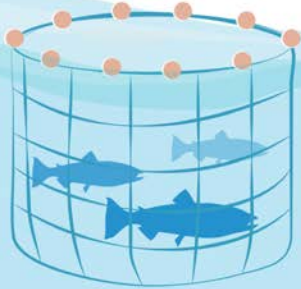




# The New Wave: Oyster Farming in the Southern US

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# 2015 Aquaculture Production Highlights



## Marine and Freshwater National Totals

### U.S. Value

**\$1.4**  
billion dollars

**21%**  
of total U.S.  
seafood production  
& fishery products  
by value

### U.S. Production

**627**  
million pounds

**16<sup>th</sup>**  
in global  
aquaculture  
production

## Marine Species Totals

**\$173 million**  
35 million pounds

**Oysters**

**\$112 million**  
9 million pounds

**Clams**

**\$88 million**  
48 million pounds

**Salmon**

**\$11 million**  
4 million pounds

**Shrimp**

**\$10 million**  
0.7 million pounds

**Mussels**

## Regional Marine Totals

**Pacific**  
36%  
by value

**Gulf of Mexico**  
23%  
by value

**Atlantic**  
41%  
by value



**NOAA FISHERIES**



## Shellfish Culture in USA

- ▶ Oysters, clams, mussels – a success story for US aquaculture
- ▶ But in 2008, very limited oyster culture in Southern US

# Two Means of Traditional Oyster Production in the Gulf

- ▶ 'Wild' public oyster reefs



- ▶ Private 'oyster beds'



# Both Rely upon Natural Set

- ▶ 'Cultching' /shell planting is done to improve the habitat for oyster settlement to improve set
- ▶ On private beds, oyster seed may be moved to different areas



# Primarily Commodity Market

- ▶ Focused on the commodity, shucked product market
- ▶ High volume, low price



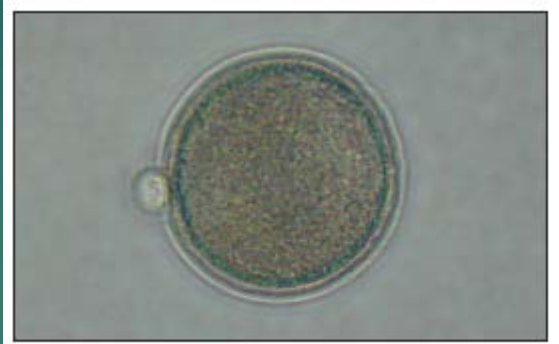
# Auburn University Shellfish Laboratory

- ▶ Opened in 2003
- ▶ Capacity to spawn over 2 billion oysters per year
  - ▶ Facilities could readily support other marine invertebrate culture
- ▶ Capacity to raise at least 42 million 2 mm oyster spat per year
- ▶ Resource for oystermen, resource managers, etc. – focused on applied research



# Hatcheries Maximize Steps of Oyster Life Cycle

- ▶ Spawning
- ▶ Fertilization
- ▶ Larval Growth and Survival
- ▶ Metamorphosis
- ▶ Early growth of oysters after metamorphosis (typically considered 'nursery')



**Figure 8.** Fertilized egg with first polar body.





# Larval Care in Hatchery



# Larvae Go Through Metamorphosis and 'Set' to Become 'Seed'



# Bird's Eye View



# Off-Bottom Culture

- ▶ Typically relies on hatchery-reared seed
- ▶ Gear is used to protect oysters from predators, burial and other losses
  - ▶ Requires \$ investment
  - ▶ Requires time
- ▶ Can be established in areas where oysters on the bottom don't survive (high salinity, soupy bottom)



# Why Weren't We Doing More Off-Bottom Oyster Farming?

- ▶ Why Farm Something that Nature Provides in Abundance?
- ▶ Problems of Fouling and Overset
- ▶ Concerns about Potential Price for Regional Farmed Oysters
- ▶ Risk of Hurricanes
- ▶ Risk of Theft, Vandalism



We Can Now  
Provide Consistently  
High Quality that  
Nature Does Not

- ▶ South historically has had a lot of relatively inexpensive oysters
- ▶ Quantity and quality vary
- ▶ Target high-end market with beautiful, branded oysters

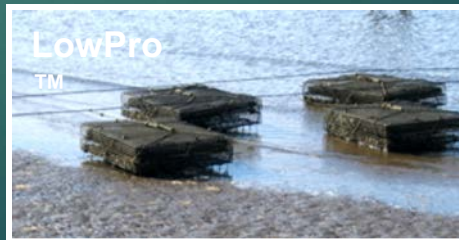


# Solving Problem of Fouling & Overset Cost Effectively

- ▶ In Alabama, collaboratively tested 4 types of gear, of which 3 control fouling through air drying
  - ▶ Australian long-lines
  - ▶ Floating cages
  - ▶ Floating bags
  - ▶ Bottom cages
- ▶ Needed to produce oysters that at most needed a rinse



# Grow-Out Gear



Photos: Bill Walton, Courtney Coddington, & Julie Davis



# Air Drying Takes Oysters Fully Out of Water


CONTROL FREQUENCY  
AND DURATION OF LOW  
TIDE



# Markets and Price

- ▶ In 2009, advised that top price would be 15 cents more per oyster than wild oysters
- ▶ Currently, wholesale prices of 35 to 70 cents per oyster
- ▶ Focused on high end markets in US Southeast
  - ▶ New Orleans, Atlanta, Houston, Birmingham, Nashville, etc.
- ▶ Opportunity/challenges in outside markets?

OYSTERS	\$	QTY
Man Louis, Portersville Bay, AL braised greens; salted cream John Webster	2.25	
Turtleback, Portersville Bay, AL low salinity; butter & seagrass Troy & Rebecca Cornelius	2.25	
Point aux Pins, Grand Bay, AL full, firm & mossy Steve Crockett	2.65	
Murder Point, Sandy Bay, AL clarified butter over scallops Lana Ziriatt	2.75	
Sea Level Salts, Nelson Bay, NC sea salted cauliflower Jimmy Morris	2.50	
Stones Bay, Stones Bay, NC mild salinity; baby cabbage Matt & Kim Schwab	2.40	
Pensacola Bay, Pensacola Bay, FL plump & mild Don McMahon	2.50	
Salty Birds, St Marks River, FL feta; boquerones; delicious! Calnon Gregg	2.60	
Palmetto Island, Oyster Bay, FL parsnip & bonito flake Ben Wiggins, Phil & Bob Bruggner	2.55	
Wakulla Mystique, Panacea, FL cream of mushroom Matt Hodges	2.50	
Hatteras Salts, Cape Hatteras, NC corn pudding & sandalwood Ryan & Bill Belter	3.00	



**WATCHMAN'S**  
SEAFOOD  
AND SPIRITS

CONSUMING RAW OR UNDERCOOKED MEATS, POULTRY, SEAFOOD, SHELLFISH, OR EGGS MAY INCREASE YOUR RISK OF FOODBORNE ILLNESS.



# Why Weren't We Doing More Off-Bottom Oyster Farming?

- ▶ ~~Why Farm Something that Nature Provides in Abundance?~~
- ▶ ~~Problems of Fouling and Overset~~
- ▶ ~~Concerns about Potential Price for Regional Farmed Oysters~~
- ▶ Risk of Hurricanes – Developing strategies and insurance options
- ▶ Risk of Theft, Vandalism – To be determined

# Opportunities and Needs for Auburn University Research and Outreach

01

Improving  
production  
methods and  
product quality

02

Improving  
product safety

03

Understanding  
and predicting  
water quality  
issues

04

Understanding  
ecological  
interactions

05

Training and  
technical  
advice

# Hands-On Training

- ▶ 34 farmers trained over two years, including two high school students
- ▶ Provided classes and hands-on instruction
- ▶ Each farmer chose a gear type and was given 20,000 oyster seed to raise
- ▶ Currently class with 20 students
- ▶ Developing program for military veterans



# Bonus Point Oyster Company



- ▶ Collaborating with Alma Bryant High School near Bayou la Batre to form a high school student-run commercial oyster farm with production of at least 200,000 oysters per year
- ▶ To test and compare the effect upon profit per oyster and ten-year internal rate of return of:
  - ▶ Two different culture methods to control bio-fouling;
  - ▶ Two different tumbling and grading schedules;
  - ▶ Use of diploid or triploid oysters

# Alabama Growth

- ▶ In 2008, no farming
- ▶ In 2016, Situation & Outlook Report
  - ▶ 14 oyster aquaculture
  - ▶ Farm gate at least \$1.9 million
  - ▶ At least 2.6 million oysters harvested
  - ▶ Oyster market prices ranged from \$0.30 to \$0.80 with an average price of \$0.45
  - ▶ At least 20 full-time employees and 10 part-time employees
  - ▶ At least 28 acres permitted for oyster aquaculture with at least 18.1 acres used in production.



Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat  
Image © 2015 TerraMetrics  
Image NOAA

# Where Has This Gotten Us Regionally?

- ▶ In Louisiana, now 4 oyster farms
- ▶ In Mississippi, changing regulations and creating up to 3 oyster farm 'zones'
- ▶ In Florida, at least 36 farms now raising oysters
- ▶ Working with colleagues in NC, SC and GA as well





# Good But Can Do Better

- ▶ Need to think and produce results in terms that are relevant to oyster farmers
  - ▶ Profit per oyster, returns on investment, etc.
- ▶ Frame the research questions specifically so that income and costs are accounted for



# Conclusions

- ▶ Exciting growth of off-bottom oyster farming in the region
- ▶ Auburn University and Alabama Cooperative Extension System will continue to provide:
  - ▶ Science-based advice
  - ▶ Demonstration of new techniques
  - ▶ Training for individuals





# Questions