

**Natural Resources Conservation Service** 



# Washington Water Supply Outlook Report

March 1, 2024



Low atmospheric pressure near the Gulf of Alaska created significant bands of rain and snow that swept across the state on February 28th. Despite notable increases in precipitation from this storm event, snowpack in all major basins remains below normal as of March 1st. NASA Earth Observing System Data and Information System (February 28, 2024)

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#### **Contact for Report**

Matt Warbritton Supervisory Hydrologist Portland Data Collection Office USDA-NRCS Snow Survey and Water Supply Forecasting Program matt.warbritton@usda.gov Phone: (503) 307-2829

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## **Conditions Overview**

#### Summary

Despite some significant snow accumulation in February across the Washington Cascades and Olympic Peninsula, and some impacts east of the Cascades, pervasive and in some cases severe snowpack deficits persist. Several SNOTEL stations in the Puget Sound and Upper Columbia Basins are measuring snow amounts that indicate a severe to extreme snow drought. The poor start to the snow accumulation season, in addition to a mid-winter heatwave melting snowpack towards the end of January, resulted in a severely diminished capacity for most sites to recover during subsequent storm events, like the most recent storm at the end of February. The MF Nooksack SNOTEL best exemplifies this, when prior to the melt event in January the snow water equivalent (SWE) was at 22.7 in. on January 27. The mid-winter heatwave resulted in a 9.9 in. loss in SWE, with the site not fully recovering that loss until February 26. This mid-winter melt event will very likely continue to have strong negative implications for any potential snowpack recovery through March, in addition to spring and summer runoff.

As we approach the normal timing for peak snow accumulation, substantial snow accumulation is needed to reach normal levels in most basins. Water resource managers should expect negative impacts to summer water supplies if conditions don't substantially improve.

\*Note that basin conditions outlined in this report include data from stations within the SNOTEL and SNOLITE network, and/or cooperator weather stations.



Deep snow nearly conceals a vault toilet at the Blue Lake trailhead in the Mt. Baker-Snoqualmie National Forest. Marten Ridge, a nearby SNOTEL site, reported snowpack at 47% of median on March 1st. Photo taken by Irene Henninger, Northwest Avalanche Center (March 1, 2024)

#### Snowpack

As of March 1, statewide snowpack is 70% of normal. Almost all SNOTEL stations in the state are experiencing a snowpack deficit of varying magnitude. Snowpack is generally more moderately below normal in the southern Washington Cascades and along the eastern front of the Cascades, with more well-below normal snowpack in the Lower Yakima Basin. Along the western front of the central and northern Cascades, on the Olympic Peninsula, and east of the Okanogan River, snowpack is below to well-below normal. Several snow courses in northeastern Washington are at their lowest snowpack on record as of March 1.



Basin snowpack (% of median) as of March 1. Points with no values either represents sites with no data available or no median (normal) established.

## Precipitation

Precipitation during February was variable across the state, with much of northeastern Washington near to well-above normal. Across the Cascades, February precipitation was near to above normal mostly in the eastern portion of the Wenatchee Mountains, northern Blue Mountains, and around Mt. St. Helens, Mt. Rainier, and Mt. Baker. On the Olympic Peninsula, monthly precipitation ranges from near to below normal. WYTD precipitation is generally below normal for much of the state, except in the Lower Columbia Basin, parts of northeastern Washington, and in the eastern Wenatchee Mountains where WYTD precipitation is near normal.



Basin monthly precipitation (% of median) as of March 1



Basin water-year precipitation (% of median) as of March 1. Points with no values either represents sites with no data available or no median (normal) established.

Snow Survey and Water Supply Forecasting Program

#### Reservoirs

Volumetric storage for reservoirs across Washington is mostly near to above normal with some exceptions. Reservoirs in Kittitas County are storing volumes below to well-below normal. Reservoir storage at Conconully Reservoir and Lake and at Rimrock are storing volumes slightly below normal.

Reservoir storage values aren't necessarily reflective of water supply conditions. Reservoir operators control for a variety of factors when choosing to store or release water, including flooding, irrigation, fisheries, and other water needs. These management needs may impact storage values for a reservoir.



Reservoir storage (% of median) as of March 1

#### **Streamflow and Forecasts**

Volumetric streamflow in Washington varies slightly from west to east. Along the western front of the Cascades and on the Olympic Peninsula, streamflow ranges from slightly below normal to well-above normal. Along the eastern front of the Cascades and in northeastern Washington, streamflow is generally well-above normal. In southeastern Washington, streamflow ranges from below to slightly above normal.

Water supply forecasts (WSF) for March 1st have either stayed the same or have slightly degraded across the state since February 1. Most WSFs in the southern Washington Cascades are near normal, while most points elsewhere are slightly to moderately below normal.

Predictive skill for WSFs continues to improve for most points compared to February 1 as the normal timing for peak snow accumulation approaches. However, in basins that are rain-dominated (ex., several water-sheds along the western front of the Cascades), skill may still be sufficiently low, meaning current conditions are a poor predictor of summer water supply. In this case, the 50%-exceedance value typically has a greater tendency toward the climatological normal, which may or may not be more reflective of March-1 conditions. Forecast product-users should bear this and any model uncertainty (quantitatively captured by exceedance intervals) in mind when interpreting WSFs for decision making.



View the map for February observed streamflow here.

Streamflow forecasts (% of normal) for the primary period as of March 1

### Drought

As of March 5, nearly 8% of Washington is in some drought category (D1-D2). Drought is primarily distributed in the northeastern corner of the state (D1-D2; moderate to severe drought), with additional designations in the North Cascades, Olympic Peninsula, and the southeastern corner of Asotin County in southeast Washington.

At the beginning of the water year, 75% of the state was in some drought category (D1-D4), with 10% of the state in severe to extreme drought.



## Soils

The NASA SPoRT-LiS product for soil moisture (0-100 cm depth) indicates drier soil moisture profiles notably in the Walla Walla Basin, parts of the northern Washington Cascades, and in portions of the Upper Yakima Basin.

Soil moisture conditions are useful in assessing current drought and future drought potential. In addition, soil moisture is generally a good indicator in some regions of the potential efficiency of snowmelt runoff into streamflow in the spring. Drier soils tend to absorb more water from snowmelt than wetter soils, thus less melt is translated into streamflow (i.e. low efficiency).



### 1-Month Outlook

The Climate Prediction Center 1-month climatic outlook calls for equal chances of below and abovenormal precipitation and temperatures for all of Washington.



https://www.cpc.ncep.noaa.gov/

## **North Puget Sound Basin Summary**

### SNOWPACK



View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 60% of median. This is higher than February 1 when the basin snowpack was 49% of median.

#### PRECIPITATION



View precipitation for individual sites by accessing the basin data report <u>here</u>.

#### FoM = First of Month

February precipitation is slightly below normal at 97% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 83% of median.

As of March 1, storage at Upper Baker Reservoir is above normal at 138% of median. Volumetric storage at Lake Shannon is 130% of median, and 117% of median at Ross Lake.

	North Rugot Sound	Current	Last Year	Median	Capacity	Current %	Last Year %	Median %	Current %	Last Year %
	North Puger Sound	(KAF)	(KAF)	(KAF)	(KAF)	Capacity	Capacity	Capacity	Median	Median
Upper Baker		119.3	94.1	86.7					138%	109%
Ross		954.0	773.5	816.3	1434.7	66%	54%	57%	117%	95%
Lake Shannon		98.6	68.1	76.0					130%	90%
	Basin	Index				66%	54%	57%	120%	96%
	# of res	ervoirs				1	1	1	3	3

#### STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin are below normal and range from 78% to 88% of median.



# **Central Puget Sound Basin Summary**

#### **SNOWPACK**



View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 62% of median. This is slightly higher than February 1 when the basin snowpack was 59% of median.

#### PRECIPITATION



► View precipitation for individual sites by accessing the basin data report <u>here</u>.

February precipitation is below normal at 94% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 84% of median.

FoM = First of Month

#### **STREAMFLOW FORECAST**

The April through September streamflow forecasts in the basin are near-normal and range from 77% to 88% of median.



## **South Puget Sound Basin Summary**

#### **SNOWPACK**

# South Puget Sound Basin Snowpack



► View snowpack for individual sites by accessing the basin data report here.

As of March 1, the basin snowpack is 69% of median. This is slightly higher than February 1 when the basin snowpack was 64% of median.

# South Puget Sound Basin Precipitation

#### PRECIPITATION

View precipitation for individual sites by accessing the basin data report <u>here</u>.

FoM = First of Month

February precipitation is below normal at 83% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 85% of median.

As of March 1, volumetric storage at Howard Hansen Reservoir is well above normal at 219% of median.

South Puget Sound	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)	Current % Capacity	Last Year % Capacity	Median % Capacity	Current % Median	Last Year % Median
Howard Hansen	5.0	2.9	2.3	106.0	5%	3%	2%	219%	124%
Basin Inde	ex				5%	3%	2%	219%	124%
# of reservoi	irs				1	1	1	1	1

## STREAMFLOW FORECAST

The April through September streamflow forecast for Green R bl Howard Hanson Dam is below normal at 88% of median.

For data in tabular format, non-primary period data, and data for the new forecast point above, please view the basin data reports <u>here</u>.



# **Olympic Basin Summary**

## SNOWPACK



► View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 42% of median. This is higher than February 1 when the basin snowpack was 32% of median.



#### PRECIPITATION

► View precipitation for individual sites by accessing the basin data report <u>here</u>.

FoM = First of Month

February precipitation is below normal at 91% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 83% of median.

#### STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin are below normal and range from 68% to 73% of median.



# **Upper Columbia Basin Summary**

#### **SNOWPACK**



View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 70% of median. This is slightly lower than February 1 when the basin snowpack was 71% of median.

#### PRECIPITATION



View precipitation for individual sites by accessing the basin data report <u>here</u>.

FoM = First of Month

February precipitation is below normal at 94% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 87% of median.

As of March 1, storage at Conconully Reservoir is below normal at 89% of median. Volumetric storage at Conconully Lake (Salmon Lake Dam) is 73% of median.

Unner Columbia	Current	Last Year	Median	Capacity	Current %	Last Year %	Median %	Current %	Last Year %
Opper Columbia	(KAF)	(KAF)	(KAF)	(KAF)	Capacity	Capacity	Capacity	Median	Median
Conconully Lake (Salmon Lake Dam)	5.7	6.5	7.8	10.5	54%	62%	74%	73%	84%
Conconully Reservoir	7.7	7.4	8.7	13.0	59%	57%	67%	89%	86%
Bas	sin Index				57%	59%	70%	81%	85%
# of r	eservoirs				2	2	2	2	2

#### STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin are below normal and range from 70% to 91% of median.



# **Central Columbia Basin Summary**

#### **SNOWPACK**



View snowpack for individual sites by accessing the basin data report here.

As of March 1, the basin snowpack is 72% of median. This is slightly higher than February 1 when the basin snowpack was 69% of median.

## **Central Columbia Basin Precipitation Basin Precipitation Index** 108%108% 86% 80% 51% Monthly % - FoM WY '91-'20 Median WY Current Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct

PRECIPITATION

View precipitation for individual sites by accessing the basin data report here.

FoM = First of Month

February precipitation is below normal at 86% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 85% of median.

As of March 1, storage at Lake Chelan is slightly above normal at 138% of median.

	Central Columbia	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)	Current % Capacity	Last Year % Capacity	Median % Capacity	Current % Median	Last Year % Median
Lake Chelan		341.7	215.9	248.2	676.1	51%	32%	37%	138%	87%
	Basin Index	C				51%	32%	37%	138%	87%
	# of reservoirs	6				1	1	1	1	1

#### **STREAMFLOW FORECAST**

The April through September streamflow forecasts in the basin are below normal and range from 71% to 90% of median.



# **Lower Columbia Basin Summary**

#### **SNOWPACK**



► View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 81% of median. This is higher than February 1 when the basin snowpack was 73% of median.

#### PRECIPITATION



View precipitation for individual sites by accessing the basin data report <u>here</u>.

February precipitation is above normal at 106% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 110% of median.

FoM = First of Month

As of March 1, storage at Mossyrock Dam (Riffe Lake) is slightly below normal at 95% of median. Volumetric storage at Mayfield Lake is slightly above normal at 103% of median.

Lower Columbia	Current	Last Year	Median	Capacity	Current %	Last Year %	Median %	Current %	Last Year %
Lower Columbia	(KAF)	(KAF)	(KAF)	(KAF)	Capacity	Capacity	Capacity	Median	Median
Mossyrock Dam (Riffe Lk)	806.7	424.5	850.6	1298.0	62%	33%	66%	95%	50%
Mayfield	131.0	127.7	127.4	133.7	98%	95%	95%	103%	100%
Basin In	dex				65%	39%	68%	96%	56%
# of reserv	oirs				2	2	2	2	2

#### STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin are below normal and range from 89% to 96% of median.



# **Upper Yakima Basin Summary**

#### **Upper Yakima Basin Snowpack** Median Snowpack **Current Snowpack** Historic Range Basin Snowpack Index May Oct Nov Dec Jan Feb Mar Apr Jun Jul Aug Sep

► View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 81% of median. This is slightly higher than February 1 when the basin snowpack was 79% of median.



#### PRECIPITATION

**SNOWPACK** 

View precipitation for individual sites by accessing the basin data report <u>here</u>.

#### FoM = First of Month

February precipitation is below normal at 83% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 84% of median.

As of March 1, storage at Keechelus Reservoir is below normal at 60% of median. Volumetric storage at Cle Elum Reservoir is 58% of median, and 46% of median at Kachess Reservoir.

	Unner Vekime	Current	Last Year	Median	Capacity	Current %	Last Year %	Median %	Current %	Last Year %
		(KAF)	(KAF)	(KAF)	(KAF)	Capacity	Capacity	Capacity	Median	Median
Kachess		69.8	141.3	151.8	239.0	29%	59%	64%	46%	93%
Cle Elum		137.8	182.0	235.6	436.9	32%	42%	54%	58%	77%
Keechelus		61.3	63.0	102.4	157.8	39%	40%	65%	60%	62%
		Basin Index				32%	46%	59%	55%	79%
		# of reservoirs				3	3	3	3	3

#### **STREAMFLOW FORECAST**

The April through September streamflow forecasts in the basin are below normal and range from 86% to 89% of median.



# Lower Yakima Basin Summary

#### **SNOWPACK**



► View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 59% of median. This is slightly higher than February 1 when the basin snowpack was 56% of median.

#### PRECIPITATION



► View precipitation for individual sites by accessing the basin data report <u>here</u>.

FoM = First of Month

February precipitation is below normal at 82% of median. Precipitation since the beginning of the water year (October 1 - March 1) is also 82% of median.

#### **STREAMFLOW FORECAST**

The April through September streamflow forecasts in the basin are near-normal and range from 94% to 96% of median.



## **Naches Basin Summary**

## SNOWPACK



View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 77% of median. This is slightly higher than February 1 when the basin snowpack was 73% of median.

#### PRECIPITATION



View precipitation for individual sites by accessing the basin data report <u>here</u>.

FoM = First of Month

February precipitation is below normal at 86% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 85% of median.

As of March 1, storage at Bumping Lake is above normal at 165% of median. Volumetric storage at Rimrock Lake is below normal at 80% of median.

Naches	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)	Current % Capacity	Last Year % Capacity	Median % Capacity	Current % Median	Last Year % Median
Rimrock	111.3	120.6	138.5	198.0	56%	61%	70%	80%	87%
Bumping Lake	25.2	14.3	15.3	33.7	75%	42%	45%	165%	93%
	Basin Index				59%	58%	66%	89%	88%
	# of reservoirs				2	2	2	2	2

#### STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin are below normal and range from 89% to 94% of median.



# **Klickitat Basin Summary**

#### **SNOWPACK**



View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 74% of median. This is slightly higher than February 1 when the basin snowpack was 70% of median.

#### PRECIPITATION



View precipitation for individual sites by accessing the basin data report <u>here</u>.

#### FoM = First of Month

February precipitation is below normal at 83% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 88% of median.

## STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin are below normal to normal and range from 95% to 100% of median.



## **Lower Pend Oreille Basin Summary**

#### **SNOWPACK**



View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 65% of median. This is higher than February 1 when the basin snowpack was 58% of median.

## PRECIPITATION



View precipitation for individual sites by accessing the basin data report <u>here</u>.

#### FoM = First of Month

February precipitation is above normal at 139% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 94% of median.

As of March 1, storage at Priest Lake is above normal at 164% of median. Volumetric storage at Lower Pend Oreille Lake is slightly below normal at 83% of median.

Lower Band Oreille	Current	Last Year	Median	Capacity	Current %	Last Year %	Median %	Current %	Last Year %
Lower Pend Orellie	(KAF)	(KAF)	(KAF)	(KAF)	Capacity	Capacity	Capacity	Median	Median
Priest Lake	91.7	47.1	55.8	119.3	77%	39%	47%	164%	84%
Lake Pend Oreille	563.9	552.6	682.0	1561.3	36%	35%	44%	83%	81%
Basin Ind	ex				39%	36%	44%	89%	81%
# of reservo	pirs				2	2	2	2	2

#### **STREAMFLOW FORECAST**

The three April through September streamflow forecasts in the basin are below normal at 80% of median.



## **Spokane Basin Summary**

#### SNOWPACK **Spokane Basin Snowpack** Median Snowpack Current Snowpack Historic Range Basin Snowpack Index Mar Oct Nov Dec lan Feb Apr May Jun Jul Aug Sep

► View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 62% of median. This is higher than February 1 when the basin snowpack was 51% of median.

#### PRECIPITATION



View precipitation for individual sites by accessing the basin data report <u>here</u>.

#### FoM = First of Month

February precipitation is above normal at 117% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 82% of median.

As of March 1, volumetric storage at Lake Coeur d' Alene is above normal at 124% of median.

	Spokano	Current	Last Year	Median	Capacity	Current %	Last Year %	Median %	Current %	Last Year %
Spokane		(KAF)	(KAF)	(KAF)	(KAF)	Capacity	Capacity	Capacity	Median	Median
Lake Coeur d' Alene		125.3	47.4	101.2	238.5	53%	20%	42%	124%	47%
	Basin Index					53%	20%	42%	124%	47%
	# of reservoirs					1	1	1	1	1

### STREAMFLOW FORECAST

The streamflow forecasts for the primary period in the basin are below normal and range from 65% to 81% of median.



# Lower Snake-Walla Walla Basin Summary

#### **SNOWPACK**



► View snowpack for individual sites by accessing the basin data report <u>here</u>.

As of March 1, the basin snowpack is 84% of median. This is higher than February 1 when the basin snowpack was 78% of median.

#### PRECIPITATION



View precipitation for individual sites by accessing the basin data report <u>here</u>.

FoM = First of Month

February precipitation is above normal at 122% of median. Precipitation since the beginning of the water year (October 1 - March 1) is 96% of median.

As of March 1, volumetric storage at Wallowa Lake is above normal at 153% of median.

Lower Snake-Walla Walla	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)	Current % Capacity	Last Year % Capacity	Median % Capacity	Current % Median	Last Year % Median
Wallowa Lake	26.9	21.4	17.6	37.5	72%	57%	47%	153%	121%
Basin Index					72%	57%	47%	153%	121%
# of reservoirs					1	1	1	1	1

#### STREAMFLOW FORECAST

The April through September streamflow forecasts in the basin are below normal to normal and range from 89% to 100% of median.



#### **Additional Links**

<u>Development and Interpretation of Water Supply Forecasts</u> <u>User Guide to Forecast Charts</u>

For more water supply and resource management information, contact:

Matt Warbritton Supervisory Hydrologist Portland Data Collection Office USDA-NRCS Snow Survey and Water Supply Forecasting Program matt.warbritton@usda.gov Phone: (503) 307-2829



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