USDA United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

March 1, 2021

Northern Idaho Mountains near Lookout Pass Ski Area
Photo taken by Peter Youngblood, February 20, 2021

Cloudy days and frequent snowfall occurred throughout February over much of Idaho's mountains. In some areas, particularly in northern Idaho, record increases in snow water content for the month were observed! Most of Idaho now holds a normal to above normal snowpack, which bodes well for water supplies. Continue reading the full report for in-depth details and learn which areas we still have concerns about (*hint: déjà vu*).

IDAHO WATER SUPPLY OUTLOOK REPORT

March 1, 2021

Overview and winter outlook

A wet and cold February brought snowpack levels to near or above normal conditions across most of Idaho. For this water year (WY21), basin-wide snowpack ranges from 67% to 120% (Fig. 3). Especially heartening was the improvement in the Southern Snake River basins' snowpack. Dry conditions persist in the Wood and Lost basins; the combination of a low snowpack, previous dry water year, and low to moderate reservoir storage levels raise concerns about ample water supply in this region. At report time, we expect near normal irrigation water supply across most basins. Northwest River Forecast Center ten day forecasts predict cold temperatures and lower than normal precipitation. The one month outlook from NOAA's Climate Prediction Center (CPC) indicates temperatures may remain slightly colder than normal in western Idaho and near normal in the eastern part of the state. Near normal precipitation is predicted across much of Idaho except in the southeast, where March could be slightly drier than the historical average. For an insightful analysis about how this winter compares to previous La Niña winters, check out this NOAA blog post.

Snowpack

Although late to the party, La Niña finally arrived this February with above average monthly snowfall throughout most of Idaho. Storms brought snow to both low and high elevations which bodes well for Snake River aquifer recharge efforts. Snowpack throughout the major river systems is near to above normal conditions on March 1 (Fig. 3). The Bear River Basin continues to be the driest but has improved from last month's dismal 68% and is now 85% of normal. The Pend Oreille-Kootenai-Spokane Basin is at 100% and the Snake River basins (lower, middle, and upper) are 95 to 112% of normal. Observations show a steady increase in snow water content in the mountains with record high February snowfall totals in the Clearwater and Coeur d'Alene-St. Joe basins. A few SNOTEL sites in the Salmon Falls and Owyhee drainages also received record high snowfall. Despite near to above normal snowpack conditions across the majority of Idaho, dry conditions persist in the Wood and Lost basins with snowpack ranging from 67% to 85% of normal.

The average date of peak snowpack primarily depends on elevation. Most SNOTEL sites reach peak snowpack in April, leaving four to six weeks left in the snow accumulation season. In the Owyhee Basin, however, winter is shorter with an average snowpack peak date in March. At the high elevation sites in the Snake River headwaters, maximum snow water content occurs between late April to early May. For

basins with above normal snowpack, it's likely that snowmelt onset will occur around the usual time. Basins with lower snowpack levels are more susceptible to warm weather events. Despite short-term forecasts for less than normal precipitation, freezing levels are not predicted to increase, thus limiting loss of snowpack during this period. Looking ahead at the spring snowpack melt season, the CPC three month outlook indicates that slightly colder and wetter conditions may occur in northern Idaho. Everywhere else, they predict seasonal average temperatures and accumulated precipitation.

Precipitation

February accumulated precipitation was near to above normal in all basins except for the majority of the Wood and Lost basins (Fig. 1). Precipitation totals ranged from 103% (Little Lost) to 206% (Salmon Falls) compared to the historical monthly average. Despite wet conditions throughout February, if we look at total precipitation for the water year to date, storms clearly have favored northern Idaho (Fig. 2). Water year precipitation ranges from 94% to 105% from the Clearwater Basin northward. All other basins are below normal and range from 64% (Big Lost) to 93% (Bruneau). Differences between basin-wide total precipitation and snow water content likely result from more precipitation falling as snow than rain due to colder than average air temperature in February.

Water supply

NRCS generates streamflow forecasts for a range of exceedance volumes in order to provide water users with information specific to their needs. Currently, forecast streamflow volumes at the 50% exceedance probability indicates streamflow will be near to above normal in the Boise, Payette, Weiser, Clearwater, and Panhandle basins (Fig. 4). Within the Salmon and Upper Snake basins, streamflow conditions are predicted to range from 70 to 100% of normal depending on the forecast point. Streamflow conditions are predicted to be below normal in the Southern Snake River basins and quite a bit below normal in the Bear River, Wood and Lost basins as of March 1. We recommend using the 70% or 90% exceedance forecast volumes to water users concerned about shortages and who need more confidence in the amount of water most likely to be available.

Below normal precipitation, snowpack, and low reservoir storage in the Wood and Lost basins cause concern about ample water supply. It is possible that a few big storms in the next few months could switch this narrative. In these basins, forecasts range from ~40 to 70% of normal streamflow volume (50% exceedance). In other regions, sufficient reservoir storage leads us to believe there will be near normal irrigation water supply at report time. Reports of dry conditions in low elevation areas are raising concerns for

dryland grazing operations in central and southern Idaho. We hope a wet spring will bring ample forage and reverse dry conditions for these ranchers.

Please keep in mind that March 1 streamflow forecasts are affected by the inherent uncertainty in (1) how the snowpack develops during the remaining winter season and (2) the frequency and amount of spring precipitation. Water users can expect streamflow forecasts, issued by the National Water and Climate Center team, to become more accurate as we near peak snowpack. Streamflow, snowpack, and precipitation data for each basin can be accessed here or on the interactive map here. For questions about current conditions and water supply impacts, please contact erin.whorton@usda.gov , (office) 208-685-6983 or (cell) 208-510-7294.

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.

Starting in 2020, streamflow forecasts with poor prediction skill (jackknife $r^2 < 0.34$) will no longer be issued. This will primarily affect January and June forecasts, with little change anticipated for February, March, April, and May forecasts. For more information, please contact Danny Tappa (daniel.tappa@usda.gov)

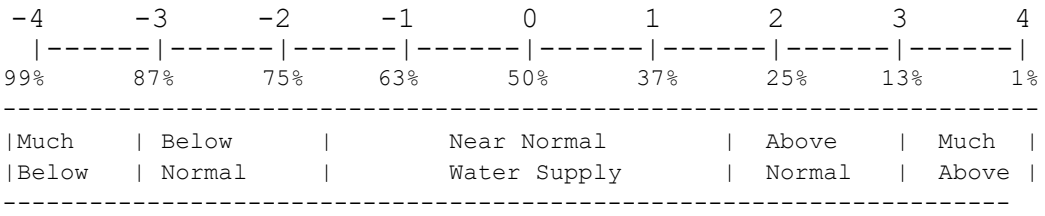
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) March 1, 2021

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	**1.6**	**2018**	**NA**
Clearwater	**1.3**	**2019**	**NA**
Salmon	**-1.1**	**2002**	**NA**
Weiser	**0.0**	**2003**	**NA**
Payette	**-0.3**	**2014**	**NA**
Boise	**-0.3**	**2016**	**- 2.0**
Big Wood above Hailey	**-1.1**	**2014**	**- 2.8**
Big Wood	**-2.2**	**2014**	**0.4**
Little Wood	**-1.3**	**2020**	**- 1.7**
Big Lost	**-0.8**	**2013**	**0.7**
Little Lost	**---**	**---**	**1.5**
Teton	**0.3**	**2019**	**- 3.9**
Henrys Fork	**0.8**	**2014**	**- 2.6**
Snake (Heise)	**-0.3**	**2012**	**- 1.7**
Oakley	**-0.5**	**2008**	**- 0.4**
Salmon Falls above Jackpot	**0.0**	**2020**	**NA**
Salmon Falls	**-0.8**	**2005**	**- 0.9**
Bruneau	**-0.3**	**2004**	**NA**
Owyhee	**-0.3**	**2008**	**- 2.6**
Bear River	**1.3**	**2013**	**- 3.6**

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.

Figure 1: Monthly Precipitation February 2021

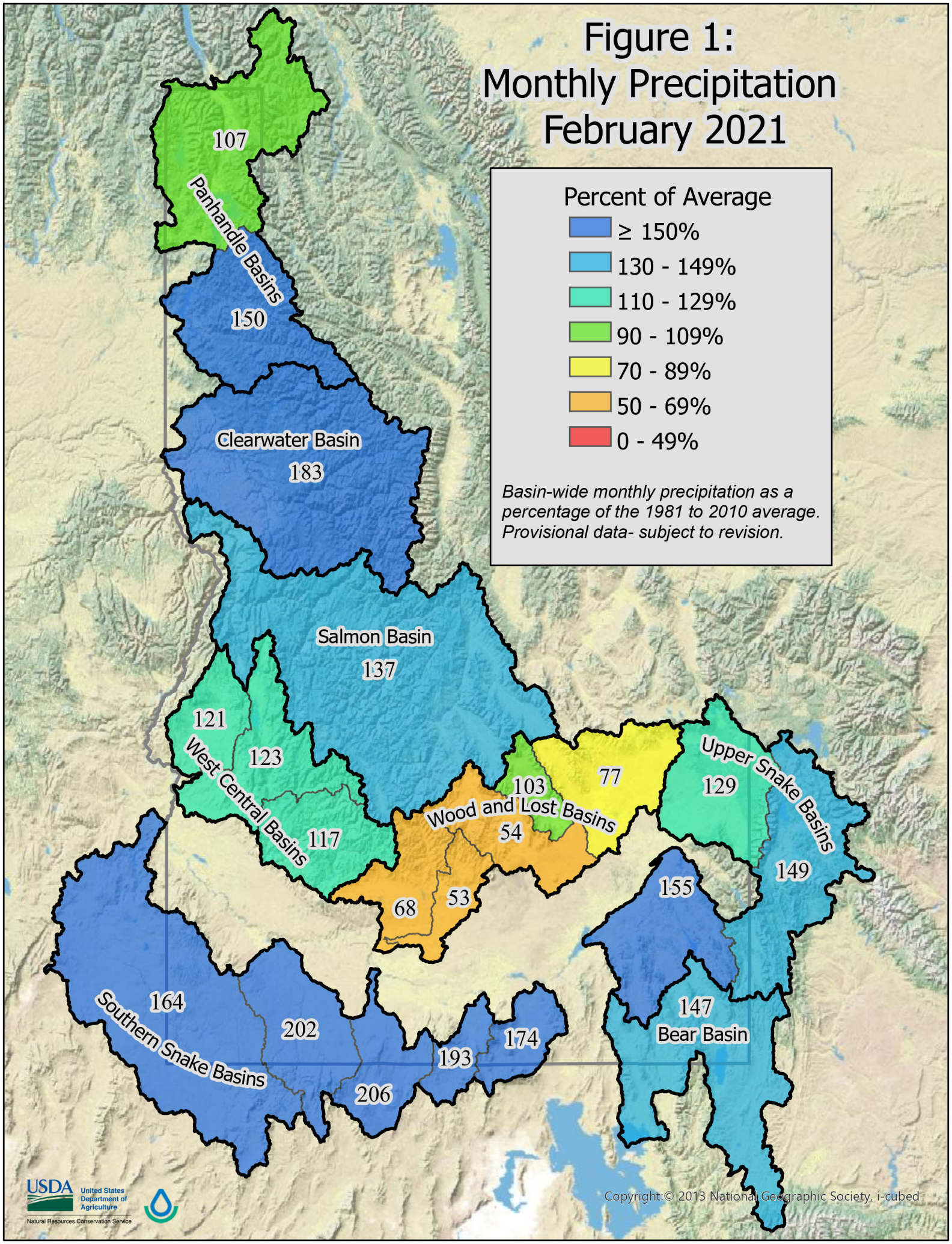


Figure 2:
March 1, 2021
Water-Year-to-Date-Precipitation

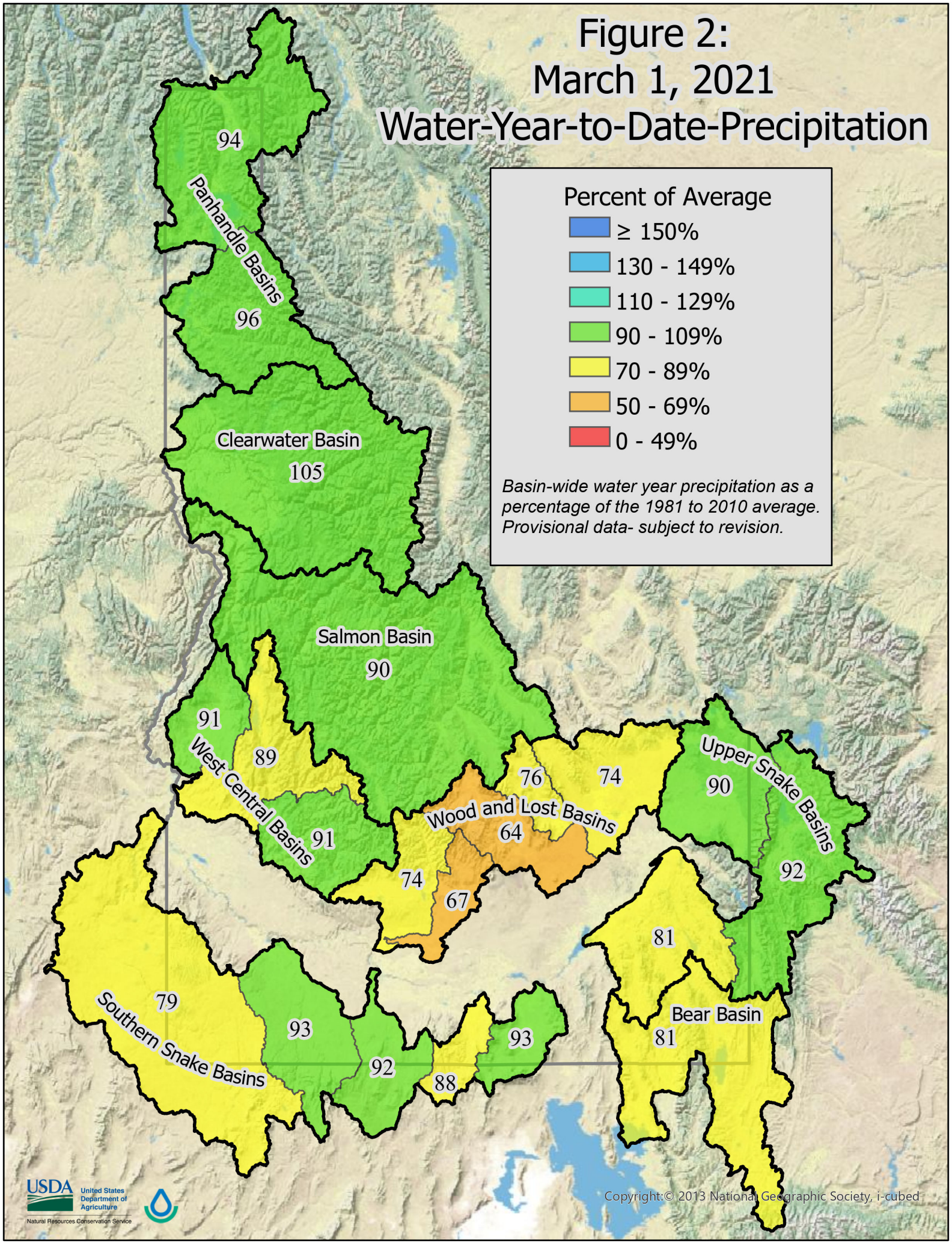
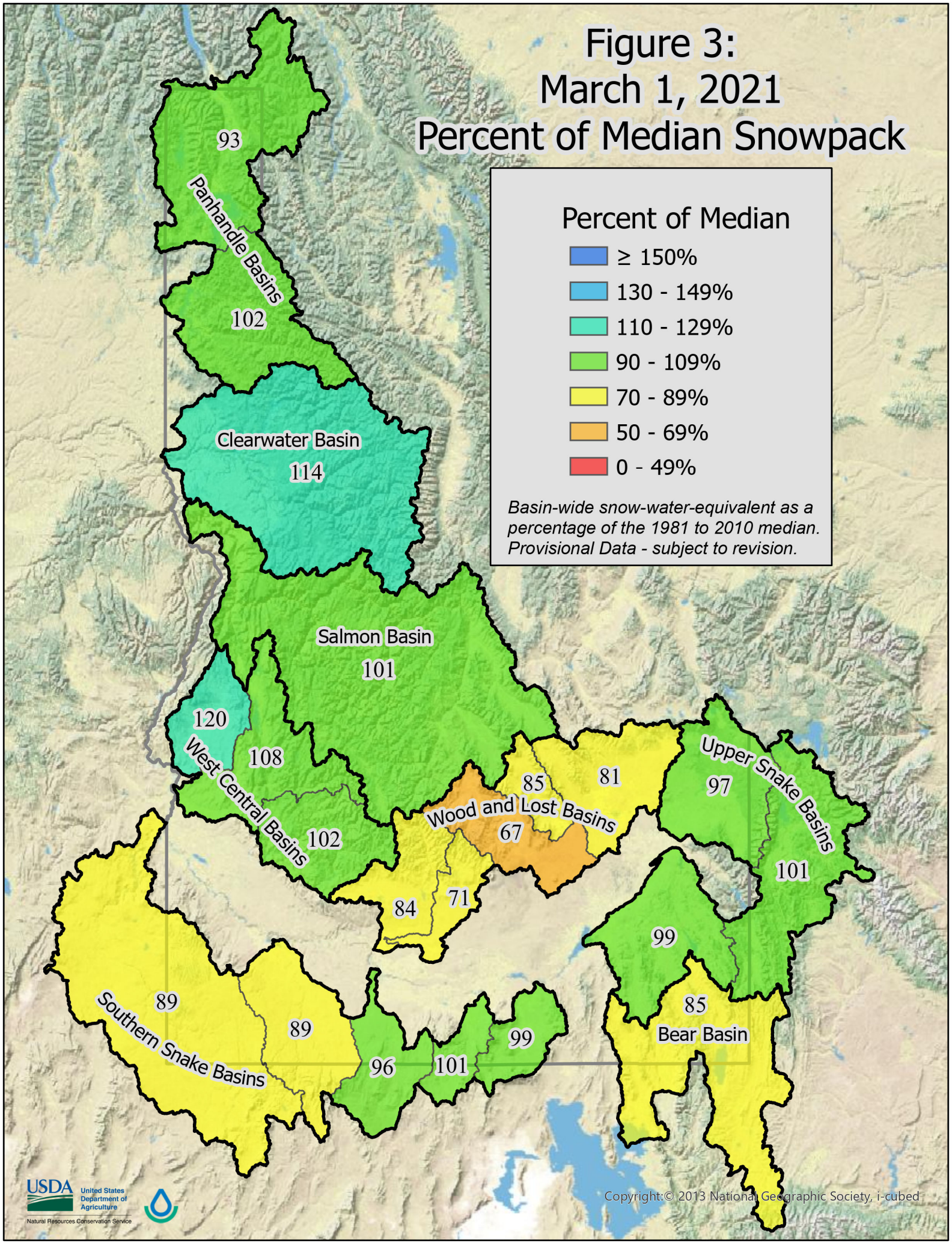


Figure 3:
March 1, 2021
Percent of Median Snowpack



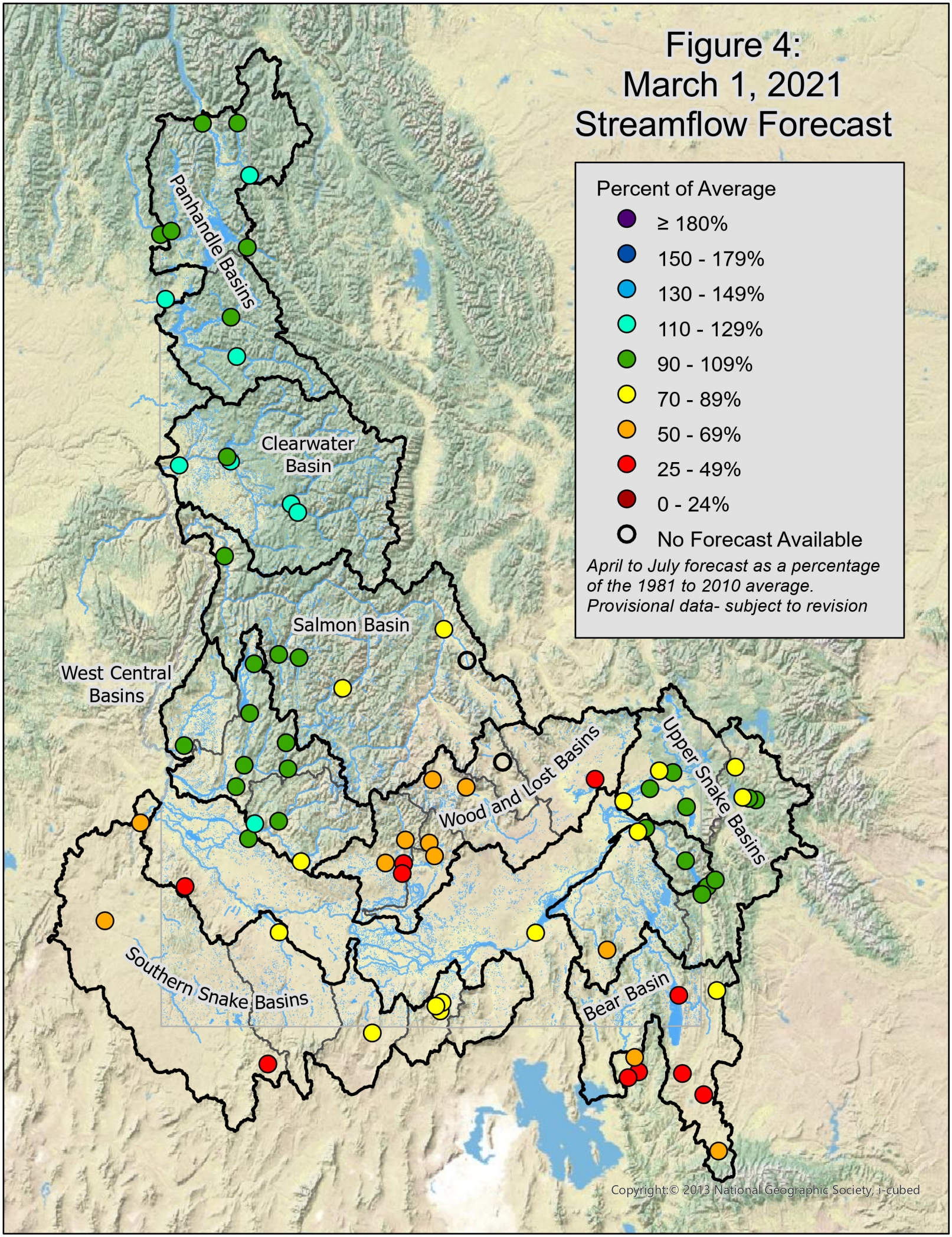
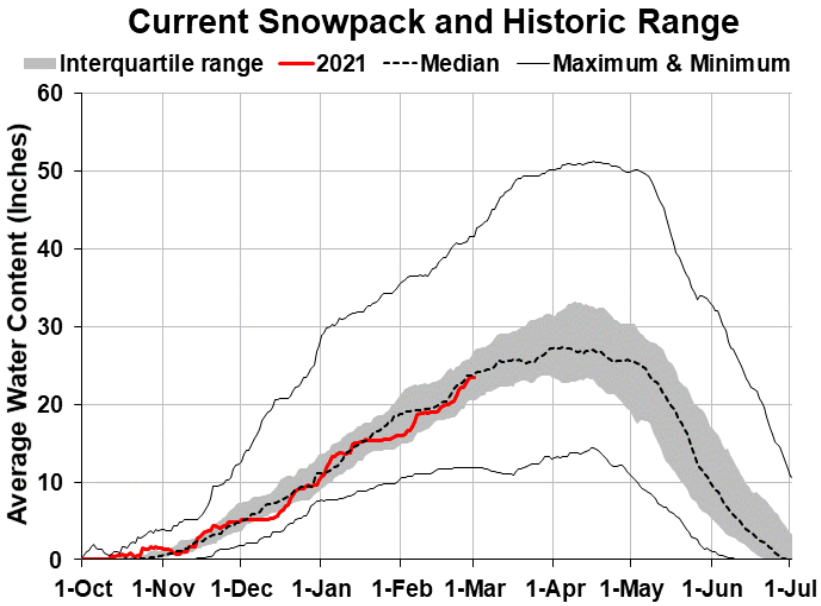
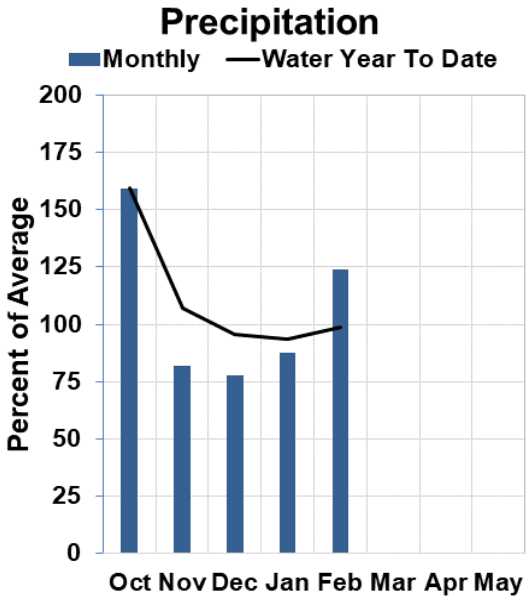


Figure 4:
March 1, 2021
Streamflow Forecast
Percent of Average
≥ 180%
150 - 179%
130 - 149%
110 - 129%
90 - 109%
70 - 89%
50 - 69%
25 - 49%
0 - 24%
No Forecast Available
April to July forecast as a percentage of the 1981 to 2010 average.
Provisional data- subject to revision
Panhandle Basins
Clearwater Basin
Salmon Basin
West Central Basins
Wood and Lost Basins
Upper Snake Basins
Southern Snake Basins
Bear Basin
Copyright:© 2013 National Geographic Society, i-cubed

Panhandle Basins

March 1, 2021





WATER SUPPLY OUTLOOK

Precipitation for the month of February was 100 to 155% of normal in the Panhandle basins (Fig. 1). As of March 1, total water year precipitation is 88 to 116% of normal (Fig. 2). Snowpack ranges from 89 to 110% of normal (Fig. 3). The above normal precipitation observed in February helped bolster the region from below normal precipitation conditions on February 1 to near normal conditions on March 1. The snowpack typically peaks around April 6 in the Coeur d'Alene-St. Joe basin, and near April 14 in the Pend Oreille-Kootenai basin. This leaves about 30 to 45 days remaining in the normal snow accumulation season. As of March 1, the Coeur d'Alene- St. Joe and Pend Oreille-Kootenai basins are about 84 and 76% of peak SWE respectively.

Reservoir storage in the region is 46 to 125% of normal. Lake and reservoir storage as a percent of capacity are: Coeur d'Alene at 26%, Pend Oreille at 36%, Priest Lake at 35%, and Hungry Horse at 80%. Streamflow forecasts for the April through July period range from 96 to 129% of normal (Fig. 4). Below normal temperatures and normal precipitation are predicted in March according to the NOAA Climate Prediction Center's 30-day forecast. If these conditions persist, there should be ample water supply for users in the upcoming spring and summer months.

Panhandle Region Streamflow Forecasts - March 1, 2021

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Moyie R at Eastport	APR-JUL	320	375	410	109%	445	500	375
	APR-SEP	330	385	425	110%	460	515	385
Kootenai R at Leonia 1 & 2	APR-JUL	5450	6740	7330	111%	7920	9210	6600
	APR-SEP	6450	7770	8370	110%	8970	10300	7590
Boundary Ck nr Porthill	APR-JUL	87	102	112	96%	123	138	117
	APR-SEP	91	107	117	95%	127	142	123
Clark Fork R bl Cabinet Gorge Dam 2	APR-JUL	8590	10100	11100	108%	12100	13600	10300
	APR-SEP	9320	11000	12100	107%	13200	14800	11300
Pend Oreille Lake Inflow 2	APR-JUL	9680	11400	12500	106%	13600	15300	11800
	APR-SEP	10500	12400	13600	106%	14800	16700	12800
Priest R nr Priest River 2	APR-JUL	540	665	750	96%	835	960	780
	APR-SEP	575	705	795	96%	880	1010	830
NF Coeur dAlene R at Enaville	APR-JUL	515	660	760	109%	860	1000	700
	APR-SEP	550	700	800	108%	900	1040	740
St. Joe R at Calder 2	APR-JUL	1050	1230	1350	129%	1470	1650	1050
	APR-SEP	1120	1300	1420	127%	1550	1730	1120
Spokane R nr Post Falls 2	APR-JUL	2070	2550	2880	121%	3210	3690	2390
	APR-SEP	2150	2640	2970	120%	3300	3790	2480

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

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

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

Reservoir Storage (KAF): End of February

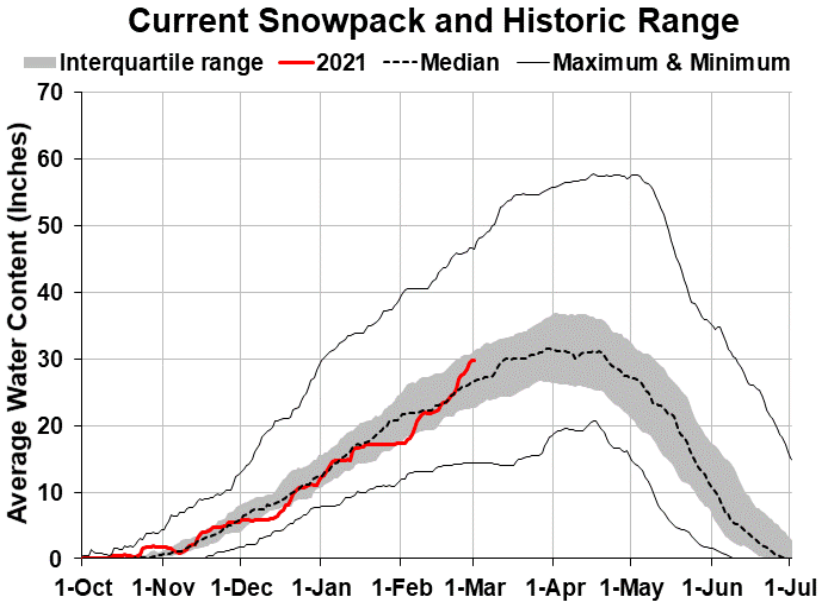
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Hungry Horse Lake	2755.2	2743.4	2209.0	3451.0
Flathead Lake	838.9	776.7	812.8	1791.0
Noxon Rapids Reservoir	316.5	296.4	313.9	335.0
Lake Pend Oreille	559.6	561.3	792.6	1561.3
Priest Lake	41.8	50.6	57.1	119.3
Lake Coeur d' Alene	61.6	64.8	132.8	238.5

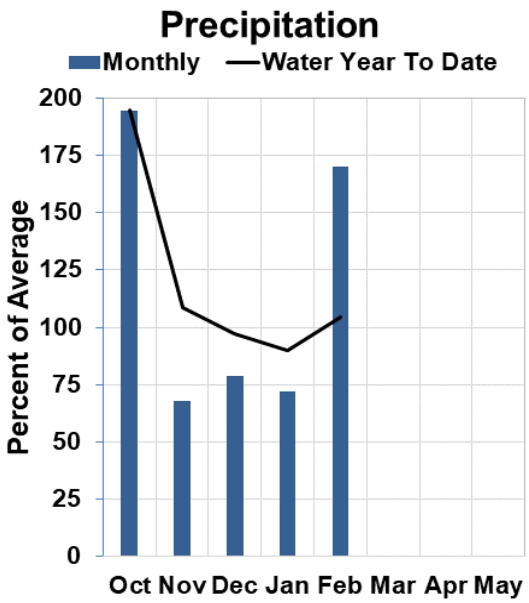
Watershed Snowpack Analysis: March 1, 2021

Basin Name	# of Sites	% of Median 2021	2020
Moyie River	1	98%	115%
Priest River	6	100%	118%
Rathdrum Creek	3	90%	96%
Coeur d' Alene River	8	94%	109%
St. Joe River	5	110%	108%
Pend Oreille Lake	5	89%	106%
Palouse River	2	119%	109%
Lower Kootenai	2	101%	114%
Pend Oreille-Kootenai	13	93%	110%
Coeur d' Alene-St. Joe Total	12	102%	109%

Clearwater River Basin

March 1, 2021





WATER SUPPLY OUTLOOK

Precipitation during February was above normal (165 to 284%)in the Clearwater Basin (Fig. 1). As of March 1, total water year precipitation is 98 to 119% of normal in this basin (Fig. 2). The snowpack in the Clearwater sub basins are 107 to 127% of normal (Fig. 3). Large increases in precipitation were observed in February, with a few sites nearing or breaking records in the region. The steady stream of storms during February left only about 5 to 6 days of no snow accumulation at sites above ~4,600 feet. This persistent increase in SWE also broke records for monthly SWE accumulation.
Peak snowpack is typically reached around April 11, leaving about 40 days left in the average snow accumulation season. As of March 1, the Clearwater basin is about 93% of peak SWE.

Dworshak Reservoir is 70% of its storage capacity, which is 102% of normal. The Clearwater River at Spalding streamflow forecast for April through July is 112% of normal (Fig. 4). The NOAA Climate Prediction Center's 30-day forecast suggests continued snowpack building conditions in the Clearwater Basin, with below normal (colder) air temperatures and normal precipitation.

Clearwater River Basin Streamflow Forecasts - March 1, 2021

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Selway R nr Lowell	APR-JUL	1860	2110	2290	119%	2460	2710	1920
	APR-SEP	1950	2210	2390	118%	2570	2830	2020
Lochsa R nr Lowell	APR-JUL	1240	1420	1550	110%	1670	1850	1410
	APR-SEP	1300	1490	1620	109%	1750	1940	1480
Dworshak Reservoir Inflow 2	APR-JUL	2040	2390	2630	109%	2870	3220	2410
	APR-SEP	2180	2540	2790	109%	3030	3390	2570
Clearwater R at Orofino	APR-JUL	3870	4470	4880	113%	5290	5890	4310
	APR-SEP	4070	4690	5120	113%	5540	6170	4540
Clearwater R at Spalding 2	APR-JUL	6050	7060	7750	112%	8430	9450	6890
	APR-SEP	6390	7440	8140	112%	8850	9900	7270

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

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

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

Reservoir Storage (KAF): End of February

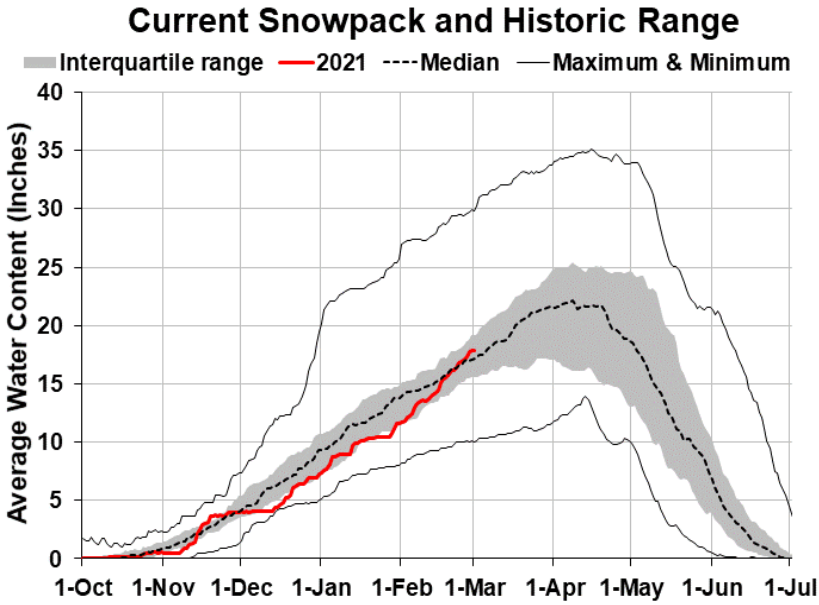
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Dworshak Reservoir	2413.9	2272.0	2358.0	3468.0

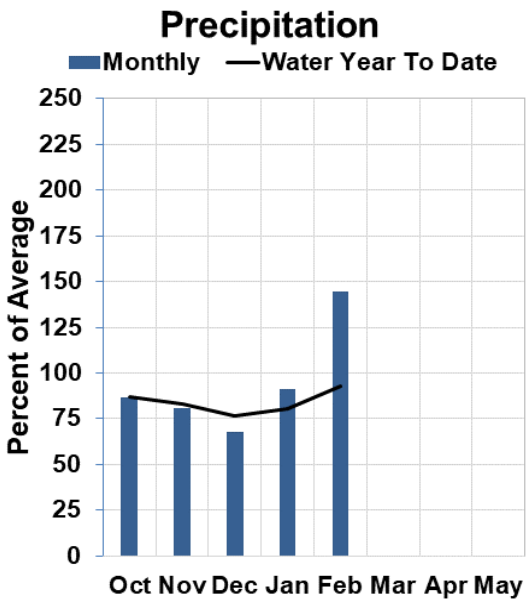
Watershed Snowpack Analysis: March 1, 2021

Basin Name	# of Sites	% of Median 2021	2020
NF Clearwater River	8	110%	112%
Lochsa River	2	107%	110%
Selway River	4	125%	130%
SF Clearwater River	1	127%	139%
Clearwater Basin Total	15	114%	115%

Salmon River Basin

March 1, 2021





WATER SUPPLY OUTLOOK

February precipitation in the Salmon Basin was well above average, at 137% of normal (Fig. 1). Consistent and above normal February precipitation brought the water year precipitation up to 90% of normal in the basin (Fig. 2). The general forecast for a north-to-south gradient in precipitation during La Niña years is present in the Salmon Basin, and the northern-most Lower-Middle Salmon sub basin has the highest amount of water year precipitation, at 102% of normal. The Salmon Basin snowpack is 101% of normal, which is the highest with respect to normal that it has been since early December (Fig. 3). The Lower-Middle Salmon sub basin snowpack is the highest of the sub basins, at 110% of normal. SNOTEL measurements of snowpack density, snowpack volume, and average daily air temperature all indicate a fairly typical snowpack in the Salmon Basin as of March 1, and with about one month remaining in a typical accumulation season, the Salmon Basin currently has about 76% of its normal peak SWE.

The April through July 50% exceedance streamflow forecasts for the Salmon Basin range from 84% to 93% (Fig. 4). NOAA Climate Prediction Center's 30-day forecast predicts slightly increased chances of below normal temperatures in Central Idaho.

Salmon River Streamflow Forecasts - March 1, 2021

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Salmon R at Salmon	APR-JUL	395	550	650	84%	755	905	775
	APR-SEP	475	640	755	84%	870	1040	900
Lemhi R nr Lemhi								
MF Salmon R at MF Lodge	APR-JUL	390	525	615	89%	705	840	690
	APR-SEP	440	590	685	89%	785	930	770
SF Salmon R nr Krassel Ranger Station	APR-JUL	163	215	250	93%	280	335	270
	APR-SEP	178	230	265	91%	300	355	290
Johnson Ck at Yellow Pine	APR-JUL	111	150	177	93%	205	245	191
	APR-SEP	119	160	188	92%	215	260	205
Salmon R at White Bird	APR-JUL	3430	4260	4830	90%	5400	6230	5370
	APR-SEP	3820	4720	5340	90%	5960	6860	5940

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

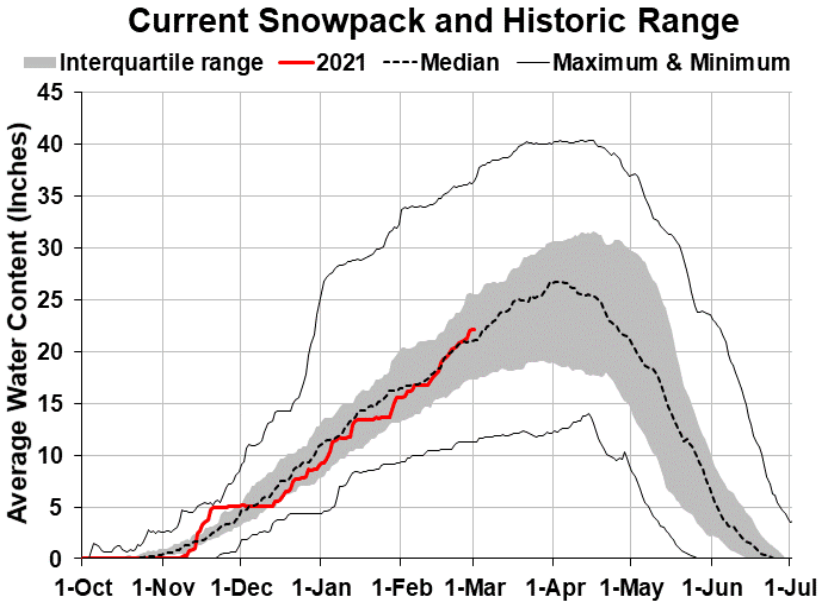
1) 90% and 10% exceedance probabilities are actually 95% and 5%

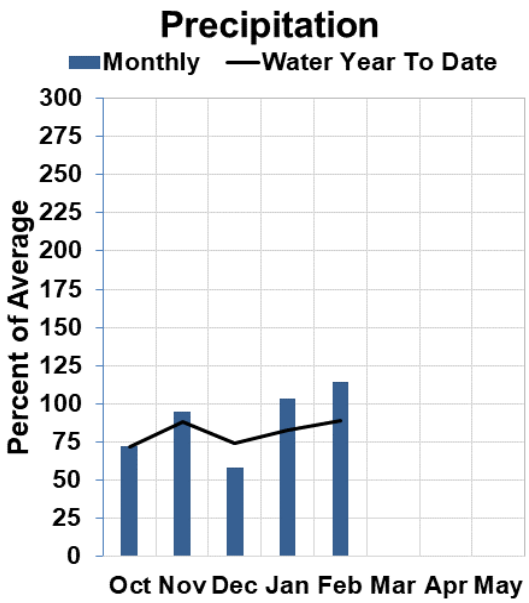
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis: March 1, 2021 Basin Name	# of Sites	% of Median 2021	2020
Salmon River ab Salmon	9	92%	93%
Lemhi River	8	93%	114%
MF Salmon River	3	90%	82%
SF Salmon River	3	96%	85%
Little Salmon River	4	117%	108%
Lower-Middle Salmon	5	110%	110%
Salmon Basin Total	26	101%	100%

West Central Basins

March 1, 2021





WATER SUPPLY OUTLOOK

The West Central basins all received above normal precipitation in February, from 117% of normal in the Boise Basin, to 121% of normal in the Weiser Basin, and 123% of normal in the Payette Basin (Fig. 1). Water year precipitation remains slightly below normal, from 89% of normal in the Payette Basin to 91% of normal in the Boise and Weiser basins (Fig. 2). The March 1 snowpack is close to normal in the Boise and Payette basins, and 120% normal in the Weiser Basin (Fig. 3). SNOTEL measurements of snowpack density, snowpack volume, and average daily air temperatures all indicate fairly typical snowpack in the West Central basins as of March 1. The Boise and Payette basins currently have about 80 to 85% of the normal peak SWE values, and the Weiser Basin currently has 91% of its typical peak SWE.

The reservoir system in the Boise Basin is close to normal capacity on March 1, with Anderson Ranch at 110% of normal, Arrowrock at 125%, and Lucky Peak at 72%. Reservoir storage in the Payette and Weiser Basins are similar: Deadwood is at 91%, Cascade at 99%, and Mann Creek at 76% of normal. April to July 50% exceedance streamflow forecast for the Boise Basin is 80% to 116% of normal, Payette Basin is 92% to 101%, and Weiser Basin is 96% of normal (Fig. 4). NOAA Climate Prediction Center's 30-day forecast predicts slightly increased chances of below normal temperatures in Central Idaho. At this time, water supplies look to be sufficient throughout the West Central basins.

West Central Basins Streamflow Forecasts - March 1, 2021

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	APR-JUL	240	325	380	80%	435	520	475
	APR-SEP	265	350	410	80%	470	555	510
Boise R nr Twin Springs	APR-JUL	380	480	545	93%	615	715	585
	APR-SEP	415	520	595	94%	665	770	635
Mores Ck nr Arrowrock Dam	APR-JUL	80	111	133	116%	154	186	115
	APR-SEP	83	116	138	116%	160	192	119
Boise R nr Boise 2	APR-JUL	820	1050	1200	95%	1360	1590	1260
	APR-SEP	855	1090	1250	92%	1410	1650	1360
Lake Fork Payette R nr McCall	APR-JUL	59	72	81	101%	89	102	80
	APR-SEP	61	74	83	100%	92	106	83
NF Payette R at Cascade 2	APR-JUL	305	400	465	96%	525	620	485
	APR-SEP	310	410	475	96%	540	635	495
NF Payette R nr Banks 2	APR-JUL	375	505	595	95%	685	815	625
	APR-SEP	385	520	610	95%	700	830	640
SF Payette R at Lowman	APR-JUL	280	345	385	96%	425	485	400
	APR-SEP	320	390	435	96%	480	545	455
Deadwood Reservoir Inflow 2	APR-JUL	79	100	113	92%	127	148	123
	APR-SEP	85	107	122	93%	137	159	131
Payette R nr Horseshoe Bend 2	APR-JUL	945	1240	1430	97%	1630	1920	1480
	APR-SEP	1020	1330	1540	94%	1740	2050	1630
Weiser R nr Weiser	MAR-JUL	310	430	520	98%	620	780	530
	APR-JUL	210	295	355	96%	425	540	370
	APR-SEP	230	320	385	96%	455	575	400

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

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

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

Reservoir Storage (KAF): End of February

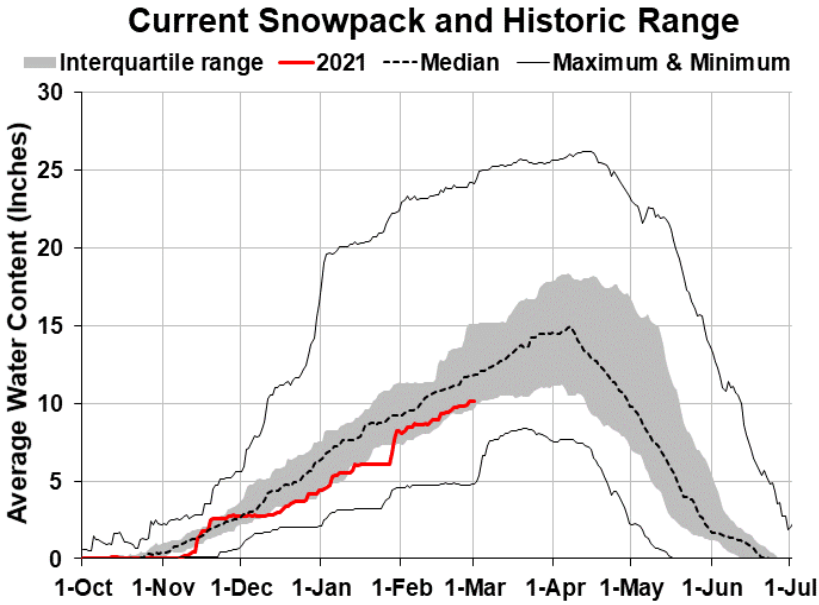
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	270.5	313.9	247.0	450.2
Arrowrock Reservoir	231.6	243.0	185.9	272.2
Lucky Peak Reservoir	86.7	109.8	120.5	293.2
Sub-Basin Total	**588.8**	**666.7**	**553.4**	**1015.6**
Deadwood Reservoir	81.2	90.8	88.9	161.9
Cascade Reservoir	454.7	449.3	457.6	693.2
Sub-Basin Total	**535.9**	**540.2**	**546.5**	**855.1**
Lake Lowell	105.8	105.1	97.7	165.2
Mann Creek Reservoir	3.9	4.2	5.2	11.1

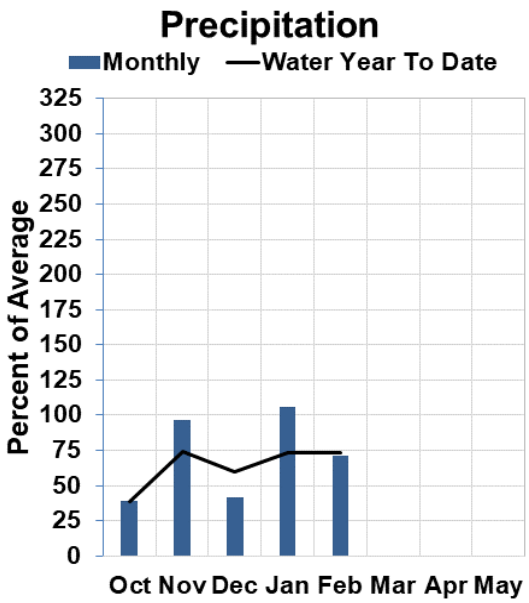
Watershed Snowpack Analysis: March 1, 2021

Basin Name	# of Sites	% of Median 2021	2020
SF Boise River	8	93%	80%
MF & NF Boise Rivers	6	96%	87%
Mores Creek	5	110%	100%
Canyon Creek	4	130%	93%
Boise Basin Total	17	102%	91%
NF Payette River	8	111%	103%
SF Payette River	4	96%	81%
Payette Basin Total	18	108%	96%
Mann Creek	1	107%	85%
Weiser Basin Total	8	120%	93%

Wood & Lost River Basins

March 1, 2021





WATER SUPPLY OUTLOOK

February precipitation continued to be below normal for most of the Wood and Lost basins, from 53% of normal in the Little Wood Basin to 77% in the Birch-Medicine Lodge-Camas basins (Fig. 1). The Little Lost Basin was an outlier; February precipitation was 103% of normal and was driven by near normal February precipitation at two of the three SNOTEL sites within the basin. Water year to date precipitation continued to be below normal, from 64% normal in the Big Lost to 76% in the Little Lost (Fig. 2). The current snowpack is below normal; from 67% of normal in the Big Lost to 85% of normal in the Little Lost Basin (Fig. 3). In the Little Lost Basin there is variability in individual SNOTEL site SWE values with respect to normal; 74% of normal at Hilts Creek SNOTEL to 113% of normal at Moonshine SNOTEL. In the Big Lost Basin, Smiley Mountain SNOTEL set record low SWE values since February 7, with records going back to 2001. Chances of reaching normal peak SWE snowpack levels continue to diminish, especially in the Little Wood and Big Lost basins. Currently they are less than 60% of their normal peak SWE with only about a month left in a typical accumulation season. Both the Little Wood and Big Lost basins would need snowpack accumulation over the 90th percentile in March to reach normal peak SWE values. The Big Wood and Little Lost basins currently have about 70% of a normal peak snowpack.

Despite the relatively dry water year in these basins so far, Mackay Reservoir is at 98% of normal capacity for March 1. Little Wood Reservoir is below average at 86% of normal, and Magic Reservoir remains well below its storage capacity at 37% of normal. April to July 50% exceedance streamflow forecasts continue to predict well below normal streamflow, from 35% of normal for Camas Creek at Camas to 69% of normal for Big Lost at Howell Ranch (Fig. 4). At this time, water shortages appear likely for some users in the Wood and Lost basins.

Wood and Lost Basins Streamflow Forecasts - March 1, 2021

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Camas Ck at Camas	APR-JUL	1.7	5.7	9.7	35%	14.8	24	28
Little Lost R bl Wet Ck nr Howe								
Big Lost R at Howell Ranch	APR-JUL	47	84	109	69%	134	170	159
	APR-SEP	53	95	123	68%	152	193	180
Big Lost R bl Mackay Reservoir	APR-JUL	11.1	48	73	59%	98	135	123
	APR-SEP	24	66	95	63%	124	167	150
Little Wood R ab High Five Ck	MAR-JUL	19	32	42	55%	54	75	77
	MAR-SEP	21	35	46	56%	59	81	82
Little Wood R nr Carey 2	MAR-JUL	19.3	33	45	52%	59	82	86
	MAR-SEP	21	36	48	52%	63	88	92
Big Wood R at Hailey	APR-JUL	49	105	144	61%	182	240	235
	APR-SEP	58	120	163	62%	205	270	265
Big Wood R ab Magic Reservoir	APR-JUL	16.6	44	70	41%	102	160	170
	APR-SEP	19.4	49	77	42%	111	173	182
Camas Ck nr Blaine	MAR-JUL	22	42	59	60%	79	115	99
	MAR-SEP	22	42	59	60%	79	115	99
Big Wood R bl Magic Dam 2	APR-JUL	28	68	104	42%	148	230	250
	APR-SEP	32	74	112	42%	158	240	265

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

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

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

Reservoir Storage (KAF): End of February

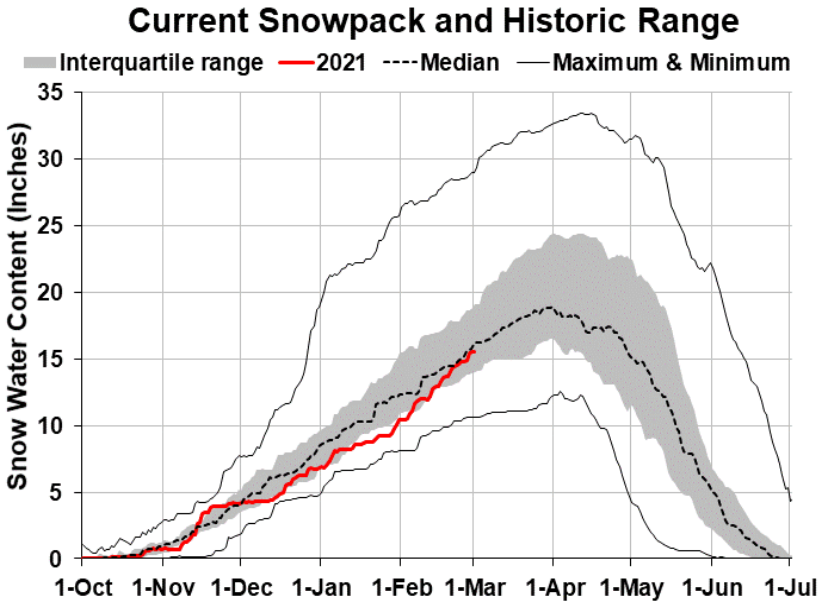
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Mackay Reservoir	28.7	39.4	29.3	44.4
Little Wood Reservoir	14.9	25.3	17.4	30.0
Magic Reservoir	26.6	134.5	72.5	191.5

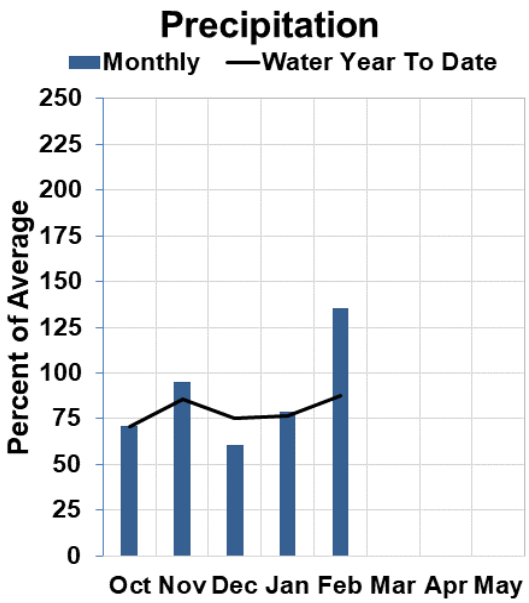
Watershed Snowpack Analysis: March 1, 2021

Basin Name	# of Sites	% of Median 2021	2020
Camas-Beaver Creeks	4	83%	96%
Birch-Medicine Lodge Creeks	4	79%	105%
Little Lost River	4	85%	89%
Big Lost River ab Mackay	5	66%	59%
Big Lost Basin Total	7	67%	64%
Fish Creek	3	71%	70%
Little Wood ab Resv	5	71%	60%
Big Wood River ab Hailey	6	81%	65%
Camas Creek	4	88%	74%
Birch-Medicine Lodge-Camas-Beaver Total	8	81%	100%
Little Wood Basin Total	8	71%	63%
Big Wood Basin Total	10	84%	68%

Upper Snake River Basins

March 1, 2021





WATER SUPPLY OUTLOOK

February precipitation with respect to normal for all sub basins ranged from 100 to 189% of normal. This increased the Upper Snake Basin total precipitation by 10% since February 1 (Fig. 1). At the individual SNOTEL site level, above normal precipitation was observed at nearly all sites, except a small number near the northern border of the basin. As of March 1, water year precipitation in the Upper Snake basins ranges from 81 to 92% of normal (Fig. 2). Snowpack for the major basins are Henrys Fork-Teton is 97%, Snake Basin above Palisades is 101%, and Willow-Blackfoot-Portneuf is 99% of normal (Fig. 3). All sub basins range from 93% to 112%. Peak SWE in the Upper Snake is typically reached on April 4, leaving approximately a month in the typical accumulation season. Currently, SWE is about 75% of the median peak snowpack level. These basins need snowpack accumulation in the 80th percentile in March to reach the normal peak. However, NOAA's 30-day forecast predict an equal chance of above or below normal temperatures and lower than normal precipitation.

Reservoir total system storage in the Upper Snake is 120% of normal. As of March 1, the Jackson-Palisades system is 130% of normal storage for this time of the year. Streamflow forecasts are below normal for the Upper Snake basins and range from 67 to about normal for the April-July period (Fig. 4). The critical Snake River near Heise forecast is 91% of normal. With ample reservoir storage and near normal streamflow forecasts, water supplies are expected to be sufficient for users dependent on the Upper Snake system. Conditions continuously change; please see our daily products for current station and basin information.

Upper Snake River Basin Streamflow Forecasts - March 1, 2021

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton 2	APR-JUL	330	400	445	84%	490	555	530
	APR-SEP	485	560	610	86%	660	740	710
Falls R nr Ashton 2	APR-JUL	285	330	360	99%	390	435	365
	APR-SEP	345	400	435	100%	475	530	435
Teton R nr Driggs	APR-JUL	100	130	150	97%	170	200	154
	APR-SEP	125	162	188	97%	215	250	193
Teton R nr St Anthony	APR-JUL	250	315	360	99%	400	465	365
	APR-SEP	300	375	425	98%	480	555	435
Henrys Fk nr Rexburg 2	APR-JUL	910	1100	1230	88%	1360	1550	1400
	APR-SEP	1180	1410	1580	88%	1740	1970	1790
Snake R at Flagg Ranch	APR-JUL	295	370	415	89%	465	535	465
	APR-SEP	325	400	455	89%	505	580	510
Snake R nr Moran 2	APR-JUL	485	590	665	87%	735	840	765
	APR-SEP	540	655	735	87%	815	930	845
Pacific Ck at Moran	APR-JUL	99	128	148	90%	168	197	164
	APR-SEP	106	136	156	90%	177	205	173
Buffalo Fk ab Lava Ck nr Moran	APR-JUL	205	240	265	95%	290	325	280
	APR-SEP	225	270	300	94%	325	370	320
Snake R ab Reservoir nr Alpine 2	APR-JUL	1570	1820	1990	92%	2160	2410	2170
	APR-SEP	1790	2080	2290	92%	2490	2780	2500
Greys R ab Reservoir nr Alpine	APR-JUL	230	270	295	97%	325	365	305
	APR-SEP	265	315	345	96%	375	425	360
Salt R ab Reservoir nr Etna	APR-JUL	157	225	275	92%	320	390	300
	APR-SEP	200	280	335	91%	390	475	370
Snake R nr Irwin 2	APR-JUL	2130	2500	2750	91%	3010	3380	3010
	APR-SEP	2450	2900	3200	91%	3500	3940	3500
Snake R nr Heise 2	APR-JUL	2290	2690	2960	91%	3220	3620	3240
	APR-SEP	2670	3140	3460	92%	3780	4250	3780
Willow Ck nr Ririe 2	MAR-JUL	21	35	47	70%	61	85	67
Portneuf R at Topaz	MAR-JUL	32	43	51	67%	60	74	76
	MAR-SEP	40	53	63	68%	74	91	93
Snake R at Neeley 2	APR-JUL	925	1530	2040	77%	2610	3590	2650
	APR-SEP	925	1570	2100	75%	2720	3760	2810

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

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

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

Reservoir Storage (KAF): End of February

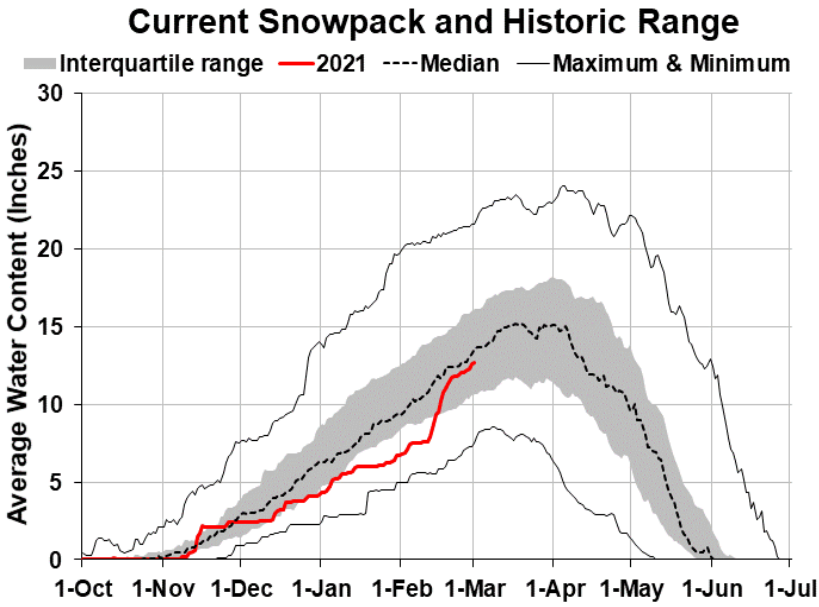
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Jackson Lake	656.1	625.3	434.7	847.0
Palisades Reservoir	1108.7	1338.5	925.7	1400.0
Sub-Basin Total	**1764.8**	**1963.9**	**1360.4**	**2247.0**
Henrys Lake	85.5	87.4	80.6	90.4
Island Park Reservoir	118.8	118.1	104.7	135.2
Grassy Lake	12.5	13.0	12.1	15.2
Sub-Basin Total	**216.8**	**218.5**	**197.4**	**240.8**
Ririe Reservoir	49.4	51.4	41.2	80.5
Blackfoot Reservoir	258.2	300.1	181.3	337.0
American Falls Reservoir	1409.7	1552.6	1296.0	1672.6
Basin-Wide Total	**3699.0**	**4086.4**	**3076.3**	**4577.9**

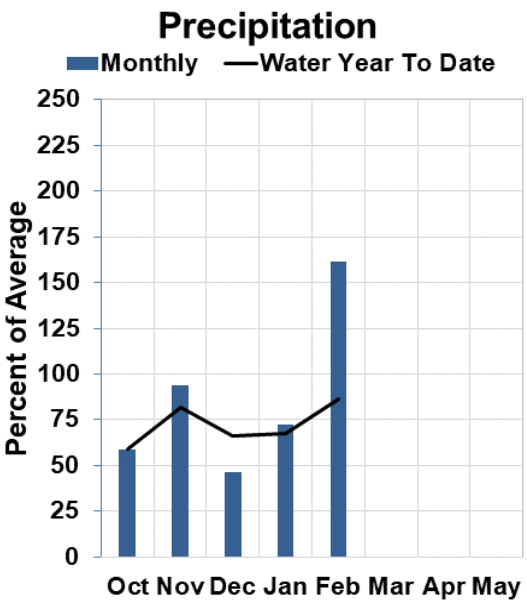
Watershed Snowpack Analysis: March 1, 2021

Basin Name	# of Sites	% of Median 2021	2020
Henrys Fork-Falls River	12	95%	98%
Teton River	9	103%	106%
Henrys Fork-Teton	19	97%	101%
Snake River ab Jackson Lake	12	96%	97%
Pacific Creek	4	103%	102%
Buffalo Fork	4	112%	120%
Gros Ventre River	4	101%	111%
Hoback River	5	99%	108%
Greys River	5	110%	127%
Salt River	6	106%	126%
Snake ab Palisades Resv	34	101%	107%
Willow Creek	5	110%	127%
Blackfoot River	6	101%	108%
Portneuf River	7	93%	90%
Willow-Blackfoot-Portneuf	17	99%	101%

Southern Snake River Basins

March 1, 2021





WATER SUPPLY OUTLOOK

Precipitation in February was in the 90th percentile for areas along the Idaho-Nevada border, while areas in the Owyhee Mountains are in the 50th to 80th percentile. Overall, monthly precipitation in the Southern Snake River basins is above normal and ranges from 156 to 206% (Fig. 1). As of March 1, water year total precipitation in the Southern Snake basins ranges from ~80 to 95% of normal (Fig. 2). The snowpack is ~90 to 100% of normal (Fig. 3). Most of the Southern Snake River basins had a lower than normal snowpack going into February. However, conditions have significantly improved and the snowpack is now near normal. March 1 basin snowpack compared to the 30-year normal are: Owyhee is 89%, Bruneau is 89%, Salmon Falls is 96%, Goose Creek is 101%, and Raft River is 99% of normal (Fig. 3). The Southern Snake River sub basins have 15 to 35 days until reaching the average peak snowpack date and they are currently 70 to 80% of the normal peak SWE. Most of these basins are on track to have a near normal peak snowpack; however, the Owyhee and Bruneau basins both need snow accumulation in the 90th percentile to reach normal peak SWE. NOAA's 30-day forecast predict lower than normal temperatures and precipitation throughout most of this region.

Current reservoir storage expressed as a percent of normal current storage are: Oakley 96%, Salmon Falls 100%, Wild Horse 142%, Lake Owyhee 93%. April to July streamflow forecasts predict 40% to 55% of normal in Owyhee and Reynolds Creek basins, 76% of normal in the Bruneau Basin, and 80% to 90% in the Oakley Basins (Fig. 4).

Southside Snake River Basins Streamflow Forecasts - March 1, 2021

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 ab Trapper Ck nr Oakley	MAR-JUL	11.3	16	19.6	89%	24	30	22
	MAR-SEP	11.8	16.8	21	88%	25	32	24
Trapper Ck nr Oakley	MAR-JUL	3.7	4.5	5	85%	5.6	6.5	5.9
	MAR-SEP	4.7	5.5	6.1	86%	6.8	7.8	7.1
Oakley Reservoir Inflow	MAR-JUL	12.6	17.8	22	79%	26	34	28
	MAR-SEP	13.9	19.6	24	77%	29	37	31
Salmon Falls Ck nr San Jacinto	MAR-JUL	34	49	60	74%	73	93	81
	MAR-SEP	36	51	63	74%	76	97	85
Bruneau R nr Hot Spring	MAR-JUL	90	127	155	76%	187	240	205
	MAR-SEP	95	133	162	75%	195	250	215
Reynolds Ck at Tollgate	MAR-JUL	2	3.2	4.2	47%	5.3	7.1	9
	MAR-SEP	1.88	3	4	44%	5.1	6.9	9.1
Owyhee R nr Gold Ck 2	MAR-JUL	4.6	9.4	13.7	49%	18.7	28	28
	APR-JUL	1.16	4.9	9	41%	14.3	24	22
Owyhee R nr Rome	MAR-JUL	113	198	270	52%	350	495	515
	MAR-SEP	123	210	285	54%	370	510	530
	APR-JUL	44	112	176	51%	255	395	345
Owyhee R bl Owyhee Dam 2	MAR-JUL	126	225	305	55%	400	565	555
	MAR-SEP	151	250	335	57%	430	590	585
	APR-JUL	61	137	205	55%	285	435	375

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

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

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

Reservoir Storage (KAF): End of February

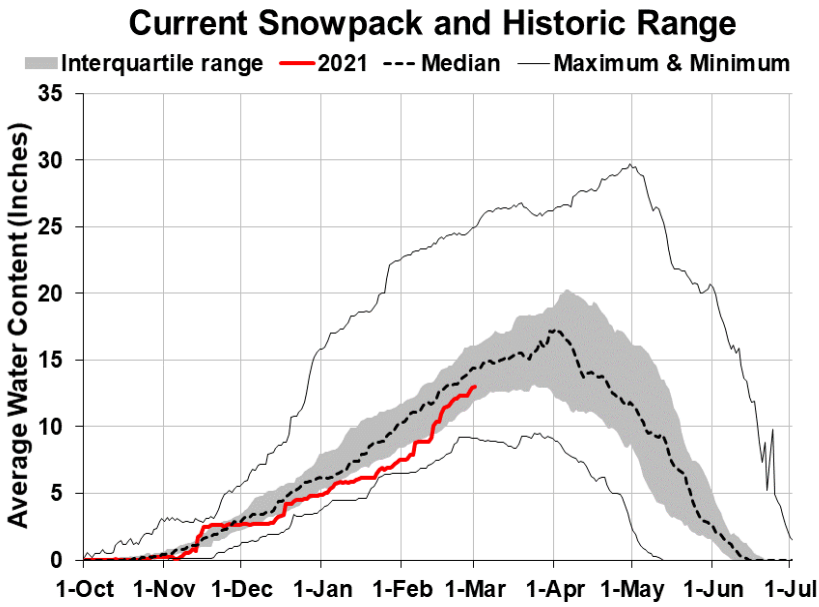
Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Oakley Reservoir	24.3	34.7	25.3	75.6
Salmon Falls Reservoir	47.3	83.3	47.1	182.6
Wild Horse Reservoir	49.0	60.5	34.5	71.5
Lake Owyhee	366.0	538.7	392.6	715.0
Brownlee Reservoir	837.3	930.2	1129.0	1420.0

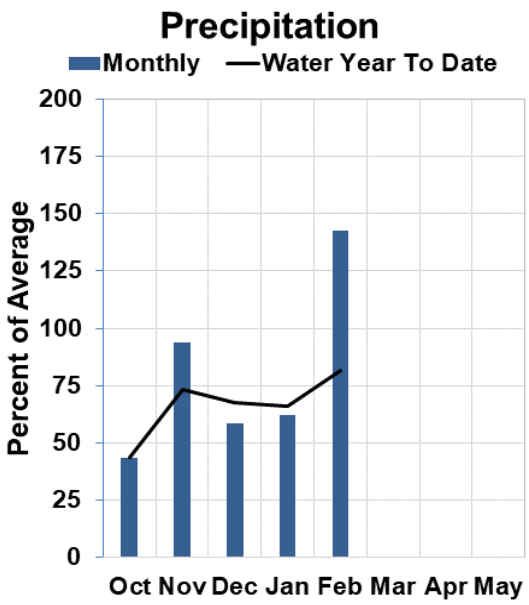
Watershed Snowpack Analysis: March 1, 2021

Basin Name	# of Sites	% of Median 2021	2020
Raft River	5	99%	114%
Goose-Trapper Creeks	6	101%	125%
Salmon Falls Creek	7	96%	115%
Bruneau River	9	89%	106%
Reynolds Creek	5	93%	96%
Upper Owyhee	13	88%	105%
Owyhee Basin Total	18	89%	110%

Bear River Basin

March 1, 2021





WATER SUPPLY OUTLOOK

Storms in February brought above normal precipitation to the Bear River Basin. Precipitation for the water year is currently 81% of normal (Fig. 2) and the snowpack is 85% of normal (Fig. 3). The snowpack percent of normal for each sub basin as of March 1 is: Smith-Thomas Forks 97%, Cub River 88%, and Bear Lake 87%. Snow water equivalent across the Bear River Basin is in the 38th percentile. Although there are around 30 days until the median peak snowpack date, it looks possible, but unlikely that we'll reach normal snowpack conditions this winter according to NRCS snowpack projections. To reach normal precipitation conditions by April 1, precipitation during March needs to be above average (in the 90th percentile) in this basin. NOAA's 30-day forecast predict normal temperatures and below normal precipitation.

Bear Lake is 62% capacity, which is 136% of average storage volume for this time of year. Streamflow forecasts are 11% to 60% of normal for the April-July runoff period (Fig. 4). Above normal storage in Bear Lake should provide an adequate water supply for downstream users. However, users relying on natural surface water in the Bear River Basin still need above normal total precipitation during the remainder of the 2021 wet season.

Bear River Basin Streamflow Forecasts - March 1, 2021

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	30	52	66	59%	81	103	112
	APR-SEP	34	58	74	60%	91	115	123
Bear R ab Resv nr Woodruff	APR-JUL	3.6	9.7	42	35%	74	110	121
	APR-SEP	2.6	16.6	45	35%	81	133	128
Big Ck nr Randolph	APR-JUL	0.11	0.46	1.5	39%	2.5	4.3	3.8
Smiths Fk nr Border	APR-JUL	44	61	72	81%	83	100	89
	APR-SEP	53	72	85	82%	98	117	104
Bear R bl Stewart Dam 2	MAR-JUL	0	13.5	60	29%	106	175	205
	MAR-SEP	0	14.1	67	29%	120	198	230
	APR-JUL	0	9.2	49	27%	96	164	183

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

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

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

Reservoir Storage (KAF): End of February

Reservoir Name	Current (KAF)	Last YR	Average (KAF)	Capacity (KAF)
Bear Lake	807.7	908.2	594.1	1302.0
Montpelier Reservoir	2.4	1.9	1.8	4.0

Watershed Snowpack Analysis: March 1, 2021

Basin Name	# of Sites	% of Median 2021	2020
Smiths-Thomas Forks	5	97%	114%
Bear Lake	9	87%	109%
Montpelier Creek	2	79%	118%
Mink Creek	3	86%	104%
Cub River	3	88%	100%
Bear River Total	27	85%	105%
Malad River	3	88%	94%

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 Dec. 2018).**

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 bl Cabinet Gorge (2)
+ Hungry Horse storage change
+ Flathead Lake storage change
+ Noxon Res storage change
Whitehorse Rapid gage used create longer term record

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 gage used to create longer term record

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 nr Etna, WY - no corrections
Palisades Res Inflow (2)
+ Snake R nr Irwin
+ Jackson Lake storage change
+ Palisades Res storage change
Snake R nr Heise (2)
+ Jackson Lake storage change
+ Palisades Res storage change
Ririe Res Inflow (2)
+ Willow Ck nr Ririe
+ Ririe Res storage change
The forecasted natural volume for Willow Creek nr Ririe does not include Grays Lake water diverted from Willow Creek drainage through the Clarks Cut diversion and into Blackfoot Reservoir.
Blackfoot R ab Res nr Henry (2)
+ Blackfoot Res storage change
The forecasted Blackfoot Reservoir Inflow includes Grays Lake water diverted from the Willow Creek drainage through the Clarks Cut diversion and into Blackfoot Reservoir.
Portneuf R at Topaz - no corrections
American Falls Res Inflow (2)
+ Snake R at Neeley
+ Jackson Lake storage change
+ Palisades Res storage change
+ American Falls storage change
+ Teton Dam for water year 1976 only

Southside Snake River Basins

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

Bear River Basin

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

Reservoir Capacity Definitions (Units in 1,000 Acre-Feet, KAF)

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

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

<u>Forecast use example:</u>

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

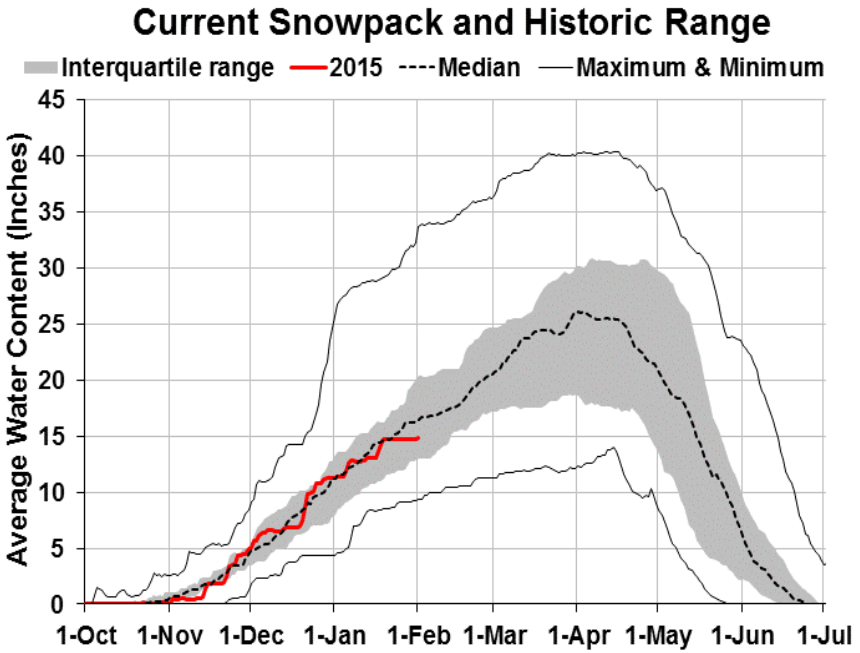
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

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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This publication is dedicated to the people, agencies and organizations utilizing this data, information and forecasts for short and long term water management, planning, preparation, recreation and otherwise, for the enhancement of the economy and enrichment of livelihoods.