

U.S. EPA REGION 9 MARINE DEBRIS STRATEGY

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A REGIONAL PERSPECTIVE: CLEANUP, PREVENTION AND REDUCTION

- ❖ Marine debris degrades Pacific Ocean habitats, endangers marine and coastal wildlife, causes navigation hazards, results in economic losses, and threatens human health and safety.
- ❖ Marine debris may consist of plastic, glass, metals, styrofoam, rubber, derelict fishing gear and derelict vessels. Plastics are the predominant type of marine debris in the Pacific Gyre; plastic is estimated to represent between 60% and 80% of the total marine debris in the world's oceans¹.
- ❖ It has been estimated that as much as 80% of marine debris is derived from land-based sources² although the relative percentage of land-based versus ocean-based varies by region and is difficult to identify since trash and debris can travel long distances before sinking or being deposited on shorelines.
- ❖ Individual federal agencies participating in the national Interagency Marine Debris Coordinating Committee (IMDCC), co-chaired by NOAA and EPA, are expected to lead coordinated efforts and work together to enhance and develop existing capacities to address the collective needs, threats and challenges identified in the recommendations of the August 2008 IMDCC Report to Congress.
- ❖ Region 9's Strategy to address Marine Debris in the North Pacific builds upon specific recommendations of the IMDCC Report by targeting threats and sources of debris and responding to debris impacts.



Marine Debris on a Hawaiian Beach-NOAA

APPROACH

The R9 Marine Debris Strategy utilizes existing EPA program tools and resources to address the problem of marine debris both on land and in the open ocean. The Strategy builds upon recommendations of the IMDCC August 2008 Report to Congress and targets threats and sources of marine debris with the long term goal of reducing marine debris in the North Pacific Ocean region. The Strategy encompasses waste minimization and trash reductions from stormwater discharges as well as further assessment of marine debris characteristics and investigation of potential cleanup approaches in the open ocean. Efforts will also be initiated to address key data gaps to more fully understand the problems and potential solutions.

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OCEAN ASSESSMENT AND CLEANUP

EPA Region 9 will conduct assessment and removal efforts within the North Pacific. We will do this in partnership with NOAA, USCG, industry, universities and others. The open ocean assessment and cleanup activities will focus on areas most heavily impacted by large debris items such as derelict fishing nets and gear and small and micro-sized particles. A preliminary assessment based on existing literature characterizing marine debris in

Assessment and Cleanup

- ❖ Assessment of marine debris in North Pacific
- ❖ Fill critical data gaps on the nature and extent of the debris, and fish tissue studies
- ❖ Test innovative cleanup technologies

the North Pacific is posted on the EPA Region 9 website on Marine Debris: <http://www.epa.gov/region9/marine-debris/>.

Studies

Research has shown that persistent organic pollutants (POPs) including polychlorinated biphenyls (PCBs) and dichlorodiphenyltrichloroethane and metabolites (DDTs) adsorb to plastic debris in the marine environment. Few studies, however, have examined the effects of ingestion of marine debris-borne contaminants on fish tissue. The prevalence of plastic debris in the marine environment poses the threat of transfer of POPs associated with this debris into the food web. Of particular interest are fish from the family Myctophidae, which have a circumglobal distribution and perform key roles in ecological communities and the pelagic food web³.

EPA is collaborating with the State of California EPA's Office of Environmental Health Hazard Assessment, on a fish tissue study designed to genetically identify and analyze fish already collected and frozen from an area within the "Eastern Garbage Patch." Further, EPA may participate with NOAA or others on an expedition in the vicinity of the Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands (NWHI) to conduct additional studies. The results of these studies should provide valuable information on the actual and potential chemical effects of ingestion of plastics on marine and human life.



Northwest Hawaiian Islands Marine National Monument–NOAA

Assessment

EPA will collaborate with NOAA and other partners to undertake further assessment of the nature and extent of the marine debris within the area of the Hawaiian Islands. Using sensing equipment and visual scans, EPA plans to assess and record the locations of high debris density and determine the extent to which marine life is entrained within the floating debris. We will also make best estimates regarding the general depth to which the debris present can be captured, and factor this assessment information into subsequent work.

Testing Innovative Cleanup Technologies

Our studies and assessment efforts will be used to determine the need to test technologies capable of addressing the impacts of the plastic debris. EPA R9 may support development and testing of innovative technologies designed to capture plastic particles in the open water with minimal impact on marine life. The goal of these tests is to determine the extent to which cleanup of plastic debris in the open ocean is possible and useful.

LAND BASED PREVENTION

In municipal areas trash enters the ocean via stormwater systems, streams and rivers. EPA R9 will work with our state partners, storm water discharge permit holders and others to prevent trash from entering the marine environment via surface water discharges. We will utilize the Clean Water Act (CWA), particularly through the storm water permits and total maximum daily loads (TMDLs) in Los Angeles, San Francisco, and Honolulu, to reduce trash discharges. These ground-breaking efforts by storm water control programs will serve as models for controlling land-based sources of marine debris.

Prevention

- ❖ Support trash reduction through TMDLs and stormwater permitting requirements
- ❖ Focus on stormwater discharges in Los Angeles Basin, San Francisco Bay Region, and the Island of Oahu
- ❖ Support key partnerships and initiatives

Southern California

Efforts are underway to prevent trash from entering the marine environment through discharges to storm drains and surface waters. For example, trash TMDLs, action plans to restore water quality, have been developed for the Los Angeles basin. Trash limits established



Plastic Debris in LA Waterway- Algalita Marine

by these TMDLs have been incorporated into storm water discharge permits. As a result, municipalities in the LA River basin are required through the municipal separate storm sewer system (MS4) permit to achieve zero discharges of trash by 2016 by conducting approved trash control measures.

We will work with the Los Angeles Regional Water Quality Control Board, municipalities, and others to promote installation of trash

control measures to reduce trash loads to zero by 2016 in the LA River basin. Milestones to achieve this goal are: 70% reduction in trash loads from MS4 by 2012, 80% by 2013, 90% by 2014, 96.7% by 2015, and 100% by 2016. From the LA River basin alone, it is anticipated that more than 1,620 tons of trash annually will be prevented from contributing to the marine environment by 2019⁴.

San Francisco Bay

The San Francisco Bay Region municipal storm water permit, covering five counties and 66 cities surrounding San Francisco Bay, requires compliance with trash discharge prohibitions and receiving water limitations through implementation of trash load reduction plans. These trash reduction requirements were established to address San Francisco Bay area waters impaired by trash without diverting limited resources from TMDL development. EPA R9 will work with the San Francisco Regional Water Quality Control Board, municipalities and others to promote installation of trash control measures to reduce trash load to zero by 2022. Milestones to achieve this goal are: 40% reduction by 2014, 70% by 2017, 100% by 2022.

Island of Oahu

The pending City and County of Honolulu (CCH) MS4 stormwater permit will require development and implementation of a trash control plan to reduce trash discharge to zero. The plan must establish a baseline of current trash discharges, describe control measures, target trash-impaired water bodies, integrate education efforts, and monitor progress toward reducing trash. EPA R9 will work with CCH and the Hawaii Department of Health (HDOH) to finalize MS4 Permits to require trash control measures and reduce trash discharges to zero. We will also assist CCH and HDOH with development and implementation of the trash control plan.

Other Regional Activities

EPA Region 9 will work to enhance partnerships to strengthen land-based controls along the West Coast and throughout the Pacific Rim as follows:

- The West Coast Governors' Agreement, HI Marine Debris Action Plan, and CA Marine Debris Implementation Strategy will coordinate regional marine debris reduction efforts.
- Support development of California statewide policy, initiated by the CA State Water Board, to prevent trash discharges to surface waters and establish statewide control methods.
- Consider the benefits of MARPOL Annex V special area designation for the Hawaiian Islands. MARPOL Annex V aims to reduce the amount of garbage ships dump into

oceans and allows for designation of “Special Areas” which establish additional protection from vessel-derived garbage.

- Support State implementation of California “Plastic Pellet Litter Prevention Law.”
- Cooperate with emerging international partnerships to address marine debris issues across the Pacific Rim.

LAND BASED REDUCTION

Approximately 80% of marine debris comes from land-based sources, and reducing the amount of material generated upstream will result in less litter entering the oceans. EPA R9 will work with our state partners, local governments, and others to reduce the amount of material entering the marine environment from land-based sources.

Local Government Costs of Marine Debris

The responsibility for managing and preventing marine debris usually ends up in the hands of local governments. Communities are largely accountable for addressing marine debris through recycling and trash collection, street cleaning, and litter cleanup. In California taxpayers pay \$44 million each year for litter removal⁵, and cities such as Los Angeles spend approximately \$18 million annually on street sweeping, catch basin cleanouts, cleanup programs, and litter prevention and education efforts⁶. Reduction and prevention strategies will reduce the economic burden of marine debris management on communities. To help communities make an economic case for reducing marine debris, EPA will compile data quantifying the local governments’ costs attributable to preventing marine debris. Economic data provides a powerful driver for reducing marine debris through product stewardship, implementing material reduction ordinances, and/or changing procurement practices.

Reduction

- ❖ Support trash reduction through product stewardship
- ❖ Quantify the economic burden of marine debris on local governments
- ❖ Identify opportunities to work with partners to reduce packaging

Product Stewardship and Problem Packaging

Plastic comprises an estimated 60% – 80% of marine debris, and more specific characterizations show that packaging makes up 30% - 40%⁷ of marine debris collected on beaches and in catchment systems. Nationally, 72 million tons of food containers and packaging were generated in 2009⁸; and International Coastal Cleanup data reveals that food packaging, containers, cups, and lids make up the most commonly found items in beach cleanups. Minimizing this waste stream will significantly reduce the amount of potential ocean litter.

Working with local and state governments and manufacturers, as appropriate, EPA will promote innovative source reduction practices for commonly found marine debris materials including procurement and product substitutions.

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