

# THE S.A.R.A.H. INITIATIVE

*A Citizen Science Movement in partnership with Florida International University  
to Solve the Marine Plastic Pollution Epidemic*



# Why do we care about plastic pollution and its impact on marine ecosystems?

Marine plastic pollution is a contemporary issue.

We have failed at balancing the convenience of plastic in daily life (particularly single-use plastics) against causing severe ecological harm through careless disposal. The tremendous increases in production of plastic materials has led to an accumulation of plastic pollution worldwide. Plastic pollution poses obvious threats through the ingestion and strangulation of marine organisms who mistake it for food or become entangled.

Microplastics are derived either from small particles that are developed for specific applications such as cosmetics, or alternatively produced through the breakdown of larger items. Micro-sized ( $1\ \mu\text{m}$ - $1\ \text{mm}$ ) and nano-sized ( $<1\ \mu\text{m}$ ) plastic particles are increasingly being consumed by marine life. This bioaccumulates in the food web as consumers eat more and more prey species containing plastic. Nanoparticles have distinct chemical, physical and mechanical properties and have been demonstrated, once transferred up through a food chain, to enter the brain of the top consumer and affect its behavior, thereby severely disrupting the function of natural ecosystems.



Plastic debris in coastal areas can smother live coral, causing irreversible damage to an already severely impacted marine critical habitat. This bioaccumulates in the food web as consumers eat more and more prey species containing plastic.



Plastic, especially single-use plastics, which eventually end up in the ocean, often initially come from land, as seen here.

Plastics are composed of hydrocarbon polymers. These polymers may contain chemical additives and contaminants, including some known endocrine disruptors that may be harmful at extremely low concentrations for marine biota, thus posing potential risks to marine ecosystems.

Microplastics provide a structure to which organic material and contaminants can successively bind to form an “ecological halo” increasing the density and surface charge of particles and changing their bioavailability and toxicity.

Chronic exposure to microplastic can adversely affect individual animals, reducing feeding thereby depleting energy stores, with knock-on effects for fecundity and growth.

# A solution with support from the yachting community

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The International SeaKeepers Society's DISCOVERY Yachts Program partners with Florida International University (FIU) in an effort to:

## Address the Issue of Ocean Plastics

SeaKeepers DISCOVERY Yachts Program is partnering with FIU researchers that are studying the impacts of plastics on the marine environment and together we are developing a citizen science program for expanded data that will inform ocean management and policy.

## Build Capacity

The International SeaKeepers Society will further engage with the yachting community to expand the global reach and capacity of the SARAH Initiative through both data collection from our DISCOVERY Yachts fleet, as well as data analysis from our FIU researcher partners.

## Support the Experts

Working with the Center for Aquatic Chemistry and the Environment (CACHÉ) a National Science Foundation (NSF) Center of Research Excellence in Science and Technology (CREST) the SARAH Initiative will tackle one of the most complex challenges affecting environmental contamination.



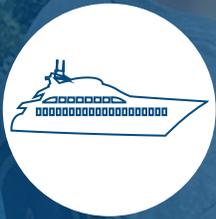
Dr. Mark Bond towing a water sampling net behind D/Y Shredder, making sure speed and depth are correct.



Dr. Mark Bond and Tony Gilbert rinsing the water sampling net to aggregate all that has been collected during the tow run.



THE INTERNATIONAL  
**SEAKEEPERS**  
SOCIETY



## Sample

Conduct net tows and collect samples with the kits provided.



## Aggregate

After each net tow, rinse contents from the net into sample filters, label, and seal filters.



## Return

After each voyage, package samples and ship back to the SARAH Initiative research team at FIU.



## Analyze

Researchers will analyze the density, type, and size of plastic particles and archive the results in a database.



## Help

By collecting this data, you will help researchers quantify and map marine plastic debris and help stakeholders end this current epidemic.

In Partnership with:

**FIU** | Arts, Sciences  
& Education