United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

March 1, 2024

Snow Surveyor Bella after a ski session on a sunny but brisk February day near Stanley, ID, marking her 13th winter sampling Idaho's snow!
Photo courtesy of Danny Tappa, NRCS Boise, taken 2/17/2024

Plentiful precipitation and snow piled up in Idaho's mountains during February. Once again, higher precipitation amounts relative to normal were observed across southern Idaho, but all major basins did receive above normal precipitation during the month – the first time that's happened this water year. While snowpack in the north still lags behind its normal pace, basins south of the Snake River Plain have, as of March 6, exceeded their typical seasonal peak snowpack. Several basins just to the north (Boise, Wood & Lost, Upper Snake) look to have a 50/50 chance at reaching or exceeding their seasonal peaks during the dog days of winter.

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: https://www.nrcs.usda.gov/idaho/snow-survey
Natural Resources Conservation Service Snow Surveys
9173 West Barnes Drive, Suite C
Boise, ID 83709-1574, (208) 378-5700 ext. 5

To join a free email subscription list, please contact us by email at: idboise-nrcs-snow@usda.gov

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How forecasts are made

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

Forecasts of any kind 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 the January and June forecasts, with little change anticipated for the February, March, April, and May forecasts. For more information, please contact Erin Whorton (erin.whorton@usda.gov)

March 2024: Idaho Water Supply Summary

Overview

March officially arrived with a lion's roar. Storms at the end of February improved snowpack across the state and continue to bring precipitation at publication time. Snowpack returned to near normal conditions in many parts of the state since last month but is still significantly below normal north of the Salmon Basin to the Canadian border. Increases in the snowpack, in combination with above normal reservoir storage, improved water supply conditions across much of Idaho. Low snowpack conditions in central and northern Idaho likely will lead to low streamflow conditions this summer unless late-winter and spring precipitation significantly improve conditions.

Weather, climate and drought outlook

February was warmer than usual, continuing the trend of warmer than normal temperatures this winter. The 5-day total precipitation forecast indicates wet conditions will continue into early March across the Snake River Plain into the Snake River Headwaters. Unfortunately, these storms over the next 5 to 10 days will miss central and northern Idaho. These basins are expected to be drier than normal, thus continuing their below normal snowpack (Fig. 3) and total water year precipitation conditions (Fig. 2).

NOAA's Climate Prediction Center (CPC) one-month outlook forecasts that basins south of the Clearwater may receive more precipitation than typical. The one-month outlook does not indicate whether March will be warmer or colder than usual. El Niño ocean-atmosphere conditions are weakening although the impacts of El Niño (drier and warmer conditions) will likely continue. The CPC predicts there's a 79% chance of transitioning to El Niño-Southern Oscillation (ENSO) neutral conditions this spring. However, the CPC three-month outlooks for spring and summer predict warmer and drier conditions than normal. Historically, La Niña conditions often follow strong El Niño events, so we could see a return to La Niña conditions later this year. This, in theory, would increase the chances of wetter and colder conditions in Idaho next fall and winter.

Currently, 49% of Idaho lands are abnormally dry or are in drought. Drought slightly worsened in northern Idaho with minor expansion of D2 and D1 drought categories in the Panhandle and Clearwater basins. The D0 (abnormally dry) area of the state shrunk with February storms finally bringing moisture into central Idaho. The seasonal drought outlook predicts drought will continue in northern and central Idaho through the spring.

Snowpack

All Idaho basins saw improvements in their snowpack last month (Fig. 3). Although, storm tracks continued to favor southern Idaho over northern Idaho in February. This winter's

trend of above normal snowpack south of the Snake River Plain and drier conditions north of the river's corridor continues.

Early February storms increased snow water equivalent (SWE) in the Boise, Wood, and Lost basins bringing the snowpack to near normal levels (87 to 98%) on March 1. This storm cycle also improved the snowpack in the Salmon Basin from 67% to 84% of normal last month. Modest gains in SWE during February occurred in the Weiser, Payette, Birch-Medicine Lodge, Henrys Fork-Teton, and Snake River Headwater basins. Snowpack now ranges from 75 to 90% in these basins. Snowpack is well above normal in the Southern Snake, Willow-Blackfoot-Portneuf and Bear River basins (120 to 147%). As of March 1, snow has fallen across the state and improved snowpack everywhere. Conditions can change drastically as we write these water supply reports; so keep an eye on the latest snowpack conditions with our interactive map or daily ready-to-print maps.

The lack of snow in the Panhandle and Clearwater basins is very concerning. Snowpack increased slightly last month but remains well below normal (65 to 70%). The Clearwater snowpack was at record low levels before the recent storms slightly improved conditions. Even if the Clearwater receives its typical amount of snowfall in March, this year's snowpack will still be one of the lowest on record due to the large precipitation deficit that's built up over the water year. Storms at the end of February finally brought more moisture to northern Idaho but it remains to be seen whether conditions in these basins will improve significantly before April 1.

Precipitation

February was a wet month in Idaho with above normal precipitation measured across the entire state (Fig. 1). Total monthly precipitation during February ranged from 110% of normal monthly precipitation in the Clearwater to 244% in the Little Wood Basin. Storm tracks strongly favored the Wood and Lost basins during the early February atmospheric river event thanks to the south-southwest flow direction. Thankfully at the end of the month, storms finally brought well above normal precipitation to northern Idaho, too.

All of the moisture delivered to Idaho during February brought total water year precipitation (WYP) closer to normal in all basins. However, total water year precipitation remains near to well below normal north of the Snake River Plain and well above normal to the south (Fig. 2). In other words, southern Idaho is still the wettest portion of the state and northern Idaho is still the driest. In the West Central basins, the Boise Basin is the closest to normal on March 1 at 91% of normal for WYP. The Weiser and Payette are drier (~85%). WYP in the Wood and Lost basins now ranges from 87 to 102% of normal. Henrys Fork-Teton and the Snake River Headwaters are near normal for WYP (~95%).

Water supply

Improvements in Idaho's snowpack boosted confidence in water supply this upcoming season, especially with major winter storms delivering snow as we write this report. Reservoir storage is at or above normal on March 1 with the exception of Mackay Reservoir (69%) and Lake Pend Orielle (83%). Increases in snowpack will hopefully translate into improved mid to late-summer streamflow but the influence of spring and summer weather on irrigation demand will play a critical role in water supply.

The Boise River system has well above normal storage at 121% of normal (73% full) on March 1. Reservoir inflows increased last month and these reservoirs are likely to fill. Snowpack in the Boise Basin is much higher than other West Central basins. Given the above normal reservoir storage and near normal snowpack in Boise at report time, water supply looks good in this basin. Reservoir storage in the Payette River system is 108% of normal (70% full). However, snowpack is only 85% of normal on March 1 which could prevent Deadwood Reservoir from filling. Cascade Reservoir will likely fill. The NRCS forecast for the primary snowmelt runoff period (April to July) at Boise River near Boise predicts near normal runoff at 96% of normal (1,090 KAF).

Total storage in the Upper Snake Reservoir system above Milner Dam is ~110% of normal (78% full) on March 1 with reservoir storage increasing at a faster rate than average. Currently, there is ~725 KAF (thousand acre-feet) more water in the system than is typical for early March. Combined Jackson Lake and Palisades storage above Heise is 125% of normal (83% full). The NRCS forecast for the primary snowmelt runoff period at Heise (April to July) predicts below normal runoff at 94% of normal (2,950 KAF). This forecast increased by 590 KAF since last month. Within the Snake River Headwaters, streamflow forecasts range between 72 to 105% with the lowest predicted volumes for the sub-basins in between Jackson and Palisades reservoirs. Streamflow forecasts in the Henrys Fork-Teton Basin increased too, and now range from 81 to 95% of normal. Streamflow in the Willow-Blackfoot-Portneuf Basin is predicted to range from 138 to 160% of normal.

Streamflow forecasts increased across Idaho and in the Snake River Headwaters since our February 1 forecasts. Wet weather last month continued to improve total water year precipitation and snowpack, the two main influences on our streamflow forecast models. The only region with well above normal streamflow predicted for the upcoming runoff season includes the Southern Snake River, Bear River and Willow-Blackfoot-Portneuf basins due to the consistently above normal conditions along the border. Streamflow forecasts at the 50% exceedance level range from 137 to 222% in the Southern Snake basins, and 101 to 222% in the Bear River Basin. Forecasted streamflow generally decreases from south to north. Portions of the Boise, Wood and Lost basins experienced enough improvement in conditions to achieve near normal streamflow forecasts at many forecast locations (88 to 108%). Predicted streamflow volumes increased slightly in the Weiser, Payette, Salmon, Clearwater, and Panhandle basins but the improvements in snowpack were not enough to bring streamflow to normal levels given the SWE and WYP

deficits. Streamflow forecasts remain significantly below normal at most forecast locations in the Salmon, Clearwater, Coeur d'Alene-St. Joe, and Kootenai-Pend Oreille basins (65 to 89%). Since weather forecasts indicate dry weather has returned and will likely continue in these basins during the next ~10 days, we encourage readers to consider the 'drier' 70% or 90% exceedance forecast volumes. Unless precipitation conditions really turn around in central and northern Idaho, streamflow is likely to be significantly below normal this summer.

Streamflow, snowpack, and precipitation data for each basin can be accessed in basin reports or on the NRCS interactive map. Replacements for the daily, ready-to-print maps of SWE and total water year precipitation maps are available on the National Water and Climate website.

IDAHO SURFACE WATER SUPPLY INDEX (SWSI) March 1, 2024

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 1991 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	**-2.3**	**2016**	**NA**
Clearwater	**-2.6**	**2010**	**NA**
Salmon	**-1.1**	**2003**	**NA**
Weiser	**-0.9**	**2018**	**NA**
Payette	**-1.1**	**2022**	**NA**
Boise	**0.9**	**2009**	**- 2.0**
Big Wood above Hailey	**-0.4**	**2008**	**- 2.7**
Big Wood	**0.9**	**2012**	**0.5**
Camas Creek nr Blaine	**-0.1**	**2010**	**NA**
Little Wood	**0.4**	**2009**	**- 1.7**
Big Lost	**0.1**	**2016**	**0.7**
Little Lost	**0.4**	**2012**	**1.7**
Teton	**-0.6**	**2015**	**- 3.9**
Henrys Fork	**-0.1**	**2010**	**- 2.9**
Snake (Heise)	**0.9**	**2006**	**- 1.5**
Oakley	**2.3**	**1996**	**- 0.2**
Salmon Falls above Jackpot	**1.6**	**2016**	**NA**
Salmon Falls	**1.8**	**1995**	**-0.7**
Bruneau	**2.1**	**2005**	**NA**
Owyhee	**3.3**	**1998**	**- 2.2**
Bear River	**2.6**	**2018**	**- 3.7**

SWSI SCALE, PERCENT CHANCE OF EXCEEDANCE, AND INTERPRETATION

```
 -4      -3      -2      -1       0       1       2       3       4
  |------|------|------|------|------|------|------|------|------|
99%      87%      75%      63%      50%      37%      25%     13%      1%
-----------------------------------------------------------------------
|Much    | Below      |        Near Normal        |  Above    |  Much  |
|Below   | Normal     |        Water Supply       |  Normal   |  Above |
-----------------------------------------------------------------------
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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.

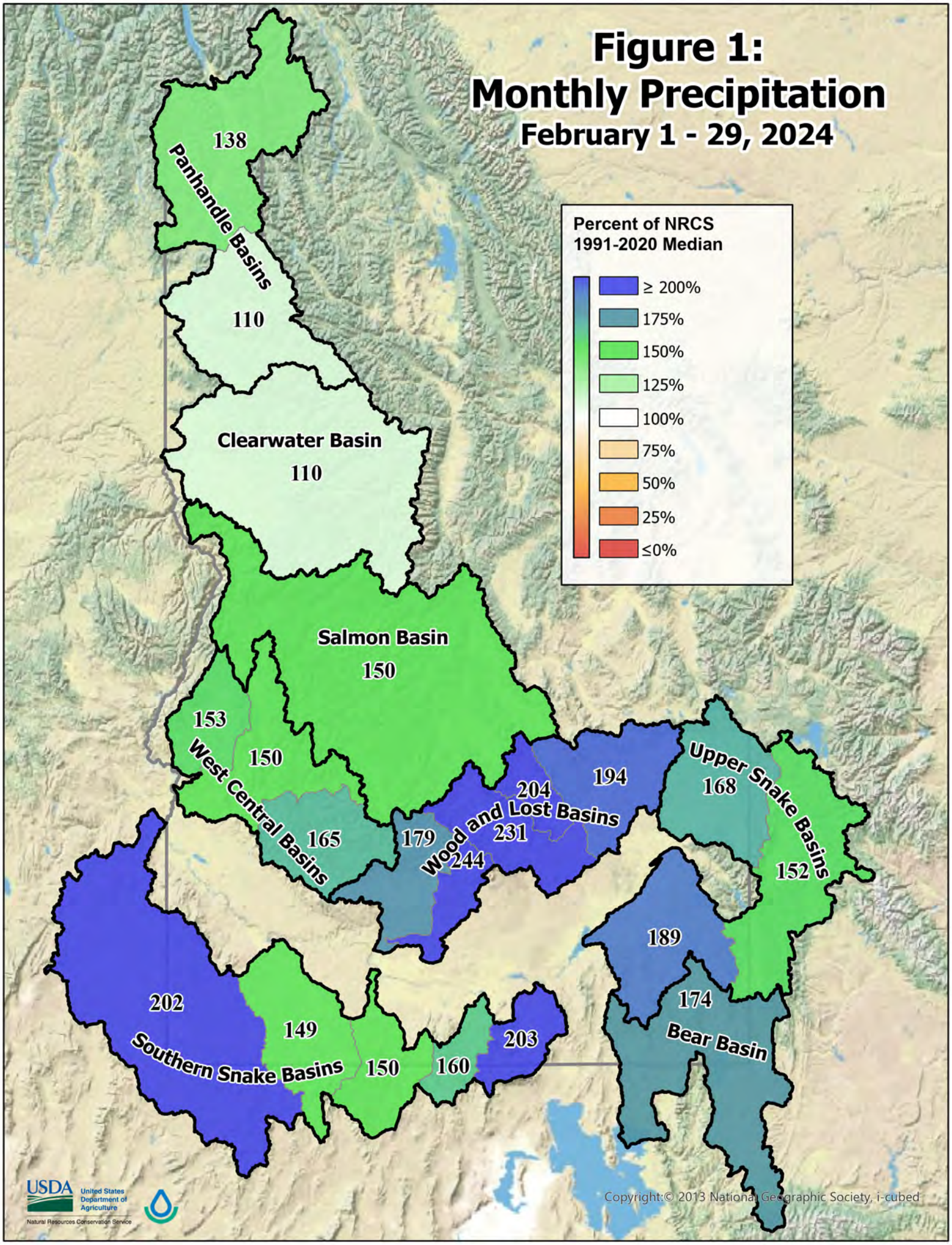
Figure 1:
Monthly Precipitation
February 1 - 29, 2024
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
Panhandle Basins
138
110
Clearwater Basin
110
Salmon Basin
150
153
150
West Central Basins
165
179
Wood and Lost Basins
204
231
244
194
Upper Snake Basins
168
152
189
174
Bear Basin
202
149
Southern Snake Basins
150
160
203
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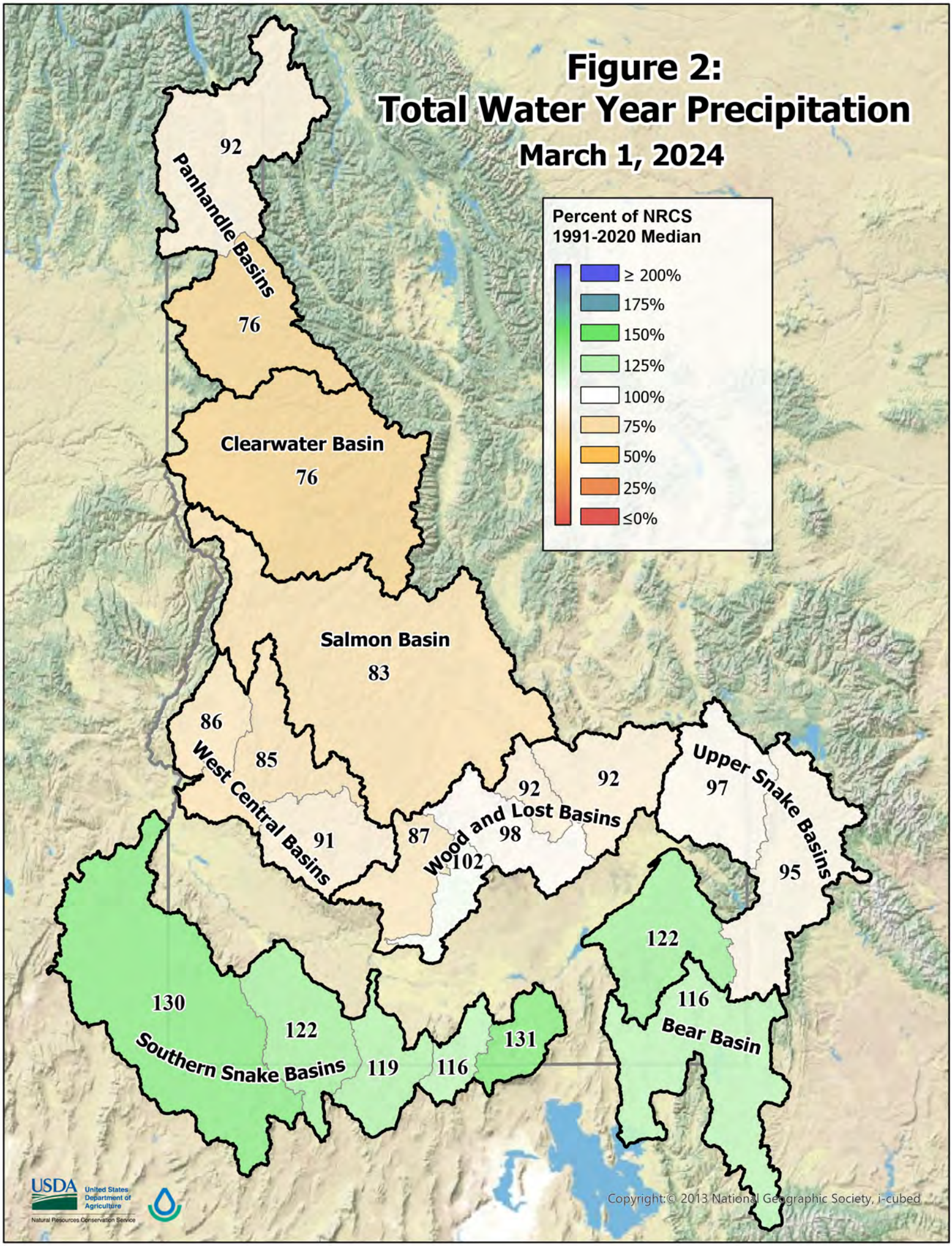
Figure 2:
Total Water Year Precipitation
March 1, 2024
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
Panhandle Basins
92
76
Clearwater Basin
76
Salmon Basin
83
86
85
West Central Basins
91
87
Wood and Lost Basins
98
102
92
92
Upper Snake Basins
97
95
122
116
Bear Basin
130
122
Southern Snake Basins
119
116
131
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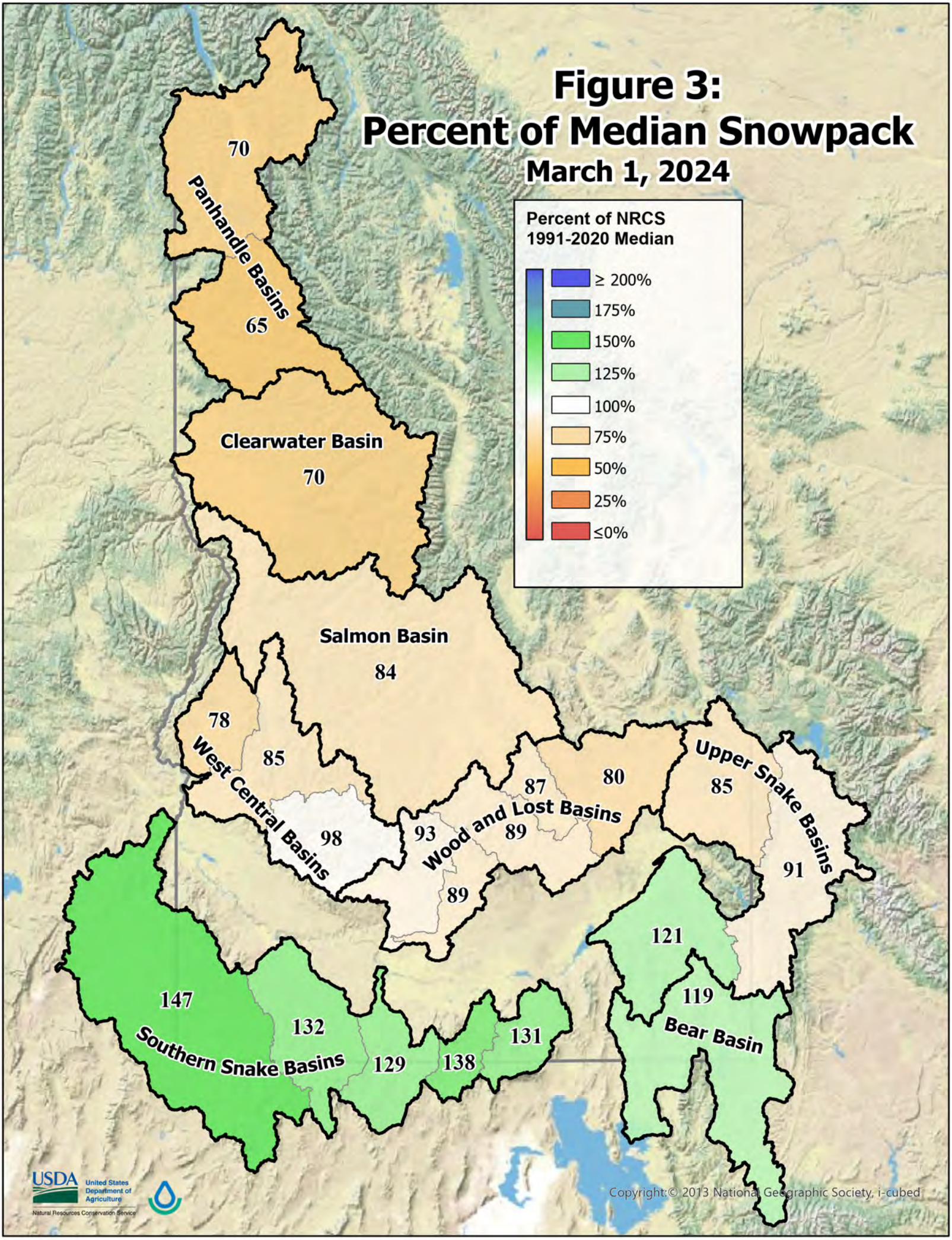
Figure 3:
Percent of Median Snowpack
March 1, 2024
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
Panhandle Basins
70
65
Clearwater Basin
70
Salmon Basin
84
West Central Basins
78
85
98
Wood and Lost Basins
93
87
89
89
80
Upper Snake Basins
85
91
Southern Snake Basins
147
132
129
138
131
Bear Basin
121
119
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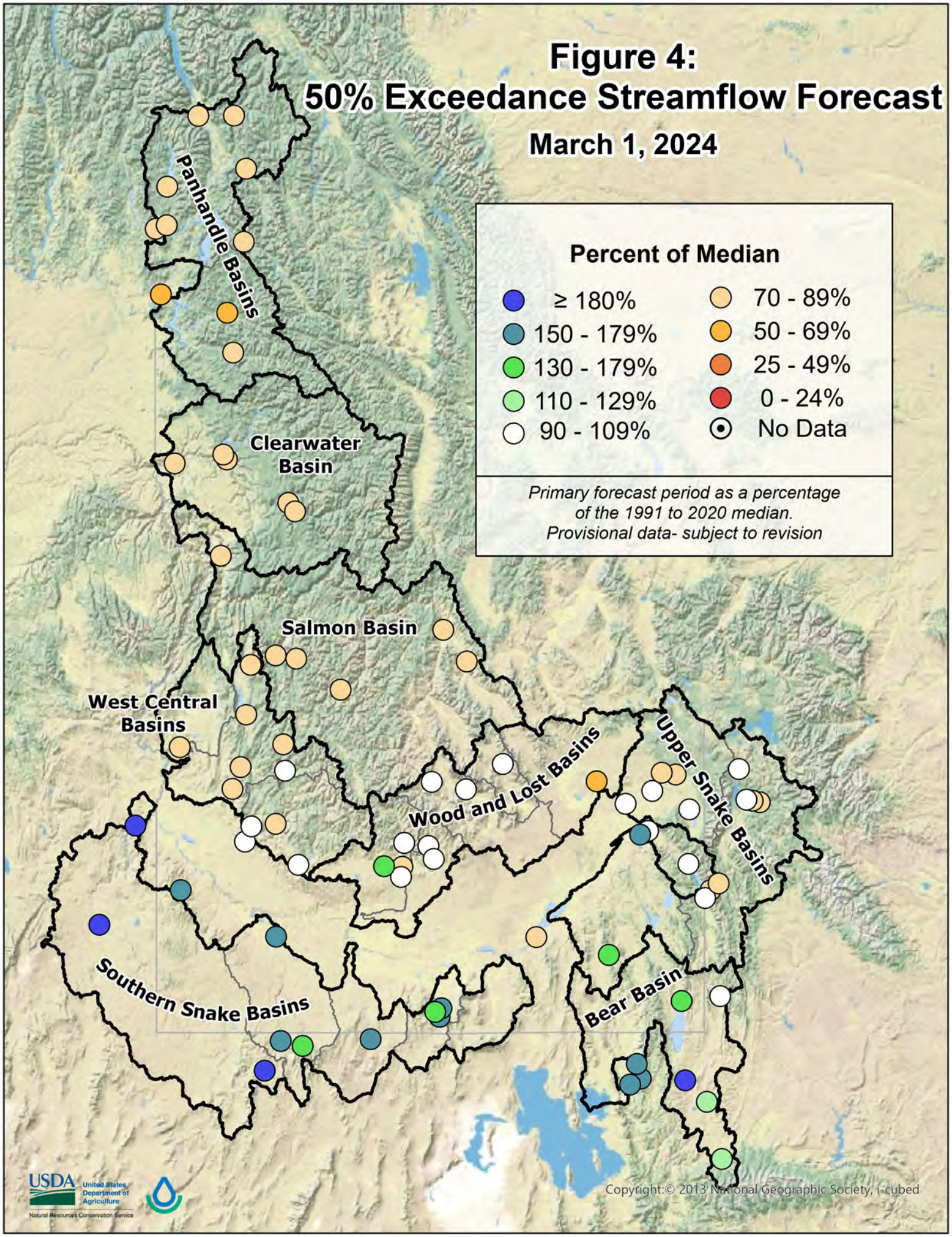
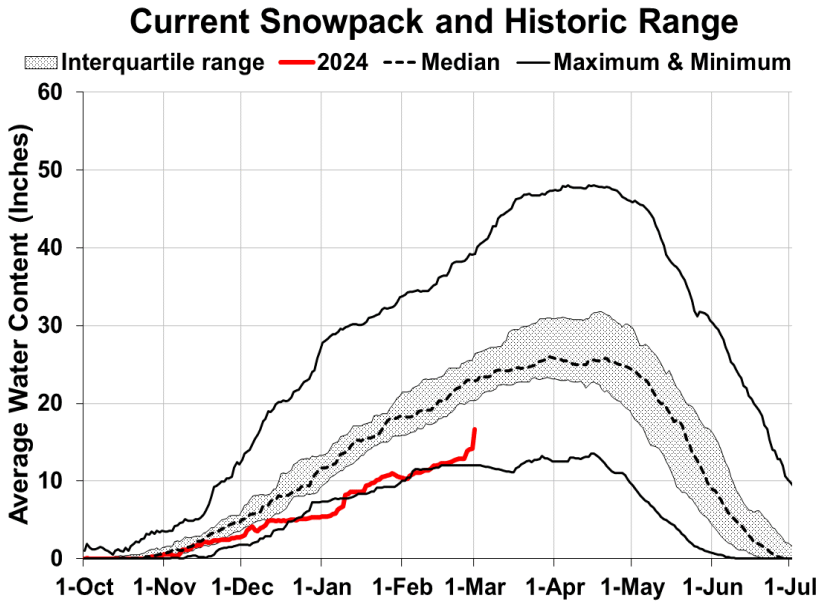
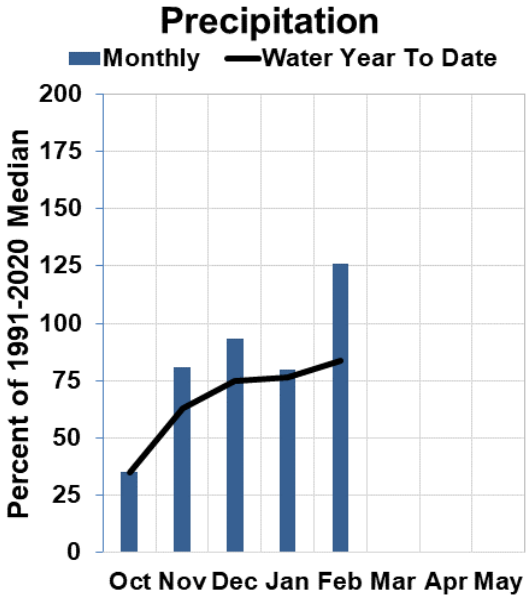
Figure 4:
50% Exceedance Streamflow Forecast
March 1, 2024



Panhandle Basins

March 1, 2024





WATER SUPPLY OUTLOOK

Precipitation in February was ~110 to 140% of normal (Fig. 1) which brought much needed water to these basins. Water Year 2024 continues to be below normal. March 1 total water year precipitation ranges from ~75 to 90% of normal (Fig. 2). February ended with a big storm that improved snowpack across the Panhandle, but snowpack is still well below normal. Snowpack ranges from ~65 to 70% of normal (Fig. 3). Even if well above normal snow accumulation occurs during the remainder of winter, the Coeur d'Alene-St. Joe and Pend Oreille-Kootenai basins will end their winter with well below normal snowpacks. NOAA's 30-Day Outlook does not favor below normal precipitation or above normal temperatures which offers a glimmer of hope that snow conditions will continue to improve during the last leg of the snow accumulation season.

Reservoir storage in the Panhandle lakes on March 1: Coeur d'Alene is 124% of normal (53% full), Pend Oreille is 83% of normal (36% full), and Priest Lake is 164% of normal (77% full). Streamflow forecasts for April through July are ~65 to 90% of normal at the 50% exceedance level in the Panhandle basins (Fig. 4).

Panhandle Region Streamflow Forecasts - March 1, 2024

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Med (KAF)
Kootenai R at Leonia 1 & 2	APR-JUL	4050	5370	5970	89%	6570	7890	6680
	APR-SEP	4850	6220	6850	91%	7480	8850	7560
Boundary Ck nr Porthill	APR-JUL	75	90	100	84%	111	124	119
	APR-SEP	75	92	102	82%	112	128	124
Moyie R at Eastport	APR-JUL	225	275	310	83%	345	400	375
	APR-SEP	230	280	315	81%	355	415	390
Priest R nr Priest River 2	APR-JUL	450	555	640	76%	730	845	840
	APR-SEP	495	610	700	80%	800	915	880
Pend Oreille Lake Inflow 2	APR-JUL	6530	8130	9270	79%	10400	11900	11700
	APR-SEP	7130	8870	10100	80%	11400	12900	12600
Priest R Outflow NR Coolin	APR-JUL	390	470	525	76%	570	650	690
	APR-SEP	420	505	565	78%	615	705	725
Pend Oreille R bl Box Canyon	APR-JUL	6500	8170	9260	79%	10500	11800	11700
	APR-SEP	7100	9030	10200	80%	11500	13200	12700
NF Coeur dAlene R at Enaville	APR-JUL	305	400	470	66%	560	695	715
	APR-SEP	285	390	485	65%	575	715	750
St. Joe R at Calder 2	APR-JUL	485	625	740	70%	845	1010	1050
	APR-SEP	505	665	775	69%	895	1070	1120
Spokane R nr Post Falls 2	APR-JUL	925	1330	1620	65%	1940	2410	2510
	APR-SEP	1020	1400	1690	66%	2030	2500	2570
Clark Fork R bl Cabinet Gorge Dam 2	APR-JUL	5590	6940	7860	79%	8940	10200	9980
	APR-SEP	6180	7550	8570	79%	9710	11000	10900
Pend Oreille Lake Inflow 2	APR-JUL	6530	8130	9270	79%	10400	11900	11700
	APR-SEP	7130	8870	10100	80%	11400	12900	12600

Normals based on 1991-2020 reference period: streamflow, snowpack, precipitation, & reservoir normals are medians.

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

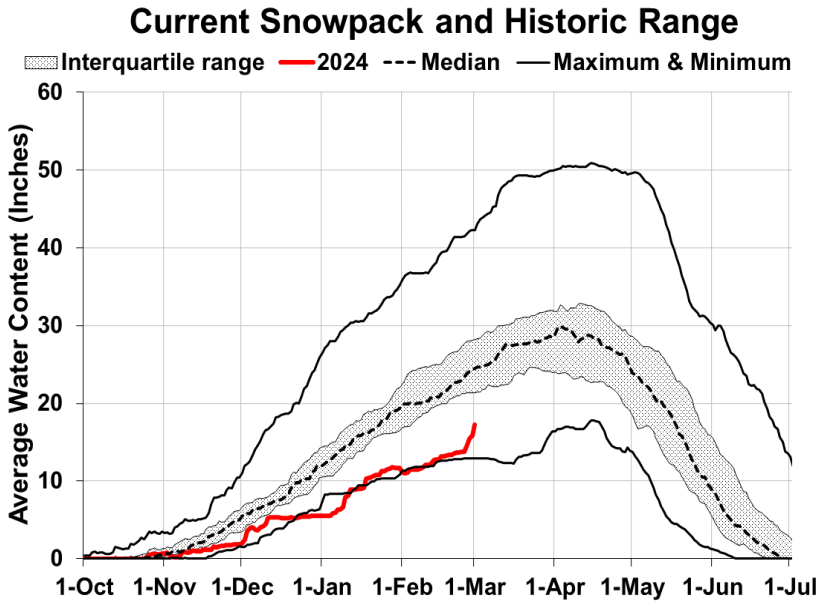
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

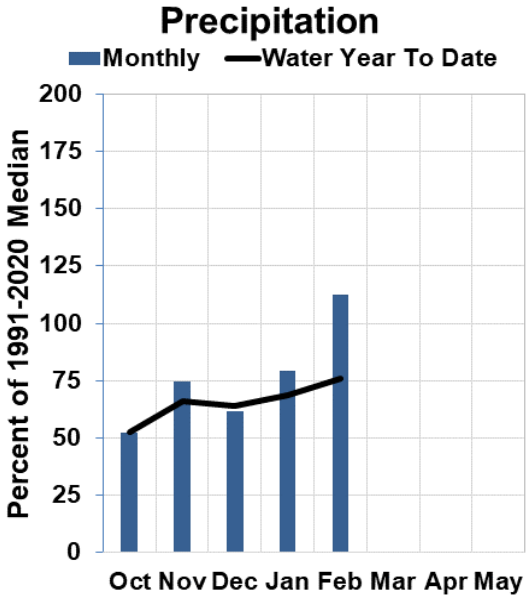
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Hungry Horse Lake	2847.2	2538.8	2474.0	3451.0
Flathead Lake	943.6	769.5	784.5	1791.0
Noxon Rapids Reservoir	316.6	311.1	319.8	335.0
Lake Pend Oreille	563.9	552.6	682.0	1561.3
Priest Lake	91.7	47.1	55.8	119.3
Lake Coeur d' Alene	125.3	47.4	101.2	238.5

Watershed Snowpack Analysis: March 1, 2024			
Basin Name	# of Sites	% of Median 2024	% of Median 2023
Moyie River	1	76%	90%
Priest River	8	71%	89%
Rathdrum Creek	3	59%	100%
Coeur d' Alene River	7	66%	99%
St. Joe River	5	64%	96%
Pend Oreille Lake	6	69%	90%
Palouse River	2	67%	95%
Lower Kootenai	2	83%	82%
Pend Oreille-Kootenai	16	70%	89%
Coeur d' Alene-St. Joe Total	11	65%	99%

Clearwater River Basin

March 1, 2024





WATER SUPPLY OUTLOOK

Precipitation in February was ~110% of normal (Fig. 1) which brought much needed water to the Clearwater Basin. Water Year 2024 continues to be below normal with March 1 total water year precipitation at ~75% (Fig. 2). The Clearwater benefited from a big storm that improved snowpack at the end of February, but snowpack is still well below normal at ~70% (Fig. 3). With about a month left in the normal snow accumulation season (peak snowpack occurs near April 10), it is likely this year's snowpack will peak well below normal. NOAA's Climate Prediction Center's 30-day outlook favors above normal precipitation across the southern edge of the basin. The seasonal three-month outlooks predict there is an increased chance that it will be warmer and drier than normal this spring. There is potential for conditions to improve, but the Clearwater Basin will need cold, frequent storms with record snowfall during March to reach near normal snowpack conditions.

Dworshak Reservoir is 68% full, which is 102% of normal on March 1. The 50% exceedance streamflow forecasts are ~70 to 90% of normal for April to July (Fig. 4). There's a set amount of water released every year from Dworshak to aid anadromous fish migration. This flow augmentation provides favorable streamflow levels and temperature conditions to protect migrating fish. If the Clearwater doesn't get significantly more snow, there is a chance these releases will be limited. While there are less irrigation water supply concerns in this basin, the ecological impacts of the dry water year are increasing.

Clearwater River Basin Streamflow Forecasts - March 1, 2024

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Med (KAF)
Selway R nr Lowell	APR-JUL	1290	1550	1720	88%	1900	2150	1960
	APR-SEP	1370	1630	1810	88%	1990	2260	2050
Lochsa R nr Lowell	APR-JUL	775	965	1100	77%	1230	1420	1430
	APR-SEP	830	1030	1160	77%	1290	1490	1500
Dworshak Reservoir Inflow 2	APR-JUL	1070	1440	1690	71%	1940	2310	2370
	APR-SEP	1200	1580	1840	72%	2100	2480	2560
Clearwater R at Orofino	APR-JUL	2700	3330	3760	86%	4190	4820	4380
	APR-SEP	2860	3510	3960	87%	4400	5060	4570
Clearwater R at Spalding 2	APR-JUL	3750	4870	5640	83%	6400	7520	6820
	APR-SEP	4040	5200	5980	82%	6770	7930	7290

Normals based on 1991-2020 reference period: streamflow, snowpack, precipitation, & reservoir normals are medians.

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

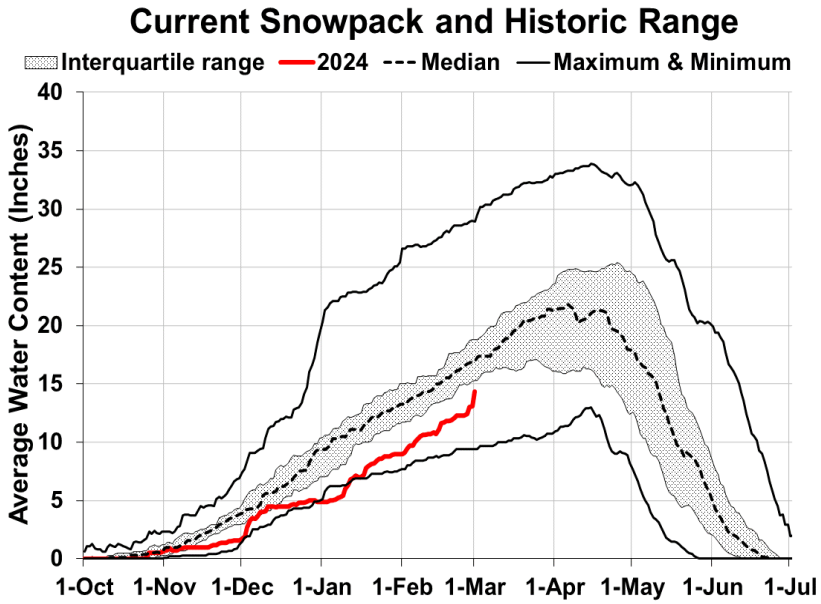
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

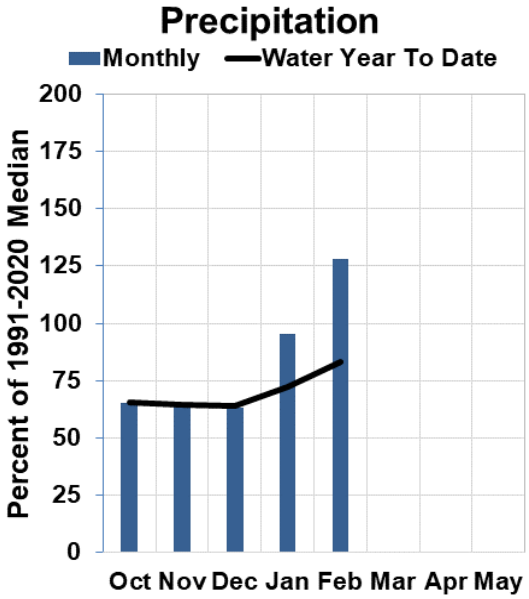
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Dworshak Reservoir	2352.3	2233.0	2299.0	3468.0

Watershed Snowpack Analysis: March 1, 2024			
Basin Name	# of Sites	% of Median 2024	% of Median 2023
NF Clearwater River	9	66%	97%
Lochsa River	3	70%	87%
Selway River	4	81%	90%
SF Clearwater River	1	95%	97%
Clearwater Basin Total	18	70%	95%

Salmon River Basin

March 1, 2024





WATER SUPPLY OUTLOOK

The Salmon River Basin received well above normal precipitation (150%) during February (Fig. 2), raising total water year precipitation to 83% (Fig. 1). The significant snow accumulation in the month improved snowpack conditions across the basin to 84% (Fig. 3). Precipitation this month was greatest in the eastern portion of the basin due to a southerly storm track in the beginning of the month. Still, snowpack at nearly all sites remains below normal due to early season precipitation deficits (10th to 40th percentile compared to the period of record). To reach median snowpack conditions by April 1, snow accumulation in March needs to be nearly 200% of normal. The only time in the period of record that an amount of that magnitude happened in March was in 2011. NOAA's Climate Prediction Center's 30-day outlook suggests above normal precipitation conditions in March, with equal chances for above or below normal temperature. Reaching normal peak snowpack this winter is still unlikely, but these projected conditions for wetter than normal conditions is encouraging for continued improvement.

There are no reservoirs in the Salmon Basin. The 50% exceedance streamflow forecasts are ~80 to 90% of normal for April through July (Fig. 4), with the Middle Fork Salmon River at 81% of normal.

Salmon River Streamflow Forecasts - March 1, 2024

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Med (KAF)
Salmon R at Salmon	APR-JUL	400	565	680	85%	790	955	800
	APR-SEP	475	660	785	85%	910	1090	920
Lemhi R nr Lemhi	APR-JUL	16.2	42	60	88%	78	104	68
	APR-SEP	22	53	73	89%	93	124	82
MF Salmon R at MF Lodge	APR-JUL	395	535	630	81%	725	865	775
	APR-SEP	445	595	700	82%	805	955	850
SF Salmon R nr Krassel Ranger Station	APR-JUL	141	194	230	79%	265	320	290
	APR-SEP	152	205	245	79%	285	340	310
Johnson Ck at Yellow Pine	APR-JUL	95	137	165	79%	194	235	210
	APR-SEP	102	146	176	80%	205	250	220
Salmon R at White Bird	APR-JUL	3170	4070	4680	79%	5290	6180	5940
	APR-SEP	3530	4500	5160	78%	5820	6790	6600

Normals based on 1991-2020 reference period: streamflow, snowpack, precipitation, & reservoir normals are medians.

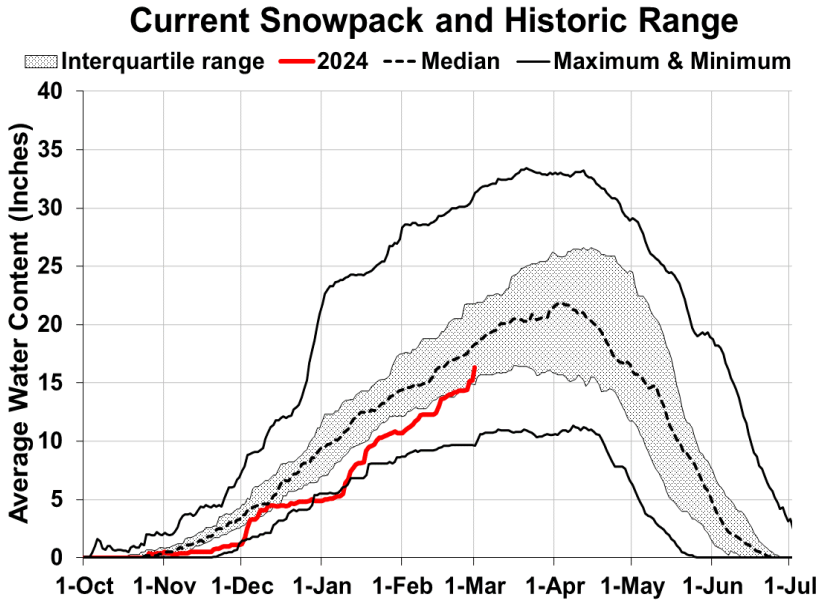
1) 90% and 10% exceedance probabilities are actually 95% and 5%

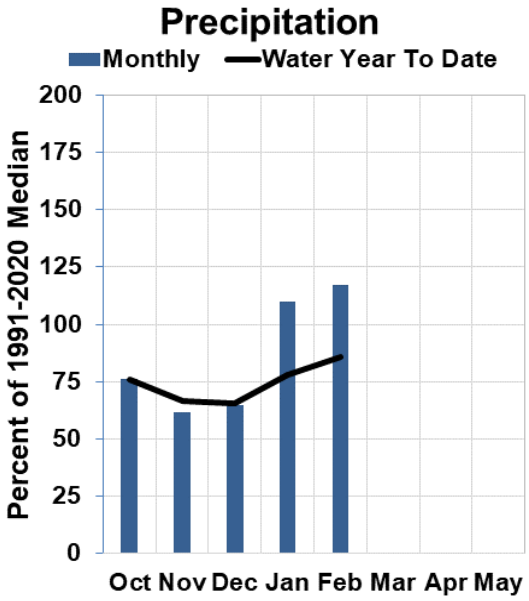
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis: March 1, 2024 Basin Name	# of Sites	% of Median 2024	2023
Salmon River ab Salmon	9	89%	100%
Lemhi River	7	91%	104%
MF Salmon River	3	79%	92%
SF Salmon River	3	77%	90%
Little Salmon River	4	81%	94%
Lower-Middle Salmon	5	85%	96%
Salmon Basin Total	26	84%	95%

West Central Basins

March 1, 2024





WATER SUPPLY OUTLOOK

Precipitation in February was 150 to 165% of normal across the West Central basins (Fig. 1). Total water year precipitation is 85 to 91% of normal (Fig. 2). February snowfall ranged from ~91 to 300% of normal with a majority of the SNOTEL stations receiving well above the monthly median amount. This higher than normal monthly snowfall in these basins brought the snowpack closer to normal after the dry early winter. However, as of March 1, snowpack in these basins is still slightly below normal (78 to 98%).

Reservoir storage in the Boise system (Anderson Ranch, Arrowrock and Lucky Peak combined) is 121% of normal on March 1. Storage in the Payette system is 108% of normal and 121% of normal in the Weiser. The 50% exceedance streamflow forecasts for the April through July period in the Boise River Basin is 94% of normal, the Payette is 85% of normal, and the Weiser is 82% of normal (Fig. 4). Soil moisture ranges from above normal in the valleys, to below normal in the mountains. NOAA's 30-Day Outlook predicts a slight chance of above normal precipitation during March.

West Central Basins Streamflow Forecasts - March 1, 2024

Forecast Point	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Med (KAF)
		Forecast Exceedance Probabilities for Risk Assessment						
		<--Drier		Projected Volume			Wetter-->	
SF Boise R at Anderson Ranch Dam 2	APR-JUL	235	325	385	92%	445	535	420
	APR-SEP	260	355	415	92%	480	570	450
Boise R nr Twin Springs	APR-JUL	345	450	525	88%	595	705	600
	APR-SEP	380	495	570	88%	645	755	645
Mores Ck nr Arrowrock Dam	APR-JUL	51	82	102	106%	123	154	96
	APR-SEP	53	85	106	106%	127	158	100
Boise R nr Boise 2	APR-JUL	690	925	1090	96%	1250	1490	1130
	APR-SEP	765	1010	1180	97%	1350	1600	1220
Lake Fork Payette R nr McCall	APR-JUL	49	62	70	86%	79	92	81
	APR-SEP	50	63	72	87%	82	95	83
NF Payette R at Cascade 2	APR-JUL	235	330	395	82%	455	550	480
	APR-SEP	235	335	400	82%	465	560	490
NF Payette R nr Banks 2	APR-JUL	270	405	490	82%	580	710	595
	APR-SEP	275	410	500	82%	590	725	610
SF Payette R at Lowman	APR-JUL	260	325	370	90%	415	480	410
	APR-SEP	295	365	415	91%	465	535	455
Deadwood Reservoir Inflow 2	APR-JUL	63	85	100	81%	115	137	124
	APR-SEP	69	93	109	80%	125	149	136
Payette R nr Horseshoe Bend 2	APR-JUL	720	1010	1220	85%	1420	1710	1430
	APR-SEP	775	1090	1300	85%	1510	1820	1530
Weiser R nr Weiser	MAR-JUL	210	315	395	82%	485	635	480
	APR-JUL	146	220	280	82%	345	455	340
	APR-SEP	165	240	305	82%	370	485	370

Normals based on 1991-2020 reference period: streamflow, snowpack, precipitation, & reservoir 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

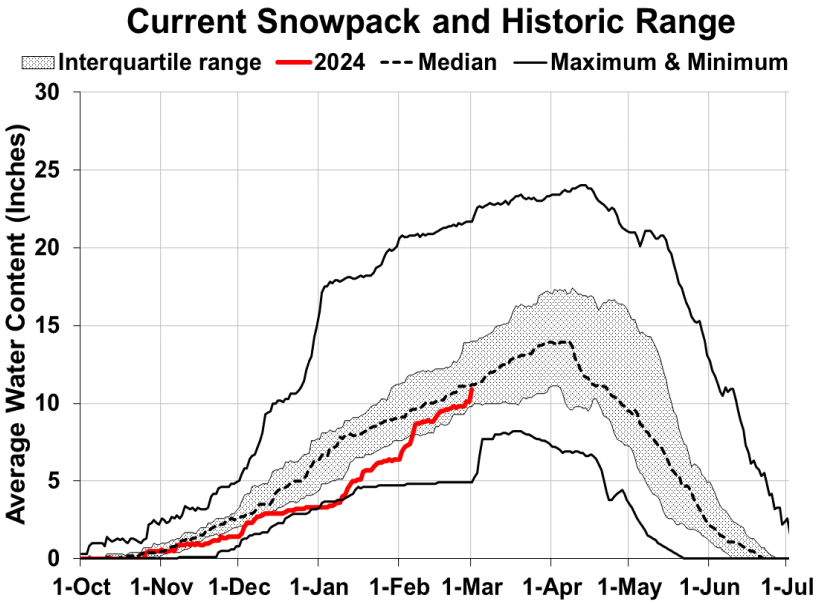
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	392.1	342.0	271.4	450.2
Arrowrock Reservoir	222.4	193.9	224.3	272.2
Lucky Peak Reservoir	125.3	90.3	115.3	293.2
Sub-Basin Total	**739.9**	**626.3**	**611.0**	**1015.6**
Deadwood Reservoir	99.0	78.4	91.1	161.9
Cascade Reservoir	498.9	440.3	464.2	693.2
Sub-Basin Total	**597.9**	**518.7**	**555.3**	**855.1**
Lake Lowell	115.1	80.3	98.2	165.2
Mann Creek Reservoir	5.1	1.6	4.2	11.1

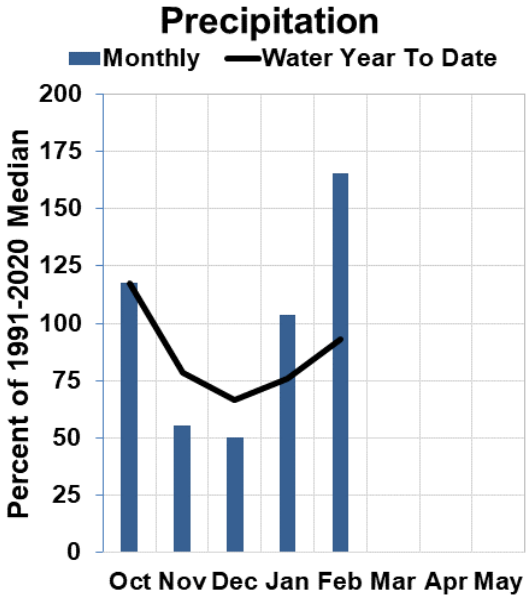
Watershed Snowpack Analysis: March 1, 2024

Basin Name	# of Sites	% of Median 2024	% of Median 2023
SF Boise River	9	98%	110%
MF & NF Boise Rivers	6	87%	100%
Mores Creek	5	96%	100%
Canyon Creek	4	121%	137%
Boise Basin Total	18	98%	105%
NF Payette River	9	81%	92%
SF Payette River	4	80%	95%
Payette Basin Total	19	85%	96%
Mann Creek	2	89%	112%
Weiser Basin Total	10	76%	101%

Wood & Lost River Basins

March 1, 2024





WATER SUPPLY OUTLOOK

Significant storms throughout the month of the February greatly improved conditions in the Wood and Lost basins. Precipitation during February was well above normal, ranging from ~180 to 245% of normal (Fig. 1). Total water year precipitation improved to near normal and now ranges from ~90 to 100% of normal. Snowpack conditions also approached normal conditions, ranging from ~80 to 95% of normal on March 1 (Fig. 3). A large proportion of the monthly accumulation occurred during the first week of February when an atmospheric river event from the south-southwest brought abundant snowfall to the Wood and Lost basins. Another month with above normal accumulation is needed to reach normal peak snowpack for all basins in the area. The Birch-Medicine Lodge-Beaver-Camas Basin needs the most precipitation to reach normal snowpack conditions. This basin needs more than 200% of normal March precipitation, whereas the Big Wood River basin only needs 120% of normal March snowfall to reach median peak Snow Water Equivalent (SWE). NOAA's Climate Prediction Center's 30-day outlook projects above normal precipitation in March, which is a great sign for further snowpack improvement.

March 1 reservoir storage remains above the 30-year normal at Magic Reservoir with 232% of normal storage (75% full). Little Wood Reservoir is 155% of normal (83% full). Mackay Reservoir storage improved but is still behind at 69% of normal (49% full). Returning to normal fill by April 1 would require a 9 thousand acre-feet increase in March. Streamflow forecasts for the Wood and Lost basins are ~90 to 130% of normal for the 50% exceedance forecast, except for Camas Creek at Camas at 65% of normal (Fig. 4).

Wood and Lost Basins Streamflow Forecasts - March 1, 2024

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Med (KAF)
Camas Ck at Camas	APR-JUL	1.69	6.4	11.3	65%	17.6	29	17.3
Little Lost R bl Wet Ck nr Howe	APR-JUL	14.3	21	25	100%	29	36	25
	APR-SEP	16	24	30	103%	36	44	29
Big Lost R at Howell Ranch	APR-JUL	82	121	148	102%	175	215	145
	APR-SEP	92	135	165	104%	195	240	159
Big Lost R bl Mackay Reservoir	APR-JUL	47	83	107	103%	131	167	104
	APR-SEP	67	106	132	104%	158	197	127
Little Wood R ab High Five Ck	MAR-JUL	27	44	57	98%	72	97	58
	MAR-SEP	29	47	61	98%	77	104	62
Little Wood R nr Carey 2	MAR-JUL	32	51	66	108%	83	112	61
	MAR-SEP	34	54	70	108%	88	119	65
Big Wood R at Hailey	APR-JUL	95	155	195	93%	235	295	210
	APR-SEP	111	176	220	96%	265	330	230
Big Wood R ab Magic Reservoir	APR-JUL	43	86	124	89%	169	245	139
	APR-SEP	49	95	135	92%	182	265	146
Camas Ck nr Blaine	MAR-JUL	28	50	69	130%	91	129	53
	MAR-SEP	28	51	70	132%	92	130	53
Big Wood R bl Magic Dam 2	APR-JUL	73	130	178	103%	235	330	172
	APR-SEP	84	144	193	106%	250	345	182

Normals based on 1991-2020 reference period: streamflow, snowpack, precipitation, & reservoir normals are medians.

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

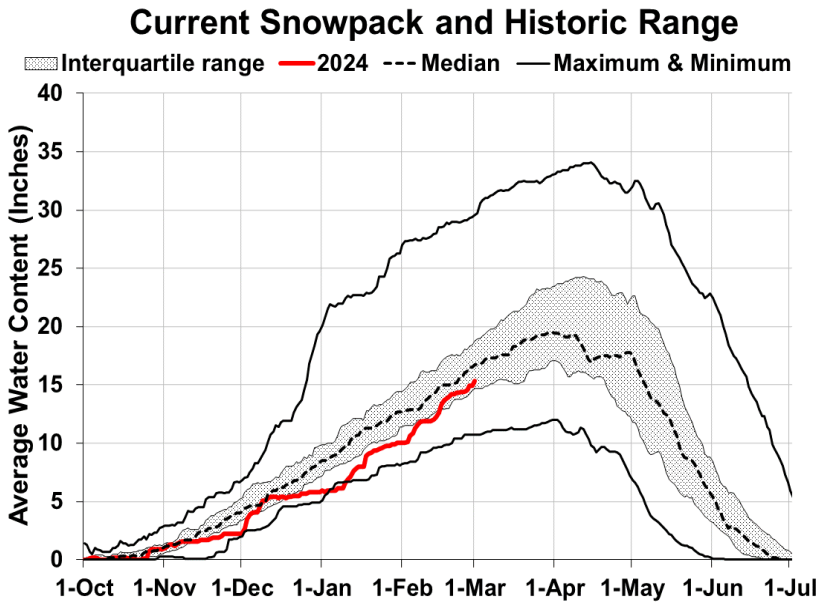
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

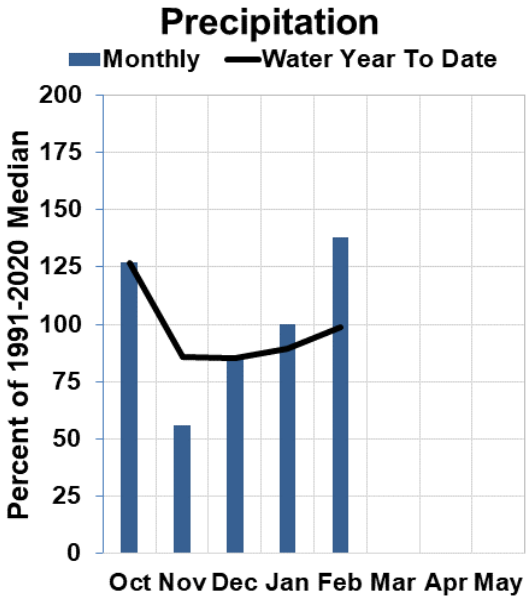
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Mackay Reservoir	21.7	26.9	31.6	44.4
Little Wood Reservoir	24.9	16.1	16.1	30.0
Magic Reservoir	142.8	27.0	61.6	191.5

Watershed Snowpack Analysis: March 1, 2024			
Basin Name	# of Sites	% of Median 2024	% of Median 2023
Camas-Beaver Creeks	4	79%	124%
Birch-Medicine Lodge Creeks	6	81%	128%
Little Lost River	5	87%	115%
Big Lost River ab Mackay	5	92%	121%
Big Lost Basin Total	7	89%	124%
Fish Creek	3	71%	120%
Little Wood ab Resv	5	99%	123%
Big Wood River ab Hailey	8	89%	120%
Camas Creek	4	100%	114%
Birch-Medicine Lodge-Camas-Beaver Total	10	80%	126%
Little Wood Basin Total	8	89%	122%
Big Wood Basin Total	12	93%	118%

Upper Snake River Basins

March 1, 2024





WATER SUPPLY OUTLOOK

February precipitation was well above normal in all Upper Snake sub-basins ranging from 116% to 207% with all SNOTEL sites receiving above normal precipitation. The Willow-Blackfoot-Portneuf received 189% of normal precipitation, Henrys Fork-Teton received 168%, and Snake River above Heise received 152% during February (Fig. 1). The strong February improved precipitation conditions across these basins by at least 10 percent since February 1. As of March 1, total water year precipitation is Henrys Fork-Teton 97% of normal, Snake River above Heise is 95%, and Willow-Blackfoot-Portneuf is 122% of normal (Fig. 2). While snowpack (Fig. 3) in Willow-Blackfoot-Portneuf continues to be well above normal at 121%, both Henrys Fork-Teton and Snake River above Heise remain below normal at 85% and 91% respectively despite the above normal precipitation during February. Although snowpack percentages compared to the 30-year median for Henrys Fork-Teton and Snake River above Heise indicate near normal conditions, most sites are in the bottom third percentile when compared to period of record on March 1. Willow-Blackfoot-Portneuf already exceeded median peak SWE with 27 days left in normal accumulation period. Both Henrys Fork-Teton and Snake River above Heise have approximately 35 days left in the normal accumulation period to reach median peak SWE. NOAA's 30-day Outlook favors above normal precipitation during March with no clear signal for temperature patterns in the Upper Snake.

The Upper Snake reservoir system above Milner Dam (excluding Blackfoot Reservoir due to lack of data) is currently 110% of normal (78% full). The Jackson-Palisades system is 125% of normal (83% full). The 50% exceedance streamflow forecasts in the region range from ~72 to 160% of median runoff for the primary forecast period (Fig. 4). The forecast at Heise is 94% of normal at the 50% exceedance level during the April through July period.

Upper Snake River Basin Streamflow Forecasts - March 1, 2024

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Med (KAF)
Henrys Fk nr Ashton 2	APR-JUL	295	360	405	85%	450	515	475
	APR-SEP	430	505	555	88%	605	680	630
Falls R nr Ashton 2	APR-JUL	250	295	320	81%	350	395	395
	APR-SEP	300	355	390	82%	430	480	475
Teton R nr Driggs	APR-JUL	85	116	138	95%	160	191	146
	APR-SEP	100	140	167	94%	194	235	178
Teton R nr St Anthony	APR-JUL	215	285	330	93%	375	445	355
	APR-SEP	255	330	385	91%	440	515	425
Henrys Fk nr Rexburg 2	APR-JUL	805	995	1120	93%	1250	1430	1210
	APR-SEP	1030	1260	1420	90%	1580	1810	1580
Snake R at Flagg Ranch	APR-JUL	300	370	420	90%	470	540	465
	APR-SEP	330	410	460	91%	510	590	505
Snake R nr Moran 2	APR-JUL	505	610	680	93%	750	855	730
	APR-SEP	555	670	750	93%	830	945	810
Pacific Ck at Moran	APR-JUL	75	106	127	82%	148	179	154
	APR-SEP	81	113	135	84%	157	189	160
Buffalo Fk ab Lava Ck nr Moran	APR-JUL	138	178	205	72%	230	270	285
	APR-SEP	146	193	225	73%	255	305	310
Snake R ab Reservoir nr Alpine 2	APR-JUL	1210	1480	1660	78%	1840	2110	2140
	APR-SEP	1380	1690	1900	78%	2110	2420	2430
Greys R ab Reservoir nr Alpine	APR-JUL	205	250	280	89%	310	355	315
	APR-SEP	245	295	330	90%	365	415	365
Salt R ab Reservoir nr Etna	APR-JUL	215	280	320	105%	360	425	305
	APR-SEP	270	340	390	103%	440	510	380
Snake R nr Irwin 2	APR-JUL	2010	2410	2680	91%	2950	3350	2930
	APR-SEP	2330	2790	3100	91%	3410	3870	3420
Snake R nr Heise 2	APR-JUL	2260	2670	2950	94%	3230	3640	3130
	APR-SEP	2650	3120	3450	94%	3780	4250	3660
Willow Ck nr Ririe 2	MAR-JUL	34	53	69	160%	86	116	43
Portneuf R at Topaz	MAR-JUL	65	76	84	138%	93	106	61
	MAR-SEP	77	90	100	133%	110	126	75
Snake R at Neeley 2	APR-JUL	795	1570	2100	88%	2630	3400	2390
	APR-SEP	665	1500	2070	88%	2640	3470	2360

Normals based on 1991-2020 reference period: streamflow, snowpack, precipitation, & reservoir 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

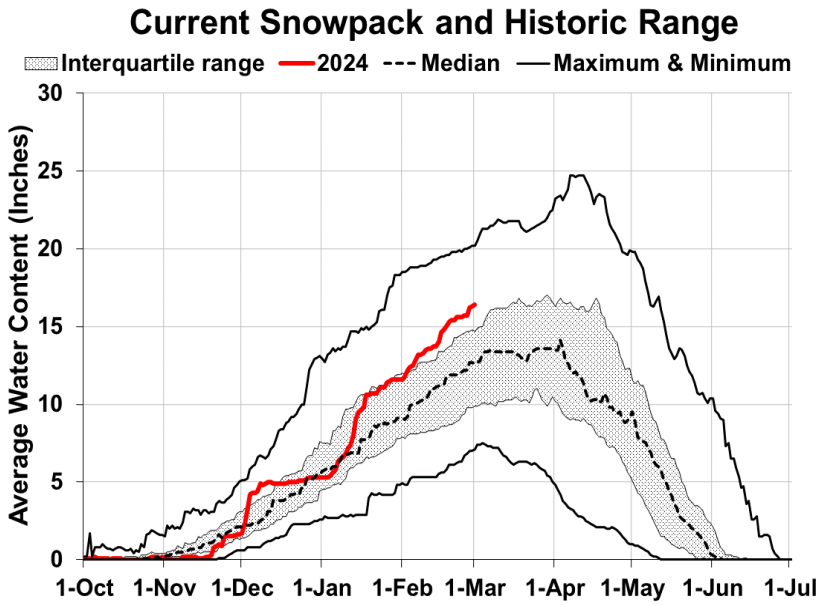
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Jackson Lake	613.8	185.9	626.4	847.0
Palisades Reservoir	1260.4	564.3	875.1	1400.0
Sub-Basin Total	**1874.3**	**750.1**	**1501.5**	**2247.0**
Henrys Lake	83.8	81.1	85.1	90.4
Island Park Reservoir	122.1	110.0	109.1	135.2
Grassy Lake	13.1	11.6	12.9	15.2
Sub-Basin Total	**219.0**	**202.7**	**207.1**	**240.8**
Ririe Reservoir	51.4	46.8	44.8	80.5
Blackfoot Reservoir		174.3	187.8	337.0
American Falls Reservoir	1426.9	1058.2	1317.0	1672.6
Basin-Wide Total	**3571.5**	**2232.2**	**3258.2**	**4577.9**

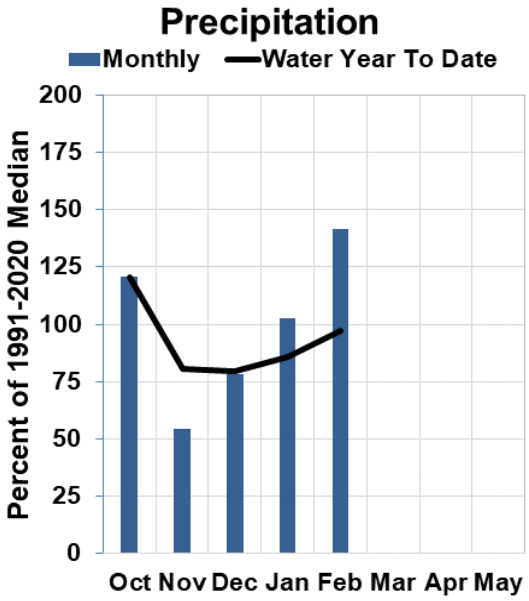
Watershed Snowpack Analysis: March 1, 2024

Basin Name	# of Sites	% of Median 2024	% of Median 2023
Henrys Fork-Falls River	11	85%	118%
Teton River	7	96%	112%
Henrys Fork-Teton	16	87%	115%
Snake River ab Jackson Lake	9	84%	105%
Pacific Creek	3	86%	102%
Buffalo Fork	4	78%	97%
Gros Ventre River	4	84%	96%
Hoback River	5	84%	95%
Greys River	5	96%	107%
Salt River	6	110%	123%
Snake ab Palisades Resv	30	88%	105%
Willow Creek	5	96%	107%
Blackfoot River	6	118%	153%
Portneuf River	7	129%	158%
Willow-Blackfoot-Portneuf	17	122%	156%
Snake River ab American Falls	50	98%	121%

Southern Snake River Basins

March 1, 2024





WATER SUPPLY OUTLOOK

February precipitation was 149 to 203% of normal across the Southern Snake River basins (Fig. 1). Total water year precipitation is now 116 to 131% of normal (Fig. 2). This water year's trend of above average snowfall in the Southern Snake River basins continued in February. February snowfall varied between 100 to 295% of normal. The snowmelt runoff season typically begins around now in this area. So far, snowmelt has not begun at our snow monitoring sites. However, there has been a slight increase in runoff registered on the USGS stream gauges. We have continued to see increased snowpack accumulation at all elevations. Snowpack in the Southern Snake River basins remains well above normal, ranging from 129 to 147% on March 1 (Fig. 3).

Reservoir storage in the region is above normal. Lake Owyhee storage is 171% of normal (73% full), Wild Horse is 186% of normal (82% full), Salmon Falls is 119% of normal (24% full), and Oakley Reservoir is 124% of normal (38% full). The 50% exceedance streamflow forecasts range from 137 to 223% of median runoff for the primary forecast period (Fig. 4). The primary forecast period for streamflow in these basins is runs from either March to July or April to July, depending on when snowmelt runoff has historically occurred. Soil moisture is above normal throughout these basins which bodes well for higher runoff efficiency during the melt season. NOAA's 30-Day Outlook predicts above normal precipitation during March.

Southern Snake River Basins Streamflow Forecasts - March 1, 2024

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Med (KAF)
Goose Ck ab Trapper Ck nr Oakley	MAR-JUL	17.7	24	29	172%	34	43	16.9
	MAR-SEP	18.3	25	30	173%	36	45	17.3
Trapper Ck nr Oakley	MAR-JUL	5.4	6.1	6.7	137%	7.3	8.2	4.9
	MAR-SEP	6.5	7.3	7.9	132%	8.5	9.4	6
Oakley Reservoir Inflow	MAR-JUL	23	30	35	159%	41	50	22
	MAR-SEP	24	32	37	154%	43	52	24
Salmon Falls Ck nr San Jacinto	MAR-JUL	67	88	104	163%	121	148	64
	MAR-SEP	70	91	107	162%	125	152	66
Bruneau R nr Hot Spring	MAR-JUL	191	245	290	168%	335	405	173
	MAR-SEP	197	255	300	168%	345	420	179
Reynolds Ck at Tollgate	MAR-JUL	7.6	9.8	11.4	156%	13.2	16	7.3
	MAR-SEP	7.7	9.9	11.5	155%	13.3	16.2	7.4
Owyhee R nr Gold Ck 2	MAR-JUL	29	40	49	223%	58	73	22
	APR-JUL	17.9	29	38	221%	48	65	17.2
Owyhee R nr Rome	MAR-JUL	405	570	700	197%	835	1070	355
	MAR-SEP	425	590	715	193%	855	1090	370
	APR-JUL	205	340	455	222%	585	805	205
Owyhee R bl Owyhee Dam 2	MAR-JUL	450	615	745	191%	880	1110	390
	MAR-SEP	480	645	770	183%	910	1130	420
	APR-JUL	235	375	485	206%	610	825	235
Bruneau R at Rowland	APR-JUL	47	64	76	158%	88	105	48
	APR-SEP	48	66	78	159%	90	107	49
Jarbidge River Below Jarbidge	APR-JUL	20	24	27	138%	30	35	19.6
	APR-SEP	21	25	28	140%	31	36	20

Normals based on 1991-2020 reference period: streamflow, snowpack, precipitation, & reservoir normals are medians.

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

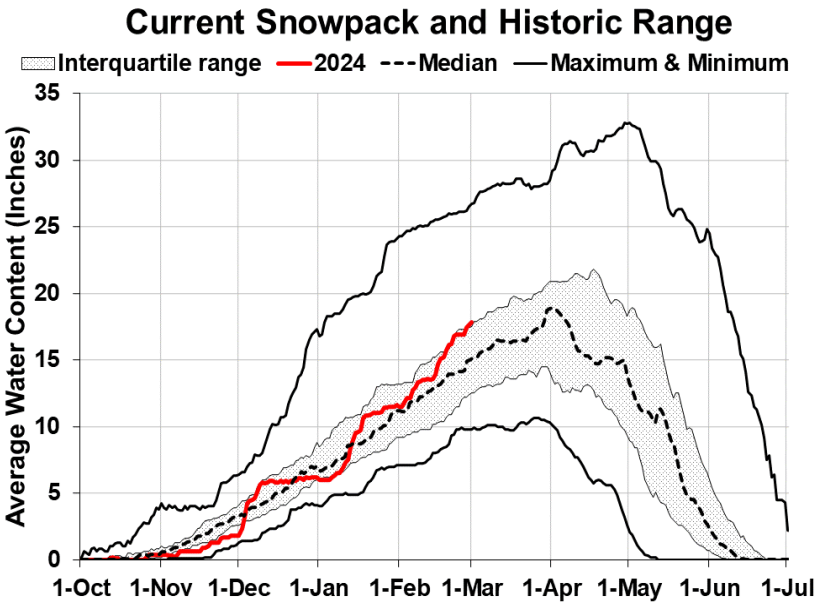
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

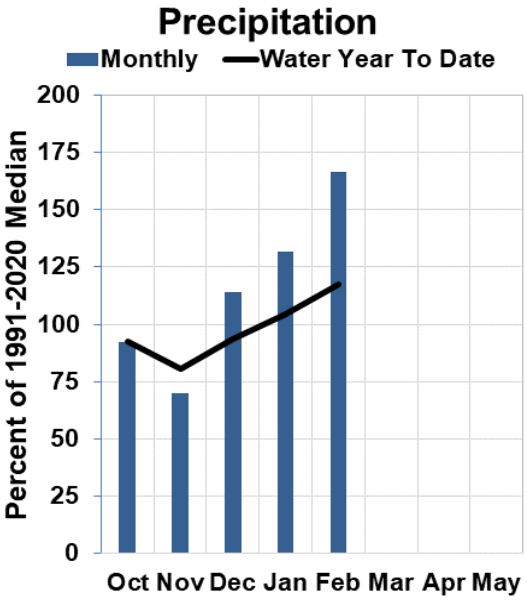
Reservoir Storage (KAF): End of February				
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Oakley Reservoir	28.7	13.8	23.2	75.6
Salmon Falls Reservoir	44.1	16.1	37.0	182.6
Wild Horse Reservoir	58.7	29.3	31.6	71.5
Lake Owyhee	519.7	137.2	304.5	715.0
Brownlee Reservoir	1078.2	899.5	1109.0	1420.0

Watershed Snowpack Analysis: March 1, 2024			
Basin Name	# of Sites	% of Median 2024	% of Median 2023
Raft River	5	127%	125%
Goose-Trapper Creeks	5	134%	125%
Salmon Falls Creek	7	129%	129%
Bruneau River	9	132%	118%
Reynolds Creek	6	129%	85%
Upper Owyhee	13	151%	113%
Owyhee Basin Total	20	147%	121%

Bear River Basin

March 1, 2024





WATER SUPPLY OUTLOOK

Monthly precipitation was well above normal across the Bear River Basin, ranging from 123% to 375% across individual SNOTEL sites and 174% of normal for the entire basin (Fig. 1). Total water year precipitation is also well above normal at 116% on March 1 (Fig. 2). Snowpack is currently 119% of normal with 36 days left in the normal snow accumulation season (Fig. 3). NOAA's 30-day Outlook favors above normal precipitation during March with no clear signal for temperature patterns in the Bear River. There is a strong chance of matching or surpassing median peak SWE in the Bear River Basin with the above normal precipitation predicted for March.

Reservoir storage for Bear Lake is well above normal at 182% of normal (68% full) and Montpelier Reservoir is 115% of normal (58% full) on March 1. The 50% exceedance streamflow forecasts in the basin range from 123 to 222% for the April to July period (Fig.4).

Bear River Basin Streamflow Forecasts - March 1, 2024

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Med (KAF)
Bear R nr UT-WY State Line	APR-JUL	93	109	124	123%	140	164	101
	APR-SEP	100	118	135	118%	152	182	114
Bear R ab Resv nr Woodruff	APR-JUL	69	91	114	124%	143	192	92
	APR-SEP	82	107	130	131%	158	205	99
Big Ck nr Randolph	APR-JUL	4.5	5.9	7.1	222%	8.3	10.8	3.2
Smiths Fk nr Border	APR-JUL	60	76	87	101%	99	115	86
Bear R bl Stewart Dam 2	MAR-JUL	86	144	192	152%	245	340	126
	MAR-SEP	94	158	210	151%	270	370	139
	APR-JUL	61	117	165	143%	220	320	115

Normals based on 1991-2020 reference period: streamflow, snowpack, precipitation, & reservoir 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	Median (KAF)	Capacity (KAF)
Bear Lake	879.9	414.4	482.9	1302.0
Montpelier Reservoir	2.3	.8	2.0	4.0

Watershed Snowpack Analysis: March 1, 2024			
Basin Name	# of Sites	% of Median 2024	% of Median 2023
Smiths-Thomas Forks	5	107%	125%
Bear Lake	12	122%	148%
Montpelier Creek	2	112%	143%
Mink Creek	3	126%	147%
Cub River	3	122%	149%
Bear River Total	33	120%	142%
Malad River	3	142%	151%

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. 2024).**

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
Priest R nr Coolin (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 Median. The 30-year median streamflow for each forecast period is provided for comparison. The median is based on data from 1991-2020. The % MED column compares the 50% chance of exceedance forecast to the 30-year median streamflow; values above 100% denote when the 50% chance of exceedance forecast would be greater than the 30-year median 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

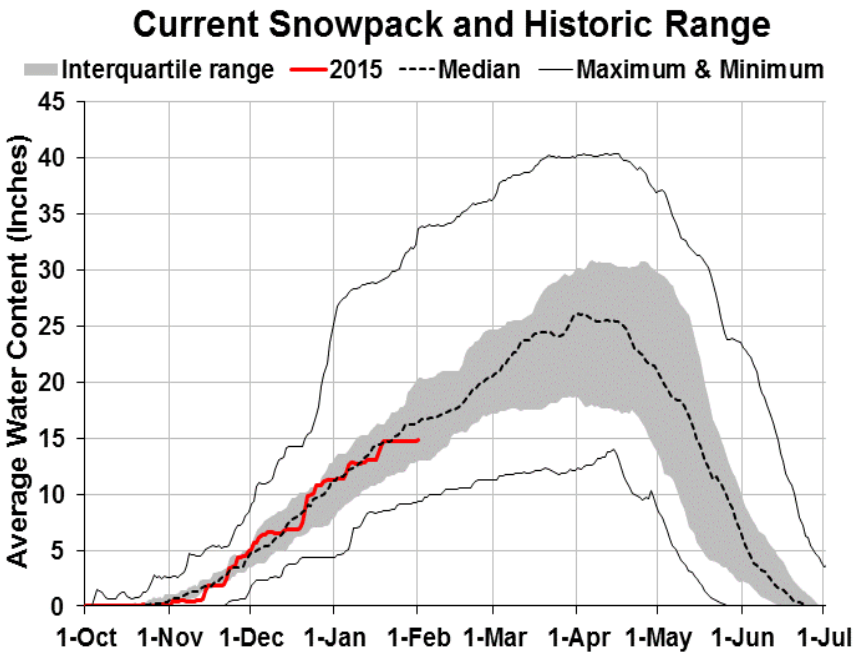
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

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.