

The Sound's Disappearing Lobster Population

by Bob Bachand

*American lobster - Long Island Sound.
Photo by Bob Bachand*

Long Island Sound's lobster fisheries reached their peak in 1997 when lobstermen landed approximately 11.7 million pounds valued at \$42 million. But just two years later, few if any of the Sound's 1200 lobstermen could have foreseen the rapid decline of their livelihood. In the early fall of 1999, millions of the Sound's lobsters were found scattered dead or dying on the bottom or lying in traps. Within a couple of days of delivery to market, even outwardly healthy-looking lobsters were reported to be dying in holding tanks. West of Norwalk, CT, landings of the valuable crustaceans declined by up to 99 percent from the previous year! East of the site, reductions ranged from 64 to 99 percent. Scientists were at a loss for an explanation. Bluefish, bunker and striped bass were being caught in greater numbers, yet there was no clear cause for the crash in lobster stocks.

At about the same time, the mosquito-borne West Nile virus struck in Manhattan, Queens and the Bronx. It then made its appearance along the Connecticut shoreline communities and other northeastern states. As a measure to control the mosquito population, the states ordered the spraying of pesticides – malathion, resmethrin and methoprene. The latter two probably had no effect, but malathion is known to have adverse effects on grass shrimp, hermit crabs, silversides, mummichogs, lobsters and others. It was concluded, however, that only a few sites in far western Long Island Sound (LIS) could have had water concentrations of the pesticide high enough to cause less than lethal effects in lobsters.

One of the early findings by investigators showed that 94 percent of the dead lobsters were infected by a parasitic amoeba. But why were so many of them susceptible to the parasite?

In 1991, the Sound's bottom water temperature reached above 68°F, triggering a die-off in the lobster population. At that time, a bacterium which causes red-tail disease was implicated in

the mortalities.

During the height of the 1999 die-off, bottom water temperatures had again topped 68°F. The increase in temperature and its duration was undoubtedly a factor in the die-off, but other important considerations such as heavy-metal poisoning, low oxygen content in the water (hypoxia) and pesticides may have also played a role in stressing the animals to the point of disease. Pesticides, for instance, were not ruled out as the cause of lesions found in the eyes in nearly three-quarters of all of western Long Island Sound's lobsters.

Nitrogen, phosphorous and other nutrients entering the Sound from agricultural and storm water runoff, sewage outfalls and the atmosphere foster excess growth of marine algae called phytoplankton. These microscopic plants eventually sink to the bottom where they are decomposed by bacteria. In the process, the bacteria use up oxygen causing bottom water levels to drop to a point, at times, at which life cannot be sustained. During hypoxic events, animals that are attached to the bottom die off; mobile animals swim off, but they can become stressed.

The western Sound is most susceptible to hypoxia. This occurs especially during the month of August. But in 2008, even areas in the central Sound, the levels of dissolved oxygen were found to have dropped to a point barely able to support marine life.

The greatest numbers of lobsters are also lost during the months when the bottom waters reach their highest temperatures. Egg-bearing females seem to be the most vulnerable, or perhaps the stress, as pointed out by researchers, may simply prevent them from successfully carrying their eggs.

American lobsters inhabit Atlantic waters from Labrador to Cape Hatteras, North Carolina. South of Long Island Sound, they are found mainly in cold, offshore waters, at depths of up to 1575 feet (480 meters). Lobsters that live close to

shore tend to remain in a very small area. The Sound's western and central population of lobsters does not migrate; the eastern population moves somewhat in and out with the season and may, as a result, have a better chance of long-term survival as the oceans warm.

Increases in water temperature are a major factor in changes of the distribution of marine species. In North Carolina, blue mussels are at the southern limit of their range. Recently, they have begun to disappear from North Carolina's warming shoreline waters. In coastal Rhode Island and Long Island Sound, scientists have noticed the decline of cold-water fish species such as the winter flounder, in favor of warm-water species such as butterfish. In a *Journal of Shellfish Research* article published in 2005, the authors concluded that, "Recent changes in water temperature regimes in the bottom waters of Long Island Sound suggest that it may in the long term become inhospitable for lobster survival." In 2008, New York commercial lobster (LIS) landings totaled 436,350 pounds; Connecticut landings totaled 387,306 pounds, representing more than a 75 percent decrease in landings since 1997.

Will we lose this valuable resource any time soon from the Sound? The jury is still out. Lobsters are not necessarily the canaries in the coal mine, but hypoxic events are a threat for all of Long Island Sound's marine life, its seabirds and to those of us who enjoy its shoreline and waters. It's up to us to get involved in preserving the Sound by reducing the amount of nutrients entering its waters, and to slow man's contribution to global warming by encouraging the cutting the consumption of CO₂-producing energy and other greenhouse gasses.

For a complete account regarding the life history of the lobster, go to http://www.maritimeaquarium.org/lis_bibliography.html, click on *Coastal Atlantic Sea Creatures*, and go to pages 111 to 118.