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 mostly near or above normal, influenced by near or above normal precipitation and groundwater levels. 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 minimal (<1 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.

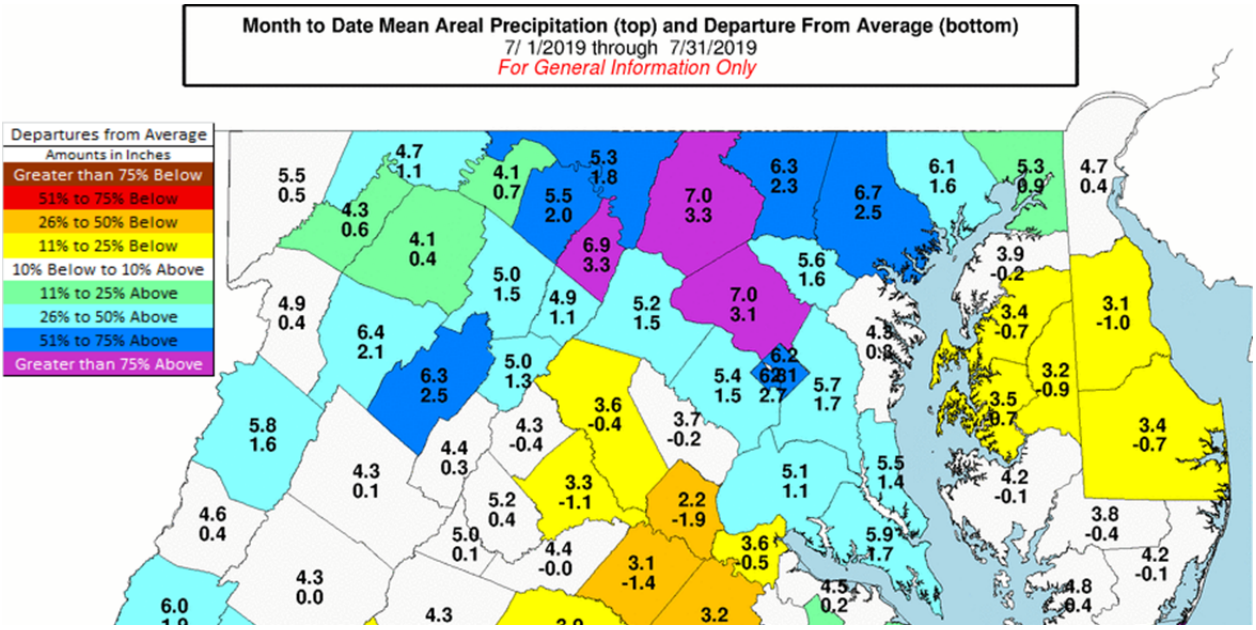
The conditional probability is estimated by analyzing the historical stream flow records and giving consideration to recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most 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 minimal (<1 percent) conditional probability compares to the 7 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 August 1, 2019

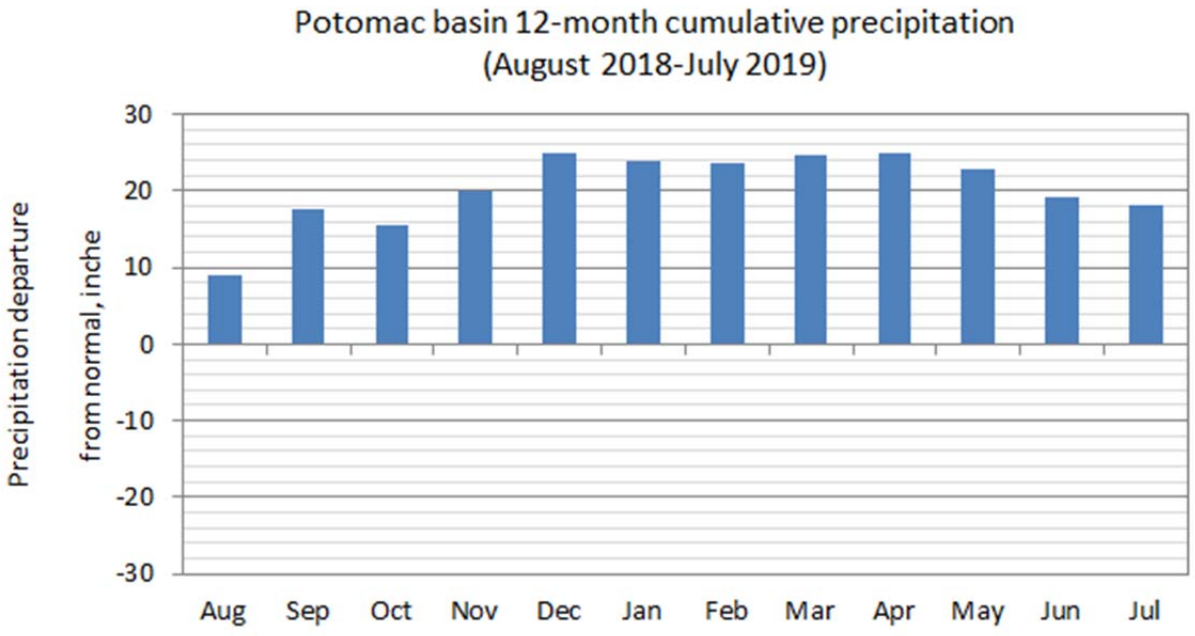
Low flow threshold (MGD)	*Low flow threshold (cfs)*	*Historical probability of lower flow August 1 through December 31*	*Conditional probability of lower flow August 1 through December 31*
1200	1858	67%	29%
1000	1548	47%	4%
800	1238	24%	<1%
700	1084	15%	<1%
600	929	7%	<1%

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 5.2 inches in the month of July, which is 1.3 inches above normal. The map below shows that July rainfall has been normal plus or minus an inch or two for most areas. Central Maryland, the extreme eastern parts of the eastern West Virginia panhandle and extreme northeastern Virginia are running 1 to over 3 inches above. The graph below shows that the basin cumulative precipitation over the past 12 months (August 2018 through July 2019) has been 17.9 inches above normal.

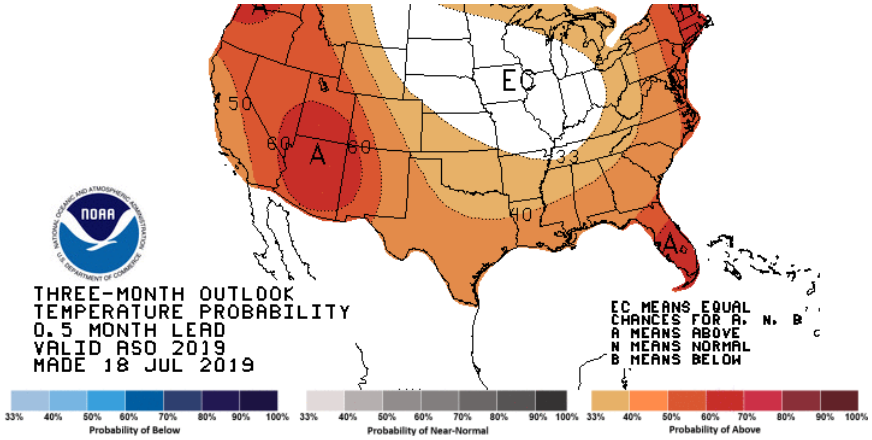


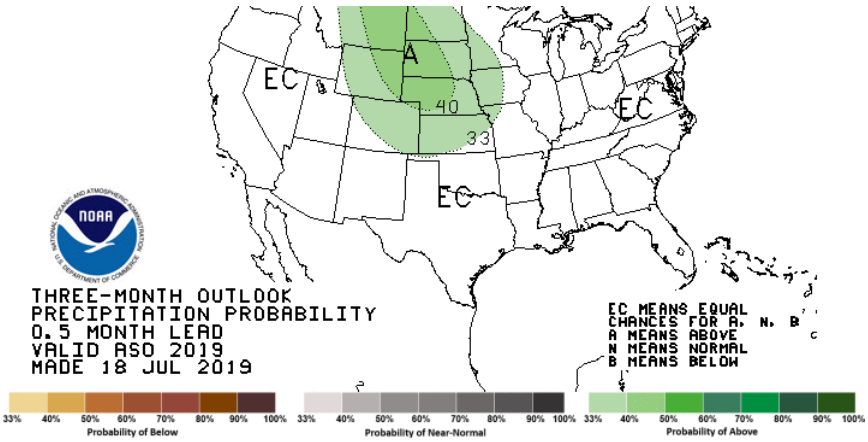
Source: Middle Atlantic River Forecast Center, National Weather Service



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

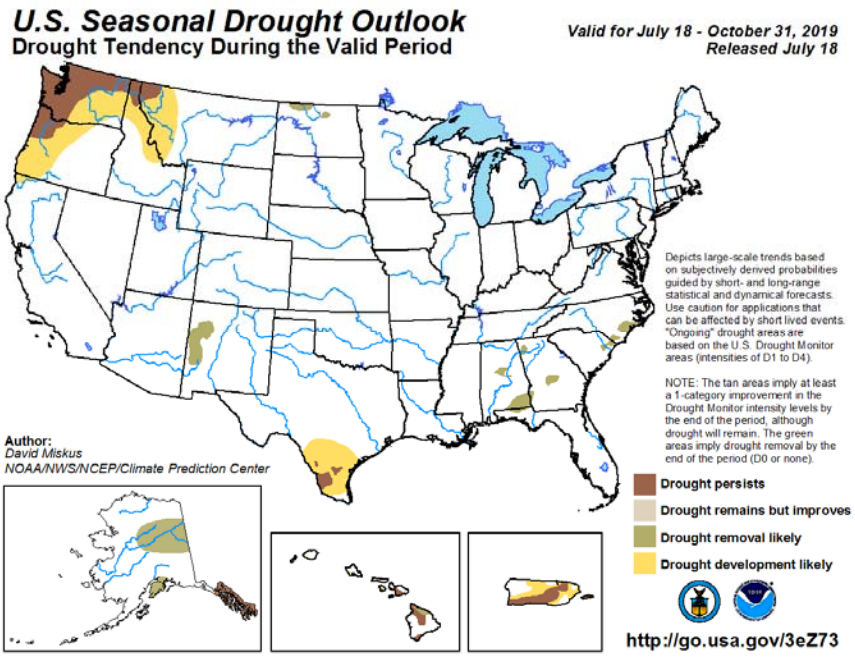
Precipitation and Drought Outlook for August, September, October 2019





MARFC's Water Resource Outlook for the southern portion of the Middle Atlantic calls for near average rainfall and near or below normal temperatures through the next couple of weeks.

The NWS Climate Prediction Center's 30 day outlook for August as well as the 90 day outlook for August through October calls for near average rainfall and above average temperatures.

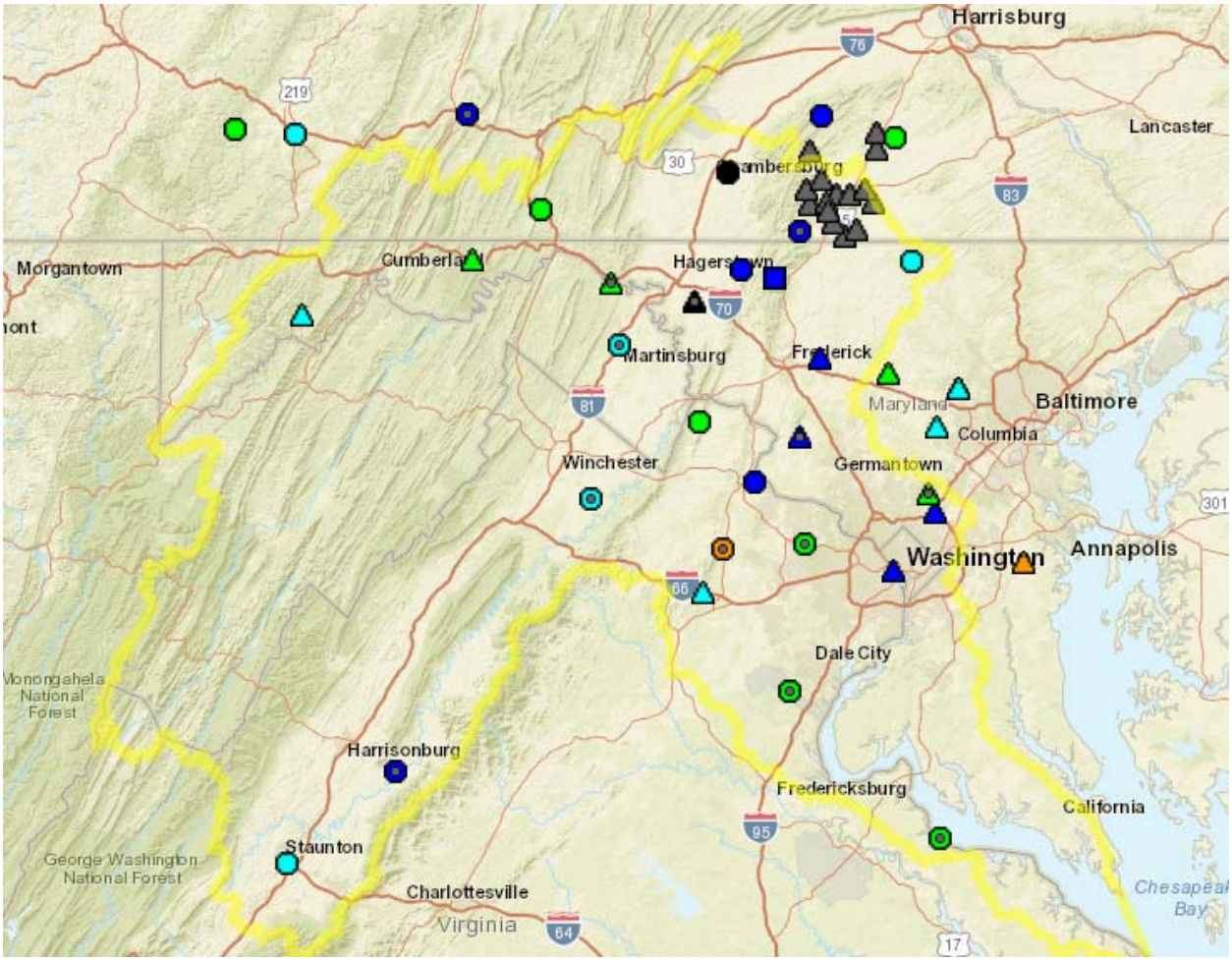


As of July 18, the Climate Prediction Center's U.S. Seasonal Drought Outlook reports no drought development in the Potomac basin.

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

Groundwater – Current Conditions:

MARFC's Water Resource Outlook for the Southern portion of the Middle Atlantic reports that groundwater levels are near or above 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 "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 25th and 75th 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 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	High	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 next year because of rehabilitation work being done at the dam. 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, August 24-25, 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 August 1, 2019

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC's Patuxent reservoirs[4,5]	57	6.0	10.5
Fairfax Water's Occoquan Reservoir	99	8.0	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]	95	15.4	16.3
Savage Reservoir[3]	89	5.6	6.3

[1] Usable capacity consistent with Ortt, *el 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 total usable storage currently reduced to approximately 5.5 BG due to the Brighton dam rehabilitation project.

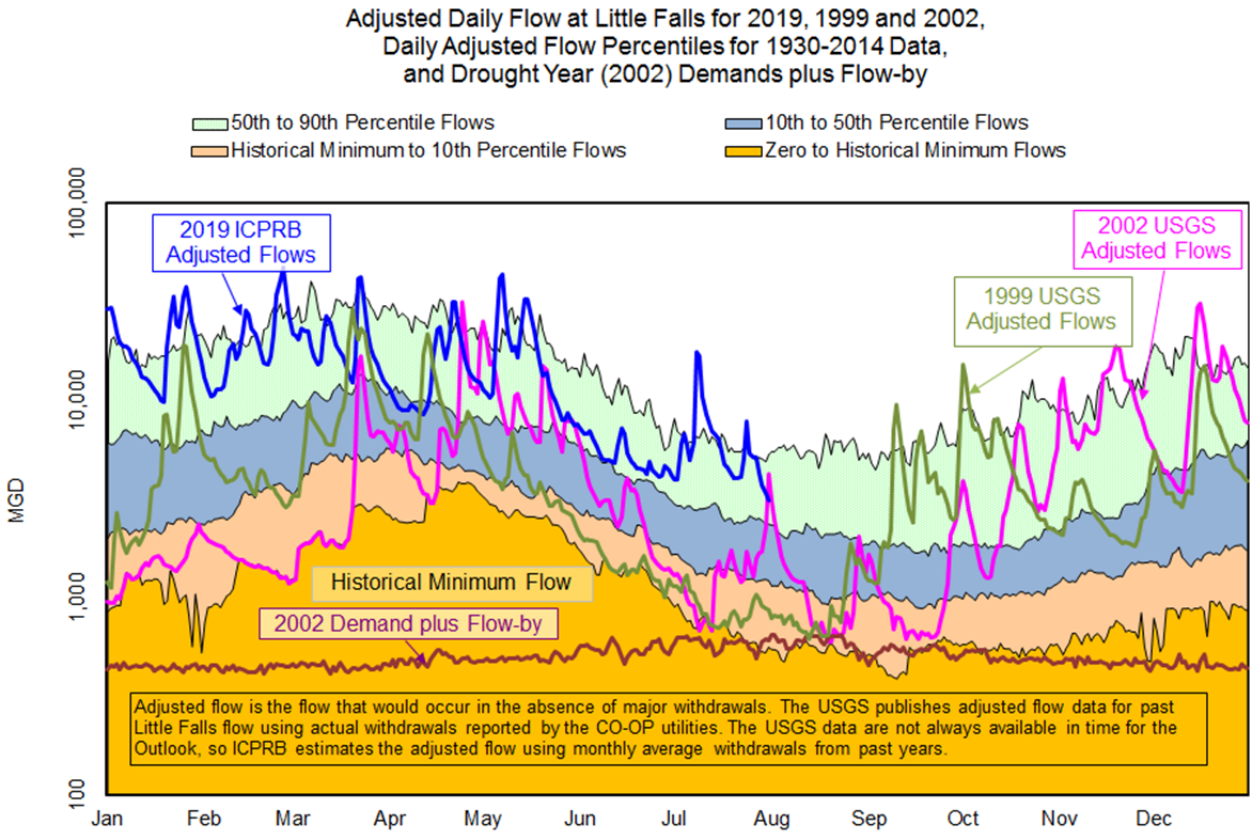
Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on July 31 was 3.1 billion gallons per day (BGD). For this day of the year, this value was above the 50th percentile flow value of 2.4 BGD and below the 90th percentile flow value of 5.3 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 9.7 BGD for the last three months and 6.3 BGD in July.

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

Environmental Flow-by:

Average observed Potomac flow at Little Falls in July 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.

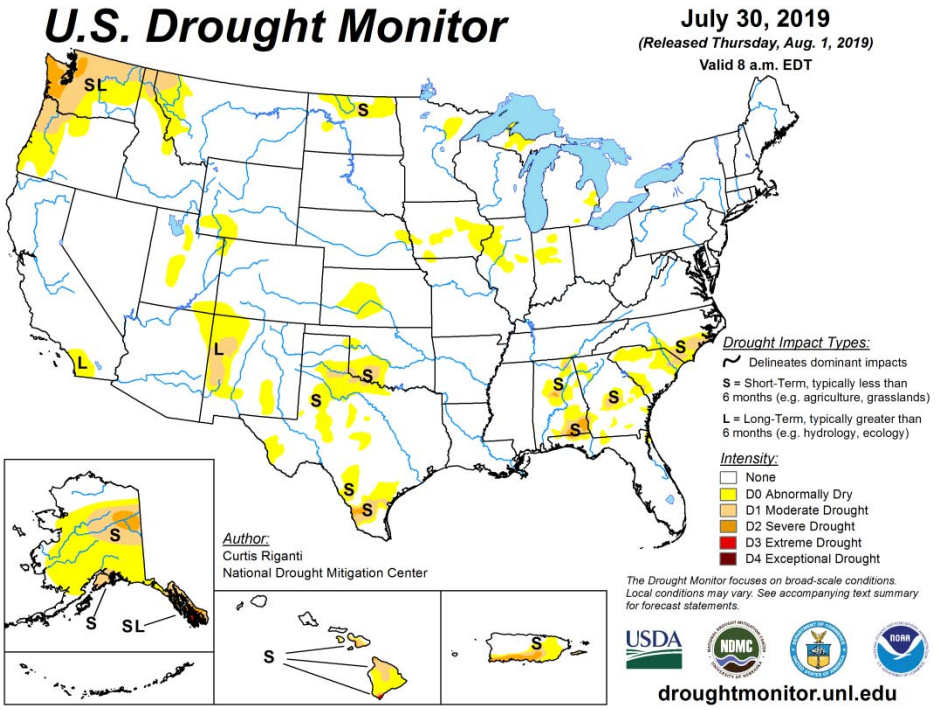
Drought Status:

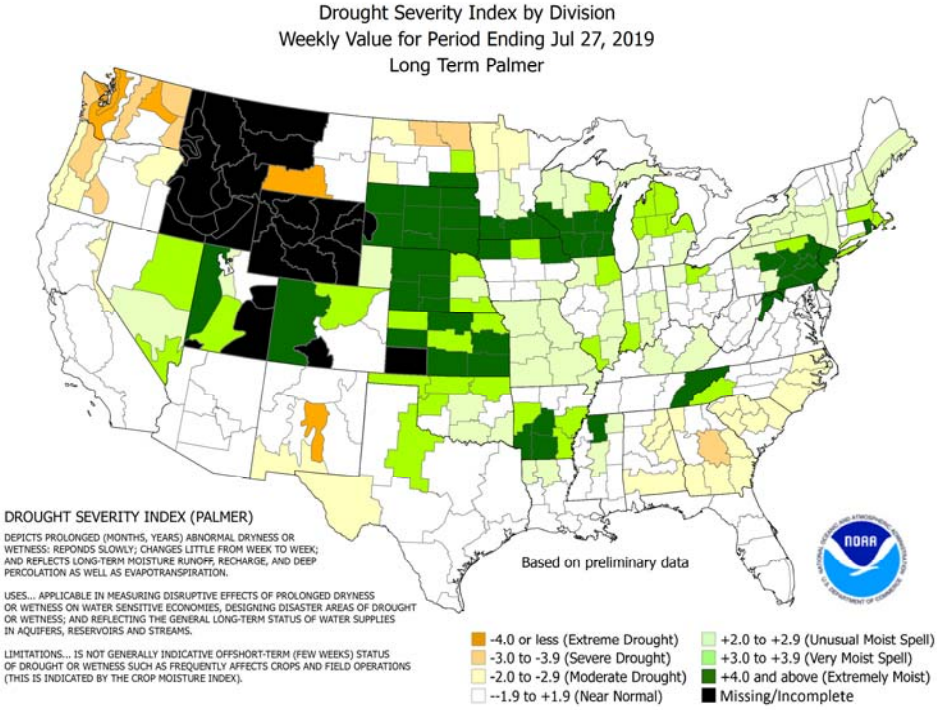
The states of Maryland, Pennsylvania, and Virginia have “Normal drought status.”

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 no drought conditions for the Potomac basin. The Palmer Drought Severity Index by Division map (see second figure) indicates near normal to extremely moist conditions in the Potomac Basin.





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