2024 Magothy River Index

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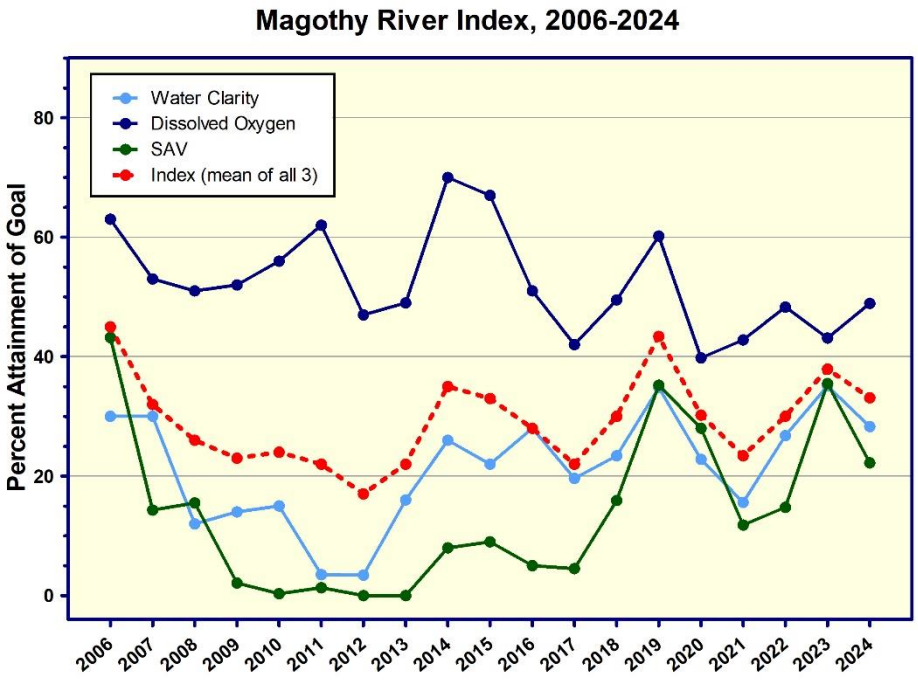
Prepared for "State of the Magothy" event to be presented at Anne Arundel Community College on 3/28/25

Magothy River Index declined in 2024

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).



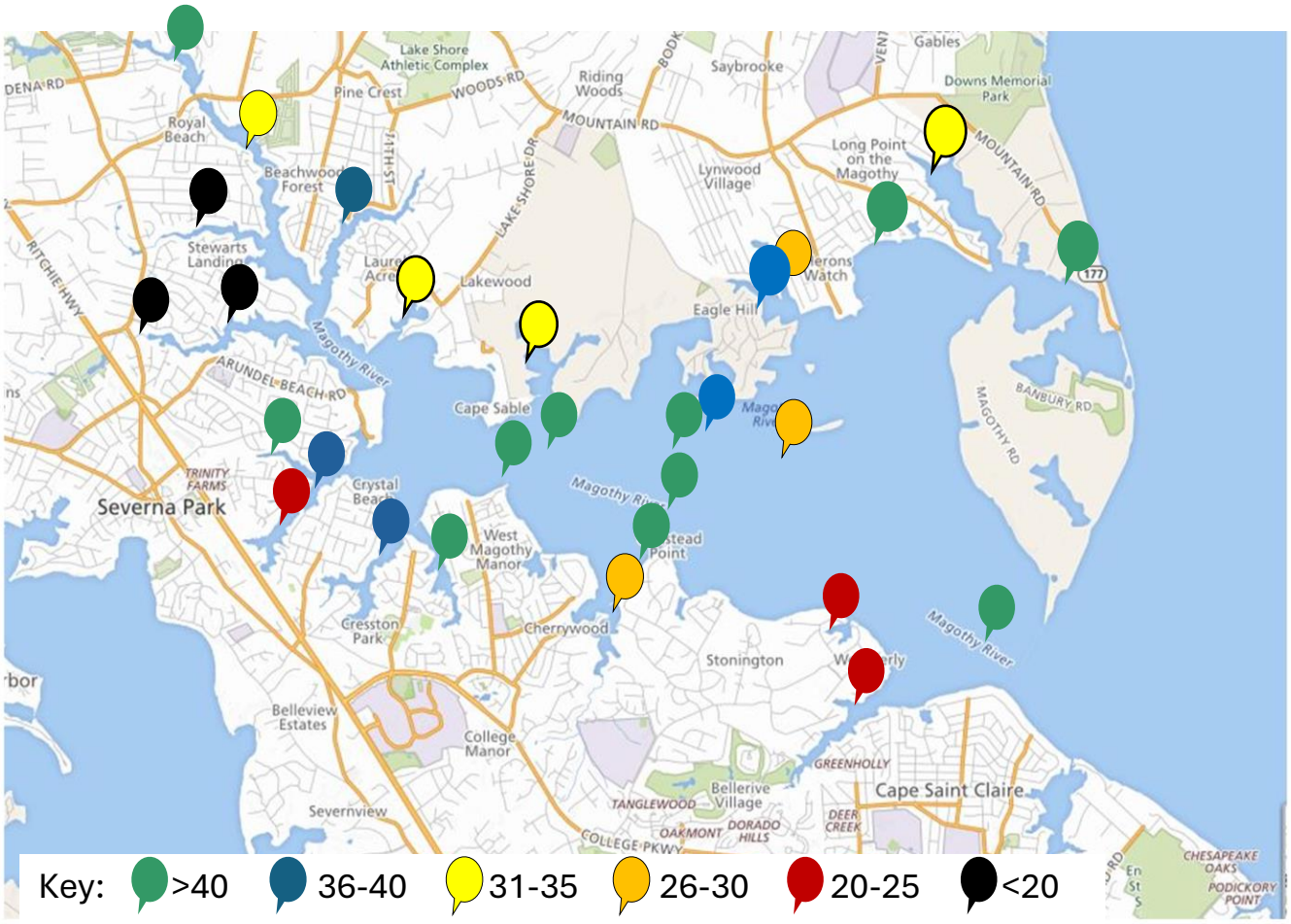
SAV requires water clarity for growth and provides oxygen as well as key food and habitat for fish and crabs while reducing the impact of wave action on the shore. Most fish, shellfish and aquatic invertebrates require at least 5 mg/L dissolved oxygen (DO) in the water column for their sustained growth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

SAV acreage in the Magothy is provided by Bayland Consultants & Designers Inc., and by the Virginia Institute of Marine Science (VIMS). In 2024, BayLand surveyed five creeks: Deep Creek, Cypress, Cattail, Old Man and Mill. They found 55.5 acres of SAV during their early season and mid-season surveys. Three species were present: horned pondweed (*Zannichellia palustris*), coontail (*Ceratophyllum demersum*) and common waterweed (*Elodea canadensis*). VIMS aerial data revealed a slight increase from 71 acres in 2023 to 73 acres in 2024. Interestlingly, they found SAV on the south shore of Dobbins Island last year, which hasn't been seen for many years. Thus the total SAV coverage was 128 acres, which is 22.2 % of our goal. If Bayland had been able to survey more creeks, we might have had more coverage. 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, Widgeongrass, Common Waterweed and Milfoil. We saw an overall decrease in water clarity this year which is surprising since we didn't see mahogany tide algal blooms in most of the river.

We did see an increase in bottom dissolved oxygen. The lower clarity and higher DO are most likely due to overall algal growth without causing blooms. There were some mahogany tides in Cattail Creek in late summer which led to blooms of sulfur bacteria and toxic hydrogen sulfide (H_2S) levels.

In addition to the SAV coverage, this year's index is based on data collected by volunteers from seven open water mainstem sites and 23 stations sampled from shore. 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 33,earning a D.

2024 Magothy Index Based on Bottom Dissolved Oxygen and Water Clarity

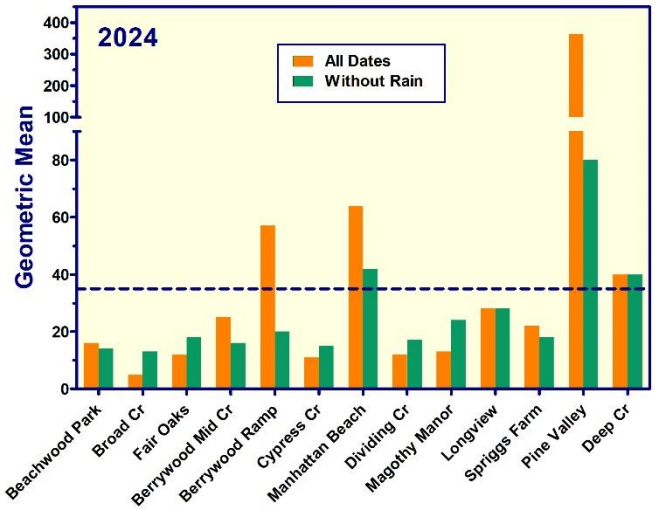


In the figure above, the Index is calculated for each station using only bottom DO and water clarity data, since we don't have SAV coverage goals for creeks. Of the 30 sites monitored, 12 showed improvement over 2023 results, 7 showed poorer water quality and 11 showed no change. This year many sites on the south shore had better water quality than last year but there were two problematic exceptions: Cattail and Old Man Creeks. There have been numerous stormwater restoration projects carried out by the County on south shore creeks and these projects may in part be responsible for improved water quality. Additionally, rainfall was again lower than average in 2024, bringing less stormwater into our creeks. We thank our volunteer monitors for their dedicated work again this year: Mike and Trish Lehman, John Maliszewski, Chris Kerchner, Paul Spadaro,

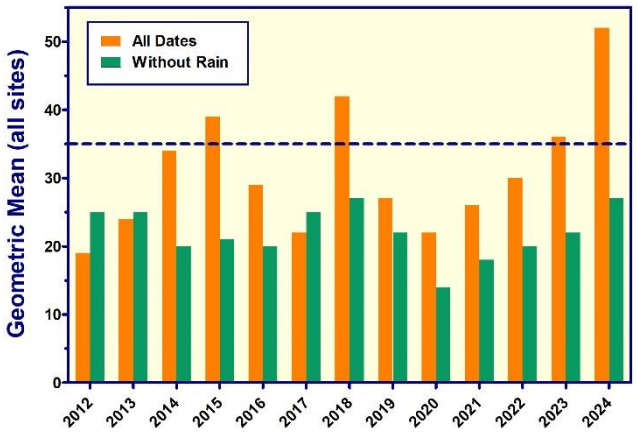
Bob Royer, Jim Crafton, Chuck McClain, Jay and Jennie Mulford, and Larry and Angela Turner. We sincerely thank waterfront property owners for access to their piers.

Good Bacterial Water Quality in 2024

Our waterways were safe for recreational use this year most of the time and at most sites. 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/aaccecoperationclearwater.



Enterococci (CFU/100 ml) at Magothy sites



We 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. MRA monitored the kayak launch site at Spriggs Farm Park and found much lower bacterial counts this year compared to last year. It seems that whatever was causing high counts last year has left the area. The Deep Creek site has had high bacterial counts for years and we we thought that geese at the upstream golf course might be the source. In 2024, we monitored bacterial counts at the headwaters of Deep Creek, just downstream from the golf course and indeed we found very high counts there (Pine Valley site). Geese do indeed seem to be the source. We also suspect that the high counts at Manhattan Beach are due to waterfowl since bacterial counts are high even in the absence of rain

In the figures above, bacterial numbers are expressed as the geometric mean, which enables us to see the summary for each site each season. The dotted line drawn at 35 CFU/100 ml 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. This year 87% of the our bacterial water quality data revelaed swimmable conditions. 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.

President's Statement

Since 1946, the Magothy River Association has been dedicated to preserving and protecting the Magothy watershed. Because we are an all-volunteer organization, we are not dependent on government funding but we always appreciate member support to carry out our monitoring and projects such as those mentioned in this newsletter.

Congratulations to AACC Student who received MRA Scholarships

This year Loki Murphy received both the Jim Gutman Scholarship and the E. Gordon Riley Scholarship. Loki is studying ecological research and restoration at AACC while pursing a degree in Environmental Science.

MRA members investigate fish diversity in the Magothy

In September and October MRA members borrowed a 50' seine from AACC Environmental Center and tried seining for fish off the beach near Henderson Point, as well as near SAV beds and marshes in the vicinity. We found at least 17 different species of fish including several flounder, yellow perch, pipefish, croaker, spot, sunfish, pickerel, eels, and lots of silversides, killifish and mummichugs. We found the highest diversity and abundance near SAV beds and marshes. We plan to seine in more areas in 2025 and invite others to join us.

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.