Fall 2016

Great Pacific Garbage Patch

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**Recommended Citation**  
Miller, Katie; Son, Jinho; Strickling, Meghan; and Wu, Stephanie, "Great Pacific Garbage Patch" (2016). *Introduction to Public Health Posters*. 4.  
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## Great Pacific Garbage Patch

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### Plastic
- There are many different plastics spread throughout the ocean
  - Toxicity from lead, cadmium, and mercury
- Styrofoam breaks into small parts of polystyrene
- Pollutant spreads throughout the sea column

### What We Eat
- The ocean is like a huge sponge that soaks up toxins
- Chemicals are ingested by the animals
- Contaminated fish and mammals
- Diethyhexyl phthalate (DEHP): a toxic carcinogen found in many fish in the ocean

### Defects from Plastic
- Cancers, birth defects, immune system problems, and childhood developmental issues
- BPA polymer chains broken down contaminating the water affecting human hormonal function

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### Not So Fun Facts
- Plastic is found in 9% of fish
- At this rate, the Garbage Island will likely double in size in ten years
- 7 billion pounds of non recyclable plastic are produced every year
- Only 7% of the plastic in America is recycled
- 1500 plastic water bottles are put in landfills every second
- The average person produces a half-pound of plastic waste every day in the U.S.
- 1350 plastic water bottles are put in landfills every second

### Build a Wheel
- Giant water wheel in Baltimore, MD
- Collected 50 tons of garbage in a month
- Solar panel to turn wheel
- Satellite imagery does not show a giant patch of garbage like we think
- Solar panel to turn wheel

### Build a Wall
- 62 mile floating wall in 2020
- Works with ocean currents to capture millions of tons of plastic
- Plastic will be trapped, collected, recycled

### Potential to clean up half of the patch in 10 years
- Pilot testing a 1-mile wall of the coast of Japan in 2016
- Nestle, Coca-Cola, Procter & Gamble, Bank of America, and the World Wildlife Fund are committing to making their products “ocean-friendly”

### Steps to Reduce the “Patch”
- Reusable shopping bags, food containers, and water bottles are the better option to use
- Avoid extra and excessive packaging
- Be educated on what your area recycles
- DO NOT litter. Ever. And try your best to pick up litter when seen.

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### How it Impacts Pharmacy
- Overall sickness caused by chemicals creating an influx in need for healthcare
- Growth in area of pharmacokinetics of BPA
- Drug Research
  - Adverse effects

### Determinants of Health
- Individual Behavior Choices
  - Recycling and reusing, donation to funds to help in efforts to cleanup trash, and volunteering
- Policy
  - Recycling Policies
  - Safe Drinking Water Act
  - Free Trash Sea Alliance: companies including Nestle, Coca-Cola, Procter & Gamble, Bank of America, and the World Wildlife Fund commit to making their products “ocean-friendly”

### Health Indicators
- Economy
- Communities based on tourism, reaction, and seafood industry
- Cleanup efforts
- BPA (Mortality Rates)
- Developmental issues, birth defects, infertility, linked to cancer
- Prevention
- Purification of water, recycling
- Employment
- Recycling programs increasing job opportunity

### Indirectly
- Educational Attainment
- Polluted areas → $5
- Access to Healthcare
- Pacific Islanders

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### What is the Great Pacific Garbage Patch?

**Gyre: a system of circular ocean currents formed by the Earth’s wind/current patterns and the forces created by the rotation of the planet**

Plastic is not biodegradable. However, over time it breaks down into tiny particles that are as small as a few millimeters. These are known as microplastics. These small pieces of plastic are far more dangerous than the large bottles and bags we think of when it comes to plastic.

### The Naked Eye
- Satellite imagery does not show a giant patch of garbage like we think
- It would take a country to go bankrupt to clean it up

### “Plastic Soup”
- Contains the large pieces of garbage mixed with the tiny pieces of microplastics
- Largest numbers of plastic collect in “gyres”
- Ocean currents collect the plastics like a circulating vortex

### Pacific Ocean Garbage Patch
- Twice the size of Texas
- 7 million tons of waste
- Roughly 9 feet deep
- 6 times more plastic than plankton (which is the largest food source for sea animals)
- 93% of Americans age 6 and up test positive for BPA
- Personal Costs:
  - Cigarettes, plastic bottles, cans, etc
  - Health visits for at-risk pregnancies, fertility consults
  - Water purification systems
- Community Costs:
  - Plastic waste causes $13 billion yearly in financial damage to marine ecosystems
  - Recycling costs
  - Educational Programs on recycling

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### Reference List

[10] The Ocean Cleanup. The Ocean Cleanup, developing technologies to extract, prevent and intercept plastic pollution. 2015.