

October 2007 USGS Maryland-Delaware-DC Water Conditions Summary

October began exceptionally dry in the Mid-Atlantic region with the first three weeks receiving not even a trace of rain. The situation changed Oct 24-27 when a stalled weather system dropped more than 5 inches of rain. The rain was steady to intense and helped to recharge the streams, although ground water was barely affected. October temperatures were 7-8 degrees warmer than normal across the region and it was the fifth warmest October on record at the Baltimore weather station, according to the National Weather Service. The higher temperature resulted in greater than normal evaporation and increased water use by vegetation as well as people.

Although streams responded to runoff from the 5 plus inches of rainfall, many streams have returned to close to the level they were before the rains. The Chicamicamico River near Salem set a record low for October with an average streamflow of 2.95 cubic feet per second (cfs). The previous record October low was 3.58 cfs in 1954. Some of the water levels in wells did respond to the abundant rainfall and leveled off instead of continuing their decline. The deep well in Baltimore County however, showed virtually no response and continues to drop. Very little rainfall has been received since this storm. Ground-water levels are normally expected to rise this time of year. If the region doesn't get several months of steady, above normal rainfall over the winter to recharge the water supply, water levels may be extremely low next spring and summer.

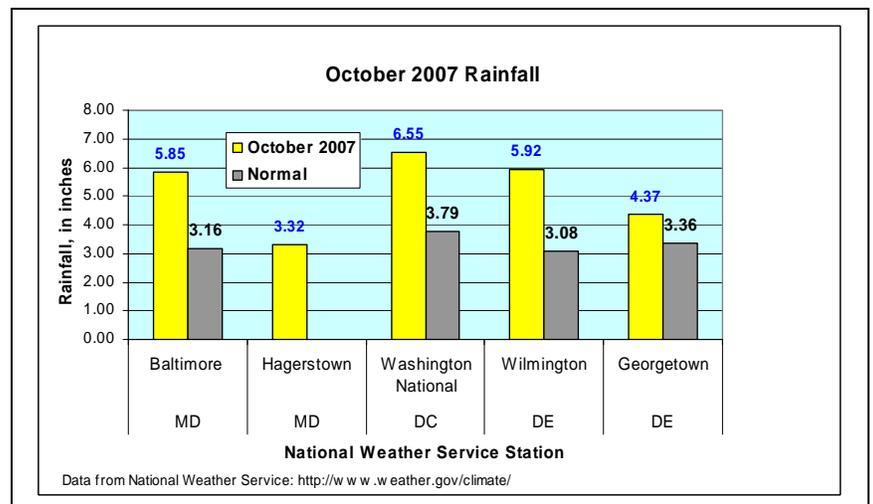
The table below lists one stream and 3 wells setting new record low water levels for October 2007. Further details are in the streamflow and ground-water sections that follow.

Record Low October 2007 Water Levels					
USGS Streamflow Gaging Station	County	Monthly mean in cubic feet per second (cfs)			
		October 2007	Previous Record Low	Year	Normal for October
Chicamacomico River near Salem, MD	Dorchester	2.95	3.58	1954	8.06

USGS Water Table Monitoring Wells	County	Depth in feet below land surface			
		October 2007	Previous Record Low	Year	Normal for October
CH De 45 near La Plata, MD	Charles	11.73	11.31	1998	8.04
MO Eh 20 near Fairland, MD	Montgomery	16.50	16.36	1986	13.73
WI Cg 20 near Parsonsburg, MD	Wicomico	9.17	8.61	1980	6.48

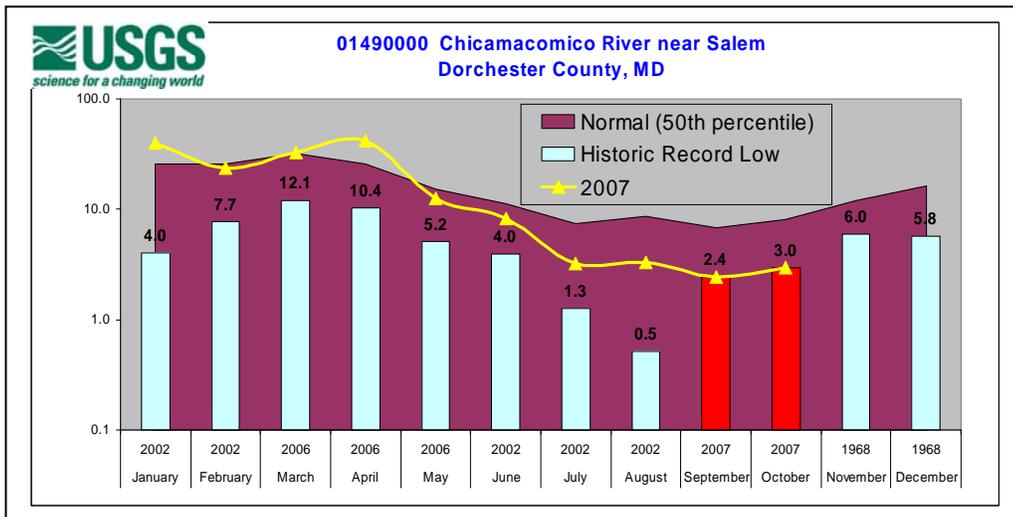
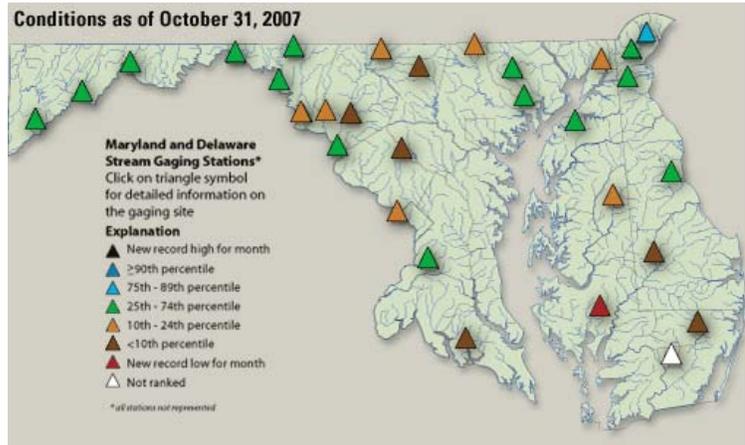
Precipitation

Rainfall at select National Weather Service stations for October 2007 are shown in the graph to the left. Several sites received more than 3 inches of rain above normal from the October 24-27 storm, but the annual totals are still below normal and the region is in a rainfall deficit.

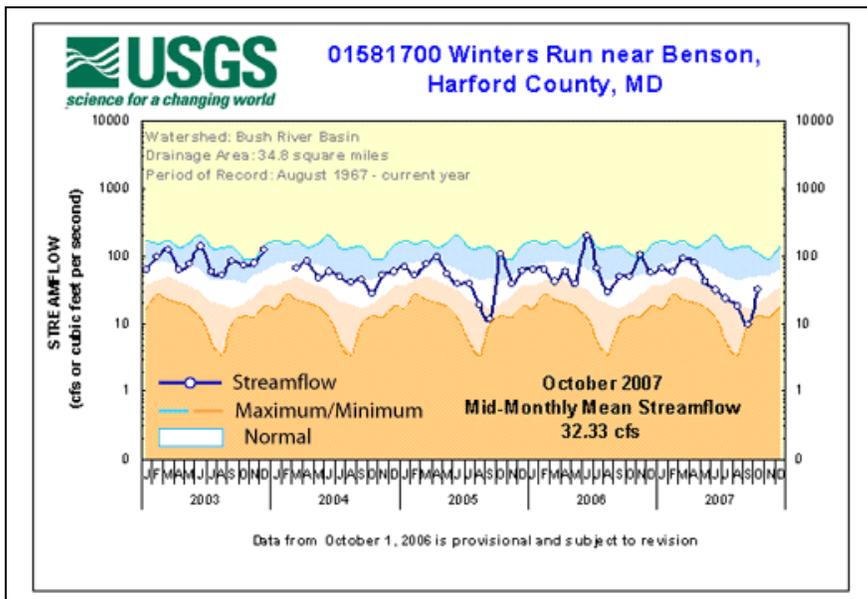


Streamflow

At the end of October 2007, the Chicamacomico River near Salem continued to set a record low for the second straight month. It was the lowest monthly mean streamflow for October since record-keeping began in 1951. Of the 29 USGS streamflow gaging stations used to characterize streamflow conditions, about half were normal or above and half were below normal. Six streams had very low water levels (below the 10th percentile).



The graph to the left shows a new low monthly mean streamflow record for the second straight month at Chicamacomico River near Salem. Streamflow had been above normal in April. The lack of rain in late summer to early fall has led to the record setting lows. The all-time record low streamflow was in August of 2002.

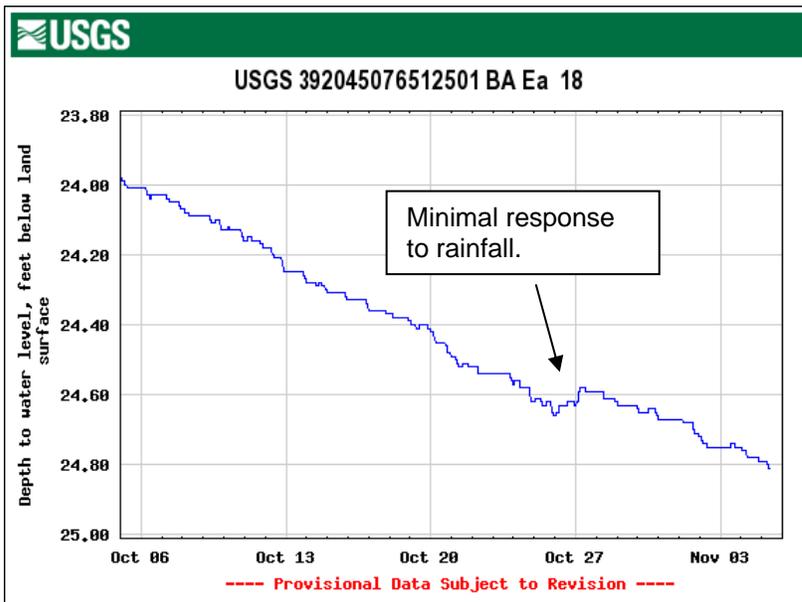


Monthly mean streamflow for Winters Run near Benson shows recovery with an increase from record setting low to normal conditions as a result of the 5 inches of rain.

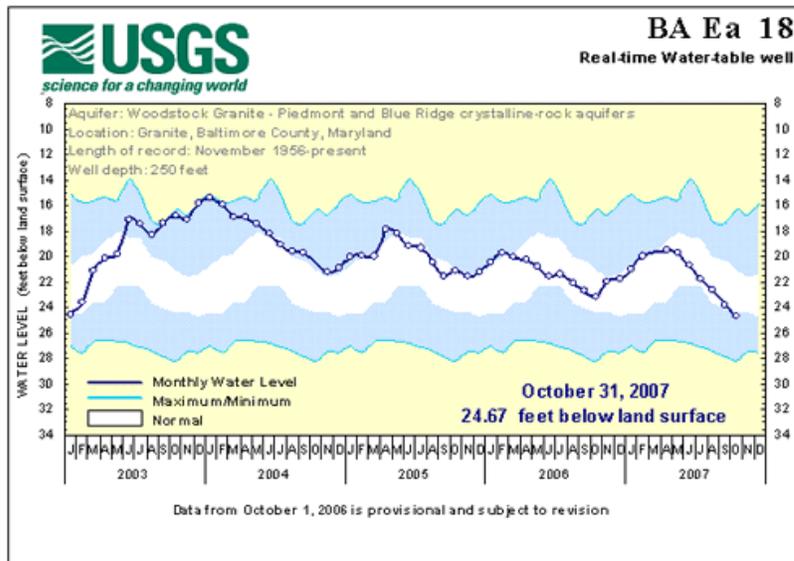
Ground Water

Most of the water levels in the water-table wells showed very little response to the rainfall in October. The status of 5 of the 21 wells used to monitor hydrologic conditions by the U.S. Geological Survey (USGS), improved, but 3 wells continue to be at monthly record lows. The record-setting wells are located in Charles, Montgomery, and Wicomico Counties. Over 70% of the wells are below normal.

To cause ground-water levels to rise, the region needs at least normal precipitation, but preferably above normal throughout the fall and winter. Without normal rainfall, many of the wells will be below normal or at extremely low levels next year.



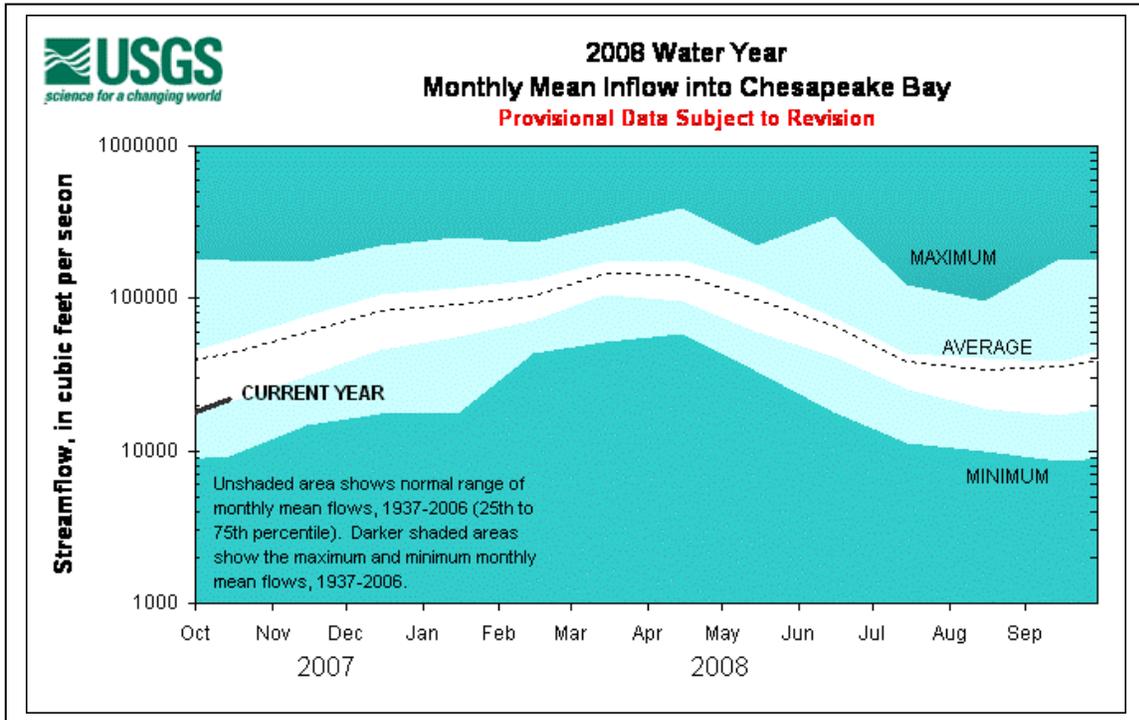
The hydrograph below is for a well in Baltimore County. It shows the depth to the water surface in depth below land surface for 31 days. Data are collected every 15 minutes at this site. The water level rose about a tenth of an inch in response to the rain from October 24-27, but has since continued its downward trend.



This hydrograph is for the same well in Baltimore County with monthly measurements over 5 years. Notice the cyclic pattern of water level rise and fall over the year. The white band shows the normal range. The water level has just now crossed into below normal status. Water levels typically rise from December through June in this well. If we don't get at least normal if not above normal precipitation in the next two months, the water level will continue to be below normal. Water levels in this area respond very slowly to climatic conditions.

Chesapeake Bay Freshwater Flow

The estimated mean monthly flow to the Chesapeake Bay for October was 21,700 cfs (cubic feet per second) or about 50 percent of the long-term mean for October. Average October flow is 43,500 cfs.



Reservoirs

Contents of the Baltimore reservoir system (Loch Raven, Liberty, and Prettyboy) was 71% available at the end of October.