

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

February 2013 – More than 60 percent of streamflow and groundwater 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.

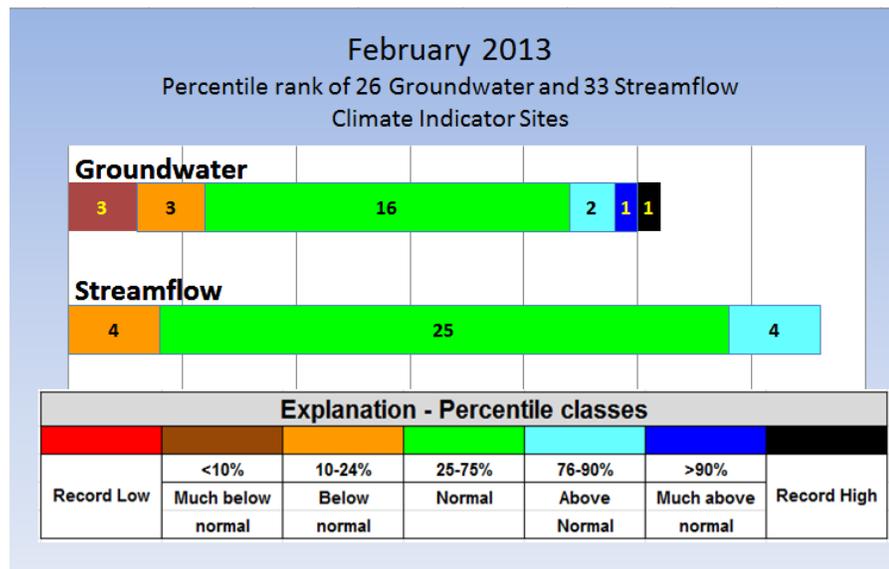
In addition to providing the most extensive set of historical streamflow and groundwater data available to the public, the USGS collects water data and quality-assures the data by employing standardized techniques across the country. The uniformity of the dataset allows for multi-state comparisons and 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 February 2013 Water Conditions Summary

February precipitation was 0.37 to 1.30 inches below normal, but the preceding 2 months had precipitation close to the long-term average, leading to more than 60 percent of the groundwater levels and 75 percent of the streamflow levels in the normal range at sites used to monitor climatic conditions in Maryland, Delaware, and the District of Columbia. The normal range is considered to be between the 25th-75th percentiles.

Groundwater levels at the 26 USGS monitoring wells in February ranged from the lowest 10th percentile to a record high in February. There was a similar percentile distribution to January 2013, although the record high and the low groundwater levels were not at the same sites. The February record high groundwater level was at the USGS observation well in Wicomico County, Maryland.



The monthly mean streamflows were normal at 25 of the 33 USGS streamgages used to monitor climatic conditions in Maryland, Delaware, and the District of Columbia. The remaining 8 sites were evenly distributed between above normal and below normal levels.

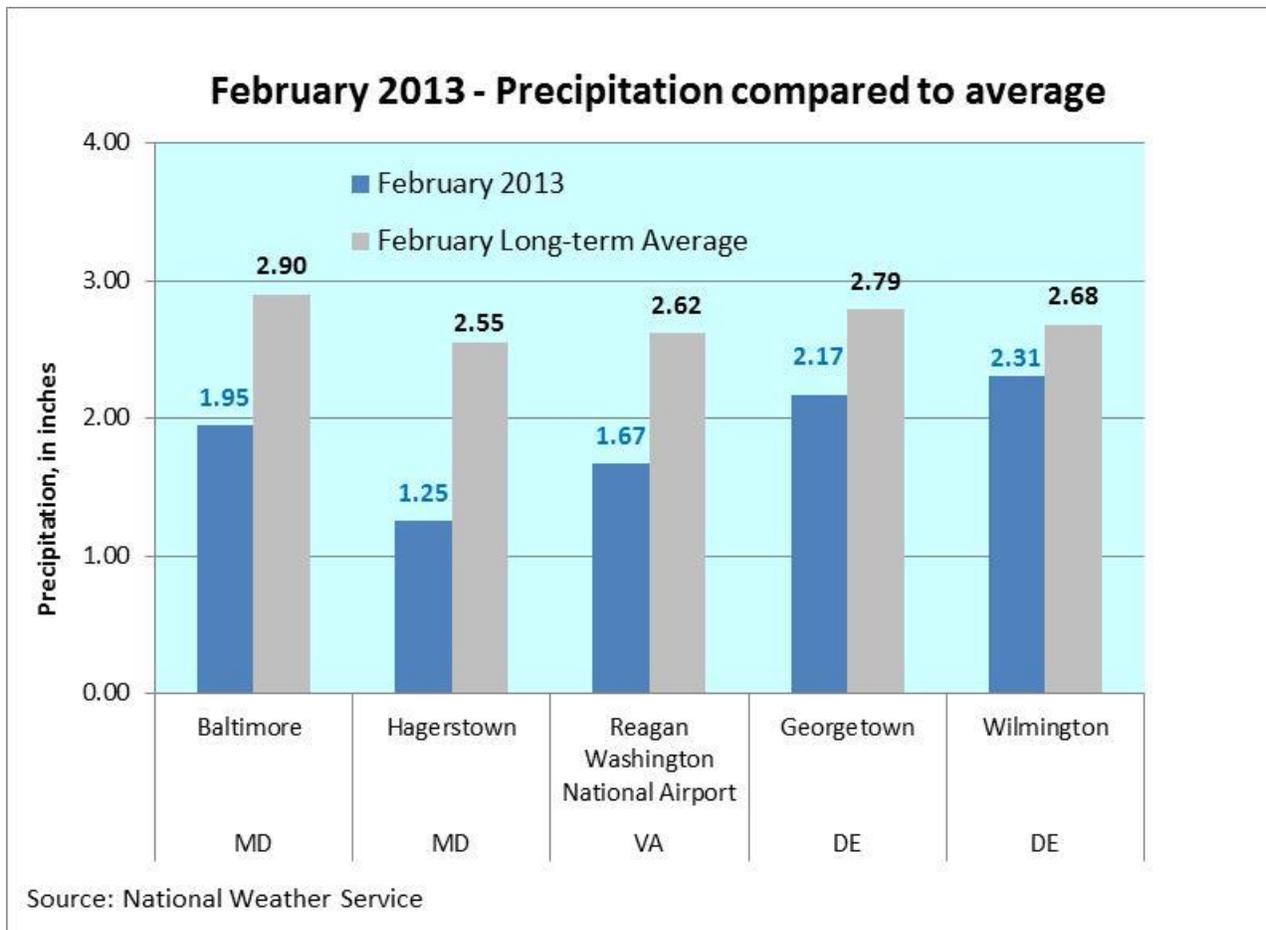
A **percentile** is a value on a scale from 0 to 100 that indicates the percent of a distribution that is equal to or below it. A percentile between 25 and 75 is considered normal.

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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February 2013 Precipitation and Weather

Precipitation was below the long-term average at five National Weather Service (NWS) stations in Maryland, Delaware, and the District of Columbia in February. Most of the precipitation was in the form of rain, with less snow than average for February. The NWS normal (long-term average) period used for determining records is from 1981-2010. February temperatures were slightly below normal at all the weather stations except Georgetown, which was 0.1 degrees Fahrenheit above the long-term average, according to the NWS.



Sources:

National Weather Service

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

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

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

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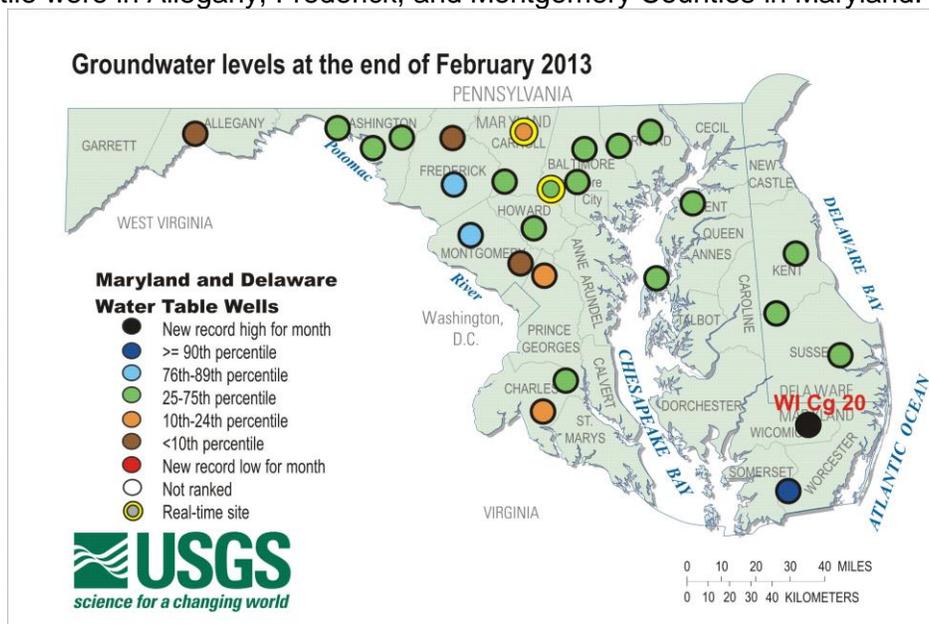
Groundwater

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.

February 2013 Groundwater Levels

For the second consecutive month, groundwater levels used to monitor climatic conditions in Maryland and Delaware ranged from the lowest 10th percentile to a record high in February 2013. Normal is considered to be between the 25th and 75th percentiles. The record high groundwater level was in Wicomico County, Maryland and the groundwater level in the observation well in Somerset County, Maryland was in the highest 10th percentile. Both of these sites are in the southern part of the Delmarva Peninsula. The groundwater levels in the lowest 10th percentile were in Allegany, Frederick, and Montgomery Counties in Maryland.

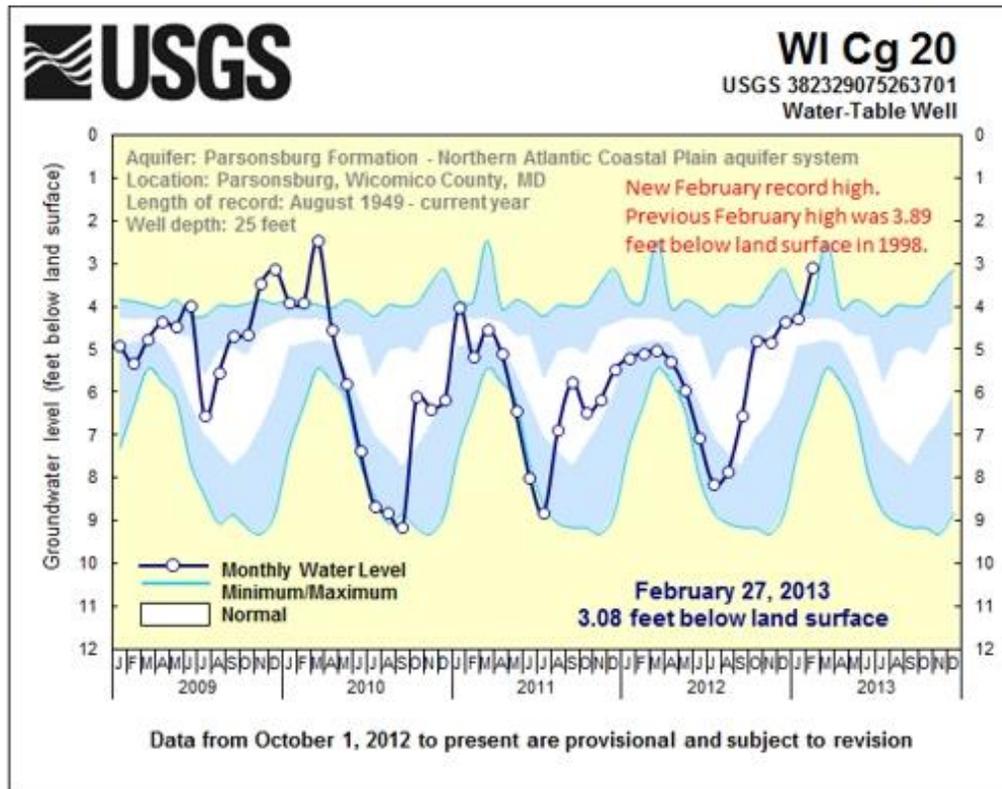


To access the clickable groundwater map, go to:

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

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The groundwater level in USGS monitoring well WI Cg 20 in Wicomico County, Maryland (black circle on map) rose to a record February high at 3.08 feet below land surface. This value exceeded the previous record of 3.89 feet below land surface in 1998 by 0.81 feet. The hydrograph shows that in April 2010, the groundwater level rose to an all-time high. The February 2013 value seems to follow a similar trend.



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

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Streamflow

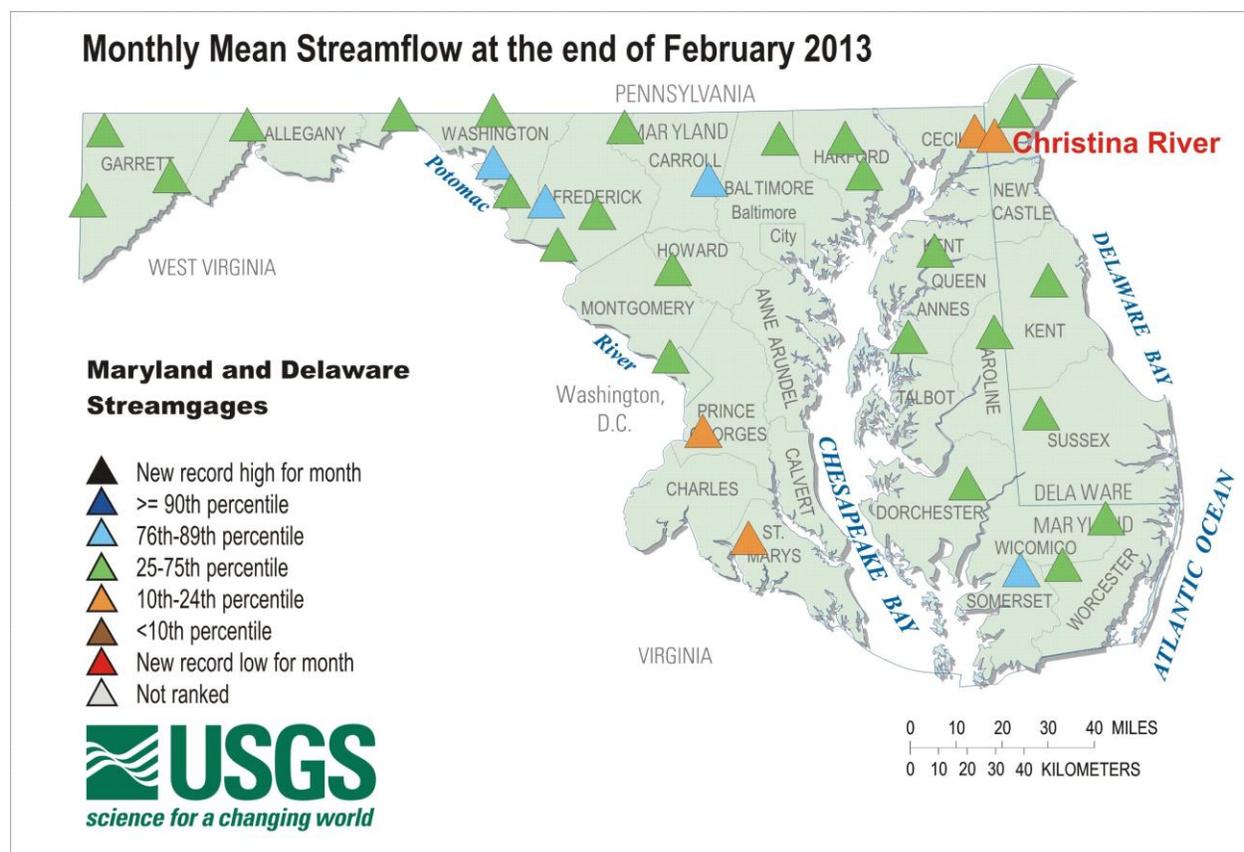
Streamflow data are used for many purposes. A few of the most obvious uses are to assess water supply and the risk of droughts and floods. Streamflow data are also used to calculate loads of chemical constituents and assess how biological communities are affected by hydrologic conditions. The USGS operates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

February 2013 Streamflow

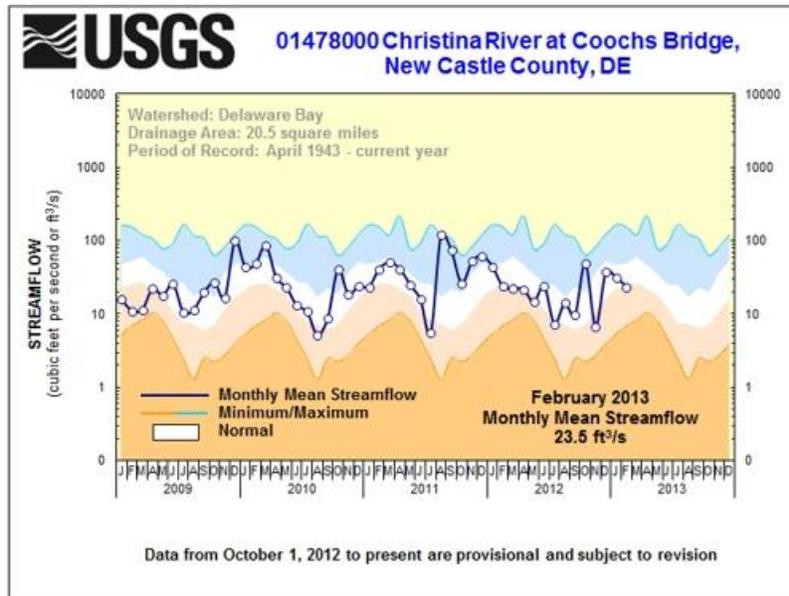
Monthly mean streamflow was normal at 25 of the 33 USGS streamgages used to monitor climatic response in Maryland, Delaware, and the District of Columbia in February. Normal is considered to be between the 25th and 75th percentiles. Among the remaining eight sites, four had above normal monthly mean streamflows, and four had below normal monthly mean streamflows.



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

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The normal seasonal peak at the Christina River in New Castle County, Delaware is usually in April or May, but in 2013, the streamflow is showing a declining trend 3 months earlier than typical. This trend could easily change with spring rain and runoff.



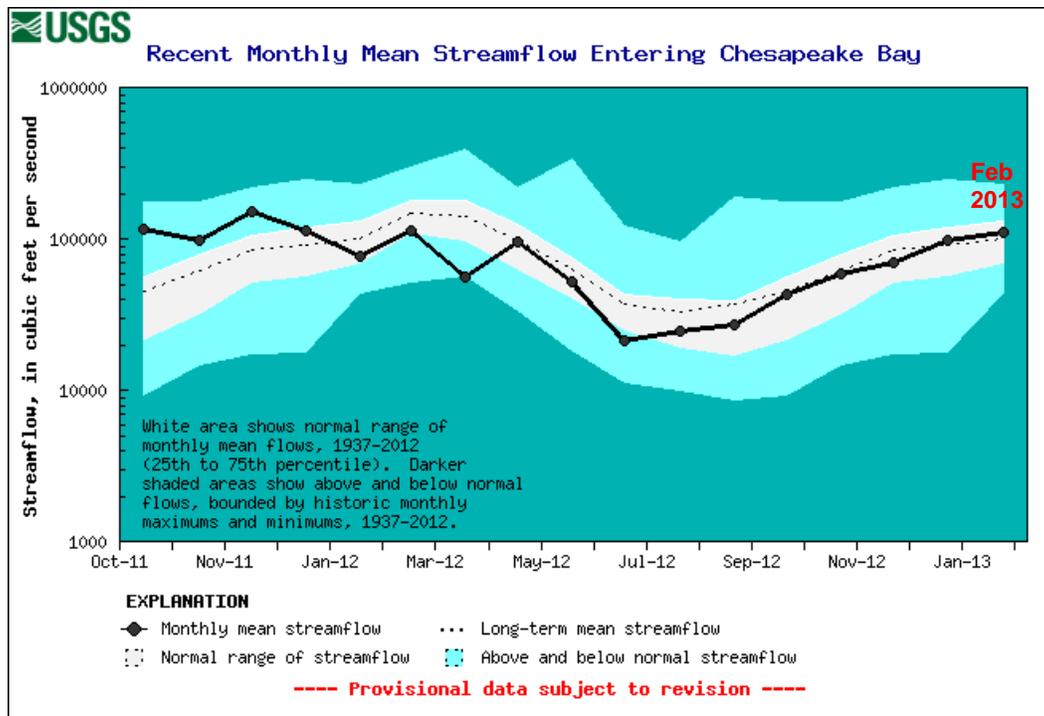
Five-year hydrographs can be viewed at:
<http://md.water.usgs.gov/surfacewater/streamflow/>

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 remained in the normal range in February 2013, at 111,000 cubic feet per second (ft³/s; provisional and subject to revision). The normal range for average (mean) monthly streamflow for February is between 69,400 ft³/s and 132,000 ft³/s, the 25th and 75th percentiles of all February 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/recent/>

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Reservoir Levels

Reservoir storage at the end of February 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 94 percent of normal storage capacity or 82 percent of capacity at the end of February with 9.98 billion gallons. Not all of the water in the reservoir is usable for water supply purposes. In February, the Duckett Reservoir was lowered for maintenance.

February 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%	17.85	
Total	100%	75.85	
Patuxent Reservoirs			Washington Suburban Sanitary Commission (WSSC)
Triadelphia	103%	5.77	
Duckett	84%	4.21	
Total	94%	9.98	