

Oyster Gardening on Mobile Bay

The Eastern oyster, *Crassostrea virginica*, is an important species both commercially and ecologically. Oyster harvests in the Gulf of Mexico were 20.6 million pounds in 2008, or 89.0 percent of the total U.S. landings. During the same year in Alabama, 72,776 pounds of oyster meat were harvested at a value of \$243,000. In 2008, Alabama's production of oysters fell 90 percent from 2007 in large part from an influx of the predacious oyster drill, *Stramonita baemastoma*. Higher salinities in Mobile Bay resulting from drought conditions produced an ideal environment for the proliferation of the drills on the commercially harvested oyster beds.

The oyster plays an equally important role in estuarine ecology. Oysters grow naturally in beds. Juvenile oyster larvae settle and permanently affix themselves to adult oyster shells, becoming spat (Figure 1). These beds serve as habitat for an estimated 300 species of vertebrates and invertebrates that help to form the food web of the estuarine ecosystem.



Figure 2. The oyster drill, a snail, is a major predator.



Figure 3. Microcultch for setting single oysters, which are valuable to the half-shell market and research applications



Figure 1. Juvenile oysters set on hard substrate, such as adult oyster shells, and form clumps.

By filtering as much as 4 gallons of water per hour, adult oysters help to remove phytoplankton from the estuarine waters they inhabit. This filtering activity improves the water quality in critical nursery areas where numerous fish and shellfish species undergo crucial developmental stages.

The health of oyster beds varies widely and is subject to both natural and anthropogenic impacts. Oyster drills (Figure 2), taking advantage of the elevated salinities seen in drought years, can significantly reduce oyster populations. Oyster beds can be buried over time by sedimentation from upstream sources or in a single day from a hurricane.

Oyster aquaculture attempts to reduce the variability in the supply for the consumer market. Culture techniques range from planting shell to catching natural oyster larvae, to hanging ropes in deep water to collect larvae, to using intensive culture to produce single oysters for the half shell market. In each method, oyster larvae are collected from the wild or are hatchery spawned, set on a substrate (Figure 3), and the resulting spat are grown to a marketable size.

Oyster Gardening began in the Chesapeake Bay. Borrowing from the aquaculture approach, the Mobile Bay Oyster Gardening Program collects and sets wild and hatchery-spawned oyster larvae, protects the resulting oyster spat in small gardens, grows them for a period of

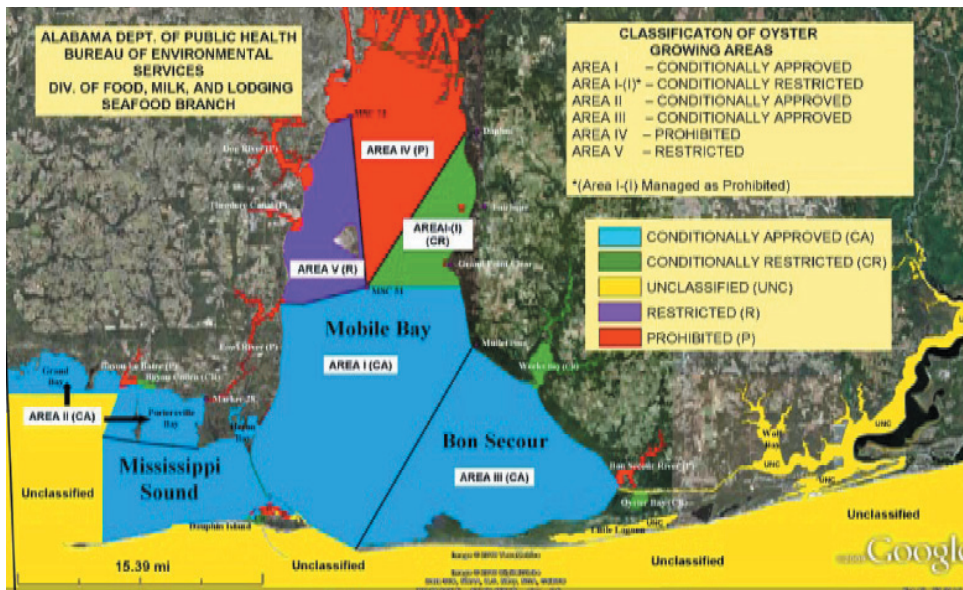


Figure 4. Alabama Department of Public Health classification map of oyster growing areas

time, and returns them to restoration reefs within Mobile Bay.

Like the Chesapeake Bay program, the Mobile Bay program relies upon volunteer Oyster Gardeners from Mobile and Baldwin counties who have wharves located in conditionally open waters as classified by the Alabama Department of Public Health (Figure 4).

Each Oyster Gardener grows oysters in up to four gardens from late June to November. During this time, the juvenile oysters grow from a few millimeters to more than 2 inches. The gardens are suspended from the Oyster Gardener's wharf so they remain off the bottom and away from pilings, increasing the water flow through the cages (Figure 5). Increased water flow brings more food and oxygen while removing wastes and improving the growth rates. Additionally, by keeping the gardens off the bottom and away from pilings, the juvenile oysters are protected from predators including oyster drills. On average, each volunteer grows 250 oysters per garden.

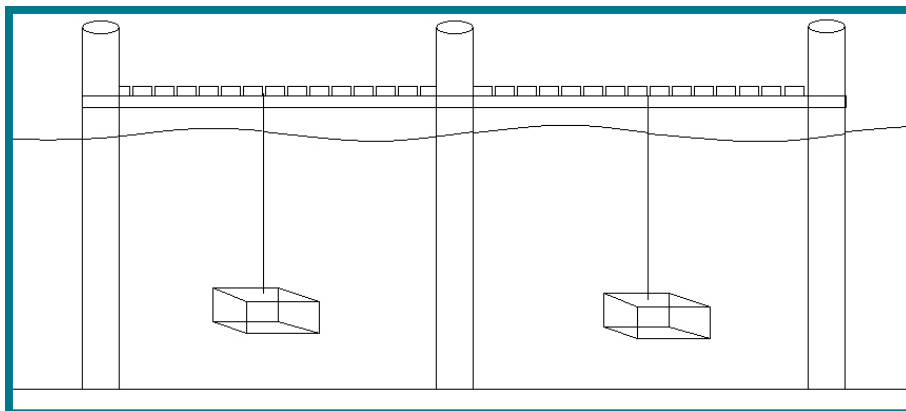


Figure 5. Diagram showing correct placement of oyster gardens. Each is positioned between pilings and off the bottom.

Once a week, Oyster Gardeners pull each of their gardens out of the water and rinse the mud, algae, and any other fouling material from them. A water hose is helpful, but not a requirement. Oyster Gardeners who do not have running water on their wharf can rinse their oysters by rapidly raising and lowering the gardens at the water surface three or four times (Figure 6). After the fouling material has been rinsed from the oysters, Oyster Gardeners visually inspect the gardens for predators including blue crabs, stone crabs, and oyster drills. Any predators are removed, and the gardens are returned to the water until the next week. This weekly maintenance not only enhances the oysters' growth, but also prevents them from growing through the mesh of the garden, which will make them impossible to stock on the restoration reefs. The entire maintenance process for four gardens takes 20 to 30 minutes each week.

Near the end of August, personnel with the Mobile Bay Oyster Gardening Program visit each site to survey the oyster growth. If at this time the oysters have grown rapidly, Extension personnel remove a portion of the oysters to stock on reefs, giving the remaining oysters more room to grow and making the weekly maintenance more effective.

In mid-November, program personnel return to each oyster gardening site, collect the remaining oysters, and stock them on the reefs (Figure 7). The reefs are carefully selected to be outside normally harvested areas. The protection and maintenance the Oyster Gardeners give their oysters allow them to



Figure 6. An oyster garden being washed of fouling materials at the water surface

attain a larger size more rapidly than they would in the wild. This larger size will improve the survival rate, increasing the probability of restoration success.

The Mobile Bay Oyster Gardening Program is always looking for new Oyster Gardeners each spring. Some questions to think about when considering participating in this program include the following:

1. Do you have a wharf or access to a wharf in waters considered conditionally open for shellfish harvesting by the Alabama Department of Public Health? (Figure 4)



Figure 7. Students from Alma Bryant High School stock oysters grown by Oyster Gardeners on restoration reef sites.

2. Are you at the location (or can make arrangements for the necessary maintenance) weekly from June to November?
3. Are you able to spend 20 to 30 minutes a week maintaining the oysters?
4. Will you allow Extension personnel associated with the Oyster Gardening Program to access your wharf periodically to check the growth and condition of the oysters in the gardens during the project?
5. If you cannot garden, consider Adoption. See www.oystergardening.org for details on the Adopt-a Garden options.

If you are interested, please contact the Auburn University Marine Extension and Research Center at (251) 438-5690.



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For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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