



# News Release

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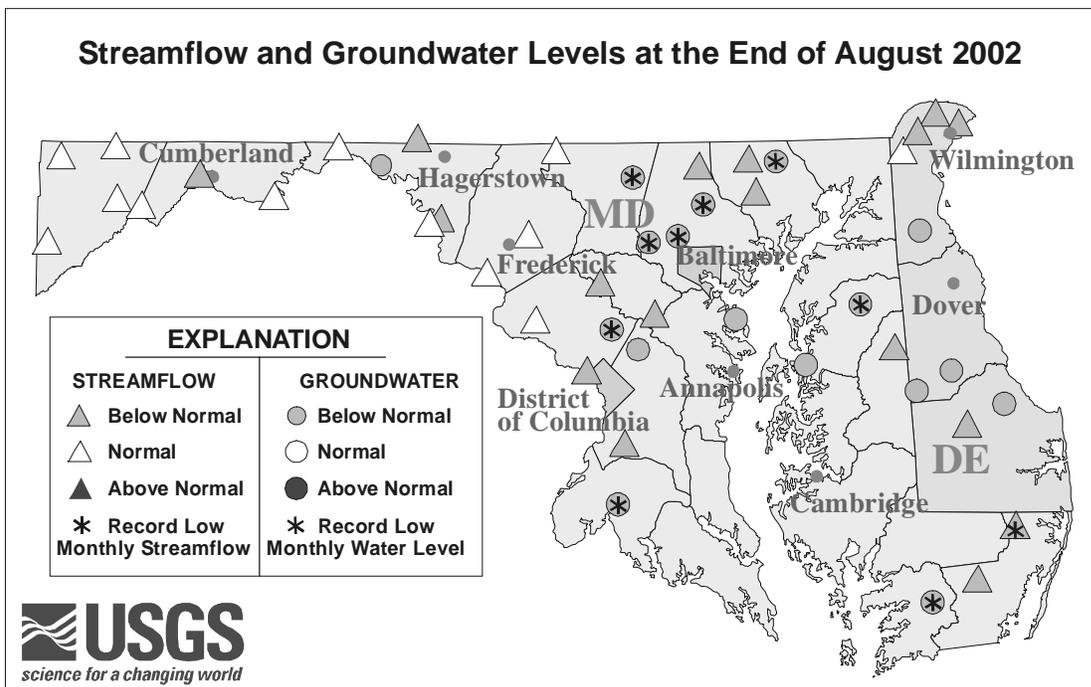
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## Groundwater in Parts of Maryland Reaches Lowest Levels Since 1962, Despite Late August Rains

Streamflow and groundwater levels continued to decline in August across Maryland and Delaware, setting many daily, monthly, and all-time record low levels. Rain at the end of August helped to improve soil moisture, and streamflow rose temporarily, yet groundwater levels showed little response to the rain. All of the 17 wells used for drought analysis in Maryland and Delaware had below normal water levels at the end of August, according to hydrologists at the U.S. Geological Survey (USGS). Nine of the wells set record low groundwater levels for August and four of these wells set all-time record low levels (since record-keeping began in 1962). More than half of the streams used to monitor drought conditions had below normal flow at the end of August, despite several inches of rain at the end of the month.



For news release and images, go to [http://md.water.usgs.gov/publications/press\\_release/current/](http://md.water.usgs.gov/publications/press_release/current/)

In Maryland, wells in Baltimore, Harford, Montgomery, and Queen Annes Counties reached the lowest level since record-keeping began in 1962 (see attached table), breaking the records set during the 1966, 1981, and 1999 drought years. These wells and five additional wells from Charles, Carroll, and Somerset Counties, set record lows for August.

Record Low Monthly Groundwater Levels in Maryland, August 2002									
[Water levels are in feet below land surface]									
County	Well Name	August Water Level	Record			Normal		All-Time Record	
			Water level*	Date	Exceeds Record (feet)	Water Level	Departure (feet)	Water Level	Date
Baltimore	BA Ce 21	<b>22.47</b>	20.11	1997	2.36	18.41	4.06	21.54	Feb-66
Baltimore	BA Ea 18	<b>27.38</b>	26.95	1966	0.43	21.95	5.43	27.57	Sep-66
Baltimore	BA Ec 43	<b>4.06</b>	3.94	1988	0.12	3.31	0.75	4.69	Nov-64
Charles	CH Ee 16	<b>16.51</b>	16.24	1991	0.27	15.40	1.11	20.65	Dec-49
Carroll	CL Bf 1	<b>75.88</b>	73.96	1999	1.92	68.14	7.74	76.76	Mar-92
Harford	HA Bd 31	<b>19.68</b>	16.38	1981	3.30	12.52	7.16	19.59	Feb-66
Montgomery	MO Eh 20	<b>17.59</b>	16.67	1999	0.92	13.74	3.85	16.67	Aug-99
Queen Annes	QA Cg 1	<b>7.13</b>	6.24	1966	0.89	4.57	2.56	6.47	Jul-81
Somerset	SO Cf 2	<b>6.40</b>	5.83	1977	0.57	4.51	1.89	6.49	Nov-98

The drought monitoring well with the largest deficit from normal is in Carroll County, Maryland. The groundwater level at this well was 7.74 feet below normal for August, surpassing the previous August record set in 1999 by 1.92 feet. The monitoring well in Harford County, Maryland is 7.16 feet below normal for August, and exceeded the previous record low of 16.38 feet set in August 1981. In Baltimore County, Maryland, the 5-year hydrograph shows that the groundwater level has been dropping since summer 2001, indicating that rainfall has not recharged the groundwater system (see graphs and a record comparison table at <http://md.water.usgs.gov/groundwater/>).

Recent abundant rainfall on the lower Eastern Shore of Maryland caused record daily high streamflow and some recovery of groundwater levels. The Pocomoke River on the Eastern Shore went from having its lowest 7-day streamflow at the end of August to setting daily record highs as a result of the rain that fell on the region. The groundwater level in the real-time well, located in Kent County, rose by about a half a foot in response to the rainfall. Real-time groundwater levels and streamflow are monitored by the USGS across the Nation at 15-60 minute intervals and the data are transmitted via satellite to USGS offices every 1 to 4 hours. This information can be viewed within minutes of arrival at: <http://waterdata.usgs.gov/>.

Except for western Maryland, where streamflow was normal at the end of August, streamflow was below normal across Maryland and Delaware. Record low monthly streamflows were recorded at Antietam Creek, Deer Creek, and Pocomoke River in Maryland, and Brandywine Creek in Delaware. Each of these sites also set new daily lows for more than 20 days in August. The Potomac River near Washington, D.C. also set several new daily record low flows, and monthly streamflow was only 52 percent of normal (see graphs at <http://md.water.usgs.gov/monthly/poto.html>). Streamflow on the Choptank River near Greensboro, Maryland was 85 percent below normal. Five-year streamflow hydrographs can now be viewed on the USGS website: <http://md.water.usgs.gov/surfacewater/streamflow>.

Average streamflow at Deer Creek in Harford County, Maryland, was the lowest monthly August flow for the period of record at 79 percent below normal. Streamflow at Deer Creek has been below normal for 15 of the last 16 months, and set daily low streamflow records for 24 of the 31 days in August. This is the seventh consecutive month with record-setting monthly low streamflow for Deer Creek.

The Baltimore region has been supplementing its water supply with water from the Susquehanna River since the end of January. Streamflow on the Susquehanna River reached low levels that required Maryland water suppliers to reduce the amount of water withdrawn from the river and increased the amount of water withdrawn from reservoirs. One result was a 7-percent decline in storage of the Baltimore Reservoir System since July. Storage in the Baltimore reservoir system was 48 percent of capacity at the end of August and the contents of the Triadelphia and Duckett Reservoirs were at 51 percent of capacity.

Another result of the low Susquehanna River flow was the second lowest total flow into the Chesapeake Bay for August since 1964. Total flow into the Chesapeake Bay during August averaged 7.75 bgd (billion gallons per day), which is 64 percent below average. The lowest August total flow to the Bay for the period of record was 6.34 bgd in 1966 (see graphs at <http://md.water.usgs.gov/monthly/bay.html>.)

Although August rainfall was near normal across Maryland and Delaware, the average temperature was higher than normal, and the annual rainfall deficit from 5 inches below normal in Garrett County, Maryland to 16.80 inches below normal in Calvert County, according to the National Weather Service.

Rainfall from scattered thunderstorms may temporarily raise streamflow levels, but most of the rainfall in the summer is used by plants or evaporates, resulting in minimal recharge to groundwater aquifers. Only about 5 percent of the recent rain between August 28 and September 4 became runoff, or contributed water to streams. This indicates that more than 95 percent of the water was used by plants, evaporated, or remained in the soil and possibly recharged groundwater. The rapid decline in streamflows after a rainfall event is caused by the low groundwater storage. Streamflows in the summer normally are maintained by groundwater storage, which typically is highest in early spring, yet have been at record lows for many months in central Maryland. Streamflow and groundwater levels reflect the long-term effects and severity of the hydrologic drought, and generally do not recover during the summer months.

Tracking streamflow and groundwater levels is essential to gauge drought severity and recovery. These USGS data have been provided to State and local water resource managers and are critical for making appropriate decisions on water restrictions. For more information on how the drought is affecting streamflow and groundwater levels in Maryland and Delaware, see Drought Watch at: <http://md.water.usgs.gov/drought/>. Please note that the streamflow and groundwater level data is provisional and subject to change.

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, and other agencies. The observation wells used in this analysis are operated in cooperation with the Maryland and Delaware Geological Surveys. The USGS publishes data for 128 streamflow stations and 379 wells across Maryland and Delaware.

The USGS, a bureau within the Department of the Interior, is the Nation's largest water, earth and biological science, and civilian mapping agency providing reliable, impartial scientific information to resource managers, planners, and other customers. This information is gathered in every state by USGS scientists to minimize the loss of life and property from natural disasters, contribute to the sound conservation and the economic and physical development of the Nation's natural resources, and enhance the quality of life by monitoring water, biological, energy, and mineral resources.

\* \* \* USGS \* \* \*