

Disturbances to Oyster Resources on the Public Oyster Seed Grounds

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OVERVIEW

- ✓ Biological Information
- ✓ Importance of Oyster Resources
- ✓ Historical and Geographical Perspective of Fishery
- ✓ Disturbance Types
- ✓ Management Responses to Disturbance

OYSTER BIOLOGY 101

American (=Eastern) oyster: *Crassostrea virginica*

- ✓ Optimal salinity – 5 to 15 ppt (psu)
 - > 15 ppt = predators
 - < 5 ppt = physiological stress
- ✓ Tolerates wide range of temperature
 - Spawn at ~ 25° C (77° F)
 - High temps can lead to disease (Dermo)
- ✓ Bottom Type
 - Need clean, hard substrate for larval attachment
- ✓ Broadcast Spawners
 - Millions of eggs and sperm produced
 - Larval stages last about 14 days



IMPORTANCE OF OYSTERS

- ✓ Keystone species
- ✓ Indicator of ecosystem health
- ✓ Provide forage and shelter habitat
 - Crabs, fish, worms, barnacles, etc.
- ✓ Food Source
- ✓ Affect water quality
 - Filter out microscopic particles
- ✓ Affect estuarine current patterns and sedimentation rates
- ✓ Provide shoreline stabilization



HISTORY AND GEOGRAPHY

✓ Industry Timeline

- Native Americans and shell middens
- 1758: First written documentation of harvest*
- 1905: Invention of oyster dredge
- Present day – LA leads U.S. in oyster harvest and value

✓ Public Oyster Areas – Approx. 1.7M acres

✓ Private Leases – Approx. 390K acres

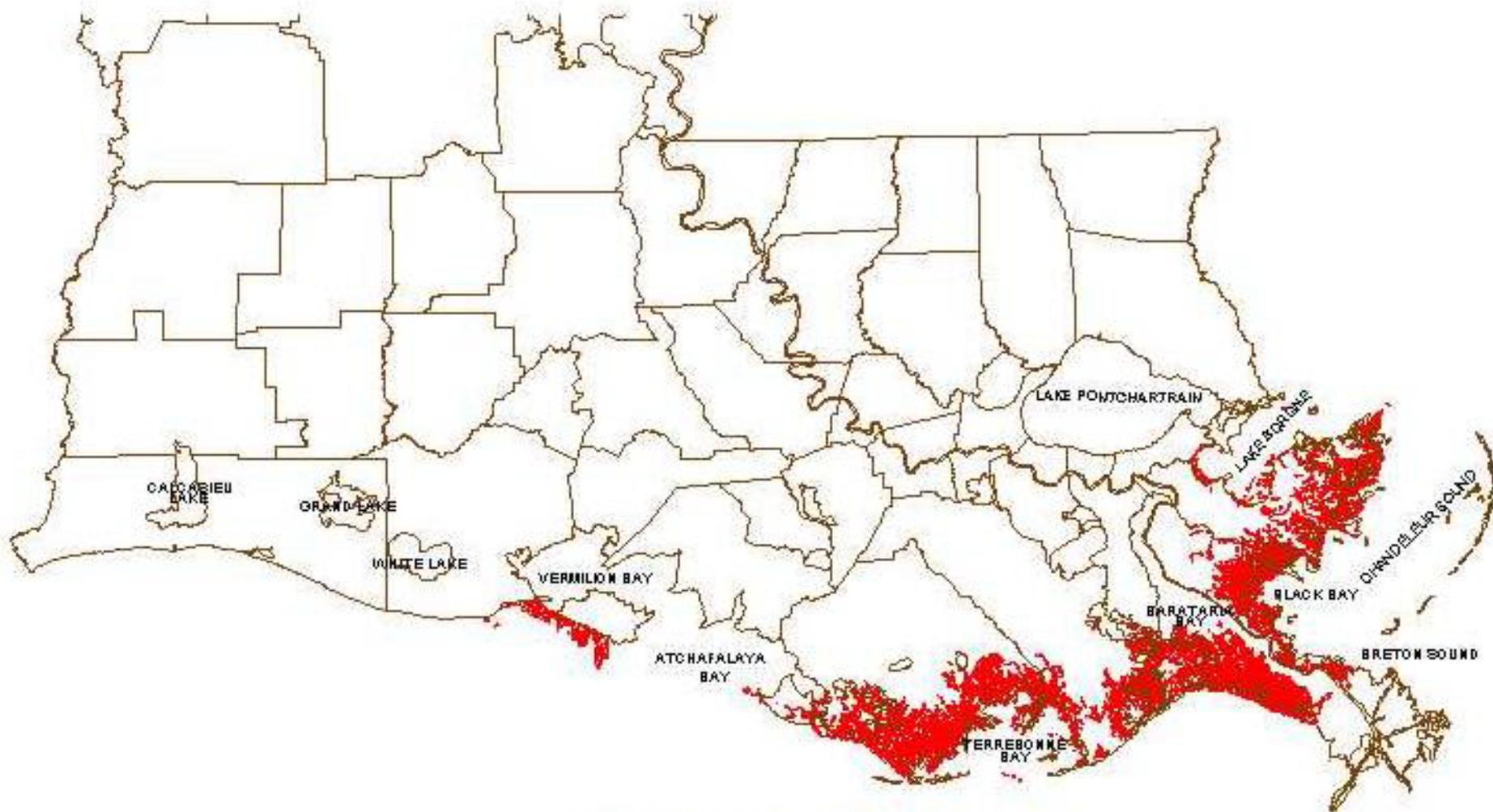
- First issued by parishes
- 1902 – First state lease issued in Whale Bay



Louisiana Public Oyster Areas

Louisiana Department of Wildlife and Fisheries

April 2, 2007



GULF OF MEXICO

DISTURBANCE TYPES

- ✓ Direct Disturbances
 - Sedimentation/burial
 - Hurricanes
 - Spoil placement
 - Prop-washing
 - Physical removal of animals
 - Commercial (over)harvest
 - Dredging of access channels/pipeline corridors/borrow areas
 - Pollution
 - Predation
- ✓ Indirect Disturbances
 - Environmental changes (salinity fluctuations)
 - Sediment drift
 - Competition
- ✓ Man-made vs. Natural

OIL AND GAS ACTIVITIES

- ✓ Impacts can be both direct and indirect
- ✓ State permit process serves to address potential impacts up-front
- ✓ Activities often in close proximity to productive reef areas
- ✓ Pre-project water bottom assessments help reduce disturbance
- ✓ Post-project compensation helps rehabilitate disturbed resources



TROPICAL WEATHER EVENTS

- ✓ Hurricanes have proven history of direct and indirect disturbance to oyster resources
- ✓ Direct oyster mortality is primary result of the disturbance
 - 70% mortalities in central LA, from Andrew
 - > 70% mortalities in eastern LA, from Katrina
- ✓ Reefs directly buried by sediment and marsh vegetation
- ✓ Rotting vegetation reduces dissolved oxygen



COMMERCIAL HARVEST

- ✓ Direct removal of oyster resources
- ✓ Harvest must be managed to ensure continued existence of species
 - Harvest times
 - Harvest places
 - Harvest gear
 - Harvest limits



OTHER DISTURBANCES

- ✓ Environmental changes (i.e., salinity)
 - Saltwater intrusion
 - Freshwater inflow
 - Natural “freshets”
 - Freshwater releases
 - Ocean acidification
- ✓ Pollution
 - Can cause direct and/or indirect disturbance to oyster populations
 - Direct oiling can smother reefs
 - Toxicity of pollutants impacts animal, prey, life-history
 - Can limit commercial access to oyster resources via health closures
- ✓ Predation and competition

MANAGEMENT RESPONSES

- ✓ Oyster management response to disturbance depends on many factors
 - Natural or man-made?
 - Socioeconomics
 - Politics
 - Funding-based
 - Biological
- ✓ Limit oyster development in “at-risk” areas?
- ✓ Limit some man-made disturbances in areas of high oyster productivity?



SUMMARY

- ✓ Public ground oyster resources exposed to many disturbances
 - Direct and indirect
 - Man-made and natural
- ✓ Management responses to disturbances depend on variety of factors
- ✓ “At-risk” areas can be identified
- ✓ Consider reducing investment in “at-risk” areas
- ✓ Consider avoiding/limiting some man-made disturbances in areas of high oyster productivity

An aerial photograph of a coastal region. A river flows from the top left towards the center, forming a delta that empties into a large body of water. The water is dark blue, while the river and delta areas are a mix of green, brown, and tan, indicating vegetation and sediment. The word "QUESTIONS?" is overlaid in the center in a bold, yellow, sans-serif font.

QUESTIONS?