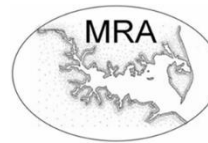


2023 Magothy River Index



Magothy River Assn., Inc.
P. O. Box 550
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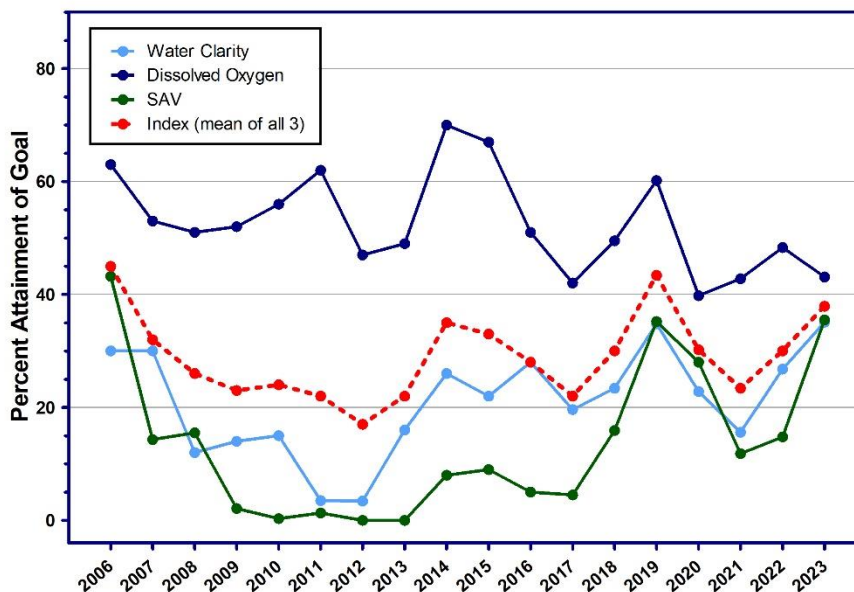
Prepared for "State of the Magothy" event to be presented at Anne Arundel Community College on 4/5/24

Magothy River Health improved again in 2023

The Magothy River Association's annual "Magothy River Index", first presented in 2003, assesses water quality in the tidal river. The Index is based on three criteria established by the Chesapeake Bay Program for ecosystem health, and is expressed as percent attainment of a desirable goal and as a letter grade where 0-20% is an F, 21-40 is a D and 41 to 60 is a C. The criteria are percent attainment of:

- water clarity based on Secchi disk depth of at least 1 meter
- dissolved oxygen of at least 5 mg/L in the deepest water at each station and
- achievement of the Chesapeake Bay Program Goal of 579 acres of submerged aquatic vegetation (SAV).

Magothy River Index, 2006-2023

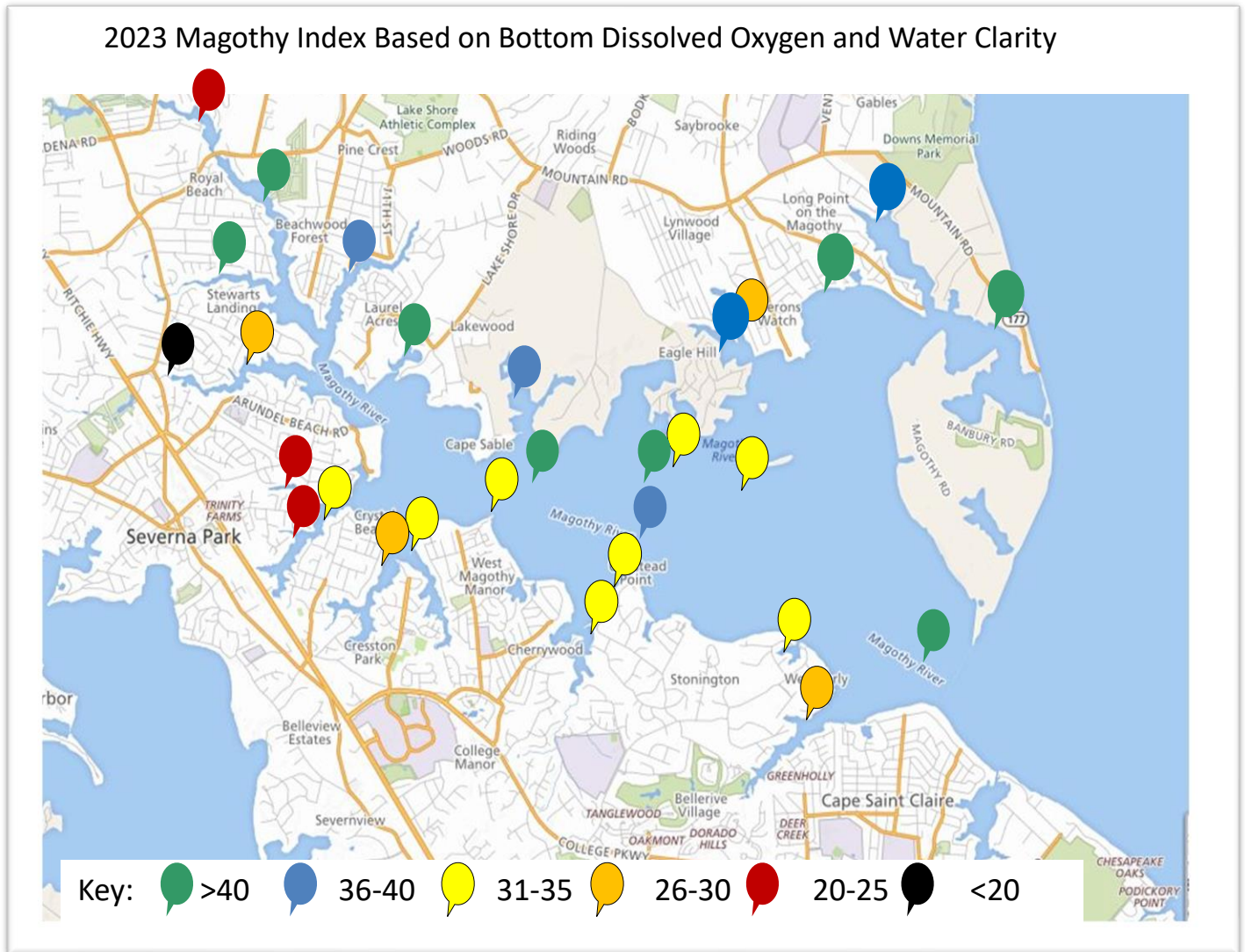


SAV requires water clarity for growth and provides dissolved oxygen as well as key food and habitat for fish and crabs while reducing the impact of wave action on the shore. Most fish, shellfish and aquatic invertebrates require at least 5 mg/L dissolved oxygen (DO) in the water column for their sustained growth and reproduction.

In 2023, BayLand Consultants & Designers Inc. surveyed eight creeks plus Lake Placid and the inlet at Hunter's Harbor; they found 155

acres of underwater grasses during their early season and mid-season surveys. BayLand scientists found seven different species of grass in their surveys, with Cornfield Creek having the greatest diversity. The Virginia Institute of Marine Science (VIMS) aerial data for 2023 showed a slight decrease from 81 acres of SAV in 2022 to 71 acres in 2023. There was some overlap of the coverage of grass in these two data sets, requiring subtraction of overlapping areas. Once this was done, we found a total of 205.6 acres, which is 35.5 % of our goal. Thanks to MRA volunteers who kayaked throughout the SAV beds last summer and Bayland scientists, we know that the dominant grasses in the river were the early season horned pondweed plus the mid-season Redhead, Sago, Common Waterweed and Milfoil. As expected, more SAV growth occurs when water clarity and light availability are increased. Improved water clarity indicates less growth of microscopic algae in the water column as well as less sediment. We saw little of the algal bloom known as mahogany tide in 2023, contributing to the improved water clarity.

In addition to the SAV coverage, this year's index is based on data collected by volunteers from seven open water mainstem sites, two upstream mainstem sites and 19 creek or cove sites sampled from piers. All sites are shown in the map below. We did not include the most upstream site of Cattail Creek in the final index since this is a restoration site with less than one foot of water depth. This year's index is 38, which earns a D+.



In the figure above, the Index is calculated for each station using only bottom DO and water clarity data, since we don't have SAV coverage goals for creeks. This year many creeks on the south shore had poorer water quality than in 2022 but others were improved, especially in the upper Magothy. We saw a significant improvement in the south shore sites between 2021 and 2022 but in 2023, we lost some of that improvement. Overall, the availability of oxygen in the deepest water is slightly lower than last year but water clarity was improved. Both the County and MRA have focused attention on the south shore in the last few years, building stormwater restoration projects and keeping watch on site stabilization during construction. Rainfall was again lower than average in 2023, causing salinity of the river to be elevated. We would have expected to see better bottom DO since fewer nutrients would have been added via stormwater but we did not see this in the overall score in 2023. Water temperature was not elevated in 2023. We thank our volunteer monitors for their dedicated work again this year: Mike and Trish Lehman, John Maliszewski, Chris Kerchner, Paul Spadaro, Bob Royer, Jim Crafton, Chuck McClain, Jay and Jennie Mulford, and Larry and Angela Turner. We sincerely thank waterfront property owners for access to their piers.

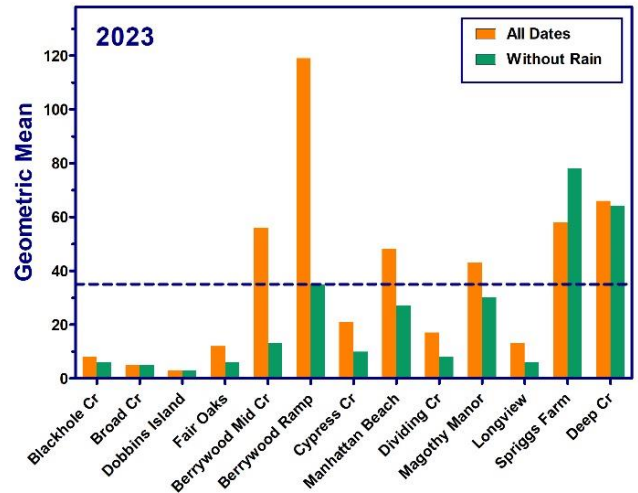
Good Bacterial Water Quality in 2023

Our waterways were safe for recreational use this year most of the time and at most sites. We always expect to see high enteric bacterial populations at the Berrywood restoration site as that water is very shallow and receives a great deal of runoff after at least a half inch

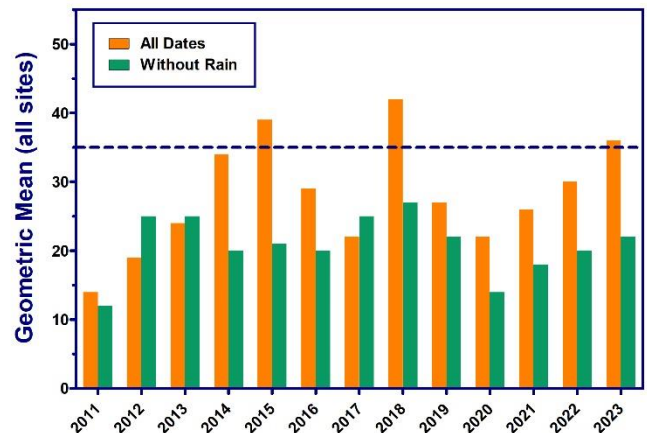
rain. Again MRA monitored the popular swim area behind Dobbins Island this year and found excellent water quality even after a heavy rain. The Deep Creek site has had high bacterial counts for years and we still don't know the source of these bacteria. We sampled at the small boat launching site at Spriggs Farm Park this year for the first time and were surprised to see that bacterial water quality there was not good. Since bacterial counts are high even in the absence of rain, we suspect the source of enteric bacteria for both Spriggs Farm and Deep Creek may be birds or other wildlife but we have not been able to find evidence to support that suspicion. We monitor the population of enterococci (*Enterococcus faecalis*) in our waterways as this bacterium is an indicator of recent input of fecal waste from mammals and birds. Sites are sampled weekly or biweekly by students at AACC in the Op. Clearwater program. Water samples are collected on Wednesday mornings, processed by filtration at the lab, and results, expressed as colony forming units or CFU/100 ml, are posted on Dr. Tammy Domanski's website :

<https://sites.google.com/view/aaccoperationclearwater>.

In the figures to the right, bacterial numbers are expressed as the geometric mean, which enables us to see the summary for each site each season. The dotted line is drawn at 35 CFU/100 ml, which is the upper limit for safe recreational use. Heavy rains producing stormwater runoff sweep pet and wildlife waste into our creeks. By showing both dry weather conditions and all weather conditions, we can see which sites are most impacted by stormwater. The good news is that if we calculate the percent of the time that our waterways were swimmable, we would have an 86% score. The second figure shows the trend for the last 12 years. Most of the time water quality is good for swimming but it's important to remember that **swimming in the 48 hours following a heavy rain is not recommended**. If you are interested in having your community join Operation Clearwater, you can find the application for the 2024 season at the AACC website given above.



Enterococci (CFU/100 ml) at Magothy sites



President's Statement

During the 2023 circumnavigation, MRA volunteers saw bait fish everywhere, crabs returning to Cattail Creek, and SAV returning to Henderson Point. These are good signs. In 2024 consider joining the MRA, become active, working together we can restore the Magothy for generations to enjoy.

Congratulations to AACC Student who received MRA Scholarships



This year Parinaaz Patel received both the Jim Gutman Scholarship and the E. Gordon Riley Scholarship. Pari Patel is pursuing a degree in Environmental Science at AACC. She is interested in geology and environmental restoration including wetlands and oyster reefs and plans to transfer to the University of Maine for her B.S. to study geology and environmental science.

MD Dept. of Natural Resources Delivers Oysters to the Magothy



On July 5, 2023, Maryland DNR and the Oyster Recovery Partnership brought oyster spat on shell to our river on the vessel Robert Lee. They delivered enough oyster shell to cover 3.1 acres of historic reef at Chestneck Point and Ulmstead Point. This amounts to 23.58 million young oysters that can now grow and help improve water quality by their filter-feeding activities. Spat on shell is produced at the Horn Point Laboratory of the University of Maryland Center for Environmental Science. Federal funding for this work is also provided by the US Army Corps of Engineers and the National Oceanographic and Atmospheric Administration (NOAA).

MRA Volunteers in Action

- Again this year MRA participated in the Chesapeake Bay Program's SAV Watchers where volunteers look for underwater grasses by kayak. This information is key to "groundtruthing" the images seen in aerial photography taken by VIMS. Interested in monitoring for SAV? We will provide instruction on SAV identification and methods for monitoring and ask that you go out at least twice between May and September to look for grasses in an area of your choice. Please contact sally.hornor@gmail.com to find out more and to volunteer.
- Interested in growing oysters at your pier or in helping to monitor construction sites for sediment runoff? Contact Brad Knopf at bdknopf@gmail.com.
- Do you have stories about growing up on the Magothy that you would like to share in our Living History project? Contact Andrea Germain at a3germain@gmail.com.
- Join MRA (MagothyRiver.org); only \$25 for individuals and \$35 for communities.

This index prepared by Sally Hornor with graphics support from Tom Caperna.