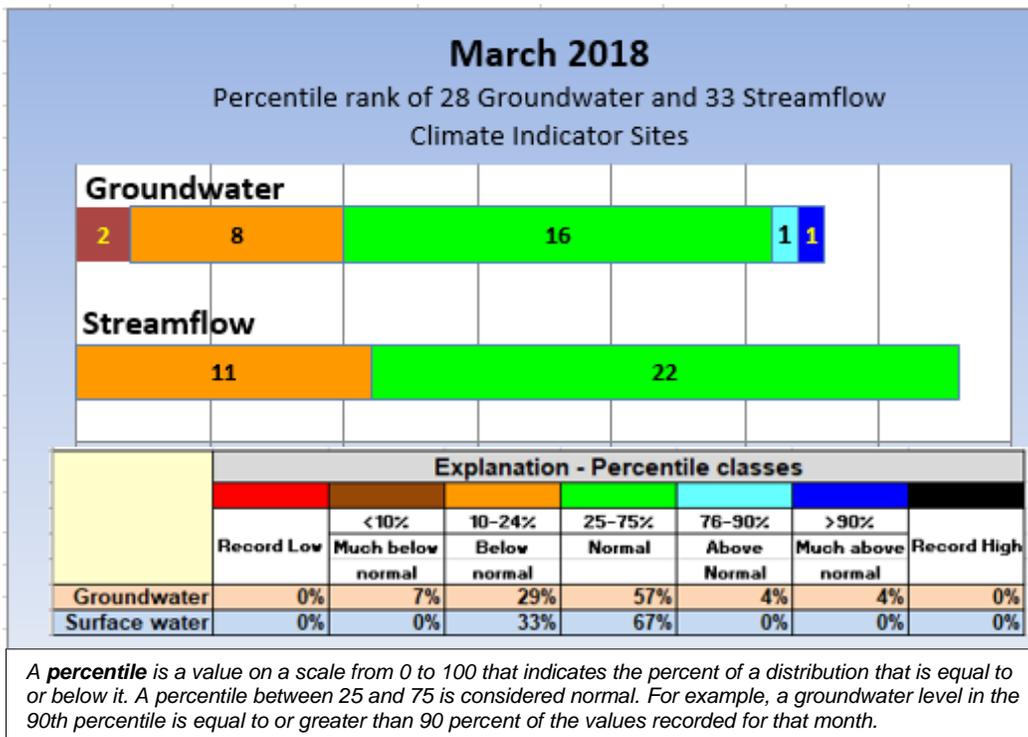


U.S. Geological Survey (USGS) Maryland-Delaware-District of Columbia Monthly Water Conditions Summary

USGS March 2018 Water Conditions Summary

Hydrologic data from 28 wells and 33 streamgages are used to monitor the monthly groundwater and streamflow response to weather conditions in Maryland, Delaware, and the District of Columbia. In March 2018, groundwater levels ranged from below to above normal and monthly mean streamflows ranged from below normal to normal.

The number of groundwater and surface-water sites, and the percentage of the total number of groundwater or surface-water sites, that fall within each percentile range are shown in the graphic below for March 2018.



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 extreme conditions like floods and droughts. The USGS is known for its consistent measurement techniques and the most extensive set of historical groundwater and streamflow data available to the public. Since these long-term data were collected during wet and dry periods, they can be used to assess how water resources respond to changes in weather, and to evaluate how current data compare to the historical data. The uniformity of the dataset enables multi-state comparisons and other comparative statistical analyses that can better inform policy makers of possible water-resources conditions they might encounter in the future.

The sites used in this water summary were carefully selected to include long-term datasets, and show the response of streamflow and groundwater levels to weather conditions, rather than the effects of human influences. Of the USGS sites presented in this summary, 13 wells and 29 streamgages have more than 50 years of data. The current streamflow and groundwater data are ranked in comparison to the historical record and summarized. In addition to groundwater and streamflow data, this summary includes precipitation data and reservoir levels, to give a more complete picture of the region's water resources. Hydrologic and weather data have not

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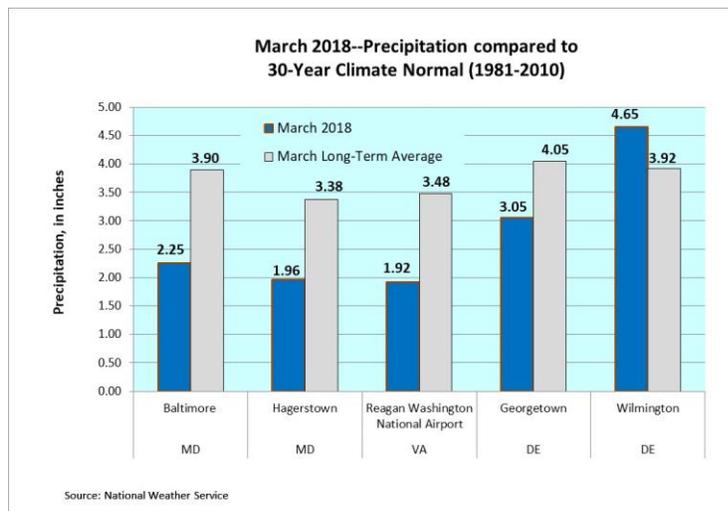
been reviewed, and are therefore provisional and subject to revision.

Precipitation

Monthly data from five Mid-Atlantic National Weather Service (NWS) stations are used to present monthly precipitation data to compare to the response of groundwater and streamflow. The NWS uses averages of data over the 30-year climate normal period from 1981 through 2010.

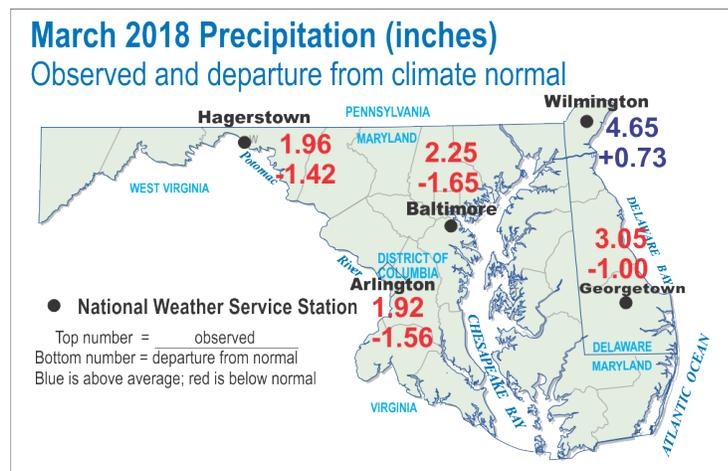
March 2018 Precipitation

The long-term average March precipitation for the five Mid-Atlantic NWS weather stations is shown in the graph and map below, and uses the 30-year climate normal period from 1981-2010.



National Weather Service Stations

- Baltimore** = Baltimore/Washington International Thurgood Marshall Airport (BWI)
- Georgetown** = Georgetown, Sussex County Airport
- Hagerstown** = Hagerstown Regional Airport
- Arlington** = Ronald Reagan Washington National Airport
- Wilmington** = New Castle Airport



Source: National Weather Service
 DC and MD: <http://www.weather.gov/climate/index.php?wfo=lxr>
 DE: <http://www.weather.gov/climate/index.php?wfo=phi>
 MARFC: http://www.weather.gov/marfc/Precipitation_Departures

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Groundwater

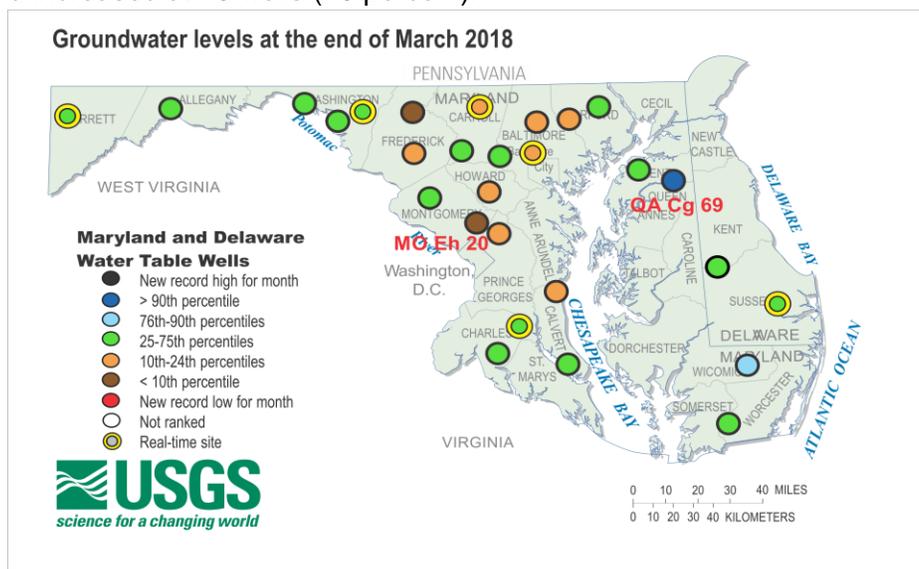
The USGS monitors groundwater levels in surficial or unconfined aquifers, providing observations that can be compared to both short-term and long-term changes in weather conditions. The groundwater wells used for the monthly water summary were selected based on the following criteria:

- Located in a surficial or unconfined (water-table) aquifer
- Open to a single, known hydrogeologic unit/aquifer
- Groundwater hydrograph generally reflects response to weather
- No indicated nearby pumpage, and likely to remain uninfluenced by pumpage 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 a casing – dug wells are generally not used
- Water levels show no apparent hydrologic connection to nearby streams
- Well rarely goes dry
- Long-term accessibility likely, such as on public land

In the Maryland, Delaware, and District of Columbia region, it is useful to compare current data to historical data, such as data from the droughts of 2002 and the 1960s. There are 11 wells that have over 60 years of groundwater data, and 23 wells that have more than 30 years of groundwater data as of 2018.

March 2018 Groundwater Levels

Fifty-seven percent, or 16 USGS observation wells, had groundwater levels within the normal range (25th-75th percentiles) in March. Groundwater levels were above normal at 2 wells (1 in the 75th-90th percentile range, and 1 greater than the 90th percentile), and below normal at the remaining 10 wells, including 8 wells in the 10th-24th percentile range, and 2 wells below the 10th percentile. Between February and March, groundwater levels decreased at 15 wells (54 percent) and increased at 13 wells (46 percent).

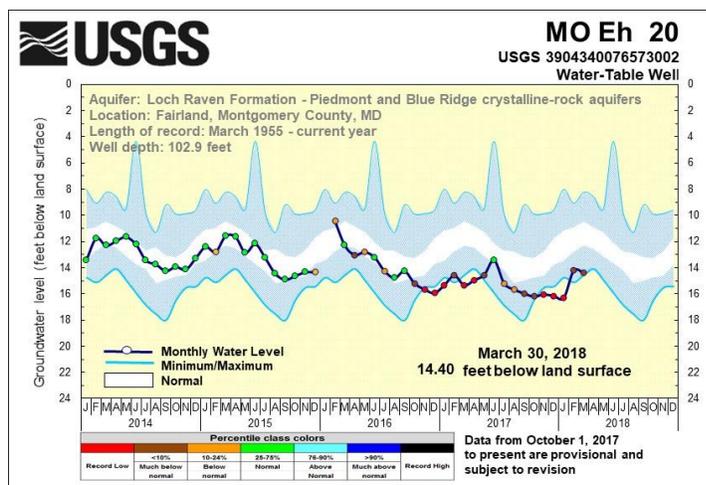


To access the clickable groundwater map, go to:
http://md.water.usgs.gov/groundwater/web_wells/current/water_table/counties/

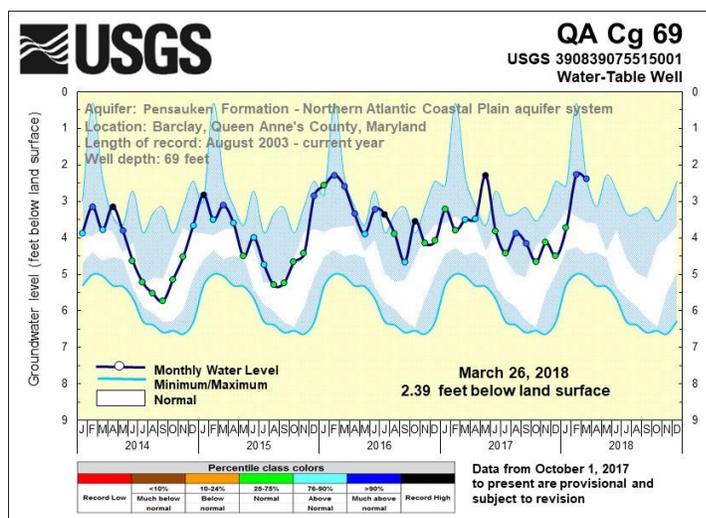
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In the two 5-year hydrographs for the selected wells, groundwater levels are shown as a dark blue line. Each monthly measurement is colored according to the percentile rank compared to the historical values at the site for the month. The normal range is displayed as a white band, and is based on the period of record. The maximum water level is at the top of the upper blue section, and the minimum water level is at the bottom of the lower blue area in the graph.

The groundwater level at observation well MO Eh 20, in Montgomery County, Maryland, was below the 10th percentile in March at 14.40 feet below land surface. Normal March groundwater levels at this well range from 10.51 to 12.33 feet below land surface. Monthly record-keeping at this well began in March 1955.



The groundwater level at USGS observation well QA Cg 69, in Queen Anne's County, Maryland, was 2.39 feet below land surface. The normal range of groundwater levels for March at this well is between 3.30 and 4.41 feet below land surface. Record-keeping at this well began in August 2003.



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 most commonly used for assessing water supply and to determine 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.

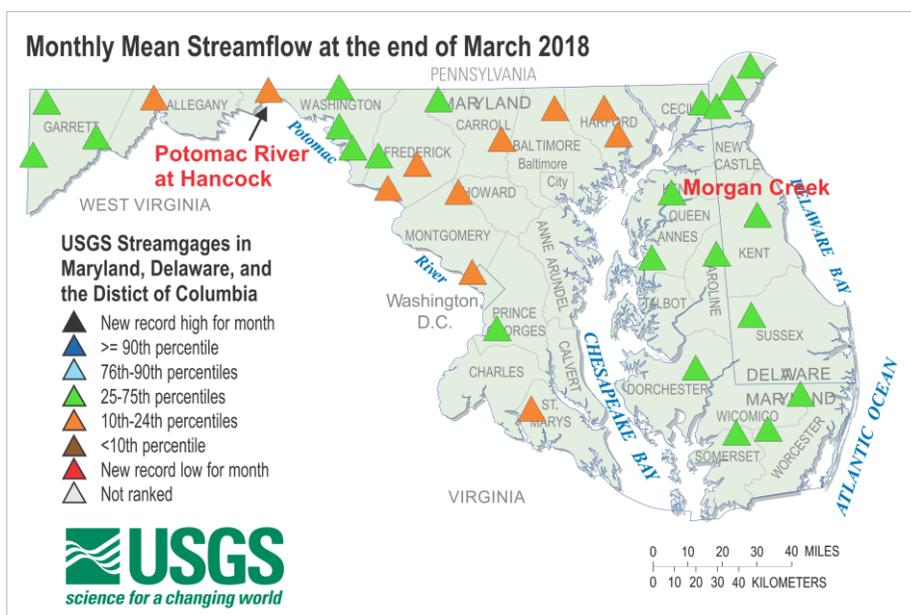
The USGS streamgages chosen for the monthly water summary were selected based on the following criteria:

- Minimum period of record is 10 years of continuous data
- Watershed areas greater than 5 square miles
- Streamflow is not regulated, such as by a dam or diversion, and has relatively natural flow
- Streamflow data reflect a response to weather conditions
- Most of the surrounding area and watershed are not urban

Of the 33 streamgages used in this summary, 22 have more than 60 years of data, allowing for comparison to data from the historical droughts of 2002 and the 1960s. All 33 streamgages have at least 30 years of monthly mean streamflow data.

March 2018 Streamflow

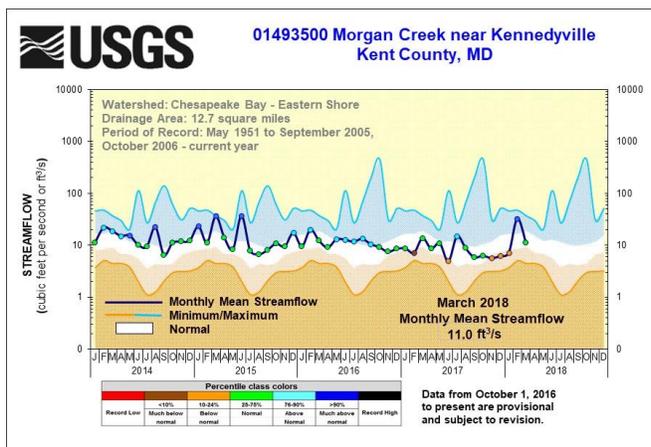
Monthly mean streamflows were in the normal range at 67 percent, or 22 of 33 selected USGS streamgages. Streamflow was below normal at the remaining 11 streamgages in Maryland, Delaware, and the District of Columbia. Streamflow decreased at all 33 streamgages in March.



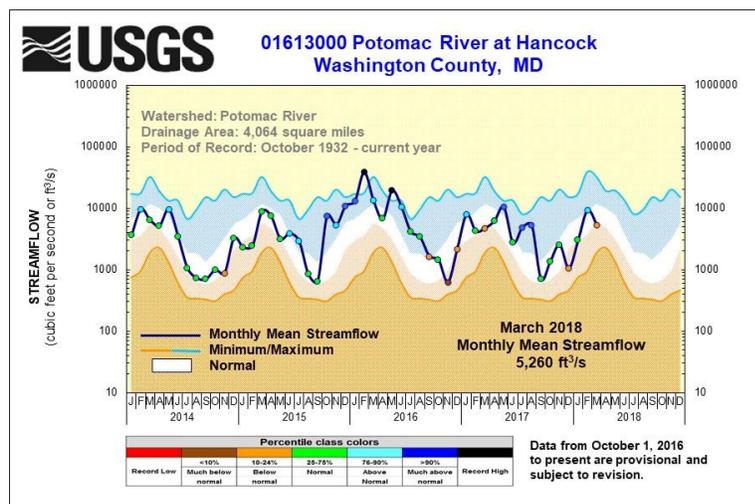
To access the clickable streamflow map, go to:
<http://md.water.usgs.gov/surfacewater/streamflow/>

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In the hydrograph for the selected streamgages, 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-75th percentiles) 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 bottom of the tan area. Each monthly mean streamflow is colored according to the percentile rank compared to the historical data for the month.



Monthly mean streamflow at Morgan Creek near Kennedyville in Kent County, Maryland, was 11.0 cubic feet per second (ft³/s), which is in the normal range. The normal streamflow range for March is between 8.43 ft³/s and 16.8 ft³/s. Record-keeping at this streamgage began in October 2006.



At the Potomac River at Hancock, in Washington County, Maryland, the monthly mean streamflow was 5,260 ft³/s, which is below normal. The normal streamflow range for March is between 5,600 ft³/s and 17,000 ft³/s. Record-keeping at this streamgage began in October 1932.