The Pacific Mess

By

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 Many of you don’t know much about our oceans, I’m here to raise awareness about one specific problem. The Pacific Ocean is dying. Humans are destroying the Pacific Ocean, between dumping plastic waste and other non-biodegradable, the Fukushima disaster, are just two among many other issues. One of the main problems is all the garbage debris in the Pacific Ocean. According to the website [www.snopes.com](http://www.snoops.com), the trash vortex is between California and Japan. Some say the trash vortex is twice the size of Canada, but according to a 2011 study from Oregon State University, “The North Pacific Subtropical Gyre is too large for scientists to trawl. In addition, not all trash floats on the surface. Denser debris can sink centimeters or even several meters beneath the surface, making the vortex’s area nearly impossible to measure.” (Dan Evon, [www.snopes.com](http://www.snopes.com)). Although in the website [www.snopes.com](http://www.snopes.com), they are unsure of the exact mass size photo’s of the trash will better help you understand the seriousness of this problem.

 Trash is not natural and unless biodegradable it is very hard to take care of. Trash comes in all shapes and sizes from plastic bottles, organizing tubs to bottle caps and tiny microplastics smaller than grains of sand. You can imagine how hard it would be to clean up plastic the size of a grain of sand, let alone the whole plastic vortex! This garbage patch threatens so much, marine life, human life, as well as the beauty of the ocean and our beaches! Think about it like this, you go fishing to feed your family as well as to enjoy the sport, you catch TEN beautiful, enormous fish and just the species you were hoping for. You bring the fish home to gut, clean, and cook them. Finally you arrive home and stick your knife in the belly as you open your perfect catch up, you see plastic caps and who knows what else. Do you see how big of a disappointment that would be? Maybe you don’t fish, but you love the ocean and beaches. Say you don’t live anywhere near one. You work your butt off all week, all year, and finally saved up just enough to take a vacation! You are so excited to bask in the sun, feel the sand between your toes, and maybe see a few fish, turtles etc. You book your flight, a dreaded 18 hours, but you finally arrive. Hours later you find yourself at the beach but you seem uneasy. There’s trash everywhere, you can see it floating in the water sitting in the sand. You take a well deserved vacation and it turns gloomy, although it’s a bright sunny day. No fun right? Well now think about the animals living, breathing, eating trash. The ocean is their home!

 In [www.seattlepi.com’s](http://www.seattlepi.com’s) article they state that 9% of fish collected during the same seaplex voyage had plastic in their stomachs. “That investigation, published in Marine Ecology Progress Series, estimated the fish at the intermediate ocean depths in the North Pacific Ocean could be ingesting plastic at a rate of roughly 12,000 to 24,000 tonnes per year.” (Amy Rolph, [www.seattlepi.com](http://www.seattlepi.com)). It doesn’t stop there, [www.biologicaldiversity.org](http://www.biologicaldiversity.org) talks about how nearly 300 species eat and get caught in the plastic litter. Thousands of marine life turtles, seabirds, seals, and many more are killed yearly. “ Sea turtles also mistake floating plastic garbage for food. While plastic bags are the most commonly ingested item, loggerhead sea turtles have been found with soft plastic, ropes, styrofoam, and monofilament lines in their stomachs. Ingestion of plastic can lead to blockage in the gut, ulceration, internal perforation and death; even if their organs remain intact, turtles may suffer from false sensations of satiation and slow or halt reproduction.

 Hundreds of thousands of seabirds ingest plastic every year. Plastic ingestion reduces the storage volume of the stomach, causing birds to consume less food and ultimately starve. Nearly all Laysan Albatross chicks- 97.5%- have plastic pieces in their stomachs; their parents feed them plastic particles mistaken for food. Based on the amount of plastic found in seabirds stomachs, the amount of garbage in our oceans has rapidly increased in the past 40 years.Marine mammals ingest and get tangled in plastic. Large amounts of plastic debris have been found in the habitat of endangered Hawaiian Monk Seals, including in areas that serve as pup nurseries. Entanglement deaths are severely undermining recovery efforts of this seal, which is already on the brink of extinction. Entanglement in plastic debris has also lead to injury and mortality in the endangered steller sea lion, with packing bands the most common entangling material. In 2008, two sperm whales were found stranded along the California coast with large amounts of fishing net scraps, rope and other plastic debris in their stomachs.” ([www.biologicaldiversity.org](http://www.biologicaldiversity.org))

 “Midway Atoll, also known as Pihe Manu, is part of the Hawaiian chain of volcanic islands, critical habitat in the Pacific Ocean.” (Jack Eidt, [www.pacificvoyagers.org](http://www.pacificvoyagers.org))

An estimated 3 million sea birds live there and about 250 different marine species populate the nearby reefs and lagoons. Midway Island makes a winter home for most of the world’s populations of the Laysan, Black-footed, and short tailed Albatrosses, as well as 14 other species of seabirds. ([www.pacificvoyagers.org](http://www.pacificvoyagers.org))

With as many animals that populate this island you would think it’d be a very positive place, think again. Tens of thousands birds lay all over the grounds unable to fly, eat, move. In agonizing pain suffering from plastic. With all the plastic they eat it makes it close to impossible to survive. Chris Jordan investigated this environmental tragedy creating a documentary, MIDWAY. This island has a huge cosmological and traditional significance for living Native Hawaiian culture. “Of the 500,000 albatross chicks born here each year, about 200,000 die, mostly from dehydration or starvation.” (Jack Eidt, [www.pacificvoyagers.org](http://www.pacificvoyagers.org))

 A two year study showed that Albatross chicks that died from dehydration or starvation had twice as much plastic in their stomachs. Albatross search for their food along the ocean surface, finding plastic everywhere; mistaking it for food. Almost all seabirds and marine mammals suffer the same, because plastic is a huge problem around this island especially. ([www.pacificvoyager.org](http://www.pacificvoyager.org))

 Another major issue happening in the Pacific Ocean is Fukushima. What is the Fukushima disaster? On March 11, 2011 The Great East Japan Earthquake damaged the city, while the tsunami after caused much more. The tsunami was about 560 sq km and resulted in a human death toll of over 19,000 and much damage to coastal ports and towns with over a million buildings destroyed or partially collapsed. “11 reactors at four nuclear power plants in the region were operating at the time and all shut down automatically when the quake hit. Subsequent inspection showed no significant damage to any from the earthquake. The main problem initially centred on Fukushima Daiichi units 1-3. Until the 4th one became a problem on day five. ([www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-accident/](http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-accident/)). Unit 1’s water level dropped to the top of the fuel and soon after to the bottom of the fuel, causing the temperature of the exposed fuel to rise to about 2800 degrees C. The vented steam of this unit, noble gases and aerosols along with hydrogen. There was a hydrogen explosion, at 3:36 p.m. on Saturday 12th. Most of the insides on this unit was melted, as well as unit 2 and 3 but not as bad. Unit 2 had almost the same problems as unit 1, causing another hydrogen explosion. Most of the radioactive release from Fukushima came from unit 2.

“Early on Monday 14th PCV venting was repeated, this evidently back flowed to the service floor of the building, so that at 11a.m. a very large hydrogen explosion here about unit 3 reactor containment blew off much of the roof and walls and demolished the top part of the building. This explosion created a lot of debris, and some of that on the ground near unit 3 was very radioactive. In defueled unit 4, at about 6a.m. on Tuesday, March 1st, there was an explosion which destroyed the top of the building and damaged unit 3’s superstructure further. This was apparently from hydrogen arising in unit 3 and reaching unit 4 by back flow in shared ducts when vented from unit 3.” ([www.world-nuclea.org/information-library/safety-and-security/safety-of-plants/fukushima-accident.aspx](http://www.world-nuclea.org/information-library/safety-and-security/safety-of-plants/fukushima-accident.aspx))

“NHK transcript: December 17th, 2015 [TEPCO] said the substances in one of the reactors probably leaked directly from the containment vessel… They suspect the heat of fuel caused the containment vessel to lose airtightness.” (enenews.com)

“UBS Investment Research, April 2011: Of Particular concern was unit 3, because, since September 2010, the plant had been fueled with mixed oxide, or MOx.. use of MOx heightened fuel risk- Fukushima Daiichi unit 3 is about 93% Uranium and 7% Plutonium. This has caused additional worries for TEPCO and the government, because MOx is more radioactively aggressive. We think national safety reviews might consider restrictions on its use.” (enenews.com)

“Asahi Shimbun, December 22, 2015 (emphasis added): More than 90 percent of fir trees in forests close to the site of Japan’s 2011 nuclear disaster are showing signs of abnormality, and plant lice specimens collected in a town more than 30 kilometers from the crippled facility are missing legs or crooked. But it remains unclear whether the mutations in the plants and animals are definitively connected to the disaster at the Fukushima NO.1 nuclear power plant. All that scientists in Japan are prepared to say is they are trying to figure out the effects of radioactive cesium caused by the release of huge amounts of radioactive materials from the triple meltdown at the Fukushima plant… Scientists are seeking… signs of mutation in plants and animals in areas close to the stricken nuclear plant… scientists have reported on mutations and abnormalities among species varying from fir trees and plant lice to Japanese monkeys, carp and frogs. The national Institute of Radiological Sciences (NIRS), a government-affiliated entity, said in late August that trunks of fir trees are among the 44 species that the Environment ministry asked the NIRS and other research organizations to study in trying to determine the effects of radiation on living creatures. The NIRS reported that the frequency of these mutations corresponds to a rise in natural background radiation. More than 90 percent of fir trees in the town of Okuma, just 3.5 kilometers from the crippled plant, showed signs of abnormal growth… Among other changes reported: the legs of plant lice collected in Kawamata, were found to be missing or crooked and the white blood cell count of Japanese monkeys was lower in Fukushima.” ([www.enenews.com](http://www.enenews.com))

December 9th, 2015, the operator of the Fukushima Daiichi nuclear power plant states the levels of radioactivity in underground tunnels have risen enormously. Tokyo Electric Power Company has detected 482,000 becquerels per liter of radioactive cesium in water taken from the tunnels. It’s risen 4,000 times higher since samples taken in December from last year. ([www.enenews.com](http://www.enenews.com))

November 4th, 2015: More cases of cancer are coming to light in post-Fukushima Japan. Chief Engineer Arnie Gundersen presents two reports that confirm the direct link of numerous cancers in Japan to the triple meltdown. Arnie concludes that heavy radioactive discharges will be the cause of spikes in cancer in Japan. “It’s been almost five years from the Fukushima Daiichi meltdowns, and the news from Japan is still not good. Two reports recently released in Japan, one by Japanese medical professionals and the second from Tokyo Power Corporation-TEPCO- acknowledged that there will be numerous cancers in Japan, much greater than normal, due to the radioactive discharges from the triple meltdown at Fukushima Daiichi… I believe, as do many of my colleagues, that there will be at least 100,000 and as many as one million more cancers in Japan’s future as a result of this meltdown… The second report received from Japan proves that the incidence of thyroid cancer is approximately 230 times higher than normal in Fukushima Prefecture... So what’s the bottom line? The cancers already occurring in Japan are just the tip of the iceberg. I’m sorry to say that the worst is yet to come.” (Arnie Gundersen, Chief Engineer at fairewinds, [www.enenews.com](http://www.enenews.com))

There are many issues going on in the Pacific Ocean but pollution/trash vortex and Fukushima, I feel are the biggest. Now that I’ve gone into detail with both problems I would like to talk about ways to prevent or slow down the processes. To start off with the vortex, there are many ways to help halt this problem. Each year many people gather around the Gulf of Mexico to collect trash. This is the single largest global volunteer effort on behalf of the ocean, starting in 1986. “In 2013, nearly 650,000 people in 44 U.S states and over 90 countries around the globe come together to remove 12,329,332 pounds of trash from 12,914 miles off the coast and beach. Every piece of trash is catalogued to help scientists better understand pollution’s biggest players. The #1 most common item found: cigarette butts, of which volunteers picked up 2,043,470!” ([www.ocean.si.edu](http://www.ocean.si.edu))

With that being said you don’t HAVE to travel all that way to help out. Whether you volunteer to pick trash up on highways or wherever or you just pick up the trash you see while you walk, camp, or even just hanging out at your local park. This will all help to keep trash out of our oceans.

In seattle voters approved a law starting in January, 2015, that prohibits residents from throwing food and compostable paper in your regular trash bin. This requires collectors to visually inspect trash to make sure that no more than 10 percent of the contents is compostable. “In 2016, residents will be fined $1 per violation, $50 for apartment managers or commercial customers.” ( Daniel Demay [www.seattlepi.com](http://www.seattlepi.com))

June 3rd, 2014 19 year old boy invents feasible solution to clean up ocean garbage patches. Using the natural ocean currents and winds to passively transport plastic towards a collection platform. By using solid floating barriers it makes it impossible to tangle up sea life. (www.theoceancleanup.com)

So many kids and adults are getting involved with cleaning up the oceans. It’s overwhelming to think that so many people day by day are becoming more aware and are turning ideas into actual solutions. You never know if you don’t try! It’s great knowing aware people are in action over this pollution! RECYCLE! Recycling helps keep non- decomposable items to be reused, which keeps it out of the Pacific. If you’re a smoker please do not toss the butts out of your windows, keep an ashtray around and dispose of them properly!

Fukushima is a big issue that has not happened before. The more they understand the better the chance of reversing or preventing spills. TEPCO says it may take up to 40 years to clean up the disaster, but they are currently in the act of cleaning it up. The nuclear reactor is stable, but making slow progress. “If I may put this in terms of mountain climbing, we’ve just passed the first station on a mountain of 10 stations.”, said Akira Ono, head of the Fukushima plant. The biggest obstacle is closing down the plant permanently, because of removing all the melted nuclear fuel debris from three reactors. The gas explosions released lethal levels of radiation at the time of the disaster. The levels have went down since the explosion but because of radiation they can not get into the reactors to survey the condition of the molten fuel debris. Another problem is the large volume of contaminated water, and what to do with it. (enenews.com). Scientists are studying Fukushima every day and all the effects it has. That is a very positive thing and can only have beneficial side effects for figuring out ways to fix this nuclear spill. I think the best ways to prevent disasters like Fukushima, is to teach kids, high schoolers, and workers in that field, the dangers of spills. How they affect our world and how hard it is to reverse. Teach them safety tips and how to be careful. Being aware is probably the best way in my opinion to prevent spills.

 Thank you for listening to my senior paper, I hope I’ve made you think. Remember to always question the situations in life. This is YOUR home, take care of her.