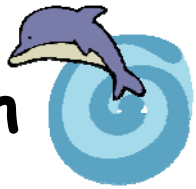
Student Fact Sheet F-2

# The Great Pacific Garbage Patch



## As Big as Texas!


Right now**,** there is a gigantic "soup" of trash floating somewhere between California, Hawaii and Asia. This is called the **North Pacific Gyre**, or more commonly referred to as the **Great Pacific Garbage Patch**. It is a swirling collection of plastic **debris**, or garbage, in the middle of the Pacific Ocean that is bigger than the state of Texas! This enormous collection of trash moves with the currents of the ocean and cannot be seen from the sky because most pieces are very tiny and float a few inches below the water's surface.

## How Did it Get There?

No one really knows when the Great Pacific Garbage Patch began. In the 1970s, scientists started studying the area. They noticed that garbage was floating in the water, collecting together in a **cluster,** or group. They could see that ocean currents carried this plastic garbage. **Currents** are the flow, or continuous movement, that water takes in one direction. Some large currents are **circular**; instead of moving in a straight line, they move in a circle, kind of like the way water moves when you flush a toilet! These circular currents are called **gyres** (*rhymes with fire*,) and the Great Pacific Garbage Patch is basically one enormous collection of trash floating in a huge circular current. The only time trash leaves the gyre is when it sinks, or is flushed out by a big storm and washes ashore hundreds of miles away.

## Where Does the Trash Come From?

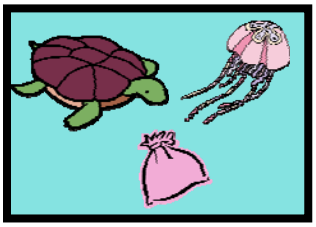
About 80% of the trash in the Great Pacific Garbage Patch comes from activities on land. Litter like plastic bottles, bottle caps, and candy wrappers can end up in storm drains or in rivers and streams that empty into a bay or the ocean. Also, in coastal cities like San Francisco and Los Angeles, the wind often blows litter into waterways or directly into the ocean. The rest of the trash in the Garbage Patch (20%) comes from activities at sea. Every year, about 100 million containers are shipped over the world's oceans. One of the shipping routes is between Asia and North America. There are frequent, severe storms along this route, which cause hundreds of containers to go overboard each year. Many of these containers hold things like tens of thousands of shoes or millions of plastic shopping bags and other plastic items.

## Persistent Plastic

Plastic tends to make up a large part of ocean debris. Since plastic is **buoyant**, or able to float, it can easily travel long distances on ocean currents. In addition to being buoyant, plastic is also **persistent.** That means it lasts a very, very, very long time without naturally breaking down or **decomposing** into smaller **particles** or tiny pieces. Another way of saying this is that plastics do not **biodegrade**. **Bio** means "life," and **degrade** means "to break down." When something is **biodegradable**, it means it is made from

something natural that was once alive (either a plant or an animal.) It also means it can decompose and return to the natural **elements** or naturally occurring materials found on Earth. Most plastic is made from **petroleum**, or oil, which is not biodegradable. Therefore, it can take *500 years* for a piece of plastic to wear down into smaller particles! And even then, it still doesn't return to a natural element. It just becomes a very tiny piece of plastic. Another source of plastics in the ocean, are **nurdles.** These are small plastic **pellets,** or balls, that get melted down to make a variety of plastic products. Nurdles cause big problems! They often end up in the ocean where animals will eat them and get sick from the poisonous chemicals that nurdles contain. Nurdles also damage the bodies of fish, which makes it hard for them to breathe through their gills.

## The Problem with the Patch



Some people think that because the ocean is so big, a gyre full of floating garbage doesn't matter that much. Well, they're wrong! Oceans are complicated **ecosystems** where billions of **organisms,** or living things, live in natural balance. Plants like algae, plankton, and seaweed make up the beginning of the food chain for animals such as shrimp, fish, jellyfish, birds, sea turtles, otters, dolphins, sharks, and whales. A **food chain** is the natural order of how animals get food. When plastics end up in our ocean, they often appear as food to animals and become a dangerous part of the food chain. Imagine a plastic bag floating in the ocean. It can look just like a jellyfish, which sea turtles and dolphins love to eat! When these animals eat plastic bags, it can choke them. It can also

fill their stomach with trash that doesn't **digest** or move through their bodies to provide them with the nutrition needed to survive. Often, animals will stop eating if their belly is full of plastic, and they end up starving to death! Each year, more than 1 million sea birds and 100 thousand marine mammals die from plastics. Not only do they die from eating, or **ingesting** it, they also die from getting **entangled** or caught in it. Plastic six-pack rings and plastic ropes and nets are common traps for fish, birds and other marine life that get entangled in them.

## What Can We Do to Help?

1. Stop buying water in plastic bottles. Instead, drink tap water from reusable bottles made from glass or steel.
2. Use cloth bags at the store instead of plastic bags. We often don't even need a bag!
3. Put lunch items in reusable containers instead of plastic baggies. Carry a reusable, metal spork so that you don't need to use plastic utensils.
5. Eat ice cream in cones, not plastic cups.
6. Cut plastic six-pack rings so that animals can't get caught in them.
7. Stop litter! Tell family and friends that litter hurts animals. Join beach clean-ups.
8. Pick up trash outside your home and sweep sidewalks with a broom. Hosing sidewalks wastes water and can push trash into storm drains.
9. Recycle! Learn your city's recycling rules for plastic and other items.
10. Use bio-plastics made from plants like corn or potato. They biodegrade naturally.
11. Learn more! Algalita.org, Surfrider.org AdventureEcology.com