

What's a Clam Worth?

Greenwich wants to know.

Mark S. Dixon, Julie M. Rose, Anthony Dvarskas, Roger Bowgen, Gary H. Wikfors.

What's a clam worth?

This seemingly simple question may actually be more interesting and complex than expected. Historically we have valued clams as currency, traded them as a commodity, and even assigned a dollar equivalency through vernacular slang.

The clam in question is the northern quahog, *Mercenaria mercenaria*; or as we call it locally, the hard clam. It is a commercially important species found along the entire east coast of the United States, living in the seafloor of shallow bays and estuaries. Clams and other shellfish filter phytoplankton and other small particles out of the water as they feed and breathe, leaving behind an environment that is cleaner and clearer.

Now a group of scientists from the NOAA National Marine Fisheries Service lab in Milford Connecticut, Roger Bowgen from the Town of Greenwich Shellfish Commission, and Anthony Dvarskas, an environmental economist at Stony Brook University, are conducting a study to determine the overall economic value of clams to this coastal community. Their goal is to answer: What is the total dollar value of the commercial and recreational harvest of clams to the Town of Greenwich? What is the ecological value of the water quality improvements that the town's clam population provides and how does that translate into a dollar value?

Clam Commercial and Recreational Harvest

Commercial harvesters and aquaculturists harvest clams as part of a business model. The clams are sold as commodities, much like any produce. The value of commercially harvested clams relies heavily upon consumer confidence in the product and in water quality, and the cachet associated with a local product.

Recreational harvesters can purchase a permit to gather clams, under strictly controlled circumstances, for personal consumption. The perceptions of good water quality and pride in the shellfish heritage in Greenwich play important roles in residents' appreciation for, and participation in, recreational harvest.

Both manners of harvest generate direct and ancillary income for the town and support the local economy. Commercial harvesters pay lease fees to the town for their grounds, pay taxes, own or lease a land-based facility, and pay dock fees. They consume fuel, maintain vessels and equipment, employ workers, and buy equipment and supplies. Commercial harvesters are also earning a living and supporting families in the community. Recreational harvesters buy permits from the town and support local business by buying equipment and supplies.

Commercial harvesters have access to over 1200 acres available to lease from the Town of Greenwich and almost 4000 acres in state waters. Recreational harvesters can access



A group of NOAA scientists and members of the Town of Greenwich Shellfish Commission survey recreational shellfish grounds in Greenwich Connecticut. This was an important part of the process of planning and organizing several research projects with the goal of determining the value of shellfish resources to the coastal community. Photo: Mark Dixon

660 acres of public grounds via the shoreline.

Most of these dollars can be tracked directly and often are part of the public record. Some of the ancillary benefits are more difficult to estimate. One aim of the project is to assist the Greenwich Shellfish Commission and resource economists in quantifying the direct and indirect financial benefits that the town gains from its commercial and recreational clambers.

FUN FACT: Greenwich sells approximately 250 recreational shellfish permits every year

Ecosystem Services

The term “ecosystem services” refers to the suite of physical, chemical, and biological benefits provided by healthy shellfish resources in estuaries and coastal waters. These include, but are not limited to: creating habitat for fish, barnacles, seaweed, and other marine organisms; stabilizing shorelines and sediment; improving water clarity by filtering particles from the water; linking life on the seafloor with food from the water above, and removing excess nitrogen and other nutrients from the water (an article on shellfish ecosystems services was featured in the spring/summer 2014 edition of *Wrack Lines*).

As part of this project, NOAA scientists measured two of these ecosystem services provided by clams in Greenwich during summer 2015. First, they examined the type and quantity of clam food and other particles in Greenwich waters and then measured how much material clams removed from local waters. Results showed that the water in Greenwich is highly suitable for supporting clams and other shellfish; and that the clams are effective filterers that help to “clear” the waters. Second, by adding some chemistry to the clam experiments, scientists also measured

the amount of nitrogen that clams removed from Greenwich waters. Nitrogen is an essential nutrient for living organisms; however, many coastal areas have become overloaded with nitrogen from land sources such as fertilizers and wastewater treatment plants. Excess nitrogen can lead to a range of environmental problems, such as the overgrowth of seaweeds, algal blooms, and fish kills. Shellfish consume lots of this nitrogen by feeding on plankton and when harvested, the nitrogen is effectively removed from the system. Results indicated that clams are removing a great deal of nitrogen from Greenwich waters, which improves water quality. The second aim of this project is to put a dollar value on this service the clams provide to the ecosystem.

FUN FACT: Hard clams can live for 40 years

Socioeconomic Benefits

This research project will also examine the connection between water quality in Greenwich and the value locals place on their coastal resources. Ecosystem services often are described as the benefits that nature provides “at no charge” to humans. These include clean water for swimming, clean fish for consumption, and aesthetic benefits associated with a water view, among others. Professor Anthony Dvarskas, an environmental economist at Stony Brook University, is working to identify the human beneficiaries of the ecosystem services provided by clams in Greenwich and surrounding communities. Beneficiaries may include recreational users who appreciate being able to harvest a bucket of clams; homeowners who benefit from residing near water that is clearer because of filtration of water by shellfish, and shellfishing businesses who rely on

good water quality as a part of their business plans.

By having a fuller understanding of the number of beneficiaries, the researchers can calculate the potential value associated with ecosystem services such as nitrogen reduction and improved water clarity attributable to clam filtration. The results will help inform planning and management decisions by local, state, and federal stakeholders. The lessons learned from the work being conducted in Greenwich can be replicated in other communities along the Connecticut shoreline.

FUN FACT: Clams are marketed by size, with names like Littlenecks, Cherrystones, Topnecks and Chowders

What's Next

This work is a pilot study to develop an approach that can be used in other towns around the country, and with other species besides clams. The Town of Greenwich Shellfish Commission plans to incorporate the results of the ecological and socioeconomic research described above into ongoing educational programs with schools and the public. They will also share the results with Town of Greenwich officials in other departments so that land-based planning decisions consider potential impacts to shellfisheries. Additionally, the shellfish commission plans to host a presentation of the results to the public at the Bruce Museum (Greenwich, Connecticut) later this year.

Because of the value of ecosystem services a clam in the sand may be worth as much as one in the hand.

ABOUT THE AUTHORS:

Mark Dixon, Julie Rose, and Gary Wikfors are researchers at the NOAA Fisheries Laboratory in Milford, Connecticut. Anthony Dvarskas is a professor and environmental economist at Stony Brook University. Roger Bowgen is Chair of the Greenwich Shellfish Commission.



Clams are sorted from other shellfish and sea creatures, and sediment and rocks as they come aboard a commercial clam boat plying the waters off Greenwich, Connecticut. The clams will be cleaned, sorted by size, and bagged for market. Photo: Julie Rose