Nothing Compares
NORTH CAROLINA

Oyster and Hard Clam Fishery Management Plan Amendments

Marine Fisheries Commission

November 19, 2015

Department of Environmental Quality

Timeline Highlights

MFC MILESTONES	PROJECTED COMPLETION DATE
1. Present Timeline and Goal and Objectives to MFC; Solicit MFC Input on Issues	August 2014
2. Draft/Revise and Review Informational Sections and Issue Papers in the FMP and Establish NCDMF/AC Positions	September 2014 – September 2015
3. Obtain MFC Approval for Public Review of FMP	**November 2015**
4. MFC Selects Preferred Management Options	February 2016
5. Department/Legislative Review	March 2016
6. MFC Procedural Approval for Notice of Text for Rules	May 2016
7. Direct Rules Through APA Process	August-October 2016
8. Final FMP and Rule Approval by MFC	November 2016
9. Selected Management Measures Effective Date	48 hrs. if proclamation; April 1, 2017 if rule

- Management Authority
- General Problem Statements
  - Insufficient Data
  - Management (Public bottom)
  - Private Culture
  - Environment and Public Health
  - Enhancement
- Management Unit – All Eastern oysters (*Crassostrea virginica*) and hard clams (*Mercenaria mercenaria*) that occur in all North Carolina coastal waters.
- Existing Plans, Statutes, and Rules

Life History - Oyster

- Found from Canada to the Caribbean.
- Temperatures 32 to 90 ^{o}F, salinities at 5-40 parts per thousand (optimum between 14-28 parts per thousand).
- Change sex yearly, develop and spawn first as males.
- Begin spawning at 68 ^{o}F and peaks at 77 ^{o}F.
- Larvae develop through multiple free swimming stages, before settlement.
- Recruitment variable, typically two settlement peaks in June and October, intensity and success is variable.
- Highest growth six months after settlement and declines during the life of the oyster.
- Seasonal growth is fastest in spring and fall. In Pamlico Sound, market size (three inches) in about three years.

Life History – Hard Clam

- Found from the Canada to Texas.
- Most abundant in higher salinity waters inside the barrier islands from Ocracoke south, occur in Pamlico Sound but at much less quantities than further south.
- Endures wide temperatures and salinity ranges.
- Spawning occurs when temperatures reach 68 ^{o}F.
- Juveniles contain both sex cells and often differentiate into males and then as adults transform into females.
- Populations show a wide size range in individuals.
- Growth rates are highly variable.
- Shell growth greatest the first year and seasonally in the spring and fall.
- There is a lot of variation in age of similar-sized clams even within the same habitat.

Oysters – Concern

- Vulnerable to overharvest because of several factors that negatively impact their survival.
- Data is not available to produce a traditional stock assessment.
- Evaluation of the catch rates in the commercial fisheries were inconclusive.

Hard Clam – Unknown

- Continued lack of data to produce a reliable stock assessment.
- Catch rates in hard clam commercial harvest were evaluated, increasing trends occurred in some waterbodies.

Status of the Fisheries - Oysters

Present Public Bottom Mechanical Commercial Fisheries

- Mechanical gear is restricted to deeper portions of the sounds, rivers and bays north of Core Sound.
- About 30,000 acres closed to mechanical harvest gear, in the upper portions of the bays around Pamlico Sound and part of Roanoke Sound.
- Reduced the mechanical oyster harvest limit to match the hand harvest limit in the remaining portion of those areas in Amendment 2.
- 2010 Supplement established a monitoring system to determine the closure of mechanical harvest areas and allowed mechanical harvest limits up to 20 bushels per commercial fishing operation per day.
- The bays around Pamlico Sound are opened for a six-week season (mid November through December) with a daily 10-bushel-per-commercial-fishing-operation harvest limit and outside the bays allowed a daily 15 bushel per commercial fishing operation harvest limit.

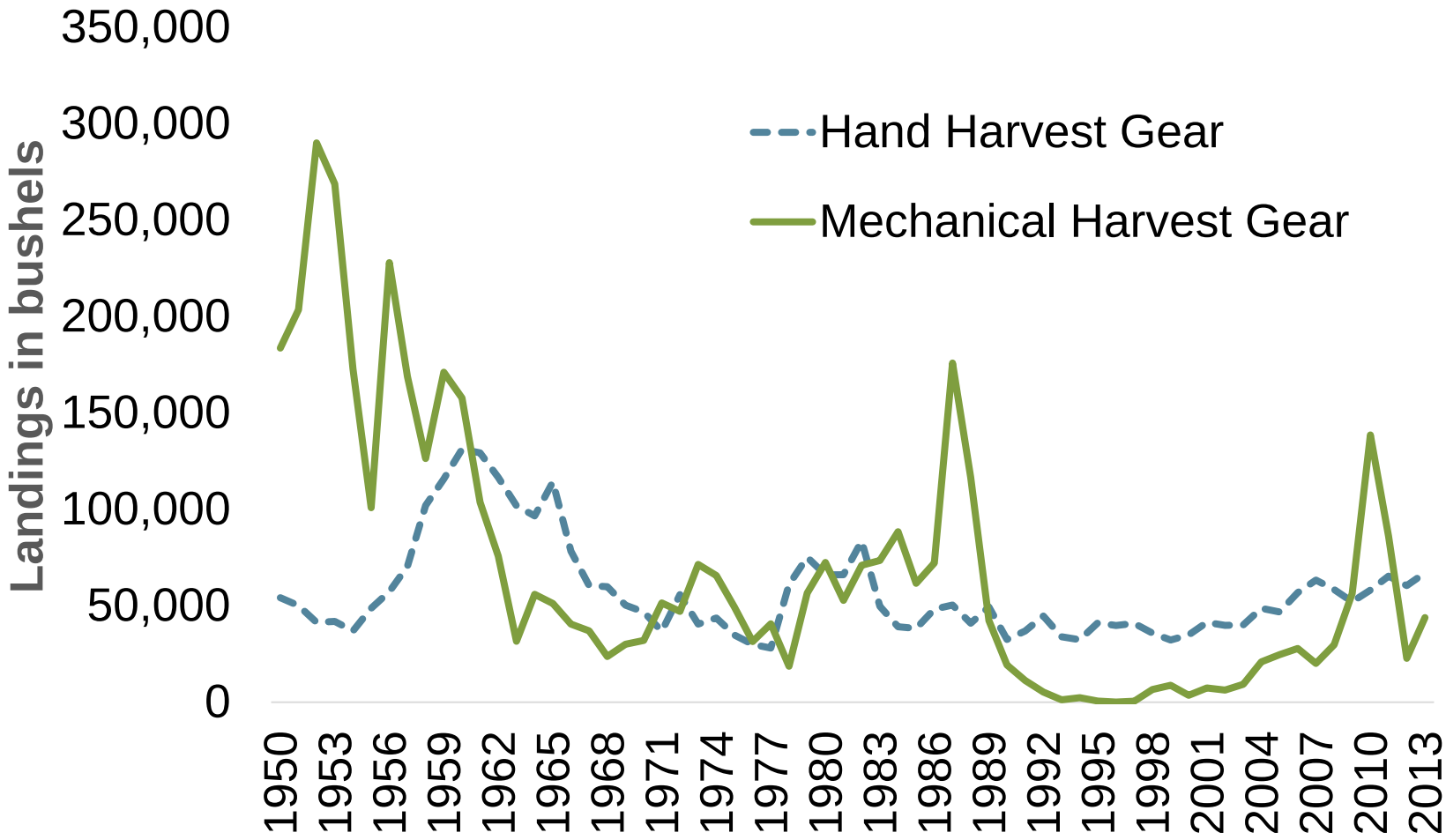
Status of the Fisheries - Oysters

Present Public Bottom Hand Harvest Commercial and Recreational Fisheries

- Hand gears: hand tongs, hand rakes and by hand.
- Hand-harvest season for commercial and recreational harvest begins on Oct. 15 each year through March 31, although some locations may close earlier.
- Commercial harvest limited to Monday through Friday each week, recreational is allowed seven days a week.
- Harvest limits is five bushels not to exceed 10 bushels per commercial operation from Core Sound south.
- Recreational daily harvest limit is set at one bushel per person per day not to exceed two bushels per vessel.
- Oyster commercial hand harvest north of Core Sound limited to 10 bushels per fishing operation in the bays, small rivers and shallow sounds and15-bushel limit in the deeper water areas outside the bays.

Status of the Fisheries - Oysters

Public Bottom Commercial Fisheries



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Status of the Fisheries – Hard Clams

Present Public Bottom Mechanical Commercial Fisheries

- Main gears are the clam trawl and the hydraulic escalator dredge.
- Season is from December through March (by proclamation).
- Allowed in only very specific areas from Core Sound to New River and the Intracoastal Waterway in Onslow and Pender counties.
- Some mechanical harvest areas are rotated annually.
- Daily harvest limits vary by waterbody.

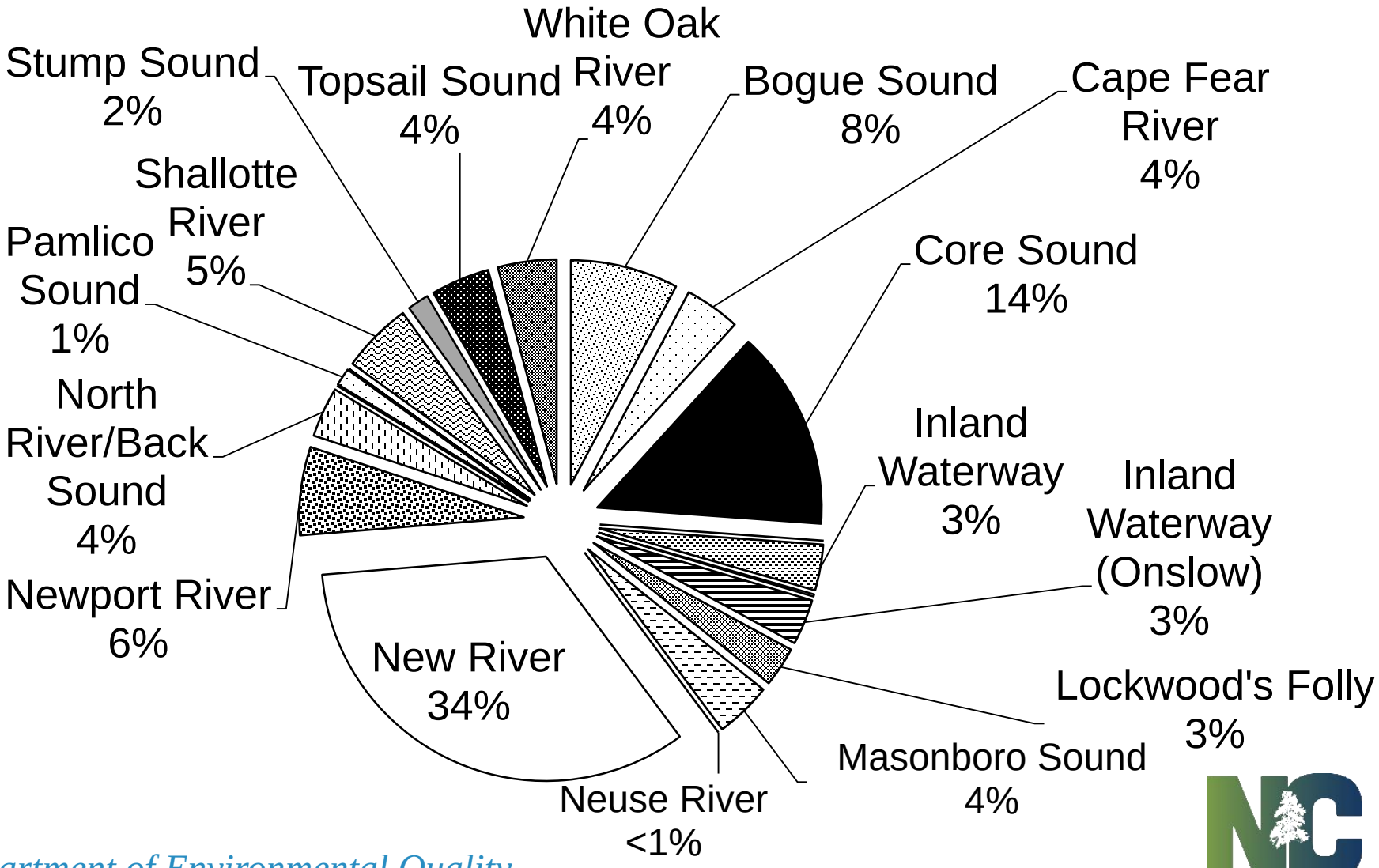
Commercial Fishery – Hard Clam

Present Public Bottom Hand Harvest Commercial and Recreational Fisheries

- Gear include rakes and by hand in shallow water up to four feet.
- Hand tongs and bull rakes can be used in deeper waters from a vessel in waters up to 20 feet. In use in areas of New River, White Oak River, Bogue Sound, and the Intracoastal Waterway.
- Commercial and recreational hand harvest open year round.
- Commercial daily harvest limit is 6,250 clams per person per day.
- Recreational daily harvest limit is 100 clams per person per day not to exceed 200 clams per vessel.

Commercial Fishery – Hard Clam

Public Bottom Commercial Fisheries by Waterbody 1994-2013



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Private Culture Fishery

Oyster and Hard Clam

- Long history of private culture in North Carolina.
- In 1989 legislation was enacted to allow the use of the water column above existing shellfish leases. The first water column lease was issued in 1991.
- An Aquaculture Operation Permit is required for operations that involve rearing of shellfish in a land-based facility (tanks, ponds, raceways, etc.) or in any contained structure in submerged waters (cages, bags, racks).
- There is a shellfish lease application process with specific standards that have to be met before issuance of a lease and contract.
- Also have a short season where relay is allowed to take clams or oysters from polluted areas and put them on a lease. The relaying is strictly controlled and enforced to eliminate health risks.

Private Culture Fishery

Oyster and Hard Clam

- There has been an expanded interest in aquaculture
  - Legislative studies currently in development.
- Four issues are included in the amendments to:
  - Identify ways to improve on the lease permitting process.
  - Investigate the possibility for stricter penalties for theft from leases and franchises.

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Protected Species Interactions

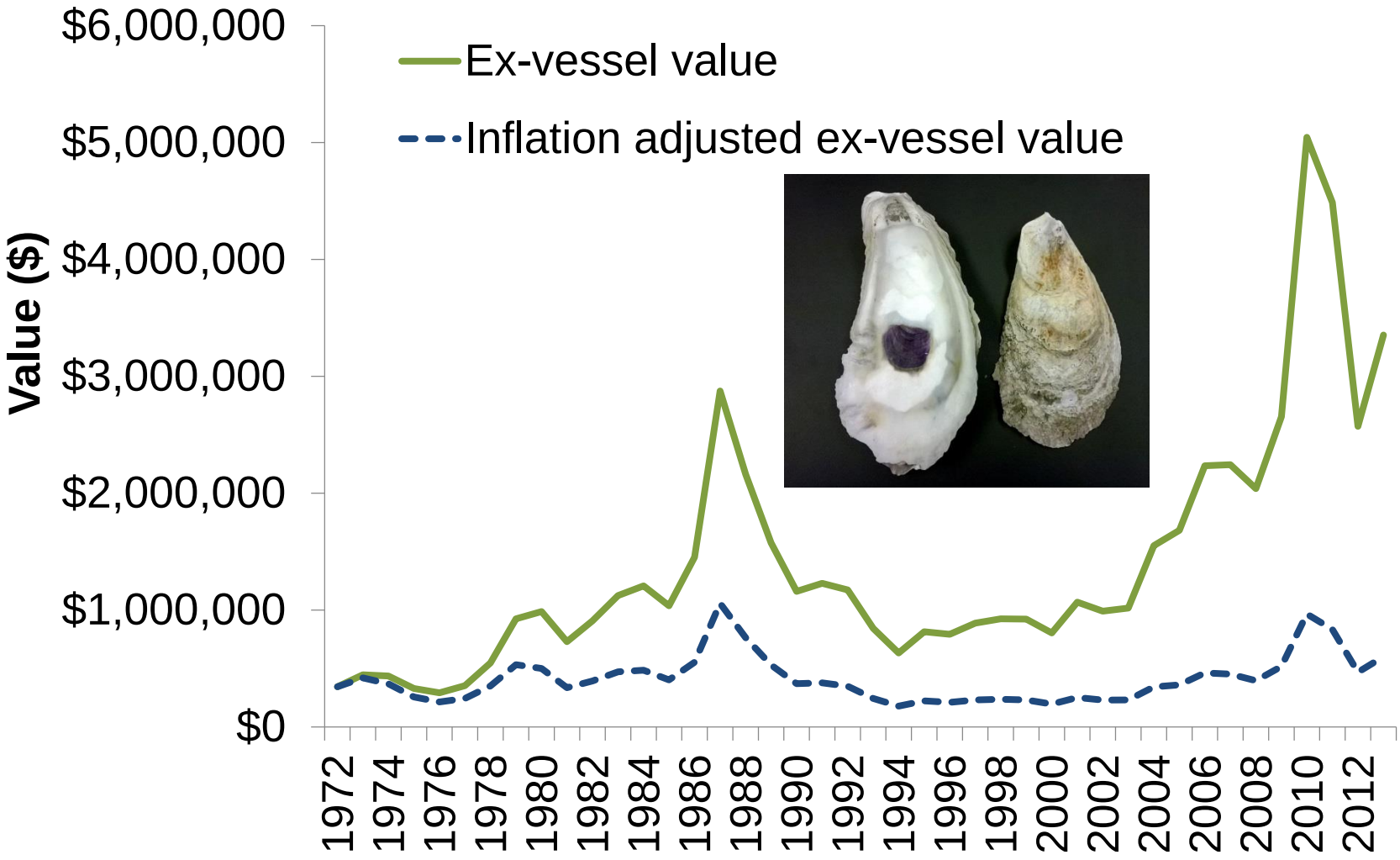
Oysters and Hard Clams

- Atlantic Ocean shellfish fisheries considered Category III fisheries, which have a remote likelihood or no known interactions.
- 2014 List of Fisheries had no documented interactions in shellfish fisheries.

Socioeconomic Status - Oysters

- Primarily a commercial fishery.
- Little is known of the recreational fishery.
- 2013: About 111,000 bushels of oysters landed commercially, ex-vessel value of $3.35 million.
- Fourth most economically important commercial seafood species in the state.
- Approximately 900 commercial participants.
- Hand harvest gears account for the majority of the harvest value in most years.
- Mechanical harvest gears have accounted for a greater share in recent years, exceeded hand harvest in 2009-2011.

Socioeconomic Status - Oysters



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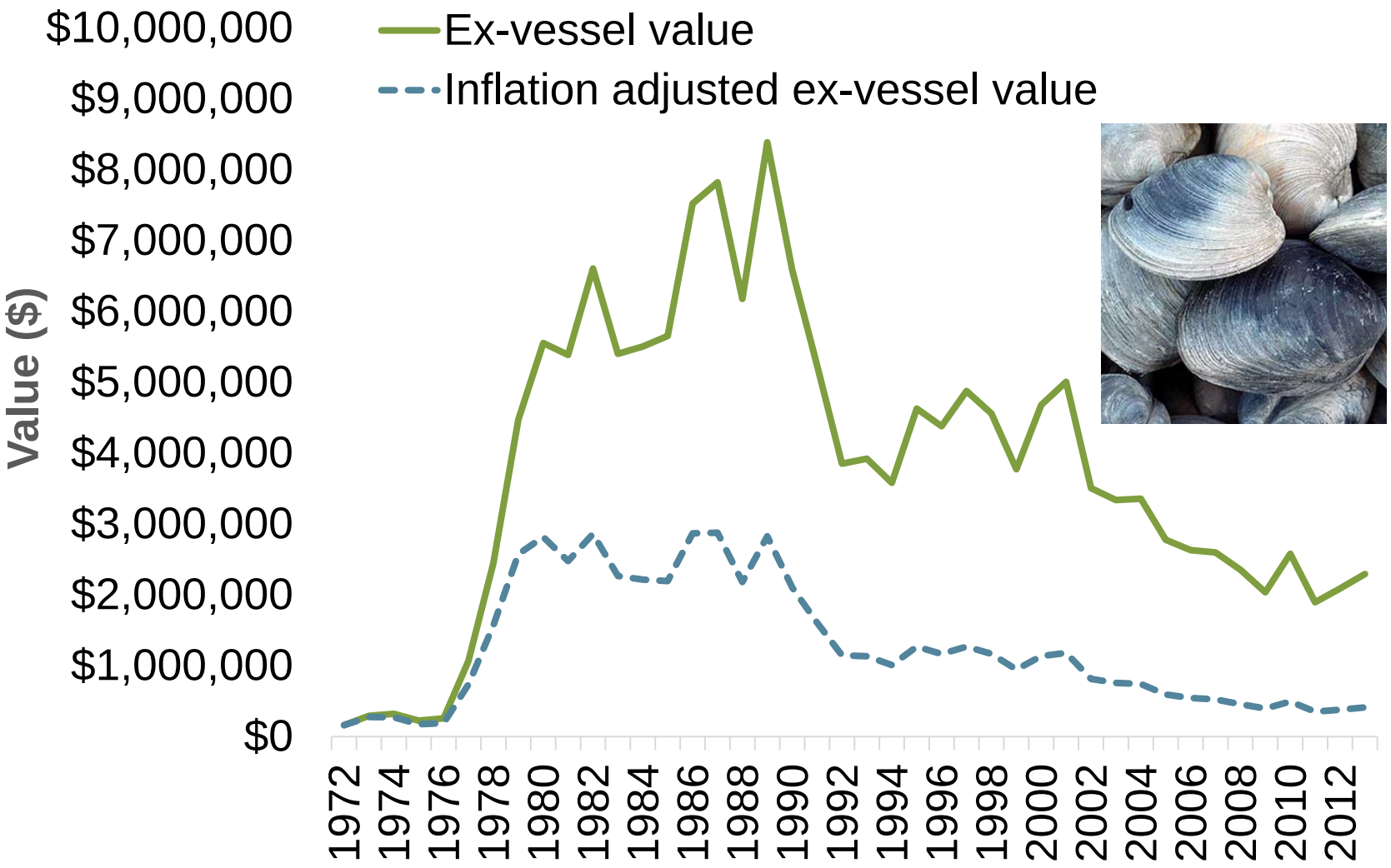
Socioeconomic Status – Hard Clams

- Primarily a commercial fishery.
- Little is known about the recreational fishery.
- In 2013: About 17.9 million clams landed commercially, ex-vessel value of $2.3 million.

- Sixth most economically important commercial seafood species in the state.
- Approximately 500 commercial participants.
- Hand harvest gears account for the majority of the harvest value in most years.

Socioeconomic Status – Hard Clams



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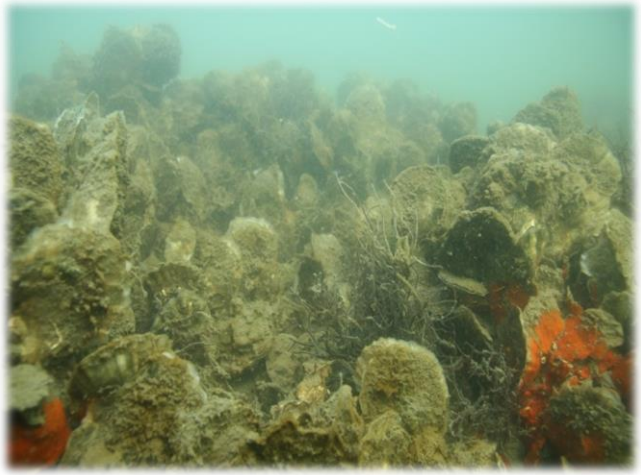
Habitat Enhancement

Oysters and Hard Clams

- Oysters are an ecological engineer that benefit many species.
- Historical overfishing, habitat destruction, disease, and pollution is behind the extensive population decline of oysters worldwide.
- Enhancement activities include:
  - Cultch Planting
  - Oyster Sanctuaries
  - Shellfish Relay Operations



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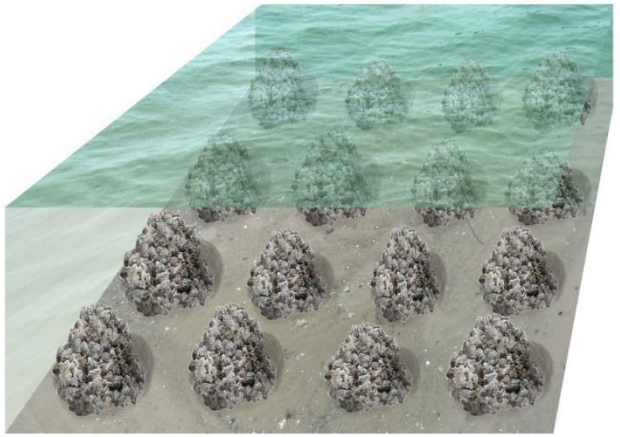
Cultch Planting

- Cultch planting began in North Carolina In 1915.
- Planting efforts peaked in 1934 with 825,000 bushels of seed oysters relayed and 78,567 bushels of oyster shells planted.
- Cultch planting efforts have recently decreased to approximately 200,000 bushels annually due to limited funding, shell availability, increased costs, and competition with other states for resources.

Oyster Sanctuaries

- Program began in 1996
- Existing: 13 sanctuaries 329 acres
- Planned: Four sanctuaries, ~50 acres
- Variety of materials
- Varying vertical relief and complexity



- Focus on improving larval supply and connectivity
- A lot of interest legislatively for the Jean Preston Sanctuary Network in Pamlico Sound and the division will provide a report early next year with a 10-year plan.

Shellfish Relay

- Relay shellfish from closed areas to potential harvest areas.
- Relay shellfish from possible destructive events to preserve the resource.
- Limited in funding, participation, and availability of seed in polluted areas.

- Oysters are considered a keystone species and contribute greatly to the estuarine system.
- Oysters are the primary component of shell bottom habitat.
- Oysters are the only fishery species that is also a habitat.
- Oysters occur in both subtidal and intertidal habitats in North Carolina.

Ecosystem Enhancement

- Productive habitat
  - Refuge
  - Forage
- Reduces turbidity
- Improves water quality
- Recycles nutrients
- Stabilizes sediment

Threats

- Fishing gear
- Introduced nuisance species
  - Dermo
  - MSX
- Non-native oysters
- Biological stressors
  - Boring sponge
- Water-dependent development

Threats

- Water quality degradation
  - Turbidity and sedimentation
  - Chemical contamination
  - Microbial contamination
- Environmental pathogens
  - Neurotoxic shellfish poisoning
  - Vibrios
- Green gill

Issues - Discontinued

These issue will no longer go through the process and now will be in an Appendix because of the passage of Session Law 2015-241 on Sept. 18, 2015.

- Utilizing GPS coordinates instead of a survey to define shellfish lease boundaries
- Core Sound shellfish lease moratorium
- Redefine off bottom culture

Issues – Oysters

- Re-open shallow bays (less than six feet) of Pamlico Sound to mechanical harvest
- Adopting Supplement A to Amendment 2 to the N.C. Oyster Fishery Management Plan
- Differences in hand harvest limits statewide
- Assessing and mitigating harvest effort impacts on oyster resources in the Southern region

Issues – Hard Clams

- Consider increasing the recreational maximum daily harvest limit for hard clams
- The use of power hauling equipment in the hand harvest of hard clams
- Management of public mechanical clam harvest

Issues – Oysters and Hard Clams

- Protection of shellfish lease and franchise rights
- Defining adverse impacts to submerged aquatic vegetation from shellfish leases and franchises
- Brunswick County shellfish lease moratorium
- Modify shellfish lease provisions

Issues – Oysters and Hard Clams

- Consider the elimination of the Shellfish License and require all shellfish harvesters to have a Standard/Retired Commercial Fishing License
- Requirements for shading Molluscan shellstock

Next Step

Vote to send Amendment 4 of the Oyster Fishery Management Plan and Amendment 2 of the Hard Clam Fishery Management Plan for review by the public and Marine Fisheries Commission's standing and regional advisory committees.