

Oysters in Alabama

► Alabama waters contain several of the more than 100 species of oysters found throughout the world. Among those in Alabama, only the Eastern oyster (*Crassostrea virginica*) is commercially important. Oysters, along with mussels and scallops, are among the invertebrates called pelecypods (hatchet foot) that are included in the phylum Mollusca (clams, snails, squids, and octopods).

Biology

Oysters spawn from April through October if the water temperature is 72 degrees F or higher and salinity is above six parts per thousand (ppt). Eggs and sperm are released into the water for fertilization. Females release from 70 million to 170 million eggs. The fertilized eggs develop into a free-swimming larval stage in about 24 hours. After several weeks, the developing shell on larvae becomes too heavy for swimming, and the larvae settle to the bottom. Larval oysters require a clean, hard bottom for attachment and can actually move about on the bottom seeking a good substrate. If good bottom is found, larvae secrete a fluid that cements them permanently to the bottom. Larvae settling out in soft mud or other unsuitable areas usually do not survive. Once settled, the developing oysters can become sexually mature within a month but usually take longer. They can then contribute to another generation of oysters in a very short time. Interestingly, oysters sometimes change sex after spawning. In particular, young males often become egg-producing females.

Oysters eat by filtering food from the surrounding water through their gills. Under ideal conditions, an oyster can pump 5 gallons of water an hour through its filtering apparatus, however, a more conservative estimate of 2 gallons/ hour is generally used to calculate filtration capacity in situ. See the filtration video on the Alabama Extension YouTube channel at <https://www.youtube.com/user/alcoopextensionvideo>. In the wild, Alabama oysters reach harvestable size (3 inches) in about 24 to 30 months. Farmers are able to harvest their oysters at smaller sizes if desired. Generally, Alabama farmers harvest oysters between 2½ and 3 inches. Oysters held in grow-out gear can reach these sizes in 10 to 14 months.

The Environment

Oysters are bound to one spot after they settle and are at the mercy of the water brought to them by currents and tides. When the water is too fresh (less than 10 ppt salinity) for long periods, oysters die. On



the other hand, when salinity is high, oysters are likely to be devastated by oyster drills (snails), crabs, and a tiny parasite called a dermo. Oyster drills alone are capable of killing 85 percent of the young oysters on a reef. Furthermore, oysters can be smothered by sand and silt from dredging operations or extremely heavy storms. Extended periods of low oxygen can also result in localized heavy oyster mortality as they are unable to seek more favorable conditions.

Management

Oyster management can be divided into two areas of concern—public health and conservation. The Alabama Department of Public Health (Seafood Division) and the Department of Conservation and Natural Resources (Marine Resources Division) monitor the waters around oyster reefs. They close the reefs to harvesting when bacterial counts indicate that disease-causing organisms are above acceptable levels. These closures generally coincide with high river flow in winter and early spring, which carries increased pollution into the lower portion of Mobile Bay. Bacteria and other pollutants cause problems for oysters because they are filter feeders and can concentrate harmful substances in their body tissues. Generally, these pollutants do not harm the oysters but make them unfit to eat, especially raw.

Oyster abundance within a harvest area is another factor considered by regulatory officials when opening or closing a particular area.

The Marine Resources Division conserves oysters by requiring licenses, by enforcing a size limit of 3 inches (wild caught), and by allowing only hand or oyster tong harvest on public reefs. The Marine Resources Division also plants oyster shells or clamshells to provide new substrate for oyster larvae to settle on and grow. Large amounts of clamshells or other materials are often planted after natural disasters, and oyster shells are regularly planted to replace shells removed in the harvesting process. Significant opportunities remain for additional shell plantings as resources become available through the Alabama Oyster Shell Recycling Program or similar efforts.

Oyster Measures

Commercial Wild Catch

Unlike many other foods, wild caught oysters are harvested, processed, and sold on the basis of volume rather than weight. Oyster harvesters catch tubs, sacks, and barrels of oysters. Oyster shuckers are paid by the gallon for meat shucked, and consumers buy sacks of whole oysters and gallons, half-gallons, or pints of oyster meat.

Following are the approximate relationships among the different measures.

- A bushel basket or a tub equals 1 sack.
- Four sacks equal 1 barrel.
- An average sack yields about 6 pints of oyster meat, depending on the time of year.
- If oysters are packed 4 sacks to a barrel, a sack should weigh about 60 pounds.

Farm Raised Oysters (Aquaculture)

There are currently three categories of oyster culture in Alabama: commercial (including under piers), oyster gardening, and personal consumption. Commercial oyster culture entails production of oysters with the intent to sell, trade, or barter. For more information, visit www.alaquaculture.com. Oyster gardening is

the non-consumptive culture of oysters for habitat enhancement or ecological benefit. Oysters grown for personal consumption are strictly for the benefit of the individual grower.

Each category carries specific production and regulatory requirements related to oyster culture and harvest. It is important for you to know what these are prior to beginning any oyster production.

Ecological Value

Oyster reefs are becoming widely recognized for their ecological value as well as their economic value. Healthy reefs filter large amounts of water (adults average an estimated 2 gallons/hour), contribute to a reduction in excess nutrients, and provide food and shelter for an estimated 360 species of marine organisms. Highly valued game fish are also often associated with oyster reefs. Additionally, reefs serve as wave breaks, reducing shoreline erosion by dissipating energy rather than reflecting it.

Economic Value

Commercial Wild Catch

During the period between 2010 and 2019, annual commercial, wild oyster landings in Alabama ranged from 26,275 to 295,989 pounds of meat, averaging 107,622 pounds. Similarly, the value of landings (amount paid to fishermen) has varied from \$1.5 million to \$340,000 with an average of \$813,000. During this time, Alabama's oyster aquaculture industry has developed, and contributed additional oysters (reported by the whole piece) and dollars.

Commercial Farm Raised (Aquaculture)

Currently, Alabama's shellfish aquaculture industry produces oysters (*Crassostrea virginica*) through off-bottom farming using an adjustable long-line system and floating cages. An anonymous survey was developed and administered to operators in Alabama to obtain the information in this report. All values are compiled so individual responses are not revealed. In addition, total values are based solely on responses provided and thus are likely underestimated.

The survey was modeled after the shellfish aquaculture survey program conducted by the Virginia Institute of

Marine Science and Virginia Sea Grant as well as the Rutgers University New Jersey Agricultural Experiment Station and New Jersey Sea Grant.

Highlights for 2019

- There were 21 commercial oyster aquaculture operations in Alabama per Alabama Department of Public Health.
- Farm gate value for Alabama oyster commercial operations was at least \$1,452,000.
- Total number of single market oysters sold in 2019 was at least 2,425,000.
- Oyster market prices realized for respondents ranged from \$0.50 to \$0.70 with a weighted average price of \$0.59, and the mode was \$0.50.
- Operators reported 34 full-time employees and 30 part-time employees.
- At least 74 acres were permitted for oyster aquaculture with at least 40 acres used in production.

For more information, see the Alabama Aquaculture Oyster website.

Personal Consumption (On-Pier)

Oysters, which are commonly eaten raw and whole, are very efficient at filtering water for food particles. This feeding practice results in the intake of other particles, including bacteria. Eating oysters with high concentrations of bacteria may pose a health risk to consumers.

In commercial operations, this risk is managed by allowing the harvest of oysters only from waters that the Alabama Department of Public Health (ADPH)

has classified as “conditionally approved” through a nationally recognized sampling process. While this is not required for personal consumption, it is strongly recommended that people follow this guideline and grow oysters for personal consumption only in waters that are conditionally approved and open for harvest (e.g., not closed by ADPH due to high rainfall).

Consumers also should be aware of the risks associated with eating raw oysters, even when harvested from open, conditionally approved waters. There are naturally occurring bacteria called vibrios that may cause adverse health consequences, particularly for immune-compromised individuals. This risk is managed by ensuring that harvested oysters are chilled and kept cold within specific time frames to prevent the vibrios from multiplying and increasing the risk. It is strongly recommended that anyone harvesting oysters for personal consumption be aware of the risk and follow the requirements used for commercial harvest.

Before you begin to raise oysters for personal consumption, you should contact the ADPH to confirm the status of the growing waters where you are located. Additionally, become familiar with the time and temperature requirements for commercial harvest of oysters for live, raw consumption.

The Future

Oysters are a valuable natural resource in Alabama. The industry provides jobs and a large economic benefit to the state. Like all marine resources, oysters depend on good water quality for continued use by man. Good water quality can be maintained by preserving wetlands, by careful planning of dredging activities, and by controlling pollution both in Mobile Bay and in the tributaries that feed the bay.



P. J. Waters, Associate Extension Professor, and **Russell Grice**, Administrator, Outreach Programs, both in Aquatic Resources at Auburn University. Originally written by **R. Wallace**, former Extension Specialist.

For more information, contact your county Extension office. Visit www.aces.edu/directory.

This publication was supported by the U.S. Department of Commerce's National Oceanic and Atmospheric Administration under NOAA Award NA18OAR4170080, the Mississippi-Alabama Sea Grant Consortium, Auburn University, and the Alabama Cooperative Extension System. The views expressed herein do not necessarily reflect the views of any of these organizations. **MASGP-21-024**.

Trade and brand names used in this publication are given for information purposes only. No guarantee, endorsement, or discrimination among comparable products is intended or implied by the Alabama Cooperative Extension System.

The Alabama Cooperative Extension System (Alabama A&M University and Auburn University) is an equal opportunity educator and employer. Everyone is welcome! Please let us know if you have accessibility needs.

Revised May 2021, ANR-0832 © 2021 by the Alabama Cooperative Extension System. All rights reserved.

www.aces.edu