

# Microplastic Marine Debris



Microplastics from Chesapeake Bay Surface Water Samples (Photo Credit: Will Parson Chesapeake Bay Program)

## What are microplastics?

Particles in the size range 1 nanometer to < 5 mm.

### Types of Microplastics

Primary microplastics are manufactured as microbeads, capsules, fibers or pellets. Examples include microbeads used in cosmetics and personal care products, industrial scrubbers used for abrasive blast cleaning, microfibers used in textiles, and virgin resin pellets used in plastic manufacturing processes.

Secondary microplastics are the result of larger pieces of plastic breaking down into smaller pieces. This occurs when plastic debris is exposed to sunlight and the plastic begins to weather and fragment.

### Impacts of Microplastics

Microplastics have been found in the stomachs of many marine organisms from plankton species to whales. Chemical additives can leach out of microplastics into the ocean; conversely, contaminants from the water may adhere to microplastics. There is ongoing research to determine whether these contaminants may transfer through the food chain.

### NOAA Marine Debris Program Involvement

NOAA's Marine Debris Program (MDP) continues to support efforts to understand the impacts associated with microplastic debris. Our work includes gathering experts to assess the state of the science; funding research projects to determine distribution, abundance, and impacts of microplastic debris; and raising awareness through public education programs focusing on microplastic issues.

### Workshops & Advisory Roles

NOAA's MDP and the University of Washington, Tacoma hosted two International Microplastic Workshops. Researchers met to standardize microplastic terminology, and identify data gaps and research needs that are currently being addressed.

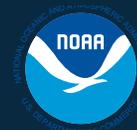
- [2008 International Microplastic Workshop Proceedings](#)
- [2010 International Microplastic Workshop Proceedings](#)

NOAA sponsored and participated in the GESAMP 40 Working Group (Joint Group of Experts on the Scientific Aspects of Marine Environmental Pollution) which published the first global assessment regarding microplastics in the marine environment.

- [GESAMP 90 Reports and Studies](#)

### Education

NOAA MDP has sponsored partners to create education and outreach materials that address the issue of micro- and macro- plastic debris. One such project is the [Microplastics Curriculum](#) from Project SORT (University of Georgia).



## Microplastics Research Projects (funded by NOAA MDP)

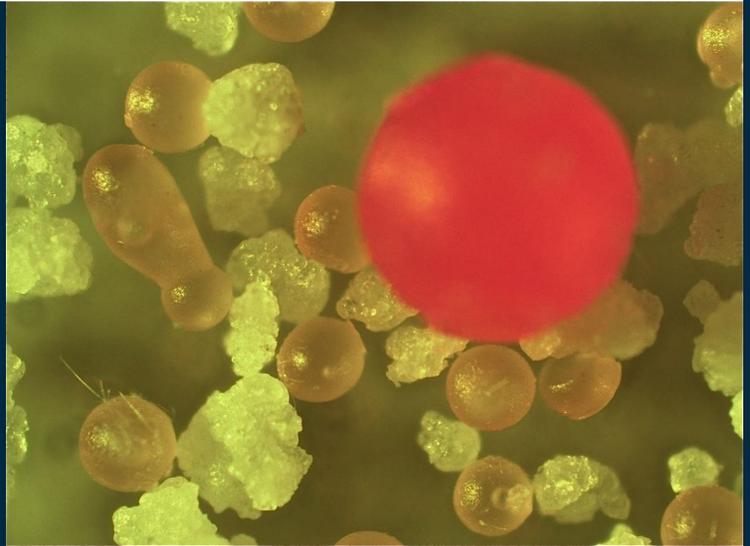
### Microplastic Consumption and Contamination

- Scientists at the Virginia Institute of Marine Science (VIMS) are investigating how environmental factors (e.g. temperature) affect chemical adherence to- and leaching from- microplastic debris.
- Researchers at the University of California, Davis are investigating whether microplastic debris is toxic to marine organisms and if toxic impacts can transfer up the food chain.
- Scientists at the Sea Education Association (SEA) and Helix Science, LLC are conducting experiments that address fundamental questions about the ability of zooplankton to ingest microplastic particles.
- Researchers from the University of Southern Mississippi are analyzing the gut contents of juvenile fish that inhabit floating sargassum mats in the Gulf of Mexico to determine if the fish are actively consuming microplastic debris.

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### Microplastic Distribution and Detection

- The National Park Service and Clemson University are collecting and analyzing beach sediments to assess the abundance and distribution of microplastics in U.S. National Parks.
- University of Washington researchers are measuring microplastic levels from archived plankton samples taken from the Gulf of Alaska to compare microplastic abundance at several locations across the Gulf over time.
- Researchers from the University of Washington, Tacoma created a [laboratory manual](#) describing step-by-step instructions for measuring microplastics in environmental samples.



Microbeads (Photo Credit: University of Washington, Tacoma)



Microplastics found in triggerfish stomach (Photo Credit: David M. Lawrence / Sea Education Association)



Educators Sorting Marine Debris in Georgia (Photo Credit: NOAA MDP)