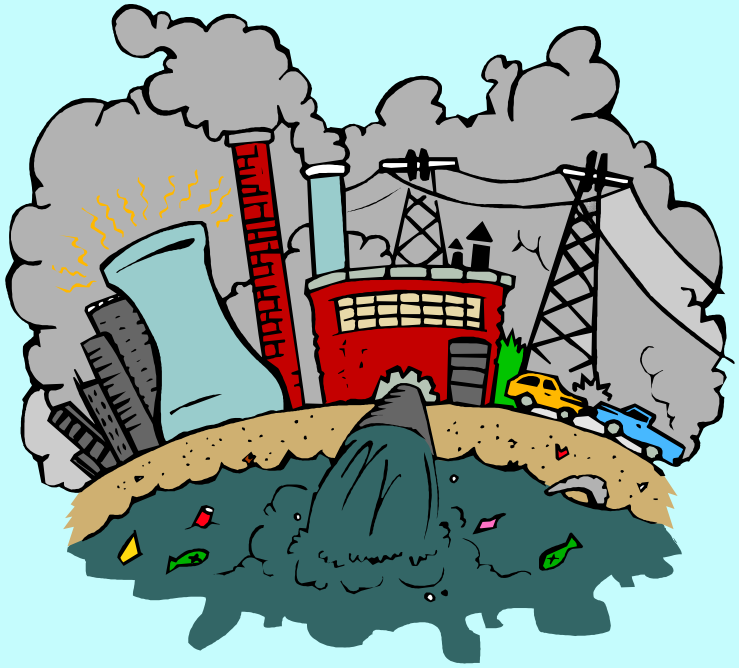
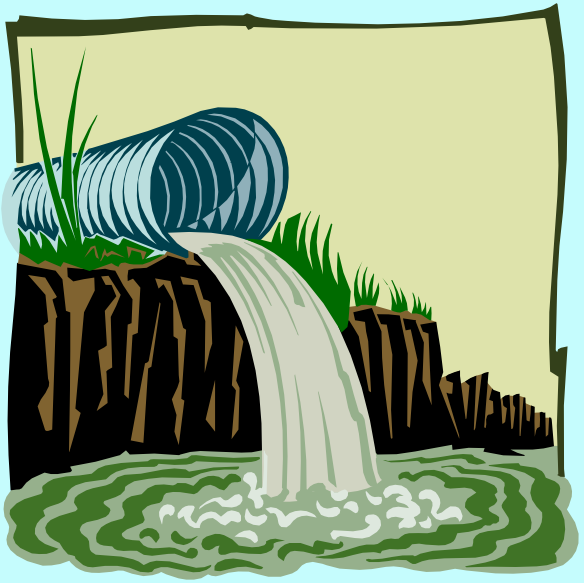
Toxic Contaminants

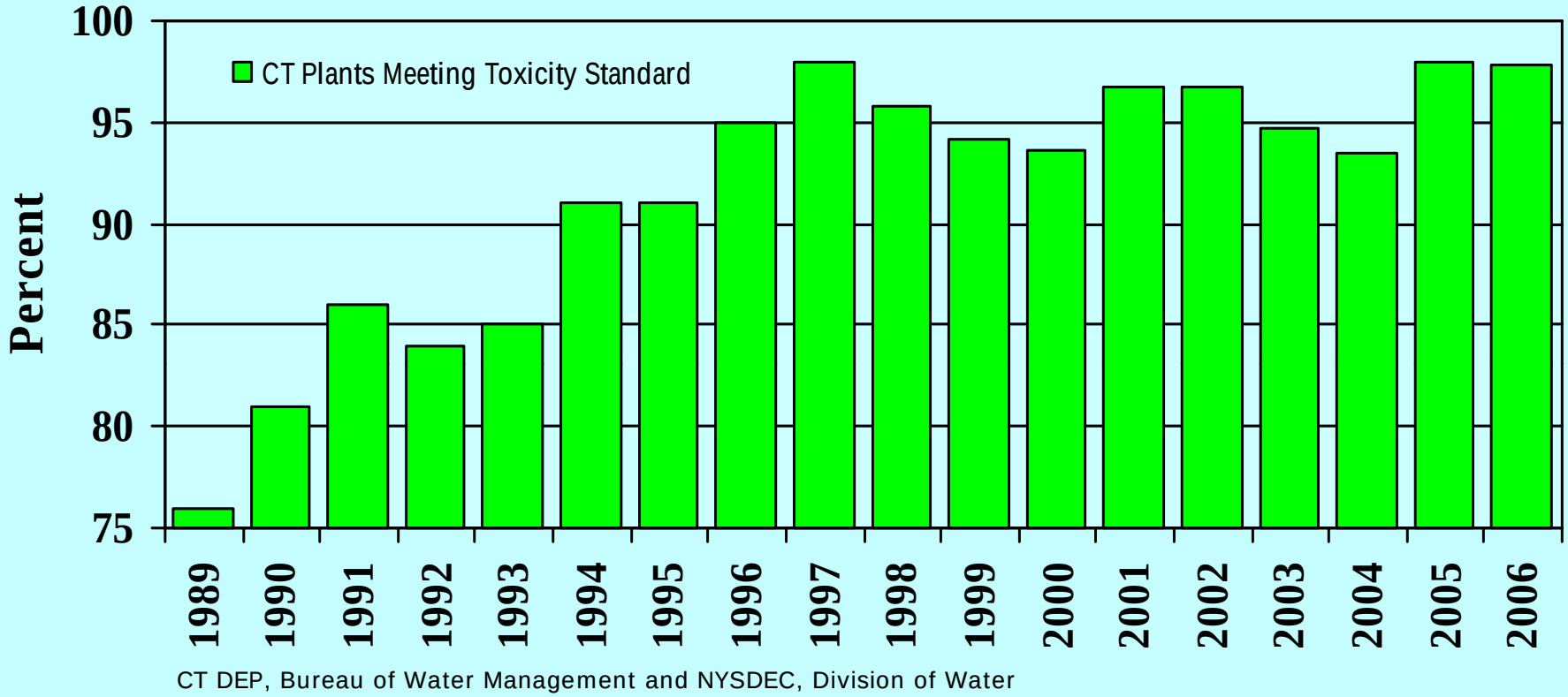
- Long Island Sound has been a resource and disposal site since industrialization began.
- Measurable quantities of contaminants exist in sediments dating back to the mid-1800s.
- Quantities for some contaminants have increased over time, new contaminants have been added, and amounts of some have decreased in response to regulatory action.





- 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 STPs and industries.

Percent of Municipal Treatment Plants Tested to be Non-Toxic



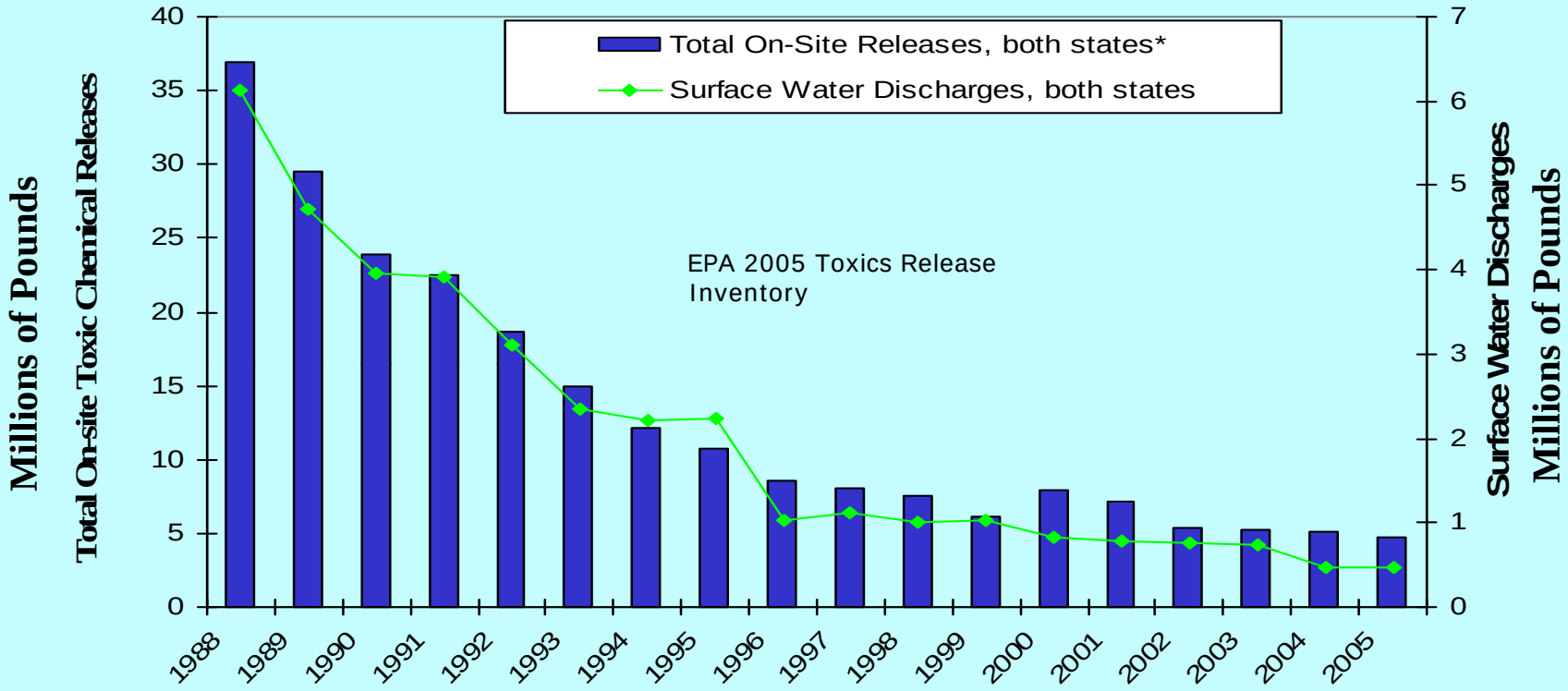
CT DEP, Bureau of Water Management and NYSDEC, Division of Water

In 2006, 98% (89 out of 91) of CT's municipal sewage treatment plants passed toxicity tests compared to nearly 25% failure rate in 1989. In CT, an STP facility is designated as toxic if it fails 2 consecutive or 3 separate acute tests. In NY, most treatment plants are tested in a five year cycle. In NY, three plants were tested in 2006: two passed and one required further testing.

Indicator Type: Pressure

LISS Indicators: Water Quality (2.2)

Industrial Chemical Discharges Combined NY & CT Within the LISS Watershed



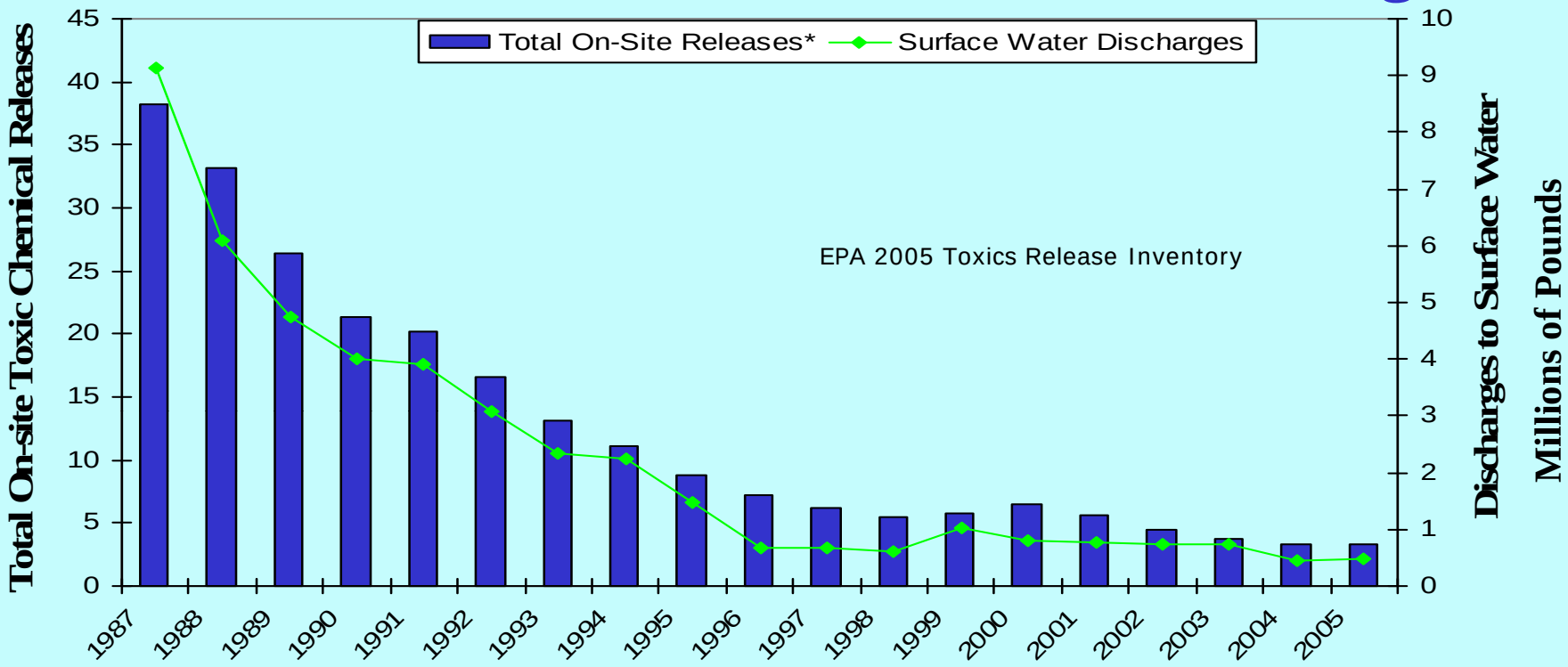
*Total on-site releases include air emissions, other on-site land releases, and surface water discharges.

The EPA maintains the Toxics Release Inventory (TRI), a national database that identifies more than 600 designated toxic chemicals manufactured and used at industrial facilities and the annual amounts of these chemicals released as waste. Toxic releases in the Sound's watershed have declined by more than 90 percent since the late 1980s. This is consistent with toxic releases throughout the country. Air emissions account for the majority of on-site releases.

Indicator Type: Pressure

LISS Indicators: Water Quality (2.2)

Connecticut Industrial Chemical Discharges



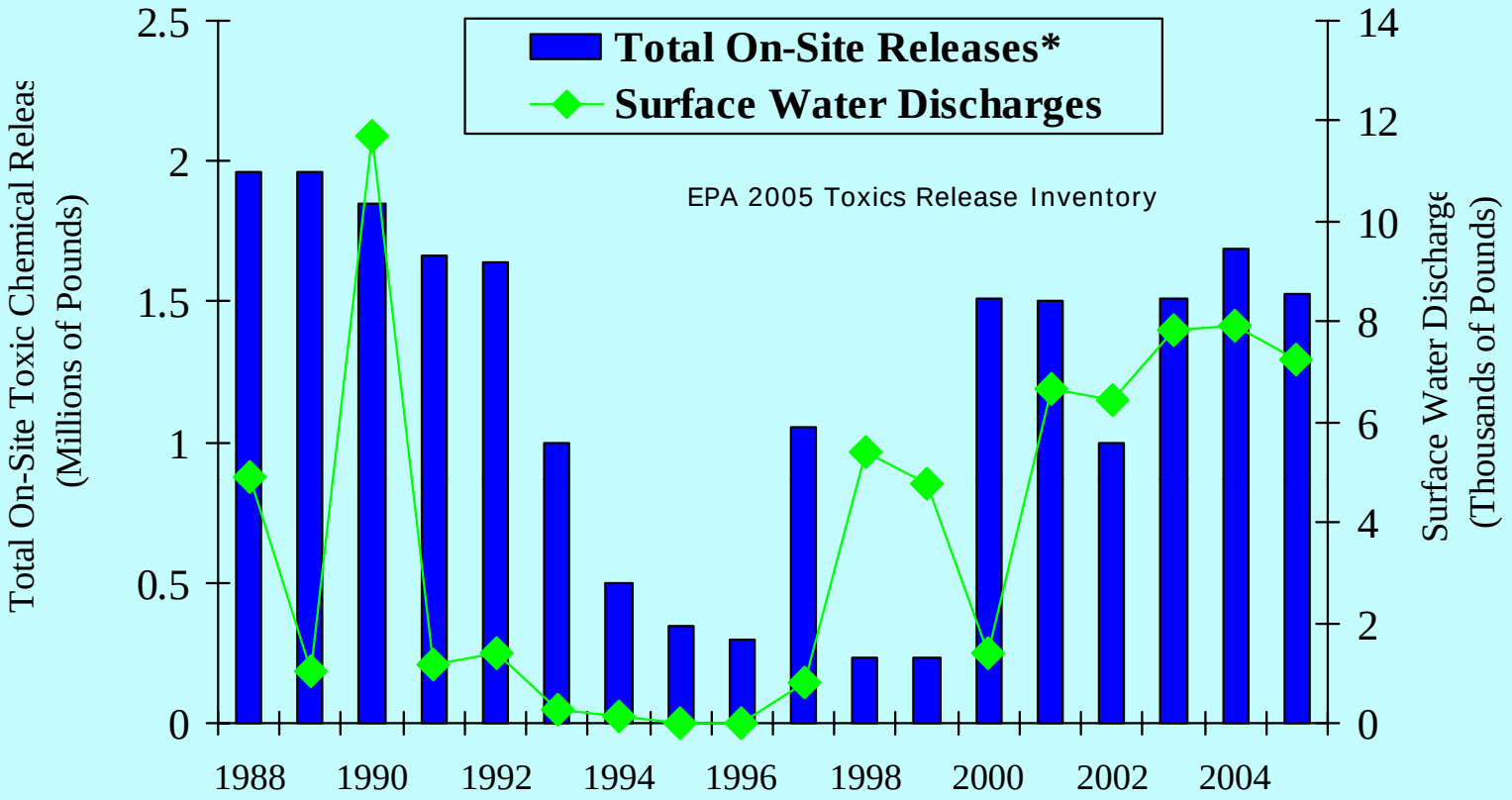
***Total On-site Releases include total air emissions, other on-site land releases, and surface water discharges.**

The Emergency Planning and Community Right to Know Act of 1986 requires facilities in the United States to report releases to the environment of more than 600 designated toxic chemicals. The EPA maintains the Toxics Release Inventory, a national database that identifies the chemicals manufactured and used at industrial facilities and the annual amounts of these chemicals released in waste. Toxic releases in the Sound's watershed have declined since the late 1980s. This is consistent with toxic releases throughout the country.

Indicator Type: Pressure

LISS Indicators: Water Quality (2.2)

New York Industrial Chemical Discharges



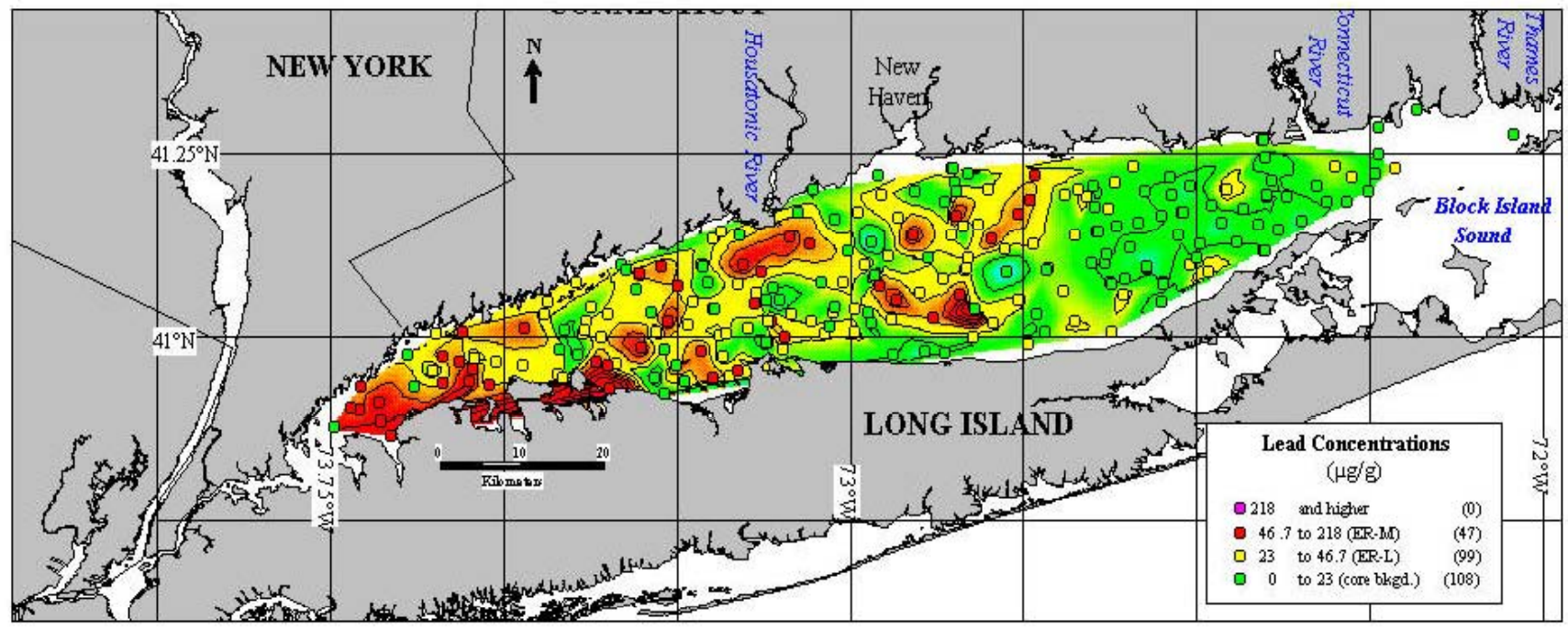
***Total on-site releases include total air emissions, other on-site land releases, and surface water discharges.**

While Connecticut's water, land, and air discharges into the Sound and its tributaries have steadily declined, New York's discharges have varied.

Indicator Type: Pressure

LISS Indicators: Water Quality (2.2)

Lead in Surface Sediments



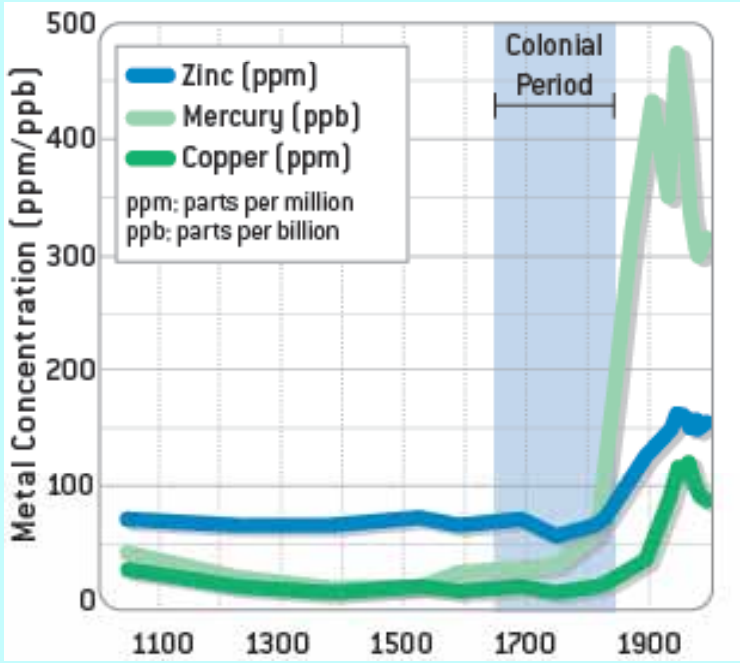
Source: Mecray, E.L. and M.R. Buchholtz ten Brink, 2000, "Contaminant Distribution and Accumulation in the Surface Sediments of Long Island Sound", Journal of Coastal Research, v. 16, no. 3, p. 575-590

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 locations of pollutant sources and the westward transport of contaminants associated with fine-grained particles.

Indicator Type: State

LISS Indicators: Water Quality (2.2)

Heavy Metals in the Sediment



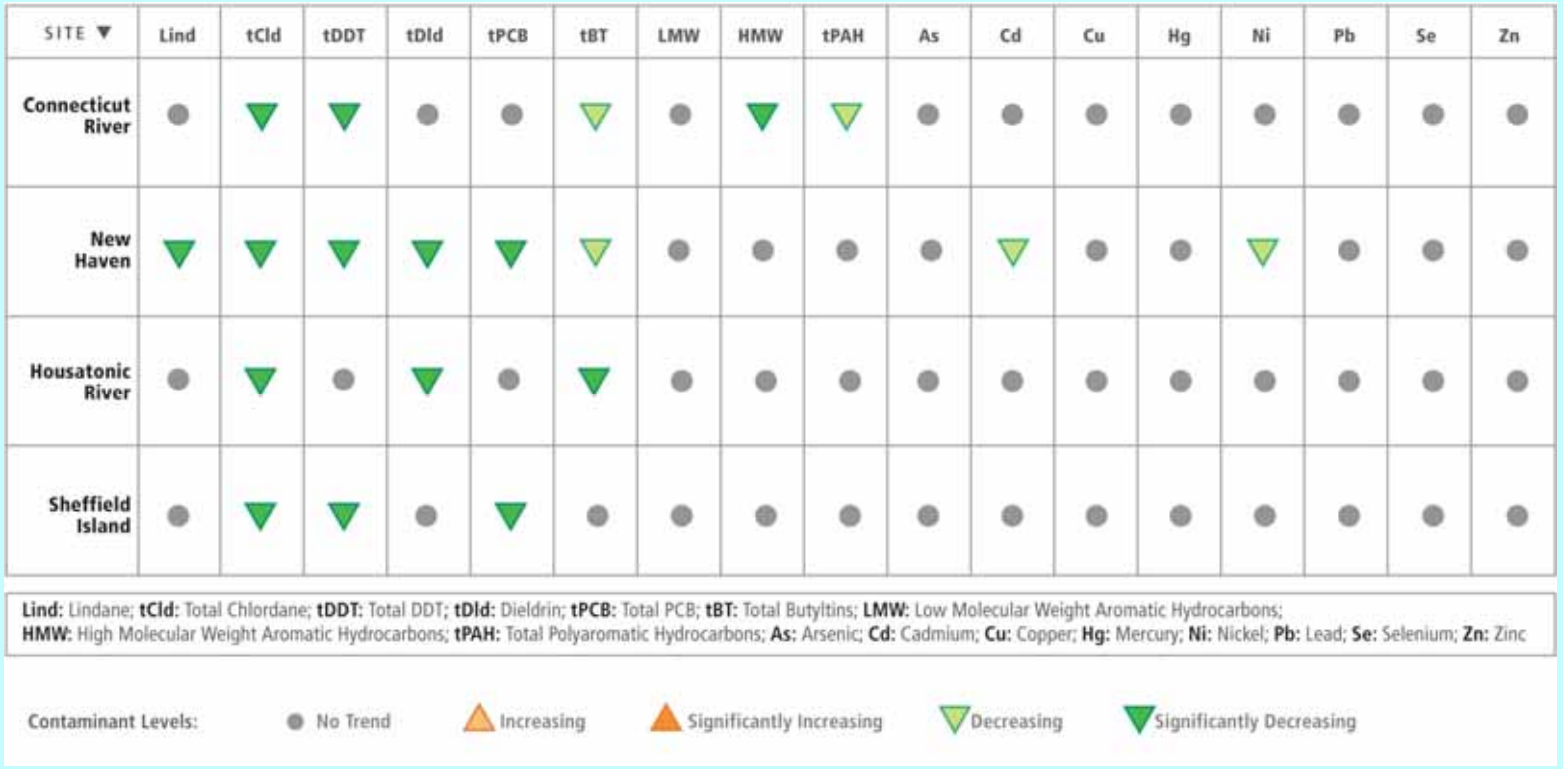
Wesleyan Univ./USGS Woods Hole Field Center

During the 19th and early and mid-20th centuries, industries discharged large amounts of heavy metals into the Sound and its tributaries as byproducts of manufacturing processes. Concentrations of heavy metals in the sea floor have since declined, but are still high compared to the colonial period.

Indicator Type: State

LISS Indicators: Water Quality (2.2)

Contaminant Trends in Mussels (1986-2003)
Connecticut Sites



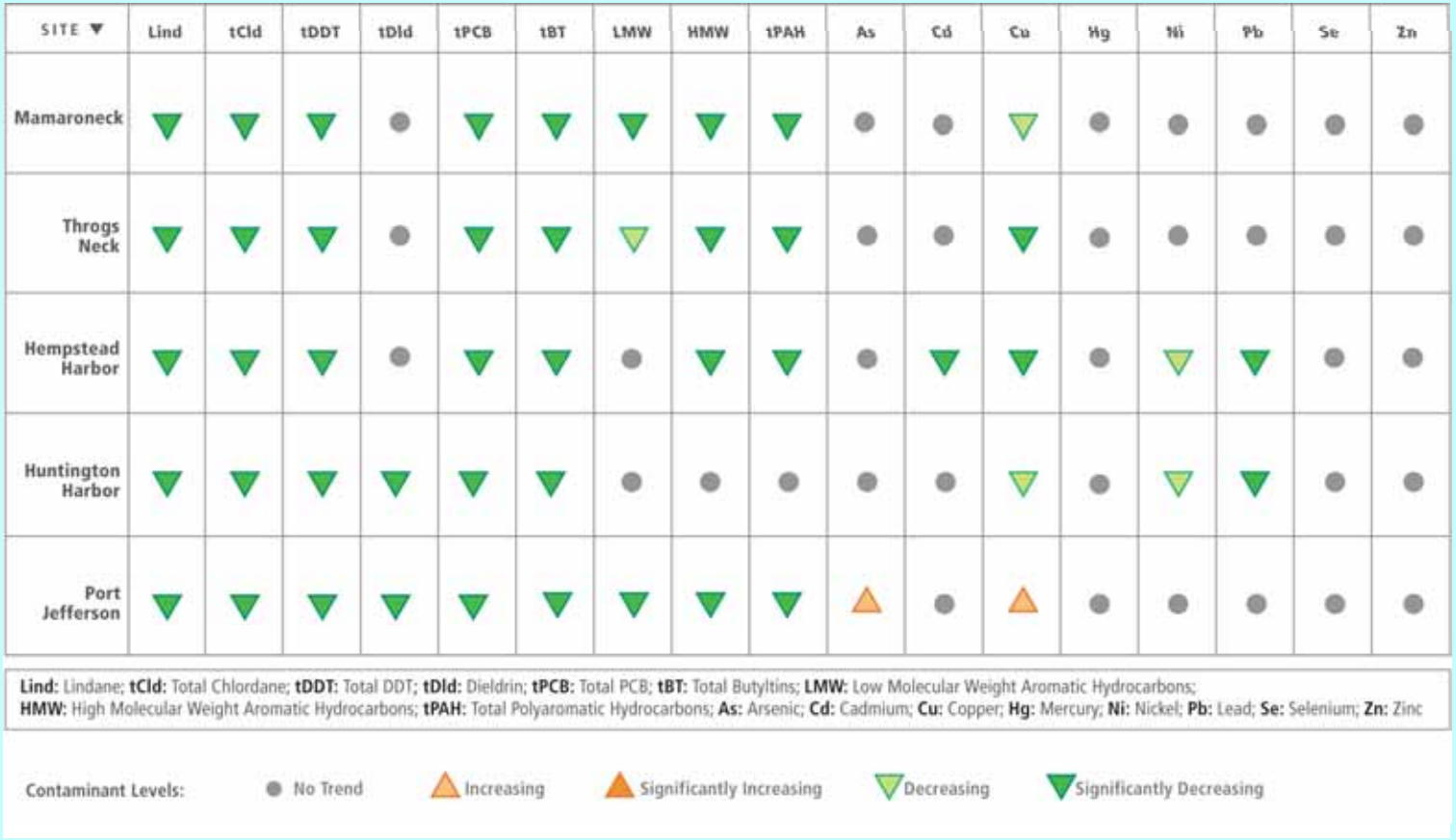
NOAA, National Status and Trends Program

Since 1986, the National Status and Trends Mussel Watch program has monitored chemical contaminants in bivalve mollusks (mussels). Concentrations of chemicals in mussels are related to the levels of chemicals in the water that they inhabit and in the food that they filter from the water. Decreased chemical concentrations in the water and in food sources will result in decreased concentrations. Overall, no chemical or metal has increased in concentration along CT harbors. Contamination has been decreasing at many sites whose use has been banned such as DDT and chlordane.

Indicator Type: State

LISS Indicators: Water Quality (2.2)

Contaminant Trends in Mussels (1986-2003)
NY Sites



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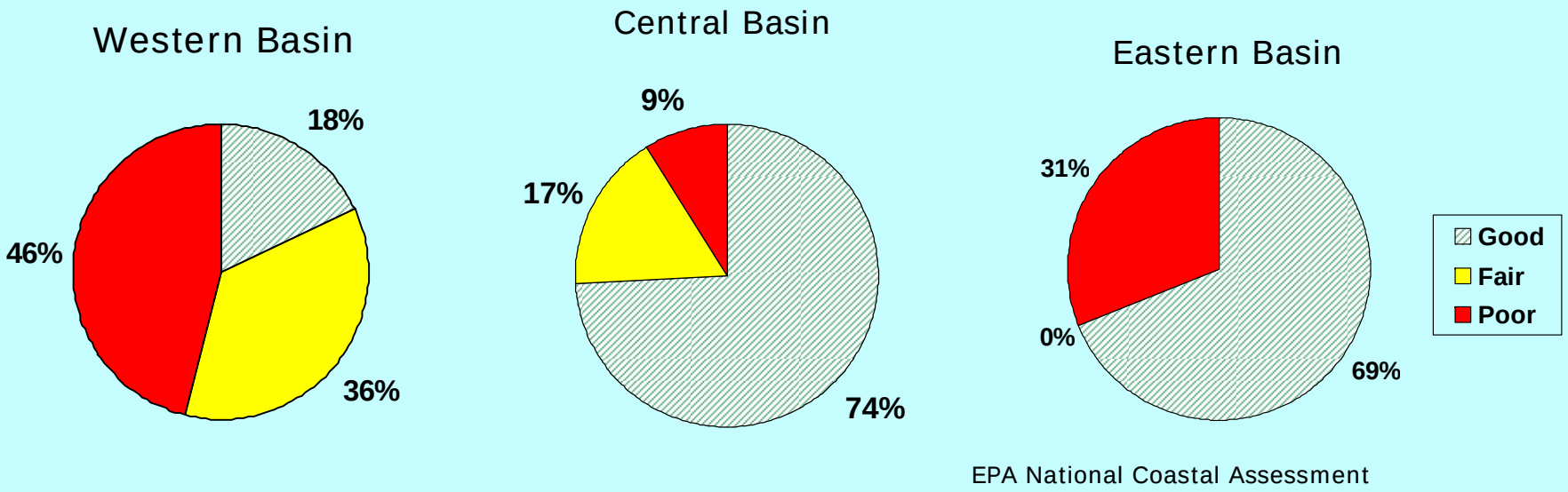
Indicator Type: State

LISS Indicators: Water Quality (2.2)

Sediment Quality Index



EPA National Coastal Assessment

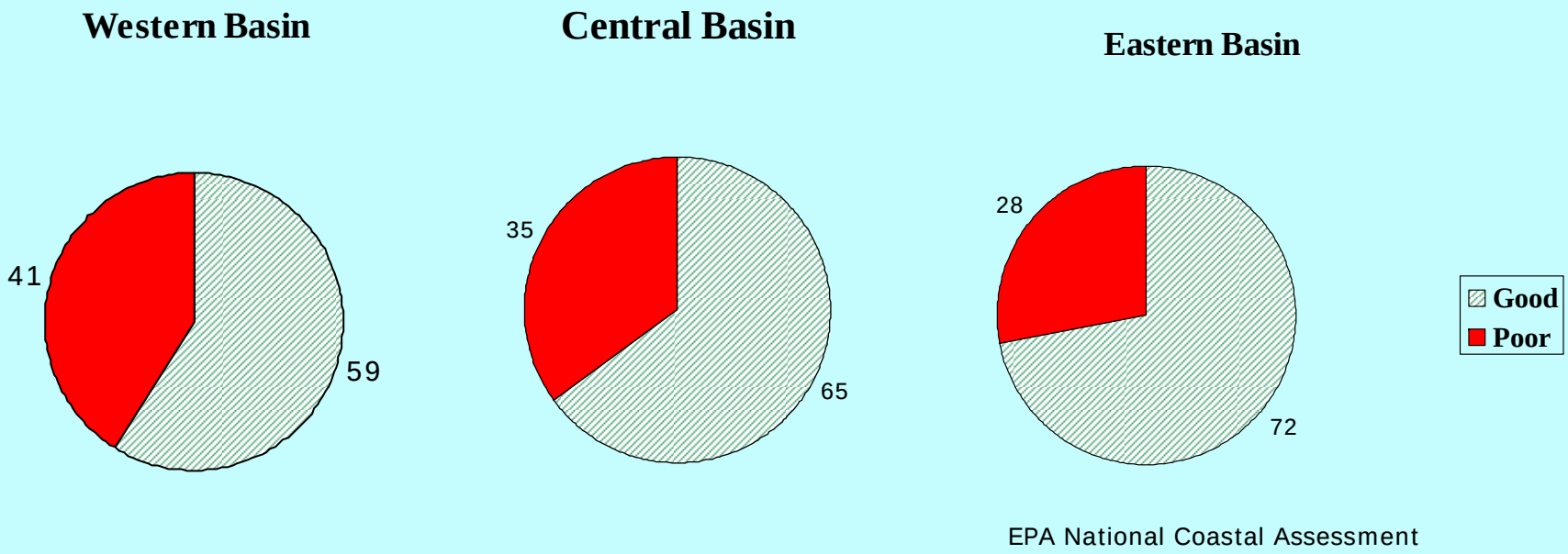
Average percent area with good, fair or poor quality, 2000-2004

The sediment quality index is based on National Coastal Assessment methods that measure sediment contamination, sediment toxicity and total organic carbon. The sediment indices represent the average condition for the years 2000-2004. A wide variety of metals and organic substances, such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and pesticides are discharged into estuaries from urban, industrial, agricultural, and industrial sources in a watershed. These contaminants attach onto suspended particles and eventually accumulate in the sediments of the seafloor, where they can disrupt the benthic community of invertebrates, shellfish, and crustaceans. To the extent that contaminants become concentrated in the organisms they can pose a risk to organisms throughout the food web. Sediment quality in each basin is depicted as the total area of each basin that rated good, fair or poor for sediment quality.

Indicator Type: State

LISS Indicators: Water Quality (2.2)

Benthic Index by Basin



EPA National Coastal Assessment

Average percent area with good or poor benthic conditions, 2000-2004

The worms, clams, and crustaceans that inhabit the bottom substrates of estuaries are collectively called benthic macroinvertebrates, or benthos. Benthic population and community characteristics are sensitive indicators of chemical contaminant and dissolved oxygen stress, salinity fluctuations, and sediment disturbance. In the Sound, the benthic index for each basin depicts the total area of each basin that tested good or poor for each basin. The benthic indices represents the average benthic condition for each basin from 2000-2004. Note that no samples were collected in 2002.

Indicator Type: State

LISS Indicators: Water Quality (2.2)