



Micro-Plastic Investigation

Collecting and Analyzing Micro-Debris Samples

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2014 Lloyd's List Awards ENVIRONMENT AWARD WINNER



What Do You Think?

- Do you think scientists know what type of plastic exists in the ocean and how long has it been there?
- How do you think plastic might break down in the ocean over a period of time?
- What types of plastic do you think you might find in the ocean? Write three down.
- Do you think these will change over 1 year? 5 years? 10 years?
- How do you think scientists take samples when researching marine debris?

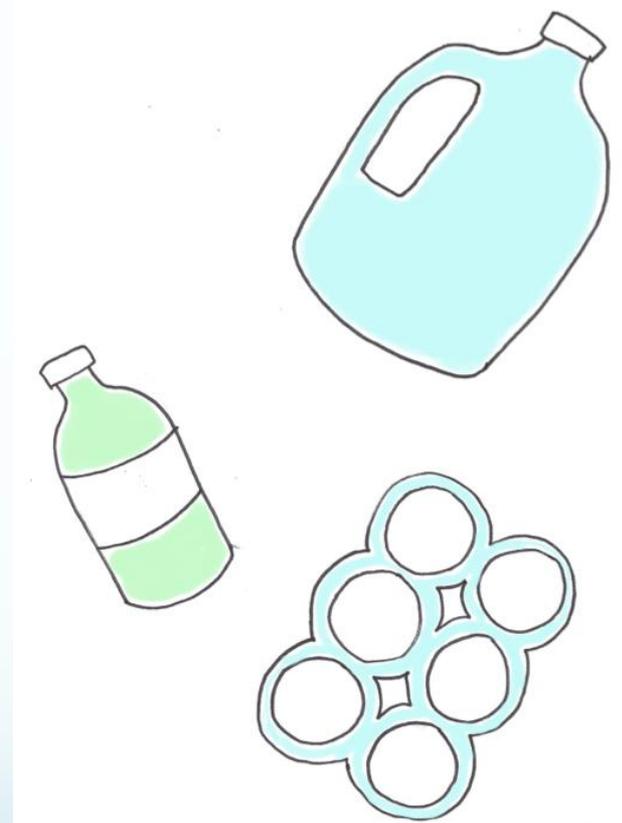
MARINE DEBRIS IS THE NUMBER ONE OCEAN POLLUTANT

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What is Marine Debris?

- Marine debris is ‘Any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or Great Lakes’ (NOAA, 2007)
- Marine debris can be classified by the activity that created the waste item
 - “ocean and waterway activities,”
 - “illegal dumping,” “smoking-related activities”



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What are some sources of marine debris?



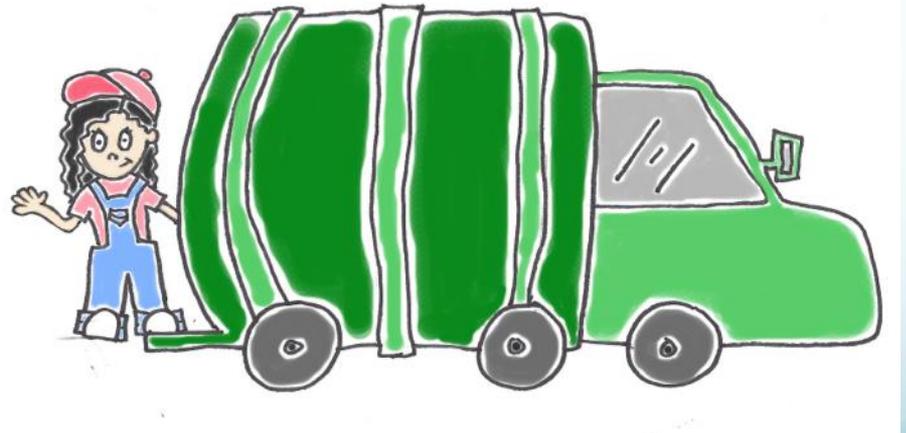
C. Morishige, NOAA Marine Debris Program

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Primary Sources of Marine Debris

- Beachgoers
- Improper disposal of trash on land
- Stormwater sewers and combined sewer overflow
- Ships and other vessels
- Industrial facilities
- Waste disposal activities
- Offshore oil and gas platforms



Biodegradation

- Microorganisms (Bacteria and fungi) cause material to break down into compounds that can be reused in the environment
- Higher temperature + greater moisture levels = high rates of biodegradation
- Some materials can break down due to chemical interactions (for example, rust on steel), and others breakdown due to physical forces, including erosion or weathering, where the material actually falls apart into smaller pieces.

Photo/ Mechanical Degradation

- **Photodegradation:** When a substance or object is broken down via sunlight
- **Mechanical Degradation:** Physical interaction between ocean waves and plastic, causing plastic to break into smaller pieces
 - Includes grinding against solid objects
- “Mermaid Tears:” Small pieces of plastic often mistaken for fish eggs



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Effects of Marine Debris

- Entanglement of wildlife
- Ingestion by wildlife
- Habitat Degradation
- Unsightliness
- Costly Cleanup
- Negative effects on tourism



Working Toward Solutions

- Governments, organizations, and research institutions are actively developing solutions
- Educational programs to prevent marine debris
- Beach cleanups, adopt-a-beach programs, and other initiatives.
- Local, state, federal, and international laws have been established to regulate commercial and recreational activities that frequently result in the generation of marine debris

Working Toward Solutions Continued

- Efforts are focused on:
 - Changing the behaviors that lead to marine debris
 - Increasing awareness and a better understanding of the problem
 - Finding alternative materials
 - Increasing recycling of waste items



What YOU can do to help!

- **REDUCE** your wastes
- **REUSE** products
- **RECYCLE** plastics, cardboards, and metals!
- Pick up trash at your local beach!!
- Proper disposal of trash
- Secure your trash
- Become an Ocean advocate
- **Educate others about the impacts**

marine debris has on our environment!



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YOU CAN MAKE A DIFFERENCE!!

**NAMEPA Beach Cleanup in
Fairfield, CT, November
2013**



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