

# News articles



## ARTICLE 1

### **Plastic Garbage Patch Bigger Than Mexico Found in Pacific.**

WATER, WATER, EVERYWHERE – AND most of it filled with plastic.

July 25th 2017

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A new discovery of a massive amount of plastic floating in the South Pacific is yet another piece of bad news in the fight against ocean plastic pollution. This patch was recently discovered by Captain Charles Moore, founder of the Algalita Research Foundation, a non-profit group dedicated to solving the issue of marine plastic pollution.

Moore, who was the first one to discover the famed North Pacific garbage patch in 1997, estimates this zone of plastic pollution could be upwards of a million square miles in size. (Read: A Whopping 91% of Plastic Isn't Recycled.)

The team is currently processing the data and weighing the plastic, so they can get a handle on exactly how much garbage they've discovered in this area off the coast of Chile and Peru.

The term “patch” referring to the plastic pollution in oceanic gyres can be misleading. The pieces of plastic are not necessarily floating bottles, bags, and buoys, but teeny-tiny pieces of plastic resembling confetti, making them almost impossible to clean up.

These microplastic particles may not be visible floating on the surface, but in this case, they were detected after collecting water samples on Moore's recent six-month expedition to the remote area that had only been explored for plastic once before.

On the first transect of the South Pacific gyre in 2011, Marcus Eriksen, marine plastic expert and research director at the 5 Gyres Institute, did not spot much plastic. In only six years, according to the new data collected by Moore, things have changed drastically.

Henderson Island, located in this South Pacific region, was recently crowned the most plastic-polluted island on Earth, as researchers discovered it is covered in roughly 38 million pieces of trash.

The problem of plastic pollution is becoming ubiquitous in the oceans, with 90 percent of sea birds consuming it and over eight million tons of new plastic trash finding its way into the oceans every year.

### Trash-mapping expedition sheds light on 'Great Pacific-Garbage Patch'

August 23<sup>rd</sup> 2015

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Scientists and volunteers who have spent the last month gathering data on how much plastic garbage is floating in the Pacific Ocean returned to San Francisco on Sunday and said most of the trash they found is in medium to large-sized pieces, as opposed to tiny ones.

Volunteer crews on 30 boats have been measuring the size and mapping the location of tons of plastic waste floating between the west coast and Hawaii that according to some estimates covers an area twice the size of Texas.

"It was a good illustration of why it is such an urgent thing to clean up, because if we don't clean it up soon, then we'll give the big plastic time to break into smaller and smaller pieces," said Boyan Slat, who has developed a technology he says could start removing the garbage by 2020.

A 171ft mother ship carrying fishing nets, buckets, buoys and bottles, among other items, and two sailing boats with volunteers who helped collect the garbage samples arrived at San Francisco's Piers 30-32. The boats went on a 30-day voyage as part of the "Mega Expedition", a major step in an effort to clean up what is known as the Great Pacific Garbage Patch.

The expedition was sponsored by the Ocean Cleanup, an organisation founded by Slat, a 21-year-old innovator from the Netherlands.

Slat said the group would publish a report of its findings by mid-2016 and after that hoped to test out a one-mile barrier to collect garbage near Japan. The ultimate goal is the construction of a 60-mile (96.5km) barrier in the middle of the Pacific. Slat said he became passionate about cleaning the oceans of plastic while diving in the Mediterranean Sea five years ago. "I was diving in Greece and realised that there were more plastic bags than fish," he said, "and I wondered: why can't we clean this up?"

After dropping out of university after six months, Slat dedicated his life to developing the technology the group will start testing next year. He has envisioned using long-distance floating barriers that will attach to the seabed and target swirling ocean currents full of waste to skim garbage from the surface while aquatic life and currents pass underneath.

After a 2012 Ted Talk about his idea was viewed more than 2 million times, Slat decided to launch a Kickstarter campaign and raised \$2.27m, helping to start his organisation. Soon, his innovative solution got the attention of major philanthropists in Europe and Silicon Valley, including Salesforce.com chief executive Marc Benioff, who are helping pay for the data-gathering efforts and the technology's development.

The Pacific expedition, which will end in mid-September, will gather data more extensive than what has been collected in the past 40 years. It also will give a better estimate of the how much plastic waste is in the Pacific, Slat said.

## STUDENT SHEET 3a

ARTICLE 2 (CONTINUED)

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The boaters are using GPS and a smartphone app to search for and record the plastic. They take samples and ship them to the Netherlands, where the plastics are counted and recorded.

The Great Pacific Garbage Patch was discovered by Charles Moore in 1997, as he returned home from the Transpacific Yacht Race.

ARTICLE 3

### There Are 48 Times More Pieces of Plastic In The Ocean Than There Have Been Humans Ever

December 11<sup>th</sup> 2014

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There are “at least 5.25 trillion plastic particles” in the world’s oceans, a new study found.

There are at least 5,250,000,000,000 pieces of plastic in the world’s oceans, a new study estimates. The study, published Wednesday in the scientific journal PLOS ONE, points out that “plastic pollution is ubiquitous throughout the marine environment.” To study the problem, scientists consequently embarked on a series of 24 expeditions to look at and haul up plastic. The researchers ultimately visited 1,571 locations around the world.

The researchers also estimated that all the plastic in the ocean weighs 268,940 tons. And that’s “highly conservative,” they wrote, because even more plastic may be lying around on beaches, inside animals, on the seabed, or hidden elsewhere in the water.

That means there are about 48 times as many pieces of plastic in the ocean as there are people who have ever lived on Earth. A widely cited estimate puts the total human population since the dawn of the species at about 108 billion. The estimate comes from the Population Reference Bureau and includes a number of qualifications. But assuming it’s more or less accurate, it means there are about 48 times as many pieces of plastic as there are humans in the history of the world.

Or, put another way, this means that if we took all the plastic out of the ocean and divided it up among all of humanity ever, everyone would get (at least) 48 pieces each.

Of course, a lot of those pieces are very, very small. The study found that 92.4% of the particles were “microplastics” that are 4.75 millimetres or less thick. Still, most of those particles came from larger pieces breaking up. And larger “macro plastics” – things like fishing gear, old buoys, and bottles – actually contributed the most to the overall weight of the oceans’ plastic content.

## STUDENT SHEET 3a

ARTICLE 3 (CONTINUED)

### **There Are 48 Times More Pieces of Plastic In The Ocean Than There Have Been Humans Ever**

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And speaking of weight...

All of this plastic weighs more than 500 fully loaded Boeing 747s. A 747 has a maximum take-off weight of nearly 500 tons, meaning that it would take nearly about 537 of the behemoth airplanes to equal as much weight as all the plastic in the ocean.

The plastic also weighs 26 times as much as the Eiffel Tower. So dump 26 Eiffel Towers into the sea, then that's more or less equal to the amount of plastic that's out there.

The plastic in the northern and southern hemispheres is comparable, which surprised the researchers. The southern hemisphere oceans had less, but were "still within the same range as for the northern hemisphere oceans." This surprised the researchers because there are more "inputs" – such as people, shipping routes, etc. – in the north.

The researchers speculate on a variety of reasons that they found so much plastic in the southern hemisphere: plastic may move more easily than expected; there may be pollution sources they hadn't considered; or the plastic could sink more in the northern hemisphere.

Ultimately the researchers point out that all this garbage floating around in the ocean is hurting animals. Even though much of the plastic is small, it ends up being consumed by sea creatures and working its way up the food chain. The researchers also write that it's "economically and ecologically prohibitive" to remove all this plastic, so it will probably end up buried in the sediment. That, the researchers write, reinforces the need to stop the flow of plastic into the ocean and "reverse this growing environmental problem."

ARTICLE 4

### **Oceans swallowed 13 million tonnes of plastic in 2010**

12<sup>th</sup> February 2015

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Vast floating islands of plastic are just a drop in the ocean compared with what's lurking deeper down. Between 5 and 13 million tonnes of plastic debris entered the marine environment in 2010 – and most of it is under water. What's more, without improvements in the way we manage waste, it could be 10 times as much each year by 2025.

It has been 40 years since the first scientific reports of plastic pollution in the ocean, but we still have plenty to learn. For instance, the combined results from 24 oceanic expeditions published late last year concluded there may be perhaps 244,000 tonnes

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12<sup>th</sup> February 2015

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of floating plastic out there. This is puzzling, because conservative estimates suggest something like 9 million tonnes of plastic have entered the oceans since the 1970s.

Now we know there's even more missing plastic than that. Jenna Jambeck at the University of Georgia, Athens, and her colleagues have looked at data on plastic use and disposal in 192 coastal countries. They calculate that between 4.8 and 12.7 million tonnes entered the world's oceans in 2010 alone. This means the amount of plastic that has entered the ocean down the years might be 1000 times more than the mass of floating plastic that scientific surveys have measured.

Surprisingly, the 10 countries with the largest problem – many of which are in south-east Asia – generally have relatively low rates of plastic waste generation per person. For instance, in China – which tops the list with an estimate of up to 3.53 million tonnes of plastic marine debris a year – the average person generates about 1.1 kilograms of waste per day of which just 11 per cent is plastic. In the US – at 20 on the list – the average person generates more than twice as much waste. But the top offending countries also have high coastal populations and low rates of plastic recycling.

It's an interesting study, says Marcus Eriksen of the Five Gyres Institute in Los Angeles, who led last year's floating plastic study – but some of the assumptions used to arrive at the new calculations could be quibbled with. "I believe the authors underestimate the amount of trash that is scavenged, burned and buried before it reaches the ocean," he says. "I think there's much less leaving land."

Even so, there is clearly a huge mismatch between the plastic entering the ocean and the plastic we find there. "The disturbing conclusion is that much of the plastic entering the oceans is unaccounted for," says Carlos Duarte at the King Abdullah University of Science and Technology in Saudi Arabia, who has also helped conduct surveys into the amount of plastic in the oceans.

#### Plastic smog

Where is the missing plastic? Perhaps it's hiding in plain sight. "It's important to understand that plastic shreds rapidly into microplastics that distribute widely into the most remote waters on the planet," says Eriksen. "Of the 5.25 trillion particles of plastic we reported recently in PLoS One, 92 per cent are less than the size of a grain of rice."

Such small particles spread throughout the water column, says Eriksen, also finding their way into sea-floor sediments and ice cores. That means we should stop thinking of plastic waste in terms of unsightly chunks of debris floating in vast oceanic garbage patches, and instead see it more as a pervasive "plastic smog" of tiny particles spread through the entire volume of ocean water.

"It's not sensible to go to the ocean with nets to capture trash, but rather to focus on mitigation strategies on land," says Eriksen.

## STUDENT SHEET 3a

ARTICLE 4 (CONTINUED)

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Yet the amount of plastic entering the ocean is likely to keep rising in the years to come. Jambeck and her colleagues point out that 16 of the top 20 plastic producers they identified are middle-income countries, where strong economic growth will probably result in even more plastic use, but where the infrastructure to deal with the waste is still lacking.

But the solution isn't to burden these developing countries with the cost of building effective waste management infrastructures, says Eriksen. Instead, we should require the plastics industry to rethink the way it designs its products – in particular, the industry should phase out plastic products designed for single use.

Change the way plastic is produced, says Eriksen, “and the plastic pollution issue would largely diminish”.