United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

March 1, 2016

Snow Surveyors tracks coming out from the Big Creek Summit SNOTEL site February 26, 2016. Big Creek Summit is located east of Cascade on the way to Warm Lake. This site is located along the North Fork Payette River and South Fork Salmon River divide at 6,580 feet in elevation and is used to monitor the snow in both drainages. The site was first measured April 3, 1936. The blue skies and sunshine in the picture represent most of the weather experienced in February that brought below normal precipitation across southern Idaho. Snowpack percentages decreased across southern Idaho during February but are still near to above average across most of the state. Read the full report to learn the details about what happened in your basin.
Photo by Danny Tappa, Hydrologist on the Idaho NRCS Snow Survey Staff.

Water Supply Outlook Report
Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information:

Contact: Your local county Natural Resources Conservation Service Office
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Natural Resources Conservation Service Snow Surveys
9173 West Barnes Drive, Suite C
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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when the snow melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to produce runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertainty is in the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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IDAHO WATER SUPPLY OUTLOOK REPORT

March 1, 2016

SUMMARY

Even with below normal February precipitation across the southern two-thirds of Idaho, our snowpack ended the month near normal across most of the state. February precipitation was only about half of average across the west-central and central basins and increased to above average in the Clearwater and Panhandle Region. As a result, snowpacks decreased and currently range from 90-110% of normal for the majority of the state. The basins south of the Snake River continue to host the highest snowpacks at 110-130% of normal. The lowest snowpacks are in isolated pockets at about 85% of normal in the Spokane and Little Wood basins. Streamflow forecasts call for 80-110% of average across the majority of the state, except for the Owyhee, Bruneau, Salmon Falls and Oakley basins which are forecast at 115-140% of average. Reservoir storage increased slightly during February from the low elevation melt and February rains. Reservoirs are in good shape across the region. Weather patterns appear to be changing in the first full week of March with the potential to bring abundant moisture to the West coast and into Idaho. Stay tuned to see how long this wet pattern lasts and to see how it impacts water supply outlooks. One or two more storms will help to ensure an adequate supply across most of the state.

SNOWPACK

A drier than normal February across most of the state decreased snowpack percentages relative to the median. Warm temperatures also melted low elevation snow and started melting mid-elevation sites across southern, western and northern Idaho. Higher elevation SNOTEL sites are not melting yet, but snow surveyors across that state noted snowpack densities are high for this time of the year. Many sites are registering with densities in the 36-38% range, while densities are typically in the low 30-34% in late February and early March. The warmer February temperatures allowed the snow to ripen-up earlier than usual. Snow usually starts to melt when the densities reach 40-45%.

The highest snowpacks, with respect to normal, remain across southern Idaho ranging from 123% of median in the Bruneau basin to 127% in the Salmon Falls basin. The lowest snowpacks are about 85% of median in the Spokane and Little Wood basins. Elsewhere snowpacks are in the near normal range, ranging from about 90% of median in the Henrys Fork and Bear River to about 105% in the Salmon, Payette and Boise basins. In the headwaters of the Snake River above Jackson Lake, the snowpack is 92% of median, which is about the same as last year on March 1st, and near last year's peak snow water content. Moving downstream, the snowpack above Palisades Reservoir is 94% of median, which is less than the 102% reported last year. On the bright side, the basins from Raft River to the Owyhee River have exceeded their normal seasonal peaks and the Owyhee and Bruneau basins have twice the amount of snow water compared to a year ago.

PRECIPITATION

The Salmon River was the divide for above and below normal precipitation across the state during February. Nearly all the SNOTEL sites north of the Salmon River received above average February precipitation. The Lochsa basin received the most at 144% of average while the rest of northern Idaho was in the 110-120% of average range. Meanwhile, nearly all the SNOTEL sites south of the Salmon River received below normal February amounts. Only a few sites and a couple of tributary basins in the Upper Snake in Wyoming received near average amounts. The lowest February amounts were a half of average in the Big Wood, Little Wood, Owyhee and Bruneau basins. Pockets of well below normal or minimal precipitation were observed in the Owyhee basin and eastward towards the Snake River Plain, see the February PRISM map for more details.

Precipitation since the water year started October 1, 2015, is near to above average across the state. The lowest amounts are 90-99% in the Bear River, eastern Idaho, Upper Snake in Wyoming, Mud Lake area, Little Lost, Big Lost, and Little Wood basins. Basins with normal to slightly above normal precipitation amounts since October 1st include Big Wood, Boise, Payette, Salmon, Clearwater and Spokane. The areas with the highest precipitation percentages since October 1 are in the northern and southern regions of Idaho - the northern Panhandle Region has received 117% of average precipitation since October 1 while the Bruneau has received 136% of average. Salmon Falls basin is not far behind at 131% of average, followed by Owyhee basin at 121% and Oakley basin at 116%. The Weiser and Raft River basins have received 111% of average precipitation since October 1.

RESERVOIRS

February brought warm temperatures, rain in the lower elevations and the winter's first runoff event. Lower elevation streams across the state saw a flush of water move through the hydrologic system from the February rain and low elevation snowmelt. The runoff increased reservoir storage from a month ago across the state. Keep in mind, February is not usually a big runoff month when compared to the volumes that normally occur during the snowmelt runoff season. However, the opposite happened last year and some February runoff volumes were higher than those that occurred later in the spring runoff season.

Reservoirs in the Panhandle, Dworshak, Boise and Payette basins are reporting near to above average storage levels. Even Mackay Reservoir is 107% of average, 70% of capacity, possibly from the fall and early winter rains providing better baseflows. Little Wood Reservoir is 81%, half full, while Magic Reservoir remains at only half of average, 19% full. Jackson Lake and Palisades have a combined storage of 106% of average, about two-thirds full. Ririe Reservoir is 117% of average, 60% full; Blackfoot is 99% of average, 53% full and American Falls is 87% of average, 67% of capacity. Across southern Idaho, storage ranges from a low of 37% of average in Wild Horse Reservoir to 75% of average in Oakley Reservoir. In terms of capacity, this equates to Salmon Falls and Wild Horse reservoirs being 14% and 18% full respectively, while Oakley and Owyhee reservoirs are 25% and 30% full respectively. Bear Lake is 83% of average, 38% of capacity, while Montpelier Reservoir is a whopping 147% of average and two-thirds full.

STREAMFLOW

Changes in streamflow forecasts from a month ago mirrored February's precipitation by keeping the forecasts the same or decreasing when precipitation was below normal. Northern Idaho's rivers along with the Clearwater basin are forecast at 85-105% of average, the exception is the NF Coeur d'Alene River at only 74% of average. The Salmon River and its tributaries are forecast at about 90-100% of average. Streams across central Idaho from the Weiser basin to Mud Lake are basically forecast at 85-110% of average. Streamflow forecasts in eastern Idaho and the Upper Snake in Wyoming decreased about 5-15 percentage points from last month and are now forecast at 70-90% of average. The highest streamflow forecasts are still across southern Idaho's high desert rivers ranging from 115-140% of average. Streamflow forecasts in the Bear River basin range from about 80% of average in the headwaters in Utah to 60% of average for the Bear River below Stewart Dam.

The Surface Water Supply Index (SWSI) continues to indicate supplies may be marginally adequate in the Wood and Lost basins of central Idaho based on the 50% chance of exceedance forecasts. February precipitation was only 40-55% of average in the Big Wood, Big Lost and Little Lost basins and as a result streamflow forecasts decreased 10-20 percentage points to below normal runoff volumes. Additional winter storms or good spring precipitation is needed to ensure adequate irrigation supplies.

Note: The volumes referenced in these narratives are the 50% Chance of Exceeding Forecast, unless otherwise noted. Users may wish to use a different forecast to reduce their risk of having too much or too little water.

RECREATION

With a near normal or better snowpack across the state, Idaho's water supplies are looking promising for all who depend on Idaho's snowfall and resulting runoff to make a living. River runners watching the Owyhee River saw one peak last month and there is enough snow to generate another increase in streamflow. Northern Idaho's river also had increases for the river runners to get on the rivers. With the forecast for wet weather next week, these lower elevation streams across southern, western and northern Idaho have the potential to rise again. Streamflow increases will be mostly a function of precipitation form (rain/snow), quantity, and the duration of the wet pattern, and we know the hydrologic system is primed from the February rain and runoff event. The Bruneau basin is hosting a snowpack of 123% of median and will provide a longer boating season than the past couple of season's combined. The near normal snowpack in the Clearwater, Salmon and Payette basins will provide an excellent floating season. More snow in Idaho's mountains this year also means an extended ski season that will last much longer than last year so don't put the skis and sleds away yet.

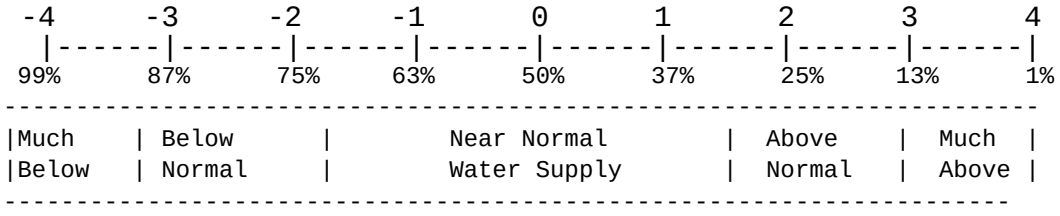
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) March 1, 2016

The Surface Water Supply Index (SWSI) is a predictive indicator of surface water availability within a watershed for the spring and summer water use season. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer streamflow. SWSI values are scaled from +4.0 (abundant supply) to -4.0 (extremely dry), with a value of zero indicating a median water supply as compared to historical occurrences. The SWSI analysis period is from 1981 to present.

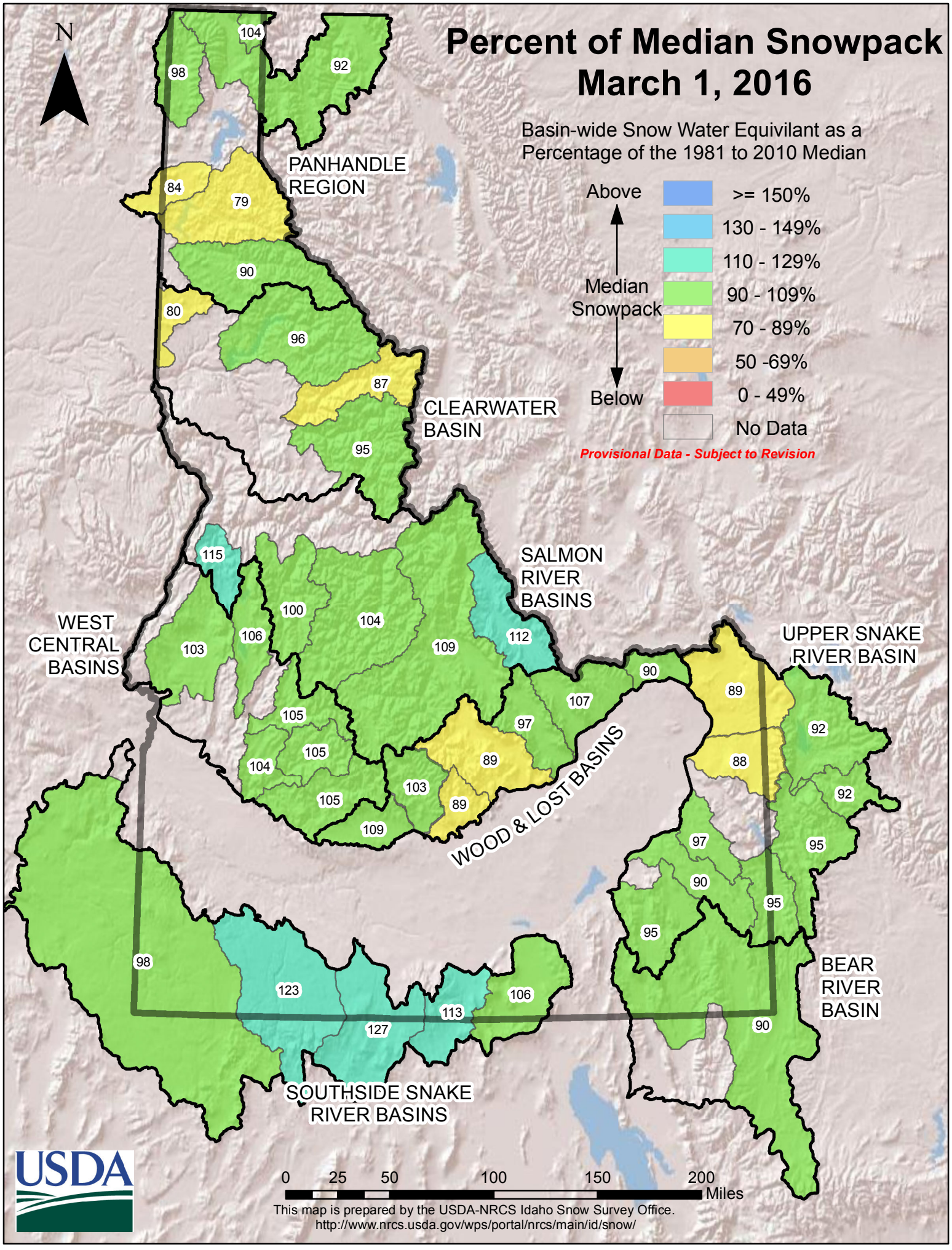
SWSI values provide a more comprehensive outlook of water availability by combining streamflow forecasts and reservoir storage where appropriate. The SWSI index allows comparison of water availability between basins for drought or flood severity analysis. Threshold SWSI values have been determined for some basins to indicate the potential for agricultural irrigation water shortages.

BASIN or REGION	*SWSI Value*	*Most Recent Year With Similar SWSI Value*	*Agricultural Water Supply Shortage May Occur When SWSI is Less Than*
Spokane	**-0.8**	**2013**	**NA**
Clearwater	**0.1**	**2003**	**NA**
Salmon	**0.3**	**2010**	**NA**
Weiser	**0.8**	**2012**	**NA**
Payette	**0.6**	**2003**	**NA**
Boise	**1.0**	**2009**	**-1.6**
Big Wood	**0.3**	**2000**	**0.2**
Little Wood	**0.3**	**2009**	**-1.4**
Big Lost	**-0.1**	**2012**	**0.7**
Little Lost	**0.1**	**2012**	**1.4**
Teton	**-0.8**	**2015**	**-3.9**
Henrys Fork	**-0.8**	**2010**	**-3.7**
Snake (Heise)	**-0.8**	**1993**	**-1.6**
Oakley	**1.0**	**2000**	**0.0**
Salmon Falls	**1.0**	**2009**	**-0.7**
Bruneau	**1.5**	**2005**	**NA**
Owyhee	**0.8**	**2005**	**-3.0**
Bear River	**-0.8**	**2015**	**-3.7**

SWSI SCALE, PERCENT CHANCE OF EXCEEDANCE, AND INTERPRETATION



NA=Not Available / Not Applicable; Note: The Percent Chance of Exceedance is an indicator of how often a range of SWSI values might be expected to occur. Each SWSI unit represents about 12% of the historical occurrences. As an example of interpreting the above scale, the SWSI can be expected to be greater than -3.0, 87% of the time and less than -3.0, 13% of the time. Half the time, the SWSI will be below and half the time above a value of zero. The interval between -1.5 and +1.5 described as "Near Normal Water Supply," represents three SWSI units and would be expected to occur about one-third (36%) of the time.


Percent of Median Snowpack
March 1, 2016
Basin-wide Snow Water Equivilant as a Percentage of the 1981 to 2010 Median
Above
Median Snowpack
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
N
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
UPPER SNAKE RIVER BASIN
WOOD & LOST BASINS
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
104
98
92
84
79
90
80
96
87
95
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106
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109
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107
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105
105
104
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88
92
105
103
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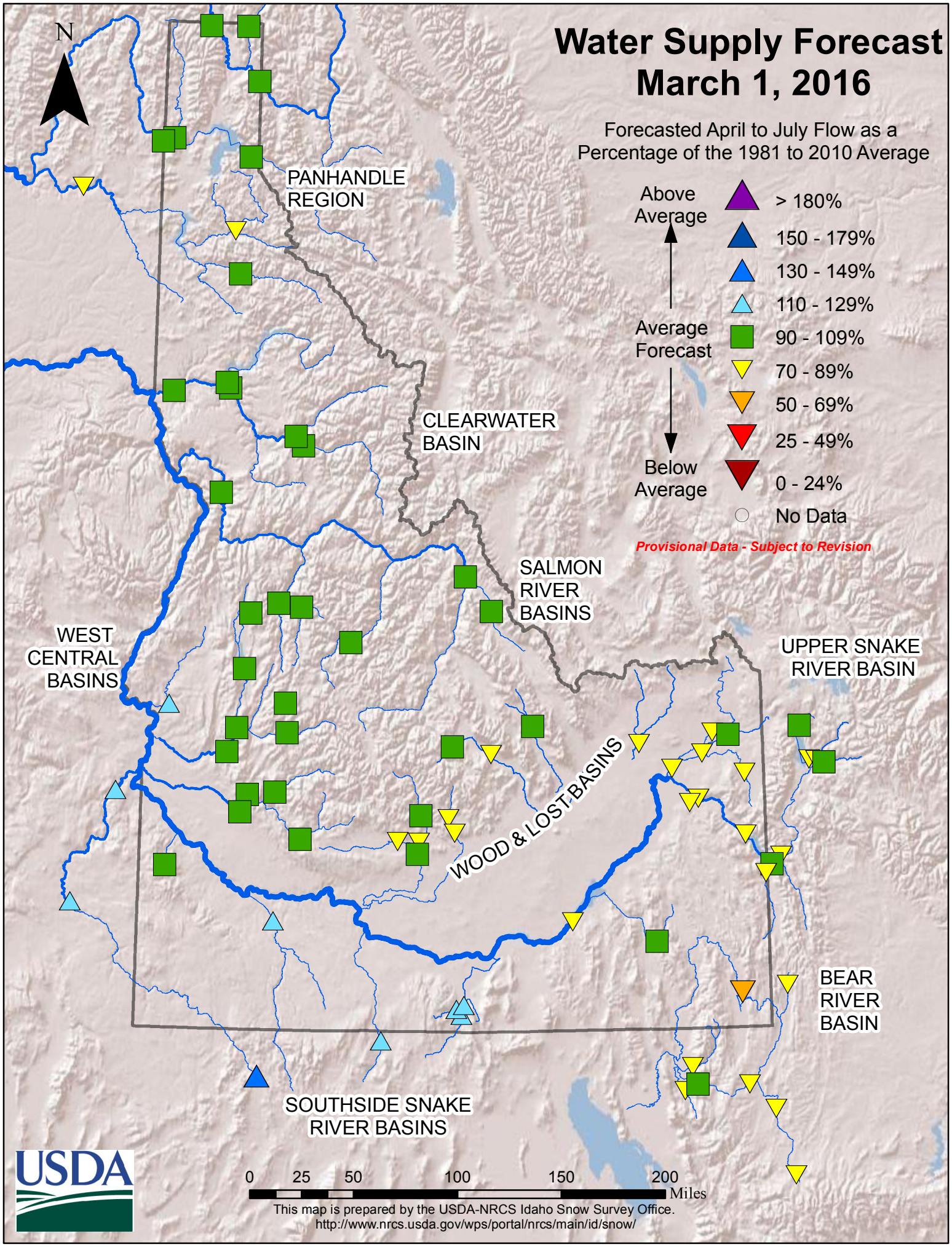
109
92
97
95
90
95
95
98
123
106
113
127
90
USDA
0 25 50 100 150 200
Miles
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/


N
Water Supply Forecast
March 1, 2016
Forecasted April to July Flow as a
Percentage of the 1981 to 2010 Average
Above Average
Average Forecast
Below Average
> 180%
150 - 179%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 - 69%
25 - 49%
0 - 24%
No Data
Provisional Data - Subject to Revision
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
UPPER SNAKE RIVER BASIN
WOOD & LOST BASINS
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
USDA
0 25 50 100 150 200
Miles
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.
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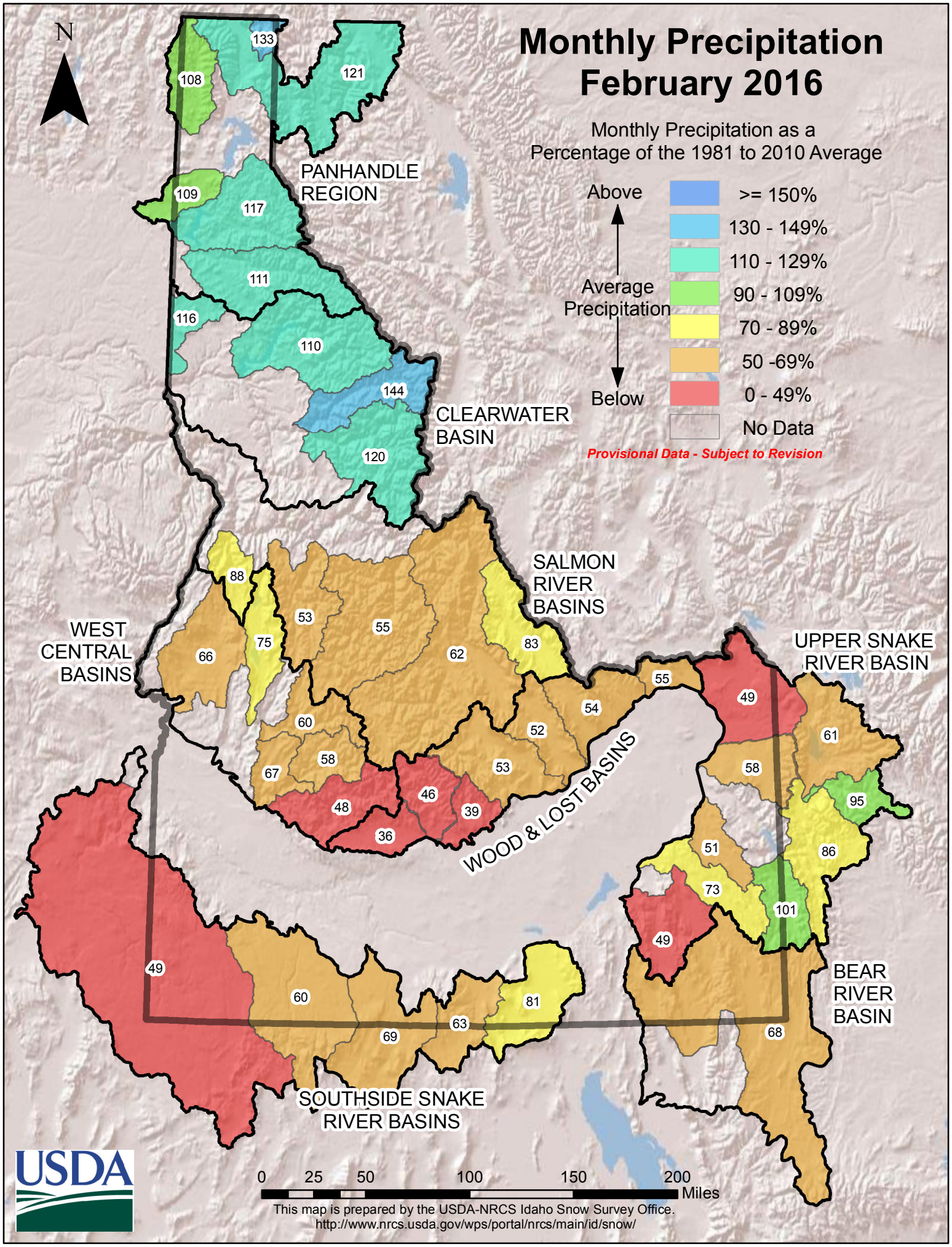
N
Monthly Precipitation
February 2016
Monthly Precipitation as a
Percentage of the 1981 to 2010 Average
Above
Average Precipitation
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
UPPER SNAKE RIVER BASIN
WOOD & LOST BASINS
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
133
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108
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144
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53
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75
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53
46
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36
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49
61
58
95
51
86
73
101
49
49
60
81
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69
68
0
25
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150
200
Miles
USDA
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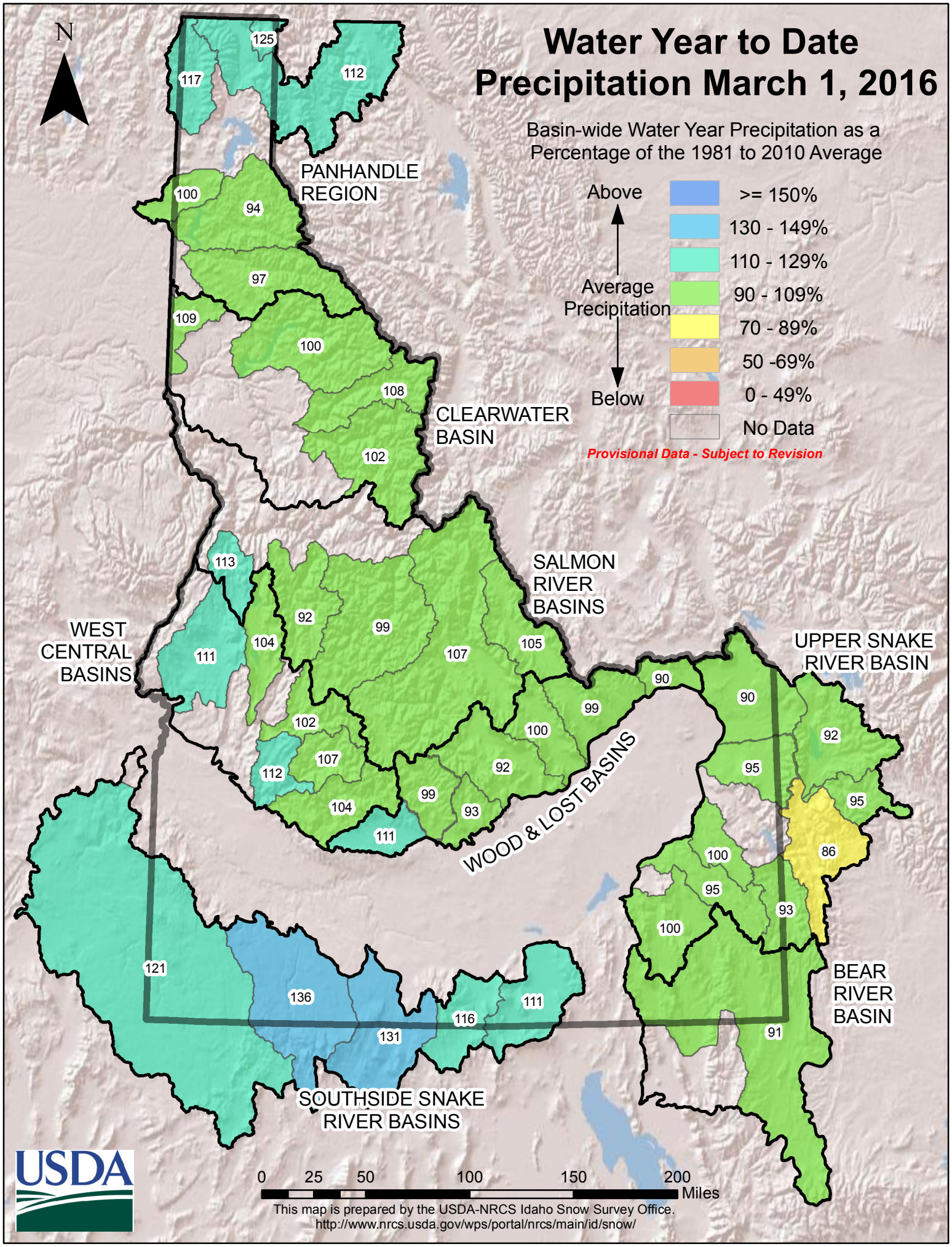
N
Water Year to Date Precipitation March 1, 2016
Basin-wide Water Year Precipitation as a Percentage of the 1981 to 2010 Average
Above
Average Precipitation
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
UPPER SNAKE RIVER BASIN
WOOD & LOST BASINS
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
125
117
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95
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86
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111
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25
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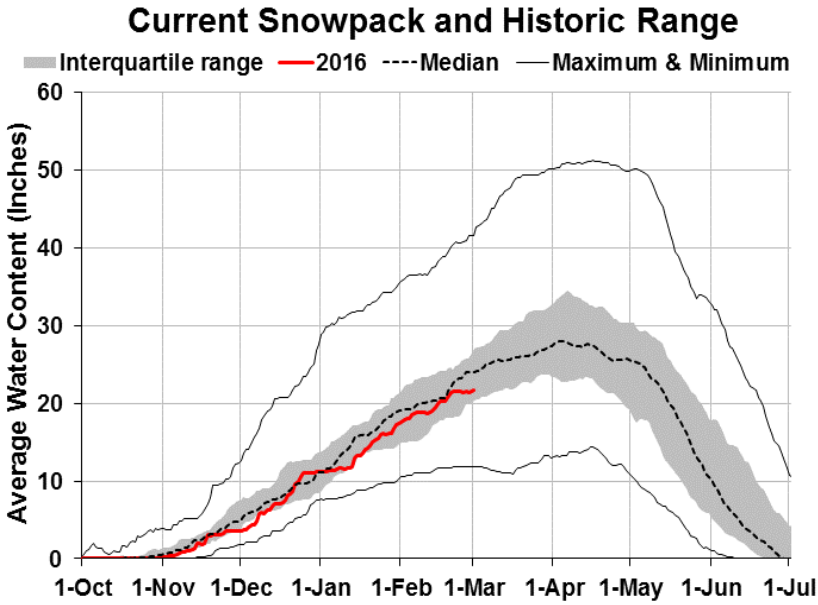
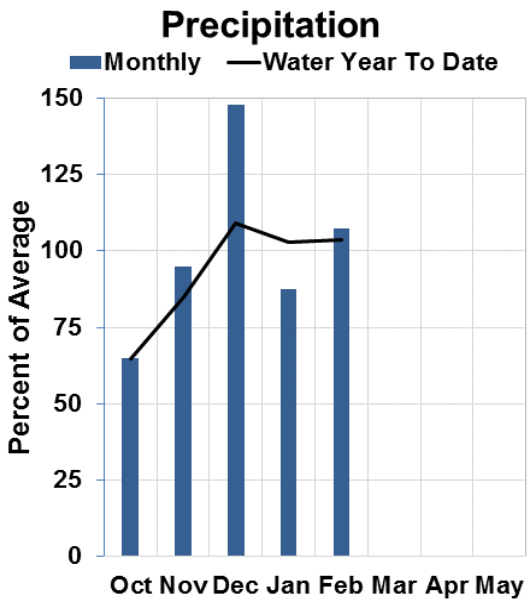
150
200
Miles
This map is prepared by the USDA-NRCS Idaho Snow Survey Office.
http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/
USDA

Panhandle Region

March 1, 2016





WATER SUPPLY OUTLOOK

Following a below average January, February came in strong across the Panhandle region with many basins reporting well above average precipitation. Monthly precipitation totals for February ranged from a high of 133% of average in the Moyie to a low of 86% in Rathdrum Creek. Larger basins, including the St. Joe (111%), Kootenai (121%), and the Spokane (109%) all reported above average monthly precipitaion. The bountiful February precipitation bumped up water year to date totals, which range from a high of 125% in the Moyie, to a low of 94% in the Coeur d' Alene basin. Snowfall throughout the month of February was lower than usual and left most basins slightly below their median March 1st snowpack. The Moyie leads the way with 104% of median snowpack, followed by the Priest River (98%) and the Kootenai (92%). On the low end, the Coeur d' Alene and the Palouse rivers came in at 79% and 80% respectively. Five of the six Panhandle reservoirs have above average storage for the end of February, ranging from 103% to 129%. Lake Pend Oreille has been drawn down for bank erosion work, and levels are at 43% of total capacity, which equates to 84% of normal.

Projected streamflow volumes across the Panhandle region remain similar to, or slightly below the February 1st forecast volumes, reflecting the slightly below normal snow accumulation coupled with solid precipitation numbers. Overall forecast numbers are near average, with most basins projected to have greater than 90% of typical April to July streamflow volumes. In the southern portions of the Panhandle region the NF Coeur d' Alene River is projected to have 74% of average volumes, while the Spokane River is forecasted at 84% of average at Post Falls and 87% at Long Lake.

Panhandle Region Streamflow Forecasts - March 1, 2016

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Moyie R at Eastport	APR-JUL	305	350	385	103%	420	465	375
	APR-SEP	310	360	395	103%	430	480	385
Kootenai R at Leonia [1 & 2]	APR-JUL	5290	6030	6370	97%	6710	7450	6600
	APR-SEP	6260	6990	7330	97%	7660	8390	7590
Boundary Ck nr Porthill	APR-JUL	104	116	125	107%	134	146	117
	APR-SEP	110	123	132	107%	141	154	123
Clark Fork R at Whitehorse Rapids [1 & 2]	APR-JUL	7180	8840	9600	91%	10400	12000	10500
	APR-SEP	7890	9720	10500	91%	11400	13200	11500
Pend Oreille Lake Inflow [2]	APR-JUL	8730	9950	10800	92%	11600	12800	11800
	APR-SEP	9460	10800	11700	91%	12600	13900	12800
Priest R nr Priest River [2]	APR-JUL	665	750	805	103%	865	950	780
	APR-SEP	705	795	855	103%	920	1010	830
NF Coeur dAlene R at Enaville	APR-JUL	285	425	520	74%	615	755	700
	APR-SEP	315	455	550	74%	645	785	740
St. Joe R at Calder [2]	APR-JUL	740	875	965	92%	1060	1190	1050
	APR-SEP	800	935	1030	92%	1120	1260	1120
Spokane R nr Post Falls [2]	APR-JUL	1310	1720	2010	84%	2290	2700	2390
	APR-SEP	1370	1790	2070	83%	2360	2780	2480
Spokane R at Long Lake	APR-JUL	1510	1960	2270	87%	2580	3030	2620
	APR-SEP	1680	2140	2450	86%	2770	3230	2850

Normals based on 1981-2010 reference period: streamflow, precipitation, & reservoir normals are averages, SWE normals are medians.

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

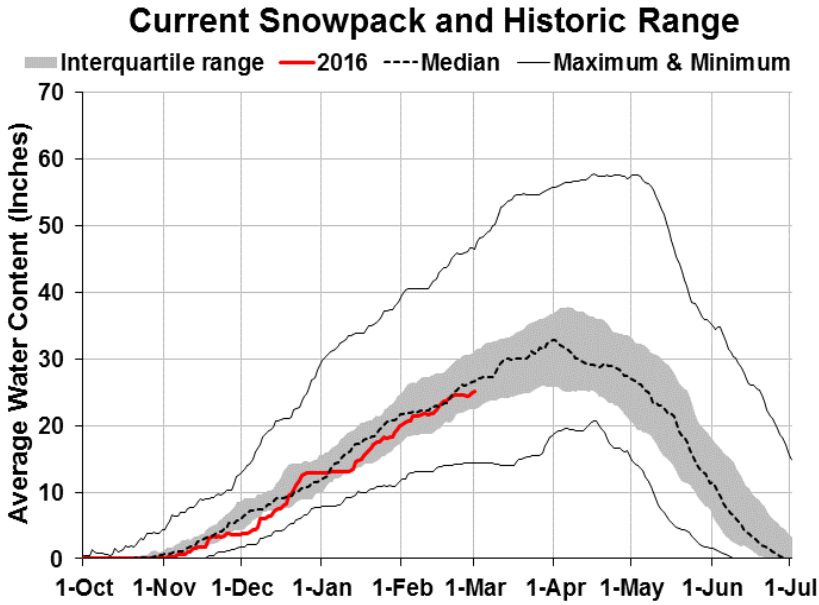
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

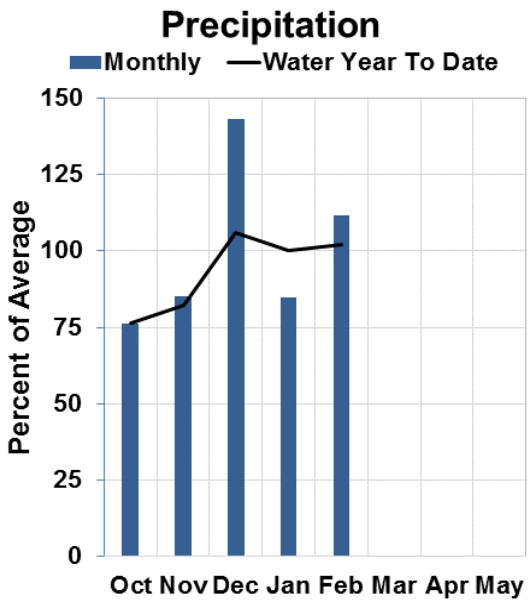
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last Yr (KAF)	Average (KAF)	Capacity (KAF)
Hungry Horse Lake	2498.6	2888.3	2209.0	3451.0
Flathead Lake	835.3	861.8	812.8	1791.0
Noxon Rapids Reservoir	323.3	319.7	313.9	335.0
Lake Pend Oreille	665.3	610.0	792.6	1561.3
Priest Lake	64.1	78.9	57.1	119.3
Lake Coeur d' Alene	171.4	144.1	132.8	238.5

Watershed Snowpack Analysis: March 1, 2016			
Basin Name	# of Sites	% of Median 2016	2015
Moyie River	7	104%	75%
Priest River	5	98%	52%
Rathdrum Creek	3	91%	25%
Coeur d' Alene River	9	79%	44%
St. Joe River	5	90%	60%
Spokane River	16	84%	46%
Palouse River	2	80%	23%
Kootenai ab Bonners Ferry	24	92%	66%

Clearwater River Basin

March 1, 2016





WATER SUPPLY OUTLOOK

After a relatively dry January, precipitation across the Clearwater basin picked up again in February, with the basin as a whole receiving 117% of average. Individual basins ranged from 144% (Lochsa) to 110% (NF Clearwater). The water year to date precipitation totals are right on target with the Clearwater as a whole at 102%, while the NF Clearwater (100%), Selway (102%), and Lochsa (108%) are at or above average. February snowfall across north central Idaho was average, meaning that as a precentage of the median most basins showed very little change from the February 1st report. The Clearwater as a whole has 94% of median snowpack. While individual sites show some variability, the basins are very consistent ranging from a low of 87% of median in the Lochsa to a high of 96% in the NF of the Clearwater. Dworshak Reservoir is at 77% of capacity which is 113% of average for this time of year.

Forecasted steamflow volumes in the Clearwater basin as a whole remain nearly identical to the February 1st values, with all basins projected to have average or above average volumes for both the April to July and April to September forecast periods. The Clearwater River basin as a whole is forecast to have about 95% of average volumes.

The NOAA Apr-May-Jun outlook is for average precipitation and a slightly elevated chance of above average temperatures, meaning that the potential to finish the snow season right on target is very real.

Clearwater River Basin Streamflow Forecasts - March 1, 2016

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Selway R nr Lowell	APR-JUL	1460	1670	1820	95%	1970	2180	1920
	APR-SEP	1540	1770	1920	95%	2070	2300	2020
Lochsa R nr Lowell	APR-JUL	1070	1240	1350	96%	1460	1630	1410
	APR-SEP	1160	1330	1440	97%	1550	1720	1480
Dworshak Reservoir Inflow [2]	APR-JUL	1720	2060	2290	95%	2520	2860	2410
	APR-SEP	1860	2200	2440	95%	2680	3020	2570
Clearwater R at Orofino	APR-JUL	3120	3690	4080	95%	4470	5050	4310
	APR-SEP	3320	3920	4320	95%	4730	5330	4540
Clearwater R at Spalding [2]	APR-JUL	4990	5910	6540	95%	7180	8100	6890
	APR-SEP	5310	6280	6930	95%	7580	8550	7270

Normals based on 1981-2010 reference period: streamflow, precipitation, & reservoir normals are averages, SWE normals are medians.

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

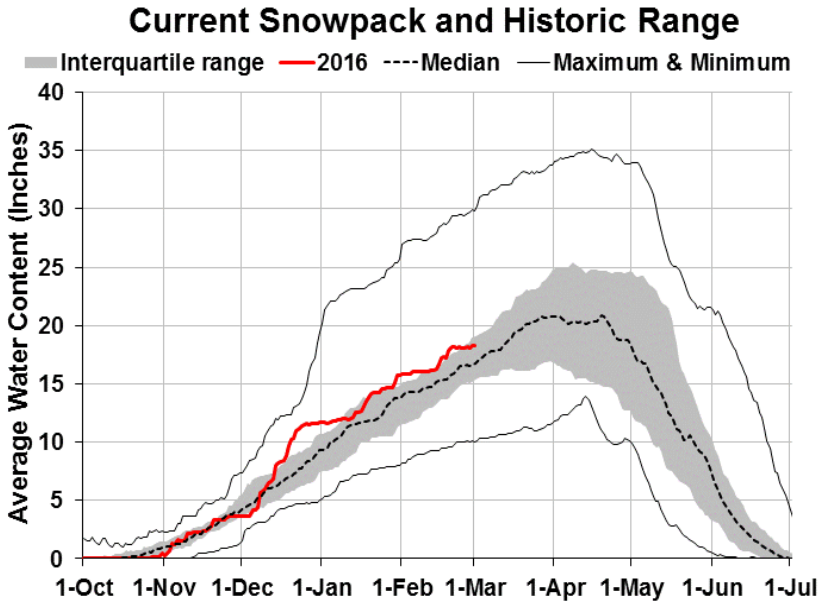
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

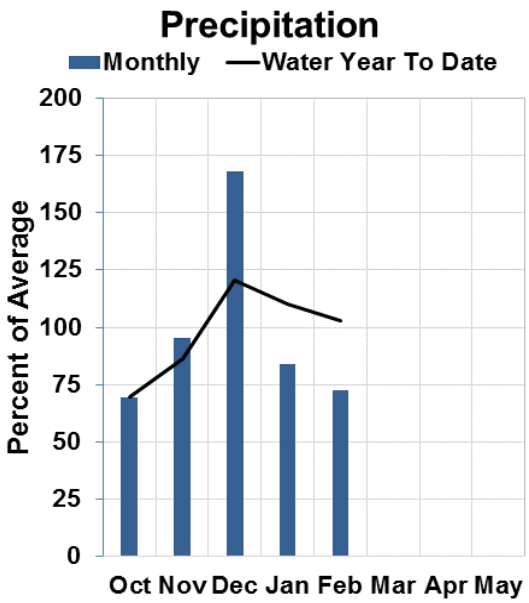
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last Yr (KAF)	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	2670.9	2880.4	2358.0	3468.0

Watershed Snowpack Analysis: March 1, 2016			
Basin Name	# of Sites	% of Median 2016	2015
NF Clearwater River	9	96%	71%
Lochsa River	3	87%	78%
Selway River	4	95%	103%
Clearwater Basin Total	18	94%	73%

Salmon River Basin

March 1, 2016





WATER SUPPLY OUTLOOK

The disappointing precipitation numbers from January persisted into February with the Salmon basin as a whole receiving just 75% of average preciptation for the month. Monthly precipitation in indivual basins ranged from a high of 88% in the Little Salmon to a low of 55% in the SF of the Salmon. Water year to date totals have been buffered to some extent by a very wet December, and are at 104% of average for the basin as a whole, with smaller basins ranging from a low of 93% (SF of the Salmon) to a high of 113% in the Little Salmon. Snow accumlation throughout the month of February was about normal, and as of March 1st all measured sub-basins are at or above their median snowpack values, while the Salmon basin as whole is at 108% of median snowpack. Individual basins range from a low of 100% in the SF of the Salmon, to 112% and 115% in the Lemhi and Little Salmon respectively.

Forecasted streamflow volumes reflect the strong snowpack and are above 90% of average for all forecast points and periods. The Salmon River at Salmon is projected to have 96% of average volumes, while further down stream at Whitebird the April to July forecast creeps up to 97%. Those individuals lucky enough to have drawn river permits for the Middle Fork of the Salmon are looking at total seasonal volumes projected at 101% of normal.

Future conditions are always uncertain, but the NOAA May-Jun-Jul seasonal outlook shows an elevated chance of above average temperatures and an uncertain precipitation outlook, meaning we should be on the cusp of a great boating season on the Salmon. In the shorterm (March 3-10) much of western and central Idaho is projected by NOAA to receive substantial water input which has the potential to improve the existing snowpack if temperatures remain low enough to generate snow rather than rain.

Salmon River Streamflow Forecasts - March 1, 2016

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Salmon R at Salmon	APR-JUL	535	660	745	96%	830	955	775
	APR-SEP	615	765	865	96%	965	1110	900
Lemhi R nr Lemhi	APR-JUL	37	54	67	91%	82	107	74
	APR-SEP	47	67	82	91%	99	127	90
MF Salmon R at MF Lodge	APR-JUL	450	595	695	101%	795	940	690
	APR-SEP	510	670	780	101%	890	1050	770
Sf Salmon R nr Krassel Ranger Station	APR-JUL	169	215	245	91%	275	320	270
	APR-SEP	197	240	270	93%	300	345	290
Johnson Ck at Yellow Pine Id	APR-JUL	124	153	173	91%	192	220	191
	APR-SEP	137	166	186	91%	205	235	205
Salmon R at White Bird	APR-JUL	3880	4670	5210	97%	5750	6540	5370
	APR-SEP	4220	5100	5700	96%	6300	7180	5940

Normals based on 1981-2010 reference period: streamflow, precipitation, & reservoir normals are averages, SWE normals are medians.

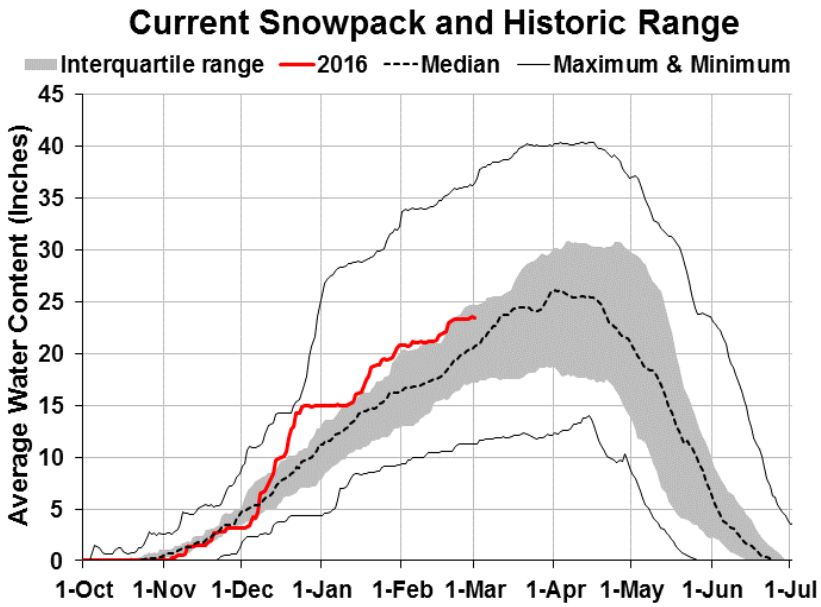
1) 90% and 10% exceedance probabilities are actually 95% and 5%

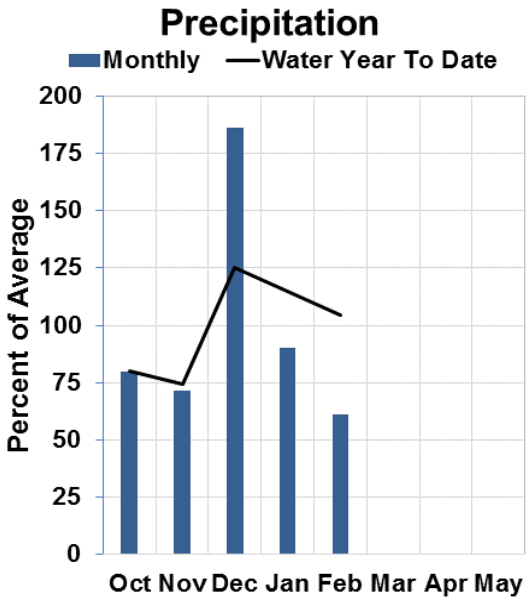
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis: March 1, 2016 Basin Name	# of Sites	% of Median 2016	2015
Salmon River ab Salmon	9	109%	99%
Lemhi River	9	112%	104%
MF Salmon River	3	104%	82%
SF Salmon River	3	100%	77%
Little Salmon River	4	115%	65%
Salmon Basin Total	28	108%	92%

West Central basins

March 1, 2016





WATER SUPPLY OUTLOOK

The West Central basins were drier than average during February, only receiving about 65% of the average February precipitation totals. The Boise River basin received 57% of average precipitation during February while the Payette River and Weiser River basins were a little better off, at 70% and 66% of average. Even with back-to-back months of subpar precipitation, water year to date precipitation is above average in the West Central basins. As the precipitation graph above illustrates, the impressively wet month of December is the reason why water year to date is still above 100% of average. Likewise, the mountains of the West Central basins picked up less snow than normal during February but the early season snowfall provided a healthy and above normal base. March 1st snow measurements reveal the snowpack is about 105% of normal. This is stark contrast from March 1st, 2015, when the snowpack was about 70% of normal in the Boise and Payette basins and only 45% of normal in the Weiser River basin.

So far, reservoir storage in the West Central basins is right on schedule with all reservoirs between 80-120% of average for the end of February. With normal snow water amounts in the mountains and a return to wet weather, these reservoirs should fill. All river forecast points in these basins for the spring and summer runoff period are about 90-110% of average, reflecting the near normal snowpack numbers. Irrigation supplies are anticipated to be adequate this year, while water recreation enthusiasts should enjoy a mostly normal runoff season.

West Central Basins Streamflow Forecasts - March 1, 2016

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
SF Boise R at Anderson Ranch Dam [2]	MAR-JUL	345	420	475	91%	530	605	520
	APR-JUL	300	380	430	91%	480	560	475
	APR-SEP	325	405	460	90%	515	595	510
Boise R nr Twin Springs	MAR-JUL	535	615	670	103%	725	805	650
	APR-JUL	475	555	610	104%	665	745	585
	APR-SEP	515	600	660	104%	720	805	635
Mores Ck nr Arrowrock Dam	MAR-JUL	100	130	153	104%	177	215	147
	APR-JUL	73	100	120	104%	142	178	115
	APR-SEP	76	103	124	104%	147	184	119
Boise R nr Boise [2]	MAR-JUL	1120	1300	1420	99%	1540	1720	1430
	APR-JUN	890	1020	1100	96%	1190	1320	1140
	APR-JUL	920	1110	1240	98%	1370	1560	1260
	APR-SEP	1020	1210	1340	99%	1470	1660	1360
Lake Fork Payette R nr McCall	APR-JUL	65	76	83	104%	91	104	80
	APR-SEP	67	78	86	104%	95	108	83
NF Payette R at Cascade [2]	APR-JUL	350	435	490	101%	545	630	485
	APR-SEP	370	450	505	102%	560	640	495
NF Payette R nr Banks [2]	APR-JUL	480	575	640	102%	700	795	625
	APR-SEP	485	585	650	102%	720	820	640
SF Payette R at Lowman	APR-JUL	325	380	415	104%	455	510	400
	APR-SEP	370	430	470	103%	510	575	455
Deadwood Reservoir Inflow [2]	APR-JUL	95	113	125	102%	137	155	123
	APR-SEP	101	121	134	102%	147	166	131
Payette R nr Horseshoe Bend [2]	APR-JUL	1250	1440	1570	106%	1690	1880	1480
	APR-SEP	1290	1510	1660	102%	1810	2040	1630
Weiser R nr Weiser	MAR-JUL	375	500	595	112%	700	865	530
	APR-JUL	245	335	410	111%	485	615	370
	APR-SEP	270	365	440	110%	520	650	400

Normals based on 1981-2010 reference period: streamflow, precipitation, & reservoir normals are averages, SWE normals are medians.

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

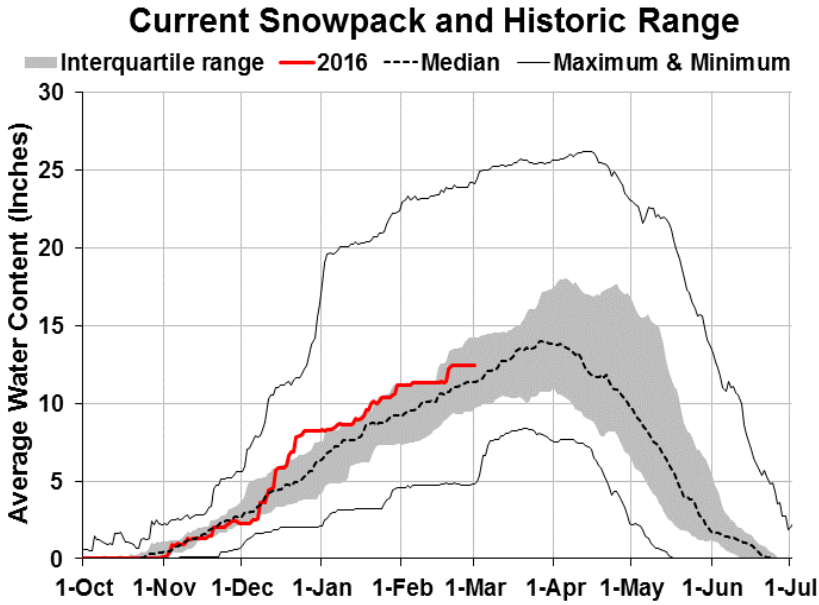
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

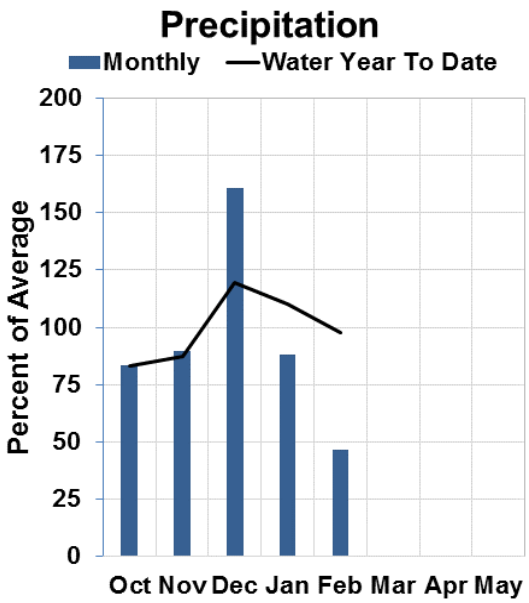
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last Yr (KAF)	Average (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	234.9	294.9	247.0	450.2
Arrowrock Reservoir	224.6	249.7	185.9	272.2
Lucky Peak Reservoir	122.9	237.6	120.5	293.2
Sub-Basin Total	**582.3**	**782.2**	**553.4**	**1015.6**
Deadwood Reservoir	73.3	123.1	88.9	161.9
Cascade Reservoir	413.8	517.4	457.6	693.2
Sub-Basin Total	**487.1**	**640.4**	**546.5**	**855.1**
Lake Lowell	103.5	90.7	97.7	165.2
Mann Creek Reservoir	4.6	7.5	5.2	11.1

Watershed Snowpack Analysis: March 1, 2016			
Basin Name	# of Sites	% of Median 2016	2015
SF Boise River	7	105%	76%
MF & NF Boise Rivers	6	105%	79%
Mores Creek	4	104%	65%
Canyon Creek	1	110%	32%
Boise Basin Total	16	103%	69%
NF Payette River	9	106%	66%
SF Payette River	5	105%	72%
Payette Basin Total	16	105%	67%
Mann Creek	1	117%	52%
Weiser Basin Total	8	103%	45%

Wood & Lost River Basin

March 1, 2016





WATER SUPPLY OUTLOOK

The Wood and Lost River basins received below average precipitation for the second consecutive month. February precipitation was slightly less than half of average as a whole, with precipitation numbers decreasing from east to west. The Big Lost River basin received 53% of average monthly precipitation, while the Big Wood River basin received 44%. Water year to date precipitation is now slightly below average. Despite the below average precipitation to start 2016, snowpack numbers in these basins are still hovering close to normal for March 1st. Camas-Beaver Creek, Big Lost River, Fish Creek, and the Little Wood River drainages are between 85-90% of normal snowpack. The Big Wood River basin is reporting 105% of normal snowpack as of March 1st.

Reservoir storage in the Wood and Lost River basins is mixed, with Mackay Reservoir leading the way at 70% of capacity (107% of average), while Little Wood and Magic Reservoirs are at 47% and 19% of capacity, respectively. As a result of below normal precipitation during February, streamflow forecasts have decreased since February 1st. The April-July streamflow forecast for the Big Wood River above Magic Reservoir is 152 KAF (89% of average), and the Little Wood above High Five Creek is forecast at 61 KAF (also 88% of average). The same forecast period for the Big Lost River at Howell Ranch yields nearly the same result (90% of average), which is 148 KAF. As it stands, irrigation supplies look to be marginally adequate, with potential shortages looming if the current trend of less than normal precipitation continues.

Wood and Lost Basins Streamflow Forecasts - March 1, 2016

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Camas Ck at Camas	APR-JUL	2.9	14.7	23	82%	31	42	28
Little Lost R nr Howe	APR-JUL	15.1	22	26	93%	30	37	28
	APR-SEP	17.6	26	32	94%	38	46	34
Big Lost R at Howell Ranch	APR-JUL	79	117	143	90%	169	205	159
	APR-SEP	89	132	162	90%	192	235	180
Big Lost R bl Mackay Reservoir	APR-JUL	42	80	107	87%	133	171	123
	APR-SEP	58	102	132	88%	162	205	150
Little Wood R ab High Five Ck	MAR-JUL	26	51	68	88%	85	110	77
	MAR-SEP	27	54	72	88%	90	117	82
	APR-JUL	19.1	44	61	88%	78	103	69
	APR-SEP	21	48	66	88%	84	111	75
Little Wood R nr Carey [2]	MAR-JUL	27	55	74	86%	92	120	86
	MAR-SEP	28	57	77	84%	97	127	92
	APR-JUL	19	46	65	84%	84	111	77
	APR-SEP	21	50	70	84%	89	118	83
Big Wood R at Hailey	APR-JUL	132	184	220	94%	255	310	235
	APR-SEP	152	210	250	94%	290	350	265
Big Wood R ab Magic Reservoir	APR-JUL	56	113	152	89%	191	250	170
	APR-SEP	64	125	167	92%	210	270	182
Camas Ck nr Blaine	APR-JUL	25	48	68	83%	91	130	82
	APR-SEP	26	48	68	82%	91	131	83
Big Wood R bl Magic Dam [2]	APR-JUL	79	165	225	90%	280	365	250
	APR-SEP	91	181	240	91%	305	395	265

Normals based on 1981-2010 reference period: streamflow, precipitation, & reservoir normals are averages, SWE normals are medians.

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

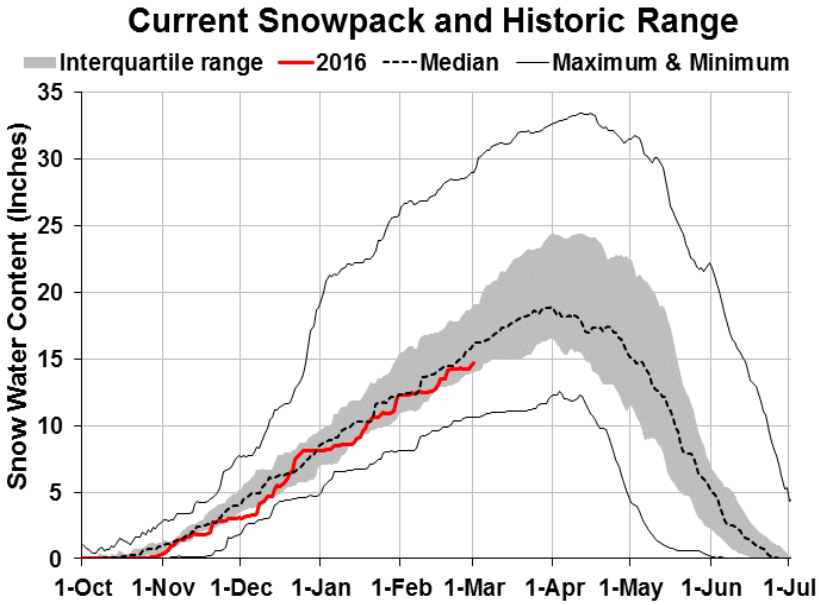
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

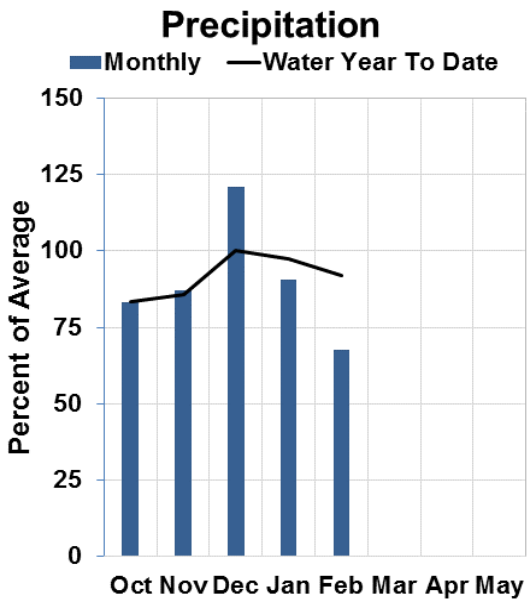
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last Yr (KAF)	Average (KAF)	Capacity (KAF)
Mackay Reservoir	31.3	31.8	29.3	44.4
Little Wood Reservoir	14.1	17.0	17.4	30.0
Magic Reservoir	35.8	60.9	72.5	191.5

Watershed Snowpack Analysis: March 1, 2016			
Basin Name	# of Sites	% of Median 2016	2015
Camas-Beaver Creeks	4	90%	56%
Birch-Medicine Lodge Creeks	4	107%	84%
Little Lost River	4	97%	95%
Big Lost River ab Mackay	6	90%	82%
Big Lost Basin Total	7	89%	82%
Fish Creek	3	85%	57%
Little Wood River	4	89%	65%
Big Wood River ab Hailey	7	103%	93%
Camas Creek	4	109%	53%
Big Wood Basin Total	11	105%	80%

Upper Snake River Basin

March 1, 2016





WATER SUPPLY OUTLOOK

February monthly percipitation continued the January trend with below normal input to the Snake River above American Falls (70% of average monthly precipitation). The variability in the smaller basins that comprise the Upper Snake was considerable, with monthly precipitation ranging from 49% in the Henrys Fork-Falls River, to 106% in the Buffalo Fork and Greys River drainages. Water year to date precipitation shows substantially less variability ranging from a low of 86% of average in the Hoback River drainage to a high of 100% in the Buffalo Fork. Most basins have between 90-95% of average precipitation for this time of the year. Although the total amount of snow water equivilant (SWE) increased during the month of February, many basins in the Upper Snake are showing double digits reductions in their percentage of median snowpack, which is the result of below average snow accumulation. Snowpack precentages range from a low of 88% in the Teton River drainage to a high of 102% in the Greys River, while looking at the Snake River above American Falls shows that the basin as a whole is at roughly 93% of median snowpack. End of February reservoir storage shows that the Upper Snake as a whole is at 65% of capacity, which is right on target at 97% of average storage for this point in the year.

Forecasted streamflow volumes have been reduced from their February 1st values reflecting the below normal snow accumulation and precipitation numbers for February. On the lower end of the forecasts is the Snake River at Neeley which is projected to have 75% of average volumes, while the Henry's Fork, Salt River, Pacific Creek, and the Teton River all have forecasts in the 80-85% range. Moving further down in the system the Snake River at Irwin and at Heise is forecasted at 87% of average April to July and April to September flows. Based on current reservoir storage and forecasts, water supply demands in the coming season will likely be satisfied. With the NOAA May-Jun-Jul seasonal outlook showing a slightly elevated chance of above average temperature and precipitation, the potential to wrap up the winter on a positive note definitely exists!

Upper Snake River Basin Streamflow Forecasts - March 1, 2016

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton [2]	APR-JUL	320	400	455	86%	510	590	530
	APR-SEP	460	555	620	87%	690	785	710
Falls R nr Ashton [2]	APR-JUL	250	295	330	90%	360	405	365
	APR-SEP	300	355	390	90%	430	485	435
Teton R nr Driggs	APR-JUL	75	105	125	81%	146	176	154
	APR-SEP	95	133	158	82%	184	220	193
Teton R nr St Anthony	APR-JUL	195	265	310	85%	355	420	365
	APR-SEP	240	315	370	85%	425	500	435
Henrys Fk nr Rexburg [2]	APR-JUL	845	1050	1200	86%	1340	1550	1400
	APR-SEP	1070	1340	1530	85%	1710	1980	1790
Snake R at Flagg Ranch	APR-JUL	315	375	420	90%	465	530	465
	APR-SEP	345	415	460	90%	510	580	510
Snake R nr Moran [2]	APR-JUL	520	615	680	89%	745	835	765
	APR-SEP	570	675	750	89%	820	930	845
Pacific Ck at Moran	APR-JUL	93	121	140	85%	159	187	164
	APR-SEP	100	129	148	86%	168	197	173
Buffalo Fk ab Lava Ck nr Moran	APR-JUL	189	230	255	91%	285	320	280
	APR-SEP	210	255	290	91%	320	370	320
Snake R ab Reservoir nr Alpine [2]	APR-JUL	1420	1680	1850	85%	2020	2270	2170
	APR-SEP	1630	1930	2130	85%	2330	2630	2500
Greys R ab Reservoir nr Alpine	APR-JUL	215	250	280	92%	305	345	305
	APR-SEP	250	295	325	90%	360	405	360
Salt R ab Reservoir nr Etna	APR-JUL	134	200	245	82%	290	355	300
	APR-SEP	177	255	305	82%	355	435	370
Snake R nr Irwin [2]	APR-JUL	1960	2350	2610	87%	2880	3260	3010
	APR-SEP	2280	2730	3040	87%	3350	3800	3500
Snake R nr Heise [2]	APR-JUL	2120	2530	2810	87%	3090	3500	3240
	APR-SEP	2480	2960	3300	87%	3630	4120	3780
Willow Ck nr Ririe [2]	MAR-JUL	21	36	48	72%	62	87	67
Portneuf R at Topaz	MAR-JUL	43	58	69	91%	79	95	76
	MAR-SEP	52	71	84	90%	98	117	93
Snake R at Neeley [2]	APR-JUL	745	1480	1990	75%	2490	3230	2650
	APR-SEP	650	1470	2030	72%	2590	3410	2810

Normals based on 1981-2010 reference period: streamflow, precipitation, & reservoir normals are averages, SWE normals are medians.

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

Reservoir Storage (KAF): End of February

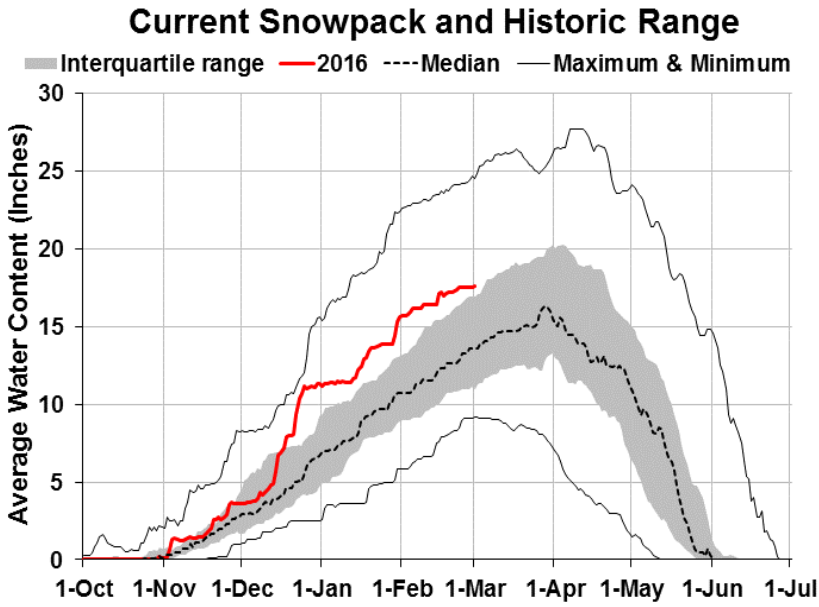
Reservoir Name	Current (KAF)	Last Yr (KAF)	Average (KAF)	Capacity (KAF)
Jackson Lake	564.7	646.2	434.7	847.0
Palisades Reservoir	874.5	1183.6	925.7	1400.0
Sub-Basin Total	**1439.2**	**1829.9**	**1360.4**	**2247.0**
Henrys Lake	78.1	88.7	80.6	90.4
Island Park Reservoir	107.8	116.2	104.7	135.2
Grassy Lake	13.3	12.9	12.1	15.2
Sub-Basin Total	**199.1**	**217.8**	**197.4**	**240.8**
Ririe Reservoir	48.0	48.5	41.2	80.5
Blackfoot Reservoir	179.6	167.4	181.3	337.0
American Falls Reservoir	1126.1	1337.9	1296.0	1672.6
Basin-Wide Total	**2992.1**	**3601.5**	**3076.3**	**4577.9**

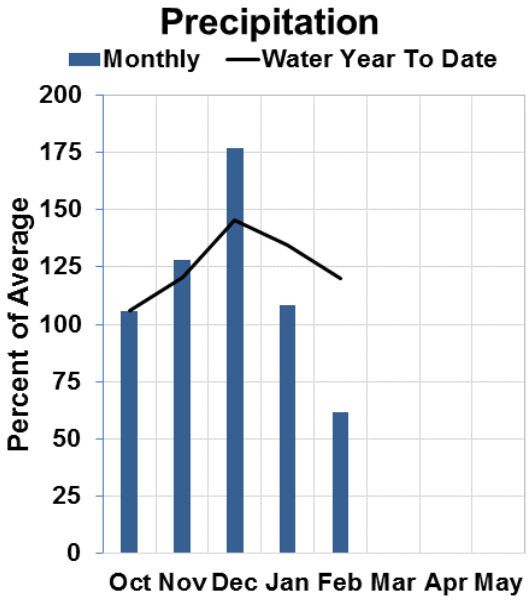
Watershed Snowpack Analysis: March 1, 2016

Basin Name	# of Sites	% of Median 2016	% of Median 2015
Henrys Fork-Falls River	10	89%	81%
Teton River	9	88%	93%
Henrys Fork ab Rexburg	19	89%	86%
Snake River ab Jackson Lake	12	92%	90%
Pacific Creek	4	98%	103%
Buffalo Fork	3	103%	123%
Gros Ventre River	4	92%	113%
Hoback River	6	95%	114%
Greys River	4	102%	110%
Salt River	5	95%	96%
Snake ab Palisades Resv	33	94%	100%
Willow Creek - Ririe	7	97%	65%
Blackfoot River	5	90%	83%
Portneuf River	6	95%	65%
Snake River ab American Falls	53	93%	90%

Southside Snake River Basins

March 1, 2016





WATER SUPPLY OUTLOOK

Precipitation across the Southside Snake River basins was on the light side during February, and only about 60% of average as a whole. The western most basins received the least precipitation relative to average during February, with the Owyhee River basin only receiving about 50%. Water year to date precipitation is still well above average, at about 120%, largely resulting from an incredibly wet December. The early winter weather pattern that brought ample moisture to the Southside Snake River basins changed during February, but it appears a wet pattern is set to return in early March and possibly persist for the first-half of March. The dry and warm month of February resulted in some snowmelt, especially below 6,000 ft. As the red line in the snowpack graph above depicts, the Southside Snake River basin snowpack is still above normal.

Excluding Brownlee Reservoir, the remaining reservoirs documented in the Southside Snake River basins are 14-30% full, so there's plenty of room to capture the upcoming snowmelt. Forecasts for major points in the Southside Snake River basin have dropped in recent months, but still favor an above normal runoff season. Additionally, soil moisture has been above normal since last fall (Bruneau River, Jarbidge River, Owyhee River, Salmon Falls Creek), which enhances the likelihood of a good runoff season. Oakley Reservoir inflow, Salmon Falls creek near San Jacinto, and the Owyhee River near Rome are all forecast to be about 115-125% of average during March-September. Additionally, it still looks good for a spring rafting season on the Bruneau River with flows forecast at 122% of average during March-July.

Southside Snake River Basins Streamflow Forecasts - March 1, 2016

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Goose Ck abv Trapper Ck nr Oakley	MAR-JUL	16.5	23	28	127%	34	43	22
	MAR-SEP	17.7	25	30	125%	36	46	24
Trapper Ck nr Oakley	MAR-JUL	5.6	6.5	7.1	120%	7.8	8.8	5.9
	MAR-SEP	6.7	7.7	8.4	118%	9.1	10.2	7.1
Oakley Reservoir Inflow	MAR-JUL	22	29	35	125%	41	51	28
	MAR-SEP	24	32	38	123%	45	56	31
Salmon Falls Ck nr San Jacinto	MAR-JUL	68	87	101	125%	116	141	81
	MAR-SEP	71	90	105	124%	121	146	85
Bruneau R nr Hot Spring	MAR-JUL	167	215	250	122%	285	335	205
	MAR-SEP	174	225	260	121%	295	345	215
Reynolds Ck at Tollgate	MAR-JUL	4	6.4	8	91%	9.6	12	8.8
Owyhee R nr Gold Ck [2]	MAR-JUL	23	32	39	139%	47	60	28
	MAR-SEP	23	30	36	133%	43	54	27
	APR-JUL	12.8	22	31	141%	42	62	22
Owyhee R nr Rome	MAR-JUL	390	520	610	118%	700	830	515
	MAR-SEP	405	540	630	119%	720	850	530
	APR-SEP	205	330	415	114%	500	625	365
Owyhee R bl Owyhee Dam [2]	MAR-JUL	405	540	645	116%	755	935	555
	MAR-SEP	440	575	675	115%	785	960	585
	APR-SEP	250	360	445	110%	540	700	405

Normals based on 1981-2010 reference period: streamflow, precipitation, & reservoir normals are averages, SWE normals are medians.

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

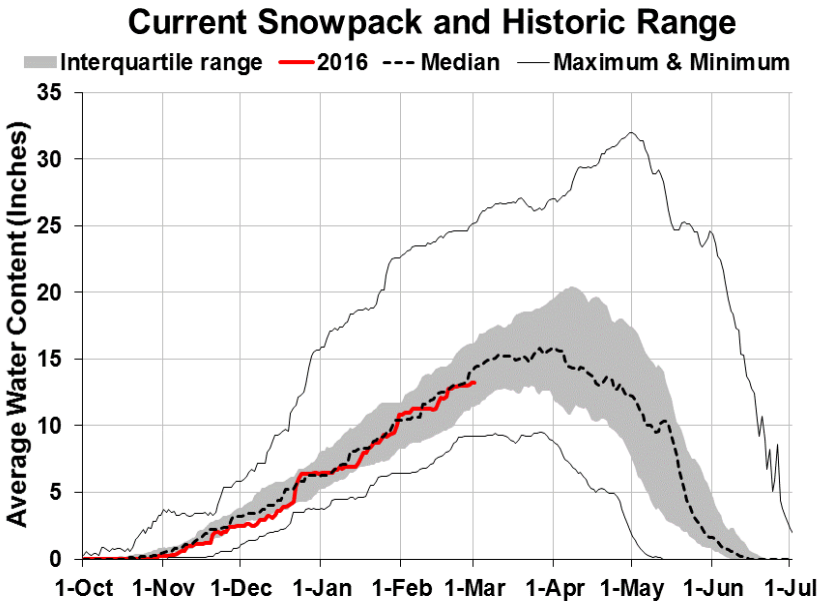
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

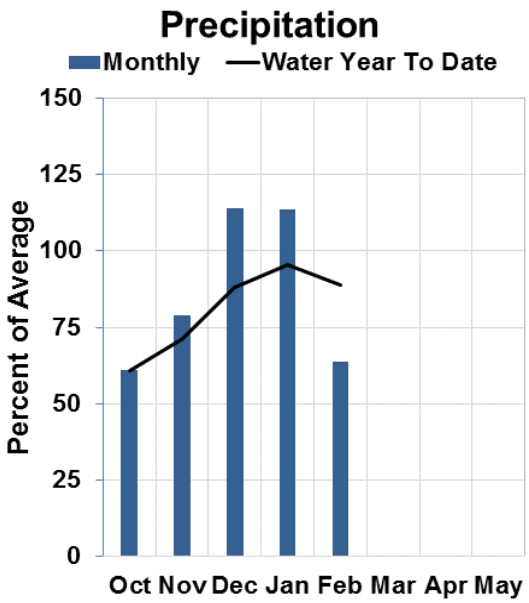
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last Yr (KAF)	Average (KAF)	Capacity (KAF)
Oakley Reservoir	18.9	20.0	25.3	75.6
Salmon Falls Reservoir	26.3	28.2	47.1	182.6
Wild Horse Reservoir	12.9	13.5	34.5	71.5
Lake Owyhee	217.7	168.7	392.6	715.0
Brownlee Reservoir	1058.2	1549.3	1129.0	1420.0

Watershed Snowpack Analysis: March 1, 2016			
Basin Name	# of Sites	% of Median 2016	2015
Raft River	6	106%	87%
Goose-Trapper Creeks	6	113%	89%
Salmon Falls Creek	8	127%	74%
Bruneau River	8	123%	58%
Reynolds Creek	7	102%	61%
Owyhee Basin Total	20	98%	22%
Owyhee Basin Snotel Total	8	108%	39%

Bear River Basin

March 1, 2016





WATER SUPPLY OUTLOOK

After back-to-back months of above average precipitation in December and January, the Bear River basin received about 70% of average precipitation during February. Smiths-Thomas forks, which are the farthest east drainages, were the best off at about 86% of average monthly precipitation. The Malad River basin, represented by only one SNOTEL site, was the worst off at 36% of average precipitation during February. In better news, water year to date precipitation numbers are closer to average through the first 5 months, at about 90%. Similar to the water year precipitation numbers, the snowpack has been tracking very close to normal (median) during the 2016 water year. This is displayed by the red line (2016 water year) tracking very closely to the black-dashed line (median) in the snowpack graph above. The best snowpack in the Bear River basin is the Bear River above WY-ID line, which is 95% of median, while the Mink Creek drainage is the worst off at 82% of median.

Bear Lake is currently storing 38% of capacity and 83% of average for the end of February, while Montpelier Reservoir is storing 65% of capacity and 147% of average. Streamflow forecasts for the Bear River basin have decreased by 10-15 percentage points since last month, with respect to average observed flow. Forecasts now range from about 75-90% of average for April-July, with the usual exception being the Bear River below Stewart Dam, which is only forecast at 60% of average during the same time frame. Based on current storage and streamflow forecast volumes, irrigation supplies in the Bear River basin will likely be adequate for 2016.

Bear River Basin Streamflow Forecasts - March 1, 2016

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bear R nr UT-WY State Line	APR-JUL	59	78	91	81%	104	123	112
	APR-SEP	65	86	101	82%	116	138	123
Bear R ab Resv nr Woodruff	APR-JUL	44	72	91	75%	110	138	121
	APR-SEP	44	72	92	72%	112	140	128
Big Ck nr Randolph	APR-JUL	1.25	2.4	3.2	84%	4	5.2	3.8
Smiths Fk nr Border	APR-JUL	43	60	71	80%	82	98	89
	APR-SEP	53	72	84	81%	97	115	104
Bear R bl Stewart Dam [2]	MAR-JUL	6.1	80	130	63%	181	255	205
	MAR-SEP	3.9	88	145	63%	200	285	230
	APR-JUL	7.3	63	110	60%	157	225	183
	APR-SEP	6.2	71	125	61%	179	260	205
Little Bear at Paradise	APR-JUL	9.9	23	32	78%	40	53	41
Logan R nr Logan	APR-JUL	58	77	89	80%	102	121	111
Blacksmith Fk nr Hyrum	APR-JUL	14.9	29	39	91%	49	63	43

Normals based on 1981-2010 reference period: streamflow, precipitation, & reservoir normals are averages, SWE normals are medians.

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

Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last Yr (KAF)	Average (KAF)	Capacity (KAF)
Bear Lake	491.7	571.1	594.1	1302.0
Montpelier Reservoir	2.6	2.5	1.8	4.0

Watershed Snowpack Analysis: March 1, 2016			
Basin Name	# of Sites	% of Median 2016	2015
Smiths-Thomas Forks	4	93%	102%
Bear River ab WY-ID Line	11	95%	80%
Montpelier Creek	2	85%	86%
Mink Creek	4	82%	69%
Cub River	3	92%	75%
Bear River ab ID-UT Line	25	90%	78%
Malad River	1	86%	39%

Streamflow Adjustment List for All Forecasts Published in Idaho Water Supply Outlook Report: Streamflow forecasts are projections of runoff volumes that would occur without influences from upstream reservoirs or diversions. These values are referred to as natural, unregulated or adjusted flows. To make these adjustments, changes in reservoir storage, diversions, and inter-basin transfers are added or subtracted from the observed (actual) streamflow volumes. The following list documents the adjustments made for each forecast point. **(Revised Feb. 2015).**

Panhandle Region

Kootenai R at Leonia, MT (2)
+ Lake Koocanusa storage change

Moyie R at Eastport – no corrections

Boundary Ck nr Porthill – no corrections

Clark Fork R at Whitehorse Rapids (2)
+ Hungry Horse storage change
+ Flathead Lake storage change
+ Noxon Res storage change

Pend Oreille Lake Inflow (2)
+ Pend Oreille R at Newport, WA
+ Hungry Horse Res storage change
+ Flathead Lake storage change
+ Noxon Res storage change
+ Lake Pend Oreille storage change
+ Priest Lake storage change

Priest R nr Priest R (2)
+ Priest Lake storage change

NF Coeur d' Alene R at Enaville - no corrections

St. Joe R at Calder- no corrections

Spokane R nr Post Falls (2)
+ Lake Coeur d' Alene storage change

Spokane R at Long Lake, WA (2)
+ Lake Coeur d' Alene storage change
+ Long Lake, WA storage change

Clearwater River Basin

Selway R nr Lowell - no corrections

Lochsa R nr Lowell - no corrections

Dworshak Res Inflow (2)
+ Clearwater R nr Peck
- Clearwater R at Orofino
+ Dworshak Res storage change

Clearwater R at Orofino - no corrections

Clearwater R at Spalding (2)
+ Dworshak Res storage change

Salmon River Basin

Salmon R at Salmon - no corrections

Lemhi R nr Lemhi – no corrections

MF Salmon R at MF Lodge – no corrections

SF Salmon R nr Krassel Ranger Station – no corrections

Johnson Creek at Yellow pine – no corrections

Salmon R at White Bird - no corrections

West Central Basins

Boise R nr Twin Springs - no corrections

SF Boise R at Anderson Ranch Dam (2)
+ Anderson Ranch Res storage change

Mores Ck nr Arrowrock Dam – no corrections

Boise R nr Boise (2)
+ Anderson Ranch Res storage change
+ Arrowrock Res storage change
+ Lucky Peak Res storage change

SF Payette R at Lowman - no corrections

Deadwood Res Inflow (2)
+ Deadwood R bl Deadwood Res nr Lowman
+ Deadwood Res storage change

Lake Fork Payette R nr McCall – no corrections

NF Payette R at Cascade (2)
+ Payette Lake storage change
+ Cascade Res storage change

NF Payette R nr Banks (2)
+ Payette Lake storage change
+ Cascade Res storage change

Payette R nr Horseshoe Bend (2)
+ Deadwood Res storage change
+ Payette Lake storage change
+ Cascade Res storage change

Weiser R nr Weiser - no corrections

Wood and Lost Basins

Little Lost R bl Wet Ck nr Howe - no corrections

Big Lost R at Howell Ranch - no corrections

Big Lost R bl Mackay Res nr Mackay (2)
+ Mackay Res storage change

Little Wood R ab High Five Ck – no corrections

Little Wood R nr Carey (2)
+ Little Wood Res storage change

Big Wood R at Hailey - no corrections

Big Wood R ab Magic Res (2)
+ Big Wood R nr Bellevue (1912-1996)
+ Big Wood R at Stanton Crossing nr Bellevue (1997 to present)
+ Willow Ck (1997 to present)

Camas Ck nr Blaine – no corrections

Magic Res Inflow (2)
+ Big Wood R bl Magic Dam
+ Magic Res storage change

Upper Snake River Basin

Falls R nr Ashton (2)
+ Grassy Lake storage change
+ Diversions from Falls R ab nr Ashton

Henrys Fork nr Ashton (2)
+ Henrys Lake storage change
+ Island Park Res storage change

Teton R nr Driggs - no corrections

Teton R nr St. Anthony (2)
- Cross Cut Canal into Teton R
+ Sum of Diversions for Teton R ab St. Anthony
+ Teton Dam for water year 1976 only

Henrys Fork nr Rexburg (2)
+ Henrys Lake storage change
+ Island Park Res storage change
+ Grassy Lake storage change
+ 3 Diversions from Falls R ab Ashton-Chester
+ 6 Diversions from Falls R abv Ashton
+ 7 Diversions from Henrys Fk btw Ashton to St. Anthony
+ 21 Diversions from Henrys Fk btw St. Anthony to Rexburg
Snake R nr Flagg Ranch, WY – no corrections
Snake R nr Moran, WY (2)
+ Jackson Lake storage change
Pacific Ck at Moran, WY - no corrections
Buffalo Fork ab Lava nr Moran, WY - no corrections
Snake R ab Res nr Alpine, WY (2)
+ Jackson Lake storage change
Greys R nr Alpine, WY - no corrections
Salt R R nr Etna, WY - no corrections
Palisades Res Inflow (2)
+ Snake R nr Irwin
+ Jackson Lake storage change
+ Palisades Res storage change
Snake R nr Heise (2)
+ Jackson Lake storage change
+ Palisades Res storage change
Ririe Res Inflow (2)
+ Willow Ck nr Ririe
+ Ririe Res storage change
The forecasted natural volume for Willow Creek nr Ririe does not include Grays Lake water diverted from Willow Creek drainage through the Clarks Cut diversion and into Blackfoot Reservoir.
Blackfoot R ab Res nr Henry (2)
+ Blackfoot Res storage change
The forecasted Blackfoot Reservoir Inflow includes Grays Lake water diverted from the Willow Creek drainage through the Clarks Cut diversion and into Blackfoot Reservoir.
Portneuf R at Topaz - no corrections
American Falls Res Inflow (2)
+ Snake R at Neeley
+ Jackson Lake storage change
+ Palisades Res storage change
+ American Falls storage change
+ Teton Dam for water year 1976 only

Southside Snake River Basins
Goose Ck nr Oakley - no adjustments
Trapper Ck nr Oakley - no adjustments
Oakley Res Inflow - *flow does not include Birch Creek*
+ Goose Ck
+ Trapper Ck
Salmon Falls Ck nr San Jacinto, NV - no corrections
Bruneau R nr Hot Springs - no corrections
Reynolds Ck at Tollgate - no corrections
Owyhee R nr Gold Ck, NV (2)
+ Wildhorse Res storage change
Owyhee R nr Rome, OR – no Corrections
Owyhee Res Inflow (2)
+ Owyhee R bl Owyhee Dam, OR
+ Lake Owyhee storage change
+ Diversions to North and South Canals

Bear River Basin
Bear R nr UT-WY Stateline, UT- no corrections
Bear R abv Res nr Woodruff, UT- no corrections
Big Ck nr Randolph, UT - no corrections
Smiths Fork nr Border, WY - no corrections
Bear R bl Stewart Dam (2)
+ Bear R bl Stewart Dam
+ Rainbow Inlet Canal
Little Bear R at Paradise, UT - no corrections
Logan R nr Logan, UT - no corrections
Blacksmith Fk nr Hyrum, UT - no corrections

Reservoir Capacity Definitions (Units in 1,000 Acre-Feet, KAF)
Different agencies use various definitions when reporting reservoir capacity and contents. Reservoir storage terms include dead, inactive, active, and surcharge storage. This table lists the volumes for each reservoir, and defines the storage volumes NRCS uses when reporting capacity and current reservoir storage. In most cases, NRCS reports usable storage which includes active and/or inactive storage. **(Revised Feb. 2015)**

Basin- Lake or Reservoir	Dead Storage	Inactive Storage	Active Storage	Surcharge Storage	NRCS Capacity	NRCS Capacity Includes
Panhandle Region						
Hungry Horse	39.73	---	**3451.00**	---	**3451.0**	Active
Flathead Lake	Unknown	---	**1791.00**	---	**1791.0**	Active
Noxon	Unknown	---	**335.00**	---	**335.0**	Active
Lake Pend Oreille	**406.20**	**112.40**	**1042.70**	**---**	**1561.3**	Dead + Inactive + Active
Lake Coeur d'Alene	Unknown	13.50	**225.00**	**---**	**238.5**	Inactive + Active
Priest Lake	**20.00**	**28.00**	**71.30**	**---**	**119.3**	Dead + Inactive + Active
Clearwater Basin						
Dworshak	Unknown	**1452.00**	**2016.00**	**---**	**3468.0**	Inactive + Active
West Central Basins						
Anderson Ranch	24.90	**37.00**	**413.10**	---	450.1	Inactive + Active
Arrowrock	Unknown	---	**272.20**	**---**	**272.2**	Active
Lucky Peak	Unknown	**28.80**	**264.40**	13.80	**293.2**	Inactive + Active
Lake Lowell	7.90	**5.80**	**159.40**	---	165.2	Inactive + Active
Deadwood	Unknown	---	**161.90**	**---**	**161.9**	Active
Cascade	Unknown	**46.70**	**646.50**	**---**	**693.2**	Inactive + Active
Mann Creek	1.61	0.24	**11.10**	**---**	**11.1**	Active
Wood and Lost Basins						
Mackay	0.13	---	**44.37**	**---**	**44.4**	Active
Little Wood	Unknown	---	**30.00**	**---**	**30.0**	Active
Magic	Unknown	---	**191.50**	**---**	**191.5**	Active
Upper Snake Basin						
Jackson Lake	Unknown	---	**847.00**	**---**	**847.0**	Active
Palisades	44.10	**155.50**	**1200.00**	**---**	**1400.0**	Dead + Inactive+Active
Henrys Lake	Unknown	---	**90.40**	**---**	**90.4**	Active
Island Park	0.40	---	**127.30**	**7.90**	**135.2**	Active + Surcharge
Grassy Lake	Unknown	---	**15.18**	**---**	**15.2**	Active
Ririe	4.00	6.00	**80.54**	10.00	**80.5**	Active
Blackfoot	0.00	---	**333.50**	3.50	**333.50**	Active (rev. 2/1/2015)
American Falls	Unknown	---	**1672.60**	**---**	**1672.6**	Active
Southside Snake Basins						
Oakley	0.00	---	**75.60**	**---**	**75.6**	Active
Salmon Falls	48.00	**5.00**	**182.65**	**---**	**182.6**	Active + Inactive
Wild Horse	Unknown	---	**71.50**	**---**	**71.5**	Active
Lake Owyhee	406.83	---	**715.00**	**---**	**715.0**	Active
Brownlee	0.45	**444.70**	**975.30**	**---**	**1420.0**	Inactive + Active
Bear River Basin						
Bear Lake	5000.00	119.00	**1302.00**	**---**	**1302.0**	Active:
Capacity does not include 119 KAF that can used, historic values below this level are rounded to zero						
Montpelier	**0.21**	**---**	**3.84**	**---**	**4.0**	Dead + Active

Interpreting Water Supply Forecasts

Each month, five forecasts are issued for each forecast point and each forecast period. Unless otherwise specified, all streamflow forecasts are for streamflow volumes that would occur naturally without any upstream influences. Water users need to know what the different forecasts represent if they are to use the information correctly when making operational decisions. The following is an explanation of each of the forecasts.

90 Percent Chance of Exceedance Forecast. There is a 90 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 10 percent chance that the actual streamflow volume will be less than this forecast value.

70 Percent Chance of Exceedance Forecast. There is a 70 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 30 percent chance that the actual streamflow volume will be less than this forecast value.

50 Percent Chance of Exceedance Forecast. There is a 50 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 50 percent chance that the actual streamflow volume will be less than this forecast value. Generally, this forecast is the middle of the range of possible streamflow volumes that can be produced given current conditions.

30 Percent Chance of Exceedance Forecast. There is a 30 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 70 percent chance that the actual streamflow volume will be less than this forecast value.

10 Percent Chance of Exceedance Forecast. There is a 10 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 90 percent chance that the actual streamflow volume will be less than this forecast value.

*Note: There is still a 20 percent chance that actual streamflow volumes will fall either below the 90 percent exceedance forecast or above the 10 percent exceedance forecast.

These forecasts represent the uncertainty inherent in making streamflow predictions. This uncertainty may include sources such as: unknown future weather conditions, uncertainties associated with the various prediction methodologies, and the spatial coverage of the data network in a given basin.

30-Year Average. The 30-year average streamflow for each forecast period is provided for comparison. The average is based on data from 1981-2010. The % AVG. column compares the 50% chance of exceedance forecast to the 30-year average streamflow; values above 100% denote when the 50% chance of exceedance forecast would be greater than the 30-year average streamflow.

AF - Acre-feet, forecasted volume of water are typically in thousands of acre-feet (KAF).

These forecasts are given to users to help make risk-based decisions. Users can select the forecast corresponding to the level of risk they are willing to accept in order to minimize the negative impacts of having more or less water than planned for.

To Decrease the Chance of Having Less Water than Planned for
A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive less than this amount). To reduce the risk of having less water than planned for, users can base their operational decisions on one of the forecasts with a greater chance of being exceeded such as the 90 or 70 percent exceedance forecasts.

To Decrease the Chance of Having More Water than Planned for
A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive more than this amount). To reduce the risk of having more water than planned for, users can base their operational decisions on one of the forecasts with a lesser chance of being exceeded such as the 30 or 10 percent exceedance forecasts.

Forecast use example:

Using the 50 Percent Exceedance Forecast. Using the example forecasts shown on the next page, there is a 50% chance that actual streamflow volume at the Henry's Fork near Ashton will be less than 280 KAF between June 1 and Sept. 30. There is also a 50% chance that actual streamflow volume will be greater than 280 KAF.

Using the 90 and 70 Percent Exceedance Forecasts. If an unexpected shortage of water could cause problems (such as irrigated agriculture), users might want to plan on receiving 245 KAF during Jun 1 through September 30 (from the 70 percent exceedance forecast). There is a 30% chance of receiving *less* than 245 KAF.

Alternatively, if users determine the risk of using the 70 percent exceedance forecast is too great, then they might plan on receiving 198 KAF (from the **90** percent exceedance forecast). There is 10% chance of receiving less than 198 KAF.

Using the 30 or 10 Percent Exceedance Forecasts. If an unexpected excess of water could cause problems (such as operating a flood control reservoir), users might plan on receiving 315 KAF between June 1 and Sept. 30 (from the 30 percent exceedance forecast). There is a 30% chance of receiving *more* than 315 KAF.

Alternatively, if users determine the risk of using the 30 percent exceedance forecast is too great, then they might plan on receiving 360 KAF (from the 10 percent exceedance forecast). There is a 10% chance of receiving more than 360 KAF. Users could also choose a volume in between any of these values to reflect their desired risk level.

Upper Snake River Basin Streamflow Forecasts - June 1, 2015

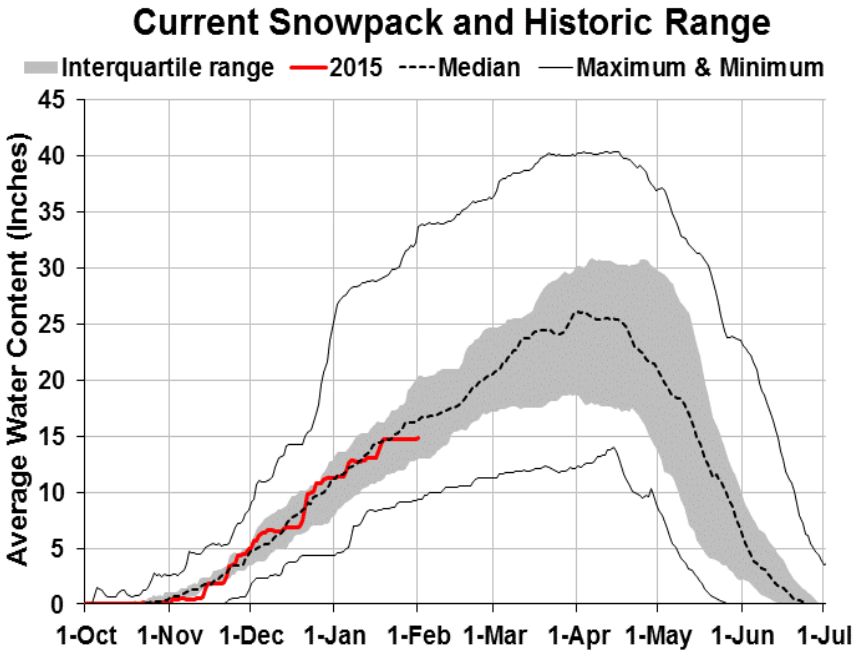
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

Interpreting Snowpack Plots

Basin snowpack plots represent snow water equivalent indices using the average daily SNOTEL data[1] from several sites in or near individual basins. The solid red line (2015), which represents the current water year snowpack water content, can be compared to the normal dashed black line (Median) which is considered "normal", as well as the SNOTEL observed historical snowpack range for each basin. This allows users to gather important information about the current year's snowpack as well as the historical variability of snowpack in each basin.

The gray shaded area represents the interquartile range (also known as the "middle fifty"), which is the 25th to 75th percentiles of the historical daily snowpack data for each basin. Percentiles depict the value of the average snowpack below which the given percent of historical years fall. For example, the top part of the interquartile range (75th percentile) indicates that the snowpack index has been below this line for 75 percent of the period of record, whereas the reverse is true for the lower part of the interquartile range (25th percentile). This means 50 percent of the time the snowpack index is within the interquartile range (gray area) during the period of record.

[1] All data used for these plots come from daily SNOTEL data only and does not include snow course data (collected monthly), whereas the official basin snowpack percent of normal includes both SNOTEL and snow course data, potentially leading to slight discrepancies between plots and official basin percent of normal.



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