

AUBURN ON THE COAST

A Fisheries Extension Newsletter



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AUBURN
FISHERIES, AQUACULTURE AND
AQUATIC SCIENCES

OYSTER GARDENING ON THE GULF COAST

Emily McCay

Oyster Gardening is a volunteer-driven project with hands-on opportunities for participants to assist in oyster reef restoration. Oyster gardeners are individuals with waterfront access that grow oysters in containers (gardens) suspended from a pier. Oyster gardens are maintained by the gardener during the 4–8-month season. Limited care of the gardens is required, and generally takes less than an hour per week. The primary care necessary involves 'shaking' the gardens about once a week to clear oysters of mud and debris and prevent the oysters from growing through the mesh of the garden. At the end of the season, all oysters are picked up by program staff and planted onto restoration oyster reefs. In 2022, the Alabama and Mississippi Oyster Gardening Programs produced 120,000+ oysters representing a restorative potential of nearly 6 acres.

Oysters for the Alabama and Mississippi gardening programs are spawned at the Auburn University Shellfish Lab on Dauphin Island. These programs use florets or spat-set shell to replicate a natural oyster reef more closely. The shells themselves are sourced through the oyster shell recycling program, meaning the oyster you eat today may well play host to the juvenile oysters you grow for the reef next year.



A recycled oyster shell, set with juvenile oysters 'spat', ready to go to a gardening site.

A recycled oyster shell, set with juvenile oysters 'spat', ready to go to a gardening site. Program seasons vary by state, with Alabama traditionally starting in May/June and running through November, while Mississippi sites run August/September through March. Variations in seasons can be attributed to freshwater conditions which can lead to high mortalities. To date, the volunteers in Alabama and Mississippi have produced more than 1.3 million oysters for restoration sites.

If you are interested in learning more, or wish to get involved, contact us at:

oystergardening@auburn.edu

CITY OF FAIRHOPE PLANS COMMUNITY RESILIENCE INDEX EXERCISE

Jody Thompson

Cities and towns along the Gulf coast are highly vulnerable to damages from tropical systems, storms and hurricanes, and these damages are costly to the municipalities they target, and their residents. The 2020 hurricane Sally, a relatively small storm at category 2 on the Saffir-Simpson scale, created over \$300 million in damages in Alabama alone, caused massive losses to pecan orchards in Baldwin County and over \$1.5 million in timber losses. For municipalities to come back quickly after a storm event, they must prepare and put plans in place for storm preparation and recovery.

Recently AUMERC representatives met with the Fairhope City Council and presented the Community Resilience Index (CRI), resulting in approval to plan and hold a CRI exercise for the City. Fairhope participated in a CRI in 2017 under a previous administration and recognized the need to update the Index since experiencing the effects of Hurricane Sally two years ago. The CRI is a free tool available to be facilitated with municipalities and businesses across the five Gulf states to help them better plan for and recover from natural hazards like tropical storms and hurricanes.

The purpose of the Index, which has been used by over 70 communities across the Gulf, is twofold: to describe the current snap-shot of natural hazard preparedness, and to bring together all facets of the municipal government and key community groups in a robust discussion to explore past successes, improvements and changes since the last major event, what the municipality is doing well right now, and identify actions to better plan for and respond in the future. The exercise expands beyond typical hazard planning to discuss mitigation, experience levels, and partnerships within the community.

Recently updated, the CRI now includes an emphasis on green infrastructure and human health, and more robust items dealing with business and community partnerships in times of emergency. A benefit to participation is access to apply to grant funding that requires completion of this or a similar self-assessment. Many participating municipalities have received small grant awards from a variety of partners to implement solutions to needs identified during the CRI exercise.

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Resilience Index Continued

One aspect that attracted Fairhope to use the CRI in their hazard planning is the emphasis the tool has on flood risk mitigation and reduction. Although not a key component, the CRI includes helpful tips to the participating municipality to increase their score in the Community Rating System, valuable to Fairhope since they plan to join the program in the future.

The Community Rating System (CRS) is a FEMA incentive program designed to promote flood mitigation and decrease flood damages. Residents of participating municipalities see benefits through discounts on their National Flood Insurance Program sponsored flood insurance premiums, with those discounts increasing as the municipality's score improves.

A CRI exercise is a facilitated process lead by a trained facilitator and there is no cost to a participating city or town. The municipality needs only to provide a meeting location and minimal staff time: the typical exercise takes only 2-3 hours.

The CRI is a free tool available to be facilitated with municipalities and businesses across the five Gulf states to help them better plan for and recover from natural hazards like tropical storms and hurricanes .



Damage following a hurricane on the Gulf coast.

For more information on the Community Resilience Index, contact:

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DENSE SPAWNING AGGREGATES

Conrad Horst

Eastern oysters (*Crassostrea virginica*) are a keystone species commonly found in estuarine ecosystems along the Gulf of Mexico and the Atlantic coast. Their presence in an ecosystem can provide several benefits such as water filtration through filter feeding, shoreline stabilization to reduce erosion, and the creation of habitat for many other marine species. Natural populations of oysters have dwindled down from historic levels over the past several decades due to pressures from overharvesting and habitat loss. Several efforts, such as the oyster gardening program, are underway and have been quite helpful to help restore wild populations. In conjunction with these programs, the Dense Spawning Aggregate project seeks to expand the numbers of oysters used in habitat restoration projects in Mobile Bay and surrounding areas.

The Dense Spawning Aggregate project will determine if this method of growing oysters is suitable for restoration purposes. One question we seek to answer is the effectiveness of raising oysters at a dense stocking density in off-bottom systems, and what, if any, spatial variation may exist. This project will also evaluate the effectiveness of two different predator exclusion devices in order to limit exposure to oyster drills, a



Topside view of a dense spawning aggregate structure in Mobile Bay. In the background is a local oyster farm.

significant predator of oysters. Finally, we are interested in the spawning condition of these oysters and what happens to the larval load in each environment when spawning occurs.

This project includes two site locations that vary in physical and chemical conditions. One site is located in Mobile Bay, north of the town of Fort Morgan. The second site is located at the Grand Bay Oyster Park in the Mississippi Sound. Each site has 12 structural pilings that support the off bottom grow out systems, and each grow out system is outfitted with wire mesh baskets to contain the oysters. Baskets are stocked with spat set shell that are grown at the Auburn University Shellfish Laboratory on Dauphin Island.

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Spawning Aggregates Continued

Stocked oysters are allowed to grow for approximately one year before being removed and transported to wild reefs or living shoreline projects.

Oysters are sampled at both sites each month to obtain data on growth, survivability, pre and post spawning condition, presence or absence of predators, and mortality.

The Dense Spawning Aggregate project is currently in the second growing season of a five-year study. Early findings suggest up to a seven-fold increase in capacity compared to a standard oyster gardening site. The analysis of gamete presence/absence in stocked oysters suggest that spawning activities are occurring within the grow units.

Funding for this project is provided through NRDA and the Alabama Department of Conservation and Natural Resources.

MEET OUR SCIENTISTS: KAYLA BOYD

Kayla is a PhD student stationed at the Auburn University Shellfish Laboratory! She has been hard at work running experiments to investigate the energy consumption of diploid and triploid oysters when they are undergoing short (acute) thermal temperature ramps. By looking at how changes in oyster behavior relates to cellular stress, she is attempting to observe differences in how diploid and triploids react to and recover from acute thermal stress. Once the tell-tale signs of thermal stress in oysters have been identified, she is going to begin incorporating other environmental stressors (such as low salinity and low oxygen environments) to see how oysters may be reacting to stressful environments in the field. If there are major differences in the way diploid and triploids react to stressors, it may indicate why some oysters are more sensitive to environmental changes than others and it may identify management practices to help reduce oyster mortalities during the grow out period in the Gulf of Mexico.



WEED CONTROL IN SMALL IMPOUNDMENTS

P.J. Waters

It is that time of year again. Warmer weather not only brings us back to more outdoor activities, but those pond weeds are awaking too. I have already noticed an uptick in the samples being submitted for identification and treatment recommendations. We have had successful pond/lake management workshops in Coastal Alabama with more planned.

If you are planning on attending a workshop, feel free to bring a sample along from your pond. If you prefer, you can also bring or mail us samples any-time. It is important not to treat plants in your pond without knowing what the plant is. We have a number of treatment options available, however, they do not all work on all the plants. We can help you match the best treatment option for your particular situation saving you both time and money.

To submit a plant sample:

1. Pull the plant from the pond and shake all the water from it
2. Wrap the plant in a paper towel
3. Put the plant in a plastic bag, but be sure to leave the bag OPEN
4. Add your name and phone number to the sample (or at least with the sample)
5. Send it to us

To Send Pond Samples:

- *Include your name and phone number*
- *Package your samples correctly*
- *Mail or drop off to:*
50A Midtown Park West
Mobile, Alabama 36606

It is not a bad idea to include a water sample as well. Spring and summer are a good time to check your total alkalinity (the buffering capacity of the pond). If we find it to be low, you will need to lime your pond with agricultural limestone powder during the wintertime. Checking this each summer will give you time to plan for winter applications.

To submit a water sample:

1. Fill a plastic bottle (15-20 ounce with a screw on lid) completely with pond water. No air, no plants.
2. Put the lid back on
3. Send it to us

Try to avoid taking a sample within a few days of rain, and if you are not going to mail it right away, hold it in the refrigerator.

We will call you back with the results, provide our recommendations, and answer any questions you may have.

THE AUBURN UNIVERSITY SHELLFISH LABORATORY

Andrea M. Tarnecki

This year marks the 20th anniversary of the Auburn University Shellfish Laboratory (AUSL), located in Dauphin Island, AL, with the official dedication ceremony on 11 April, 2003. Since then, the lab has grown to house 11 full-time employees and 6 graduate students.

Our mission is to ensure a thriving shellfish seafood community in the United States, through globally relevant research, extension, and education.

AUSL works with collaborators throughout the world on research devoted to shellfish aquaculture, enhancement, and restoration, primarily focusing on the Eastern oyster.

The research, extension, and outreach at AUSL focuses on the needs of the shellfish aquaculture industry. Two Extension Specialists within the Alabama Cooperative Extension System, focused on shellfish production aquaculture and business, are available to provide assistance and advice to commercial seafood stakeholders.

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We work with oyster aquaculture stakeholders to identify relevant research topics that address hurdles experienced by the industry.

Current research topics at AUSL include:

- *Broodstock conditioning*
- *Oyster breeding programs*
- *Aquaculture-based restoration*
- *Phytoplankton monitoring*
- *Oyster health & disease*
- *Seafood safety*

Follow us for research, extension, and education updates!



AUSL webpage

NEW PROGRAMMING

MASTER OYSTER GARDENING

Emily McCay & Conrad Horst

Oyster gardening in Mississippi and Alabama facilitates hands on efforts to ultimately restore estuarine habitat through restocking local oyster reefs. In total, the volunteers with Little Lagoon, Mobile Bay, and coastal Mississippi oyster gardening programs have sent more than 1.3 million advanced stocker sized oysters to reefs.

From the beginning of oyster gardening along the northern Gulf of Mexico, participation has been limited to those with waterfront property access in the two states. This year, a new program is beginning that will allow volunteers without waterfront property a chance to get involved in restoring their local estuarine reef resources.

The Master Oyster Gardening Program will include a series of informational sessions and field trips led by local professionals in both Alabama and Mississippi. Informational sessions and field trips will be designed to increase participants' knowledge of oysters and estuarine ecology as a whole. Topics covered will include anatomy, ecology, restoration, farming, and food safety, each focused on local oysters. Participants will have the opportunity to visit oyster farming operations, sorting facilities, and restoration projects to see first-hand how oysters can be utilized to serve different purposes.

Those who complete the program will be certified as Master Oyster Gardeners and will have the ability to promote their knowledge and environmental awareness through engagement opportunities and volunteer efforts. Participation in this program is open to individuals with or without waterfront property access.

The Master Oyster Gardening project is still in the initial phase of development in partnership with the Mississippi Alabama Sea Grant Consortium. Currently, we are working on the curriculum and confirming times, dates, and locations for field excursions. We look forward to this next step in restoration engagement!

EXPANSION OF OYSTER GARDENING IN ALABAMA

P.J. Waters

Auburn is developing a partnership with Mobile BayKeeper to expand oyster gardening programming in coastal Alabama. We are currently working with regulators to outline an operational strategy that will open up numerous additional regions to this effort. These new regions will closely follow the success witnessed in Little Lagoon during the past 6+ years. Like all gardening efforts in Alabama, all oysters produced will make their way to restoration sites and projects in Alabama at the conclusion of each season.

To get involved, or to make specific topical requests for program inclusion, contact us:

oystergardening@auburn.edu

Introducing:
**COMMERCIAL OYSTER AQUACULTURE
SECTOR TRAINING**



**A new initiative in oyster
aquaculture workforce development**

With the COAST program, you will:

- Learn directly from individuals in the oyster aquaculture industry (producer, farmer, restaurant, distributor, processor, etc.)
- Prepare for a career in the oyster industry
- Receive hourly wages

We are looking for individuals who are:

- At least 18 years old
- Have transportation
- Interested in the oyster industry
- Located near the Mississippi or Alabama coast

Support for this program comes from:

- Mississippi-Alabama Sea Grant
- Alabama Cooperative Extension System
- Auburn University

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Contact us to learn more!

Stories of monitoring, regulations, and outreach.

Missy Partyka

Portersville Bay is a shallow-water bay situated off the coast of Coden and Bayou La Batre in southern Mobile County. Both Portersville and Grand Bays, separated by the spit of land known as Point aux Pins, are both rich and productive bays home to natural oyster reefs and multiple commercial oyster farms which have helped contribute to Bayou La Batre being named the “Seafood Capital of Alabama”. The fertile waters are a mixture of freshwater coming in from coastal rivers and streams and the salty waters of the Gulf of Mexico, making it an ideal habitat for multiple commercially and recreationally important species. Humans also enjoy using this beautiful landscape for swimming, boating, fishing, and even growing oysters off their piers for personal use. All these activities rely on clean, healthy water quality.

Oysters are one popular seafood item, both farmed and wild caught, that are particularly vulnerable to changes in water quality, whether from heavy rains or other periodic events. These events can and do require growing waters to be occasionally closed for harvest. Two state agencies are responsible for monitoring water quality in these bays and assuring human safety—and all water ways of Alabama—the Alabama Department of Environmental Management (ADEM) and the Alabama Department of Public Health (ADPH).

In conjunction with the U.S. Food and Drug Administration (FDA), ADPH is also responsible for ensuring that the seafood being grown and harvested in our coastal waters are safe for us to eat. Additionally, the Alabama Department of Conservation and Natural Resources’ (ADCNR) Marine Resources Division (MRD) is responsible for enforcing any closures to seafood harvest and for protecting natural oyster reefs from overharvest.

A recent closure of the oyster growing areas of Both Portersville and Grand Bays required all four of these agencies to come together, along with Bayou La Batre’s waterboard, the operator of the local wastewater treatment plant, oyster farmers, and extension professionals representing Auburn. The closure was caused by a potential boat strike to the wastewater treatment plant outfall line situated in about six feet of water, causing it to float to the surface. Effluent, or discharge, that comes from this plant is essentially clean fresh water. But the floating of the pipe revealed a particular problem in the way oyster growing areas are designated and regulated. Even though the surrounding water quality was not impacted by the supposed boat strike, the location of the pipe on the surface changed the way that the

Water Quality Corner Continued

dilution of the treated effluent was modeled. Updated models that placed the outfall at the surface suggested that oyster farms in Portersville and Grand Bays were vulnerable to contamination. This meant that the growing areas had to close to harvest until a minimum of seven days after the pipe could be returned to the seafloor. That happened 25 days after the problem was first discovered, the entire closure will be for more than 35 days, a tremendous length of time for these areas to be closed.

While there is little that extension professionals, like me, can do to resolve situations like this when they pop up (pun intended), it is our job to help open the lines of communication between everyone involved. Through a grant from the National Ocean and Atmospheric Administration (NOAA) Saltonstall-Kennedy program, my colleagues and I have had the opportunity to work closely with many of the impacted oyster growers under both rosy and adverse conditions like they experienced this past month. What those interactions have revealed is a need for training on the regulations that impact their businesses, help navigating the various levels of bureaucracy that govern the agencies involved, new data on the water quality in and around farms, and



Map showing approved oyster growing areas (blue), restricted growing areas (green), unclassified areas (yellow), and prohibited areas (red). The standard buffer around the Bayou. La Batre wastewater treatment outfall (red circle around black dot) helps ensure that oysters harvested from nearby Portersville and Grand Bay are safe for human consumption. New models that incorporate the outfall at the surface suggested that the buffer be extended out to 3.8 miles from the outfall (black ring). Photo: The Bayou La Batre Wastewater treatment outfall could be seen at the surface and posed a hazard to navigation until it was reattached to the seafloor on May 19th. (Photo Credit ADPH)

someone to cobble all the information together in a way that makes sense. Over the course of the next two years my colleagues and I will be doing just that. I look forward to keeping everyone up to date on our work and to hearing from folks about their questions, concerns, and need for information about seafood regulations and conditions that impact the bountiful waters and successful businesses of our beautiful coast.