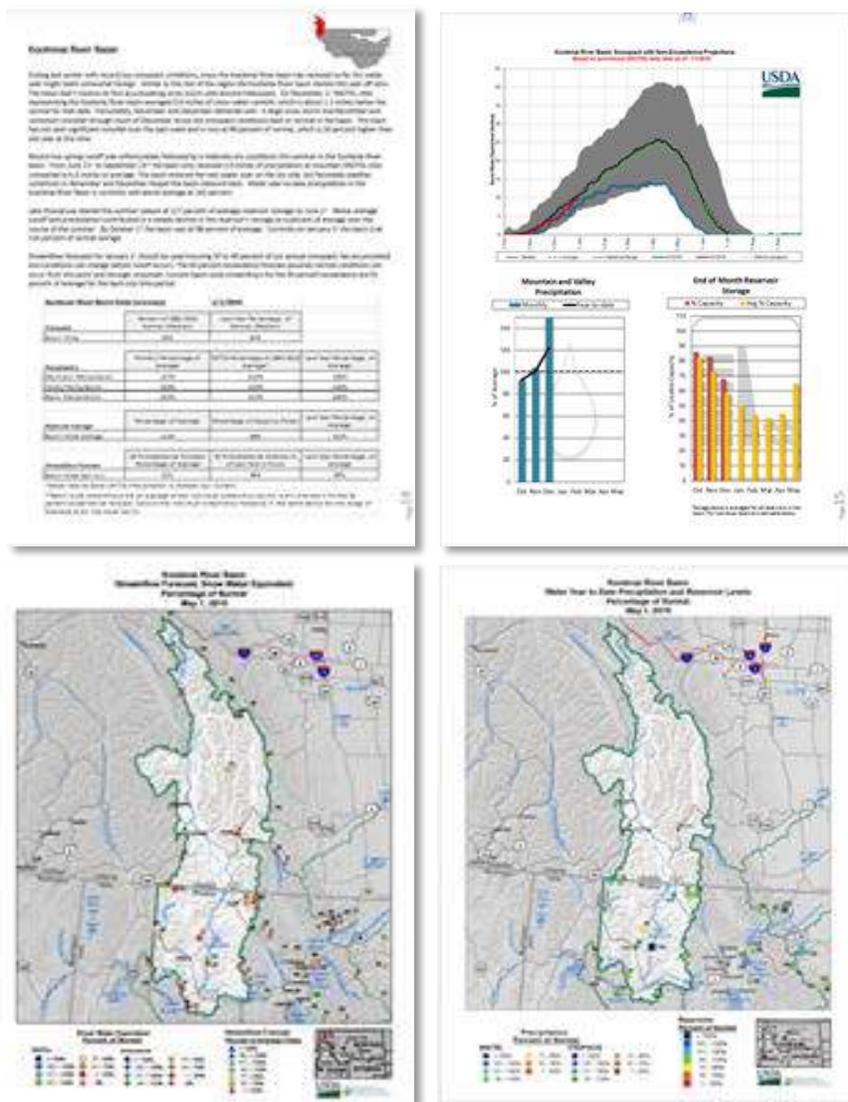


Montana

Water Supply Outlook Report

January 1st, 2016



The Montana Snow Survey staff has worked hard over the last few months to reformat the Water Supply Outlook Report in order to provide more information to our water users in the state. We are pleased to release the first report of 2016 in the new format which includes additional graphical information for snowpack, precipitation, reservoir and streamflow forecasts for all of the major river basins that feed Montana's rivers. The report still includes the targeted basin narratives that have always been delivered. Online versions of all the new maps can be found here: [Montana State Library](#). For comments or questions on the report please contact [Lucas Zukiewicz](#), water supply specialist.

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Montana Water Supply Outlook Report as of January 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

After a great deal of uncertainty around what strong El Nino would mean for Montana’s snowpack and precipitation this water year, the start to this winter felt eerily familiar with two holiday storms providing a substantial amount of our mountain snowpack.

West of the Divide the seasonal snow cover started at higher elevations during the last week of October and around mid-November at lower elevations. What looked like a promising storm during the first week of November dropped as substantial amount of rain at low elevations, in some areas up to 5” of precipitation, but unfortunately even the higher elevations received rain on the existing snowpack. East of the Divide where elevations are generally higher this storm dropped snow at most mountain elevations and marked the onset of the seasonal snowpack.

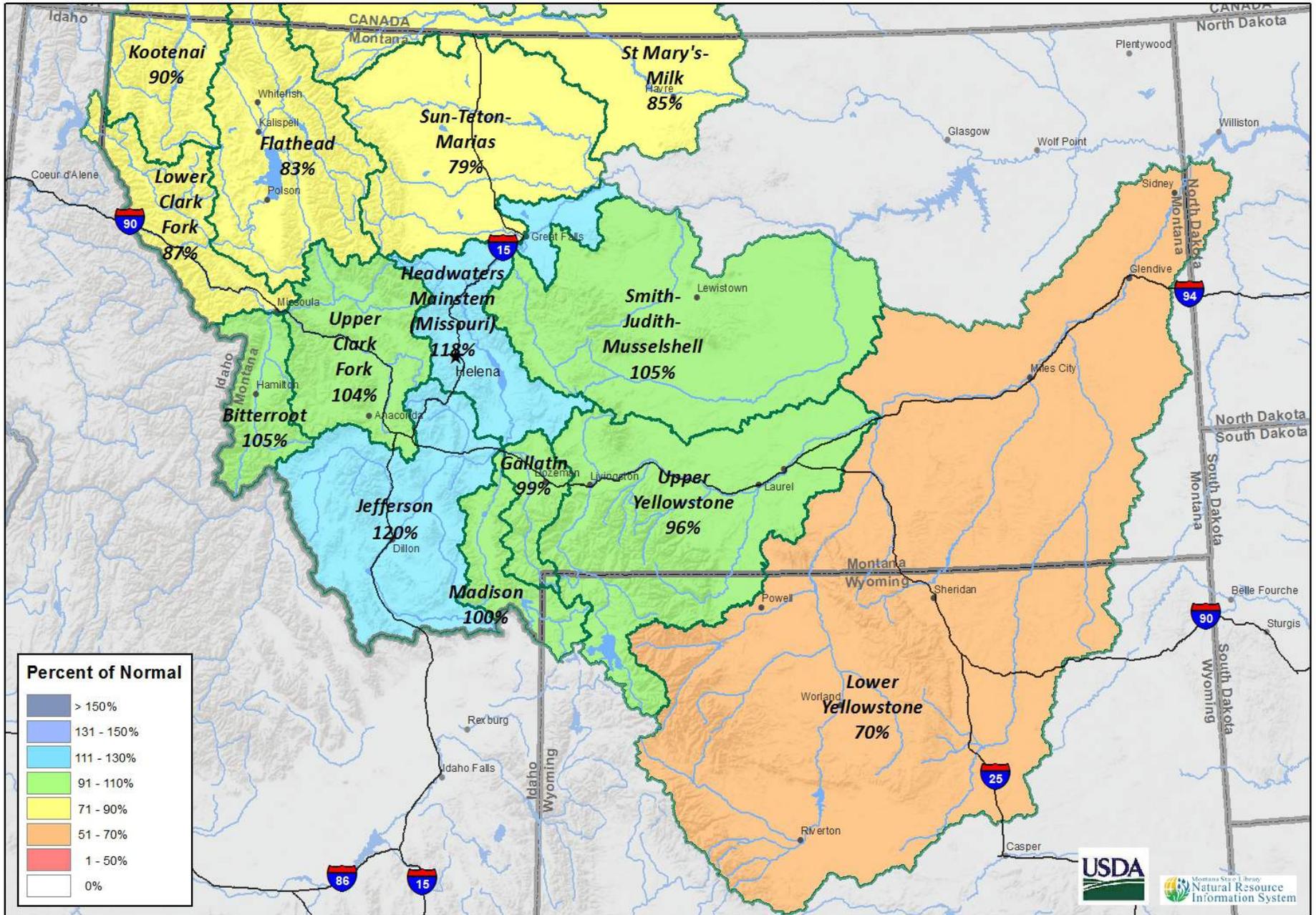
Another round of storms dropped some snow towards the end of November and marked a transition to more consistent snowfall in most basins. After the first week of December all basins in the state saw improvements in snowpack percentages, the mountains in the southern half of the state received above normal snowfall under moist southwest flow and are near to above normal on January 1st. Northern basins in the state did see improvement during December but ended the month below normal. State-wide snowpack is 97 percent of normal for Jan 1st and behind last year at this time.

On January 1st, 35 to 40 percent of our seasonal snowpack has generally accumulated in the mountains around the state. There is a lot of time between now and when we can make reasonable predictions on what will occur in terms of snowmelt runoff. Hopefully everyone asked Santa for snow or water this year.

Snow Water Equivalent

<i>1/1/2016</i>	<i>% Normal</i>	<i>% Last Year</i>
Columbia River Basin	94	85
Kootenai in Montana	90	113
Flathead in Montana	83	75
Upper Clark Fork	104	79
Bitterroot	105	84
Lower Clark Fork	87	112
Missouri River Basin	107	99
Jefferson	120	103
Madison	100	112
Gallatin	99	98
Headwaters Mainstem	118	94
Smith-Judith-Musselshell	105	94
Sun-Teton-Marias	79	70
St. Mary-Milk	85	93
Yellowstone River Basin	82	75
Upper Yellowstone	96	83
Lower Yellowstone	70	69
West of Divide	94	85
East of Divide	94	88
Montana State-Wide	97	89

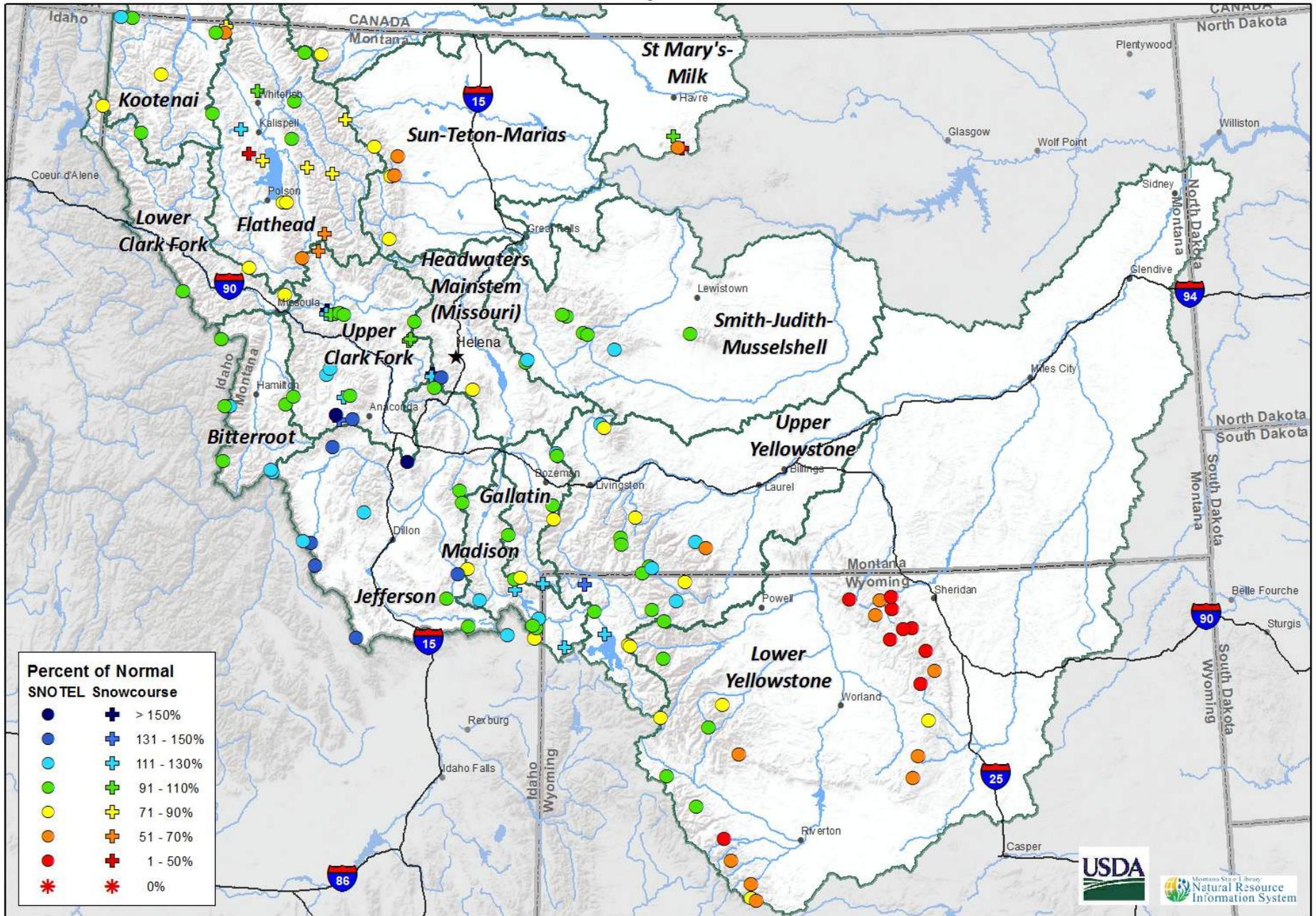
Montana Data Collection Office
 Current Snow Water Equivalent
 Basin Percentage of Normal - January 1, 2016



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



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



Precipitation - Overview

Last summer 20 of the 39 SNOTEL sites west of the Divide received record low precipitation from June 1st through September 30th, 2015. Southern basins we're spared, to some extent, from the extremely dry conditions but still received below normal precipitation as the summer turned to fall. This is important to remember as we enter this water year on October 1st, as last year's snowpack and precipitation has a direct correlation to the soil moisture around the state.

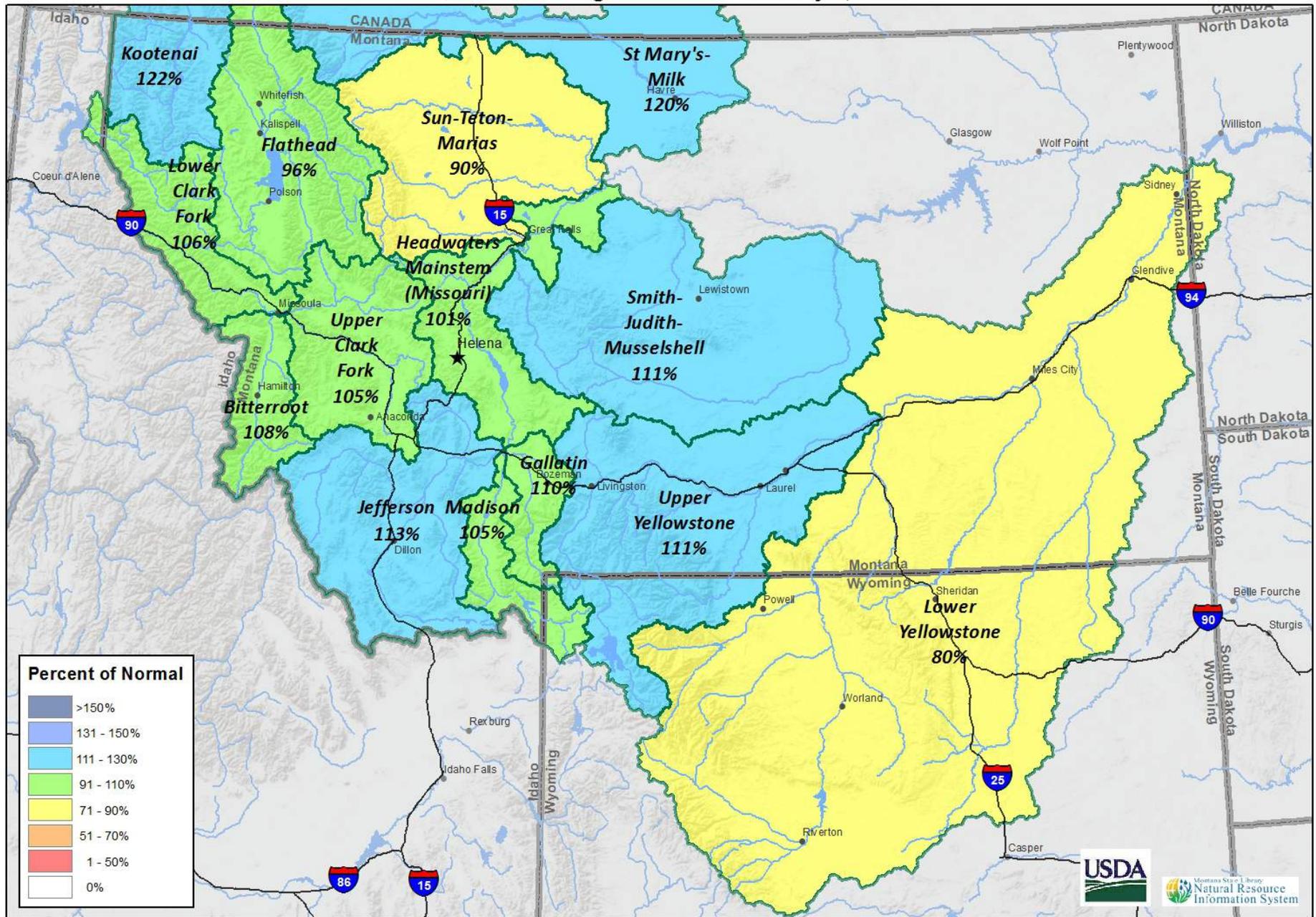
October was mostly disappointing across the state with basins receiving below average precipitation for the month, but it's typically a month of transition when summer weather patterns end and wet systems begin to enter the state. Entering November a major precipitation event occurred west of the Divide dropping up to 5" of moisture at SNOTEL sites. Considering how dry conditions were last year any precipitation is welcome, however much of this event was rain and not snow. East of the Divide this storm began the snow year where higher elevations and colder temperatures prevailed.

Since mid-November favorable storm patterns has brought more frequent precipitation to the state, and most basins rose from near to below average on December 1st to above average on January 1st. Only two basins are below average for water year-to-date precipitation on January 1st (Sun-Teton-Marias – 90%, Lower Yellowstone – 80%).

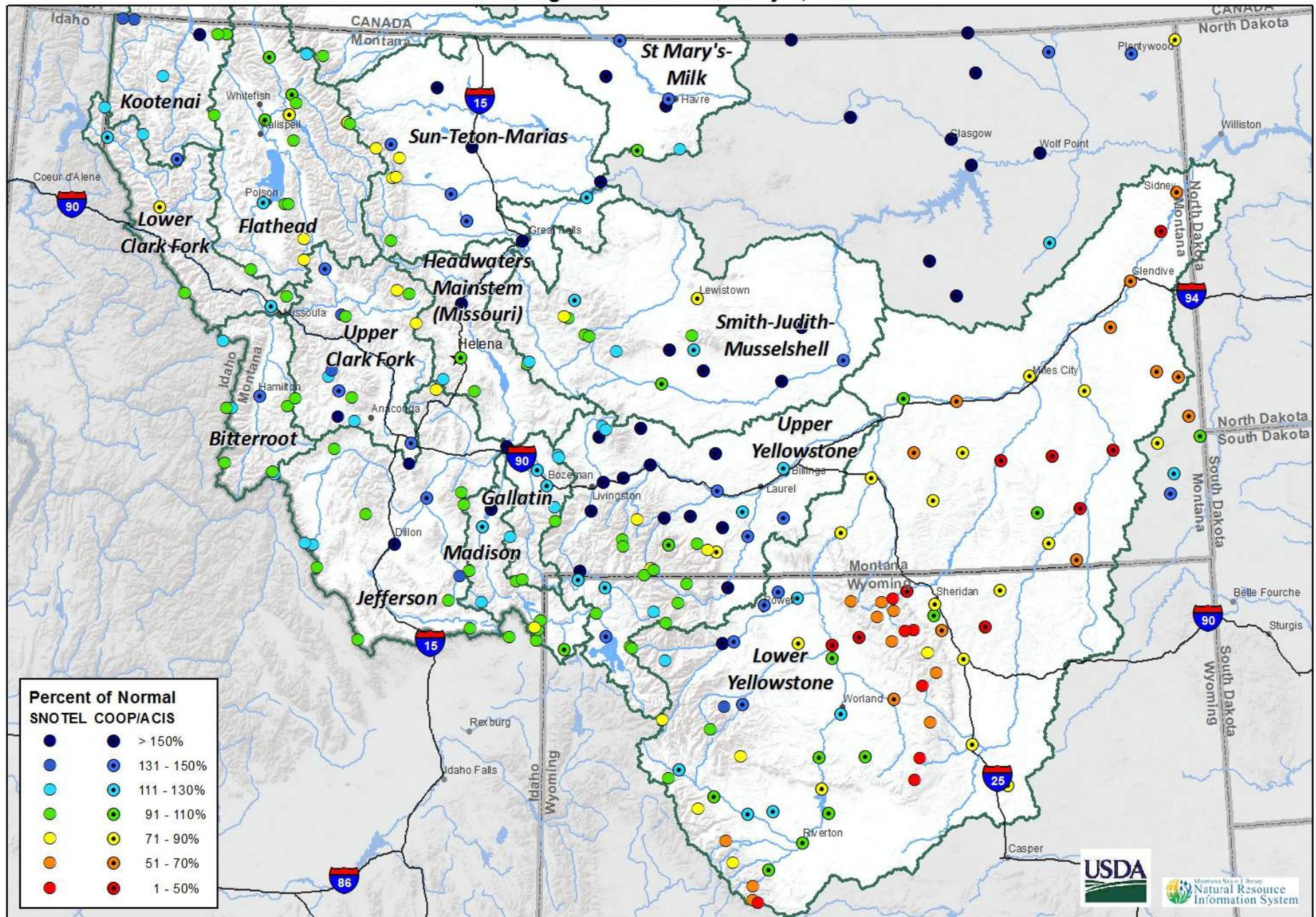
Precipitation

1/1/2016	<i>Monthly % Avg</i>	<i>Water Year % Avg</i>	<i>WY % Last Year</i>
Columbia River Basin	141	107	90
Kootnenai in Montana	162	122	112
Flathead in Montana	132	96	79
Upper Clark Fork	124	105	85
Bitterroot	141	108	83
Lower Clark Fork	139	106	94
Missouri River Basin	132	111	104
Jefferson	152	113	107
Madison	138	105	117
Gallatin	131	110	109
Headwaters Mainstem	139	101	87
Smith-Judith-Musselshell	132	111	108
Sun-Teton-Marias	105	90	72
St. Mary-Milk	126	120	98
Yellowstone River Basin	105	93	94
Upper Yellowstone	125	111	108
Lower Yellowstone	89	80	64
West of Divide	141	107	90
East of Divide	122	102	99
Montana State-Wide	135	108	97

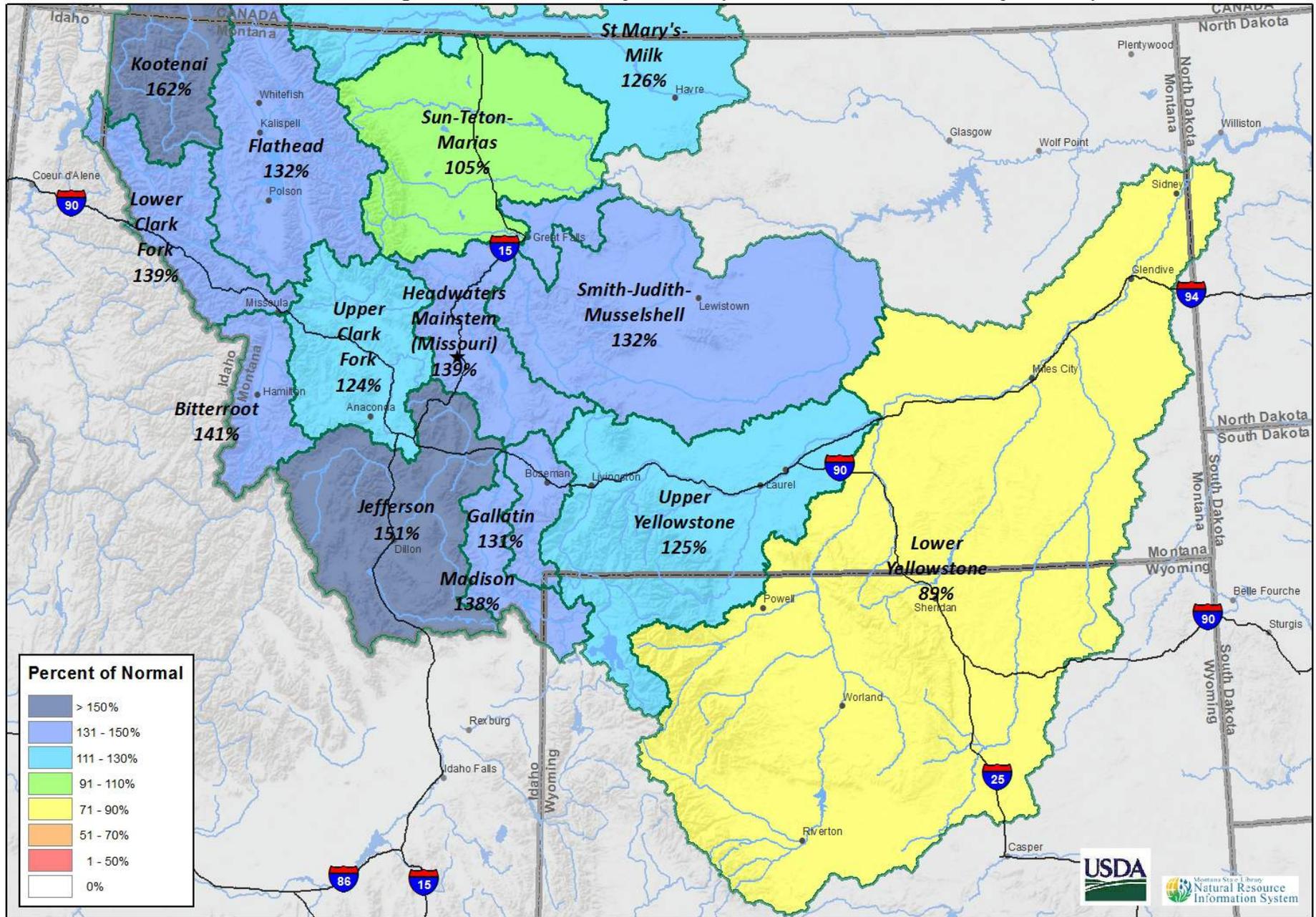
Montana Data Collection Office
 Water Year to Date Precipitation
 Basin Percentage of Normal - January 1, 2016



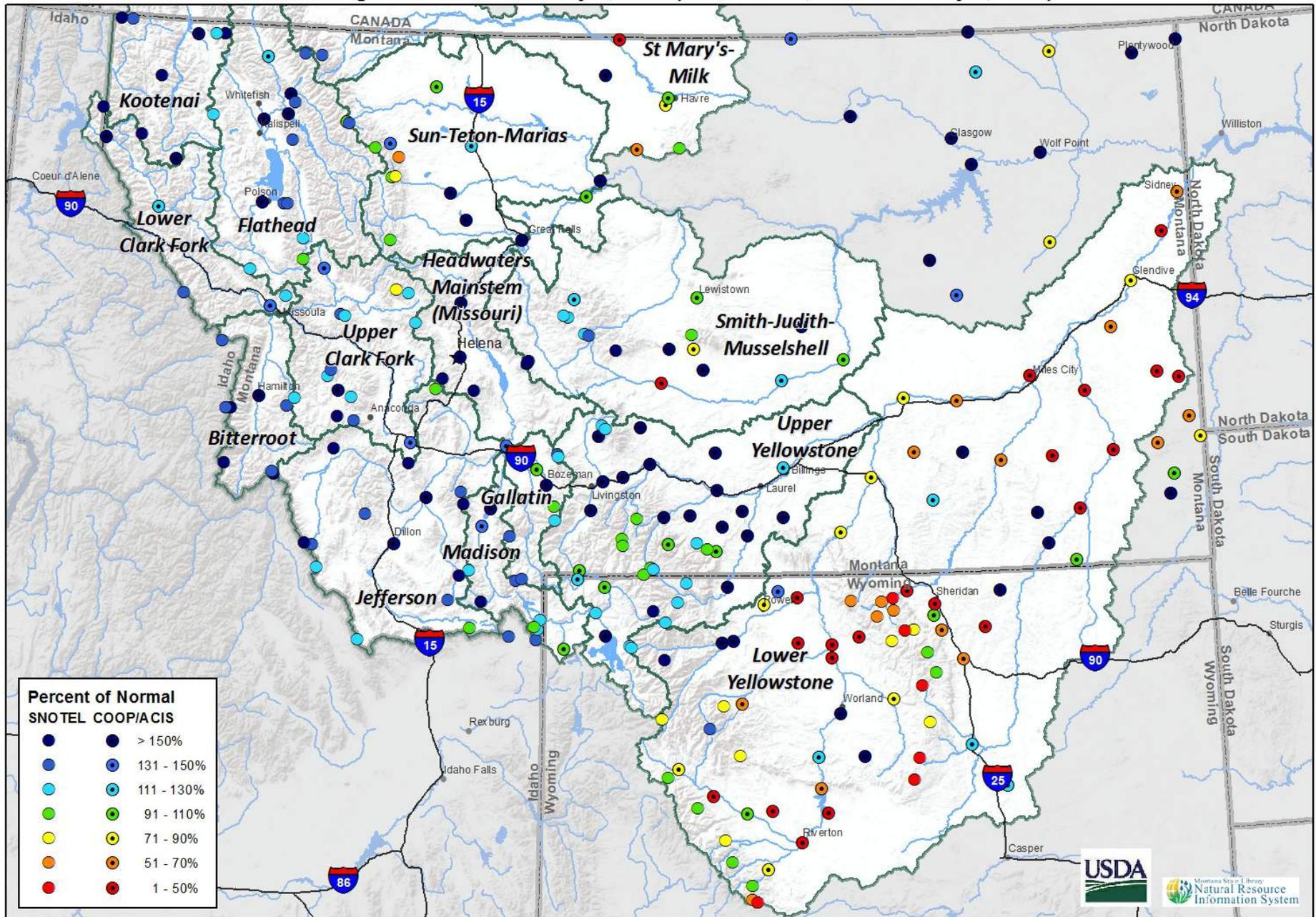
Montana Data Collection Office
 Water Year to Date Precipitation
 Percentage of Normal - January 1, 2016



**Montana Data Collection Office
Monthly Precipitation
Basin Percentage of Normal - January 1, 2016 (December 1, 2015 - January 1, 2016)**



**Montana Data Collection Office
Monthly Precipitation
Percentage of Normal - January 1, 2016 (December 1, 2015 - January 1, 2016)**



Reservoirs - Overview

Reservoirs in the state of Montana are used for a variety of purposes and when needed can be called upon by agricultural producers for crop and livestock water and fish and game officials to augment flows in rivers to protect fish habitat. Coming out of the 2014 water year most reservoirs were above average last summer and this water was available last year when below normal snowpack and precipitation translated into below average runoff during the spring and summer.

Consumptive use of reservoir contents was wisely managed this past year and planning for future need led reservoir operators to conserve what water they could for the upcoming runoff season. Some reservoirs were called upon more heavily than others this past year. Reservoirs in the Jefferson (Lima, Clark Canyon), Bitterroot (Lake Como) and Sun-Teton-Marias (Pishkun, Gibson) River basins are below to well below average for this time of year. Many other MT state project, Bureau of Reclamation and Core of Engineers reservoirs look to be near normal at this time.

Last year at this time our snowpack and precipitation looked to be in good shape but quickly made a turn for the worse. Wise water management planning for the upcoming runoff season will be the key to ensuring that water is available not only this year but the following in case we experience conditions similar to last year from here on out.

Reservoir Storage

1/1/2016	<i>% Average</i>	<i>% Capacity</i>	<i>% Last Year</i>
Columbia River Basin	108	71	96
Kootenai in Montana	114	68	104
Flathead in Montana	104	73	89
Upper Clark Fork	101	91	109
Bitterroot	83	22	46
Lower Clark Fork	103	97	102
Missouri River Basin	111	76	99
Jefferson	72	31	86
Madison	111	83	97
Gallatin	not reported	not reported	
Headwaters Mainstem	115	80	102
Smith-Judith-Musselshell	not reported	not reported	
Sun-Teton-Marias	98	51	91
St. Mary-Milk	127	50	78
Yellowstone River Basin	104	65	96
Upper Yellowstone	161	60	103
Lower Yellowstone	104	65	97
West of Divide	108	71	96
East of Divide	111	76	99
Montana State-Wide	110	74	98

Streamflow - Overview

Long-duration streamflow forecasting proved difficult last year where record low snowpack and record low precipitation gripped the northwest part of the state producing well below average streamflows during the April-September time period and in the headwaters of the Lower Yellowstone in Wyoming where anomalously wet conditions in the spring provided ample runoff during the same time. Overall streamflows across the state were above average early in the runoff season (March-April) and below average during the summer and early fall to the lack of snowpack and below average summer precipitation.

January streamflow forecasts are issued with the expectation that the user recognize that only 35 to 40 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 in the future 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>1/1/2016</i>	<i>% Average</i>	<i>% Last Year</i>
Columbia River Basin	103	152
Kootenai in Montana	109	156
Flathead in Montana	96	147
Upper Clark Fork	104	147
Bitterroot	113	133
Lower Clark Fork	103	157
Missouri River Basin	90	123
Jefferson	105	199
Madison	90	131
Gallatin	94	129
Headwaters Mainstem	89	117
Smith-Judith-Musselshell	87	88
Sun-Teton-Marias	81	134
St. Mary-Milk	90	124
Yellowstone River Basin	91	91
Upper Yellowstone	100	114
Lower Yellowstone	85	78
West of Divide	103	152
East of Divide	91	107
Montana State-Wide	97	127

Surface Water Supply Index (SWSI)

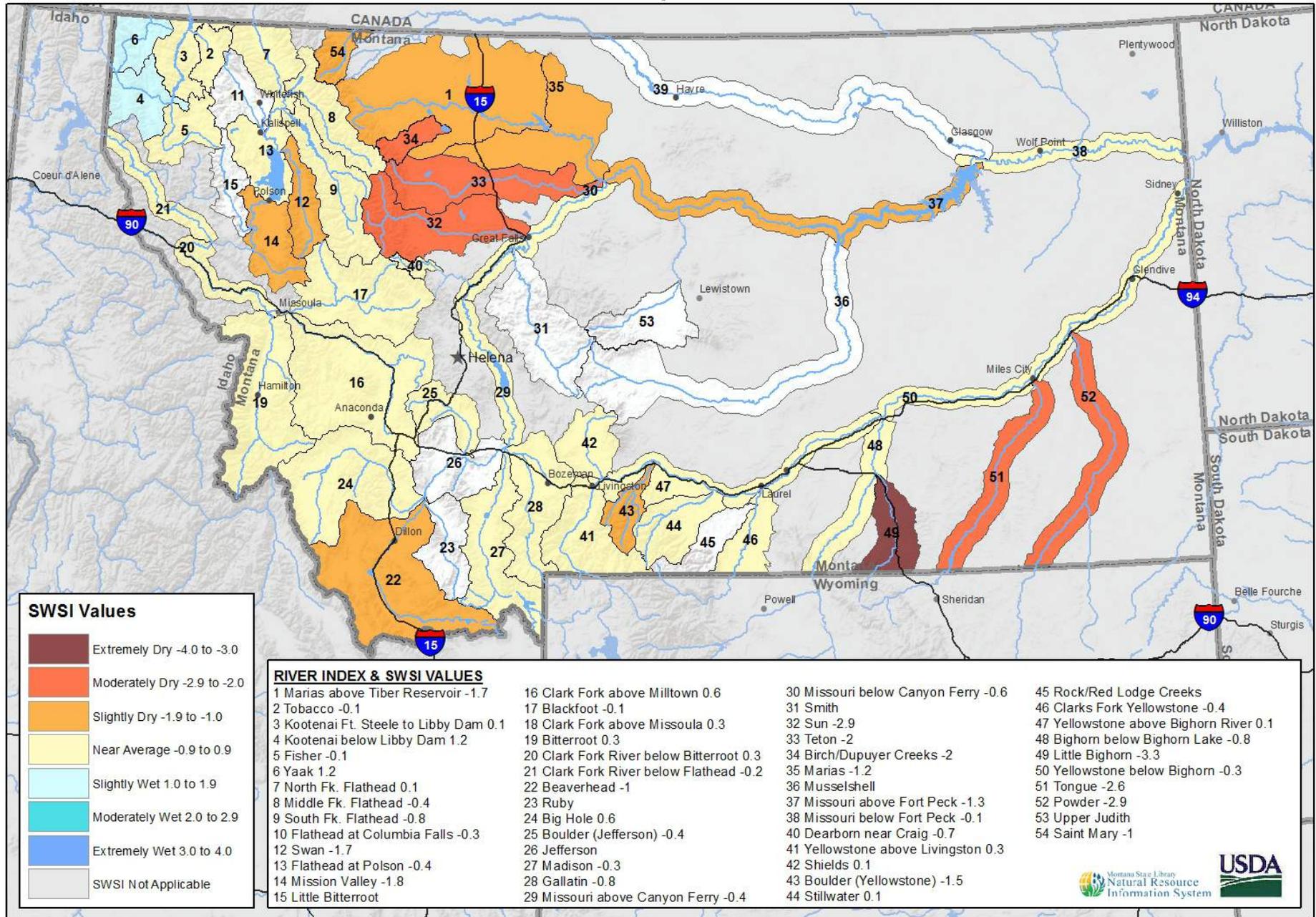
The Surface Water Supply Index (SWSI) is a measure of available surface water availability for the spring and summer months. Water users that rely on mountain precipitation can use the index to evaluate seasonal surface water supplies. The SWSI accounts for mountain snowpack, mountain precipitation,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

Watershed	This month's SWSI	Last Year's SWSI
Marias above Tiber Reservoir	-1.7	0.4
Tobacco	-0.1	-1.6
Kootenai Ft. Steele to Libby Dam	0.1	-0.4
Kootenai below Libby Dam	1.2	0.6
Fisher	-0.1	-1.3
Yaak	1.2	-2.2
North Fk. Flathead	0.1	0.2
Middle Fk. Flathead	-0.4	0.2
South Fk. Flathead	-0.8	2.7
Flathead at Columbia Falls	-0.3	1.4
Swan	-1.7	1.8
Flathead at Polson	-0.4	0.7
Mission Valley	-1.8	1.2
Little Bitterroot		1.7
Clark Fork above Milltown	0.6	1.1
Blackfoot	-0.1	0.4
Clark Fork above Missoula	0.3	1.1
Bitterroot	0.3	0.2
Clark Fork River below Bitterroot	0.3	0.8
Clark Fork River below Flathead	-0.2	0.8
Beaverhead	-1.0	-1.1
Ruby		-0.4
Big Hole	0.6	1.1
Boulder (Jefferson)	-0.4	0.5
Jefferson		0.4
Madison	-0.3	-0.4
Gallatin	-0.8	-0.7
Missouri above Canyon Ferry	-0.4	-0.2
Missouri below Canyon Ferry	-0.6	-0.2
Smith		2.1
Sun	-2.9	0.0
Teton	-2.0	0.8
Birch/Dupuyer Creeks	-2.0	0.2
Marias	-1.2	2.2
Musselshell		1.3
Missouri above Fort Peck	-1.3	0.7
Missouri below Fort Peck	-0.1	0.0
Milk		
Dearborn near Craig	-0.7	-0.2
Yellowstone above Livingston	0.3	0.7
Shields	0.1	0.0
Boulder (Yellowstone)	-1.5	-0.5
Stillwater	0.1	0.2
Rock/Red Lodge Creeks		-0.2
Clarks Fork Yellowstone	-0.4	0.7
Yellowstone above Bighorn River	0.1	0.6
Bighorn below Bighorn Lake	-0.8	0.2
Little Bighorn	-3.3	-1.1
Yellowstone below Bighorn	-0.3	0.4
Tongue	-2.6	-0.2
Powder	-2.9	0.2
Upper Judith		1.8
Saint Mary	-1.0	-0.7

SWSI Scale

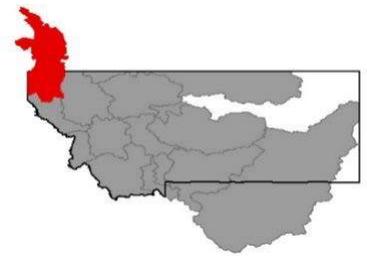
+3.0 to +4.0	Extremely Wet
+2.0 to +2.9	Moderately Wet
+1.0 to +1.9	Slightly Wet
+0.9 to -0.9	Near Average
-1.0 to -1.9	Slightly Dry
-2.0 to -2.9	Moderately Dry
-3.0 to -4.0	Extremely Dry

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



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

Kootenai River Basin



Ending last winter with record low snowpack conditions, snow the Kootenai River basin has received so far this water year might seem somewhat foreign. Similar to the rest of the region the Kootenai River basin started this year off slow. The basin didn't receive its first accumulating snow until around Halloween. On November 1st SNOTEL sites representing the Kootenai River basin averaged 0.6 inches of snow water content, which is about 1.1 inches below the normal for that date. Fortunately, November and December delivered moisture. A large snow storm mid-November and consistent snowfall through much of December drove the snowpack conditions back to normal in the basin. The basin has not seen significant snowfall over the past week and is now at 90 percent of normal, which is 10 percent higher than last year at this time.

Below normal snowmelt was unfortunately followed by a relatively dry conditions this summer in the Kootenai River basin. From June 21st to September 23rd the basin only received 3.9 inches of precipitation at mountain SNOTEL sites compared to 6.3 inches on average. The basin entered the new water year on the dry side, but favorable weather conditions in November and December helped increase moisture in the basin. Water year-to-date precipitation in the Kootenai River basin is currently well above average at 122 percent.

Lake Koocanusa started the summer season at 117 percent of average reservoir storage on June 1st. Below average runoff and precipitation contributed to a steady decline in the reservoir's level as a percent of average over the course of the summer. By October 1st the basin was at 98 percent of average. Currently on January 1st the basin is at 114 percent of average storage.

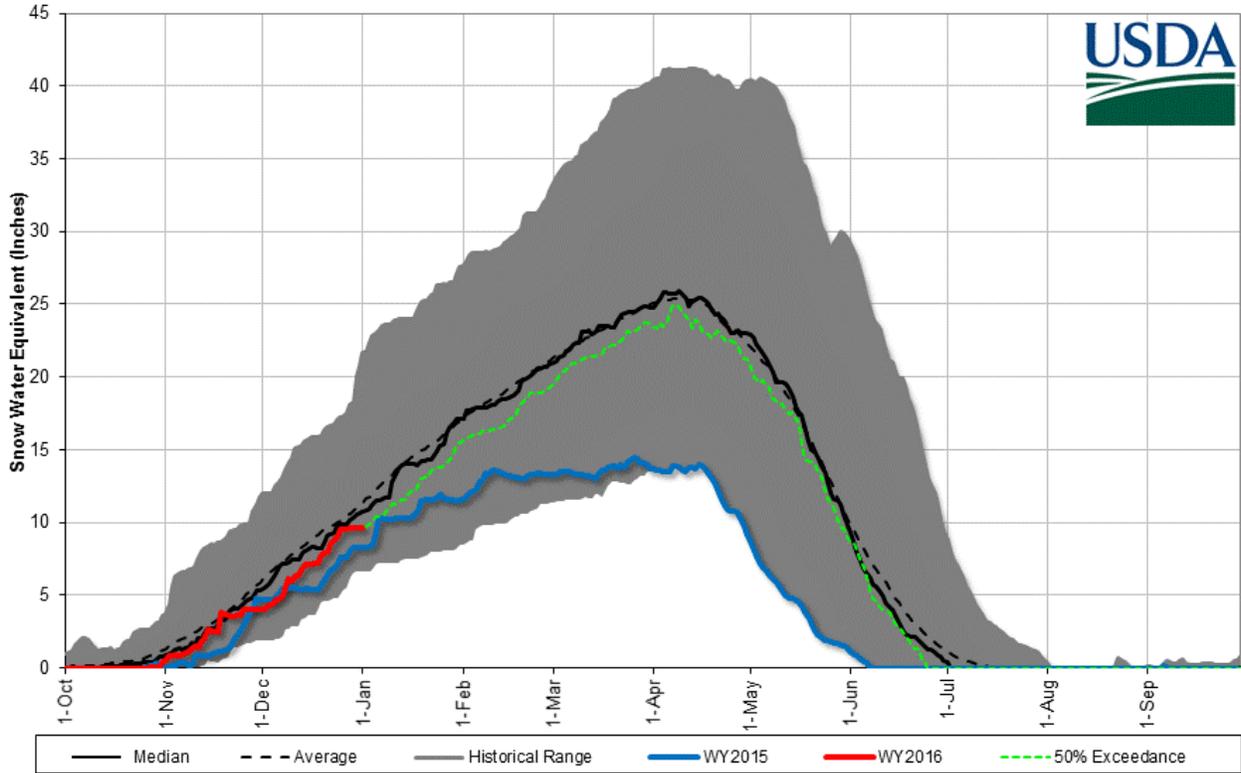
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 109 percent of average for the April-July time period.

Kootenai River Basin Data Summary		1/1/2016	
Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	96%	84%	
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	157%	120%	108%
Valley Precipitation	230%	144%	119%
Basin Precipitation	162%	122%	109%
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	114%	68%	110%
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	109%	156%	70%

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

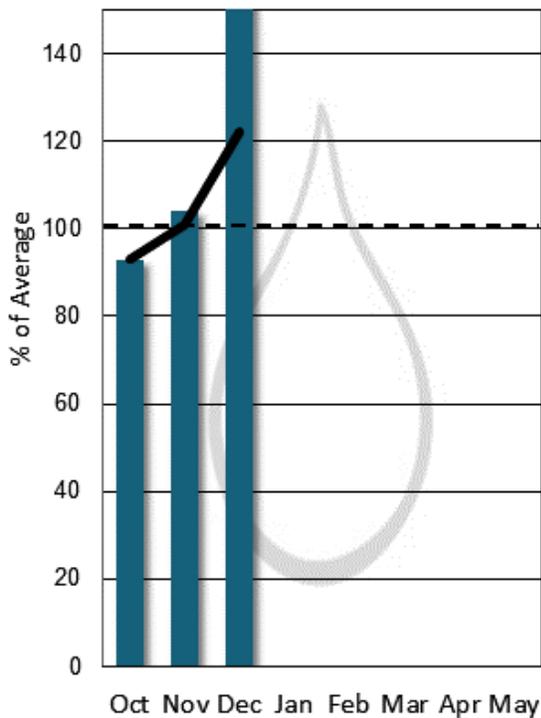
**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

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



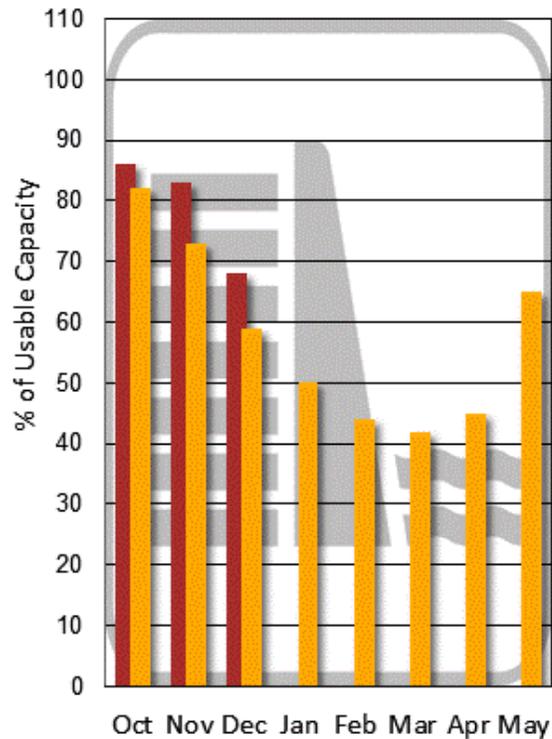
Mountain and Valley Precipitation

■ Monthly — Year-to-date



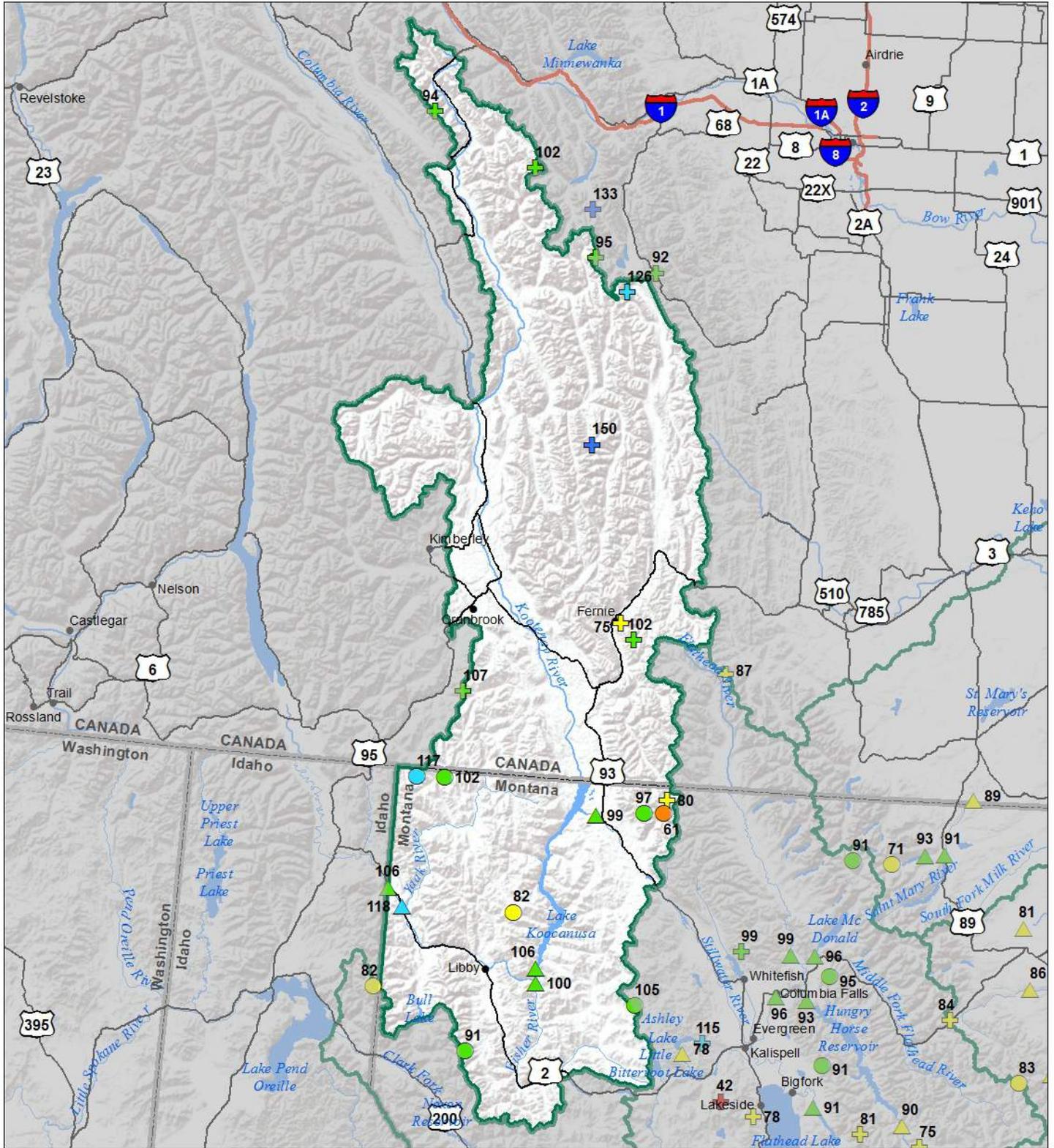
End of Month Reservoir Storage

■ % Capacity ■ Avg % Capacity



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

Kootenai River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal January 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

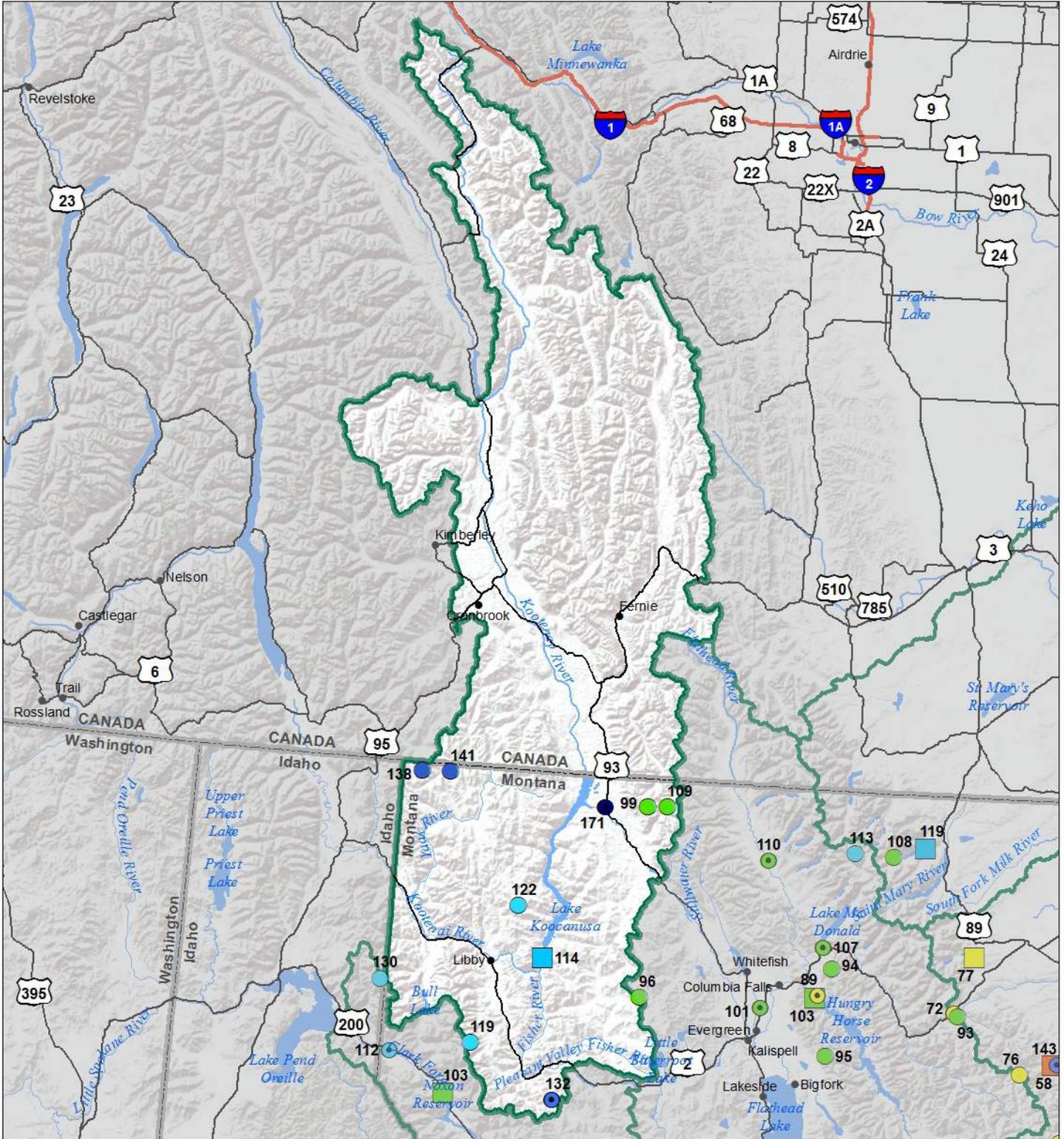
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Kootenai River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

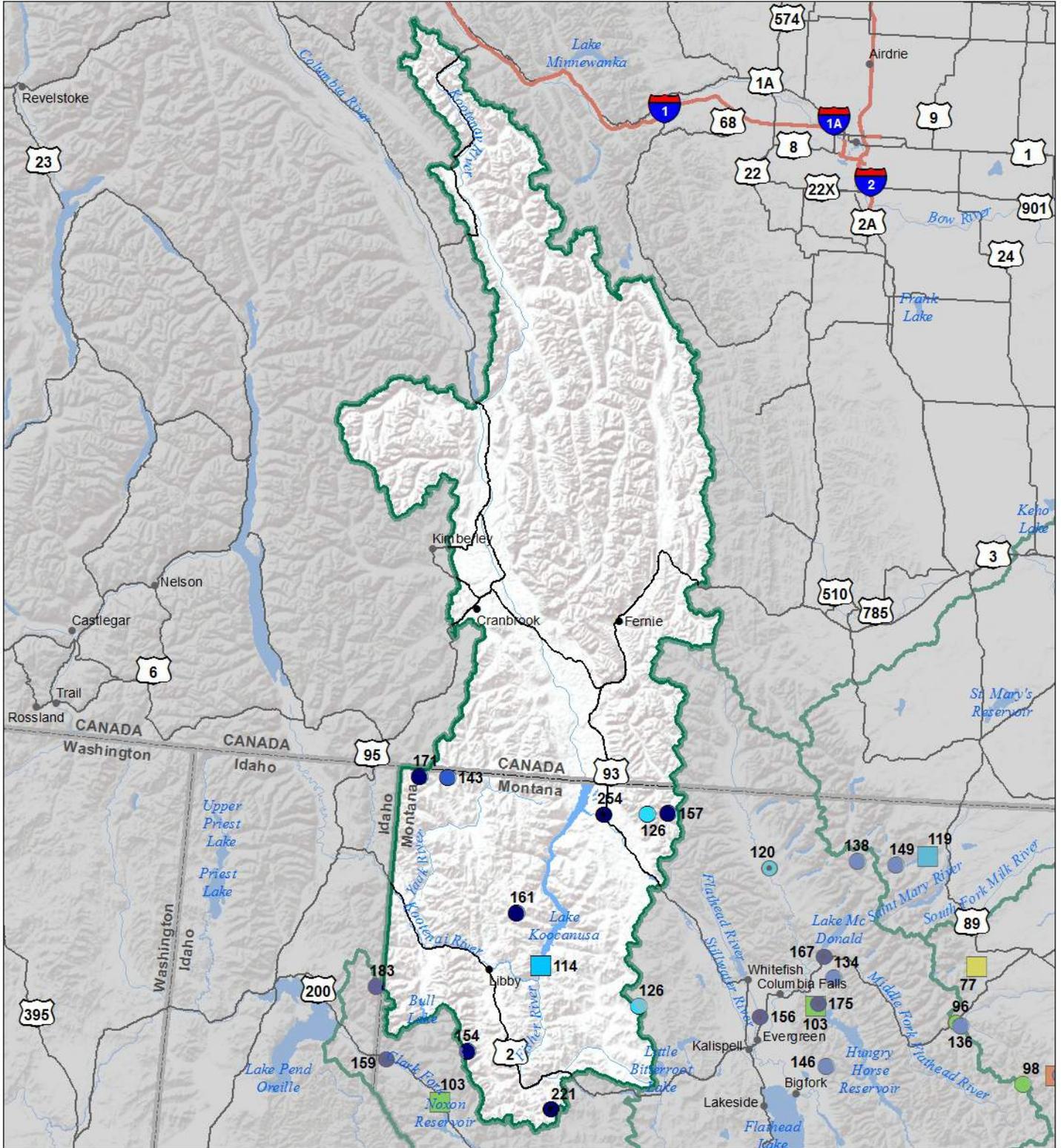
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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 January 1, 2016 (December 1, 2015 - January 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%
- 1 - 50%



Kootenai River Basin In Montana Streamflow Forecasts - January 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	86	110	125	99%	141	164	126
	APR-SEP	96	121	138	99%	156	181	140
Libby Reservoir Inflow ¹	APR-JUL	4570	5410	5790	108%	6170	7010	5340
	APR-SEP	5390	6240	6620	106%	7010	7860	6250
Fisher R nr Libby	APR-JUL	116	169	205	100%	240	295	205
	APR-SEP	127	182	220	100%	255	310	220
Yaak R nr Troy	APR-JUL	345	435	500	119%	560	650	420
	APR-SEP	365	455	520	118%	585	675	440
Kootenai R at Leonia ^{1,2}	APR-JUL	5640	6700	7180	109%	7660	8710	6600
	APR-SEP	6500	7570	8060	106%	8540	9620	7590

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

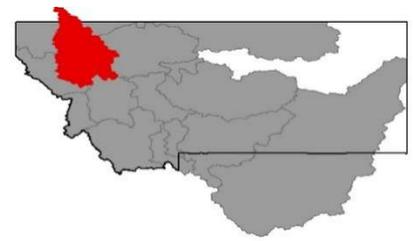
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

Reservoir Storage End of December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Koocanusa	3894.2	3747.5	3417.0	5748.0
Basin-wide Total	3894.2	3747.5	3417.0	5748.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
KOOTENAY in CANADA	4	107	75
KOOTENAI MAINSTEM	3	85	62
TOBACCO	3	84	98
FISHER	1	105	100
YAAK	2	113	83
KOOTENAI RIVER BASIN in MONTANA	9	90	80
KOOTENAI ab BONNERS FERRY	12	96	84

Flathead River Basin



Above average temperatures and below average precipitation during October in the Flathead River basin made for a slow start to the water year. Mountain SNOTEL sites in the basin had only received about a third of their average precipitation prior to a snow storm that arrived around Halloween. The storm came as a mixture of rain and snow delivering almost 3 inches of total precipitation to the basin’s SNOTEL sites. Cooler temperatures arrived in November yet mountain locations still received mixed rain and snow events. A mid-November storm brought moisture to the region and Flattop Mountain SNOTEL (6300 ft) received about 1.6 inches of total precipitation with only 0.9 inches snow water. Starting the month of December at only 76 percent of normal snowpack, the Flathead River basin received near normal monthly snowfall during December, which left the basin at 83 percent of normal on January 1st.

Ending the 2015 Water Year at 85 percent of average, the largest precipitation event the Flathead River basin received all summer was during the first week of September when mountain SNOTEL sites received about 1.7 inches of precipitation. Mid to low elevation soil moisture was, in general, lower than at the start of the previous 2 water years. Blacktail Mountain SNOTEL’s 20 inch soil moisture sensor saw a decrease from 20 percent on October 1st, 2013 to 3 percent on October 1st 2015. Blacktail’s 8 inch sensor had no soil moisture on Oct 1st, 2015. Similar to the rest of the region, November and December in the Flathead River basin brought much needed precipitation. Over 14.5 inches has fallen since Oct 1st. Currently, water year-to-date precipitation in the basin is slightly below average at 96 percent.

Both Flathead Lake and Hungry Horse Reservoir started the summer season with average to above average reservoir storage on June 1st. Good water management over the course of the summer contributed to the reservoirs maintaining near average conditions despite below average moisture. Currently both reservoirs are at slightly above average storage for this time of the year.

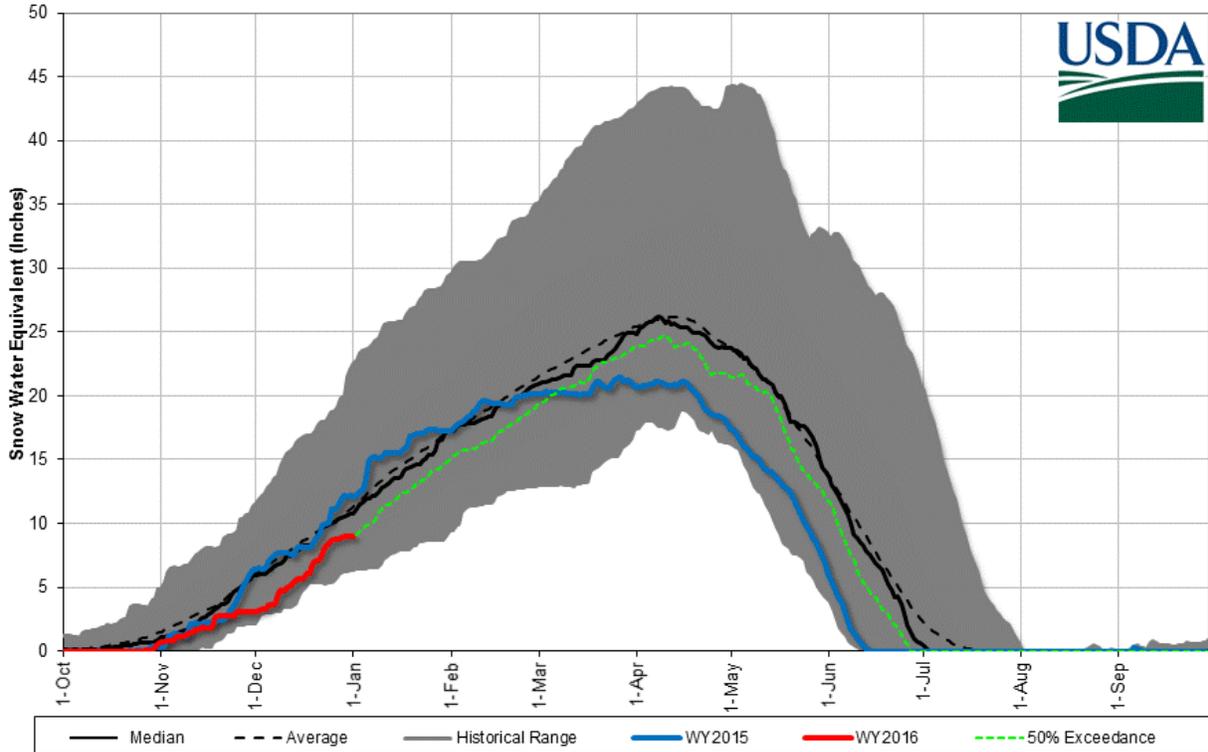
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 96 percent of average for the April-July time period.

Flathead River Basin Data Summary		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	83%	108%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	131%	96%	120%
Valley Precipitation	164%	113%	165%
Basin Precipitation	132%	96%	121%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	104%	73%	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	96%	147%	65%

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

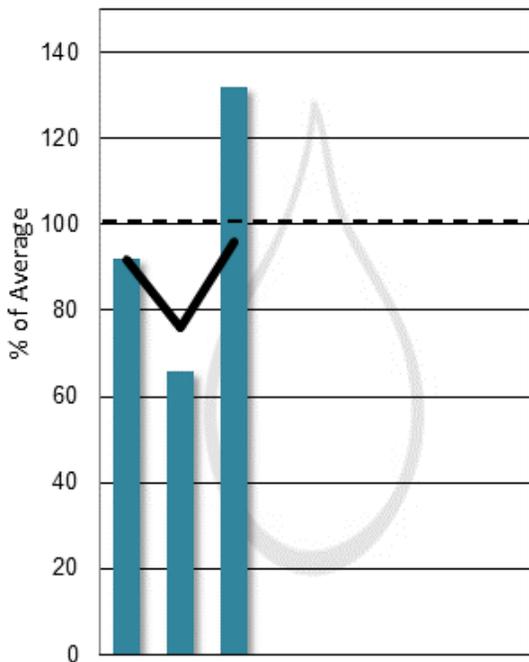
**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

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



Mountain and Valley Precipitation

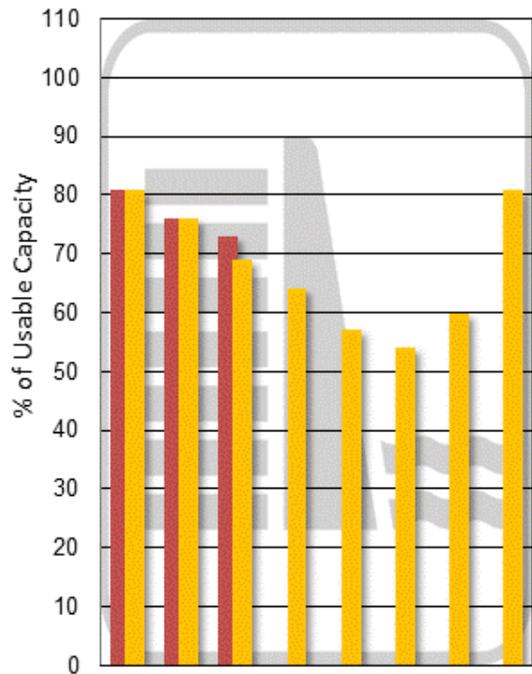
Monthly (teal bar) Year-to-date (black line)



Oct Nov Dec Jan Feb Mar Apr May

End of Month Reservoir Storage

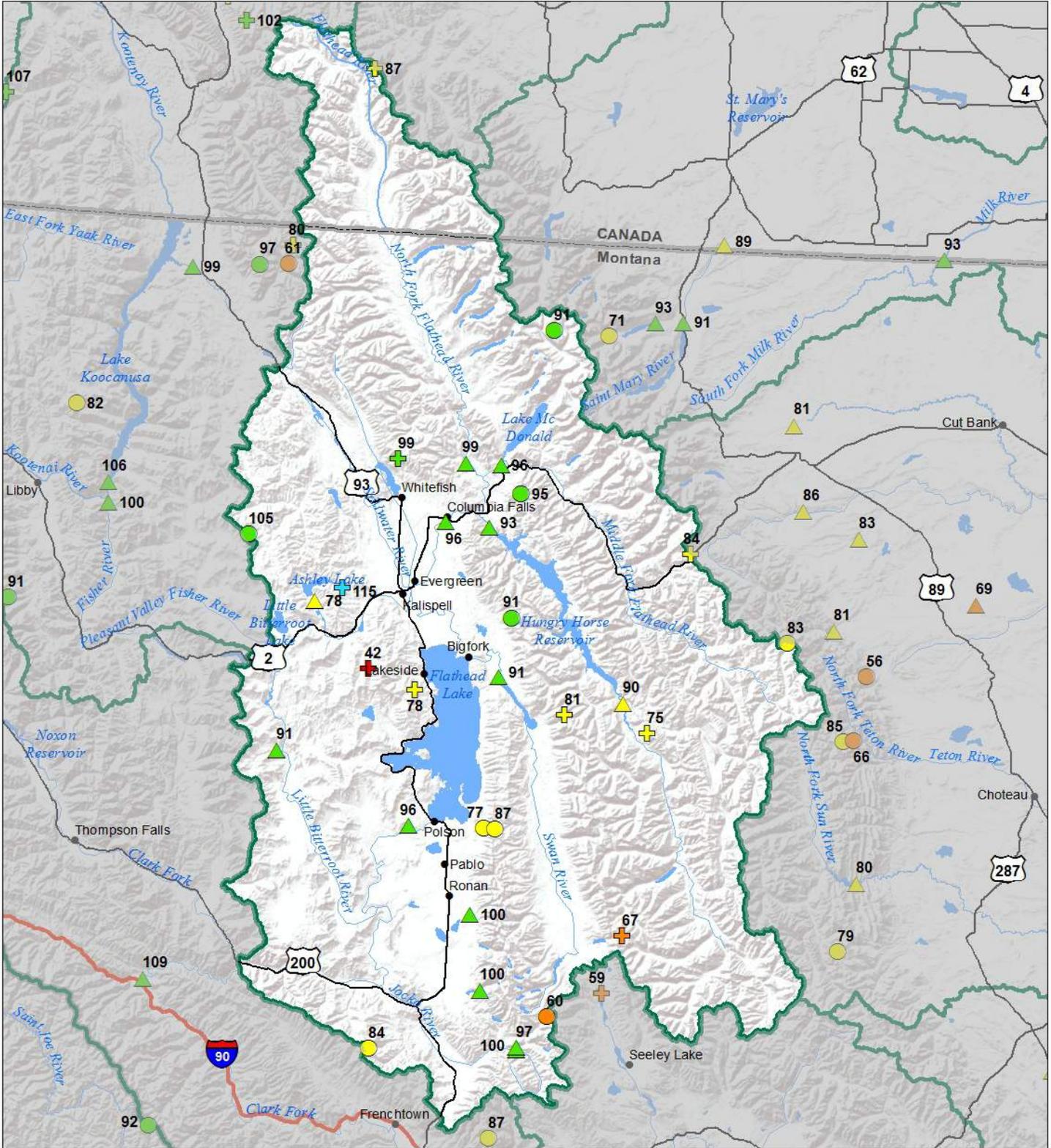
% Capacity (red bar) Avg % Capacity (yellow bar)



Oct Nov Dec Jan Feb Mar Apr May

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

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



Snow Water Equivalent Percent of Normal

SNOTEL

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

- 71 - 90%
- 51 - 70%
- 1 - 50%
- * 0%

Snowcourse

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

Streamflow Forecast Percent of Average Flows

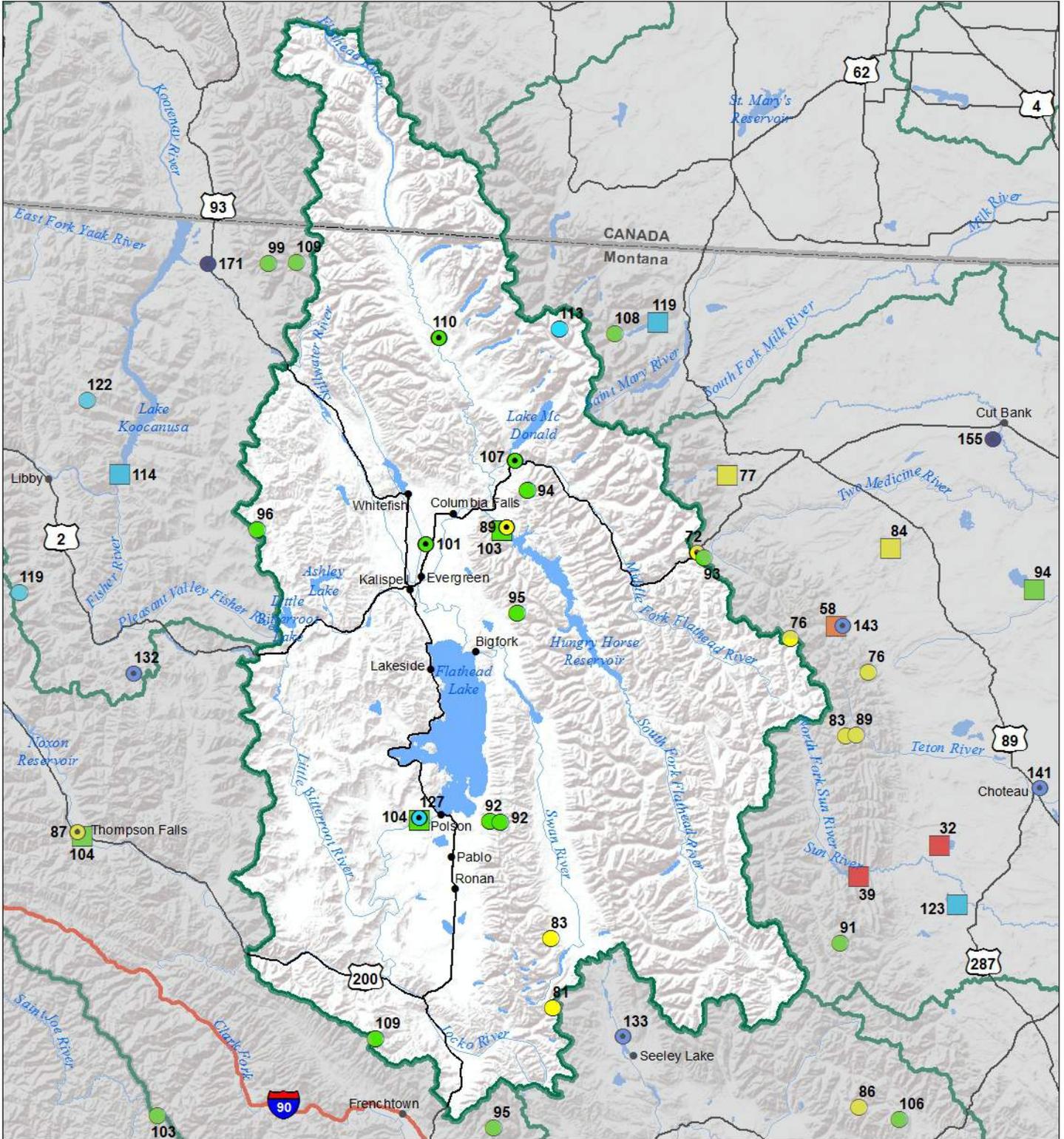
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Flathead River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

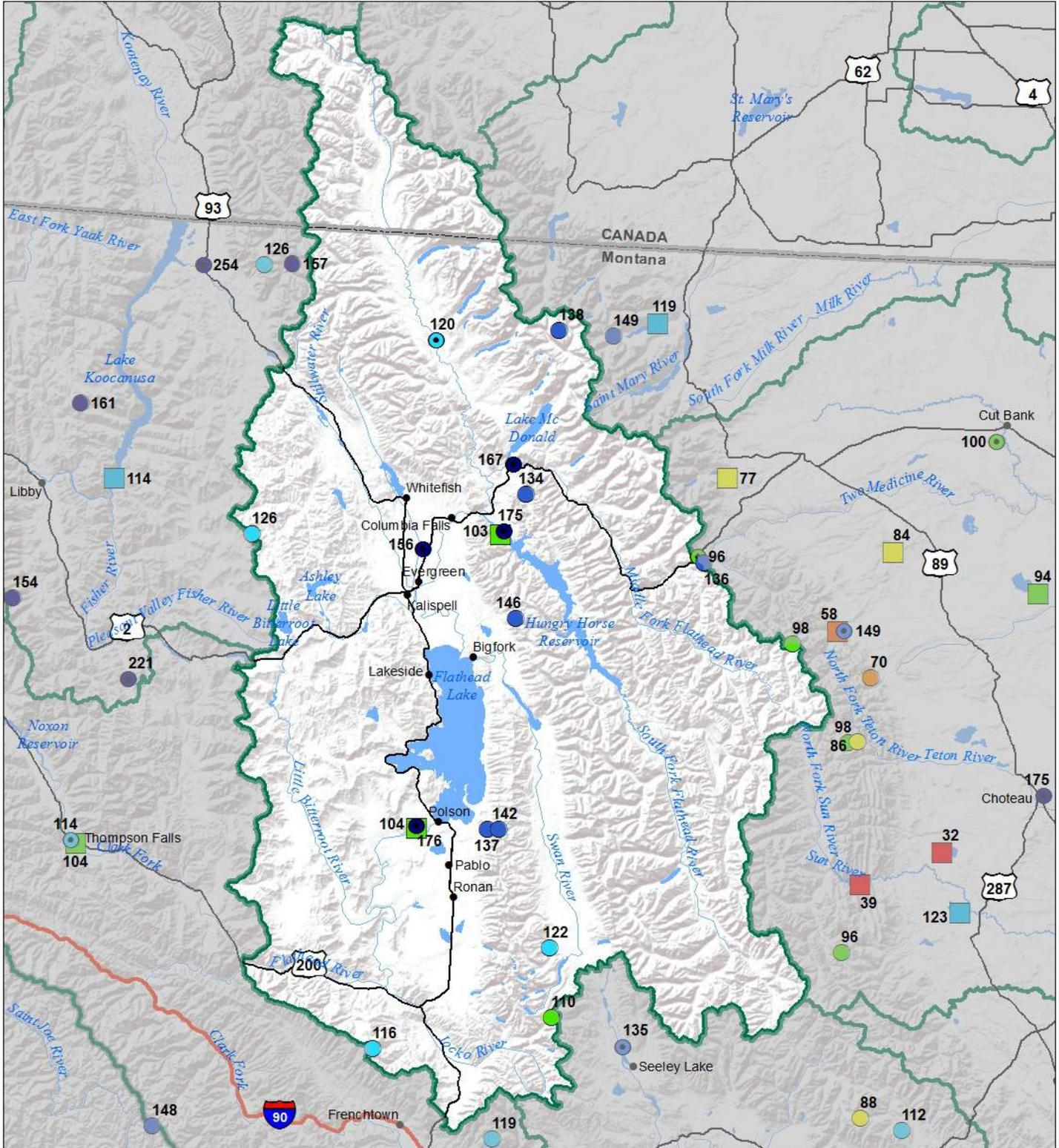
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



Flathead River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal January 1, 2016 (December 1, 2015 - January 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 - January 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	1160	1370	1520	99%	1660	1880	1540
	APR-SEP	1300	1530	1680	99%	1830	2060	1700
MF Flathead R nr West Glacier	APR-JUL	1070	1300	1450	97%	1600	1820	1500
	APR-SEP	1180	1420	1570	96%	1730	1970	1630
Sf Flathead R nr Hungry Horse	APR-JUL	770	950	1080	92%	1200	1380	1180
	APR-SEP	820	1010	1140	90%	1270	1460	1260
Hungry Horse Reservoir Inflow ^{1,2}	APR-JUL	1170	1570	1750	94%	1940	2340	1860
	APR-SEP	1250	1660	1850	93%	2040	2450	1980
Flathead R at Columbia Falls ²	APR-JUL	3690	4370	4840	96%	5300	5980	5020
	APR-SEP	4040	4750	5230	96%	5720	6430	5450
Ashley Ck nr Marion ²	MAR	0.17	0.66	0.99	83%	1.33	1.82	1.19
	APR-JUL	2.4	4	5.1	78%	6.2	7.8	6.5
Swan R nr Bigfork	APR-JUL	340	415	470	90%	525	600	520
	APR-SEP	395	480	540	91%	600	685	595
Flathead Lake Inflow ^{1,2}	APR-JUL	3820	5030	5580	96%	6130	7350	5810
	APR-SEP	4130	5410	6000	96%	6580	7860	6270
Mill Ck ab Bassoo ck nr Niarada	APR-JUL	1.44	2.8	3.7	93%	4.6	5.9	4
	APR-SEP	1.72	3.1	4	91%	4.9	6.3	4.4
South Crow Ck nr Ronan	APR-JUL	7.7	9.2	10.2	101%	11.2	12.7	10.1
	APR-SEP	8.9	10.5	11.6	100%	12.7	14.4	11.6
Mission Ck nr St. Ignatius	APR-JUL	21	24	25	100%	27	29	25
	APR-SEP	25	28	30	100%	32	35	30
SF Jocko R nr Arlee	APR-JUL	23	29	33	100%	37	42	33
	APR-SEP	26	33	37	100%	41	47	37
NF Jocko R bl Tabor Feeder Canal	APR-JUL	24	28	31	100%	33	37	31
	APR-SEP	26	30	32	97%	35	39	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 December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Camas (4)		27.3	17.4	45.2
Lower Jocko Lake		0.0	0.0	6.4
Mission Valley (8)		33.2	30.0	100.0
Hungry Horse Lake	2621.7	3152.7	2537.0	3451.0
Flathead Lake	1209.8	1185.4	1158.0	1791.0
Basin-wide Total	3831.5	4338.2	3695.0	5242.0
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
NF FLATHEAD in CANADA	1	87	80
NF FLATHEAD in MONTANA	6	87	97
MIDDLE FORK FLATHEAD	4	89	105
SOUTH FORK FLATHEAD	5	81	115
STILLWATER-WHITEFISH	2	101	113
SWAN	5	77	117
MISSION VALLEY	2	85	148
LITTLE BITTERROOT-ASHLEY	0		
JOCKO	3	74	112
FLATHEAD in MONTANA	18	83	110
FLATHEAD RIVER BASIN	19	83	108

Upper Clark Fork River Basin



After starting the water year warm and dry the Upper Clark Fork River basin made a good comeback during November and December. This year's seasonal snowpack started with a bang when the first storm of the season dumped 17 inches of snow at Barker Lakes SNOTEL (8250 ft) in the Anaconda Range in early November. Several small storms added to the snowpack during November. Snowpack percentage was well below normal on December 1st. Fortunately, the storm system that blanketed much of the west in December also favored the Upper Clark Fork River basin. From December 1st to January 1st the basin's SNOTEL sites received 4.0 inches of snow water content driving it to slightly above normal conditions. On January 1st the snowpack at Upper Clark Fork measurement locations ranged from 47 inches of snow depth at Stuart Mountain (7400 ft) to 8 inches at Lubrecht Forest No 4 (4650 ft).

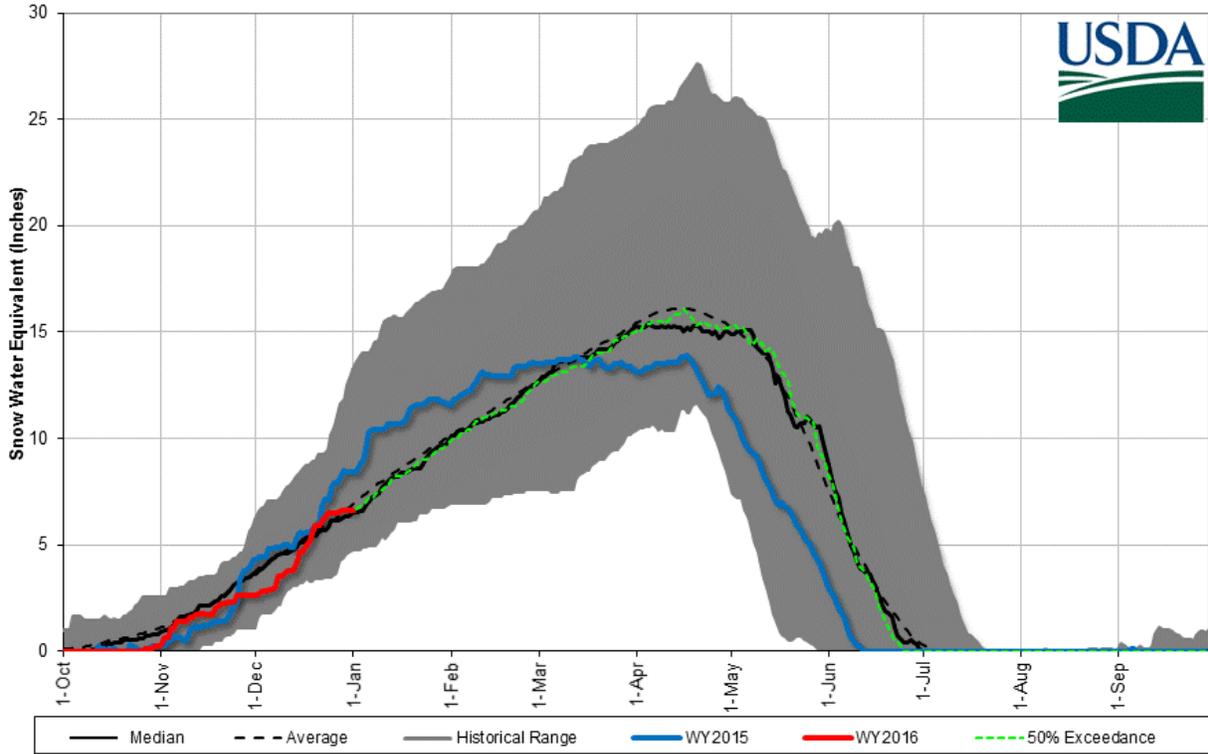
Nearing late August of last summer, the Upper Clark Fork River basin was on track to reach record low mountain precipitation levels. The basin received late July and early September precipitation events that were significant enough to prevent record lows from occurring. The basin's SNOTEL sites ended the water year at 85 percent of average precipitation. After resetting the running average on October 1st the basin started received the much need moisture. Receiving most of it in November and December, the Upper Clark Fork River basin currently has slightly above average water year-to-date precipitation conditions.

Georgetown Lake started the summer season with average reservoir storage on June 1st. Good water management over the course of the summer contributed to the reservoirs maintaining near average conditions despite below average moisture. Currently Georgetown Lake is at slightly above average storage for this time of the year.

Streamflow forecasts for January 1st should be used knowing 35 to 40 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 and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 104 percent of average for the April-July time period.

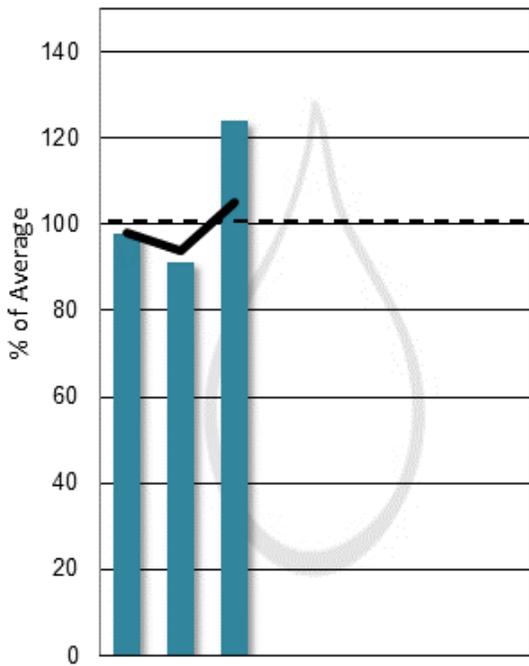
Upper Clark Fork River Basin Data Summary		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	104%	131%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	122%	103%	121%
Valley Precipitation	158%	137%	140%
Basin Precipitation	124%	105%	123%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	101%	91%	93%
	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	104%	147%	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 1/1/2016



Mountain and Valley
 Precipitation

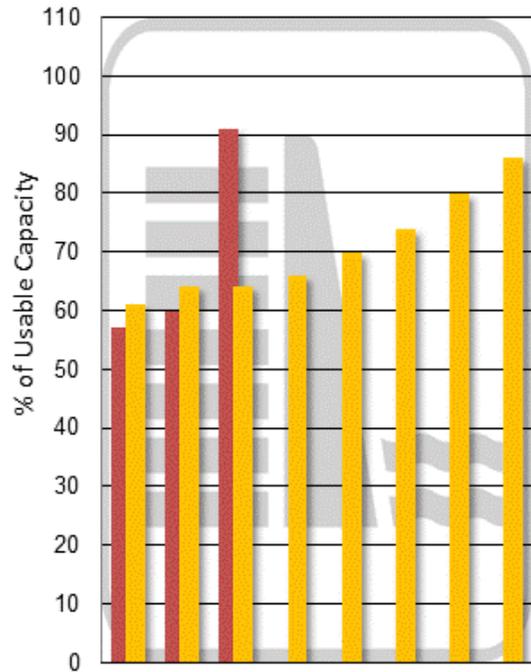
Monthly (teal bar), Year-to-date (black line)



Oct Nov Dec Jan Feb Mar Apr May

End of Month Reservoir
 Storage

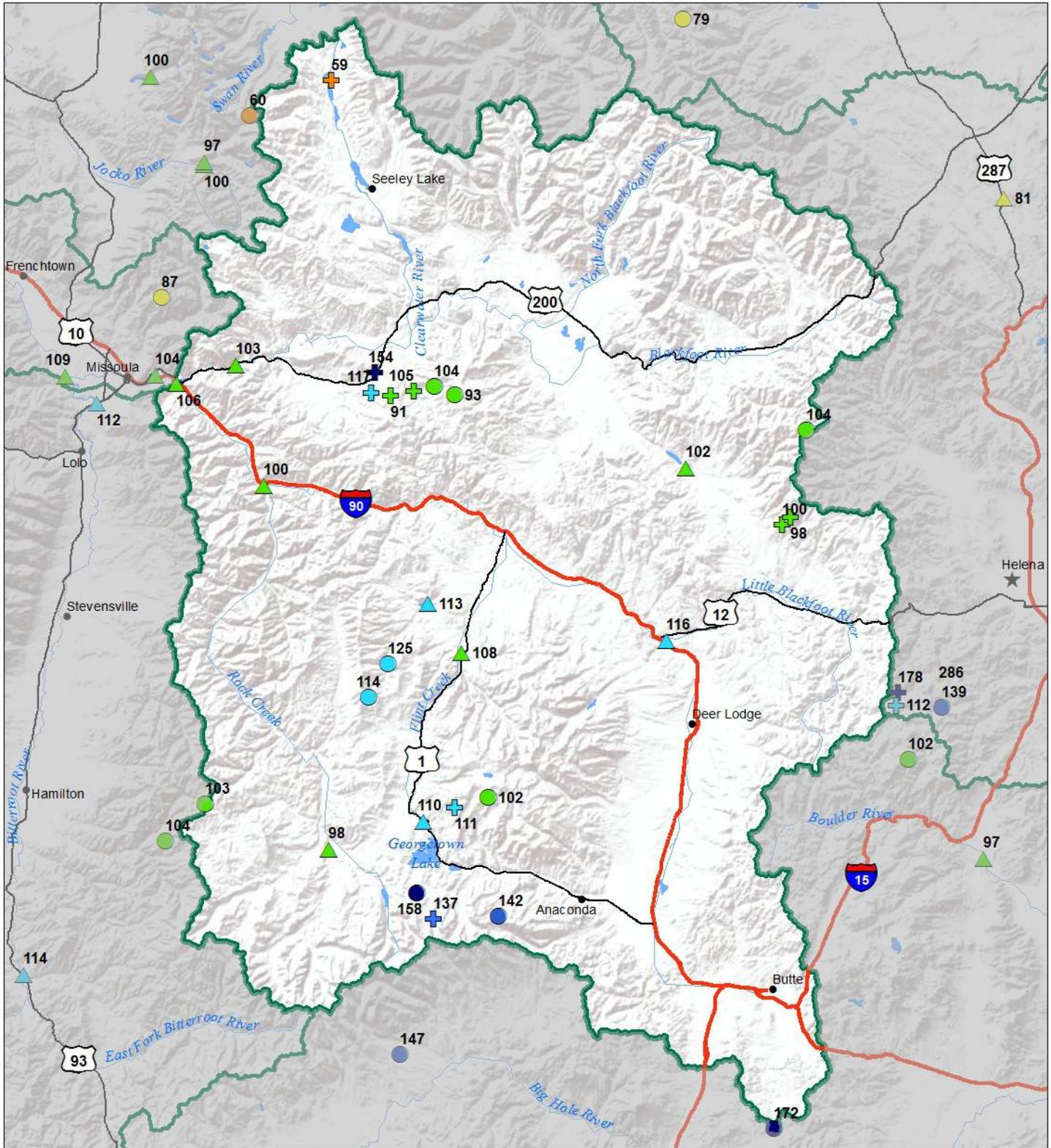
% Capacity (red bar), Avg % Capacity (yellow bar)



Oct Nov Dec Jan Feb Mar Apr May

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

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



Snow Water Equivalent Percent of Normal

SNOTEL

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

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

Snowcourse

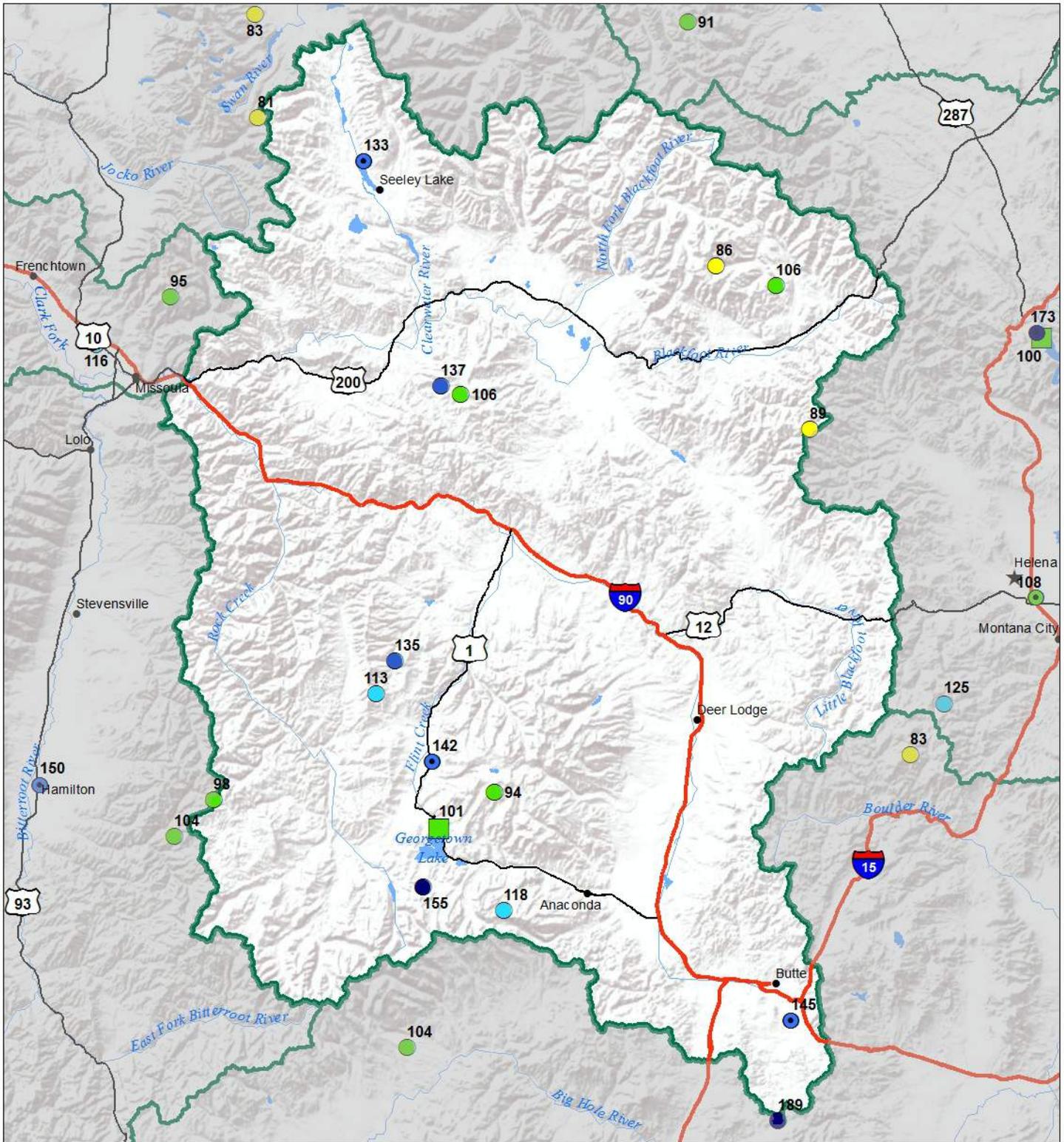
- ⊕ > 150%
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- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

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 January 1, 2016

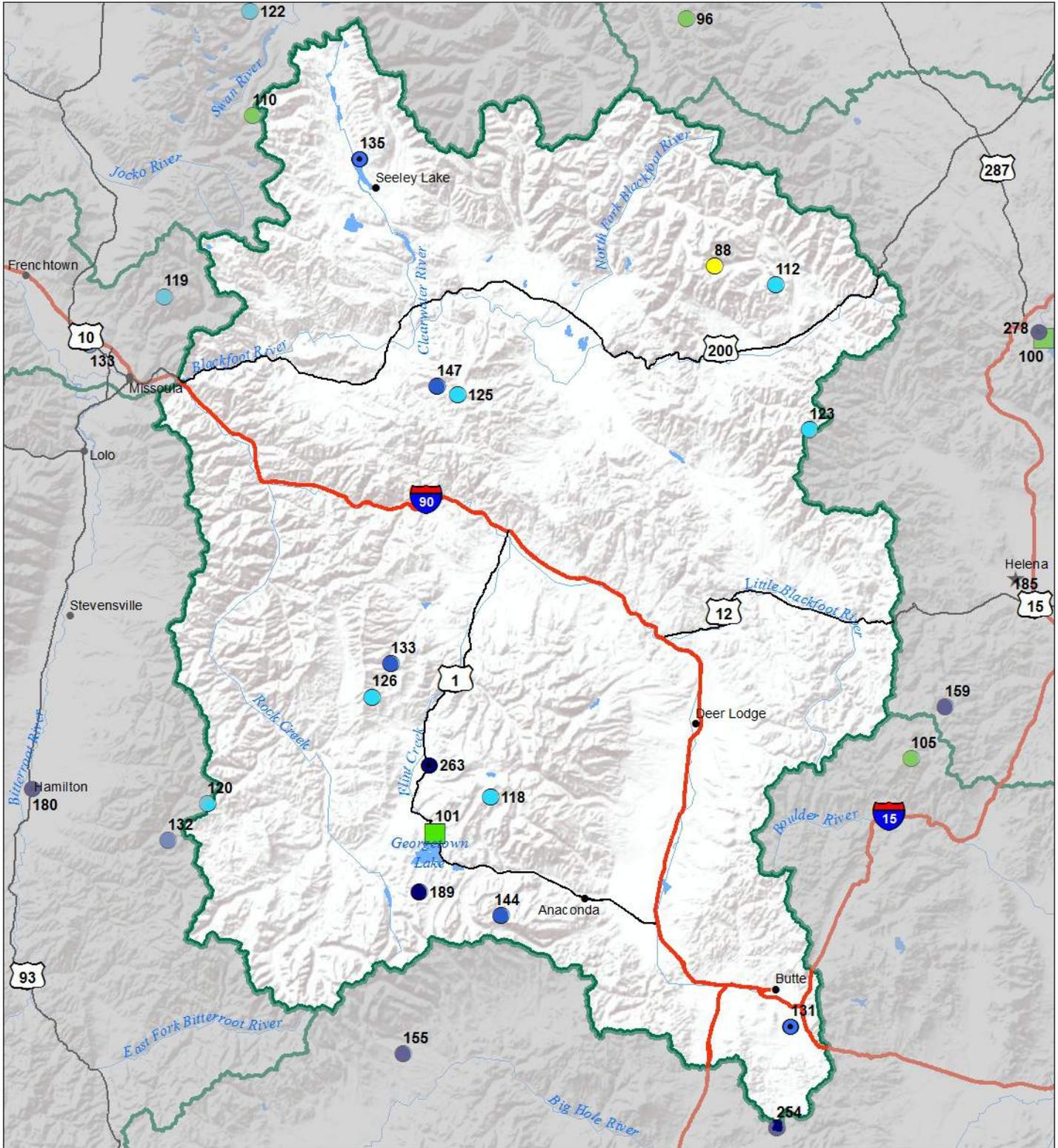


Precipitation Percent of Normal	
SNOTEL	COOP/ACIS
● > 150%	● > 150%
● 131 - 150%	● 131 - 150%
● 111 - 130%	● 111 - 130%
● 91 - 110%	● 91 - 110%
● 71 - 90%	● 71 - 90%
● 51 - 70%	● 51 - 70%
● 1 - 50%	● 1 - 50%

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



Upper Clark Fork River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal January 1, 2016 (December 1, 2015 - January 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 - January 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	42	66	82	117%	98	122	70
	APR-SEP	47	72	89	116%	106	131	77
Flint Ck nr Southern Cross	APR-JUL	7.1	11.2	14	113%	16.8	21	12.4
	APR-SEP	7.3	12.5	16	110%	19.5	25	14.6
Flint Ck bl Boulder Ck	APR-JUL	32	48	58	112%	69	85	52
	APR-SEP	39	58	71	108%	85	104	66
Lower Willow Ck Reservoir Inflow ²	APR-MAY	3.4	6.1	8	110%	9.9	12.6	7.3
	APR-JUL	4.3	8.9	12	113%	15.1	19.7	10.6
MF Rock Ck nr Philipsburg	APR-JUL	38	49	57	98%	65	76	58
	APR-SEP	43	56	64	98%	72	85	65
Rock Ck nr Clinton	APR-JUL	144	205	245	98%	285	345	250
	APR-SEP	170	235	280	100%	325	390	280
Clark Fork R ab Milltown	APR-JUL	270	440	555	105%	670	840	530
	APR-SEP	340	525	650	106%	775	960	615
Nevada Ck nr Helmville	APR-MAY	3.1	6.4	8.6	102%	10.8	14.1	8.4
	APR-JUL	5.6	10.9	14.5	102%	18.1	23	14.2
Blackfoot R nr Bonner	APR-JUL	440	615	735	102%	855	1030	720
	APR-SEP	505	690	820	103%	950	1140	800
Clark Fork R ab Missoula	APR-JUL	795	1100	1300	104%	1510	1810	1250
	APR-SEP	940	1260	1480	104%	1700	2020	1420

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

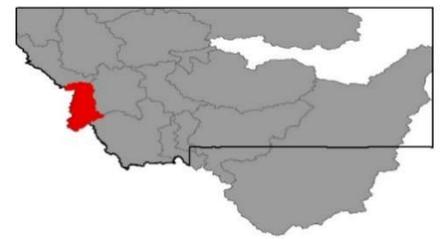
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

Reservoir Storage End of December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
East Fork Rock Creek Res		9.5	7.0	15.6
Georgetown Lake	28.1	25.9	27.8	31.0
Lower Willow Creek Reservoir		2.9	1.7	4.9
Nevada Creek Res		6.3	4.7	12.6
Basin-wide Total	28.1	25.9	27.8	31.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
CLARK FORK ab FLINT CREEK	9	117	129
FLINT CREEK	5	130	157
ROCK CREEK	3	125	142
CLARK FORK ab BLACKFOOT	15	119	136
BLACKFOOT	12	85	124
UPPER CLARK FORK RIVER BASIN	25	104	131

Bitterroot River Basin



Reaching its peak snowpack nearly a month early and at about 80 percent of its normal April peak last winter, water users of the Bitterroot River were probably hoping for a snowier start to this water year. Several small events brought precipitation over the course of October, however above normal temperatures delivered these storms as rain rather than snow. The basin did not see its first significant snowfall until early November. Once the snow arrived it didn't stop for more than 4 days. Over the course of November and December the Bitterroot River basin SNOTEL sites received 9.8 inches of snow water content. Currently, on January 1st the snowpack in the basin is slightly above of normal at 105 percent.

Mountain precipitation in the Bitterroot River basin was somewhat anomalous last summer compared to its neighboring basins to the north. Basin precipitation percentages did drop below average in early May, however gradual mountain precipitation during the summer contributed to the percentages not falling to well below average. The Bitterroot River basin ended Water Year 2015 with mountain precipitation at 92 percent of average, one of the highest of basin percentages in the state. As mentioned previously, minor precipitation in October followed by near continuous snowfall in November and December helped increase moisture in the basin. Currently, water year-to-date precipitation in the basin is slightly above average at 108 percent.

Both Painted Rocks Lake and Lake Como started the summer season with average to above average reservoir storage on June 1st. Both reservoirs saw a gradual decline in storage over the course of the summer. As of October 1st, the reservoir capacities were at 50 to 60 percent of average storage. On December 1st Painted Rocks Lake was at 97 percent of average and as of January 1st Lake Como was at 83 percent of average.

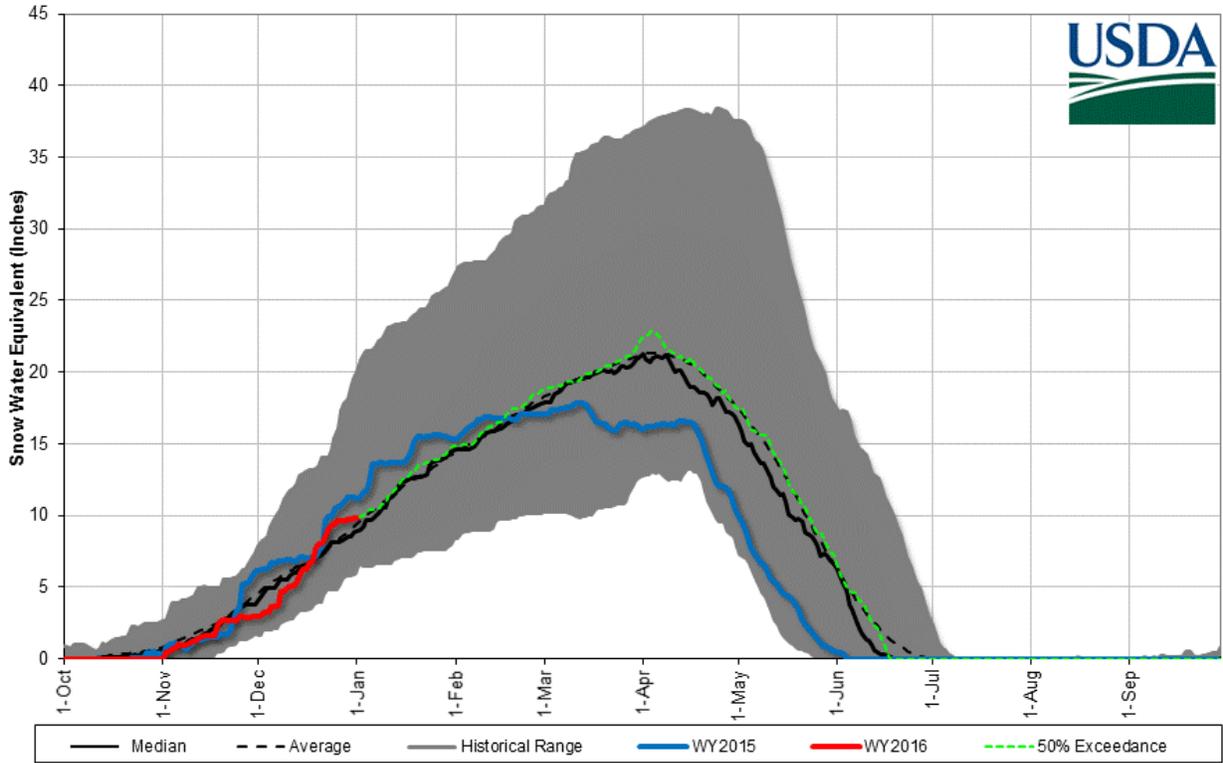
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 113 percent of average for the April-July time period.

Bitterroot River Basin Data Summary		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	105%	125%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	140%	107%	128%
Valley Precipitation	180%	150%	169%
Basin Precipitation	141%	108%	130%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	83%	22%	182%
	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	113%	133%	79%

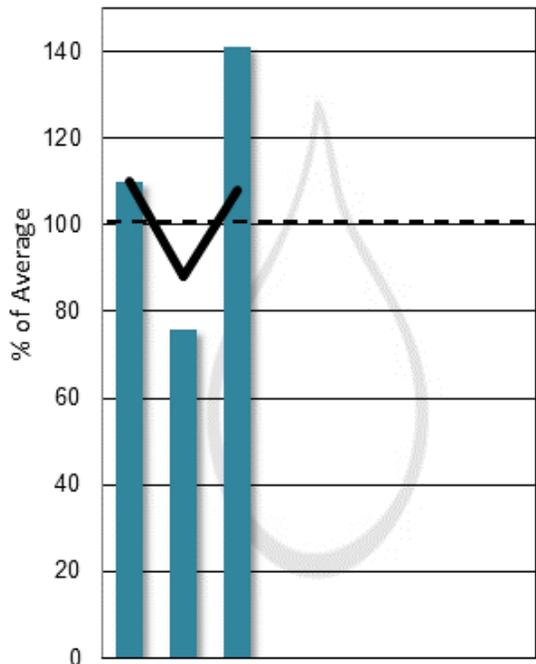
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**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-Exceedance Projections
Based on provisional SNOTEL daily data as of 1/1/2016

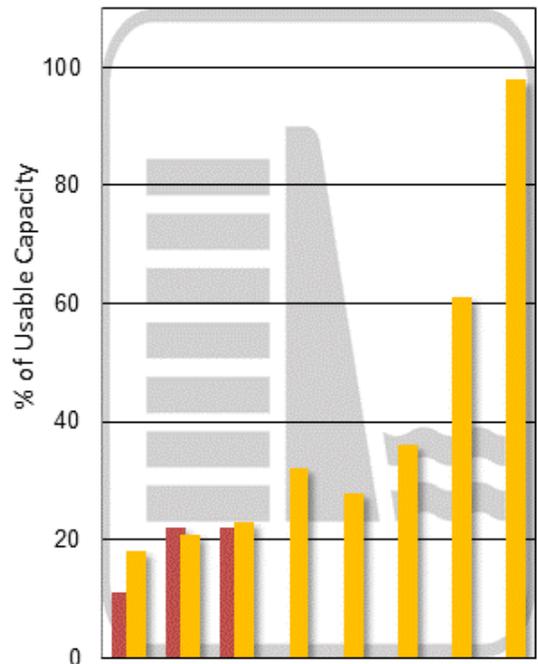


Mountain and Valley Precipitation



Oct Nov Dec Jan Feb Mar Apr May

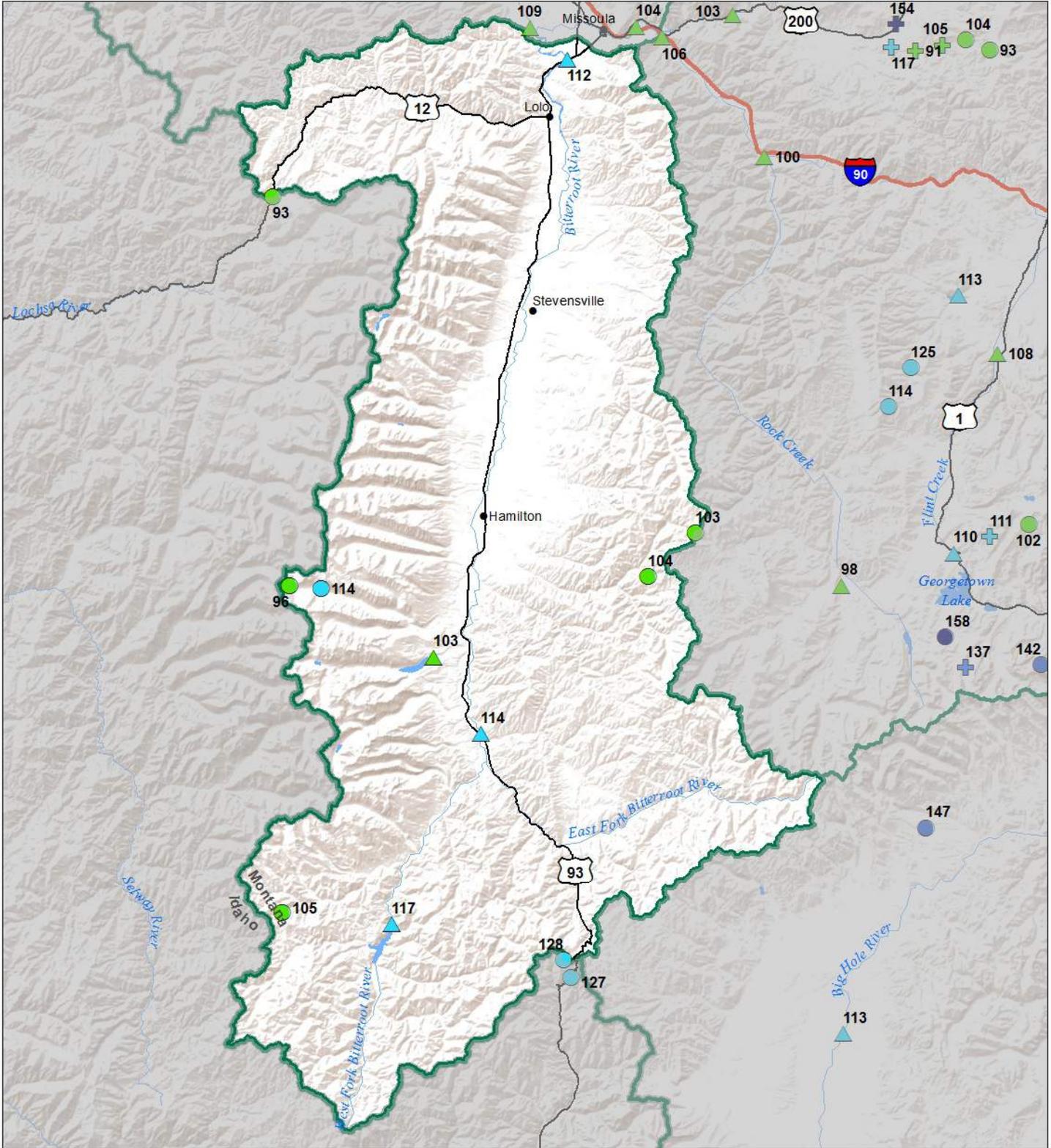
End of Month Reservoir Storage



Oct Nov Dec Jan Feb Mar Apr May

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

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



Snow Water Equivalent Percent of Normal

SNOTEL

- > 150%
- 131 - 150%
- 111 - 130%
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- 71 - 90%
- 51 - 70%
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- *

Snowcourse

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- ⊕ 1 - 50%
- ⊕ *

Streamflow Forecast Percent of Average Flows

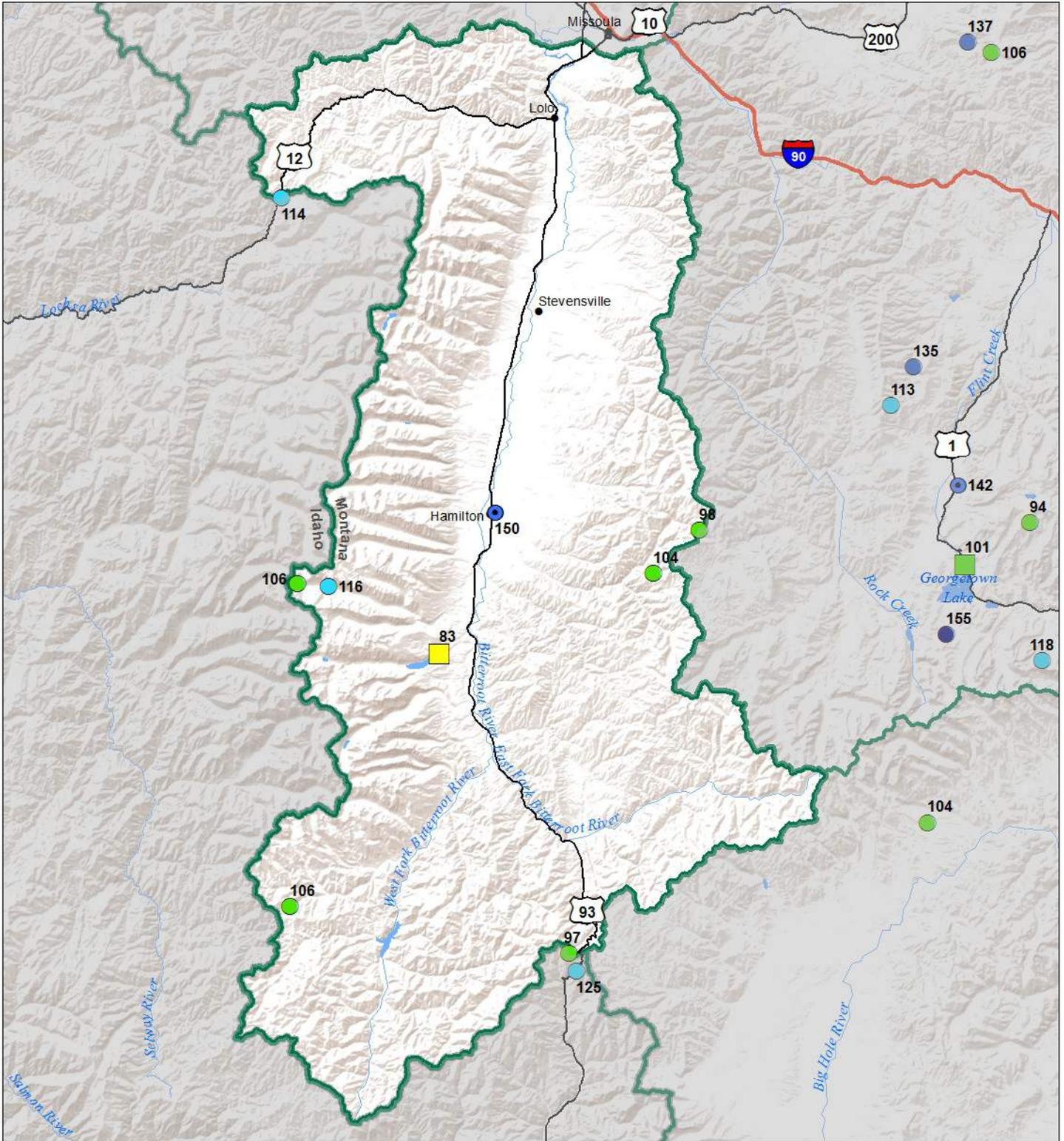
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Bitterroot River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

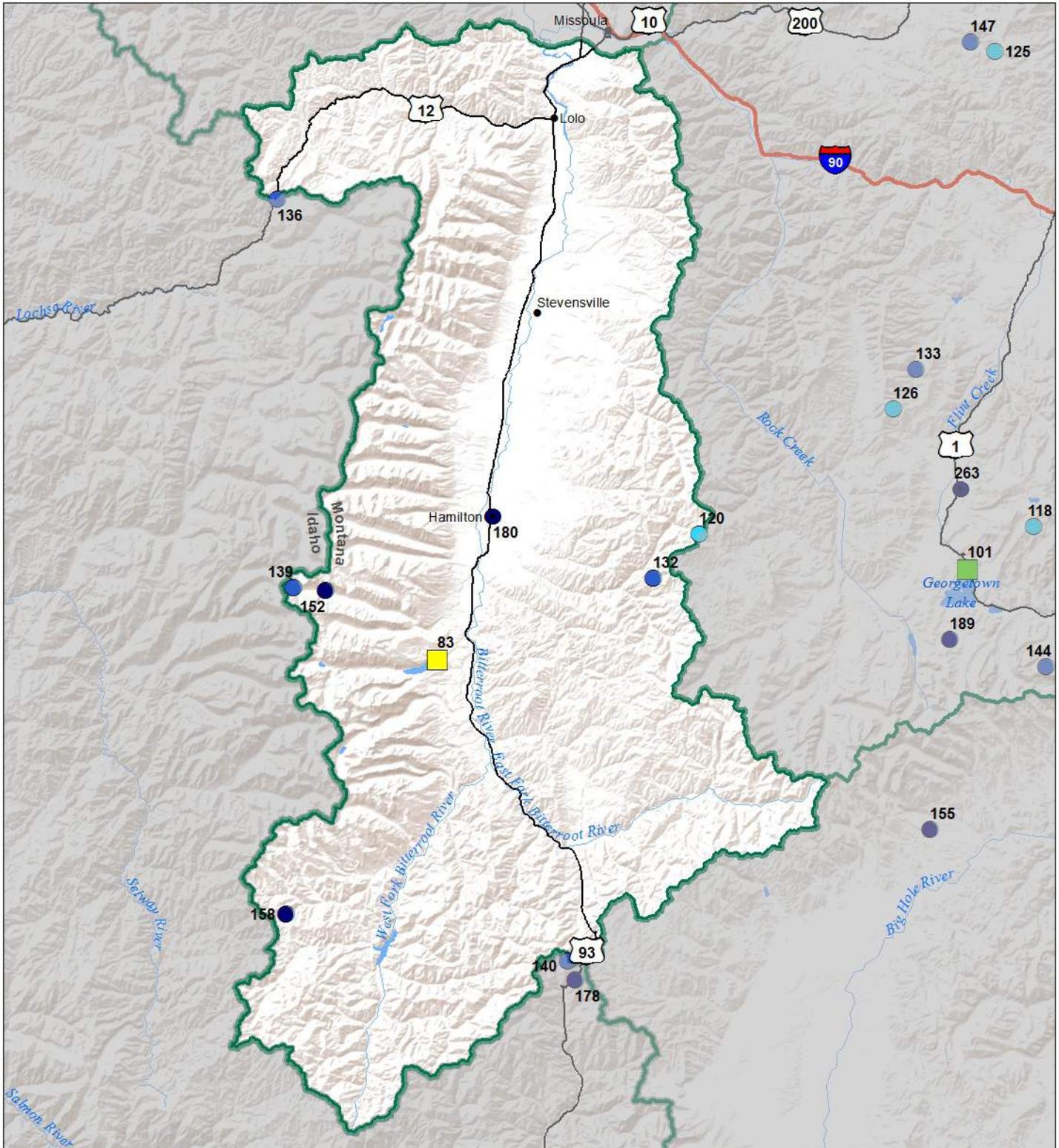
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



Bitterroot River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal January 1, 2016 (December 1, 2015 - January 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 - January 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	86	124	150	117%	176	215	128
	APR-SEP	93	135	163	117%	191	235	139
Bitterroot R Nr Darby	APR-JUL	285	395	475	116%	550	665	410
	APR-SEP	345	460	535	114%	610	725	470
Como Reservoir Inflow ²	APR-JUL	58	69	77	101%	85	97	76
	APR-SEP	61	73	81	103%	89	101	79
Bitterroot R nr Missoula	APR-JUL	825	1100	1290	112%	1480	1760	1150
	APR-SEP	910	1200	1400	112%	1600	1900	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 December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Painted Rocks Lake		7.9	6.2	31.7
Lake Como	7.8	17.1	9.4	34.9
Basin-wide Total	7.8	17.1	9.4	34.9
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
WEST FORK BITTERROOT	2	120	125
EAST SIDE BITTERROOT	3	114	134
WEST SIDE BITTERROOT	3	98	120
BITTERROOT RIVER BASIN	7	105	125

Lower Clark Fork River Basin



Last winter the Lower Clark Fork River basin experienced record low snowpack conditions reaching a peak snow water equivalent that was over 12.0 inches below its normal value. Needless to say water users of the Clark Fork River are hoping for a snowier winter this year. Unfortunately, this water year started slow with no significant snow accumulation occurring until November. This left the basin behind on its normal snowpack levels. November through December brought more moisture to the Lower Clark Fork River basin increasing the basin wide snow water content by over 10 inches. Hoodoo Basin SNOTEL (6050 ft) currently has the deepest snowpack in the basin at 57 inches. Even though the Lower Clark Fork had a slow start, it is currently not too far below normal at 87 percent.

Similar to Montana’s other western basins Water Year 2015 precipitation in the Lower Clark Fork River basin dropped below average shortly before the transition to summer. Below average conditions and only one significant storm last summer left the basin wide mountain precipitation average of about 88 percent. The start of the new water year on October 1st brought wetter conditions to the basin. Following the winter storms that arrived at the end of October mountain precipitation has been near average. As of January 1st both mountain and valley precipitation was above average for this water year.

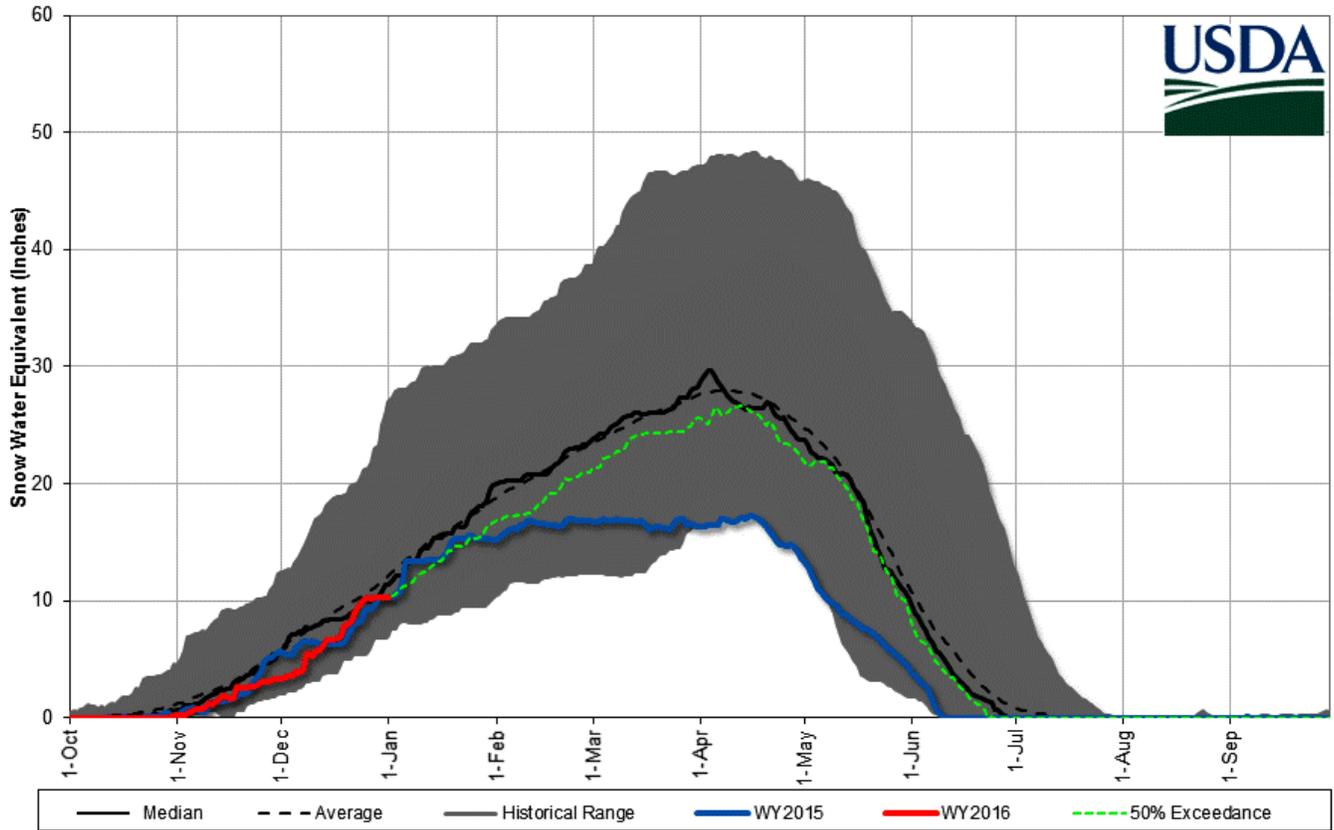
Noxon Rapids Reservoir started the summer season with average reservoir storage on June 1st. Good water management over the course of the summer contributed to the reservoirs maintaining near average conditions despite below average moisture. Currently Noxon Rapids Reservoir is slightly above average storage for this time of the year.

Streamflow forecasts for January 1st should be used knowing 35 to 40 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 and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 103 percent of average for the April-July time period.

Lower Clark Fork River Basin Data Summary		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	87%	90%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	139%	106%	112%
Valley Precipitation	141%	105%	118%
Basin Precipitation	139%	106%	113%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	103%	97%	101%
	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	103%	157%	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.			

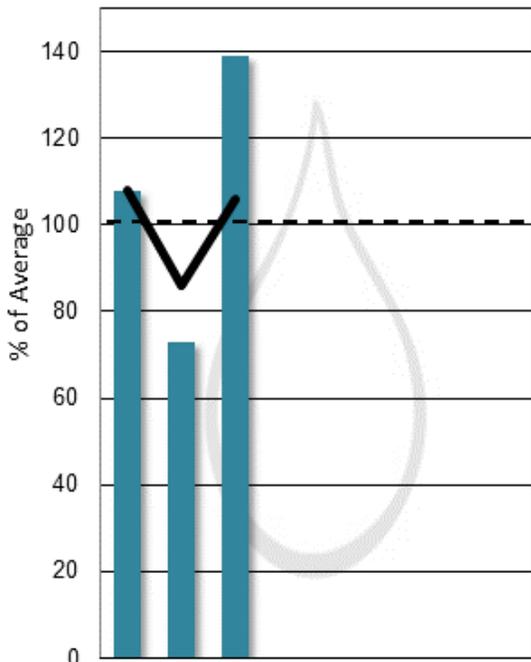
Lower Clark Fork River Basin Snowpack with Non-Exceedence Projections

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



Mountain and Valley Precipitation

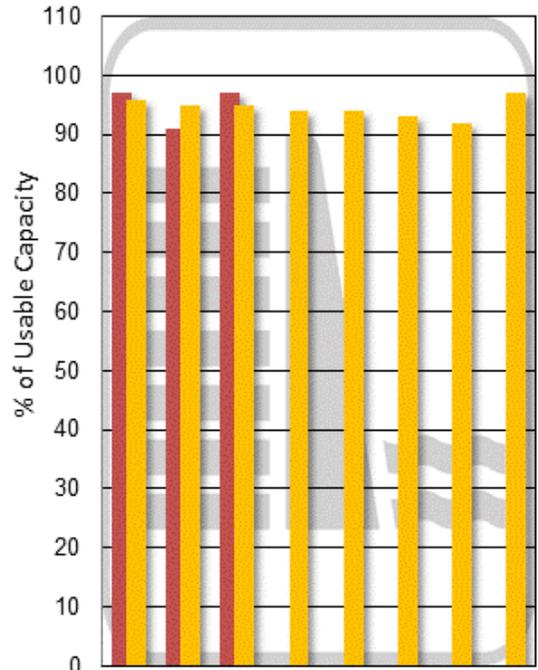
Monthly (teal bar), Year-to-date (black line)



Oct Nov Dec Jan Feb Mar Apr May

End of Month Reservoir Storage

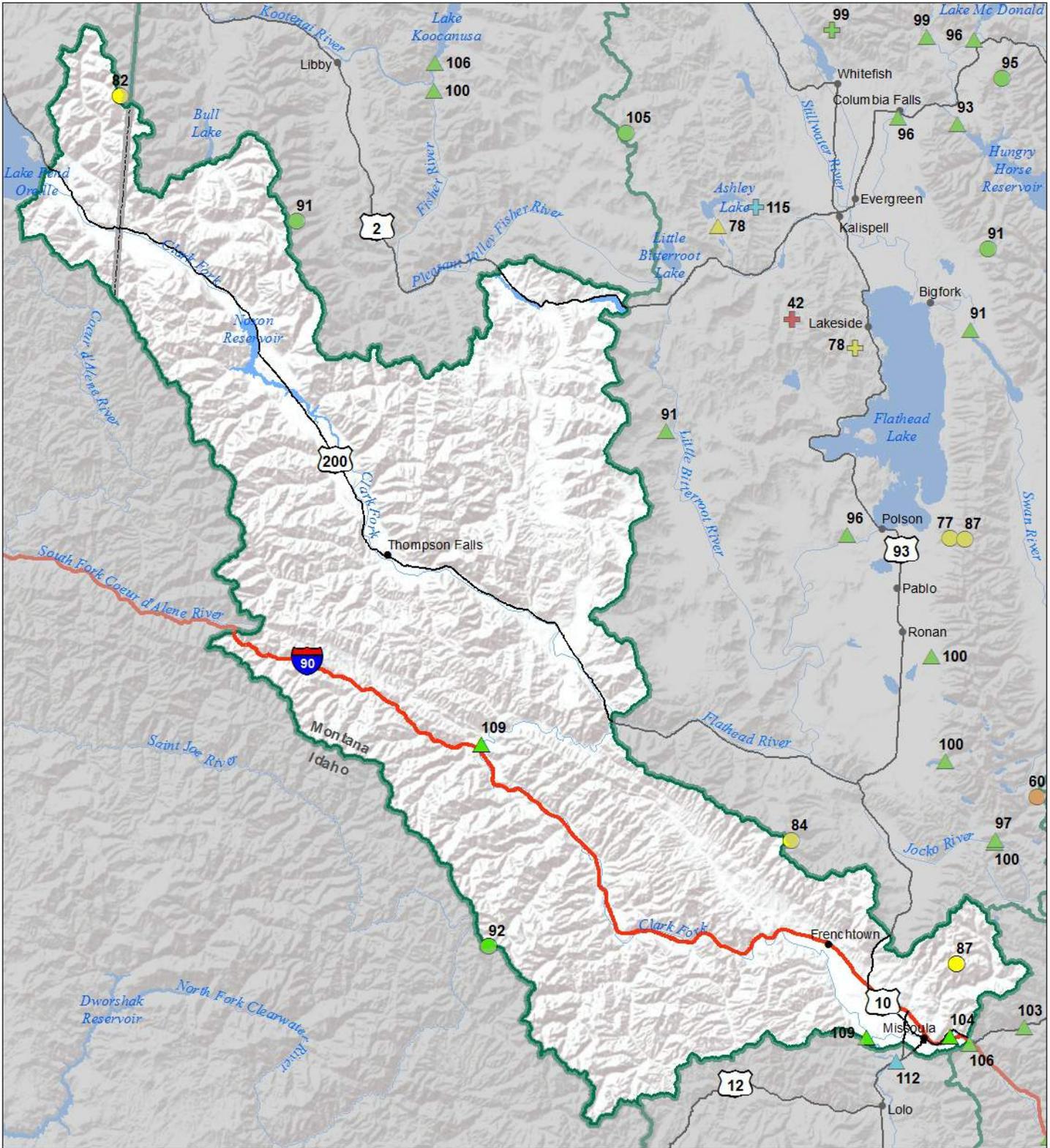
% Capacity (red bar), Avg % Capacity (yellow bar)



Oct Nov Dec Jan Feb Mar Apr May

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

Lower Clark Fork River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal January 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

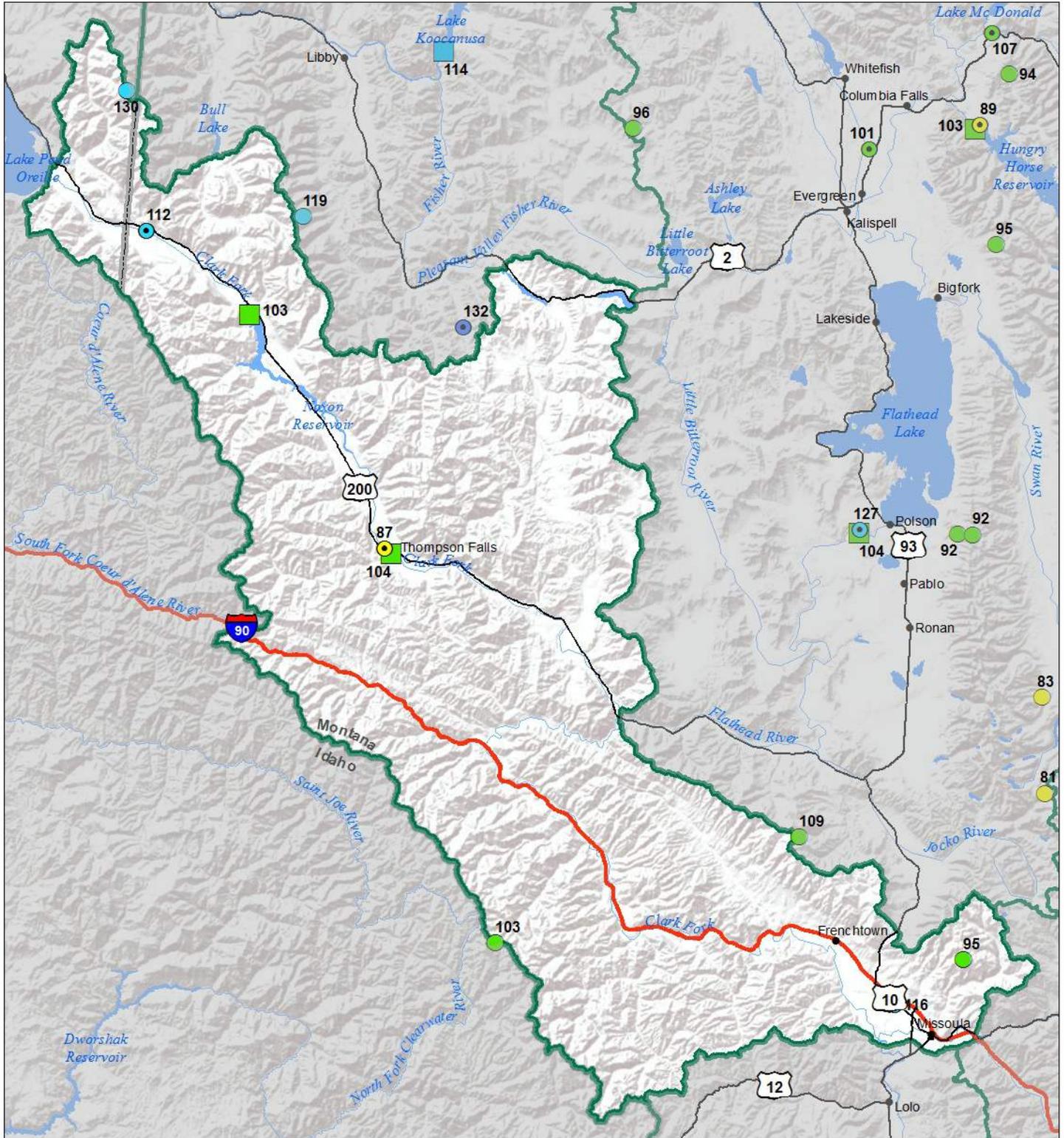
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
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- ▲ 51 - 70%
- ▲ 1 - 50%



Lower Clark Fork River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

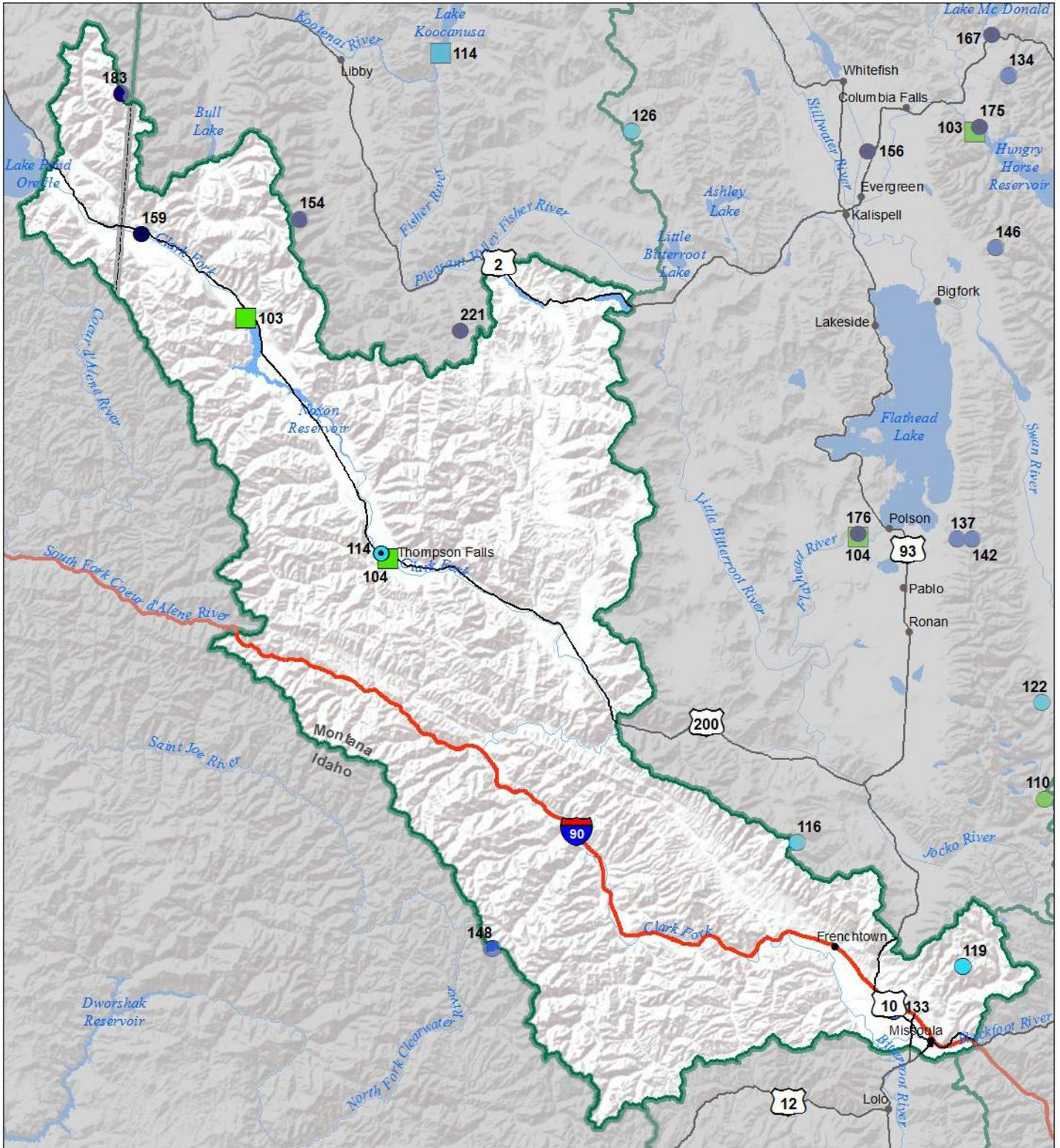
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



Lower Clark Fork River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal January 1, 2016 (December 1, 2015 - January 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 - January 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	1720	2250	2610	109%	2970	3490	2400
	APR-SEP	1960	2520	2900	109%	3270	3830	2670
Clark Fork R at St. Regis ¹	APR-JUL	2040	3010	3450	109%	3890	4850	3160
	APR-SEP	2350	3370	3830	109%	4290	5300	3510
Clark Fork R nr Plains ^{1,2}								
Thompson nr Thompson Falls								
Prospect Ck at Thompson Falls								
Clark Fork R at Whitehorse Rapids ^{1,2}								

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

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

3) Median value used in place of average

Reservoir Storage End of December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Noxon Rapids Reservoir	326.4	319.9	317.9	335.0
Basin-wide Total	326.4	319.9	317.9	335.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
LOWER CLARK FORK RIVER BASIN	7	87	90

Jefferson River Basin



The 2016 Jefferson Basin water year got off to a slow start. On October 1st Lima, Clark Canyon, and Ruby River reservoir levels were at 54, 58, and 102 percent of average, respectively. Additionally, precipitation and snowfall through October were also well below average. Luckily, storms began reaching the area by the end of the month and by the third week of November nearly two inches of water had fallen. This rebounded both precipitation and snow water equivalency (SWE) totals to above their average marks at 118 percent and 106 percent. Moisture continued to trickle in through the remainder of November adding another inch of water. December 1st water year totals remained slightly below normal, however the relatively wet November set the basin well on its way to recovering from October's parched performance.

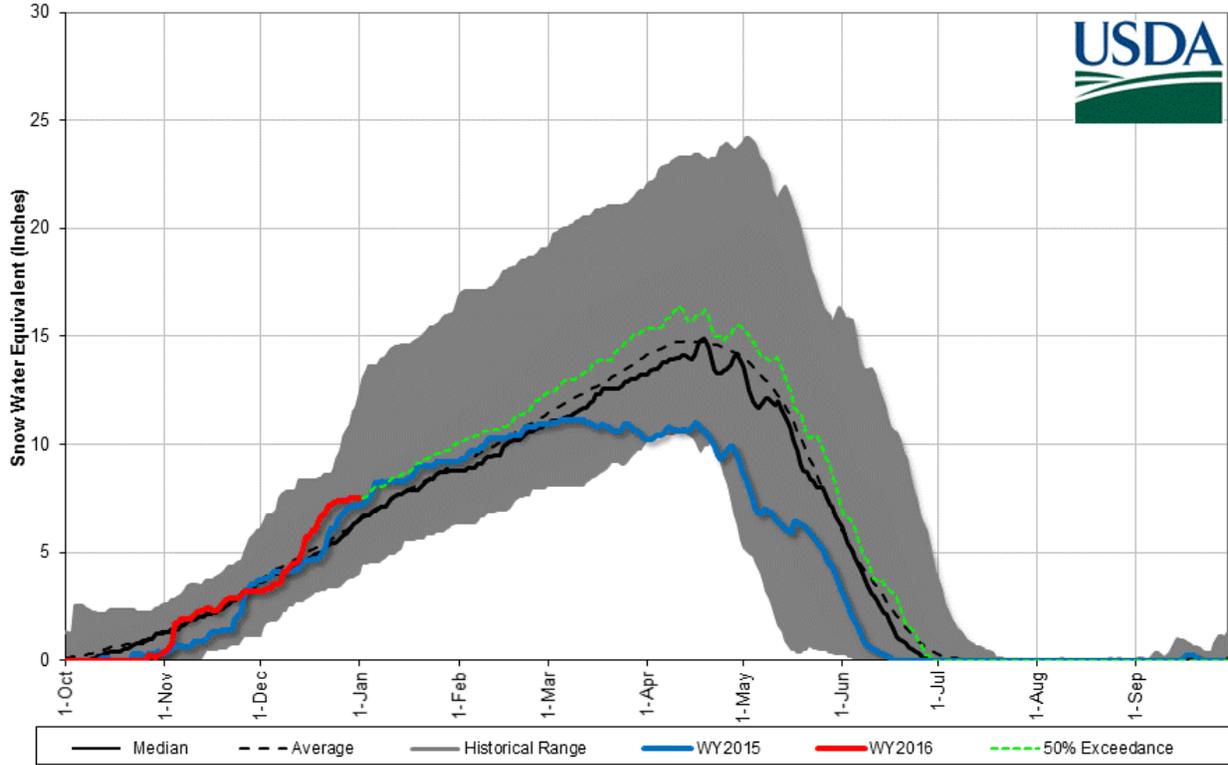
Significant and steady storm systems returned to the basin beginning the second week of December. Before finally tapering off around Christmas, these storms drenched the region with nearly four inches of water. The precipitation from those two weeks allowed mountain snow water equivalency and precipitation totals to climb above average to 120 percent and 113 percent of average, respectively. Minor storms filled out the rest of December.

For the water year, as of January 1st, The Jefferson basin had collected 120 percent of average SWE and 113 percent of average precipitation. Reservoirs recovered somewhat from October 1st but remained below average with Lima reporting 73 percent of normal and Clark Canyon at 72 percent.

Streamflow forecasts for January 1st should be used knowing 35 to 40 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 and through snowmelt. Current basin-wide stream flows for the 50 percent exceedance are 105 percent of average for the April-July time period.

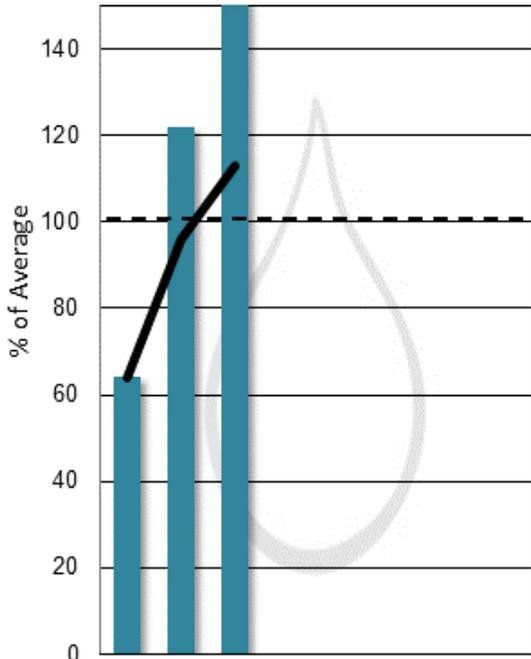
Jefferson River Basin Data Summary		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	120%	116%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	150%	112%	106%
Valley Precipitation	250%	187%	103%
Basin Precipitation	152%	113%	106%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	72%	31%	84%
	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%	199%	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 1/1/2016



Mountain and Valley Precipitation

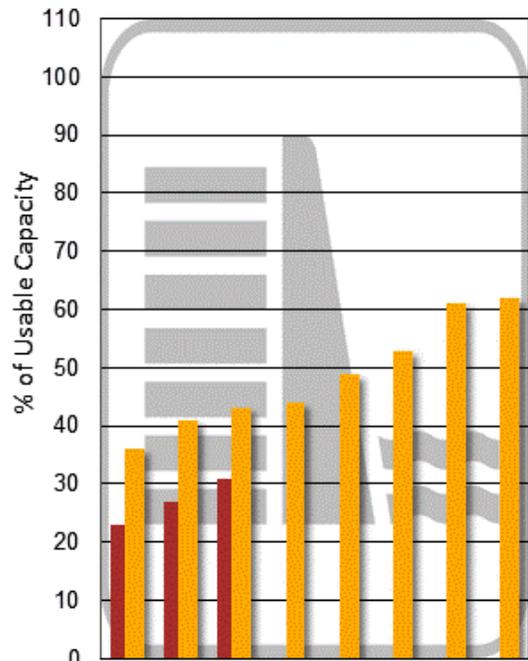
Monthly (teal bar) Year-to-date (black line)



Oct Nov Dec Jan Feb Mar Apr May

End of Month Reservoir Storage

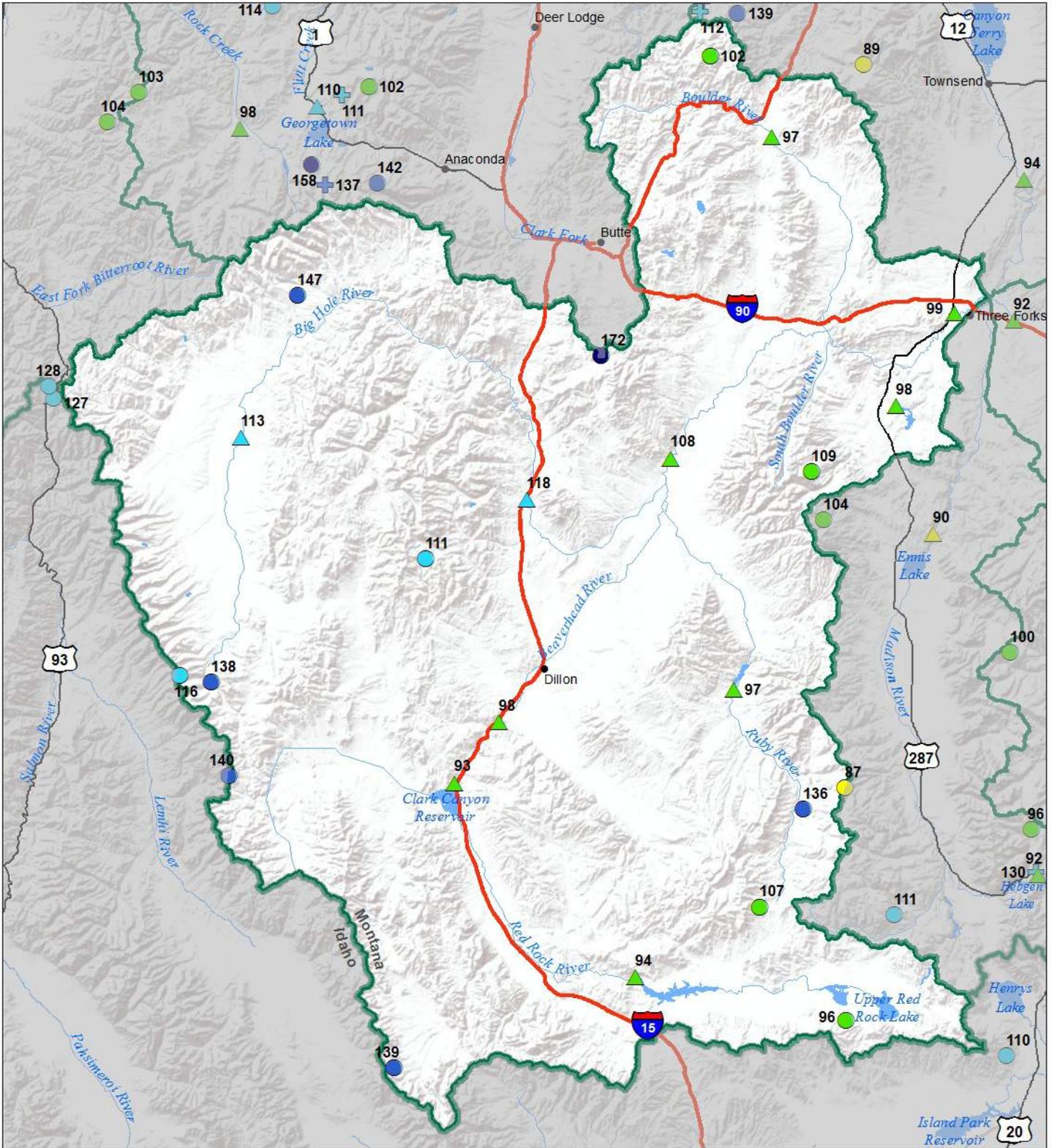
% Capacity (red bar) Avg % Capacity (yellow bar)



Oct Nov Dec Jan Feb Mar Apr May

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

Jefferson River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal January 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

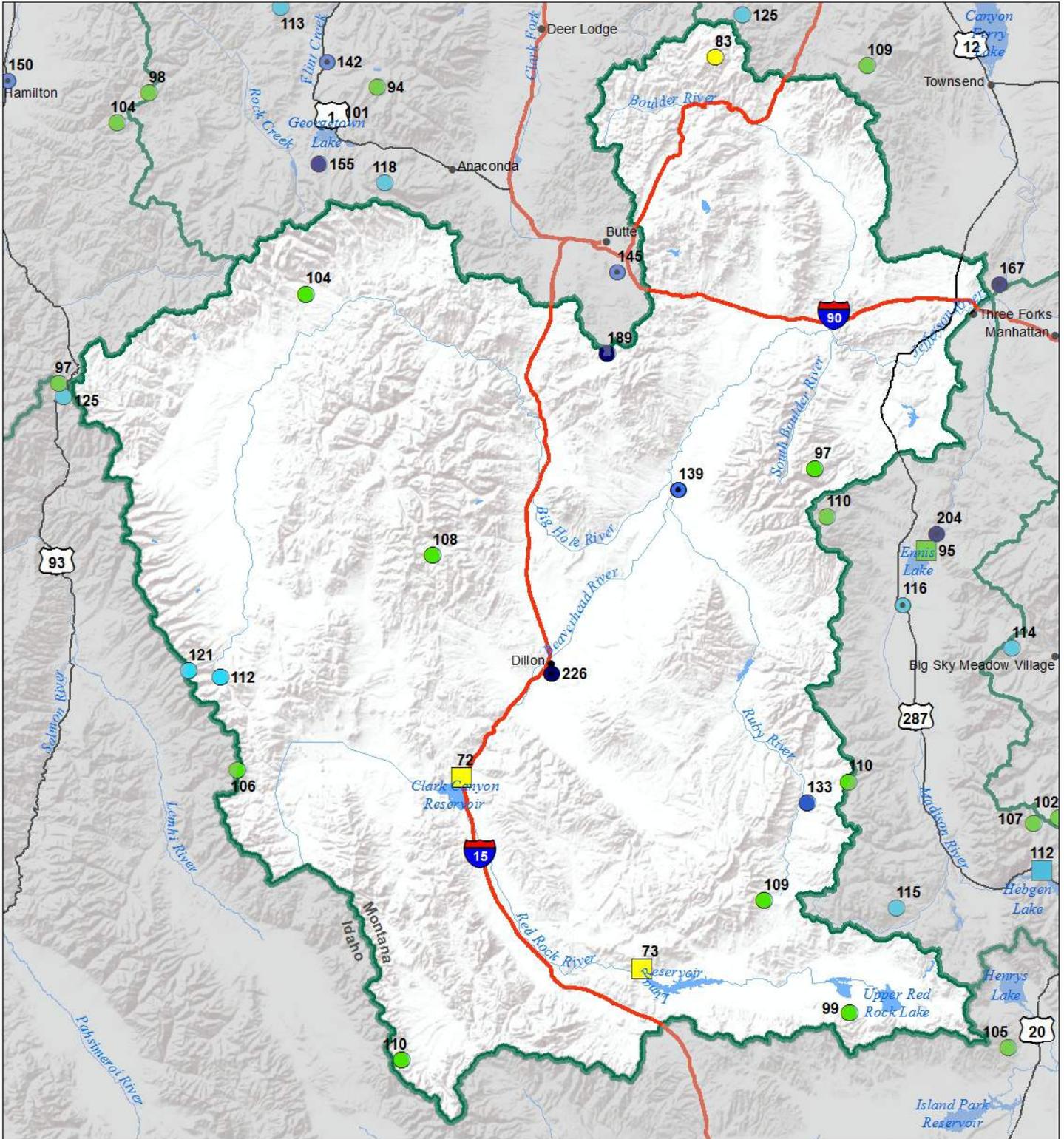
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Jefferson River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

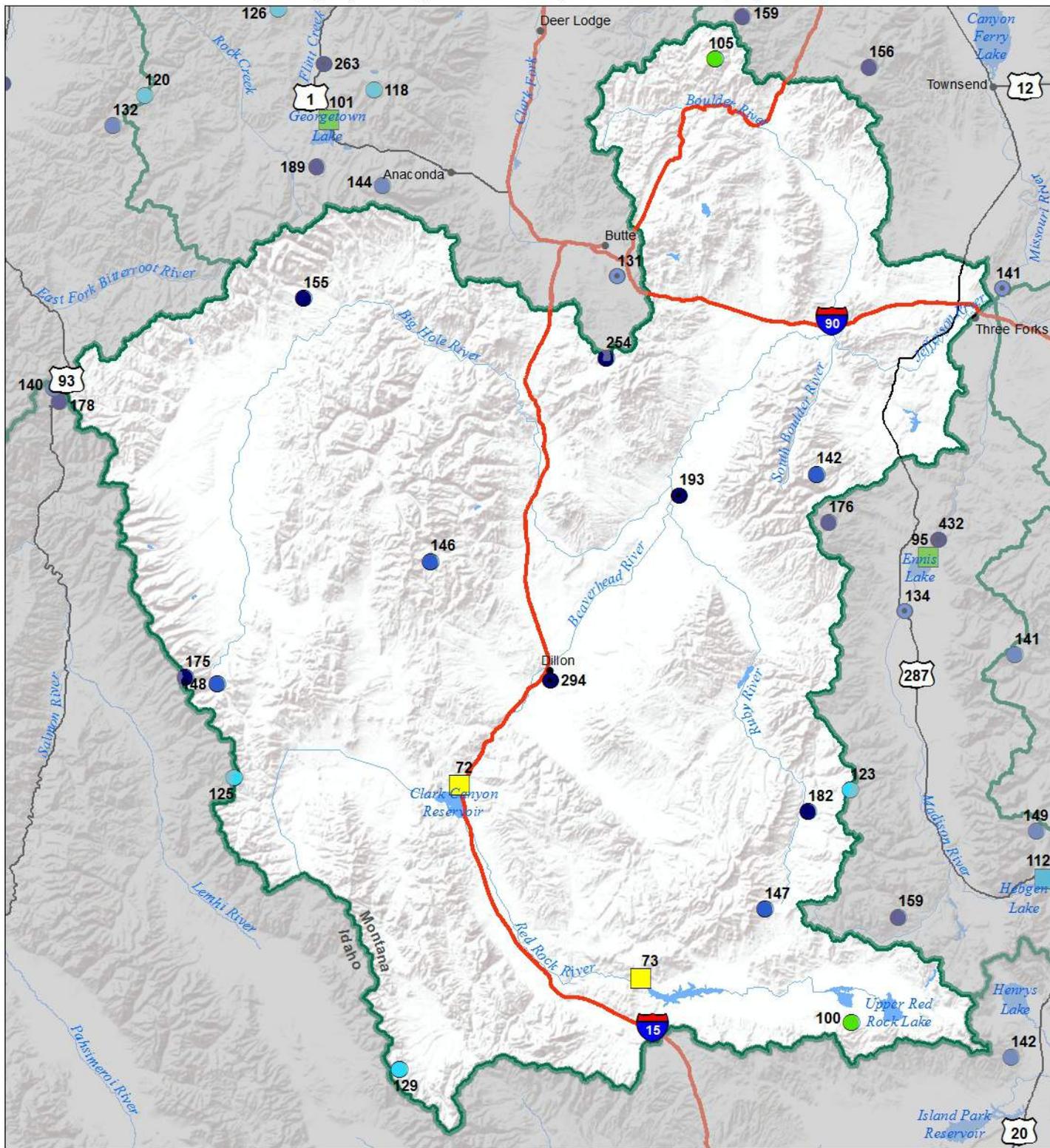
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

Reservoirs Percent of Normal

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



Jefferson River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal January 1, 2016 (December 1, 2015 - January 1, 2016)



Precipitation Percent of Normal

SNOTEL

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

COOP/ACIS

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

Reservoirs Percent of Normal

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



Jefferson River Basin Streamflow Forecasts - January 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-SEP	43	67	84	94%	101	125	89
	APR-JUL	41	62	77	94%	92	113	82
Clark Canyon Inflow ²	APR-SEP	7.7	72	116	97%	160	225	120
	APR-JUL	-4.4	54	94	93%	134	192	101
Beaverhead R at Barretts ²	APR-SEP	8.9	96	156	100%	215	305	156
	APR-JUL	1	76	127	98%	178	255	129
Ruby R Reservoir Inflow ²	APR-SEP	52	74	89	98%	105	127	91
	APR-JUL	42	62	75	97%	89	108	77
Big Hole R at Wisdom	APR-SEP	30	85	122	113%	159	215	108
	APR-JUL	29	80	115	113%	150	200	102
Big Hole R nr Melrose	APR-SEP	380	545	655	117%	765	930	560
	APR-JUL	355	505	610	118%	715	865	515
Jefferson R nr Twin Bridges ²	APR-SEP	340	615	805	110%	995	1270	730
	APR-JUL	325	575	745	108%	915	1170	690
Boulder R nr Boulder	APR-SEP	40	59	72	97%	85	104	74
	APR-JUL	37	55	67	97%	79	97	69
Willow Ck Reservoir Inflow ²	APR-SEP	6.4	13.9	19.1	99%	24	32	19.3
	APR-JUL	4.6	11.6	16.4	98%	21	28	16.8
Jefferson R nr Three Forks ²	APR-SEP	290	595	800	100%	1010	1310	800
	APR-JUL	270	545	730	99%	915	1190	740

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

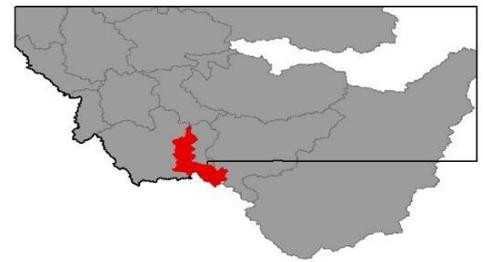
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

Reservoir Storage End of December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lima Reservoir	20.1	31.4	27.4	84.0
Clark Canyon Res	83.6	89.5	116.7	255.6
Ruby River Reservoir		29.9	20.1	38.8
Basin-wide Total	103.7	120.9	144.1	339.6
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
BEAVERHEAD	8	117	111
RUBY	5	104	91
BIGHOLE	9	130	132
BOULDER	4	126	135
JEFFERSON RIVER BASIN	21	120	116

Madison River Basin



As was the case in neighboring basins the Madison began the 2016 water year dry. Both above and below Hebgen Lake, precipitation was minimal in October averaging only 1.2 inches or 61 percent of normal. Additionally, that precipitation favored valleys resulting in higher elevations receiving only 53 percent of average. By the end of the month, this combination led to a significantly below normal snowpack.

November opened with an impressive storm delivering nearly two inches of water over higher elevations and shooting basin totals up to near normal levels. The remainder of the month was fairly mild and, while the monthly totals were above average, the disappointing October left water year totals below average at 84 percent for precipitation and 70 percent for snow water equivalence (SWE) on Dec 1st.

As it did across the region, December brought the gift of copious snowfall. Between December 6th and the 26th the mountains of the Madison Basin collected five inches of snow water, nearly 1.3 inches above the month's historical average. As for the water year, On January 1st, both SWE and precipitation totals sat near normal at 100 percent and 105 percent, respectively. Reservoirs in the basin began the water year at around average levels and on January 1st Ennis Lake was at 95 percent and Hebgen was at 112 percent.

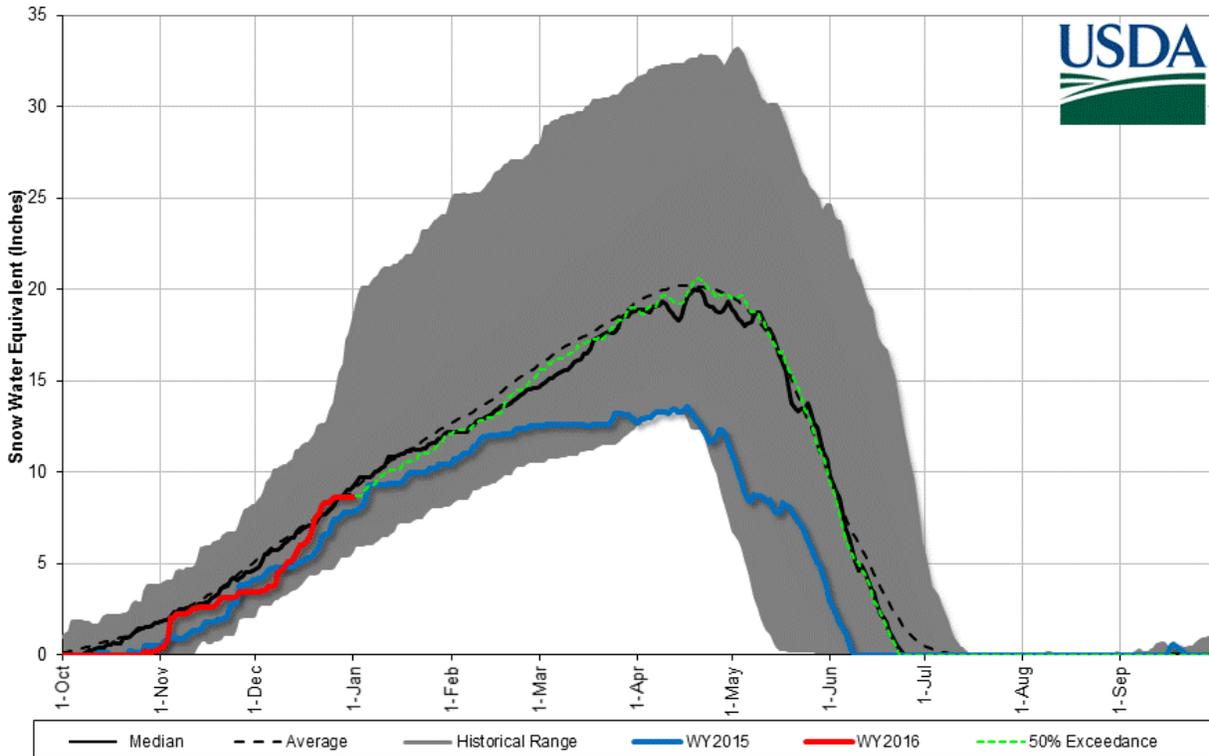
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide stream flows for the 50 percent exceedance are 90 percent of average for the April-July time period.

Madison River Basin Data Summary		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	100%	89%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	137%	103%	89%
Valley Precipitation	149%	124%	104%
Basin Precipitation	138%	105%	90%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	111%	83%	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	90%	131%	69%

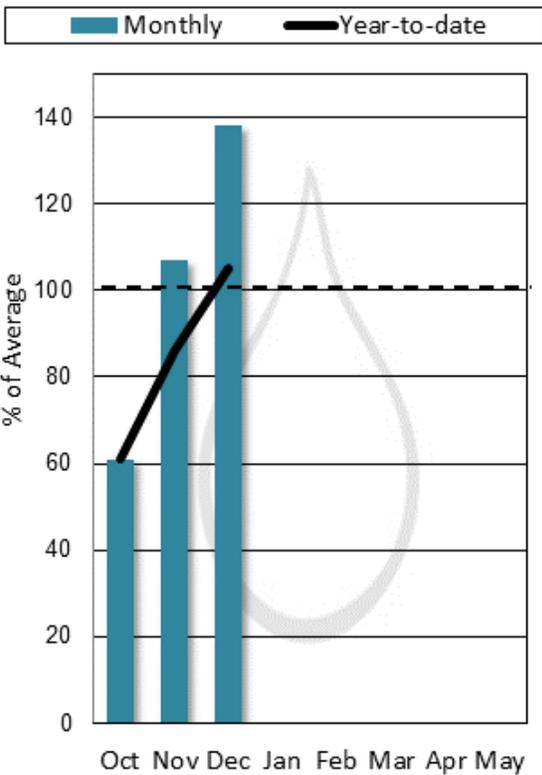
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**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.

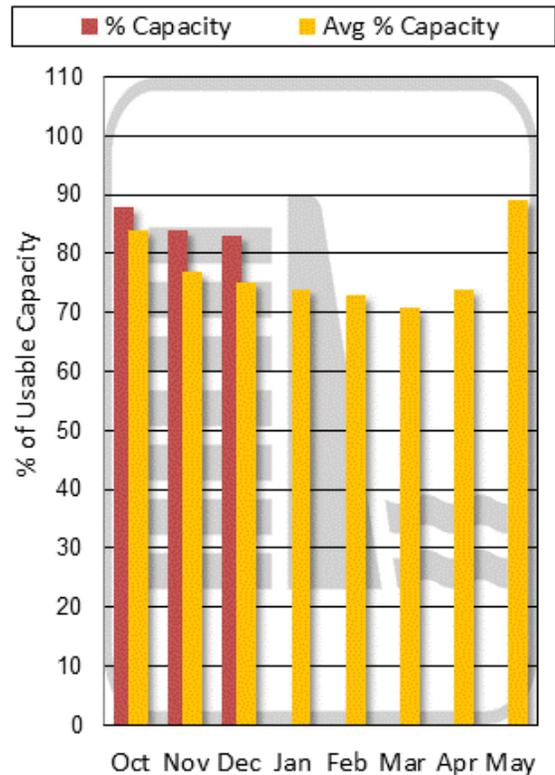
Madison River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 1/1/2016



Mountain and Valley Precipitation

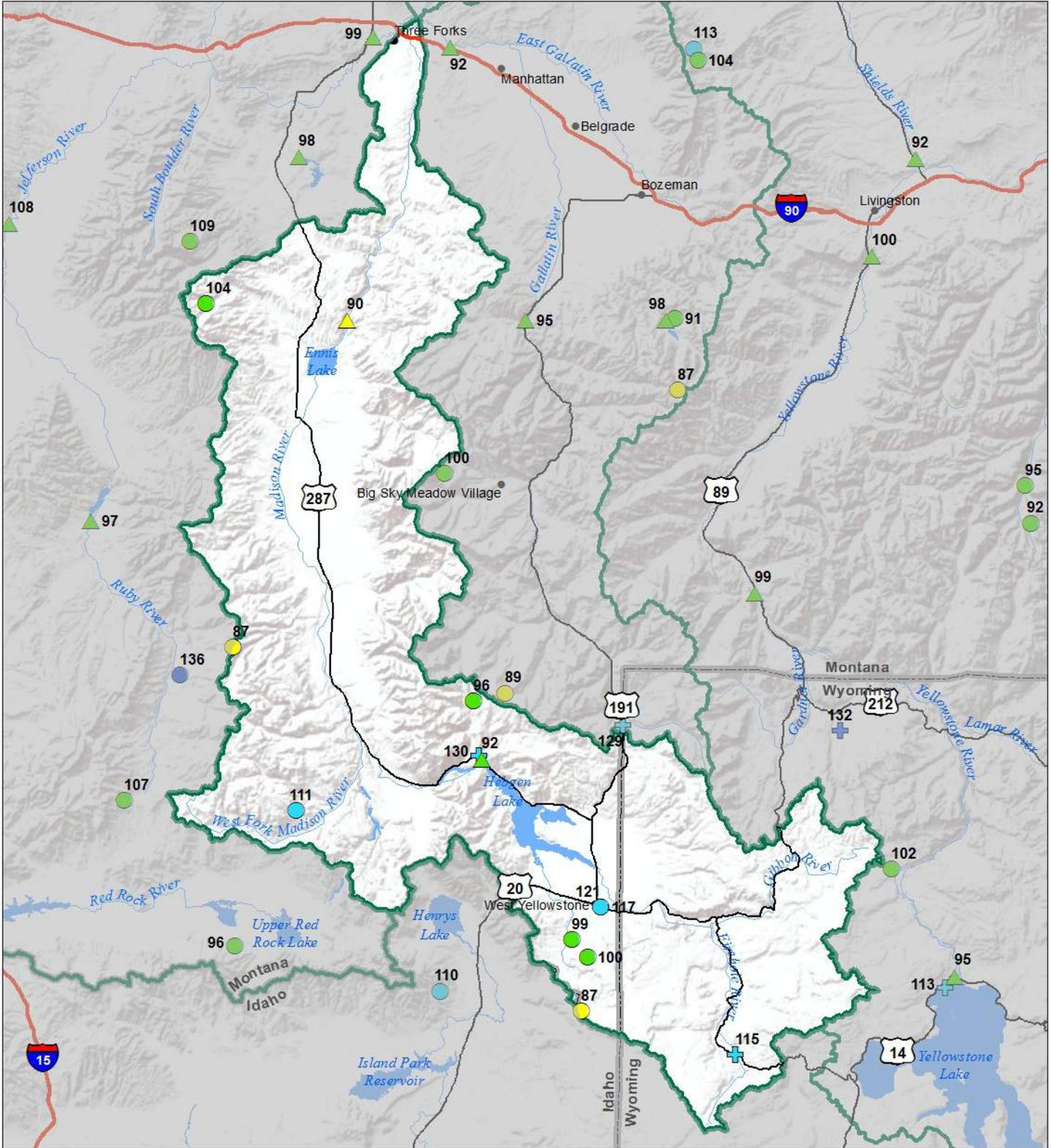


End of Month Reservoir Storage



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

Madison River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal January 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%
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Streamflow Forecast Percent of Average Flows

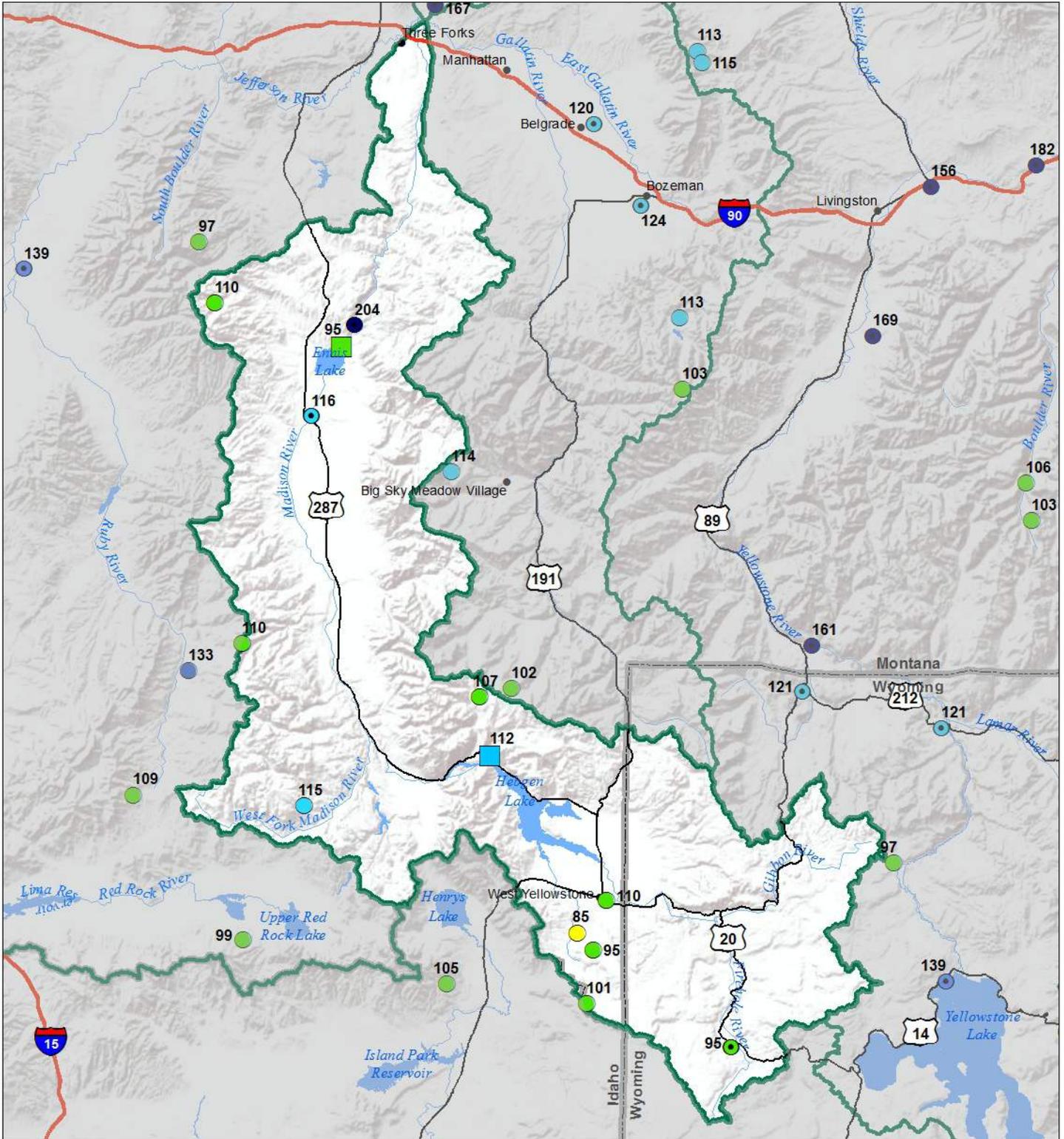
- ▲ > 150%
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- ▲ 71 - 90%
- ▲ 51 - 70%
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Madison River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

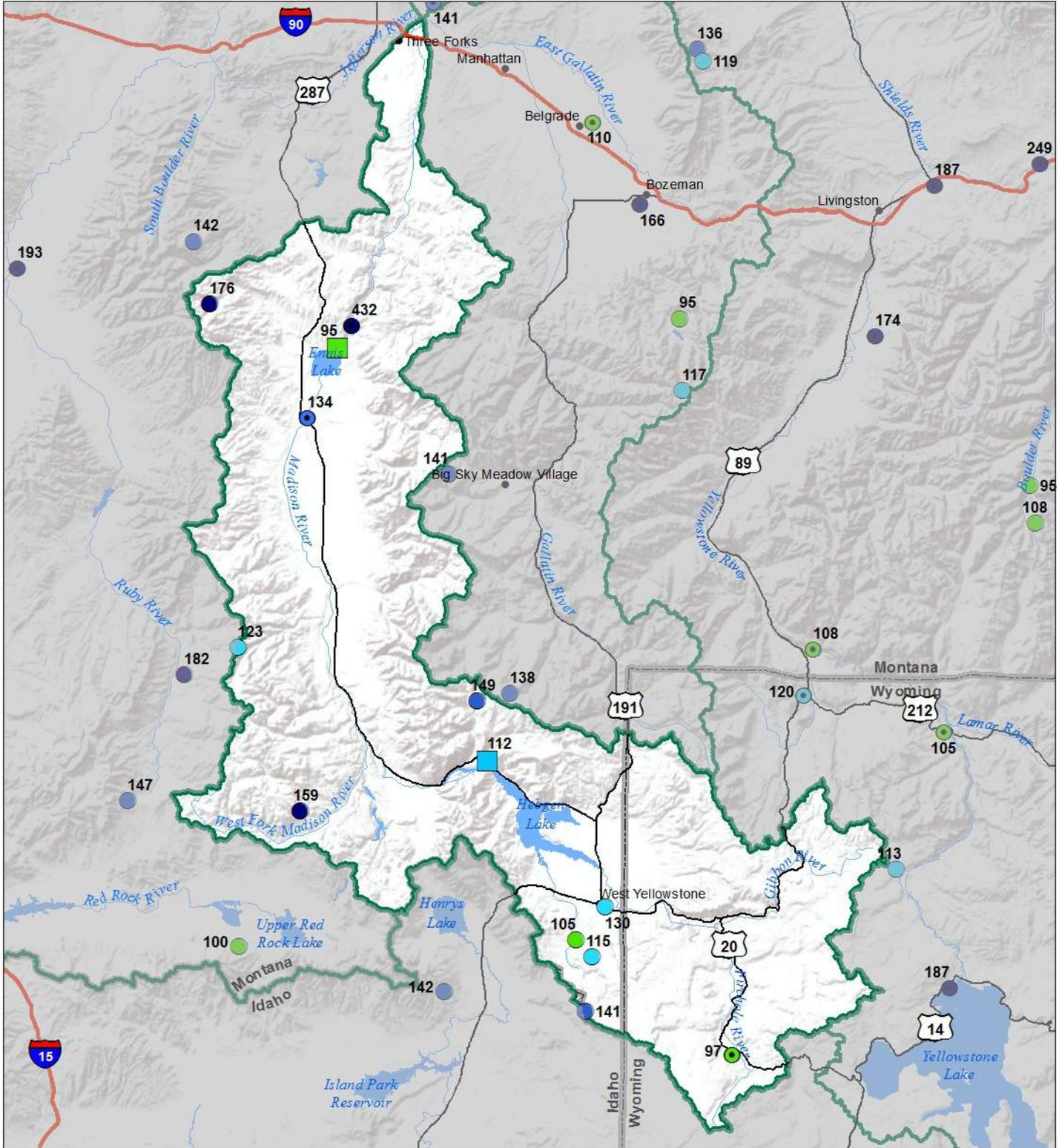
SNOTEL		COOP/ACIS	
Dark Blue	> 150%	Dark Blue	> 150%
Blue	131 - 150%	Blue	131 - 150%
Cyan	111 - 130%	Cyan	111 - 130%
Green	91 - 110%	Green	91 - 110%
Yellow	71 - 90%	Yellow	71 - 90%
Orange	51 - 70%	Orange	51 - 70%
Red	1 - 50%	Red	1 - 50%

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%



Madison River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal January 1, 2016 (December 1, 2015 - January 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 - January 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-SEP	325	390	430	91%	470	535	470
	APR-JUL	255	305	340	92%	375	425	370
Ennis Reservoir Inflow ²	APR-SEP	505	615	690	89%	765	875	775
	APR-JUL	400	495	560	90%	620	715	625

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 December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ennis Lake	28.5	28.5	30.0	41.0
Hebgen Lake	318.5	332.8	283.2	378.8
Basin-wide Total	347.0	361.4	313.2	419.8
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
MADISON abv HEBGEN LAKE	5	98	88
MADISON blw HEBGEN LAKE	8	100	90
MADISON RIVER BASIN	13	100	89

Gallatin River Basin



Basin-wide, precipitation in the Gallatin during the first month of the water year was relatively average however, the Bridger and Gallatin ranges were favored over the Upper Gallatin. Unfortunately, that moisture came in the form of rain instead of snow leaving the basin sorely lacking and well below average in terms of snow water equivalence (SWE). Snow finally began falling during the first week of November and by the 6th nearly one and a half inches of SWE had accumulated. The second significant storm to impact the area occurred before thanksgiving and added another inch to totals. For the month of November precipitation was slightly above average and snow water was near average. For the water year beginning October 1st, cumulative precipitation remained near normal but, due to the lack of snow in October, SWE levels fell short and ended the month of December at only 65 percent of normal.

December barreled onto the scene bringing with it a seemingly endless string of storms with storms dropping 4+ inches of snow water between December 4th and 25th. The consistent snowfall raised water year SWE totals to near normal levels and exceeded the monthly average by an over an inch. By January 1st precipitation for the water year was at 110 percent of normal and water year SWE was at 99 percent. Middle Creek Reservoir levels were above average throughout the three month period.

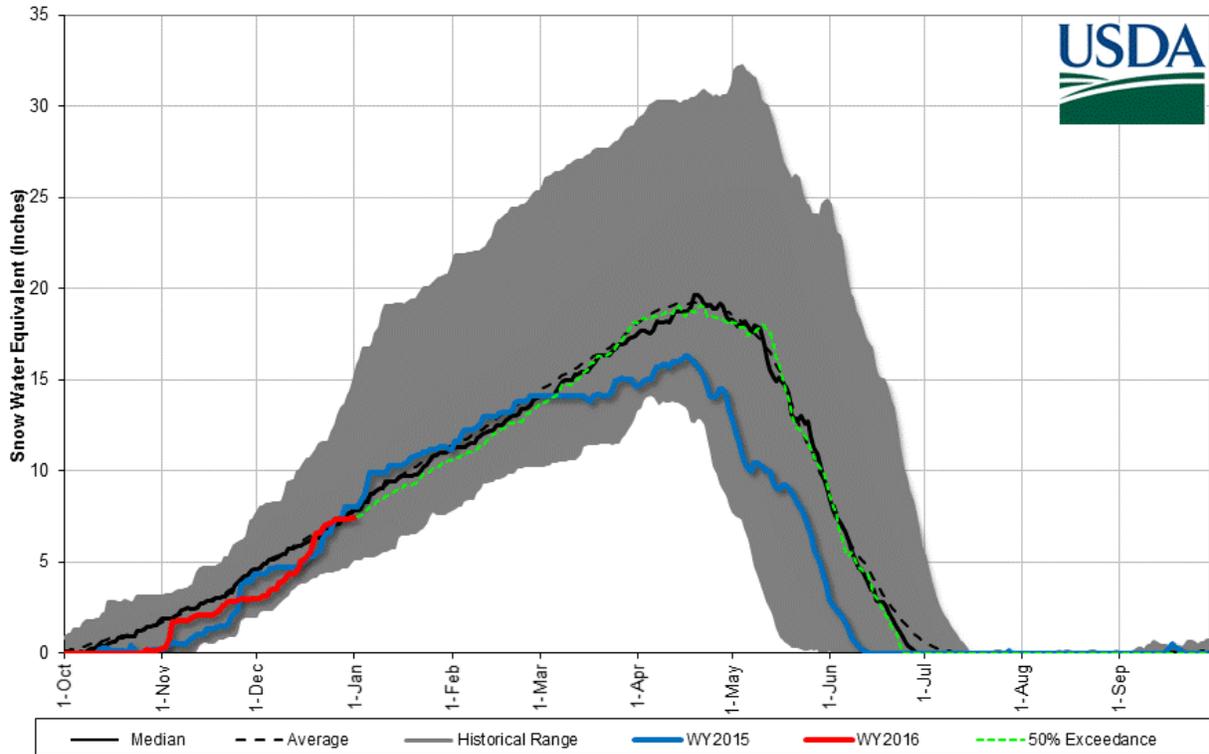
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide stream flows for the 50 percent exceedance are 94 percent of average for the April-July time period.

Gallatin River Basin Data Summary		1/1/2016	
Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	99%	101%	
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	130%	109%	103%
Valley Precipitation	146%	123%	88%
Basin Precipitation	131%	110%	101%
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	%	%	%
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	94%	129%	71%

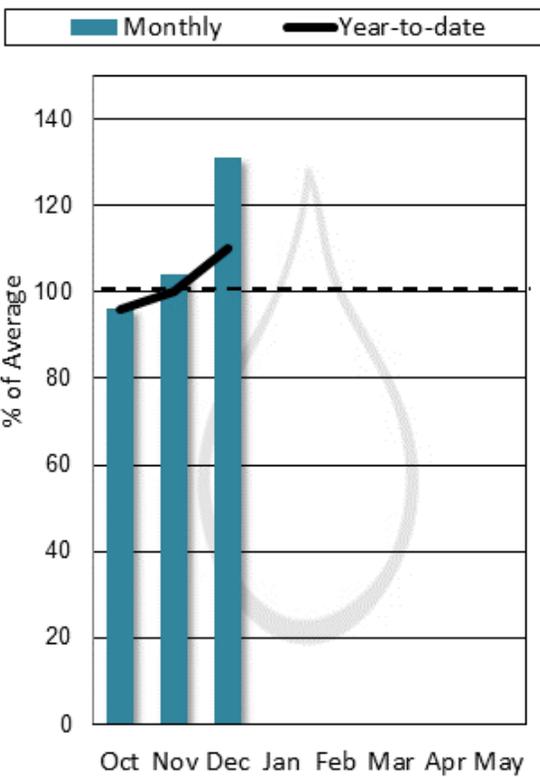
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**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.

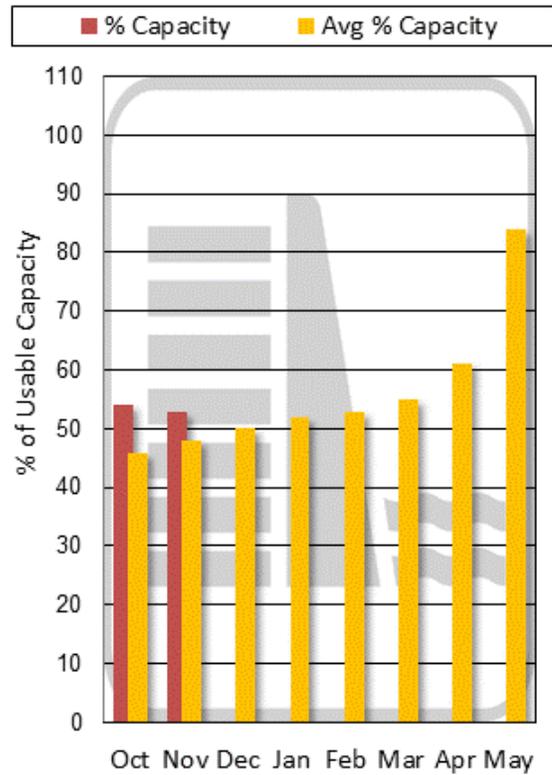
Gallatin River Basin Snowpack with Non-Exceedence Projections
 Based on provisional SNOTEL daily data as of 1/1/2016



Mountain and Valley
 Precipitation

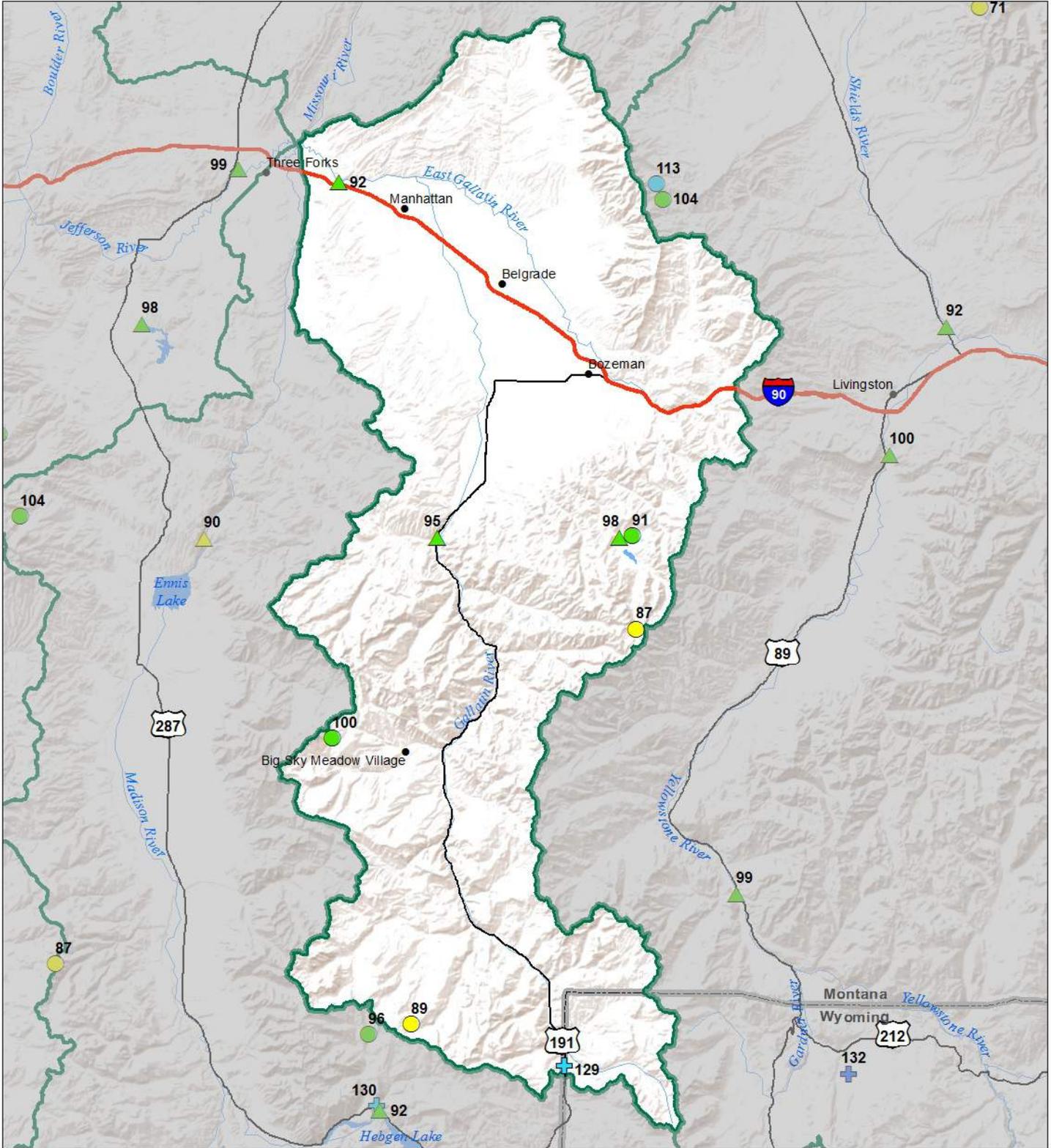


End of Month Reservoir
 Storage



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

Gallatin River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal January 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

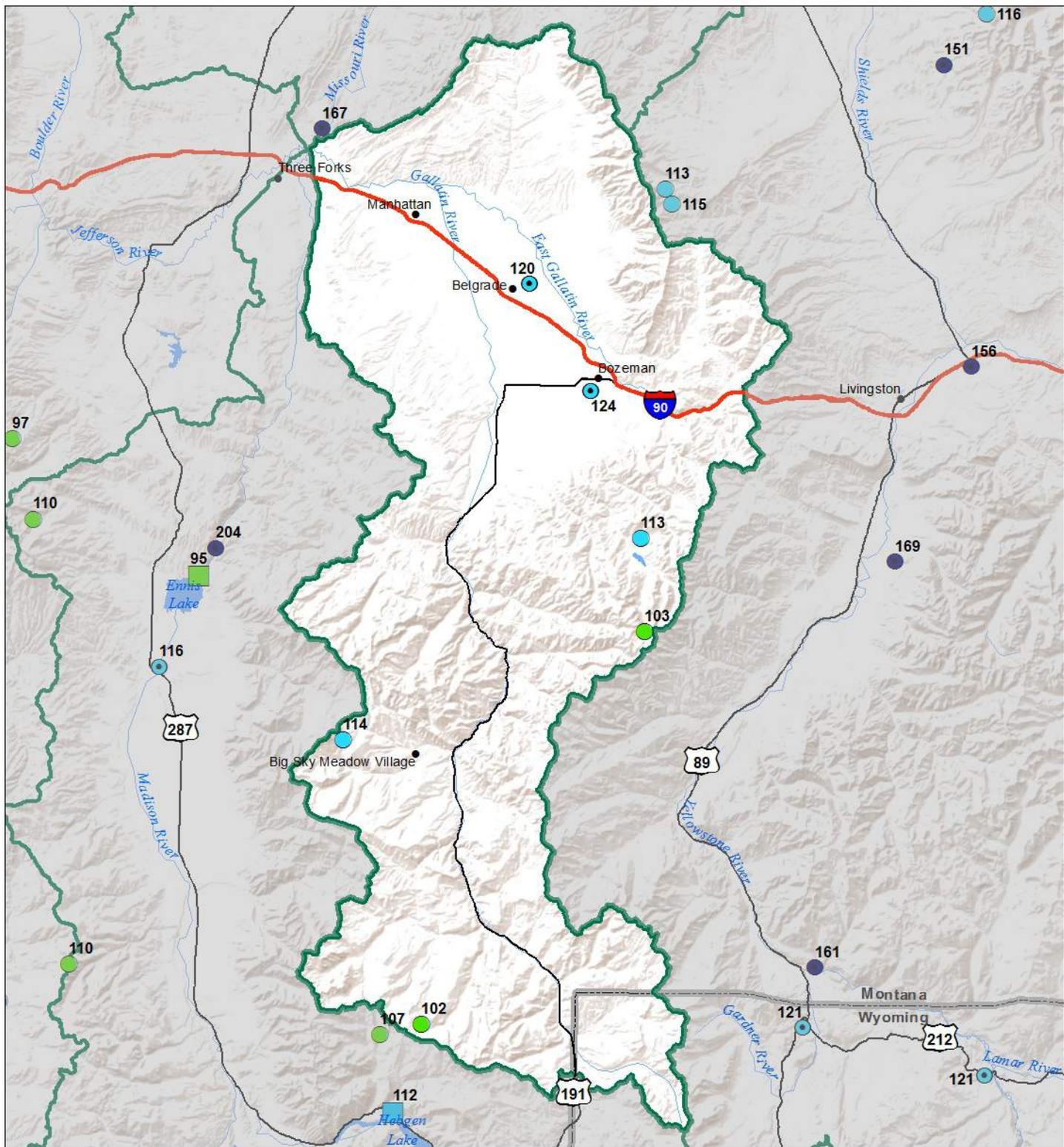
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Gallatin River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

SNOTEL

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

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

COOP/ACIS

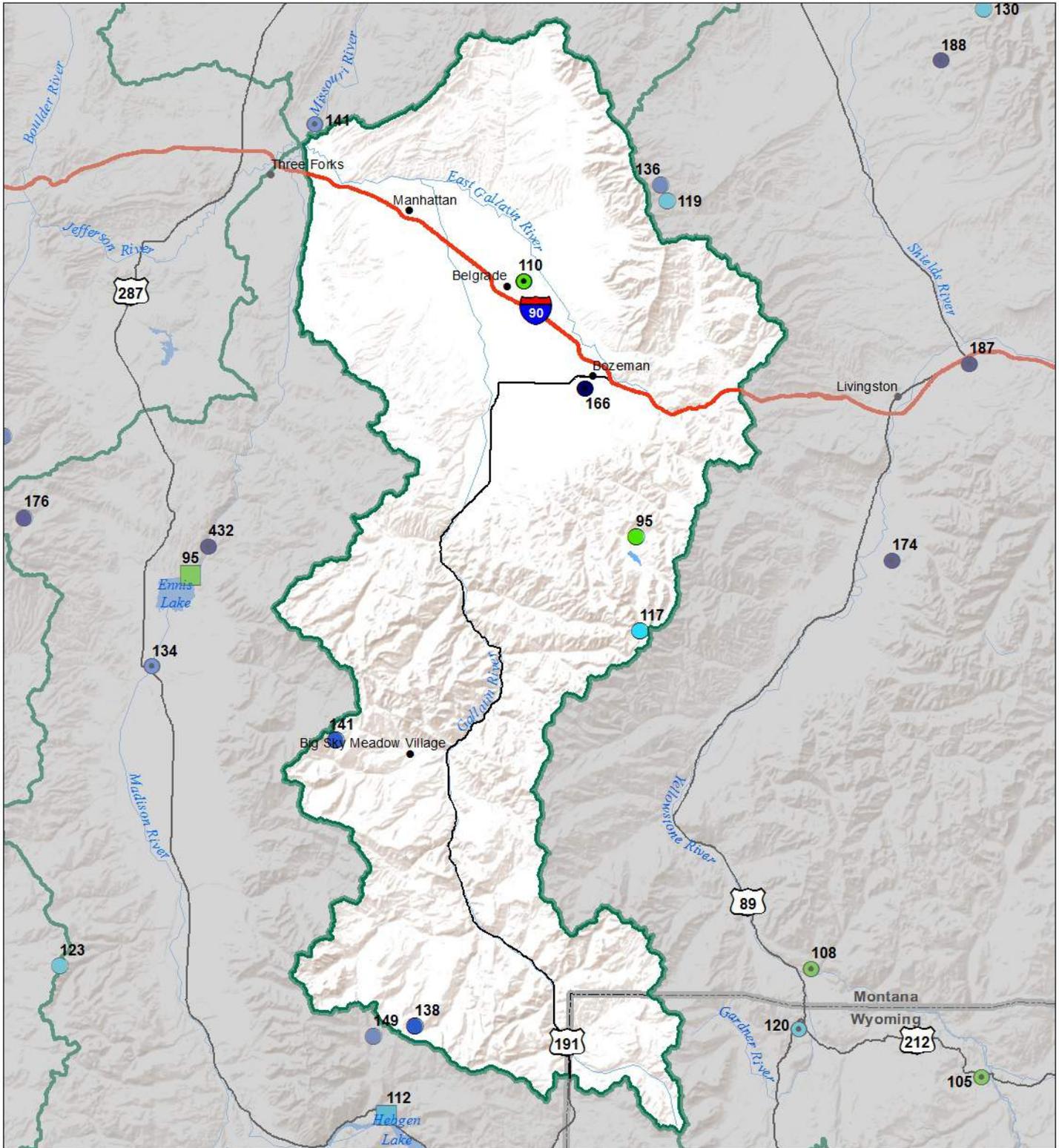
- > 150%
- 131 - 150%
- 111 - 130%
- 91 - 110%
- 71 - 90%
- 51 - 70%
- 1 - 50%

Reservoirs Percent of Normal

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



Gallatin River Basin Monthly Precipitation and Reservoir Levels Percentage of Normal January 1, 2016 (December 1, 2015 - January 1, 2016)



Precipitation Percent of Normal

SNOTEL

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

COOP/ACIS

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

Reservoirs Percent of Normal

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



Gallatin River Basin Streamflow Forecasts - January 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-SEP	320	390	440	94%	490	565	470
	APR-JUL	270	335	380	95%	425	490	400
Hyalite Reservoir Inflow ²	APR-SEP	17.8	20	22	96%	24	27	23
	APR-JUL	15.4	17.9	19.5	98%	21	24	20
Gallatin R at Logan	APR-SEP	255	380	460	91%	545	670	505
	APR-JUL	220	330	405	92%	480	590	440

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

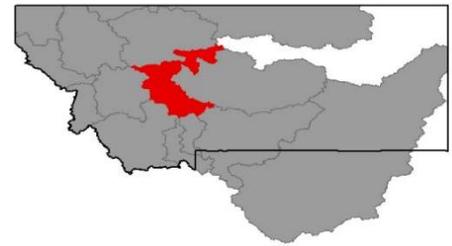
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

Reservoir Storage End of December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Middle Creek Res		5.5	5.1	10.2
Basin-wide Total		0.0	0.0	0.0
# of reservoirs	0	0	0	0

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
UPPER GALLATIN	4	100	82
HYALITE	2	88	100
BRIDGER	2	109	150
GALLATIN RIVER BASIN	8	99	101

Headwaters Mainstem (Missouri) River Basin



An early November storm that dropped up to 18” of low density snow in the Ten Mile area outside Helena started the seasonal snowpack in the Headwaters Mainstem River basin. Storms continued to trickle through the area under southwest flow, but the area remained largely below normal until mid-December. The storm pattern that emerged in mid-December made significant additions to the local snowpack, the Frohner Meadow SNOTEL site received up to 24” of snow and 2” of snow water during a five day period. Although the storm didn’t drop this amount at all SNOTEL locations it was enough to improve the conditions from below normal to above normal. Continued snowfall through the holiday gave way to a less active pattern as the calendar year came to a close.

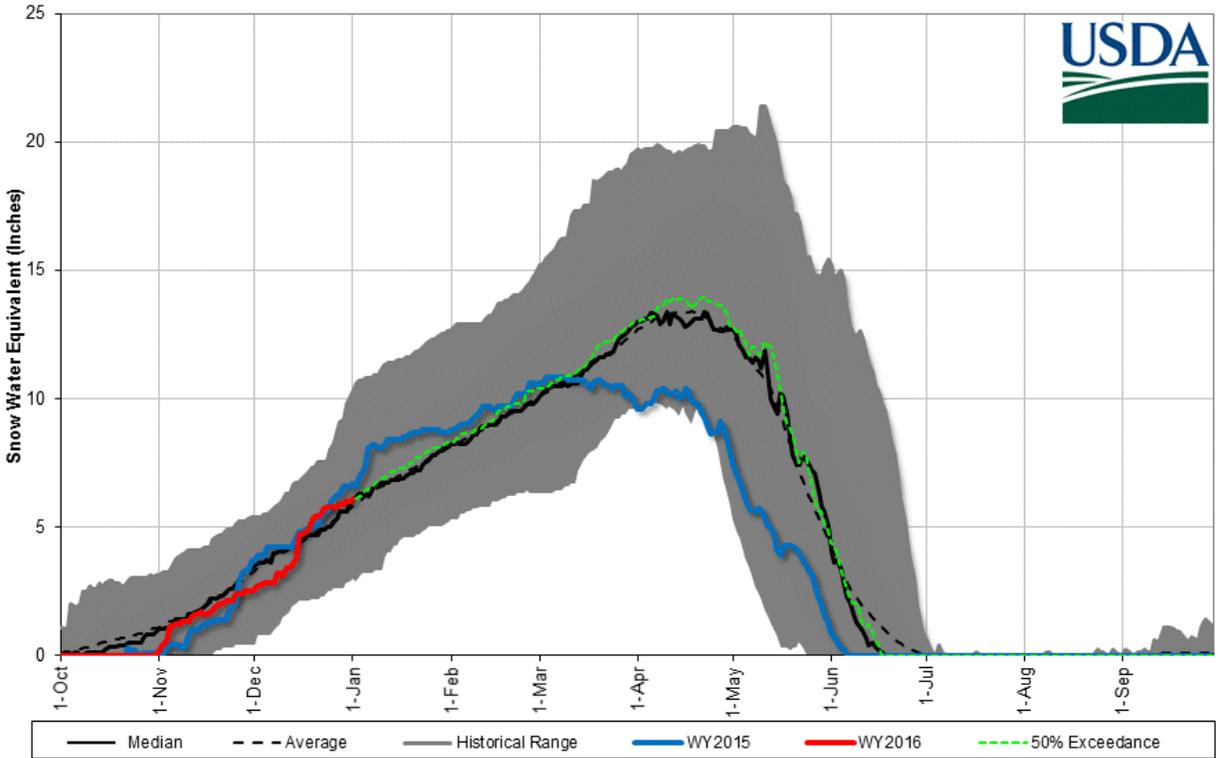
SNOTEL sites reported 50 percent of average precipitation for the month of October, with a basin-wide average of 1.0” of precipitation. Favorable flow resulted in more storms during November and December when above average precipitation was received during the storms that passed through. Since November 1st around 4 to 7’ of precipitation has fallen at SNOTEL sites in the form of snow. Water year-to-date precipitation is near normal for this time of year at 103 percent on January 1st.

Reservoir storage is below what it was last year at this time in the Headwaters Mainstem basin with the exception of Helena Valley which is above average for January 1st, all other reservoirs are slightly below average.

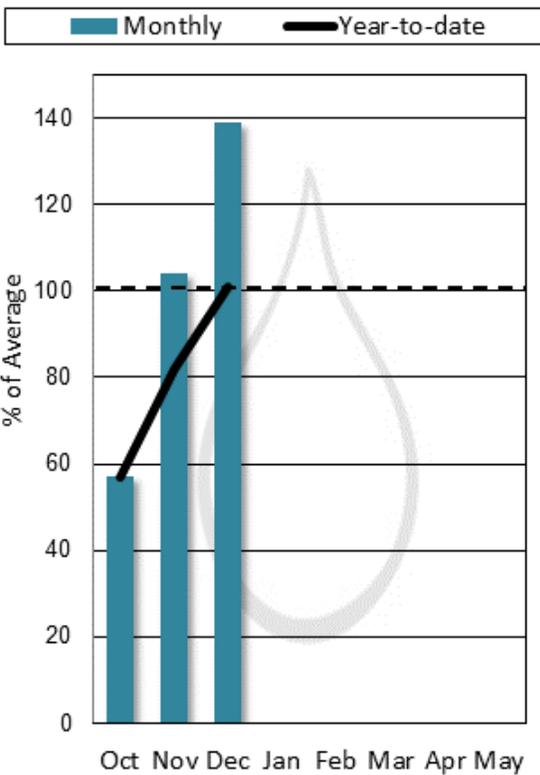
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 89 percent of average for the April-July time period.

Missouri Mainstem River Basin Data Summary		1/1/2016	
Snowpack			
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	118%	126%	
Precipitation			
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	139%	101%	116%
Valley Precipitation	158%	161%	112%
Basin Precipitation	124%	103%	116%
Reservoir Storage			
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	112%	79%	112%
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	89%	117%	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.			

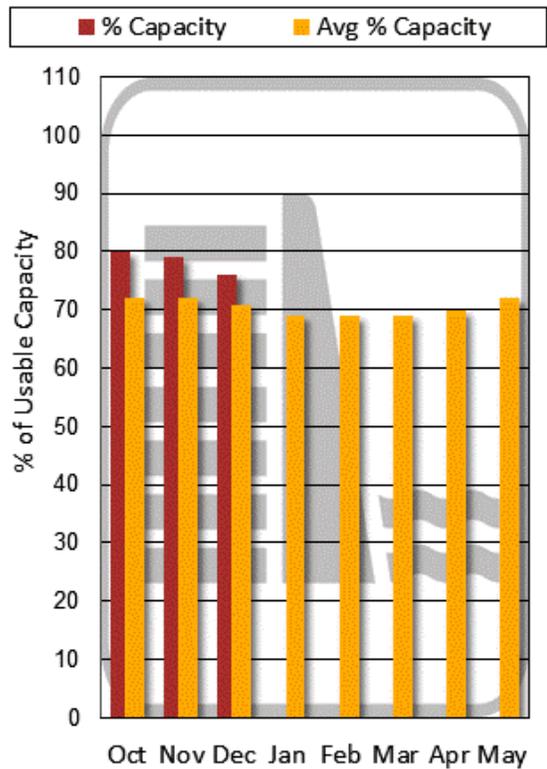
Missouri Headwaters Mainstem River Basin (below Toston, above the Smith) Snowpack with Non-Exceedence
Based on provisional SNOTEL daily data as of 1/1/2016



**Mountain and Valley
Precipitation**

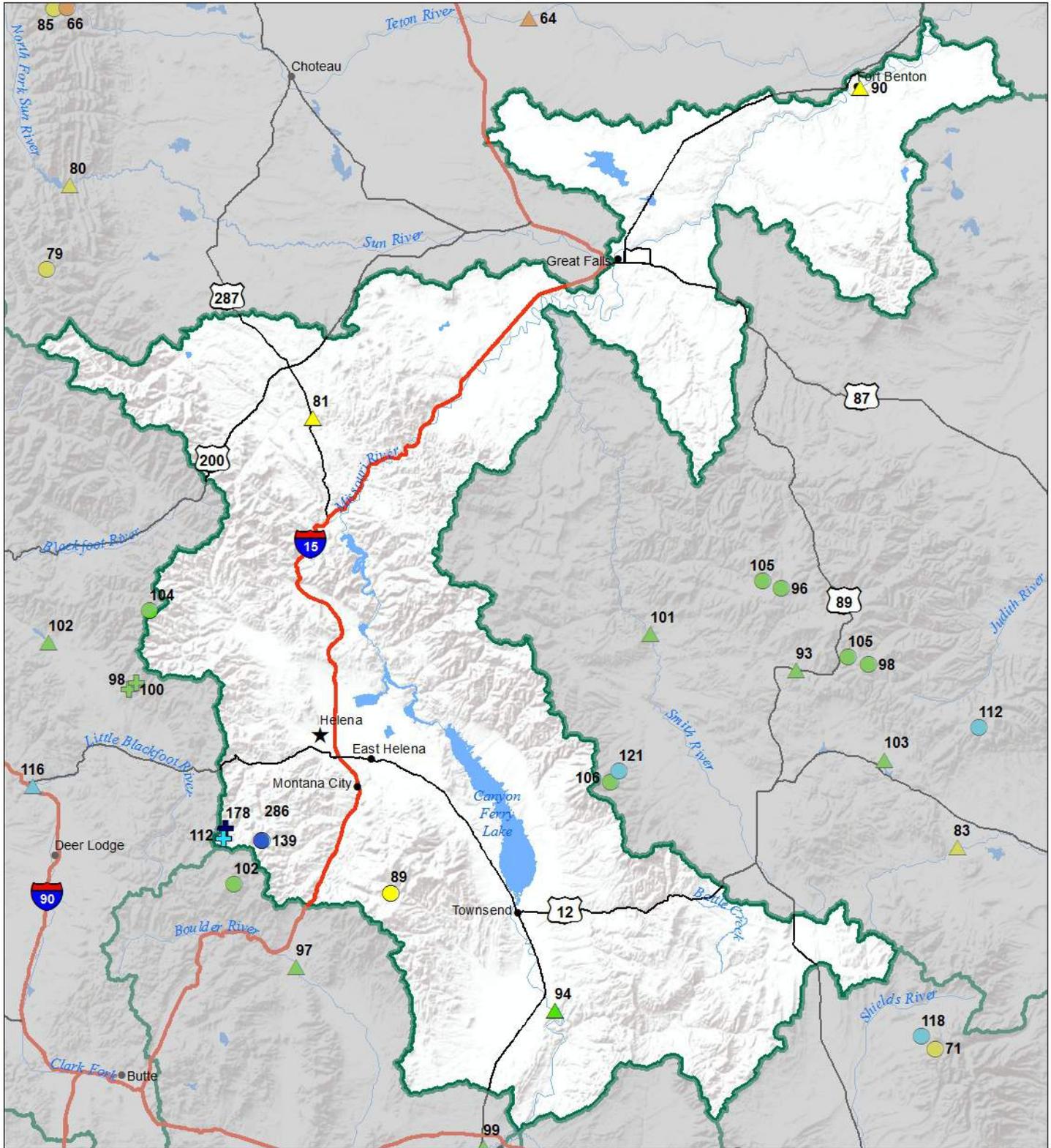


**End of Month Reservoir
Storage**



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

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



Snow Water Equivalent Percent of Normal

SNOTEL

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

Snowcourse

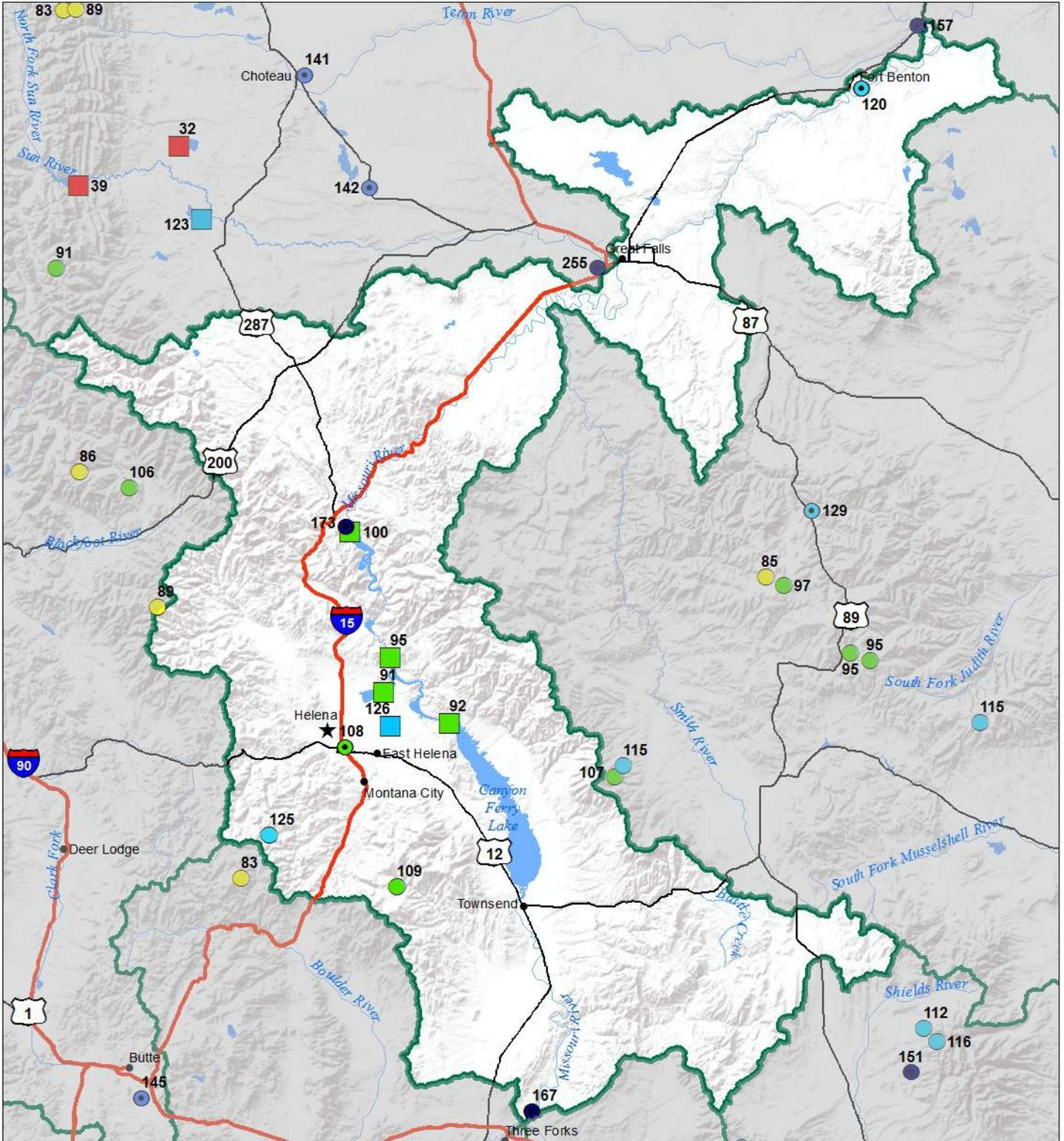
- ⊕ > 150%
- ⊕ 131 - 150%
- ⊕ 111 - 130%
- ⊕ 91 - 110%
- ⊕ 71 - 90%
- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

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 January 1, 2016



Precipitation Percent of Normal

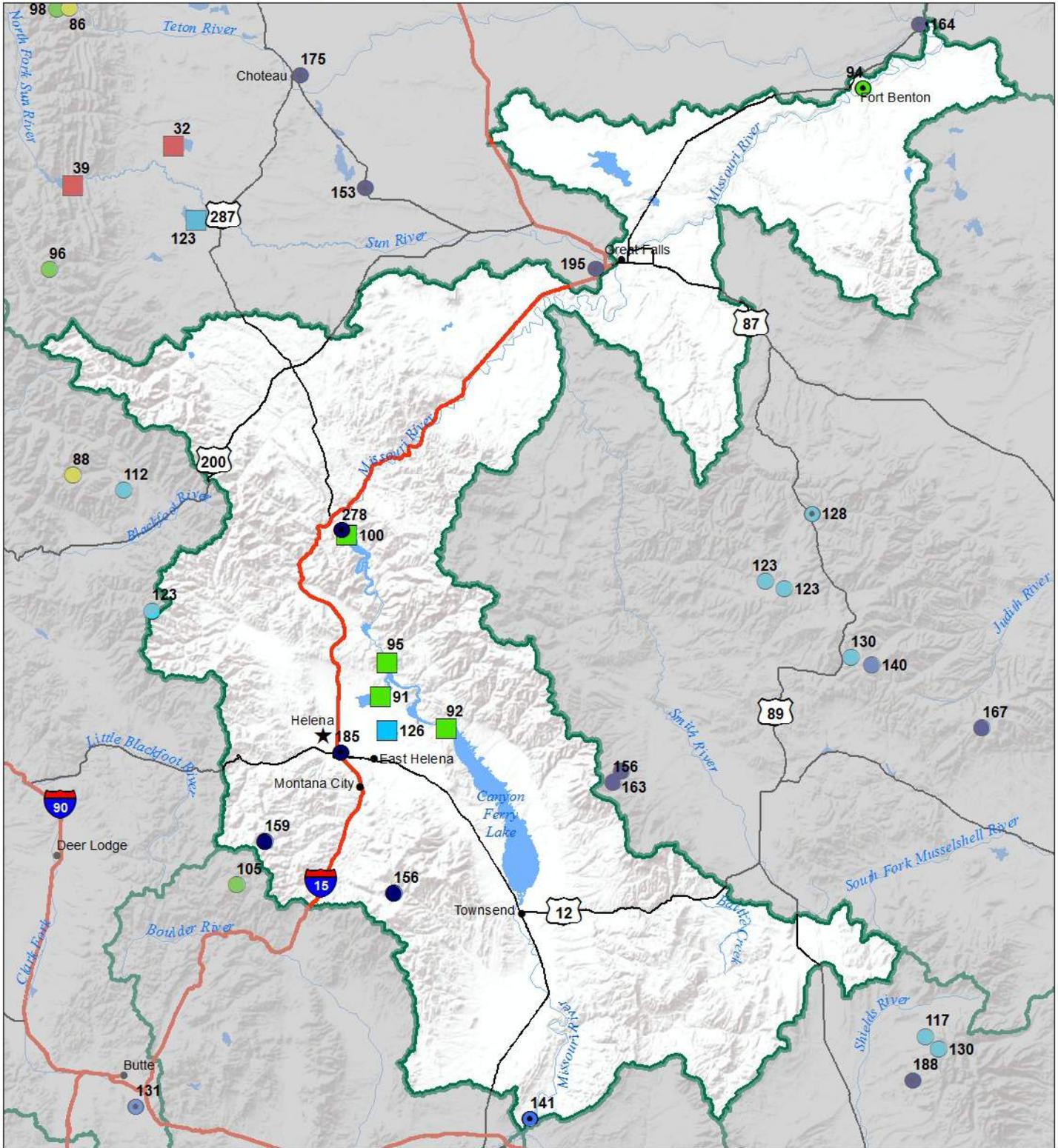
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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 January 1, 2016 (December 1, 2015 - January 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%



Missouri Mainstem Basin Streamflow Forecasts - January 1, 2016

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

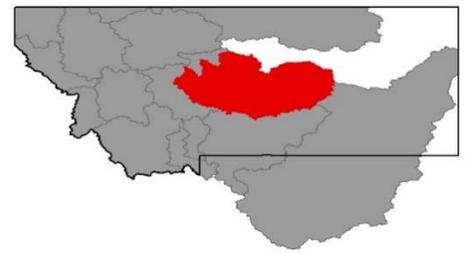
MISSOURI MAINSTEM BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Missouri R at Toston ²	APR-SEP	1050	1580	1940	94%	2290	2820	2070
	APR-JUL	920	1380	1690	94%	2000	2450	1790
Dearborn R nr Craig	APR-SEP	31	58	77	81%	96	123	95
	APR-JUL	28	54	72	81%	90	116	89
Missouri R at Fort Benton ²	APR-SEP	1630	2330	2800	90%	3270	3970	3110
	APR-JUL	1360	1960	2360	90%	2760	3350	2610
Missouri R nr Virgelle ²	APR-SEP	1790	2570	3100	88%	3630	4410	3520
	APR-JUL	1540	2210	2660	89%	3110	3770	3000
Missouri R nr Landusky ²	APR-SEP	1920	2740	3290	88%	3840	4650	3720
	APR-JUL	1660	2350	2810	89%	3280	3970	3160
Missouri R bl Fort Peck Dam ²	APR-SEP	1670	2590	3200	86%	3820	4730	3700
	APR-JUL	1670	2370	2850	88%	3330	4030	3240
Lake Sakakawea Inflow ²	APR-SEP	4770	6780	8150	87%	9510	11500	9400
	APR-JUL	4590	6210	7310	88%	8400	10000	8310

- 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 December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Canyon Ferry Lake	1478.0	1610.1	1598.0	2043.0
Helena Valley Reservoir	6.4	5.5	5.1	9.2
Lake Helena	9.9	9.9	10.9	12.7
Hauser Lake & Lake Helena	70.1	70.3	73.8	74.6
Holter Lake	80.9	80.8	80.5	81.9
Fort Peck Lake	15063.1	14896.7	13143.0	18910.0
Basin-wide Total	16708.3	16673.4	14911.3	21131.4
# of reservoirs	6	6	6	6

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
HEADWATERS MAINSTEM	8	118	126
SMITH-JUDITH-MUSSELSHELL	9	105	112
SUN-TETON-MARIAS	6	79	113
MAINSTEM ab FT PECK RES	22	101	119
MILK RIVER BASIN	1	65	155
MISSOURI MAINSTEM BASIN	23	100	120

Smith-Judith-Musselshell River Basin



The snowpack in the Smith-Judith-Musselshell River basin is off to a good start this winter after receiving abundant snowfall during the month of December. Seasonal snowcover began at most SNOTEL elevations during the first week in November when a moist system from the west crossed the basin. While the snowpack began at that time it was slightly below average until a mid-December storm brought up to 18” of snow depth and 1.5” to 2.5” of snow water equivalent at SNOTEL sites in the basin. Currently SNOTEL sites in the Big Belt Range are the highest (106% to 116%) in terms of percentage of normal snowpack for January 1st, and sites the Little Belt and Big Snowy Range near or only slightly below normal.

Like all basins in Montana October was below average with regards to precipitation in the Smith-Judith-Musselshell basin. Since November 1st mountain SNOTEL sites and valley precipitation gauges have received above average precipitation and overall is 111 percent of the January 1st water year-to-date average. Valleys have received 2.5” to 4” of precipitation since the water year began while mountain locations have received 5.5 to 10.5” in the form of snow during November and December.

Reservoir storage in the basin is well above average for January 1st, although slightly below last year at this time. Reservoir storage in the basin has been above average since the 2014 snowpack allowed reservoirs to enter last winter at maximum levels.

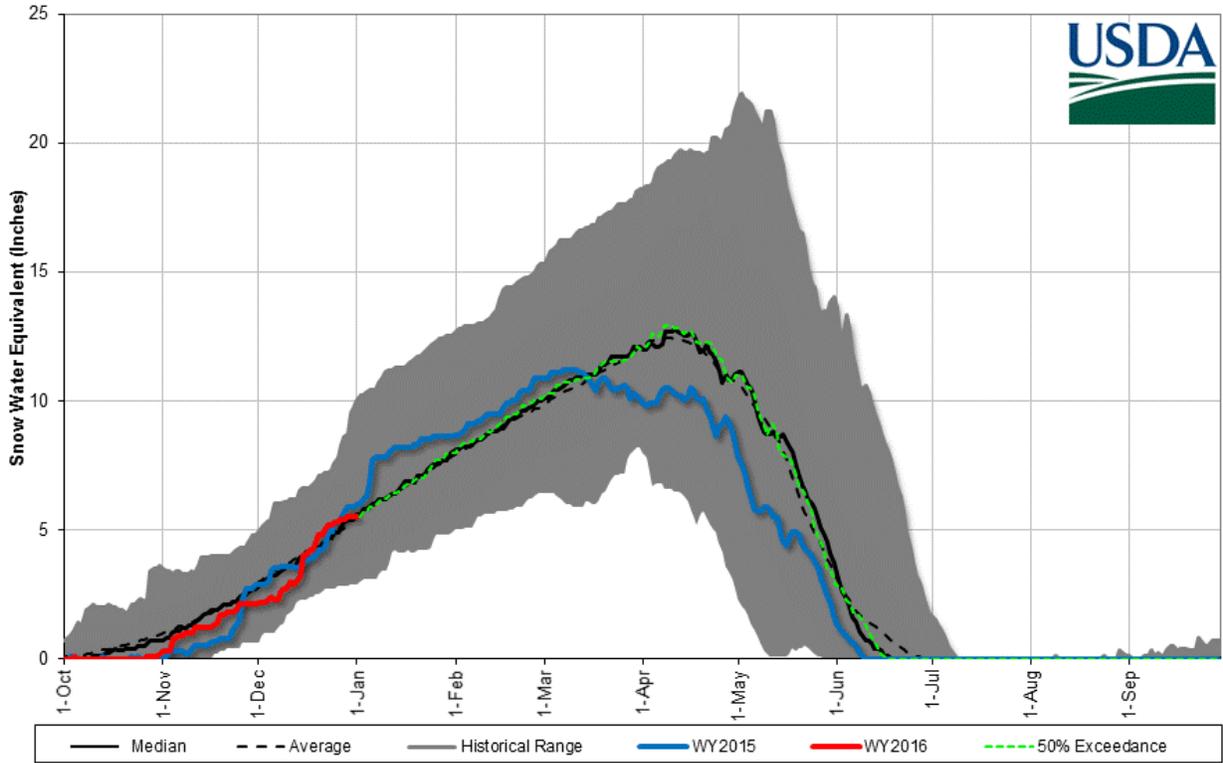
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 87 percent of average for the April-July time period.

Smith-Judith-Musselshell River Basin Data Summ		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	105%	112%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	136%	103%	110%
Valley Precipitation	112%	141%	79%
Basin Precipitation	132%	111%	103%
	Percentage of Average	Percentage of Usable Capacity	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	%	%	%
	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%	92%

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

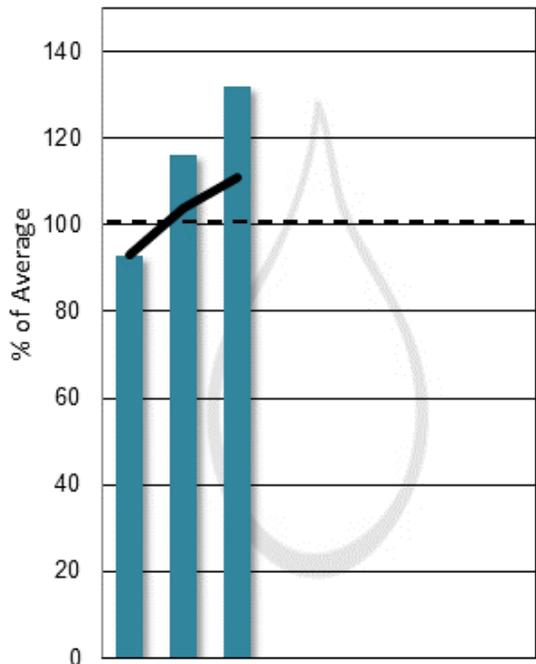
**Basin-wide streamflows are an average of the individual streamflow points within the basin for the 50 percent exceedance forecast. Consult the individual streamflow forecasts in the table below for the range of forecasts at an individual point.

Smith-Judith-Musselshell River Basin Snowpack with Non-Exceedance Projections
Based on provisional SNOTEL daily data as of 1/1/2016



Mountain and Valley Precipitation

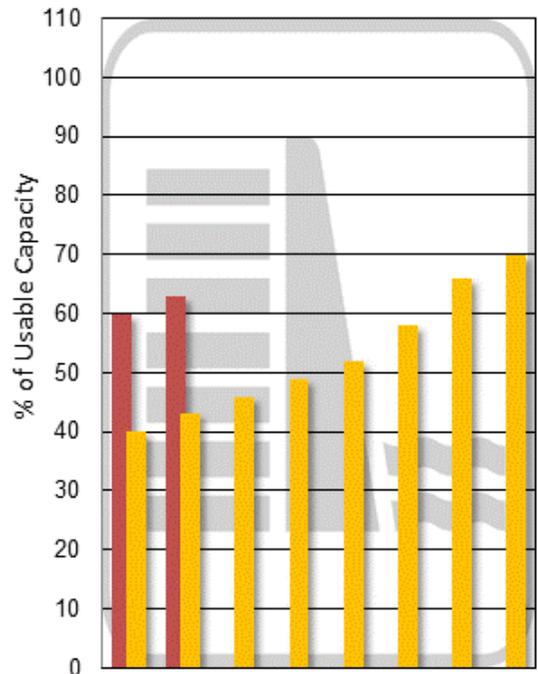
Monthly (teal bar), Year-to-date (black line)



Oct Nov Dec Jan Feb Mar Apr May

End of Month Reservoir Storage

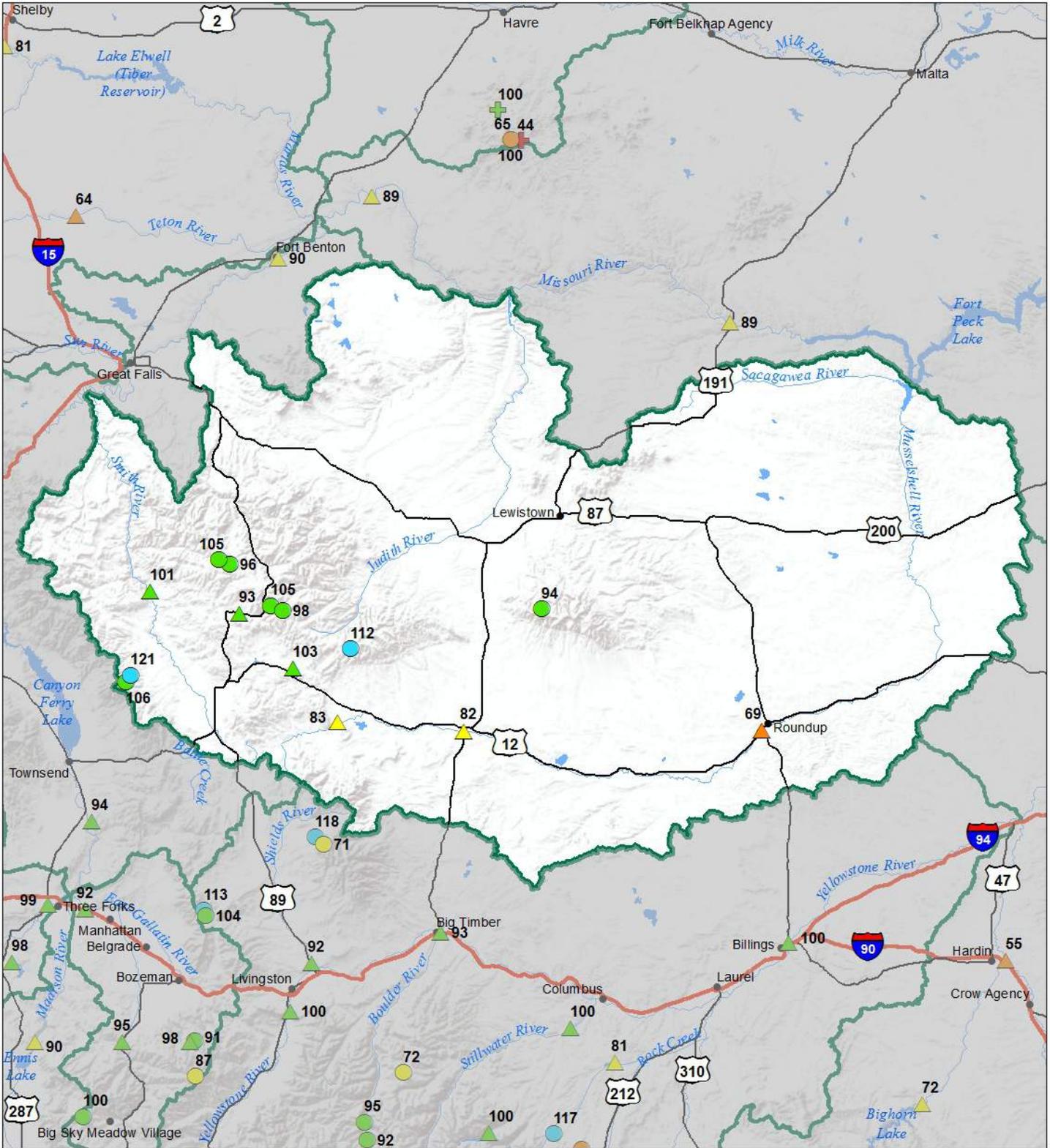
% Capacity (red bar), Avg % Capacity (yellow bar)



Oct Nov Dec Jan Feb Mar Apr May

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

Smith-Judith-Musselshell River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal January 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%
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- ⊕ 51 - 70%
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- ⊕ *

Streamflow Forecast Percent of Average Flows

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

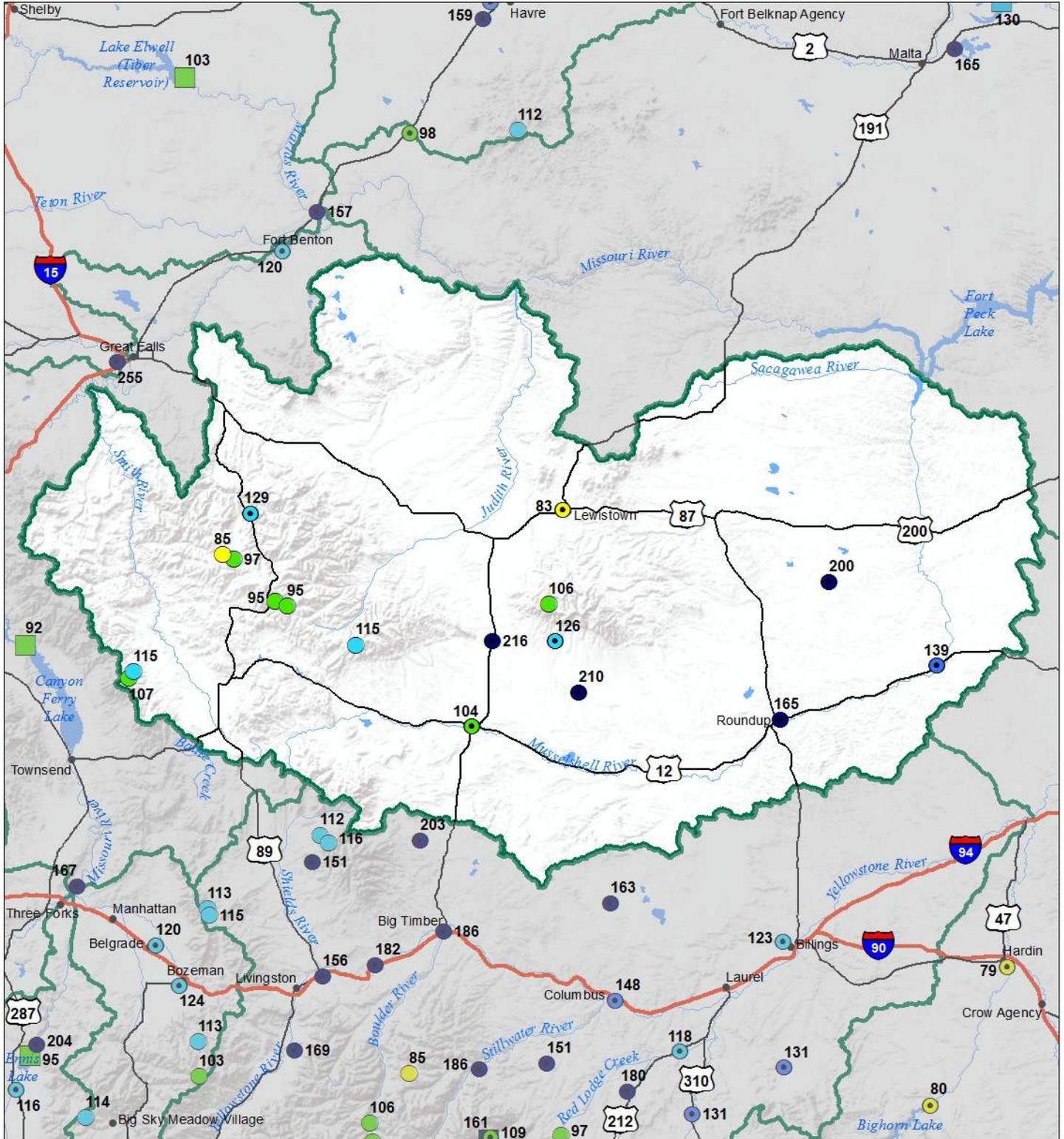


Smith-Judith-Musselshell River Basin

Water Year to Date Precipitation and Reservoir Levels

Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

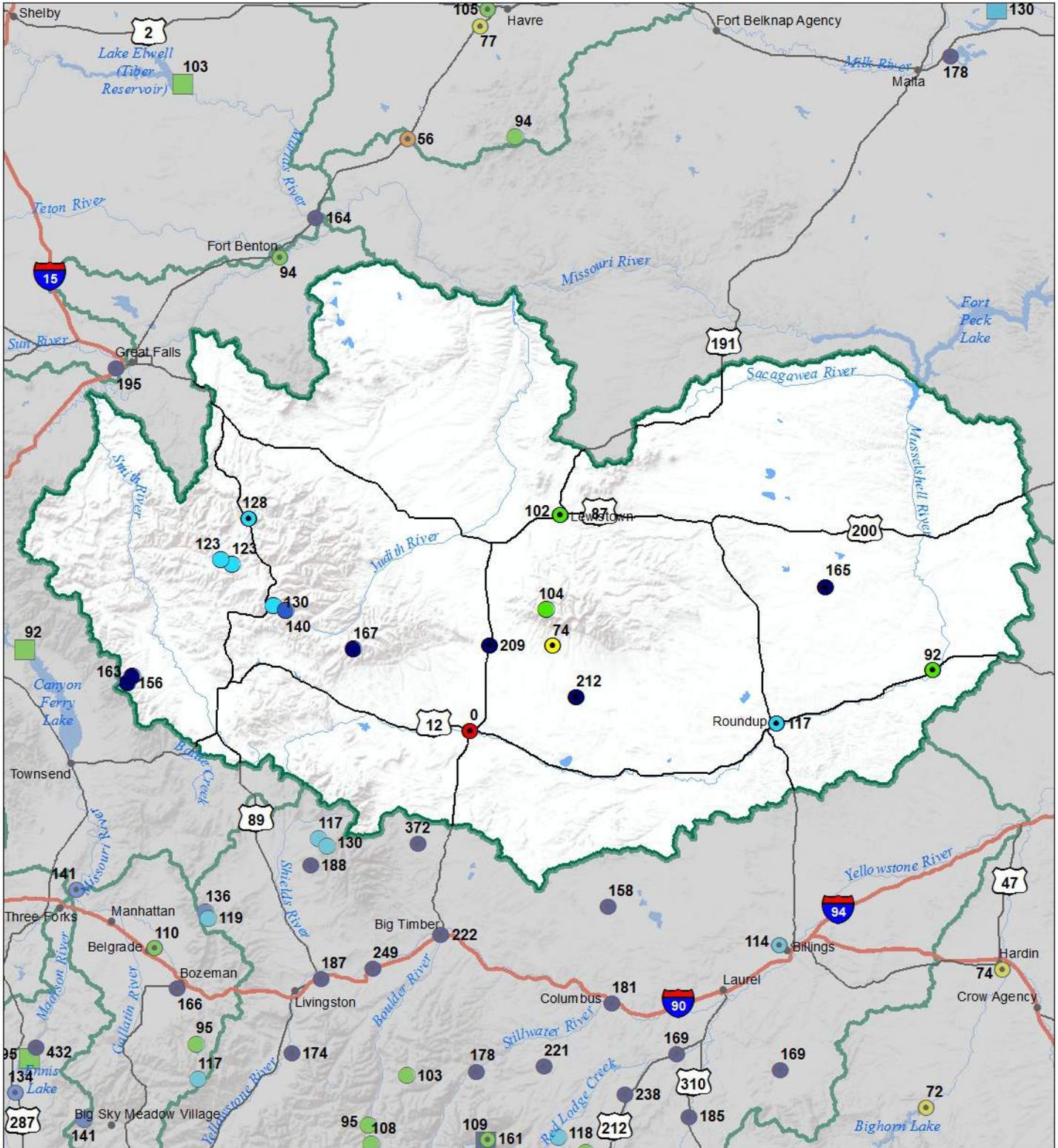
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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 January 1, 2016 (December 1, 2015 - January 1, 2016)



Precipitation Percent of Normal

SNOTEL

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

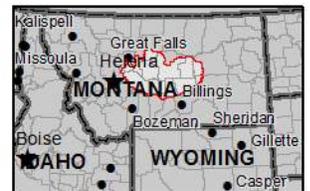
COOP/ACIS

- > 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%



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

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

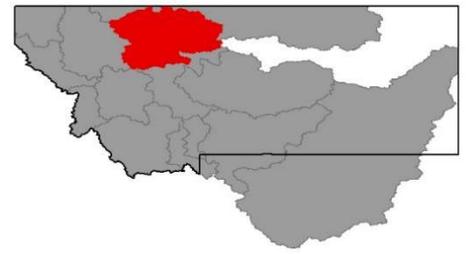
SMITH-JUDITH-MUSSELSHELL	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Sheep Ck nr White Sulphur Springs	APR-SEP	10.5	14.4	17.1	93%	19.7	24	18.4
	APR-JUL	8.6	12	14.4	93%	16.7	20	15.5
Smith R bl Eagle Ck ²	APR-SEP	58	95	121	104%	147	185	116
	APR-JUL	52	85	107	101%	129	162	106
NF Musselshell R nr Delpine	APR-SEP	0.92	2.8	4.1	103%	5.4	7.3	4
	APR-JUL	0.71	2.4	3.5	103%	4.6	6.2	3.4
SF Musselshell R ab Martinsdale	APR-SEP	1	16.2	32	84%	48	71	38
	APR-JUL	1	13.9	29	83%	43	65	35
Musselshell R at Harlowton ²	APR-SEP	-2	21	48	81%	75	115	59
	APR-JUL	-2	22	47	82%	72	110	57
Musselshell R nr Roundup ²	APR-SEP	-26	-11.2	45	68%	101	183	66
	APR-JUL	-23	-9.1	46	69%	102	183	67

- 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 December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Smith River Res		8.6	5.0	10.6
Ackley Lake		3.9	2.5	7.0
Bair Res		5.3	2.7	7.0
Martinsdale Res		17.6	7.7	23.1
Deadman's Basin Res		63.4	37.0	72.2
Basin-wide Total		0.0	0.0	0.0
# of reservoirs	0	0	0	0

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
SMITH	6	104	117
HIGHWOOD	0		
JUDITH	4	101	113
MUSSELSHELL	2	114	110
SMITH-JUDITH-MUSSELSHELL	9	105	112

Sun-Teton-Marias River Basin



New record low snowpack measurements on April 1 and May 1 combined with record low precipitation at mountain locations from June through the end of September to cause well below average streamflows in the Sun, Teton and Marias River basins last year. This year has gotten off to a slow start with most of the storms missing mountain locations for snowfall so far. Seasonal snowpack in the basin started at the beginning of November and approached normal conditions during the middle of the month. Although SNOTEL sites did receive snow during the month of December it was not enough to bring the basin to normal conditions for January 1st. Last year at this time the snowpack was above normal at mountain SNOTEL sites and snowcourses, and hopefully the storm patterns change and favor the Rocky Mountain Front in the coming months.

As we entered the new water year in October mountain locations needed precipitation to make up for last year's deficits in snowpack and summer precipitation. Unfortunately it didn't happen in October where below average precipitation fell, but a change occurred in November when slightly above average precipitation fell and December was only slightly below average in the mountains. On January 1st the basin overall is 90 percent of average. Mountain locations are below the water year-to-date average at 85 percent while valley locations are above average at 107 percent.

Low streamflows that were experienced during the summer put the burden on reservoirs to supply water to irrigators in all of the river basins. Entering the 2016 water year some of the headwaters reservoirs are well below average for the date (Gipson (39%), Pishkun (32%) Swift (59%) If mountain the snowpack doesn't make a comeback before spring runoff and precipitation is below average during the summer then water resources could be scarce for irrigators that rely on these reservoirs as we enter the summer months. Other reservoirs further east in the basin are currently slightly below to near average on January 1st.

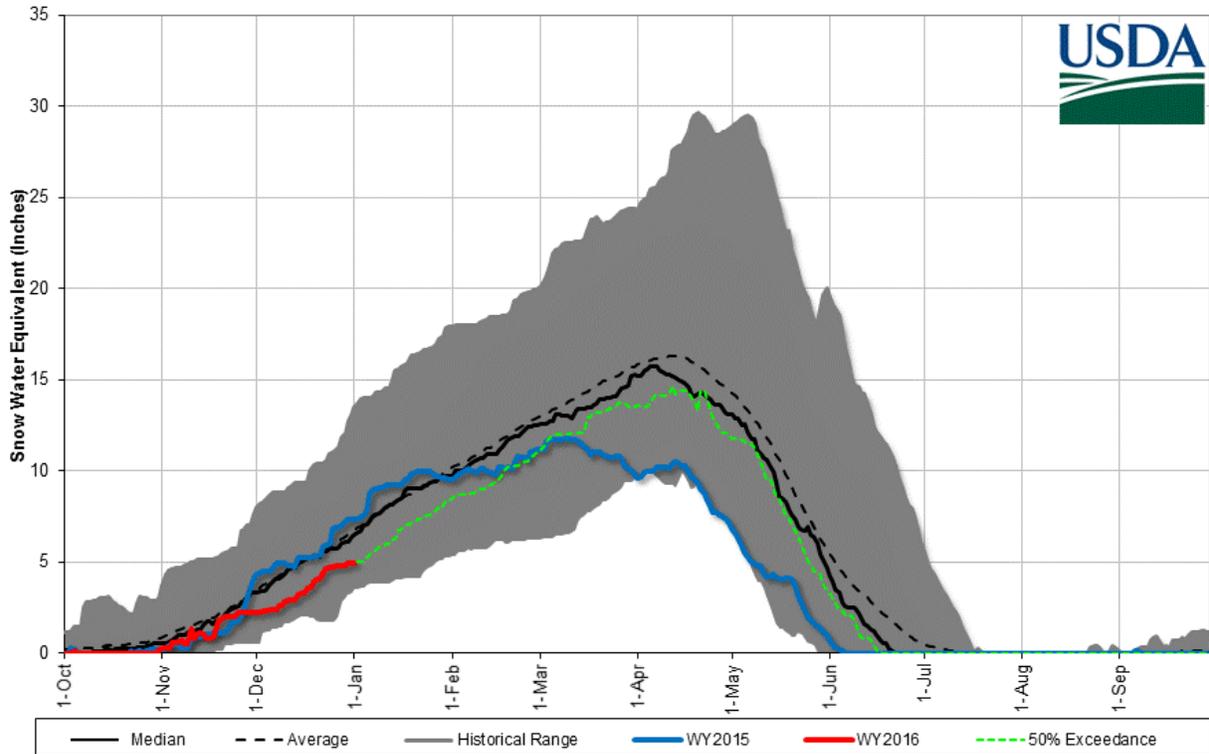
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 81 percent of average for the April-July time period.

Sun-Teton-Marias River Basin Data Summary		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	79%	113%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	103%	85%	124%
Valley Precipitation	115%	107%	130%
Basin Precipitation	105%	90%	125%
	Percentage of Average	Percentage of Usable Capacity	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	98%	51%	108%
	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	81%	134%	57%

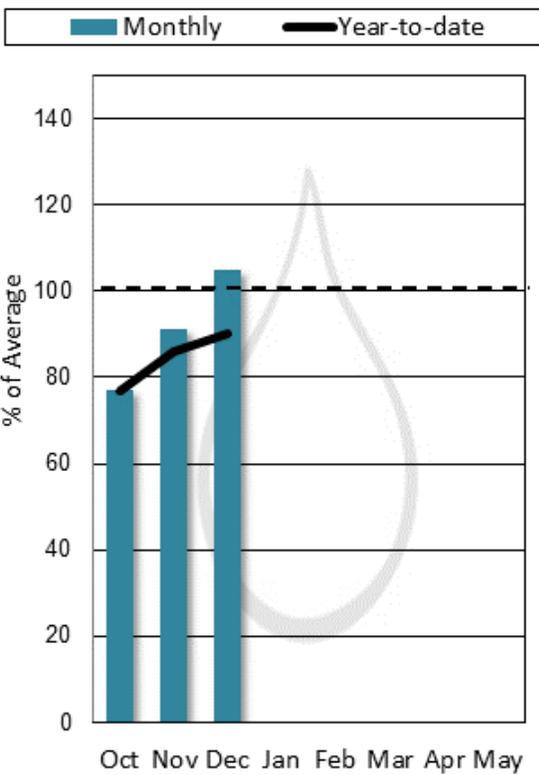
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**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.

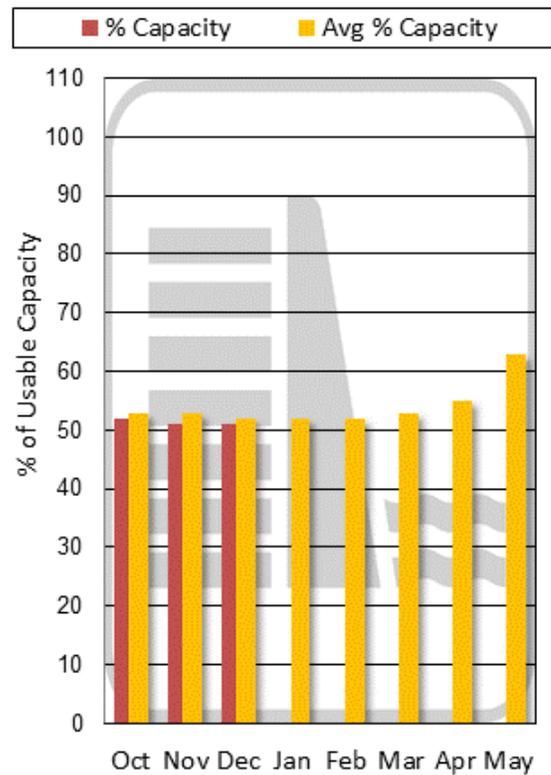
Sun-Teton-Marias River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 1/1/2016



Mountain and Valley Precipitation

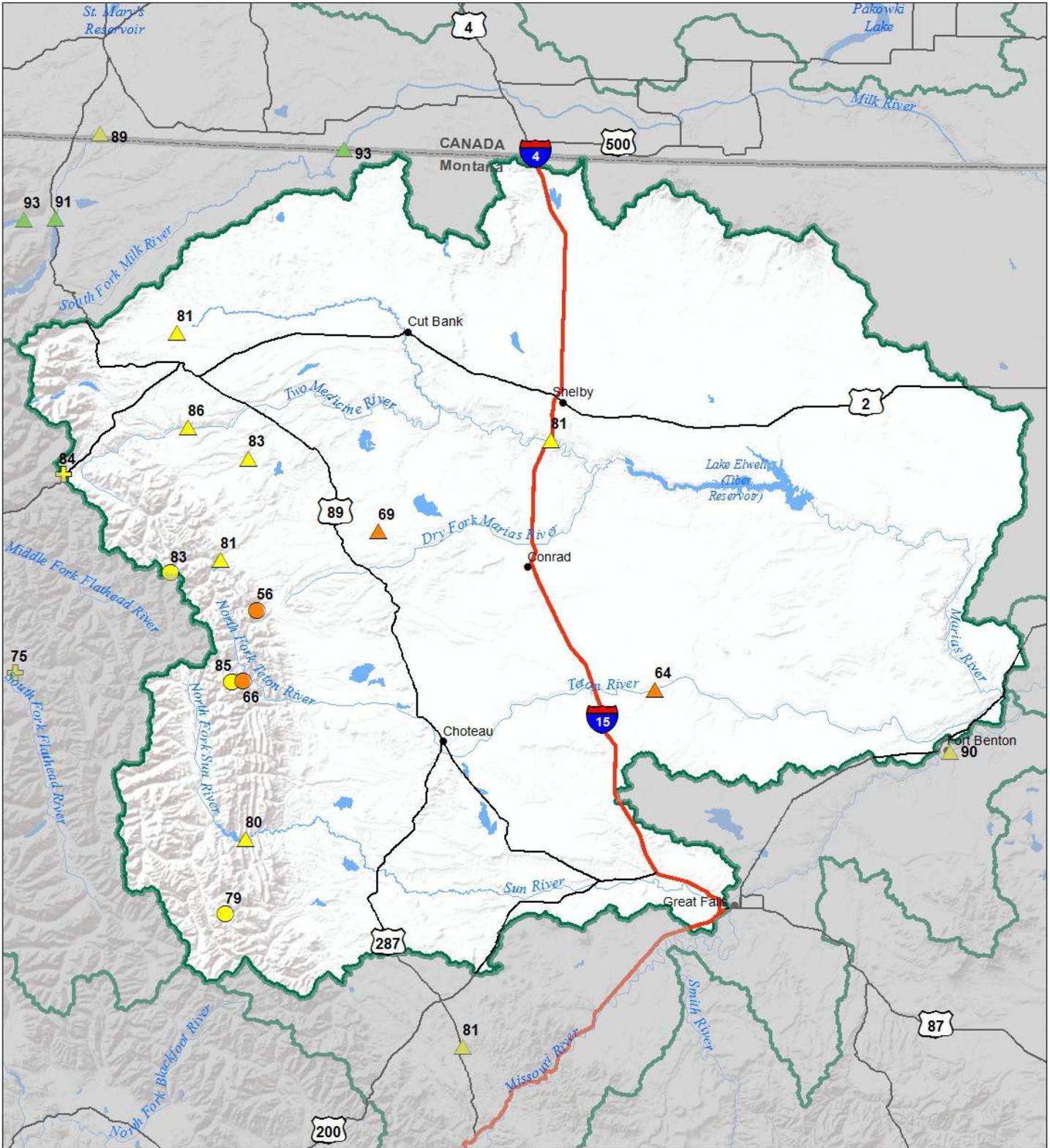


End of Month Reservoir Storage



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

Sun-Teton-Marias River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal January 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

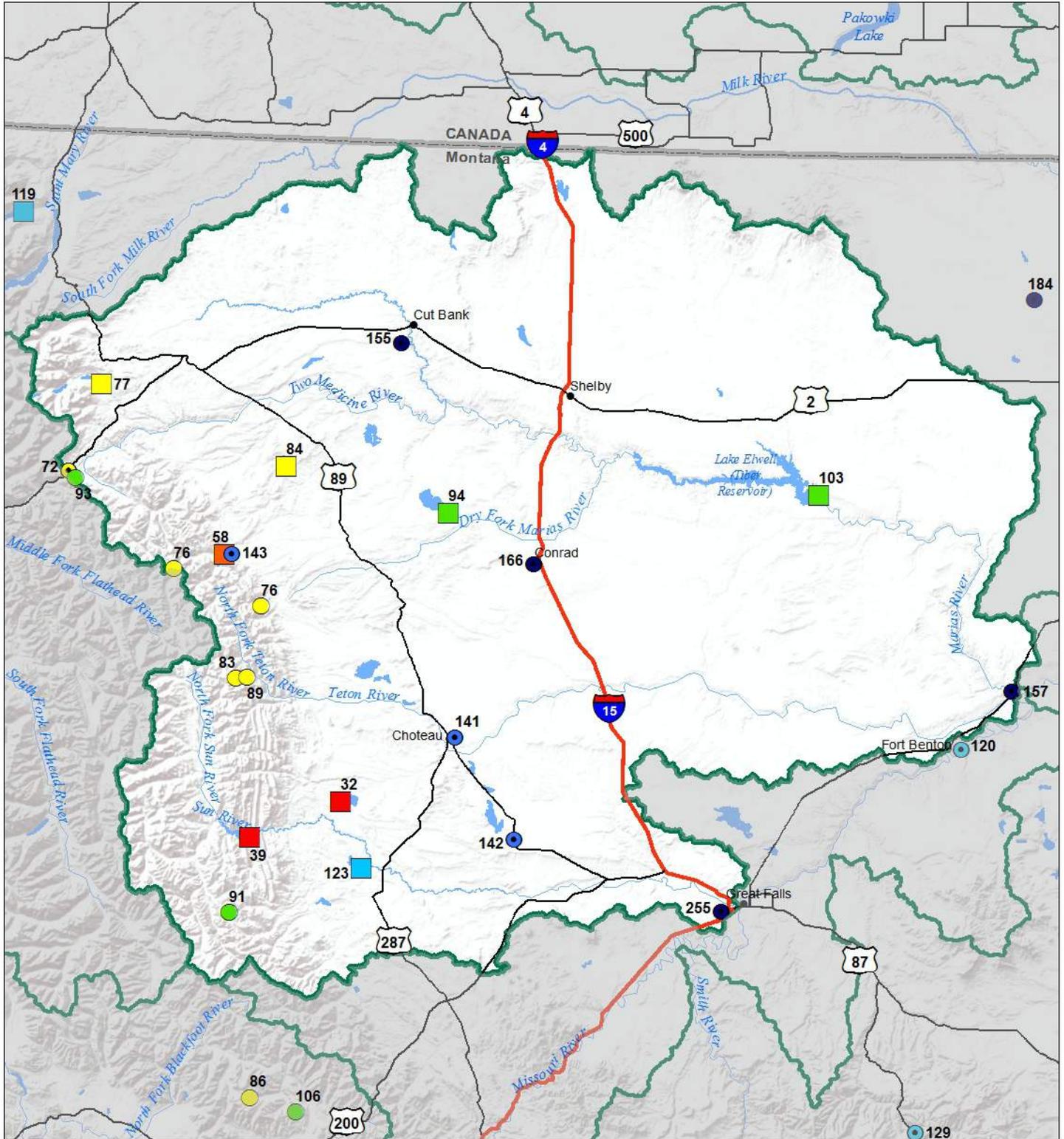
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Sun-Teton-Marias River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 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%

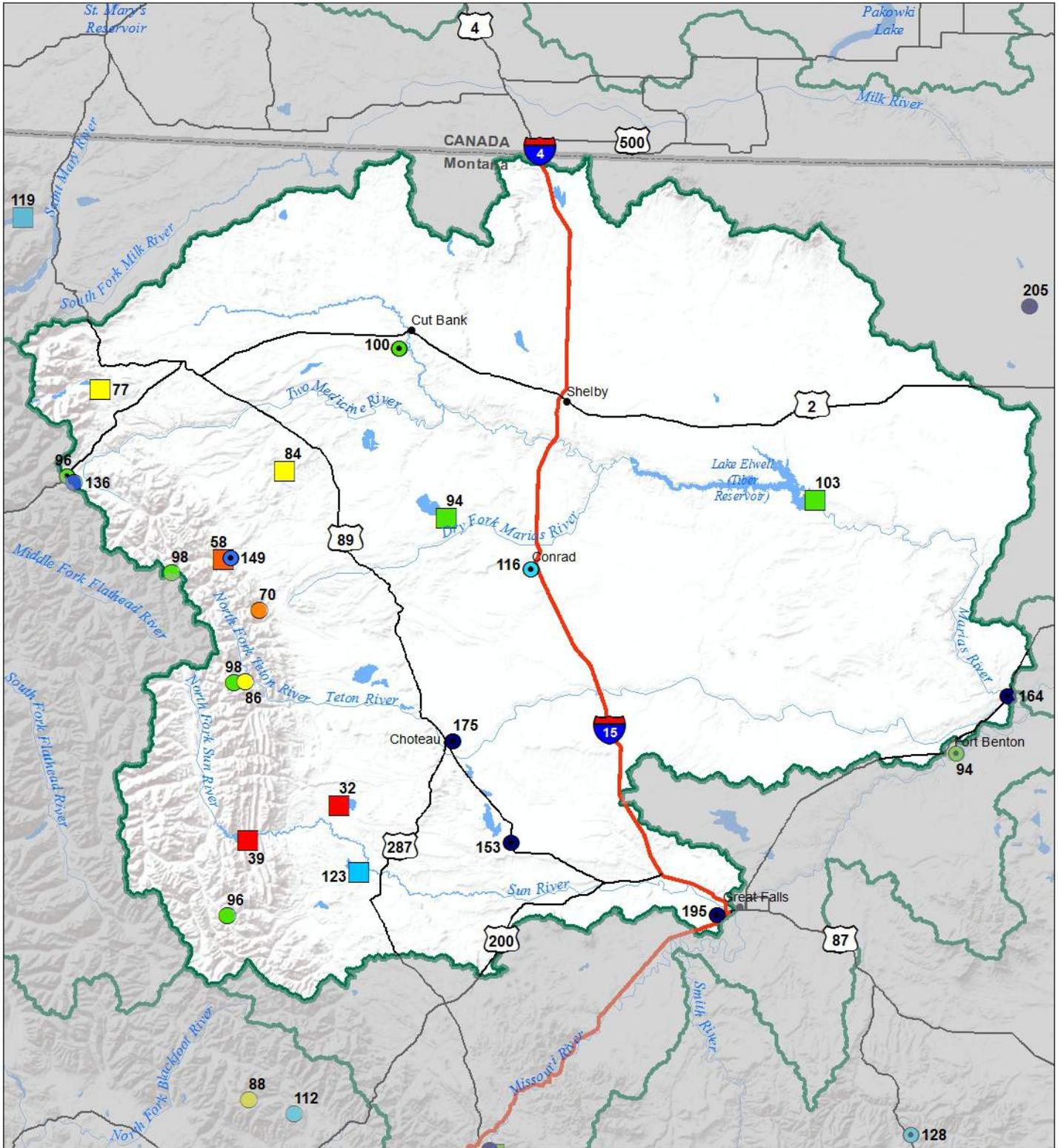


Sun-Teton-Marias River Basin

Monthly Precipitation and Reservoir Levels

Percentage of Normal

January 1, 2016 (December 1, 2015 - January 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 Streamflow Forecasts - January 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-SEP	225	300	350	80%	405	480	440
	APR-JUL	197	270	315	80%	365	435	395
Two Medicine R nr Browning ²	APR-SEP	118	148	168	87%	188	220	194
	APR-JUL	108	138	158	86%	178	210	183
Badger Ck nr Browning	APR-SEP	49	70	85	83%	100	121	103
	APR-JUL	39	59	73	83%	87	107	88
Swift Reservoir Inflow ²	APR-SEP	31	45	54	81%	63	77	67
	APR-JUL	25	37	46	81%	55	67	57
Dupuyer Ck nr Valier	APR-SEP	1	2.8	8.2	65%	13.7	22	12.7
	APR-JUL	1	2.8	7.7	69%	12.6	19.8	11.1
Cut Bank Ck nr Browning	APR-SEP	32	49	61	81%	73	90	75
	APR-JUL	29	45	56	81%	67	83	69
Marias R nr Shelby ²	APR-SEP	80	200	285	79%	370	490	360
	APR-JUL	79	197	280	81%	360	475	345
Teton R nr Dutton	APR-SEP	1	11.3	31	65%	51	81	48
	APR-JUL	1	8	27	64%	46	74	42

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

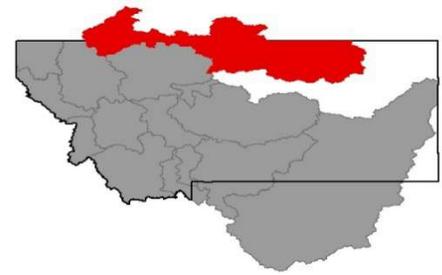
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

Reservoir Storage End of December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Gibson Res	14.2	18.5	36.4	99.1
Pishkun Res	5.6	19.7	17.7	32.0
Willow Creek Res - Augusta	27.7	29.1	22.5	32.2
Lower Two Medicine Lake	6.3	10.3	8.1	11.9
Four Horns Lake	8.8	9.9	10.4	19.2
Swift Res	8.1	13.8	13.8	30.0
Lake Frances	54.4	69.3	57.6	112.0
Lake Elwell (Tiber)	740.8	778.8	715.9	1347.0
Nilan Reservoir		6.2	5.9	11.0
Basin-wide Total	865.7	949.4	882.4	1683.4
# of reservoirs	8	8	8	8

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
SUN	2	83	126
TETON	3	74	107
MARIAS	3	79	107
SUN-TETON-MARIAS	6	79	113

St. Mary-Milk River Basin



The snowpack at higher elevations in Glacier National Park which are the headwaters of the St. Mary and Milk River basins started this year as a rain/snow mix during the first week of November, while lower elevations didn't start accumulating snow until mid-November. Mid-December storms that impacted most of the state made some improvements to the snowpack but snowpack remained below normal as we entered the new year on Jan 1st. Further east in the Bear Paw mountains snowpack is well below average for this date. Snow that began accumulating at the Rocky Boy SNOTEL sites in mid-November melted during the second week of December and then started fresh when mid-December storms came through. Overall, snowpack in the basin is below normal for January 1st. High elevation snowpack in the park is slightly below normal while low elevation snowpack across the basin is well below normal.

SNOTEL sites at higher elevations in the basin experienced very dry conditions with near record low precipitation this summer until a September storm finally gave the basin some reprieve. October precipitation was below average in the western half of the basin, but above average as you moved east. November and December precipitation has been slightly above average at mountain locations and well above average at valley locations further east. Overall the basin is above average for water year-to-date precipitation and off to a decent start.

Basin-wide reservoir storage is near average for this date but well below last year at this time due to summer demand and lack of streamflow and precipitation this summer.

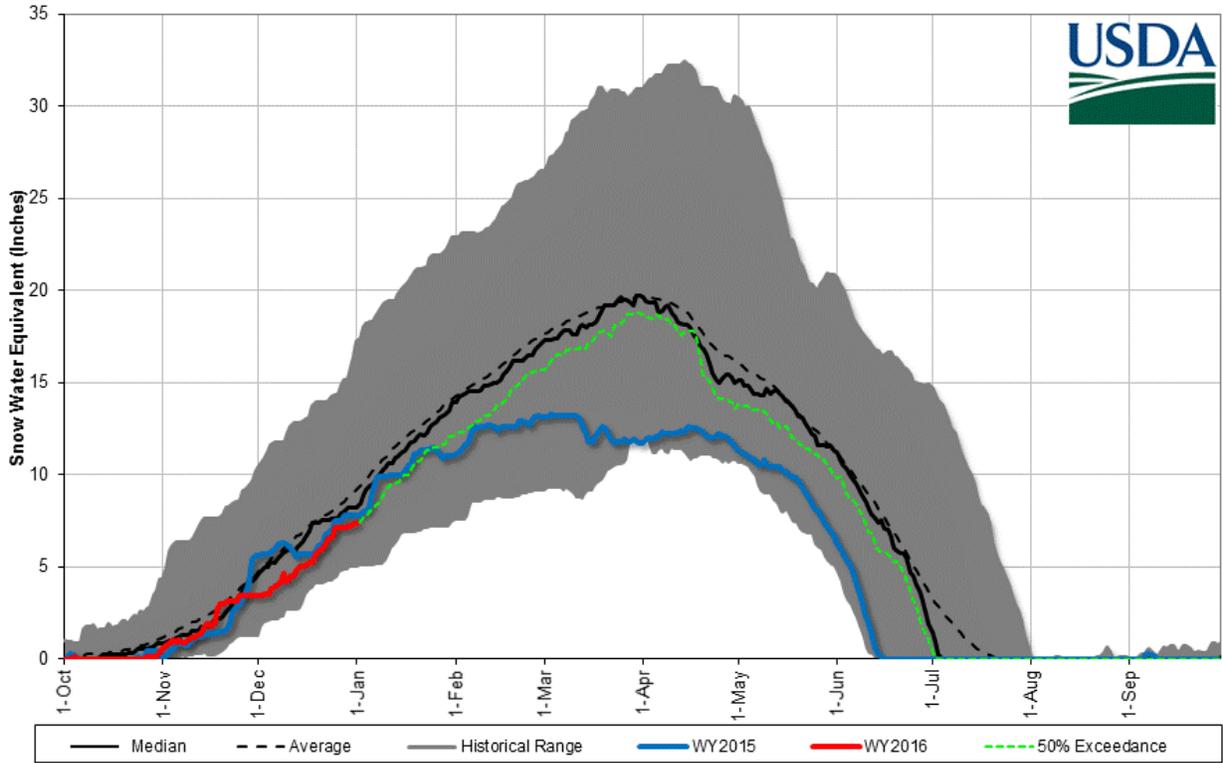
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 90 percent of average for the April-July time period.

St. Mary-Milk River Basin Data Summary		1/1/2016	
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Snowpack			
Basin-Wide	85%	91%	
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Precipitation			
Mountain Precipitation	125%	106%	129%
Valley Precipitation	131%	178%	89%
Basin Precipitation	126%	120%	122%
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Reservoir Storage			
Basin-Wide Storage	127%	50%	163%
	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	90%	124%	72%

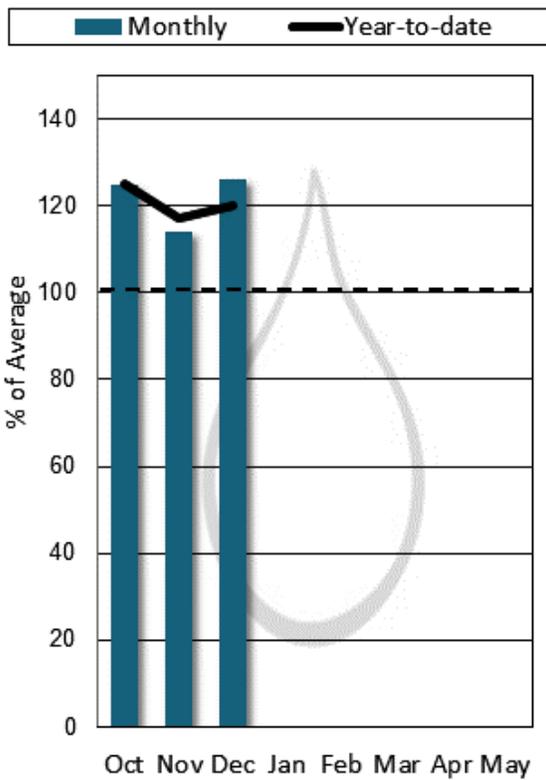
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**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.

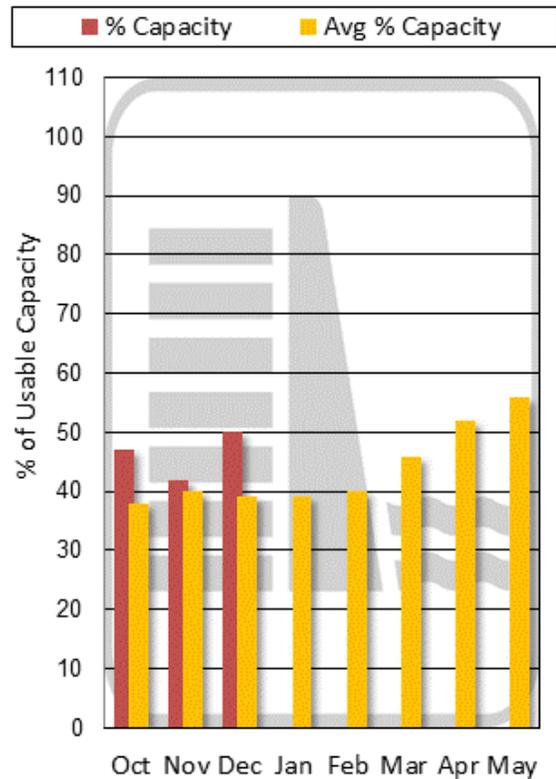
St. Mary-Milk River Basin Snowpack with Non-Exceedance Projections
Based on provisional SNOTEL daily data as of 1/1/2016



Mountain and Valley Precipitation

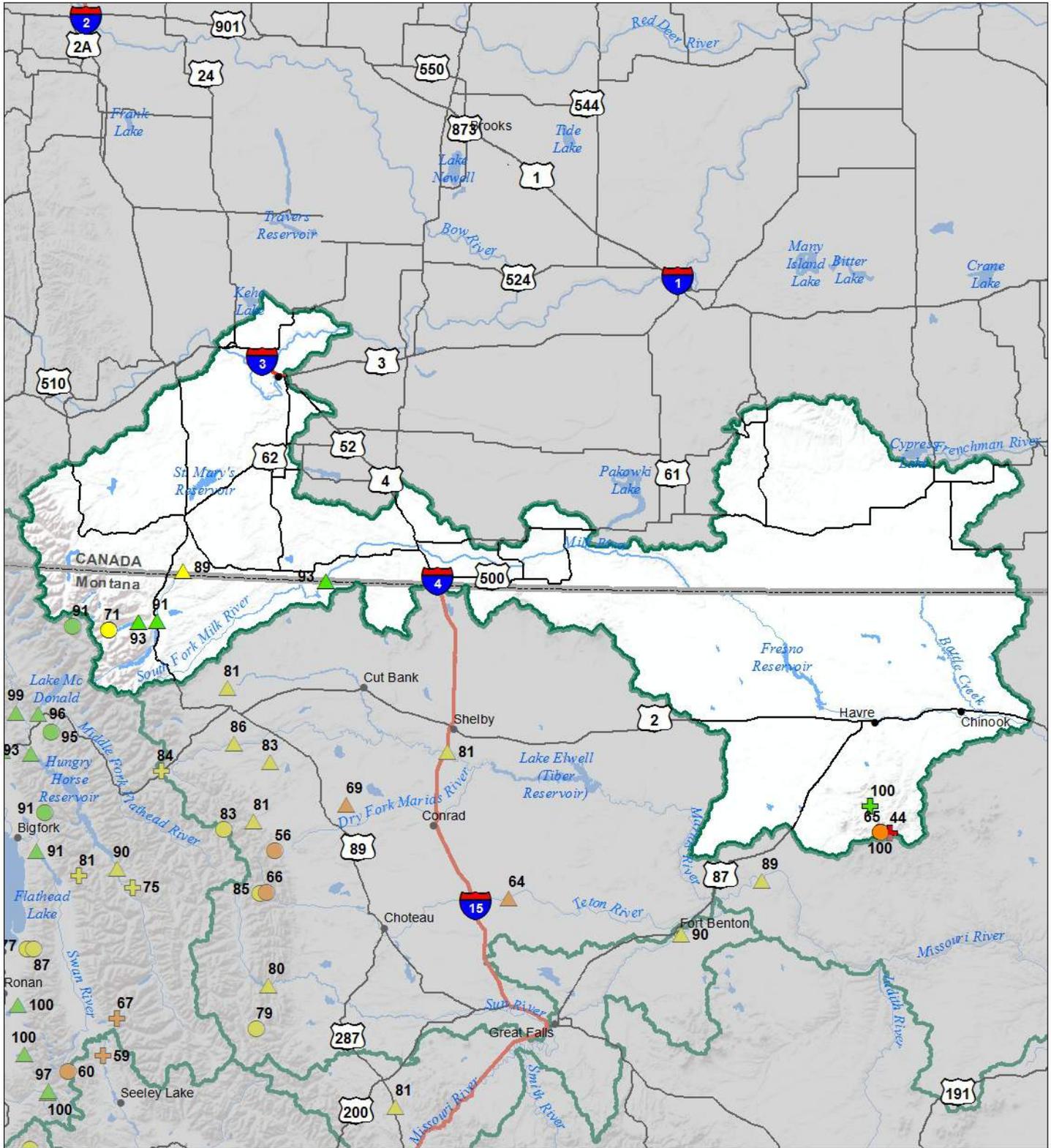


End of Month Reservoir Storage



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

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



Snow Water Equivalent Percent of Normal

SNOTEL

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

- 71 - 90%
- 51 - 70%
- 1 - 50%
- * 0%

Snowcourse

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

Streamflow Forecast Percent of Average Flows

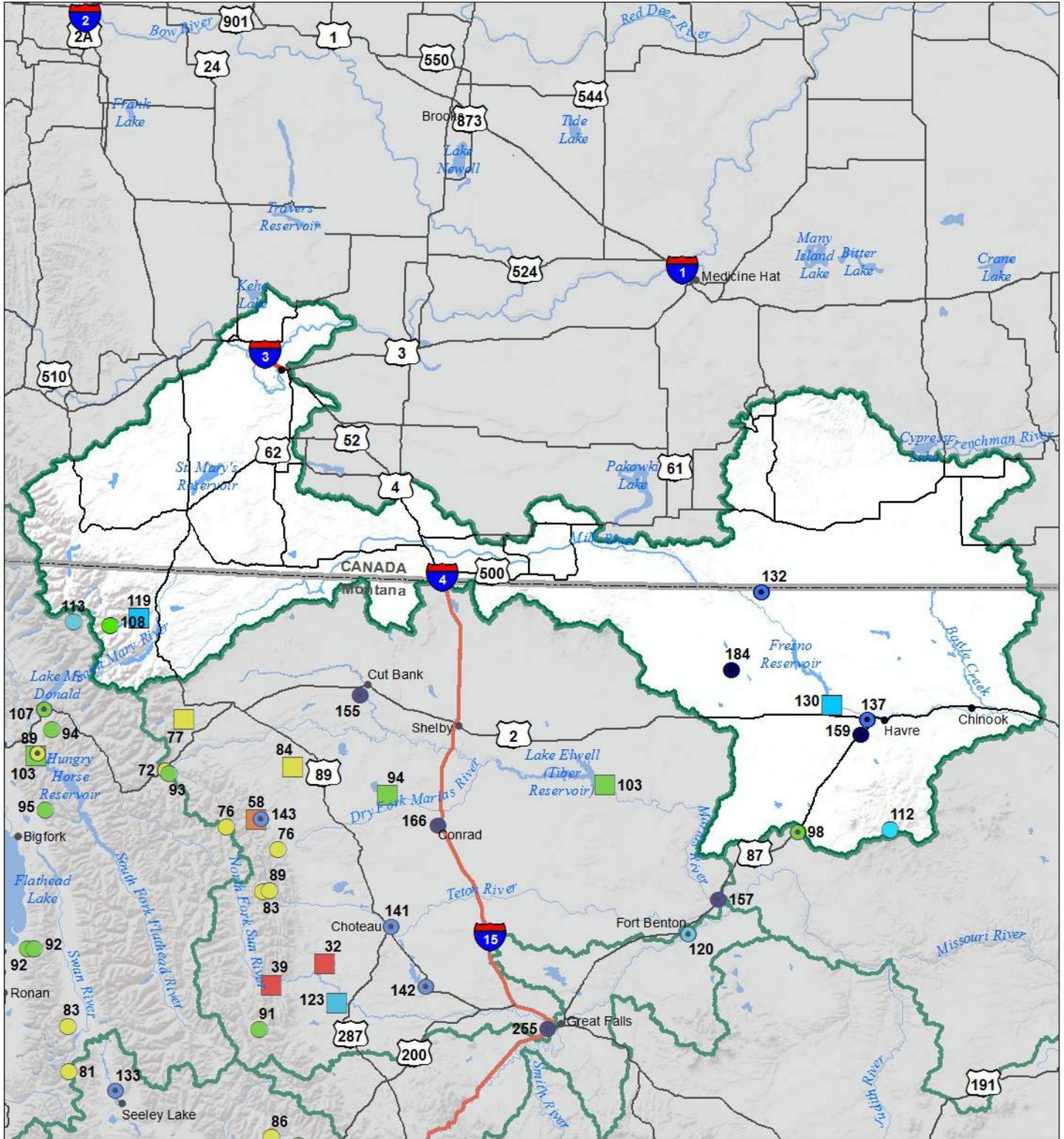
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



St Mary's-Milk River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 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 & Milk Basins Streamflow Forecasts - January 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-SEP	85	97	105	94%	113	125	112
	APR-JUL	70	82	90	93%	99	110	97
St. Mary R nr Babb²								
	APR-SEP	305	355	390	92%	425	475	425
	APR-JUL	255	305	335	91%	370	420	370
St. Mary R at Intl Boundary²								
	APR-SEP	330	400	450	89%	500	570	505
	APR-JUL	270	340	385	89%	435	505	435
Milk R at Western Crossing of Intl Bndry, AB								
	MAR-SEP	1.48	16.8	27	82%	38	54	32.77
	MAR-JUL	1.48	16.2	26	93%	36	51	28
	APR-SEP	1	12.5	22	85%	32	46	26
	APR-JUL	1	12.6	21	84%	30	43	25
Milk R at Eastern Crossing of Intl Bndry								

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

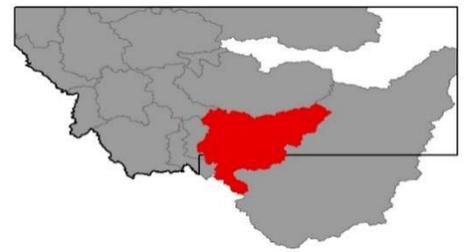
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

Reservoir Storage End of December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Sherburne	30.4	50.2	25.5	64.3
Fresno Res	56.1	68.6	43.2	127.0
Nelson Res	42.8	47.2	33.0	66.8
Basin-wide Total	129.4	165.9	101.7	258.1
# of reservoirs	3	3	3	3

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
ST. MARY	2	87	86
BEARPAW MOUNTAINS	1	65	155
CYPRESS HILLS, CANADA	0		
MILK RIVER BASIN	1	65	155
ST. MARY & MILK BASINS	3	85	91

Upper Yellowstone River Basin



Snow began accumulating at SNOTEL sites in the Upper Yellowstone River basin during the end of October and first week of November this water year. The early November storm brought the mostly non-existent snowpack to normal basin-wide on November 5th. Mid-November and mid-December storms helped to improve the snowpack in the basin, but lack of snowfall at the end of the month left the basin slightly below normal for January 1st. Snowpack conditions in the southern and western portions of the basin are generally better with snowpack that is near normal for this date in the Shields, Yellowstone above Livingston, and Clark’s Fork River basins. As you move east the snowpack percentages decrease with the Boulder-Stillwater (85%) and Rock Creek (72%) drainages below normal for this time.

Mountain and valley Precipitation was below average for the month of October but was near to slightly above average for the months of November and December. Currently, basin-wide valley precipitation is 152 percent of average for the water year (October 1st to current) and mountain precipitation is 103 percent of average.

Reservoir storage is currently slightly below last year at this time, but above average for January 1st.

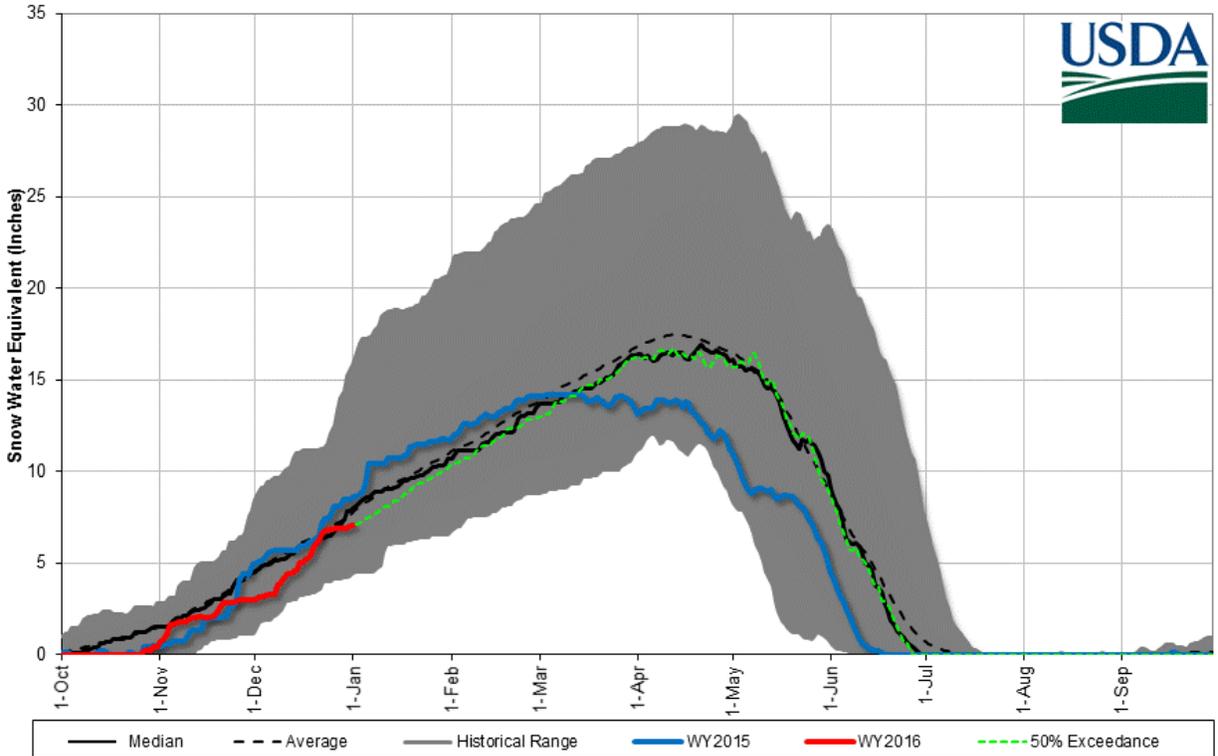
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 100 percent of average for the April-July time period.

Upper Yellowstone River Basin Data Summary		1/1/2016	
Snowpack			
	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	96%	116%	
Precipitation			
	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	118%	103%	106%
Valley Precipitation	187%	152%	88%
Basin Precipitation	125%	111%	103%
Reservoir Storage			
	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	161%	60%	157%
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	100%	114%	87%

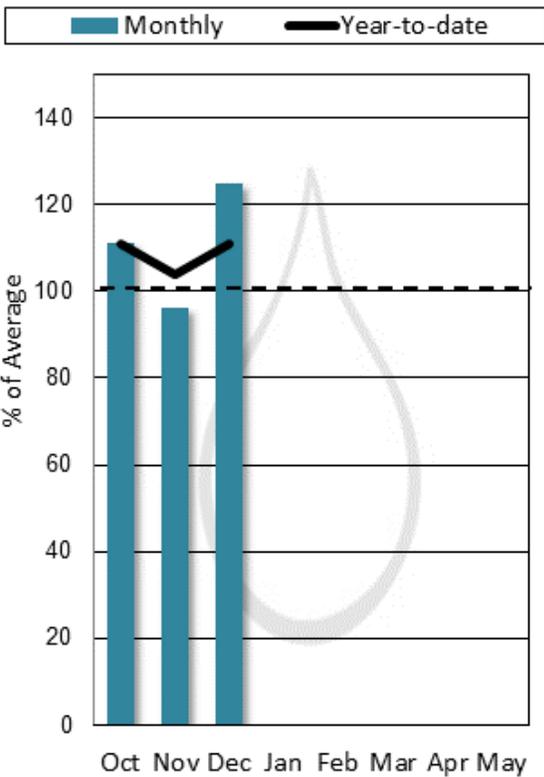
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**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.

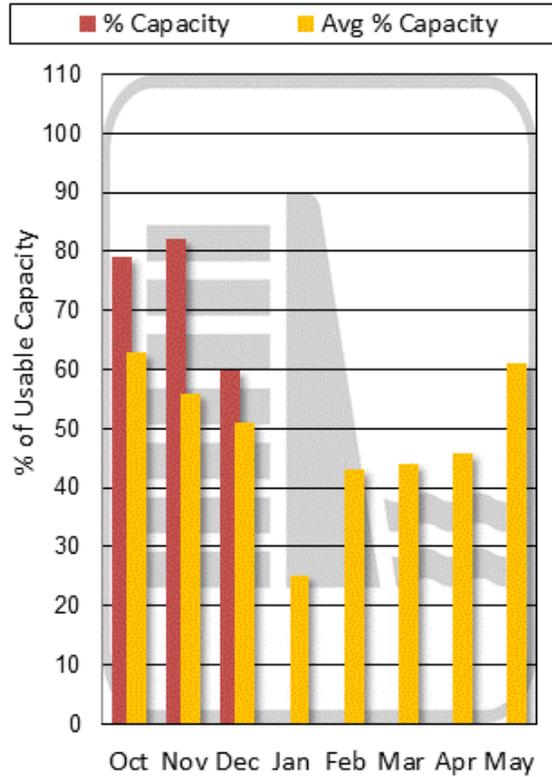
Upper Yellowstone River Basin Snowpack with Non-Exceedence Projections
Based on provisional SNOTEL daily data as of 11/1/2016



Mountain and Valley Precipitation

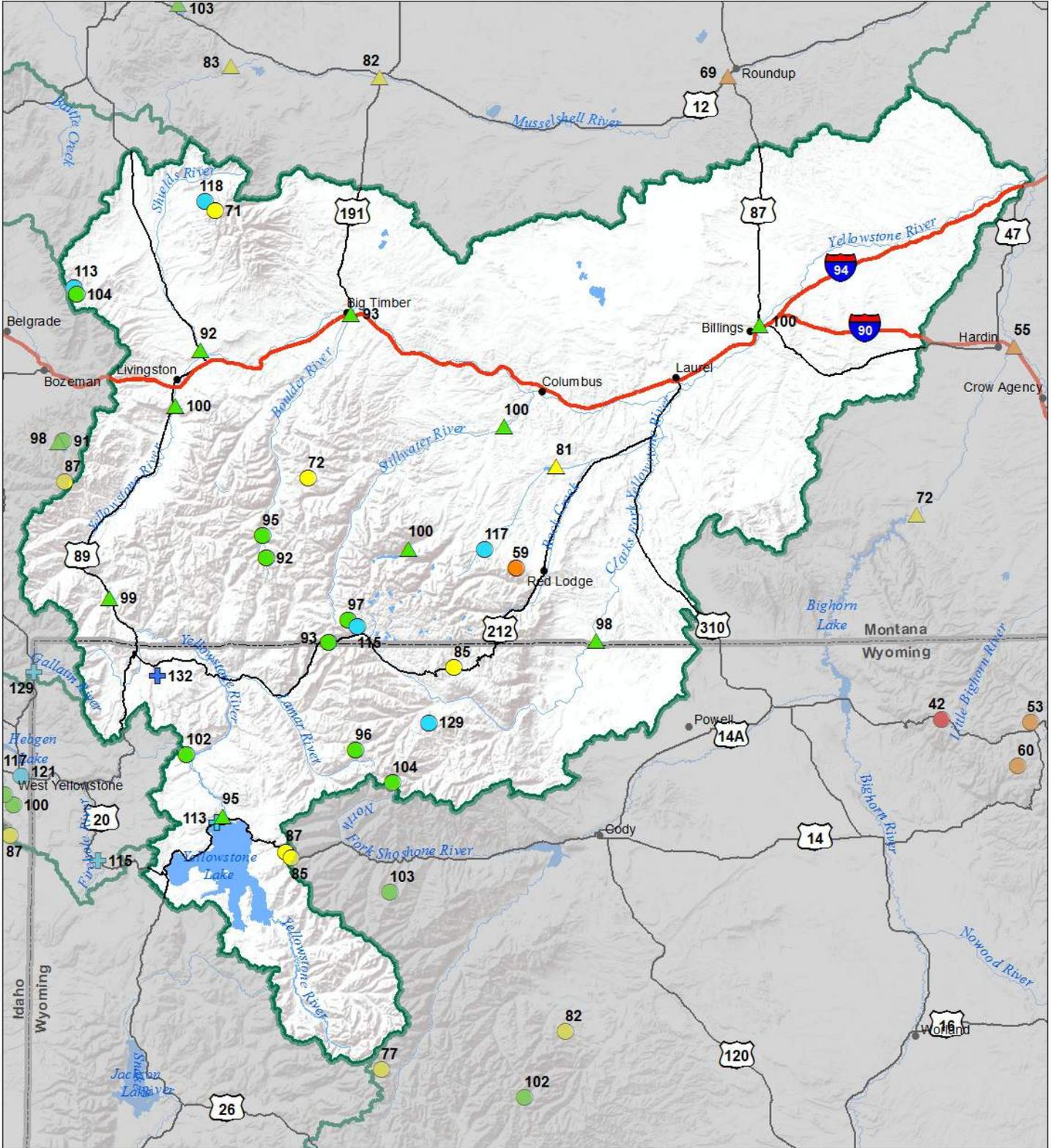


End of Month Reservoir Storage



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 January 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%
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- ⊕ 51 - 70%
- ⊕ 1 - 50%
- ⊕ *

Streamflow Forecast Percent of Average Flows

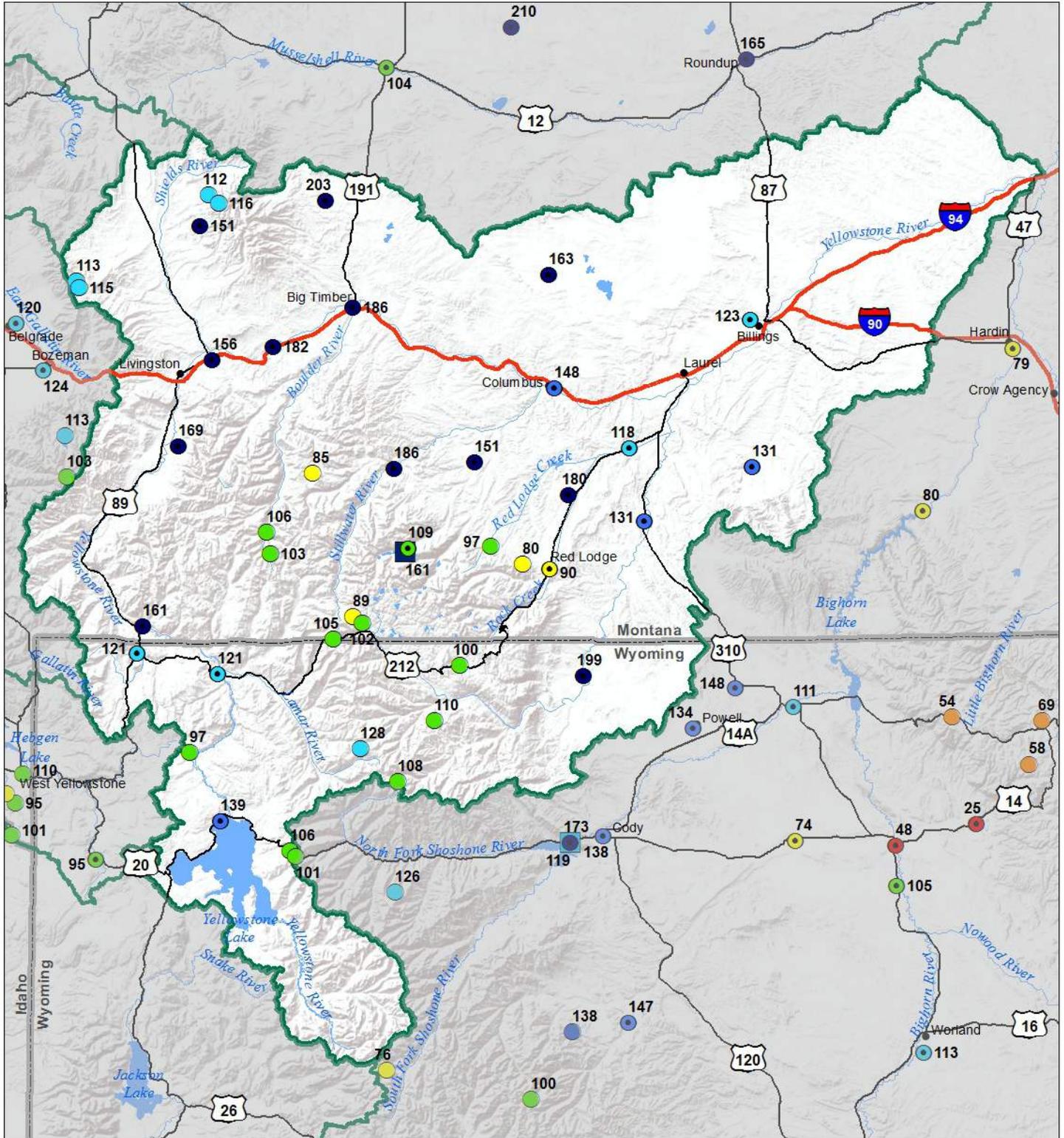
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Upper Yellowstone River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

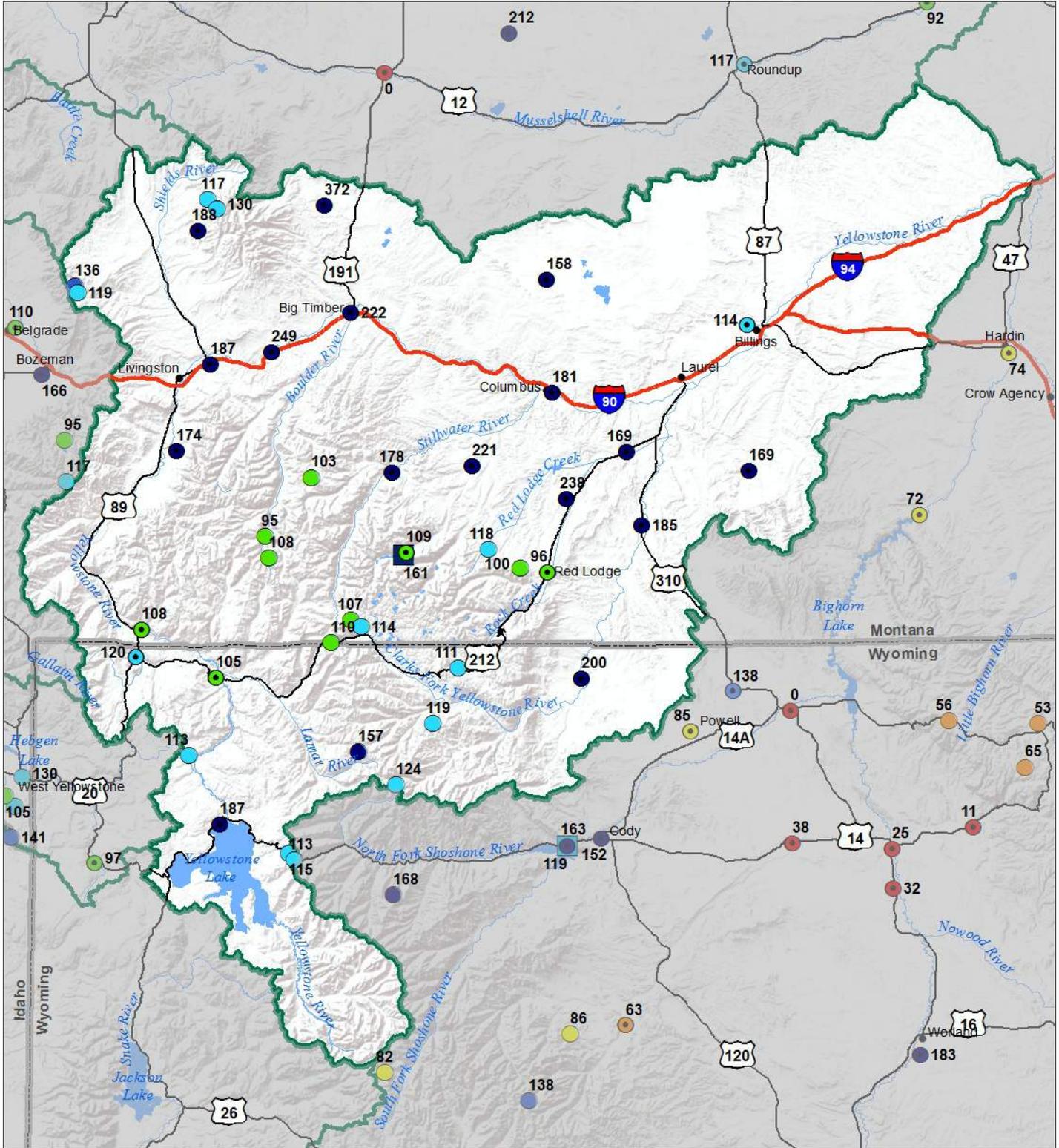
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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 January 1, 2016 (December 1, 2015 - January 1, 2016)



Precipitation Percent of Normal

SNOTEL

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

COOP/ACIS

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

Reservoirs Percent of Normal

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



Upper Yellowstone River Basin Streamflow Forecasts - January 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	410	495	550	96%	605	690	575
	APR-SEP	550	655	730	95%	800	910	770
Yellowstone R at Corwin Springs	APR-JUL	1250	1450	1590	100%	1730	1930	1590
	APR-SEP	1460	1700	1860	99%	2020	2260	1880
Yellowstone R at Livingston	APR-JUL	1410	1650	1810	101%	1980	2210	1800
	APR-SEP	1660	1940	2130	100%	2310	2590	2140
Shields R nr Livingston	APR-JUL	20	80	121	94%	162	220	129
	APR-SEP	21	87	132	92%	177	245	143
Boulder R at Big Timber	APR-JUL	181	230	260	93%	290	340	280
	APR-SEP	191	245	280	93%	315	370	300
Mystic Lake Inflow ²	APR-JUL	48	54	58	98%	62	68	59
	APR-SEP	61	69	74	100%	79	87	74
Stillwater R nr Absarokee ²	APR-JUL	335	400	445	100%	485	550	445
	APR-SEP	395	470	520	100%	570	645	520
Clarks Fk Yellowstone R nr Belfry	APR-JUL	385	455	500	98%	545	610	510
	APR-SEP	420	495	540	98%	590	665	550
Cooney Reservoir Inflow	APR-JUL	8.4	21	30	79%	39	52	38
	APR-SEP	15.3	29	39	81%	48	62	48
Yellowstone R at Billings	APR-JUL	2410	2910	3250	101%	3590	4090	3230
	APR-SEP	2740	3330	3730	100%	4130	4720	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 December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Mystic Lake	12.7	12.4	7.9	21.0
Cooney Res		19.2	16.6	27.4
Basin-wide Total	12.7	12.4	7.9	21.0
# of reservoirs	1	1	1	1

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
YELLOWSTONE ab LIVINGSTON	11	99	112
SHIELDS	4	98	129
BOULDER-STILLWATER	3	85	104
RED LODGE-ROCK CREEK	2	72	127
CLARK'S FORK	7	101	122
UPPER YELLOWSTONE RIVER BASIN	24	96	116

Lower Yellowstone River Basin



The water year in the Lower Yellowstone River Basin began with a very dry October. The majority of the SNOTEL sites in the region recorded precipitation totals for the month that were less than 60% of normal. The Bighorn Mountains and the southern portion of the Wind River Range saw even less precipitation with many sites below 30% of normal. The basin finally received some snow in the mountains in early November but storm systems have been few and far between. With the exception of the Shoshone River Basin, snow accumulation during November and December was below normal across the Lower Yellowstone.

On January 1, 2016 all sub basins in the Lower Yellowstone reported below normal snowpack's. Percentages were quite variable across the region and conditions improved from east to west. The east side of the basin was exceptionally dry with 7 SNOTEL sites in the Bighorn Mountain Range reporting record low snow water equivalent (SWE) on January 1 and an additional 3 sites reporting their second lowest values on record. Snowpack percentages for the Tongue and Powder River Basins were at just 47% and 56% of normal respectively. On the western side, SNOTEL sites in the Shoshone River Basin reported SWE values closer to normal at 97%.

Water year-to-date precipitation in the Lower Yellowstone Basin has been below normal throughout the water year and was at 80% on January 1. This is an improvement from last month thanks to well above normal precipitation in December in the Shoshone River Basin and a slight increase in precipitation in the other sub basins.

Reservoir storage in the basin remains in good condition with totals hovering right around normal for this time of year.

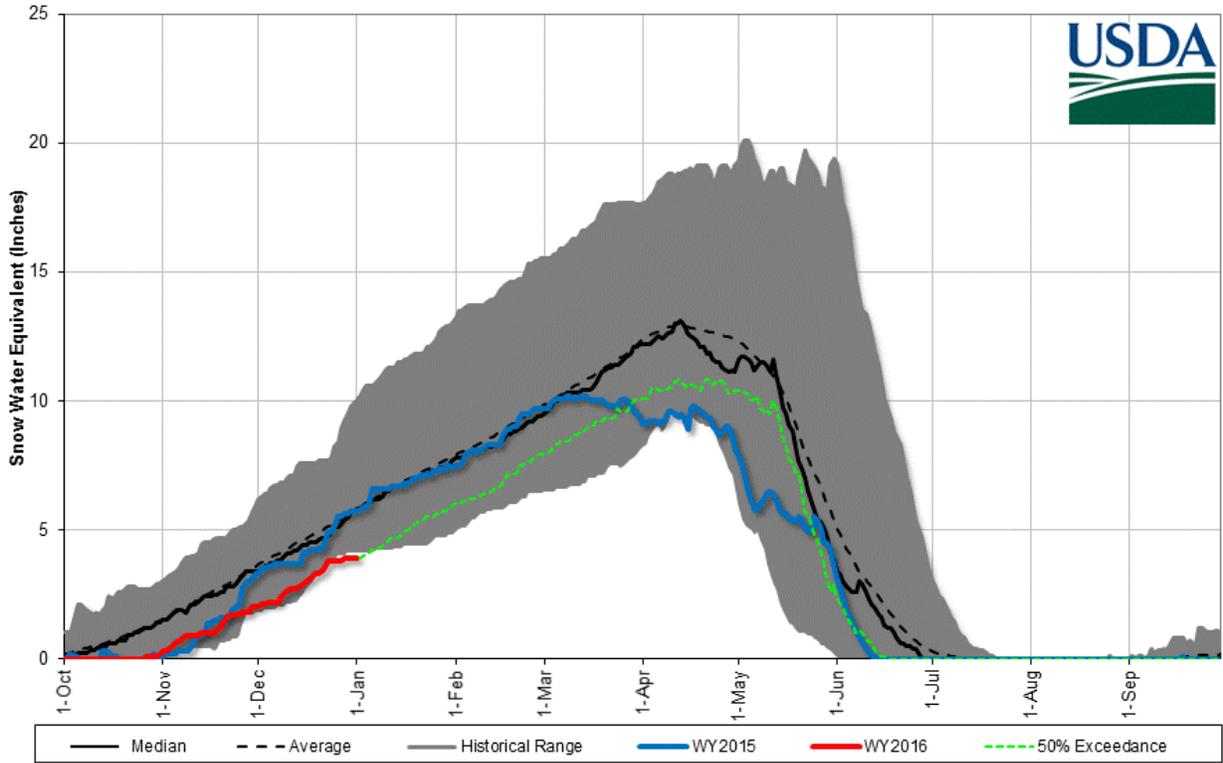
Streamflow forecasts for January 1st should be used knowing 35 to 40 percent of our annual snowpack has accumulated and conditions can change before runoff occurs. The 50 percent exceedance forecast assumes normal conditions will occur from this point and through snowmelt. Current basin-wide streamflows for the 50 percent exceedance are 85 percent of average for the April-July time period.

Lower Yellowstone River Basin Data Summary		1/1/2016	
Snowpack	Percent of 1981-2010 Normal (Median)	Last Year Percentage of Normal (Median)	
Basin-Wide	70%	102%	
Precipitation	Monthly Percentage of Average	WYTD Percentage of 1981-2010 Average*	Last Year Percentage of Average
Mountain Precipitation	89%	75%	97%
Valley Precipitation	88%	88%	97%
Basin Precipitation	89%	80%	97%
Reservoir Storage	Percentage of Average	Percentage of Capacity (Total)	Last Year Percentage of Average
Basin-Wide Storage	104%	65%	107%
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	85%	78%	108%

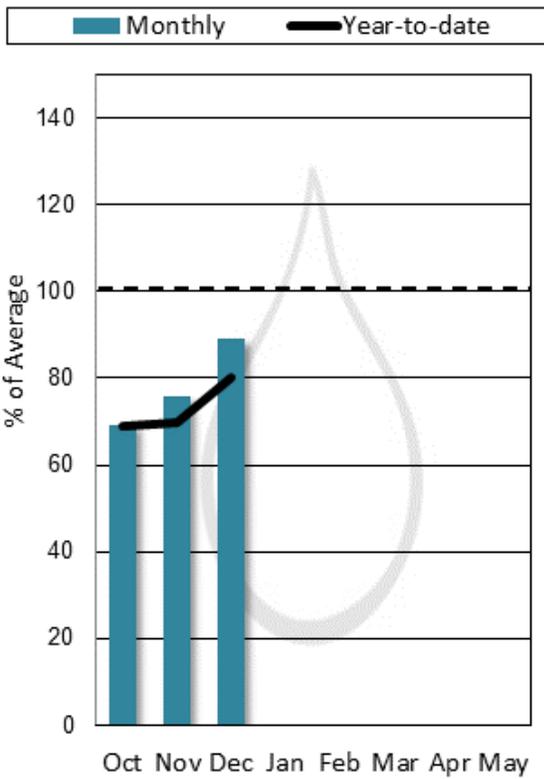
*Water Year-to-Date (WYTD) Precipitation is October 1st - Current

**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.

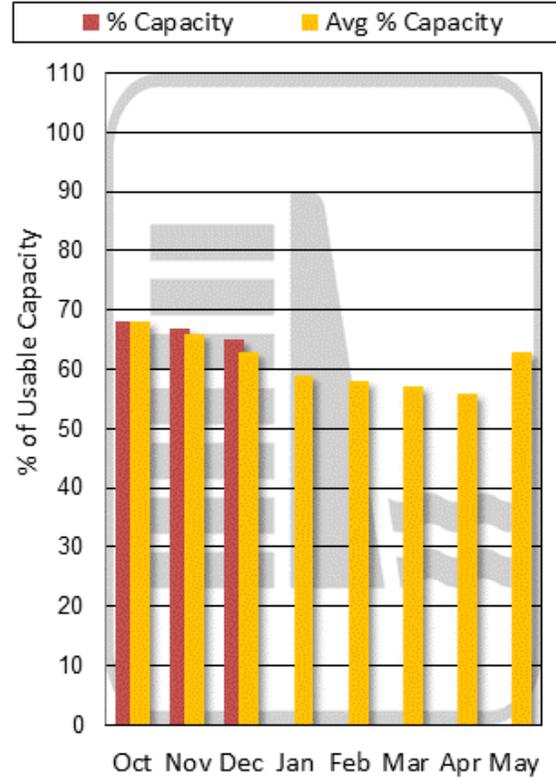
Lower Yellowstone River Basin Snowpack with Non-Exceedance Projections
Based on provisional SNOTEL daily data as of 1/1/2016



**Mountain and Valley
Precipitation**

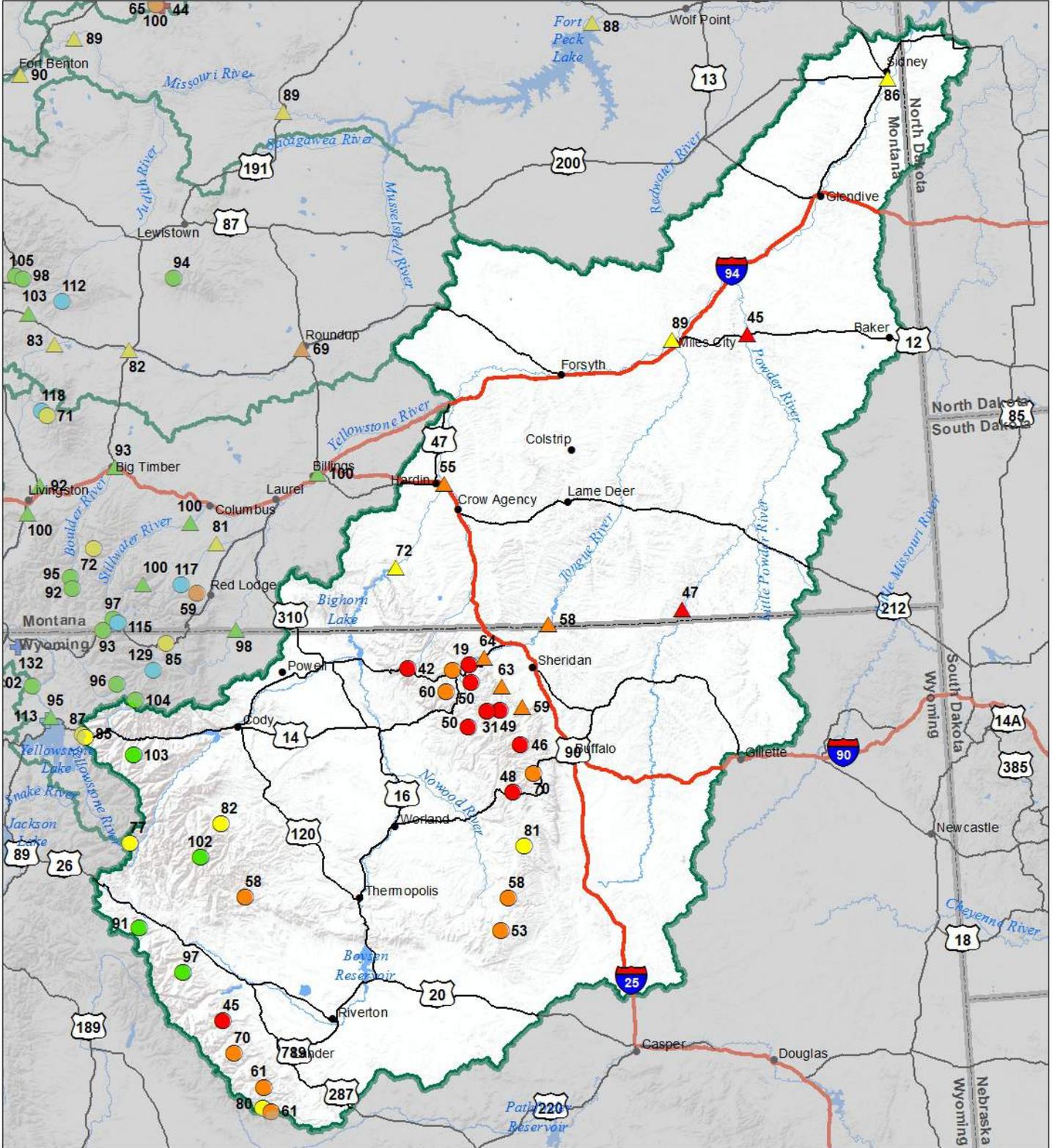


**End of Month Reservoir
Storage**



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

Lower Yellowstone River Basin Streamflow Forecast, Snow Water Equivalent Percentage of Normal January 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

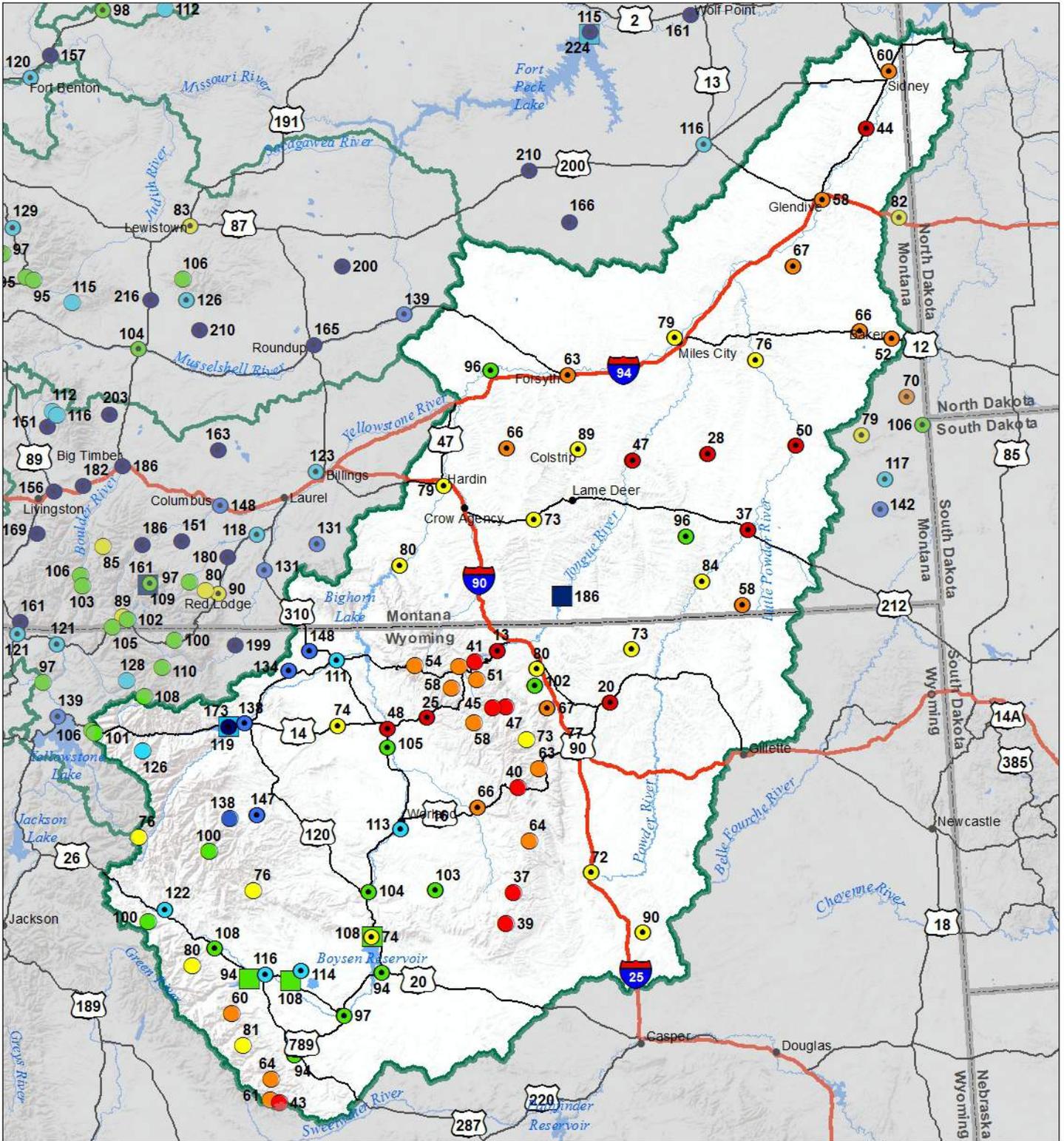
- ▲ > 150%
- ▲ 131 - 150%
- ▲ 111 - 130%
- ▲ 91 - 110%
- ▲ 71 - 90%
- ▲ 51 - 70%
- ▲ 1 - 50%



Lower Yellowstone River Basin

Water Year to Date Precipitation and Reservoir Levels Percentage of Normal

January 1, 2016



Precipitation Percent of Normal

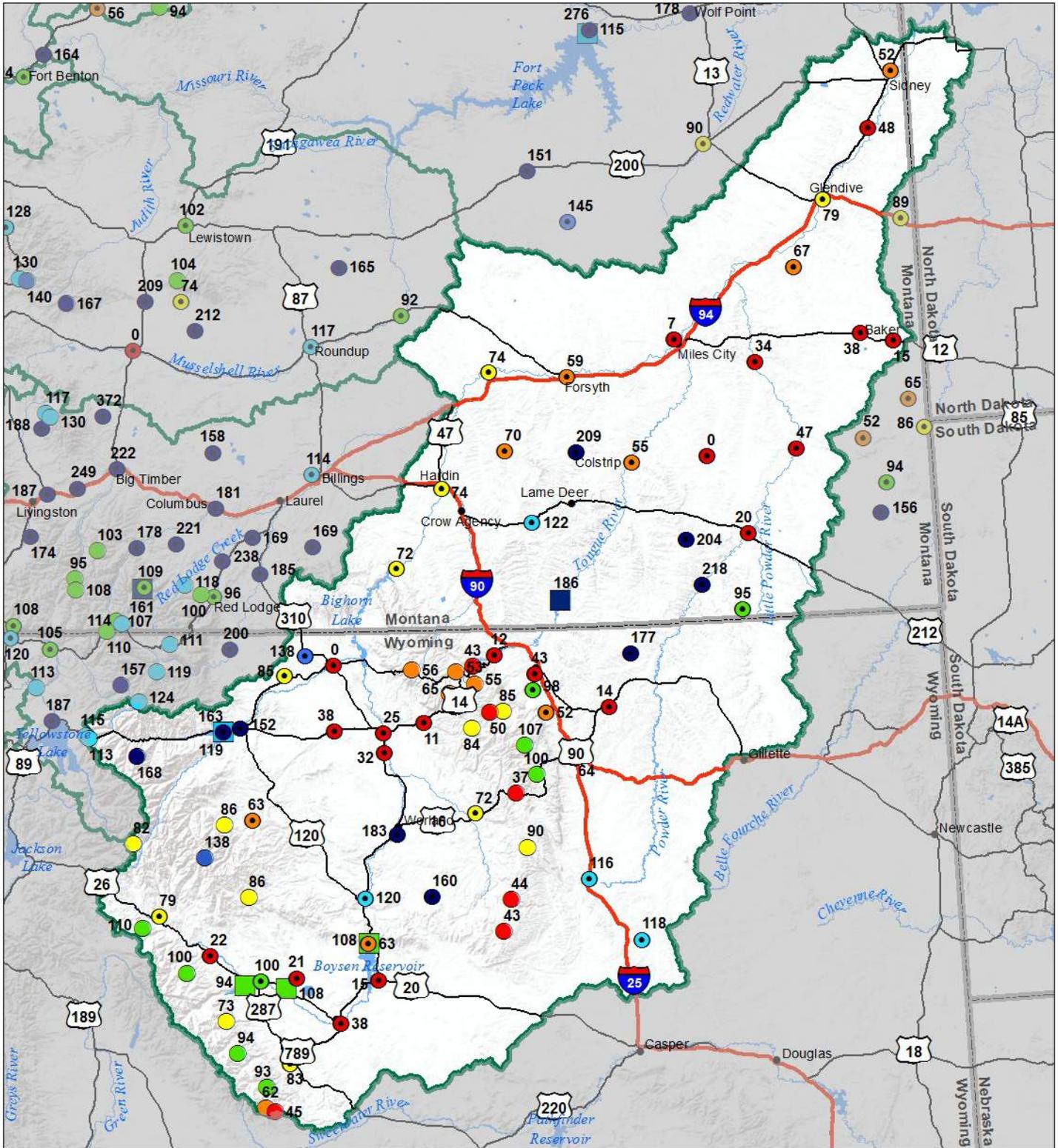
SNOTEL		COOP/ACIS	
● > 150%	● 71 - 90%	● > 150%	● 71 - 90%
● 131 - 150%	● 51 - 70%	● 131 - 150%	● 51 - 70%
● 111 - 130%	● 1 - 50%	● 111 - 130%	● 1 - 50%
● 91 - 110%		● 91 - 110%	

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 January 1, 2016 (December 1, 2015 - January 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 - January 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	470	810	1040	75%	1280	1620	1380
	APR-SEP	405	790	1050	72%	1310	1700	1460
Little Bighorn R nr Hardin	APR-JUL	1	32	54	55%	76	108	98
	APR-SEP	1	37	61	55%	85	121	111
Tongue R nr Dayton ²	APR-JUL	21	41	55	64%	69	89	86
	APR-SEP	26	48	63	64%	78	100	98
Big Goose Ck nr Sheridan	APR-JUL	6.9	18.9	27	59%	35	47	46
	APR-SEP	13.5	26	34	63%	42	55	54
Little Goose Ck nr Bighorn	APR-JUL	4.1	11.8	17.1	55%	22	30	31
	APR-SEP	8.6	16.9	23	59%	28	36	39
Tongue River Reservoir Inflow ²	APR-JUL	5.4	69	112	58%	156	220	193
	APR-SEP	12.3	79	125	58%	171	245	215
Yellowstone R at Miles City ²	APR-JUL	2900	3750	4330	91%	4900	5750	4780
	APR-SEP	3200	4200	4870	89%	5550	6550	5450
Powder R at Moorehead	APR-JUL	1	29	76	43%	123	192	177
	APR-SEP	1	43	92	47%	141	210	196
Powder R nr Locate	APR-JUL	1	27	83	42%	140	225	199
	APR-SEP	1	37	98	45%	160	250	220
Yellowstone R nr Sidney ²	APR-JUL	2620	3590	4240	88%	4900	5870	4830
	APR-SEP	2770	3910	4690	86%	5460	6610	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 December, 2015	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bighorn Lake	883.6	912.9	871.2	1356.0
Tongue River Res	49.0	51.2	26.4	79.1
Basin-wide Total	932.6	964.1	897.6	1435.1
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis January 1, 2016	# of Sites	% Median	Last Year % Median
WIND RIVER (Wyoming)	10	76	100
SHOSHONE RIVER (Wyoming)	4	97	108
BIGHORN RIVER (Wyoming)	14	76	106
LITTLE BIGHORN (Wyoming)	2	46	96
TONGUE RIVER (Wyoming)	6	47	90
POWDER RIVER (Wyoming)	6	56	112
LOWER YELLOWSTONE RIVER BASIN (Wyoming)	29	70	102

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	34	8.5	7.8	109	7.9	101
Ambrose	SC	6480						
Arch Falls	SC	7350						
Ashley Divide	SC	4820	16	3.0	2.6	115		
Badger Pass	SNOTEL	6900	39	10.4	12.5	83	15.2	122
Banfield Mountain	SNOTEL	5600	29	6.4	7.8	82	5.7	73
Baree Creek	SC	5500						
Baree Midway	SC	4600						
Baree Trail	SC	3800						
Barker Lakes	SNOTEL	8250	33	8.4	5.9	142	7.0	119
Basin Creek	SNOTEL	7180	28	6.2	3.6	172	4.9	136
Bassoo Peak	SC	5150						
Beagle Springs	SNOTEL	8850	26	5.3	3.8	139	4.2	111
Bear Basin	SC	8150						
Bear Mountain	SNOTEL	5400	73	18.7	22.9	82	12.4	54
Beartooth Lake	SNOTEL	9360	37	8.5	10.0	85	11.5	115
Beaver Creek	SNOTEL	7850	33	7.5	7.8	96	6.7	86
Big Snowy	SC	7150						
Bisson Creek	SNOTEL	4920	13	3.0	3.9	77	5.8	149
Black Bear	SNOTEL	8170	62	15.4	17.8	87	15.1	85
Black Mountain	SC	7750						
Black Pine	SNOTEL	7210	22	4.8	4.2	114	6.8	162
Blacktail	SC	5650	24	4.2	5.4	78		
Blacktail Mtn	SNOTEL	5650	24	5.1			5.0	
Bloody Dick	SNOTEL	7600	32	6.9	5.0	138	6.5	130
Bots Sots	SC	7750						
Boulder Mountain	SNOTEL	7950	42	9.9	9.3	106	8.1	87
Box Canyon	SNOTEL	6670	18	3.5	3.7	95	4.9	132
Boxelder Creek	SC	5100	8	1.1	2.5	44		
Brackett Creek	SNOTEL	7320	34	7.9	7.0	113	11.0	157
Bristow Creek	SC	3900						
Brush Creek Timber	SC	5000						
Bull Mountain	SC	6600						
Burnt Mtn	SNOTEL	5880	11	2.1	1.8	117	4.0	222
Cabin Creek	SC	5200						
Calvert Creek	SNOTEL	6430	25	5.1	3.4	150	5.4	159
Camp Senia	SC	7890						
Canyon	SNOTEL	7870	26	5.6	5.5	102	6.5	118
Carrot Basin	SNOTEL	9000	48	11.0	12.3	89	10.4	85
Chessman Reservoir	SC	6200	21	4.0	1.4	286	3.0	214
Chicago Ridge	SC	5800						
Chicken Creek	SC	4060						
Clover Meadow	SNOTEL	8600	31	6.8	7.8	87	6.1	78
Cole Creek	SNOTEL	7850	20	3.7	6.3	59	6.3	100
Combination	SNOTEL	5600	12	2.5	2.0	125	2.7	135
Copper Bottom	SNOTEL	5200	13	2.2			4.1	
Copper Camp	SNOTEL	6950	46	12.2			21.6	
Copper Mountain	SC	7700						
Cottonwood Creek	SC	6400						
Coyote Hill	SC	4200	18	1.9	3.2	59	4.9	153
Crevice Mountain	SC	8400						

Site Name	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Crystal Lake	SNOTEL	6050	26	4.8	5.1	94	4.3	84
Dad Creek Lake	SC	8800						
Daisy Peak	SNOTEL	7600	23	4.6	4.1	112	4.6	112
Daly Creek	SNOTEL	5780	21	4.7	4.5	104	6.4	142
Darkhorse Lake	SNOTEL	8600	58	15.0	12.9	116	16.6	129
Deadman Creek	SNOTEL	6450	18	4.2	4.0	105	5.9	148
Desert Mountain	SC	5600						
Discovery Basin	SC	7050	25	4.2	3.8	111	6.6	174
Divide	SNOTEL	7800	25	4.7	4.4	107	3.6	82
Dix Hill	SC	6400	18	3.9	3.9	100	4.9	126
Dupuyer Creek	SNOTEL	5750	12	1.9	3.4	56	2.8	82
Eagle Creek	SC	7000						
East Boulder Mine	SNOTEL	6335	12	2.1			2.7	
El Dorado Mine	SC	7800						
Elk Horn Springs	SC	7800						
Elk Peak	SNOTEL	7600	35	9.4			7.3	
Elk Peak	SC	8000						
Emery Creek	SNOTEL	4350	21	5.6	5.9	95	7.4	125
Fatty Creek	SC	5500						
Fish Creek	SC	8000			3.6		6.6	183
Fisher Creek	SNOTEL	9100	52	14.3	14.7	97	15.7	107
Flattop Mtn.	SNOTEL	6300	61	16.9	18.5	91	17.2	93
Fleecer Ridge	SC	7500						
Foolhen	SC	8280						
Forest Lake	SC	6400						
Four Mile	SC	6900						
Freight Creek	SC	6000						
Frohner Meadow	SNOTEL	6480	23	4.3	3.1	139	5.0	161
Garver Creek	SNOTEL	4250	18	4.8	4.7	102	3.5	74
Gibbons Pass	SC	7100						
Goat Mountain	SC	7000						
Government Saddle	SC	5270						
Grave Creek	SNOTEL	4300	18	4.0	6.6	61	7.4	112
Griffin Creek Divide	SC	5150						
Hand Creek	SNOTEL	5035	20	4.4	4.2	105	4.2	100
Hawkins Lake	SNOTEL	6450	50	12.3	10.5	117	9.1	87
Haymaker	SC	8050						
Hebgen Dam	SC	6550	26	5.2	4.0	130	3.8	95
Hell Roaring Divide	SC	5770	49	10.9	11.0	99	13.0	118
Herrig Junction	SC	4850						
Highwood Divide	SC	5650						
Highwood Station	SC	4600						
Holbrook	SC	4530			3.2		3.0	94
Hoodoo Basin	SNOTEL	6050	57	15.2	16.6	92	14.0	84
Humboldt Gulch	SNOTEL	4250		5.2	5.7	91	4.8	84
Jakes Canyon	SC	9040						
Johnson Park	SC	6450			2.0		4.0	200
Kishenehn	SC	3890						
Kraft Creek	SNOTEL	4750	17	3.8			5.2	
Lake Camp	SC	7780	19	4.5	4.0	113	4.4	110
Lakeview Canyon	SC	6930						
Lakeview Ridge	SNOTEL	7400	22	4.7	4.9	96	2.8	57
Lemhi Ridge	SNOTEL	8100	28	6.3	4.5	140	6.0	133

Site Name	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Lick Creek	SNOTEL	6860	19	4.0	4.4	91	4.8	109
Little Park	SC	7400						
Logan Creek	SC	4300						
Lolo Pass	SNOTEL	5240		10.2	11.0	93	11.1	101
Lone Mountain	SNOTEL	8880	32	7.7	7.7	100	6.5	84
Lookout	SNOTEL	5140	38	8.7	11.9	73	6.9	58
Lower Twin	SNOTEL	7900	35	8.5	8.2	104	8.2	100
Lubrecht Flume	SNOTEL	4680	10	2.5	2.4	104	4.0	167
Lubrecht Forest No 3	SC	5450	11	2.0	2.2	91	3.0	136
Lubrecht Forest No 4	SC	4650	8	1.4	1.2	117	1.6	133
Lubrecht Forest No 6	SC	4040	12	2.0	1.3	154	3.2	246
Lubrecht Hydroplot	SC	4200	12	2.1	2.0	105	3.1	155
Lupine Creek	SC	7380	22	4.5	3.4	132	4.2	124
Madison Plateau	SNOTEL	7750	45	10.3	10.3	100	9.5	92
Many Glacier	SNOTEL	4900	18	3.7	5.2	71	3.1	60
Marias Pass	SC	5250	24	4.9	5.8	84	5.2	90
Mineral Creek	SC	4000						
Monument Peak	SNOTEL	8850	35	8.1	8.8	92	9.3	106
Moss Peak	SNOTEL	6780	50	12.5	14.3	87	21.1	148
Moulton Reservoir	SC	6850			2.8		5.9	211
Mount Allen No 7	SC	5700						
Mount Lockhart	SNOTEL	6400	28	6.8	8.0	85	9.3	116
Mudd Lake	SC	7650						
Mule Creek	SNOTEL	8300	31	7.0	6.3	111	8.4	133
N Fk Elk Creek	SNOTEL	6250	19	4.2	4.5	93	6.1	136
Nevada Ridge	SNOTEL	7020	27	5.8	5.6	104	7.6	136
New World	SC	6900						
Nez Perce Camp	SNOTEL	5650	18	6.1	5.8	105	6.5	112
Noisy Basin	SNOTEL	6040	64	14.6	16.1	91	19.9	124
Norris Basin	SC	7550			4.3		4.7	109
North Fork Jocko	SNOTEL	6330	43	10.5	17.6	60	17.6	100
Northeast Entrance	SNOTEL	7350	18	3.8	4.1	93	6.0	146
Onion Park	SNOTEL	7410	23	5.2	5.4	96	7.1	131
Ophir Park	SC	7150	25	5.6	5.7	98	6.0	105
Parker Peak	SNOTEL	9400	40	9.5	9.9	96	11.8	119
Peterson Meadows	SNOTEL	7200	29	6.3	4.0	158	6.4	160
Pickfoot Creek	SNOTEL	6650	28	5.7	4.7	121	5.3	113
Pike Creek	SNOTEL	5930	4	1.4			1.8	
Pipestone Pass	SC	7200			1.6			
Placer Basin	SNOTEL	8830	30	5.9	8.2	72	7.4	90
Poorman Creek	SNOTEL	5100	47	11.5	12.6	91	8.7	69
Porcupine	SNOTEL	6500	12	2.6	2.2	118	2.3	105
Potomageton Park	SC	7150						
Revais	SC	4800						
Rock Creek Mdws	SC	3400						
Rocker Peak	SNOTEL	8000	28	6.1	6.0	102	7.4	123
Rocky Boy	SNOTEL	4700	7	1.3	2.0	65	3.1	155
Roland Summit	SC	5120						
S Fork Shields	SNOTEL	8100	20	4.6	6.5	71	6.3	97
Sacajawea	SNOTEL	6550	24	5.7	5.5	104	7.8	142
Saddle Mtn.	SNOTEL	7940	48	13.4	10.5	128	13.8	131
Short Creek	SNOTEL	7000	16	3.4	2.5	136	2.1	84
Shower Falls	SNOTEL	8100	35	7.8	9.0	87	8.6	96

Site Name	Network	Elevation (ft)	Depth (in)	SWE (in)	Median (in)	% Median	Last Year SWE (in)	Last Year % Median
Skalkaho Summit	SNOTEL	7250	37	9.0	8.7	103	11.5	132
Sleeping Woman	SNOTEL	6150	23	5.1	6.1	84	7.5	123
Slide Rock Mountain	SC	7100						
Spotted Bear Mountain	SC	7000	19	4.0	5.3	75	5.6	106
Spur Park	SNOTEL	8100	38	8.8	9.0	98	10.3	114
Stahl Peak	SNOTEL	6030	55	14.7	15.1	97	15.1	100
Stemple Pass	SC	6600						
Storm Lake	SC	7780	32	7.0	5.1	137	7.4	145
Stringer Creek	SNOTEL	6550	21	4.2	4.0	105	5.8	145
Stryker Basin	SC	6180						
Stuart Mountain	SNOTEL	7400	47	11.7	13.4	87	16.4	122
Taylor Road	SC	4080	7	1.0	1.0	100		
Ten Mile Lower	SC	6600	27	4.8	2.7	178	4.9	181
Ten Mile Middle	SC	6800	28	4.8	4.3	112	5.7	133
Tepee Creek	SNOTEL	8000	31	6.9	6.2	111	5.9	95
Timberline Creek	SC	8850						
Tizer Basin	SNOTEL	6880	21	4.2	4.7	89	5.2	111
Trinkus Lake	SC	6100	52	13.7	16.9	81	18.7	111
Truman Creek	SC	4060	11	0.8	1.9	42		
Twelvemile Creek	SNOTEL	5600	31	7.5	6.6	114	8.0	121
Twenty-One Mile	SC	7150	32	7.6	5.9	129	4.2	71
Twin Lakes	SNOTEL	6400	54	15.4	16.1	96	21.4	133
Upper Holland Lake	SC	6200	33	8.7	13.0	67	14.2	109
Waldron	SNOTEL	5600	12	2.7	4.1	66	4.5	110
Warm Springs	SNOTEL	7800	40	8.8	8.6	102	11.1	129
Weasel Divide	SC	5450	44	10.1	12.6	80	11.1	88
West Yellowstone	SNOTEL	6700	28	5.7	4.7	121	4.2	89
Whiskey Creek	SNOTEL	6800	32	6.6	6.7	99	6.0	90
White Elephant	SNOTEL	7710	52	12.7	11.5	110	10.8	94
White Mill	SNOTEL	8700	41	11.4	9.9	115	13.0	131
Wolverine	SNOTEL	7650	23	6.2	4.8	129	7.8	163
Wood Creek	SNOTEL	5960	14	2.6	3.3	79	4.9	148
Wrong Creek	SC	5700						
Wrong Ridge	SC	6800						
Younts Peak	SNOTEL	8350	21	5.4	7.0	77		