

# Water Supply Outlook

April 4, 2023

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## Interstate Commission on the Potomac River Basin (ICPRB)

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*The ICPRB, through its Section for Cooperative Water Supply Operations on the Potomac (CO-OP), coordinates water supply operations during times of drought and recommends releases of stored water. These operations ensure adequate water supplies for Washington metropolitan area water users and for environmental flow levels. The water supply outlooks are published by CO-OP on a monthly basis between April and October. They are meant to provide an update on the possibility of low-flow conditions in the Potomac basin.*

## Summary/Conclusions

**The likelihood of releases from backup water supply reservoirs in the Washington metropolitan area during the summer and fall seasons of 2023 is currently assessed as close to normal.** The use of Jennings Randolph and Little Seneca reservoirs is generally triggered by low flows brought about by a combination of low summer precipitation and low groundwater levels. At present, streamflow is below average, and groundwater levels in some monitoring wells are below normal, but many are anticipated to improve in the future. As of March 31, the 12-month cumulative basin precipitation is 2.9 inches below normal, with March alone experiencing 1.3 inches below average. Although winter precipitation was within normal levels in the northern areas, other regions received below-average amounts. As for early spring conditions in the Mid-Atlantic, there are no significant dry or wet areas, and there is no strong evidence of a particularly wet season ahead. According to the Middle Atlantic River Forecast Center (MARFC), the water resources and supplies for the Potomac Basin are currently “fair” to “good,” with a low risk of drought unless precipitation falls below expectations. The Washington metropolitan area has enough water from the Potomac River currently, and it has drought-contingency plans to prevent any water supply shortages.

## ICPRB’s Low Flow Outlook

**There is an 8 to 16 percent conditional probability that natural Potomac flow will drop below 600 to 700 million gallons per day (MGD) at Little Falls through December 31 of this year; at these flow levels, water supply releases from Jennings Randolph and Little Seneca reservoirs may occur.** Releases occur when predicted flow is less than demand plus a required environmental flow-by. Drinking water demand ranges from 400 to 700 MGD during the summer months and the minimum flow-by at Little Falls is 100 MGD. Note that natural flow is defined as observed flow at the Little Falls gage plus total Washington metropolitan Potomac withdrawals, with an adjustment made to remove the effect of North Branch reservoir releases on stream flow.

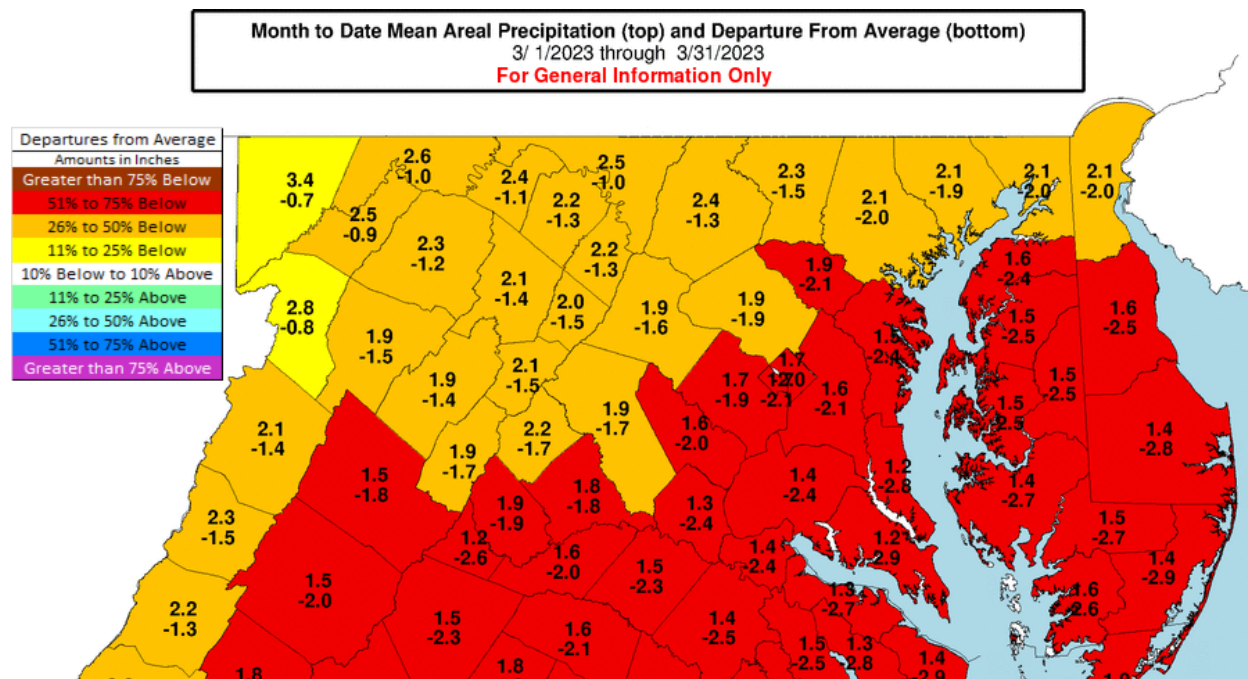
The conditional probability is estimated by analyzing the historical stream flow records and considering recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most closely resemble current conditions are weighted more heavily in the determination of conditional probability. The historical, or unconditional, probability is based on an analysis of the historical record without weighing for current conditions. The 8 to 16 percent conditional probability compares to the 8 to 15 percent historical probability and is considered the more reliable indicator.

Outlook for natural Potomac River flow at Little Falls – Watershed conditions as of April 1, 2023

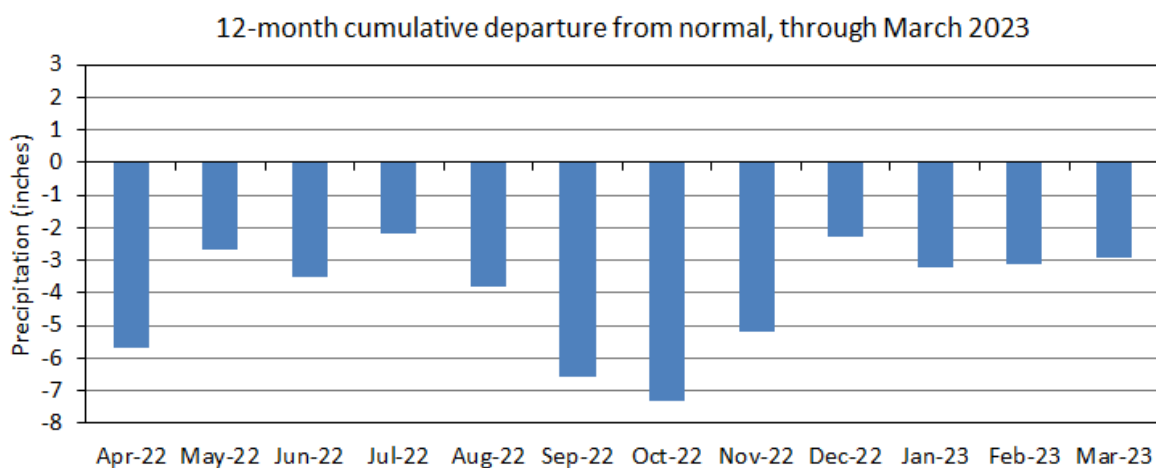
Low flow threshold (MGD)	Low flow threshold (cfs)	Historical probability of lower flow April 1 through December 31	Conditional probability of lower flow April 1 through December 31
1200	1858	68%	74%
1000	1548	49%	55%
800	1238	25%	27%
700	1084	15%	16%
600	929	8%	8%

## Past Precipitation

Data from the National Weather Service's Middle Atlantic River Forecast Center (MARFC) shows that the Potomac basin upstream of Washington, D.C. has received 2.2 inches of precipitation for the month of March, which is 1.3 inches below normal. The 12-month cumulative basin precipitation is 2.9 inches below normal as of March 31 (see graph).

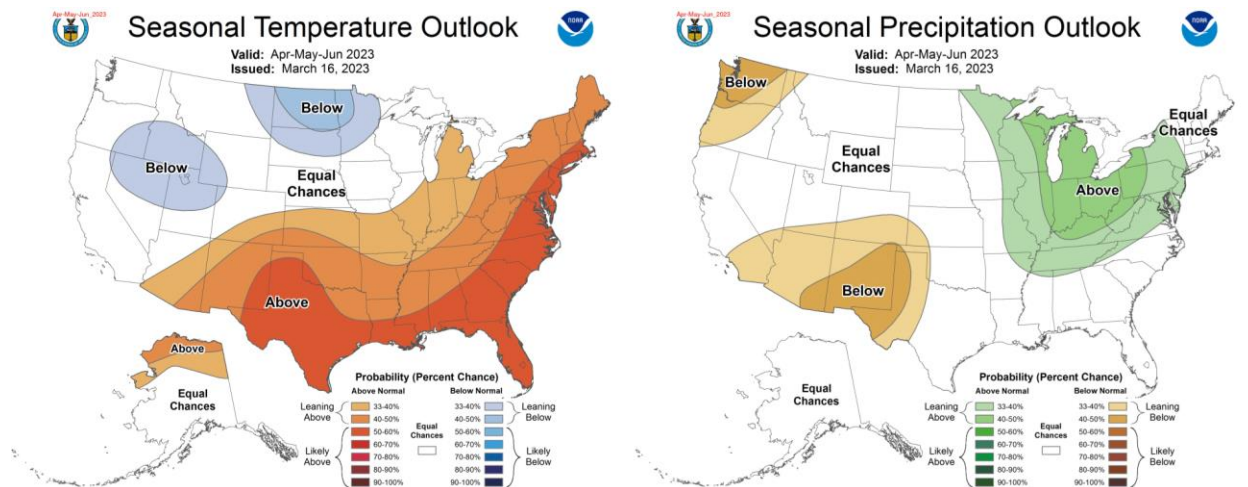


Source: Middle Atlantic River Forecast Center, National Weather Service



## Precipitation and Drought Outlook for April, May, and June 2023

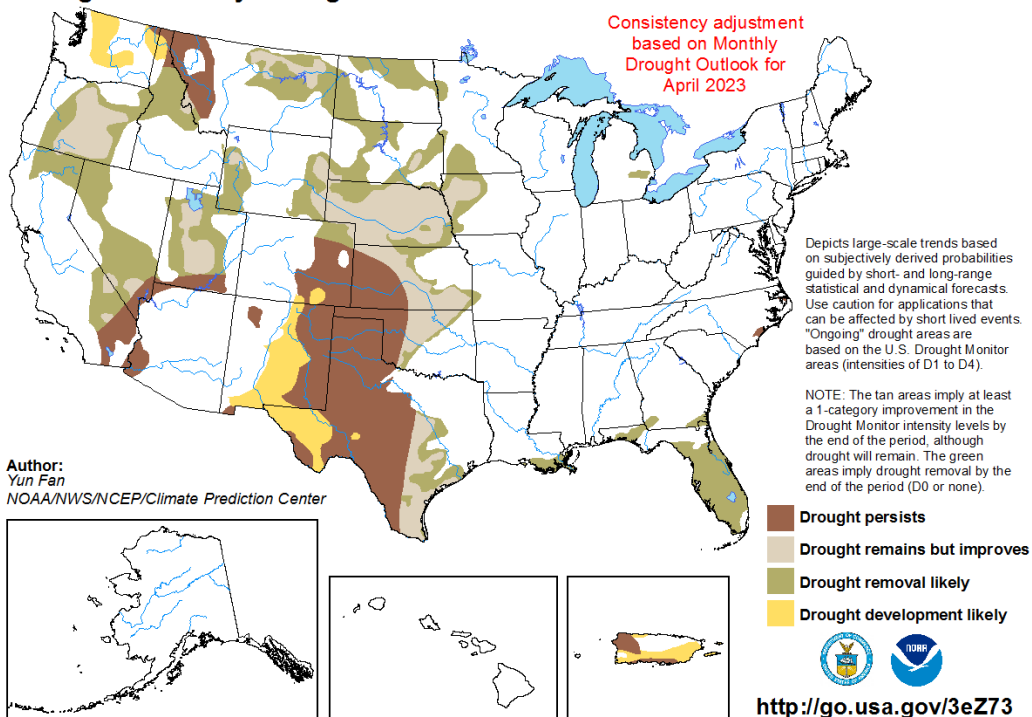
The Middle Atlantic River Forecast Center (MARFC) predicts "good" water resources and supplies in northern Mid-Atlantic Region and "fair" to "good" elsewhere. April's outlook is for above-normal temperatures and normal to above-normal precipitation in the Potomac Basin. The 90-day outlook (April-June) calls for above-normal temperatures and precipitation.



The Climate Prediction Center's U.S. Seasonal Drought Outlook, as of March 31, 2023, indicates no occurrence of drought development in the Potomac Basin.

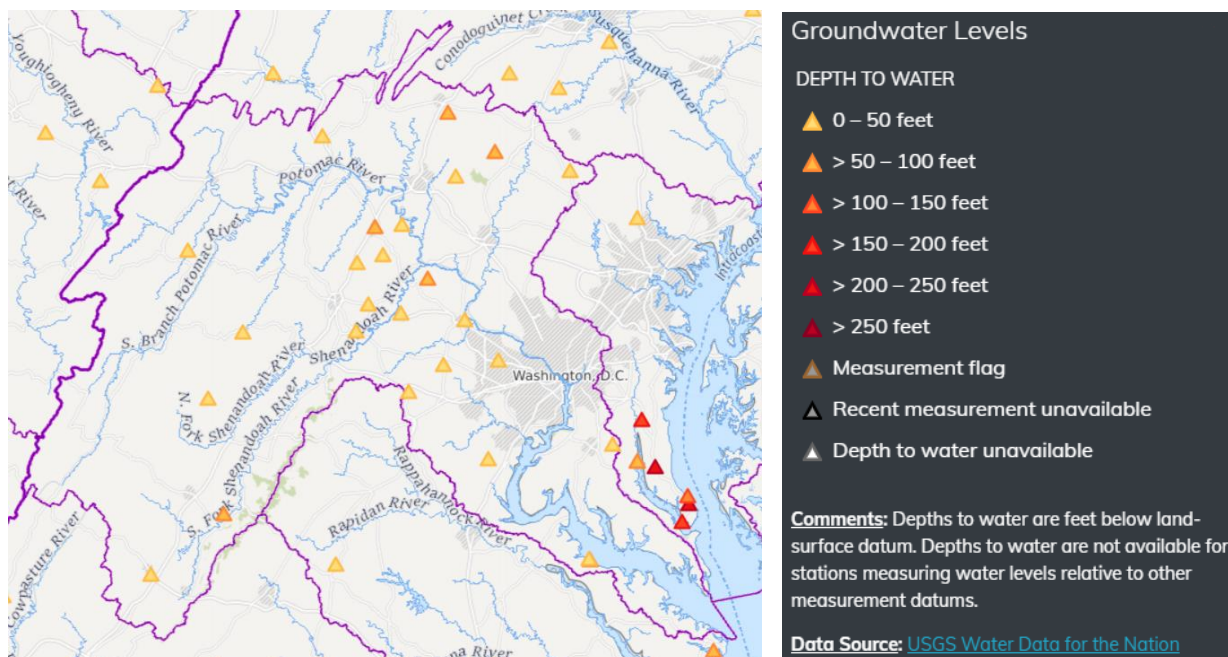
### U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for April 1 - June 30, 2023  
Released March 31, 2023



## Groundwater – Current Conditions

The U.S. Geological Survey (USGS) National Water Dashboard provides estimates on the status of wells in and around the Potomac basin. Based on data from 40 stations within the geographic extent (37.9442,-79.5519), (40.1285,-76.2512), the dashboard reports that: 20 percent of wells are considered "Normal," meaning their water levels are between the 25th and 75th percentiles of historical records; 7.5 percent of wells are categorized as "Below Normal," with water levels between the 10th and 24th percentile; 2.5 percent of wells are classified as "Much Below Normal," with water levels below the 10th percentile; 5.0 percent of wells are at an all-time low for this day-of-year. Approximately 47.5 percent of wells are experiencing an increase in water levels and 15.0 percent of wells are experiencing a decrease in water levels.



## Reservoir Storage – Current Conditions

There have been no water supply releases from the CO-OP shared system so far this year. However, there is a scheduled whitewater release from Jennings Randolph Reservoir on April 15-16 and April 29-30, 2023.

Reservoir storage as of April 2, 2023

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC Water's Patuxent reservoirs <sup>1</sup>	100	10.5	10.5
Fairfax Water's Occoquan Reservoir <sup>2</sup>	100	8.2	8.2
Little Seneca Reservoir <sup>3</sup>	99	3.8	3.9
Jennings Randolph water supply <sup>4</sup>	100	13.1	13.1
Jennings Randolph water quality <sup>4</sup>	94	15.3	16.3
Savage Reservoir <sup>5</sup>	80	5.1	6.3

<sup>1</sup> Bathymetric study conducted December 2015 with revisions in December 2016, and unusable storage corrected June 2017.

<sup>2</sup> Bathymetric study conducted in 2019.

<sup>3</sup> Usable capacity consistent with Ortt, *et al.* (2011).

<sup>4</sup> 2013 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

<sup>5</sup> 1998 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

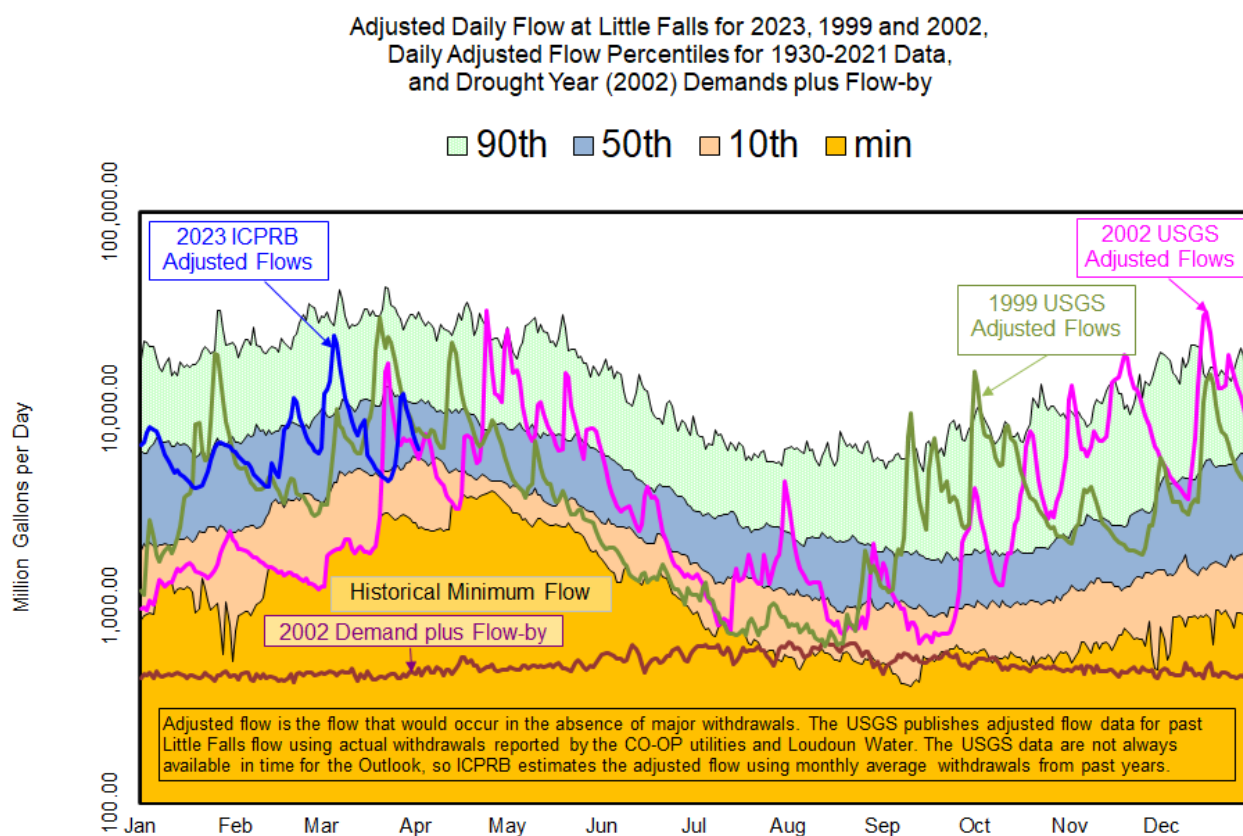


## Potomac River Flow

The estimated adjusted Potomac flow at Little Falls on April 1 was 6.7 billion gallons per day (BGD). For this day of the year, this value was below the 50<sup>th</sup> percentile flow value of 10.7 BGD and slightly above the 10<sup>th</sup> percentile flow value of 5.7 BGD. Adjusted flow, shown in the figure below, is the flow that would occur in the absence of major Washington metropolitan area withdrawals, but includes releases from upstream reservoirs. Adjusted flow averaged 7.1 BGD for the past three months and 9.2 BGD in March.

## Environmental Flow-by

Average observed Potomac flow at Little Falls in March was well above the minimum recommendation of 100 MGD.



*Little Falls flow statistics are based on 1930 through 2021 USGS published gage flow, "USGS 01646502 POTOMAC RIVER (ADJUSTED) NEAR WASH, DC". To create this flow record, the USGS has added historical water supply withdrawals from the Potomac as reported by FW, WSSC Water, Washington Aqueduct, Loudoun Water, and Rockville to the Little Falls gage flow record.*

## Drought Status

Drought status in [Maryland](#), [Pennsylvania](#), and [Virginia](#) are normal. The current drought stage as defined in the Metropolitan Washington Council of Governments (MWCOC)'s water supply and drought response awareness plan is normal.

## Drought Monitor and Soil Moisture

The U.S. Drought Monitor map by the NOAA Climate Prediction Center (refer to the first figure below) shows abnormally dry to moderate drought conditions in the lower half of the Potomac basin covering Maryland and Virginia. Furthermore, based on the Palmer Drought Severity Index by Division map (refer to the second figure), moderate to extreme drought conditions are observed in specific areas including the South Fork Shenandoah and middle to lower Potomac regions.

