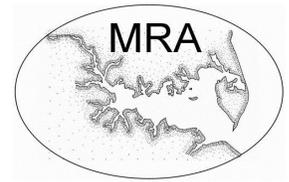


# Magothy River Index

## for 2014



Presented at "State of the Magothy," Wed. 2/18/15, by the Magothy River Association

## Magothy Health Was 32% in 2014 (Grade: D)

The Magothy River Association's annual "Magothy River Index," first presented in 2003, assesses the ecosystem health of the tidal river. Status is expressed as a percent (%) of a desirable goal (more is better), and also as a letter grade (0-20% is F, 80-100% is A).

MRA assessed ecosystem health based on three factors: water clarity (April-October Secchi depth  $\geq 1$  meter) and dissolved oxygen (DO, June-September water column DO  $\geq 5$  milligrams/liter or mg/l), both from MRA volunteers' data, and submerged aquatic vegetation (SAV) area from the Virginia Institute of Marine Science (VIMS). SAV need adequate water clarity to grow, and fish and shellfish need adequate DO to survive.

The 2014 mean score, **32% or D**, was substantially higher than the 22 we found last year. We have not had such a high score since 2007 (Fig. 1). The improvement in the index was due to both a significant increase in dissolved oxygen concentrations in the water column and to improved water clarity. As of this printing, we have not received a report from VIMS on SAV in the Magothy. There may have been a small patch of widgeon grass (*Ruppia*) by Stonington, but no quantitative data were available. Water quality was no doubt improved by both the cooler summer of 2014 and the filtering activity of dark false mussels. There may also have been a reduction in sediments and pollutants entering our creeks thanks to the installation of stormwater management systems by the County. Although there was little or no SAV mapped by VIMS, volunteers in kayaks did locate many beds of "early season" submerged aquatic vegetation, primarily horned pondweed or *Zannichellia palustris* (Fig.4).

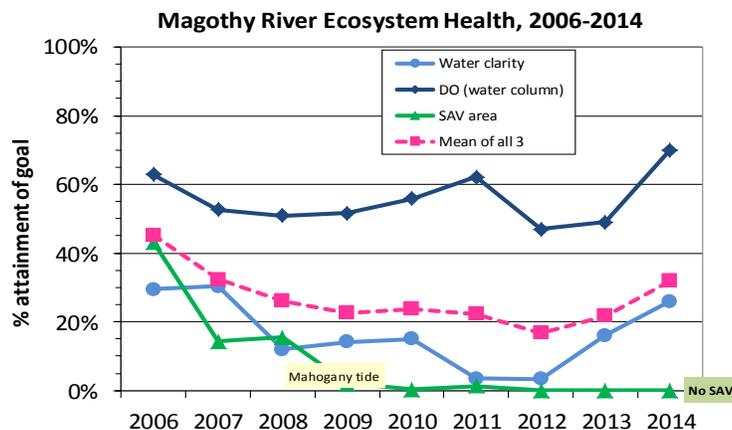


Fig. 1. Magothy ecosystem health status by year, 2006-2014, using data from 9 mainstem and 9 creek sites.

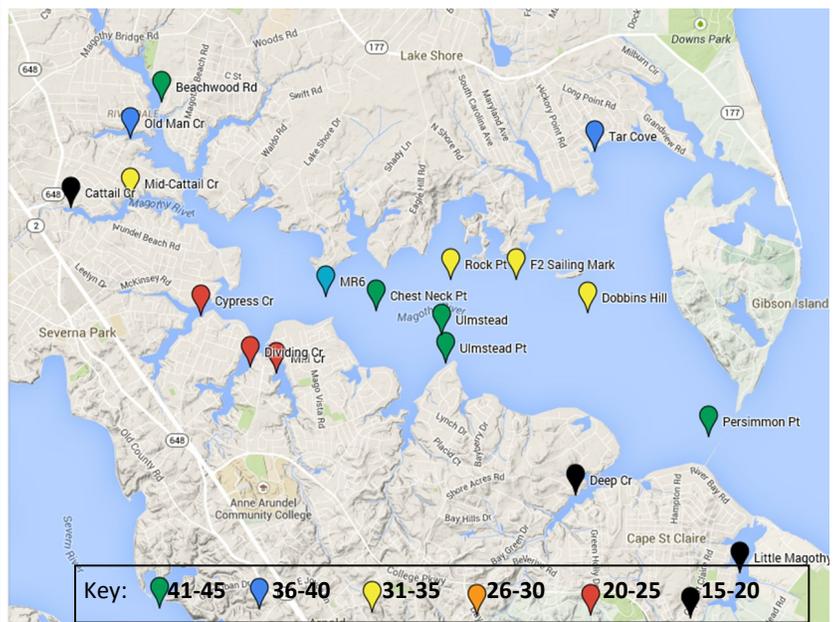


Fig. 2. Water quality monitoring sites for 2014. Sites are ranked according to dissolved oxygen, water clarity and presence of SAV.

## Mainstem DO and water clarity show improvement in 2014

Magothy water quality monitoring by the MRA has two components: in the creeks off piers, starting in 1992, and in the mainstem by boat, starting in 2002 (Fig. 2). In the mainstem, Dick Carey, and in 2013-14 Paul Spadaro, sampled 6 sites consistently, 5 over oyster reefs, and 1 at the same spot sampled by the state (MR6), which is about twice as deep as the other sites.

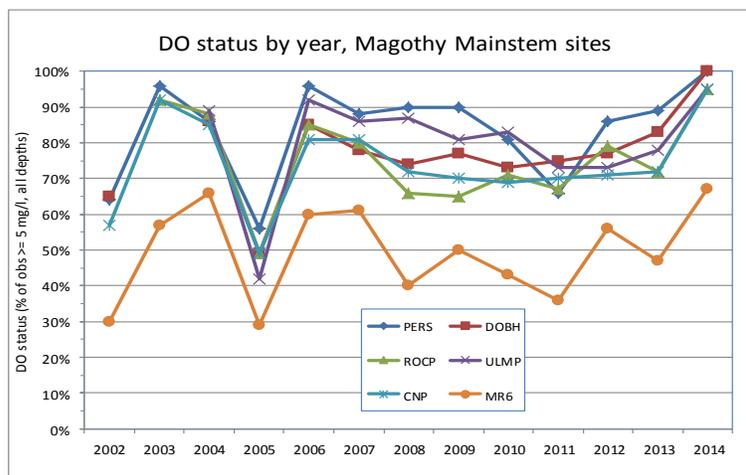
The trend in DO status (Fig. 3a) shows significant improvements in 2014, most likely due to the cooler temperatures. DO concentrations were always lower at MR6, probably because it is deeper.

In contrast, clarity status (Fig. 3b) showed a mixed response in 2014. High values in water clarity in 2004-2007 are attributed to filtration and removal of sediments and algae by mussels. We hypothesize that greater water clarity in 2013-2014 is due to both the mussels and to the cooler temperatures resulting in less algal growth. Indeed, we had very little mahogany tide-colored water in 2014.

### 2014 SAV Hunt

We had a successful launch for the SAV Hunt this year thanks to the help of Jeff Reagan and many volunteers who traveled the shorelines of our creeks and river to locate and identify underwater grasses (Fig. 4). About a dozen groups reported their findings on this Google map. Most of the grass that was seen was horned pondweed, *Zanichellia palustris*, a grass that is considered “early season” because it doesn’t persist beyond June. Nevertheless, it does provide habitat and food for wildlife in May and June. We wanted to document the presence of these grasses since they are not recorded in the VIMS aerial surveys. We hope to continue and improve monitoring next year.

a



b

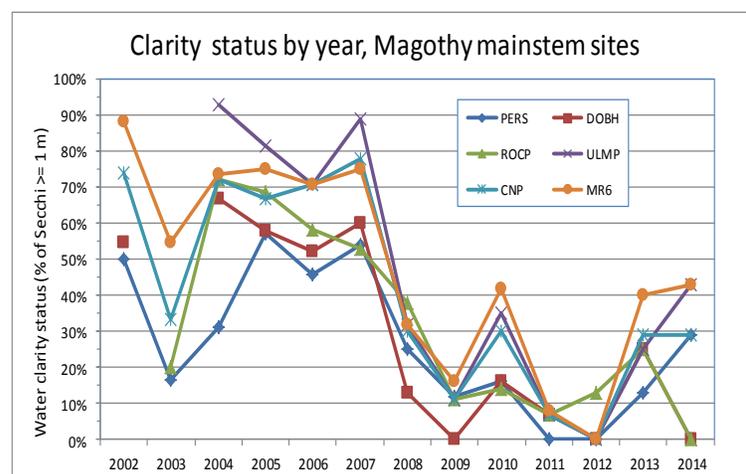


Fig. 3, a-b. Graphs of Magothy DO status (a) and water clarity status (b).

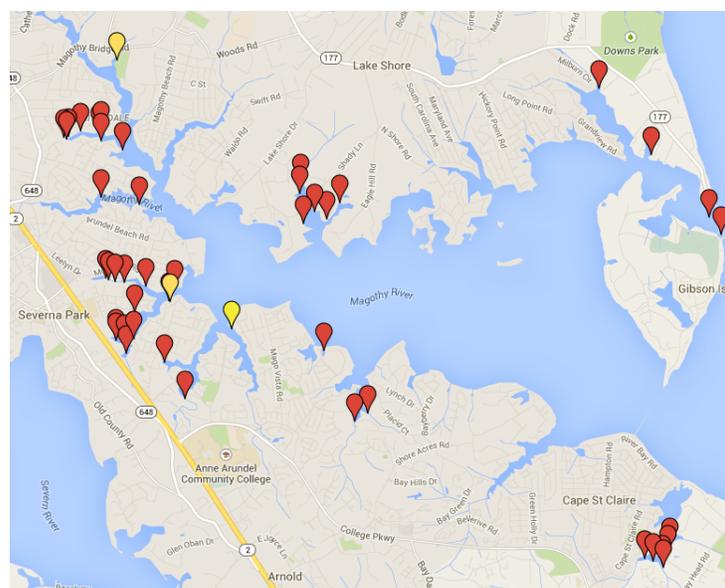


Fig. 4. “Early season” SAV locations noted by kayakers in 2014. Yellow points are launch sites.

## Dark False Mussels Have Returned

We have seen great improvements in water clarity in our creeks where the dark false mussels, *Mytilopsis leucophaeata*, are found, see Fig. 5. This is very similar to what we saw in 2004-2005 when the mussels were last in abundance. Our hypothesis is that mussels do well in years when we have enough rain to reduce salinity in our creeks. We also learned this summer that they grow best at depths of 4-6 feet, thanks to an experiment that Steve Troy carried out at his pier on Dividing Creek, see Fig. 6. Mussels were also seen in Mill Creek and in Cattail Creek on pilings and oyster cages. Over the course of this summer, it appears that the mussels reproduced at least twice, leading to very high biomass in some areas. The floating gardens that were placed in Dividing Creek were covered with mussels on their undersides when they were returned to the AACC Environmental Center at the end of the summer. We scraped off the mussels and weighed them; they weighed 75 pounds!



Fig. 5. A typical clump of dark false mussels found on an appropriate substrate such as a piling or oyster shell. Photo by Steve Troy .



Fig. 6. Results of Steve Troy's preferred depth experiment for dark false mussels. Tiles were hung at 1' intervals on a line hanging from his pier. Barnacles dominated at 2' and 3' while mussels dominated between 4'-6'. Photo by Steve Troy.

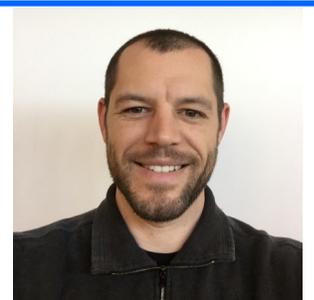
**"I am encouraged to report that the health of the Magothy has improved. We are on the right track. As good stewards, we must continue to take proactive steps to protect the river and not be bullied into thinking that we cannot control development. This is where we live; this is our home."**

**— MRA President Paul Spadaro**

The MRA is proud to honor two students' commitment to our watershed by awarding them MRA's two scholarships in 2014: E. Gordon Riley Scholarship: **Greg Wolf**

James Gutman Scholarship: **Kevin Gautrey**

Both support studies in Environmental Science at Anne Arundel Community College. Contact the AACC Science office (Dragun 238, 410-777-2260) to apply for MRA's 2015 scholarships.



# Ways To Get Involved!

Action	Result (or details)
Join the Magothy River Association: see <a href="http://www.magothyriver.org">www.magothyriver.org</a> and click "Join Us."	Contact President Paul Spadaro at 410-647-8772 or <a href="mailto:president@magothyriver.org">president@magothyriver.org</a>
Volunteer to help with oyster gardening, the wetland plant floats and with monitoring of water quality , SAV and oysters.	Contact Carl Treff to sign up for oyster gardening and the wetland floats <a href="mailto:magothyriversavers@yahoo.com">magothyriversavers@yahoo.com</a> ; Dick Carey to help with oyster monitoring <a href="mailto:magothyriverdiver@gmail.com">magothyriverdiver@gmail.com</a> ; or Paul Spadaro to help with water quality monitoring <a href="mailto:president@magothyriver.org">president@magothyriver.org</a>
Plant more native trees. Cut trees down <i>only</i> when they pose an imminent threat to people or property.	Trees absorb nitrogen, reduce air pollution, provide food and habitat to animals, shade houses, and help hold soil
Install rain gardens and stormwater retrofits in your yard and neighborhood.	Reduces the quantity of stormwater runoff, and improve its quality, as was done in Manhattan Beach.
Replace some of your lawn with native flowers and shrubs; fertilize it only in the fall (if needed).	Reduces your use of fertilizer, lawn chemicals, water, and gas for mowing; increase habitat and food for animals, reduce harmful effects of runoff. For more info, see <a href="http://mda.maryland.gov/SiteAssets/Pages/fertilizer/HowToFertilizeYourLawn.pdf">http://mda.maryland.gov/SiteAssets/Pages/fertilizer/HowToFertilizeYourLawn.pdf</a>
If you have a septic system, maintain it on schedule. Consider upgrading to a nitrogen removing system (priority is failing septic systems in the Critical Area).	Reduces nitrogen runoff into ground water and nearby streams. Grants may be available for septic upgrades—see <a href="http://www.ahealth.org/programs/env-hlth/well-septic-systems/brf/instructions">http://www.ahealth.org/programs/env-hlth/well-septic-systems/brf/instructions</a>

*2014 was the second year for water gardens on the Magothy, with 30 community members growing aquatic plants, with 8 wetland plant floats (shown at right), 2 SAV floats, and 20 wetland plant buckets tested. Thanks to Dr. Steve Ailstock and Mike Norman, AACC, for planning and organizing the project, Bruce Lenderking for building the prototype floats, and all the volunteers who helped.*



**Mark your calendars for Magothy River Day on Saturday, June 13, 2015 at Lake Waterford Park in Pasadena.** The Nautical Wheelers Band will provide great music again under the trees, and MRA and other organizations will have displays. Hope to see you there!  
See <http://www.magothyriver.org> for more details!



Printed on 100% post-consumer recycled paper.

#### Thanks to:

- the MRA volunteers who helped with Beachwood Park , especially Kelly Kalinowski
- Volunteers who grew and planted oysters, especially Carl Treff and Brad Knopf
- the water quality monitors: Steve Troy, Dave Kemp, Mike and Trish Lehman, Chris Kerschner & Paul Spadaro.
- Jeff Reagan and all the kayakers who monitored SAV.
- Peter Bergstrom who developed the Magothy River Index.
- Sally Hornor who prepared the 2014 Index.
- Anne Arundel County Dept. of Public Works for stormwater restoration projects

