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Introduction

In 2019, the Georgia legislature passed a law providing for commercial oyster farming in the state’s coastal waters. Oyster farming, also known as oyster aquaculture or mariculture, utilizes cages and other gear to grow oysters that are suitable for the half-shell market, and is a growing industry in many coastal states. The Georgia Department of Natural Resources (DNR) Coastal Resources Division (CRD) oversees the oyster farming program. It issues leases for “on-bottom” farms in shallow, intertidal waters and “off-bottom,” floating farms in deeper, subtidal waters. CRD’s program seeks to grow Georgia’s new oyster farming industry in a conscientious way that adds to the state’s economy while protecting other uses of the state’s public coastal waters.

Oyster farming can be a profitable business and fulfilling career, but it is challenging and hard work. It also requires significant startup costs and has a few administrative hurdles farmers must overcome before getting started (leases, permits, etc.). This guide will help cover the basics of getting into the oyster farming business in Georgia, with helpful tips and simple explanations of the more complex processes.

For those interested in beginning a career in oyster farming in Georgia, contacting the Georgia CRD Shellfish and Water Quality Program and UGA Marine Extension and Georgia Sea Grant Shellfish Research Lab before investing time and effort in the process is highly recommended.
I. Farming Oysters in Georgia Waters:

Georgia’s coastal waters are prime growing areas for both wild and farm-raised Eastern oysters, *Crassostrea virginica*. Georgia’s coast is much less developed than other states on the eastern seaboard, resulting in generally healthy water quality. This is a benefit for oyster farmers, because CRD does not need to utilize its authority to close shellfish harvests after rain events due to pollution concerns. Georgia’s waters are also highly productive, with plenty of algae and nutrients for oysters to feed on. Finally, relatively warm average water temperatures mean that oysters here can reach marketable size in 10 to 15 months, significantly faster than oysters in colder northern waters that can take 2 to 3 years to mature.

The oyster farming process can be summarized in a few steps. After obtaining an intertidal or subtidal lease, an oyster farmer purchases suitable gear and installs it at the lease site. The farmer then purchases oyster seed (also called spat) from a hatchery. The seed oysters are placed in cages at the lease to grow, where they are monitored and tended to until they reach a suitable size for harvest and sale. We provide more detail on each of these steps below, first covering the general process and then diving deeper into the differences between intertidal and subtidal leases. The procedures for obtaining a lease are described in Section II.
Gear Selection

The type of oyster gear used will depend on the type of lease: intertidal or subtidal. Intertidal leases utilize gear that rests on the bottom of shallow waters, while subtidal leases use floating gear. For each gear type, there are a number of different options available from commercial manufacturers. Talking with existing oyster farmers, UGA Marine Extension and Georgia Sea Grant aquaculture agents, or manufacturers about the pros and cons of each gear type can be helpful for a beginning farmer. Cost and the effort required to use and maintain the gear will be primary considerations when making a gear selection. Several of the resources listed in Appendix D contain information on gear selection and use.

Acquiring Oyster Seed

Oyster farmers, much like agricultural farmers, need seed (also known as spat) to grow their product. Oyster seed is obtained from hatcheries, which spawn oysters and set the larvae on micro-cultch – tiny pieces of shell or other material that the larvae attach onto to grow – to produce single oyster seed. Currently, there are very few oyster hatcheries in the South Atlantic Bight region (from Cape Hatteras, North Carolina to Cape Canaveral, FL). Georgia has only one hatchery in operation: the UGA Marine Extension and Georgia Sea Grant hatchery located at the Shellfish Research Lab on Skidaway Island.

Most oyster farmers place seed orders in winter and early spring. Oyster seed are sold by size (mm) and ploidy. Most hatcheries sell seed between 1 mm and 6 mm in size. The size purchased depends on whether the oyster farmer has established a nursery where small seed is grown to larger sizes before being placed on the farm. Nurseries can be a FLUPSY (floating upweller system) or a land-based system using upwelling tanks. Both systems need...
access to raw (unfiltered, brackish) water. All hatcheries and nurseries require permits/certifications from the Georgia Department of Natural Resources Coastal Resources Division and the Army Corp of Engineers. Land-based systems may require additional permits from the Georgia Environmental Protection Division for water withdrawal and discharge back into surface waters. Newer farmers may have better success starting out with larger seed sizes, if available, which can be placed at the farm immediately. Larger seed tends to result in lower losses in mesh bags and cages as well as lower mortality rates. Price of seed does, however, increase with seed size.

Ploidy refers to the number of complete sets of chromosomes in a cell; diploid oysters have two sets and can therefore reproduce, while triploid oysters have three sets and are sterile. Many oyster farmers prefer triploid oysters because they do not expend energy spawning and remain “fat” year-round. Triploid seed is more expensive than diploid seed, and hatcheries will require a down payment regardless of the seed type purchased.

According to CRD’s Shellfish Policy Manual, the maximum size seed that can be purchased from instate and out-of-state hatcheries is 1 inch. Imported seed must come from a hatchery approved by CRD. As of the writing of this guide (fall of 2023), there is only one out-of-state hatchery approved to import oyster seed into Georgia. An Importation Permit is required for all seed imports; the Importation Permit Application must be submitted to CRD at least 5 business days before the seed is imported, and seed may not be imported until the permit is approved. See the CRD Shellfish Policy Manual for more information on importing oyster seed.

**Tending the Farm**

The day-to-day tending of an oyster farm is hard, physical labor. Heavy gear must be cleaned or flipped and repaired when necessary. Oysters must be sorted, culled, and restocked into gear at correct stocking densities. This requires weekly and possibly daily tending depending upon the time of year, size of the oysters, tides, weather, and harvest. Weather can make this work even harder, damaging gear and negatively impacting oyster growth. New oyster farmers should understand that leases require constant upkeep and pitfalls are inevitable. It may take some time before a farmer figures out exactly what techniques work well at their particular site.

**Harvesting and Selling Oysters**

When oysters reach harvest size (a minimum of 2 inches from hinge to mouth, according to CRD), farmers remove them from their gear and bring them inland to a Georgia Department of Agriculture (GDA)-approved processing space and cooler. Minimum times from harvest to mechanical refrigeration, established by CRD and GDA, are based on the time of year. Since there are human health risks associated with eating raw oysters, it is important that all regulations established by CRD and GDA are followed. Once the oysters have been properly harvested, tagged, cleaned, sorted, and processed they can be sold. Only oyster farmers certified with the GDA can sell their product directly to consumers or sell larger orders to seafood stores, restaurants, restaurant groups, or distributors (see UGA Marine Extension and Georgia Sea Grant’s Selling Seafood in Georgia for more information). New oyster farmers should develop a marketing plan to identify customers well in advance of their first harvest.
Intertidal Versus Subtidal Farming

Two types of oyster farming leases are available from CRD: intertidal leases for growing oysters in cages or racks that rest on the bottom of shallow waters and subtidal leases in deeper waters where floating gear such as floating cages, floating baskets, or floating bags will be utilized. CRD selects the sites for both intertidal and subtidal leases. This is different than most other states, where prospective oyster farmers propose their own lease sites for agency approval. Here, we provide general considerations concerning intertidal and subtidal oyster farms. In Section II we discuss CRD procedures for issuing leases.

**Intertidal Farming** leases are located in the intertidal zone on water bottoms that are periodically inundated and exposed at high and low tides. Intertidally farmed oysters are grown in cages that rest on the water bottom, and spend part of the day submerged and part of the day out of water. This drying period can help with management of “fouling” organisms that grow on gear but also reduces the amount of time that the oyster is feeding. Bottom gear is only easily accessible to the farmer at low tide, and therefore the time available to work the lease is dependent upon the tidal period which varies in length and time of day. Oysters raised in on-bottom cages tend to have a higher mortality rate when compared to oysters raised in floating gear due to increased presence of sediments that can cause suffocation and other impacts.

CRD locates intertidal lease sites in Approved Growing Areas – locations in every seaward-facing coastal county where CRD conducts monthly water quality testing to ensure safe oyster harvest. The agency selects sites where, due to factors such as substrate characteristics and the

![Image of Intertidal versus Subtidal Farming](image-url)
condition of existing shellfish resources, it believes intertidal oyster farming could be successful.

**Subtidal Farming** utilizes floating gear in deeper waters where the bottom is never exposed at low tide. Gear is accessible by boat at any tide and therefore farming activities are not dictated by tidal schedule. With floating gear, oysters remain submerged in cages and have consistent access to food. Biofouling – when aquatic organisms grow on cages and oysters, competing for food and restricting water flow – can be an issue, particularly in Georgia’s productive coastal waters, so floating gear must be regularly flipped to expose the cages to air. Drying time on subtidal farms is controlled by the farmer rather than the tide, giving more flexibility in how and when gear is dried than is possible with intertidal farming.

Subtidal leases must be sited in Approved Growing Areas determined by CRD, and they must meet regulatory standards adopted in 2020. When determining lease locations, CRD must consider other uses of the State’s waters, such as commercial recreational fishing, high boat traffic, riparian viewsheds, research sites, areas where property owners may exercise riparian rights to construct docks or marinas, and areas of dynamic shorelines and shoaling. Subtidal leases must have a minimum depth of 6 feet at low tide and comply with specified distance requirements from other shellfish beds, private docks, federally maintained areas, shorelines, and commercial enterprises. These requirements mean that areas suitable for subtidal leases are limited. CRD clusters groups of subtidal leases in “Mariculture Zones” to make use of this limited space. As of the writing of this guide, CRD has sited two Mariculture Zones containing three leases each; one in McIntosh County in the Mud River and one in Chatham County at the mouth of the Bull River.

Due to a few key factors, subtidal oyster farming will likely be more profitable than intertidal farming in Georgia. Mortality rates for subtidal oysters are lower, as the partially submerged, floating cages in deeper waters offer better protection from predators, extreme heat, and tide fluctuations. These conditions create a more consistent environment for the developing oysters, positively impacting growth rates and the quality and reliability of the product. Additionally,
while both types of oyster farming are labor intensive, subtidal farming allows for cage flipping and other tasks at any tide, which can have a net impact on time spent and labor costs.

While subtidal leases are likely able to generate more money in the long run, they are also typically associated with higher entry costs due to the need to anchor gear to the ocean floor. There are also currently few subtidal lease opportunities in Georgia, and the process for obtaining a subtidal lease is more difficult than that for intertidal leases. As a result, intertidal leases could prove a useful entryway into the oyster farming industry. A beginning oyster farmer could learn the ropes on an intertidal lease with less financial investment, gaining valuable experience that could make them more likely to receive a subtidal lease in the future, should one become available.

Georgia CRD manages an ongoing Commercial Shellfish Interest Survey to notify interested parties about opportunities (including available oyster farming leases) and to determine where to site new leases and which types of leasing opportunities to provide. Those who are interested in available oyster farming leases, or want to inform CRD of where they want new leases located, should take this survey.
II. Oyster Farming Permitting in Georgia:

In addition to securing a lease through the CRD, oyster farmers must acquire several permits and licenses.

**LEASES:** Starting an oyster farm requires a lease from the state (or, less likely, having access to a privately owned intertidal water bottom). Both intertidal and subtidal leases are issued by CRD. The agency’s *Shellfish Policy Manual* provides details on the leasing process.

**INTERTIDAL.** The process for intertidal leases is relatively straightforward. Pre-selected sites are bid on in the farmer’s preferred county, with a minimum bid set at $15.00 per acre. CRD prefers bidders it views as most advantageous to the State. However, the 2019 law also requires that CRD give priority to Georgia residents over nonresidents, regardless of equal bids. CRD may consider an applicant’s previous performance and compliance with applicable law when selecting winning bids.

**SUBTIDAL.** The process for issuing subtidal leases is more complicated. Instead of the bidding process, subtidal leases are offered via a lottery that is based on a priority points system. Candidates for a subtidal lease can earn points for being a Georgia state resident, having one or more years in the commercial molluscan shellfish industry, already possessing a commercial harvest area, and certifications for commercial molluscan shellfish handling. Once the lottery application period for a particular Mariculture Zone closes, CRD groups applicants into points tiers and randomly selects winners from the candidates with the highest tier of priority points, moving down by tier until all leases have been awarded.

Subtidal leases also require proof of financial means to begin a floating oyster farming business. Those wishing to enter the subtidal lottery must provide a bank instrument (Pre-Approval Letter, Proof of Funds Letter, Line of Credit, etc.) of at least $70,000. This figure was selected based on the funding it would require to grow 100,000 oysters to harvest size, according to UGA Marine Extension and Georgia Sea Grant’s Oyster Crop Budget Tool. The CRD Shellfish Policy Manual states that this requirement is designed to ensure that only applicants with the financial means to establish a subtidal farm are considered in the lottery.

For more information and view current leasing opportunities, visit the following link: [https://coastalgadnr.org/commercialshellfishharvest](https://coastalgadnr.org/commercialshellfishharvest)
Certifications, Licenses, and Permits:

In addition to a leased site, the State requires a series of State and Federal certifications, licenses, and permits from a variety of different entities before placing any oyster gear in State waters. Some are required before securing a lease, depending on the lease type (noted below).

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| Food Safety – Shellfish License | • The GDA Seafood Safety program regulates fish and shellfish vendors and ensures that they have proper food safety training. This program reviews and approves Hazard Analysis and Critical Control Point (HACCP) plans for seafood operations in Georgia, and coordinates HACCP inspections in conjunction with the U.S. Food & Drug Administration (FDA).  
• Application information here: https://www.agr.georgia.gov/seafood | |
| Wholesale Fish Dealers (Manufacturers) License | • Wholesale Fish Dealers licenses are active for 1 year, July 1 - June 30, and must be renewed annually.  
• Application information here: https://agr.georgia.gov/wholesale-fish-dealers-licenses-manufacturers | |
| GDA Hazard Analysis Critical Control Point (HACCP) training | • Seafood safety training mandated for seafood processors by FDA and GDA to obtain and maintain a seafood wholesale license in Georgia.  
• Online and in-person trainings are offered by UGA MAREX and Georgia Sea Grant: https://gacoast.uga.edu/outreach/resources-outreach/haccp-training/ | |
| Food Sales Establishment License | • Food Establishment licenses are active for 1 year, July 1 - June 30, and must be renewed annually.  
• Application information here: https://agr.georgia.gov/food-establishment-licenses-retailers | |
| Mobile Meat License | • Mobile Meat Sales licenses are active for 1 year, expire 12 months from the date of issue, and must be renewed annually.  
• Application information here: https://agr.georgia.gov/mobile-meat-sales-licenses-retailers | |

*Required if food is stored more than 24 hours. *Required if planning to make direct sales to consumers.
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| CRD    | Commercial Fishing License with Shellfish Endorsement, plus Commercial Fishing Vessel License  *Required BEFORE entering subtidal lease lottery. | • Application also includes Commercial Fishing Vessel License application for farmers who will require a boat.  
• May be purchased in person or by mail from DNR offices located at One Conservation Way, Brunswick, GA 31520 or 2065 Hwy. 278 S.E., Social Circle, GA 30025.  
• Application packet here:  
| CRD    | Master Harvester Permit  *Required AFTER obtaining a lease and BEFORE beginning farming operations. | • The Master Harvester Permit can only be obtained once both the Harvest Area has been determined in the lease and the Commercial Fishing License has been obtained.  
• The application process for the Master Harvester Permit can be started by calling CRD at (912)264-7218. |
| CRD    | Shellfish Mariculture Permit (SMP) | • This is an extensive application: It requires details as to other licenses obtained, the actual operations of the oyster farm, including seed sources, gear inventory details and images, information on commercially licensed vehicles, facility information, harvesting plans and timelines, a plan for securing the farm in case of a major storm, and anticipated markets. Additional information is required for subtidal farms, including bond information (verified by CRD) and a plan for mitigating wildlife (turtles, birds, etc.) interactions with mariculture gear.  
• Application packet here:  
| US Army Corps of Engineers (USACE) | Nationwide Permit (NWP) 48 | • This permit authorizes the placement of objects such as buoys, trays, nets, containers, and other objects into waters of the United States. It also authorizes the depositing of dredge or fill material into waters of the United States necessary for shellfish seeding, rearing, cultivating, transplanting, and harvesting activities.  
• More information here:  
[https://www.sas.usace.army.mil/Missions/Regulatory/Permitting](https://www.sas.usace.army.mil/Missions/Regulatory/Permitting) |
**ISSUER** | **CERTIFICATION** | **INFORMATION/LINKS**
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Food and Drug Administration (FDA) | Interstate Shellfish Dealer’s Certificate | • A principal objective of the Interstate Certified Shellfish Shippers List (ICSSL) is to provide a mechanism for state health officials and consumers to receive information as to whether lots of shellfish shipped in interstate commerce meet acceptable sanitation criteria.

• To be on the ICSSL, must complete FDA Form 3038 and submit to the Retail Food & Cooperative Programs office. Form can be found here by searching “3038”: https://www.fda.gov/about-fda/reports-manuals-forms/forms

• More information on the ICSSL and the current list can be found here: https://www.fda.gov/food/federalstate-food-programs/interstate-certified-shellfish-shippers-list

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**Local Zoning and Other Requirements:**

Oyster farmers should ensure that the on-shore activities of their business comply with local zoning codes and other regulations. Discovering that on-shore activities are prohibited at a farmer’s landing or processing and storage site after the fact can be disastrous for his or her business. Contacting local officials about applicable restrictions or requirements during the initial stages of planning the business is essential. The National Sea Grant Law Center’s [Zoning 101 reference guide](https://www.fda.gov/food/federalstate-food-programs/interstate-certified-shellfish-shippers-list) can help new oyster farmers navigate local land use considerations.

**Oyster Farming Business Plans**

Business plans can help oyster farmers make informed decisions, set goals and measure progress, reduce risk, manage cash flow, and attract investors. The University of Georgia Small Business Development Center (SBDC), in collaboration with the UGA Carl Vinson Institute of Government and UGA Marine Extension and Georgia Sea Grant, has developed an oyster farming business plan template, Building a [Better Oyster Business: A Business Plan Template for Georgia Oyster Farmers](https://www.fda.gov/food/federalstate-food-programs/interstate-certified-shellfish-shippers-list), to help Georgia oyster farmers prepare these valuable resources. New oyster farmers can contact one of the many [SBDC offices](https://www.fda.gov/food/federalstate-food-programs/interstate-certified-shellfish-shippers-list) located across the state for individual assistance with business planning and other business development needs.
III. Financing and Insuring an Oyster Farm:

Starting and maintaining an oyster farm can be an expensive endeavor. Farmers must spend money on leases, spat, gear, boats, storage facilities, licenses and certifications, taxes, insurance, fees—not to mention labor and time spent. Most of these will be ongoing costs.

Because of high startup costs, most new oyster farms will not see a profit for the first two or three years of operation. Tools such as UGA Marine Extension and Georgia Sea Grant’s Georgia Oyster Crop Budget Tools for subtidal and intertidal farms can help prospective farmers anticipate costs, revenues, and estimate when they can expect to turn a profit. In addition to personal capital, prospective farmers may want to seek financing from other sources, such as loans and grants.

Another financial consideration for oyster farmers is insurance. By virtue of their location in coastal waters, oyster farms are vulnerable to tropical storms and other weather and environmental events. Insurance is one precautionary measure that can help farmers stay afloat if a disaster hits.

Loans:

Loans are a common financing option for agriculture, including aquaculture. Several federal agencies offer a variety of loan options, generally with low interest rates. The U.S. Department of Agriculture (USDA), the Small Business Administration, and the National Oceanic and Atmospheric Administration (NOAA) all offer one or more types of loans that could be viable options for beginner oyster farmers. The Georgia Development Authority also offers a variety of loans open to shellfish farmers. Terms and details vary significantly across loan programs.

Guaranteed Loans are initiated and managed by private lenders but guaranteed by federal agencies – keeping interest rates lower and lenders more confident in their investments. Some private lenders may also provide loans to beginner oyster farmers without federal guarantee programs.

Grants:

Grants, which vary in size and focus, are also an avenue for securing up-start costs. A variety of grant programs exist at federal agencies (such as NOAA aquaculture grants), NGOs, and other groups. Some grants, like those offered by the Small Business Innovation Research program, focus on economic efficiency and technological innovation. Others, like those offered by the USDA Agricultural Marketing Service, focus on business development and market expansion. Some grant programs can only be awarded to government bodies or nonprofits and then distributed to businesses.
Insurance and Disaster Assistance:

Disasters, like tropical storms and hurricanes, can damage gear and significantly impact oyster crop yields. As a result, they must be a consideration for both the fledgling and seasoned oyster farmer. A few disaster grant and loan programs exist. The USDA Noninsured Crop Disaster Assistance Program (NAP) offers financial assistance in the case of low inventory resulting from disasters. The USDA Emergency Assistance for Livestock, Honey Bees, and Farm-raised Fish (ELAP) program can pay between 70 and 90 percent of the value of an oyster farm’s covered losses due to a weather-related catastrophe.

IV. Conclusion

Oyster farming is an excited new industry in coastal Georgia that can be a fulfilling – and challenging – career. This guide can serve as a useful tool for those wishing to learn more about oyster farming and Georgia’s program. For those who are interested in becoming Georgia oyster farmers, contacting the Georgia CRD Shellfish and Water Quality Program and UGA Marine Extension and Georgia Sea Grant Shellfish Research Lab before investing time and effort in the process is highly recommended.