

The human legacy: plastic in the oceans

Business



At least once a year, Union County, KY experiences a flood, and every year the Ohio River swells and usurps the once dry shore. Several years ago, as the water finally subsided after one such flood, my family went to the river to collect the driftwood that washed up on the bank.

What seemed especially strange, however, was what lie around the pale wood. Ducks flocked around the bright spots of color on the ground: dirt-encrusted Tide caps, water bottles filled with murky water; yellow Laffy Taffy wrappers. There were even pieces of furniture and car parts lying around. I was young at the time, and all I saw was potential parts for a future art project. In retrospect, it wasn't some odd river bounty.

It was pollution. There was a reason that I didn't see banana peels and paper towels lying around. Those things biodegrade fairly quickly. That day, we were surrounded by the one man-made product that will never fade: plastic. It's produced by the millions of tons each year, and each year much of that ends up in waterways and, eventually, the oceans. All those years ago, I stood on the edge of one river out of countless others around the world, and many of those rivers also produced a plastic tide.

This plastic poses an extreme risk to marine life, as well as humans. But how does our plastic waste get into rivers and oceans? According to the National Oceanic and Atmospheric Administration, marine debris comes from two places: the oceans and land. Ocean-based plastic comes from three main sources. First, fishermen and boaters may lose fishing gear, bottles, containers, etc. Unfortunately, some also purposely discard trash into waterways. Second, cargo ships may accidentally lose cargo in bad weather.

Such cargo might include sneakers, toys, and electronic devices, among countless products. Third, offshore oil and gas platforms regularly lose “plastic drill pipe thread protectors, hard hats, and 55-gallon storage drums.” (NOOA, Marine Debris Program) Land-based plastic is also common. Littering and irresponsible/illegal waste management can contribute to plastic pollution in the oceans, even if the trash was originally discarded on land. One way litter is transported to bodies of water is from heavy rain pushing the trash into storm drains. The litter is then eventually carried to a nearby waterway.

The last way plastic can go from land to the oceans is fairly dramatic: tornadoes, hurricanes, floods, etc. can fling anything from a plastic ball to a high tunnel into an adjacent waterway. Gradually, this river/lake/stream will make its way to an ocean, and the plastic will infiltrate the world’s sustenance. This plastic is hard to track down, but it’s not impossible to estimate how much is in the oceans. In an article in Science, Jenna R. Jambeck, Roland Geyer, and peers report that 4.

8 to 12. 7 million metric tons of plastic entered the oceans from land in 2010 alone. This estimate doesn’t even account for the aforementioned trash lost by fishermen, cargo ships, or natural disasters so there is most likely even more plastic debris winding up in the oceans every year. And, unfortunately, the article predicts that, as plastic production increases, so will plastic pollution. Plastic- from shopping bags to Gatorade rings to shampoo bottles- can do a lot of damage to the food web. While floating on the surface, plastic is being constantly battered by saltwater and sunlight.

As a result, plastics break down into micro- and nano-plastics and sink deeper into the oceans. Nano-plastics are consumed by minuscule creatures such as plankton, and micro-plastics are often consumed by fish, sea turtles, birds, etc. These plastics harbor DEHP and BPA, which are carcinogenic and interfere with human hormonal function, respectively. (Manikkam, Tracey and peers) Moreover, plastic can cause starvation if ingested, and asphyxiation if caught around a creature's neck. If we don't begin mitigating plastic marine debris, we will fail to rise against an obvious moral, ethical, and environmental issue. A 2015 Science article by Sid Perkins predicts that by 2050, almost all seabirds will have eaten plastic.

Already, many fish are eating micro-plastics, which is then ingested by unsuspecting humans when they consume seafood. Eating plastic can even make fish ignore their predators, putting their entire species in danger. As plastic continues to flood our oceans, the lives of marine and human life will be further threatened by this dangerous and toxic material. What can we do, then, to help mitigate such a widespread problem? From my perspective, there are three categories solutions fall into: Reduction, Clean-up, and Change of Lifestyle. Reduction: Legislation must be passed to cap plastic waste. One method to mitigate waste suggests that, if we capped per capita waste production at the 2010 average in the 91 countries that exceed it, as well as capped the plastic percentage at 11%, we could actually decrease our waste generation by 26% by 2025.

This is a suggestion that should be implemented in higher-income countries, such as the U. S. (Plastic Waste Inputs from the Land into the Ocean.

Jambeck, Geyer, and peers) This method would decrease both plastic and

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general waste. Another suggestion from the authors of this report: the 20 countries that mishandle the most plastic waste should reduce their general mismanaged waste by 50%. This would reduce mismanaged plastic waste by 41% by 2025.

Reducing mismanaged waste can be achieved by better funding and supervision to and of waste management programs. Furthermore, encouraging recycling programs on local and state levels could greatly reduce discarded waste. Citizens should also encourage their local and state governments to consider banning plastic bags and/or disposable plasticware. Clean-up: Unfortunately, modern clean-up efforts are simply not enough. At this moment, most marine debris is collected by vessels via nets.

This is time-consuming, costly, and not nearly as effective as one might hope for it to be. One theoretical solution that interested me was proposed by Dutch inventor, Boyan Slat. In his own words, from a National Public Radio Interview: “ The first test that will actually happen on the ocean will be deployed in June [2016]. I envisioned an extremely long network of floating barriers – they’re like curtains floating in the ocean which are attached to the seabed.” This ‘ vision’ is shaped and placed so that the ocean currents force plastic into a central point. The plastic can then be more adroitly extracted and then transported to land to be recycled.

A prototype was recently installed off-shore in the Netherlands. If successful, this contraption will use the ocean currents to its advantage, and greatly increase the efficiency of clean-up. Change of Lifestyle: This is the most important, difficult, and far-reaching solution of them all. Simply put, the

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general public must be convinced to act on this global issue in their daily lives. As smoking cigarettes has evolved from commonplace to frowned upon, so must the production and use of plastic.

A paradigm shift is needed, but how can it begin? Foremost, focus on using less plastic. Say no to plastic straws and plasticware at restaurants; instead, bring your own straw and silverware. And if you think you might want to take some food or a drink home after eating, bring your own reusable container and/or bottle. Invest in cloth shopping bags, and cloth diapers, if you have a baby. To avoid needless plastic packaging, try to buy food in bulk. (Green Education Foundation) When you're purchasing something, think can this be replaced or easily recycled? If the answer is no, ask yourself if it's a necessity.

Attempt an alternative way of living, and even if the going gets tough, try to stick it out. Of course, this may seem overwhelming, but it's also necessary. In the end, plastic has only one source: humans. It's up to us to fix the problem we created.