Chesapeake Bay Oyster Aquaculture

Types of Oysters on the Bay
Native and imported species of oyster have been considered for aquaculture in the Chesapeake Bay.

Crassostrea virginica — The Eastern Oyster is native to the U.S. where it has been fished and farmed from the North Atlantic down to the Gulf of Mexico. Disease epidemics of MSX and Dermo began devastating oyster stocks in Delaware Bay and the southern Chesapeake Bay in the late 1950s. New disease outbreaks in the 1980s reduced harvests from fishing and farming to all-time lows and raised interest in introducing a non-native oyster.


Crassostrea gigas — This Japanese and Korean species has been renamed the Pacific oyster and transplanted for aquaculture to a number of countries, including the West Coast of the U.S., Canada and Mexico, the British Isles, France, Portugal, Australia, and New Zealand. The species was rejected for use in Maryland in 1932. Starting in 1993, gigas was tested in Virginia waters before also being rejected in 1998.


The Chinese Suminoe oyster, native to coastal China, was also evaluated for introduction into the Chesapeake. After laboratory experiments and field trials with sterile triploids, the species was rejected in April 2009, ending a long-time interest in using a foreign oyster to replace or supplement the native virginica oyster.

[http://ww2.mdsg.umd.edu/CQ/V09N2/main2/]
History of Upper Chesapeake Bay Oyster Fishing

In some years of the late 1800's, Chesapeake Bay, which encompasses the States of Maryland and Virginia, produced nearly 20 million bushels of eastern oysters, about 60% of North America's oyster production. Maryland produced somewhat more than Virginia, and its oyster industry then had a value of 17% of the total fisheries products of the United States and employed 20% of the people involved in U.S. fisheries. The Maryland oyster fishery was the most extensive and valuable oyster fishery in the world. It also affected many people in the state. Probably no state in the union has for its area so great an inland water-surface as Maryland. Of the twenty-three counties in the state, the oyster fishery is prosecuted from eleven, in which, because of the innumerable tributaries of the Chesapeake extending into land, there are few localities removed a greater distance than 6 miles (9.5 km) from navigable water, thus bringing all the residents into close contact with the fisheries.

Maryland's oyster grounds in the upper Chesapeake Bay, most of which have been maintained as public, have included the Potomac and Patuxent Rivers on the western shore and the Chester River, Eastern Bay, Choptank River, and Tangier Sound on the eastern shore. Vast natural beds of oysters apparently were present in them in colonial times. Water salinities where nearly all Maryland oyster beds occur are below 15%, except in periods of extreme drought. The tidal range is about 60 cm.

In the early 1800's dugout canoes, which originally had been used by Native Americans, were almost the only type of tonging boat used. By the late 1800's, boats used for tonging included skiffs, bateaux, and large log canoes, all under sail. (A dugout canoe was made from one large-diameter log, whereas a log canoe was made of from two to seven smaller logs joined together edgewise). The dredging vessels ranged from small two-man boats to schooners 23 m long and included pungies, bugeyes, and sloops. Pungies were first used in the oyster industry in the 1840's. They had a large keel and two raked masts. By the 1880's, bugeyes became the most important dredging vessels. In the late 1800's, the first skipjacks (i.e., vessels with one mast and a V-bottom) were built for dredging oysters. Cheaper to construct and more economical to operate, they eventually replaced the
pungies and bugeyes. Power hoists, driven by gasoline engines, replaced the manual winders beginning in 1906.

The first records of hand tongs being used for harvesting oysters in Maryland was in the early 1700's. In 1887, patent tongs came into use to harvest oysters in waters too deep for hand tongs. In the early 1800's, oyster dredging began, and it soon took place on all Maryland grounds, except those the state had reserved for tonging.

Around 1900, in terms of quantities of oysters landed, Baltimore ranked first not only in Maryland but in the nation as well. The city was close to the oyster grounds and had good transportation facilities. During the oyster seasons, railroads shipped many cars daily, loaded entirely with shucked oysters throughout the Midwest.

[http://spo.nwr.noaa.gov/mfr584/mfr5841.pdf]

**On the Brink: Chesapeake’s Native Oysters**

Oyster reefs were once such a dominant feature in the Chesapeake Bay that visitors described them as both a wonder and a physical hazard. During a 1608 voyage of exploration, Captain John Smith wrote that the oysters “lay as thick as stones” in the Bay. “The abundance of oysters is incredible,” wrote the Swiss nobleman Francis Louis Michel in 1701. “There are whole banks of them, so that the ships must avoid them. A sloop, which was to land us at Kings Creek, struck an oyster bed, where we had to wait about two hours for the tide. They surpass those in England by far in size, indeed they are four times as large.”

After the Civil War, the invention of canning machines allowed oysters to be transported long distances by railroad without spoiling. This triggered explosive growth of the Chesapeake’s oyster-harvesting industry, which became the largest in the world by the late 19th century. Whole towns, such as Crisfield on Maryland’s Eastern Shore, grew from oystering, and were built upon the mountains of shells produced by shucking houses. But technology cut both ways for the Chesapeake Bay. The introduction of dredges—steel basket-like devices dragged across the bottom—and other destructive
harvesting techniques\textsuperscript{5} ripped out about three quarters of the Bay’s oyster reefs between 1860 and 1920.\textsuperscript{6} The peak of the shellfish harvest came in the 1880s, when about 50,000 oystermen\textsuperscript{7} were working the Bay, pulling out about 120 million pounds of oyster meat a year (or about 17 million bushels).\textsuperscript{8} Maryland’s oyster commissioner at the time, Dr. William K. Brooks, foresaw the precipitous decline that was to follow, and raised alarms about overharvesting. “Everywhere, in France, in Germany, in England, in Canada, and in all northern coast states [of the U.S.] history tells the same story. In all waters where oysters are found at all they are usually found in abundance, and in all of these places the residents supposed that their natural beds were inexhaustible until they suddenly found that they were exhausted,” Dr. Brooks wrote in 1891. “Our present system can have only one result—extermination.”\textsuperscript{9} The calls by Dr. Brooks and other scientists for oyster sanctuaries, limits on catches, and a shift to oyster farming were ignored, as legislators repeatedly bowed to an influential vocal minority of watermen who fought regulation, according to a history of oyster management.\textsuperscript{10}
Three-quarters of the Bay’s oyster reefs were removed between the Civil War and the 1920s, leaving huge mounds of shells like this [http://hdl.loc.gov/loc.pnp/det.4a23103]

Oyster harvests tumbled by two-thirds between the 1890s and 1930, but then remained relatively stable at a lower level until the 1950s. Then a pair of diseases hit. MSX and
Dermo are both caused by parasites that attack and frequently kill oysters, although they are harmless to people.\textsuperscript{12} Compounded by continued overharvesting and pollution, these diseases devastated oyster populations in the Chesapeake. The losses to disease were especially severe in the 1980s, and have tended to be worse in Virginia than in Maryland because both parasites thrive in the saltier waters of the Southern Bay. But Maryland has also suffered, with oyster reefs in this state’s portion of the Bay declining by about 80 percent in the last 25 years alone. During this time period, oyster harvests have fallen by 90 percent and the number of oystermen has plummeted by 75 percent.\textsuperscript{13} Harvests across the Bay today have fallen to less than one percent of their historic highs in the late 19th century.\textsuperscript{14}

In 2009, there are only about 1,000 people\textsuperscript{15} in Maryland and Virginia with oyster harvesting licenses—roughly two percent the number of oystermen in the late 19th century. And many of those who have oyster licenses today are no longer active.\textsuperscript{16}
A brief history of oysters in the Chesapeake Bay
June 03, 2014 by Kit Waskom Pollard, For The Baltimore Sun

2500 B.C.: The earliest evidence of oyster harvesting — shell deposits called middens — indicate that people living in the Chesapeake region were eating oysters and other shellfish as long as early as 2,500 B.C.

1600s: Early colonial settlers frequently remark on the size and quantity of oysters in the Chesapeake Bay. Oysters were likely harvested using boats, rakes and by wading into shallow water to simply gather them.

1700s: Around 1700, oyster harvesters began using tongs to retrieve oysters from the water.

Early 1800s: New England fishermen bring dredging equipment to rapidly harvest oysters from the bay.

1820s: Baltimore begins canning oysters. And in 1820, Maryland banned the use of dredging equipment.

1830: Maryland passes legislation allowing only Maryland residents to harvest oysters in local waters.

1839: One of the first oyster harvest estimates indicates that 700,000 bushels were harvested in Maryland in 1839; this number doubled over the next two decades.
1865: Oyster dredging is again legalized in Maryland, and the oyster harvest in Maryland jumped to 5 million bushels.

1880s: Oyster production peaks; estimates range from 14 million to 20 million bushels harvested from the bay each year.

Late 1800s: The "Oyster Wars" begin, with "oyster pirates" and legal watermen in Maryland and Virginia fighting over harvesting rights in the Chesapeake Bay. The disputes will not end until the mid-20th century.

1890s-1900s: New state laws seek to improve some of the poor working conditions in the oyster industry. At the same time, harvests begin to decline as oysters are overfished and the shells are not returned to the water to create new attachment sites.

1950s-1960s: New diseases emerge in the Chesapeake, further damaging the oyster population.

1970s-1990s: After somewhat stabilizing during the late 1960s and 1970s, the oyster population drops again during the 1980s and 1990s. In the mid-1980s, the bay's polluted, low-oxygen "dead zones" are identified.

1993: The Oyster Roundtable — a group of organizations, institutions, elected officials, businesses and individuals in Maryland — is convened to address concerns about the state's oyster population. The result is an action plan for oyster recovery and the founding, in 1994, of the Oyster Recovery Partnership.

1999: A combination of drought and disease starting in 1999 leads to another drastic downturn in Maryland's oyster population.

2009: Oyster farming on leased water bottom is legalized in Maryland.

2010: Maryland passes the Oyster Restoration and Aquaculture Development Plan, designating 24 percent of the oyster habitat in the bay as off-limits for harvesting.
2013: The first harvests of Maryland-farmed oysters become available.


Aquaculture Resource Guide, Maryland Aquaculture
http://extension.umd.edu/sites/extension.umd.edu/files/_images/programs/aquaculture/A
RG%202015%20text.pdf

Chesapeake Bay Oyster Management
http://ww2.mdsg.umd.edu/store/books/mdoysters/

Sixteen Decades of Political Management of the Oyster Fishery in Maryland’s Chesapeake Bay

Reported landings of oysters in Maryland from 1840 to 1980, in millions of bushels [http://ww2.mdsg.umd.edu/store/books/mdoysters/]