United States Department of Agriculture

*Natural Resources Conservation Service*

# Idaho Water Supply Outlook Report

# April 1, 2024


**Surveyors from Avista Corp. measuring the Roland Summit Snow Course in northern Idaho**
*Pictured from left to right: Sue Ward, Patrick Maher, and Steve Lentini; photo credit: John Ward*

April 1 is an important date on the calendar because it coincides with the time of year (in most areas) when Idaho's mountain snowpack reaches its typical seasonal maximum. The seasonal snowpack maximum is key for the prediction of spring and summer streamflow in Idaho's many river systems. The discrepancy in conditions across Idaho this April 1 is dramatic and was well captured by Julie Koeberle, Idaho's forecast hydrologist from the NRCS National Water & Climate Center, who noted, "I thought it was quite interesting to see the range of April 1 streamflow forecast percentiles in Idaho. Northern Idaho forecasts are calling for some of the lowest streamflows in history, meanwhile southern Idaho forecasts are among some of the highest."

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

For more water supply and resource management information:

**Contact: Your local county *Natural Resources Conservation Service Office* Internet Web Address: https://www.nrcs.usda.gov/idaho/snow-survey**
**Natural Resources Conservation Service Snow Surveys**
**9173 West Barnes Drive, Suite C**
**Boise, ID 83709-1574, (208) 378-5700 ext. 5**

**To join a free email subscription list, please contact us by email at: idboise-nrcs-snow@usda.gov**

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### *How forecasts are made*

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

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

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

*Starting in 2020, streamflow forecasts with poor prediction skill (jackknife $r^2 < 0.34$) will no longer be issued. This will primarily affect the January and June forecasts, with little change anticipated for the February, March, April, and May forecasts. For more information, please contact Erin Whorton (erin.whorton@usda.gov)*

# April 2024: Idaho Water Supply Summary

*Overview*

Winter is coming to an end and the verdict is in. Northern Idaho has one of its lowest snowpacks on record and southern Idaho has one of its biggest snowpacks for a second year in a row. March was tumultuous; significant snowfall brought many basins closer to normal snowpack conditions, but these storms were punctuated by periods of warm, spring weather and widespread snowmelt. The melt season has begun across Idaho. In March, reservoir operators began walking the tightrope between mitigating downstream flood risks and maximizing stored water in preparation for the irrigation season. Water supply looks sufficient this season, especially for users with ample storage rights. As usual, natural flow priorities depend on the unique combination of weather, irrigation demand and snowpack runoff.

*Weather, climate and drought outlook*

Temperatures in March were near normal from the Salmon Basin northward, and cooler than normal from central to southern Idaho. Western Idaho is forecasted to receive above normal precipitation over the next few days, but then warmer temperatures will return across Idaho after the first weekend of April. Warm temperatures will bring the snowpack even closer to the melting point and will likely melt any snow that accumulated in lower elevations zones during these early April storms. Spring is upon us.

NOAA's Climate Prediction Center (CPC) one-month outlook favors warmer than normal conditions across most of Idaho in April, with southeastern Idaho continuing to be wetter than normal. Looking further ahead this spring and summer, the CPC predicts that the spring and summer will be warmer and drier than normal across our region. This could impact water supply by increasing irrigation demand, changing the timing and duration of irrigation demand this summer as well as potentially reducing summer streamflow volumes.

Currently, ~47% of Idaho lands are abnormally dry or are in drought. Drought improved slightly in northern Idaho with reduction of D2 and D1 drought categories in the Panhandle and Clearwater basins. The seasonal drought outlook predicts drought will continue in northern and parts of central Idaho through the spring.

*Snowpack*

We publish two different snowpack maps this time of year. Figure 4 shows how this year's April 1 snowpack compares to the typical peak SWE in each basin (snow water equivalent is also generally referred to as snowpack in this report) which may occur earlier or later than April 1. The peak snowpack is the maximum amount of SWE that accumulates in

each basin (Fig. 4). The timing of peak snowpack varies from year to year based on weather. Typically the snowpack peaks earlier (late March to early April) in southern Idaho basins, and later (mid-April) in northern Idaho or in higher elevation mountains like the Snake River Headwaters.

The other snowpack map (Fig. 3) compares this year's snowpack to the 30-year median snowpack on April 1 (or given day). As we enter the melt season, these daily SWE maps become a handy tool to evaluate whether the snowpack is melting sooner or later than is typical in each basin.

Barring a miracle, the snowpack from the Canadian border down into the Clearwater Basin, will peak well below normal (Fig. 4). The snowpack in these basins falls within the historically low range (10 – 14$^{th}$ percentile). This second consecutive year of drought in northern Idaho will impact recreation, fisheries, and beyond. While not as bad as up north, snowpack in the Salmon, Weiser and Payette basins is also peaking well below normal (Fig. 3,4). Filling reservoirs like Deadwood, may not be possible this year. In the Boise Basin and moving east through the Wood and Lost basins into the Snake River Headwaters, the snowpack is near to slightly below normal (Fig. 3,4). Southern Idaho's snowpack has or is peaking well above normal. Figures 3 and 4 show in places like the Owyhee Basin, the snowpack not only peaked at historically high levels, but is also melting later than typical.

Snowmelt season has begun in earnest. Periods of warm temperatures during March brought the snowpack closer to its melt point. We can track where we are in the runoff season by watching the increase in snow density at SNOTEL and snow course stations. When the snowpack density exceeds 40%, this broadly indicates the snowpack is ready to melt. The snowpack will begin melting slowly or rapidly (melt rate) depending on whether nighttime temperatures fall below freezing (slows snowmelt rate down) and how many consecutive days with above freezing temperatures occur (speeds up melt rate). Rain-on-snow events can also speed up the melt process this time of year. This year, with above normal storage in many reservoirs and a near or above normal snowpack, it would be ideal if the snowpack melted slowly to improve chances of completely capturing this year's snowmelt runoff and filling reservoirs while managing flood risks. Reservoir operators must balance filling reservoirs to meet summer water supply demands while spilling water now to ensure public safety downstream. It's a delicate balancing act that deserves a thank you to the many people in Idaho who are doing this on our behalf. Keeping an eye on USGS streamflow gauges or our snow to flow graphs is an excellent way to keep track of how the snowmelt season is progressing.

*Precipitation*

March was another wet month with near to above normal precipitation across the state. Southern and eastern Idaho were the wettest, with northern Idaho remaining drier than the rest of the state (Fig. 1). Total monthly precipitation during March ranged from 89%

of normal monthly precipitation in the Coeur d'Alene-St. Joe to 183% in the Oakley (Goose Creek) basins.

Northern Idaho remains very dry with southern and eastern Idaho remaining very wet compared to the 30-year normal for total water year precipitation (WYP). Basins along the southern Idaho border range from 118 to 138% of normal (Fig. 2). To the east and north, the upper Snake, Wood and Lost basins WYP is near normal and range from 91 to 105% of normal. Conditions get drier to the west and farther north of the Snake River Plain. West Central basins WYP ranges from 89 to 93% of normal. Total water year precipitation conditions from the Salmon Basin to the Canadian border range from 76 to 92% of normal. The Clearwater and Coeur d'Alene-St. Joe basins are the driest in the state (Fig. 2).

Total water year precipitation conditions are best understood by looking at the SNOTEL site percentile data. Stations with below 25$^{th}$ percentile WYP conditions (red dots) are very dry compared to the past 40+ years of precipitation measurements at these sites, and stations with above 75$^{th}$ percentile are very wet comparatively (blue dots). Northern Idaho, the Clearwater, Salmon and the northern portions of Weiser, Payette, and Boise basins are very dry, which could negatively impact water supply conditions this year.

*Water supply*

Another month of improvements in Idaho's snowpack boosted confidence in water supply for this upcoming season. Reservoir storage is at or above normal on April 1 with the exception of Mackay Reservoir (79%), Brownlee (76%) and Lake Pend Orielle (76%). In general, reservoir storage this water year is greater than storage levels at this time during Water Year 2021, our last water year with above normal storage at the beginning of the irrigation season.

The Boise River system has well above normal storage at 123% of normal (83% full) on April 1. Snowpack in the Boise Basin is much higher than other West Central basins (Fig. 3,4). Flood Risk Management (FRM) operations began on the Boise River on March 25. These reservoirs are likely to fill given the near normal snowpack conditions and a full water supply this season is expected. The NRCS forecast for the primary snowmelt runoff period (April to July) at Boise River near Boise predicts near normal runoff at 99% of normal (1,120 KAF). Reservoir storage in the Payette River system is 108% of normal (74% full). However, snowpack is only 79% of peak SWE on April 1 (Fig. 4) which could prevent Deadwood Reservoir from filling. Cascade Reservoir will likely fill.

Total storage in the Upper Snake Reservoir system above Milner Dam is ~120% of normal (90% full) on April 1. Combined Jackson Lake and Palisades storage above Heise is 134% of normal (86% full). FRM operations began on March 22 to safely release water that cannot be stored. A large proportion of water that is being spilled past Milner Dam is

being used to recharge the Eastern Snake River Plain Aquifer (ESPA). Details for current ESPA recharge are at the IDWR website. According to Water District 1, "reservoir water rights are expected to fill this year leading to near full storage allocations for space holders" in the upper Snake River reservoir system. Natural flow priorities will depend on irrigation demand, future weather and how the snowmelt runoff season is progressing.

The NRCS forecast for the primary snowmelt runoff period at Heise (April to July) predicts below normal runoff at 106% of normal (3,320 KAF, thousand acre-feet). This forecast increased by 370 KAF since last month. Streamflow in the Willow-Blackfoot-Portneuf Basin is predicted to range from 164 to 250% of normal. Last year, the wetter (10% and 30%) forecasts were more accurate for the Willow-Blackfoot-Portneuf Basin. If we get another rapid melt out and/or rain-on-snow event like last year, this area could see flooding again. Please keep an eye on flood risk warnings in your region or at your local National Weather Service office webpage.

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

Streamflow forecasts across Idaho remain sharply divided between the north and south as this streamflow percentile map shows. Above normal streamflow is expected in southern Idaho (151 to 279%) and well below normal streamflow is expected in central and northern Idaho (62 to 92%). Near normal streamflow is expected in the Wood and Lost basins (95 to 122%) as well as the Henrys Fork-Teton Basin (92 to 121%).

Streamflow, snowpack, and precipitation data for each basin can be accessed in basin reports or on the NRCS interactive map. Replacements for the daily, ready-to-print maps of SWE and total water year precipitation maps are available on the National Water and Climate website.

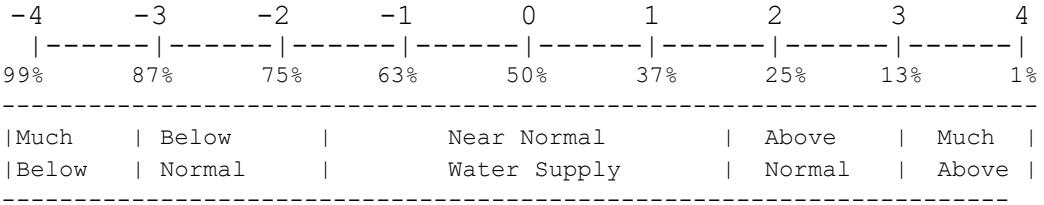
## IDAHO SURFACE WATER SUPPLY INDEX (SWSI) April 1, 2024

The Surface Water Supply Index (SWSI) is a predictive indicator of surface water availability within a watershed for the spring and summer water use season. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer streamflow. SWSI values are scaled from +4.0 (abundant supply) to -4.0 (extremely dry), with a value of zero indicating a median water supply as compared to historical occurrences. The SWSI analysis period is from 1991 to present.

SWSI values provide a more comprehensive outlook of water availability by combining streamflow forecasts and reservoir storage where appropriate. The SWSI index allows comparison of water availability between basins for drought or flood severity analysis. Threshold SWSI values have been determined for some basins to indicate the potential for agricultural irrigation water shortages.

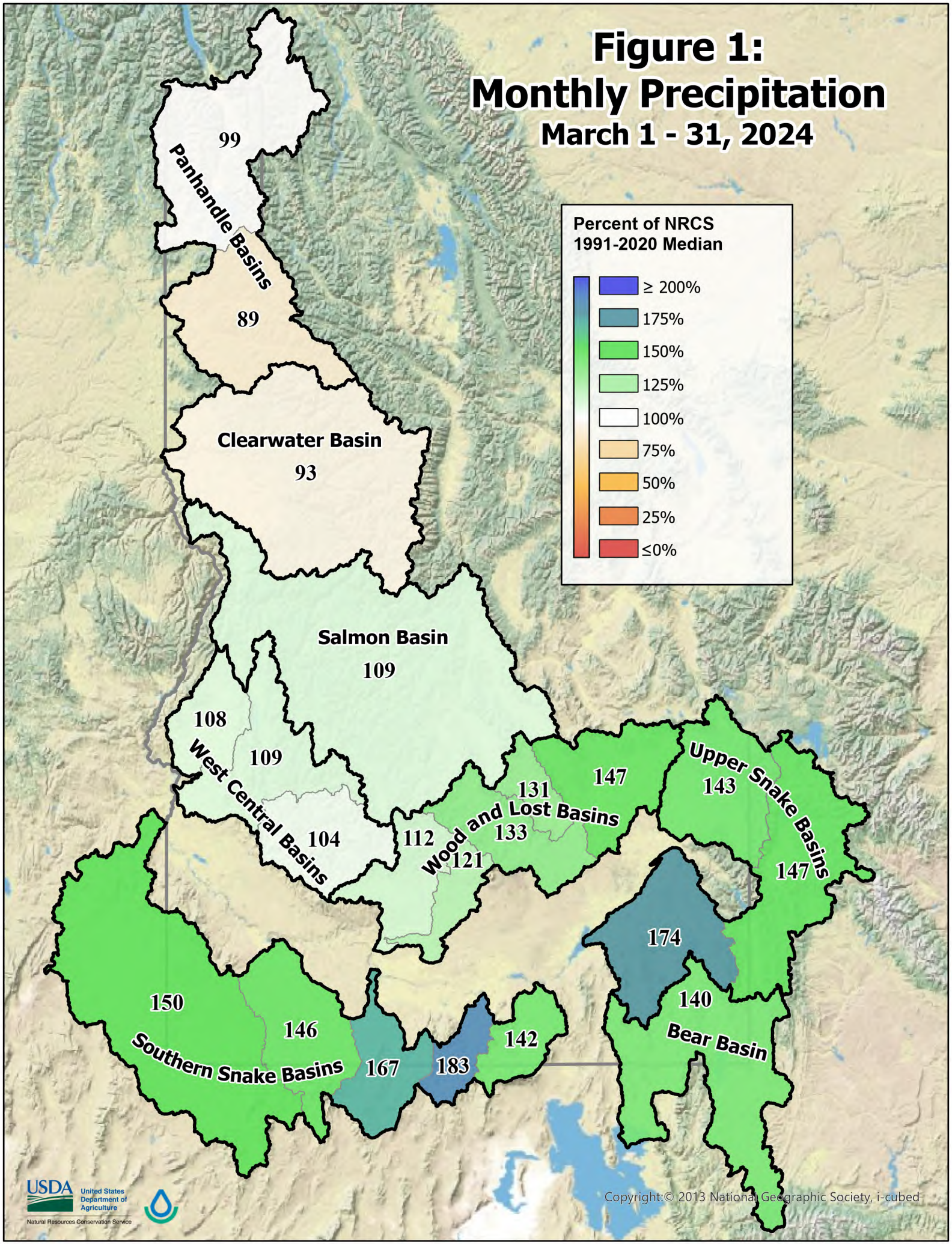
| *BASIN or REGION* | *SWSI Value* | *Most Recent Year With Similar SWSI Value* | *Agricultural Water Supply Shortage May Occur When SWSI is Less Than* |
|---|---|---|---|
| **Spokane** | **-2.6** | **2021** | **NA** |
| **Clearwater** | **-2.6** | **2021** | **NA** |
| **Salmon** | **-1.1** | **2003** | **NA** |
| **Weiser** | **-0.6** | **2016** | **NA** |
| **Payette** | **-0.9** | **2020** | **NA** |
| **Boise** | **0.9** | **1993** | **- 2.5** |
| **Big Wood above Hailey** | **0.1** | **2016** | **- 2.7** |
| **Big Wood** | **0.9** | **2018** | **0.5** |
| **Camas Creek nr Blaine** | **1.3** | **2012** | **NA** |
| **Little Wood** | **0.9** | **2018** | **- 1.5** |
| **Big Lost** | **0.4** | **2012** | **0.7** |
| **Little Lost** | **0.4** | **2012** | **1.7** |
| **Teton** | **1.1** | **2023** | **- 3.9** |
| **Henrys Fork** | **0.9** | **2012** | **- 2.9** |
| **Snake (Heise)** | **1.8** | **2019** | **- 1.7** |
| **Oakley** | **2.6** | **2019** | **- 0.2** |
| **Salmon Falls above Jackpot** | **3.1** | **2017** | **NA** |
| **Salmon Falls** | **2.3** | **1996** | **-0.7** |
| **Bruneau** | **3.3** | **2017** | **NA** |
| **Owyhee** | **4.0** | **2011** | **- 2.2** |
| **Bear River** | **3.0** | **2011** | **- 3.9** |

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

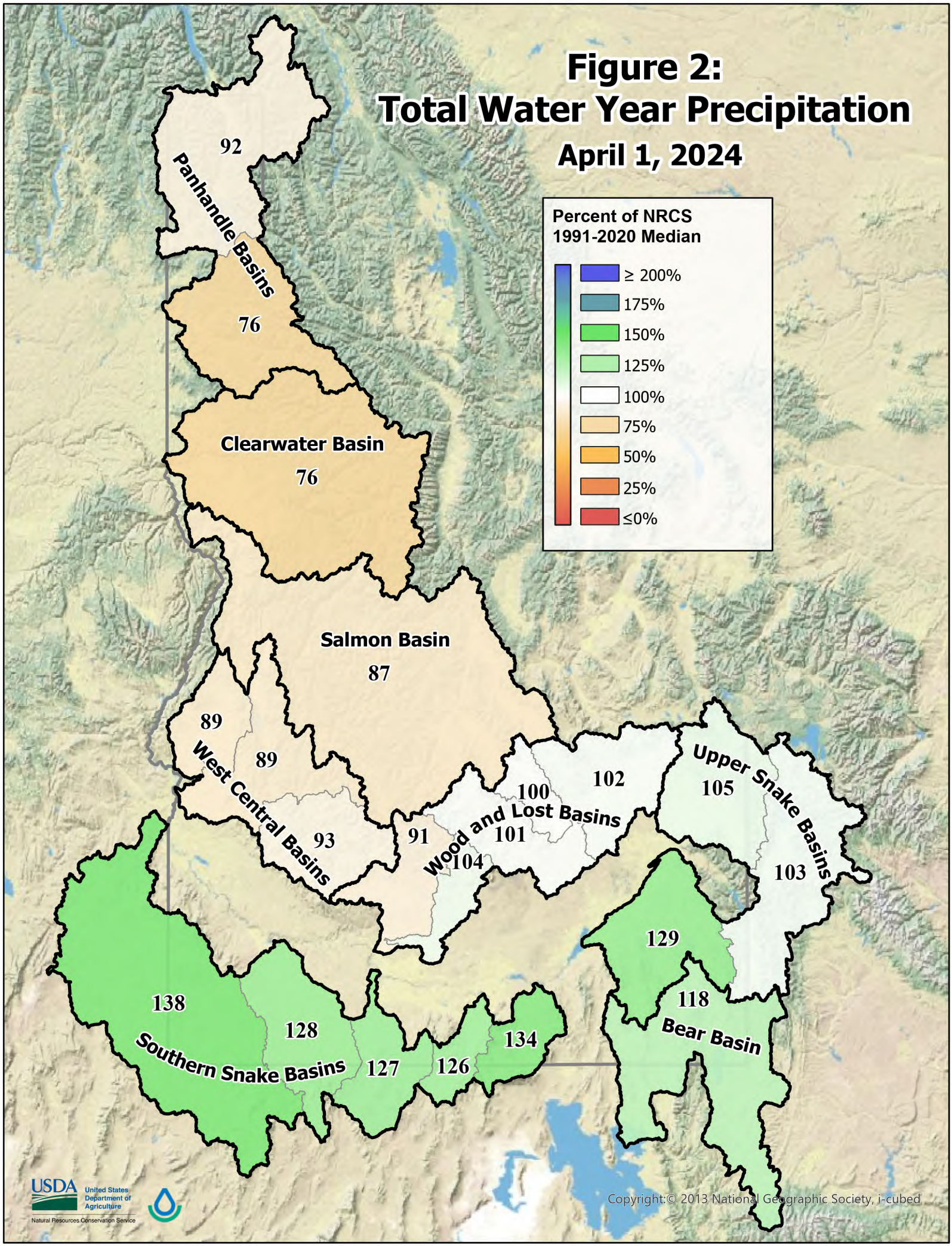



NA=Not Available / Not Applicable; Note: The Percent Chance of Exceedance is an indicator of how often a range of SWSI values might be expected to occur. Each SWSI unit represents about 12% of the historical occurrences. As an example of interpreting the above scale, the SWSI can be expected to be greater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

# Figure 1:
# Monthly Precipitation
## March 1 - 31, 2024



# Figure 2:
# Total Water Year Precipitation
## April 1, 2024

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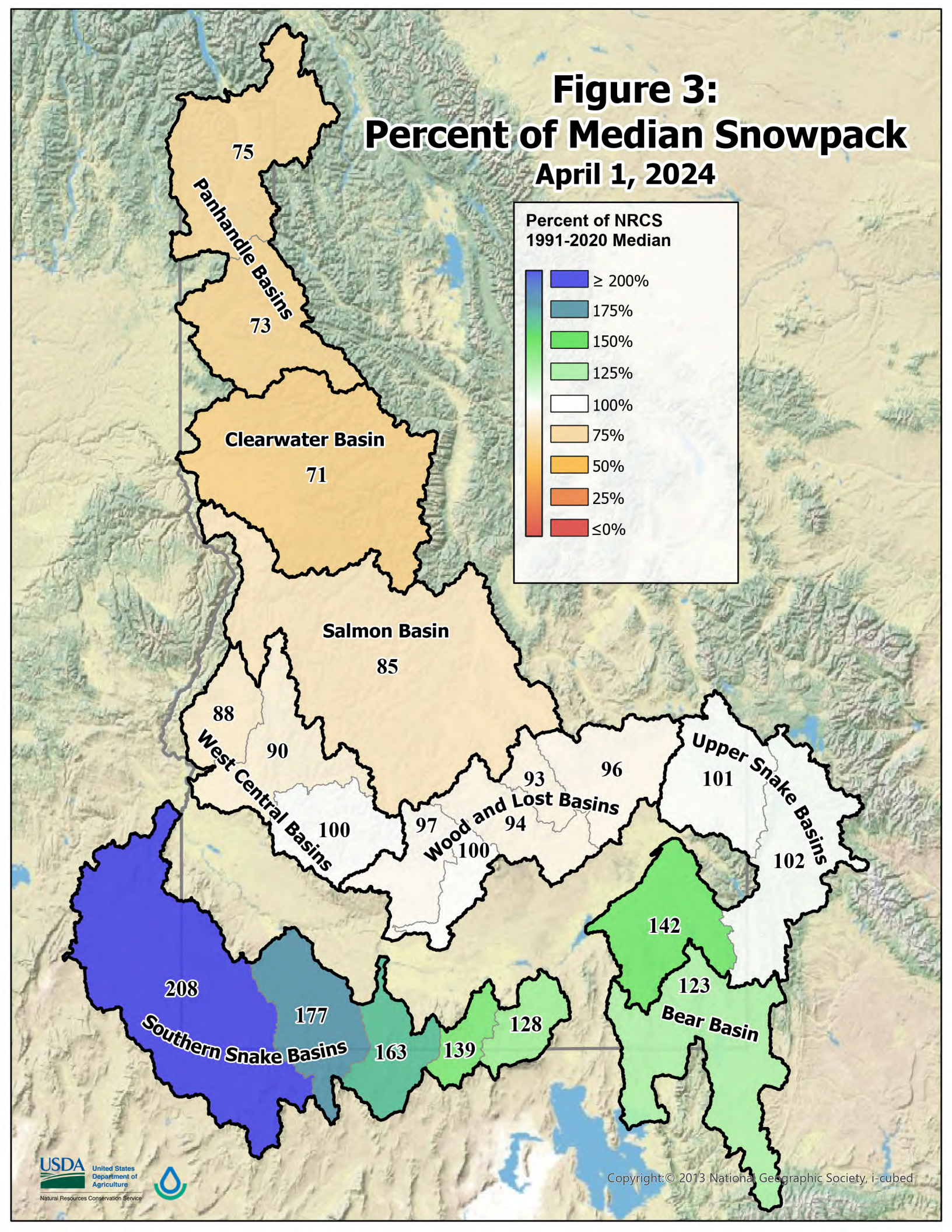
Figure 3:
Percent of Median Snowpack
April 1, 2024
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
75
Panhandle Basins
73
Clearwater Basin
71
Salmon Basin
85
88
West Central Basins
90
100
97
Wood and Lost Basins
94
100
93
96
Upper Snake Basins
101
102
142
123
Bear Basin
208
Southern Snake Basins
177
163
139
128
USDA United States Department of Agriculture
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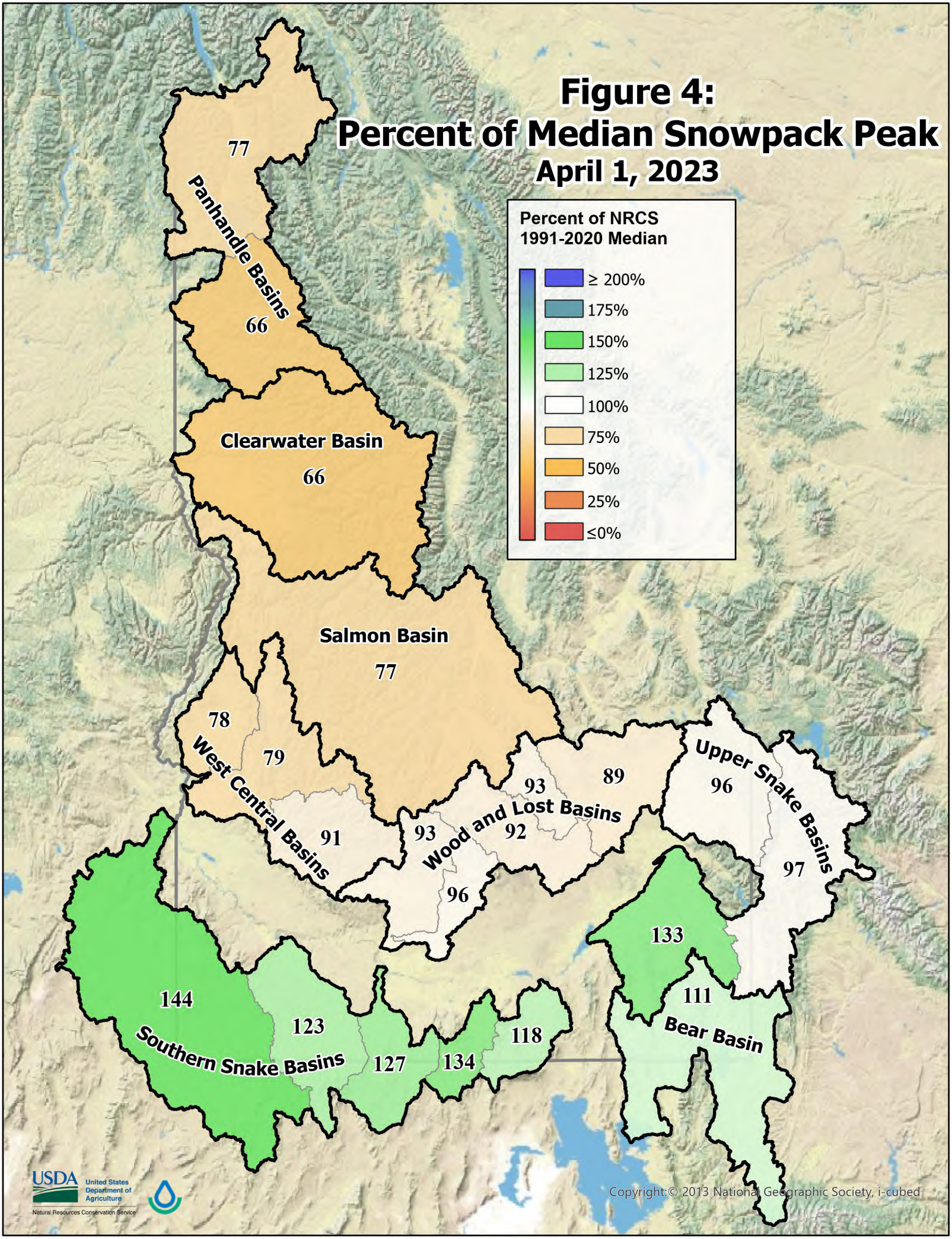
Figure 4:
Percent of Median Snowpack Peak
April 1, 2023
Percent of NRCS
1991-2020 Median
≥ 200%
175%
150%
125%
100%
75%
50%
25%
≤0%
Panhandle Basins
77
66
Clearwater Basin
66
Salmon Basin
77
78
79
West Central Basins
91
93
89
93
92
Wood and Lost Basins
96
Upper Snake Basins
97
96
133
111
Bear Basin
144
123
Southern Snake Basins
127
134
118
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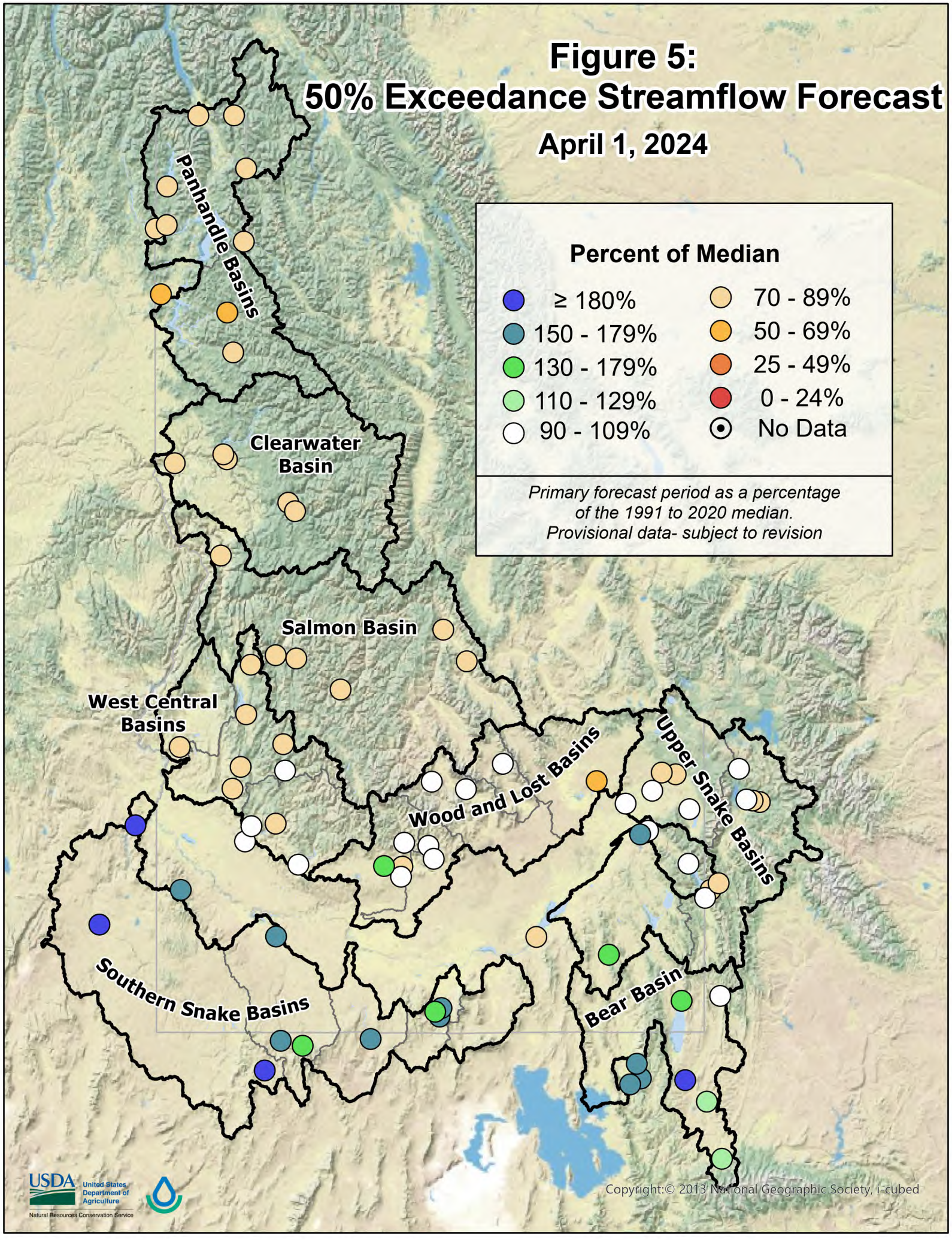
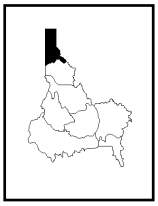
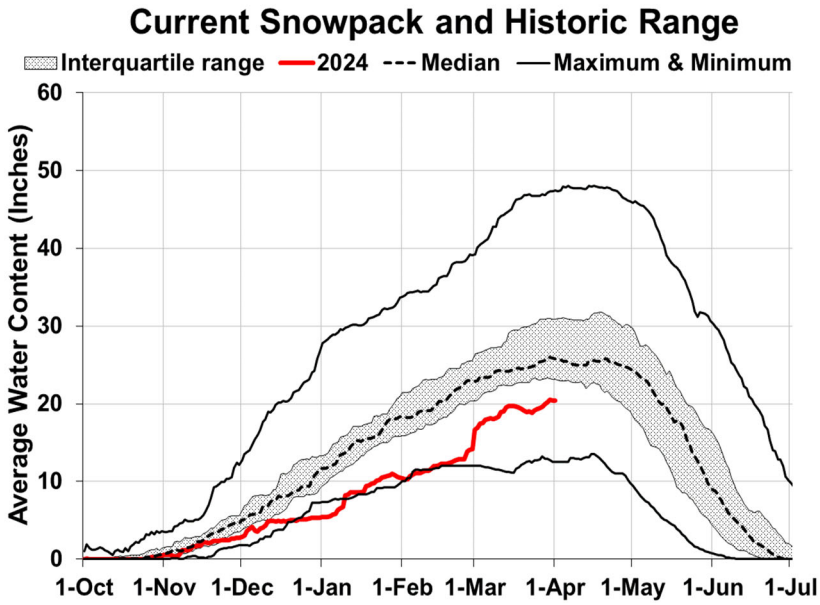
# Figure 5:
# 50% Exceedance Streamflow Forecast
## April 1, 2024

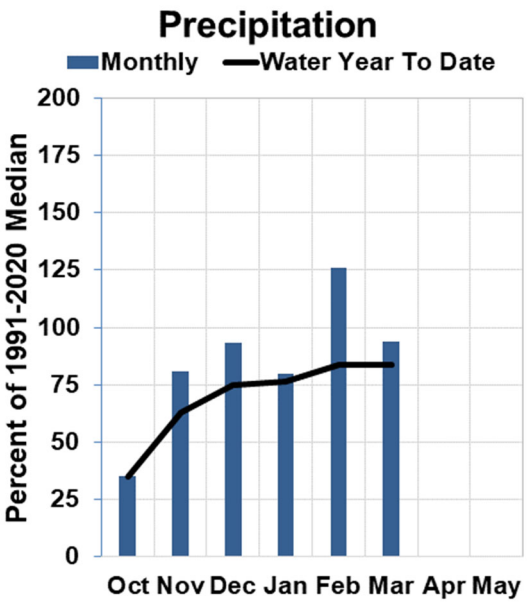




# Panhandle Basins

**April 1, 2024**




## WATER SUPPLY OUTLOOK

Precipitation in March was ~90 to 100% of normal (Fig. 1), but Water Year 2024 continues to be below normal with total water year precipitation ranging from ~75 to 90% of normal on April1 (Fig. 2). Snowpack is still below normal at ~75%, despite near normal precipitation in March (Fig. 3). Record-breaking warm temperatures on March 19 caused snowmelt across the basin up to ~5,500ft. Current snowpack is between ~70 to 75% of the normal peak SWE (Fig. 4) which typically occurs between April 5 and 13. NOAA's 30-Day Outlook favors above normal temperatures which suggests an increased chance for earlier than normal snowmelt.

Reservoir storage at Priest Lake continues to be above normal at 134% of normal which is 72% full. Lake Coeur d'Alene is 97% of normal and 63% full. Pend Oreille is 76% of normal and 37% full. Streamflow forecasts for April through July are ~60 to 90% of normal at the 50% exceedance level in the Panhandle basins (Fig. 5). Long-term weather outlooks predict an increased chance for above normal temperatures throughout the spring and summer, which could push streamflow closer to the 70 to 90% exceedance forecasts for the primary forecast period.

# Panhandle Region Streamflow Forecasts - April 1, 2024

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Med (KAF) |
|---|---|---|---|---|---|---|---|---|
| Kootenai R at Leonia 1 & 2 | APR-JUL | 4840 | 5750 | 6170 | 92% | 6590 | 7500 | 6680 |
| | APR-SEP | 5460 | 6420 | 6860 | 91% | 7300 | 8260 | 7560 |
| Boundary Ck nr Porthill | APR-JUL | 77 | 90 | 100 | 84% | 108 | 122 | 119 |
| | APR-SEP | 81 | 93 | 102 | 82% | 111 | 124 | 124 |
| Moyie R at Eastport | APR-JUL | 255 | 295 | 325 | 87% | 360 | 410 | 375 |
| | APR-SEP | 270 | 310 | 345 | 88% | 375 | 425 | 390 |
| Priest R nr Priest River 2 | APR-JUL | 545 | 635 | 695 | 83% | 765 | 875 | 840 |
| | APR-SEP | 550 | 640 | 705 | 80% | 775 | 895 | 880 |
| Pend Oreille Lake Inflow 2 | APR-JUL | 7130 | 8000 | 8920 | 76% | 9730 | 10800 | 11700 |
| | APR-SEP | 7800 | 8930 | 9790 | 78% | 10800 | 12100 | 12600 |
| Priest R Outflow NR Coolin | APR-JUL | 485 | 545 | 590 | 86% | 640 | 730 | 690 |
| | APR-SEP | 475 | 545 | 595 | 82% | 645 | 745 | 725 |
| Pend Oreille R bl Box Canyon | APR-JUL | 7300 | 8220 | 9130 | 78% | 9970 | 11100 | 11700 |
| | APR-SEP | 7840 | 9030 | 9960 | 78% | 11000 | 12400 | 12700 |
| NF Coeur dAlene R at Enaville | APR-JUL | 370 | 440 | 490 | 69% | 555 | 645 | 715 |
| | APR-SEP | 415 | 490 | 545 | 73% | 610 | 720 | 750 |
| St. Joe R at Calder 2 | APR-JUL | 585 | 665 | 730 | 70% | 785 | 890 | 1050 |
| | APR-SEP | 610 | 695 | 755 | 67% | 820 | 935 | 1120 |
| Spokane R nr Post Falls 2 | APR-JUL | 1140 | 1370 | 1560 | 62% | 1740 | 2100 | 2510 |
| | APR-SEP | 1220 | 1460 | 1650 | 64% | 1840 | 2200 | 2570 |
| Clark Fork R bl Cabinet Gorge Dam 2 | APR-JUL | 6140 | 7120 | 7700 | 77% | 8500 | 9460 | 9980 |
| | APR-SEP | 6380 | 7310 | 8090 | 74% | 9000 | 10000 | 10900 |
| Pend Oreille Lake Inflow 2 | APR-JUL | 7130 | 8000 | 8920 | 76% | 9730 | 10800 | 11700 |
| | APR-SEP | 7800 | 8930 | 9790 | 78% | 10800 | 12100 | 12600 |

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 March

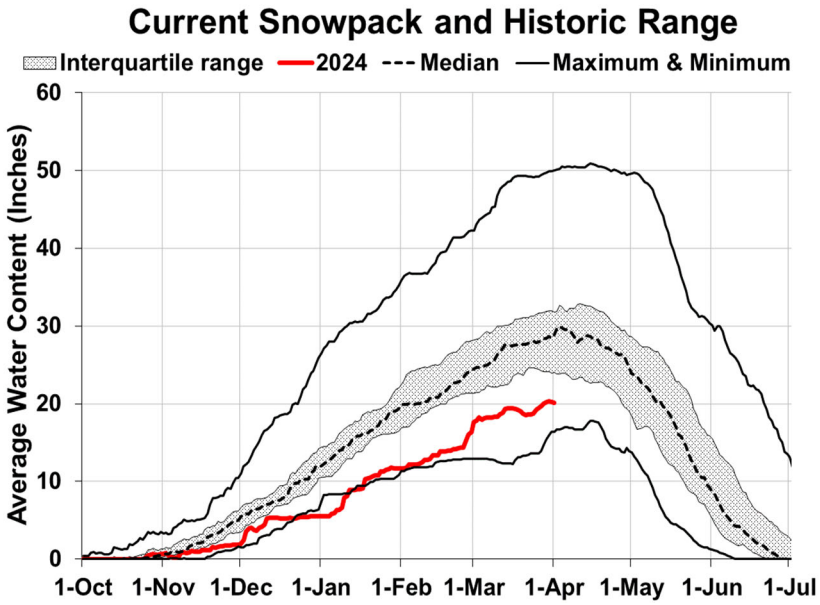
| Reservoir Name | Current (KAF) | Last YR | Median (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| Hungry Horse Lake | 2863.1 | 2388.8 | 2357.0 | 3451.0 |
| Flathead Lake | 797.0 | 761.1 | 739.1 | 1791.0 |
| Noxon Rapids Reservoir | 311.0 | 313.2 | 320.0 | 335.0 |
| Lake Pend Oreille | 570.9 | 591.0 | 755.3 | 1561.3 |
| Priest Lake | 86.5 | 53.9 | 64.4 | 119.3 |
| Lake Coeur d' Alene | 149.7 | 68.8 | 153.8 | 238.5 |

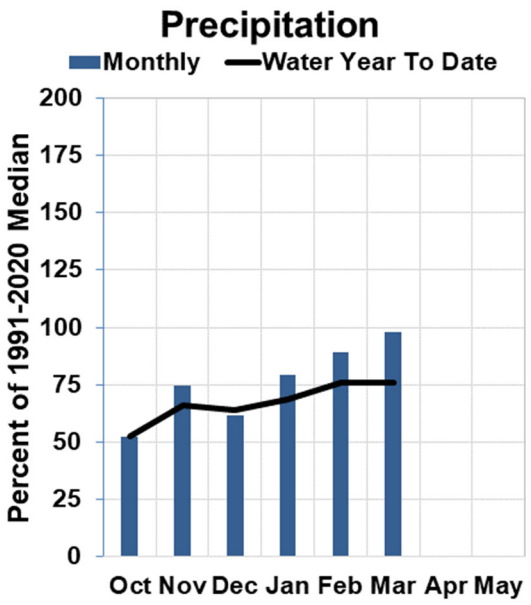
Watershed Snowpack Analysis: April 1, 2024

| Basin Name | # of Sites | % of Median 2024 | 2023 |
|---|---|---|---|
| Moyie River | 1 | 77% | 82% |
| Priest River | 8 | 77% | 95% |
| Rathdrum Creek | 3 | 61% | 115% |
| Coeur d' Alene River | 7 | 77% | 106% |
| St. Joe River | 6 | 70% | 97% |
| Pend Oreille Lake | 6 | 73% | 96% |
| Palouse River | 2 | 62% | 129% |
| Lower Kootenai | 2 | 85% | 84% |
| Pend Oreille-Kootenai | 17 | 75% | 94% |
| Coeur d' Alene-St. Joe Total | 12 | 73% | 102% |

# Clearwater River Basin

**April 1, 2024**




## WATER SUPPLY OUTLOOK

Precipitation in March was 93% of normal (Fig. 1). Water Year 2024 continues to be below normal with total water year precipitation at ~75% of normal on April 1 (Fig. 2). Despite near normal precipitation in March, it wasn't enough to significantly improve the snowpack; it is still well below normal at ~70% (Fig. 3). Record-breaking warm temperatures on March 19 caused widespread snowmelt across the basin up to ~6,000ft. Current snowpack is ~65% of the normal peak SWE (Fig. 4) which typically occurs on April 10. NOAA's 30-Day Outlook favors above normal temperatures which suggests an increased chance for earlier than normal snowmelt.

Dworshak Reservoir is 75% full, which is 109% of normal on April 1. The 50% exceedance streamflow forecasts are ~70 to 85% of normal for April to July (Fig. 5). There's a set amount of water released every year from Dworshak to aid anadromous fish migration. This flow augmentation provides favorable streamflow levels and temperature conditions to protect migrating fish. Because of the low snowpack, there is a chance these releases will be limited. While there are less irrigation water supply concerns in this basin, the ecological impacts of the dry water year are increasing. Long-term weather outlooks predict an increased chance for above normal temperatures throughout the spring, which could push streamflow closer to the 70 to 90% exceedance forecasts for the primary forecast period.

# Clearwater River Basin Streamflow Forecasts - April 1, 2024

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Med (KAF) |
|---|---|---|---|---|---|---|---|---|
| Selway R nr Lowell | APR-JUL | 1320 | 1520 | 1650 | 84% | 1780 | 1980 | 1960 |
| | APR-SEP | 1380 | 1590 | 1730 | 84% | 1870 | 2080 | 2050 |
| Lochsa R nr Lowell | APR-JUL | 835 | 980 | 1080 | 76% | 1180 | 1330 | 1430 |
| | APR-SEP | 880 | 1040 | 1140 | 76% | 1250 | 1400 | 1500 |
| Dworshak Reservoir Inflow 2 | APR-JUL | 1130 | 1410 | 1600 | 68% | 1790 | 2070 | 2370 |
| | APR-SEP | 1260 | 1550 | 1750 | 68% | 1950 | 2240 | 2560 |
| Clearwater R at Orofino | APR-JUL | 2720 | 3240 | 3600 | 82% | 3960 | 4480 | 4380 |
| | APR-SEP | 2820 | 3370 | 3750 | 82% | 4130 | 4680 | 4570 |
| Clearwater R at Spalding 2 | APR-JUL | 3910 | 4780 | 5370 | 79% | 5960 | 6830 | 6820 |
| | APR-SEP | 4120 | 5040 | 5660 | 78% | 6280 | 7200 | 7290 |

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

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

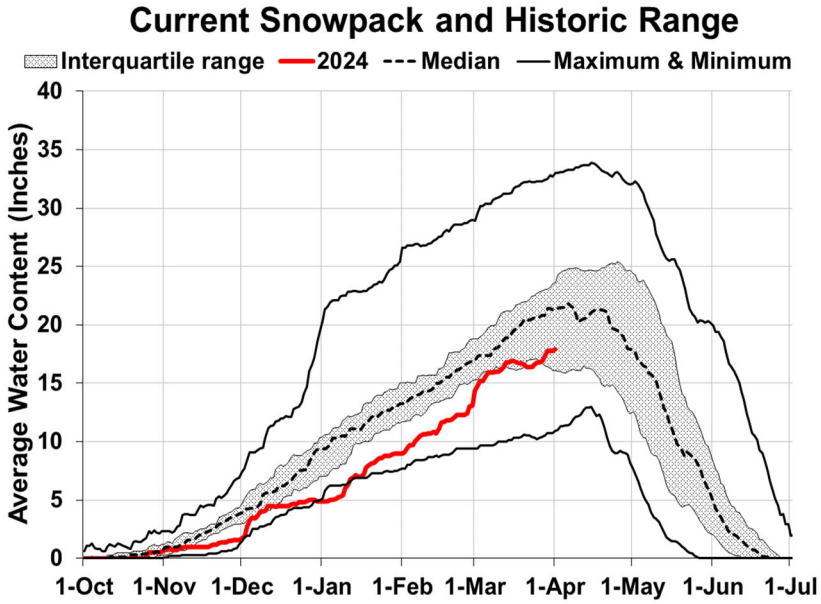
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

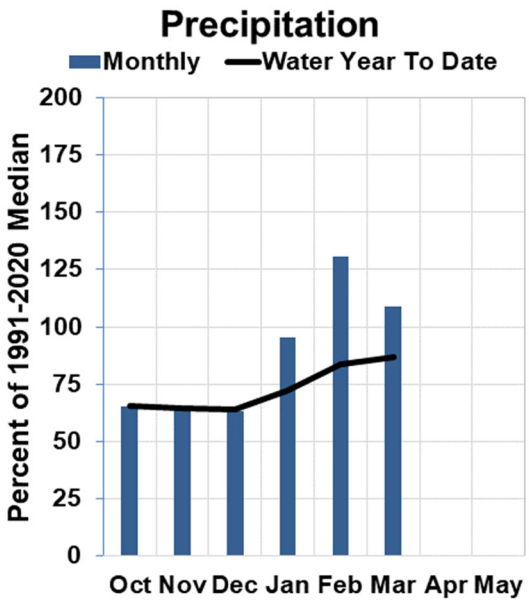
| Reservoir Storage (KAF): End of March | | | | |
|---|---|---|---|---|
| Reservoir Name | Current (KAF) | Last YR | Median (KAF) | Capacity (KAF) |
| Dworshak Reservoir | 2587.9 | 2252.0 | 2380.0 | 3468.0 |

| Watershed Snowpack Analysis: April 1, 2024 | | | |
|---|---|---|---|
| Basin Name | # of Sites | % of Median 2024 | 2023 |
| NF Clearwater River | 9 | 68% | 99% |
| Lochsa River | 3 | 60% | 93% |
| Selway River | 4 | 81% | 99% |
| SF Clearwater River | 1 | 96% | 110% |
| Clearwater Basin Total | 18 | 70% | 102% |

# Salmon River Basin

**April 1, 2024**




## WATER SUPPLY OUTLOOK

The Salmon River Basin received above normal precipitation (109%) during March (Fig. 1), raising total water year precipitation to 87% of normal (Fig. 2). Snowpack conditions across the basin increased slightly to 85% of normal (Fig. 3). Precipitation last month was greatest in the western portion of the basin, but snowpack conditions are still closer to normal in the east. Above normal temperatures in the middle of the month led to snowmelt at many sites, but storms at the end of March offset these SWE losses. Snowpack is currently 77% of the normal peak SWE (Fig 4.), which typically occurs near April 11. Without record precipitation during April, it is unlikely this winter's snowpack will reach the normal peak SWE this year.

There are no reservoirs in the Salmon Basin. The 50% exceedance streamflow forecasts are ~75 to 95% of normal for April through July (Fig. 5). The Middle Fork of the Salmon River at Middle Fork Lodge streamflow forecast is 81% of normal, and the Salmon River at Salmon is 86% of normal. With long-term outlooks suggesting above normal temperatures this spring and summer, streamflow forecasts could align more closely with the drier 70 - 90% exceedance streamflow volumes for the primary forecast period.

## Salmon River Streamflow Forecasts - April 1, 2024

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Med (KAF) |
|---|---|---|---|---|---|---|---|---|
| Salmon R at Salmon | APR-JUL | 495 | 605 | 685 | 86% | 760 | 870 | 800 |
| | APR-SEP | 570 | 700 | 790 | 86% | 875 | 1000 | 920 |
| Lemhi R nr Lemhi | APR-JUL | 34 | 52 | 65 | 96% | 78 | 96 | 68 |
| | APR-SEP | 44 | 65 | 80 | 98% | 95 | 116 | 82 |
| MF Salmon R at MF Lodge | APR-JUL | 485 | 570 | 630 | 81% | 690 | 775 | 775 |
| | APR-SEP | 540 | 635 | 700 | 82% | 760 | 855 | 850 |
| SF Salmon R nr Krassel Ranger Station | APR-JUL | 173 | 205 | 230 | 79% | 255 | 285 | 290 |
| | APR-SEP | 185 | 220 | 245 | 79% | 270 | 305 | 310 |
| Johnson Ck at Yellow Pine | APR-JUL | 111 | 140 | 160 | 76% | 180 | 210 | 210 |
| | APR-SEP | 120 | 150 | 171 | 78% | 191 | 220 | 220 |
| Salmon R at White Bird | APR-JUL | 3700 | 4300 | 4700 | 79% | 5110 | 5700 | 5940 |
| | APR-SEP | 4090 | 4750 | 5190 | 79% | 5640 | 6300 | 6600 |

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

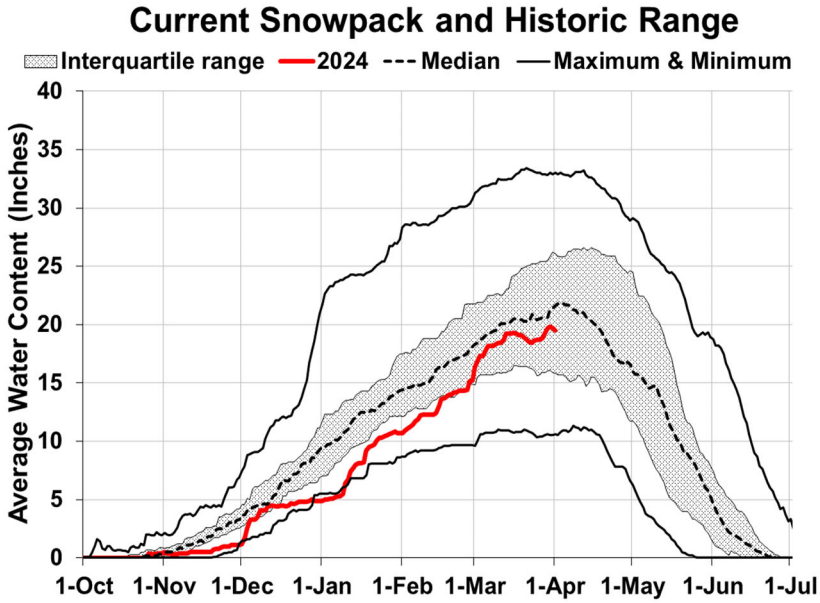
1) 90% and 10% exceedance probabilities are actually 95% and 5%

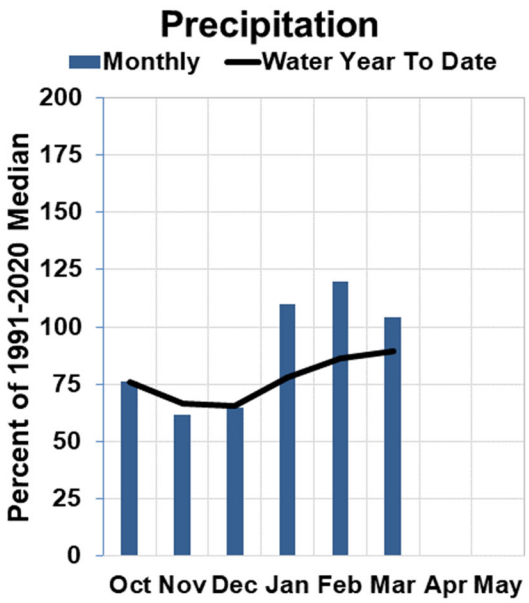
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

| Watershed Snowpack Analysis: April 1, 2024 Basin Name | # of Sites | % of Median 2024 | 2023 |
|---|---|---|---|
| Salmon River ab Salmon | 8 | 90% | 119% |
| Lemhi River | 7 | 90% | 129% |
| MF Salmon River | 3 | 83% | 109% |
| SF Salmon River | 3 | 82% | 104% |
| Little Salmon River | 4 | 84% | 111% |
| Lower-Middle Salmon | 5 | 88% | 115% |
| Salmon Basin Total | 26 | 85% | 113% |

# West Central Basins

**April 1, 2024**




## WATER SUPPLY OUTLOOK

Precipitation in March was 104 to 109% of normal across the West Central basins (Fig. 1). Total water year precipitation is 89 to 93% of normal on April 1 (Fig. 2). March was a complex month for the snowpack in these basins. In the middle of March, warmer than normal temperatures led to the snowpack ripening and the beginning stages of melt out. This phase of warming was followed by cold temperatures and increased snowfall toward the latter part of the month. Snowpack in these basins is still slightly below normal (88 to 100%) (Fig. 3) and typically peaks from March 27 through April 5. On April 1, the snowpack is 78 to 91% of median peak snowpack (Fig. 4).

Reservoir storage in the Boise system (Anderson Ranch, Arrowrock and Lucky Peak combined) is 123% of normal on April 1. Flood risk management operations on the Boise River began on March 25. Storage in the Payette system is 108% of normal and 114% of normal in the Weiser. The 50% exceedance streamflow forecasts for the April through July period in the Boise River Basin is 96% of normal, the Payette is 87% of normal, and the Weiser is 85% of normal (Fig. 5). NOAA's 30-Day Outlook predicts a slight chance of above normal temperatures during May.

# West Central Basins Streamflow Forecasts - April 1, 2024

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Med (KAF) |
|---|---|---|---|---|---|---|---|---|
| SF Boise R at Anderson Ranch Dam 2 | APR-JUL | 305 | 360 | 400 | 95% | 440 | 495 | 420 |
| | APR-SEP | 330 | 390 | 430 | 96% | 470 | 530 | 450 |
| Boise R nr Twin Springs | APR-JUL | 415 | 480 | 525 | 88% | 570 | 635 | 600 |
| | APR-SEP | 450 | 520 | 570 | 88% | 620 | 690 | 645 |
| Mores Ck nr Arrowrock Dam | APR-JUL | 71 | 93 | 107 | 111% | 121 | 143 | 96 |
| | APR-SEP | 74 | 96 | 111 | 111% | 126 | 148 | 100 |
| Boise R nr Boise 2 | APR-JUL | 795 | 985 | 1120 | 99% | 1250 | 1440 | 1130 |
| | APR-SEP | 875 | 1070 | 1210 | 99% | 1340 | 1540 | 1220 |
| Lake Fork Payette R nr McCall | APR-JUL | 58 | 66 | 72 | 89% | 78 | 86 | 81 |
| | APR-SEP | 59 | 68 | 74 | 89% | 80 | 89 | 83 |
| NF Payette R at Cascade 2 | APR-JUL | 295 | 355 | 400 | 83% | 445 | 505 | 480 |
| | APR-SEP | 295 | 360 | 405 | 83% | 450 | 515 | 490 |
| NF Payette R nr Banks 2 | APR-JUL | 350 | 440 | 500 | 84% | 560 | 650 | 595 |
| | APR-SEP | 350 | 440 | 505 | 83% | 570 | 660 | 610 |
| SF Payette R at Lowman | APR-JUL | 310 | 345 | 370 | 90% | 395 | 430 | 410 |
| | APR-SEP | 340 | 380 | 410 | 90% | 440 | 480 | 455 |
| Deadwood Reservoir Inflow 2 | APR-JUL | 77 | 89 | 98 | 79% | 107 | 119 | 124 |
| | APR-SEP | 83 | 97 | 107 | 79% | 117 | 131 | 136 |
| Payette R nr Horseshoe Bend 2 | APR-JUL | 940 | 1130 | 1260 | 88% | 1390 | 1580 | 1430 |
| | APR-SEP | 995 | 1190 | 1330 | 87% | 1470 | 1670 | 1530 |
| Weiser R nr Weiser | APR-JUL | 189 | 250 | 290 | 85% | 340 | 415 | 340 |
| | APR-SEP | 210 | 270 | 315 | 85% | 365 | 445 | 370 |

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 March

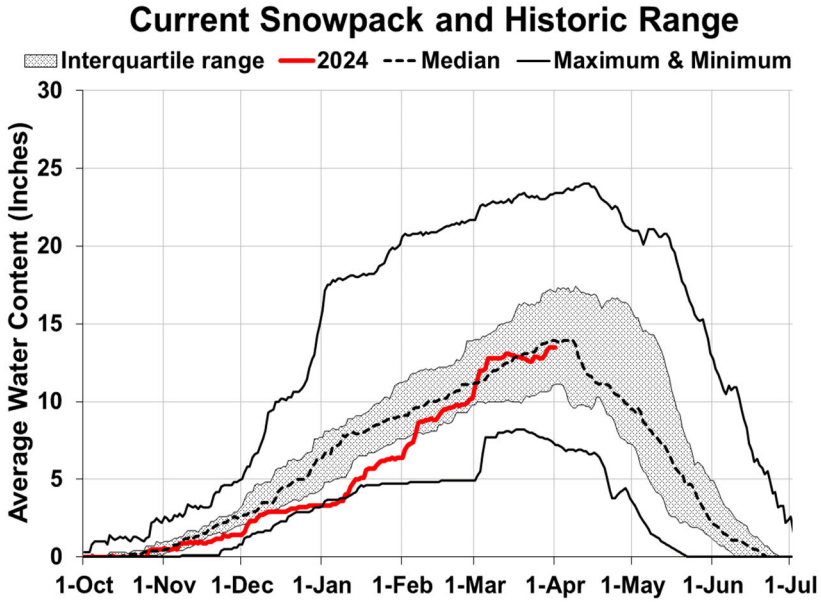
| Reservoir Name | Current (KAF) | Last YR | Median (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| Anderson Ranch Reservoir | 407.3 | 345.7 | 282.5 | 450.2 |
| Arrowrock Reservoir | 210.4 | 204.5 | 221.3 | 272.2 |
| Lucky Peak Reservoir | 222.7 | 128.3 | 177.4 | 293.2 |
| **Sub-Basin Total** | **840.5** | **678.5** | **681.2** | **1015.6** |
| Deadwood Reservoir | 102.0 | 79.9 | 91.3 | 161.9 |
| Cascade Reservoir | 527.5 | 452.9 | 493.5 | 693.2 |
| **Sub-Basin Total** | **629.5** | **532.8** | **584.8** | **855.1** |
| Lake Lowell | 112.3 | 90.7 | 118.1 | 165.2 |
| Mann Creek Reservoir | 9.4 | 2.5 | 8.2 | 11.1 |

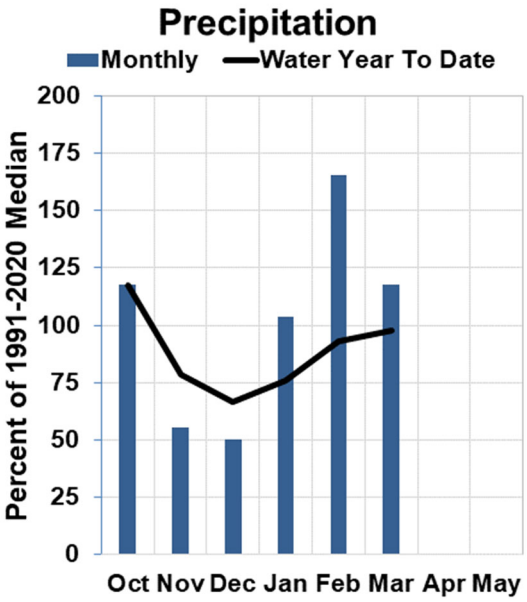
Watershed Snowpack Analysis: April 1, 2024

| Basin Name | # of Sites | % of Median 2024 | 2023 |
|---|---|---|---|
| SF Boise River | 9 | 100% | 159% |
| MF & NF Boise Rivers | 6 | 88% | 119% |
| Mores Creek | 5 | 99% | 125% |
| Canyon Creek | 2 | 135% | 349% |
| Boise Basin Total | 18 | 100% | 145% |
| NF Payette River | 9 | 87% | 119% |
| SF Payette River | 4 | 83% | 112% |
| Payette Basin Total | 18 | 90% | 128% |
| Mann Creek | 2 | 101% | 193% |
| Weiser Basin Total | 6 | 93% | 157% |

# Wood & Lost River Basins

**April 1, 2024**




## WATER SUPPLY OUTLOOK

For the first time in Water Year 2024, snowpack caught up to normal conditions in the Wood and Lost River basins. During March, precipitation ranged from ~110 to 150% of normal (Fig. 1). Total water year precipitation continued to improve last month and is now ~90 to 105% of normal (Fig. 2). As of April 1, snowpack conditions are ~95 to 100% of normal (Fig. 3). A large proportion of the precipitation came from an atmospheric river event during the first week of March. However, a long dry and warm period followed this storm, which triggered snowmelt across the basin. Cold storms at the end of the month mitigated these SWE losses except at low elevation SNOTEL sites. The Wood and Lost River basins are currently ~90 to 95% of the normal peak SWE (Fig. 4). The normal peak snowpack date for the Big and Little Wood River Basins occurred in late March. Peak snowpack typically occurs between April 5 – 14 for the rest of the area's basins. Continued cold and wet weather is needed for the snowpack to reach these normal peak SWE values by mid-April.

April 1 reservoir storage remains above the 30-year normal at Magic Reservoir with 198% of normal storage (84% full). Little Wood Reservoir is 108% of normal (79% full). Managed aquifer recharge was started on March 8 for the Little Wood River. Mackay Reservoir storage improved but is still behind at 79% of normal (58% full). Streamflow forecasts for the Wood and Lost basins are ~95 to 150% of normal for the 50% exceedance forecast (Fig. 5).

# Wood and Lost Basins Streamflow Forecasts - April 1, 2024

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Med (KAF) |
|---|---|---|---|---|---|---|---|---|
| Camas Ck at Camas | APR-JUL | 9.1 | 15.4 | 21 | 121% | 27 | 37 | 17.3 |
| Little Lost R bl Wet Ck nr Howe | APR-JUL | 16.9 | 22 | 25 | 100% | 28 | 33 | 25 |
| | APR-SEP | 19.6 | 26 | 30 | 103% | 34 | 40 | 29 |
| Big Lost R at Howell Ranch | APR-JUL | 117 | 142 | 160 | 110% | 178 | 205 | 145 |
| | APR-SEP | 129 | 158 | 178 | 112% | 198 | 225 | 159 |
| Big Lost R bl Mackay Reservoir | APR-JUL | 78 | 102 | 118 | 113% | 134 | 158 | 104 |
| | APR-SEP | 99 | 125 | 143 | 113% | 161 | 187 | 127 |
| Little Wood R ab High Five Ck | APR-JUL | 44 | 54 | 62 | 119% | 70 | 83 | 52 |
| | APR-SEP | 48 | 59 | 67 | 120% | 76 | 90 | 56 |
| Little Wood R nr Carey 2 | APR-JUL | 47 | 59 | 67 | 124% | 76 | 90 | 54 |
| | APR-SEP | 51 | 63 | 72 | 124% | 82 | 97 | 58 |
| Big Wood R at Hailey | APR-JUL | 136 | 174 | 200 | 95% | 225 | 265 | 210 |
| | APR-SEP | 154 | 196 | 225 | 98% | 255 | 295 | 230 |
| Big Wood R ab Magic Reservoir | APR-JUL | 62 | 99 | 129 | 93% | 163 | 220 | 139 |
| | APR-SEP | 69 | 108 | 140 | 96% | 176 | 235 | 146 |
| Camas Ck nr Blaine | APR-JUL | 37 | 53 | 66 | 147% | 80 | 104 | 45 |
| | APR-SEP | 37 | 54 | 67 | 146% | 81 | 105 | 46 |
| Big Wood R bl Magic Dam 2 | APR-JUL | 116 | 168 | 210 | 122% | 255 | 330 | 172 |
| | APR-SEP | 129 | 182 | 225 | 124% | 270 | 345 | 182 |

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 March

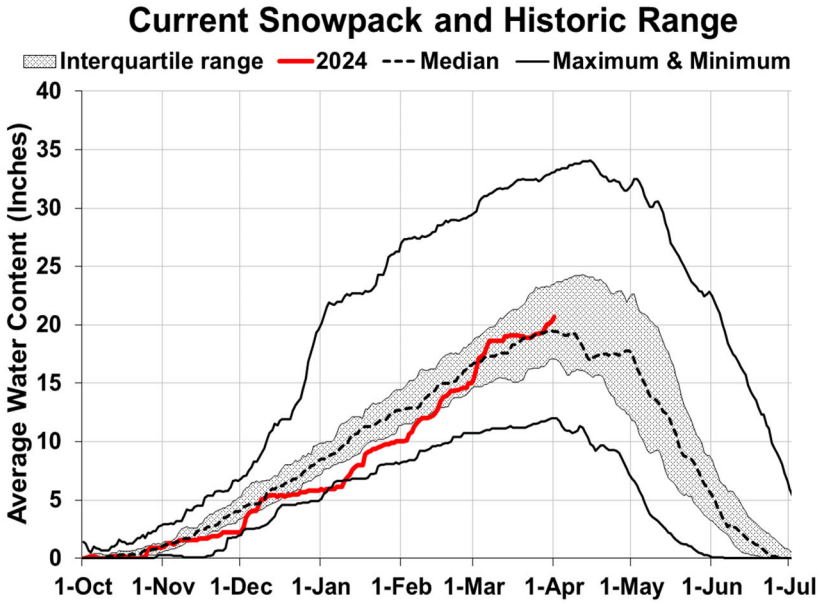
| Reservoir Name | Current (KAF) | Last YR | Median (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| Mackay Reservoir | 25.9 | 28.4 | 32.8 | 44.4 |
| Little Wood Reservoir | 23.8 | 11.4 | 22.1 | 30.0 |
| Magic Reservoir | 161.3 | 30.1 | 81.4 | 191.5 |

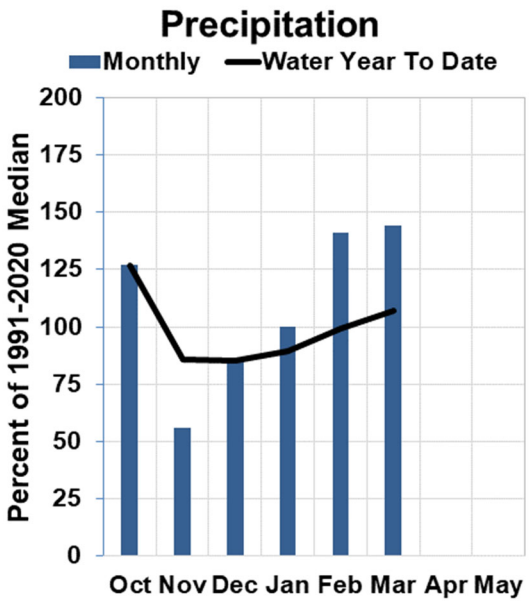
Watershed Snowpack Analysis: April 1, 2024

| Basin Name | # of Sites | % of Median 2024 | % of Median 2023 |
|---|---|---|---|
| Camas-Beaver Creeks | 4 | 100% | 154% |
| Birch-Medicine Lodge Creeks | 6 | 94% | 141% |
| Little Lost River | 5 | 93% | 133% |
| Big Lost River ab Mackay | 5 | 93% | 142% |
| Big Lost Basin Total | 7 | 94% | 150% |
| Fish Creek | 3 | 94% | 208% |
| Little Wood ab Resv | 5 | 102% | 162% |
| Big Wood River ab Hailey | 8 | 92% | 147% |
| Camas Creek | 4 | 111% | 202% |
| Birch-Medicine Lodge-Camas-Beaver Total | 10 | 96% | 146% |
| Little Wood Basin Total | 8 | 100% | 176% |
| Big Wood Basin Total | 12 | 97% | 162% |

# Upper Snake River Basins

**April 1, 2024**




## WATER SUPPLY OUTLOOK

March precipitation was well above normal in all three Upper Snake basins; precipitation was 143% in the Henrys Fork-Teton, 147% above Heise, and 174% in the Willow-Blackfoot-Portneuf Basin (Fig. 1). As of April 1, total water year precipitation in the Henrys Fork-Teton is 105%, Snake River above Heise is 103%, and Willow-Blackfoot-Portneuf is 129% of normal (Fig. 2). Snowpack in these basins ranges from nearly normal in the Henrys Fork-Teton to 142% of normal in the Willow-Blackfoot-Portneuf (Fig. 3). On April 1, snowpack in Willow-Blackfoot-Portneuf was 133% of the normal winter peak SWE, Henrys Fork-Teton was 96%, and Snake River above Heise was 97% of normal peak SWE. (Fig. 4). Melt was observed across the Upper Snake basins prior to the latest winter storms, but with near normal precipitation predicted in the next 10 days, there remains a strong possibility all three Upper Snake basins will reach normal peak SWE this season.

The Upper Snake Reservoir system above Milner is currently 122% of normal (90% full). The Jackson-Palisades system is 134% of normal (86% full). The 50% exceedance streamflow forecasts in the region range from ~88 to 250% of median runoff for the primary forecast period (Fig. 5). The April through July forecast at Heise is 106% of normal at the 50% exceedance level. Water supply from reservoir storage is ample. Flood risk management operations on the Snake River above Milner began on March 25. Excess water that would spill past Milner is being used to continue recharging the Eastern Snake River Plain Aquifer. Flooding could also be a concern this year again if the snowpack melts too rapidly, particularly on the Portneuf River.

# Upper Snake River Basin Streamflow Forecasts - April 1, 2024

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Med (KAF) |
|---|---|---|---|---|---|---|---|---|
| Henrys Fk nr Ashton 2 | APR-JUL | 370 | 420 | 455 | 96% | 490 | 540 | 475 |
| | APR-SEP | 510 | 570 | 610 | 97% | 650 | 710 | 630 |
| Falls R nr Ashton 2 | APR-JUL | 310 | 345 | 365 | 92% | 390 | 425 | 395 |
| | APR-SEP | 375 | 415 | 445 | 94% | 475 | 515 | 475 |
| Teton R nr Driggs | APR-JUL | 135 | 159 | 176 | 121% | 193 | 215 | 146 |
| | APR-SEP | 162 | 193 | 215 | 121% | 235 | 270 | 178 |
| Teton R nr St Anthony | APR-JUL | 325 | 375 | 410 | 115% | 445 | 495 | 355 |
| | APR-SEP | 375 | 435 | 475 | 112% | 515 | 575 | 425 |
| Henrys Fk nr Rexburg 2 | APR-JUL | 1000 | 1150 | 1250 | 103% | 1350 | 1500 | 1210 |
| | APR-SEP | 1320 | 1500 | 1630 | 103% | 1760 | 1940 | 1580 |
| Snake R at Flagg Ranch | APR-JUL | 390 | 445 | 480 | 103% | 515 | 570 | 465 |
| | APR-SEP | 420 | 480 | 520 | 103% | 560 | 620 | 505 |
| Snake R nr Moran 2 | APR-JUL | 630 | 705 | 760 | 104% | 815 | 890 | 730 |
| | APR-SEP | 705 | 790 | 850 | 105% | 910 | 995 | 810 |
| Pacific Ck at Moran | APR-JUL | 93 | 122 | 142 | 92% | 161 | 190 | 154 |
| | APR-SEP | 99 | 129 | 150 | 94% | 170 | 200 | 160 |
| Buffalo Fk ab Lava Ck nr Moran | APR-JUL | 196 | 230 | 250 | 88% | 270 | 305 | 285 |
| | APR-SEP | 205 | 245 | 270 | 87% | 295 | 335 | 310 |
| Snake R ab Reservoir nr Alpine 2 | APR-JUL | 1720 | 1920 | 2050 | 96% | 2190 | 2390 | 2140 |
| | APR-SEP | 1970 | 2200 | 2350 | 97% | 2510 | 2740 | 2430 |
| Greys R ab Reservoir nr Alpine | APR-JUL | 255 | 295 | 315 | 100% | 340 | 380 | 315 |
| | APR-SEP | 300 | 340 | 370 | 101% | 395 | 440 | 365 |
| Salt R ab Reservoir nr Etna | APR-JUL | 300 | 350 | 385 | 126% | 420 | 475 | 305 |
| | APR-SEP | 365 | 425 | 465 | 122% | 505 | 565 | 380 |
| Snake R nr Irwin 2 | APR-JUL | 2590 | 2900 | 3110 | 106% | 3320 | 3630 | 2930 |
| | APR-SEP | 2990 | 3350 | 3600 | 105% | 3850 | 4210 | 3420 |
| Snake R nr Heise 2 | APR-JUL | 2790 | 3110 | 3320 | 106% | 3530 | 3850 | 3130 |
| | APR-SEP | 3240 | 3610 | 3870 | 106% | 4130 | 4500 | 3660 |
| Willow Ck nr Ririe 2 | APR-JUL | 65 | 85 | 100 | 250% | 116 | 143 | 40 |
| Portneuf R at Topaz | APR-JUL | 64 | 75 | 82 | 164% | 90 | 102 | 50 |
| | APR-SEP | 80 | 92 | 101 | 155% | 110 | 124 | 65 |
| Snake R at Neeley 2 | APR-JUL | 1370 | 1980 | 2450 | 103% | 2980 | 3840 | 2390 |
| | APR-SEP | 1390 | 2060 | 2510 | 106% | 2960 | 3630 | 2360 |

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

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

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

Reservoir Storage (KAF): End of March

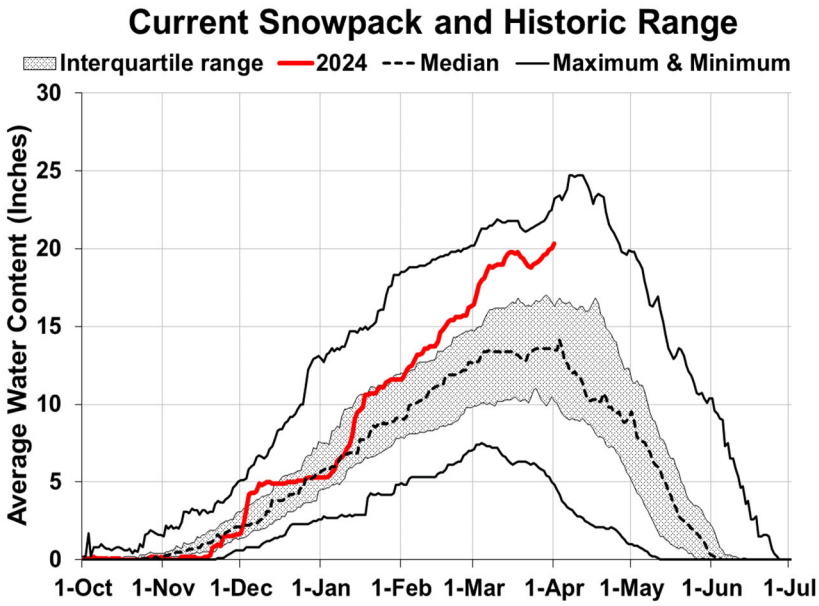
| Reservoir Name | Current (KAF) | Last YR | Median (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| Jackson Lake | 630.4 | 199.6 | 627.0 | 847.0 |
| Palisades Reservoir | 1291.0 | 618.6 | 803.3 | 1400.0 |
| **Sub-Basin Total** | **1921.4** | **818.2** | **1430.3** | **2247.0** |
| Henrys Lake | 85.4 | 83.9 | 85.0 | 90.4 |
| Island Park Reservoir | 123.8 | 117.4 | 109.3 | 135.2 |
| Grassy Lake | 13.4 | 12.0 | 13.2 | 15.2 |
| **Sub-Basin Total** | **222.6** | **213.4** | **207.5** | **240.8** |
| Ririe Reservoir | 56.8 | 49.1 | 48.7 | 80.5 |
| Blackfoot Reservoir | 293.5 | 185.7 | 198.6 | 337.0 |
| American Falls Reservoir | 1643.0 | 1293.8 | 1498.0 | 1672.6 |
| **Basin-Wide Total** | **4137.3** | **2560.1** | **3383.1** | **4577.9** |

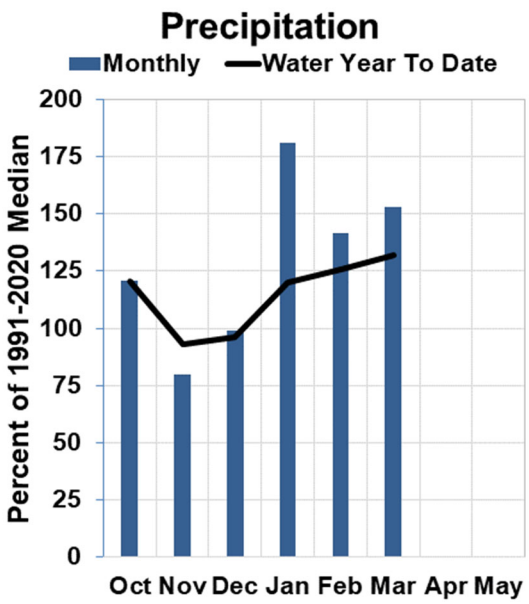
Watershed Snowpack Analysis: April 1, 2024

| Basin Name | # of Sites | % of Median 2024 | 2023 |
|---|---|---|---|
| Henrys Fork-Falls River | 13 | 96% | 122% |
| Teton River | 9 | 110% | 119% |
| Henrys Fork-Teton | 20 | 101% | 122% |
| Snake River ab Jackson Lake | 12 | 97% | 116% |
| Pacific Creek | 3 | 101% | 111% |
| Buffalo Fork | 5 | 91% | 100% |
| Gros Ventre River | 5 | 90% | 101% |
| Hoback River | 5 | 97% | 116% |
| Greys River | 5 | 104% | 114% |
| Salt River | 6 | 120% | 136% |
| Snake ab Palisades Resv | 34 | 99% | 115% |
| Willow Creek | 5 | 104% | 114% |
| Blackfoot River | 6 | 141% | 170% |
| Portneuf River | 7 | 137% | 192% |
| Willow-Blackfoot-Portneuf | 17 | 142% | 179% |
| Snake River ab American Falls | 55 | 109% | 131% |

# Southern Snake River Basins

**April 1, 2024**




## WATER SUPPLY OUTLOOK

March precipitation was 142 to 183% of normal across the Southern Snake River basins (Fig. 1). Total water year precipitation is now 126 to 138% of normal (Fig. 2). The recent warm temperatures led to periods of melt throughout March. There are noticeable increases in snowmelt runoff observed at downstream USGS stream gauges, however, there is still a ways to go until peak streamflow is reached from snowmelt. Snowpack in the Southern Snake River basins remains well above normal, ranging from 128 to 208% on April 1 (Fig. 3). Snowpack in these basins typically peaks from March 18 through April 18. The April 1 snowpack is 118 to 144% of median peak snowpack (Fig. 4).

Reservoir storage in the region is above normal. Lake Owyhee storage is 141% of normal (91% full), Wild Horse is 188% of normal (87% full), Salmon Falls is 116% of normal (28% full), and Oakley Reservoir is 123% of normal (43% full). The 50% exceedance streamflow forecasts range from 192 to 262% of median runoff for the primary forecast period (Fig. 5). The primary forecast period for streamflow in these basins runs from either March or April to July, depending on when snowmelt runoff has historically occurred. Soil moisture is above normal throughout these basins which bodes well for higher runoff efficiency this spring. NOAA's 30-Day Outlook predicts above normal precipitation and temperatures during April.

## Southern Snake River Basins Streamflow Forecasts - April 1, 2024

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Med (KAF) |
|---|---|---|---|---|---|---|---|---|
| Goose Ck ab Trapper Ck nr Oakley | APR-JUL | 19.3 | 25 | 29 | 216% | 33 | 41 | 13.4 |
| | APR-SEP | 19.8 | 26 | 30 | 214% | 35 | 42 | 14 |
| Trapper Ck nr Oakley | APR-JUL | 5.1 | 5.7 | 6.2 | 151% | 6.7 | 7.4 | 4.1 |
| | APR-SEP | 6.3 | 7.1 | 7.6 | 149% | 8.1 | 9 | 5.1 |
| Oakley Reservoir Inflow | APR-JUL | 24 | 30 | 34 | 194% | 39 | 46 | 17.5 |
| | APR-SEP | 26 | 32 | 37 | 194% | 42 | 50 | 19.1 |
| Salmon Falls Ck nr San Jacinto | APR-JUL | 78 | 97 | 110 | 196% | 125 | 148 | 56 |
| | APR-SEP | 81 | 100 | 114 | 197% | 129 | 152 | 58 |
| Bruneau R nr Hot Spring | APR-JUL | 225 | 275 | 310 | 197% | 350 | 405 | 157 |
| | APR-SEP | 235 | 290 | 325 | 199% | 365 | 425 | 163 |
| Reynolds Ck at Tollgate | APR-JUL | 7.7 | 9.5 | 10.9 | 170% | 12.4 | 14.7 | 6.4 |
| | APR-SEP | 7.8 | 9.7 | 11.1 | 173% | 12.6 | 15 | 6.4 |
| Owyhee R nr Gold Ck 2 | APR-JUL | 31 | 41 | 48 | 279% | 56 | 69 | 17.2 |
| Owyhee R nr Rome | APR-JUL | 350 | 470 | 560 | 273% | 660 | 820 | 205 |
| | APR-SEP | 385 | 505 | 600 | 273% | 700 | 865 | 220 |
| Owyhee R bl Owyhee Dam 2 | APR-JUL | 385 | 500 | 590 | 251% | 685 | 840 | 235 |
| | APR-SEP | 435 | 555 | 645 | 243% | 740 | 895 | 265 |
| Bruneau R at Rowland | APR-JUL | 67 | 81 | 90 | 188% | 99 | 113 | 48 |
| | APR-SEP | 69 | 83 | 92 | 188% | 101 | 115 | 49 |
| Jarbidge River Below Jarbidge | APR-JUL | 25 | 29 | 31 | 158% | 33 | 37 | 19.6 |
| | APR-SEP | 25 | 29 | 31 | 155% | 33 | 37 | 20 |

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 March

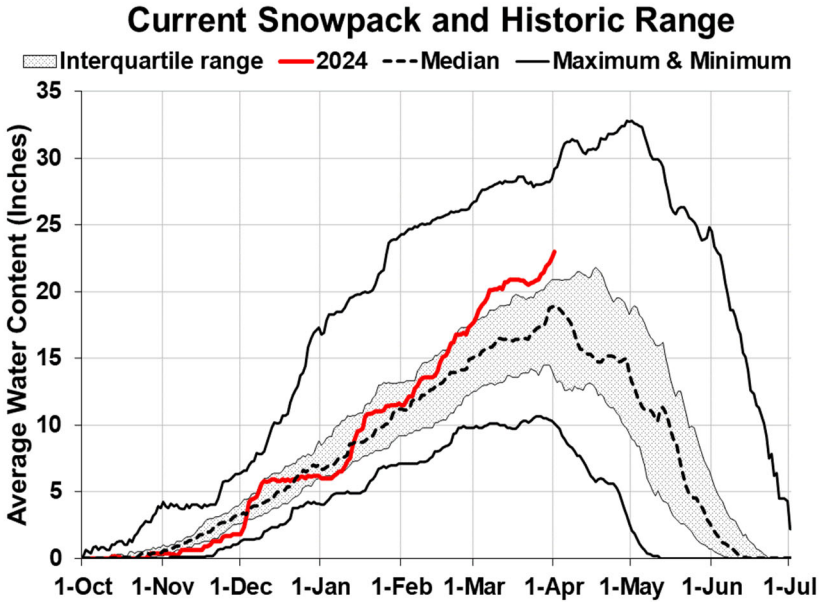
| Reservoir Name | Current (KAF) | Last YR | Median (KAF) | Capacity (KAF) |
|---|---|---|---|---|
| Oakley Reservoir | 32.6 | 18.8 | 26.6 | 75.6 |
| Salmon Falls Reservoir | 51.8 | 23.6 | 44.7 | 182.6 |
| Wild Horse Reservoir | 62.5 | 30.4 | 33.3 | 71.5 |
| Lake Owyhee | 649.5 | 229.5 | 460.0 | 715.0 |
| Brownlee Reservoir | 858.3 | 883.1 | 1123.0 | 1420.0 |

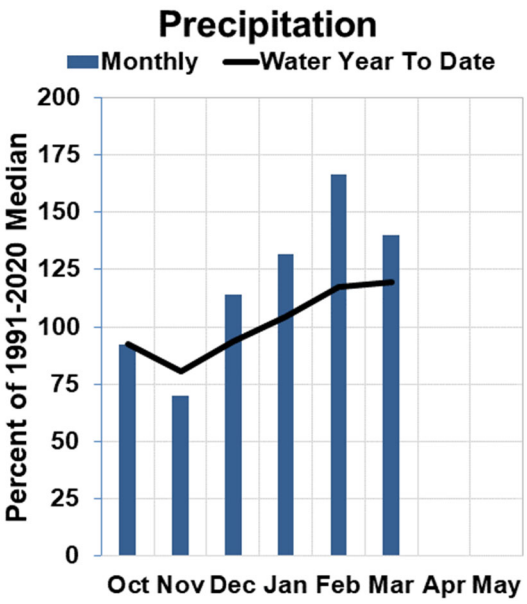
Watershed Snowpack Analysis: April 1, 2024

| Basin Name | # of Sites | % of Median 2024 | 2023 |
|---|---|---|---|
| Raft River | 2 | 127% | 135% |
| Goose-Trapper Creeks | 3 | 149% | 163% |
| Salmon Falls Creek | 7 | 163% | 199% |
| Bruneau River | 9 | 177% | 203% |
| Reynolds Creek | 6 | 129% | 124% |
| Upper Owyhee | 13 | 226% | 244% |
| Owyhee Basin Total | 20 | 208% | 226% |

# Bear River Basin

**April 1, 2024**




## WATER SUPPLY OUTLOOK

Monthly precipitation was well above normal in March across the Bear River Basin, ranging from 114% to 191% at individual SNOTEL sites, and 140% of normal for the entire basin (Fig. 1). Total water year precipitation is also well above normal at 118% on April 1 (Fig. 2). Snowpack is currently 123% of normal (Fig. 3) and is 111% of median peak SWE on April 1 (Fig. 4). There are a few days left in the normal snow accumulation season. The snowpack typically peaks around April 6. NOAA's 30-day Outlook favors above normal precipitation during April in the Bear River Basin.

Reservoir storage for Bear Lake is well above normal at 181% (71% full) on April 1. The 50% exceedance streamflow forecasts in the basin range from 101 to 216% for the April to July period (Fig. 5). With evidence of the snowpack nearing its melt phase, it is important to keep an eye on flood risk warnings in the coming months.

# Bear River Basin Streamflow Forecasts - April 1, 2024

| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <--Drier----------Projected Volume----------Wetter--> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Med (KAF) |
|---|---|---|---|---|---|---|---|---|
| Bear R nr UT-WY State Line | APR-JUL | 95 | 110 | 122 | 121% | 135 | 155 | 101 |
| | APR-SEP | 103 | 121 | 134 | 118% | 148 | 169 | 114 |
| Bear R ab Resv nr Woodruff | APR-JUL | 81 | 105 | 124 | 135% | 147 | 185 | 92 |
| | APR-SEP | 85 | 110 | 132 | 133% | 159 | 205 | 99 |
| Big Ck nr Randolph | APR-JUL | 3.4 | 5.1 | 6.9 | 216% | 9.2 | 14.3 | 3.2 |
| Smiths Fk nr Border | APR-JUL | 67 | 77 | 87 | 101% | 96 | 109 | 86 |
| | APR-SEP | 78 | 90 | 100 | 100% | 111 | 128 | 100 |
| Bear R bl Stewart Dam 2 | APR-JUL | 107 | 163 | 210 | 183% | 270 | 375 | 115 |
| | APR-SEP | 135 | 184 | 235 | 193% | 280 | 330 | 122 |

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 March | | | | |
|---|---|---|---|---|
| Reservoir Name | Current (KAF) | Last YR | Median (KAF) | Capacity (KAF) |
| Bear Lake | 922.7 | 443.5 | 510.6 | 1302.0 |
| Montpelier Reservoir | | .5 | 2.2 | 4.0 |

| Watershed Snowpack Analysis: April 1, 2024 | | | |
|---|---|---|---|
| Basin Name | # of Sites | % of Median 2024 | 2023 |
| Smiths-Thomas Forks | 4 | 113% | 137% |
| Bear Lake | 12 | 124% | 165% |
| Montpelier Creek | 2 | 128% | 153% |
| Mink Creek | 2 | 122% | 184% |
| Cub River | 2 | 124% | 177% |
| Bear River Total | 30 | 124% | 164% |
| Malad River | 3 | 141% | 221% |

**Streamflow Adjustment List for All Forecasts Published in Idaho Water Supply Outlook Report:** Streamflow forecasts are projections of runoff volumes that would occur without influences from upstream reservoirs or diversions. These values are referred to as natural, unregulated or adjusted flows. To make these adjustments, changes in reservoir storage, diversions, and inter-basin transfers are added or subtracted from the observed (actual) streamflow volumes. The following list documents the adjustments made for each forecast point. **(Revised Dec. 2024).**

## Panhandle Region

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

Moyie R at Eastport – no corrections

Boundary Ck nr Porthill – no corrections

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

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

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

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

NF Coeur d' Alene R at Enaville - no corrections

St. Joe R at Calder- no corrections

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

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

## Clearwater River Basin

Selway R nr Lowell - no corrections

Lochsa R nr Lowell - no corrections

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

Clearwater R at Orofino - no corrections

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

## Salmon River Basin

Salmon R at Salmon - no corrections

Lemhi R nr Lemhi – no corrections

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

SF Salmon R nr Krassel Ranger Station – no corrections

Johnson Creek at Yellow pine – no corrections Salmon R at White Bird - no corrections

## West Central Basins

Boise R nr Twin Springs - no corrections

SF Boise R at Anderson Ranch Dam (2)
+ Anderson Ranch Res storage change Mores Ck nr Arrowrock Dam – no corrections

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

SF Payette R at Lowman - no corrections

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

Lake Fork Payette R nr McCall – no corrections

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

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

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

Weiser R nr Weiser - no corrections

## Wood and Lost Basins

Little Lost R bl Wet Ck nr Howe - no corrections

Big Lost R at Howell Ranch - no corrections

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

Little Wood R ab High Five Ck – no corrections

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

Big Wood R at Hailey - no corrections

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

Camas Ck nr Blaine – no corrections

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

## Upper Snake River Basin

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

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

Teton R nr Driggs - no corrections

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

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

**Southside Snake River Basins**

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

**Bear River Basin**

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

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

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

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

# Interpreting Water Supply Forecasts

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

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

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

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

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

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

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

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

***30-Year Median.*** The 30-year median streamflow for each forecast period is provided for comparison. The median is based on data from 1991-2020. The % MED column compares the 50% chance of exceedance forecast to the 30-year median streamflow; values above 100% denote when the 50% chance of exceedance forecast would be greater than the 30-year median streamflow.

AF - Acre-feet, forecasted volume of water are typically in thousands of acre-feet (KAF).

These forecasts are given to users to help make risk-based decisions. Users can select the forecast corresponding to the level of risk they are willing to accept in order to minimize the negative impacts of having more or less water than planned for.

**To Decrease the Chance of Having Less Water than Planned for**
A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive less than this amount). To reduce the risk of having less water than planned for, users can base their operational decisions on one of the forecasts with a greater chance of being exceeded such as the 90 or 70 percent exceedance forecasts.

**To Decrease the Chance of Having More Water than Planned for**
A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive more than this amount). To reduce the risk of having more water than planned for, users can base their operational decisions on one of the forecasts with a lesser chance of being exceeded such as the 30 or 10 percent exceedance forecasts.

**<u>Forecast use example:</u>**

***Using the 50 Percent Exceedance Forecast.*** Using the example forecasts shown on the next page, there is a 50% chance that actual streamflow volume at the Henry's Fork near Ashton will be less than 280 KAF between June 1 and Sept. 30. There is also a 50% chance that actual streamflow volume will be greater than 280 KAF.

***Using the 90 and 70 Percent Exceedance Forecasts.*** If an unexpected shortage of water could cause problems (such as irrigated agriculture), users might want to plan on receiving 245 KAF during Jun 1 through September 30 (from the 70 percent exceedance forecast). There is a 30% chance of receiving *less* than 245 KAF.

Alternatively, if users determine the risk of using the 70 percent exceedance forecast is too great, then they might plan on receiving 198 KAF (from the **90** percent exceedance forecast). There is 10% chance of receiving less than 72 KAF.

***Using the 30 or 10 Percent Exceedance Forecasts.*** If an unexpected excess of water could cause problems (such as operating a flood control reservoir), users might plan on receiving 315 KAF between June 1 and Sept. 30 (from the 30 percent exceedance forecast). There is a 30% chance of receiving *more* than 315 KAF.

Alternatively, if users determine the risk of using the 30 percent exceedance forecast is too great, then they might plan on receiving 360 KAF (from the 10 percent exceedance forecast). There is a 10% chance of receiving more than 360 KAF. Users could also choose a volume in between any of these values to reflect their desired risk level.

**Upper Snake River Basin Streamflow Forecasts - June 1, 2015**

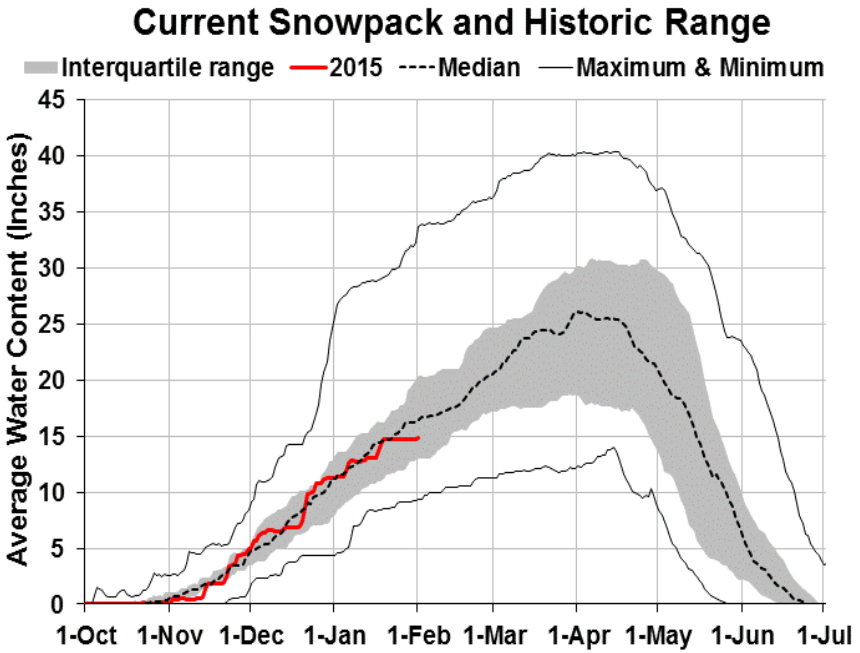
| Forecast Point | Forecast Period | Forecast Exceedance Probabilities for Risk Assessment <---Drier----------Projected Volume----------Wetter---> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|---|---|---|---|---|---|---|---|---|
| Henrys Fk nr Ashton | JUN-JUL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

## Interpreting Snowpack Plots

Basin snowpack plots represent snow water equivalent indices using the average daily SNOTEL data[1] from several sites in or near individual basins. The solid red line (2015), which represents the current water year snowpack water content, can be compared to the normal dashed black line (Median) which is considered "normal", as well as the SNOTEL observed historical snowpack range for each basin. This allows users to gather important information about the current year's snowpack as well as the historical variability of snowpack in each basin.

The gray shaded area represents the interquartile range (also known as the "middle fifty"), which is the 25th to 75th percentiles of the historical daily snowpack data for each basin. Percentiles depict the value of the average snowpack below which the given percent of historical years fall. For example, the top part of the interquartile range (75th percentile) indicates that the snowpack index has been below this line for 75 percent of the period of record, whereas the reverse is true for the lower part of the interquartile range (25th percentile). This means 50 percent of the time the snowpack index is within the interquartile range (gray area) during the period of record.

[1] All data used for these plots come from daily SNOTEL data only and does not include snow course data (collected monthly), whereas the official basin snowpack percent of normal includes both SNOTEL and snow course data, potentially leading to slight discrepancies between plots and official basin percent of normal.



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This publication is dedicated to the people, agencies and organizations utilizing this data, information and forecasts for short and long term water management, planning, preparation, recreation and otherwise, for the enhancement of the economy and enrichment of livelihoods.