LONG ISLAND SOUND STUDY

Floatable Debris

In the summer of 1988, debris washing up on Northeastern shores marred the beauty of our beaches and raised the specter of threats to public health caused by pollution. In the wake of these washups, the public in the Long Island Sound area began asking questions: what is this debris, where does it come from, and what are the health risks involved? As always, fact must be carefully sorted from fiction.

What Is It, and Where Does It Come From?

Material that washes up on the beach is called floatable marine debris, or simply "floatables". Floatables are unique in that they are an aspect of water pollution that is readily visible to even the untrained eye. This type of pollution has been with us since the first castaway sent a message in a bottle, but only recently has it gained attention as a serious water quality problem. These days, bottles are joined by paper, wood, sewage, garbage and street litter, as well as the highly publicized plastic and medically-related items.

Contrary to what you might think, there was no sudden outbreak of "dumping" activity - legal or otherwise - behind the washups. Although frequently mentioned together in the press, beach debris is unrelated to either sewage sludge or dredge spoil disposal. In addition, no municipal garbage has been legally disposed of in Northeast coastal waters for over 50 years, nor is illegal disposal common enough to account for much of the problem. The sources of floatables are more pervasive and complex than illegal dumping. Most of this debris started out on our streets as common litter, *or* in our homes as household waste. This includes the "medical waste," predominantly medically-related household items such as insulin syringes, that were flushed down toilets. The most important sources of floatables are described below (see also Figure 1).

Storm Drains and Combined Sewer Overflows

When it rains, litter washed off the streets is carried either directly into the water, or more commonly into storm sewers. Many storm sewers feed directly into LIS or a tributary, discharging floatables and other pollutants after every rainstorm. In other areas, the storm sewers are connected to the sanitary sewers used to carry household wastewater and human waste to the local sewage treatment plant (STP). This type of system, where both storm water and sewage are passed through a STP, is called a combined sewer system, and is common in New York City and many of the older urban areas along the Sound such as Norwalk, Bridgeport, and New Haven. With a combined system, the flood of water from any substantial rainfall (usually over 0.04 inch per hour) overloads the capacity of the STP, and everything in the system, including sewage and floatable debris, is allowed to pass unscreened and untreated into the water. This "raw" discharge is called a *combined sewer overflow (CSO)*. CSOs are probably the single greatest source of floatables in the Northeast, and the primary reason why slicks in the western Sound during 1988 were characterized by sewage waste combined with plastic floatables.

Sewage Treatment Plants

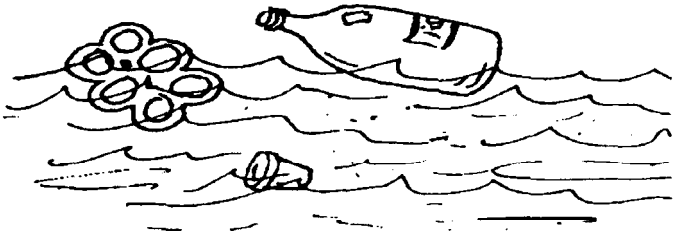
During the summer of 1988 beaches in Stamford, Huntington, Bridgeport and other towns along LIS were closed by high coliform bacteria counts resulting from the presence of sewage. Although CSO discharges can account for much of this, there were also instances of STP's being disabled by power outages or equipment failure. In such cases, untreated wastewater carrying both sewage and floatables can be discharged directly into the Sound.

Offshore Sources

A huge volume of waste material, much of it floatable trash and plastic, has been dumped daily into the oceans by the naval, commercial shipping and fishing fleets of the world. This waste is considered such a threat to a wide variety of marine life that an international agreement to control off shore disposal was put into effect in the United States in 1989. Although this material is not a major source of beach debris in the Northeast, some of it may find its way inshore.

Marine Transfer and Landfills

Floatable debris can enter the water through mishandling of solid waste that is being loaded on barges for transport to a landfill. Despite onsite precautions like collection booms and skimmer systems, material can also escape from the landfill itself, particularly during the



offloading of garbage from barges. Although marine transfer operations are considered to be a significant source of floatables in the New York/New Jersey Harbor area, they are not a major source of floatables to LIS, because only in the far western Sound do any water-borne garbage operations occur.

Other Sources

There are a number of smaller, yet significant, sources of beach debris. In addition to the off shore fleets, fishing and recreational vessels using our coastal waters contribute some overboard trash and sanitary waste. Rivers, especially during high flow periods in the spring, also add to the influx of floatables. Finally, beachgoers themselves add to the problem by littering. In fact, many of the syringes on Connecticut beaches were found above the high water mark, indicating that they had not come from the sea but from drug users at the beach.

Why was 1988 So Bad?

In terms of the pollution of Long Island Sound and surrounding waters, Summer 1988 was pretty much "business as usual". Why, then, was there a marked increase in beach debris? The major reason was the weather. The spring of '88 was very dry, causing an accumulation of debris on streets and in storm sewers of the region. The dry perii was followed in mid-summer by a series of torrential rains which swept the streets clean, overloaded combined sewers, and flushed large amounts of debris into nearshore waters.

Once in the water, the movement of floatables is dictated primarily by wind conditions, which vary from year to year. During most years, offshore summer winds help to disperse much of the floatable material. In 1988, however, persistent South-Southwest winds in July collected floatables into large slicks and then pushed them onshore, bringing home to us - quite literally - an awareness of what we have been putting into our coastal waters for years.

The good news is that this weather pattern is unlikely to occur every year - in fact, the last time was in 1976, when beaches on Long Island were also closed because of washups. The bad news is that whether or not it washes onshore, the waste is out there every year, and its volume may be increasing. Long Island Sound and its neighbor to the south, New York/New Jersey Harbor, are surrounded by some of the most heavily populated areas in the country. As the population living in a watershed continues to grow, so does the amount of household waste, sewage, and street litter. Another factor is that our use of plastics has tripled since 1970, increasing the percentage of floatable waste.

How Safe Is the Beach?

The beach closures of 1988 were caused by high bacterial counts (indicating sewage), concerns about the health hazards of medically-related debris, or both. Of the two, sewage contamination poses by far the greater threat to human health. Coliform bacteria, used as a test for the presence of sewage, are not a danger, but indicate the potential presence of other microorganisms which can be harmful in high concentrations. Swimming in sewagecontaminated water can lead to bacterial and viral infections, most often gastrointestinal. In contrast, floatable debris, when not combined with sewage, is not particularly dangerous to humans. While unsightly and sometimes downright disgusting, most of this material is common trash.

What About Medical Waste?

The amount of real medical waste found on beaches in 1988 was very small. Much of the material termed "medical waste" was either misidentified trash or medically-related household items - frequently insulin syringes used by diabetics. These items, flushed down the toilet, can easily end up in the Sound during CSO discharges or STP failures. Environmental officials have concluded that intravenous drug users frequenting the shore were also a significant source of syringes. Although no material discovered on LIS beaches was found to originate in a doctor's off ice or medical facility, some isolated incidences of medical waste found in the New York/New Jersey Harbor area almost surely resulted from illegal disposal.

Proper disposal of medical waste is a serious health concern not limited to the beach alone. However, it's important to emphasize that the chances of getting AIDS or other infectious diseases from beach debris of any kind is practically non-existent. Here's why:

- The chance of any debris being real medical waste is slight (on New York beaches in 1988, only 1% of the beach debris was medically related).
- The chance of any medical waste being infectious is slight - about a 10% nationwide, according to EPA.
- The AIDS virus is fragile and unable to survive for long in the stressful chemical and physical environment of the ocean (it can't survive in fish, either).

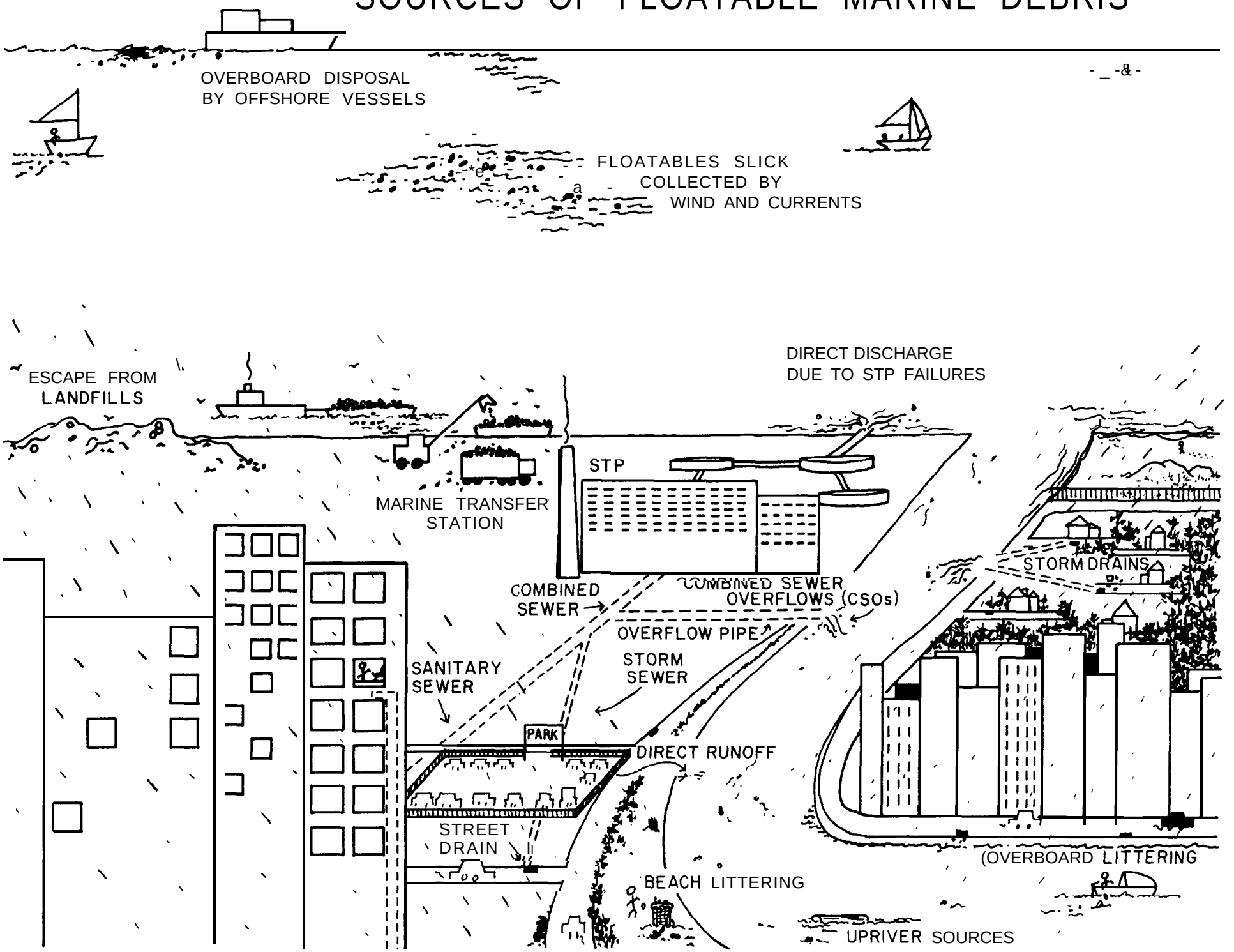
*Tremendous dilution also occurs in the ocean, further decreasing the virulence of any pathogens.

Despite the minimal health risks involved, beachgoers should approach suspicious-looking debris with caution. Although syringes pose little threat, blood vials could conceivably be a hazard if stepped on (breaking the skin). Certainly, anything that looks like medical waste should be left alone and reported immediately to beach authorities. Based on the experiences of the last two summers, beach managers have been devising guidelines and strict procedures to deal with future washups.

The Headlines of 1988

The summer of '88 was unprecedented both in the media coverage of the beach closings and in the effect that these stories had on people's behavior. Although much media coverage was accurate, there's no doubt

SOURCES OF FLOATABLE MARINE DEBRIS



that public fears ballooned out of proportion in response to sensational headlines. Justifiable public concerns over water pollution often escalated to near-frenzy pitch as irrational fears overwhelmed common sense. For instance, at the height of the summer furor things like dishwashing gloves, drowned sewer rats, and fish parts were misidentified as surgical gloves, shaved laboratory rats, and human lungs!

As a result, people deserted the beaches in droves for backyard swimming pools and mountain resorts. For instance, despite the fact that beach closures on the south shore of Long Island could be measured in hours rather than days or weeks, attendance at state park beaches in that area dropped by 5.6 million from1987 to 1988. Seafood retailers and restaurants throughout the Northeast saw business drop off, as public concern over beach safety spilled over into worries about the health effects of seafood consumption. Estimates of the loss to Long Island economy alone during the summer of 1988 are as high as 1-2 billion dollars! Whether warranted or not, the bottom line is that there were drastic - for some, disastrous - social and economic consequences resulting from the floatables problem.

What Can Be Done About Floatable Debris?

The one good thing about floatable debris is that the sources of the problem are generally understood, and there are few if any scientific mysteries to be deciphered before action can be taken. Encouraging as this may be, it doesn't make the problem any less difficult to solve. Unfortunately, floatables will be with us in varying degrees for some time to come.

The floatables problem is where the two major environmental concerns of water pollution and solid waste disposal meet. Stopping floatables at their sources - our households and streets - will be tied to such increasingly familiar issues as litter control, recycling, and enforcement of existing laws.

At the next level of the problem, the underground infrastructure systems in our towns and cities must be changed. Storm and combined sewers, a major source of floatable debris, also degrade water quality in other ways, discharging sewage, toxic contaminants and excess nutrients to the Sound (see LISS fact sheets #1, #2, #3). The redesign and restructuring of these systems are major public works projects, involving massive doses of money, long periods of time, and inconvenient disruption of services. For instance, the cost of separating combined sewers or abating their effects is estimated to be about 1/2 billion dollars in Connecticut and $1.5 billion in New York City. Nonetheless, the states of New York and Connecticut and the City of New York are all undertaking such projects, and are looking at ways to combat runoff -caused, or nonpoint source, pollution (see fact sheet #7). In addition to upgrading sewage treatment plants, better operation of STPs and striiter enforcement of laws regulating their discharge are being called for. A new federal law calls for New York, Connecticut, and New Jersey to begin a pilot program to track medical waste disposal in June 1989.

More immediate attempts at controlling floatables involve debris collection, either in the water or after it has washed up on beaches. An example of the former is the effort being undertaken in New York/New Jersey Harbor by a consortium of federal, state, and local agencies; an example of the latter is Operation Beachwatch in Connecticut, which has set beach testing and cleanup guidelines for local coastal authorities. Officials feel that although they do not attack floatables at their sources, programs to keep debris off beaches may restore to the public some of the confidence it lost during the last two summers.

Lastly, the Long Island Sound Study (LISS) plans to incorporate the control of floatables into its management plan. This plan, the sum of 6 years of research and planning by the Study, will be a blueprint to guide the federal government and the states of Connecticut and New York in the protection and cleanup of Long Island Sound. Because sources of floatables often coincide with sources of other pollutants, the Study has already given much consideration to possible solutions. When the LISS management plan is implemented, the persistent problem of floatable debris hopefully will be once again reduced to an occasional message in a bottle.

The Long Island Sound Study

The Long Island Sound Study (LISS) is a six-year research and management project that began in 1985 as part of the National Estuary Program, a recent addition to the federal Clean Water Act created to protect estuaries of national importance. The LISS is acooperative bi-state effort involving research institutions, regulatory agencies, marine user groups, and other concerned organizations and individuals. The purpose of the Study is to produce a management plan for the Sound that will be implemented by the three major LISS partners, the Environmental Protection Agency and the states of Connecticut and New York. To get involved with the Study, or for more information, contact: the New York Sea Grant Extension Program, Dutchess Hall, SUNY, Stony Brook, NY. 11794, Tel. (516) 632-8737; or the Connecticut Sea Grant Marine Advisory Program, 43 Marne Street, Hamden, CT 06514, Tel. (203) 789-7866.

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