USDA United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

January 1, 2024

Looking west towards Long Valley from the patchy snow-covered hills above the Gold Fork River.
Photo courtesy of Jessica Barrie

Where's the snow? After a wet water year in 2023 for most of Idaho, along with an unusually wet late summer, water year 2024 started off unseasonably warm and dry. With an exception across Idaho's southern border where snowpack is near normal, many SNOTEL sites across Idaho and western Wyoming are reporting record low snowpack for January 1. Conditions are especially concerning in northern Idaho and in the Upper Snake, where basin-wide conditions are currently the lowest we've observed in the SNOTEL era. Luckily, confidence is increasing that a significant weather pattern change is on Idaho's doorstep. This should favor better snowpack building conditions (wet and cold) for at least the first few weeks of January.

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)

New NRCS Water Supply Forecast System for the American West

This year, the NRCS begins using a new water supply forecast system, the Multi-Model Machine-Learning Metasystem, or M^4. In comparison to the historic singular water supply forecast model, the new system creates a mean value from six different forecast models. Using the mean of the ensemble of models harnesses the strengths of each technique while insulating against potential individual model vulnerabilities. The original NRCS water supply forecast model remains as part of the suite of ensemble models. Testing shows that the ensemble mean generally equals or exceeds the performance of any individual model member.

Application of NRCS water supply probabilistic forecasts remains unchanged.

Contact:
Angus Goodbody, angus.goodbody@usda.gov, Lead Forecast Hydrologist**,** USDA NRCS Snow Survey and Water Supply Forecasting Program

Additional reading:

Assessing the new NRCS water supply forecast model for the American West
A Machine Learning Metasystem for Robust Probabilistic Nonlinear Regression-Based Forecasting

January 2024: Idaho Water Supply Summary

Overview

Out with the old and in with the new in 2024! Mother Nature brought Idaho a welcome New Year's gift with the snow finally starting to accumulate across the region in early January. Dry and warm conditions, typical of El Niño conditions in the Northwest, have impeded snowpack development this winter. Thankfully reservoir storage is above normal and will provide a buffer for many water users if the snowpack continues to lag. While total water year precipitation is higher than snowpack relative to normal, if the snowpack remains low, users with storage rights may still feel impacted by reduced storage accrual during spring. Users more reliant on natural flow will feel the biggest impacts of a low snowpack year. With nearly three months left in the snow accumulation season, we remain optimistic, although the continuation of El Niño does temper our hopes slightly.

Weather, climate and drought outlooks

Winter finally arrived in January with storms bringing much needed moisture across Idaho. With freezing levels remaining low, most areas should see their snowpack grow. Above normal precipitation is forecasted for the Panhandle, Clearwater, West Central, Southern Snake, and upper Snake basins over the next ten days. The Salmon, Wood, and Lost basins are forecasted to also receive precipitation but only ~50% of what they normally receive during this period. NOAA's Climate Prediction Center (CPC) indicate that wet and cold conditions are likely through the middle of January. Whether snowpack building conditions will persist through the month is unclear with models indicating equal chances of any conditions in the one-month outlook for Idaho.

The CPC forecasts a continuation of El Niño conditions this winter with a 60% chance of transitioning to El Niño-Southern Oscillation (ENSO) neutral conditions between April and June. El Niño is the warm phase of the ENSO climate pattern, and this current event is considered a strong El Niño. There is a 54% chance this could become a historically strong event (top five El Niño events since 1950). The implication of these predictions are reflected in the seasonal outlook, which predicts warm and dry conditions are likely to continue this winter for our region.

Currently, 45% of Idaho lands are abnormally dry or are in drought. The Panhandle basins are experiencing the driest conditions with total water year precipitation remaining below normal for more than a year now. The seasonal drought outlook forecasts drought will persist in northern Idaho with drought conditions continuing to decline further south into the Salmon, Wood and Lost basins.

Snowpack

Idaho is in a snow drought with record low or near record low SWE (snow water equivalent) observed at many SNOTEL stations. These conditions extend across the Western U.S. The combination of very little precipitation and often warm temperatures has been detrimental to building the early season snowpack across elevations so far. Snowpack conditions are well below normal in all basins north of the Snake River Plain and range from 42 to 60% of normal as of January 1 (Fig. 3). Apart from the Bruneau Basin (79%), snowpack south of the Snake River Plain is faring much better than the rest of the state. The snowpack in Southern Snake River basins is near to above normal (92 to 110%). Southeast Idaho varies as well; Bear River Basin snowpack is 84%, while slightly to the north, the Willow-Blackfoot-Portneuf Basin is 80% of normal. Thankfully there's almost three months left for the snowpack to recover so keep your fingers crossed for the flurries to fly.

Precipitation

Total water year precipitation (WYP) closely mimics the snowpack pattern through Idaho albeit with moderate improvements in each basin due to the atmospheric river event in early December and intermittent fall rain events. In general, basins north of the Snake River Plain are much drier than normal and basins to the south are wetter or are at least experiencing near normal precipitation conditions (Fig. 2). On January 1, WYP conditions in the Salmon Basin up to the Panhandle range from 63 to 81% of normal. In the West Central basins, WYP ranges from 64 to 67% of normal. In the Wood and Lost basins, WYP spans 59% in the Big Wood Basin to 75% of normal in the Birch-Medicine Lodge-Beaver-Camas Basin. The upper Snake River basins, the Willow-Blackfoot-Portneuf Basin, WYP is slightly above normal at 101%, while the Henrys Fork-Teton and Snake River headwaters are 83% and 80% of normal respectively. Storm tracks favored basins south of the Snake River Plain, including Bear River Basin. WYP in this area range from 88 to 110% of normal (Fig. 2). Given the excellent reservoir storage, if precipitation remains near to slightly above normal in the Southern Snake River basins, these basins are in the best shape for water supply this spring in Idaho.

Water supply

There's no doubt the well below normal snowpack is cause for water supply concerns at this junction. While being an agricultural producer requires a certain level of optimism, whether water users see their glasses as half full or half empty most likely depends on their proportion of storage to natural flow water rights. Reservoir storage in Idaho is near or above normal. This banked water is providing users with storage rights some peace of mind in face of a dismal January 1 snowpack. Thankfully there is still time for the snowpack to recover.

The Boise River system has above normal storage at 119% of normal (62% of capacity) and is maintaining the ~120 KAF (thousand acre-feet) more water than is typical. Reservoir storage is accruing this winter at a typical rate in the Boise system and an above normal rate in the Upper Snake system. The U.S. Army Corps of Engineers (USACE) in coordination with the U.S. Bureau of Reclamation (USBR) forecasts 1,150 KAF for Boise River's January through July streamflow, which is 73% of average. They expect the Boise system to fill this spring and predict that “flood risk management releases from Lucky Peak Dam may still be necessary during the spring to manage refill.”

Total storage in the Upper Snake River system above Milner Dam is 114% of normal with ~1.38 MAF (million acre-feet) more water in the system than this time last year. Water Year 2023 ended with significantly more carryover compared to the previous year, especially in the Jackson-Palisades reservoirs. Combined Jackson Lake and Palisades storage above Heise is 118% of normal (75% of capacity). The coordinated BOR and USACE forecast for the January through July period is 2,950 KAF (76% of normal) at Heise. The NRCS forecast for the primary snowmelt runoff period at Heise (April to July) also predicts below normal runoff at 77% of normal.

January 1 streamflow forecasts reflect the current mountain snowpack and total water year precipitation conditions. In January, NRCS only publishes streamflow forecasts at locations where model confidence is high. For the April through July forecast period, below normal streamflow is predicted in the upper Snake River, Henrys Fork-Teton, Panhandle and Bear River basins. Reflecting the snowpack conditions, near normal streamflow is expected in the Southern Snake basins at this time. Streamflow, snowpack, and precipitation data for each basin can be accessed in basin reports or on the NRCS interactive map.

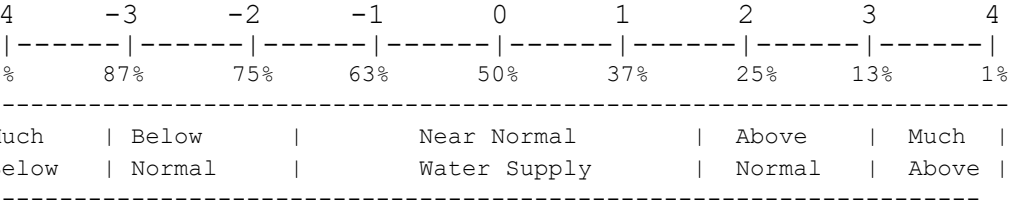
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) January 1, 2024

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	**-1.6**	**2023**	**NA**
Clearwater	**-2.8**	**2007**	**NA**
Salmon	**----**	**----**	**NA**
Weiser	**----**	**----**	**NA**
Payette	**----**	**----**	**NA**
Boise	**----**	**----**	**- 1.4**
Big Wood above Hailey	**----**	**----**	**- 2.7**
Big Wood	**----**	**----**	**0.9**
Camas Creek nr Blaine	**----**	**----**	**NA**
Little Wood	**----**	**----**	**- 1.1**
Big Lost	**----**	**----**	**0.9**
Little Lost	**----**	**----**	**1.6**
Teton	**-0.9**	**2004**	**- 3.9**
Henrys Fork	**-0.4**	**2007**	**- 2.9**
Snake (Heise)	**-0.9**	**1991**	**- 1.5**
Oakley	**----**	**----**	**1.0**
Salmon Falls above Jackpot	**0.1**	**2020**	**NA**
Salmon Falls	**-0.6**	**2005**	**- 0.7**
Bruneau	**----**	**----**	**NA**
Owyhee	**1.6**	**2005**	**- 1.5**
Bear River	**1.6**	**2021**	**- 3.7**

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
December 2023

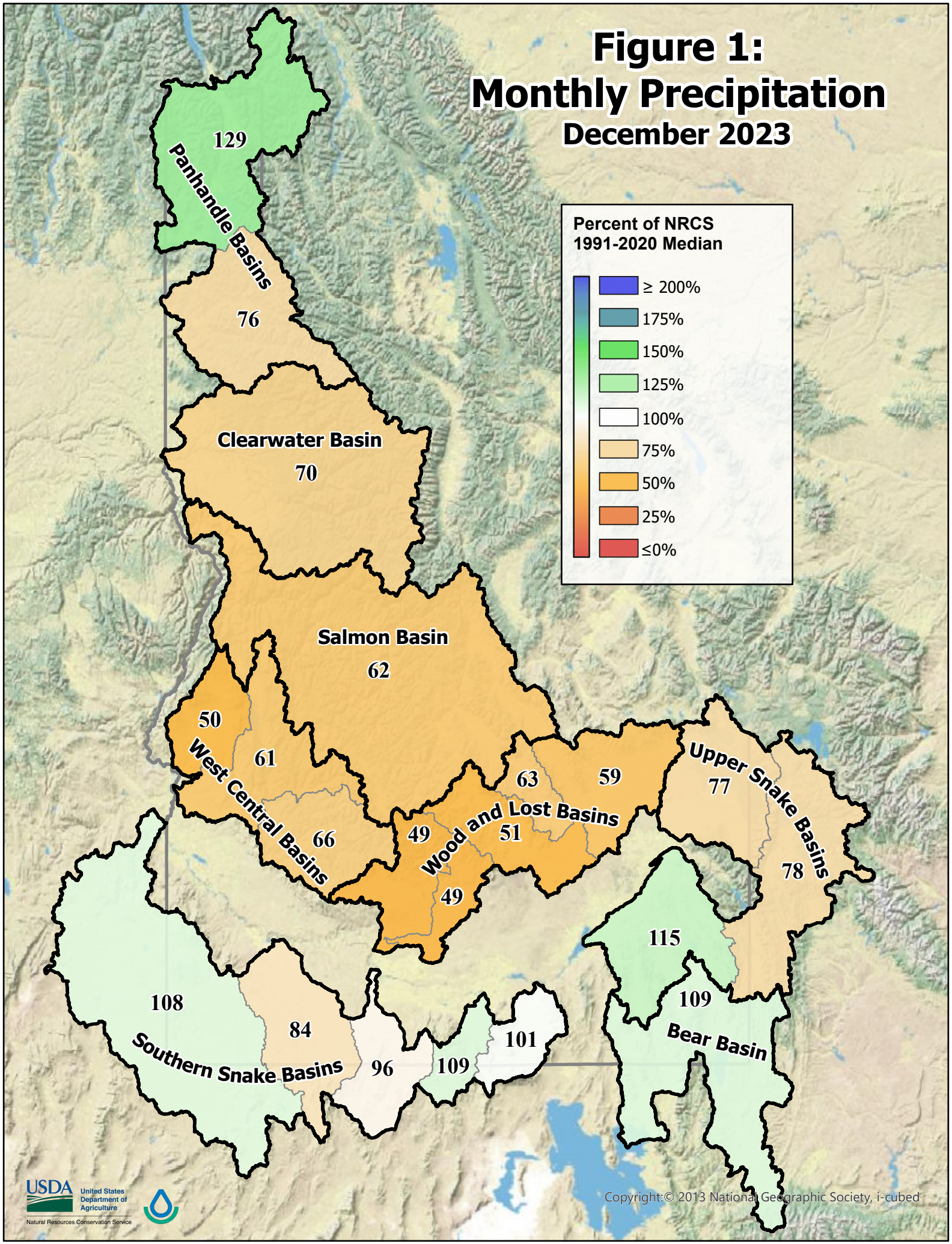


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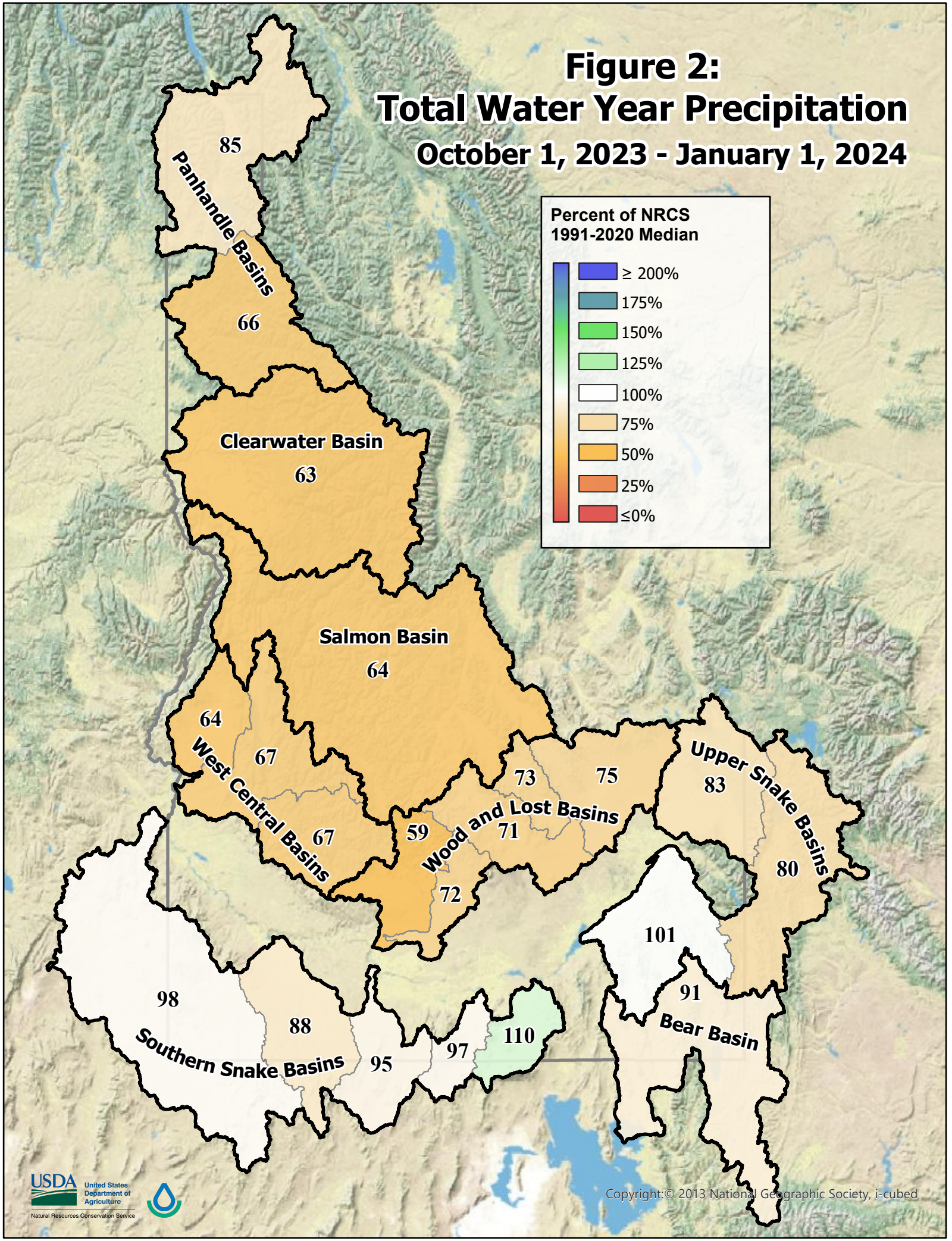
Figure 2:
Total Water Year Precipitation
October 1, 2023 - January 1, 2024



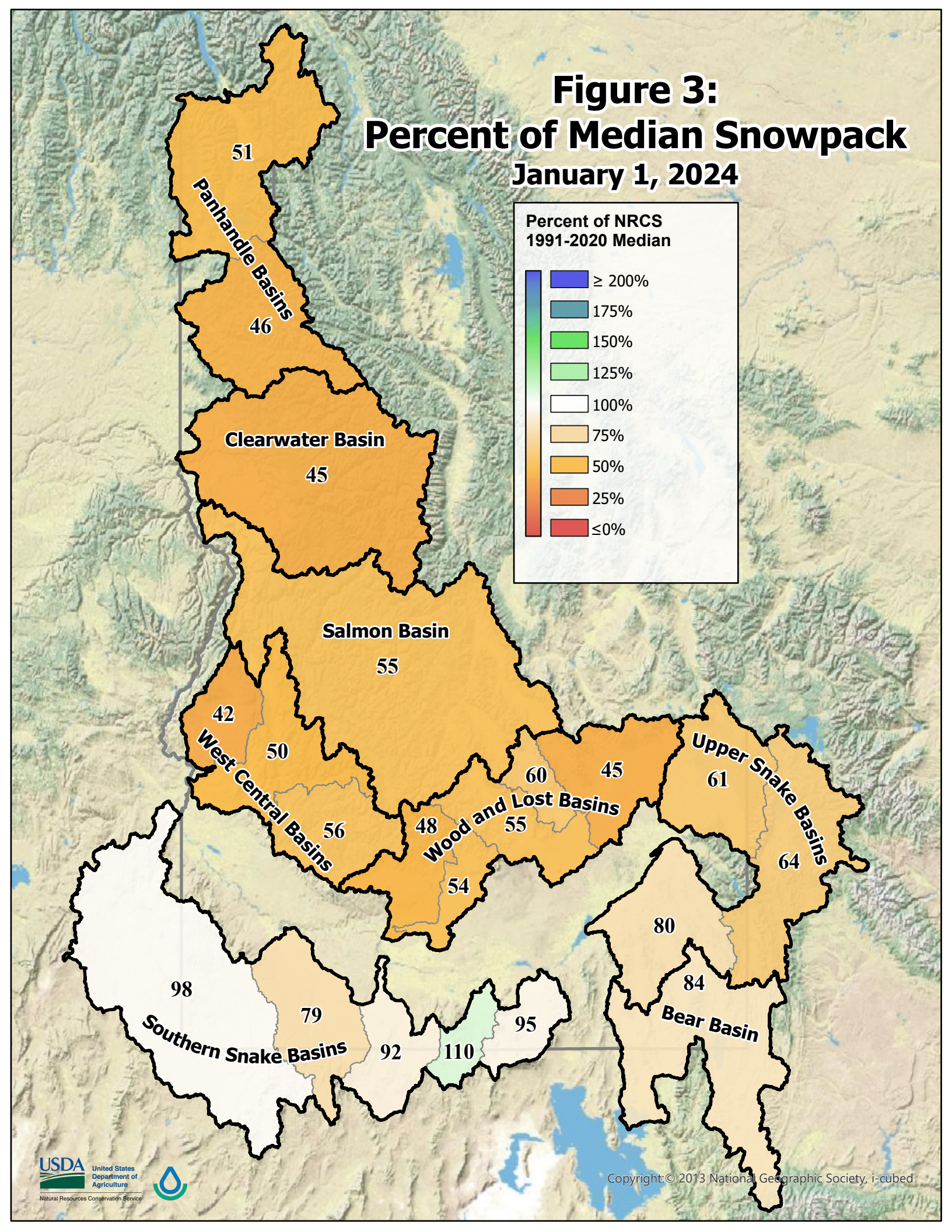


Figure 3:
Percent of Median Snowpack
January 1, 2024
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
Panhandle Basins
51
46
Clearwater Basin
45
Salmon Basin
55
42
50
West Central Basins
56
48
Wood and Lost Basins
55
60
45
54
Upper Snake Basins
61
64
80
84
Bear Basin
98
79
Southern Snake Basins
92
110
95
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Agriculture
Natural Resources Conservation Service
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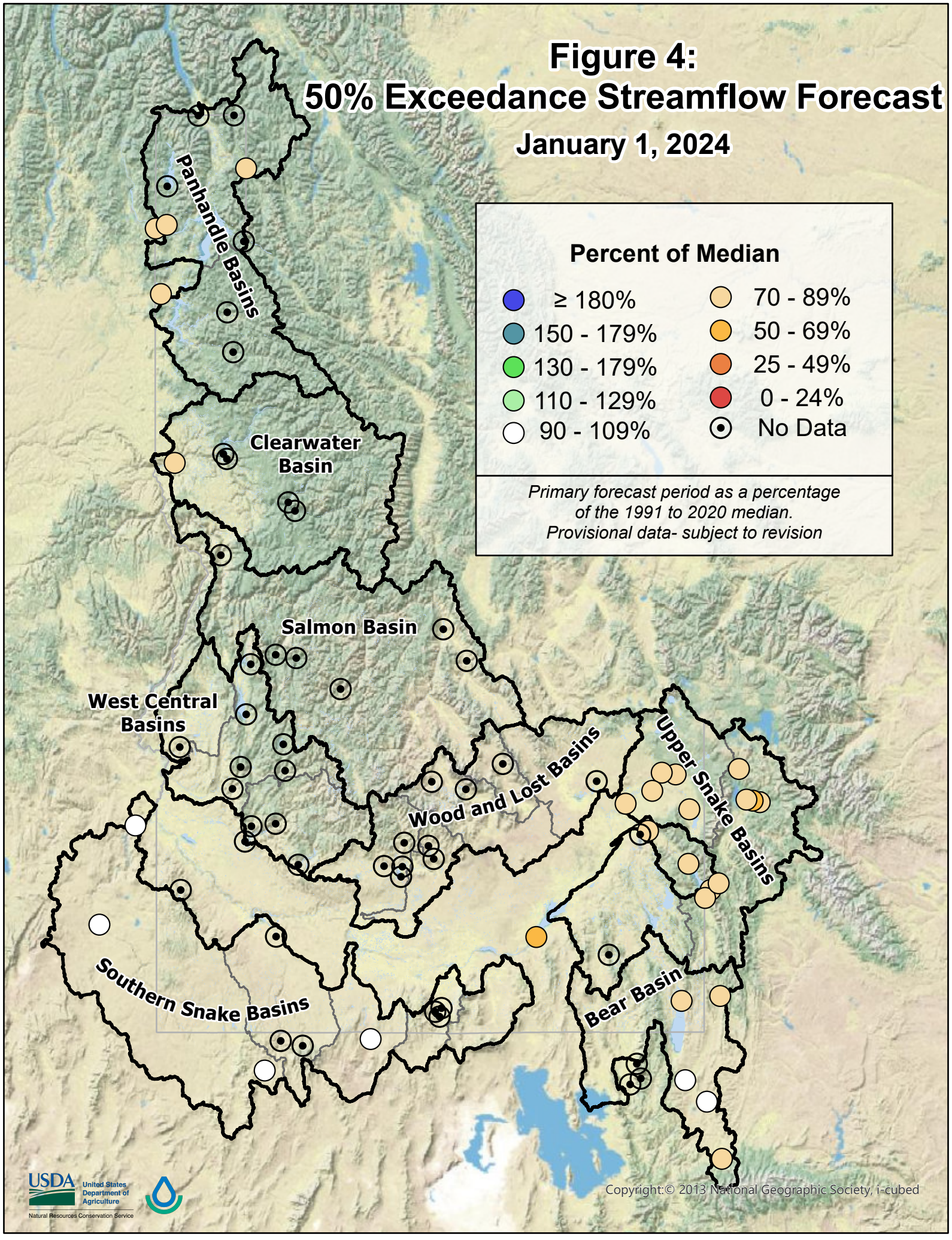
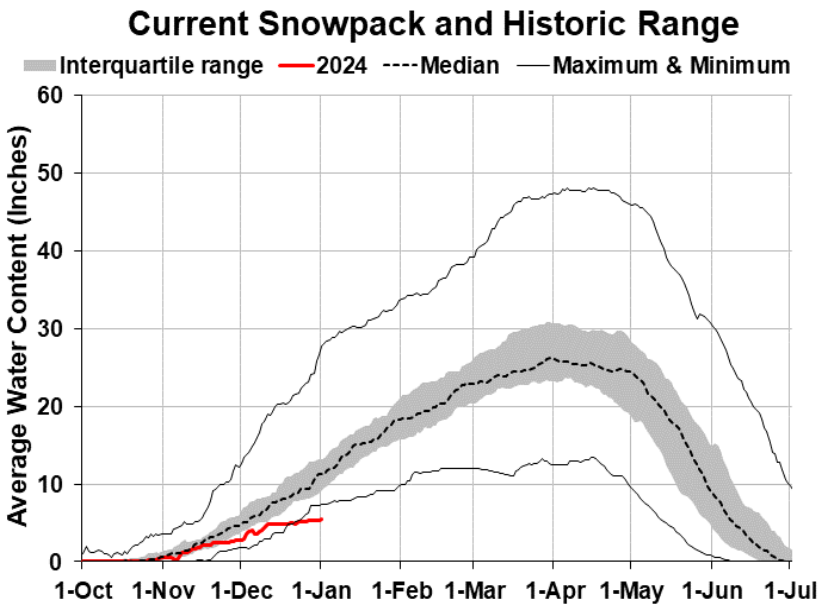
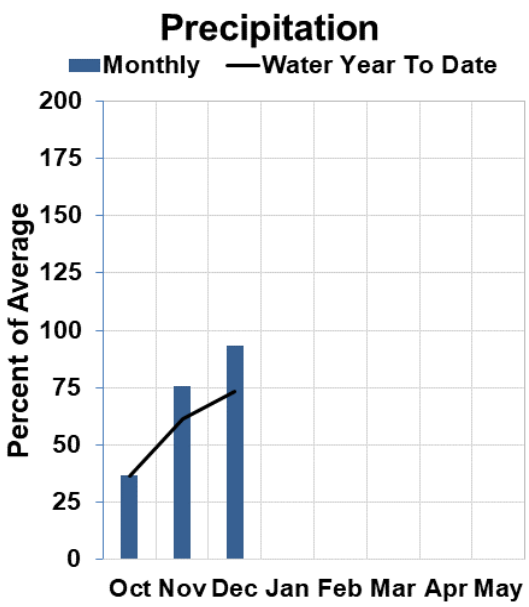
Figure 4:
50% Exceedance Streamflow Forecast
January 1, 2024



Panhandle Basins

January 1, 2024





WATER SUPPLY OUTLOOK

The Idaho Panhandle is having a very slow start to the 2024 winter with record low snowpack at most snow measurement sites above 4,000 ft. October precipitation was 35% of normal precipitation and November precipitation ranged between ~75 to 85% of normal. Storms in December brought much more precipitation to the Pend Orielle Basin (~130%) compared to the Coeur d'Alene Basin (~75%) (Fig. 1). Total water year precipitation ranges from ~65 to 85% of normal (Fig. 2). Although there was above normal precipitation during December in the Pend Orielle Basin, temperatures have been above normal with a major rain-on-snow event that caused significant snowmelt across the region on December 5. As a result, the snowpack is ~45 to 50% of normal on January 1 (Fig. 3). NOAA's 8- to 14-day outlooks predict above normal precipitation and below normal temperatures. The seasonal Jan-Feb-Mar Outlook predicts above normal temperatures and below normal precipitation. There is still time for the snowpack to recover, but if the seasonal outlook of warm and dry conditions become reality it will continue to negatively impact snowpack development.

Reservoir storage in the panhandle lakes is the following: Coeur d'Alene is 82% of normal (24% of capacity), Pend Oreille is 90% of normal (36% of capacity), and Priest Lake is 181% of normal (84% of capacity). Streamflow forecasts for April through July are ~70 to 85% of normal at the 50% exceedance level in the Panhandle basins. Some streamflow forecasts are unavailable in January due to the high errors with early season forecasts.

Panhandle Region Streamflow Forecasts - January 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	3270	4980	5750	86%	6530	8230	6680
	APR-SEP	3990	5750	6550	87%	7360	9120	7560
Pend Oreille Lake Inflow 2	APR-JUL	4960	7410	9070	78%	10700	13200	11700
	APR-SEP	5420	8010	9770	78%	11500	14100	12600
Priest R nr Priest River 2	APR-JUL	345	520	635	76%	750	925	840
	APR-SEP	370	550	670	76%	790	970	880
Priest R Outflow NR Coolin	APR-JUL	385	500	580		660	775	
	APR-SEP	390	510	590		670	790	

Normals based on 1991-2020 reference period

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 December

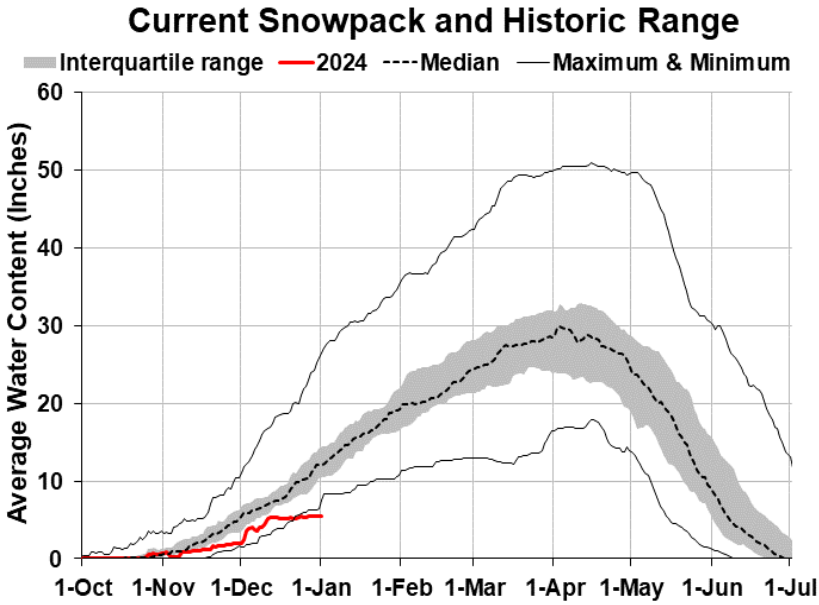
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Hungry Horse Lake	2902.8	2825.6	2870.0	3451.0
Flathead Lake	1313.7	1150.2	1181.0	1791.0
Noxon Rapids Reservoir	325.5	318.1	317.4	335.0
Lake Pend Oreille	559.6	544.8	620.0	1561.3
Priest Lake	100.5	46.6	55.6	119.3
Lake Coeur d' Alene	58.4	76.9	70.8	238.5

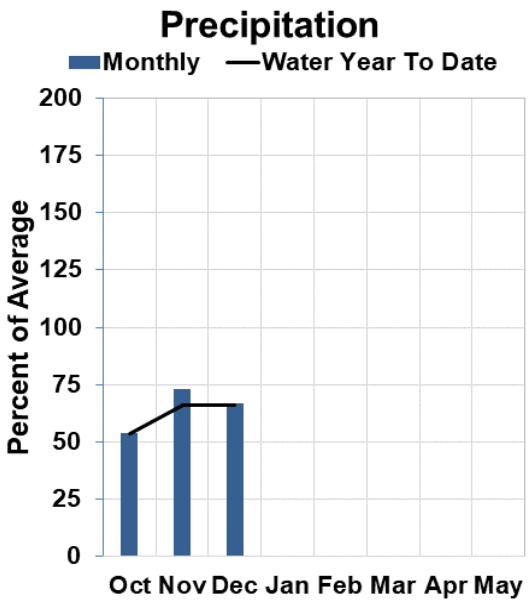
Watershed Snowpack Analysis: January 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
Moyie River	1	42%	115%
Priest River	6	48%	122%
Rathdrum Creek	3	52%	155%
Coeur d' Alene River	5	46%	136%
St. Joe River	4	46%	128%
Pend Oreille Lake	5	54%	125%
Palouse River	2	54%	140%
Lower Kootenai	2	49%	104%
Pend Oreille-Kootenai	13	51%	122%
Coeur d' Alene-St. Joe Total	8	48%	137%

Clearwater River Basin

January 1, 2024





WATER SUPPLY OUTLOOK

Fall to early winter weather conditions in the Clearwater Basin are a unique blend of infrequent heavy precipitation, warm temperatures, and record low snowpack. December monthly precipitation was ~70% of normal (Fig. 1) and total water year precipitation is 64% of normal (Fig. 2). January 1 snowpack is ~45% of normal (Fig. 3). The Clearwater Basin received near normal precipitation from October 1 to mid- December. By January 1, snowpack remained below normal, even with the atmospheric river event in early-December. Upon the atmospheric river's arrival, snow accumulation began increasing to near normal, but due to the warmer tropical air being advected into the region coupled with the warming effects of El Niño, snow quickly transitioned to rain. On December 5, nearly all SNOTEL sites within the basin saw a reduction in snow water equivalent (SWE) from warm temperatures and rain-on-snow, with some sites losing up to an inch of SWE over a 24-hour period. Many lower elevation SNOTEL sites below 5,700 ft. continued to melt until another cooler storm ceased SWE losses. From December 12, little snowpack accumulation occurred through January 1. The impact of these events resulted in the lowest snowpack on record for nearly all SNOTEL sites in the basin above 4,500 ft. elevation, and have set a new minimum for basin-wide SWE in the SNOTEL site era. This is two inches less SWE than the previous January 1 minimum in ~40 years of record.

Dworshak Reservoir is at 63% capacity, which is 94% of normal on January 1. The 50% exceedance streamflow forecast for the Clearwater River at Spalding is 78% of normal for the April through July forecast period. Most streamflow forecasts are unavailable this period due to high errors in the early season forecast but will be available in February. While the snowpack is in bad shape on January 1, it is still early in the accumulation season. Current weather forecasts look promising for incoming storms to bolster snowpack over the next few weeks. NOAA's 8- to 14-day outlook shows below normal temperatures and above normal precipitation.

Clearwater River Basin Streamflow Forecasts - January 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)
Clearwater R at Spalding 2	APR-JUL	2770	4290	5330	78%	6370	7890	6820
	APR-SEP	2990	4550	5610	77%	6660	8220	7290

Normals based on 1991-2020 reference period

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 December

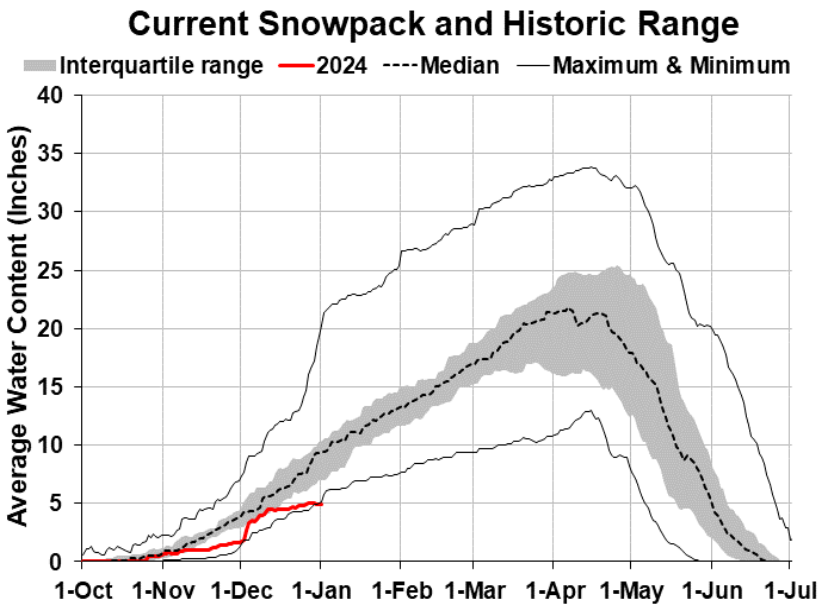
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Dworshak Reservoir	2186.1	2197.0	2316.0	3468.0

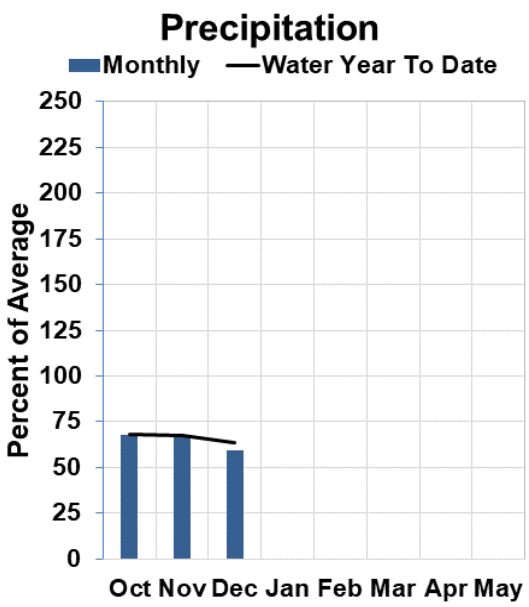
Watershed Snowpack Analysis: January 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
NF Clearwater River	9	42%	126%
Lochsa River	3	46%	108%
Selway River	4	53%	100%
SF Clearwater River	1	66%	98%
Clearwater Basin Total	18	45%	121%

Salmon River Basin

January 1, 2024





WATER SUPPLY OUTLOOK

Infrequent storms, increased temperatures, and below normal precipitation typical of El Niño patterns in the Northwest befell the Salmon Basin. From October 1 to the first week of November, near to above normal precipitation occurred. Snow accumulation began in late October, leading to a weak start to a building snowpack. By November 7, the basin remained dry until early December when an atmospheric river event passed through the region. The atmospheric river event brought warm air into the basin, shifting the precipitation from snow to rain and impeding snow accumulation. Once the atmospheric river passed, little precipitation occurred through January 1; December precipitation was 62% of normal (Fig. 1) and total water year precipitation is 64% of normal (Fig. 2). Snowpack on January 1 is ~55% below normal (Fig. 3). Warm temperatures and precipitation falling as rain led to the third and second lowest snowpack on record for many Salmon Basin SNOTEL sites.

There are no reservoirs in the Salmon River Basin. Streamflow forecasts are unavailable for the Salmon Basin. They will be available in the February 1 report. While January 1 snowpack conditions look bleak, there may be hope on the horizon during the first weeks of January. Current weather forecast models show frequent, cold storms bringing snow to the region. NOAA's Climate Prediction Center's 8- to 14-day outlook predicts below normal temperatures and above normal precipitation.

Salmon River Streamflow Forecasts - January 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								

Normals based on 1991-2020 reference period

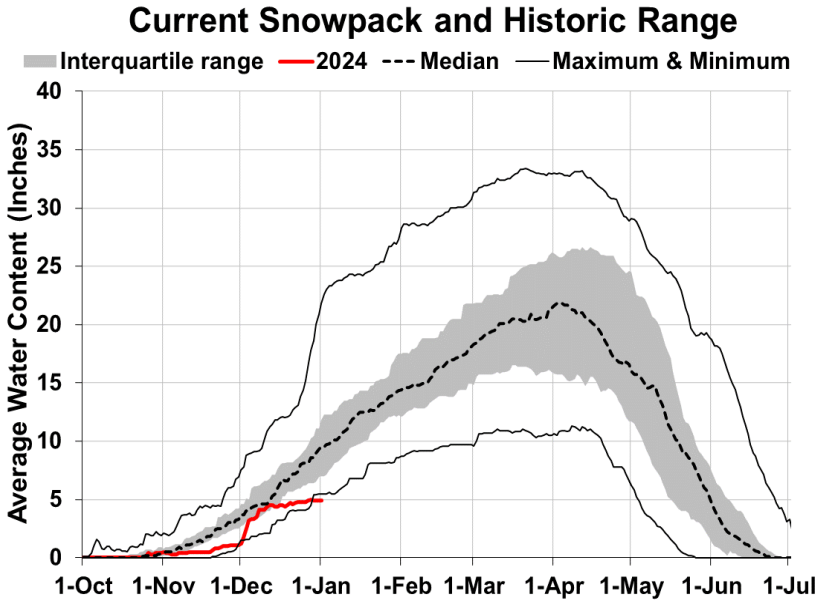
1) 90% and 10% exceedance probabilities are actually 95% and 5%

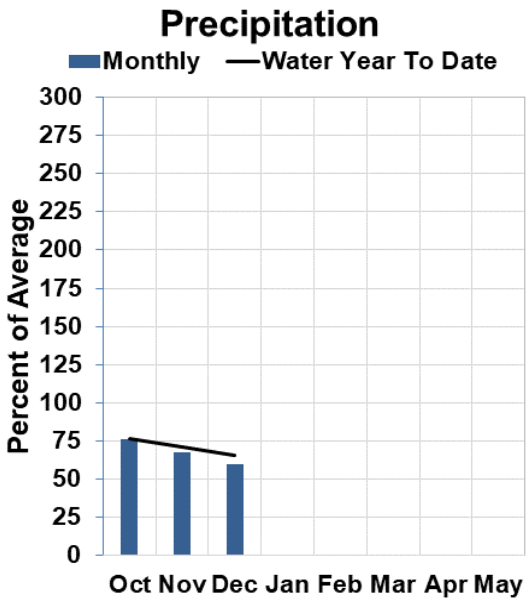
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis: January 1, 2024			
Basin Name	# of Sites	% of Median 2024	2023
Salmon River ab Salmon	7	58%	129%
Lemhi River	3	57%	139%
MF Salmon River	3	54%	119%
SF Salmon River	3	48%	116%
Little Salmon River	4	57%	140%
Lower-Middle Salmon	4	57%	114%
Salmon Basin Total	20	55%	125%

West Central Basins

January 1, 2024





WATER SUPPLY OUTLOOK

After record breaking rainfall ended Water Year 2023, the West Central basins transitioned to warm and dry conditions typical of El Niño winters in the Northwest. Monthly precipitation in December was ~50 to 65% of normal (Fig. 1). With similarly dry months during October and November, total water year precipitation ranges from ~60 to 65% of normal on January 1 (Fig. 2). Snowpack is also well below normal (~50 to 60%) (Fig. 3), with the second lowest January 1 snow water equivalent (SWE) totals at multiple SNOTEL stations. The majority of snow accumulation in December occurred during an atmospheric river event at the beginning of the month. Warm temperatures after this event temporarily melted snowpack in the West Central basins. This change was only observed at lower elevation sites near Cascade Reservoir, but the melt likely occurred area wide. Very little precipitation occurred in the weeks before and after this event. With the lack of snowpack, these basins will need significant snowfall to catch up to normal values. Medium range outlooks are encouraging with above normal precipitation expected through mid-January. Forecast models indicate that projected storm tracks are favorable for high snow accumulation in these basins.

Combined reservoir storage in the Boise system (Anderson Ranch, Arrowrock and Lucky Peak combined) is 119% of normal (62% capacity). Reservoir storage in the Payette Basin is ~100% of normal and storage in the Weiser Basin is 92% of normal. Due to high uncertainty with early season forecasts, no streamflow forecasts are available for January in the West Central basins. Forecasts will be available in the February 1 report.

West Central Basins Streamflow Forecasts - January 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)
Boise R nr Boise 2								

Normals based on 1991-2020 reference period

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 December

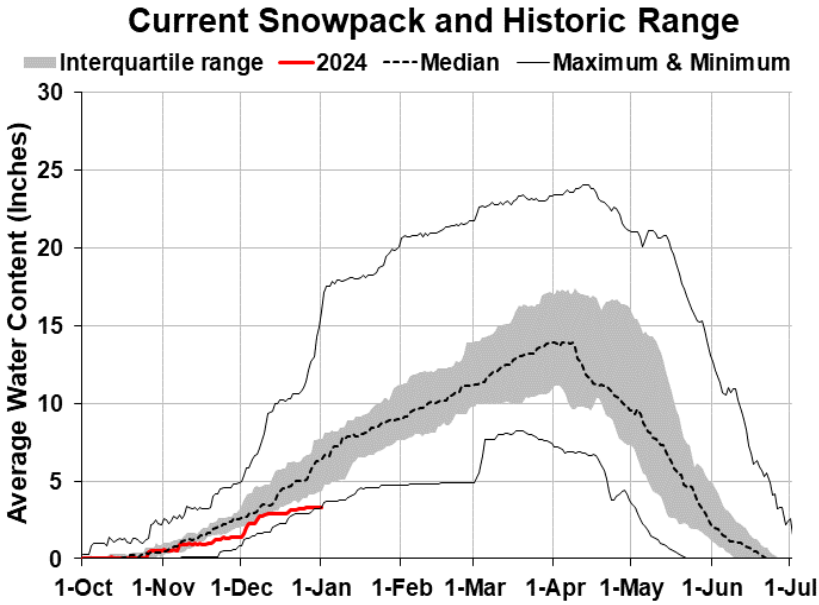
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	386.7	343.6	270.8	450.2
Arrowrock Reservoir	163.2	128.0	169.1	272.2
Lucky Peak Reservoir	79.4	83.4	89.5	293.2
Sub-Basin Total	**629.3**	**554.9**	**529.4**	**1015.6**
Deadwood Reservoir	96.0	76.9	90.9	161.9
Cascade Reservoir	461.7	429.4	453.0	693.2
Sub-Basin Total	**557.7**	**506.2**	**543.9**	**855.1**
Lake Lowell	116.0	81.0	97.9	165.2
Mann Creek Reservoir	1.5	.6	1.6	11.1

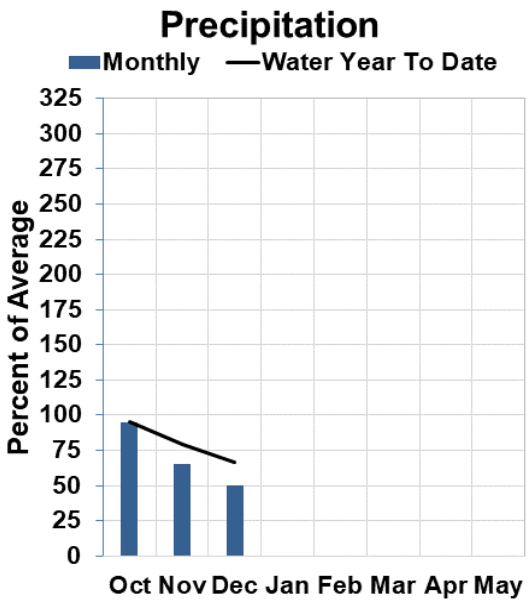
Watershed Snowpack Analysis: January 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
SF Boise River	9	53%	147%
MF & NF Boise Rivers	6	57%	138%
Mores Creek	5	58%	136%
Canyon Creek	4	47%	175%
Boise Basin Total	18	56%	142%
NF Payette River	9	47%	130%
SF Payette River	4	54%	124%
Payette Basin Total	19	50%	129%
Mann Creek	1	40%	165%
Weiser Basin Total	8	42%	146%

Wood & Lost River Basins

January 1, 2024





WATER SUPPLY OUTLOOK

Water Year 2024 was preceded by record-breaking August rainfall totals, which contributed to a much needed wet year for Water Year 2023 in the Wood and Lost basins. The above normal precipitation pattern did not continue for long in the new water year. October precipitation was above normal at most stations across these basins, but was followed by a dry November, and an even drier December. Warm, dry conditions are typical of strong El Niño winters. Monthly precipitation in December (Fig. 1) was between ~45 to 65% of normal. Total water year precipitation on January 1 (Fig. 2) ranges between ~60 to 75% of normal, which is quite low compared to the period of record. Snowpack conditions are also very low in the Wood and Lost basins (Fig. 3) ranging from ~45 to 60% of normal. This is the lowest January 1 snowpack on record for multiple SNOTEL sites. While air temperatures have been warmer than normal so far, the lack of snowpack accumulation can be attributed to very little precipitation rather than temperature effects. That is, snowpack is well below normal at all elevations. Encouragingly, medium range forecasts show that above normal precipitation and below normal temperatures are likely across Idaho during the first half of January. With NOAA's 30-day outlook indicating equal chances of above or below normal precipitation, though, it is likely that a deficient snowpack will continue to February 1. However, history has shown that a few large storms can provide enough precipitation to get back to normal conditions quickly.

Magic Reservoir and Little Wood Reservoir storage are above normal for this time of year, at 284% and 129% of normal respectively (66% and 60% capacity). Mackay Reservoir storage is 41% of normal (21% capacity). This anomaly is due to the failure of underwater gates earlier this year which forced the reservoir to be drained for repairs. Due to high errors with early season forecasts, no streamflow forecasts are available for January in the West Central basins. Forecasts will be available in the February 1 report.

Wood and Lost Basins Streamflow Forecasts - January 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)
Big Wood R at Hailey								

Normals based on 1991-2020 reference period

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 December

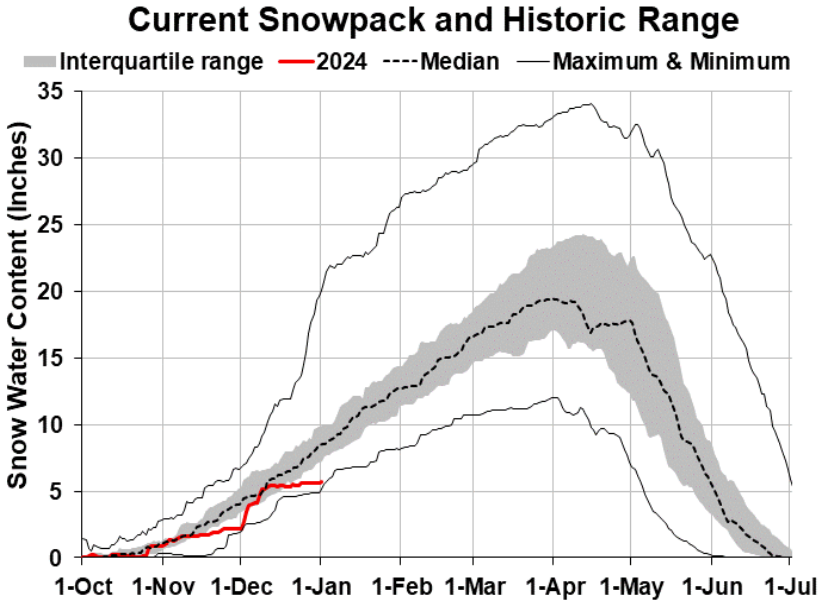
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Mackay Reservoir	9.5	22.8	23.4	44.4
Little Wood Reservoir	17.9	11.1	13.9	30.0
Magic Reservoir	127.2	21.4	44.8	191.5

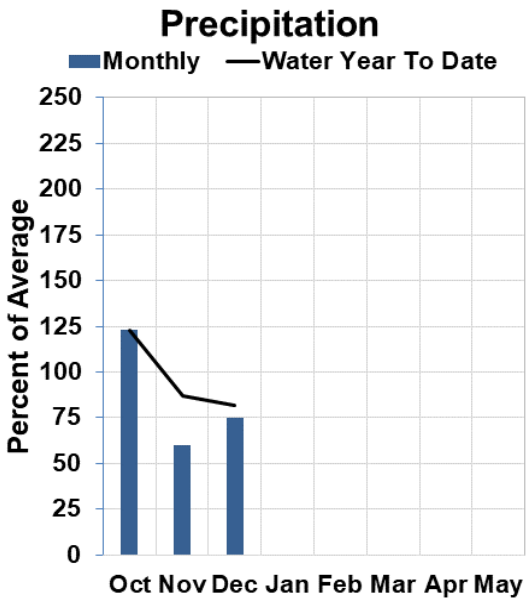
Watershed Snowpack Analysis: January 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
Camas-Beaver Creeks	4	31%	194%
Birch-Medicine Lodge Creeks	2	65%	141%
Little Lost River	3	60%	161%
Big Lost River ab Mackay	5	52%	161%
Big Lost Basin Total	6	55%	165%
Fish Creek	0		
Little Wood ab Resv	4	54%	152%
Big Wood River ab Hailey	8	48%	159%
Camas Creek	4	47%	162%
Birch-Medicine Lodge-Camas-Beaver Total	6	45%	172%
Little Wood Basin Total	4	54%	152%
Big Wood Basin Total	12	48%	160%

Upper Snake River Basins

January 1, 2024





WATER SUPPLY OUTLOOK

Water Year 2024 in the Upper Snake began with well above normal conditions with a very wet October that was immediately followed by a very dry November which reduced water year total precipitation by more than 30% in all three basins. December precipitation in the Henrys Fork-Teton and Snake River above Heise basins continued the dry trend with ~80% of normal precipitation (Fig. 1). Favorable storm tracks benefited the Willow-Blackfoot-Portneuf Basin with 115% of normal precipitation in December (Fig. 1). As of January 1, total water year precipitation in the Upper Snake basins is ~80% for Henrys Fork-Teton, ~80% for Snake River above Heise, and ~100% for Willow-Blackfoot-Portneuf (Fig. 2). Like most of Idaho, the snowpack is well below normal due to warm temperatures and dry conditions. On January 1, Upper Snake and Henrys Fork-Teton basins were quickly approaching record low snowpack with a significant number of sites at or near their historical minimum SWE. Basins range from ~60 to 75% of normal (Fig. 3). While the lack of snow is worrisome it is important to remember there are nearly 100 days until the median peak SWE date, leaving ample time to accumulate more snow. NWRFC's 10-day forecast predicts well above normal precipitation and is supported by NOAA's 8- to 14-day outlook which predicts below normal temperatures and above normal precipitation.

The Upper Snake reservoir system above Milner Dam is currently 131% of normal (75% capacity), and the Jackson-Palisades system is at 118% of normal (75% capacity). Median streamflow forecasts in the region range from ~70 to 90% for the April to July runoff period. Conditions can evolve rapidly during the early winter months so continue to monitor daily conditions and subsequent water supply reports.

Upper Snake River Basin Streamflow Forecasts - January 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	250	325	375	79%	425	495	475
	APR-SEP	385	465	520	83%	575	660	630
Falls R nr Ashton 2	APR-JUL	205	260	300	76%	340	395	395
	APR-SEP	250	320	365	77%	410	480	475
Teton R nr Driggs	APR-JUL	70	104	127	87%	150	184	146
	APR-SEP	84	127	156	88%	185	230	178
Teton R nr St Anthony	APR-JUL	184	260	310	87%	360	435	355
	APR-SEP	215	305	360	85%	420	510	425
Henrys Fk nr Rexburg 2	APR-JUL	670	895	1040	86%	1200	1420	1210
	APR-SEP	870	1140	1320	84%	1510	1780	1580
Snake R at Flagg Ranch	APR-JUL	245	335	395	85%	455	545	465
	APR-SEP	260	360	425	84%	490	590	505
Snake R nr Moran 2	APR-JUL	410	545	640	88%	735	870	730
	APR-SEP	470	620	720	89%	820	970	810
Pacific Ck at Moran	APR-JUL	49	84	107	69%	130	165	154
	APR-SEP	55	91	115	72%	139	175	160
Buffalo Fk ab Lava Ck nr Moran	APR-JUL	120	174	210	74%	245	300	285
	APR-SEP	134	194	235	76%	275	335	310
Snake R ab Reservoir nr Alpine 2	APR-JUL	765	1210	1510	71%	1810	2250	2140
	APR-SEP	915	1410	1740	72%	2070	2570	2430
Greys R ab Reservoir nr Alpine	APR-JUL	160	225	270	86%	315	380	315
	APR-SEP	189	265	315	86%	365	440	365
Salt R ab Reservoir nr Etna	APR-JUL	102	190	250	82%	310	400	305
	APR-SEP	142	240	310	82%	380	480	380
Snake R nr Irwin 2	APR-JUL	1080	1730	2170	74%	2610	3260	2930
	APR-SEP	1270	2000	2490	73%	2980	3710	3420
Snake R nr Heise 2	APR-JUL	1300	1960	2410	77%	2860	3520	3130
	APR-SEP	1500	2250	2760	75%	3260	4010	3660
Snake R at Neeley 2	APR-JUL	130	700	1380	58%	2060	3060	2390
	APR-SEP	105	625	1350	57%	2080	3140	2360

Normals based on 1991-2020 reference period

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 December

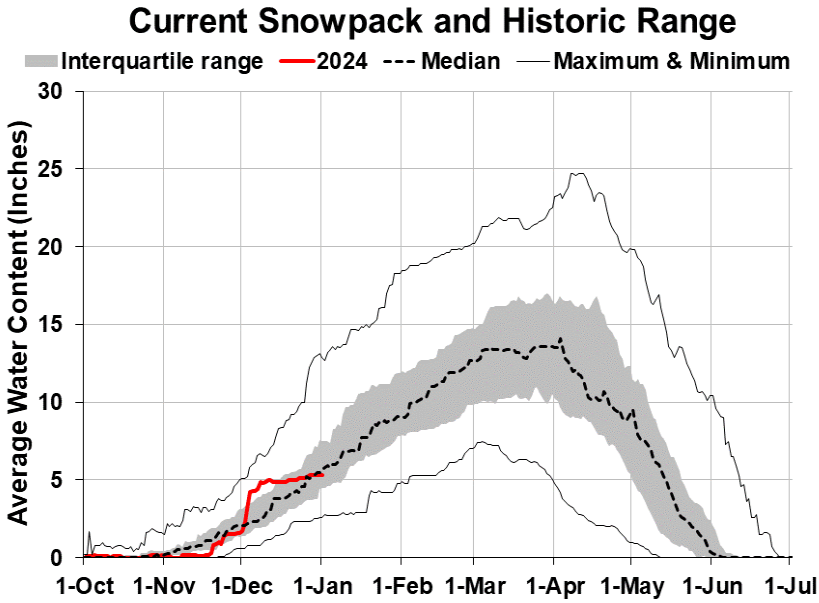
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Jackson Lake	586.5	167.9	615.6	847.0
Palisades Reservoir	1100.5	439.7	811.1	1400.0
Sub-Basin Total	**1687.0**	**607.6**	**1426.7**	**2247.0**
Henrys Lake	81.3	77.6	84.0	90.4
Island Park Reservoir	120.1	95.7	99.3	135.2
Grassy Lake	12.5	10.9	12.5	15.2
Sub-Basin Total	**213.8**	**184.2**	**195.8**	**240.8**
Ririe Reservoir	44.6	43.5	39.3	80.5
Blackfoot Reservoir	263.4	159.7	173.1	337.0
American Falls Reservoir	927.9	664.2	909.3	1672.6
Basin-Wide Total	**3136.6**	**1659.2**	**2744.2**	**4577.9**

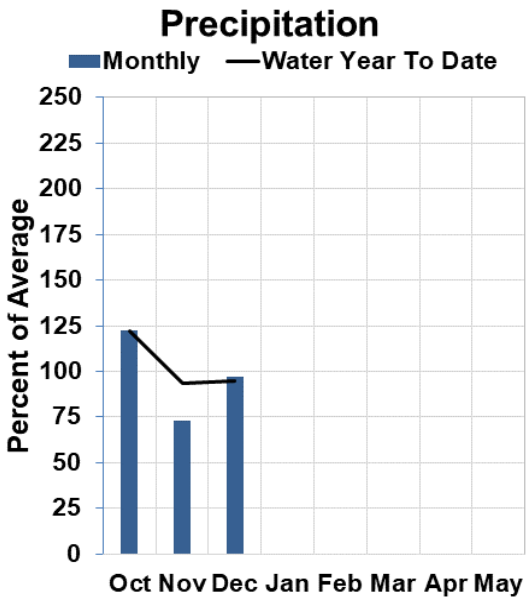
Watershed Snowpack Analysis: January 1, 2024

Basin Name	# of Sites	% of Median 2024	2023
Henrys Fork-Falls River	9	61%	136%
Teton River	6	60%	120%
Henrys Fork-Teton	13	61%	129%
Snake River ab Jackson Lake	9	70%	129%
Pacific Creek	3	59%	115%
Buffalo Fork	2	61%	108%
Gros Ventre River	4	53%	106%
Hoback River	4	52%	113%
Greys River	5	69%	120%
Salt River	4	72%	136%
Snake ab Palisades Resv	24	64%	122%
Willow Creek	5	69%	120%
Blackfoot River	2	87%	174%
Portneuf River	3	102%	160%
Willow-Blackfoot-Portneuf	6	93%	167%
Snake River ab American Falls	33	67%	130%

Southern Snake Basins

January 1, 2024





WATER SUPPLY OUTLOOK

Southern Snake River basins had a strong start to Water Year 2024 with ~120 to 140% of normal precipitation in October, then dipped below normal in November at 75 to 95% of normal precipitation. December monthly precipitation was ~85 to 105% of normal (Fig. 1). Total water year precipitation is ~90 to 110% of normal as of January 1 (Fig. 2). Snowpack ranges from ~80 to 110% of normal (Fig. 3). The National Water and Climate Center publishes snowpack projections that display a range of possibilities based on previously observed snowpack data. Within this range of outcomes, the 50% projection represents what would happen under normal conditions and the 70% projection is considered to be slightly above normal. The 70% projections for the Owyhee, Bruneau, Salmon Falls, Goose Creek, and Raft basins are all near normal which bodes well for water supply if this winter continues to be slightly above normal.

On January 1, reservoir storage as a percent of normal is: Owyhee is 185% of normal (55% capacity), Wildhorse is 197% of normal (80% capacity), and Oakley is 138% of normal (31% capacity), Salmon Falls is 119% of normal (21% capacity). At this time last year, reservoir storage ranged from ~40 to 100% of normal. Streamflow forecasts for the Southern Snake River basins are ~100% of normal for the March to July period. Some streamflow forecasts are unavailable in January due to high errors in early season forecasts. NOAA's Official 30-Day Outlook predicts increased chances for above normal precipitation and equal chances for below or above normal temperatures in these basins.

Southern Snake Basins Streamflow Forecasts - January 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 Falls Ck nr San Jacinto	MAR-JUL	30	48	63	98%	79	107	64
	MAR-SEP	33	51	66	100%	83	111	66
Owyhee R nr Gold Ck 2	MAR-JUL	6	14.8	23	105%	33	51	22
	APR-JUL	2.1	8.8	16	93%	25	43	17.2
Owyhee R nr Rome	FEB-JUL	103	235	355	95%	505	765	375
	FEB-SEP	111	250	370	95%	520	785	390
	APR-JUL	32	117	205	100%	320	535	205
Owyhee R bl Owyhee Dam 2	FEB-JUL	136	275	400	95%	545	805	420
	FEB-SEP	157	305	430	96%	580	835	450
	APR-JUL	50	143	235	100%	345	555	235

Normals based on 1991-2020 reference period

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

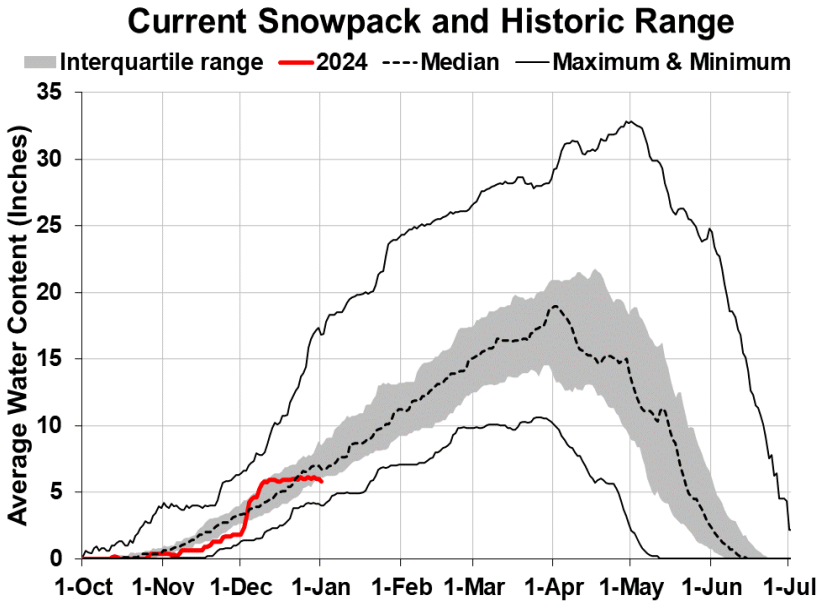
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

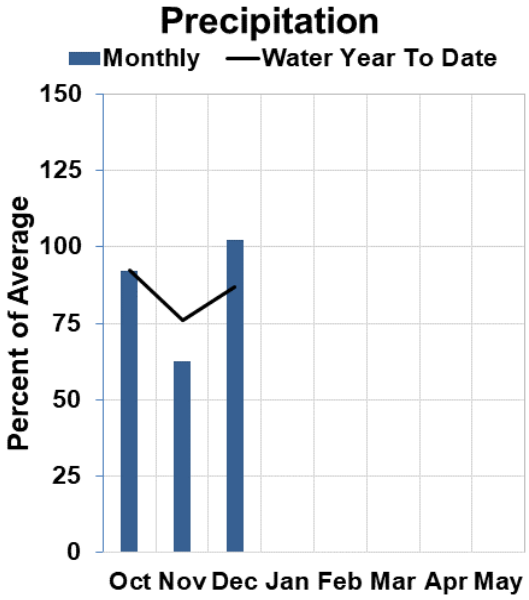
Reservoir Storage (KAF): End of December				
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Oakley Reservoir	23.2	10.3	16.8	75.6
Salmon Falls Reservoir	38.3	12.7	32.3	182.6
Wild Horse Reservoir	57.4	29.0	29.1	71.5
Lake Owyhee	395.3	93.9	213.9	715.0
Brownlee Reservoir		1162.7	1313.0	1420.0

Watershed Snowpack Analysis: January 1, 2024			
Basin Name	# of Sites	% of Median 2024	2023
Raft River	2	95%	135%
Goose-Trapper Creeks	2	110%	154%
Salmon Falls Creek	5	92%	138%
Bruneau River	5	79%	140%
Reynolds Creek	7	72%	145%
Upper Owyhee	5	110%	173%
Owyhee Basin Total	9	94%	164%

Bear River Basin

January 1, 2024





WATER SUPPLY OUTLOOK

Water Year 2024 precipitation has been variable in the Bear River Basin. This basin received approximately normal precipitation during October, then only ~70% of normal in November. December precipitation was slightly above normal at 108% (Fig. 1). December precipitation was not enough to recover and bring water year total precipitation back to normal. On January 1, total water year precipitation is ~90% of normal (Fig. 2). Bear River Basin has received below normal snow and current snowpack is ~85% of normal (Fig. 3). With nearly 100 days left until the median peak SWE date, there is ample time to accumulate more snow. NOAA's 8- to 14-day outlook is predicting below normal temperatures and above normal precipitation for the entire basin and the 30-day outlook is predicting similar conditions for most of the basin as well.

Bear Lake reservoir storage for January 1 is at 182% of normal (64% capacity). Streamflow forecasts in the region range from 74 to 103% for the April to July period. Conditions can evolve rapidly during the early winter months so continue to monitor daily conditions and subsequent water supply reports.

Bear River Basin Streamflow Forecasts - January 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	45	71	88	87%	105	131	101
	APR-SEP	50	78	97	85%	116	144	114
Bear R ab Resv nr Woodruff	APR-JUL	26	47	75	82%	94	144	92
	APR-SEP	23	49	78	79%	104	151	99
Big Ck nr Randolph	APR-JUL	0.5	2.3	3.3	103%	6.1	10.9	3.2
Smiths Fk nr Border	APR-JUL	35	57	72	84%	87	109	86
	APR-SEP	44	68	85	85%	102	126	100
Bear R bl Stewart Dam 2	FEB-JUL	14.9	58	104	78%	163	275	133
	FEB-SEP	15.7	63	113	78%	178	300	145
	APR-JUL	6.6	43	85	74%	142	250	115

Normals based on 1991-2020 reference period

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 December

Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Bear Lake	831.0	372.0	456.5	1302.0
Montpelier Reservoir		1.0	1.9	4.0

Watershed Snowpack Analysis: January 1, 2024

Basin Name	# of Sites	% of Median 2024	% of Median 2023
Smiths-Thomas Forks	4	71%	130%
Bear Lake	6	93%	159%
Montpelier Creek	1	74%	147%
Mink Creek	0		
Cub River	1	102%	163%
Bear River Total	21	84%	153%
Malad River	1	113%	153%

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

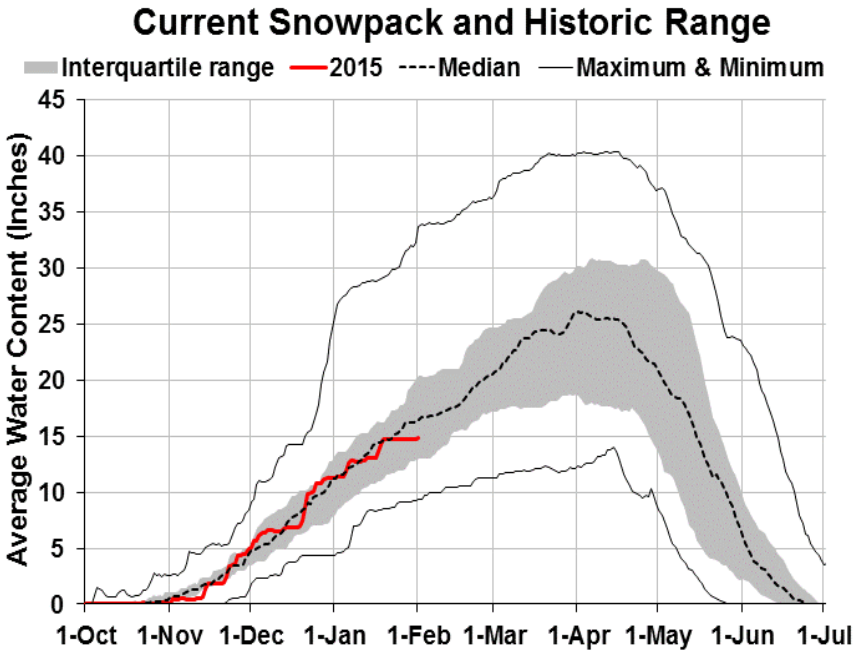
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

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.