Cabrillo Marine Aquarium

Virginia Reid Moore Marine Research Library

Library Pathfinder: Plastics in the Ocean

Plastics pollution is one of most serious threats to the world's oceans. Plastics in our oceans endanger marine life and marine ecosystems. Of all trash floating on the earth's surface, 90% consists of plastic. Plastic is not biodegradable. It photo-degrades with sunlight and breaks down into smaller pieces, often referred to as micro-plastics.

As plastics break apart in the ocean, they release toxic chemicals such as BPA (Biphenol A – an industrial chemical used to make plastic and epoxy resin) and they absorb pollutants such as PCBs and pesticides. Many micro-plastics are consumed by marine animals and are passed up the food chain. They can then ultimately be consumed by humans. Polychlorinated biphenyls, or PCBs, are man-made organic chemicals that were banned in 1979. PCBs are known to cause cancer and other adverse health effects on the immune, reproductive, nervous and endocrine systems in humans.

Plastic pollution poses a significant threat to the lives and health of marine life. Fishes living in the north Pacific ingest up to 24,000 tons of plastic each year. Sea turtles often mistake floating plastic bags, nets and styrofoam for food, resulting in death from choking, ulcerations and intestinal blockage. Plastic ingestion by seabirds reduces the storage volume of the stomach, resulting in eating less and eventually results in starvation. Marine mammals, especially whales, seals and sea lions drown from ingesting plastic and can get tangled in plastic nets.

Plastic is also swept away by ocean currents, landing in swirling vortexes called ocean gyres. The North Pacific Gyre is home to the Great Pacific Garbage Patch, the largest ocean garbage site in the world. The floating mass of plastic is twice the size of Texas, with plastic pieces outnumbering sea life by 6 to 1.

The majority of the plastic pollution in the ocean begins on land. Convenient, disposable plastics are the main source of plastic pollution. Beach clean-ups can help, but solutions to plastic pollution should start at home. You can reduce your plastic use to zero by utilizing reusable grocery bags and food containers. Purchasing products with minimal packaging is another way to help reverse this important environmental issue.

BOOKS

Books for Adults

Gyre: The Plastic Ocean/Decker, Julie. TD1120 .E28 G96 2014

Plastic Free: How I kicked the plastic habit and you can too/Terry, Beth. TD196 .P86 T47 2012

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Plastic Ocean : How a Sea Captain's chance discovery launched a determined quest to Save the Oceans/Captain Charles Moore with Cassandra Philips. GC1085 .M67 2011

Plastic Purge: How to use less plastic, eat better, keep toxins out of your body and help save the sea turtles/SanClements, Michael. TP1122 .S24 2014

Tracking Trash: flotsam, jetsam and the science of ocean motion/Burns, Griffin. GC232 .B87 2007

Children's Books

All the Way to the Ocean/Harper, Joel. TD176 .H377 2006

Plastic, Ahoy! Investigating the great pacific garbage patch/Newman, Patricia. GC1090 .N48 2014

Periodicals and News Articles

Microplastics in the Seas. Law, Kara L. & Thompson, Richard C. *Science*, 11 July 2014, Vol. 345, No. 6193, pp.144-145.

Tracking Marine Pollution. Elliott, John E & Kyle H. *Science*, 3 May 2013, Vol. 340, No. 6132, pp. 556-558.

Featured Websites

Algalita Marine Research Institute
www.algalita.org

5 Gyres: Understanding Plastic Pollution through Exploration, Education & Action
www.5gyres.org

My Plastic-Free Life Blog
www.myplasticfreelife.com

National Geographic – Oceans
ocean.nationalgeographic.com/ocean/critical-issues-marine-pollution

Ocean Conservancy – Fighting for Trash Free Seas
www.oceanconservancy.org/our-work/marine-debris

Plastic Oceans
www.plasticoceans.net