

Marine Debris

A Fact Sheet from the Southern California Coastal Water Research Project



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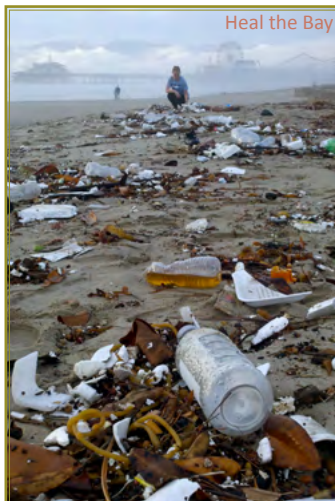
Debris Effects

Marine debris, including trash, negatively affects coastal recreation areas and aquatic habitats. It also directly harms wildlife. Debris can:

- Remain in the environment for decades or longer;
- Entangle, strangle, smother, or be ingested by wildlife;
- Reduce aesthetic appeal and safety of coastal recreation areas; and/or
- Require costly cleanup.

Debris Sources

Most debris consists of small items from land-based sources, such as pre-production plastic pellets, cigarette butts, plastic containers, and styrofoam packing material. Even so, the issue historically centered on ocean-based debris, such as discarded fishing gear, as well as large, highly visible items such as shopping carts, appliances, tires. Common debris transport pathways include direct dumping, accidental release on land or water, and movement through the ocean, rivers, and storm drains.



Great Pacific Garbage Patch

Media outlets have popularized the idea of a "Great Pacific Garbage Patch" — a remote area of the ocean likened to the size of Texas where debris from the entire North Pacific region collects due to natural ocean circulation patterns. While it is striking to find land-based debris more than 1,000 miles from shore, it is not altogether accurate to characterize debris concentrations in the North Pacific Gyre as a "patch" or a single floating mass. In fact, average debris density in this area is about one-third that found in coastal waters.

Plastic Debris

Plastic poses a special concern because it takes so long to degrade in the environment. In addition, ingested plastic debris may cause both physical effects and contaminant exposure. Coastal wildlife often mistake small plastic fragments for food, and organic compounds in plastics can adsorb and concentrate toxic contaminants from the environment or be toxic themselves.

Japanese Tsunami Debris

Debris in Southern California usually comes from nearby sources; however, some debris from Japan's 2011 earthquake and tsunami has or will reach the US West Coast over the next several years. Although this debris will not arrive in a single mass or transmit radioactivity, it will add to the existing load of debris washing up on Southern California beaches and may transport invasive species from abroad.

SCCWRP collects data to characterize the type and abundance of debris throughout coastal Southern California, from watersheds to the ocean.

Debris Characterization

SCCWRP helped develop standardized methods to characterize the amount and type of debris in beach and open ocean areas during regional surveys in the late 1990s and North Pacific Gyre studies in the early 2000s. More intensive studies of the most common debris item (pre-production plastic pellets) followed in 2009 and 2012, examining their distribution relative to land-based sources. These studies provide an important baseline to monitor changes in marine debris type and abundance over time.



SCCWRP researchers sift beach sand (top) to sample debris smaller than 5 mm (left).



Regional studies monitor both organisms and debris in trawl samples from the ocean floor.

Regional Monitoring

The Southern California Bight Regional Monitoring Program has examined debris trawled from the ocean floor about once every five years beginning in 1994. Some SCCWRP member agencies monitor debris more often and report results to their respective Regional Water Quality Control Boards.

2013 Bight Regional Monitoring Program (Bight '13)

Bight '13 will bring together multiple organizations involved in debris research, outreach, and cleanup as well as monitoring, regulation, and source control to document debris types and abundances in Southern California coastal watersheds, beaches, and nearshore zones. In addition to linking upstream and ocean debris, Bight '13 will gather new information not examined in previous Bight surveys, such as a) plastic debris abundance, type, and distribution in/on marine sediments; b) characterization of plastic ingestion in fish; and c) debris abundance and distribution in wadeable streams not currently monitored by the Southern California Stormwater Monitoring Coalition.

Debris Management Measures

SCCWRP's marine debris research helps inform state-, city-, and county-level policy actions that reduce key debris sources. Such policies often ban or restrict the use of items, such as cigarettes, take-out containers, or single-use plastic bags, that tend to end up as debris in the environment. Research also helps determine where best management practices to reduce debris transport would be most effective.