ALABAMA OYSTER REEF RESTORATION PROGRAM

Sean Powers, Robert Shipp & Ken Heck

Department of Marine Sciences
University of South Alabama
&
Dauphin Island Se Lab
Outline

- Alabama oyster fishery
- Overview of the program’s goals and components
- Current and planned restoration projects
- Research projects & monitoring efforts
Alabama oyster fishery

- hand tongs with a 20 bushel/day limit
- only a small portion of Mobile Bay is intensively fished
- recent changes in the shrimp industry have resulted in increased effort in the oyster fishery
AL Oyster Restoration

- **The Good**
  - Relatively rapid growth (1.5 – 2 yrs)
  - High spat set in western bay and Mississippi sound
  - Low disease levels

- **The Bad**
  - Low dissolved oxygen
  - Low recruitment in upper and eastern bay areas
  - Oyster drills
Project Objectives

- to develop the scientific understanding necessary to direct oyster restoration and enhancement in Alabama coastal waters.

- to assist in the development of a long-term strategy for sustained productivity of Alabama’s oyster resources and the associated ecological benefits that accrue from healthy oyster-based habitat.

- to provide this information to state and federal management agencies, the fishing industry and the general public through outreach activities.
Project Components

- Reef Creation/Enhancement
- Targeted Research Projects
  - Ecological benefits
  - Fisheries benefits
  - Oyster biology
  - Environmental studies
  - Socioeconomic studies

Design criteria
- site selection

Education/Outreach
Elevation of oyster reefs appears critical to successful reef restoration in areas with poor water quality or low oyster recruitment.

Unfortunately elevated reefs cost more to build.

Given the need for oyster reef restoration in multiple areas of the bay, the program has designed a large-scale planting effort to examine the efficacy of elevated reefs under varying environmental conditions.
Reef Creation

2003-2004
• Cedar Point Reef Area H
• Sand Bar Reef Area A
• Shell Bank Reef Area
  □ Heck et al.

2004-2005
• Perdido Bay
Experimental Design - 2003

Twenty-four 25 m x 25 m reefs

Cedar Point

Sand Reef

Shell Bank

High relief (1m) oyster reefs

Low relief (0.1 m) oyster reefs

Response variables: (1) Oyster survivorship, (2) Oyster growth, (3) oyster recruitment and (4) finfish and crab utilization.
Targeted Projects: Ecological Benefits

- **Heck, Cebrian, Powers** - *Ecosystem services provided by oyster reefs: An experimental assessment.*

- **Kelly Major** - *Indicators of oyster reef functioning: Benthic algal community composition and productivity.*
Tidal creek – oyster reef creation (Heck et. al)

6 tidal creeks – 3 with oyster & 3 without
Response variables (primarily off-reef)
- Water column – turbidity, chl a and primary production
- Benthos – microphyto production, macr algalgae biomass, benthic and epibenthic invertebrate density and biomass
- Oyster – density live and dead, biomass
- Demersal/pelagic – fish & mobile inverts (block netting)
Targeted Projects: Fisheries Benefits

- Powers & Heck - Quantifying fisheries benefits of oyster reef restoration in Mobile Bay.

- Aronson - Influences of reef surface characteristics on recruitment, survival and production of the eastern oyster Crassostrea virginica.
Targeted Projects: Oyster Biology


- Brockhouse - *The genetic identity of oysters in the Alabama Oyster Reef Restoration Program.*
Targeted Projects: Environmental Studies

- Park, Schroeder, Chen
  Development of a three-dimensional Hydrodynamic model for Mobile Bay. Once developed the model can be used to examine water quality and oyster recruitment.
Oyster Biology: Bay-wide oyster recruitment survey

- AORR reef sites
- Additional survey sites
- Monthly settlement plates
- Water quality
Coastal water quality/meteorological mooring at Middle Bay Light (in cooperation with the Mobile Bay National Estuary Program and the Dauphin Island Sea Lab).

Data gathered by this station and other NEP/DISL stations will be critical in validating the Mobile Bay circulation model as well as serving the needs of the fishing community through real-time web access.
Socioeconomic

- Picou - Maintaining a balance between sustainability and harvesting practices: a socioeconomic characterization.
Education/Outreach

- **Dindo** – Alabama Oyster Reef Restoration Program: Public outreach and K-12 education.
- **Bayou LaBatre High School Aquaculture Program**: Seed oyster production for restored oyster reefs.
Cooperating/participating agencies

- National Marine Fisheries Service
- Alabama Marine Resources Division
- Dauphin Island Sea Lab
- Mobile Bay National Estuary Program
- Bon Secour Seafood, Inc.
- Auburn University Extension Service
- Alma Bryant High School Aquaculture Program (Bayou LaBatre)
Future Program Activities

- Development and implementation of a fishermen directed oyster enhancement program.
- Second request for proposals to University researchers.
- Expansion of outreach/education activities.
Distribution of effort

FY 02 Appropriation
FY 03 Appropriation
FY 04 Appropriation (?)

- Reef creation/enhancement
- Targeted Research Projects
- F & A costs