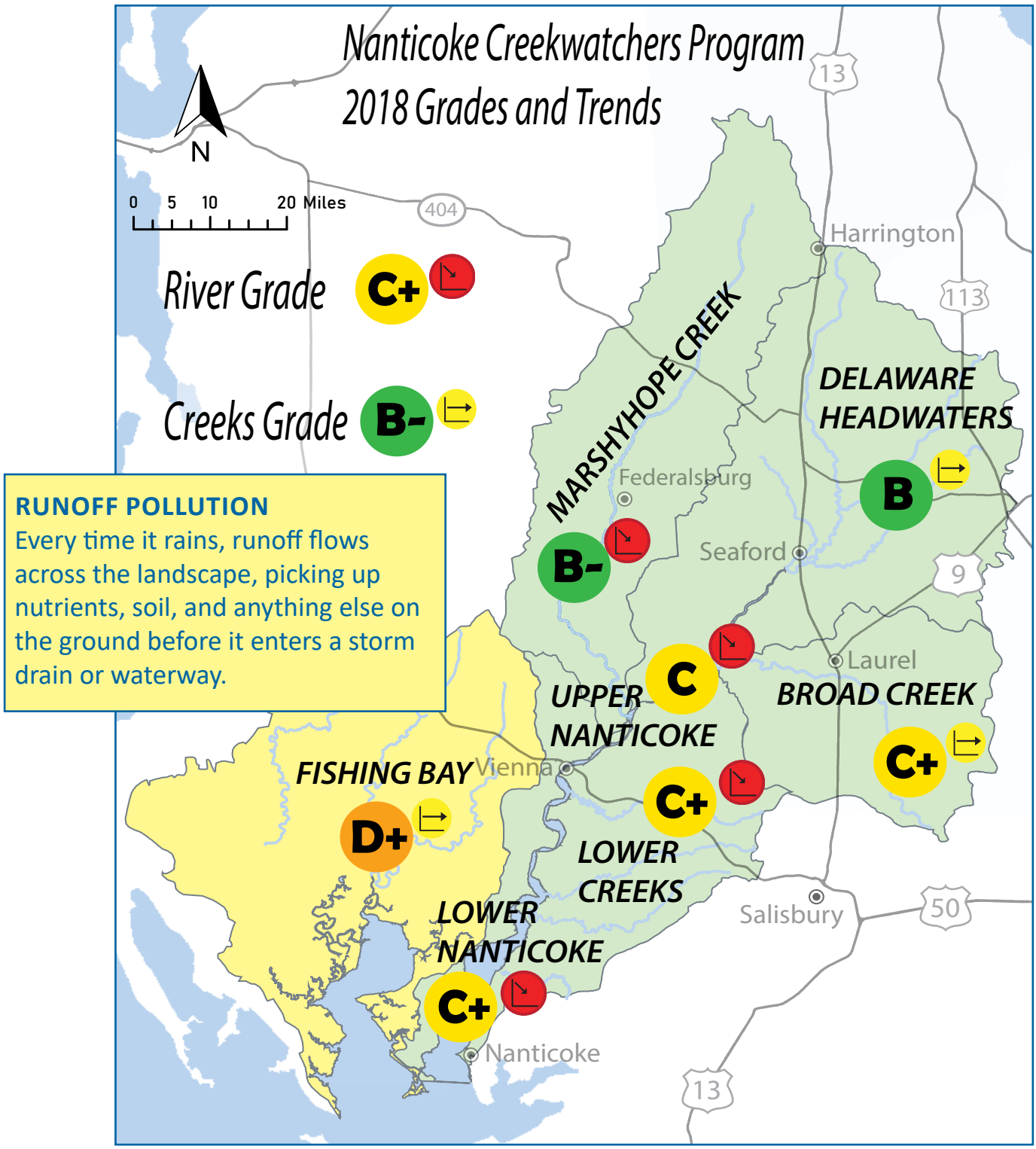
Nanticoke Watershed Alliance

2018 Nanticoke River Report Card

www.NanticokeRiver.org

A record-breaking year of rainfall throughout the Nanticoke River region caused broad declines in most parameters for many of the river and creek regions. Delaware Headwaters, Broad Creek, and Fishing Bay were flat and scored the same overall grades as in 2017. All other regions showed declines from 2017 to 2018. **Overall, the River (Upper Nanticoke and Lower Nanticoke regions) dropped to a C+, while the Creeks (Delaware Headwaters, Broad Creek, Marshyhope Creek, and Lower Creeks) held steady with a B-.** Fishing Bay also scored a D+, same as in 2017. As has been a regular trend since the beginning of this program, **the Upper Nanticoke region continued to decline**; that segment scored the lowest of all Nanticoke regions in 2018.



In general, **DISSOLVED OXYGEN** is a strong indicator of water quality throughout the Nanticoke River region. Oxygen is required for life, and low or no amounts of oxygen cause fish kills and dead zones. Low dissolved oxygen is often caused by high water temperatures and algal blooms or other decaying organic matter, such as leaves in the autumn. Forested buffers along waterways can reduce water temperatures and algal growth. **Although scores slightly slipped for many regions in 2018, all regions scored A or higher, except for Lower Creeks (B). Fishing Bay scored a C-.**

In 2018, Creekwatchers began to measure **CONDUCTIVITY**, the measurement of ion concentration in nontidal waterways. Since conductivity is only measured in nontidal systems (we measure salinity in tidal waterways), the River regions (Upper Nanticoke and Lower Nanticoke) are not included. Ions include sodium, chloride, and calcium, which dissolve in water. When there are too many ions present, changes can occur in the ecosystem, as salt levels increase and waters become more acidic. These changes can stress, damage, and kill aquatic organisms. Road salts, runoff, and faulty septic systems can all increase conductivity. **All creeks regions scored moderately good in conductivity, with the Delaware Headwaters and Marshyhope Creek scoring highest (Bs). However, Fishing Bay scored a D+.**

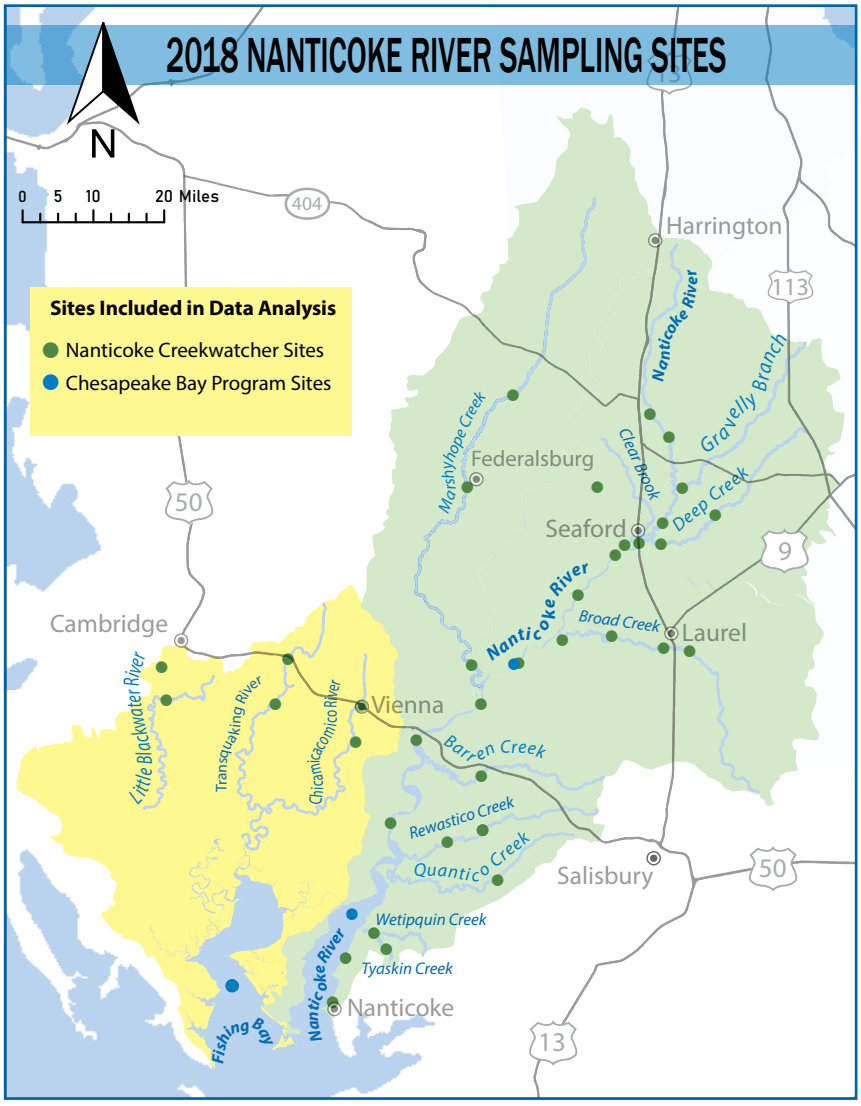


Figure 1 (opposite page): The map shows the overall and region grades for the 2018 season. Figure 2 (above): The map shows 2018 Nanticoke Creekwatchers and Chesapeake Bay Program sites used for data analysis. Sites on the Transquaking River and Chicamacomico River changed during the season. The original nontidal sites moved downstream to tidal locations. NWA graded each site separately. NWA also incorporated three Chesapeake Bay Program sites (Fishing Bay, Tyaskin, and Sharptown) in data analysis.

Figure 3 (above): A Creekwatcher collects a chlorophyll a sample during the summer. Algae is visible on the filter, which will be sent to the lab and analyzed.

Figure 4 (above): Creekwatchers Tedi Kohinke and Tami Hartz (rear) prepare to grab a water sample on the James Branch.

CHLOROPHYLL A is the measurement of algae present in tidal waterways. While algae is naturally-occurring, excessive amounts of nutrients can fuel algal blooms. Some species can cause health issues for humans and pets that contact water during an algal bloom.

Although rainfall increases the amount of nutrients in waterways, it also tends to flush algae, which improved most scores. All regions showed better scores than in 2017, except for the Delaware Headwaters, which worsened slightly, and Fishing Bay, which worsened greatly. However, two Fishing Bay sites changed from nontidal locations to tidal freshwater locations in June, and the inclusion of two additional tidal sites certainly impacted the chlorophyll *a* grade.

Marshyhope Creek at Federalsburg Marina, Nanticoke River at Middleford, and Rewastico Creek headwaters had the best chlorophyll *a* site grades.

As in 2017, the Upper Nanticoke scored worst in chlorophyll *a* (C-), while the Marshyhope Creek region had the best grade (B).

NITROGEN is a naturally-occurring element that is required for plants to grow and is commonly found in lawn and garden and agricultural fertilizers. Nitrogen "greens up" vegetation and is used to encourage plant growth. Excessive amounts of nitrogen (and phosphorus) in waterways can help fuel algal blooms and cause low dissolved oxygen and fish kills. Nitrates can also cause health issues in drinking water. **Unfortunately, the Nanticoke River in general continued to score poorly in nitrogen, with all regions scoring Fs except for Lower Nanticoke (D), Lower Creeks (D), and Fishing Bay (D).**

Deep Creek at Old Furnace Rd., Gravelly Branch at Coverdale Rd., and Quantico Creek at Quantico had the best nitrogen site grades, although they were only fair.

Region scores were flat in the Upper Nanticoke and Delaware Headwaters and worsened in all other regions, including Fishing Bay.

PHOSPHORUS is the other major nutrient responsible for algal blooms and poor water quality. Phosphorus is a fertilizer used to increase plant growth and fruit yield. Unlike nitrogen, phosphorus binds with soil, which means that as rainfall and runoff increases, phosphorus tends to increase.

All Nanticoke regions saw worsened phosphorus grades in 2018 due to heavy rainfall throughout the season and subsequent runoff. Fishing Bay remained flat.

By far, the Delaware Headwaters region scored the best site grade in phosphorus with an A. Many of this region's sites were able to hold their own, unlike other segments. Gravelly Branch, Deep Creek at Old Furnace Rd., and river sites on Redden Rd. and Rifle Range Rd. all individually scored As in this parameter. Outside of Fishing Bay, two sites in the Lower Creeks region scored the worst grades in this category in 2018: a site on Rewastico Creek and one on Quantico Creek.

WATER CLARITY is related to nutrient pollution, as storm-related runoff can easily overwhelm waterways with soil, chemicals, and nutrients. Murky or turbid waterways are unable to support aquatic life such as freshwater mussels, oysters, and aquatic grasses. Many Creekwatchers and NWA staff noticed visual changes in many waterways that followed the heavy, steady rains that began in May and continued throughout the rest of the season. Areas that have supported thick beds of river grasses in the past were not as robust in 2018 as in previous years.

In 2018, water clarity worsened in both the Upper Nanticoke and Lower Nanticoke regions, as well as Fishing Bay. (Again, note that the number of tidal sites in Fishing Bay increased from two to four, which impacted that region's grade.) However, water clarity was flat in all Creeks regions.

The only sites to score A- (there were no As) in water clarity were the Nanticoke River at Middleford and Rewastico Creek headwaters. However, both of these sites saw sharp drops in water clarity following heavy rainfall events.

Figure 5 (above): In 2018, ditches filled with and held water for extended periods of time. This typically dry residential ditch is pictured the day after a heavy rainfall on June 10. Runoff was intense over much of the 2018 season, which negatively impacted a number of sites and waterways.

Figure 6 (above): Creekwatchers Mary Lynn Huberty and John Huberty take dissolved oxygen measurements at a site on the Nanticoke River near Seaford, DE.

Many people make the Nanticoke Creekwatchers program a success. Alongside our citizen scientists, our program partners ensure that each season is a success and that we are able to obtain the very highest quality data possible. Nanticoke Watershed Alliance particularly wants to recognize our primary 2018 partners, the Delaware Department of Natural Resources and Environmental Control (DNREC) for funding and technical support, Envirocorp Labs Inc. for extensive lab support, and the Franklin P. and Arthur W. Perdue Foundation for their support of our 2018 Wade In and Ten Year Report Card release.

THANKS TO OUR 2018 NANTICOKE CREEKWATCHERS!

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Stan Shedaker
Julia Stoshak
Michele Thomas
Howard Vanderslice
Beverly Wilson
George Wilson
Helen Wilson
Nan Zamorski
Rick Zamorski

Figure 7 (above-left): Nanticoke Creekwatchers and Nanticoke Watershed Alliance staff celebrate the end of a successful 2018 season. Figure 8 (above-right): Creekwatcher Howard Vanderslice aces the "Whirl-twirl" at Phillips Landing. The Whirl-bag is sterile and is used for collecting bacteria samples.

DOWNLOAD OUR DATA!

The Nanticoke Watershed Alliance uploads Nanticoke Creekwatchers data to the Chesapeake Monitoring Cooperative's Chesapeake Data Explorer so that agencies, partner organizations, and individuals can easily access, view, and download data. Currently, data from the 2017 and 2018 seasons are available at

cmc.vims.edu.

Figures 9-10 (opposite page): Congregations Caring for Our Lands and Waters *and* River-Friendly Homes *are available at www.NanticokeRiver.org.*

VOLUNTEER!

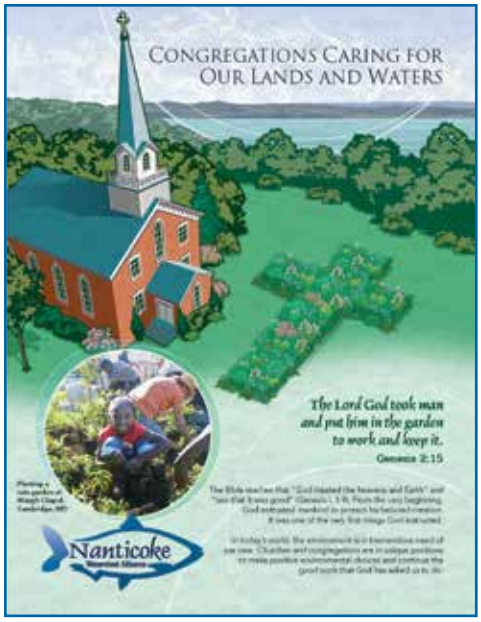
Nanticoke Watershed Alliance (NWA) is always looking for new Nanticoke Creekwatchers (and other volunteers) to join the team! Nanticoke Creekwatchers may be the program for you, if you want to:

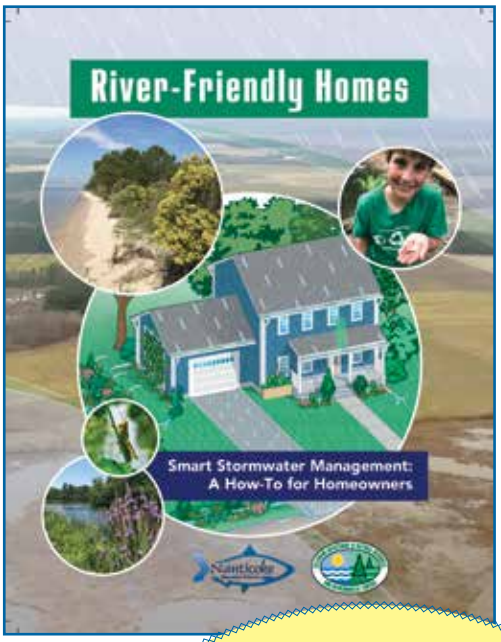
- Be a part of your community,
- Learn how to use cool equipment and follow an EPA-approved protocol,
- See your data used by a variety of agencies and organizations, and
- Meet awesome new people.

The program requires an hour to two hours every other week from late March through early November. Teenagers are welcome to join our program (with a parent or guardian) and can participate in valuable volunteer service and get hands-on experience with water quality monitoring equipment.

Looking to help one day instead? NWA holds river clean-ups, plantings, and other volunteer opportunities that only require a few hours of your time.

Visit www.NanticokeRiver.org to view our current needs.





GROW!

Landscapes come in all shapes and sizes. No matter where you are in Nanticoke country and no matter how small your budget, you can make decisions that help preserve and improve the beauty, diversity, and health of the Nanticoke River. With help from the Delaware Department of Natural Resources and Environmental Control, the Nanticoke Watershed Alliance has recently published a *River-Friendly Guide for Homeowners* that looks at some of the practices you can put into play at home, at the office, or at your church. We also have a church-specific brochure for your congregation. Download our guides at www.NanticokeRiver.org.

INTERESTED IN PURSUING A PLANTING PROJECT AT YOUR PLACE? WE MAY HAVE FUNDING AVAILABLE. CONTACT US AT INFO@NANTICOKERIVER.ORG OR AT 410-443-8878.

The Nanticoke Watershed Alliance works throughout the Nanticoke River region to conserve our natural, cultural, and recreational resources. Besides monitoring our local waterways, we are:

- Installing "Designer Ditches" to beautify ditches, provide habitat for pollinators, and reduce runoff pollution,
- Educating over 700 seventh graders in Wicomico County,
- Providing recreational opportunities on the Nanticoke River and its creeks through organized paddles and the PaddleTheNanticoke.com website,
- Applying stickers by local young artists to storm drains in nearby communities to increase awareness about stormwater pollution,
- Hosting homeowner workshops that educate and empower local residents to put backyard conservation practices such as native tree canopies and designer ditches into play in home, business, and church landscapes, and
- Developing a volunteer river grass monitoring program.

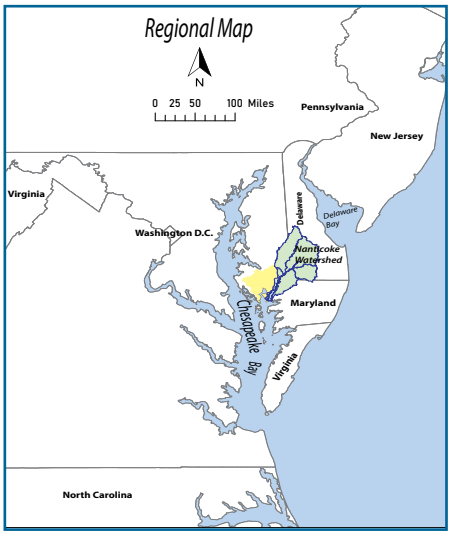


Figure 11 (above): This map shows the Nanticoke River and Fishing Bay watersheds' locations in the region.

Figures 12-14 (left to right): Paddlers enjoy a summer day on Broad Creek. Young artists and NWA staff apply stickers near a storm drain to draw attention to water pollution. Recycled Cardboard Boat Regatta sailors ape bailing their banana boat. The Regatta is an annual event in the Reclaim Our River: Nanticoke Series.

The Nanticoke Watershed Alliance would like to thank the following organizations for their contributions and support of the Creekwatchers program during the 2018 season:

Project Supervisor/Author
Beth Wasden

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