



Chesapeake Bay Program
A Watershed Partnership

Backgrounder

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Due to dramatic declines in the number of oysters living in the Chesapeake Bay and the seafood industry's eagerness to restore a viable local fishery, Bay region scientists and resource managers are exploring the idea of introducing a non-native oyster species into the Bay's waters.

Over the past century, harvests of the Bay's native oyster, *Crassostrea virginica* or the Eastern oyster, have declined from more than 33 million pounds annually in the 1950s to 1.47 million pounds in 2001.

While Chesapeake Bay Program partners continue their work to restore native oysters, efforts are also underway to better understand the risks and benefits surrounding the possible introduction of non-native oysters into the Bay.

Non-native Oysters and the Chesapeake Bay

In hopes of reversing declining populations of native oysters, the Bay states and the federal government are working with researchers to develop innovative restoration programs aimed at returning abundant native oyster populations to the Bay. As recently as July 2003, Bay Program partners re-affirmed their *Chesapeake 2000* commitment to a ten-fold increase in the number of restore native oysters in the Bay.



With native Chesapeake Bay oyster populations about one percent of historic records, researchers are exploring the introduction of *Crassostrea ariakensis* (above) into the Bay's waters.

While most of the historic decline of Chesapeake Bay oyster population is attributed to habitat degradation and overharvest, two diseases - Dermo and MSX - are considered the leading cause of native oyster mortality.

Dermo and MSX were first discovered in the Eastern oyster in the 1950s. While the effects of MSX and Dermo are most acute in higher salinity waters found in the lower portion of the Bay, both diseases have expanded into less saline waters further up the Bay. Scientists believe MSX was inadvertently introduced to the Chesapeake through the importation of a non-native oyster, *Crassostrea gigas*, in the 1930s.

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Introducing Non-Native Oysters into the Bay

In hopes of reestablishing a Virginia commercial oyster industry, in 1995, the Virginia legislature directed the Virginia Institute of Marine Science (VIMS) to begin a study on non-native oyster species for possible introduction to the Chesapeake Bay.

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VIMS first studied *C. gigas*, a popular and widely cultivated non-native oyster. The studies used oysters in a triploid, or non-reproductive, form. The *gigas* results were unimpressive, showing inferior growth and survival in lower salinities compared to the native oyster.

Introducing *Ariakenis*, the Suminoe Oyster

Once researchers determined *gigas* unsuitable for Bay waters, efforts began to focus on an Asian Suminoe oyster, *C. ariakensis*. In limited field trials, the Suminoe oyster demonstrated lower mortality from Dermo and MSX, hearty and rapid growth, and success in taste tests. Researchers found Suminoe oysters grow to market size in only nine months as opposed to two years for the native *virginica*. This has resulted in increased pressure from the seafood industry to adopt the non-native alternative.

As of August 2003, approximately 60,000 triploid Suminoe oysters have been tested in the Bay. The Virginia Seafood Council has received permits to initiate industry trials with one million triploid Suminoe oysters.

Due to the possibility of oysters reverting to diploid, or reproductive form, some scientists and managers are concerned that the proposed industry trials could result in establishing a free-living reproductive Suminoe population in the Bay.

Such a non-native introduction could be an irreversible action, and some are concerned that it could significantly affect the health of the Bay ecosystem. Because of this concern, federal and state permits for the Virginia Seafood Council trials imposed strict bio-security and monitoring requirements.

What's at Stake?

Within the Bay community, there is an ongoing debate among those supporting immediate *ariakensis* introduction and those advocating further research before making a decision about introducing the species to the Bay.

Some stakeholders, including the Virginia Seafood Council and some Maryland and Virginia watermen,

view the Suminoe oyster as a promising solution to several problems, and strongly urge widespread introduction of sterile – or possibly even fertile – Suminoe oysters. Their view is that the Suminoe oyster could serve to revitalize the industry as well as provide the means for improved water quality through increased bio-filtration. Other potential benefits include a reduction of fishing pressure on the native oyster and the creation of hard substrate for further oyster attachment and reef development.

Other stakeholders believe that a non-native species introduction needs to be approached with a high level of caution. Many are concerned about the species' disease-harboring capabilities including possible pathogens that could harm native populations of aquatic plants and animals. Others are concerned about food web effects that could alter benthic communities and ecosystems, while competition and reproductive interference with the native oyster may create additional pressures on already low *virginica* populations.

The National Research Council Study

The National Research Council's National Academy of Sciences recently completed a year-long study to evaluate whether enough is known about the biology of *ariakensis* to effectively assess these benefits or risks at this time.

The study represents the most complete analysis to date of available literature and science pertaining to the possible introduction of non-native oysters into Chesapeake Bay. It will serve as the basis for both near- and long-term management strategies affecting the future of non-native oysters in the Chesapeake. Its findings will guide new research, establish risk assessment needs and form a significant component of a planned Environmental Impact Statement regarding the possible introduction of the Suminoe oyster.

The \$315,000 study was funded by the U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, the states of Maryland and Virginia, the National Fish and Wildlife Foundation and the Maryland, Virginia and Connecticut Sea Grant programs.