

# 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 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 a below normal probability of releases from the Washington metropolitan area's back-up water supply reservoirs for the 2014 fall season.** Generally, the use of Jennings Randolph and Little Seneca reservoirs are triggered by low flows brought about by a combination of low summer precipitation and low groundwater levels. It is typical that the probability of releases decreases around this time of year, when evaporative loss and drinking water demands begin to decline due to lower temperatures. The Potomac basin has not had much precipitation for the month of September, however most flows are near normal due to precipitation that occurred in the last couple of days. Groundwater levels are generally near normal with both above and below normal levels scattered throughout the area. Precipitation from a tropical system is not expected in the near term. Daily monitoring of Point of Rocks and Little Falls flows began on September 17 and will continue to prepare for the possibility that more serious drought conditions develop in the upcoming weeks. 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 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 less than 1 to 3 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 less than 1 to 3 percent compares to a historical probability of 3 to 5 percent and is considered the more reliable indicator.

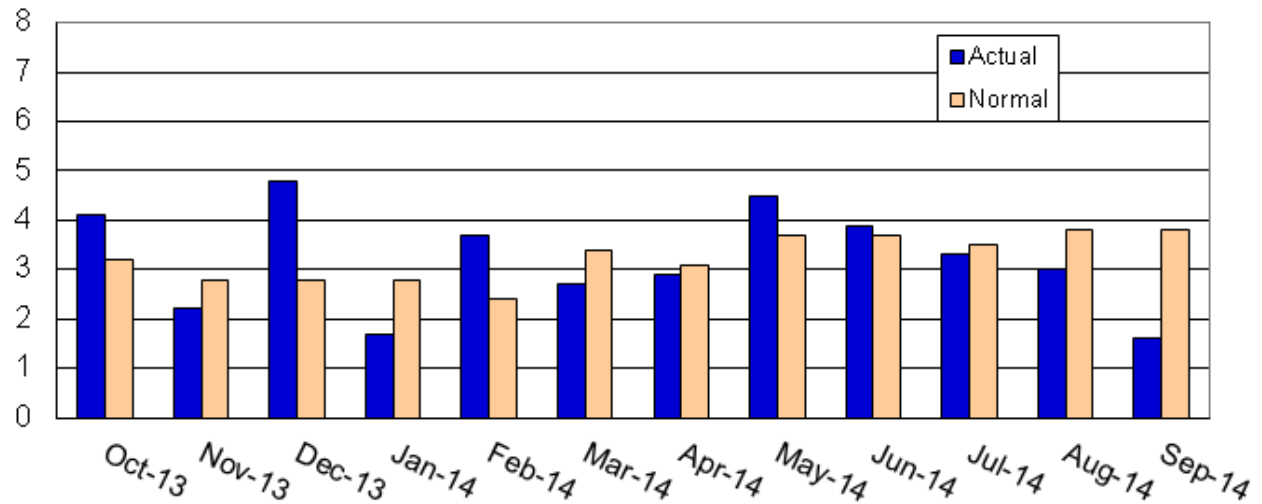
Outlook for Potomac River at Little Falls – Watershed conditions as of October 3, 2014

Low flow threshold (MGD)	Low flow threshold (cfs)	Historical probability of lower flow October 1 through December 31	Conditional probability of lower flow October 1 through December 31
1200	1858	49%	57%
1000	1548	28%	25%
800	1238	9%	6%
700	1084	5%	3%
600	929	3%	<1%

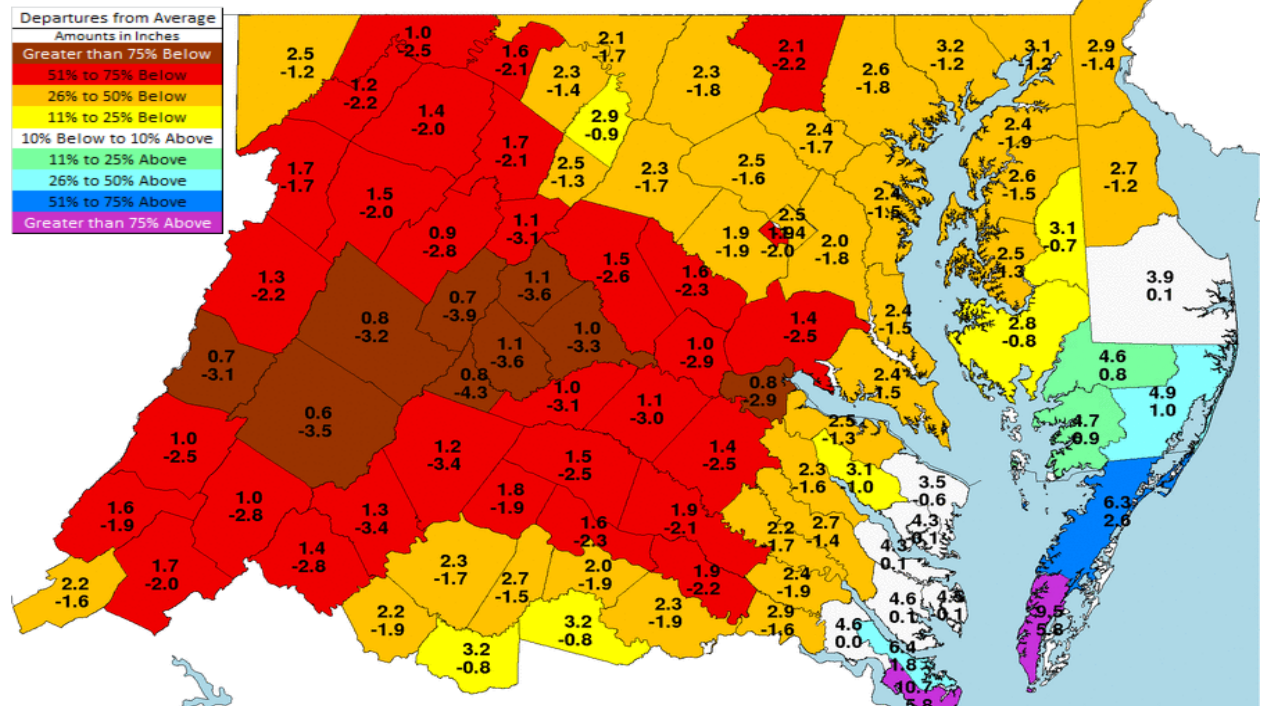
**Past Precipitation:**

Data from the National Weather Service’s Middle Atlantic River Forecast Center (MARFC) shows that the Potomac basin upstream of Washington, D.C. had a precipitation total of 1.6 inches for the month of September, which is 2.2 inches below normal (see graph). MARFC reports a basin total of 28.3 inches for the year to date, which is 2.3 inches below normal. The map on the bottom of the page shows that the basin was drier than normal over the past 30 days.

**Potomac River Basin Precipitation Upstream of Washington**

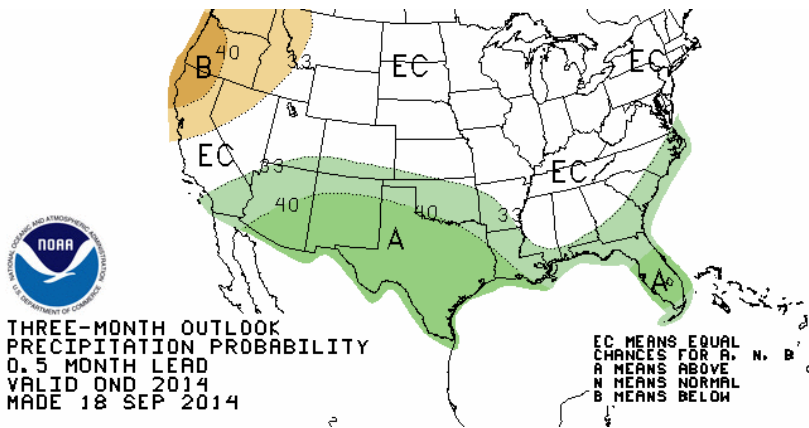


**30 Day Mean Areal Precipitation (top) and Departure From Average (bottom)**  
 9/ 2/2014 through 10/ 1/2014  
*For General Information Only*



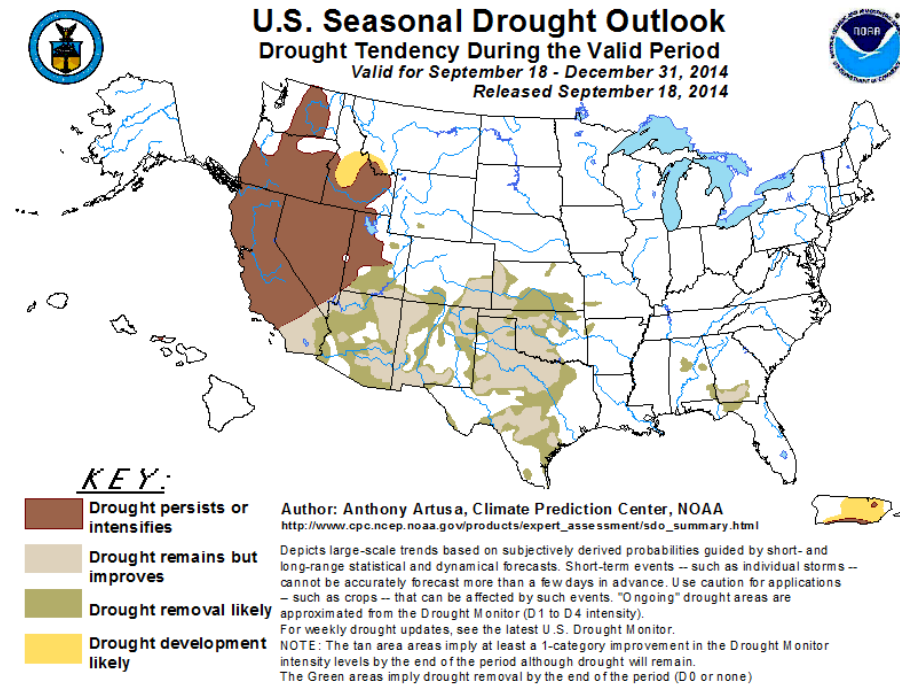
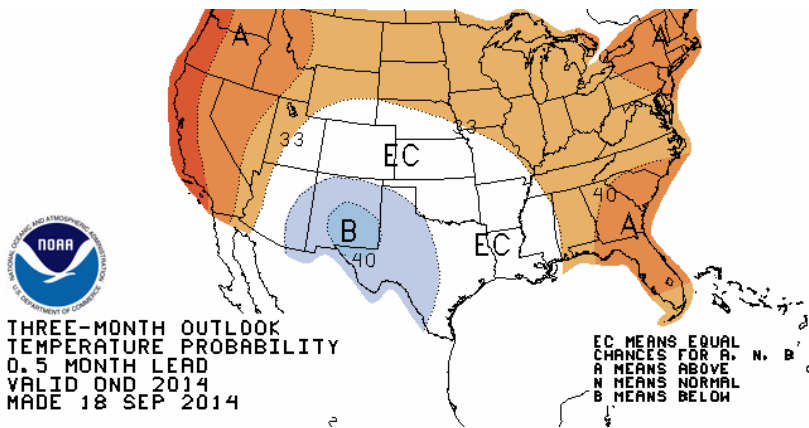
Source: Middle Atlantic River Forecast Center, National Weather Service.

**Precipitation and Drought Outlook for October, November, and December:**



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

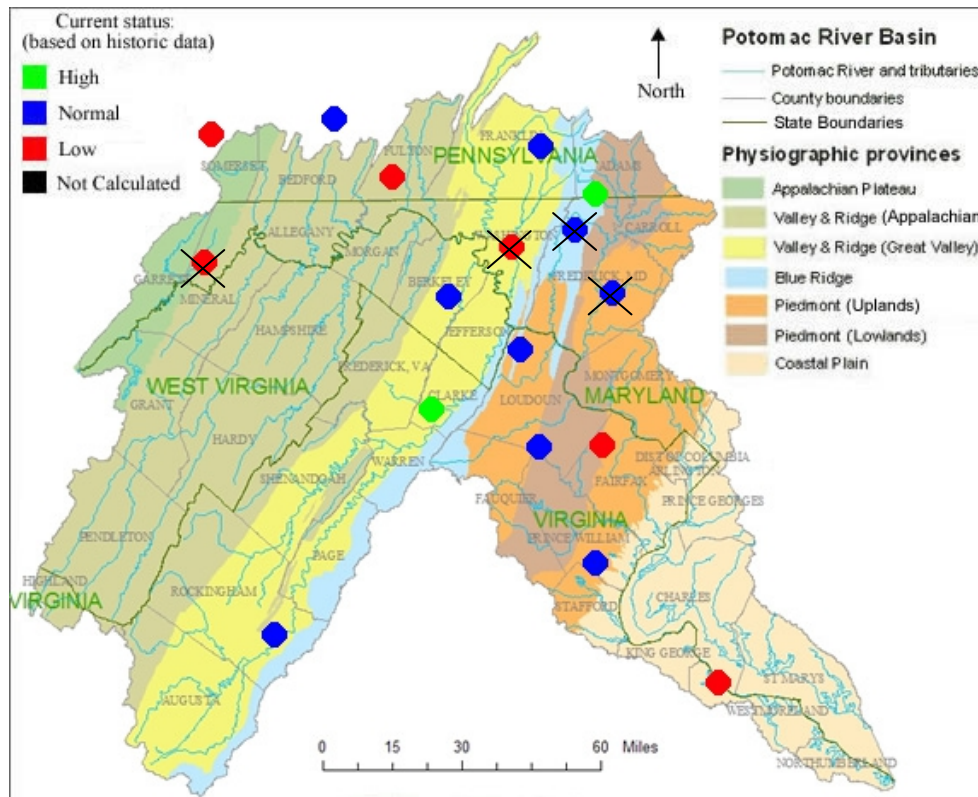
The NWS Climate Prediction Center's 30-day outlook for October along with the 90 day outlook for October through December calls for near average precipitation and above average temperatures.



As of September 18 the Climate Prediction Center's U.S. Seasonal Drought Outlook indicates that drought development is not likely for the Potomac basin over the next three months.

**Groundwater – Current Conditions:**

The groundwater map below, created by the U.S. Geological Survey, Pennsylvania Water Science Center on October 1, shows that water levels in monitoring wells in the Potomac basin range from “Low” to “High”. In this map, the USGS defines “High” as greater than 75<sup>th</sup> percentile, “Normal” as between the 25<sup>th</sup> and 75<sup>th</sup> percentiles, and “Low” as less than the 25<sup>th</sup> 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.

Reservoir storage as of October 3, 2014

Facility	Percent Full	Current usable storage, BG	Total usable capacity, BG
WSSC’s Patuxent reservoirs	81	8.3	10.2
Fairfax Water’s Occoquan Reservoir	98	7.8	8.0
Little Seneca Reservoir <sup>1</sup>	100	3.9	3.9
Jennings Randolph water supply <sup>2</sup>	100	13.1	13.1
Jennings Randolph water quality <sup>2</sup>	55	9.0	16.3
Savage Reservoir <sup>3</sup>	54	3.4	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.

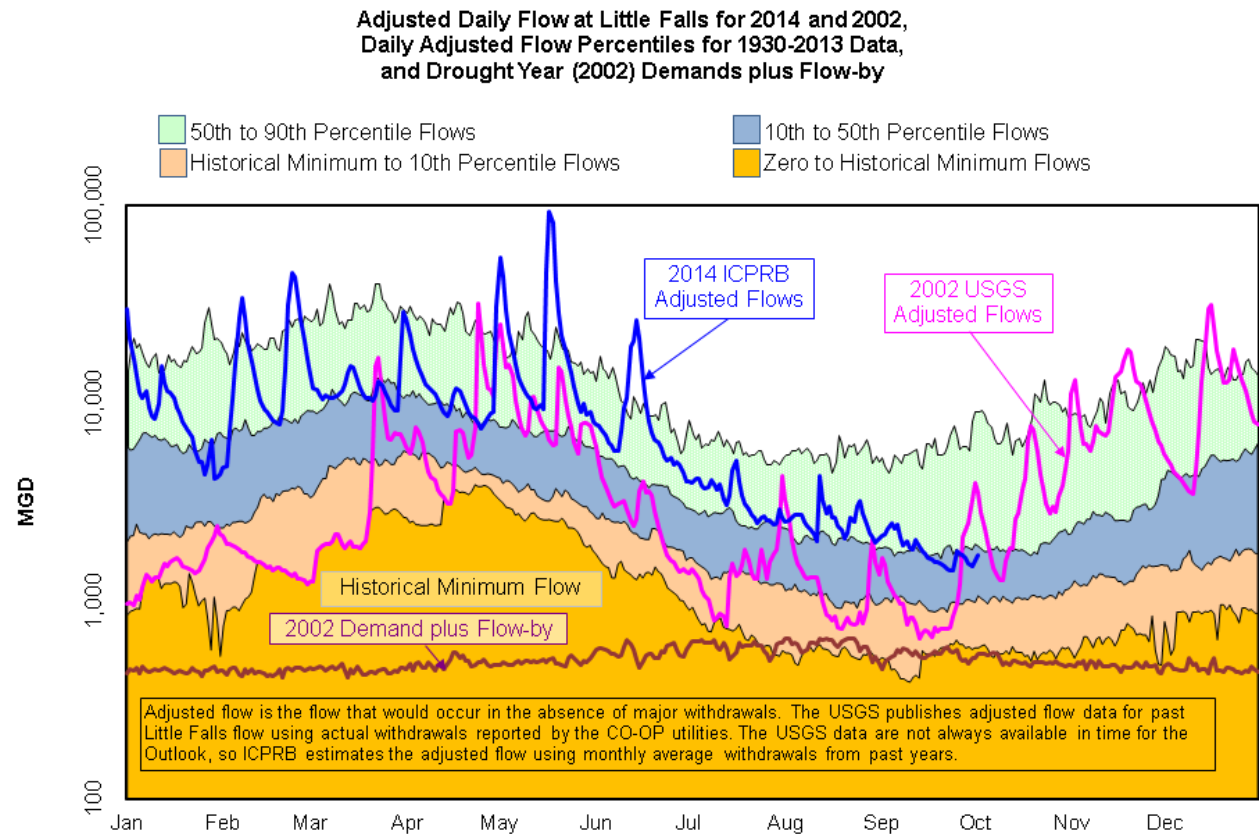
<sup>3</sup> 1998 revised stage-storage curve provided by Bill Haines, US Army Corps of Engineers, Baltimore District.

**Potomac River Flow:**

The estimated adjusted Potomac flow at Little Falls on October 1 was 1.7 billion gallons per day (BGD). This value was below the historical 50<sup>th</sup> percentile value for this day of the year of 1.8 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 10.1 BGD for the first nine months of the year and 1.8 BGD in September.

**Environmental Flow-by:**

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



*Little Falls flow statistics are based on 1930 through 2013 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.*

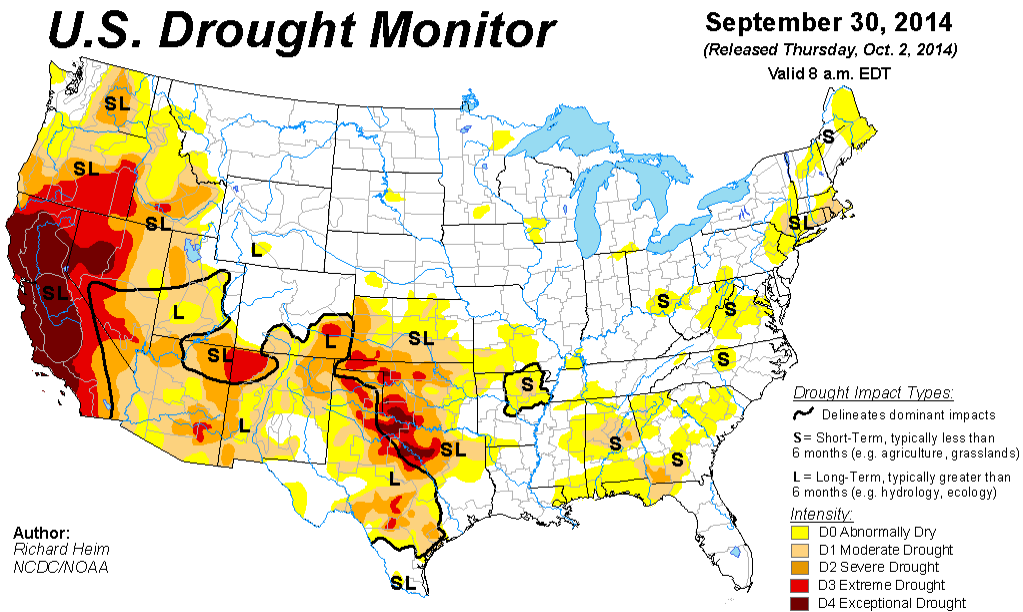
**Drought Status:**

The Metropolitan Washington Council of Government’s Drought Awareness Response Plan status is “Normal.”

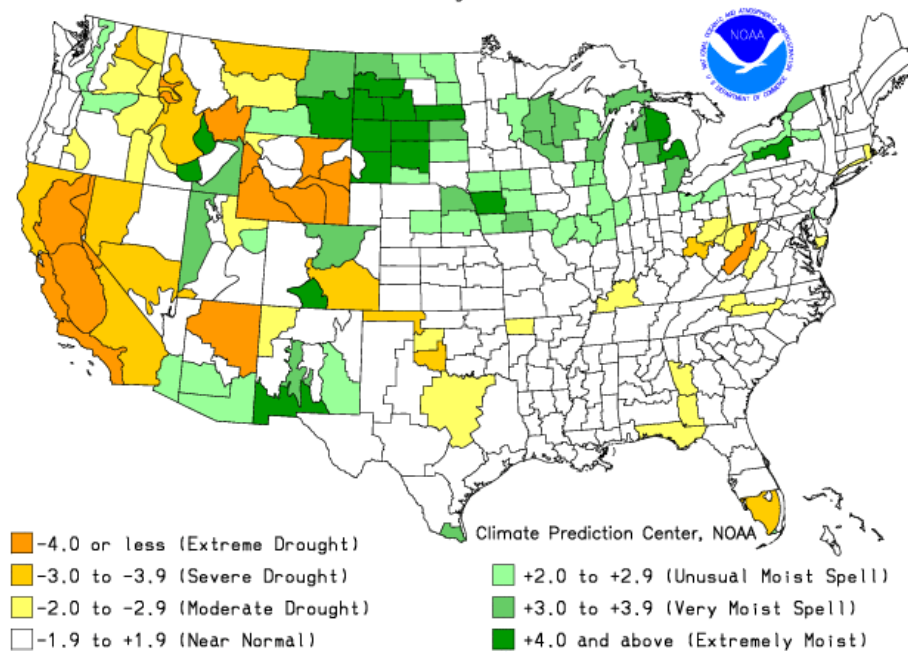


**Drought Monitor and Soil Moisture:**

The NOAA Climate Prediction Center's U.S. Drought Monitor map (see first figure below) indicates that the Potomac basin is abnormally dry in parts of western Maryland, Virginia, and West Virginia. The Palmer Drought Severity Index by Division map (see second figure below) indicates normal conditions in the Potomac basin except for parts of Virginia and West Virginia that are experiencing moderate to extreme drought conditions.



Drought Severity Index by Division  
Weekly Value for Period Ending SEP 27, 2014  
Long Term Palmer



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