

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 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 May has been above normal. Recent rainfall events have caused flooding in many areas of the basin. Streamflow data from the U.S. Geological Survey shows that flows are above or much above normal. Groundwater levels are near normal. According to the Middle Atlantic River Forecast Center, the outlook for water resources and water supplies is good 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 a 1 to 3 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.

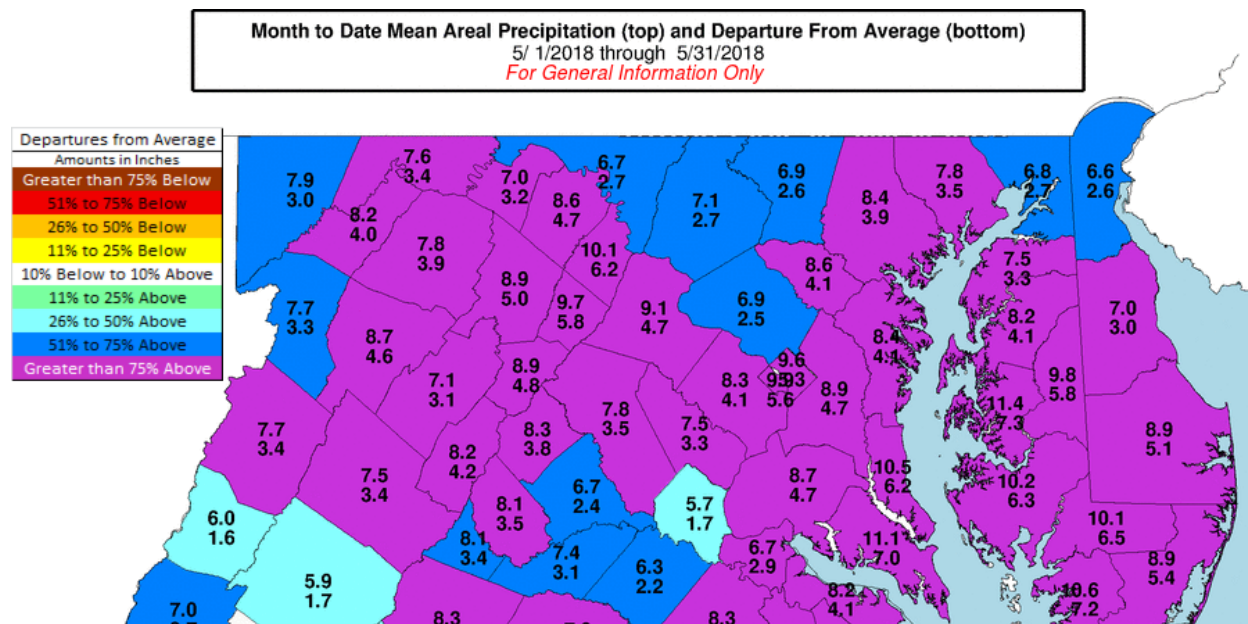
The conditional probability is estimated by analyzing the historical stream flow records and giving consideration to recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most 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 1 to 3 percent current conditional probability compares to the eight 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 June 4, 2018

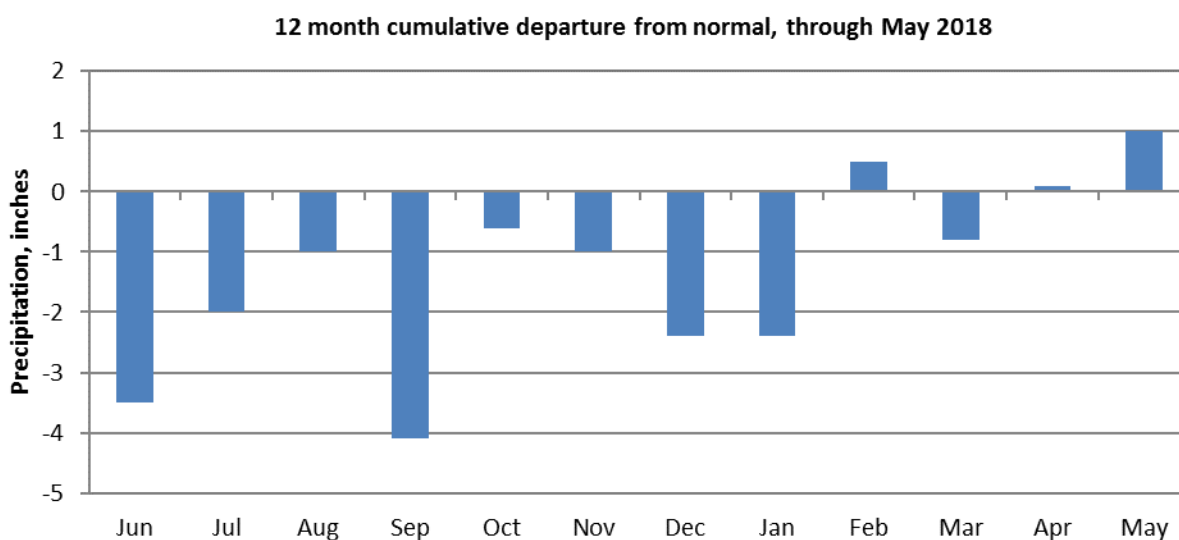
<i>Low flow threshold (MGD)</i>	<i>Low flow threshold (cfs)</i>	<i>Historical probability of lower flow April 1 through December 31</i>	<i>Conditional probability of lower flow April 1 through December 31</i>
1200	1858	68%	55%
1000	1548	49%	35%
800	1238	25%	10%
700	1084	15%	3%
600	929	8%	1%

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 a precipitation total of 7.4 inches in the month of May, which is 3.3 inches above normal. The map below shows that May precipitation has been 11% to more than 75% above normal in the Potomac Basin. The 12-month cumulative basin precipitation has been below normal for most of the past 12 months but is currently 1 inch above normal (see graph).

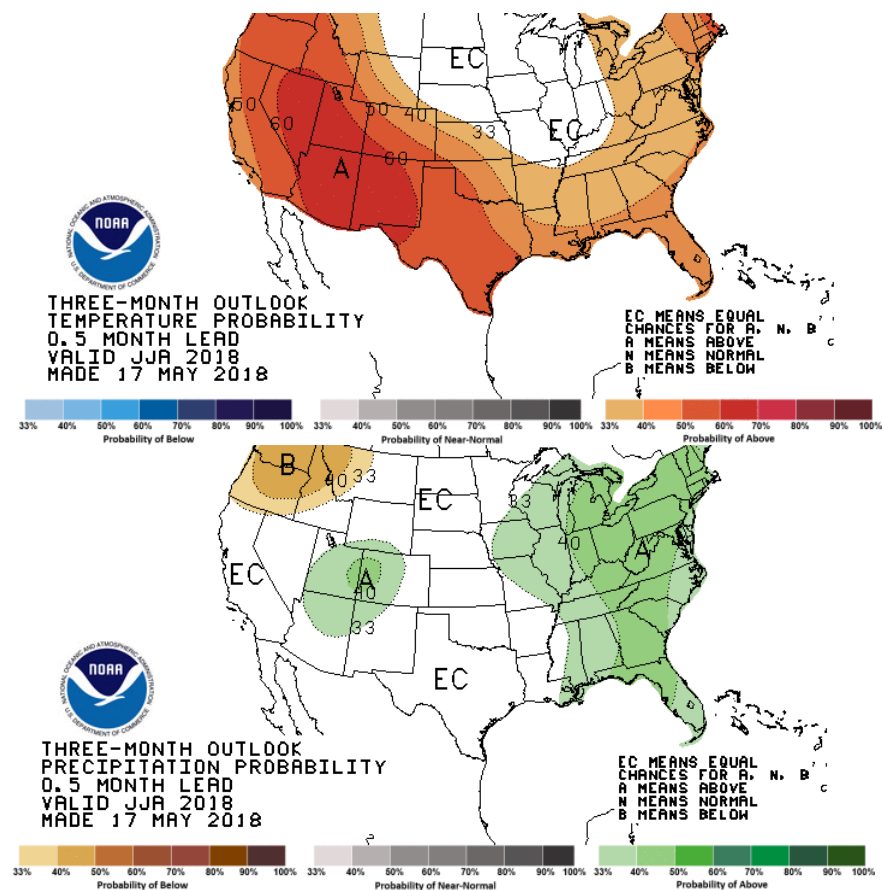


Source: Middle Atlantic River Forecast Center, National Weather Service



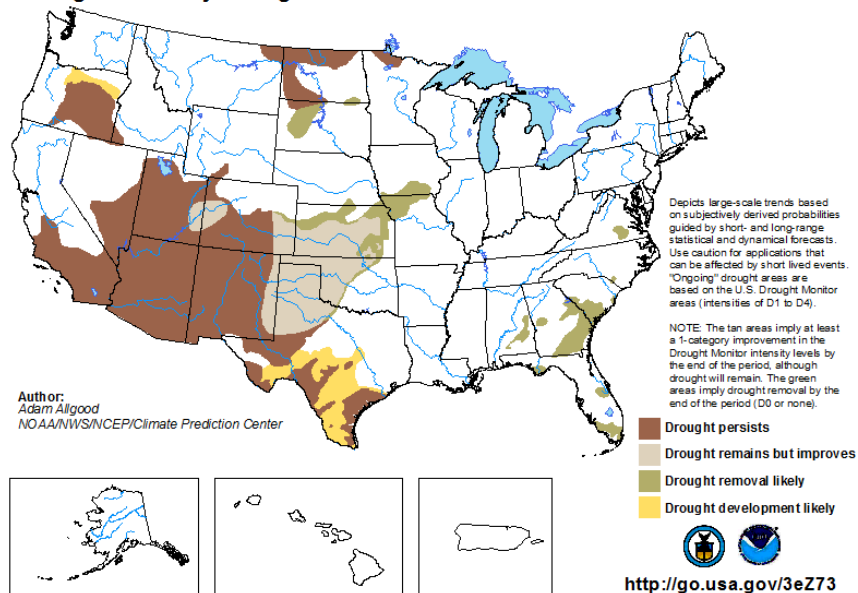
Information provided by the USGS, the Middle Atlantic River Forecast Center, the National Weather Service, and CO-OO suppliers.

Precipitation and Drought Outlook for May, June and July 2018



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

Valid for May 17 - August 31, 2018
Released May 17, 2018



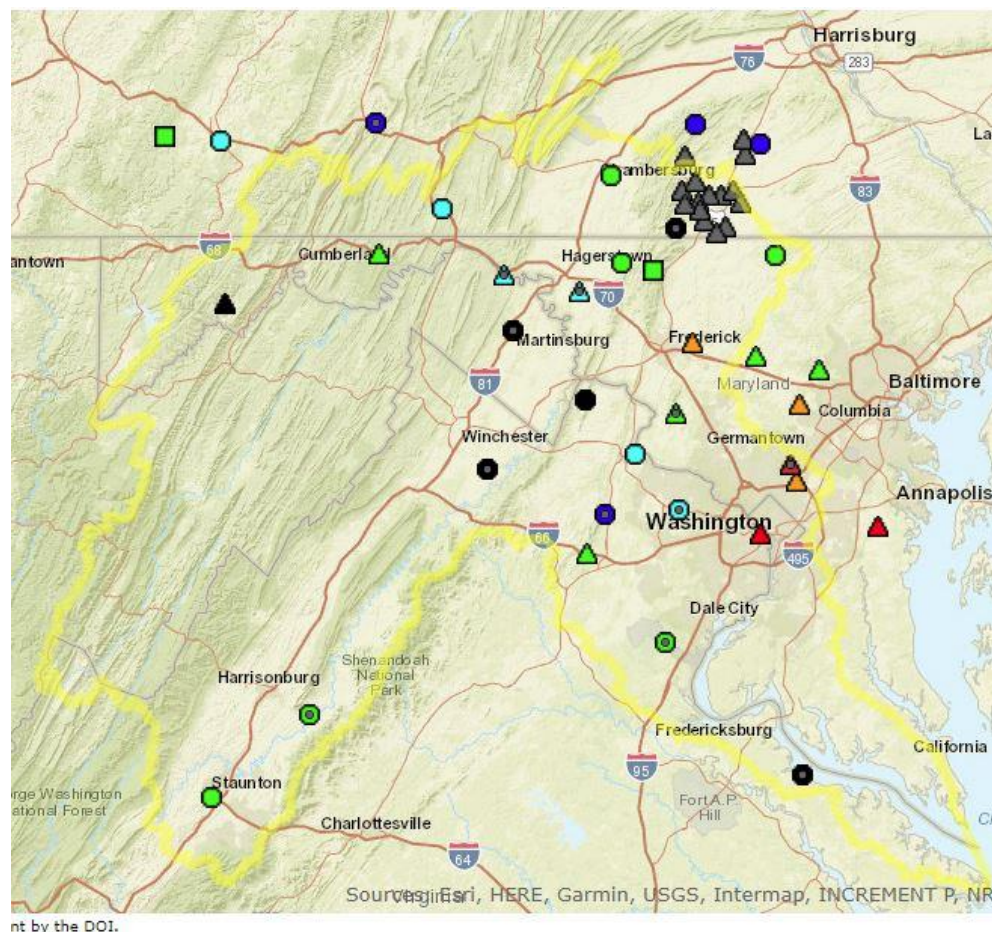
MARFC's Water Resource Outlook for the southern portion of the Middle Atlantic calls for much above normal rainfall for the beginning of June but then near or below average rainfall. Temperatures are expected to be near or below normal.

The National Weather Service Climate Prediction Center's 30-day outlook for June as well as the 90 day outlook for June through August calls for above average rainfall and temperatures..

As of May 17, 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 near or normal. The groundwater map below, 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 "Much Above Normal". Wells with a gray dot inside the symbol identify Water Supply Outlook wells, the majority of which fall in the "Normal" and "Above Normal" categories.



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	Not Ranked

Wells

- Real Time
- Continuous
- Periodic Measurement
- Periodic Measurement

Reservoir Storage – Current Conditions:

No water supply releases from the CO-OP shared system have been made this year. Following recent rain events, all reservoirs in the CO-OP shared systems are currently 100% full, aside from Triadelphia Reservoir (one of the two Patuxent reservoirs). Water level in this reservoir is low due to the ongoing dam rehabilitation project.

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

Reservoir storage as of June 4, 2018

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC's Patuxent reservoirs ^{4,5}	79	8.2	10.3
Fairfax Water's Occoquan Reservoir	100	8.1	8.1
Little Seneca Reservoir ¹	100	3.9	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.

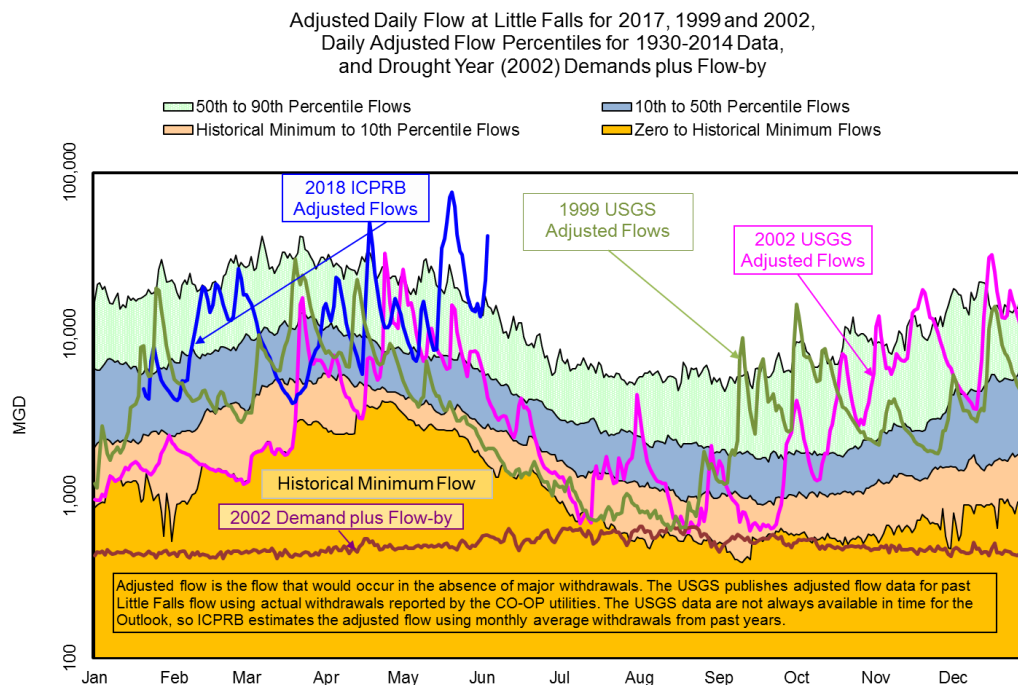
⁵ Patuxent usable storage currently reduced to approximately 6 BG due to the Brighton dam rehabilitation project

Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on June 1 was 14.9 billion gallons per day (BGD). For this day of the year, this value was above the 90th percentile flow value of 13.0 BGD and below the maximum flow value of 45.6 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 15.5 BGD for the first three months of the year and 22.6 BGD in May.

Environmental Flow-by:

Average observed Potomac flow at Little Falls in May 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.

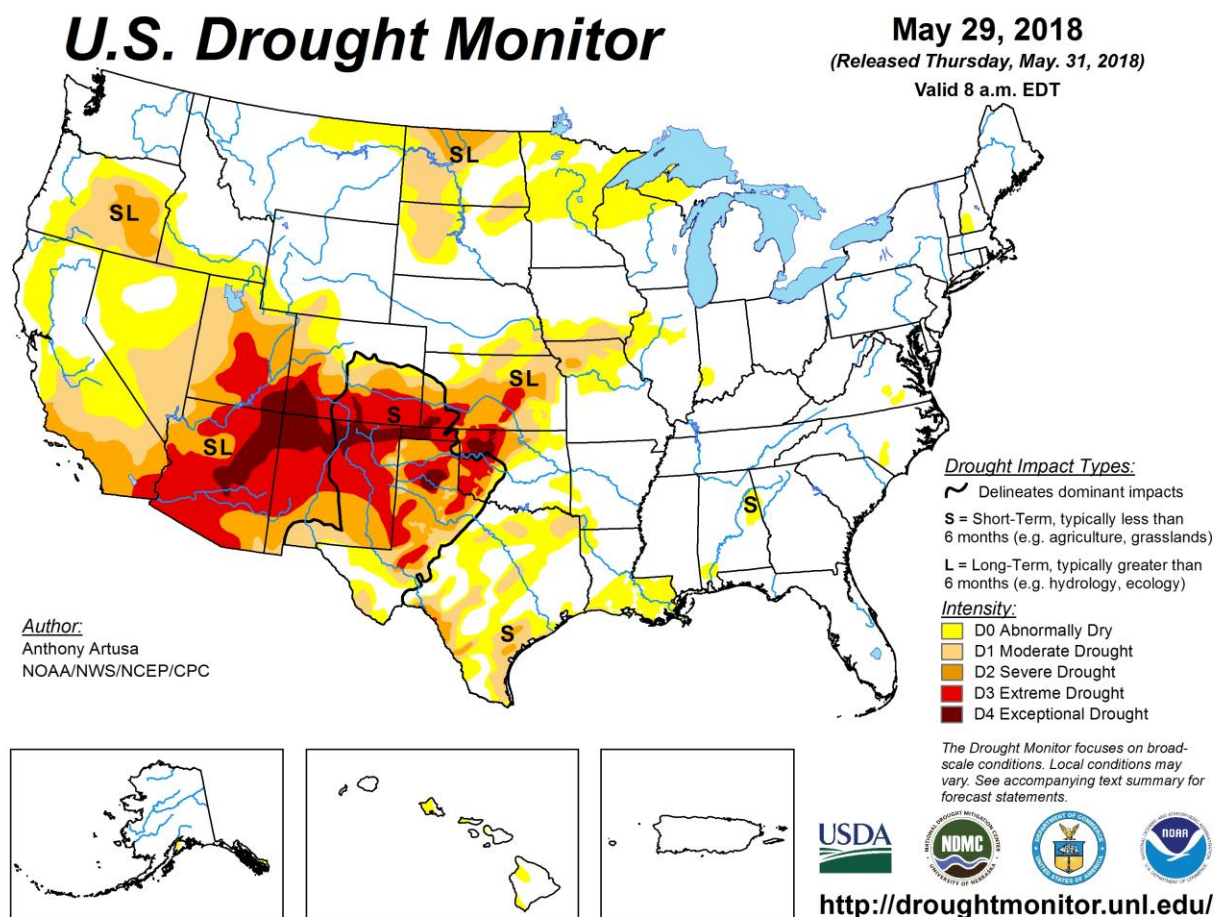
Information provided by the USGS, the Middle Atlantic River Forecast Center, the National Weather Service, and CO-OO suppliers.

Drought Status:

The states of [Maryland](#) and [Pennsylvania](#) have “Normal drought status.” The state of [Virginia](#) has a “Drought Watch” in effect in central 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. The Palmer Drought Severity Index by Division map (see second figure on next page) indicates near normal to unusually moist conditions in the Potomac Basin.



Drought Severity Index by Division
Weekly Value for Period Ending May 26, 2018
Long Term Palmer

