

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

January 2013 – More than 95 percent of streamflow and groundwater measurements at normal to above 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.

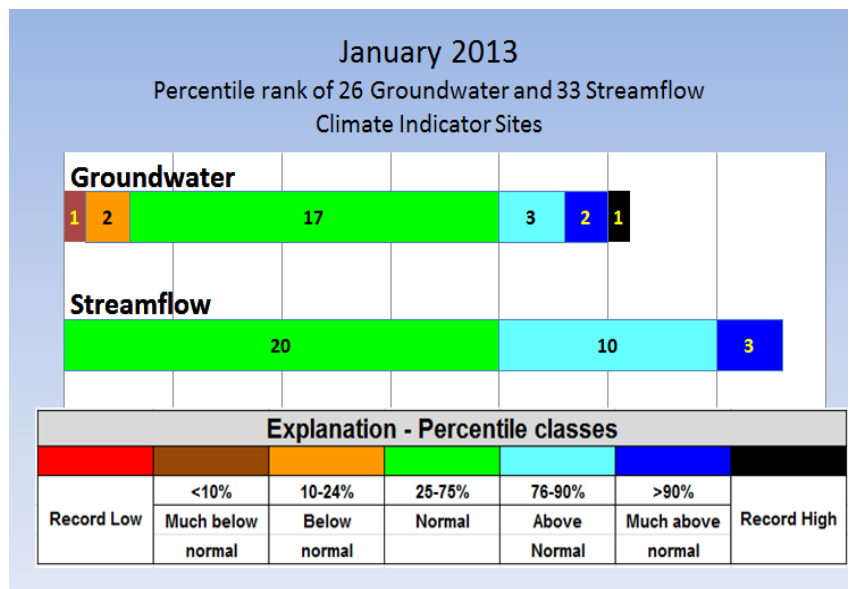
USGS January 2013 Water Conditions Summary

Groundwater and streamflow levels were normal to above normal at 95 percent of the sites used to monitor climatic conditions in Maryland, Delaware, and the District of Columbia, although some of the streamflow levels may have been affected by ice. The normal range is considered to be between the 25th-75th percentiles.

Precipitation was near normal and temperatures were above normal throughout the area for the second consecutive month.

January groundwater levels were similar to those in December 2012, and ranged from a record high to the lowest 10th percentile at the 26 USGS monitoring wells.

The monthly mean streamflows were normal to above normal at all of the USGS streamgaging sites used to monitor climatic conditions in Maryland, Delaware, and the District of Columbia. The majority (30 of 33 sites) were above normal.



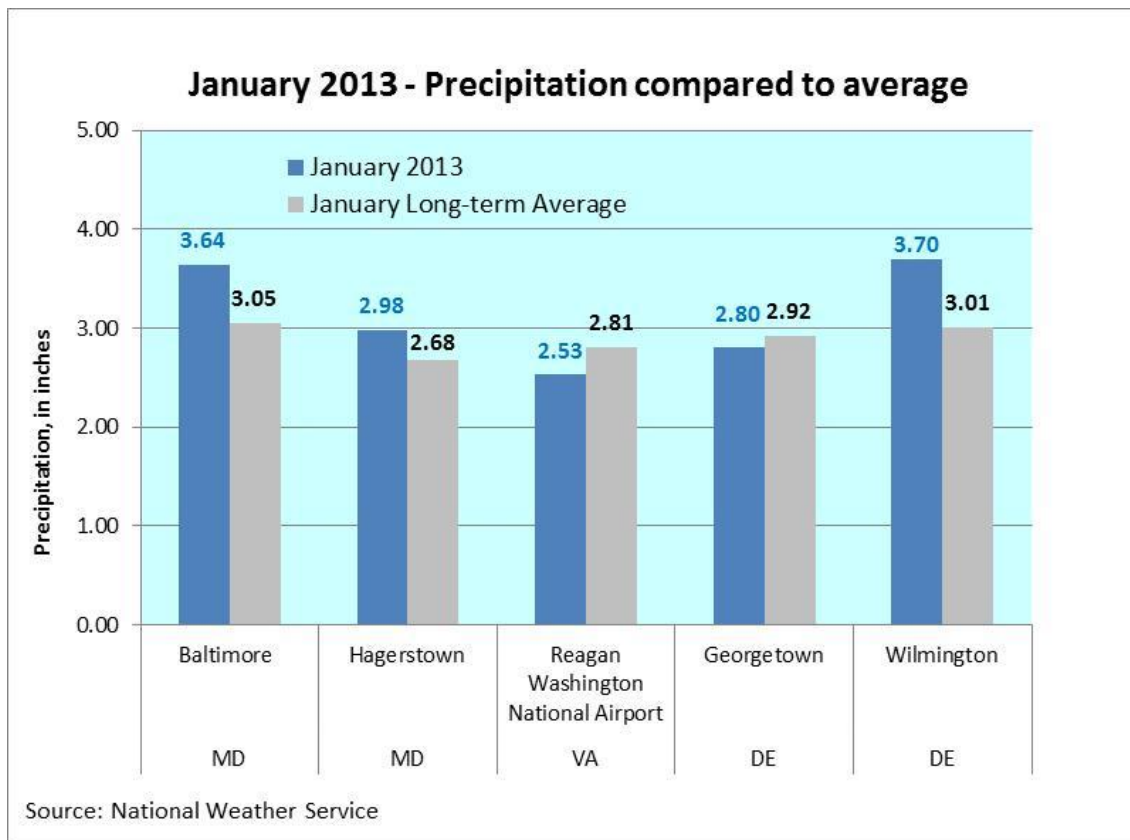
A **percentile** is a value on a scale from 0 to 100 that indicates the percent of a distribution that is equal to or below it. A percentile between 25 and 75 is considered normal.

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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January 2013 Precipitation and Weather

For the second consecutive month, precipitation was near the long-term average at five National Weather Service (NWS) stations in Maryland, Delaware, and the District of Columbia in January. Most of the precipitation was in the form of rain because of the higher than normal temperatures, with less snow than average in January. The NWS normal (long-term average) period used for determining records is the 30-year period from 1981-2010.



Temperatures were highly variable during January with a prolonged cold period from January 22-25 when the temperature in Baltimore averaged 25.5 degrees Fahrenheit, according to the NWS. There had not been a 4-day span with temperatures below 30 degrees since February 2007.

At the end of January, temperatures were much above average. In Baltimore, the temperature reached 70 degrees Fahrenheit. The overall average monthly temperatures were more than 3 degrees Fahrenheit above the long-term average at all five weather stations in the region. In Wilmington, Delaware, the high temperature of 65 degrees tied the 66-year-old record. At the Georgetown, Delaware weather station, the 67-degree temperature beat the previous record set in 2012 by 4 degrees. At the Ronald Reagan Washington National Airport, the 52-degree temperature was tied with the record set in 2002.

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

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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.

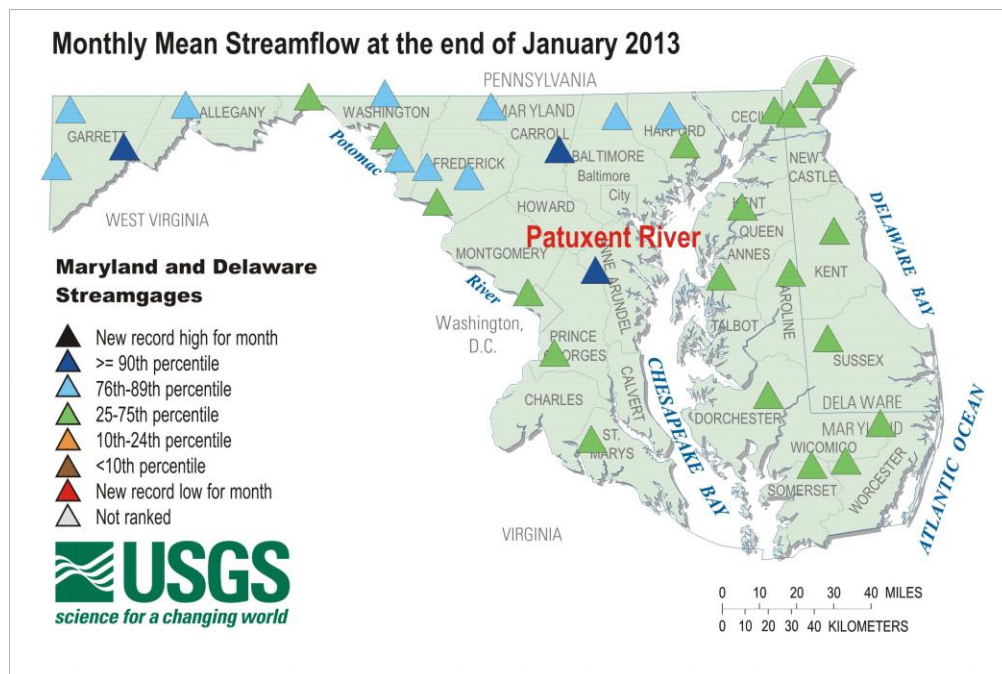
The streamflow locations chosen for the monthly water summary were selected based on the following criteria:

- 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.

January 2013 Streamflow

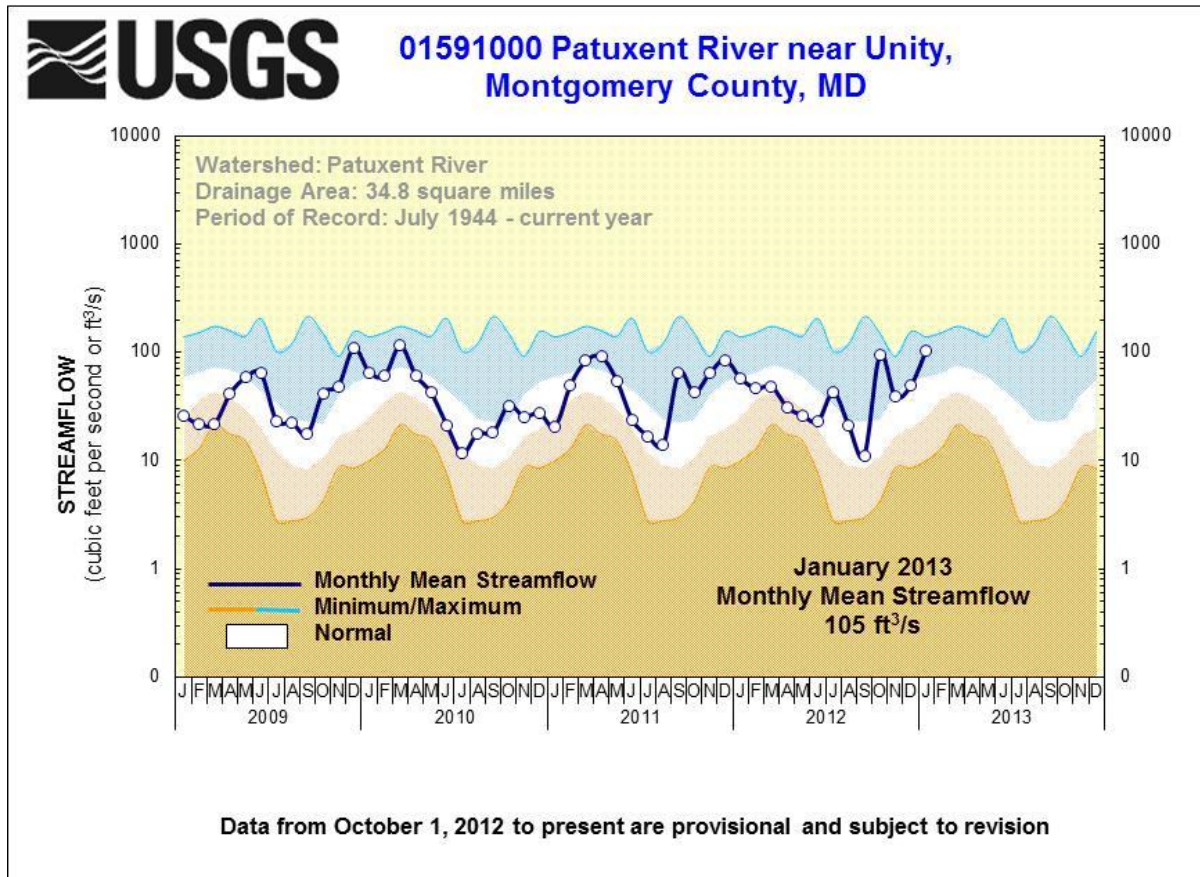
Monthly mean streamflow was normal to above normal at all of the 33 USGS streamflow-gaging stations used to monitor climatic response in Maryland, Delaware, and the District of Columbia in January. Normal is considered to be between the 25th and 75th percentiles.

Streamflow values could be higher or lower than the provisional values, because of cold weather, potentially creating ice dams, freezing of the intake pipes and orifice lines at the streamgages, or because of the frozen ground and lack of melting and runoff.



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The monthly mean streamflows rose at 26 of the streamflow sites in January, including the site at the Patuxent River in Montgomery County, Maryland. Streamflows are typically larger at this time of year when plants use less water and evapotranspiration is minimal. The Patuxent River site was one of three sites that had monthly mean streamflows in the highest 10th percentile in January. The other two sites were also in Maryland: Beaver Run in Carroll County and Savage River in Garrett County.



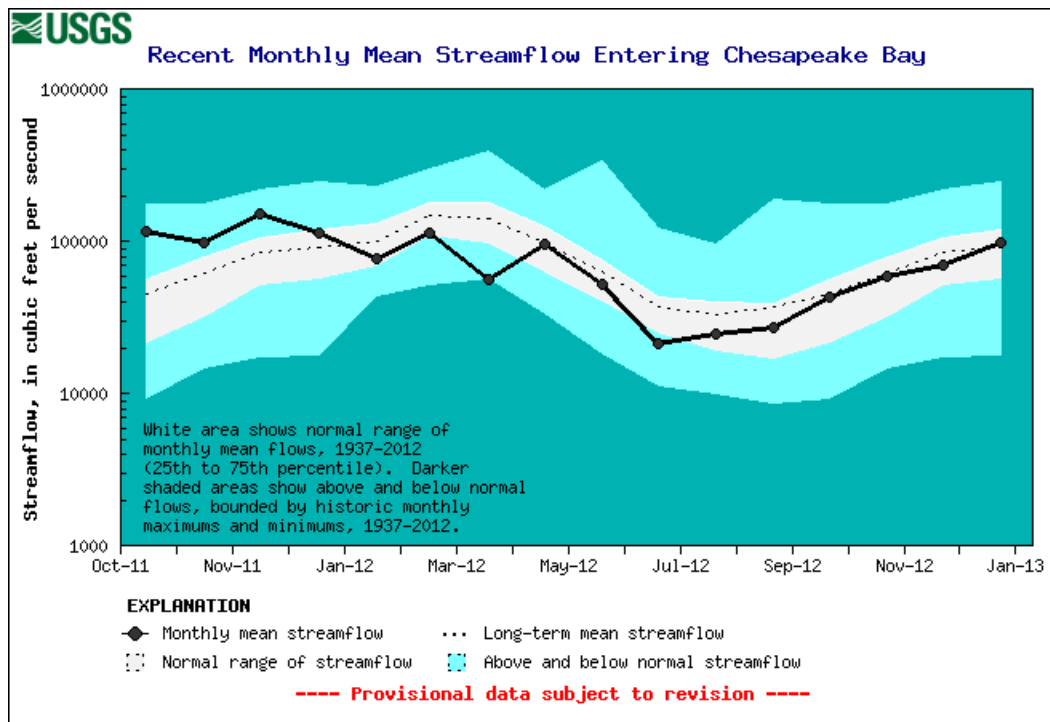
Five-year hydrographs can be viewed at:
<http://md.water.usgs.gov/surfacewater/streamflow/>

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 January 2013, at 98,500 cubic feet per second (ft³/s; provisional and subject to revision). The normal range for average (mean) monthly streamflow for January is between 57,200 ft³/s and 120,000 ft³/s, the 25th and 75th percentiles of all January 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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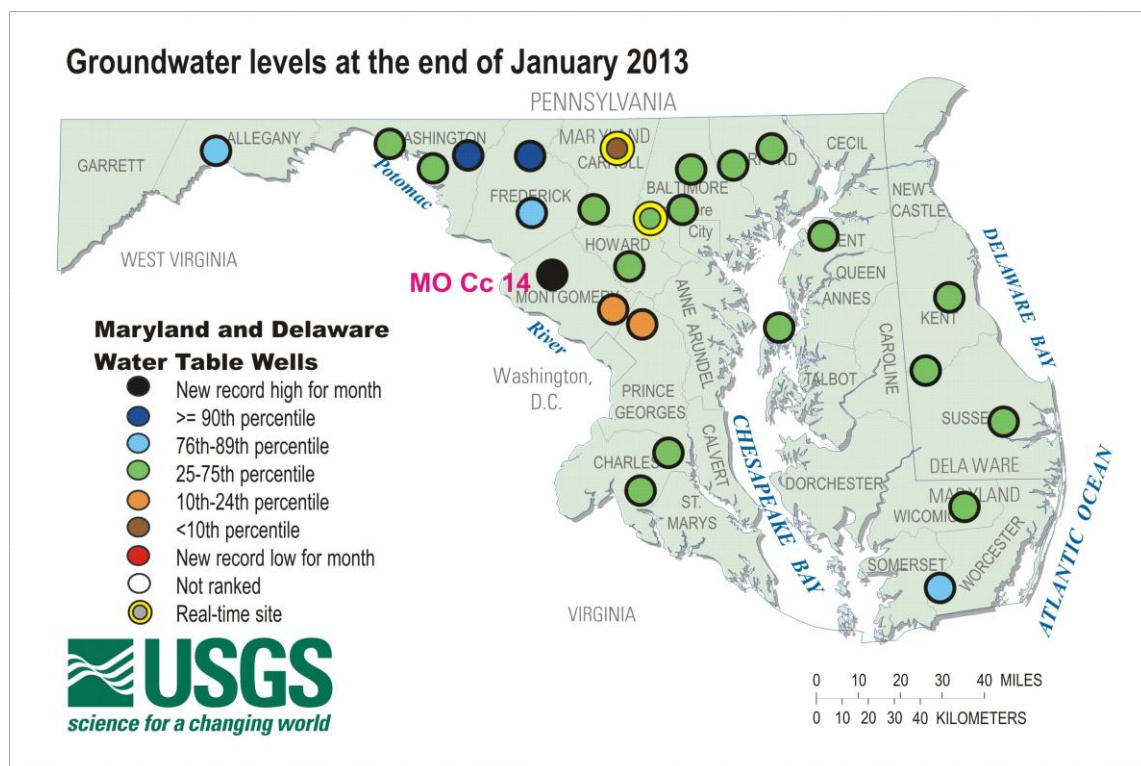
Groundwater

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.

January 2013 Groundwater Levels

Groundwater levels used to monitor climatic conditions in Maryland and Delaware ranged from the lowest 10th percentile to a record high in January 2013. Normal is considered to be between the 25th and 75th percentiles.

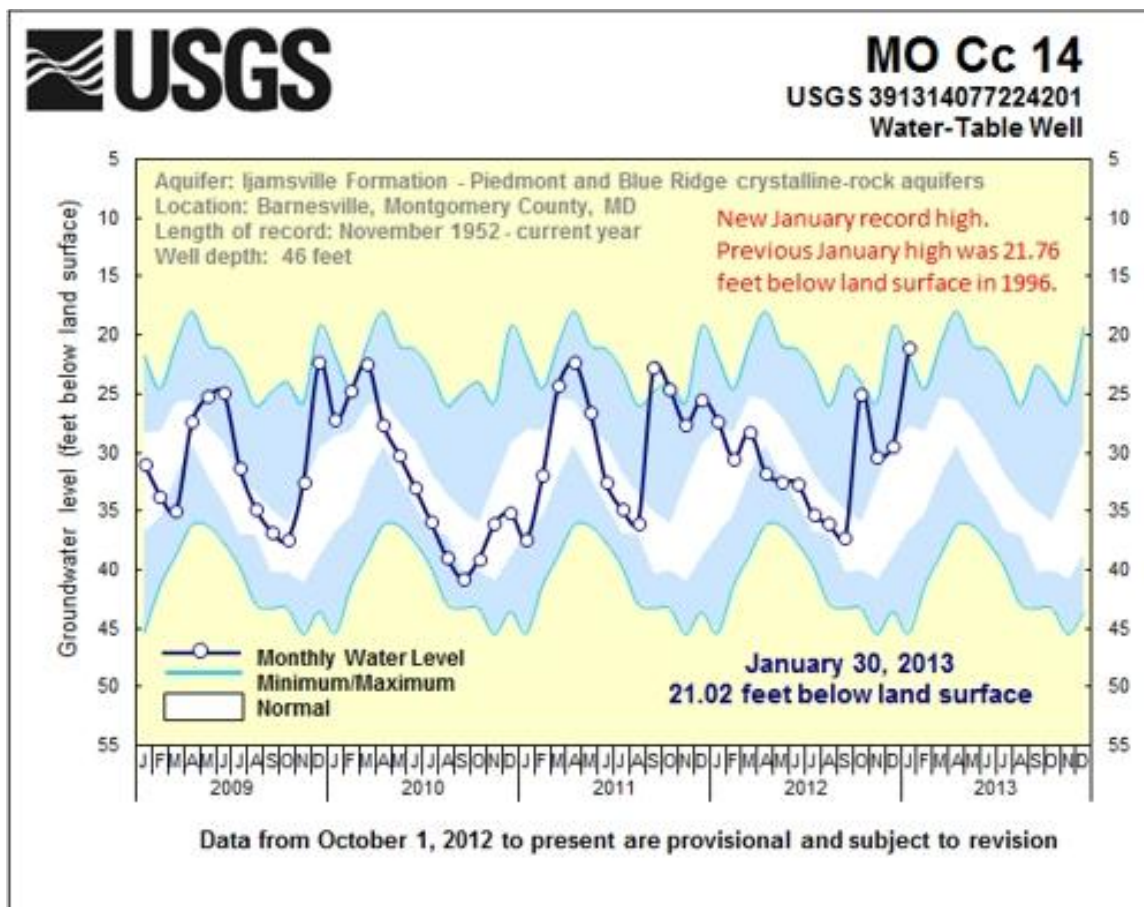


To access the clickable groundwater map, go to:

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

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The groundwater level in USGS monitoring well MO Cc 14 in Montgomery County, Maryland rose 8.43 feet from December 2012, and set a new January high at 21.02 feet below land surface (black circle on map). This value exceeded the previous record of 21.76 feet below land surface in 1996. Average January precipitation combined with the wet fall and major recharge from Superstorm Sandy rainfall have contributed to the record high groundwater level at this well. Warm than average temperatures may have also keep the ground from freezing, allowing a greater percentage of precipitation to infiltrate.



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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Reservoir Levels

Reservoir storage at the end of January 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.

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 100 percent of normal storage capacity or 112 percent of usable capacity at the end of January with 11.92 billion gallons. Not all of the water in the reservoir is usable; for operational purposes, percent of normal storage capacity is used, but this value can exceed 100 percent.

January 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	119%	6.65	Above normal storage; 104 percent of usable capacity (6.374 billion gallons)
Duckett	105%	5.27	Above normal storage; 92 percent of usable capacity (5.7189 billion gallons)
Total	112%	11.92	