RISE ABOVE PLASTICS

Plastic Consumption and Pollution Basics

In this three part series, we will provide an overview of the problems caused by single-use plastics, examine the science of plastic degradation, and discuss ocean ecosystem impacts.

"We have met the enemy and he is us" – Pogo, 1971

As a society we use and dispose of an incredible amount of "stuff." Much of that "stuff" is made of plastic, and way too much of it is "single-use," including plastic bags and bottles. In fact, over 24 billion pounds of plastic packaging is produced in the United States annually, and is specifically designed to be discarded after use. The United States also produces over 100 billion plastic bags, which are commonly used at grocery stores. These bags, derived from petroleum, require about 12 million barrels of oil annually for their production.

What happens to these bags after use? It is estimated that only about 5% are recycled and the other 95% end up in our landfills, on our streets, in our parks, on our beaches, and in the ocean.

The story is the same with plastic water bottles. Americans purchase 28 billion water bottles annually, which use up 20 million barrels of oil. Eighty percent of those bottles end up in landfills, and about 20% are recycled (assuming none end up on our streets or in the ocean, which we know is not true).

Plastic bags are the modern-day urban tumbleweed. Sadly, they aren't just littering our streets creating an aesthetic problem, but they are also hitting cities and taxpayers in the wallet. Municipal litter abatement efforts cost about 17 cents per bag to clean up the mess caused by something that originally cost between 2 and 5 cents to produce.

What's more, plastics do not biodegrade, but instead break down into small particles. These particles persist in the ocean where they absorb toxins and are mistaken for food by fish, sea birds and other marine life. It is estimated that over 100,000 marine mammals and sea turtles die each year from ingestion or entanglement in plastics. Plastic bags are especially dangerous to sea turtles, who mistake them for jellyfish, their primary food source. Nearly all known species of sea turtles have had reported problems of entanglement in or ingestion of marine plastics.

In the ocean, large systems of rotating currents called gyres cause marine debris, which is overwhelmingly plastic, to collect in the center of the sea. These so called "garbage patches" are actually areas of high plastic concentrations that aren't visible from the surface.

The most infamous of these patches is in the North Pacific, but there are also similar gyres (and garbage patches) in the South Pacific, North and South Atlantic, and Indian Oceans.

In the South Atlantic, the amount of debris increased 100-fold during the early 1990s. In coastal areas of Japan, beginning in the 1970s, marine plastic-particle densities increased ten-fold each decade, and in the 1990s increased ten-fold every two to three years. In the last decade alone, the amount of micro-plastics in the North Pacific has tripled. And the growth continues.

Some of that plastic ends up on remote, uninhabited islands thousands of miles from coastal cities. In a study of nine remote locations throughout the Hawaiian Archipelago, scientists collected beach sand samples and sieved the combined sample for particles between 1mm and 15mm in size. Of the samples collected, 72% were primarily plastic, ranging from pre-production pellets called nurdles to larger pieces.

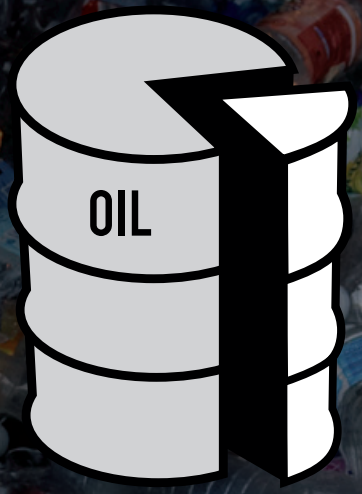
On Midway Atoll, dead albatross chicks have been found with their stomachs full of plastic, including bottle caps, cigarette lighters, buttons, balloons, gloves and other plastic fragments. The birds die from starvation – plastic does not digest, and it reduces their appetite, causes dehydration, and blocks their digestive tract.

There are two ways to address most pollution problems: clean up the mess or stop it at the source. While both solutions are important, source control is a much more cost-effective method. Surfrider Chapters host beach cleanups, but unfortunately the clean beaches don't stay that way for long. In addition to cleanups, the Foundation encourages practices such as frequent street sweeping, adequate trash and recycling receptacles, and screens and other collection devices on storm drains in an effort to eliminate the amount of pollution that washes out into our oceans.

Sadly, these practices don't necessarily get to the heart of the problem. We need to make small lifestyle changes that eliminate the amount of waste we are putting into our environment. Simple solutions include using a reusable water bottle with filtered water, carrying a reusable bag, and packing your lunch in reusable containers.

Plastic pollution is a huge problem for the environment, but by changing our habits, we can begin to make the transition to a cleaner and more sustainable world.

The amount of oil needed to produce a year's worth of plastic packaging would fuel 480,000 cars for a year.



The United States produces 24 billion pounds of plastic packaging annually. That is the equivalent weight of 300,000 gray whales.

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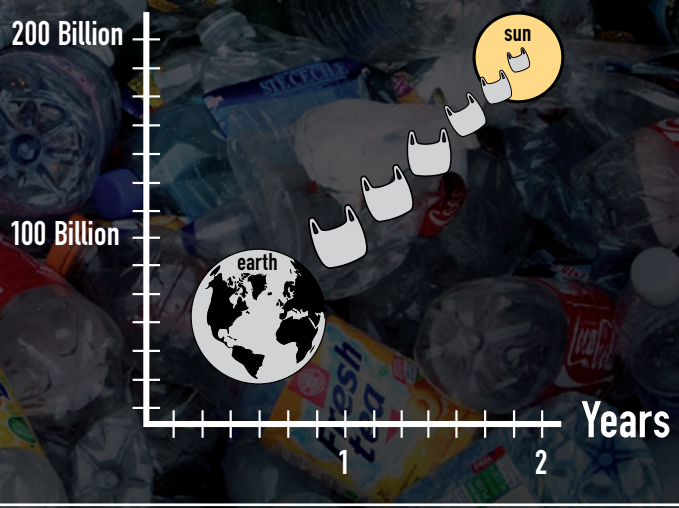
1 Years worth of plastic packaging

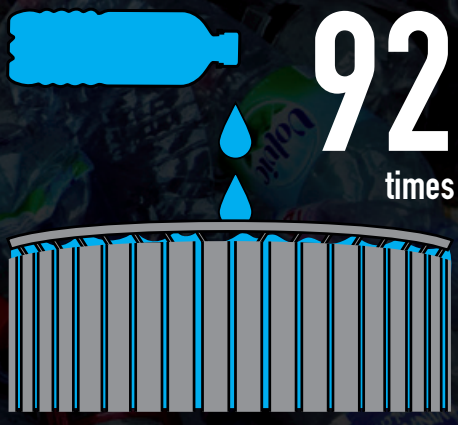
OR

Fuel for 480,000 cars



If you stretched end-to-end 100 billion plastic bags (a year's supply), they would reach from the earth to the Sun every two years.

Americans purchase 28 billion water bottles annually, which could fill Madison Square Garden from top to bottom with water



Cost to produce

2-5¢

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Cost to clean up

17¢

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