# Effects of Heavy Rain and Patapsco River Sewage Spill Captured by Continuous Monitor at Masonville Cove

Beginning late afternoon on March 13th, 2010, and continuing for approximately 20 hours into March 14th, the Patapsco Pumping Station located at 4612 Annapolis Road in Halethorpe (Figure 1) overflowed and spilled approximately 30 million gallons of diluted sewage into the Patapsco River. The spill was caused by heavy rains and snowmelt which overwhelmed the system and necessitated the pumping system to be shut down until flood waters receded. Effects of the heavy rain and snow melt on water levels can be seen in the USGS stream discharge data from the East Branch Herbert Run, which flows into the Patapsco approximately three miles upstream from the pumping station. The graph in Figure 2 clearly shows increased flow rates on March 13th as the mean discharge rate on that day was an order of magnitude higher than the historic median.


**Figure 1.** Map of the Patapsco River showing the Patapsco Pumping Station, USGS Stream Flow Gage, and Maryland DNR's Continuous Monitor in Masonville Cove.

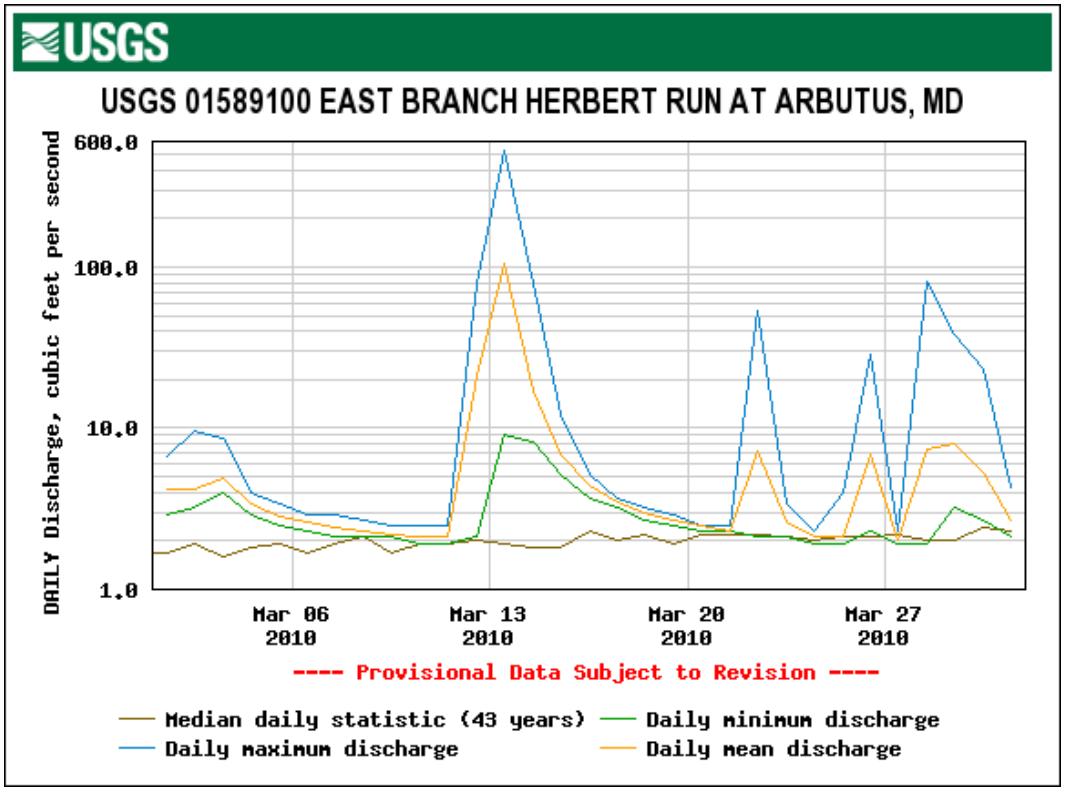


**Figure 2.** USGS Stream Discharge data from the East Branch Herbert Run site in Arbutus (39.240000°, -76.692194°). *(Graph courtesy of United States Geological Survey)*

The stretch of the Patapsco River where the pumping station is located forms the border between Baltimore and Anne Arundel Counties and flows past the communities of Brooklyn Park, Curtis Bay, and Orchard Beach, before reaching the Chesapeake Bay at Fort Smallwood Park. For the second consecutive year, Maryland DNR is maintaining a Continuous Monitoring site in Masonville Cove near Curtis Bay (Figure 1). The Continuing Monitoring Program consists of a series of sites throughout Maryland's tidal waters, which collect water quality readings every 15 minutes around the clock during the spring and summer. Data collected include water temperature, dissolved oxygen, salinity, turbidity (water clarity), and chlorophyll levels. The data collector for Masonville Cove was deployed for the 2010 monitoring year on March 10th.

Data collected from Masonville Cove show that beginning in the early evening on the 13th, salinity levels and pH (a measure of how acidic the water is) decreased (Figures 3a & 3b), reflecting the increased flow of water into the system from the storm event. Turbidity spiked rapidly beginning on March 13th and remained relatively high until March 16th (Figure 3c). Increased turbidity levels indicate a high concentration of particles and sediment clouding the water and decreasing clarity. These particles enter waterways via runoff from land, waste water from treatment plants, or sediment from the bottom being stirred up. Sustained elevated turbidity levels can depress the growth of underwater vegetation and decrease the health of fish by increasing stress levels and decreasing their ability to extract oxygen from the water.

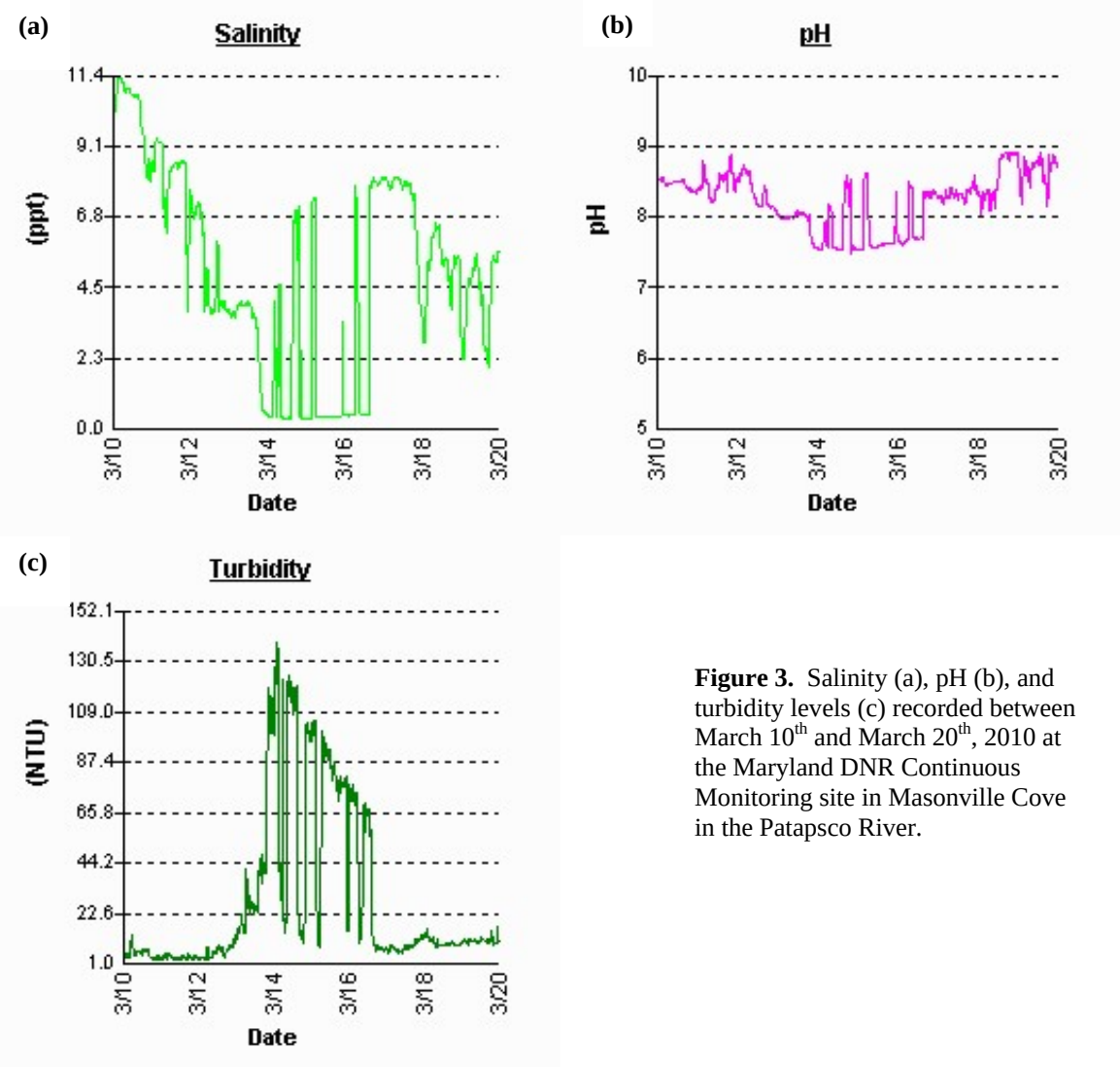


**Figure 3.** Salinity (a), pH (b), and turbidity levels (c) recorded between March 10th and March 20th, 2010 at the Maryland DNR Continuous Monitoring site in Masonville Cove in the Patapsco River.

The graphs in Figure 3 indicate that the initial effects of the storm and sewage spill on the Patapsco were short-lived. Longer-term effects, however, may not be apparent until later this year. Excessive nutrients, particularly nitrogen and phosphorus, flow into waterways with sewage spills and have the potential to fuel algae blooms, particularly as the water warms up. Such a scenario has the potential of increasing the risk of harmful algae blooms, which produce toxins harmful to humans and aquatic life. The death and decomposition of large algae blooms can also reduce oxygen levels in waterways to the point where fish and other aquatic animals cannot survive in affected areas. Thus, Maryland DNR will continue to actively monitor and report on the condition of the Patapsco River. For the most recent Water Quality data for waterways throughout Maryland, please visit www.eyesonthebay.net.