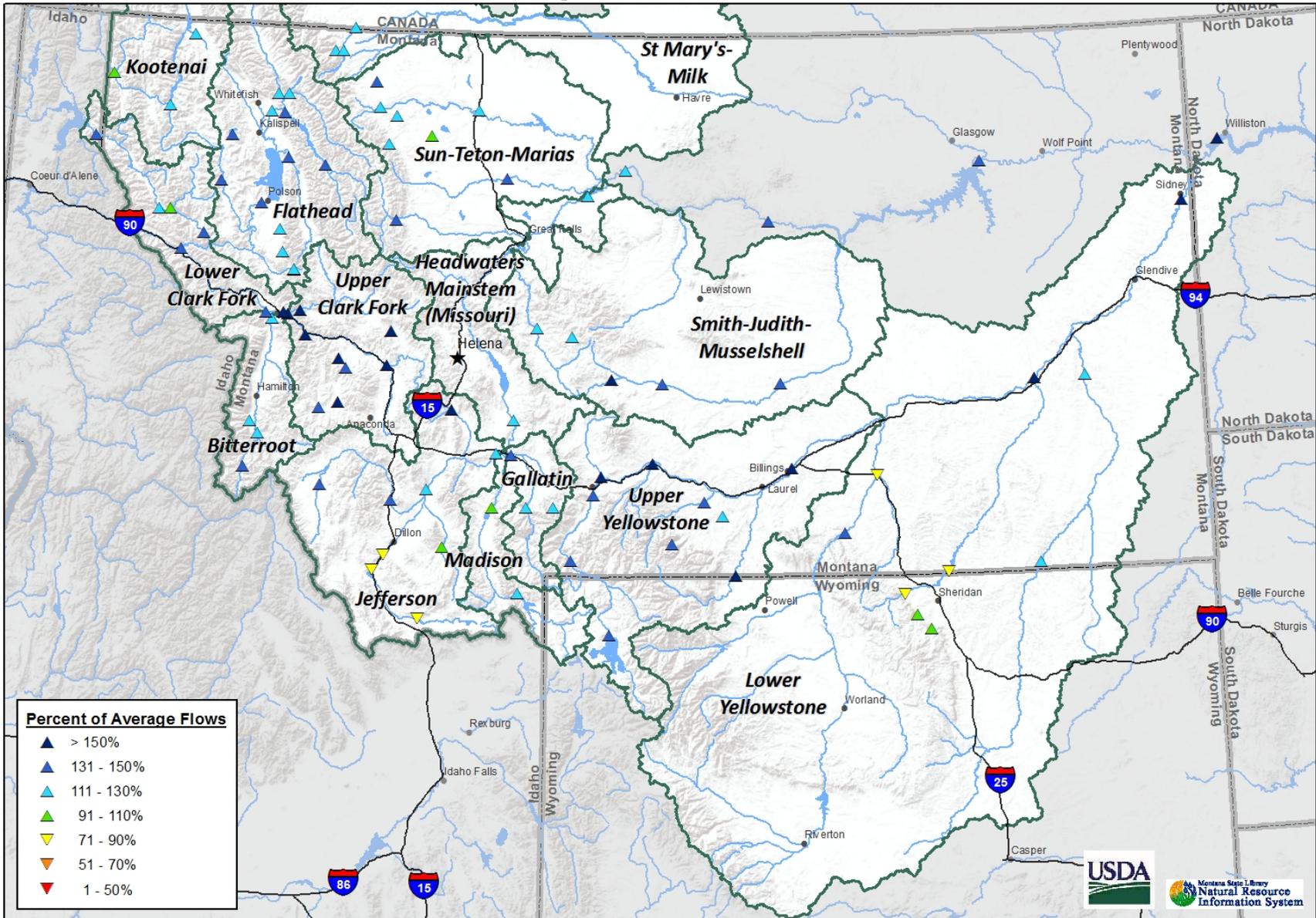
NOTE: Streamflow forecasts are issued for multiple points on rivers and streams within a major river basin and are given as a range of exceedance probabilities. Consult the individual river basin of interest to see the range of values for streams of interest.

*Highest point forecast is the highest 50% forecast of all forecast points within the basin

**Lowest point forecast is the lowest 50% forecast of all forecast points within the basin

***Basin Average Forecast is an average of all 50% forecasts within the basin

Montana Data Collection Office
 Streamflow Forecast
 Percentage of Normal - March 1, 2018



Kootenai River Basin



Precipitation has been well above average in the Kootenai River basin this season. February did not break that trend. It snowed nearly 20 days in February at Poorman Creek SNOTEL, and the site received 153 percent of its normal monthly snow water accumulation. The basin’s deepest storm of February arrived on Valentine’s Day. In 5 days Poorman Creek SNOTEL received over 3.2 inches of snow water, which attributed to 2-3 feet of new snow. Other sites within the basin have fared well this water year too. Grave Creek SNOTEL has its second largest March 1st snowpack in 43 years of record. Also, nearly all of the basin’s SNOTEL sites have either exceeded or are near their normal peak snow water equivalent value. Higher elevation sites within the watershed don’t typically peak until late April or early May. Overall, the snowpack in the Kootenai River basin is well above normal for March 1st.

Kootenai River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
KOOTENAY in CANADA	115%	97%
KOOTENAI MAINSTEM	110%	79%
TOBACCO	126%	108%
FISHER	135%	105%
YAAK	130%	112%
KOOTENAI RIVER BASIN in MONTANA	122%	97%
KOOTENAI ab BONNERS FERRY	122%	101%
Basin-Wide Snowpack	122%	97%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	149%	117%	130%
Valley Precipitation	205%	142%	220%
Basin-Wide Precipitation	150%	117%	132%

*WYTD Precipitation is October 1st- Current

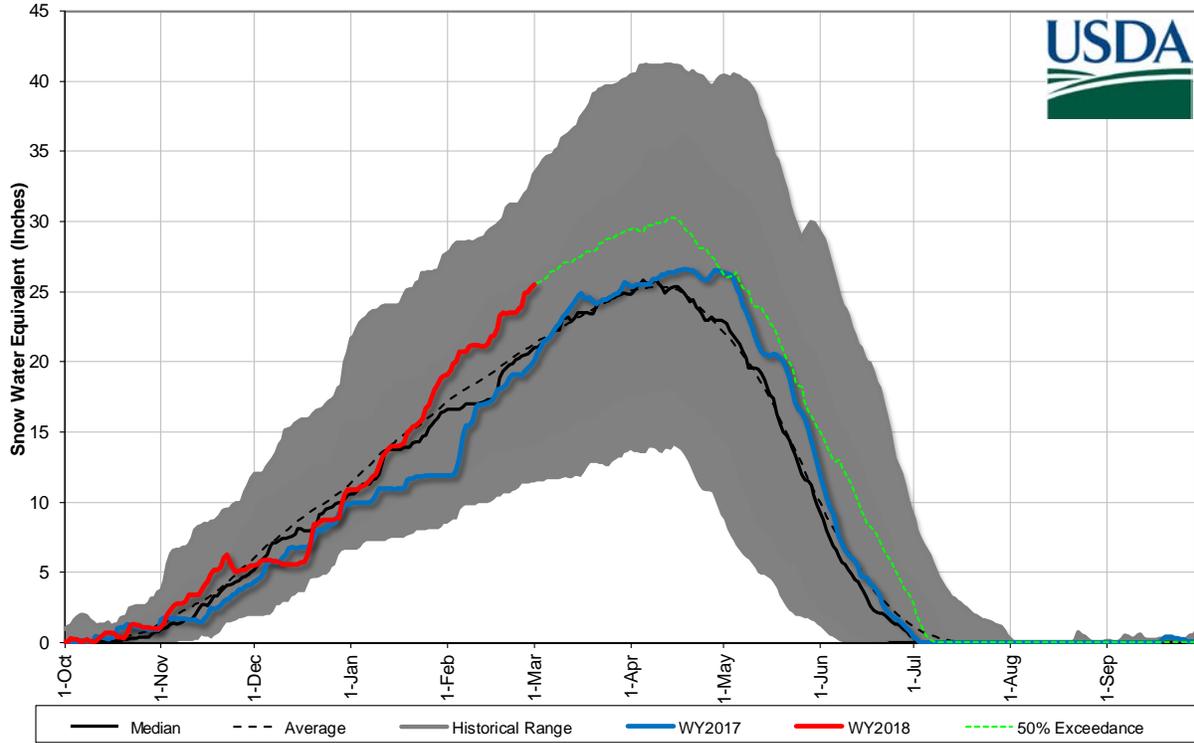
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Reservoir Storage	117%	51%	129%

*See Reservoir Storage Table for storage in individual reservoirs

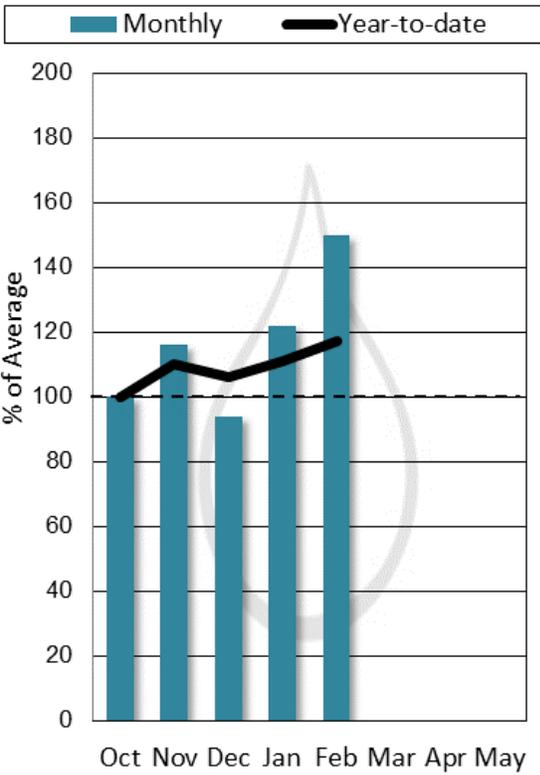
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Lake Koocanusa	2934.9	3216.5	2501.0	5748.0	117%	51%

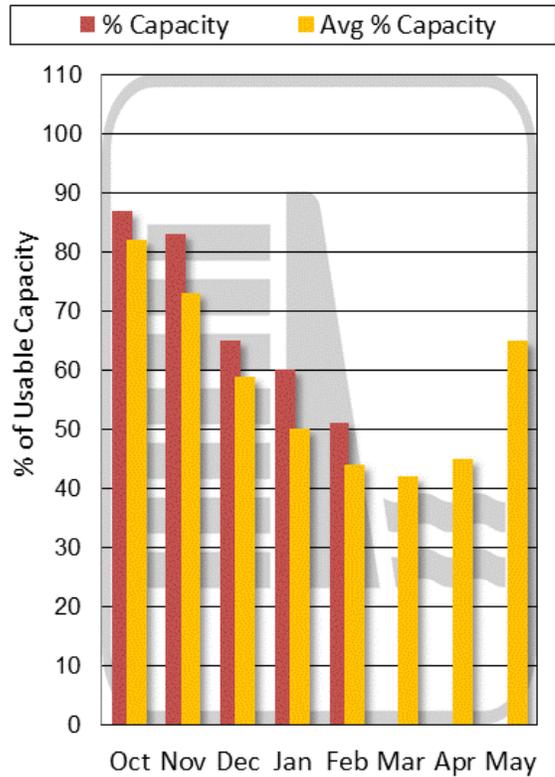
Kootenai River Basin Snowpack with Non-Exceedance Projections
Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

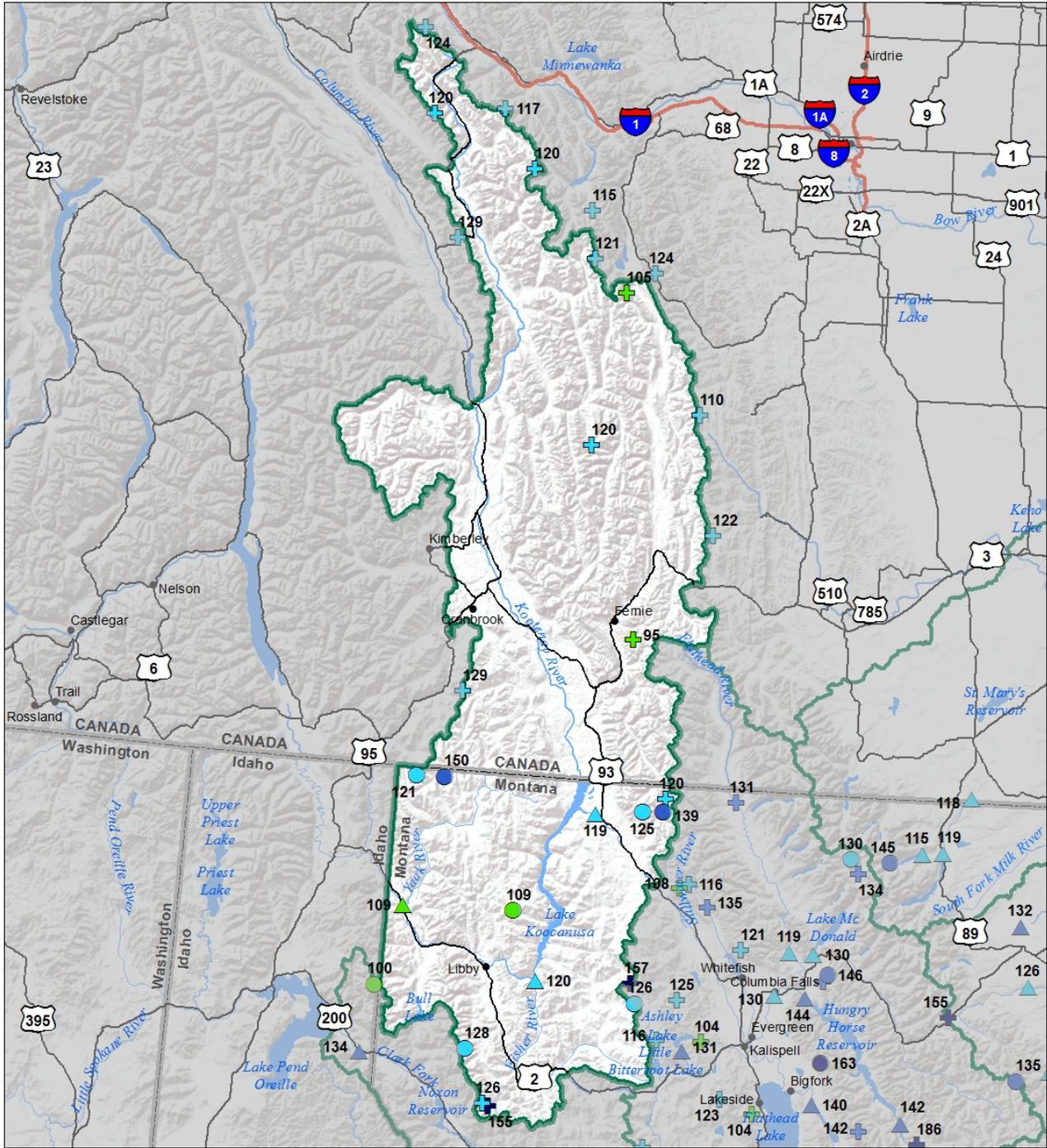
Kootenai River Basin

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Tobacco R nr Eureka	APR-JUL	116	138	152	121%	167	189	126
	APR-SEP	126	151	167	119%	184	210	140
Libby Reservoir Inflow ¹	APR-JUL	4860	5850	6300	118%	6750	7750	5340
	APR-SEP	5750	6780	7250	116%	7720	8740	6250
Fisher R nr Libby	APR-JUL	191	225	250	122%	275	315	205
	APR-SEP	205	240	265	120%	290	330	220
Yaak R nr Troy	APR-JUL	335	410	460	110%	510	585	420
	APR-SEP	350	430	480	109%	535	610	440
Kootenai R at Leonia ^{1,2}	APR-JUL	6770	7510	7850	119%	8190	8930	6600
	APR-SEP	7810	8540	8880	117%	9210	9940	7590

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Kootenai River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal

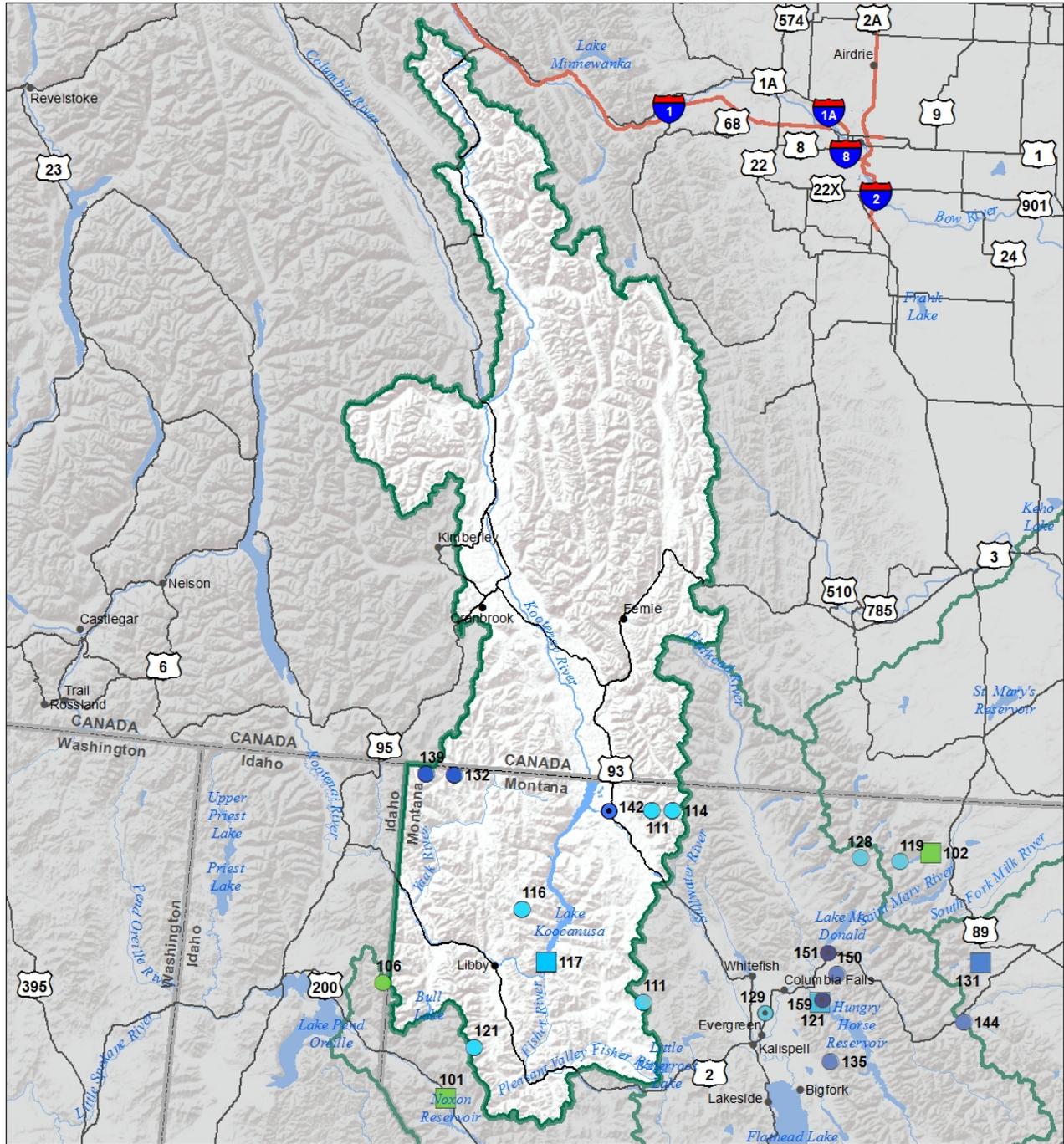
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

Streamflow Forecast Percent of Average Flows

▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%



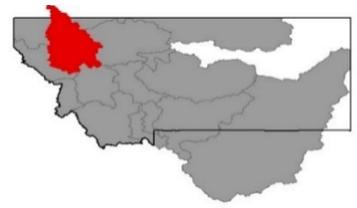
Kootenai River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018



SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal	
■ > 150%	■ 131 - 150%
■ 111 - 130%	■ 91 - 110%
■ 71 - 90%	■ 51 - 70%
■ 1 - 50%	

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Flathead River Basin

The Flathead River basin had another above average month of precipitation in February and its wettest month so far this water year. Flattop Mountain SNOTEL was the basin’s largest recipient of this February precipitation having received just over 15 inches of snow water which is 289% of normal. Other sites within the basin have also done well this water year. Both Grave Creek and Emery Creek SNOTEL currently have their 2nd largest snow water equivalent value for March 1st in over 40 years of record. Noisy Basin SNOTEL has its deepest snow depth in 21 years of record. Nearly all SNOTEL sites within the basin have already exceeded their normal snowpack peaks, which for some of the higher elevation sites typically doesn’t happen until mid-to-late April. Overall, the snowpack in the Flathead River basin is well above normal for March 1st.

Flathead River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
NF FLATHEAD in CANADA	%	%
NF FLATHEAD in MONTANA	127%	101%
MIDDLE FORK FLATHEAD	139%	104%
SOUTH FORK FLATHEAD	158%	88%
STILLWATER-WHITEFISH	121%	93%
SWAN	151%	90%
MISSION VALLEY	138%	96%
LITTLE BITTERROOT-ASHLEY	107%	83%
JOCKO	138%	92%
FLATHEAD in MONTANA	137%	97%
Basin-Wide Snowpack	137%	97%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	186%	132%	124%
Valley Precipitation	167%	124%	179%
Basin-Wide Precipitation	185%	132%	126%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

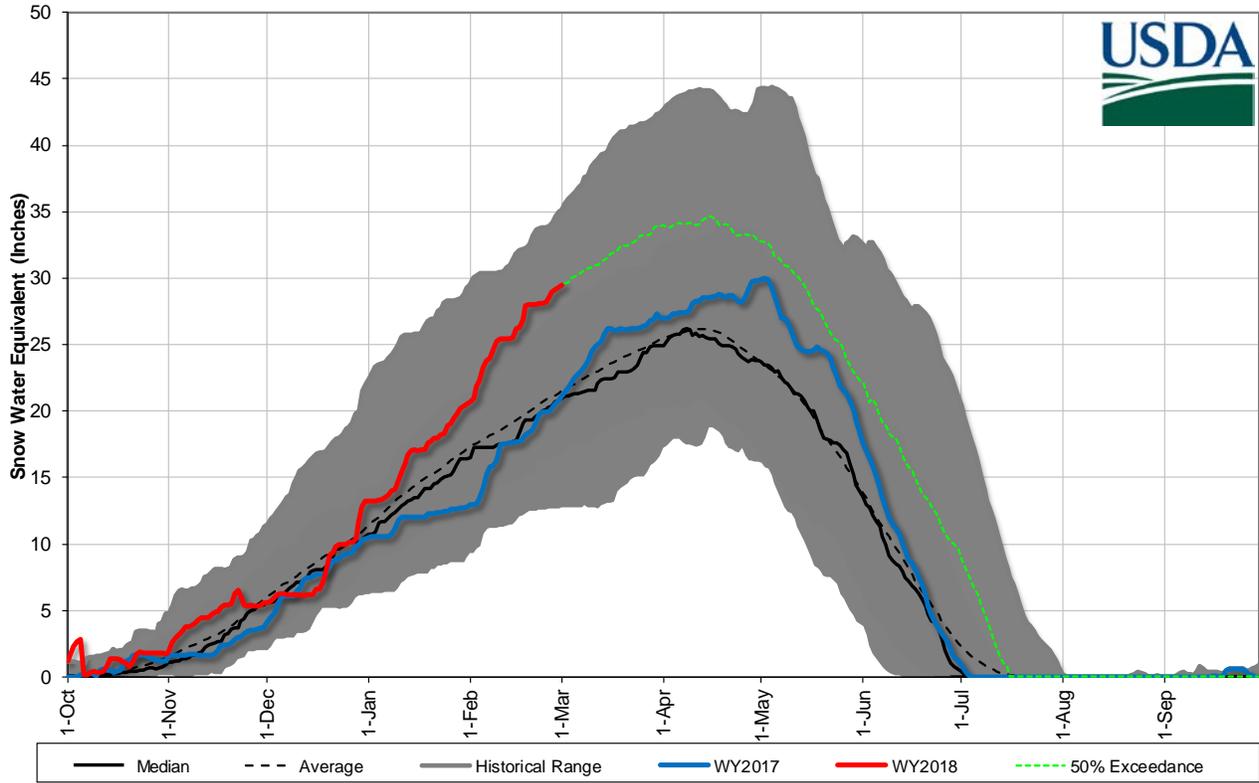
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Reservoir Storage	115%	66%	125%

*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

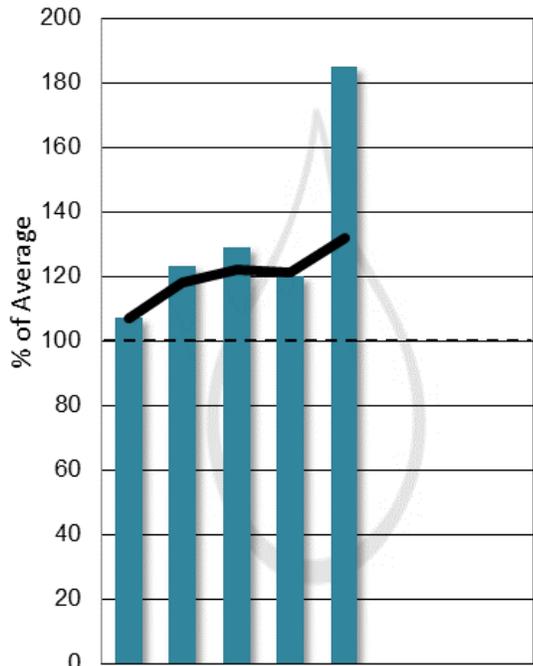
	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Camas (4)		18.8	19.5	45.2		
Lower Jocko Lake		0.0	0.0	6.4		
Mission Valley (8)		29.0	32.0	100.0		
Hungry Horse Lake	2666.5	3014.5	2209.0	3451.0	121%	77%
Flathead Lake	816.1	756.4	812.8	1791.0	100%	46%

Flathead River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation

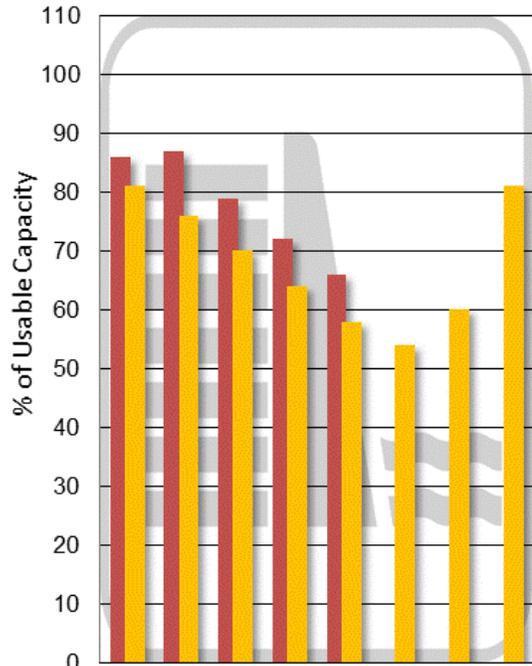
Monthly (teal bar), Year-to-date (black line)



Oct Nov Dec Jan Feb Mar Apr May

End of Month Reservoir Storage

% Capacity (red bar), Avg % Capacity (yellow bar)



Oct Nov Dec Jan Feb Mar Apr May

Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

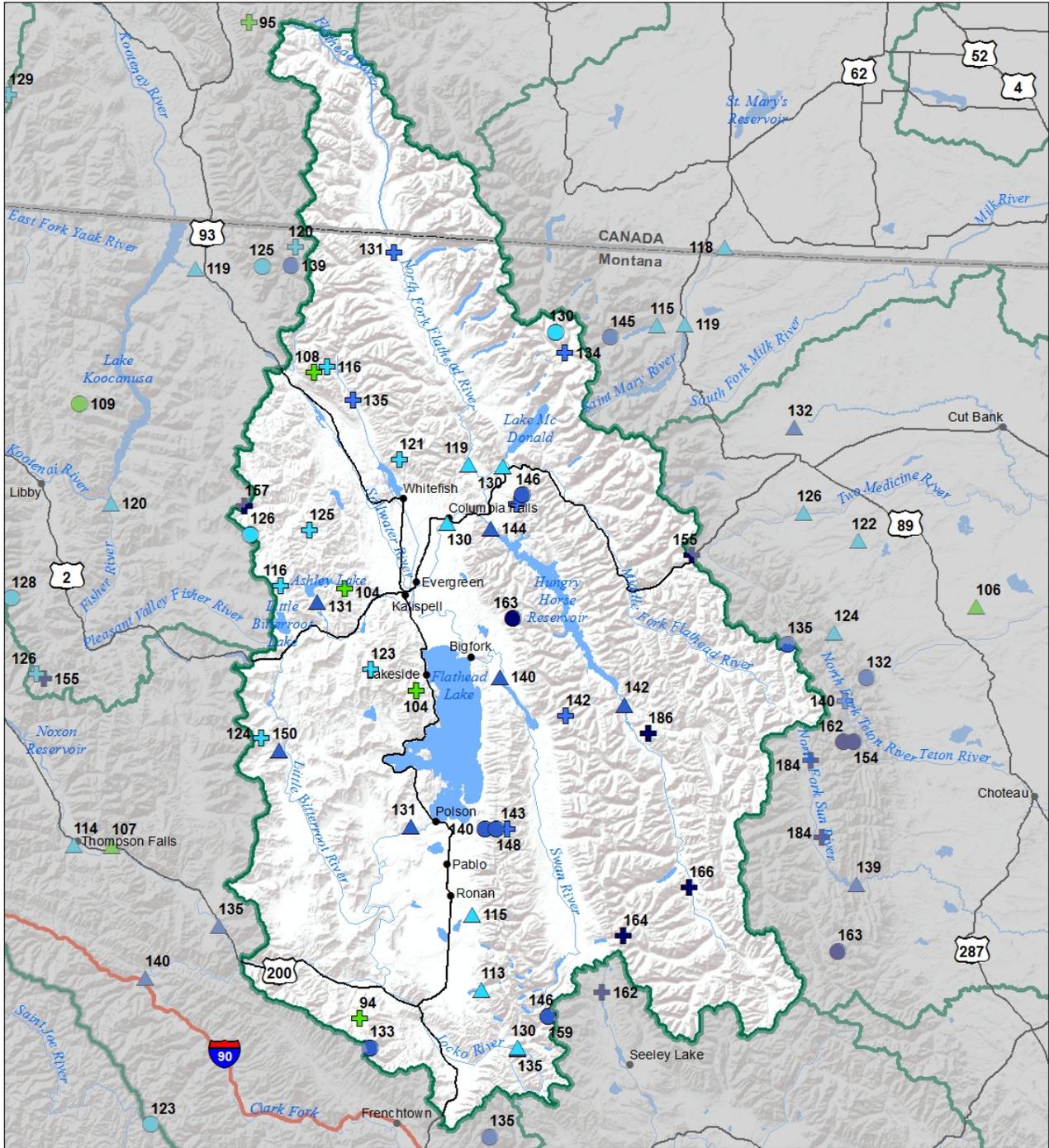
Flathead River Basin

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
NF Flathead R nr Columbia Falls	APR-JUL	1690	1810	1900	123%	1990	2110	1540
	APR-SEP	1800	1940	2030	119%	2120	2260	1700
MF Flathead R nr West Glacier	APR-JUL	1700	1850	1950	130%	2050	2200	1500
	APR-SEP	1860	2020	2120	130%	2230	2390	1630
Sf Flathead R nr Hungry Horse	APR-JUL	1540	1650	1730	143%	1800	1910	1210
	APR-SEP	1640	1760	1830	142%	1910	2030	1290
Hungry Horse Reservoir Inflow ^{1,2}	APR-JUL	2350	2600	2710	146%	2830	3080	1860
	APR-SEP	2480	2740	2860	144%	2990	3250	1980
Flathead R at Columbia Falls ²	APR-JUL	5870	6290	6570	131%	6860	7270	5020
	APR-SEP	6340	6790	7100	130%	7410	7860	5450
Ashley Ck nr Marion ²	MAR	0.65	1.12	1.44	121%	1.76	2.2	1.19
	APR-JUL	6.1	7.5	8.5	131%	9.4	10.8	6.5
Swan R nr Bigfork	APR-JUL	655	705	740	142%	775	825	520
	APR-SEP	740	800	835	140%	875	935	595
Flathead Lake Inflow ^{1,2}	APR-JUL	6520	7290	7640	131%	7990	8770	5810
	APR-SEP	7000	7850	8240	131%	8630	9480	6270
Mill Ck ab Bassoo ck nr Niarada	APR-JUL	4.7	5.6	6.2	155%	6.9	7.8	4
	APR-SEP	5.1	6	6.6	150%	7.3	8.2	4.4
South Crow Ck nr Ronan	APR-JUL	9.1	10.7	11.7	116%	12.7	14.2	10.1
	APR-SEP	10.5	12.2	13.3	115%	14.5	16.2	11.6
Mission Ck nr St. Ignatius	APR-JUL	24	26	28	112%	30	32	25
	APR-SEP	29	32	34	113%	36	39	30
SF Jocko R nr Arlee	APR-JUL	37	42	46	139%	49	54	33
	APR-SEP	42	47	50	135%	54	59	37
NF Jocko R bl Tabor Feeder Canal	APR-JUL	36	39	40	129%	42	45	31
	APR-SEP	38	41	43	130%	45	47	33

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Flathead River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal

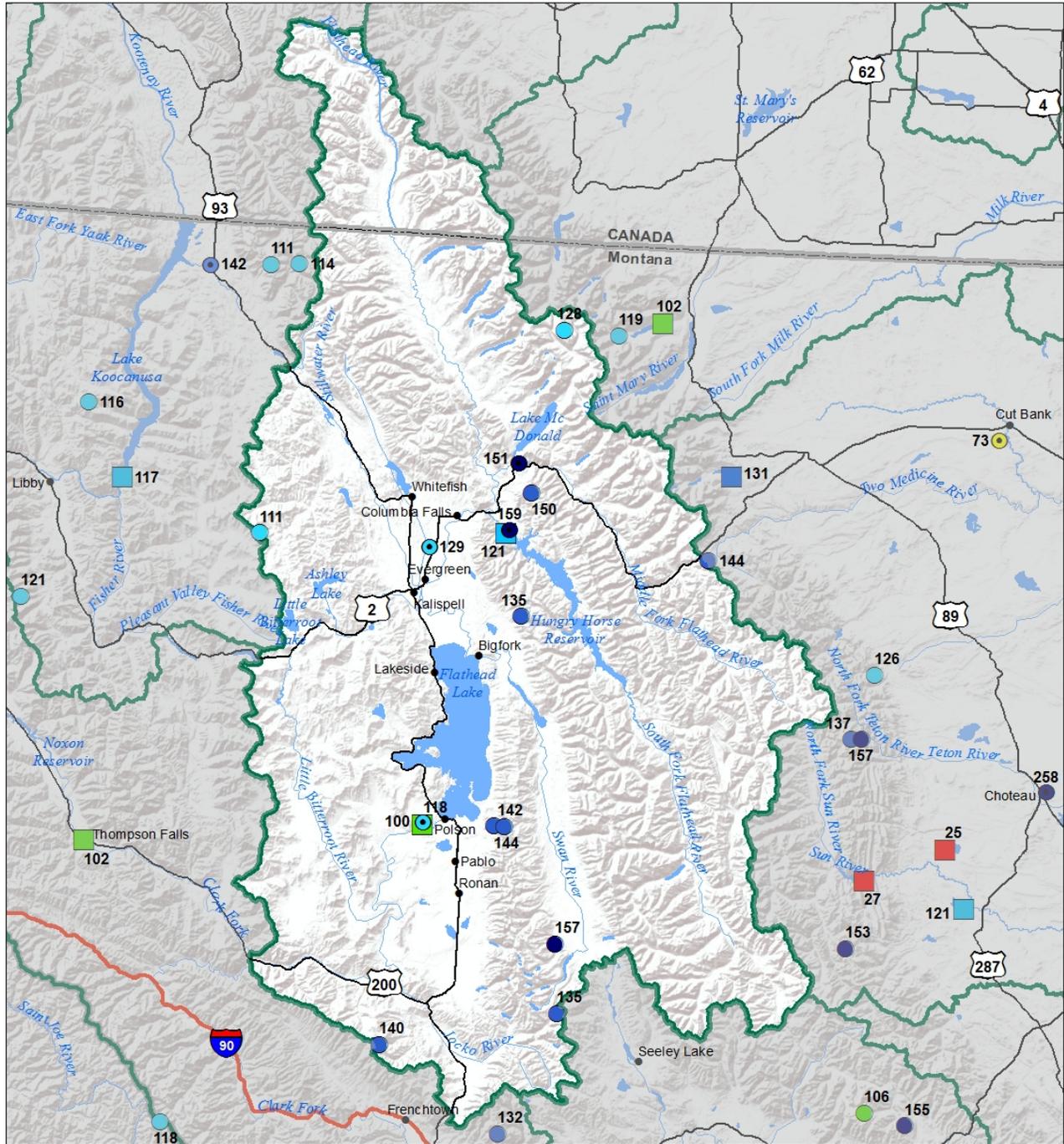
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

Streamflow Forecast Percent of Average Flows

▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%



Flathead River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018



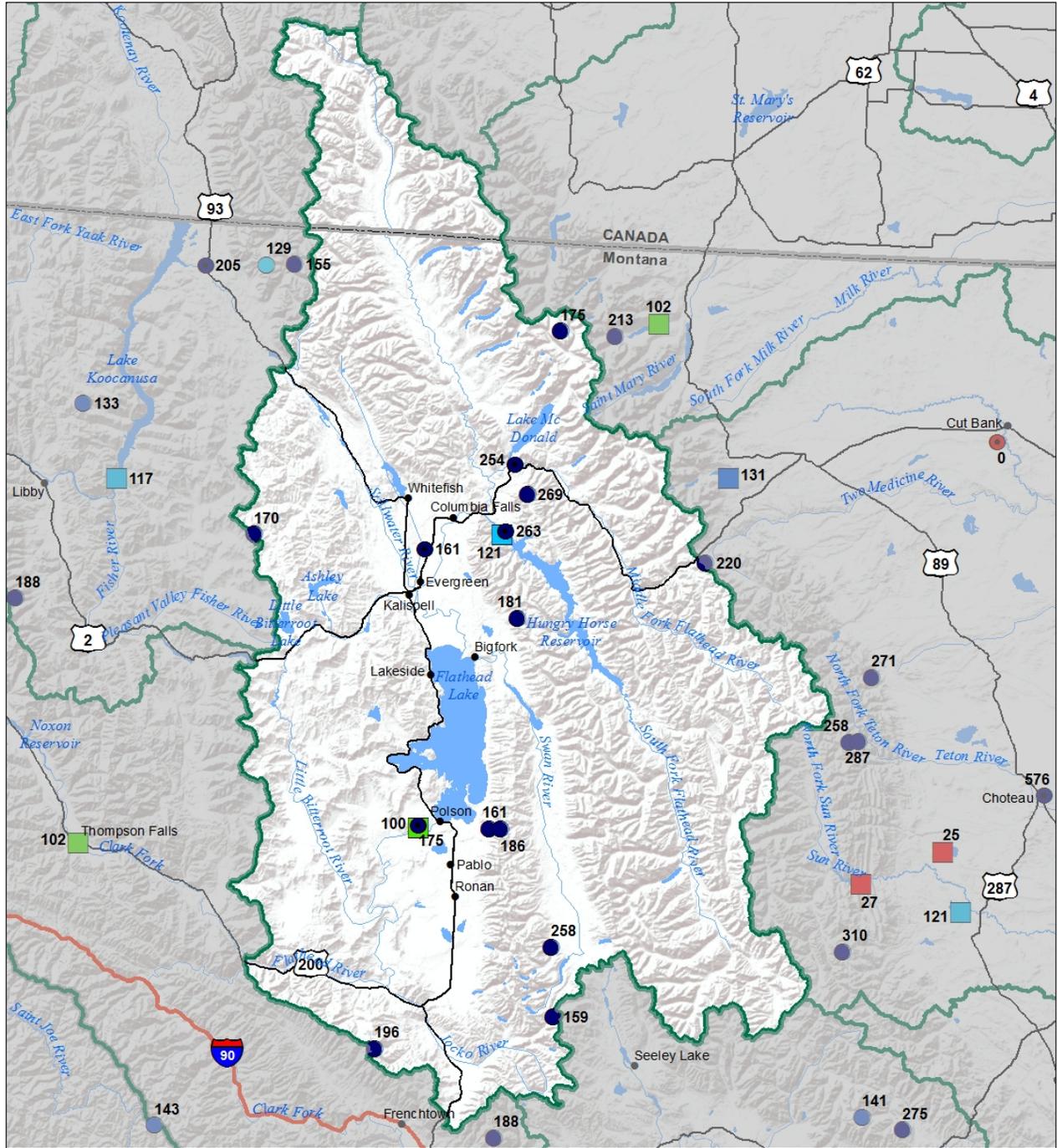
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%

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Flathead River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal March 1, 2018 (February 1, 2018 - March 1, 2018)



Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%

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Upper Clark Fork River Basin



It has been dumping snow in the Upper Clark Fork River basin this year, and February was no exception. Five snowpack measurement locations set new records for February snowfall totals, and nine others were the second highest on record. Currently, six snow survey sites within the watershed have their highest March 1st snowpack on record, and six more have their second highest snowpack on record. One example is Lower Ten Mile Creek Snow Course near Helena, which has its highest March 1st snowpack in 84 years of record. Typically all SNOTEL sites within the basin reach their maximum snowpack for season sometime in April. This year all SNOTEL sites within the basin exceeded their normal snow water peaks sometime in February, more than two months early in some locations. The record snowpack totals in the basin have resulted in forecasts for the April 1st through July 31st period that ranges from 148% to 190% of average. The median forecast for the Clark's Fork at Missoula is 164%. There will be a significant amount of water coming out of the mountains this year so a close eye should be kept on the weather this spring, as it will undoubtedly play a critical role in the timing and volumes of water in the rivers and streams.

Upper Clark Fork River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
CLARK FORK ab FLINT CREEK	168%	93%
FLINT CREEK	157%	104%
ROCK CREEK	148%	95%
CLARK FORK ab BLACKFOOT	162%	95%
BLACKFOOT	158%	97%
Basin-Wide	159%	95%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	203%	133%	107%
Valley Precipitation	199%	187%	140%
Basin-Wide Precipitation	203%	135%	108%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

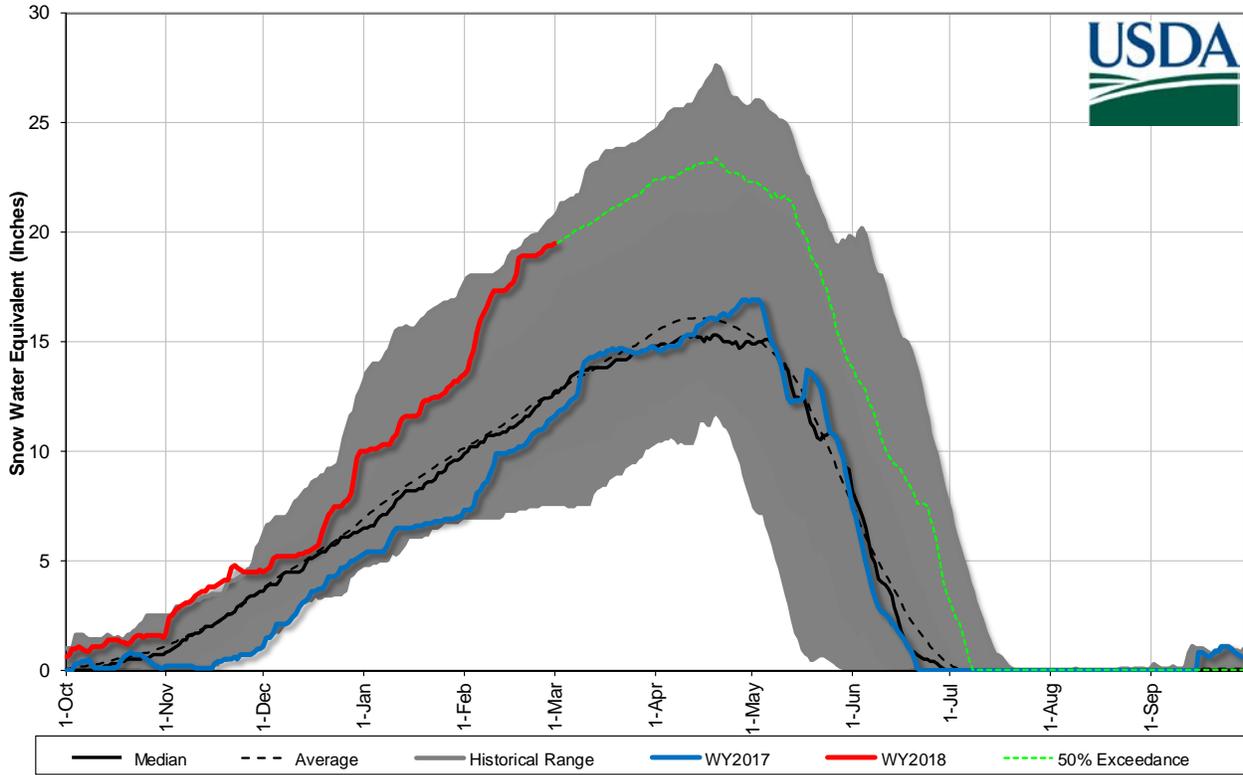
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	106%	74%	101%

*See Reservoir Storage Table for storage in individual reservoirs

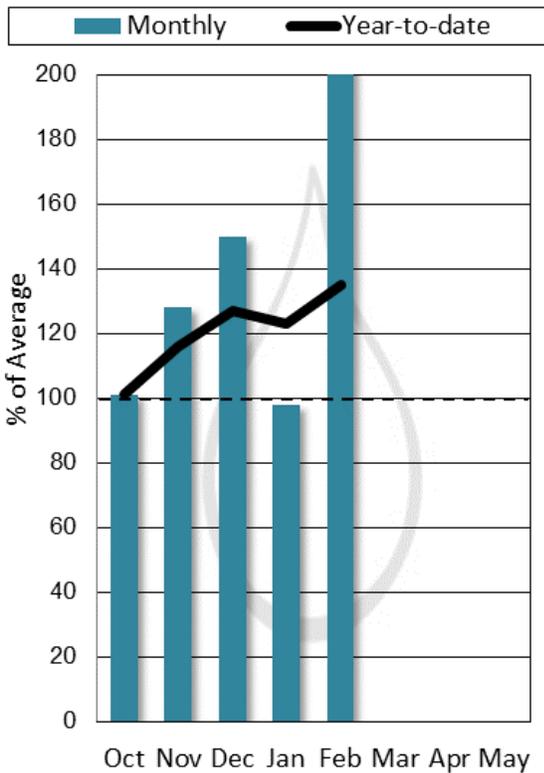
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
East Fork Rock Creek Res	8.5	8.7	8.3	15.6	103%	55%
Georgetown Lake	27.5	28.6	27.6	31.0	100%	89%
Lower Willow Creek Reservoir			2.2	4.9		
Nevada Creek Res	8.0	4.7	5.6	12.6	142%	63%

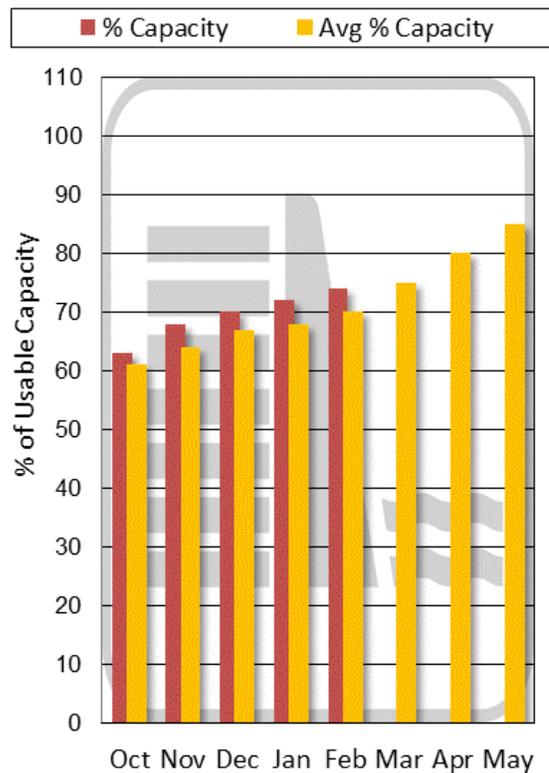
Upper Clark Fork River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

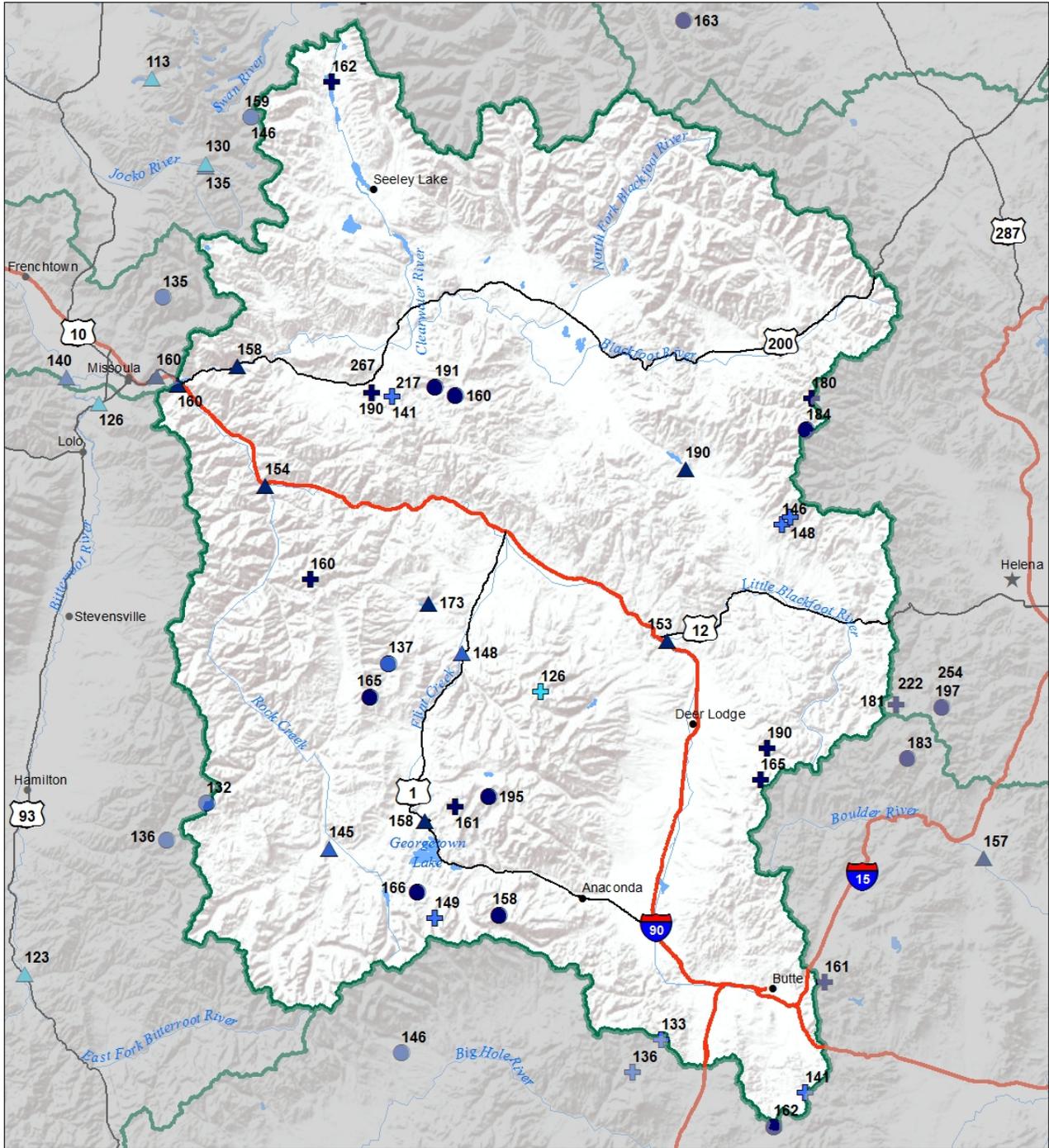
*Upper Clark Fork River
Basin*

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
<i>Little Blackfoot nr Garrison</i>	APR-JUL	77	97	109	156%	122	141	70
	APR-SEP	84	104	118	153%	132	153	77
<i>Flint Ck nr Southern Cross</i>	APR-JUL	13.3	17.1	19.6	158%	22	26	12.4
	APR-SEP	15.5	20	23	158%	27	31	14.6
<i>Flint Ck bl Boulder Ck</i>	APR-JUL	55	70	80	154%	90	105	52
	APR-SEP	68	86	98	148%	109	127	66
<i>Lower Willow Ck Reservoir Inflow²</i>	APR-MAY	8.1	10.5	12.1	166%	13.8	16.2	7.3
	APR-JUL	11.9	15.7	18.3	173%	21	25	10.6
<i>MF Rock Ck nr Philipsburg</i>	APR-JUL	70	80	86	148%	93	102	58
	APR-SEP	77	87	94	145%	102	112	65
<i>Rock Ck nr Clinton</i>	APR-JUL	305	355	395	158%	430	480	250
	APR-SEP	335	390	430	154%	470	530	280
<i>Clark Fork R ab Milltown</i>	APR-JUL	625	775	880	166%	980	1130	530
	APR-SEP	705	870	985	160%	1100	1270	615
<i>Nevada Ck nr Helmville</i>	APR-MAY	11.1	14.3	16.5	196%	18.7	22	8.4
	APR-JUL	20	24	27	190%	29	33	14.2
<i>Blackfoot R nr Bonner</i>	APR-JUL	960	1070	1150	160%	1230	1350	720
	APR-SEP	1050	1180	1260	158%	1350	1470	800
<i>Clark Fork R ab Missoula</i>	APR-JUL	1600	1870	2050	164%	2230	2500	1250
	APR-SEP	1780	2070	2270	160%	2460	2750	1420

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

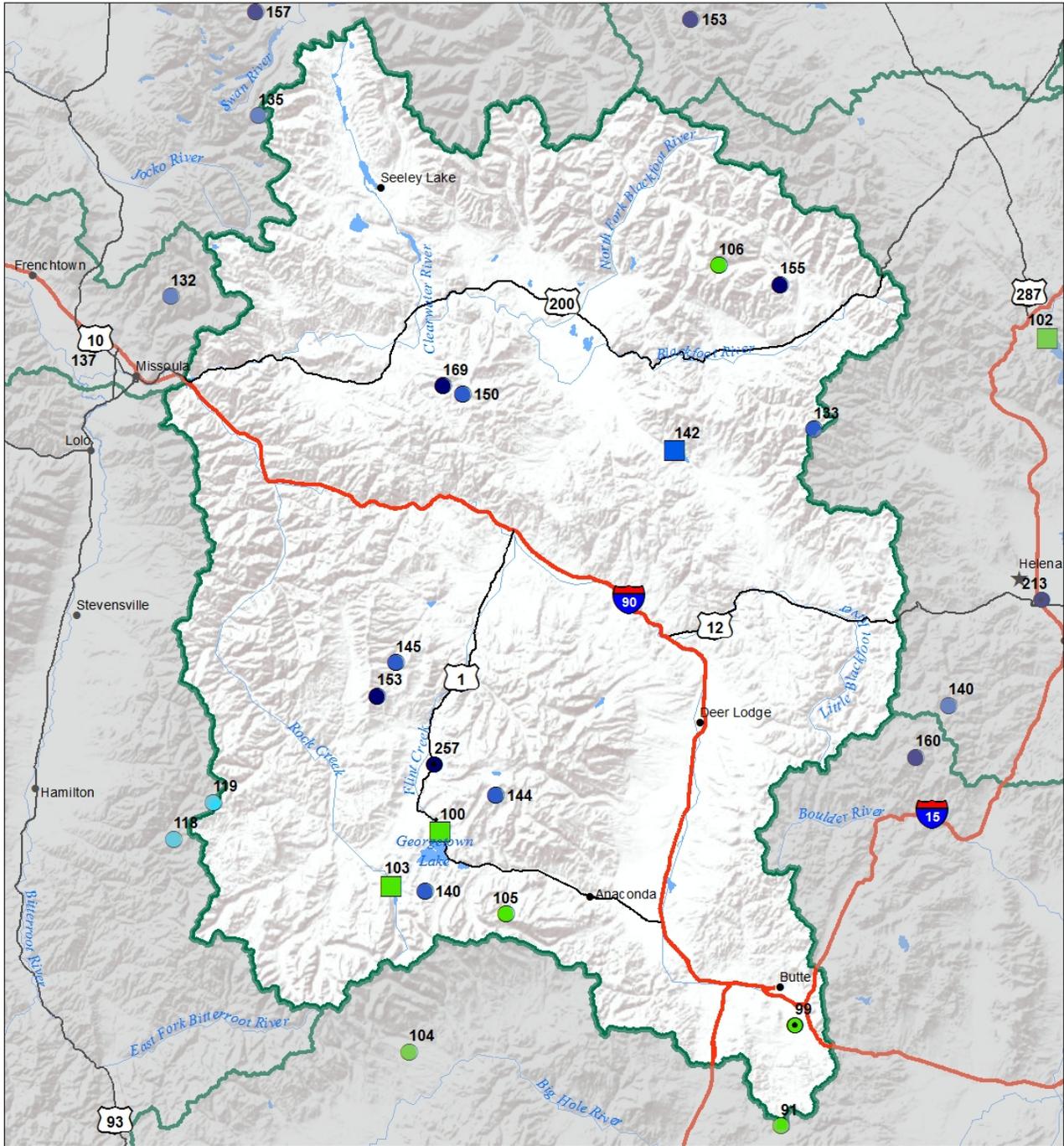
Upper Clark Fork River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal			
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

Streamflow Forecast Percent of Average Flows	
▲ > 150%	▲ 131 - 150%
▲ 111 - 130%	▲ 91 - 110%
▲ 71 - 90%	▲ 51 - 70%
▲ 1 - 50%	

**Upper Clark Fork River Basin
Water Year to Date Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018**



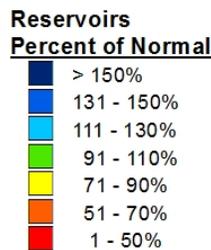
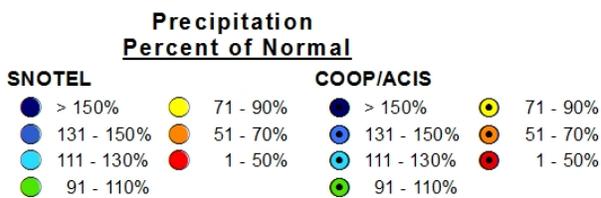
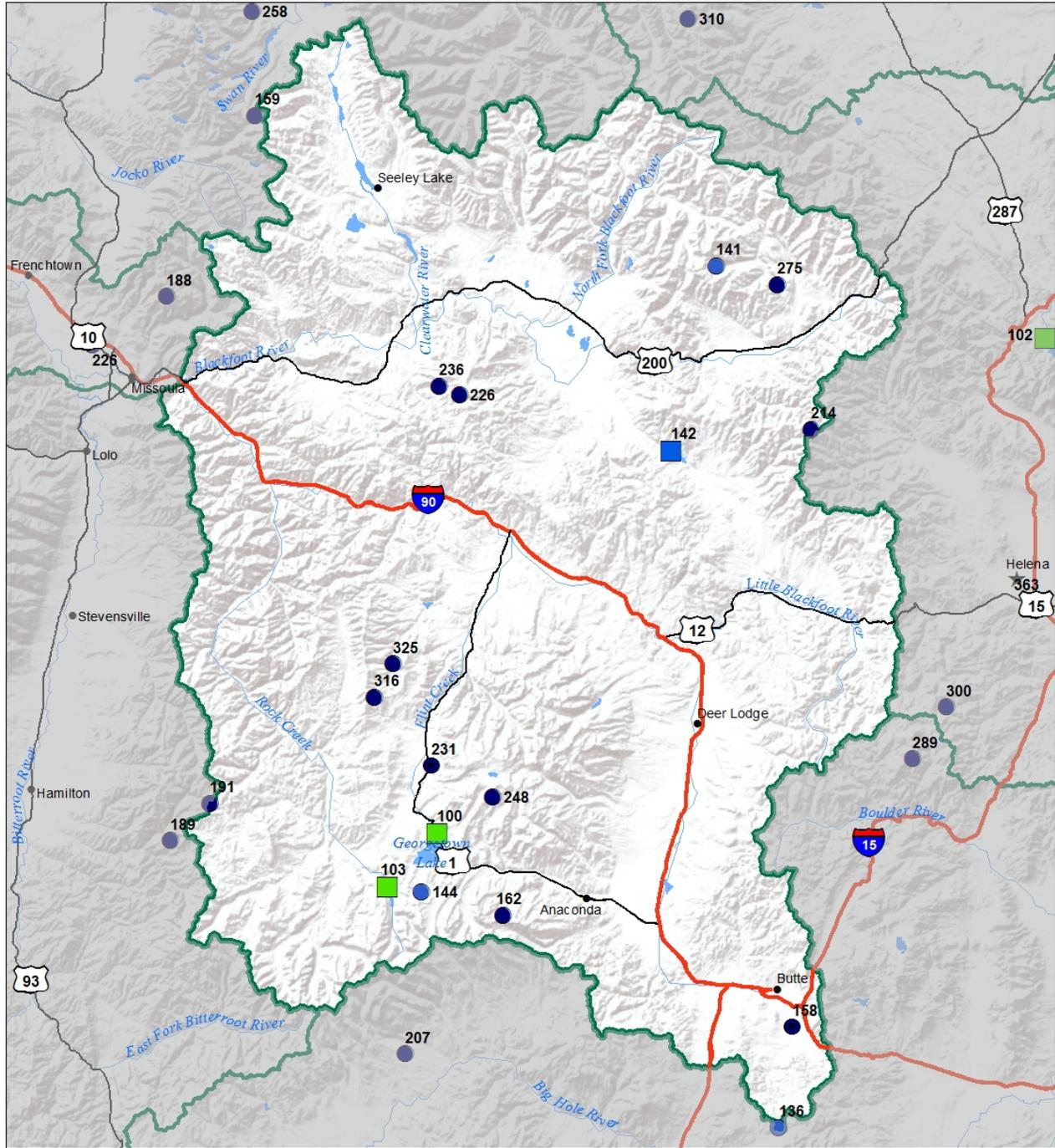
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%

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**Upper Clark Fork River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018 (February 1, 2018 - March 1, 2018)**



Bitterroot River Basin



February was the wettest month so far this water year in the Bitterroot River basin. Twin Lakes SNOTEL is an excellent example of this as it snowed over 20 days there in February. The basin’s most significant storm of the month occurred early. Twin Lakes typically receives about 5.3 inches of snow water accumulation for the entire month of February. This February the site had already accumulated that amount by the 5th day. The monthly total for the site this year was 14.4 inches which was 271 percent of normal. Other locations within the basin are had a big month too. Reports from Lost Trail Ski Resort was that they were skiing chest deep snow early in the month. Typically SNOTEL sites within the basin peak anywhere from late March to mid-April. This year all sites have already exceeded their normal peak snow water values. Overall, the snowpack in the Bitterroot River basin is well above normal for March 1st.

Bitterroot River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
WEST FORK BITTERROOT	137%	100%
EAST SIDE BITTERROOT	138%	96%
WEST SIDE BITTERROOT	131%	100%
Basin-Wide	133%	99%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	191%	122%	105%
Valley Precipitation	%	%	%
Basin-Wide Precipitation	191%	122%	105%

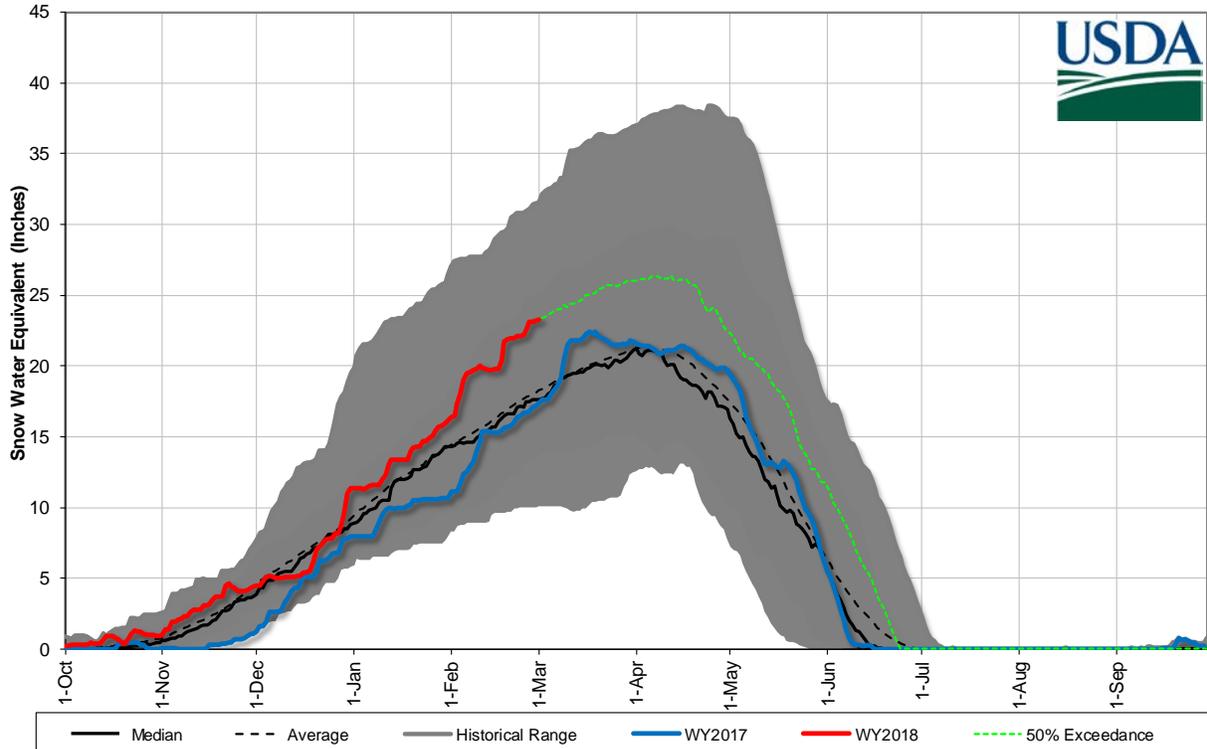
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	186%	52%	155%

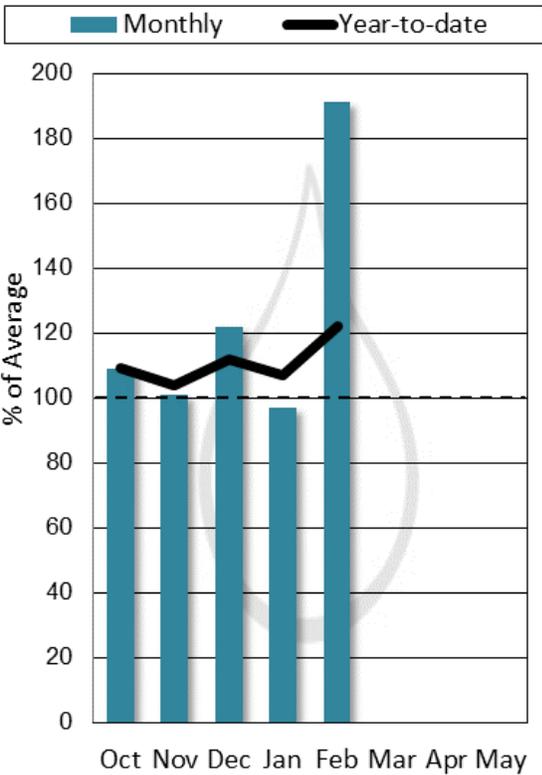
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Painted Rocks Lake	10.7	7.6	5.7	31.7	187%	34%
Lake Como	24.0	21.1	12.9	34.9	186%	69%

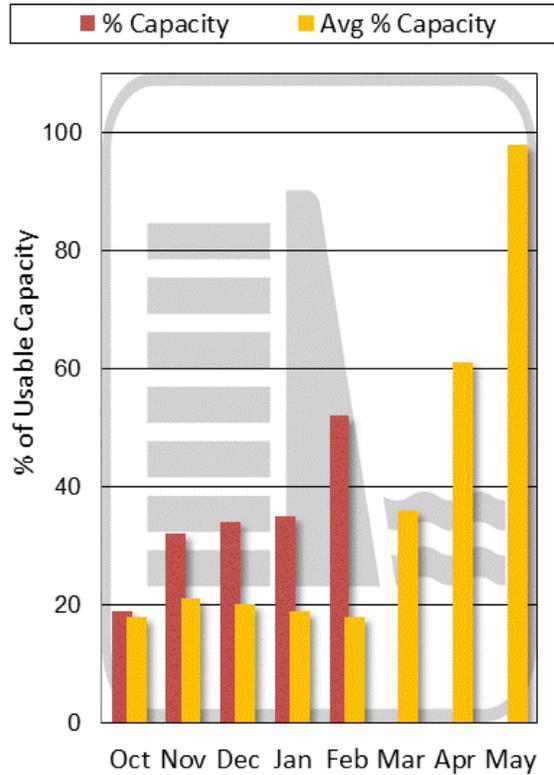
Bitterroot River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



**Mountain and Valley
Precipitation**



**End of Month Reservoir
Storage**



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

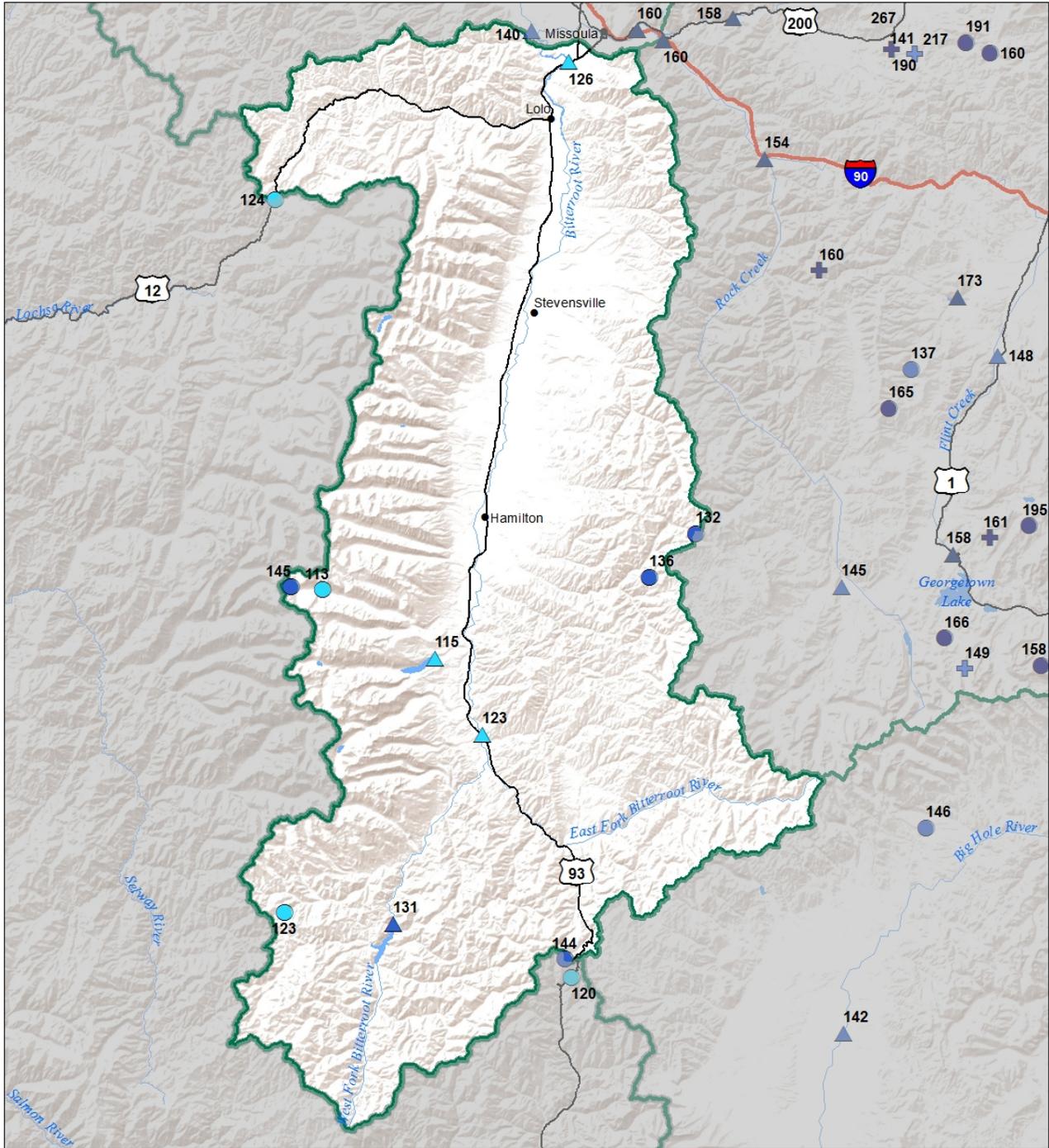
Bitterroot River Basin

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
WF Bitterroot R Nr Conner ²	APR-JUL	125	149	166	130%	183	205	128
	APR-SEP	129	160	182	131%	205	235	139
Bitterroot R Nr Darby	APR-JUL	380	465	520	118%	575	660	440
	APR-SEP	450	530	585	123%	640	720	475
Como Reservoir Inflow ²	APR-JUL	74	82	87	114%	92	99	76
	APR-SEP	78	86	91	115%	96	104	79
Bitterroot R nr Missoula	APR-JUL	1160	1330	1450	126%	1560	1730	1150
	APR-SEP	1260	1450	1570	126%	1700	1880	1250

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Bitterroot River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal

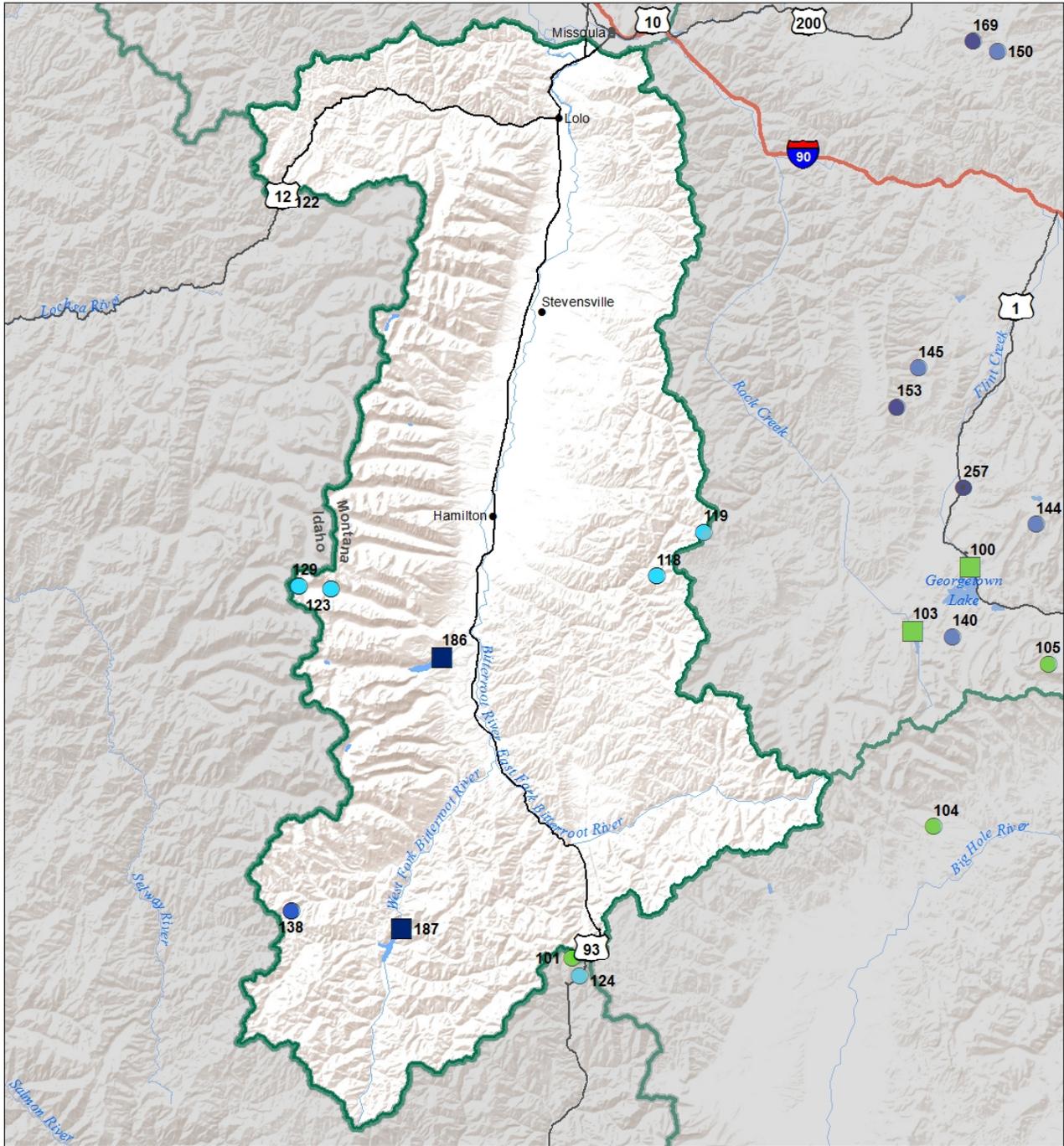
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	✱ 0%	⊕ 91 - 110%	✱ 0%

Streamflow Forecast Percent of Average Flows

▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%



Bitterroot River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018

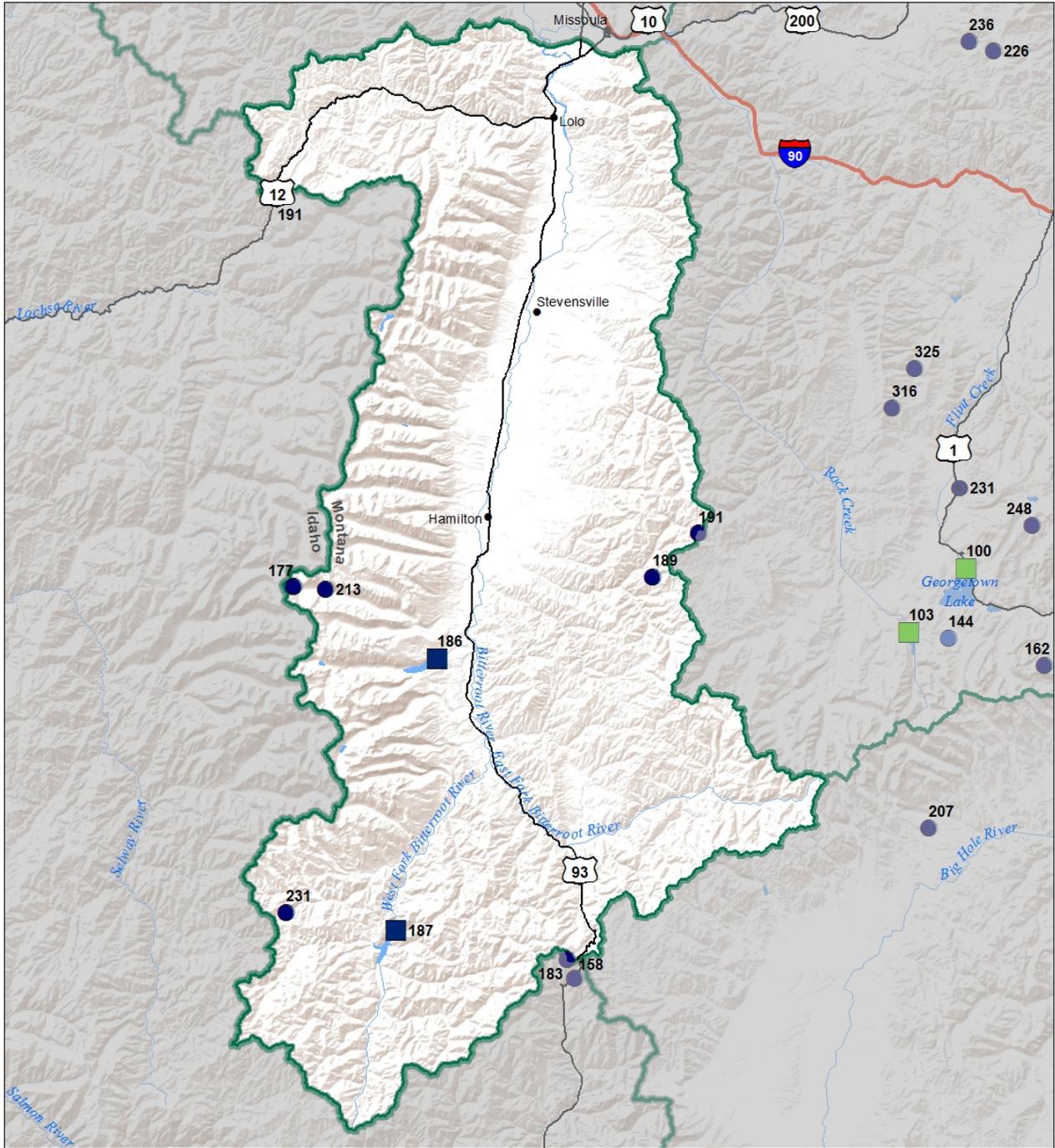


Precipitation Percent of Normal	
SNOTEL	COOP/ACIS
● > 150%	● > 150%
● 131 - 150%	● 131 - 150%
● 111 - 130%	● 111 - 130%
● 91 - 110%	● 91 - 110%
● 71 - 90%	● 71 - 90%
● 51 - 70%	● 51 - 70%
● 1 - 50%	● 1 - 50%

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%

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**Bitterroot River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018 (February 1, 2018 - March 1, 2018)**



Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%

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Lower Clark Fork River Basin

The Lower Clark Fork River basin had another above average month of precipitation in February and its wettest month so far this water year. The SNOTEL sites within the basin received 174% of their average precipitation during the month. Snow trickled in over February, but a mid-month storm brought the most significant accumulation to the basin in February. This storm lasted three days and delivered 3.5 inches of snow water to Hoodoo Basin SNOTEL, which is about 60% of what hoodoo typical gets during the entire month. Currently, Hoodoo Basin SNOTEL site has the deepest snowpack in the basin at 133 inches of depth and 39.8 inches of snow water. Nearly all of the basin's SNOTEL sites have either exceeded or are near their normal peak snow water equivalent, which is about a month early. Overall, the snowpack in the Lower Clark Fork River basin is well above normal for March 1st.

Lower Clark For River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
LOWER CLARK FORK RIVER BASIN	123%	98%
Basin-Wide	123%	98%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	174%	123%	122%
Valley Precipitation	226%	137%	177%
Basin-Wide Precipitation	175%	123%	123%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	101%	95%	97%

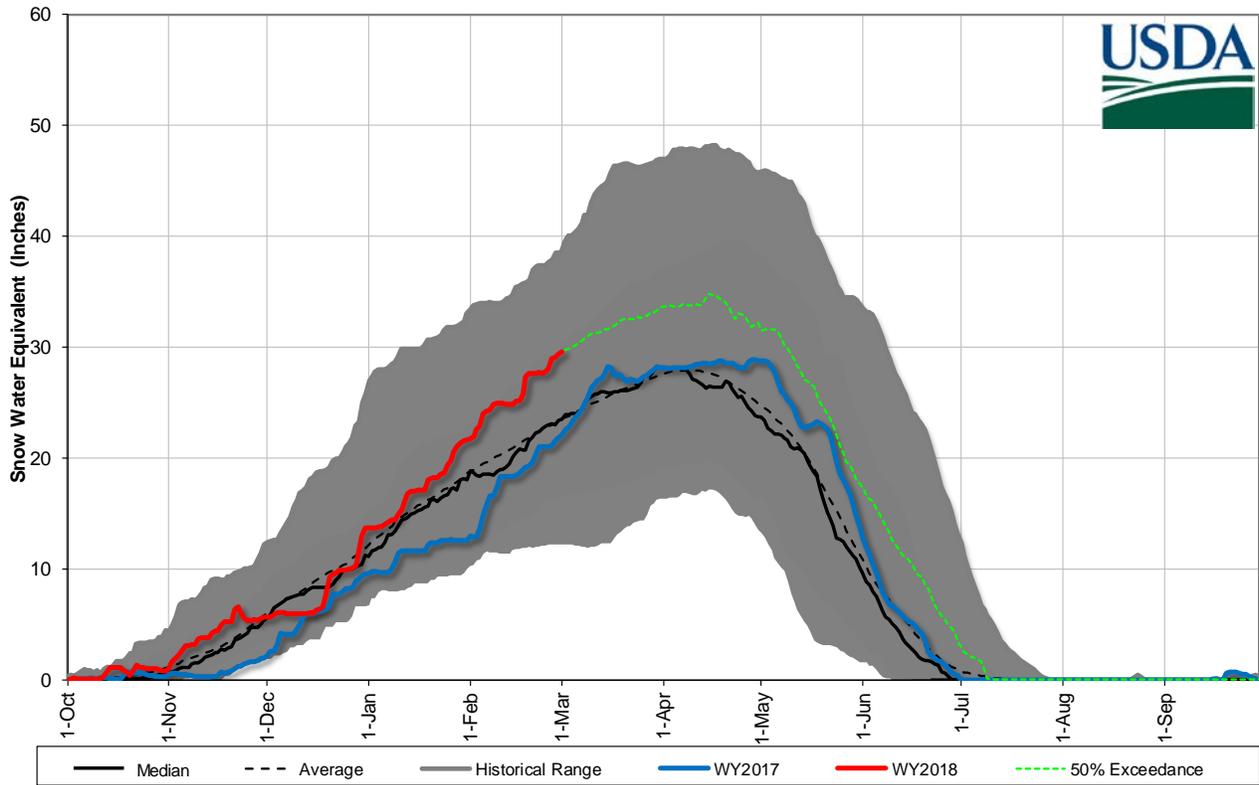
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Noxon Rapids Reservoir	316.9	303.3	313.9	335	101%	95%

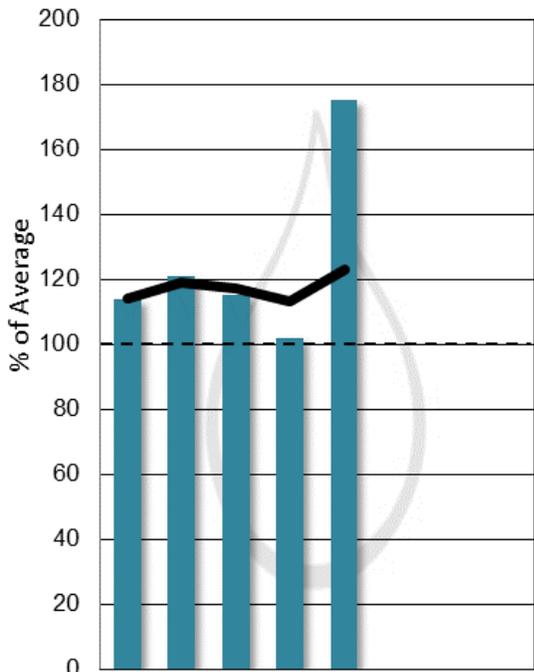
Lower Clark Fork River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation

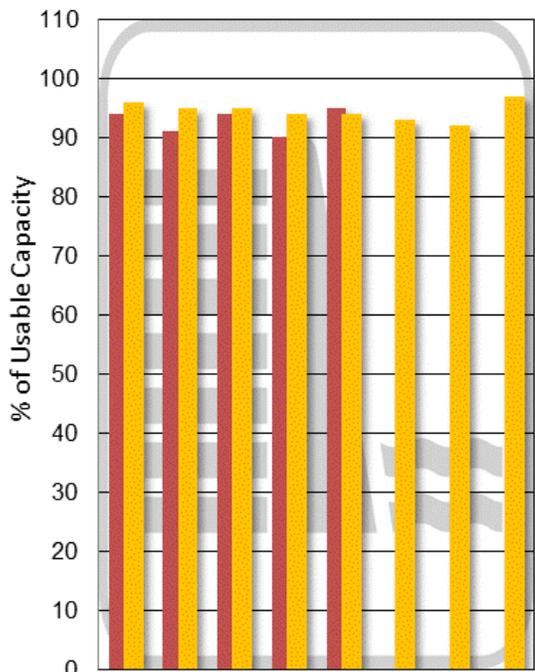
Monthly (teal bars) Year-to-date (black line)



Oct Nov Dec Jan Feb Mar Apr May

End of Month Reservoir Storage

% Capacity (red bars) Avg % Capacity (yellow bars)



Oct Nov Dec Jan Feb Mar Apr May

Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

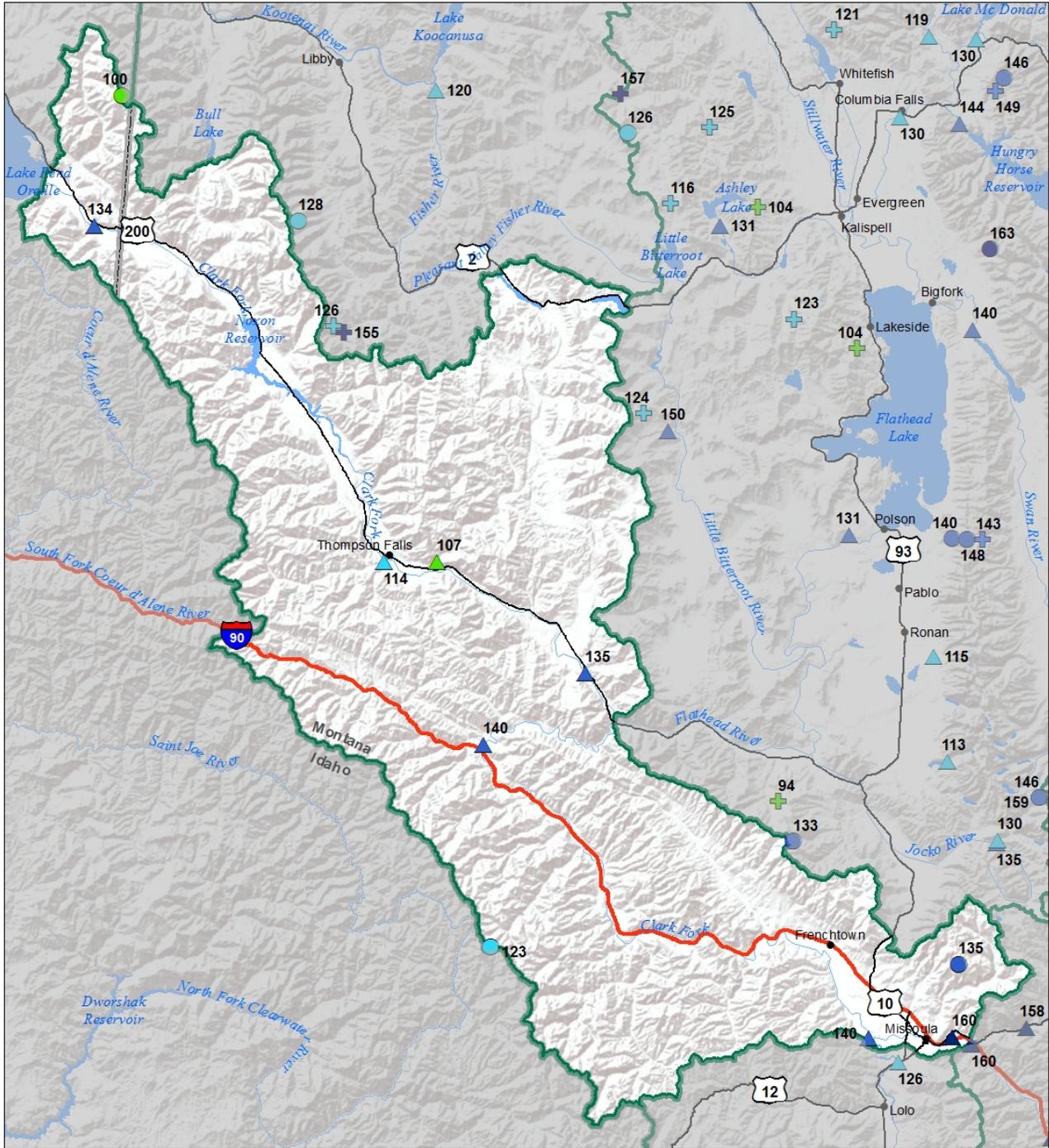
*Lower Clark Fork River
Basin*

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Clark Fork R bl Missoula	APR-JUL	2700	3110	3390	141%	3660	4080	2400
	APR-SEP	2990	3430	3730	140%	4040	4480	2670
Clark Fork R at St. Regis ¹	APR-JUL	3410	4130	4460	141%	4790	5520	3160
	APR-SEP	3770	4550	4900	140%	5260	6040	3510
Clark Fork R nr Plains ^{1,2}	APR-JUL	10300	11800	12500	136%	13200	14700	9200
	APR-SEP	11200	12900	13600	135%	14400	16000	10100
Thompson nr Thompson Falls	APR-JUL	132	169	194	107%	220	255	181
	APR-SEP	152	191	220	107%	245	285	205
Prospect Ck at Thompson Falls	APR-JUL	89	106	117	115%	128	145	102
	APR-SEP	96	113	125	114%	136	153	110
Clark Fork R at Whitehorse Rapids ^{1,2}	APR-JUL	11700	13400	14100	134%	14900	16600	10500
	APR-SEP	12800	14600	15400	134%	16200	18100	11500

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

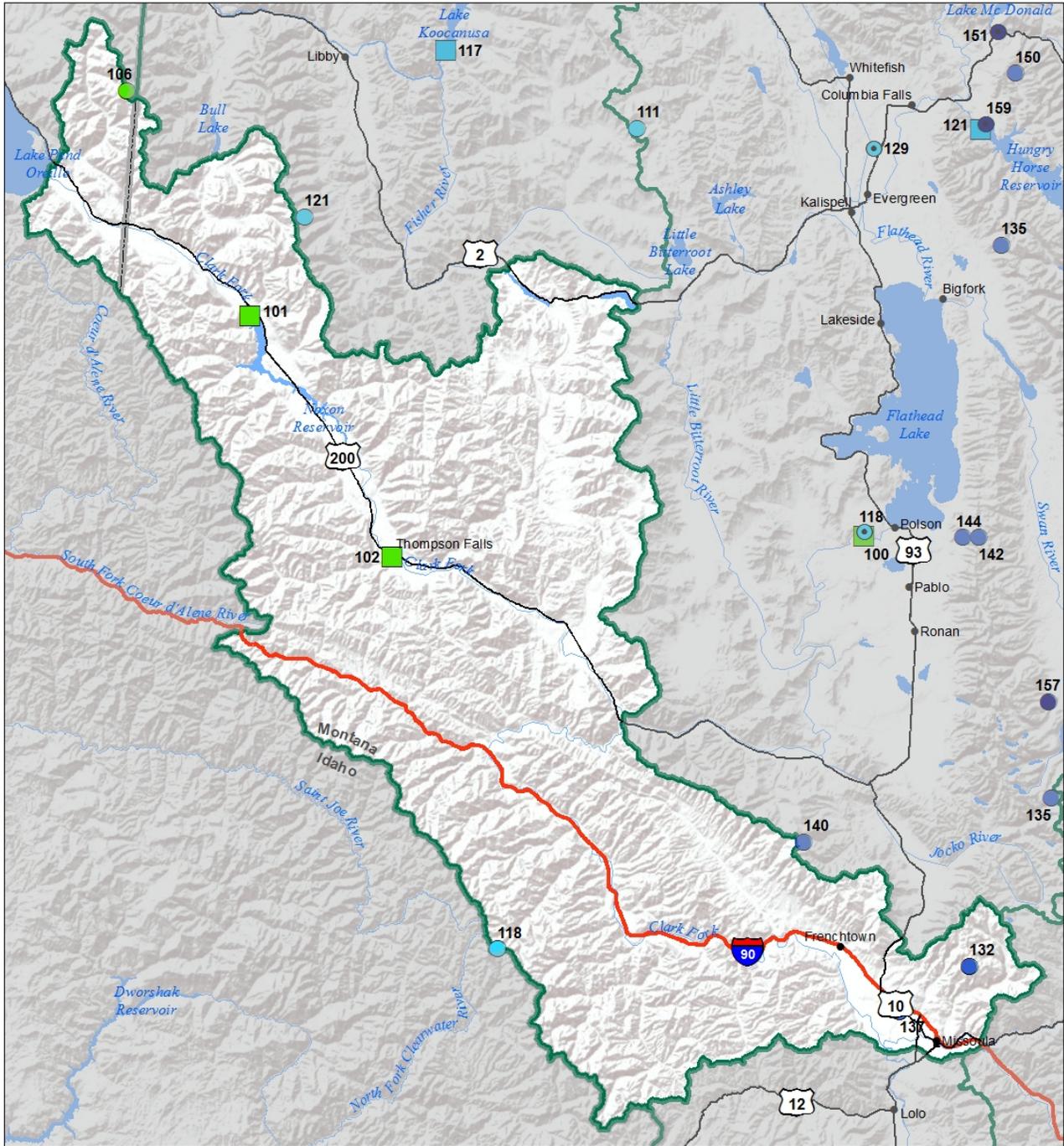
Lower Clark Fork River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal			
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
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● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

Streamflow Forecast Percent of Average Flows
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Lower Clark Fork River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018

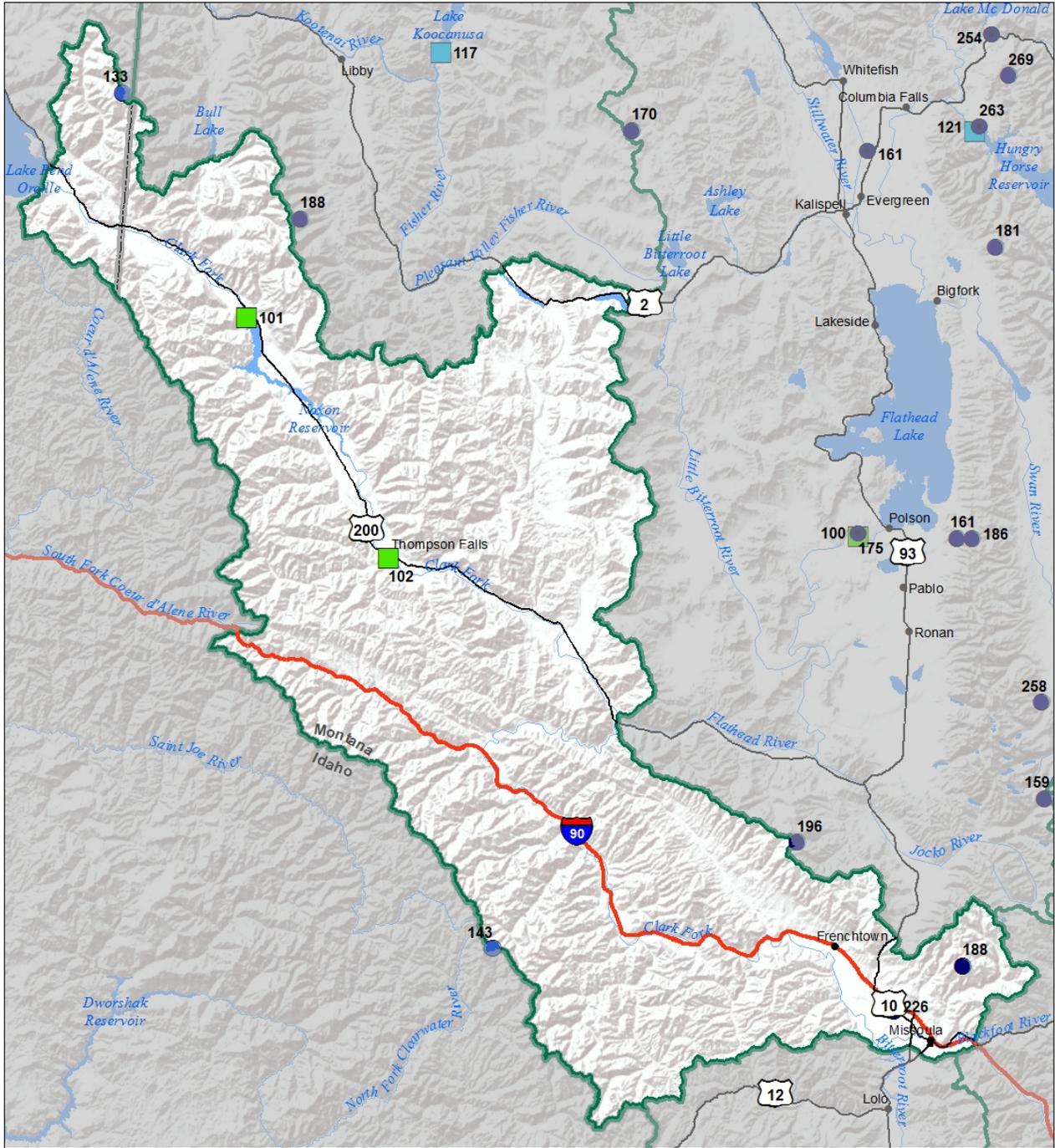


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
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■ 1 - 50%



**Lower Clark Fork River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018 (February 1, 2018 - March 1, 2018)**



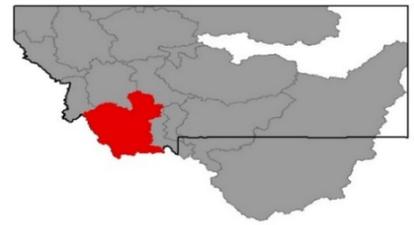
Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



Jefferson River Basin



Snowpack in the Jefferson River basin is well above normal for this time of year in the in the Boulder and Big Hole River basins and is above normal in the Ruby River basin. The Beaverhead, while above normal overall for March 1st, has one area that remains below normal. The Upper Red Rocks River basin above Lima Reservoir continues to have snowpack that lags behind the rest of the state and ranges from 74% to 90% of normal for this date. Water Supply forecasts issued on March 1 reflect the abundant snowfall across the basin, most forecasts for the April 1 – July 31st time period are well above average. A close eye will be kept on the weather with above normal snowpack in the mountains as we enter the spring. A slow transition to spring with cool weather would be ideal, providing a slow release of mountain water into the rivers and streams.

Jefferson River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
BEAVERHEAD	125%	114%
RUBY	125%	88%
BIGHOLE	145%	103%
BOULDER	174%	93%
Basin-Wide	138%	103%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	159%	110%	119%
Valley Precipitation	96%	91%	203%
Basin-Wide Precipitation	158%	109%	121%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

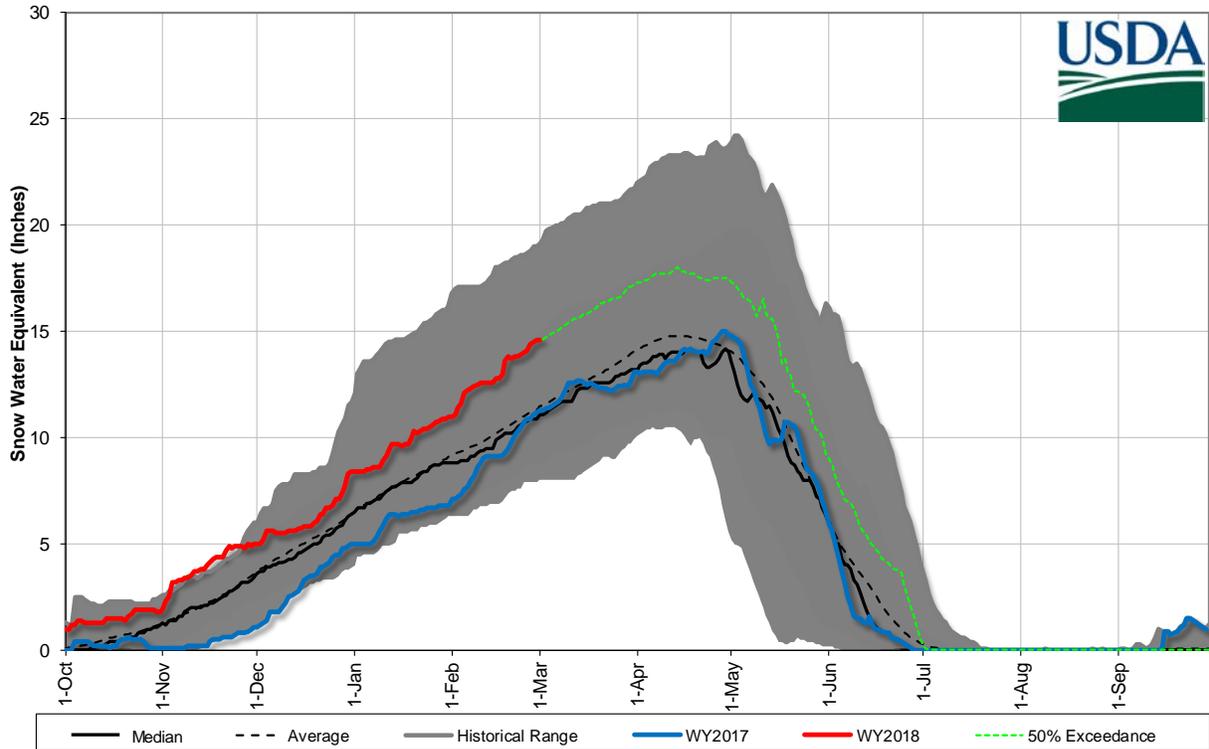
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	129%	63%	93%

*See Reservoir Storage Table for storage in individual reservoirs

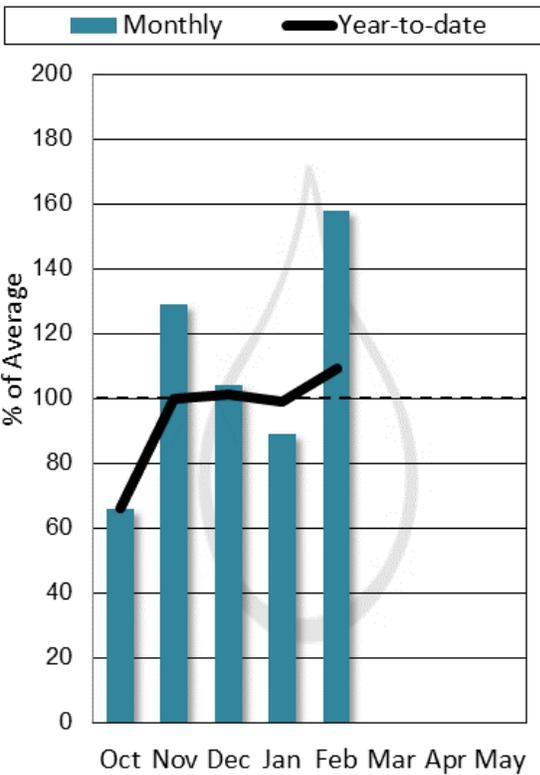
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Lima Reservoir	55.9	36.2	31.1	84.0	180%	67%
Clark Canyon Res	152.0	106.1	126.4	255.6	120%	59%
Ruby River Reservoir	30.0	28.7	27.2	38.8	110%	77%

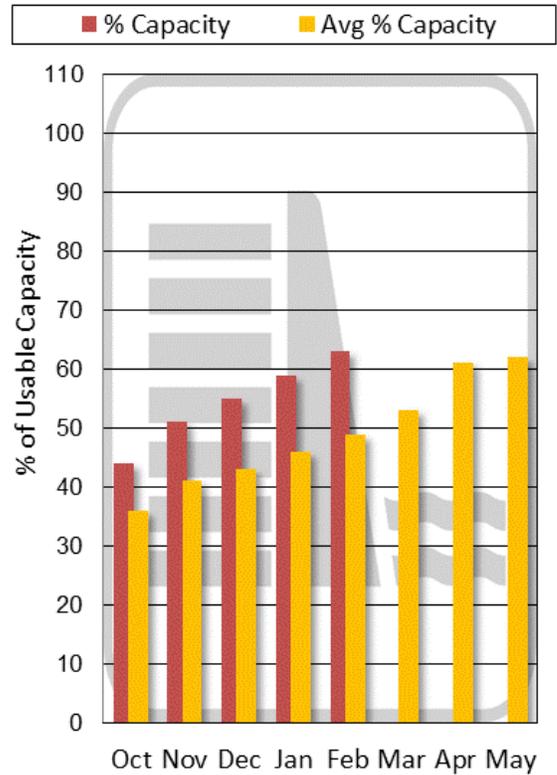
Jefferson River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



**Mountain and Valley
Precipitation**



**End of Month Reservoir
Storage**



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

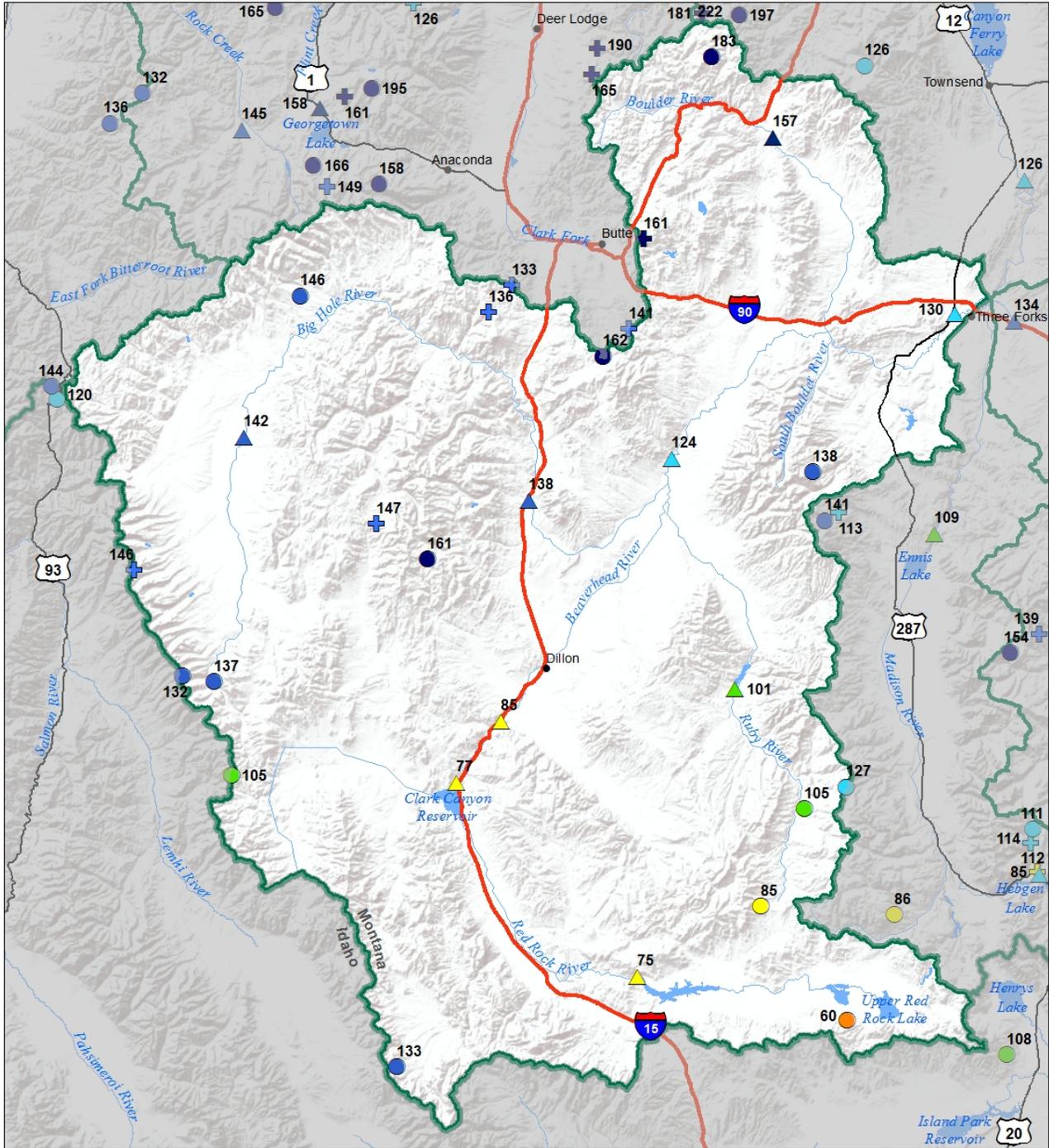
Jefferson River Basin

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Lima Reservoir Inflow ²	APR-JUL	22	42	56	75%	69	89	75
	APR-SEP	22	44	60	75%	75	97	80
Clark Canyon Inflow ²	APR-JUL	17.9	52	75	74%	98	132	101
	APR-SEP	25	65	92	77%	119	159	120
Beaverhead R at Barretts ²	APR-JUL	38	79	107	83%	135	176	129
	APR-SEP	55	101	132	85%	163	210	156
Ruby R Reservoir Inflow ²	APR-JUL	51	67	77	100%	87	103	77
	APR-SEP	63	80	92	101%	104	121	91
Big Hole R at Wisdom	APR-JUL	68	114	145	142%	176	220	102
	APR-SEP	71	120	153	142%	186	235	108
Big Hole R nr Melrose	APR-JUL	505	635	725	141%	810	940	515
	APR-SEP	540	680	775	138%	870	1010	560
Jefferson R nr Twin Bridges ²	APR-JUL	465	695	850	123%	1010	1240	690
	APR-SEP	495	740	905	124%	1070	1310	730
Boulder R nr Boulder	APR-JUL	75	94	108	157%	122	141	69
	APR-SEP	79	101	116	157%	130	152	74
Willow Ck Reservoir Inflow ²	APR-JUL	11.7	18.3	23	137%	27	34	16.8
Jefferson R nr Three Forks ²	APR-JUL	615	835	985	133%	1140	1360	740
	APR-SEP	620	870	1040	130%	1210	1460	800

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Jefferson River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal

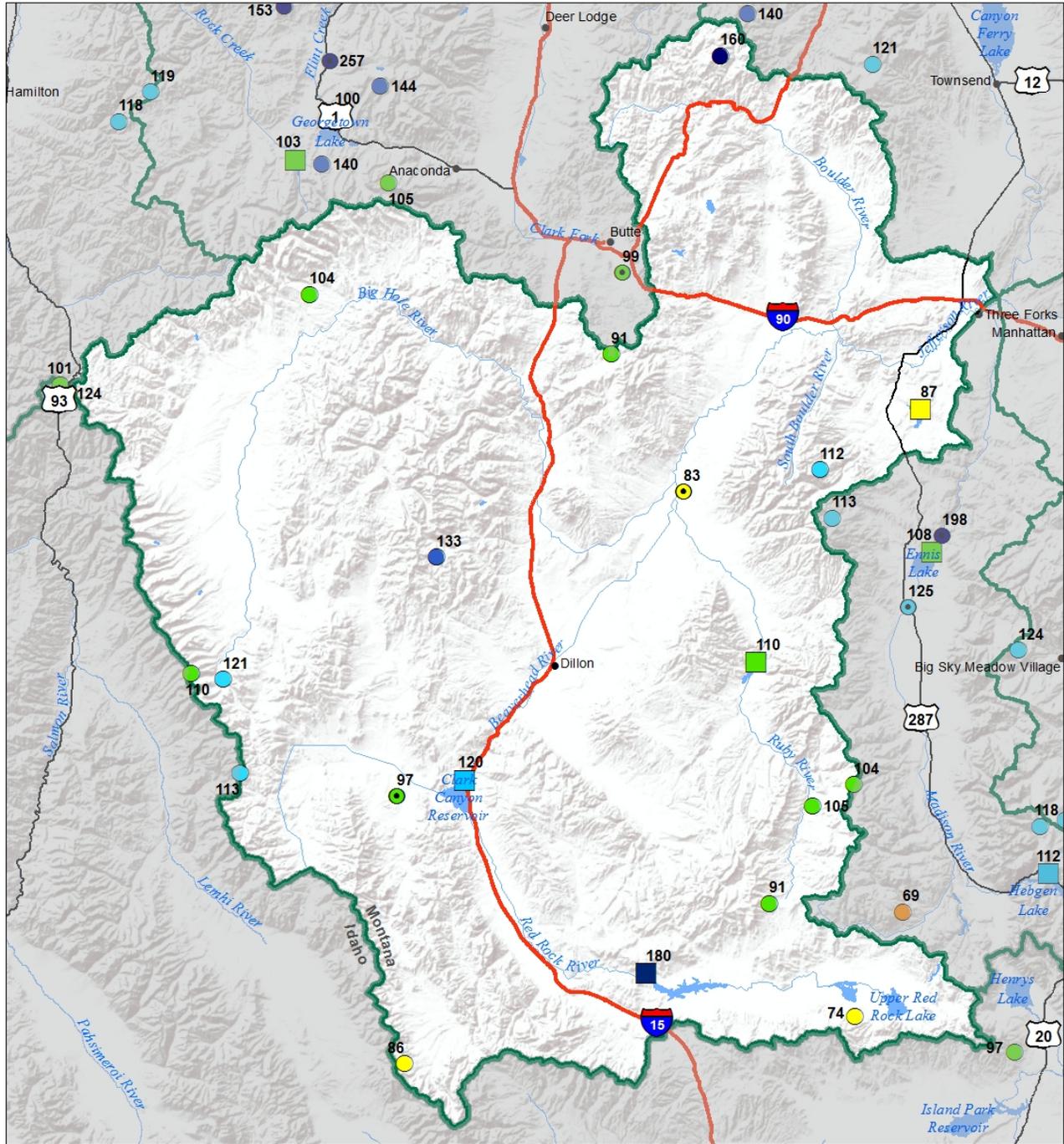
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

Streamflow Forecast Percent of Average Flows

▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%



Jefferson River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018

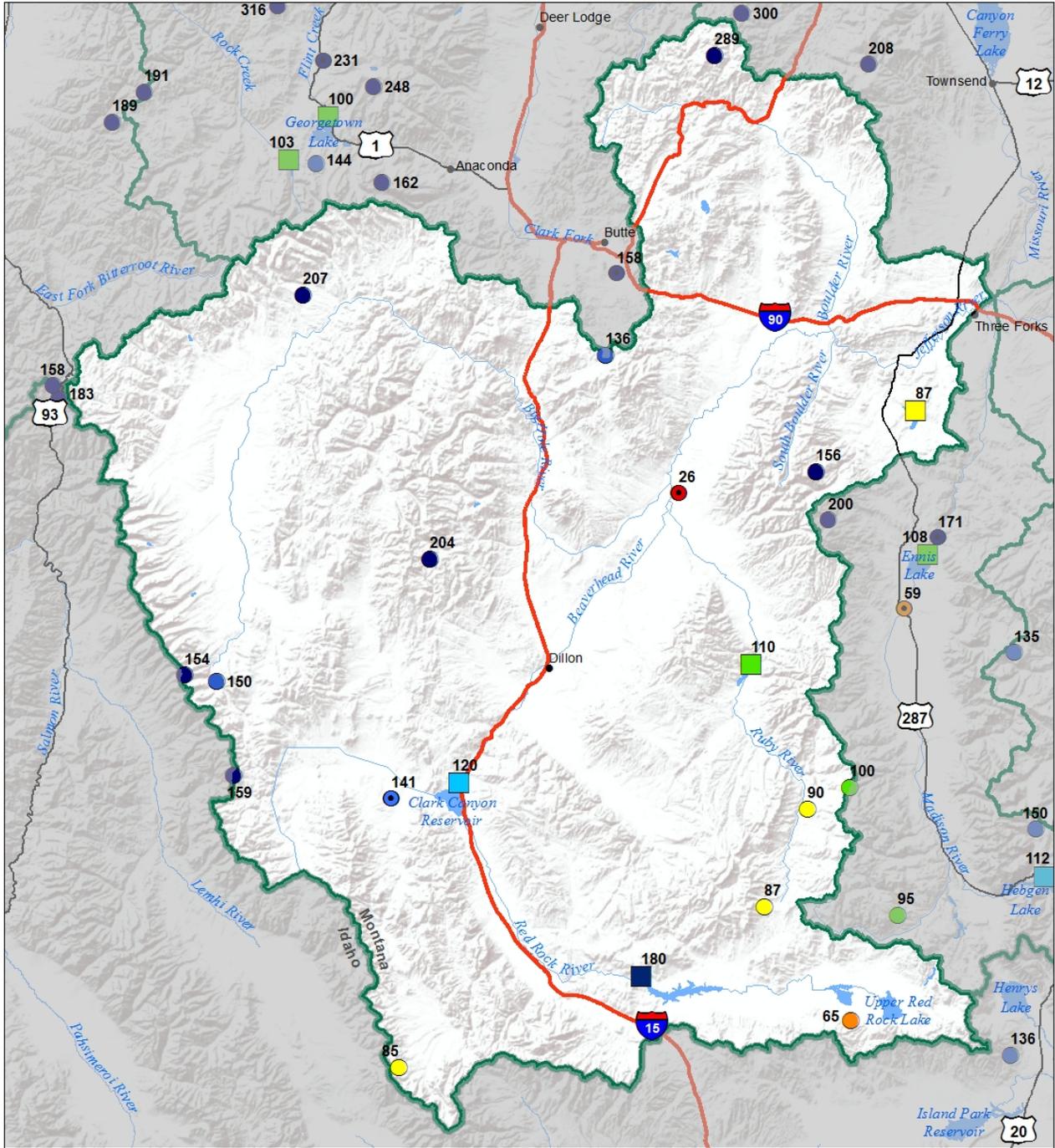


Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%

USDA
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**Jefferson River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018 (February 1, 2018 - March 1, 2018)**



**Precipitation
Percent of Normal**

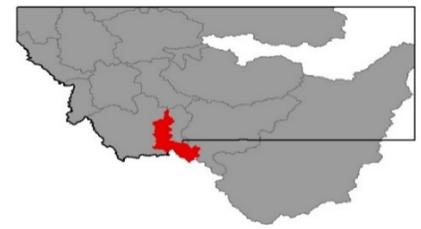
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



Madison River Basin



Above normal snowfall for the third straight month has resulted in basin snowpack totals for the Madison River basin which are well above normal for March 1. Snowfall favored the region above Hebgen Lake over the course of the month, but the lower section also received above normal snowfall. It hasn't been a record breaking winter like it has been in some other areas of southern Montana, but snowpack is looking good for supplying runoff as we approach spring. Snowpack and precipitation totals for this date have resulted in seasonal volume forecasts issued for the April 1 – July 31st time period which are above average across the basin. March – May are typically the wettest months in the basin and continued wet weather could continue to build the mountain snowpack before runoff.

Madison River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
MADISON abv HEBGEN LAKE	124%	131%
MADISON blw HEBGEN LAKE	121%	101%
Basin-Wide	122%	113%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	142%	109%	139%
Valley Precipitation	158%	147%	193%
Basin-Wide Precipitation	143%	112%	144%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

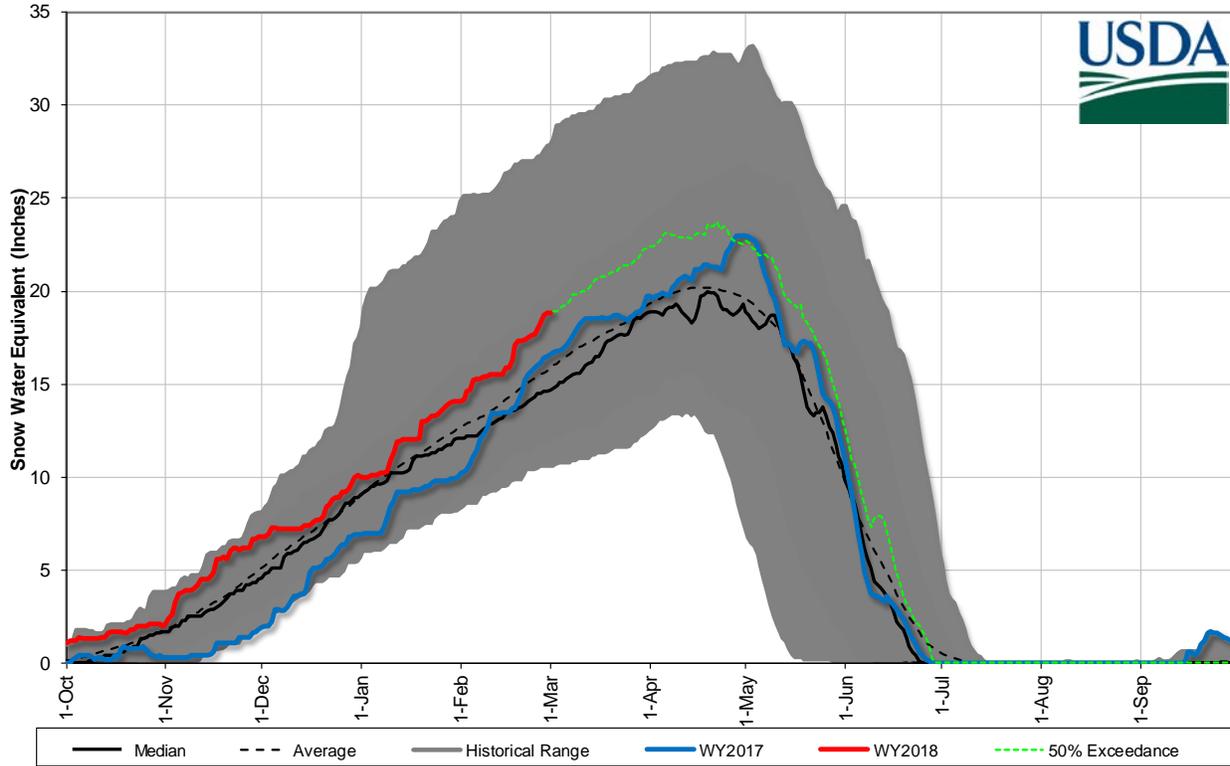
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	111%	81%	109%

*See Reservoir Storage Table for storage in individual reservoirs

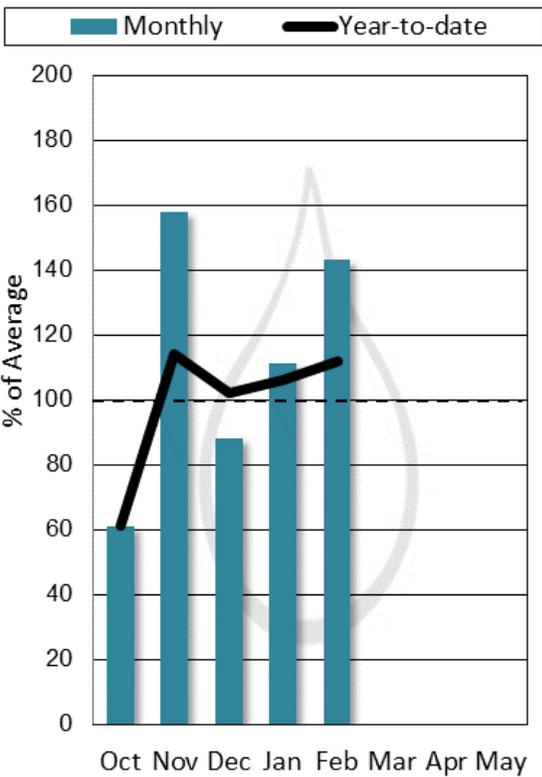
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Ennis Lake	32.1	28.9	29.8	41.0	108%	78%
Hebgen Lake	307.0	302.6	274.6	378.8	112%	81%

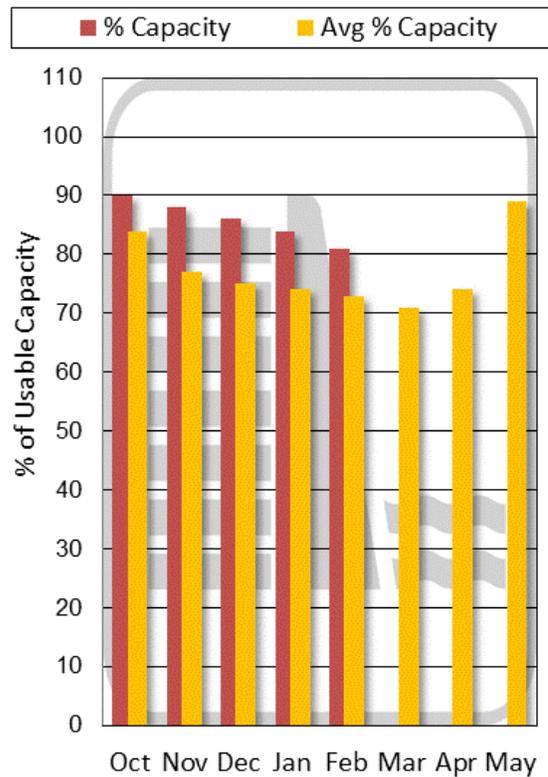
Madison River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



**Mountain and Valley
Precipitation**



**End of Month Reservoir
Storage**



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

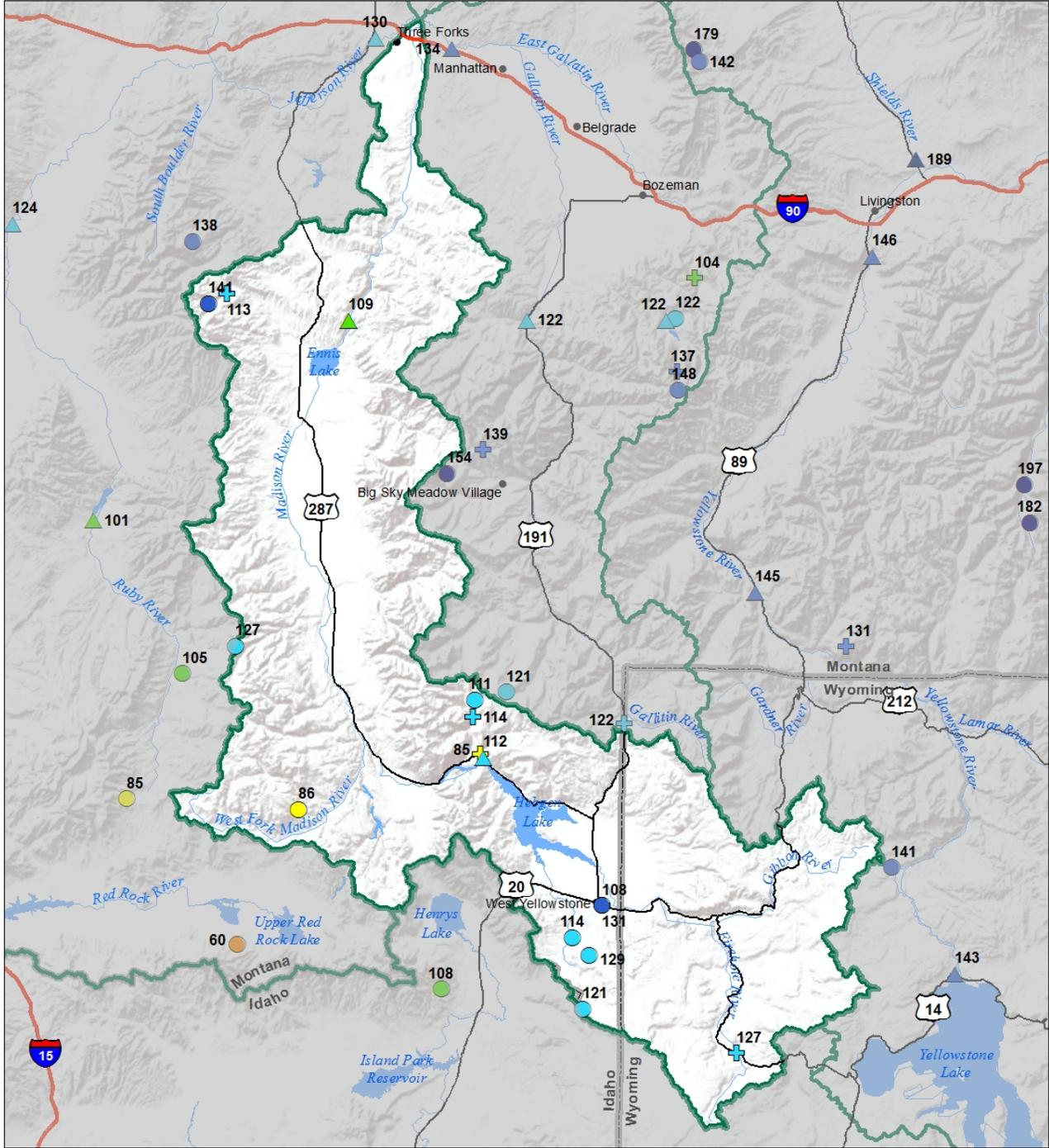
Madison River Basin

		Chance Actual Volume Will Exceed Forecasted Volume						
Forecast Point	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Hebgen Reservoir Inflow ²	APR-JUL	340	385	415	112%	445	490	370
	APR-SEP	435	490	525	112%	560	615	470
Ennis Reservoir Inflow ²	APR-JUL	535	620	680	109%	740	825	625
	APR-SEP	670	775	845	109%	915	1020	775

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Madison River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal

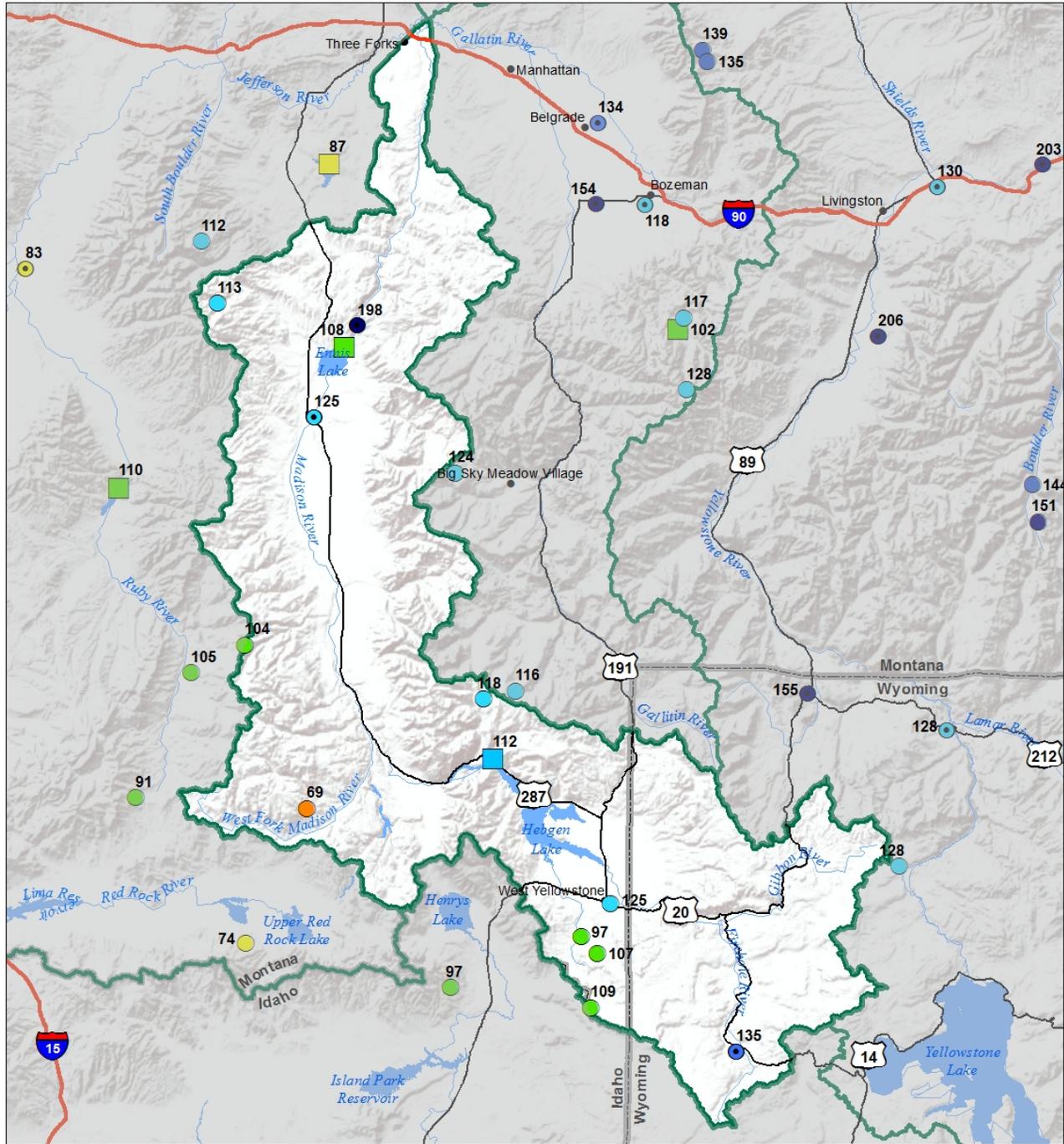
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

Streamflow Forecast Percent of Average Flows

▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%



Madison River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018



SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

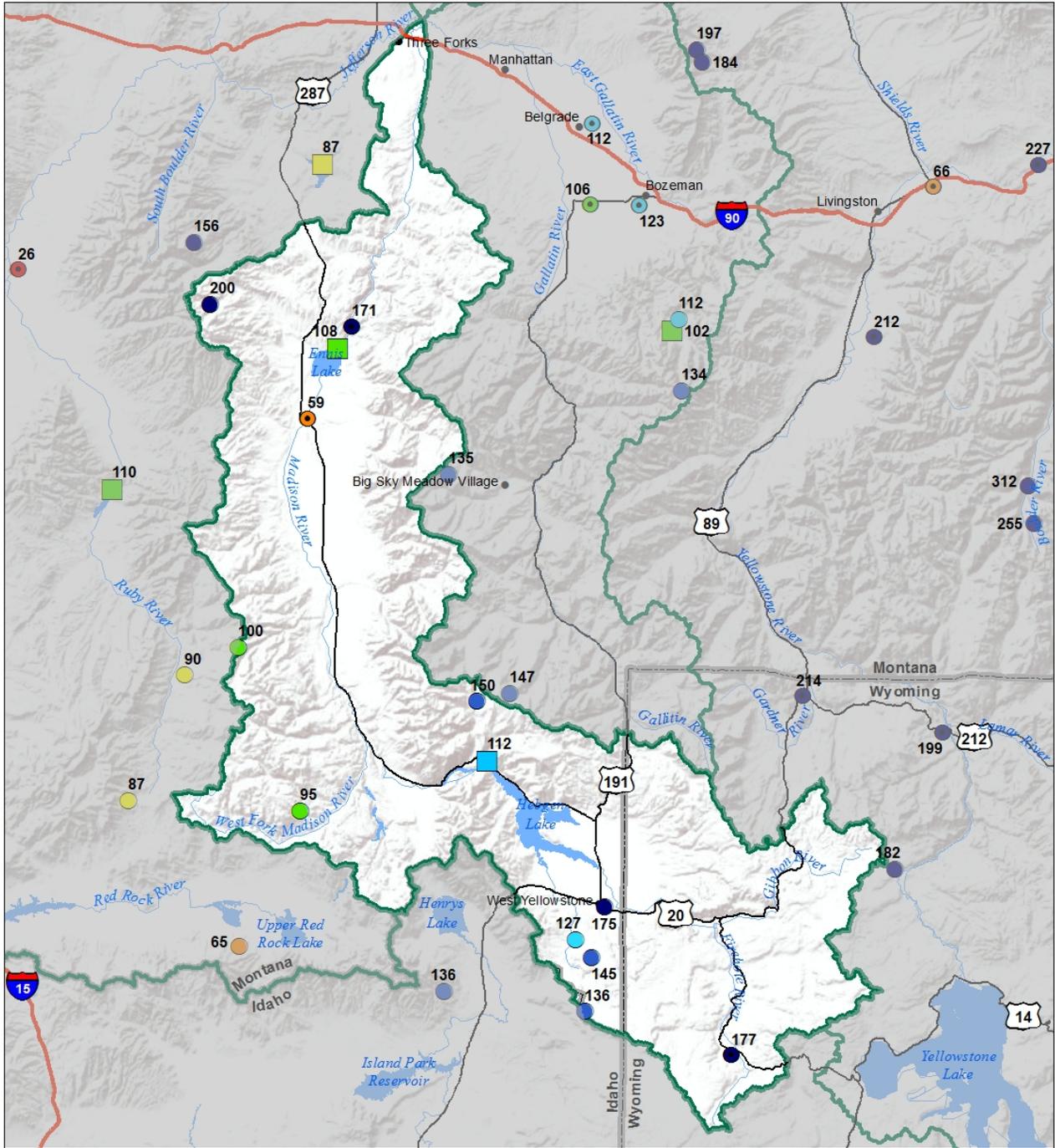
Reservoirs Percent of Normal	
■ > 150%	■ 131 - 150%
■ 111 - 130%	■ 91 - 110%
■ 71 - 90%	■ 51 - 70%
■ 1 - 50%	



Madison River Basin

Monthly Precipitation and Reservoir Levels Percentage of Normal

March 1, 2018 (February 1, 2018 - March 1, 2018)



Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%

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Montana State Library
Natural Resource
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Gallatin River Basin



A favorable pattern for snowfall has been in place throughout this winter, and February was no exception in the Gallatin River basin. Snowcourses and SNOTEL sites in the region received well above normal snowfall this month, with a few breaking records for February monthly totals. Brackett Creek (24 years of record) and Sacajawea (19 years of record) had their highest monthly snowpack increases since they have been recording snowpack data. Both of these sites have already exceeded the normal snowpack peak we typically expect to experience sometime during the month of April. Other locations in the Gallatin and Madison Ranges are reporting well above normal snowpack for March 1st, but snowfall in the southern basins has not been record setting. March and April are typically the most significant months of the year with regards to snowfall, so the climatologically favored months are still yet to come. Streamflow forecasts issued for the April 1st – July 31st period reflects the well above normal snowpack for this date. The coming months will define how much water is available for spring and summer runoff and will also dictate the timing of how the water leaves the mountains. A cool, wet spring would be the ideal scenario, allowing for a slow release of mountain water into the rivers and streams.

Gallatin River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
UPPER GALLATIN	131%	106%
HYALITE	130%	85%
BRIDGER	162%	95%
Basin-Wide	136%	98%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	156%	126%	129%
Valley Precipitation	119%	124%	131%
Basin-Wide Precipitation	154%	126%	129%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

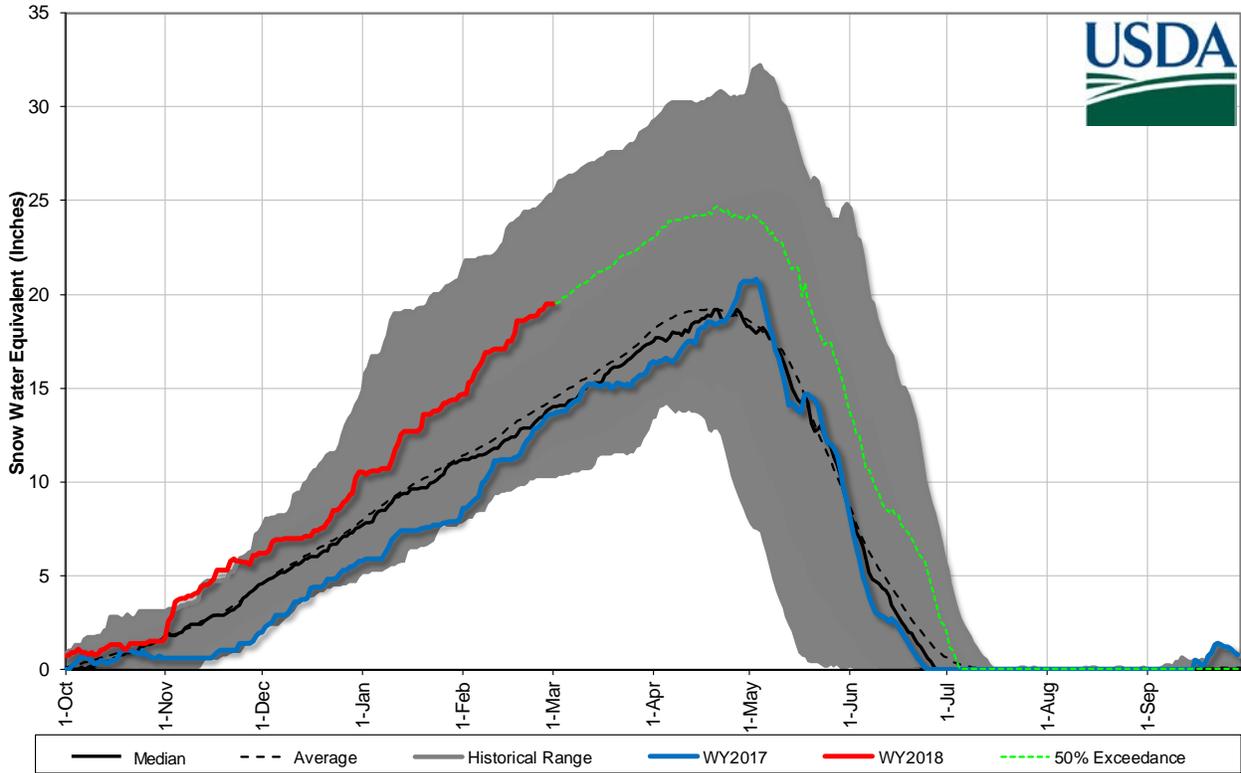
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	102%	54%	98%

*See Reservoir Storage Table for storage in individual reservoirs

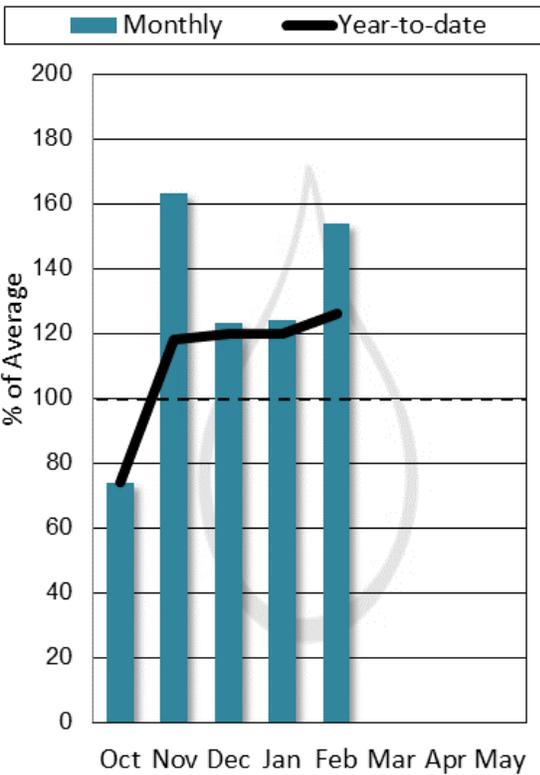
End of Month Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Middle Creek Res	5.5	5.3	5.4	10.2	102%	54%

Gallatin River Basin Snowpack with Non-Exceedence Projections

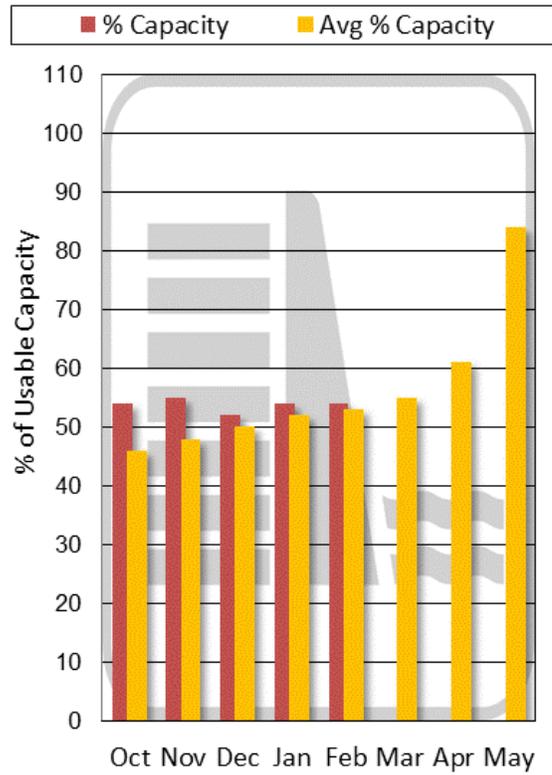
Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

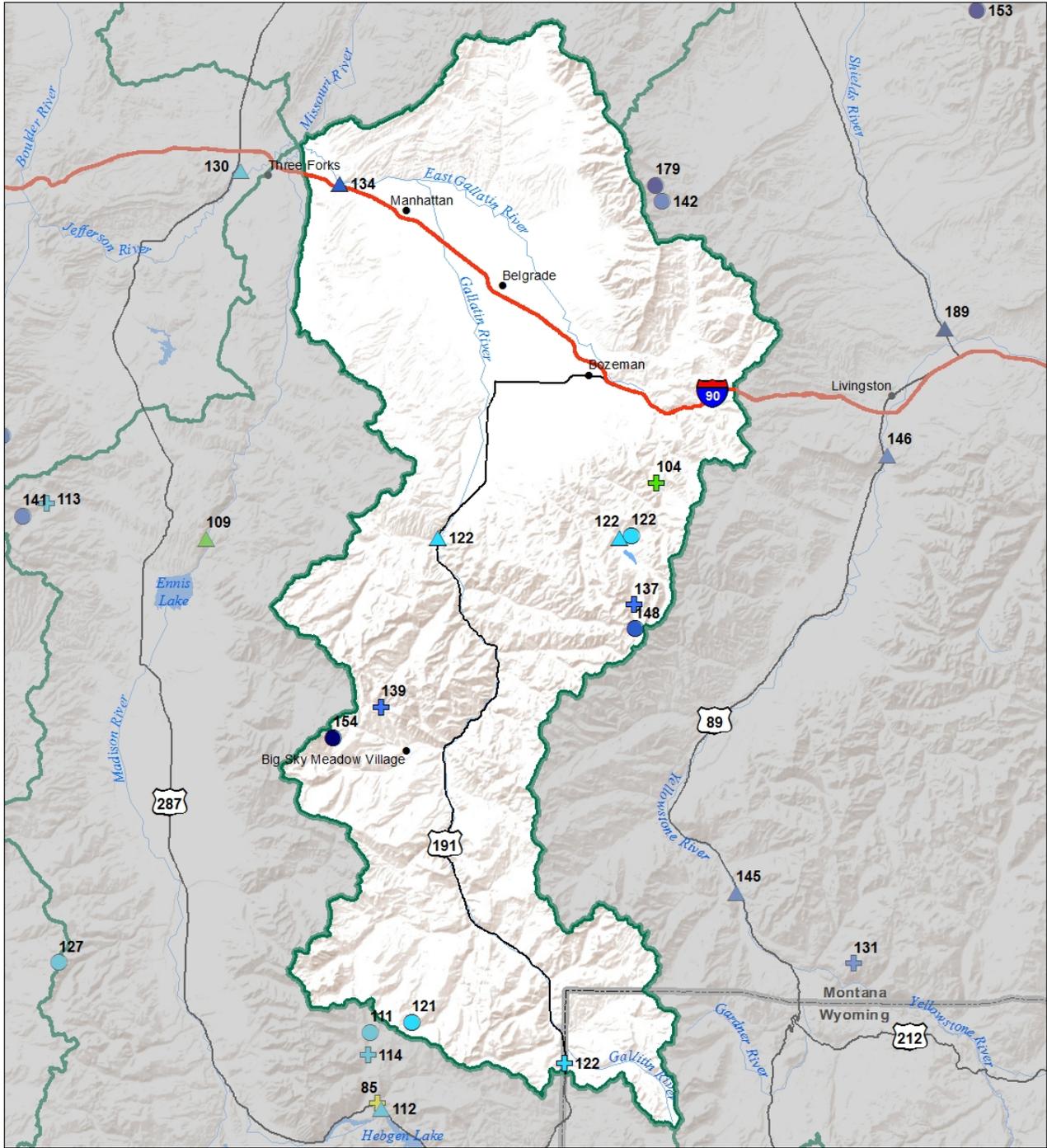
Gallatin River Basin

		Chance Actual Volume Will Exceed Forecasted Volume						
GALLATIN RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Gallatin R nr Gateway	APR-JUL	395	455	495	124%	535	595	400
	APR-SEP	460	525	575	122%	620	690	470
Hyalite Reservoir Inflow ²	APR-JUL	20	22	24	120%	26	28	20
	APR-SEP	24	26	28	122%	30	32	23
Gallatin R at Logan	APR-JUL	415	520	595	135%	665	775	440
	APR-SEP	475	595	675	134%	760	880	505

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

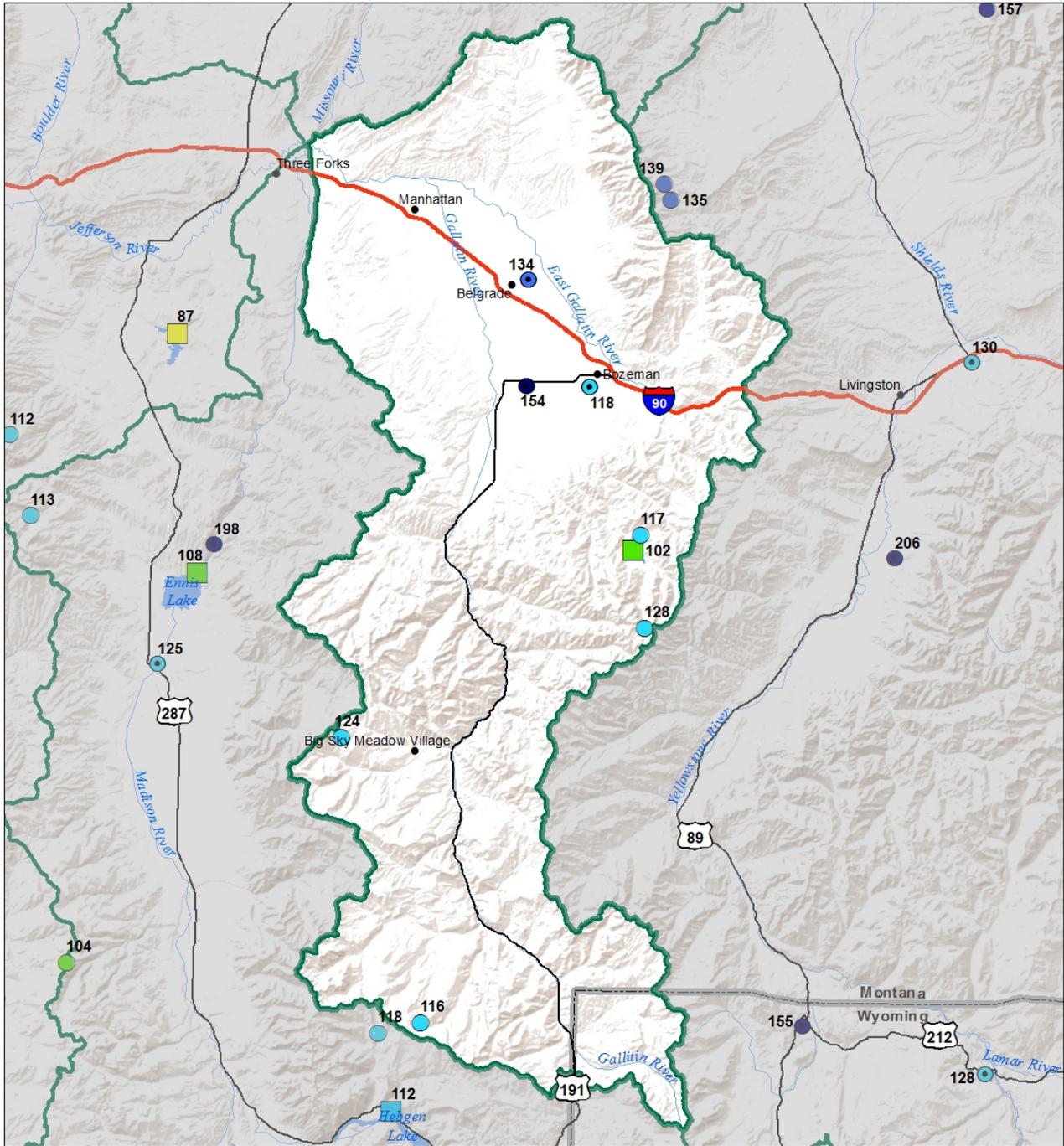
Gallatin River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal			
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	* 0%	⊕ 91 - 110%	* 0%

Streamflow Forecast Percent of Average Flows	
▲ > 150%	▲ 131 - 150%
▲ 111 - 130%	▲ 91 - 110%
▲ 71 - 90%	▲ 51 - 70%
▲ 1 - 50%	

Gallatin River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018

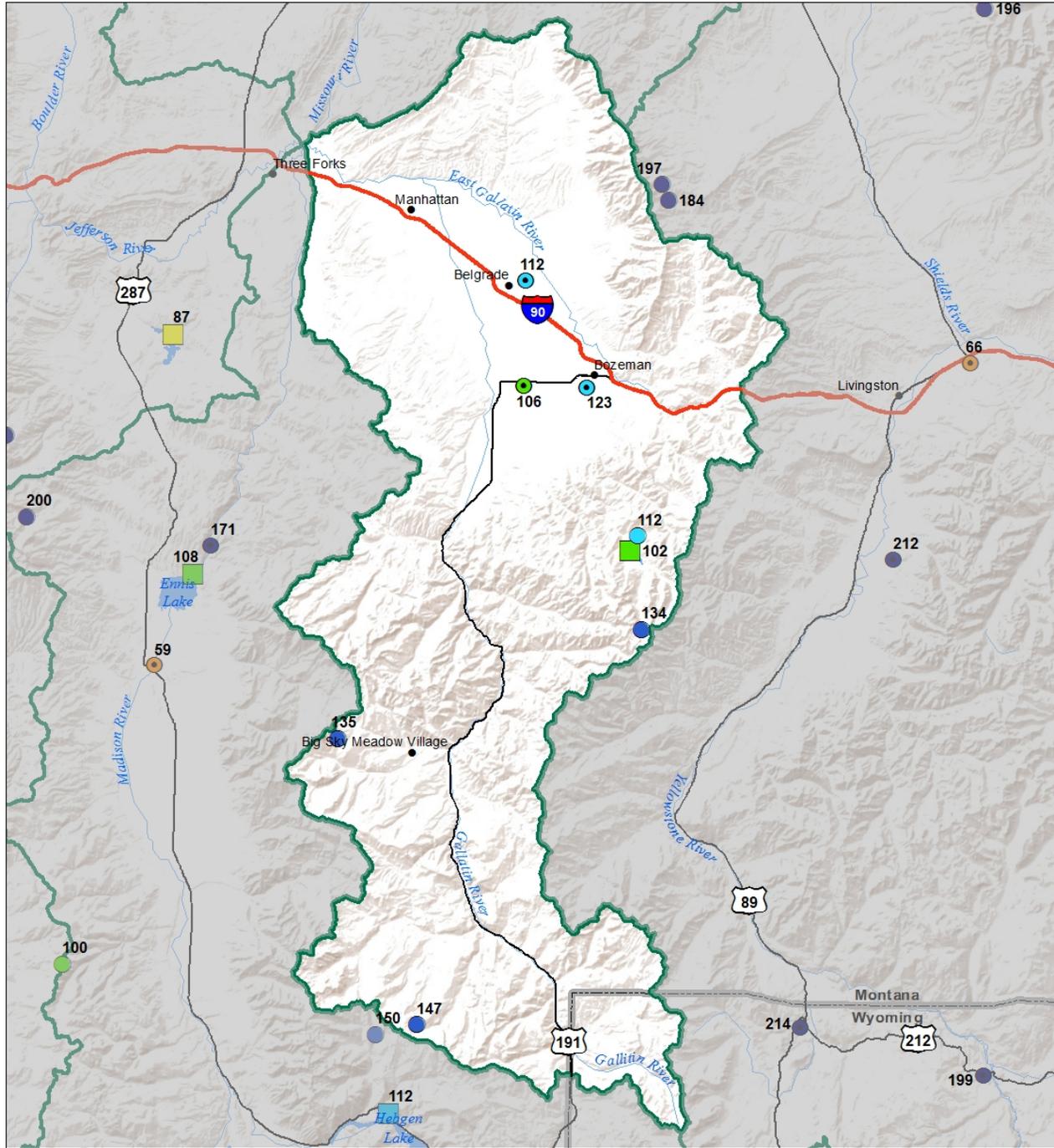


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal	
■ > 150%	■ 131 - 150%
■ 111 - 130%	■ 91 - 110%
■ 71 - 90%	■ 51 - 70%
■ 1 - 50%	

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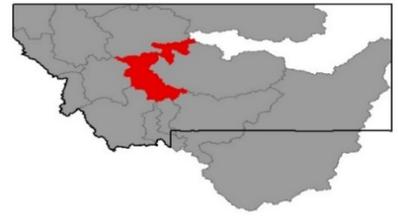
**Gallatin River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018 (February 1, 2018 - March 1, 2018)**



Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal	
■ > 150%	
■ 131 - 150%	
■ 111 - 130%	
■ 91 - 110%	
■ 71 - 90%	
■ 51 - 70%	
■ 1 - 50%	





Headwaters Mainstem (Missouri) River Basin

It's been a big winter so far in the mountains around the Missouri River Valley and Helena with some SNOTEL sites and snowcourses setting new records for March 1st Snow Water Equivalent (SWE). Four SNOTEL sites in the region set new records for Mar 1 SWE, and three others were the second highest on record for the date. The Boulder and Big Belt Mountains have benefitted from a persistent storm pattern which has been in place since early December and has provided ample precipitation. February set new records for snow totals at the Nevada Ridge SNOTEL site north of Helena and was second highest on record at five other locations. What does this mean for water users in the basin? All of the monitoring sites have already exceeded the normal amount of water that is typically contained in the snowpack at peak accumulation, which usually occurs during April. Any water received in the form of snow during the remainder of the year will build on this. Streamflow forecasts reflect the above normal snowpack and are above average for the April 1 – July 31st period. Forecasts assume normal conditions until and during the forecast time period so that things could change. It's possible to have too much of a good thing; a close eye will be kept on future snow accumulation and weather patterns entering runoff in case there are implications from too much snow water.

Headwaters Missouri Mainstem River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
HEADWATERS MAINSTEM	175%	100%
SMITH-JUDITH-MUSSELSHELL	137%	77%
SUN-TETON-MARIAS	153%	112%
MAINSTEM ab FT PECK RES	150%	94%
MILK RIVER BASIN	116%	70%
Basin-Wide	150%	94%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	235%	140%	114%
Valley Precipitation	363%	213%	192%
Basin-Wide Precipitation	239%	143%	117%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

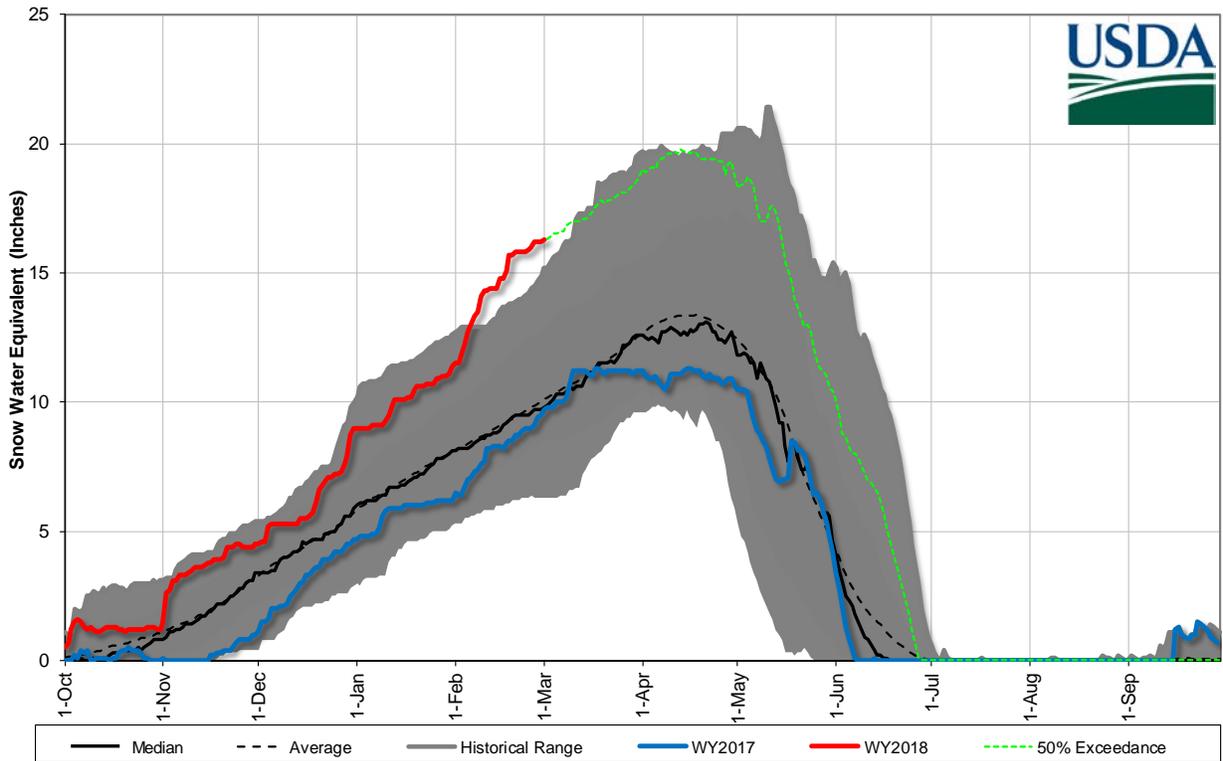
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	114%	78%	116%

*See Reservoir Storage Table for storage in individual reservoirs

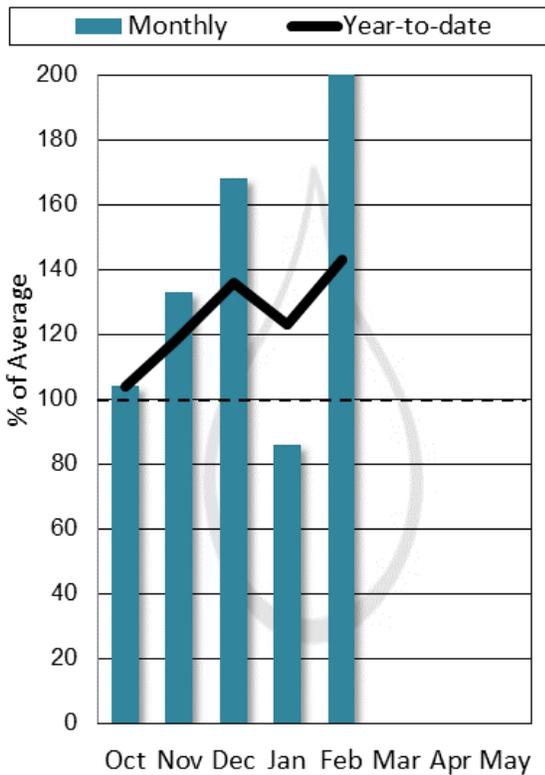
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Canyon Ferry Lake	1383.7	1462.9	1482.0	2043.0	93%	68%
Helena Valley Reservoir	5.7	6.2	4.4	9.2	129%	62%
Lake Helena	9.9	9.8	10.9	12.7	91%	78%
Hauser Lake & Lake Helena	70.3	69.9	73.7	74.6	95%	94%
Holter Lake	81.1	81.1	79.5	81.9	102%	99%
Fort Peck Lake	14970.4	15193.7	12838.0	18910.0	117%	79%

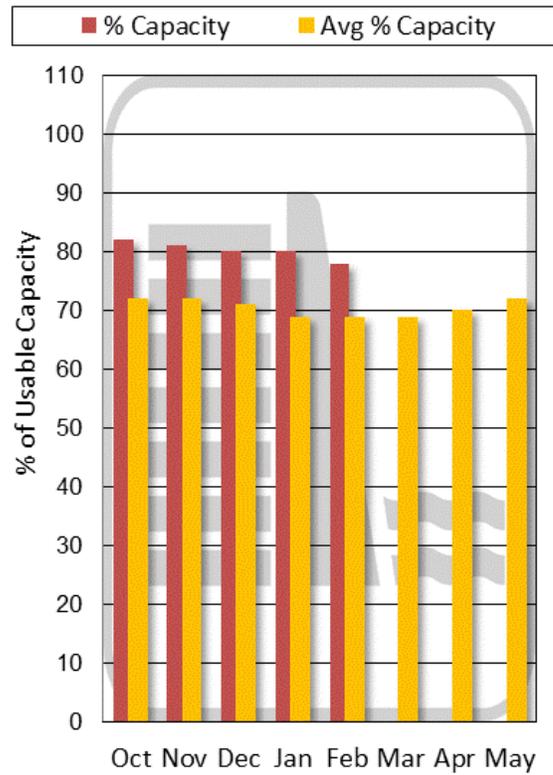
Missouri River Basin below Toston above Smith River Inflow Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

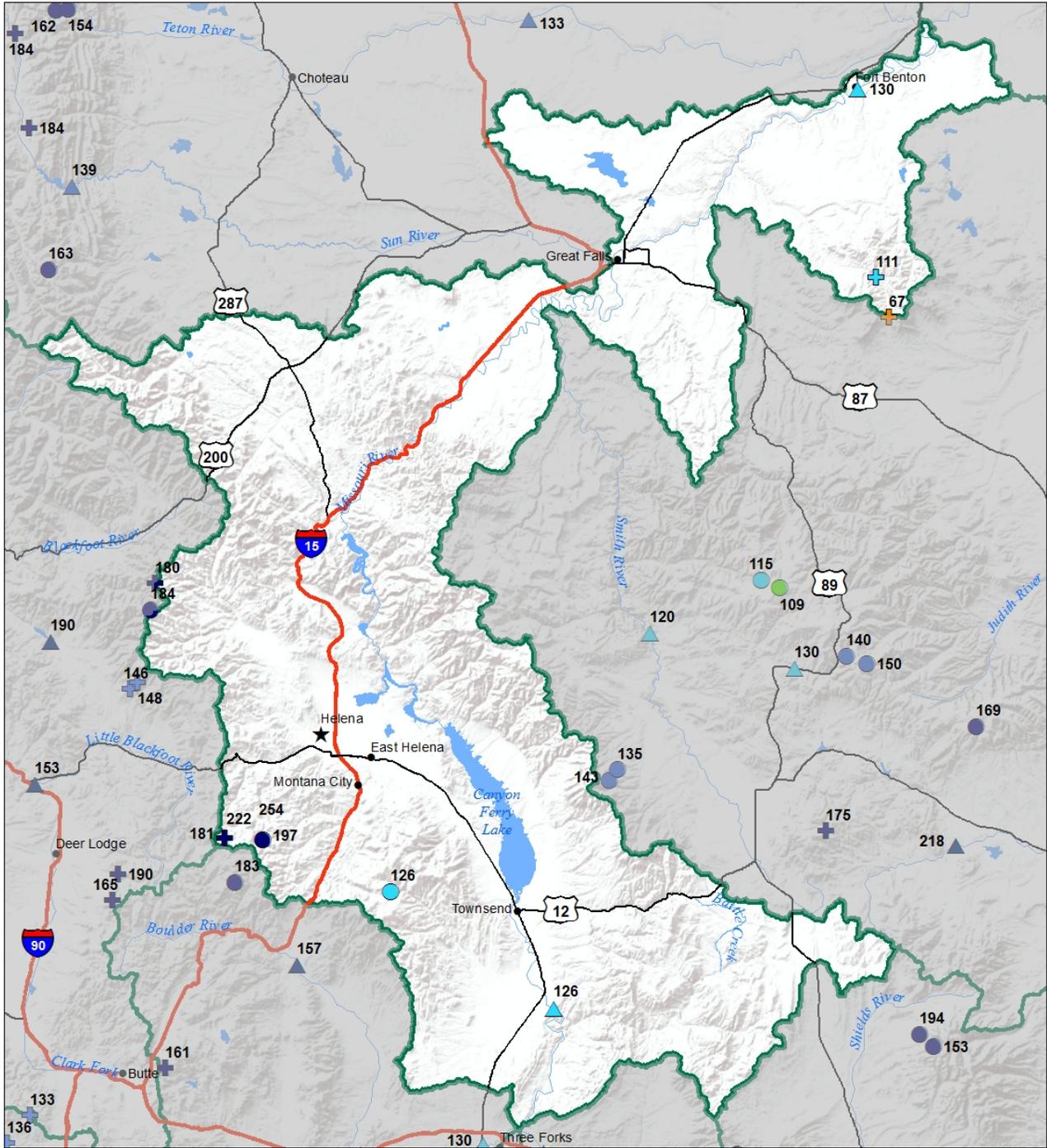
*Missouri Mainstem
Basin*

		<i>Chance Actual Volume Will Exceed Forecasted Volume</i>						
Forecast Point	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Missouri R at Toston ²	APR-JUL	1650	2030	2290	128%	2550	2930	1790
	APR-SEP	1860	2300	2600	126%	2900	3340	2070
Dearborn R nr Craig								
Missouri R at Fort Benton ²	APR-JUL	2450	3040	3460	133%	3850	4450	2610
	APR-SEP	2860	3560	4030	130%	4510	5210	3110
Missouri R nr Virgelle ²	APR-JUL	2800	3470	3940	131%	4380	5050	3000
	APR-SEP	3210	3990	4520	128%	5060	5840	3520
Missouri R nr Landusky ²	APR-JUL	3030	3750	4240	134%	4720	5430	3160
	APR-SEP	3460	4290	4860	131%	5430	6260	3720
Missouri R bl Fort Peck Dam ²	APR-JUL	3200	3920	4410	136%	4880	5590	3240
	APR-SEP	3380	4300	4930	133%	5550	6470	3700
Lake Sakakawea Inflow ²								

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

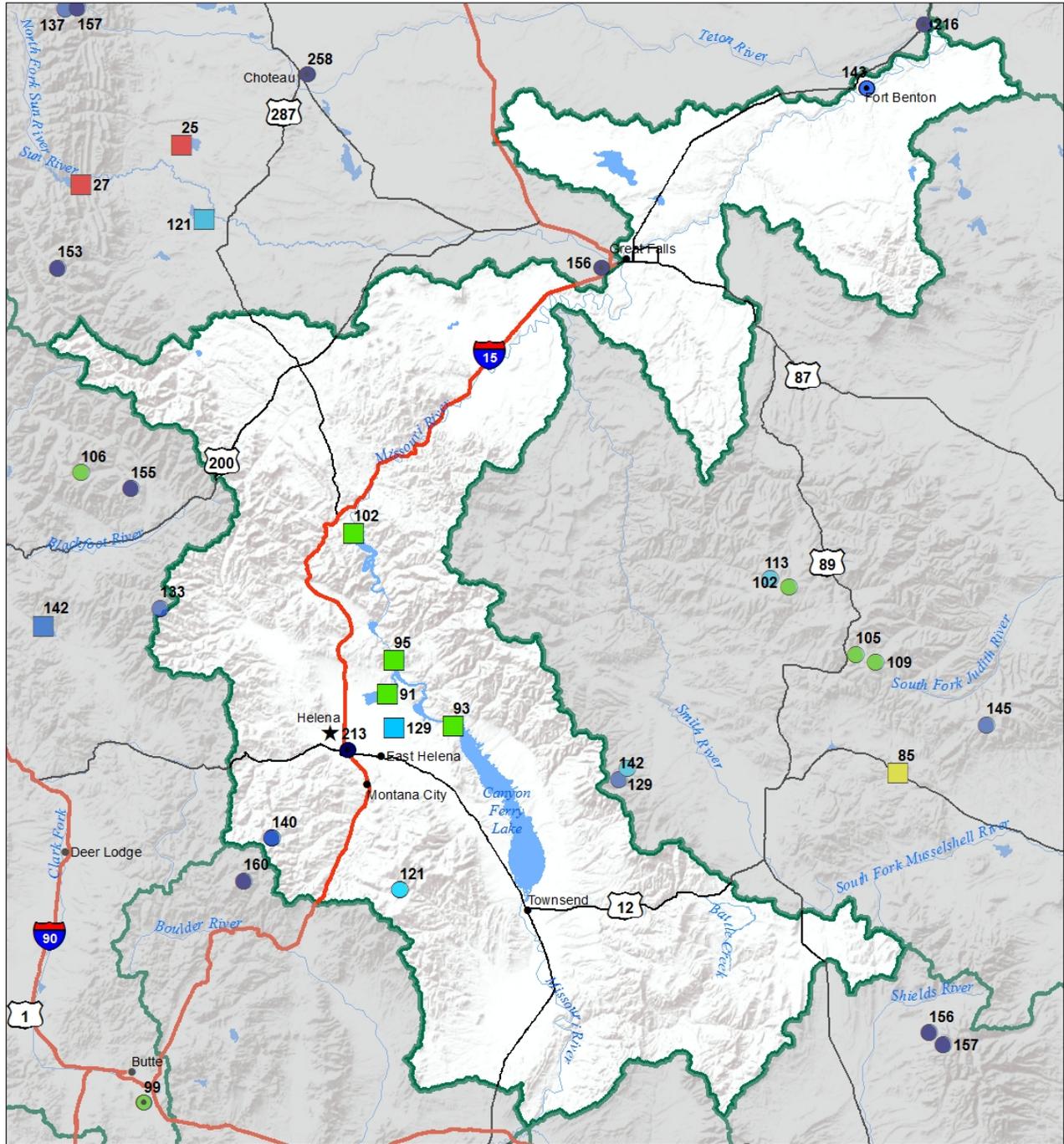
Headwaters Mainstem (Missouri) River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



SNOWTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *
			● *

Streamflow Forecast Percent of Average Flows	
▲ > 150%	▲ 131 - 150%
▲ 111 - 130%	▲ 91 - 110%
▲ 71 - 90%	▲ 51 - 70%
▲ 1 - 50%	

Headwaters Mainstem (Missouri) River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018

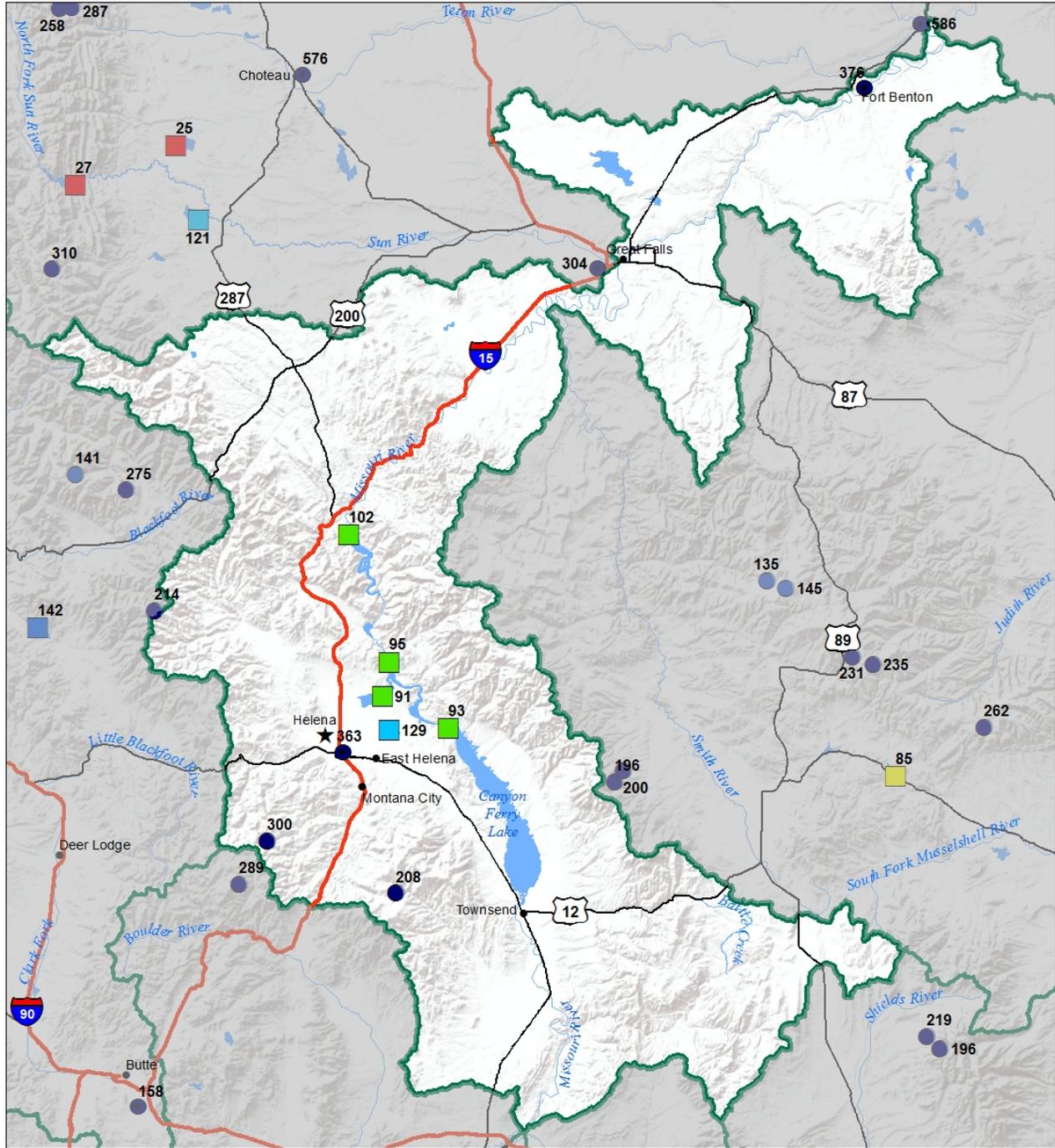


Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%

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Headwaters Mainstem (Missouri) River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal March 1, 2018 (February 1, 2018 - March 1, 2018)

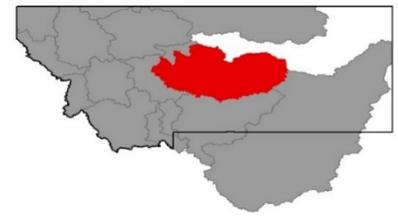


Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal	
■ > 150%	■ 131 - 150%
■ 111 - 130%	■ 91 - 110%
■ 71 - 90%	■ 51 - 70%
■ 51 - 70%	■ 1 - 50%



Smith-Judith-Musselshell River Basin



Unlike the Smith River Applicants who were turned down for a float trip this summer, agricultural water users should be rejoicing at the beginning of March due to the abundance of snow in the mountains feeding the river basin. Snowpack totals at measurement locations are all well above normal for this time of year, with one site Daisy Peak SNOTEL setting a new March 1st record. Snowpack started early this year and a consistent stream of moisture through the winter months had built a substantial snowpack for runoff this spring. Snow totals for February, although not record-breaking, were well above normal and ranged from 129% to 180% of normal. In fact, most sites already reached the normal water year peak for snow water as of March 1st, normal peak Snow Water Equivalent (SWE) typically occurs in April. As storm patterns change entering the spring months, the river basins are favored climatologically during March through May, which the big months for precipitation. Adequate water supply for irrigation looks positive at this point, but the coming few months will dictate the timing and volume of runoff this springs. So far, so good!

Smith Judith Musselshell River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
SMITH	140%	83%
HIGHWOOD	83%	33%
JUDITH	131%	70%
MUSSELHELL	178%	78%
Basin-Wide	137%	77%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	191%	122%	107%
Valley Precipitation	349%	145%	164%
Basin-Wide Precipitation	198%	123%	110%

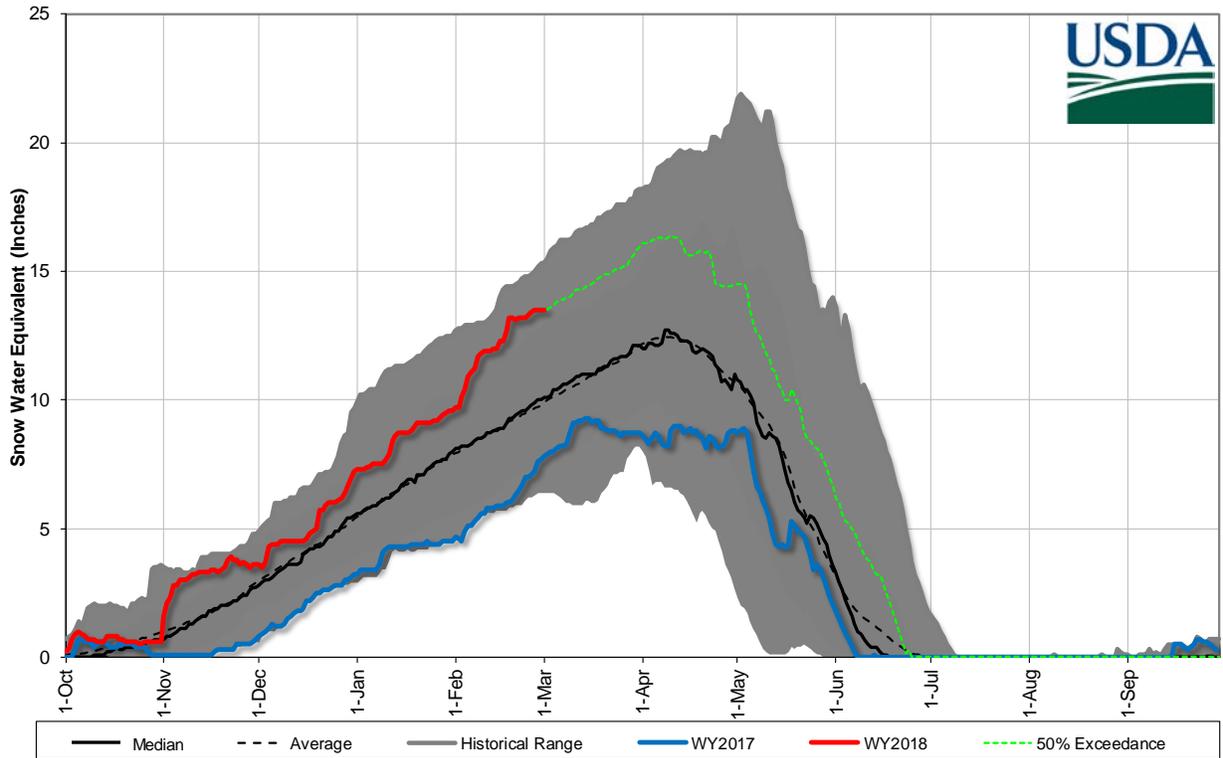
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	133%	76%	116%

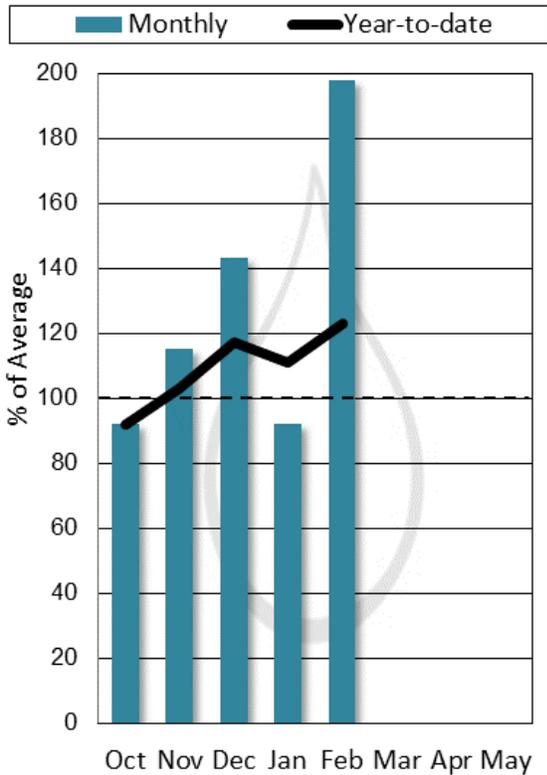
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Smith River Res		5.4	5.8	10.6		
Ackley Lake	2.8	3.5	2.6	7.0	107%	40%
Bair Res	2.7	3.8	3.2	7.0	85%	39%
Martinsdale Res		7.1	7.8	23.1		
Deadman's Basin Res	60.0	49.8	43.4	72.2	138%	83%

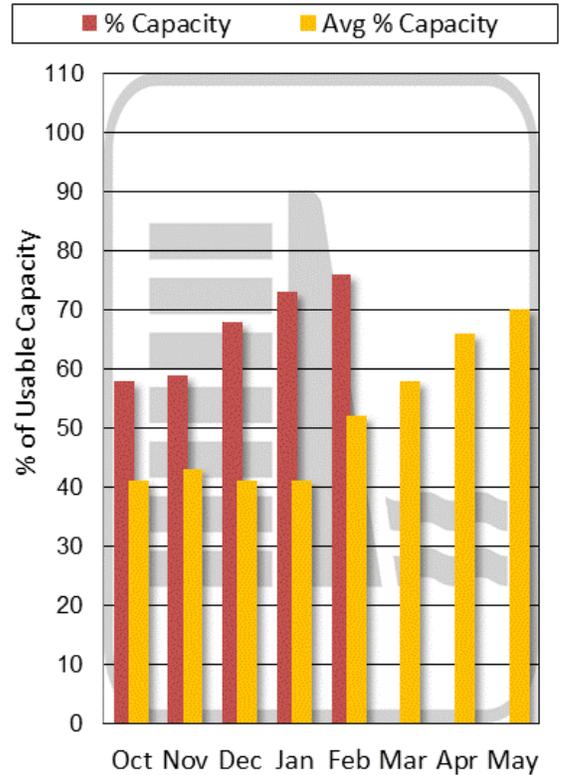
Smith-Judith-Musselshell River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

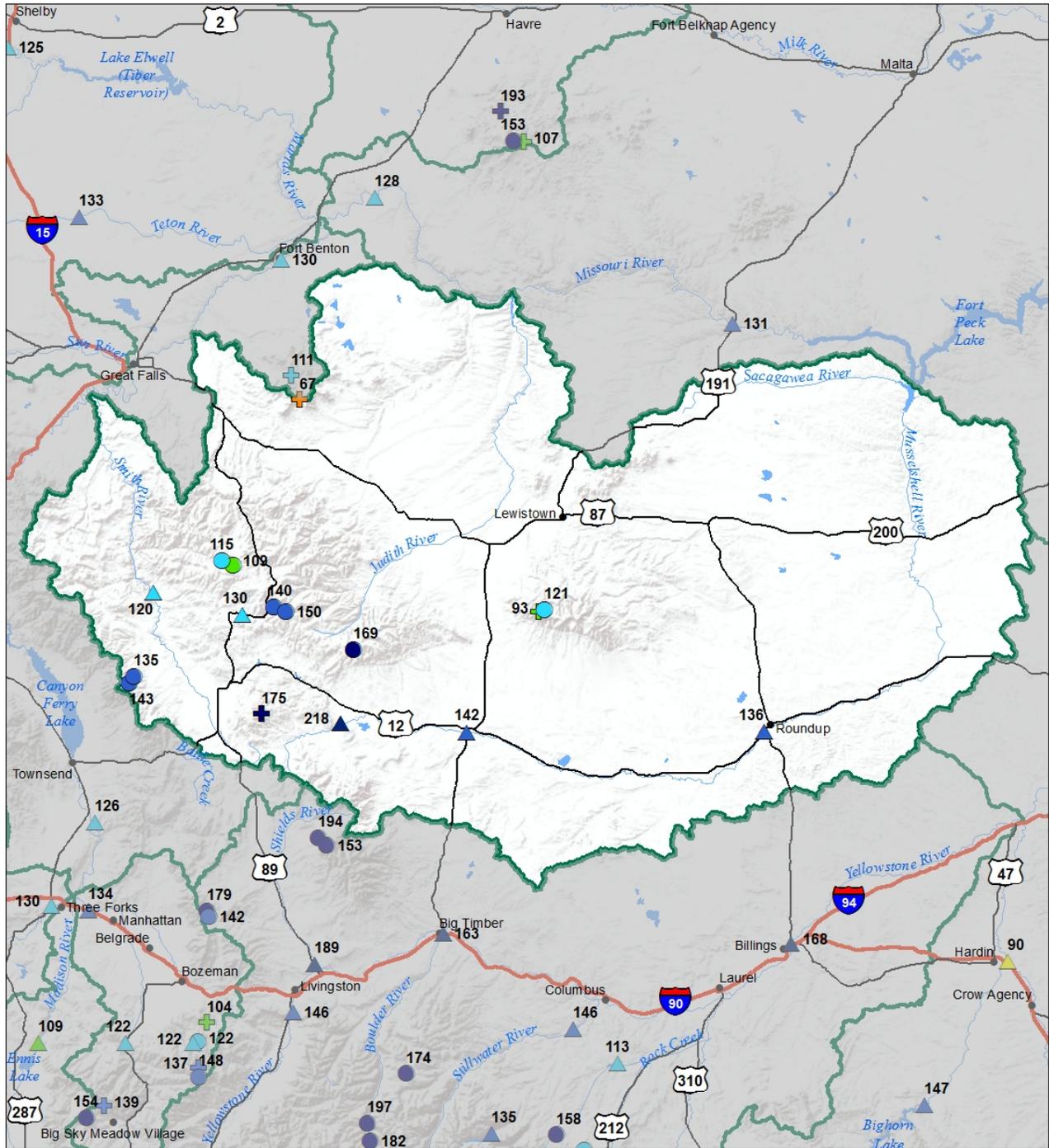
Smith-Judith-Musselshell

		<i>Chance Actual Volume Will Exceed Forecasted Volume</i>						
Forecast Point	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Sheep Ck nr White Sulphur Springs	APR-JUL	14.3	17.7	20	129%	22	26	15.5
	APR-SEP	17.3	21	24	130%	27	31	18.4
Smith R bl Eagle Ck ²	APR-JUL	70	103	126	119%	149	182	106
	APR-SEP	73	112	139	120%	166	205	116
NF Musselshell R nr Delpine								
SF Musselshell R ab Martinsdale	APR-JUL	50	66	76	217%	86	102	35
	APR-SEP	55	72	83	218%	94	111	38
Musselshell R at Harlowton ²	APR-JUL	47	68	83	146%	97	118	57
	APR-SEP	45	68	84	142%	101	124	59
Musselshell R nr Roundup ²	APR-JUL	35	66	87	130%	109	138	67
	APR-SEP	-21	45	90	136%	135	200	66

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Smith-Judith-Musselshell River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018

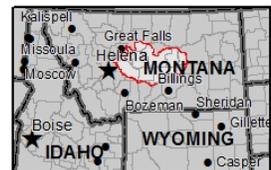


Snow Water Equivalent Percent of Normal

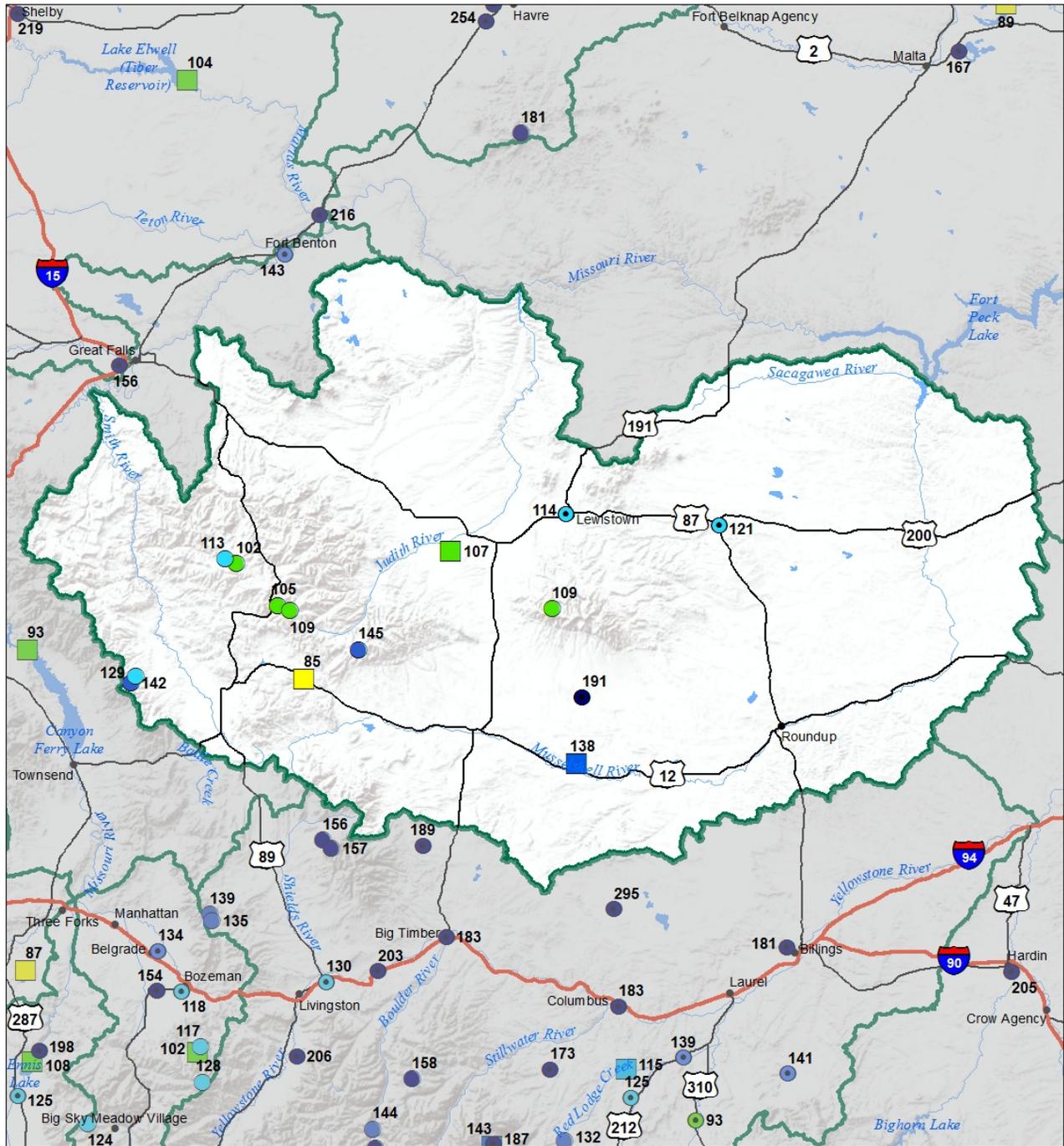
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

Streamflow Forecast Percent of Average Flows

▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%



Smith-Judith-Musselshell River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018

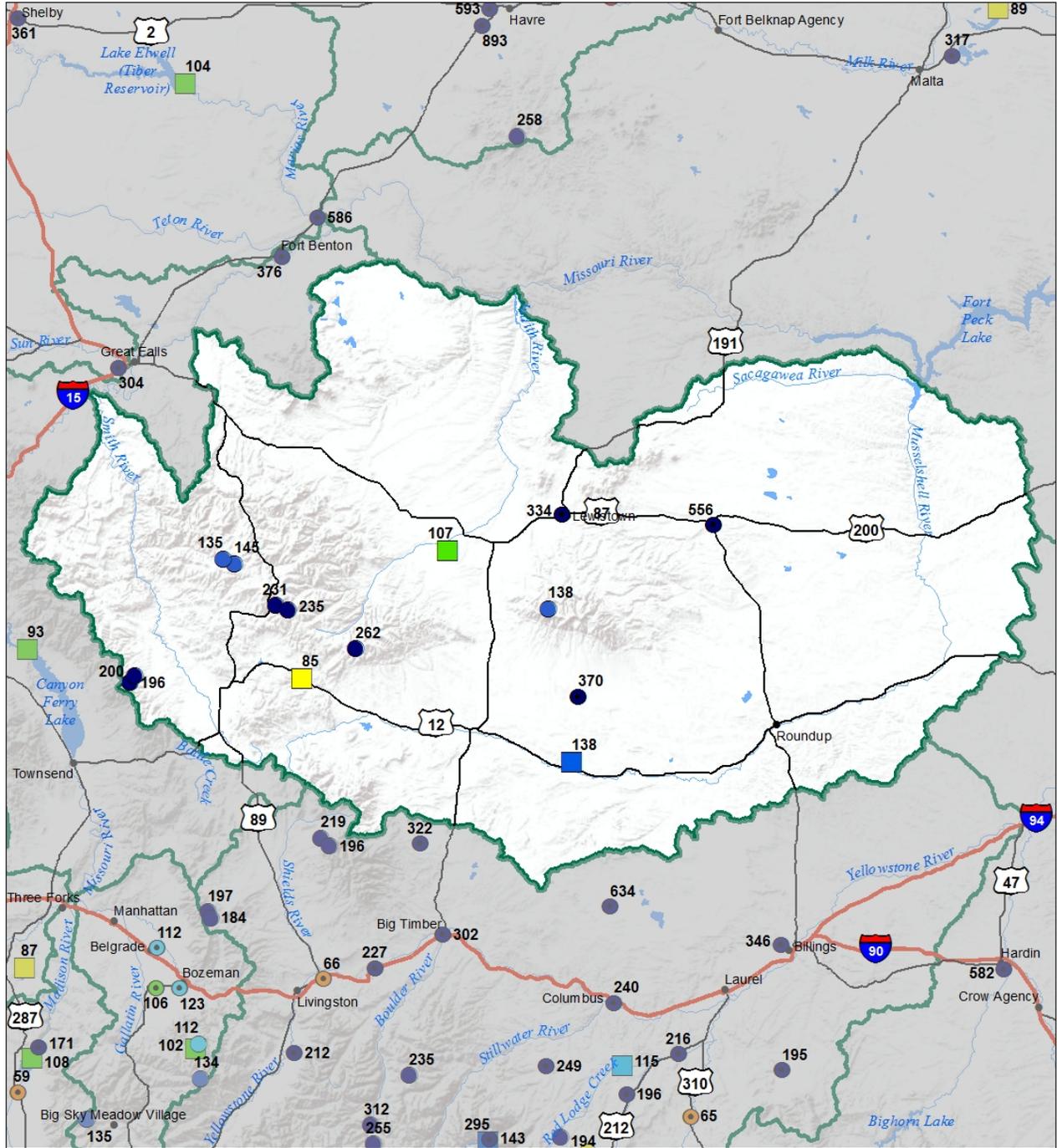


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



Smith-Judith-Musselshell River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal March 1, 2018 (February 1, 2018 - March 1, 2018)

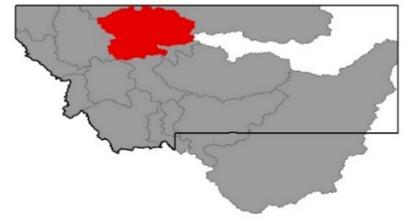


Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
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Reservoirs Percent of Normal
■ > 150%
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Sun-Teton-Marias River Basin



“Febru-buried” may be the best way to describe the month of February in the mountains and plains of the Rocky Mountain Front. All three river sub-basins in the region are reporting well above normal snowpack for March 1st, but only one is the second highest on record for the date. Records were set for February, snowpack measurement locations received 4.5” to 9.9” of snow water during the month, resulting in the highest or second highest monthly totals on record. How significant are these increases? If you look at the normal snowpack peak for the SNOTEL sites and snowcourses, which typically occurs between the beginning and end of April, these increments would account for 44% to 56% of a typical water year peak in just one month. Percentage-wise, sites range from 132% to 184% of normal across the basin, with the highest percentages found in the Sun River basin and vicinity. Streamflow forecasts for the April 1st through July 31st period reflect the above normal snowpack conditions and range from 107% to 142% of average. Most sites have already exceeded the normal amount of snow water during the typical peak snowpack, so a wet spring could continue to build the snowpack and increase streamflow prospects. This region is climatologically favored for spring precipitation events during March through May, so a close eye should be kept on the snowpack and weather patterns this spring.

Sun-Teton-Marias River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
SUN	170%	117%
TETON	150%	114%
MARIAS	141%	108%
Basin-Wide	153%	112%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	261%	143%	125%
Valley Precipitation	381%	205%	207%
Basin-Wide Precipitation	267%	147%	130%

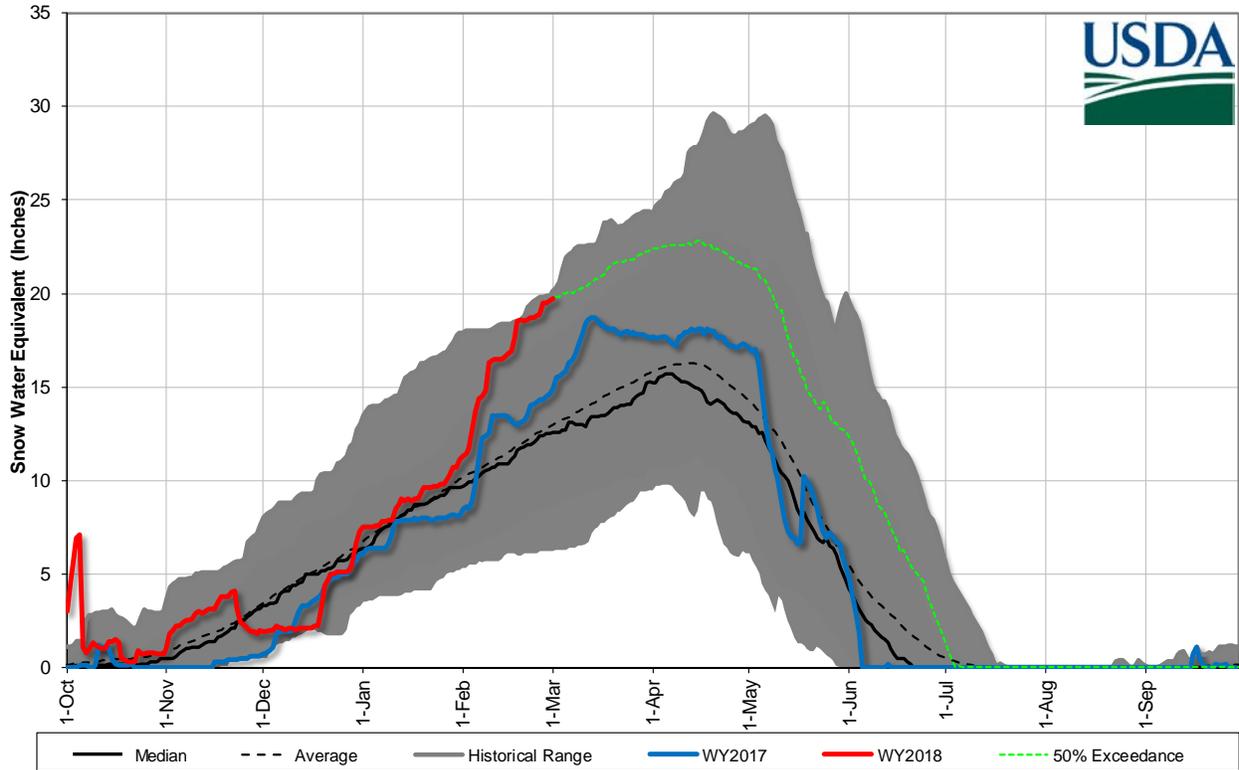
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	99%	51%	103%

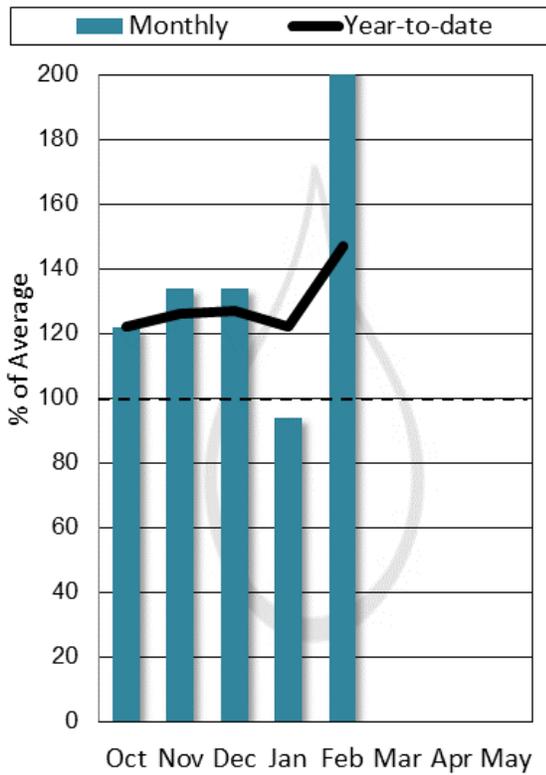
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Gibson Res	11.8	36.6	43.1	99.1	27%	12%
Pishkun Res	4.3	4.5	17.2	32.0	25%	13%
Willow Creek Res - Augusta	28.2	28.2	23.3	32.2	121%	87%
Lower Two Medicine Lake	11.0	10.3	8.4	11.9	131%	92%
Four Horns Lake		12.5	10.1	19.2		
Swift Res		14.7	16.5	30.0		
Lake Frances		39.7	57.5	112.0		
Lake Elwell (Tiber)	724.9	728.8	693.8	1347.0	104%	54%
Nilan Reservoir		5.8	6.9	11.0		

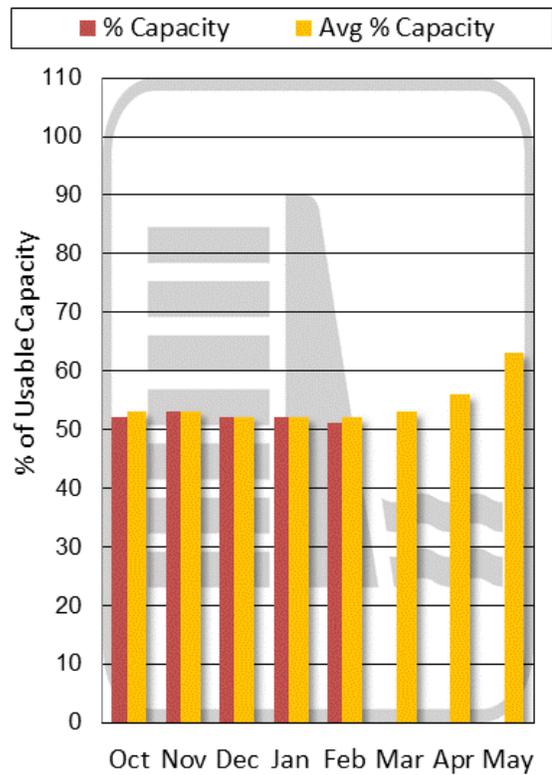
Sun-Teton-Marias River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



**Mountain and Valley
Precipitation**



**End of Month Reservoir
Storage**



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

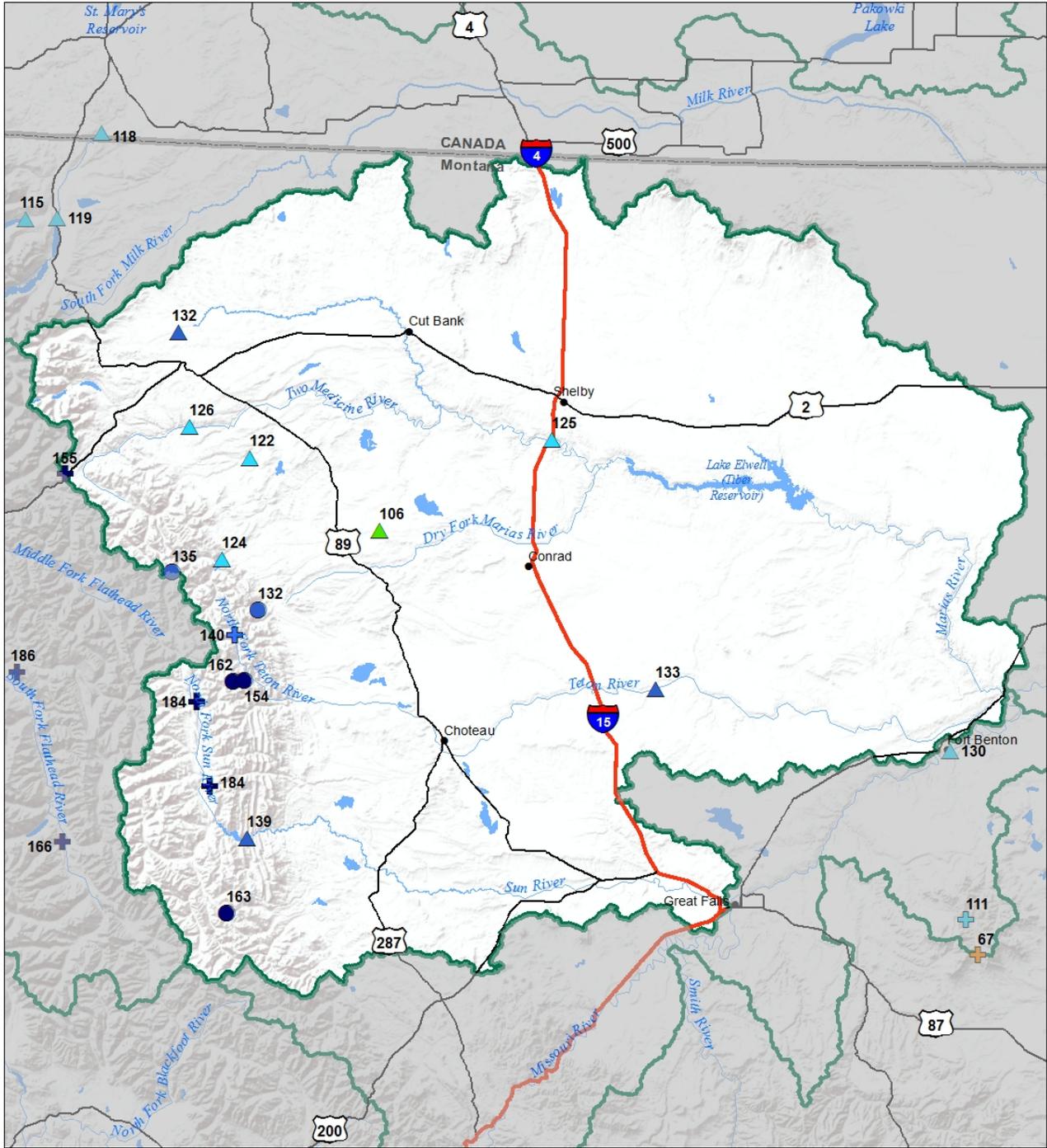
Sun-Teton-Marias Basins

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Gibson Reservoir Inflow	APR-JUL	460	520	560	142%	600	660	395
	APR-SEP	500	565	610	139%	655	720	440
Two Medicine R nr Browning ²	APR-JUL	187	215	235	128%	255	285	183
	APR-SEP	195	225	245	126%	265	295	194
Badger Ck nr Browning	APR-JUL	83	99	110	125%	121	137	88
	APR-SEP	96	114	126	122%	138	156	103
Swift Reservoir Inflow ²	APR-JUL	50	62	70	123%	78	90	57
	APR-SEP	60	74	83	124%	92	106	67
Dupuyer Ck nr Valier	APR-JUL	5.8	9.4	11.9	107%	14.4	18	11.1
	APR-SEP	6.8	10.8	13.5	106%	16.2	20	12.7
Cut Bank Ck nr Browning	APR-JUL	68	82	92	133%	102	116	69
	APR-SEP	74	89	99	132%	109	124	75
Marias R nr Shelby ²	APR-JUL	295	390	450	125%	510	605	360
	APR-SEP	310	405	470	125%	535	630	375
Teton R nr Dutton	APR-JUL	8.8	37	56	133%	75	103	42
	APR-SEP	12.9	43	64	133%	85	115	48

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

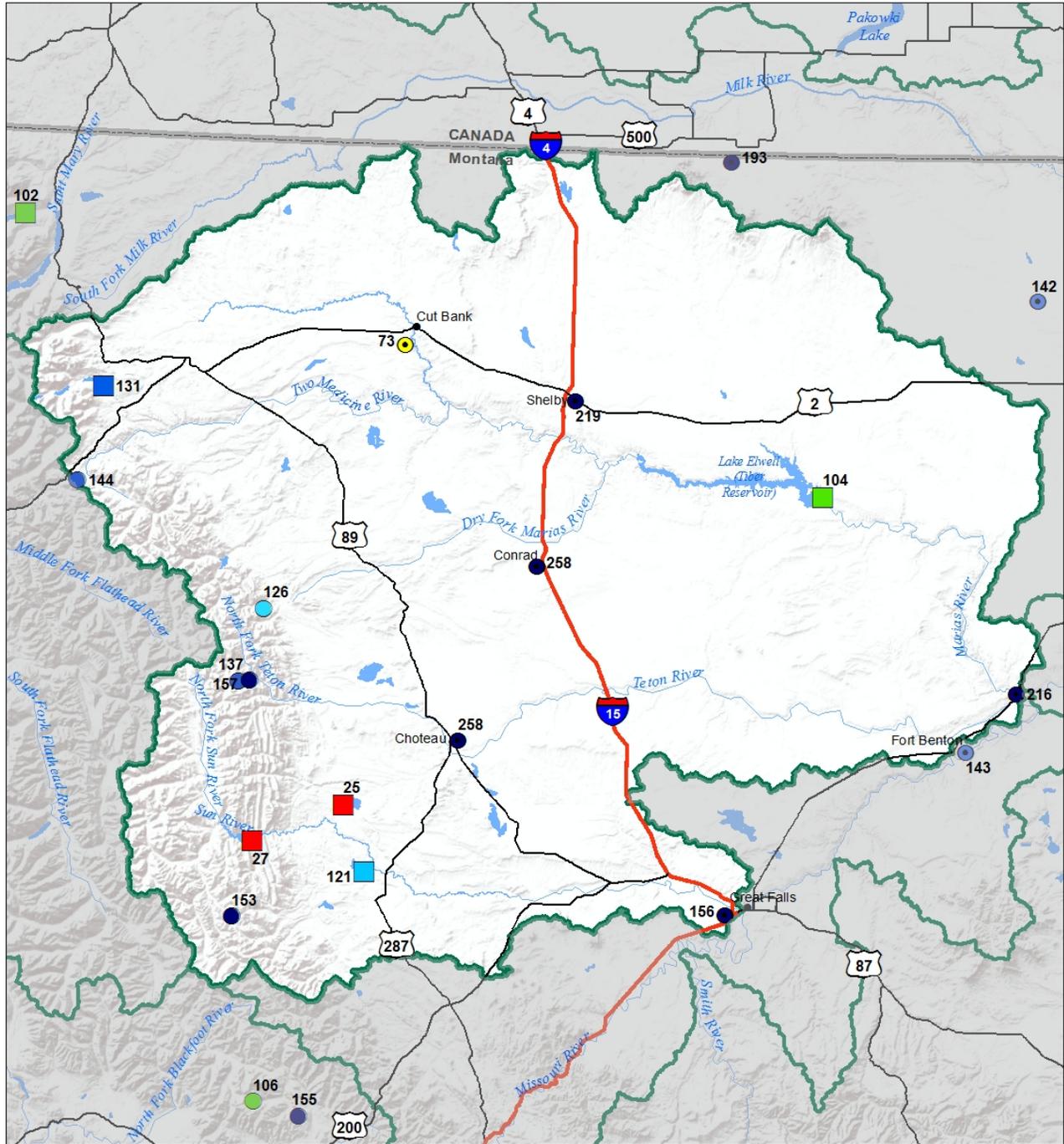
**Sun-Teton-Marias River Basin
Streamflow Forecast, Snow Water Equivalent
Percentage of Normal
March 1, 2018**



Snow Water Equivalent Percent of Normal			
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *
			● *

Streamflow Forecast Percent of Average Flows	
▲ > 150%	▲ 131 - 150%
▲ 111 - 130%	▲ 91 - 110%
▲ 71 - 90%	▲ 51 - 70%
▲ 1 - 50%	

Sun-Teton-Marias River Basin
Water Year to Date Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018



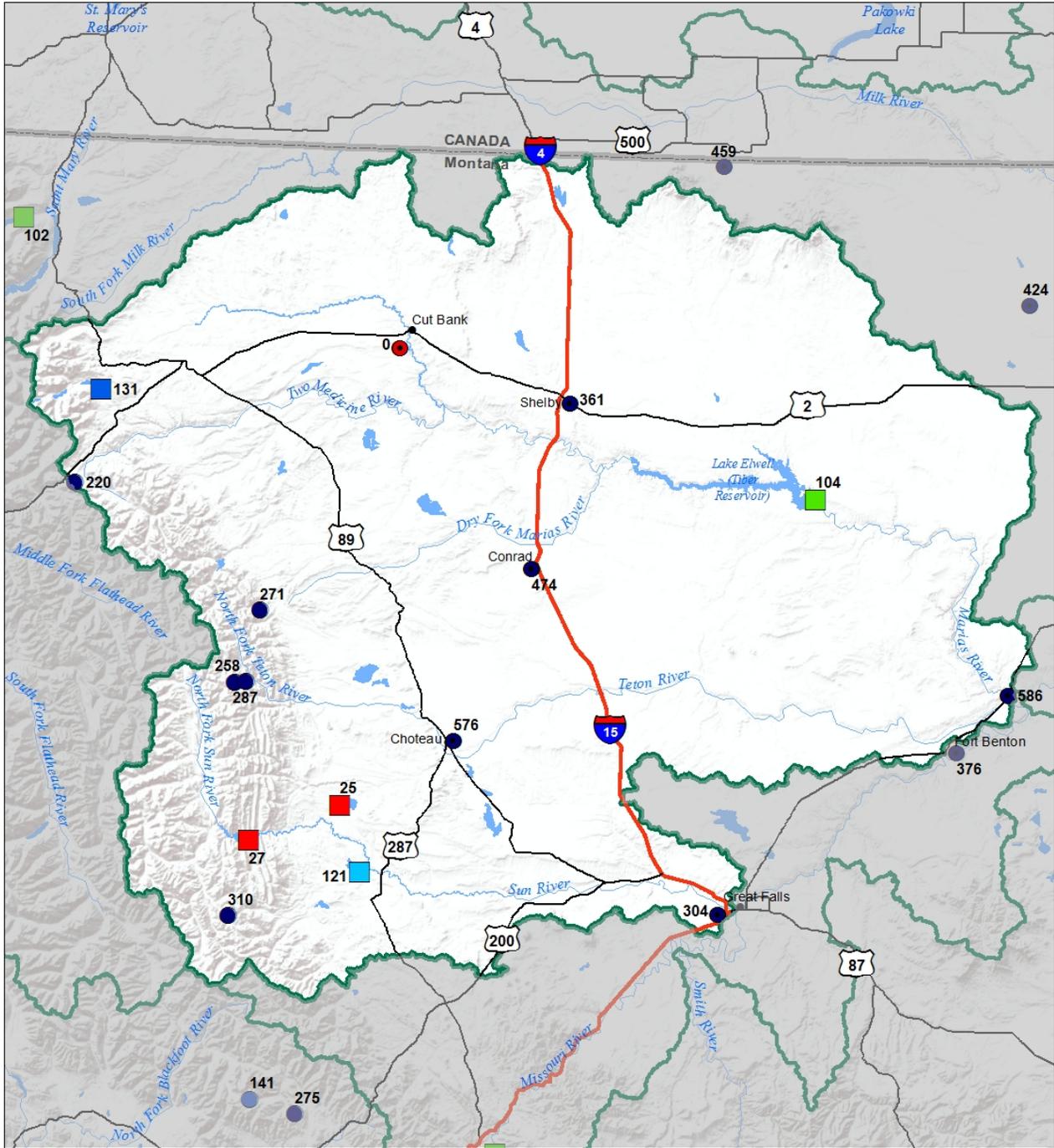
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs
Percent of Normal

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



**Sun-Teton-Marias River Basin
 Monthly Precipitation and Reservoir Levels
 Percentage of Normal
 March 1, 2018 (February 1, 2018 - March 1, 2018)**

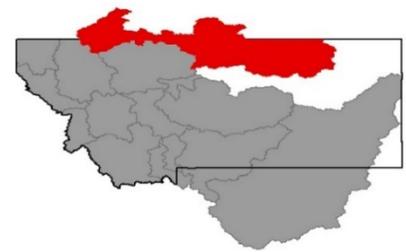


Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



St. Mary-Milk River Basin



Nearly every site in the St. Mary-Milk River basin is reporting above normal snowpack conditions for March 1st after a record-setting February boosted snowpack totals. Mountain snowpack in the western half of the basin in both the U.S and Canada is well above normal for this date, and snowpack further east in the Bearpaw Range is well above normal. Snow totals for February were record-setting in the Bearpaw Range this month where 2.5" to 4.5" of snow water was added to the snowpack. Further west, snow totals at the Flattop SNOTEL were second highest on record for the month. Over 15" of snow water was added to the snowpack, that's pretty impressive. What does all this snow mean? Forecasts issued on March 1st within the basin are above average for the April 1st through July 31st period. Spring is an essential time in this region and March through May are typically the most significant months with regards to precipitation. With an already above normal snowpack for this date, a close eye will be kept on what spring delivers this year both in terms of additional snow water and the week to week weather patterns.

St. Mary-Milk River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
ST. MARY	134%	107%
BEARPAW MOUNTAINS	142%	75%
CYPRESS HILLS, CANADA	97%	68%
MILK RIVER BASIN	116%	70%
Basin-Wide	127%	95%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation (St. Mary)	189%	125%	124%
Mountain Precipitation (Bearpaw Mtns)	258%	181%	191%
Valley Precipitation	298%	146%	259%
Basin-Wide Precipitation	211%	133%	153%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

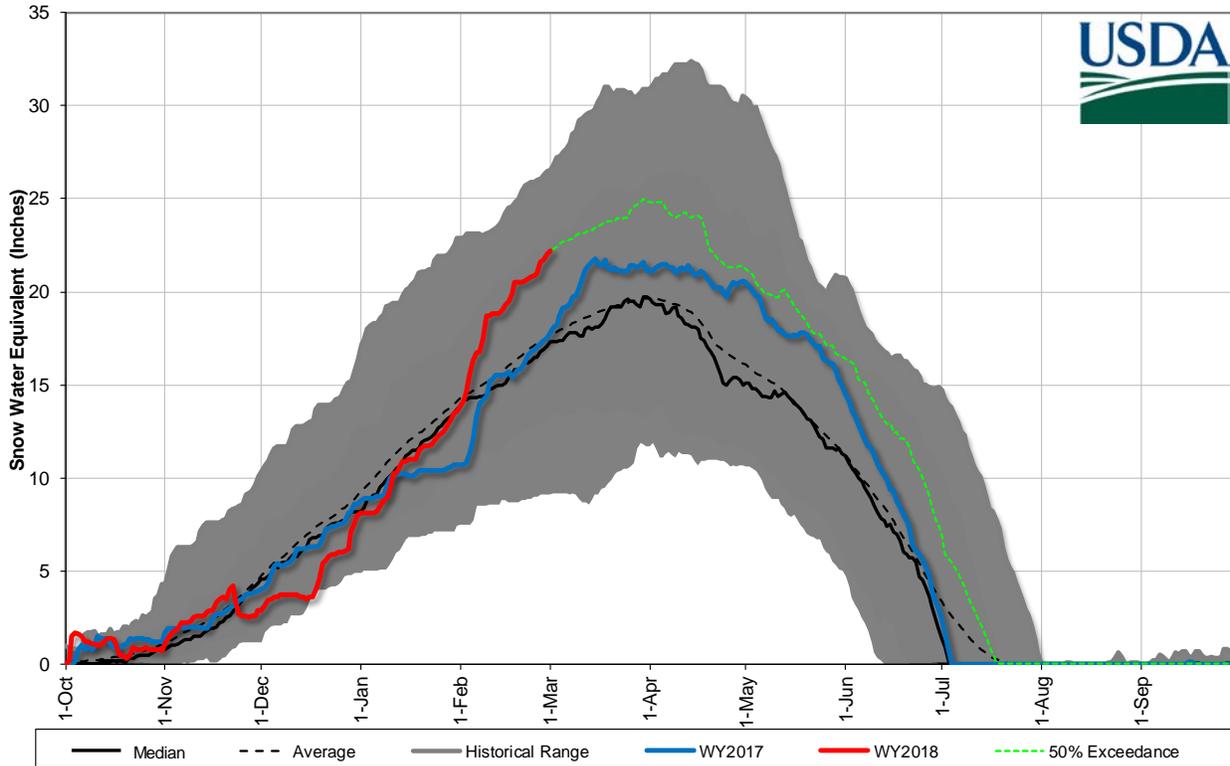
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	91%	37%	119%

*See Reservoir Storage Table for storage in individual reservoirs

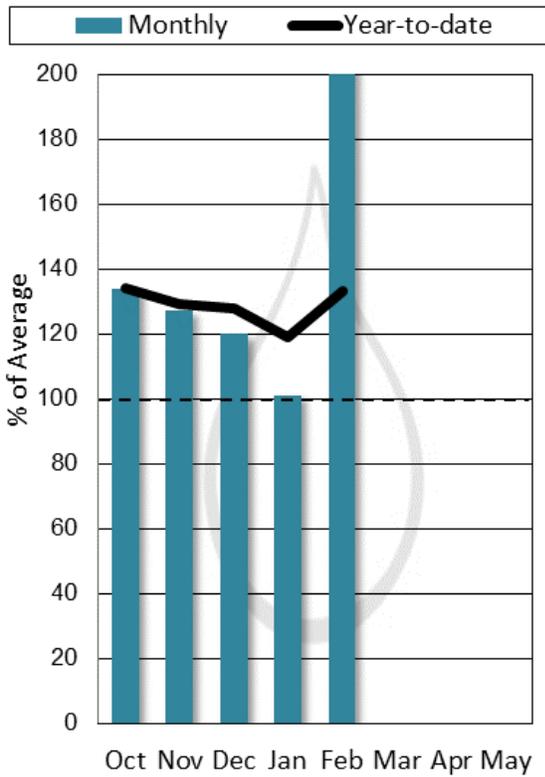
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Lake Sherburne	31.3	49.0	30.7	64.3	102%	49%
Fresno Res	36.0	64.3	42.6	127.0	84%	28%
Nelson Res	27.0	9.7	30.4	66.8	89%	40%

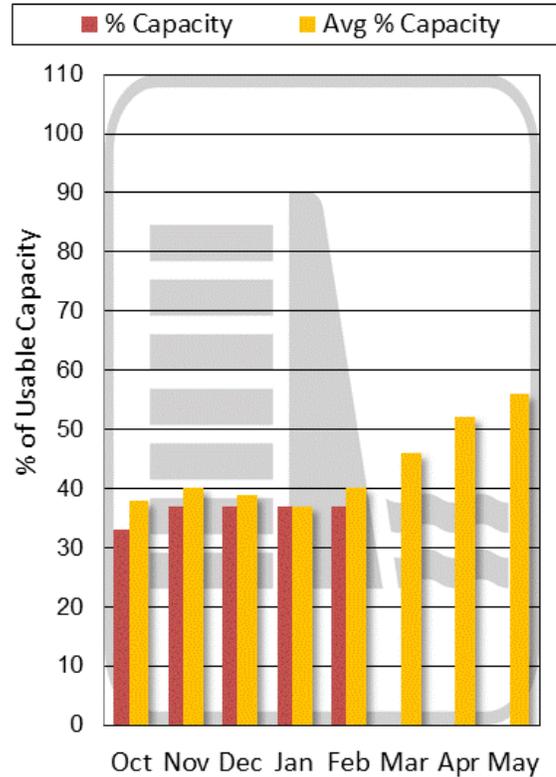
Saint Mary-Milk River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

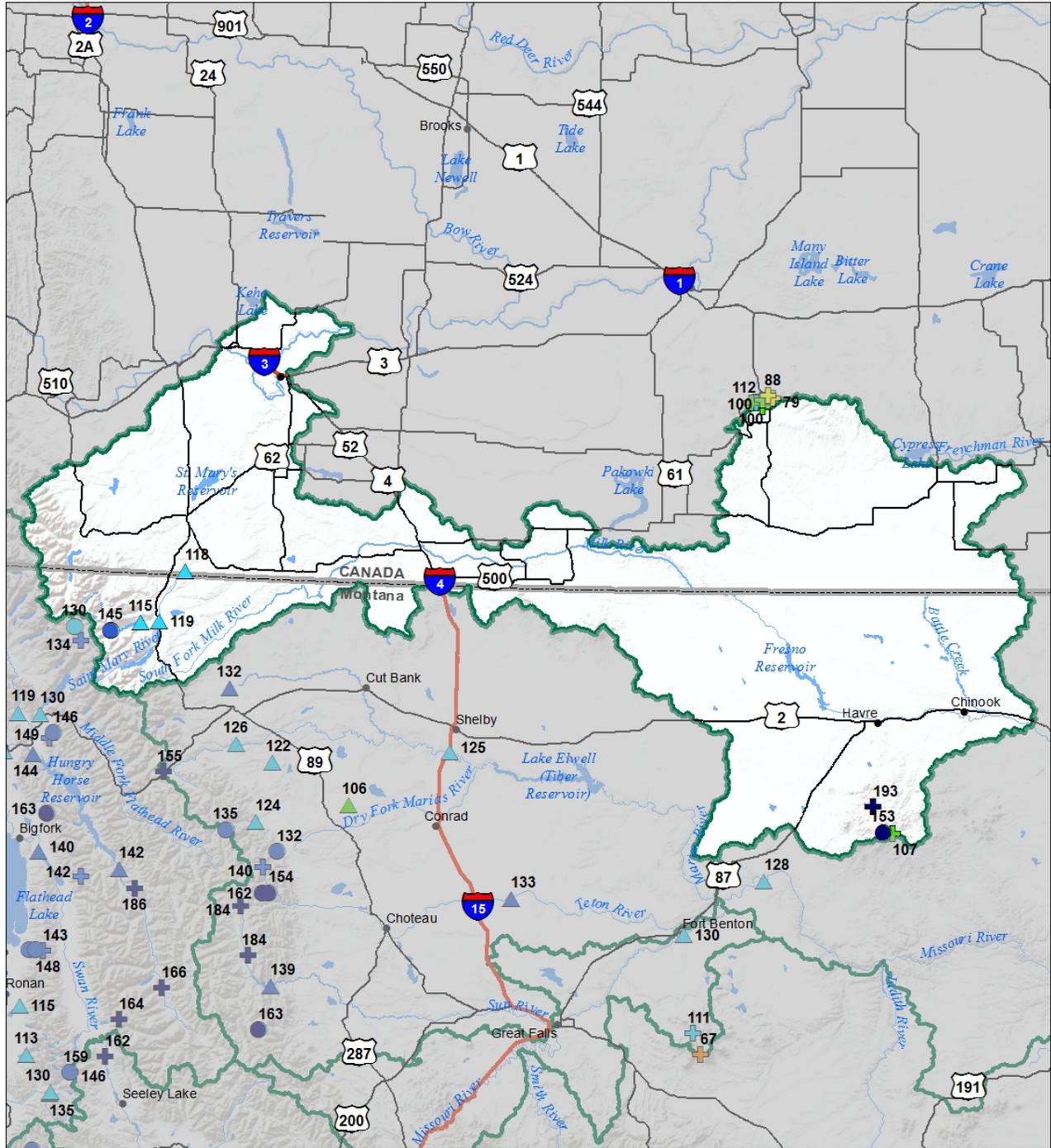
St. Mary River Basin

		Chance Actual Volume Will Exceed Forecasted Volume						
ST. MARY & MILK BASINS	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Lake Sherburne Inflow	APR-JUL	92	105	113	116%	121	134	97
	APR-SEP	106	120	129	115%	138	152	112
Two Medicine R nr Browning ²	APR-JUL	355	405	440	119%	470	520	370
	APR-SEP	410	465	505	119%	540	595	425
Badger Ck nr Browning	APR-JUL	410	475	520	120%	565	635	435
	APR-SEP	475	545	595	118%	645	720	505

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

St Mary's-Milk River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal

SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

Streamflow Forecast Percent of Average Flows

▲ > 150%
▲ 131 - 150%
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▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%

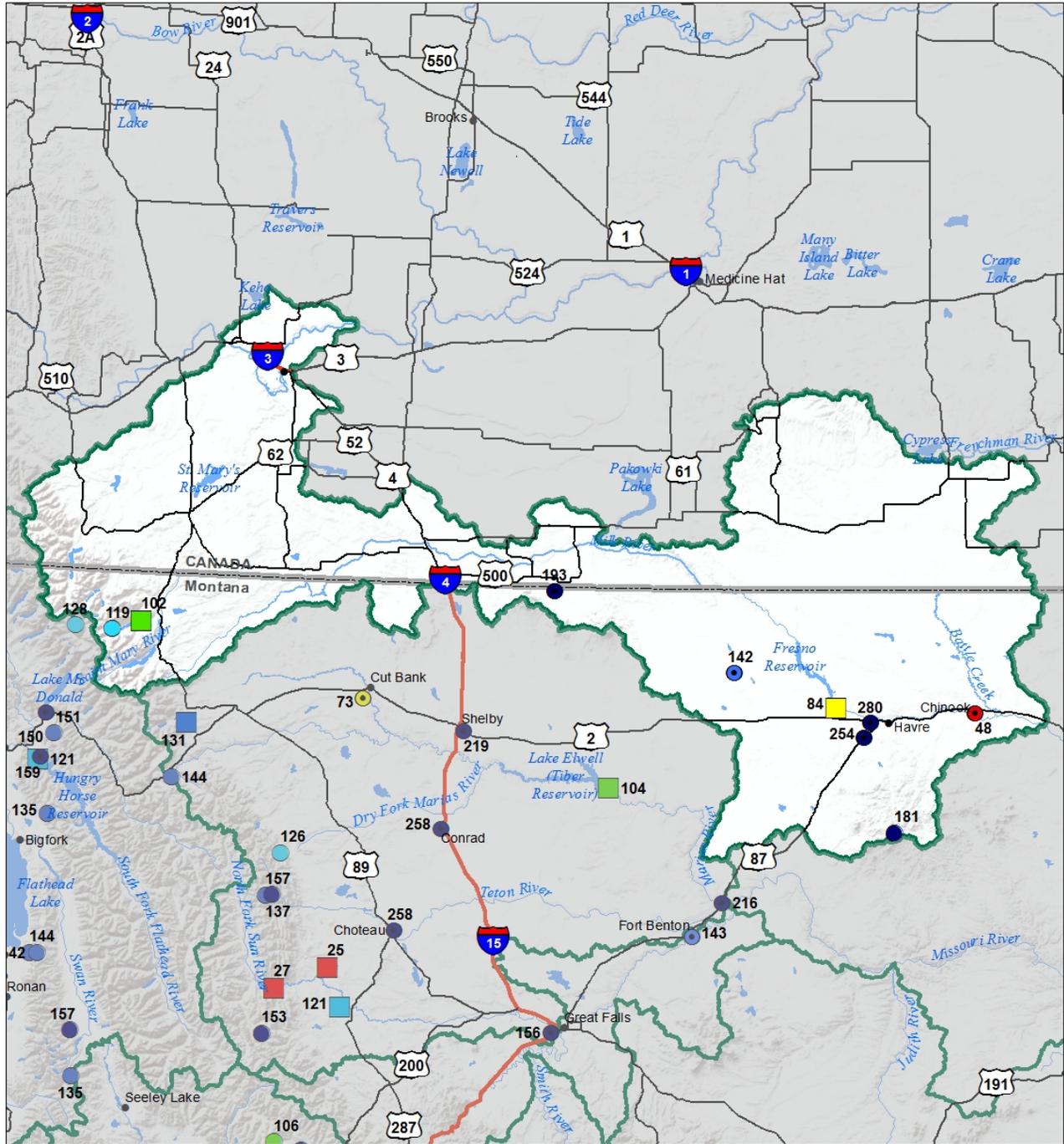


St Mary's-Milk River Basin

Water Year to Date Precipitation and Reservoir Levels

Percentage of Normal

March 1, 2018



Precipitation Percent of Normal		COOP/ACIS	
SNOTEL			
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%





Upper Yellowstone River Basin

Wow. What a year for snowfall in the Upper Yellowstone River basin. Every month of the water year (October 1st – Current) there has been a record, or near record to reference in the river basin, this month was no different. February snow totals were record-breaking at nine SNOTEL sites, and second highest at two others. Five SNOTEL sites are the record high on March 1st for Snow Water Equivalent (SWE), and four locations are the second highest on record. This region has seen consistent snowfall throughout the winter, and the snowpack is deep and juicy. The typical water year peak snowpack occurs in late April to mid-May in this region, meaning there could be more yet to come, and a record amount of water could be coming out the mountains in some sub-basins. In some areas, this could be cause for concern entering the spring if snowfall continues. The median forecast for Clark’s Fork at Belfry is above the record observed flows for the April 1st – July 31st period. A close eye will be kept on both the amount of snow we receive before runoff and the week to week weather patterns that play out. Cool weather during spring and early summer, and a slow release of mountain water would be ideal. Only time will tell.

Upper Yellowstone River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
<i>YELLOWSTONE ab LIVINGSTON</i>	156%	131%
<i>SHIELDS</i>	164%	85%
<i>BOULDER-STILLWATER</i>	182%	106%
<i>RED LODGE-ROCK CREEK</i>	158%	119%
<i>CLARK’S FORK</i>	186%	145%
Basin-Wide	164%	126%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	193%	141%	141%
Valley Precipitation	253%	173%	180%
Basin-Wide Precipitation	199%	145%	146%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	119%	51%	129%

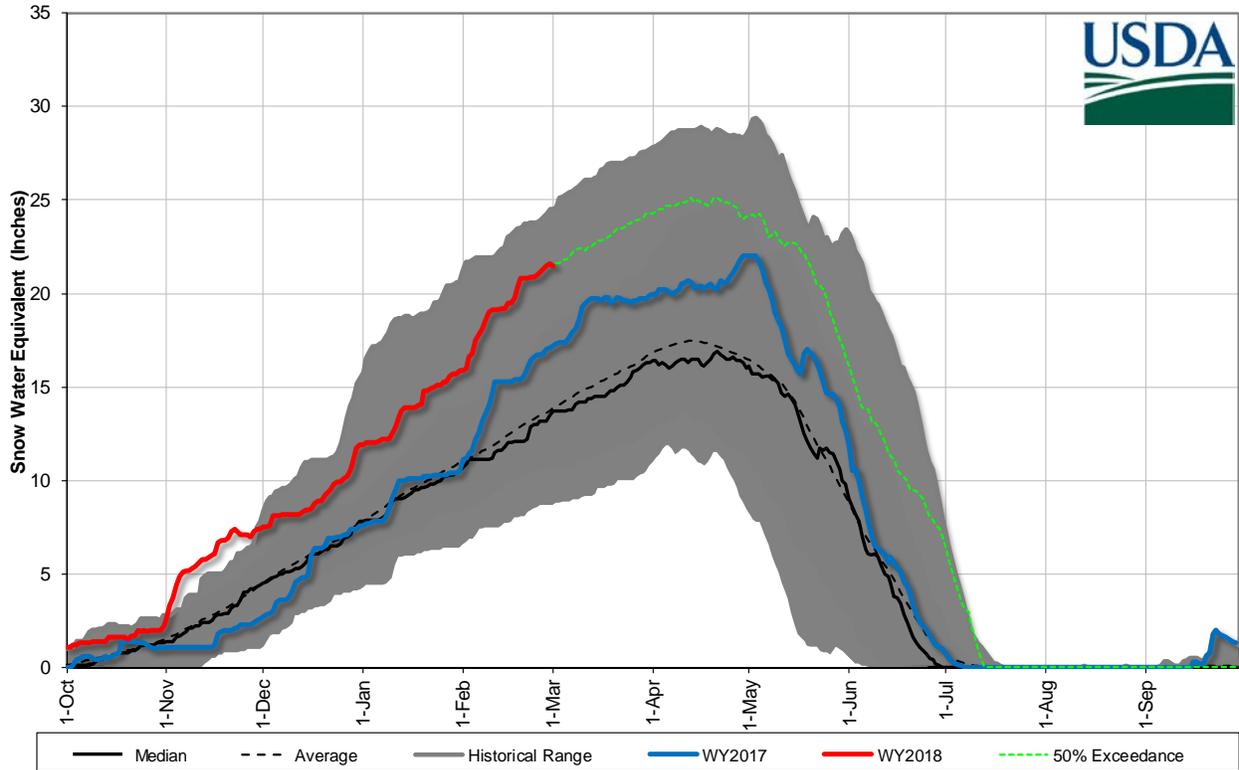
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

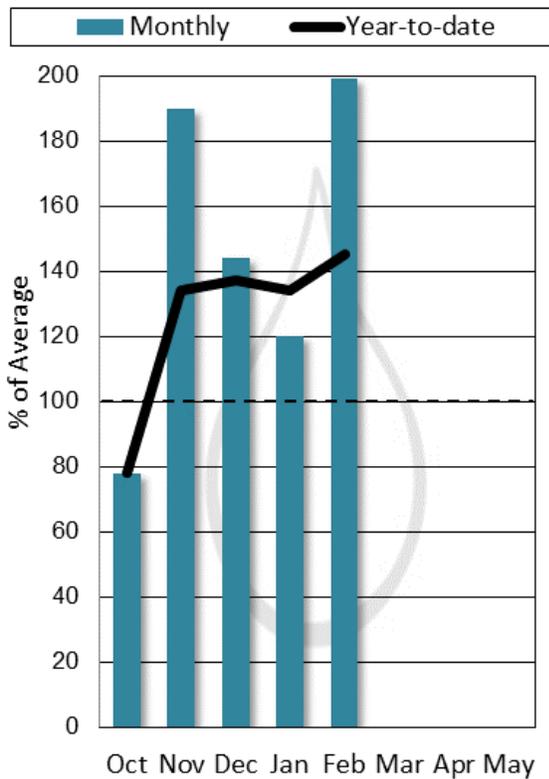
	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Mystic Lake	4.3	4.5	3.0	21.0	143%	20%
Cooney Res	20.6	22.4	17.9	27.4	115%	75%

Upper Yellowstone River Basin Snowpack with Non-Exceedance Projections

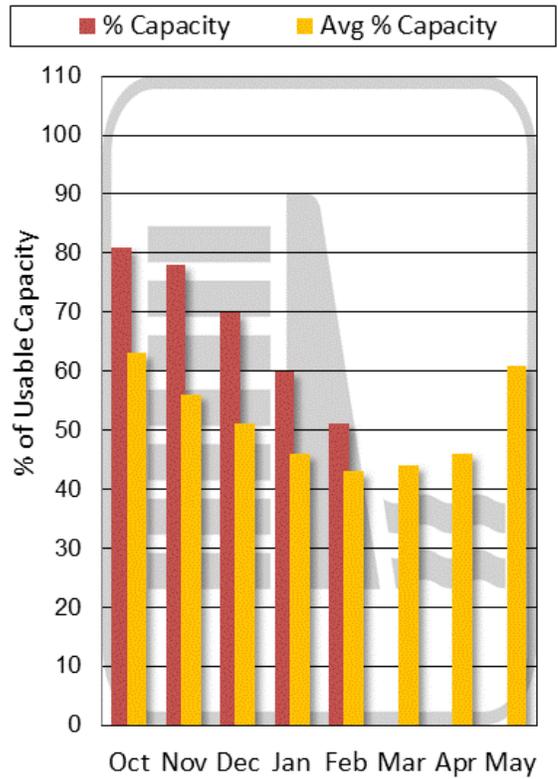
Based on provisional SNOTEL daily data as of 3/1/2018



Mountain and Valley Precipitation



End of Month Reservoir Storage



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

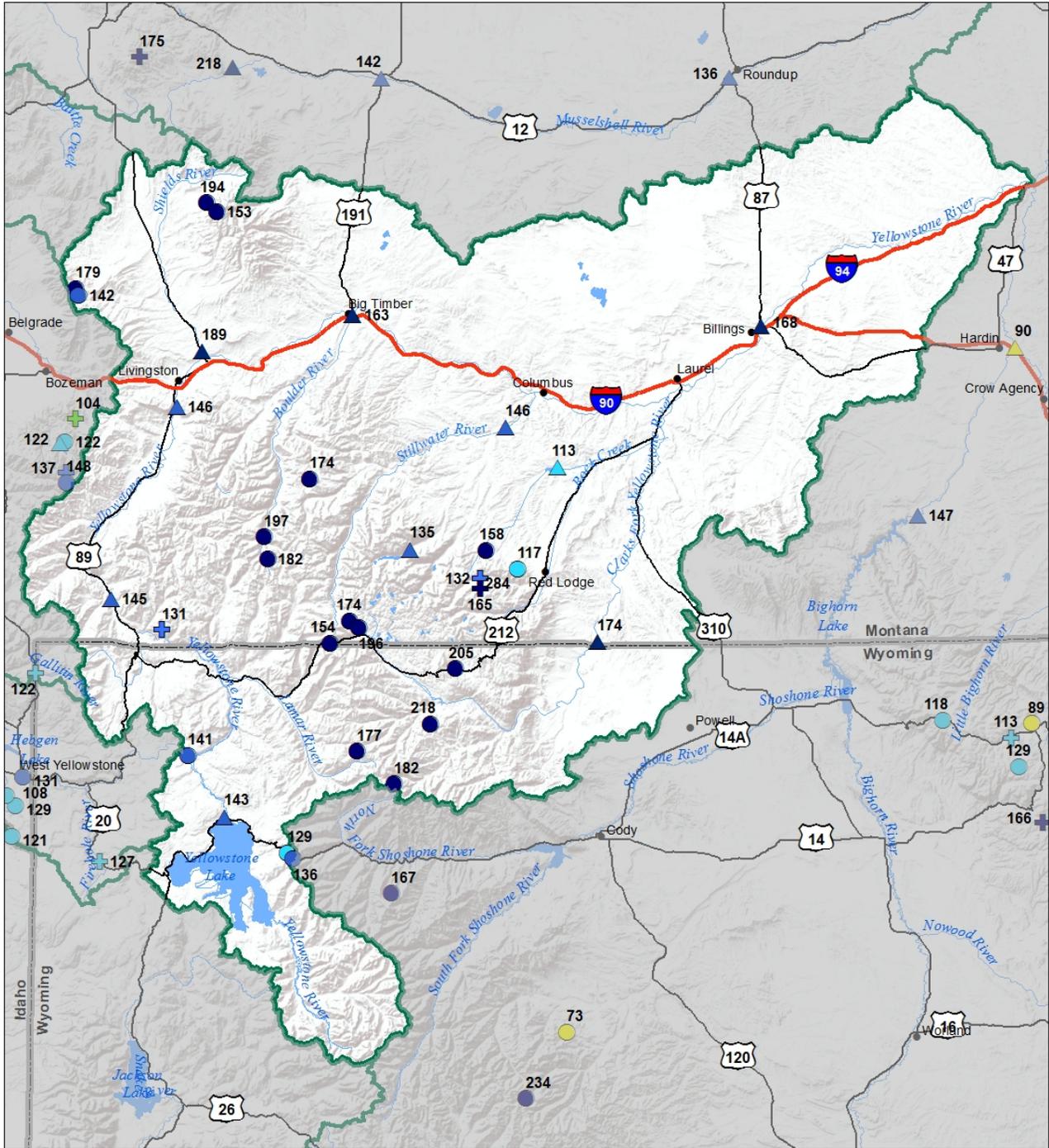
Upper Yellowstone River Basin

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Yellowstone R at Yellowstone Lake Outlet	APR-JUL	700	775	825	143%	875	950	575
	APR-SEP	925	1030	1100	143%	1170	1280	770
Yellowstone R at Corwin Springs	APR-JUL	1990	2180	2300	145%	2420	2610	1590
	APR-SEP	2350	2570	2720	145%	2870	3090	1880
Yellowstone R at Livingston	APR-JUL	2250	2490	2650	147%	2810	3040	1800
	APR-SEP	2660	2930	3120	146%	3310	3590	2140
Shields R nr Livingston	APR-JUL	180	220	250	194%	280	320	129
	APR-SEP	195	240	270	189%	300	350	143
Boulder R at Big Timber	APR-JUL	365	415	450	161%	485	535	280
	APR-SEP	400	455	490	163%	530	585	300
Mystic Lake Inflow ²	APR-JUL	67	73	77	131%	81	87	59
	APR-SEP	88	95	100	135%	105	112	74
Stillwater R nr Absarokee ²	APR-JUL	520	595	645	145%	695	770	445
	APR-SEP	615	700	760	146%	820	905	520
Clarks Fk Yellowstone R nr Belfry	APR-JUL	740	815	865	170%	915	990	510
	APR-SEP	820	900	955	174%	1010	1090	550
Cooney Reservoir Inflow	APR-JUL	23	35	44	116%	53	65	38
	APR-SEP	31	45	54	113%	63	77	48
Yellowstone R at Billings	APR-JUL	4450	5030	5430	168%	5830	6410	3230
	APR-SEP	5100	5790	6250	168%	6710	7400	3730

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

**Upper Yellowstone River Basin
Streamflow Forecast, Snow Water Equivalent
Percentage of Normal
March 1, 2018**



**Snow Water Equivalent
Percent of Normal**

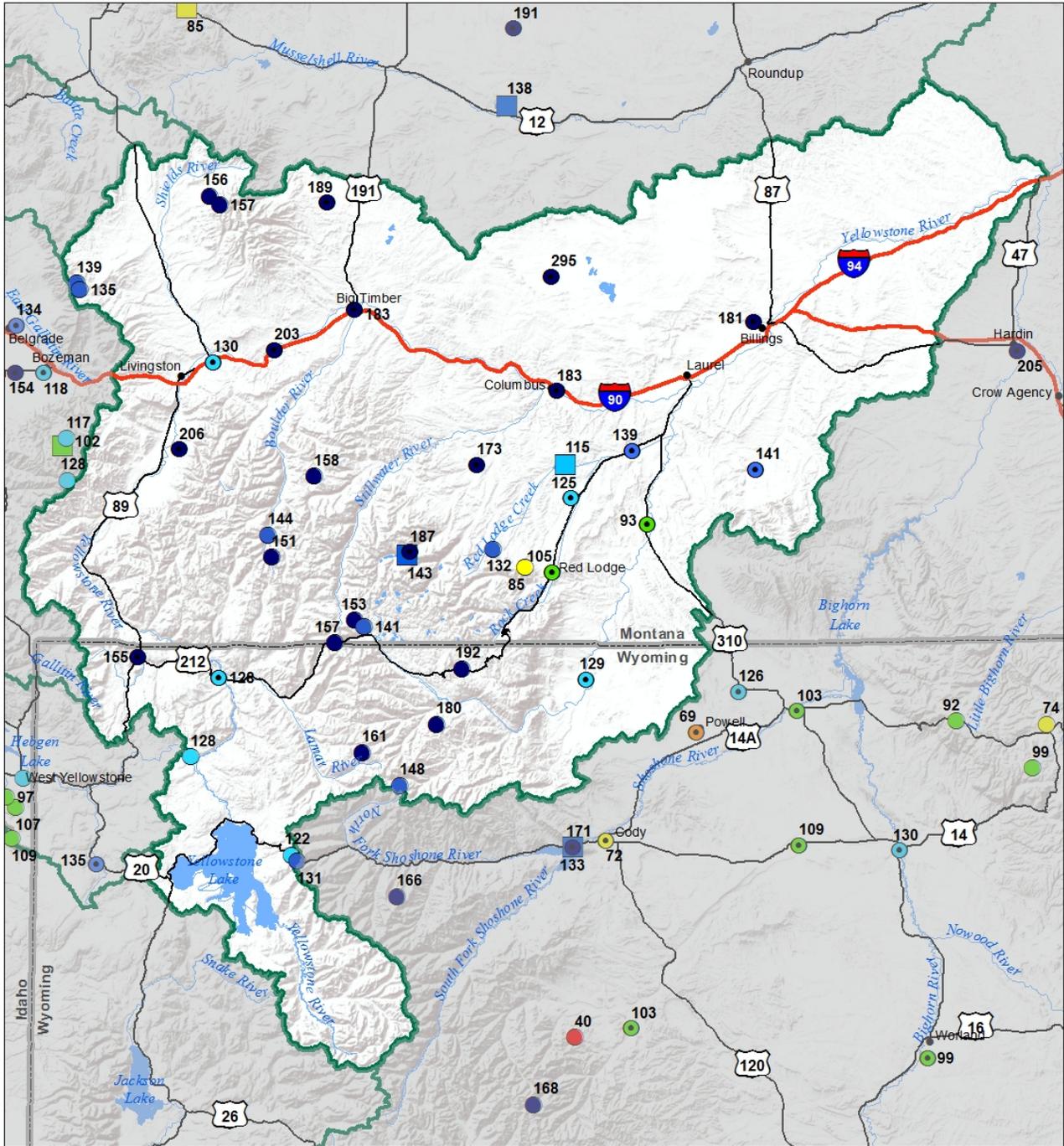
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

**Streamflow Forecast
Percent of Average Flows**

▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%



Upper Yellowstone River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal March 1, 2018



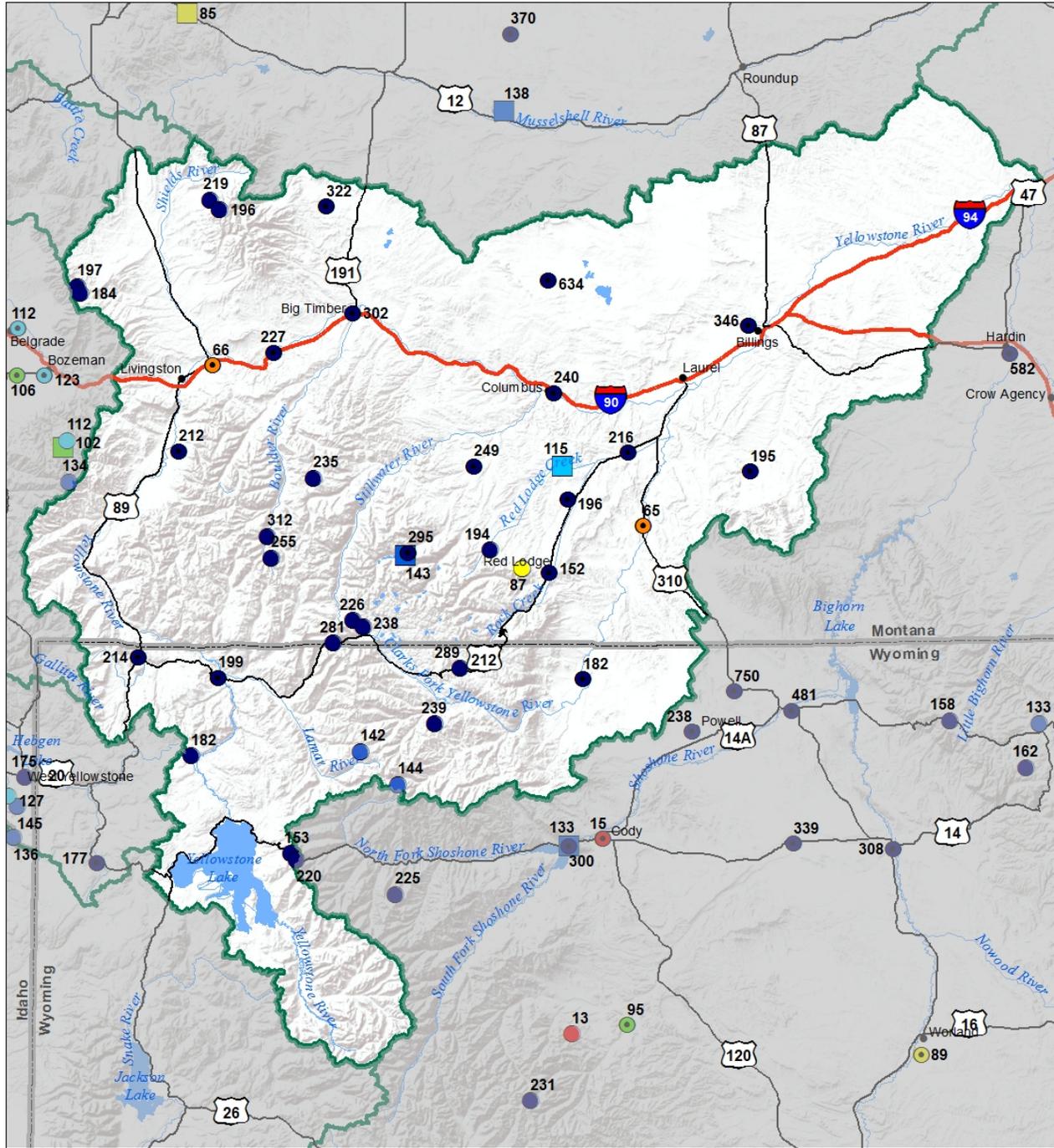
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



**Upper Yellowstone River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018 (February 1, 2018 - March 1, 2018)**



SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



Lower Yellowstone River Basin



As far as water supply is concerned, the Lower Yellowstone River basin is faring quite well this season. Precipitation across the valley and mountains of the basin was well above normal for February. All sub-basins received above normal snow accumulation during the month and snowpack percentages have improved compared to last month's report. Across the basin, conditions have been somewhat variable. In the Tongue River basin, snow water equivalent totals were tracking right along with normal conditions until February when snow accumulation was 189% of normal! This was likely a welcome shift for the recreationists in the basin. On the other hand, the Wind River basin received well above normal snow accumulation early this season but has been tracking along with normal conditions since mid-November. The snowpack remains above normal in this basin but is nowhere near the record-breaking totals recorded last season. Outlooks for temperature and precipitation into the spring look favorable at this point for continued snowfall.

Lower Yellowstone River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
WIND RIVER BASIN	123%	211%
SHOSHONE RIVER BASIN	157%	156%
BIGHORN RIVER BASIN	147%	125%
LITTLE BIGHORN BASIN	109%	95%
TONGUE RIVER BASIN	114%	101%
POWDER RIVER BASIN	131%	100%
Basin-Wide	128%	151%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	149%	107%	144%
Valley Precipitation	287%	127%	157%
Basin-Wide Precipitation	181%	113%	148%

*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	100%	58%	116%

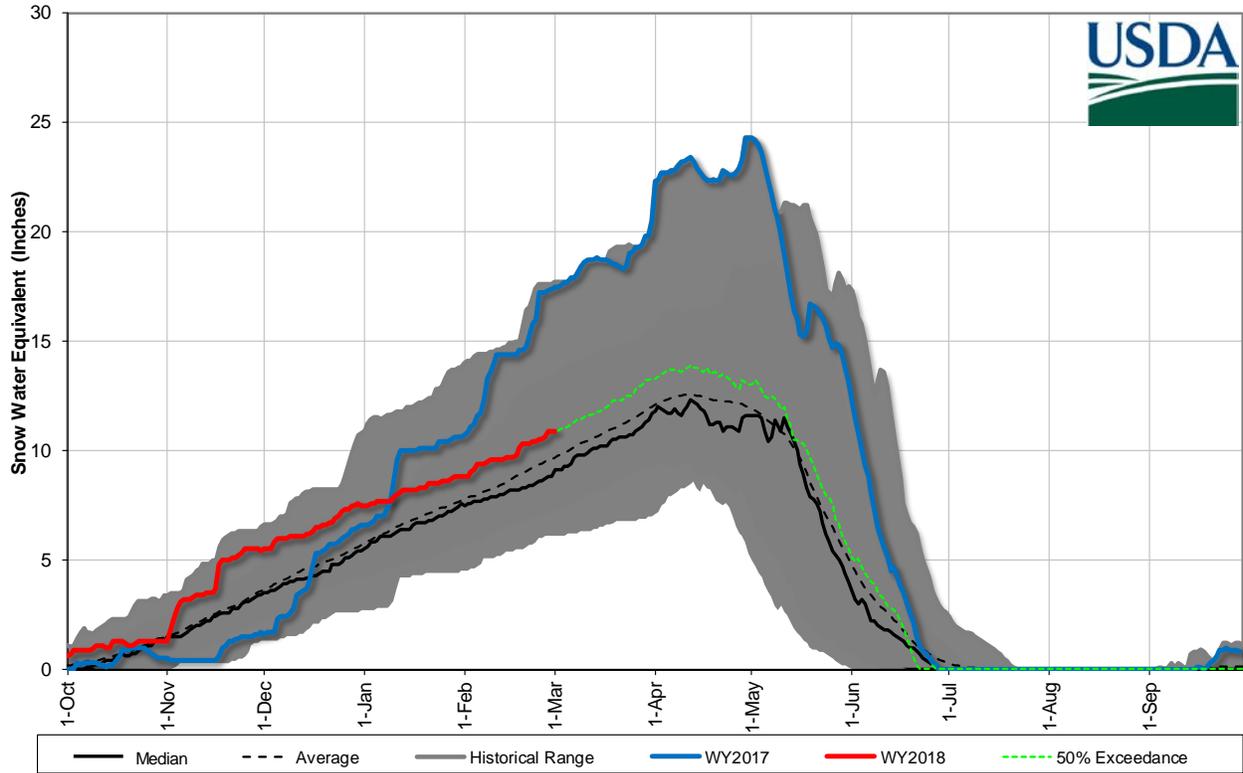
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Bighorn Lake	776.2	900.9	797.1	1356.0	97%	57%
Tongue River Res	49.5	60.3	28.2	79.1	176%	63%

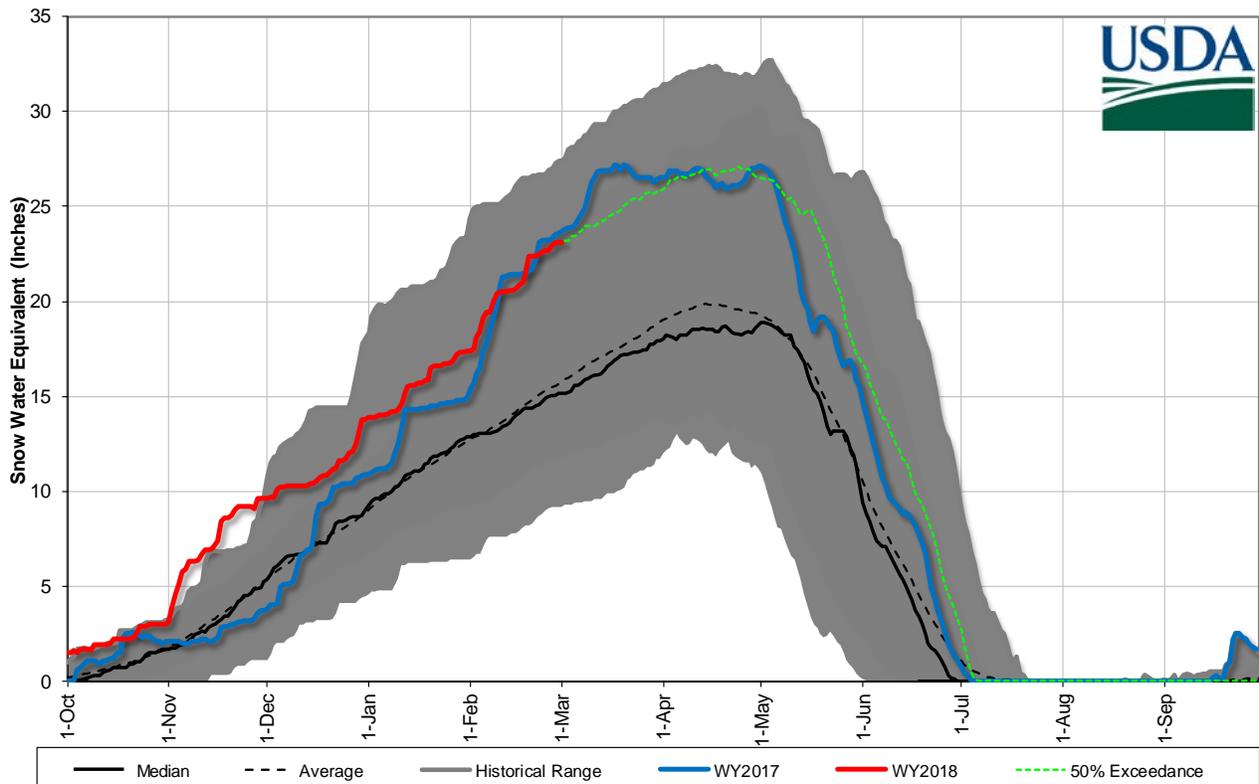
Wind River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 3/1/2018



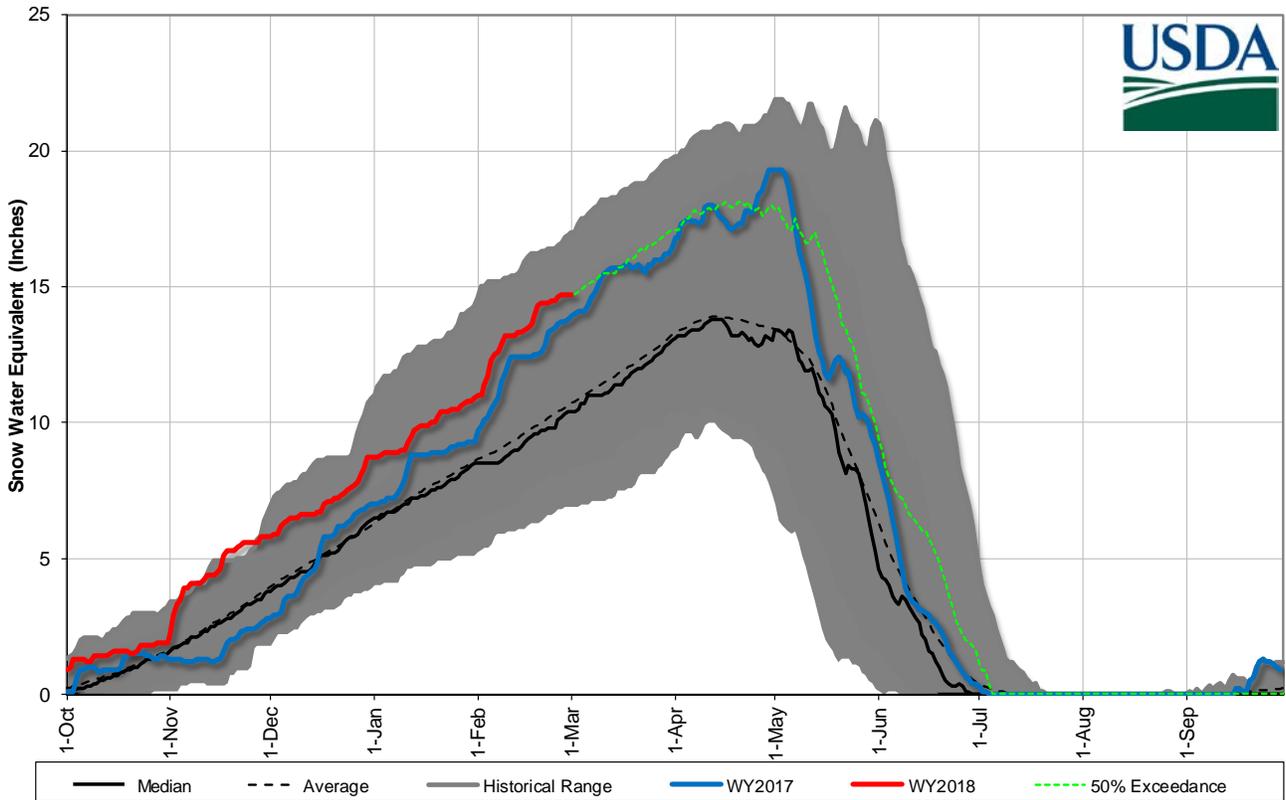
Shoshone River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 3/1/2018



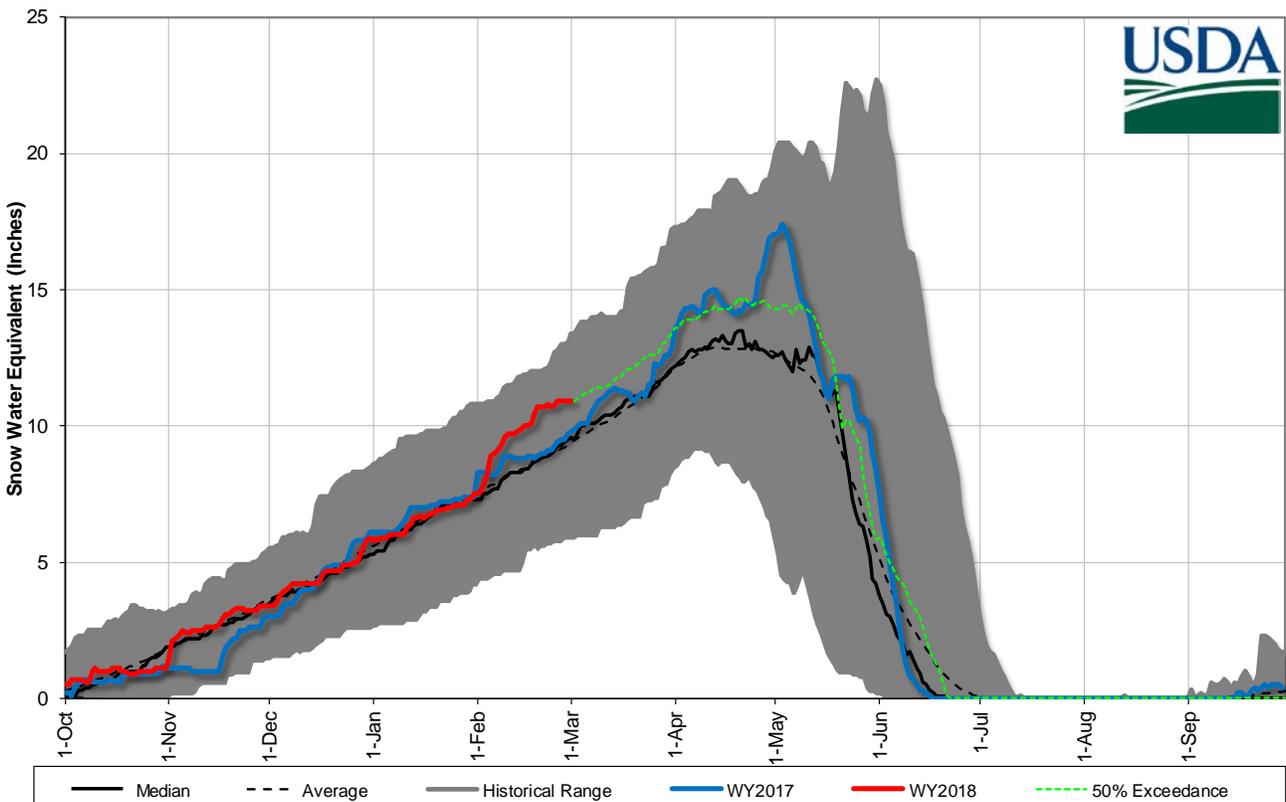
Bighorn River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 3/1/2018

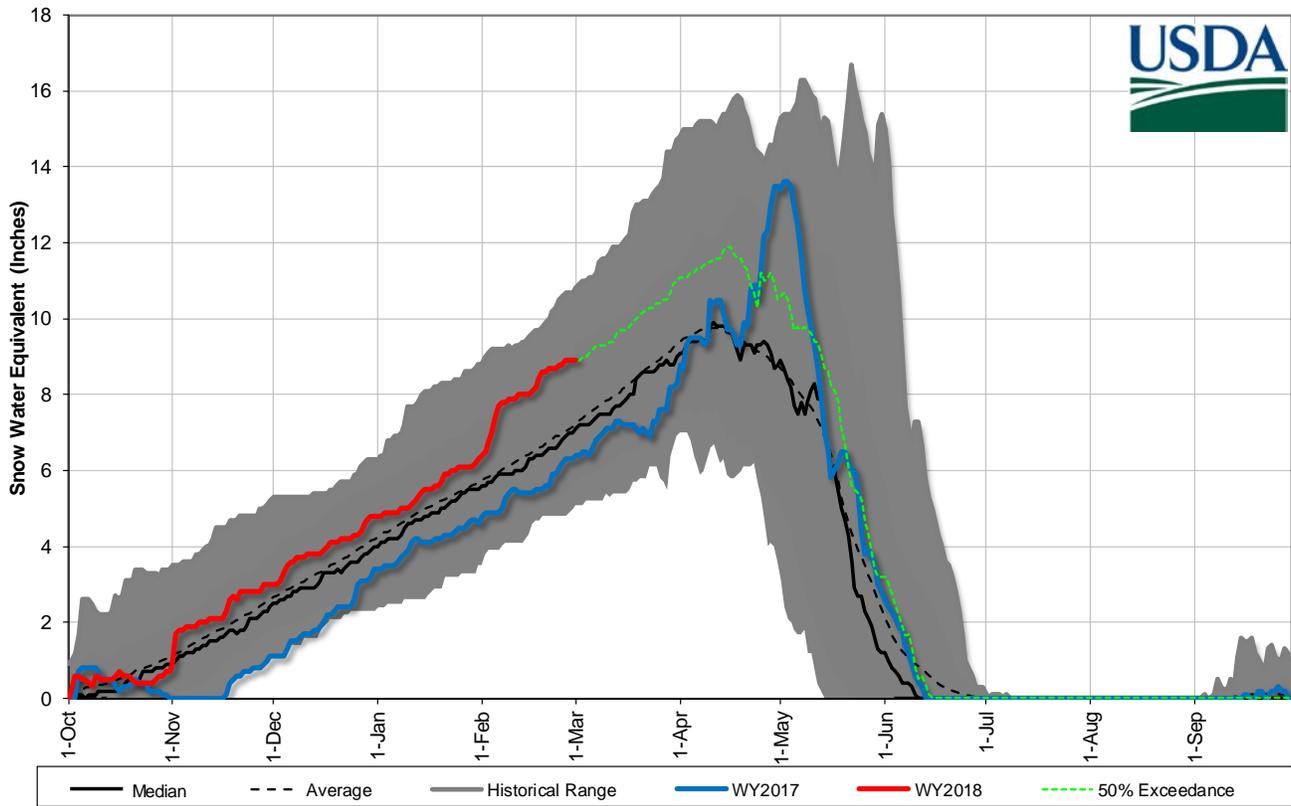


Tongue River Basin Snowpack with Non-Exceedence Projections

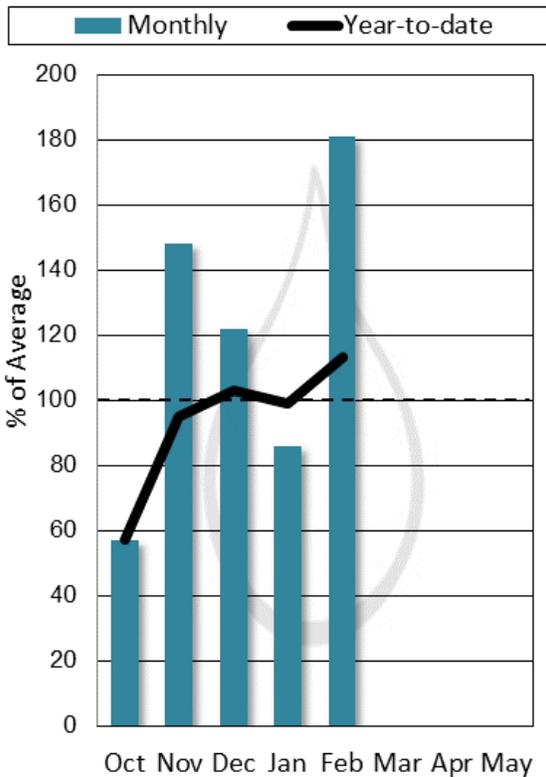
Based on provisional SNOTEL daily data as of 3/1/2018



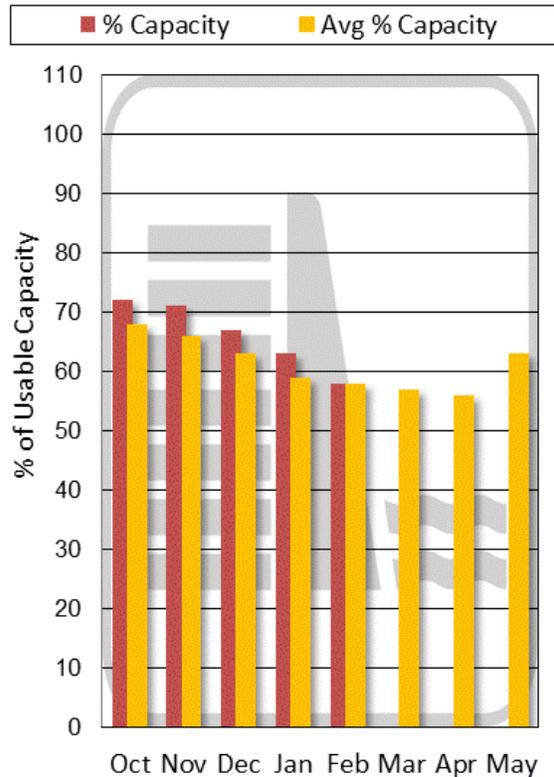
Powder River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 3/1/2018



**Mountain and Valley
Precipitation**



**End of Month Reservoir
Storage**



Storage above is averaged for all reservoirs in the basin. For individual reservoirs see table below.

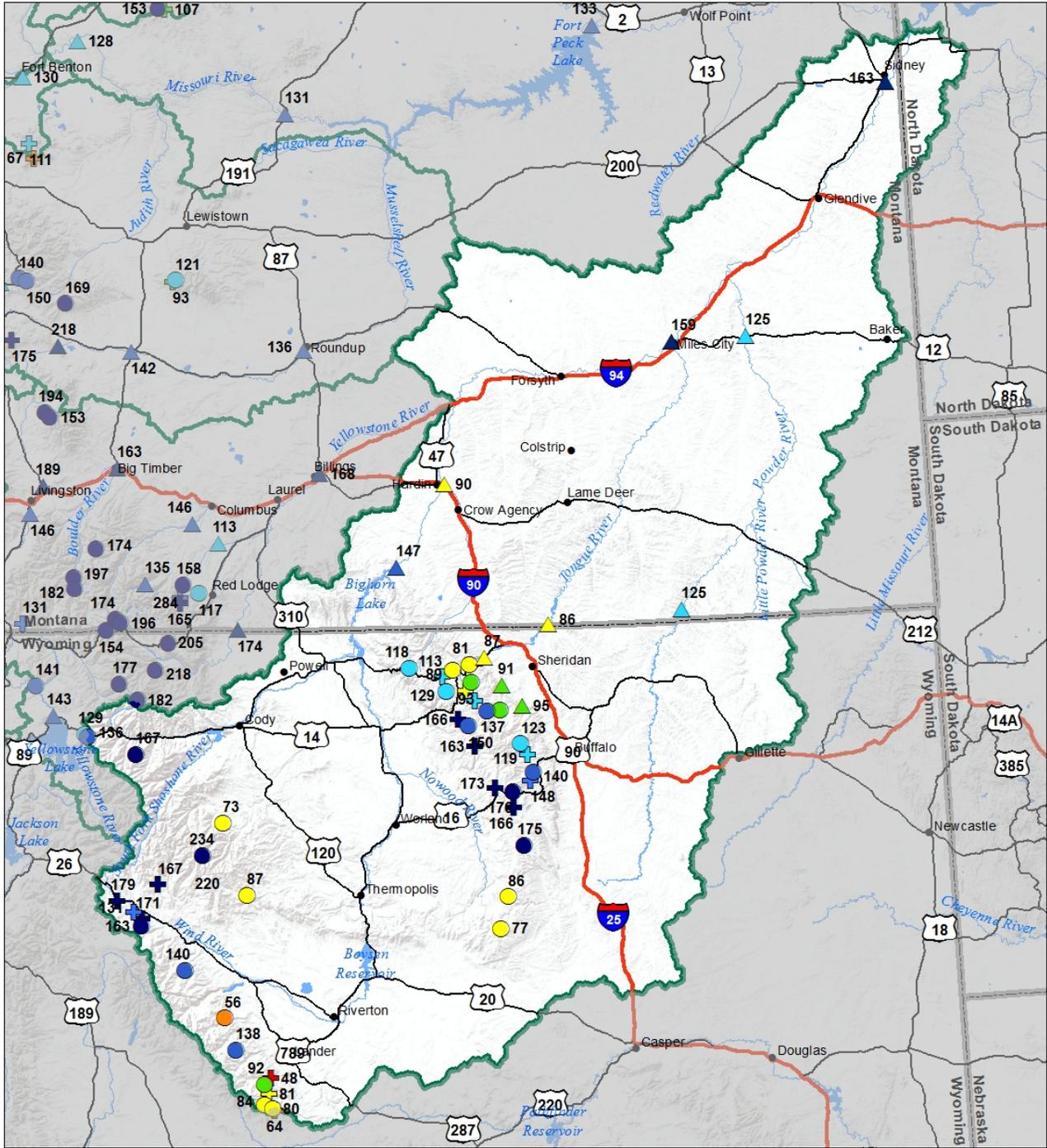
Lower Yellowstone River Basin

Forecast Point	Forecast Period	Chance Actual Volume Will Exceed Forecasted Volume						30yr Avg (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	
Bighorn R nr St. Xavier ²	APR-JUL	1320	1730	2000	145%	2270	2680	1380
	APR-SEP	1390	1840	2140	147%	2440	2890	1460
Little Bighorn R nr Hardin	APR-JUL	30	65	88	90%	111	146	98
	APR-SEP	36	74	100	90%	126	164	111
Tongue R nr Dayton ²	APR-JUL	43	61	73	85%	86	104	86
	APR-SEP	51	71	85	87%	98	118	98
Big Goose Ck nr Sheridan	APR-JUL	20	33	41	89%	50	62	46
	APR-SEP	28	40	49	91%	58	71	54
Little Goose Ck nr Bighorn	APR-JUL	15.9	24	29	94%	34	42	31
	APR-SEP	23	31	37	95%	43	52	39
Tongue River Reservoir Inflow ²	APR-JUL	52	117	161	83%	205	270	193
	APR-SEP	68	137	184	86%	230	300	215
Yellowstone R at Miles City ²	APR-JUL	5920	6910	7580	159%	8240	9220	4780
	APR-SEP	6710	7860	8670	159%	9440	10600	5450
Powder R at Moorehead	APR-JUL	75	161	220	124%	280	365	177
	APR-SEP	96	185	245	125%	305	395	196
Powder R nr Locate	APR-JUL	88	183	245	123%	310	405	199
	APR-SEP	107	205	275	125%	345	445	220
Yellowstone R nr Sidney ²	APR-JUL	5970	7060	7800	161%	8540	9630	4830
	APR-SEP	6700	7990	8870	163%	9750	11000	5430

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Lower Yellowstone River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal March 1, 2018



Snow Water Equivalent Percent of Normal

SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *
			● *

Streamflow Forecast Percent of Average Flows

▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%

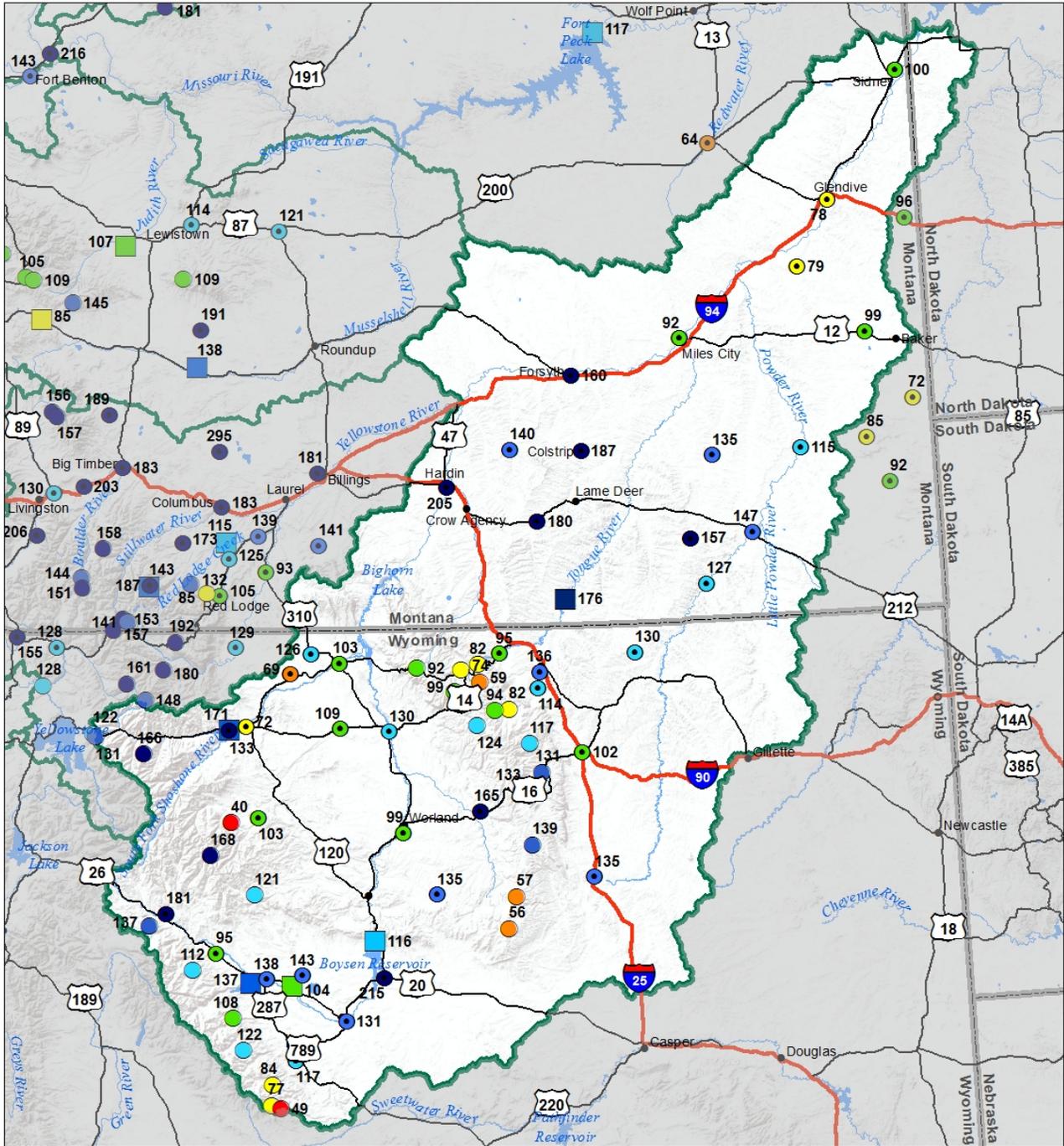


Lower Yellowstone River Basin

Water Year to Date Precipitation and Reservoir Levels

Percentage of Normal

March 1, 2018



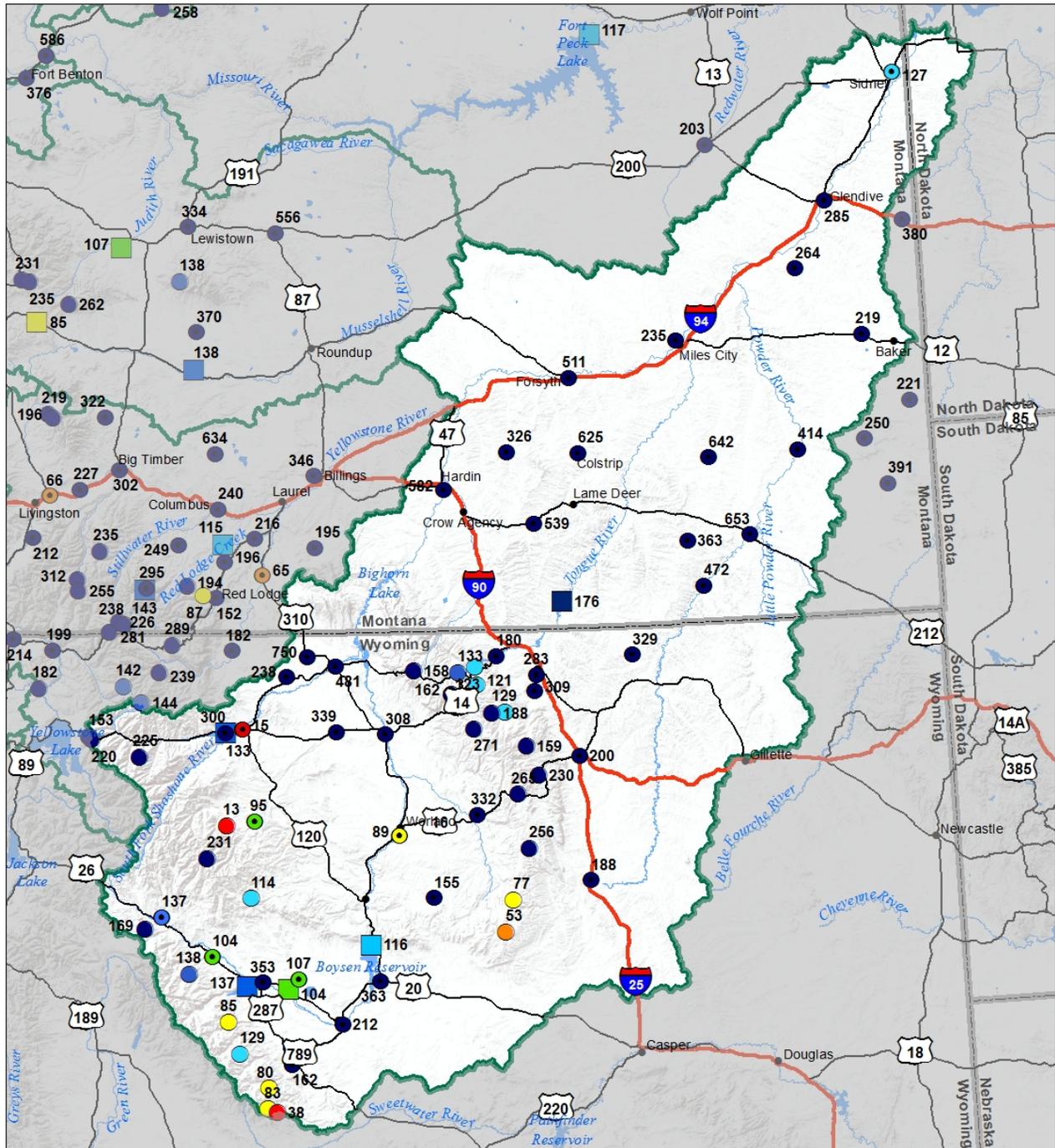
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs
Percent of Normal

■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



**Lower Yellowstone River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
March 1, 2018 (February 1, 2018 - March 1, 2018)**



Precipitation Percent of Normal		Reservoirs Percent of Normal	
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



Data Summary (SNOTEL and Snowcourse)

Montana Snow Sites	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Albro Lake	SNOTEL	8300	68	19.1	13.8	138	14.3	104
Ambrose	SC	6480			9.2			
Arch Falls	SC	7350	36	10.7	7.8	137	6.5	83
Ashley Divide	SC	4820	32	5.5	5.3	104	4.4	83
Badger Pass	SNOTEL	6900	107	32.1	23.7	135	25.6	108
Banfield Mountain	SNOTEL	5600	61	15.6	14.3	109	12.3	86
Baree Creek	SC	5500						
Baree Midway	SC	4600	94	29.8	23.6	126	20.5	87
Baree Trail	SC	3800	47	12.1	7.8	155	10.5	135
Barker Lakes	SNOTEL	8250	55	16.3	10.3	158	9.6	93
Basin Creek	SNOTEL	7180	36	8.9	5.5	162	4.4	80
Bassoo Peak	SC	5150	36	9.4	7.6	124		
Beagle Springs	SNOTEL	8850	36	8.4	6.3	133	9.3	148
Bear Basin	SC	8150			14.7			
Bear Mountain	SNOTEL	5400	141	48.4	48.4	100	34.5	71
Beartooth Lake	SNOTEL	9360	111	34.3	16.7	205	25.4	152
Beaver Creek	SNOTEL	7850	58	15.6	14	111	14.9	106
Big Snowy	SC	7150	45	12.8	13.8	93	6.9	50
Bisson Creek	SNOTEL	4920	41	11.8	8.4	140	7.9	94
Black Bear	SNOTEL	8170	125	35.8	29.6	121	37.5	127
Black Mountain	SC	7750	60	18.1	11	165	9.7	88
Black Pine	SNOTEL	7210	48	13.5	8.2	165	9.4	115
Blacktail	SC	5650	46	11.4	11	104	7.6	69
Blacktail Mtn	SNOTEL	5650	45	12.8			10.9	
Bloody Dick	SNOTEL	7600	47	12.7	9.3	137	11.2	120
Bots Sots	SC	7750	29	7	5.3	132	4.4	83
Boulder Mountain	SNOTEL	7950	73	22	15.4	143	12.6	82
Box Canyon	SNOTEL	6670	47	14.6	7.4	197	7.8	105
Boxelder Creek	SC	5100	26	6	5.6	107	3.1	55
Brackett Creek	SNOTEL	7320	81	25.8	14.4	179	14.7	102
Bristow Creek	SC	3900						
Brush Creek Timber	SC	5000	40	9.9	6.3	157	9.2	146
Bull Mountain	SC	6600	28	6.4	4.8	133	4.6	96
Burnt Mtn	SNOTEL	5880	27	6.3	4	158	5.2	130
Cabin Creek	SC	5200	39	9	4.9	184	5.2	106
Calvert Creek	SNOTEL	6430	37	9.9	6.8	146	8.4	124
Camp Senia	SC	7890	45	10.8	3.8	284	8.3	218
Canyon	SNOTEL	7870	58	14.8	10.5	141	15.3	146
Carrot Basin	SNOTEL	9000	85	24.7	20.4	121	23.9	117
Chessman Reservoir	SC	6200	29	7.1	2.8	254	2.8	100
Chicago Ridge	SC	5800	116	39.4			23.6	

Chicken Creek	SC	4060	66	17.3	12.8	135	11.7	91
Clover Meadow	SNOTEL	8600	59	15.7	12.4	127	8.6	69
Cole Creek	SNOTEL	7850	43	11.6	9.9	117	8.4	85
Combination	SNOTEL	5600	22	5.6	4.1	137	4.9	120
Copper Bottom	SNOTEL	5200	43	11.9			7.8	
Copper Camp	SNOTEL	6950	83	33.3			30.1	
Copper Mountain	SC	7700	45	12.9	8	161	6.9	86
Cottonwood Creek	SC	6400	37	9.9	5.2	190	5.6	108
Coyote Hill	SC	4200	51	12.6	7.8	162	9.2	118
Crevice Mountain	SC	8400	42	11.3	8.6	131	7.5	87
Crystal Lake	SNOTEL	6050	40	11	9.1	121	6.4	70
Dad Creek Lake	SC	8800			9.8			
Daisy Peak	SNOTEL	7600	48	12.2	7.2	169	5.2	72
Daly Creek	SNOTEL	5780	42	11.4	8.4	136	9.2	110
Darkhorse Lake	SNOTEL	8600	92	29.4	22.2	132	24.5	110
Deadman Creek	SNOTEL	6450	43	11.2	8	140	5.7	71
Desert Mountain	SC	5600	59	16.1	10.8	149	10	93
Discovery Basin	SC	7050	42	11.9	7.4	161	6.9	93
Divide	SNOTEL	7800	32	6.9	8.1	85	6.1	75
Dix Hill	SC	6400	40	12	8.2	146	8.1	99
Dupuyer Creek	SNOTEL	5750	37	9.4	7.1	132	8.5	120
Eagle Creek	SC	7000					7.4	
East Boulder Mine	SNOTEL	6335	23	7.1			5.4	
El Dorado Mine	SC	7800	51	16.3	12.9	126	8.6	67
Elk Horn Springs	SC	7800	37	10	6.8	147	7.2	106
Elk Peak	SNOTEL	7600	82	29.8			13.1	
Elk Peak	SC	8000	59	18.2	10.4	175	8.8	85
Emery Creek	SNOTEL	4350	64	18.2	12.5	146	11.9	95
Fatty Creek	SC	5500	80	24.8	17.4	143	17.9	103
Fish Creek	SC	8000			7			
Fisher Creek	SNOTEL	9100	134	44.9	25.8	174	32.6	126
Flattop Mtn.	SNOTEL	6300	141	43.8	33.8	130	35.6	105
Fleecer Ridge	SC	7500	42	10.5	7.7	136	8.2	106
Foolhen	SC	8280	59	19	11	173	11.2	102
Forest Lake	SC	6400					6.4	
Four Mile	SC	6900	28	6.8	6	113	6.2	103
Freight Creek	SC	6000	53	14.6	10.4	140	9.8	94
Frohner Meadow	SNOTEL	6480	42	11.6	5.9	197	7.3	124
Garver Creek	SNOTEL	4250	47	12	8	150	9.1	114
Gibbons Pass	SC	7100						
Goat Mountain	SC	7000			7.6			
Government Saddle	SC	5270	107	34.8			22.6	
Grave Creek	SNOTEL	4300	67	18.7	13.5	139	13.5	100
Griffin Creek Divide	SC	5150	38	9.4	8.1	116		
Hand Creek	SNOTEL	5035	50	12	9.5	126	9.5	100
Hawkins Lake	SNOTEL	6450	85	23.4	19.3	121	21.6	112
Haymaker	SC	8050						

Hebgen Dam	SC	6550	35	7.8	9.2	85	8.4	91
Hell Roaring Divide	SC	5770	95	28.9	23.9	121	19.6	82
Herrig Junction	SC	4850	84	24.6	21.2	116	15.8	75
Highwood Divide	SC	5650	18	4	6	67	1.2	20
Highwood Station	SC	4600	19	4	3.6	111	2	56
Holbrook	SC	4530	42	12.6	7.6	166	7.3	96
Hoodoo Basin	SNOTEL	6050	133	39.8	32.3	123	31.8	98
Humboldt Gulch	SNOTEL	4250	61	14.8	9.8	151	10.6	108
Jakes Canyon	SC	9040	48	12.3	9.6	128	15	156
Johnson Park	SC	6450			4.6			
Kishenehn	SC	3890	37	9.4	7.2	131	9.2	128
Kraft Creek	SNOTEL	4750	56	18.4			10.7	
Lake Camp	SC	7780			7.8		12.4	159
Lakeview Canyon	SC	6930			7.2			
Lakeview Ridge	SNOTEL	7400	22	5.1	8.5	60	8.4	99
Lemhi Ridge	SNOTEL	8100	39	8.5	8.1	105	9.5	117
Lick Creek	SNOTEL	6860	36	10	8.2	122	5.7	70
Little Park	SC	7400	52	15.8	11.4	139	10.1	89
Logan Creek	SC	4300	31	6.9	5.5	125	7.4	135
Lolo Pass	SNOTEL	5240	93	28.3	22.9	124	24.5	107
Lone Mountain	SNOTEL	8880	62	20.3	13.2	154	12.8	97
Lookout	SNOTEL	5140	85	23.8	24.5	97	20	82
Lower Twin	SNOTEL	7900	67	18.3	13	141	12.7	98
Lubrecht Flume	SNOTEL	4680	31	9	4.7	191	5	106
Lubrecht Forest No 3	SC	5450	25	6.2	4.4	141	4.6	105
Lubrecht Forest No 4	SC	4650	17	4	2.1	190	2.4	114
Lubrecht Forest No 6	SC	4040	29	7.2	2.7	267	5.4	200
Lubrecht Hydroplot	SC	4200	31	8.9	4.1	217	4.2	102
Lupine Creek	SC	7380			6.4		9.2	144
Madison Plateau	SNOTEL	7750	86	22.9	17.8	129	22.7	128
Many Glacier	SNOTEL	4900	57	16.7	11.5	145	14.2	123
Marias Pass	SC	5250	70	20.3	13.1	155	14.5	111
Mineral Creek	SC	4000	60	18.6	13.9	134	13.8	99
Monument Peak	SNOTEL	8850	89	27.6	15.2	182	17.6	116
Moss Peak	SNOTEL	6780	126	41.7	28.1	148	28.7	102
Moulton Reservoir	SC	6850			6			
Mount Allen No 7	SC	5700						
Mount Lockhart	SNOTEL	6400	80	24.6	15.2	162	18	118
Mudd Lake	SC	7650			15.1		16.9	112
Mule Creek	SNOTEL	8300	66	18	11.2	161	13	116
N Fk Elk Creek	SNOTEL	6250	47	14.2	8.9	160	7.3	82
Nevada Ridge	SNOTEL	7020	63	20.1	10.9	184	12.6	116
New World	SC	6900	42	10.4	10	104	9.9	99
Nez Perce Camp	SNOTEL	5650	46	13.3	10.8	123	11.9	110
Noisy Basin	SNOTEL	6040	146	51.2	31.5	163	29.2	93
Norris Basin	SC	7550			8			
North Fork Jocko	SNOTEL	6330	143	48.8	33.5	146	25.6	76

Northeast Entrance	SNOTEL	7350	44	12.6	8.2	154	10.3	126
Onion Park	SNOTEL	7410	46	11	10.1	109	7.1	70
Ophir Park	SC	7150	54	16.6	11.2	148	10.7	96
Parker Peak	SNOTEL	9400	86	28.3	16	177	26.2	164
Peterson Meadows	SNOTEL	7200	44	11.8	7.1	166	7.5	106
Pickfoot Creek	SNOTEL	6650	44	11.3	8.4	135	10	119
Pike Creek	SNOTEL	5930	36	10.3			7.5	
Pipestone Pass	SC	7200	21	4.5	3.2	141	2.8	88
Placer Basin	SNOTEL	8830	72	22.3	12.8	174	12.3	96
Poorman Creek	SNOTEL	5100	113	39.4	30.9	128	27.6	89
Porcupine	SNOTEL	6500	38	10.1	5.2	194	3.7	71
Potomageton Park	SC	7150	47	13	11.4	114	12.9	113
Revais	SC	4800	11	1.7	1.8	94	1.8	100
Rock Creek Mdws	SC	3400	61	16			14.4	
Rocker Peak	SNOTEL	8000	66	18.5	10.1	183	9	89
Rocky Boy	SNOTEL	4700	25	6.1	4	153	3.5	88
Roland Summit	SC	5120	113	28.6	27	106	26.4	98
S Fork Shields	SNOTEL	8100	62	18	11.8	153	7.9	67
Sacajawea	SNOTEL	6550	57	16.9	11.9	142	10.3	87
Saddle Mtn.	SNOTEL	7940	83	27.4	19	144	17.8	94
Short Creek	SNOTEL	7000	23	4.6	4.4	105	3.7	84
Shower Falls	SNOTEL	8100	76	23.1	15.6	148	13.2	85
Skalkaho Summit	SNOTEL	7250	79	23.1	17.5	132	16.2	93
Sleeping Woman	SNOTEL	6150	57	16.2	12.2	133	14.9	122
Slide Rock Mountain	SC	7100	54	16.2	10.1	160	9.3	92
Spotted Bear Mountain	SC	7000	60	19.9	10.7	186	8.6	80
Spur Park	SNOTEL	8100	81	23.2	15.5	150	13.3	86
Stahl Peak	SNOTEL	6030	107	34.5	27.5	125	33	120
Stemple Pass	SC	6600	47	12.6	7	180	7.7	110
Storm Lake	SC	7780	50	14.2	9.5	149	9.1	96
Stringer Creek	SNOTEL	6550	40	9.9	8.6	115	5.9	69
Stryker Basin	SC	6180	93	27	25	108	24.7	99
Stuart Mountain	SNOTEL	7400	110	34.9	25.9	135	25.2	97
Taylor Road	SC	4080	23	5.8	3	193	2.8	93
Ten Mile Lower	SC	6600	46	12	5.4	222	6.4	119
Ten Mile Middle	SC	6800	50	13.6	7.5	181	6.9	92
Tepee Creek	SNOTEL	8000	44	9.1	10.6	86	10.1	95
Timberline Creek	SC	8850	53	15.2	9.2	165	12.1	132
Tizer Basin	SNOTEL	6880	37	9.2	7.3	126	6.9	95
Trinkus Lake	SC	6100	134	46.1	32.4	142	27.4	85
Truman Creek	SC	4060	19	4.9	4	123	4.8	120
Twelvemile Creek	SNOTEL	5600	68	15.6	13.8	113	14.7	107
Twenty-One Mile	SC	7150	55	15.1	12.4	122	15.9	128
Twin Lakes	SNOTEL	6400	129	43.8	30.2	145	27.6	91
Upper Holland Lake	SC	6200	125	42.7	26	164	22.4	86
Waldron	SNOTEL	5600	47	13.7	8.9	154	11	124
Warm Springs	SNOTEL	7800	91	28.8	14.8	195	13.9	94

Weasel Divide	SC	5450	104	31.4	26.2	120	26.3	100
West Yellowstone	SNOTEL	6700	46	11.8	9	131	11.8	131
Whiskey Creek	SNOTEL	6800	58	13.7	12	114	13.8	115
White Elephant	SNOTEL	7710	90	22.1	20.4	108	22.9	112
White Mill	SNOTEL	8700	102	35.9	18.3	196	25	137
Wolverine	SNOTEL	7650	52	18.5	8.5	218	13.9	164
Wood Creek	SNOTEL	5960	46	12.2	7.5	163	7.6	101
Wrong Creek	SC	5700	55	16.2	8.8	184	11.8	134
Wrong Ridge	SC	6800			12.4		16.3	131
Younts Peak	SNOTEL	8350			11.7		22.5	192

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Montana
Water Supply Outlook
Report
Natural Resources Conservation Service

