USDA United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

May 1, 2024

John Wilford prepares to measure sample point #5 at the Mores Creek Summit Snow Course
Pictured: John Wilford, Photo Credit: Danny Tappa, 4/30/2024

As we transition to spring and the snow disappears until next season, the NRCS Idaho Snow Survey team will also be going through a period of transition. John Wilford, lead Electronic Technician for the Idaho Snow Survey, will be hanging up his skis and work boots at the end of this month. After nearly 10 years of service with NRCS Idaho Snow Survey, 20 years total service with USDA, and a military veteran, John's retirement is much deserved. During his tenure with Snow Survey, he oversaw the installation of four new SNOTEL stations, seven new SNOLITE stations, and the rebuild of one SNOTEL station post fire (Soldier R.S.). In addition, John oversaw the most meaningful infrastructure upgrade to the Idaho SNOTEL network in several decades – the complete overhaul of our telemetry systems to modern (cell, satellite) forms of remote data communications, resulting in more consistent and reliable data delivery to our many users. Over the last 10 years, if your favorite SNOTEL station went offline, it's more than likely John was the one who was directly involved in its repairs!

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)

May 2024: Idaho Water Supply Summary

Overview

With the generally warm and dry conditions in April, snowmelt is well underway in Idaho. As we've seen all year, snow conditions varied greatly across the state. Snowpack peaked well above normal south of the Snake River, and well below normal north of the Salmon River Basin (Fig. 3). One consistency across the state was the timing of peak snowpack which was right on schedule this year. However, southern Idaho experienced above normal snowmelt over the last month which greatly elevated the region's streamflow compared to the rest of the state. Total water year precipitation follows a similar trend to the snowpack with northern Idaho continuing to be drier than normal. South of the Salmon River Basin, water supply looks sufficient this season with reservoirs already full or projected to fill, and ample streamflow anticipated during the early summer. In contrast, northern Idaho will likely feel the impacts of the low snow year with below normal streamflow, especially later in the summer.

We*ather, climate and drought outlook*

By early April, drought conditions improved significantly in the Salmon River Basin portion of the central mountains, moving from moderate drought to no drought classification in southwest Idaho County. There was some improvement along the southern edge of the Clearwater Basin, but most of the Panhandle region showed no change or worsening drought. The U.S. Drought outlook indicates that this area will remain in drought this month with little to no improvement at the seasonal timeframe.

May is forecasted to start with below normal temperatures and above normal precipitation statewide. This is projected to transition to warmer than normal temperatures toward the middle of the month. Because of this variation, though, NOAA's 30-day outlook is less certain, with equal chances for above or below normal temperature and precipitation.

Snowpack

Snowpack peaked for Water Year 2024 in April, and now melt season is in full swing across Idaho. Peak SWE occurred at normal dates for most SNOTEL sites, and lower elevation sites that have melted out have done so at normal rates. However, a cold air mass and its associated storms late in April stalled melt at higher elevation sites, especially north and east of the Snake River Plain.

We published two maps this month to better characterize snowpack conditions in the state. Figure 3 displays the peak SWE (snow water equivalent) for Water Year 2024 as a percentage of the normal peak (30-year median) for each basin. This is intended to show the broader picture of snowpack conditions this winter compared to years past. Figure 4

compares May 1 SWE to this year's peak SWE. What portion of the snowpack remains can be useful for understanding the amount of water still to come as the spring melt out continues. We have chosen not to publish our typical May 1 percent of normal SWE map, as it can be misleading at this time of year because of the season-to-season variation in melt timing that skews site and basin calculations (SNOTEL percent of normal snowpack currently ranges from 0 to 2,650%).

Alas, no miracle occurred in northern Idaho, and the snowpack in the Panhandle and Clearwater basins peaked well below normal. The peak SWE at most sites in these basins fell within a historically low range (5 to 20th percentile), which will likely impact recreational and ecological sectors. Snowpack peaked below normal in the Salmon and West Central basins, except in the Boise Basin where the snowpack peak was near normal. Moving east along the north end of Snake River Plain and into the Snake River headwaters, snowpack peaked near normal. Basins south of the Snake River Plain, including the Willow-Blackfoot-Portneuf and Bear basins had an astounding accumulation year for the second consecutive year. These basins peaked well above normal in April. In southern Idaho, the Owyhee Basin has less than 40% of the peak SWE remaining. In general, the amount of snowpack left in the mountains is greater as you move north; the Panhandle region has nearly ~80% of its peak snowpack remaining. Our AWS graphs are an excellent tool for keeping track of how quickly the snowpack is melting this spring and how much remains in each basin.

Precipitation

April was a relatively dry month, with monthly precipitation below normal across all of Idaho. This is the first time since November that there was drier than normal conditions in all 21 of the state's major subbasins. The Clearwater Basin fared best this month, at 91% of normal monthly precipitation. The lowest monthly precipitation totals compared to normal occurred in the Southern Snake basins, with Bruneau Basin at 32% of normal.
Because of below normal precipitation in April, total water year precipitation (WYP) compared to the 30-year normal decreased in all basins except the Clearwater. However, the effect of below normal April precipitation on WYP was muted because April precipitation isn't usually a large portion of the annual precipitation budget. Overall, the general trend in WYP observed this water year continued. Northern Idaho remained very dry and southern and eastern Idaho were wetter than normal.

A large portion of April precipitation occurred during storms in the first week of the month. This was the last snowpack accumulation event before widespread melting started. While the middle of the month was relatively warm and dry, a cold front brought cool and wet conditions at the end of the month to north and southeast Idaho. This storm event stalled melt and even boosted the snowpack at many SNOTEL sites in those basins.

Water supply

With snowmelt well under way across Idaho, conditions look promising for water supply south of the Salmon River Basin. Reservoir storage is near or above normal across Idaho with the lowest levels in Lake Coeur d'Alene at 83% of normal. In general, reservoir storage this water year is still greater than storage levels on May 1 during Water Year 2021, our last water year with above normal storage at the beginning of the irrigation season

The Boise River system has well above normal storage at 119% of normal (90% full) on May 1. Snowpack peaked in the Boise Basin higher than other West Central basins (Fig. 3). Flood Risk Management (FRM) operations began on the Boise River on March 25, but streamflow in the river was reduced by May 1 due to reductions in flood risk. These reservoirs are likely to fill given the near normal snowpack conditions and a full water supply this season is expected. The NRCS forecast for the primary snowmelt runoff period (May to July) at Boise River near Boise predicts near normal runoff at 82% of normal (690 KAF, thousand acre-feet). Reservoir storage in the Payette River system is 111% of normal (82% full). However, snowpack peaked at only 84% of normal on April 7 in the Payette Basin (Fig. 4) which could prevent Deadwood Reservoir from filling. Meanwhile, Cascade Reservoir on the North Fork of the Payette River will likely fill.

Total storage in the Upper Snake Reservoir system above Milner Dam is ~109% of normal (92% full). Combined Jackson Lake and Palisades storage above Heise is 130% of normal (82% full). In order to safely release water that cannot be stored, FRM operations began in March and continued throughout April in the Upper Snake. Excess water was used for groundwater recharge in the Eastern Snake River Plain Aquifer (ESPA) during April, and total volume recharged for WY2024 is now approaching 370 KAF! Details for current ESPA recharge can be found on the Idaho Department of Water Resources website.

The NRCS forecast for the primary snowmelt runoff period at Heise (May to July) predicts runoff at 90% of normal (2460 KAF). Streamflow in the Willow-Blackfoot-Portneuf Basin is predicted to range from 139 to 204% of normal. Last year, the wetter forecasts (10% and 30%) were more accurate for the Willow-Blackfoot-Portneuf Basin. If we get another rapid melt out and/or rain-on-snow event like last year, this area could see flooding again. Please keep an eye on flood risk warnings in your region or at your local National Weather Service office webpage.

Water supply conditions for agriculture look sufficient everywhere else in the state, although the impacts of a low snow year will be felt in northern Idaho. Low snowpack conditions in central and northern Idaho likely will lead to low streamflow conditions later this summer. If this spring and summer are hot and dry as predicted by the Climate Prediction Center, it becomes more likely that the drier forecasts (70% and 90%) will be the most accurate. We urge water users to strongly consider the 70 and 90% forecasted streamflow volumes as the most likely scenario in the Weiser, Payette, Salmon, Clearwater and Panhandle basins this year.

Streamflow forecasts across Idaho remain sharply divided between the north and south as this streamflow percentile map shows. Above normal streamflow is expected in southern Idaho (116 to 201%) and well below normal streamflow is expected in central and northern Idaho (61 to 90%). Near normal streamflow is expected in the Wood and Lost basins (71 to 92%) as well as the Henrys Fork-Teton Basin (94 to 111%).

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.

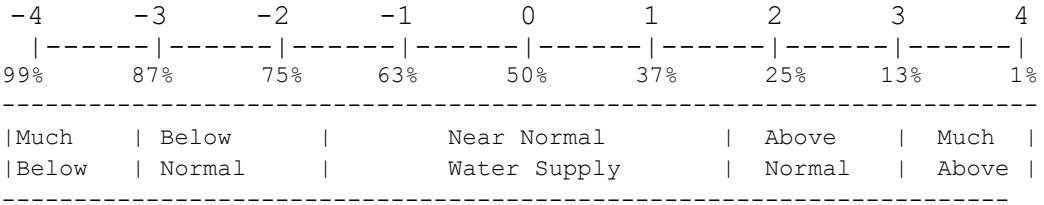
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) May 1, 2024

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.

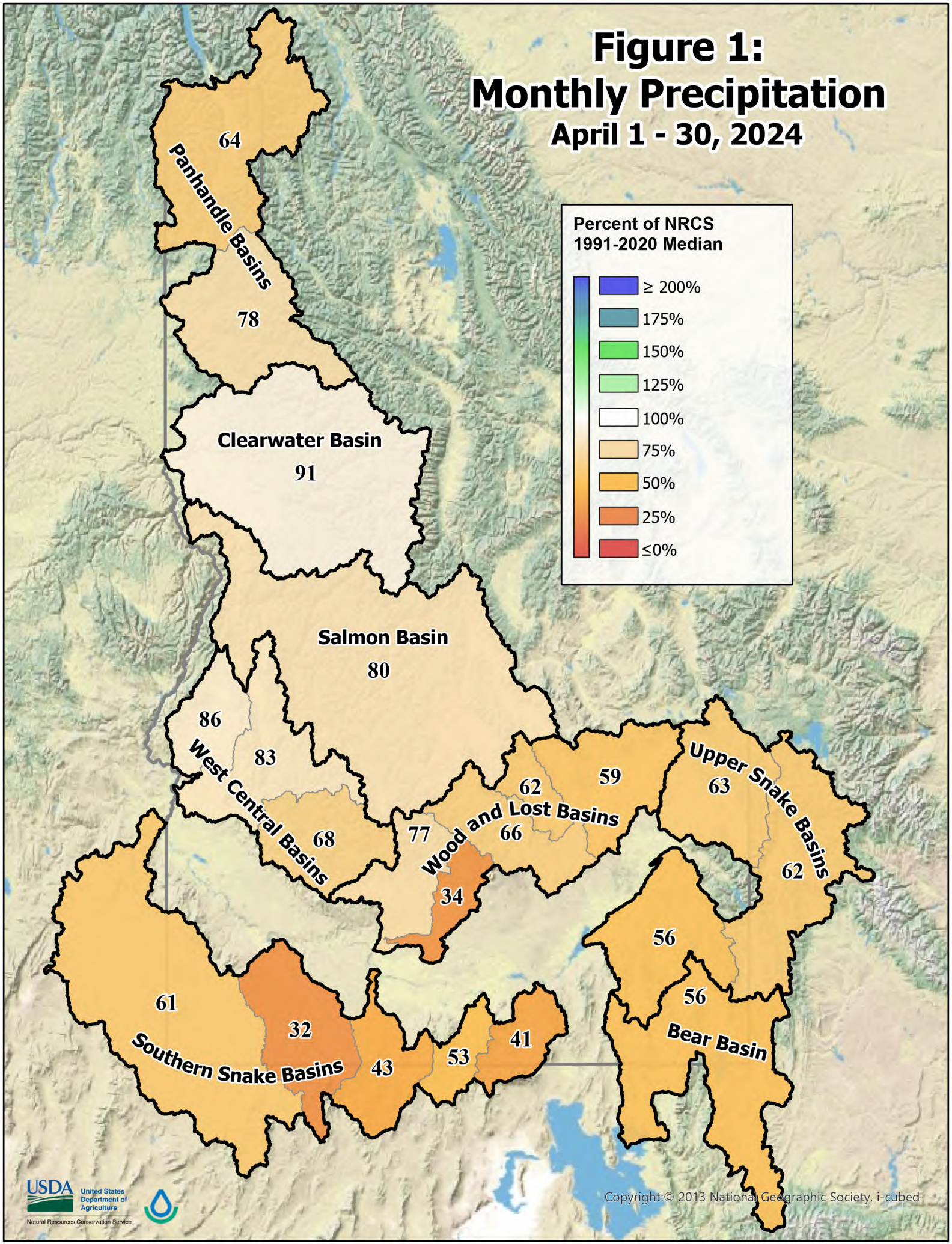
BASIN or REGION	*SWSI Value*	*Most Recent Year With Similar SWSI Value*	*Agricultural Water Supply Shortage May Occur When SWSI is Less Than*
Spokane	**-1.8**	**2019**	**NA**
Clearwater	**-1.6**	**2023**	**NA**
Salmon	**-1.3**	**2016**	**NA**
Weiser	**-1.3**	**2014**	**NA**
Payette	**-1.6**	**2005**	**NA**
Boise	**0.1**	**2016**	**- 2.7**
Big Wood above Hailey	**-0.9**	**2000**	**- 2.7**
Big Wood	**0.8**	**2000**	**0.5**
Camas Creek nr Blaine	**-0.9**	**2002**	**NA**
Little Wood	**-0.6**	**2022**	**- 1.7**
Big Lost	**-0.1**	**2016**	**0.0**
Little Lost	**-0.4**	**2016**	**1.5**
Teton	**0.4**	**2019**	**- 3.9**
Henrys Fork	**0.6**	**2020**	**- 3.2**
Snake (Heise)	**0.4**	**1993**	**- 1.2**
Oakley	**2.1**	**2007**	**0.2**
Salmon Falls above Jackpot	**0.9**	**2016**	**NA**
Salmon Falls	**1.3**	**1993**	**- 0.7**
Bruneau	**0.4**	**2009**	**NA**
Owyhee	**2.6**	**1999**	**- 1.0**
Bear River	**2.8**	**2018**	**- 3.9**

SWSI SCALE, PERCENT CHANCE OF EXCEEDANCE, AND INTERPRETATION



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

Figure 1:
Monthly Precipitation
April 1 - 30, 2024



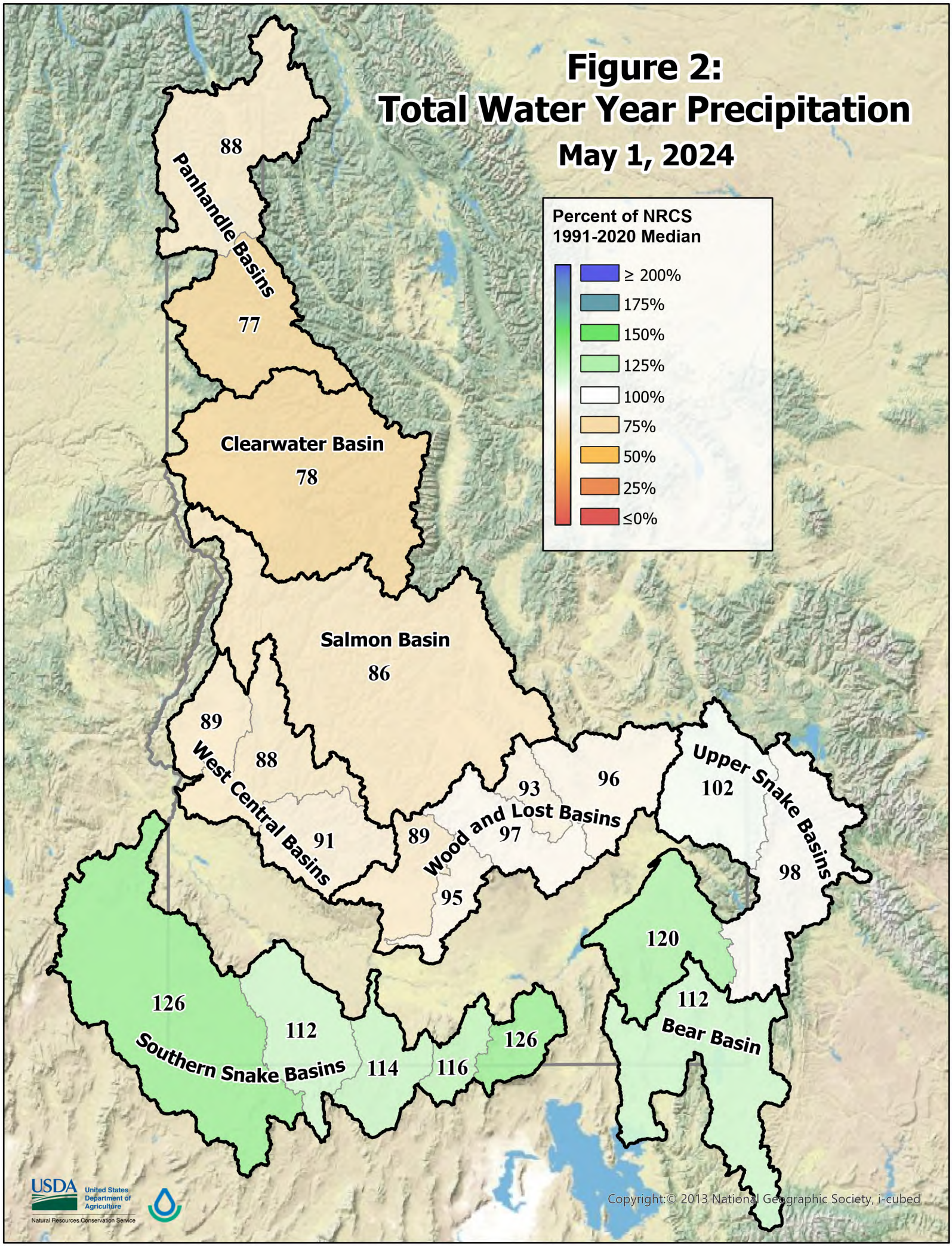


Figure 2:
Total Water Year Precipitation
May 1, 2024
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
Panhandle Basins
88
77
Clearwater Basin
78
Salmon Basin
86
89
88
West Central Basins
91
89
Wood and Lost Basins
93
97
96
Upper Snake Basins
102
98
95
120
126
112
Southern Snake Basins
114
116
126
112
Bear Basin
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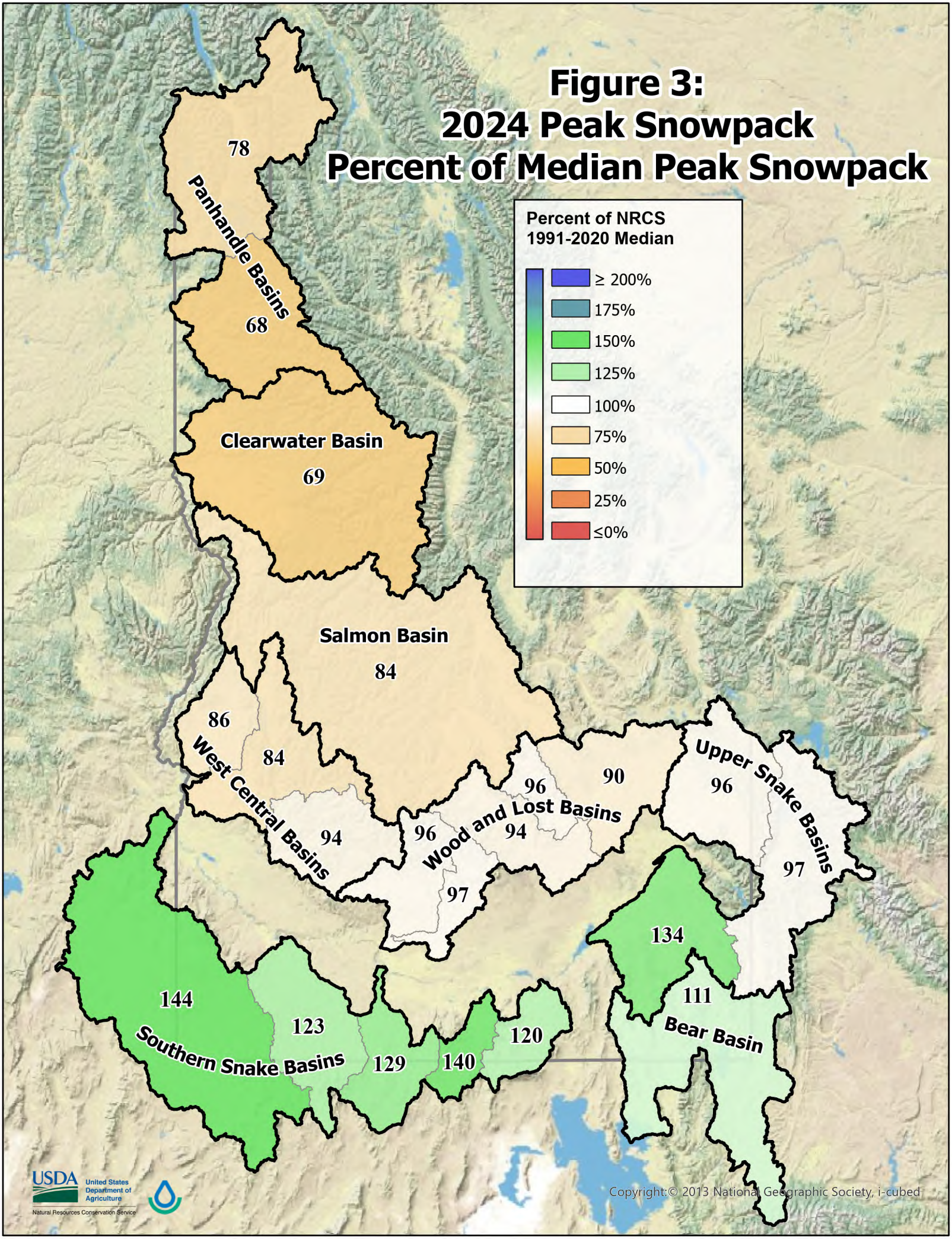
Figure 3:
2024 Peak Snowpack
Percent of Median Peak Snowpack
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
78
Panhandle Basins
68
Clearwater Basin
69
Salmon Basin
84
86
84
West Central Basins
94
96
90
Wood and Lost Basins
96
94
Upper Snake Basins
96
97
97
134
111
Bear Basin
144
123
Southern Snake Basins
129
140
120
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Figure 4: Percent of Peak Snowpack Remaining
May 1, 2024

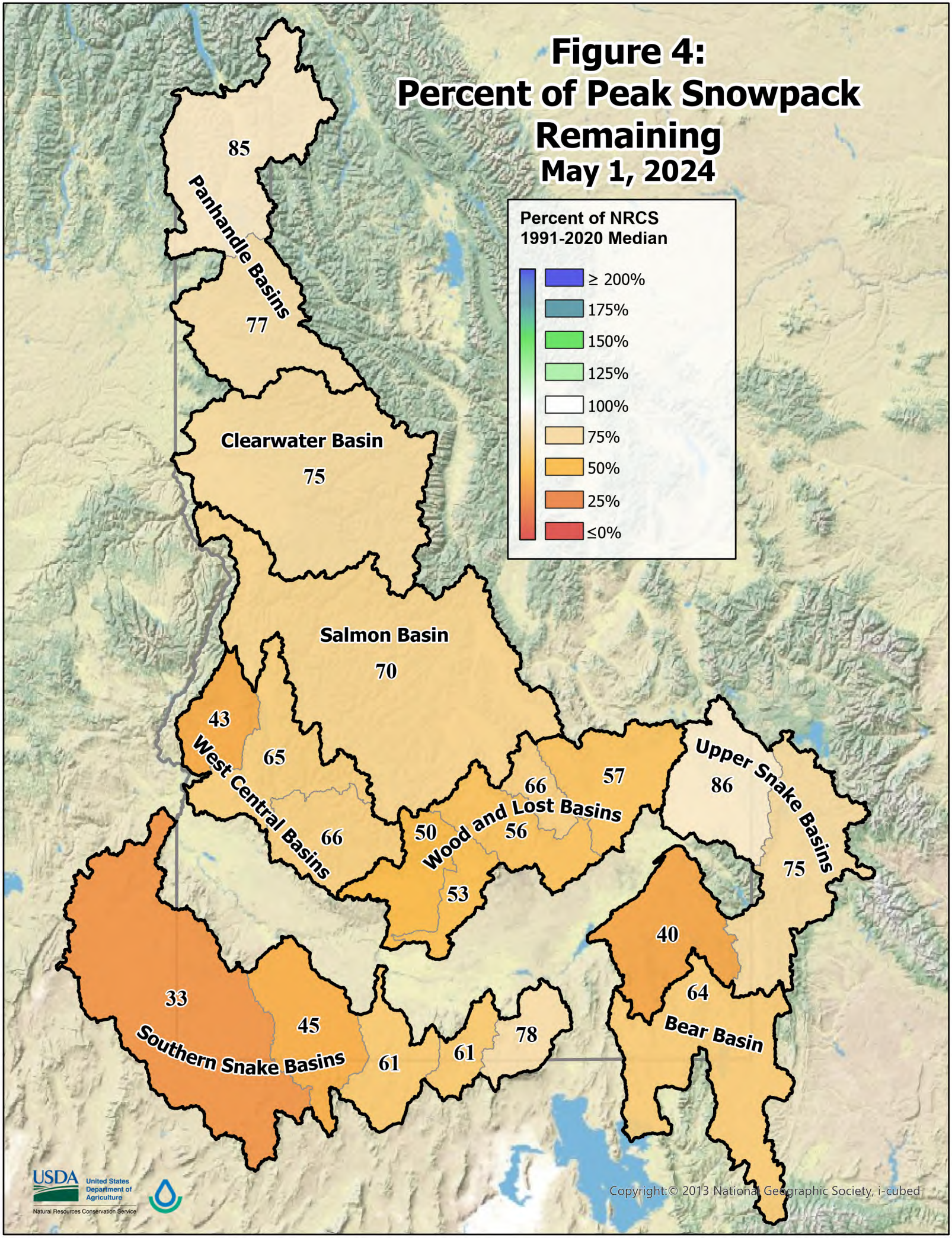
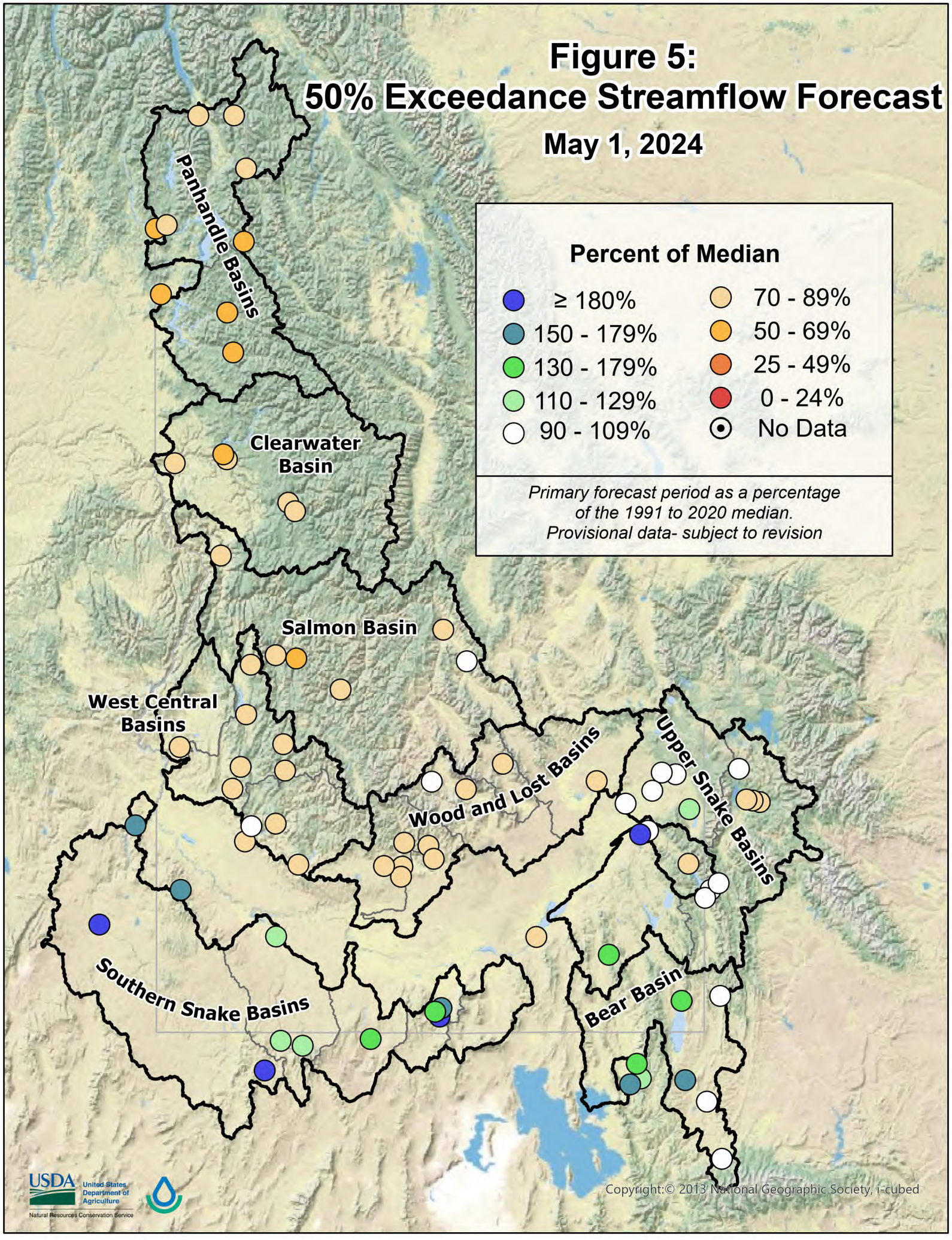
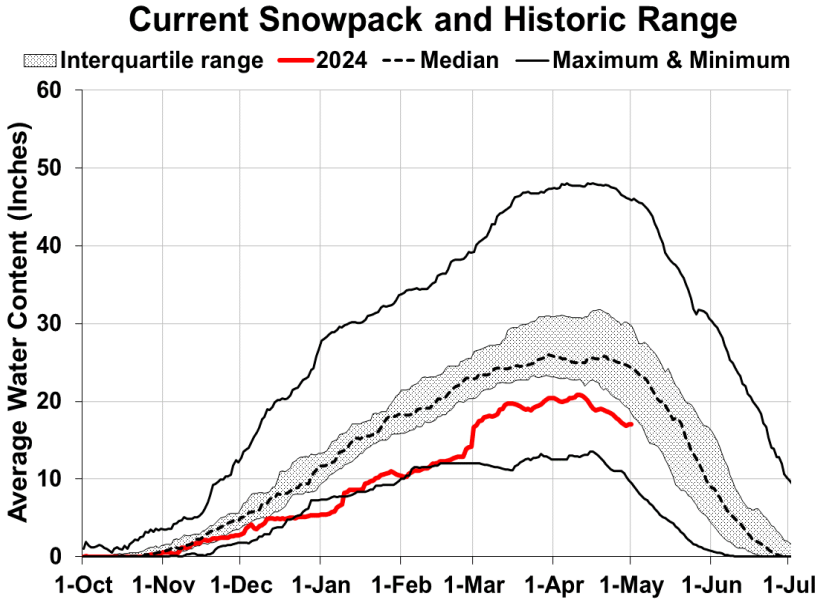


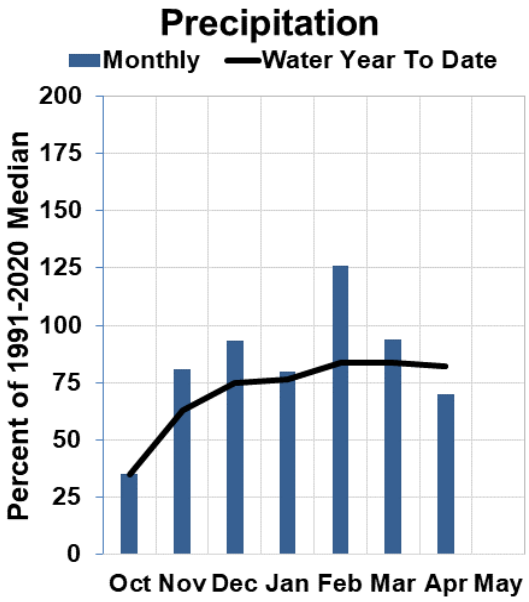
Figure 5:
50% Exceedance Streamflow Forecast
May 1, 2024



Panhandle Basins

May 1, 2024





WATER SUPPLY OUTLOOK

Precipitation in April was ~65 to 80% of normal (Fig. 1), and Water Year 2024 continues to be below normal with total water year precipitation ranging from ~75 to 90% of normal on May 1 (Fig. 2). Snowpack peaked in the Coeur d'Alene-St. Joe Basin at 68% of normal (Fig. 3) on April 10 (median peak date is April 5). Snowpack peaked in the Pend Orielle Basin at 79% of normal (Fig. 3) on April 10 (median peak date is April 13). Snowmelt is occurring at a near normal rate and as of May 1, Panhandle basins have 77 to 85% of this year's peak snowpack remaining (Fig. 4). NOAA's 30-Day Outlook predicts equal chances for above or below normal temperatures and precipitation which suggests we could expect near normal conditions in May.

Reservoir storage at Priest Lake is near normal at 92% of normal which is 77% full. Lake Coeur d'Alene is 83% of normal and 73% full. Pend Oreille is 96% of normal and 57% full. Refill of Lake Pend Orielle will likely be delayed due to modified spillway operations on Albeni Falls Dam. Streamflow forecasts for May through July are ~60 to 80% of normal at the 50% exceedance level in the Panhandle basins (Fig. 5). Long-term weather outlooks predict an increased chance for above normal temperatures throughout the spring and summer, which could shift observed streamflow volumes closer to the 70 to 90% exceedance forecasts for the primary forecast period.

Panhandle Region Streamflow Forecasts - May 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	MAY-JUL	3610	4480	4870	79%	5260	6130	6190
	MAY-SEP	4480	5440	5880	83%	6320	7280	7090
Boundary Ck nr Porthill	MAY-JUL	61	71	80	80%	87	100	100
	MAY-SEP	62	73	83	80%	91	105	104
Moyie R at Eastport	MAY-JUL	180	215	245	82%	280	325	300
	MAY-SEP	187	220	260	83%	295	350	315
Priest R nr Priest River 2	MAY-JUL	365	425	475	75%	520	595	635
	MAY-SEP	385	455	510	76%	570	655	670
Pend Oreille Lake Inflow 2	MAY-JUL	5460	6020	6500	67%	7030	7920	9640
	MAY-SEP	5970	6650	7220	68%	7960	8830	10600
Priest R Outflow NR Coolin	MAY-JUL	310	375	420	82%	470	545	515
	MAY-SEP	325	395	445	84%	495	580	530
Pend Oreille R bl Box Canyon	MAY-JUL	5330	5970	6510	68%	7020	8010	9600
	MAY-SEP	5720	6510	7110	66%	7780	8790	10800
NF Coeur dAlene R at Enaville	MAY-JUL	175	215	250	66%	290	355	380
	MAY-SEP	205	240	275	66%	315	385	415
St. Joe R at Calder 2	MAY-JUL	390	455	505	68%	565	650	740
	MAY-SEP	400	480	535	66%	600	700	815
Spokane R nr Post Falls 2	MAY-JUL	680	810	955	61%	1100	1320	1560
	MAY-SEP	800	950	1070	65%	1230	1440	1640
Clark Fork R bl Cabinet Gorge Dam 2	MAY-JUL	4710	5280	5710	68%	6150	6950	8430
	MAY-SEP	5350	5970	6490	68%	7160	8080	9490
Pend Oreille Lake Inflow 2	MAY-JUL	5460	6020	6500	67%	7030	7920	9640
	MAY-SEP	5970	6650	7220	68%	7960	8830	10600

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%

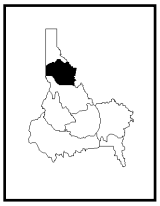
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Reservoir Storage (KAF): End of April

Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Hungry Horse Lake	3008.3	2439.1	2480.0	3451.0
Flathead Lake	1069.2	920.7	1025.0	1791.0
Noxon Rapids Reservoir	321.3	297.4	318.8	335.0
Lake Pend Oreille	892.3	878.8	925.0	1561.3
Priest Lake	91.4	88.6	99.2	119.3
Lake Coeur d' Alene	173.6	176.2	210.3	238.5

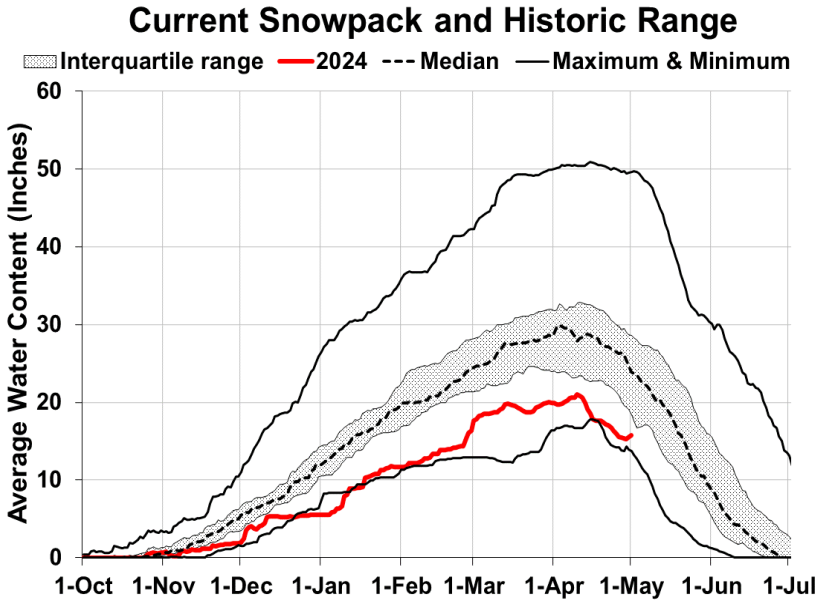
Watershed Snowpack Analysis: May 1, 2024

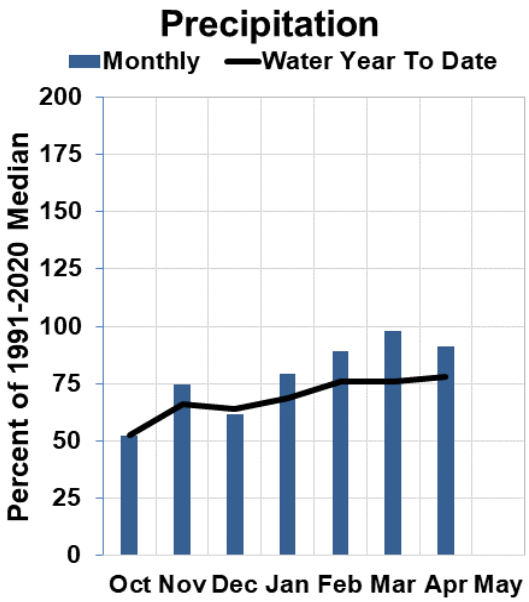
Basin Name	# of Sites	% of Median 2024	2023
Moyie River	1	77%	79%
Priest River	5	78%	96%
Rathdrum Creek	3	38%	153%
Coeur d' Alene River	6	65%	111%
St. Joe River	4	69%	103%
Pend Oreille Lake	5	71%	92%
Palouse River	2	0%	310%
Lower Kootenai	2	91%	83%
Pend Oreille-Kootenai	13	75%	92%
Coeur d' Alene-St. Joe Total	9	66%	110%



Clearwater River Basin

May 1, 2024





WATER SUPPLY OUTLOOK

Precipitation in April was 91% of normal (Fig. 1). Water Year 2024 continues to be below normal with total water year precipitation at 78% of normal on April 1 (Fig. 2). Snowpack is still well below normal. It peaked in the Clearwater Basin at 69% of normal (Fig. 3) on April 10 (median peak is April 10). Shortly after peak snowpack, there was a period of rapid snowmelt that brought basin-wide SWE to record low conditions. However, this was followed by cooler weather which slowed the melt, and there was fresh snowfall at the end of April which helped pull this basin away from record low snowpack conditions. Snowmelt is occurring at near normal rates in the Clearwater, and there is still 74% of this year's peak snowpack remaining (Fig. 4).

Dworshak Reservoir is 86% full, which is 114% of normal on May 1. The 50% exceedance streamflow forecasts are ~65 to 80% of normal for May to July (Fig. 5). 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. Because of the low snowpack, 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. Long-term weather outlooks predict an increased chance for above normal temperatures throughout the spring, which could shift observed streamflow closer to the 70 to 90% exceedance forecasts for the primary forecast period. If the 90% exceedance forecast is realized, it will be the second lowest streamflow volume in nearly a century of streamflow data for the North Fork Clearwater and Lochsa watersheds.

Clearwater River Basin Streamflow Forecasts - May 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	MAY-JUL	945	1130	1250	79%	1370	1550	1580
	MAY-SEP	995	1190	1320	79%	1450	1650	1670
Lochsa R nr Lowell	MAY-JUL	560	695	790	71%	885	1030	1110
	MAY-SEP	605	750	850	73%	950	1100	1170
Dworshak Reservoir Inflow 2	MAY-JUL	740	960	1110	64%	1260	1480	1740
	MAY-SEP	945	1160	1300	66%	1440	1650	1960
Clearwater R at Orofino	MAY-JUL	1940	2360	2650	79%	2940	3360	3350
	MAY-SEP	2050	2500	2810	79%	3120	3570	3540
Clearwater R at Spalding 2	MAY-JUL	2900	3550	3990	78%	4430	5080	5120
	MAY-SEP	3180	3900	4380	79%	4860	5580	5560

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 April

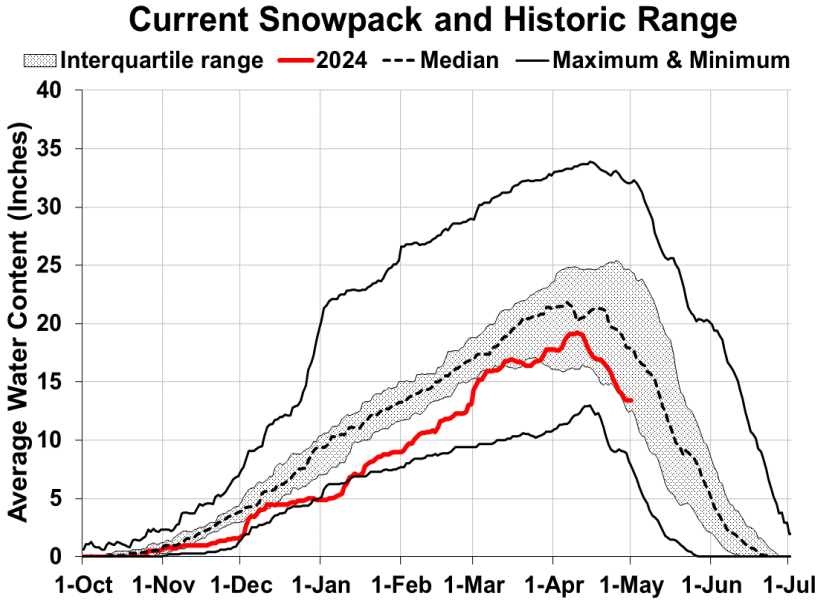
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Dworshak Reservoir	2995.5	2230.0	2623.0	3468.0

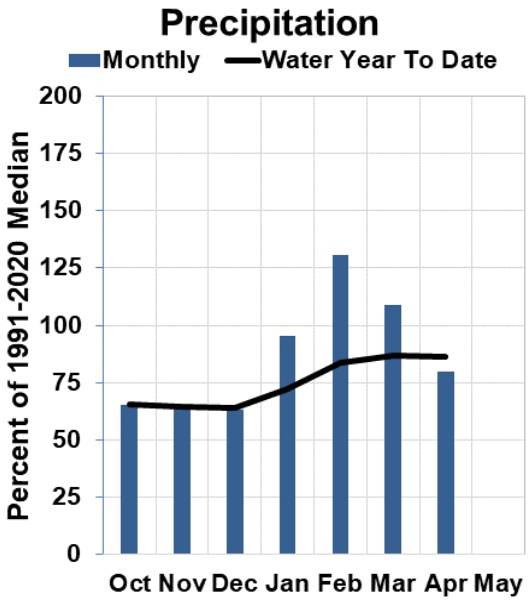
Watershed Snowpack Analysis: May 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
NF Clearwater River	9	65%	109%
Lochsa River	3	63%	100%
Selway River	4	65%	110%
SF Clearwater River	1	94%	120%
Clearwater Basin Total	17	65%	111%

Salmon River Basin

May 1, 2024





WATER SUPPLY OUTLOOK

The Salmon River Basin received below normal precipitation (80%) during April (Fig. 1), slightly lowering total water year precipitation to 86% of normal (Fig. 2). Snowpack peaked at 84% of normal (Fig. 3) on April 10 (median peak date is April 11). Snowmelt is occurring at normal to slightly above normal rates in the basin, but a cold front at the end of the month stalled the melt. As of May 1, the Salmon River Basin has 70% of this year's peak snowpack remaining (Fig. 4).

There are no reservoirs in the Salmon Basin. The 50% exceedance streamflow forecasts are ~65 to 90% of normal for May through July (Fig. 5). The Middle Fork of the Salmon River at Middle Fork Lodge had 138% of normal streamflow volume in April, with the forecast at 79% of normal for the remaining forecast period. The Salmon River at Salmon had 128% of normal streamflow volume in April, with the forecast at 80% of normal. Given the below normal streamflow forecasts and the slightly above normal snowmelt rates, rivers and streams within the Salmon River Basin are expected to return to baseflow (low flow) sooner than normal this summer.

Salmon River Streamflow Forecasts - May 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	MAY-JUL	380	480	545	80%	615	710	680
	MAY-SEP	455	570	645	80%	725	840	805
Lemhi R nr Lemhi	MAY-JUL	21	37	47	90%	58	73	52
	MAY-SEP	30	48	60	92%	72	90	65
MF Salmon R at MF Lodge	MAY-JUL	370	445	495	79%	545	620	625
	MAY-SEP	430	510	565	80%	620	700	710
SF Salmon R nr Krassel Ranger Station	MAY-JUL	121	150	171	71%	191	220	240
	MAY-SEP	133	165	187	72%	210	240	260
Johnson Ck at Yellow Pine	MAY-JUL	88	111	127	67%	142	165	189
	MAY-SEP	96	120	136	68%	153	177	200
Salmon R at White Bird	MAY-JUL	2810	3370	3750	76%	4130	4690	4910
	MAY-SEP	3180	3800	4220	77%	4640	5260	5480

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

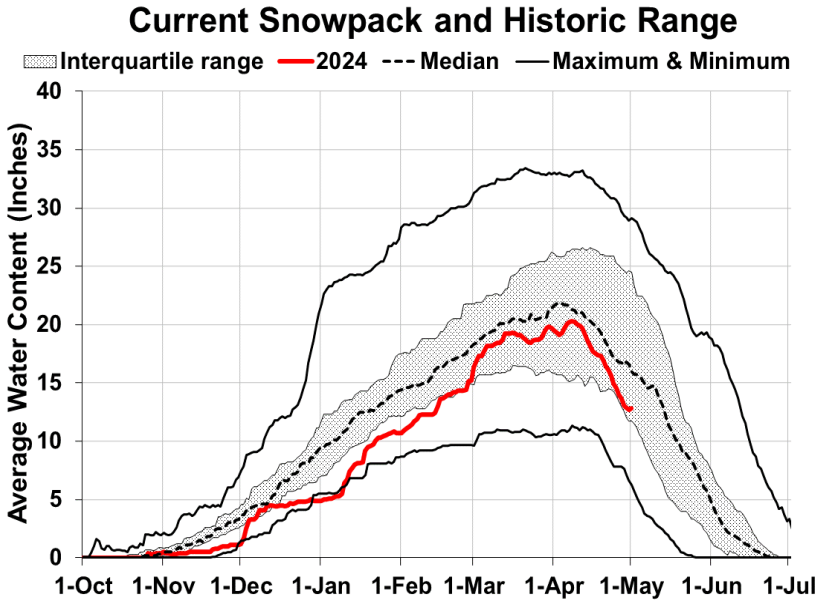
1) 90% and 10% exceedance probabilities are actually 95% and 5%

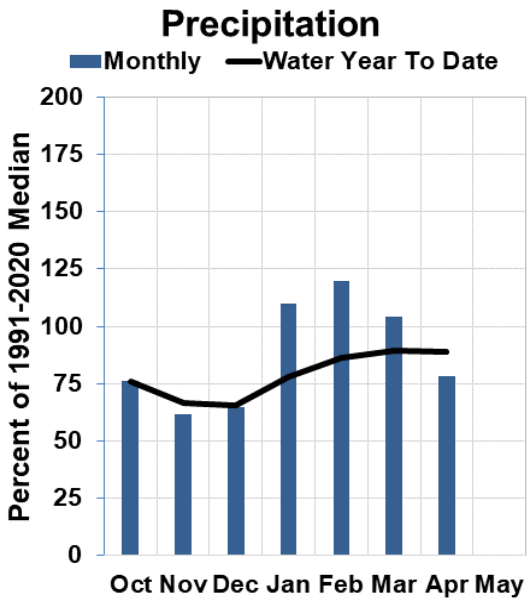
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis: May 1, 2024			
Basin Name	# of Sites	% of Median 2024	2023
Salmon River ab Salmon	7	79%	125%
Lemhi River	3	77%	136%
MF Salmon River	3	73%	129%
SF Salmon River	3	76%	121%
Little Salmon River	4	71%	152%
Lower-Middle Salmon	4	74%	132%
Salmon Basin Total	20	76%	128%

West Central Basins

May 1, 2024





WATER SUPPLY OUTLOOK

Precipitation in April was 68 to 86% of normal across the West Central Basins (Fig. 1). Total water year precipitation is 88 to 91% of normal on May 1 (Fig. 2). The Boise Basin's peak snowpack was 94% of normal (Fig. 3) and occurred on April 7 (median peak date is April 4). The Payette Basin's peak was 84% of normal and also occurred on April 7 (median peak date is April 5). The Weiser Basin had 86% of normal peak snowpack that occurred on March 13 (median peak date is April 5). However, the Weiser had a complex spring with multiple sequences of melt and snow accumulation occurring; basin-wide melt did not begin until April 9. As of May 1, all basins in this region are well into the melt phase. Boise Basin has 66% of its peak snowpack remaining, Payette has 65%, and Wieser has 43% (Fig. 4). Snowmelt in this region is occurring at near normal to slightly above normal rates.

Reservoir storage in the Boise system (Anderson Ranch, Arrowrock and Lucky Peak combined) is 119% of normal on May 1. Storage in the Payette system is 111% of normal and 99% of normal in the Weiser. The 50% exceedance streamflow forecasts for the May through July period in the Boise River Basin is 78% of normal, the Payette is 74% of normal, and the Weiser is 83% of normal (Fig. 5). Observed streamflow volumes through April were 93 to 130% of normal.

West Central Basins Streamflow Forecasts - May 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)
SF Boise R at Anderson Ranch Dam 2	MAY-JUL	145	198	235	73%	270	325	320
	MAY-SEP	170	225	260	75%	300	355	345
Boise R nr Twin Springs	MAY-JUL	245	300	340	72%	380	440	475
	MAY-SEP	275	340	385	73%	425	490	525
Mores Ck nr Arrowrock Dam	MAY-JUL	31	44	54	106%	63	77	51
	MAY-SEP	33	47	57	106%	67	81	54
Boise R nr Boise 2	MAY-JUL	485	605	690	82%	775	900	845
	MAY-SEP	555	685	775	82%	865	1000	945
Lake Fork Payette R nr McCall	MAY-JUL	46	53	58	82%	63	70	71
	MAY-SEP	47	55	60	82%	65	73	73
NF Payette R at Cascade 2	MAY-JUL	197	245	280	71%	315	365	395
	MAY-SEP	195	250	285	71%	325	380	400
NF Payette R nr Banks 2	MAY-JUL	220	290	335	71%	380	450	475
	MAY-SEP	225	295	345	71%	390	465	485
SF Payette R at Lowman	MAY-JUL	215	245	265	78%	285	320	340
	MAY-SEP	250	285	310	81%	335	370	385
Deadwood Reservoir Inflow 2	MAY-JUL	56	67	74	73%	81	92	101
	MAY-SEP	62	74	82	73%	91	103	112
Payette R nr Horseshoe Bend 2	MAY-JUL	610	755	850	75%	945	1090	1140
	MAY-SEP	675	830	935	75%	1040	1190	1240
Weiser R nr Weiser	MAY-JUL	101	138	166	83%	198	250	200
	MAY-SEP	120	159	190	84%	220	275	225

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%

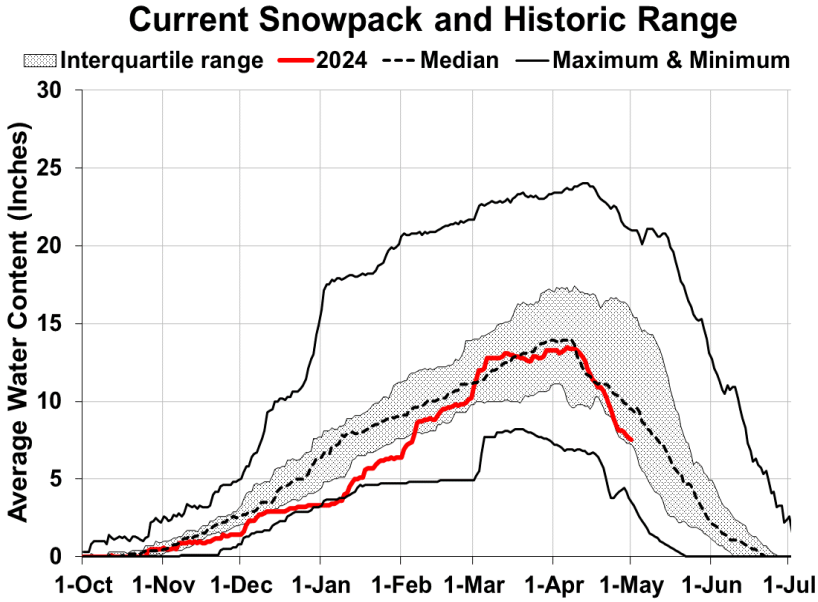
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

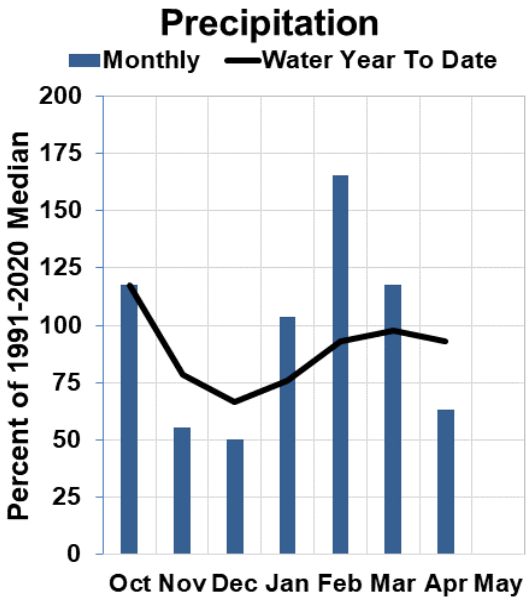
Reservoir Storage (KAF): End of April				
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	426.9	357.0	329.8	450.2
Arrowrock Reservoir	222.5	96.3	210.9	272.2
Lucky Peak Reservoir	268.7	164.4	230.6	293.2
Sub-Basin Total	**918.1**	**617.7**	**771.3**	**1015.6**
Deadwood Reservoir	123.9	86.3	107.6	161.9
Cascade Reservoir	580.5	459.6	523.8	693.2
Sub-Basin Total	**704.4**	**545.9**	**631.4**	**855.1**
Lake Lowell	124.1	120.8	127.9	165.2
Mann Creek Reservoir	10.7	5.5	10.8	11.1

Watershed Snowpack Analysis: May 1, 2024			
Basin Name	# of Sites	% of Median 2024	2023
SF Boise River	7	78%	152%
MF & NF Boise Rivers	6	75%	147%
Mores Creek	5	92%	203%
Canyon Creek	1		
Boise Basin Total	15	86%	172%
NF Payette River	8	78%	147%
SF Payette River	4	79%	141%
Payette Basin Total	16	87%	158%
Mann Creek	1	109%	318%
Weiser Basin Total	4	78%	223%

Wood & Lost River Basins

May 1, 2024





WATER SUPPLY OUTLOOK

April was the first month since December with below normal monthly precipitation in the Wood and Lost basins, ranging from ~35 to 75% of normal (Fig. 1). Because of the dry month, total water year precipitation fell slightly to ~90 to 95% of normal (Fig. 2). Snowpack peaked slightly below normal across the region in mid-April, ranging from ~90 to 95% of normal (Fig. 3). Since peaking, significant melt has started across the basin, with many sites below 7,000 feet completely melted out. While lower elevation sites melted at normal rates, higher elevation sites appeared to melt at higher-than-normal rates prior to a cold front at the end of the month. As of May 1, the Wood and Lost basins have ~50 to 65% of this year's peak snowpack remaining (Fig. 4).

May 1 reservoir storage remains above the 30-year normal at Magic Reservoir with 130% of normal storage (100% full). Little Wood Reservoir is 98% of normal (87% full). Mackay Reservoir is 105% of normal (74% full). This is the first time Mackay reservoir has had above normal storage since it was drained for repairs last summer. Streamflow forecasts for the Wood and Lost basins are ~80 to 90% of normal for the 50% exceedance forecast (Fig. 5). Observed streamflow volume in April was ~130 to 175% of normal.

Wood and Lost Basins Streamflow Forecasts - May 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	MAY-JUL	2.5	5.7	8.6	79%	12.1	18.4	10.9
Little Lost R bl Wet Ck nr Howe	MAY-JUL	12.8	16.8	19.6	85%	22	26	23
	MAY-SEP	15	20	24	89%	28	33	27
Big Lost R at Howell Ranch	MAY-JUL	69	96	115	92%	134	161	125
	MAY-SEP	77	108	129	92%	150	181	140
Big Lost R bl Mackay Reservoir	MAY-JUL	33	60	78	87%	96	123	90
	MAY-SEP	51	81	101	90%	121	151	112
Little Wood R ab High Five Ck	MAY-JUL	17.4	26	33	87%	41	54	38
	MAY-SEP	19.7	29	37	88%	46	60	42
Little Wood R nr Carey 2	MAY-JUL	17.2	27	34	87%	42	56	39
	MAY-SEP	18.7	29	37	88%	46	61	42
Big Wood R at Hailey	MAY-JUL	92	124	145	82%	166	198	176
	MAY-SEP	106	141	165	83%	189	225	198
Big Wood R ab Magic Reservoir	MAY-JUL	37	62	83	79%	107	147	105
	MAY-SEP	42	68	90	80%	115	157	113
Camas Ck nr Blaine	MAY-JUL	2	6.5	11	71%	16.7	27	15.5
	MAY-SEP	2.2	6.7	11.3	72%	17	28	15.8
Big Wood R bl Magic Dam 2	MAY-JUL	43	71	94	79%	120	165	119
	MAY-SEP	49	79	104	79%	131	178	131

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 April

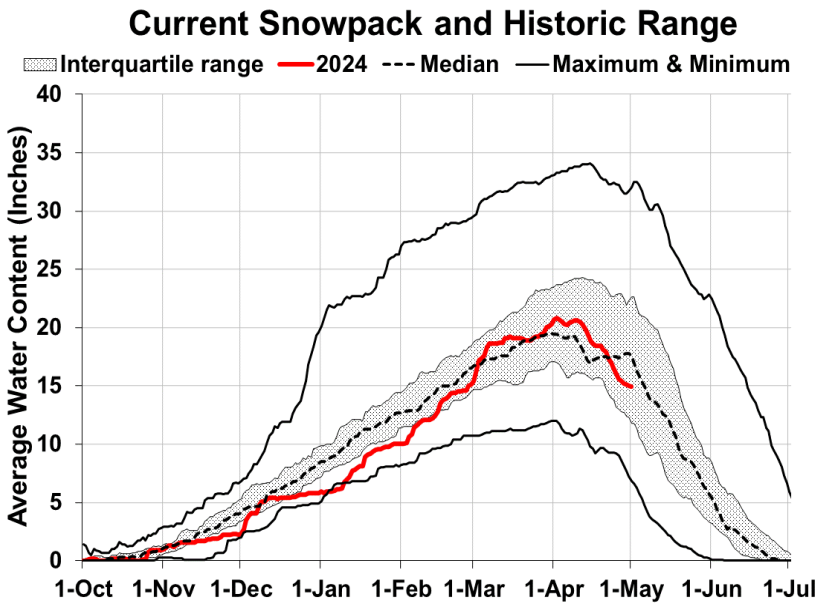
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Mackay Reservoir	32.7	19.6	31.0	44.4
Little Wood Reservoir	26.1	12.4	26.7	30.0
Magic Reservoir	191.5	77.4	146.8	191.5

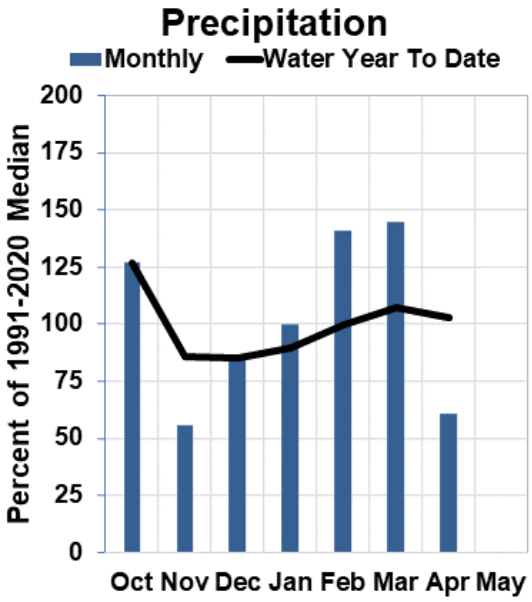
Watershed Snowpack Analysis: May 1, 2024

Basin Name	# of Sites	% of Median 2024	% of Median 2023
Camas-Beaver Creeks	2	30%	180%
Birch-Medicine Lodge Creeks	2	85%	127%
Little Lost River	3	83%	163%
Big Lost River ab Mackay	4	70%	169%
Big Lost Basin Total	5	73%	171%
Fish Creek	0		
Little Wood ab Resv	4	71%	185%
Big Wood River ab Hailey	6	78%	167%
Camas Creek	3	33%	720%
Birch-Medicine Lodge-Camas-Beaver Total	4	65%	146%
Little Wood Basin Total	4	71%	185%
Big Wood Basin Total	9	75%	199%

Upper Snake River Basins

May 1, 2024





WATER SUPPLY OUTLOOK

April precipitation was well below normal in all three Upper Snake basins, ranging from 56 to 63% (Fig. 1). As of May 1, total water year precipitation in the Henrys Fork-Teton is 102%, Snake River above Heise is 98%, and Willow-Blackfoot-Portneuf is 120% of normal (Fig. 2). Snowpack in the Willow-Blackfoot-Portneuf peaked in early April at 133% of the normal peak SWE (Fig. 3) but has melted rapidly leaving 40% of this year's snowpack remaining as of May 1 (Fig. 4). Henrys Fork-Teton and Snake River above Heise basins ended the winter with near normal peak SWE in mid-April at 96% and 97% of normal. These basins now have 86% and 75% of their snowpack remaining as of May 1 (Fig. 4).

The Upper Snake Reservoir System above Milner is currently 109% of normal (92% full). The Jackson-Palisades system is 130% of normal (82% full). The 50% exceedance streamflow forecasts in the region range from ~85% to 205% of median runoff for the primary forecast period (Fig. 5). The May through July forecast at Heise is 90% of normal. The Portneuf River at Pocatello is currently at moderate flood stage and will likely continue as we approach peak streamflow. The Blackfoot River is currently in minor flood stage. Please keep a close eye on local conditions.

Upper Snake River Basin Streamflow Forecasts - May 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	MAY-JUL	240	290	325	94%	360	410	345
	MAY-SEP	380	440	480	94%	520	580	510
Falls R nr Ashton 2	MAY-JUL	260	290	305	94%	325	350	325
	MAY-SEP	325	360	385	94%	405	440	410
Teton R nr Driggs	MAY-JUL	109	127	139	111%	151	169	125
	MAY-SEP	136	159	174	111%	189	210	157
Teton R nr St Anthony	MAY-JUL	265	305	330	106%	355	395	310
	MAY-SEP	315	360	390	103%	420	465	380
Henrys Fk nr Rexburg 2	MAY-JUL	790	920	1010	104%	1100	1230	975
	MAY-SEP	1060	1220	1330	99%	1440	1600	1350
Snake R at Flagg Ranch	MAY-JUL	325	370	400	96%	430	475	415
	MAY-SEP	360	405	440	97%	475	520	455
Snake R nr Moran 2	MAY-JUL	540	605	650	100%	695	755	650
	MAY-SEP	605	675	720	99%	770	840	725
Pacific Ck at Moran	MAY-JUL	69	98	118	87%	137	166	135
	MAY-SEP	75	105	126	88%	146	176	143
Buffalo Fk ab Lava Ck nr Moran	MAY-JUL	182	205	225	85%	240	265	265
	MAY-SEP	205	235	255	86%	275	305	295
Snake R ab Reservoir nr Alpine 2	MAY-JUL	1420	1570	1670	86%	1770	1920	1950
	MAY-SEP	1660	1830	1940	86%	2060	2230	2250
Greys R ab Reservoir nr Alpine	MAY-JUL	192	220	240	92%	260	290	260
	MAY-SEP	230	265	285	92%	310	345	310
Salt R ab Reservoir nr Etna	MAY-JUL	169	210	235	96%	265	305	245
	MAY-SEP	225	270	305	97%	335	380	315
Snake R nr Irwin 2	MAY-JUL	1920	2150	2310	89%	2470	2700	2590
	MAY-SEP	2280	2560	2740	90%	2930	3200	3060
Snake R nr Heise 2	MAY-JUL	2060	2300	2460	90%	2620	2860	2730
	MAY-SEP	2480	2760	2950	90%	3140	3420	3270
Willow Ck nr Ririe 2	MAY-JUL	31	45	55	204%	67	85	27
Portneuf R at Topaz	MAY-JUL	40	48	53	139%	59	67	38
	MAY-SEP	54	63	70	130%	77	88	54
Snake R at Neeley 2	MAY-JUL	680	1160	1480	74%	1800	2280	2000
	MAY-SEP	635	1150	1500	76%	1850	2360	1980

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 April

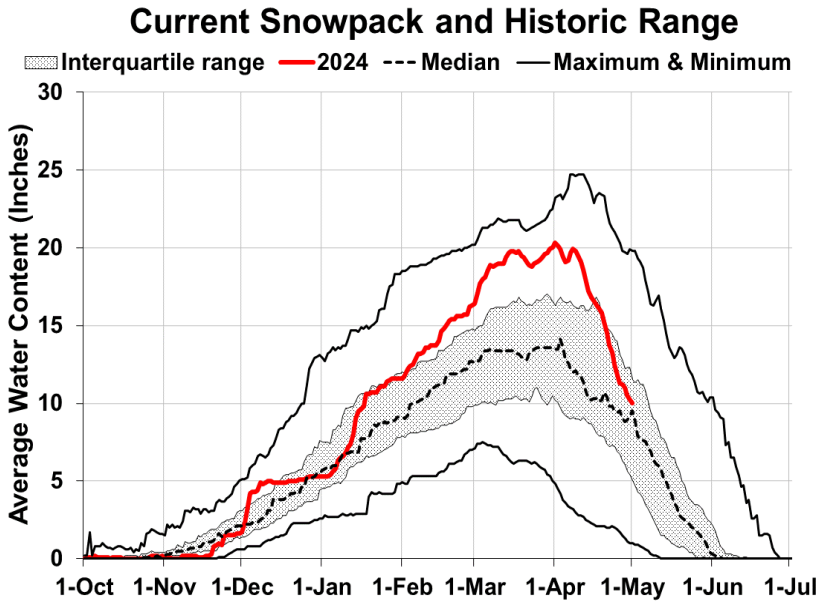
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Jackson Lake	676.8	220.4	600.7	847.0
Palisades Reservoir	1110.3	715.3	769.8	1400.0
Sub-Basin Total	**1787.1**	**935.7**	**1370.5**	**2247.0**
Henrys Lake	88.8	86.1	87.2	90.4
Island Park Reservoir	125.5	114.2	123.8	135.2
Grassy Lake	13.9	12.0	13.6	15.2
Sub-Basin Total	**228.2**	**212.3**	**224.6**	**240.8**
Ririe Reservoir	81.1	50.1	63.0	80.5
Blackfoot Reservoir		200.0	227.6	337.0
American Falls Reservoir	1661.0	1375.6	1576.0	1672.6
Basin-Wide Total	**3757.3**	**2773.7**	**3461.7**	**4577.9**

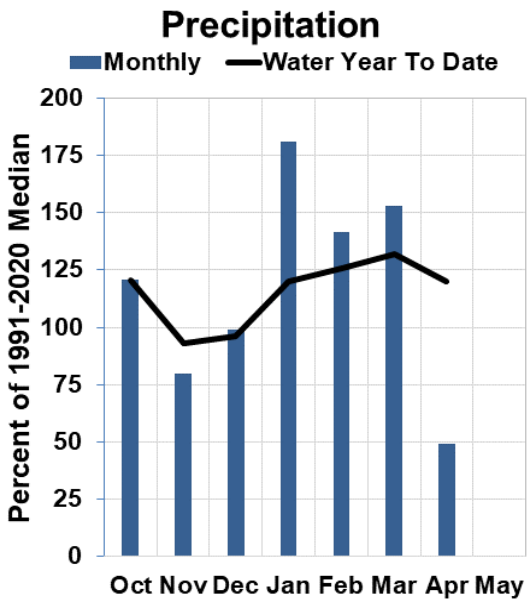
Watershed Snowpack Analysis: May 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
Henrys Fork-Falls River	9	86%	150%
Teton River	9	97%	130%
Henrys Fork-Teton	16	92%	137%
Snake River ab Jackson Lake	5	88%	122%
Pacific Creek	2	88%	117%
Buffalo Fork	2	76%	93%
Gros Ventre River	3	82%	97%
Hoback River	4	74%	120%
Greys River	5	93%	128%
Salt River	6	104%	199%
Snake ab Palisades Resv	22	86%	126%
Willow Creek	5	93%	128%
Blackfoot River	4	124%	295%
Portneuf River	5	123%	361%
Willow-Blackfoot-Portneuf	13	126%	363%
Snake River ab American Falls	40	92%	160%

Southern Snake River Basins

May 1, 2024





WATER SUPPLY OUTLOOK

Precipitation in April was 32 to 61% of normal across the Southern Snake River Basins (Fig. 1). Total water year precipitation is 112 to 126% of normal on May 1 (Fig. 2). Peak snowpack was 121 to 145% of normal (Fig. 3) and occurred between March 15 and April 8. The Owyhee Basin's peak snowpack was 145% of normal and occurred on March 15 (median peak date is March 18). However, the Owyhee had a complex spring with multiple sequences of melt and accumulation and did not begin its major melt phase until April 9. As of May 1, all basins in this region are well into the melt phase. The Raft River Basin has 78% of its peak snowpack remaining, Goose Creek has 61%, Salmon Falls has 61%, Bruneau has 45%, and the Owyhee has 33% (Fig. 4). Snowpack melt out in this region is occurring at above normal rates.

Reservoir storage in the region is above normal. Lake Owyhee storage is 140% of normal (99% full), Wild Horse is 184% of normal, Salmon Falls is 132% of normal (42% full), and Oakley Reservoir is 132% of normal (53% full). The 50% exceedance streamflow forecasts range from 119 to 183% of median runoff (Fig. 5). Observed streamflow volumes in April were well above median at 191 to 371% of normal.

Southern Snake River Basins Streamflow Forecasts - May 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	MAY-JUL	9.8	14	17.3	201%	21	27	8.6
	MAY-SEP	10.8	15.2	18.7	205%	23	29	9.1
Trapper Ck nr Oakley	MAY-JUL	3.2	3.8	4.2	145%	4.6	5.3	2.9
	MAY-SEP	4.2	4.8	5.3	133%	5.8	6.5	4
Oakley Reservoir Inflow	MAY-JUL	12.8	17.5	21	179%	25	31	11.7
	MAY-SEP	14.5	19.3	23	176%	27	33	13.1
Salmon Falls Ck nr San Jacinto	MAY-JUL	31	43	52	130%	62	79	40
	MAY-SEP	34	47	56	130%	66	83	43
Bruneau R nr Hot Spring	MAY-JUL	88	119	143	116%	169	210	123
	MAY-SEP	94	126	151	117%	178	220	129
Reynolds Ck at Tollgate	MAY-JUL	3.4	4.8	6	150%	7.2	9.3	4
	MAY-SEP	3.4	4.9	6.1	149%	7.3	9.5	4.1
Owyhee R nr Gold Ck 2	MAY-JUL	8.1	9.1	9.8	192%	10.5	11.7	5.1
Owyhee R nr Rome	MAY-JUL	89	154	210	186%	270	375	113
	MAY-SEP	103	170	225	179%	290	395	126
Owyhee R bl Owyhee Dam 2	MAY-JUL	112	180	235	168%	295	400	140
	MAY-SEP	137	205	265	160%	325	430	166
Bruneau R at Rowland	MAY-JUL	23	33	40	129%	47	57	31
	MAY-SEP	24	35	42	135%	49	59	31
Jarbidge River Below Jarbidge	MAY-JUL	16.3	19	21	124%	23	26	17
	MAY-SEP	16.9	19.8	22	125%	24	26	17.6

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 April

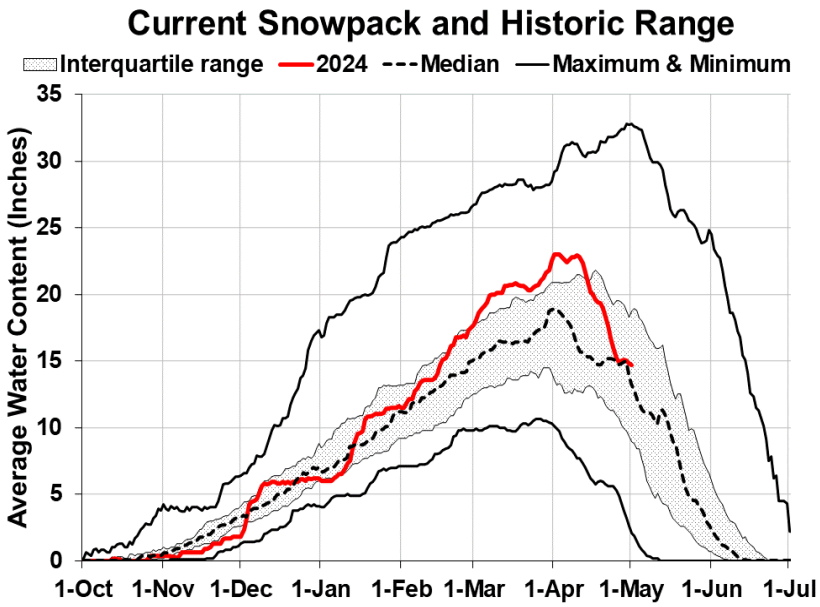
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Oakley Reservoir	40.4	23.8	30.6	75.6
Salmon Falls Reservoir	77.1	40.4	58.6	182.6
Wild Horse Reservoir	75.7	50.4	41.1	71.5
Lake Owyhee	705.7	486.1	502.4	715.0
Brownlee Reservoir	1271.1	1193.8	1148.0	1420.0

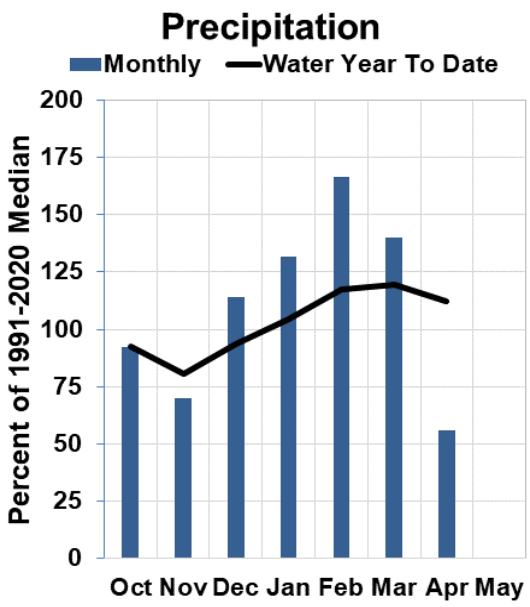
Watershed Snowpack Analysis: May 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
Raft River	2	116%	155%
Goose-Trapper Creeks	2	145%	217%
Salmon Falls Creek	4	114%	184%
Bruneau River	5	91%	188%
Reynolds Creek	6	133%	172%
Upper Owyhee	5	117%	189%
Owyhee Basin Total	9	154%	208%

Bear River Basin

May 1, 2024





WATER SUPPLY OUTLOOK

Monthly precipitation was well below normal in April across the Bear River Basin ranging from 14% to 78% at individual SNOTEL sites, and 56% of normal for the entire basin (Fig. 1). Total water year precipitation remains well above normal at 112% on May 1 (Fig. 2). Snowpack peaked in early April at 111% of normal peak SWE (Fig. 3), then proceeded to melt rapidly until recent cold temperatures and a late April storm paused snow melt and even slightly increased SWE at several SNOTEL sites. Currently there is ~65% of the Bear River Basin snowpack remaining. The snowpack is usually completely melted out by mid-June in this region.

Reservoir Storage for Bear Lake is well above normal at 172% (76% full) on May 1. The 50% exceedance streamflow forecasts in the basin range from ~90% to 150% for the May through July period (Fig. 5). As melt continues and peak streamflow approaches it is important to keep an eye on flood risk warnings.

Bear River Basin Streamflow Forecasts - May 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	89	102	111	110%	120	136	101
	APR-SEP	99	113	122	107%	132	149	114
	MAY-JUL	77	90	99	102%	108	124	97
Bear R ab Resv nr Woodruff	APR-JUL	86	106	121	132%	137	169	92
	APR-SEP	87	108	127	128%	146	171	99
	MAY-JUL	51	71	86	108%	102	134	80
Big Ck nr Randolph	APR-JUL	2.8	3.8	4.8	150%	5.9	8.1	3.2
	MAY-JUL	1.8	2.8	3.8	152%	4.9	7.1	2.5
Smiths Fk nr Border	APR-JUL	64	73	80	93%	87	98	86
	APR-SEP	75	84	92	92%	100	113	100
	MAY-JUL	52	61	68	91%	75	86	75
Bear R bl Stewart Dam 2	APR-JUL	107	151	180	157%	210	250	115
	APR-SEP	116	164	197	161%	230	275	122
	MAY-JUL	55	99	129	140%	159	200	92

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 April

Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Bear Lake	983.9	492.3	572.8	1302.0
Montpelier Reservoir	3.4	.6	3.2	4.0

Watershed Snowpack Analysis: May 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
Smiths-Thomas Forks	5	92%	168%
Bear Lake	7	109%	224%
Montpelier Creek	1		
Mink Creek	0		
Cub River	1	123%	183%
Bear River Total	24	106%	198%
Malad River	1		

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

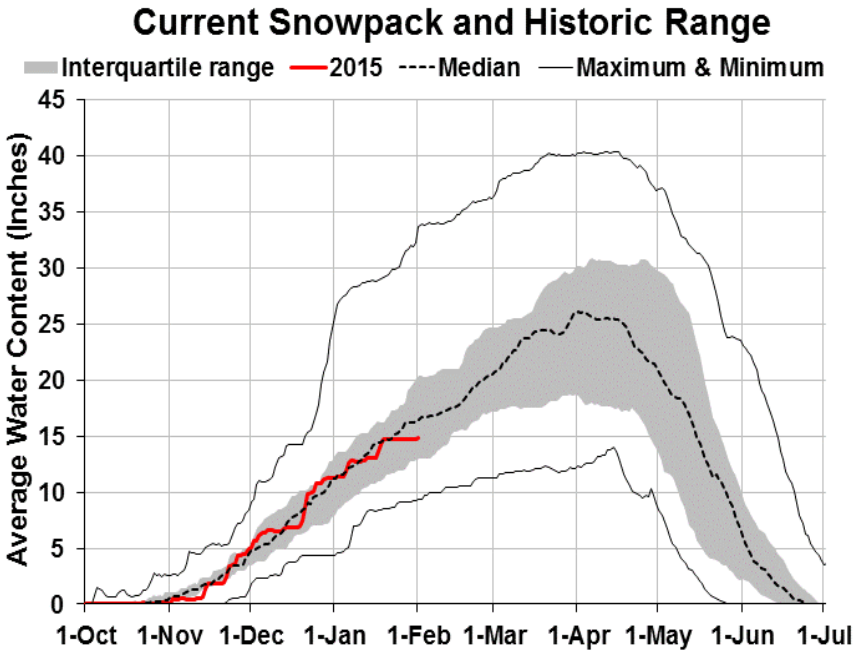
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

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.