

Montana Water Supply Outlook Report February 1st, 2016



Snow surveyors from across the west gathered in Bend, OR in January for the 2016 West-Wide Snow School. Instructors from the Snow Survey program in the western states spend a week teaching students about snow sampling and data collection, avalanche awareness, winter survival, wilderness medicine, trip planning and safe operation of snowmobiles. This annual training provides an excellent opportunity to enhance snow surveyor's skillsets for safe winter snow sampling, as well as, share experiences with other snow surveyors across the west. The Montana staff teaches snow sampling and avalanche awareness annually.

Photo: Tracy Robillard – NRCS Oregon

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Montana Water Supply Outlook Report as of February 1st, 2016

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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Table of Contents

State-Wide Overview

Snowpack	1
Snowpack Maps	2-3
Precipitation.....	4
Precipitation Maps.....	5-8
Reservoir Storage.....	9
Streamflow Forecasts.....	10
Surface Water Supply Index (SWSI)	11
SWSI Map.....	12

Individual Basin Summaries

Kootenai River Basin	13
Flathead River Basin.....	19
Upper Clark Fork River Basin.....	25
Bitterroot River Basin.....	31
Lower Clark Fork River Basin.....	37
Jefferson River Basin	43
Madison River Basin.....	49
Gallatin River Basin	55
Headwaters Mainstem (Missouri) River Basin.....	61
Smith-Judith-Musselshell River Basin	67
Sun-Teton-Marias River Basin.....	73
St. Mary-Milk River Basin	79
Upper Yellowstone River Basin	85
Lower Yellowstone River Basin	91

Snowpack Data Report

SNOTEL and Snowcourse Data Summary.....	97
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Snowpack – Overview

Old Man Winter took a hiatus snowfall wise across the state right just before entering the new calendar year, likely too stuffed full of holiday goodies to make much happen. During this time the river basins across the state received little in the way of snowfall leaving skiers, snowmobilers and water managers wondering if this year would be a repeat of the last. Like the previous month of December snowfall came rolling in during the middle of the month, dropping up to 7.5” of snow water equivalent (SWE) at SNOTEL sites in the Kootenai and Flathead River basins in northwest Montana over 7 days, helping to stop the decline in basin percentages that was occurring during the dry spell. East of the Divide in the southern half of the state this storm also helped to stop the slow decline within the basins although the storm didn’t pack as big of a punch dropping 2 to 3” of SWE during the same period. As this storm passed a few smaller systems dropped snowfall in the state favoring areas west of the Divide and in the southern half of the state east of the Divide.

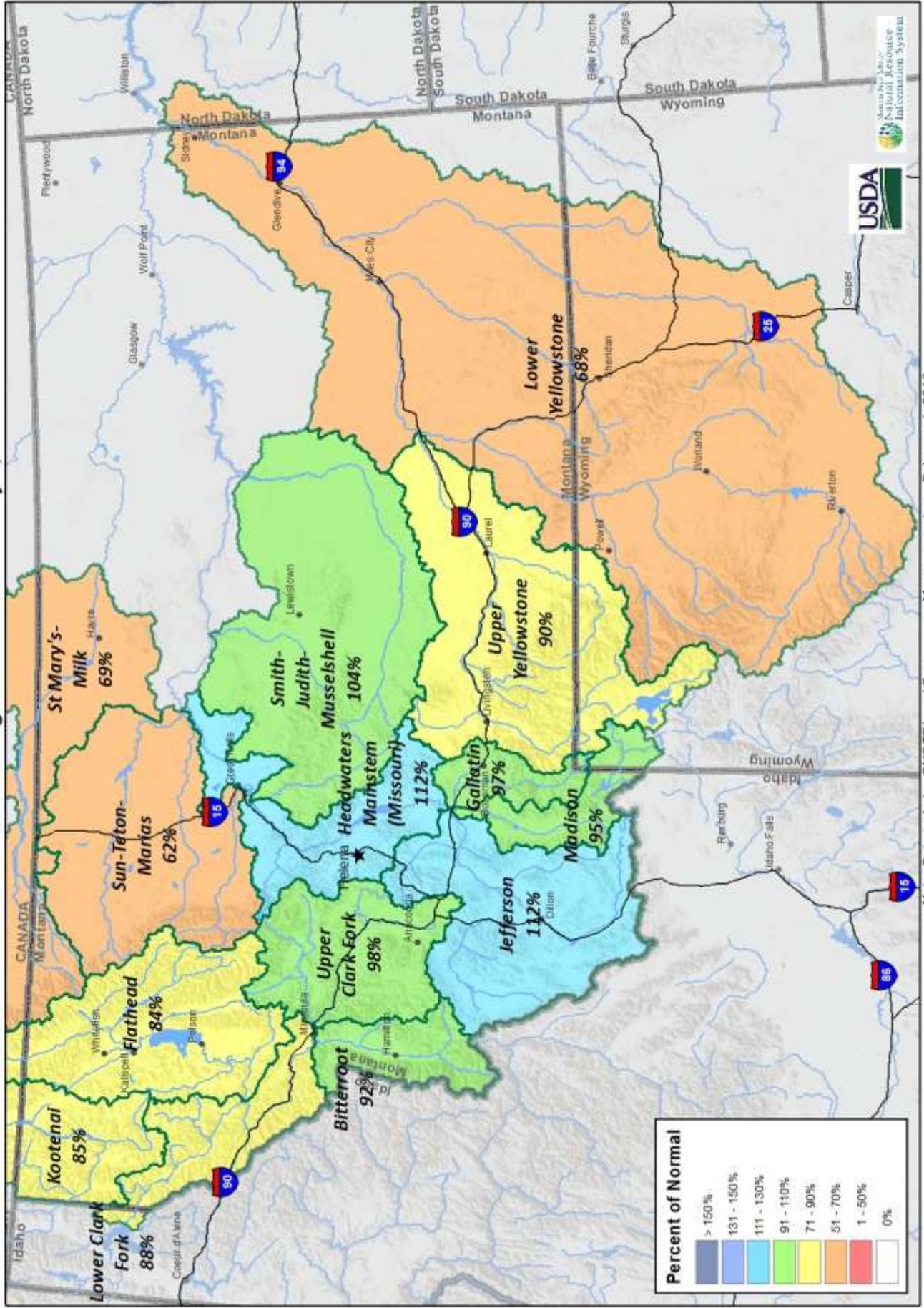
Almost all of the river basins saw declines in snowpack percentages over the last 30 days due to the slow start to snowfall during the first two weeks. The Flathead River basin was the only basin to see an increase during the month, due to the sheer volume of moisture that fell at some SNOTEL sites in the basin during the third week. However, the Flathead and other northwest basins, as well as, the north central basins are still below average to well below average for this date. The combined Stun-Teton-Marias River basin is currently 62 percent of normal for this date and has been largely overlooked so far this year with regards to snowfall. The greater Lower Yellowstone River basin which feeds the Yellowstone in Montana from the south is also well below normal for this date at 68 percent of normal. The Tongue and Powder River basins in Wyoming are experiencing near record low to record low snowpack at SNOTEL sites for the last 38 years.

Early winter snowfall patterns tend to favor the basins along and west of the Continental Divide, late winter and spring tends to favor the basins along and east of the Divide. February will start to tell the story of our potential peak snowpack in the west this year, and this spring will indicate whether the east facing basins can recover from the lack of early winter snowfall.

Snow Water Equivalent

2/1/2016	<i>% Normal</i>	<i>% Last Year</i>
Columbia River Basin	89	92
Kootenai in Montana	85	123
Flathead in Montana	84	87
Upper Clark Fork	98	82
Bitterroot	92	86
Lower Clark Fork	88	124
Missouri River Basin	99	99
Jefferson	112	105
Madison	95	112
Gallatin	97	99
Headwaters Mainstem	112	92
Smith-Judith-Musselshell	104	94
Sun-Teton-Marias	62	68
St. Mary-Milk	69	83
Yellowstone River Basin	77	73
Upper Yellowstone	90	81
Lower Yellowstone	68	67
West of Divide	89	92
East of Divide	87	86
Montana State-Wide	92	92

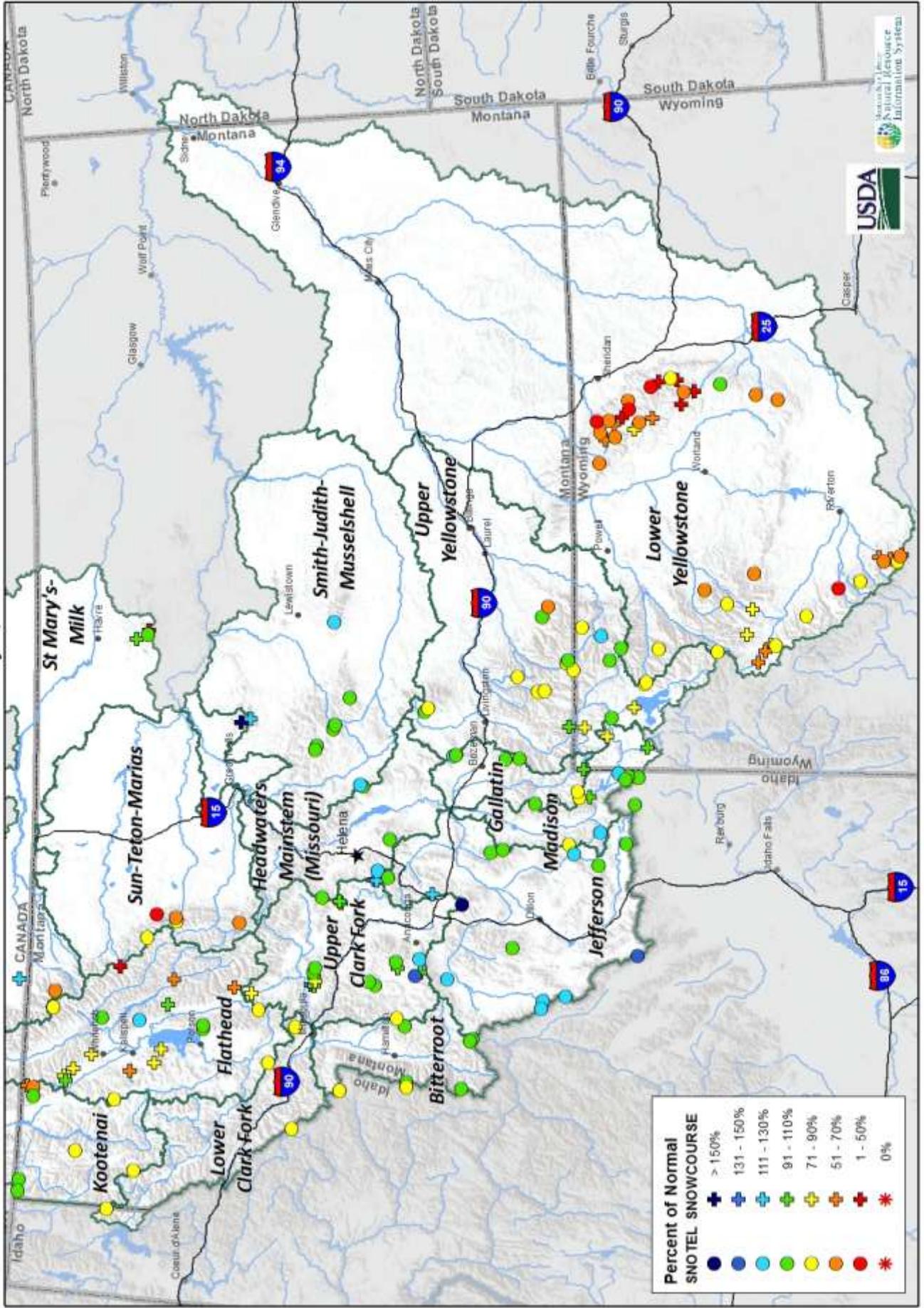
Montana Data Collection Office
 Current Snow Water Equivalent
 Basin Percentage of Normal - February 1, 2016



Note: Data includes SNOTEL and Snow course Measurements on February 1, 2016



Montana Data Collection Office
 Current Snow Water Equivalent
 February 1, 2016



Precipitation - Overview

On February 1st some basins snowpack percentages and water year-to-date precipitation (beginning October 1st, 2015) stand in juxtaposition with each other. On one hand you have the snowpack percentages indicating that conditions are below normal for the date, while the water year precipitation indicates conditions may be better. It is important to remember that water year precipitation is a combination of rain and snow and includes rain events during the fall, as well as, snowfall that occurs during the winter. In river basins where there is a strong correlation between snowmelt and spring runoff like those in northwestern Montana, it is important to know the difference in these two values. Last year, water year precipitation was only slightly below normal as we entered spring runoff while snowpack percentages were well below normal. What occurred from the lack of late winter and spring snowfall, and record low summer precipitation, was below average runoff even though water year precipitation was on track at that time.

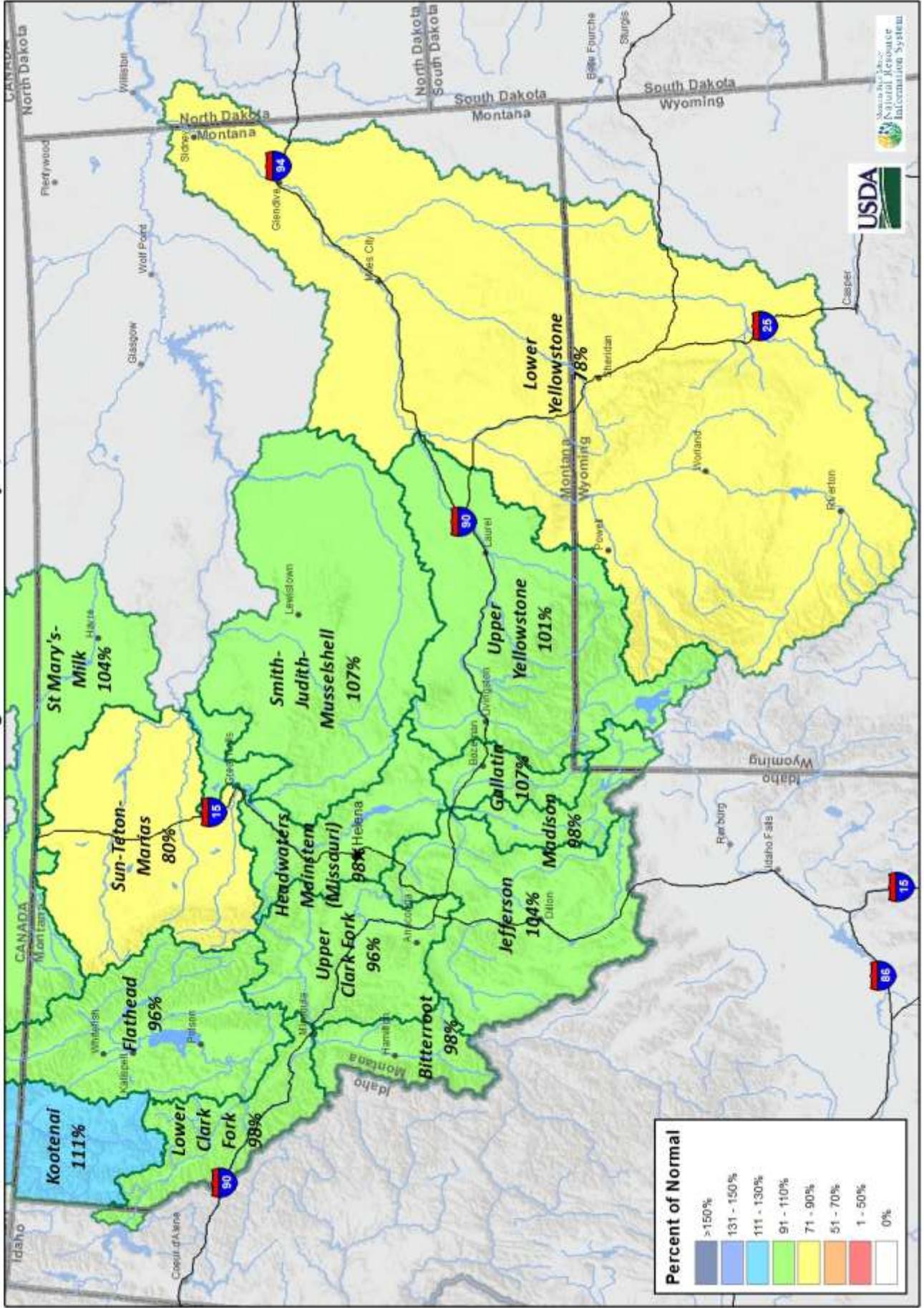
Other basins along and east of the Divide have stronger connections between spring precipitation and runoff. Basins east of the Divide rely on this spring precipitation to add to the snowpack, and later on in the spring provide water in the form of rain to sustain river flows. Some basins that have experienced low water year precipitation so far this year (Sun-Teton-Marias, Lower Yellowstone) could see improvements from this spring precipitation as it is historically when it is possible to experience large spring events.

Monthly precipitation for January was below average in all but the Flathead, Gallatin and Smith-Judith-Musselshell River basins. This caused the water year-to-date precipitation to drop in the basins, however most basins remain near to above normal for February 1st. The lack of precipitation so far this year has left the Lower Yellowstone and Sun-Teton-Marias well below average for this date. Spring events could go a long way in helping to improve these basins. State-wide precipitation was 79% of average for the month of January, and water year-to-date precipitation is 100% of average for February 1st.

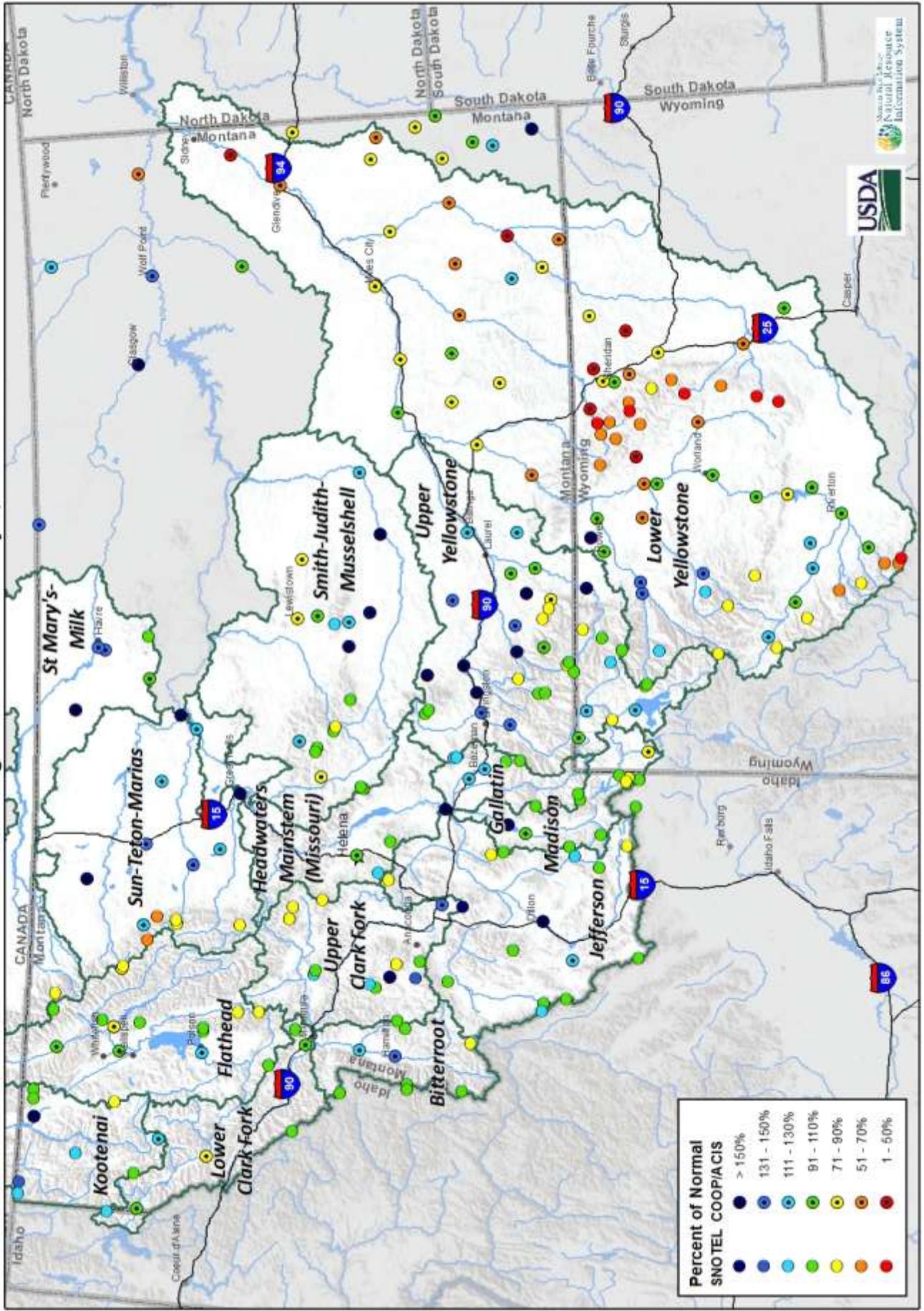
Precipitation

2/1/2016	<i>Monthly % Avg</i>	<i>Water Year % Avg</i>	<i>WY % Last Year</i>
Columbia River Basin	80	100	91
Kootnenai in Montana	80	111	113
Flathead in Montana	95	96	85
Upper Clark Fork	75	96	84
Bitterroot	67	98	82
Lower Clark Fork	76	98	93
Missouri River Basin	80	102	100
Jefferson	75	104	106
Madison	77	98	117
Gallatin	96	107	107
Headwaters Mainstem	89	98	88
Smith-Judith-Musselshell	95	107	103
Sun-Teton-Marias	51	80	69
St. Mary-Milk	77	104	90
Yellowstone River Basin	70	87	89
Upper Yellowstone	72	101	97
Lower Yellowstone	69	76	59
West of Divide	80	100	91
East of Divide	73	94	94
Montana State-Wide	79	100	94

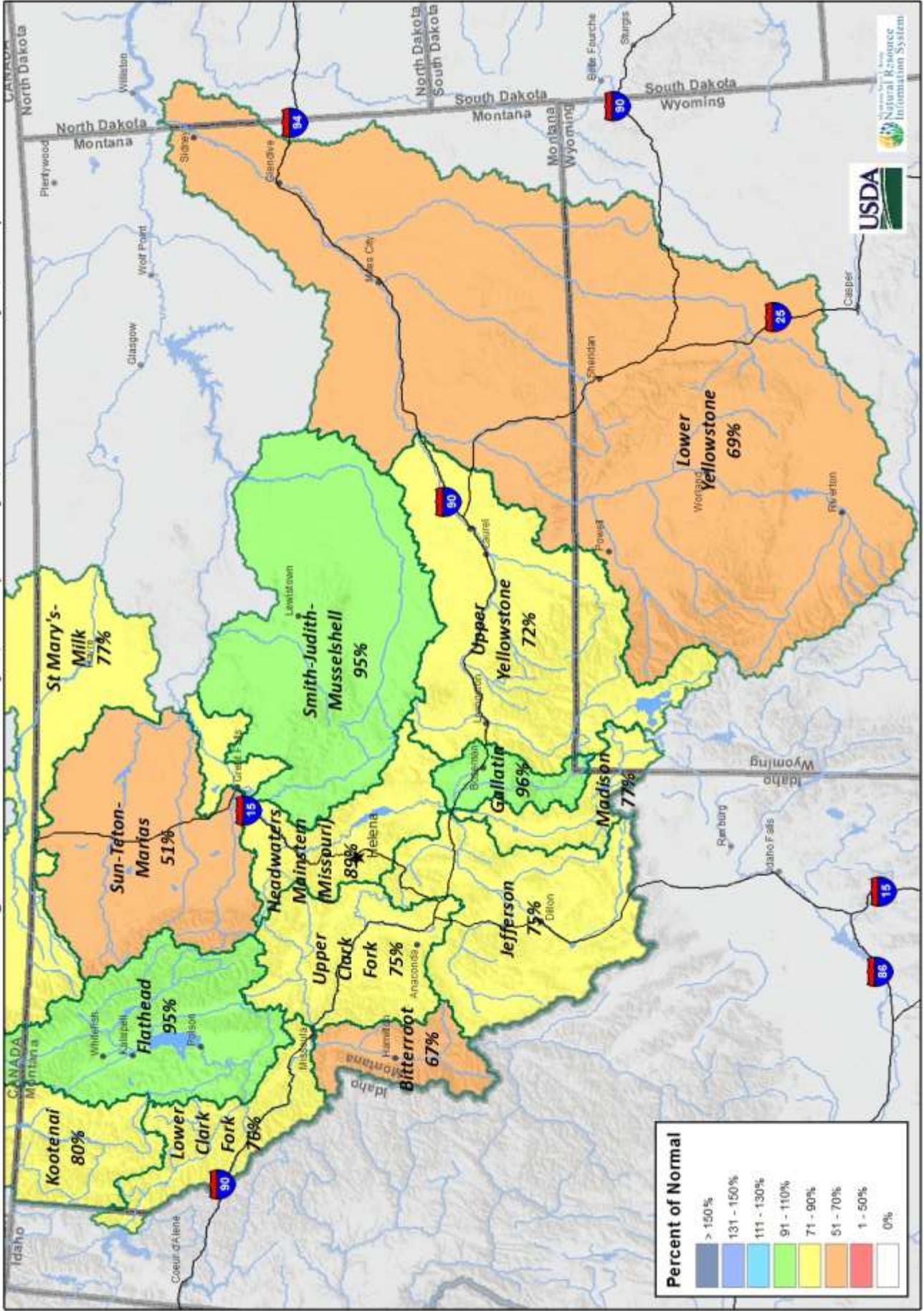
Montana Data Collection Office
 Water Year to Date Precipitation
 Basin Percentage of Normal - February 1, 2016



Montana Data Collection Office
 Water Year to Date Precipitation
 Percentage of Normal - February 1, 2016

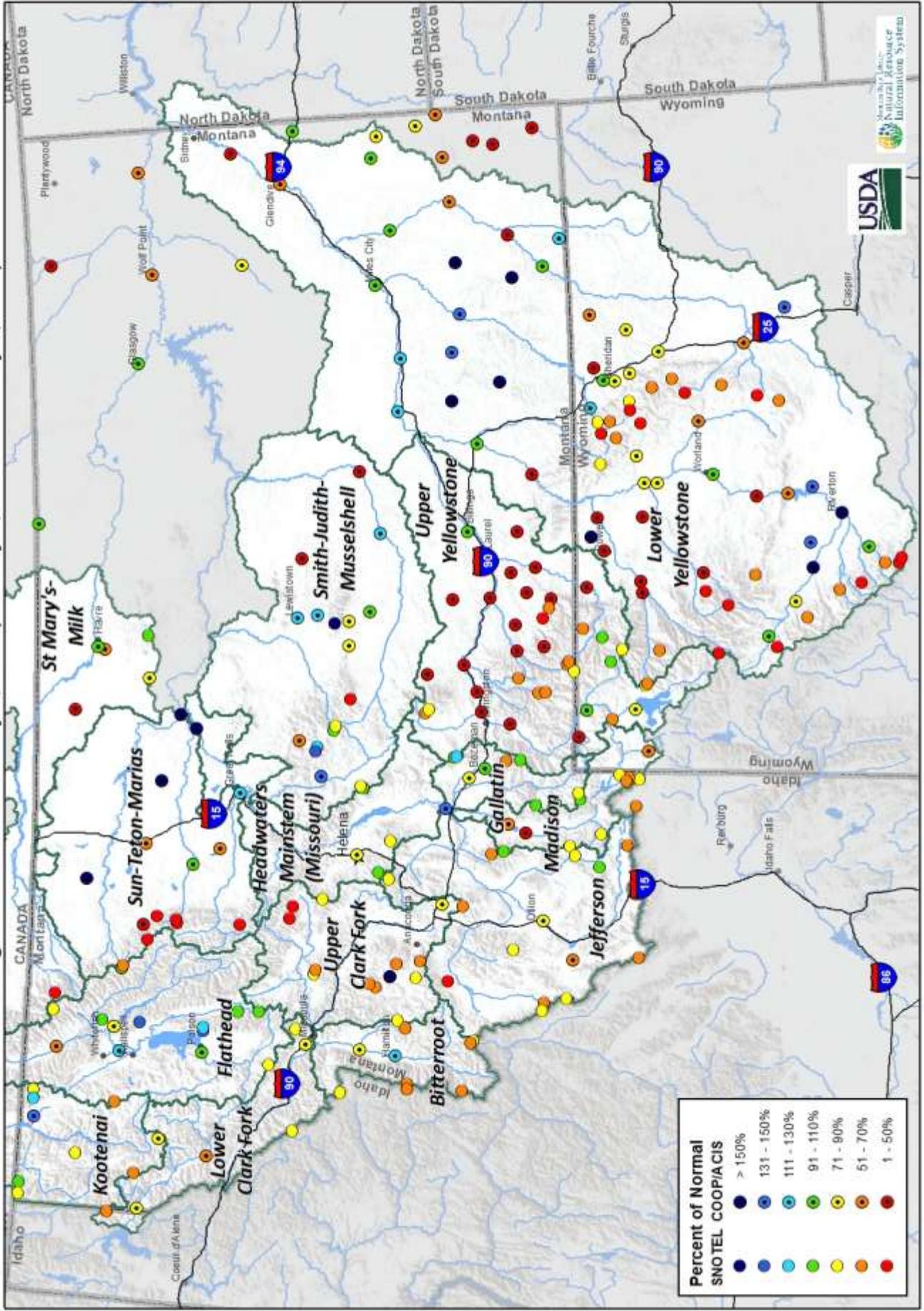


Montana Data Collection Office
 Monthly Precipitation
 Basin Percentage of Normal - February 1, 2016 (January 1, 2016 - February 1, 2016)



Montana Data Collection Office
 Monthly Precipitation

Percentage of Normal - February 1, 2016 (January 1, 2016 - February 1, 2016)



Reservoirs - Overview

At this time reservoir storage is generally near to above average at most locations across the state. Carryover from the big snowpack of 2014 and wise water management last year has allowed water managers to enter the winter with reservoir contents in mostly good shape. East of the Divide there are a few reservoirs that are well below average for this date. In the Jefferson River basin Lima (71%) and Clark Canyon (77%) reservoirs are below average as of Feb 1st. In this basin snowpack percentages are currently above normal and water year precipitation is also above normal.

In the Sun-Teton-Marias River basin Pishkun (32%) and Gibson (52%) reservoirs are also well below average at this time, however snowpack totals and precipitation are well below average for February 1st. Wise water management and near to above average spring runoff will be needed in order to reach average conditions as water is called on this summer, and to ensure carryover is available as we enter the next water year.

Reservoir Storage

2/1/2016	<i>% Average</i>	<i>% Capacity</i>	<i>% Last Year</i>
Columbia River Basin	116	66	95
Kootenai in Montana	131	65	102
Flathead in Montana	105	66	90
Upper Clark Fork	108	73	94
Bitterroot	91	23	53
Lower Clark Fork	103	97	101
Missouri River Basin	112	76	98
Jefferson	81	37	84
Madison	110	81	97
Gallatin	105	54	85
Headwaters Mainstem	115	79	99
Smith-Judith-Musselshell	144	70	85
Sun-Teton-Marias	98	51	91
St. Mary-Milk	129	51	77
Yellowstone River Basin	107	63	98
Upper Yellowstone	139	65	109
Lower Yellowstone	106	63	97
West of Divide	116	66	95
East of Divide	112	75	98
Montana State-Wide	113	72	97

Streamflow - Overview

The USDA-NRCS generates long duration streamflow forecasts (April-July, April-September) based on the relationship between current snowpack, precipitation, streamflow conditions and historical runoff. Due to the nature of these forecasts the skill of streamflow forecasts generally improves through the winter as forecasters have a better indication the maximum snowpack for the year.

February streamflow forecasts are issued with the expectation that the user recognize that only 50 to 65 percent of the seasonal snowpack has accumulated at this time. Streamflow forecasts are given as a range of values that encompass the conditions that could occur given current conditions (10%, 30%, 50%, 70%, 90% exceedances). 50 percent exceedance values expect normal conditions to occur from this point until and during runoff.

For more information on streamflow forecasts and how to interpret these forecasts [click here](#).

THE FIGURES IN THE TABLE BELOW ARE AN AVERAGE OF ALL FORECASTS WITHIN THE PARTICULAR BASIN AT THE 50 PERCENT EXCEEDANCE ONLY. ALL 50 PERCENT EXCEEDANCE FORECASTS ASSUME NEAR NORMAL WEATHER THROUGH THE END OF THE FORECAST PERIOD.

FOR FORECASTS ABOVE AND BELOW THE 50 PERCENT EXCEEDANCE, LOOK TO THE SPECIFIC BASIN REPORTS.

APR-JUL 50 % Exceedance Forecast

<i>2/1/2016</i>	<i>% Average</i>	<i>% Last Year</i>
Columbia River Basin	97	144
Kootenai in Montana	106	152
Flathead in Montana	93	143
Upper Clark Fork	97	137
Bitterroot	97	114
Lower Clark Fork	94	142
Missouri River Basin	85	116
Jefferson	105	198
Madison	88	128
Gallatin	92	128
Headwaters Mainstem	83	109
Smith-Judith-Musselshell	87	88
Sun-Teton-Marias	66	109
St. Mary-Milk	84	117
Yellowstone River Basin	82	82
Upper Yellowstone	92	105
Lower Yellowstone	74	69
West of Divide	97	144
East of Divide	83	99
Montana State-Wide	91	119

Surface Water Supply Index (SWSI)

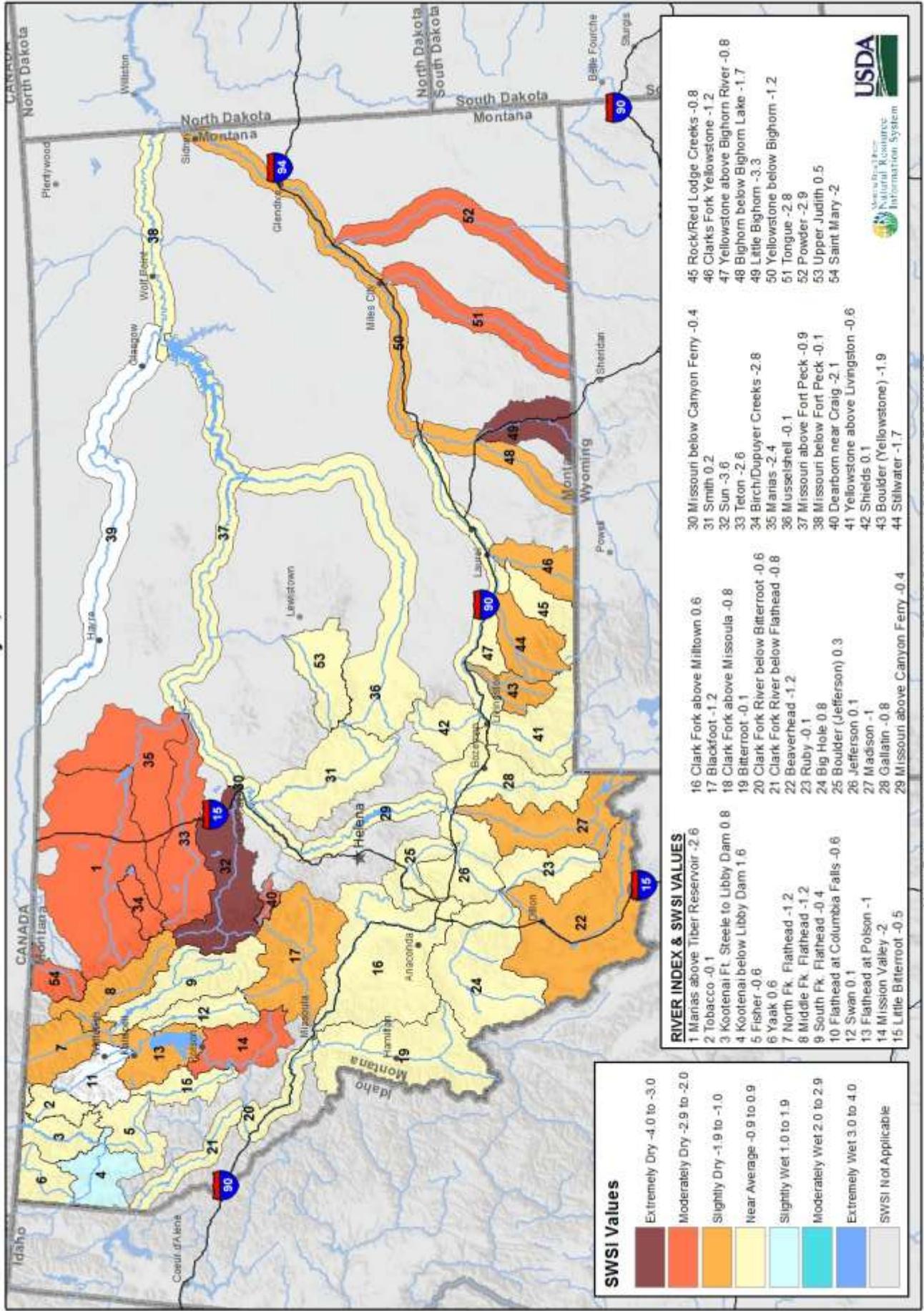
The Surface Water Supply Index (SWSI) is a measure of available surface water availability for the spring and summer months. Water users that rely on mountain precipitation can use the index to evaluate seasonal surface water supplies. The SWSI accounts for mountain snowpack, mountain precipitation, streamflow, reservoir storage, and soil moisture.

Watershed	This month's SWSI	Last Year's SWSI
Marias above Tiber Reservoir	-2.6	-0.5
Tobacco	-0.1	-2.7
Kootenai Ft. Steele to Libby Dam	0.8	-1.1
Kootenai below Libby Dam	1.6	0.6
Fisher	-0.6	-1.8
Yaak	0.6	-3.3
North Fk. Flathead	-1.2	-1.6
Middle Fk. Flathead	-1.2	-0.4
South Fk. Flathead	-0.4	3.1
Flathead at Columbia Falls	-0.6	0.7
Swan	0.1	2.0
Flathead at Polson	-1.0	0.2
Mission Valley	-2.0	1.7
Little Bitterroot	-0.5	2.1
Clark Fork above Milltown	0.6	0.9
Blackfoot	-1.2	0.2
Clark Fork above Missoula	-0.8	1.1
Bitterroot	-0.1	0.2
Clark Fork River below Bitterroot	-0.6	0.8
Clark Fork River below Flathead	-0.8	0.4
Beaverhead	-1.2	-1.8
Ruby	-0.1	-1.6
Big Hole	0.8	0.9
Boulder (Jefferson)	0.3	0.5
Jefferson	0.1	0.0
Madison	-1.0	-1.6
Gallatin	-0.8	-0.9
Missouri above Canyon Ferry	-0.4	-0.9
Missouri below Canyon Ferry	-0.4	-0.9
Smith	0.2	2.1
Sun	-3.6	-0.7
Teton	-2.6	0.8
Birch/Dupuyer Creeks	-2.8	-0.2
Marias	-2.4	2.0
Musselshell	-0.1	1.1
Missouri above Fort Peck	-0.9	0.4
Missouri below Fort Peck	-0.1	0.0
Milk		
Dearborn near Craig	-2.1	-0.5
Yellowstone above Livingston	-0.6	0.5
Shields	0.1	-0.4
Boulder (Yellowstone)	-1.9	-0.5
Stillwater	-1.7	0.2
Rock/Red Lodge Creeks	-0.8	0.0
Clarks Fork Yellowstone	-1.2	1.6
Yellowstone above Bighorn River	-0.8	0.7
Bighorn below Bighorn Lake	-1.7	0.2
Little Bighorn	-3.3	-1.1
Yellowstone below Bighorn	-1.2	0.1
Tongue	-2.8	-0.2
Powder	-2.9	0.0
Upper Judith	0.5	2.8
Saint Mary	-2.0	-2.2

SWSI Scale

+3.0 to +4.0	Extremely Wet
+2.0 to +2.9	Moderately Wet
+1.0 to +1.9	Slightly Wet
+0.9 to -0.9	Near Average
-1.0 to -1.9	Slightly Dry
-2.0 to -2.9	Moderately Dry
-3.0 to -4.0	Extremely Dry

Montana Data Collection Office
 Surface Water Supply Index (SWSI)
 February 1, 2016



SWSI Values

Dark Red	Extremely Dry -4.0 to -3.0
Red	Moderately Dry -2.9 to -2.0
Orange	Slightly Dry -1.9 to -1.0
Yellow	Near Average -0.9 to 0.9
Light Green	Slightly Wet 1.0 to 1.9
Green	Moderately Wet 2.0 to 2.9
Dark Green	Extremely Wet 3.0 to 4.0
Grey	SWSI Not Applicable

RIVER INDEX & SWSI VALUES

- 1 Manas above Tiber Reservoir -2.6
- 2 Tobacco -0.1
- 3 Kootenai Ft. Steele to Libby Dam 0.8
- 4 Kootenai below Libby Dam 1.6
- 5 Fisher -0.6
- 6 Yaak 0.6
- 7 North Fk. Flathead -1.2
- 8 Middle Fk. Flathead -1.2
- 9 South Fk. Flathead -0.4
- 10 Flathead at Columbia Falls -0.6
- 12 Swan 0.1
- 13 Flathead at Polson -1
- 14 Mission Valley -2
- 15 Little Bitterroot -0.5

- 16 Clark Fork above Milltown 0.6
- 17 Blackfoot -1.2
- 18 Clark Fork above Missoula -0.8
- 19 Bitterroot -0.1
- 20 Clark Fork River below Bitterroot -0.6
- 21 Clark Fork River below Flathead -0.8
- 22 Beaverhead -1.2
- 23 Ruby -0.1
- 24 Big Hole 0.8
- 25 Boulder (Jefferson) 0.3
- 26 Jefferson 0.1
- 27 Madison -1
- 28 Gallatin -0.8
- 29 Missoula above Canyon Ferry -0.4
- 30 Missoula below Canyon Ferry -0.4
- 31 Smith 0.2
- 32 Sun -3.6
- 33 Teton -2.8
- 34 Birch/Dupuyer Creeks -2.8
- 35 Manas -2.4
- 36 Musselshell -0.1
- 37 Missoula above Fort Peck -0.9
- 38 Missoula below Fort Peck -0.1
- 40 Dearborn near Craig -2.1
- 41 Yellowstone above Livingston -0.6
- 42 Shields 0.1
- 43 Boulder (Yellowstone) -1.9
- 44 Stillwater -1.7

- 45 Rock/Red Lodge Creeks -0.8
- 46 Clarks Fork Yellowstone -1.2
- 47 Yellowstone above Bighorn River -0.8
- 48 Bighorn below Bighorn Lake -1.7
- 49 Little Bighorn -3.3
- 50 Yellowstone below Bighorn -1.2
- 51 Tongue -2.8
- 52 Powder -2.9
- 53 Upper Judith 0.5
- 54 Saint Mary -2



Note: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE

Kootenai River Basin



Entering 2016 at 90% of normal snowpack on January 1st the Kootenai River basin was 10% higher than last year at that time. The basin received more snow this January than it did in January of 2015, when much of the high elevation precipitation came as rain instead of snow. January of 2015, 3 of the 9 NRCS measurement locations in the Kootenai River basin actually saw a reduction in snow depth over the month. The basin also only received about 50% of its normal January snow water content increment at SNOTEL locations. Heading into January 2016 with a slightly deeper snowpack the weather remained relatively dry until January 12th. Fortunately moisture trickled in over the remainder of the month. The Kootenai River basin ended the month at 85% of normal on February 1st, which was 16% higher than last year at this time.

Much needed precipitation was received in the Kootenai River basin during the month of January. Relatively warm temperatures brought some of the moisture to the basin as mixed rain and snow events even at high elevations. The good news is, the rain the basin received was retained in the snowpack at SNOTEL locations. Mountain SNOTEL sites received 79% of average precipitation for the month of January, while valley weather stations received 103% of average precipitation in the Kootenai River basin.

Reservoir storage in Lake Koocanusa is currently above average at 131%.

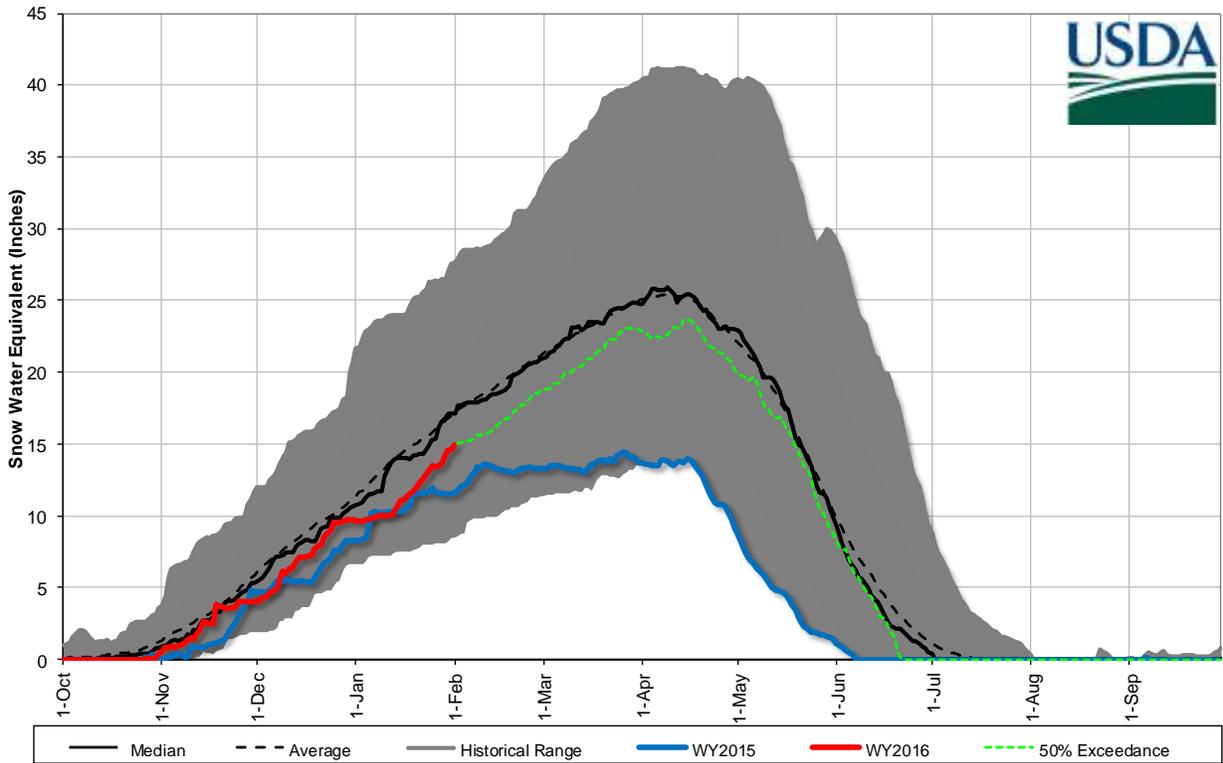
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 % exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 106% of average for the April-July time period.

Kootenai River Basin Data Summary		2/1/2016	
Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	85%	69%	
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	79%	109%	96%
Valley Precipitation	103%	135%	120%
Basin Precipitation	80%	111%	98%
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	131%	65%	129%
Streamflow Forecast	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Basin-Wide Apr-July	106%	152%	70%

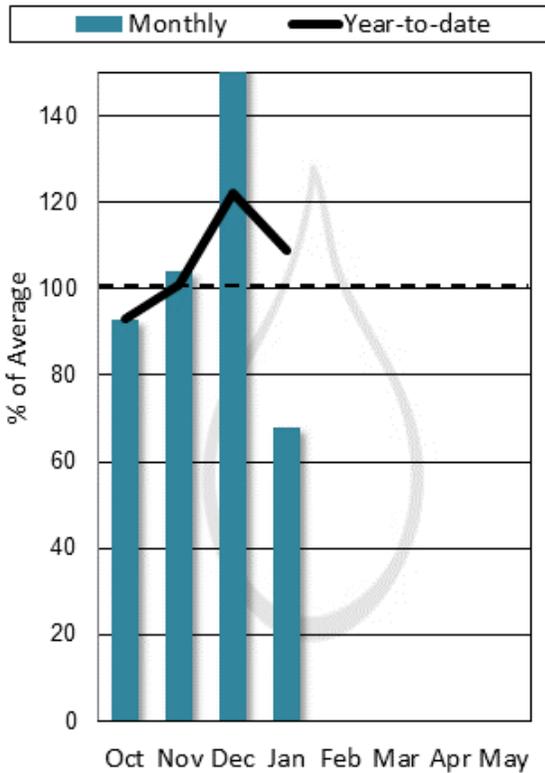
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

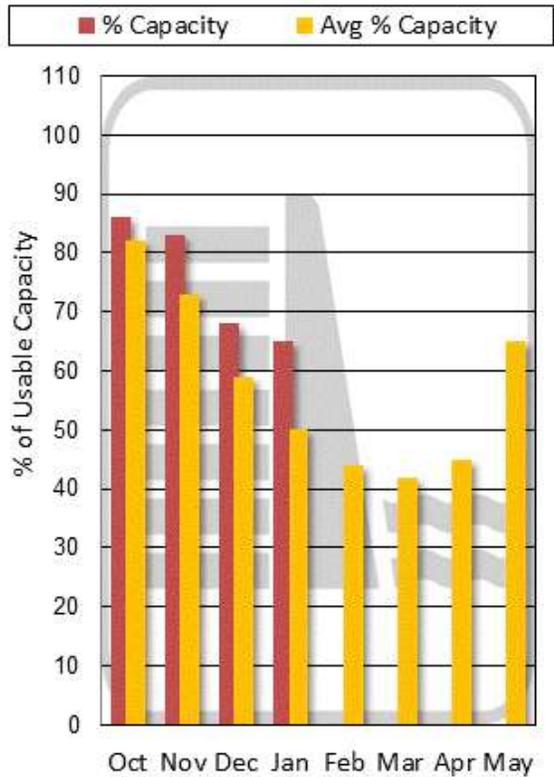
Kootenai River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016



Mountain and Valley Precipitation

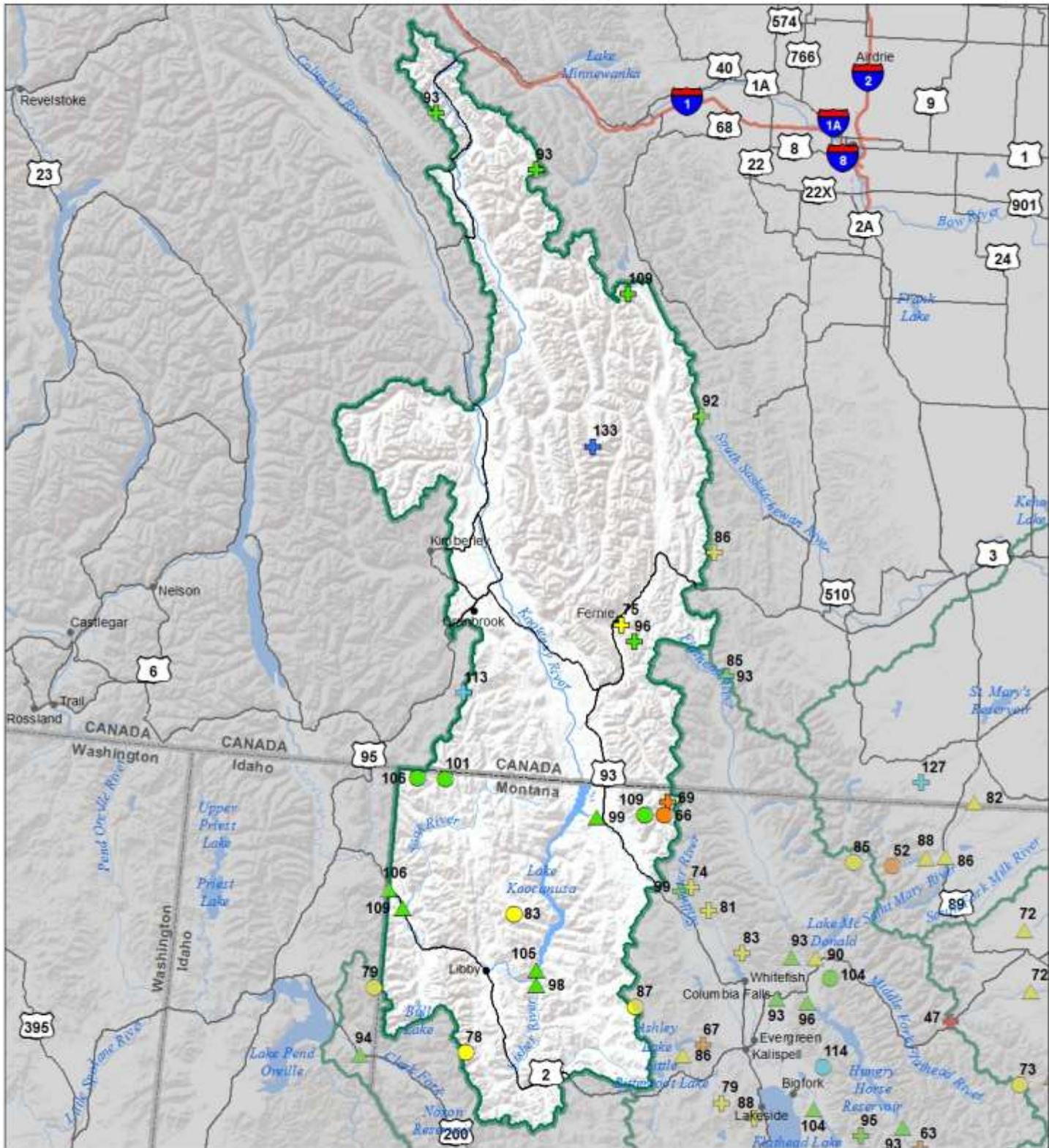


End of Month Reservoir Storage



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

Kootenai River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

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

Snowcourse

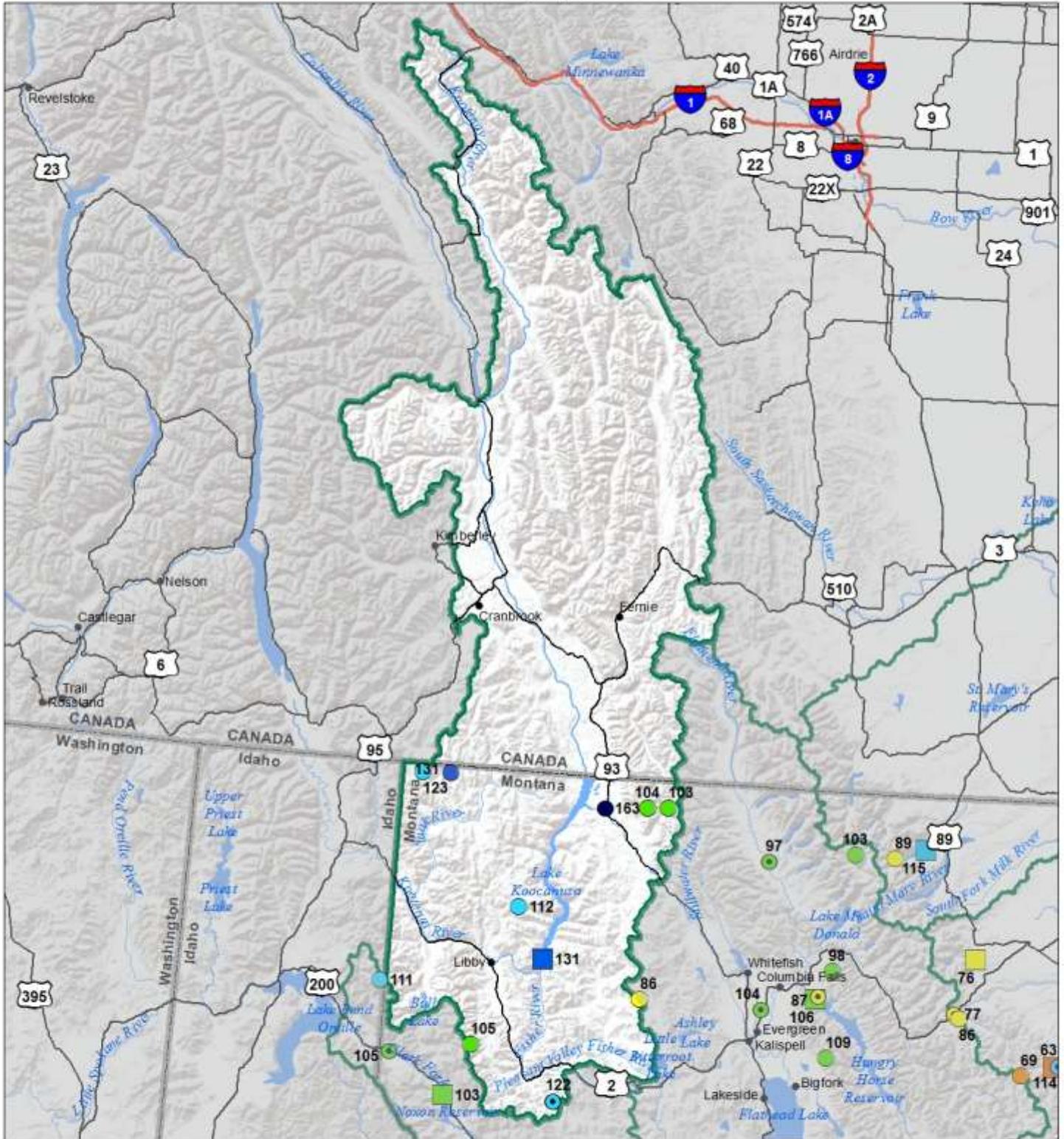
- ⊕ > 150%
- ⊕ 131 - 150%
- ⊕ 111 - 130%
- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

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 February 1, 2016



Precipitation Percent of Normal

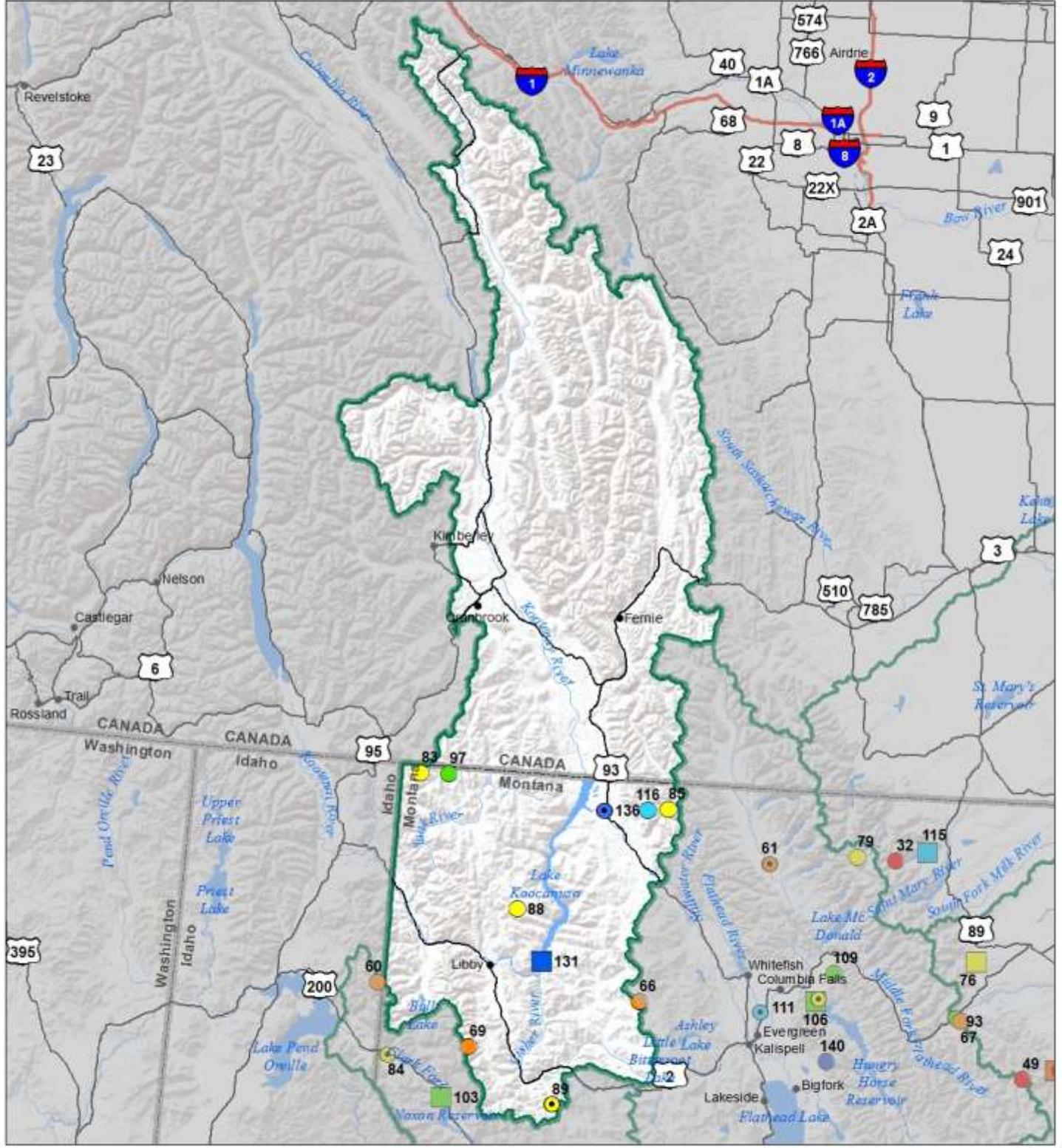
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



Kootenai River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal February 1, 2016 (January 1, 2016 - February 1, 2016)



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%



Kootenai River Basin In Montana Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

KOOTENAI RIVER BASIN in MONTANA	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Tobacco R nr Eureka	APR-JUL	98	115	126	100%	138	154	126
	APR-SEP	108	126	139	99%	152	171	140
Libby Reservoir Inflow ¹	APR-JUL	4740	5370	5650	106%	5940	6570	5340
	APR-SEP	5740	6330	6590	105%	6860	7440	6250
Fisher R nr Libby	APR-JUL	130	173	200	98%	230	275	205
	APR-SEP	141	186	215	98%	245	290	220
Yaak R nr Troy	APR-JUL	360	415	455	108%	495	555	420
	APR-SEP	375	435	480	109%	520	580	440
Kootenai R at Leonia ^{1,2}	APR-JUL	5770	6610	6990	106%	7370	8210	6600
	APR-SEP	6850	7650	8020	106%	8380	9190	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

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Koocanusa	3749.7	3705.0	2865.0	5748.0
Basin-wide Total	3749.7	3705.0	2865.0	5748.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
KOOTENAY in CANADA	8	98	78
KOOTENAI MAINSTEM	3	79	57
TOBACCO	3	85	82
FISHER	1	87	77
YAAK	2	104	73
KOOTENAI RIVER BASIN in MONTANA	9	85	69
KOOTENAI ab BONNERS FERRY	16	92	76

Flathead River Basin



Despite receiving a couple large storms in the Flathead River basin during January, the basin struggled to reach fully normal conditions. A similar weather pattern that the basin experienced in December occurred in February. Lack of precipitation to start the month brought basin percentages down. On January 9th North Fork of Jocko SNOTEL had its second lowest snowpack on record. Fortunately this dry period was followed by very large storms that brought percentages back up. Noisy Basin SNOTEL was the prime beneficiary of moisture in these storms. From January 13th to the 15th it received 27 inches of snow (5.0 inches SWE). Currently Noisy Basin SNOTEL has the deepest snowpack of all the Montana Data Collection Office measurement locations at 97 inches.

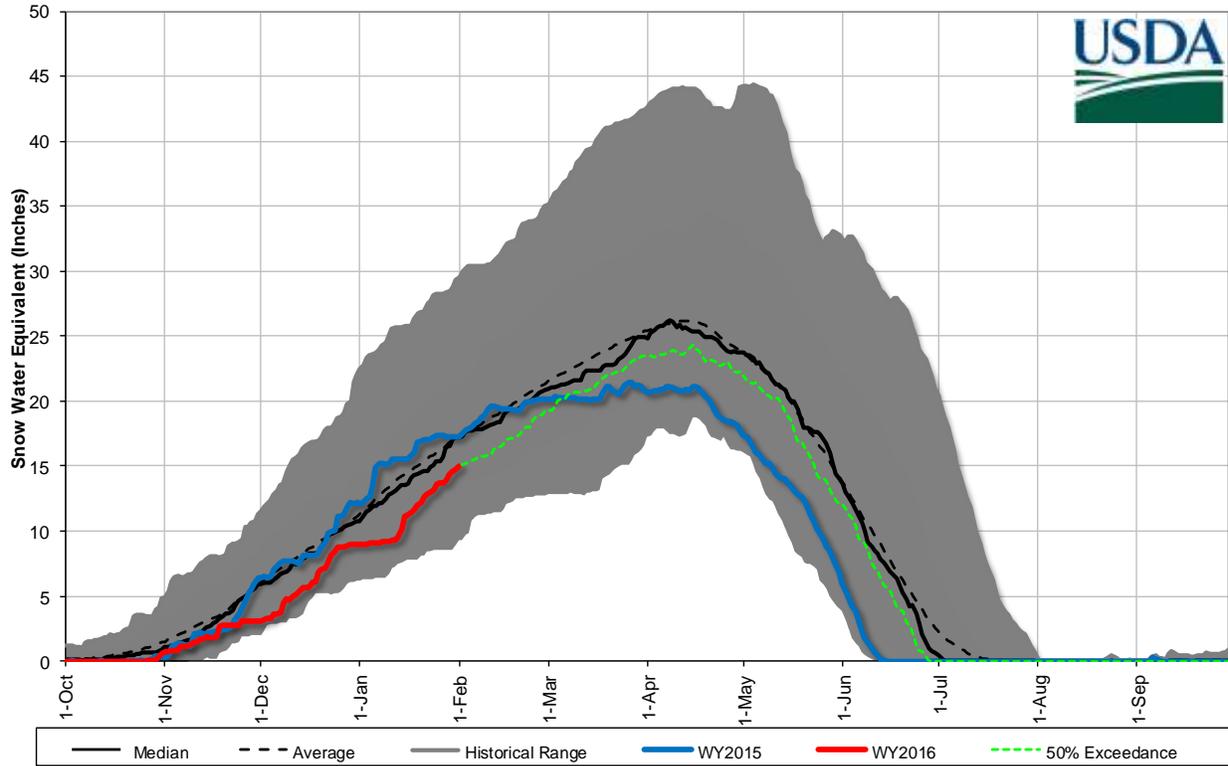
Unlike the snowpack, water year-to-date precipitation was at above averages conditions near the end of December. The dry spell that lasted until about the second week of January brought this percentage down. During the month of January mountain SNOTEL sites received 95% of average precipitation, while valley weather stations received 109% of average precipitation in the Flathead River basin.

All reservoirs in the basin currently have above average storage with the exception of Mission Valley Reservoir, which is at 78% of average. The basin wide percent of average is at 105%.

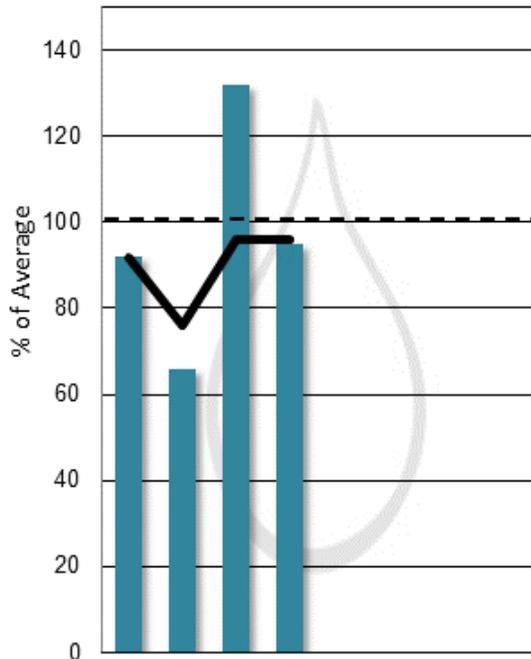
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 93% of average for the April-July time period.

Flathead River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	84%	96%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	95%	96%	111%
Valley Precipitation	109%	112%	168%
Basin Precipitation	95%	96%	113%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	105%	66%	117%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	93%	143%	65%
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current			
**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.			

Flathead River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016

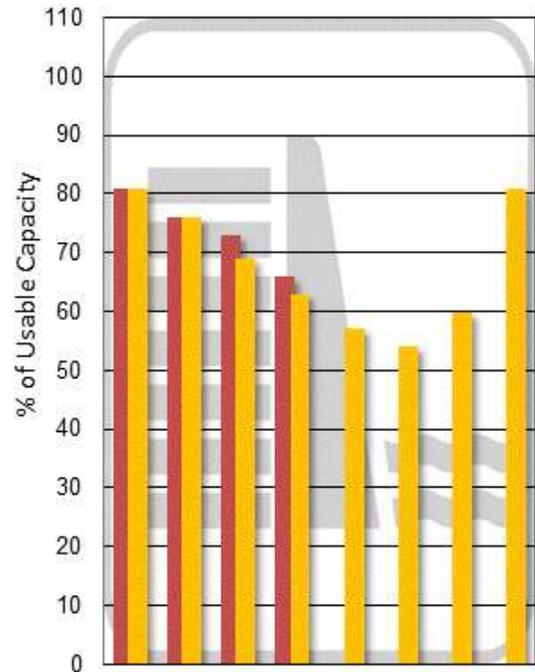


Mountain and Valley Precipitation



Oct Nov Dec Jan Feb Mar Apr May

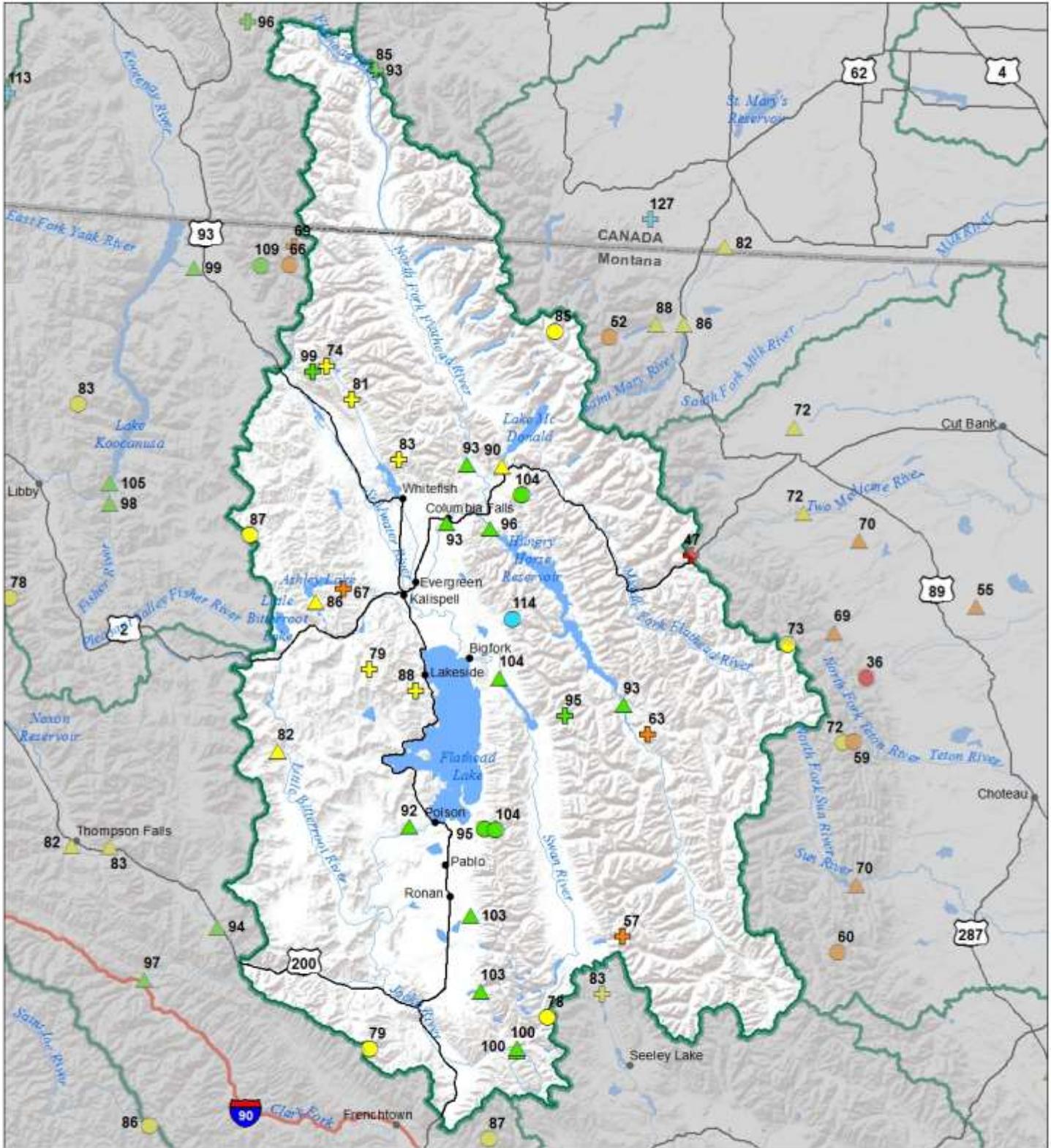
End of Month Reservoir Storage



Oct Nov Dec Jan Feb Mar Apr May

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

Flathead River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%
- *

Snowcourse

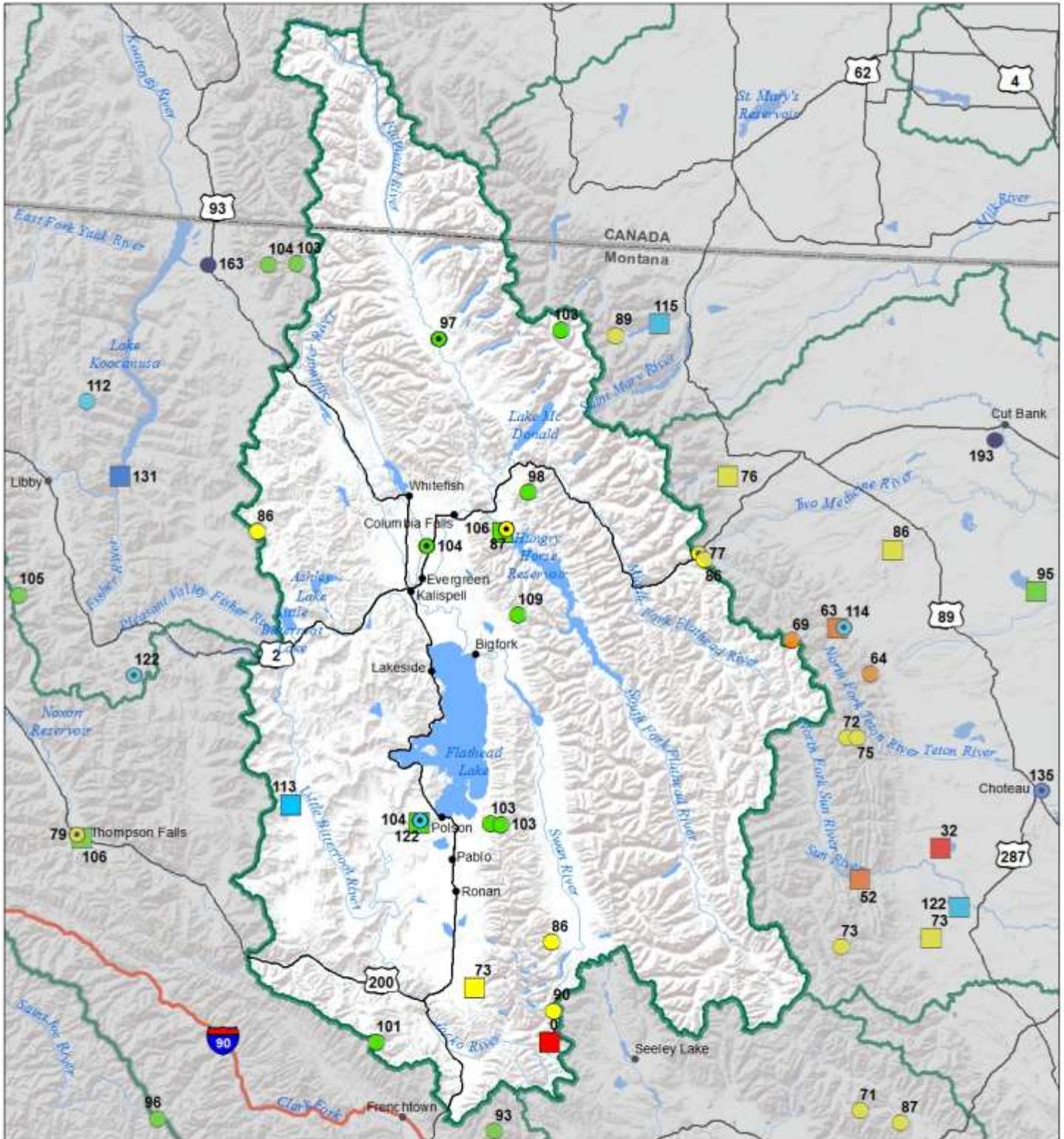
- ⊕ > 150%
- ⊕ 131 - 150%
- ⊕ 111 - 130%
- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

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 February 1, 2016



Precipitation Percent of Normal

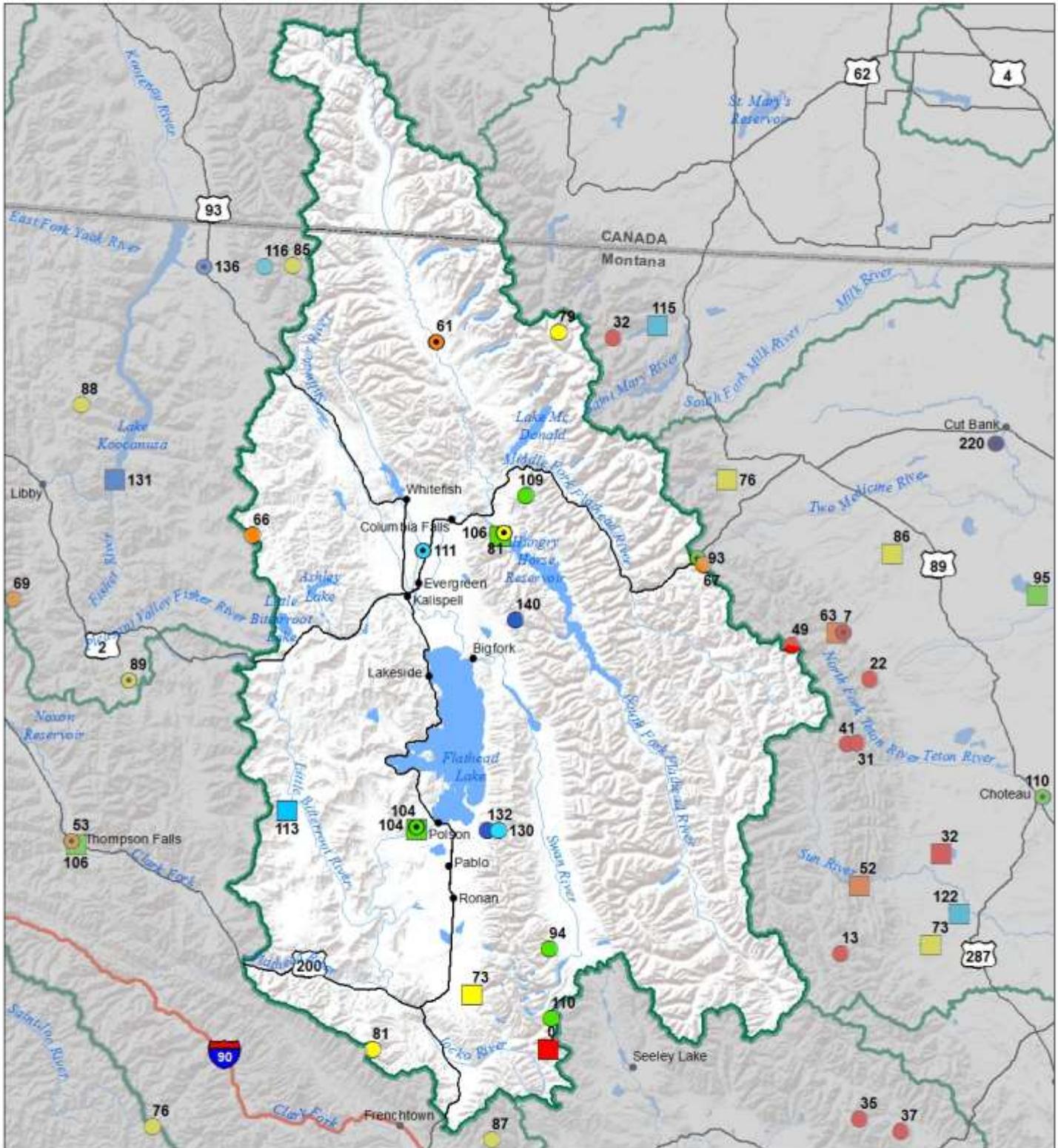
SNOTEL		COOP/ACIS	
Dark Blue	> 150%	Dark Blue	> 150%
Blue	131 - 150%	Blue	131 - 150%
Cyan	111 - 130%	Cyan	111 - 130%
Green	91 - 110%	Green	91 - 110%
Yellow	71 - 90%	Yellow	71 - 90%
Orange	51 - 70%	Orange	51 - 70%
Red	1 - 50%	Red	1 - 50%

Reservoirs Percent of Normal

Dark Blue	> 150%
Blue	131 - 150%
Cyan	111 - 130%
Green	91 - 110%
Yellow	71 - 90%
Orange	51 - 70%
Red	1 - 50%



Flathead River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal February 1, 2016 (January 1, 2016 - February 1, 2016)



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%



Flathead River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

FLATHEAD RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
NF Flathead R nr Columbia Falls	APR-JUL	1180	1330	1430	93%	1530	1670	1540
	APR-SEP	1320	1470	1580	93%	1680	1840	1700
MF Flathead R nr West Glacier	APR-JUL	1080	1240	1360	91%	1470	1630	1500
	APR-SEP	1190	1360	1470	90%	1590	1760	1630
Sf Flathead R nr Hungry Horse	APR-JUL	885	1020	1100	93%	1190	1330	1180
	APR-SEP	940	1080	1170	93%	1260	1400	1260
Hungry Horse Reservoir Inflow ^{1,2}	APR-JUL	1380	1660	1780	96%	1910	2180	1860
	APR-SEP	1480	1760	1900	96%	2030	2310	1980
Flathead R at Columbia Falls ²	APR-JUL	3890	4350	4660	93%	4980	5440	5020
	APR-SEP	4240	4730	5060	93%	5390	5870	5450
Ashley Ck nr Marion ²	MAR	0.3	0.77	1.09	92%	1.4	1.87	1.19
	APR-JUL	3.2	4.7	5.6	86%	6.6	8	6.5
Swan R nr Bigfork	APR-JUL	450	505	545	105%	585	640	520
	APR-SEP	515	575	620	104%	665	725	595
Flathead Lake Inflow ^{1,2}	APR-JUL	4150	4990	5370	92%	5750	6590	5810
	APR-SEP	4490	5390	5790	92%	6200	7090	6270
Mill Ck ab Bassoo ck nr Niarada	APR-JUL	1.63	2.6	3.3	83%	3.9	4.9	4
	APR-SEP	1.92	2.9	3.6	82%	4.3	5.3	4.4
South Crow Ck nr Ronan	APR-JUL	8.1	9.5	10.5	104%	11.4	12.9	10.1
	APR-SEP	9.2	10.8	11.9	103%	13	14.6	11.6
Mission Ck nr St. Ignatius	APR-JUL	22	24	26	104%	27	30	25
	APR-SEP	26	29	31	103%	32	35	30
SF Jocko R nr Arlee	APR-JUL	25	30	33	100%	37	41	33
	APR-SEP	28	34	37	100%	41	46	37
NF Jocko R bl Tabor Feeder Canal	APR-JUL	26	29	31	100%	33	36	31
	APR-SEP	28	31	33	100%	35	38	33

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

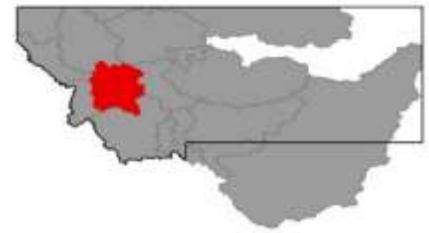
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Camas (4)	20.5	34.6	18.2	45.2
Lower Jocko Lake	0.0	0.0	0.0	6.4
Mission Valley (8)	22.5	35.3	30.9	100.0
Hungry Horse Lake	2523.5	2973.0	2375.0	3451.0
Flathead Lake	990.7	925.5	955.6	1791.0
Basin-wide Total	3557.2	3968.4	3379.7	5393.6
# of reservoirs	5	5	5	5

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
NF FLATHEAD in CANADA	1	85	66
NF FLATHEAD in MONTANA	7	81	82
MIDDLE FORK FLATHEAD	4	78	91
SOUTH FORK FLATHEAD	5	90	107
STILLWATER-WHITEFISH	6	84	92
SWAN	5	90	112
MISSION VALLEY	3	98	121
LITTLE BITTERROOT-ASHLEY	3	80	87
JOCKO	3	81	108
FLATHEAD in MONTANA	24	84	97
FLATHEAD RIVER BASIN	25	84	96

Upper Clark Fork River Basin



The Upper Clark Fork River Basin entered 2016 with near normal snowpack conditions and due to slightly below January snowfall entered February close to the same. The basin typically receives about 3.3 inches of snow water at mountain SNOTEL locations, this January the basin received 2.7 inches. Much like the rest of Montana most of the snow accumulation in the Upper Clark Fork River basin occurred after around January 12th following the high and dry conditions during the first week of the month. Much of the January moisture favored the region from Butte to Phillipsburg. On February 1st that region had 3 of the top 5 highest SNOTEL snow water equivalent percentages in Montana, with Basin Creek (158%) and Peterson Meadows (135%) ranking 1st and 2nd.

The Upper Clark Fork River basin stayed slightly cooler than much of the other lower elevation watersheds west of the divide. Mixed rain and snow events did not appear to have happened in the basin throughout the month. In January mountain SNOTEL sites received 73% of their average precipitation, while valley weather stations received 149% of average precipitation in the Flathead River basin.

All reservoirs in the basin currently have above average storage. Nevada Creek Reservoir is the highest at 150% of average.

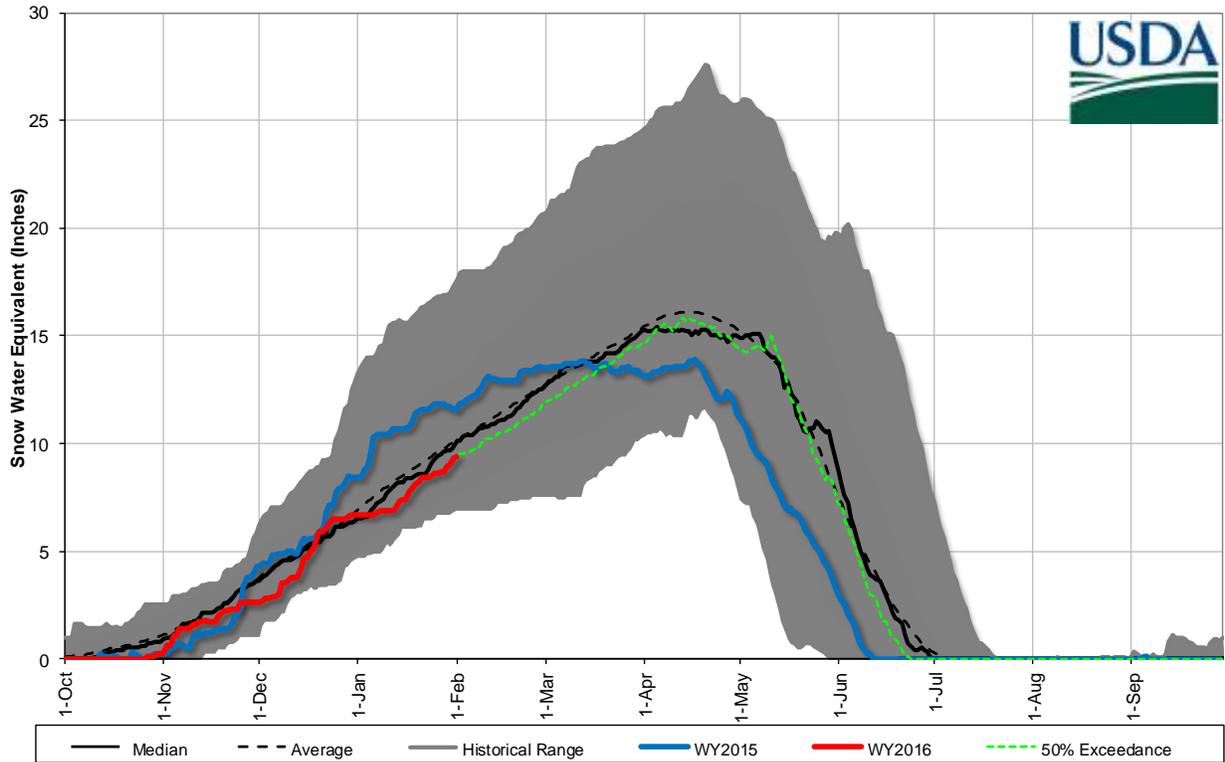
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 97% of average for the April-July time period.

Upper Clark Fork River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	98%	120%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	73%	95%	114%
Valley Precipitation	149%	144%	129%
Basin Precipitation	75%	96%	114%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	108%	73%	115%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	97%	137%	71%

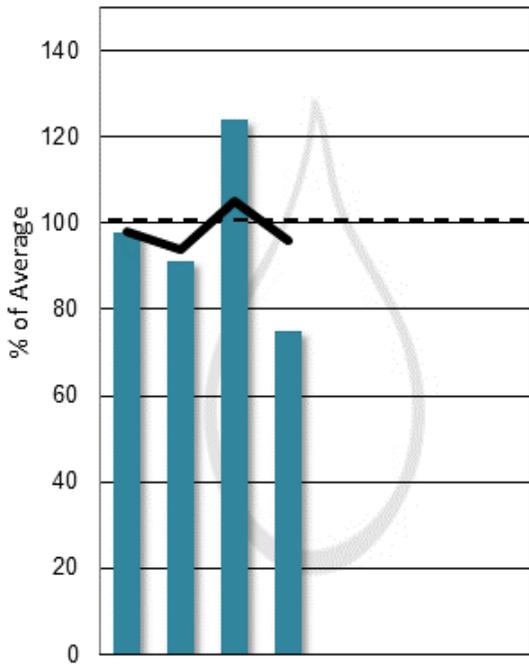
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

Upper Clark Fork River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016

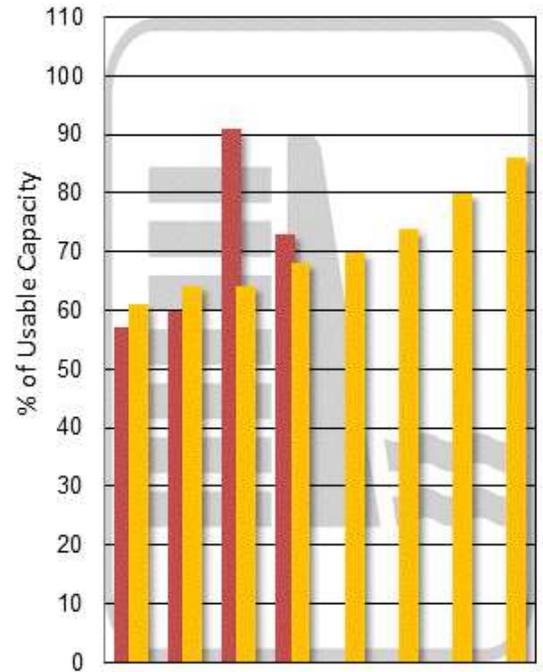


Mountain and Valley Precipitation



Oct Nov Dec Jan Feb Mar Apr May

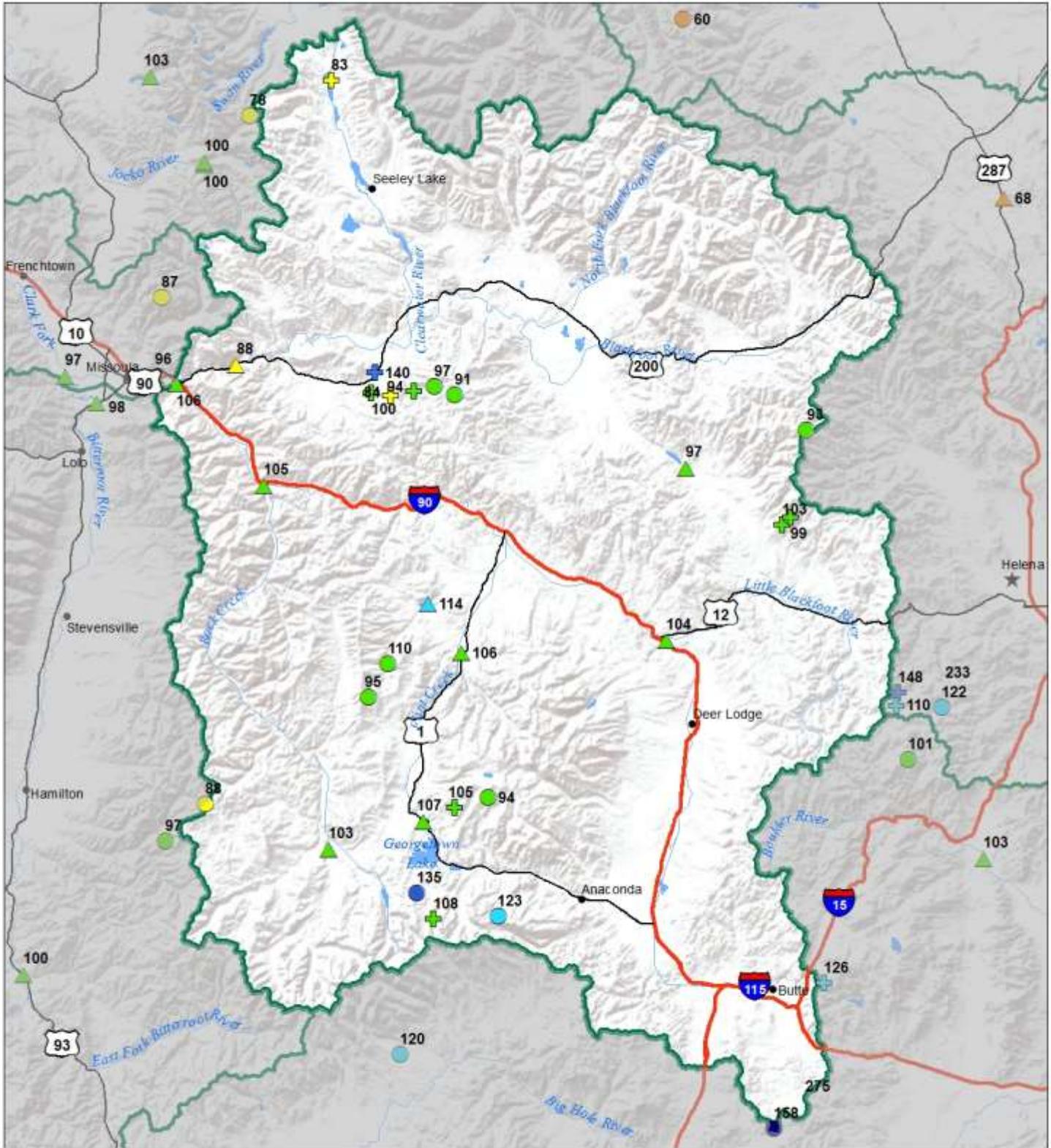
End of Month Reservoir Storage



Oct Nov Dec Jan Feb Mar Apr May

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

Upper Clark Fork River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%
- *

Snowcourse

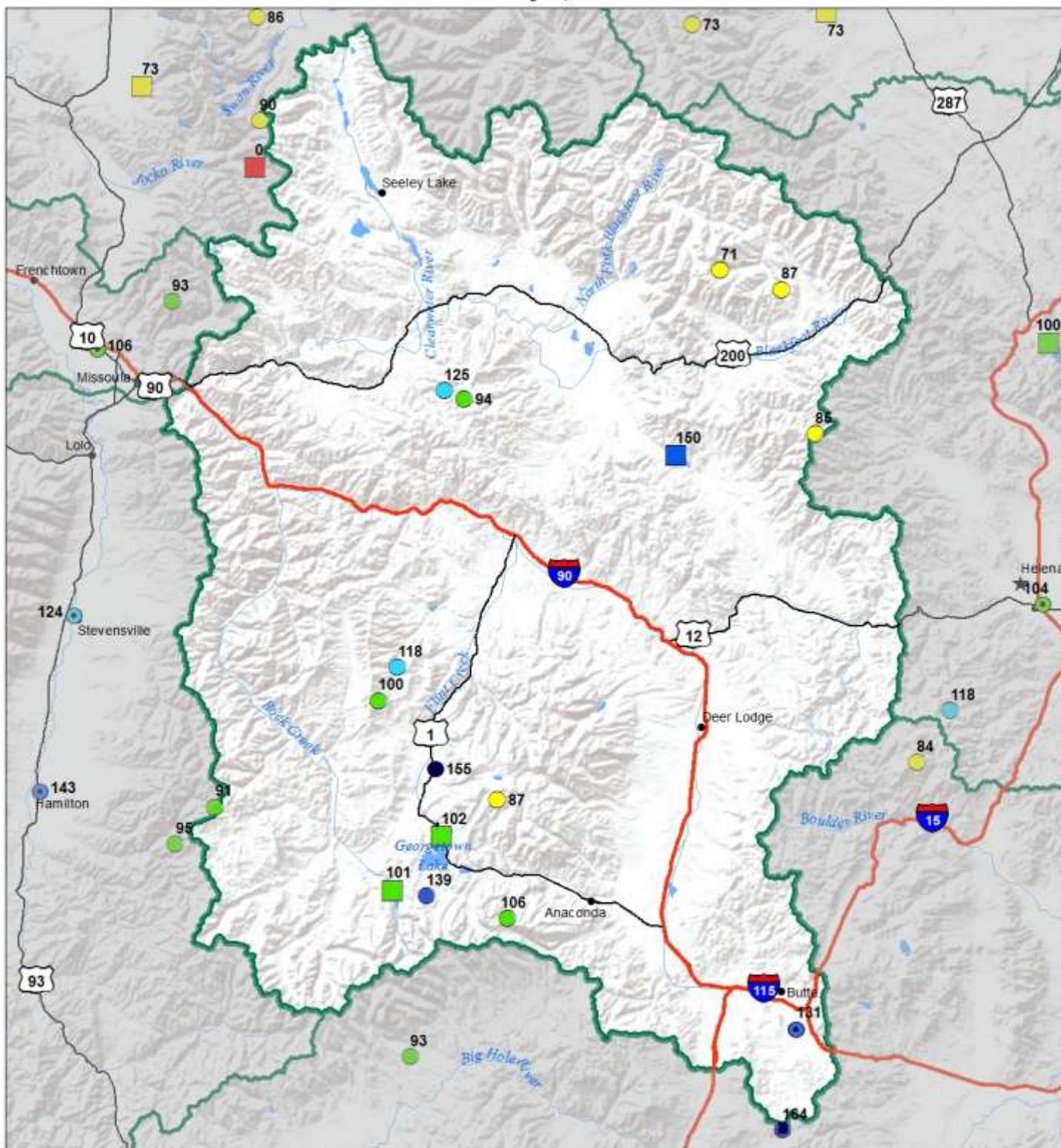
- ⊕ > 150%
- ⊕ 131 - 150%
- ⊕ 111 - 130%
- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

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 February 1, 2016



Precipitation Percent of Normal

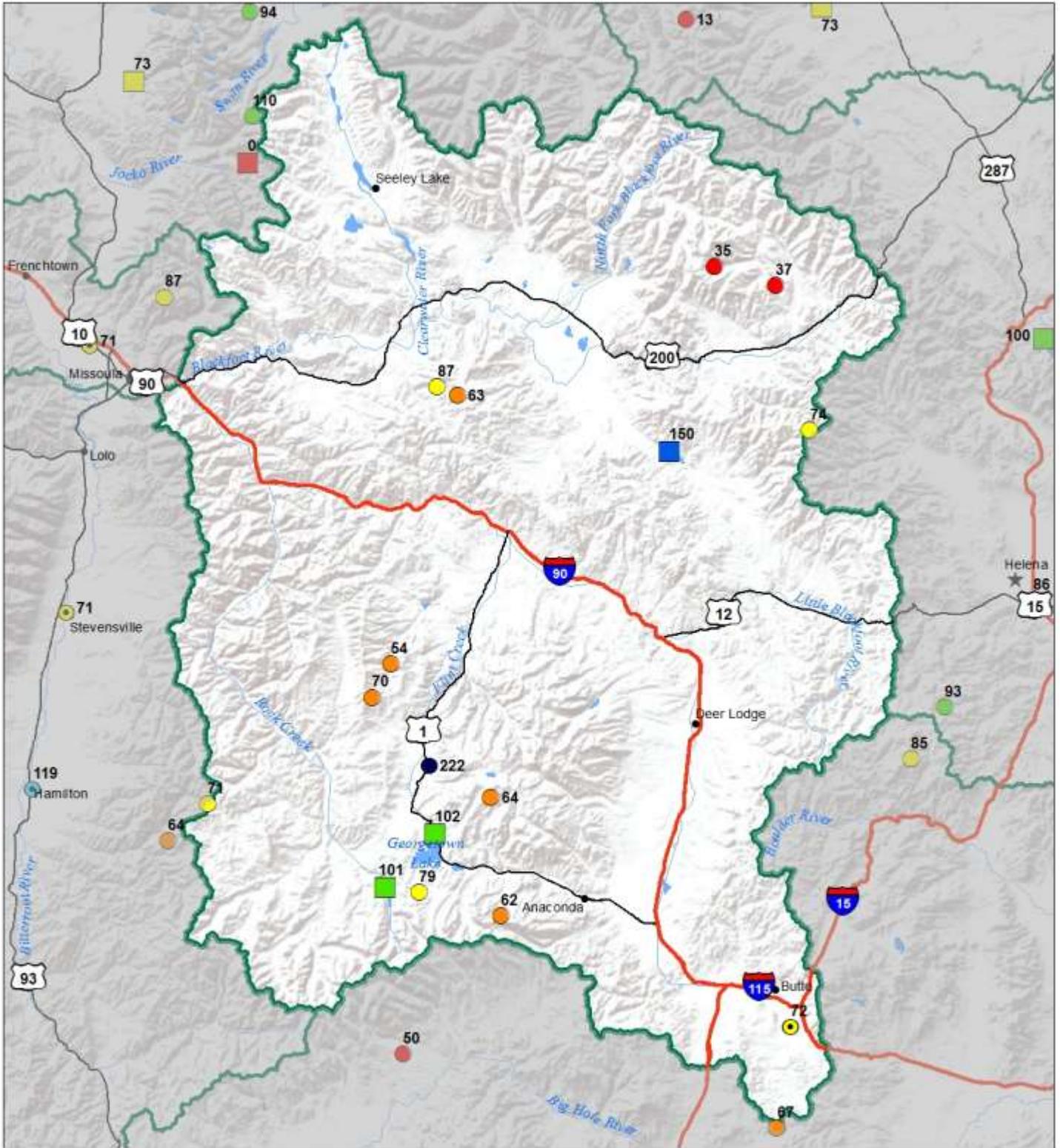
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



**Upper Clark Fork River Basin
 Monthly Precipitation and Reservoir Levels
 Percentage of Normal
 February 1, 2016 (January 1, 2016 - February 1, 2016)**



**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 Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

UPPER CLARK FORK RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Little Blackfoot nr Garrison	APR-JUL	44	61	73	104%	85	103	70
	APR-SEP	48	67	80	104%	93	112	77
Flint Ck nr Southern Cross	APR-JUL	6.7	10.6	13.2	106%	15.9	19.8	12.4
	APR-SEP	7.4	12.3	15.6	107%	19	24	14.6
Flint Ck bl Boulder Ck	APR-JUL	30	45	55	106%	66	81	52
	APR-SEP	40	58	70	106%	82	100	66
Lower Willow Ck Reservoir Inflow ²	APR-MAY	4	6.4	8	110%	9.7	12.1	7.3
	APR-JUL	5.9	9.6	12.1	114%	14.6	18.3	10.6
MF Rock Ck nr Philipsburg	APR-JUL	43	53	60	103%	66	76	58
	APR-SEP	48	59	67	103%	74	85	65
Rock Ck nr Clinton	APR-JUL	175	225	260	104%	295	345	250
	APR-SEP	200	255	295	105%	330	390	280
Clark Fork R ab Milltown	APR-JUL	315	460	560	106%	660	805	530
	APR-SEP	380	540	650	106%	760	925	615
Nevada Ck nr Helmville	APR-MAY	2.7	5.9	8.2	98%	10.4	13.7	8.4
	APR-JUL	4.8	10.2	13.8	97%	17.4	23	14.2
Blackfoot R nr Bonner	APR-JUL	430	545	630	88%	710	830	720
	APR-SEP	490	615	700	88%	790	915	800
Clark Fork R ab Missoula	APR-JUL	780	1030	1200	96%	1370	1630	1250
	APR-SEP	910	1180	1360	96%	1540	1810	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

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
East Fork Rock Creek Res	7.6	10.1	7.5	15.6
Georgetown Lake	28.4	28.8	27.8	31.0
Lower Willow Creek Reservoir		3.6	1.9	4.9
Nevada Creek Res	7.5	7.5	5.0	12.6
Basin-wide Total	43.5	46.4	40.3	59.2
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
CLARK FORK ab FLINT CREEK	9	109	120
FLINT CREEK	5	110	132
ROCK CREEK	3	103	119
CLARK FORK ab BLACKFOOT	15	106	121
BLACKFOOT	12	89	118
UPPER CLARK FORK RIVER BASIN	25	98	120

Bitterroot River Basin



The first three weeks of December in the Bitterroot basin brought well above normal monthly snow accumulation. Entering 2016 with a near normal snowpack, moisture didn't arrive again until around January 12th, in which it continued to trickle in for the remainder of the month. The two largest producing storms in January in the Bitterroot River basin occurred during the third week and last 4 days of the month in which each storm delivered 12+ inches of snow. If it wasn't for the relatively dry period before January 12th the basin would mostly likely have well above normal snowpack conditions. Currently as of February 1st the Bitterroot River basin snowpack is at 92% of normal, which is 13% lower than last month and 15% lower than last year at this time.

The Bitterroot River basin ended Water Year 2015 with one of the highest precipitation averages in the state. Entering January 2016 with slightly above average water year to date conditions, mountain precipitation since then hasn't been so average. Mountain SNOTEL sites received 66% of average precipitation for the month of January, while valley weather stations received 94% of average precipitation in the Bitterroot River basin.

Reservoir storage is currently above average in Painted Rocks Lake at 116% and below average in Lake Como at 78%.

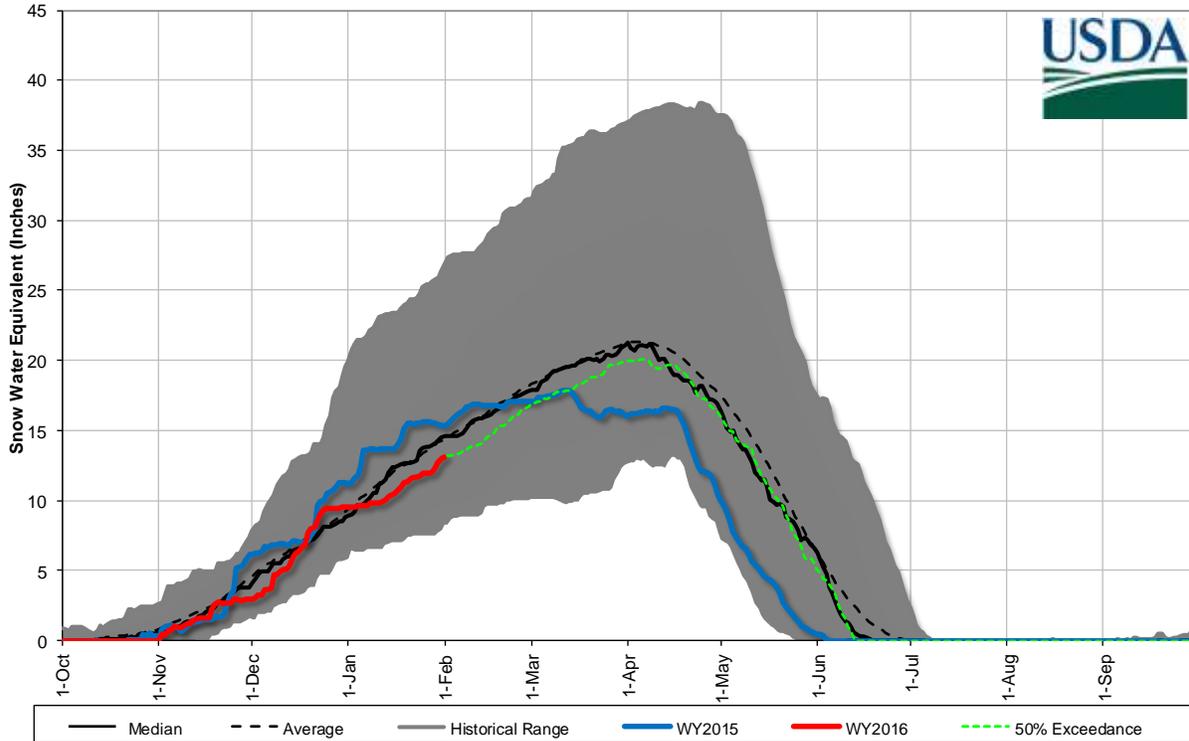
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 97% of average for the April-July time period.

Bitterroot River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	92%	107%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	66%	96%	118%
Valley Precipitation	94%	134%	160%
Basin Precipitation	67%	98%	120%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	91%	23%	171%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	97%	114%	79%

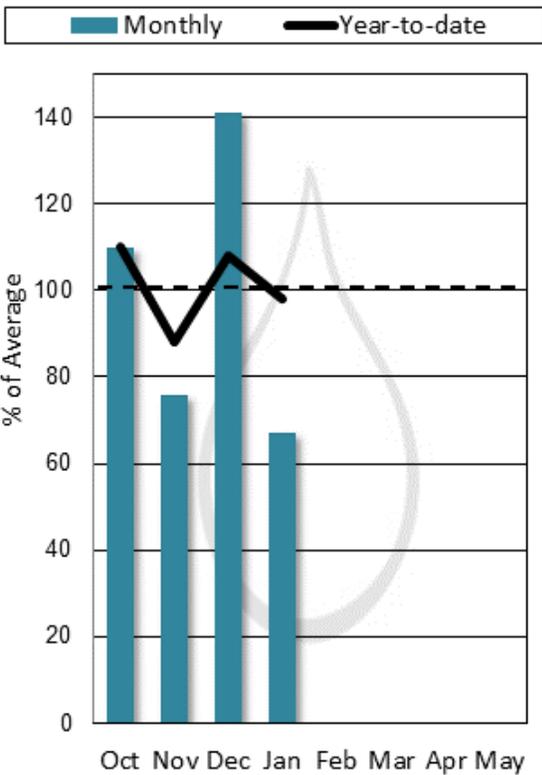
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

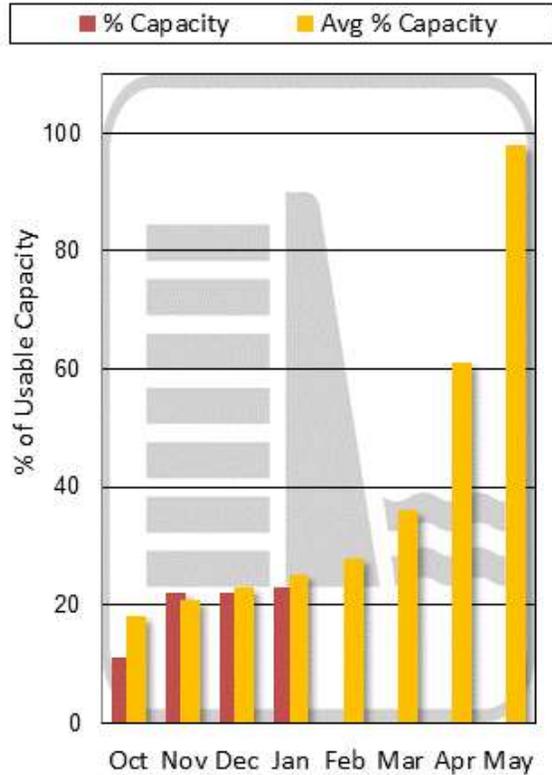
Bitterroot River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016



Mountain and Valley Precipitation

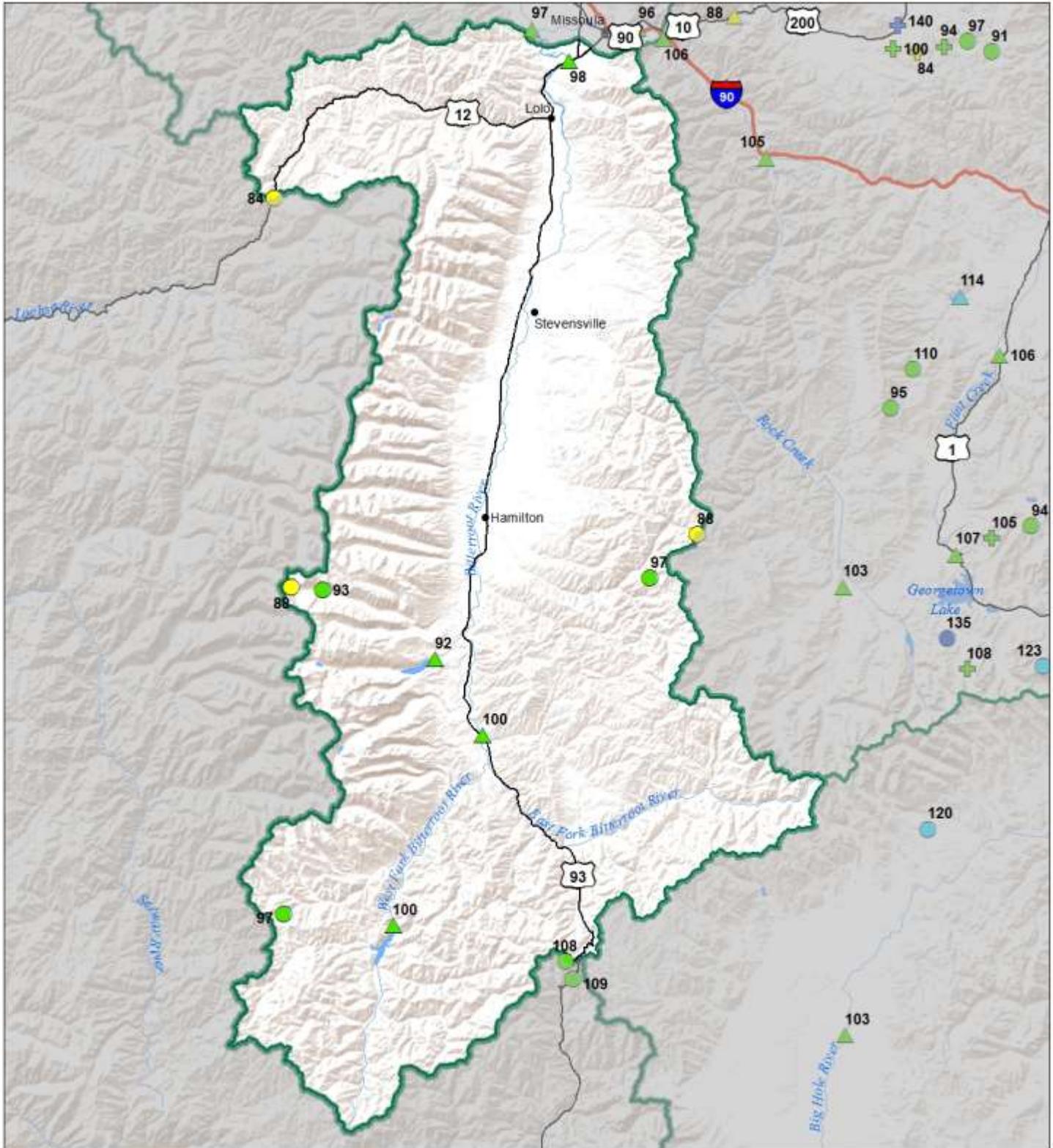


End of Month Reservoir Storage



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

Bitterroot River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%
- *

Snowcourse

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

Streamflow Forecast Percent of Average Flows

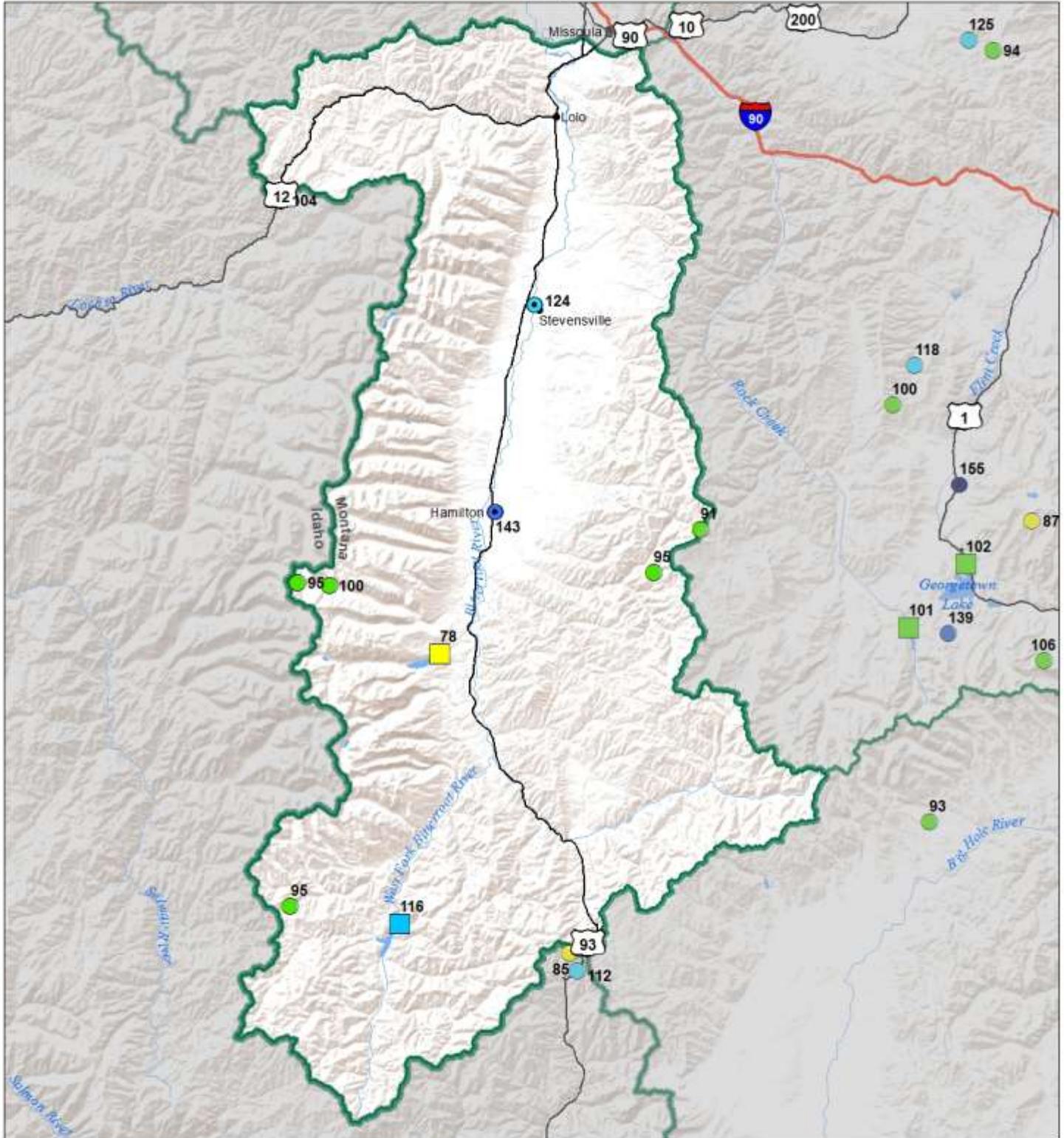
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Bitterroot River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

February 1, 2016

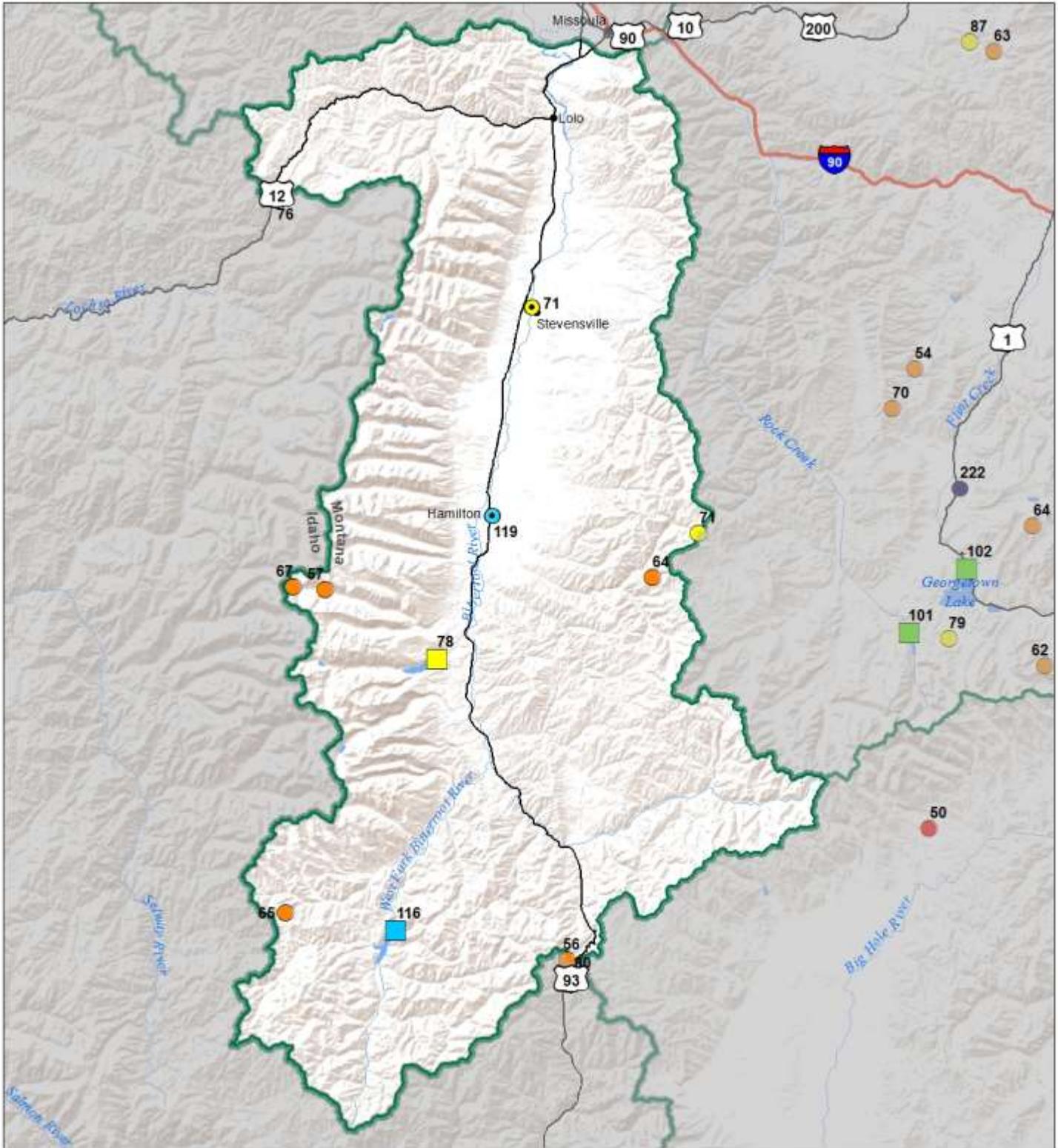


Precipitation Percent of Normal	
SNOTEL	COOP/ACIS
● > 150%	● > 150%
● 131 - 150%	● 131 - 150%
● 111 - 130%	● 111 - 130%
● 91 - 110%	● 91 - 110%
● 71 - 90%	● 71 - 90%
● 51 - 70%	● 51 - 70%
● 1 - 50%	● 1 - 50%

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
 February 1, 2016 (January 1, 2016 - February 1, 2016)**



**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
Streamflow Forecasts - February 1, 2016**

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

BITTERROOT RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
WF Bitterroot R Nr Conner ²	APR-JUL	79	108	127	99%	147	175	128
	APR-SEP	85	117	139	100%	161	194	139
Bitterroot R Nr Darby	APR-JUL	265	350	405	99%	465	550	410
	APR-SEP	325	410	470	100%	525	615	470
Como Reservoir Inflow ²	APR-JUL	58	65	70	92%	75	82	76
	APR-SEP	61	68	73	92%	78	85	79
Bitterroot R nr Missoula	APR-JUL	810	990	1110	97%	1240	1420	1150
	APR-SEP	900	1090	1220	98%	1350	1550	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

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Painted Rocks Lake	6.8	8.3	5.9	31.7
Lake Como	8.6	20.5	11.0	34.9
Basin-wide Total	15.4	28.9	16.9	66.6
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
WEST FORK BITTERROOT	2	104	119
EAST SIDE BITTERROOT	3	98	115
WEST SIDE BITTERROOT	3	88	101
BITTERROOT RIVER BASIN	7	92	107

Lower Clark Fork River Basin



Snowpack percentages quickly dwindled from 88% of normal on January 1st while not receiving much more than a trace of snow during the first part of January in the Upper Clark Fork River basin. On January 12th Sleeping Woman SNOTEL reached its second lowest snowpack on record. Fortunately a day later it snowed 6 inches (0.6 inches SWE) at Sleeping Woman during a storm that graced the entire region. From January 13th to February 1st Hoodoo Basin SNOTEL received over 2 feet of snow and 6.6 inches of snow water content. Currently the snowpack is at 83 percent of normal in the Lower Clark Fork River basin.

Precipitation in the Lower Clark Fork River basin came as mixed rain and snow. During the last week of the month daily low temperatures at Hoodoo basin SNOTEL were at or near 32 degrees F. During that time precipitation was arriving from the southwest. Fortunately most of the snowpack was deep enough to absorb any rain and no high elevation snowmelt was measured at this time. Mountain SNOTEL sites received 76% of average precipitation for the month of January, while valley weather stations received 73% of average precipitation in the Bitterroot River basin.

Reservoir storage in Noxon Rapids Reservoir is currently above average at 131%.

Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 94% of average for the April-July time period.

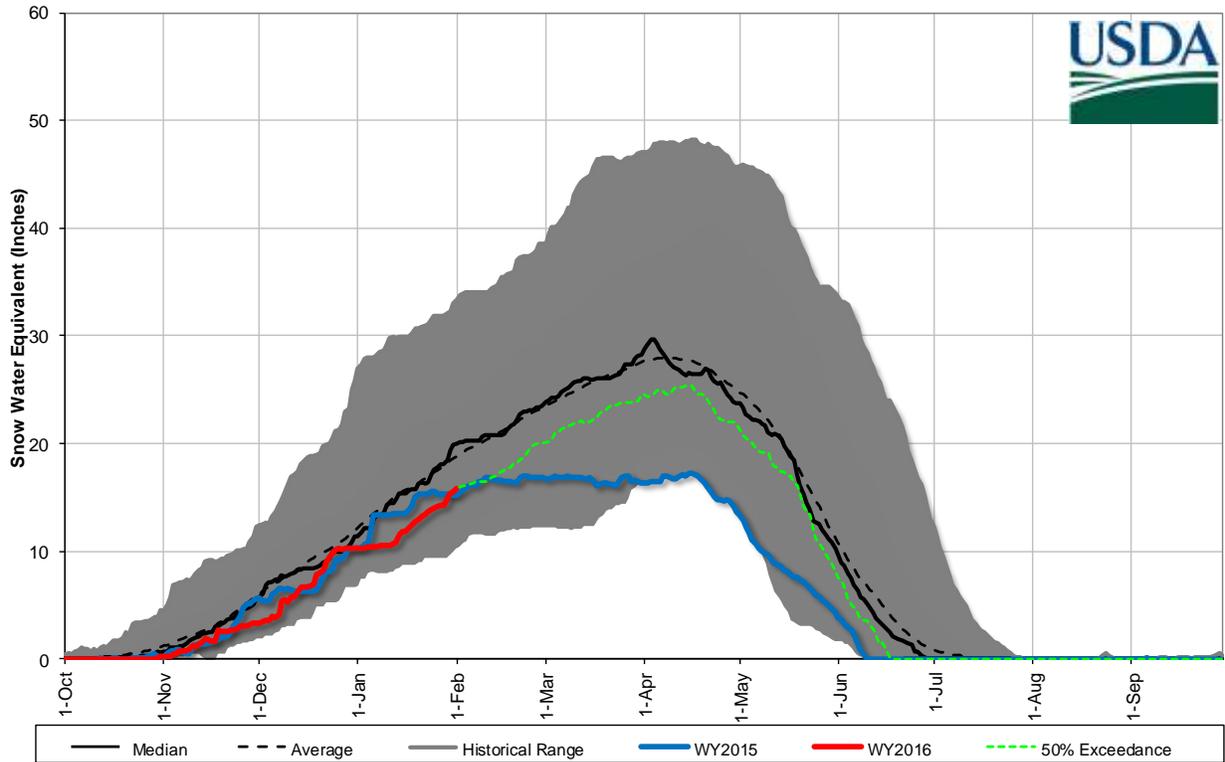
Lower Clark Fork River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	83%	81%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	76%	98%	104%
Valley Precipitation	73%	96%	115%
Basin Precipitation	76%	98%	105%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	103%	97%	102%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	94%	142%	39%

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

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

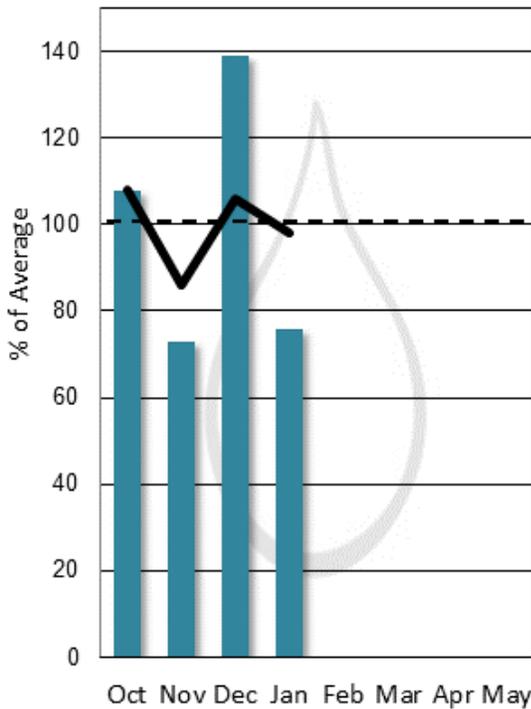
Lower Clark Fork River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 2/1/2016



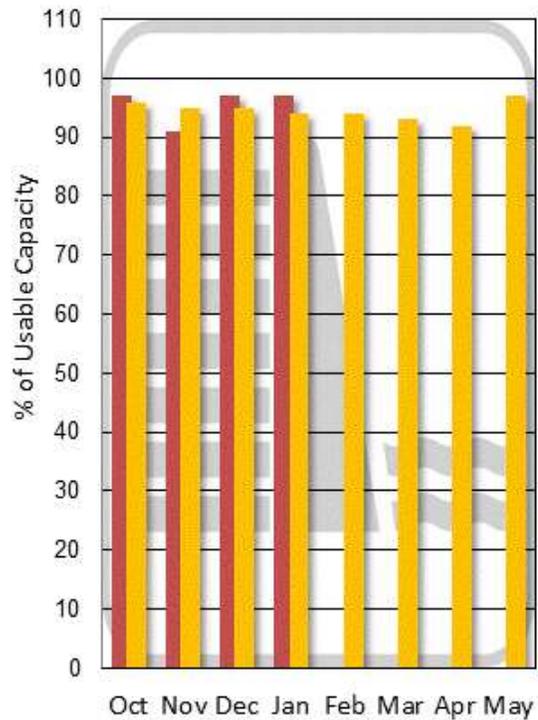
Mountain and Valley Precipitation

Monthly Year-to-date



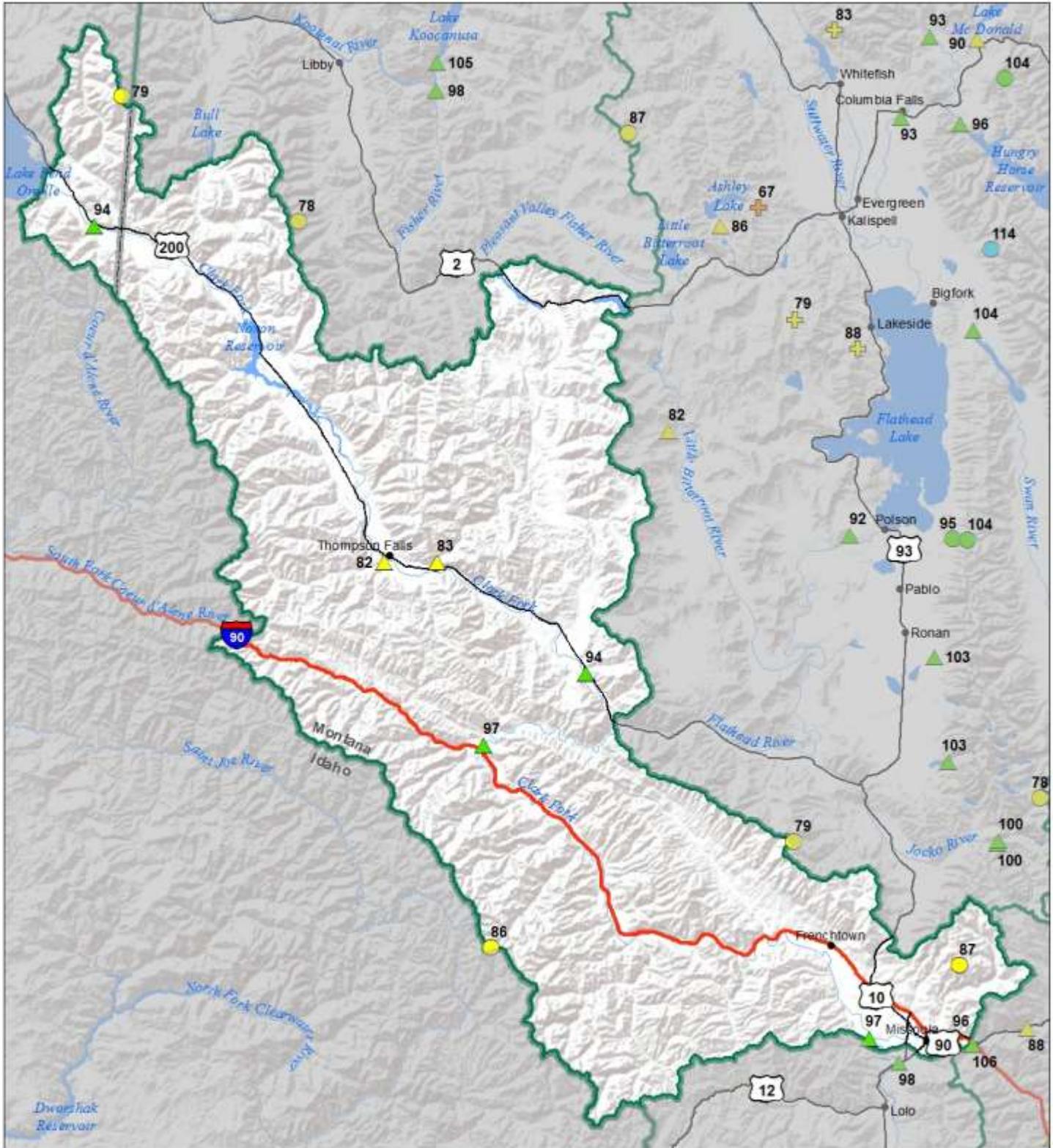
End of Month Reservoir Storage

% Capacity Avg % Capacity



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

Lower Clark Fork River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%
- *

Snowcourse

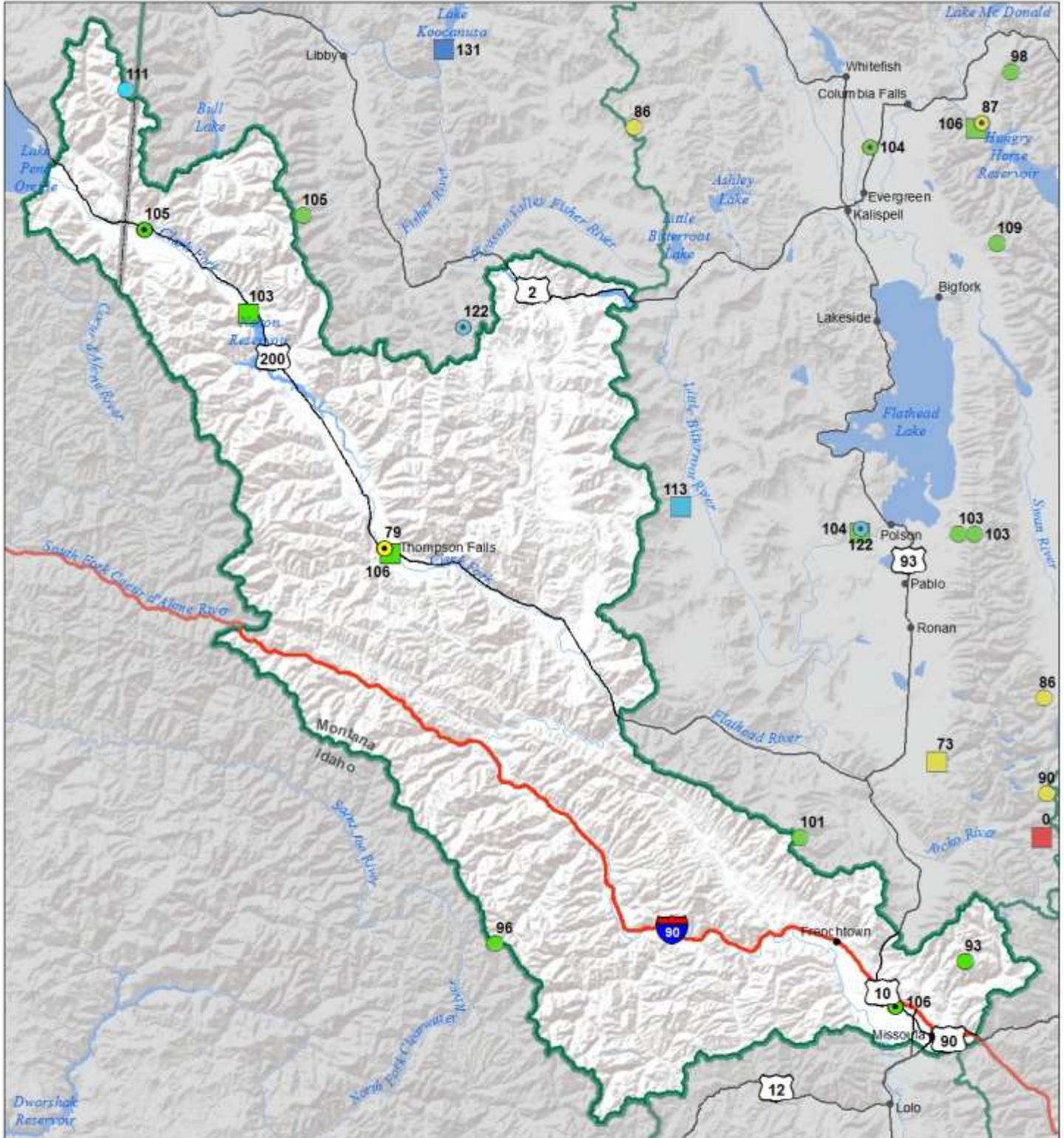
- ⊕ > 150%
- ⊕ 131 - 150%
- ⊕ 111 - 130%
- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

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 February 1, 2016



Precipitation Percent of Normal

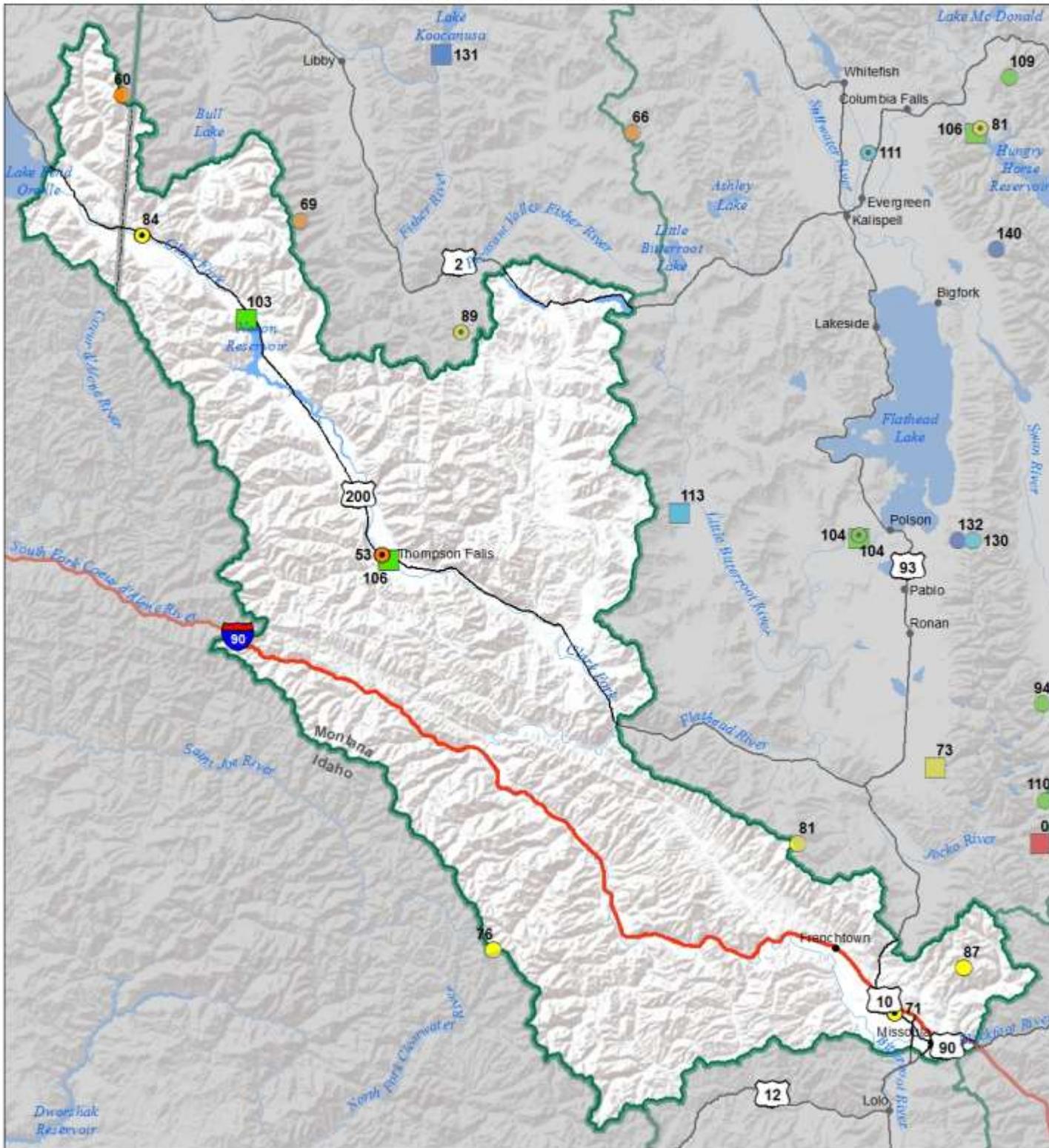
SNOTEL		COOP/ACIS	
Dark Blue	> 150%	Dark Blue	> 150%
Blue	131 - 150%	Blue	131 - 150%
Cyan	111 - 130%	Cyan	111 - 130%
Light Green	91 - 110%	Light Green	91 - 110%
Yellow	71 - 90%	Yellow	71 - 90%
Orange	51 - 70%	Orange	51 - 70%
Red	1 - 50%	Red	1 - 50%

Reservoirs Percent of Normal

Dark Blue	> 150%
Blue	131 - 150%
Cyan	111 - 130%
Light Green	91 - 110%
Yellow	71 - 90%
Orange	51 - 70%
Red	1 - 50%



**Lower Clark Fork River Basin
 Monthly Precipitation and Reservoir Levels
 Percentage of Normal
 February 1, 2016 (January 1, 2016 - February 1, 2016)**



**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 Clark Fork River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

LOWER CLARK FORK RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Clark Fork R bl Missoula	APR-JUL	1610	2030	2310	96%	2590	3000	2400
	APR-SEP	1840	2280	2580	97%	2880	3310	2670
Clark Fork R at St. Regis ¹	APR-JUL	1990	2720	3060	97%	3390	4120	3160
	APR-SEP	2290	3060	3410	97%	3760	4540	3510
Clark Fork R nr Plains ^{1,2}	APR-JUL	6380	7950	8670	94%	9380	11000	9200
	APR-SEP	7060	8740	9500	94%	10300	11900	10100
Thompson nr Tompson Falls	APR-JUL	87	124	149	82%	174	210	181
	APR-SEP	103	143	170	83%	197	235	205
Prospect Ck at Thompson Falls	APR-JUL	57	73	84	82%	95	112	102
	APR-SEP	62	79	90	82%	102	119	110
Clark Fork R at Whitehorse Rapids ^{1,2}	APR-JUL	7300	9020	9800	93%	10600	12300	10500
	APR-SEP	8110	9930	10800	94%	11600	13400	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

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Noxon Rapids Reservoir	324.5	321.9	315.0	335.0
Basin-wide Total	324.5	321.9	315.0	335.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
LOWER CLARK FORK RIVER BASIN	7	83	81

Jefferson River Basin



After starting the new year well above normal on Jan 1st the Jefferson River basin as a whole received enough snowfall during the month to remain above normal on Feb 1st. Snowfall was slightly below normal at SNOTEL sites for the month overall. Like the rest of the state, the region was plagued by mostly dry conditions during the first two weeks but western flow mid-month and southwest flow during the third week helped to stop the decline in basin snowpack percentages. Currently all of the sub-basins in the Jefferson are near to above average for February 1st; Beaverhead – 112%, Ruby – 99%, Bighole – 115%, Boulder – 132%. Currently, the basin overall is 110% of normal for Feb 1, down 8% from last month. There is more snow water in the basin than last year at this time which is excellent news for water users in the basin. This year southwest flow has been the predominant storm patten for many of the southern basins and the Jefferson River basin does well when storms approach from that direction. Late winter and spring precipitation is important in the southern basins and accounts for a substantial amount of water available for runoff during the spring and summer. Let’s hope this pattern keeps up in southwest Montana.

Precipitation this month was below average in both valley locations (66%) and at mountain SNOTEL sites (75%). Despite the below average month both valley precipitation (164%) and mountain precipitation (103%) remain above average for the water year beginning October 1st. Again, continued precipitation this spring will play a large role in runoff.

Reservoir storage in the basin is below average for this date at both Clark Canyon (77%) and Lima Reservoirs (71%). Ruby reservoir (110%) is currently above average for Feb 1st. Continued snowfall, spring precipitation and wise water management will be needed to reach normal levels for summer use.

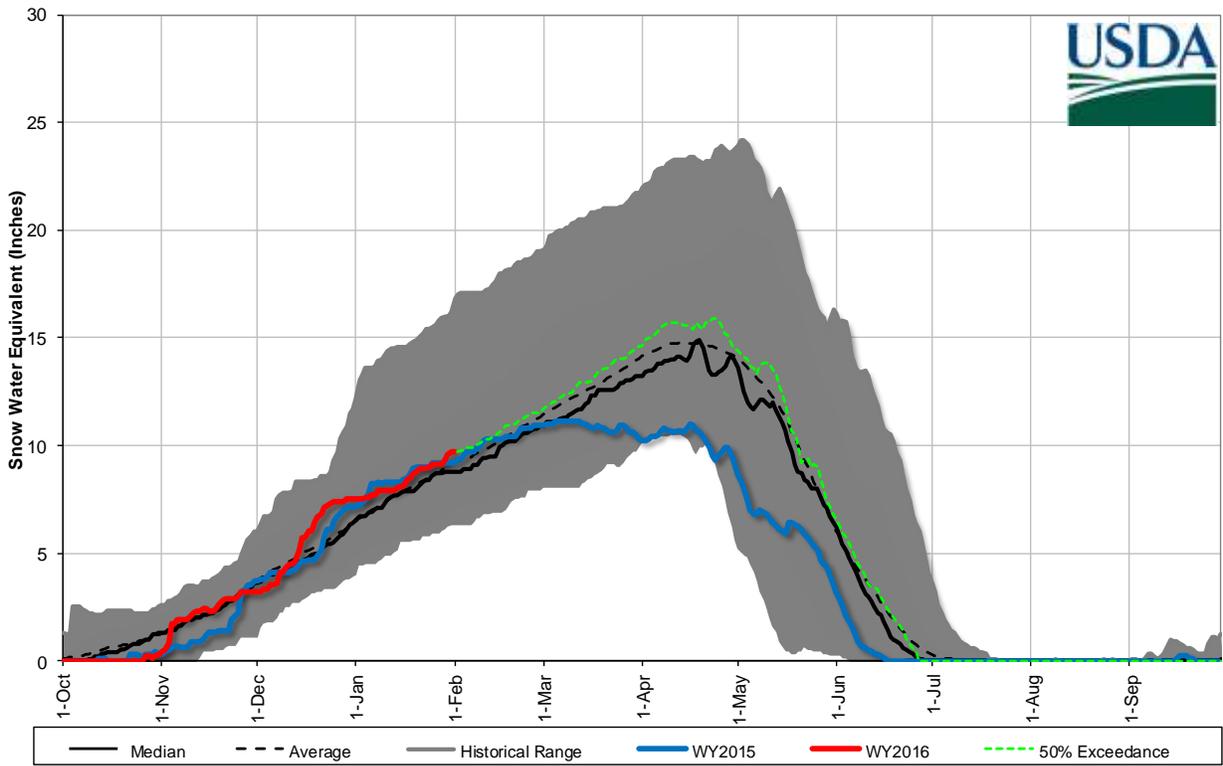
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 105% of average for the April-July time period.

Jefferson River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	112%	107%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	75%	103%	98%
Valley Precipitation	66%	164%	94%
Basin Precipitation	75%	104%	98%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	81%	37%	96%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	105%	198%	53%

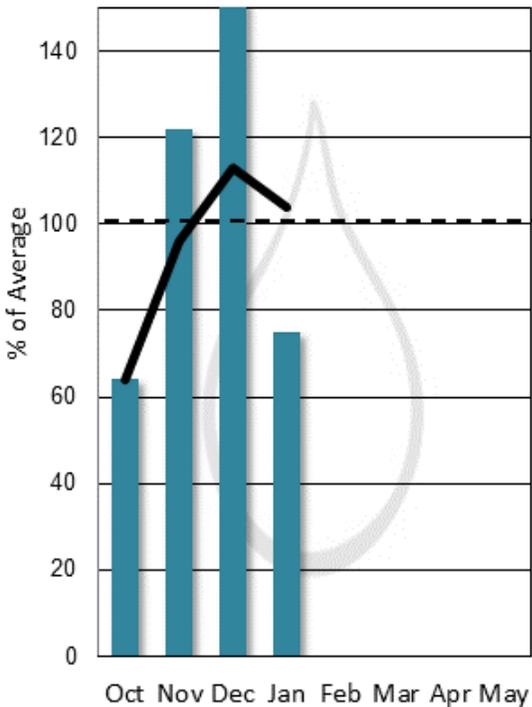
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

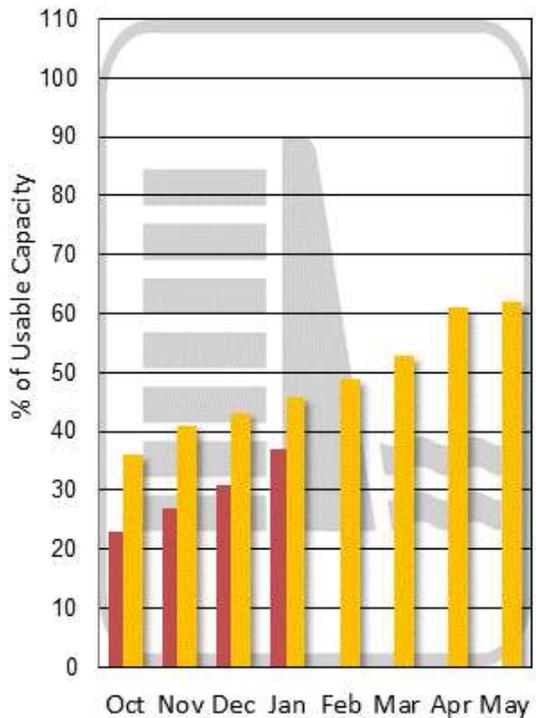
Jefferson River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016



Mountain and Valley Precipitation

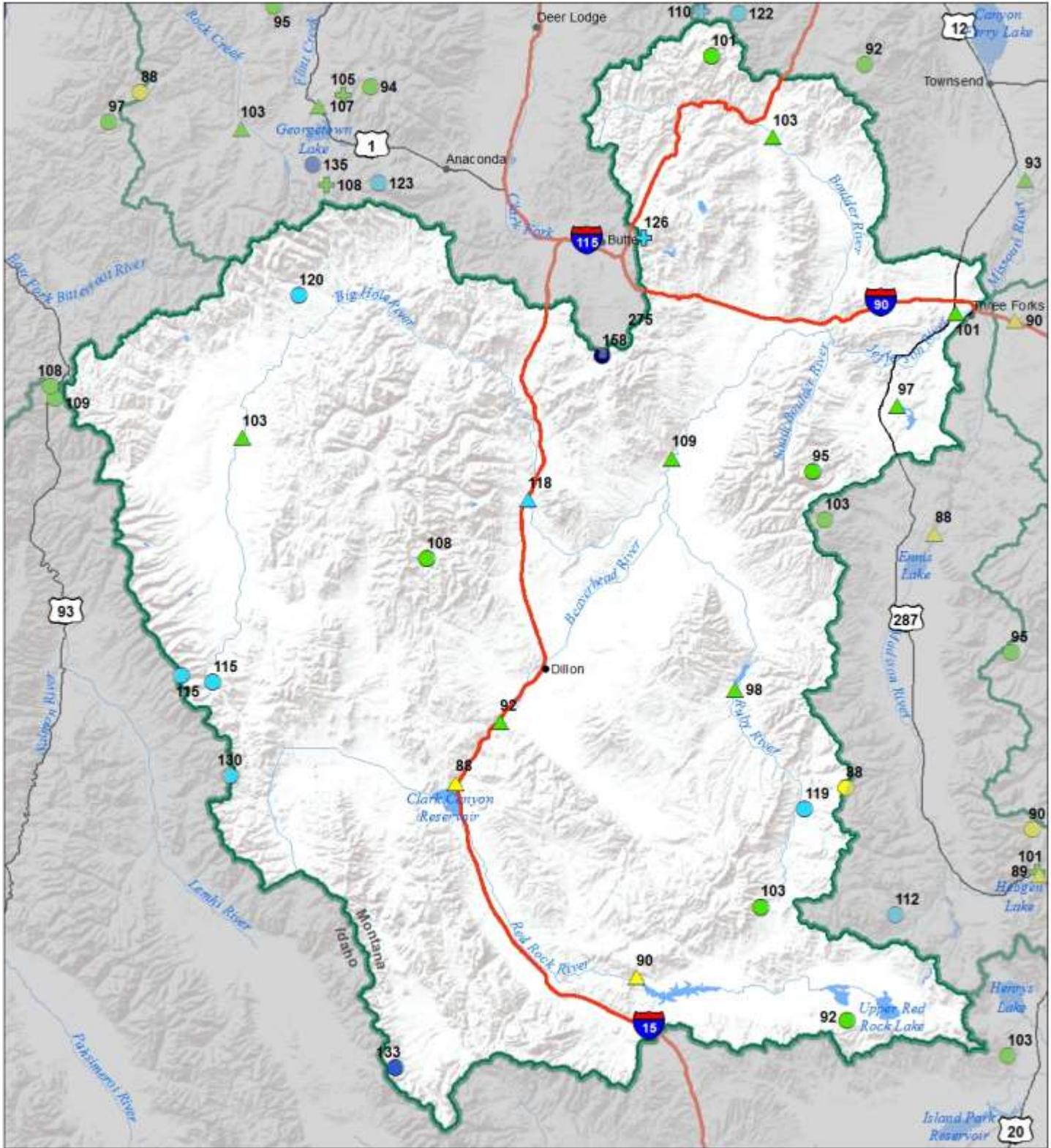


End of Month Reservoir Storage



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

Jefferson River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



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%	⊕ *

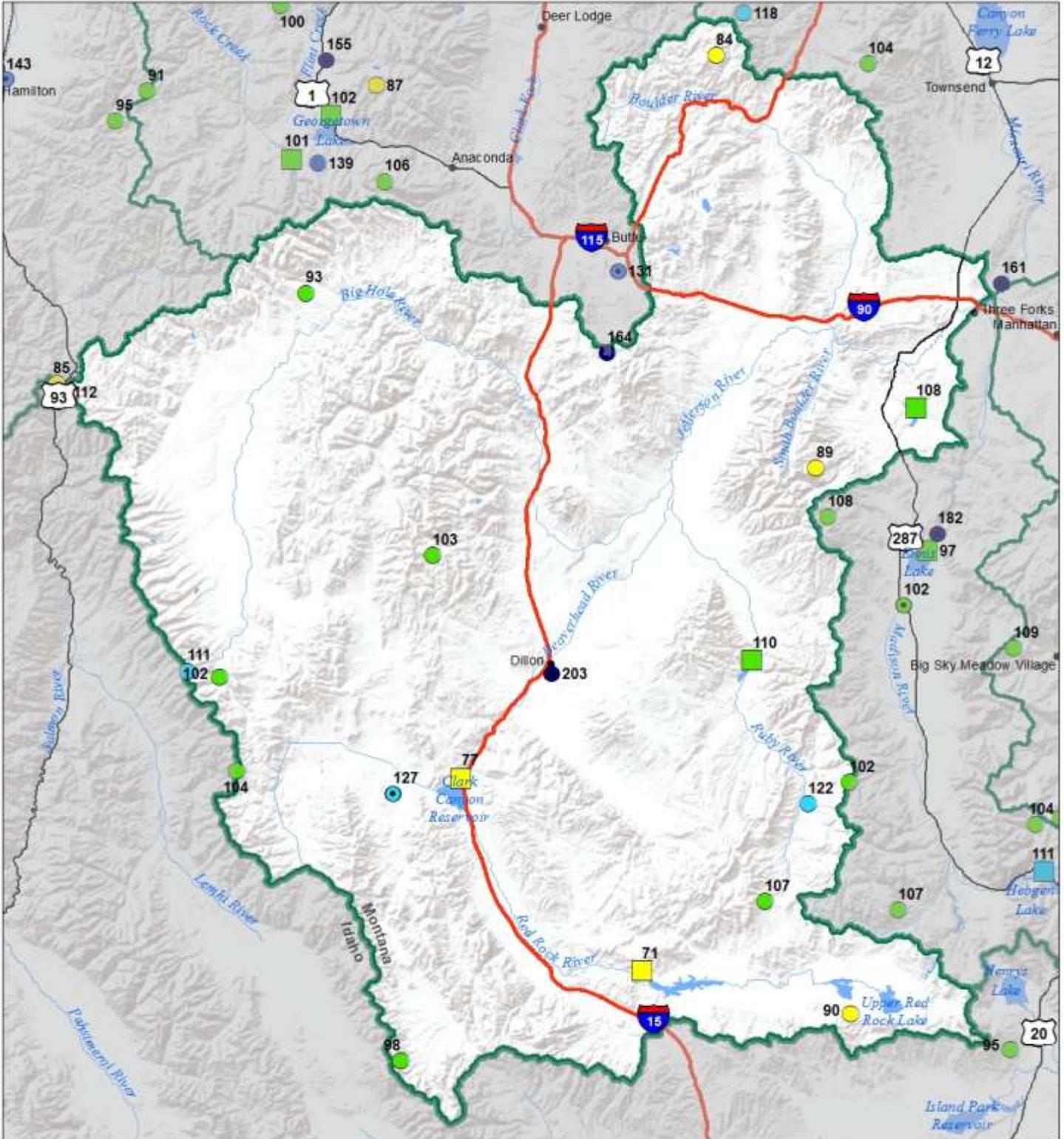
Streamflow Forecast Percent of Average Flows	
▲ > 150%	▲ 131 - 150%
▲ 111 - 130%	▲ 91 - 110%
▲ 71 - 90%	▲ 51 - 70%
▲ 1 - 50%	



Jefferson River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

February 1, 2016

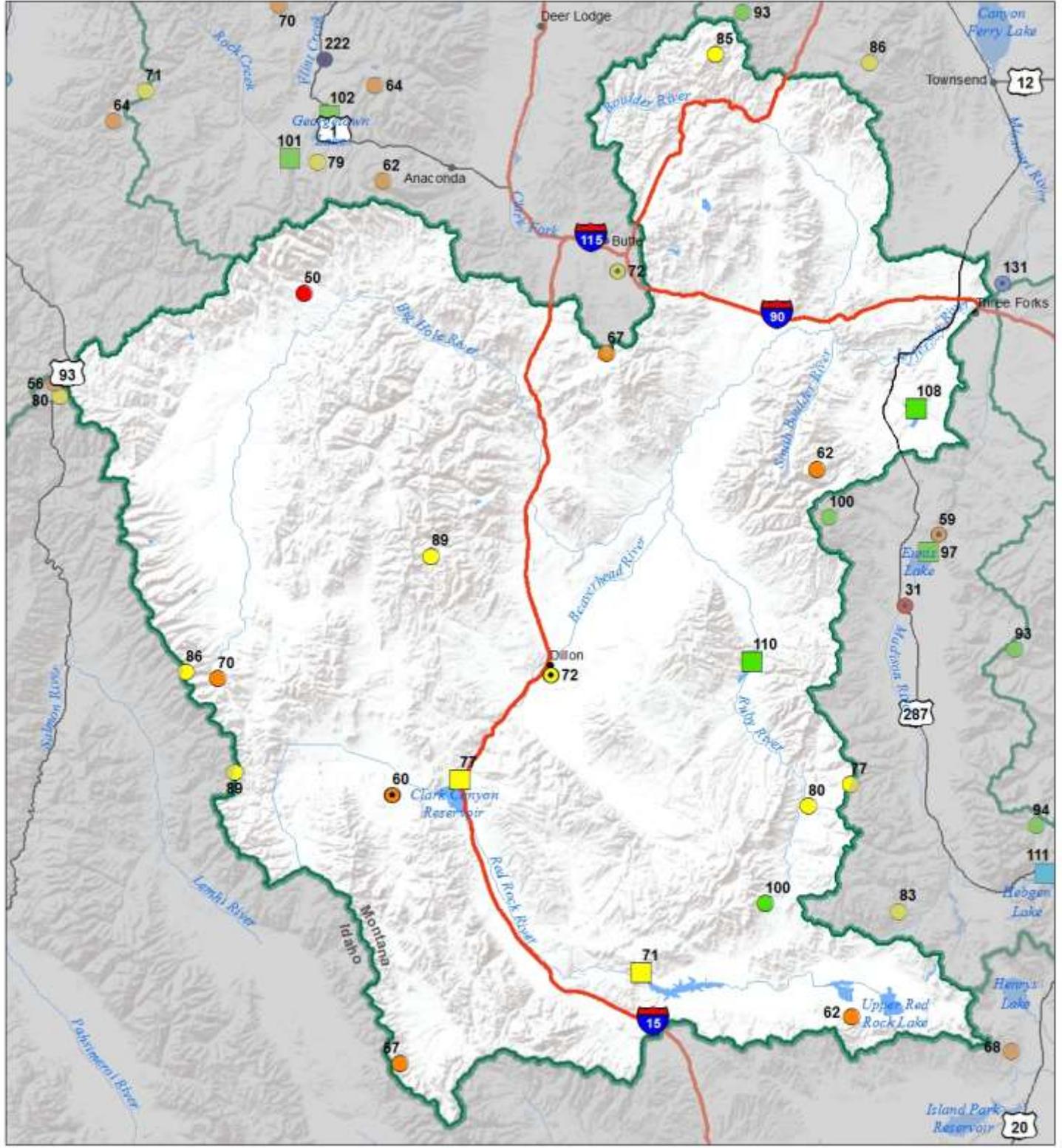


Precipitation Percent of Normal	
SNOTEL	COOP/ACIS
● > 150%	● > 150%
● 131 - 150%	● 131 - 150%
● 111 - 130%	● 111 - 130%
● 91 - 110%	● 91 - 110%
● 71 - 90%	● 71 - 90%
● 51 - 70%	● 51 - 70%
● 1 - 50%	● 1 - 50%

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



Jefferson River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal February 1, 2016 (January 1, 2016 - February 1, 2016)



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 Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

JEFFERSON RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Lima Reservoir Inflow ²	APR-JUL	38	59	74	90%	88	109	82
	APR-SEP	41	64	80	90%	96	119	89
Clark Canyon Inflow ²	APR-JUL	25	61	85	84%	110	146	101
	APR-SEP	36	77	105	88%	133	175	120
Beaverhead R at Barretts ²	APR-JUL	25	67	117	91%	167	240	129
	APR-SEP	36	86	144	92%	200	290	156
Ruby R Reservoir Inflow ²	APR-JUL	50	65	75	97%	87	102	77
	APR-SEP	59	77	89	98%	101	119	91
Big Hole R at Wisdom	APR-JUL	31	74	104	102%	134	178	102
	APR-SEP	32	29	111	103%	142	189	108
Big Hole R nr Melrose	APR-JUL	395	525	615	119%	700	830	515
	APR-SEP	430	565	660	118%	755	895	560
Jefferson R nr Twin Bridges ²	APR-JUL	385	600	745	108%	890	1110	690
	APR-SEP	415	640	795	109%	950	1180	730
Boulder R nr Boulder	APR-JUL	44	60	71	103%	82	98	69
	APR-SEP	47	64	76	103%	88	105	74
Willow Ck Reservoir Inflow ²	APR-JUL	5.4	11.8	16.2	96%	21	27	16.8
	APR-SEP	7	13.9	18.7	97%	23	30	19.3
Jefferson R nr Three Forks ²	APR-JUL	365	590	740	100%	895	1120	740
	APR-SEP	385	635	805	101%	975	1230	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

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lima Reservoir	20.7	33.4	29.3	84.0
Clark Canyon Res	94.2	99.4	121.7	255.6
Ruby River Reservoir	25.6	34.6	23.2	38.8
Basin-wide Total	140.5	167.3	174.2	378.4
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
BEAVERHEAD	8	112	102
RUBY	5	99	80
BIGHOLE	9	115	122
BOULDER	6	132	128
JEFFERSON RIVER BASIN	23	112	107

Madison River Basin



Like the other southwest Montana basins the Madison River basin benefitted from the early season snowpack that fell during November and December and remains near normal for February 1st. Shortly before the new calendar year began high pressure set into the state which resulted in mostly dry conditions during the first two weeks of the month. The major pattern shift mid-month marked a return to wetter conditions before a final storm at the end of the month dropped up snow in the basin. Overall, snowfall for the month of January was slightly below normal (88%) at mountain SNOTEL sites. SNOTEL and snowcourse measurements for Feb 1 indicate a range of 88 to 114% of normal snowpack for the date, with the basin overall at 95 % of normal. There was a marginal decline (-4%) through the month of January due to the lack of snowfall during the early part of the month, but luckily the snowfall that was received was sufficient to keep the basin snowpack near normal.

Mountain SNOTEL (80%) and valley precipitation (56%) were below average for the month and the combined monthly precipitation reported at 78% on February 1st. Due to the early season moisture Mountain SNOTEL water year-to-date precipitation remains near average at 97%, while valley locations remain above average at 110%. Spring precipitation in the form of snow and rain play an important role in the seasonal runoff in the basin, so hopefully the southwest flow continues through the spring.

Reservoir storage in the basin is near to above average for the date. On Feb 1 Hebgen Lake was reported at 111% of average and Ennis Lake reported 97% of average.

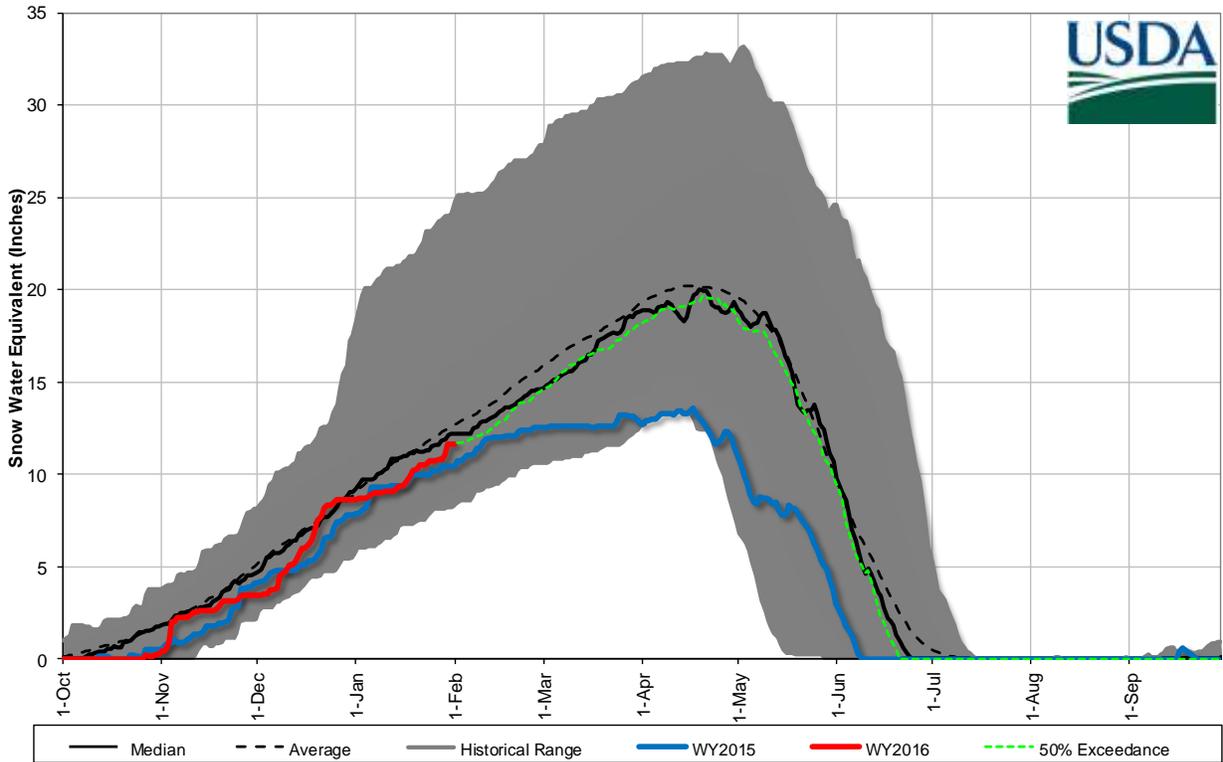
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 88% of average for the April-July time period.

Madison River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	95%	85%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	79%	97%	84%
Valley Precipitation	56%	110%	93%
Basin Precipitation	77%	98%	84%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	110%	81%	113%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	88%	128%	69%

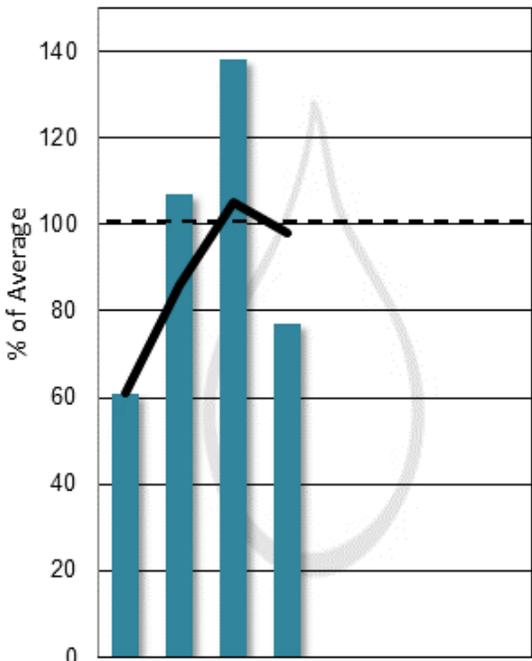
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

Madison River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016

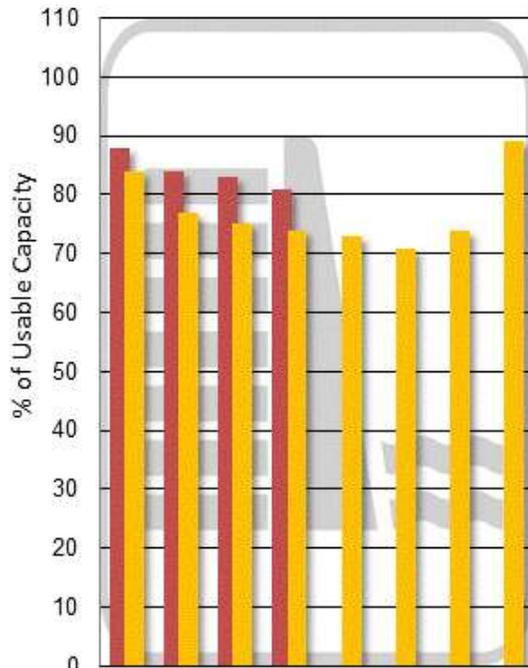


**Mountain and Valley
Precipitation**



Oct Nov Dec Jan Feb Mar Apr May

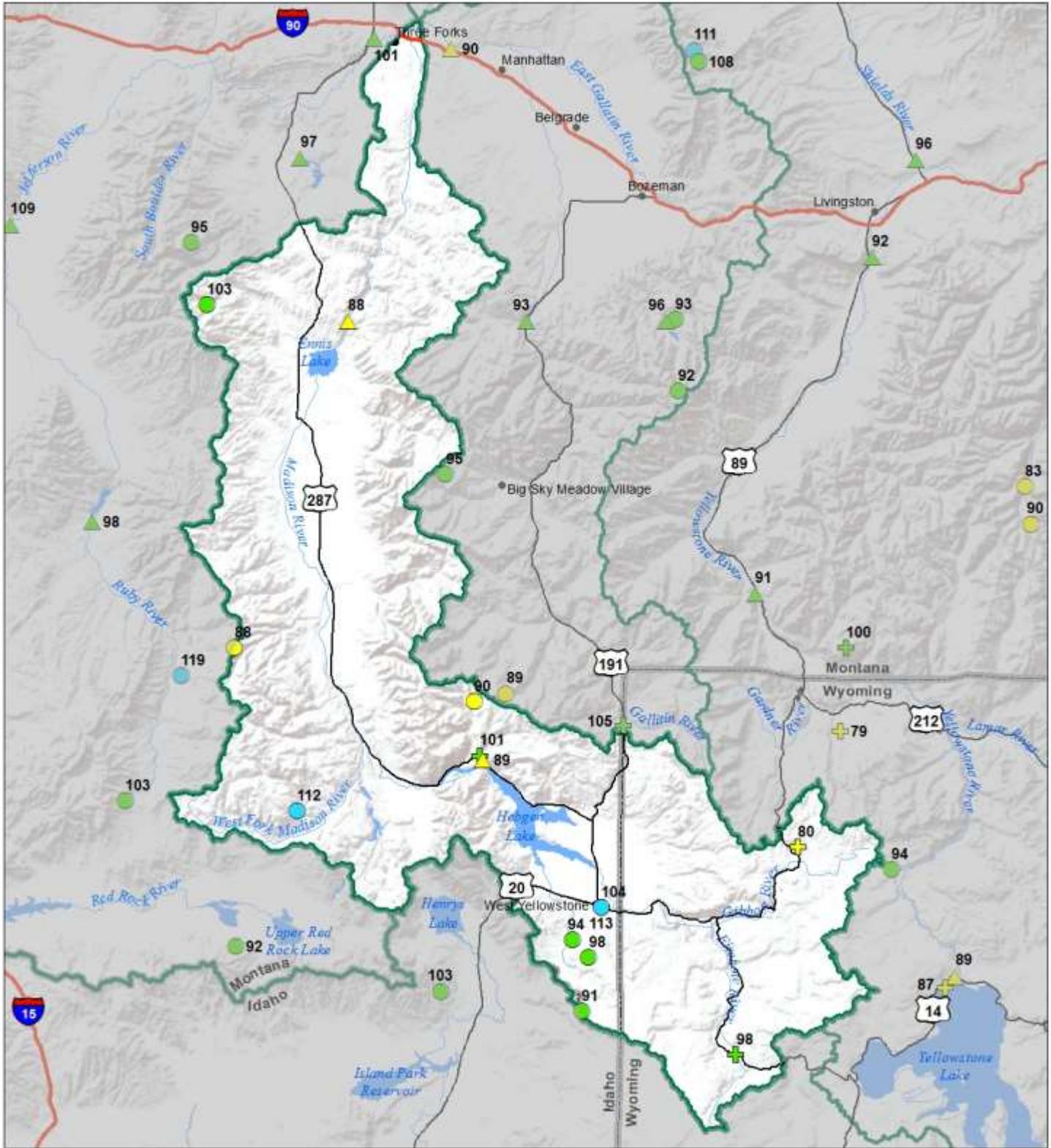
**End of Month Reservoir
Storage**



Oct Nov Dec Jan Feb Mar Apr May

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

Madison River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



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%	⊕ *

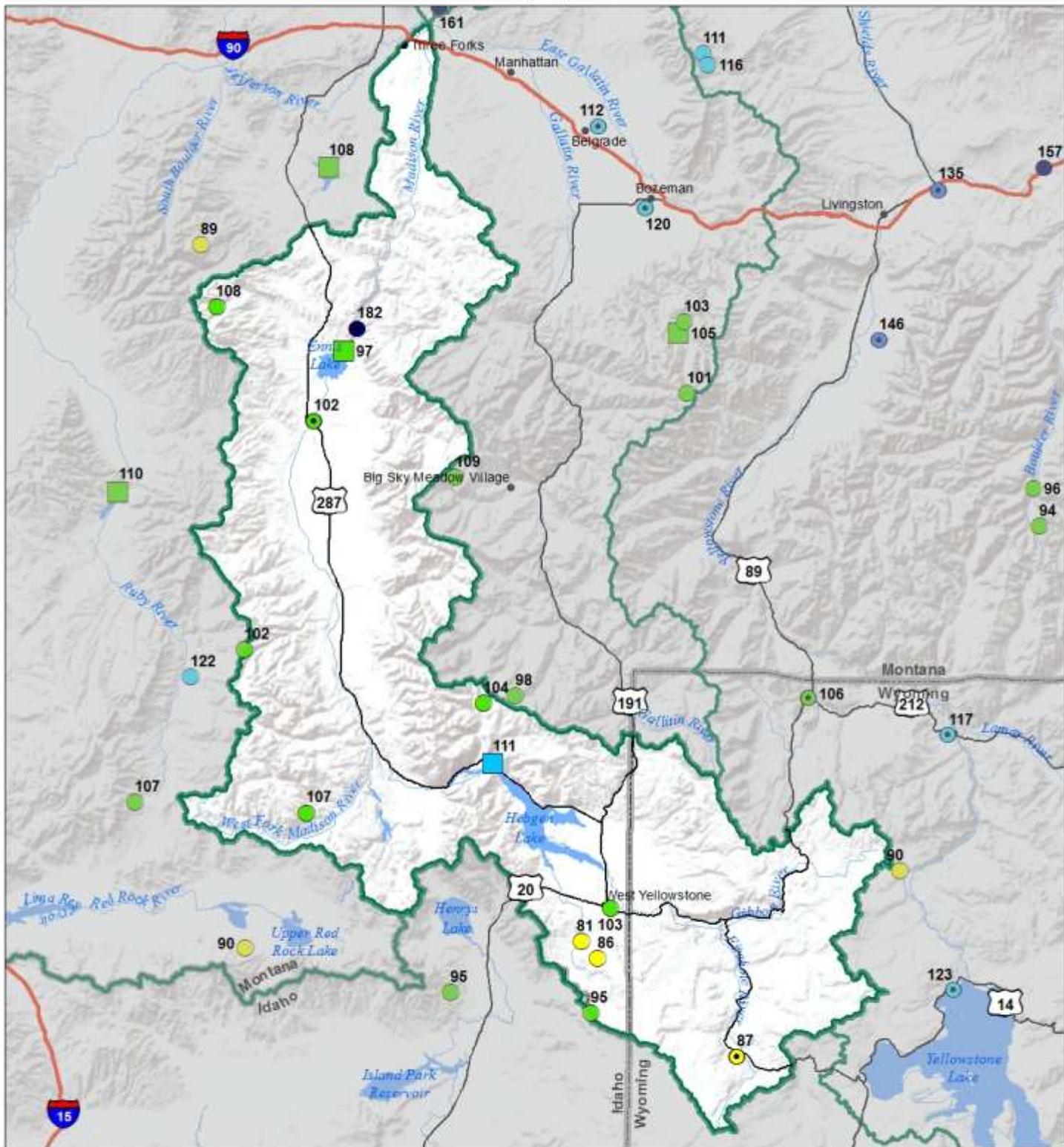
Streamflow Forecast Percent of Average Flows	
▲ > 150%	▲ 131 - 150%
▲ 111 - 130%	▲ 91 - 110%
▲ 71 - 90%	▲ 51 - 70%
▲ 1 - 50%	

USDA
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Madison River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

February 1, 2016



Precipitation Percent of Normal

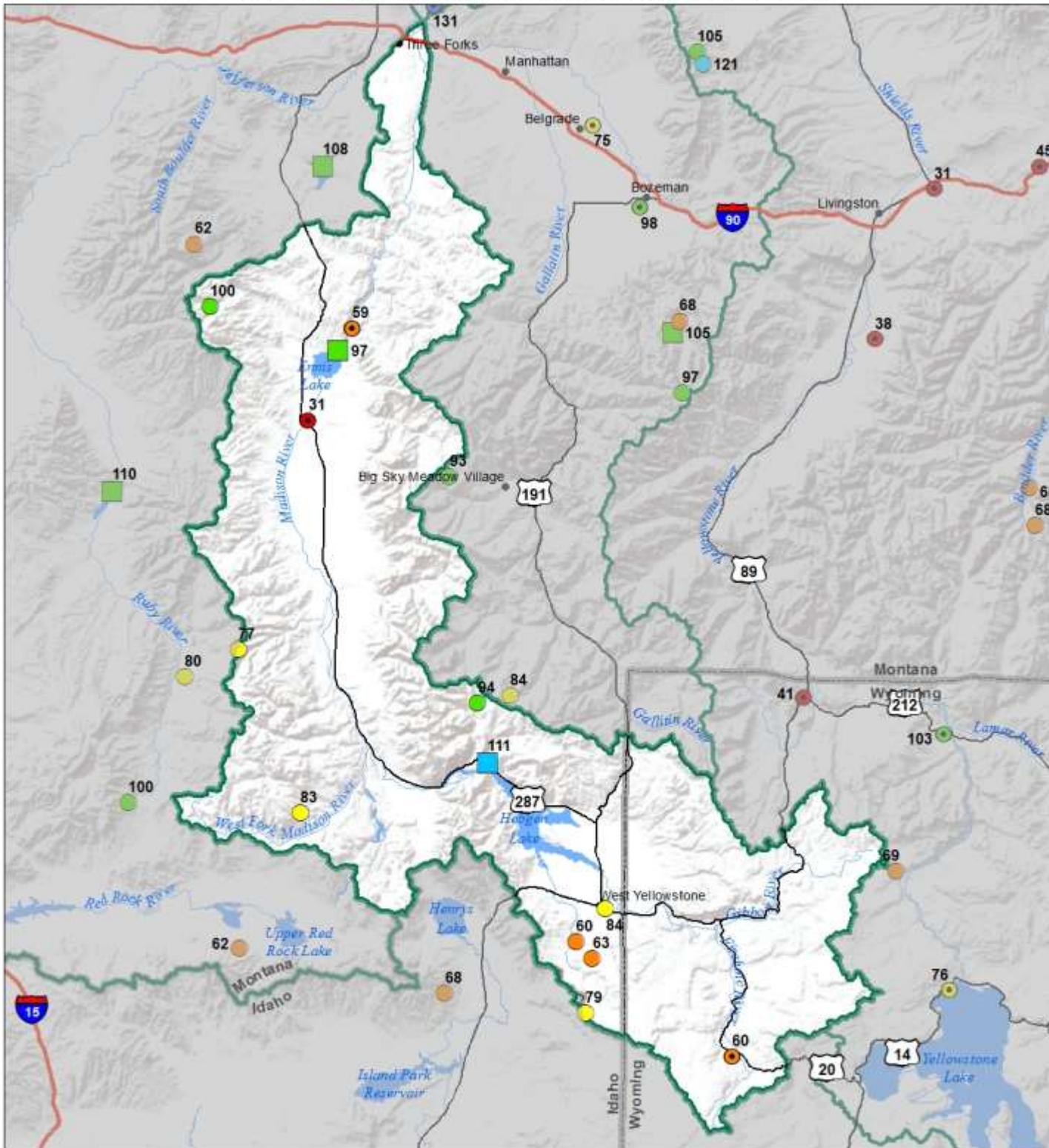
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



**Madison River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
February 1, 2016 (January 1, 2016 - February 1, 2016)**



**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 Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

MADISON RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Hebgen Reservoir Inflow ²	APR-JUL	260	300	330	89%	355	400	370
	APR-SEP	335	385	420	89%	450	500	470
Ennis Reservoir Inflow ²	APR-JUL	400	490	550	88%	610	700	625
	APR-SEP	505	610	680	88%	750	855	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
 3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ennis Lake	28.9	29.2	29.8	41.0
Hebgen Lake	310.9	318.8	279.0	378.8
Basin-wide Total	339.8	348.1	308.8	419.8
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
MADISON abv HEBGEN LAKE	6	95	86
MADISON blw HEBGEN LAKE	8	95	85
MADISON RIVER BASIN	14	95	85

Gallatin River Basin



Two plus weeks of high pressure can be a lot to swallow when you shucked out all that hard earned money for a Bridger Bowl or Big Sky season pass, and that’s exactly what happened during the first two weeks of January. High pressure dominated the weather patterns during the initial two weeks of the month basin causing basin percentages to drop from near normal on Jan 1st to 85% of normal on Jan 13th. A welcomed change occurred mid-month allowing moist air to stream in from the west and southwest, dropping snow in the mountains to the delight of skiers, snowmobilers, irrigators and water managers. The snowfall through the end of the month helped the basin to recover by Feb 1st where overall basin-wide snowpack is currently 97% of normal. Conditions vary across the basin snowpack wise. The Upper Gallatin (94%) and Hyalite (92%) are currently slightly below normal in terms of snowpack, while the Bridger Range SNOTEL sites indicate 110% of normal conditions for the date.

The Gallatin Valley and mountains surrounding it were some of the only areas in the state to see near normal precipitation during the month. Valley totals for Feb 1st were 89% of average for the month of January, leaving the water year total at 117%. Mountain locations experienced 96% of average precipitation for the month and are 106% of average for the water year. So far, weather patterns have been favorable for the region.

Reservoir storage is slightly above average in Middle Creek Reservoir (Hyalite) for this time of year and was reported at 105% on Feb 1st.

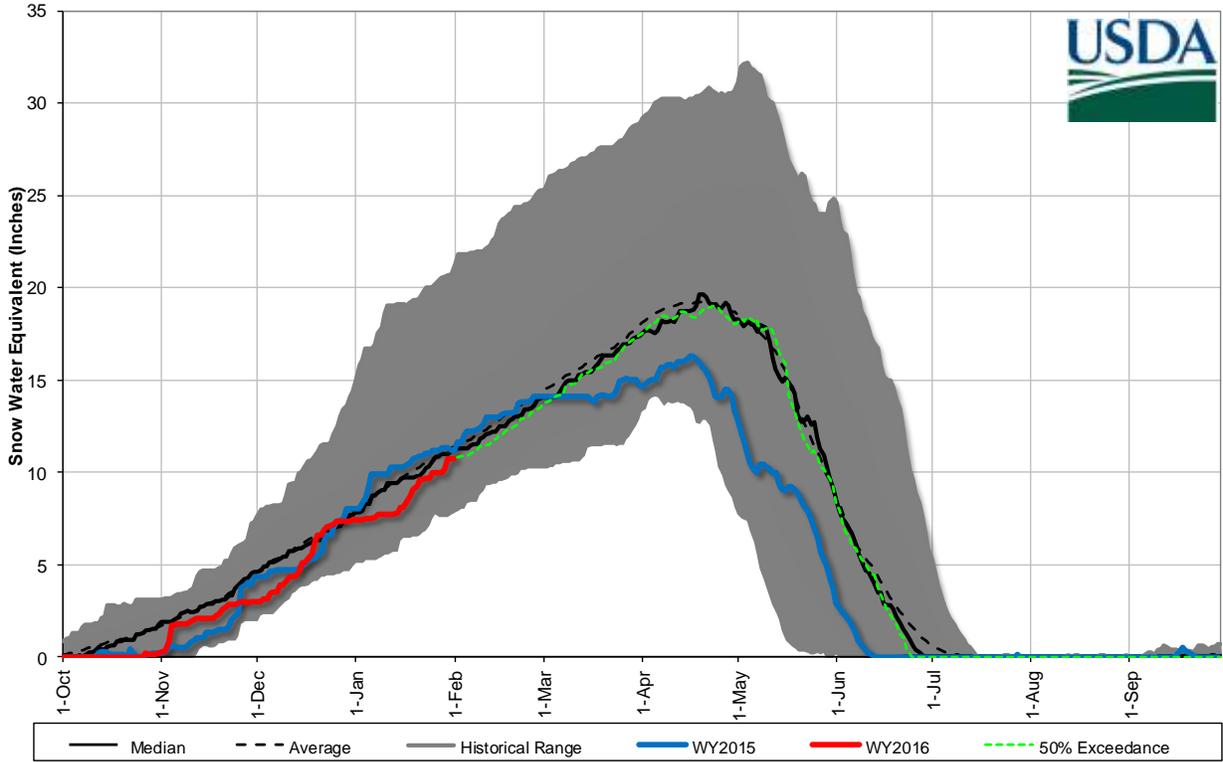
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 92% of average for the April-July time period.

Gallatin River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	97%	98%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	96%	106%	101%
Valley Precipitation	89%	117%	83%
Basin Precipitation	96%	107%	100%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	105%	54%	100%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	92%	128%	71%

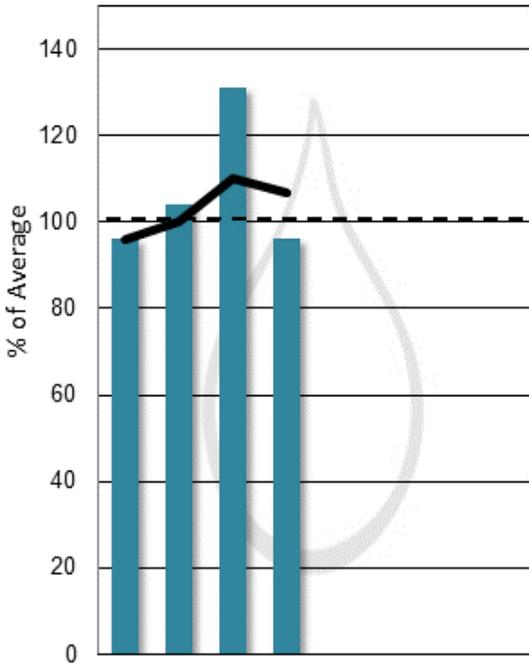
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

Gallatin River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016

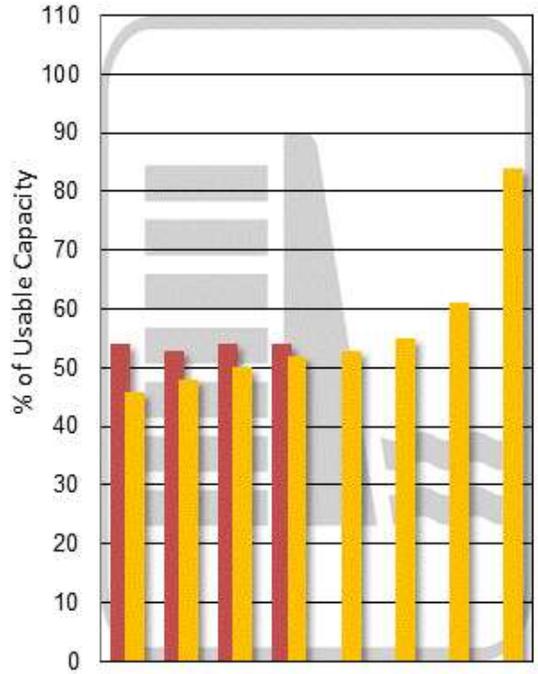
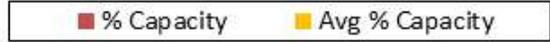


**Mountain and Valley
Precipitation**



Oct Nov Dec Jan Feb Mar Apr May

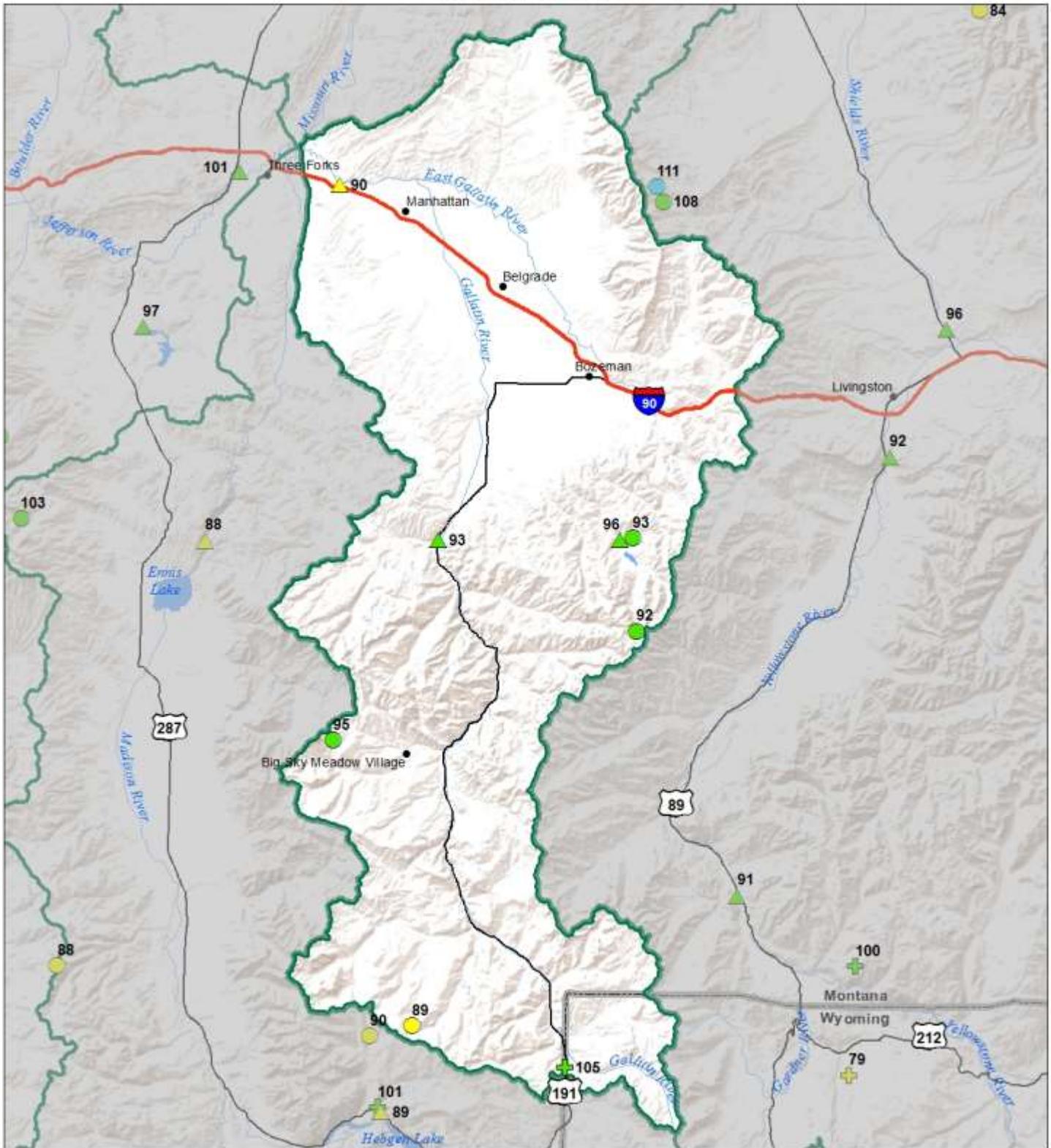
**End of Month Reservoir
Storage**



Oct Nov Dec Jan Feb Mar Apr May

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

Gallatin River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016

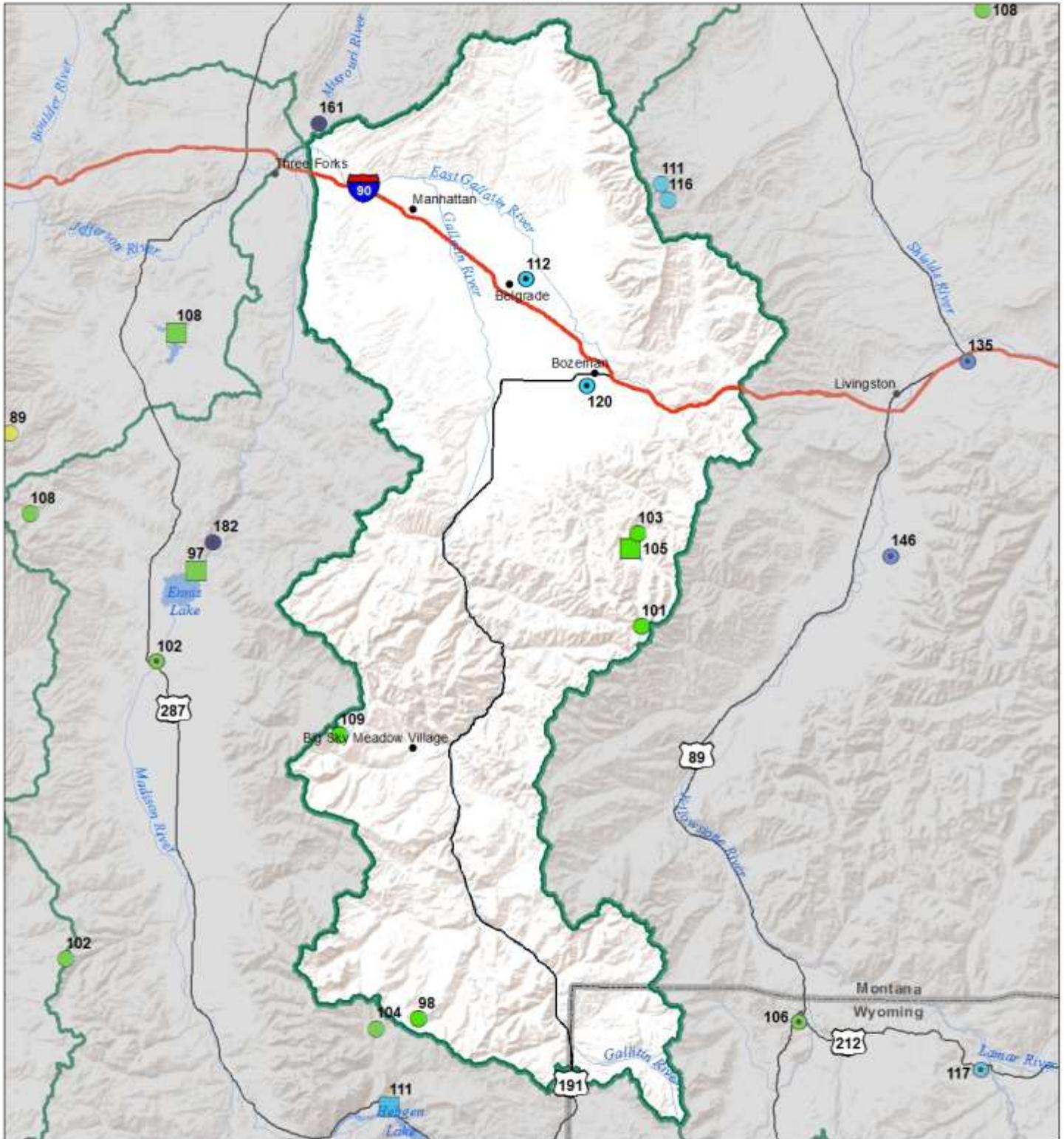


SNOTEL		Snowcourse	
● > 150%	● 71 - 90%	⊕ > 150%	⊕ 71 - 90%
● 131 - 150%	● 51 - 70%	⊕ 131 - 150%	⊕ 51 - 70%
● 111 - 130%	● 1 - 50%	⊕ 111 - 130%	⊕ 1 - 50%
● 91 - 110%	● *	⊕ 91 - 110%	⊕ *

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

USDA
Natural Resource Information System

Gallatin River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal February 1, 2016

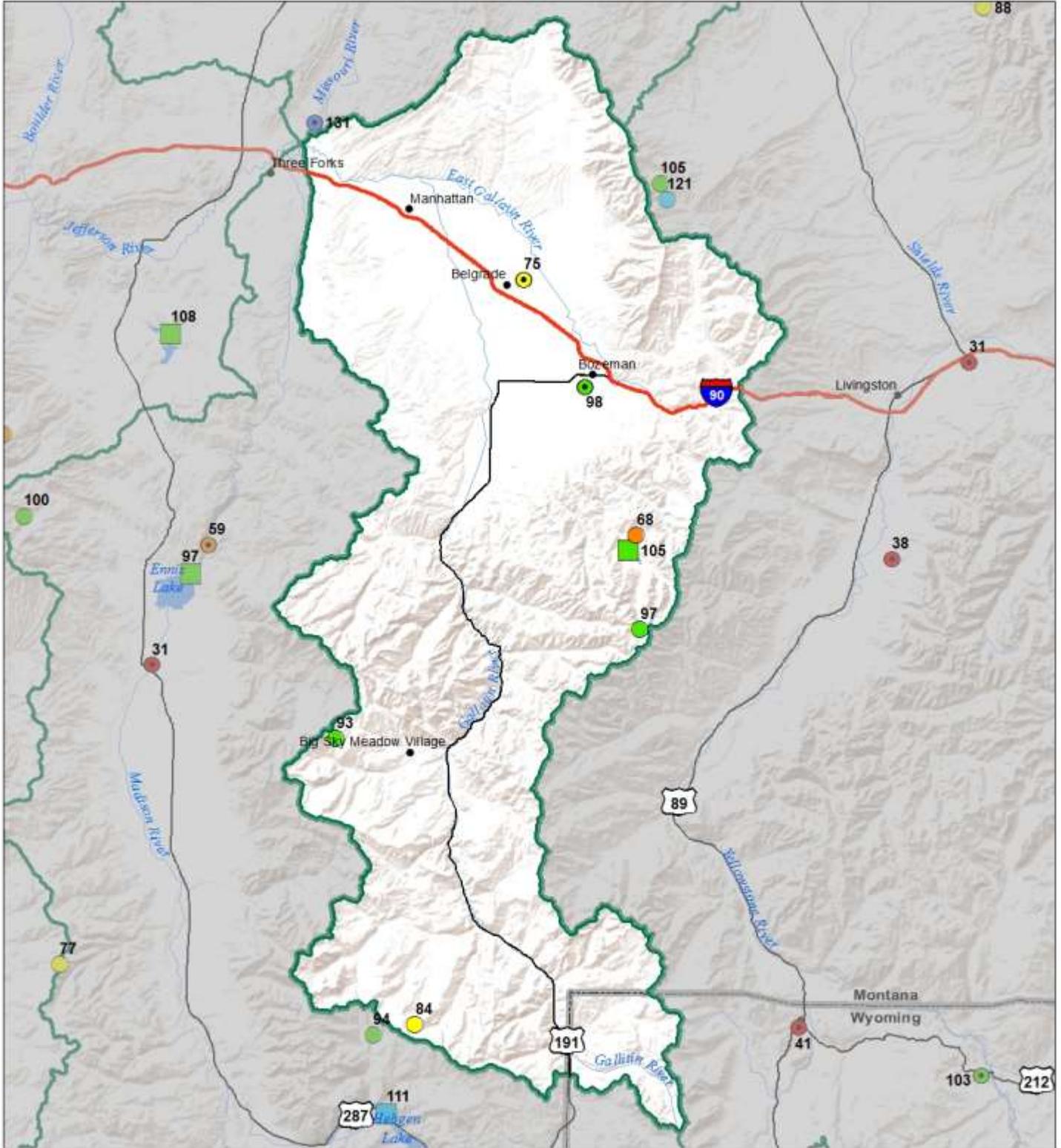


Precipitation Percent of Normal	
SNOTEL	COOP/ACIS
● > 150%	● > 150%
● 131 - 150%	● 131 - 150%
● 111 - 130%	● 111 - 130%
● 91 - 110%	● 91 - 110%
● 71 - 90%	● 71 - 90%
● 51 - 70%	● 51 - 70%
● 1 - 50%	● 1 - 50%

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



**Gallatin River Basin
 Monthly Precipitation and Reservoir Levels
 Percentage of Normal
 February 1, 2016 (January 1, 2016 - February 1, 2016)**



**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
Streamflow Forecasts - February 1, 2016**

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

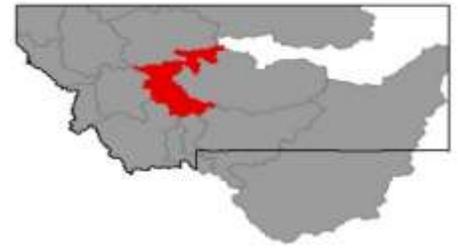
GALLATIN RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Gallatin R nr Gateway	APR-JUL	280	335	375	94%	415	470	400
	APR-SEP	325	390	435	93%	480	545	470
Hyalite Reservoir Inflow ²	APR-JUL	15.6	17.9	19.4	97%	21	23	20
	APR-SEP	18.1	20	22	96%	24	26	23
Gallatin R at Logan	APR-JUL	230	330	400	91%	470	570	440
	APR-SEP	265	375	455	90%	530	645	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
- 3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Middle Creek Res	5.5	5.3	5.3	10.2
Basin-wide Total	5.5	5.3	5.3	10.2
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
UPPER GALLATIN	4	94	81
HYALITE	2	92	99
BRIDGER	2	110	137
GALLATIN RIVER BASIN	8	97	98

Headwaters Mainstem (Missouri) River Basin



Snowpack in the mountains around Helena and the surrounding area got off to a good start this water year and remains above average on Feb 1st. Mid-December snowfall pushed the basin percentages well above average on Jan 1st which enabled the snowpack was to remain above normal during the dry first two weeks of January. A return to a more active weather pattern in the basin mid-month brought snow totals up at SNOTEL sites by the end of the month, and allowed the basin to end the month at 112% of normal overall. Snowpack in the Ten Mile and Chessman Reservoir area is currently the highest in the basin ranging from 110 to 233% of normal for the date. As you move south and west the snowpack percentages decline but remain near normal for this date.

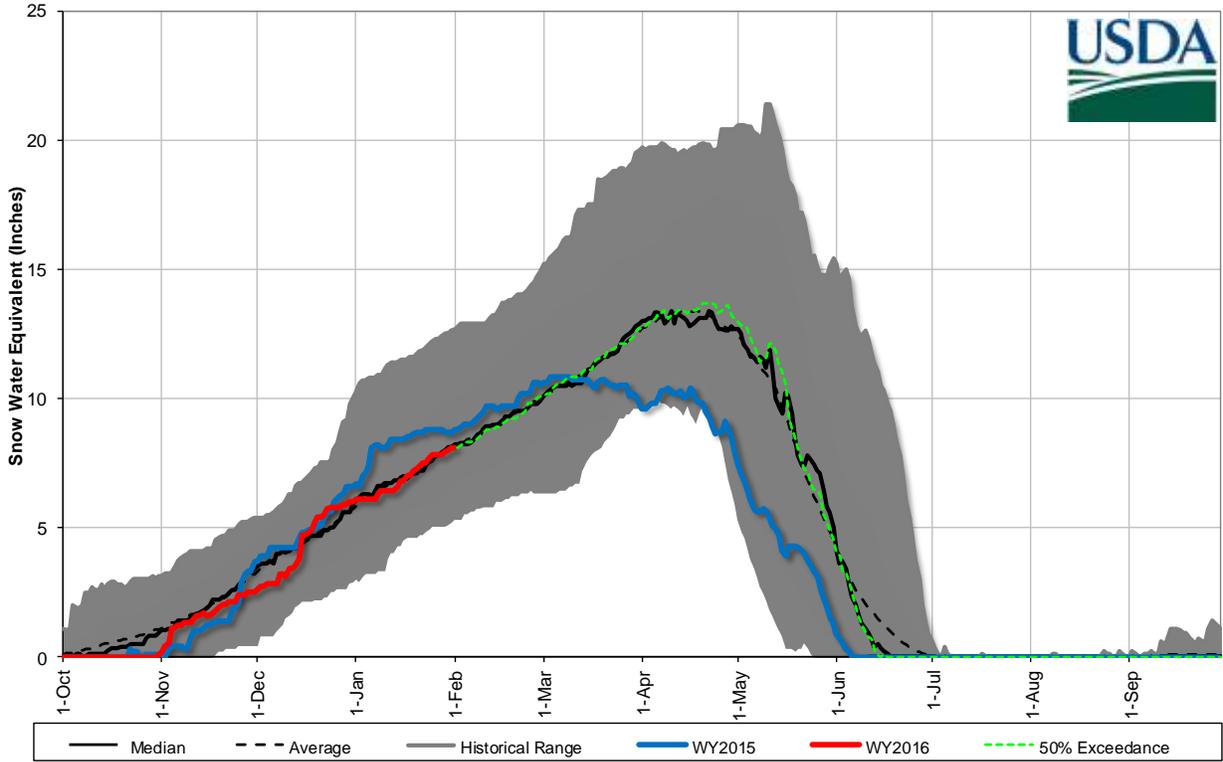
Mountain and valley precipitation was slightly below average for the month of January at 89%. This caused the water year-to-date total to dip slightly and which is currently 98 percent of average for February 1st. Water Year totals this year are behind last year where similar weather patterns were experienced but more precipitation fell earlier in the year.

Reservoir storage in the basin is near to slightly below average for Canyon Ferry, Lake Helena, Hauser and Holter Lake. Helena Valley Reservoir was reported as well above average at 131% for this date.

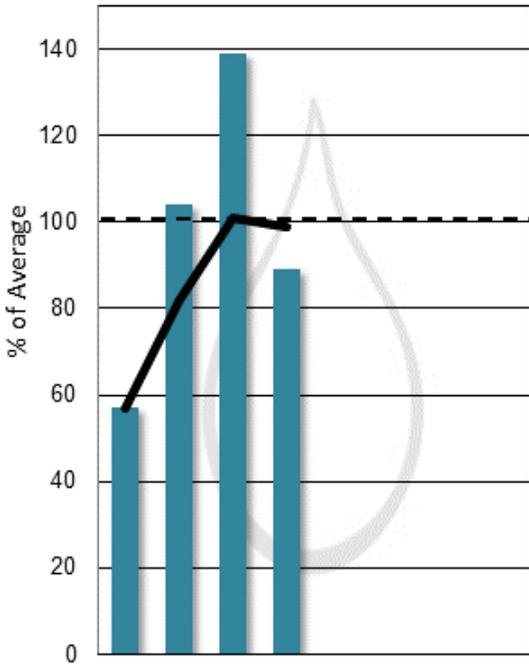
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 83% of average for the April-July time period.

Missouri Mainstem River Basin Data Summary		2/1/2016	
Snowpack			
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	112%	122%	
Precipitation			
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	89%	98%	112%
Valley Precipitation	89%	98%	112%
Basin Precipitation	89%	98%	112%
Reservoir Storage			
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	113%	79%	114%
Streamflow Forecast			
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Basin-Wide Apr-July	83%	109%	76%
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current			
**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.			

Missouri Headwaters Mainstem River Basin (below Toston, above the Smith) Snowpack with Non-Exceedence
Based on provisional SNOTEL daily data as of 2/1/2016

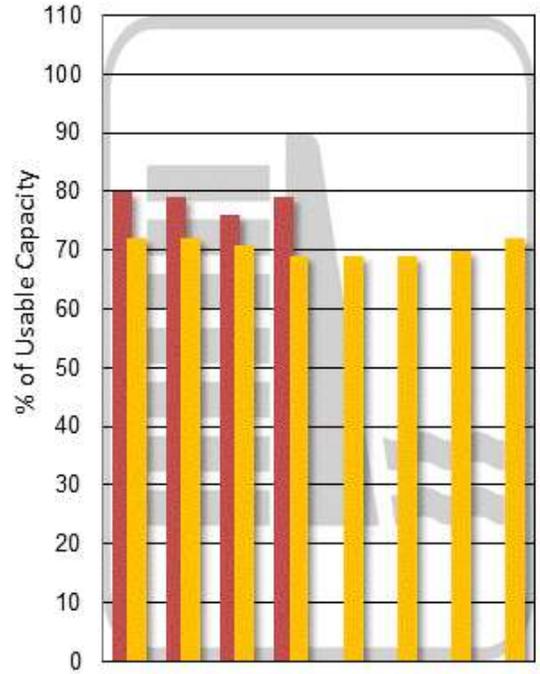
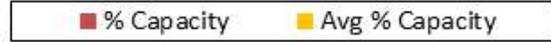


Mountain and Valley Precipitation



Oct Nov Dec Jan Feb Mar Apr May

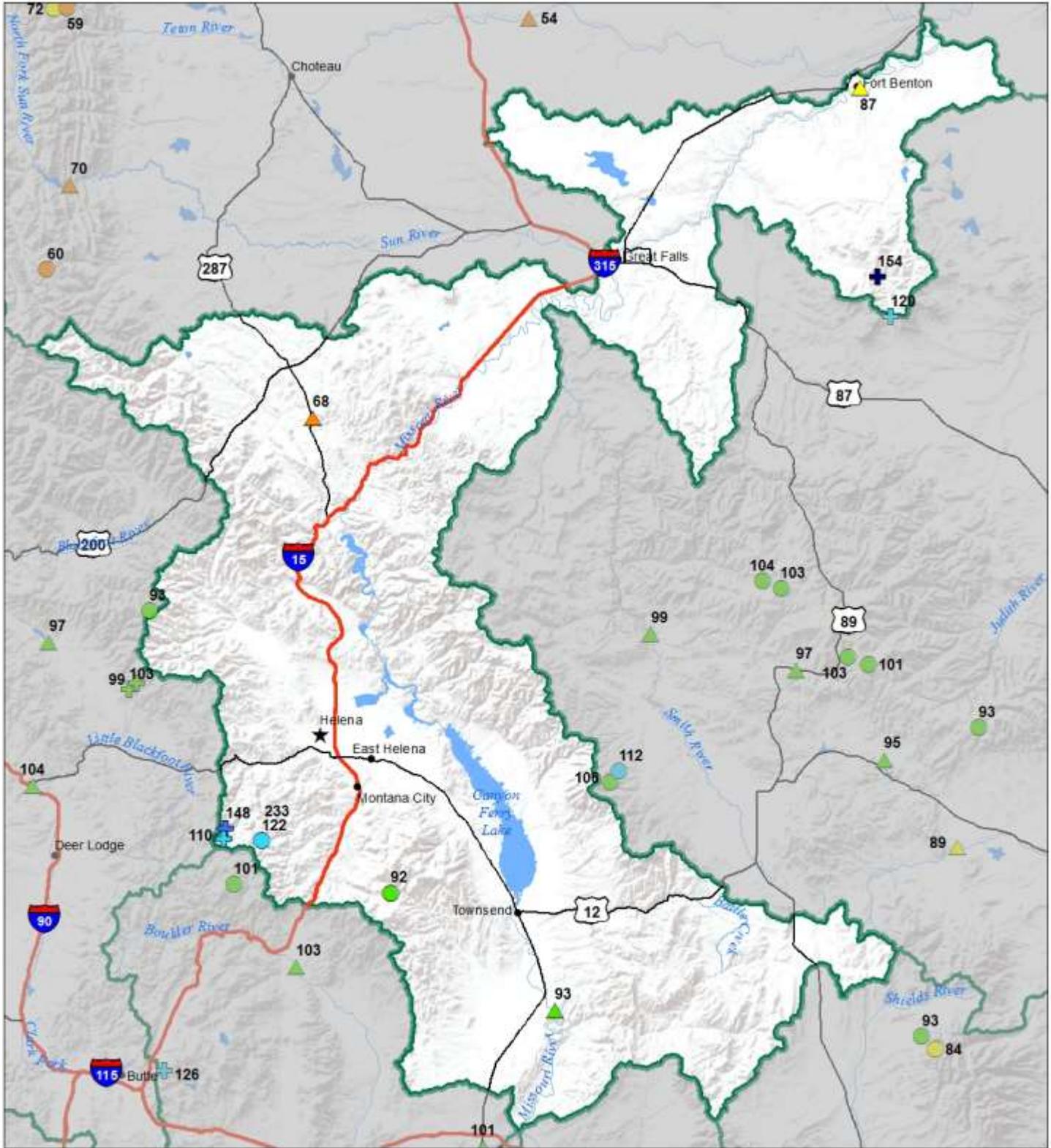
End of Month Reservoir Storage



Oct Nov Dec Jan Feb Mar Apr May

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

Headwaters Mainstem (Missouri) River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%
- *

Snowcourse

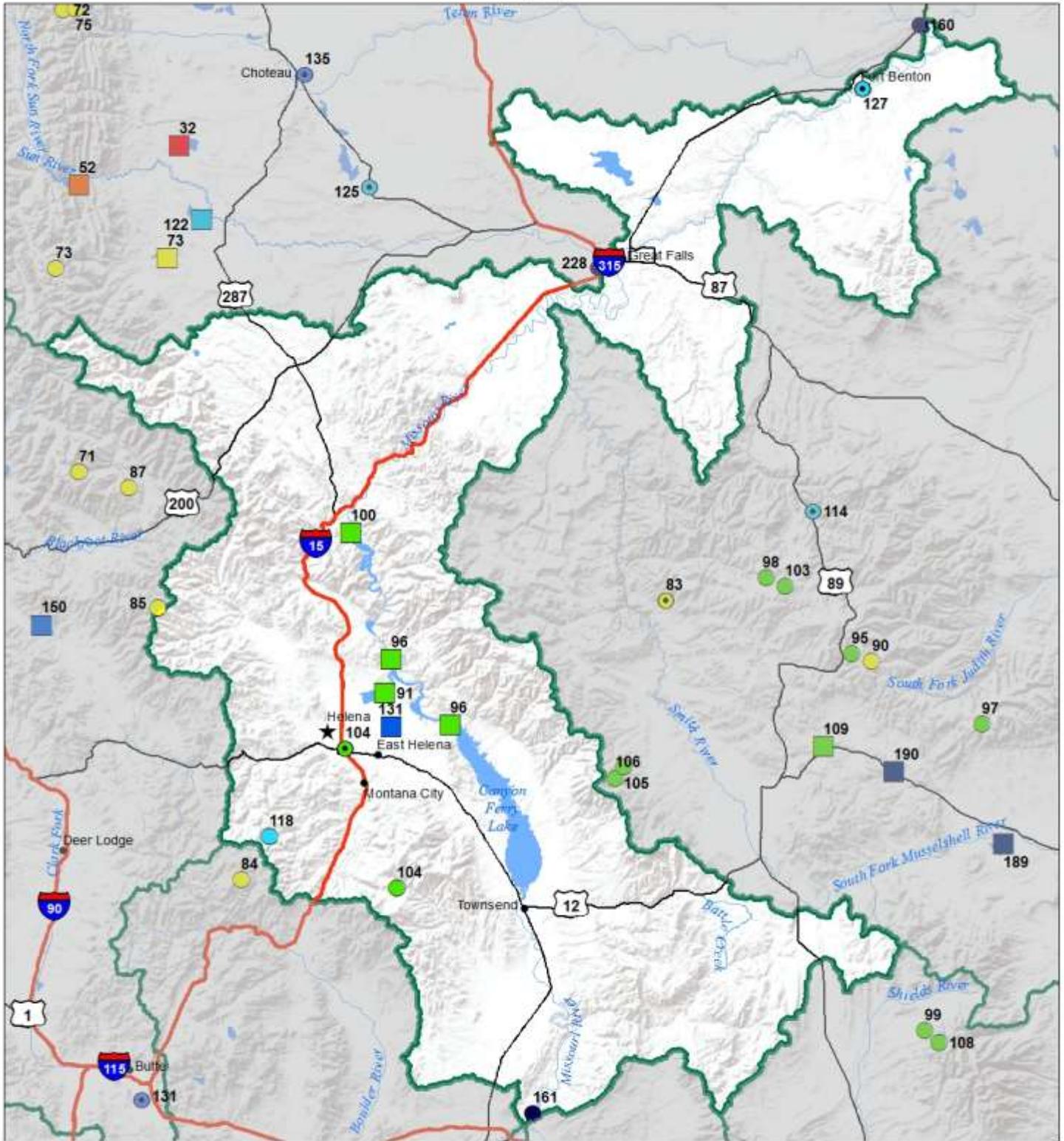
- ⊕ > 150%
- ⊕ 131 - 150%
- ⊕ 111 - 130%
- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

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 February 1, 2016



Precipitation Percent of Normal

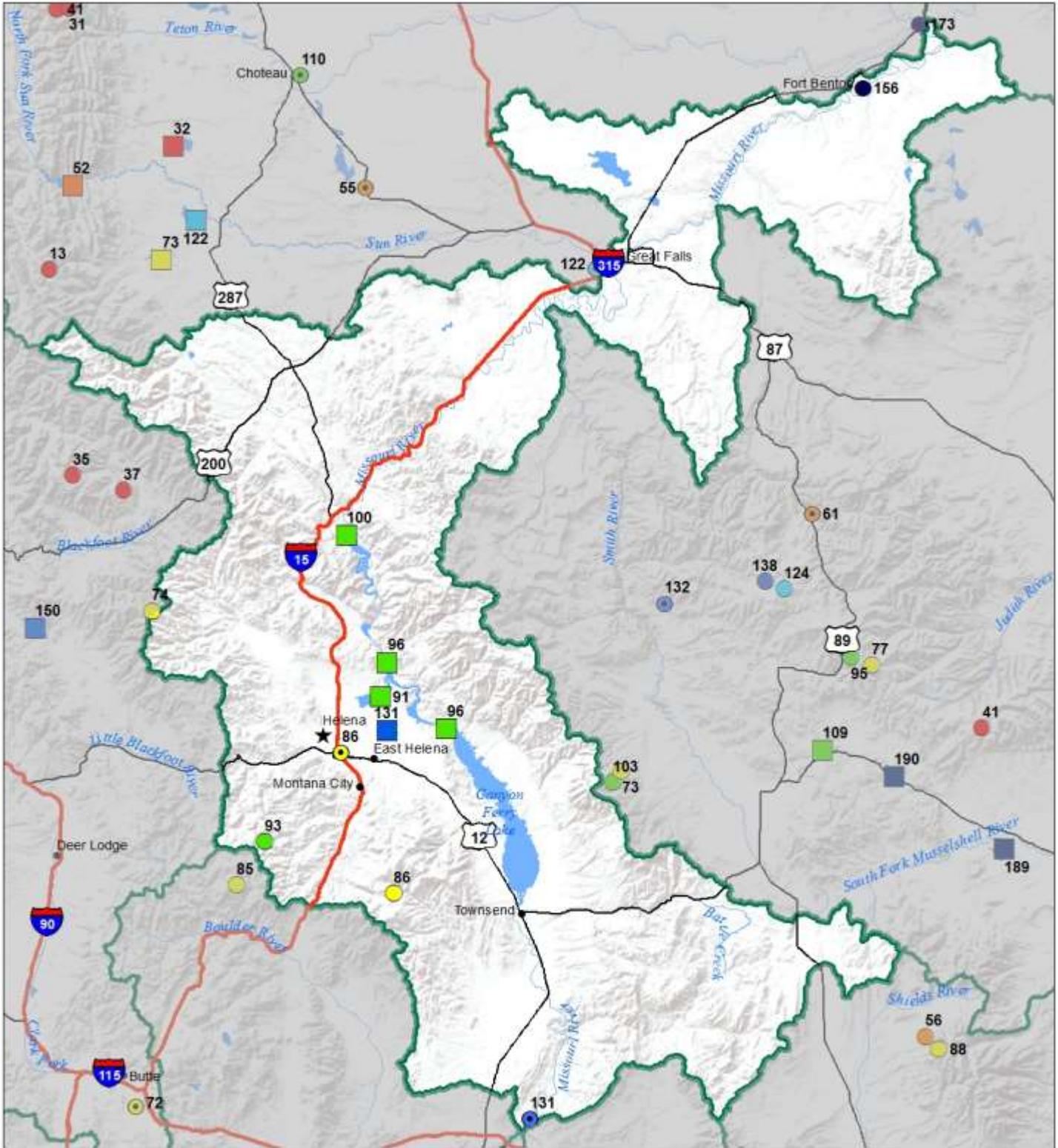
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



**Headwaters Mainstem (Missouri) River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
February 1, 2016 (January 1, 2016 - February 1, 2016)**



**Precipitation
Percent of Normal**

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%

COOP/ACIS

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%

**Reservoirs
Percent of Normal**

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



Missouri Mainstem Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

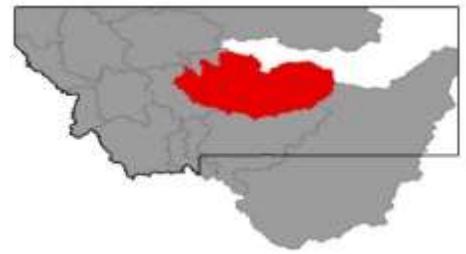
MISSOURI MAINSTEM BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Missouri R at Toston ²	APR-JUL	1030	1420	1680	94%	1940	2320	1790
	APR-SEP	1160	1610	1920	93%	2230	2680	2070
Dearborn R nr Craig	APR-JUL	14.7	42	60	67%	78	105	89
	APR-SEP	17.1	45	65	68%	84	112	95
Missouri R at Fort Benton ²	APR-JUL	1370	1920	2290	88%	2660	3200	2610
	APR-SEP	1610	2270	2720	87%	3160	3820	3110
Missouri R nr Virgelle ²	APR-JUL	1480	2100	2520	84%	2940	3550	3000
	APR-SEP	1710	2450	2960	84%	3460	4210	3520
Missouri R nr Landusky ²	APR-JUL	1570	2220	2650	84%	3090	3740	3160
	APR-SEP	1820	2600	3130	84%	3660	4440	3720
Missouri R bl Fort Peck Dam ²	APR-JUL	1480	2180	2660	82%	3140	3840	3240
	APR-SEP	1510	2410	3020	82%	3630	4530	3700
Lake Sakakawea Inflow ²	APR-JUL	3880	5480	6580	79%	7660	9260	8310
	APR-SEP	3990	5970	7320	78%	8660	10600	9400

- 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
 3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Canyon Ferry Lake	1472.5	1559.2	1531.0	2043.0
Helena Valley Reservoir	6.1	5.3	4.7	9.2
Lake Helena	9.9	10.0	10.9	12.7
Hauser Lake & Lake Helena	70.3	70.4	73.5	74.6
Holter Lake	80.9	80.9	80.7	81.9
Fort Peck Lake	14957.8	15042.5	12953.0	18910.0
Basin-wide Total	16597.6	16768.2	14653.8	21131.4
# of reservoirs	6	6	6	6

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
HEADWATERS MAINSTEM	8	112	122
SMITH-JUDITH-MUSSELSHELL	9	104	111
SUN-TETON-MARIAS	6	62	91
MAINSTEM ab FT PECK RES	24	93	107
MILK RIVER BASIN	9	52	93
MISSOURI MAINSTEM BASIN	33	88	105

Smith-Judith-Musselshell River Basin



The snowpack in the Smith, Judith and Musselshell drainages continue to be near to a little above normal of Feb 1st even though January started off rather dry and warm. Some of the low to mid-elevation sites saw decreases in snow water equivalents. There was a whopper of a storm around mid-month that started off the moisture train for the rest of the month. The Crystal Lake SNOTEL site in the Big Snowy Mountains picked up 1.4 inches of snow water equivalent and 12 to 13 inches of snow depth between January 14th and 15th. Sites in the Musselshell and Smith River Basins also received decent snow from this system.

There were a couple of other notable systems that came through the area in the latter half of January. Like the previous storm, the Judith River Basin was favored with higher snow accumulations. Central Montana winds were prevalent throughout the month causing some drifting and blizzard conditions. Daytime temperatures were well above freezing but fell to below freezing at night which helped maintain the snowpack. Currently the basin-wide snowpack is 104% of normal for Feb 1st.

Precipitation that fell in January was mostly in the form of snow. However, the storms that occurred towards in the end of the month were a rain/snow mixture. January mountain precipitation ranged from 57% of average in the Musselshell River Basin to 101% of average in the Smith River Basin. Valley precipitation for January followed the same trend as the mountain precipitation and was quite variable throughout the basins. The largest amounts were seen near Lewistown and the smaller amounts in the area around Harlowton. Combined mountain and valley water year precipitation is a slightly above average at 107% for Feb 1st.

Reservoir storages in the basins are near to well above average.

Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 87% of average for the April-July time period.

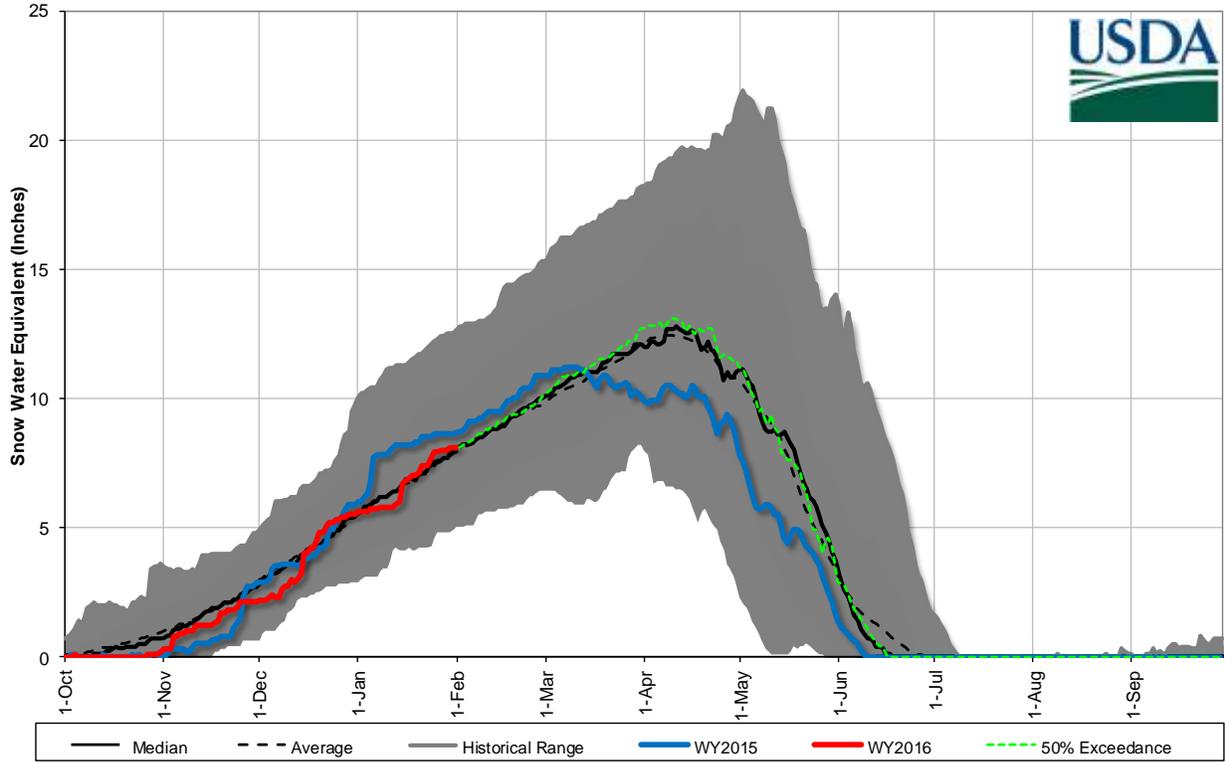
Smith-Judith-Musselshell River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	104%	111%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	99%	102%	109%
Valley Precipitation	79%	124%	87%
Basin Precipitation	95%	107%	104%
	Percentage of Average	Percentage of Usable Capacity	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	144%	70%	169%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	87%	88%	98%

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

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

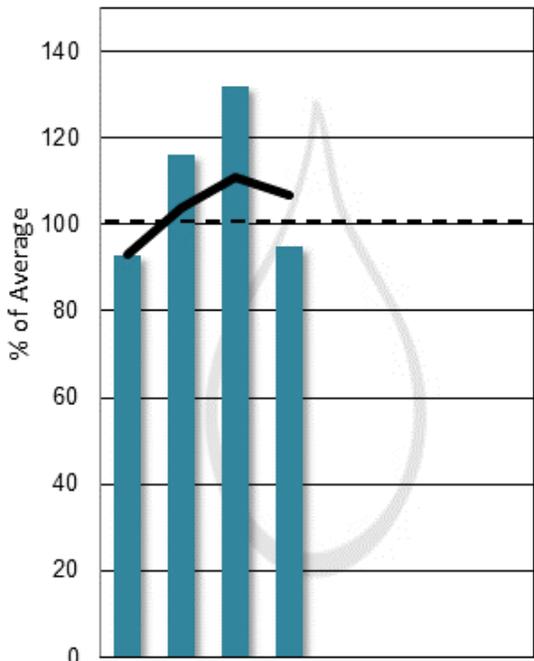
Smith-Judith-Musselshell River Basin Snowpack with Non-Exceedence Projections

Based on provisional SNOTEL daily data as of 2/1/2016



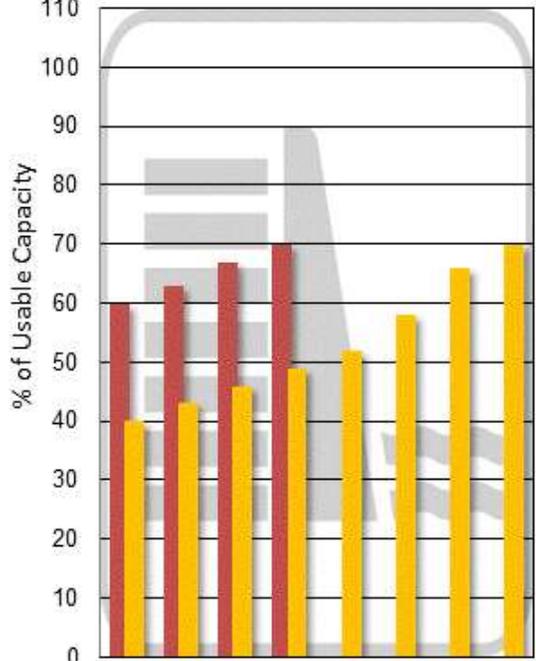
Mountain and Valley Precipitation

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



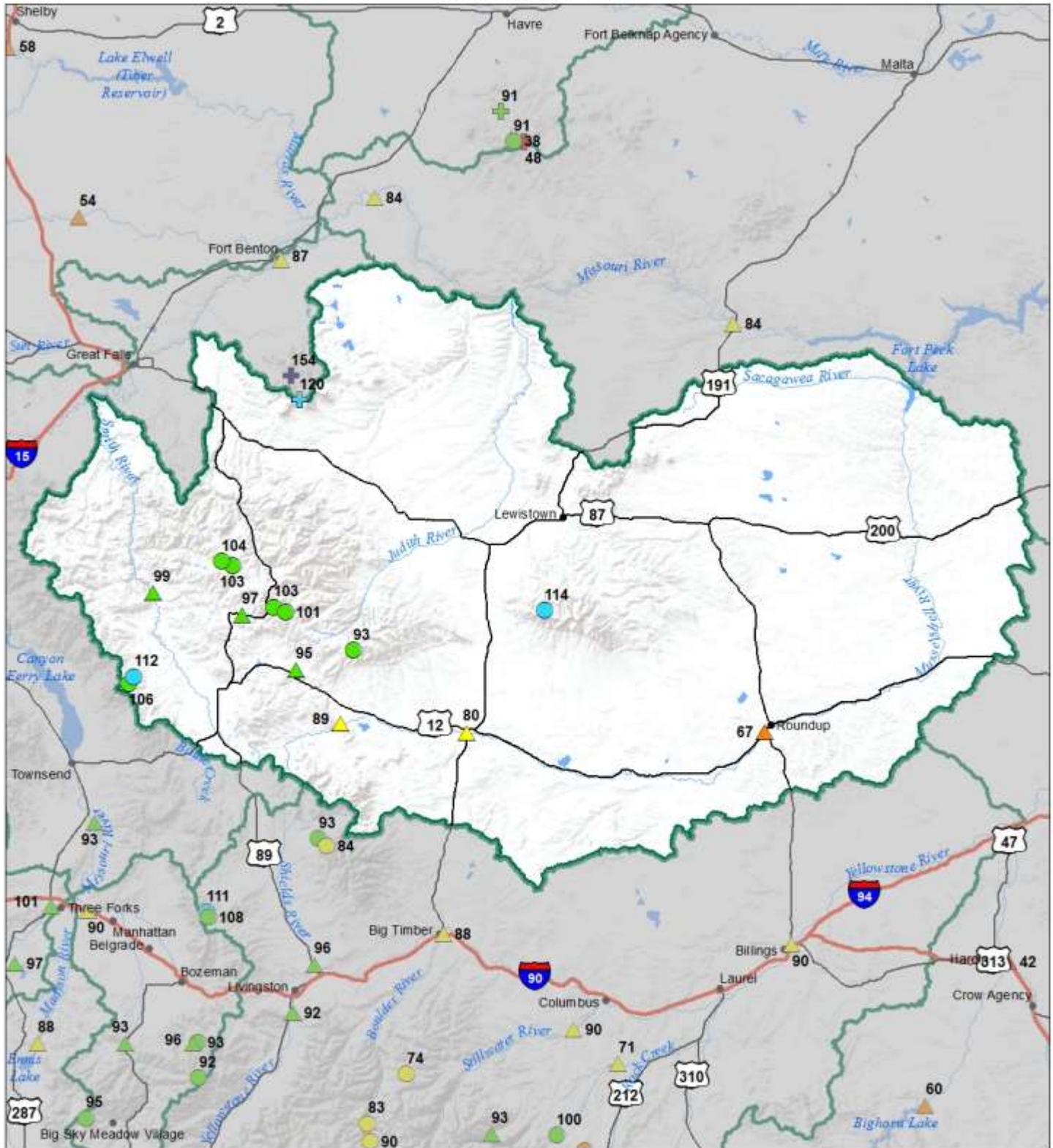
End of Month Reservoir Storage

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



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

Smith-Judith-Musselshell River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%
- *

Snowcourse

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

Streamflow Forecast Percent of Average Flows

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

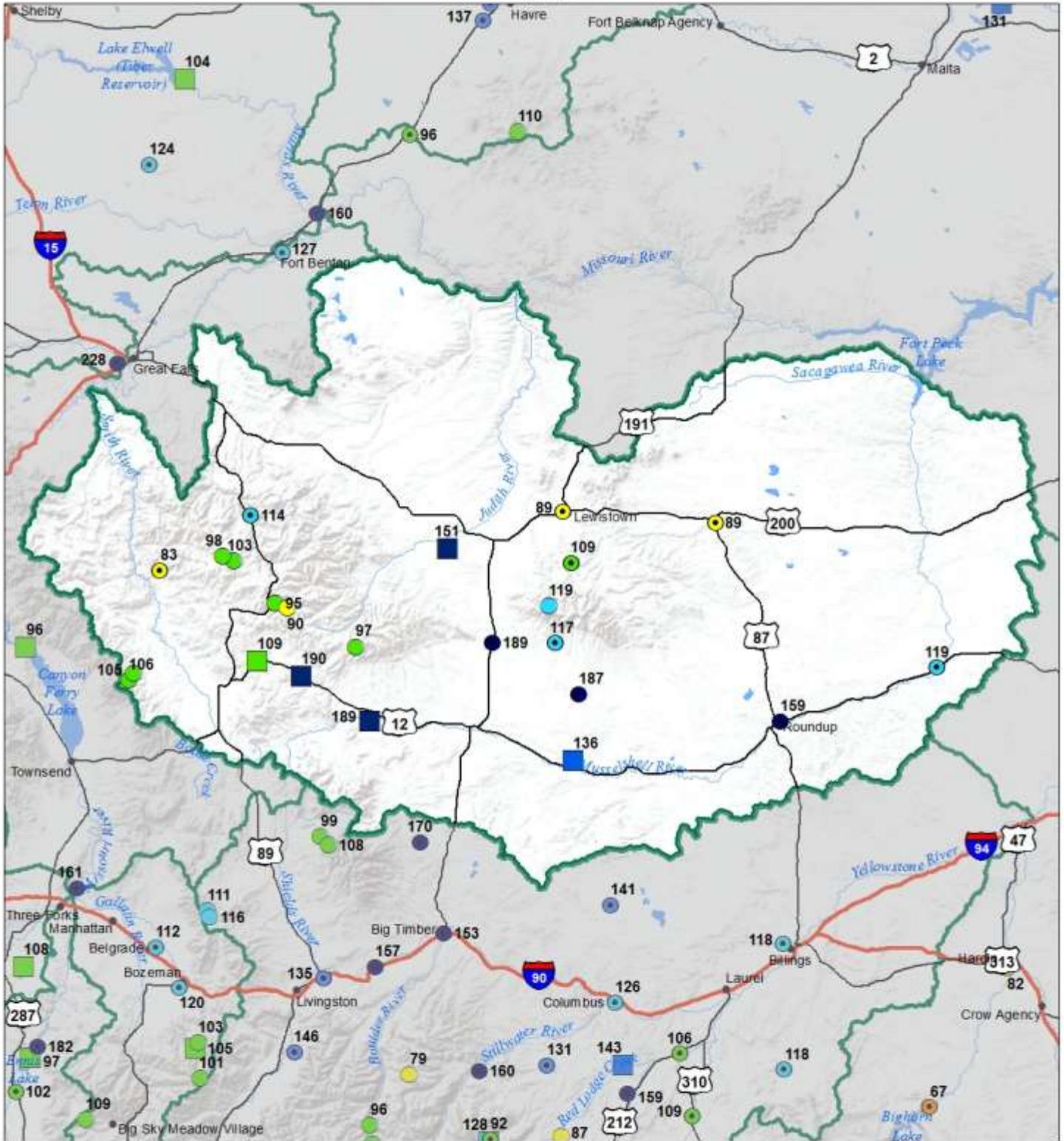


Smith-Judith-Musselshell River Basin

Water Year to Date Precipitation and Reservoir Levels

Percentage of Normal

February 1, 2016



Precipitation Percent of Normal

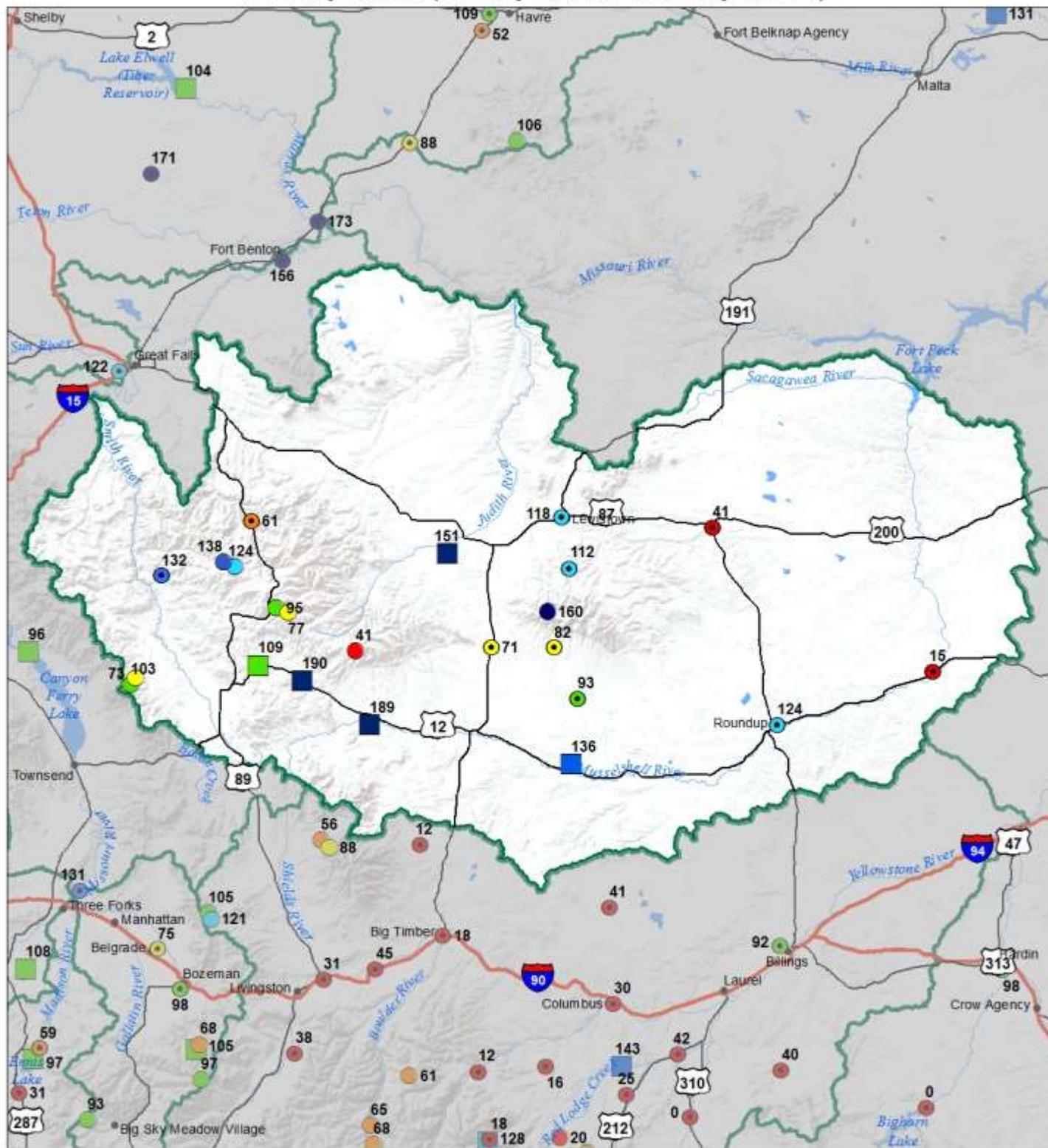
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



Smith-Judith-Musselshell River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal February 1, 2016 (January 1, 2016 - February 1, 2016)



Precipitation Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%

COOP/ACIS

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%

Reservoirs Percent of Normal

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



Smith-Judith-Musselshell Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

SMITH-JUDITH-MUSSEL SHELL	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Sheep Ck nr White Sulphur Springs								
	APR-JUL	9.5	12.7	15	97%	17.2	20	15.5
	APR-SEP	11.6	15.3	17.8	97%	20	24	18.4
Smith R bl Eagle Ck²								
	APR-JUL	54	86	107	101%	128	160	106
	APR-SEP	54	90	115	99%	140	176	116
NF Musselshell R nr Delpine								
	APR-JUL	1.12	2.4	3.2	94%	4	5.3	3.4
	APR-SEP	1.43	2.8	3.8	95%	4.8	6.2	4
SF Musselshell R ab Martinsdale								
	APR-JUL	1	18.1	31	89%	44	63	35
	APR-SEP	1	20	34	89%	48	68	38
Musselshell R at Harlowton²								
	APR-JUL	-2	24	46	81%	68	101	57
	APR-SEP	-2	23	47	80%	71	105	59
Musselshell R nr Roundup²								
	APR-JUL	-23	-1	45	67%	90	158	67
	APR-SEP	-26	-1	44	67%	89	156	66

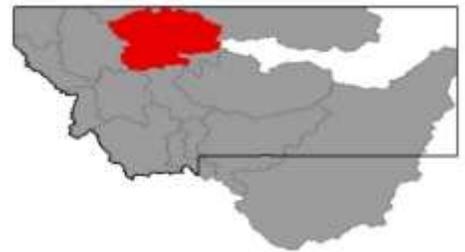
1) 90% and 10% exceedance probabilities are actually 95% and 5%

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

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Smith River Res	6.0	8.8	5.5	10.6
Ackley Lake	3.9	3.9	2.6	7.0
Bair Res	5.5	5.4	2.9	7.0
Martinsdale Res	14.5	18.2	7.7	23.1
Deadman's Basin Res	54.4	63.4	40.1	72.2
Basin-wide Total	84.4	99.5	58.8	119.9
# of reservoirs	5	5	5	5

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
SMITH	6	105	114
HIGHWOOD	2	133	65
JUDITH	4	103	119
MUSSEL SHELL	2	93	100
SMITH-JUDITH-MUSSEL SHELL	9	104	111



Sun-Teton-Marias River Basin

Mother Nature seems to have forgotten this part of Montana in the moisture department! Snowpack continues to be well below normal ranging from 61% of normal in the Teton River Drainage to 68% of normal in the Sun River drainage. The Marias is in the middle at 65% of normal. A series of storms hit the region but none were enough to bring any of the basins back to a normal by the end of the month. The best snowpack is at the higher elevations and they are only around 73% of normal. Significant changes to the storm patterns are needed to improve this situation. Currently basin-wide snowpack is 62% on Feb 1st.

January mountain precipitation was disappointing to say the least. The Sun River Drainage was only 31% of average, the Teton was slightly better at 34% of average, and the Marias River Drainage was the best at 53% of average. Basin-wide January mountain precipitation was 44% of average. Above average temperatures towards the end of the month resulted in precipitation of a rain/snow mix. Valley stations fared a little better for precipitation in January but is quite variable depending on the location. There are only trace amounts of valley snow due to the warm temperatures and winds. As a whole the combined mountain and valley water year precipitation is 80% of average for Feb 1st.

Reservoir storages reported for Feb 1st indicate below average storage in most reservoirs in the basin. The exceptions are Willow Creek (122%) and Tiber (104%). Some reservoirs are well below average for the date, Gibson Reservoir is currently 52% of average and Pishkun is 32% of average.

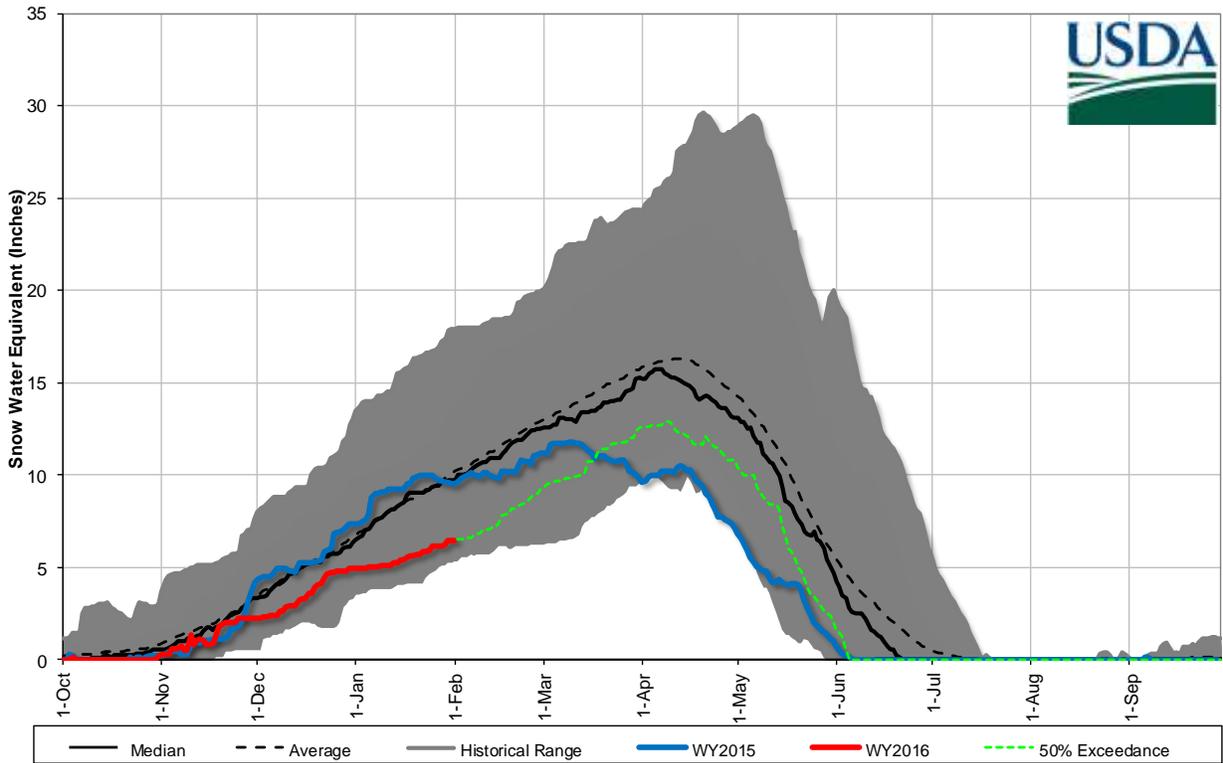
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 66% of average for the April-July time period.

Sun-Teton-Marias River Basin Data Summary		2/1/2016	
Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	62%	91%	
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	44%	74%	114%
Valley Precipitation	76%	101%	122%
Basin Precipitation	51%	80%	116%
Reservoir Storage	Percentage of Average	Percentage of Usable Capacity	Last Year Percentage of Average
Basin-Wide Storage	98%	51%	108%
Streamflow Forecast	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Basin-Wide Apr-July	66%	109%	57%

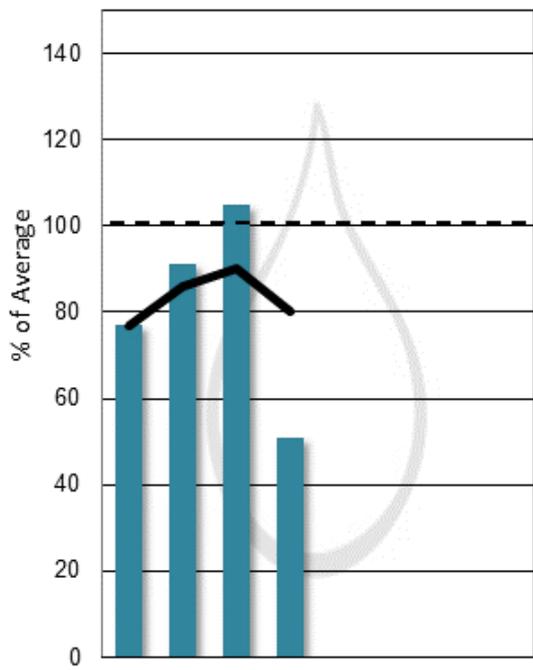
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

Sun-Teton-Marias River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016

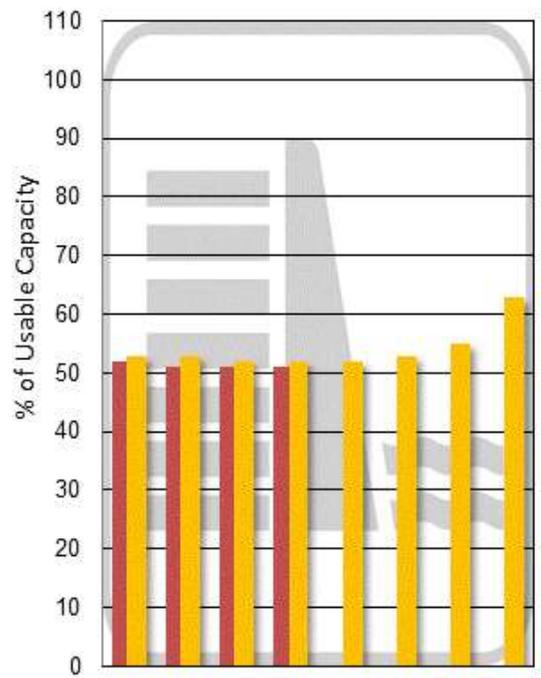


Mountain and Valley Precipitation



Oct Nov Dec Jan Feb Mar Apr May

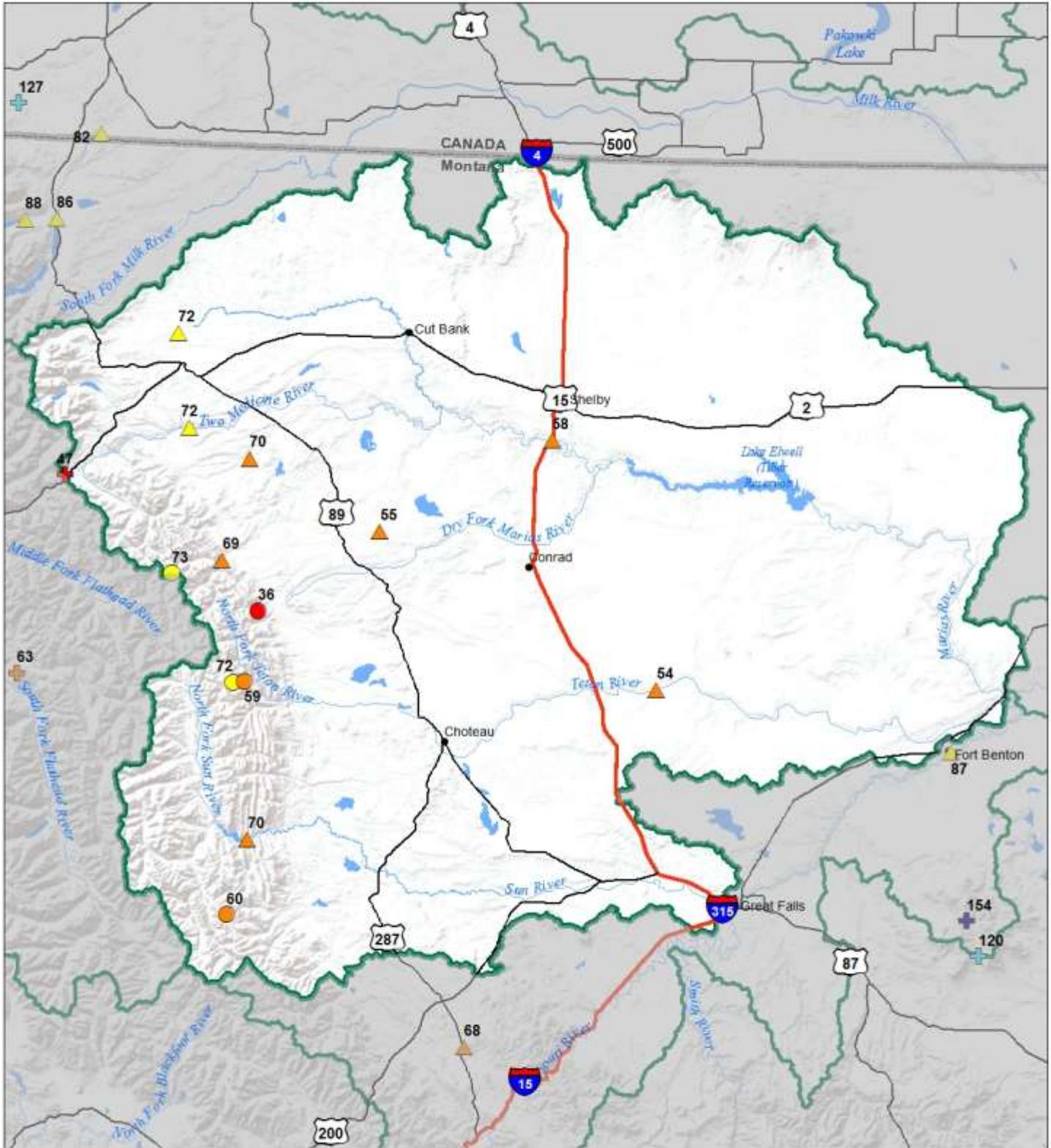
End of Month Reservoir Storage



Oct Nov Dec Jan Feb Mar Apr May

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

Sun-Teton-Marias River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%
- *

Snowcourse

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Streamflow Forecast Percent of Average Flows

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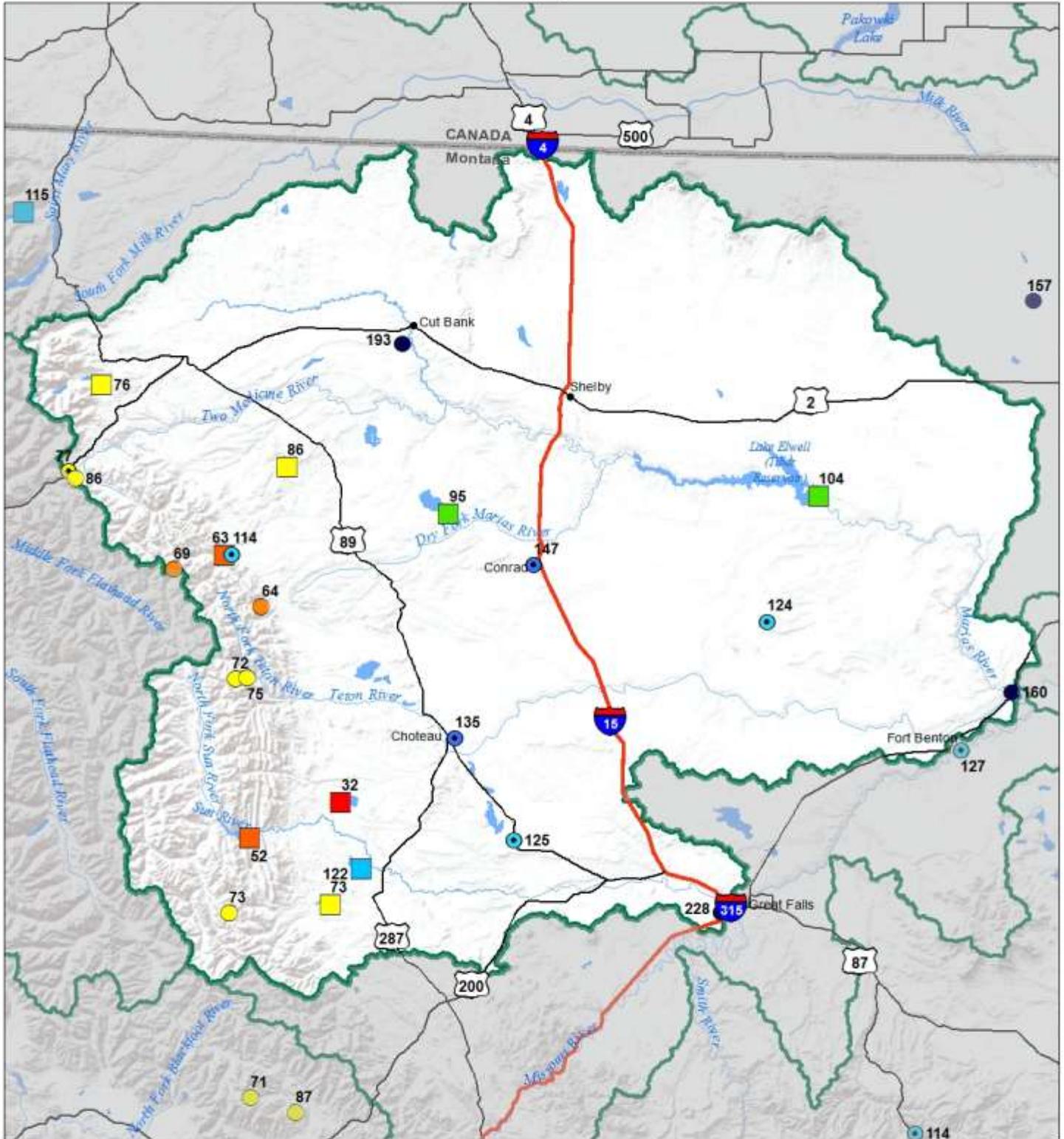


Sun-Teton-Marias River Basin

Water Year to Date Precipitation and Reservoir Levels

Percentage of Normal

February 1, 2016



Precipitation Percent of Normal

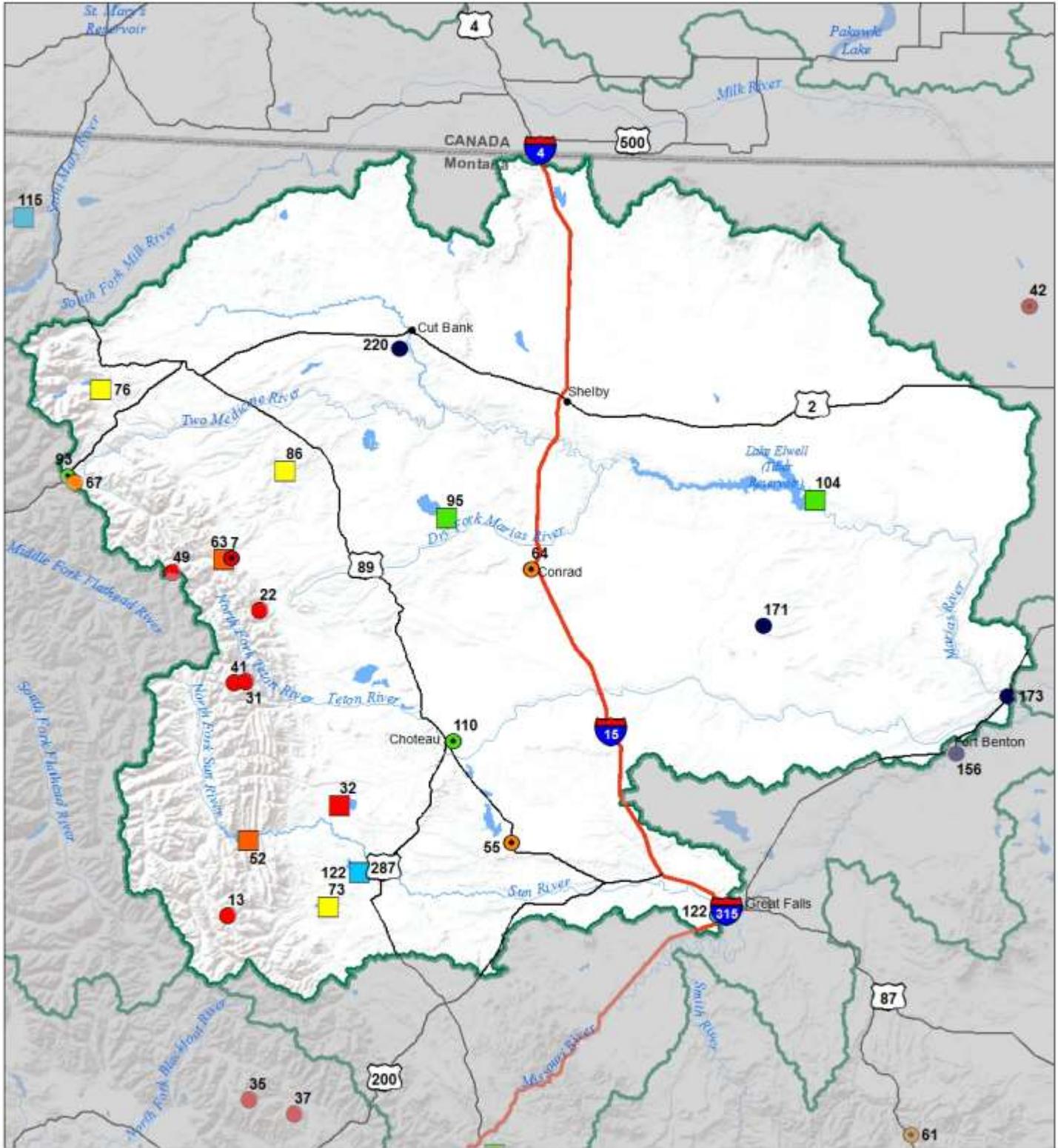
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



**Sun-Teton-Marias River Basin
 Monthly Precipitation and Reservoir Levels
 Percentage of Normal
 February 1, 2016 (January 1, 2016 - February 1, 2016)**



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%

USDA
 National Resource Information System

Sun-Teton-Marias Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

SUN-TETON-MARIAS	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Gibson Reservoir Inflow	APR-JUL	177	235	275	70%	315	375	395
	APR-SEP	205	265	310	70%	350	415	440
Two Medicine R nr Browning ²	APR-JUL	79	110	131	72%	151	182	183
	APR-SEP	66	118	139	72%	161	192	194
Badger Ck nr Browning	APR-JUL	31	49	61	69%	72	90	88
	APR-SEP	40	59	72	70%	85	104	103
Swift Reservoir Inflow ²	APR-JUL	18.1	30	37	65%	45	57	57
	APR-SEP	25	38	46	69%	55	68	67
Dupuyer Ck nr Valier	APR-JUL	0.1	3.7	6.1	55%	8.6	12.3	11.1
	APR-SEP	0.44	4.4	7	55%	9.7	13.7	12.7
Cut Bank Ck nr Browning	APR-JUL	27	41	51	74%	61	75	69
	APR-SEP	29	44	54	72%	64	79	75
Marias R nr Shelby ²	APR-JUL	54	133	205	59%	275	385	345
	APR-SEP	52	134	210	58%	285	400	360
Teton R nr Dutton	APR-JUL	4.5	12.9	23	55%	41	69	42
	APR-SEP	5.6	13	26	54%	46	75	48

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

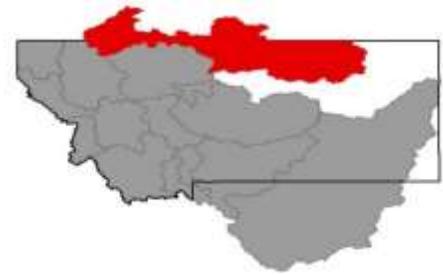
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Gibson Res	20.6	18.5	39.9	99.1
Pishkun Res	5.6	19.5	17.5	32.0
Willow Creek Res - Augusta	27.9	13.1	22.9	32.2
Lower Two Medicine Lake	6.3	8.9	8.2	11.9
Four Horns Lake	8.8	9.9	10.2	19.2
Swift Res	9.7	17.3	15.3	30.0
Lake Frances	54.6	69.8	57.5	112.0
Lake Elwell (Tiber)	726.4	786.5	700.8	1347.0
Nilan Reservoir	4.6	7.4	6.3	11.0
Basin-wide Total	864.4	950.8	878.6	1694.4
# of reservoirs	9	9	9	9

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
SUN	2	68	103
TETON	3	61	89
MARIAS	3	60	85
SUN-TETON-MARIAS	6	62	91

St. Mary-Milk River Basin



The “Crown of the Continent” isn’t so sparkly right now. Snowpacks continue to be well below normal. Flattop Mtn. SNOTEL site in Glacier National Park is only 85% of normal. Lower elevation snowpack are much lower with Many Glacier at only 52% of normal. January started off rather dry and the storms really didn’t start in this area until mid-January. None of these storms produced major snow. Valley areas with the St. Mary River Basin, picked up a little snow during the month. Temperatures warmed to well above freezing towards the end of the month which resulted in any remaining snow to either melt or blow away. Unfortunately, the Milk River Basin is not doing much better than the St. Mary. Sites in the Bear Paw Mountains are reporting 71% of normal for February 1. Measurements taken near mid-January in the Cypress Hills, AB, were only 39% of normal. Like the St. Mary Basin, more favorable weather patterns were seen after mid-January but were not very productive. Currently the basin-wide snowpack for the St. Mary-Milk is only 69% of normal for Feb 1st

January mountain precipitation was quite variable in both basins ranging from well below average in Glacier National Park to well above average in the Bear Paw Mountains. As a result of the unseasonably warm temperatures, most of the precipitation in the Milk River Basin fell in the form of rain or rain and snow. Valley precipitation for January followed the same pattern as mountain precipitation with sites in the St. Mary River Basin below to well below average. Valley stations in the Milk River Basin received average to well above precipitation. Strong winds were also prevalent towards the end of January with high wind warnings posted by the National Weather Service. Only trace amounts of snow are found in the valley areas. Currently, the basin-wide combined mountain and valley water year-to-date precipitation is 104% of average for February 1st.

Reservoir storages are the bright spot in both basins with near to well above average storage.

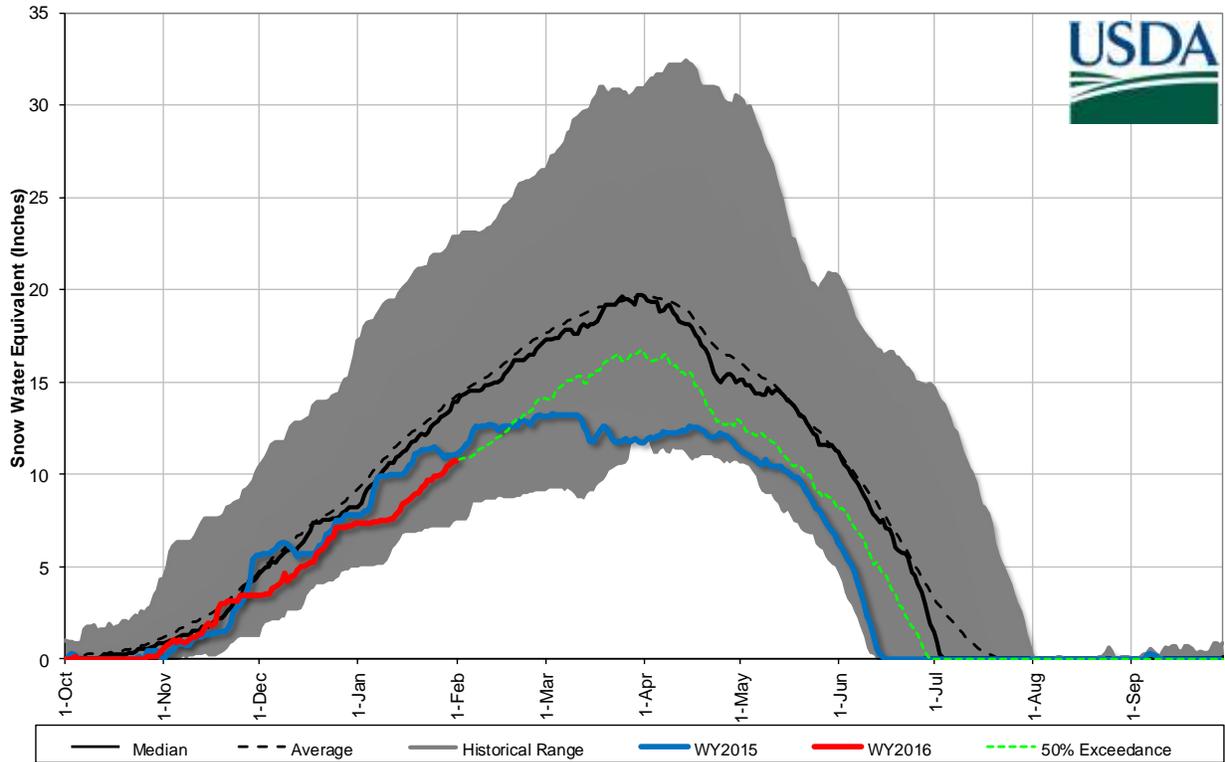
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 84% of average for the April-July time period.

St. Mary-Milk River Basin Data Summary		2/1/2016	
Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	69%	83%	
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	77%	98%	115%
Valley Precipitation	79%	149%	119%
Basin Precipitation	77%	104%	116%
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	129%	51%	167%
Streamflow Forecast	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Basin-Wide Apr-July	84%	117%	72%

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

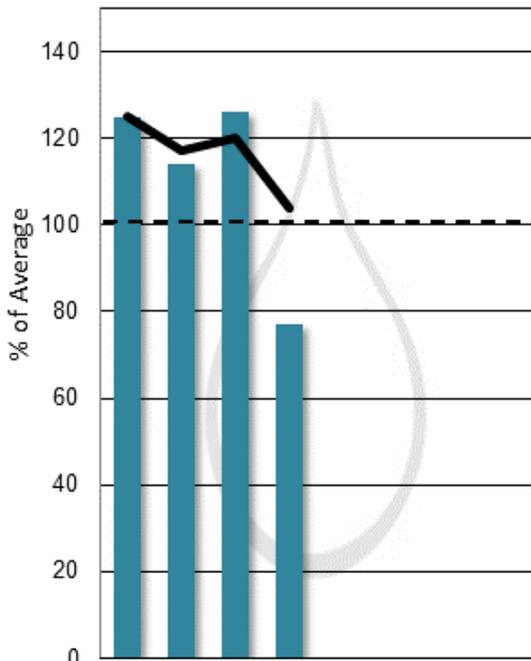
**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

St. Mary-Milk River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 2/1/2016



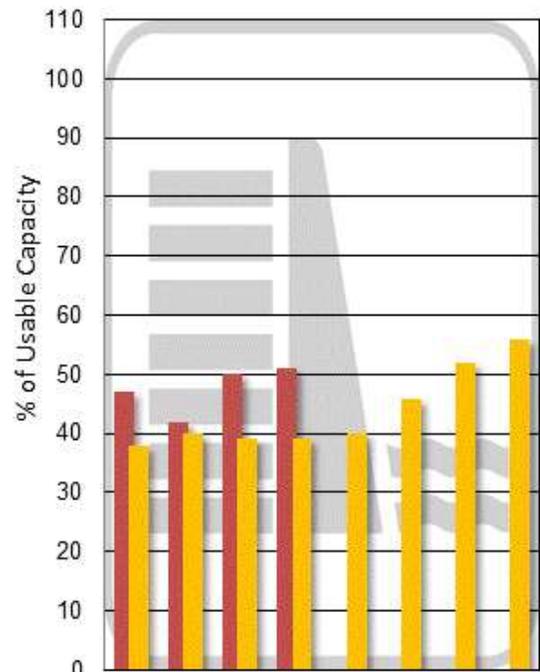
**Mountain and Valley
Precipitation**

■ Monthly — Year-to-date



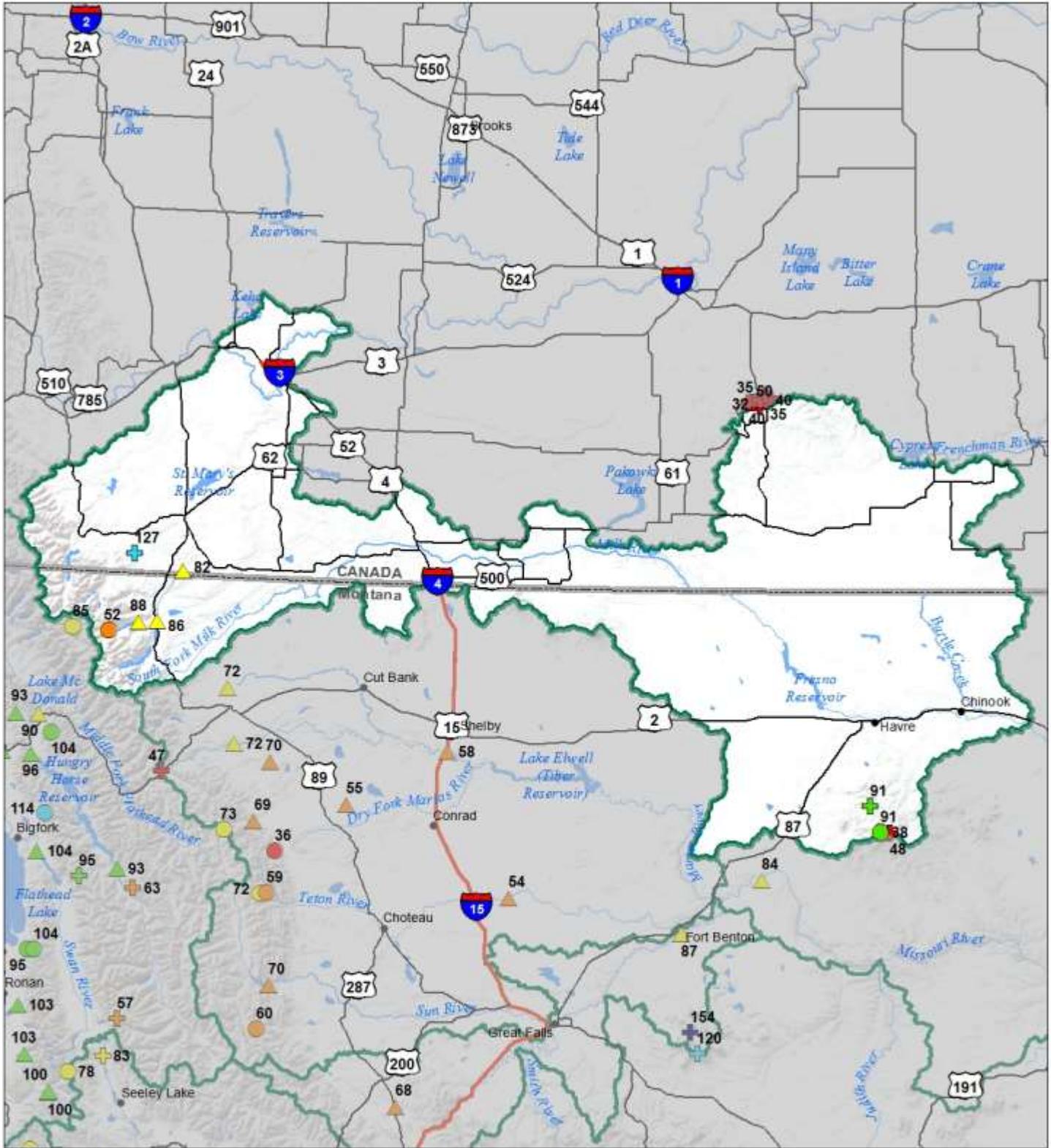
**End of Month Reservoir
Storage**

■ % Capacity ■ Avg % Capacity



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

St Mary's-Milk River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
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Snowcourse

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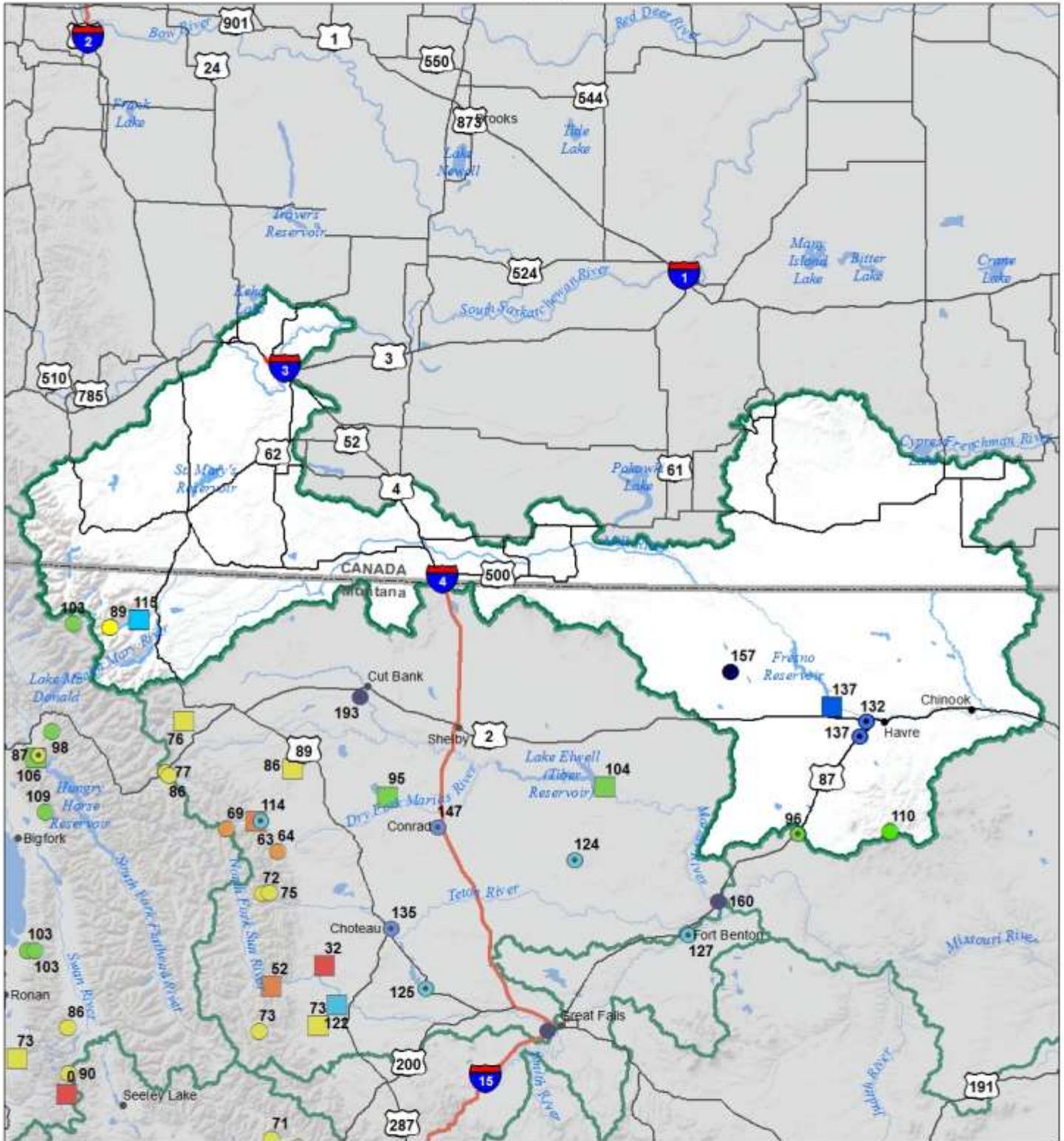
Streamflow Forecast Percent of Average Flows

- ▲ > 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 February 1, 2016



Precipitation Percent of Normal

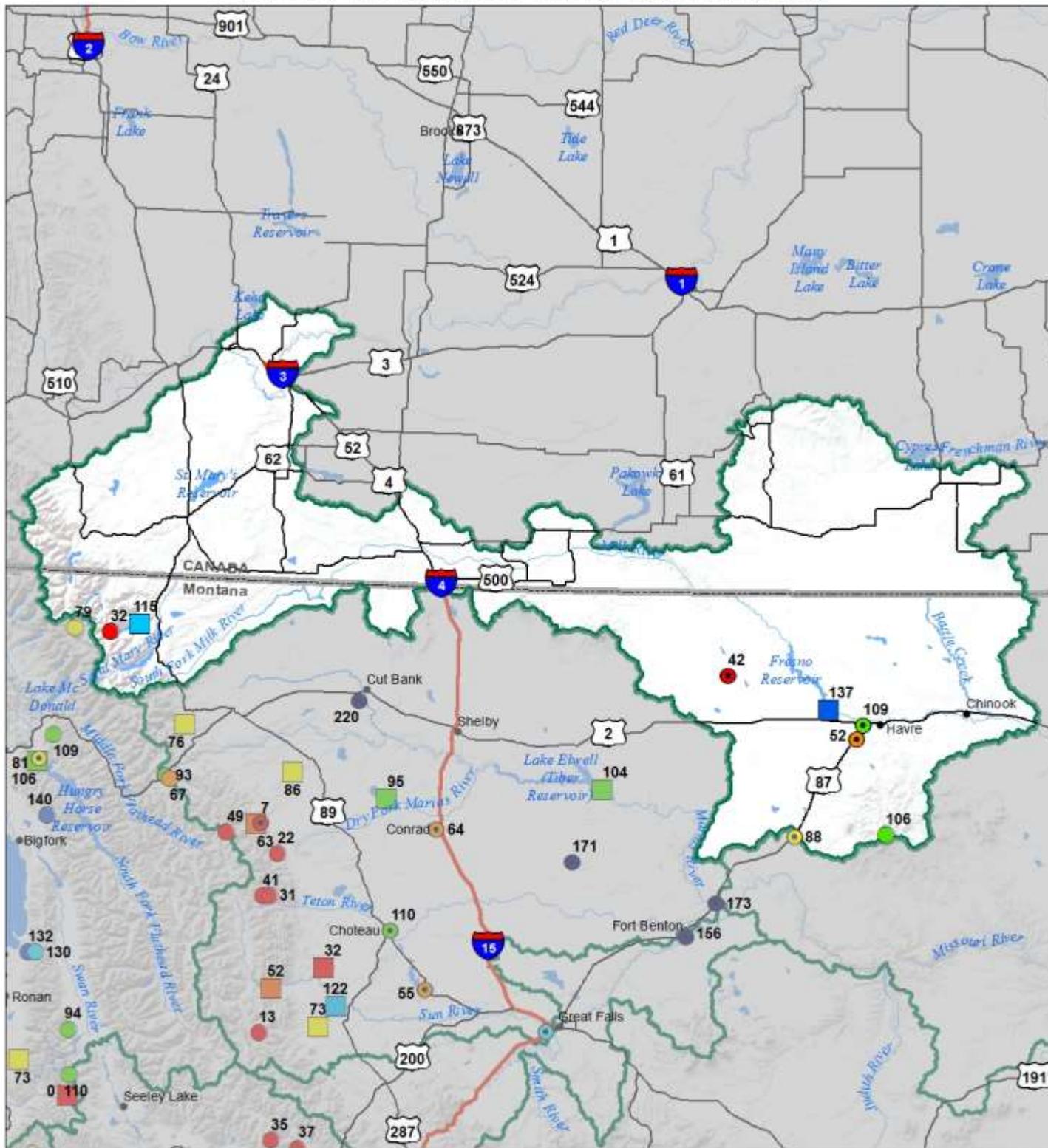
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



**St Mary's-Milk River Basin
 Monthly Precipitation and Reservoir Levels
 Percentage of Normal
 February 1, 2016 (January 1, 2016 - February 1, 2016)**



**Precipitation
 Percent of Normal**

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%

COOP/ACIS

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

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**Reservoirs
 Percent of Normal**

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



**St. Mary & Milk Basins
Streamflow Forecasts - February 1, 2016**

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

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	69	78	84	87%	90	99	97
	APR-SEP	83	92	98	88%	104	113	112
St. Mary R nr Babb ²	APR-JUL	245	285	315	85%	345	385	370
	APR-SEP	295	335	365	86%	395	435	425
St. Mary R at Intl Boundary ²	APR-JUL	260	320	360	83%	400	460	435
	APR-SEP	315	375	415	82%	455	515	505
Milk R at Western Crossing of Intl Bndry, AB	MAR-SEP	11.8	18.9	27	82%	38	54	32.77
Milk R at Eastern Crossing of Intl Bndry								

- 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
- 3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Sherburne	32.9	53.5	28.5	64.3
Fresno Res	57.0	70.2	41.7	127.0
Nelson Res	41.4	45.9	31.5	66.8
Basin-wide Total	131.3	169.5	101.7	258.1
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
ST. MARY	3	79	77
BEARPAW MOUNTAINS	3	71	92
CYPRESS HILLS, CANADA	6	39	93
MILK RIVER BASIN	9	52	93
ST. MARY & MILK BASINS	12	69	83

Upper Yellowstone River Basin



Conditions vary greatly across the greater Upper Yellowstone River basin but all of the basins have one thing in common, they all experienced almost two and a half weeks without snow during the end of December until mid-January. Once a pattern change occurred during mid-January the moist westerly and southwesterly flow favored the western and southern halves of the basin, stopping the slow decline of basin percentages. Sub-basins in the eastern half of the river basin were left high and dry as the Beartooth Plateau sucked the moisture from the storms before it could fall on eastern basins. The Upper Yellowstone above Livingston, Clark's Fork of the Yellowstone and Shields River basins are currently the highest in terms of basin snow water equivalent, 90%, 93% and 101%, respectively. As you move east basin percentages decline with the Boulder-Stillwater reporting 83% of normal and Red Lodge-Rock Creek reporting 62% for Feb 1st. Overall the basin is currently 90% of normal for Feb 1st, and 81% of last year at this time. Spring precipitation makes up a substantial percentage of the total snowpack in the east facing basins in the Upper Yellowstone, so hopefully the transition to spring will help to bring the snowpack totals up before snowmelt begins.

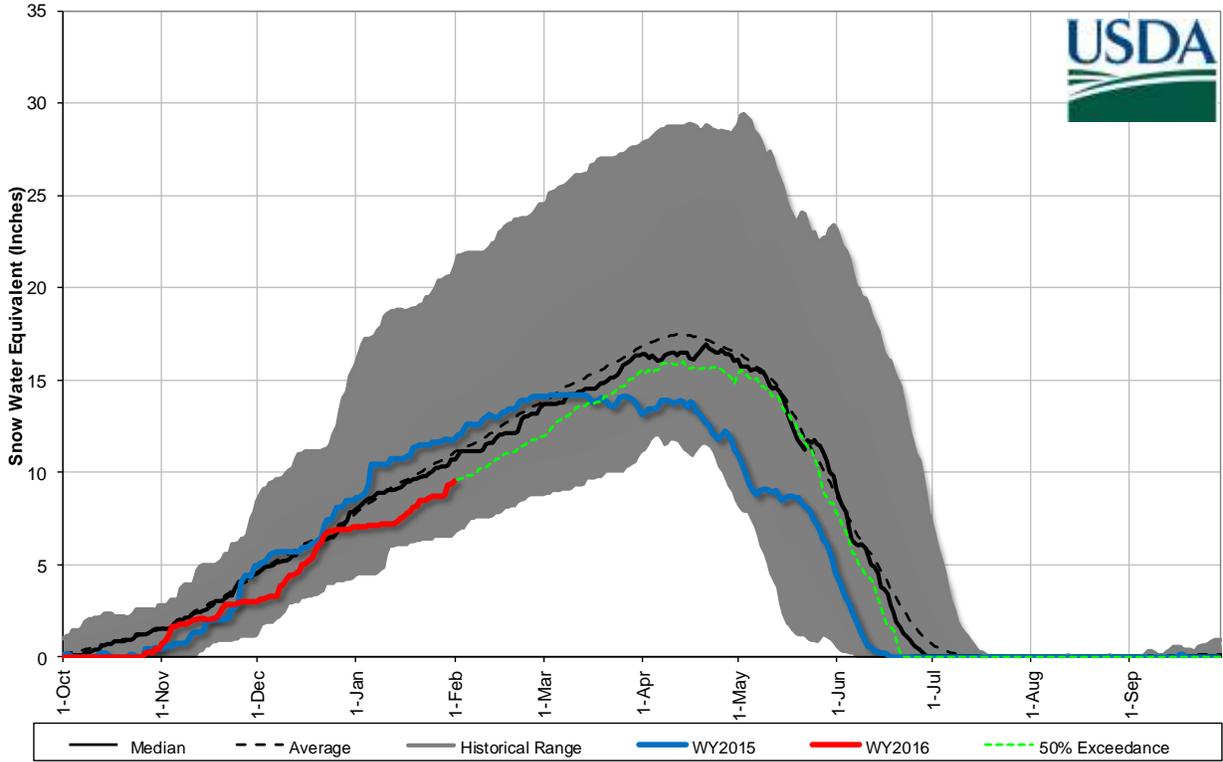
Monthly precipitation in the mountains mimics the snowfall trend and decreases from west to east and was below normal for the month at 77% of average overall. Valley precipitation in the region was well below average reporting only 36% of average for the month. Early season rain and snowfall at mountain and valley locations has assisted in keeping the water year totals closer to average with mountain locations reporting 97% of average for Oct 1st to current, and valley locations reporting 128%.

Reservoir storage was reported as well above average for the date with Mystic Lake reporting 128% and Cooney Reservoir reporting 143%.

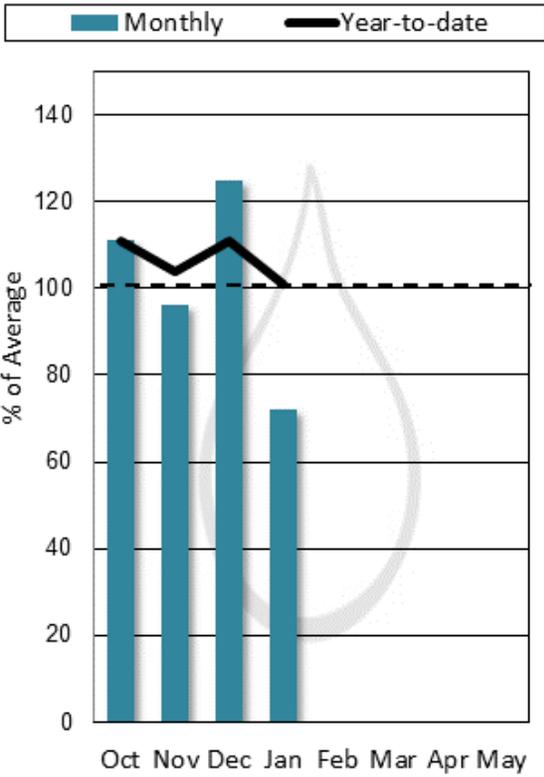
Streamflow forecasts for February 1st should be used knowing 50 to 65% of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50% exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflow forecasts for the 50% exceedance are 92% of average for the April-July time period.

Upper Yellowstone River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	90%	111%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	76%	97%	105%
Valley Precipitation	33%	131%	98%
Basin Precipitation	72%	101%	104%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	139%	65%	127%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	92%	105%	87%
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current			
**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.			

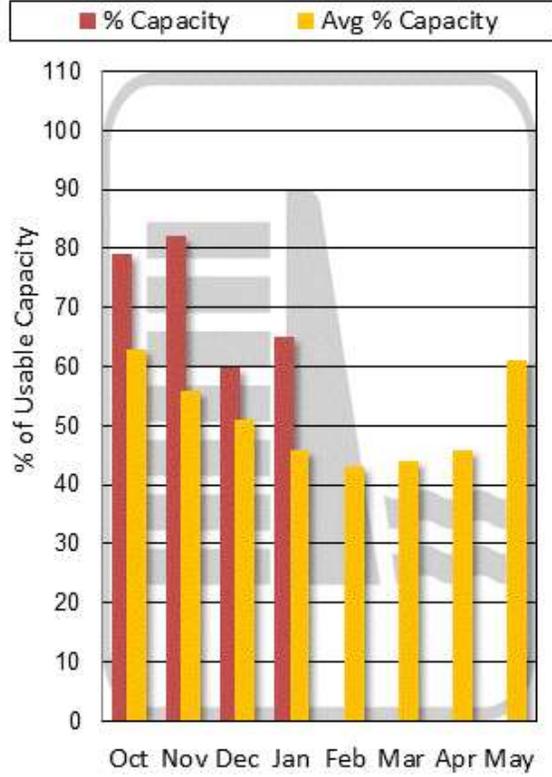
Upper Yellowstone River Basin Snowpack with Non-Exceedance Projections
Based on provisional SNOTEL daily data as of 2/1/2016



Mountain and Valley Precipitation

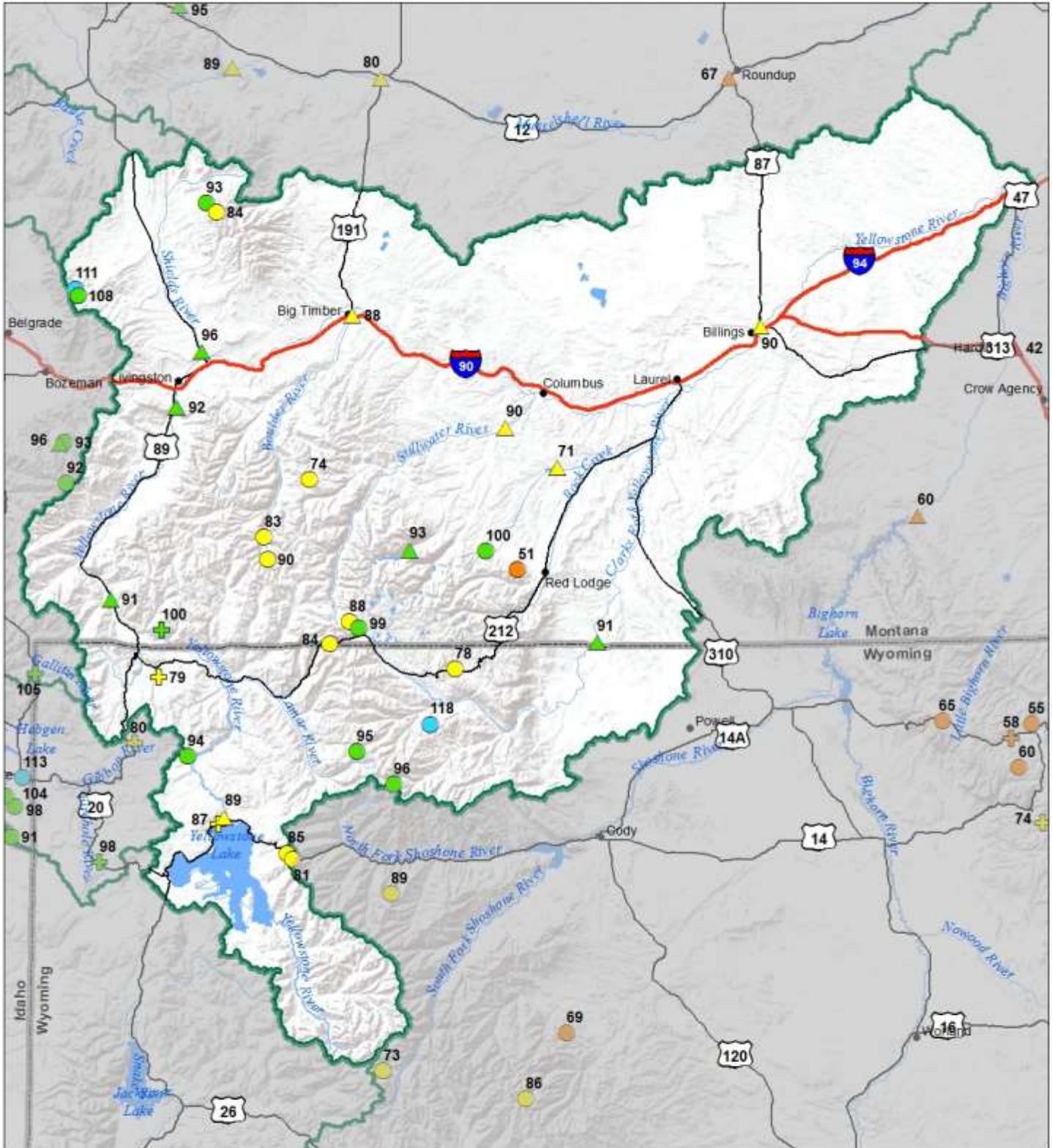


End of Month Reservoir Storage



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

Upper Yellowstone River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%
- *

Snowcourse

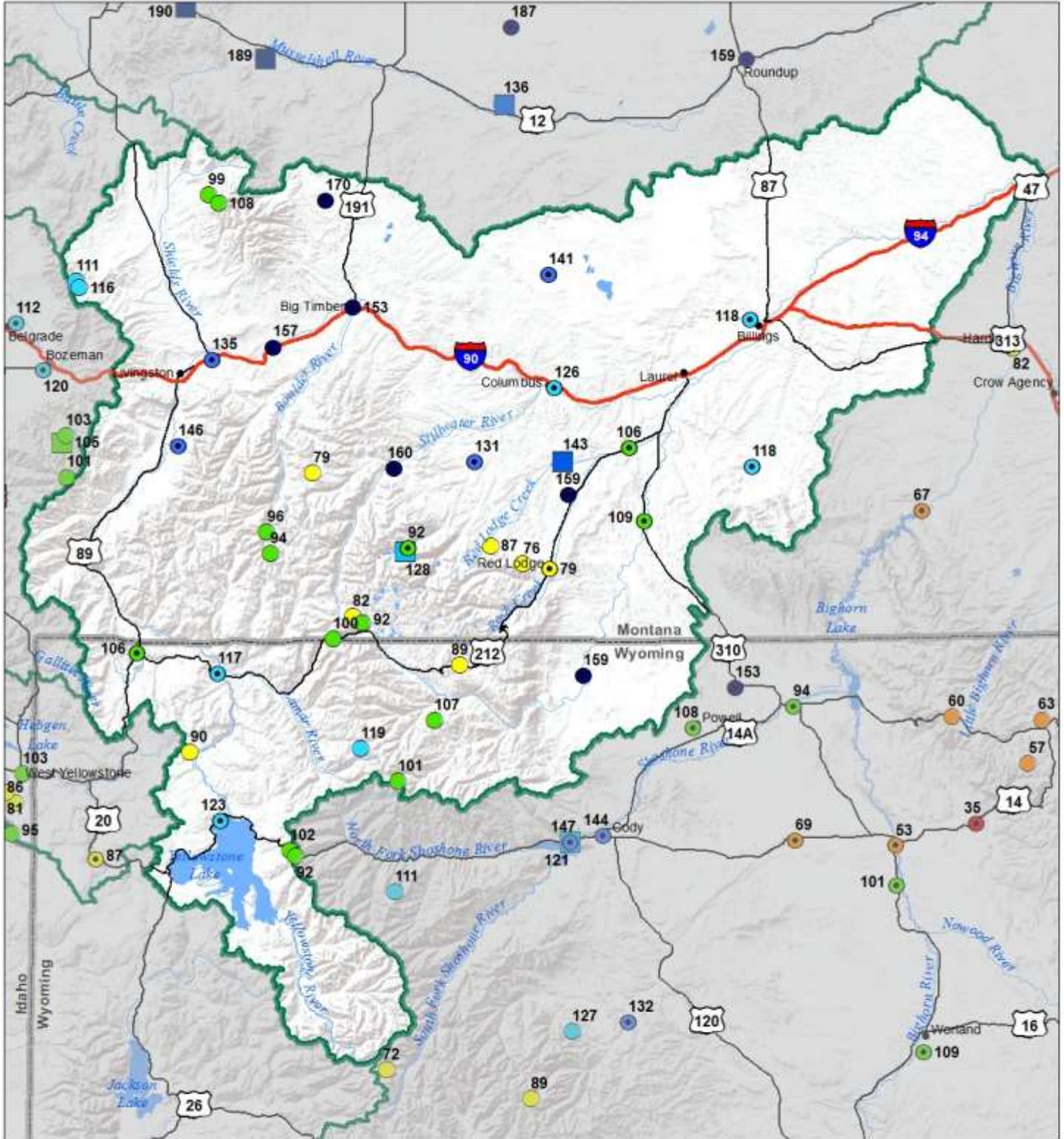
- ⊕ > 150%
- ⊕ 131 - 150%
- ⊕ 111 - 130%
- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

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 February 1, 2016



Precipitation Percent of Normal

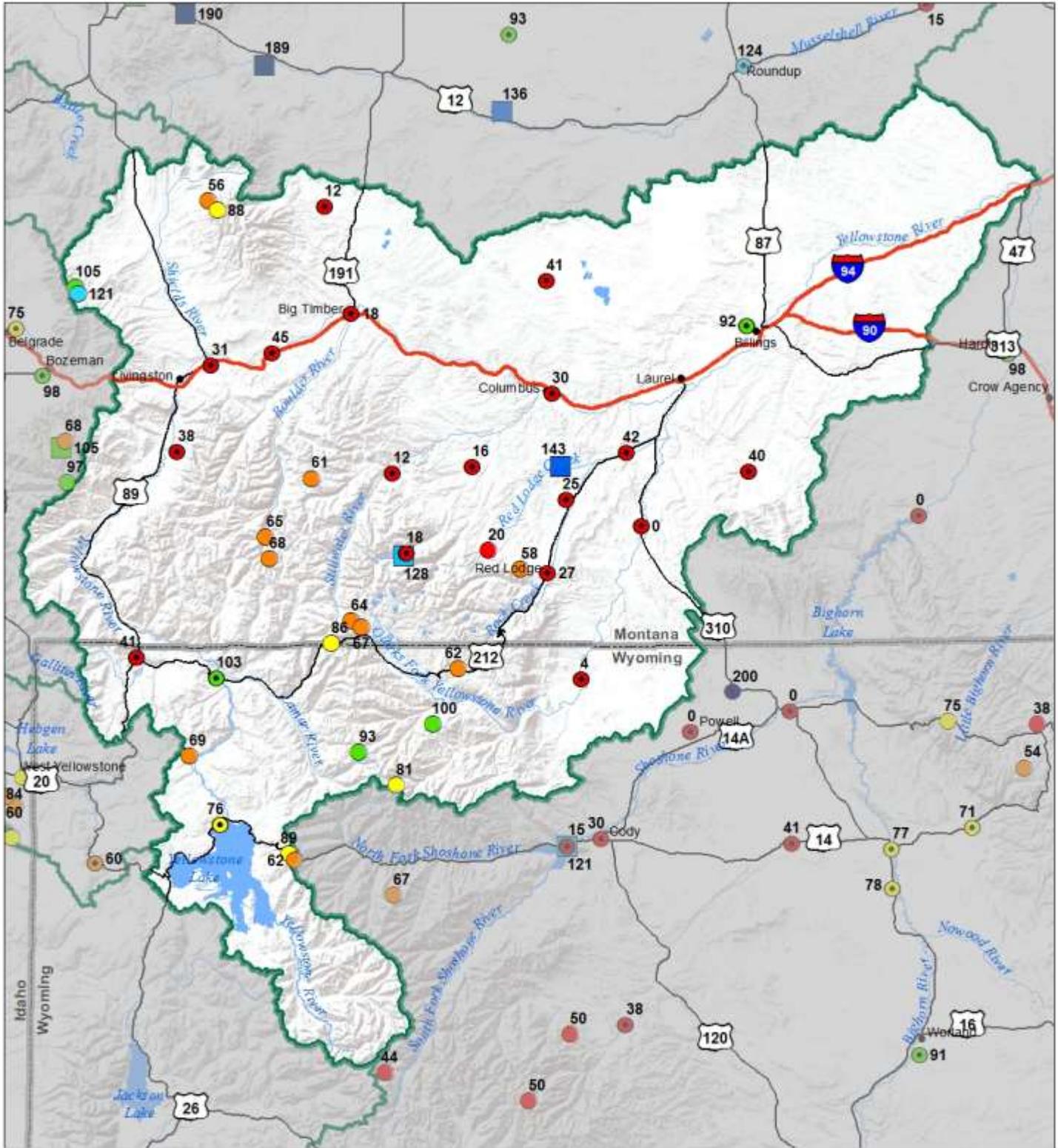
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



**Upper Yellowstone River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
February 1, 2016 (January 1, 2016 - February 1, 2016)**



**Precipitation
Percent of Normal**

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

COOP/ACIS

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

- 71 - 90%
- 51 - 70%
- 1 - 50%

**Reservoirs
Percent of Normal**

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



Upper Yellowstone River Basin Streamflow Forecasts - February 1, 2016

Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

UPPER YELLOWSTONE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Yellowstone R at Yellowstone Lake Outlet	APR-JUL	415	480	520	90%	560	625	575
	APR-SEP	550	630	685	89%	740	820	770
Yellowstone R at Corwin Springs	APR-JUL	1210	1360	1470	92%	1580	1730	1590
	APR-SEP	1410	1590	1720	91%	1850	2030	1880
Yellowstone R at Livingston	APR-JUL	1350	1550	1680	93%	1810	2000	1800
	APR-SEP	1590	1810	1970	92%	2120	2350	2140
Shields R nr Livingston	APR-JUL	47	93	125	97%	157	205	129
	APR-SEP	52	102	137	96%	172	220	143
Boulder R at Big Timber	APR-JUL	179	220	250	89%	275	315	280
	APR-SEP	186	230	265	88%	295	340	300
Mystic Lake Inflow ²	APR-JUL	47	52	55	93%	58	63	59
	APR-SEP	58	65	69	93%	73	80	74
Stillwater R nr Absarokee ²	APR-JUL	305	365	405	91%	445	505	445
	APR-SEP	360	425	470	90%	515	585	520
Clarks Fk Yellowstone R nr Belfry	APR-JUL	375	430	465	91%	500	555	510
	APR-SEP	405	460	500	91%	540	595	550
Cooney Reservoir Inflow	APR-JUL	5.3	17.6	26	68%	34	47	38
	APR-SEP	11.7	25	34	71%	43	56	48
Yellowstone R at Billings	APR-JUL	2150	2620	2930	91%	3250	3710	3230
	APR-SEP	2430	2980	3350	90%	3720	4260	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

3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Mystic Lake	6.8	7.5	5.3	21.0
Cooney Res	24.6	21.0	17.2	27.4
Basin-wide Total	31.4	28.6	22.5	48.4
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
YELLOWSTONE ab LIVINGSTON	13	90	110
SHIELDS	4	101	119
BOULDER-STILLWATER	3	83	109
RED LODGE-ROCK CREEK	2	62	99
CLARK'S FORK	7	93	119
UPPER YELLOWSTONE RIVER BASIN	26	90	111

Lower Yellowstone River Basin



Following a short lived snowy period just before the Christmas holiday, the Lower Yellowstone river basin accumulated just 0.5 inches of snow water from December 24th through January 16th. A couple of small storms returned the basin to normal accumulation rates in the latter half of January. Unfortunately, at this point in the winter, normal is not going to be enough to put the basin back on track to reach its typical peak snowpack. As of February 1, the snowpack in the basin was at just 68 percent of normal. In order for the basin to at least see a normal snowpack peak this spring, snow accumulation needs to be 143 percent of normal from now until mid to late April.

Conditions are somewhat variable across the basin with the west side being closer to normal conditions than the east side but all sub-basins coming in below normal for this time of year. The snowpack in the Shoshone river basin was at 89 percent of normal on February 1. This basin maintains the most snow in the Lower Yellowstone but a lack of snow in early January caused its snowpack percentage to drop this month. On the east side of the basin, the Powder and Tongue sub-basins continue to deal with exceptionally low snowpack's. The Powder's snowpack came in at 59 percent of normal and the Tongue was at 53 percent. These basins had 6 SNOTEL sites report record low snow water totals on February 1; there were also 2 snow courses that recorded the second lowest snow water values in over 55 years of observations.

Mountain precipitation in the Lower Yellowstone was well below normal for January; monthly totals ranged from 76 percent in the Shoshone to 51 percent in the Tongue. This led to a slight drop in water year to date precipitation this month, with February 1 readings at 72 percent of normal. Precipitation recorded in the basin valley paints a slightly rosier picture, at 87 percent of normal for the water year. Conditions in the Tongue river basin are anything but rosy; 5 out of 8 SNOTEL sites reported the lowest year to date precipitation in over 35 years of data and Burgess Junction SNOTEL recorded the lowest January precipitation in 36 years.

On a positive note, reservoir storage in the basin remains in good condition with totals hovering just above normal for this time of year; this may help alleviate water shortages this spring and summer.

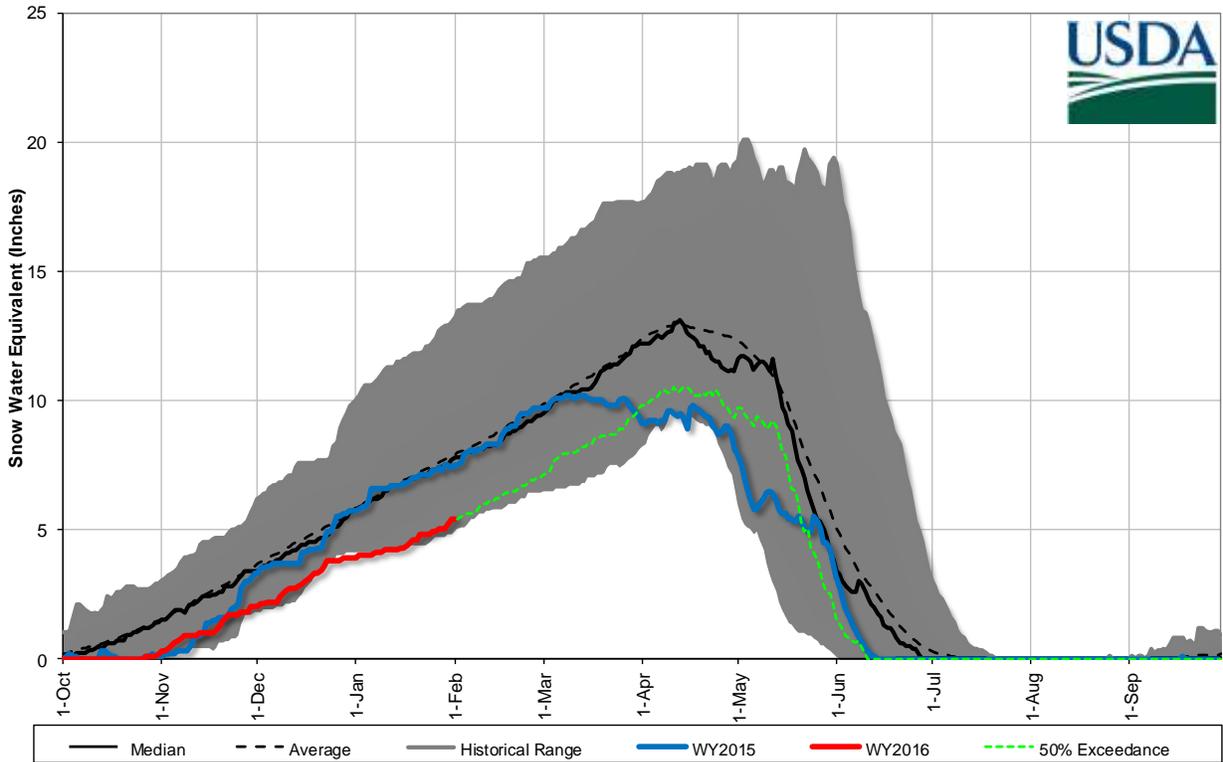
Streamflow forecasts for February 1 should be used knowing 50 to 65 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 74 percent of average for the April-July time period.

Lower Yellowstone River Basin Data Summary		2/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	68%	101%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	62%	72%	93%
Valley Precipitation	86%	87%	98%
Basin Precipitation	69%	78%	94%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	106%	63%	109%
	50 % Exceedance Forecast Percentage of Average	50 % Exceedance Forecast % of Last Year's Flows	Last Year Percentage of Average
Streamflow Forecast			
Basin-Wide Apr-July	74%	69%	108%

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

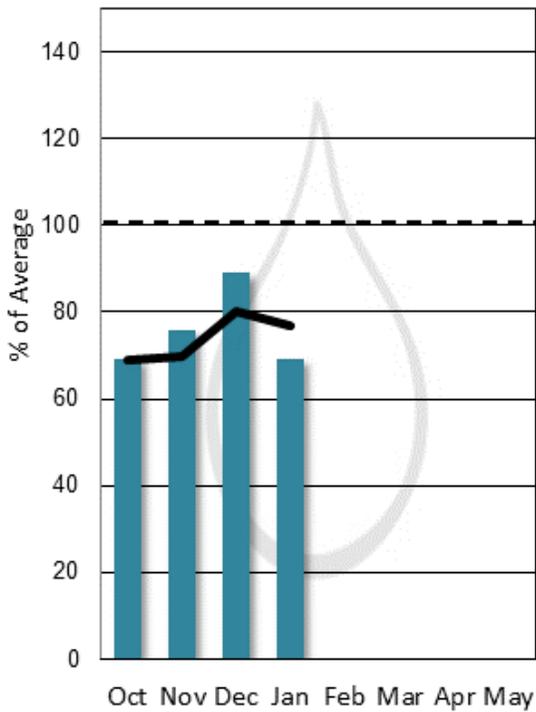
**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

Lower Yellowstone River Basin Snowpack with Non-Exceedance Projections
Based on provisional SNOTEL daily data as of 2/1/2016



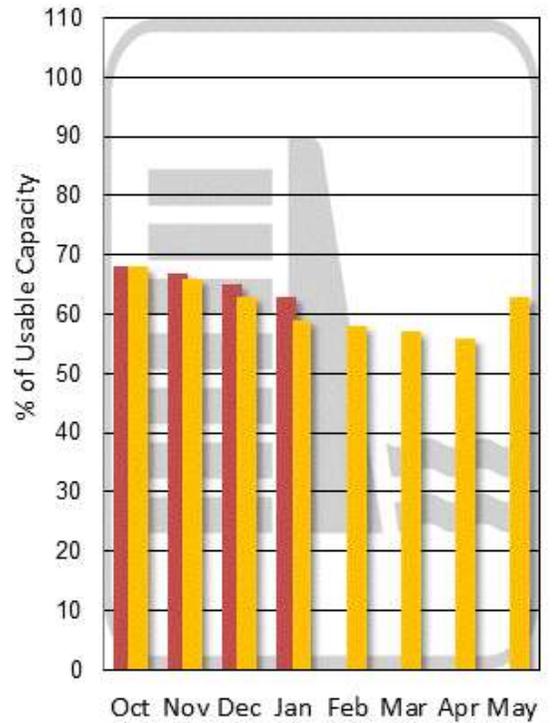
Mountain and Valley Precipitation

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



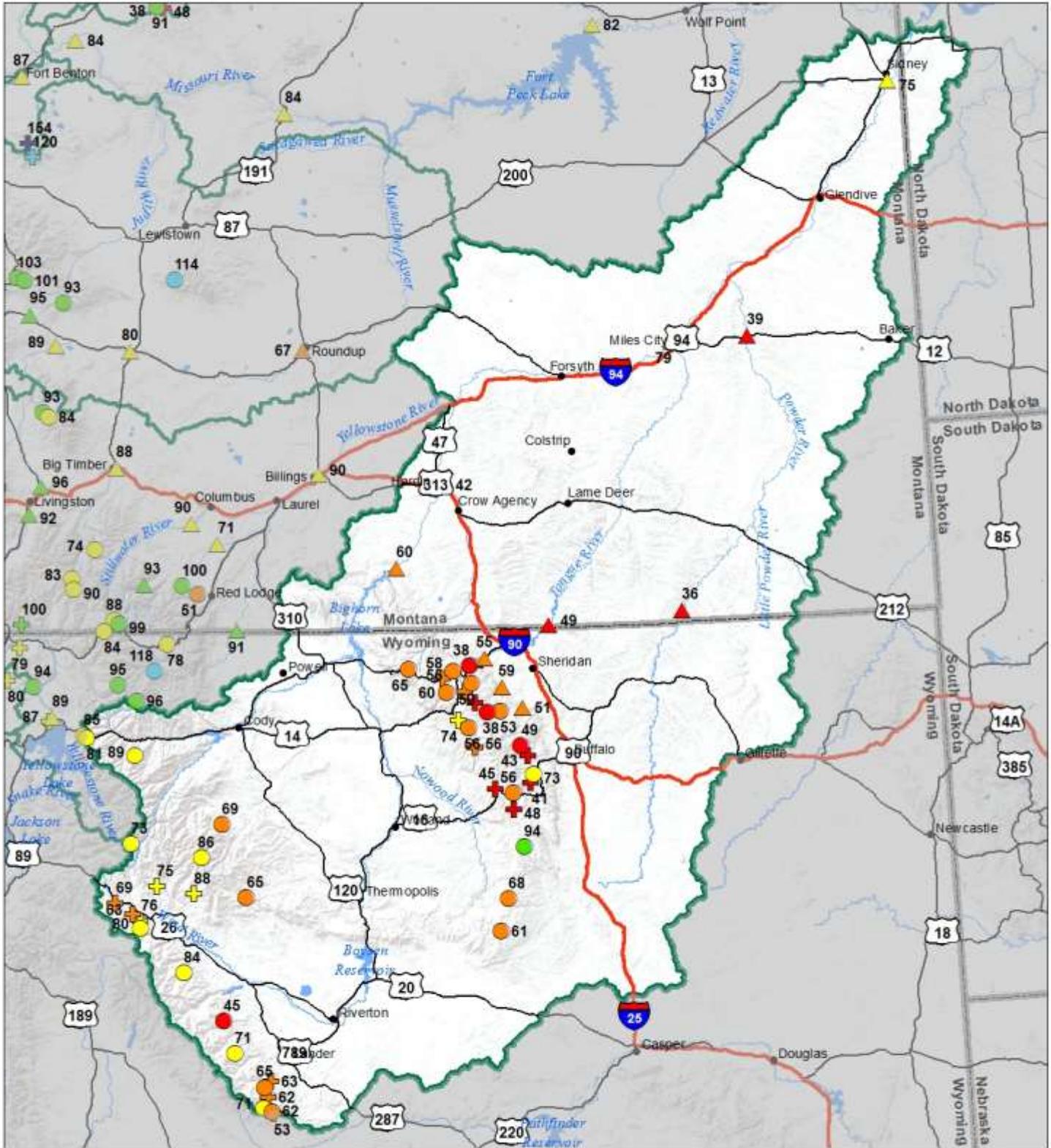
End of Month Reservoir Storage

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



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

Lower Yellowstone River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal February 1, 2016



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%

Snowcourse

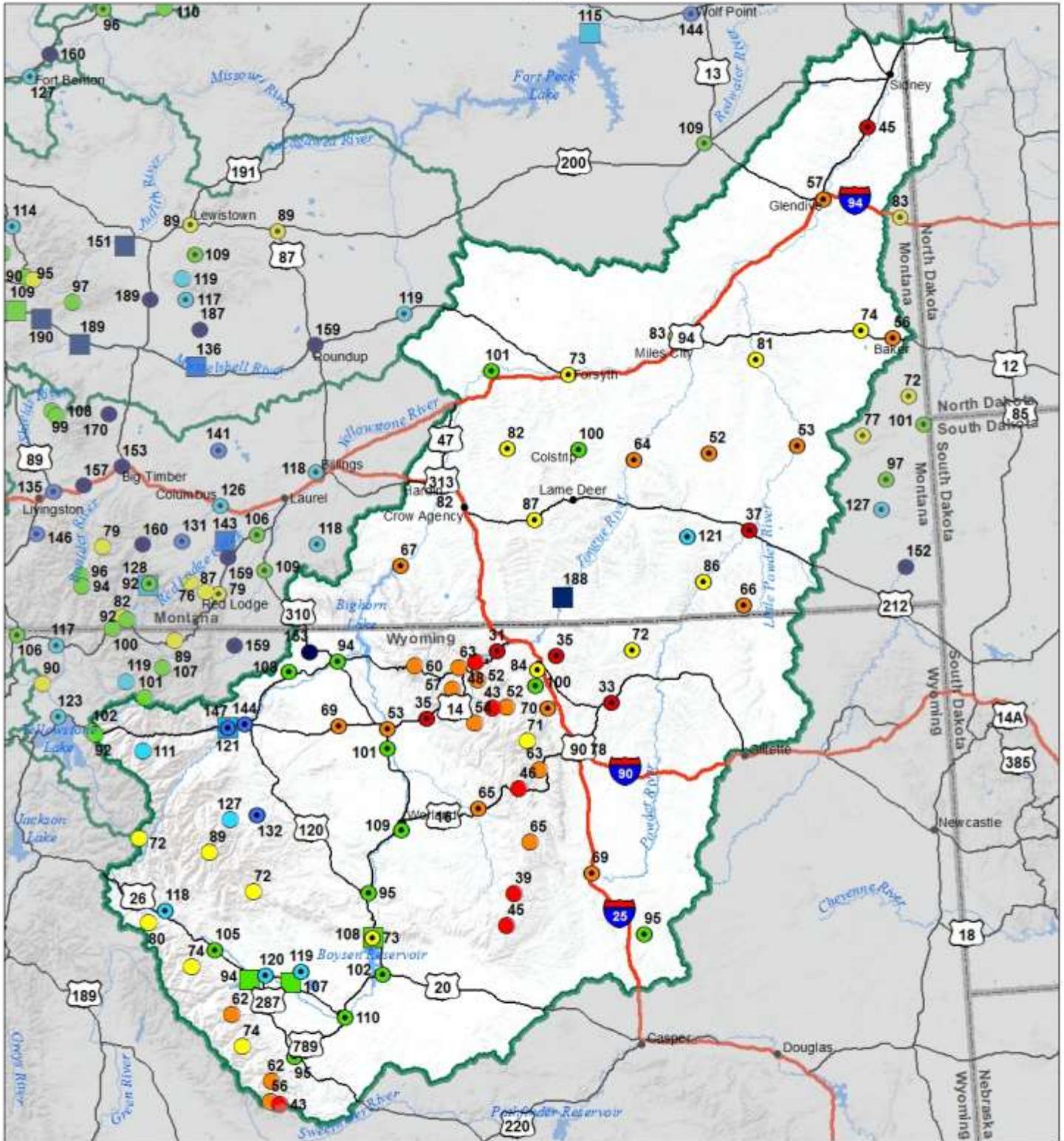
- ⊕ > 150%
- ⊕ 131 - 150%
- ⊕ 111 - 130%
- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ 0%

Streamflow Forecast Percent of Average Flows

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



Lower Yellowstone River Basin Water Year to Date Precipitation and Reservoir Levels Percentage of Normal February 1, 2016



Precipitation Percent of Normal

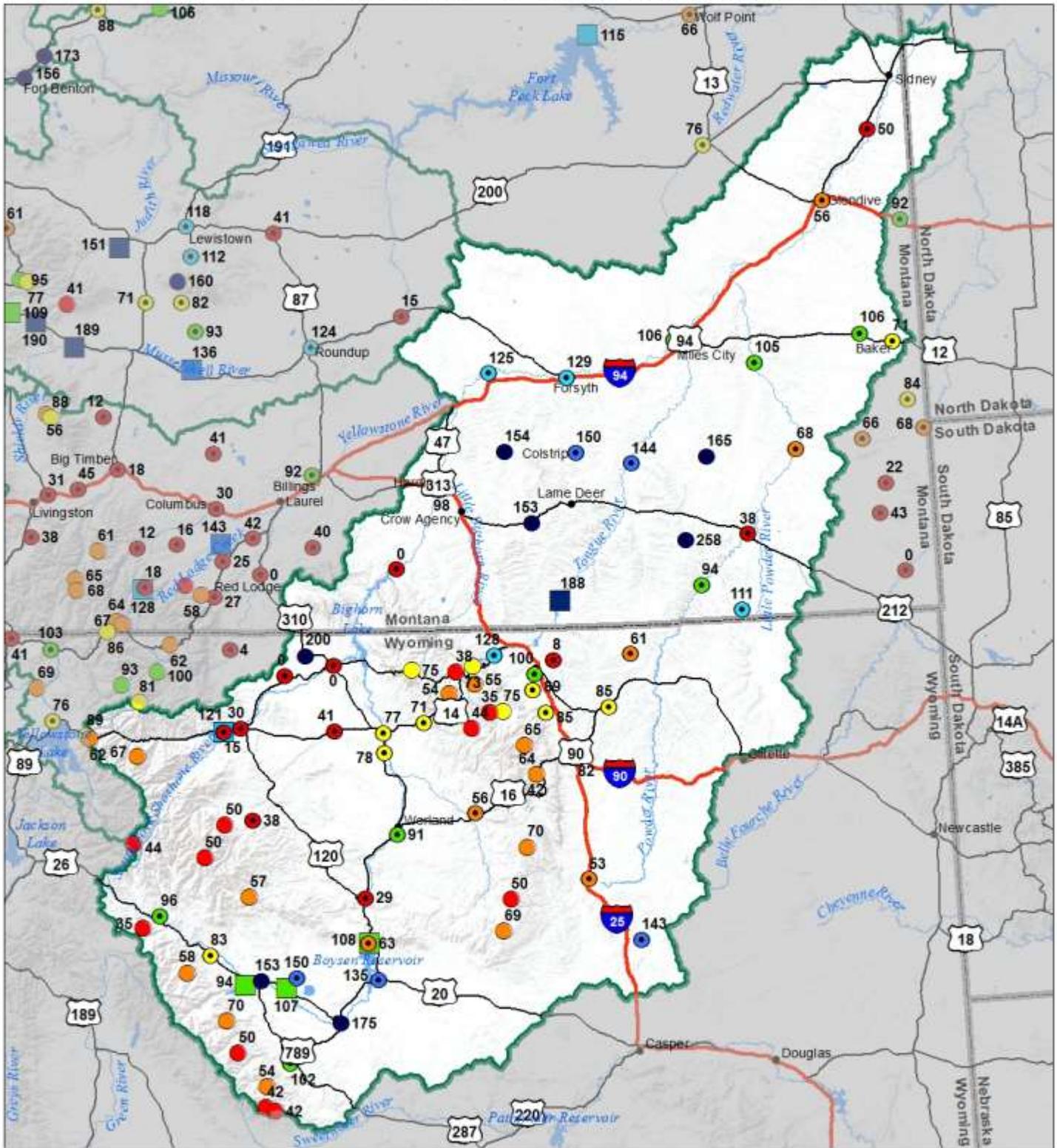
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



**Lower Yellowstone River Basin
Monthly Precipitation and Reservoir Levels
Percentage of Normal
February 1, 2016 (January 1, 2016 - February 1, 2016)**



**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 (Wyoming)
Streamflow Forecasts - February 1, 2016**

Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast

LOWER YELLOWSTONE RIVER BASIN (Wyoming)	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bighorn R nr St. Xavier ²	APR-JUL	275	640	890	64%	1140	1510	1380
	APR-SEP	193	595	870	60%	1150	1550	1460
Little Bighorn R nr Hardin	APR-JUL	-6.9	22	41	42%	60	89	98
	APR-SEP	-5.6	26	47	42%	68	100	111
Tongue R nr Dayton ²	APR-JUL	14.8	33	46	53%	59	77	86
	APR-SEP	20	40	54	55%	67	87	98
Big Goose Ck nr Sheridan	APR-JUL	5.8	17.2	25	54%	33	44	46
	APR-SEP	12.5	24	32	59%	40	52	54
Little Goose Ck nr Bighorn	APR-JUL	2.3	9.7	14.8	48%	19.8	27	31
	APR-SEP	7	14.9	20	51%	26	34	39
Tongue River Reservoir Inflow ²	APR-JUL	5	51	94	49%	137	200	193
	APR-SEP	5	61	106	49%	151	220	215
Yellowstone R at Miles City ²	APR-JUL	2410	3250	3830	80%	4400	5240	4780
	APR-SEP	2620	3610	4280	79%	4960	5950	5450
Powder R at Moorehead	APR-JUL	1	22	63	36%	104	163	177
	APR-SEP	1	28	70	36%	112	173	196
Powder R nr Locate	APR-JUL	1	15.3	78	39%	142	235	199
	APR-SEP	1	18.7	85	39%	152	250	220
Yellowstone R nr Sidney ²	APR-JUL	2120	3070	3720	77%	4370	5320	4830
	APR-SEP	2150	3280	4050	75%	4820	5950	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
- 3) Median value used in place of average

Reservoir Storage End of January, 2016	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bighorn Lake	852.7	877.5	825.9	1356.0
Tongue River Res	50.2	51.0	26.7	79.1
Basin-wide Total	902.8	928.5	852.6	1435.1
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2016	# of Sites	% Median	Last Year % Median
WIND RIVER (Wyoming)	18	72	94
SHOSHONE RIVER (Wyoming)	4	89	105
BIGHORN RIVER (Wyoming)	18	73	106
LITTLE BIGHORN (Wyoming)	3	60	100
TONGUE RIVER (Wyoming)	9	53	96
POWDER RIVER (Wyoming)	9	59	113
LOWER YELLOWSTONE RIVER BASIN (Wyoming)	46	68	101

Data Summary (SNOTEL and Snowcourse)

Site Name	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Albro Lake	SNOTEL	8300	40	10.4	11.0	95	9.0	82
Ambrose	SC	6480						
Arch Falls	SC	7350						
Ashley Divide	SC	4820	17	3.0	4.5	67	3.8	84
Badger Pass	SNOTEL	6900	51	14.2	19.5	73	20.5	105
Banfield Mountain	SNOTEL	5600	43	10.0	12.1	83	7.9	65
Baree Creek	SC	5500						
Baree Midway	SC	4600						
Baree Trail	SC	3800						
Barker Lakes	SNOTEL	8250	37	9.8	8.0	123	8.3	104
Basin Creek	SNOTEL	7180	28	7.1	4.5	158	5.4	120
Bassoo Peak	SC	5150						
Beagle Springs	SNOTEL	8850	32	6.9	5.2	133	5.0	96
Bear Basin	SC	8150						
Bear Mountain	SNOTEL	5400	97	28.9	36.6	79	19.0	52
Beartooth Lake	SNOTEL	9360	50	10.9	13.9	78	15.7	113
Beaver Creek	SNOTEL	7850	44	10.3	11.5	90	10.0	87
Big Snowy	SC	7150						
Bisson Creek	SNOTEL	4920	23	6.0	6.3	95	8.1	129
Black Bear	SNOTEL	8170	77	21.1	23.3	91	20.5	88
Black Mountain	SC	7750						
Black Pine	SNOTEL	7210	25	5.9	6.2	95	8.5	137
Blacktail	SC	5650	31	7.7	8.8	88	7.9	90
Blacktail Mtn	SNOTEL	5650	33	8.3			7.7	
Bloody Dick	SNOTEL	7600	39	8.8	7.6	116	8.4	111
Bots Sots	SC	7750						
Boulder Mountain	SNOTEL	7950	50	13.4	12.6	106	11.3	90
Box Canyon	SNOTEL	6670	24	4.8	5.8	83	7.2	124
Boxelder Creek	SC	5100	10	2.1	4.4	48	4.8	109
Brackett Creek	SNOTEL	7320	51	12.7	11.4	111	16.5	145
Bristow Creek	SC	3900						
Brush Creek Timber	SC	5000						
Bull Mountain	SC	6600						
Burnt Mtn	SNOTEL	5880	12	2.4	2.4	100	3.7	154
Cabin Creek	SC	5200						
Calvert Creek	SNOTEL	6430	29	6.6	5.5	120	7.3	133
Camp Senia	SC	7890						
Canyon	SNOTEL	7870	37	7.7	8.2	94	8.8	107
Carrot Basin	SNOTEL	9000	61	14.9	16.7	89	13.9	83
Chessman Reservoir	SC	6200	21	4.9	2.1	233	5.2	248
Chicago Ridge	SC	5800	67	20.0			17.2	
Chicken Creek	SC	4060	36	8.7	10.8	81	11.7	108
Clover Meadow	SNOTEL	8600	39	9.1	10.3	88	7.3	71
Cole Creek	SNOTEL	7850	21	4.3	8.4	51	7.0	83
Combination	SNOTEL	5600	12	3.3	3.0	110	2.7	90
Copper Bottom	SNOTEL	5200	14	3.2			5.0	
Copper Camp	SNOTEL	6950	51	16.4			26.7	
Copper Mountain	SC	7700	31	7.8	6.2	126	8.0	129
Cottonwood Creek	SC	6400						
Coyote Hill	SC	4200	22	5.0	6.0	83	7.2	120
Crevice Mountain	SC	8400	27	6.0	6.0	100	7.3	122

Site Name	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Crystal Lake	SNOTEL	6050	36	8.5	7.4	115	7.6	103
Dad Creek Lake	SC	8800						
Daisy Peak	SNOTEL	7600	24	5.5	5.9	93	6.8	115
Daly Creek	SNOTEL	5780	30	6.4	6.6	97	7.7	117
Darkhorse Lake	SNOTEL	8600	74	20.5	17.6	116	22.5	128
Deadman Creek	SNOTEL	6450	27	6.7	6.5	103	9.1	140
Desert Mountain	SC	5600						
Discovery Basin	SC	7050	25	6.2	5.9	105	8.8	149
Divide	SNOTEL	7800	30	6.4	6.2	103	4.6	74
Dix Hill	SC	6400	28	6.8	6.6	103	6.1	92
Dupuyer Creek	SNOTEL	5750	6	1.8	5.0	36	2.7	54
Eagle Creek	SC	7000						
East Boulder Mine	SNOTEL	6335	11	2.5			1.6	
El Dorado Mine	SC	7800						
Elk Horn Springs	SC	7800						
Elk Peak	SNOTEL	7600	51	16.5			14.0	
Elk Peak	SC	8000						
Emery Creek	SNOTEL	4350	35	9.9	9.5	104	11.0	116
Fatty Creek	SC	5500						
Fish Creek	SC	8000			5.5		6.2	113
Fisher Creek	SNOTEL	9100	66	18.2	20.6	88	22.2	108
Flattop Mtn.	SNOTEL	6300	83	24.2	28.5	85	24.2	85
Fleecer Ridge	SC	7500						
Foolhen	SC	8280						
Forest Lake	SC	6400						
Four Mile	SC	6900						
Freight Creek	SC	6000						
Frohner Meadow	SNOTEL	6480	27	5.5	4.5	122	5.9	131
Garver Creek	SNOTEL	4250	25	6.9	6.8	101	5.0	74
Gibbons Pass	SC	7100						
Goat Mountain	SC	7000						
Government Saddle	SC	5270	64	16.8			14.6	
Grave Creek	SNOTEL	4300	26	7.2	10.9	66	10.1	93
Griffin Creek Divide	SC	5150						
Hand Creek	SNOTEL	5035	29	6.7	7.7	87	5.9	77
Hawkins Lake	SNOTEL	6450	65	17.0	16.1	106	11.8	73
Haymaker	SC	8050						
Hebgen Dam	SC	6550	30	6.9	6.8	101	7.4	109
Hell Roaring Divide	SC	5770	62	16.5	19.9	83	17.3	87
Herrig Junction	SC	4850	49	13.0	17.6	74	16.1	91
Highwood Divide	SC	5650	23	4.9	4.1	120	2.0	49
Highwood Station	SC	4600	20	4.3	2.8	154	2.5	89
Holbrook	SC	4530			6.0		6.1	102
Hoodoo Basin	SNOTEL	6050	79	22.6	26.3	86	20.2	77
Humboldt Gulch	SNOTEL	4250		8.1	8.6	94	8.0	93
Jakes Canyon	SC	9040						
Johnson Park	SC	6450			3.4		4.9	144
Kishenehn	SC	3890						
Kraft Creek	SNOTEL	4750	26	6.9			8.2	
Lake Camp	SC	7780	26	5.2	6.0	87	6.6	110
Lakeview Canyon	SC	6930						
Lakeview Ridge	SNOTEL	7400	27	6.0	6.5	92	3.8	58
Lemhi Ridge	SNOTEL	8100	38	8.3	6.4	130	7.5	117

Site Name	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Lick Creek	SNOTEL	6860	25	5.5	5.9	93	5.9	100
Little Park	SC	7400						
Logan Creek	SC	4300						
Lolo Pass	SNOTEL	5240	64	15.7	18.7	84	16.8	90
Lone Mountain	SNOTEL	8880	41	10.6	11.2	95	8.8	79
Lookout	SNOTEL	5140	56	14.7	19.4	76	10.5	54
Lower Twin	SNOTEL	7900	44	11.3	11.0	103	10.0	91
Lubrecht Flume	SNOTEL	4680	16	3.7	3.8	97	5.7	150
Lubrecht Forest No 3	SC	5450	14	2.7	3.2	84	4.8	150
Lubrecht Forest No 4	SC	4650	9	1.8	1.8	100	2.2	122
Lubrecht Forest No 6	SC	4040	15	2.8	2.0	140	3.3	165
Lubrecht Hydroplot	SC	4200	16	3.0	3.2	94	5.6	175
Lupine Creek	SC	7380	23	3.8	4.8	79	5.5	115
Madison Plateau	SNOTEL	7750	54	13.8	14.1	98	12.6	89
Many Glacier	SNOTEL	4900	18	4.9	9.5	52	4.9	52
Marias Pass	SC	5250	22	5.0	10.6	47	6.6	62
Mineral Creek	SC	4000						
Monument Peak	SNOTEL	8850	46	10.8	12.0	90	13.4	112
Moss Peak	SNOTEL	6780	83	22.5	21.7	104	28.5	131
Moulton Reservoir	SC	6850			4.2		7.0	167
Mount Allen No 7	SC	5700						
Mount Lockhart	SNOTEL	6400	31	8.8	12.2	72	12.5	102
Mudd Lake	SC	7650						
Mule Creek	SNOTEL	8300	40	9.5	8.8	108	10.9	124
N Fk Elk Creek	SNOTEL	6250	28	6.1	6.7	91	8.5	127
Nevada Ridge	SNOTEL	7020	34	8.0	8.6	93	11.2	130
New World	SC	6900			7.8			
Nez Perce Camp	SNOTEL	5650	26	8.3	8.6	97	9.9	115
Noisy Basin	SNOTEL	6040	97	29.1	25.4	115	29.7	117
Norris Basin	SC	7550	23	5.2	6.5	80	6.0	92
North Fork Jocko	SNOTEL	6330	82	21.1	27.1	78	28.2	104
Northeast Entrance	SNOTEL	7350	26	5.4	6.4	84	8.5	133
Onion Park	SNOTEL	7410	34	8.1	7.9	103	9.5	120
Ophir Park	SC	7150	36	8.6	8.7	99	9.1	105
Parker Peak	SNOTEL	9400	54	12.4	13.0	95	16.4	126
Peterson Meadows	SNOTEL	7200	31	7.4	5.5	135	7.8	142
Pickfoot Creek	SNOTEL	6650	30	7.3	6.5	112	7.3	112
Pike Creek	SNOTEL	5930	16	4.3			2.5	
Pipestone Pass	SC	7200	21	6.6	2.4	275	4.2	175
Placer Basin	SNOTEL	8830	38	7.8	10.5	74	10.2	97
Poorman Creek	SNOTEL	5100	61	18.2	23.4	78	14.2	61
Porcupine	SNOTEL	6500	16	3.8	4.1	93	3.2	78
Potomageton Park	SC	7150						
Revais	SC	4800						
Rock Creek Mdws	SC	3400					8.8	
Rocker Peak	SNOTEL	8000	36	8.3	8.2	101	9.8	120
Rocky Boy	SNOTEL	4700	15	2.9	3.2	91	4.2	131
Roland Summit	SC	5120						
S Fork Shields	SNOTEL	8100	30	7.7	9.2	84	9.0	98
Sacajawea	SNOTEL	6550	39	9.6	8.9	108	11.4	128
Saddle Mtn.	SNOTEL	7940	56	17.1	15.8	108	19.1	121
Short Creek	SNOTEL	7000	19	4.3	3.6	119	2.8	78
Shower Falls	SNOTEL	8100	49	11.1	12.1	92	12.0	99

Site Name	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Skalkaho Summit	SNOTEL	7250	48	12.3	14.0	88	15.0	107
Sleeping Woman	SNOTEL	6150	33	7.6	9.6	79	9.8	102
Slide Rock Mountain	SC	7100						
Spotted Bear								
Mountain	SC	7000	21	5.5	8.7	63	7.3	84
Spur Park	SNOTEL	8100	50	12.9	12.8	101	15.3	120
Stahl Peak	SNOTEL	6030	78	24.0	22.1	109	19.1	86
Stemple Pass	SC	6600						
Storm Lake	SC	7780	33	8.0	7.4	108	9.2	124
Stringer Creek	SNOTEL	6550	34	7.0	6.7	104	7.8	116
Stryker Basin	SC	6180	69	19.4	19.6	99	19.1	97
Stuart Mountain	SNOTEL	7400	71	17.8	20.4	87	23.4	115
Taylor Road	SC	4080	9	2.0	2.2	91	0.0	0
Ten Mile Lower	SC	6600	26	5.9	4.0	148	6.7	168
Ten Mile Middle	SC	6800	29	6.6	6.0	110	7.4	123
Tepee Creek	SNOTEL	8000	40	9.5	8.5	112	7.5	88
Timberline Creek	SC	8850						
Tizer Basin	SNOTEL	6880	23	5.5	6.0	92	5.9	98
Trinkus Lake	SC	6100		23.9	25.2	95	28.4	113
Truman Creek	SC	4060	11	2.3	2.9	79	2.4	83
Twelvemile Creek	SNOTEL	5600	41	10.2	11.0	93	11.0	100
Twenty-One Mile	SC	7150	42	10.5	10.0	105	7.4	74
Twin Lakes	SNOTEL	6400	75	22.0	24.9	88	27.5	110
Upper Holland Lake	SC	6200	50	11.7	20.6	57	19.6	95
Waldron	SNOTEL	5600	16	3.9	6.6	59	5.9	89
Warm Springs	SNOTEL	7800	53	11.6	12.3	94	16.2	132
Weasel Divide	SC	5450	54	14.3	20.6	69	14.8	72
West Yellowstone	SNOTEL	6700	35	8.0	7.0	114	6.2	89
Whiskey Creek	SNOTEL	6800	42	9.0	9.6	94	8.3	86
White Elephant	SNOTEL	7710	59	16.5	16.0	103	13.3	83
White Mill	SNOTEL	8700	52	14.5	14.6	99	18.3	125
Wolverine	SNOTEL	7650	34	8.4	7.1	118	9.7	137
Wood Creek	SNOTEL	5960	16	3.5	5.8	60	6.1	105
Wrong Creek	SC	5700						
Wrong Ridge	SC	6800						
Younts Peak	SNOTEL	8350	29	7.0	9.6	73		