

Water Supply Outlook

July 7, 2022

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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 an above normal probability of releases from the Washington metropolitan area's back-up water supply reservoirs for the 2022 summer and fall seasons. 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. Average precipitation in the Potomac Basin in June was 0.8 inches below normal. The 12-month cumulative basin precipitation is 3.5 inches below normal as of June 30. Streamflow is currently near normal, and groundwater levels remain normal for most of the monitoring wells in the Basin. However, the Palmer Drought Severity Index map indicates the presence of extreme and severe drought conditions in portions of the Basin in West Virginia and Virginia. The Middle Atlantic River Forecast Center's (MARFC) outlook indicators for water resources and supplies for the Potomac Basin are fair. At present, there is sufficient flow in the Potomac River to meet the Washington metropolitan area's water demands without releases from upstream reservoirs. If low-flow conditions do develop, the Washington metropolitan area is well-protected from a water supply shortage owing to carefully designed drought-contingency plans.

ICPRB's Low Flow Outlook:

There is a 13 to 23 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.

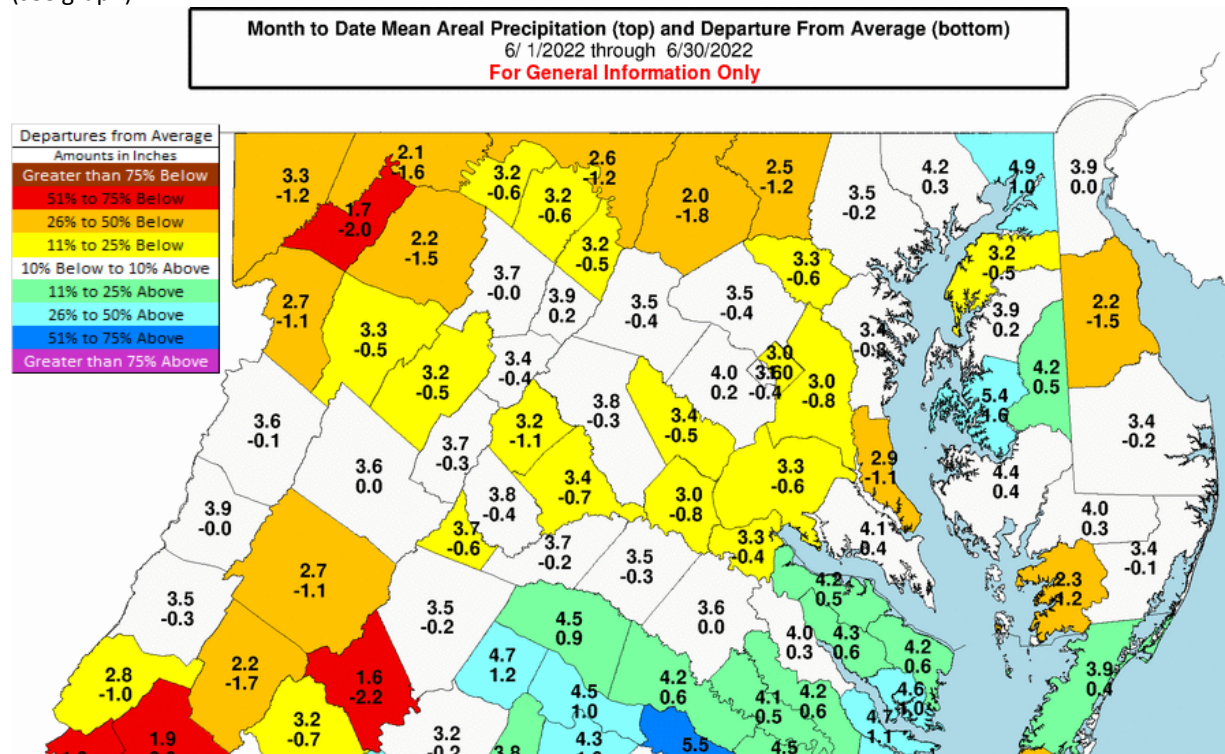
The conditional probability is estimated by analyzing the historical stream flow records and considering recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most closely resemble 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 conditional probability of 13 to 23% reflects the presence of moderate and severe drought in areas of the basin according to Palmer Drought Index.

Outlook for natural Potomac River flow at Little Falls – Watershed conditions as of July 1, 2022

Low flow threshold (MGD)	Low flow threshold (cfs)	Historical probability of lower flow July 1 through December 31	Conditional probability of lower flow July 1 through December 31
1200	1858	68%	80%
1000	1548	49%	65%
800	1238	25%	38%
700	1084	15%	23%
600	929	8%	13%

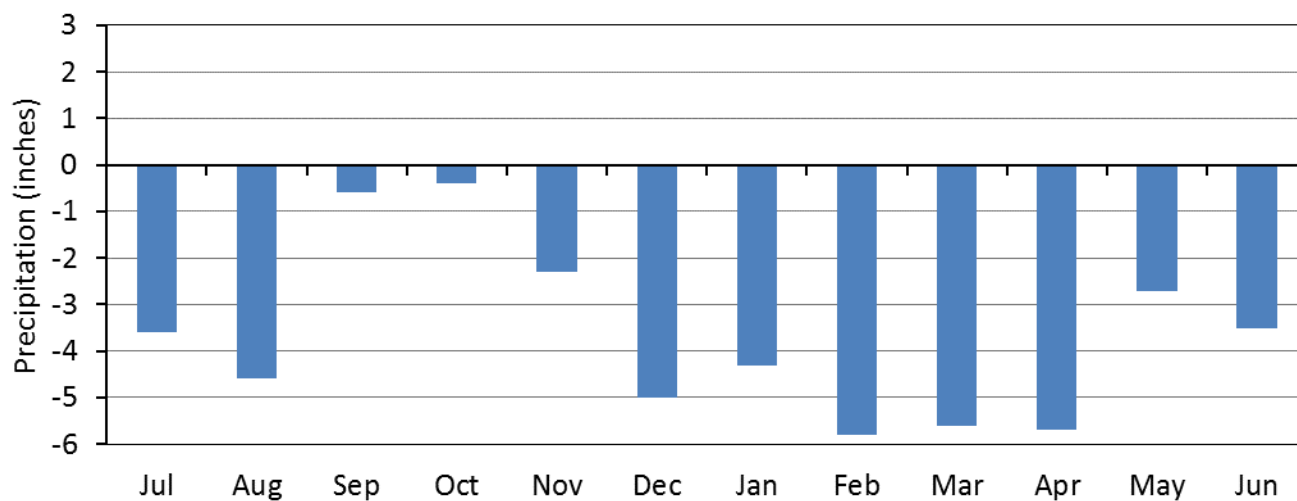
Past Precipitation:

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 3 inches of precipitation for the month of June, which is 0.8 inches below normal. The 12-month cumulative basin precipitation is now 3.5 inches below normal as of June 30 (see graph).

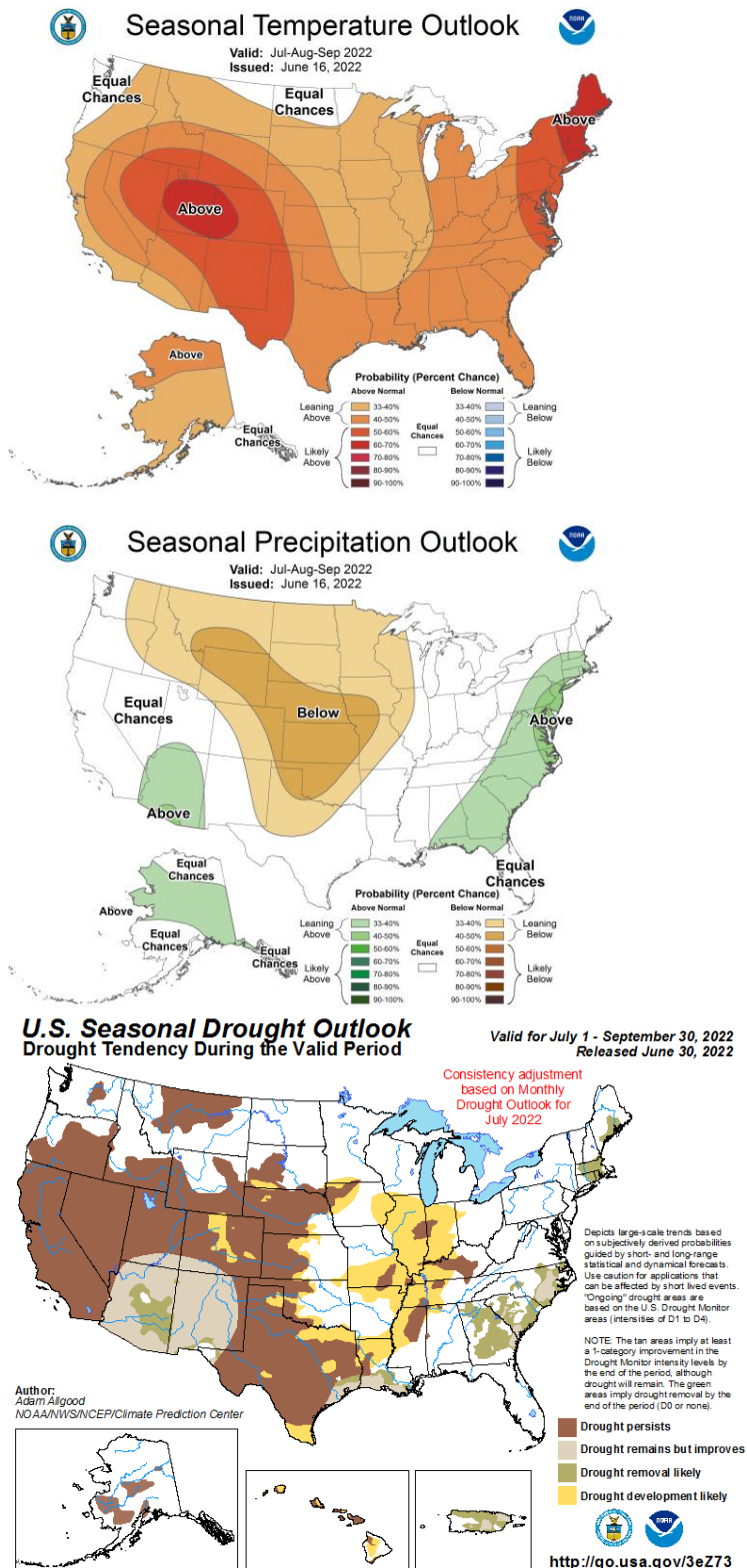


Source: Middle Atlantic River Forecast Center, National Weather Service

12-month cumulative departure from normal, through June 2022



Precipitation and Drought Outlook for July, August and September 2022:



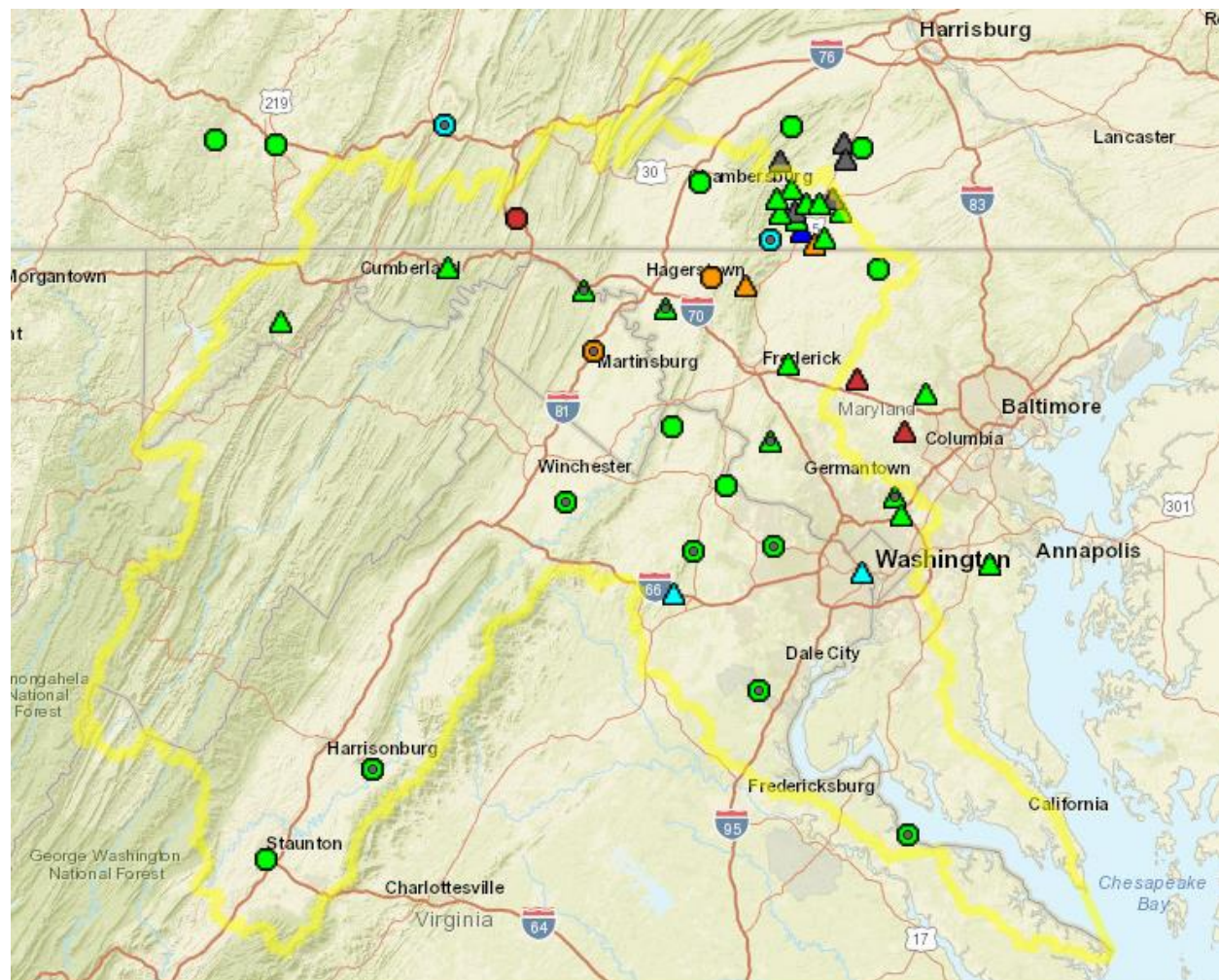
The Middle Atlantic River Forecast Center's (MARFC) outlook for water resources and supplies is fair.

The National Weather Service Climate Prediction Center's one-month outlook for July calls for above normal temperatures and above normal precipitation in the Potomac Basin. The 90-day outlook for July through September calls for above normal temperatures and above normal precipitation.

As of June 30, 2022, the Climate Prediction Center's U.S. Seasonal Drought Outlook reports no drought development in the Potomac basin.

Groundwater – Current Conditions:

The groundwater map below, developed by the U.S. Geological Survey (USGS), Pennsylvania Water Science Center, shows that current water levels in most monitoring wells in the Potomac basin are in the “Normal” range. Wells with a gray dot inside the symbol identify Water Supply Outlook wells. In this map, the USGS defines “Normal” as between the 25th and 75th percentiles, and “Below Normal” as between the 10th and 24th percentile. “Much Below Normal” is defined as below the 10th percentile.



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	Not Ranked
	Much Below Normal	Below Normal	Normal	Above Normal	Much Above Normal		

Wells		
○	■	Real Time
□	▣	Continuous
△	▤	Periodic Measurement

Reservoir Storage – Current Conditions:

No water supply releases from the CO-OP shared system have been made this year.

Reservoir storage as of July 8, 2022

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC Water's Patuxent reservoirs ¹	100	10.5	10.5
Fairfax Water's Occoquan Reservoir ²	100	8.1	8.1
Little Seneca Reservoir ³	98	3.8	3.9
Jennings Randolph water supply ⁴	100	13.1	13.1
Jennings Randolph water quality ⁴	83	13.5	16.3
Savage Reservoir ⁵	73	4.6	6.3

¹ Bathymetric study conducted December 2015 with revisions in December 2016, and unusable storage corrected June 2017. Note that 1.37 BG is not considered usable capacity because it is reserved for storm inflow (T. Supply, personal communication, August 3, 2018).

² Bathymetric study conducted in 2020.

³ Usable capacity consistent with Ortt, *et al.* (2011).

⁴ 2013 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

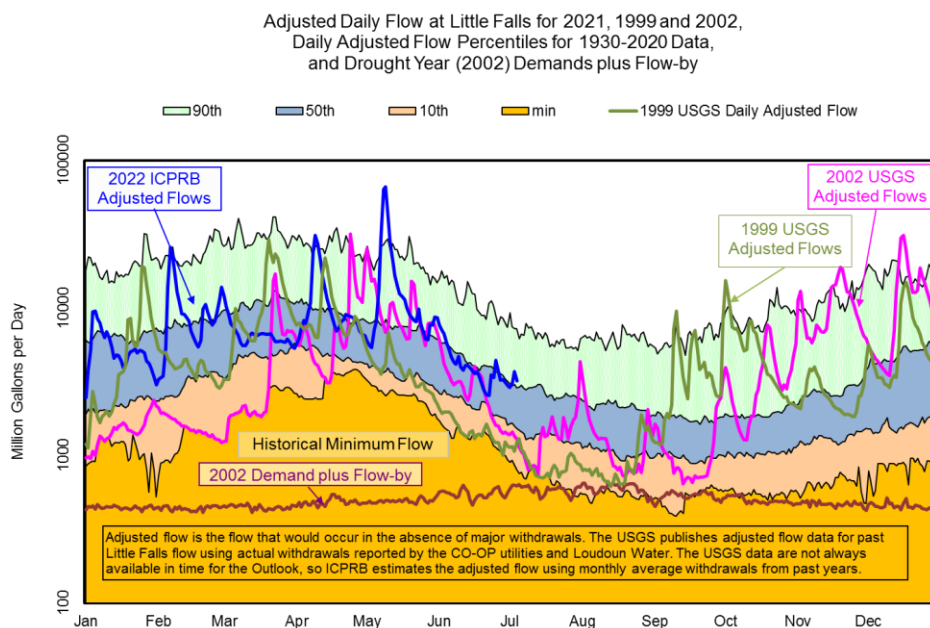
⁵ 1998 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on July 1 was 2.9 billion gallons per day (BGD). For this day of the year, this value was below the 50th percentile flow value of 3.06 BGD and above the 10th percentile flow value of 1.65 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 8.6 BGD for the past six months and 4.1 BGD in June. Streamflow is currently close to normal.

Environmental Flow-by:

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



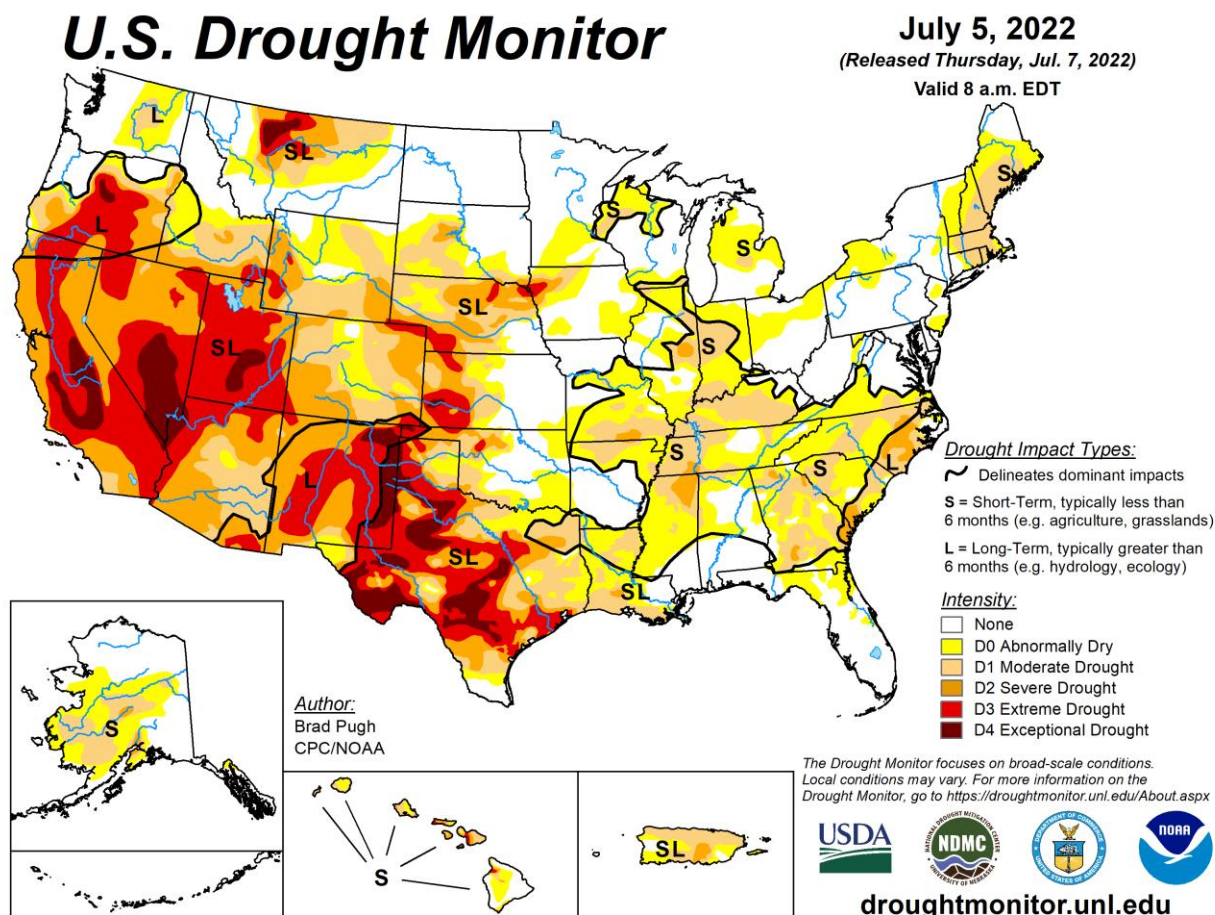
Little Falls flow statistics are based on 1930 through 2020 USGS published gage flow, "USGS 01646502 POTOMAC RIVER (ADJUSTED) NEAR WASH, DC". To create this flow record, the USGS has added historical water supply withdrawals from the Potomac as reported by U.S. Army Corps of Engineers, Washington Suburban Sanitary Commission, Fairfax County Water Authority, city of Rockville, and Loudoun Water to the Little Falls gage flow record.

Drought Status:

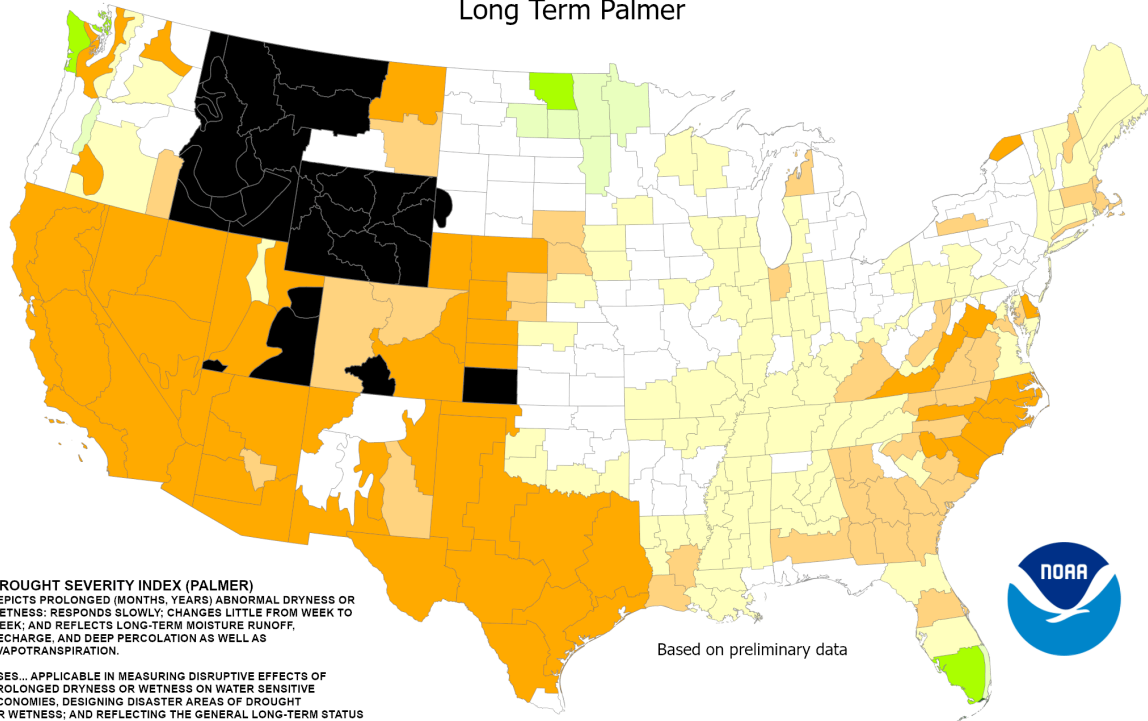
Drought status is normal in [Maryland](#)'s central region, in [Pennsylvania](#) and most of [Virginia](#). The Western region in Maryland is in drought watch as of April 30, 2022. In Virginia, the Chowan, Southeast Virginia, and York James drought evaluation regions are in drought watch. The current drought stage, as defined in the Metropolitan Washington Council of Governments (MWCOC)'s water supply and drought response awareness plan, is normal.

Drought Monitor and Soil Moisture:

The NOAA Climate Prediction Center's U.S. Drought Monitor map (see first figure below) indicates the presence of abnormally dry (D0) conditions in a small portion of the Potomac basin, in Western Virginia. The Palmer Drought Severity Index by Division map (see second figure on next page) indicates the presence of extreme and severe drought conditions in portions of the Basin in West Virginia and Virginia.



Drought Severity Index by Division Weekly Value for Period Ending Jul 02, 2022 Long Term Palmer



DROUGHT SEVERITY INDEX (PALMER)

DEPICTS PROLONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS; RESPONDS SLOWLY; CHANGES LITTLE FROM WEEK TO WEEK; AND REFLECTS LONG-TERM MOISTURE RUNOFF, RECHARGE, AND DEEP PERCOLATION AS WELL AS EVAPOTRANSPIRATION.

USES... APPLICABLE IN MEASURING DISRUPTIVE EFFECTS OF PROLONGED DRYNESS OR WETNESS ON WATER SENSITIVE ECONOMIES, DESIGNING DISASTER AREAS OF DROUGHT OR WETNESS; AND REFLECTING THE GENERAL LONG-TERM STATUS OF WATER SUPPLIES IN AQUIFERS, RESERVOIRS AND STREAMS.

LIMITATIONS... IS NOT GENERALLY INDICATIVE OF SHORT-TERM (FEW WEEKS) STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).

Based on preliminary data



- 4.0 or less (Extreme Drought)
- 3.0 to -3.9 (Severe Drought)
- 2.0 to -2.9 (Moderate Drought)
- 1.9 to +1.9 (Near Normal)
- +2.0 to +2.9 (Unusual Moist Spell)
- +3.0 to +3.9 (Very Moist Spell)
- +4.0 and above (Extremely Moist)
- Missing/Incomplete