

# Water Supply Outlook



## 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 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 March was 1.7 inches below normal. The 12-month cumulative basin precipitation is 0.1 inches below normal as of March 31. Streamflow is currently below normal, and groundwater levels remain normal for most of the monitoring wells in the basin. The Middle Atlantic River Forecast Center's (MARFC) outlook for water resources and supplies for the Potomac Basin is good. At present, there is sufficient flow in the Potomac River to meet the Washington metropolitan area's water demands without releases from upstream reservoirs. In the event that low-flow conditions do 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 four 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.

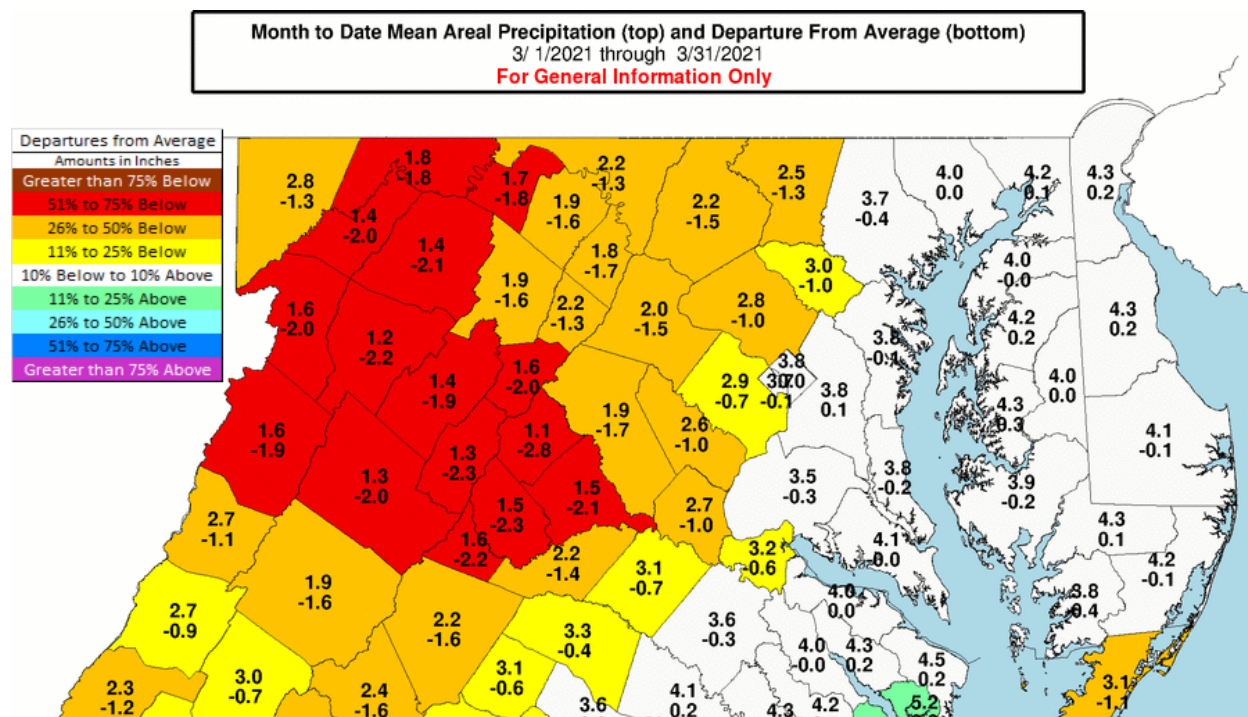
The conditional probability is estimated by analyzing the historical stream flow records and giving consideration to recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most 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 four to eight 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, 2021

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%	63%
1000	1548	49%	44%
800	1238	25%	21%
700	1084	15%	8%
600	929	8%	4%

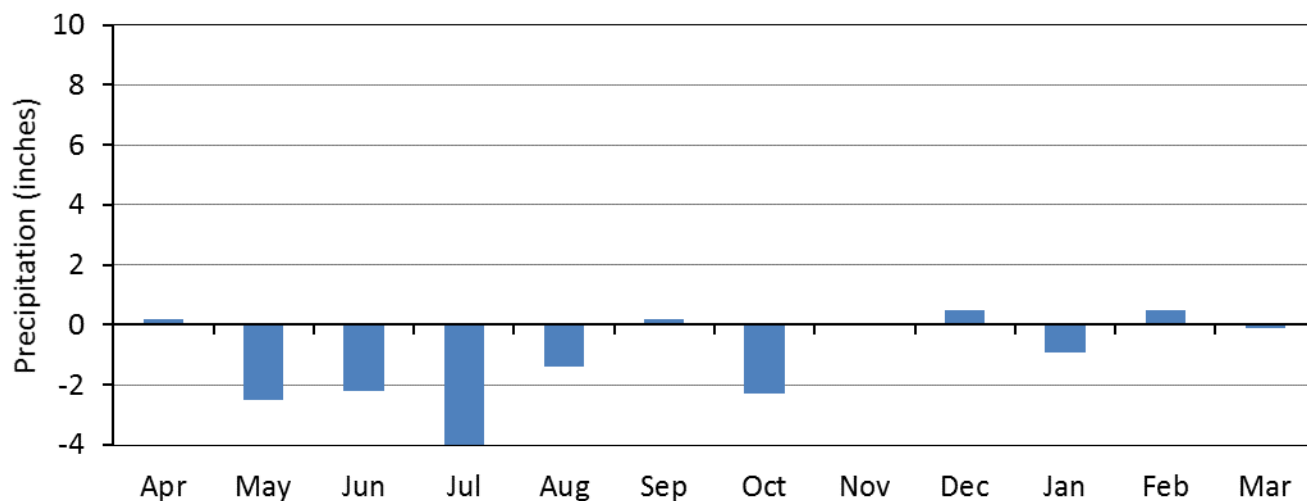
## Past Precipitation:

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 1.8 inches of precipitation for the month of March, which is 1.7 inches below normal. The 12-month cumulative basin precipitation is 0.1 inches below normal as of March 31 (see graph).

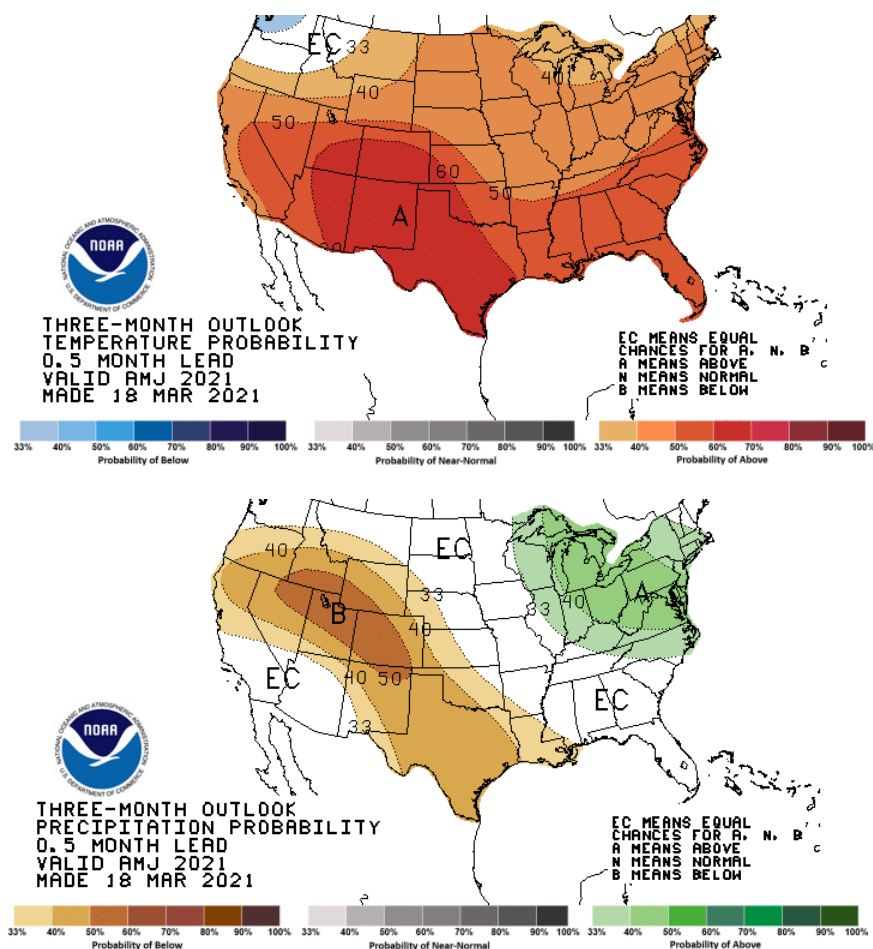


Source: Middle Atlantic River Forecast Center, National Weather Service

## 12-month cumulative departure from normal, through March 2021



## Precipitation and Drought Outlook for April, May and June 2021:



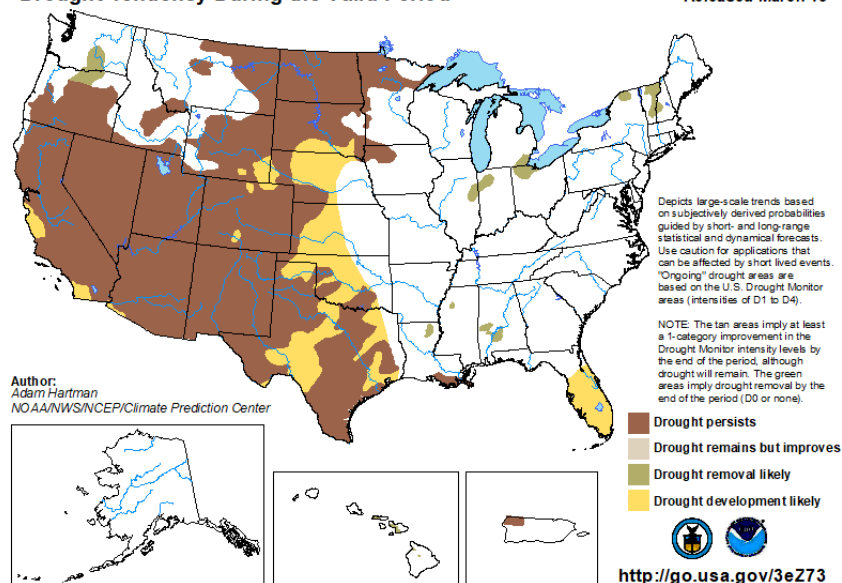
The Middle Atlantic River Forecast Center's (MARFC) outlook for water resources and supplies is good.

The National Weather Service Climate Prediction Center's one-month outlook for April calls for normal temperatures, and below normal precipitation in the Potomac Basin. The 90-day outlook for April through June calls for above normal temperatures and above normal precipitation.

As of March 18, 2021, the Climate Prediction Center's U.S. Seasonal Drought Outlook reports no drought development in the Potomac basin.

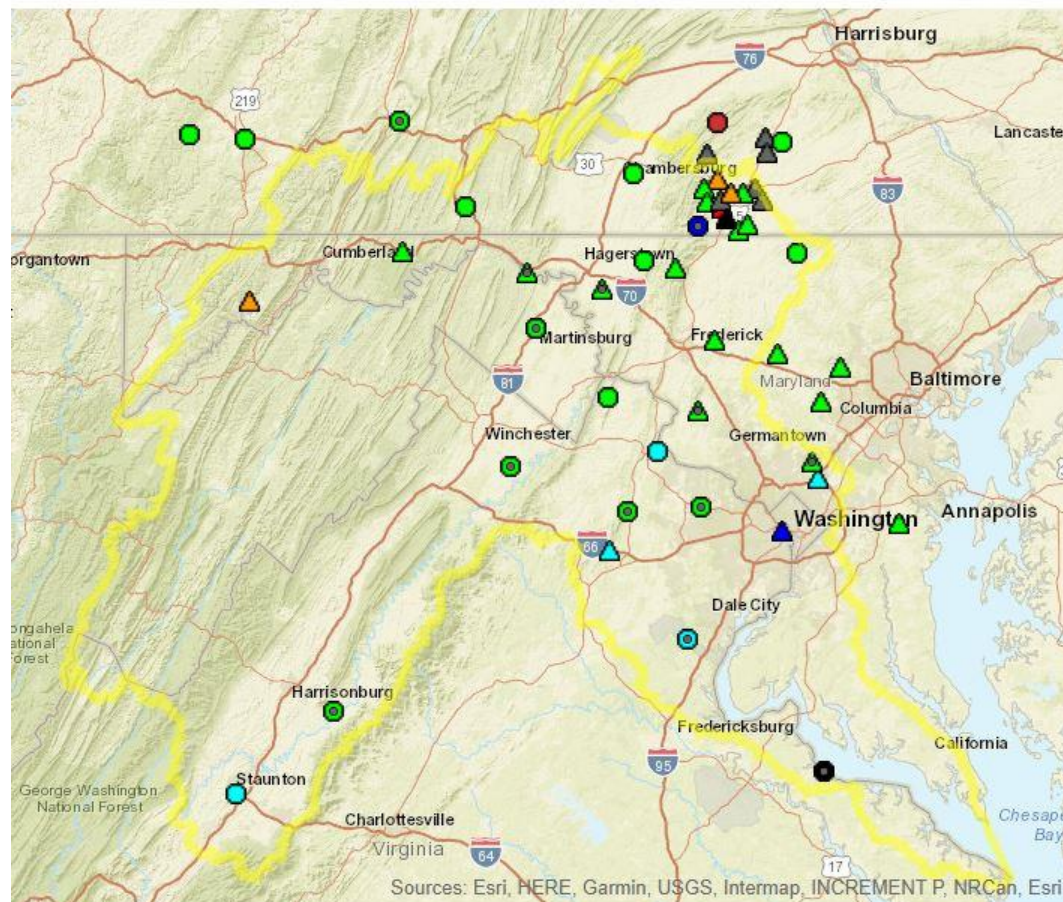
### U.S. Seasonal Drought Outlook

Valid for March 18 - June 30, 2021  
Released March 18



### Groundwater – Current Conditions:

The groundwater map below, developed by the U.S. Geological Survey (USGS), Pennsylvania Water Science Center, shows that current water levels in most monitoring wells in the Potomac basin are in the “Normal” or “Above Normal” range with some local exceptions. Wells with a gray dot inside the symbol identify Water Supply Outlook wells. In this map, 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.



Wells with a gray dot inside the symbol identify water supply outlook wells

Explanation - Percentile classes (symbol color based on most recent measurement)						
<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: lightblue;">●</span>	<span style="color: darkblue;">●</span>	<span style="color: black;">●</span>	<span style="color: gray;">●</span>
Low	<10	10-24	25-75	76-90	>90	High
	Much Below Normal	Below Normal	Normal	Above Normal	Much Above Normal	Not Ranked

Wells

<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">○</span>	<span style="border: 1px solid black; border-radius: 50%; padding: 2px;">●</span>	Real Time
<span style="border: 1px solid black; padding: 2px;">□</span>	<span style="border: 1px solid black; padding: 2px;">■</span>	Continuous
<span style="border: 1px solid black; padding: 2px;">△</span>	<span style="border: 1px solid black; padding: 2px;">▲</span>	Periodic Measurement

### Reservoir Storage – Current Conditions:

No water supply releases from the CO-OP shared system have been made this year.  
A whitewater release from Jennings Randolph Reservoir is scheduled for April 17 and 18, 2021.



Reservoir storage as of April 6, 2021

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC Water's Patuxent reservoirs <sup>1</sup>	96	11.4	11.9
Fairfax Water's Occoquan Reservoir <sup>2</sup>	100	8.1	8.1
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>	88	14.4	16.3
Savage Reservoir <sup>5</sup>	72	4.5	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 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.

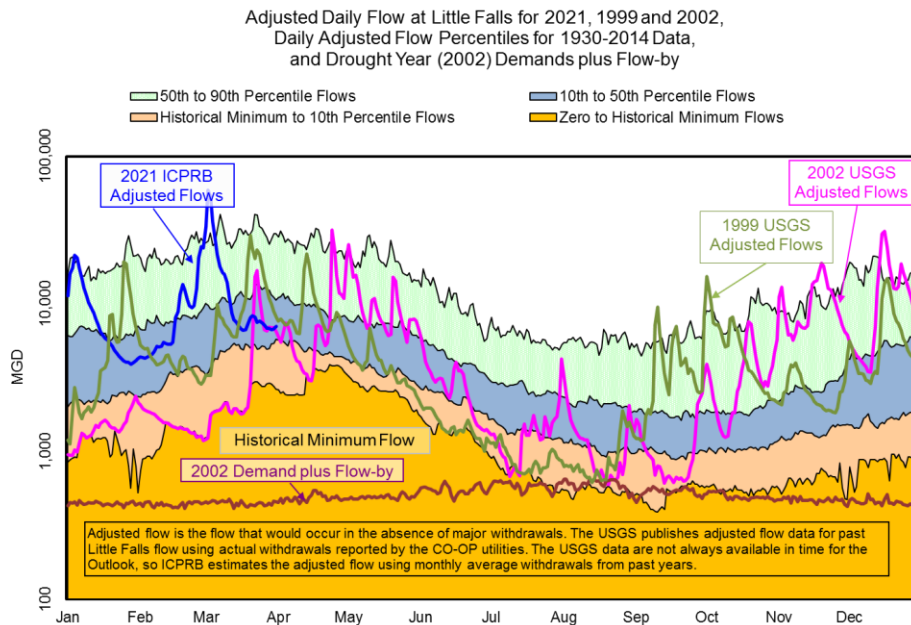
<sup>5</sup> 1998 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

### Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on April 1 was 8.5 billion gallons per day (BGD). For this day of the year, this value was below the 50<sup>th</sup> percentile flow value of 11.1 BGD and 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 10.8 BGD for the past three months and 14.6 BGD in March.

### Environmental Flow-by:

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



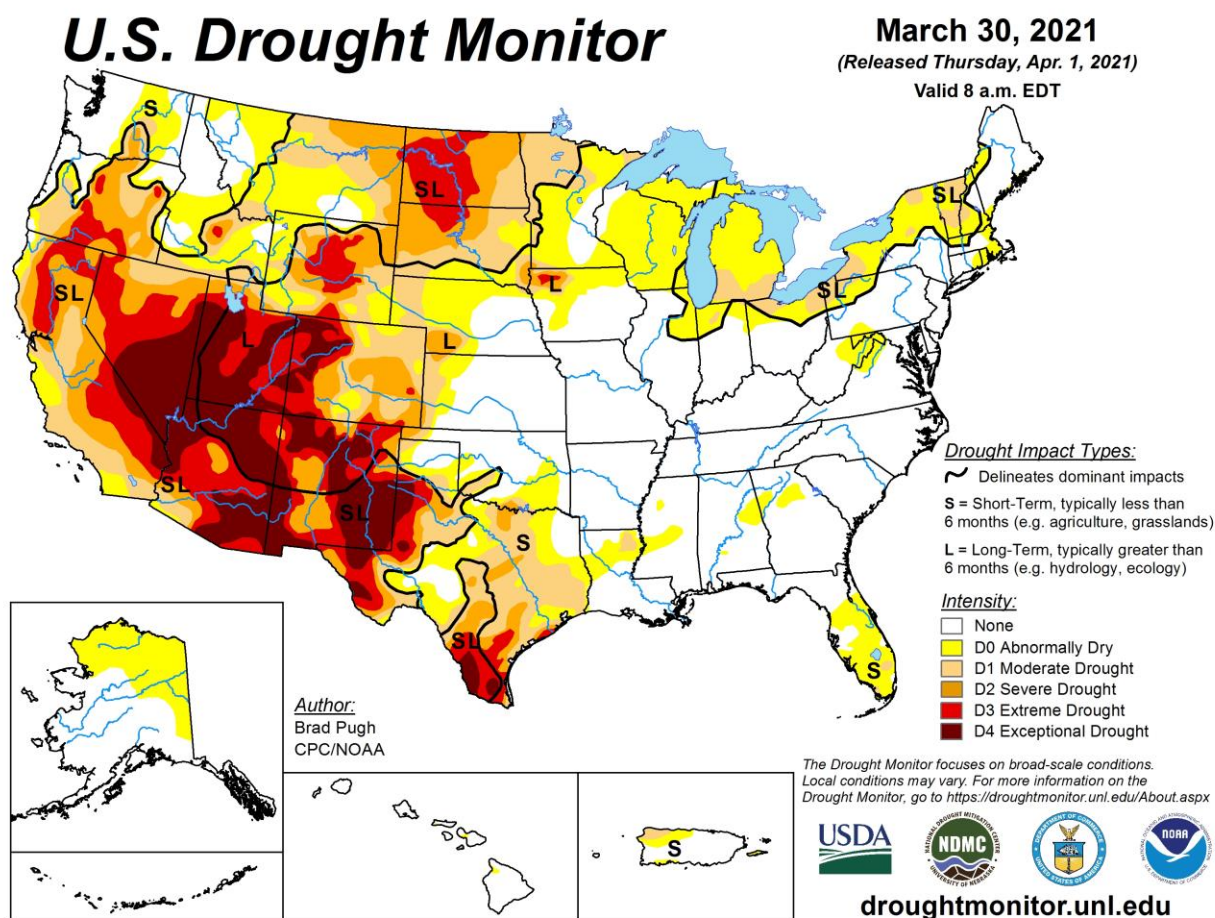
Little Falls flow statistics are based on 1930 through 2014 USGS published gage flow, "USGS 01646502 POTOMAC RIVER (ADJUSTED) NEAR WASH, DC". To create this flow record, the USGS has added historical water supply withdrawals from the Potomac as reported by FW, WSSC, the Aqueduct, and Rockville to the Little Falls gage flow record.

### Drought Status:

Drought status in [Maryland](#), [Virginia](#) and [Pennsylvania](#) is 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 NOAA Climate Prediction Center's U.S. Drought Monitor map (see first figure below) indicates no drought conditions for the Potomac basin. Abnormally dry conditions are present in a portion of the basin Potomac basin in West Virginia. The Palmer Drought Severity Index by Division map (see second figure on next page) indicates no drought conditions in most of the basin. Severe drought conditions are present in western Pennsylvania.



Drought Severity Index by Division  
Weekly Value for Period Ending Apr 03, 2021  
Long Term Palmer

