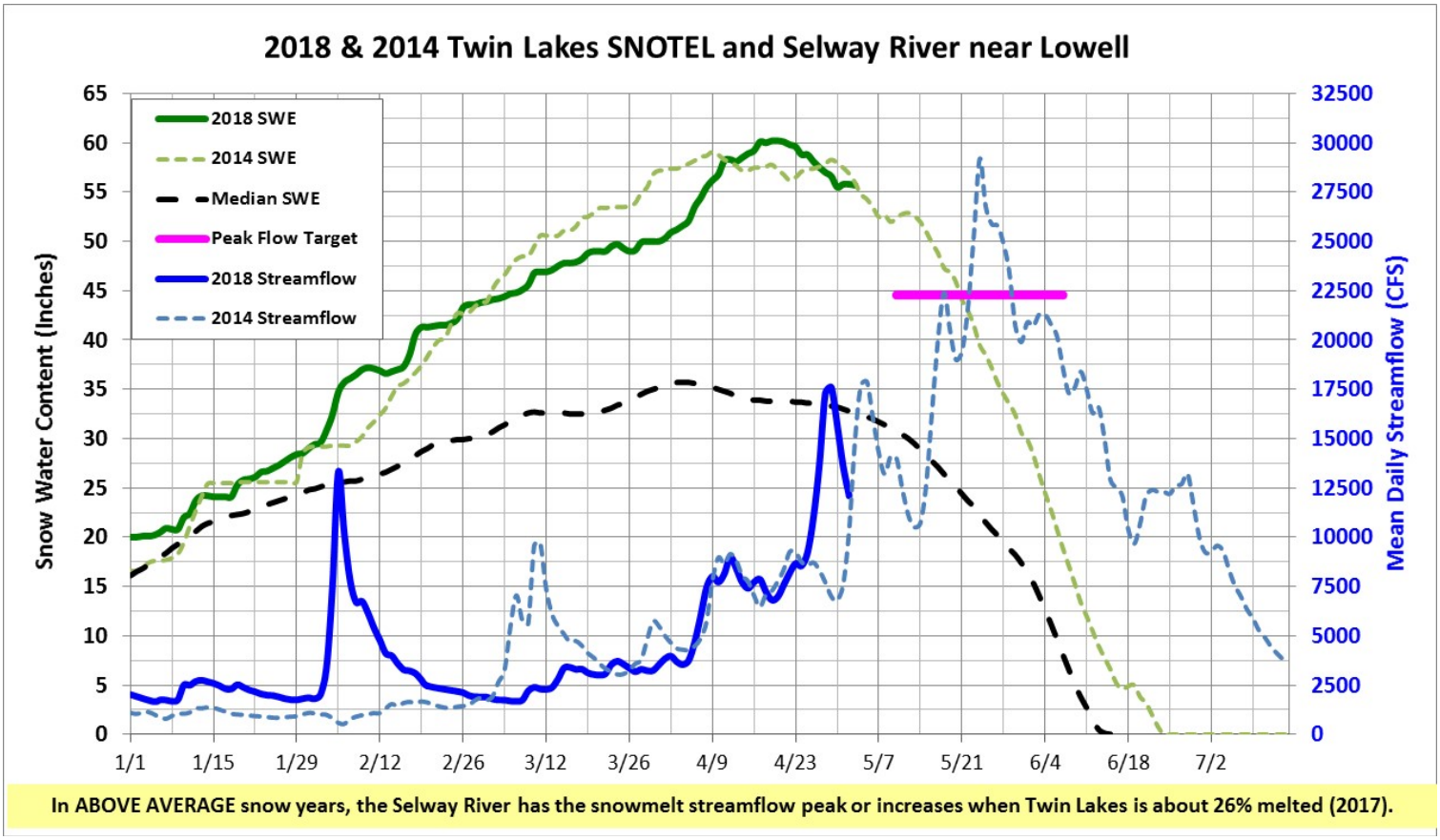
USDA United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

May 1, 2018



Snowmelt Streamflow Relationships

Idaho rivers generally have their highest streamflow of the season (peak flow) as a result of spring snowmelt. In a year with little springtime rain, the peak flow is entirely driven by snowmelt processes. Conversely, during a wet spring, the peak flow is typically driven by a combination of snowmelt and rainfall. The Idaho Snow Survey in collaboration with Boise State University has updated these historic snowmelt streamflow relationships using the full SNOTEL period of record where possible.

The above graph shows that the Selway River in above average years reaches its snowmelt peak when Twin Lakes SNOTEL site is about 26% melted. A similar snowpack year, 2014, also shows this is when the snowmelt streamflow peak occurred.

Continue reading the Water Supply Outlook Report to learn about these snowmelt timing relationships and where to find timely updates to assist in water management or river running decisions!

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
Internet Web Address: http://www.id.nrcs.usda.gov/snow/
Natural Resources Conservation Service Snow Surveys
9173 West Barnes Drive, Suite C
Boise, Idaho 83709-1574 (208) 378-5700 ext. 5

To join a free email subscription list contact us by email at: IDBOISE-NRCS-SNOW@one.usda.gov

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 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.

IDAHO WATER SUPPLY OUTLOOK REPORT

May 1, 2018

SUMMARY

Most of Idaho's numerous water users, which include - farmers, irrigators, water managers, river runners, hydropower producers, fishers, fish managers, ground water users, and more, should be satisfied with this year's water supply. A combination of high reservoir carryover storage from last year, above normal baseflows through the winter months, and adequate snowfall means adequate water supplies for most despite low streamflows in some headwater tributaries. Mother Nature brought a steady stream of winter storms across the northern half of Idaho all winter, while storms were late in arriving in southern and central Idaho, but worth the wait. As snow continued accumulating in the mountains, reservoir releases were being made by late winter and early spring. This is a sign there would be adequate snowmelt runoff to fill Idaho's primary reservoirs. A few rivers have already had their snowmelt streamflow peaks, and the rest will soon be peaking with the return of warm temperatures in early to mid-May. A later snow melt would provide higher streamflows in the latter half of summer for the irrigators who rely on natural streamflow in the Wood and Lost basins. Enjoy and play it safe, be careful around Idaho's rivers and canals and enjoy the abundant water activities that Idaho has to offer.

SNOWPACK

April brought a mixture of weather (wind, snow, and rain) across Idaho. The higher elevation SNOTEL sites continued accumulating snow during April and just reached their seasonal peaks. The majority of SNOTEL sites were in full melt during April, marking the start of our annual snowmelt runoff season with the critical water that feeds the streams and fills reservoirs. Lower elevation SNOTEL sites are melted out. Overall, current May 1 snowpacks reflect this winter's precipitation pattern with numbers increasing from south to north and west to east as you move towards the Montana border and the Continental Divide. Snowpacks range from nearly melted out in the Owyhee basin to over 140% in the Clearwater and Panhandle Region.

The Schweitzer Basin SNOTEL site is at 6,090 feet in the middle of Idaho's Panhandle Region and has 72 inches of snow water, 150 inches of snow depth; May 1 median is 45.4 inches. Normally this site melts out in late June, but with this amount of snow, snow should remain into early July on the north-facing shady slopes of Idaho's Selkirk Range. It is also interesting that the May 1 Clearwater basin snow index which is made up of 13 sites is the 8th highest since 1977 but only the 18th highest since 1961. This shows how many more wet years there were in the 1960s and early 1970s.

These 5-day delta reports from this web page **Current Water Year** are an excellent way to monitor 24-hour precipitation amounts, snow melt rates (inches of melt / day), and snow depth changes:

- **SNOTEL SWE, Snow Depth and Precipitation Rates of Change Last 5 Days**
  North Idaho **Central Idaho**
  Southern Idaho **Eastern Idaho & Upper Snake Wyoming**

PRECIPITATION

April's precipitation pattern brought normal or greater precipitation to central Idaho and north to the Canadian border, and to eastern Idaho and Upper Snake basin in Wyoming. Based on SNOTEL

percentages, the highest monthly amounts were 160% to 170% of normal in the Spokane and Northern Panhandle Region. Next highest were 145% to 155% of normal in the Clearwater, Henrys Fork, and Upper Snake above Palisades Reservoir. The Salmon River basin was the dividing region again and received 119% of normal April precipitation along with the Payette basin, while the Boise and Big Wood basin only received near normal amounts. The Little Wood, Big Lost and Owyhee basins received 75% of normal April amounts and the least amounts were 58% to 68% in the Bruneau, Salmon Falls and Oakley basins.

Water year-to-date totals follow the April precipitation pattern with the Clearwater at 125% of normal, Northern Idaho at 116%, and Henrys Fork and Upper Snake at 110%. Idaho's central basins are in the near normal range of 90% to 102%, while basins south of the Snake River have only received 80% to 90% of their normal precipitation amounts since October 1, 2017.

Spring precipitation can often make or break the volume streamflow forecasts. Future precipitation is not included in streamflow forecast equations. Lessons learned from past years, normal April to June precipitation is generally needed for the projected runoff to reach or surpass the 50% chance of exceedance forecasts. If the April to June precipitation is in the 75% of normal range, then the runoff is more likely to be in the 70% chance of exceedance range. This may be the runoff scenario in the basins across Idaho's southern border – especially when combined with this year's below normal snowpacks. If the April to June precipitation is in the 125% above normal range, then streamflow runoff typically responds accordingly with observed runoff volumes closer to the 30% chance of exceedance forecasts. Stay tuned and keep your eye on the weather forecasts which influences snowmelt rates (inches of melt / day) which provides the runoff to fill our streams and reservoirs. NOAA temperature forecasts for May are calling for an increase likelihood of above normal temperatures across the West and near to slightly above normal precipitation for Idaho in their **6-10 Day and 8-14 Day Outlooks**

RESERVOIRS

Overall, Idaho's reservoirs are in great shape. Current storage varies across the state and depends upon three things: last year's carryover, how much snow has melted, and how much remains in the mountains to melt. Here is a quick summary from south to north: Owyhee Reservoir has peaked in storage as drafting has started. Salmon Falls Reservoir is nearing its peak storage of 58% full. Much of the storage water will be used this year to grow crops, and the residual runoff forecast of 45% will help provide some carryover storage for next year. Oakley Reservoir is 56% full and started releasing irrigation water in mid-April. With May - July residual flows forecast at only 70% of average, Bear Lake is 79% full and nearing its peak storage for the season. With wise water use and management, Bear Lake should be able to provide adequate irrigation supplies for several years to come.

Jackson Lake and Palisades Reservoir have a combined storage of 62% full, 102% of average. Drafting is still occurring to make room for the snowmelt runoff that will flow into Palisades Reservoir. Final fill for Palisades Reservoir will occur in late June or early July. Blackfoot Reservoir is 100% full. This is just the third time the reservoir has filled since 1999. American Falls Reservoir is nearly full at 97%, and should fill in mid-May and remain full until irrigation demand exceeds inflows. Reservoirs on the Henrys Fork are near full and releasing water. Rapid melt of the low elevation snowpack brought the Henrys Fork to flood stage in Late April.

Magic Reservoir is full and passing inflow from Camas Creek and the Big Wood River. Releases were made from Little Wood Reservoir starting in early March and with inflows forecast at 65% of average, final fill of the reservoir will occur soon. The Boise Reservoir system is 91% full, 133% of average with inflows forecast at 79% of average, much less than last year's 185% of average runoff. The Payette

system is 79% full, 111% of average and there is plenty of water to complete final fill when the time is right. Mann Creek Reservoir is full.

With an inflow forecast of 129% of average, Dworshak Reservoir was releasing water to make space for this year's runoff. Dworshak Reservoir is currently 55% full, 72% of average and there will be plenty of water to complete final fill of the reservoir in June. Northern Idaho hosts some of the most favorable runoff conditions and will have plenty of streamflow to fill all the natural lakes and storage facilities. In fact, runoff will be very high on the Clark Fork River that flows into Lake Pend Oreille with many rivers forecast in the top 20 exceedance probability percentile.

STREAMFLOW

Streamflow volume forecasts mirror Idaho's snowpack with volume forecasts ranging from 35% to 70% of average across Idaho's southern basins to 135% to 145% in the Selway River, northern Idaho and a few Snake River tributaries in Wyoming. With the abundant and near record high snowfall that fell in Montana, any of Idaho streams that border Montana or the continental divide in Wyoming will have an extended runoff season.

Some streams, like the Owyhee River, have seen their snowmelt streamflow peaks while the Bruneau River and Salmon Falls may be peaking in early May with a very short high water season compared to recent years. Other streams like the Teton and Selway rivers will not peak for several more weeks based upon the updated snowmelt-streamflow relationships. To assist and educate water users about the timing of snowmelt streamflow peaks, NRCS collaborated with Boise State University to update snowmelt timing runoff products. These snowmelt streamflow relationship graphs are updated several times a week on this web page along with additional streamflow graphs: Peak Streamflow Information.

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

Spring is here and the rivers are rising. Some rivers have peaked in southern Idaho while others are several weeks away from seeing their snowmelt streamflow peak. With a return of warmer temperatures in early to mid-May, expect another increase in flows where snow remains. Streams along the Montana border will benefit from the abundant and record high snow that fell in Montana and see an extended high water season. The MF Salmon River has seen one peak, but will rise again indicated by the relationship with the remaining snow at Banner Summit. With the Salmon River at White Bird forecast at 110% of average, river runners can expect a normal runoff season, and maybe the abundant snowfall across the northern US border will help to put a damper on forest fires this summer.

As mentioned last month - spring rain and temperatures will determine the timing and magnitude of snowmelt peak flow. Play it safe and know your boating skills and limits as rivers rise. The rivers will stay high as long as there is snow to feed them especially with streams that border Montana or that have their headwaters in Yellowstone National Park. Keep your mouse on these snow-to-flow relationship graphs to monitor and better understand when the snowmelt peaks may occur and if the potential for additional streamflow peaks from snowmelt has passed: **Peak Streamflow Information**

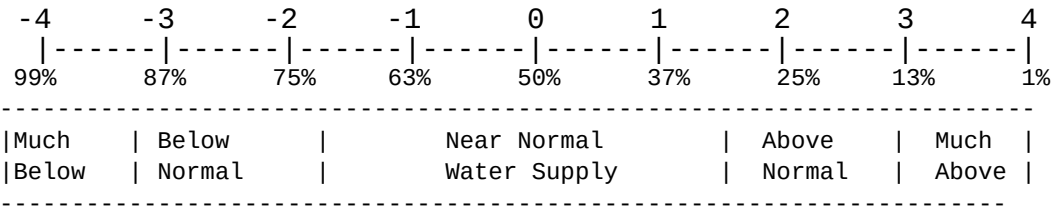
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) May 1, 2018

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.

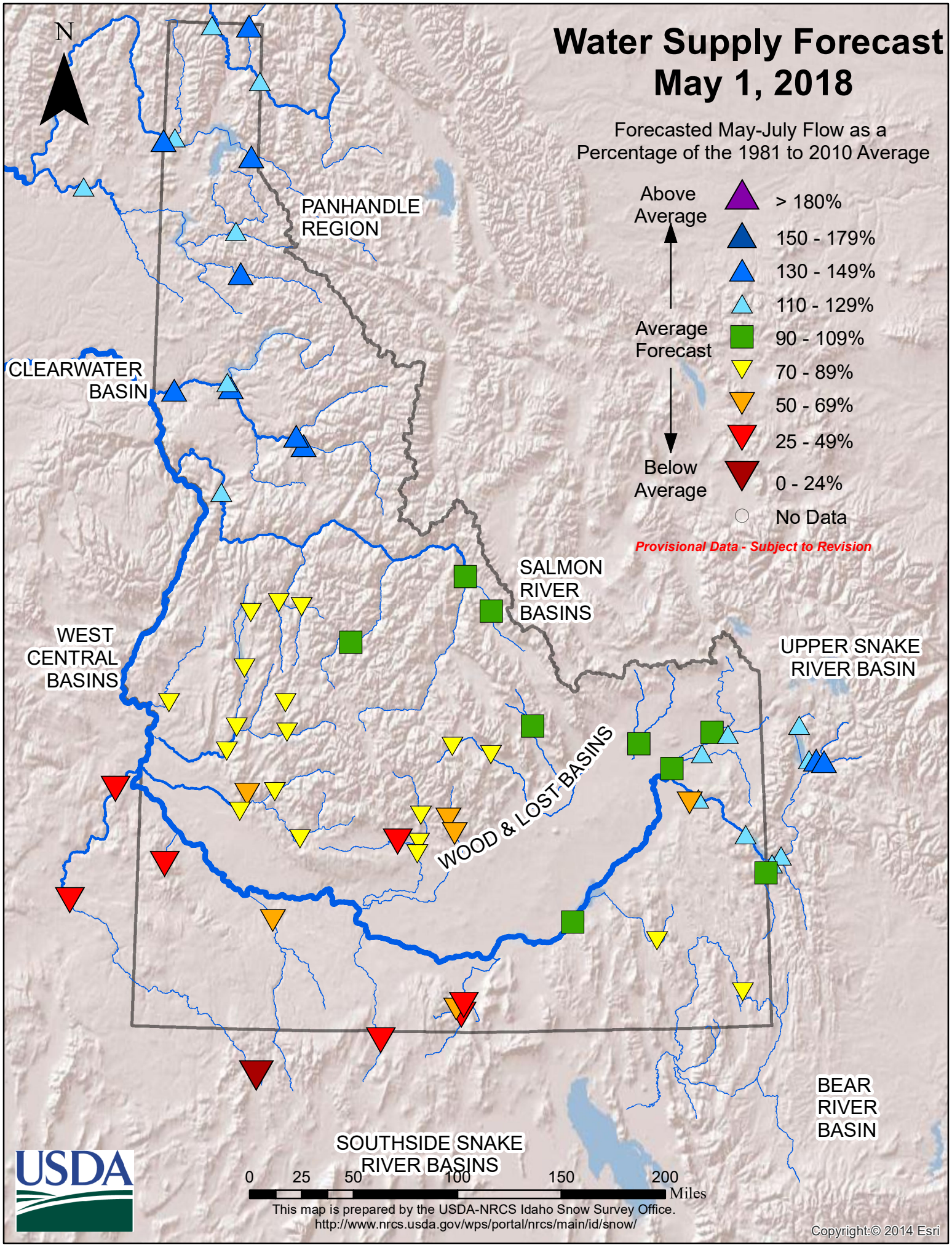
SWSI values provide a more comprehensive outlook of water availability by combining streamflow forecasts and reservoir storage. The SWSI index allows comparison of water availability between basins for drought or flood severity analysis. Threshold SWSI values have been determined for some basins to indicate 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	**2.5**	**1999**	**NA**
Clearwater	**2.5**	**2014**	**NA**
Salmon	**0.5**	**2014**	**NA**
Weiser	**-1.6**	**2016**	**NA**
Payette	**-0.6**	**2000**	**NA**
Boise	**0.1**	**2010**	**-2.4**
Big Wood above Hailey	**-0.1**	**2016**	**NA**
Big Wood	**1.2**	**2012**	**0.2**
Little Wood	**-0.1**	**2012**	**-1.8**
Big Lost	**-0.3**	**2016**	**0.0**
Little Lost	**0.8**	**2006**	**-1.3**
Teton	**1.0**	**2009**	**-3.9**
Henrys Fork	**2.0**	**2008**	**-2.0**
Snake (Heise)	**1.2**	**2008**	**-1.5**
Oakley	**0.8**	**2009**	**0.2**
Salmon Falls above Jackpot	**-1.6**	**2014**	**NA**
Salmon Falls	**1.0**	**2016**	**-0.9**
Bruneau	**-1.0**	**2015**	**NA**
Owyhee	**-0.1**	**2012**	**-1.5**
Bear River	**1.9**	**2011**	**-3.9**

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.


Water Supply Forecast
May 1, 2018
Forecasted May-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
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
USDA
0 25 50 100 150 200
Miles
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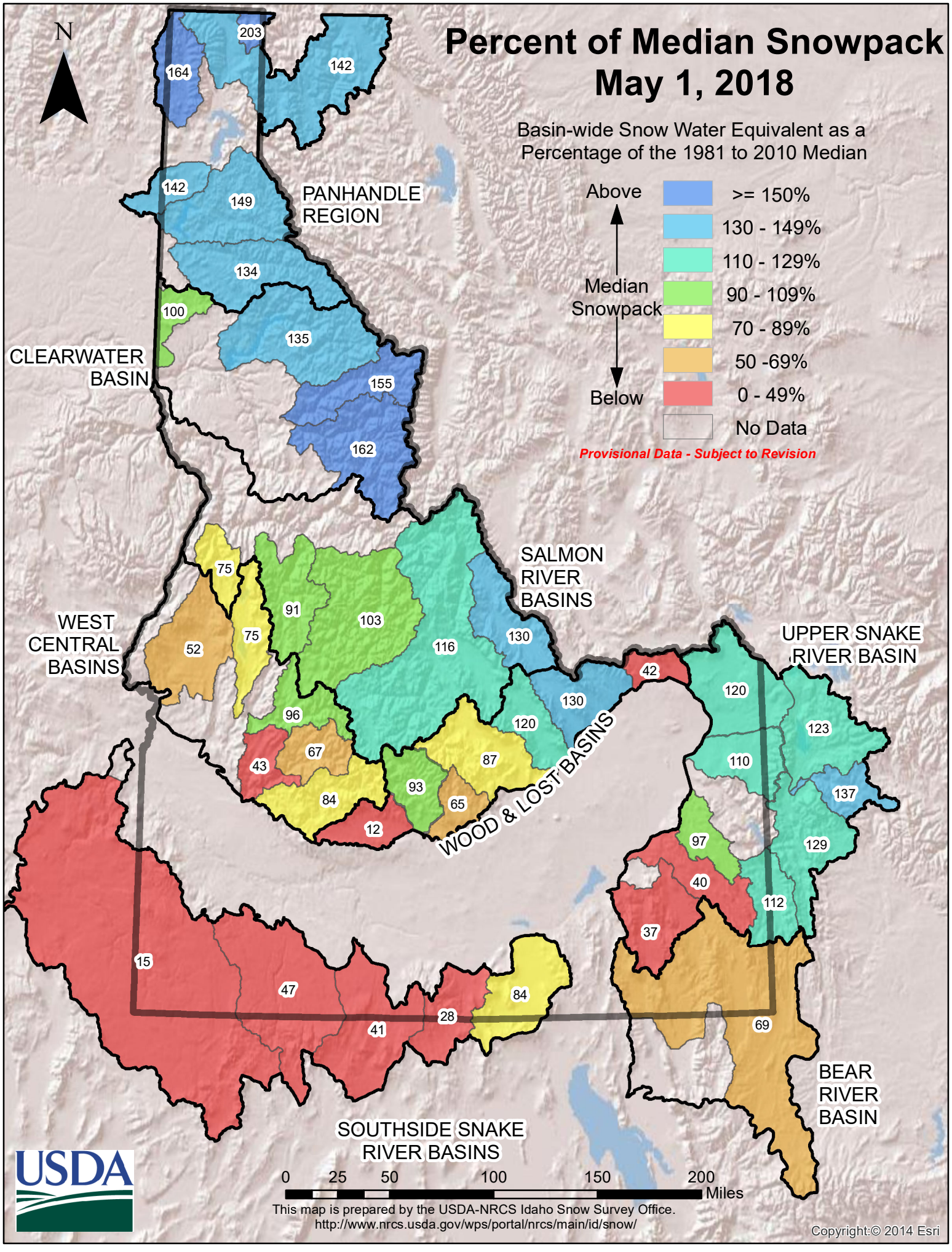
Percent of Median Snowpack
May 1, 2018
Basin-wide Snow Water Equivalent as a Percentage of the 1981 to 2010 Median
Above
Median Snowpack
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
N
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
WOOD & LOST BASINS
UPPER SNAKE RIVER BASIN
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
203
164
142
142
149
134
100
135
155
162
75
91
103
52
75
116
130
96
120
130
42
120
123
110
137
67
43
87
84
93
65
12
97
129
40
112
37
15
47
84
28
41
69
0 25 50 100 150 200
Miles
USDA
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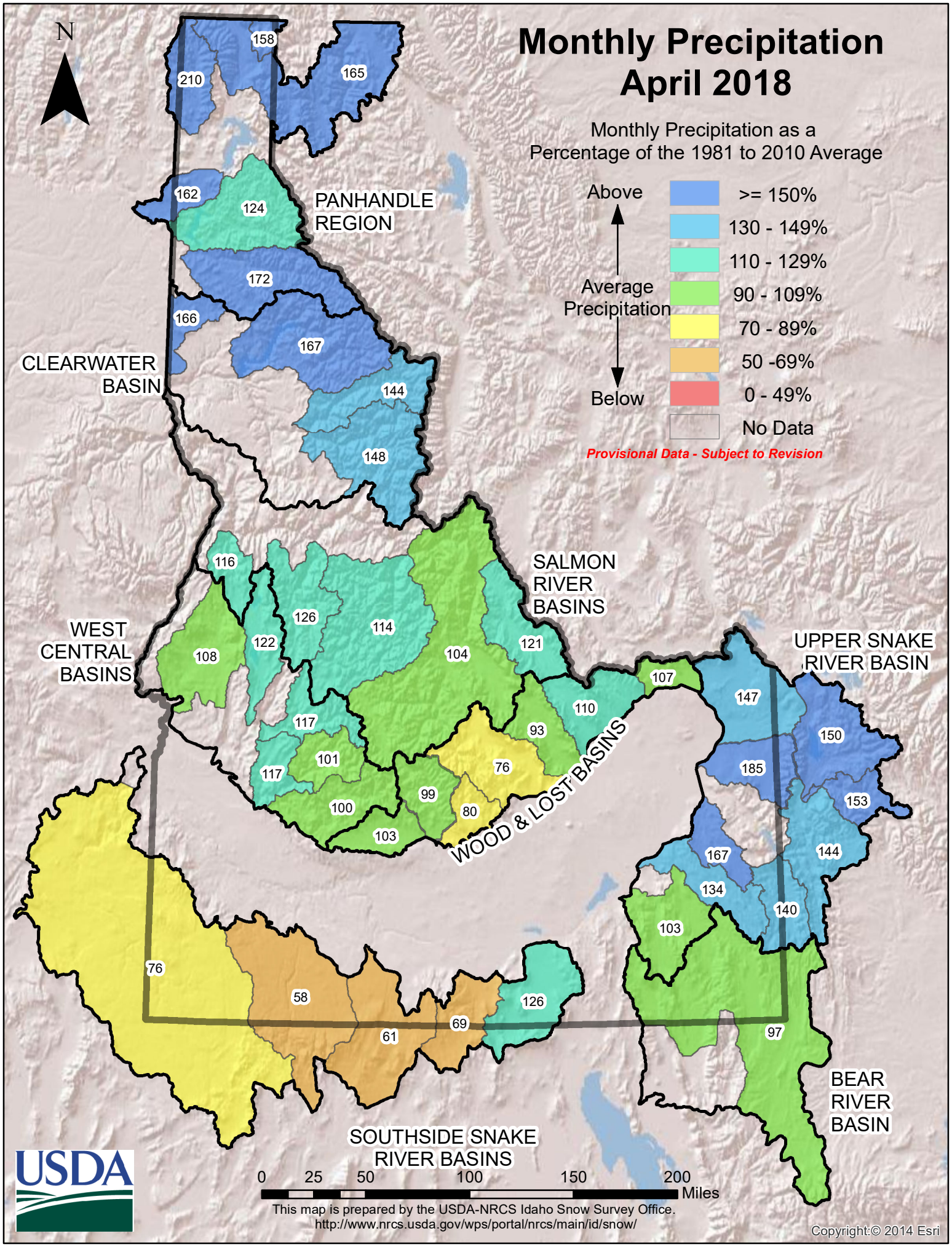
N
Monthly Precipitation
April 2018
Monthly Precipitation as a
Percentage of the 1981 to 2010 Average
Above
Average
Precipitation
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
PANHANDLE
REGION
CLEARWATER
BASIN
SALMON
RIVER
BASINS
WEST
CENTRAL
BASINS
UPPER SNAKE
RIVER BASIN
WOOD & LOST BASINS
BEAR
RIVER
BASIN
SOUTHSIDE SNAKE
RIVER BASINS
158
165
210
162
124
172
166
167
144
148
116
126
114
122
108
104
121
107
147
150
110
93
117
101
76
185
153
117
99
80
100
103
167
144
134
140
103
76
58
126
69
61
97
0
25
50
100
150
200
Miles
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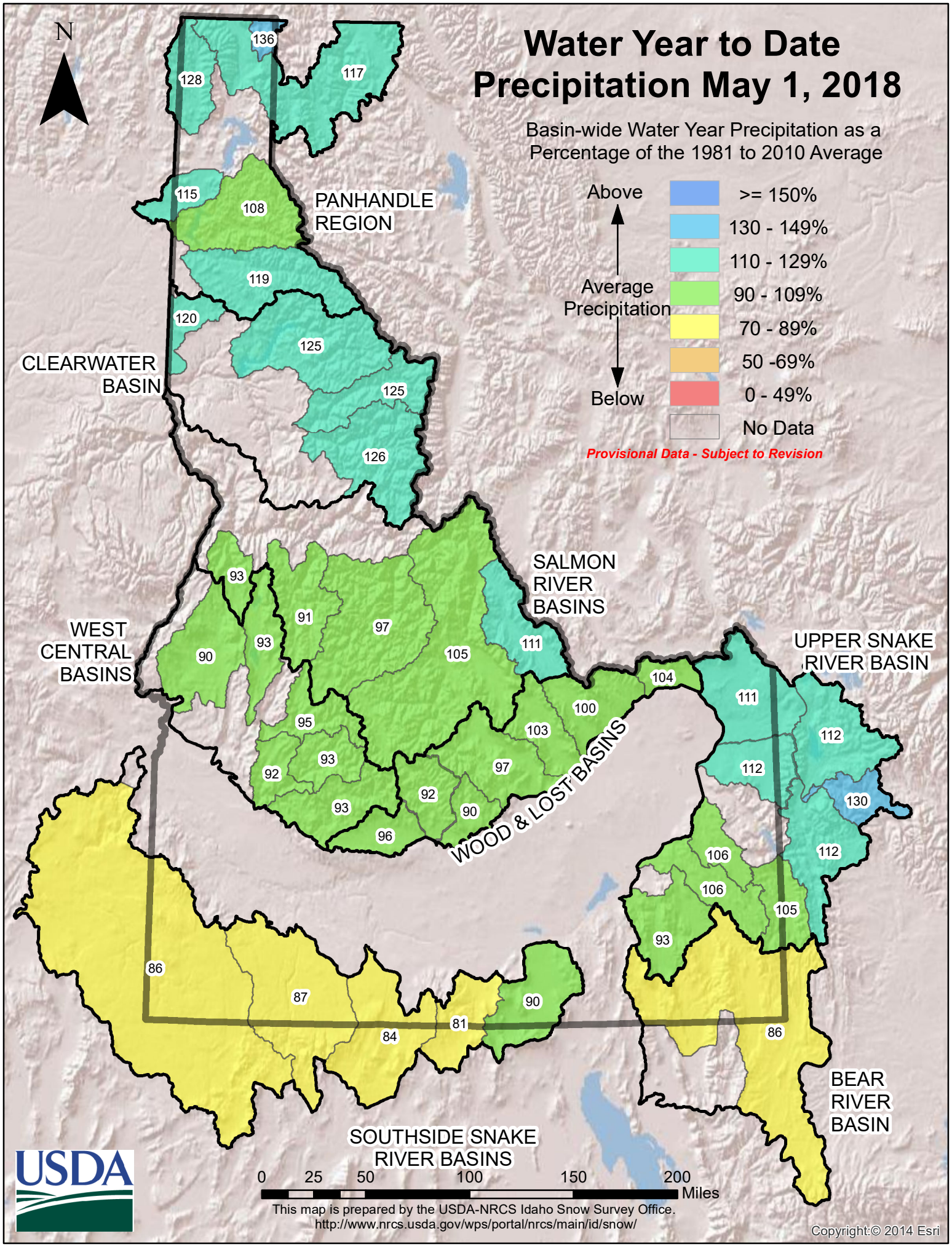
N
Water Year to Date Precipitation May 1, 2018
Basin-wide Water Year Precipitation as a Percentage of the 1981 to 2010 Average
Above
Average Precipitation
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
UPPER SNAKE RIVER BASIN
WOOD & LOST BASINS
SOUTHSIDE SNAKE RIVER BASINS
BEAR RIVER BASIN
136
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111
104
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103
95
93
92
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93
92
90
96
111
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112
130
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105
112
93
86
87
90
81
84
86
0 25 50 100 150 200
Miles
USDA
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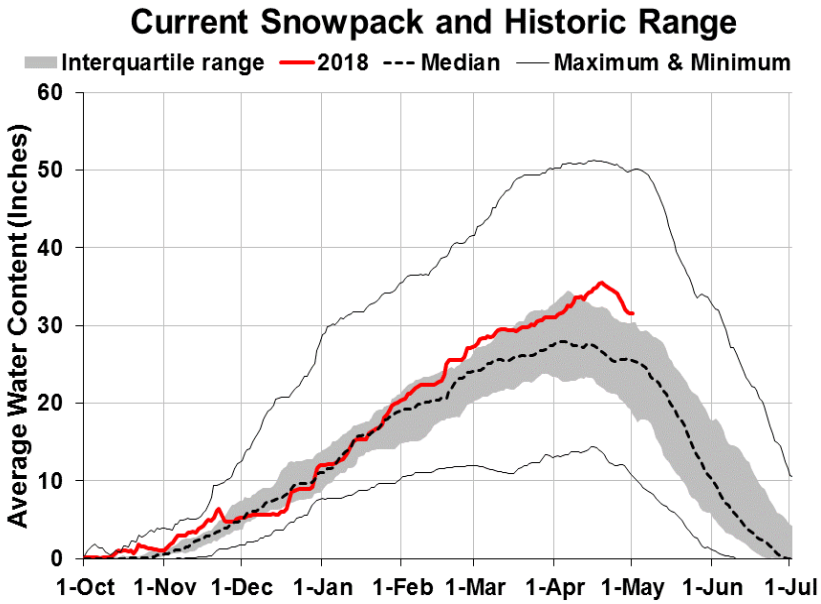
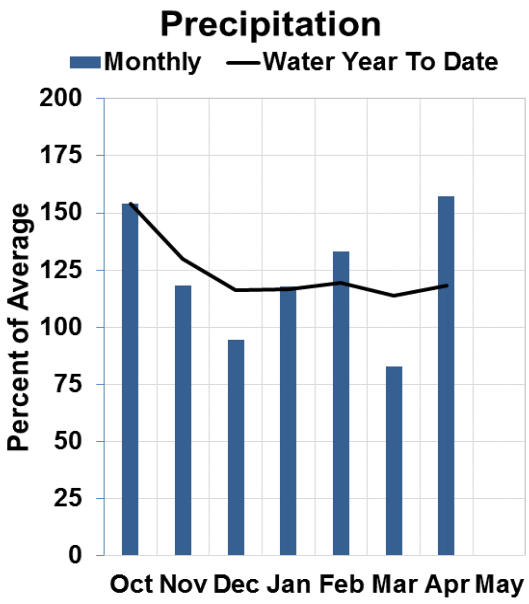
Panhandle Region

May 1, 2018





WATER SUPPLY OUTLOOK

April was especially wet in the Panhandle Region, with precipitation totals ranging from 124% of normal in the Coeur d'Alene basin to 227% of normal in the Rathdrum Creek basin. These early April weather events allowed snowpack accumulation to continue through mid-month. The initiation of meltout was seen at higher elevation sites starting around April 19, but melt was slowed by cooler weather this past week. May 1 snowpack totals are well above normal across all basins in the region.

Streamflow forecasts for basins in the Panhandle Region range from 110% to 145% of normal for the May-July period. A warmer than normal May is projected for all western states. As temperatures rise this month, be sure to watch USGS current streamflow conditions, as well as the NWRFC short-term river forecasts for flood warnings. Water supplies will be more than adequate and concerns remain about how the abundant snowpack will melt in the Clark Fork basin in Montana where volumes are forecast 145% of average and greater.

Panhandle Region Streamflow Forecasts - May 1, 2018

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	MAY-JUL	335	375	405	135%	435	475	300
	MAY-SEP	350	390	420	133%	450	495	315
Kootenai R at Leonia 1 & 2	MAY-JUL	5460	6380	6800	119%	7220	8140	5730
	MAY-SEP	6810	7670	8060	120%	8460	9320	6730
Boundary Ck nr Porthill	MAY-JUL	101	114	123	128%	132	145	96
	MAY-SEP	106	120	130	129%	139	153	101
Clark Fork R at Whitehorse Rapids 1 & 2	MAY-JUL	10900	12200	12700	145%	13300	14600	8740
	MAY-SEP	12000	13500	14100	144%	14800	16200	9760
Pend Oreille Lake Inflow 2	MAY-JUL	12500	13500	14100	146%	14800	15700	9690
	MAY-SEP	13700	14800	15600	146%	16300	17400	10700
Priest R nr Priest River 2	MAY-JUL	600	665	710	122%	755	820	580
	MAY-SEP	635	710	765	121%	815	890	630
NF Coeur dAlene R at Enaville	MAY-JUL	265	380	455	112%	535	645	405
	MAY-SEP	300	415	495	111%	570	690	445
St. Joe R at Calder 2	MAY-JUL	840	940	1010	132%	1080	1180	765
	MAY-SEP	905	1010	1080	130%	1150	1250	830
Spokane R nr Post Falls 2	MAY-JUL	1420	1690	1870	122%	2060	2330	1530
	MAY-SEP	1480	1780	1980	122%	2180	2480	1620
Spokane R at Long Lake	MAY-JUL	1590	1910	2130	125%	2350	2680	1710
	MAY-SEP	1800	2150	2380	122%	2620	2960	1950

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 April

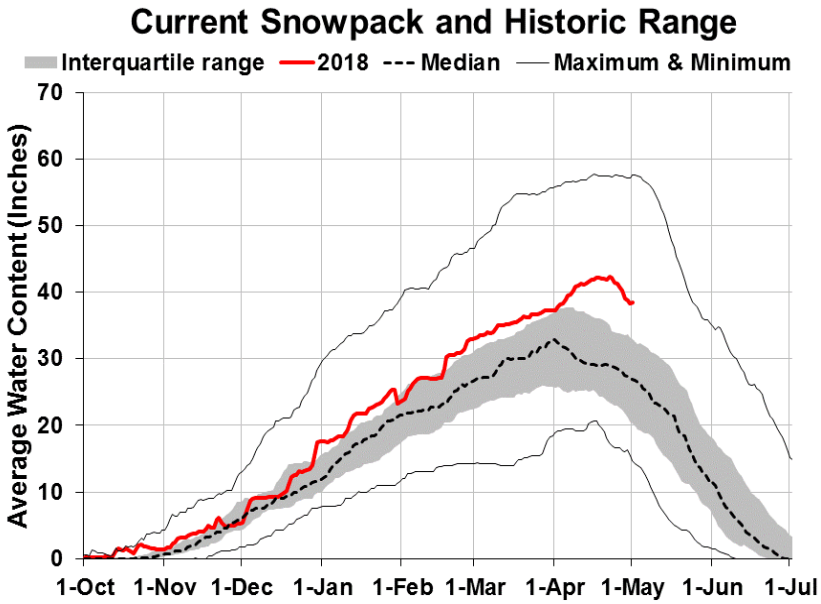
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Hungry Horse Lake	1798.8	2739.1	2188.0	3451.0
Flathead Lake	1158.7	1186.6	971.5	1791.0
Noxon Rapids Reservoir	332.6	329.6	307.4	335.0
Lake Pend Oreille	959.7	953.4	931.7	1561.3
Priest Lake	105.0	113.5	101.9	119.3
Lake Coeur d' Alene	306.2	248.0	228.0	238.5

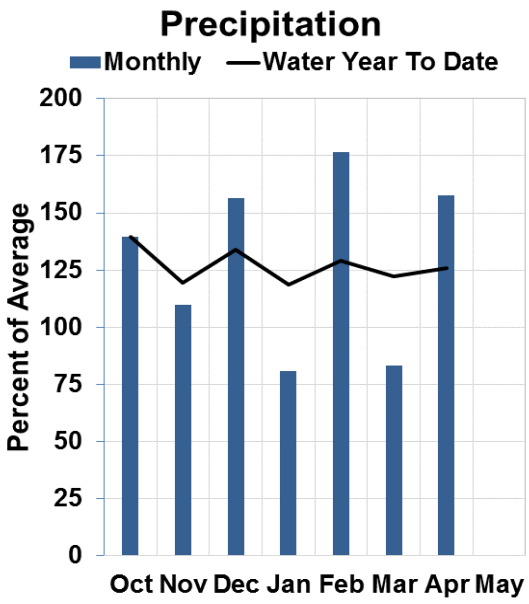
Watershed Snowpack Analysis: May 1, 2018

Basin Name	# of Sites	% of Median 2018	2017
Moyie River	7	203%	132%
Priest River	4	164%	124%
Rathdrum Creek	2	141%	100%
Coeur d' Alene River	6	149%	116%
St. Joe River	4	134%	116%
Spokane River	12	142%	114%
Palouse River	2	100%	297%
Kootenai ab Bonners Ferry	25	142%	121%

Clearwater River Basin

May 1, 2018





WATER SUPPLY OUTLOOK

April precipitation across the Clearwater basin was 161% of normal. These early April weather events allowed snowpack accumulation to continue through mid-month. The initiation of meltout was seen at higher elevation sites starting around April 18, but melt was slowed by cooler weather this past week. The May 1 snowpack in the Clearwater basin as a whole is 141% of normal.

Dworshak Reservoir is currently at 55% capacity and maintaining space for the higher than normal projected inflows. Streamflow forecasts for rivers in the Clearwater basin range from 129% of normal for Dworshak Reservoir Inflow to 135% of normal on the Selway and Lochsa rivers. A warmer than normal May is projected for the entire West. As temperatures rise this month, be sure to watch USGS current streamflow conditions, as well as the NWRFC short-term river forecasts for flood warnings as peak flows could be high. The above normal snow will provide an extended period of high flows and adequate water supplies.

Clearwater River Basin Streamflow Forecasts - May 1, 2018

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	MAY-JUL	1860	2010	2110	134%	2210	2350	1570
	MAY-SEP	1950	2110	2220	133%	2330	2500	1670
Lochsa R nr Lowell	MAY-JUL	1370	1470	1530	135%	1590	1680	1130
	MAY-SEP	1450	1550	1610	133%	1680	1780	1210
Dworshak Reservoir Inflow 2	MAY-JUL	1920	2130	2280	129%	2420	2630	1770
	MAY-SEP	2060	2290	2450	128%	2610	2840	1920
Clearwater R at Orofino	MAY-JUL	3950	4290	4530	133%	4760	5100	3400
	MAY-SEP	4170	4530	4790	132%	5040	5410	3630
Clearwater R at Spalding 2	MAY-JUL	5990	6520	6890	131%	7250	7780	5260
	MAY-SEP	6360	6930	7320	130%	7710	8280	5640

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%

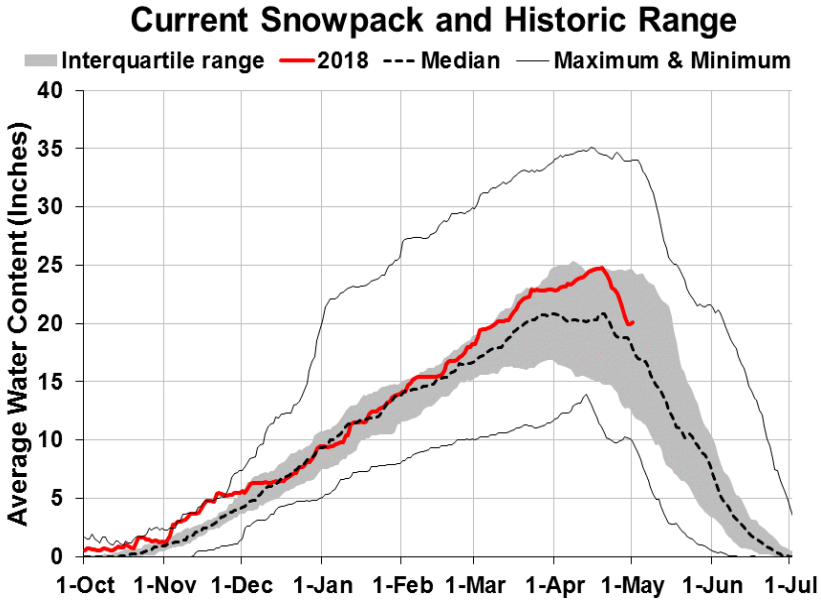
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

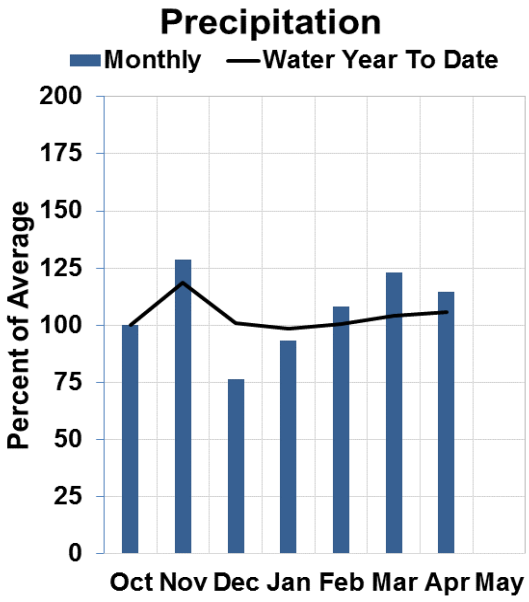
Reservoir Storage (KAF): End of April				
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	1895.8	2303.2	2646.0	3468.0

Watershed Snowpack Analysis: May 1, 2018			
Basin Name	# of Sites	% of Median 2018	2017
NF Clearwater River	8	135%	115%
Lochsa River	2	155%	125%
Selway River	4	162%	118%
Clearwater Basin Total	15	141%	117%

Salmon River Basin

May 1, 2018





WATER SUPPLY OUTLOOK

For the third straight month, monthly precipitation was above normal in the Salmon River basin, at about 120% of normal. Total precipitation since the water year began (Oct 1), is slightly above normal. The snowpack graph above illustrates that the Salmon basin snowpack reached its seasonal peak in mid-April, and began rapidly melting over the last 10 days of April. The seasonal peak was about 125% of the normal snowpack peak, so the stage has been set for plentiful snow-driven runoff. Much warmer than normal temperatures are expected for early May and even the entire month of May, which will likely continue the rapid progression of water phase change from solid to liquid (snowmelt).

Similar to last month, streamflow volume for the Salmon River along its main stem is forecast to be near normal. There is some forecast variability between sub-drainages; the median forecast for the MF Salmon is nearly 110% of average while the SF Salmon and Johnson Creek are ~85% of average. Widespread snowmelt began in late April, briefly slowed around May 1, and will rapidly increase again in May with warmer than normal temperatures expected for the short and long-term. The MF Salmon River crested around 8,000 CFS (6.0 ft) at the MF Lodge gage on April 29, and it's likely to come back up soon with warmer temperatures returning, suggesting we could see the snowmelt driven streamflow peak within the next 2 weeks. River runners are all but guaranteed a healthy whitewater season based on current snow conditions and water year precipitation.

Salmon River Streamflow Forecasts - May 1, 2018

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	MAY-JUL	530	625	690	101%	755	850	680
	MAY-SEP	620	735	815	101%	890	1010	805
Lemhi R nr Lemhi	MAY-JUL	40	53	61	100%	69	82	61
	MAY-SEP	53	66	76	100%	85	99	76
MF Salmon R at MF Lodge	MAY-JUL	530	600	645	108%	690	760	600
	MAY-SEP	600	675	730	108%	780	860	675
Sf Salmon R nr Krassel Ranger Station	MAY-JUL	142	171	191	85%	210	240	225
	MAY-SEP	152	184	205	84%	225	260	245
Johnson Ck at Yellow Pine Id	MAY-JUL	112	133	148	86%	163	184	172
	MAY-SEP	121	144	159	86%	175	198	184
Salmon R at White Bird	MAY-JUL	4140	4730	5120	110%	5520	6110	4660
	MAY-SEP	4620	5270	5720	110%	6160	6820	5220

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

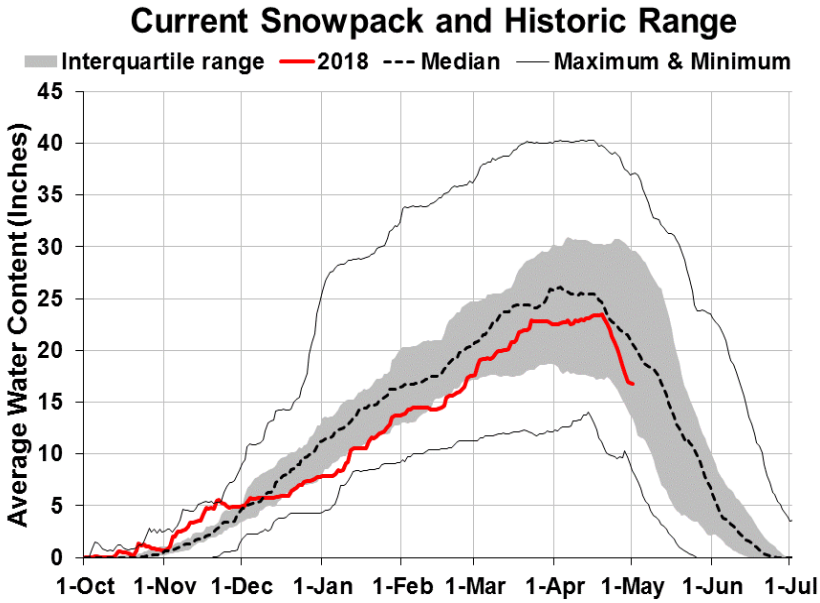
1) 90% and 10% exceedance probabilities are actually 95% and 5%

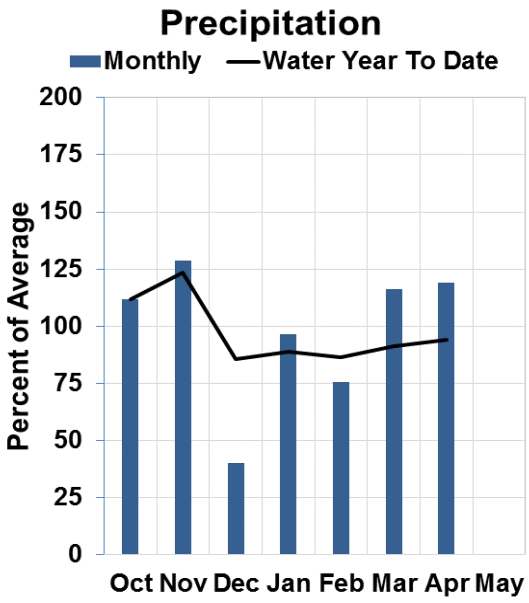
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis: May 1, 2018 Basin Name	# of Sites	% of Median 2018	2017
Salmon River ab Salmon	7	116%	198%
Lemhi River	7	130%	151%
MF Salmon River	3	103%	181%
SF Salmon River	3	91%	144%
Little Salmon River	4	75%	159%
Salmon Basin Total	24	110%	158%

West Central Basins

May 1, 2018





WATER SUPPLY OUTLOOK

Monthly precipitation was above normal across the West Central basins, with the Payette River drainage receiving the most at nearly 120% of normal. Water year (Oct. 1 through March 31) precipitation is about 95% of normal. Area wide, snowpack water content peaked in late April and rapidly began the melt process to end April. Currently, snowpack in the Payette basin is 79% of the normal, while the Boise basin is 67% and Weiser is 52%. Continued warmer than normal conditions are expected in May, meaning rapid snowmelt and rising streams will likely continue.

As has been the case since last fall, reservoirs continue to hold above average. The combined Boise system (Anderson Ranch + Arrowrock + Lucky Peak) is 91% full and 133% of average. The Payette system (Deadwood + Cascade) is 79% full and 111% of average. Forecasts range from approximately 70 to 85% of average for all points in the West Central basins, except Mores Creek which is only forecast at 62% of average for the May through July period. Even with a below seasonal snowpack and expected below average streamflow, shortages are not anticipated for users on the major projects in the West Central basins due in part to much above reservoir carryover from 2017.

West Central Basins Streamflow Forecasts - May 1, 2018

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	MAY-JUL	184	240	275	74%	310	365	370
	MAY-SEP	200	260	300	74%	340	400	405
Boise R nr Twin Springs	MAY-JUL	305	360	400	87%	440	495	460
	MAY-SEP	335	395	440	86%	485	545	510
Mores Ck nr Arrowrock Dam	MAY-JUL	22	33	42	62%	51	67	68
	MAY-SEP	24	36	45	63%	55	72	72
Boise R nr Boise 2	MAY-JUL	585	680	745	78%	810	905	950
	MAY-SEP	660	760	830	79%	900	1000	1050
Lake Fork Payette R nr McCall	MAY-JUL	46	52	56	80%	60	67	70
	MAY-SEP	47	54	58	79%	63	70	73
NF Payette R at Cascade 2	MAY-JUL	220	270	300	79%	330	380	380
	MAY-SEP	215	270	305	77%	340	395	395
NF Payette R nr Banks 2	MAY-JUL	255	320	360	76%	400	465	475
	MAY-SEP	255	325	370	75%	415	485	495
SF Payette R at Lowman	MAY-JUL	230	255	275	81%	295	325	340
	MAY-SEP	265	300	320	81%	345	380	395
Deadwood Reservoir Inflow 2	MAY-JUL	67	78	85	82%	92	103	104
	MAY-SEP	71	83	92	82%	101	113	112
Payette R nr Horseshoe Bend 2	MAY-JUL	760	870	945	81%	1020	1130	1160
	MAY-SEP	845	965	1050	80%	1130	1250	1310
Weiser R nr Weiser	MAY-JUL	97	138	170	72%	205	265	235
	MAY-SEP	107	150	183	69%	220	280	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 April

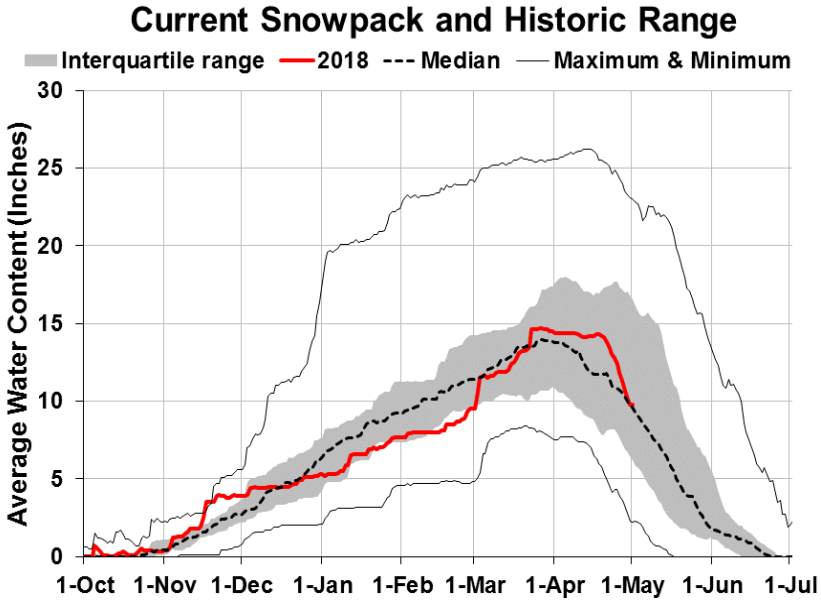
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	423.8	400.4	284.9	450.2
Arrowrock Reservoir	239.1	137.6	189.0	272.2
Lucky Peak Reservoir	259.3	187.0	219.8	293.2
Sub-Basin Total	**922.2**	**724.9**	**693.7**	**1015.6**
Deadwood Reservoir	127.6	126.3	105.1	161.9
Cascade Reservoir	546.1	455.1	501.5	693.2
Sub-Basin Total	**673.7**	**581.5**	**606.6**	**855.1**
Lake Lowell	152.0	154.3	125.6	165.2
Mann Creek Reservoir	10.9	10.4	10.7	11.1

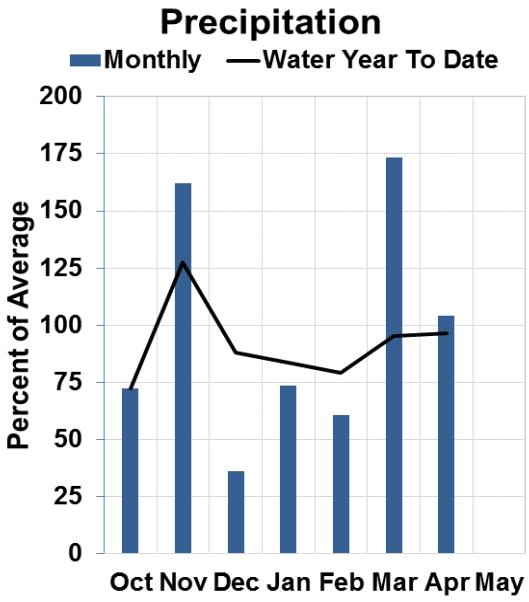
Watershed Snowpack Analysis: May 1, 2018

Basin Name	# of Sites	% of Median 2018	2017
SF Boise River	6	84%	188%
MF & NF Boise Rivers	6	67%	158%
Mores Creek	4	43%	130%
Canyon Creek	1		
Boise Basin Total	14	67%	163%
NF Payette River	8	75%	137%
SF Payette River	5	96%	187%
Payette Basin Total	15	79%	155%
Mann Creek	1	62%	198%
Weiser Basin Total	4	52%	182%

Wood & Lost River Basin

May 1, 2018





WATER SUPPLY OUTLOOK

April was the first relatively “normal” month this year in the Wood & Lost basins, with monthly precipitation at about 100% of normal. Even with the boom-or-bust monthly precipitation cycle outlined in the chart above, water year-to-date precipitation is near normal. The New Year began with a lack of impactful snow storms in this area, until significant storms occurred in late February and March. Resulting, snowpack conditions exceeded the normal seasonal peak in late March and early April. Peak conditions are now in the past, as rapid snowmelt began in late April and will likely continue in early May.

Mackay Reservoir is holding 90% of capacity (122% of average), Little Wood is 97% full (116% of average), and Magic is full and currently spilling excess inflows. Streamflow forecasts generally range from 65 to 80% of average, except for the Little Lost (104%) and Camas Creek near Blaine (27%). Above normal precipitation during March and April secured plentiful irrigation supplies for users in the Wood & Lost River drainages.

Wood and Lost Basins Streamflow Forecasts - May 1, 2018

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	MAY-JUL	9.1	17.2	23	92%	28	36	25
Little Lost R nr Howe	MAY-JUL	18.1	22	25	104%	27	31	24
	MAY-SEP	21	27	31	103%	35	41	30
Big Lost R at Howell Ranch	MAY-JUL	75	99	115	78%	131	155	148
	MAY-SEP	86	113	132	78%	150	178	169
Big Lost R bl Mackay Reservoir	MAY-JUL	39	63	80	72%	96	121	111
	MAY-SEP	54	84	104	75%	124	153	138
Little Wood R ab High Five Ck	MAY-JUL	14.2	27	36	69%	44	57	52
	MAY-SEP	16	30	40	69%	50	64	58
Little Wood R nr Carey 2	MAY-JUL	14.1	27	36	65%	45	59	55
	MAY-SEP	15.4	30	40	66%	50	65	61
Big Wood R at Hailey	MAY-JUL	120	147	166	81%	184	210	205
	MAY-SEP	136	168	190	81%	210	245	235
Big Wood R ab Magic Reservoir	MAY-JUL	38	78	105	71%	132	172	147
	MAY-SEP	41	85	115	72%	144	188	159
Camas Ck nr Blaine	MAY-JUL	1	4.9	9.3	27%	15	26	35
	MAY-SEP	1.12	5.2	9.7	27%	15.5	27	36
Big Wood R bl Magic Dam 2	MAY-JUL	52	96	126	72%	156	200	176
	MAY-SEP	59	106	138	72%	170	220	191

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%

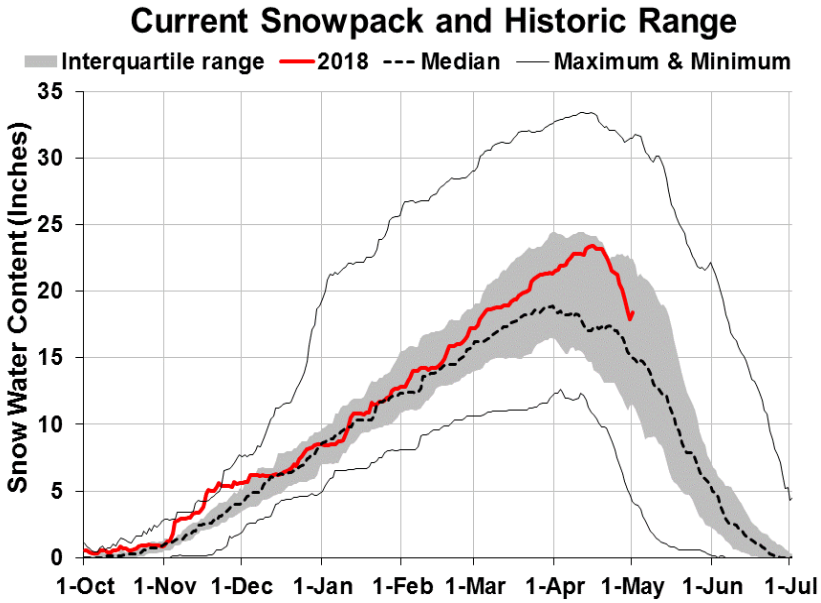
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

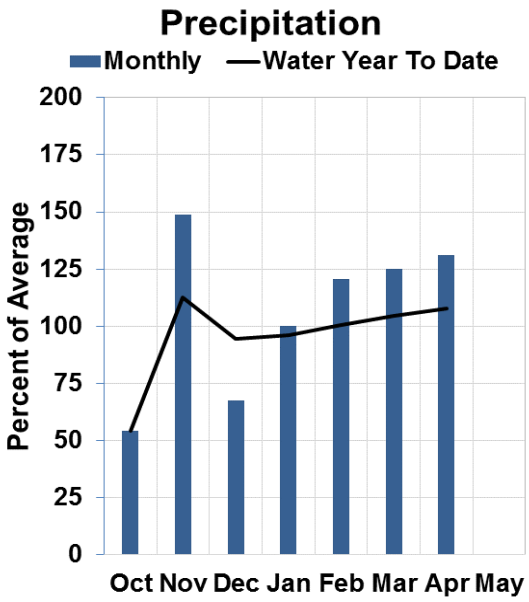
Reservoir Storage (KAF): End of April				
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Mackay Reservoir	39.9	16.6	32.8	44.4
Little Wood Reservoir	29.1	14.7	25.0	30.0
Magic Reservoir	191.1	181.5	128.0	191.5

Watershed Snowpack Analysis: May 1, 2018			
Basin Name	# of Sites	% of Median 2018	2017
Camas-Beaver Creeks	2	42%	83%
Birch-Medicine Lodge Creeks	2	130%	168%
Little Lost River	3	120%	184%
Big Lost River ab Mackay	4	84%	205%
Big Lost Basin Total	5	87%	198%
Fish Creek	0		
Little Wood River	3	65%	263%
Big Wood River ab Hailey	6	93%	215%
Camas Creek	3	12%	243%
Big Wood Basin Total	9	88%	216%

Upper Snake River Basin

May 1, 2018





WATER SUPPLY OUTLOOK

The majority of the Upper Snake River drainage has reached its maximum snowpack for this winter, except sites in the highest elevations in this region. The Upper Snake is 124% of normal snowpack, and 110% of normal precipitation, while the month of April brought 145% of normal precipitation. Lower elevation sites have lost significant amounts of snowpack, for example the Blackfoot River sites are almost snow free as of May 1 at 40% of normal.

The Upper Snake reservoir storage system is currently at 80% of capacity and 108% of average. Parts of the Henrys Fork experienced minor flooding as rivers were near flood stage as the lower elevation snow began to melt off in late April. The cool weather and recent snowstorm at the end of April has slowed runoff, but the NOAA Outlook for May suggests we can expect above average temperatures and precipitation, which may enhance snow melt rates and higher streamflow levels. Reservoir managers are releasing water from Jackson Lake (74% of capacity) and Palisades Reservoir (54% of capacity) to make room for the upcoming snow melt. American Falls Reservoir is near full at 97% of capacity. With 111% of normal runoff forecast for the mainstem Snake River near Heise and 110% forecast for the Henrys Fork near Rexburg, recreationists and irrigators can expect an ample run off season.

Upper Snake River Basin Streamflow Forecasts - May 1, 2018

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	MAY-JUL	340	405	450	108%	495	560	415
	MAY-SEP	510	590	645	108%	700	780	595
Falls R nr Ashton 2	MAY-JUL	295	330	355	113%	380	415	315
	MAY-SEP	365	410	440	114%	470	515	385
Teton R nr Driggs	MAY-JUL	122	142	155	116%	168	188	134
	MAY-SEP	160	184	200	116%	215	240	173
Teton R nr St Anthony	MAY-JUL	300	340	370	116%	400	440	320
	MAY-SEP	370	415	450	115%	485	530	390
Henrys Fk nr Rexburg 2	MAY-JUL	990	1160	1270	109%	1380	1550	1170
	MAY-SEP	1340	1560	1710	110%	1860	2080	1560
Snake R at Flagg Ranch	MAY-JUL	465	510	540	127%	570	615	425
	MAY-SEP	510	555	590	126%	625	670	470
Snake R nr Moran 2	MAY-JUL	750	820	865	124%	910	980	700
	MAY-SEP	820	900	955	123%	1010	1090	775
Pacific Ck at Moran	MAY-JUL	169	193	210	138%	225	250	152
	MAY-SEP	178	205	220	137%	240	265	161
Buffalo Fk ab Lava Ck nr Moran	MAY-JUL	315	340	360	136%	380	405	265
	MAY-SEP	365	395	415	136%	435	465	305
Snake R ab Reservoir nr Alpine 2	MAY-JUL	2190	2350	2460	126%	2570	2730	1960
	MAY-SEP	2540	2730	2850	125%	2970	3160	2280
Greys R ab Reservoir nr Alpine	MAY-JUL	255	280	295	111%	310	335	265
	MAY-SEP	295	325	345	110%	365	395	315
Salt R ab Reservoir nr Etna	MAY-JUL	160	200	230	94%	260	300	245
	MAY-SEP	210	255	290	94%	325	370	310
Snake R nr Irwin 2	MAY-JUL	2660	2920	3090	116%	3260	3520	2660
	MAY-SEP	3100	3400	3600	114%	3800	4100	3150
Snake R nr Heise 2	MAY-JUL	2720	2990	3170	112%	3350	3620	2840
	MAY-SEP	3240	3560	3770	111%	3980	4300	3390
Willow Ck nr Ririe 2	MAY-JUL	12.6	21	28	65%	36	49	43
Portneuf R at Topaz	MAY-JUL	22	30	35	70%	40	48	50
	MAY-SEP	29	40	47	70%	54	65	67
Snake R at Neeley 2	MAY-JUL	1210	1670	1980	94%	2290	2750	2100
	MAY-SEP	1220	1740	2100	93%	2460	2980	2260

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 April

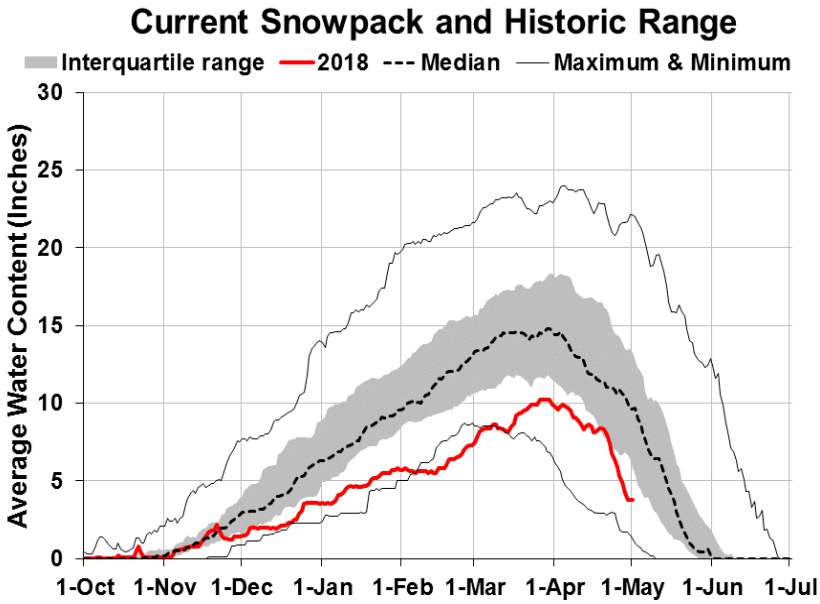
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Jackson Lake	625.6	462.2	445.7	847.0
Palisades Reservoir	762.4	335.8	911.7	1400.0
Sub-Basin Total	**1387.9**	**798.0**	**1357.4**	**2247.0**
Henrys Lake	85.3	88.4	83.5	90.4
Island Park Reservoir	122.0	128.8	123.8	135.2
Grassy Lake	14.4	13.3	12.8	15.2
Sub-Basin Total	**221.7**	**230.5**	**220.1**	**240.8**
Ririe Reservoir	80.6	74.9	58.7	80.5
Blackfoot Reservoir	337.0	317.8	211.3	337.0
American Falls Reservoir	1618.9	1604.1	1528.0	1672.6
Basin-Wide Total	**3646.1**	**3025.3**	**3375.5**	**4577.9**

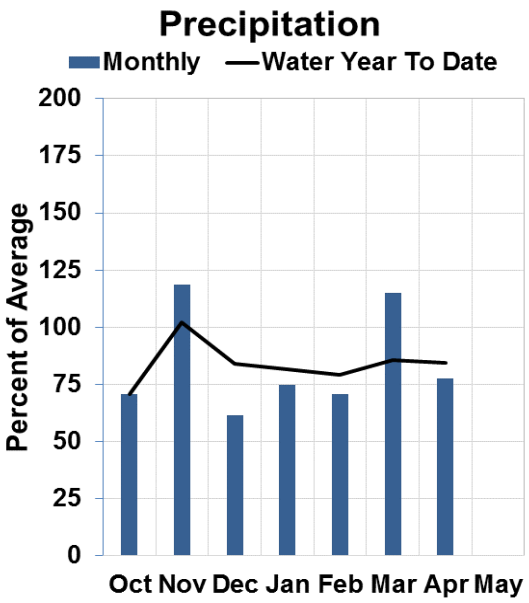
Watershed Snowpack Analysis: May 1, 2018

Basin Name	# of Sites	% of Median 2018	2017
Henrys Fork-Falls River	9	120%	139%
Teton River	8	110%	133%
Henrys Fork ab Rexburg	17	115%	136%
Snake River ab Jackson Lake	8	123%	155%
Pacific Creek	2	146%	194%
Buffalo Fork	2	145%	149%
Gros Ventre River	5	137%	161%
Hoback River	6	129%	215%
Greys River	4	134%	196%
Salt River	4	112%	200%
Snake ab Palisades Resv	26	124%	171%
Willow Creek - Ririe	7	97%	189%
Blackfoot River	3	40%	205%
Portneuf River	6	37%	185%
Snake River ab American Falls	44	116%	166%

Southside Snake River Basins

May 1, 2018





WATER SUPPLY OUTLOOK

What you see is what you get in these Southside Snake River basins. The rivers have likely peaked at very low flow levels or will in early May and start their return to low summer streamflow levels. April precipitation was the lowest in the state at only 60% of average in the Bruneau and Salmon Falls basins, increasing to 69% in Oakley, and 76% in the Owyhee basin. Water year-to-date precipitation remains the lowest in the state at 80% to 90% of average as the primary storm track was farther north. Only one site in the Owyhee basin has snow and overall this year's snowpack was eerily similar to the 2014 drought year. Snowpack in the Bruneau basin is 47% of median and also was very similar to the 2014 snowpack. At 41% and 28% of median, respectively, the Salmon Falls and Oakley snowpacks are even less than the dry 2014 year.

On the positive side, reservoir carryover storage from last year's abundant snowfall and runoff will provide adequate irrigation supplies in these basins. With 105,500 acre-feet in behind Salmon Falls Dam, and 110,000 acre-feet needed for adequate irrigation supplies, this year's runoff of 24,000 acre-feet for the May - September period will help provide some reservoir carryover storage for 2019. The same is true in the Owyhee basin where 575,000 acre-feet is need for an adequate supply and there is exactly 574,051 acre-feet in the reservoir. Oakley water users need 50,000 acre-feet and the reservoir is currently storing 42,437 acre-feet with 9,600 acre-feet projected for the May-September period.

Southside Snake River Basins Streamflow Forecasts - May 1, 2018

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	MAY-JUL	1.54	3.5	5.3	40%	7.4	11.3	13.2
	MAY-SEP	1.82	4	6	41%	8.4	12.6	14.5
Trapper Ck nr Oakley	MAY-JUL	1.7	2.2	2.5	68%	2.8	3.4	3.7
	MAY-SEP	2.6	3.2	3.6	73%	4	4.7	4.9
Oakley Reservoir Inflow	MAY-JUL	3.1	5.6	7.8	46%	10.3	14.6	16.9
	MAY-SEP	4.2	7.2	9.6	49%	12.4	17.1	19.4
Salmon Falls Ck nr San Jacinto	MAY-JUL	3.5	14.2	21	43%	29	39	49
	MAY-SEP	6	16.9	24	45%	32	43	53
Bruneau R nr Hot Spring	MAY-JUL	28	61	82	59%	104	136	140
	MAY-SEP	32	66	89	60%	111	145	148
Reynolds Ck at Tollgate	MAY-JUL	0.32	1.43	2.2	43%	2.9	4	5.1
Owyhee R nr Gold Ck 2	MAY-JUL	0	0.34	1.21	13%	2.6	5.7	9.6
Owyhee R nr Rome	MAY-JUL	12.8	40	66	35%	100	162	188
	MAY-SEP	19.7	50	79	39%	115	179	205
Owyhee R bl Owyhee Dam 2	MAY-JUL	24	57	87	41%	124	191	210
	MAY-SEP	41	80	114	48%	154	225	240
Snake R bl Lower Granite Dam 1								

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%

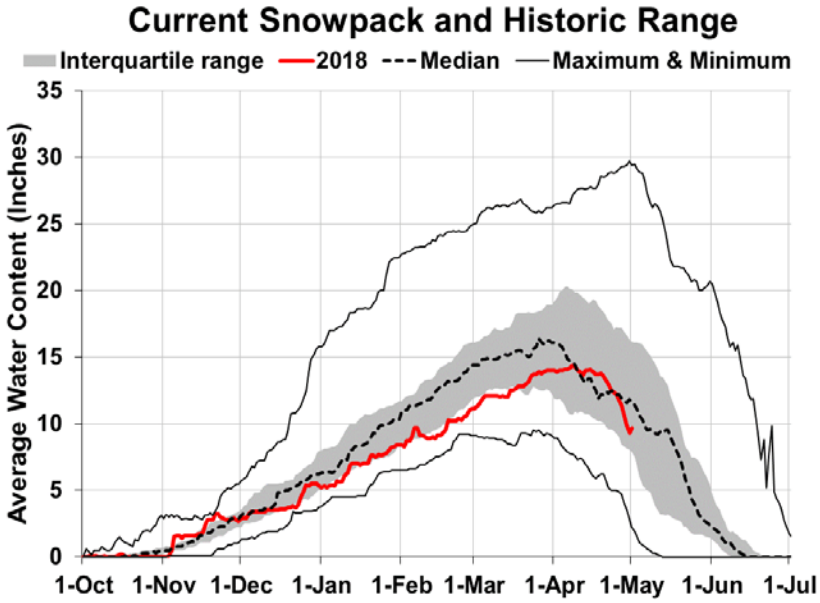
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

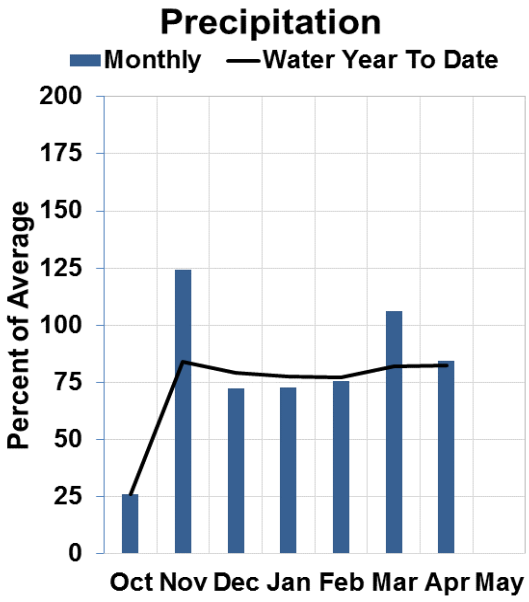
Reservoir Storage (KAF): End of April				
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Oakley Reservoir	42.4	56.9	34.3	75.6
Salmon Falls Reservoir	105.5	146.2	71.6	182.6
Wild Horse Reservoir	68.7	73.1	49.4	71.5
Lake Owyhee	574.1	713.5	533.1	715.0
Brownlee Reservoir	846.9	713.2	1161.0	1420.0

Watershed Snowpack Analysis: May 1, 2018			
Basin Name	# of Sites	% of Median 2018	2017
Raft River	1	84%	199%
Goose-Trapper Creeks	2	28%	173%
Salmon Falls Creek	5	41%	143%
Bruneau River	5	47%	145%
Reynolds Creek	1		
Owyhee Basin Total	8	15%	119%
Owyhee Basin Snotel Total	8	15%	119%

Bear River Basin

May 1, 2018





WATER SUPPLY OUTLOOK

The Bear River snowpack is currently 69% of normal and precipitation in the region is 86% of normal, receiving 97% of average precipitation during the month of April. Montpelier Creek and Smith and Thomas Forks currently hold the only near normal snowpack in the drainage, the lowest snowpack is in Mink Creek at 41% of normal. Mink Creek did receive 108% of normal precipitation in April. The rest of the region received near normal precipitation in April, which will bolster the much needed runoff lacking from snowmelt.

Bear Lake is currently at 79% capacity and 158% of average. As mentioned previously, Bear Lake will mitigate the effects of a low snow year with snowmelt stored from last year's runoff. Bear Lake almost filled completely after last year's snowmelt, an event that doesn't happen often; the most recent occurrence was in 2011 when the lake filled to 88% of capacity. Natural flow forecasts in the Bear River drainage range from 40% to 90% of normal. The reservoir water users will have an ample supply this summer while natural streamflow irrigators would benefit from additional precipitation.

Bear River Basin Streamflow Forecasts - May 1, 2018

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	47	60	69	62%	78	91	112
	APR-SEP	52	66	76	62%	86	101	123
	MAY-JUL	44	57	65	63%	73	85	104
Bear R ab Resv nr Woodruff	APR-JUL	13.3	45	67	55%	89	121	121
	APR-SEP	10	45	69	54%	93	128	128
	MAY-JUL	7.4	37	57	54%	77	107	105
Big Ck nr Randolph	APR-JUL	0.11	0.87	2.1	55%	3.3	5.1	3.8
	MAY-JUL	0.12	0.5	1.58	51%	2.7	4.2	3.1
Smiths Fk nr Border	APR-JUL	63	73	80	90%	87	97	89
	APR-SEP	74	86	94	90%	102	114	104
	MAY-JUL	54	64	71	89%	78	88	80
Bear R bl Stewart Dam 2	APR-JUL	54	100	132	72%	164	210	183
	APR-SEP	61	114	150	73%	186	240	205
	MAY-JUL	27	72	102	70%	132	177	146
Little Bear at Paradise	APR-JUL	7.2	14.5	19.5	43%	24	32	45
	MAY-JUL	1.28	7.1	12	38%	17	24	32
Logan R nr Logan	APR-JUL	60	72	80	72%	88	100	111
	MAY-JUL	47	59	67	70%	75	87	96
Blacksmith Fk nr Hyrum	APR-JUL	13.3	24	31	72%	38	49	43
	MAY-JUL	6.1	16	23	74%	29	39	31

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 April				
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Bear Lake	1027.1	883.3	651.7	1302.0
Montpelier Reservoir	3.3	2.2	2.7	4.0

Watershed Snowpack Analysis: May 1, 2018			
Basin Name	# of Sites	% of Median 2018	2017
Smiths-Thomas Forks	4	93%	193%
Bear River ab WY-ID Line	10	66%	182%
Montpelier Creek	2	102%	172%
Mink Creek	1	41%	142%
Cub River	1	87%	180%
Bear River ab ID-UT Line	18	69%	181%
Malad River	1		

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 <u>does not include</u> 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 <u>includes</u> 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

<u>Southside Snake River Basins</u>
Goose Ck nr Oakley - no adjustments
Trapper Ck nr Oakley - no adjustments
Oakley Res Inflow - *<u>flow does not include</u> 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

<u>Bear River Basin</u>
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

<u>Reservoir Capacity Definitions</u> (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
<u>Panhandle Region</u>						
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
<u>Clearwater Basin</u>						
Dworshak	Unknown	**1452.00**	**2016.00**	**---**	**3468.0**	Inactive + Active
<u>West Central Basins</u>						
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
<u>Wood and Lost Basins</u>						
Mackay	0.13	---	**44.37**	**---**	**44.4**	Active
Little Wood	Unknown	---	**30.00**	**---**	**30.0**	Active
Magic	Unknown	---	**191.50**	**---**	**191.5**	Active
<u>Upper Snake Basin</u>						
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
<u>Southside Snake Basins</u>						
Oakley	0.00	---	**75.60**	**---**	**75.6**	Active
Salmon Falls	48.00	**5.00**	**182.65**	**---**	**182.6**	Active
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
<u>Bear River Basin</u>						
Bear Lake	5000.00	119.00	**1302.00**	**---**	**1302.0**	Active:
Capacity does not include 119 KAF that can be 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 72 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

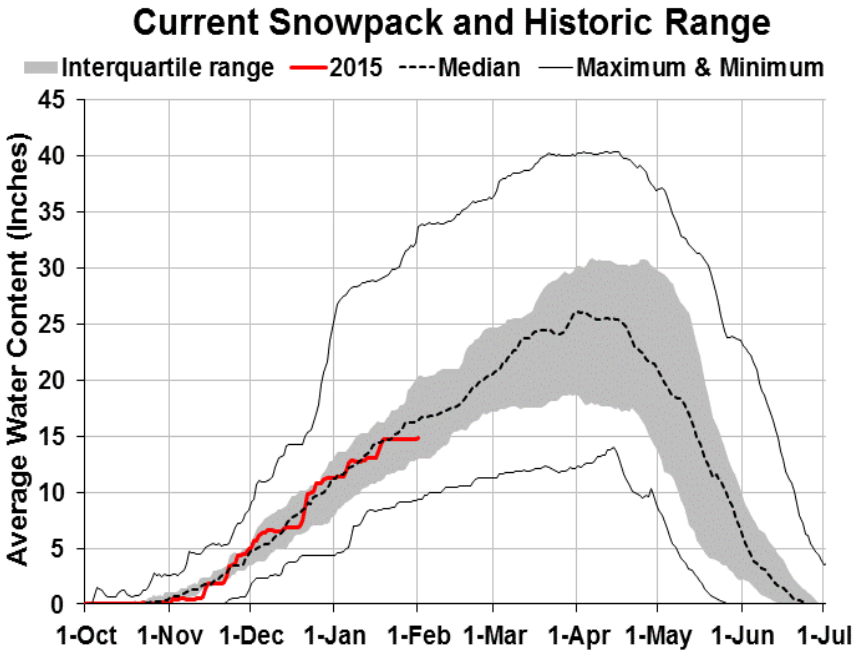
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

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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