NOAA Marine Debris Program | Office of Response and Restoration | NOAA National Ocean Service

What We Know About:
Plastic Marine Debris

http://marinedebris.noaa.gov/info/plastic.html

Introduction

One of the main types of marine debris that you hear about today is plastic marine debris. In many places, it is the main type of debris that you will see as you walk along a beach, though perhaps not underwater. As common as they are on our beaches and in our homes, how much do you really know about plastics?

Plastic bottle, such as those shown above, are some of the more common types of debris found on beaches in Hawaii.

What is plastic marine debris?

The word "plastic" is used to describe a collection of artificial or manmade chemical compounds that come in about as many shapes, sizes, and colors as you can imagine! For example, foam carry-out containers (made of polystyrene) and bottle caps (made of polypropylene) are items that would be considered plastic marine debris if found in our oceans or waterways.

One source of microplastics is through the fragmentation of larger pieces. *Photo courtesy of NOAA Restoraction Center.*

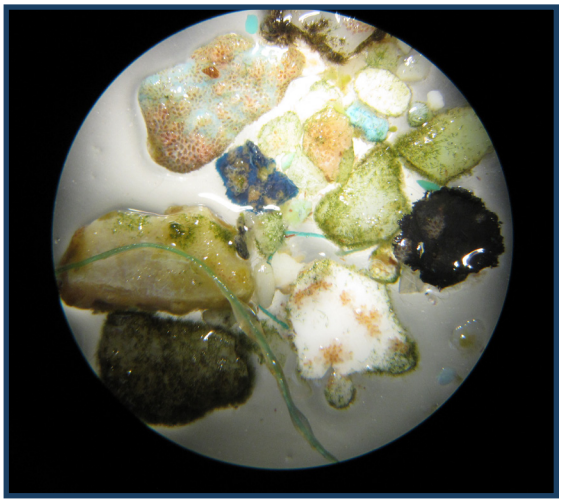
Some common types of plastic:

Acronym	Full name	Common Example
PET (PETE)	Polyethylene terephthalate	soda bottles
PES	Polyester (yes, it's actually a plastic!)	polyester clothing
PE	Polyethylene	plastic bags
HDPE	High-density polyethylene	detergent bottles
PVC	Polyvinyl chloride	plumbing pipes
PP	Polypropylene	drinking straws
PA	Polyamide (aka nylon)	toothbrushes
PS	Polystyrene	take-out food containers

Why is plastic marine debris so common?

Plastics are used in many aspects of daily life, are a big part of our waste stream, and can last a long time. Many

plastics are colorful and will float in water, which makes plastic debris a very visible part of the marine debris problem. However, an accurate estimate does not yet exist for how much debris is composed of plastic materials.



Microplastics skimmed from the North Pacific Ocean. *Photo courtesy of J. Foley, C-MORE.*

Do plastics "go away"?

Plastics will **degrade** into small pieces until you can't see them anymore (so small you'd need a microscope or better!). Because the ocean is a cold, dark place, this process happens slower in water than on land. But, do plastics fully "go away?" Full degradation into carbon dioxide, water, and inorganic molecules is called **mineralization**. Most commonly used plastics *do not* mineralize (or go away) in the ocean and instead break down into smaller and smaller pieces. We call these pieces "microplastics" if they are less than 5mm long.

Bio-based and truly biodegradable plastics break down in a compost pile or landfill, but are generally not designed to degrade as quickly in the ocean.

Can plastic marine debris harm fish?

Plastic has the potential to harm fish and other wildlife in two main ways.

Direct Impacts - Studies have shown that fish and other marine life do eat plastic. Plastics could cause irritation or damage to the digestive system. If plastics are kept in the gut instead of passing through, the fish could feel full (of plastic not food) and this could lead to malnutrition or starvation.

Indirect Impacts - Plastic debris accumulates pollutants such as PCBs (polychlorinated biphenyls) up to 100,000 to 1,000,000 times the levels found in seawater. PCBs, which were mainly used as coolant fluids, were banned in the U.S. in 1979 and internationally in 2001. It is still unclear whether these pollutants can seep from plastic debris into the organisms that happen to eat the debris and very difficult to determine the exact source of these pollutants as they can come from sources other than plastic debris. More research is needed to help better understand these areas.

What can we do?

- Get involved! Participate in local cleanups in your area.
- Remember that the land and sea, no matter where you are, are connected.
- Reduce the amount of waste you produce.
- Reuse items whenever possible. Choose reusable items over disposable ones.
- Recycle as much as possible. Bottles, cans, cell phones, ink cartridges, and many other items can be recycled.

For more information visit

www.MarineDebris.noaa.gov/info/plastic.html
www.MarineDebris.noaa.gov/projects/microplastic.html