



News Release

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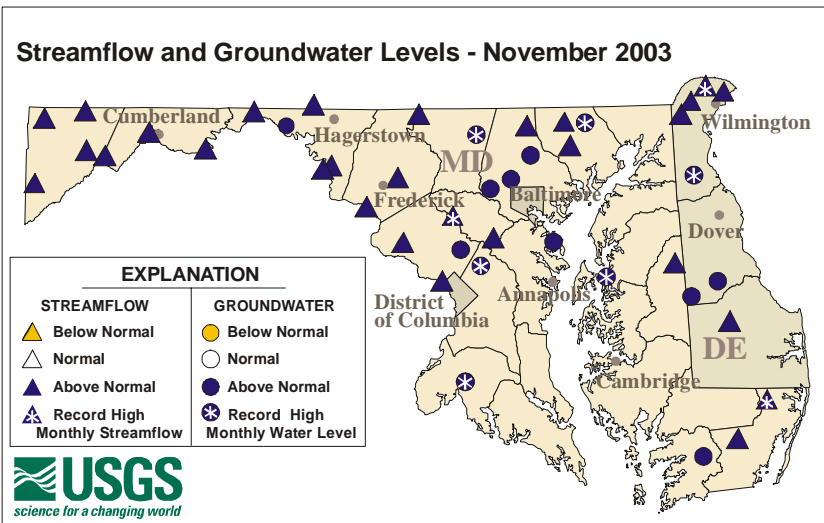
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More Record-High Water Levels in November 2003

Eleven months of above normal precipitation makes 2003 one of the top three wettest years on record. The abundant precipitation has led to record-setting high streamflow and groundwater levels across Maryland and Delaware. Monthly mean streamflow into the Chesapeake Bay was the second highest November flow for the period of record (since 1937). Monthly mean streamflow at three streams was at their highest November flows. Groundwater levels at six wells were at their highest November levels in 40 years, and for three of these wells, it was the third consecutive month of record high levels, according to hydrologists at the U.S. Geological Survey (USGS). Hydrologists expect to see the highest water levels for the year in the winter and spring when recharge has reached its peaked and precipitation becomes runoff. Water levels in several wells and streams are already near their annual high levels. However, water levels in some of the deep aquifers in southern and eastern Maryland continue to decline because the aquifers are being pumped more quickly than they can be recharged.



The map to the left shows the wells and streams used by the USGS to monitor water conditions in Maryland, Delaware, and Washington, D.C. In November, all wells and streams were at above normal levels (dark circles and triangles). Six wells were at their highest November levels in 40 years (represented by an asterisk). Three streams had the highest monthly mean flow for November.

Since the region recovered from the drought last winter, water levels in most of these streams and wells have been at above normal levels.

For news release and images, go to http://md.water.usgs.gov/publications/press_release/current/

Precipitation

Precipitation during 2003 has been far above normal levels. To date, 2003 is the third wettest year on record in Baltimore, and only 4.40 inches of precipitation are needed in December to break the record set in 1889, according to the National Weather Service. Above normal rainfall has left groundwater and streamflow levels across Maryland and Delaware at very high levels. Since the ground is nearly saturated, when it rains, the water has little place to go except to accumulate in low-lying areas or become runoff and fill our waterways. The high water levels make the region vulnerable to localized flooding.

Chesapeake Bay

Total flow into the Chesapeake Bay during November was the second highest since record keeping began in 1937. Flow averaged 99.2 bgd (billion gallons per day), which is three times the normal November flow into the Bay. The highest November flow was in 1985 (113 bgd). Flow has been above average since March 2003, which has contributed to higher amounts of nutrients and sediments entering the Bay.

With normal flow in December, calendar year 2003 will be the third highest annual flow to the Chesapeake Bay. A record-setting December flow could make 2003 the highest annual flow to the Bay. The outcome will largely depend on how much rain falls in the Susquehanna River basin, which typically contributes more than 50 percent of the flow to the Bay. More information about streamflow, water quality, and the Chesapeake Bay can be found at <http://chesapeake.usgs.gov/> and www.chesapeakebay.net.

Streamflow

Streamflow across Maryland and Delaware has been at above normal levels for more than a year. In November, the Patuxent and Pocomoke Rivers in Maryland, and Brandywine Creek in Delaware were at their highest November monthly mean streamflows. Monthly flows were all above normal at all the streamflow stations used to assess water conditions. Five-year monthly streamflow hydrographs from the USGS stream-gaging network can be viewed on the USGS website at <http://md.water.usgs.gov/surfacewater/streamflow/>. Current and historical streamflow data can be monitored on the web at: <http://waterdata.usgs.gov/>.

Daily streamflow on the Potomac River near Washington, D.C. in November averaged 15.7 bgd, which is about 3 times higher than normal November flow. During the last 6 months, the lowest daily flow for each month has exceeded the long-term monthly mean. More information on the Potomac River is available at: <http://md.water.usgs.gov/monthly/poto.html>

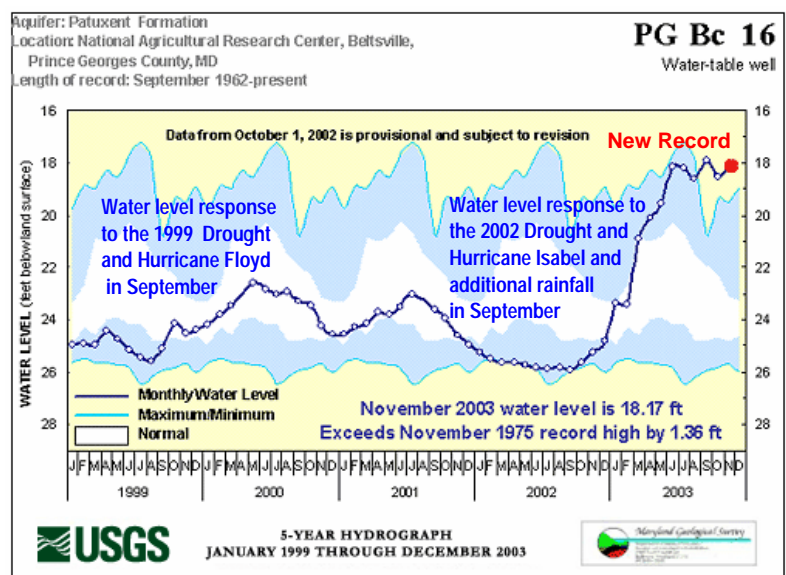
Groundwater-Unconfined or Shallow Aquifers

All of the 15 wells used by the USGS to monitor unconfined or shallow aquifer response to climatic conditions in the bi-state region were either at record highs or within a foot of their highest November levels. Wells in Carroll, Charles, Harford, Prince Georges, and Queen Annes Counties, Maryland, and New Castle County in Delaware reached the highest November level in 40 years. This is the third consecutive month of record-setting high levels for wells in Harford, Queen Annes, and Prince Georges Counties. Last November, the region had just recovered from the severe hydrologic drought of 2002. Water levels are expected to rise through the winter and spring months as groundwater resources are recharged. Recharge typically begins in October when most plants are dormant and temperatures are lower. This year, water levels are already at high levels typically seen during the winter and spring. Winter's cold temperatures can cause the ground to freeze and recharge will subside until warmer temperatures and melting occurs in the spring.

The 5-year hydrograph for a well in Prince Georges County at left shows that the water level in the well, measured in depth below land surface, is at a record-setting high for November 2003 and has been for the last three consecutive months. The water level is near to the all-time record set in July 1972. Water levels recovered from the record-setting low during the 2002 drought a year ago, and have been above normal for the past 9 months.

Notice the greater response in the water level at this well to the drought and hurricanes in 2002-2003 in comparison to the drought in 1999 and recovery from Hurricane Floyd.

For 5-year hydrographs of groundwater levels for the climatic indicator wells, visit: <http://md.water.usgs.gov/groundwater/>.



Groundwater-Confined or Deep Aquifers

Although water is plentiful at the surface (streams, reservoirs, and shallow groundwater reserves are full), some of the deep confined aquifers used for water supply by many people living in southern and eastern Maryland continue to decline. The water levels continue to decline because they are being pumped more quickly than deep groundwater is recharged and because the confined aquifers are deep, water levels in confined aquifers take longer to respond to climatic conditions than shallow aquifers. Confined aquifer wells are measured monthly and can be viewed at <http://md.water.usgs.gov/groundwater>.

Reservoir Storage

High groundwater levels and above normal streamflow and rainfall helped to keep reservoir storage levels in the Baltimore reservoir system and in the Triadelphia and Duckett Reservoirs on the Patuxent River at capacity in November.

USGS Water Monitoring

Streamflow and groundwater levels are used to assess the current water conditions and can be used to predict the potential for flooding and drought conditions. These USGS data have been provided to State and local water resource managers and are critical for making appropriate decisions on water regulation. For more information on streamflow and groundwater levels in Maryland, Delaware, and Washington, D.C., visit Water Watch at: <http://md.water.usgs.gov/waterwatch/>.

Groundwater is an important component (in addition to streamflow and reservoir storage) in assessing water resources, however, as groundwater is usually hidden underground, it is difficult to know the status of aquifers in a timely manner. Most wells are measured by hand on a regular basis, commonly monthly. Real-time data collection offers many benefits. Real-time groundwater data are defined as data automatically collected, transmitted, and made available to the public at least once a day. These data can be transmitted by land-line telephone, cellular telephone, radio, satellite telemetry, or a combination of these technologies. The advantages of real-time data collection include timeliness, data quality, data availability, and cost. There are currently five wells in Maryland and one well in Delaware equipped with real-time data collection. Within the next year, several wells in Calvert County, Maryland will also be monitored in real-time. To view real-time groundwater levels, visit the USGS NWISWeb site at <http://waterdata.usgs.gov/>. Select groundwater from the data category, then real-time, then your region of interest, such as Maryland.

The real-time streamflow stations used in this analysis are operated in cooperation with the Maryland and Delaware Geological Surveys, the Maryland State Highway Administration, the U.S. Army Corps of Engineers, the Maryland Department of Natural Resources, the Maryland Department of the Environment, Baltimore County, Baltimore City, and other agencies. The observation wells used in this analysis are operated in cooperation with the Maryland and Delaware Geological Surveys. The real-time wells are operated in cooperation with the Maryland and Delaware Geological Surveys, the Interstate Commission on the Potomac River Basin, and Calvert County, Maryland. The USGS publishes data for 137 streamflow stations and 379 observation wells across Maryland and Delaware.

The USGS serves the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

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