Water Supply Outlook

September 12, 2024
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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

The probability of releases from backup water supply reservoirs in the Washington metropolitan area during the summer and fall seasons of 2024 is currently near normal. 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. The Potomac basin upstream of Washington, D.C., received 6.7 inches of rain in August, which is 3.3 inches above normal. As of August 31, the 12-month cumulative basin precipitation is 0.9 inches above normal. Streamflow is currently near normal. As of September 11, ICPRB has re-initiated daily drought monitoring due to river flow at the Point of Rocks gage reaching a 2000 cfs threshold. Groundwater levels have improved but remain below normal levels in many observation wells in the basin. Still, drought conditions have overall improved over the month of August. The U.S. Drought Monitor reports 33% of the Potomac Basin area is under severe drought and 38% under moderate drought conditions. Extreme drought conditions have virtually disappeared (0.1%). While the MWCOG drought watch issued on July 29 is still in effect, most regions in Pennsylvania, Maryland, and Virginia are under normal conditions according to state drought status reports. The Shenandoah region remains under a drought warning. The Climate Prediction Center indicates that normal to above-normal precipitation is likely over the next three months. Below normal temperatures are expected in September. The U.S. Seasonal Drought Outlook, as of August 31, 2024, indicates that drought removal is likely in the eastern parts of the Potomac Basin over the coming months, while drought is likely to persist and develop in western areas. At present, there is sufficient flow in the Potomac River to meet the Washington metropolitan area's water demands without releasing water from upstream reservoirs. If low-flow conditions further develop, the Washington metropolitan area is protected from a water supply shortage owing to carefully designed drought-contingency plans.

ICPRB's Low Flow Outlook

There is a 5 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-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.

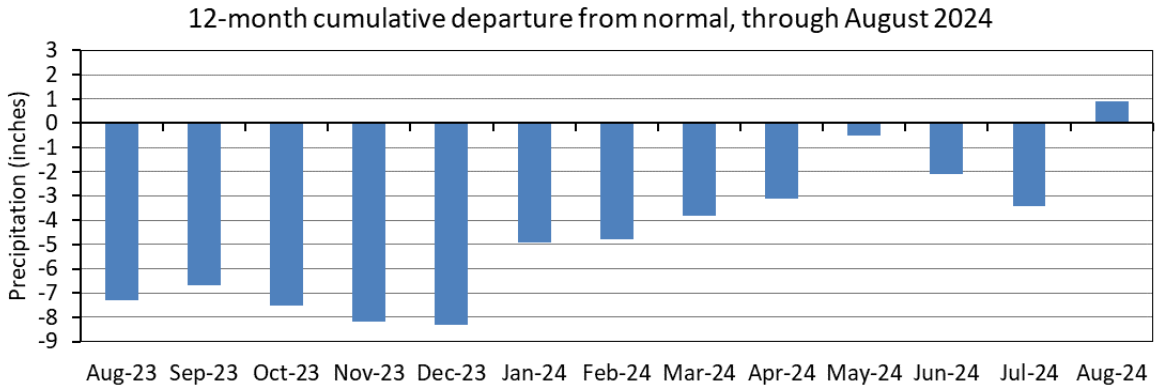
The conditional probability is estimated by analyzing the historical stream flow records and considering recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most closely resemble 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 5 to 15 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, 2024

Low flow threshold (MGD)	*Low flow threshold (cfs)*	*Historical probability of lower flow September 1 through December 31*	*Conditional probability of lower flow September 1 through December 31*
1200	1858	64%	83%
1000	1548	45%	71%
800	1238	22%	28%
700	1084	14%	15%
600	929	7%	5%

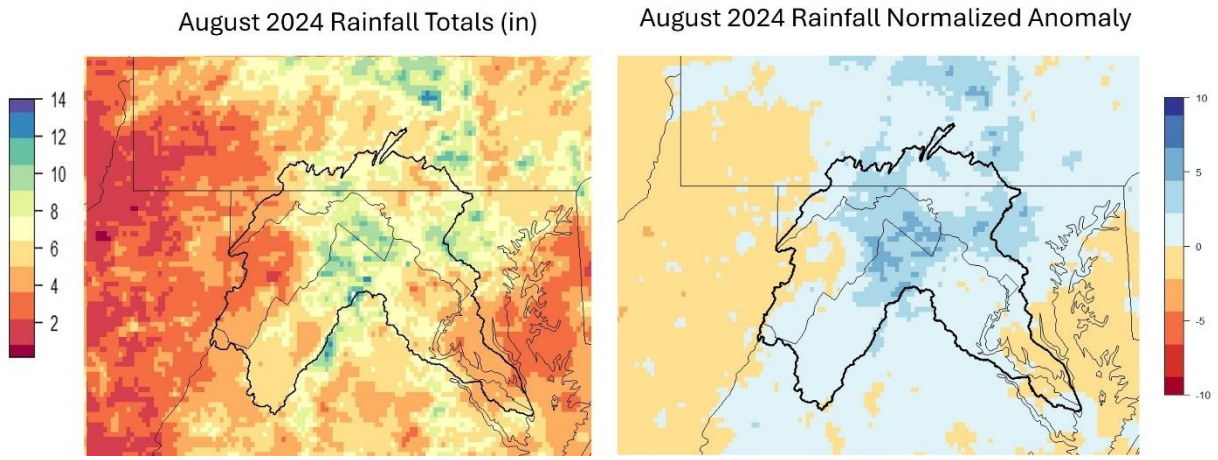
Past Precipitation

Data from the National Weather Service's Middle Atlantic River Forecast Center (MARFC) shows that the Potomac basin upstream of Washington, D.C., received 6.7 inches of precipitation in the month of August, which is 3.3 inches above normal. The 12-month cumulative basin precipitation is 0.9 inches above normal as of August 31 (see graph below).



Source: Middle Atlantic River Forecast Center, National Weather Service

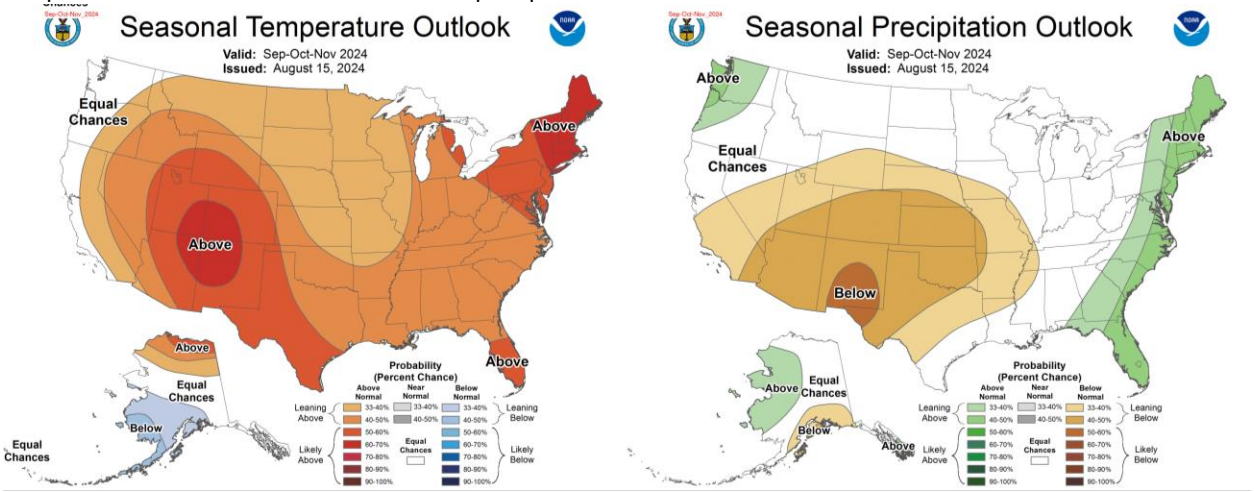
The maps below illustrate the spatial variability of rainfall over the Potomac Basin in August based on PRISM (Parameter-elevation Regressions on Independent Slopes Model) data. Normalized rainfall anomaly, indicating departure from normal conditions, reveals that rainfall was above normal for most of the basin, particularly in central areas. Western portions of the basin registered rainfall deficits.



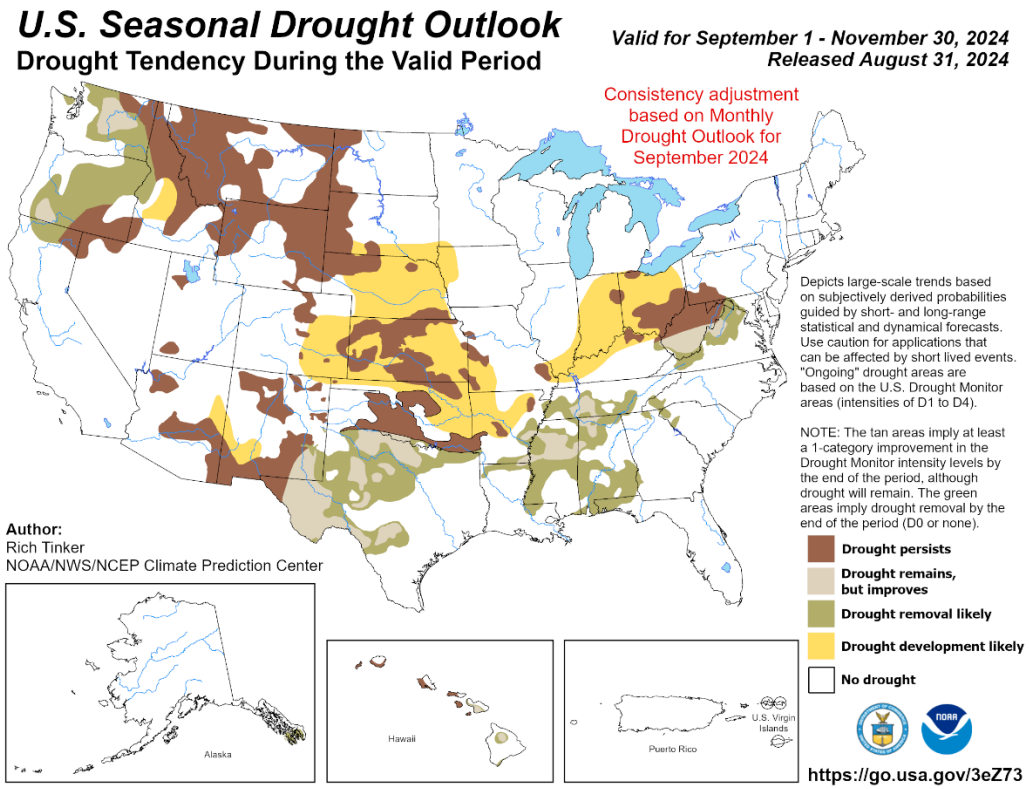
Source: PRISM Climate Group, Oregon State University, https://prism.oregonstate.edu

Precipitation and Drought Outlook for September, October, and November 2024

The Climate Prediction Center's September outlook calls for below-normal temperatures and normal to above-normal precipitation in the Potomac Basin. The 90-day outlook (September-November) calls for above-normal temperatures and normal to above-normal precipitation.

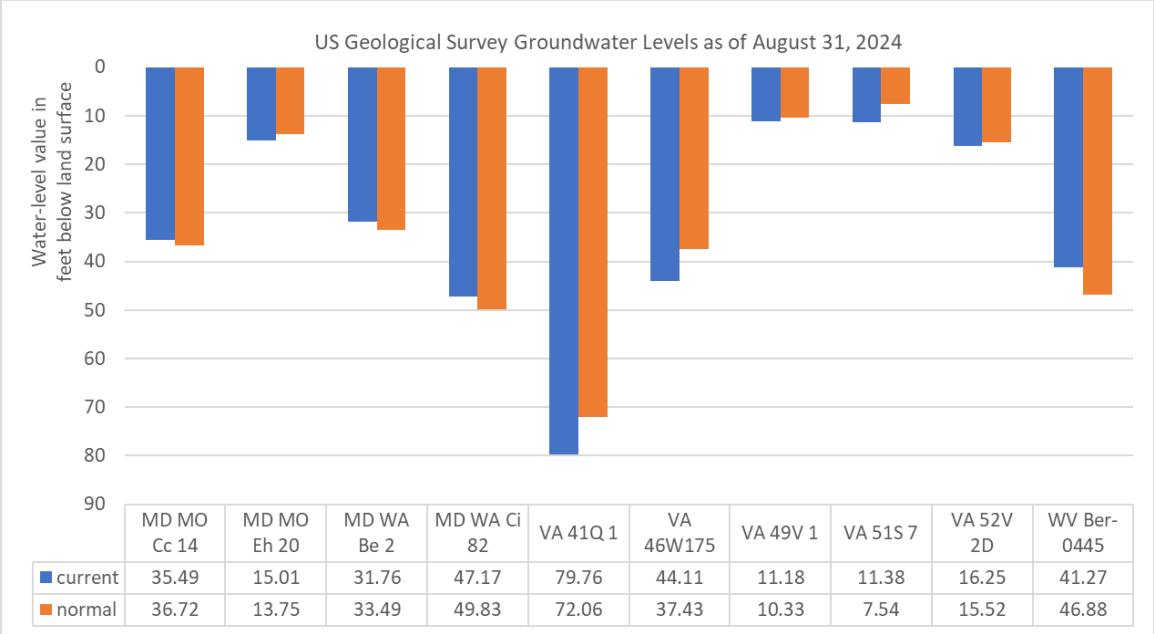


The Climate Prediction Center's U.S. Seasonal Drought Outlook, as of August 31, 2024, indicates drought removal is likely to eastern parts of the basin, but drought will persist in western parts of the basin.



Groundwater – Current Conditions

Based on U.S. Geological Survey (USGS) data, the depth to groundwater level (measured in feet) shows below normal depths for most wells, as depicted in the graph below, displaying current and normal groundwater levels for August. While groundwater levels have improved, many wells remain below normal levels, especially in Virginia.



	MD MO Cc 14	MD MO Eh 20	MD WA Be 2	MD WA Ci 82	VA 41Q 1	VA 46W175	VA 49V 1	VA 51S 7	VA 52V 2D	WV Ber-0445
current	35.49	15.01	31.76	47.17	79.76	44.11	11.18	11.38	16.25	41.27
normal	36.72	13.75	33.49	49.83	72.06	37.43	10.33	7.54	15.52	46.88

Reservoir Storage – Current Conditions

There have been no water supply releases from the CO-OP shared system so far this year.

Reservoir storage as of September 5, 2024

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC Water's Patuxent reservoirs[1]	89	9.33	10.5
Fairfax Water's Occoquan Reservoir[2]	100	8.1	8.2
Little Seneca Reservoir[3]	98	3.8	3.9
Jennings Randolph water supply[4]	100	13.1	13.1
Jennings Randolph water quality[4]	35	5.7	16.3
Savage Reservoir[5]	43	2.7	6.3

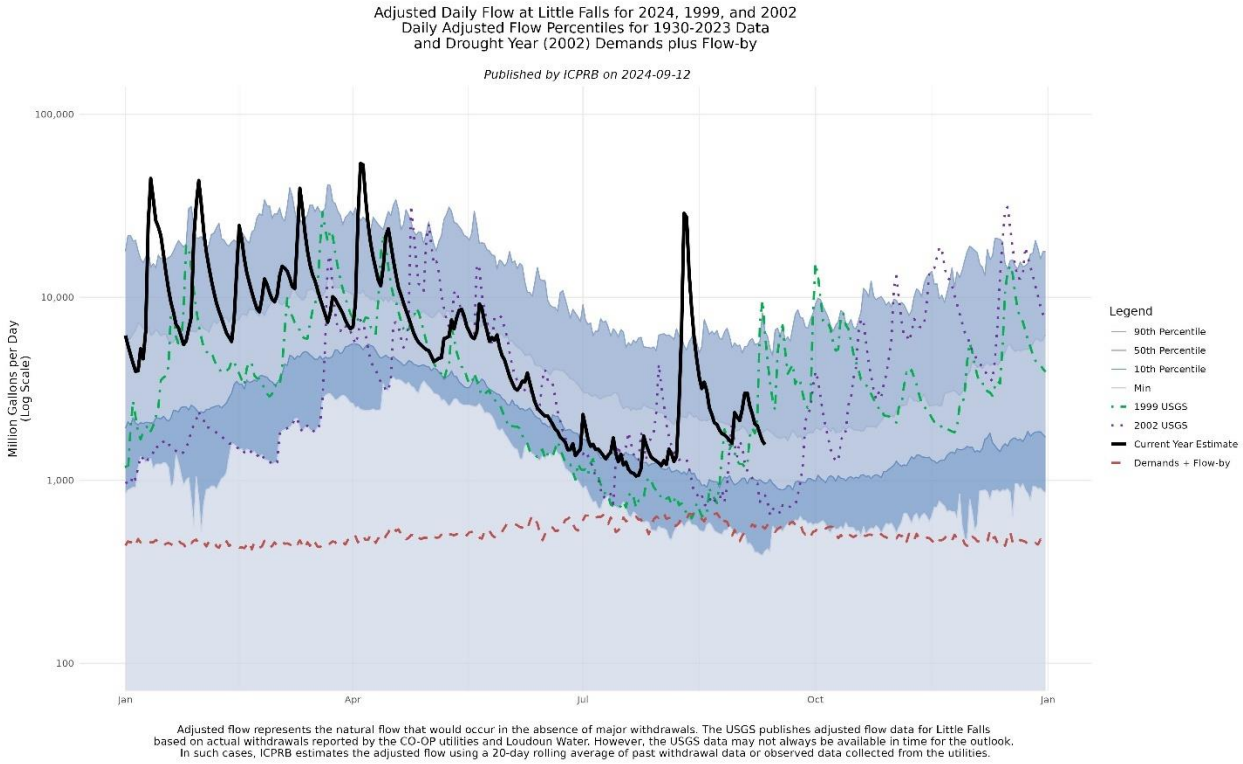
[1] Bathymetric study conducted December 2015 with revisions in December 2016, and unusable storage corrected June 2017.
[2] Bathymetric study conducted in 2019.
[3] Usable capacity consistent with Ortt, *el al.* (2011).
[4] 2013 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.
[5] 1998 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

Potomac River Flow

The estimated adjusted Potomac flow at Little Falls on September 1 was 2.03 billion gallons per day (BGD). For this day of the year, this value was below the 90th percentile flow value 5.4 BGD and above the median value of 1.9 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 five months and 2.9 BGD in August.

Environmental Flow-by

The average observed Potomac flow at Little Falls in August was well above the minimum recommendation of 100 MGD.



Drought Status

The drought status in Pennsylvania is normal. In Maryland, the Western region remains under a drought watch. In Virginia, the Northern Virginia region, and the Big Sandy and New River regions to the west are under a drought watch, while The Shenandoah region is under a drought warning. The drought watch declared on July 29 by the Metropolitan Washington Council of Governments (MWCOG) is still in effect.

Drought Monitor and Soil Moisture

The U.S. Drought Monitor map from the NOAA Climate Prediction Center (refer to the first figure on the next page) indicates that moderate to severe drought conditions are present in the Potomac Basin. According to the data, 33% of the Potomac Basin is experiencing severe drought conditions, while 38% is facing moderate drought conditions. A small speck of the basin in western Maryland is experiencing extreme drought conditions. The Palmer Drought Severity Index by Division map (refer to the second figure on the next page) indicates varying conditions

across the basin from unusually wet conditions in Pennsylvania to moderate to extreme drought in the western and southern areas.