

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

## March 2013 – 65 percent of groundwater and 85 percent of streamflow measurements at normal levels

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

USGS water data is 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.

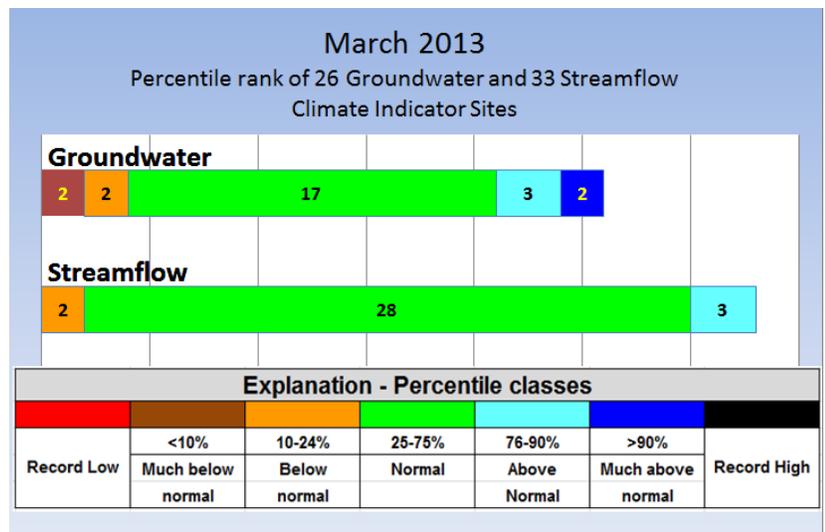
### USGS March 2013 Water Conditions Summary

In March, 65 percent of the groundwater levels were in the normal range and 85 percent of the streamflow levels were in the normal range at sites used to monitor the response of water resources to changes in climatic conditions in Maryland, Delaware, and the District of Columbia.

The normal range is considered to be between the 25th and 75th percentiles.

March groundwater levels at the 26 USGS monitoring wells ranged from below the 10th percentile to above the 90th percentile. The percentile distribution was similar to January and February 2013, although not all sites were in the same percentile class as in the previous months. The above normal and below normal sites are spread across Maryland and Delaware as shown on the map.

Monthly mean streamflows were normal at 28 of the 33 USGS streamgages used to monitor stream response to changes in climatic conditions in Maryland, Delaware, and the District of Columbia. Of the remaining five sites, two sites (one in Maryland and one in Delaware) had below normal levels and three sites on the southern Delmarva Peninsula had



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.

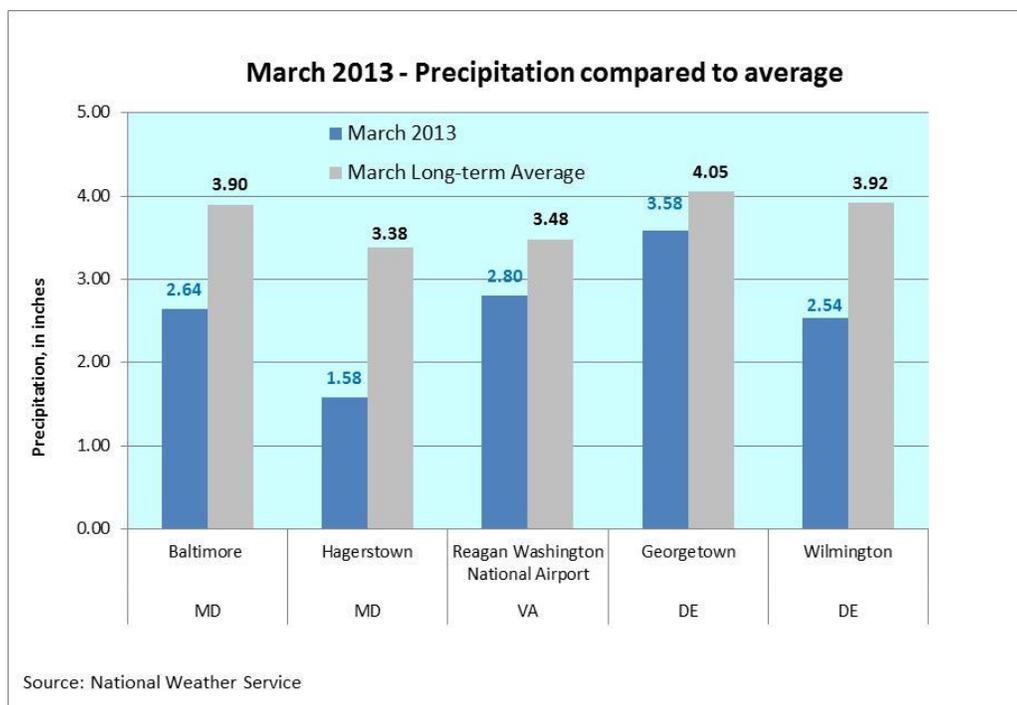
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above normal levels.

## March 2013 Precipitation and Weather

Precipitation has been below the long-term average at five National Weather Service (NWS) stations in Maryland, Delaware, and the District of Columbia since October 2012, including March 2013. A daily record snowfall was set in Baltimore on March 25 with 3.2 inches, surpassing the previous record of 2.5 inches set in 1933. It is uncommon to get snow this late in the season in the Mid-Atlantic region.

March temperatures were 2.7 – 3.6 degrees Fahrenheit below the long-term average at all 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>

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

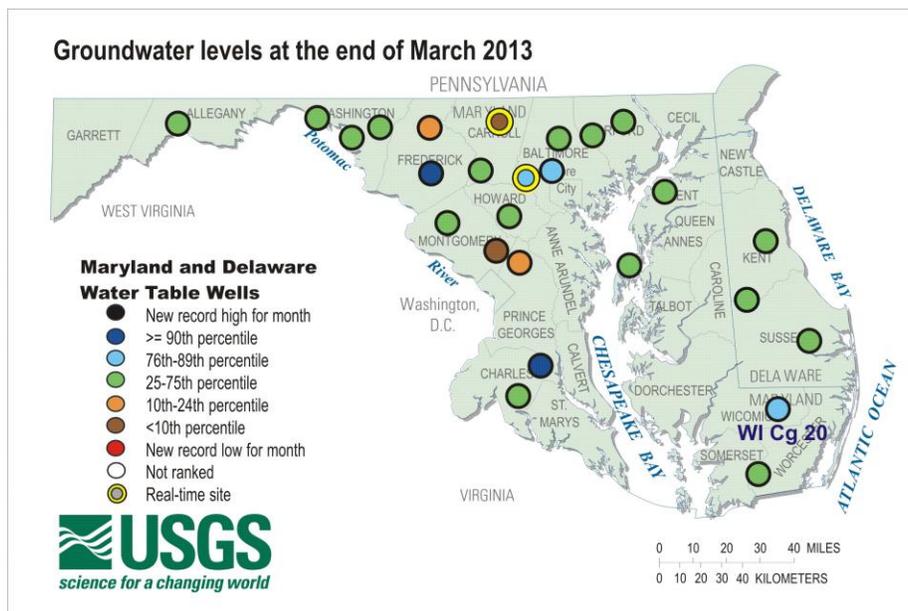
## Groundwater

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.

## March 2013 Groundwater Levels

Groundwater levels used to monitor climatic conditions in Maryland and Delaware ranged from below the 10th percentile to above the 90th percentile in March 2013. This is the third consecutive month with a similar range in percentile rankings, but the sites that are below and above normal are not always the same and they are distributed across Maryland and Delaware. Seventeen of the sites were in the normal range. Normal is considered to be between the 25th and 75th percentiles.



To access the clickable groundwater map, go to:

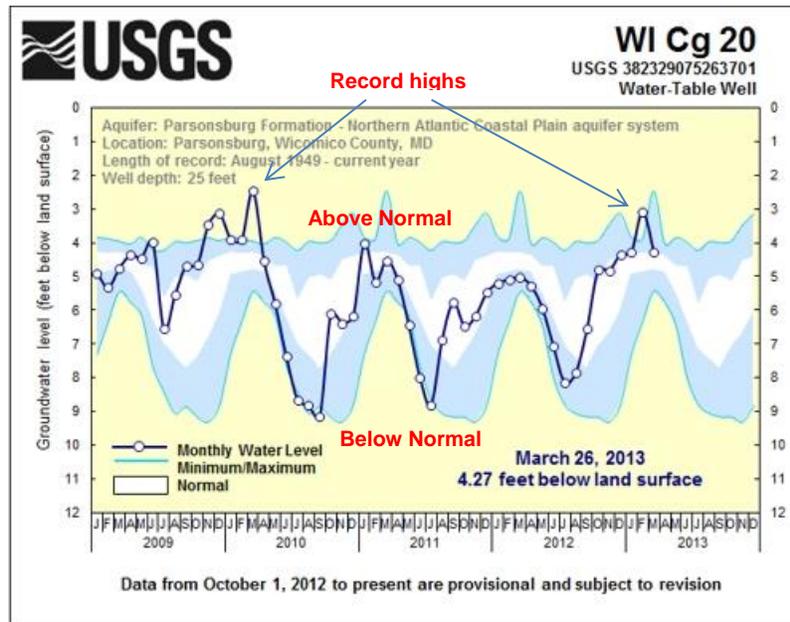
[http://md.water.usgs.gov/groundwater/web\\_wells/current/water\\_table/counties/index.html](http://md.water.usgs.gov/groundwater/web_wells/current/water_table/counties/index.html)

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observation well WI Cg 20 in Wicomico County, Maryland is featured again this month to show

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

how the groundwater level dropped from the monthly record high in February to close to normal in March. In April 2010, snowmelt caused the groundwater level to reach an all-time high, but during the following months, the groundwater level dropped quickly and was near record lows through the summer and fall of that year. The groundwater level has only been above normal once since then, until the record set in February.



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.

Five-year groundwater hydrographs can be viewed at:  
[http://md.water.usgs.gov/groundwater/web\\_wells/current/water\\_table/counties](http://md.water.usgs.gov/groundwater/web_wells/current/water_table/counties)

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

## Streamflow

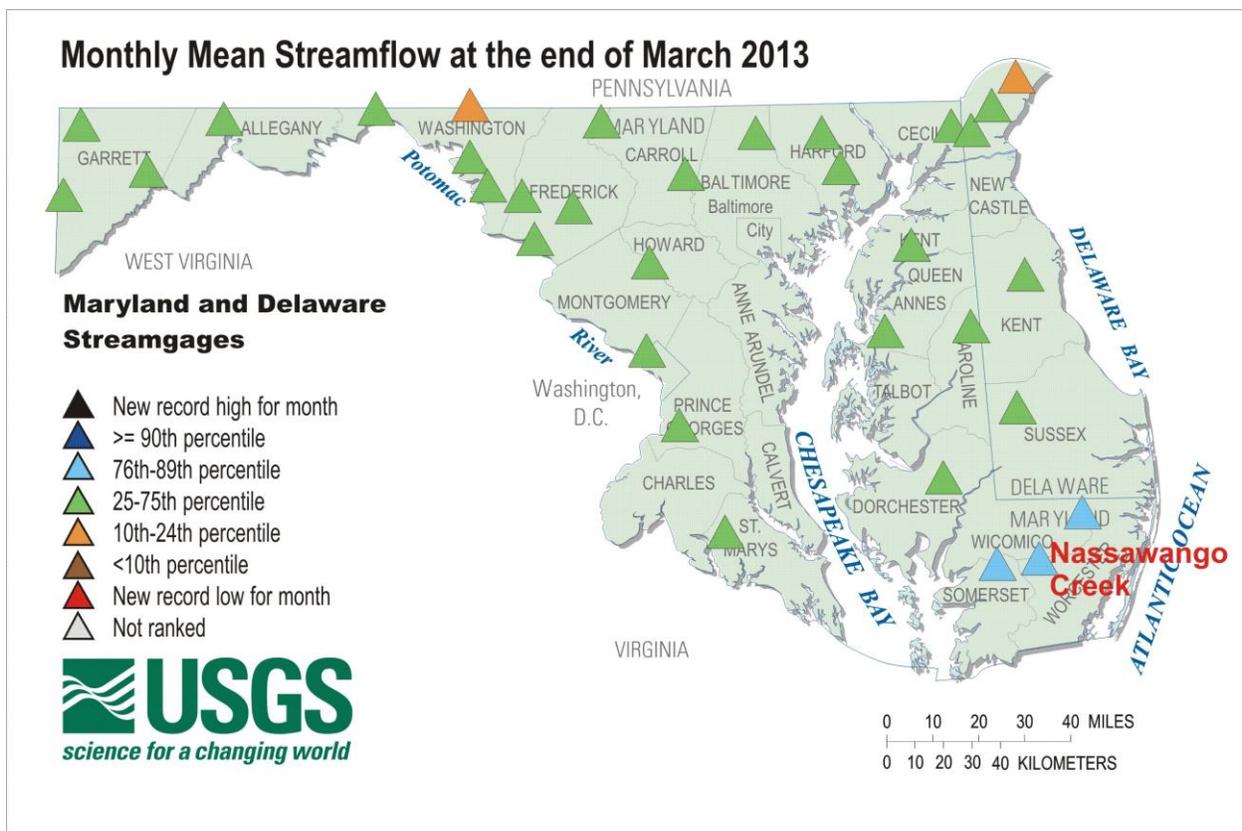
Streamflow data are used for many purposes. A few of the most obvious uses are to assess water supply and the risk of droughts and floods. Streamflow data are also used to calculate loads of chemical constituents and assess how biological communities are affected by hydrologic conditions. The USGS operates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

## March 2013 Streamflow

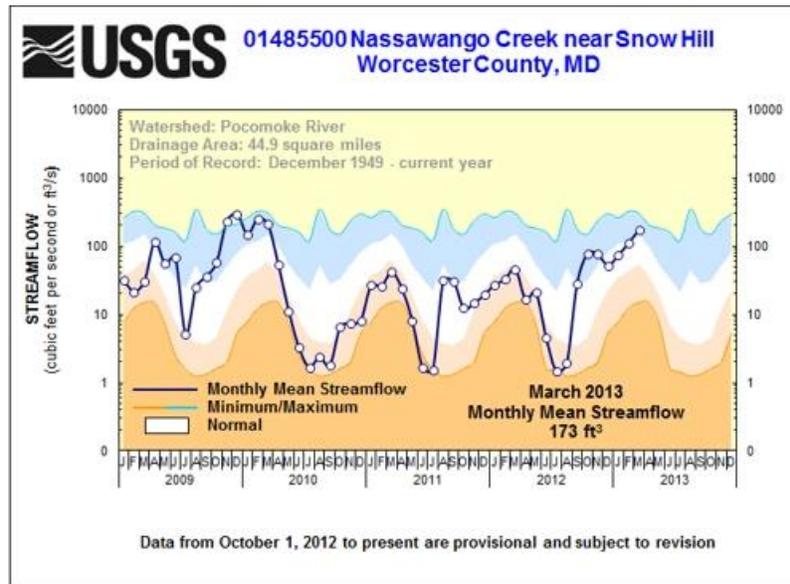
Twenty-eight of the USGS streamgages used to monitor climatic response in Maryland, Delaware, and the District of Columbia had normal streamflow levels during March. Monthly mean streamflow at two streamgages was below normal, and monthly mean streamflow was above normal at three streamgages on the southern tip of the Delmarva Peninsula. Normal is considered to be between the 25th and 75th percentiles.



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

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

Monthly mean streamflow at Nassawango Creek in Worcester County, Maryland continued to rise for the fourth consecutive month. Based on the historical pattern, streamflow is expected to begin dropping in May. In 2010, the streamflow was in the highest 10th percentile, but quickly dropped to near record lows and streamflow had not been above normal until the above normal rainfall last autumn from Superstorm Sandy. Manokin Branch and Pocomoke River, two nearby streams, showed similar patterns in response to climatic conditions.



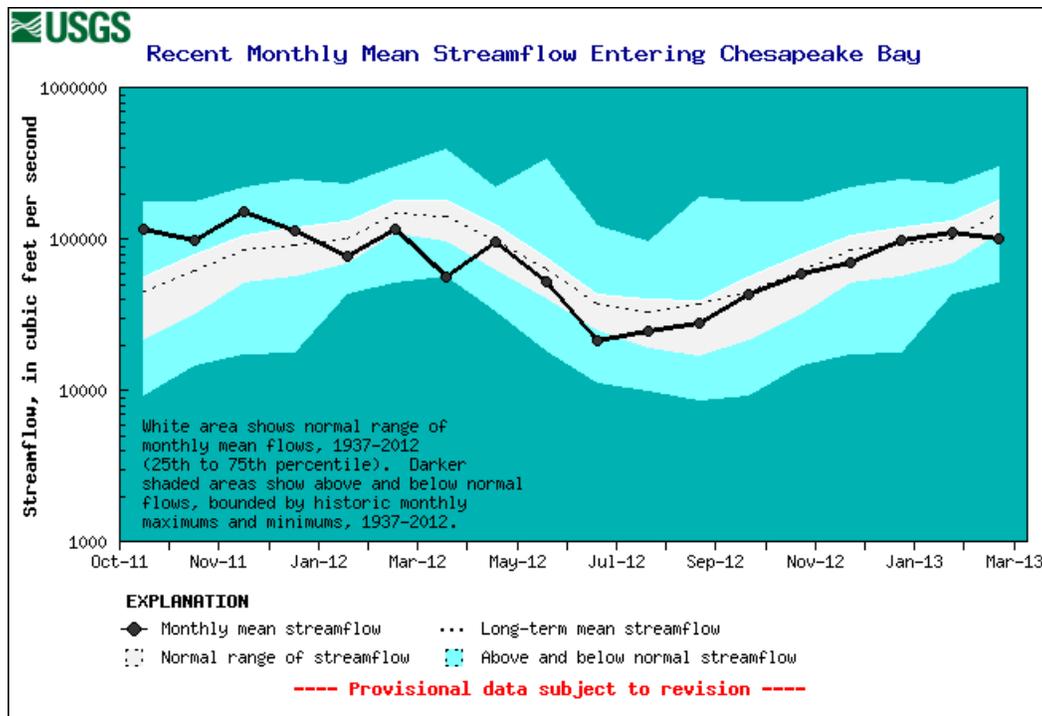
Five-year hydrographs can be viewed at:  
<http://md.water.usgs.gov/surfacewater/streamflow/>

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.

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

## Estimated Streamflow to the Chesapeake Bay

For the first time since July 2012, the estimated monthly mean freshwater streamflow to Chesapeake Bay was below normal in March 2013, at 100,000 cubic feet per second (ft<sup>3</sup>/s; provisional and subject to revision). The normal range for average (mean) monthly streamflow for March is between 108,000 ft<sup>3</sup>/s and 183,000 ft<sup>3</sup>/s, the 25th and 75th percentiles of all March 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 March in the Baltimore reservoirs (Loch Raven, Liberty, and Prettyboy) remained at 100 percent of available storage capacity, with a total of 75.85 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 over 103 percent of normal storage capacity with 10.91 billion gallons in March.

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

March 2013	Percent available/ normal storage	Volume (billion gallons)	Source
<b>Baltimore Reservoirs</b>			<b>Baltimore City – Environmental Services Division</b>
Liberty	100	36.80	
Loch Raven	100	21.20	
Prettyboy	100	17.85	
Total	100	75.85	
<b>Patuxent Reservoirs</b>			<b>Washington Suburban Sanitary Commission (WSSC)</b>
Triadelphia	102	5.71	
Duckett	104	5.20	
Total	103	10.91	