



News Release

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U.S. Geological Survey

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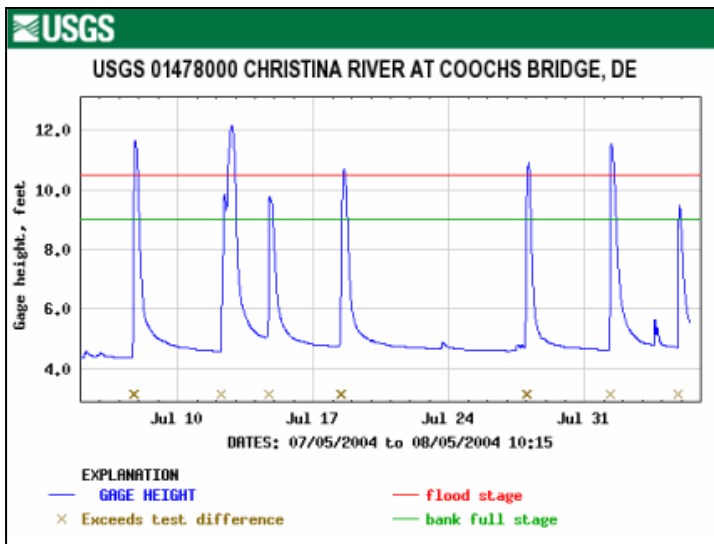
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Localized Flooding in Northeastern Maryland and Delaware in July

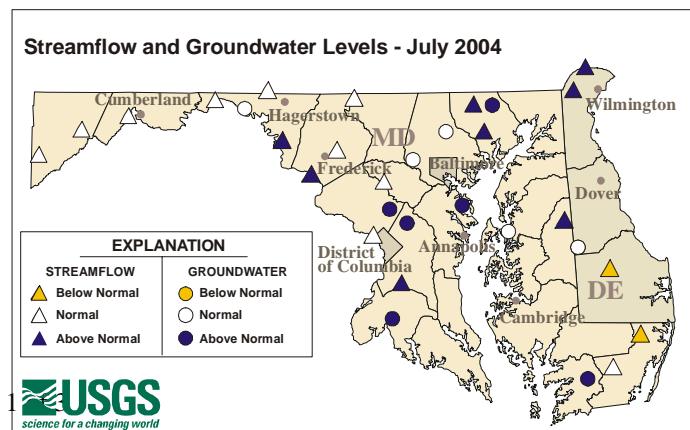
Intense rainfall left many areas flooded during July (see hydrograph below). Monthly water levels in streams and wells, however, do not show any extremes and most generally continued their downward trend, which is common during the summer when evapotranspiration (evaporation and water used by plants) rates are high. Streamflow and groundwater levels for Maryland and Delaware ranged from below normal to above normal, according to hydrologists at the U.S. Geological Survey (USGS).



The Christina River watershed is located in an urban setting and streamflow levels typically respond quickly to rainfall, as seen in the hydrograph to the left. The river filled its banks 7 times in July, and reached flood stage 4 times. The water level rose more than 5 feet in a matter of hours during these periods. Real-time water data is available on the web at <http://waterdata.usgs.gov>.

Status of Streams and Wells

The map to the right shows the location of the wells and streams used by the USGS to monitor water conditions in Maryland, Delaware, and the District of Columbia. In July, water levels were normal in western Maryland, normal to above normal in the Piedmont and southern Maryland regions. Water levels ranged from below normal to above normal in eastern Delaware.



Precipitation

Rainfall in July ranged from a high of 8.69 inches, or 4.84 inches above normal, at Baltimore-Washington International (BWI) Airport, to a low of only 2.30 inches at Hagerstown, Maryland, according to preliminary rainfall data from the National Weather Service. Rainfall in Wilmington, Delaware was above normal for the second consecutive month with 8.24 inches. Intense rainfall in short periods of time caused localized flooding in many small streams and low-lying areas.

Chesapeake Bay

Monthly mean streamflow into the Chesapeake Bay during July averaged 37.0 bgd (billion gallons per day), which is 52 percent above normal. The Susquehanna, Potomac, and James Rivers are the largest rivers in the Chesapeake Bay watershed and usually contribute about 90 percent of the freshwater streamflow to the Bay (see table below). In an average year, approximately 50 percent of the freshwater flow comes from the Susquehanna River, 25 percent from the Potomac River, and 15 percent from the James River. The remaining 10 percent comes from surrounding tributaries and smaller streams. This July, more freshwater entered the Bay from the Susquehanna River (59 percent) than normal, while the Potomac and James Rivers contributed less water than normal. The Potomac River contributed 13 percent, the James River 11 percent, and 17 percent was from other sources in July. More information about USGS studies to help with the protection and restoration of the Chesapeake Bay and its watershed can be found at <http://chesapeake.usgs.gov>.

Monthly Flow to the Chesapeake Bay (percent)				
	Susquehanna River	Potomac River	James River	Other
Average	50	25	15	10
July 2004	59	13	11	17

Streamflow

Several small streams overflowed their banks and caused flooding. Because many of these streams are small, streamflow is not measured at these sites. Urban streams respond quickly to rain events. This happens because pavement and other impervious surfaces do not allow the water to soak in and the water runs off to storm drains that channel the water quickly downstream. The water levels in streams such as Christina River in Delaware and at Jones Falls in Maryland rose more than 6 feet in a matter of hours in response to intense rainfall events. Streams in Maryland and Delaware ranged from below normal to above normal levels in July. Streams in western Maryland were flowing at normal levels, while streams in the central Maryland Piedmont region were above normal. In eastern Maryland and Delaware, streamflow on the Nanticoke and Pocomoke Rivers was below normal. Current and historical streamflow data can be monitored on the web at: <http://waterdata.usgs.gov/>. 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/>.

Daily streamflow on the Potomac River near Washington, D.C. averaged 3.6 bgd in July, which is 11 percent above normal for the month of July. More information on the Potomac River is available at: <http://md.water.usgs.gov/monthly/poto.html>.

Groundwater-Unconfined or Shallow Aquifers

Groundwater levels dropped in most of the wells used by the USGS to monitor unconfined or shallow aquifer response to climatic conditions in the bi-state region. Water levels were in the normal to above normal range during June. 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 water levels in the deep confined aquifers used for water supply by many people living in southern Maryland and the Delmarva Peninsula continue to decline. The decline is caused by pumping at greater rates than the rate at which deep groundwater is recharged, and because the confined aquifers are deep, water levels in confined aquifers take longer to respond to climatic conditions than water levels in shallow aquifers. Confined aquifer wells can be viewed at <http://md.water.usgs.gov/groundwater>. Real-time water-level data can be viewed at: <http://waterdata.usgs.gov/md/nwis/gw>

Reservoir Storage

Contents of the Baltimore reservoir system were at 98 percent capacity in July. The Baltimore reservoirs (Loch Raven, Liberty, and Prettyboy) have been nearly full since May 2003. Storage in the Triadelphia and Duckett Reservoirs on the Patuxent River, which serves Montgomery and Prince Georges Counties, remains at 96 percent of capacity.

Water Monitoring

The USGS has been collecting National streamflow data for 120 years, since 1884. Streamflow monitoring began in Maryland on the Potomac River at Point of Rocks, Maryland in 1895 and continues today. 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 the District of Columbia, visit Water Watch at: <http://md.water.usgs.gov/waterwatch/>.

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 long-term observation wells used in this analysis are operated in cooperation with the Maryland and Delaware Geological Surveys and the Interstate Commission on the Potomac River Basin. 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, 393 observation wells, and 4 springs across Delaware, Maryland, and the District of Columbia.

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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