Could oysters be used to clean up Chesapeake Bay?

January 21 2011

Chronic water quality problems caused by agricultural and urban runoff, municipal wastewater, and atmospheric deposition from the burning of fossil fuels leads to oxygen depletion, loss of biodiversity, and harmful algal blooms. This nutrient pollution is prevalent in many coastal marine and estuarine ecosystems worldwide. Chesapeake Bay is the largest estuary in North America and although many efforts have been taken to improve its water quality, nutrient pollution still keeps it at unacceptable levels.

In a study funded by the U.S. Environmental Protection Administration and administered by the National Fish and Wildlife Foundation, biologists at Virginia Commonwealth University measured the nutrient removal capacity of the Eastern oyster, *Crassostrea virginica*.

Researchers found that an additional 2.5 cm of growth allowed a farmed oyster to remove 2.2 times the nutrients of a regular oyster. In fact, a large scale oyster farm harvesting 1 million of these 76 mm oysters can remove 132 kg of nitrogen, 19 kg of phosphorus, and 3,823 kg of carbon. The full study is available in the January/February 2011 issue of the Journal of Environmental Quality.

Oysters were a novel yet obvious choice to enhance the ecosystem's water quality. They process nutrients while feeding on phytoplankton and then store the nutrients in their shells and tissue through a process known as bioassimilation. Although Chesapeake Bay is a natural habitat for the Eastern oyster, 99% of the native population has been lost. This

prompted researchers to explore the use of commercial oyster farms.

Oysters were raised at two commercial-scale aquaculture sites in Chesapeake Bay as well as a site in Maryland and one in Virginia to represent two typical cultivation environments in the Bay. The nutrient contents of the tissues and shells of oysters of various sizes were measured.

According to Colleen Higgins of Virginia Commonwealth University, "Based on these results, it would take eight large-scale oyster farms harvesting one million (of these) 76 mm oysters per year to remove one ton of nitrogen from the Bay, providing managers with the ability to determine the practical implication of such an ecosystem service."

More information: View the abstract at www.agronomy.org/publications/ … q/abstracts/40/1/271

Provided by American Society of Agronomy