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# The Gross Truth About Garbage Gyres



By **Gemma Alexander**

SEP 21, 2022 [garbage patches](#), [Great Pacific Garbage Patch](#), [gyres](#),

[microplastics](#), [plastic pollution](#)



All rivers lead to the sea. And along the way, they collect a lot of garbage. That garbage gets washed out to the middle of the ocean where it joins debris from fishing vessels. The marine debris accumulates in patches of polluted water that have grown to truly astounding sizes. And although they exist far from human sight, these floating garbage patches have far-reaching impacts.

## Great Garbage Gyres

Created mostly by surface winds, [ocean currents](#) are also influenced by temperature and salinity gradients, Earth's rotation, and tides. The currents transport warm water and precipitation from the equator toward the poles and move cold water from the poles back to the tropics in circular patterns called gyres. In this way, ocean currents regulate global climate, counteracting the uneven distribution of solar radiation reaching Earth's surface.

Besides heat, they also transport any materials floating in the ocean. While organic materials break down over time, nonbiodegradable human-made materials simply continue to accumulate. Moved by the currents, they collect in patches. It's easy to imagine these patches as floating islands of garbage. But a more accurate description might be [plastic soup](#).

### What Do You Think?

**Are you considering moving because of climate change?**

Yes

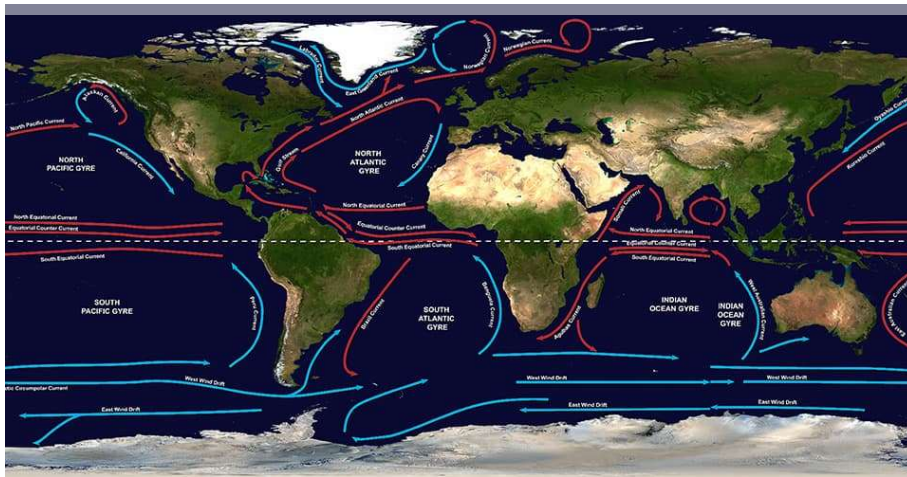
I'm researching my options to decide

No

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Trash accumulates in the circulating currents of the five ocean gyres, creating a “soup” of debris that we call garbage patches. Image: [NOAA](#)

## Plastic Soup

Garbage gyres are so large that studies attempting to identify the source of the debris generate different results depending on the sample location. However, there seem to be a handful of distinct entry points for each gyre. In [a survey](#) of the Great Pacific Garbage Patch (GPGP) that looked at more than 6,000 floating items large enough to identify, one-third of the pieces came from Japan. As much as [86% of these large pieces](#) in the GPGP were abandoned, lost, or discarded by fishing vessels. By mass, [nearly half](#) of all the waste is fishing nets. [Microplastics](#), which are less than 5 millimeters long, make up only about [8%](#) of the mass of the gyre. But they comprise more than 90% of the gyre by number of pieces.

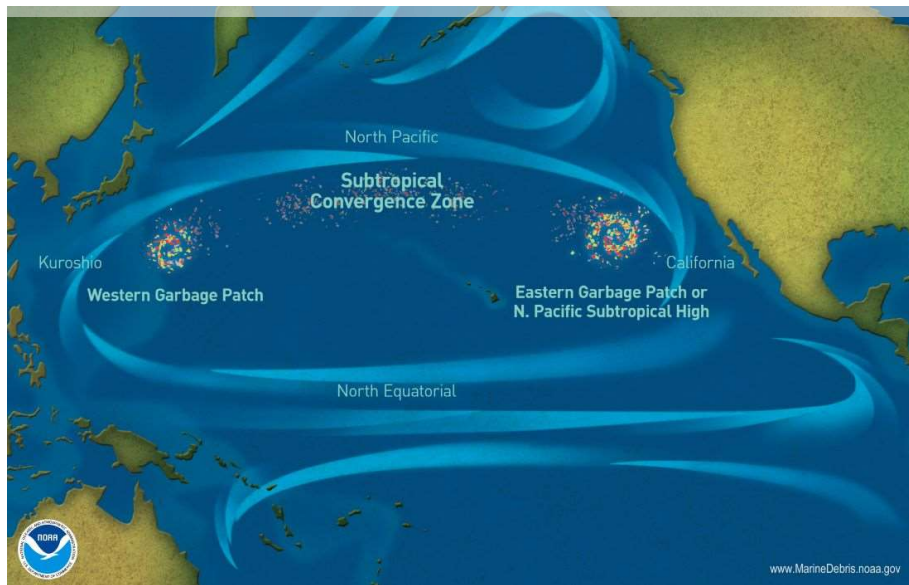
## Ocean Dump

Nation-sized pools of ocean debris are obviously nasty. But the problem is more than aesthetic. After all, few people will ever take in the view from the middle of the ocean. So, it might be tempting to think of these patches as a sort of wet landfill. But unlike landfills, gyres are not stationary, and the waste is not contained.

Plastics of any size and the toxic chemicals that adhere to them [harm sea creatures](#). Thousands of individuals from nearly [700 species](#) including sea birds, sea turtles, and endangered marine mammals are killed each year after consuming or becoming entangled in marine debris. Microplastics bioaccumulate. Plastics have been found in deep-sea organisms and in fish sold for human consumption, as well as many other [human foods](#). It's no surprise then, that microplastics have been found in human [lungs](#) and [feces](#). The long-term [impacts on human health](#) from consuming plastic are uncertain.

## Five Garbage Patches

There are [five garbage patches](#) around the world, but by far the largest is the Great Pacific Garbage Patch. It covers most of the North Pacific – more than 7.7 million square miles. In fact, the GPGP is actually two patches that have grown together. Centered on the foci of the elliptical North Pacific Subtropical Gyre, the GPGP collects garbage from beaches in California and Hong Kong.



The largest of the patches is the Great Pacific Garbage Patch, which covers more than 7.7 million square miles. Image: [NOAA](#)

The South Pacific Garbage Patch is located midway between Australia and South America. The newest garbage patch, it was first noticed in 2011 and is now almost twice the size of Texas. The Indian Ocean Garbage Patch collects waste from Southeast Asia, especially Indonesia. The final two garbage patches are the North Atlantic Gyre and the South Atlantic Gyre. The northern patch is midway between the United States and North Africa, fed by the Southeastern United States. The southern patch, which is the smallest of the five, is midway between Brazil and Southern Africa.

## Cleanup

In the largest effort to date, nonprofit The Ocean Cleanup has removed [100,000 kilograms](#) of plastic from the GPGP in the past year. It's an exciting milestone. But at this rate, it would take 1,000 years to clean up the GPGP — if we don't add more garbage to the gyre.

Without a massive, concerted global effort, cleanup is nearly impossible. But samples have identified the fishing industry (especially in Japan) and even [specific beaches](#) around the world as the gateways for marine debris bound for the garbage patches. Targeting those gateways for cleanup could prevent further gyre growth.



Thousands of marine creatures are killed by eating or becoming entangled in marine debris like this discarded commercial fishing net.

## What You Can Do

You can [protect the oceans](#) by working towards a [post-plastic world](#). Eliminate single-use plastics and recycle plastic whenever possible. Be very careful to dispose of [cigarette butts](#) and [PPE like masks](#). Pick up [litter on the beach](#) or wherever you find it, to keep it from making its way to the ocean. Choosing [products](#) made from recycled ocean plastic can help make use of plastic waste that would otherwise harm ecosystems and wildlife.

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By [Gemma Alexander](#)

Gemma Alexander has an M.S. in urban horticulture and a backyard filled with native plants. After working in a genetics laboratory and at a landfill, she now writes about the environment, the arts and family. See more of her writing [here](#).

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