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*Natural Resources Conservation Service*

# **Idaho Water Supply Outlook Report**

## **June 1, 2023**



Little to no snow remains near Hoodoo Pass in the Clearwater Basin on May 31, 2023 (photo by Peter Youngblood)

During the 2023 Clearwater Basin snowline flight on May 31, Idaho Snow Survey and the Army Corps of Engineers (USACE) staff confirmed the snowpack had melted out consistently below 5,900 ft. with snow remaining consistently above 6,000 ft. elevation. These observations match what the SNOTEL network is measuring and helps verify if these individual snowpack measurements are representative of all elevations across the basin. This is invaluable information for determining if the USACE needed to hold additional space in Dworshak Reservoir to accommodate the remaining snowmelt and large rain events. Based on the remaining snowpack, the USACE determined there couldn't be a rain event with enough volume to cause an issue at Dworshak Reservoir before the snowpack melts completely.

# Water Supply Outlook Report

## Federal - State – Private Cooperative Snow Surveys

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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](mailto:idboise-nrcs-snow@usda.gov)

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### *How forecasts are made*

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

Forecasts of any kind are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertainty is in the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

**\*Starting in 2020, streamflow forecasts with poor prediction skill (jackknife  $r^2 < 0.34$ ) will no longer be issued. This will primarily affect the January and June forecasts, with little change anticipated for the February, March, April, and May forecasts. For more information, please contact [Danny Tappa \(daniel.tappa@usda.gov\)](mailto:danny.tappa@usda.gov)\***

# June 2023: Idaho Water Supply Summary

## *Overview*

May brought rapid snowmelt across Idaho. With peak snowpack greater than normal in many basins, water managers were busy during May trying to strike the balance of capturing the runoff for the irrigation season and ensuring the safety of downstream communities. Many rivers, like the Portneuf and Big Wood, reached flood stage conditions. Warm temperatures during May kickstarted irrigation deliveries across Idaho and reservoir storage increased significantly. Reservoir storage is above normal across the state. The above normal snowpack has yielded a good water supply year across Idaho, although uncertainty remains whether the Upper Snake River system will fill.

## *Weather and drought outlooks*

The first part of June is expected to be [warmer and wetter than normal](#). The 30-day monthly outlook also shows [warm and wet conditions for the month](#). [Drought status improved](#) across central Idaho with some areas of Idaho still classified as [abnormally dry \(DO\)](#). Northern Idaho remains in moderate drought (D1). The [seasonal drought outlook](#) predicts drought will persist in the Panhandle and will improve in the Snake River headwaters.

## *Snowpack*

[Warmer than normal temperatures during May](#) drove rapid snowmelt last month. Many SNOTEL sites set records for the most amount of SWE loss during May. Despite storms that brought a little bit of new snow to high elevation sites, snowpack peaked in all basins during April. [Peak snowpack](#) was well above normal in all basins south of the Clearwater Basin (Fig. 4). Most SNOTEL sites have melted out as of June 1. [At the sites that still have snow remaining](#), roughly 25% of the snowpack is left on June 1. There are only seven high-elevation sites that have significant amount of snow present. Those sites have about 40% to 60% of their WY23 snowpack remaining. [Freezing levels](#) are forecasted to be above 10,000-ft during the first part of June, so it's likely the snowpack will continue to melt rapidly and conclude by July 1.

## *Precipitation*

May precipitation was higher than normal in the majority of the Southern Snake, Boise, Wood and Lost basins and ranged from 95% to 159% in these areas (Fig. 1). Everywhere else in Idaho was drier than normal during May with monthly precipitation ranging from

59% to 93%. Southeast Idaho and the Upper Snake basins were the driest during May with 59% to 74% of normal precipitation (Fig. 1).

For total water year precipitation (WYP) on June 1, northern Idaho remains the driest portion of the state, with wetter conditions in the more southern basins (Fig. 2). WYP ranges from 79% to 81% from the Canadian border to the Clearwater Basin. WYP is 96% to 109% in the West Central and Salmon River basins. The Wood and Lost basins range from 111% to 122%. The Upper Snake basins range from 107% to 130%, with the Snake River above Heise receiving the least amount of precipitation this year at 99%. Southeast Idaho was extremely wet all winter; Bear River Basin received 131% of the normal total water year precipitation so far. The Southern Snake basins are also very wet this year. Conditions are drier towards the west but are still well above normal. WYP ranges from 126% (Raft) to 111% (Owyhee) of normal.

### *Water supply and streamflow forecasts*

[Reservoirs](#) continue to fill as the snowpack melts. Except in a few places like Jackson Lake and Mackay Reservoir, storage is near to above normal in reservoirs across the state. [Reservoir storage in the Boise system](#) is 91% full and the Payette system is 88% full. On June 1, [reservoir storage in the Upper Snake River](#) system (above Milner Dam) is 86% full, which is ~218 thousand acre-feet (KAF) more than average.

[Observed May streamflow](#) was well above normal across Idaho with warmer than normal temperatures driving rapid snowmelt. These '[Snow to Flow](#)' graphs are very helpful to see how the timing of snowmelt corresponds to streamflow levels. The Northwest River Forecast Center (NWRFC) provide [river and flood forecasts](#), and the USGS site shows [real-time streamflow conditions](#).

Streamflow forecasts (Fig. 5) continue to show well below normal streamflow volume in northern Idaho and the Clearwater basins for the remainder of the runoff season. Streamflow forecasts range from 48% to 77% of normal. Typically, there are quite a few SNOTEL sites that still have snow in June. This lack of snow from the dry winter, rapid snowpack melting in May, and dry conditions during May brought streamflow forecasts down in this area. Streamflow is forecasted to be near normal in the Salmon, Weiser, and Payette basins. The large snowpack and wet May conditions have kept streamflow forecasts above normal in the Boise, Wood and Lost, and Southern Snake basins. A mixture of near normal and below normal streamflow volumes are expected in the Upper Snake basins. The exception continues to be in the Willow-Blackfoot-Portneuf Basin, where well above normal streamflow is still expected. Lack of precipitation and rapid snowmelt in May brought these forecasts down. The NRCS forecast for [Snake River at Heise](#) during the June through July period is 88% of normal (1,550 KAF). Downstream, the NWRFC forecast for the [Snake River at Milner](#) increased slightly from last month. It is 107% of normal (6,614 KAF) for the April through September time period. Given current

storage and streamflow forecasts, available water supply will likely be good but insufficient for all water users in this region.

To look at the range of possible streamflow volume outcomes, consult 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](#).

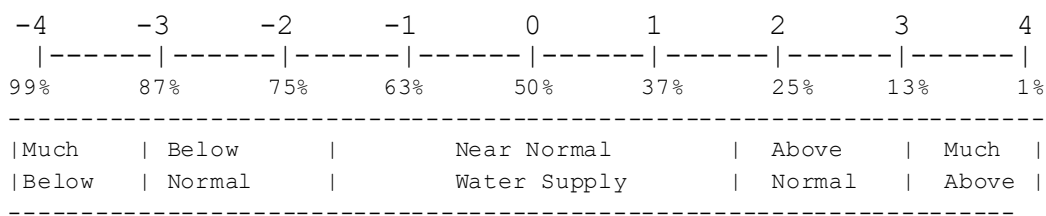
## IDAHO SURFACE WATER SUPPLY INDEX (SWSI) June 1, 2023

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.

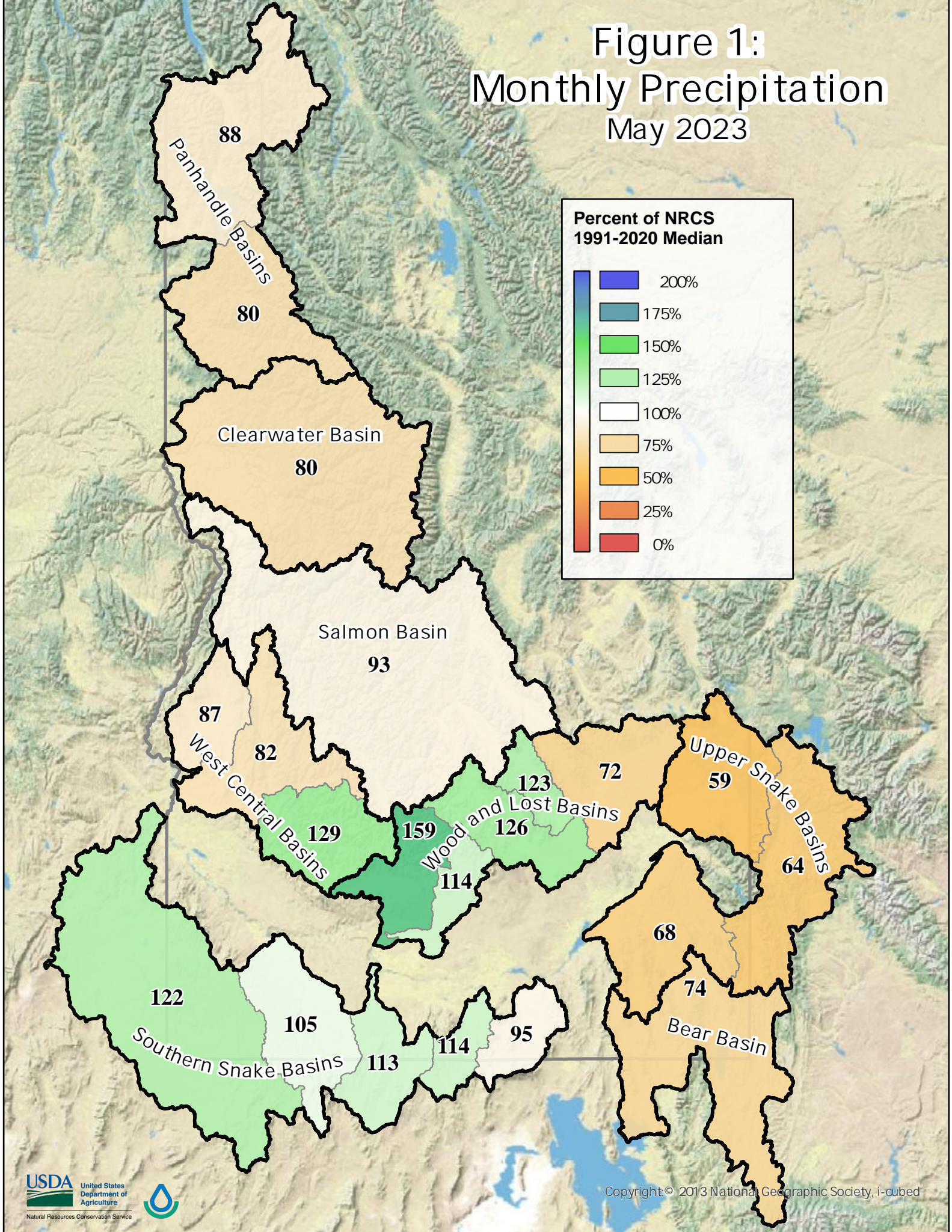
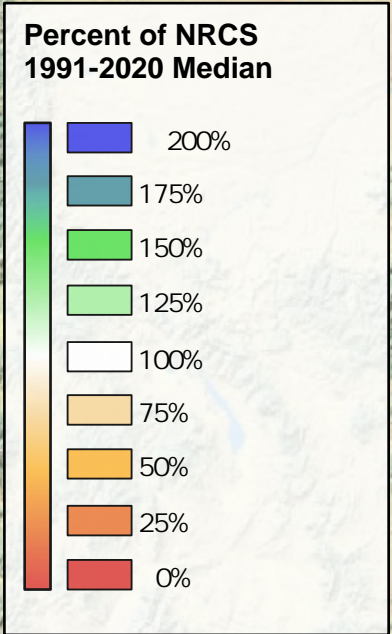
<i>BASIN or REGION</i>	<i>SWSI Value</i>	<i>Most Recent Year With Similar SWSI Value</i>	<i>Agricultural Water Supply Shortage May Occur When SWSI is Less Than</i>
Spokane	-2.5	2005	NA
Clearwater	-2.0	2021	NA
Salmon	-1.2	1991	NA
Weiser	0.0	2009	NA
Payette	-0.5	2014	NA
Boise	1.1	2010	- 2.7
Big Wood above Hailey	1.8	1996	NA
Big Wood	2.5	2019	-0.4
Camas Creek nr Blaine	1.3	2009	NA
Little Wood	2.3	1999	- 1.6
Big Lost	1.0	2019	0.6
Little Lost	1.8	1993	1.4
Teton	-0.3	2005	- 3.2
Henry's Fork	0.0	2020	- 2.9
Snake (Heise)	-0.8	2000	- 1.6
Oakley	1.1	1995	0.9
Salmon Falls above Jackpot	2.5	2017	NA
Salmon Falls	1.0	2016	- 0.6
Bruneau	1.8	2005	NA
Owyhee	1.2	2020	- 2.1
Bear River	-0.3	2022	- 3.7

### SWSI SCALE, PERCENT CHANCE OF EXCEEDANCE, AND INTERPRETATION

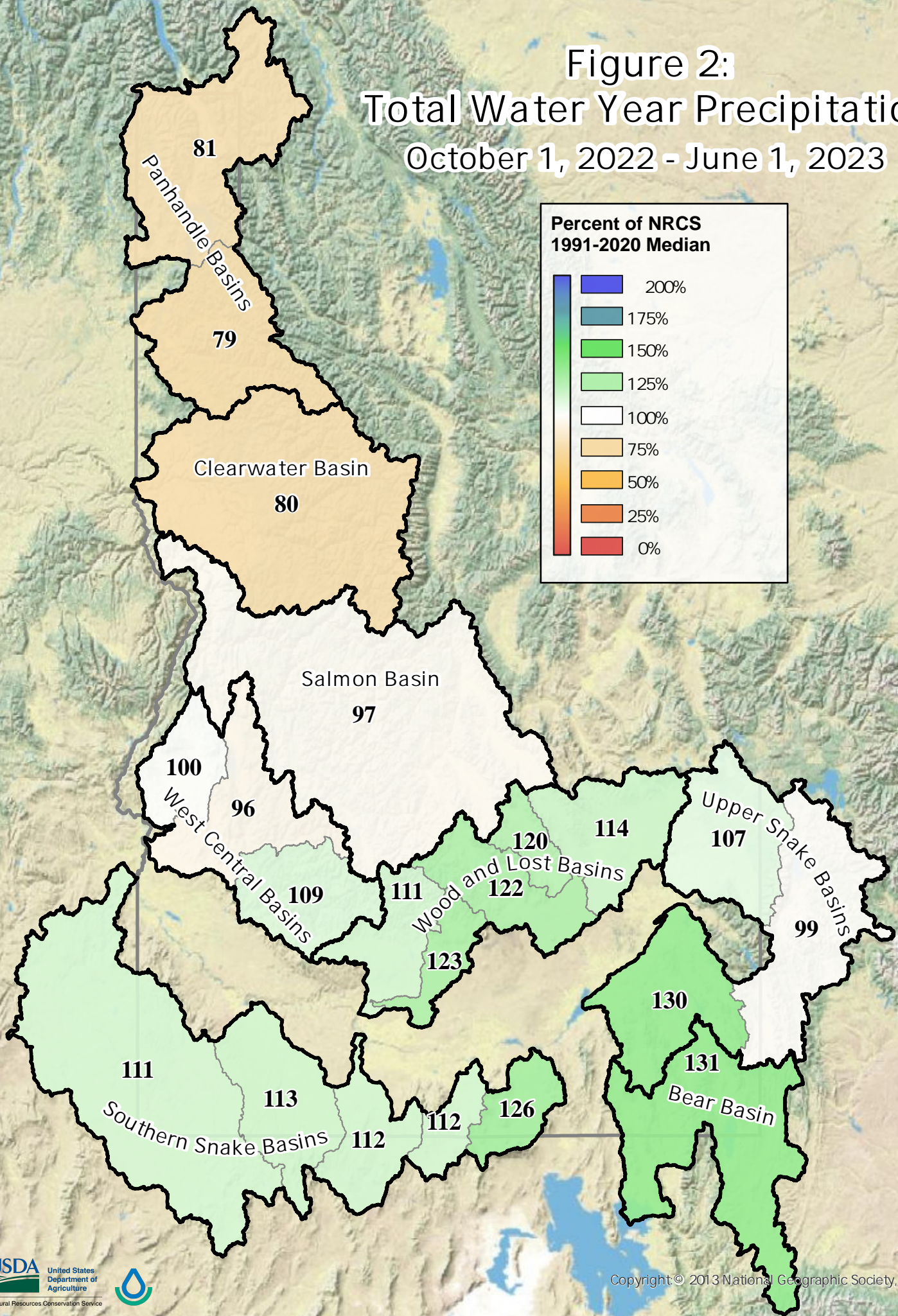
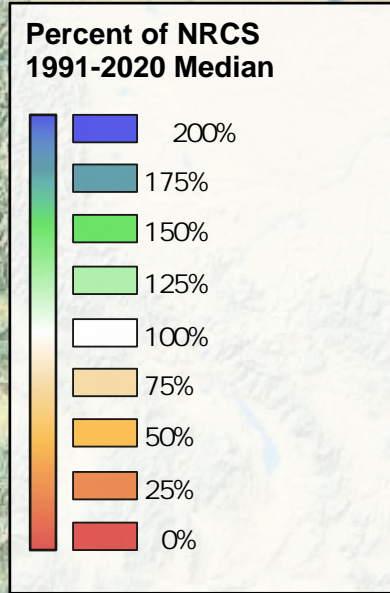


NA=Not Available / Not Applicable; Note: The Percent Chance of Exceedance is an indicator of how often a range of SWSI values might be expected to occur. Each SWSI unit represents about 12% of the historical occurrences. As an example of interpreting the above scale, the SWSI can be expected to be greater 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 May 2023

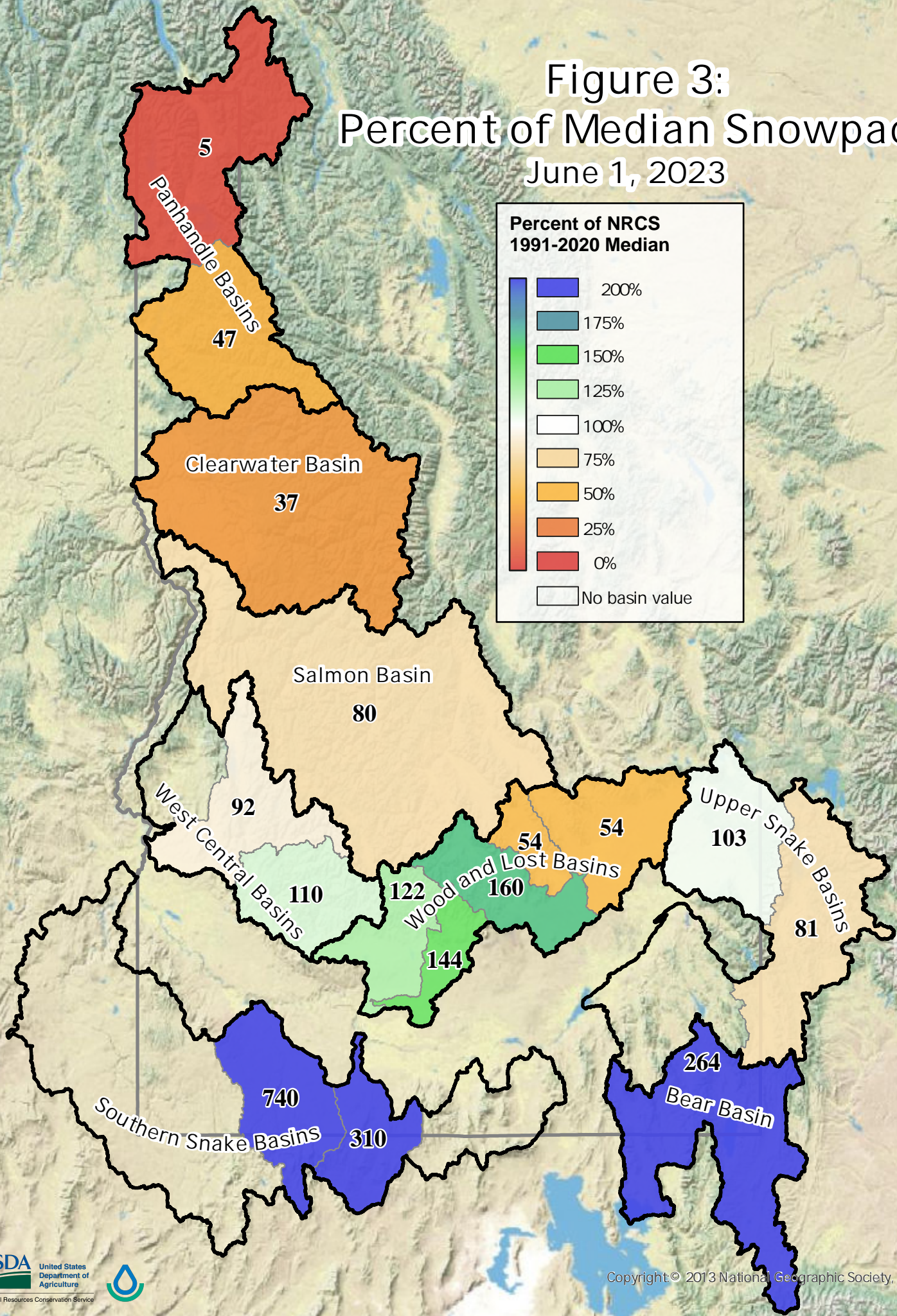
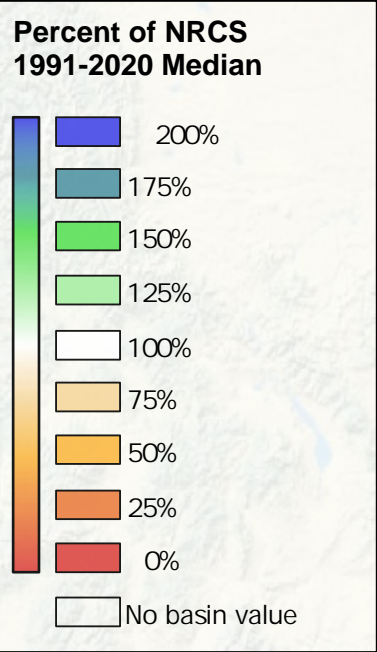


# Figure 2: Total Water Year Precipitation October 1, 2022 - June 1, 2023

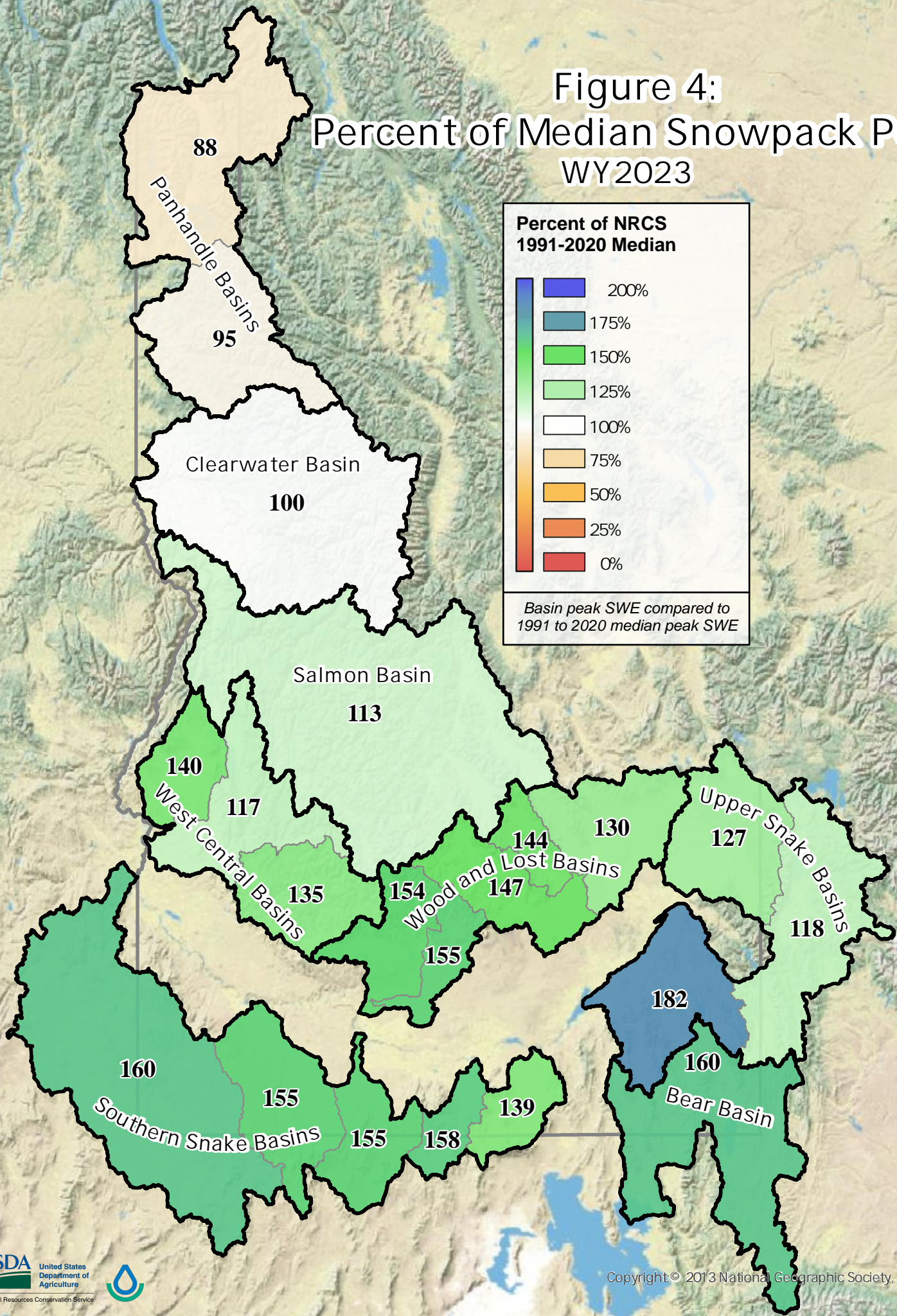
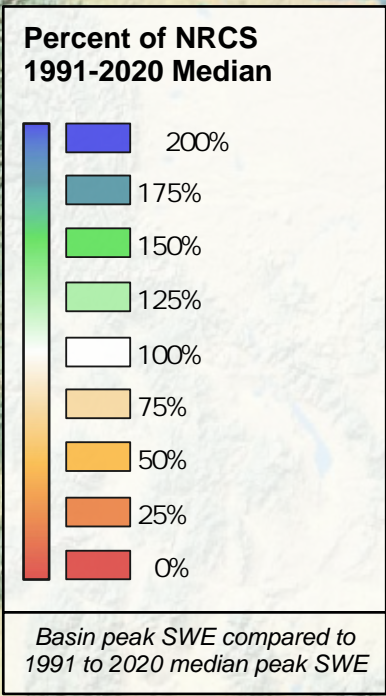




# Figure 3: Percent of Median Snowpack June 1, 2023



# Figure 4: Percent of Median Snowpack Peak WY2023

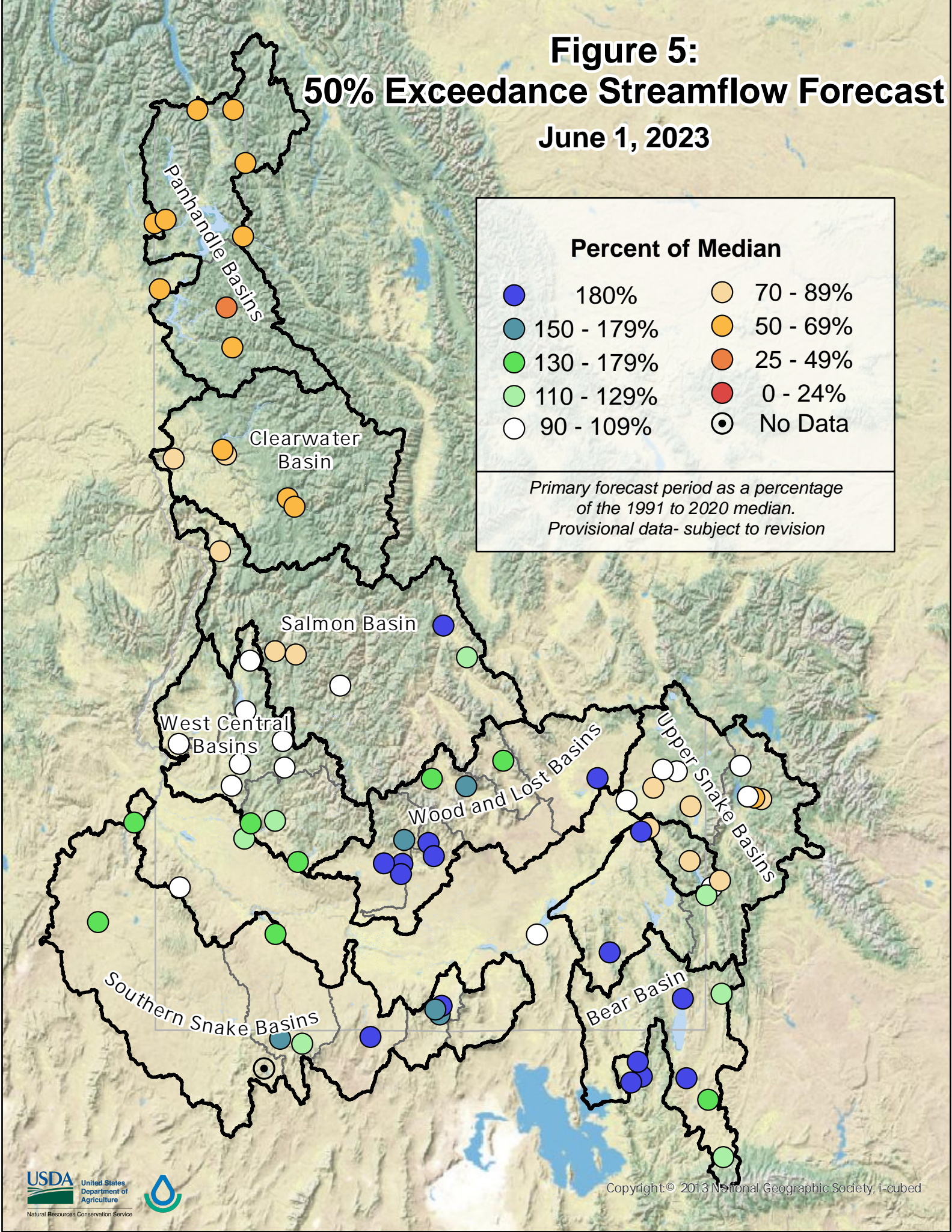


# Figure 5: 50% Exceedance Streamflow Forecast June 1, 2023

**Percent of Median**

<span style="color: blue;">●</span> 180%	<span style="color: orange;">●</span> 70 - 89%
<span style="color: teal;">●</span> 150 - 179%	<span style="color: yellow;">●</span> 50 - 69%
<span style="color: green;">●</span> 130 - 179%	<span style="color: red;">●</span> 25 - 49%
<span style="color: lightgreen;">●</span> 110 - 129%	<span style="color: darkred;">●</span> 0 - 24%
<span style="color: white;">○</span> 90 - 109%	<span style="color: black;">⊙</span> No Data

*Primary forecast period as a percentage of the 1991 to 2020 median.  
Provisional data- subject to revision*

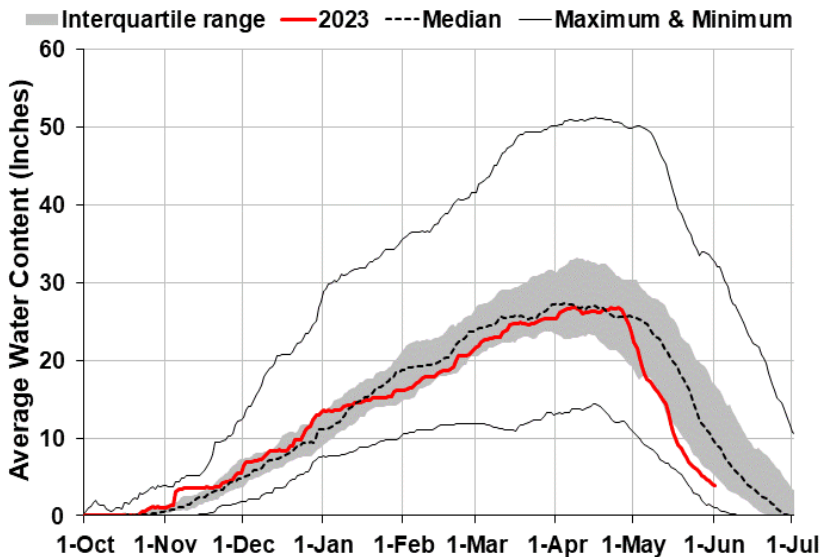




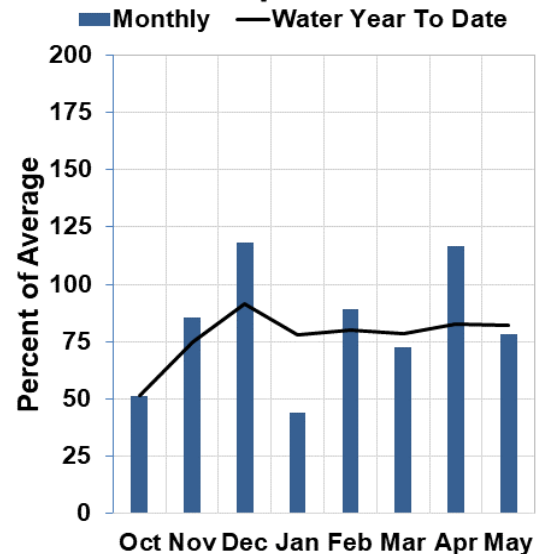
# Panhandle Basins

June 1, 2023

## Current Snowpack and Historic Range



## Precipitation



## WATER SUPPLY OUTLOOK

The Panhandle basins received between ~80 to 90% of normal precipitation in May (Fig. 1), and total water year precipitation is ~80% of normal (Fig. 2). The current snowpack ranges from ~5 to 50% of normal (Fig. 3). Despite peak snowpack occurring about two weeks later than usual, a very warm May caused rapid snowmelt and early peak streamflow across the basin. Snowmelt was so rapid in May that [some SNOTEL sites broke records for the largest monthly decrease in SWE](#). Although there was rapid snowmelt, there wasn't any major flooding across Panhandle basins. SWE peaked below normal at ~85% in the [Pend Orielle-Kootenai](#), and 95% in the [Coeur d'Alene-St. Joe](#) basins this winter (Fig. 4). [Drought is forecasted to persist in the Panhandle basins](#) and [NOAA's Official 30-Day Outlook](#) predicts increased chances of above normal temperatures and above normal precipitation in June.

Lakes in the Panhandle range from ~97 to 100% of normal storage: Lake Coeur d'Alene is at 100%, Lake Pend Oreille is at 97%, and Priest Lake is at 98%. Streamflow forecasts for June through September range from ~45 to 65% of normal at the 50% exceedance level in the Panhandle basins.

### Panhandle Region Streamflow Forecasts - June 1, 2023

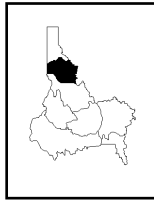
Forecast Point	Forecast Exceedance Probabilities for Risk Assessment							
	Forecast Period	<--Drier-->		-----Projected Volume-----		>--Wetter-->		30yr Med (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	
Moyie R at Eastport	JUN-JUL	23	54	75	63%	96	127	120
	JUN-SEP	29	62	85	63%	108	141	134
Kootenai R at Leonia 1 & 2	JUN-JUL	905	1810	2220	64%	2630	3530	3450
	JUN-SEP	1320	2330	2780	63%	3240	4250	4400
Boundary Ck nr Porthill	JUN-JUL	10.6	18.1	23	56%	28	36	41
	JUN-SEP	13.1	21	27	61%	32	41	44
Clark Fork R bl Cabinet Gorge Dam 2	JUN-JUL	1400	2330	2950	62%	3580	4500	4790
	JUN-SEP	1910	2950	3660	64%	4370	5410	5750
Pend Oreille Lake Inflow 2	JUN-JUL	1380	2470	3210	60%	3950	5040	5340
	JUN-SEP	1950	3180	4010	64%	4840	6070	6260
Priest R nr Priest River 2	JUN-JUL	51	116	160	60%	205	270	265
	JUN-SEP	62	135	185	60%	235	310	310
NF Coeur d'Alene R at Enaville	JUN-JUL	9	27	59	48%	91	137	122
	JUN-SEP	9.6	40	73	47%	107	156	156
St. Joe R at Calder 2	JUN-JUL	0.85	113	190	64%	265	380	295
	JUN-SEP	37	156	235	65%	320	440	360
Spokane R nr Post Falls 2	JUN-JUL	40	117	255	50%	395	600	505
	JUN-SEP	52	163	310	50%	455	670	625

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

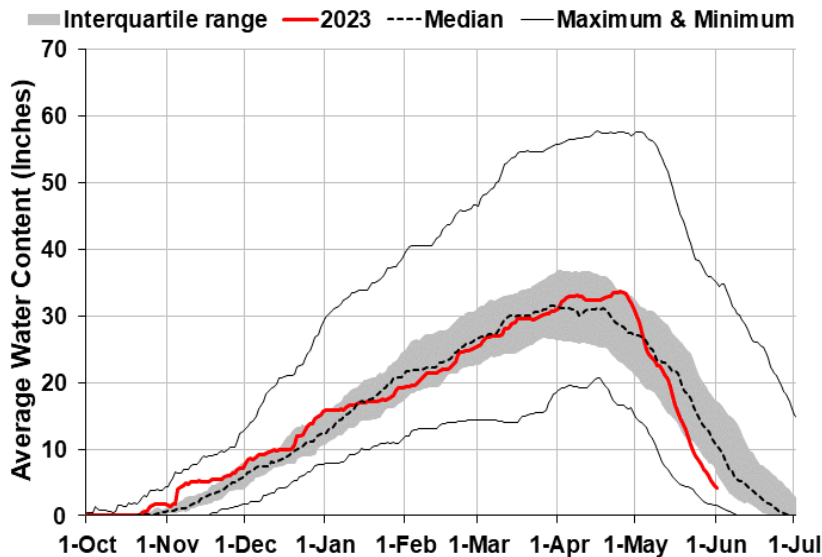
Reservoir Storage (KAF): End of May					Watershed Snowpack Analysis: June 1, 2023			
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)	Basin Name	# of Sites	% of Median 2023	% of Median 2022
Hungry Horse Lake	3117.6	2939.5	2954.0	3451.0	Moyie River	1	0%	406%
Flathead Lake	1709.1	1398.6	1542.0	1791.0	Priest River	3	10%	189%
Noxon Rapids Reservoir	318.8	320.4	328.3	335.0	Rathdrum Creek	2		
Lake Pend Oreille	1281.8	1292.9	1318.0	1561.3	Coeur d' Alene River	4	0%	482%
Priest Lake	130.4	132.7	133.7	119.3	St. Joe River	4	52%	140%
Lake Coeur d' Alene	231.5	227.3	231.3	238.5	Pend Oreille Lake	4	7%	154%
					Palouse River	2		
					Lower Kootenai	2	0%	656%
					Pend Oreille-Kootenai	9	5%	195%
					Coeur d' Alene-St. Joe Total	7	40%	203%



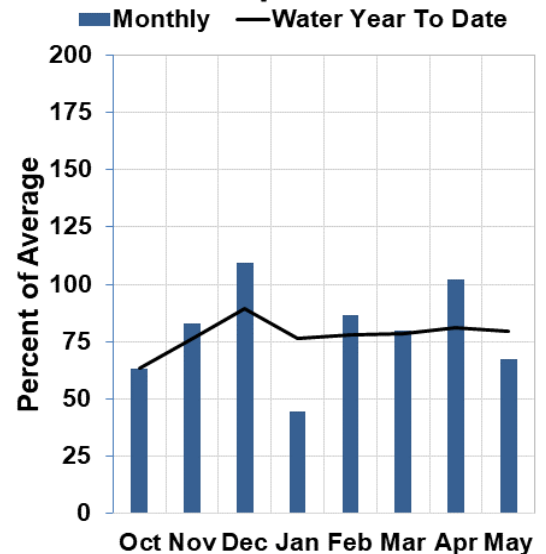
# Clearwater River Basin

June 1, 2023

## Current Snowpack and Historic Range



## Precipitation



## WATER SUPPLY OUTLOOK

The Clearwater Basin received ~80% of normal precipitation in May (Fig. 1), and total water year precipitation is ~80% of normal (Fig. 2). Despite peak snowpack occurring about two weeks later than usual, a very warm May caused rapid snowmelt and early peak streamflow throughout the basin. Snowmelt was so rapid in May that [some SNOTEL sites broke records for the largest monthly decrease in SWE](#), leaving basin snowpack at only 35% of normal as of June 1 (Fig. 3). Although there was rapid snowmelt, there was no major flooding across Clearwater basin. The [Clearwater Basin reached 100% of its normal peak SWE](#) (Fig. 4). The Climate Prediction Center predicts [drought will persist](#) in this basin and [NOAA's Official 30-Day Outlook](#) predicts increased chances of above normal temperatures and precipitation in June.

Dworshak Reservoir is currently at 92% of its storage capacity, which is 102% of normal at this time of the year. Streamflow forecasts for the June through September period range from ~65 to 75% of normal at the 50% exceedance level for the Clearwater River Basin.

**Clearwater River Basin Streamflow Forecasts - June 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)
Selway R nr Lowell	JUN-JUL	245	405	515	66%	620	780	785
	JUN-SEP	315	480	595	69%	715	880	865
Lochsa R nr Lowell	JUN-JUL	141	260	345	66%	425	545	520
	JUN-SEP	189	315	400	67%	490	615	595
Dworshak Reservoir Inflow 2	JUN-JUL	210	375	490	64%	605	770	760
	JUN-SEP	315	505	630	70%	755	945	900
Clearwater R at Orofino	JUN-JUL	715	1000	1200	77%	1390	1680	1550
	JUN-SEP	870	1190	1400	77%	1610	1930	1810
Clearwater R at Spalding 2	JUN-JUL	910	1390	1710	74%	2040	2520	2310
	JUN-SEP	1180	1700	2060	75%	2410	2930	2730

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

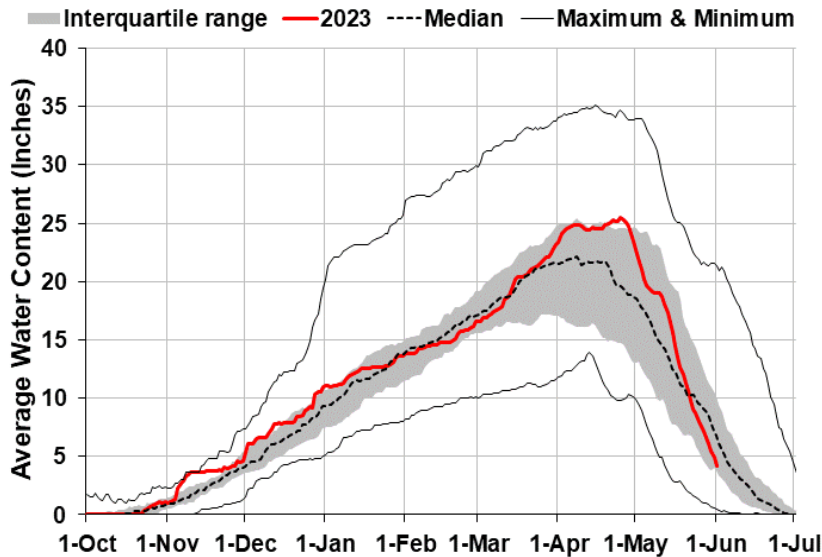
Reservoir Storage (KAF): End of May					Watershed Snowpack Analysis: June 1, 2023			
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)	Basin Name	# of Sites	% of Median 2023	% of Median 2022
Dworshak Reservoir	3195.0	3120.0	3132.0	3468.0	NF Clearwater River	9	41%	162%
					Lochsa River	2	0%	421%
					Selway River	4	10%	306%
					SF Clearwater River	1	127%	#####
					Clearwater Basin Total	16	37%	180%



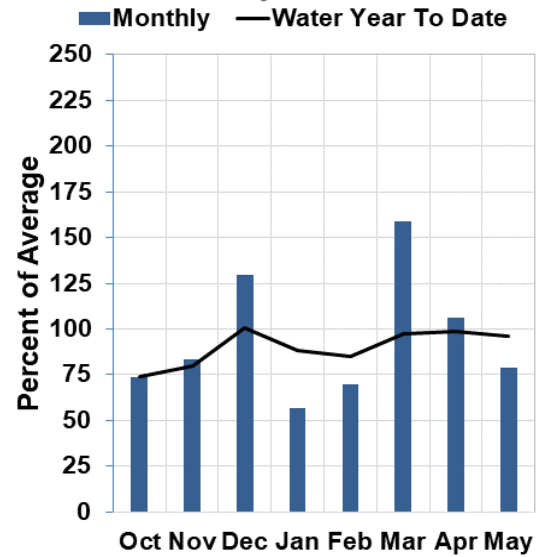
# Salmon River Basin

June 1, 2023

## Current Snowpack and Historic Range



## Precipitation



## WATER SUPPLY OUTLOOK

Near normal precipitation totals continued in May (93%, Fig. 1), with the highest precipitation totals observed in the headwaters of the Salmon River basin above Stanley, Idaho near Galena Summit. Water year total precipitation remains near normal (97%, Fig. 2). With warmer than normal temperatures throughout May, snowmelt accelerated over the last month and what remains is 80% of normal for June 1 (Fig. 3). There's limited to no snow below 7,000 ft. elevation with only 15% of the snowpack remaining compared to the [2023 seasonal peak](#) observed in late April.

The Salmon River Basin streamflow forecasts are near normal and range from ~74 to 109%, except the Lemhi River (125%) for the June through September period. The Climate Prediction Center's [30-Day Outlook](#) for June predicts warmer than normal temperatures and above normal precipitation. The seasonal [snowmelt-runoff peak](#) likely occurred in May on the Middle Fork Salmon, but recreationalists with float plans will want to continue to keep an eye on spring weather as major precipitation-driven hydrologic events can still occur.



**Salmon River Streamflow Forecasts - June 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	JUN-JUL	335	400	445	110%	485	550	405
	JUN-SEP	450	530	580	109%	630	710	530
Lemhi R nr Lemhi	JUN-JUL	28	38	45	129%	52	62	35
	JUN-SEP	39	51	60	125%	68	81	48
MF Salmon R at MF Lodge	JUN-JUL	240	285	320	100%	350	395	320
	JUN-SEP	315	365	400	99%	430	485	405
SF Salmon R nr Krassel Ranger Station	JUN-JUL	56	80	96	86%	112	136	112
	JUN-SEP	71	96	113	87%	130	155	130
Johnson Ck at Yellow Pine	JUN-JUL	46	58	67	76%	75	88	88
	JUN-SEP	52	65	74	74%	82	95	100
Salmon R at White Bird	JUN-JUL	1630	2030	2300	89%	2570	2970	2590
	JUN-SEP	2010	2450	2750	89%	3050	3490	3080

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

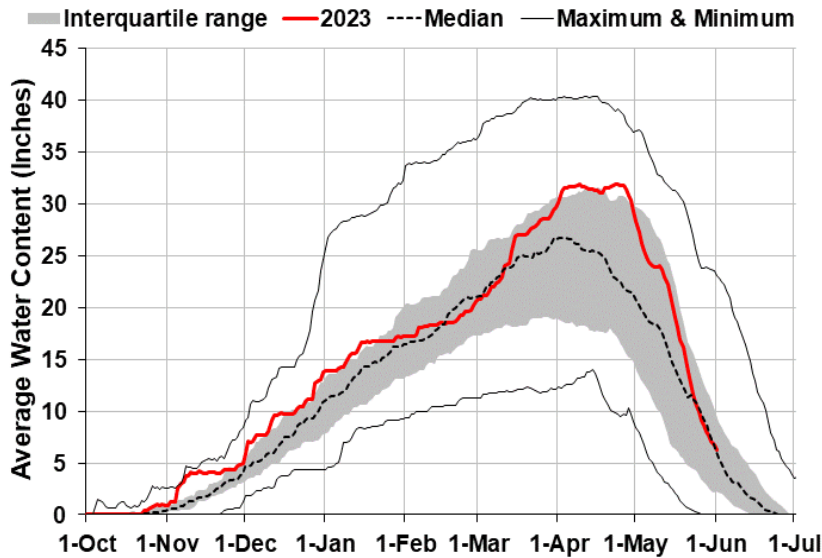
Watershed Snowpack Analysis: June 1, 2023			
Basin Name	# of Sites	% of Median	
		2023	2022
Salmon River ab Salmon	6	94%	207%
Lemhi River	3	54%	377%
MF Salmon River	3	93%	174%
SF Salmon River	3	87%	183%
Little Salmon River	4		
Lower-Middle Salmon	4	38%	689%
Salmon Basin Total	19	80%	229%



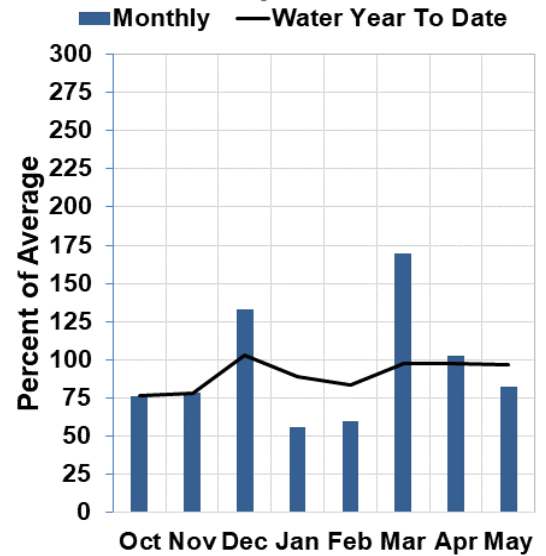
# West Central Basins

June 1, 2023

## Current Snowpack and Historic Range



## Precipitation



## WATER SUPPLY OUTLOOK

Convective and isolated storms were frequent throughout May across the West Central Mountains. This weather pattern resulted in highly variable precipitation totals across the area, and basin level totals ranged from 130% in the Boise Basin to 82% in the Payette Basin, while the Weiser Basin received 87% of normal monthly precipitation (Fig. 1). Water year total precipitation is now ~95 to 110% of normal (Fig. 2). Limited snow remains below 7,000 ft elevation area wide, and an [aerial reconnaissance on May 23](#) revealed that little snow remained outside of the Trinity Mountains in the Boise River Basin. The 2023 snowpack exceeded the normal seasonal peak in each of the [Weiser](#), [Boise](#), and [Payette](#) River basins (Fig. 4). According to our SNOTEL observations on June 1, no snow remains in the Weiser basin and only 12% and 32% of the peak 2023 snowpack remains in the Payette and Boise basins.

Reservoir storage in the Boise system (Anderson Ranch, Arrowrock and Lucky Peak combined) is 102% of normal, and storage in the Payette system is 97% of normal. Flood control releases are being reduced to prepare for the final fill of these systems. Streamflow forecasts for the Boise River system range from ~113 to 135% of normal for the May through September period, and the Payette is ~95 to 100% of normal. The Climate Prediction Center's [30-Day Outlook](#) for June predicts warmer temperatures and above normal precipitation.

### West Central Basins Streamflow Forecasts - June 1, 2023

Forecast Point	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment							30yr Med (KAF)
		<--Drier-----Projected Volume-----Wetter-->					30% (KAF)	10% (KAF)	
		90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)			
SF Boise R at Anderson Ranch Dam 2	JUN-JUL	142	169	188	135%	205	235	139	
	JUN-SEP	182	210	230	135%	250	280	171	
Boise R nr Twin Springs	JUN-JUL	205	235	260	113%	285	315	230	
	JUN-SEP	245	285	310	113%	335	370	275	
Mores Ck nr Arrowrock Dam	JUN-JUL	17.1	22	26	130%	30	35	20	
	JUN-SEP	20	26	30	125%	34	40	24	
Boise R nr Boise 2	JUN-JUL	395	450	485	124%	520	570	390	
	JUN-SEP	495	550	590	120%	630	690	490	
Lake Fork Payette R nr McCall	JUN-JUL	25	32	36	95%	41	48	38	
	JUN-SEP	27	34	39	98%	44	51	40	
NF Payette R at Cascade 2	JUN-JUL	99	138	165	98%	192	230	169	
	JUN-SEP	97	140	170	97%	200	245	176	
NF Payette R nr Banks 2	JUN-JUL	119	168	200	98%	235	280	205	
	JUN-SEP	120	172	205	95%	240	295	215	
SF Payette R at Lowman	JUN-JUL	172	195	210	102%	225	250	205	
	JUN-SEP	220	245	260	100%	280	305	260	
Deadwood Reservoir Inflow 2	JUN-JUL	32	40	45	100%	49	57	45	
	JUN-SEP	40	48	54	96%	60	68	56	
Payette R nr Horseshoe Bend 2	JUN-JUL	360	455	520	95%	585	685	550	
	JUN-SEP	445	550	620	95%	690	795	655	
Weiser R nr Weiser	JUN-JUL	51	70	85	106%	101	127	80	
	JUN-SEP	68	89	105	102%	122	149	103	

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

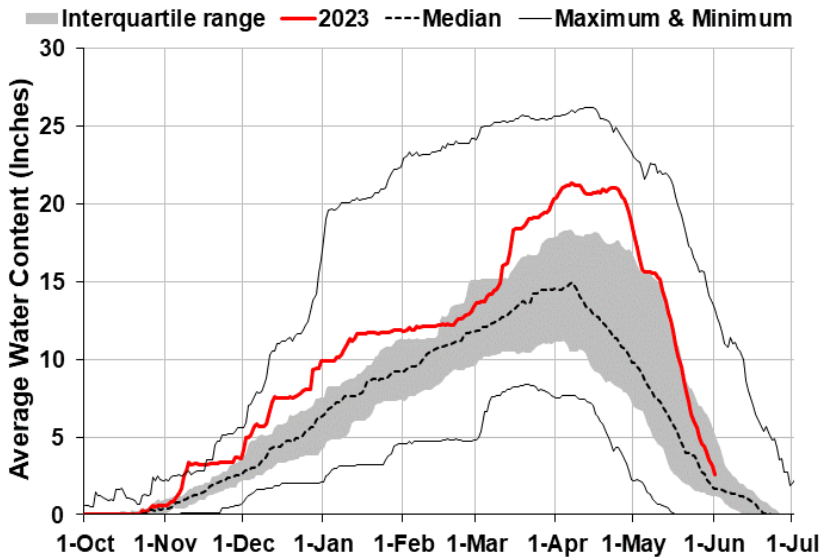
Reservoir Storage (KAF): End of May					Watershed Snowpack Analysis: June 1, 2023			
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)	Basin Name	# of Sites	% of Median 2023	% of Median 2022
Anderson Ranch Reservoir	419.4	322.5	399.6	450.2	SF Boise River	6	108%	109%
Arrowrock Reservoir	235.2	254.4	219.9	272.2	MF & NF Boise Rivers	5	131%	117%
Lucky Peak Reservoir	265.5	242.1	284.4	293.2	Mores Creek	2		
<b>Sub-Basin Total</b>	<b>920.0</b>	<b>819.0</b>	<b>903.9</b>	<b>1015.6</b>	Canyon Creek	1		
Deadwood Reservoir	135.9	117.6	145.3	161.9	<b>Boise Basin Total</b>	<b>10</b>	<b>110%</b>	<b>117%</b>
Cascade Reservoir	619.3	617.3	635.8	693.2	NF Payette River	6	64%	277%
<b>Sub-Basin Total</b>	<b>755.2</b>	<b>734.9</b>	<b>781.1</b>	<b>855.1</b>	SF Payette River	4	103%	173%
Lake Lowell	129.6	99.8	132.5	165.2	<b>Payette Basin Total</b>	<b>12</b>	<b>92%</b>	<b>204%</b>
Mann Creek Reservoir	10.7	10.7	10.9	11.1	Mann Creek	1		
					<b>Weiser Basin Total</b>	<b>4</b>		



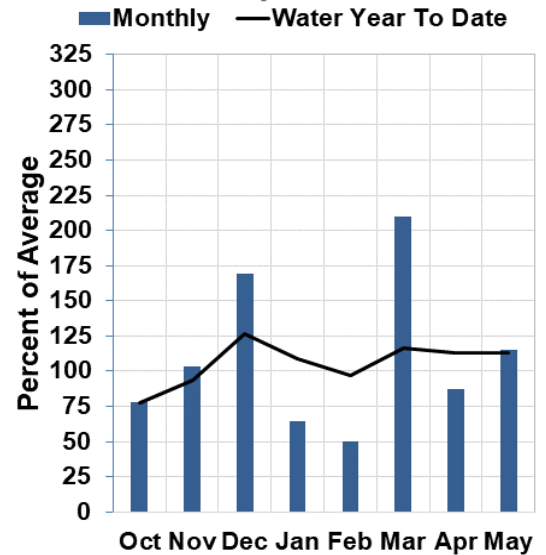
# Wood & Lost River Basins

June 1, 2023

## Current Snowpack and Historic Range



## Precipitation



## WATER SUPPLY OUTLOOK

Monthly precipitation in May was above normal across the Wood and Lost River basins. The Big and Little Wood, as well as the Big and Little Lost basins, received [~114 to 159%](#) of normal monthly precipitation, while the Birch-Medicine Lodge Basin received only [~72%](#) of normal. Water year total precipitation remains above normal across the region and now ranges from [~111 to 123%](#) of normal. Many SNOTEL sites within the region have melted out entirely. The lowest elevation site to still hold onto snow is Dollarhide Summit (8,420 ft.) in the Smokey Mountains. SNOTEL sites above ~8,420 ft. continue to rapidly melt while sites below this elevation no longer hold snow. Streamflow was extremely high across the region during May; observed streamflow was [~131 to 472%](#) of normal. The [Big Wood River in Hailey](#) has been in the minor flood stage since May 15, and increased to a moderate flood stage from May 19 to 27, before receding back to the minor flood stage. Although Big Wood River is currently holding at the minor flood stage, the streamflow is [forecasted to increase to moderate flood stage](#) by next week. Additional rivers within the region that reached flood stage during May are: [Camas Creek](#), [Big Lost River](#), and the [Little Wood River](#).

June 1 reservoir storage in these basins is mixed when compared to the 30-year normal, with values for Magic Reservoir (134% normal, 98% full), Mackay Reservoir (76% normal, 63% full), and Little Wood Reservoir (99% normal, 90% full). [Streamflow forecasts](#) for the Wood and Lost basins are still significantly above normal and range from ~138 to 270% of normal. NOAA's [Northwest River Forecast Center](#) also provides a variety of additional products related to flood forecasting and awareness.

### Wood and Lost Basins Streamflow Forecasts - June 1, 2023

Forecast Point	Forecast Exceedance Probabilities for Risk Assessment								
	Forecast Period	<--Drier-->			-----Projected Volume-----		>--Wetter-->		30yr Med (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)		
Camas Ck at Camas	JUN-JUL	3.5	6.2	8.4	233%	11	15.4	3.6	
Little Lost R bl Wet Ck nr Howe	JUN-JUL	15	17.6	19.3	142%	21	24	13.6	
	JUN-SEP	20	24	26	145%	28	32	17.9	
Big Lost R at Howell Ranch	JUN-JUL	92	112	126	138%	140	160	91	
	JUN-SEP	109	132	148	140%	165	188	106	
Big Lost R bl Mackay Reservoir	JUN-JUL	73	90	103	163%	115	133	63	
	JUN-SEP	96	116	130	155%	144	165	84	
Little Wood R ab High Five Ck	JUN-JUL	31	39	45	214%	51	61	21	
	JUN-SEP	37	46	53	212%	60	71	25	
Little Wood R nr Carey 2	JUN-JUL	32	40	46	219%	52	63	21	
	JUN-SEP	35	44	51	213%	58	70	24	
Big Wood R at Hailey	JUN-JUL	131	152	166	171%	180	200	97	
	JUN-SEP	157	182	199	167%	215	240	119	
Big Wood R ab Magic Reservoir	JUN-JUL	83	108	127	208%	147	180	61	
	JUN-SEP	93	120	141	207%	163	199	68	
Camas Ck nr Blaine	JUN-JUL	4.6	7.5	10	270%	12.8	17.6	3.7	
	JUN-SEP	5.3	8.5	11	275%	13.9	18.7	4	
Big Wood R bl Magic Dam 2	JUN-JUL	112	134	151	248%	169	196	61	
	JUN-SEP	124	149	167	235%	186	215	71	

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

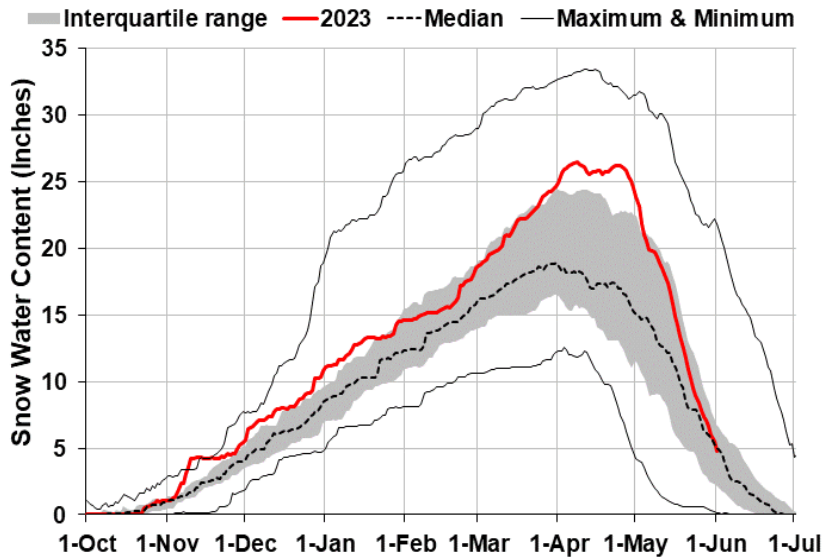
Reservoir Storage (KAF): End of May					Watershed Snowpack Analysis: June 1, 2023			
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)	Basin Name	# of Sites	% of Median	
							2023	2022
Mackay Reservoir	28.0	27.0	36.8	44.4	Camas-Beaver Creeks	2		
Little Wood Reservoir	26.9	25.7	27.3	30.0	Birch-Medicine Lodge Creeks	2	54%	464%
Magic Reservoir	187.6	42.1	139.5	191.5	Little Lost River	3	54%	374%
					Big Lost River ab Mackay	4	160%	205%
					Big Lost Basin Total	5	160%	222%
					Fish Creek	0		
					Little Wood ab Resv	4	144%	207%
					Big Wood River ab Hailey	6	122%	197%
					Camas Creek	2		
					Birch-Medicine Lodge-Camas-Beaver Total	4	54%	464%
					Little Wood Basin Total	4	144%	207%
					Big Wood Basin Total	8	122%	197%



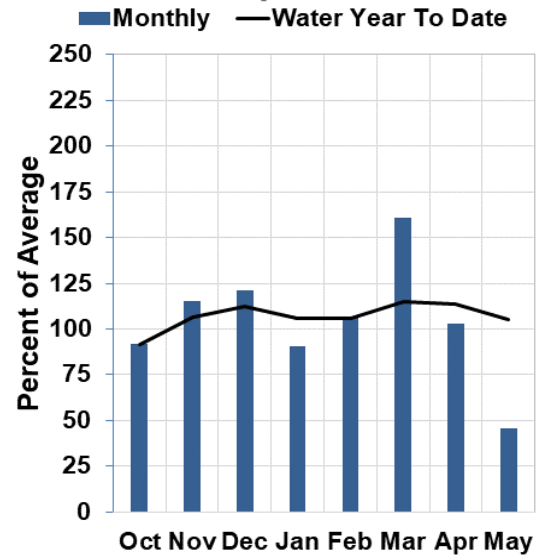
# Upper Snake River Basins

June 1, 2023

## Current Snowpack and Historic Range



## Precipitation



## WATER SUPPLY OUTLOOK

Monthly precipitation for May was well below normal in the Upper Snake River, ranging from ~60 to 70%. Water year total precipitation decreased last month as a result of the drier than normal May but remains near normal to above normal at ~100% in the Snake River above Heise, at ~105% in Henrys Fork-Teton, and 130% in Willow-Blackfoot-Portneuf basins (Fig. 2). While snowpack in the Upper Snake basins was well above normal at the beginning of May, warm temperatures throughout the month resulted in rapid melting. Several sites in the region experienced the [largest amount of SWE loss on record for May](#). As of June 1, snowpack is ~105% of normal in Henrys Fork-Teton and ~80% in Snake River above Heise. SNOTEL stations in the Willow-Blackfoot-Portneuf Basin were melted out as of June 1.

Storage is 101% of normal for the Upper Snake system. The Jackson Lake and Palisades reservoirs are 102% of normal (78% of capacity), and Henrys Fork-Teton reservoirs are 100% of normal (99% of capacity). Storage for the lower system, American Falls and Lake Walcott, is ~90% of normal. Median streamflow forecasts for the region range from ~69 to 120% for the June through September runoff period, except in the Willow-Blackfoot-Portneuf. Willow Creek near Rire is forecast for ~305% of normal for the June through July period, while Portneuf at Topaz is forecast ~168% for the June through September runoff period. The Portneuf River ([at Topaz](#), and [Pocatello](#)) has been in flood stage for most of May and remains a concern. [NOAA's Northwest River Forecast Center](#) provides a variety of products related to flood forecasting and awareness, and users should stay up to date throughout the runoff season.

### Upper Snake River Basin Streamflow Forecasts - June 1, 2023

Forecast Point	Forecast Exceedance Probabilities for Risk Assessment							
	Forecast Period	<--Drier-----Projected Volume-----Wetter-->						30yr Med (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	
Henrys Fk nr Ashton 2	JUN-JUL	149	177	196	102%	215	245	193
	JUN-SEP	290	325	345	96%	370	405	360
Falls R nr Ashton 2	JUN-JUL	155	176	190	97%	205	225	195
	JUN-SEP	225	255	270	100%	290	320	270
Teton R nr Driggs	JUN-JUL	61	74	84	85%	93	107	99
	JUN-SEP	90	108	120	92%	133	151	131
Teton R nr St Anthony	JUN-JUL	122	155	178	85%	200	235	210
	JUN-SEP	179	220	245	88%	270	310	280
Henrys Fk nr Rexburg 2	JUN-JUL	440	525	585	96%	640	725	610
	JUN-SEP	720	825	900	96%	970	1080	940
Snake R at Flagg Ranch	JUN-JUL	150	184	205	91%	230	265	225
	JUN-SEP	187	225	245	92%	270	310	265
Snake R nr Moran 2	JUN-JUL	280	325	360	97%	395	440	370
	JUN-SEP	345	400	435	96%	470	525	455
Pacific Ck at Moran	JUN-JUL	10.6	31	46	67%	60	81	69
	JUN-SEP	16.7	38	53	69%	68	89	77
Buffalo Fk ab Lava Ck nr Moran	JUN-JUL	109	132	147	74%	162	185	200
	JUN-SEP	131	158	176	73%	194	220	240
Snake R ab Reservoir nr Alpine 2	JUN-JUL	735	840	910	72%	980	1080	1260
	JUN-SEP	960	1080	1170	76%	1250	1380	1530
Greys R ab Reservoir nr Alpine	JUN-JUL	145	161	171	104%	182	198	164
	JUN-SEP	191	210	225	107%	235	255	210
Salt R ab Reservoir nr Etna	JUN-JUL	119	146	165	129%	184	210	128
	JUN-SEP	186	220	240	120%	260	295	200
Snake R nr Irwin 2	JUN-JUL	1130	1270	1370	81%	1470	1610	1690
	JUN-SEP	1470	1640	1760	82%	1870	2040	2150
Snake R nr Heise 2	JUN-JUL	1300	1450	1550	88%	1650	1800	1760
	JUN-SEP	1700	1880	2000	88%	2120	2300	2280
Willow Ck nr Ririe 2	JUN-JUL	14.2	20	25	305%	30	39	8.2
Portneuf R at Topaz	JUN-JUL	38	42	45	196%	48	53	23
	JUN-SEP	56	63	67	168%	72	78	40
Snake R at Neeley 2	JUN-JUL	325	610	810	91%	1000	1290	895
	JUN-SEP	175	525	760	90%	995	1350	840

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

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

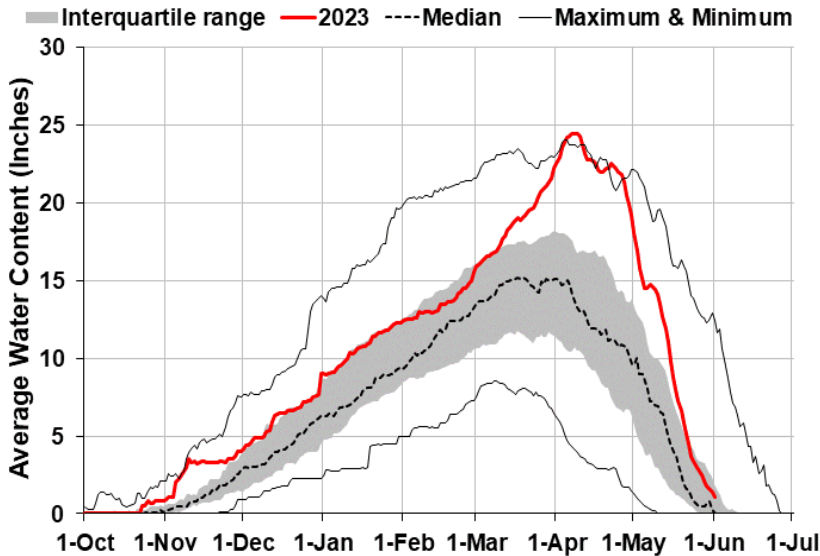
Reservoir Storage (KAF): End of May					Watershed Snowpack Analysis: June 1, 2023			
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)	Basin Name	# of Sites	% of Median 2023	% of Median 2022
Jackson Lake	532.8	245.9	741.6	847.0	Henrys Fork-Falls River	5	121%	107%
Palisades Reservoir	1220.8	783.9	974.3	1400.0	Teton River	3	85%	91%
<b>Sub-Basin Total</b>	<b>1753.6</b>	<b>1029.8</b>	<b>1715.9</b>	<b>2247.0</b>	Henrys Fork-Teton	8	103%	99%
Henrys Lake	91.8	88.7	88.0	90.4	Snake River ab Jackson Lake	5	87%	114%
Island Park Reservoir	131.8	134.7	134.2	135.2	Pacific Creek	2	72%	114%
Grassy Lake	14.7	14.0	15.1	15.2	Buffalo Fork	2	41%	105%
<b>Sub-Basin Total</b>	<b>238.3</b>	<b>237.4</b>	<b>237.3</b>	<b>240.8</b>	Gros Ventre River	3	35%	136%
Ririe Reservoir	77.1	62.1	75.5	80.5	Hoback River	4	73%	126%
Blackfoot Reservoir		247.2	220.5	337.0	Greys River	5	103%	177%
American Falls Reservoir	1498.0	1192.7	1534.0	1672.6	Salt River	4	102%	277%
<b>Basin-Wide Total</b>	<b>3567.1</b>	<b>2769.2</b>	<b>3783.2</b>	<b>4577.9</b>	Snake ab Palisades Resv	19	79%	130%
					Willow Creek	5	103%	177%
					Blackfoot River	2		
					Portneuf River	3		
					Willow-Blackfoot-Portneuf	6		



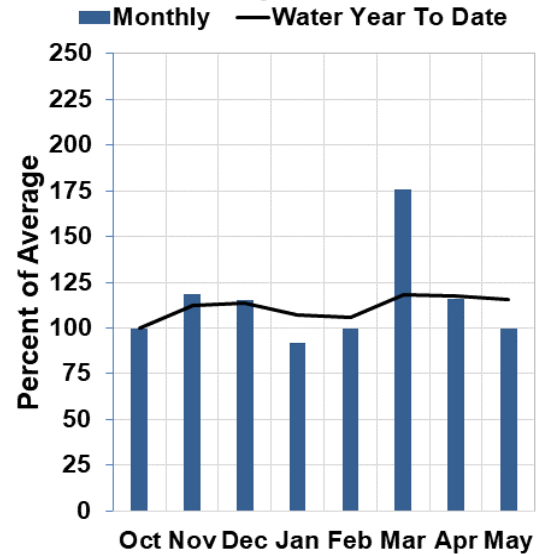
# Southern Snake River Basins

June 1, 2023

## Current Snowpack and Historic Range



## Precipitation



## WATER SUPPLY OUTLOOK

The Southern Snake River basins saw slightly above normal monthly precipitation in all five basins. Monthly precipitation ranged between [~95 to 122%](#) of normal. Water year total precipitation continues to stay above average and is ~111 to 126% of normal across these basins. All SNOTEL sites in these basins have melted out except for Pole Creek R.S. (8,360 ft.) in the Jawbridge Wilderness, with ~12% of its peak SWE (3.1" SWE compared to WY peak of 26.6") remaining. Streamflow remained high across all Southern Snake basins during May; observed streamflow was [~188 to 264%](#) of normal.

Reservoir storage, as a percent of normal, remains healthy over these basins. Current percent of normal storage in Oakley is 101%, Wild Horse 148%, Lake Owyhee ~113%, and Salmon Falls ~105%. The current [streamflow volume forecasts](#) are well above normal at the 50% exceedance probability in each basin, they are: Owyhee ~135%, Bruneau ~141%, Salmon Falls ~188%, and Goose Creek ~188%. According to the [Northwest River Forecast Center](#), Salmon Falls Creek is running at 80% of bankfull capacity and the Owyhee and Bruneau Rivers are running at normal flow rates.



### Southside Snake River Basins Streamflow Forecasts - June 1, 2023

Forecast Point	Forecast Exceedance Probabilities for Risk Assessment							
	Forecast Period	<--Drier-----Projected Volume-----Wetter-->						30yr Med (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	
Goose Ck ab Trapper Ck nr Oakley	JUN-JUL	2.3	3.7	4.7	168%	5.9	8	2.8
	JUN-SEP	3.1	4.6	5.8	161%	7.1	9.3	3.6
Trapper Ck nr Oakley	JUN-JUL	1.91	2.2	2.4	156%	2.7	3	1.54
	JUN-SEP	3.1	3.4	3.7	148%	3.9	4.3	2.5
Oakley Reservoir Inflow	JUN-JUL	5.9	7.8	9.3	211%	10.9	13.4	4.4
	JUN-SEP	9	11.2	12.8	210%	14.5	17.2	6.1
Salmon Falls Ck nr San Jacinto	JUN-JUL	18.5	24	28	188%	32	39	14.9
	JUN-SEP	22	28	32	180%	36	43	17.8
Bruneau R nr Hot Spring	JUN-JUL	53	69	82	141%	96	118	58
	JUN-SEP	57	74	87	136%	101	124	64
Reynolds Ck at Tollgate	JUN-JUL	0.45	0.8	1.1	94%	1.44	2	1.17
	JUN-SEP	0.44	0.78	1.07	#DIV/0!	1.4	1.97	0
Owyhee R nr Gold Ck 2								
Owyhee R nr Rome	JUN-JUL	30	46	60	136%	75	101	44
	JUN-SEP	42	61	76	131%	93	120	58
Owyhee R bl Owyhee Dam 2	JUN-JUL	42	61	75	134%	91	117	56
	JUN-SEP	67	88	105	122%	123	152	86

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

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

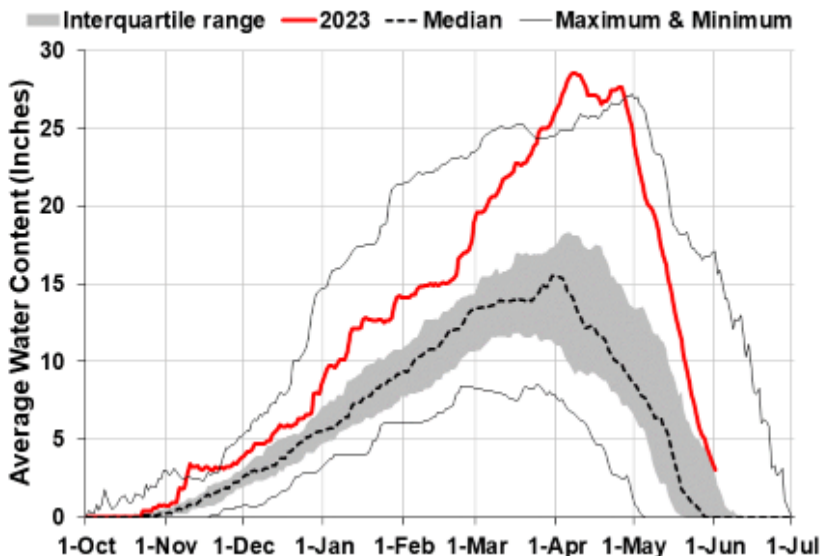
Reservoir Storage (KAF): End of May					Watershed Snowpack Analysis: June 1, 2023			
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)	Basin Name	# of Sites	% of Median	
							2023	2022
Oakley Reservoir		22.3	33.5	75.6	Raft River	2		
Salmon Falls Reservoir	78.9	37.2	75.3	182.6	Goose-Trapper Creeks	2		
Wild Horse Reservoir	71.5	43.3	48.3	71.5	Salmon Falls Creek	4	310%	960%
Lake Owyhee	570.1	311.1	502.8	715.0	Bruneau River	5	740%	900%
Brownlee Reservoir	1380.3	1348.3	1386.0	1420.0	Reynolds Creek	1		
					Upper Owyhee	5		
					Owyhee Basin Total	8		



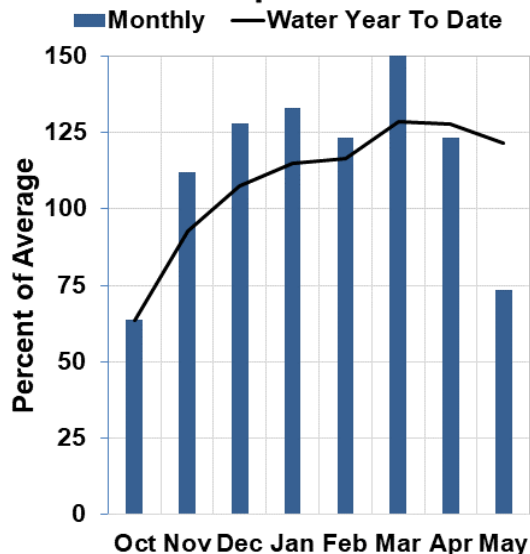
# Bear River Basin

June 1, 2023

### Current Snowpack and Historic Range



### Precipitation



## WATER SUPPLY OUTLOOK

Bear River Basin received ~74% of normal precipitation during May (Fig. 1), the first month since October that was below normal. Water year total precipitation is now ~131%, still well above normal for this time of year (Fig. 2). While most of Bear River Basin SNOTEL sites have melted out, there is still significant snow above ~8,000 feet. Snowpack is ~255% of normal for these sites. While snowpack peaked at ~160% of the median peak (Fig. 4), warm temperatures throughout May caused rapid melting. Bear River Basin [appears likely to reach total meltout](#) in the basin around the normal date of June 14. The Climate Prediction Center's [30-Day Outlook](#) predicts above normal precipitation in June.

Reservoir storage for Bear Lake is 111% of normal (54% full) as of June 1. Streamflow forecasts in the region are predicting high runoff volumes and range from ~126 to 238% for the June through September period. Observed streamflow in May ranged from ~169 to 586%, and the Bear River on the ID-WY border has been in flood stage since May 4. Please stay up to date on conditions with [NOAA's Colorado Basin River Forecast Center's](#) flood forecasting and awareness products.

### Bear River Basin Streamflow Forecasts - June 1, 2023

Forecast Point	Forecast Exceedance Probabilities for Risk Assessment							
	Forecast Period	<--Drier-----Projected Volume-----Wetter-->						30yr Med (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	

Bear R nr UT-WY State Line  
 Bear R ab Resv nr Woodruff  
 Big Ck nr Randolph  
 Smiths Fk nr Border  
 Bear R bl Stewart Dam 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 May					Watershed Snowpack Analysis: June 1, 2023			
Reservoir Name	Current (KAF)	Last YR	Median (KAF)	Capacity (KAF)	Basin Name	# of Sites	% of Median	
							2023	2022
Bear Lake	703.3	606.9	635.6	1302.0	Smiths-Thomas Forks	4	126%	135%
Montpelier Reservoir		3.7	4.0	4.0	Bear Lake	6	181%	84%
					Montpelier Creek	1		
					Mink Creek	0		
					Cub River	1		
					Bear River Total	21	264%	90%
					Malad River	1		

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

<b>Basin- Lake or Reservoir</b>	<b>Dead Storage</b>	<b>Inactive Storage</b>	<b>Active Storage</b>	<b>Surcharge Storage</b>	<b>NRCS Capacity</b>	<b>NRCS Capacity Includes</b>
<b><u>Panhandle Region</u></b>						
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
<b><u>Clearwater Basin</u></b>						
Dworshak	Unknown	1452.00	2016.00	---	3468.0	Inactive + Active
<b><u>West Central Basins</u></b>						
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
<b><u>Wood and Lost Basins</u></b>						
Mackay	0.13	---	44.37	---	44.4	Active
Little Wood	Unknown	---	30.00	---	30.0	Active
Magic	Unknown	---	191.50	---	191.5	Active
<b><u>Upper Snake Basin</u></b>						
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
<b><u>Southside Snake Basins</u></b>						
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
<b><u>Bear River Basin</u></b>						
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.

## **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)	
Henrys Fk nr Ashton	JUN-JUL	72	106	129	56	152	186	230
	JUN-SEP	198	245	280	68	315	360	410

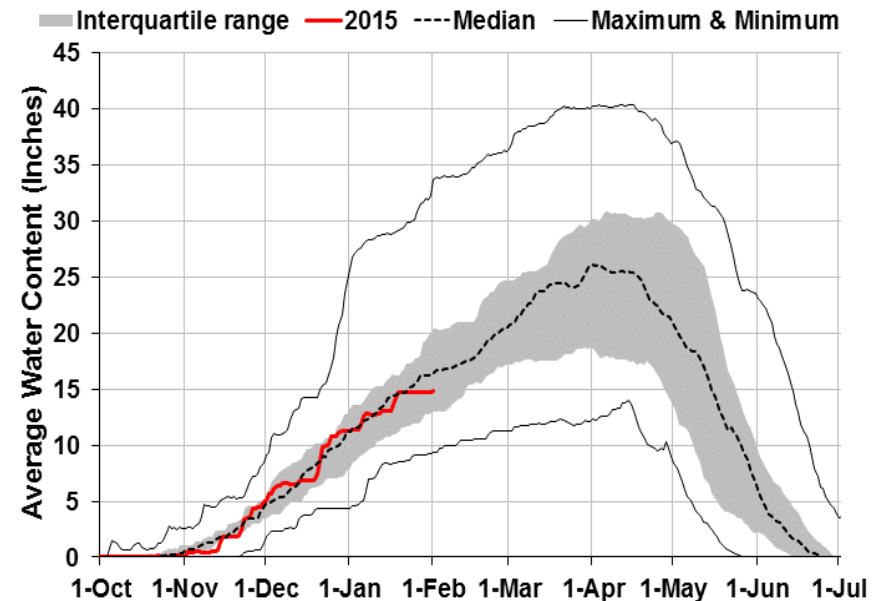
## Interpreting Snowpack Plots

Basin snowpack plots represent snow water equivalent indices using the average daily SNOTEL data<sup>1</sup> 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 25<sup>th</sup> to 75<sup>th</sup> 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 (75<sup>th</sup> 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 (25<sup>th</sup> percentile). This means 50 percent of the time the snowpack index is within the interquartile range (gray area) during the period of record.

<sup>1</sup> 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.

## Current Snowpack and Historic Range



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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.

