

TOXIC CONTAMINANTS

Humans have used Long Island Sound as a resource and a disposal site since industrialization began. Measurable quantities of contaminants exist in sediments dating back to the mid-1800s. Quantities of some have increased over time, new contaminants have been added, and amounts of some have decreased in response to regulatory action. Toxic chemicals enter Long Island Sound from sources such as manufacturing processes, household cleaning and pest control products, automobile exhausts, and emissions from fossil fuel power plants. Stormwater pipes carry contaminants washed from roads, parking lots, disturbed land, and construction sites. Rivers and streams transport contaminants from the watershed into Long Island Sound.

Potentially toxic substances, both naturally-occurring and human-generated, can cause adverse ecosystem or human health risks when exceeding certain concentrations. These substances include trace metals (chromium, copper, lead, mercury, silver, arsenic, zinc) and organic compounds such as PAHs (polycyclic aromatic hydrocarbons), PCBs, and pesticides (such as DDT, chlordane, and atrazine).

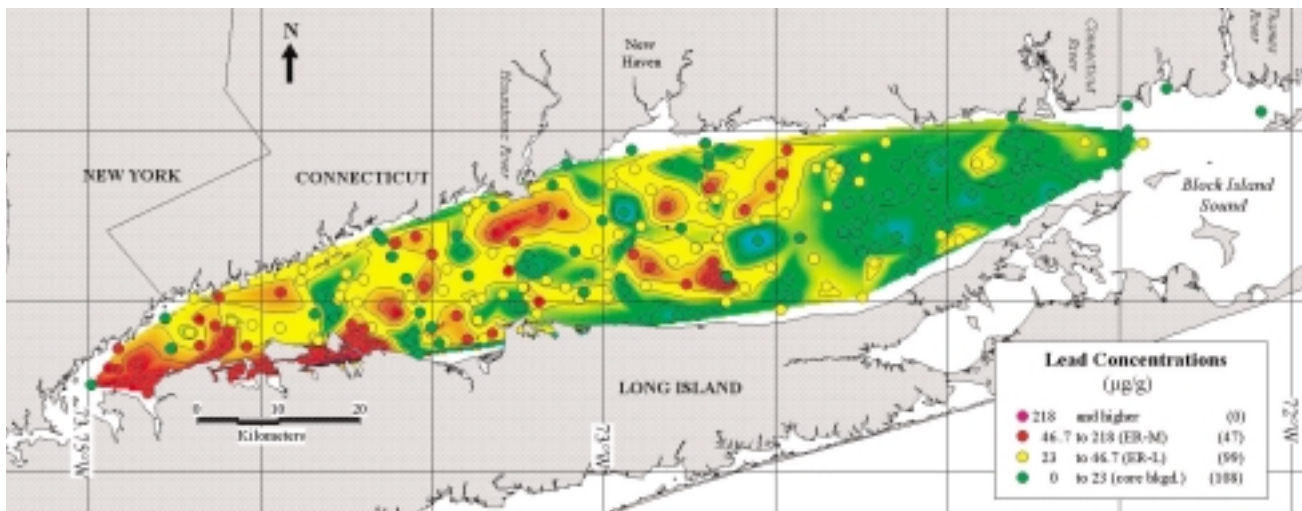
Many contaminants become associated with particles suspended in the water. These particles then settle to the bottom, accumulat-

ing the contaminants at higher concentrations in the sediments than in the overlying waters. However, contaminants are not uniformly distributed throughout the Sound. Contaminants accumulate in areas of weak currents, large sediment inputs, and little sediment reworking. Areas where strong bottom currents stir up the bottom tend to have less sediment accumulation and lower contaminant concentrations.

As particles settle to the bottom of the Sound, they create a reservoir of contaminants that can harm marine life living or feeding near sediments. Fish and shellfish can, in turn, accumulate toxic contaminants, posing a human health risk. Public health advisories are published to inform consumers about potential risks from eating large amounts of seafood that contain higher chemical levels.

Today, the major sources of toxic chemicals to Long Island Sound are STPs, industrial discharges, urban stormwater, and atmospheric deposition. Federal and state programs strive to reduce toxic chemical discharges to the Sound and to minimize the toxicity of effluents from sewage treatment plants and industries.

Lead in Surface Sediments



Mecray, E.L. and M.R. Buchholtz ten Brink, 2000, "Contaminant Distribution and Accumulation in the Surface Sediments of Long Island Sound", *Journal of Coastal Research*, v. 16, no. 3, p. 575-590.

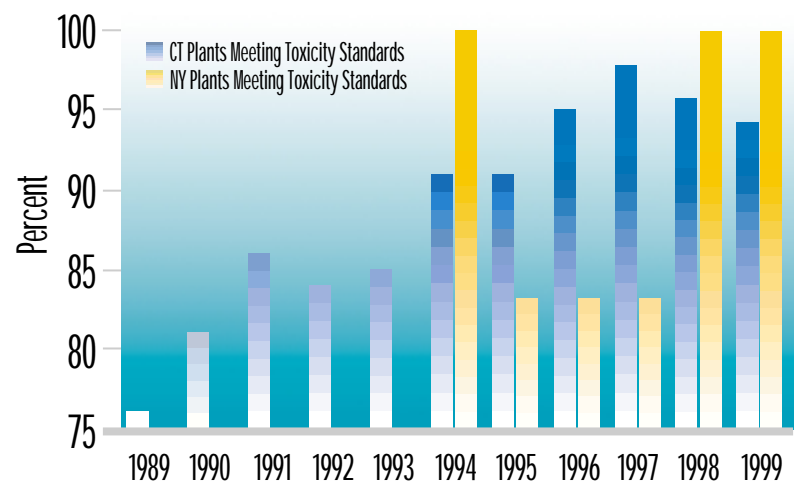
The concentrations of lead and other metals in bottom sediments are generally higher in the western Sound and lower in the bottom-scoured regions of the eastern Sound. This is primarily due to both the location of pollutant sources and the westward transport of contaminants associated with fine-grained particles.

End-of-Pipe Toxicity

Tests are conducted to measure the effects of chemicals and identify facilities that are discharging potentially toxic effluents to waterways. Connecticut requires toxicity testing at STPs throughout the state. New York State requires toxicity testing when appropriate to adequately protect aquatic life.

In 1989, the effluent from 76 percent of Connecticut STPs tested was non-toxic. In 1999, 94 percent were non-toxic, a 75 percent reduction in the number of facilities discharging a potentially toxic effluent. In 1998 and 1999, no New York municipal treatment facilities discharging to the Sound exhibited toxicity.

Percent of Municipal Treatment Plants Tested to be Non-Toxic



CT DEP, Bureau of Water Management, and NYSDEC, Division of Water