

MICROPLASTICS AND CORALS

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WHAT ARE MICROPLASTICS?

Sources

Primary: intentionally created to be microscopic

Secondary: degraded from large plastics

Considered <1 mm

Sinks

Topography of reefs allow for buildup of microplastics



PLASTICS MOVE IN WATER

Lightweight- easily move long distances

Durable- can take 400+ years for microbead to decay

Buoyant- suspended towards top of water column

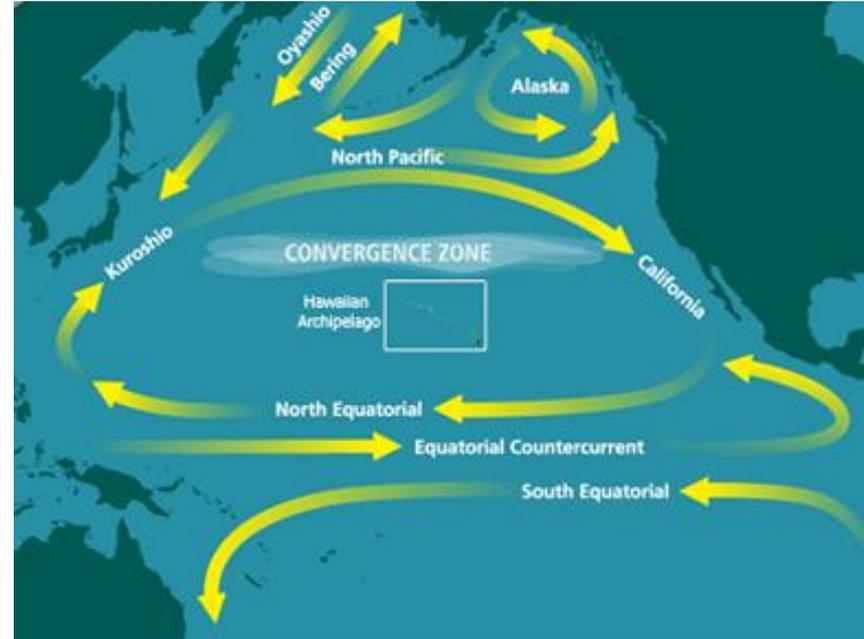


GREAT PACIFIC GARBAGE PATCH

Exists in North Pacific Gyre

“Slowly rotating mass of trash-laden materials about 2x The size of Texas”-LA Times

“Trash Island”



THE GREAT PACIFIC GARBAGE PATCH



TOP 10 MARINE DEBRIS ITEMS

HOW LONG UNTIL IT'S GONE?



SCIENTISTS FOUND PLASTIC IN 9% OF GARBAGE PATCH FISH



SCIENTISTS HAVE COLLECTED UP TO 1.9 MILLION BITS OF PLASTIC PER SQUARE MILE OF THE GREAT PACIFIC GARBAGE PATCH



THE GREAT PACIFIC GARBAGE PATCH IS LARGER THAN THE SIZE OF THE UNITED STATES



THE GREAT GARBAGE PATCH IS A DANGEROUS GARBAGE SOUP FLOATING IN THE OCEAN



5 YEARS 1 YEAR

AMOUNT OF TIME IT TAKES GARBAGE FROM NORTH AMERICA TO REACH THE GARBAGE PATCH



AMOUNT OF TIME IT TAKES GARBAGE FROM ASIA TO REACH THE GARBAGE PATCH

267 DIFFERENT SPECIES ARE KNOWN TO HAVE 30 LARVAE FROM ENLIGHTENMENT OR UNWITTINGLY OF OCEAN GARBAGE

35 BILLION NUMBER OF PLASTIC WATER BOTTLES THROWN AWAY EACH YEAR IN THE U.S.

ONLY 7% OF PLASTIC IN THE U.S. IS RECYCLED



OF THE GARBAGE IN THE OCEAN,

80% COMES FROM LAND
20% COMES FROM SHIPS



THE PACIFIC OCEAN COVERS 30% OF THE EARTH'S SURFACE



IN AREAS AFFECTED BY THE GREAT PACIFIC GARBAGE PATCH, FISH INGEST APPROXIMATELY 12,000 - 24,000 POUNDS OF PLASTIC EVERY YEAR

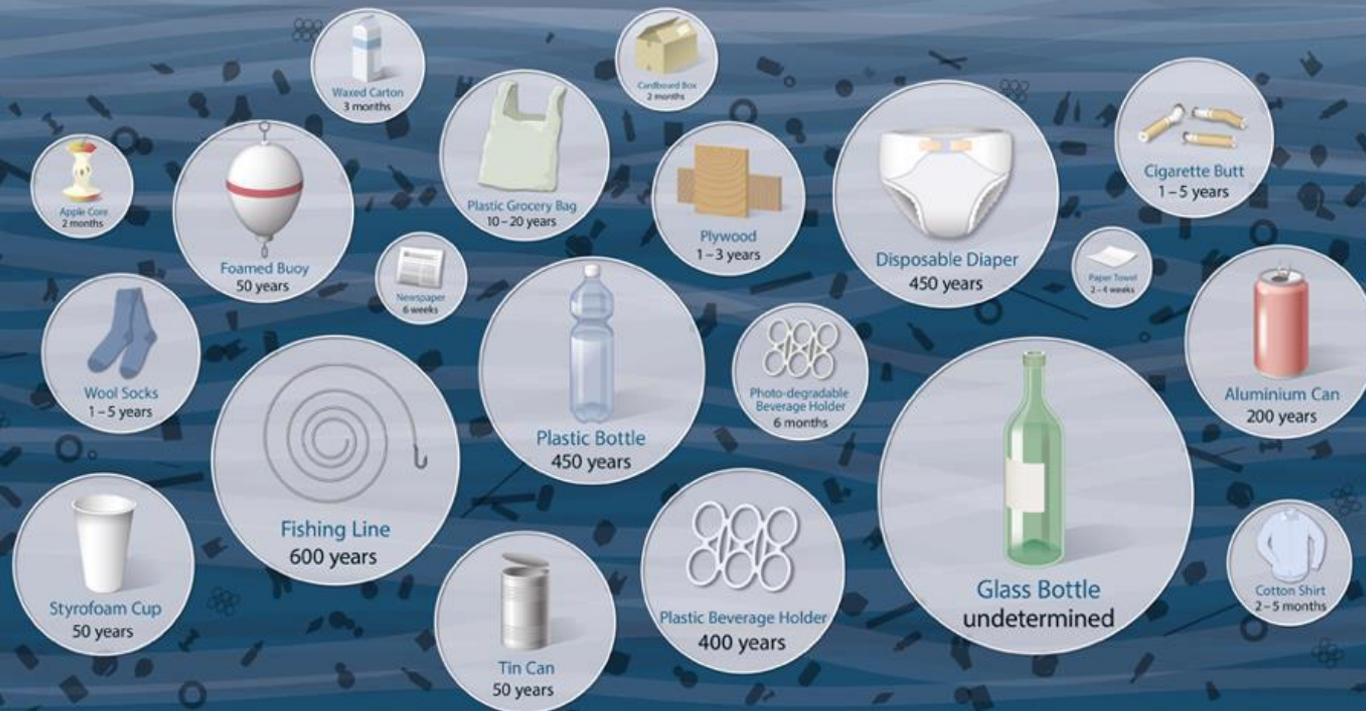
WHAT CAN YOU DO? REDUCE, REUSE, RECYCLE

BY CITY VIEW CHARTER SECOND GRADE CLASS OF 2013-2014



HOW LONG UNTIL IT'S GONE?

Estimated decomposition rates of common marine debris items



Estimated individual item timelines depend on product composition and environmental conditions.

Source: NOAA / National Oceanic and Atmospheric Administration, US / Woods Hole Sea Grant, US Graphics: Oliver Läder / Museum für Gestaltung Zürich, ZHOK.

PLASTICS IN THE FOOD CHAIN

Larvae have been found to contain microbeads

Zooplankton eat microplastics & are then consumed by higher trophic levels

Fish consume microbeads, and they get trapped in the gills



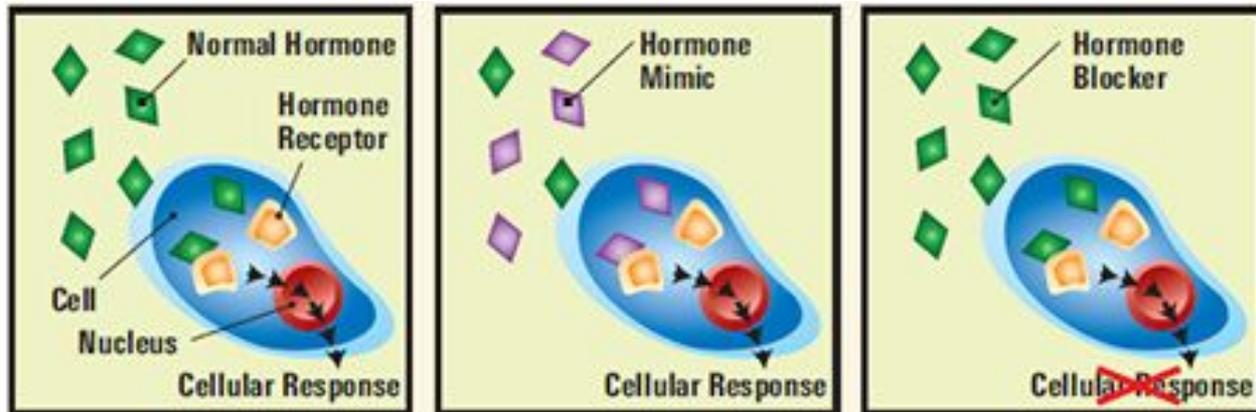
OTHER ISSUES WITH MICROPLASTICS

Plastic additives and hydrophobic chemicals in water

POPs affects all levels of the food chain

EDCs have severe effects on development

Translocation is possible



CORAL FEEDING

Symbiotic Relationship with Algae

- Most Reef building corals partner with algae (zooxanthellae)
 - Receive photosynthetic energy
 - Provide carbon dioxide and shelter

Hunting

- Polyps catch tiny floating organisms (usually zooplankton)
 - Polyps leave skeleton at night
 - Use stinging tentacles to catch and pull prey into mouth of polyp where it is digested in their stomach

PLASTIC CONSUMPTION

Corals are non-selective feeders

Polyps eat anything they physically can

Corals in GBR have demonstrated feeding on microplastics



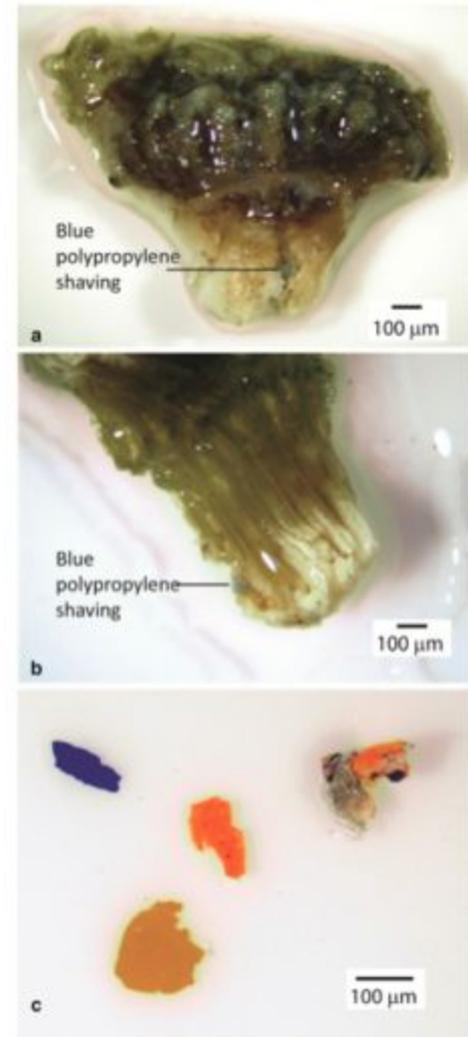
PROBLEMS

Impacts on corals still not fully understood

Increase in levels microplastics in marine ecosystems will result in an increase in consumption by corals

Leads to slow starvation

Hall, N. M., Berry, K. L., Rintoul, L., & Hoogenboom, M. O. (2015). Microplastic ingestion by scleractinian corals. *Marine Biology* *Mar Biol*, 162(3), 725-732. doi:10.1007/s00227-015-2619-7



HOW CAN YOU HELP?

Recycle

Don't buy products with
microbeads

Clean up the beach

Properly dispose of medications
and chemicals

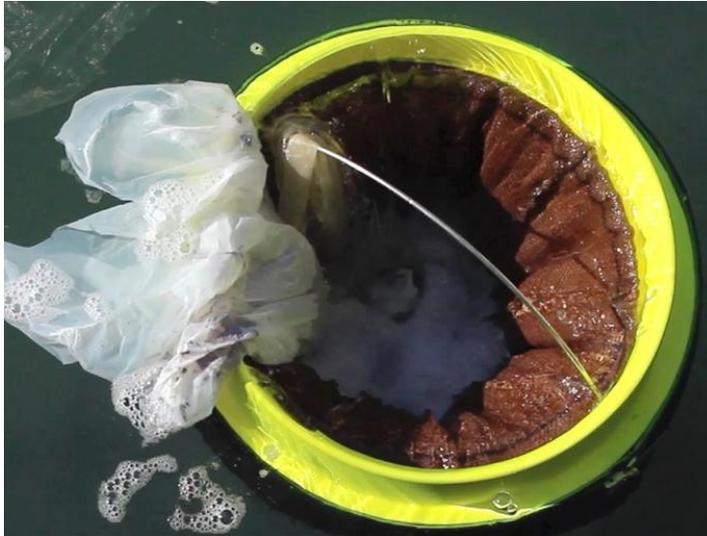
10 THINGS YOU CAN DO FOR TRASH FREE SEAS



CLEAN-UP EFFORTS

Plastic-Eating Mealworms

Seabin



<http://inhabitat.com/floating-seabin-sucks-up-ocean-waste-including-oil-and-detergents/>



<http://www.backyardchickens.com/a/how-to-raise-mealworms>

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