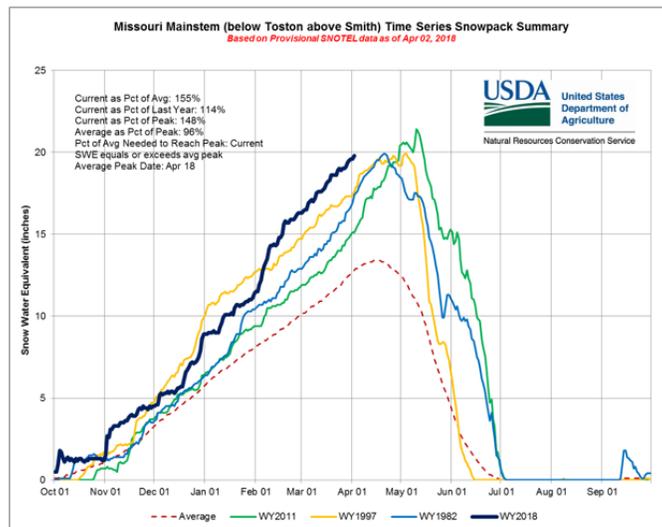
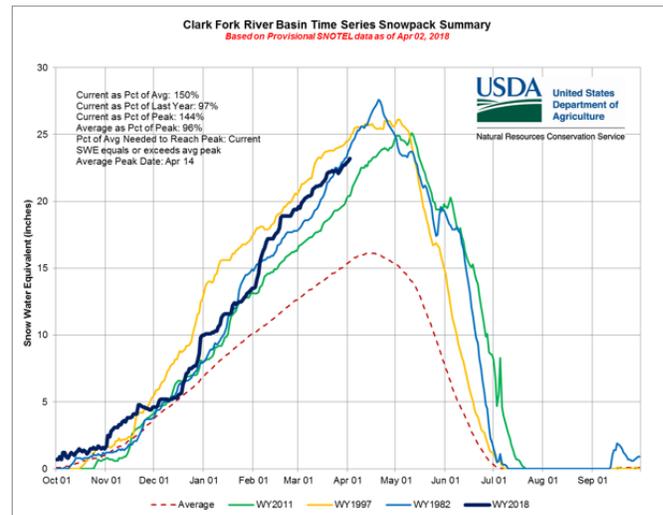
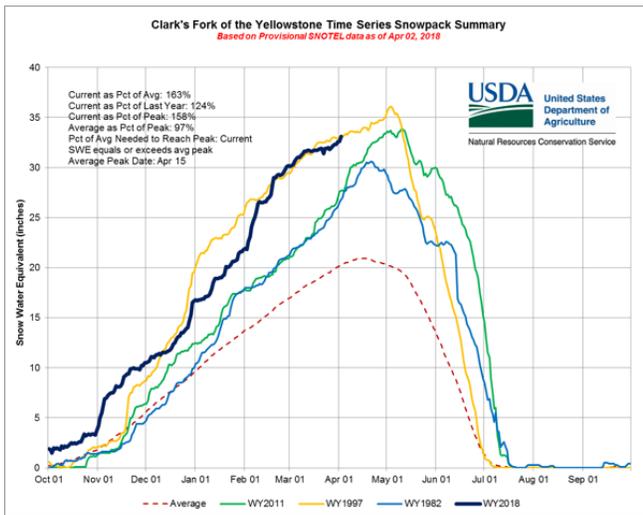


Montana

Water Supply Outlook Report

April 1st, 2018



The above graphics compare the snowpacks of 1982, 1997 and 2011 to the current water year (2018) in the Clark Fork, Clark's Fork of the Yellowstone, and the mountains of the Missouri Mainstem near Helena. All three areas are experiencing record, or near record, snowpack for this time of year. At this time, only a few SNOTEL sites in the Clark's Fork River basin have set new records for peak snow water equivalent (SWE), but there is a lot of winter still left to come. The rest of the state remains well above normal for snowpack on April 1st but hasn't been record setting. With long-range forecasts indicating little change to the cool and wet pattern that has persisted throughout this winter, some additional records may fall as we reach peak snowpack this spring in Montana's river basins.

For more water supply and resource management information, contact:

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Montana Water Supply Outlook Report as of April 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

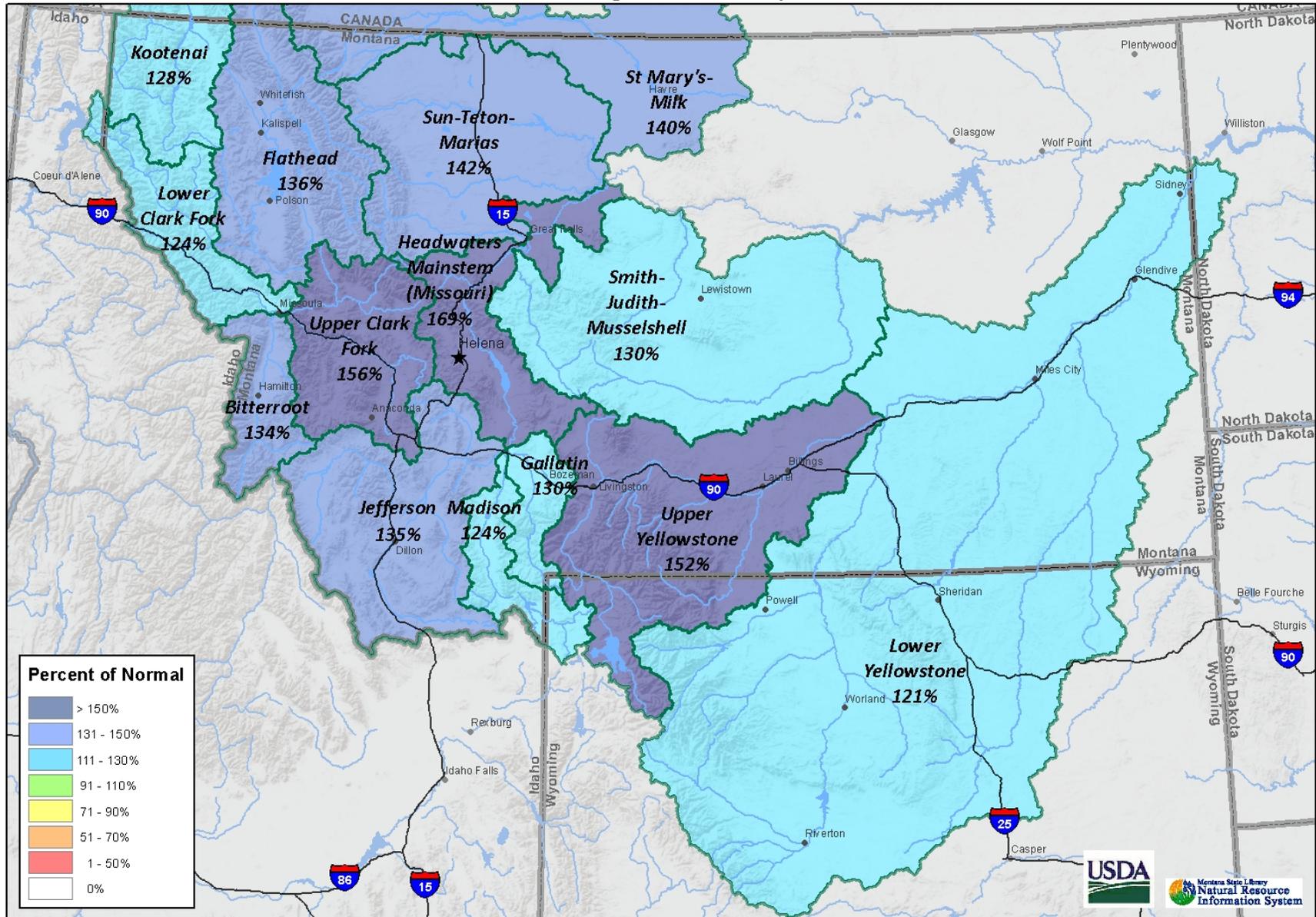
One thing is for sure; it's been a snowy winter across the state of Montana. Unlike February, snowfall wasn't record-breaking in the state during March, but it was sufficient to keep the snowpack near to well above normal on April 1st. A pattern shift occurred over the month weather-wise, with southwest flow finally delivering snowfall to the southwest portion of the state, especially in the Red Rocks River basin, which was the only region that was well below normal last month. Fortunately, conditions improved over the month in this region, and now all river basins across the state have a snowpack that is AT LEAST normal for today's date. Last month, records were set for both monthly totals for February snowfall, and for total snowpack accumulation on March 1st. Many snowpack measuring locations that feed Montana's rivers and streams remain record for April 1st. 10 SNOWpack TElemetry (SNOTEL) and snowcourse locations remain the highest on record for this date, and 12 measurement locations are the second highest on record. These sites can be found in the mountains that feed the Upper Yellowstone River, Upper Clark Fork and Missouri Mainstem River basins, where snowfall has been abundant throughout the winter months. Although not record-setting like these regions, the snowpack in other river basins across the state is well above normal for this time.

There is still a lot more winter yet to come for the mountains across the state, and many measurement locations have already reached, or exceeded, the normal amount of snow water that is typically contained in the snowpack before runoff occurs. How are we comparing to other big snowpack years? A few years that could be referenced as comparable years; 1972, 1997, 2011 and 2014 were all big winters across the state. It is important to note that these year's experienced peak snowpack during late-April to mid-May. At a few locations in the Clark's Fork of the Yellowstone we have already exceeded the peak snowpack experienced during these years as of April 1st, but in most locations, we still fall below these years with regards to the peak snow water equivalent (SWE). April will be critical in determining how much snow water is available for runoff this spring, and the weather during May and June will largely determine the timing and volumes experienced on a day-to-day and week-by-week basis. Above normal snowpack is great news for long-duration water supply, but water users should be aware that there could be other implications as spring and summer approaches in some basins. The May 1st measurements should provide some insights into what to expect later this runoff season.

Snow Water Equivalent

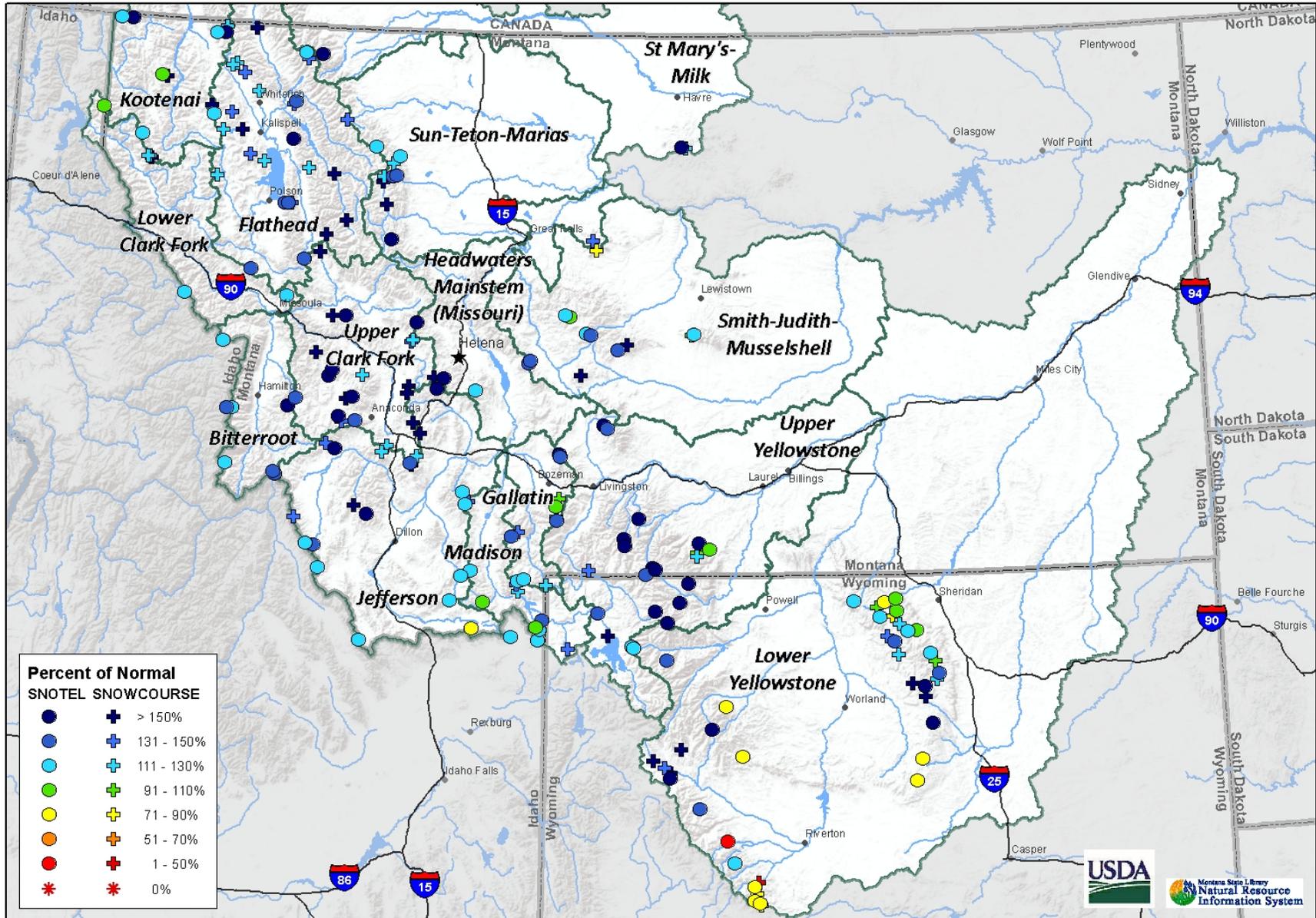
4/1/2018	% Normal	% of Last Year
Columbia River Basin	137	134
Kootenai in Montana	128	122
Flathead in Montana	136	130
Upper Clark Fork	156	170
Bitterroot	134	128
Lower Clark Fork	124	117
Missouri River Basin	133	145
Jefferson	135	134
Madison	124	118
Gallatin	130	148
Headwaters Mainstem	169	190
Smith-Judith-Musselshell	130	186
Sun-Teton-Marias	142	122
St. Mary-Milk	140	149
Yellowstone River Basin	135	102
Upper Yellowstone	152	128
Lower Yellowstone	121	85
West of Divide	137	134
East of Divide	133	119
Montana State-Wide	137	137

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



Note: Data includes SNOTEL and Snowcourse Measurements on April 1, 2018

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



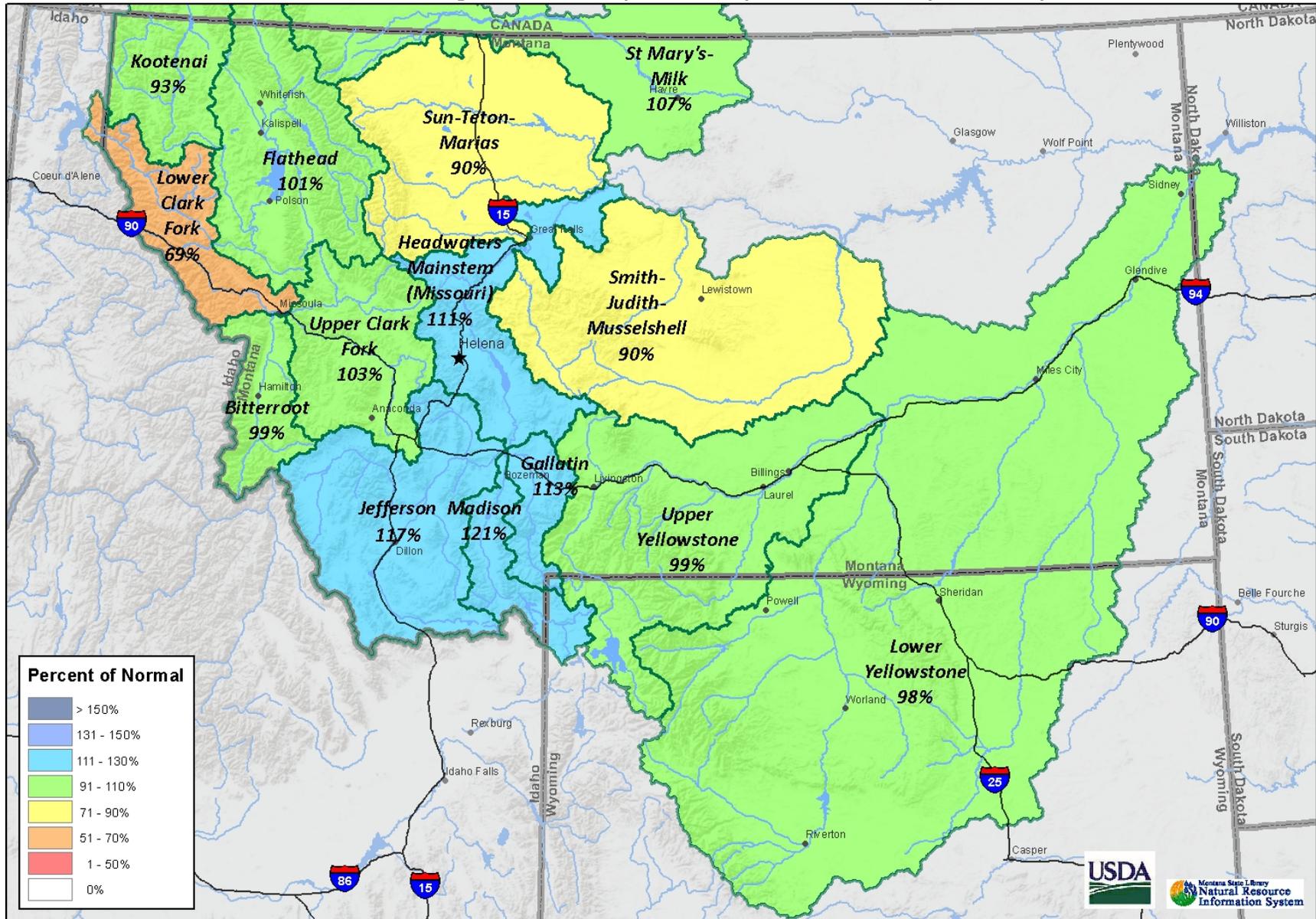
Precipitation - Overview

Snowfall and precipitation favored the southwest portion of the state over the course of March; moist southwest flow dropped above normal precipitation in the mountains and valleys of the Madison, Jefferson and Gallatin River basins. West of the Divide, mountain locations were favored over valleys during the month, with some areas reporting below average precipitation totals. Central and south central basins experienced an opposite trend with valley locations favored over mountain locations. Water-Year precipitation remains well above average at all mountain SNOTEL locations across the state, but behind last year at this time. Last year heavy October and November precipitation front-loaded the water year totals, which to some extent biased the winter precipitation totals when compared to snowpack totals for the water-year. Precipitation has been consistent from month to month this year, leaving almost all mountain locations in good standing on April 1.

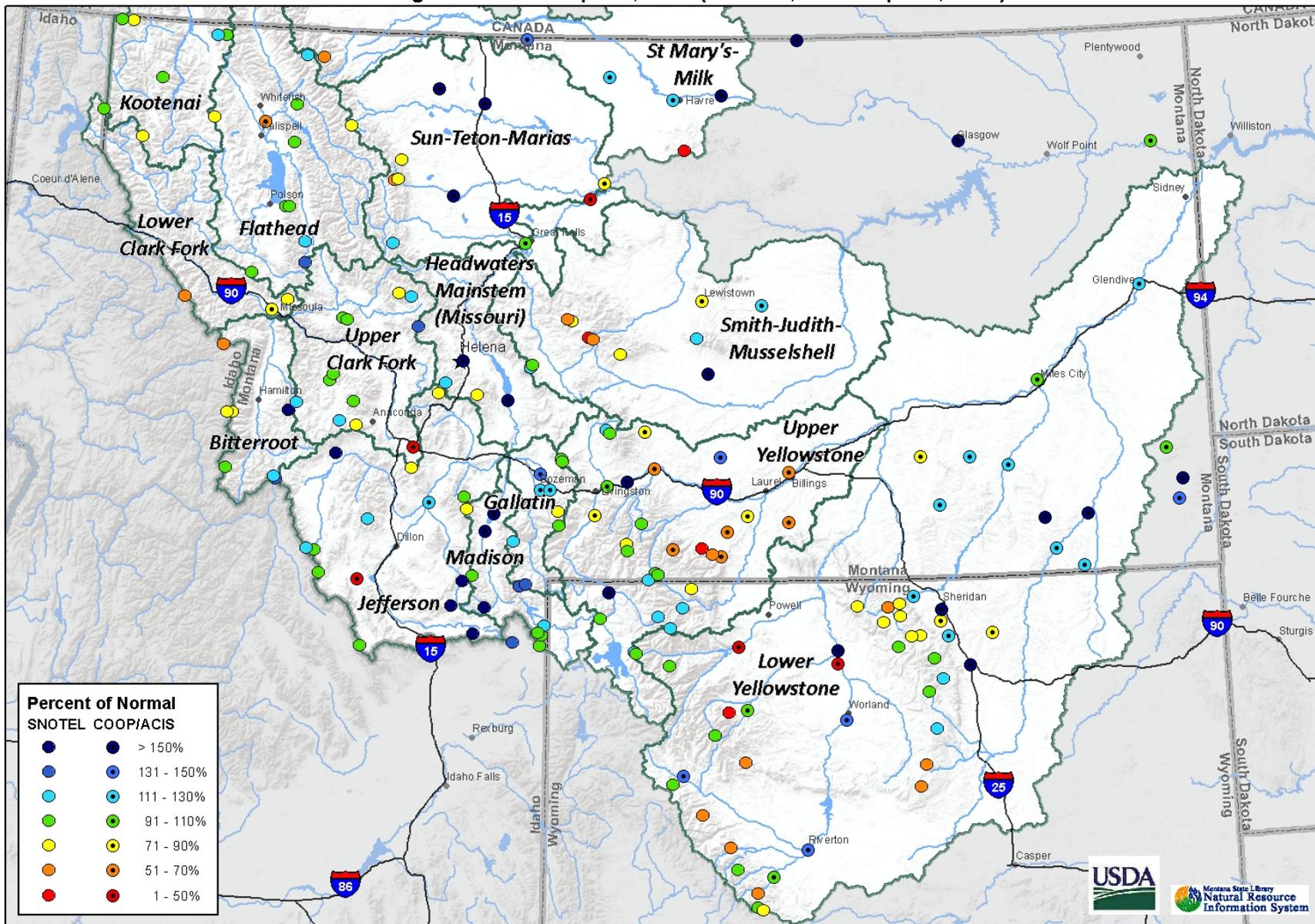
Precipitation

4/1/2018	Monthly % Avg	Water Year % Avg	WY % of Last Year
Columbia River Basin	93	123	95
Kootenai in Montana	93	113	81
Flathead in Montana	101	129	96
Upper Clark Fork	103	130	114
Bitterroot	99	119	100
Lower Clark Fork	69	115	85
Missouri River Basin	111	119	95
Jefferson	117	111	93
Madison	121	113	82
Gallatin	113	124	98
Headwaters Mainstem	111	137	120
Smith-Judith-Musselshell	90	117	111
Sun-Teton-Marias	90	136	104
St. Mary-Milk	107	130	88
Yellowstone River Basin	98	122	83
Upper Yellowstone	99	138	95
Lower Yellowstone	98	108	72
West of Divide	93	123	95
East of Divide	103	121	89
<i>Montana State-Wide</i>	102	124	95

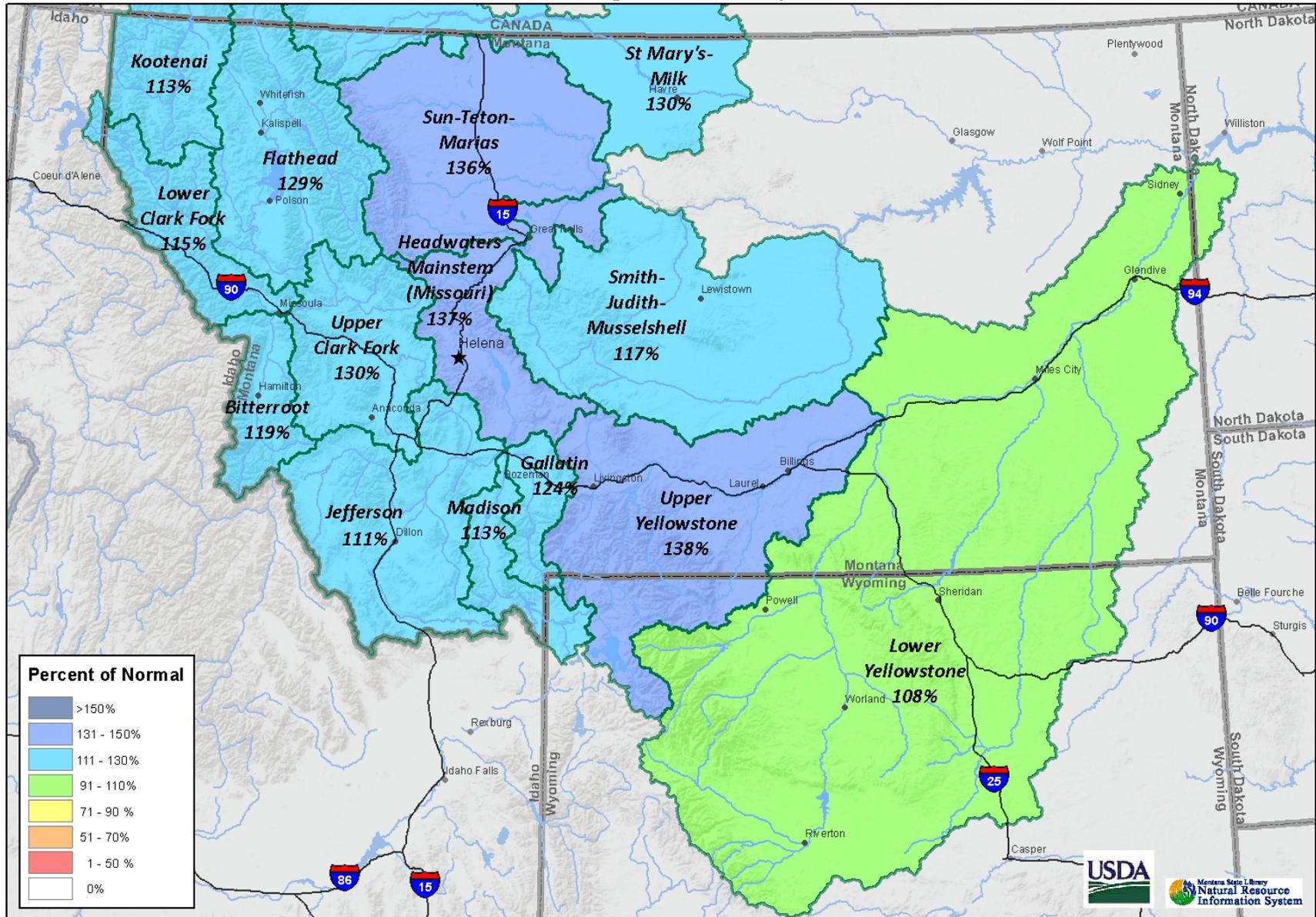
**Montana Data Collection Office
 Monthly Precipitation
 Basin Percentage of Normal - April 1, 2018 (March 1, 2018 - April 1, 2018)**



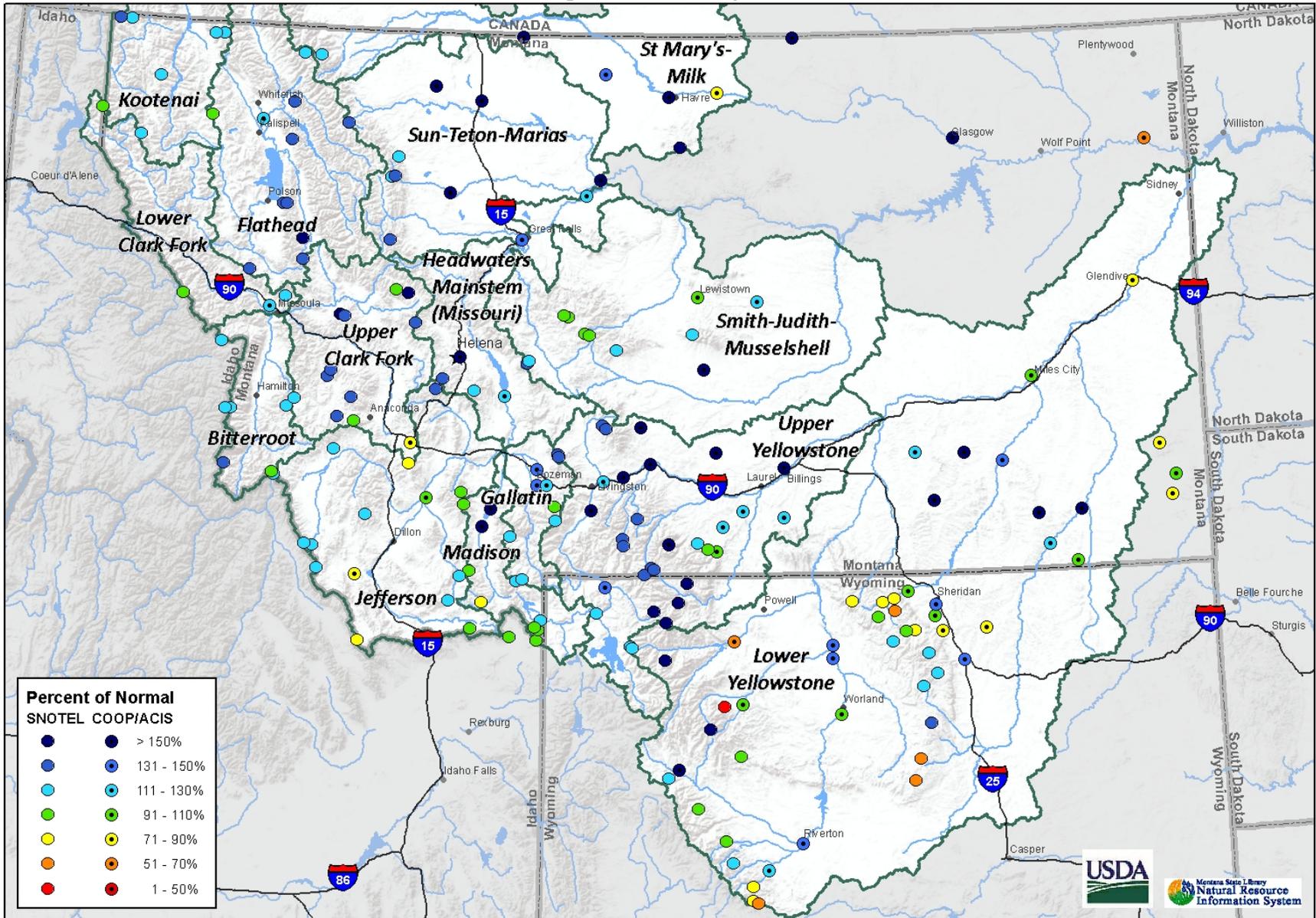
Montana Data Collection Office
 Monthly Precipitation
 Percentage of Normal - April 1, 2018 (March 1, 2017 - April 1, 2018)



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



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



Reservoirs - Overview

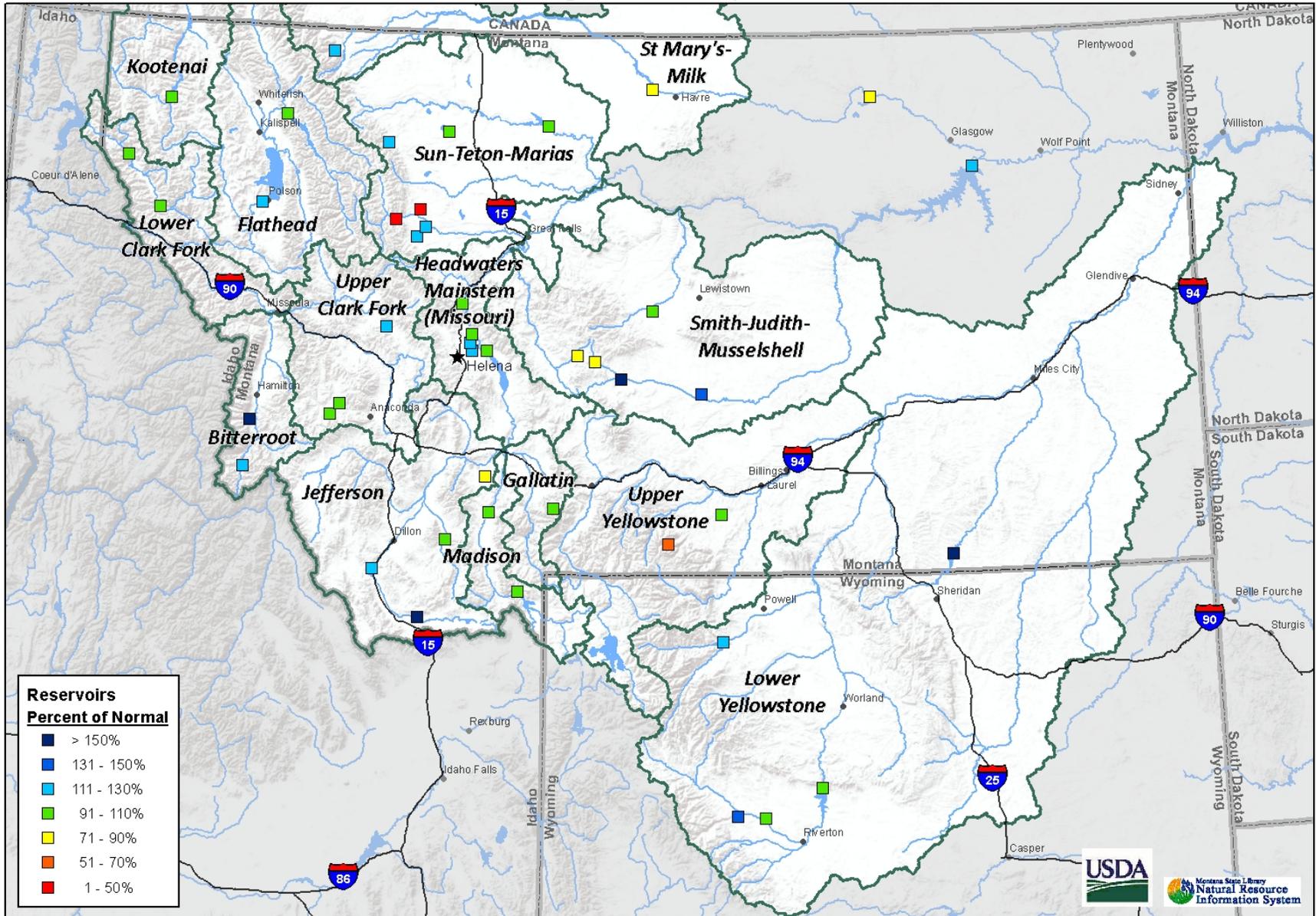
Many reservoir operators find themselves in a quandary this water year. Abundant snowpack in the mountains in many river basins has almost assured average to well above average runoff this spring and summer. The questions that remain are; when will the runoff begin, and how quickly will it melt? A few years in recent memory, 2011 and 2014, provided very different outcomes when it came to runoff. The snowpack of 2011 was accompanied by record spring precipitation, which combined with downstream flooding on the Missouri in neighboring states, compounded the reservoir management in Montana. On the other hand, the large snowpack of 2014 experienced runoff in an ideal fashion. Periods of melt were slowed by cool weather, which caused a slow release of the well above normal snowpack into the rivers and streams. With these scenarios in mind, some water managers are opting to take the conservative approach with regards to operations to make sure that agricultural water supply is available when needed but also providing room in the reservoirs to mitigate the impacts of potential high water. Reservoir management is a complicated process with various stakeholders involved. The good news is there will be plenty of water to fill the reservoirs in the state. Managing the inflows and outflows for multiple uses will be the tricky part.

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

Reservoir Storage

<i>4/1/2018</i>	<i>% Average</i>	<i>% Capacity</i>	<i>% Last Year</i>
Columbia River Basin	99	49	76
Kootnenai in Montana	91	38	75
Flathead in Montana	105	57	74
Upper Clark Fork	100	76	93
Bitterroot	144	52	81
Lower Clark Fork	100	93	93
Missouri River Basin	115	78	98
Jefferson	128	68	119
Madison	107	76	97
Gallatin	99	54	97
Headwaters Mainstem	118	82	99
Smith-Judith-Musselshell	133	77	113
Sun-Teton-Marias	100	52	92
St. Mary-Milk	88	41	63
Yellowstone River Basin	100	57	100
Upper Yellowstone	107	47	89
Lower Yellowstone	100	57	100
West of Divide	99	49	76
East of Divide	114	76	98
<i>Montana State-Wide</i>	110	68	92

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



Streamflow - Overview

Forecasts haven't changed significantly since March 1st, and continue to predict above average streamflows for most of the state for the April 1st – July 31st period, and April 1st – September 30th. The highest forecasts in the state can be found in the Upper Clark Fork and Upper Yellowstone River basins, where flows are expected to be well above average, and could approach record levels. The lowest forecasts in the state are in the Upper Beaverhead River basin where flows are expected to be 95% to 100% of average. This is a significant improvement in this area since last month, the moist southwest flow favored the mountains of this region in March.

Moving forward it is important to remember that the median, or 50% forecast, assumes normal precipitation and temperatures through the period. Should cool and wet weather build the snowpack into record territory, and delay snowmelt from lower elevations, the 30% exceedance or 10% exceedance should be considered as they better represent anomalously "wet" conditions in the future. Conversely, if conditions turn warm and dry (hopefully not!) then the 70% and 90% values should be considered. It will interesting to see what happens during the course of April.

<i>River Basin</i>	APR-JUL 50 % Exceedance Forecasts		
	Highest Point Forecast*	Lowest Point Forecast**	Basin Avg Forecast***
<i>Columbia River Basin</i>	231%	107%	134%
Kootenai River Basin	124%	110%	118%
Flathead River Basin	158%	112%	131%
Upper Clark Fork	231%	148%	170%
Bitterroot River Basin	128%	113%	121%
Lower Clark Fork	144%	107%	130%
<i>Missouri River Basin</i>	174%	95%	125%
Jefferson	161%	95%	126%
Madison	114%	111%	113%
Gallatin	123%	115%	120%
Headwaters Mainstem	135%	128%	132%
Smith Judith Musselshell	174%	117%	141%
Sun Teton Marias	141%	99%	123%
St Mary	123%	119%	121%
<i>Yellowstone River Basin</i>	194%	83%	133%
Upper Yellowstone	194%	97%	147%
Lower Yellowstone	159%	83%	119%

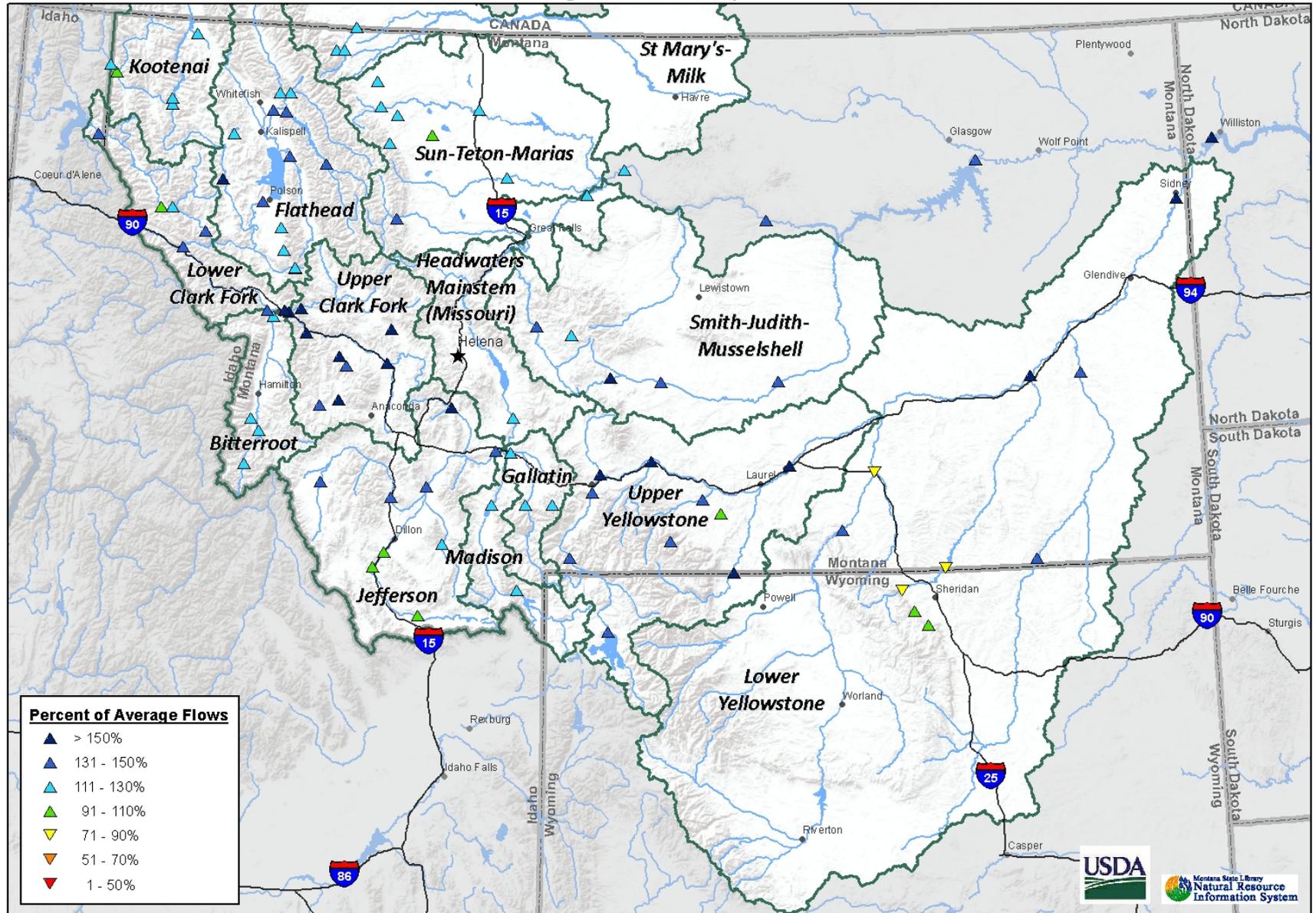
NOTE: Streamflow forecasts are issued for multiple points on rivers and streams within a major river basin and are given as a range of exceedance probabilities. Consult the individual river basin of interest to see the range of values for streams of interest.

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

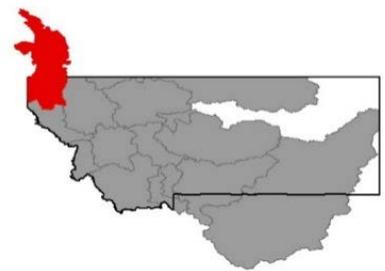
**Lowest point forecast is the lowest 50% forecast of all forecast points within the basin

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

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



Kootenai River Basin



Following a very wet February, precipitation was slightly below average during March in the Kootenai River basin. But don't let that be a concern, this water year has brought above-average precipitation to the basin. With the exception of some storms, most of this winter's precipitation came in the form of snow at all elevations, and all NRCS snow sites in the basin have an above-normal snowpack. Lower elevation sites within the basin have over 1.5 times their typically April 1st snowpack. These low elevation sites normally begin snowmelt near the end of March, but recent forecasts indicate more cool wet weather is on the way. All SNOTEL sites within the basin have exceeded their normal peak snowpack values. Higher elevation sites like Bear Mountain SNOTEL typically don't peak until late April. It's safe to say there is no lack of water available in the mountains of the Kootenai River Basin. The timing of the runoff will depend on how the weather plays out over the next couple months. April through June can bring significant precipitation the region, so it is advised to read the May 1st, 2018 NRCS Water Supply Outlook Report and monitor National Weather Service web pages for weather and daily runoff forecasts this runoff season. Currently, April-July streamflows are forecasted to be above average in the Kootenai River basin.

Kootenai River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
<i>KOOTENAY in CANADA</i>	93%	141%
<i>KOOTENAI MAINSTEM</i>	117%	96%
<i>TOBACCO</i>	135%	116%
<i>FISHER</i>	135%	100%
<i>YAAK</i>	131%	126%
<i>KOOTENAI RIVER BASIN in MONTANA</i>	128%	105%
<i>KOOTENAI ab BONNERS FERRY</i>	122%	118%
Basin-Wide Snowpack	128%	105%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	93%	113%	139%
Valley Precipitation	%	%	%
Basin-Wide Precipitation	93%	113%	139%

*WYTD Precipitation is October 1st- Current

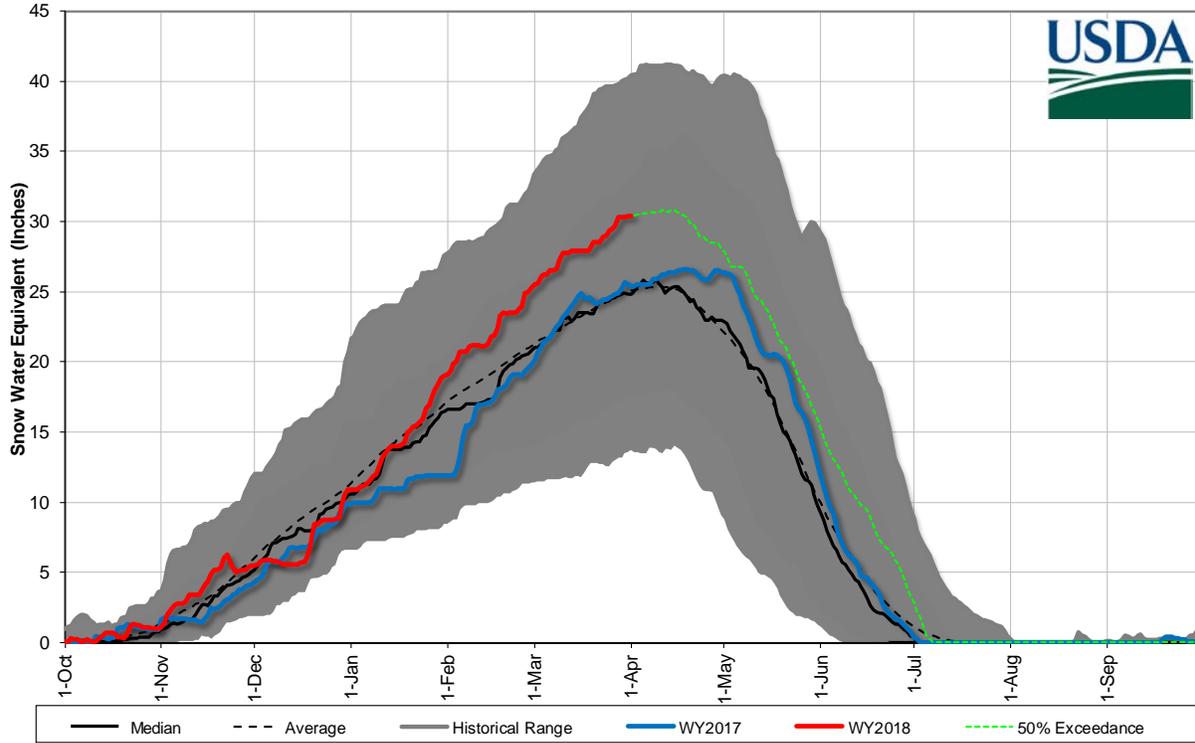
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Reservoir Storage	91%	38%	122%

*See Reservoir Storage Table for storage in individual reservoirs

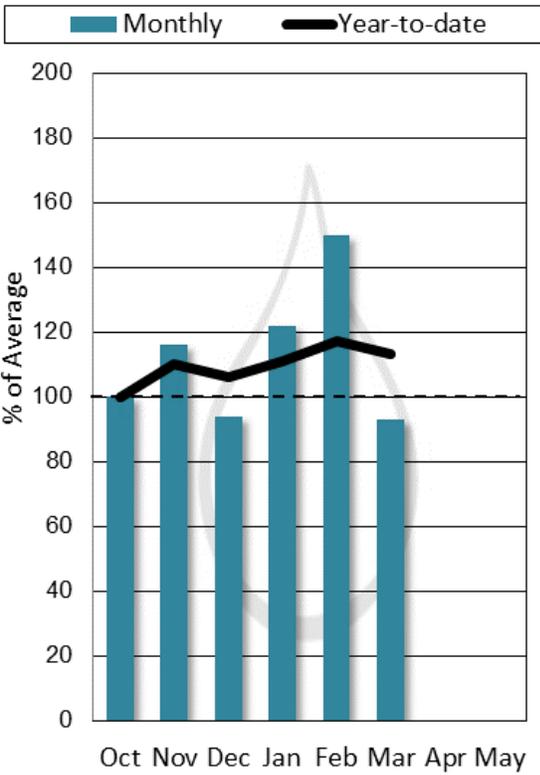
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Lake Koocanusa	2192.9	2940.1	2408.0	5748.0	91%	38%

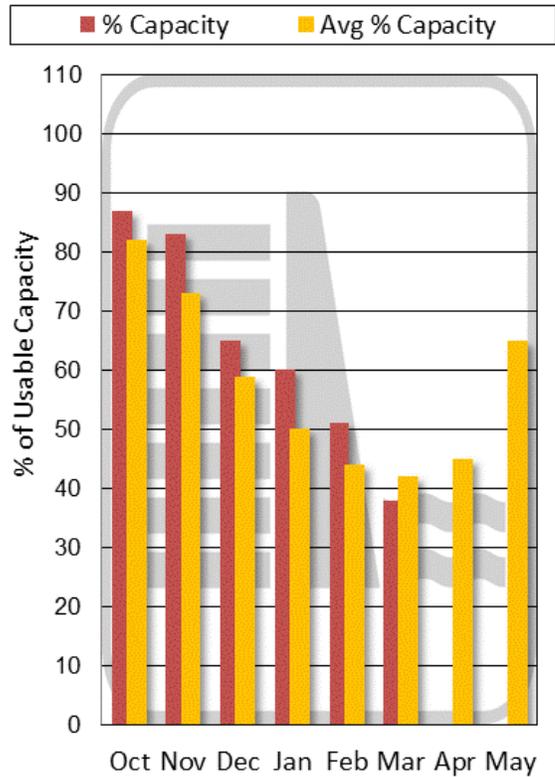
Kootenai River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 4/1/2018



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.

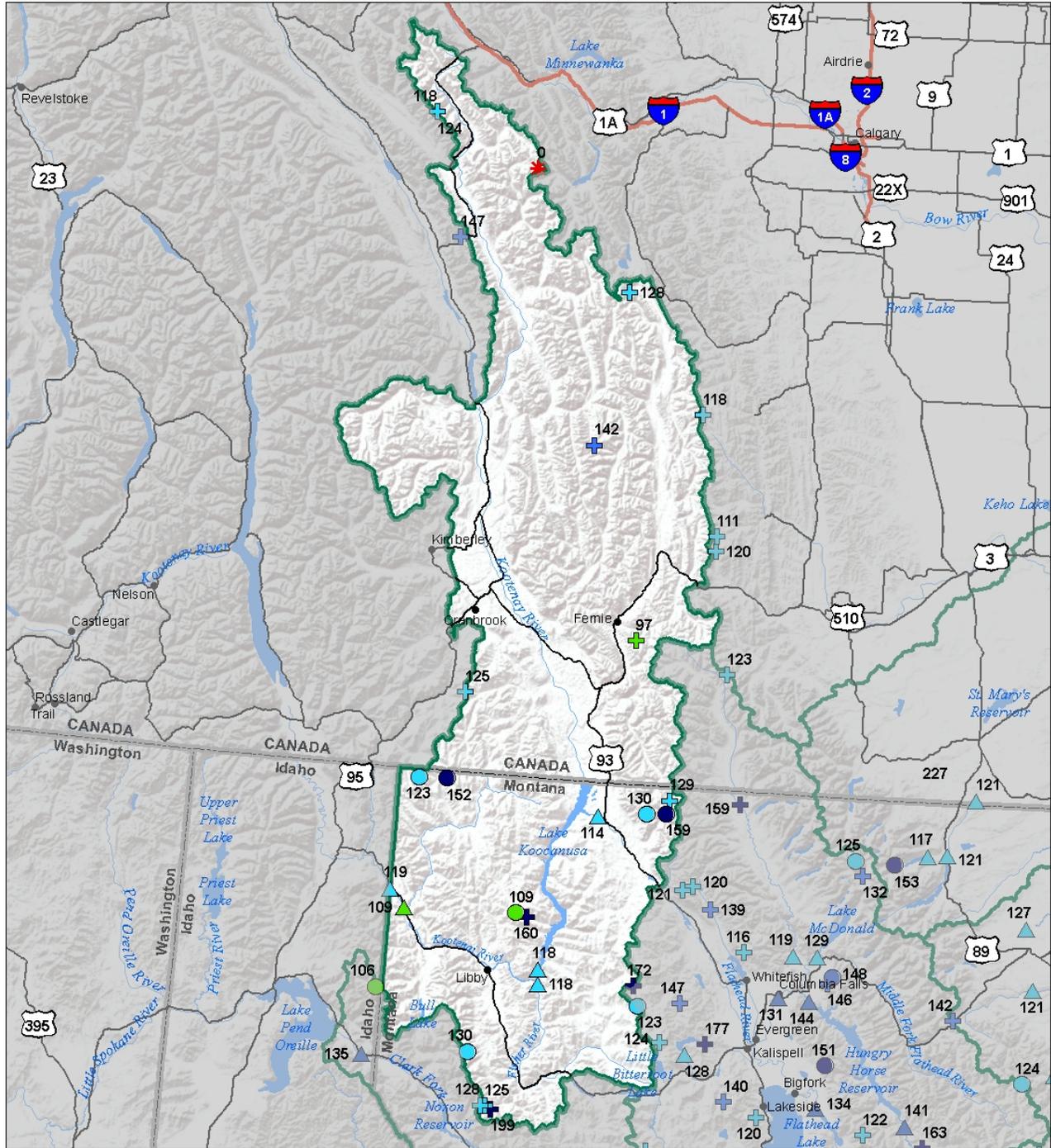
Kootenai River Basin

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	114	133	145	115%	158	176	126
	APR-SEP	124	145	160	114%	174	195	140
Libby Reservoir Inflow ¹	APR-JUL	5660	6260	6540	122%	6810	7420	5340
	APR-SEP	6500	7120	7400	118%	7680	8300	6250
Fisher R nr Libby	APR-JUL	196	225	245	120%	265	290	205
	APR-SEP	210	240	260	118%	280	310	220
Yaak R nr Troy	APR-JUL	360	420	460	110%	495	555	420
	APR-SEP	375	435	480	109%	520	580	440
Kootenai R at Leonia ^{1,2}	APR-JUL	7090	7830	8170	124%	8500	9240	6600
	APR-SEP	7980	8730	9070	119%	9410	10200	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 April 1, 2018



Snow Water Equivalent Percent of Normal

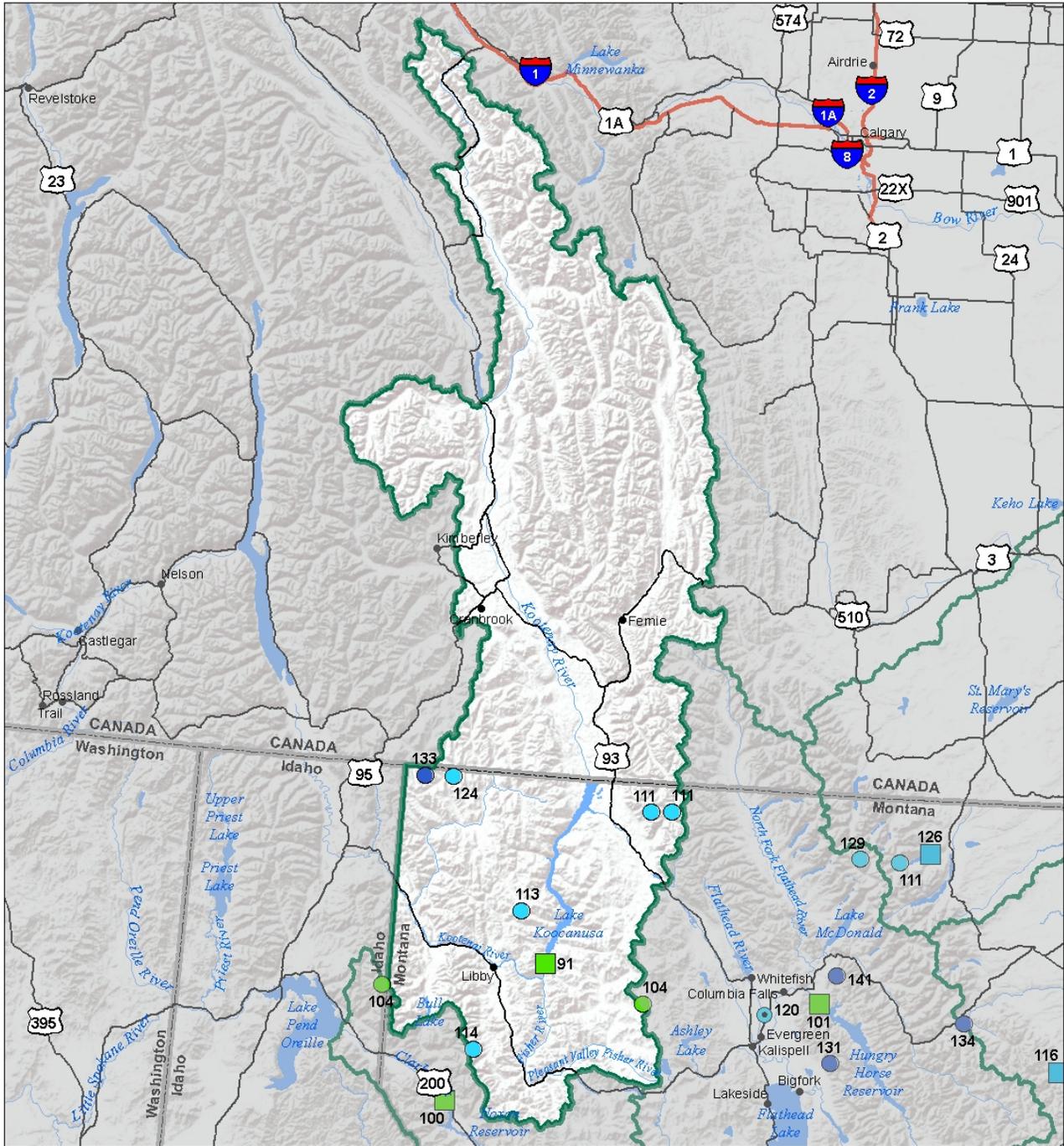
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

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 April 1, 2018

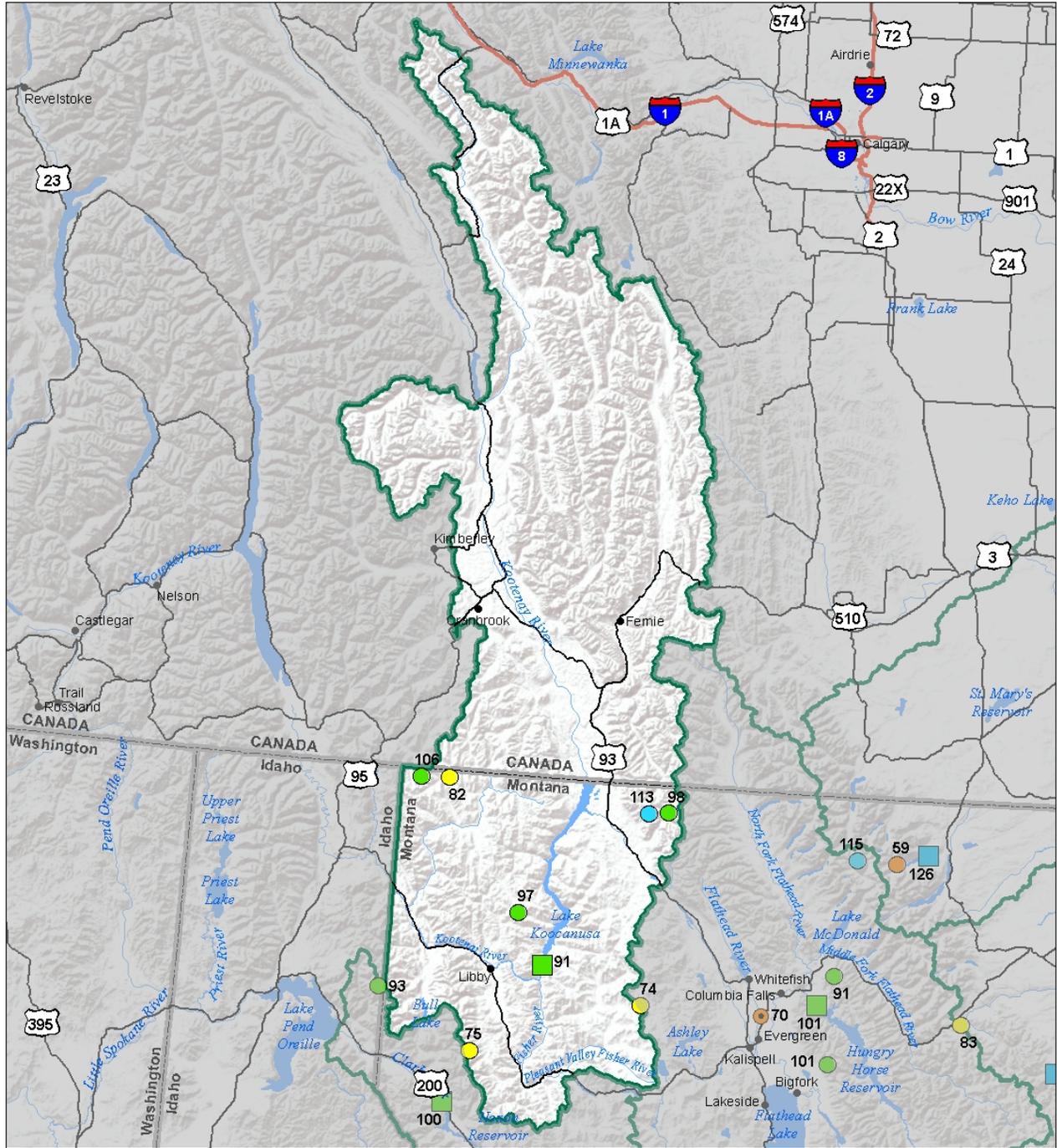


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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

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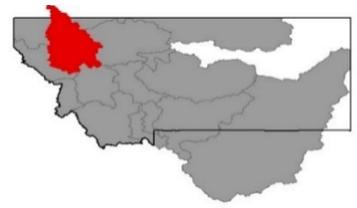
Kootenai River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal April 1, 2018 (March 1, 2018 - April 1, 2018)



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%





Flathead River Basin

Residents of the Flathead region need not worry about a lack of runoff this year. This winter has consistently brought above-average precipitation to all elevations within the basin. Following a very wet February, March was back to normal receiving near average precipitation. All NRCS snow measurement locations within the Flathead River basin currently have an above-normal snowpack. Several of these sites have near record snow water content. At 146 inches of depth, 59.3 inches of water and rising, Noisy Basin SNOTEL near Big Fork currently has the highest water content of all SNOTEL sites in Montana. Holding that statistic isn't rare for Noisy Basin SNOTEL. However, it normally peaks at only about 44 inches of snow water near the end of April. All SNOTEL sites within the Flathead River basin have already exceeded their normal peak snowpack values. April through June typically brings significant moisture to the basin. As usual, spring weather will dictate the rate at which this substantial amount of water enters our waterways. Be sure to read the May 1st, 2018 NRCS Water Supply Outlook Report and monitor National Weather Service web pages for weather and daily runoff forecasts this runoff season. Currently, April-July streamflows are forecasted to be well above average in the Flathead River basin.

Flathead River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
NF FLATHEAD in CANADA	123%	111%
NF FLATHEAD in MONTANA	130%	109%
MIDDLE FORK FLATHEAD	131%	114%
SOUTH FORK FLATHEAD	148%	99%
STILLWATER-WHITEFISH	127%	102%
SWAN	142%	101%
MISSION VALLEY	134%	104%
LITTLE BITTERROOT-ASHLEY	130%	103%
JOCKO	136%	105%
FLATHEAD in MONTANA	136%	105%
Basin-Wide Snowpack	136%	105%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	101%	129%	135%
Valley Precipitation	70%	120%	185%
Basin-Wide Precipitation	101%	129%	135%

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

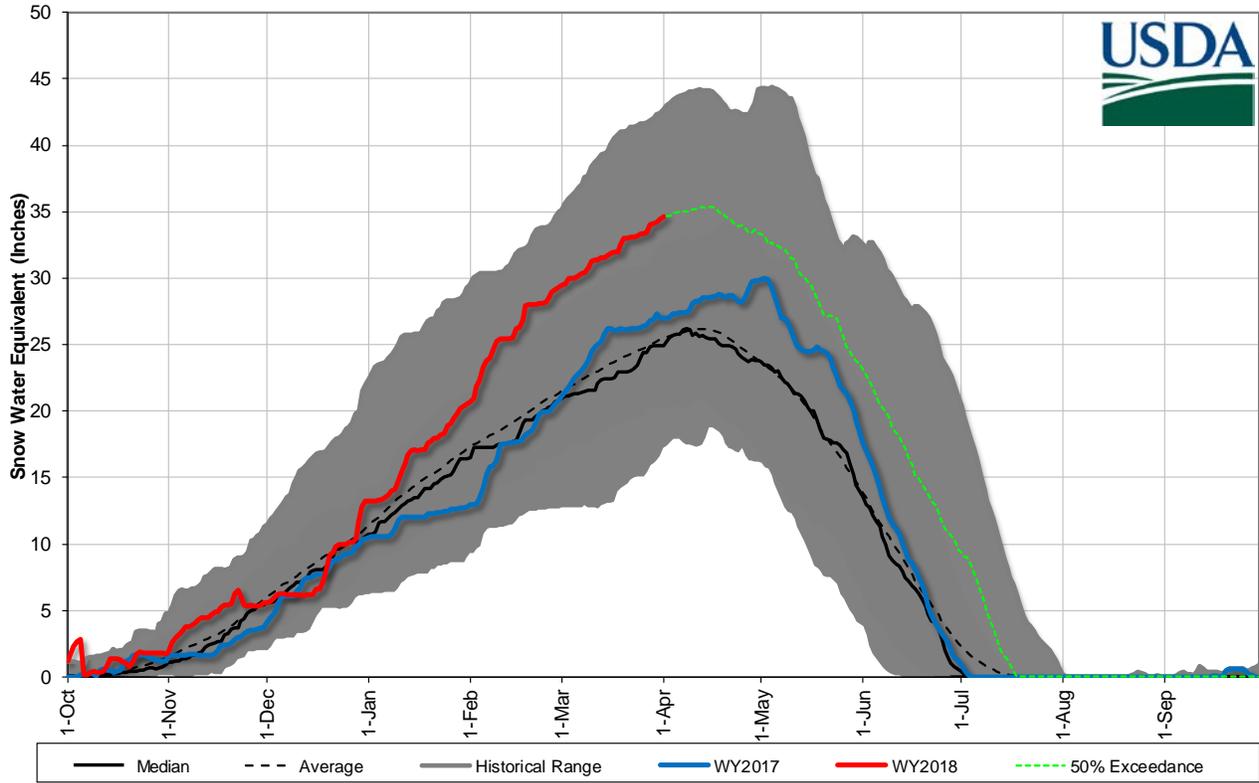
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Reservoir Storage	105%	57%	141%

*See Reservoir Storage Table for storage in individual reservoirs

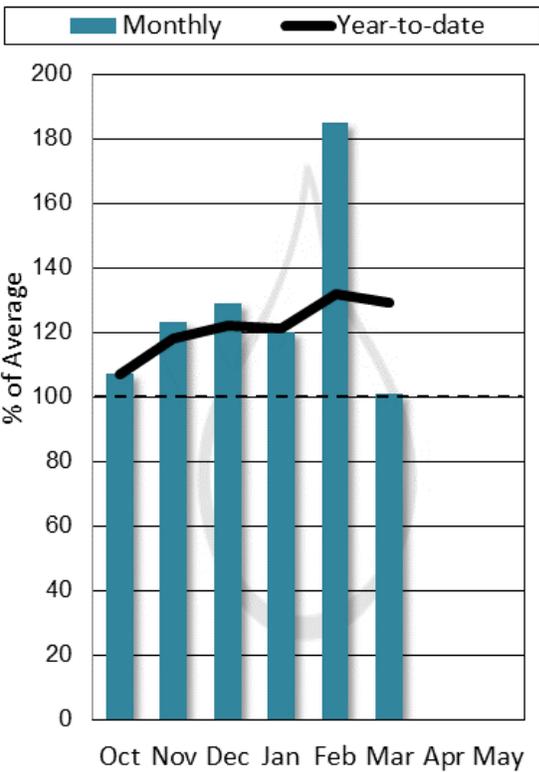
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Camas (4)		28.3	22.5	45.2		
Lower Jocko Lake		0.1	0.0	6.4		
Mission Valley (8)		37.6	33.7	100.0		
Hungry Horse Lake	2109.2	2918.5	2081.0	3451.0	101%	61%
Flathead Lake	884.6	1080.0	762.6	1791.0	116%	49%

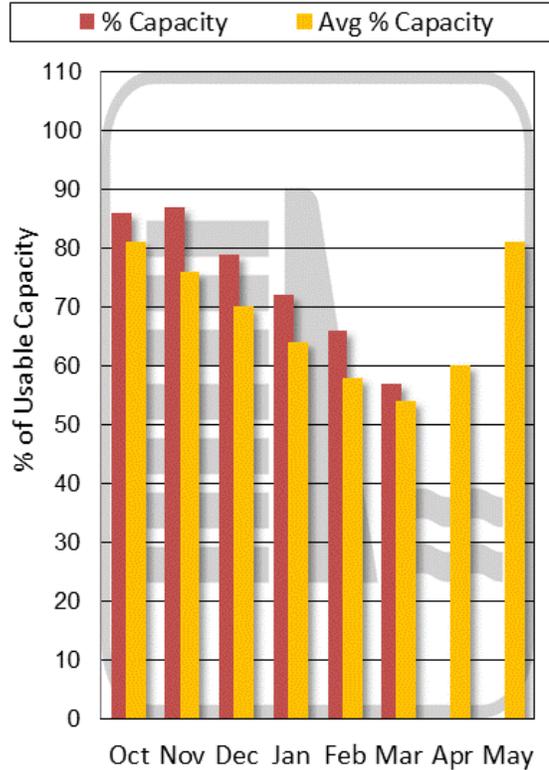
Flathead River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 4/1/2018



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.

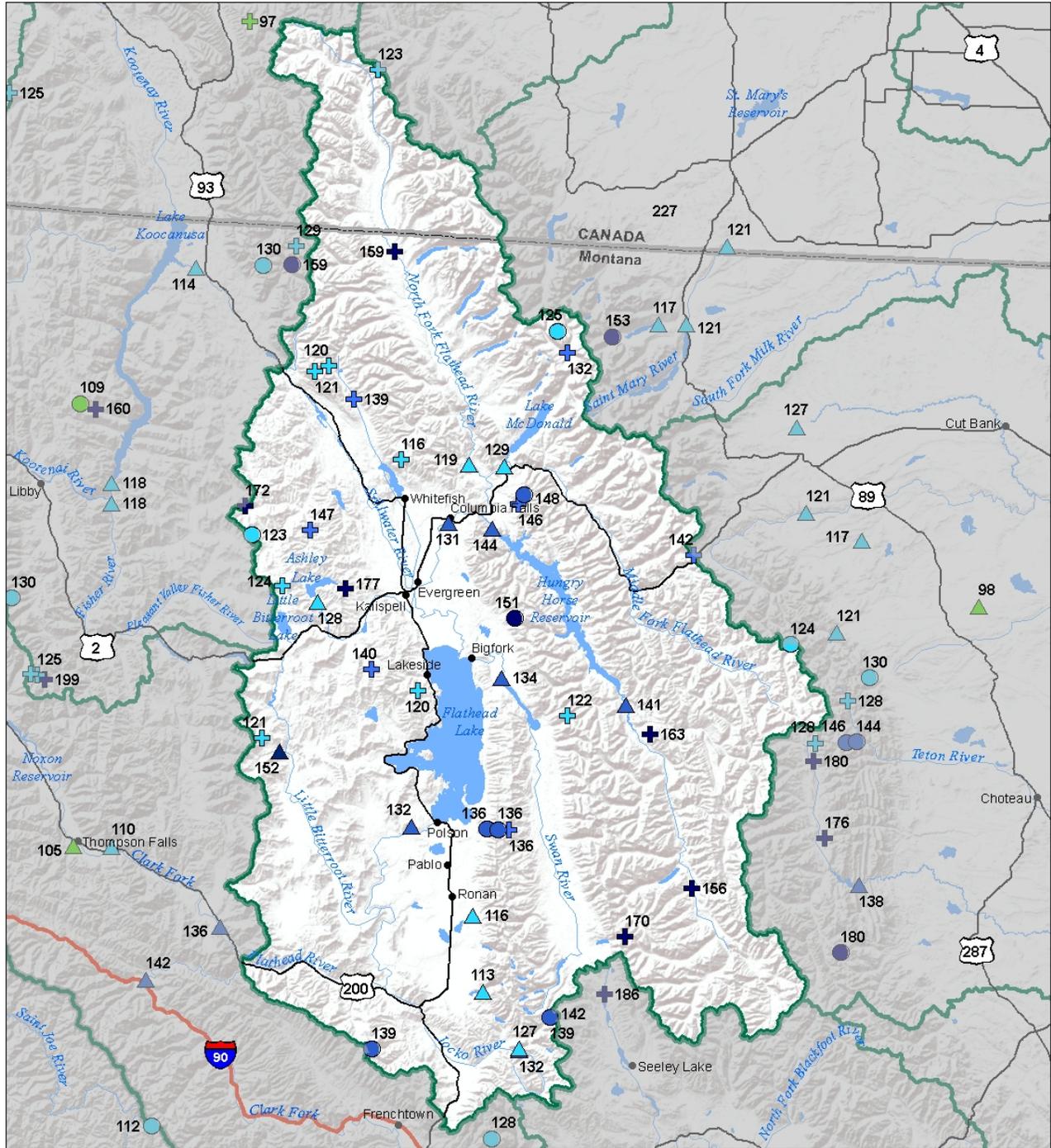
Flathead River Basin

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	1630	1760	1840	119%	1920	2040	1540
	APR-SEP	1800	1930	2030	119%	2120	2260	1700
MF Flathead R nr West Glacier	APR-JUL	1720	1850	1940	129%	2030	2160	1500
	APR-SEP	1870	2010	2110	129%	2200	2340	1630
Sf Flathead R nr Hungry Horse	APR-JUL	1560	1650	1720	142%	1790	1880	1210
	APR-SEP	1650	1750	1820	141%	1890	2000	1290
Hungry Horse Reservoir Inflow ^{1,2}	APR-JUL	2330	2580	2700	145%	2810	3070	1860
	APR-SEP	2450	2730	2850	144%	2980	3250	1980
Flathead R at Columbia Falls ²	APR-JUL	5950	6340	6600	131%	6870	7260	5020
	APR-SEP	6410	6840	7140	131%	7440	7880	5450
Ashley Ck nr Marion ²	APR	1.65	2.5	3.1	119%	3.7	4.5	2.6
	APR-JUL	6.1	7.4	8.3	128%	9.3	10.6	6.5
Swan R nr Bigfork	APR-JUL	610	660	700	135%	735	790	520
	APR-SEP	690	750	795	134%	835	900	595
Flathead Lake Inflow ^{1,2}	APR-JUL	6630	7350	7680	132%	8010	8730	5810
	APR-SEP	7090	7910	8290	132%	8670	9490	6270
Mill Ck ab Bassoo ck nr Niarada	APR-JUL	5	5.8	6.3	158%	6.8	7.5	4
	APR-SEP	5.4	6.1	6.7	152%	7.2	8	4.4
South Crow Ck nr Ronan	APR-JUL	9.5	10.9	11.9	118%	12.8	14.2	10.1
	APR-SEP	10.9	12.4	13.5	116%	14.6	16.2	11.6
Mission Ck nr St. Ignatius	APR-JUL	24	26	28	112%	29	32	25
	APR-SEP	29	32	34	113%	36	38	30
SF Jocko R nr Arlee	APR-JUL	37	42	45	136%	47	52	33
	APR-SEP	42	46	49	132%	52	57	37
NF Jocko R bl Tabor Feeder Canal	APR-JUL	35	38	39	126%	41	44	31
	APR-SEP	37	40	42	127%	43	46	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 April 1, 2018



Snow Water Equivalent Percent of Normal

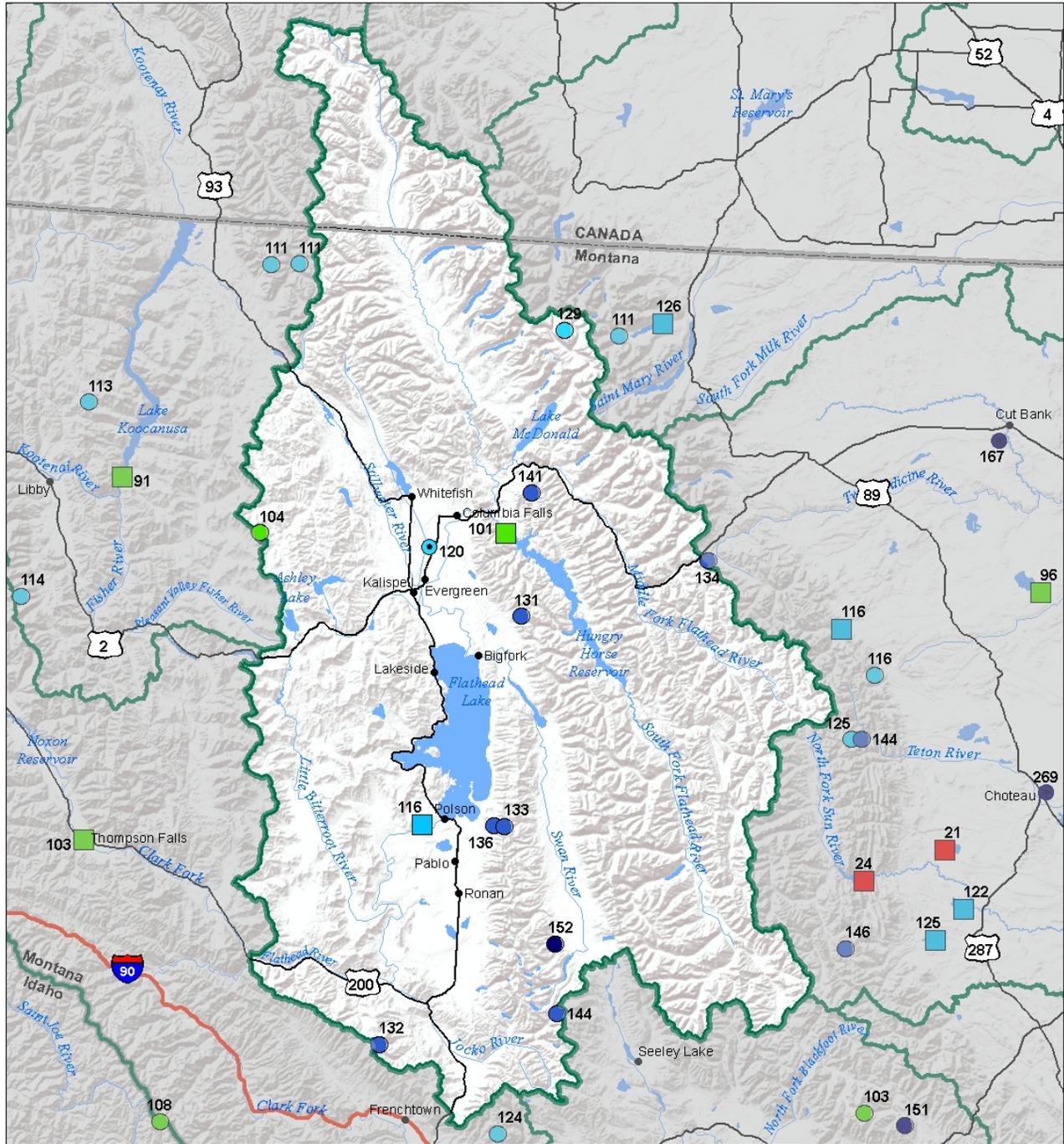
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *
			● *

Streamflow Forecast Percent of Average Flows

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



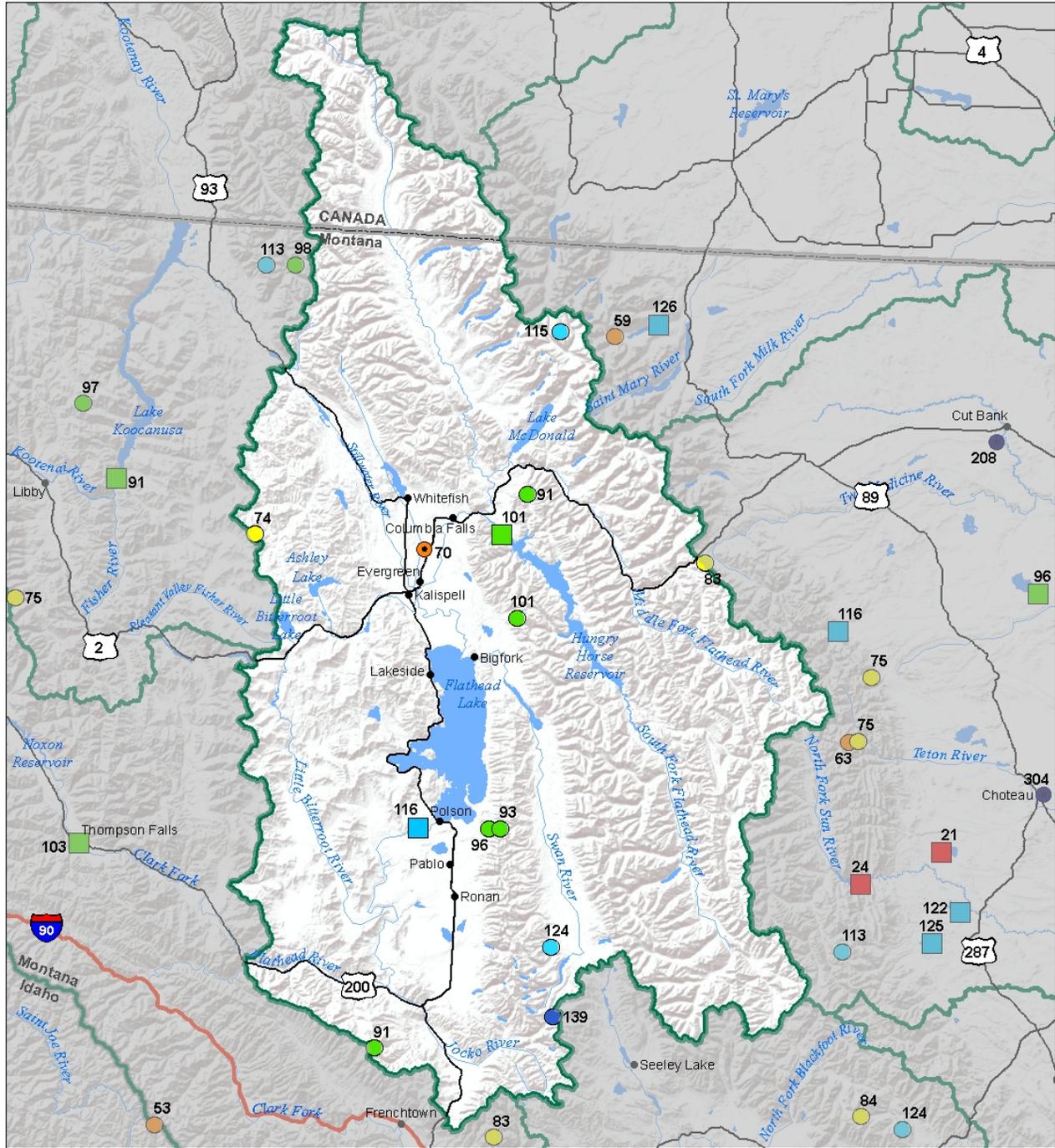
Flathead River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal April 1, 2018



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%	

**Flathead River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
April 1, 2018 (March 1, 2018 - April 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%



Upper Clark Fork River Basin



At this point, it should be no surprise to residents of the Upper Clark Fork River basin that this winter has brought a significant amount of precipitation. March was actually near average, but overall precipitation has been well above average since October 1st. This has resulted in record amounts of snow in some parts of the Upper Clark Fork River basin. Currently, all NRCS snow sites have a well above normal snowpack, and many of the basin's sites have a record snowpack for today's date. That includes both the low and high elevation sites. Ten Mile Creek Lower Snow Course has its deepest snowpack in 83 years of record. Frohner Meadows SNOTEL south of Helena currently has nearly double the amount of snow water it typically peaks at in mid-April. The snowpack in the basin is currently trending similar to big years such as 1997, 2011, 2014, and is most similar to conditions in 1982. The basin's highest overall snowpack recorded in history occurred in late April of 1982. This will no doubt be a big runoff year in the Upper Clark Fork River basin. As of April 1st, streamflows are forecasted to be significantly above average this season. The timing of runoff and volume will depend on day-to-day and week-to-week weather, so water users are strongly advised to read the May 1st, 2018 NRCS Water Supply Outlook Report and monitor National Weather Service web pages for weather and daily runoff forecasts this runoff season.

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	153%	85%
FLINT CREEK	160%	96%
ROCK CREEK	146%	106%
CLARK FORK ab BLACKFOOT	153%	90%
BLACKFOOT	161%	96%
Basin-Wide	156%	92%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	104%	131%	114%
Valley Precipitation	49%	88%	139%
Basin-Wide Precipitation	103%	130%	114%

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

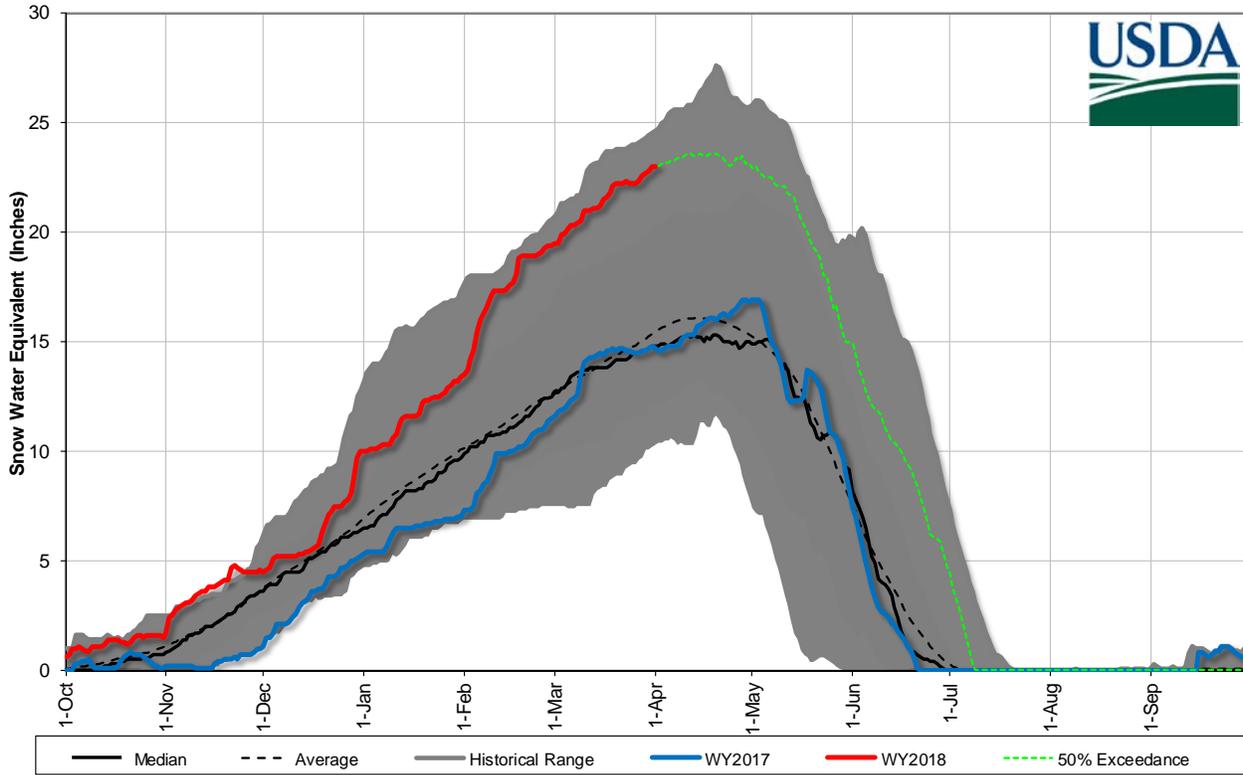
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	100%	76%	107%

*See Reservoir Storage Table for storage in individual reservoirs

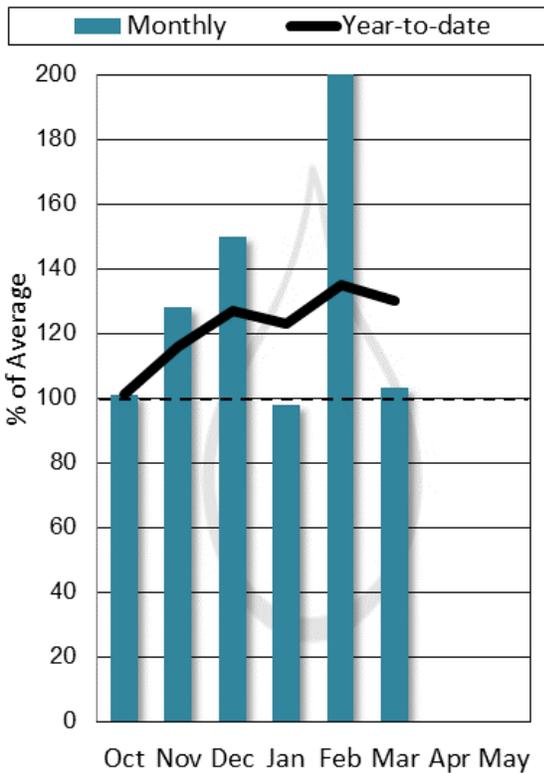
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
East Fork Rock Creek Res	9.1	9.0	9.1	15.6	101%	59%
Georgetown Lake	27.0	28.9	27.8	31.0	97%	87%
Lower Willow Creek Reservoir			3.0	4.9		
Nevada Creek Res	8.6	9.8	7.7	12.6	111%	68%

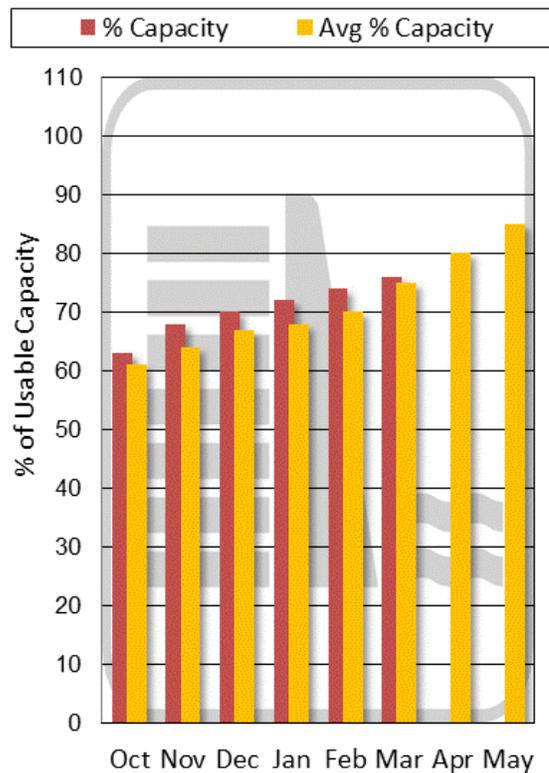
Upper Clark Fork River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 4/1/2018



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.

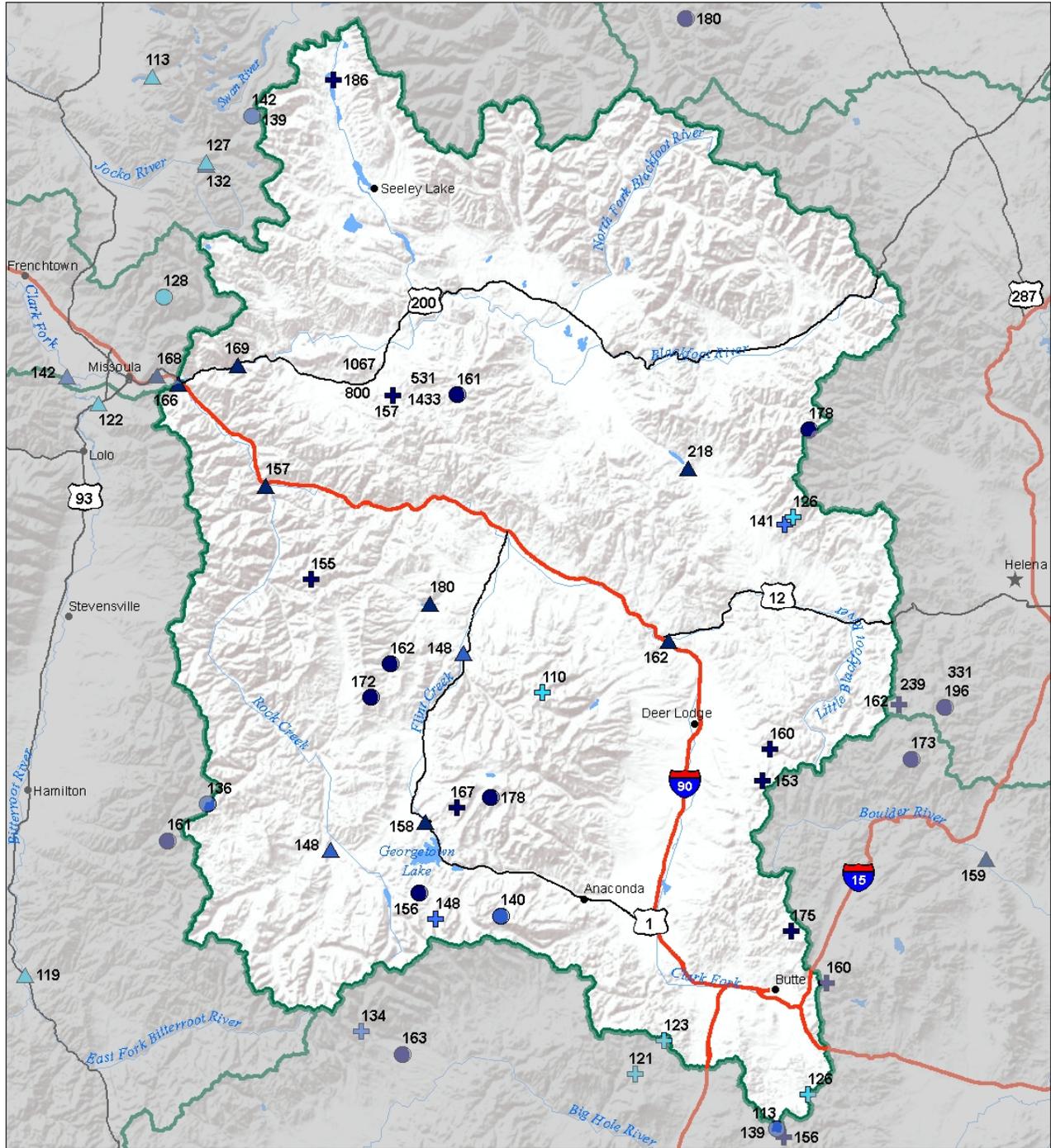
*Upper Clark Fork River
Basin*

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	88	105	116	166%	127	143	70
	APR-SEP	95	112	125	162%	137	155	77
<i>Flint Ck nr Southern Cross</i>	APR-JUL	13.2	16.9	19.4	156%	22	26	12.4
	APR-SEP	15.5	20	23	158%	26	31	14.6
<i>Flint Ck bl Boulder Ck</i>	APR-JUL	56	70	79	152%	89	103	52
	APR-SEP	69	86	98	148%	109	126	66
<i>Lower Willow Ck Reservoir Inflow²</i>	APR-MAY	9.1	11.2	12.6	173%	14	16.2	7.3
	APR-JUL	13.5	16.8	19.1	180%	21	25	10.6
<i>MF Rock Ck nr Philipsburg</i>	APR-JUL	70	80	86	148%	93	102	58
	APR-SEP	78	89	96	148%	103	113	65
<i>Rock Ck nr Clinton</i>	APR-JUL	315	360	395	158%	425	470	250
	APR-SEP	355	405	440	157%	475	525	280
<i>Clark Fork R ab Milltown</i>	APR-JUL	705	825	905	171%	990	1110	530
	APR-SEP	795	930	1020	166%	1120	1250	615
<i>Nevada Ck nr Helmville</i>	APR-MAY	14.2	17.3	19.4	231%	21	25	8.4
	APR-JUL	23	28	31	218%	35	40	14.2
<i>Blackfoot R nr Bonner</i>	APR-JUL	1100	1190	1250	174%	1310	1400	720
	APR-SEP	1180	1280	1350	169%	1410	1510	800
<i>Clark Fork R ab Missoula</i>	APR-JUL	1810	2030	2180	174%	2330	2550	1250
	APR-SEP	1990	2230	2390	168%	2560	2800	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

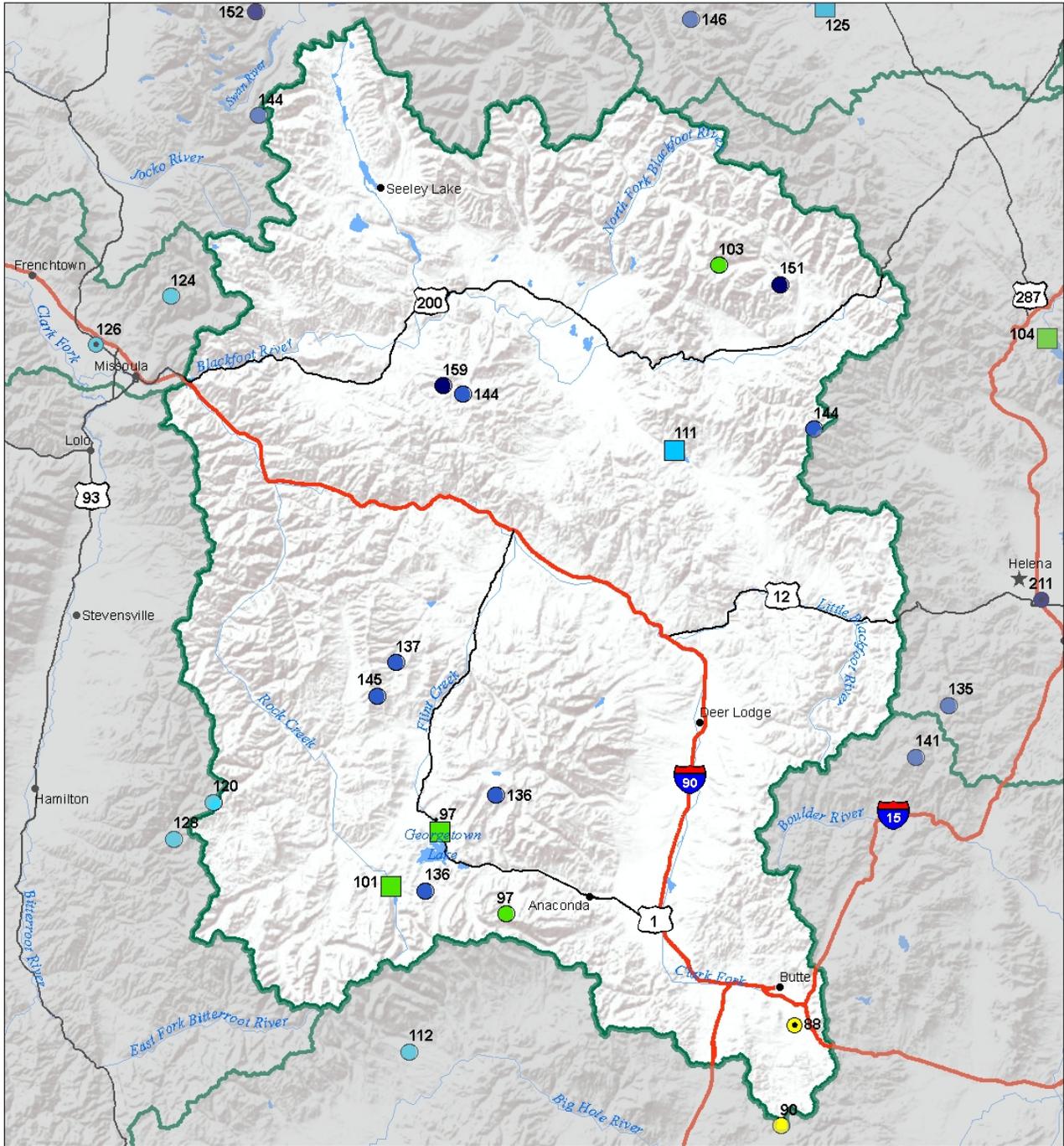
Upper Clark Fork River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal April 1, 2018



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

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

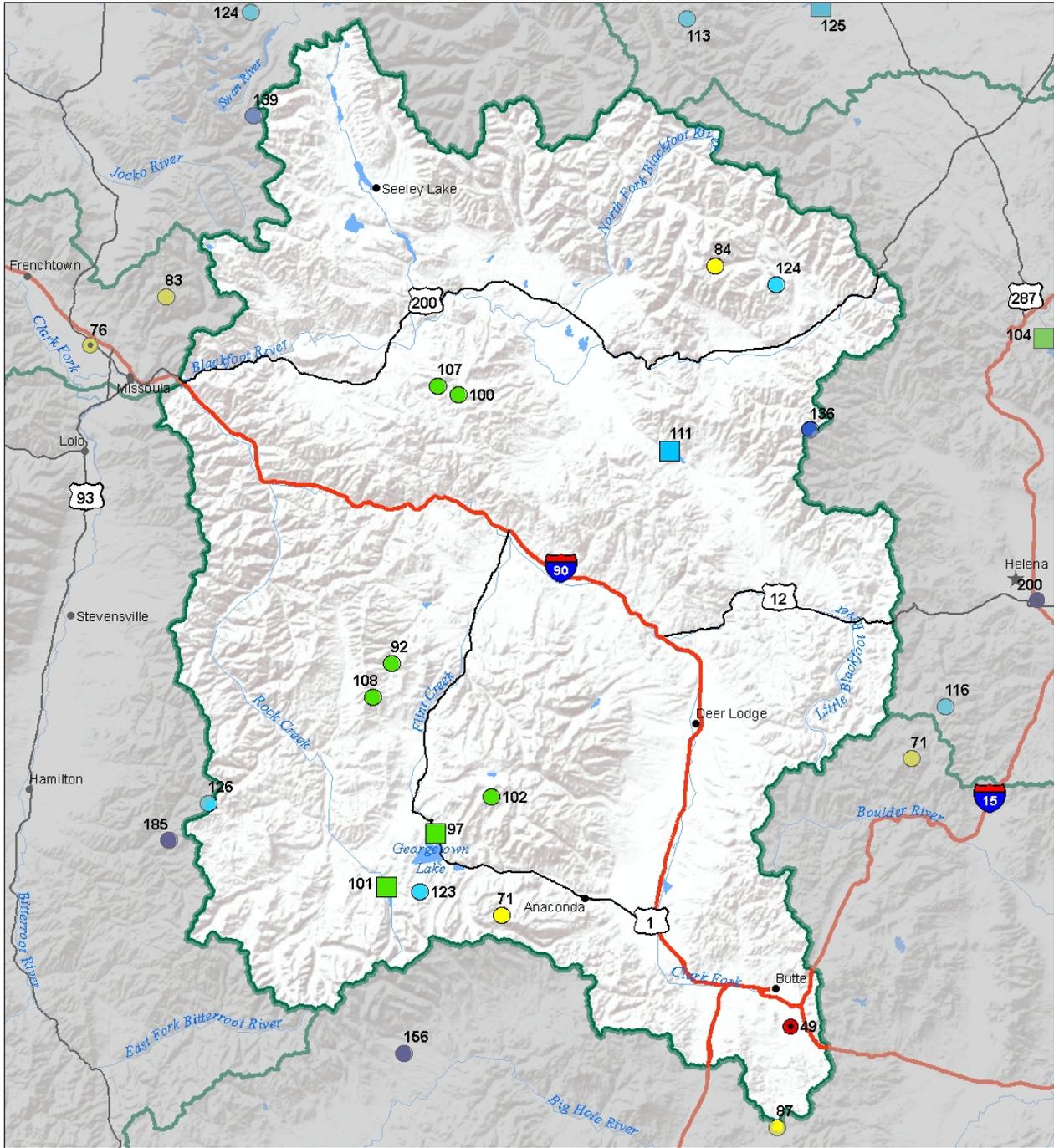
Upper Clark Fork River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal April 1, 2018



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 Clark Fork River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
April 1, 2018 (March 1, 2018 - April 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%	



Bitterroot River Basin



After receiving nearly double its typical February precipitation, the sun decided to peak out and show itself as if spring was really going to arrive in March. Overall, March precipitation was near normal in the Bitterroot, but as of April 1st, it doesn't really feel like spring. Some of this precipitation fell as rain on some of the lower elevation snow, but the basin saw significant snow water accumulation over the month at mid to high elevations. Currently, all SNOTEL sites within the basin have above normal snowpack and have exceeded their normal peak snow water values. The most significant example is Twin Lakes SNOTEL which typically peaks in late April at about 36 inches of snow water, but currently has over 50 inches and climbing. It is also worth noting that the mid-to-low elevation snowpack on the east side of the Bitterroot Valley is reaching record levels and if cold, wet weather persists then these records will likely be met. With that said, if it does stop snowing in the region, the Bitterroot will likely have ample water supply this summer. Be sure to read the May 1st, 2018 NRCS Water Supply Outlook Report and monitor National Weather Service web pages for weather and daily runoff forecasts this runoff season. Currently, April-July streamflows are forecasted to be well above average in the Bitterroot River basin.

Bitterroot River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
WEST FORK BITTERROOT	134%	100%
EAST SIDE BITTERROOT	143%	105%
WEST SIDE BITTERROOT	131%	106%
Basin-Wide	134%	105%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	99%	119%	119%
Valley Precipitation	%	%	%
Basin-Wide Precipitation	99%	119%	119%

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

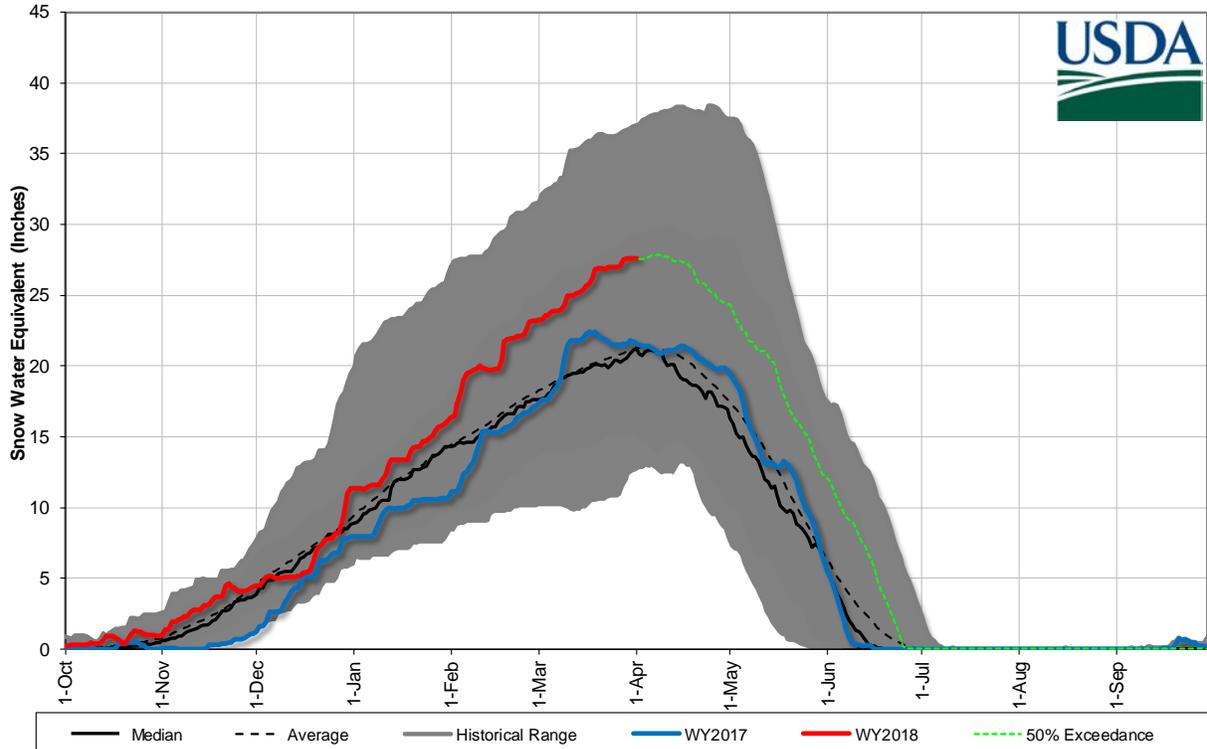
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	144%	52%	178%

*See Reservoir Storage Table for storage in individual reservoirs

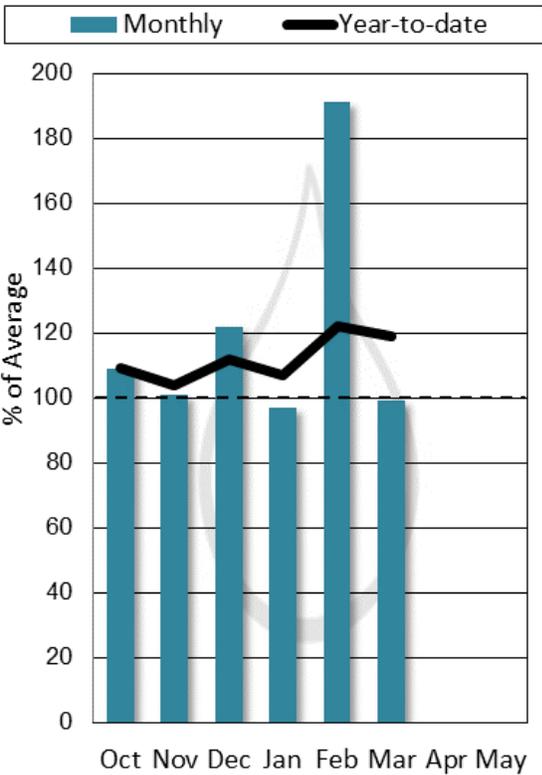
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Painted Rocks Lake	10.4	15.4	8.7	31.7	119%	33%
Lake Como	24.5	27.9	15.6	34.9	157%	70%

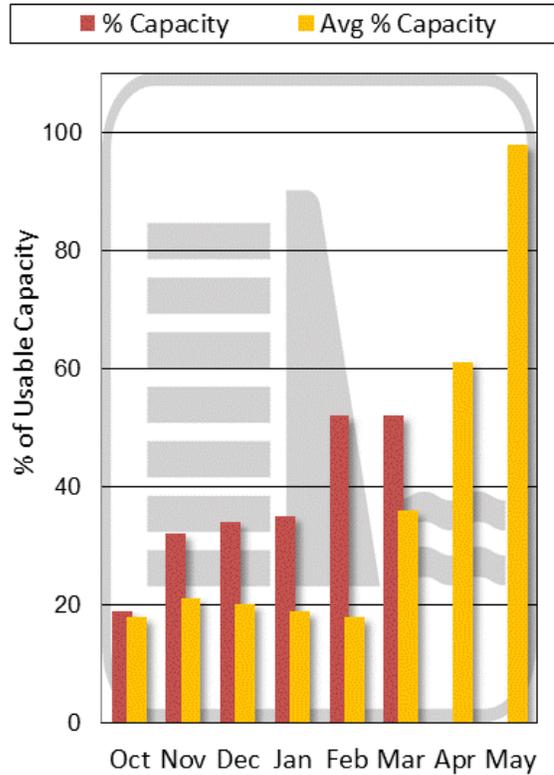
Bitterroot River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 4/1/2018



**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.

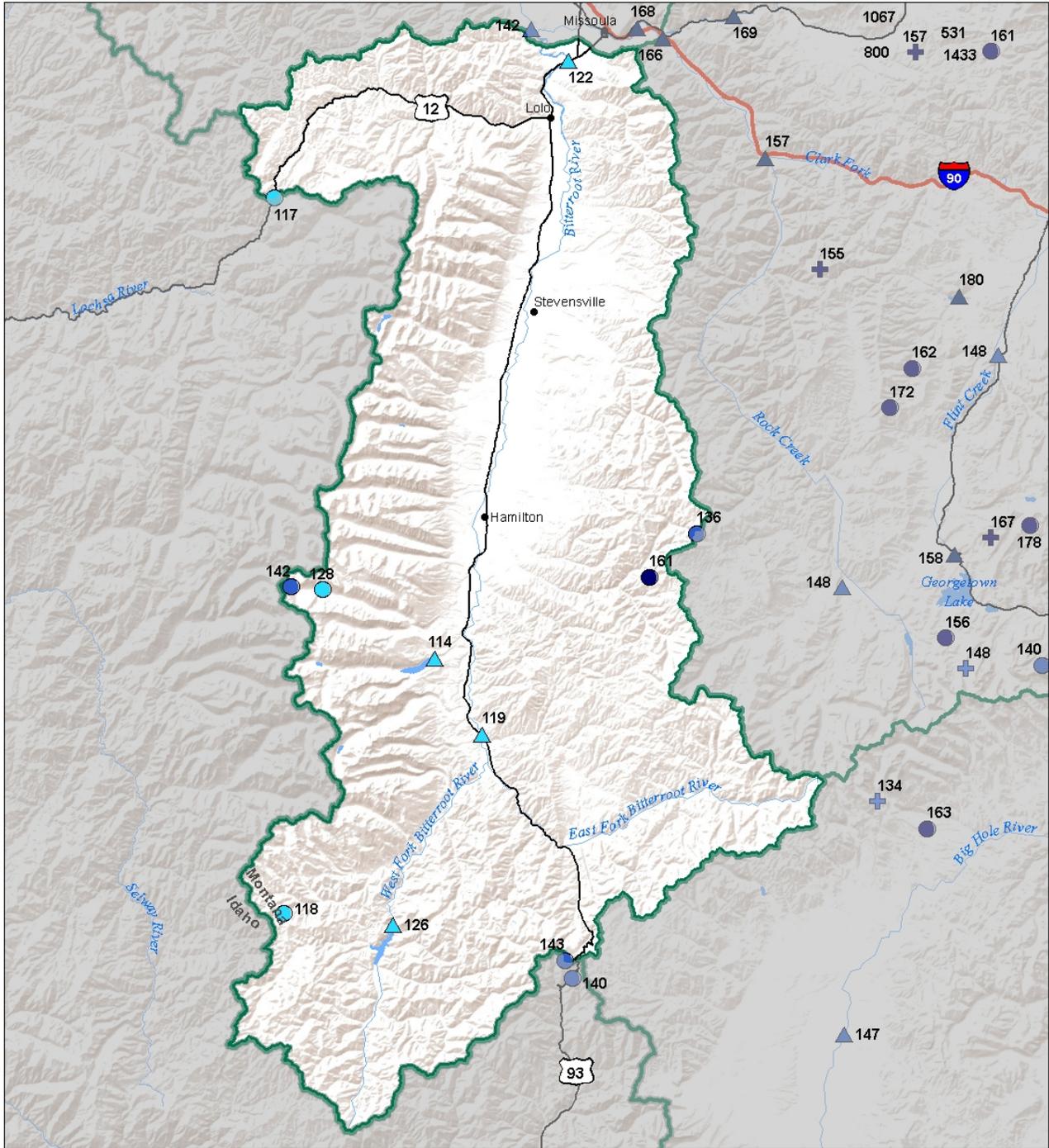
Bitterroot River Basin

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	123	147	164	128%	181	205	128
	APR-SEP	130	157	175	126%	193	220	139
Bitterroot R Nr Darby	APR-JUL	395	465	515	117%	565	635	440
	APR-SEP	445	515	565	119%	615	685	475
Como Reservoir Inflow ²	APR-JUL	74	81	86	113%	91	98	76
	APR-SEP	77	85	90	114%	95	103	79
Bitterroot R nr Missoula	APR-JUL	1170	1330	1430	124%	1530	1690	1150
	APR-SEP	1250	1410	1530	122%	1640	1800	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

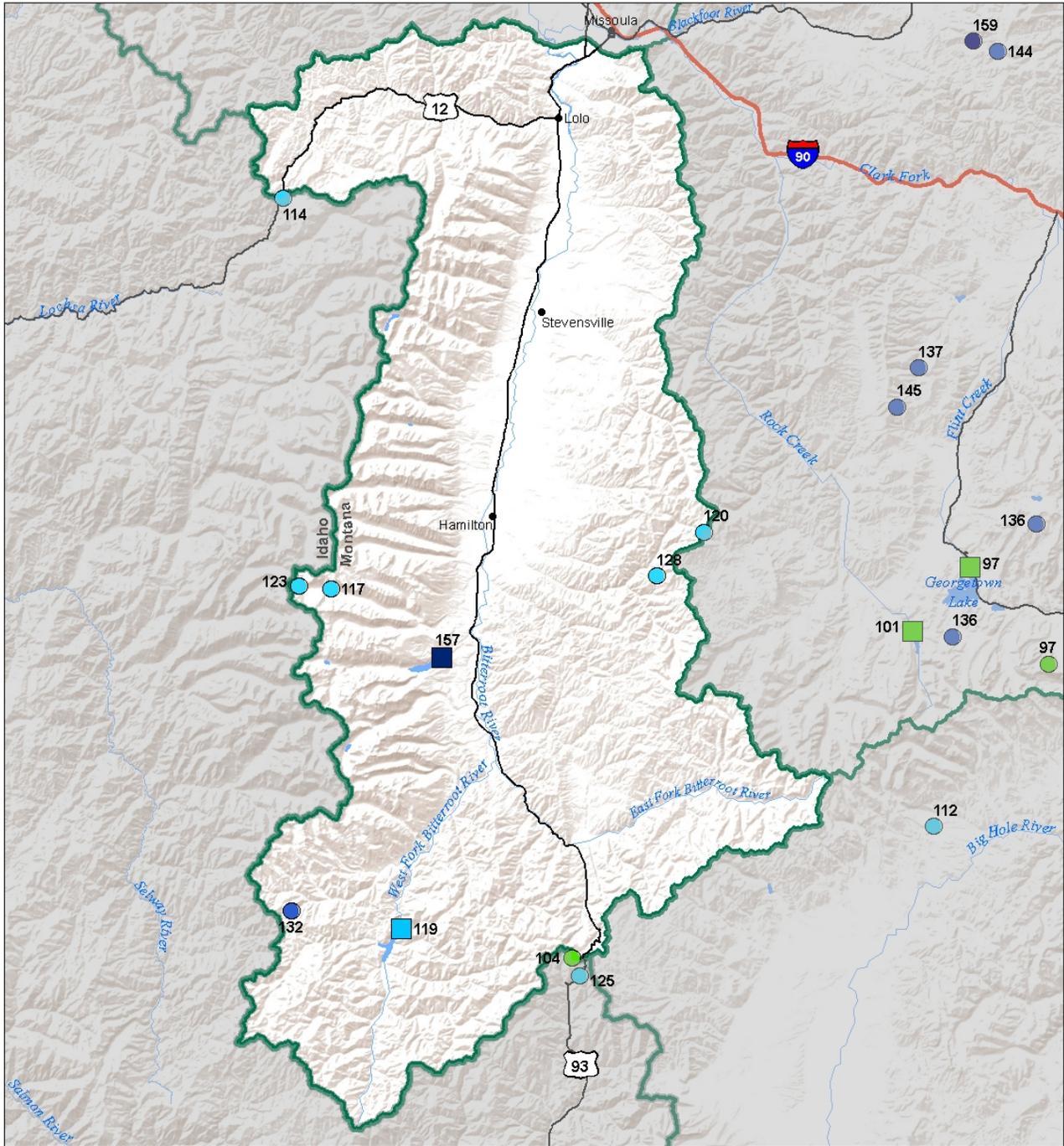
Bitterroot River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal April 1, 2018



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%	

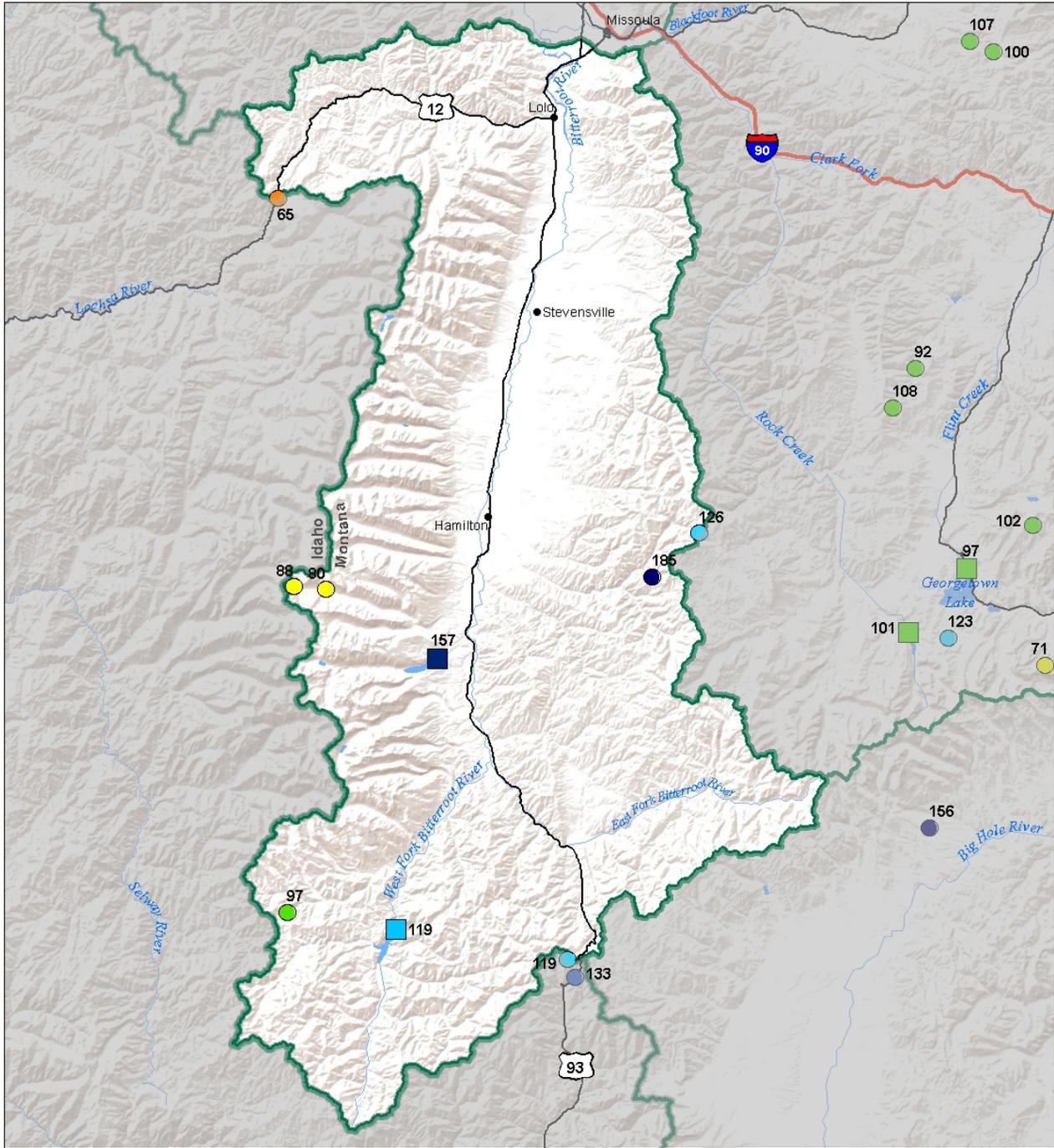
Bitterroot River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal April 1, 2018



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%

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



Precipitation Percent of Normal		COOP/ACIS	
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
Montana State Library
Natural Resource
Information System



Lower Clark Fork River Basin

Precipitation was slightly below average in the Lower Clark Fork River basin during March, but don't let that fool you. Water year precipitation has been above average, and there is plenty of water available in the mountains. Currently, all NRCS snow sites in the basin have an above-normal snowpack. Some of the lower elevations sites have 1.5 to 2 times their typical April 1st snowpack. Additionally, all SNOTEL sites within the basin have exceeded their normal peak snow water values. The basin is not breaking any records at this point, but don't consider winter over yet in the mountains. The drier months of summer are yet to arrive. In 2014 when the basin had a similar snowpack, it peaked around May 1st. Regardless of what happens to the snowpack in the Lower Clark Fork region over the next couple months, there is a substantial amount of snow in the Upper Clark Fork that will no doubt provide significant water supply downstream. As of April 1st, streamflows are forecasted to be well above average this summer. There are still a couple of months left before the drier months of summer season arrive so don't be surprised if we get more snow accumulation. The timing of runoff and volume will depend on day-to-day and week-to-week weather, so water users are strongly advised to read the May 1st, 2018 NRCS Water Supply Outlook Report and monitor National Weather Service web pages for weather and daily runoff forecasts this runoff season.

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	124%	106%
Basin-Wide	124%	106%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	69%	115%	135%
Valley Precipitation	76%	126%	181%
Basin-Wide Precipitation	69%	115%	136%

*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%	93%	107%

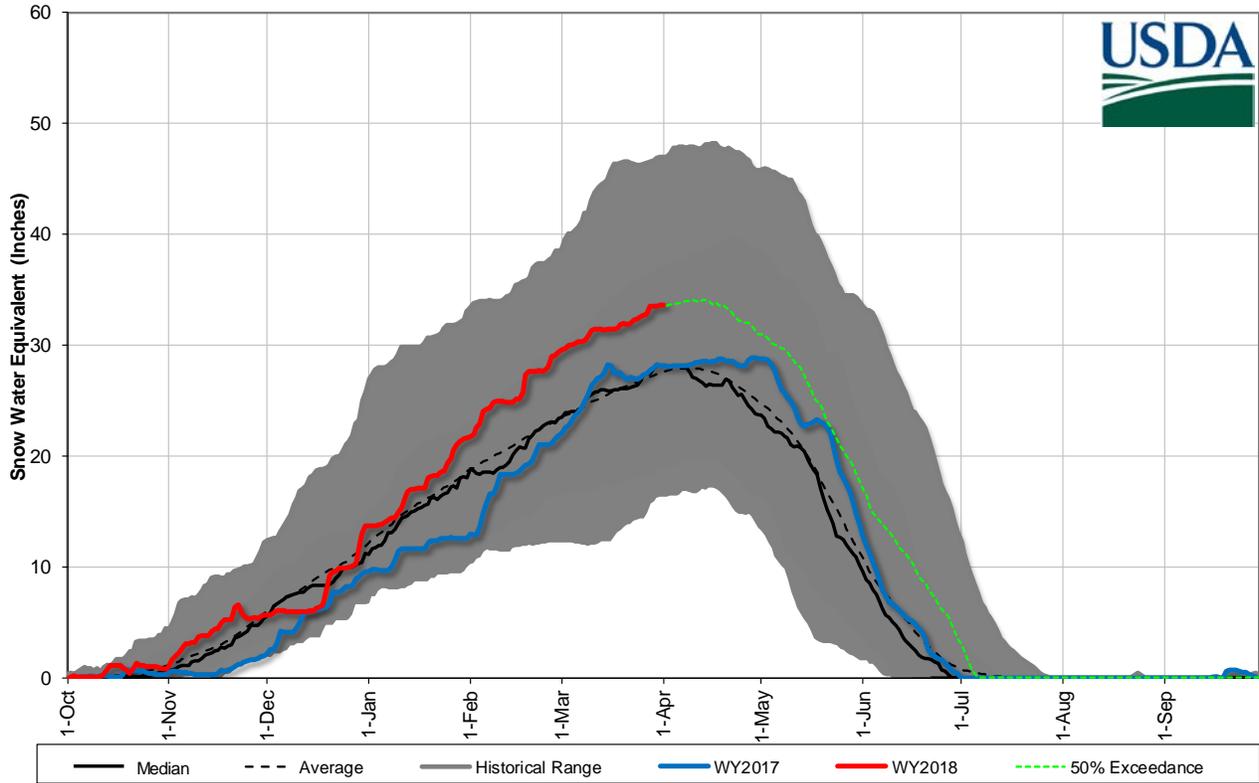
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Noxon Rapids Reservoir	310.8	330.089	309.9	335	100%	93%

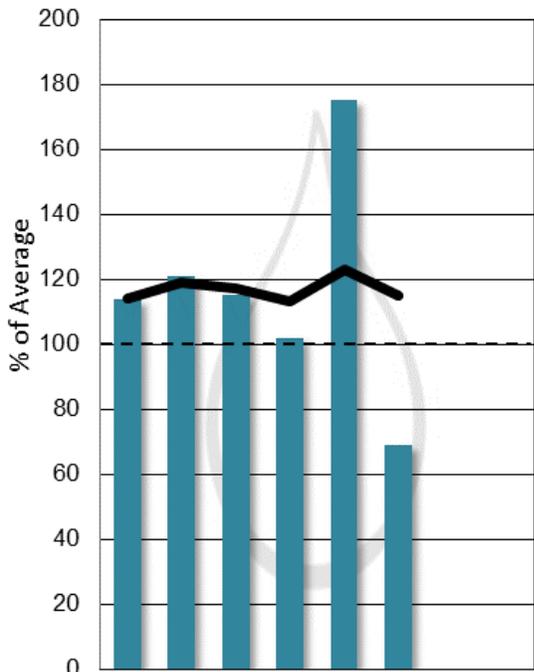
Lower Clark Fork River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 4/1/2018



Mountain and Valley Precipitation

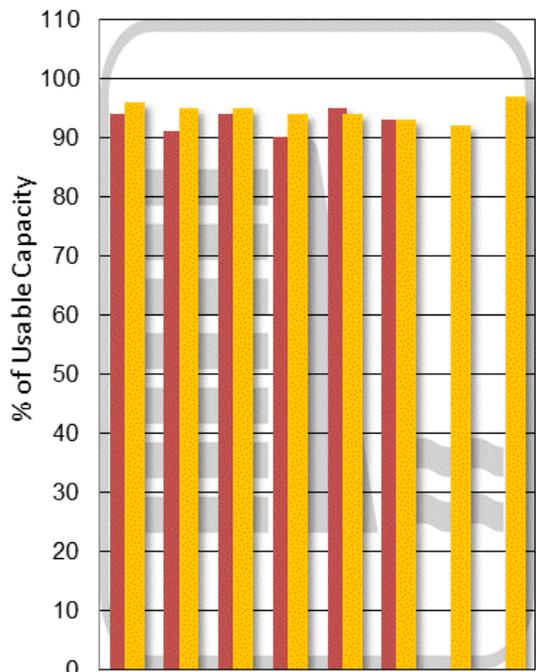
Monthly (teal bars) Year-to-date (black line)



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.

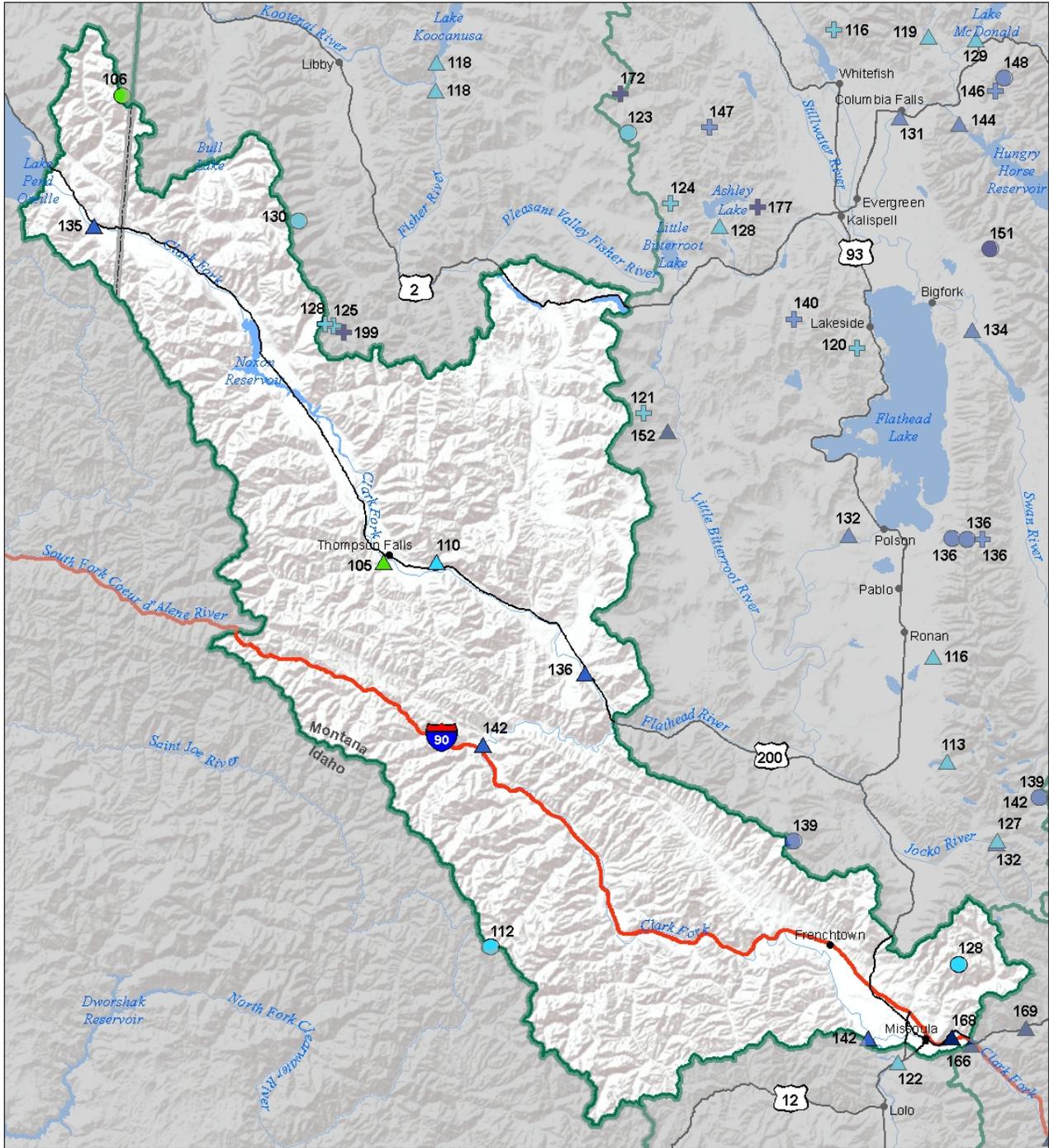
*Lower Clark Fork River
Basin*

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	2860	3220	3460	144%	3700	4060	2400
	APR-SEP	3130	3520	3780	142%	4040	4430	2670
Clark Fork R at St. Regis ¹	APR-JUL	3640	4270	4550	144%	4840	5470	3160
	APR-SEP	3970	4660	4970	142%	5280	5960	3510
Clark Fork R nr Plains ^{1,2}	APR-JUL	10600	12000	12600	137%	13200	14600	9200
	APR-SEP	11500	13000	13700	136%	14400	16000	10100
Thompson nr Thompson Falls	APR-JUL	146	179	200	110%	225	255	181
	APR-SEP	167	200	225	110%	250	285	205
Prospect Ck at Thompson Falls	APR-JUL	89	101	109	107%	116	128	102
	APR-SEP	96	108	116	105%	124	136	110
Clark Fork R at Whitehorse Rapids ^{1,2}	APR-JUL	12200	13600	14300	136%	14900	16300	10500
	APR-SEP	13200	14800	15500	135%	16300	17900	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

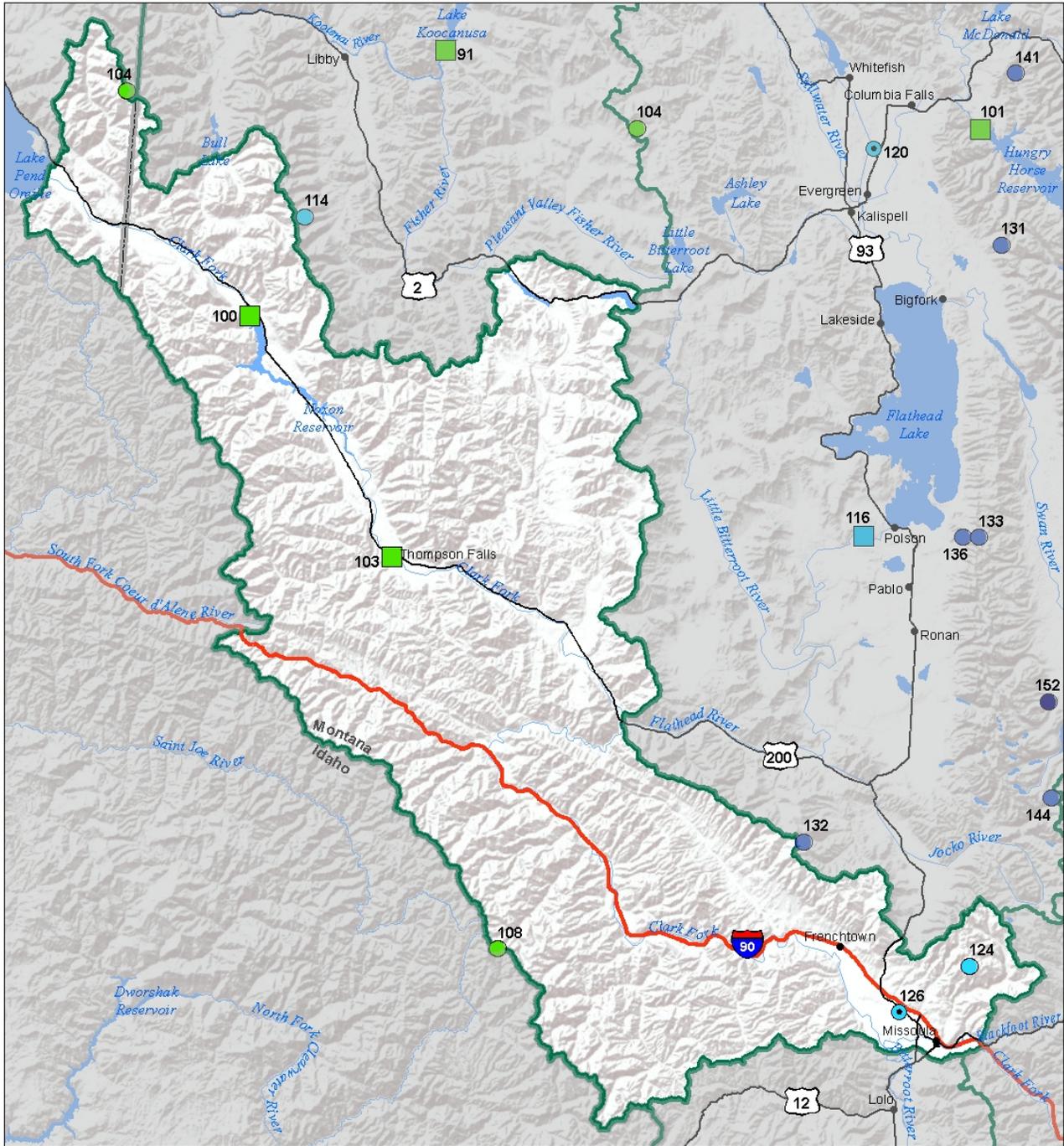
Lower Clark Fork River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal April 1, 2018



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



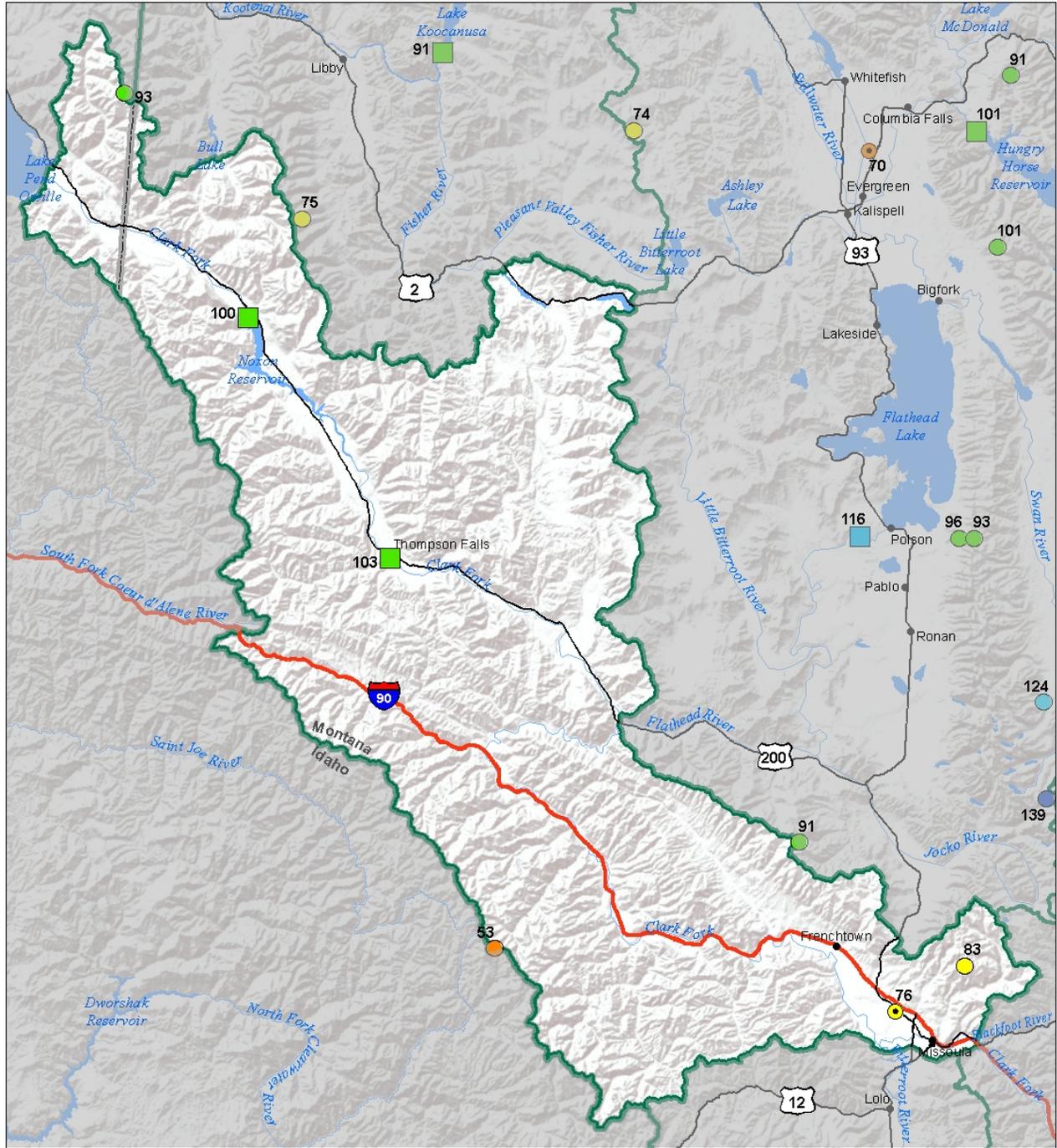
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

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

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

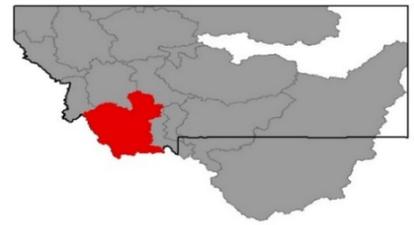


Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

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

Jefferson River Basin



Finally! During March storm directions changed from the prevailing northwest flow that most of Montana has been in this winter, to southwest flow which favors most of the mountains that feed the Jefferson snowfall wise. Snowpack totals for the month of March were above normal basin-wide, but the Upper Red Rock and Beaverhead River basins were favored during the month with 170% to 215% of normal snowfall. Throughout most of the year the Red Rock basin has been below normal for snowpack, but ending the month most SNOTEL sites and snowcourses are reporting near to slightly above normal snowpack. Streamflow forecasts for the April 1st – July 31st period reflect the above normal snowpack on this date for most river basins. Forecasts have improved since March 1 in the Upper Beaverhead due to the above normal snowfall during the month, but remain slightly below average for Clark Canyon inflow. Although it is now officially spring, April and May are both significant for the basin snowfall and precipitation wise and will play a critical role in determining the timing and magnitude of runoff this spring and summer. Hopefully, the wet and cool pattern will persist.

Jefferson River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
BEAVERHEAD	124%	108%
RUBY	124%	89%
BIGHOLE	141%	107%
BOULDER	163%	84%
Basin-Wide	135%	101%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	117%	111%	118%
Valley Precipitation	75%	88%	176%
Basin-Wide Precipitation	117%	111%	119%

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

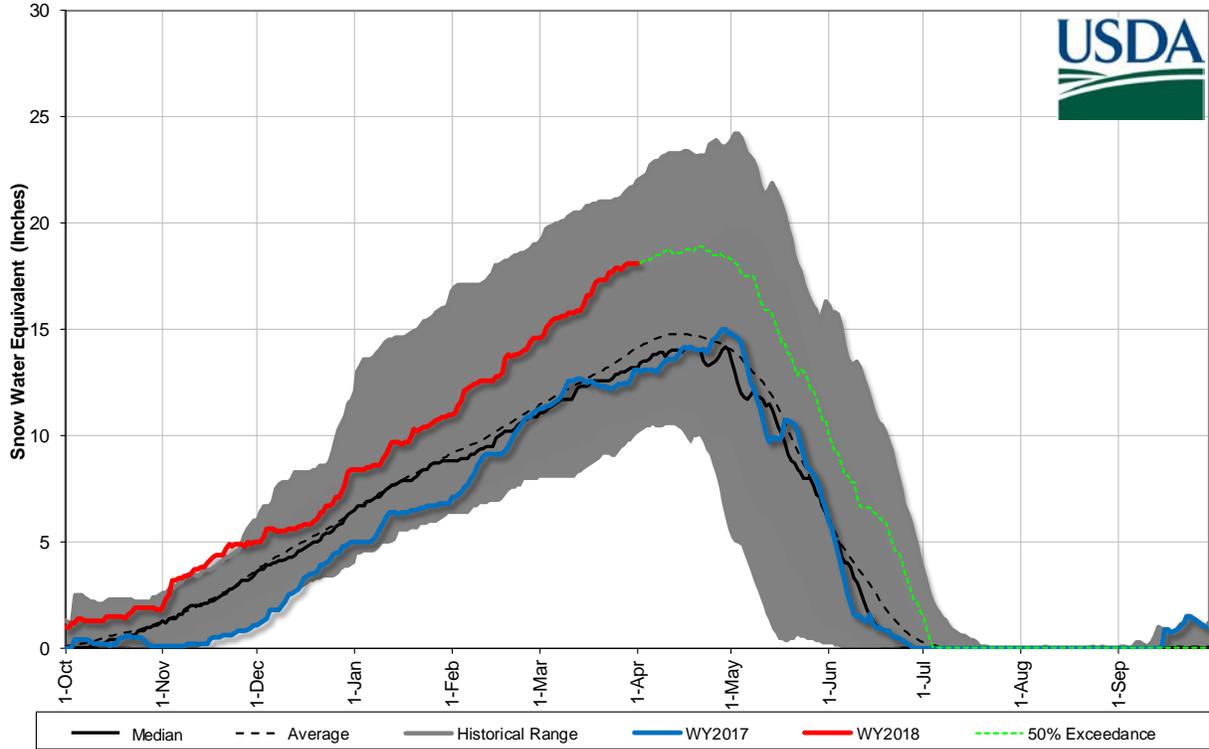
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	128%	68%	108%

*See Reservoir Storage Table for storage in individual reservoirs

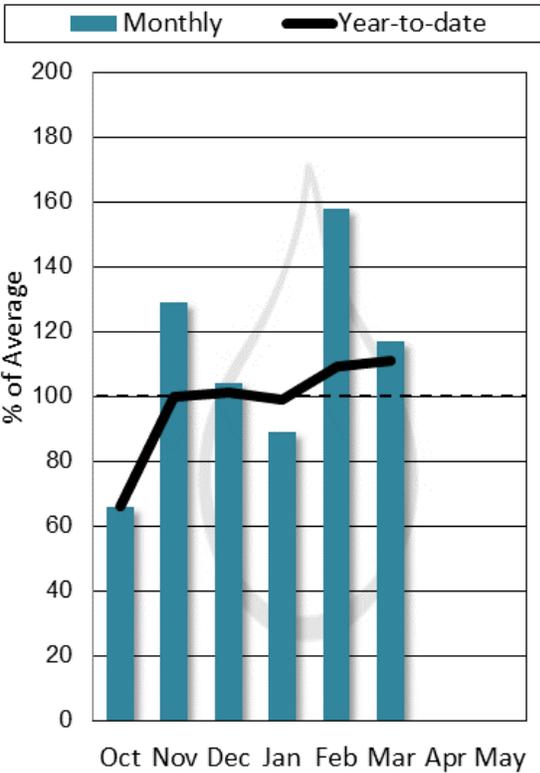
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Lima Reservoir	60.7	56.5	34.2	84.0	177%	72%
Clark Canyon Res	163.6	125.9	134.5	255.6	122%	64%
Ruby River Reservoir	32.9	34.2	31.5	38.8	105%	85%

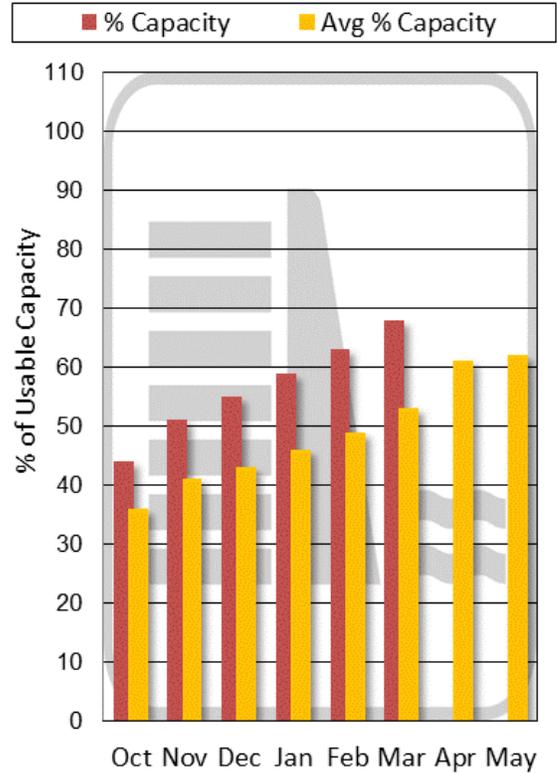
Jefferson River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 4/1/2018



**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.

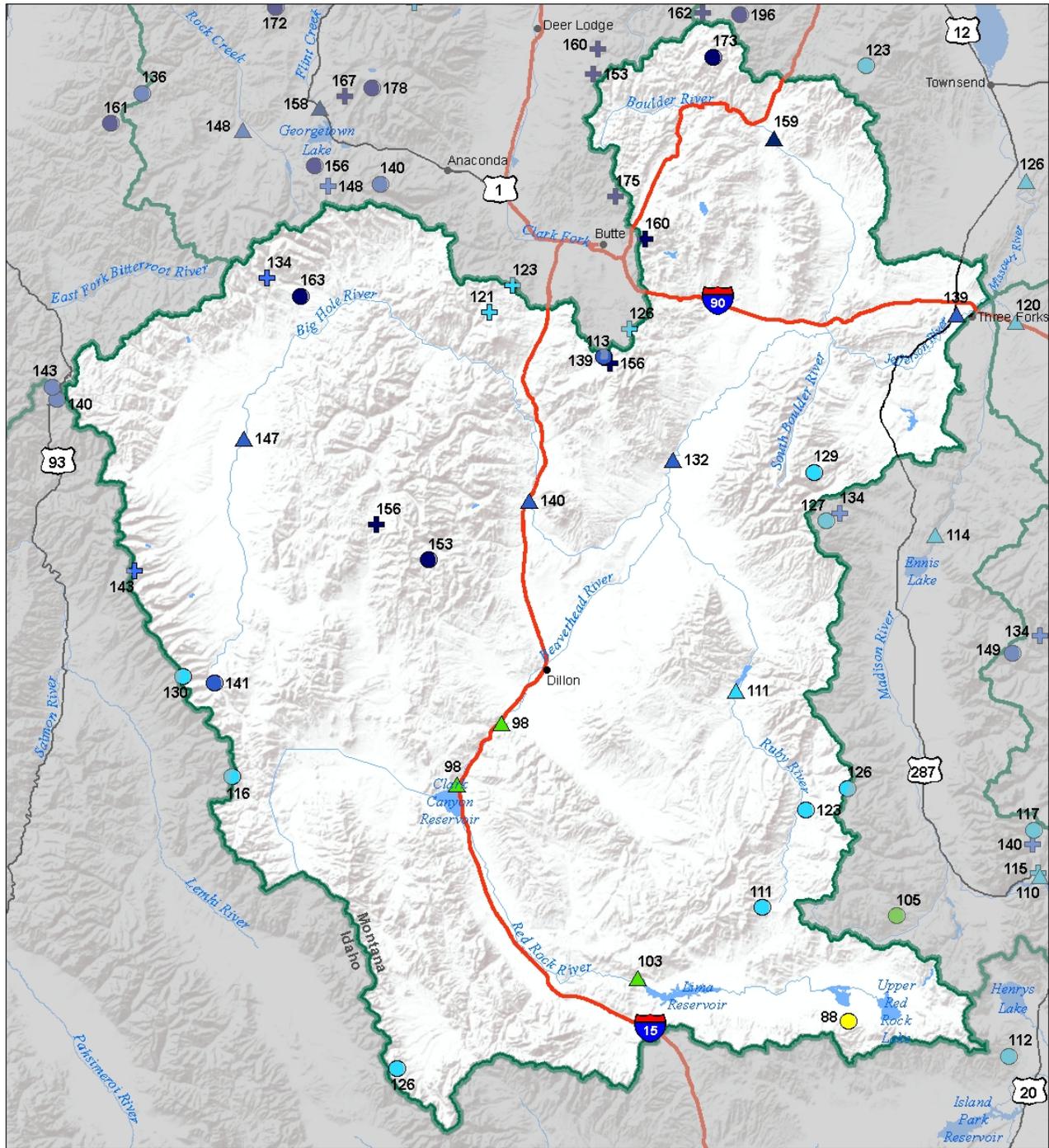
Jefferson River Basin

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	49	65	75	100%	86	101	75
	APR-SEP	53	70	82	103%	93	110	80
Clark Canyon Inflow ²	APR-JUL	49	77	96	95%	115	144	101
	APR-SEP	63	96	118	98%	140	173	120
Beaverhead R at Barretts ²	APR-JUL	71	103	126	98%	148	180	129
	APR-SEP	91	128	153	98%	178	215	156
Ruby R Reservoir Inflow ²	APR-JUL	63	76	85	110%	94	107	77
	APR-SEP	76	91	101	111%	111	126	91
Big Hole R at Wisdom	APR-JUL	83	124	151	148%	178	220	102
	APR-SEP	87	130	159	147%	189	230	108
Big Hole R nr Melrose	APR-JUL	555	660	730	142%	800	905	515
	APR-SEP	595	710	785	140%	865	975	560
Jefferson R nr Twin Bridges ²	APR-JUL	575	765	895	130%	1020	1210	690
	APR-SEP	620	820	960	132%	1100	1300	730
Boulder R nr Boulder	APR-JUL	82	99	111	161%	123	140	69
	APR-SEP	86	105	118	159%	131	150	74
Willow Ck Reservoir Inflow ²	APR-JUL	11.9	17.8	22	131%	26	32	16.8
Jefferson R nr Three Forks ²	APR-JUL	735	920	1050	142%	1180	1370	740
	APR-SEP	750	965	1110	139%	1250	1470	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

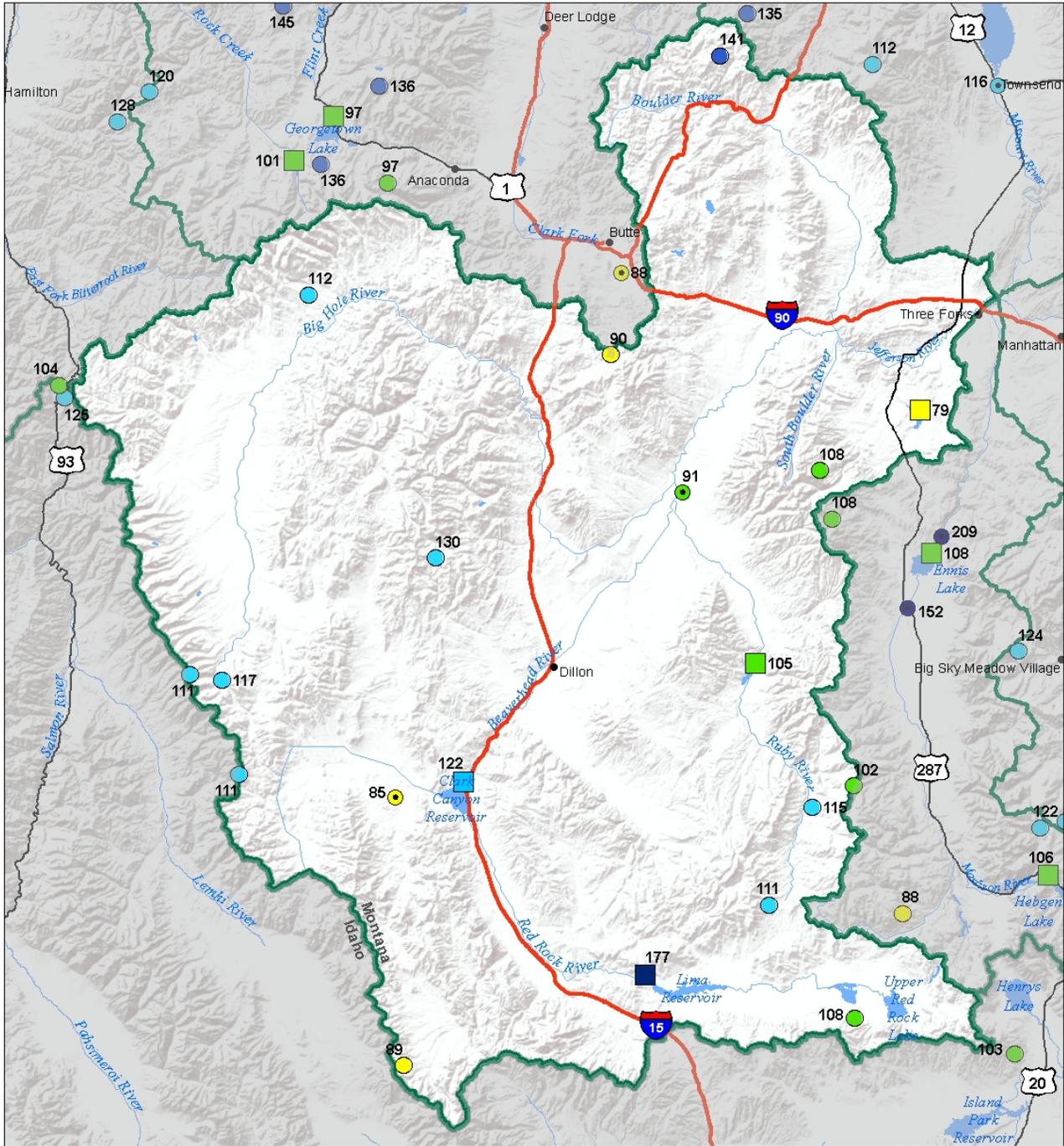
Jefferson River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal April 1, 2018



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 April 1, 2018

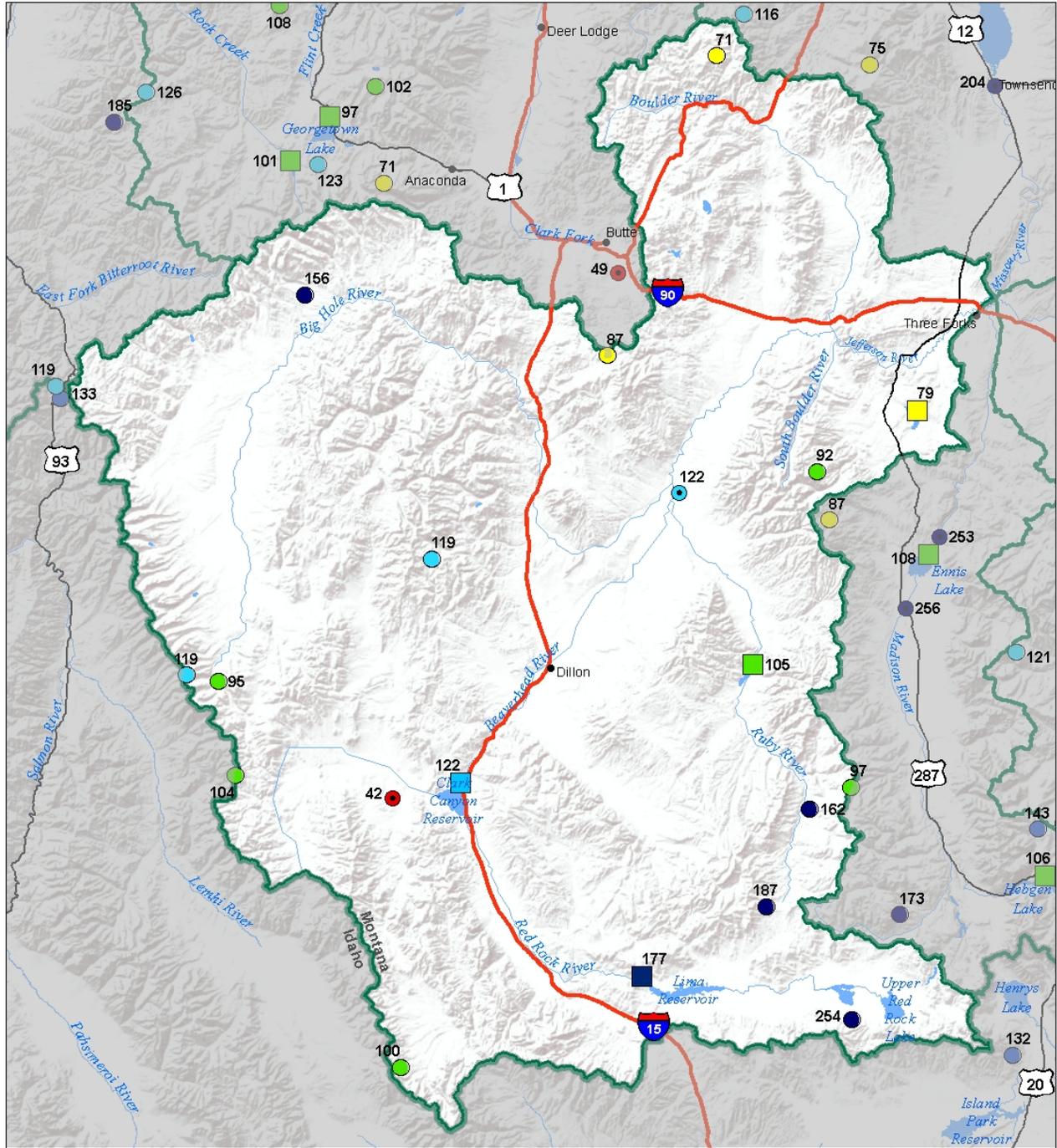


Precipitation Percent of Normal		COOP/ACIS	
SNOTEL			
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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

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



Precipitation Percent of Normal

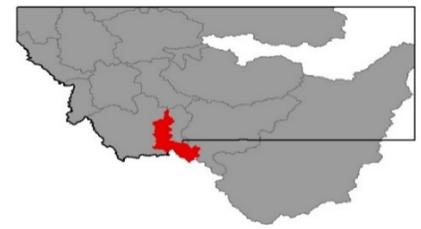
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



Madison River Basin



While not record breaking like some other adjacent regions of the state, the Madison River basin snowpack is above normal for this date. Until March, snowfall has favored the northern end of the basin under northwest flow, resulting in snowpack that is well above normal in the Tobacco Root and Northern Madison ranges. Patterns changed this month to southwest flow, which favors most of the terrain in the Madison. Snowfall during March favored the southern region of the river basin where snow totals for the month were 120% to 170% of normal. As we enter spring and southwest flow becomes more typical, the months of April and May will play a critical role in determining both peak snowpack for this year and the timing of runoff in the spring. Continued cool and wet weather will continue to build on the snowpack, all but assuring adequate water supply for irrigation and power. Streamflow forecasts for the April 1st – July 31st time period reflect the above normal snowpack and water year precipitation totals, and are above average for most gauges. It has been a welcomed change this year when compared to a few recent years in the basin for water users. Let's hope it keeps going!

Madison River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
MADISON <i>abv</i> HEBGEN LAKE	121%	115%
MADISON <i>blw</i> HEBGEN LAKE	126%	99%
Basin-Wide	124%	105%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	114%	110%	136%
Valley Precipitation	254%	183%	171%
Basin-Wide Precipitation	121%	113%	137%

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

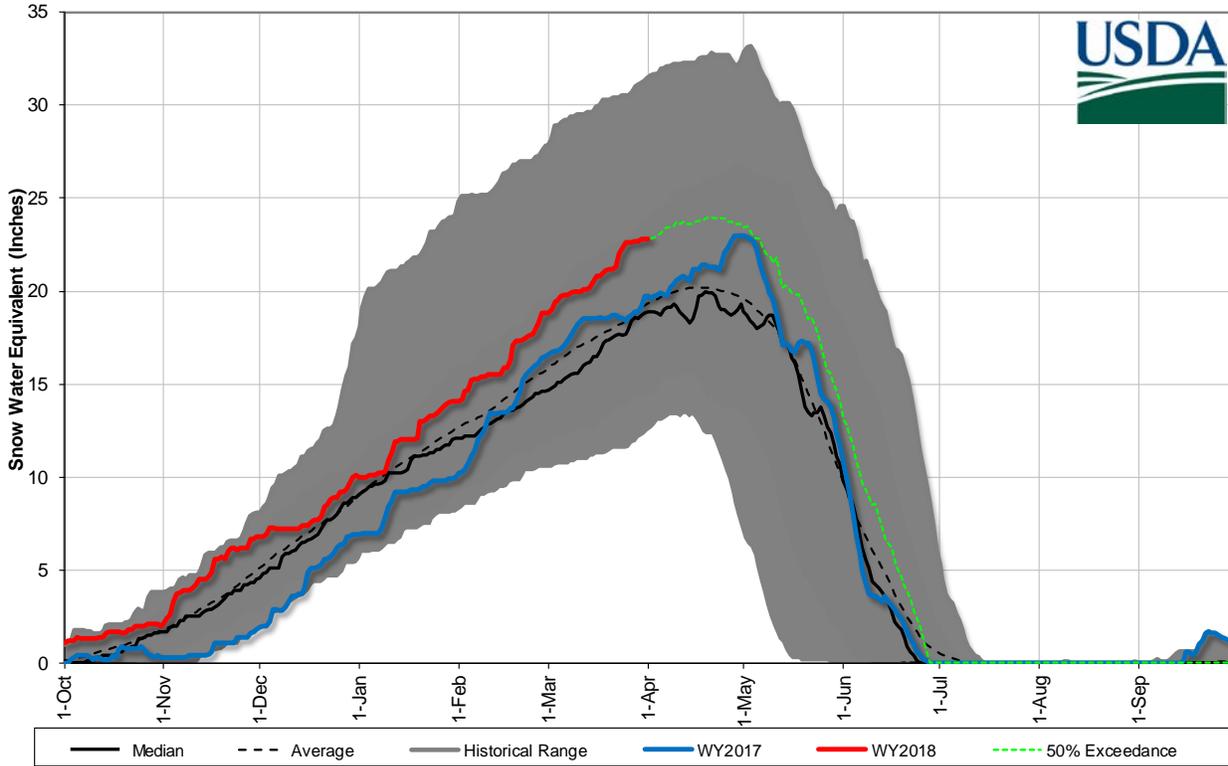
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	107%	76%	110%

*See Reservoir Storage Table for storage in individual reservoirs

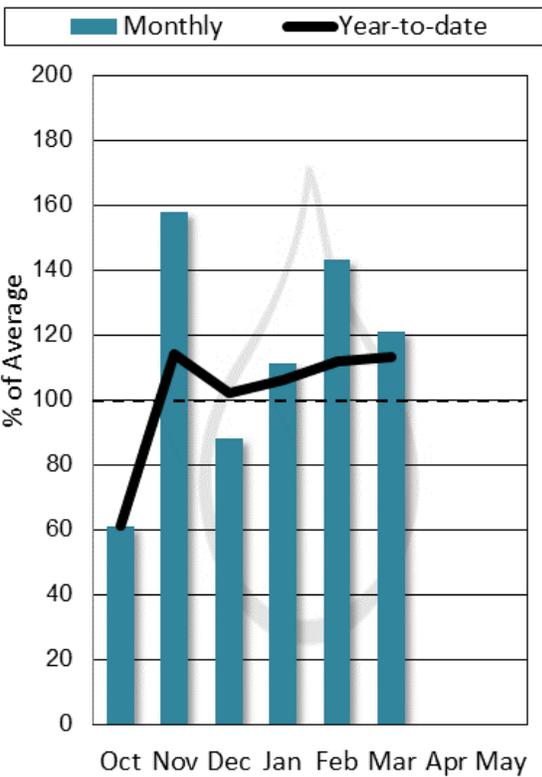
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Ennis Lake	31.8	34.7	29.5	41.0	108%	77%
Hebgen Lake	287.9	294.0	270.4	378.8	106%	76%

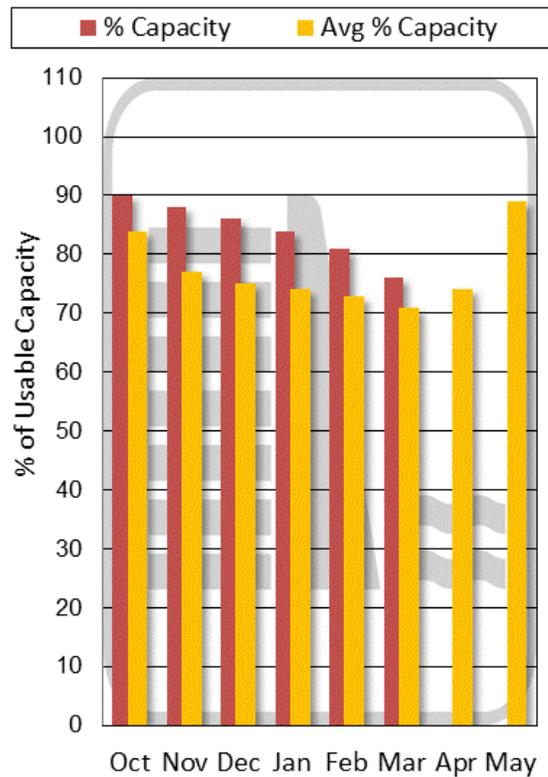
Madison River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 4/1/2018



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.

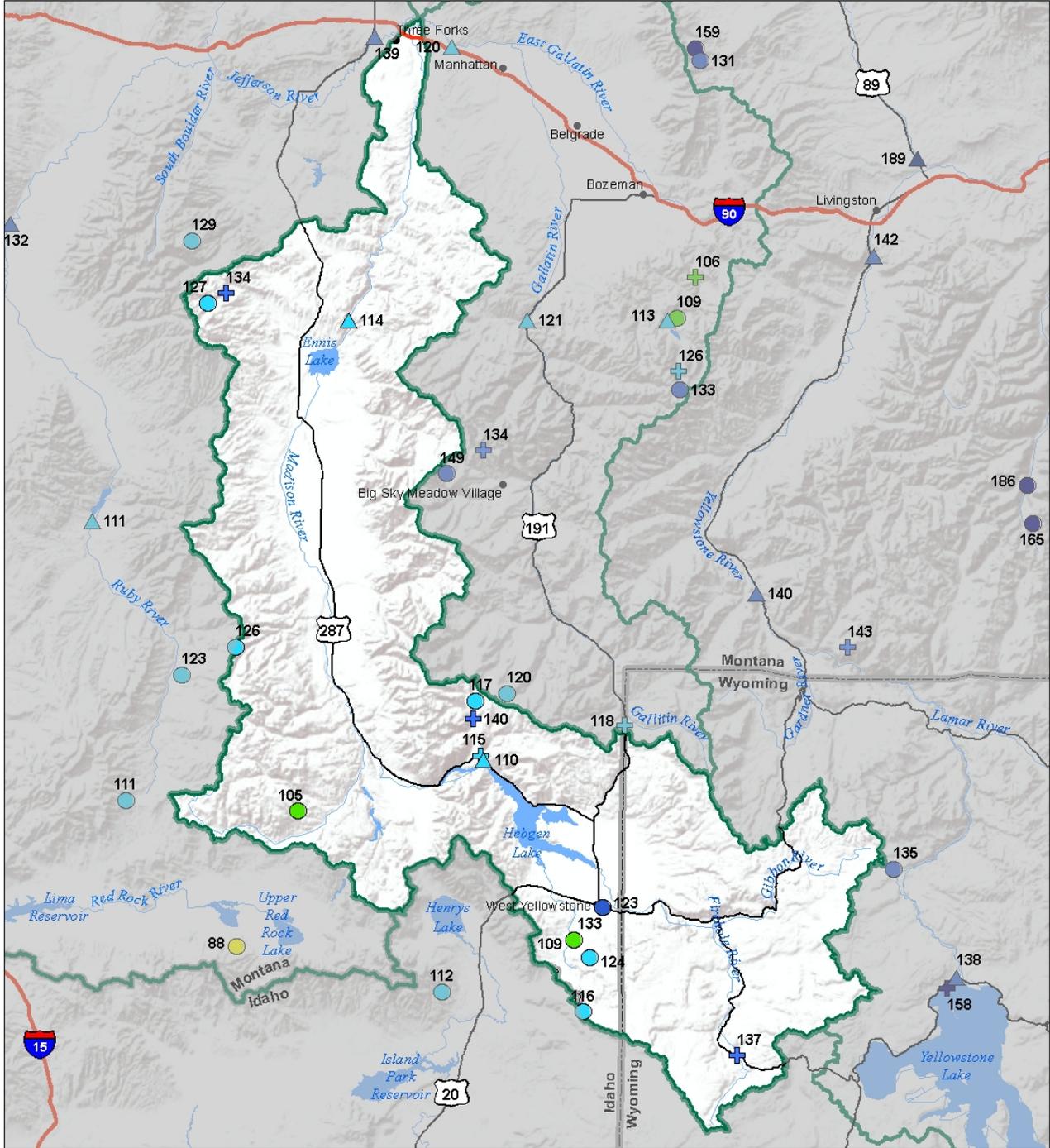
Madison River Basin

		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	380	410	111%	440	480	370
	APR-SEP	430	480	515	110%	550	600	470
Ennis Reservoir Inflow ²	APR-JUL	585	660	715	114%	770	845	625
	APR-SEP	725	815	880	114%	945	1040	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 April 1, 2018



Snow Water Equivalent Percent of Normal

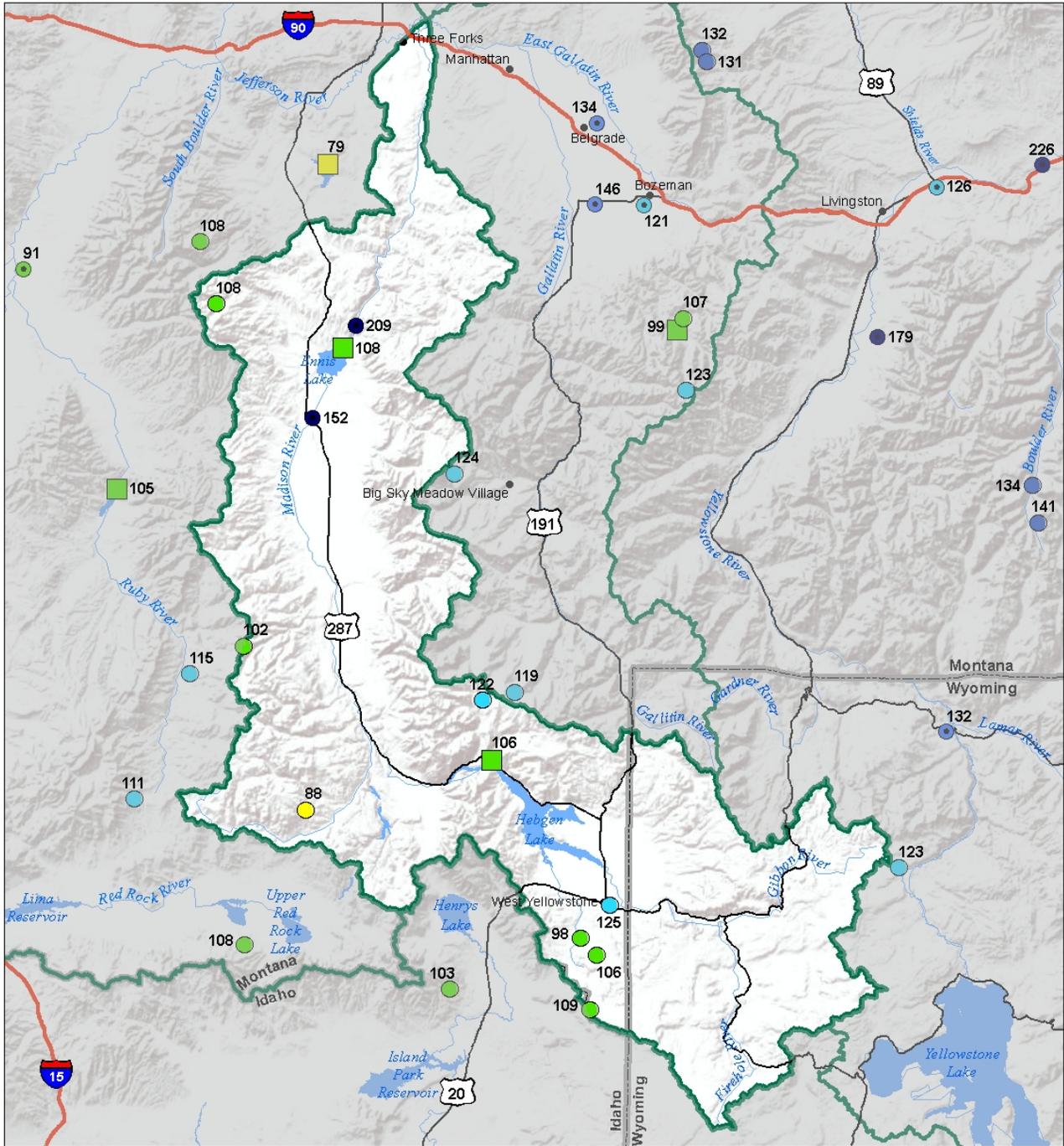
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	✱ 0%	⊕ 91 - 110%	✱ 0%

Streamflow Forecast Percent of Average Flows

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



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

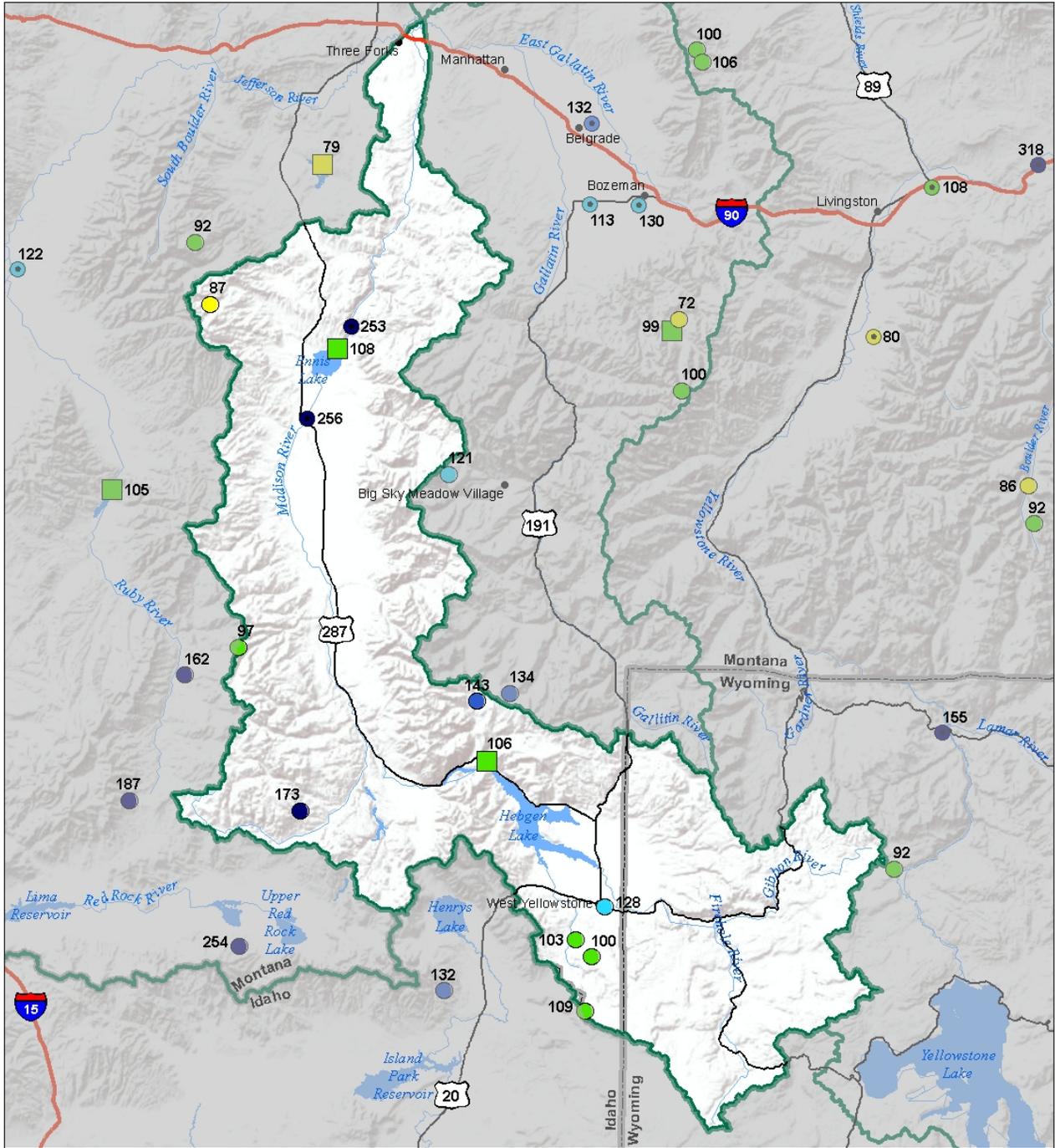


Precipitation Percent of Normal		COOP/ACIS	
SNOTEL			
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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



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



**Precipitation
Percent of Normal**

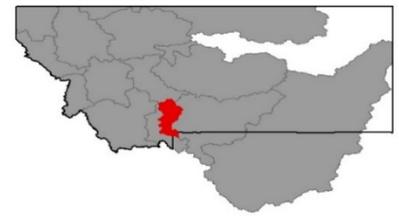
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

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



Gallatin River Basin



Both irrigators and skiers can agree on one thing; it's been great to see so much snowfall in the valleys and mountains that feed the Gallatin River. March snowfall was below normal in the Gallatin and Bridger range but was above normal in the headwaters of the Gallatin River south of Gallatin Gateway. The Lone Mountain SNOTEL is currently the second highest snowpack in 27 years of record for April 1 after receiving 131% of normal snowfall for March. Regarding water supply, has this year been record-breaking? Not really. The 1971 and 1997 water years were the highest with regards to maximum Snow Water Equivalent (SWE) at peak, which during those years occurred in late April to early May, depending on the elevation. Has snowfall been above normal this year? Absolutely. Most snowpack measurement locations have already reached their normal water year peak SWE, which typically occurs during late April to early May. Could we still set records? Maybe. Assuming the weather patterns persist, and typical spring patterns play out with regards to temperature and snowfall/precipitation, the snowpack will only continue to build over the coming month and a half. April, May, and June are typically the "wettest" months in the basin, so the story isn't over, yet. Streamflow forecasts for the Gallatin River issued on April 1 are above average for the April 1st – July 31st period. The future weather will dictate how much water is available for runoff, and when the snowpack begins to feed our rivers. It should be an interesting couple months!

Gallatin River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
UPPER GALLATIN	129%	101%
HYALITE	121%	64%
BRIDGER	147%	86%
Basin-Wide	130%	88%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	111%	123%	127%
Valley Precipitation	131%	126%	130%
Basin-Wide Precipitation	113%	124%	127%

*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%	54%	102%

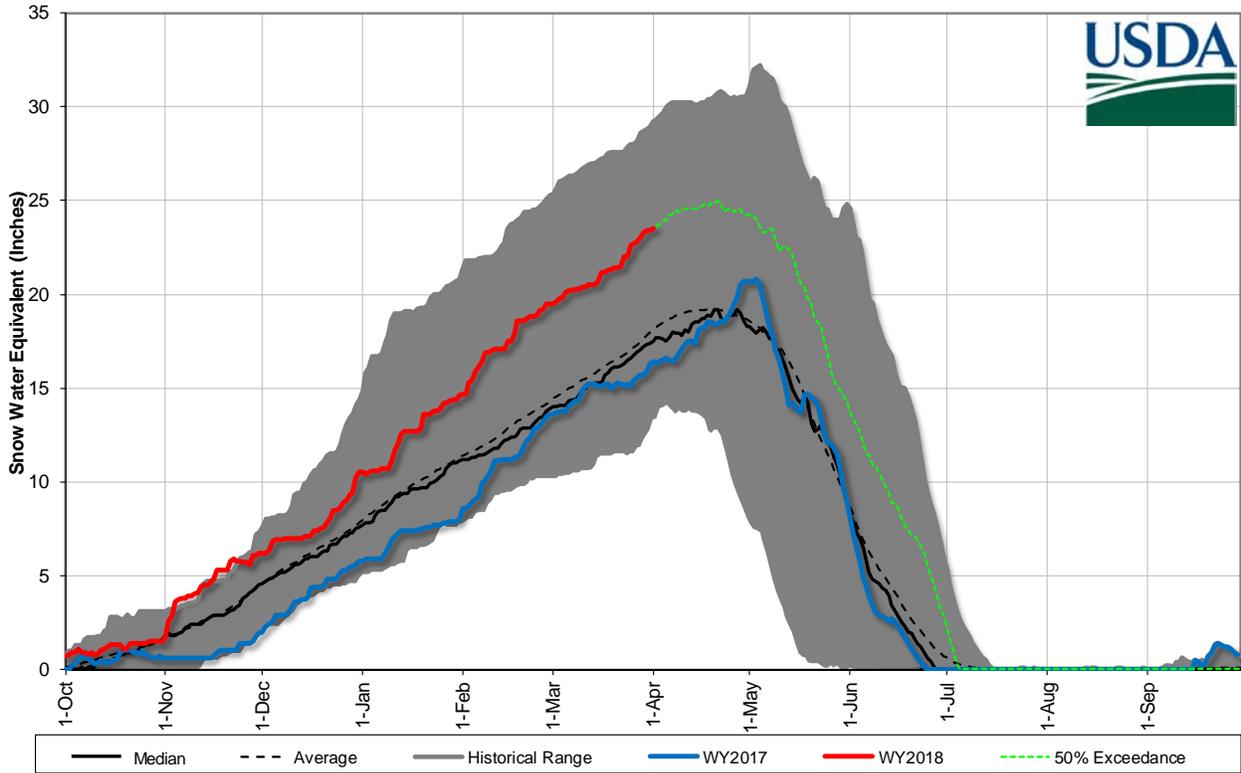
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

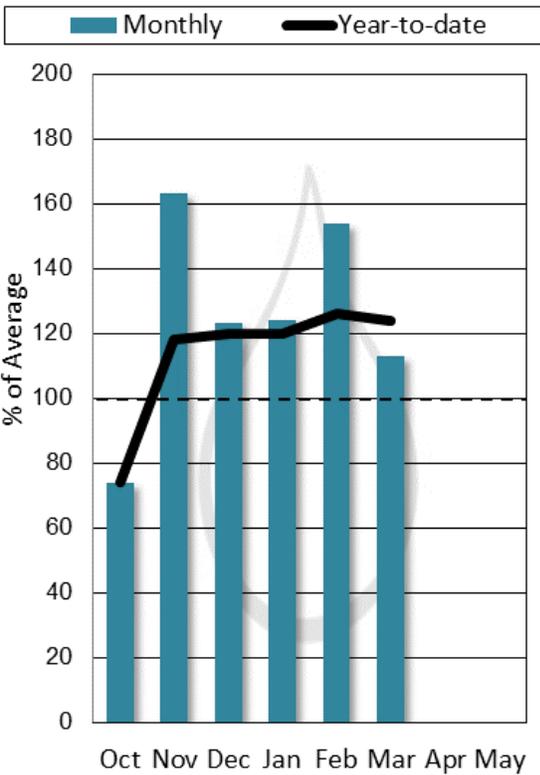
	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Middle Creek Res	5.5	5.7	5.6	10.2	99%	54%

Gallatin River Basin Snowpack with Non-Exceedence Projections

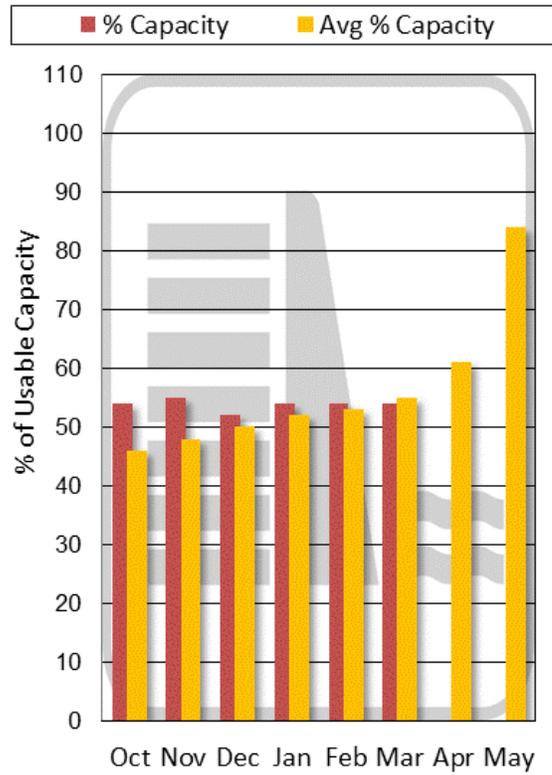
Based on provisional SNOTEL daily data as of 4/1/2018



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.

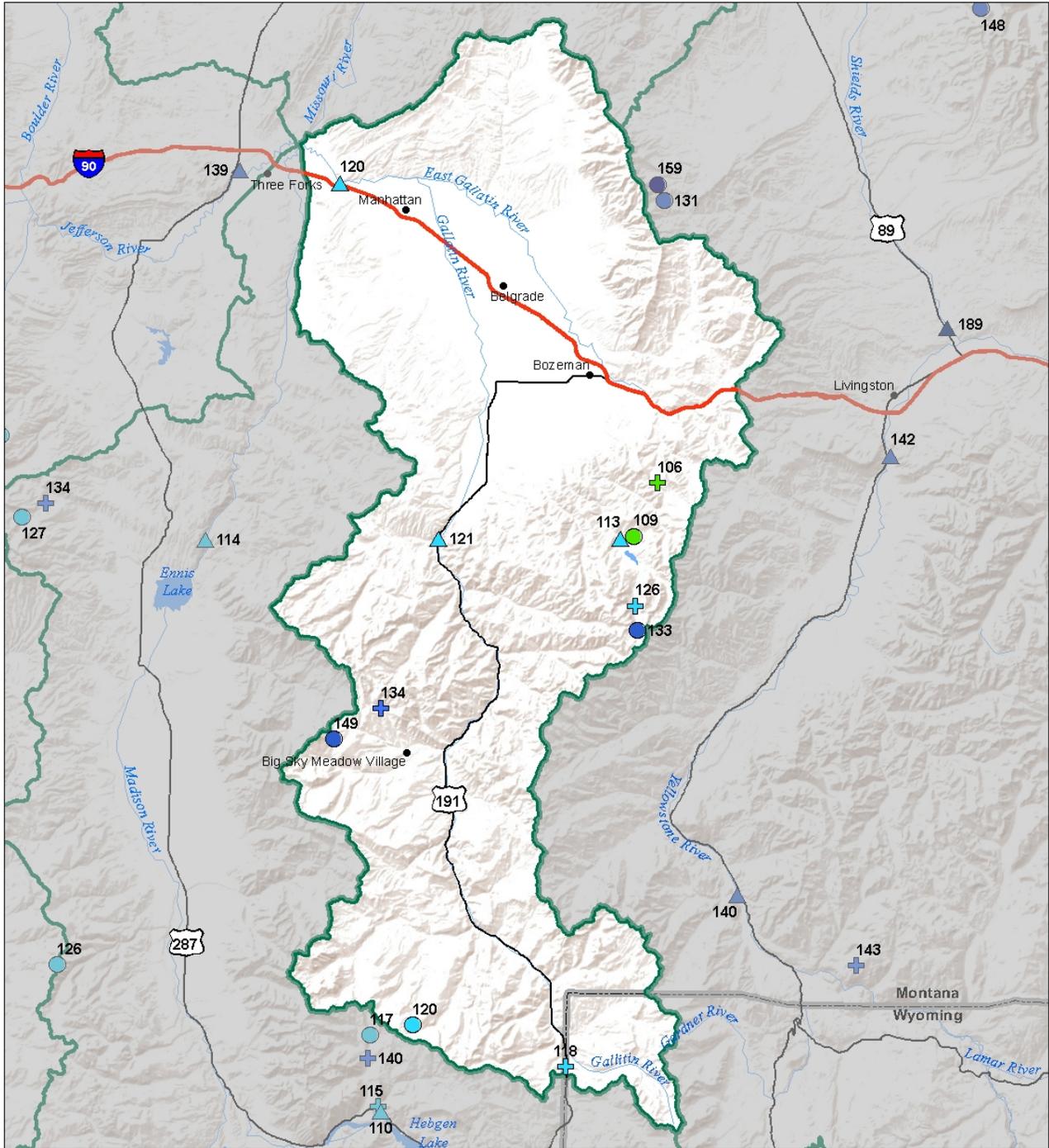
Gallatin River Basin

		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	405	455	490	123%	525	575	400
	APR-SEP	470	530	570	121%	605	665	470
Hyalite Reservoir Inflow ²	APR-JUL	19.6	22	23	115%	24	26	20
	APR-SEP	23	25	26	113%	27	29	23
Gallatin R at Logan	APR-JUL	380	470	535	122%	600	690	440
	APR-SEP	425	535	605	120%	675	785	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 April 1, 2018



Snow Water Equivalent Percent of Normal

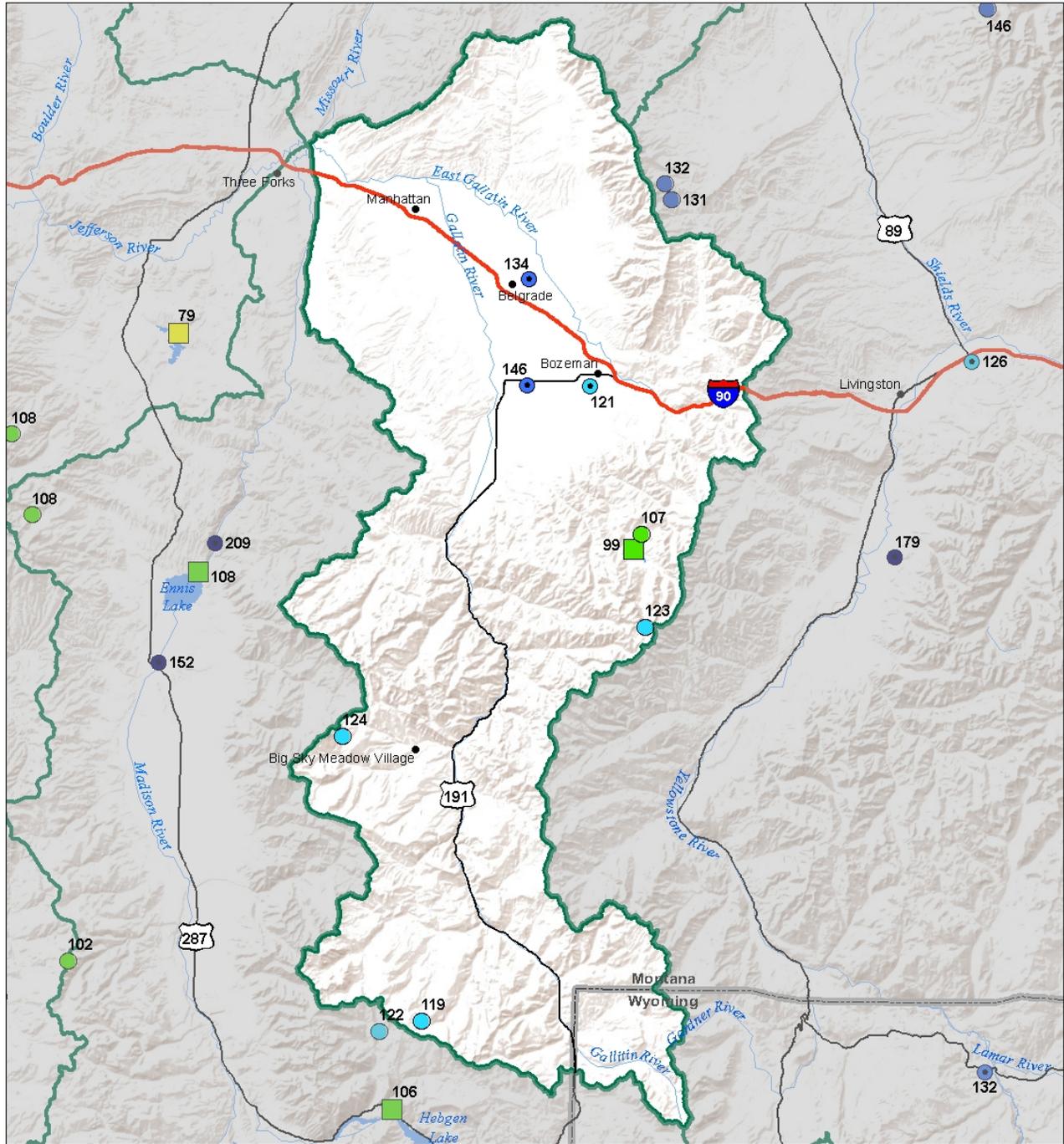
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	✱ 0%	⊕ 91 - 110%	✱ 0%

Streamflow Forecast Percent of Average Flows

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



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

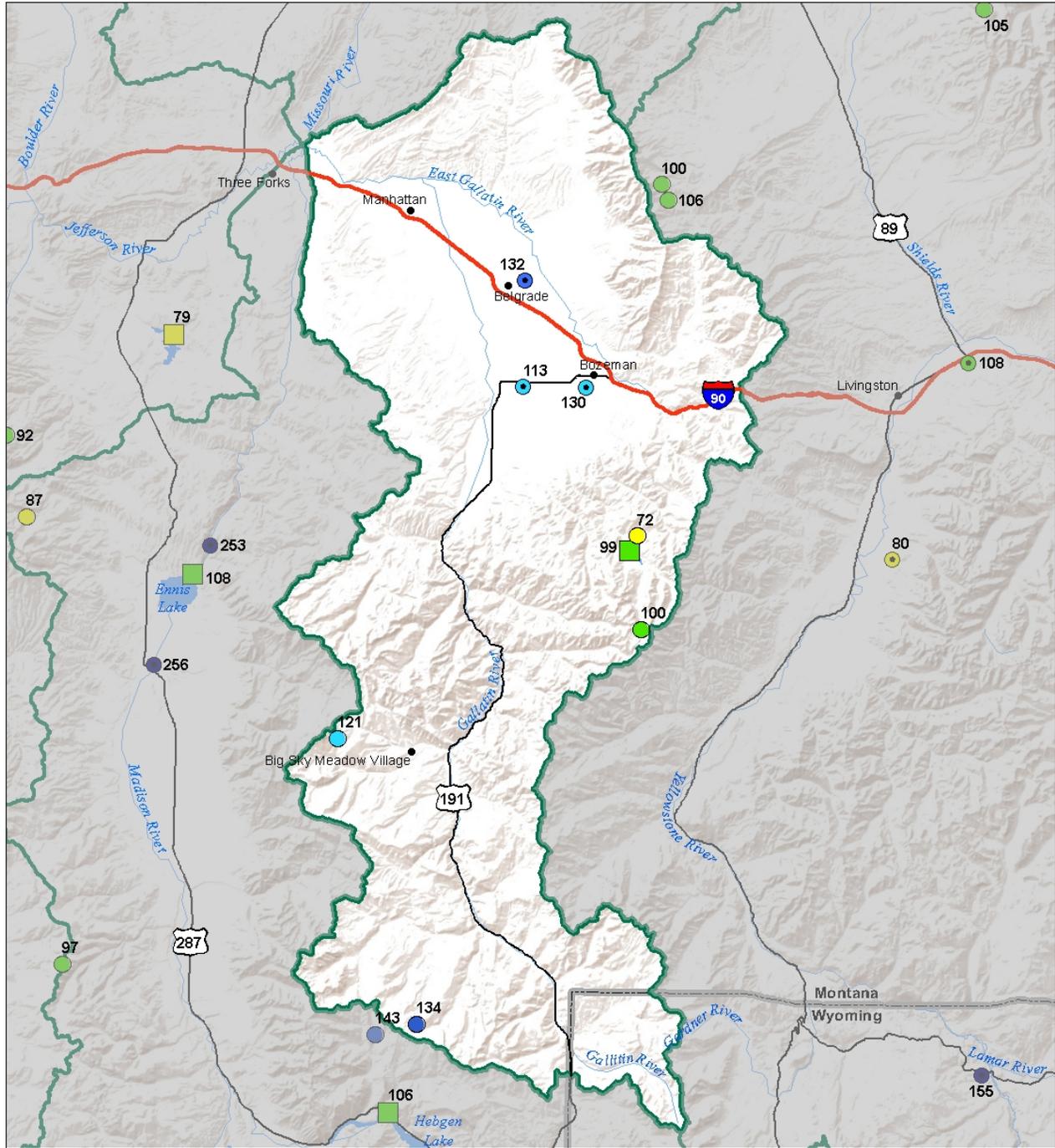


Precipitation Percent of Normal			
SNOTEL		COOP/ACIS	
● > 150%	■ 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	■ 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	■ 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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



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



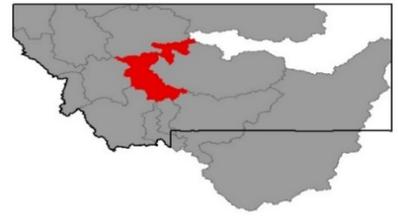
Precipitation
Percent of Normal

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

Snowfall during March wasn't record-breaking, it was closer to normal in the Missouri Mainstem River basin, but that did little to change the fact that some snowpack measurement locations in the basin are the highest on record, or second highest on record for this date. All sites in the basin remain in the top 4 years on record for almost all SNOTEL sites and snowcourses; there is an impressive amount of water stored in the mountains both north and south of Helena. At two locations, Rocker Peak and Frohner Meadow SNOTELs, this is the most amount of snow water we have seen stored in the snowpack since measurements began 40+ years ago. Other measurement locations experienced higher peaks in 1972, 2011 and 2014. During these years the peak snow water equivalent (SWE) occurred during early to mid-May. So what does this mean? April, May, and June typically provide substantial precipitation in both frozen and liquid form. We will almost certainly add more water to the snowpack if this winter's cool and wet weather persists, and doing so would further increase streamflows prospects this spring. Most streamflow forecasts within the basin issued on April 1 are already well above average for the April 1st – July 31st period. Future weather will dictate not only how much snow we have to melt, but it will also control how fast the snow water is released into the rivers and streams. A close eye should be kept on the day-to-day and week-to-week weather as we approach runoff, and water users are advised to monitor National Weather Service weekly weather and runoff forecasts this spring and summer.

Headwaters Missouri Mainstem River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
HEADWATERS MAINSTEM	169%	89%
SMITH-JUDITH-MUSSELSHELL	130%	70%
SUN-TETON-MARIAS	142%	116%
MAINSTEM ab FT PECK RES	143%	89%
MILK RIVER BASIN	164%	0%
Basin-Wide	143%	89%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	103%	135%	111%
Valley Precipitation	202%	170%	155%
Basin-Wide Precipitation	111%	137%	114%

*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	116%	80%	117%

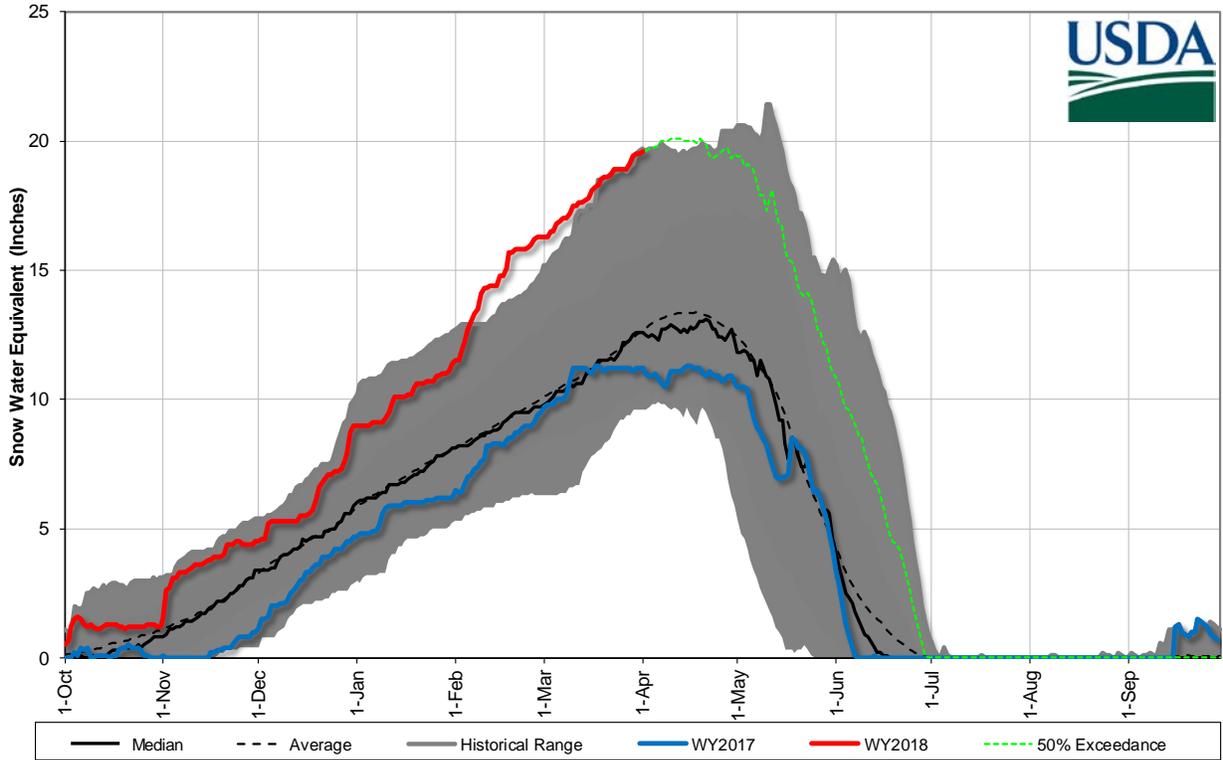
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

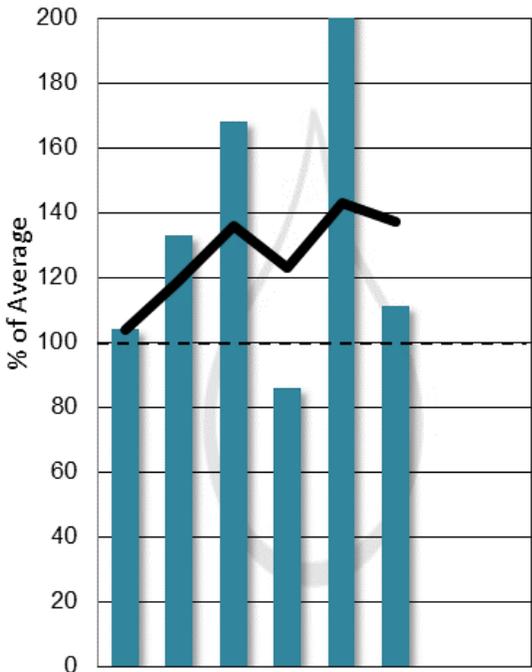
	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Canyon Ferry Lake	1348.5	1560.4	1457.0	2043.0	93%	66%
Helena Valley Reservoir	5.7	6.0	4.6	9.2	125%	62%
Lake Helena	12.1	10.8	10.9	12.7	111%	95%
Hauser Lake & Lake Helena	72.4	73.6	73.5	74.6	99%	97%
Holter Lake	80.9	81.1	77.9	81.9	104%	99%
Fort Peck Lake	15417.3	15462.9	13029.0	18910.0	118%	82%

Missouri River Basin below Toston above Smith River Inflow Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 4/1/2018

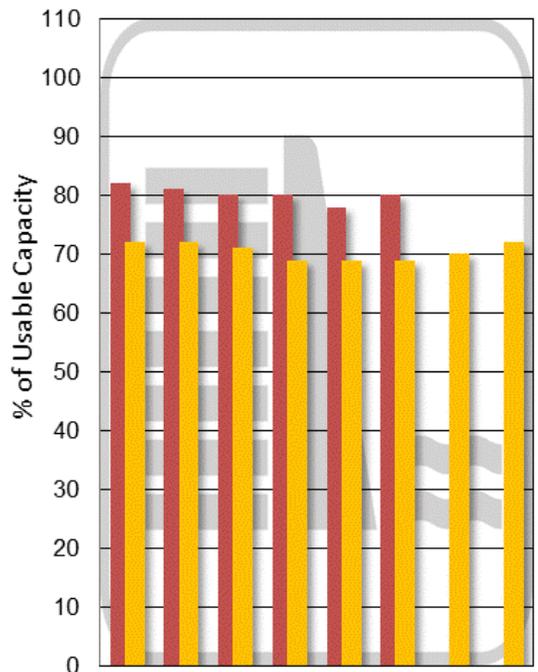


Mountain and Valley Precipitation



Oct Nov Dec Jan Feb Mar Apr May

End of Month Reservoir Storage



Oct Nov Dec Jan Feb Mar Apr May

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

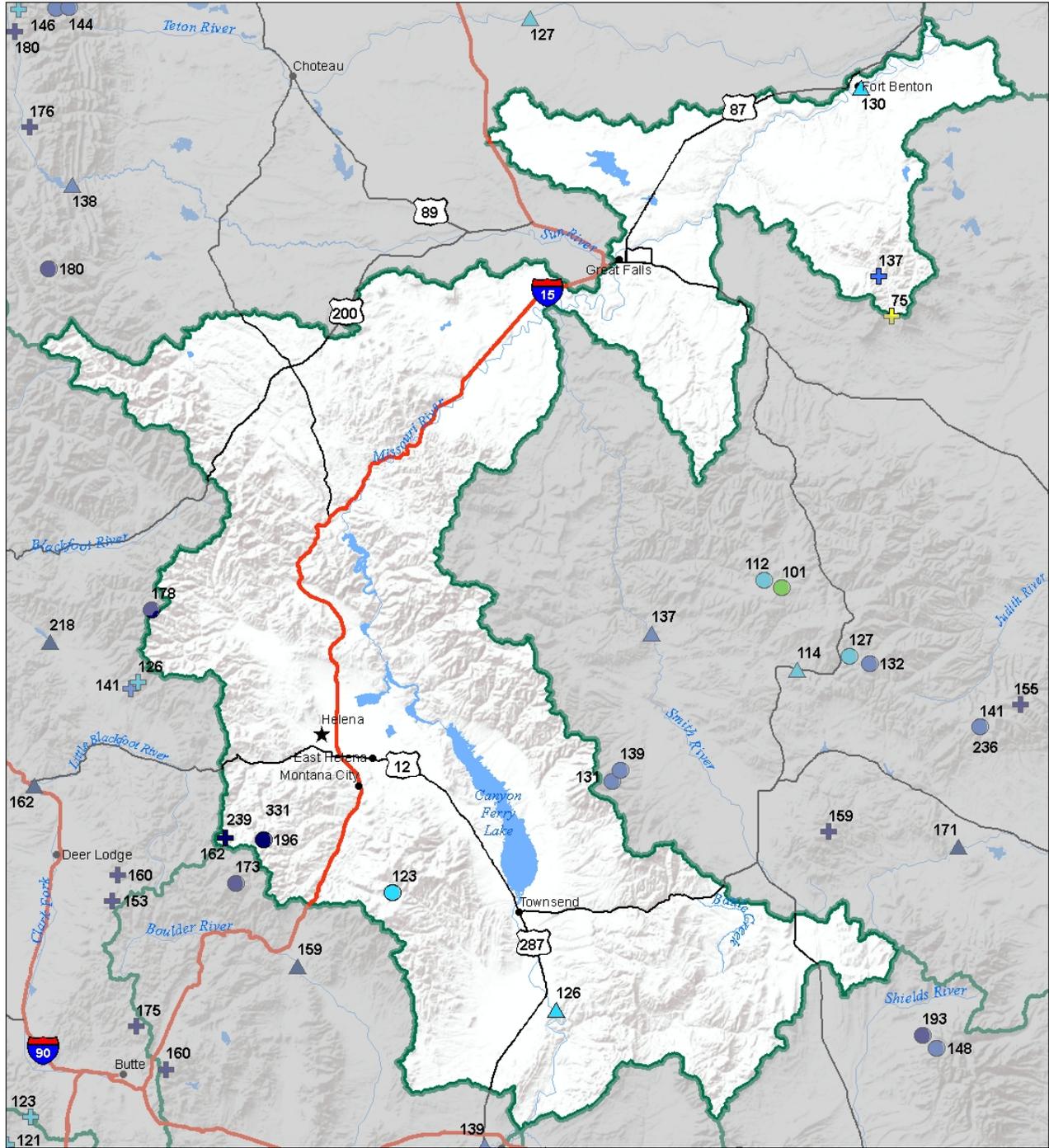
**Missouri Mainstem
Basin**

		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)
Missouri R at Toston ²	APR-JUL	1760	2080	2300	128%	2520	2840	1790
	APR-SEP	1960	2340	2610	126%	2870	3250	2070
Dearborn R nr Craig								
Missouri R at Fort Benton ²	APR-JUL	2560	3100	3470	133%	3840	4380	2610
	APR-SEP	2950	3600	4040	130%	4480	5130	3110
Missouri R nr Virgelle ²	APR-JUL	2940	3540	3940	131%	4350	4950	3000
	APR-SEP	3320	4040	4530	129%	5010	5730	3520
Missouri R nr Landusky ²	APR-JUL	3160	3800	4240	134%	4680	5330	3160
	APR-SEP	3580	4350	4870	131%	5390	6160	3720
Missouri R bl Fort Peck Dam ²	APR-JUL	3190	3890	4370	135%	4840	5540	3240
	APR-SEP	3410	4300	4910	133%	5520	6410	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 April 1, 2018



Snow Water Equivalent Percent of Normal

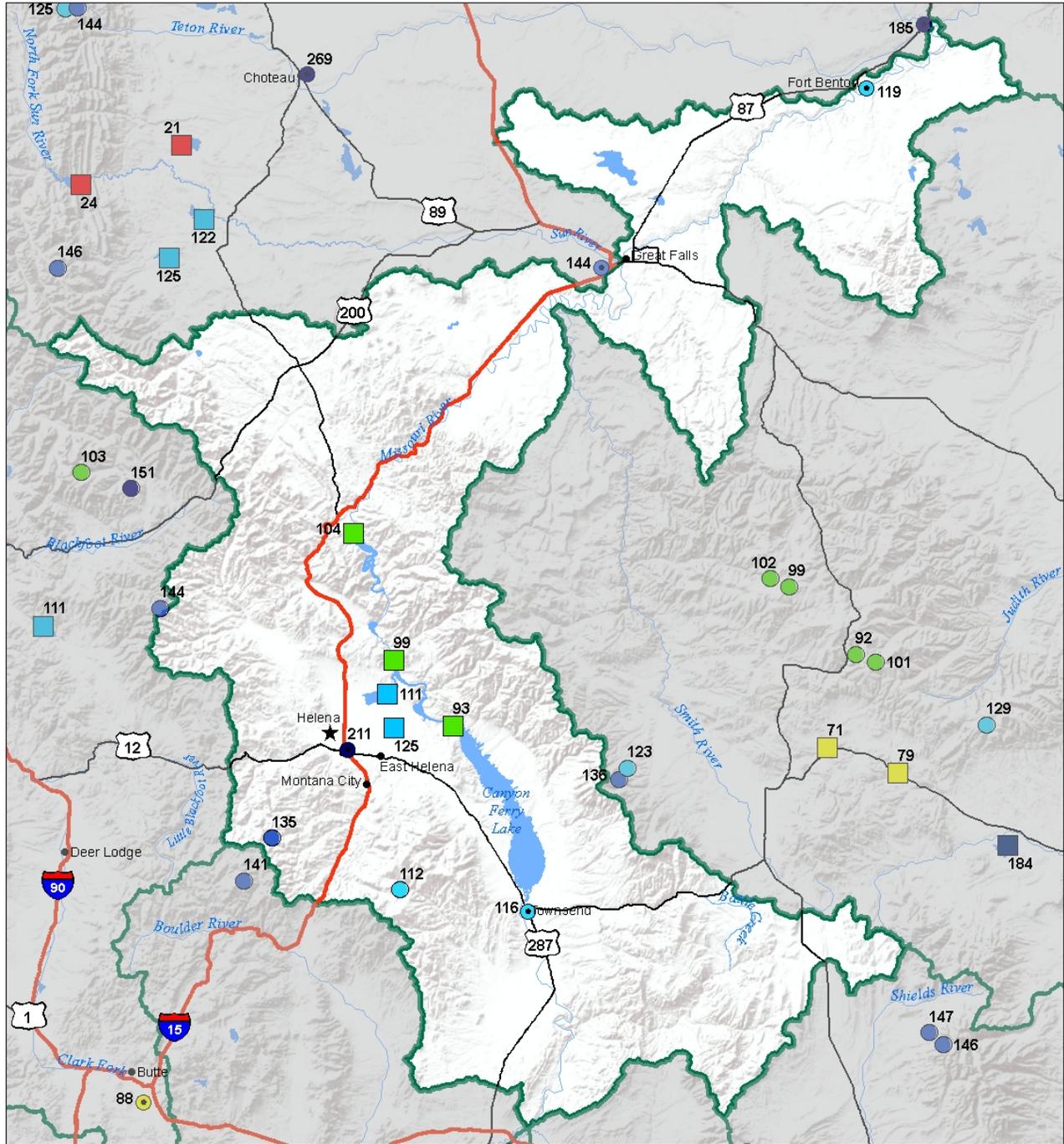
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	✱ 0%	⊕ 91 - 110%	✱ 0%

Streamflow Forecast Percent of Average Flows

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



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

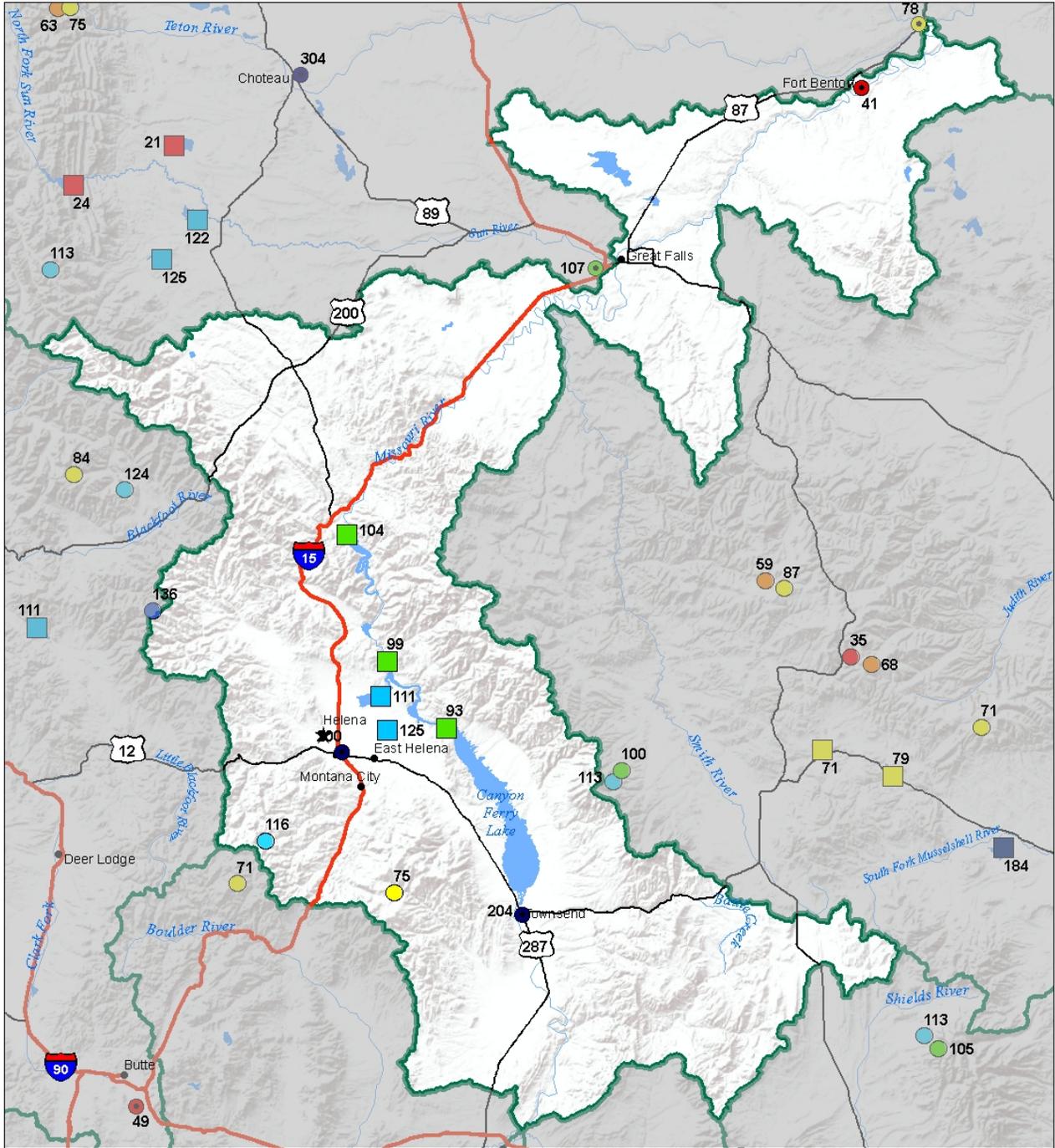


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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



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



**Precipitation
Percent of Normal**

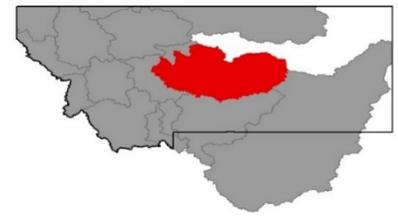
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

**Reservoirs
Percent of Normal**

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



Smith-Judith-Musselshell River Basin



Following exceptional snow accumulation in these basins in February and near normal accumulation during March the snowpack as of April 1st is around 125% of the normal water year peak. Peak Snow Water Equivalent (SWE) in these basins typically occurs in early April. Given current weather conditions and short and long-term forecasts, it appears that we have likely not reached peak snow accumulation yet! Current snowpack percentages in all sub-basins are slightly lower than last month but still well above normal meaning the outlook for irrigation this summer is very good. Spring precipitation can be a big driver of streamflows in these basins as April, May and June typically bring the bulk of annual precipitation. The current climate outlook for these next three months calls for below normal temperatures and above normal precipitation. Given this forecast, it may be prudent to pay attention to the 30% exceedance forecasts in the table below.

Smith Judith Musselshell River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
SMITH	129%	80%
HIGHWOOD	97%	0%
JUDITH	120%	61%
MUSSELSHELL	169%	73%
Basin-Wide	130%	70%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	88%	115%	103%
Valley Precipitation	130%	142%	147%
Basin-Wide Precipitation	90%	117%	105%

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

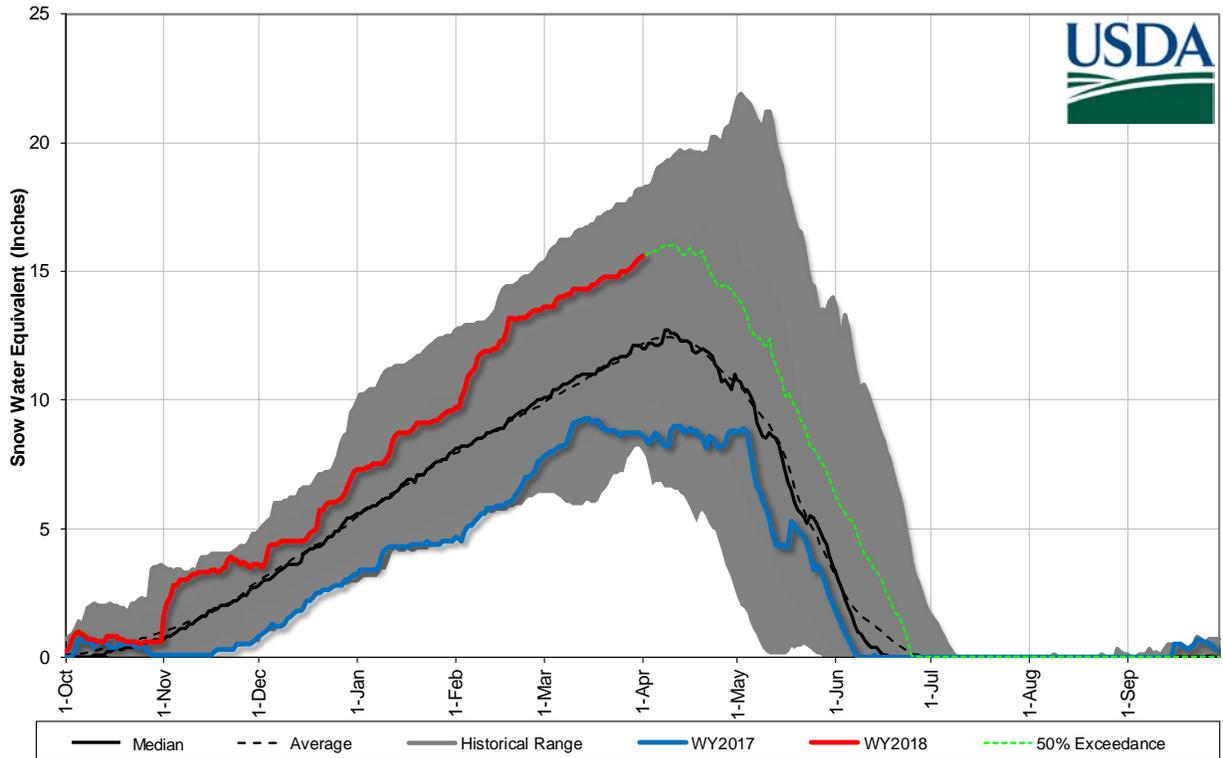
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	133%	77%	118%

*See Reservoir Storage Table for storage in individual reservoirs

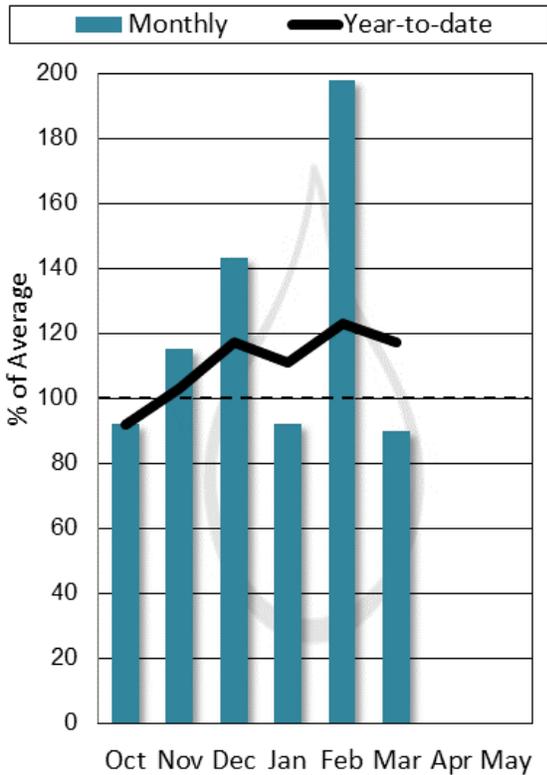
End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Smith River Res	4.8	6.4	6.7	10.6	71%	45%
Ackley Lake	2.9	3.6	2.8	7.0	103%	41%
Bair Res	2.9	4.4	3.7	7.0	79%	42%
Martinsdale Res	16.2	10.9	8.8	23.1	184%	70%
Deadman's Basin Res	66.0	56.8	47.5	72.2	139%	91%

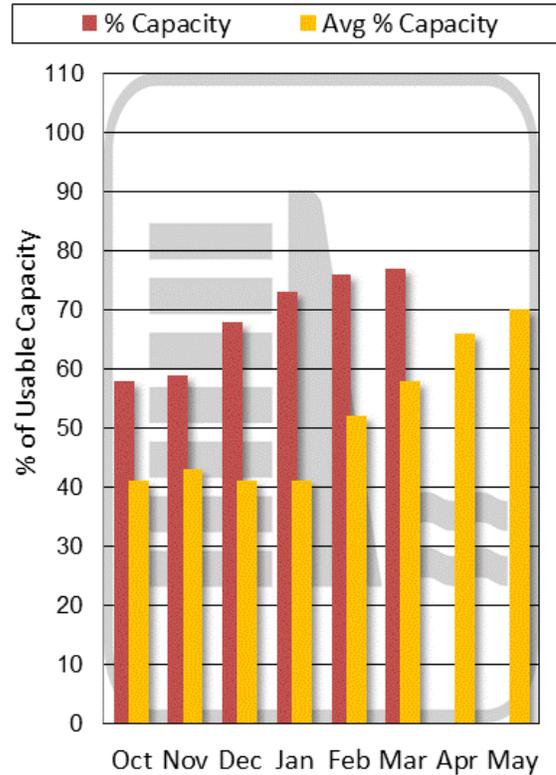
Smith-Judith-Musselshell River Basin Snowpack with Non-Exceedence Projections
 Based on provisional SNOTEL daily data as of 4/1/2018



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.

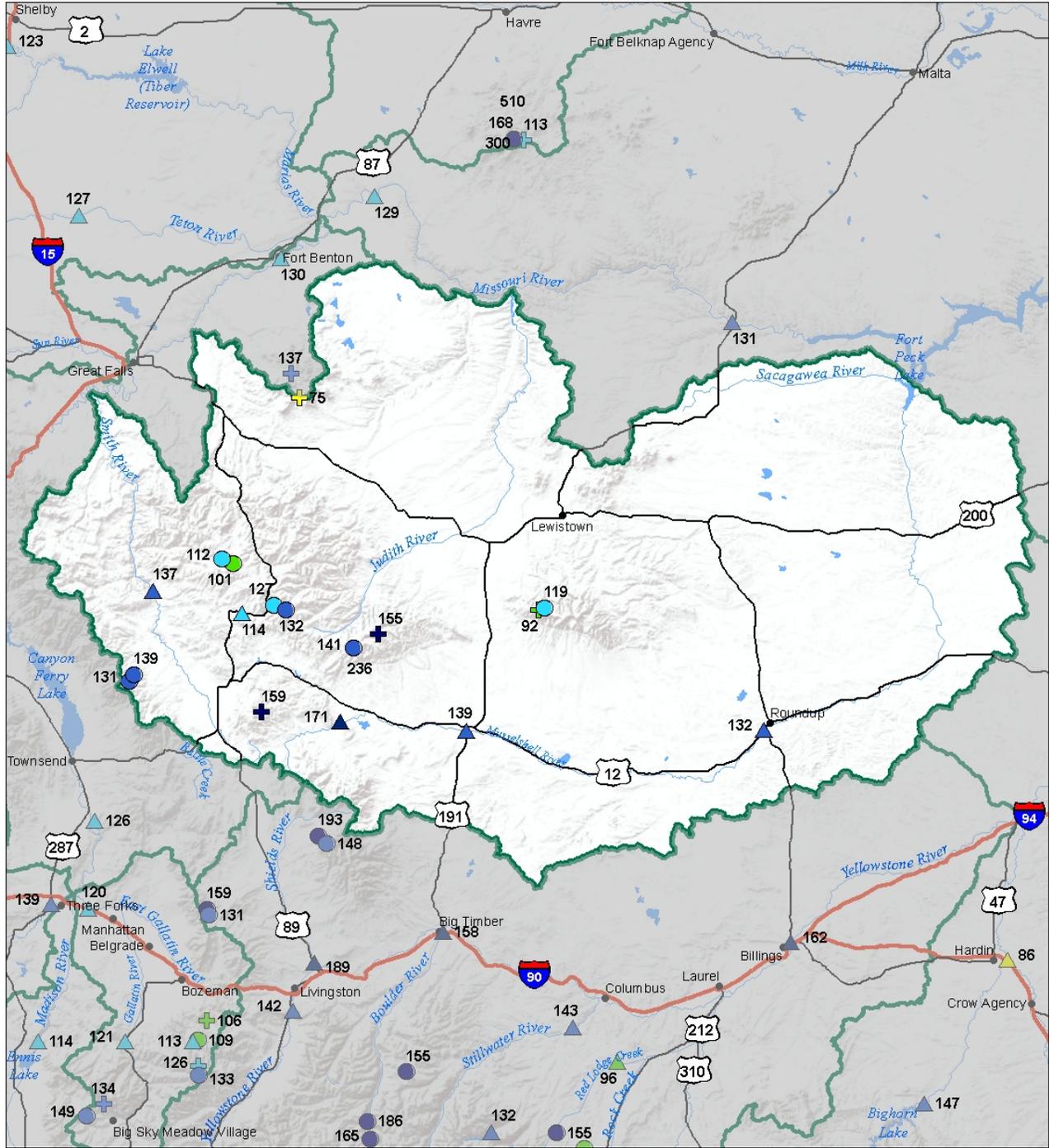
Smith-Judith-Musselshell

		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)
Sheep Ck nr White Sulphur Springs	APR-JUL	12.7	15.9	18.1	117%	20	23	15.5
	APR-SEP	14.5	18.4	21	114%	24	28	18.4
Smith R bl Eagle Ck ²	APR-JUL	93	124	145	137%	166	197	106
	APR-SEP	96	133	159	137%	185	220	116
NF Musselshell R nr Delpine								
SF Musselshell R ab Martinsdale	APR-JUL	34	50	61	174%	72	88	35
	APR-SEP	35	53	65	171%	77	95	38
Musselshell R at Harlowton ²	APR-JUL	43	64	78	137%	92	113	57
	APR-SEP	42	66	82	139%	98	122	59
Musselshell R nr Roundup ²	APR-JUL	-18.6	44	86	128%	128	191	67
	APR-SEP	-17.1	45	87	132%	129	191	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 April 1, 2018



Snow Water Equivalent Percent of Normal

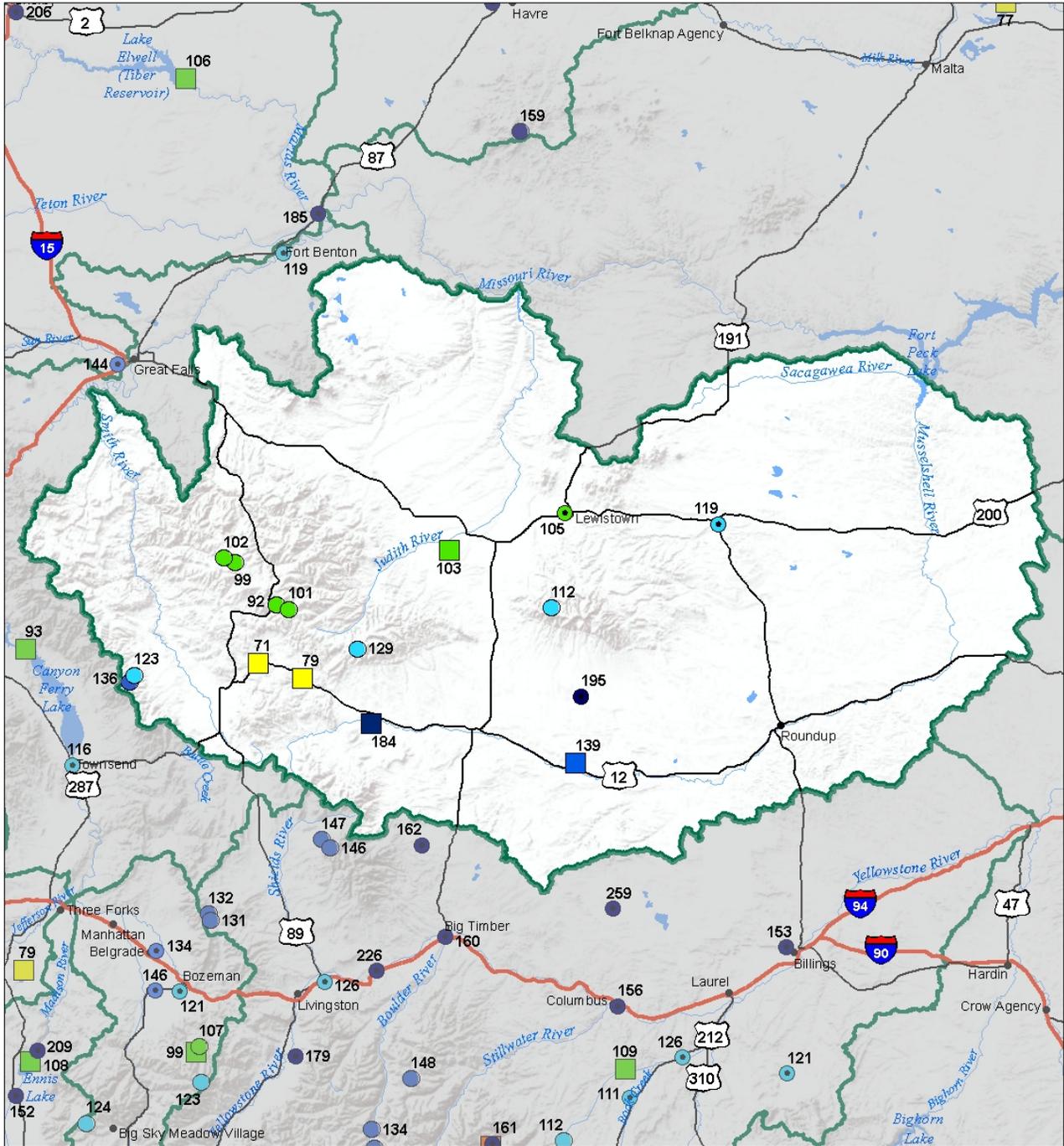
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

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 April 1, 2018

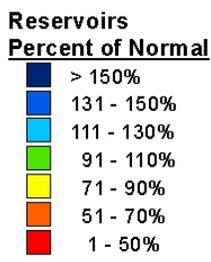
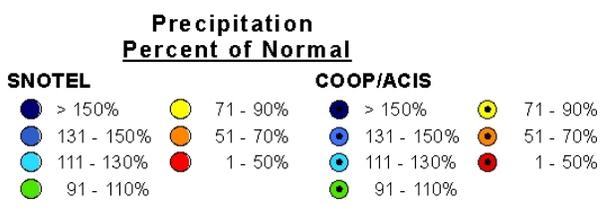
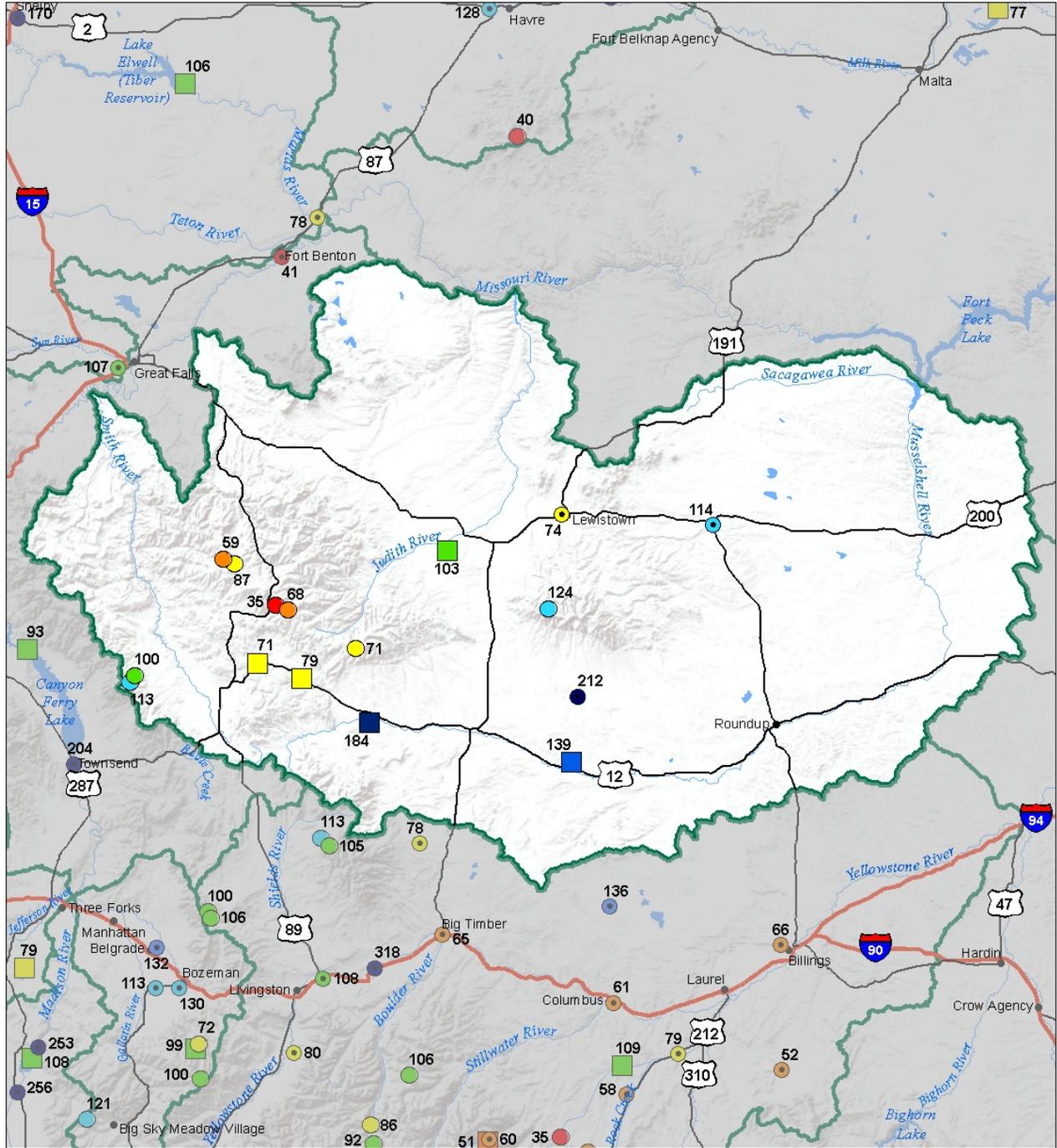


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

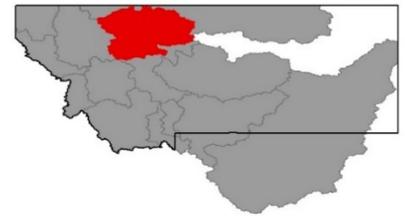
Reservoirs Percent of Normal
■ > 150%
■ 131 - 150%
■ 111 - 130%
■ 91 - 110%
■ 71 - 90%
■ 51 - 70%
■ 1 - 50%



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



Sun-Teton-Marias River Basin



Another month of winter has passed with above normal snow accumulation in the Sun, Teton, and Marias river basins. March was not able to compete with February, but totals were very respectable for the month, and all three sub-basins continue to report well above normal snowpacks as of April 1st. The snowpack in these basins typically reach peak Snow Water Equivalent (SWE) in early April, and all SNOTEL sites have already far exceeded their normal peak SWE values. Current snowpack percentages which include SNOTEL and snow course data range from 156% recorded in the Sun River basin to 130% for the Marias River basin. Spring precipitation can play a big role in water supplies in these basins, and the current climate outlook for this region for April to June is for below normal temperatures and above normal precipitation. It will be important in the coming months to keep an eye on weather conditions and pay attention to the appropriate exceedance probabilities in the streamflow forecast table below.

Sun-Teton-Marias River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
SUN	156%	117%
TETON	138%	115%
MARIAS	130%	115%
Basin-Wide	142%	116%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	80%	133%	129%
Valley Precipitation	254%	218%	187%
Basin-Wide Precipitation	90%	136%	131%

*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%	52%	109%

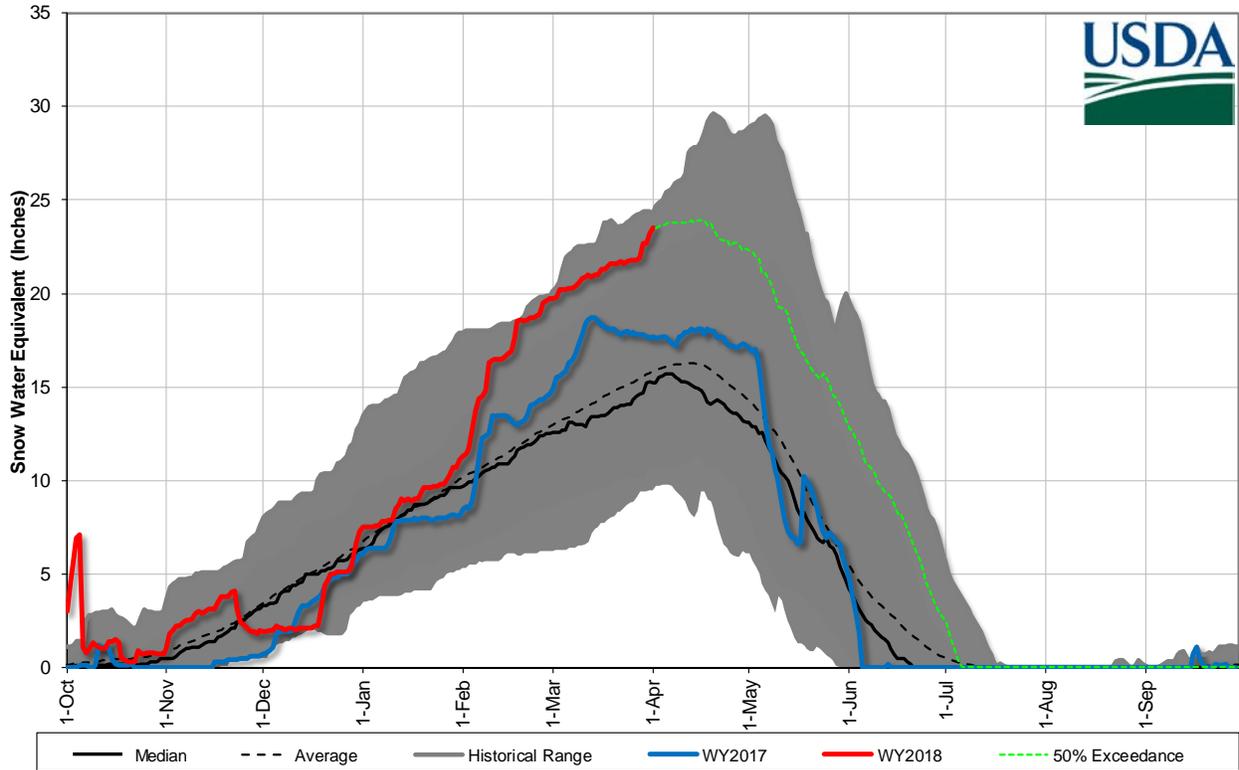
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

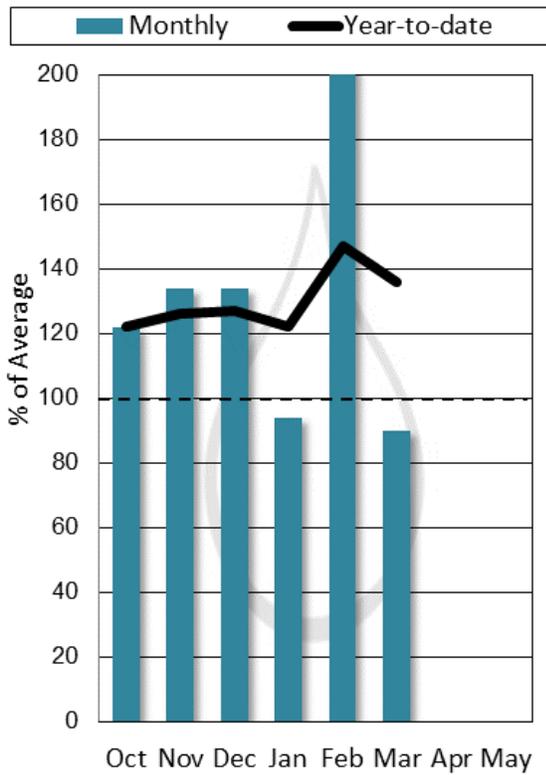
	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Gibson Res	11.4	40.4	47.9	99.1	24%	11%
Pishkun Res	3.7	4.8	18.2	32.0	21%	12%
Willow Creek Res - Augusta	29.1	29.1	23.8	32.2	122%	91%
Lower Two Medicine Lake		7.0	9.0	11.9		
Four Horns Lake		11.8	10.1	19.2		
Swift Res	20.0	11.2	17.2	30.0	116%	67%
Lake Frances	57.6	54.0	60.1	112.0	96%	51%
Lake Elwell (Tiber)	741.6	803.7	697.7	1347.0	106%	55%
Nilan Reservoir	9.0	5.8	7.2	11.0	125%	82%

Sun-Teton-Marias River Basin Snowpack with Non-Exceedence Projections

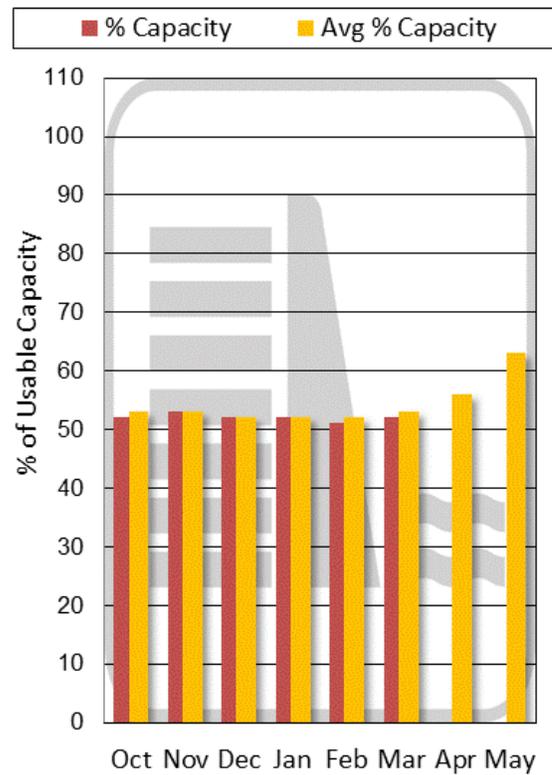
Based on provisional SNOTEL daily data as of 4/1/2018



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.

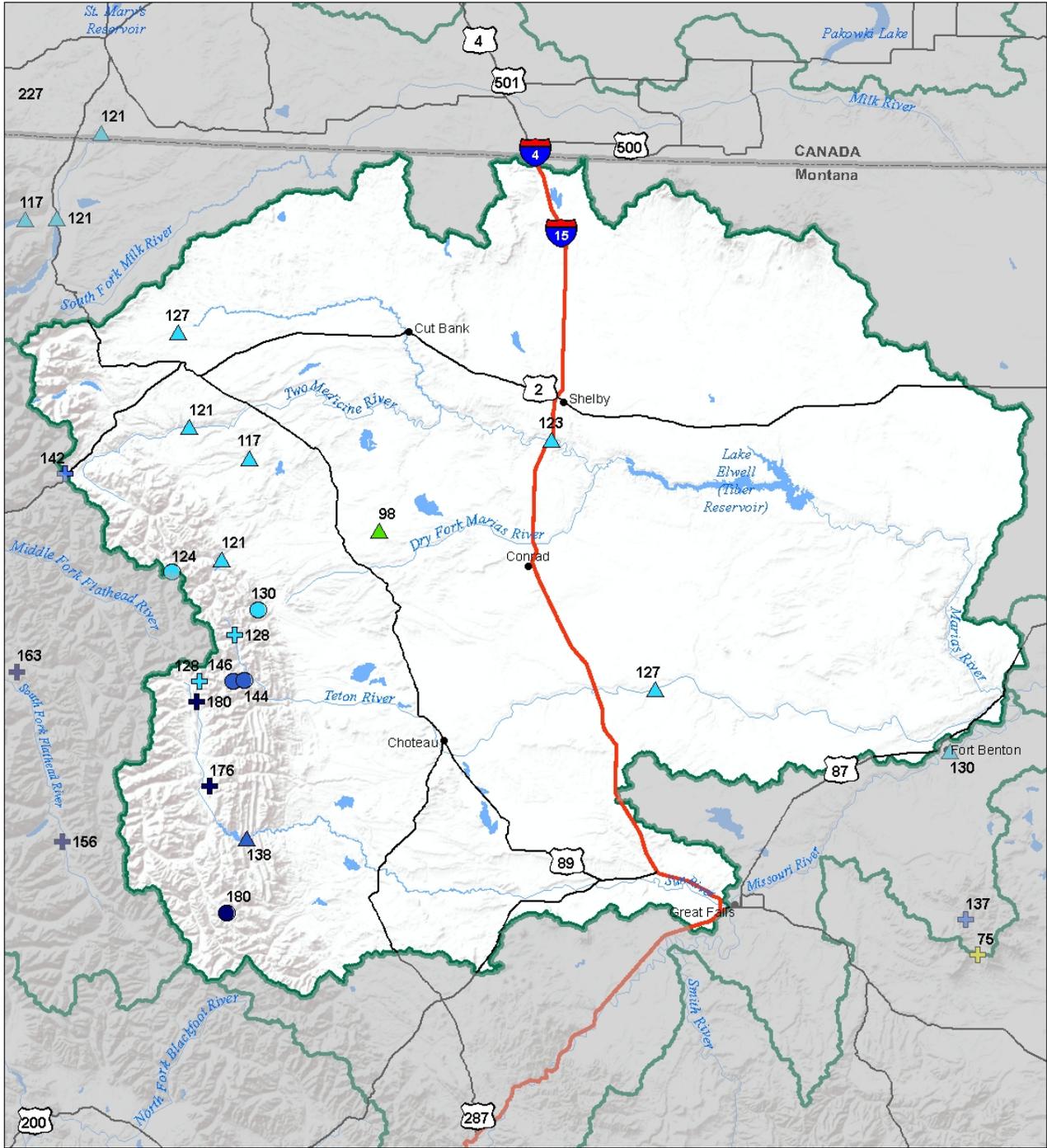
Sun-Teton-Marias Basins

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	475	520	555	141%	590	635	395
	APR-SEP	515	570	605	138%	640	695	440
Two Medicine R nr Browning ²	APR-JUL	187	210	225	123%	240	265	183
	APR-SEP	196	220	235	121%	255	280	194
Badger Ck nr Browning	APR-JUL	80	95	105	119%	115	130	88
	APR-SEP	91	108	120	117%	132	149	103
Swift Reservoir Inflow ²	APR-JUL	50	61	69	121%	77	88	57
	APR-SEP	59	72	81	121%	90	103	67
Dupuyer Ck nr Valier	APR-JUL	5.3	8.7	11	99%	13.3	16.7	11.1
	APR-SEP	6.1	9.9	12.4	98%	14.9	18.7	12.7
Cut Bank Ck nr Browning	APR-JUL	69	80	88	128%	96	107	69
	APR-SEP	74	87	95	127%	103	116	75
Marias R nr Shelby ²	APR-JUL	315	390	445	124%	495	570	360
	APR-SEP	325	405	460	123%	520	600	375
Teton R nr Dutton	APR-JUL	9.4	35	53	126%	71	97	42
	APR-SEP	13.8	42	61	127%	80	108	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
April 1, 2018**

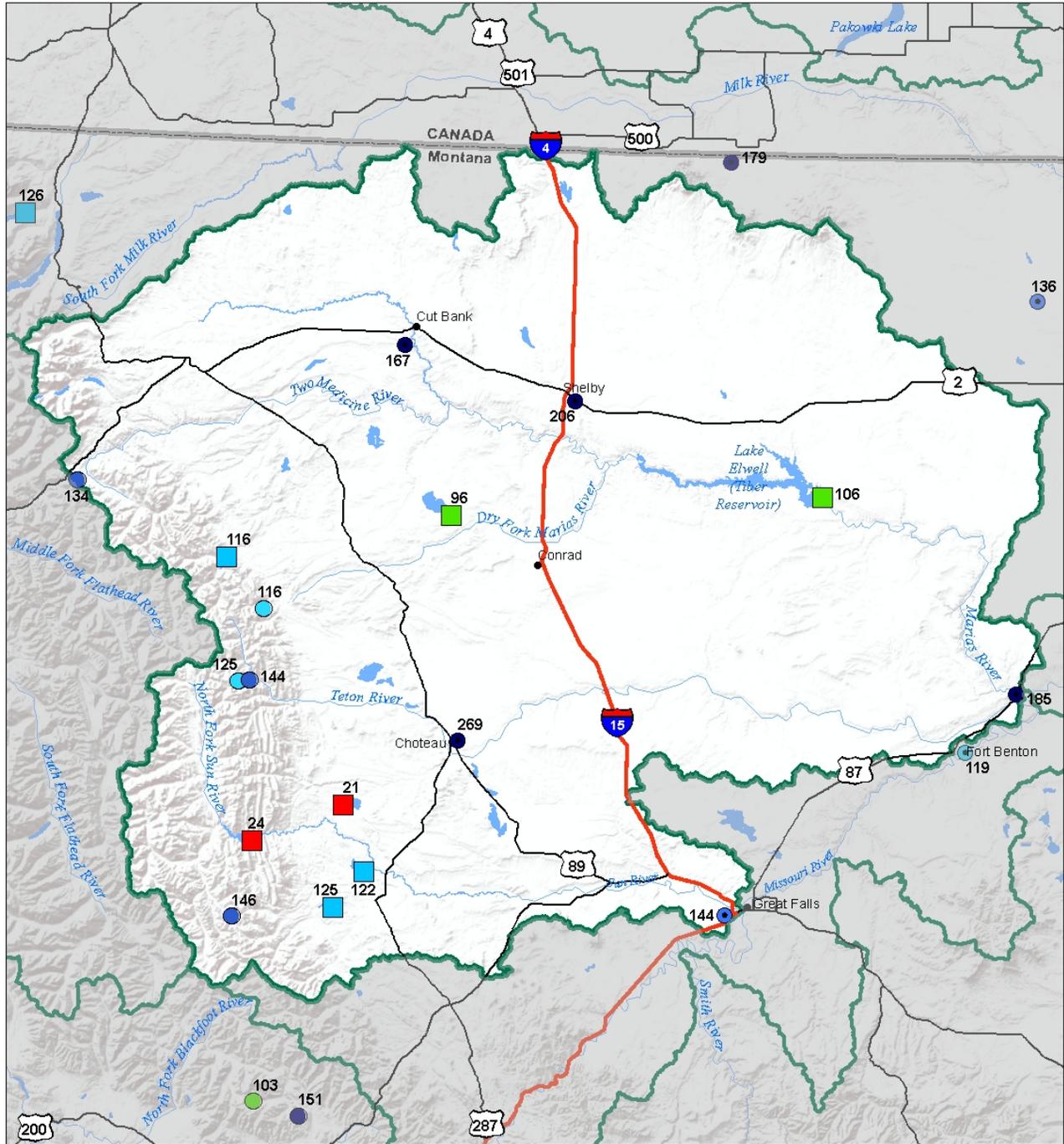


Snow Water Equivalent Percent of Normal			
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	✱ 0%	⊕ 91 - 110%	✱ 0%

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

USDA
Montana State Library
Natural Resource
Information System

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

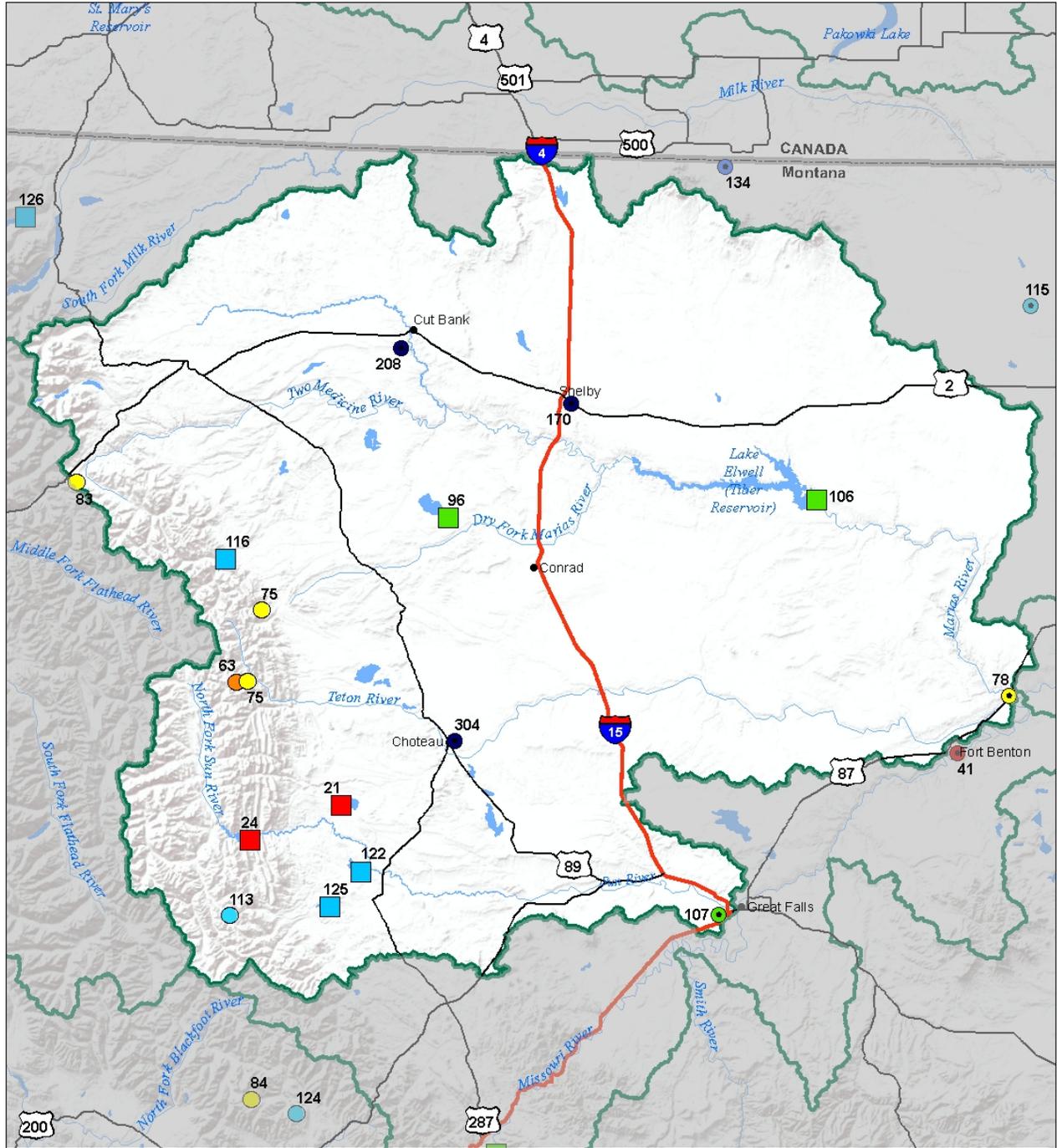


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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

USDA
 National Water Library
 Natural Resource Information System

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



Following on the heels of a record-setting February, snow accumulation during March in the St. Mary and Milk River basins was once again well above normal! The snowpack in this region typically peaks in the first few days of April. Current snowpack totals are well above the normal peak and given current weather conditions and the short and long-term outlooks it appears that snowpack will reach peak levels a bit later than normal this year. In the headwaters of the St. Mary River, monitoring sites in the US and Canada were well above normal on April 1st, ranging from 124% to 227%. Current streamflow forecasts for the Inflow to Lake Sherburne and the St. Mary River reflect these snowpack totals calling for above normal flows this season. The Bearpaw Mountains received little precipitation this month and only added around 0.5 inches of Snow Water Equivalent (SWE) to the snowpack. Despite a relatively quiet month in the region current snowpack totals remain well above normal with the lower elevations holding onto much higher SWE totals than they typically have at this point in the season. All of this bodes well for the upcoming runoff season, but it is important to keep in mind that April, May & June can be big months for precipitation in this area and water users should keep an eye on local weather conditions and plan accordingly.

St. Mary-Milk River Basin Data Summary

Snowpack

	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
ST. MARY	136%	109%
BEARPAW MOUNTAINS	164%	0%
CYPRESS HILLS, CANADA	%	%
MILK RIVER BASIN	164%	0%
Basin-Wide	140%	94%

Precipitation

	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation (St. Mary)	93%	122%	137%
Mountain Precipitation (Bearpaw Mtns)	40%	159%	164%
Valley Precipitation	207%	158%	202%
Basin-Wide Precipitation	107%	130%	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	88%	41%	139%

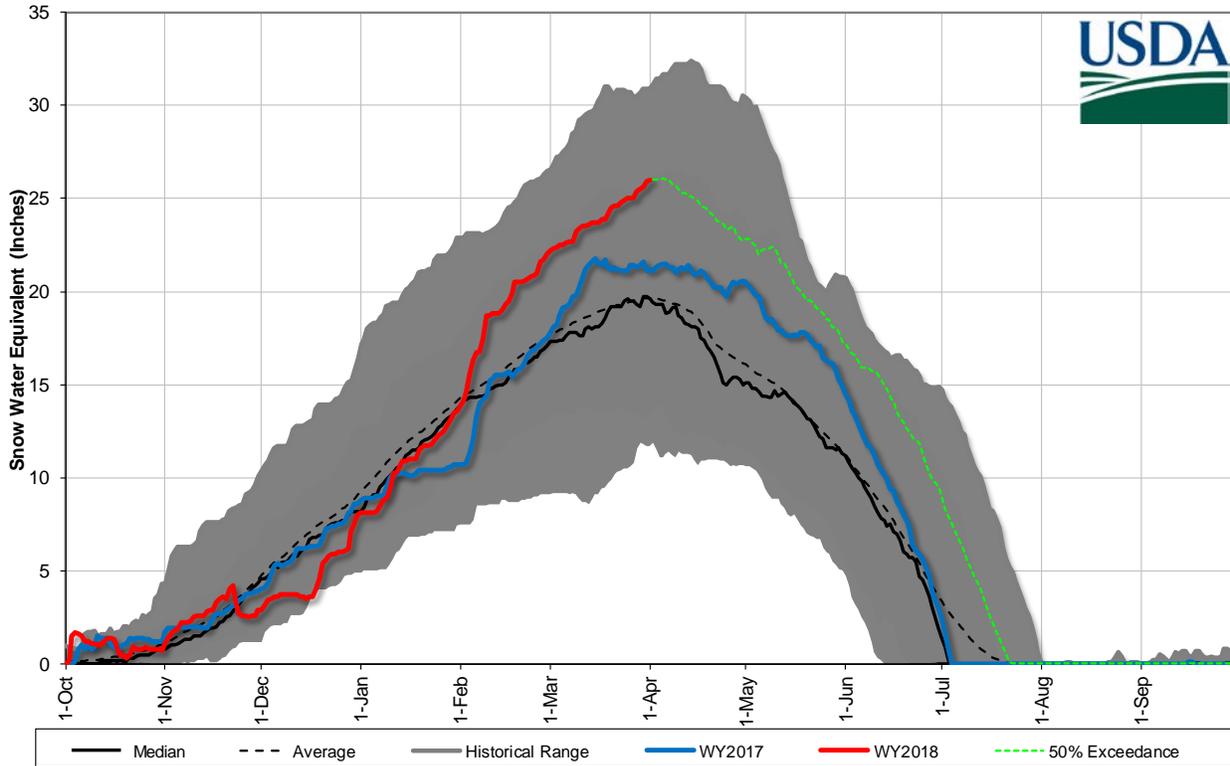
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

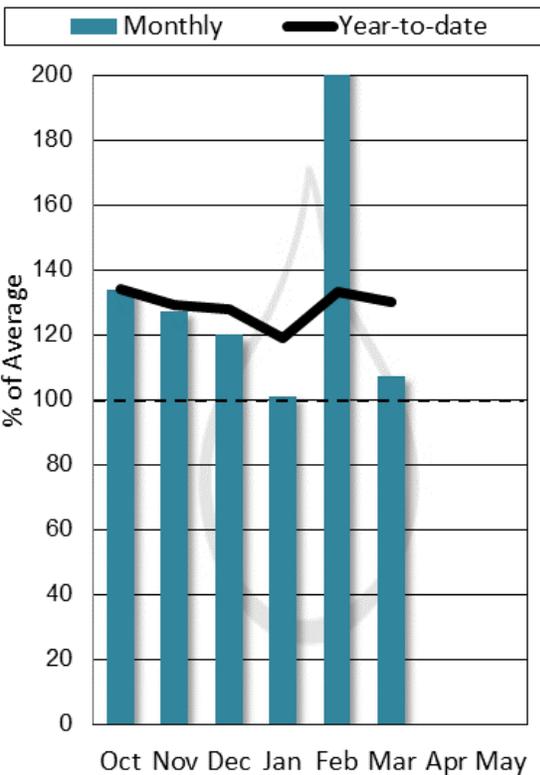
	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Lake Sherburne	33.3	54.4	26.4	64.3	126%	52%
Fresno Res	45.2	86.5	58.6	127.0	77%	36%
Nelson Res	26.3	24.2	34.0	66.8	77%	39%

Saint Mary-Milk River Basin Snowpack with Non-Exceedance Projections

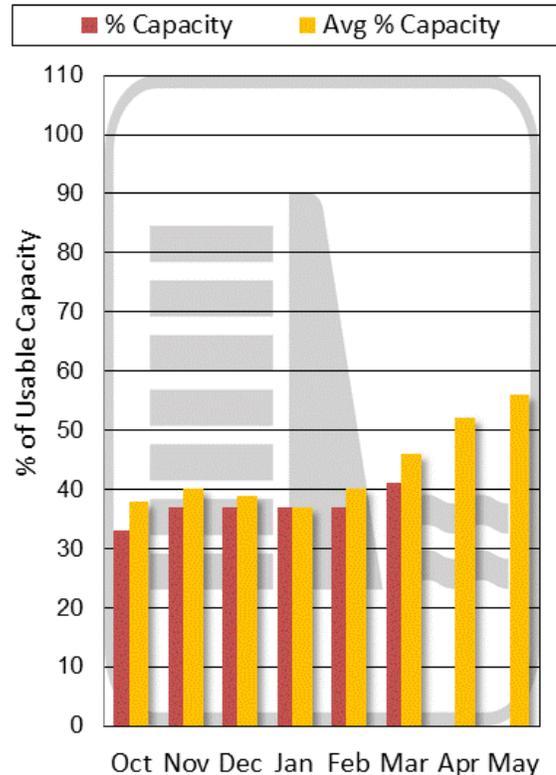
Based on provisional SNOTEL daily data as of 4/1/2018



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.

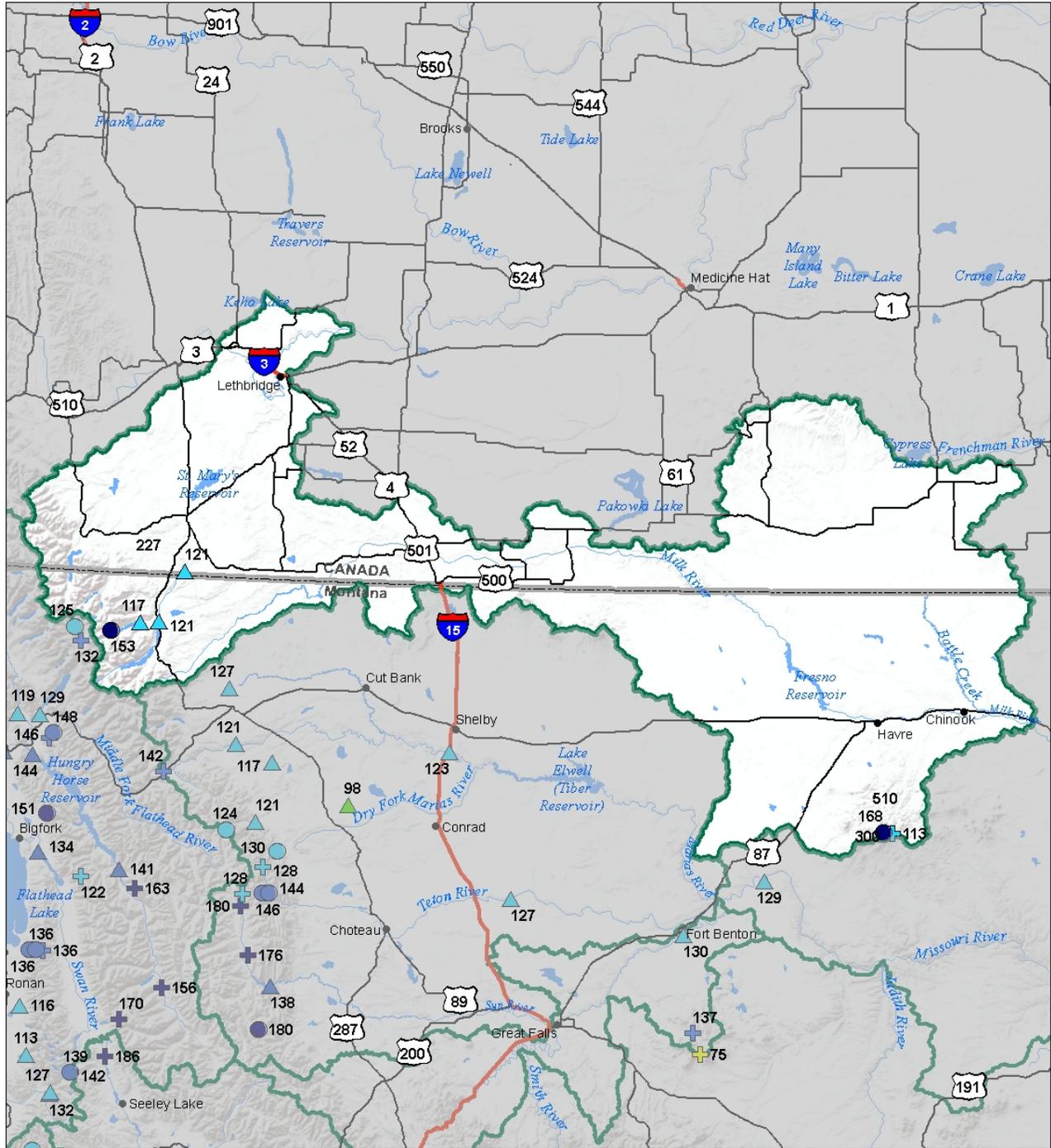
St. Mary River Basin

		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	98	108	115	119%	122	133	97
	APR-SEP	111	123	131	117%	139	151	112
Two Medicine R nr Browning ²	APR-JUL	380	420	450	122%	475	515	370
	APR-SEP	435	480	515	121%	545	590	425
Badger Ck nr Browning	APR-JUL	435	495	535	123%	570	630	435
	APR-SEP	500	565	610	121%	650	715	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 April 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

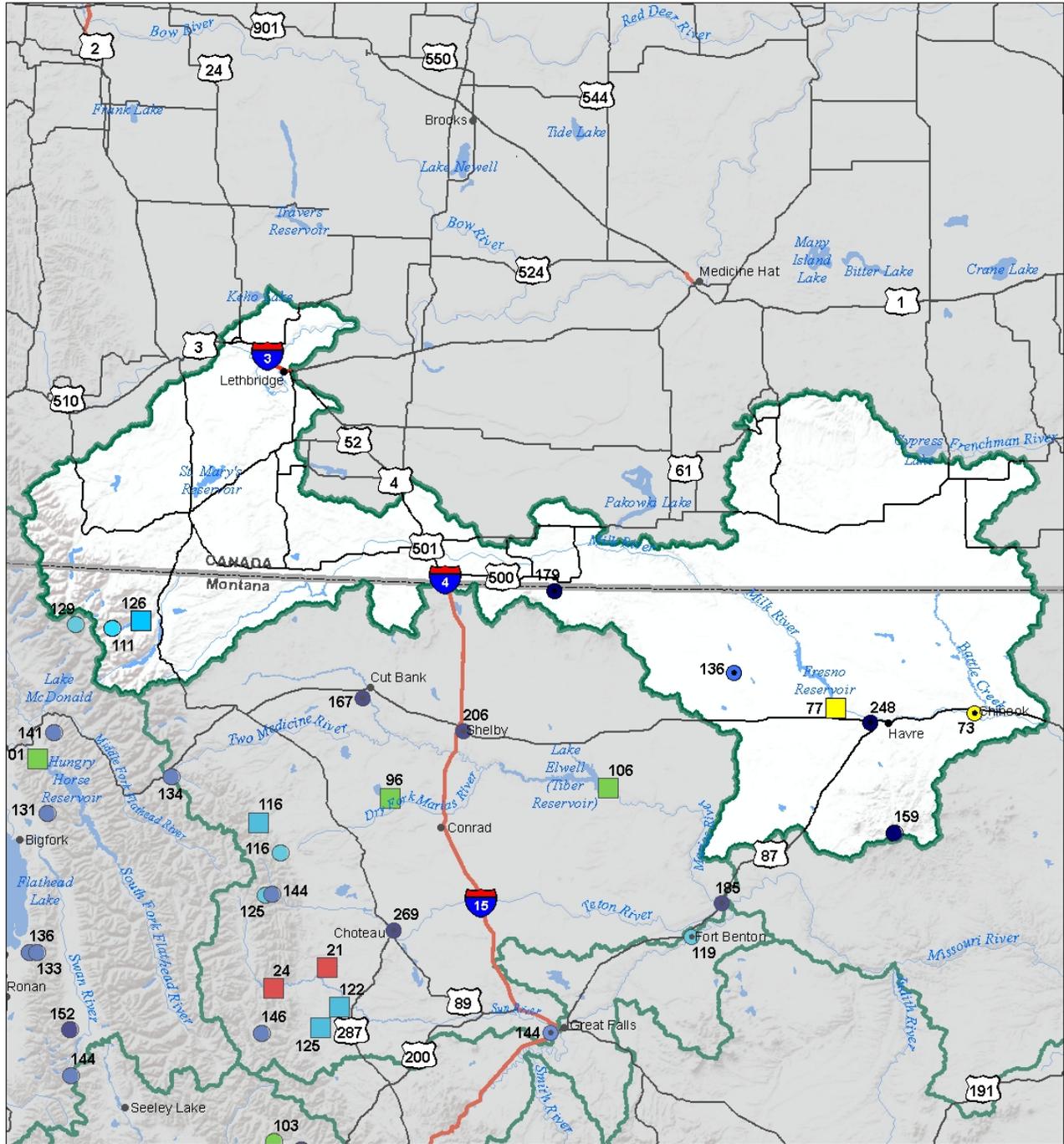
▲ > 150%
▲ 131 - 150%
▲ 111 - 130%
▲ 91 - 110%
▲ 71 - 90%
▲ 51 - 70%
▲ 1 - 50%



St Mary's-Milk River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

April 1, 2018

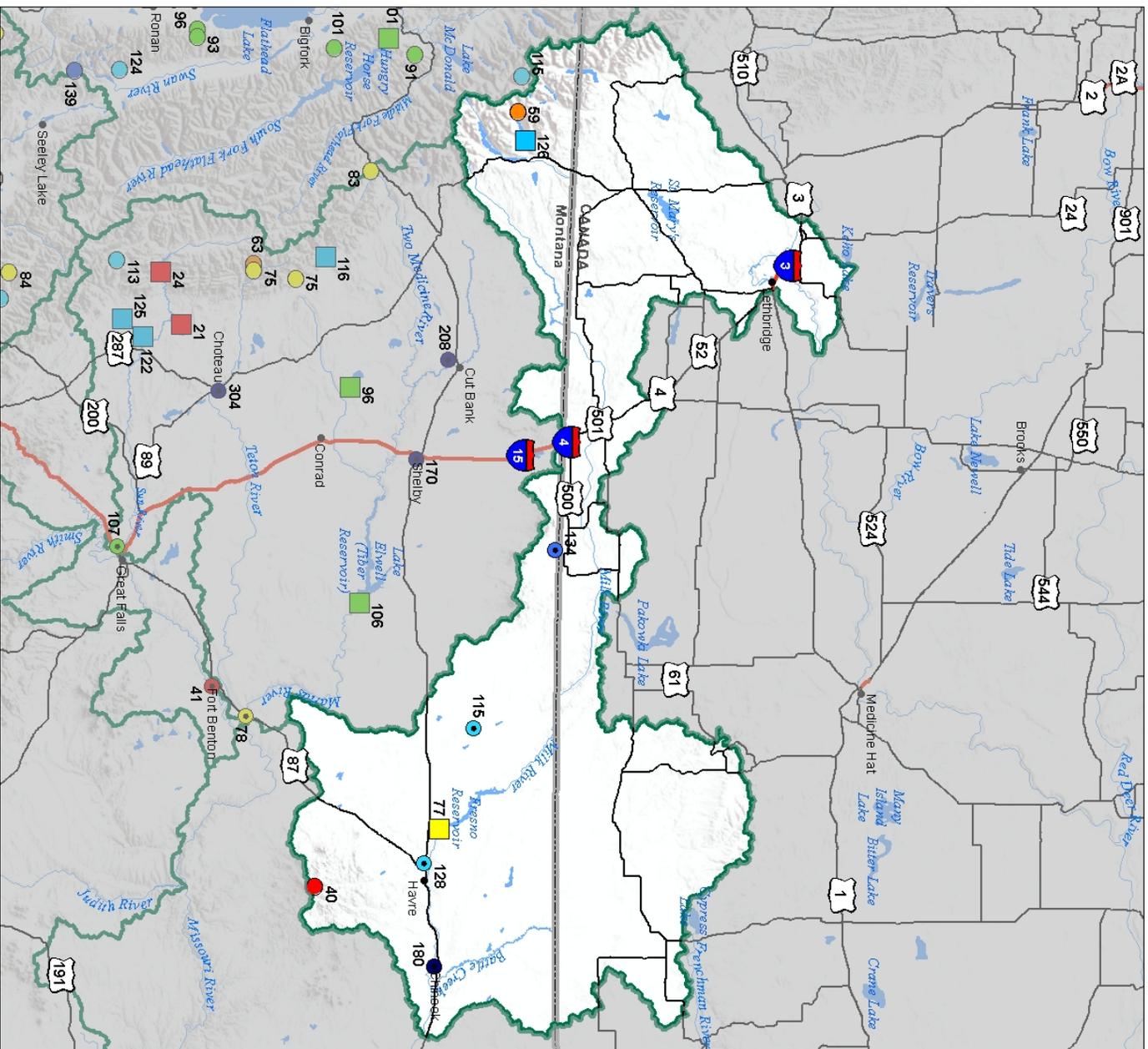


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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

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 National Water Library
 Natural Resource Information System

St Mary's-Milk River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal April 1, 2018 (March 1, 2018 - April 1, 2018)



- SNOTEL**
- > 150%
 - 131 - 150%
 - 111 - 130%
 - 91 - 110%
- COOP/FACS**
- > 150%
 - 131 - 150%
 - 111 - 130%
 - 91 - 110%
- Reservoirs**
- > 150%
 - 131 - 150%
 - 111 - 130%
 - 91 - 110%
 - 71 - 90%
 - 51 - 70%
 - 1 - 50%
- Precipitation**
- 71 - 90%
 - 51 - 70%
 - 1 - 50%





Upper Yellowstone River Basin

It's no news to water users in the Upper Yellowstone River basin that it's been a big winter snowpack wise. The better question might be; how big has it been? The simple answer is it depends on where you are within the basin. The snowpack that feeds the Yellowstone above Livingston and on the northeast side of the Beartooth Plateau near Red Lodge is well above normal for this date, but not record-setting. It should provide ample flow in the rivers this spring and summer. The Boulder River snowpack is currently the second highest on record for this date but still lags behind 1997 and 2011 regarding the annual peak snow water equivalent (SWE), which typically occurs at the end of April or in early May. New all-time high peak SWE values are however being recorded in the Clark's Fork of the Yellowstone, where frequent snowfall during the winter has pushed the basin well into record territory at some snowpack monitoring sites. It is important to keep in mind that April, May, and even June typically yield a significant portion of the water year precipitation in the region, in the form of both snow and rain. Even though spring is here, winter is far from over in the mountains of the basin. Continued accumulations will only build on the current snowpack and add more water available for runoff this spring and summer. Streamflow forecasts for the April 1st – July 31st period are already in well above average to record territory on April 1st, all but assuring water resources this spring and for irrigators and recreationists. The timing of runoff and volume will depend on day-to-day and week-to-week weather, so water users are strongly advised to monitor National Weather Service web pages for weather and daily runoff forecasts this runoff season.

Upper Yellowstone River Basin Data Summary

Snowpack

	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
YELLOWSTONE ab LIVINGSTON SHIELDS	150%	129%
BOULDER-STILLWATER	166%	100%
RED LODGE-ROCK CREEK	129%	85%
CLARK'S FORK	173%	148%
Basin-Wide	152%	119%

Precipitation

	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	100%	136%	143%
Valley Precipitation	96%	156%	167%
Basin-Wide Precipitation	99%	138%	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	107%	47%	120%

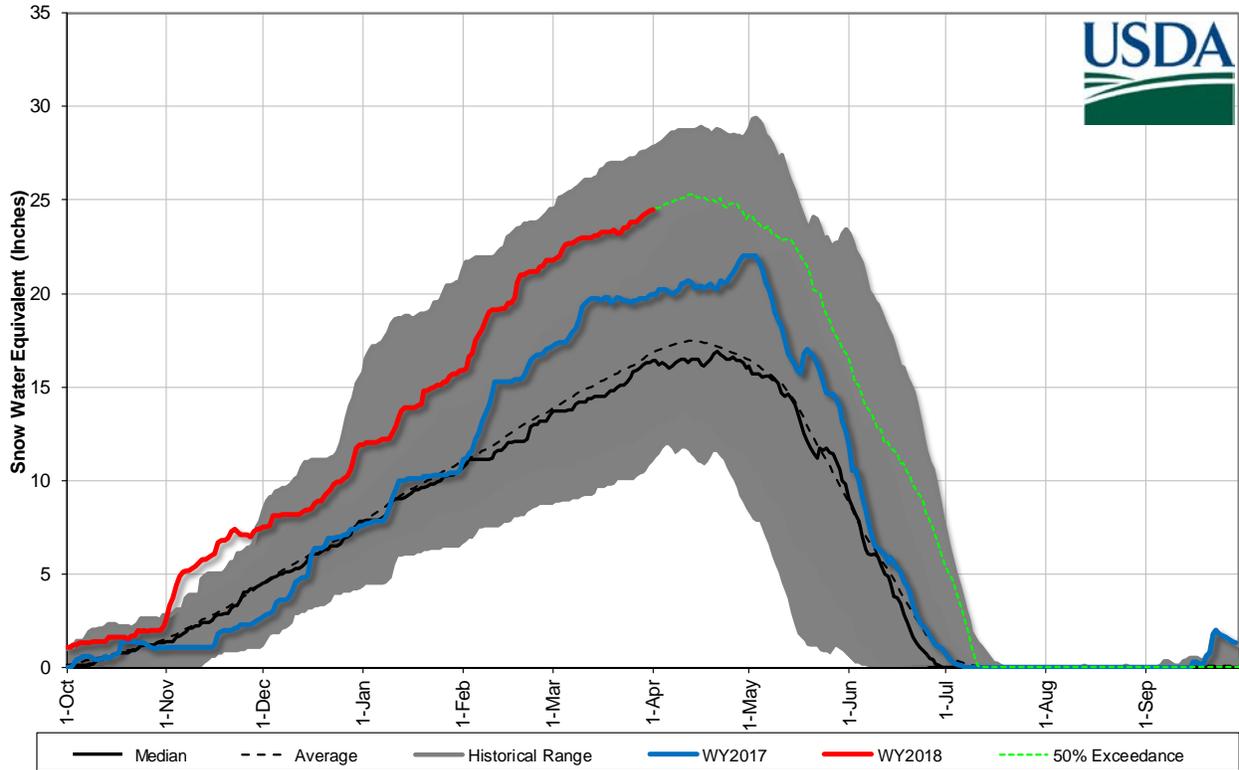
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

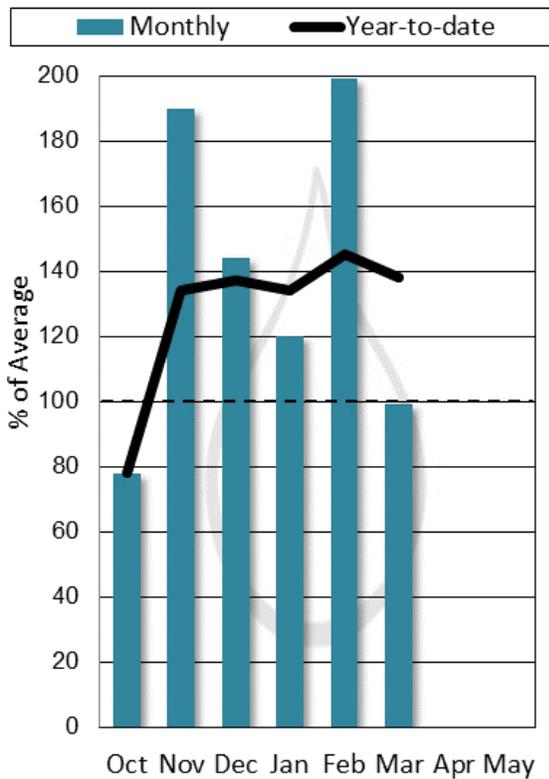
	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Mystic Lake	0.5	1.5	1.0	21.0	51%	2%
Cooney Res	22.1	24.0	20.2	27.4	109%	81%

Upper Yellowstone River Basin Snowpack with Non-Exceedance Projections

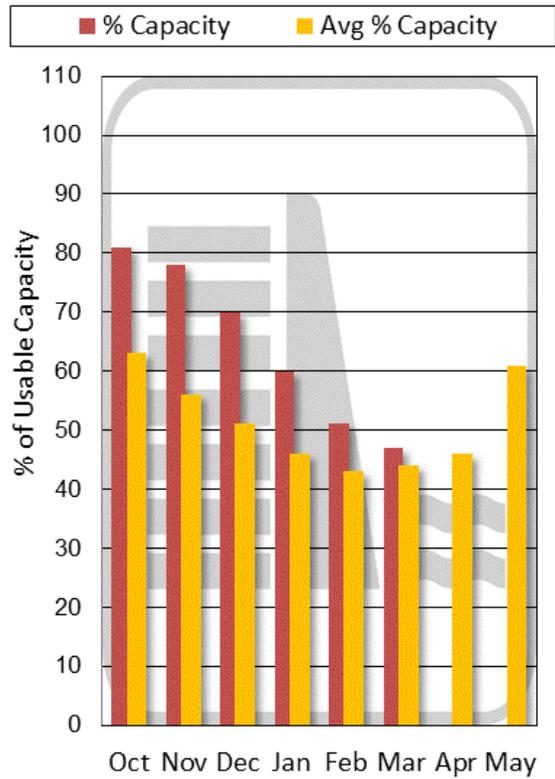
Based on provisional SNOTEL daily data as of 4/1/2018



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.

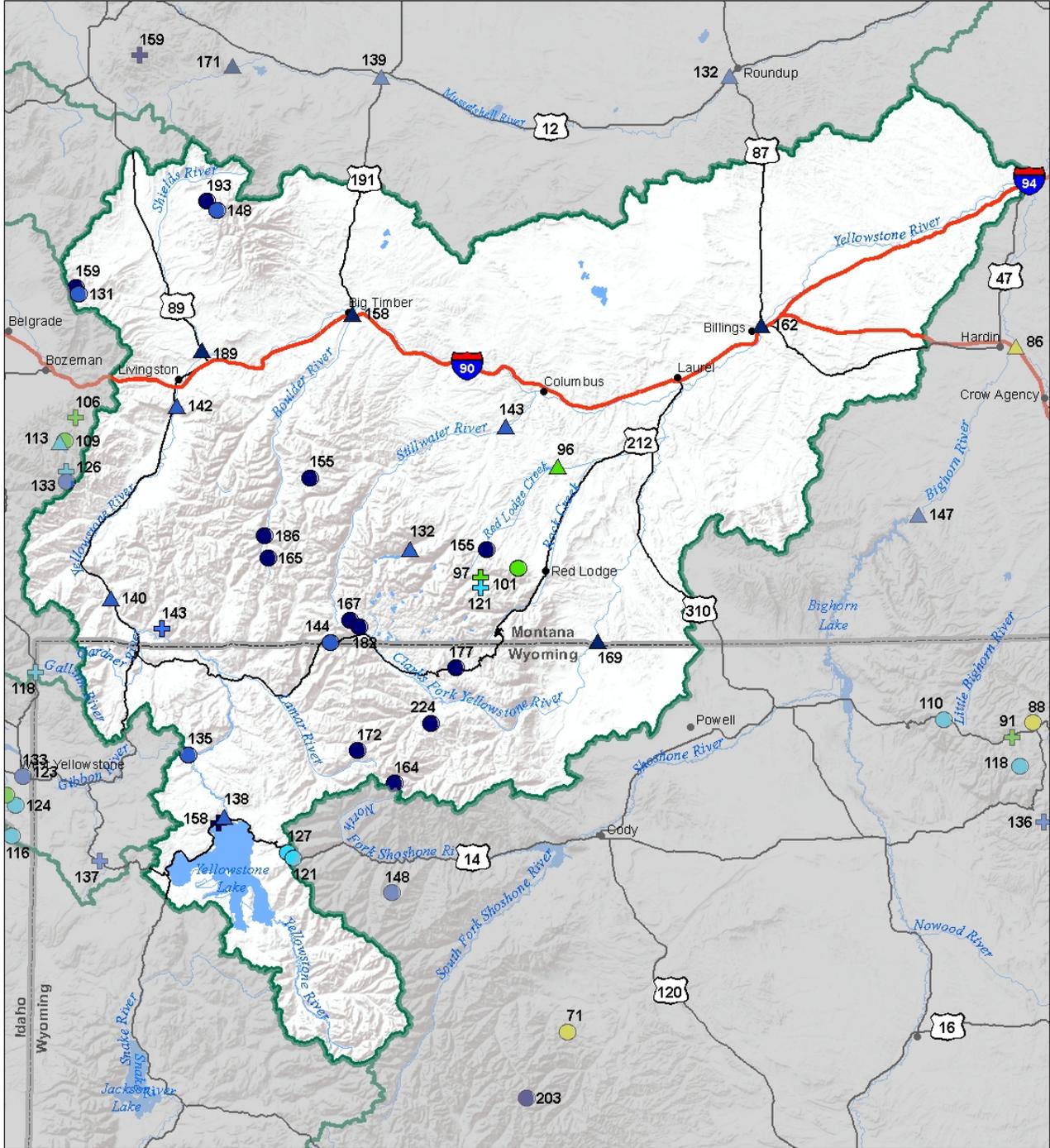
Upper Yellowstone River Basin

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	685	750	790	137%	835	900	575
	APR-SEP	915	1000	1060	138%	1120	1210	770
Yellowstone R at Corwin Springs	APR-JUL	1940	2110	2220	140%	2340	2510	1590
	APR-SEP	2300	2500	2640	140%	2770	2970	1880
Yellowstone R at Livingston	APR-JUL	2190	2410	2550	142%	2700	2910	1800
	APR-SEP	2610	2860	3030	142%	3200	3450	2140
Shields R nr Livingston	APR-JUL	197	230	250	194%	275	305	129
	APR-SEP	210	245	270	189%	295	330	143
Boulder R at Big Timber	APR-JUL	360	405	435	155%	465	505	280
	APR-SEP	390	440	475	158%	505	555	300
Mystic Lake Inflow ²	APR-JUL	68	73	76	129%	79	84	59
	APR-SEP	87	94	98	132%	102	109	74
Stillwater R nr Absarokee ²	APR-JUL	520	590	635	143%	680	745	445
	APR-SEP	615	690	745	143%	795	875	520
Clarks Fk Yellowstone R nr Belfry	APR-JUL	750	805	845	166%	885	940	510
	APR-SEP	825	885	930	169%	970	1040	550
Cooney Reservoir Inflow	APR-JUL	17.6	29	37	97%	45	56	38
	APR-SEP	25	38	46	96%	55	68	48
Yellowstone R at Billings	APR-JUL	4420	4920	5260	163%	5600	6100	3230
	APR-SEP	5060	5660	6060	162%	6470	7070	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 April 1, 2018



Snow Water Equivalent Percent of Normal

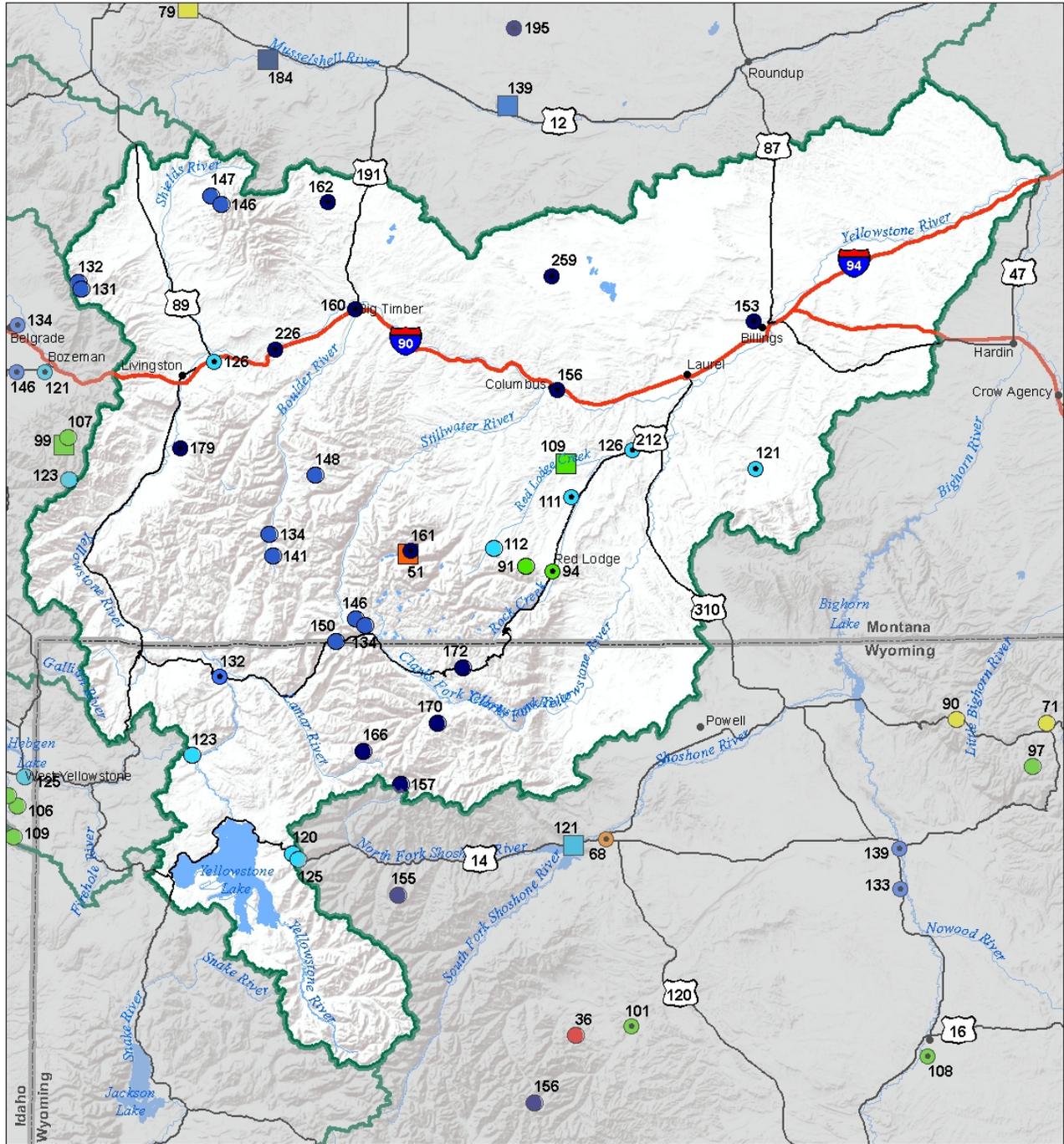
SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%	● 0%	● 91 - 110%	● 0%

Streamflow Forecast Percent of Average Flows

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



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

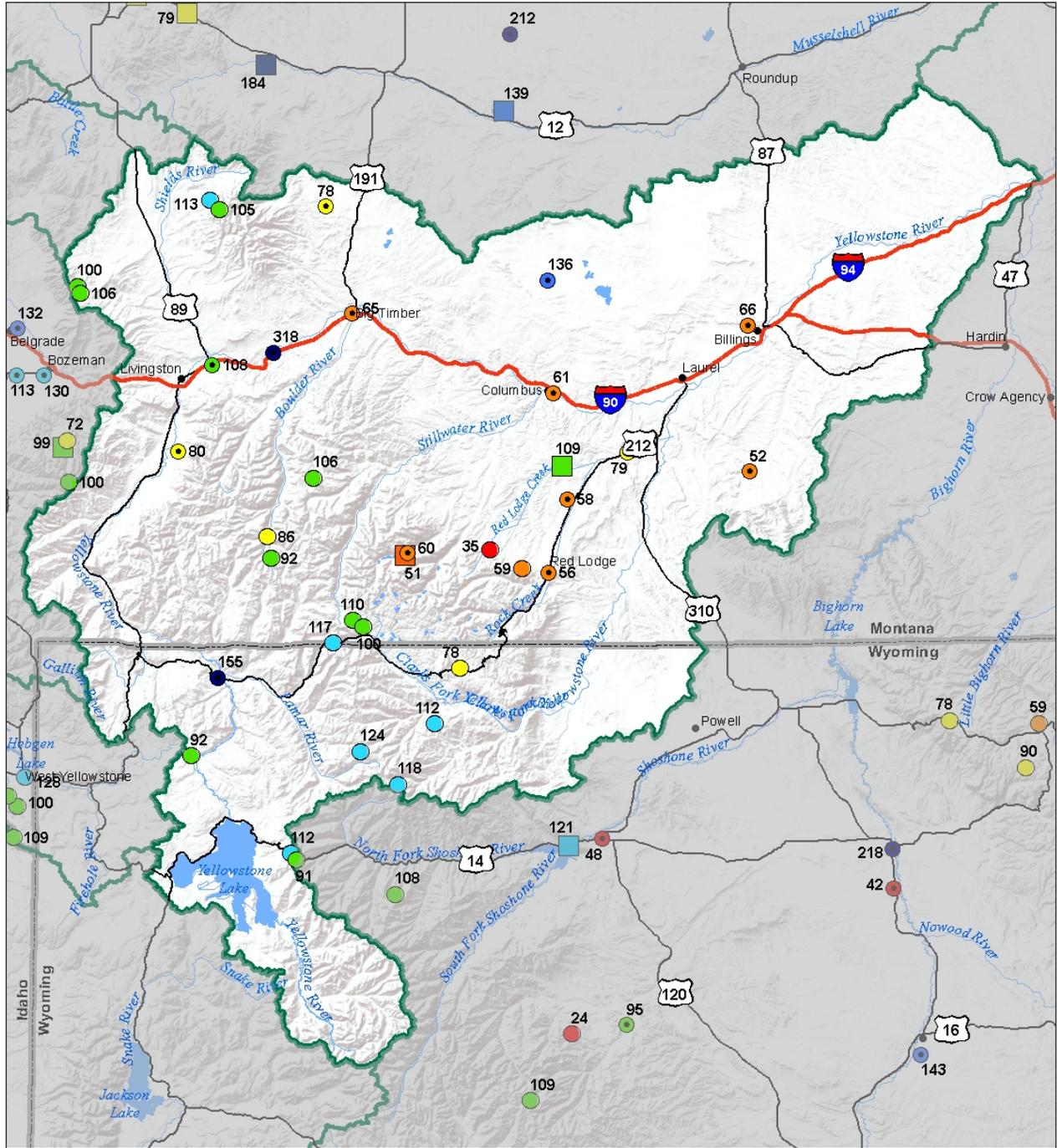


SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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

USDA
Western State Library
Natural Resource
Information System

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





Lower Yellowstone River Basin

Snow accumulation across the Lower Yellowstone River basin was fairly normal during March. After a banner February, this month's totals resulted in sub-basin snowpack percentages that are slightly below those reported last month yet still above normal for this time of year. The impacts of February snowfall are still prevalent at a couple of SNOTEL sites in the Big Horn Mountain Range. Shell Creek and Powder River Pass SNOTEL sites both recorded record high Snow Water Equivalent (SWE) totals for April 1st and Bear Trap Meadow SNOTEL recorded the second highest SWE in its 38-year record. Valley and mountain precipitation across the basin was a similar story to snow accumulation. Basin-wide precipitation was 99% of average for the month of February with valley precipitation at 126% and mountain precipitation at 90%.

Lower Yellowstone River Basin Data Summary

Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)
WIND RIVER BASIN	118%	191%
SHOSHONE RIVER BASIN	144%	141%
BIGHORN RIVER BASIN	135%	121%
LITTLE BIGHORN BASIN	99%	98%
TONGUE RIVER BASIN	107%	111%
POWDER RIVER BASIN	125%	101%
Basin-Wide	121%	143%

Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	WYTD Last Year Percentage of Average
Mountain Precipitation	90%	105%	150%
Valley Precipitation	126%	118%	150%
Basin-Wide Precipitation	98%	108%	150%

*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%	57%	100%

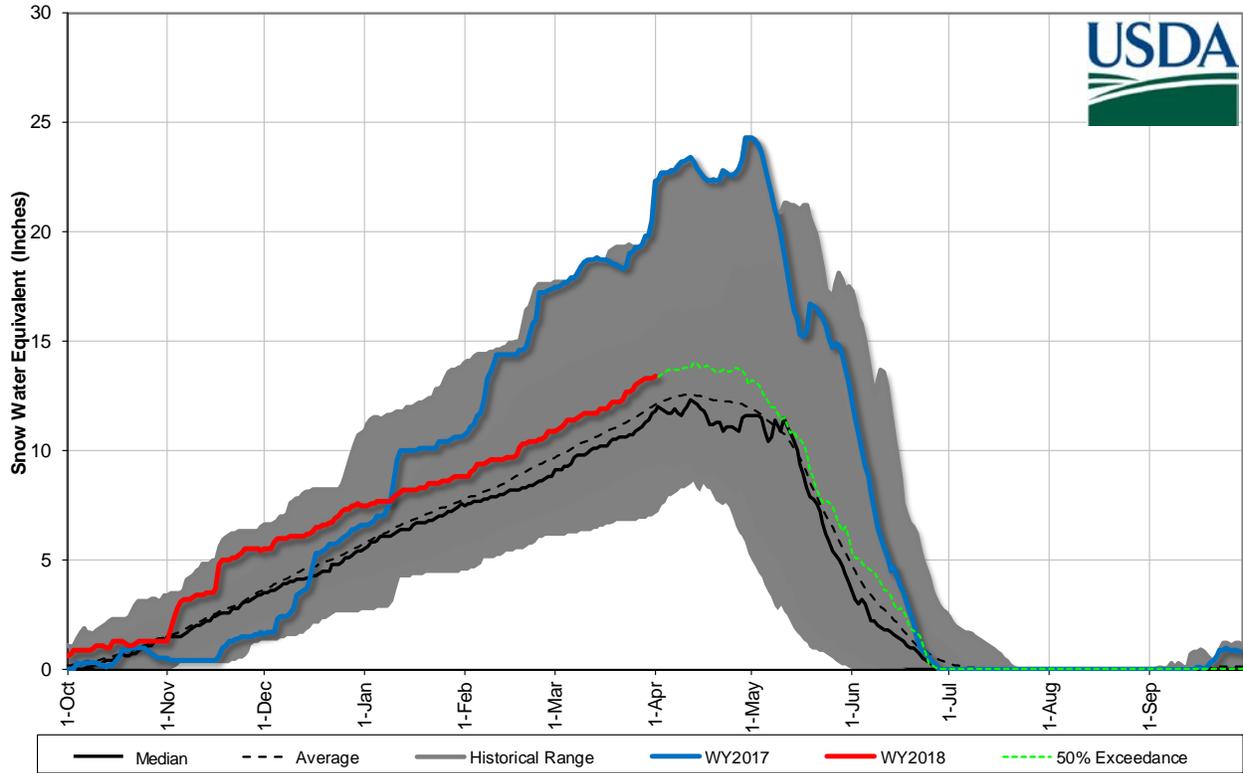
*See Reservoir Storage Table for storage in individual reservoirs

End of Month Storage

	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)	% Average	% Capacity
Bighorn Lake	755.5	751.5	787.5	1356.0	96%	56%
Tongue River Res	62.4	64.7	32.3	79.1	193%	79%

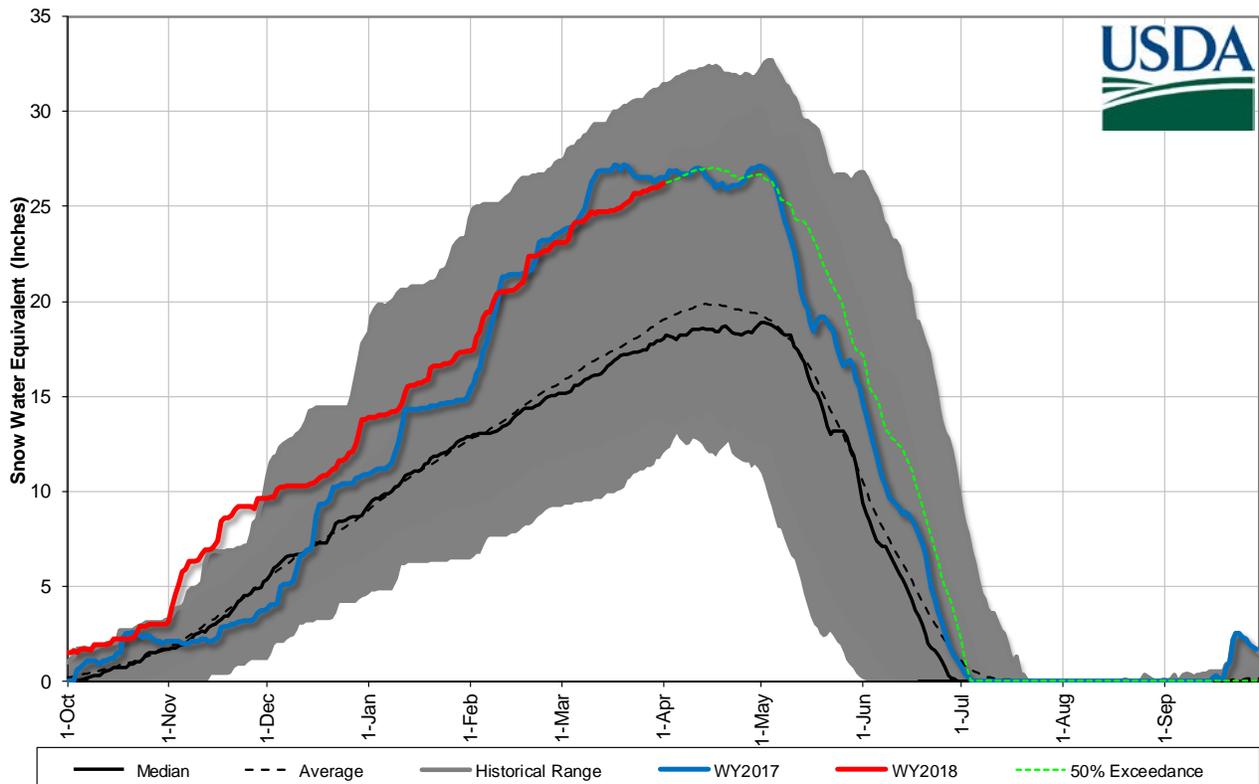
Wind River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 4/1/2018



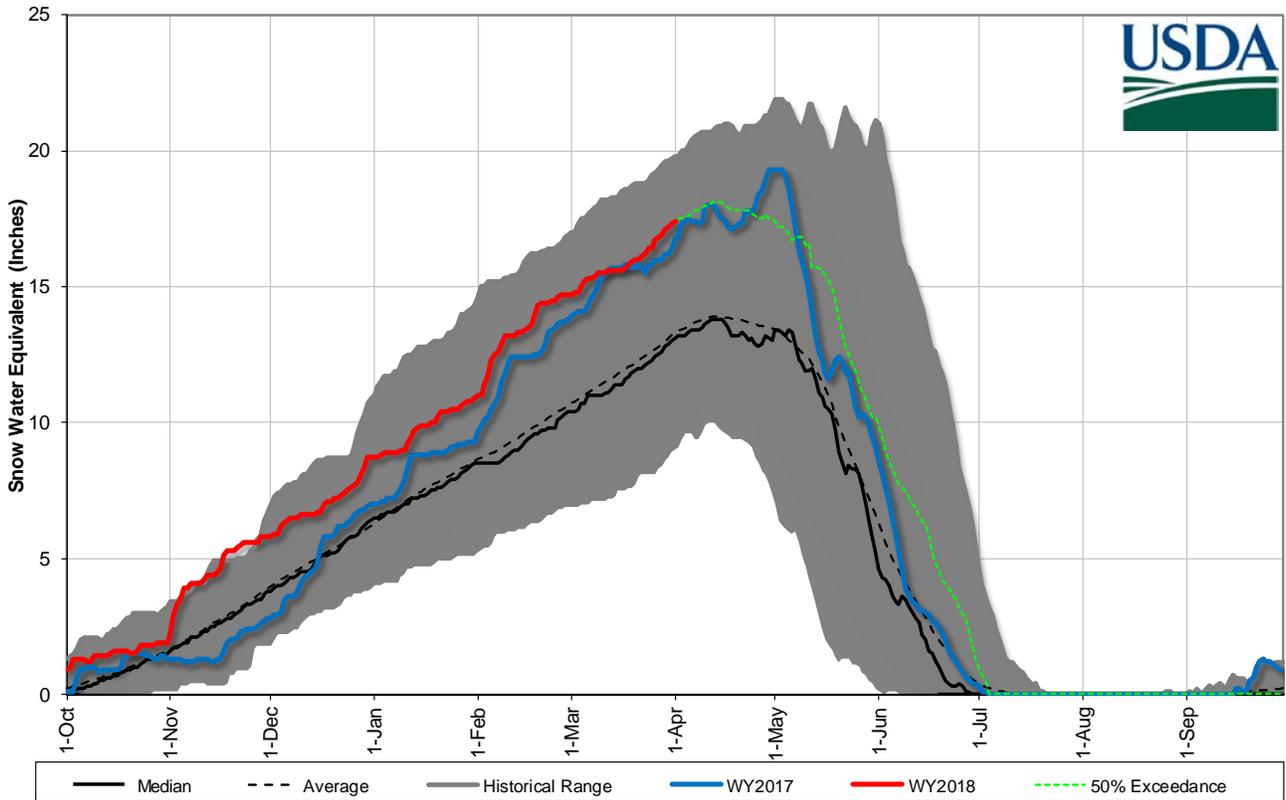
Shoshone River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 4/1/2018



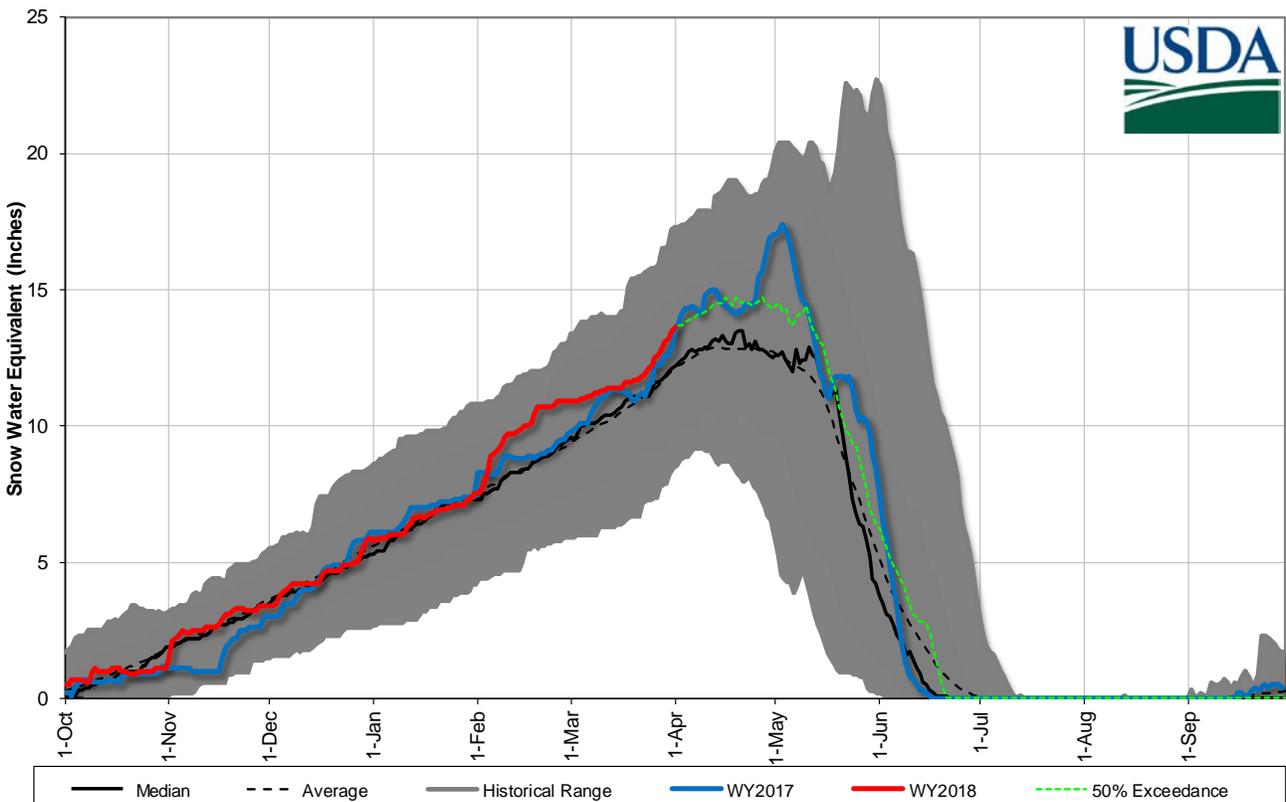
Bighorn River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 4/1/2018

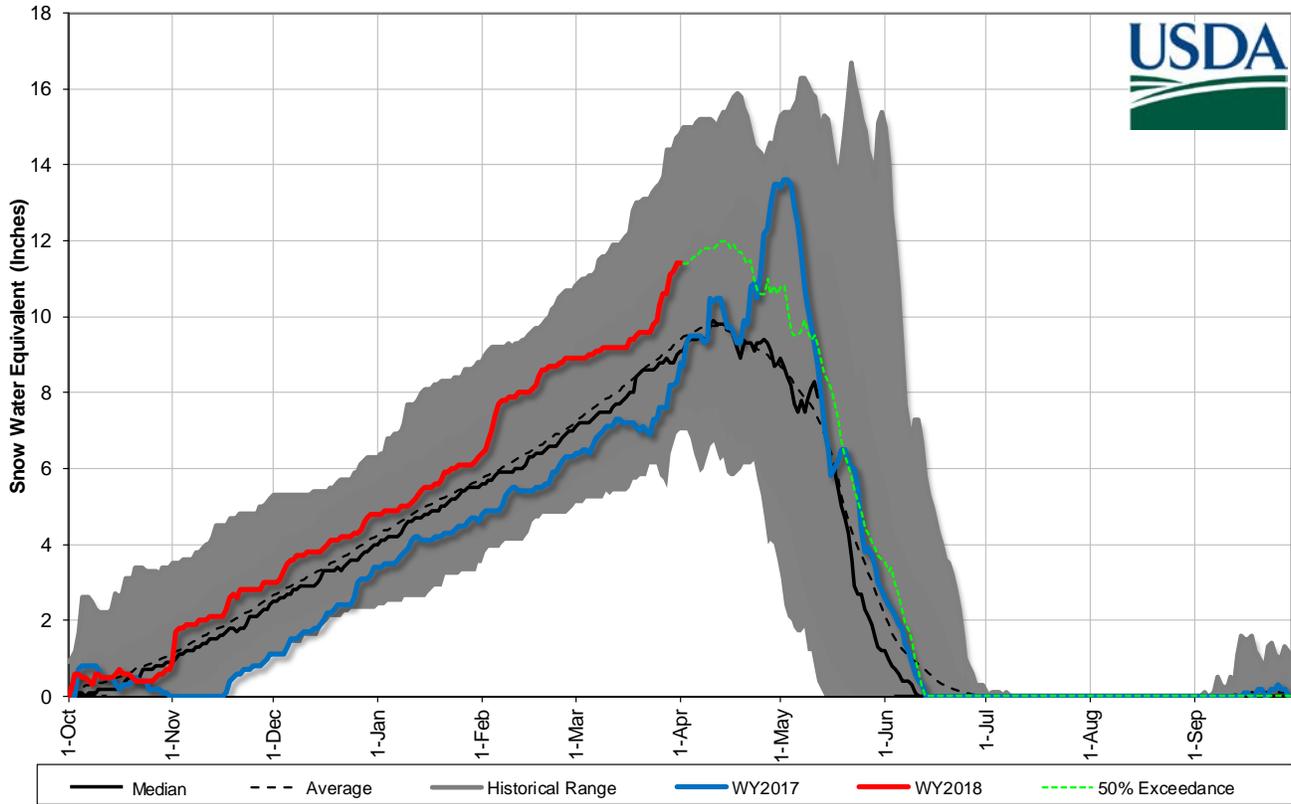


Tongue River Basin Snowpack with Non-Exceedence Projections

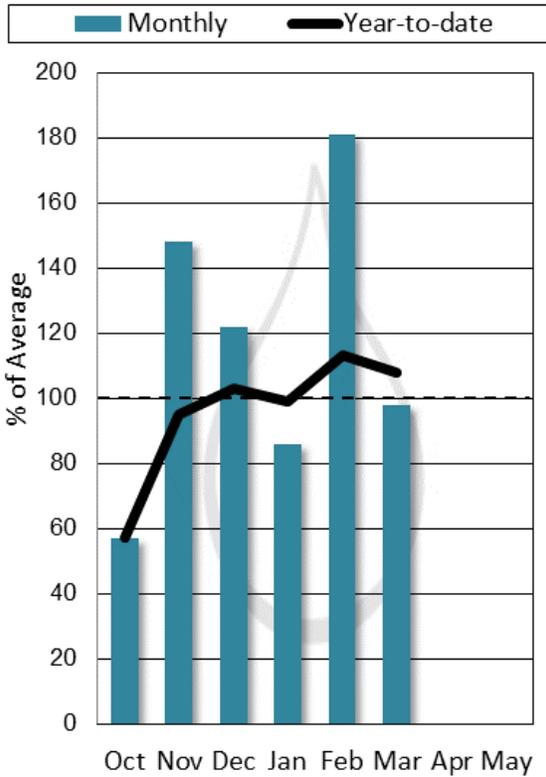
Based on provisional SNOTEL daily data as of 4/1/2018



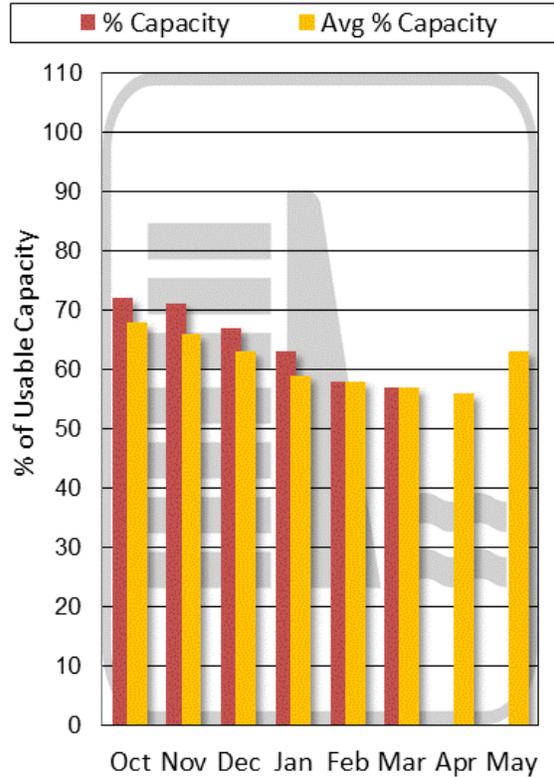
Powder River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 4/1/2018



**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.

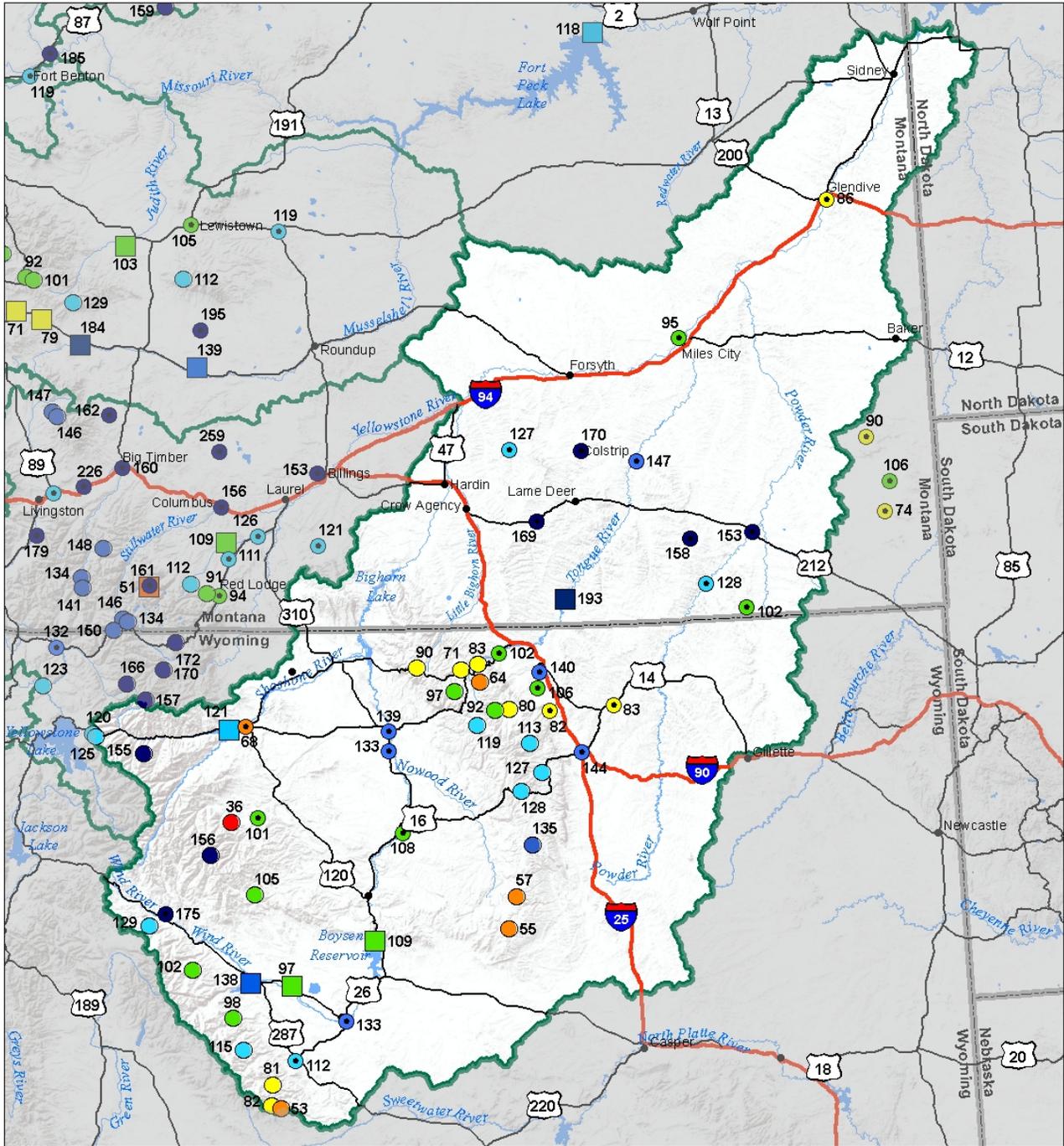
Lower Yellowstone River Basin

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	1380	1750	2010	146%	2270	2650	1380
	APR-SEP	1440	1860	2140	147%	2420	2840	1460
Little Bighorn R nr Hardin	APR-JUL	33	63	83	85%	103	133	98
	APR-SEP	39	72	95	86%	118	151	111
Tongue R nr Dayton ²	APR-JUL	44	60	71	83%	82	98	86
	APR-SEP	52	70	82	84%	94	112	98
Big Goose Ck nr Sheridan	APR-JUL	24	36	44	96%	52	63	46
	APR-SEP	32	44	52	96%	60	72	54
Little Goose Ck nr Bighorn	APR-JUL	18.2	25	30	97%	35	42	31
	APR-SEP	25	33	38	97%	44	52	39
Tongue River Reservoir Inflow ²	APR-JUL	63	123	163	84%	205	265	193
	APR-SEP	78	141	184	86%	225	290	215
Yellowstone R at Miles City ²	APR-JUL	5900	6790	7400	155%	8000	8900	4780
	APR-SEP	6670	7730	8450	155%	9170	10200	5450
Powder R at Moorehead	APR-JUL	108	193	250	141%	305	390	177
	APR-SEP	132	215	275	140%	335	420	196
Powder R nr Locate	APR-JUL	125	215	280	141%	345	435	199
	APR-SEP	146	245	310	141%	375	470	220
Yellowstone R nr Sidney ²	APR-JUL	5940	6960	7660	159%	8350	9370	4830
	APR-SEP	6640	7860	8690	160%	9520	10700	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 Water Year to Date Precipitation and Reservoir Levels Percentage of Normal April 1, 2018

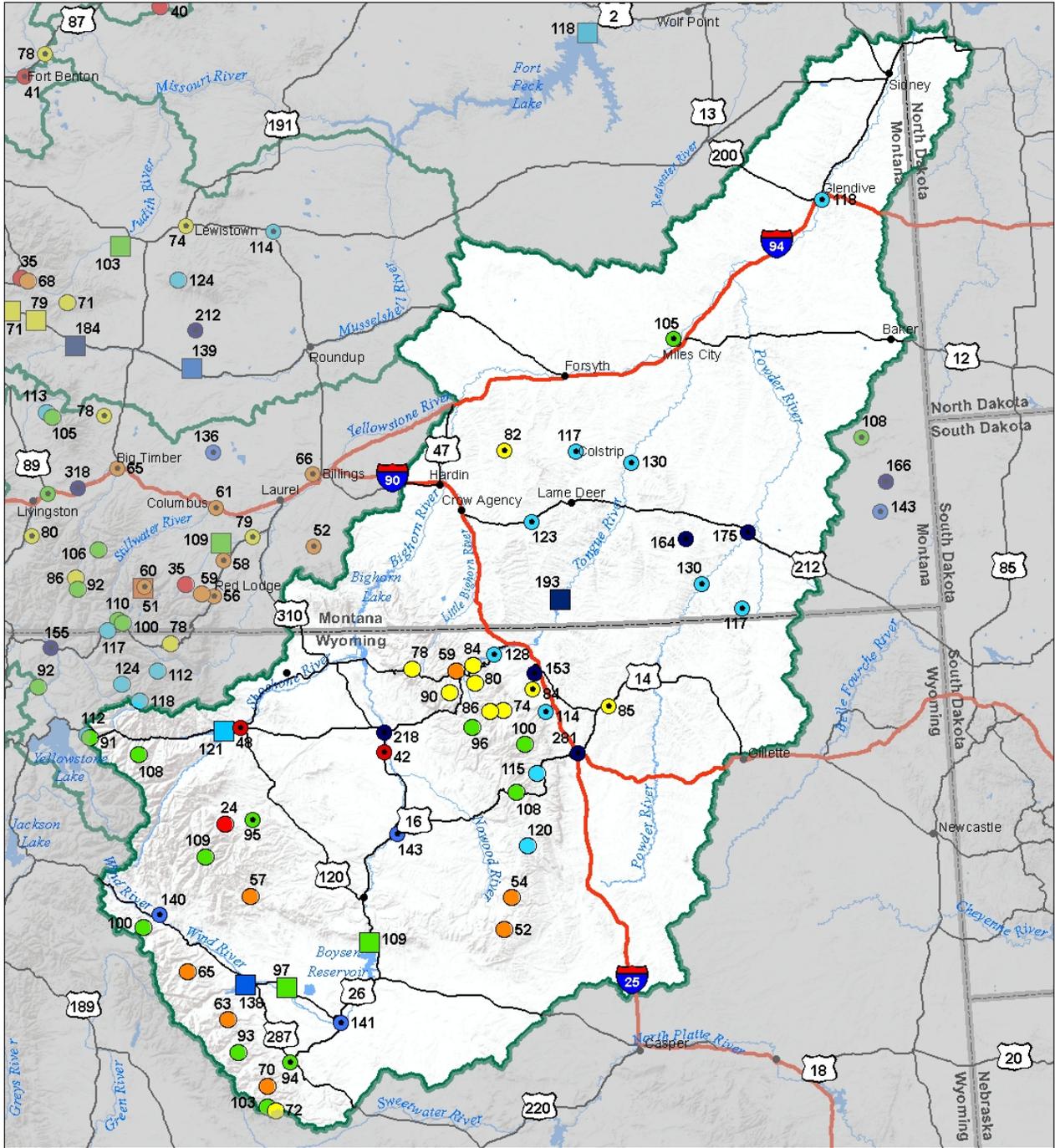


Precipitation Percent of Normal		COOP/ACIS	
SNOTEL			
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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

USDA
 National Resource Information System

**Lower Yellowstone River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
April 1, 2018 (March 1, 2018 - April 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
Montana State Library
Natural Resource
Information System

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	69	22.8	17.7	129	20.3	115
Ambrose	SC	6480			10.4			
Arch Falls	SC	7350	43	13.6	10.8	126	6.7	62
Ashley Divide	SC	4820	23	7.8	4.4	177	4.8	109
Badger Pass	SNOTEL	6900	103	37.1	29.8	124	36.1	121
Banfield Mountain	SNOTEL	5600	59	18.7	17.2	109	16.7	97
Baree Creek	SC	5500	114	44.6	34.9	128	34.3	98
Baree Midway	SC	4600	94	34.8	27.8	125	26.7	96
Baree Trail	SC	3800	37	14.3	7.2	199	10.7	149
Barker Lakes	SNOTEL	8250	63	19.5	13.9	140	12.5	90
Basin Creek	SNOTEL	7180	38	10.4	7.5	139	4.9	65
Bassoo Peak	SC	5150	30	9.4	7.8	121	9.1	117
Beagle Springs	SNOTEL	8850	39	11.1	8.8	126	10.8	123
Bear Basin	SC	8150			17.7		13.4	76
Bear Mountain	SNOTEL	5400	147	57.4	54.3	106	47.1	87
Beartooth Lake	SNOTEL	9360	105	37.1	21	177	31.5	150
Beaver Creek	SNOTEL	7850	65	19.5	16.6	117	17.9	108
Big Snowy	SC	7150	59	16.8	18.2	92	8.2	45
Bisson Creek	SNOTEL	4920	40	13.6	10	136	8.3	83
Black Bear	SNOTEL	8170	114	42.2	36.3	116	44.9	124
Black Mountain	SC	7750	62	21.6	14.1	153	12.2	87
Black Pine	SNOTEL	7210	48	16.5	9.6	172	11.7	122
Blacktail	SC	5650	42	14.4	12	120	11.5	96
Blacktail Mtn	SNOTEL	5650	40	14.3			12.1	
Bloody Dick	SNOTEL	7600	48	15.4	10.9	141	14	128
Bots Sots	SC	7750	25	6.8	7	97	1	14
Boulder Mountain	SNOTEL	7950	80	25.5	19.4	131	17.3	89
Box Canyon	SNOTEL	6670	39	16	8.6	186	4.8	56
Boxelder Creek	SC	5100	22	8	7.1	113	0	0
Brackett Creek	SNOTEL	7320	82	30.3	19	159	19.3	102
Bristow Creek	SC	3900	34	11.2	7	160	9.9	141
Brush Creek Timber	SC	5000	31	10.5	6.1	172	6.1	100
Bull Mountain	SC	6600	26	6.9	5.6	123	1.8	32
Burnt Mtn	SNOTEL	5880	23	6.8	4.4	155	0.8	18
Cabin Creek	SC	5200	33	8.8	5	176	3.6	72
Calvert Creek	SNOTEL	6430	33	11.6	7.1	163	6	85
Camp Senia	SC	7890	46	12.9	5.4	239	9.6	178
Canyon	SNOTEL	7870	55	16.6	12.3	135	17.2	140
Carrot Basin	SNOTEL	9000	95	30.3	25.2	120	29.5	117
Chessman Reservoir	SC	6200	27	8.6	2.6	331	1.2	46
Chicago Ridge	SC	5800	105	39			35.2	

Chicken Creek	SC	4060	57	19.2	13.8	139	13.8	100
Clover Meadow	SNOTEL	8600	64	19.6	15.6	126	10.8	69
Cole Creek	SNOTEL	7850	47	13.6	13.5	101	11.3	84
Combination	SNOTEL	5600	20	6.8	4.2	162	0.3	7
Copper Bottom	SNOTEL	5200	36	13.3			3.1	
Copper Camp	SNOTEL	6950	91	40			39	
Copper Mountain	SC	7700	48	15.8	9.9	160	9.7	98
Cottonwood Creek	SC	6400	36	11.7	7.3	160	4.6	63
Coyote Hill	SC	4200	36	13	7	186	8.3	119
Crevice Mountain	SC	8400	45	13.4	9.4	143	8.8	94
Crystal Lake	SNOTEL	6050	47	14.2	11.9	119	4.7	39
Dad Creek Lake	SC	8800			13.4			
Daisy Peak	SNOTEL	7600	51	13.8	9.8	141	7	71
Daly Creek	SNOTEL	5780	46	15.5	9.6	161	10.1	105
Darkhorse Lake	SNOTEL	8600	98	34.1	26.2	130	30.5	116
Deadman Creek	SNOTEL	6450	40	12.3	9.7	127	4.9	51
Desert Mountain	SC	5600	55	18.4	12.6	146		
Discovery Basin	SC	7050	47	15.4	9.2	167	8.8	96
Divide	SNOTEL	7800	41	10.9	9.8	111	7.7	79
Dix Hill	SC	6400	37	12.8	9.1	141	5.4	59
Dupuyer Creek	SNOTEL	5750		11.2	8.6	130	9.9	115
Eagle Creek	SC	7000			11.6			
East Boulder Mine	SNOTEL	6335	19	7.9			2.5	
El Dorado Mine	SC	7800	55	19.1	17.4	110	11.1	64
Elk Horn Springs	SC	7800		12.5	8	156	10	125
Elk Peak	SNOTEL	7600	85	33.4			17.2	
Elk Peak	SC	8000	60	20.3	12.8	159	11.4	89
Emery Creek	SNOTEL	4350	54	20.3	13.7	148	12.6	92
Fatty Creek	SC	5500	79	28.8	21.2	136	21.7	102
Fish Creek	SC	8000	50	14	9	156		
Fisher Creek	SNOTEL	9100	133	50.4	30.1	167	42.7	142
Flattop Mtn.	SNOTEL	6300	138	52.6	42	125	49	117
Fleecer Ridge	SC	7500	42	11.5	9.5	121	10.4	109
Foolhen	SC	8280		22	14.4	153	14.2	99
Forest Lake	SC	6400			10		9.1	91
Four Mile	SC	6900	31	9.4	7	134	7.1	101
Freight Creek	SC	6000	44	15.2	11.9	128	12.8	108
Frohner Meadow	SNOTEL	6480	36	14.5	7.4	196	6.4	86
Garver Creek	SNOTEL	4250	43	13.8	9.1	152	11.3	124
Gibbons Pass	SC	7100			20			
Goat Mountain	SC	7000			8			
Government Saddle	SC	5270	100	37			31.8	
Grave Creek	SNOTEL	4300	61	22	13.8	159	14.5	105
Griffin Creek Divide	SC	5150	34	10.4	8.4	124	10.7	127
Hand Creek	SNOTEL	5035	43	13.6	11.1	123	9.6	86
Hawkins Lake	SNOTEL	6450	87	28.7	23.4	123	29.5	126
Haymaker	SC	8050	60	16.4	10.6	155		

Hebgen Dam	SC	6550	31	11.3	9.8	115	6.4	65
Hell Roaring Divide	SC	5770	89	29.8	25.8	116	25.7	100
Herrig Junction	SC	4850	82	28.8	24.1	120	22	91
Highwood Divide	SC	5650	18	5	6.7	75	0	0
Highwood Station	SC	4600	17	5.2	3.8	137	0	0
Holbrook	SC	4530	29	10.6	6.8	156	5.3	78
Hoodoo Basin	SNOTEL	6050	121	43.6	38.9	112	42.4	109
Humboldt Gulch	SNOTEL	4250	47	15	9.1	165	9	99
Jakes Canyon	SC	9040	53	10.2	11.2	91	17.8	159
Johnson Park	SC	6450	34	9.9	4.2	236	3.4	81
Kishenehn	SC	3890	31	10.5	6.6	159	9.7	147
Kraft Creek	SNOTEL	4750	57	21.4			8.7	
Lake Camp	SC	7780	48	13.9	8.8	158	11.5	131
Lakeview Canyon	SC	6930	34	9.9	9.5	104	8	84
Lakeview Ridge	SNOTEL	7400	28	9.2	10.4	88	5.3	51
Lemhi Ridge	SNOTEL	8100	39	11.3	9.7	116	10.4	107
Lick Creek	SNOTEL	6860	38	12.2	11.2	109	5.6	50
Little Park	SC	7400	57	18.4	13.7	134	10.4	76
Logan Creek	SC	4300	28	8.5	5.8	147	6.5	112
Lolo Pass	SNOTEL	5240	80	31.7	27.1	117	28.6	106
Lone Mountain	SNOTEL	8880	72	24.9	16.7	149	16.4	98
Lookout	SNOTEL	5140	77	26.9	26.2	103	24.1	92
Lower Twin	SNOTEL	7900	66	21	16.6	127	17.8	107
Lubrecht Flume	SNOTEL	4680	22	8.5	1.6	531	0	0
Lubrecht Forest No 3	SC	5450	24	7.2	4.6	157	2.7	59
Lubrecht Forest No 4	SC	4650	10	3.2	0.4	800	0	0
Lubrecht Forest No 6	SC	4040	20	6.4	0.6	1067	0.8	133
Lubrecht Hydroplot	SC	4200	24	8.6	0.6	1433	2.1	350
Lupine Creek	SC	7380			7.4		5.2	70
Madison Plateau	SNOTEL	7750	77	26.4	21.3	124	26.3	123
Many Glacier	SNOTEL	4900	53	19	12.4	153	14.5	117
Marias Pass	SC	5250	64	20.5	14.4	142	15.9	110
Mineral Creek	SC	4000	52	20.3	15.4	132	12	78
Monument Peak	SNOTEL	8850	89	31.1	18.8	165	22.6	120
Moss Peak	SNOTEL	6780	126	47.8	35.1	136	39.9	114
Moulton Reservoir	SC	6850	36	11	6.3	175		
Mount Allen No 7	SC	5700						
Mount Lockhart	SNOTEL	6400	77	26.8	18.4	146	21.5	117
Mudd Lake	SC	7650	68	23.1	17.2	134	20.8	121
Mule Creek	SNOTEL	8300	68	21.1	13.8	153	16.7	121
N Fk Elk Creek	SNOTEL	6250	51	17.1	10.6	161	9.3	88
Nevada Ridge	SNOTEL	7020	73	24.7	13.9	178	15.7	113
New World	SC	6900	42	13.6	12.8	106	7.2	56
Nez Perce Camp	SNOTEL	5650	48	15.4	13	118	13.2	102
Noisy Basin	SNOTEL	6040	146	59.3	39.3	151	40.4	103
Norris Basin	SC	7550			8.8		6.1	69
North Fork Jocko	SNOTEL	6330	151	57.2	40.3	142	36	89

Northeast Entrance	SNOTEL	7350	39	13.8	9.6	144	9.3	97
Onion Park	SNOTEL	7410	50	13.1	13	101	8.2	63
Ophir Park	SC	7150	54	18.6	14.8	126	13	88
Parker Peak	SNOTEL	9400	95	32.3	18.8	172	33	176
Peterson Meadows	SNOTEL	7200	51	15	9.6	156	10.5	109
Pickfoot Creek	SNOTEL	6650	42	13.2	9.5	139	10.3	108
Pike Creek	SNOTEL	5930	39	12.5			8.4	
Pipestone Pass	SC	7200	22	5.8	4.6	126	2.2	48
Placer Basin	SNOTEL	8830	71	25.8	16.6	155	16.6	100
Poorman Creek	SNOTEL	5100	117	45.5	35.1	130	35	100
Porcupine	SNOTEL	6500	36	11.4	5.9	193	2.1	36
Potomageton Park	SC	7150	48	16.8	12	140	11.3	94
Revais	SC	4800			0.2			
Rock Creek Mdws	SC	3400	50	17.6			15.6	
Rocker Peak	SNOTEL	8000	67	21.5	12.4	173	11.5	93
Rocky Boy	SNOTEL	4700	21	6.4	3.8	168	0	0
Roland Summit	SC	5120	104	35.2	31	114	33.8	109
S Fork Shields	SNOTEL	8100	73	22.6	15.3	148	12.9	84
Sacajawea	SNOTEL	6550	56	19.4	14.8	131	9.8	66
Saddle Mtn.	SNOTEL	7940	86	32.8	22.9	143	22.8	100
Short Creek	SNOTEL	7000	24	7	5.7	123	1.7	30
Shower Falls	SNOTEL	8100	84	27.6	20.7	133	16.1	78
Skalkaho Summit	SNOTEL	7250	81	29	21.4	136	23.7	111
Sleeping Woman	SNOTEL	6150	56	19.3	13.9	139	18.2	131
Slide Rock Mountain	SC	7100	57	20	12.9	155	13.7	106
Spotted Bear Mountain	SC	7000	52	19.9	12.2	163	12.6	103
Spur Park	SNOTEL	8100	82	25.7	19.5	132	17.1	88
Stahl Peak	SNOTEL	6030	116	43.2	33.3	130	39.6	119
Stemple Pass	SC	6600			8.3		9.6	116
Storm Lake	SC	7780	56	18.7	12.6	148	12.1	96
Stringer Creek	SNOTEL	6550	40	11.3	10.1	112	6	59
Stryker Basin	SC	6180	97	34.1	28.2	121	30.8	109
Stuart Mountain	SNOTEL	7400	106	39.2	30.6	128	34.9	114
Taylor Road	SC	4080	15	5.1	1	510	0	0
Ten Mile Lower	SC	6600	43	13.6	5.7	239	6.2	109
Ten Mile Middle	SC	6800	50	15.9	9.8	162	8.6	88
Tepee Creek	SNOTEL	8000	48	13.9	13.3	105	11.7	88
Timberline Creek	SC	8850	55	14.6	12.1	121	13.4	111
Tizer Basin	SNOTEL	6880	35	11.6	9.4	123	5.2	55
Trinkus Lake	SC	6100	112	45.4	37.2	122	37.7	101
Truman Creek	SC	4060	12	3.5	2.5	140	0	0
Twelvemile Creek	SNOTEL	5600	54	18.5	14.5	128	15.8	109
Twenty-One Mile	SC	7150	54	17.4	14.7	118	15.7	107
Twin Lakes	SNOTEL	6400	119	50.3	35.4	142	37	105
Upper Holland Lake	SC	6200	129	50.2	29.6	170	29.5	100
Waldron	SNOTEL	5600	49	15.4	10.7	144	12.8	120
Warm Springs	SNOTEL	7800	96	33.8	19	178	19.7	104

Weasel Divide	SC	5450	99	37.3	29	129	33.9	117
West Yellowstone	SNOTEL	6700	40	13.6	10.2	133	8	78
Whiskey Creek	SNOTEL	6800	52	16.3	15	109	13.4	89
White Elephant	SNOTEL	7710	82	28.9	25.7	112	26.4	103
White Mill	SNOTEL	8700	104	39.3	21.6	182	34.9	162
Wolverine	SNOTEL	7650	48	20.4	9.1	224	10	110
Wood Creek	SNOTEL	5960	56	15.3	8.5	180	9.1	107
Wrong Creek	SC	5700	52	18.4	10.2	180	13.6	133
Wrong Ridge	SC	6800	49	17.3	13.5	128	17	126
Younts Peak	SNOTEL	8350			14.1		25.2	179

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**Montana
Water Supply Outlook
Report**
Natural Resources Conservation Service

