

# 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 2019 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 streamflows are near normal, influenced by near normal precipitation and groundwater levels. Some areas in the Potomac basin have been designated as abnormally dry (D0), which means that parts of Maryland, Virginia, and West Virginia are showing dryness but not yet in drought. According to the Middle Atlantic River Forecast Center, the outlook for water resources and water supplies is good. 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 two to less than one 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 two to less than one percent conditional probability compares to the 7 to 14 percent historical probability and is considered the more reliable indicator.

Outlook for natural Potomac River flow at Little Falls – Watershed conditions as of September 1, 2019

<i>Low flow threshold (MGD)</i>	<i>Low flow threshold (cfs)</i>	<i>Historical probability of lower flow September 1 through December 31</i>	<i>Conditional probability of lower flow September 1 through December 31</i>
1200	1858	64%	29%
1000	1548	45%	13%
800	1238	22%	3%
700	1084	14%	2%
600	929	7%	<1%

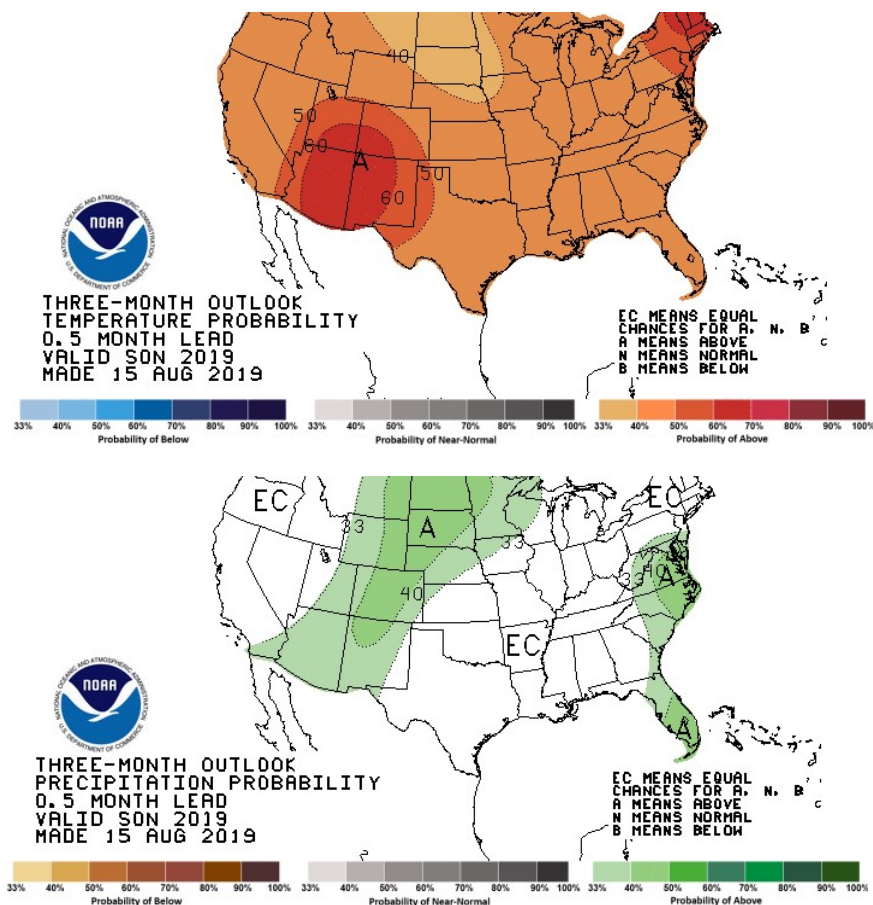
Data from the National Weather Service's Middle Atlantic River Forecast Center (MARFC) shows that the Potomac basin upstream of Washington, D.C. has received a precipitation total of 3.3 inches in the month of August, which is 0.1 inch below normal. The map below shows that August rainfall has been normal plus or minus an inch or two for most areas. The graph below shows that the basin cumulative precipitation over the past 12 months (September 2018 through August 2019) has been 15.3 inches above normal.



Month	Precipitation departure from normal, inch
Sep	18
Oct	16
Nov	20
Dec	25
Jan	24
Feb	24
Mar	25
Apr	25
May	23
Jun	19
Jul	18
Aug	15

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

## Precipitation and Drought Outlook for September, October, and November 2019



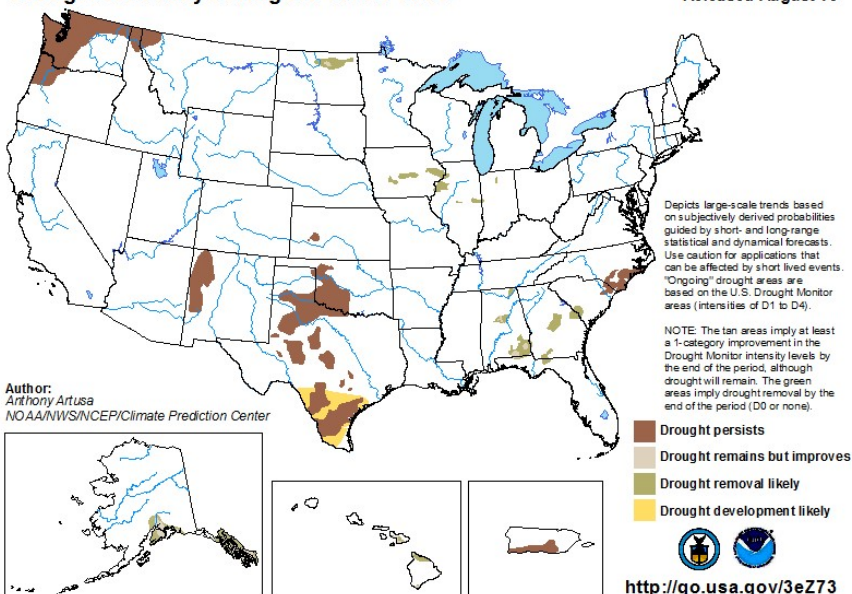
MARFC's Water Resource Outlook for the southern portion of the Middle Atlantic calls for above average rainfall and near normal temperatures going into early September.

The NWS Climate Prediction Center's 30 day outlook for September calls for near average rainfall and above normal temperatures. The 90 day outlook for September through November calls for above average precipitation and above average temperatures.

## U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for August 15 - November 30, 2019  
Released August 15

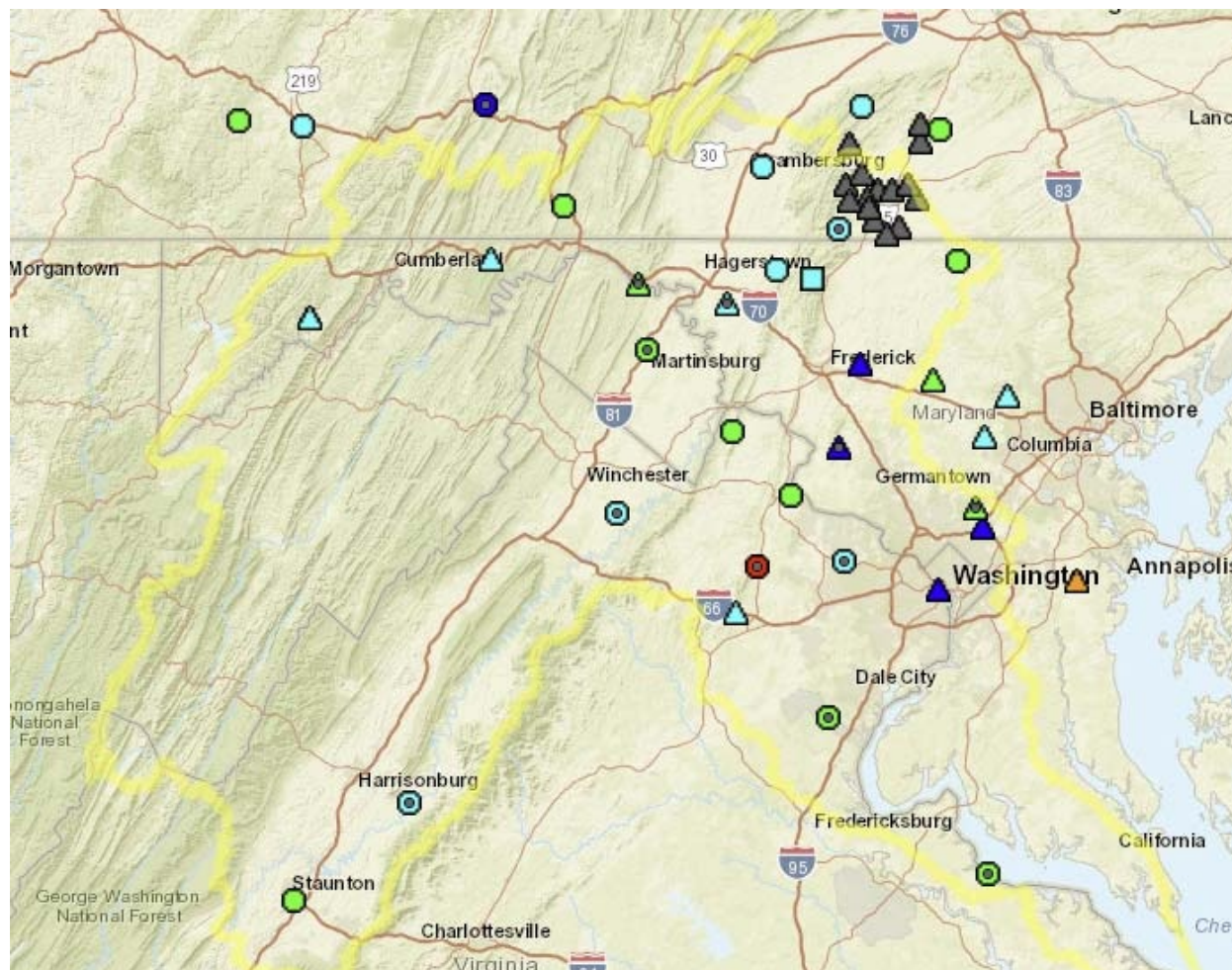


As of August 15, the Climate Prediction Center's U.S. Seasonal Drought Outlook reports no drought development in the Potomac basin.



### Groundwater – Current Conditions:

MARFC's Water Resource Outlook for the Southern portion of the Middle Atlantic reports that groundwater levels are near 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 mostly range from "Normal" to "Much Above Normal." There is one well that is "Much Below Normal" in Prince William County, Virginia. Wells with a gray dot inside the symbol identify Water Supply Outlook wells, the majority of which fall in the "Normal" category. In this map, the USGS defines "Normal" as between the 25<sup>th</sup> and 75<sup>th</sup> percentiles.



**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

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

### 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 rehabilitation work being done on Brighton Dam. Work on the dam may be completed by this December, after which the Reservoir will begin refilling. Triadelphia Reservoir is one of the two Patuxent reservoirs.

An artificially varied flow (AVF) releases from Jennings Randolph Reservoir is scheduled for Saturday and Sunday, September 14-15, 2019. A whitewater release from Savage Reservoir is scheduled for Saturday, September 28, 2019. Releases from Jennings Randolph and Savage reservoirs are made for a variety of purposes. The flow values reported for whitewater and AVF releases come entirely from water quality storage and may be increased or decreased without prior notice, depending on changing climatic and hydrologic conditions.

Reservoir storage as of September 3, 2019

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC's Patuxent reservoirs <sup>4,5</sup>	49	5.2	10.5
Fairfax Water's Occoquan Reservoir	100	8.1	8.1
Little Seneca Reservoir <sup>1</sup>	99	3.8	3.9
Jennings Randolph water supply <sup>2</sup>	100	13.1	13.1
Jennings Randolph water quality <sup>2</sup>	73	11.8	16.3
Savage Reservoir <sup>3</sup>	75	4.8	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.

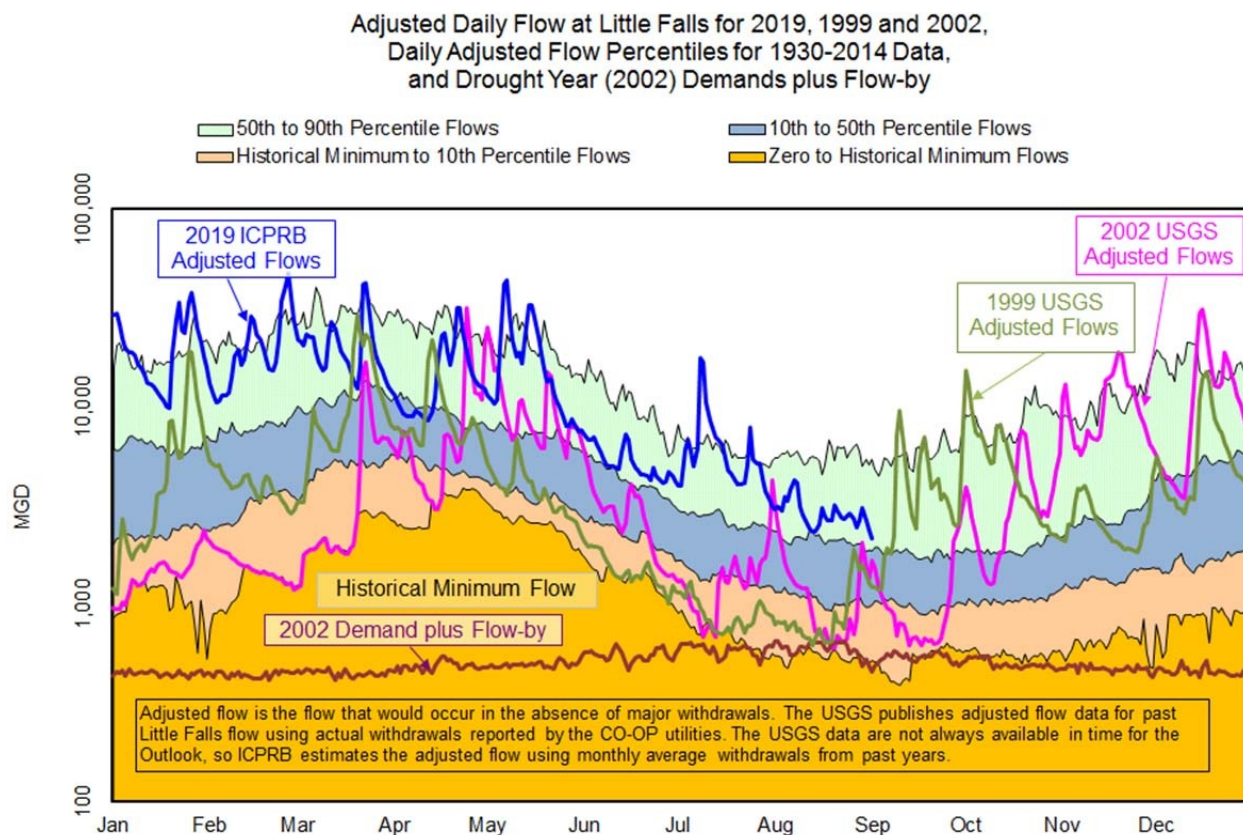
<sup>5</sup> Patuxent total usable storage currently reduced to approximately 5.5 BG due to the Brighton dam rehabilitation project.

### Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on August 31 was 2.3 billion gallons per day (BGD). For this day of the year, this value was above the 50<sup>th</sup> percentile flow value of 1.9 BGD and below the 90<sup>th</sup> percentile flow value of 5.0 BGD. Adjusted flow, shown in the figure on the next page, is the flow that would occur in the absence of major Washington metropolitan area withdrawals, but includes releases from upstream reservoirs. Adjusted flow averaged 13.44 BGD for the last eight months and 2.9 BGD in August.

### Environmental Flow-by:

Average observed Potomac flow at Little Falls in August 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:

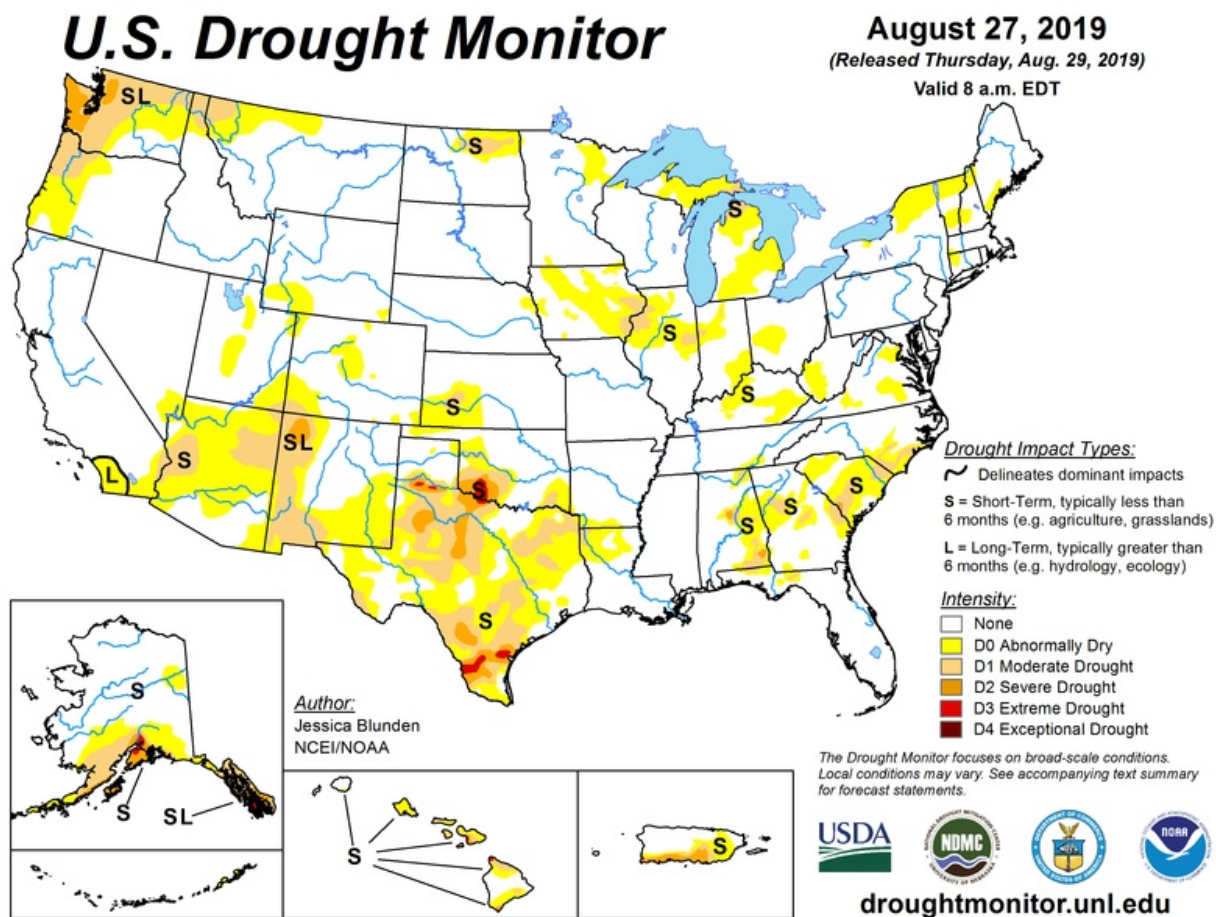
The states of [Maryland](#), [Pennsylvania](#), and [Virginia](#) have "Normal drought status."

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

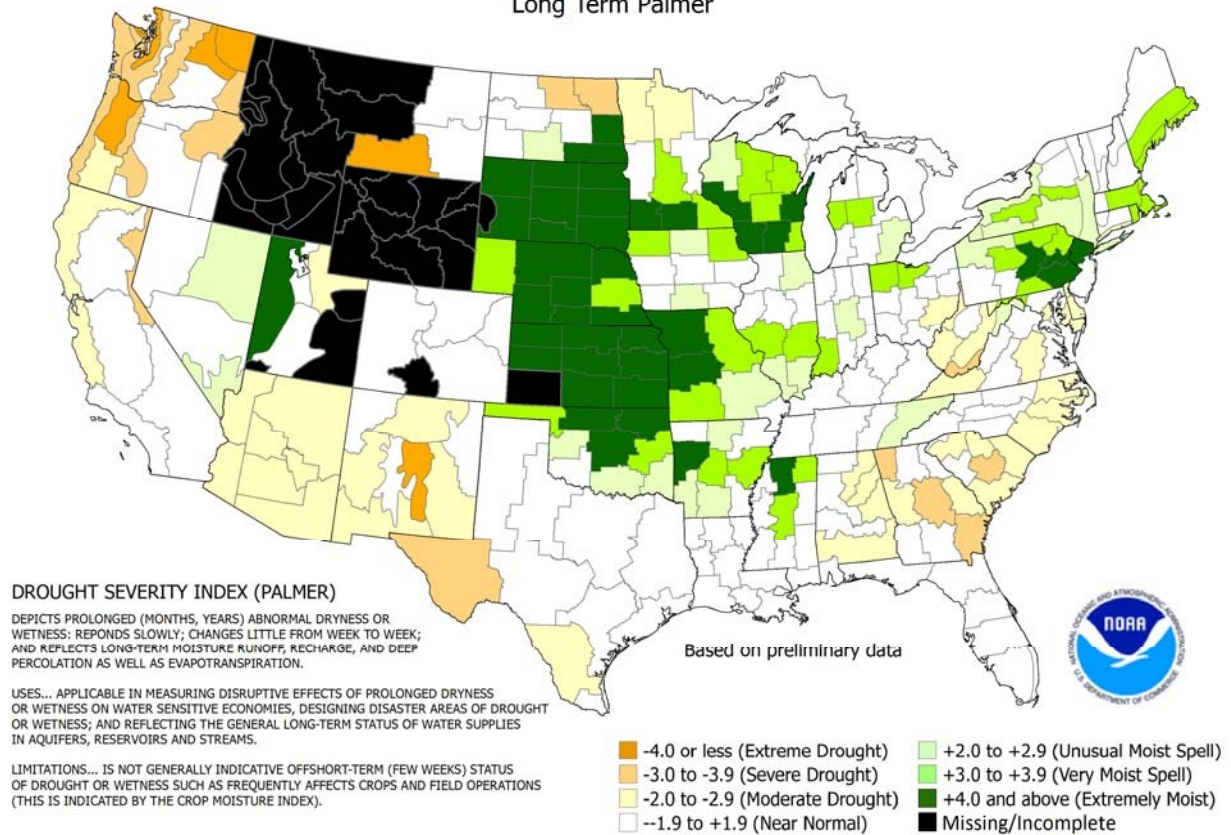


### Drought Monitor and Soil Moisture:

The NOAA Climate Prediction Center's U.S. Drought Monitor map (see first figure) indicates some development of abnormally dry conditions (D0) in the Potomac basin. Abnormally dry intensity is used for areas showing dryness but not yet in drought, or for areas recovering from drought. Maryland has less than two percent area in D0, which has persisted over the last week. Virginia has less than 20 percent area in D0, which has persisted over the last three months. West Virginia has slightly over 20 percent area in D0, which has persisted over the last week. Both Virginia and West Virginia D0 coverage includes area outside the Potomac basin. The Palmer Drought Severity Index by Division map (see second figure) indicates moderate drought to very moist conditions in the Potomac Basin.



Drought Severity Index by Division  
Weekly Value for Period Ending Aug 31, 2019  
Long Term Palmer



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