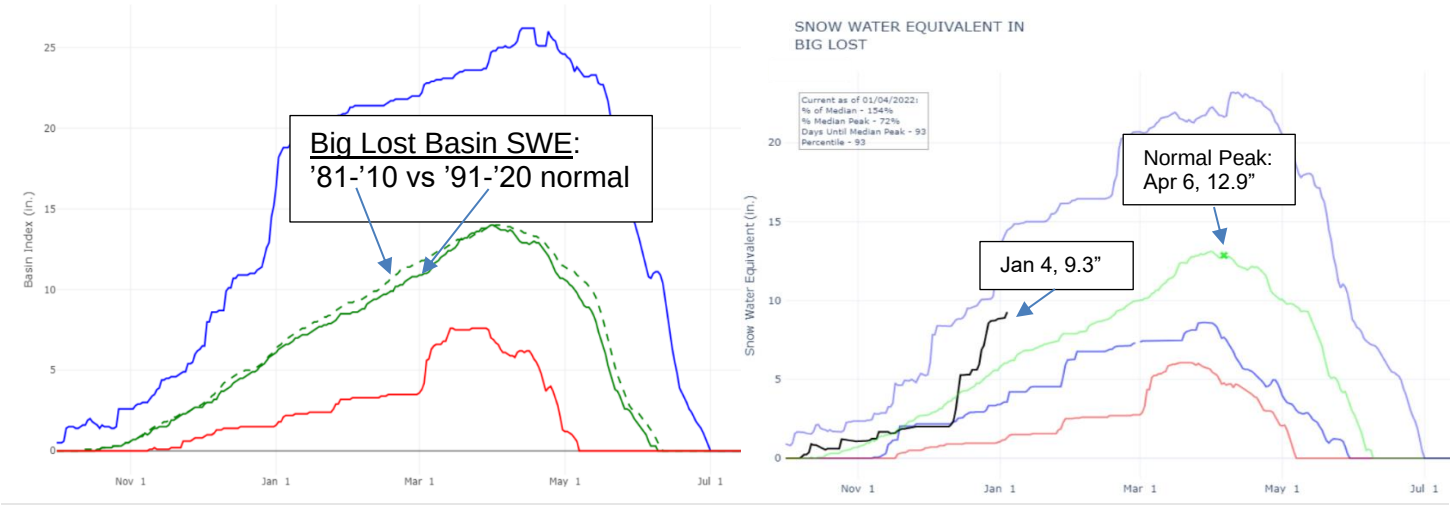
United States Department of Agriculture

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

January 1, 2022



The Big Lost basin had a very difficult go last year. The word dry barely does it justice. In fact, the past few years have not been kind to the Big Lost, but now it appears as though the tables have turned. This new Water Year brings updated 30-year normals across the West, including here in Idaho. The graphic above on the left shows small differences between the previous 1981-2010 normal and the new 1991-2020 normal during the winter to early spring timeframe. For more information about the new normals, please refer to the Idaho Snow Survey Special Report here. The graphic to the right shows the impressive snow water equivalent (SWE) accumulation thus far (to January 4). As of that date, 9.3 inches of SWE was observed over the basin, which is an impressive 154% of normal. With a median peak SWE of 12.9 inches on April 6, we are well on our way there. This graph also shows the drastic difference of the total SWE accumulation of last year (WY 2021, blue line). Let's hope that this wet trend continues. There is still at least 3 and a half months to go. Fingers crossed!

IDAHO WATER SUPPLY OUTLOOK REPORT

January 1, 2022

Overview

Thankfully, the New Year brings good news to report for Idaho's snowpack and water supply with fall precipitation and late December snowstorms bringing relief to drought conditions. Although we're not out of the woods yet, drought severity has been reduced across most regions. Improvements in soil moisture and shallow groundwater conditions throughout the fall along with above normal December snowfall provide optimism for more efficient runoff come spring. In order to completely end drought conditions by April 1, estimates indicate our region needs ~135 – 190% of normal precipitation. As a result, the probability of improving drought conditions is much higher than the probability of completely ending drought conditions across the state.

The one month outlook from NOAA's Climate Prediction Center (CPC) suggests increased odds of above normal precipitation and cooler than average temperatures across most of Idaho. These typical La Niña conditions (cooler and wetter) generally favor northern and central Idaho for the remaining winter months. The three-month outlook predicts equal chances for warm, neutral, cooler conditions for Southern Snake River and Snake headwater basins. Our primary concern for meeting irrigation demand is the low reservoir carryover storage that kicked off water year 2022 (WY 2022). Carryover storage was well below normal in all major reservoir systems across the region. Although reservoir storage continues to increase, we will need an above average snowpack to fill reservoirs this spring.

Snowpack

After some early season snowfall in October, snowpack remained alarmingly low until mid-December when winter storms and cold temperatures finally arrived. The second half of December brought significant increases in snow water equivalent (SWE) across the entire state. Snowpack is above normal in all basins north of the Snake River Plain and below or near normal in the Southern Snake basins. We have some concern about SWE totals in the Bruneau, Salmon Falls, and Goose Creek (Oakley) basins, where snowpack totals are slightly below normal. These basins generally reach their snowpack peak and subsequent snowmelt runoff earlier in the season than much of the rest of Idaho, so there's less time to 'catch-up' here than in other areas. A few SNOTEL sites in these basins were well below normal as of Jan 1.

Most notably, the Wood and Lost River basins currently have the highest percent of normal snowpacks in the state (~130% to 150% as of report time), which is a welcome departure from having the worst drought conditions in the state over the last two years.

Precipitation

October storms brought wet conditions across Idaho with above normal monthly precipitation across the entire state apart from the Clearwater Basin. Watersheds south of the Clearwater received ~130% to 330% of normal monthly precipitation. Most rainfall occurred during the atmospheric river event between October 23 – 26. Central Idaho received some snow at higher elevations, but most of this precipitation fell as rain due to the slightly warmer than normal temperatures throughout October. November was significantly warmer than normal across the entire state which, combined with a lack of precipitation, delayed early-season snowpack development. Below normal precipitation occurred south of the Clearwater-Salmon basin boundary with normal to slightly above normal precipitation to the north. Dry conditions continued into early December. Our fortunes changed in December with several cold storms bringing in much needed frozen precipitation (snowfall)!

Water supply

Total reservoir storage in the Upper Snake system is below normal. The Henrys Fork arm of the Snake is closest to normal with combined storage between Henrys Lake, Island Park Reservoir, and Grassy Lake at 98% of normal (80% of capacity). Along the mainstem of the Snake River above Idaho Falls, locally known as the “South Fork,” combined reservoir storage between Palisades and Jackson Lake is only 42% of normal (27% of capacity). Current storage improves lower down in the system, with Ririe, Blackfoot, and American Falls at 111%, 107% and 83% of normal, respectively. To the north, reservoir storage ranges from ~40 to 65% of normal in the Wood and Lost Basins (Mackay, Little Wood, and Magic). The Boise Reservoir system is currently 75% of normal (39% of capacity), while the neighboring Payette system is 87% of normal (55% of capacity). Reservoirs south of the Snake River are generally below normal, except for Bear Lake where current levels are 118% of normal (41% of capacity).

January 1 streamflow forecasts, where available, generally reflect the current mountain snowpack and precipitation conditions – with near normal expected streamflow volumes for the April through July and April through September periods throughout much of the Upper Snake basin. Likewise, normal to much above normal streamflow volumes are forecast for the Owyhee and Bear River basins. These early season forecasts should be approached with a degree of caution, as we still have multiple months of unknown winter weather in front of us, which will directly impact future streamflow forecasts and eventual spring and summer runoff!

Streamflow, snowpack, and precipitation data for each basin can be accessed here or on the NRCS interactive map

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)

Figure 1: Monthly Precipitation for December 2021

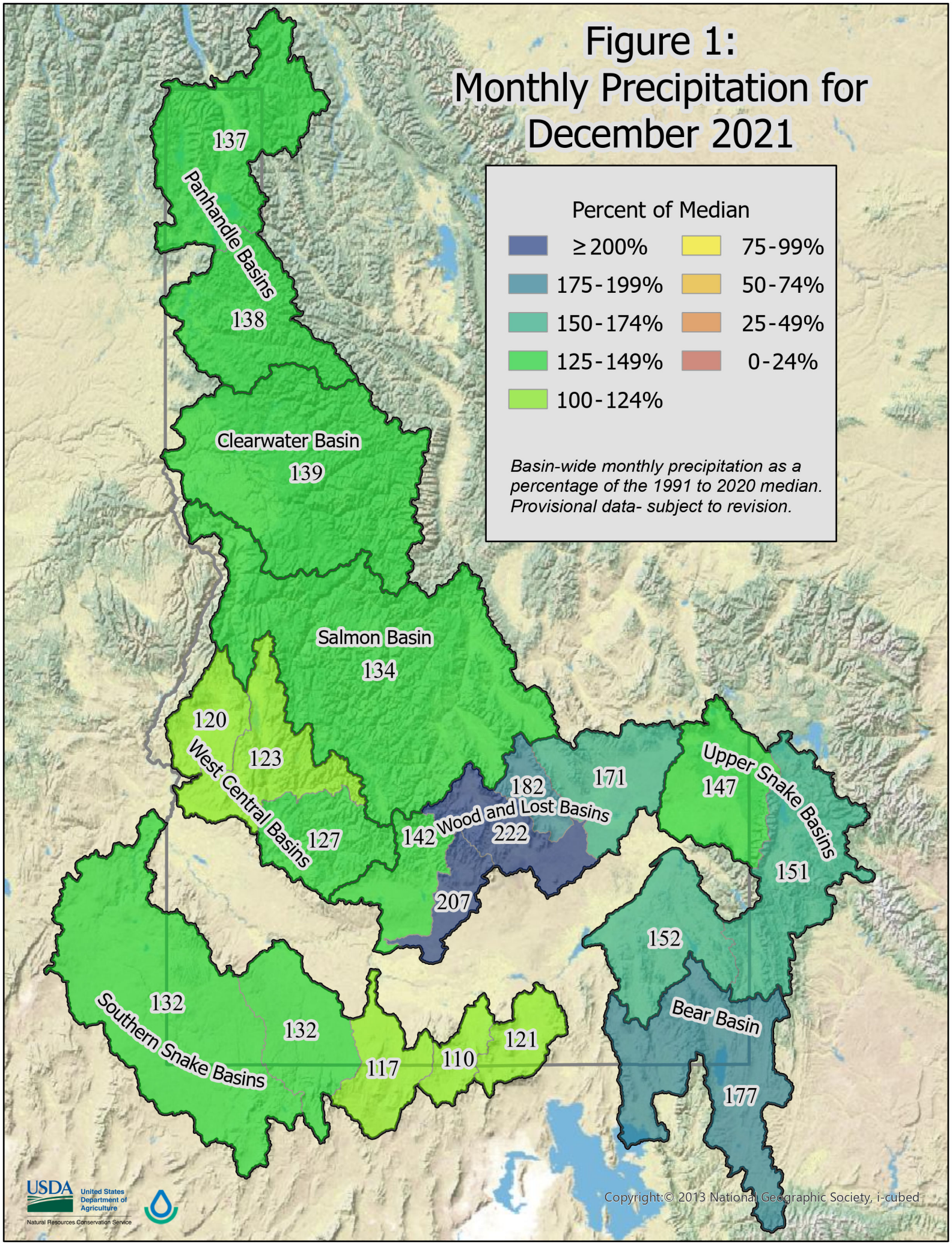


Figure 2:
January 1, 2022
Water-Year-to-Date-Precipitation

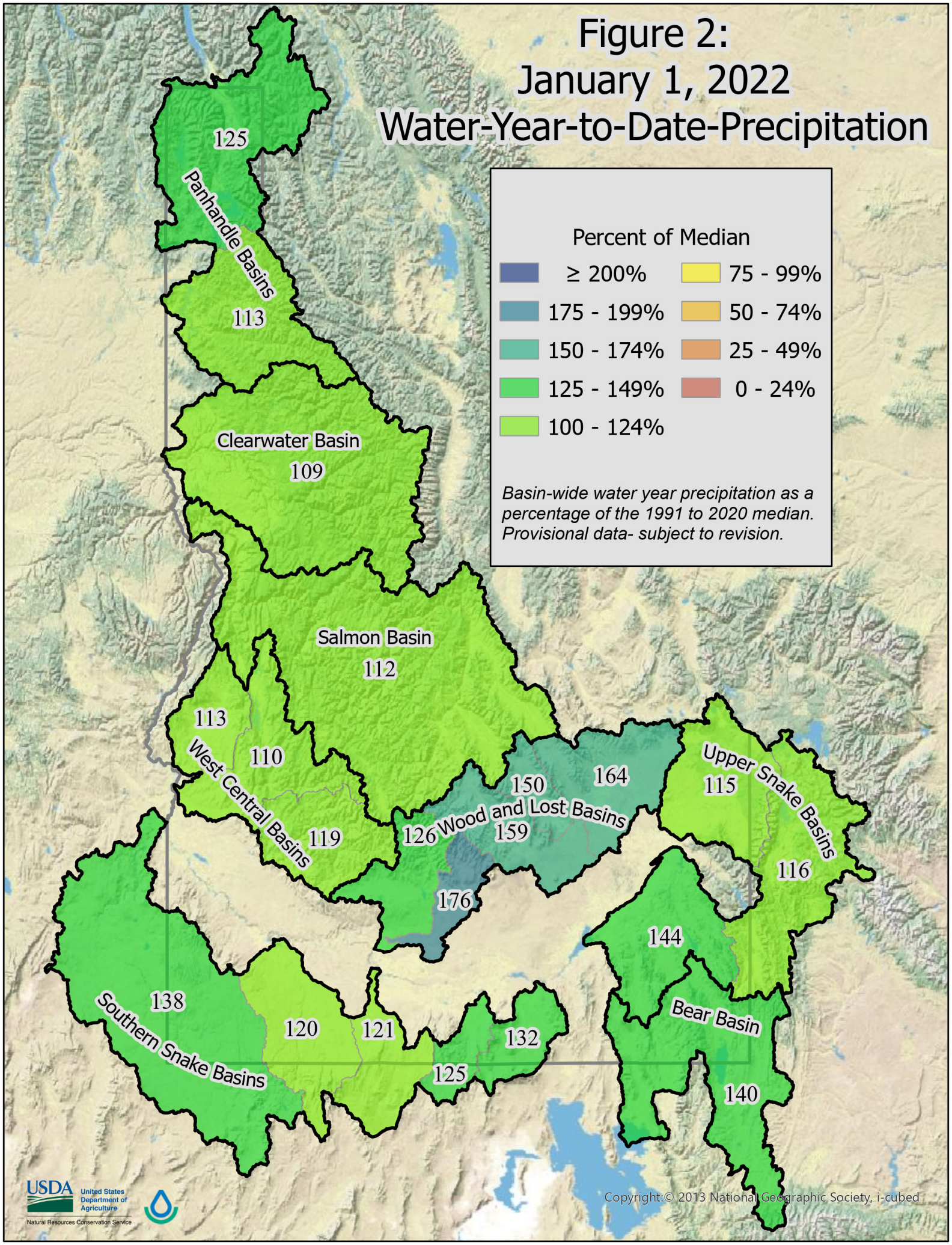
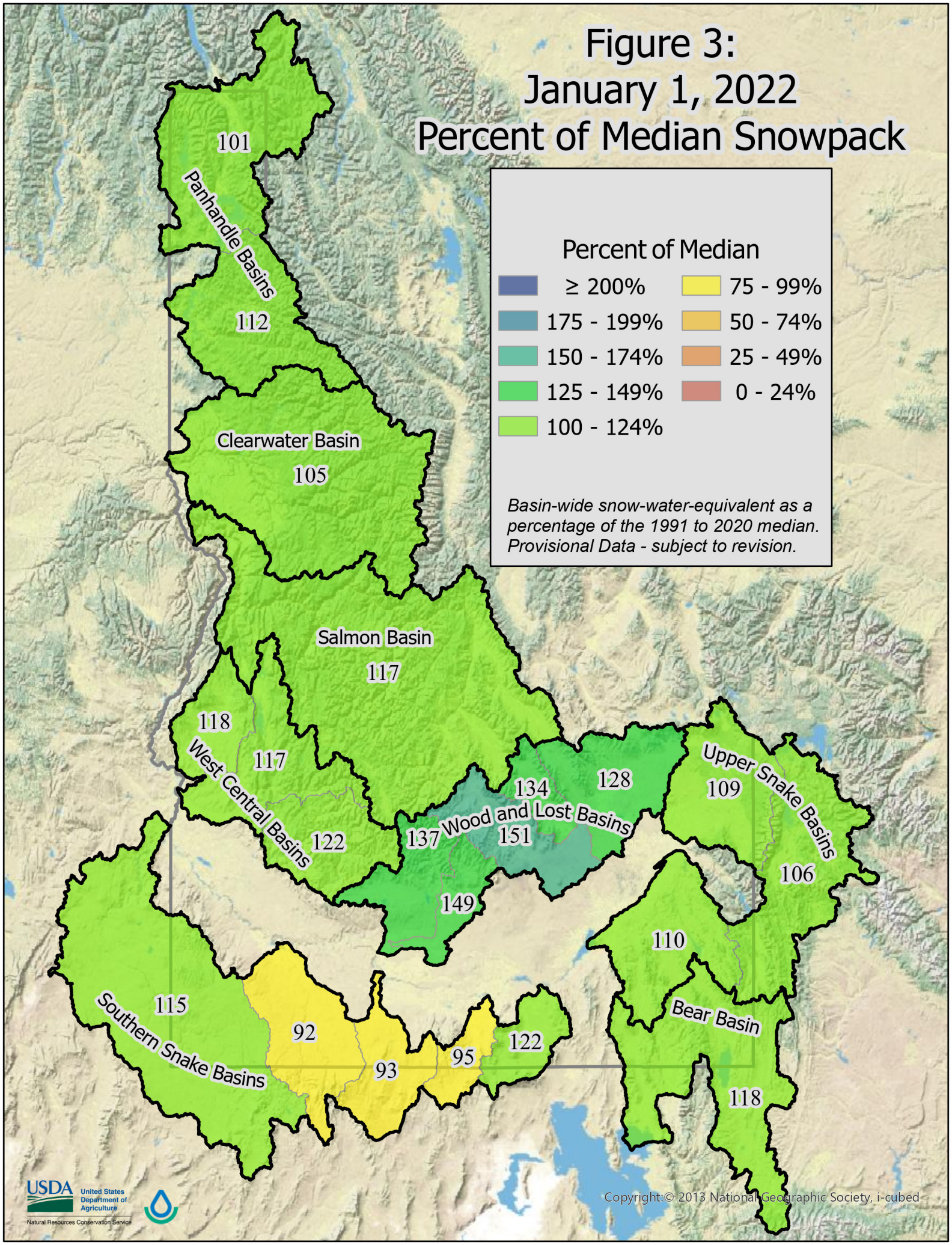
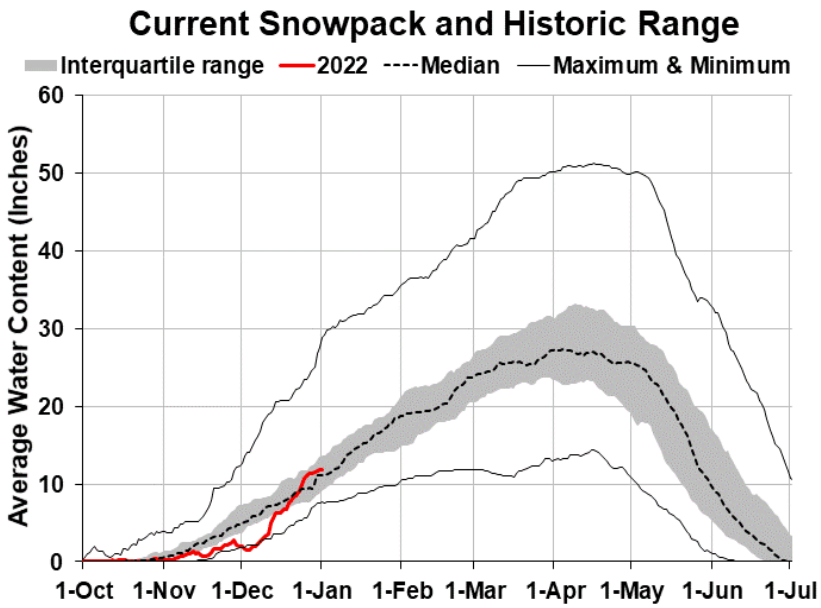


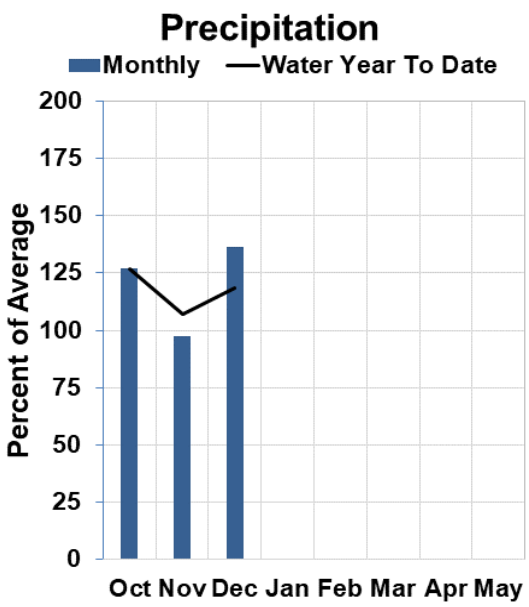
Figure 3:
January 1, 2022
Percent of Median Snowpack



Panhandle Basins

January 1, 2022





WATER SUPPLY OUTLOOK

Although October and November had well above normal temperatures, a cold and snowy December has bolstered the snowpack to near-normal conditions across the Panhandle basins. December precipitation was ~120 to 210% of normal (Fig. 1) and, WY 2022 is off to a good start with January 1 total precipitation at ~110 to 165% of normal (Fig. 2). Snowpack ranges from ~90 to 120% of normal for January 1 (Fig. 3). November started on track with near-normal snow accumulation but, warmer than normal temperatures lead to two significant snowmelt events that brought snowpack levels to record lows by the beginning of December. The early season melt and rain on snow events increased soil moisture across the region, which should help improve springtime runoff efficiency.

Lakes in the Panhandle are at ~90% of normal storage, which broken down as percent of capacity are Coeur d'Alene at 26%, Pend Oreille at 35%, and Priest Lake at 53%. Streamflow forecasts for April through July are ~130% of normal at the 50% exceedance level for the Kootenai River at Leonia. Other streamflow forecasts are not available for January 1 due to the high uncertainty with early season forecasts. NOAA's Official 30-Day Outlook show increased odds for colder and wetter than normal conditions across the Panhandle basins.

Panhandle Region Streamflow Forecasts - January 1, 2022

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	6300	8010	8780	131%	9560	11300	6680
	APR-SEP	7410	9180	9980	132%	10800	12500	7560
Pend Oreille Lake Inflow 2								
Priest R nr Priest River 2								
Spokane R nr Post Falls 2								

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

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

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

Reservoir Storage (KAF): End of December

Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Hungry Horse Lake	3147.7	3151.5	2870.0	3451.0
Flathead Lake	1264.7	1161.1	1181.0	1791.0
Noxon Rapids Reservoir	309.1	314.1	317.4	335.0
Lake Pend Oreille	543.0	557.8	620.0	1561.3
Priest Lake	63.4	42.6	55.6	119.3
Lake Coeur d' Alene	61.6	60.0	70.8	238.5

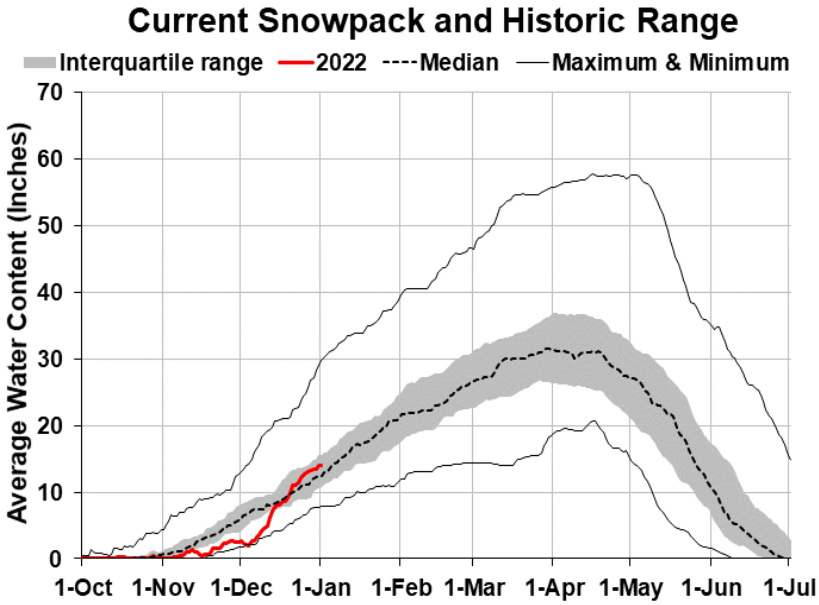
Watershed Snowpack Analysis: January 1, 2022

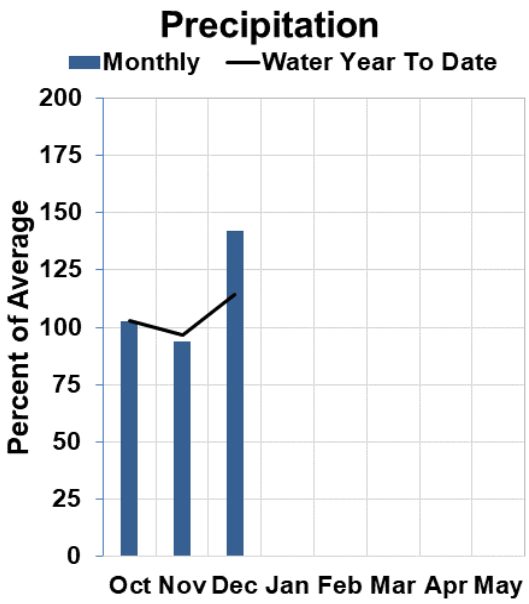
Basin Name	# of Sites	% of Median 2022	% of Median 2021
Moyie River	1	121%	101%
Priest River	6	100%	81%
Rathdrum Creek	3	81%	104%
Coeur d' Alene River	6	113%	91%
St. Joe River	4	112%	98%
Pend Oreille Lake	5	93%	88%
Palouse River	2	106%	121%
Lower Kootenai	2	117%	84%
Pend Oreille-Kootenai	13	101%	86%
Coeur d' Alene-St. Joe Total	9	113%	96%

Starting in 2020, streamflow forecasts with poor prediction skill (jackknife r2 < 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)

Clearwater River Basin

January 1, 2022





WATER SUPPLY OUTLOOK

Similar to the Panhandle Basins, October and November had well above normal temperatures, but the cold and snowy December helped improve the snowpack to near-normal conditions across the Clearwater Basin. December precipitation was ~120 to 160% of normal (Fig. 1) and WY 2022 is near normal with January 1 total precipitation at ~100 to 120% of normal (Fig. 2). Snowpack ranges from ~80 to 110% of normal for January 1 (Fig. 3). Although the Clearwater Basin currently has near-normal conditions, the beginning of December had record low snowpack levels resulting from two major snowmelt events. Although these early-season melt events were bad for snowpack conditions, they increased soil moisture throughout the region, which should help improve springtime runoff efficiency. January 1 soil moisture at 8" depth is above normal and between the 70th and 90th percentile at elevations between ~3,000 to 6,200 feet.

Dworshak Reservoir is currently at ~70% of its storage capacity, which is ~100% of normal at this time of the year. Due to high uncertainty with early season forecasts, no streamflow forecasts are available for January 1 in the Clearwater Basin. NOAA's Climate Prediction Center's three-month outlook suggests favorable snowpack building conditions in the Clearwater Basin, with below-normal, colder air temperatures and above-normal precipitation.

Clearwater River Basin Streamflow Forecasts - January 1, 2022

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								

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

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

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

Reservoir Storage (KAF): End of December				
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Dworshak Reservoir	2401.9	2340.0	2316.0	3468.0

Watershed Snowpack Analysis: January 1, 2022			
Basin Name	# of Sites	% of Median 2022	2021
NF Clearwater River	9	111%	95%
Lochsa River	3	108%	93%
Selway River	4	83%	86%
SF Clearwater River	1	83%	79%
Clearwater Basin Total	17	105%	95%

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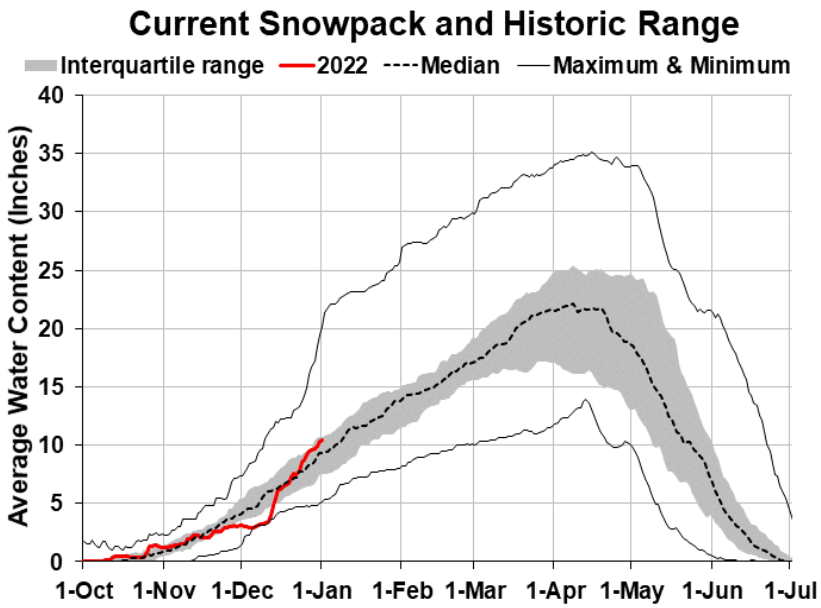
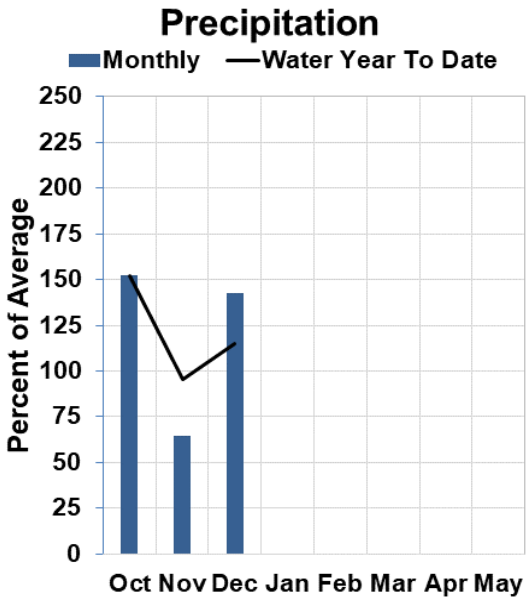
Salmon River Basin

January 1, 2022





WATER SUPPLY OUTLOOK

Significant storm cycles in October and December have precipitation and snowpack in the Salmon Basin off to a good start in WY 2022. Water year total precipitation is ~115% of normal as of January 1 (Fig. 2), with slightly higher amounts in the southern sub basins. December storms brought the snowpack from near 30-year lows on December 11 to 117% of normal on January 1 (Fig. 3). Bulk snowpack density at SNOTEL sites is remarkably uniform across the basin, ranging from 20% to 25%. Although there are not many soil moisture sensors at sites in the interior of the Salmon Basin, the combination of surrounding sites and ~150% of normal October precipitation suggest that soils in the Salmon Basin are likely to be near or above normal values.

Due to high uncertainty with early season forecasts, no streamflow forecasts are available for January 1 in the Salmon Basin. The Climate Prediction Center's 30-Day Outlook suggests above-normal chances for precipitation and below-normal temperatures, so hopefully storm tracks continue to deliver snow in February.

Salmon River Streamflow Forecasts - January 1, 2022

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, precipitation, & reservoir normals are averages, SWE normals are medians.

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

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

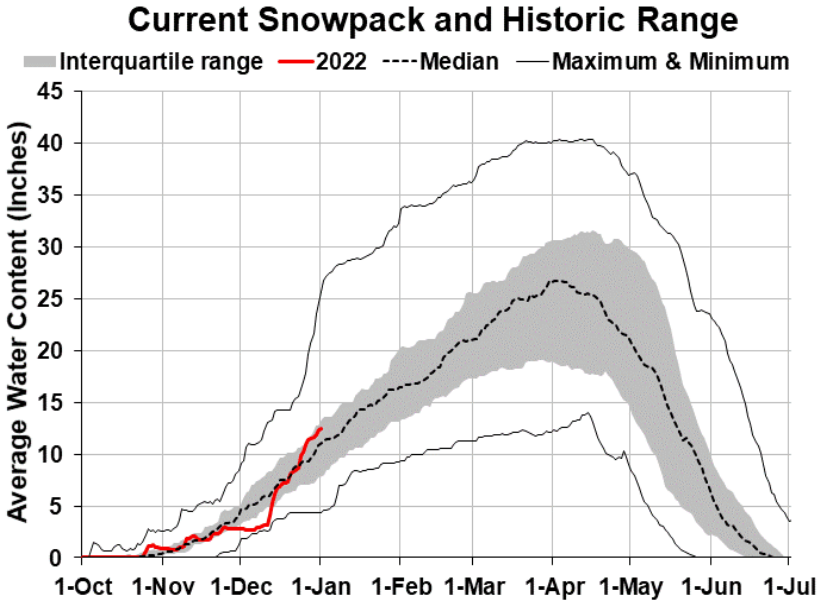
Watershed Snowpack Analysis: January 1, 2022

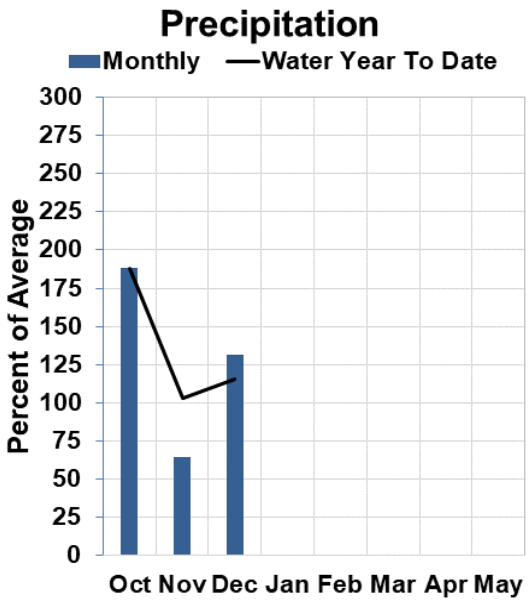
Basin Name	# of Sites	% of Median 2022	% of Median 2021
Salmon River ab Salmon	7	134%	73%
Lemhi River	4	104%	75%
MF Salmon River	3	127%	77%
SF Salmon River	3	110%	77%
Little Salmon River	4	123%	93%
Lower-Middle Salmon	4	99%	83%
Salmon Basin Total	20	117%	81%

Starting in 2020, streamflow forecasts with poor prediction skill (jackknife r2 < 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)

West Central Basins

January 1, 2022





WATER SUPPLY OUTLOOK

A series of storms in late October and the second half of December have West Central basins at 114% to 124% of normal precipitation as of January 1 (Fig. 2). Snowpack values are also above normal, from 117% of normal in the Payette Basin to 122% of normal in the Boise Basin (Fig. 3). Although this is a good start to the season, it is worth remembering that the snowpack was near 30-year low values less than a month ago, and typical peak SWE is still about three months away. Snowpack density at SNOTEL sites is relatively uniform across the basins, ranging from 17% to 24%. The October 23 storm delivered a lot of early season precipitation (up to ~4" of precipitation in the Boise Basin, most of which was rain), which likely contributed to January 1 soil moisture values that are above normal across the West Central basins.

Reservoir storage in the Boise system (Anderson Ranch, Arrowrock and Lucky Peak combined) is 75% of normal. Reservoir storage in the Payette basin is 87% of normal, and storage in the Weiser Basin is 63% of normal. Due to high uncertainty with early season forecasts, no streamflow forecasts are available for January 1 in the West Central basins. The Climate Prediction Center's 30-Day Outlook suggests above-normal chances for precipitation and below-normal temperatures, so hopefully storm tracks continue to deliver snow.

West Central Basins Streamflow Forecasts - January 1, 2022

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, precipitation, & reservoir normals are averages, SWE normals are medians.

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

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

Reservoir Storage (KAF): End of December

Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Anderson Ranch Reservoir	177.4	272.8	270.8	450.2
Arrowrock Reservoir	136.2	163.8	169.1	272.2
Lucky Peak Reservoir	85.0	79.7	89.5	293.2
Sub-Basin Total	**398.7**	**516.3**	**529.4**	**1015.6**
Deadwood Reservoir	62.3	78.8	90.9	161.9
Cascade Reservoir	408.9	433.8	453.0	693.2
Sub-Basin Total	**471.2**	**512.6**	**543.9**	**855.1**
Lake Lowell	77.8	106.3	97.9	165.2
Mann Creek Reservoir	1.0	2.6	1.6	11.1

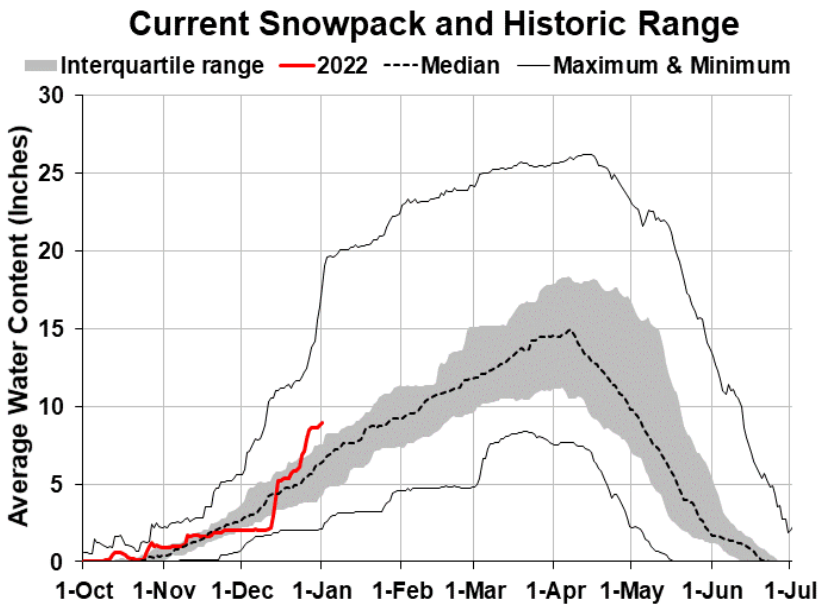
Watershed Snowpack Analysis: January 1, 2022

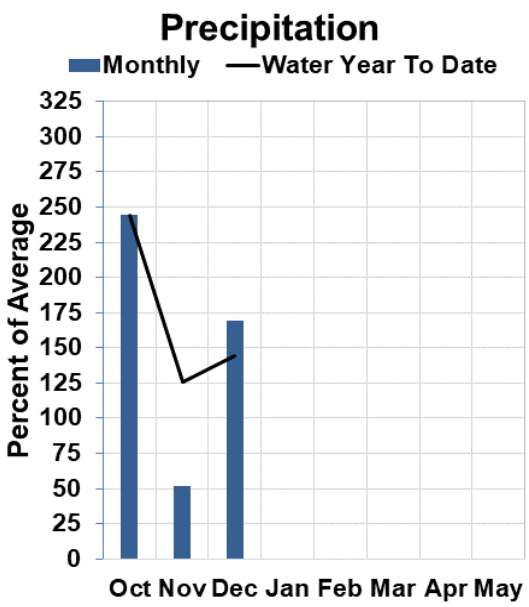
Basin Name	# of Sites	% of Median 2022	% of Median 2021
SF Boise River	8	123%	82%
MF & NF Boise Rivers	6	118%	95%
Mores Creek	5	124%	113%
Canyon Creek	1	121%	106%
Boise Basin Total	17	122%	96%
NF Payette River	8	114%	90%
SF Payette River	4	123%	85%
Payette Basin Total	18	117%	90%
Mann Creek	1	117%	96%
Weiser Basin Total	7	118%	73%

Starting in 2020, streamflow forecasts with poor prediction skill (jackknife r2 < 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)

Wood & Lost River Basins

January 1, 2022





WATER SUPPLY OUTLOOK

La Niña and the atmospheric river events from the southwest delivered to the Wood and Lost basins in the first quarter of WY 2022. The highest water year precipitation percent of normal values in the state are in these basins, which now range from ~130% to 180% of normal (Fig. 2). Several sites in the Little Wood and Big Lost basins have top three period-of-record precipitation values as of January 1. Snowpack ranges from ~130% to 150% of normal (Fig. 3), and the Big Lost and Little Wood basins are already near or above their respective WY 2021 snowpack peak SWE values. Snowpack density at SNOTEL sites is relatively uniform across the basins, ranging from 18% to 24%. Soil moisture values are above normal at all sites that have measurements available in the Wood and Lost basins, which will hopefully help increase runoff efficiency come spring.

January 1 reservoir storage remains well below 30-year normal values, with Magic Reservoir at 39% of normal, Little Wood Reservoir at 61% of normal, and Mackay Reservoir at 66% of normal. Due to high uncertainty with early season forecasts, no streamflow forecasts are available for January 1 in the Wood and Lost basins. The Climate Prediction Center's 30-Day Outlook suggests above-normal chances for precipitation and below-normal temperatures, so with a little luck the wet winter will continue.

Wood and Lost Basins Streamflow Forecasts - January 1, 2022

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, precipitation, & reservoir normals are averages, SWE normals are medians.

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

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

Reservoir Storage (KAF): End of December

Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Mackay Reservoir	15.5	21.6	23.4	44.4
Little Wood Reservoir	8.5	10.3	13.9	30.0
Magic Reservoir	17.6	20.7	44.8	191.5

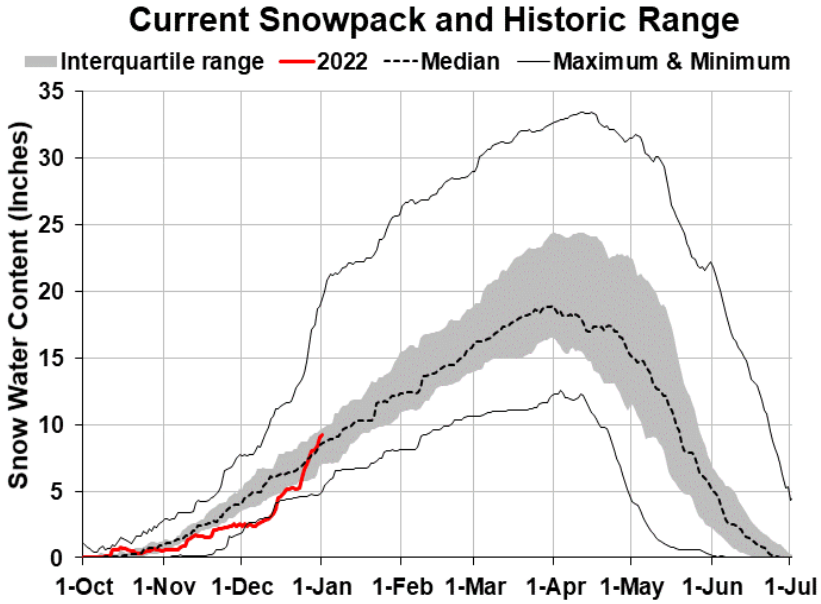
Watershed Snowpack Analysis: January 1, 2022

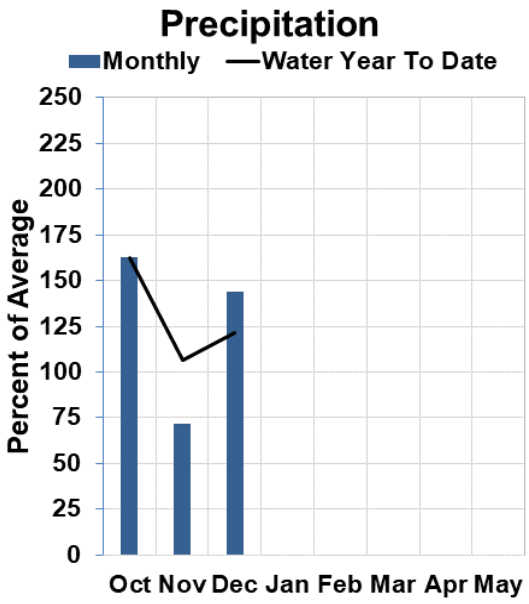
Basin Name	# of Sites	% of Median 2022	2021
Camas-Beaver Creeks	4	131%	71%
Birch-Medicine Lodge Creeks	2	123%	67%
Little Lost River	3	134%	67%
Big Lost River ab Mackay	4	150%	61%
Big Lost Basin Total	5	151%	59%
Fish Creek	0		
Little Wood ab Resv	4	149%	55%
Big Wood River ab Hailey	8	140%	66%
Camas Creek	4	129%	92%
Birch-Medicine Lodge-Camas-Beaver	6	128%	69%
Little Wood Basin Total	4	149%	55%
Big Wood Basin Total	12	137%	73%

Starting in 2020, streamflow forecasts with poor prediction skill (jackknife r2 < 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)

Upper Snake River Basins

January 1, 2022





WATER SUPPLY OUTLOOK

A series of storms beginning on December 10 significantly improved precipitation and snowpack conditions in the Upper Snake. Monthly precipitation for Upper Snake sub basins ranged from ~115 to 160% for December (Fig. 1). To begin December, water year precipitation was slightly below normal in Snake River above Palisades and the Henrys Fork-Teton basins, and 136% in the Willow-Blackfoot-Portneuf Basin. To begin January, those numbers are now ~115% and ~145% (Fig. 2), respectively. Precipitation finally fell as snow in those late December storms and brought what was a record to near-record low snowpack to a point where all sub basins are near to above normal for SWE and range from 93 to 127% (Fig. 3). Soil moisture ranges from ~100 to 120% of period of record median. Drought designations still exist but have been and continue to be reduced in the Upper Snake.

The Upper Snake reservoir system is currently 86% of normal and the Jackson-Palisades system is at 42% of normal. Due to high uncertainty with early season forecasts, no January 1 streamflow forecasts are available. Conditions change rapidly during the early winter months so continue to monitor daily conditions and subsequent water supply reports as well as the hopeful backfilling of these reservoirs.

Upper Snake River Basin Streamflow Forecasts - January 1, 2022

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	290	365	415	87%	465	535	475
	APR-SEP	420	500	560	89%	615	695	630
Falls R nr Ashton 2	APR-JUL	285	345	380	96%	420	480	395
	APR-SEP	350	420	465	98%	510	580	475
Teton R nr Driggs	APR-JUL	67	101	124	85%	147	181	146
	APR-SEP	87	130	159	89%	188	230	178
Teton R nr St Anthony	APR-JUL	178	250	305	86%	355	425	355
	APR-SEP	220	310	370	87%	425	515	425
Henrys Fk nr Rexburg 2	APR-JUL	730	950	1100	91%	1250	1480	1210
	APR-SEP	950	1220	1410	89%	1590	1860	1580
Snake R at Flagg Ranch	APR-JUL	370	460	520	112%	580	665	465
	APR-SEP	405	500	565	112%	630	730	505
Snake R nr Moran 2	APR-JUL	610	750	840	115%	935	1070	730
	APR-SEP	680	830	930	115%	1030	1180	810
Pacific Ck at Moran	APR-JUL	109	144	167	108%	191	225	154
	APR-SEP	117	152	176	110%	200	235	160
Buffalo Fk ab Lava Ck nr Moran	APR-JUL	215	270	305	107%	340	395	285
	APR-SEP	245	305	345	111%	385	445	310
Snake R ab Reservoir nr Alpine 2	APR-JUL	1570	2020	2320	108%	2620	3060	2140
	APR-SEP	1820	2310	2650	109%	2980	3470	2430
Greys R ab Reservoir nr Alpine	APR-JUL	230	295	340	108%	385	450	315
	APR-SEP	270	345	395	108%	445	520	365
Salt R ab Reservoir nr Etna	APR-JUL	205	295	355	116%	415	500	305
	APR-SEP	260	360	430	113%	495	595	380
Snake R nr Irwin 2	APR-JUL	2170	2820	3260	111%	3700	4350	2930
	APR-SEP	2550	3280	3770	110%	4260	4990	3420
Snake R nr Heise 2	APR-JUL	2370	3030	3480	111%	3930	4590	3130
	APR-SEP	2800	3540	4050	111%	4560	5310	3660
Snake R at Neeley 2	APR-JUL	720	1720	2400	100%	3080	4080	2390
	APR-SEP	695	1760	2490	106%	3210	4280	2360

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

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

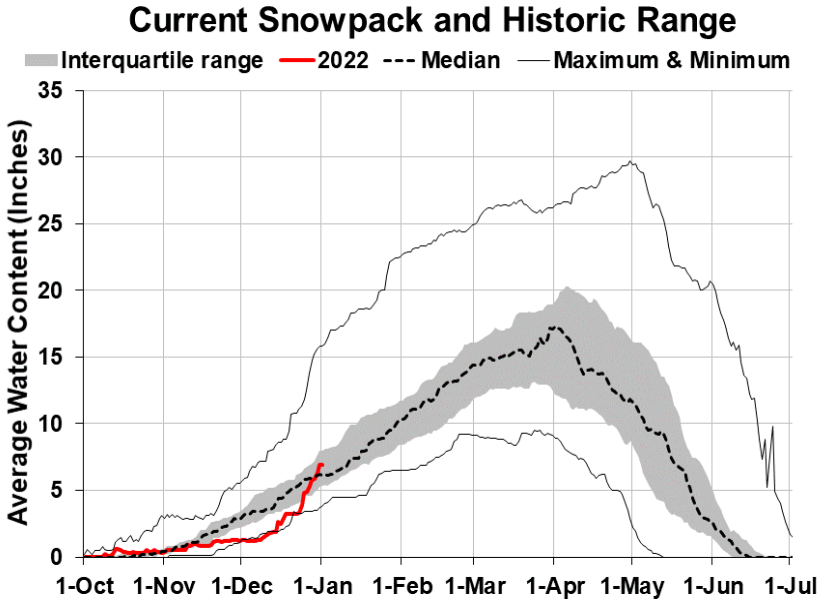
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

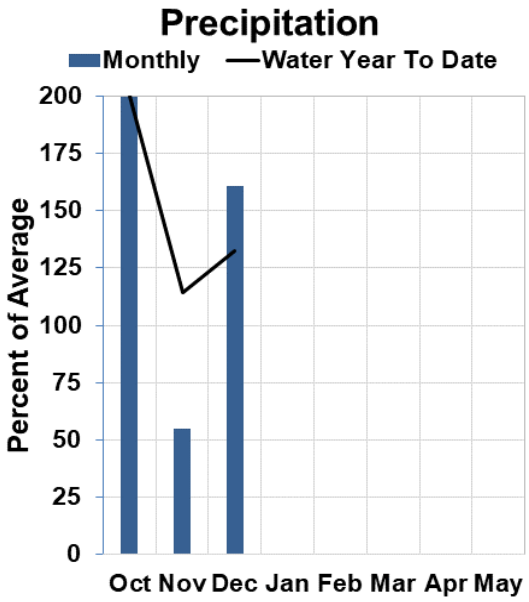
Reservoir Storage (KAF): End of December				
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Jackson Lake	156.1	652.0	615.6	847.0
Palisades Reservoir	441.7	928.4	811.1	1400.0
Sub-Basin Total	**597.8**	**1580.4**	**1426.7**	**2247.0**
Henrys Lake	79.5	81.8	84.0	90.4
Island Park Reservoir	102.5	109.6	99.3	135.2
Grassy Lake	10.0	12.0	12.5	15.2
Sub-Basin Total	**192.0**	**203.4**	**195.8**	**240.8**
Ririe Reservoir	43.7	45.0	39.3	80.5
Blackfoot Reservoir	186.3	254.1	173.1	337.0
American Falls Reservoir	752.7	969.3	909.3	1672.6
Basin-Wide Total	**1772.4**	**3052.2**	**2744.2**	**4577.9**

Watershed Snowpack Analysis: January 1, 2022			
Basin Name	# of Sites	% of Median 2022	2021
Henrys Fork-Falls River	7	117%	80%
Teton River	3	93%	90%
Henrys Fork-Teton	10	109%	84%
Snake River ab Jackson Lake	5	114%	90%
Pacific Creek	2	114%	95%
Buffalo Fork	2	98%	94%
Gros Ventre River	3	104%	88%
Hoback River	4	96%	79%
Greys River	5	105%	86%
Salt River	4	107%	88%
Snake ab Palisades Resv	19	105%	88%
Willow Creek	5	105%	86%
Blackfoot River	2	127%	105%
Portneuf River	3	100%	59%
Willow-Blackfoot-Portneuf	6	110%	80%
Snake River ab American Falls	28	108%	85%

Bear River Basin

January 1, 2022





WATER SUPPLY OUTLOOK

Fall precipitation for the Bear River basin remained near to above normal until January 1. The atmospheric river event that dropped significant amounts of precipitation in October and frequent storms in the last three weeks of December were the main producers of precipitation in the region, as much of November and the first week of December was warm and dry. Resulting December monthly precipitation was 177% of normal (Fig. 1) and water year to date precipitation was 141% of normal for January 1 (Fig. 2). Warm temperatures accompanied the Fall storm systems, and most precipitation fell as rain. Not until the second week of December did significant snowpack building begin. From about December 8 to January 1, stormy weather was persistent and brought much needed snow, increasing basin totals from 35% of normal on December 8 to ~100 to 130% of normal as of January 1 (Fig. 3). Drought conditions are expected to improve in the basin, likely due to the much needed precipitation from the preceding months. Soil moisture conditions have improved slightly in areas of the region during the Fall, NASA's GRACE satellite data shows an increase in wetness of 1-meter depths from October 4 to December 27.

January 1 reservoir storage in the Bear River basin are: Bear Lake at 118% of normal (41% capacity) Montpelier at 63% of normal (30% capacity). Reservoir storage normals have not changed significantly from the end of water year 2021 to January 1. At the same report time last year, Bear Lake was at 172% of normal and Montpelier was at 104% of normal. Streamflow forecasts for the region range from ~110 to 170% of normal for the April to July period. NOAA Climate Prediction Center's 30-day outlooks suggest above normal chance of increased precipitation in the region and equal chances of above or below normal temperatures.

Bear River Basin Streamflow Forecasts - January 1, 2022

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	88	114	131	130%	149	174	101
	APR-SEP	98	126	145	127%	164	191	114
Bear R ab Resv nr Woodruff	APR-JUL	59	107	140	152%	173	220	92
	APR-SEP	63	114	148	149%	183	235	99
Big Ck nr Randolph	APR-JUL	0.98	3.6	5.4	169%	7.2	9.8	3.2
Smiths Fk nr Border	APR-JUL	57	79	94	109%	109	131	86
	APR-SEP	68	93	109	109%	126	151	100
Bear R bl Stewart Dam 2	FEB-JUL	68	144	210	158%	295	435	133
	FEB-SEP	73	157	230	159%	320	480	145
	APR-JUL	42	108	172	150%	250	390	115

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

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

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

Reservoir Storage (KAF): End of December

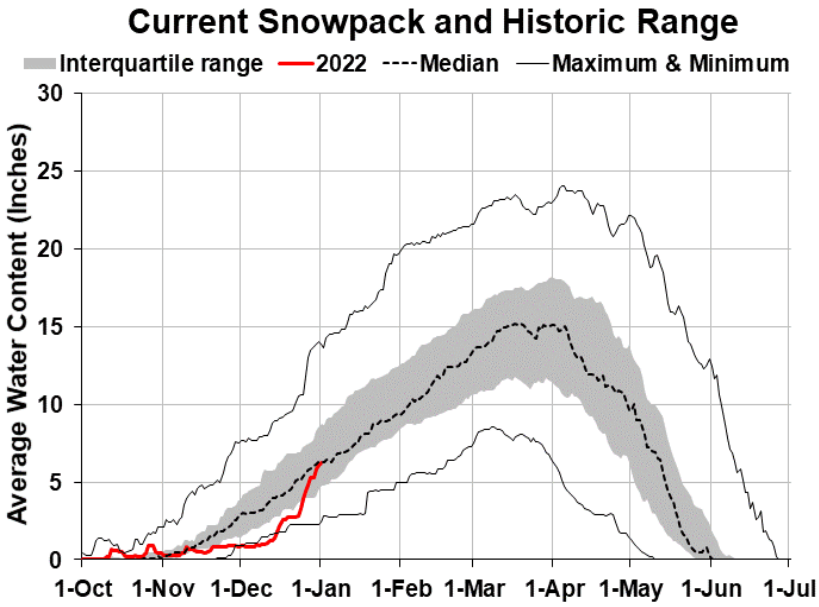
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Bear Lake	536.8	784.5	456.5	1302.0
Montpelier Reservoir	1.2	2.0	1.9	4.0

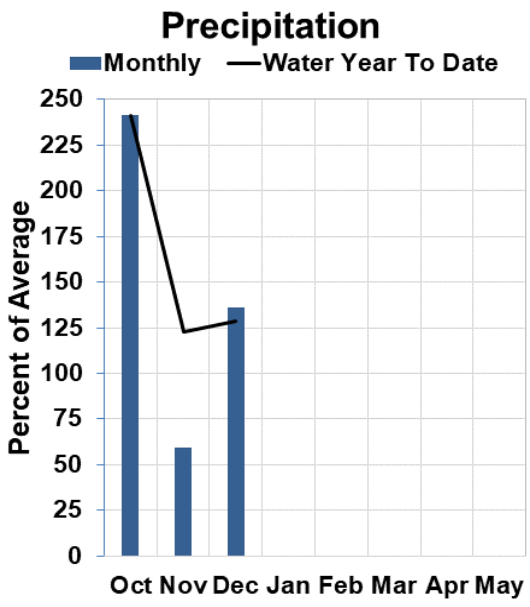
Watershed Snowpack Analysis: January 1, 2022

Basin Name	# of Sites	% of Median 2022	% of Median 2021
Smiths-Thomas Forks	4	105%	84%
Bear Lake	6	117%	79%
Montpelier Creek	1	118%	82%
Mink Creek	0		
Cub River	1	127%	70%
Bear River Total	21	118%	75%
Malad River	1	98%	60%

Southern Snake Basins

January 1, 2022





WATER SUPPLY OUTLOOK

Beginning in early October, strong atmospheric river events brought large amounts of moisture to the Southside Snake basins. Apart from a warm and dry November, the region received near to above normal precipitation through January 1, leaving December monthly precipitation at ~110 to 135% of normal (Fig. 1) and January 1 water year total precipitation at ~120 to 140% of normal (Fig. 2). Warm temperatures dominated the region in the Fall and much of the precipitation received was rain. Except for the Raft River basin which has near to above normal snowpack since early October, most sub basins saw little snowpack building from early October to mid-December. Cold and frequent storms brought much needed snow in the last half of December, boosting snowpack from much below normal to near to above normal across the basins, leaving January 1 snowpack ~90 to 120% of normal (Fig. 3). The Owyhee basin did not start building a snowpack until around December 9, where it was 1% of normal and increased to an impressive 115% of normal as of January 1! Soil moisture conditions have improved during the Fall/early Winter, as can also be seen from NASA's GRACE satellite data showing an increase in wetness of 1-meter depths from October 4 to December 27.

Total reservoir storage across the basin is ~55% of normal. Individual basin reservoir's percent of normal storage as of January 1 are: Owyhee 56%, Wildhorse 120%, Oakley 68%, Salmon Falls 38%. During the same time in 2020, reservoir storage ranged from ~130 to 170% of normal in the region. Streamflow forecasts for the Owyhee basin range from ~105 to 160% of normal for the April to July period, but additional streamflow forecasts are unavailable due to high uncertainty with early season forecasts. NOAA Climate Prediction Center's 30-day outlooks suggest above normal chance of increased precipitation in the region, and equal chances of above or below normal temperature in most of the region, with the Owyhee basin having higher chances of colder temperatures in most of the basin.

Southside Snake River Basins Streamflow Forecasts - January 1, 2022

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	47	69	86	134%	105	137	64
	MAR-SEP	50	72	90	136%	109	142	66
Bruneau R nr Hot Spring								
Reynolds Ck at Tollgate								
Owyhee R nr Gold Ck 2	MAR-JUL	6.9	16.2	25	114%	35	54	22
	APR-JUL	2.8	10.2	17.9	104%	28	46	17.2
Owyhee R nr Rome	FEB-JUL	210	390	545	145%	720	1030	375
	FEB-SEP	225	405	560	144%	740	1050	390
	APR-JUL	85	210	325	159%	460	715	205
Owyhee R bl Owyhee Dam 2	FEB-JUL	255	440	595	142%	770	1070	420
	FEB-SEP	280	470	625	139%	800	1100	450
	APR-JUL	113	240	355	151%	490	735	235

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

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

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

Reservoir Storage (KAF): End of December

Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)
Oakley Reservoir	11.4	21.4	16.8	75.6
Salmon Falls Reservoir	12.4	43.6	32.3	182.6
Wild Horse Reservoir	35.0	47.5	29.1	71.5
Lake Owyhee	118.9	329.3	213.9	715.0
Brownlee Reservoir	1224.4	1169.9	1313.0	1420.0

Watershed Snowpack Analysis: January 1, 2022

Basin Name	# of Sites	% of Median 2022	% of Median 2021
Raft River	2	122%	65%
Goose-Trapper Creeks	2	95%	75%
Salmon Falls Creek	5	93%	63%
Bruneau River	5	92%	61%
Reynolds Creek	1	146%	42%
Upper Owyhee	5	103%	65%
Owyhee Basin Total	8	115%	67%

Starting in 2020, streamflow forecasts with poor prediction skill (jackknife r2 < 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)

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 % median 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.

Forecast use example:

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

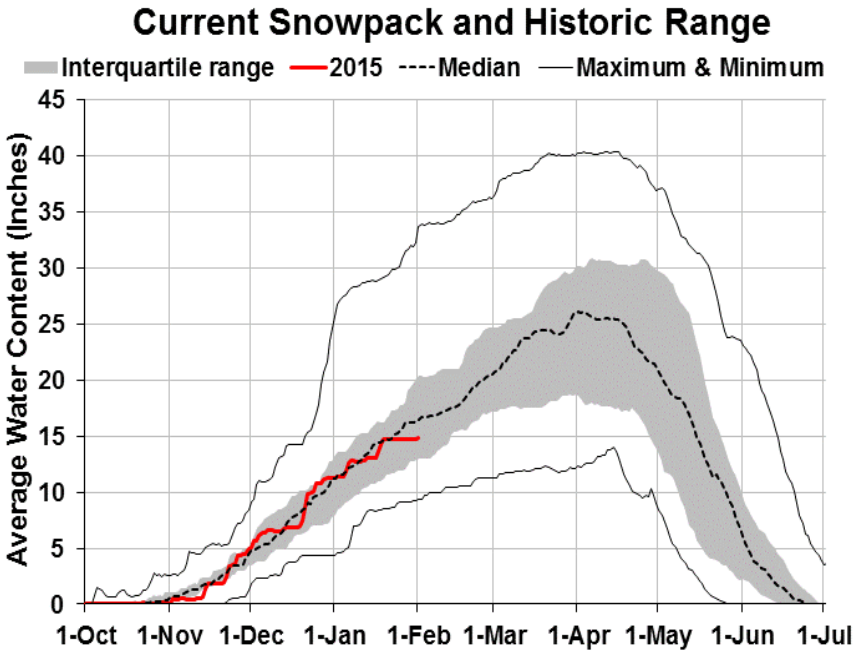
Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

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.