OTA warning on wastes in coastal waters

The "garbage barge," which has been searching for a landfill to dump 3,100 tons of trash since it left Islip, N.Y., on March 22, has become a pungent symbol of the U.S. waste disposal problem. This problem is not limited to land-based disposal sites. Wastes are channeled into the marine environment as well, and some of the country's estuaries and coastal waters, which are especially vulnerable to marine pollution, have suffered.

"We have enough information to conclude that waste disposal activities are a major contributing source" of a wide range of problems for the marine environment – including millions of dollars of losses in the fishing industry and a rising number of reported human illness from consumption of contaminated shellfish, says Howard Levenson of the Congressional Office of Technology Assessment (OTA) in Washington, D.C. Levenson has been the project director of a three-year OTA study examining the impacts and management of wastes in the marine environment.

In its report, released late last month, OTA found that environmental legislation enacted over the last two decades has helped to cut down on marine pollution in some areas. But it warns that "In the absence of additional measures to protect our marine waters, the next few decades will witness new or continued degradation in many estuaries and coastal waters around the country (including some that exhibited past improvements)."

Levenson says this is because current pollution control programs are not fully enforced and do not adequately address toxic pollutants or runoff and other "nonpoint"-source pollution. Moreover, he expects that there will be increased pressure to use marine environments for disposal in the future: The Census Bureau anticipates that as much as 75 percent of the nation's population will live along the coasts by 1990, accentuating the already difficult problem of developing land-based disposal, as evidenced by the garbage barge's sojourn. In addition, marine disposal is often less costly than land-based alternatives.

The agency notes that the open ocean appears to be in a better state than coastal waters and estuaries. This is partly because the ocean receives relatively less waste, and the waste that is deposited there tends to be widely dispersed and diluted by the ocean, according to the OTA report.

While most public attention has been focused on dumping of sewage sludge, industrial wastes and dredged material, OTA concludes that agricultural and urban runoff and pollution discharged from pipelines are at least as important in terms of their effects on the marine environment. According to Levenson, more than 2,000 pipelines discharge directly into estuaries and coastal waters, thousands more are discharged upstream in rivers that carry the pollutants to the coastal waters, and an estimated 100,000 industries dispose of wastes into municipal sewage, which, after treatment, passes into coastal waters.

Levenson says the OTA study confirmed the significance of some of the most publicized problems, such as the low oxygen levels (hypoxia) and excessively high levels of nutrients, metals, organic chemicals and bacteria found in the New York Bight and the Chesapeake Bay. "But we are also raising a red flag about less well publicized areas, along the Gulf of Mexico and along the southern Atlantic coast," he says. For example, periodic hypoxia of an unknown origin is threatening the nation's foremost fish and shellfish catches offshore of Louisiana.

The solution, says Levenson, does not necessarily entail the development of multibillion-dollar programs or major legislative efforts. Instead OTA suggests that the present system of uniform controls be continued and enhanced to provide a minimum level of protection, and that these controls be supplemented by site-specific management to deal with the unique problems of individual water bodies. The congressionally created Chesapeake Bay Program is an example of this latter approach.

"It seems to us that the critical link that's missing," says Levenson, "is that we do not have a systematic framework for deciding when and how to provide the additional types of management needed for water bodies." This framework would identify water bodies in need of additional care, develop management plans and coordinate state and federal activities. "Most of the mechanisms needed to implement this framework are already existing, although many of them are in embryonic form," he says.

Both Reps. Thomas R. Carper (D-Del.) and Mike Lowry (D-Wash.), who were on hand for the official release of the report, praised it highly. Lowry says his Subcommittee on Oceanography will be using the OTA study as a basis for oversight hearings in July, and beginning this week a few other subcommittees will hold hearings on the issue of marine pollution as well.

One program that will help policy makers take the first steps toward identifying marine areas that need attention is the National Status and Trends Program of the National Oceanic and Atmospheric Administration. The intent of this program is to monitor levels of specific toxic chemicals in sediments, bivalve mollusks and bottom-dwelling fish sampled from more than 150 sites along the U.S. coastline. In January, the program published the first progress report summarizing data collected in 1984, when it began.

"We've applied a common set of approaches and measurements on a nationwide basis," says John A. Calder, who manages the program in Rockville, Md. And it's now clear that "we have an unassailable means for evaluating which parts of the country that we sampled are the most contaminated," he says.

It's still too early in the study to determine whether the health of the marine environment sampled is improving or decaying. But Calder says the preliminary evaluation does at least provide an idea of which places may require the most attention: Boston Harbor (Mass.), Salem Harbor (Mass.), Raritan Bay (N.J.), western Long Island Sound (N.Y.) and San Diego (Calif.).

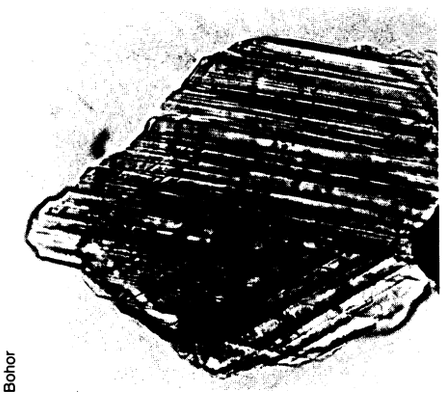
In these, as in other places, the Status and Trends Program sampled toxic trace metals, cancer-causing polychlorinated biphenyls (PCBs), aromatic hydrocarbons, pesticides, sewage and other compounds. "The sites we sampled in those five places," says Calder, "seem to stand out no matter what parameter you look at."

– S. Weisburd

Extinction upon impact?

Pieces of shocked quartz, found around the world, present strong evidence that a large meteorite or asteroid struck the earth 66 million years ago and generated a globe-girdling dust cloud that caused a round of mass extinctions and ultimately the demise of the dinosaurs, report researchers in the May 8 SCIENCE.

The grains of quartz, which were lifted from sediments at the Cretaceous-Tertiary (K-T) boundary, display microphysical features characteristic of grains found at known impact sites, write Bruce F. Bohor and his colleagues from the U.S. Geological Survey (USGS) in Denver. This resemblance indicates that the quartz was shocked, or fractured, by the impact of a large body, and that it was



Bohor

Shocked quartz grain from Brownie Butte, Mont., displays multiple lamellae.