

# Water Supply Outlook

May 4, 2020

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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 2020 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 April was 1.8 inches above normal. Streamflow is currently much above normal, and groundwater levels are normal with some local exceptions. The Middle Atlantic River Forecast Center's (MARFC) outlook for water resources and supplies is good. Rainfall has been abundant in the past month and the precipitation outlook for the coming months is above average. The NOAA Climate Prediction Center's U.S. Drought Monitor map indicates no drought conditions for the Potomac basin. The Palmer Drought Severity Index by Division map indicates normal conditions in the Potomac basin.

At present, there is sufficient flow in the Potomac River to meet the Washington metropolitan area's water demands without augmentation 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 3 to 10 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. 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.

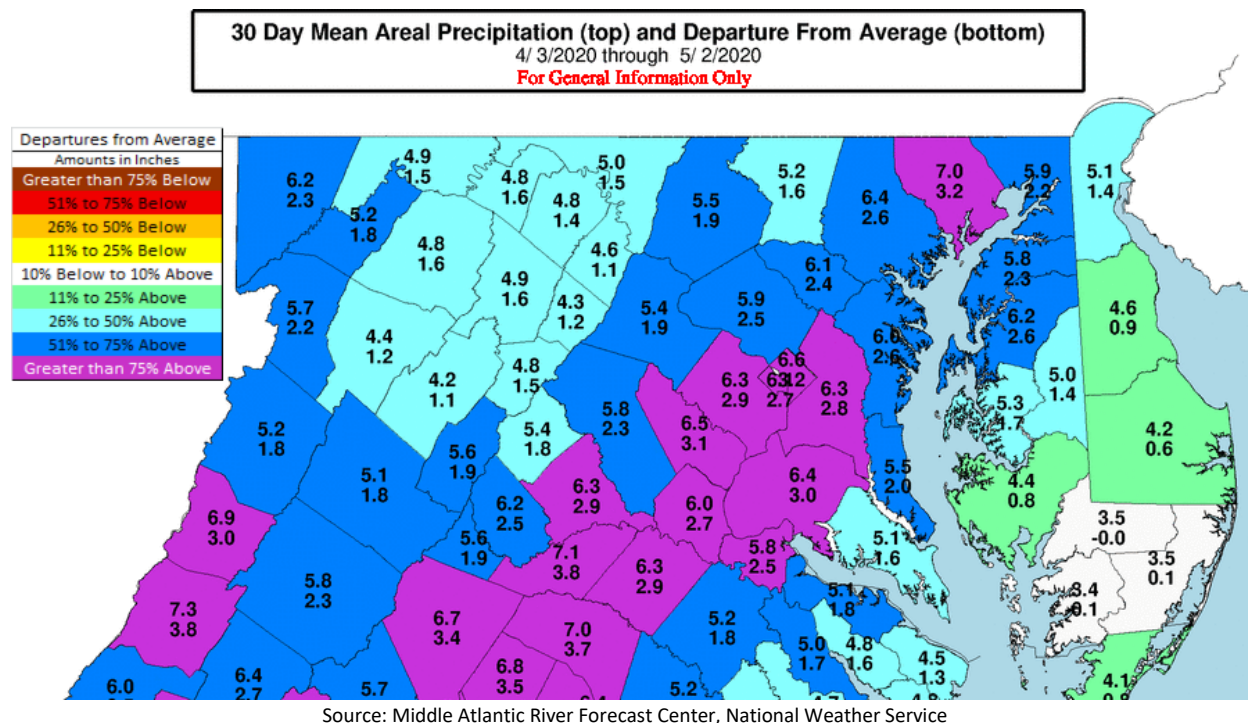
The conditional probability is estimated by analyzing the historical stream flow records and giving consideration to recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most 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 3 to 10 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 May 1, 2020

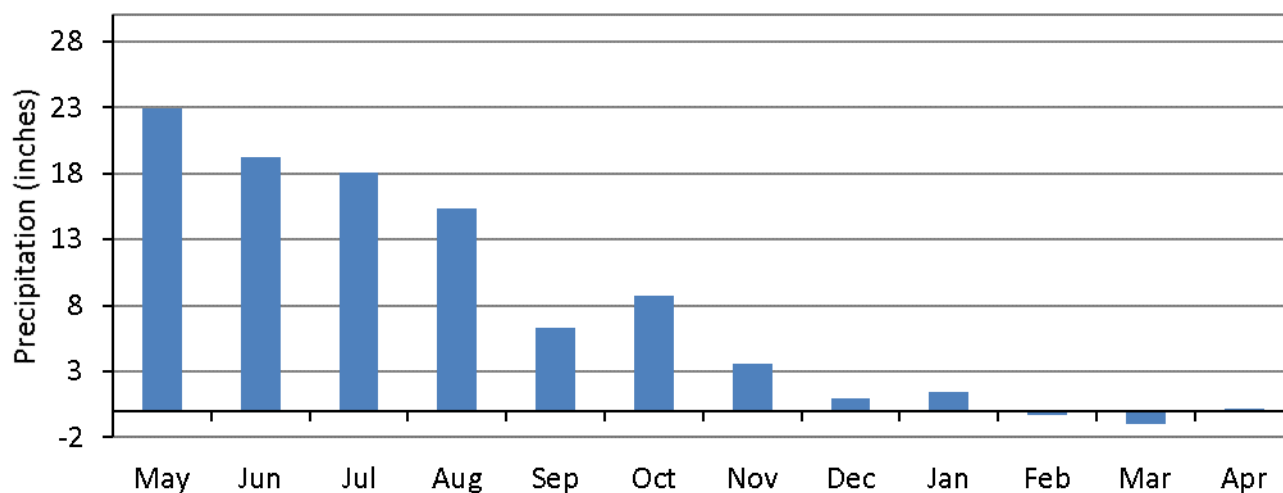
Low flow threshold (MGD)	Low flow threshold (cfs)	Historical probability of lower flow May 1 through December 31	Conditional probability of lower flow May 1 through December 31
1200	1858	68%	63%
1000	1548	49%	43%
800	1238	25%	23%
700	1084	15%	10%
600	929	8%	3%

## 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 a precipitation total of 5.2 inches for the month of April, which is 1.8 inches above normal. The map below shows that April precipitation ranged between 1.1 to about 3.7 inches throughout the region. The 12-month cumulative basin precipitation is 0.1 inches above normal as of April 30 (see graph).

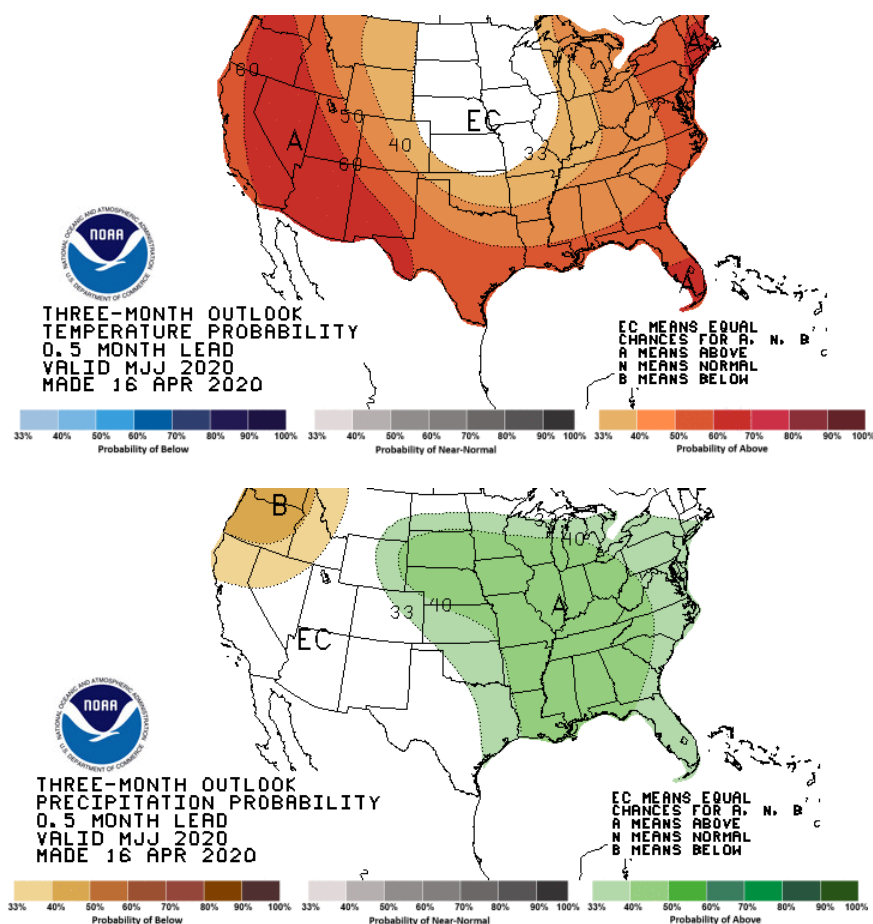


## 12-month cumulative departure from normal, through April 2020



Information provided by the USGS, the Middle Atlantic River Forecast Center, and the National Weather Service.

## Precipitation and Drought Outlook for April, May, and June 2020:



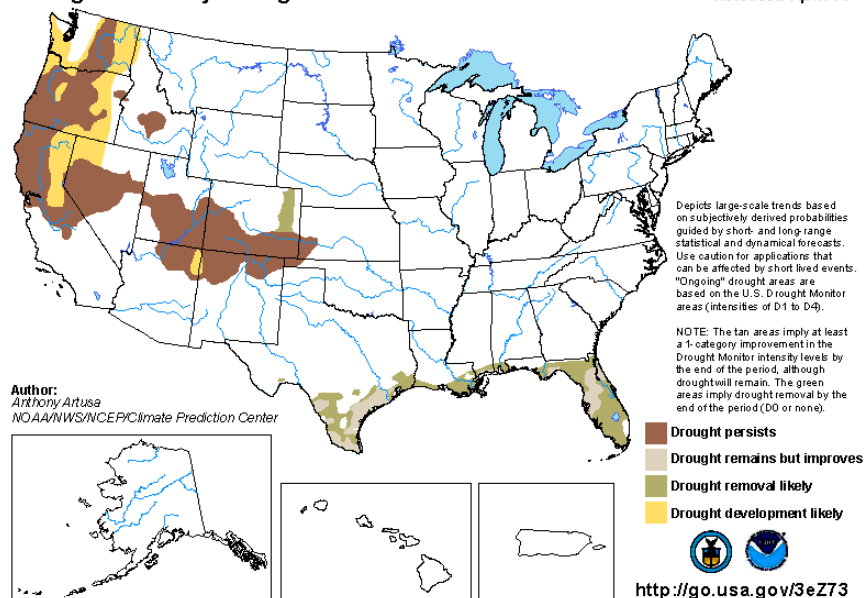
The Middle Atlantic River Forecast Center's (MARFC) outlook for water resources and supplies is good.

The National Weather Service Climate Prediction Center's one-month outlook for May calls for below normal temperatures and above normal precipitation. The 90-day outlook for May through July calls for above normal precipitation and above normal temperatures.

As of April 16, 2020, the Climate Prediction Center's U.S. Seasonal Drought Outlook reports no drought development in the Potomac basin.

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

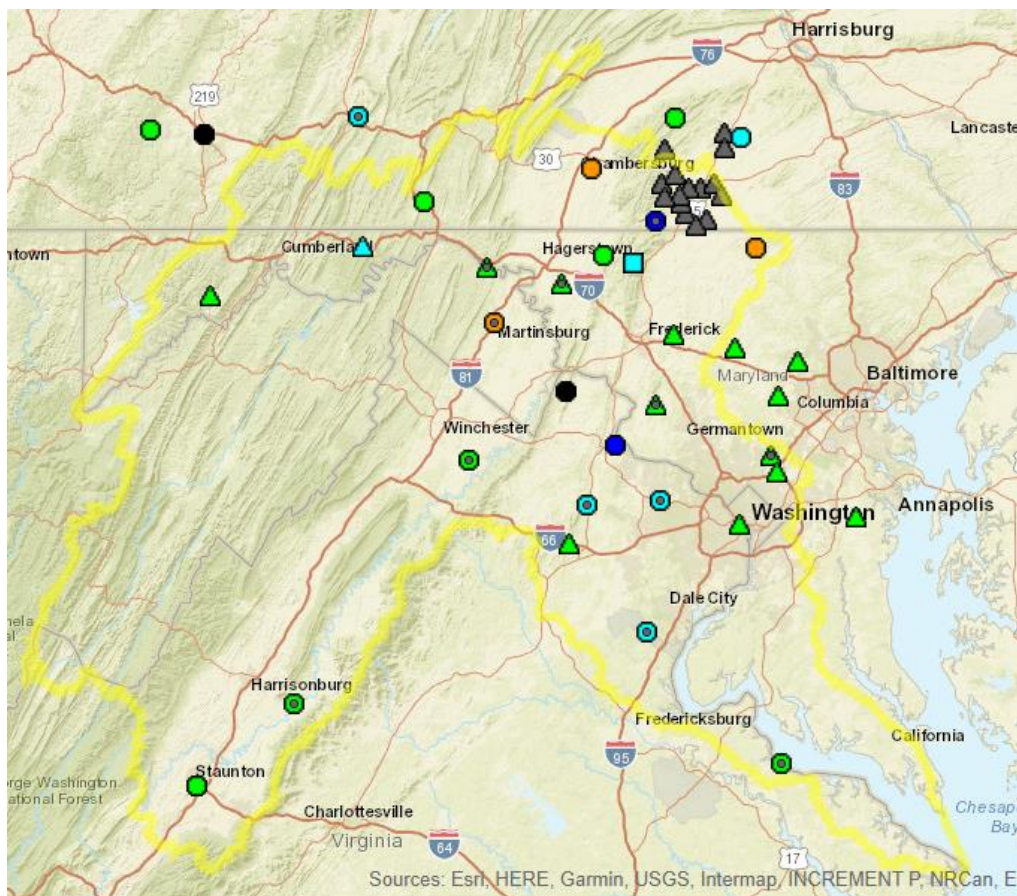
Valid for April 16 - July 31, 2020  
Released April 16



Information provided by the USGS, the Middle Atlantic River Forecast Center, and the National Weather Service.

### 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” range. 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)						
Low	<10	10-24	25-75	76-90	>90	High
	Much Below Normal	Below Normal	Normal	Above Normal	Much Above Normal	

Wells		
○	■	Real Time
□	■	Continuous
△	■	Periodic Measurement

### Reservoir Storage – Current Conditions:

No water supply releases from the CO-OP shared system have been made this year. Usable storage in the Triadelphia Reservoir, one of the two Patuxent reservoirs, has been increasing following the completion of the dam rehabilitation project.

Whitewater releases from [Jennings Randolph](#) Reservoir occurred on May 3, 2020. Releases from Jennings Randolph and Savage reservoirs are made for a variety of purposes. The flow values reported for whitewater and artificially varied flow (AVF) come entirely from water quality storage and may be increased or decreased without prior notice, depending on changing climatic and hydrologic conditions.

Information provided by the USGS, the Middle Atlantic River Forecast Center, and the National Weather Service.



Reservoir storage as of May 3, 2020

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC's Patuxent reservoirs <sup>4,5</sup>	88	9.3	10.5
Fairfax Water's Occoquan Reservoir	100	8.1	8.1
Little Seneca Reservoir <sup>1</sup>	100	3.9	3.9
Jennings Randolph water supply <sup>2</sup>	100	13.1	13.1
Jennings Randolph water quality <sup>2</sup>	100	16.3	16.3
Savage Reservoir <sup>3</sup>	91	5.7	6.3

<sup>1</sup> Usable capacity consistent with Ortt, *et al.* (2011).

<sup>2</sup> 2013 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

<sup>3</sup> 1998 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

<sup>4</sup> Bathymetric study conducted December 2015 with revisions in December 2016, and unusable storage corrected June 2017.

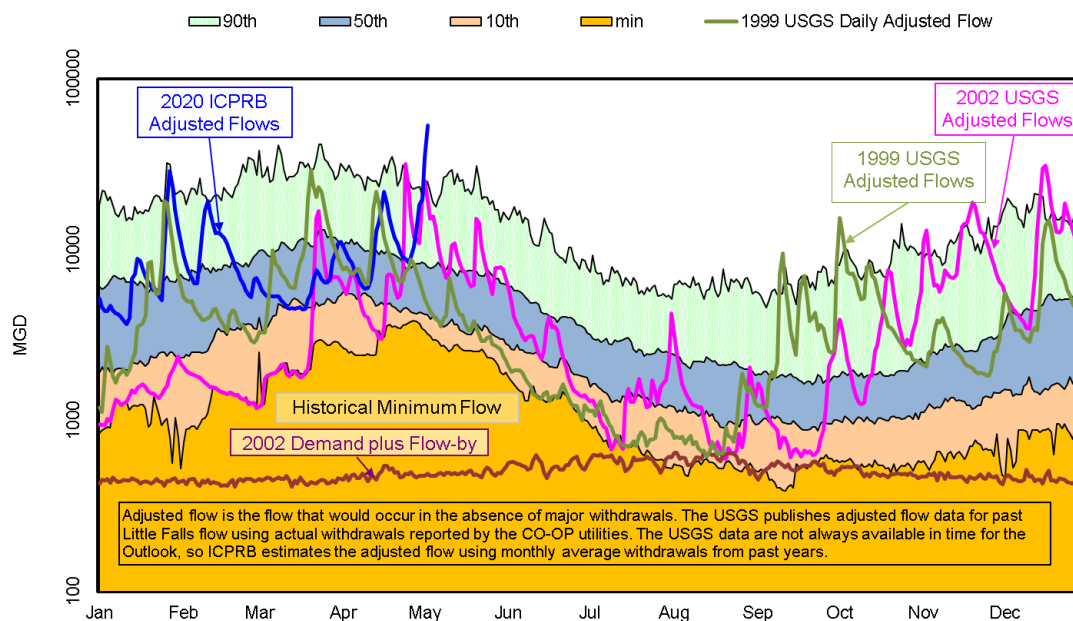
### Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on May 1st was 34.9 billion gallons per day (BGD). For this day of the year, this value was above the 90<sup>th</sup> percentile flow value of 25.0 BGD and below the maximum flow value of 56.1 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 8.9 BGD for the past three months and 11.1 BGD in April.

### Environmental Flow-by:

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

Adjusted Daily Flow at Little Falls for 2020, 1999 and 2002,  
Daily Adjusted Flow Percentiles for 1930-2014 Data,  
and Drought Year (2002) Demands plus Flow-by



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.

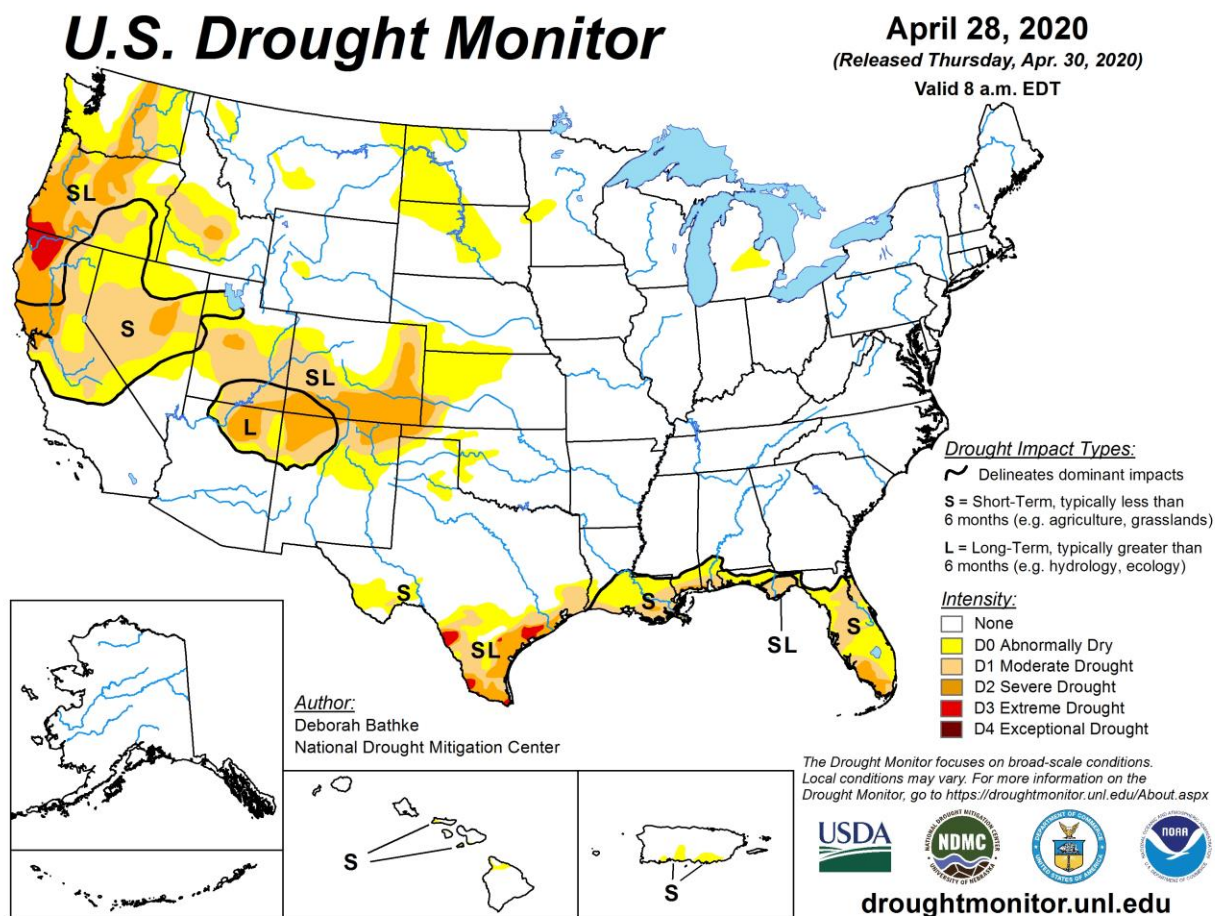
Information provided by the USGS, the Middle Atlantic River Forecast Center, and the National Weather Service.

### Drought Status:

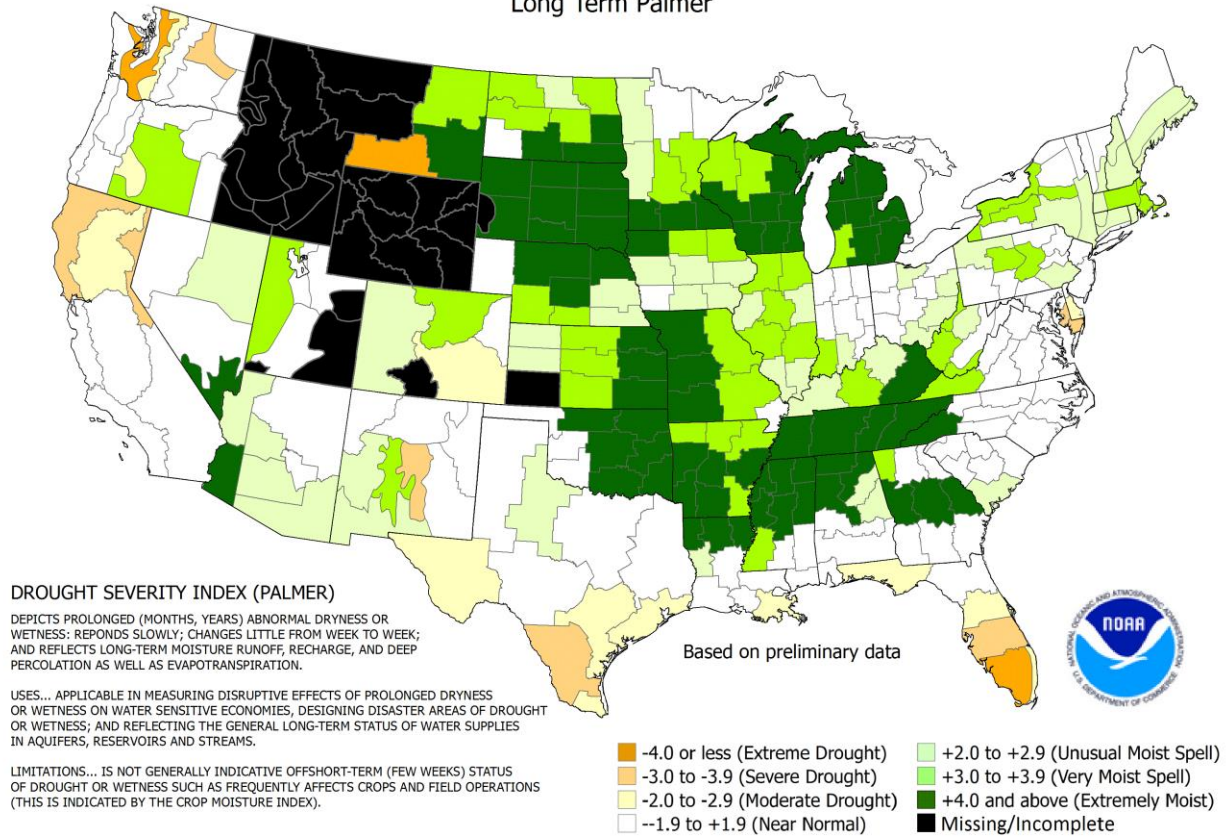
Drought status in [Maryland](#), [Pennsylvania](#), and [Virginia](#) is “Normal”.

### 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. The Palmer Drought Severity Index by Division map (see second figure on next page) indicates normal conditions in the Potomac basin.



Drought Severity Index by Division  
Weekly Value for Period Ending Apr 25, 2020  
Long Term Palmer



Information provided by the USGS, the Middle Atlantic River Forecast Center, and the National Weather Service.