

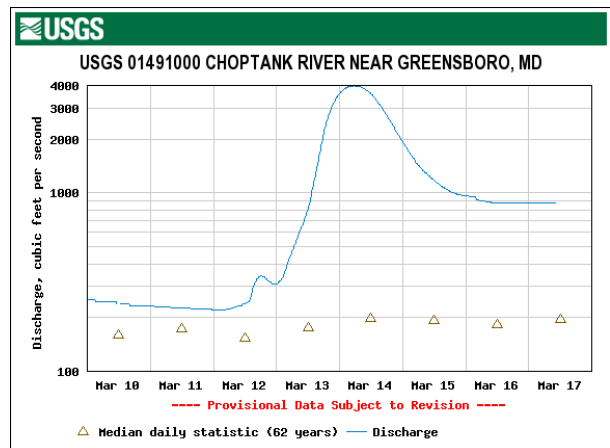
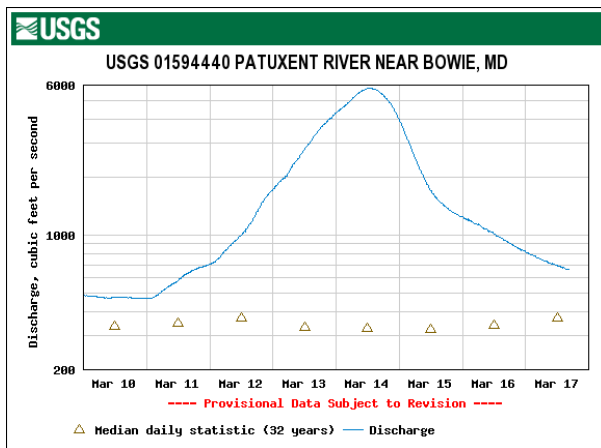
Heavy March rains and snowmelt affect Chesapeake Bay health

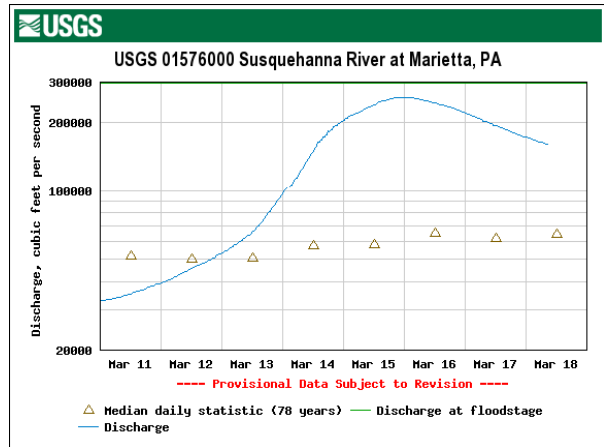
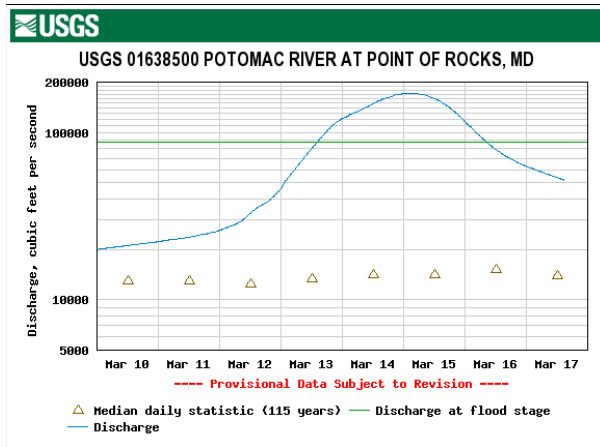
The heavy rainstorms of mid-March 2010 resulted in over 3 inches of rain across much of Maryland. In addition to the heavy rains, rapidly melting snow cover in western Maryland and Pennsylvania, and saturated soils caused the rain and snowmelt to run off streets, parking lots, buildings, residential yards and farm fields, filling neighborhood stormwater facilities and downstream culverts, small creeks and wetlands. This surge of water carrying excessive nutrients, sediments and other pollutants continued downstream to rivers, and then eventually down to the Chesapeake Bay. Continued wet spring weather could extend these high freshwater flows that might result in less underwater grasses, an increase in algal blooms and an early onset of Bay “dead-zones.” The Maryland Department of Natural Resources (MD-DNR) will continue its comprehensive Chesapeake Bay water quality, habitat, and living resources monitoring to assess any short- or long-term storm related impacts.



Rising Rivers

Localized flooding occurred in many streams throughout Maryland and United States Geological Survey stream gages (<http://waterdata.usgs.gov/md/nwis/current/?type=flow>) tracked these rising water levels. In some Chesapeake Bay rivers, such as the Choptank and Patuxent, streamflows increased rapidly until the morning of March 14th and then began to decline. In larger Bay rivers, like the Potomac and Susquehanna, this surge of rain and snowmelt occurred throughout a much larger network of feeder streams and peak water flows were observed moving progressively downstream toward the Bay. Peak flows on the Potomac River were observed early on the morning on March 15th at Little Falls (just north of Washington, DC), and in the Susquehanna River, on the morning of March 16th.





Courtesy of US Geological Survey National Watershed Information System (http://waterdata.usgs.gov/md/nwis/current/?type=flow&group_key=basin_cd)

Bay Impacts

High freshwater flows to Chesapeake Bay erode sediments and transport polluted runoff (including nutrients and sediments) downstream towards the Bay. Generally, short-term storms will have short-term impacts on the Bay, but if wet weather continues, there could be long-term consequences to the Bay’s water quality and its abundant plant and animal population as well. This late winter/early spring season is a critical period for many aquatic species such as the underwater grasses, which are beginning to grow and the many types of fish, which are beginning to spawn. Through its comprehensive Chesapeake Bay monitoring programs, MD-DNR will be assessing the short and long-term impacts of this storm on the health of the Bay’s water, habitat and its living resources. Many impacts may not be known until mid-summer or later.

One clear indicator of this storm’s impact can be seen by crossing a bridge or driving along a river or stream. Water levels are high and are now a turbid, light brown color - created by sediments eroded from stream bottoms, flood plains, and upland areas and suspended by turbulent currents. Comparing satellite photos of the Bay before and after the storm clearly show brown colored water in the upper Bay and Potomac River (yellow circles).



Before heavy rains (March 9, 2010)



After heavy rains (March 17, 2010)

Images courtesy of MODIS Rapid Response Project at NASA / GSFC (http://rapidfire.sci.gsfc.nasa.gov/subsets/?AERONET_Wallops/)

The movement of muddy water downstream can also be seen in a time-series of satellite images (<http://eyesonthebay.dnr.maryland.gov/NASAIMagery/SedPlume2010.swf>).

When high river flows decrease, heavier suspended sediments begin to settle to the bottom. The layer of sediments that will collect may smother some bottom-dwelling animals and cover valuable spawning sites and habitat. Lighter sediments will remain suspended longer and reduce the amount of light necessary for growth of underwater grasses.

Storm runoff to the Bay also contains nutrients (nitrogen and phosphorus) carried from lawns, fields, forests, parking lots and roads, as well as from overflowing sewers and flooded septic systems, into streams and rivers. Some nutrients will settle to the bottom of the Bay, while others may remain suspended in the water, providing fuel for growing algae that may include species harmful to fish, wildlife, pets or even people. Early season algal blooms may lead to early onset of dead-zones in the Bay's deeper waters - areas with low or no dissolved oxygen from late spring to early fall. In these areas, animals that can move (e.g. fish, crabs) can leave the areas while those that cannot move (e.g., oysters, clams) die.

Monitoring Maryland's progress towards restoring the Bay

The Bay saying "the wetter the year, the more polluted runoff and the worse Bay conditions" generally holds true. However, because total rainfall amounts can greatly vary from year to year, it is difficult to know whether the Bay is improving or getting worse by using short-term "snapshots" of Bay conditions. This is why Maryland scientists analyze many years of monitoring data to determine the impact of our management actions and whether or not the Bay is actually improving.

While there is still much work left to restore the Bay, long-term MD-DNR monitoring has identified major reductions in polluted runoff. Due to sewage plant upgrades and the resulting decline in nutrients entering our waterways, we are seeing Statewide improvements in stream health. These improving conditions are extending downstream all the way to some Western-Shore low salinity areas including the Potomac and Patuxent Rivers resulting in less algal blooms and more underwater grasses.

Actions for restoring the Bay

Even though there are weather-related variations in polluted runoff, Maryland is committed to reducing polluted runoff in order to meet Federal standards. Maryland, along with Pennsylvania and Virginia, agreed in May 2009 to aggressive 2-year milestones for assuring accountability in limiting nutrients and sediments entering the Bay. This will require citizens, businesses, and local, state, and federal governments to work together to reduce polluted runoff. The major actions include:

- Planting cover crops (to reduce polluted runoff from farms)
- Reducing polluted runoff from urban areas
- Restoring natural filters (to reduce polluted runoff)
- Conserving high priority lands

So, what will the heavy rains of March 2010 bring to the Bay this year? In the short-term, the Bay waters will be more turbid than usual. As far as long-term impacts to the Bay's waters and its inhabitants, only time and MD-DNR's monitoring programs will tell.

For More Information

- Real-time Maryland Tidal Water Quality Conditions:
<http://www.eyesonthebay.net>
- Restoring the Chesapeake Bay: Maryland's Actions and Progress:
<http://www.baystat.maryland.gov>
- What You Can Do to Help the Bay:
<http://www.dnr.state.md.us/bay/education/programs.html>