

AOMI Database Workshop:
Enhancing Ocean
Microplastics Monitoring
8 October 2024



National Centers for
Environmental Information (NCEI)

The NOAA NCEI Global Marine Microplastics Database and Map Portal - Fall 2024 Update

At the AOMI Database Workshop:
Enhancing Ocean Microplastics Monitoring

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3. NOAA/ National Centers for Environmental Information, Silver Spring, MD
4. General Dynamics Information Technology, Inc, Stennis Space Center, MS

2024 Activities: Growing our database and collaborations

- International Collaborations
- Database data set additions
- Microplastics from biota
- Planning of an updated Hub Site

First: Hurricane Helene update

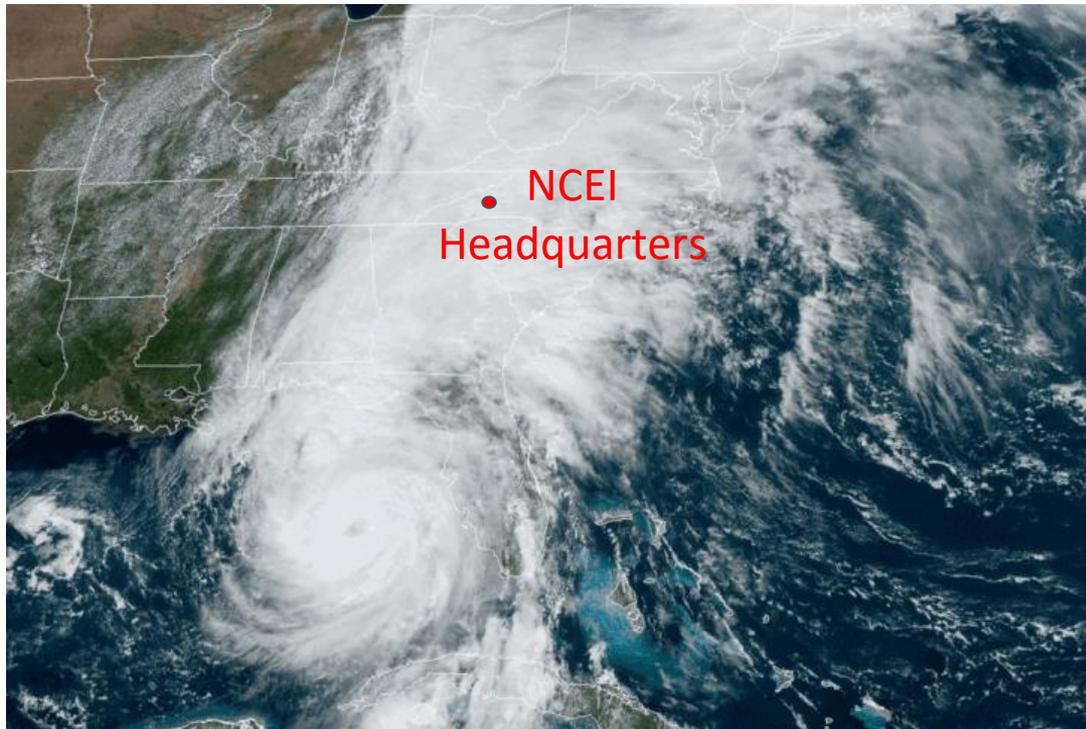


Website might be down but NOAA Archive is safe

[Helene Devastates Southeast, Impacts NOAA NCEI Headquarters](#)

26 September 2024

- **Hurricane Helene** made landfall on Florida coast as a Category 4 storm.
- Largest impacts across the southern Appalachians mountains
 - widespread severe and unprecedented flooding with hundreds of fatalities and billions in property damage.



1. NOAA Archive** (*in North Carolina, USA*)

All original data received are quality controlled and guaranteed to be available for a minimum of 75 years.

2. Geodatabase* (*in the ESRI cloud*)

Data are homogenized and added to a geodatabase which is displayed on the [NCEI microplastics ArcGIS web portal](#).

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International Collaborations

- Continued work with GPML on their Microplastic Indicator development efforts
 - Draft homogenized map created
- Promote our catalog listing on [Ocean Info Hub](#)
 - Metadata updated to conform with the Schema.org JSON-LD template
- Supporting AOMI development
- Promote our product on [SDGToday](#)



Global Partnership
on Plastic Pollution
and Marine Litter

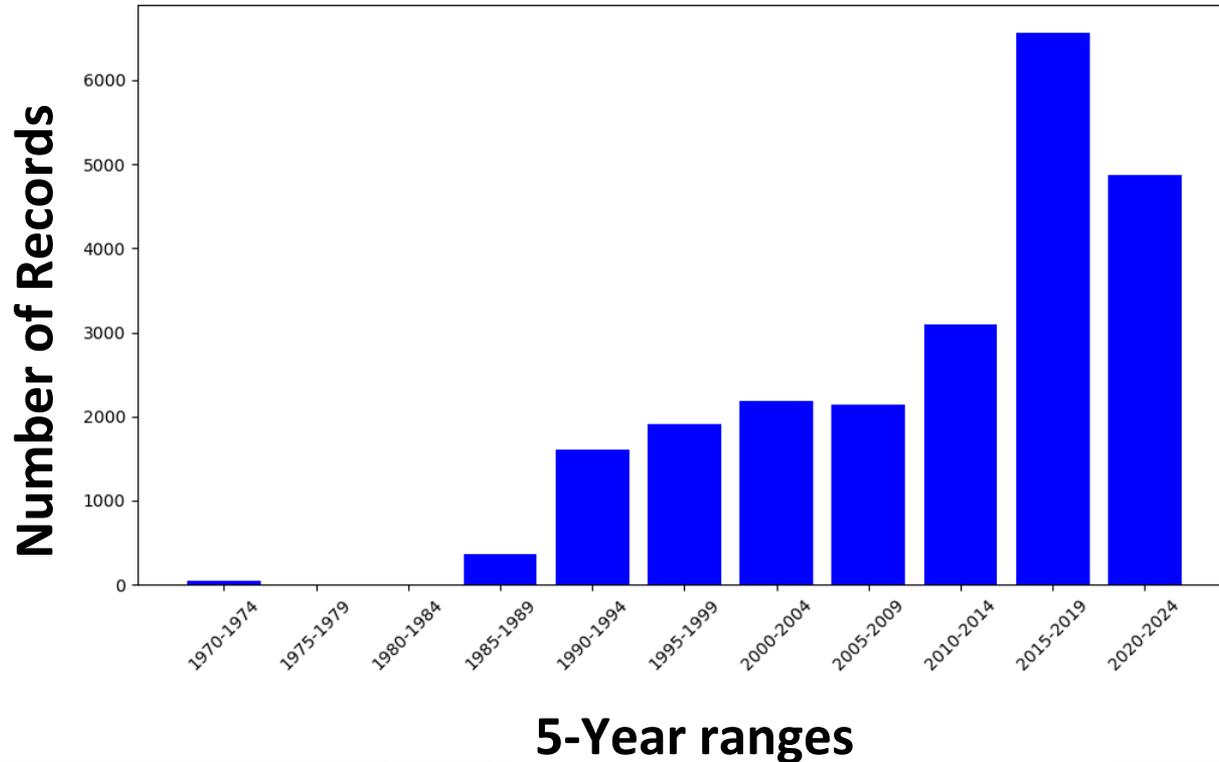


Microplastic Data Records as of October 2024

| Setting | No. of datasets | No. of data points |
|---------------------------------|-----------------|--------------------|
| Surface ocean | 47 | 14,807 |
| Subsurface ocean | 4 | 326 |
| Ocean sediment | 9 | 341 |
| Beach (including nurdle patrol) | 13 | 6,438 |
| Multiple | 10 | 658 |
| Total | 83 | 22,570 |

- Data added from different marine compartments (water, sediment, beach)
- Data acquisition success rate : ~30%

NCEI Microplastic Data Records over time



New Geodatabase for MP found in Biota

- Build a complimentary database for marine microplastics collected in biota - also to be shared publicly
- Data are also added to the NCEI Archive

Coming in 2025 ...

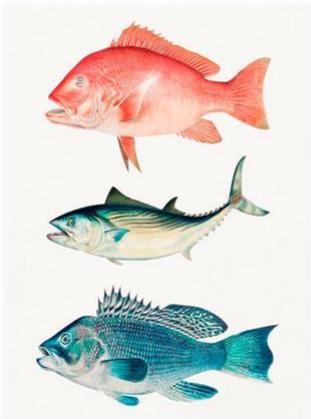
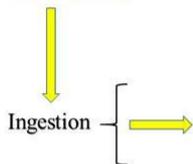
- ★ Developing a gridded data product for the map viewer
- ★ Design a ArcGIS Hub Page with data access to better serve our diverse user base

Marine Debris → Plastics → Microplastics

- Microplastic pollution is everywhere, irreversible and disrupts the ecological system
- Impact the environment, organisms therein, and human health



Exposure pathways of MPs in fish



Possible effects of MPs in fish

- ← Oxidative damage
- ← Tissue damage
- ← DNA damage
- ← Intestine damage
- ← Behavioral change
- ← Slow down swimming
- ← Growth reduction
- ← Dysbiosis
- ← Breeding impairment
- ← Disrupt digestion
- ← Inflammation
- ← Alter gene expression
- ← Neurotoxicity
- ← Reproductive organ damage
- ← Mortality



Bhuyan_2022



Microplastics in Biota

- Began collecting datasets from publish work
- Biota: 9 datasets (679 data points) archived
- Exploring ways to present data, separate from other microplastics data
- This would include species identification, body part examined for microplastics (e.g. gills, gastrointestinal tract, whole body), and count of microplastics per individual sample
- Product will help understand prevalence in biota, at risk species and guide ecosystem management

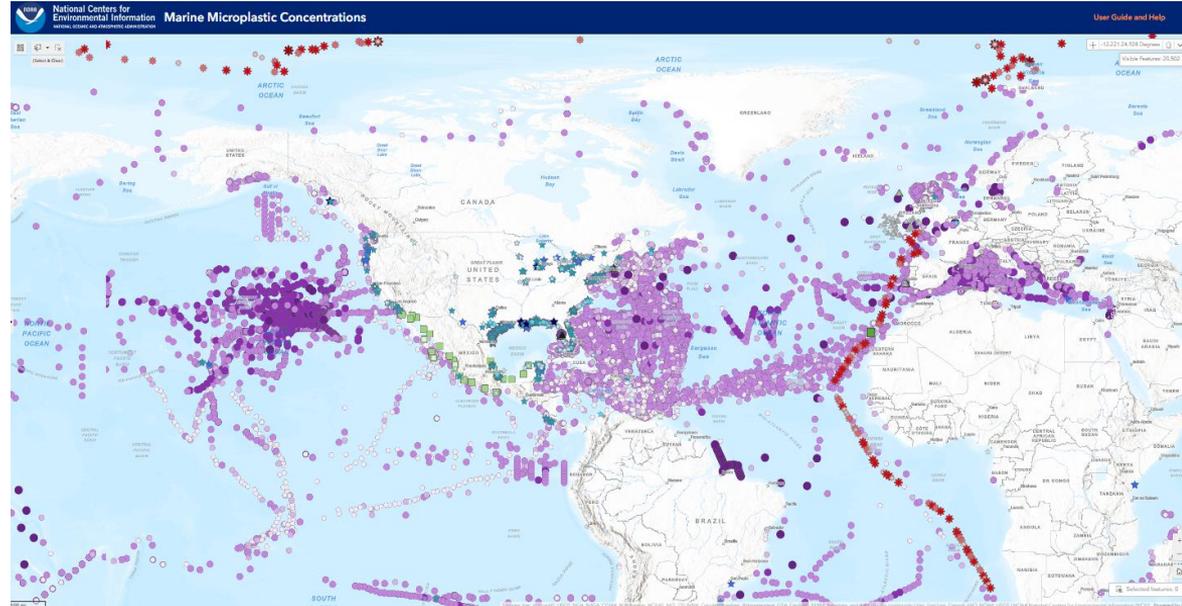


Supporting a Diverse User Base

Geoportal & Database

Users:

- Researchers
- Students
 - Middle & High School students
 - College & Graduate Students
- Environmental Managers
- General public



New Hub Page - Coming early 2025

Planned Sections

- Microplastic Dashboard
- Data Visualization
- Access our Databases
- Education & Citizen Science
- **Partners**
- Marine life and Microplastics

We will soon contact you for proper logos and links for our Partners page

The screenshot displays the Marine Microplastics website interface. At the top, a dark blue navigation bar contains links for Marine Microplastics, Web Map, Partners, Access Our Data, Citizen Science, and Education & Outreach. Below the navigation is a header section with a background image of microplastics and a paragraph describing the NCEI Marine Microplastics product. The main content area features a 'Total Collections to Date' section with a large number '22,266' and a source link 'Source: Marine Microplastics WGS84'. To the right is a 'Collections by Year' bar chart showing an increasing trend from 2015 to 2020. Below this is an 'Access Our Data' section with five database icons: Surface Ocean Microplastics, Subsurface Ocean Microplastics, Ocean Sediment Microplastics, Beach Microplastics, and Beach Nurdle Patrol. Each icon is accompanied by a brief description. At the bottom, there is a section titled 'Ecological Compartments in our Harmonized Database' with a sub-section for 'Ocean Microplastics' and a corresponding image of various plastic debris.

Early screenshots - still in development

Thank You

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**Scan for Database
Homepage**



**National Centers for
Environmental Information**

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

