

Using Monitoring and Partnerships to Provide Management-Relevant Information about Chesapeake Bay Rivers

Addressing a Critical Need

The lands and waters of the Chesapeake Bay watershed provide more than \$100 billion in economic benefits—an amount that is expected to increase by achieving the region’s clean-water goals (Phillips and McGee, 2014). Achieving those goals requires accurate and timely information about the health of the watershed’s rivers and streams. The Chesapeake Bay nontidal monitoring network (NTN), a partnership of local, State, and Federal agencies, as well as other partners, was established in 2004 to provide this information. The U.S. Geological Survey (USGS) analyzes data collected from NTN stations to provide monitoring-based information about the amount of nitrogen, phosphorus, and sediment entering the Chesapeake Bay through its nontidal rivers. Thus, data collected from the NTN inform watershed management by providing decision makers with information on which to base their restoration and conservation actions.

Monitoring Our Rivers and Streams

Streamflow is measured, and water-quality samples are collected at 123 NTN stations located throughout the Chesapeake Bay watershed. (fig. 1)

Streamflow is the amount of water moving through a river. The USGS reports streamflow data online every hour. These data are useful for planning recreational activities and are critical for managing floods and droughts.

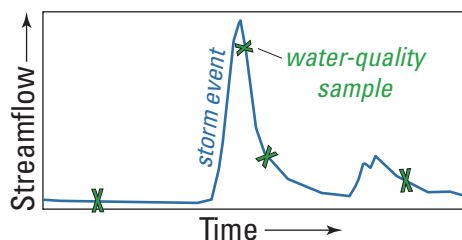


Figure 2. Example plot of streamflow and water-quality samples at a nontidal monitoring network (NTN) station.

Water-quality samples of nitrogen, phosphorus, and sediment are collected every month and during storms (fig. 2). These data are used to compute nutrient and sediment loads and trends.

- **Load:** the annual amount of nutrients or sediment at an NTN station.
- **Trend:** the change in load over a period of at least 10 years.



Individual collecting a nontidal monitoring network (NTN) water-quality sample.

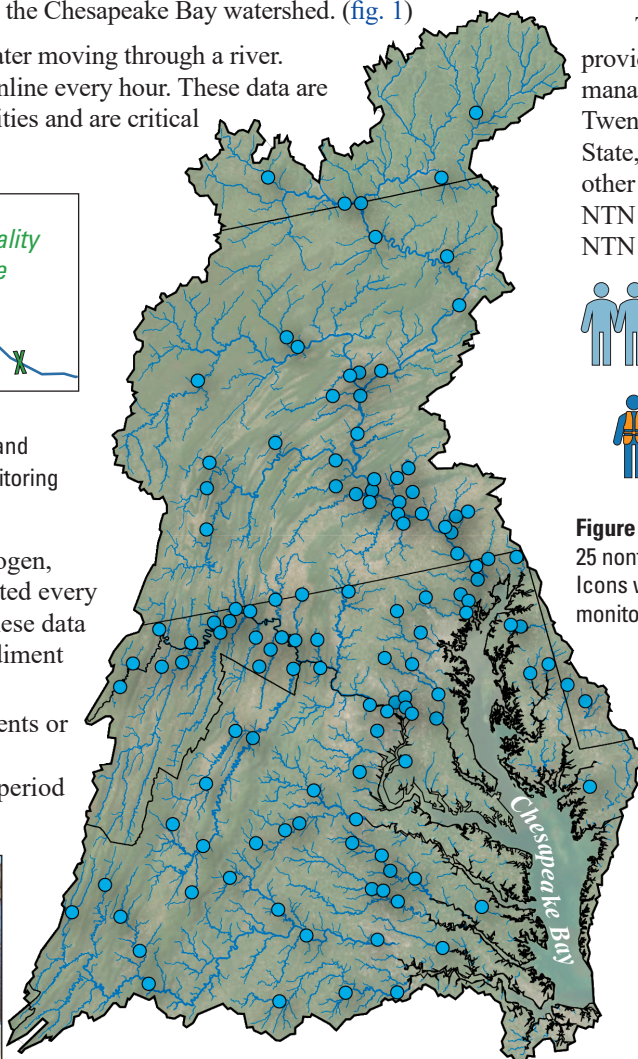


Figure 1. Map of nontidal monitoring network (NTN) monitoring stations in the Chesapeake Bay watershed. Rivers and streams in the 64,000 square mile watershed flow to the Chesapeake Bay.



Clean water helps people enjoy fishing and boating on Chesapeake Bay rivers. Photo by Will Parson, Chesapeake Bay Program, used with permission.

Partnering for Success

The NTN is a partnership that has provided information to support local management decisions for decades. Twenty-five groups, representing local, State, and Federal agencies, as well as other partners, fund the operation of the NTN (fig. 3). Seven of these partners collect NTN monitoring data.

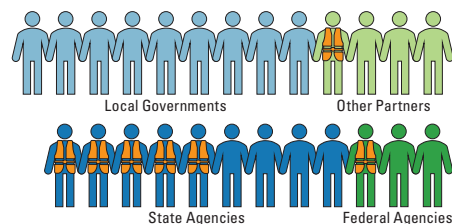


Figure 3. A visual representation of the 25 nontidal monitoring network funding partners. Icons with vests indicate partners who collect monitoring data.



USGS staff sharing information with local partners at a nontidal monitoring network (NTN) station.

Investing in Knowledge

Many partners fund the NTN because managers throughout the region value timely, monitoring-based information that supports decision making. Nearly all NTN stations (110 of 123) are funded by multiple partners. The U.S. Environmental Protection Agency (EPA) is the largest funding source, but 24 other partners contribute more than half of all NTN monitoring costs (fig. 4).

The NTN is an investment in local and accurate information about the health of Chesapeake Bay rivers. About \$7.6 million is needed to collect one year of NTN streamflow and water-quality data. This investment provides managers with monitoring-based insights that subsequently guide billions of dollars in efforts to achieve clean-water goals (Phillips and McGee, 2014; U.S. Office of Management and Budget, 2024; fig. 5).

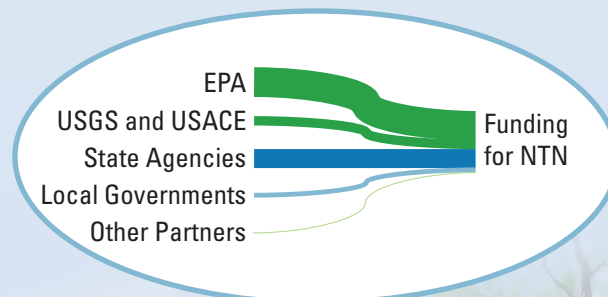


Figure 4. Graphic representing the amount of NTN funding contributed by partners. Thicker lines indicate more funding. [EPA, Environmental Protection Agency; USGS, U.S. Geological Survey; USACE, U.S. Army Corps of Engineers; NTN, nontidal monitoring network]



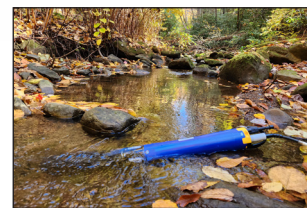
Figure 5. Conceptual diagram showing how nontidal monitoring network (NTN) station water-quality samples are collected and analyzed, and how U.S. Geological Survey researchers compute results and communicate findings with partners to inform management decisions.

Meeting Future Needs

Since its establishment in 2004, the NTN has evolved to meet the water-quality monitoring and assessment needs of partners throughout the watershed. With 85 stations at its inception, 38 stations have since been added to the NTN to provide additional information in areas that previously lacked monitoring.

The NTN uses cutting-edge technology to innovate data collection. For example, continuous water-quality monitors are now used at 30 stations. Continuous monitors accurately measure water-quality conditions every 15 minutes. These data are reported online every hour to support real-time management decisions.

As people throughout the region work to achieve clean-water goals, the need for data-driven insights about the condition of Chesapeake Bay rivers has never been greater. The USGS and its partners will continue to use information from the NTN to deliver these insights and support local decision making.



Continuous monitors are used at nearly a quarter of nontidal monitoring network (NTN) stations to measure water-quality conditions every 15 minutes.

For more information about the Chesapeake Bay Nontidal Monitoring Network, visit:
usgs.gov/CB-wq-loads-trends.



For more information about USGS Chesapeake Bay science, visit:
usgs.gov/centers/cba.



References Cited

- Phillips, S., and McGee, B., 2014, The economic benefits of cleaning up the Chesapeake—A valuation of the natural benefits gained by implementing the Chesapeake clean water blueprint: Annapolis, Maryland, Chesapeake Bay Foundation, 32 p., 2 app., accessed February 28, 2025, at <https://www.cbf.org/document-library/cbf-reports/the-economic-benefits-of-cleaning-up-the-chesapeake.pdf>.
- U.S. Office of Management and Budget, 2024, Chesapeake Bay restoration spending crosscut—Report to Congress: Washington, D.C., U.S. Office of Management and Budget, 43 p., accessed August 18, 2025, at <https://d18lev1ok5leia.cloudfront.net/chesapeakeprogress/2024-Chesapeake-Bay-Crosscut-Report.pdf>.

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