

## Media Contact

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# Water quality throughout the Chesapeake Bay watershed shows mixed results

## While water quality in the Chesapeake Bay decreases by 3.5%, conditions throughout region varies

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**Annapolis, MD**—The Chesapeake Bay Program announced today that an estimated 29.6% of the Chesapeake Bay and its tidal tributaries met clean water standards for clarity (measured by the abundance of [underwater grasses](#)), dissolved oxygen and chlorophyll *a* (a measure of algae growth) during the 2018-2020 assessment period. This is lower than the previous score of 33.1% received during 2017-2019. However, while the water quality of the Chesapeake and its tidal tributaries saw a decrease of 3.5% from the previous assessment period, the U.S. Geological Survey (USGS) reported mixed results in the trends of nitrogen, phosphorus and sediment pollution entering the Bay from the largest rivers in the watershed.

Further analysis of tidal water results reveal some improvement of the Chesapeake's water quality. Despite record high river flows to the Chesapeake in 2019, dissolved oxygen levels in the deep waters saw significant improvement in their attainment of criteria for supporting aquatic life during the 2018-2020 assessment period. Such signs of improvement during the stress of high flow impacts to the Bay ecosystem may reflect increasing resilience over the long-term. But water quality must improve in 70.4% of the Chesapeake Bay and its tidal tributaries if the estuary is to function as a healthy ecosystem.

“Monitoring water quality across the varied habitats of the Bay is critical to understanding periods of improvement and decline in response to climate events and management actions,” said Peter Tango, USGS monitoring coordinator. “In the past, the Bay responded positively during periods of average river flow but had short-term declines due to the effects of Hurricane Isabel in 2003 and Tropical Storm Lee in 2011. The high river flows in 2018 and 2019 have caused another short-term decline in the health of the Bay.”

[Water quality](#) is impacted by nitrogen, phosphorus and sediment pollution entering the Bay from its 64,000-square-mile watershed and varies each year due to land use, rainfall and river flow. The period of 2018-2020 included above average river flows in 2018 and record river flows to the Chesapeake Bay in 2019 as a result of rainfall patterns across the region which contributed to higher-than-average pollutants entering the Bay. The USGS reported that between October 2019 and September 2020, river flow to the Bay measured 50.3 billion gallons per day, a 40% reduction from the previous year, which at 83.7 billion gallons per day, was the highest recorded amount of river flows ever captured entering the Chesapeake since measurements began in 1937.

“The conditions in the Bay over the past three years have been affected by the high river flows,” said Scott Phillips, Chesapeake Bay coordinator with the USGS. “To better understand the influence of nutrient and sediment reduction efforts, the USGS looks at 10-year trends in the major rivers entering the Bay and sites across the watershed. The river and watershed pollutant trends are showing mixed results.”

Since the amount of nitrogen, phosphorus and sediment entering the Bay is dependent on variations in weather patterns, it is important to analyze trends over time to understand whether the health of the Bay and its tidal waters are improving or declining. This remained true from October 2019 to September 2020

as approximately 246 million pounds of nitrogen, 14.4 million pounds of phosphorus and 14.9 billion pounds of sediment reached the Bay: a reduction of 49%, 47% and 34% from the previous year, respectively.

[Monitoring](#) data collected from River Input Monitoring (RIM) stations on the nine largest rivers in the watershed provide the foundation for experts to determine the trends of nitrogen, phosphorus and sediment delivered to Chesapeake Bay over longer periods of time. The nine RIM stations monitor about 80% of the watershed. To estimate pollution inputs from the remaining 20% of the watershed, the Chesapeake Bay Program pairs this data with nitrogen and phosphorus levels in water samples collected at wastewater treatment plants, computer-simulated estimates of nitrogen and phosphorus loads from nonpoint pollution sources (e.g., rainfall and runoff) and computer-simulated estimates of the atmospheric deposition of nitrogen falling on tidal waters.

Findings from a recent USGS analysis of trends over the past decade (2011 to 2020) at the nine RIM stations showed mixed trend results for nitrogen, phosphorus and sediment:

- Trends in nitrogen indicate improving conditions at four stations (James River, Patuxent River, Potomac River and Susquehanna River) and degrading conditions at five stations (Appomattox River, Choptank River, Mattaponi River, Pamunkey River and Rappahannock River).
- Trends in phosphorus indicate improving conditions at four stations (James River, Pamunkey River, Patuxent River and Susquehanna River), degrading conditions at three stations (Appomattox River, Choptank River and Mattaponi River) and no change at two stations (Potomac River and Rappahannock River).
- Trends in sediment indicate improving conditions at four stations (James River, Pamunkey River, Patuxent River and Susquehanna River), degrading conditions at four stations (Appomattox River, Choptank River, Mattaponi River and Pamunkey River) and no change at one station (Potomac River).

The USGS leads the partnership-wide effort to collect data from a comprehensive network of 123 stations in non-tidal waters across the region. This network allows experts to assess the water-quality response in streams and rivers to efforts put in place to reduce nitrogen, phosphorus and sediment from agricultural and urban areas. Recently, the USGS conducted an [analysis](#) of nitrogen, phosphorus and sediment pollution using monitoring data collected from this [non-tidal network](#) during 2011-2020. The watershed trends showed mixed results with some stations improving but worsening conditions at others:

- Thirty-seven percent of non-tidal network stations show an improvement in the amount of nitrogen pollution, whereas 40% are degrading and 23% show no change.
- Forty-four percent of non-tidal network stations show an improvement in the amount of phosphorus pollution, whereas 23% are degrading and 33% show no change.
- Eighteen percent of non-tidal network stations show an improvement in the amount of sediment pollution, whereas 46% are degrading and 36% show no change.

“The water quality of the Chesapeake Bay remains a top priority for the partnership and the over 18.4 million residents throughout the watershed,” said Dr. Kandis Boyd, director of the Chesapeake Bay Program. “While the Chesapeake Bay Program has measured results over the past 30 years, these data indicate there is much that remains to be done to reduce nitrogen, phosphorus and sediment throughout the Bay and its watershed. Developing sustainable practices, infusing the latest technology and science

and acknowledging evolving climate patterns are all forward-moving steps to accelerate the change needed for the Bay.”

*The Chesapeake Bay Program is a regional partnership that has coordinated and conducted the restoration of the Chesapeake Bay since its formation in 1983. Partners include the U.S. Environmental Protection Agency, representing the federal government; the U.S. Department of Agriculture; the states of Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia; the District of Columbia; the Chesapeake Bay Commission, a tristate legislative body; and advisory groups of citizens, scientists and local government officials.*