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Subcommittee on Fisheries Conservation, Wildlife and Oceans

Oversight Hearings on the Efforts to Introduce Non-Native Oyster Species to the Chesapeake Bay

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Testimony By:

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Oysters are keystone contributors to the ecological health of the Chesapeake Bay and barrier island/lagoon system of Virginia. They also have been extremely important to the health of the economy of the Commonwealth, as they have provided livelihoods for untold numbers of Virginians, especially in rural, bayshore communities. In the 1890s, because of the significant economic value, the Commonwealth of Virginia surveyed and set aside more than 200,000 acres of oyster ground for public use. The remaining areas of bay bottom are available for private lease and have been in continuous use for private oyster production, for more than a century.

Oyster production in Virginia has declined dramatically, since the turn of the century, owing to several factors. From 1880

through the 1920's, the decline in harvest was directly related to harvesting activities. The value of the harvested shell, as a building commodity on land resulted in lost reef volume, as the reef shells were not returned to the bay. These activities resulted in a significant decline in oyster populations. Oyster restoration began when the Commission of Fisheries (currently the Virginia Marine Resources Commission) and the private oyster industry in Virginia started returning harvested shells to the oyster "rocks" or reefs in the late 1920's. At that time, the value of the shell as a building material had declined, due to the availability of quarry stone and a better highway transportation system to the bayshore communities. As shells were returned to the oyster rocks, oyster production actually increased significantly between the late 1920's and the late 1950's. Oyster management and private oyster husbandry, maintained and increased oyster production and Virginia became a worldwide leader in oyster production.

In the late 1950's, a new oyster disease was introduced to the Delaware and Chesapeake Bays, and this disease caused a rapid, and sustained decline in oyster production and population levels to the lowest point that currently exists in Virginia's waters. The newly introduced disease called MSX, in combination with the native disease called DERMO, have totally decimated the oyster industry and have reduced current population levels of oysters in Virginia to less than one half of one percent of levels only 45 years ago. The small oyster processing industry that remains in the Commonwealth survives almost exclusively from the processing of imported oyster shellstock. The industry remains at a competitive disadvantage in the marketplace, due to the costs of importation, and more oyster shucking houses close with each passing year. There were more than 400 shucking houses in Virginia in the late 1950's, while currently no more than 15 still continue any significant amount of shucking activity.

The Virginia Marine Resources Commission (VMRC) and the Virginia Institute of Marine Science (VIMS) have implemented countless strategies, research projects, and restoration programs to combat the disease-

induced decline in oyster populations since the 1950's. The private oyster industry has invested and lost many millions of dollars, using various strategies to grow oysters within the disease dominated conditions in the Bay. Private investment has mostly been suspended because of the inherent risks and losses. State restoration activities have continued throughout the decline and have included the best science and management strategies that were available at any give time. The oyster restoration effort has been especially ambitious since the early 1990s, with a combination of 3-dimensional (3-D) oyster reef reconstruction projects, the setting aside of large acreages of sanctuary areas, the strict control of wild oyster harvest, and the implementation of a quantitative, statistically sound oyster monitoring program.

The 3-D oyster reef restoration and sanctuary program implemented by VMRC has become the model for baywide oyster restoration efforts. These 3-D reef restoration sites duplicate oysters reefs that were observed prior to any significant harvesting activities. These constructed reefs improve juvenile oyster survival (resulting in improved spatset), allow oysters to grow faster (resulting in improved fecundity or reproductive capacity), and physically position oysters in the most optimal configuration for spawning success (resulting from improved fertilization rates). Broodstock oyster populations on these reefs have been allowed either to develop naturally, or, in many cases, have been augmented with genetically selected oyster broodstock. Since there has been baywide consensus that the restoration of 3-D reef structures and the establishment of oyster sanctuaries throughout the Bay is the best way to achieve the Chesapeake Bay 2002 goal of a 10-fold increase in native oyster populations by 2010, there has been an extremely significant influx of State, federal, and private monies to rebuild these reefs in Virginia. Since 1993, more than 70 of these

reefs have been constructed throughout the Bay. The significant outlay of money and effort to rebuild oyster reefs has not increased oyster populations in the Bay or provided any increase in the associated and direly needed oyster harvest in the Commonwealth. Since the reef restoration effort began in 1993, the standing

stock of oysters in Virginia's portion of the Bay has actually decreased by almost 60 percent. Oyster diseases still dominate oyster survival, as can be seen from the monitoring results from all of the restored reefs.

Newly-constructed reefs are rapidly populated by oysters, and the oysters grow very fast for the first one to 2 years, but most oysters, even on the ideally constructed reefs, succumb to disease within 2 to 4 years. The very expensive, constructed, 3-D reefs lose their value as clean, oyster habitat, as the oysters die off on the reefs, and quickly return to the background population levels of the surrounding, unrestored areas.

Significant efforts by research institutions, such as the Virginia Institute of Marine Science, have been made to understand oyster diseases and selectively breed disease tolerant native oysters. After more than forty years, MSX is still poorly understood, especially its method of transmission from oyster to oyster, and there is no dependable selected strain of genetically improved, disease tolerant oysters that can sustain a commercial aquaculture industry in Virginia. Some progress has been made in disease "tolerance", but the risks remain too great to entice significant private investment. To date, the selected, genetic improvement in disease tolerance does not appear to transfer into wild populations of oysters.

In the late 1980s, Virginia began discussing a non-native oyster introduction, as possibly the only strategy to counteract the impacts of disease on native oyster populations and as a way to save the associated, valuable industry. The process of considering a non-native introduction has been slow and deliberate, with much input from private industry, research institutions, and governmental entities. International protocols for the testing of non-native aquatic species have been followed during this time period. Introduced broodstock has been quarantined during all projects, and only sterilized oysters have been tested in the waters of the Commonwealth. The earliest tests were always conducted under research protocols by VIMS. The Pacific oyster (Crassostrea gigas), the most widely used and introduced oyster in the world, has been tested and found not acceptable in the Chesapeake Bay, in both performance and industry acceptance. In the late 1990s, another closely related and similar looking species called the Suminoe or Chinese oyster (Crassostrea ariakensis) was tested in Virginia's portion of the Chesapeake Bay and coastal bays. Research results were very good, with this oyster exhibiting significant resistance to disease and exceptional growth rates, at a number of sites. Taste tests for the oyster were also very positive.

Based on these results, the Virginia Seafood Council petitioned the Virginia Marine Resources Commission in 1999 to allow industry tests with the Suminoe oysters using very controlled methods. The first tests involved a direct, “on-bottom” comparison between the Suminoe oyster and the native oyster at 6 locations. All of the oysters were triploid (sterile) and contained within bags and cages. In low, mid, and high salinity areas, C. ariakensis grew to market size faster than the native oysters (most of the native oysters never reached market size), with most of the oysters reaching market size in one year or less.

Only 600 oysters were grown at each of the six sites in this project, and the results were so positive that a second, larger growout project was requested in 2000. In the second Virginia Seafood Council trial, 60,000 triploid (sterile) oysters were deployed by various methods at 10 sites throughout Virginia's portion of the Bay and coastal bays. This test was designed specifically to evaluate market acceptance of the new oysters by the industry participants. Growth rates were exceptional again. There was no evidence of any significant mortality, and the consumers found the oyster very acceptable as a food product. With the poor condition of our native oyster in the Bay, bushels often shuck less than 5 pints of oyster meat. In the winter local oysters can shuck up to 10 pints per bushel. The Suminoe oyster consistently shucked more than 12 to 13 pints per bushel, so the attractiveness to the industry cannot be overstated.

Concurrent with the exceptional results with the non-native oyster were the disappointing results with the native oyster. Imported shellstock from the northeast and Maryland has been unavailable because of poor oyster survival. Competition in Virginia markets from west coast oyster imports is much more severe than previously, as local Bay shellstock has become unavailable and many long held accounts have been lost by the local industry. Processors from the Gulf Coast States have become more competitive, as they have been processing more oysters locally and taking markets away from the Chesapeake Bay industry. The processors in Virginia's portion of the Bay must import shellstock, with all of the attendant transportation costs, and compete with oyster producers nationwide. The combination of the dire situation of a continued lack of local shellstock and the impressive results with the non-native oyster trials have resulted in a desperate situation for the remaining industry and its need to move this project along as quickly as possible.

The Virginia Seafood Council has continued with requests to test C. ariakensis with a proposal to use 1,000,000 triploid oysters in the current project. This appears to be a large project; however, this quantity of oysters is used by one moderately large shucking house in a single week. This project, now underway, triggered the review process that has led to this hearing and triggered the National Academy of Sciences study that was completed this summer. An exhaustive State and federal review has resulted in significant modifications to the originally proposed project. The Virginia Seafood Council has been persistent in moving this project forward and has made modifications and coped with the associated delays. The National Academy of Sciences review has supported the conservative direction of the studies using the sterile triploid, non-native oyster that have been approved by VMRC and other federal agencies.

The VMRC is monitoring the current project closely. All future project requests will require VMRC regulatory approval, as well as approval from the Army Corps of Engineers. The process of completing an Environmental Impact Statement (EIS) is beginning, and VMRC will be an active participant in that effort. It is critically important to the survival of the beleaguered oyster industry to move this process as quickly as possible. Congress can be instrumental to the success of these efforts, by fully funding the EIS process, to allow all of the projects to occur simultaneously and quickly. It is also important that non-native oyster species be exempted from House Bill 1080, the National Aquatic Invasive Species Act, so that no unnecessary regulatory hurdles are added to the process.

Currently, nearly all the important functions of the oyster in the Chesapeake Bay are either lost or severely diminished. Oysters are critically important in their ability to filter the Bay's waters, to provide a complex habitat for other species in the Bay, and to provide a sustainable, economically viable product for an historic industry. All available resources that Congress can apply to this effort are immensely important to the citizens of the Commonwealth of Virginia.