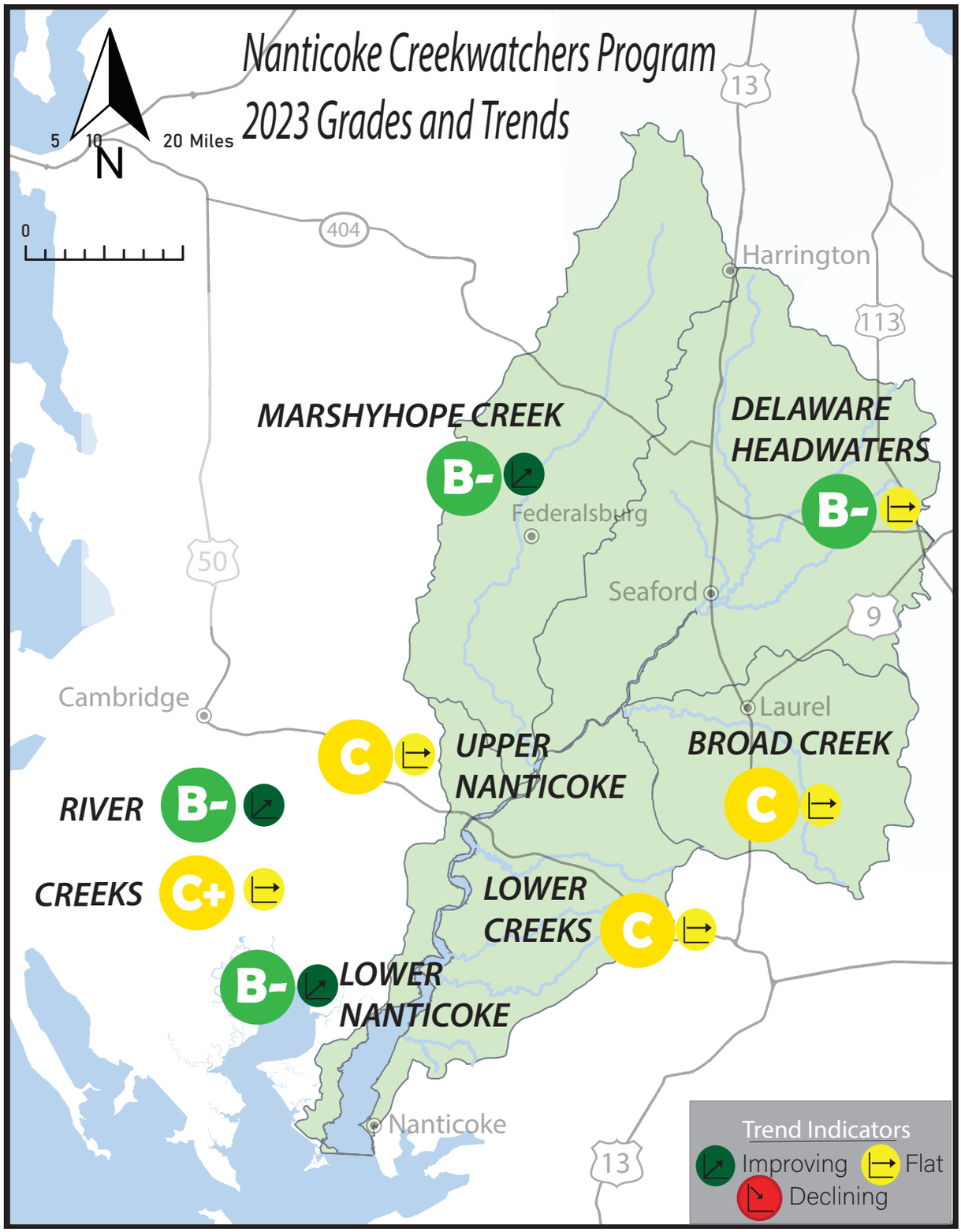
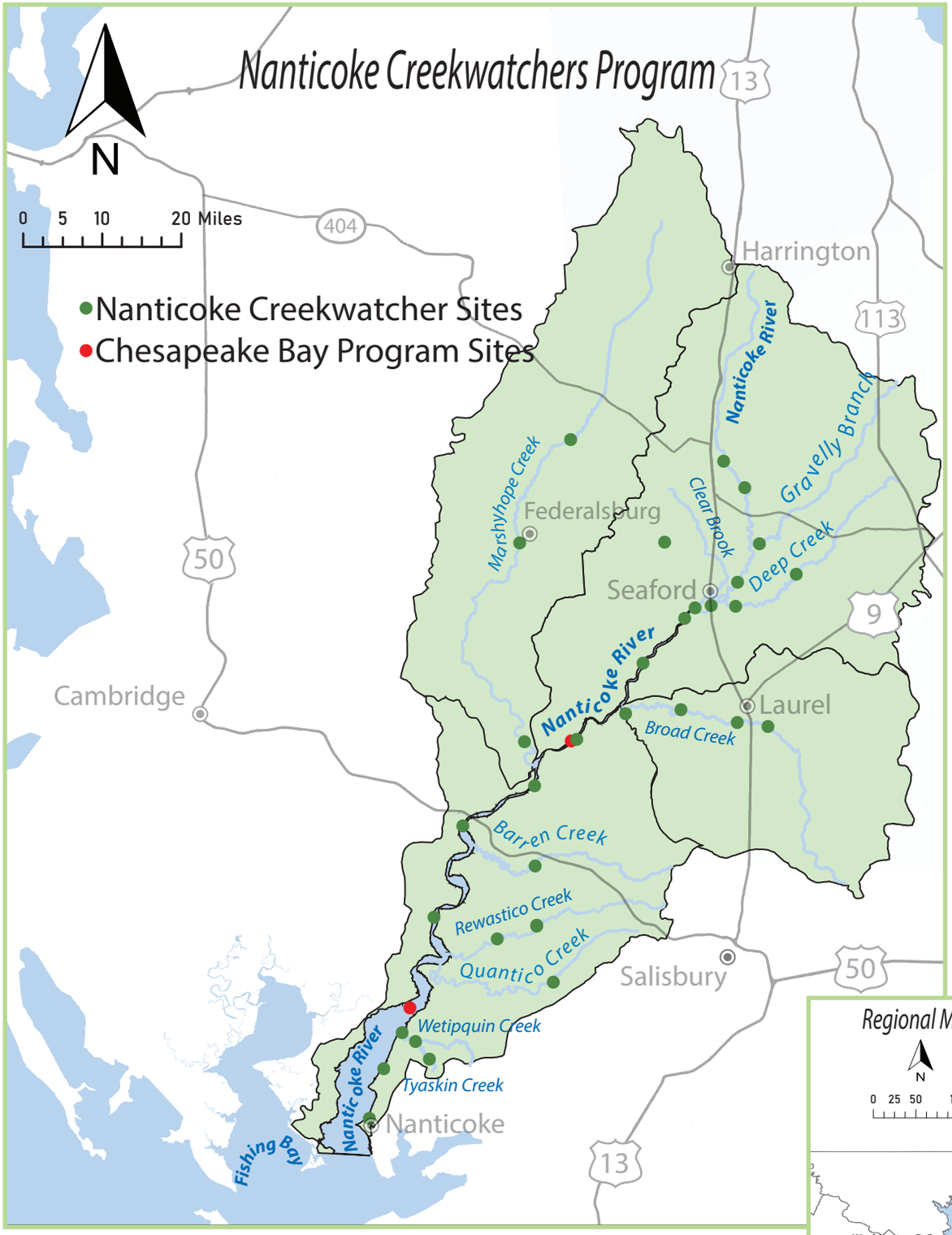
Nanticoke Watershed Alliance

2023 Nanticoke River Report Card

www.NanticokeRiver.org

The Nanticoke Watershed Alliance used data collected by volunteer Nanticoke Creekwatchers and two Chesapeake Bay Program sites to measure the health of the Nanticoke River and its creeks in 2023. Results were mostly flat when compared to 2022 results. Marshyhope Creek and the Lower Nanticoke, a section of the river from Riverton to Nanticoke, MD, saw slight improvements in overall grades compared to 2022. Overall, the Marshyhope Creek and Delaware Headwaters continue to be our healthiest regions, earning B- grades. For the first time since 2015, the Lower Nanticoke also scored a B-. nudging up from a C+ in 2022 due to improvements in total phosphorus and in chlorophyll *a* grades. The Upper Nanticoke, Broad Creek, and the Lower Creeks all received C grades, which matched their 2022 results. Although the Lower Creeks' overall grade remained flat, that region saw a number of improvements in water quality parameters.





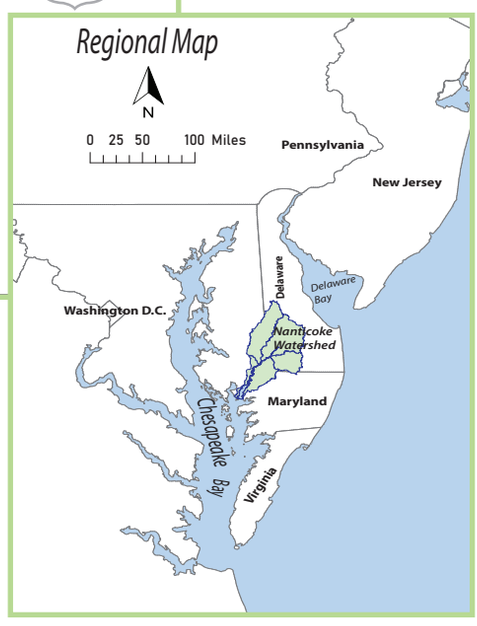


Figure 1 (left): Overall average grades and trends for 2023. Figure 2 (above): Nanticoke Creekwatchers and Chesapeake Bay Program sampling sites. Inset: The location of the Nanticoke River watershed (green) from a regional perspective.

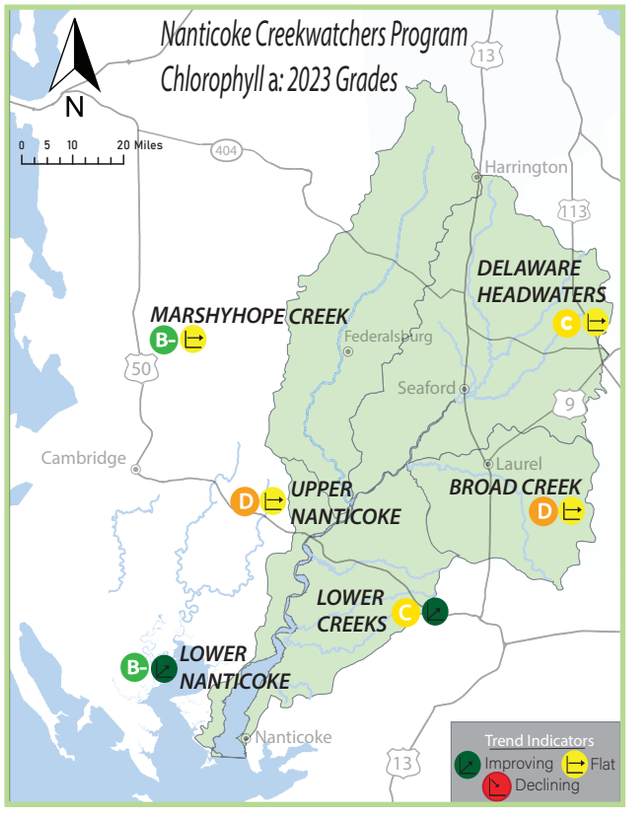


Figure 3 (above): Chlorophyll a grades in 2023.

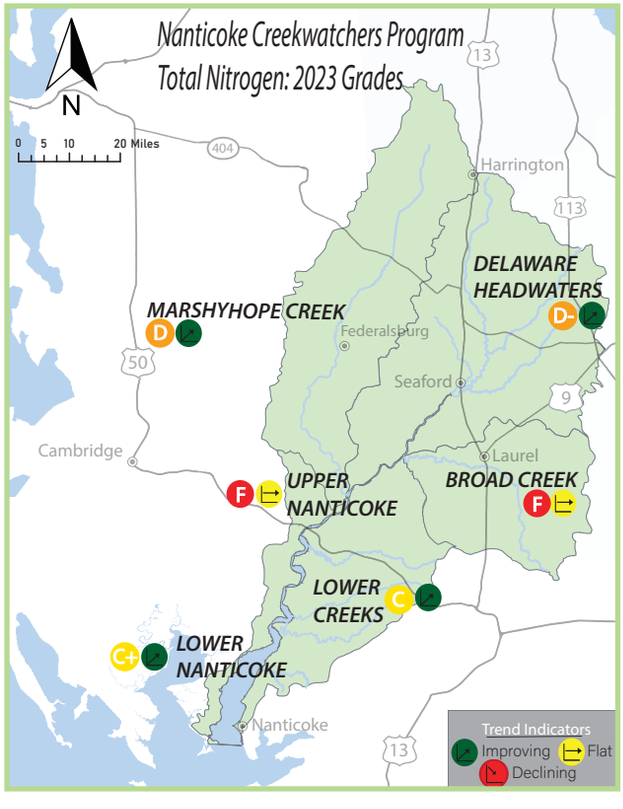


Figure 4 (above): Total nitrogen grades in 2023.

CHLOROPHYLL A (upper-left) is a measurement of algae present in tidal waterways.

In 2023, the Lower Nanticoke improved from a C in 2022 to a B- in 2023. The Lower Creeks also showed a slight improvement, going from a C- to a C. The other regions were flat.

NITROGEN (lower-left) is a naturally-occurring element that is required for plants to grow and is commonly found in lawn and garden and agricultural fertilizers. Like phosphorus, excessive amounts of nitrogen in waterways can help fuel algal blooms (some of them harmful to human and animal health) and cause low dissolved oxygen and fish kills. Excessive nitrogen in the form of nitrates can also cause health issues. **Four out of six regions scored improved grades in total nitrogen in 2023, including the Marshyhope Creek and Delaware Headwaters regions, which typically score Fs. The Lower Nanticoke and Lower Creeks, which have been trending toward improvement in total nitrogen concentrations (as documented in the Fifteen Year Report Card), improved yet again, with the Lower Nanticoke earning a C+ in 2023.**

PHOSPHORUS (p. 5, upper-right) is the other major nutrient responsible for algal blooms and a number of water quality-related issues in waterways, along with nitrogen (page 4). **Phosphorus grades were flat in half of the regions and saw slight improvements in the other half, including the Lower Nanticoke and Lower Creeks.**

WATER CLARITY (p. 5, lower-right) is related to nutrient pollution, as storm-related runoff can easily overwhelm waterways with soil, chemicals, and nutrients. Murky waterways are unable to support aquatic life such as freshwater mussels, oysters, and aquatic grasses.

Unlike other parameters, water clarity declined in the Lower Nanticoke and in Marshyhope Creek and was flat in all other regions.

2023 Highlights

- The Lower Nanticoke and Lower Creeks showed improvement across a number of water quality parameters.
- In spite of gains in these regions, sites along Barren Creek, Quantico Creek, and Rewastico Creek continue to be heavily impaired.
- The Upper Nanticoke and Broad Creek regions scored the worst grades overall, continuing a longer-term trend.
- CHLOROPHYLL *a* grades improved in the Lower Nanticoke and Lower Creeks and remained flat in all other regions.
- Most regions saw improvements in NITROGEN grades. The Marshyhope Creek improved from an F in 2022 to a D in 2023. The Lower Nanticoke and Lower Creeks continued their longer-term improvement in NITROGEN grades.
- PHOSPHORUS grades were flat throughout most of the watershed, although the Lower Nanticoke and Lower Creeks (again) showed improvement in this parameter. The Lower Creeks jumped from a D in 2022 to a C in 2023.
- WATER CLARITY grades declined or were flat. Regions are either moderately healthy or trending toward poor water clarity.
- DISSOLVED OXYGEN remains healthy in all six regions.
- CONDUCTIVITY was mostly flat. Marshyhope Creek saw a slight decline.

The Nanticoke Watershed Alliance uses multithreshold criteria developed by the Mid-Atlantic Tributary Assessment Coalition (MTAC) to analyze and grade sites and regions. See ian.umces.edu for more information.

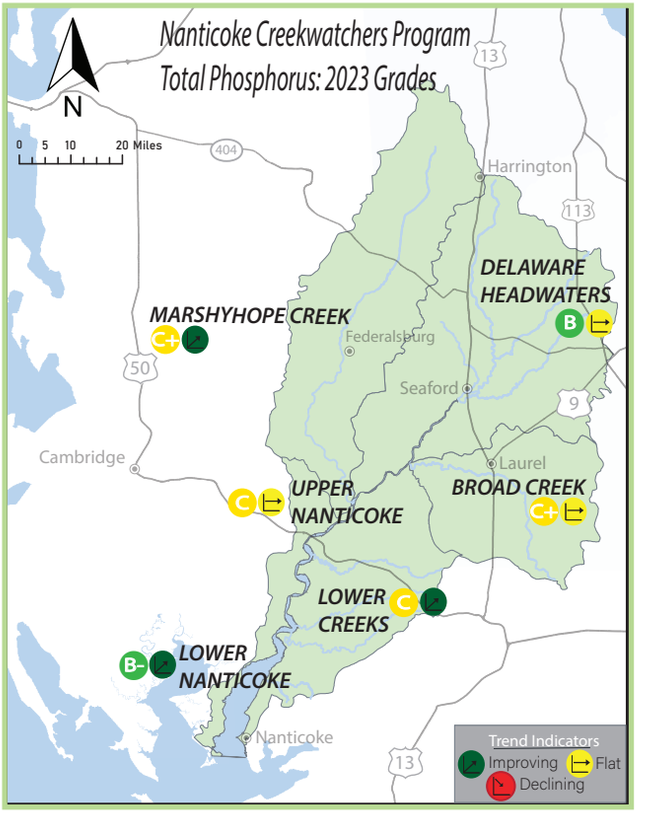


Figure 5 (above): Total phosphorus grades in 2023.

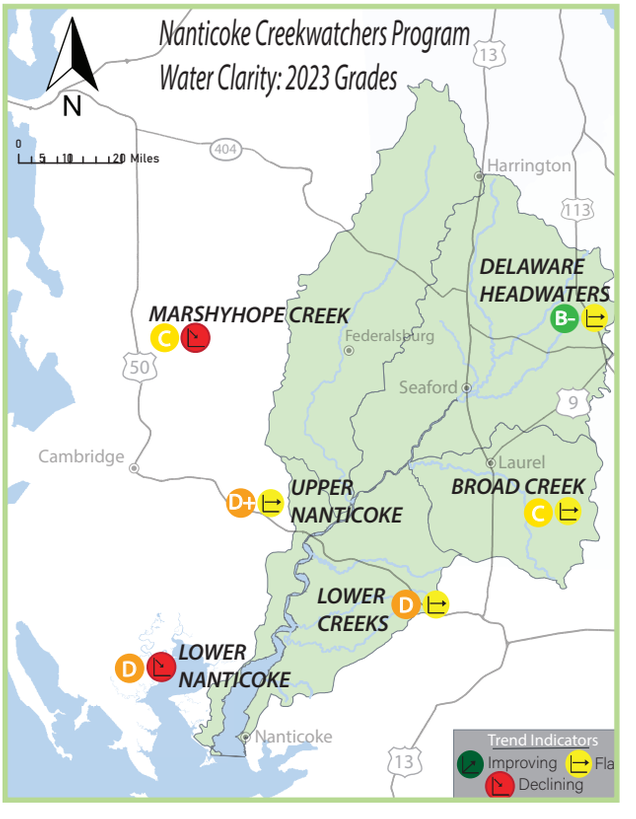


Figure 6 (above): Water clarity grades in 2023.

In general, **DISSOLVED OXYGEN** (right) is a strong indicator throughout the Nanticoke River region. **In 2023, dissolved oxygen continued to be excellent throughout the Nanticoke River watershed.**

Dissolved oxygen can differ according to the water depth; Creekwatchers have been taking multiple measurements (known as a depth profile) since 2014, and these measurements are included in analysis.

Low dissolved oxygen can be caused by decaying algal blooms or leaf litter and extremely warm water temperatures. Waterways that feature tree buffers and mature canopy tend to have lower water temperatures and higher dissolved oxygen. Low or no dissolved oxygen can create a number of issues, including fish kills and dead zones.

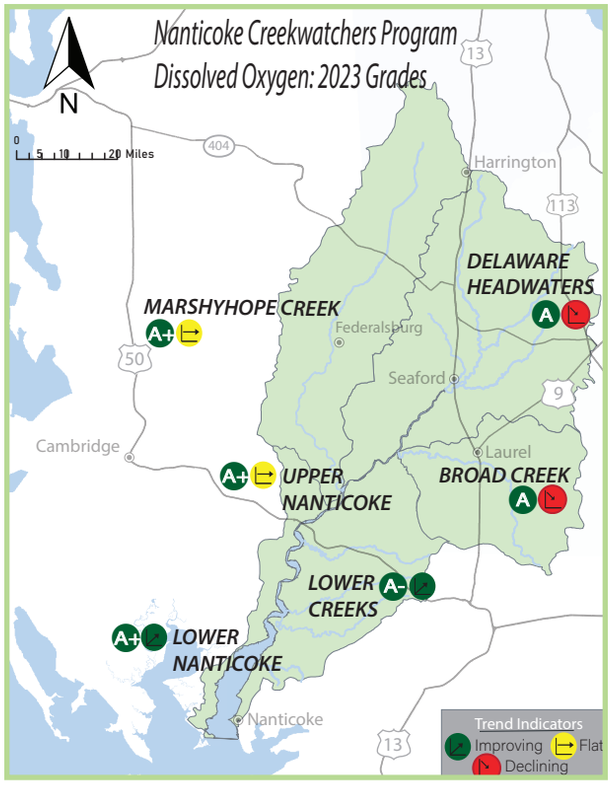


Figure 7 (above-right): Dissolved oxygen grades for 2023.

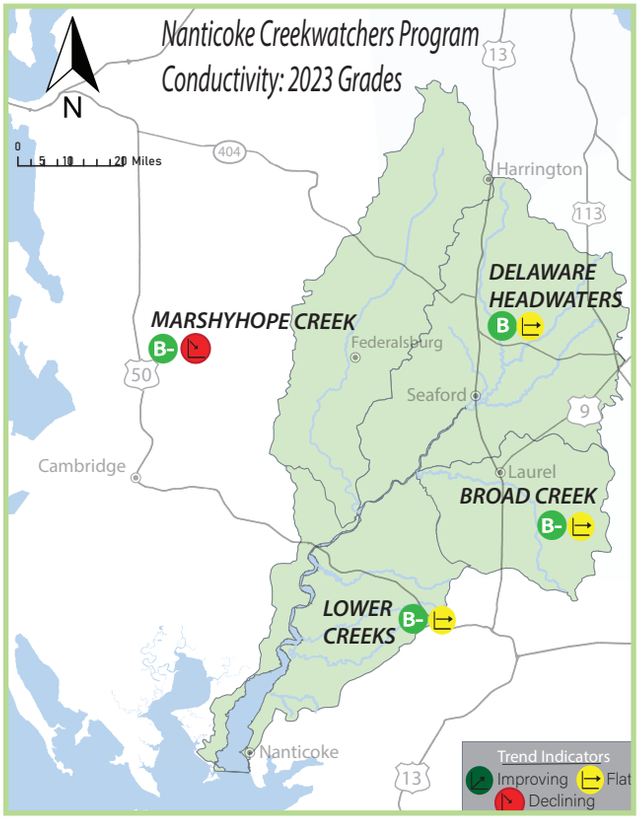


Figure 8 (above): Conductivity grades for 2023.

Conductivity measures the concentration of ions in nontidal waterways. (At tidal sites, Creekwatchers collect salinity data. Accordingly, we do not measure conductivity at any river sites, so the Upper Nanticoke and Lower Nanticoke regions do not receive conductivity grades.) As compounds enter waterways through runoff, they break down into smaller parts, including ions. Excessive ion concentrations can decrease pH levels, making waterways more acidic and harming plants and animals.

In 2023, conductivity grades were flat except for Marshyhope Creek, which saw a slight decline. Conductivity grades continued to be good.

Download or view our data at the Chesapeake Data Explorer, which is provided by the Chesapeake Monitoring Cooperative.

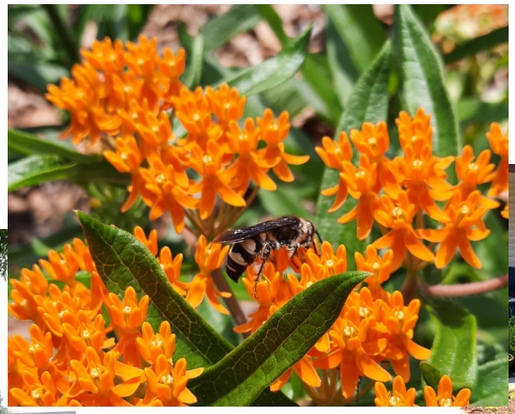
CMC.VIMS.EDU

THANKS TO OUR 2023 NANTICOKE CREEKWATCHERS!

Bill Ayrey
Richard Ball
Amber Cockey
Elijah Cockey
Genevieve Cockey
Isabel Cockey
Robin Cockey
Bonnie Erwin
Jean Hendrickson
Shawn Hoshall
Janice Justice
Tedi Kohinke
Lynn Kohler
Sally Kohler
Josh Krueger
Russ Little
Darcy Manes
Katie Manes
Laura McCann
Janet Messick
John Murrell
Bonnie Rose
Dave Rose
Howard Vanderslice
John Vrabel
Wendy Whaley-Little

(Upper-left) Bonnie Erwin takes dissolved oxygen readings at Rewastico Creek. (Upper-right) Laura McCann and Bill Ayrey take a pH reading. (Lower-left) Jean Hendrickson and John Vrabel help remove a tire from the Nanticoke River at Rifle Range Rd. after Creekwatching. (Lower-right) Creekwatchers enjoy a September paddle on the Marshyhope Creek.

Nanticoke Watershed Alliance serves the Nanticoke River watershed through outreach, education, and dialogue. We encourage you to visit our website to learn more about us and the Nanticoke Creekwatchers Program, to register for events and programs, and to download publications that can help you make your property Nanticoke-friendly.



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The Nanticoke Watershed Alliance would like to thank the following organizations for their contributions and support of the Creekwatchers program during the 2023 season:

Project Supervisor/Author:
Beth Wasden

Published: July 2024