United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

June 1, 2017

“Springtime in Idaho”

In the picture above, a farmer works the fields near Driggs, Idaho on May 19, 2017, between May storm events that brought rain to Idaho’s valleys and snow to the mountains. Grand Targhee Resort is in the background. There is still plenty of snow to melt in the high country which will keep streamflows above normal through the summer months.

Keep in mind that every one percent of organic matter in the soil can add another inch of water holding capacity within the soil profile. Soil makes up part of the unsaturated zone (vadose zone), which is the space between the ground surface and water table. This sometimes forgotten reservoir of water can temporarily store and release large quantities of water to aquifers, streams, and lakes.

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, 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.

IDAHO WATER SUPPLY OUTLOOK REPORT

June 1, 2017

SUMMARY

May's yoyo-like temperatures brought periodic cold fronts that slowed down the melting of Idaho's abundant mountain snowpack. This produced multiple streamflow peaks during May, and eased the pressure from high flows as communities prepared for high runoff. Just when the higher elevation snow sites were melting two inches of snow water a day, a cold front would come into Idaho, slowing the melting process and even adding more snow water in the higher elevations in mid-May. In addition, May precipitation was also kind to Idaho by being below normal across the state. A few areas, such as the Upper Snake, only received half their normal May amounts. Currently, many reservoirs are full or close to filling. A solid snowpack still exists above 8,000 feet in the central mountains, and in many basins the remaining high elevation snowpack is more than twice normal. Residual streamflow forecasts call for average or greater June to July volumes across the state. Some of the highest forecasts are 150 to 250% of average for those streams with their headwaters in Idaho's central mountains - SF Payette, Boise, MF Salmon, Salmon, Big Wood, Little Wood and Big Lost. Some streams, like the Big Lost River, may see their streamflow peak in early June, while others such as the Teton River in the Upper Snake will not peak until mid-June. An unseasonably strong cold front is expected the second weekend in June, which will slow the current melt down again but also has the potential for moderate rain and even high elevation snow. Water users, managers, river runners, and concerned public will want to keep watching the weather, snowmelt rates, and river levels until we are assured the high water season is behind us and the dry summer season is here.

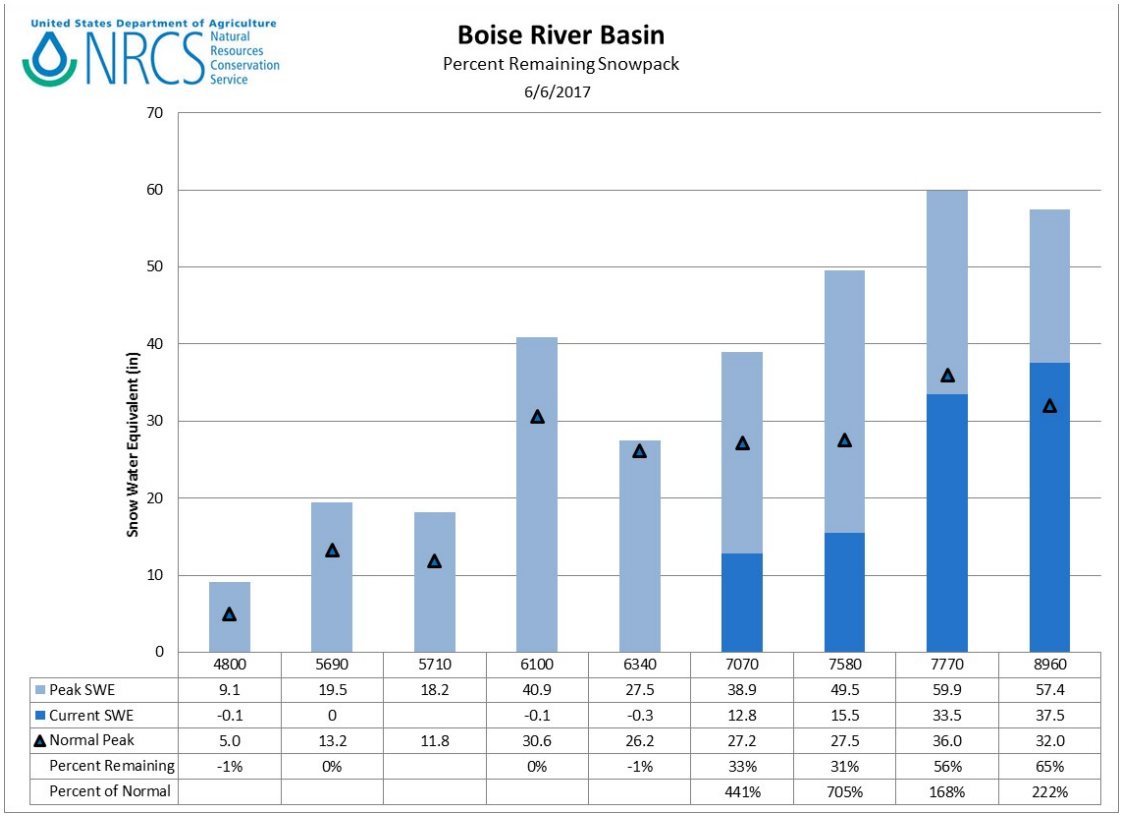
SNOWPACK

This time of the year snowpack percentages can be misleading. Comparing the abundant well above median snow water content amounts with their 30 year "normals" during the melt phase can result in unusually large percentages. Take, for example, Galena SNOTEL site in Central Idaho; the 30 year "normal" for June 1st is 0.5" of SWE, and on June 1, 2017 Galena SNOTEL reported 9.9" of SWE, suggesting the current snowpack is 1,980% of normal! Statistically, this is accurate, but it's simply a reflection of the much larger than normal 2017 snowpack taking longer than normal to melt. Why is it taking longer to melt the 2017 snowpack than normal? Well, all else being equal, it comes down to thermodynamics. A larger than normal snowpack (more mass) requires greater than normal energy inputs to start and continue melting. Overall, most basins are showing snowpack percentages in the 150 to 300% of median range in early June, so use caution using percentages in your decision making role. It might be more useful to look at the actual inches of snow water that remains at a site or in a basin and compare those amounts to other big years. June 1 snow indexes allow you to do this on the **Historical Snow Indexes and Snow Graphs for Idaho Basins** page.

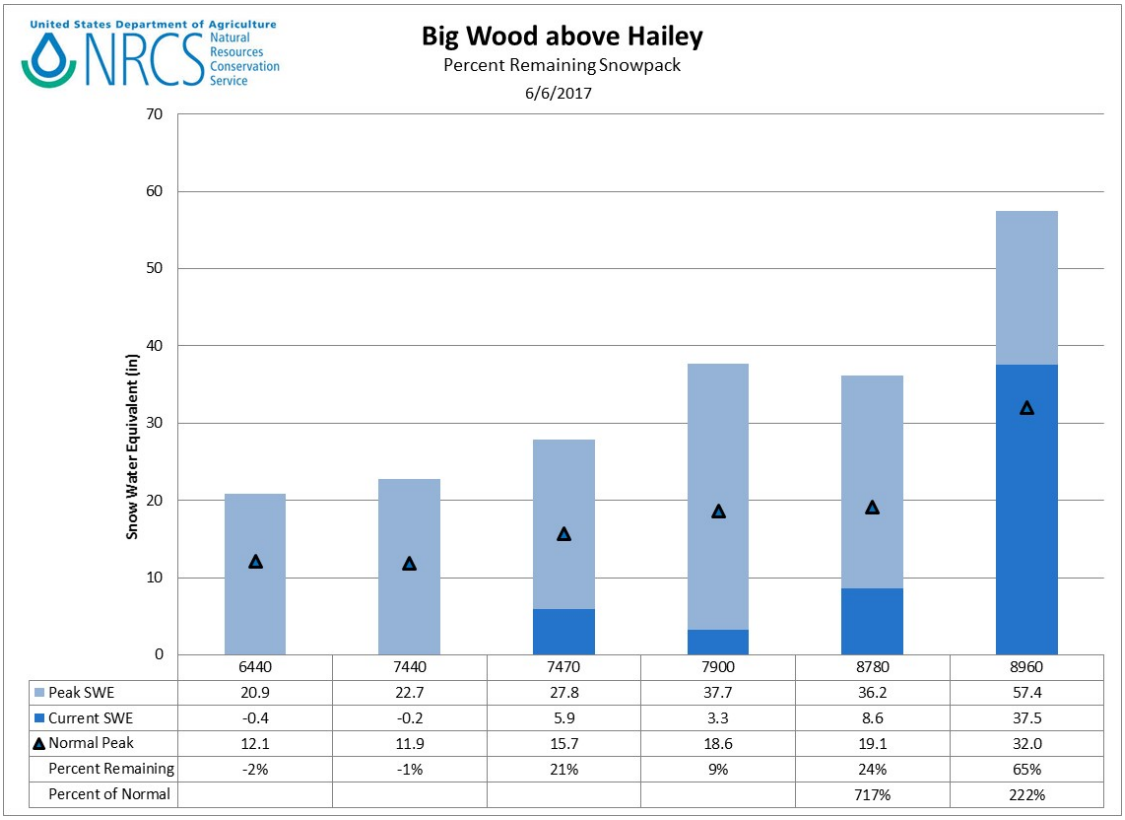
It may also be helpful to look at the remaining SWE compared to the seasonal peak at individual sites. Below are a couple of products that we hope to implement next year. The graphical display of Percent Remaining Snowpack for the Boise and Big Wood basins are presented by SNOTEL site elevation on the x-axis.

Monitoring the receding snowline elevation is another way to monitor how much snow remains in the basin to melt. Two helicopter snowline flights were flown by the NRCS Idaho Snow Survey in collaboration with the U.S. Army Corps of Engineers and Bureau of Reclamation to monitor and verify the amount of snow covered area in the Boise basin. There have been many reports of massive cornices in Idaho's central mountains and probably elsewhere as a result of the abundant snowfall

and higher wind speeds this winter. Huge cornices were observed above Vienna Mine SNOTEL site (8,960 feet) and can be seen from Banner Summit and Galena Summit highway passes. These drifts and cornices will keep streams high this summer and make it a challenge to access Idaho's backcountry until more snow melts.



	4800	5690	5710	6100	6340	7070	7580	7770	8960
Peak SWE	9.1	19.5	18.2	40.9	27.5	38.9	49.5	59.9	57.4
Current SWE	-0.1	0		-0.1	-0.3	12.8	15.5	33.5	37.5
Normal Peak	5.0	13.2	11.8	30.6	26.2	27.2	27.5	36.0	32.0
Percent Remaining	-1%	0%		0%	-1%	33%	31%	56%	65%
Percent of Normal						441%	705%	168%	222%



	6440	7440	7470	7900	8780	8960
Peak SWE	20.9	22.7	27.8	37.7	36.2	57.4
Current SWE	-0.4	-0.2	5.9	3.3	8.6	37.5
Normal Peak	12.1	11.9	15.7	18.6	19.1	32.0
Percent Remaining	-2%	-1%	21%	9%	24%	65%
Percent of Normal					717%	222%

PRECIPITATION

May precipitation was below normal across the state and may have kept many streams from flowing even higher. May precipitation ranged from 45 to 90% of average across the state with the highest amount in the Big Wood basin and lowest in the Upper Snake. Last November was the only other month in this water year when the whole state received below normal monthly precipitation. The stage was set for high flows during most of May with a ripe and melting snowpack and saturated soils. An intense rain event or one that lasts several days could have raised the rivers to even higher levels in May and still could in early June due to the high elevation snow that still remains. As we move into June, even though the longer days are able to melt more snow, the likelihood of intense rain driven events is nearly behind us as the snow covered area in each basin recedes. This threat has already passed in Idaho's high desert river basins, and future runoff will be from rain rather than the remaining winter snowfall.

Water year-to-date precipitation is above normal across the state ranging from a low of 127% of average in the Spokane and Salmon Falls basins to 170% in Little Wood and Big Lost basins. Also amazing is that the whole state, with the exception of the Mud Lake area, has already received its annual precipitation for the water year that runs from October to September. You can probably guess the basins that are leading the way – the Boise, Big Wood and Little Wood basins, all of which have already received 135 to 140% of their annual precipitation amounts.

RESERVOIRS

Idaho's reservoirs are the exciting place to be now. Spillways that have not been used in years or at least since 2011 were opened up while others, like in the Boise reservoir system have been releasing water since mid-February to make room for this winter's snowmelt. The good news is that all major reservoirs and lakes in Idaho will fill this year. The only exceptions are Salmon Falls and Oakley reservoirs which don't typically fill. The question now being asked is "When will final fill occur?" The final fill for most reservoirs is completed after the snowmelt streamflow peaks have occurred. The up and down temperatures Idaho experienced in May are actually ideal for melting a big snowpack by creating multiple streamflow peaks, but also are keeping reservoir operators on their toes. They want to ensure refill occurs but don't want to top off the reservoirs too early in case another rain event or hot spell occurs that would push more water downstream and overfill the reservoirs.

Here is a recap of the reservoir situation across the state from north to south. The natural lakes and water storage facilities in Idaho's Panhandle Region will fill; if you find one that doesn't, let us know. Dworshak Reservoir is 89% full with final fill projected in mid to late June after the streams decrease more from the early June peaks. The Payette reservoirs will fill in June and provide excellent river running opportunities throughout the summer. The Boise reservoir system is 90% full and all eyes are on the remaining snowpack to see how it melts. Operators will attempt to determine just the right time to close the gates and complete final fill of the reservoirs. Magic Reservoir has been passing inflows since Camas Creek filled the reservoir in March. The reservoir is currently 98% full as the Big Wood River reaches another near record high peak in early June. Little Wood Reservoir has been releasing water since February 1 and is 87% full and can complete final fill any day with inflows above average at 1,000 cfs since early May. Rumors from the locals in these central mountains are that springs are flowing that have been dry for several years. This will keep baseflows up and help to rejuvenate the water supply in Silver Creek and other spring fed regions. Mackay Reservoir is 58% full and increasing in storage after making releases since mid-February. Inflows at the Big Lost River at the Howell Ranch gage are over 4,000 cfs in early June with the peak flows still several days out based on the snowmelt relationship at Lost-Wood and Smiley Mountain SNOTEL sites.

In the Upper Snake basin, the Henrys, Island Park, Grassy, Ririe, Blackfoot and American Falls reservoirs are nearly full. On the mainstem Snake River, Jackson Lake is 80% full, 1111% of average, and Palisades Reservoir is 59% full, 80% of average because of flood control responsibility. With just 750,000 acre-feet needed to fill these two reservoirs, the inflow at the Snake River near Alpine above Palisades Reservoir is forecast at 183% of average, 2,340,000 acre-feet for the June-July period, so there will be plenty of water to top them off when the operators determine the time is right.

Across southern Idaho, the Owyhee River near Rome has been above average since mid-February and provided enough runoff to fill Owyhee Reservoir. Owyhee Reservoir is full and passing inflows; it is interesting to watch and learn from the Owyhee basin as the river has been so high for so long even with a March 1 snowpack of only 138% of average. It is probably a result of the abundant precipitation and October rains that are still feeding the streams. ***There is reason to expect this scenario may happen in other basins as well.*** Wild Horse Reservoir is full. Releases were made from Salmon Falls Reservoir in May and have since ceased with the increase in irrigation demand and with the snowmelt streamflow peak now past. Current storage is 89% of a capacity, 197% of average and the highest May 31st storage since 1984. Releases were made the past few months from Oakley Reservoir and have ceased as inflows decreased and irrigation demand increased. The reservoir is 80% full, 162% of average and the highest since 1999. Bear Lake is 83% full, 152% of average and highest storage since 2011. Montpelier Reservoir, has also been releasing water, and is in good shape at 78% full, 91% of average.

Now, with a good runoff year nearly behind us, and reservoirs soon to be topped off, many users will start looking at the reservoir carryover storage for next year. It is likely to be good in the Owyhee, Salmon Falls, Oakley, Bear and Little Wood; which almost guarantees a good water supply next year even if snowfall is below normal. Other basins will probably have good carryover storage as well, but the carryover and summer irrigation demand is more dependent upon how hot and wet the summer is. Some eyes will be watching the Pacific Ocean to see if the potential El Nino will continue developing and how it may influence the upcoming winter. Here is an old but interesting summary of the relationships and lag between what happens in the Pacific Ocean and our winter snowfall and summer streamflow. Southern Oscillation Index Statistical Correlation with Spring Runoff in the Western US

STREAMFLOW

Residual streamflow volumes across the state for the June to July and June to September periods can be split into major categories. Rivers are projected at 100 to 125% of average in the Clearwater basin and Panhandle Region. The NF Coeur d'Alene River has the lowest forecast in the state at 99% of average. The Clearwater streams are forecast at 100 to110% of average, while the Panhandle rivers are projected at 110 to 125% of average for most points.

Expect more of the same for the rest of the state. Numerous streams have and may continue to set new daily high flow levels this year. Residual volumes may not set records unless it really turns wet in June, but volumes are forecast at the 2nd or 3rd highest volumes since 1981 as displayed in the Surface Water Supply Index (SWSI) tables. Residual volumes are forecast at 150 to 300% of average from the Salmon to the Owyhee and across to the Bear and Upper Snake and in Idaho's west-central and central mountains. With the ground still saturated from last October's record high rains and winter precipitation, springs are flowing again in the central mountains. Record high snowpacks in the central mountains and huge cornices are still waiting to melt, and those will keep streams above average throughout most of the state this summer.

Rivers that have peaked and are in full recession include: Owyhee, Bruneau, Salmon Falls, and Goose drainages. You can see those levels in the streamflow graphs on this page: Peak Streamflow

Information. In these basins, the snowmelt feeding the streams has run out and cannot produce enough water to sustain the previous day's flows.

Peak flows in few basin are still a few days away in Big Lost River based on melt at Lost Wood Divide SNOTEL or further out in the Teton River based on the snowmelt relationships with Phillips Bench SNOTEL and Grand Targhee SNOTEL sites. In other drainages – SF Boise, MF Salmon, Salmon, Lochsa and Selway rivers, the snowmelt peak flows have probably occurred or will this week with temperatures pushing 100 F in Boise followed a potential major cool down in early June. This will result in additional streamflow peaks when temperatures rebound to melt the remaining high elevation snow. The intensity of future rains will determine the how high these rivers rise again as their headwaters are in Idaho's central mountains. As we try to estimate future streamflow scenarios, please remember that Mother Nature bats last and she can be a switch hitter.

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.

DAY OF ALLOCATION

Below is a summary of the Day of Allocation (DOA) that USDA-Natural Resources Conservation Service and Boise State University is collaborating on to help water users. The DOA is the date that natural streamflow decreases below irrigation demand, and the deficit is supplied by reservoirs. The DOA is based on peak snow water equivalent values, and amount of melt that occurs in April, May or June.

2017 Day of Allocation Predictions

- Boise River
  - July 6 +/- 8 days (50% confidence) — Average DOA = June 20
  - July 6 +/- 19 days (90% confidence)
- Payette River
  - July 11 +/- 12 days (50% confidence) — Average DOA = July 10
  - July 11 +/- 32 days (90% confidence)
- Upper Snake River
  - June 27 +/- 15 days (50% confidence) — Average DOA = June 26
  - June 27 +/- 37 days(90% confidence)

RECREATION

Three things are certain this year:

1) There will be an extended high water season,
2) The streamflow peaks are likely to be big, and
3) There will be a long streamflow recession season for all to enjoy after the snowmelt streamflow peaks have passed.

So be patient, keep an eye on the sky, check the weather for changing conditions, and know your boating skills and boating limits. This article sums up the current river running conditions better than we can: **Big snow becomes epic whitewater for Idaho's boaters — and it's not going away**, by Steve Stuebner, Special to the Idaho Statesman

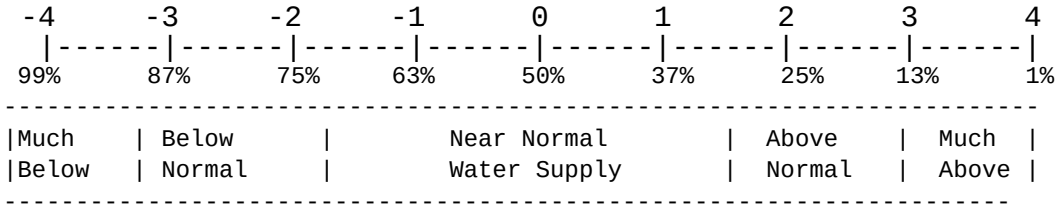
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) June 1, 2017

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.

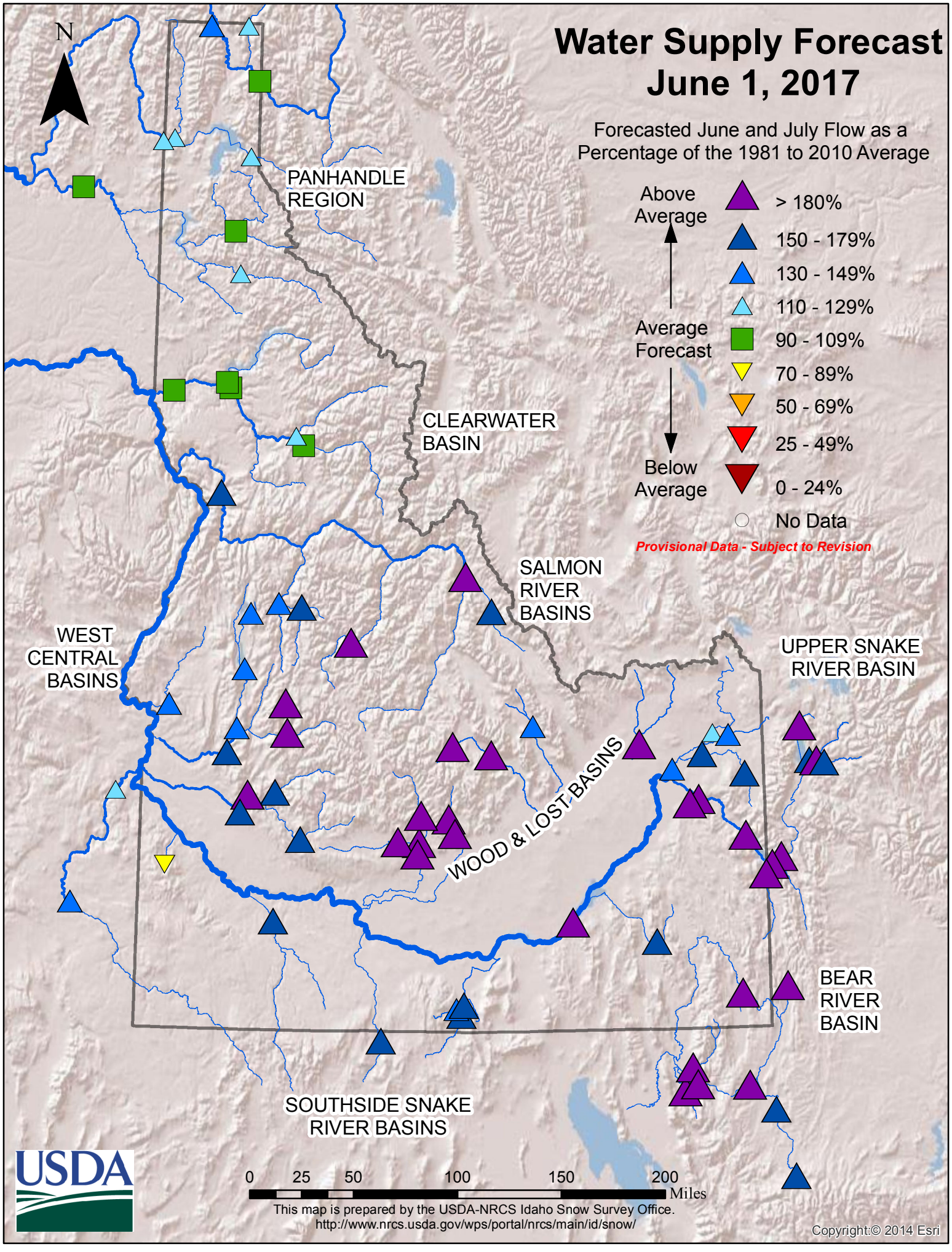
SWSI values provide a more comprehensive outlook of water availability by combining streamflow forecasts and reservoir storage where appropriate. The SWSI index allows comparison of water availability between basins for drought or flood severity analysis. Threshold SWSI values have been determined for 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	**0.9**	**1983/96**	**NA**
Clearwater	**0.2**	**1993**	**NA**
Salmon	**2.9**	**1996**	**NA**
Weiser	**2.3**	**1993**	**NA**
Payette	**2.9**	**1996/97**	**NA**
Boise	**3.6**	**1982/84**	**-2.4**
Big Wood	**3.6**	**1995**	**-0.6**
Little Wood	**3.6**	**1983**	**-1.7**
Big Lost	**3.3**	**1982/83**	**0.6**
Little Lost	**2.7**	**1998/99**	**1.2**
Teton	**3.2**	**1982**	**-3.9**
Henrys Fork	**3.4**	**1998/99**	**-2.4**
Snake (Heise)	**3.6**	**2011**	**-1.5**
Oakley	**3.0**	**2006**	**-0.8**
Salmon Falls	**3.8**	**2011**	**-0.8**
Bruneau	**2.9**	**1982/98**	**NA**
Owyhee	**3.1**	**1995/98**	**-2.6**
Bear River	**3.4**	**1984/98**	**-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.


N
Water Supply Forecast
June 1, 2017
Forecasted June and 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
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http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/
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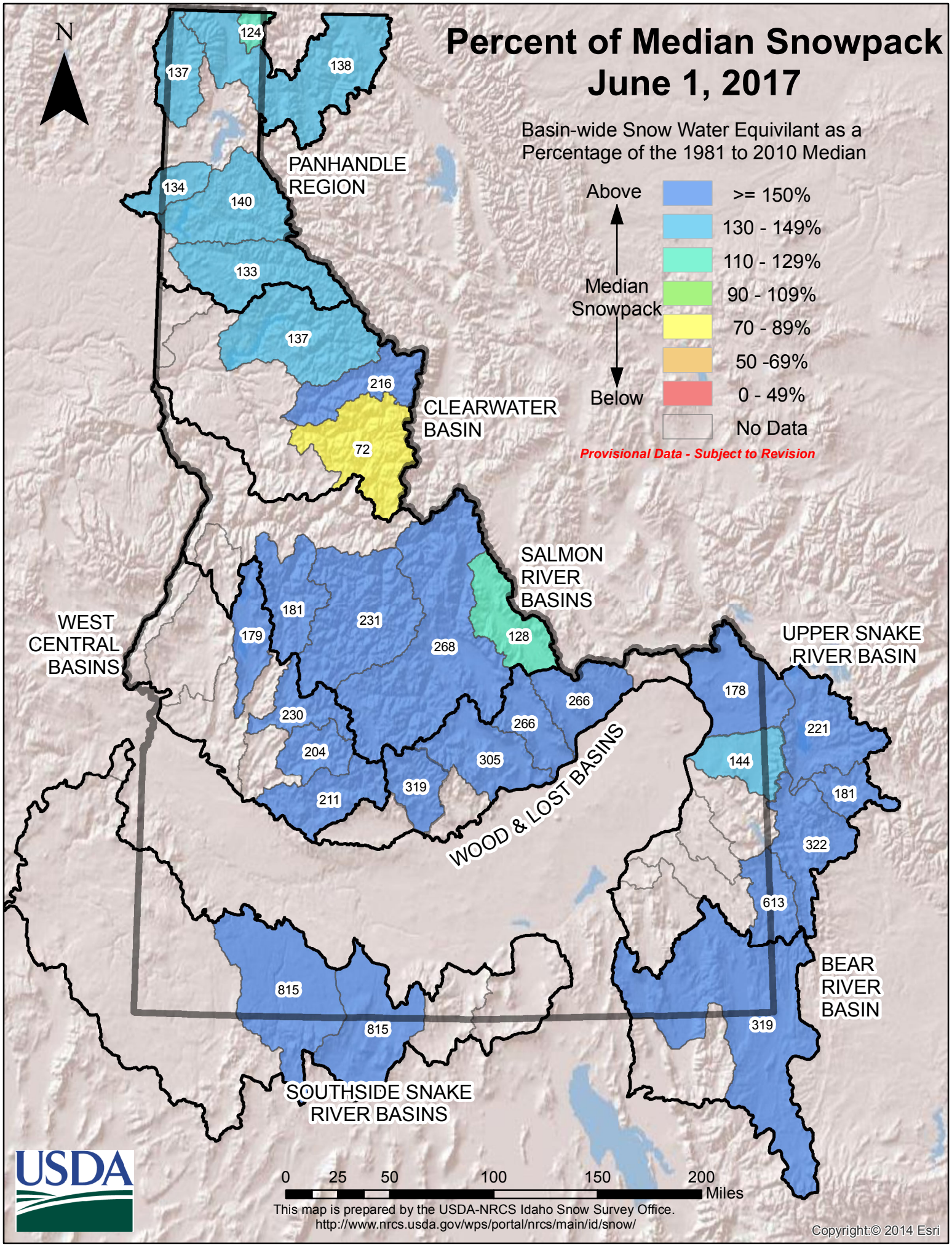
Percent of Median Snowpack
June 1, 2017
Basin-wide Snow Water Equivilant as a Percentage of the 1981 to 2010 Median
Above
Median Snowpack
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
N
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
WOOD & LOST BASINS
UPPER SNAKE RIVER BASIN
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
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138
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72
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231
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211
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613
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0 25 50 100 150 200
Miles
USDA
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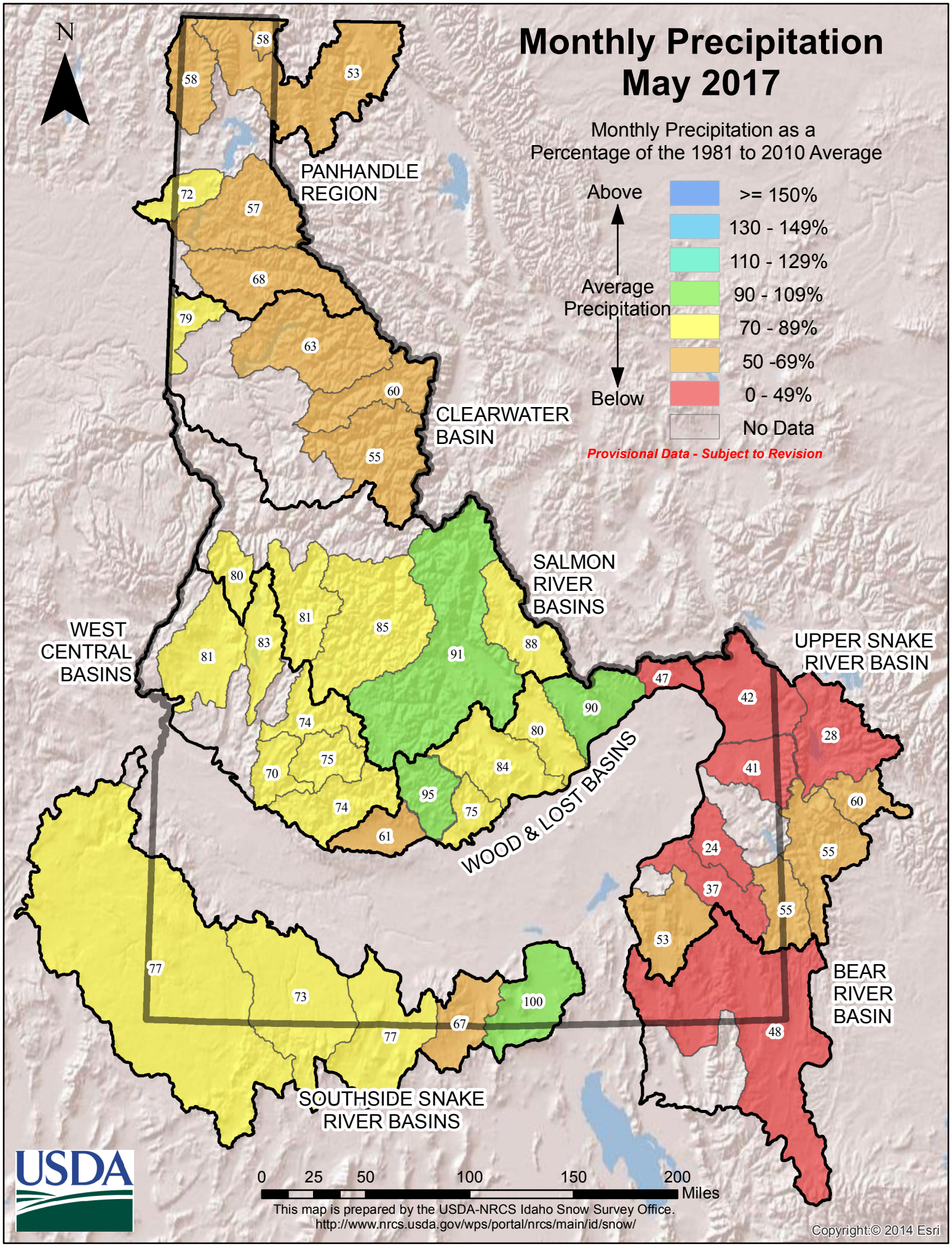
Monthly Precipitation
May 2017
Monthly Precipitation as a
Percentage of the 1981 to 2010 Average
Above
Average Precipitation
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
N
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
UPPER SNAKE RIVER BASIN
WOOD & LOST BASINS
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
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Miles
USDA
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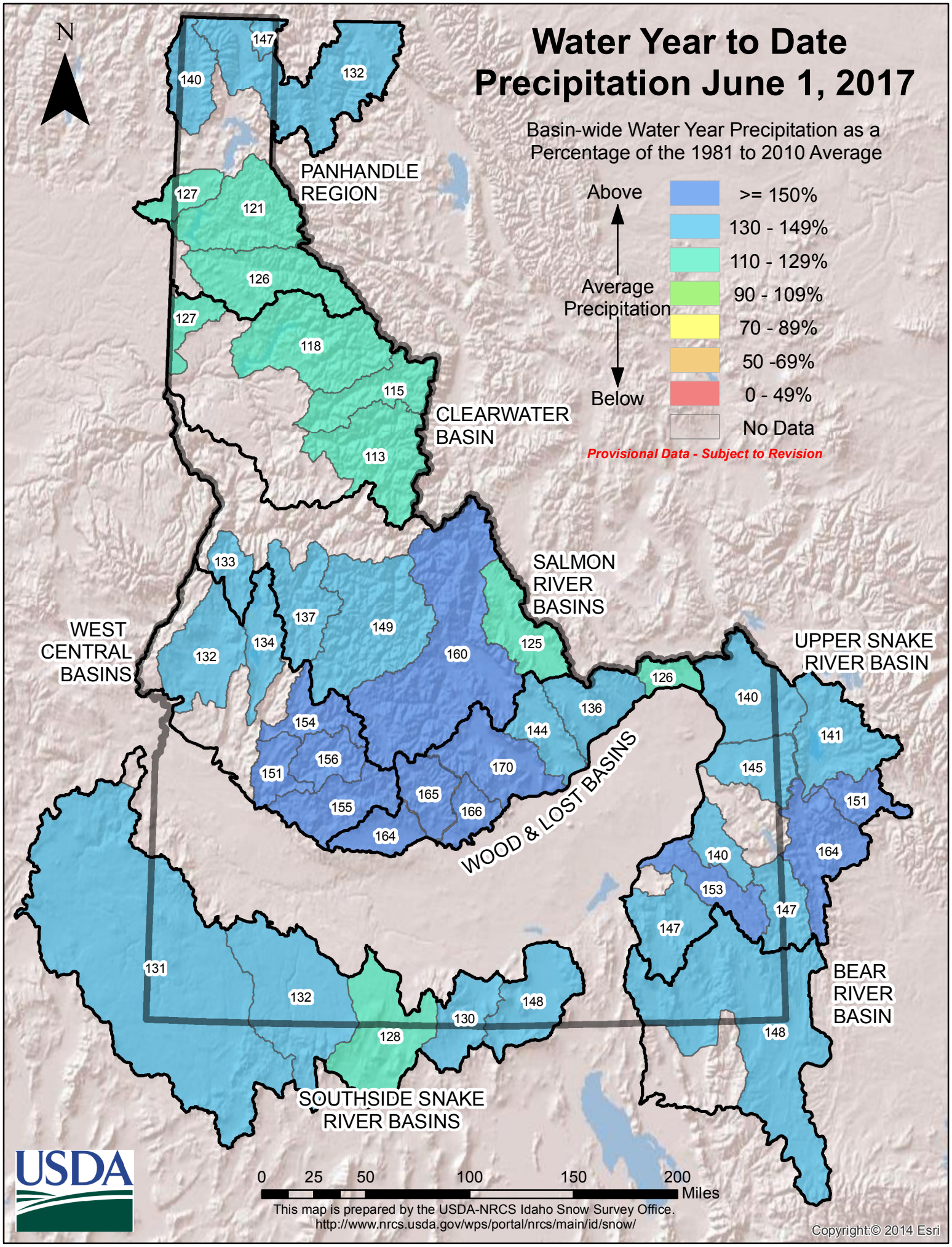
N
Water Year to Date Precipitation June 1, 2017
Basin-wide Water Year Precipitation as a Percentage of the 1981 to 2010 Average
Above
Average Precipitation
Below
>= 150%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 -69%
0 - 49%
No Data
Provisional Data - Subject to Revision
PANHANDLE REGION
CLEARWATER BASIN
SALMON RIVER BASINS
WEST CENTRAL BASINS
UPPER SNAKE RIVER BASIN
WOOD & LOST BASINS
BEAR RIVER BASIN
SOUTHSIDE SNAKE RIVER BASINS
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128
148
0 25 50 100 150 200
Miles
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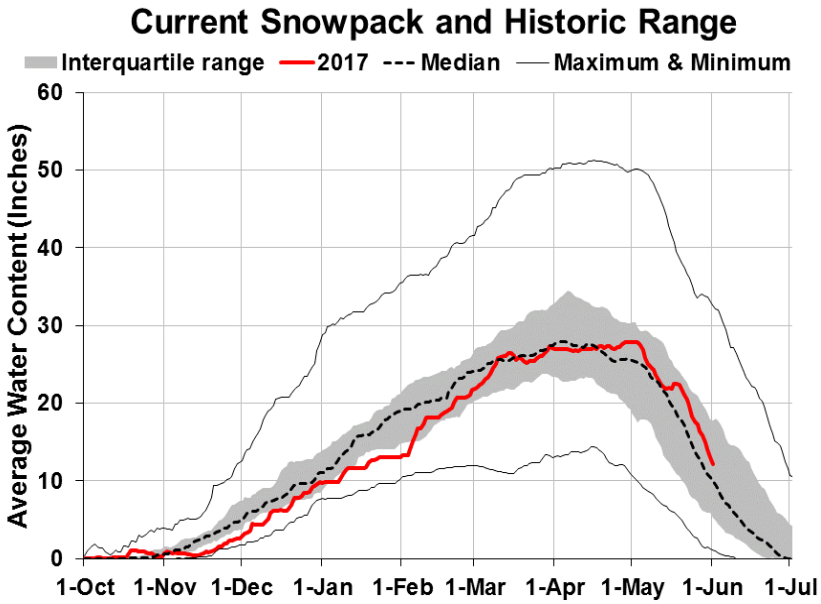
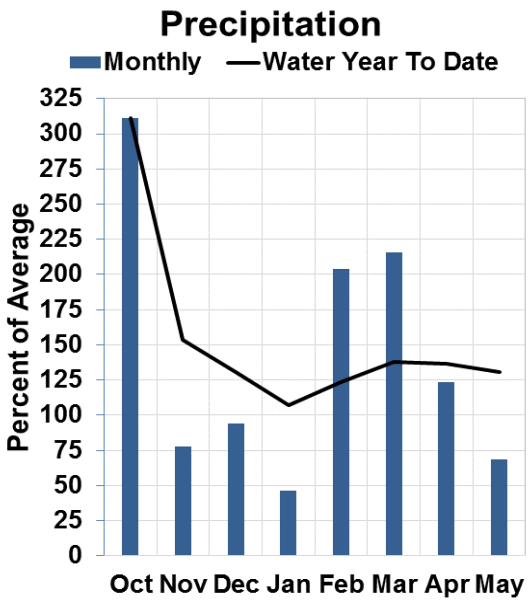
Panhandle Region

June 1, 2017





WATER SUPPLY OUTLOOK

Precipitation and Snowpack

For the first time since January, monthly precipitation was below average in the Panhandle during May, at about 70% of average. Water year-to-date precipitation is 125 to 150% of average. The building of the 2017 winter snowpack started slower than normal in the Panhandle, which is illustrated by the red line (2017) versus the black dotted line (normal) in the above snowpack chart. From early March through June 1, the snowpack was hovering around normal to slightly above normal.

Storage and Streamflow Forecasts

Lake Coeur d'Alene is 86% of average, while Lake Pend Oreille and Priest Lake are 99% and 105% of average, respectively. Streamflow forecasts are above average, and forecast summer volumes range from 100 to 130% of average in these northern Idaho basins. Therefore, adequate water supplies are expected for Panhandle water users.

Panhandle Region Streamflow Forecasts - June 1, 2017

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	JUN-JUL	106	132	150	113%	168	194	133
	JUN-SEP	116	145	165	112%	184	215	147
Kootenai R at Leonia 1 & 2	JUN-JUL	2970	3560	3830	105%	4100	4690	3640
	JUN-SEP	3830	4550	4880	105%	5200	5930	4640
Boundary Ck nr Porthill	JUN-JUL	41	50	56	133%	62	71	42
	JUN-SEP	44	54	61	127%	68	78	48
Clark Fork R at Whitehorse Rapids 1 & 2	JUN-JUL	4920	5670	6010	119%	6350	7100	5070
	JUN-SEP	5790	6690	7090	116%	7490	8390	6090
Pend Oreille Lake Inflow 2	JUN-JUL	5520	6100	6500	119%	6890	7470	5480
	JUN-SEP	6430	7130	7600	117%	8080	8770	6520
Priest R nr Priest River 2	JUN-JUL	275	320	350	127%	385	430	275
	JUN-SEP	310	365	405	125%	445	500	325
NF Coeur dAlene R at Enaville	JUN-JUL	102	128	145	97%	163	189	150
	JUN-SEP	134	164	185	99%	205	235	187
St. Joe R at Calder 2	JUN-JUL	325	390	430	125%	475	535	345
	JUN-SEP	390	455	500	122%	545	615	410
Spokane R nr Post Falls 2	JUN-JUL	540	630	685	110%	745	830	620
	JUN-SEP	600	715	790	112%	870	985	705
Spokane R at Long Lake	JUN-JUL	690	785	850	107%	915	1010	795
	JUN-SEP	865	1000	1090	106%	1180	1310	1030

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%

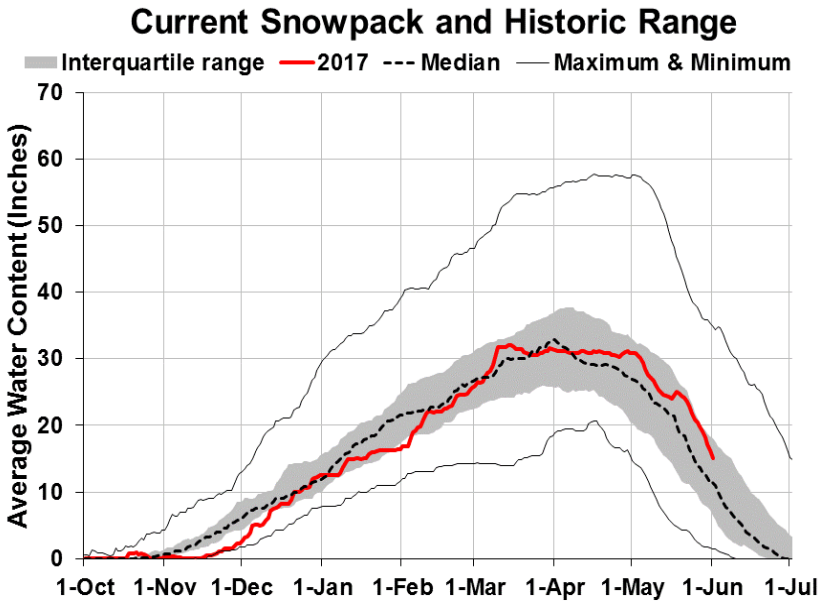
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

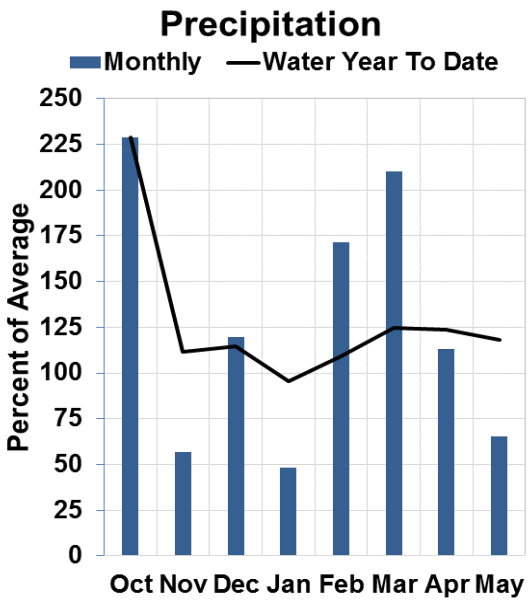
Reservoir Storage (KAF): End of May				
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Hungry Horse Lake	2961.6	3160.2	2733.0	3451.0
Flathead Lake	1513.7	1641.4	1538.0	1791.0
Noxon Rapids Reservoir	328.6	327.9	324.2	335.0
Lake Pend Oreille	1325.4	1308.5	1337.0	1561.3
Priest Lake	143.9	132.3	137.2	119.3
Lake Coeur d' Alene	229.4	233.3	265.5	238.5

Watershed Snowpack Analysis: June 1, 2017			
Basin Name	# of Sites	% of Median 2017	2016
Moyie River	5	124%	41%
Priest River	2	137%	32%
Rathdrum Creek	2		
Coeur d' Alene River	4	140%	0%
St. Joe River	4	133%	69%
Spokane River	10	134%	61%
Palouse River	2		
Kootenai ab Bonners Ferry	14	138%	44%

Clearwater River Basin

June 1, 2017





WATER SUPPLY OUTLOOK

Precipitation and Snowpack

May precipitation was below average in the Clearwater River Mountains, and the water year-to-date precipitation now sits at 118% of average. Snowmelt occurred throughout May, as depicted by the red line in the snowpack chart above. Overall, the Clearwater basin snowpack is 131% of median.

Storage and Streamflow Forecasts

Dworshak Reservoir is 99% of average, which is 89% of capacity. Streamflow forecasts have been remarkably consistent throughout the winter and spring, with all forecasts are between 104% and 112% of average for the June-July and June-September periods. Near average water supplies are expected, which will provide adequate supplies for water users including fishing and river runners.

Clearwater River Basin Streamflow Forecasts - June 1, 2017

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	JUN-JUL	680	800	885	108%	965	1090	820
	JUN-SEP	760	895	985	108%	1080	1210	915
Lochsa R nr Lowell	JUN-JUL	485	570	630	112%	690	775	565
	JUN-SEP	545	640	705	110%	770	860	640
Dworshak Reservoir Inflow 2	JUN-JUL	600	745	845	100%	945	1090	845
	JUN-SEP	730	890	1000	100%	1110	1270	1000
Clearwater R at Orofino	JUN-JUL	1360	1660	1860	108%	2060	2360	1730
	JUN-SEP	1540	1870	2100	107%	2320	2660	1960
Clearwater R at Spalding 2	JUN-JUL	1970	2410	2720	104%	3020	3470	2610
	JUN-SEP	2260	2770	3110	104%	3450	3960	2990

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%

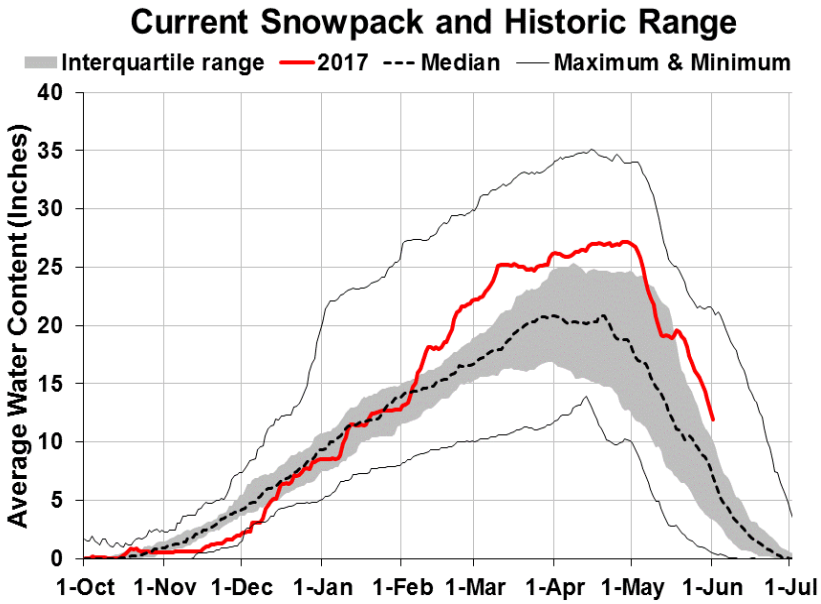
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

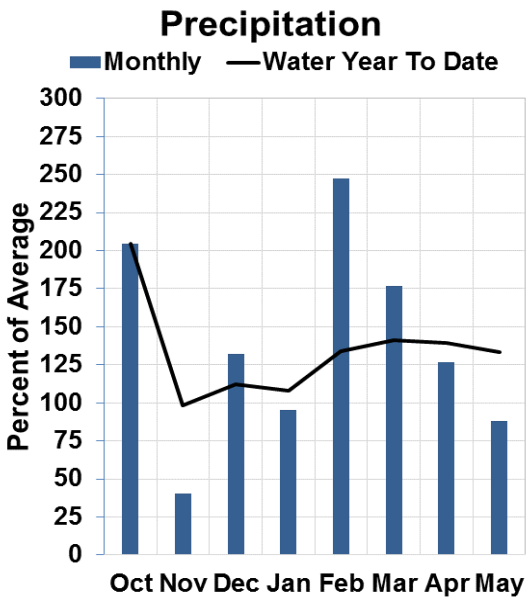
Reservoir Storage (KAF): End of May				
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	3086.2	3332.8	3113.0	3468.0

Watershed Snowpack Analysis: June 1, 2017			
Basin Name	# of Sites	% of Median 2017	2016
NF Clearwater River	8	137%	56%
Lochsa River	2	216%	0%
Selway River	4	72%	11%
Clearwater Basin Total	15	131%	48%

Salmon River Basin

June 1, 2017





WATER SUPPLY OUTLOOK

Precipitation and Snowpack

The Salmon River basin received 87% of average precipitation during May. Water year-to-date precipitation is 135% of average. Snowpack in the Salmon River basin has been above normal since early February. As expected with a much larger than normal snowpack, the onset of snowmelt was later than normal (early May instead of mid-April). The Vienna Mine SNOTEL site (8,960 ft) still has 85” of snow depth on June 1, which suggests favorable terrain above 9,000 ft could hold snow well into summer!

Storage and Streamflow Forecasts

June-September streamflow forecasts call for 190% of average for the Salmon River above Salmon and 205% of average for MF Salmon River. The other rivers are forecast 145 to 165% of average. Impressive streamflow peaks are now occurring in the SF & MF Salmon Rivers. This and the remaining snow will keep river levels above average and provide a long boating season well into the summer for the Salmon River and its tributaries.

Salmon River Streamflow Forecasts - June 1, 2017

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	JUN-JUL	830	875	905	197%	940	985	460
	JUN-SEP	1000	1060	1110	190%	1150	1210	585
Lemhi R nr Lemhi	JUN-JUL	53	63	70	159%	78	90	44
	JUN-SEP	69	81	90	150%	99	113	60
MF Salmon R at MF Lodge	JUN-JUL	550	610	650	206%	690	750	315
	JUN-SEP	675	750	800	205%	850	925	390
Sf Salmon R nr Krassel Ranger Station	JUN-JUL	133	154	168	141%	182	205	119
	JUN-SEP	170	187	198	143%	210	225	138
Johnson Ck at Yellow Pine Id	JUN-JUL	136	150	160	170%	170	184	94
	JUN-SEP	144	156	165	154%	173	185	107
Salmon R at White Bird	JUN-JUL	3850	4230	4480	162%	4740	5120	2760
	JUN-SEP	4520	4960	5270	158%	5570	6010	3330

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

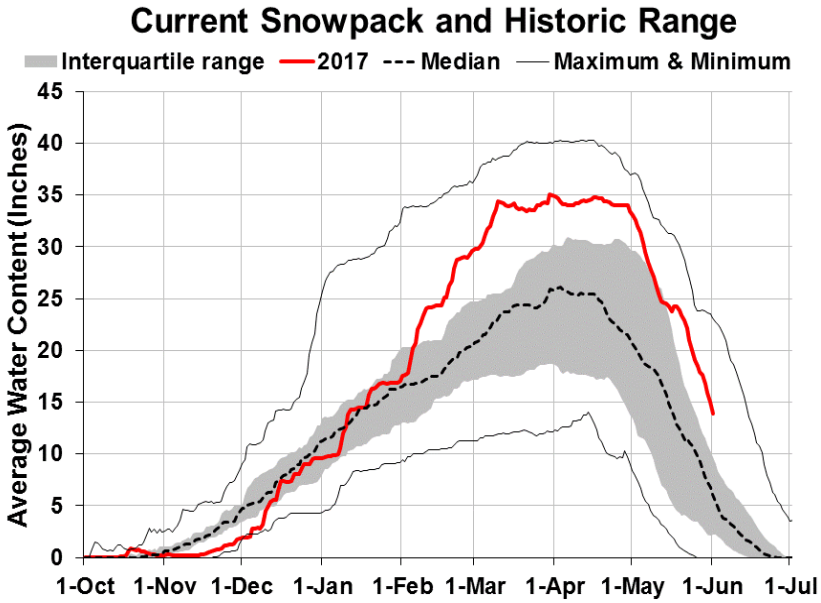
1) 90% and 10% exceedance probabilities are actually 95% and 5%

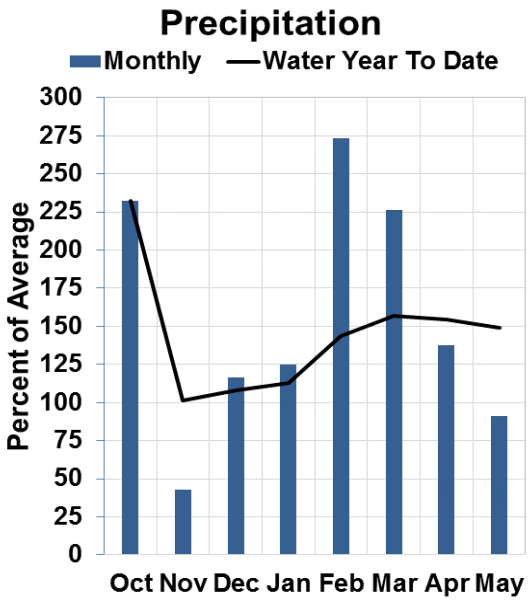
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis: June 1, 2017 Basin Name	# of Sites	% of Median 2017	2016
Salmon River ab Salmon	6	268%	63%
Lemhi River	7	128%	95%
MF Salmon River	3	231%	71%
SF Salmon River	3	181%	46%
Little Salmon River	4		
Salmon Basin Total	23	192%	66%

West Central Basins

June 1, 2017





WATER SUPPLY OUTLOOK

Precipitation and Snowpack

May precipitation was below average in the West Central basins and ranged from 75 to 82% of average. Water year-to-date precipitation ranges from 130 to 155% of average in these basins, with the Boise River basin being the highest. The 2017 snowpack was much above normal in the West Central Mountains, and widespread melt didn't begin until early May. There is still significant snow above 7,500 ft elevation in the Boise basin, and above 7,000 feet in the Payette basin. In both of these basins, the remaining high elevation snowpack is more than double normal for June 1.

Storage and Streamflow Forecasts

All eyes are still on the Boise Reservoir system, and as of June 1, it's 110% of average, which is 90% full. The Payette system is 98% of average, 88% of capacity. Streamflow forecasts in the Weiser basin and NF Payette River call for 135 to 145% of average, and increase to well above average in the SF Payette River at 205%. The Boise River forecasts range from 160 to 185% of average. The Boise River near Boise is forecast at 169% of average, 810,000 acre-feet for the June – July period. Water surplus and associated flooding is still a major concern along the Boise River and – to a lesser extent – along the Payette River.

West Central Basins Streamflow Forecasts - June 1, 2017

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	JUN-JUL	280	305	320	172%	335	355	186
	JUN-SEP	325	350	365	166%	385	410	220
Boise R nr Twin Springs	JUN-JUL	355	375	390	163%	410	430	240
	JUN-SEP	415	440	460	159%	480	510	290
Mores Ck nr Arrowrock Dam	JUN-JUL	36	44	49	181%	55	64	27
	JUN-SEP	42	51	57	184%	64	74	31
Boise R nr Boise 2	JUN-JUL	735	780	810	169%	840	885	480
	JUN-SEP	860	910	950	164%	985	1040	580
Lake Fork Payette R nr McCall	JUN-JUL	46	52	56	147%	61	68	38
	JUN-SEP	49	55	60	146%	65	73	41
NF Payette R at Cascade 2	JUN-JUL	210	240	260	145%	280	310	179
	JUN-SEP	235	270	290	151%	310	340	192
NF Payette R nr Banks 2	JUN-JUL	220	275	315	143%	355	410	220
	JUN-SEP	250	315	355	148%	395	455	240
SF Payette R at Lowman	JUN-JUL	380	410	430	205%	445	475	210
	JUN-SEP	455	485	510	196%	530	565	260
Deadwood Reservoir Inflow 2	JUN-JUL	86	93	97	180%	102	108	54
	JUN-SEP	97	105	111	176%	116	124	63
Payette R nr Horseshoe Bend 2	JUN-JUL	885	970	1030	165%	1080	1170	625
	JUN-SEP	1070	1160	1220	157%	1280	1370	775
Weiser R nr Weiser	JUN-JUL	94	118	136	137%	156	187	99
	JUN-SEP	128	154	174	137%	194	225	127

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 May

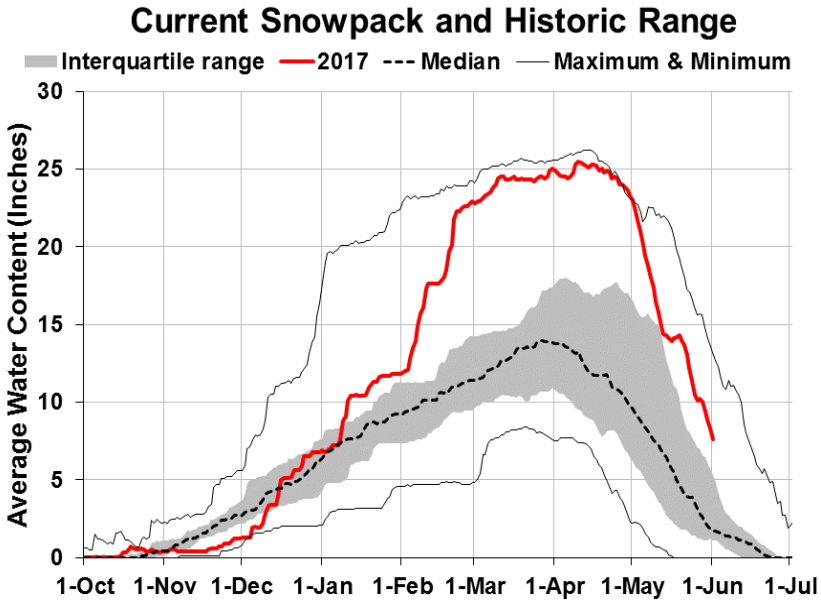
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	437.3	443.1	375.3	450.2
Arrowrock Reservoir	261.3	243.8	198.1	272.2
Lucky Peak Reservoir	219.8	283.5	262.1	293.2
Sub-Basin Total	**918.4**	**970.4**	**835.5**	**1015.6**
Deadwood Reservoir	142.4	150.0	145.5	161.9
Cascade Reservoir	612.2	670.0	625.3	693.2
Sub-Basin Total	**754.6**	**820.0**	**770.8**	**855.1**
Lake Lowell	153.4	150.9	122.9	165.2
Mann Creek Reservoir	10.9	10.5	10.5	11.1

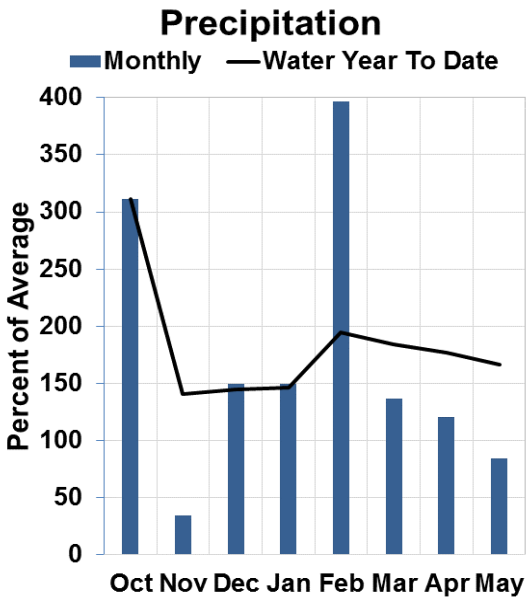
Watershed Snowpack Analysis: June 1, 2017

Basin Name	# of Sites	% of Median 2017	2016
SF Boise River	5	211%	64%
MF & NF Boise Rivers	5	204%	39%
Mores Creek	1		
Canyon Creek	1		
Boise Basin Total	10	221%	58%
NF Payette River	6	179%	0%
SF Payette River	4	230%	57%
Payette Basin Total	12	222%	37%
Mann Creek	1		
Weiser Basin Total	4		

Wood & Lost River Basin

June 1, 2017





WATER SUPPLY OUTLOOK

Precipitation and Snowpack

A month of much needed below average precipitation occurred during May, but precipitation totals were still close to average for the month (80-90% of average). Water year-to-date precipitation ranges from 165 to 170% of average in the Wood and Big Lost River basins, while the Little Lost and basins to the east range from 125 to 145% of average. Widespread snowmelt occurred during May and resulted in damaging flooding along the Big Wood River. Generally, snow below ~7,500 ft elevation has melted, but the snow remaining at the elevations above 7,500 ft is still two to three times greater than normal for June 1.

Storage and Streamflow Forecasts

Mackay Reservoir is 74% of average (58% of capacity), Little Wood Reservoir is 96% of average (87% of capacity), and Magic Reservoir is 145% of average (98% of capacity). Streamflow forecasts are for near record high volumes (200 to 260% of average) in the Big Wood, Little Wood and Big Lost basins. The Little Lost River is forecast at 148% of average. Reservoir operators continue to make releases from these three major reservoirs, as water surplus is still a concern. However, the good news is that the excess water will benefit aquifers, as well as wetlands and springs. More detailed snow and streamflow forecast information is available on the following page.

Wood and Lost Basins Streamflow Forecasts - June 1, 2017

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	33	40	46	184%	51	59	25
	JUN-JUL	4.6	8.8	11.7	136%	14.6	18.8	8.6
Little Lost R nr Howe	JUN-JUL	18.9	21	23	148%	24	26	15.5
	JUN-SEP	25	28	30	136%	32	36	22
Big Lost R at Howell Ranch	JUN-JUL	173	190	205	201%	215	235	102
	JUN-SEP	205	225	240	197%	255	275	122
Big Lost R bl Mackay Reservoir	JUN-JUL	148	165	176	215%	188	205	82
	JUN-SEP	179	200	215	197%	230	255	109
Little Wood R ab High Five Ck	JUN-JUL	58	67	73	252%	80	90	29
	JUN-SEP	68	78	86	246%	94	106	35
Little Wood R nr Carey 2	JUN-JUL	61	68	73	252%	77	84	29
	JUN-SEP	73	81	86	246%	91	99	35
Big Wood R at Hailey	JUN-JUL	245	260	270	213%	280	290	127
	JUN-SEP	290	310	320	206%	335	350	155
Big Wood R ab Magic Reservoir	JUN-JUL	191	215	230	258%	245	265	89
	JUN-SEP	210	235	255	252%	270	295	101
Camas Ck nr Blaine	JUN-JUL	17.7	25	30	270%	36	46	11.1
	JUN-SEP	18.3	25	31	265%	37	47	11.7
Big Wood R bl Magic Dam 2	JUN-JUL	210	230	245	253%	255	275	97
	JUN-SEP	235	255	270	243%	285	310	111

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%

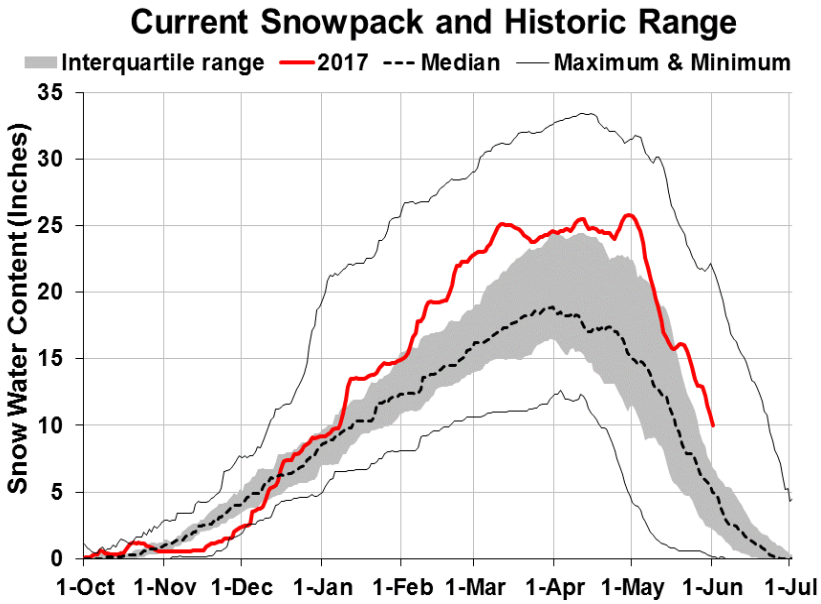
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

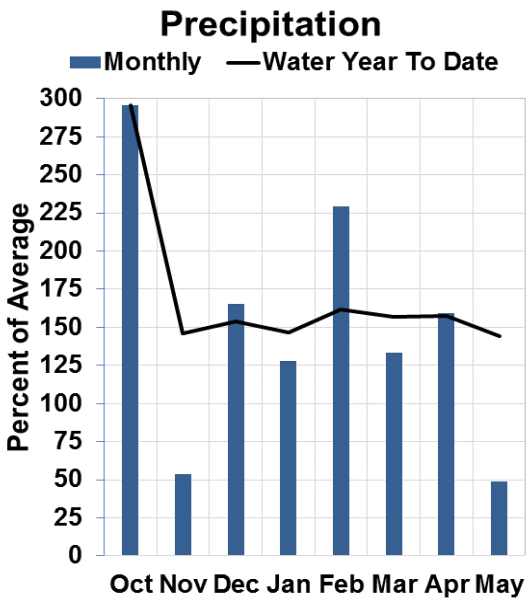
Reservoir Storage (KAF): End of May				
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Mackay Reservoir	25.5	41.7	34.6	44.4
Little Wood Reservoir	26.2	29.6	27.3	30.0
Magic Reservoir	188.3	179.2	130.3	191.5

Watershed Snowpack Analysis: June 1, 2017			
Basin Name	# of Sites	% of Median 2017	2016
Camas-Beaver Creeks	2		
Birch-Medicine Lodge Creeks	2	266%	77%
Little Lost River	3	266%	77%
Big Lost River ab Mackay	4	305%	73%
Big Lost Basin Total	5	305%	73%
Fish Creek	0		
Little Wood River	3		
Big Wood River ab Hailey	6	319%	74%
Camas Creek	2		
Big Wood Basin Total	8	319%	74%

Upper Snake River Basin

June 1, 2017





WATER SUPPLY OUTLOOK

Precipitation and Snowpack

In May, monthly precipitation was much below average for the first time since November. Water year-to-date precipitation ranges from 140 to 160% of average in these Upper Snake basins. May brought warmer temperatures and increased snowmelt. The latter is depicted by the red line in the snowpack chart above. Even after impressive and widespread snowmelt during May, higher elevations with snow remaining are holding ~2 times normal amounts for June 1. As a whole, the Snake River above American Falls snowpack is 210% of median.

Storage and Streamflow Forecasts

Combined reservoir storage for Palisades and Jackson Lake is 92% of average, and 67% of capacity. Overall, the 8 major reservoirs are 104% of average, and 83% of capacity. Streamflow forecasts generally range from 150 to 200% of average in the Upper Snake River basin, with lesser amounts forecast in the Henrys Fork and Falls River drainages. The Snake River near Heise is forecast at 181% of average. Water supplies will be plentiful for the numerous water users who rely on the Upper Snake River water and its tributaries as the rivers will be running high well into summer.

Upper Snake River Basin Streamflow Forecasts - June 1, 2017

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	JUN-JUL	215	250	275	120%	295	330	230
	JUN-SEP	385	430	465	113%	500	545	410
Falls R nr Ashton 2	JUN-JUL	225	250	265	146%	285	310	182
	JUN-SEP	310	345	365	146%	390	420	250
Teton R nr Driggs	JUN-JUL	135	149	159	159%	168	182	100
	JUN-SEP	185	205	215	155%	225	245	139
Teton R nr St Anthony	JUN-JUL	285	315	340	162%	360	395	210
	JUN-SEP	370	405	435	155%	460	500	280
Henrys Fk nr Rexburg 2	JUN-JUL	785	885	955	135%	1020	1130	710
	JUN-SEP	1150	1300	1400	127%	1500	1660	1100
Snake R at Flagg Ranch	JUN-JUL	370	400	425	181%	450	480	235
	JUN-SEP	430	465	490	175%	515	550	280
Snake R nr Moran 2	JUN-JUL	575	630	665	156%	700	755	425
	JUN-SEP	670	730	775	153%	820	880	505
Pacific Ck at Moran	JUN-JUL	133	149	159	185%	170	186	86
	JUN-SEP	144	160	172	179%	183	199	96
Buffalo Fk ab Lava Ck nr Moran	JUN-JUL	290	315	330	161%	345	365	205
	JUN-SEP	340	365	385	160%	405	430	240
Snake R ab Reservoir nr Alpine 2	JUN-JUL	2150	2260	2340	183%	2410	2520	1280
	JUN-SEP	2610	2750	2840	176%	2930	3060	1610
Greys R ab Reservoir nr Alpine	JUN-JUL	295	310	320	195%	330	345	164
	JUN-SEP	370	390	405	188%	415	435	215
Salt R ab Reservoir nr Etna	JUN-JUL	255	275	290	203%	310	330	143
	JUN-SEP	355	380	400	190%	420	450	210
Snake R nr Irwin 2	JUN-JUL	2840	2990	3090	182%	3190	3340	1700
	JUN-SEP	3550	3730	3850	176%	3970	4160	2190
Snake R nr Heise 2	JUN-JUL	3000	3150	3260	181%	3360	3510	1800
	JUN-SEP	3780	3970	4100	174%	4230	4410	2350
Willow Ck nr Ririe 2	JUN-JUL	17.4	25	31	215%	37	48	14.4
Portneuf R at Topaz	JUN-JUL	34	39	42	150%	45	50	28
	JUN-SEP	53	61	66	147%	72	80	45
Snake R at Neeley 2	JUN-JUL	2130	2420	2610	231%	2810	3090	1130
	JUN-SEP	2390	2750	3000	233%	3240	3600	1290

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 May

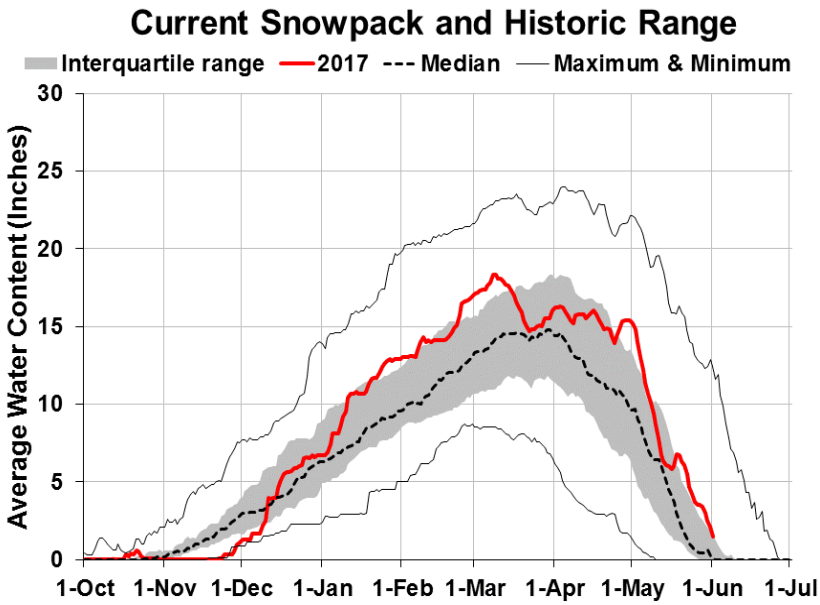
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Jackson Lake	675.1	791.7	605.7	847.0
Palisades Reservoir	820.9	1187.4	1027.0	1400.0
Sub-Basin Total	**1496.0**	**1979.1**	**1632.7**	**2247.0**
Henrys Lake	88.1	89.3	85.6	90.4
Island Park Reservoir	135.0	134.6	133.4	135.2
Grassy Lake	14.9	15.3	14.3	15.2
Sub-Basin Total	**238.0**	**239.2**	**233.3**	**240.8**
Ririe Reservoir	81.0	80.0	69.6	80.5
Blackfoot Reservoir	318.1	272.7	235.2	337.0
American Falls Reservoir	1645.9	1368.3	1459.0	1672.6
Basin-Wide Total	**3779.0**	**3939.3**	**3629.8**	**4577.9**

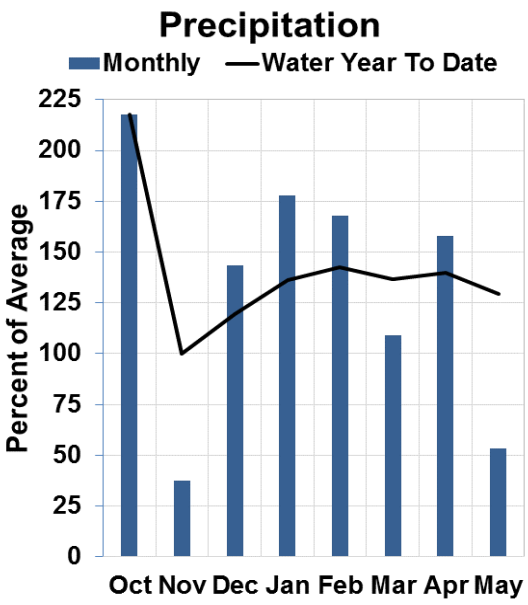
Watershed Snowpack Analysis: June 1, 2017

Basin Name	# of Sites	% of Median 2017	2016
Henrys Fork-Falls River	4	178%	34%
Teton River	3	144%	69%
Henrys Fork ab Rexburg	7	160%	53%
Snake River ab Jackson Lake	4	221%	0%
Pacific Creek	1		
Buffalo Fork	2	155%	78%
Gros Ventre River	3	181%	89%
Hoback River	4	322%	144%
Greys River	4	313%	127%
Salt River	3	613%	0%
Snake ab Palisades Resv	17	235%	76%
Willow Creek - Ririe	2		
Blackfoot River	2		
Portneuf River	3		
Snake River ab American Falls	25	210%	68%

Southside Snake River Basins

June 1, 2017





WATER SUPPLY OUTLOOK

Precipitation and Snowpack

Monthly precipitation varied across the Southside Snake River basins during May, but was consistently below average. Water year-to-date precipitation is 130 to 150% of average. Consistent high elevation snowmelt during May resulted, in part, to above average streamflow. Limited snow remains above 8,000 feet, and streams have already peaked and started receding toward baseflow as the drier summer season approaches.

Storage and Streamflow Forecasts

Oakley Reservoir is currently 162% of average (80% capacity), Salmon Falls is 197% of average (89% of capacity), while Lake Owyhee is full and passing inflows. Streamflow forecasts range from 130 to 160% of average for Oakley Reservoir Inflow, Salmon Falls Creek, the Bruneau River, and most points in the Owyhee basin. Irrigation releases are being made from Owyhee, Oakley, and Salmon Falls reservoirs as natural flows into these systems continue to recede. Irrigators and water sport recreationalists can expect plentiful runoff this year which will also benefit reservoir carryover storage for next year.

Southside Snake River Basins Streamflow Forecasts - June 1, 2017

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	JUN-JUL	4.7	6.3	7.6	162%	8.9	11.1	4.7
	JUN-SEP	6.1	8	9.5	158%	11.1	13.8	6
Trapper Ck nr Oakley	JUN-JUL	1.82	2.1	2.4	130%	2.6	3	1.85
	JUN-SEP	3	3.4	3.7	123%	3.9	4.4	3
Oakley Reservoir Inflow	JUN-JUL	6.9	8.7	10	154%	11.4	13.6	6.5
	JUN-SEP	9.5	11.6	13.2	147%	14.8	17.5	9
Salmon Falls Ck nr San Jacinto	JUN-JUL	24	28	31	155%	33	38	20
	JUN-SEP	28	32	35	146%	38	42	24
Bruneau R nr Hot Spring	JUN-JUL	89	100	107	162%	114	125	66
	JUN-SEP	99	111	119	159%	127	139	75
Reynolds Ck at Tollgate	JUN-JUL	0.38	0.88	1.22	76%	1.57	2.1	1.61
Owyhee R nr Rome	JUN-JUL	40	66	83	132%	100	125	63
	JUN-SEP	55	83	102	128%	120	148	80
Owyhee R bl Owyhee Dam 2	JUN-JUL	53	79	97	128%	114	140	76
	JUN-SEP	81	109	129	122%	148	176	106
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%

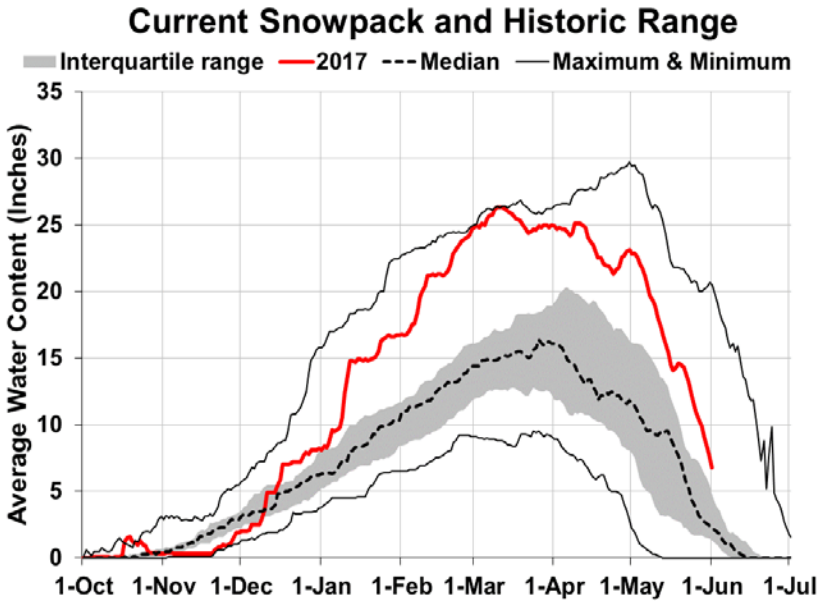
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

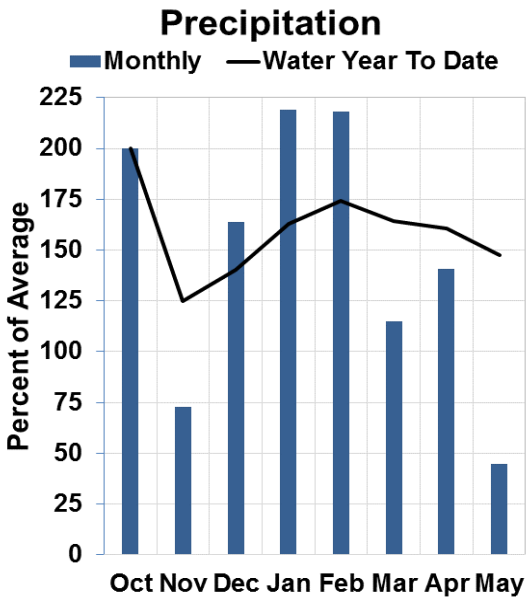
Reservoir Storage (KAF): End of May				
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Oakley Reservoir	60.6	33.1	37.4	75.6
Salmon Falls Reservoir	163.3	91.7	82.7	182.6
Wild Horse Reservoir	73.2	43.7	52.0	71.5
Lake Owyhee	715.5	454.3	536.2	715.0
Brownlee Reservoir	1189.5	1341.5	1343.0	1420.0

Watershed Snowpack Analysis: June 1, 2017			
Basin Name	# of Sites	% of Median 2017	2016
Raft River	1		
Goose-Trapper Creeks	2		
Salmon Falls Creek	5	815%	#####
Bruneau River	5	815%	#####
Reynolds Creek	1		
Owyhee Basin Total	8		
Owyhee Basin Snotel Total	8		

Bear River Basin

June 1, 2017





WATER SUPPLY OUTLOOK

Precipitation and Snowpack

Monthly precipitation was below average in the Bear River basin – ranging from 40 to 60%. Water year-to-date precipitation decreased to 148% of average for the Bear River above the Idaho-Utah border. Mountain snowmelt in the Bear River drainages was widespread throughout May, but the high elevation snow remaining is much above normal for June 1st.

Storage and Streamflow Forecasts

Bear Lake storage is 152% of average, which is 83% of capacity. Montpelier Reservoir was being drafted and is now 91% of average, 78% full. The June-July streamflow forecasts generally range from 200 to 300% of average in the Bear River basin and its tributaries. Water shortages will not be an issue for the Bear River and its tributaries. Carryover storage in Bear Lake is also looking promising for possibly several years to come.

Bear River Basin Streamflow Forecasts - June 1, 2017

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	149	166	178	159%	190	205	112
	APR-SEP	160	180	193	157%	205	225	123
	JUN-JUL	81	95	104	158%	113	127	66
Bear R ab Resv nr Woodruff	APR-JUL	156	192	215	178%	240	280	121
	APR-SEP	177	220	245	191%	275	315	128
	JUN-JUL	70	93	109	191%	124	147	57
Big Ck nr Randolph	APR-JUL	11.6	12.9	13.8	363%	14.7	16	3.8
	JUN-JUL	3.7	4.4	4.8	289%	5.3	6	1.66
Smiths Fk nr Border	APR-JUL	181	191	197	221%	205	215	89
	APR-SEP	205	215	225	216%	230	240	104
	JUN-JUL	103	109	113	226%	117	123	50
Bear R bl Stewart Dam 2	APR-JUL	600	635	660	361%	685	720	183
	JUN-JUL	260	285	305	328%	325	355	93
	JUN-SEP	315	350	374	325%	400	430	93
Little Bear at Paradise	APR-JUL	76	83	87	193%	91	98	45
	JUN-JUL	19.1	22	24	212%	26	29	11.3
Logan R nr Logan	APR-JUL	245	255	265	239%	275	285	111
	JUN-JUL	126	135	141	231%	148	157	61
Blacksmith Fk nr Hyrum	APR-JUL	70	82	91	212%	100	112	43
	JUN-JUL	28	32	34	210%	37	41	16.2

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 May

Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Bear Lake	1080.9	632.9	710.6	1302.0
Montpelier Reservoir	3.1	4.0	3.4	4.0

Watershed Snowpack Analysis: June 1, 2017

Basin Name	# of Sites	% of Median 2017	2016
Smiths-Thomas Forks	3	247%	151%
Bear River ab WY-ID Line	9	291%	153%
Montpelier Creek	1		
Mink Creek	1		
Cub River	1	443%	0%
Bear River ab ID-UT Line	15	319%	131%
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

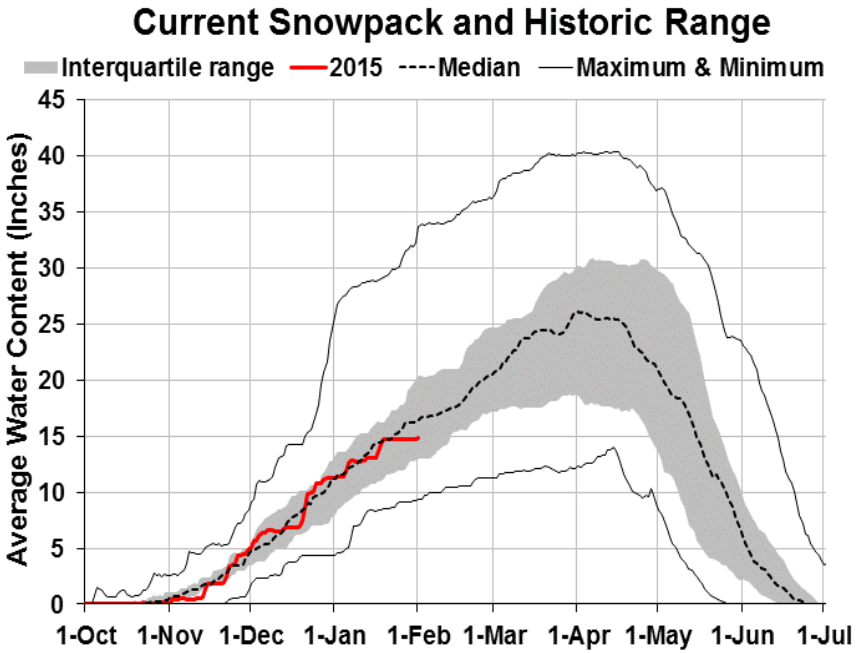
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

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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Numerous other groups and agencies provide funding and/or cooperative support for the collection, operation and maintenance of the Cooperative Idaho Snow Survey Program. Your cooperation is greatly appreciated.