The Great Pacific Garbage Patch: Our Environment, Our Health, Our Problem

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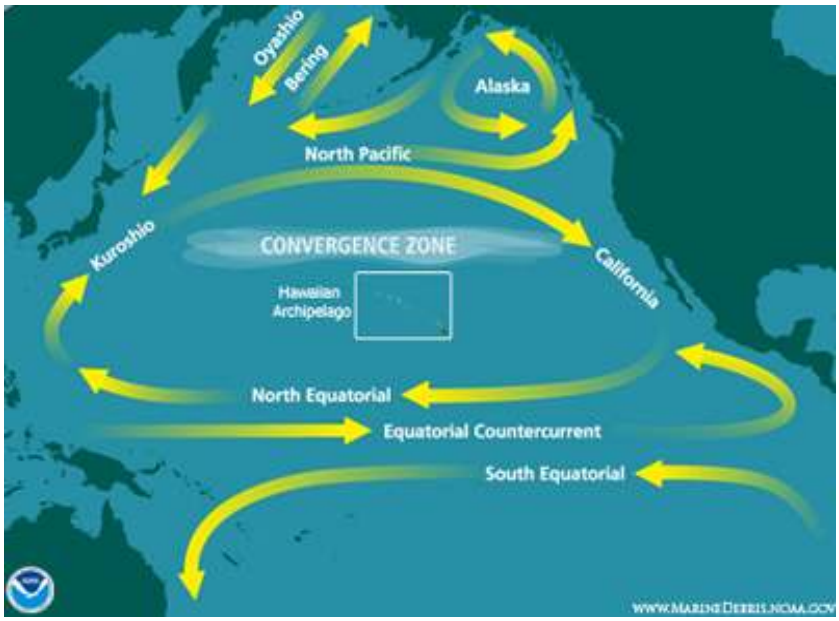
Introduction

Trash created by humans has been polluting the earth's oceans since the dawn of humanity. Where there are humans there are invariably signs of human waste accumulation. Over the last two centuries the accumulation of trash has skyrocketed to epic proportions and has become a serious global concern. And no other place highlights this problem any better degree than the great pacific garbage patch.

The great pacific garbage patch, sometimes referred to as the pacific trash vortex, is an accumulation of garbage located in the central North Pacific Ocean. Other garbage patches have been discovered throughout the world's oceans but none nearly its size and scale. To put it in perspective, the great pacific garbage patch is larger than the state of Texas and its debris span from the West Coast of North America to Japan ("trash vortex | Greenpeace International," n.d.).



The biggest concern arises from the overwhelming amount of plastics contained within the marine debris that make up the garbage patch. Plastics do not biodegrade, contain toxic chemicals, and physically destroy delicate ecosystems. Coral reefs are being destroyed by plastic

fishing nets that drag debris across their delicate structures, millions of marine animals perish in tangled masses of discarded plastic, fish consume small bits of plastic spreading toxins throughout the food chain, even humans are being injured by plastic that washes up on our shores ("Marine Debris Impacts | Marine Debris | US EPA," n.d.). Plastic has become a fundamental part of our lives and its use will only increase with time. But for our environment time is running out. That is why is of the upmost importance that we find a solution to this problem now.

Background Information

The great pacific garbage patch (trash vortex) is a massive collection of marine debris that was discovered by scientist Charles Moore in 1997. It has accumulated into a swirling gyre located in the Northern and Central Pacific Ocean. A gyre is an oceanic term referring to a ring like system of ocean currents that constantly rotate. Its actual size has been debated, but the general consensus is that it is at least as large as the state of Texas. Charles Moore estimates that the garbage patch will most likely double in size in the next ten years ("Garbage Patch Facts - Ocean Pacific Garbage Island Facts," n.d.). The most abundant marine debris found in the gyre are plastics which account for nearly 80% of the total marine debris dispersed throughout the world's oceans. The plastic found in the gyre is of special concern because plastic is not biodegradable and over time breaks down into tiny particles that are consumed by marine species ("Plastic Garbage," n.d.).

Causes

The cause of this environmental nightmare is uniquely human. We use plastics in nearly every part of our lives. From grocery bags to flip-flops, it is simply a part of our lives. And we do a poor job of disposing of it properly. When you throw you empty water bottle in the

trash, you most likely don't think that it will end up in the ocean. It would be logical to assume that the garbage patch is a result of dumping from ships. But surprisingly on about 20% of the trash comes from ships, the majority of plastics found in the ocean come from land as a result of improper waste disposal, litter being blown into the sea, poor trash management services, and manufacturing processes. So it is not a problem caused by someone else, we are all contributors to the problem (Ostdahl, 2013).

Environmental Impacts

The environmental impacts are vast and the extent of the damage is mounting. Some impacts can be clearly seen. We have all seen images of sea turtles and dolphins trapped in abandoned fishing nets. It breaks my heart every time a see the look of desperation in the eyes of these animals. Well just imagine an expanse of ocean the size of Texas with discarded and abandoned fishing nets scattered everywhere. It is like a giant mine field for the animals that must migrate through these waters. These are the direct impacts that we can see clearly with our eyes, but there is so much more damage that we don't see. Marine mammals, sea turtles, fish, and fowl all ingest marine debris. Some mistake the trash for food, but most ingest while feeding on their natural diet. This can lead to blockages in their digestive systems and ultimately starvation("Ocean Plastics Pollution," n.d.). Animals may also die from the toxins found in marine debris plastics. Plastic has a unique ability to absorb toxins from the environment, so ocean plastic can be absolutely inundated with extremely toxic chemicals. These adverse effects are not limited to these animals. Coral reefs are being damaged everyday by plastic debris, aquatic plants are being smothered, and immobile organisms like sea anemones are dying in record numbers. To add to this environmental crisis, entire ecosystems are being altered in the effort to remove debris. Mechanical beach combing aimed at removing plastics from the sand is

destroying entire habitats of coastal species. The garbage patch also provides a save haven for animals that would normally be food for others and has provided an environment for invasive species to thrive (Ostdahl, 2013).

Economic Impacts

The impact of the garbage patch is not limited to the environment. It has taken a heavy toll on the economy as well. Tourism has been greatly affected in areas of the south pacific where an endless amount of trash washes up on the shores daily. The U.S. is experiencing economic loss due plastic pollution as well. Both taxpayers and local governments must burden the costs of cleaning up waterways. Los Angles County spends nearly $18 million each year in litter clean up and prevention efforts and a significant portion of that is spent on removing plastic waste washed onto the beaches (L.A. County Boards of Supervisors Staff Report, 2007).

The fishing industry has taken the largest hit. Marine debris become entangled in propellers and trash is sucked into water intake valves leaving ships stranded. The constant need for repairs and towing is costing the industry hundreds of millions of dollars each year ("Marine Debris Impacts | Marine Debris | US EPA," n.d.). And it doesn't end there. Commercial fish and shellfish can become what they call bycatch. Bycatch is when fish that would otherwise be caught be the fishing vessels become entangled in marine debris. This has become a serious environmental and economic issue as of late and the costs are being passed down to the consumer ("Plastic Pollution in Oceans | NRDC," n.d.)

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Human Health Impacts

Humans too can become entangled in marine debris endangering health and safety. Beach goers can be cut by plastics and glass washed onto beaches. Passengers on boats can be injured

when their vessels hit large debris or when propellers are snagged. Scientific research has shown the 5 to 10% of the worlds fish contain small amounts of plastic. Carcinogenic chemicals like BPA are absorbed in their flesh, which then ends up in our food supply. Toxins in plastics have been linked to numerous adverse health effects and we have yet to see the full effects (Ostdahl, 2013).

Conclusion

You might be asking yourself what is being done about this problem? Well, I'd hate to say this, but not a whole lot. There have been efforts to clean up the debris using nets and specialized water rakes, but the patch continues to grow. To solve the problem you have to start with source. And the source of the problem is we the consumer. We the consumer must be constantly be aware of the products we use and how we dispose of them. We must hold plastic producers accountable for their role in this crisis. We must demand action from our government to ensure that future generations are not left to clean up oceans that we polluted. Above all we must educate and inform both ourselves and everyone around us. Just like plastic will never go away, nor will this problem if we don't do something now ("trash vortex | Greenpeace International," n.d.).

References

Marine Debris Impacts | Marine Debris | US EPA. (n.d.). Retrieved from http://water.epa.gov/type/oceb/marinedebris/md_impacts.cfm

McCormick, M. (2015, March 4). Attention Required! | CloudFlare. Retrieved from http://www.onegreenplanet.org/environment/great-pacific-garbage-patch-is-destroying-the-oceans/

Ocean Plastics Pollution. (n.d.). Retrieved from http://www.biologicaldiversity.org/campaigns/ocean_plastics/

Ostdahl, M. (2013, September). Plastic Pollution and its Solution | Sailors for the Sea. Retrieved from http://sailorsforthesea.org/resources/ocean-watch/plastic-pollution-and-its-solution

Plastic Garbage. (n.d.). Retrieved from http://www.sustainablecommunication.org/eco360/what-is-eco360s-causes/plastic-garbage

Plastic Pollution in Oceans | NRDC. (n.d.). Retrieved from http://www.nrdc.org/oceans/plastic-ocean/

The trash vortex | Greenpeace International. (n.d.). Retrieved from http://www.greenpeace.org/international/en/campaigns/oceans/fit-for-the-future/pollution/trash-vortex/