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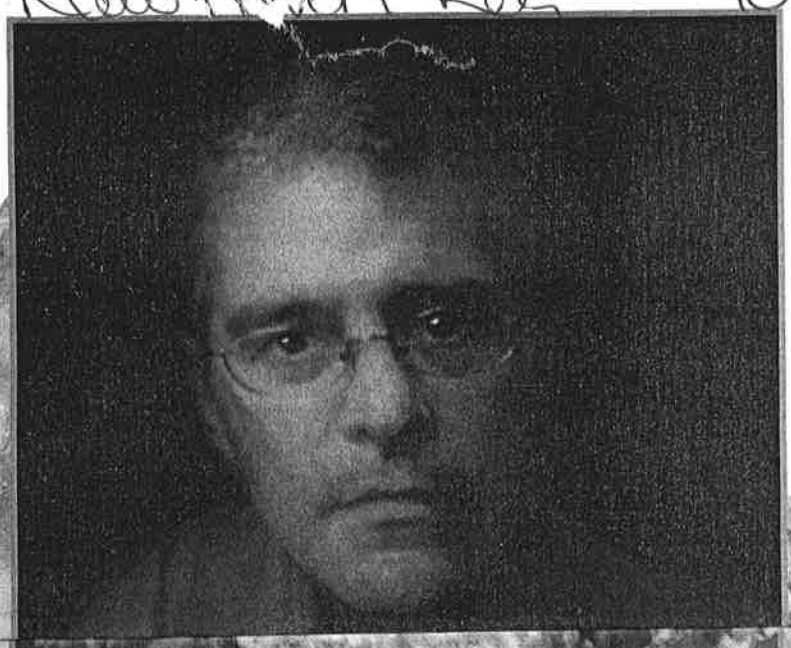

Vincent Breslin of Southern Connecticut State University with some of the oysters that he is studying. Breslin and colleagues plan a comprehensive study of oysters and oyster habitats in Long Island Sound. The measurements of temperature, salinity, currents, bacteria, sediments and other factors will provide a baseline for future studies.

Melanie Stengel/Register

The bottom line on BIVALVES

L.I. Sound study aims to understand all about oysters

By Abram Katz
Register Science Editor

IN 1996, about 1 million bushels of oysters worth $50 million were harvested from Long Island Sound.

By last year, the oyster catch had dropped to less than $10 million, according to the state bureau of aquaculture.

Oyster populations rise and fall for a number of reasons, none of them entirely clear.

When the Sound was cleaner — before fertilizer run off, shoreline development, industrialization and sewage — the mollusks were plentiful.

Biologists want to find out how changes in the estuary have affected the fortunes of oystermen. Connecticut is undertaking a comprehensive assessment of Long Island Sound with the aim of finding ways aid recovery, locating good locations for new oyster beds and, essentially, determining the character and quality of the Sound.

Vincent T. Breslin, professor of environmental studies and marine studies at Southern Connecticut State University, is coordinating the project, which is being paid for with a 1-year grant of $278,000 from the state Department of Agriculture.

At issue is the health and well-being of the eastern oyster, *Crassostrea virginica*, a bivalve that native Americans consumed long before Europeans arrived in the Northeast in the 17th century.

Like all oysters, the eastern oyster is a filter feeder, meaning that it strains water for plankton and whatever is floating by, and then expels the water. One oyster can filter up to 48 gallons of water in 24 hours.

This characteristic allows oysters to rid themselves of various bacteria and pollutants when placed in clean water.

Oysters produce larvae, which must cling to hard surfaces — ideally, other oyster shells.

While scientists have studied various aspects of the Sound and its bivalve population piecemeal, the current study is intended to provide an all-inclusive record of currents, salinity, pollution, invasive species, sediment, temperature, microorganism populations and other factors to be a base for future studies, Breslin said.

Breslin has drawn colleagues from SCSU, Central Connecticut State University, Western Connecticut State University, Wesleyan University and the Maritime Aquarium in Norwalk.

Breslin said he hopes to have a sample area of Norwalk Harbor to Bridgeport, New Haven Harbor, the lower Housatonic River, Clinton, Westbrook and Groton.

Among the basic questions is the variation in the quality of oysters from west to east in the Sound, near the shore and away from the shore.

Other objectives are evaluation of the metals buried in sediment at different sampling sites and recording sediment size and type. Finer sediment tends to hold onto metals with greater tenacity.

Water quality is a large issue. Sewage treatment plants empty into the Sound or into rivers that feed it. Coliform bacteria is a clear marker for human waste, and is not a good thing to find in oysters, Breslin said.

Rain washes fertilizer into the Sound. Algae takes advantage of the nutrients and large masses of it bloom. The algae is unable to sustain itself, however, so it dies, sinks to the bottom and decays.

Decay draws oxygen from the water, creating a stressful condition called hypoxia, which can suffocate marine life. Breslin said scientists want to determine the effects of hypoxia on oyster larvae.

"Connecticut has a long oyster history. It declined because of dredging, development, sewage and parasitic diseases," Breslin said.

"They have led to a general decline. Connecticut has 70,000 acres of leased bottom lands for oysters. Success has to do with the quality of the Sound," he said.

"Our interest is maximizing and restoring oysters, and opening up new areas."

While filter feeding allows the oysters to clean themselves of some pathogens and toxins, it also tends to concentrate pollutants.

"We need to improve sewage treatment. We don't want consumers to get oysters with E. Coli or other pathogens," Breslin said.

Water has generally become cleaner over the past two decades, but some pollutants are trapped. Mercury lies covered with sediment, and continues to be released from coal-fired power plants. Polychlorinated biphenyls, once a mainstay of electrical transformers, refrigeration systems and hydraulic equipment, also is entombed in bottom sediment. Like mercury, PCBs resist degradation.

Dredging or a strong storm can stir up sediments and put transient high levels of pollutants such as mercury and PCBs into the water. Consequently, the mercury level in oysters varies by location, weather and a number of other variables.

Breslin said he has used grant money to acquire a $40,000 instrument that can quickly measure mercury levels in oyster tissue. Older methods require time-consuming and complicated chemistry.

Breslin and colleagues also purchased a sediment grain-size analyzer. The old way of measuring grain sizes in a sample of sediment was to sift the material through a series of sieves. The process is slow. The new instrument uses a laser beam and optics to determine the percentages of different sized grains in a sample.

Ultimately, anyone researching oysters will be able to check dozens of sample points in the Sound, using a computer. Each sample site will reveal a wealth of information. The data also will be categorized and cross-linked in a number of ways to suit the different disciplines that are apt to employ the information.

The qualities and problems of Long Island Sound are not unique. Many bodies of water along the Atlantic Coast will likely benefit from the research, Breslin said.

"It's ambitious in its scope. This baseline information is important to be able to see trends over time. We're already analyzing oysters. We know where we're going," Breslin said.

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