



Plastics Breakdown Sources

92.5% of dead seabirds (Northern Fulmars) in a study had ingested plastic in amounts equal to 5% of their bodyweight.

Stephanie Avery-Gomm, Patrick D. O'Hara, Lydia Kleine, Victoria Bowes, Laurie K. Wilson, Karen L. Barry. Northern fulmars as biological monitors of trends of plastic pollution in the eastern North Pacific. *Marine Pollution Bulletin*, 2012;
DOI: 10.1016/j.marpolbul.2012.04.017 <http://www.ncbi.nlm.nih.gov/pubmed/22738464>

54% of the 120 marine mammal species on the threatened list have been observed entangled in or ingesting plastic.

STAP (2011). *Marine Debris as a Global Environmental Problem: Introducing a solutions based framework focused on plastic*. A STAP Information Document. Global Environment Facility, Washington, DC.
<http://www.thegef.org/gef/sites/thegef.org/files/publication/STAP%20MarineDebris%20-%20website.pdf>

331 million barrels of petroleum and natural gas liquids were used to make U.S. plastic products, equal to about 5% of national petroleum consumption.

US Energy Information Administration. "FAQ: How much oil is used to make plastic?" Updated 20 July 2012, visited September 2012.
<http://www.eia.gov/tools/faqs/faq.cfm?id=34&t=6>

[Total consumption: 7,550,908,000 barrels per year total divided by 331,000,000 barrels for plastic equals 4.4%]

US Energy Information Administration. "Petroleum & Other Liquids: Product Supplied." Updated 27 September 2012, visited September 2012.
http://www.eia.gov/dnav/pet/pet_cons_psup_dc_nus_mbbbl_a.htm

Plastics contain toxic chemicals: phthalates, flame retardants, and bisphenol-A (BPA). More toxins adhere as plastics break down. In plastic from the North Pacific Gyre,

- 40% contained Pesticides like DDT
- 50% contained PCBs (banned by US Congress in 1979 for having various neurotoxic effects).
- 80% contained PAH's (may be highly carcinogenic).

Rios, L.M., Jones, P.R., Moore, C., and Narayan, U.V. Quantitation of persistent organic pollutants adsorbed on plastic debris from the Northern Pacific Gyre's "eastern garbage patch". *Journal of Environmental Monitoring* 12(12): 2226-2236, 2010.

Floating, toxic microplastics are often ingested by marine life, which in turn is consumed by us.

73.9 million pounds (36,939 tons) of plastic are spread throughout the world's gyres.

Sesini, M. The Garbage Patch in the Oceans: The problem and possible solutions. Columbia University Earth Institute. August 2011.

http://www.seas.columbia.edu/earth/wtert/sofos/sesini_thesis.pdf

Plastic bags can take 400 to 1,000 years to decompose but their chemical residues remain for years after.

Americans use roughly 100 billion plastic bags per year.

The Sierra Club. "Plastic Bags."

<http://www.sierraclubmass.org/issues/conservation/plasticbags/plasticbags.html>

As of 2009, Southern California cities had spent over \$1.7 billion to keep trash-impacted waterways from being over legal trash limits.

An Implementation Strategy for the California Ocean Protection Council Resolution to Reduce and Prevent Ocean Litter. California Ocean Protection Council. 2008.

http://www.opc.ca.gov/webmaster/ftp/pdf/opc_ocean_litter_final_strategy.pdf

Circular ocean currents (gyres) thousands of miles across collect immense amounts of plastic in all of the world's oceans. Microplastic concentrations in the North Pacific Gyre increased 100X in the past 40 years.

Goldstein, M.C., M. Rosenberg and L. Cheng. 2012. Increased oceanic microplastic debris enhances oviposition in an endemic pelagic insect. *Biology Letters* doi: 10.1098/rsbl.2012.0298.

Currents carry the plastic everywhere. Rubber ducks lost from a shipping container in the North Pacific were found near Scotland, in the North Atlantic.

Hohn, Donovan. *Moby-Duck: The True Story of 28,800 Bath Toys Lost at Sea and of the Beachcombers, Oceanographers, Environmentalists, and Fools, Including the Author, Who Went in Search of Them*. Penguin Books. 2012.

Tsunami debris from Japan arrived in North America, after crossing the largest ocean on earth, in just 10 months.

Tsunami debris spotted along West Coast. Craig Johnson. CNN. December 2011.

<http://news.blogs.cnn.com/2011/12/29/tsunami-debris-spotted-along-west-coast/>

8 of the top 10 items found on beaches during last year's International Coastal Cleanup Day were plastics related to eating and drinking.

Ocean Conservancy. International Cleanup Day 2012 Data Release.

<http://www.oceanconservancy.org/our-work/marine-debris/check-out-our-latest-trash.html>