

# Short Report Series

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WINTERKILL OF HARD CLAMS IN GREAT SOUTH BAY, N.Y. 1976-77

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The winter of 1976-77 was the coldest in 41 years and the tenth coldest on record in the Long Island, N.Y. area. Because of the severe cold, many thought the hard clam industry on Long Island would suffer, but a recent study shows the winter was not as harmful to hard clams as feared.

On the contrary, clams in Great South Bay apparently survived extensive cold and icing very well, reported G. T. Greene and D.S. Becker of the Marine Science Research Center at SUNY/Stony Brook in their report "Winterkill of Hard Clams in Great South Bay, New York 1976-77."

Ironically, they say, the effects of the severe winter may have been beneficial to the clam resources of Great South Bay, because the one and one-half months of ice cover on the Bay brought a halt to clamming on many heavily-exploited clam beds and, in effect, gave the resource the benefits of a closed season.

There is evidence that severe cold has seriously hurt a major clam predator--the blue crab--and that the small percentage of clams that did die over the winter probably were the weakest of the population or perhaps the carriers of diseases and parasites. Thinning out of such unhealthy individuals, they say, may tend to strengthen the general clam population.

One negative, but not serious, effect of the winter, the researchers noted, was that there might be a slight reduction in the growth rates, because clams probably spent much more time in hibernation during the winter and may have started spring growth later than usual.

Ice up to six tenths of a meter thick (0.6) covered most parts of Great South Bay for about a month and a half last winter. In fact, the Bay was completely covered with ice except in the immediate vicinity of Fire Island Inlet where relatively strong tidal currents prevented ice cover.



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When this ice cover began to break up in late February, bay-wide clamming began, and many clambers reported unusually large numbers of dead clams--up to 20 percent--in their catches. In addition, there were reports that harvested clams had shorter shelf lives than usual, causing many to die before reaching the market.

Since winterkill of 20 percent would represent a substantial loss to the hard clam resources, the Greene-Becker study was undertaken to learn if the mortality rate was higher in the Great South Bay.

Greene and Becker sampled 31 stations in parts of the Bay controlled by the Townships of Islip and Brookhaven, where important clamming ground would be represented.

In these areas, the mortality rate was variable--from 0 to 27.2 percent. The majority of the Bay had mortalities ranging from 0-5.7 percent, or an average of 1.6 percent. Researchers noted this was not an unusually high mortality rate. Mortality was high, however, in sections of Patchogue Bay. The highest mortality there was 27.2 percent, with an average of 12.4 percent.

Because the mortality was so high, further sampling was done. Researchers learned that the higher rate could not be attributed only to ice and cold. They noted that the New York Department of Environmental Conservation considers this area polluted and uncertified for shellfishing.

The high mortality rate there could have been caused by some type of toxic contaminants originating from the Patchogue River. Parasite infection itself could have been the cause. (The severe winter could have imposed an atypical and unexpected stress on already weakened host clams, causing them to die.)

Further study of Patchogue Bay showed: mortality was seasonal--occurring over winter but easing after March; mortality increased toward the mouth of the River; dead clams had been infected by some type of parasite; survivors had delayed spring growth and reduced meat weights; recovery was fairly complete as indicated by resumption of growth; and heavy mortality is not a normal occurrence for that area.

Thus, the study on winterkill of hard clams showed that winter mortality of hard clams in Great South Bay was low, except in Patchogue Bay. This probably is attributed to the fact that clams in Great South Bay are not usually affected by four of the five processes which typically affect clams.

First, there are not significant intertidal clam beds in Great South Bay, so the clams there usually are well-sheltered from the severe cold. Second, these clams are not highly susceptible to mechanical action because the beds are not intertidal and because the clam lives beneath the substrate zone. Third, hard clams can easily survive low oxygen and low food conditions caused by icing because their metabolism is extremely low at low temperatures. And fourth, hard clams are not susceptible to silting and burial.

The fifth process does affect them. Apparently, mortality results from stresses which inhibit feeding and respiration and prevent recovery of normal metabolic activity after winter hibernation. Many clambers report that winter mortality of Great South Bay hard clams often occurs at the end of the winter.

The study of winterkill in hard clams also showed that the correlation between shelf life and mortality was negative. Shelf life is the time taken for the first 10 clams from a sample of 30 to die under constant temperature and humidity. Contrary to what they expected, the researchers found that clams from high mortality areas did not have significantly shorter shelf lives.

Further studies are suggested, including a search for the infecting parasite in live clams.

If you want more information on this subject, a complete 21-page report of this study, titled Winterkill of Hard Clams in Great South Bay, N.Y., 1976-77, by G.T. Greene and D.S. Becker, may be ordered from the director of publications, Marine Sciences Research Center, State University of New York, Stony Brook, N.Y. 11794. The price is \$4.00. It may also be ordered from New York Sea Grant Institute, 99 Washington Avenue, Albany, N.Y. 12246.

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