

# Water Supply Outlook

October 5, 2021

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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:

**There is a below normal probability of releases from the Washington metropolitan area's back-up water supply reservoirs for the remainder of the 2021 summer and fall seasons.** 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. Average precipitation in the Potomac Basin in September was 2.7 inches above normal. As of September 30, the 12-month cumulative basin precipitation was 0.6 inches below normal. Streamflow is currently well above normal and groundwater levels are normal for most of the monitoring wells in the Basin. At present, there is sufficient flow in the Potomac River to meet the Washington metropolitan area's water demands without releases from upstream reservoirs. If low-flow conditions develop, the Washington metropolitan area is well-protected from a water supply shortage owing to carefully designed drought-contingency plans.

### ICPRB's Low Flow Outlook:

There is a less than 1 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.

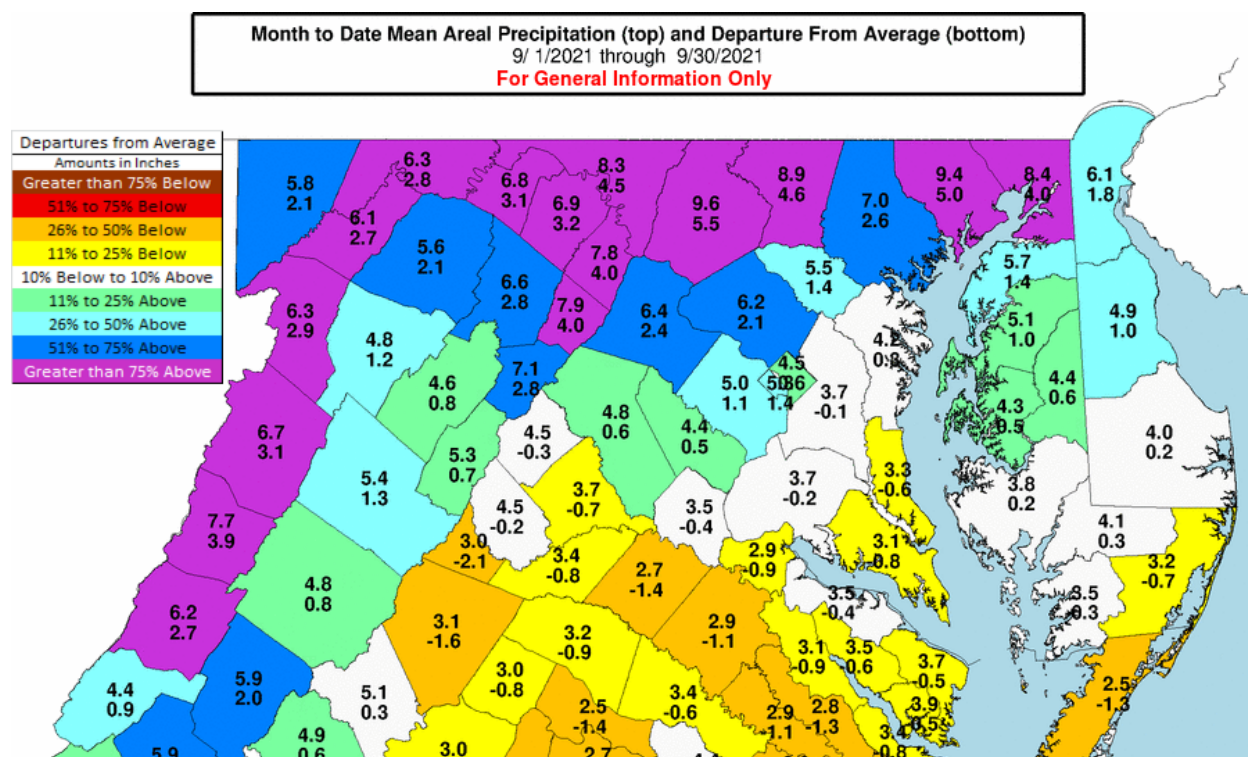
The conditional probability is estimated by analyzing the historical stream flow records and considering recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most closely resemble 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 less than 1 percent conditional probability compares to the 3 to 5 percent historical probability and is considered the more reliable indicator.

#### Outlook for natural Potomac River flow at Little Falls – Watershed conditions as of October 5, 2021

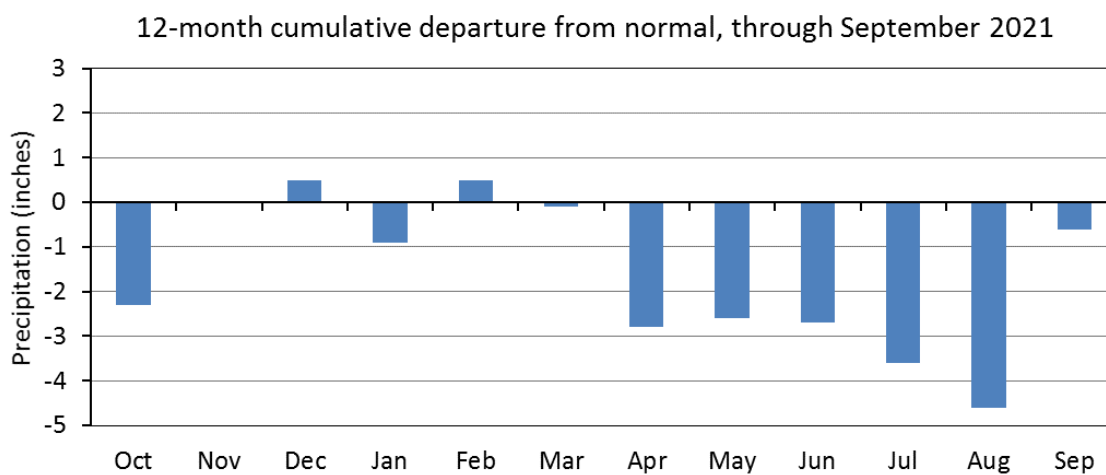
<i>Low flow threshold (MGD)</i>	<i>Low flow threshold (cfs)</i>	<i>Historical probability of lower flow October 1 through December 31</i>	<i>Conditional probability of lower flow October 1 through December 31</i>
1200	1858	49%	26%
1000	1548	28%	10%
800	1238	9%	1%
700	1084	5%	<<1%
600	929	3%	<<1%

## Past Precipitation:

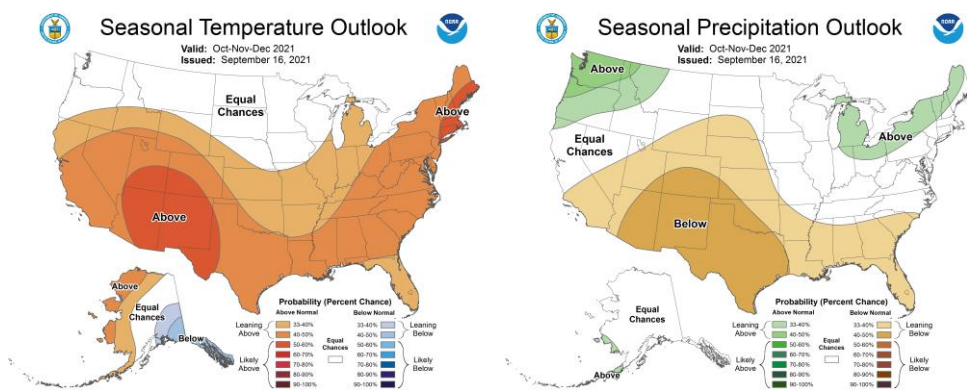
Data from the National Weather Service's Middle Atlantic River Forecast Center (MARFC) shows that the Potomac basin upstream of Washington, D.C. has received 6.6 inches of precipitation for the month of September, which is 2.7 inches above normal. The above normal precipitation in September partly offset the 12-month precipitation deficit accumulated through August. The 12-month departure from average is now 0.6 inches as of September 30 (see graph).



Source: Middle Atlantic River Forecast Center, National Weather Service



## Precipitation and Drought Outlook for October, November and December 2021:

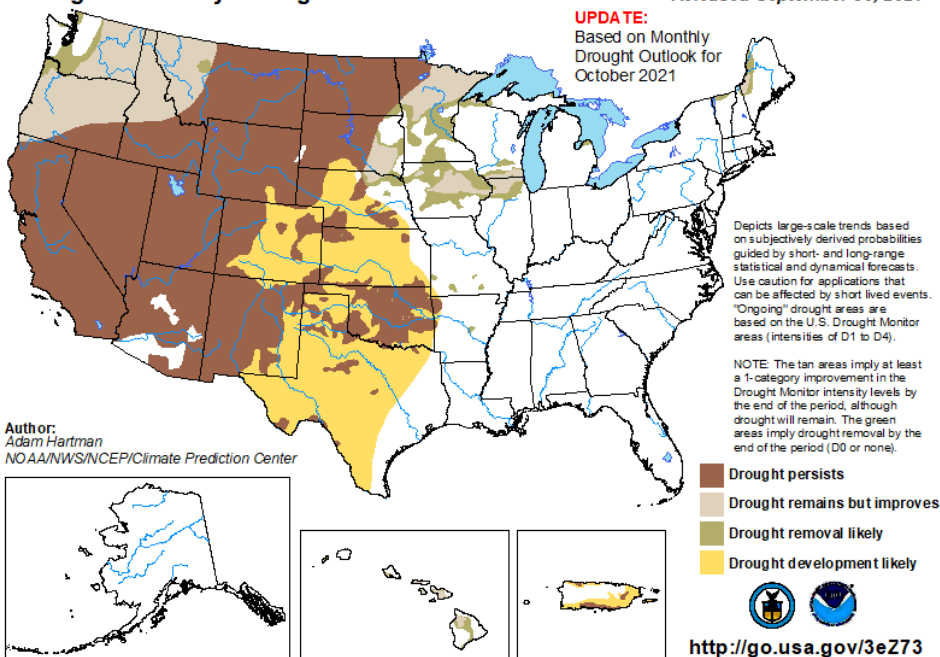


The Middle Atlantic River Forecast Center's (MARFC) outlook for water resources and supplies is good.

The National Weather Service Climate Prediction Center's one-month outlook for October calls for above normal temperatures, and below normal precipitation for a northeastern section of the Potomac Basin. The 90-day outlook for October through December calls for above normal temperatures and normal precipitation.

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

Valid for October 1 - December 31, 2021  
Released September 30, 2021

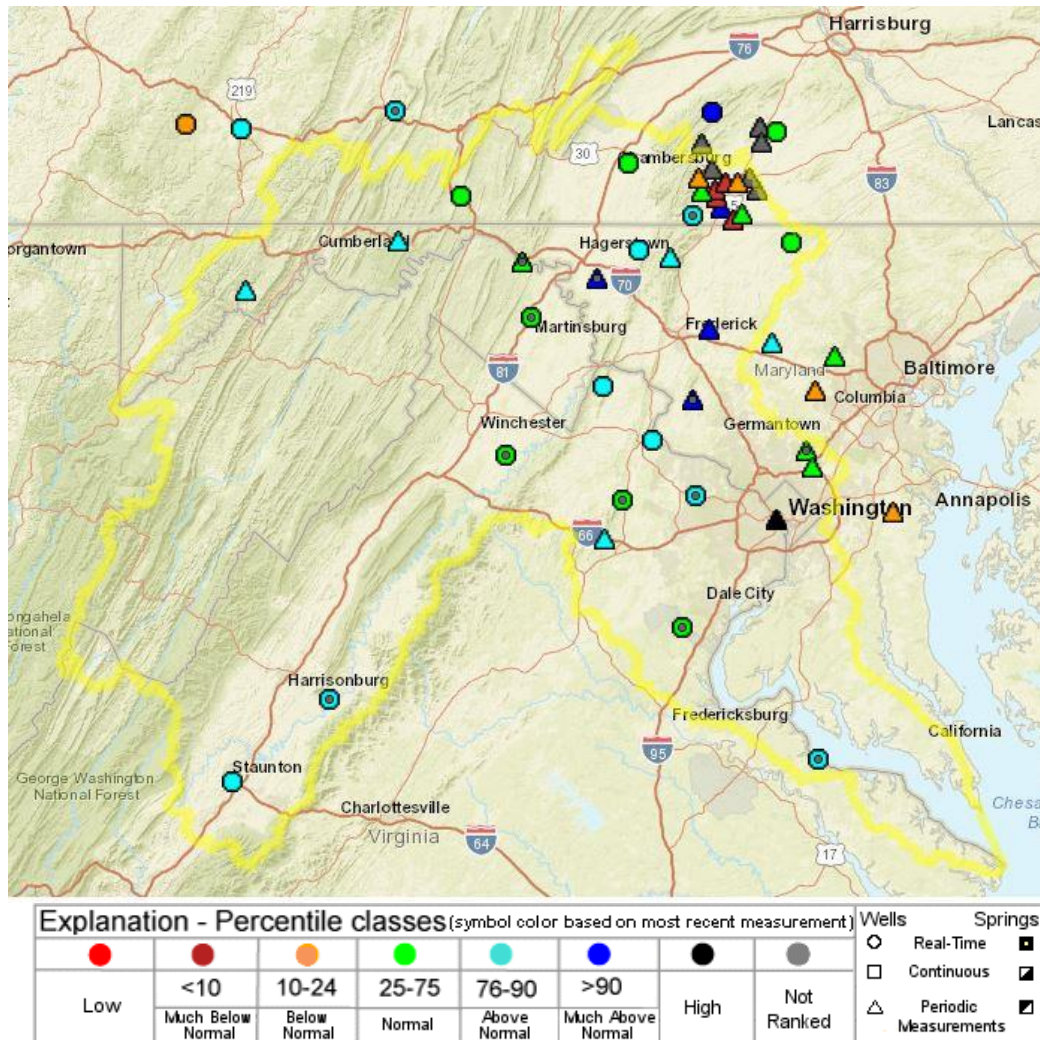


As of October 1, 2021, the Climate Prediction Center's U.S. Seasonal Drought Outlook reports no drought development in the Potomac basin.

## Groundwater – Current Conditions:

The groundwater map below, developed by the U.S. Geological Survey (USGS), shows the current water levels in the Maryland Real-Time Groundwater Level Network as of October 5. Most wells displayed are in the "Normal" range. In the map below, the USGS defines "Normal" as between the 25<sup>th</sup> and 75<sup>th</sup> percentiles, and "Below Normal" as between the 10<sup>th</sup> and 24<sup>th</sup> percentile. "Much Below Normal" is defined as below the 10<sup>th</sup> percentile.





### Reservoir Storage – Current Conditions:

No water supply releases from the CO-OP shared system have been made this year.

Reservoir storage as of October 5, 2021

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC Water's Patuxent reservoirs <sup>1</sup>	92	9.7	10.5
Fairfax Water's Occoquan Reservoir <sup>2</sup>	100	8.2	8.2
Little Seneca Reservoir <sup>3</sup>	98	3.8	3.9
Jennings Randolph water supply <sup>4</sup>	100	13.1	13.1
Jennings Randolph water quality <sup>4</sup>	71	11.6	16.3
Savage Reservoir <sup>5</sup>	69	4.3	6.3

<sup>1</sup> Bathymetric study conducted December 2015 with revisions in December 2016, and unusable storage corrected June 2017. Note that 1.37 BG is not considered usable capacity because it is reserved for storm inflow (T. Supply, personal communication, August 3, 2018).

<sup>2</sup> Bathymetric study conducted in 2020.

<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.

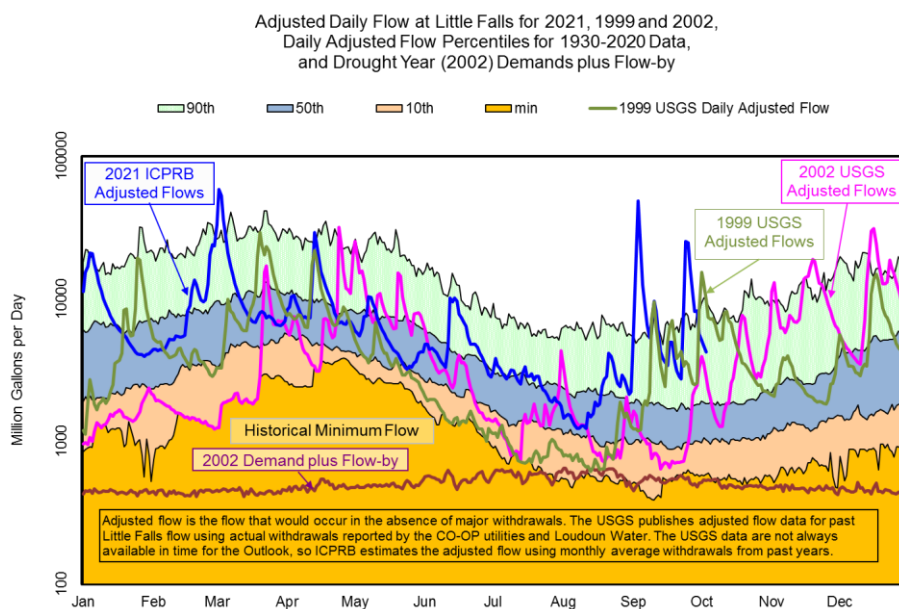
<sup>5</sup> 1998 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

### Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on October 1 was 5.13 billion gallons per day (BGD). For this day of the year, this value was above the 50<sup>th</sup> percentile flow value of 1.91 BGD and below the 90<sup>th</sup> percentile flow value of 9.24 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 7.5 BGD for the past nine months and 10.0 BGD in September.

### Environmental Flow-by:

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



*Little Falls flow statistics are based on 1930 through 2020 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 U.S. Army Corps of Engineers, Washington Suburban Sanitary Commission, Fairfax County Water Authority, city of Rockville, and Loudoun Water to the Little Falls gage flow record.*

### Drought Status:

Drought status in [Maryland](#), [Virginia](#) and [Pennsylvania](#) is normal as of October 5. 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:

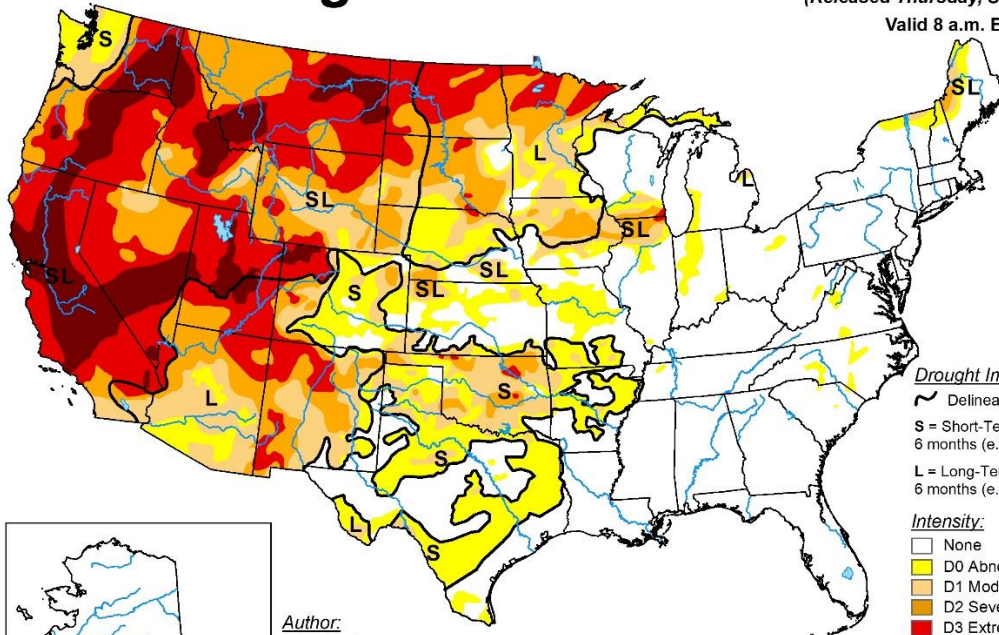
The NOAA Climate Prediction Center's U.S. Drought Monitor map (see first figure below) indicates no drought conditions were present in the Potomac Basin. The Palmer Drought Severity Index by Division map (see second figure on next page) indicates moderate drought conditions in portions of the Basin in West Virginia and Virginia.

# U.S. Drought Monitor

September 28, 2021

(Released Thursday, Sep. 30, 2021)

Valid 8 a.m. EDT



## Drought Impact Types:

~ Delineates dominant impacts

**S** = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

**L** = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

## Intensity:

None

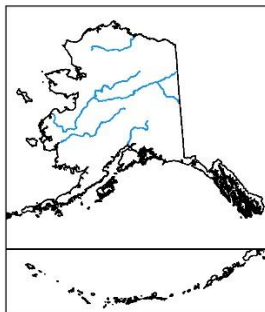
D0 Abnormally Dry

D1 Moderate Drought

D2 Severe Drought

D3 Extreme Drought

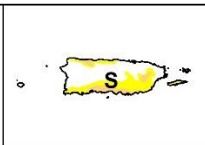
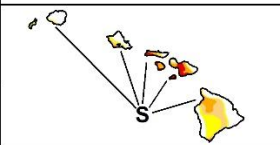
D4 Exceptional Drought



## Author:

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National Drought Mitigation Center



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

Drought Severity Index by Division  
Weekly Value for Period Ending Oct 02, 2021  
Long Term Palmer

