Oyster Aquaculture in the Gulf of Mexico

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The Industry

For decades, oysters have been tonged or dredged for harvest in the Gulf of Mexico. And Native Americans harvested Gulf oysters for centuries before that. Oyster aquaculture, however, is new. Farming oysters in raised containers presents a unique opportunity to cultivate a premium product for a growing market while being able to manage some aspects of the risks inherent in on-bottom culture. Oyster aquaculture is beneficial in that it creates jobs in rural coastal communities, provides a popular seafood product to consumers, and is complementary to restoration programs such as oyster gardening.

In the Gulf of Mexico oyster farmers use a couple of types of gear on their farms. Growers can use an adjustable long line system which consists of plastic baskets that are suspended from lines that are attached to pilings and can be moved in and out of the water column for air drying. The other system is a floating cage which can be flipped so that the oysters are entirely in the water for feeding or out of the water for air drying. The cage is tied to long ropes that are anchored to the sea floor. All farms have to be approved by the U.S. Coast Guard and must be marked with beacons so that boats can see them. Boaters frequent the farms because they are great areas for fishing.

Gear can be removed from the farm for storms, but the oysters have to be put back in the water at the farm for a specific number of days as determined by each state.

An average farm managed by one person is two acres big and will have 2 to 300 containers of oysters. Most farmers are out daily, depending on weather and closures. It is a full time effort for one person, and they will usually hire some help during harvest.

There are two types of operations for oyster farming: off-bottom and on-bottom. Off-bottom oyster farming is described above. In contrast, on-bottom oyster farming uses racks that sit on the sea floor and are filled with oysters. We have found that this doesn't work as well in the Gulf due to sediment build up and predator loss.

Photograph of Florida oyster farmers; courtesy of Russell Grice.

Being raised off of the sea floor and in containers makes it very difficult for predators to get to the oysters to feed.

New Industry to the Gulf

Farm-raised oysters are still a relatively new commodity in the Gulf of Mexico—in fact, just as recently as 2009, there wasn't a single oyster farm from Florida to Texas. Now, thanks to an increasing demand for a premium product, there are almost 50 oyster farms currently in operation in the region with new farms in the works. Seafood restaurants and oyster bars throughout the Gulf states and beyond are featuring these boutique oysters on their menus, and food enthusiasts at every level are enjoy the farm raised product.

Beyond the business opportunities that come with starting an oyster farm, it's good for the ecosystems of Gulf Coast. In fact, oysters are considered to be a "keystone species" for our waterways. Oysters help to improve the water quality in our bays by feeding on excess phytoplankton. They are known as natural filters, cleaning the water. Additionally, the presence of additional on-bottom oyster farms creates new artificial reef habitat, which are beneficial to a number of aquatic species.

Thanks to a mixture of salt water from the Gulf Coast and freshwater from our bays and rivers, Gulf oysters are in an environment where they can thrive.

Raising oysters in containers significantly reduces the threat from predators as well. Predators include a variety of fish, crabs, and oyster drills (a sea snail).

Due to the variety of the Gulf's coastline, the flavor profiles of farm raised oysters can vary a great deal. In fact, oysters from the same bay can vary in size, appearance, salinity, and taste. Plus, depending on seasons, weather, and other factors such as rainfall, characteristics of these oysters can vary even more.

Additionally, through research efforts and funding from grants the industry has developed techniques to improve the marketability of cultured oysters for the half shell market. For example, running oysters through a mechanical tumbler during the grow out phase chips the bill of the oyster which causes them to grow a deeper cup while removing fouling and barnacles from the shell. Also, the ability to raise the oysters out of the water column periodically allows for air drying which also reduces fouling.

Farm-raised oysters are known for their quality. This is due in part to the fact that farm-raised oysters are grown from individual seed instead of being harvested in clumps which form a natural reef in the wild. By minimizing fouling, sorting them by size, and tumbling them to get a deep cup, growers can produce consistent and appealing oysters for the higher end half shell market. Tumbling, which is done by electric tumblers, is a common practice among the larger operators. It helps develop a deep cup in the shell, which in turn, allows the oyster itself to become plump and even-sized.

Off-bottom oyster farming begins with oyster seed that is spawned and raised in private nurseries for sale at various sizes depending on what farmers want for the type of system that they use. This year, three new seed suppliers (in Alabama, Florida, and Louisiana) began commercial operation in the Gulf which is critical for the industry to be successful. The area has approximately a half-dozen seed suppliers now.

Challenges

Aquaculture as an industry has many challenges and oyster farming has its share. For instance, at the time of this writing the Florida panhandle was struck by Hurricane Michael in an area that has a large oyster aquaculture lease program and several commercial farms. I was able to view several of the farm sites and talk with some growers there. Although it will take some time to determine losses, it is apparent that while most of the gear and infrastructure was spared, there is significant crop loss. Oysters take several years to reach a size suitable for harvest, so the impacts from this storm could impact harvests for years. Some of the mortality can be attributed to lowering the gear to the bottom (for protection from storm surge) that led to the oysters being covered by mud and silt. Low salinity from the heavy rainfall may have also contributed to the losses. Some gear was also damaged.

Some of the other risks to the industry include water condition closures, disease outbreaks (such as vibrio), and harmful algal blooms. Note that all of these are risks for the seafood industry as whole and not just to shellfish aquaculture.

What's next?

As interest grows for oyster aquaculture in the Gulf of Mexico, we are seeing more of a focus from various agencies to meet the requests from our stakeholders. Permitting remains a long and complex process in some states, and there are areas where acceptance by traditional oystermen is slow. However, off-bottom oyster farming courses and programs have been established in Alabama, Mississippi, and Florida.

Other types of Gulf aquaculture are also taking off. As an incentive to aquaculture innovation, the national Sea Grant program awarded $11 million in grants in 2018 for 22 marine aquaculture projects around the United States. The Mississippi-Alabama Sea Grant Consortium (MASGC) received a $339,239 grant to expand blue crab aquaculture. Blue crabs are the fifth most valuable seafood in the Gulf. MASGC is developing models for blue crab hatcheries, ponds, and shedding phases to advance sustainable aquaculture of soft blue crabs in the United States. The program will involve both the Gulf of Mexico and the coast of North Carolina.

While there currently are no oyster farms in Mississippi, participants in the Sea Grant aquaculture training program are completing the training requirement this fall. Louisiana now has an oyster aquaculture lease program, and the Texas legislature will be considering a bill for oyster farming in the next congressional session. Off-bottom oyster aquaculture in the Gulf of Mexico is a new industry and not without challenges, but certainly worth keeping an eye on.

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