Saltwater Microplastics & Nanoplastics Monitoring: A Critical Gap in Environmental Surveillance

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Saltwater represents ~97% of Earth's water, yet most microplastics detection methods are developed for laboratory conditions. High salinity alters particle behavior, optical properties, and aggregation dynamics, making many **lab-based methods unreliable or impractical in ocean environments. As a result, large-scale coastal and marine monitoring remains limited.**

Current Limitations:

- Lab methods require transport and 24–48 hours to 5 days of processing
- Salinity interferes with optical and chemical detection
- Low throughput → limited coastal coverage
- Not deployable in field or marine settings

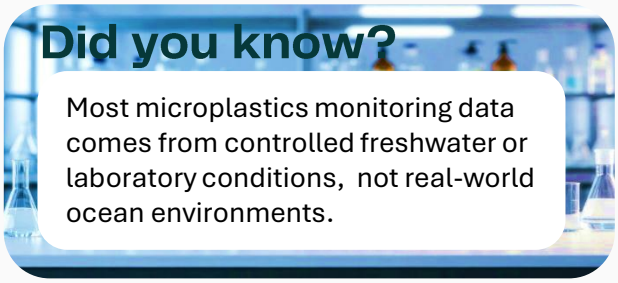
Applications:

- Coastal monitoring (EPA / NOAA)
- Marine ecosystems & fisheries
- Aquaculture safety
- Port / harbor monitoring
- Climate & plastic pollution studies

Together with the USGS Strategic Science Vision and EPA National Strategy, EcoExposure™ gives NOAA and its partners the practical, production-level field tool required for effective ocean and coastal microplastics/nanoplastics surveillance.

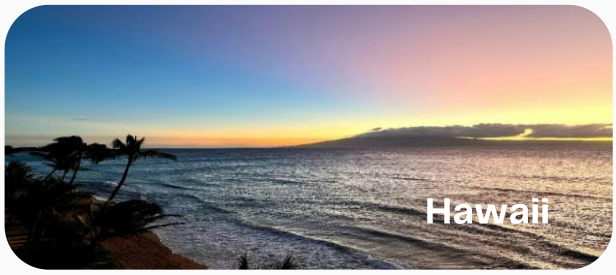
Why This Matters:

Without field-deployable tools, marine microplastic exposure remains under-measured, limiting effective regulation, ecosystem protection, and public health response.



Did you know?

Most microplastics monitoring data comes from controlled freshwater or laboratory conditions, not real-world ocean environments.



Solution: EcoExposure™ A Field–Deployable Ocean Monitoring Platform

- **Direct operation in full-strength seawater (no preprocessing)**
- **Rapid (~30 min) detection of micro- and nanoplastics**
- Smartphone-based, geotagged data collection
- Scalable across coastlines, fisheries, and ports

Directly Supports NOAA Marine Debris Program Goals

NOAA's Marine Debris Program has identified a critical need for:

- **Field-deployable monitoring tools**
- **High-salinity-compatible detection methods**
- **Scalable, real-time coastal data collection**

Michigan

EcoExposure directly fulfills these requirements by enabling:

- In situ marine testing without lab dependency
- Rapid data generation for coastal surveillance networks
- Deployment across fisheries, aquaculture, and protected areas

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