

OVERVIEW: MARINE DEBRIS IN THE NORTHWEST ATLANTIC OCEAN

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ABSTRACT

This review emphasizes recent developments (since the author's 1988 report) in regard to marine debris sources, types, amounts, and distribution, effects, and mitigation, on the Atlantic coasts of Canada and the United States.

INTRODUCTION

A substantial body of information about sources, types, amounts, and effects of marine debris exists for the northwest Atlantic Ocean, most of which is summarized in a report (Heneman 1988) distributed to participants at this conference. This presentation includes general observations based on that report but emphasizes new developments.

For our purposes, the northwest Atlantic reaches from the Atlantic coast east to midocean and south to, and including, the North Equatorial and Antilles Currents. Its western watershed, which includes the St. Lawrence and many lesser rivers, drains the most densely populated and industrialized areas of the United States and Canada.

SOURCES, TYPES, AMOUNTS, AND DISTRIBUTION

In contrast to areas of the world where a few sources account for most marine debris, the northwest Atlantic is plagued by a great variety of major debris sources. Merchant shipping, commercial fishing vessels, cruise ships, recreational boats, and naval vessels may be the largest sources, although MARPOL Annex V should cause these to diminish in importance. At the same time, inadequate storm drain and sewage treatment systems in the United States and Canada are known to dump large amounts of floatables into the marine environment, especially in periods of high rainfall; coastal landfills commonly "leak" debris into nearby waters; the plastics industry in the northeastern United States appears to have been a major source of plastic resin pellets; and beachgoers are an important source of litter. As we have seen with medical wastes for the past two summers, relatively small amounts of illegally dumped materials can have major effects. Virtually every kind of debris source that has been

identified anywhere in the world is a contributor somewhere in the northwest Atlantic. This variety of major sources obviously complicates efforts to reduce amounts of marine debris and to mitigate its effects.

It is more difficult to generalize about where debris occurs in the northwest Atlantic than in a trade wind area such as the Caribbean. The North Atlantic gyre concentrates floating debris in the Sargasso Sea and on the beaches of Bermuda. Along the gyre's southern periphery, trade winds deposit large amounts of debris from the Antilles Current onto Atlantic-facing beaches in the Bahamas. Farther north, local sources and local wind and current conditions are more important factors influencing the distribution of debris on the United States and Canadian coasts.

There is little information on trends in amounts of marine debris. Wilber (pers. commun.) points out that his data and Carpenter and Smith's (1972) data for the northern Sargasso Sea indicate a 1,000% increase in the density of plastic pieces and a 200-400% increase in plastic pellets in a period of about 15 years.

There is little recent information to report from Canada on sources, amounts, and distribution of debris. Canada's Ocean Policy of 1987 includes commitments to deal with plastic debris and lost and abandoned fishing gear, but little has been done to implement the policy. Growing public concern may be leading to a change, however. Last summer, for example, the Nova Scotia Department of the Environment conducted one of Canada's first beach cleanups. An opinion survey at the same time found increasing indignation about litter on beaches.

EFFECTS

The best-known and most serious effects of marine debris along the northwest Atlantic coast are aesthetic and economic; the summer of 1988 provided another well-documented example of that when tourist-dependent coastal economies lost tens of millions of dollars to beach closures in the New York area. This is not a new problem, however; the first major incident of this sort was in the summer of 1976, when sewage and debris closed Long Island beaches and the Governor of New York declared a disaster.

Other effects, such as damage to vessels and harm to wildlife, are either minor or are poorly documented. At the Workshop on the Fate and Impact of Marine Debris (FIMD) in 1984, participants agreed that the effects of debris on sea turtles and of derelict nets and traps on fish and shellfish deserved greater attention (Shomura and Yoshida 1985). That is especially true for the northwest Atlantic, where these subjects may represent the most important information gaps.

ACTION AND MITIGATION

Two new programs in the United States are collecting information on types, sources, and amounts of debris. The Marine Entanglement Research Program and the U.S. National Park Service are sponsoring regular data

collection at eight national seashores, including four on the Atlantic coast: Cape Cod, Assateague Island, Cape Hatteras, and Cape Canaveral.

The U.S. Environmental Protection Agency (EPA) has funded at least 1 year of a National Marine Debris Data Base, in which the Center for Marine Conservation is computerizing data from all the 1988 statewide volunteer beach cleanups. Over time, these two programs may provide a means of monitoring the success of Annex V and other mitigation measures.

On the Atlantic coast of the United States, mitigation efforts such as education and public awareness campaigns have focused on implementation of Annex V. The Marine Entanglement Research Program has funded several projects through the Center for Marine Conservation, including:

- a Marine Debris Information Office located in Washington, D.C. to respond to information requests from the Atlantic and Gulf coasts. It provides educational materials to marine user groups, industry, educators, policy makers, and the general public;
- separate public service advertisement campaigns aimed at the commercial fishing, shipping, and plastics industries, and recreational boaters and fishermen;
- a review of marine debris information for the general public, "A Citizen's Guide to Plastics in the Ocean."

The Society of the Plastics Industry helped fund the Citizen's Guide, public service announcements for television, and other marine debris educational materials produced by the Center for Marine Conservation.

Another Center for Marine Conservation project, this one in Florida and funded by the National Marine Fisheries Service Saltonstall-Kennedy program, endeavors to show that education is a cost-effective method of persuading commercial and recreational fishermen to comply with Annex V.

There have been continuing and expanding efforts to remove debris from the marine environment. For instance, most coastal states have had annual beach cleanups in recent years. The Army Corps of Engineers, the EPA, the U.S. Coast Guard, and New York and New Jersey state agencies recently announced that they have begun a cooperative program in the New York area. They will try to locate concentrations of floating debris by helicopter and use Army Corps vessels to collect it.

Canada's Department of Fisheries and Oceans convened a workshop in Halifax, Nova Scotia, 17-18 May 1989. The workshop provided an opportunity for organizations and individuals from the private sector to advise the government on the development of an action plan on marine debris (Buxton 1989; DPA 1989).

As for mitigation efforts, Canada has placed itself in an unusual position. Although Canada is a signatory to the London Dumping Convention,

it is not a signatory to MARPOL, much less to Annex V. For some years, the Canada Shipping Act has prohibited the disposal of any garbage or trash from vessels within 200 nmi of Canada's Atlantic and Pacific coasts, a provision that is stricter than Annex V. Unlike Annex V, however, the act does not restrict ocean disposal by Canadian vessels beyond 200 nmi, and it does not require ports to provide reception facilities.

Recent amendments to the Canada Shipping Act take a half step forward by *permitting* Canadian agencies to impose stricter regulations that would bring Canada into conformity with Annex V. But the agencies have not yet decided to actually adopt any new restrictions. Furthermore, there seems to be little enforcement of existing regulations and no educational programs to encourage compliance.

CONCLUSION

Although the Atlantic coast of the United States has the same marine debris problems, more or less, as other coastal areas of the country and the world, its problems receive more attention than is warranted simply by its geography. United States policy makers are concentrated in Washington, D.C. National, and to some extent international, opinion shapers are concentrated in New York City. As a result, events in that part of the world become more important.

To mention two examples: The cover story in Time magazine for 1 August 1988 is titled "Our Filthy Seas." That same week, Newsweek's cover story was "Don't Go Near the Water--Our Polluted Oceans." An issue has truly arrived on the national agenda when it makes the covers of these two magazines the same week, when it is a regular fixture on network news, and when it is an issue in a presidential campaign, as it was in 1988. The fact is, the response to marine debris problems on the Atlantic coast will continue to have a disproportionate influence on how the rest of the United States responds to its marine debris problems.

It has become abundantly clear since the 1984 FIMD workshop that the ultimate solutions to marine debris problems on the U.S. Atlantic coast are inextricably bound to solutions to the impending crisis in solid waste disposal on land. All of the elements that can contribute to reducing amounts and effects of marine debris--source reduction, recycling, degradability, changing societal attitudes towards waste--are vital in the larger arena of land disposal. That fact should inform much of our effort in regard to the marine debris subset of the problem.

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