

**GENERAL SESSION**

# **2023 AQUACULTURE OVERVIEW**



## **GULF STATES MARINE FISHERIES COMMISSION**

**74TH ANNUAL MEETING**

**October 18, 2023**

**Hilton New Orleans Riverside  
New Orleans, LA**

# Commissioners

## **ALABAMA**

Chris Blankenship, Commissioner  
Alabama Department of Conservation and  
Natural Resources  
Montgomery, Alabama

Representative Chris Pringle  
Mobile, Alabama

Chris Nelson  
Bon Secour Fisheries, Inc.  
Bon Secour, Alabama

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Florida Fish and Wildlife Conservation  
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LA Department of Wildlife and Fisheries  
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Joe Spraggins, Executive Director  
Mississippi Department of Marine Resources  
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David Yoskowitz, Executive Director  
Texas Parks and Wildlife Department  
Austin, Texas

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Boerne, Texas

# **GSMFC General Session**

## **GSMFC Aquaculture Overview**

GSMFC 74th Annual Meeting

Oct 18, 2023

Hilton New Orleans Riverside

New Orleans, LA

### *Agenda*

1. 8:30 Welcome - *TBD*
2. 8:40 Advancement of Atlantic Croaker (*Micropogonias undulatus*) aquaculture – *Dr. Nicole Kirchhoff (Live Advantage Bait LLC)*
3. 9:00 Overcoming Challenges in Commercial U.S. Marine Aquaculture: Development of Post-Harvest Processing and Value-Add Methods for Tropical Seaweed Species in the Gulf and U.S. Caribbean – *Dr. John D. Stieglitz (University of Miami – RSMAS)*
4. 9:20 Intensive practical training of women in Integrative Multi-Trophic Aquaculture: Towards a sustained mariculture workforce in Puerto Rico – *Dr. Ralph Turingan (Florida Institute of Technology)*
5. 9:40 Continued development of innovative hatchery technology for black grouper (*Mycteroperca bonaci*) including integrated multi-trophic aquaculture (IMTA) with oysters (*Crassostrea virginica*) and seaweed (*Asparagopsis taxiformis*). – *Dr. Patrick Rice (College of the Florida Keys)*

*10:00-10:20 Break*

6. 10:20 Develop education and outreach tools, strategies or initiatives aimed at improving stakeholder understanding and perceptions of marine aquaculture – *Dr. Portia Sapp (Florida Department of Agriculture and Consumer Services)*
7. 10:40 Reevaluating Co-Culture of Eastern Oysters with Sea Urchins Using Hatchery-produced Juveniles on Florida's Gulf of Mexico Coast – *Dr. Leslie Sturmer (University of Florida - Nature Coast Biological Station)*
8. 11:00 Dauphin Island Sea Lab (DISL) Gulf States Marine Fisheries Commission (GSMFC) North Central Gulf of Mexico, Integrated Multitrophic Aquaculture (IMTA) Demonstration, Research, Training, and Outreach-Phase I. - *Dr. John Valentine (Dauphin Island Sea Lab)*

### *Adjourn*

## Summary

This session highlighted six on-going and completed aquaculture projects in the region that are supported through the NOAA and Commission' Aquaculture Program. The projects were selected because they are either multi-year or have had multiple stages of research. The ability of the Commission's Aquaculture Program to fund additional work after a successful pilot study is one of the major benefits of the program. Projects include the culture of finfish, mollusks, and seaweed, an outreach tool in support of regional aquaculture, as well as two integrated multitrophic aquaculture (IMTA) projects.

## Advancement of Atlantic Croaker (*Micropogonias undulates*) Aquaculture

*Dr. Nicole T Kirchhoff (Live Advantage Bait LLC)*

Atlantic Croaker, native to the Atlantic and Gulf State regions, have high potential for multi-purpose aquaculture development, including live baitfish, food fish, and restoration. Numerous outreach publications have attempted to spur interest in developing this industry for aquaculture over the past decade, however no substantial commercial production has occurred. Guidance from Dr. Todd Sink, Texas A&M Agrilife extension agent, has helped identify several bottlenecks including availability of fertilized eggs and detailed market information.

Over the past 18 months, this project successfully demonstrated that maturation and spawning of Atlantic Croaker out-of-season could be commercially feasible. We were not only able to obtain fertilized eggs out-of-season, we were able to quantify commercial size spawns year-round and compare quality of spawns between in-season and out-of-season production. We were also able to complete an extremely comprehensive marketing survey, both through phone calls of state-wide licensed vendors and through a bait-shop marketing trial. These two survey methods demonstrated a high value and robust industry throughout the state of Florida justifying Atlantic Croaker aquaculture development and expansion.

## Strategies for Building Capacity of Integrated Multi-Trophic Aquaculture (IMTA) in the Gulf and U.S. Caribbean Regions: Development of Sustainable Production, Post-Harvest Processing, and Value-Add Methods for Tropical Seaweed Species

*Dr. John Stieglitz (University of Miami – Rosenstiel School, Miami, FL)*

There is incredible untapped potential for advancing integrated multi-trophic aquaculture (IMTA) in the Gulf of Mexico and U.S. Caribbean regions. This project aims to identify and assess the aquaculture potential of native seaweed species in these regions for use in IMTA culture systems, while also helping these seaweed products gain a stronger foothold in the marketplace, particularly markets for direct human consumption. Some of the most common impediments to expansion of tropical seaweed aquaculture throughout the regions come from the limited shelf-life, lack of processing technology, and associated food-safety risks of fresh tropical seaweed. Results of this project are directly addressing many of the challenges associated with not only the selection and production of tropical seaweed species for use in IMTA, but also the post-harvest processing, value addition, and marketing of tropical seaweed species currently identified as strong candidates for aquaculture production in the regions.

## **Intensive Practical Training of Women in Integrative Multi-Trophic Aquaculture: Towards A Sustained Mariculture Workforce in Puerto Rico**

*Dr. Ralph Turingan (Florida Institute of Technology, Melbourne, FL)*

An assessment of the social-ecological state of the fishing communities especially along the southwest coast of Puerto Rico indicates a 70% decline in the total fish and shellfish landed since 2001, and a loss in fisheries revenue of about 50%. This reduction in fisheries productivity has been caused by the massive decline in the abundance of the “keystone commercial species” including spiny lobster, queen conch, groupers, snappers, and parrotfishes. The principal drivers of the abundance of fisheries species include overfishing, habitat loss, pollution, hurricanes, and climate change. Marine aquaculture represents a potential opportunity to empower women and increase their presence in the male-dominated fishing and aquaculture industry worldwide. However, in order to have women truly empowered and fully benefit from the potential advantages of marine aquaculture, they must first be informed of the science and practice of aquaculture. This work addresses this need by addressing the following objectives: To (1) conduct “informational workshops and scoping/listening sessions on” the IMTA industry, and (2) to train women in the aquaculture of local marine species. Progress in addressing these specific goals is discussed in the presentation.

## **Continued Development of Innovative Hatchery Technology for Black Grouper (*Mycteroperca bonaci*) Including Integrated Multi-Trophic Aquaculture (IMTA) with Oysters (*Crassostrea virginica*) and Seaweed (*Asparagopsis taxiformis*)**

*Dr. Patrick H. Rice (The College of the Florida Keys)*

Commercial landings of the black grouper (*Mycteroperca bonaci*) from the southwestern Atlantic and Caribbean waters have declined by as much as 94% since 1990. However, the species remains economically important in the region and in high demand both commercially and recreationally. Therefore, the development of aquaculture technology for this species is important, not only to reduce fishing pressure and supply the seafood demand, but also to potentially contribute to wild stock populations through stock enhancement. Therefore, with support from GSMFC in February 2020, the College of the Florida Keys started the pioneering process of domestication of *M. bonaci* using innovative technology and strategies intended to reduce complications often associated with broodstock collection and maturation for this taxon.

More recently, the project has explored the incorporation of integrated multi-trophic aquaculture (IMTA) using bivalves and seaweed to stabilize water quality in the grouper recirculating aquaculture systems and reduce the labor associated with frequent water quality monitoring and water changes. The focus of this presentation is to provide an update on the progress towards these goals and objectives.

## **Public Perceptions of Offshore Aquaculture in Florida**

*Ms. Portia Sapp (Florida Department of Agriculture and Consumer Services, Division of Aquaculture)*

The intent of this project was to work with stakeholders to develop a communication strategy that can enhance understanding and perceptions of marine aquaculture in Florida state waters of the Gulf of Mexico (GoM). The University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Center for Public Issues Education in Agriculture and Natural Resources (PIE Center), in partnership with Florida Department of Agriculture and Consumer Services (FDACS) Division of Aquaculture and the National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science (NCCOS), held a series of listening sessions with targeted stakeholder groups and created an “Aquaculture toolkit” that will be utilized for direct communication and outreach, by both print and social media, designed to educate in a simplified and clear manner to the public.

## **Reevaluating Co-Culture of Eastern Oysters with Sea Urchins on Florida’s Gulf Coast**

*Ms. Leslie Sturmer<sup>1</sup> and Dr. Steven Watts<sup>2</sup> (<sup>1</sup>Extension, University of Florida, <sup>2</sup>Department of Biology, University of Alabama-Birmingham)*

The potential of culturing wild-collected sea urchins *Lytechinus variegatus* with eastern oysters at farms on Florida’s Gulf coast was demonstrated in a prior study. Preliminary results showed urchins had reduced biofouling on oysters and culture bags at one site, resulting in interest by growers as biofouling control is a major expense and effort in off-bottom culture. To move this proof of concept forward, research was needed to reevaluate the co-culture of hatchery-produced urchins and oysters through the field nursery and growout stages at commercial densities. Results of field trials over a production cycle are presented. Site and gear constraints and their limitations to commercial aquaculture development are addressed.

# Development and demonstration of integrated AquaFort multitrophic aquaculture in the north central Gulf of Mexico.

*Dr. John Valentine<sup>1</sup>, K. Lucas<sup>2</sup>, R. Blaylock<sup>2\*</sup>, S. Sempier<sup>3</sup>, M. Chambers<sup>4</sup>, and K. Riley<sup>5</sup> (<sup>1</sup>Dauphin Island Sea Lab, Dauphin Island, AL, <sup>2</sup>Thad Cochran Marine Aquaculture Center, University of Southern Mississippi, Ocean Springs, MS, <sup>3</sup>Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS, <sup>4</sup>University of New Hampshire, Durham, NH, <sup>5</sup>NOAA, National Center for Coastal Ocean Science)*

Aquaculture is the fastest growing food sector, and the demand is expected to grow. However, the US contributes little to the supply of farmed fish and meets its seafood demand by importing about 90 percent of the country's seafood supply, of which almost one-third is marine finfish (FAO 2018). There are numerous challenges and barriers to aquaculture in the United States including public acceptance, permitting, technical expertise, supply of fingerlings and seed and a trained workforce. Demonstration projects are a great way to incorporate technical expertise, training, and outreach to assist in overcoming issues that constrain the development of aquaculture. Integrated multi-trophic aquaculture (IMTA) integrates the culture of fish, mollusks and macro-algae to promote economic and environmental sustainability by converting byproducts and uneaten feed from the fish into harvestable products, reducing eutrophication and increasing seafood products and economic diversity. The University of New Hampshire (UNH) developed and successfully tested an IMTA raft in 2015 that led to a next generation IMTA offshore platform (AquaFort, AF). This project will build on the success of the AF in New England and will grow and harvest multiple seafood species, train a workforce and provide outreach to the public while testing this system in the Gulf of Mexico using local species.

This project will recruit 6-10 fishermen and farmers with access to a boat capable of harvesting product to participate in workshops and farming operations. Participants will be paid but must be able to dedicate the time necessary to complete the workshops and training. This demonstration project will provide step-by-step activities and explanations of permitting and operating a nearshore aquaculture farm. The Dauphin Island Sea Lab (DISL), The University of Southern Mississippi (USM) and Mississippi Alabama Sea Grant (MSALSG) will work with their respective networks to recruit farmers, and encourage underemployed fisherman, to participate. Workshops and field activities will be managed through the DISL.

# Presenters

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