Conowingo Dam

Conowingo Dam is one of three dams on the lower Susquehanna River. For 90 years, the deep, still water of the Conowingo Reservoir behind the dam has captured sediment and nutrient pollution carried downstream by the river. Recent studies, however, indicate that the reservoir is becoming less effective as a "pollution gate" because the reservoir has filled with sediment and is reaching capacity. During large storms and severe floods, the Susquehanna River's fast-moving flow scoops up some of the sediment (and attached nutrients) stored within the reservoir and carries it over the dam and into the Chesapeake Bay.

What is the Conowingo Dam?

The 94-foot-tall Conowingo Hydroelectric Generating Station, known as Conowingo Dam, is one of three dams on the lower Susquehanna River. Located in the town of Conowingo, Maryland, the dam began operations in 1928 after two years of construction. It is currently owned and operated by Exelon Corporation. The river water impounded by the dam forms the Conowingo Reservoir. The reservoir serves many purposes such as a drinking water supply for Baltimore, cooling water for a nuclear generation station and recreational boating and fishing spot. It also serves as a "pollution gate" by trapping sediments and nutrients in the river and preventing them from entering the Chesapeake Bay.

Why is the Reservoir Reaching Capacity and What Are the Consequences?

The fast-moving Susquehanna River carries sediment along as it flows downstream. When the river enters the Conowingo Reservoir (the deep water behind the dam), the water flow slows dramatically, allowing the sediment to drop out of suspension and settle on the bottom of the reservoir. Over time, the deep reservoir has filled up almost completely with sediment. Therefore, the reservoir has little space left to store water and sediment from the Susquehanna (i.e., it is nearing capacity). Currently, the dam is estimated to be trapping as much as two percentof nitrogen, 45 percent of phosphorus and 70 percent of sediment flowing downstream.

During large storms and severe floods (such as Hurricane Agnes in 1972 and Tropical Storm Lee in 2011), the high flows from the Susquehanna scours sediment and attached nutrients from within the reservoir and carries it over the dam and into the Chesapeake Bay. This clears up some storage volume behind the dam again, which allows the reservoir to capture sediment and nutrients in the short term—until the next storm washes it down and the cycle begins again. When scouring occurs, large amounts of sediment enter the Bay, clouding the water, blocking sunlight from reaching aquatic habitats and smothering bottom habitats. Nutrients attached to the sediment are released into Bay waters, feeding the growth of harmful algal blooms that die off and deplete the oxygen that aquatic life needs to survive.

How Does This Affect the Chesapeake Bay Cleanup Goals?

The Chesapeake Bay Total Maximum Load (Bay TMDL) developed in 2010 was based on modeling that assumed unchanging conditions within the reservoir and a steady climate beginning in the 1990s and continuing through 2025. Since 2011, however, studies using new models, monitoring data and research have indicated conditions have changed. In 2015, a U. S. Geological Survey reported that the dam had reached 92 percent capacity. The reservoir system neared capacity earlier than expected, meaning less sediments and nutrients are being trapped. Instead, they are carried downstream and into the Bay.

As part of the Bay TMDL Midpoint Assessment, Chesapeake Bay Program partners worked on quantifying the additional pollution loads entering the Chesapeake Bay to help determine the future course of action. Several possible solutions are being considered for sediment management options at the dams along the Susquehanna River, including dredging, bypassing or changing operations. The partnership is considering the effects that loadings from behind the Conowingo and other dams are having on the Bay. Reducing upstream nutrient and sediment loads through the Bay TMDL and supporting watershed implementation plans (WIPs) would offer one of the best long-term solutions to the Bay's poor health and assist jurisdictions in attaining their water quality goals.

Partnership Decision

The Chesapeake Bay Program will convene a steering committee with members from each of the six watershed states and the District of Columbia to develop and implement a separate WIP for the Conowingo Dam. In fall 2018, the partnership will decide how to divide the responsibility for accounting for the additional pollution loads entering the Chesapeake Bay from the Susquehanna River.

Conowingo Dam is just one of a number of issues being addressed through the collaborative decision-making process. Through this collective effort, partners can successfully restore the Bay.

Next Steps

Originally, all the jurisdictions in the Chesapeake Bay watershed—the District of Columbia, Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia—were responsible for implementing plans that would meet their clean water goals by 2025. Based on new information, each state is responsible for updating its WIP, which details specific actions needed to achieve new nutrient reduction goals for restoring the Bay's health. Those actions include things such as installing new controls to capture stormwater runoff, installing streamside vegetation to capture excess sediment and nutrients from agricultural areas, or upgrading wastewater treatment facilities.

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