

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 normal probability of releases from the Washington metropolitan area's back-up water supply reservoirs for the 2018 summer and fall seasons. Generally, the use of Jennings Randolph and Little Seneca reservoirs is triggered by low flows brought about by a combination of low summer precipitation and low groundwater levels. Potomac basin average precipitation in the month of March has been below normal and groundwater levels are near normal or below normal. According to the Middle Atlantic River Forecast Center, the outlook for water resources and water supplies is fair 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 because of carefully designed drought-contingency plans.

ICPRB's Low Flow Outlook:

There is an 8 to 15 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 8 to 15 percent current conditional probability is equal to the historical probability.

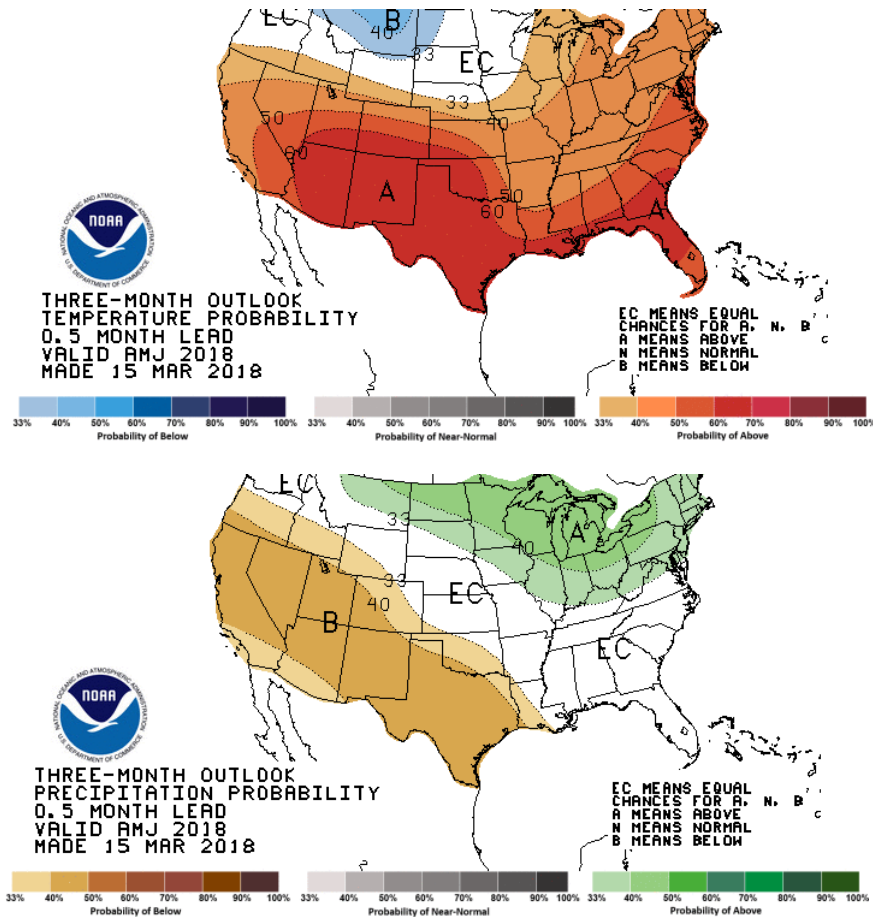
Outlook for natural Potomac River flow at Little Falls – Watershed conditions as of April 5, 2018

<i>Low flow threshold (MGD)</i>	<i>Low flow threshold (cfs)</i>	<i>Historical probability of lower flow April 1 through December 31</i>	<i>Conditional probability of lower flow April 1 through December 31</i>
1200	1858	68%	73%
1000	1548	49%	55%
800	1238	25%	27%
700	1084	15%	15%
600	929	8%	8%

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 2.1 inches for the month of March, which is 1.4 inches below normal. The map below shows that March precipitation has been about 26 to 50% below normal in most of the basin, and up to 51 to 75% below normal in central Virginia. The 12-month cumulative basin precipitation has below normal for most of the past 12 months. The 12-month cumulative basin precipitation was 0.8 inches below normal by the end of March (see graph).



Precipitation and Drought Outlook for April, May and June 2018

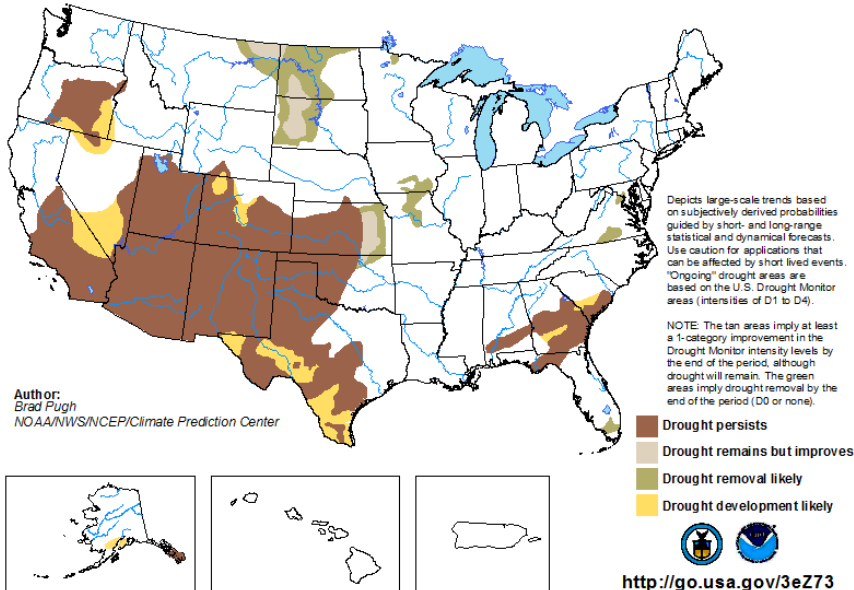


MARFC's Water Resource Outlook for the southern portion of the Middle Atlantic calls for near or above precipitation for the next couple of weeks. Temperatures are expected to be near or below average much of time, but should gradually rise to moderate to above normal by the end of April.

The National Weather Service Climate Prediction Center's 30-day outlook for April calls above average precipitation along with near or below average temperatures. The 90-day outlook for April through June calls for near or above average precipitation and above average temperatures.

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

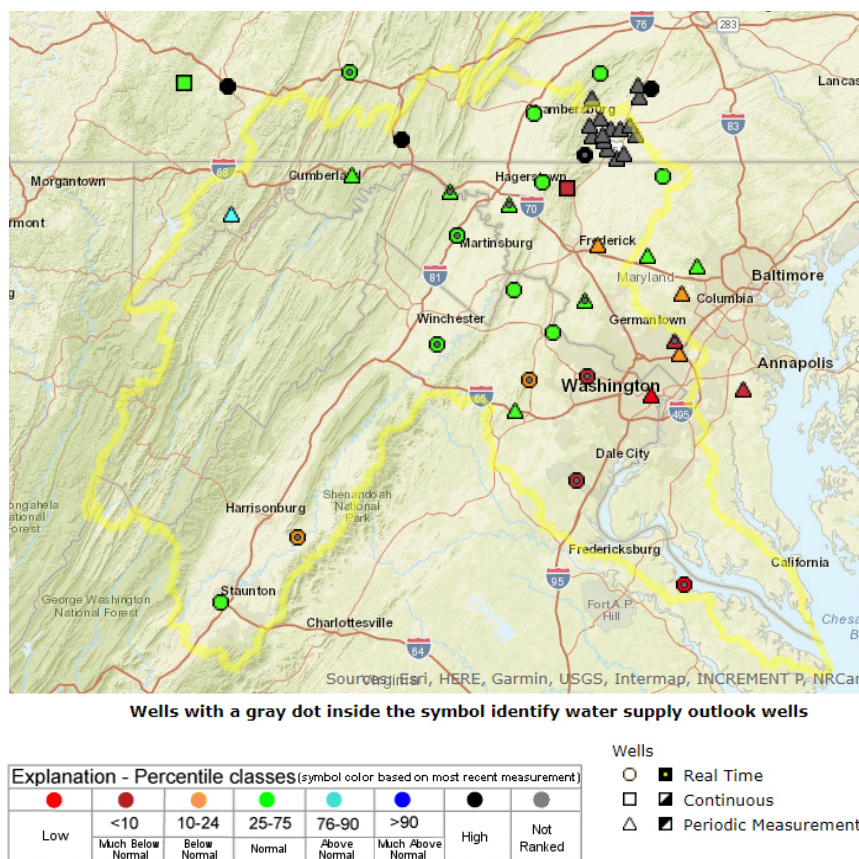
Valid for March 15 - June 30, 2018
Released March 15, 2018



As of March 15, the Climate Prediction Center's U.S. Seasonal Drought Outlook reports no drought development in the Potomac basin.

Groundwater – Current Conditions:

MARFC’s Water Resource Outlook for the Southern portion of the Middle Atlantic reports that groundwater is mostly near or below normal. The groundwater map below, created by the U.S. Geological Survey (USGS), Pennsylvania Water Science Center, shows that current water levels in monitoring wells in the Potomac basin range from “Much Below Normal” to “Above Normal.” Wells with a gray dot inside the symbol identify Water Supply Outlook wells, the majority of which fall in the “Below Normal” and “Much Below Normal” categories. In this map, the USGS defines “Below Normal” as between the 10th and 24th percentiles, and “Much Below Normal” as less than the 10th percentile.



Reservoir Storage – Current Conditions:

No water supply releases from the CO-OP shared system have been made this year. Triadelphia Reservoir is low and will remain so for the next two years because of rehabilitation work being done at the dam. Triadelphia Reservoir is one of the two Patuxent reservoirs.

A whitewater release from Jennings Randolph Reservoir is scheduled for April 7 and 8, 2018. 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 April 5, 2018

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC's Patuxent reservoirs ^{4,5}	45	4.7	10.3
Fairfax Water's Occoquan Reservoir	100	8.1	8.1
Little Seneca Reservoir ¹	99	3.8	3.9
Jennings Randolph water supply ²	100	13.1	13.1
Jennings Randolph water quality ²	100	16.3	16.3
Savage Reservoir ³	100	6.3	6.3

¹ Usable capacity consistent with Ortt, *et al.* (2011).

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

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

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

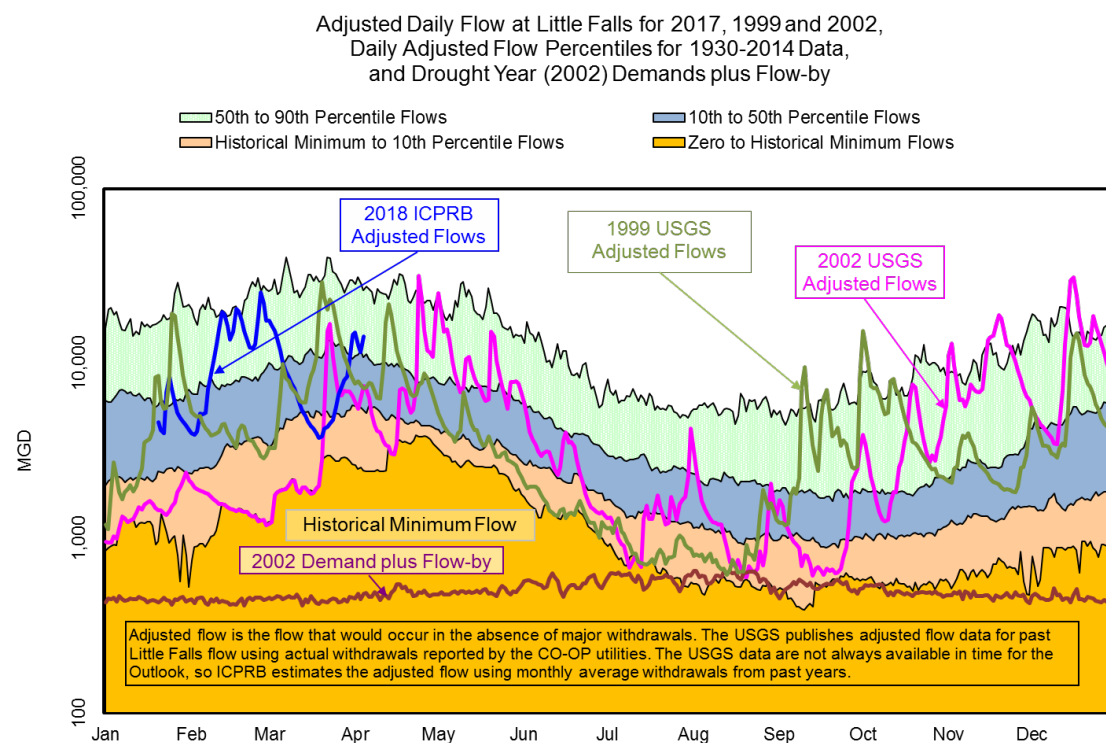
⁵ Patuxent usable storage currently reduced to approximately 6 BG due to the Brighton dam rehabilitation project

Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on March 31 was 14.6 billion gallons per day (BGD). For this day of the year, this value was above the 50th percentile flow value of 10.6 BGD and below the 90th percentile flow value of 30.0 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 9.6 BGD for the first three months of the year and 7.9 BGD in March.

Environmental Flow-by:

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



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

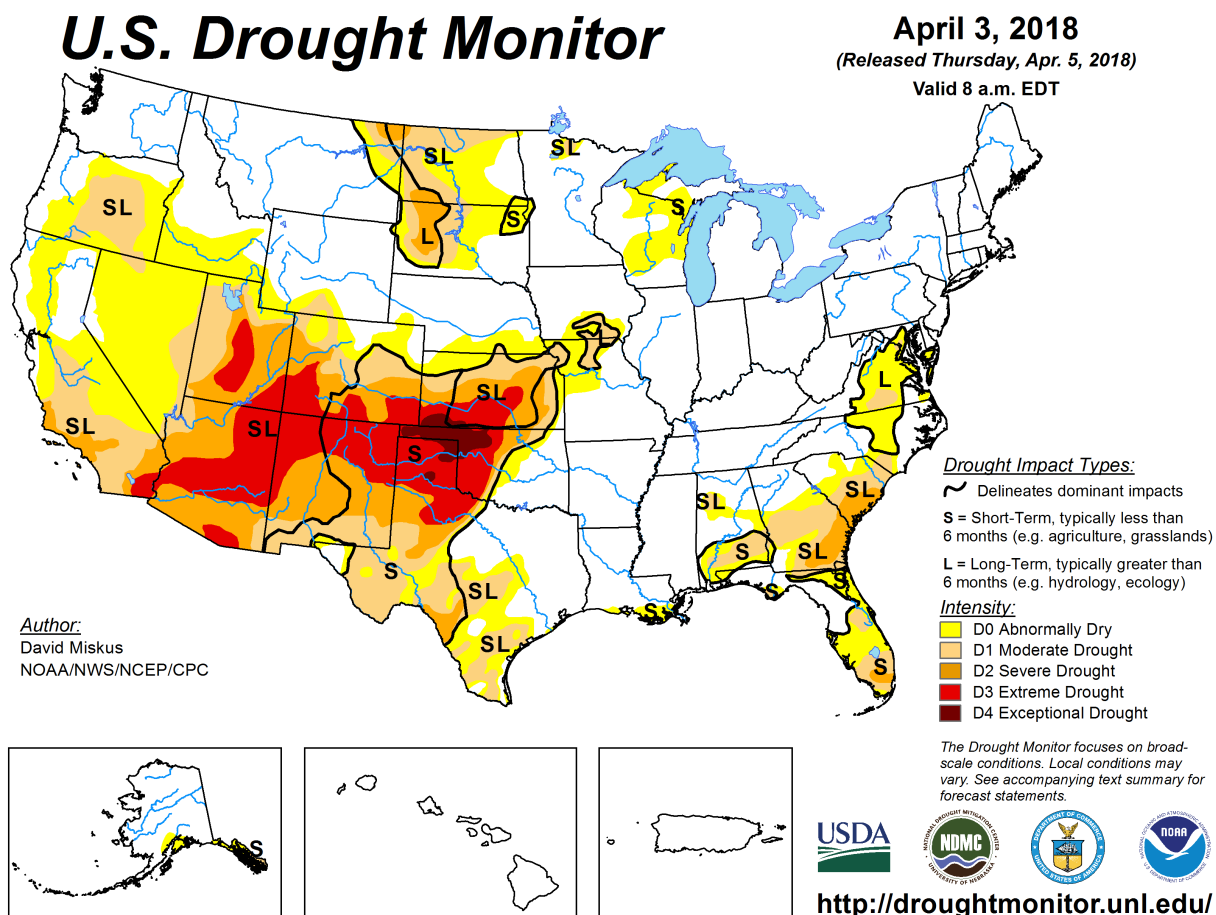
Little Falls flow statistics are based on 1930 through 2014 USGS published gage flow, "USGS 01646502 POTOMAC RIVER (ADJUSTED) NEAR WASH, DC". To create this flow record, the USGS has added historical water supply withdrawals from the Potomac as reported by FW, WSSC, the Aqueduct, and Rockville to the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

Drought Status:

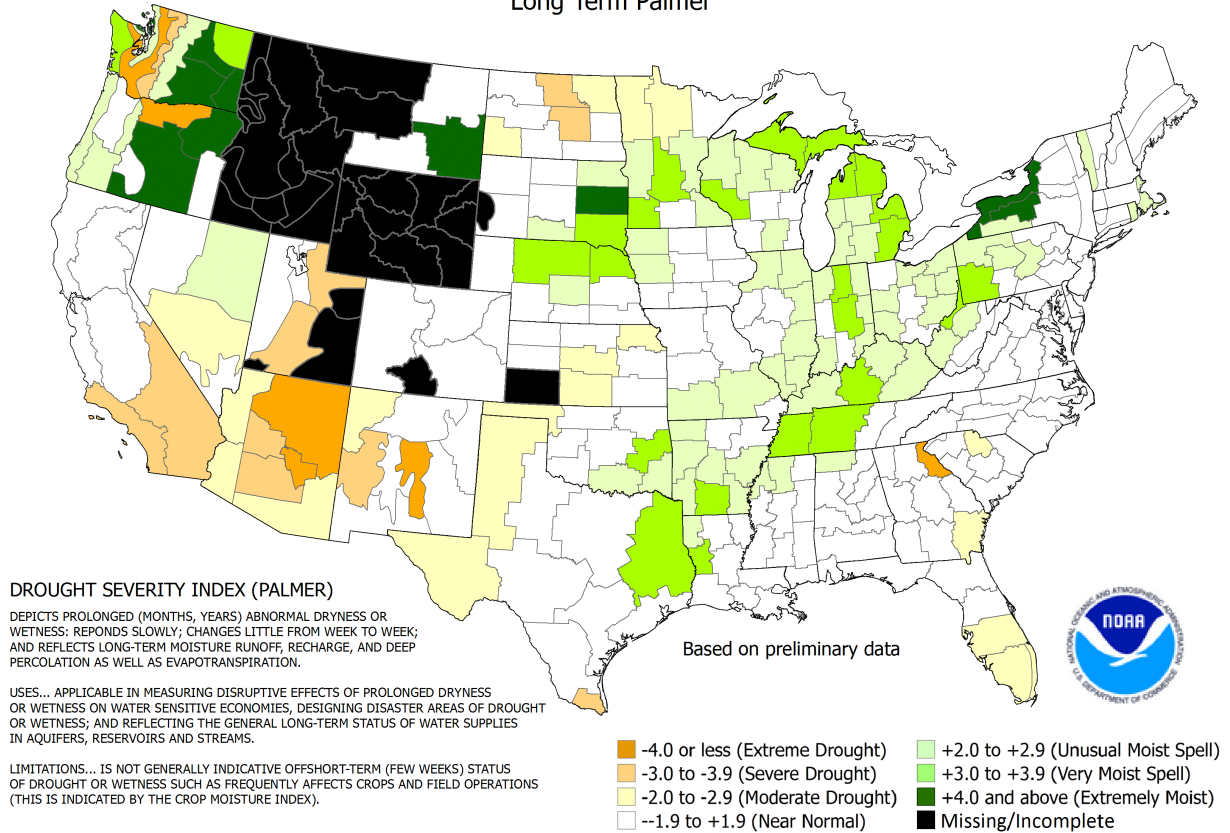
The states of [Maryland](#) and [Pennsylvania](#) have "Normal drought status." The state of [Virginia](#) has a "Drought Watch" in effect for much of northern, central, and southern parts of the state.

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. However, the District of Columbia, parts of Eastern Maryland and Virginia remain in abnormally dry (D0) conditions. The Palmer Drought Severity Index by Division map (see second figure on next page) indicates near normal conditions in the Potomac Basin.



Drought Severity Index by Division
Weekly Value for Period Ending Mar 31, 2018
Long Term Palmer



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