

U.S. Geological Survey (USGS) Maryland-Delaware-District of Columbia Monthly Water Conditions Summary

May 2015 Highlights: Forty-eight percent of groundwater and 45 percent of streamflow levels were normal at sites monitored by the U.S. Geological Survey across Maryland, Delaware, and the District of Columbia.

Why is it important for the USGS to collect and analyze water-resources data?

USGS water data are valuable to the public, researchers, water managers, planners, and agricultural users, especially during floods and droughts. These data can be used to assess how water resources respond to changes in climate. Scientists at the USGS have measured streamflow and groundwater levels to assess water resources for over 125 years.

In addition to providing the most extensive set of historical streamflow and groundwater data available to the public, the USGS continues to collect water data and quality-assures the data using standardized techniques across the country. The uniformity of the dataset enables multi-state comparisons and other comparative statistical analyses that better inform policy makers of the possible water-resources conditions they might encounter in the future.

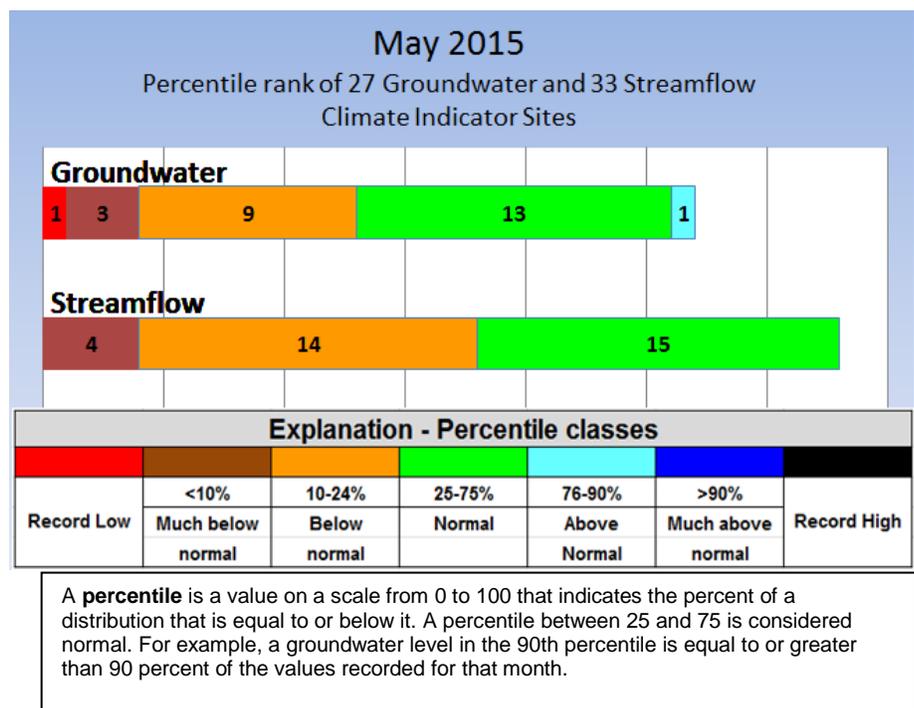
The sites used in this water summary were carefully selected to show the response of streamflow and groundwater levels to weather conditions. Ideally, these sites will show no effects from human influences. The streamflow and groundwater data are ranked in comparison to the historical record and summarized. Precipitation and reservoir data are also presented to give a more complete picture of the region's water resources.

USGS May 2015 Water Conditions Summary

Forty-eight percent of the groundwater levels and 45 percent of the streamflow levels were normal (between the 25th and 75th percentiles) at sites used to monitor the response of water resources to changes in climatic conditions in Maryland, Delaware, and the District of Columbia.

Groundwater levels were normal in 13 of 27 USGS monitoring wells. Of the remaining wells, the groundwater level was above normal in 1 well and below normal in 13 wells.

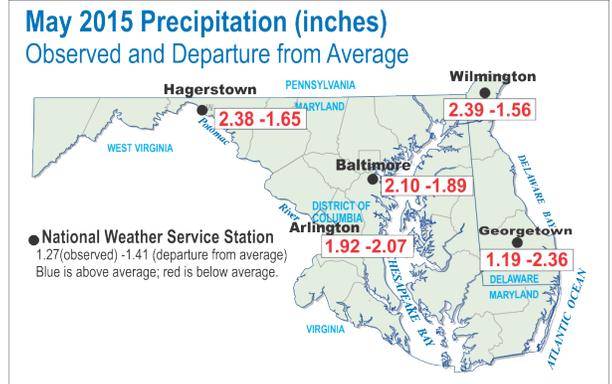
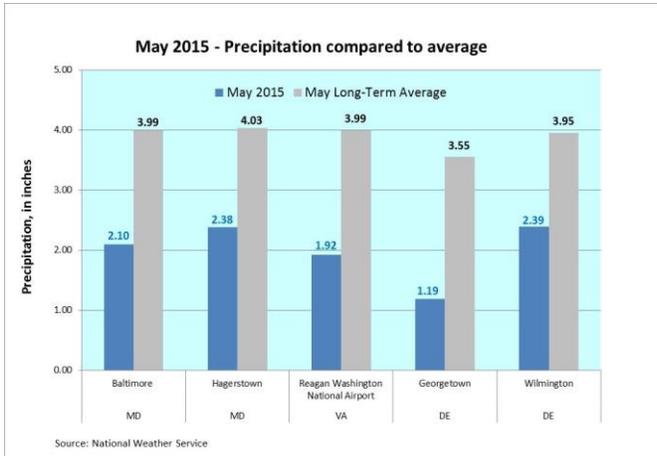
May monthly mean streamflows were normal at 15 of the 33 streamgages. Streamflow was below normal at the remaining 18 streamgages in Delaware and Maryland.



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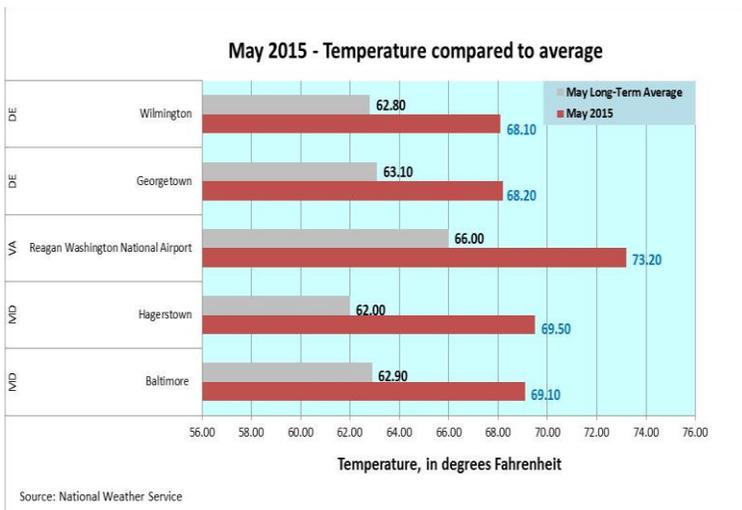
May 2015 Precipitation and Weather

May precipitation was below the long-term average at the five National Weather Service (NWS) Mid-Atlantic weather stations. The highest amount of monthly precipitation was in Wilmington, Delaware, with 2.39 inches. The lowest amount of precipitation was in Georgetown, Delaware with 1.19 inches, which also had the largest deficit with 2.36 inches.



- National Weather Service Stations**
- Baltimore** = Baltimore/Washington International Thurgood Marshall Airport (BWI)
 - Georgetown** = Georgetown, Sussex County Airport
 - Hagerstown** = Hagerstown Regional Airport
 - Arlington** = Ronald Reagan Washington National Airport
 - Wilmington** = New Castle Airport

The NWS Middle Atlantic River Forecast Center's (MARFC) 365-day precipitation data for Maryland, Delaware, and the District of Columbia showed all counties were in the normal range except for Garrett County, Maryland, which was 5.4 inches above average, Allegany County, Maryland, which was 9.5 inches below average, and Dorchester County, Maryland, which was 8.2 inches below average. All three counties in Delaware were in the normal range. See the links below to view the NWS MARFC data.



For the second consecutive month, air temperatures were above the long-term average at all five NWS Mid-Atlantic weather stations. May temperatures in Wilmington, Delaware averaged 68.1 degrees Fahrenheit; although it had the lowest temperature of the five weather stations (for the third consecutive month), the temperature was 5.3 degrees Fahrenheit above the long-term average.

The warmest May temperature was 73.2 degrees Fahrenheit in Arlington, Virginia near the District of Columbia, which was 7.2 degrees Fahrenheit above average. The largest departure from average was in

Hagerstown, Maryland, which was 7.5 degrees Fahrenheit above average at 69.5 degrees Fahrenheit. The long-term average May temperature is 62 degrees Fahrenheit.

Sources: National Weather Service and Middle Atlantic River Forecast Center (MARFC)
 MD and DC: <http://www.weather.gov/climate/index.php?wfo=lwx>
 DE: <http://www.weather.gov/climate/index.php?wfo=phi>
 MARFC <http://www.erh.noaa.gov/marfc/Precipitation/Departures/>

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Groundwater

The USGS monitors groundwater levels in unconfined aquifers, providing observations that can be compared to both short-term and long-term changes in climatic conditions. Twenty-six groundwater wells were selected based on the following criteria:

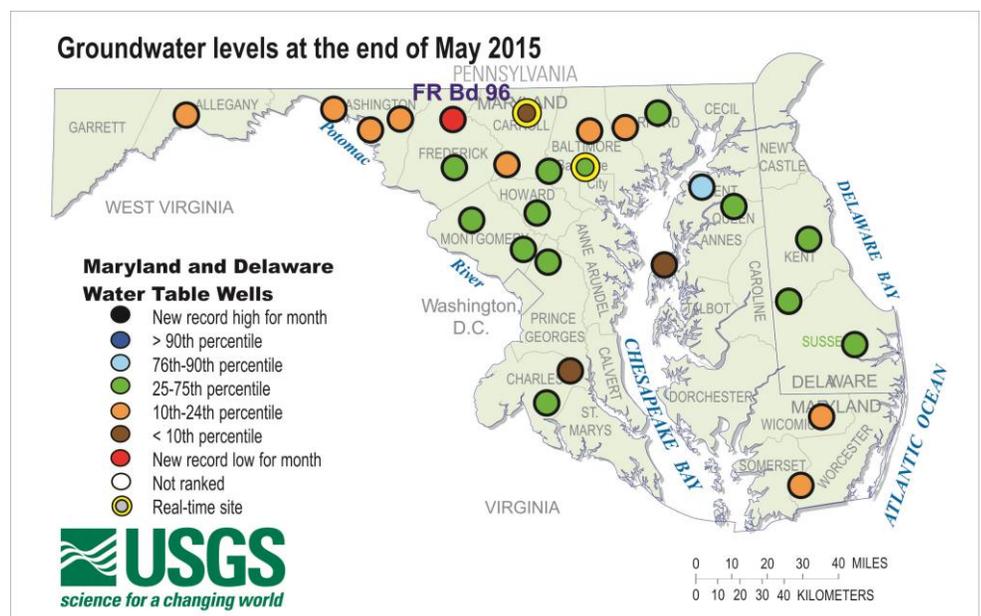
- Located in an unconfined (water-table) aquifer;
- Open to a single, known hydrogeologic unit/aquifer;
- Groundwater hydrograph reflects changes in climatic conditions;
- No indicated nearby pumpage and likely to remain uninfluenced by pumpage, regulated streamflow, or changes related to human activities;
- Minimum period of record is 10 years of continuous/monthly records;
- Minimally affected by irrigation, canals, drains, pipelines, and other potential sources of artificial recharge;
- Well has a casing – dug wells are generally not used;
- Water levels show no apparent hydrologic connection to nearby streams;
- Well has never gone dry; and
- Long-term accessibility likely.

May 2015 Groundwater Levels

May groundwater levels ranged from a record low (Frederick County, Maryland) to above normal at one site. Forty-eight percent of May groundwater levels were below normal (less than the 25th percentile), and 48 percent of groundwater levels were in the normal range (between the 25th and 75th percentiles) at USGS wells used to monitor climatic conditions in Maryland and Delaware. Only the USGS observation well in Kent County, Maryland had a groundwater level above normal (greater than the 75th percentile) in May and the groundwater level has been above normal at this well for the last 2 years.

Of the 13 USGS observation wells with below normal groundwater levels in May, 1 was at a record low, 3 were below the 10th percentile and 9 wells had groundwater levels between the 10th and 24th percentiles. All of these sites with below normal groundwater levels were in Maryland and spread throughout the state, with most of them located in counties that border Pennsylvania.

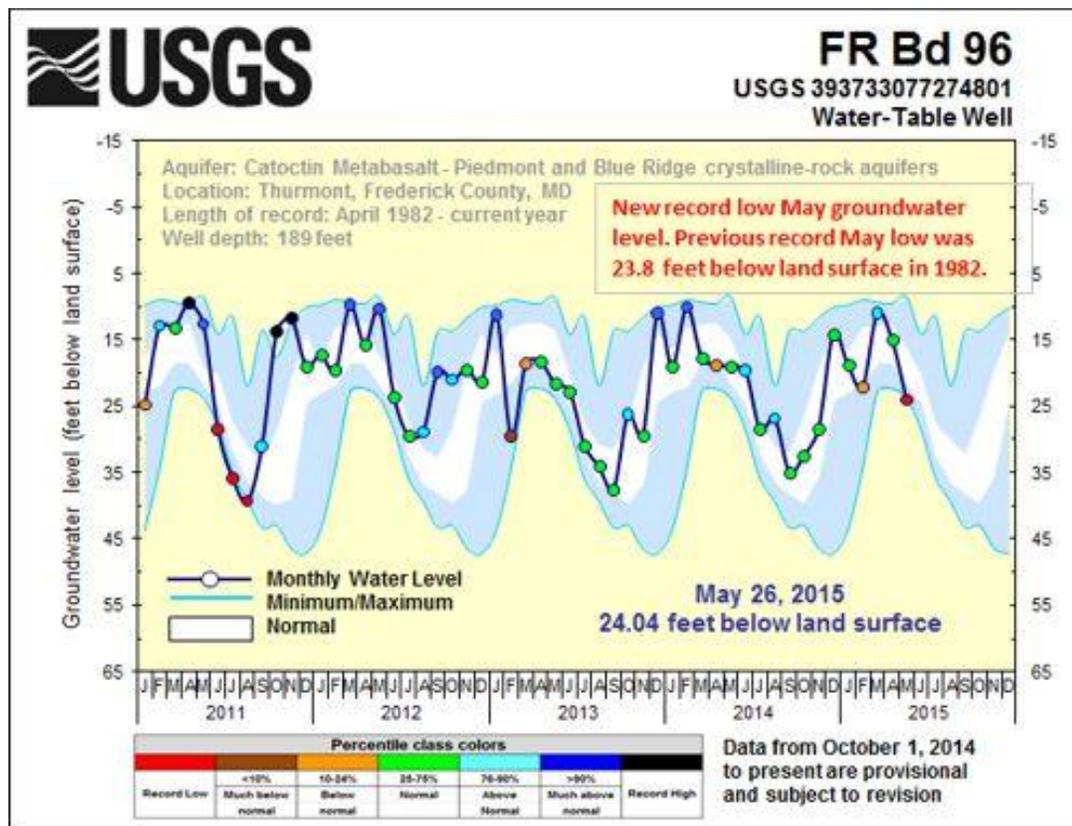
The groundwater levels in Delaware USGS observation wells were normal.



To access the clickable groundwater map, go to:
http://md.water.usgs.gov/groundwater/web_wells/current/water_table/counties/

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The groundwater level in observation well FR Bd 96 in Frederick County, Maryland was at the lowest May value since record-keeping began in 1982, which is also the year of the previous record low.



Five-year groundwater hydrographs can be viewed at:

http://md.water.usgs.gov/groundwater/web_wells/current/water_table/counties

The 5-year hydrograph shows groundwater levels as a dark blue line, the minimum and maximum monthly values, and the normal range (between the 25th and 75th percentiles) as a white band based on the period of record. The maximum water level is at the top of the upper blue section and the minimum water level is at the bottom of the lower blue section in the graph. Each monthly measurement is colored according to the percentile rank in which it falls for the month.

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Streamflow

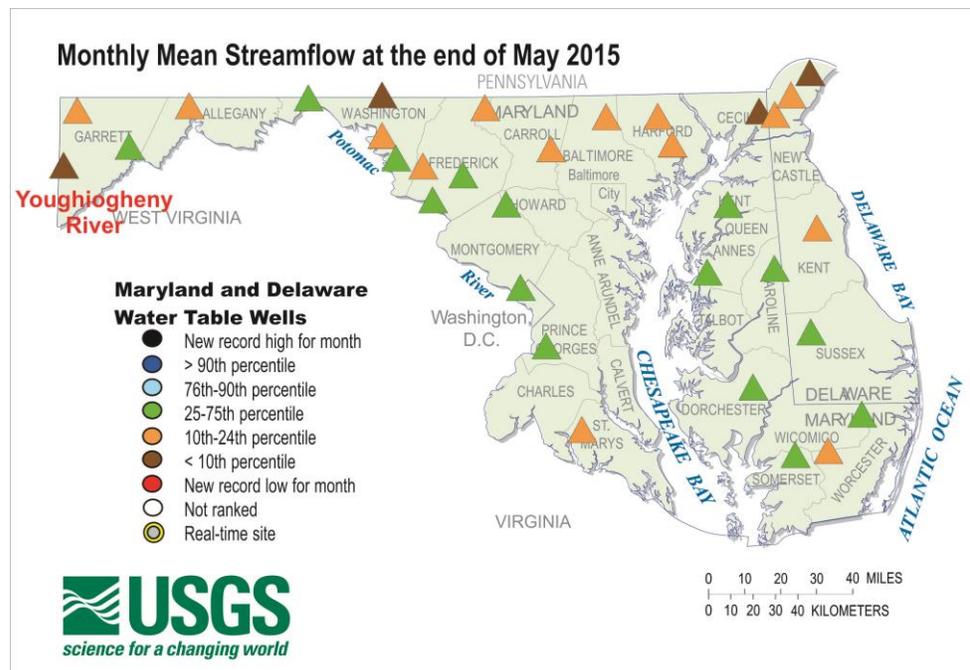
Streamflow data are used for many purposes. A few of the most common uses are to assess water supply and the risk of droughts and floods. Streamflow data are also used to calculate loads of chemical constituents and assess how biological communities are affected by hydrologic conditions. The USGS operates the most extensive network of streamgages in the region.

The streamflow locations chosen for the monthly water summary were selected based on the following criteria:

- Minimum period of record is 10 years of continuous data;
- Watershed areas greater than 5 square miles;
- Streamflow is not regulated, or has relatively natural flow;
- Streamflow data reflect climatic conditions; and
- The surrounding area and watershed are not urban.

May 2015 Streamflow

May monthly mean streamflows were all in the normal (between the 25th and 75th percentiles), to below normal (less than the 25th percentile) range at USGS streamgages used to monitor climatic response in Maryland, Delaware, and the District of Columbia. Streamflow was normal at 15 of the 33 USGS streamgages, between the 10th and 24th percentiles at 14 USGS streamgages, and in less than the 10th percentile in 4 streams, including Brandywine Creek.

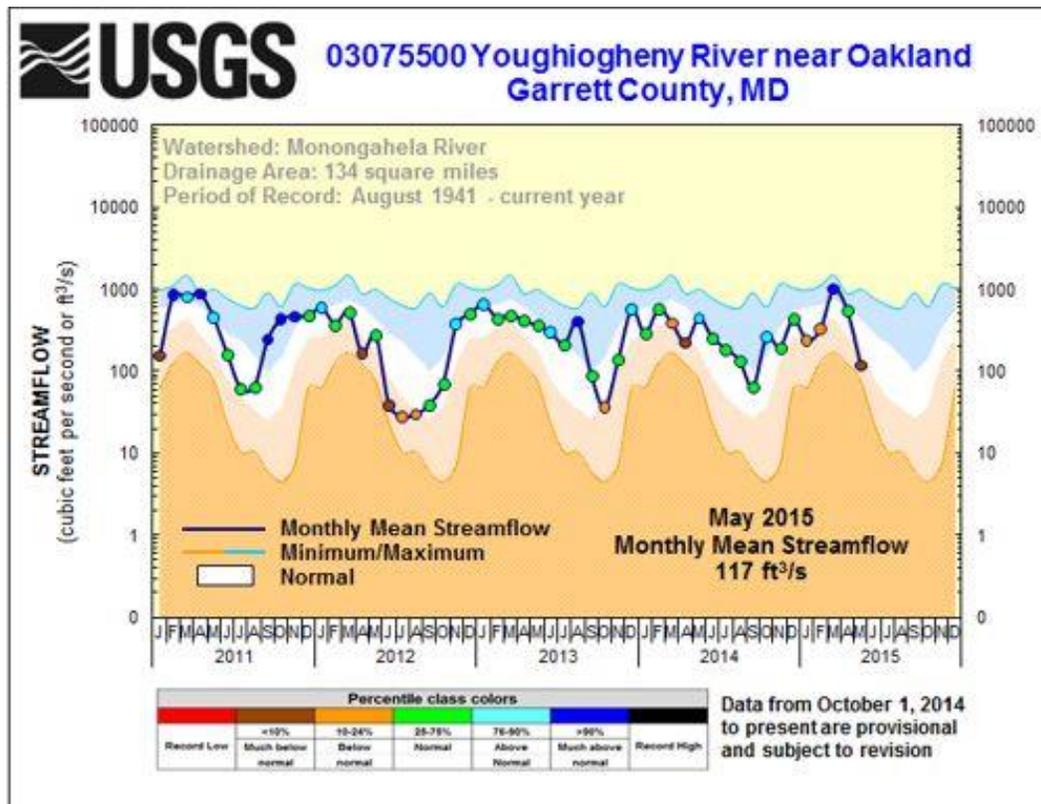


Similar to groundwater levels, most of the sites with below normal monthly mean streamflow were in counties along the Maryland or Delaware border with Pennsylvania.

To access the clickable streamflow map, go to:
<http://md.water.usgs.gov/surfacewater/streamflow/>

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The monthly mean streamflow on the Youghiogheny River near Oakland in Garrett County, Maryland dropped from the normal range to less than the 10th percentile in May 2015. The monthly mean streamflow typically falls at this time of year, but the drop in May was much steeper than the normal trend.



Five-year hydrographs can be viewed at:
<http://md.water.usgs.gov/surfacewater/streamflow/>

The dark line in the 5-year hydrograph represents the monthly mean streamflow for this period and the white band shows the normal range (25th to 75th percentiles) based on the period of record. The maximum monthly mean streamflow is at the top of the blue shaded section, and the lowest monthly mean streamflow is at the top of the dark orange area. Each monthly mean measurement is colored according to the percentile rank in which it falls for the month.

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Reservoir Levels

Available reservoir storage at the end of May 2015 in the Baltimore reservoirs (Loch Raven, Liberty, and Prettyboy) was 98.96 percent of available storage capacity, or a total of 75.06 billion gallons of water. The Baltimore City Environmental Services Division manages the Baltimore reservoirs.

Total normal storage in the Triadelphia and Duckett Reservoirs, which serve parts of Howard, Montgomery, and Prince George’s Counties in suburban Maryland around the District of Columbia, was 99.36 percent of normal storage capacity at the end of May 2015, with 10.55 billion gallons of water. Not all of the water in the Patuxent Reservoirs is usable; for operational purposes, percent of normal storage capacity is used, but this value can exceed 100 percent of the usable storage. The Washington Suburban Sanitary Commission (WSSC) manages the Patuxent reservoirs.

May 2015	Percent available/normal storage	Volume (billion gallons)
Baltimore Reservoirs		
Baltimore City – Environmental Services Division		
Liberty	98.26%	36.16
Loch Raven	100.00%	21.20
Prettyboy	99.16%	17.70
Total	98.96%	75.06
Patuxent Reservoirs		
Washington Suburban Sanitary Commission (WSSC)		
Triadelphia	100.34%	5.62
Duckett	98.38%	4.93
Total	99.36%	10.55