

## OUR WORK IN MARINE DEBRIS

Marine debris is a global problem affecting aquatic ecosystems as well as human communities. Debris in water can cause death of organisms, chemical contamination, and unsafe and unsightly waterfronts. Maryland Sea Grant (MDSG) programs are taking on plastic pollution in several ways:

### Education

Maryland high school teachers and their students are participating in hands-on field and classroom work to isolate and observe microplastics collected in **biofilm samples**. Biofilms are bacterial colonies that form in layers and support communities of other creatures. These colonies can also trap microplastics, demonstrating the prevalence of marine plastic pollution.

**Collecting biofilm samples** is a multi-step process that begins with putting aluminum discs into the water to see what grows on the submerged discs. Our team places discs in Baltimore's Inner Harbor and Oxon Hill's National Harbor, allows biofilms to grow for a month, then distributes the cultured discs to schools. The MDSG education team provided **250 biofilm discs** for classroom work in 2023.



1. Clean discs ready for submersion. 2. When removed from the water, discs are covered in biofilm. 3. Under the microscope, students observe algae and other marine life that has grown on the disc, as well as trapped microplastics.

Beyond working with high school teachers, Maryland Sea Grant **taught non-formal educators to isolate and observe microplastics** and **created new student programming** at places like the Maryland Science Center and the Waterfront Partnership of Baltimore.

The development of these methods and student engagement has resulted in **2 publications in peer-reviewed journals**—one in *The American Biology Teacher* in 2022 and an environmental study in *Heliyon* in 2023.



MDSG education staff led a workshop at the National Association of Biology Teachers workshop.



### By the Numbers 2023

**20** teachers and administrators engaged in MDSG-led professional development activities in microplastics education

**14** non-formal educators received instruction from MDSG educators about microplastics education

**300** students participated in biofilm disc study



## Outreach

A new Maryland Sea Grant project, Raising Awareness of Marine Pollution in Underserved Populations (**RAMP-UP**), enhances community literacy about marine debris and plastic pollution.

In 2023, we conducted a **pilot summer program** with Annapolis Recreation and Parks. Through field instruction, interns learned about watersheds and how marine plastic pollution can move from the land to the ocean. We gave additional presentations to summer interns at the University of Maryland Eastern Shore (UMES) and the Chesapeake Bay Research Consortium's Chesapeake Student Recruitment, Early Advisement, and Mentoring Program. In 2024, we will be developing modules about marine debris for use in courses at UMES and Hampton University.

We have also developed a module about **environmental justice** that is being used at the University of Maryland Eastern Shore.



## By the Numbers 2023

# 50+

high school and undergraduate students engaged in learning about marine debris and ocean plastics through the RAMP-UP program



RAMP-UP program students visiting Pickering Creek Audubon Center

## Our Partners

### Partners in Microplastics Education:

- MDSG staff
- Institute of Marine and Environmental Technology researchers
- Georgetown University faculty
- Teachers and administrators in Maryland school systems
- Nonprofit environmental education partners

### Partners in Marine Debris Outreach:

- City of Annapolis Recreation & Parks
- Hampton University
- Minorities in Aquaculture
- Talbot County Mentors
- University of Maryland Eastern Shore
- Virginia Beach Aquarium

### Contact Maryland Sea Grant

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Maryland Sea Grant is a federal-state partnership program that is part of the University System of Maryland. We are administered by the University of Maryland Center for Environmental Science and located in College Park, Maryland. Sea Grant Extension faculty are administered by the University of Maryland, College Park, and located in offices around the state.

The National Sea Grant College Program is a network of 34 university-based programs in coastal and Great Lakes states, Puerto Rico, and Guam.