Chesapeake Bay: Larger-than-average summer 'dead zone' forecast for 2018 after wet spring

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Ecologists from the University of Michigan and the University of Maryland Center for Environmental Science are forecasting a larger-than-average Chesapeake Bay "dead zone" in 2018, due to increased rainfall in the watershed this spring.

This summer's Chesapeake Bay hypoxic or dead zone, an area of low to no oxygen that can kill fish and other aquatic life, is expected to be about 1.9 cubic miles (7.9 cubic kilometers), according to the forecast released today by the two universities.

Spring rainfall plays an important role in determining the size of the Chesapeake Bay hypoxic zone. This year, above-average spring rainfall and streamflow is transporting nitrogen to tidal waters in amounts slightly above the long-term average, according to the U.S. Geological Survey, which provides the nitrogen-loading estimates used to generate the annual hypoxia forecast.

In spring 2018, the Susquehanna River delivered 85.7 million pounds of nitrogen into the Chesapeake Bay. The Potomac River, as measured near Washington, D.C., supplied an additional 30 million pounds of nitrogen, according to USGS.

"The forecast calls for an above-average dead zone in the Chesapeake Bay this year, illustrating that more work needs to be done. This dead

zone remains considerably larger than the size implied by the targets set under the Chesapeake Bay Total Maximum Daily Load agreement," said aquatic ecologist Don Scavia, University of Michigan professor emeritus of environment and sustainability and a member of NOAA-funded teams that produce annual forecasts for the Chesapeake Bay, the Gulf of Mexico and Lake Erie.

The bay's hypoxic (low oxygen) and anoxic (no oxygen) zones are caused by excess nutrient pollution, primarily from agriculture and wastewater. The excess nutrients stimulate an overgrowth of algae, which then sinks and decomposes in the water. The resulting low oxygen levels are insufficient to support most marine life and habitats in near-bottom waters, threatening the bay's crabs, oysters and other fisheries.

This year, the anoxic portion of the hypoxic zone is predicted to be 0.43 cubic miles (1.78 cubic kilometers) in early summer and 0.41 cubic miles (1.7 cubic kilometers) in late summer.

"The Chesapeake Bay's response to reductions in nutrient pollution may be gradual, involve lags, and be interrupted by the weather," said report co-author Jeremy Testa of the University of Maryland Center for Environmental Science. "The forecast illustrates these challenges well."

Measurements of the Chesapeake Bay's dead zone go back to 1950, and the 30-year mean maximum dead zone volume is 1.74 cubic miles.

"Despite the forecast, bottom dissolved oxygen concentrations in Maryland's portion of the Chesapeake Bay mainstem have continued to increase since 2014, and last year we recorded the second-smallest hypoxic volume ever," said Bruce Michael, director of the Resource Assessment Service at the Maryland Department of Natural Resources.

"The bay is rebounding and responding, as seen by record submerged

aquatic vegetation totals. Our strategic investments and sacrifices aimed at reducing nutrients and sediment are working, but more can still be done throughout the watershed."

The bay outlook is based on models developed at the University of Michigan and the University of Maryland Center for Environmental Science, with funding provided by the National Oceanic and Atmospheric Administration.

"Despite this year's forecast, great strides have been made in reducing nutrient pollution from various point sources entering the Chesapeake Bay, such as wastewater treatment plants," said Steve Thur, director of NOAA's National Centers for Coastal Ocean Science. "However, to reach the economic potential of the Chesapeake Bay, more work needs to be done to address nonpoint nutrient pollution, such as agriculture and stormwater runoff."

Throughout the year, researchers measure oxygen and nutrient levels as part of the Chesapeake Bay Monitoring Program, run by the Maryland Department of Natural Resources and the Virginia Department of Environmental Quality. This year's findings will be released in the fall.

USGS provides the nitrogen-loading estimates as part of its long-term water-quality and streamflow monitoring programs with the state of Maryland.

"The USGS is proud to contribute to the collaborative science reflected in this forecast," said Don Cline, associate director for the USGS Water Mission Area. "It serves to test the skill of scientists on an annual basis and to demonstrate the connection between this important estuary and its watershed."

More information: 2018 U-M Chesapeake Bay hypoxia forecast:

scavia.seas.umich.edu/hypoxia-forecasts/

Provided by University of Michigan