

STATUS OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY
MARINE DEBRIS ACTIVITIES AND PROGRAMS

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ABSTRACT

The U.S. Environmental Protection Agency (EPA) issued on 18 January 1989 an Interim National Coastal and Marine Policy (NCMP), which addresses marine debris as one aspect of a number of marine degradation problems. This policy states that one of EPA's goals is the recovery of full use of shores, beaches, and water by reducing sources of plastics, floatables, and debris.

The EPA's objectives include:

1. To control disposal of medical wastes and aggressively enforce laws to protect the public from exposure to them.
2. To accelerate efforts to identify the sources of floatables, debris, and plastics.
3. To control these materials through new technologies and substitutes, permitting, and enforcement, as well as aggressive source reduction and waste minimization programs.

This paper summarizes the status and progress of many EPA activities and programs aimed at addressing and implementing the marine debris aspects of the NCMP.

DISCUSSION

Plastic debris in the marine environment has been shown to kill or harm marine life, damage vessels, and cause aesthetic and economic damage to beach communities.

The Final Report of the Interagency Task Force on Persistent Marine Debris (1988) described the potential sources of marine debris and separated these sources into two categories: ocean sources and land-based sources. Ocean sources include commercial fishing vessels, recreational

boating, merchant vessels, cruise ships, military and research vessels, and offshore oil rigs and supply vessels. Land-based sources include plastic manufacturing and processing activities, combined sewer overflows (CSO's) and sewage treatment plants, solid waste management practices, and litter. Debris from these sources washes up on U.S. beaches and clogs our waterways. Last summer's problems on the northeastern U.S. beaches show the large-scale impact that marine debris can have.

On 18 January 1989, the U.S. Environmental Protection Agency (EPA) issued an interim National Coastal and Marine Policy (EPA 1989b), which included the agency's position on marine debris.

The EPA is taking action against many of the sources of marine debris described above and the problems they pose. These actions include

- assessment of the items that make up marine debris and their sources,
- assessment of the specific items released to the environment from CSO's and storm sewers,
- medical waste tracking,
- enforcement,
- public education,
- cleanup plans.

Some of EPA's activities are described below in relation to the authority under which they are being implemented.

MARINE PLASTIC POLLUTION RESEARCH AND CONTROL ACT OF 1987

The Marine Plastic Pollution Research and Control Act (P.L. 100-220) (MPPRCA) contains several sections pertaining to plastics and marine debris. Among these are:

1. The development of regulations by the U.S. Coast Guard implementing the requirements of MARPOL Annex V. These regulations set forth the restrictions for disposal of garbage from ships and include prohibition of the disposal of plastics.
2. An assessment of the effects of plastic materials on the marine environment by the Secretary of Commerce.
3. The development of a joint public education program by EPA, the U.S. National Oceanic and Atmospheric Administration (NOAA), and the Secretary of Transportation.

4. An assessment of the problems associated with plastic debris in the New York Bight by the EPA.
5. An assessment by the EPA of methods to reduce plastic pollution.

Activities being carried on by EPA under the requirements of MPPRCA are described below.

New York Bight Report to Congress

The EPA has prepared a report to Congress on plastics in the New York Bight (EPA 1989d), describing the types and sources of floatable debris, the fate of floatable material, the recreational activities, control programs, and recommendations for research, monitoring, and control. The recommendations presented in the report include:

1. Monitoring and surveillance
 - Monitor sources.
 - Monitor beaches and waterways.
2. Local control measures
 - Improve combined sewer overflows.
 - Increase street cleaning.
 - Remove debris from beaches and waterways.
 - Encourage volunteer cleanup activities.
 - Develop public awareness and education campaigns.
3. Research
 - Study the rates of plastic degradation.
 - Study degradable plastics and potential applications.
 - Develop cost-effective recycling approaches.

Public Awareness and Citizen Monitoring

The EPA is working with the NOAA, the Coast Guard, and other agencies in developing citizen monitoring and cleanup patrols and a public awareness program on marine debris. To date, this has included the financial support for this conference, the Second International Conference on Marine Debris held in Hawaii, financial support for the 1988 beach cleanups conducted during Coastweeks by the Center for Environmental Education (now the Center for Marine Conservation (CMC)), and sponsorship of an upcoming informal

roundtable meeting on marine debris. The EPA will be using the results of the Hawaii conference and the roundtable meeting to plan future national-level public education activities.

These future activities will also be developed using the results of the Washington State Marine Debris Task Force studies, where EPA is working with the State of Washington and many Federal, state, and local groups to combat local marine debris problems. This task force, which was set up by Washington State on its own initiative, has pulled together Federal, state, and local interests and published a report (Marine Plastic Debris Task Force 1988). The report makes a variety of recommendations for controlling, monitoring, and removing marine debris. The recommendations already implemented, such as a state information coordinator, derelict fish net removal, and a citizen monitoring program, will be evaluated by EPA as potential activities to be included in the national program to be coordinated with other Federal agencies.

New York Bight Restoration Plan

A New York Harbor Floatables Action Plan (EPA 1989a) was developed as part of the New York Bight Restoration Plan. This floatables action plan describes the routine and responsive monitoring and cleanup activities that will occur in New York Harbor to remove floating debris that may cause environmental, aesthetic, and economic damage. The plan includes:

1. routine monitoring and cleanup of debris (particularly during times of extreme high tides or major storm events) using vessels, helicopters, and planes to monitor and specially designed vessels to cleanup debris;
2. development of a reporting and action network to report sightings of debris;
3. a contingency plan using the reporting network to activate the cleanup vessels to respond to reports of debris sightings.

Methods to Reduce Plastic Pollution

The EPA is preparing a report, due to Congress in the summer of 1989, which describes:

- the production of and major markets for plastics in the United States;
- the generation of plastic waste in the United States;
- the impacts of plastics on the management of solid wastes in the United States including transportation, disposal in landfills, and incineration;

- the sources, fates, and effects of plastics in the marine environment;
- an evaluation of potential solutions such as source reduction, use of degradable plastics, recycling, and substitution; and
- recommendations for action.

In assessing the potential sources and fates of plastics for this report to Congress, EPA has funded several field investigations. One such study was the 1988 CMC beach cleanups previously mentioned. These data will help determine the distribution of plastic articles on our nation's beaches and will be useful in determining which items are most prevalent and where EPA must focus more effort. The 1988 data and data from previous beach cleanups will be a useful baseline in estimating the effect of the U.S. regulations to implement MARPOL Annex V and other mitigation efforts. Future beach surveys will be used in an attempt to indicate trends and possibly show the effectiveness of the new controls on shipboard sources of plastic debris. It may still be difficult, however, to determine which plastic articles found on beaches come from shore-based sources and which come from vessels.

To determine the variability of plastic items in inshore waters and to assess the harbors as potential sources of debris in other coastal areas, the EPA has also conducted field investigations of the floating debris in several U.S. harbors through a contract to Battelle Ocean Sciences of Duxbury, Massachusetts (December 1988-February 1989). Harbors surveyed include Boston, New York, Philadelphia, Baltimore, Miami, Seattle, Tacoma, San Francisco, and Oakland. These surveys were conducted by towing surface nets through slicks of floating debris and then sorting, identifying, and counting the contents. Plastic items 0.3 mm and larger were studied, yielding information on not only the larger plastic items readily observed on beaches but also on the smaller plastic pellets and pieces which are not so obvious to a casual observer. The final EPA report of these surveys is currently being prepared. A summary of preliminary results is presented by Trulli et al. (1990). The preliminary findings of these surveys indicates that the presence of certain plastic items can be directly linked to the presence of CSO's where storm water and street runoff combine with sewage at times of heavy rain and are discharged directly into receiving water.

The apparent correlation between certain debris items and the presence of CSO's is the basis for a new study, being designed by Battelle Ocean Sciences, where the materials released from several of the CSO's in two cities, Philadelphia and Boston, will be identified and quantified. To do this, EPA will be placing nets around the outfalls from selected CSO's in these cities (May-June 1989) to collect the materials exiting the system during dry weather and during rainy conditions. The results of this study will directly address CSO's as a source of debris, and will be used by the agency in determining the appropriate actions to be taken under the Clean Water Act. Storm drains will also be sampled during this study to determine their contribution to marine debris.

LITTER FROM VESSEL TRANSPORT OF SOLID WASTE

The Shore Protection Act (P.L. 100-688, Sections 4001-4204) provides for controls on operations relating to the vessel transport of certain solid wastes (i.e., municipal or commercial waste) so that these wastes are not deposited in coastal waters.

The EPA is developing guidance with the Coast Guard to minimize deposition of solid wastes into coastal waters during loading, transporting, or unloading. A permit and enforcement program is being developed by the U.S. Department of Transportation such that all vessels transporting solid wastes would require a permit from the Coast Guard. It is estimated that about 400 vessels will need permits--about 100 in the New York Harbor area and 300 in the Gulf of Mexico, plus a few in other locations.

Under this act, EPA is also preparing a report to Congress describing the need and effectiveness of a tracking system for vessels transporting wastes in U.S. waters. Such a tracking system could be used to monitor the movement of wastes in U.S. waters and provide the agency with a mechanism for assuring that wastes are not illegally discharged.

In New York Harbor, an area where large volumes of trash are transported by barges, the State and City of New York have strengthened the requirements for trash barges. The implementation of these requirements is expected to minimize the loss of trash during the marine transport process. The new requirements include:

- limitations on load heights in barges;
- the placement of booms around marine transfer facilities;
- the use of scavenger vessels at marine transfer facilities to collect trash which falls into the water;
- the use of covers over barges to keep the wind from blowing trash off barges.

MEDICAL WASTE--TRACKING AND DISPOSAL

The Medical Waste Tracking Act of 1988 (P.L. 100-582) requires EPA to develop a 2-year demonstration program for the tracking of medical wastes. This program would track the generation and movement of medical wastes from "cradle to grave."

The EPA has prepared an Interim Final Regulation (EPA 1989e) which describes a tracking system to be used by the states participating in the demonstration program. Medical wastes from generators of 22.7 kg (50 lb) or greater per month would have to track the movement of their wastes to the point of final disposition. Generators of less than 22.7 kg (<50 lb) per month have the same requirements but need to keep logs for their medical wastes rather than initiate tracking forms. It is anticipated that

this tracking system will allow EPA to monitor the movement of medical wastes from the point of generation to final disposal and will assure that the wastes are not disposed of illegally where they may endanger public health or degrade the marine environment.

The U.S. Public Vessel Medical Waste Anti-Dumping Act of 1988 (P.L. 100-688 Sections 3101-3105) requires that all public vessels have a management plan for medical wastes on board ship and prohibits the disposal of these wastes at sea except in times of national emergency. The EPA is distributing guidance to all EPA programs that operate boats and ships. The guidance states EPA's policy that all medical wastes generated on board an EPA vessel will be stored in a secure area on board for disposal at an appropriate shore-based facility upon return from sea. No medical wastes can be thrown overboard. Other Federal agencies are also required by the act to issue similar guidance.

COMBINED SEWER OVERFLOWS AND STORM SEWERS

The Clean Water Act (33 U.S.C. 1251 et seq.) requires EPA to regulate discharges from municipal and industrial outfalls into U.S. waters. Under this authority, the agency recently developed a strategy for enforcing the provisions of the act regarding CSO's (EPA 1989c), which are significant sources of plastic street debris entering the marine environment.

The strategy requires that all CSO's be identified and categorized according to their status of compliance with technology and water quality-based regulations. There are about 1,200 combined sewer systems in the United States serving an estimated population of 43 million. States will be required to develop a state-wide strategy for the development and implementation of measures to reduce pollutant discharges from CSO's.

The EPA strategy sets forth three objectives:

1. to ensure that all CSO discharges occur only as a result of wet weather;
2. to bring all wet weather CSO discharge points into compliance with the technology-based requirements of the Clean Water Act and applicable state water quality standards; and
3. to minimize water quality, aquatic biota, and human health impacts from wet weather overflows that do occur.

The strategy confirms that CSO's are point sources independent of the treatment works and reaffirms that both technology-based and water quality-based requirements apply to CSO's. The strategy emphasizes that CSO point sources which are discharging without a permit are unlawful and must be issued permits or eliminated.

The agency has also proposed regulations which will describe the effluent requirements for storm sewers (EPA 1988). By controlling

the effluent from CSO's and storm drains, the agency hopes to significantly curtail the discharge of sewage and sewage-related plastics and street litter into the marine environment at times of heavy rain. To implement the types of controls available for long-term solutions will require major resource expenditures.

ENFORCEMENT ACTIONS

The Ocean Dumping Regulations (40 CFR parts 220-229), which implement a section of the Marine Protection, Research, and Sanctuaries Act (MPRSA) (33 U.S.C. 1401 et seq.), were promulgated in 1977. These regulations prohibit the transport for the purpose of dumping into the ocean of any "persistent inert synthetic or natural materials which may float or remain in suspension in the ocean in such a manner that they may interfere materially with fishing, navigation, or other legitimate uses of the ocean." Activities involving transport for the purpose of disposal at sea are regulated under this act, and permits granted by the agency prohibit the dumping of floatable plastics. Any activity involving the transport of floatable plastics or debris out to sea for the purpose of dumping is illegal, and subject to the fines and penalties described under the act.

Under this authority, EPA has initiated enforcement actions against Nassau County and the City of Long Beach, in New York, and National Seatrade, Inc., for the disposal of sludge containing plastics at the 170.5-km (106-mi) sewage sludge disposal site.

The agency is seeking a total of \$100,000 in fines for these violations of the MPRSA. The county, city, and National Seatrade, which barges treated sewage sludge, are charged with one violation which occurred in September 1988 when EPA staff observed floatables being dumped along with sewage sludge from the county and city at the 170.5-km (106-mi) site. The proposed civil penalty for this violation is \$50,000. The city is also charged in a second count with sending floatables along with its sludge to be ocean dumped in December 1988. The proposed penalty for this violation is \$50,000.

CONCLUSION

The EPA is taking steps to identify and control sources of marine debris, to cleanup existing marine debris, and to involve and educate the public through cooperation with other Federal, state, and local groups. Through a combined effort, EPA hopes to greatly reduce the volume of marine debris generated and its impacts. The EPA believes that one of the primary steps in reaching this goal is to control nondegradable debris before it becomes marine debris--that is, to control it at its source. This should include source reduction and recycling as well as general pollution prevention. Wastes must be managed correctly not only by transport and disposal companies but also by the consumer. Litter thrown into the streets or directly into waterways does have an impact on the marine environment. Plastic items flushed down toilets can, in some cities, end up in the ocean through combined sewer overflows or treatment plant shutdowns. The actions being taken today by EPA as well as other Federal, state, and local

agencies will have a beneficial impact on the environment. These actions must be supplemented, however, by consumers. Proper handling of discarded items by consumers is essential for the trash and sewage collection systems to work. It is the responsibility of all Federal, state, and local agencies to get this message out and build a national/world environmental ethic, or we will be forever cleaning up our environment rather than enjoying and benefiting from it.

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