

# OFF-BOTTOM OYSTER AQUACULTURE IN THE GULF OF MEXICO

2018 GRANTS



Photo courtesy Mississippi DMR

**GULF STATES MARINE FISHERIES COMMISSION**

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# Off-Bottom Oyster Aquaculture in the Gulf of Mexico

Gulf States Marine Fisheries Commission • 69th Annual Spring Meeting  
JW Marriott New Orleans • New Orleans, Louisiana  
Wednesday, March 20, 2019 • 8:30 a.m. – 12:00 p.m.

## *Agenda*

- 8:30 Welcome and Program Overview – *Mr. David Donaldson and Mr. Steve VanderKooy (GSMFC)*
- 8:40 Experimentation of different oyster growing methods and spat retention in Oyster Bay – *Mr. Albert Wynn (Wakulla Environmental Institute)*
- 9:00 Induction of Oyster Tetraploid Founders to Address the Triploid Seed Production for the Gulf Oyster Industry – *Dr. Huiping Yang (U of FL)*
- 9:20 Identifying Potential User Conflicts and Solutions for Off-Bottom Oyster Culture in Texas – *Dr. John Scarpa (TX A&M)*
- 9:40 Lessons from the ‘Dirty Dozen’ – *Ms. Bethany Walton (Oyster South)*
- 10:00 *Break*
- 10:20 Regulatory solutions to stimulate off-bottom oyster farming in the U.S. Gulf of Mexico region – *Mr. Lawrence Marino (Oats & Marino, APPC), Ms. Amanda Carr, and Mr. Jesse DeNike (Plauché & Carr LLP)*
- 10:40 Creation of a Mobile Single Set Production System for the Eastern Oyster (*Crassostrea virginica*) – *Mr. Jason Rider (MDMR)*
- 11:00 Testing causes of triploid oyster summer mortality – *Dr. Bill Walton (Auburn)*
- 11:20 General Q & A on Off-Bottom Oyster Culture - *ALL*
- 12:00 *Adjourn*



## Summary

In 2016, the Commission began a cooperative effort with NOAA's Office of Aquaculture to develop and manage a small grants program to address the technical and regulatory opportunities and challenges of oyster farming in the Gulf region. Six projects were awarded ranging from outreach tools for advancing aquaculture to education of future industry participants, development of oyster hatcheries, and creation of tetraploid oyster seed sources for industry expansion throughout the Gulf region. In 2017, a second round of oyster projects was provided by NOAA and a total of seven projects were funded to further explore spatial planning and siting, regulatory constraints, and production challenges.

This session was a chance for our current off bottom award recipients to present on their projects. Following the presentations, a panel discussion allowed the aquaculture experts to address questions from the audience. There were a number of questions related to the role of aquaculture products for restoration, the future of this new industry, and how the states and industry could potentially incorporate shell recovery and recycling programs.

The panel took time to address the question of positive or negative ecosystem benefits in oyster aquaculture. It was pointed out that in some programs, there are requirements for diploid production in addition to triploid to aid in restoration efforts in areas where off-bottom occurs. When you consider nutrient loads, the aquaculture oysters are removing nutrients from the water column and they are 100% removed/harvested resulting in very positive effects. They are consuming nutrients, turning them into somatic growth, and then are eliminating them from the environment creating a net reduction. It is not something that is quantified but the filtration is clearly a benefit. It was also pointed out that oyster restoration is not the solution for point-source pollution in the environment. Stopping the point-source is the critical point, not simply mitigating continued pollution through shellfish enhancement.

With regards to shell recycling, the panelists explained that aquaculture product is not eliminating shell from the ecosystem. Since the oysters are hatchery-based, the shell produced during growth is additive and never existed in the system prior to their deployment into the grow-out areas. Off-bottom aquaculture has zero effect on the available shell for wild, on-bottom oysters; removing them does not result in a negative shell budget. However, use of diploid hatchery oysters can still provide spat into spat-limited systems, potentially increasing on-bottom reefs and, shell and with shell recycling, aquaculture product could be a positive addition to a shell budget.

It was agreed by the panel that aquaculture is not competition for on-bottom but could add value to the traditional oyster harvest. The future of the off-bottom industry is probably not going toward mass production but creating a boutique market of specific oysters in each region. The real value of the cultured half shell product is similar to regional wines or microbrews with marketing and limited distribution to drive demand by the food savvy public. Off-bottom is not intended to produce a shucked product that has much lower value – the capital required is just too high. It is likely that the business model for a boutique oyster will still have value when the traditional harvest returns.

A full recording of the Off-Bottom Oyster Session can be found on the GSMFC YouTube Channel (<https://youtu.be/-1E93Hsukmg>).

## **Experimentation of Different Oyster Growing Methods and Spat Retention in Oyster Bay**

*Mr. Albert Wynn, Wakulla Environmental Institute (WEI), Tallahassee Community College*

The Wakulla Environmental Institute, an arm of Tallahassee Community College, has created a noncredit oyster aquaculture certificate course. To date, 40 students have completed the course creating 30 oyster aquaculture businesses and two processing plants, all new businesses in Wakulla County. The Florida Division of Aquaculture has granted the creation of 59 lease sites in Wakulla County equating to 92 acres of workable farms that can significantly affect the overall economy of the county.

The project will purchase several different growing systems for experimentation on the WEI management site. In addition, the project will determine the effects farms utilizing diploid oysters have on the wild oyster population. The students will determine the pros and cons of each of the systems creating best management practices for farms in Wakulla County.

## **Induction of Oyster Tetraploid Founders to Address the Triploid Seed Production for the Gulf Oyster Industry**

*Dr. Huiping Yang, School of Forest Resources and Conservation - IFAS, University of Florida*

This project aims on establishment of an oyster tetraploid program to overcome the greatest barrier for the Gulf oyster industry – affordable and sufficient triploid seed production. The overall goal is to produce tetraploid founder populations to supply the growing demand for seed in the region. Production of chemically induced triploids will be continued by using broodstock from different geological locations to ensure sufficient triploids with diversified genetic background are available every year for further tetraploid production and eventual establishment of tetraploid breeding populations with diversified genetic background.

## **Identifying Potential User Conflicts and Solutions for Off-Bottom Oyster Culture in Texas**

*Dr. John Scarpa, Texas A&M University - Corpus Christi*

The objective of this project is to report on potential user conflicts and potential solutions of these conflicts as identified by the general public and other public stakeholders of coastal Texas, which would allow for future off-bottom oyster culture in Texas. This project follows the year one supported project “Identifying Information Needs and Regulatory Impediments to Off-Bottom Oyster Culture in Texas”, which surveyed Texas state agencies (e.g., Texas Parks and Wildlife Department), large non-governmental organizations (e.g., The Nature Conservancy), and commercial oyster companies (e.g., Misho’s Oysters) to identify regulatory impediments. This first project identified that the lack of regulatory authority by Texas state agencies, which can only be accomplished through legislative action, is the primary impediment. Non-governmental organizations and commercial oyster fishers have not

identified any major impediment to off-bottom culture in Texas, but have noted that it should be environmentally sound (e.g., protect sea grass) and sustainable. The follow-up project with greater public input has indicated a general positive attitude toward oyster culture in Texas waters, but concerns about recreational boating and fishing conflicts, as well as visual aesthetics, remain. The public expects environmental responsibility and applicable regulations will allow for off-bottom oyster culture in Texas.

## **Lessons From the ‘Dirty Dozen’**

*Ms. Bethany Walton, Oyster South*

Within the last five to eight years, a number of commercial off-bottom oyster farms have been established in Louisiana, Alabama, and Florida, with significant interest in Mississippi. This new industry faces significant challenges with regards to increasing production efficiency, improving product quality and consistency, assuring product safety, disaster preparation, permitting and marketing. Essentially all of the individuals engaged in commercial oyster farming in the region are vulnerable to the same miscalculations and lack of experience facing beginning farmers in any field. There is strong evidence in agriculture, however, that learning from peers can have substantial effects on productivity.

The Oyster South advisory board will select a variety of experts from across the U.S. and invite them to attend and present at the 2019 Oyster South Symposium in Orange Beach, Alabama. The experts will include oyster farmers, chefs, gear suppliers and writers. Additional invites will be made until twelve presenters have accepted. Each presenter will be offered a \$1,000 stipend to defray travel costs. These twelve oyster aquaculture experts will share their knowledge and expertise with upcoming and new oyster farmers on the Gulf Coast at the Symposium.

## **Regulatory Solutions to Stimulate Off-Bottom Oyster Farming in the U.S. Gulf of Mexico Region**

*Mr. Larry Marino, Oats & Marino, APPC*

The objective of this project is to develop solutions to regulatory constraints limiting off-bottom oyster aquaculture in the Gulf of Mexico to support the growth and diversification of shellfish production in the region. The team will utilize their extensive knowledge and expertise to identify and propose solutions to regulatory constraints and challenges to oyster farming in the Gulf of Mexico through recommendations to design or modify state laws and regulations to enable and facilitate the responsible growth of off-bottom oyster culture; outline information or research needed to answer production, environmental impact, gear selection, and permitting questions; and design efficient (e.g. “one-stop-shop”) state aquaculture permitting processes.

## **Creation of a Mobile Single Set Production System for the Eastern Oyster (*Crassostrea virginica*)**

*Mr. Jason Rider, Mississippi Department of Marine Resources*

This project will design, construct, and operate a mobile single set operation capable of setting up to two million seed for one year to ensure that Mississippi oyster farmers may obtain the single seed that they need to succeed and to demonstrate the potential of these operations to private industry members. The

rearing system would supply the future oyster farmers in Mississippi, allowing for the new industry to become more readily established. Furthermore, the mobility of the unit would allow the unit to be moved if water quality conditions become an issue at the current location. It also allows the evacuation of equipment due to the threat from tropical storms along the Gulf Coast. This will allow for protection of the system, but also increase production.

## **Testing Causes of Triploid Oyster Summer Mortality**

*Dr. Bill Walton, Auburn University*

To compare the responses of diploid and triploid oysters to farmer-induced stresses, we conducted experimental field tests of two common stressors (desiccation and tumbling) on paired half-sibling diploid and triploids at three field sites (LA, MS, and AL) deployed from April through September, 2018. Based on our results, there was substantial variation among sites suggesting that environmental factors (e.g. salinity, temperature) may be playing an important role in the dynamics. At all sites, there was a clear effect of both handling stressors, with desiccation and tumbling having significant effects at both the Grand Isle, LA and Grand Bay, AL sites, with an interactive effect at the remaining site (Deer Island, MS). Triploids suffered higher mortality only at Grand Isle by August, with no difference at the other sites, nor any interaction with the farmer-induced stresses. This implies that, under the range of desiccation and tumbling stressors tested, triploids were not more susceptible than diploids. The higher mortality of triploids at one site (Grand Isle), however, does indicate that under some environmental conditions triploids may suffer higher loss than diploids. Based on these results, farmers are recommended to be aware of the potential danger of stressing oysters (regardless of ploidy) during the summer months. These results were also presented at the Oyster South Symposium in Orange Beach, AL and Aquaculture 2019 in New Orleans, LA to ensure that the industry is aware of these results.



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