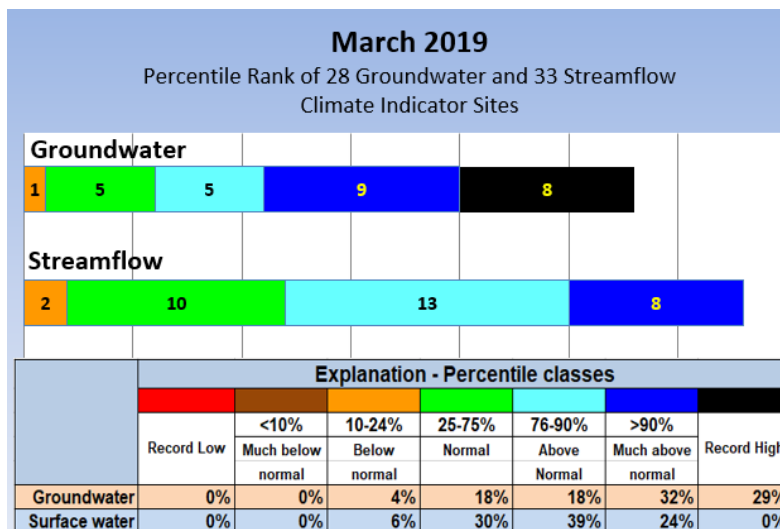


# U.S. Geological Survey (USGS) Maryland-Delaware-District of Columbia Monthly Water Conditions Summary

## USGS March 2019 Water Conditions Summary

Hydrologic data from 28 wells and 33 streamgages were used to monitor the monthly groundwater and streamflow response to weather conditions in Maryland, Delaware, and the District of Columbia. In March 2019, groundwater levels were at record March highs at eight wells and above normal at 79 percent of the wells. Monthly mean streamflow was above normal at 64 percent of the streamgages.

The number of groundwater and surface-water sites, and the percentage of the total number of groundwater and surface-water sites that fall within each percentile range, are shown in the graph for March 2019.



*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.*

### 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 32 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 to give a more complete picture of the region's water resources. Hydrologic and weather data have not been reviewed and are therefore provisional and subject to revision.

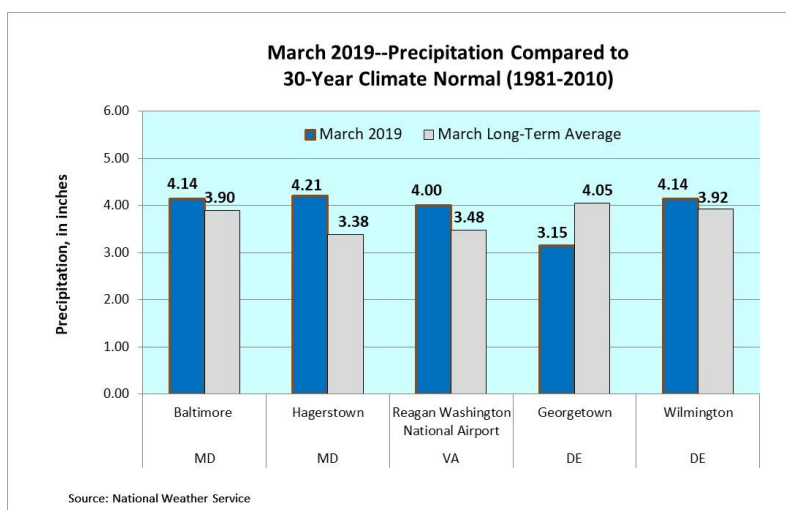
# U.S. Geological Survey (USGS) Maryland-Delaware-District of Columbia Monthly Water Conditions Summary

## Precipitation

Monthly data from five Mid-Atlantic National Weather Service (NWS) stations were used to show the relation between monthly precipitation and monthly groundwater levels and streamflows. The NWS uses averages of data over the 30-year climate normal period from 1981 through 2010.

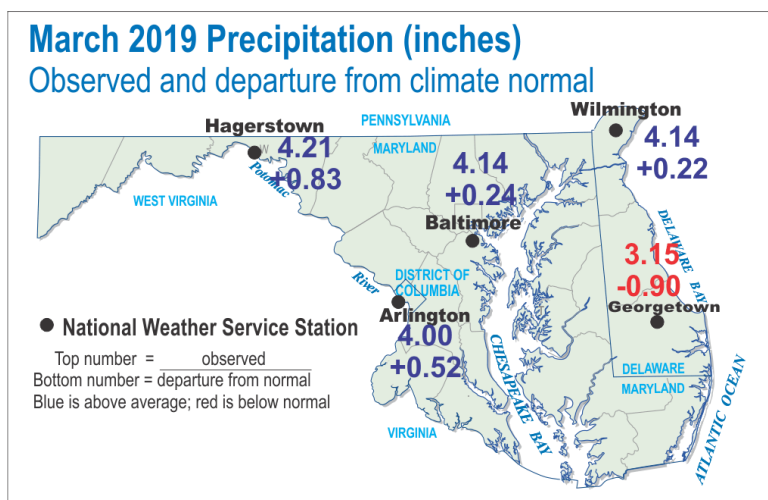
### March 2019 Precipitation

Precipitation was above normal at four Mid-Atlantic NWS weather stations and below normal at one NWS weather station in March. The long-term average March precipitation for the five Mid-Atlantic NWS weather stations is shown next to the March 2019 precipitation in the graph and map below.



### 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: <https://w2.weather.gov/climate/index.php?wfo=lwx>  
 DE: <https://w2.weather.gov/climate/index.php?wfo=phi>  
 MARFC: [http://www.weather.gov/marfc/Precipitation\\_Departures](http://www.weather.gov/marfc/Precipitation_Departures)

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

## Groundwater

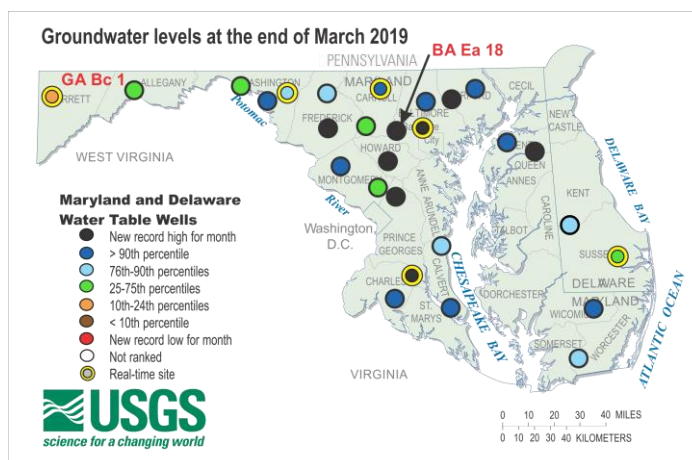
The USGS monitors groundwater levels in surficial or unconfined aquifers, providing observations that can be compared to both short-term and long-term changes in weather conditions. The groundwater wells used for the monthly water summary were selected based on the following criteria:

- 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 1999--2002 and the 1960s. There are 12 wells that have over 60 years of groundwater data, and 26 wells that have more than 30 years of groundwater data as of March 2019.

## March 2019 Groundwater Levels

Groundwater levels were at record March highs at 8 of 28 wells, above the 90<sup>th</sup> percentile at 9 wells, within the 76<sup>th</sup>-90<sup>th</sup> percentile range at 5 wells, and in the normal range (between the 25<sup>th</sup> and 75<sup>th</sup> percentiles) at 5 wells, and below normal at the observation well in Garrett County. Between February and March, groundwater levels increased at 15 wells and decreased at 13 wells included in this report.

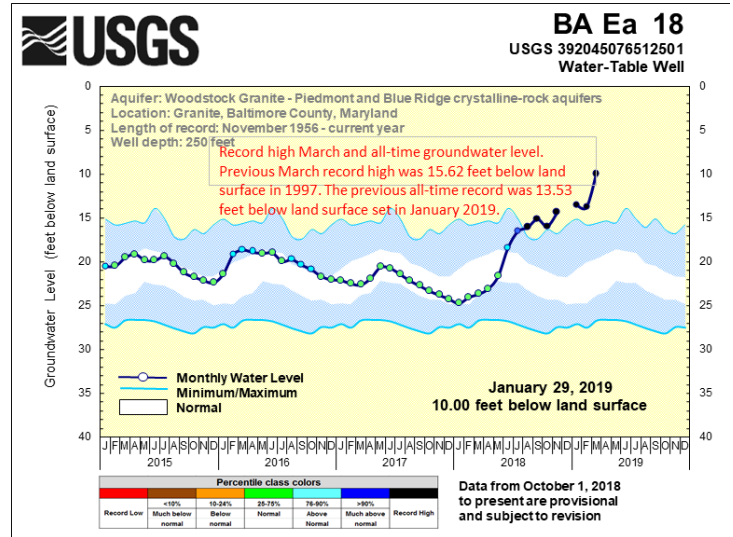


To access the clickable groundwater map, go to:  
[http://md.water.usgs.gov/groundwater/web\\_wells/current/water\\_table/counties/](http://md.water.usgs.gov/groundwater/web_wells/current/water_table/counties/)

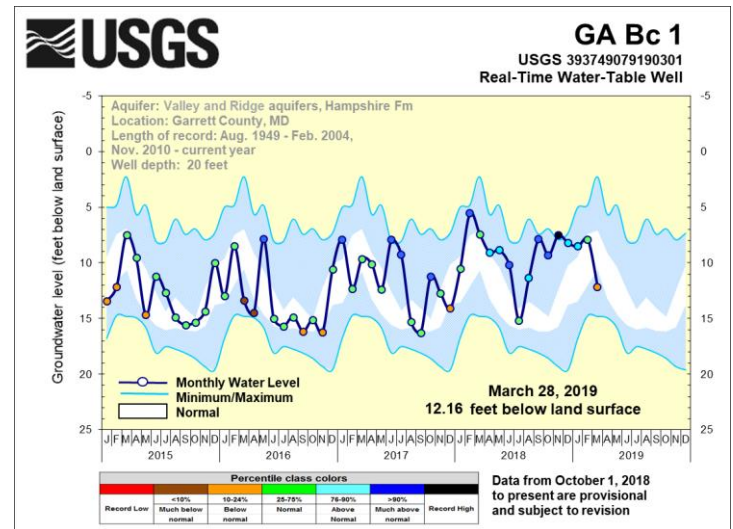
# U.S. Geological Survey (USGS) Maryland-Delaware-District of Columbia Monthly Water Conditions Summary

In the 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 BA Ea 18, in Baltimore County, Maryland, was 10.00 feet below land surface, which is a March record high and an all-time record high. The previous March record was 15.62 feet below land surface in 1997. The groundwater level rose almost 4 feet between February and March. The March 2019 value also was the all-time record high for this well, exceeding the all-time record high set in January 2019, and reaching the highest level since data collection began in 1956. Groundwater levels at this well have been at record highs for the last 6 consecutive months.



The groundwater level at USGS observation well GA Bc 1, in Garrett County, Maryland, was 12.16 feet below land surface, which is below normal. This was the only observation well out of 28 that was below normal.



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 most commonly used for assessing water supply and to determine the risk of droughts and floods. Streamflow data also are used to calculate loads of chemical constituents, and to assess how biological communities are affected by hydrologic conditions.

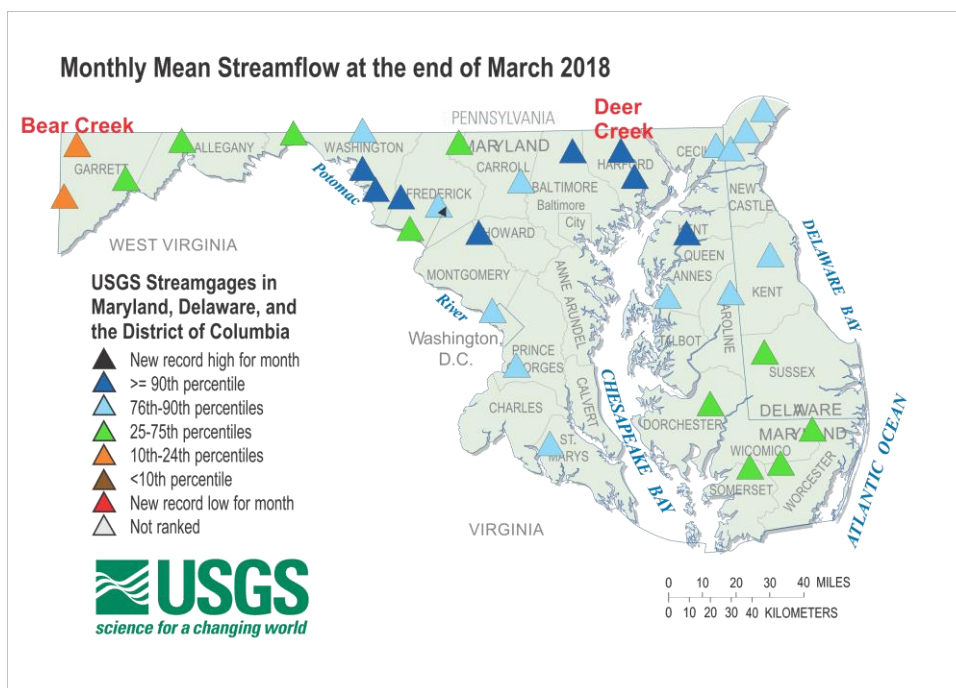
The USGS streamgages chosen for the monthly water summary were selected based on the following criteria:

- 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, 27 have more than 60 years of data, allowing for comparison to data from the historical droughts of 1999--2002 and the 1960s. All 33 streamgages have at least 30 years of monthly mean streamflow data.

## March 2019 Streamflow

Monthly mean streamflows were at or above normal at 94 percent of the streamgages in March. Streamflow was above the 90<sup>th</sup> percentile at 8 streamgages, between the 76<sup>th</sup> and 90<sup>th</sup> percentiles at 13 streamgages, in the normal range (25<sup>th</sup> – 75<sup>th</sup> percentiles) at 10 streamgages, and below normal at 2 streamgages in western Maryland. Monthly mean streamflow increased at 21 streamgages between February and March, and decreased at 12 streamgages.



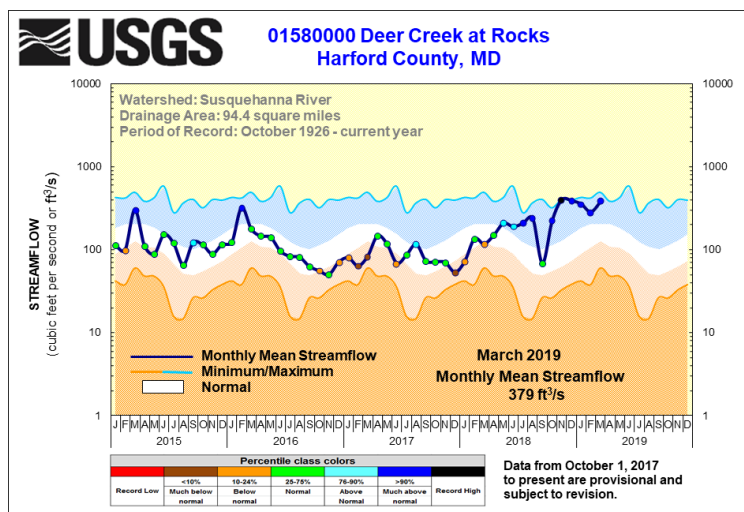
To access the clickable streamflow map, go to:  
<http://md.water.usgs.gov/surfacewater/streamflow/>



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

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 (25<sup>th</sup>-75<sup>th</sup> 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 Deer Creek at Rocks, in Harford County, Maryland, was 379 cubic feet per second (ft<sup>3</sup>/s), which is in the above normal range for March. Streamflow has been above normal for the previous 6 consecutive months. Record-keeping at this streamgage began in October 1926.



At Bear Creek in Garrett County, Maryland, the monthly mean streamflow was 124 ft<sup>3</sup>/s, decreasing from above normal for the previous 6 months to below normal in March. Record-keeping at this streamgage began in October 1964.

