

Geography In The News™



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THE GREAT PACIFIC GARBAGE PATCH

Ocean pollution is growing at an astonishing rate.

On June 1, two scientists and a photographer/blogger sailed from Long Beach, California, and headed westward across the Pacific Ocean to Hawaii. The two men and a woman are not traveling on any luxury cruise liner. They are sailing upon the *JUNK*, a boat created from 15,000 plastic bottles and the fuselage of a Cessna 310 airplane. The group hopes to raise awareness about plastics that are fouling the world's oceans.

As the *JUNK* sails across the ocean, it will venture into the "Great Pacific Garbage Patch," two areas of the Pacific that are continent-sized vortexes of swirling garbage, mostly plastics. This "plastic soup" has been growing recently at an alarming rate and scientists now estimate that it covers an area more than twice the size of the continental United States. The plastics and other trash are up to 33 feet (10 m) thick in some areas.

The "soup" stretches from about 500 nautical miles off the coast of California, across the northern Pacific, past Hawaii and almost as far as Japan. The swirling ocean currents in the Pacific subtropical gyres hold the garbage together.

An *ocean current* is a horizontal movement of seawater at the ocean's surface. Circulating winds above surface waters drive ocean currents. Friction, which occurs at the interface between the ocean and

the wind, moves the water in the direction of the wind. Some currents are fleeting features affecting only a small area. Other ocean currents are more permanent and extend over vast distances.

Globally, the continental landmasses surrounding the three major oceanic basins constrain the large ocean currents of the world. These continental borders cause these currents to develop large circular patterns of flow called a *gyres*.

All of Earth's major oceans contain a subtropical gyre located at approximately 30 degrees north and south latitude. The subtropical high-pressure systems operating in these regions drive the currents in these gyres. These circulations rotate clockwise in the Northern Hemisphere and counterclockwise in the Southern Hemisphere.

Researchers estimate that the Pacific gyres contain at least 100 million tons of garbage. According to a recent newspaper article in London's *The Independent*, the garbage includes everything from foot-

balls and kayaks to Lego blocks and plastic grocery bags. About one-fifth of the junk comes from ships or oil platforms. The rest comes from land, carried by rivers or sewage systems and storm drains that have overflowed.

that made it out to sea would biodegrade. However, modern-day plastics are so durable that the gyres contain some 50-year old plastics—the plastics do not break down for years. Because the plastics are mostly translucent, satellite photos are unable to record the vortex of the garbage islands. They can be seen clearly, however, from the bow of a ship.

The United Nations Environment Programme says that plastic debris causes the deaths of more than a million seabirds every year, as well as perhaps 100,000 marine mammals. The animals mistake the plastics for food and die trying to digest them. All manners of plastics are found inside the carcasses of dead and dying marine birds.

According to Dr. Marcus Eriksen, one of the researchers sailing on the *JUNK*, the rubbish also poses a risk to humans. Tiny plastic pellets, or *nurdles*, the raw materials comprising plastics, are lost or spilled each year. Many of these make their way into the oceans. These pollutants behave as chemical sponges, attracting synthetic chemicals like hydrocarbons and the pesticide DDT. As fish ingest the tiny polluted particles, they become contaminated. When humans eat the fish, they also ingest the chemicals.

Scientists believe that 90 percent of all trash floating in the oceans is plastic. The U.N. Environment Programme estimated in 2006 that every square mile (1.6 km) of ocean contains 46,000 pieces of floating plastic.

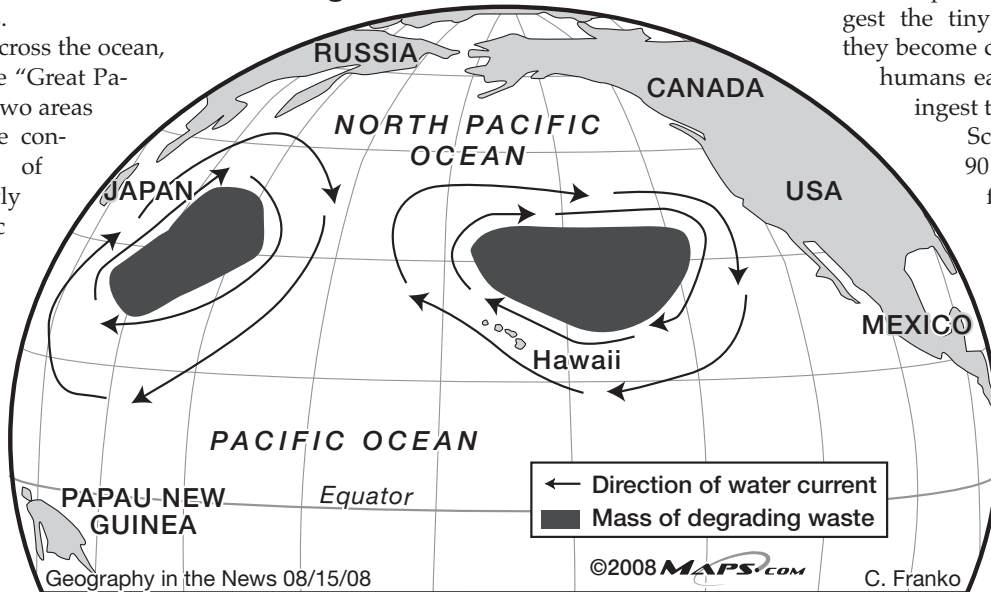
With 40 percent of the world's oceans as subtropical gyres, plastics may already cover almost a quarter of the oceans' surface area. The voyage of the *JUNK* will call attention

to this huge environmental issue.

And that is *Geography in the News™*. August 15, 2008. #950.

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Circling Waste in the North Pacific



Sources: <http://www.independent.co.uk/environment/the-worlds-rubbish-dump-a-garbage-tip-that-stretches-from-hawaii-to-japan-778016.html>; <http://www.mindfully.org/Plastic/Ocean/Moore-Trashed-PacificNov03.htm>; and http://www.nytimes.com/2008/06/22/magazine/22Plastics-t.html?_r=1&partner=rssnyt&emc=rss&oref=slogin

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The problem in the "Great Pacific Garbage Patch" is that historically the rubbish