

Objective #1: Floating debris

Detection/quantification of floating debris globally

- debris size: 0.5 m+ (ideally mm+)
- need to distinguish anthropogenic vs. non-, but not necessarily plastic (for 0.5 m+)
- global ocean coverage, including coastlines (shore)
- mean and variability

Track identifiable items as tracers of surface (0-1 m) currents and/or to estimate windage

- 10-day repeat? 5-day?

Objective #1: Floating debris

Scientific value:

- Mass balance of plastic in marine environment
- Size-frequency distribution of debris (tied to ecological impacts)
- Tracer of poorly known surface currents and windage
- Identification of hot spots
- Risk assessment (exposure: amount, type, location)
- Potentially identify sources of large debris (e.g., fisheries, acute events, etc.)

Societal value:

- Inform clean-up efforts (hot spots)
- Warning system for navigation

Objective #2: Coastal sources

Measure flux of debris from coastal sources

- Regional coverage over hypothesized “point sources” (e.g., all major rivers, or rivers in developing coastal nations)
- Quantify time variability of flux (e.g., seasonal cycle)
- Identify plastics vs. non-plastics, ideally polymer type

Objective #2: Coastal sources

Scientific value:

- Quantify input for mass balance of plastics
- Potentially solve for outputs using mass in sea surface (and other) reservoirs and quantification of other sources
- Trace sources upstream (if able to map up the watershed)
- Risk assessment (exposure: amount, type, location)

Societal value:

- Identify target regions for prevention (e.g., waste mgmt, Baltimore water wheel)
- Identify target items for behavior change (e.g., reduced use) or product redesign

Objective #3: Shallow seafloor

Detect/quantify debris on seabed in nearshore (shallow) regions

- Start with regional areas – developing nations AND U.S. (start with known accumulation coasts – e.g., HI, AK); aim for global coverage
- Debris size: as small as possible
- Identify hot spots
- Track identifiable items to determine potential transport – monthly
- Locate and identify items of particular ecological risk (e.g., DFG, traps)

Objective #3: Shallow seafloor

Scientific value:

- Quantify partial reservoir for mass balance of plastics
- Identify likely sources (e.g., litter/waste, fishing gear)
- Risk assessment (exposure: amount, type, location)

Societal value:

- Inform clean-up efforts
- Inform fishing gear design to reduce loss or aid in recovery of lost gear