

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

May 2013 – Approximately 70 percent of groundwater and streamflow levels were normal; second consecutive month with record low groundwater level in Carroll County, Maryland.

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

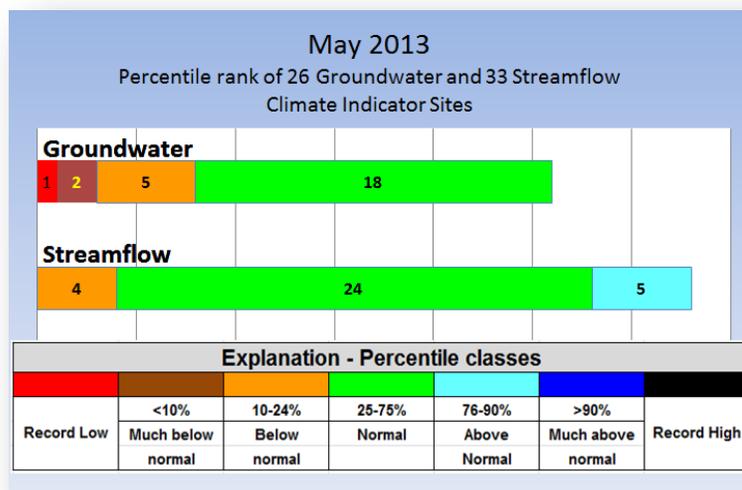
USGS water data are valuable to the public, researchers, water managers, planners, and agricultural users, especially during floods and droughts. These data can be used to assess how water resources respond to changes in climate. Scientists at the USGS have measured streamflow and groundwater levels in wells 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 collects water data and quality-assures the data by employing standardized techniques across the country. The uniformity of the dataset allows for multi-state comparisons and other comparative statistical analyses that better inform policy makers of the possible water resource 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 2013 Water Conditions Summary

About 70 percent of the monthly groundwater levels and monthly mean streamflows at sites used to monitor the response of water resources to changes in climatic conditions in Maryland, Delaware, and the District of Columbia were in the normal range (between the 25th and 75th percentiles) in May. There were no above normal groundwater levels in May. One of the USGS monitoring wells in Carroll County, Maryland set a monthly record low groundwater level for the second consecutive month. More than 50 percent of the groundwater levels have been normal to above normal since October 2012, when Superstorm Sandy inundated the Mid-Atlantic region.



In May, monthly mean streamflow was normal at 24 streamgages, below normal at 4 streamgages, and above normal at 5 streamgages. Until May of this year, streamflow had been normal to above normal at all 33 streamgages for the past year, or since May 2012.

A **percentile** is a value on a scale from 0 to 100 that indicates the percent of a distribution that is equal to or below it. A percentile between 25 and 75 is considered normal.

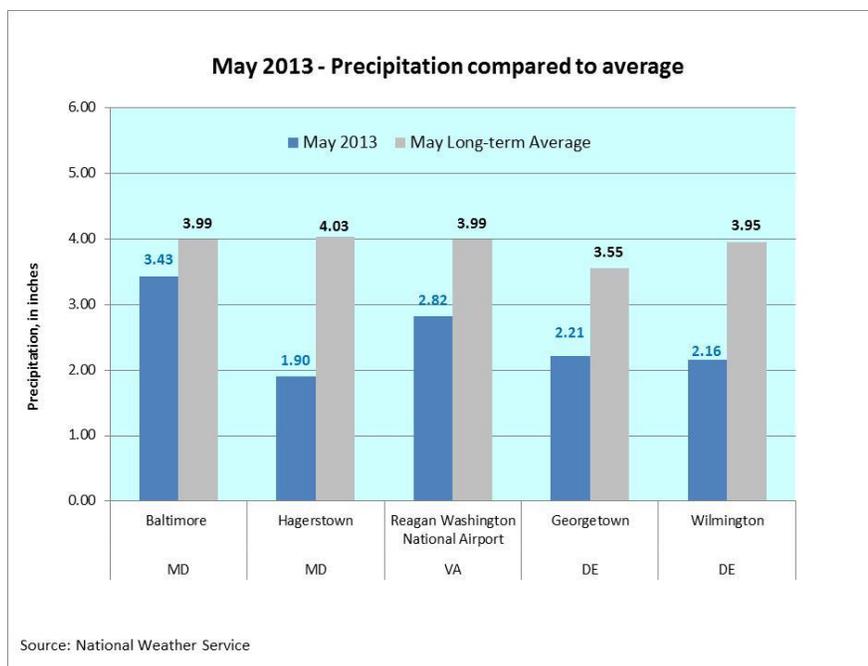
For example, a groundwater level in the 90th percentile is equal to or greater than 90 percent of the values recorded for that month.

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May 2013 Precipitation and Weather

For the fourth consecutive month, precipitation was below the long-term average at four of the National Weather Service (NWS) stations in Maryland, Delaware, and the District of Columbia. Rainfall at the weather station in Georgetown, Delaware has been below normal since February, except during April, when it was 0.46 inches above normal. Of the five NWS weather stations in the region, the lowest amount of rainfall was in Hagerstown, Maryland with 1.90 inches, and the highest amount was in Baltimore with 3.43 inches.

May temperatures were 0.7–1.3 degrees Fahrenheit above the long-term average at all five weather stations, according to the NWS. The NWS normal (long-term average) period used for determining records is from 1981–2010.



Sources:

National Weather Service

MD and DC: <http://www.weather.gov/climate/index.php?wfo=lsx>

DE: <http://www.erh.noaa.gov/phi/>

Middle Atlantic River Forecast Center (MARFC): <http://www.weather.gov/marfc/Precipitation/Departures>

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Groundwater

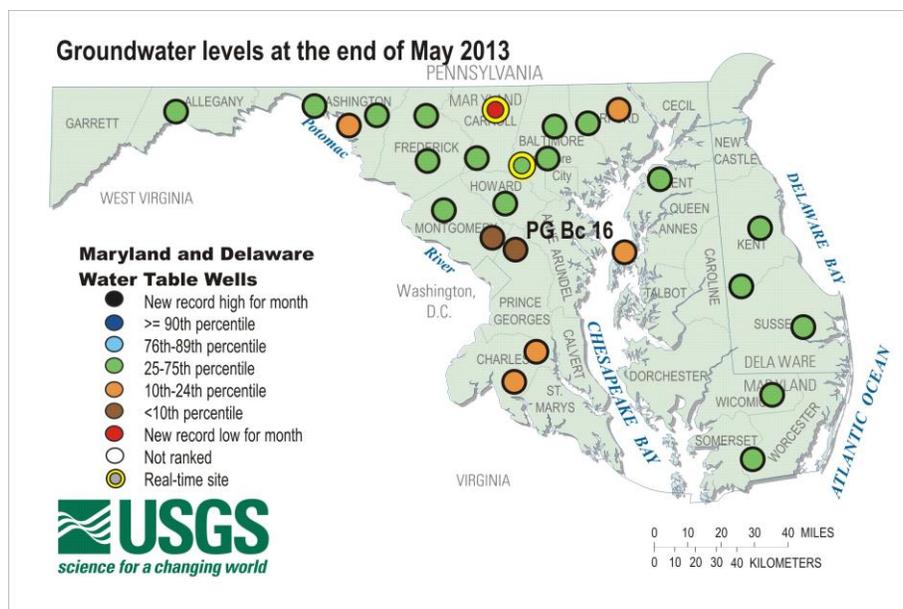
The USGS monitors groundwater levels in unconfined aquifers, providing observations that can be compared to both short-term and long-term changes in climatic conditions. Twenty-six groundwater wells were selected based on the following criteria:

- 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 casing – dug wells are not used;
- Water levels show no apparent hydrologic connection to nearby streams;
- Well has never gone dry; and
- Long-term accessibility likely.

May 2013 Groundwater Levels

Since September 2012, more than 50 percent of the groundwater levels used to monitor climatic conditions in Maryland and Delaware have been in the normal range. Normal is considered to be between the 25th and 75th percentiles. In May, groundwater levels in 18 of the 26 monitoring wells were normal, and the remaining 8 were below normal.

For the second consecutive month, the groundwater level in monitoring well CL Ad 47 in Union Mills in Carroll County, Maryland was at a monthly record low (red circle on map), and monitoring wells in Montgomery and Prince George's Counties, Maryland were in the (lowest) 10th percentile (brown circles on map).

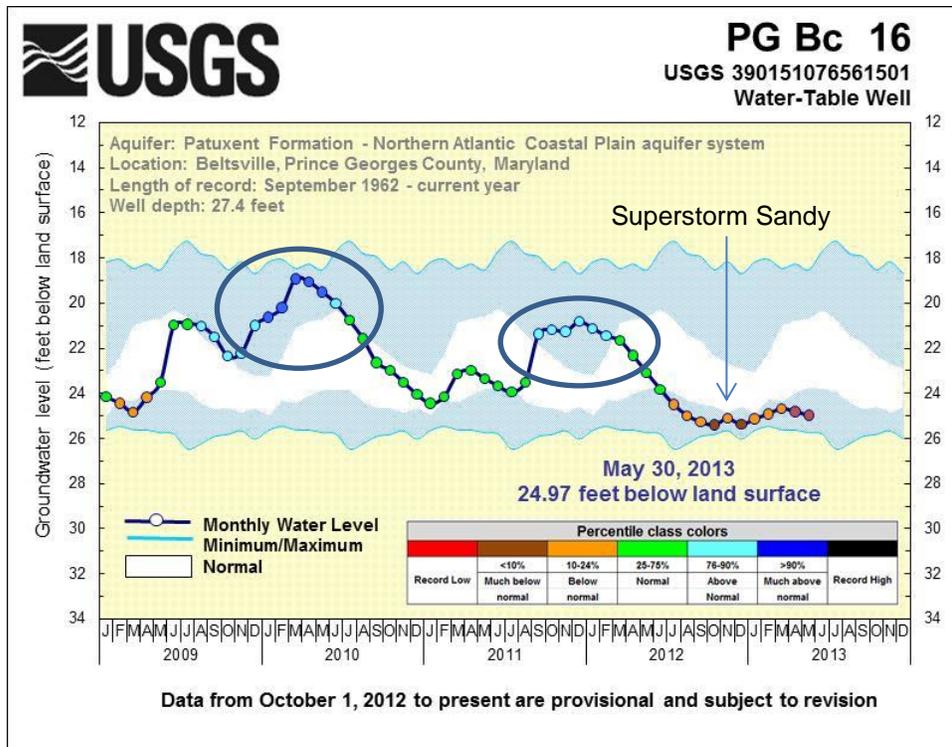


To access the clickable groundwater map, go to:

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

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The May groundwater level in USGS observation well PG Bc 16 in Prince George’s County, Maryland was in the (lowest) 10th percentile. The groundwater level was unusually high during the winter of 2009–10 and above normal during the winter of 2011–12 (circled in hydrograph), in relation to the historical pattern since record-keeping began in 1962. The groundwater level has been below normal for the last 11 months and showed little response to the rain associated with Superstorm Sandy in October 2012. Groundwater levels in a nearby Montgomery County well were also in the lowest 10th percentile.



Five-year groundwater hydrographs can be viewed at:
http://md.water.usgs.gov/groundwater/web_wells/current/water_table/counties

These 5-year hydrographs show 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 blue section and the minimum water level is at the bottom of the blue section in the graph.

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Streamflow

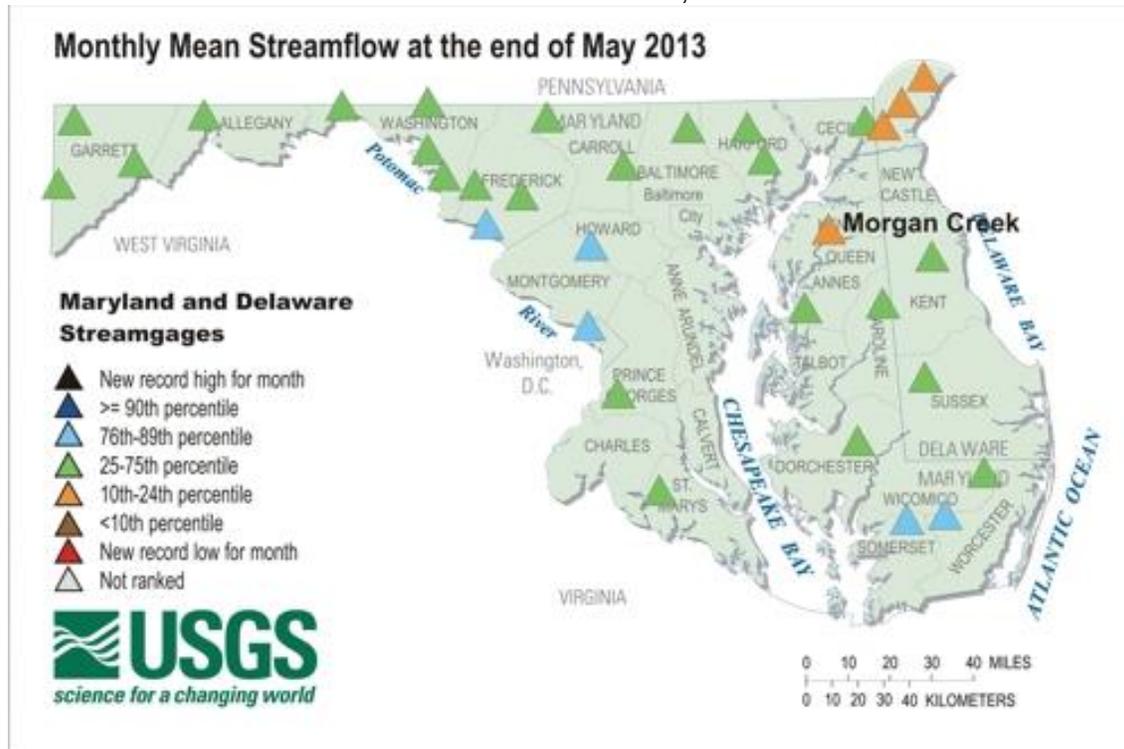
Streamflow data are used for many purposes. A few of the most obvious uses are to assess water supply and the risk of droughts and floods. Streamflow data are also used to calculate loads of chemical constituents and assess how biological communities are affected by hydrologic conditions. The USGS operates the most extensive network of streamflow gages 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 2013 Streamflow

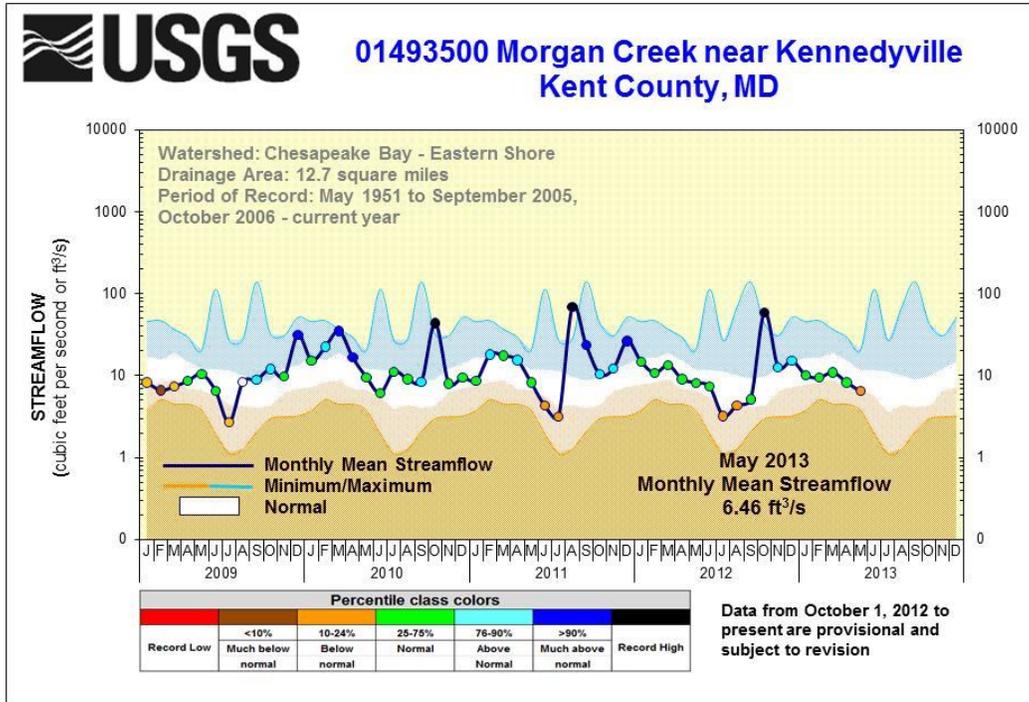
Twenty-four of the 33 USGS streamgages used to monitor climatic response in Maryland, Delaware, and the District of Columbia had normal streamflow levels in May. Normal is considered to be between the 25th and 75th percentiles. Monthly mean streamflows were below normal in northern Delaware and Queen Anne's County on the Eastern Shore of Maryland. Sites with above normal monthly mean streamflows were located in Frederick and Montgomery Counties in Maryland, and Washington D.C. west of the Chesapeake Bay, and in Somerset and Wicomico Counties on the southern Delmarva Peninsula,



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

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Monthly mean streamflow at Morgan Creek in Kent County, Maryland was below normal in May after being at normal levels for the previous 4 months and at a record high level in October 2012 following rainfall and runoff from Superstorm Sandy.



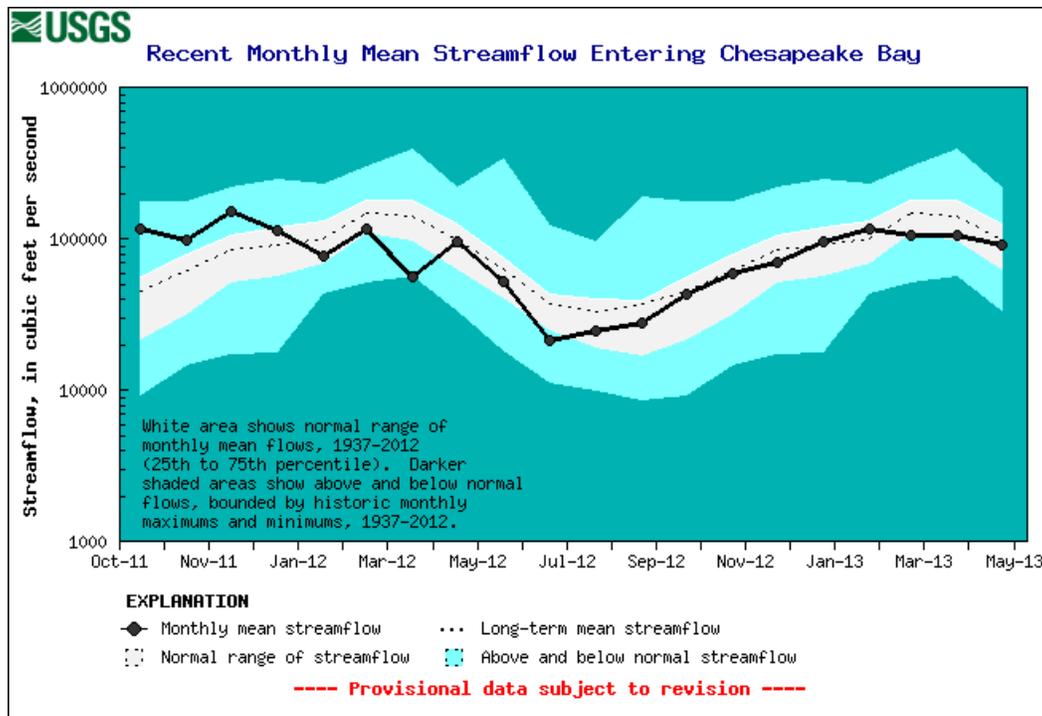
Five-year hydrographs can be viewed at:
<http://md.water.usgs.gov/surfacewater/streamflow/>

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 percentile) 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.

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Estimated Streamflow to the Chesapeake Bay

The estimated monthly mean freshwater streamflow to Chesapeake Bay was normal in May 2013, at 92,400 cubic feet per second (ft³/s; provisional and subject to revision). Average (mean) monthly streamflow for May is 98,400 ft³/s. The normal range for average (mean) monthly streamflow for May is between 62,300 ft³/s and 127,000 ft³/s, the 25th and 75th percentiles of all May values. These provisional statistics are based on a 76-year period of record.



Data and more information on the freshwater flow to the Bay can be found here:
<http://md.water.usgs.gov/waterdata/chesinflow/>

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Reservoir Levels

Reservoir storage at the end of May in the Baltimore reservoirs (Loch Raven, Liberty, and Prettyboy) remained at 100 percent of available storage capacity, with a total of 75.80 billion gallons of water.

Total storage in the Triadelphia and Duckett Reservoirs, which serve parts of Howard, Montgomery, and Prince George’s Counties in suburban areas around the District of Columbia, was 101.8 percent of normal storage capacity, with 10.79 billion gallons in May.

All reservoirs except Duckett Reservoir, where levels were dropped for maintenance in February, have been at or above 100 percent since November 2012.

May 2013	Percent available/ normal storage	Volume (billion gallons)	Source
Baltimore Reservoirs			Baltimore City – Environmental Services Division
Liberty	100	36.80	
Loch Raven	100	21.20	
Prettyboy	100	17.80	
Total	100	75.80	
Patuxent Reservoirs			Washington Suburban Sanitary Commission (WSSC)
Triadelphia	100	5.58	
Duckett	104	5.21	
Total	102	10.79	