

Creating a Man-made Debris Indicator for the Chesapeake Bay and Watershed Report Card

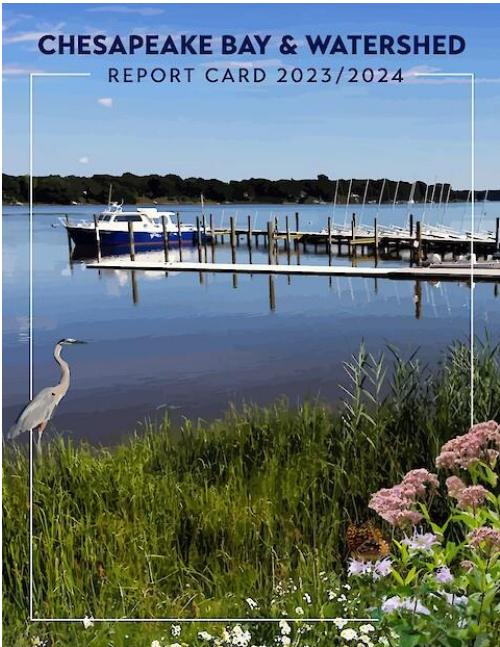
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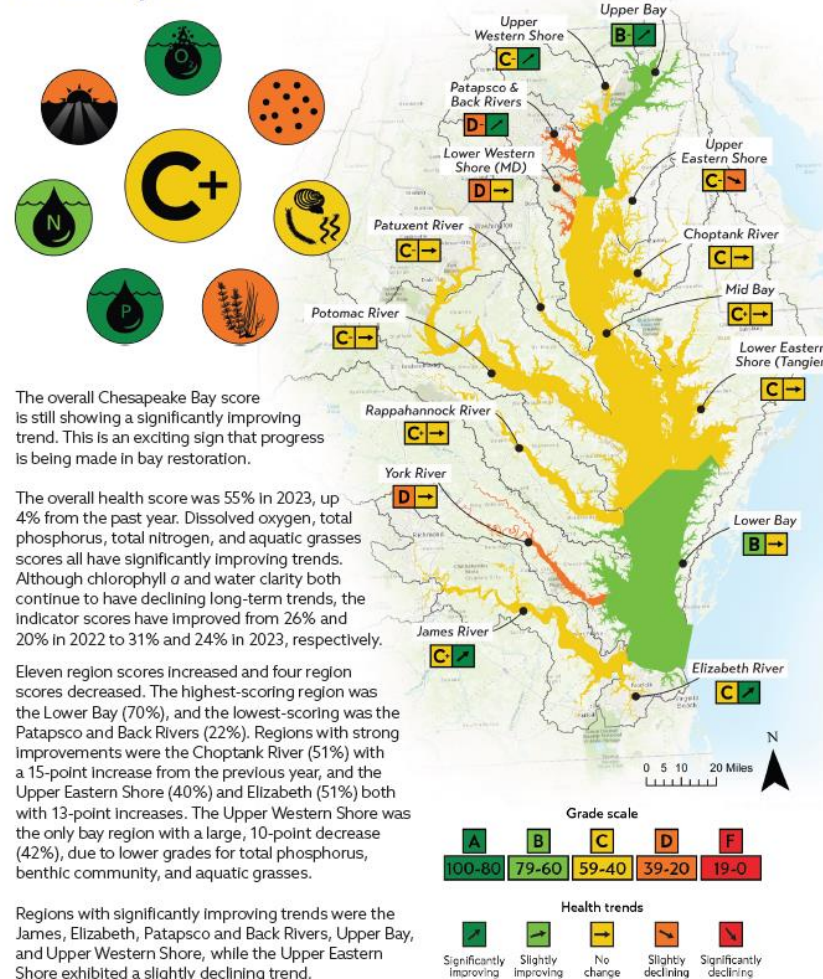
Help us!



Chesapeake Bay and Watershed Report Card

1. What is the big picture?
2. What do we measure?
3. What is healthy?
4. How does it add up?
5. What is the story?

The Chesapeake Bay has improved to C+ for the first time in over 20 years



Bay indicators:

- Phosphorous
- Nitrogen
- Dissolved oxygen
- Condition of benthic community
- Water clarity
- Chlorophyll *a*
- Aquatic grasses

<https://ian.umces.edu/chesapeakebayreportcard.org>

Chesapeake Bay and Watershed Report Card

Watershed indicators

Ecological:

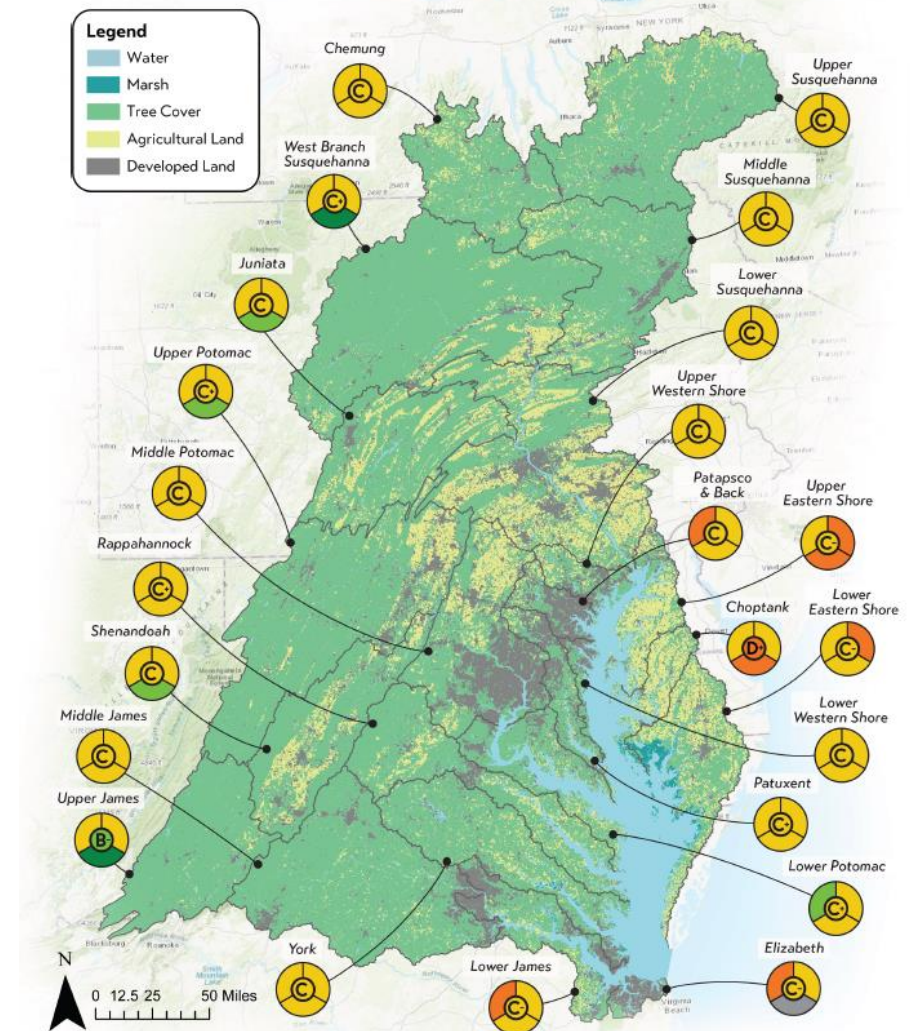
- Protected lands
- Water quality (P and N)
- Fish community index
- Condition of stream benthic community

Social:

- Citizen stewardship
- Heat vulnerability
- Social vulnerability
- Walkability

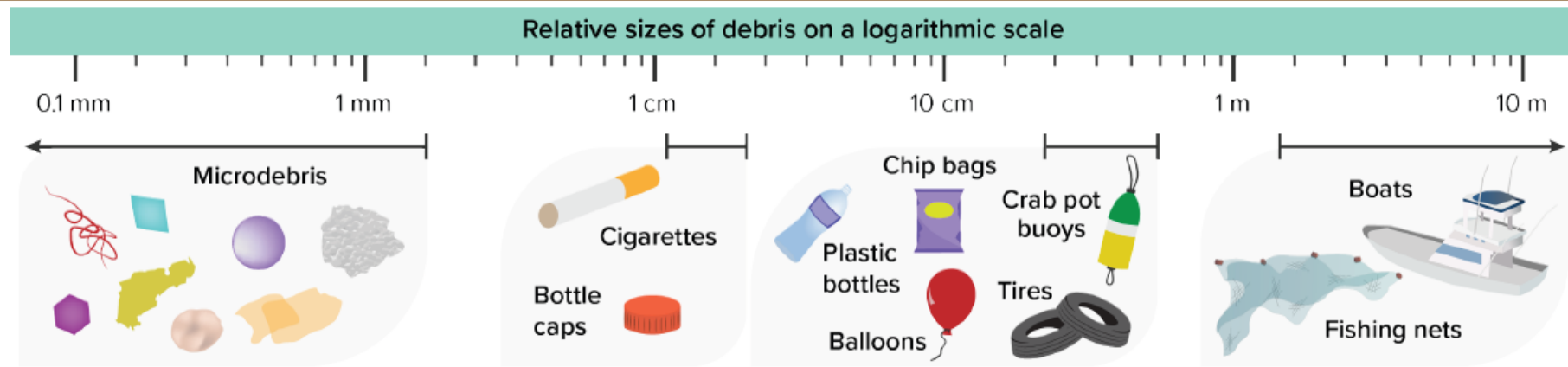
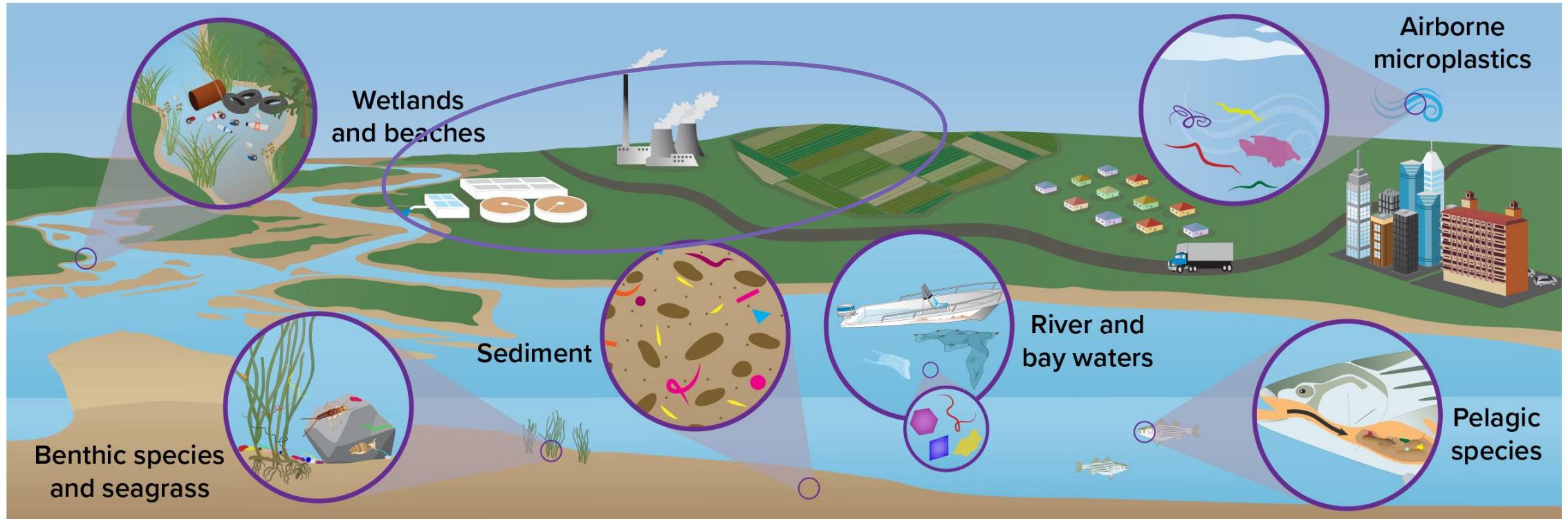
Economic:

- Median household income
- Jobs growth
- Income inequality
- Housing affordability



Map of the Chesapeake Bay Watershed showing land use and the overall grade for each reporting region based on scores for the economic (top left), social (top right) and ecological (bottom) categories.

Our Vision



Steps to Create a Score

- Establish categories-size classes, item types, units, etc.
- Gather and evaluate all existing data
- Identify monitoring gaps
- Evaluate risk and effect thresholds
- Create a framework to fill those gaps (build off Bob Murphy et al. MP water monitoring framework, and MDP action plans) and support new monitoring programs
- Gather and organize new data
- Reevaluate risk and effect thresholds
- Create a score

Examples of Monitoring Programs

- Baltimore Harbor trash wheels
- Trash traps in Anacostia
- Trash total maximum daily load (TMDL) for Anacostia and Baltimore Harbor
- Prince Georges County, MD stream trash monitoring
- MD and VA are monitoring abandoned, lost, and derelict vessels
- Many groups doing clean ups and registering the data on apps



Beach & waterway cleanups

Every year there are many cleanup efforts which can provide an understanding of the type and amount of man-made debris present in and around the water.



Mr. Trash Wheel

An iconic feature of the Baltimore Harbor, Mr. Trash Wheel is a trash interceptor that collects about 500 tons of debris each year.



Remote monitoring on buoys and towers

Cameras on buoys and other existing infrastructure throughout the bay can provide snapshots of debris in the water.

Challenges

1. Huge suite of categories
2. Many of which are not monitored yet in smaller regions or across the whole watershed
3. Methods still need to be developed
4. QA/QC of the data-need to create guidelines for what can be included
5. Risk levels are not well defined

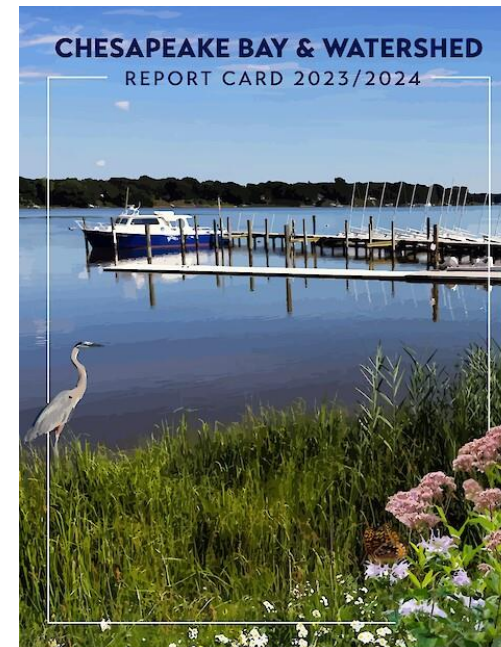
How You Can Help

Contact Form



Email me:
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<https://ian.umces.edu/publications/>



Charting the Chesapeake: Uncovering the Mysteries of Microdebris

Our vision for a man-made debris indicator in the Chesapeake Bay and Watershed

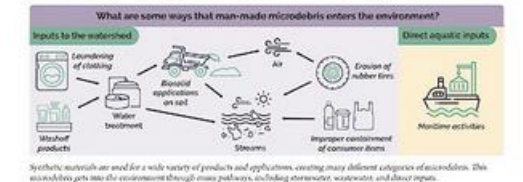
In the Chesapeake Bay region, man-made debris is seen throughout our environment. Understanding the types, quantities, and locations of debris present is important to create pollution mitigation and prevention strategies. To achieve this, we are developing a man-made debris indicator to organize the available data on the various forms of debris, ranging from small particles to large boats. These debris are found in the air, water, sediment, soil, and organisms in and around the Chesapeake Bay. However, not all of this is measured or monitored, so this effort will also highlight the gaps in information and where resources should be directed.



Man-made debris is a modern problem that began with the development of synthetic materials at the end of the 19th century. Changing efforts are being made to regulate this debris, requiring the collaboration of governments, industries, and the public to be effective.

Man-made debris breaks up into smaller particles

Through use and environmental exposure, man-made products like plastics, clothes, and tires break up into microscopic pieces called microdebris. Once very small, microdebris looks like many other environmental particles, such as organisms, algae, soil, and sediment, and can be inhaled or eaten by organisms and humans.



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