2022 Magothy River Index

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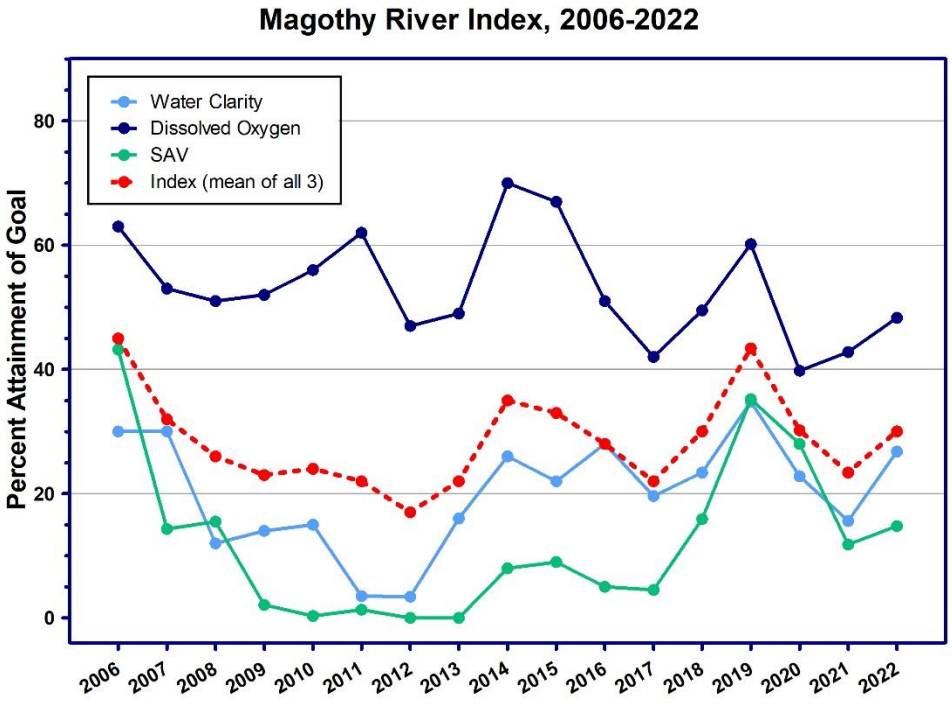
Prepared for "State of the Magothy" event to be presented at Anne Arundel Community College on 3/31/23

Magothy River Health improved in 2022

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).

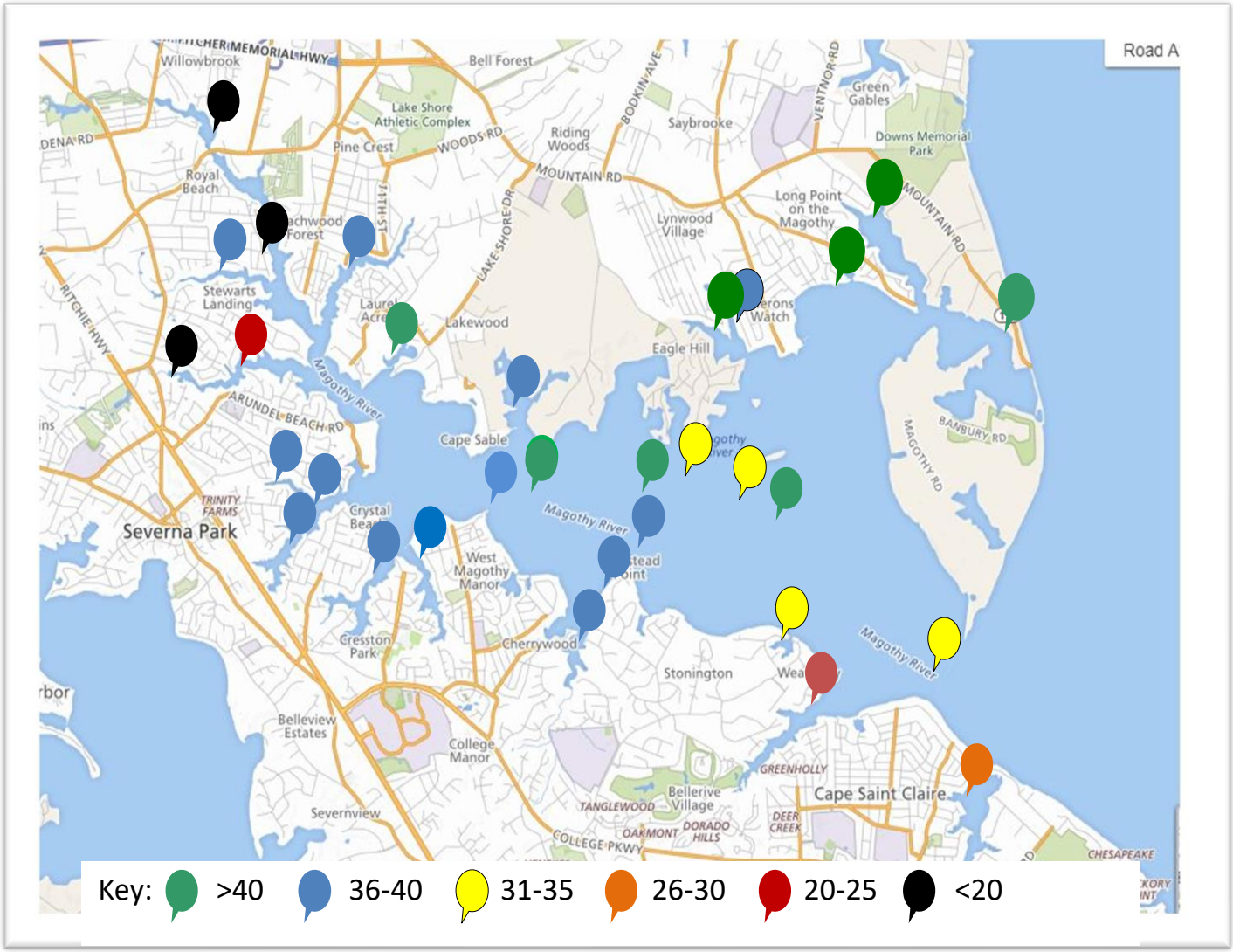


SAV requires water clarity for growth and provides dissolved oxygen as well as key food and habitat for fish and crabs while reducing the impact of wave action on the shore. Most fish, shellfish and aquatic invertebrates require at least 5 mg/L dissolved oxygen (DO) in the water column for their sustained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

In 2022, BayLand Consultants & Designers Inc. surveyed only one creek in our watershed; they found five acres of horned pondweed, the early season grass, in Mill Creek. The Virginia Institute of Marine Science (VIMS) aerial data for 2022 showed an increase from 61 acres of SAV in 2021 to 81 acres in 2022. Adding the Bayland coverage to the VIMS coverage gives us a total of 86 acres, which is 14.8 % of our goal. Thanks to MRA volunteers who kayaked throughout the SAV beds last summer, we know that the dominant grasses in the River were Redhead, Widgeon Grass, Sago, Waterweed and Milfoil. As predicted, 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. Despite the seemingly constant mahogany tides we saw in some parts of the River in 2022, overall phytoplankton growth must have been reduced. Less algal growth means less decomposition when algal blooms die off, thus adding to the increased DO in the deeper water.

In addition to the SAV coverage, this year's index is based on data collected by volunteers from eight open water mainstem sites, two upstream mainstem sites and 20 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 we don't sample in the headwaters of any of the other creeks. This year's index is 30, which earns a D.

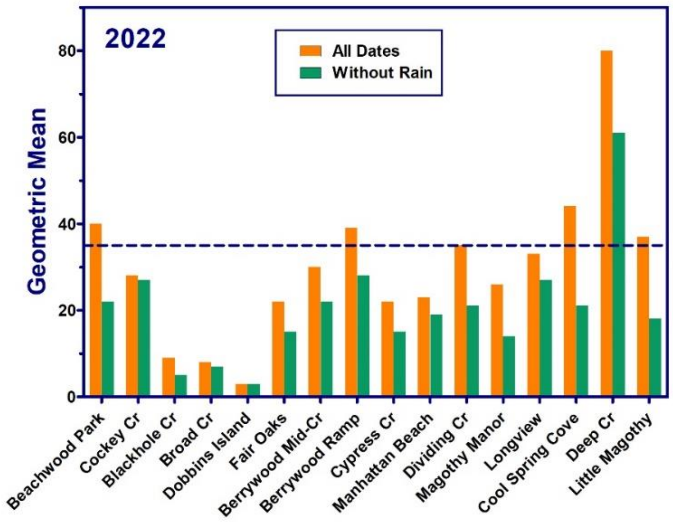
2022 Magothy Index Based on Bottom Dissolved Oxygen and Water Clarity



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 22 out of the 30 stations proved to have better water quality than they did in 2021. It is particularly gratifying to see that most of the creeks on the south shore, which have traditionally had the poorest water quality, were greatly improved in 2022. Both the County and MRA have focused most of their attention on the south shore in the last few years, building stormwater restoration projects and keeping watch on site stabilization during construction. Rainfall was somewhat less than average in 2022, causing salinity of the River to be elevated, and sending less stormwater into the river. Less stormwater means fewer nutrients enter the river, contributing to improved water quality. We thank our volunteer monitors for their dedicated work again this year: Steve Troy, Mike and Trish Lehman, Chris Kerchner, Paul Spadaro, Bob Royer, Jim Crafton, Chuck McClain, Roger Winstanley, Larry and Angela Turner and Tom Caperna. We sincerely thank waterfront property owners for access to their piers.

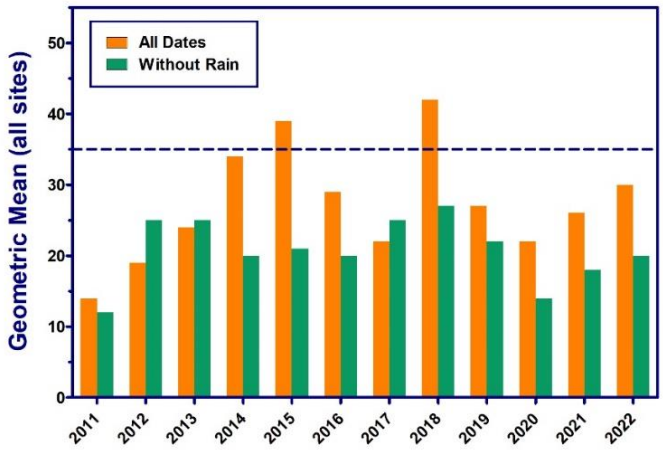
Good Bacterial Water Quality in 2022

Our waterways were safe for recreational use this summer at most sites except for a few that were above the safe level after heavy rains: Beachwood Park, the Berrywood boat ramp and Cool Spring Cove. Deep Creek was the only location with high bacterial counts even without heavy rain; waterfowl might be the source. We monitor the population of enterococci (*Enterococcus faecalis*) in our waterways as this bacterium is an indicator of recent input of fecal waste. Most sites are sampled 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/aaccecoperationclearwater.



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 83% score. Also note that the site behind Dobbins Island had excellent bacterial water quality all summer. The second figure shows the trend for the last 12 years. Wet summers typically produce higher bacterial counts. It is important to note that **swimming in the 48 hours following a heavy rain is not recommended**.

Enterococci (CFU/100 ml) at Magothy sites



Congratulations to Two AACC Students who received MRA Scholarships

This year two AACC students have received MRA scholarships: Parinaaz Patel received the Jim Gutman MRA Scholarship and Tyler Saveleski received the E. Gordon Riley MRA Scholarship. Pari Patel is pursuing a degree in Environmental Science; she is interested in environmental restoration including wetlands and oyster reefs.

Tyler is pursuing a degree in Environmental Science and is interested in environmental engineering. He is a volunteer student leader for the Chesapeake Bay Foundation and has worked with AACC Environmental Center staff to collect seeds for aquatic grass restoration. He hopes to earn a master's degree in this field and continue to help local communities to preserve our natural resources.

President's Statement

Our watershed has demonstrated resilience to many onslaughts from development but we must continue to be vigilant to ward off irresponsible development.

Reefball Project

MRA has been working with partners from the Coastal Conservation Assn., Broadneck High School Environmental Literacy Program, Maguire Marine Construction, and Cypress Marine to place reefballs in the mainstem of the Magothy. These limestone domes provide substrate on an otherwise smooth river bottom that makes habitat available for fish, shellfish, and many other invertebrates. Most of these reefballs were built by high school students throughout the Chesapeake Bay watershed. Some reefballs have oyster shell placed on the surface and some have spat on shell. Reefball sites are marked in the River, showing anglers where they can expect some good fishing.

MRA Volunteers in Action

- Again this year MRA participated in the Chesapeake Bay Program's SAV Watchers. Volunteers received training in how to identify and geolocate SAV and were given Secchi disks to measure water clarity. Volunteers then paddled in their neighborhood creeks and mainstem and monitored the presence and types of grasses. This information is key to "groundtruthing" the images seen in aerial photography taken by VIMS. Interested in monitoring for SAV by kayak or other small boat? 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? Contact Paul at president@magothyriver.org
- Help 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.