Chesapeake Bay Program
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BACKGROUNDER

Conowingo Dam

Background

The 94-foot-tall Conowingo Hydroelectric Generating Station, known as the Conowingo Dam, is one of three dams on the lower Susquehanna River. The river water impounded by the dam forms the Conowingo Reservoir that serves many purposes, such as a drinking water supply for Baltimore, cooling water for a nuclear generation station, and as a recreational fishing and boating spot. It also serves as a "pollution gate" by trapping sediments and nutrients in the river and preventing them from flowing downstream and entering the Chesapeake Bay.

When the Susquehanna River enters the Conowingo Reservoir, the water flow slows dramatically, allowing the sediment to drop out of suspension and settle on the bottom of the reservoir. Over time, the reservoir has filled up almost completely with sediment, leaving little space to store water and sediment flowing downstream from the Susquehanna River. Currently, the dam is estimated to be trapping as much as 2% of nitrogen, 45% of phosphorus and 70% of sediment.

During large storms and severe floods, the high flows from the Susquehanna scours sediment and attached nutrients from within the reservoir and carriers it over the dam and into the Chesapeake Bay. This clears up some storage volume behind the dam, allowing the reservoir to capture sediment and nutrient in the short-term—until the next storm washes it down and begins the cycle anew. When scouring occurs, large amounts of sediment enter the Bay, clouding the water, blocking sunlight from reaching, and smothering, bottom habitats. Nutrients attached to the sediment are released into Bay waters, fueling the growth of harmful algae blooms that die off and deplete the oxygen that aquatic life needs to survive.

The Susquehanna River flows south past Conowingo Dam, toward Havre de Grace, Md., on June 27, 2016. (Photo by Will Parson/Chesapeake Bay Program with aerial support by LightHawk)

The Susquehanna River flows strongly past the Conowingo Dam near Conowingo, Md., on March 11, 2015. With earlier snow melt, roughly 85,000 cubic feet of water was flowing through the dam every second that day, and all 11 turbines were in operation, generating roughly 490 megawatts of electricity. (Photo by Will Parson/Chesapeake Bay Program)

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How does this impact Chesapeake Bay restoration goals?

The Chesapeake Bay Total Maximum Daily Load (Bay TMDL), implemented in 2010, was based on modeling that assumed conditions would remain the same within the reservoir, along with a steady climate, beginning in the 1990s and continuing through 2025. Since 2011, however, studies using new models, monitoring data and research indicate that conditions have changed. A 2015 U.S. Geological Survey report found that the reservoir was nearing capacity much earlier than anticipated, meaning that less nutrients and sediment were being trapped, and instead, were flowing downstream into the Bay.

As part of the Bay TMDL midpoint assessment, the Chesapeake Bay Program partnership worked to quantify the additional pollutant loads entering the Bay to help determine the future course of action.

Reducing upstream nutrient and sediment pollutant loads through the Bay TMDL and supporting watershed implementation plans (WIPs) offer one of the best long-term solutions to restore the Chesapeake Bay, as well as assist the watershed jurisdictions in attaining their water quality goals. Other solutions are being explored for sediment management options at the dam, including dredging, bypassing or changing operations.

Next Steps

The Chesapeake Bay Program has convened a steering committee with members from each watershed jurisdiction to develop and implement a separate WIP for the Conowingo Dam to address the additional pollutant loads. Reductions of an additional six million pounds of nitrogen and 260,000 pounds of phosphorus is needed to mitigate the water quality impacts of the lost trapping capacity.

Earlier this year, the Environmental Protection Agency issued a request for applications (RFA) seeking qualified organizations to provide technical, financial and programmatic assistance in support of developing and implementing the Conowingo WIP. The RFA included three activities:

- Facilitate development and implementation of the Conowingo WIP and two-year milestones. This includes assisting the steering committee, identifying practices to reduce pollutant loadings, establishing a timeline for achieving the commitments and goals of the WIP and two-year milestones, and conducting outreach.
- Develop and propose a financing strategy that may include funding for best management practice implementation and innovative approaches for raising, allocating and disbursing funds.
- Develop a system for tracking, verifying and accurately reporting the implementation of the WIP and two-year milestones.

The draft Conowingo WIP is expected to be complete by March 13, 2020 and the final on June 19, 2020.

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