

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

October 2011

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

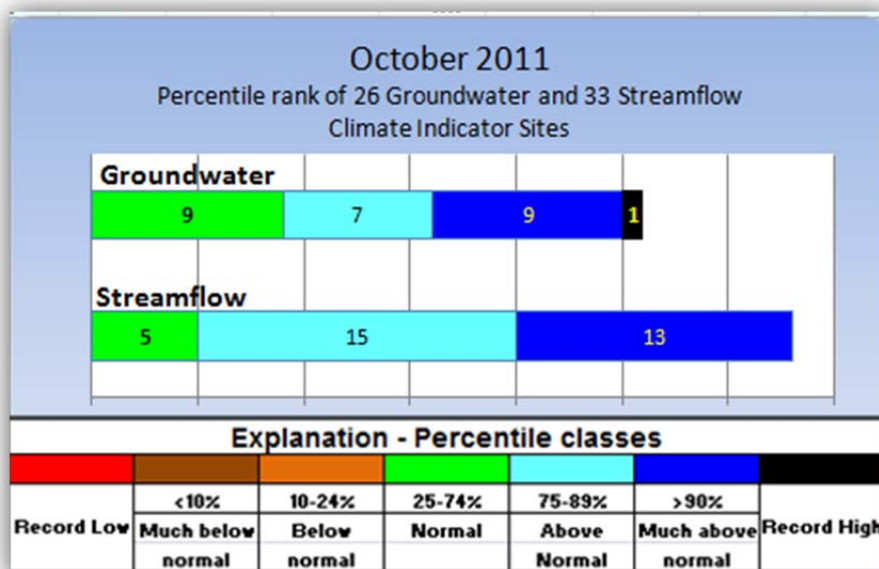
USGS water data is valuable to the public, researchers, water managers, planners, and agricultural users, especially during floods and droughts. These data can be used to assess how water resources respond to changes in climate. Scientists at the USGS have measured streamflow and groundwater levels in 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 precipitation. 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 October 2011 Water Conditions Summary

At the end of October, streamflow and groundwater levels in the Mid-Atlantic region were still showing effects from the precipitation and runoff from Hurricane Irene and Tropical Storm Lee, which had dropped heavy rain over large parts of Maryland, Delaware, and the District of Columbia in August and September. Streamflow and groundwater levels were normal to above normal at all sites monitored by the USGS to assess the response to climatic conditions in Maryland, Delaware, and the District of Columbia region.



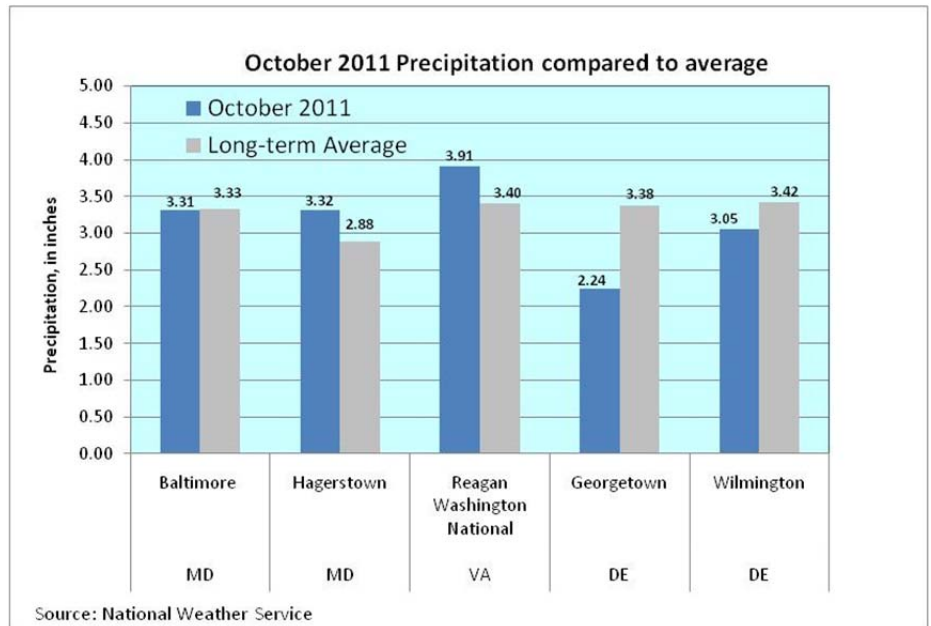
A **percentile** is a value on a scale from 0 to 100 that indicates the percent of a distribution that is equal to or below it. For example, a groundwater level in the 90th percentile is equal to or greater than 90 percent of the values recorded for that month.

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

Precipitation

After 2 months of above average rainfall, October rainfall was close to the long-term average at National Weather Service (NWS) stations in Maryland and the District of Columbia. Rainfall was lowest at the National Weather Service station in Georgetown, Delaware, with 2.24 inches.

The Middle Atlantic River Forecast Center's 365-day precipitation data show all counties in the Maryland and Delaware region at average levels, except for five counties in Maryland (Anne Arundel, Baltimore, Cecil, Harford, and Prince George's Counties), and New Castle County in Delaware, which were above average.



Note from the National Weather Service: September 2011 was the first month to incorporate the new 1981-2010 climate normals that were calculated by the National Climatic Data Center. The new normals replaced the 1971-2000 normals.

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>

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 to 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:

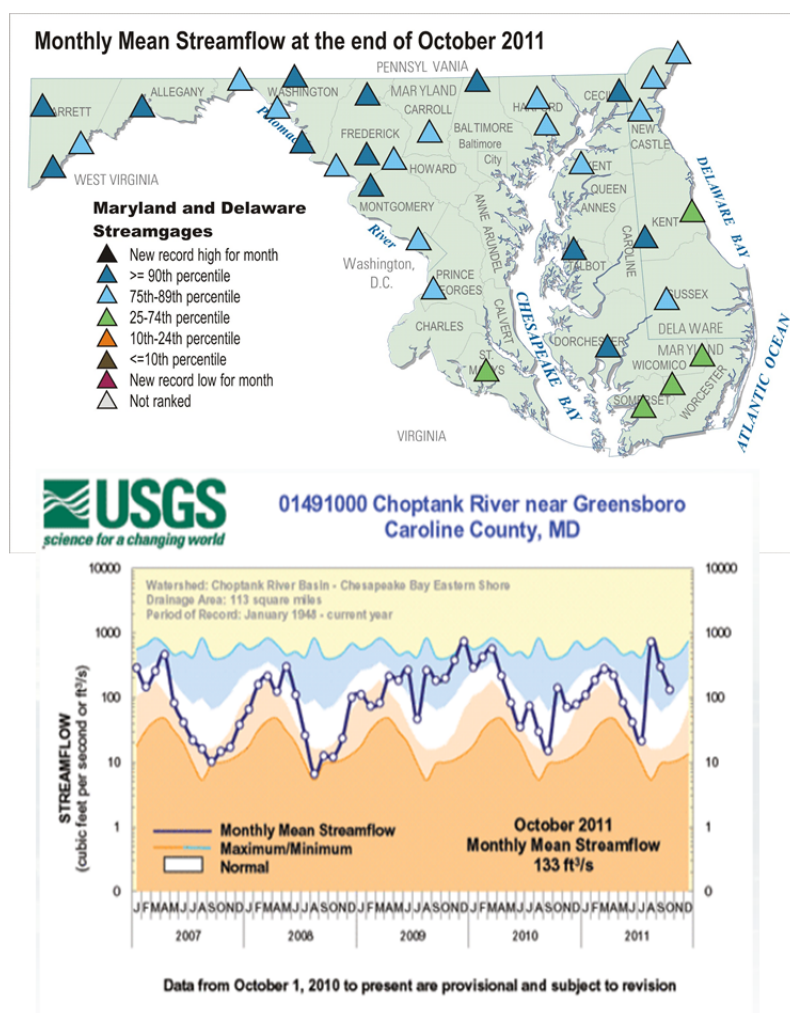
- Minimum period of record is 10 years of continuous data;
- Watersheds greater than 5 square miles;
- Streamflow is not regulated, or has relatively natural flow;
- Streamflow data reflects climatic conditions; and
- The surrounding area and watershed are not urban.

Streamflow for October 2011

Monthly mean streamflow was above normal in 85 percent (28 of 33 sites) of the monitored streams in Maryland, Delaware, and the District of Columbia. The five streams in the normal range in October were in southern Maryland, the lower Delmarva Peninsula, and Delaware.

The October 2011 monthly mean streamflow at Choptank River has continued to drop since the record peak in August, but the streamflow remains above normal.

The dark line in the 5-year hydrograph represents the current monthly mean streamflow and the white band shows the normal range (25th to 74th 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.



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

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

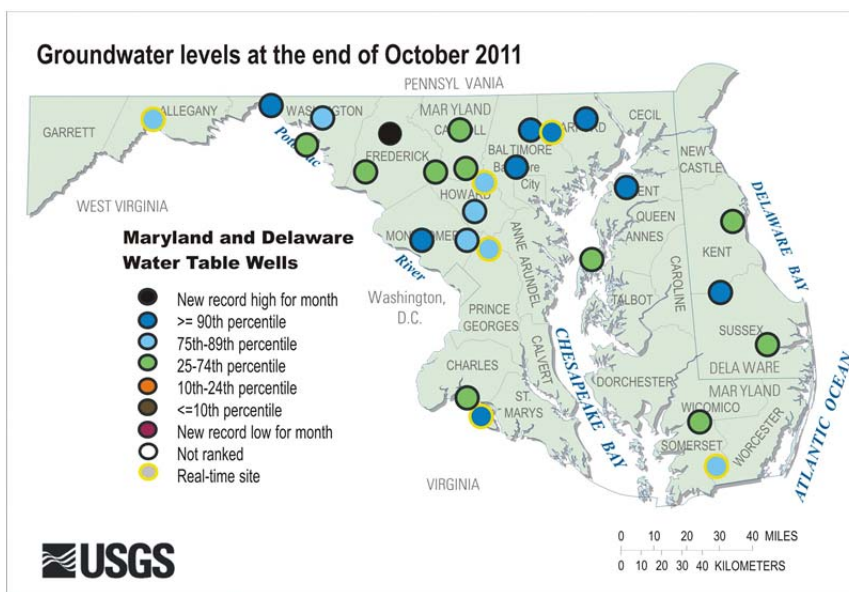
Groundwater

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

October 2011 Groundwater Levels

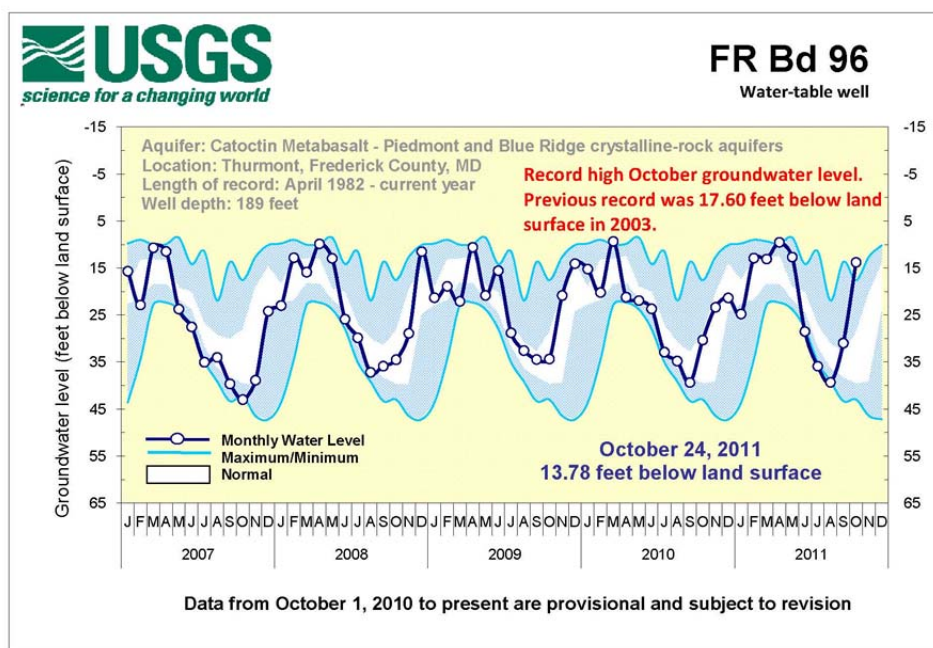
Groundwater levels remained high in October and one site was at a record high in Frederick County, Maryland. Groundwater levels were in the highest 90th percentile in another 10 wells. Overall, 65 percent of groundwater levels (in 17 of 26 wells) used by the USGS to assess climatic conditions in the region had above normal water levels. There were no below normal water levels in October.



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

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

The effects of Hurricane Irene and Tropical Storm Lee are evident in observation well FR Bd 96, which reached a record high water level of 13.78 feet below land surface this October. The previous record high of 17.60 feet was set in 2003, shortly after the East Coast was hit by Tropical Storm Isabel. Groundwater levels at FR Bd 96 had set record lows in June, July, and August, 2011.



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 line, the maximum and minimum monthly values, and the normal range (between the 25th and 74th 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.

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

Reservoir Levels

All regional reservoirs were full at the end of October 2011. Storage in the Baltimore reservoirs (Loch Raven, Liberty, and Prettyboy) was at 100 percent of available storage capacity, or 75.85 billion gallons.

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 100 percent of normal storage capacity, with 10.96 billion gallons at the end of October.

October 2011	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	100%	5.83	
Duckett	100%	5.13	
Total	100%	10.96	