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20-Year-Old Designs System to Clean Up Plastic Ocean Trash

by Leon Kaye on Monday, Jun 8th, 2015

2,000 meters long, the Ocean Cleanup Array will launch in 2016.

Our affection for plastic has put the world's oceans in a big fix. At even the most remote beaches and islands, plastic in all forms — from toys to water bottles — are a common sight as trash washes up just about everywhere. Some estimate the amount of plastic in the oceans equals five grocery bags per foot of coastline across the world.

But Boyan Slat, a 20-year-old Dutch national, believes he has invented a system that can help confront this mess. What is even more promising is that its design runs passively and requires relatively little equipment.

Slat founded the Ocean Cleanup, an NGO based in Delft, Netherlands, which aims to start the largest ocean recovery project in history. The organization is joining a bevy of other projects that have certainly been well-intended and ambitious, but involve efforts akin to taking a butter knife to a gun fight.

For example, the home cleaning products brand Method has manufactured bottles out of plastic harvested from the Pacific Garbage Patch, a floating mass of debris estimated to be larger than the state of Texas. And to take on the problem of unwanted fishing equipment, the Global Ghost Gear Initiative is trying to launch a multi-stakeholder program to cope with the problem of nets and traps being dumped into the oceans. Nevertheless, this crisis keeps worsening.

With over 5 trillion pieces of plastic mucking up the world's oceans, thanks to the 8 million metric tons of plastic ending up in the oceans annually, everyone agrees ocean trash has resulted in a variety of health, economic and environmental problems. Of course, the easiest ways to solve this problem would be to reduce plastic consumption and convince people to stop littering in the first place. But the amount of garbage already in our oceans is staggering, and that is where the Ocean Cleanup enters.

Conventional wisdom holds that harvesting this plastic would require endless fleets of boats and nets and, of course, energy and massive amounts of revenues no one is willing to spend. Slat's idea suggests that, instead of deploying resources into the oceans to remove the trash, we simply use the ocean's currents to clean them instead. Long floating booms would concentrate plastic trash as currents flow through them. In theory, currents would flow through these barriers, trapping plastic while marine life would pass under the booms, avoiding the problems of bycatch. The lightweight plastic would meanwhile collect in the floating barriers. According to the Ocean Cleanup's research, a 62 mile (100 kilometer) barrier would remove 42 percent of the Pacific Garbage Patch, or about 160 million pounds (72.3 million kilos) of plastic debris, after 10 years. The technology would be economical, too: The organization estimates the cost to clean up the plastic would be approximately $2.30 a pound (€2.07, or €5.03/$5.59 a kilogram).

To test this theory, a pilot version of this concept will be launched in the Korea Straight between Japan and South Korea. With a span of 2,000 meters (1 ¼ miles), the Ocean Cleanup Array will operate for at least two years off the Japanese island of Tsushima. Deployment is scheduled for the second quarter of 2016.

Considering Japan's struggles with plastic trash, especially after the 2011 Tohoku earthquake and tsunami, the Ocean Cleanup has found the perfect laboratory before the organization sets its sights on the greater Pacific Ocean. Tsushima officials have estimated the amount of plastic that has washed up on its shores is about 1 cubic meter per person — daunting when one considers the island's population is about 40,000. Researchers are currently evaluating whether the salvaged trash can be used as feedstock to generate energy.

The Ocean Cleanup's goal is to have its 62-mile long array operational in the Pacific within five years. Engineers plan to launch incrementally larger arrays in the interim, and an expedition is scheduled to cross the Pacific later this summer.

These long arrays may only prove to be part of the solution, as many experts say most of the plastic pieces floating in the oceans are less than 5 millimeters in size. Nevertheless, this relatively simple technology could go a long way toward solving a problem that almost everyone else finds too complicated, or expensive, to tackle.
Image credit: The Ocean Cleanup

Based in Fresno, California, Leon Kaye has written for TriplePundit since 2010. He has lived across the U.S., as well as in South Korea, Abu Dhabi and Uruguay. Some of Leon's work can also be found in The Guardian,Sustainable Brands and CleanTechnica. You can follow him on Twitter (@LeonKaye) and

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