USDA United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

January 1, 2023

First snowfall in Central Idaho (photo by Danny Tappa, 10/24/22)

Despite the warm October, a cold November and December helped bolster Idaho's snowpack to above normal levels by January 1. Although there are still several months left in the snow accumulation season, the snowpack through much of the state is already halfway to reaching normal peak snowpack conditions. The 2023 water year is off to a good start, but last year serves as a good reminder that continued snowfall is required to reach normal peak snowpack conditions and ensure adequate springtime runoff.

Water Supply Outlook Report
Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information:

Contact: Your local county *Natural Resources Conservation Service Office* Internet Web Address: http://www.id.nrcs.usda.gov/snow/
Natural Resources Conservation Service Snow Surveys
9173 West Barnes Drive, Suite C
Boise, 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

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 Danny Tappa (daniel.tappa@usda.gov)

January 2023: Idaho Water Supply Summary

Overview

We love to start the new year off with good news; the snowpack is well above normal throughout the state (Fig. 3)! However, a strong sense of déjà vu permeates water year 2023 (WY23); we are in the similar situation as last year. In order to fully recover from drought, we need an ample snowpack to replenish depleted reservoirs and provide sufficient springtime natural streamflow before irrigation deliveries begin. The past two years demonstrated that the snowpack isn't the entire Idaho water supply story. Despite that more than 70% of our surface water supply comes from our mountain snowpack, spring precipitation, the timing of snowmelt, soil moisture and shallow groundwater conditions also play a major role in water supply resiliency.

The wet, cold start to our WY23 winter gives us rose colored glasses to be moderately optimistic for ample water supply conditions at this juncture. Why only moderately optimistic you might ask? Well, the memory of little to no snowfall for three months last winter still stings, and despite the healthy snowpack, reservoir storage is very low throughout much of the state. This water year, we face an uphill battle to alleviate the multi-year drought. Hopefully, Mother Nature delivers a generous snowpack and wet spring to relieve water stress this coming irrigation season.

Weather, climate and drought outlooks

The first part of January is expected to be wetter than normal across all of Idaho. The one month outlook from NOAA's Climate Prediction Center (CPC) suggests increased chances of above normal precipitation in central and southern Idaho. Warmer than normal temperature conditions are predicted near the Canadian border with wetter than normal conditions in southern Idaho. Reminder: equal chances on these maps (white-colored areas) do not mean 'average conditions' are predicted; it means the models don't indicate there's a strong enough signal to expect below or above normal conditions in those areas.

The CPC forecasts a continuation of La Niña conditions for our third consecutive winter with a 50% chance of transitioning to El Niño-Southern Oscillation (ENSO) neutral conditions by March. La Niña is the cool phase of the ENSO climate pattern. This is only the fifth time we've experienced three consecutive La Niña winters since 1910. Often, the past predicts the future, but the limited historical data does not reveal a clear water supply outcome. Some triple-dip La Niña winters were wetter, some were drier, and to make matters more convoluted, the precipitation and temperature patterns across our state are inconsistent for these La Niña periods. We will have to ride this triple-dip La Niña winter rollercoaster all the way to spring to find how conditions will pan out. For excellent graphics and in-depth discussion, check out this NOAA webinar and blog.

Currently, 72% of Idaho lands are in moderate to severe drought, and the remainder of the state is abnormally dry (DO). The seasonal drought outlook forecasts widespread drought improvement across Idaho. According to this NOAA drought reduction tool, we need ~120% of normal precipitation to fully end hydrological drought by June in the Upper Snake Basin and ~160% of normal precipitation in the Wood basins. The probability of ending drought conditions is much higher compared to last year, and the chances of drought conditions significantly improving by June across the entire state are very favorable at report time.

Snowpack

The snowpack is in good shape as we begin the new year. All basins across the state are above normal and range from 121% to 172% of normal (Fig. 3). Our fourth coldest November on record preserved early-season snowfall throughout much of the state. Although this wasn't good for snowpack stability in terms of avalanche hazards or potentially locking in dry soil conditions that could affect spring runoff efficiency, the cold temperatures through November and December gave us an early start to building the snowpack we need this water year.

As we have seen the past two years, the snowpack isn't the entire story when it comes to water supply in Idaho. Spring precipitation, the timing of snowmelt, soil moisture and shallow groundwater conditions play a major role in water supply as well. To recap, water year 2021 (WY21) had a good snowpack on April 1 but very dry, hot spring conditions severely reduced streamflow. Coupled with low soil moisture which decreased snowmelt runoff efficiency, the normal snowpack was insufficient to provide adequate water supply in WY21. In contrast, during WY22, cold spring conditions delayed snowmelt and thankfully, wet conditions supplemented the below normal WY22 snowpack. However, two years of insufficient water supply have left many reservoir systems severely depleted; we need an above normal snowpack this winter to fill reservoirs and rejuvenate natural flow conditions come spring. We encourage water users to examine the range of possible outcomes for snowpack health in their basin of interest by looking at these projection graphs. For the Snake River above Heise, in order to have adequate water supply, we need SWE accumulation to be at least 50 to 70% of normal for the remainder of the winter to achieve an above normal snowpack.

Precipitation

Total precipitation for the water year to date is normal to above normal for all basins south of the Clearwater Basin (Fig. 2). Total water year precipitation is slightly below normal in the Clearwater and Panhandle basins. Dry, hot conditions in October started the water year off in a precipitation deficit that we've slowly been climbing out of. During October,

only a few basins south of the Snake River received near normal amounts of precipitation. In November, all basins except in the Panhandle, received above normal precipitation. Due to cold temperatures, much of this precipitation fell as snow. Thankfully, December was wet and all basins received normal to above normal precipitation last month (Fig. 1), bringing total water year precipitation to normal levels across the state (Fig. 2). The warm weather spell over Christmas that brought widespread rain did not seem to negatively impact our mid and high elevation snowpack from a water supply perspective. Thankfully, the snowpack was cold enough that any rain or meltwater generated during those storms refroze within the snowpack rather than being swept downstream.

Water supply

We are on track to meet water supply needs this irrigation season at this point in the winter due above normal snowpack conditions. However, there is still a lot of winter ahead of us. This year, with low reservoir carryover in most areas, we are dependent on the snowpack continuing to build and stay above normal to meet irrigation demand. Low reservoir storage reduces buffering capacity for contending with drier and/or hotter than normal conditions during irrigation season.

The Boise River system is in good shape, with above average storage at 105% of normal (55% full). Reservoir storage is below normal in many parts of the state. Although filling at approximately the same rate as last year, it is especially concerning that total storage for the Upper Snake River system above Milner Dam is ~920,310 acre-feet below average (34% full). The Henrys Fork arm of the Snake is closest to normal with combined storage between Henrys Lake, Island Park Reservoir, and Grassy Lake at 94% of normal (76% of capacity). American Falls Reservoir is 73% of normal. Combined Jackson Lake and Palisades storage above Heise is only 43% of normal (27% of capacity). The Bear Lake system storage is 79% of normal. Owyhee Reservoir storage is 44% of normal.

January 1 streamflow forecasts generally reflect the current mountain snowpack and total water year precipitation conditions. For both forecast periods, near or above normal streamflow volumes are predicted across the state. As a reminder: in January, NRCS only publishes streamflow forecasts at locations where model confidence is high. To look at the range of possible streamflow volume outcomes, check out these forecast graphics for your basin of interest. Streamflow, snowpack, and precipitation data for each basin can be accessed here or on the NRCS interactive map here.

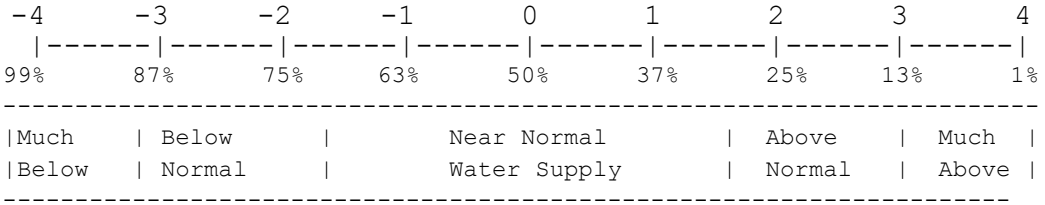
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) January 1, 2023

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	**0.0**	**2020**	**NA**
Clearwater	**-0.3**	**2000**	**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	**-0.5**	**2015**	**- 3.9**
Henrys Fork	**0.5**	**2020**	**- 2.9**
Snake (Heise)	**-0.8**	**1991**	**- 1.4**
Oakley	**----**	**----**	**0.5**
Salmon Falls above Jackpot	**0.8**	**2010**	**NA**
Salmon Falls	**-0.8**	**2008**	**- 0.6**
Bruneau	**----**	**----**	**NA**
Owyhee	**-0.3**	**2009**	**- 1.4**
Bear River	**-0.5**	**2022**	**- 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.

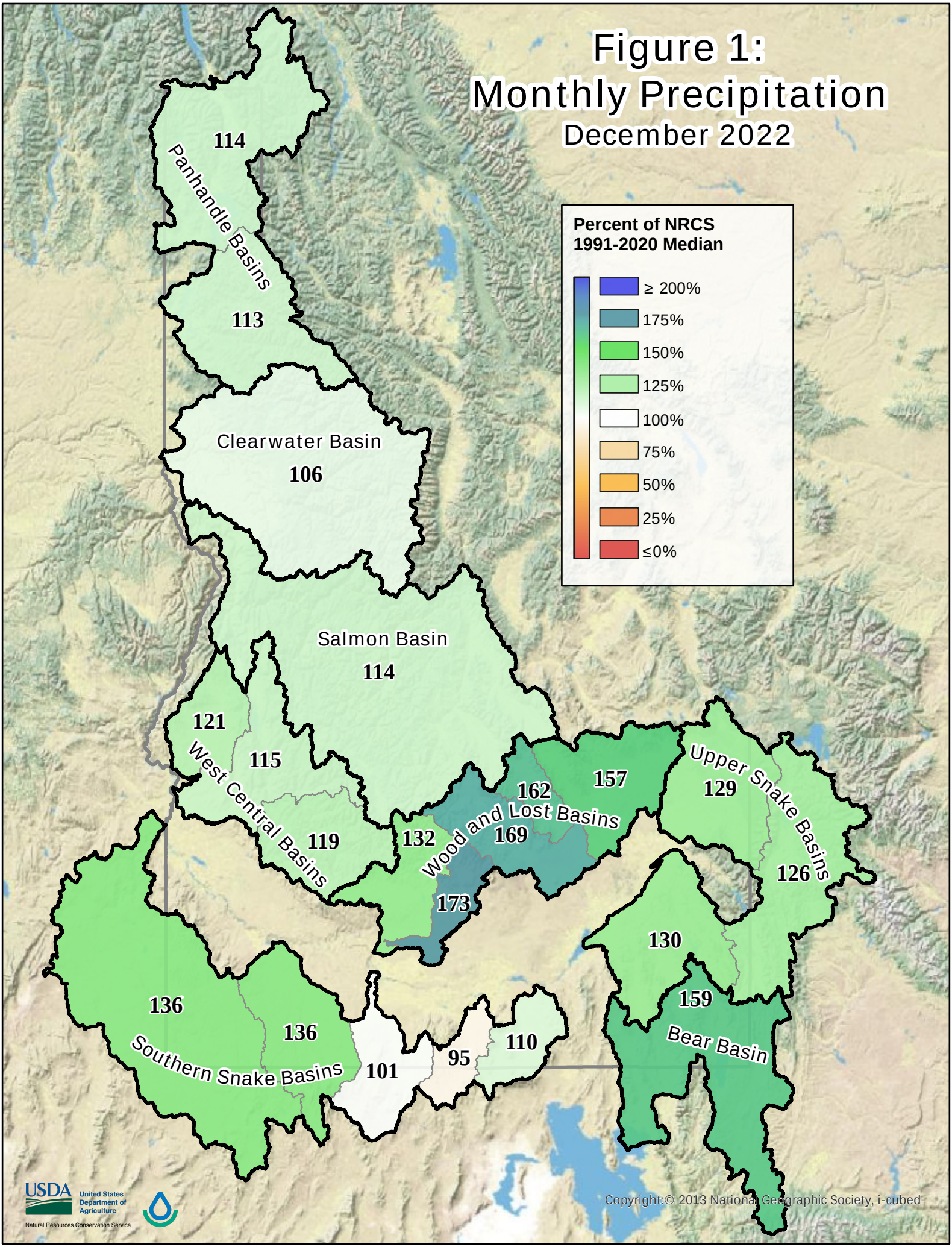


Figure 1:
Monthly Precipitation
December 2022
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
114
Panhandle Basins
113
Clearwater Basin
106
Salmon Basin
114
121
115
West Central Basins
119
162
157
Wood and Lost Basins
169
132
173
Upper Snake Basins
129
126
130
159
Bear Basin
136
136
Southern Snake Basins
101
95
110
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Figure 2:
Total Water Year Precipitation
October 1, 2022 - January 1, 2023

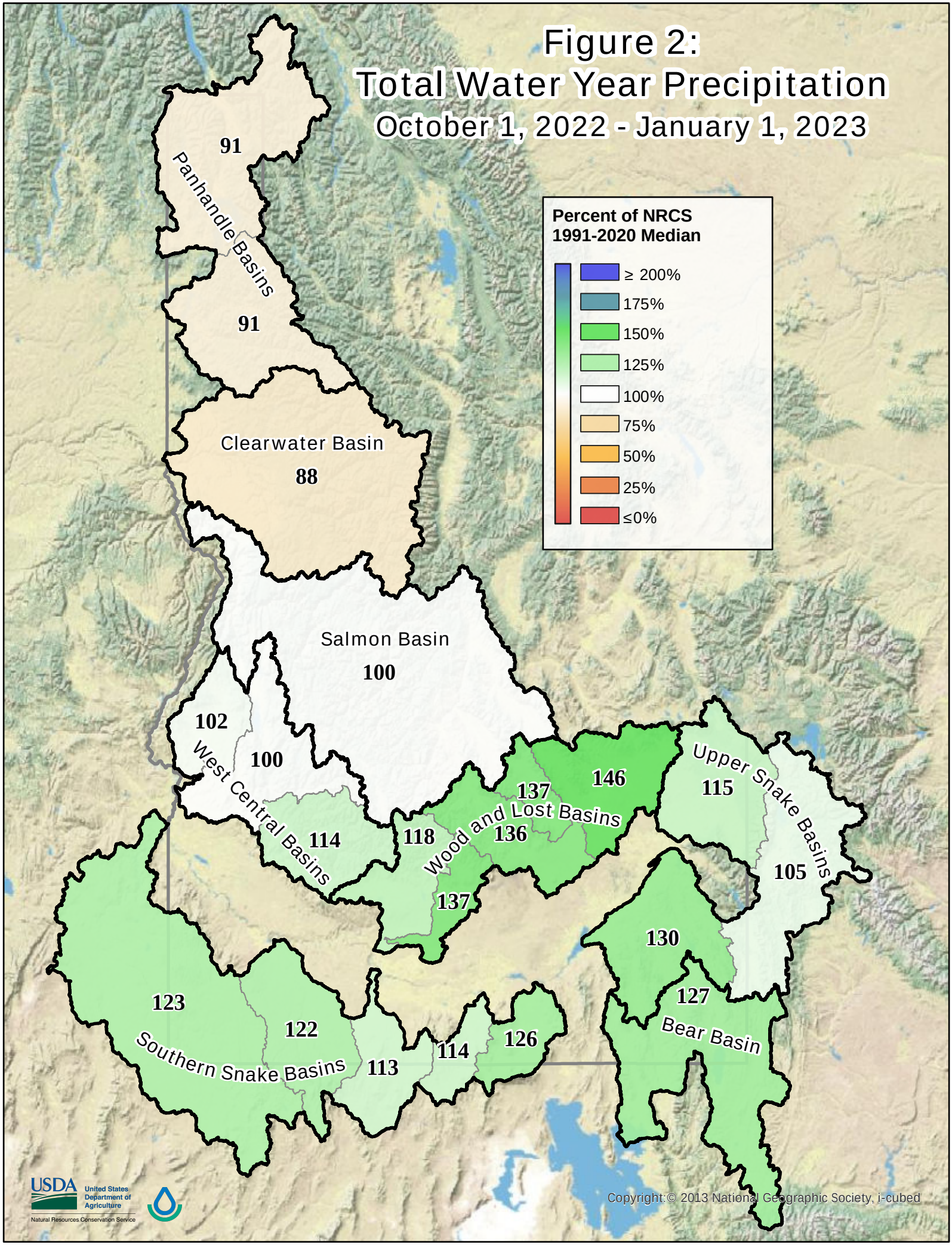

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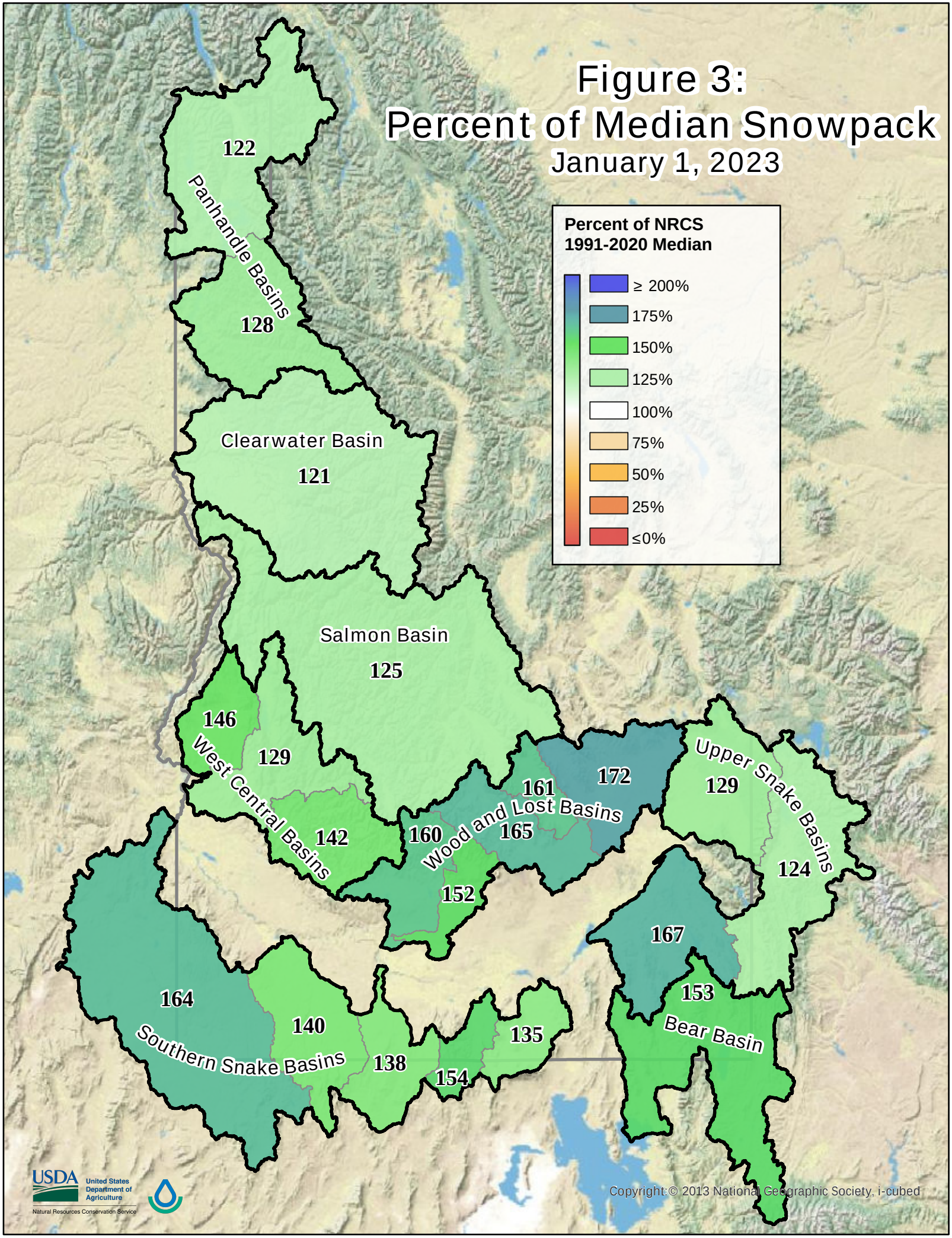
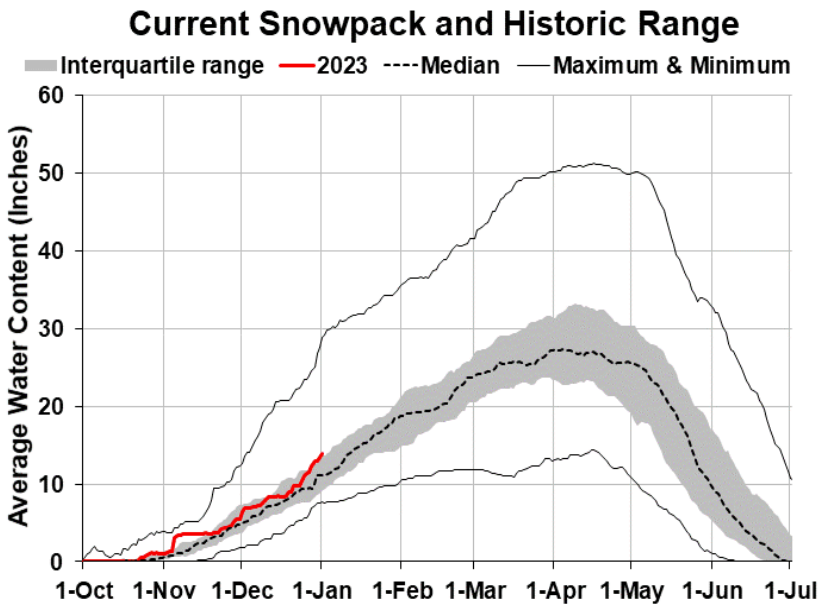
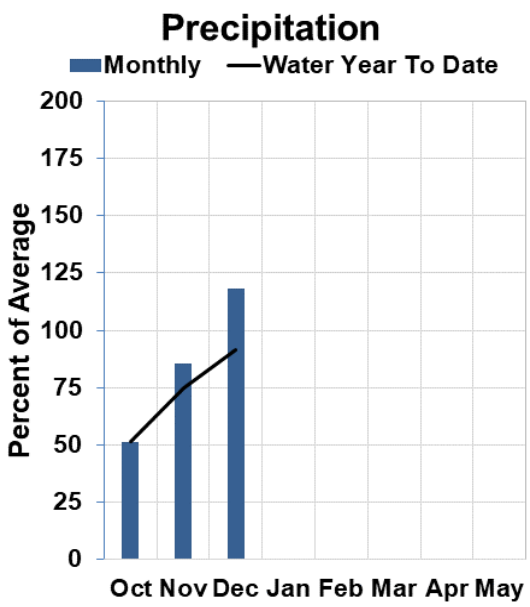
Figure 3:
Percent of Median Snowpack
January 1, 2023



Panhandle Basins

January 1, 2023





WATER SUPPLY OUTLOOK

The Idaho Panhandle skipped autumn this year when the warm and dry October gave way to a frosty November. December precipitation was ~115% of normal (Fig. 1), and total water year precipitation is slightly below normal at ~90% (Fig. 2). Snowpack is ~125% of normal as of January 1 (Fig. 3). Although water year 2023 started off slow with a mild and dry October, conditions changed in early November when a swath of snow fell across most of the Panhandle basins on November 6 and 7. An additional heavy snow event on November 30 helped to further build an above normal low-elevation snowpack. The influence of the cold, wet November on low-elevation snowpack is illustrated by new records set at the Spokane Airport weather station. Due to its long meteorological record, the Spokane airport weather station serves as a proxy for the snowpack in north Idaho low-elevation valleys; November 2022 was the 6th snowiest month on record and the Spokane airport had at least 1 inch of snow on the ground for 26 straight days in November, which broke the old record of 22 days. Low elevations have well above normal snowpack and the mountain snowpack is near normal.

Storage in the Panhandle lakes is ~100% of normal storage. Coeur d'Alene storage is at 32% of capacity, and Pend Oreille is at 35%. Priest Lake data is currently unavailable due to equipment malfunctions at the gauge site. Streamflow forecasts for April through July are ~100% of normal at the 50% exceedance level for the Panhandle basins. Some streamflow forecasts are not available in January due to the high uncertainty with early season forecasts. NOAA's Official 30-Day Outlook show increased odds for warmer than normal conditions across the Panhandle basins and equal chances for below or above normal precipitation.

Panhandle Region Streamflow Forecasts - January 1, 2023

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	4340	6050	6820	102%	7600	9300	6680
	APR-SEP	5200	6970	7770	103%	8570	10300	7560
Pend Oreille Lake Inflow 2	APR-JUL	8420	10900	12500	107%	14200	16600	11700
	APR-SEP	9180	11800	13500	107%	15300	17900	12600
Priest R nr Priest River 2	APR-JUL	520	695	810	96%	925	1100	840
	APR-SEP	555	735	855	97%	975	1150	880
Spokane R nr Post Falls 2	APR-JUL	1360	2070	2560	102%	3040	3750	2510
	APR-SEP	1430	2150	2640	103%	3130	3850	2570

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 December

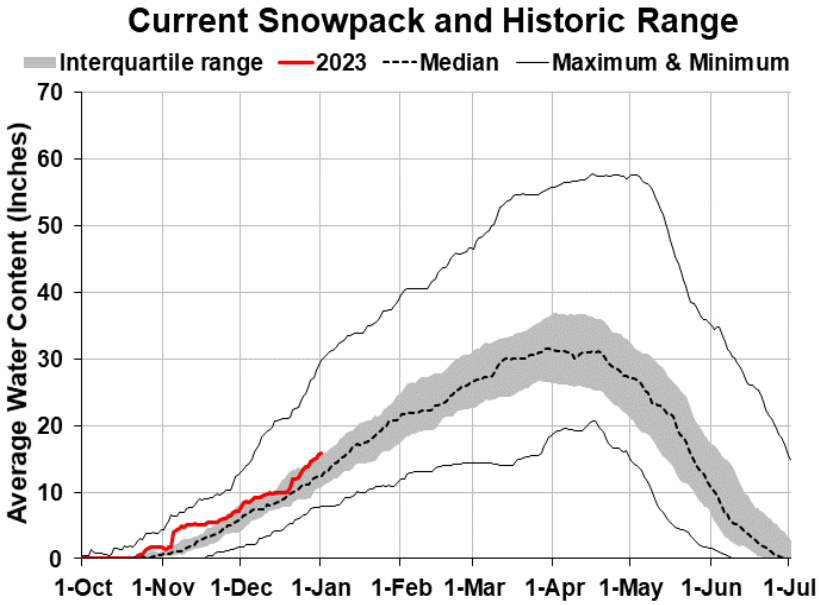
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Hungry Horse Lake	2825.6	3147.2	2870.0	3451.0
Flathead Lake	1150.2	1264.7	1181.0	1791.0
Noxon Rapids Reservoir	318.1	309.1	317.4	335.0
Lake Pend Oreille	544.8	543.0	620.0	1561.3
Priest Lake		63.4	55.6	119.3
Lake Coeur d' Alene	76.9	61.6	70.8	238.5

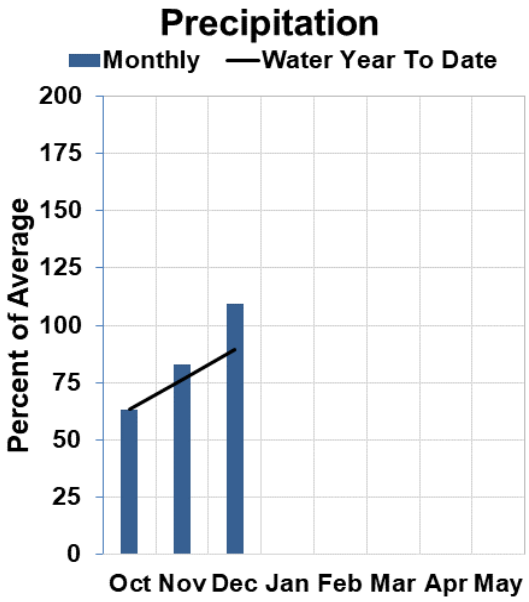
Watershed Snowpack Analysis: January 1, 2023

Basin Name	# of Sites	% of Median 2023	2022
Moyie River	1	115%	121%
Priest River	6	122%	100%
Rathdrum Creek	3	155%	81%
Coeur d' Alene River	6	128%	113%
St. Joe River	4	128%	112%
Pend Oreille Lake	5	125%	93%
Palouse River	2	140%	106%
Lower Kootenai	2	104%	117%
Pend Oreille-Kootenai	13	122%	101%
Coeur d' Alene-St. Joe Total	9	132%	113%

Clearwater River Basin

January 1, 2023





WATER SUPPLY OUTLOOK

Much like the Panhandle basins, the Clearwater experienced a warm and dry October that was followed by a cold November; this helped bolster the early season snowpack immensely. December precipitation was ~100% of normal (Fig. 1), and water year 2023 on January 1 total precipitation at ~90% of normal (Fig. 2). Snowpack ranges from ~95 to 125% of normal for January 1 (Fig. 3). Overall, the Clearwater Basin is off to a strong start this year and has almost reached 50% of the normal peak snowpack level. If precipitation continues at near normal levels, NRCS snow water equivalent (SWE) projections predict that snowpack will reach a near normal peak by April 1. These SWE projections allow water users to evaluate how the snowpack could evolve over the winter with different weather scenarios. While the 50% exceedance projection (e.g. normal precipitation pattern) is a good 'middle of the road' estimate, it is important to consider the full range of predictions, especially this early in the season. If this region receives below normal precipitation during the remaining snow accumulation season, SWE projections show that we could still end up with a below normal peak snowpack in this basin.

Dworshak Reservoir is currently at 63% of its storage capacity, which is 95% of normal at this time of the year. Due to high uncertainty with early season forecasts, no streamflow forecasts are available for January in the Clearwater Basin. NOAA's Official 30-Day Outlook show equal chances for above or below normal temperatures and increased odds for above normal precipitation.

Clearwater River Basin Streamflow Forecasts - January 1, 2023

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	4610	6140	7170	105%	8210	9740	6820
	APR-SEP	4940	6500	7550	104%	8610	10200	7290

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

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

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

Reservoir Storage (KAF): End of December

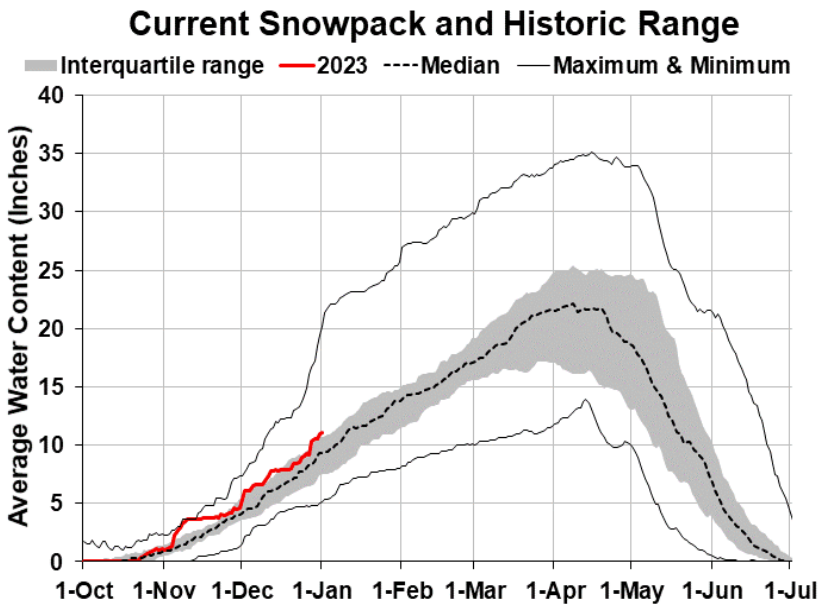
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Dworshak Reservoir	2197.7	2401.0	2316.0	3468.0

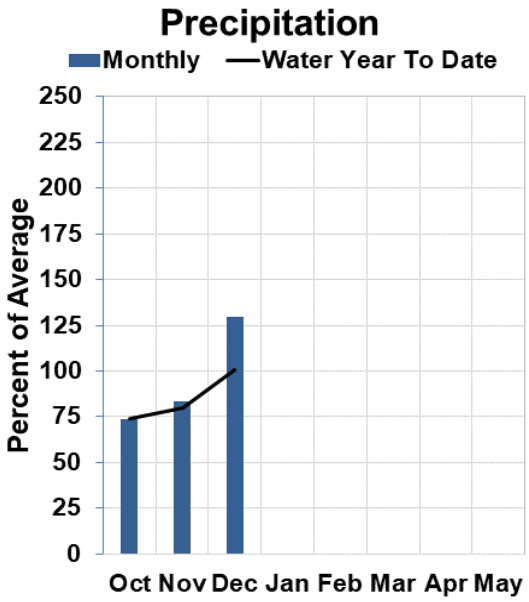
Watershed Snowpack Analysis: January 1, 2023

Basin Name	# of Sites	% of Median 2023	2022
NF Clearwater River	9	126%	111%
Lochsa River	3	108%	108%
Selway River	4	100%	83%
SF Clearwater River	1	98%	83%
Clearwater Basin Total	18	121%	105%

Salmon River Basin

January 1, 2023





WATER SUPPLY OUTLOOK

Following a long and hot summer that seemed to never end, cool and wet weather returned to the Salmon River Basin in late October. The cool and active weather continued throughout November and December, resulting in total water year precipitation at 100% of normal (Fig. 2). Since most of the precipitation this water year has come in the form of snow instead of rain, the current snowpack is 125% of normal (Fig. 3); this is substantially higher than the current water year precipitation percentage! Snowpack has been holding above normal in the Salmon River Basin since the first snowflakes fell in late October. With several months remaining in the snow accumulation season, current basin-wide snowpack has already reached 50% of the typical peak snowpack. It's a promising start to the snow season in the Salmon River Basin, but last year was a good reminder that quick starts don't always yield optimal finishes!

There are no reservoirs in the Salmon River Basin to report on. Due to high uncertainty with early season forecasts, no streamflow forecasts are available this month in the Salmon River Basin. Forecasts will be available in the February 1 report.
Recreationalists with river trip plans will want to keep an eye on future conditions to better understand runoff peaks and timing.

Salmon River Streamflow Forecasts - January 1, 2023

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: streamflow, snowpack, precipitation, & reservoir normals are medians.

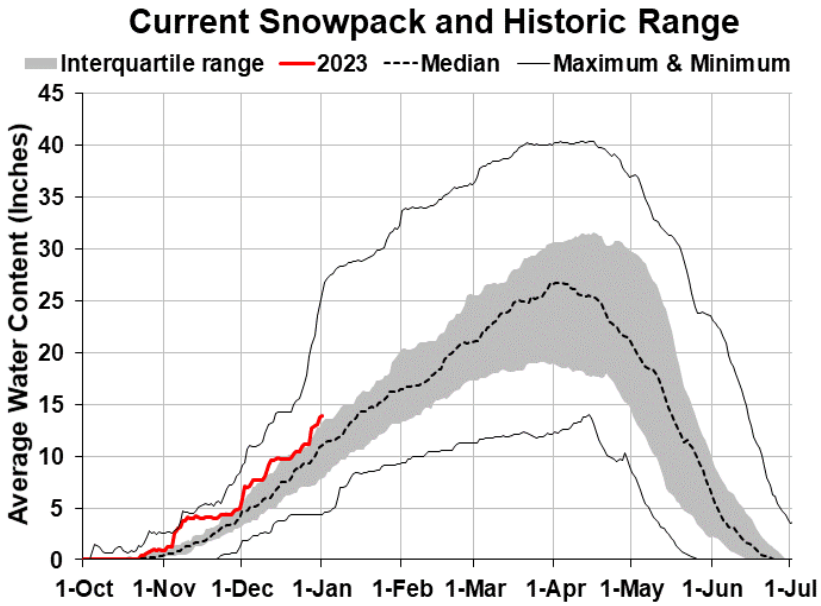
1) 90% and 10% exceedance probabilities are actually 95% and 5%

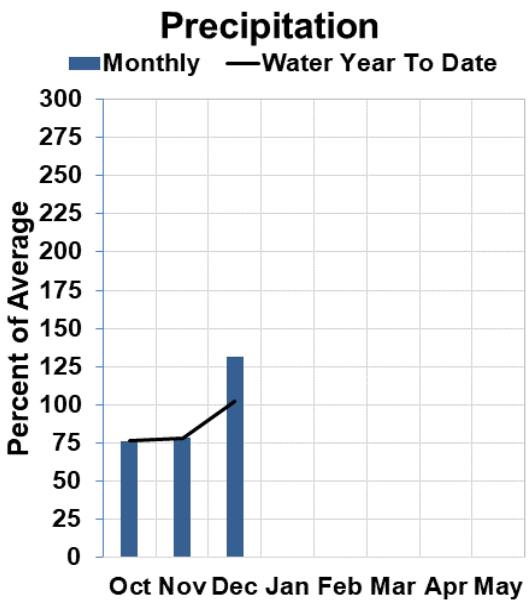
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

Watershed Snowpack Analysis: January 1, 2023			
Basin Name	# of Sites	% of Median 2023	2022
Salmon River ab Salmon	6	130%	135%
Lemhi River	3	139%	100%
MF Salmon River	3	119%	127%
SF Salmon River	3	116%	110%
Little Salmon River	4	140%	123%
Lower-Middle Salmon	4	114%	99%
Salmon Basin Total	19	125%	117%

West Central Basins

January 1, 2023





WATER SUPPLY OUTLOOK

A series of storms in late October and the second half of December left West Central basins at ~100 to 115% of normal total water year precipitation as of January 1 (Fig. 2). Snowpack is also above normal, ranging from ~125% of normal in the Payette Basin to as high as ~145% of normal in the Boise and Weiser basins (Fig. 3). An atmospheric river event brought significant early-season snow to the West Central basins between November 4 – 6, and a notable cold storm event between November 28 – December 1 brought substantial new snowfall to the area. It's a promising start to the snow accumulation season in the West Central basins, but we still need several months of continued snowfall to end up with a normal or above normal peak snowpack. Current outlooks favor above normal precipitation at least through mid-January.

Combined reservoir storage in the Boise system (Anderson Ranch, Arrowrock and Lucky Peak combined) is 105% of normal. Reservoir storage in the Payette Basin is 93% of normal, and storage in the Weiser Basin is 35% 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, 2023

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								
Boise R nr Twin Springs								
Mores Ck nr Arrowrock Dam								
Boise R nr Boise 2								
SF Payette R at Lowman								
Deadwood Reservoir Inflow 2								

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 December

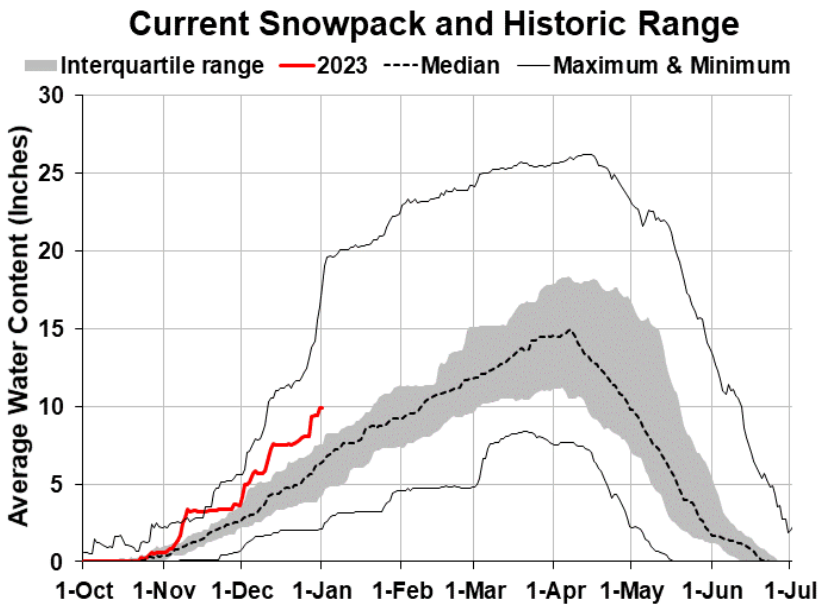
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	343.6	177.4	270.8	450.2
Arrowrock Reservoir	128.0	136.2	169.1	272.2
Lucky Peak Reservoir	83.4	85.0	89.5	293.2
Sub-Basin Total	**554.9**	**398.7**	**529.4**	**1015.6**
Deadwood Reservoir	76.9	62.3	90.9	161.9
Cascade Reservoir	429.4	408.9	453.0	693.2
Sub-Basin Total	**506.2**	**471.2**	**543.9**	**855.1**
Lake Lowell	81.0	77.8	97.9	165.2
Mann Creek Reservoir	.6	1.0	1.6	11.1

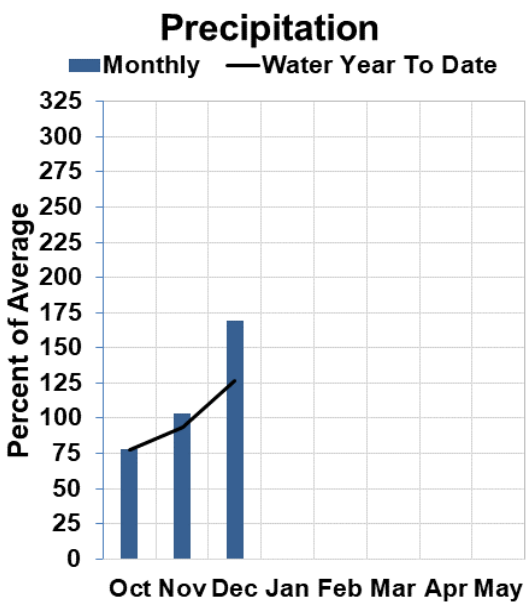
Watershed Snowpack Analysis: January 1, 2023

Basin Name	# of Sites	% of Median 2023	% of Median 2022
SF Boise River	9	148%	124%
MF & NF Boise Rivers	6	138%	118%
Mores Creek	5	136%	124%
Canyon Creek	4	180%	163%
Boise Basin Total	18	142%	123%
NF Payette River	9	130%	114%
SF Payette River	4	124%	123%
Payette Basin Total	19	129%	117%
Mann Creek	1	165%	117%
Weiser Basin Total	7	144%	118%

Wood & Lost River Basins

January 1, 2023





WATER SUPPLY OUTLOOK

Several strong storm events, especially in late December, brought plentiful precipitation to the Wood & Lost River basins. Like last year, these basins have received the most water year precipitation relative to normal in the state; totals now range from ~120 to 145% of normal (Fig. 2). Snowpack ranges from ~150 to 170% of normal (Fig. 3), and the Big Wood, Big Lost, and Little Wood basins are already near or above their respective water year 2021 and 2022 peak snowpack values. The typical peak snowpack occurs in early April across these basins, so we still have three full months in the normal snow accumulation season. If snow continues to accumulate at above normal rates in these basins, it will help remedy drought conditions. Too much snow could cause runoff concerns in the flood-prone Wood River Valley. Current weather forecasts suggest a southwest flow regime will continue in the short and medium term, which favors above normal precipitation for the Wood & Lost basins at least through mid-January.

Mackay Reservoir storage is 97% of normal, while Little Wood Reservoir and Magic Reservoir storage are 80% and 49% of normal respectively. Due to high uncertainty with early season forecasts, streamflow forecasts are not available for January in the Wood and Lost basins. Most forecasts will become available again in the February 1 report.

Wood and Lost Basins Streamflow Forecasts - January 1, 2023

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: 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 December

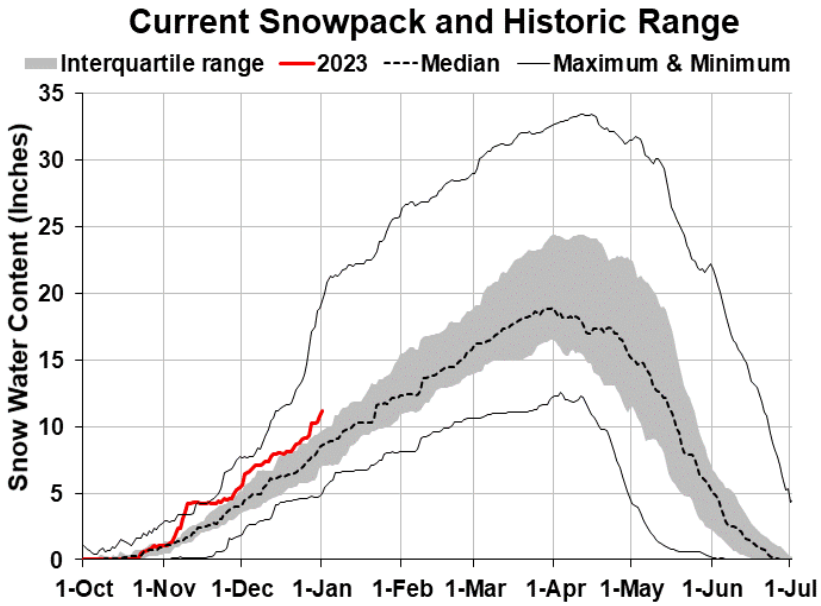
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Mackay Reservoir	22.8	15.6	23.4	44.4
Little Wood Reservoir	11.1	8.5	13.9	30.0
Magic Reservoir	22.0	18.1	44.8	191.5

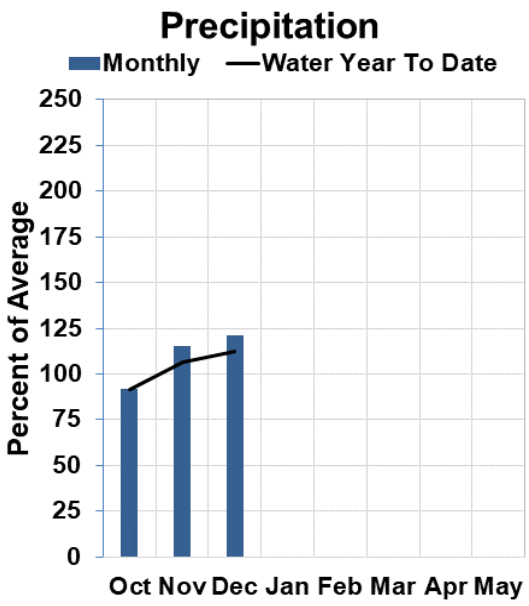
Watershed Snowpack Analysis: January 1, 2023

Basin Name	# of Sites	% of Median 2023	2022
Camas-Beaver Creeks	4	194%	131%
Birch-Medicine Lodge Creeks	2	141%	123%
Little Lost River	3	161%	134%
Big Lost River ab Mackay	4	153%	150%
Big Lost Basin Total	5	158%	151%
Fish Creek	0		
Little Wood ab Resv	4	152%	149%
Big Wood River ab Hailey	8	158%	140%
Camas Creek	4	165%	129%
Birch-Medicine Lodge-Camas-Beaver Total	6	172%	128%
Little Wood Basin Total	4	152%	149%
Big Wood Basin Total	12	160%	137%

Upper Snake River Basins

January 1, 2023





WATER SUPPLY OUTLOOK

Water year 2023 started slightly below normal in October but recovered to above normal conditions thanks to monthly precipitation in November and December being above normal. December precipitation ranged from 101 to 140% of normal in the Upper Snake sub-basins. As of January 1, total water year precipitation in the Upper Snake is 115% for the Henrys Fork-Teton, 105% for Snake River above Heise, and 130% for the Willow-Blackfoot-Portneuf basins. Snow has been accumulating in all basins since late October. All sub-basin snowpacks are above normal, ranging from 106 to 174%. While these conditions are encouraging, there are several months left in the winter. If last year taught us anything, it's that conditions can change quickly! Current outlooks favor above normal precipitation for some of the Upper Snake sub-basins through January.

Reservoir storage in the Upper Snake River system above Milner Dam on January 1 has a deficit of nearly a million-acre-foot compared to normal. Storage is 80% of normal for the Upper Snake system; above Heise, the Jackson Lake - Palisades reservoirs are 43% of normal (27% of capacity). Median streamflow forecasts for the region range from 86 to 122% for the April to July runoff period.

Upper Snake River Basin Streamflow Forecasts - January 1, 2023

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	320	395	445	94%	495	570	475
	APR-SEP	455	540	595	94%	650	735	630
Falls R nr Ashton 2	APR-JUL	325	380	420	106%	460	515	395
	APR-SEP	400	465	515	108%	560	630	475
Teton R nr Driggs	APR-JUL	68	102	125	86%	148	182	146
	APR-SEP	92	135	164	92%	193	235	178
Teton R nr St Anthony	APR-JUL	180	255	305	86%	355	430	355
	APR-SEP	230	320	380	89%	435	525	425
Henrys Fk nr Rexburg 2	APR-JUL	780	1000	1150	95%	1300	1530	1210
	APR-SEP	1020	1290	1480	94%	1660	1930	1580
Snake R at Flagg Ranch	APR-JUL	395	485	545	117%	605	695	465
	APR-SEP	435	530	595	118%	665	760	505
Snake R nr Moran 2	APR-JUL	660	795	890	122%	985	1120	730
	APR-SEP	735	885	985	122%	1080	1230	810
Pacific Ck at Moran	APR-JUL	105	140	163	106%	187	220	154
	APR-SEP	112	148	172	108%	196	230	160
Buffalo Fk ab Lava Ck nr Moran	APR-JUL	205	255	295	104%	330	385	285
	APR-SEP	230	290	330	106%	370	430	310
Snake R ab Reservoir nr Alpine 2	APR-JUL	1540	1980	2280	107%	2580	3030	2140
	APR-SEP	1780	2270	2610	107%	2940	3430	2430
Greys R ab Reservoir nr Alpine	APR-JUL	225	290	335	106%	380	445	315
	APR-SEP	260	335	385	105%	435	510	365
Salt R ab Reservoir nr Etna	APR-JUL	210	295	355	116%	415	505	305
	APR-SEP	265	365	430	113%	500	600	380
Snake R nr Irwin 2	APR-JUL	2130	2780	3220	110%	3660	4300	2930
	APR-SEP	2500	3230	3720	109%	4220	4950	3420
Snake R nr Heise 2	APR-JUL	2320	2990	3440	110%	3890	4550	3130
	APR-SEP	2740	3490	4000	109%	4510	5260	3660
Snake R at Neeley 2	APR-JUL	755	1760	2440	102%	3120	4120	2390
	APR-SEP	740	1810	2530	107%	3260	4330	2360

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

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

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

Reservoir Storage (KAF): End of December

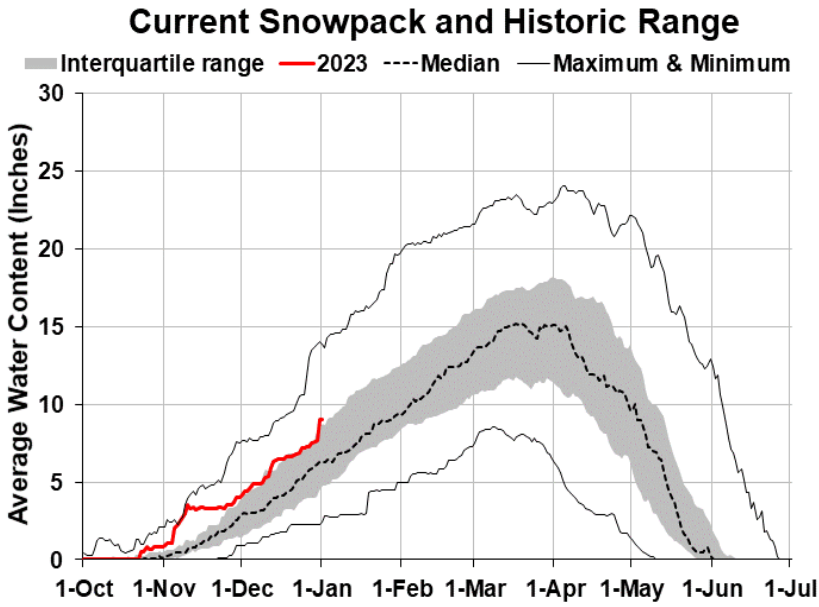
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Jackson Lake	167.9	156.1	615.6	847.0
Palisades Reservoir	439.7	441.7	811.1	1400.0
Sub-Basin Total	**607.6**	**597.8**	**1426.7**	**2247.0**
Henrys Lake	77.6	79.5	84.0	90.4
Island Park Reservoir	95.7	102.5	99.3	135.2
Grassy Lake	10.9	10.0	12.5	15.2
Sub-Basin Total	**184.2**	**192.0**	**195.8**	**240.8**
Ririe Reservoir	43.5	43.7	39.3	80.5
Blackfoot Reservoir	159.7	186.3	173.1	337.0
American Falls Reservoir	664.2	752.7	909.3	1672.6
Basin-Wide Total	**1659.2**	**1772.4**	**2744.2**	**4577.9**

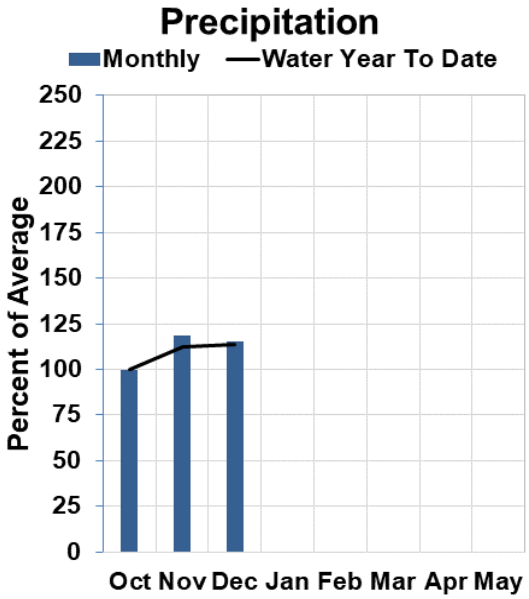
Watershed Snowpack Analysis: January 1, 2023

Basin Name	# of Sites	% of Median 2023	2022
Henrys Fork-Falls River	7	137%	117%
Teton River	4	117%	91%
Henrys Fork-Teton	11	129%	108%
Snake River ab Jackson Lake	7	133%	117%
Pacific Creek	2	120%	114%
Buffalo Fork	2	108%	98%
Gros Ventre River	3	102%	104%
Hoback River	4	113%	96%
Greys River	5	120%	106%
Salt River	4	136%	107%
Snake ab Palisades Resv	21	123%	107%
Willow Creek	5	120%	106%
Blackfoot River	2	174%	127%
Portneuf River	3	160%	100%
Willow-Blackfoot-Portneuf	6	167%	110%
Snake River ab American Falls	29	132%	109%

Southern Snake Basins

January 1, 2023





WATER SUPPLY OUTLOOK

This water year started very strong with an above normal snowpack and above normal total water year precipitation in these basins as of January 1. December monthly precipitation is ~95 to 135% of normal (Fig. 1). Total water year precipitation is ~110 to 125% of normal as of January 1 (Fig. 2). Snowpack ranges from ~135 to 165% of normal (Fig. 3). The Southern Snake basins have already reached ~50% of their peak snowpack levels. Reduced snowfall last winter was an unusual event but was an important reminder that snowfall throughout the winter is critical to reach normal peak snowpack conditions and have adequate springtime runoff.

As of January 1, reservoir storage as a percent of normal is: Owyhee is at 44% of normal, Wildhorse is 100%, and Oakley is 61%. Last year at this time, reservoir storage ranged from ~40 to 120% of normal in the region. Streamflow forecasts for the Owyhee are ~130% of normal for the March to July period. Streamflow forecasts at additional forecast locations are unavailable due to high uncertainty with 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.

Southside Snake River Basins Streamflow Forecasts - January 1, 2023

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								
Trapper Ck nr Oakley								
Oakley Reservoir Inflow								
Salmon Falls Ck nr San Jacinto	MAR-JUL	46	68	85	133%	104	136	64
	MAR-SEP	49	71	88	133%	107	139	66
Bruneau R nr Hot Spring								
Reynolds Ck at Tollgate								
Owyhee R nr Gold Ck 2	MAR-JUL	8.1	18	27	123%	38	57	22
	APR-JUL	4.1	12.6	21	122%	32	51	17.2
Owyhee R nr Rome	FEB-JUL	185	355	500	133%	670	970	375
	FEB-SEP	195	365	515	132%	690	985	390
	APR-JUL	62	170	275	134%	405	640	205
Owyhee R bl Owyhee Dam 2	FEB-JUL	230	405	550	131%	720	1010	420
	FEB-SEP	250	425	575	128%	745	1040	450
	APR-JUL	85	200	305	130%	430	660	235

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 December

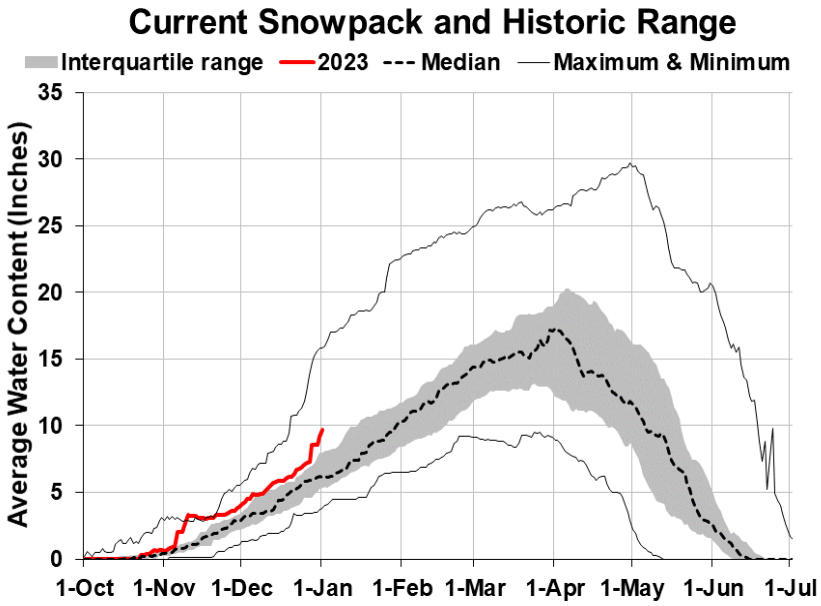
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Oakley Reservoir	10.3	11.4	16.8	75.6
Salmon Falls Reservoir		12.4	32.3	182.6
Wild Horse Reservoir	29.0	35.0	29.1	71.5
Lake Owyhee	93.9	118.9	213.9	715.0
Brownlee Reservoir	1162.7	1224.4	1313.0	1420.0

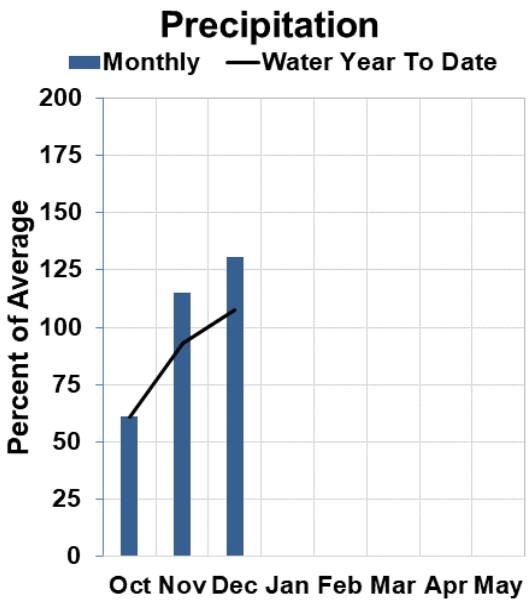
Watershed Snowpack Analysis: January 1, 2023

Basin Name	# of Sites	% of Median 2023	% of Median 2022
Raft River	2	135%	122%
Goose-Trapper Creeks	2	154%	95%
Salmon Falls Creek	5	138%	93%
Bruneau River	5	140%	92%
Reynolds Creek	7	145%	150%
Upper Owyhee	5	173%	103%
Owyhee Basin Total	9	164%	117%

Bear River Basin

January 1, 2023





WATER SUPPLY OUTLOOK

Water year 2023 got off to a slow start in the Bear River with only ~60% of normal precipitation during October. Since November 6, precipitation has been above normal. Precipitation in December ranged from 118 to 172% for all Bear River sub-basins and 159% for the entire basin. The snowpack began to accumulate in late October, and reached record high levels during mid-November due to prolonged cold temperatures. Snowpack as of January 1 for the Bear River Basin is 153%. The current snowpack has reached ~55% of the normal winter peak value. NOAA's Official 30-Day Outlook currently favors above normal precipitation through the end of January. With several more months to go and last year's dry conditions after January 8 still fresh in our minds, it is important to remember that while current snowpack conditions are encouraging, things can change quickly for water supply.

Reservoir storage in the Bear River Basin for January 1 is: Bear Lake is 81% of normal (29% capacity), and Montpelier at 55% of normal (26% capacity). Streamflow forecasts in the region range from 114 to 156% for the April to July period.

Bear River Basin Streamflow Forecasts - January 1, 2023

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	90	116	133	132%	150	176	101
	APR-SEP	97	125	144	126%	163	191	114
Bear R ab Resv nr Woodruff	APR-JUL	54	102	135	147%	168	215	92
	APR-SEP	56	107	141	142%	175	225	99
Big Ck nr Randolph	APR-JUL	0.58	3.2	5	156%	6.8	9.4	3.2
Smiths Fk nr Border	APR-JUL	61	83	98	114%	113	135	86
	APR-SEP	72	96	113	113%	130	154	100
Bear R bl Stewart Dam 2	FEB-JUL	61	134	200	150%	280	420	133
	FEB-SEP	67	147	220	152%	305	460	145
	APR-JUL	39	105	167	145%	245	385	115

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

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

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

Reservoir Storage (KAF): End of December

Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Bear Lake	372.0	536.8	456.5	1302.0
Montpelier Reservoir		1.2	1.9	4.0

Watershed Snowpack Analysis: January 1, 2023

Basin Name	# of Sites	% of Median 2023	2022
Smiths-Thomas Forks	4	130%	105%
Bear Lake	6	159%	117%
Montpelier Creek	1	147%	118%
Mink Creek	0		
Cub River	1	163%	127%
Bear River Total	21	153%	118%
Malad River	1	153%	98%

Streamflow Adjustment List for All Forecasts Published in Idaho Water Supply Outlook Report: Streamflow forecasts are projections of runoff volumes that would occur without influences from upstream reservoirs or diversions. These values are referred to as natural, unregulated or adjusted flows. To make these adjustments, changes in reservoir storage, diversions, and inter-basin transfers are added or subtracted from the observed (actual) streamflow volumes. The following list documents the adjustments made for each forecast point. **(Revised Dec. 2018).**

Panhandle Region

Kootenai R at Leonia, MT (2)
+ Lake Koocanusa storage change

Moyie R at Eastport – no corrections

Boundary Ck nr Porthill – no corrections

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

Pend Oreille Lake Inflow (2)
+ Pend Oreille R at Newport, WA
+ Hungry Horse Res storage change
+ Flathead Lake storage change
+ Noxon Res storage change
+ Lake Pend Oreille storage change
+ Priest Lake storage change

Priest R nr Priest R (2)
+ Priest Lake storage change

NF Coeur d' Alene R at Enaville - no corrections

St. Joe R at Calder- no corrections

Spokane R nr Post Falls (2)
+ Lake Coeur d' Alene storage change

Spokane R at Long Lake, WA (2)
+ Lake Coeur d' Alene storage change
+ Long Lake, WA storage change

Clearwater River Basin

Selway R nr Lowell - no corrections

Lochsa R nr Lowell - no corrections

Dworshak Res Inflow (2)
+ Clearwater R nr Peck
- Clearwater R at Orofino
+ Dworshak Res storage change

Clearwater R at Orofino - no corrections

Clearwater R at Spalding (2)
+ Dworshak Res storage change

Salmon River Basin

Salmon R at Salmon - no corrections

Lemhi R nr Lemhi – no corrections

MF Salmon R at MF Lodge – no corrections
SF Salmon gage used to create longer term record

SF Salmon R nr Krassel Ranger Station – no corrections

Johnson Creek at Yellow pine – no corrections

Salmon R at White Bird - no corrections

West Central Basins

Boise R nr Twin Springs - no corrections

SF Boise R at Anderson Ranch Dam (2)
+ Anderson Ranch Res storage change

Mores Ck nr Arrowrock Dam – no corrections

Boise R nr Boise (2)
+ Anderson Ranch Res storage change
+ Arrowrock Res storage change
+ Lucky Peak Res storage change

SF Payette R at Lowman - no corrections

Deadwood Res Inflow (2)
+ Deadwood R bl Deadwood Res nr Lowman
+ Deadwood Res storage change

Lake Fork Payette R nr McCall – no corrections

NF Payette R at Cascade (2)
+ Payette Lake storage change
+ Cascade Res storage change

NF Payette R nr Banks (2)
+ Payette Lake storage change
+ Cascade Res storage change

Payette R nr Horseshoe Bend (2)
+ Deadwood Res storage change
+ Payette Lake storage change
+ Cascade Res storage change

Weiser R nr Weiser - no corrections

Wood and Lost Basins

Little Lost R bl Wet Ck nr Howe - no corrections

Big Lost R at Howell Ranch - no corrections

Big Lost R bl Mackay Res nr Mackay (2)
+ Mackay Res storage change

Little Wood R ab High Five Ck – no corrections

Little Wood R nr Carey (2)
+ Little Wood Res storage change

Big Wood R at Hailey - no corrections

Big Wood R ab Magic Res (2)
+ Big Wood R nr Bellevue (1912-1996)
+ Big Wood R at Stanton Crossing nr Bellevue (1997 to present)
+ Willow Ck (1997 to present)

Camas Ck nr Blaine – no corrections

Magic Res Inflow (2)
+ Big Wood R bl Magic Dam
+ Magic Res storage change

Upper Snake River Basin

Falls R nr Ashton (2)
+ Grassy Lake storage change
+ Diversions from Falls R ab nr Ashton

Henrys Fork nr Ashton (2)
+ Henrys Lake storage change
+ Island Park Res storage change

Teton R nr Driggs - no corrections

Teton R nr St. Anthony (2)
- Cross Cut Canal into Teton R
+ Sum of Diversions for Teton R ab St. Anthony
+ Teton Dam for water year 1976 only

Henrys Fork nr Rexburg (2)
+ Henrys Lake storage change
+ Island Park Res storage change
+ Grassy Lake storage change
+ 3 Diversions from Falls R ab Ashton-Chester
+ 6 Diversions from Falls R abv Ashton
+ 7 Diversions from Henrys Fk btw Ashton to St. Anthony
+ 21 Diversions from Henrys Fk btw St. Anthony to Rexburg
Snake R nr Flagg Ranch, WY – no corrections
Snake R nr Moran, WY (2)
+ Jackson Lake storage change
Pacific Ck at Moran, WY - no corrections
Buffalo Fork ab Lava nr Moran, WY - no corrections
Snake R ab Res nr Alpine, WY (2)
+ Jackson Lake storage change
Greys R nr Alpine, WY - no corrections
Salt R nr Etna, WY - no corrections
Palisades Res Inflow (2)
+ Snake R nr Irwin
+ Jackson Lake storage change
+ Palisades Res storage change
Snake R nr Heise (2)
+ Jackson Lake storage change
+ Palisades Res storage change
Ririe Res Inflow (2)
+ Willow Ck nr Ririe
+ Ririe Res storage change
The forecasted natural volume for Willow Creek nr Ririe does not include Grays Lake water diverted from Willow Creek drainage through the Clarks Cut diversion and into Blackfoot Reservoir.
Blackfoot R ab Res nr Henry (2)
+ Blackfoot Res storage change
The forecasted Blackfoot Reservoir Inflow includes Grays Lake water diverted from the Willow Creek drainage through the Clarks Cut diversion and into Blackfoot Reservoir.
Portneuf R at Topaz - no corrections
American Falls Res Inflow (2)
+ Snake R at Neeley
+ Jackson Lake storage change
+ Palisades Res storage change
+ American Falls storage change
+ Teton Dam for water year 1976 only

Southside Snake River Basins

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

Bear River Basin

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

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

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

Basin- Lake or Reservoir	Dead Storage	Inactive Storage	Active Storage	Surcharge Storage	NRCS Capacity	NRCS Capacity Includes
Panhandle Region						
Hungry Horse	39.73	---	**3451.00**	---	**3451.0**	Active
Flathead Lake	Unknown	---	**1791.00**	---	**1791.0**	Active
Noxon	Unknown	---	**335.00**	---	**335.0**	Active
Lake Pend Oreille	**406.20**	**112.40**	**1042.70**	**---**	**1561.3**	Dead + Inactive + Active
Lake Coeur d'Alene	Unknown	13.50	**225.00**	**---**	**238.5**	Inactive + Active
Priest Lake	**20.00**	**28.00**	**71.30**	**---**	**119.3**	Dead + Inactive + Active
Clearwater Basin						
Dworshak	Unknown	**1452.00**	**2016.00**	**---**	**3468.0**	Inactive + Active
West Central Basins						
Anderson Ranch	24.90	**37.00**	**413.10**	---	450.1	Inactive + Active
Arrowrock	Unknown	---	**272.20**	**---**	**272.2**	Active
Lucky Peak	Unknown	**28.80**	**264.40**	13.80	**293.2**	Inactive + Active
Lake Lowell	7.90	**5.80**	**159.40**	---	165.2	Inactive + Active
Deadwood	Unknown	---	**161.90**	**---**	**161.9**	Active
Cascade	Unknown	**46.70**	**646.50**	**---**	**693.2**	Inactive + Active
Mann Creek	1.61	0.24	**11.10**	**---**	**11.1**	Active
Wood and Lost Basins						
Mackay	0.13	---	**44.37**	**---**	**44.4**	Active
Little Wood	Unknown	---	**30.00**	**---**	**30.0**	Active
Magic	Unknown	---	**191.50**	**---**	**191.5**	Active
Upper Snake Basin						
Jackson Lake	Unknown	---	**847.00**	**---**	**847.0**	Active
Palisades	44.10	**155.50**	**1200.00**	**---**	**1400.0**	Dead +Inactive +Active
Henrys Lake	Unknown	---	**90.40**	**---**	**90.4**	Active
Island Park	0.40	---	**127.30**	**7.90**	**135.2**	Active + Surcharge
Grassy Lake	Unknown	---	**15.18**	**---**	**15.2**	Active
Ririe	4.00	6.00	**80.54**	10.00	**80.5**	Active
Blackfoot	0.00	---	**333.50**	3.50	**333.50**	Active (rev. 2/1/2015)
American Falls	Unknown	---	**1672.60**	**---**	**1672.6**	Active
Southside Snake Basins						
Oakley	0.00	---	**75.60**	**---**	**75.6**	Active
Salmon Falls	48.00	**5.00**	**182.65**	**---**	**182.6**	Active
Wild Horse	Unknown	---	**71.50**	**---**	**71.5**	Active
Lake Owyhee	406.83	---	**715.00**	**---**	**715.0**	Active
Brownlee	0.45	**444.70**	**975.30**	**---**	**1420.0**	Inactive + Active
Bear River Basin						
Bear Lake	5000.00	119.00	**1302.00**	**---**	**1302.0**	Active:
Capacity does not include 119 KAF that can be used, historic values below this level are rounded to zero						
Montpelier	**0.21**	**---**	**3.84**	**---**	**4.0**	Dead + Active

Interpreting Water Supply Forecasts

Each month, five forecasts are issued for each forecast point and each forecast period. Unless otherwise specified, all streamflow forecasts are for streamflow volumes that would occur naturally without any upstream influences. Water users need to know what the different forecasts represent if they are to use the information correctly when making operational decisions. The following is an explanation of each of the forecasts.

90 Percent Chance of Exceedance Forecast. There is a 90 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 10 percent chance that the actual streamflow volume will be less than this forecast value.

70 Percent Chance of Exceedance Forecast. There is a 70 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 30 percent chance that the actual streamflow volume will be less than this forecast value.

50 Percent Chance of Exceedance Forecast. There is a 50 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 50 percent chance that the actual streamflow volume will be less than this forecast value. Generally, this forecast is the middle of the range of possible streamflow volumes that can be produced given current conditions.

30 Percent Chance of Exceedance Forecast. There is a 30 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 70 percent chance that the actual streamflow volume will be less than this forecast value.

10 Percent Chance of Exceedance Forecast. There is a 10 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 90 percent chance that the actual streamflow volume will be less than this forecast value.

*Note: There is still a 20 percent chance that actual streamflow volumes will fall either below the 90 percent exceedance forecast or above the 10 percent exceedance forecast.

These forecasts represent the uncertainty inherent in making streamflow predictions. This uncertainty may include sources such as: unknown future weather conditions, uncertainties associated with the various prediction methodologies, and the spatial coverage of the data network in a given basin.

30-Year 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

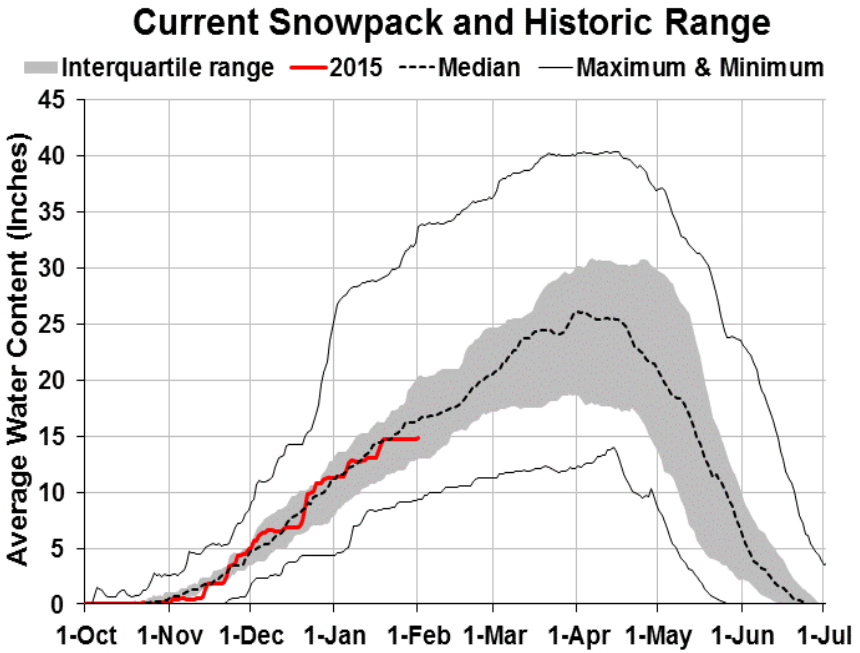
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

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.