# Water Supply Outlook

**May 4, 2015**
To subscribe: please email sahmed@icprb.org

**Interstate Commission on the Potomac River Basin (ICPRB)**
30 W. Gude Drive, Suite 450
Rockville, MD 20850
Tel: (301) 274-8120

*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 the major 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 below normal probability of releases from the Washington metropolitan area's back-up water supply reservoirs for the 2015 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. According to MARFC's Water Resource Outlook for the southern portion of the Middle Atlantic there has been enough precipitation to offset any long-term dry weather conditions in the Potomac basin. At present, there is sufficient flow in the Potomac River to meet Washington metropolitan area's water demands without augmentation from upstream reservoirs. In the event that low-flow conditions do develop, the metro area is well-protected from a water supply shortage because of carefully designed drought-contingency plans.

## ICPRB's Low Flow Outlook:

**There is a 6 to 11 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 flow-by. 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.

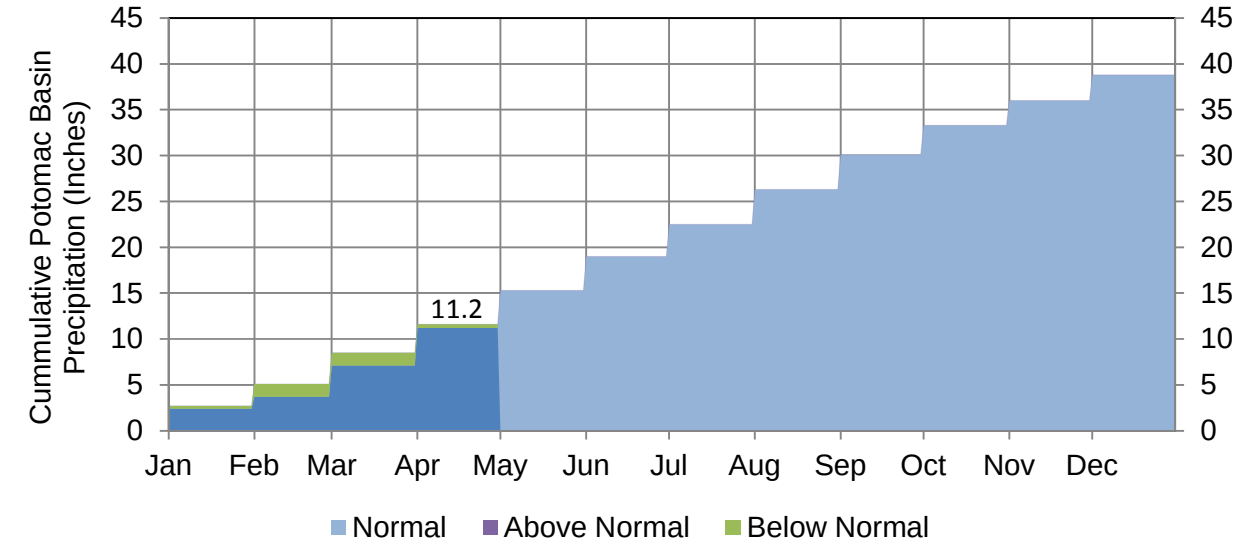
The conditional probability is estimated by analyzing the historical stream flow records and giving consideration to recent stream flow values, precipitation totals for the prior 12 months, current groundwater levels, and the current Palmer Drought Index. Past years in which watershed conditions most 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 weighting for current conditions. The conditional probability of 6 to 11 percent compares to a historical probability of 8 to 15 percent and is considered the more reliable indicator.

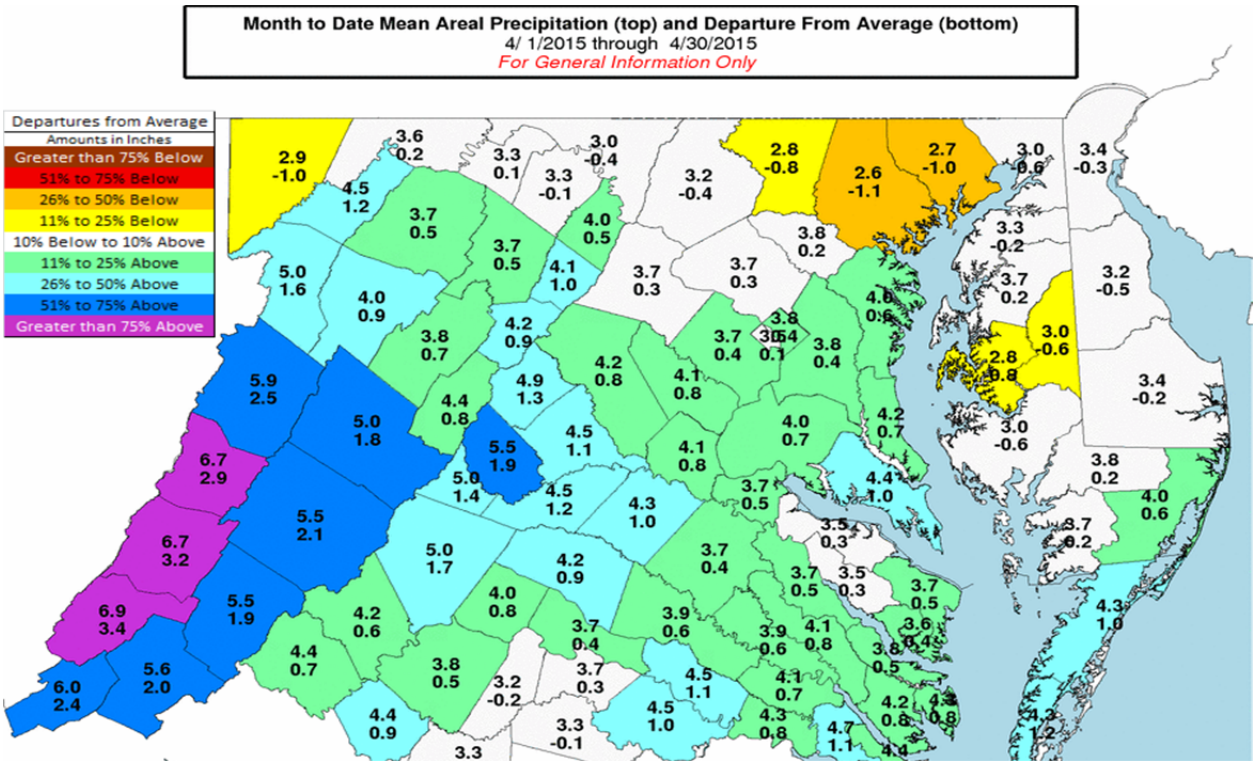
Outlook for Potomac River at Little Falls – Watershed conditions as of May 1, 2015

| *Low flow threshold (MGD)* | *Low flow threshold (cfs)* | *Historical probability of lower flow May 1 through December 31* | *Conditional probability of lower flow May 1 through December 31* |
|---|---|---|---|
| 1200 | 1858 | 68% | 67% |
| 1000 | 1548 | 49% | 47% |
| 800 | 1238 | 25% | 22% |
| 700 | 1084 | 15% | 11% |
| 600 | 929 | 8% | 6% |

## Past Precipitation:

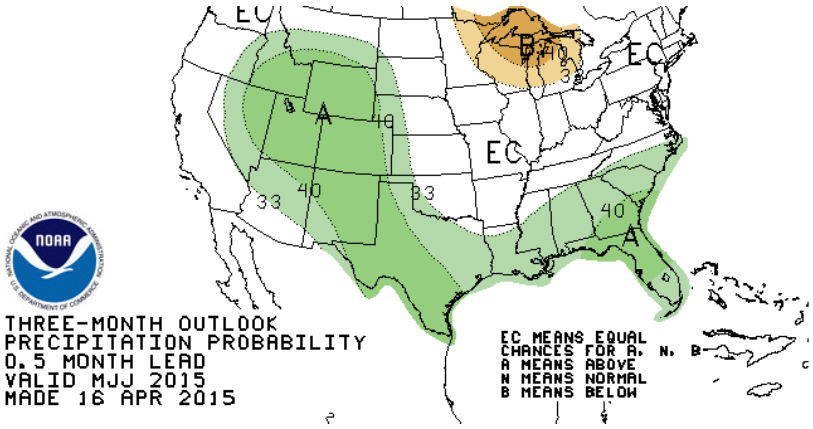
Data from the National Weather Service's Middle Atlantic River Forecast Center (MARFC) shows that the Potomac basin upstream of Washington, D.C. has received a precipitation total of 4.1 inches for the month of April, which is 0.9 inches above normal. The cumulative basin total precipitation is 11.2 inches for the year to date (January 1 to April 30), which is 0.4 inches below normal (see graph). The map on the bottom of the page shows that April precipitation has been near or above normal for the majority of the Potomac basin.



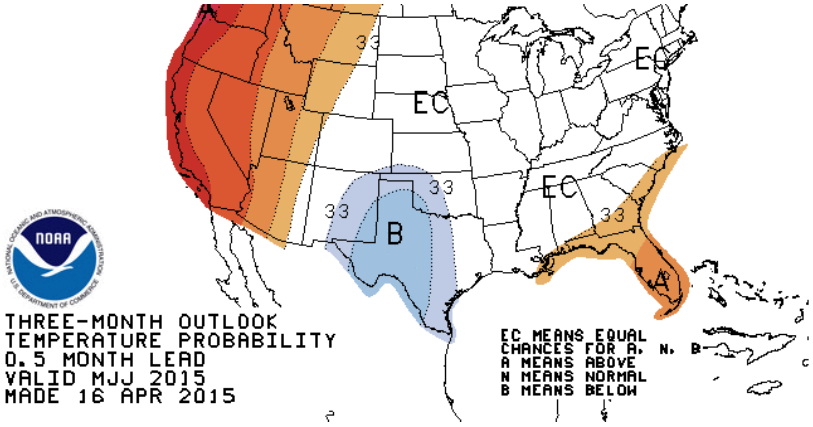




Source: Middle Atlantic River Forecast Center, National Weather Service.

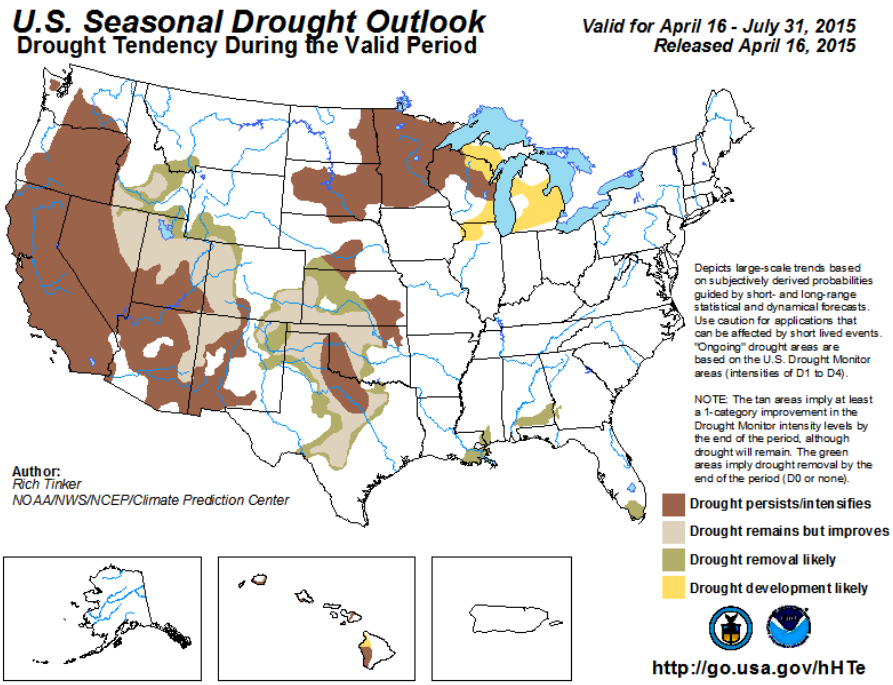
## Precipitation and Drought Outlook for May, June, and July 2015:




MARFC's Water Resource Outlook for the southern portion of the Middle Atlantic calls for near or below normal precipitation for the first half of the outlook period but then above normal precipitation for the second half. Temperatures are expected to be above normal.



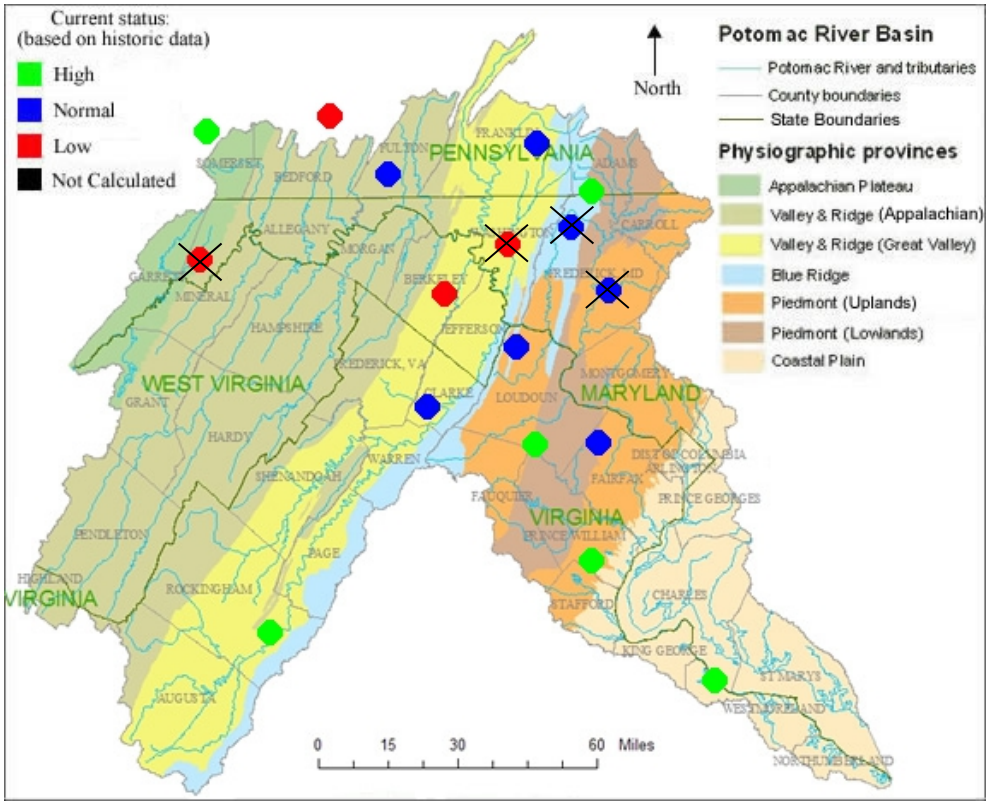

The NWS Climate Prediction Center's 30 day outlook for May as well as the 90 day outlook for May through July calls for near normal precipitation and near normal temperatures.




As of April 16 the Climate Prediction Center's U.S. Seasonal Drought Outlook indicates that drought development is not likely for the Potomac basin.

## Groundwater – Current Conditions:

The groundwater map below, created by the U.S. Geological Survey (USGS), Pennsylvania Water Science Center on May 1, shows that water levels in monitoring wells in the Potomac basin range from "Low" to "High", with most falling in the "Normal" or "High" categories. In this map, the USGS defines "High" as greater than 75$^{th}$ percentile, "Normal" as between the 25$^{th}$ and 75$^{th}$ percentiles, and "Low" as less than the 25$^{th}$ percentile. Note that there are a few wells (marked with an X) that do not reflect current conditions and are in the process of being updated on this map.




## Reservoir Storage – Current Conditions:

No water supply releases have been made this year. Two 2-day Jennings Randolph Reservoir whitewater releases are scheduled for May 9-10 and May 23-24. The first Savage Reservoir whitewater release is scheduled for Saturday, May 30.

Reservoir storage as of May 4, 2015

| Facility | Percent Full | Current usable storage, BG | Total usable capacity, BG |
|---|---|---|---|
| WSSC's Patuxent reservoirs | 100 | 10.2 | 10.2 |
| Fairfax Water's Occoquan Reservoir | 100 | 8.0 | 8.0 |
| Little Seneca Reservoir[1] | 98 | 3.8 | 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] | 91 | 5.8 | 6.3 |

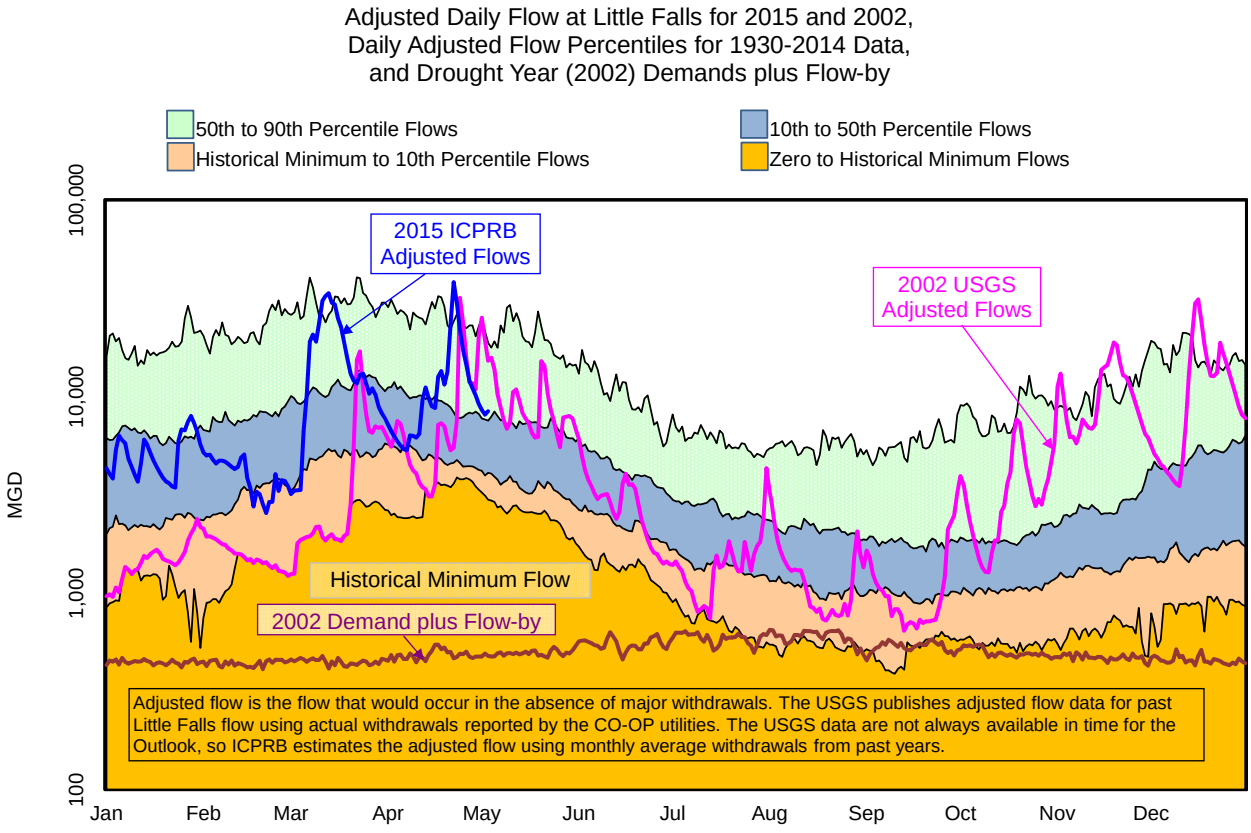
[1] Usable capacity consistent with Ortt, *el al.* (2011).
[2] 2013 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.
[3] 1998 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

## Potomac River Flow:

The estimated adjusted Potomac flow at Little Falls on May 1 was 8.5 billion gallons per day (BGD). This value was above the historical 50th percentile value for this day of the year of 7.7 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 9.2 BGD for the first four months of the year and 11.8 BGD in April.

## Environmental Flow-by:

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



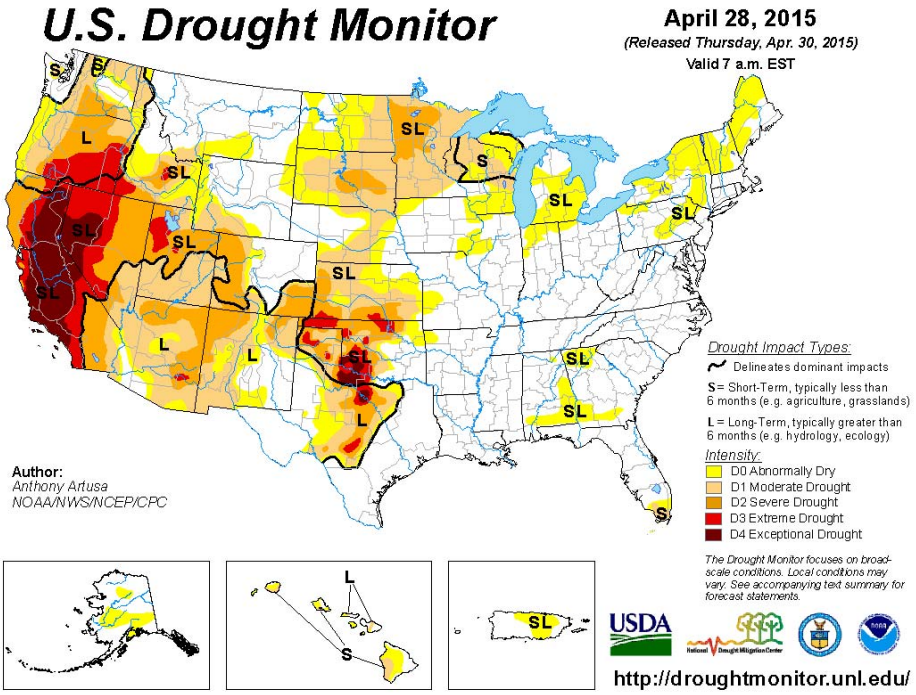

*Little Falls flow statistics are based on 1930 through 2014 USGS published gage flow, "USGS 01646502 POTOMAC RIVER (ADJUSTED) NEAR WASH, DC". To create this flow record, the USGS has added historical water supply withdrawals from the Potomac as reported by FW, WSSC, the Aqueduct, and Rockville to the Little Falls gage flow record.*

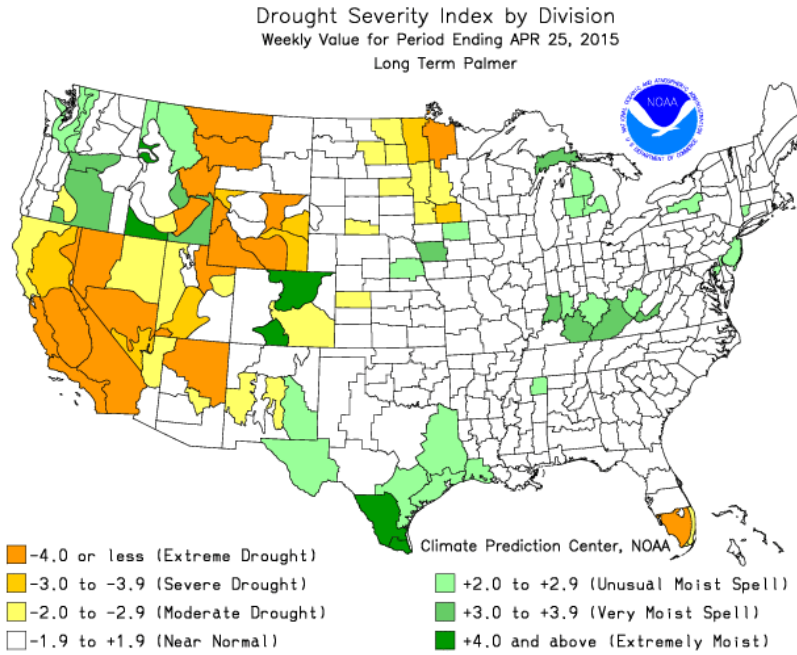
## Drought Status:

The Metropolitan Washington Council of Government's Drought Awareness Response Plan status is "Normal."

## Drought Monitor and Soil Moisture:

The NOAA Climate Prediction Center's U.S. Drought Monitor map (see first figure below) indicates that the Potomac basin is currently free of drought. However, there are some abnormally dry (D0) areas in Pennsylvania. The Palmer Drought Severity Index by Division map (see second figure below) indicates near normal conditions in the Potomac basin.




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