The Louisiana, Mississippi, Alabama Coastal System (LMACS)

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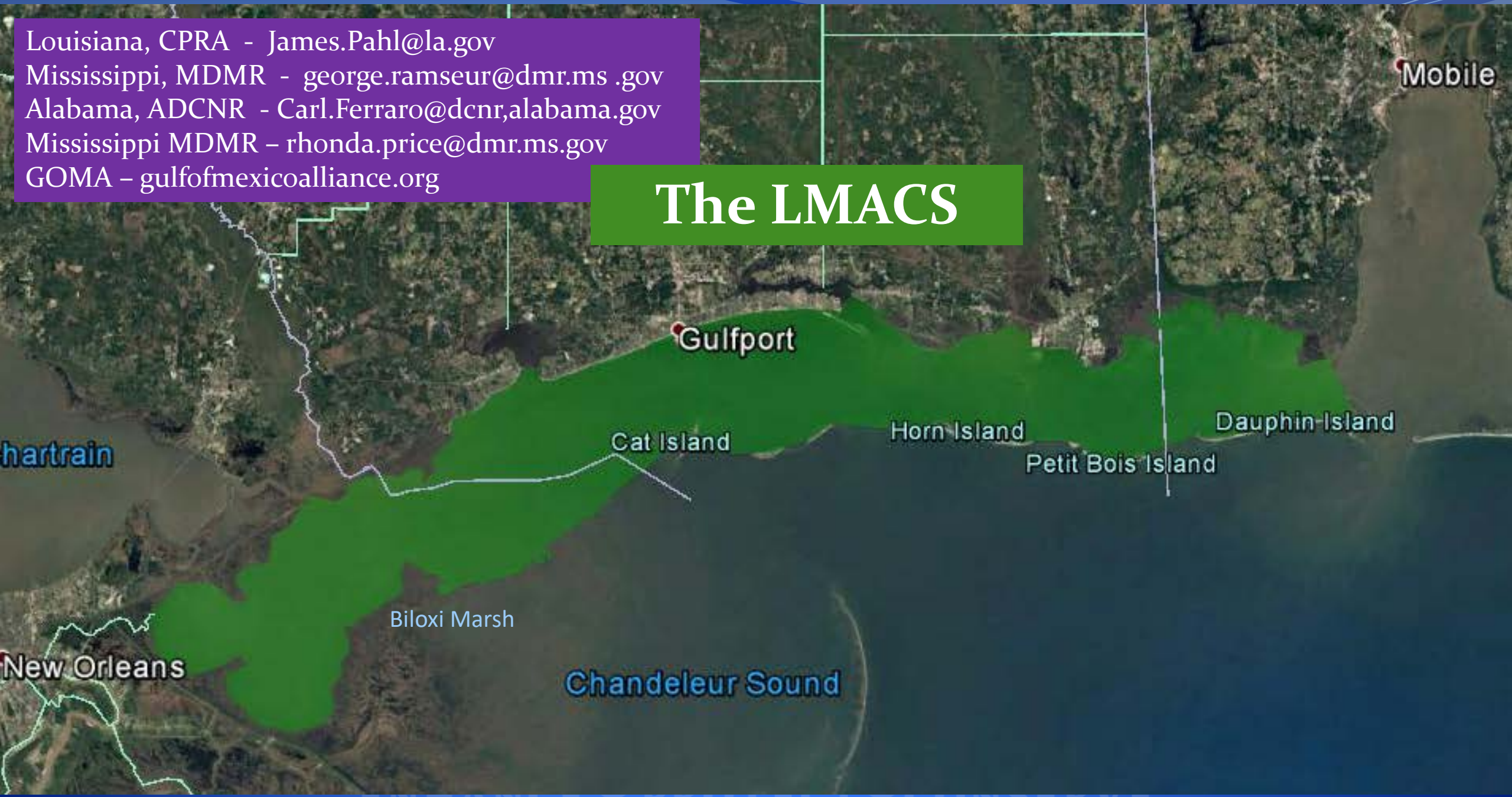
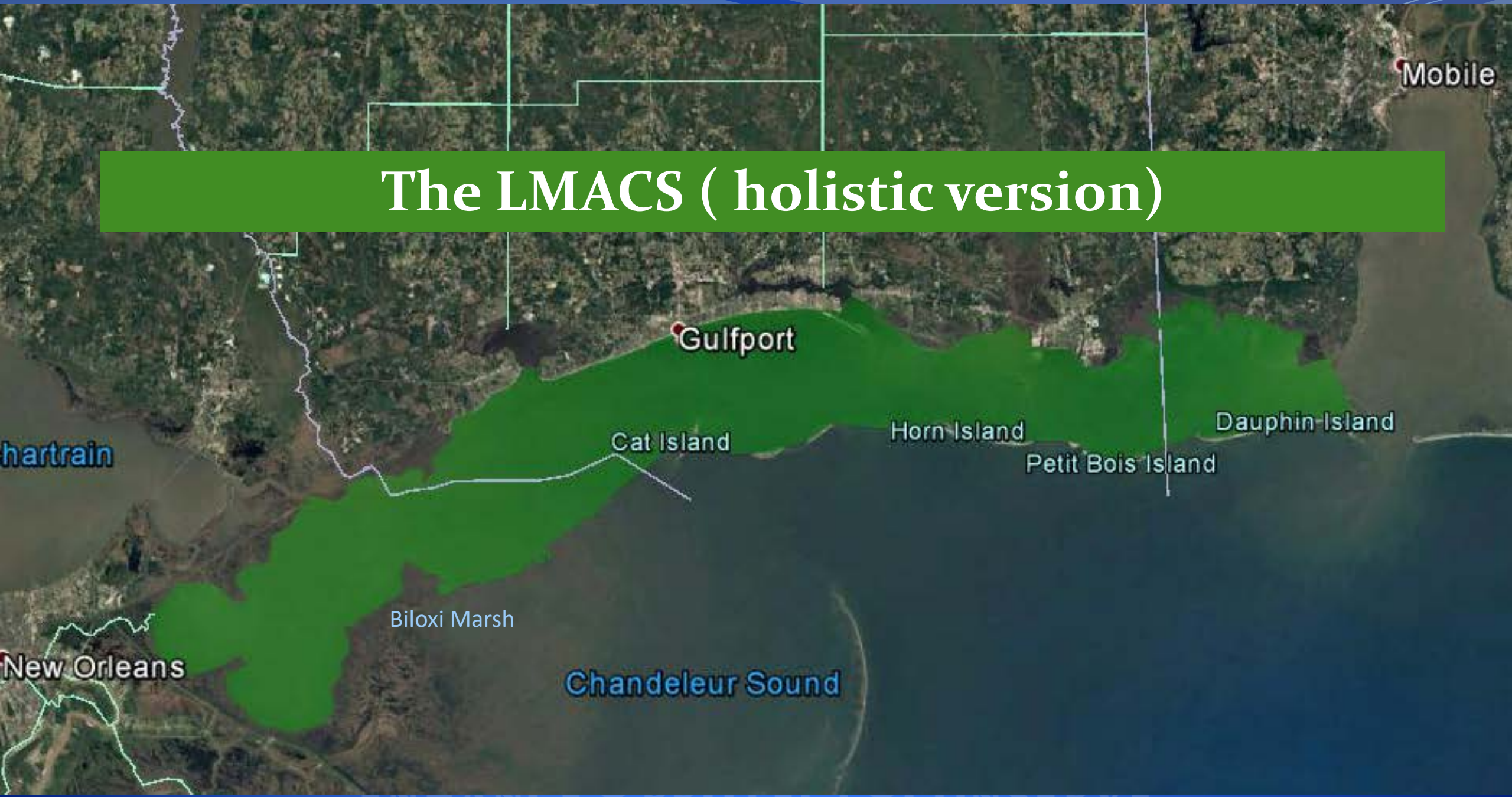
The LMACS



The LMACS (holistic version)



The LMACS Collaborative Partnership– How and Why?

- **Relationships** –
  The Gulf of Mexico Alliance (GOMA) – The LMACS concept has grown out of GOMA's Habit Resource & Coastal Resiliency Teams which have been led for over 10 years by the Louisiana Coastal Protection and Restoration Authority (CPRA) and the Mississippi Department of Marine Resources (MDMR) respectively
- **Focus –**
  The LMACS was created by experienced coastal managers to address commonly recognized, overarching obstacles to successful, long term management and restoration. ***It is an effort to identify the most critical problems and solutions related to fisheries sustainability and community resiliency, regardless of scale.***
- Funding-
  The LMACS has not been created in response to any specific funding source.
- **Observations –**
  Geomorphic change (erosion) is the primary driver of environmental change in the LMACS
  Estuary is trending marine
  Apparent failure of a keystone species (oysters)
  Louisiana restoration and management actions are significant
- **Assumptions** – (without action)
  Land loss will continue, and estuarine barrier will "fail"
  Wind/wave impacts to primary shorelines, communities & infrastructure will increase
- **Goals**–
  Comprehensive assessment, planning and implementation (Louisiana Master Plan template)
  Collaborative restoration implementation

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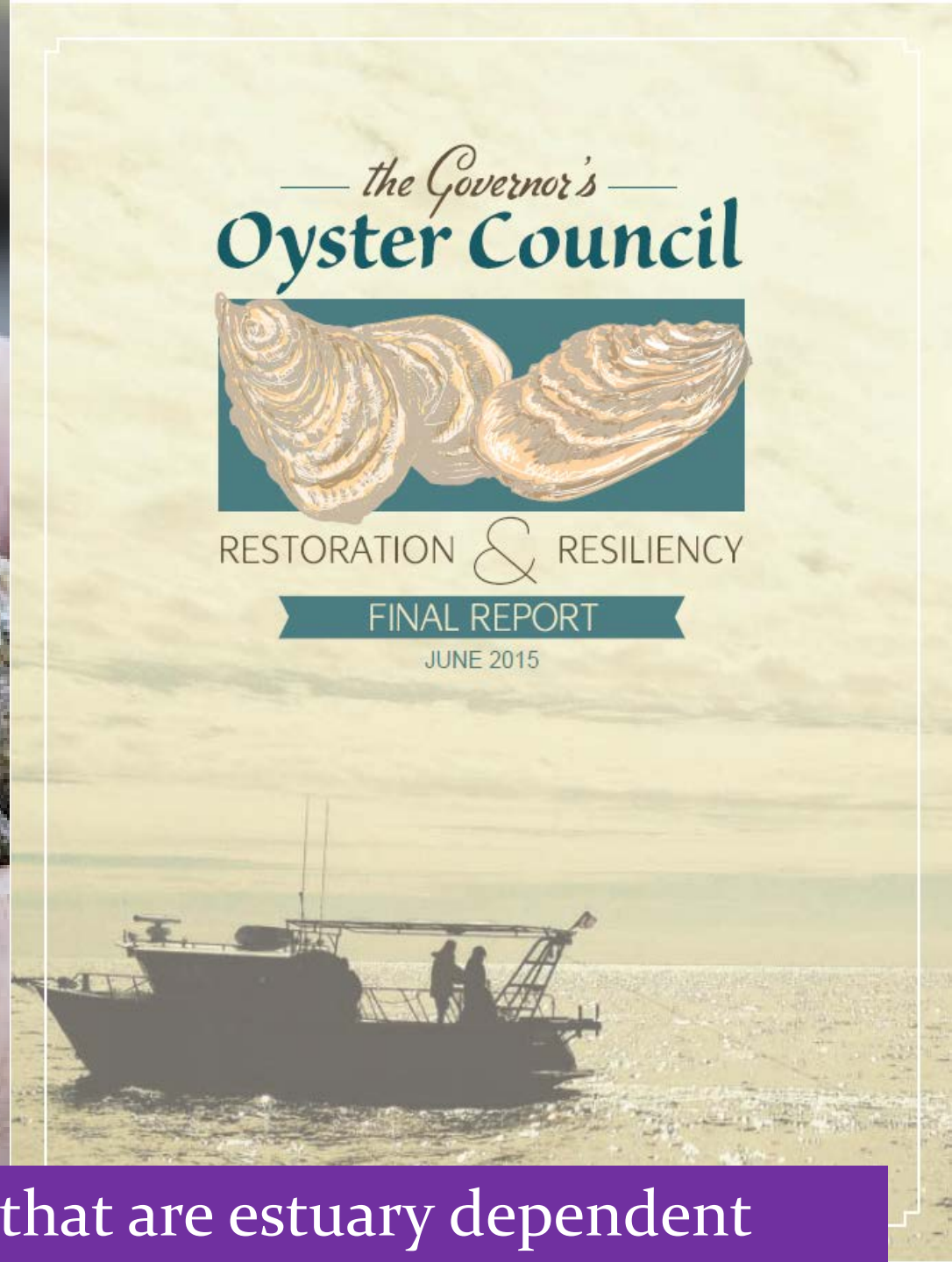
Ecological & Production Goals

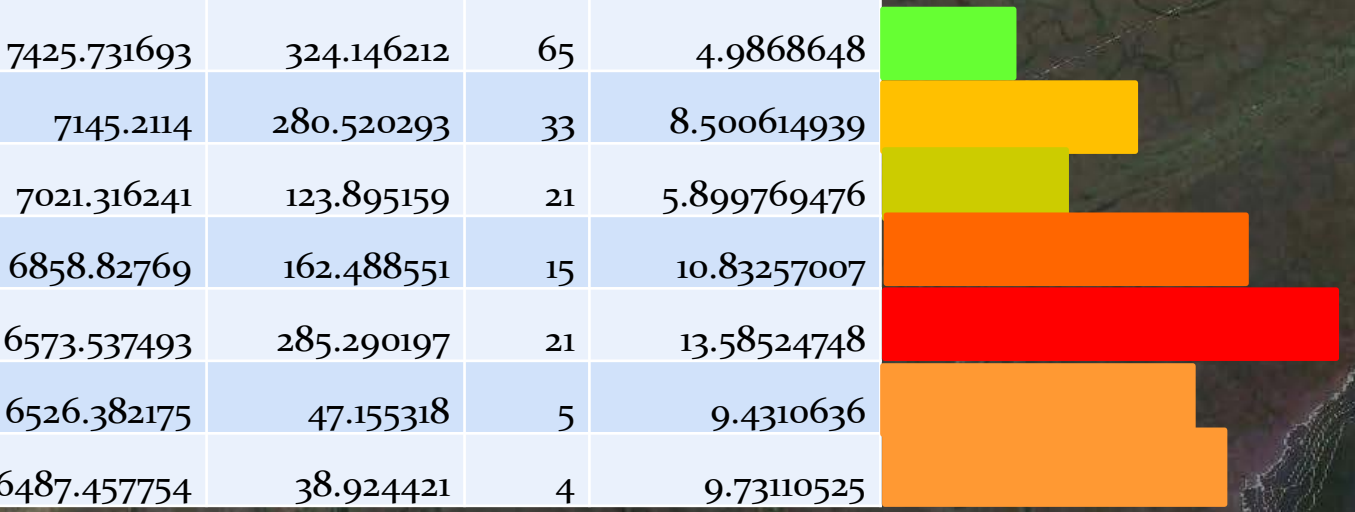
1 Million Sacks /Yr.



Mississippi has established ambitious goals that are estuary dependent


Land Loss
Heron Bay Bayou
2012
1953
1850
1969
1850
Hancock County, MS
(Western Mississippi Coast)
Heron Bay
Lighthouse Bayou
Mississippi loses over 200 acres every year
4152 ft
Google

Year	Acres	Acres Lost	#Yrs	Loss per year
1852	7749.877905			
1917	7425.731693	324.146212	65	4.9868648
1950	7145.2114	280.520293	33	8.500614939
1971	7021.316241	123.895159	21	5.899769476
1986	6858.82769	162.488551	15	10.83257007
2007	6573.537493	285.290197	21	13.58524748
2012	6526.382175	47.155318	5	9.4310636
2016	6487.457754	38.924421	4	9.73110525



Hancock County Shoreline Regression, 1852 to 2016

2016

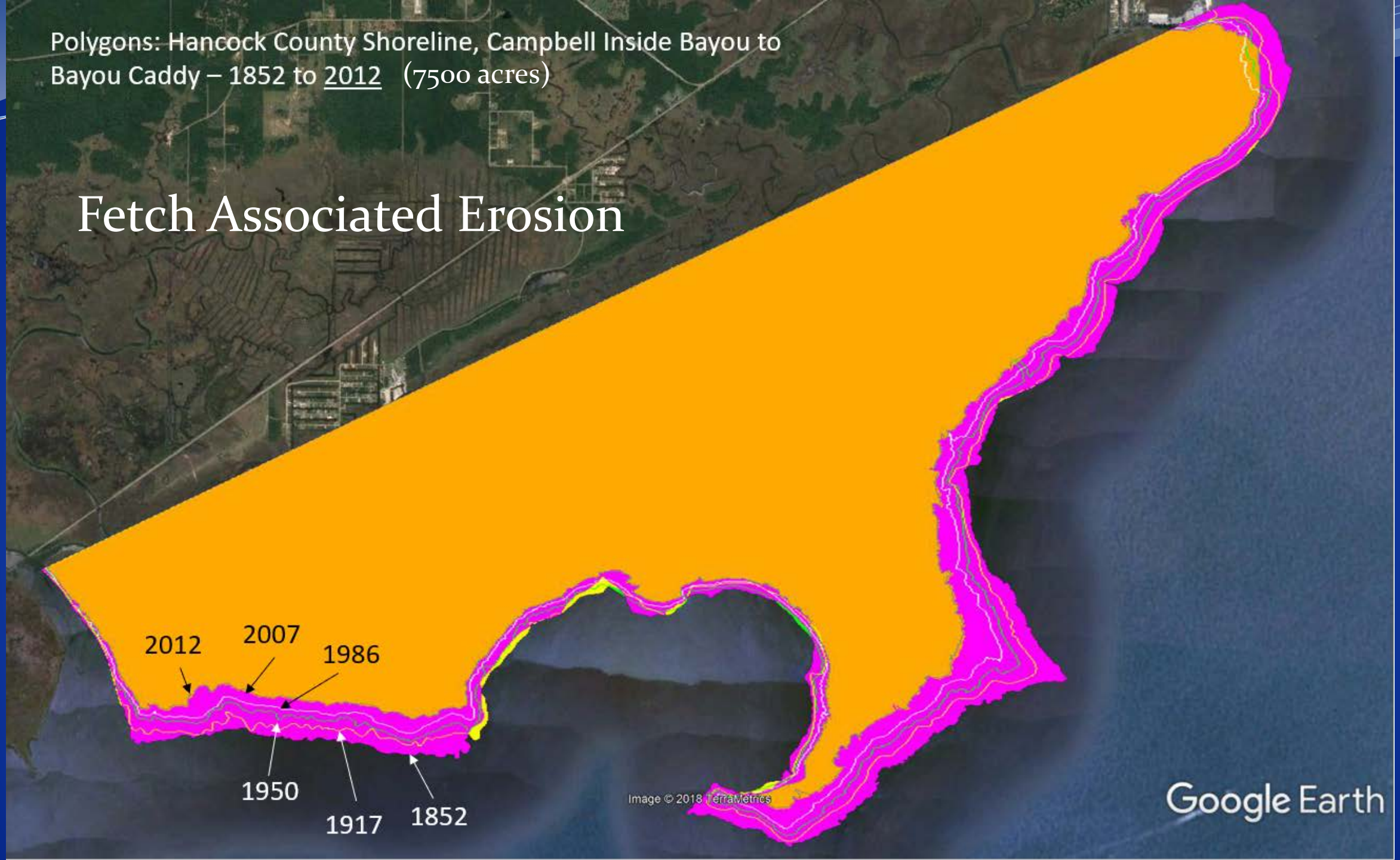
1852

Image © 2018 TerraMetrics

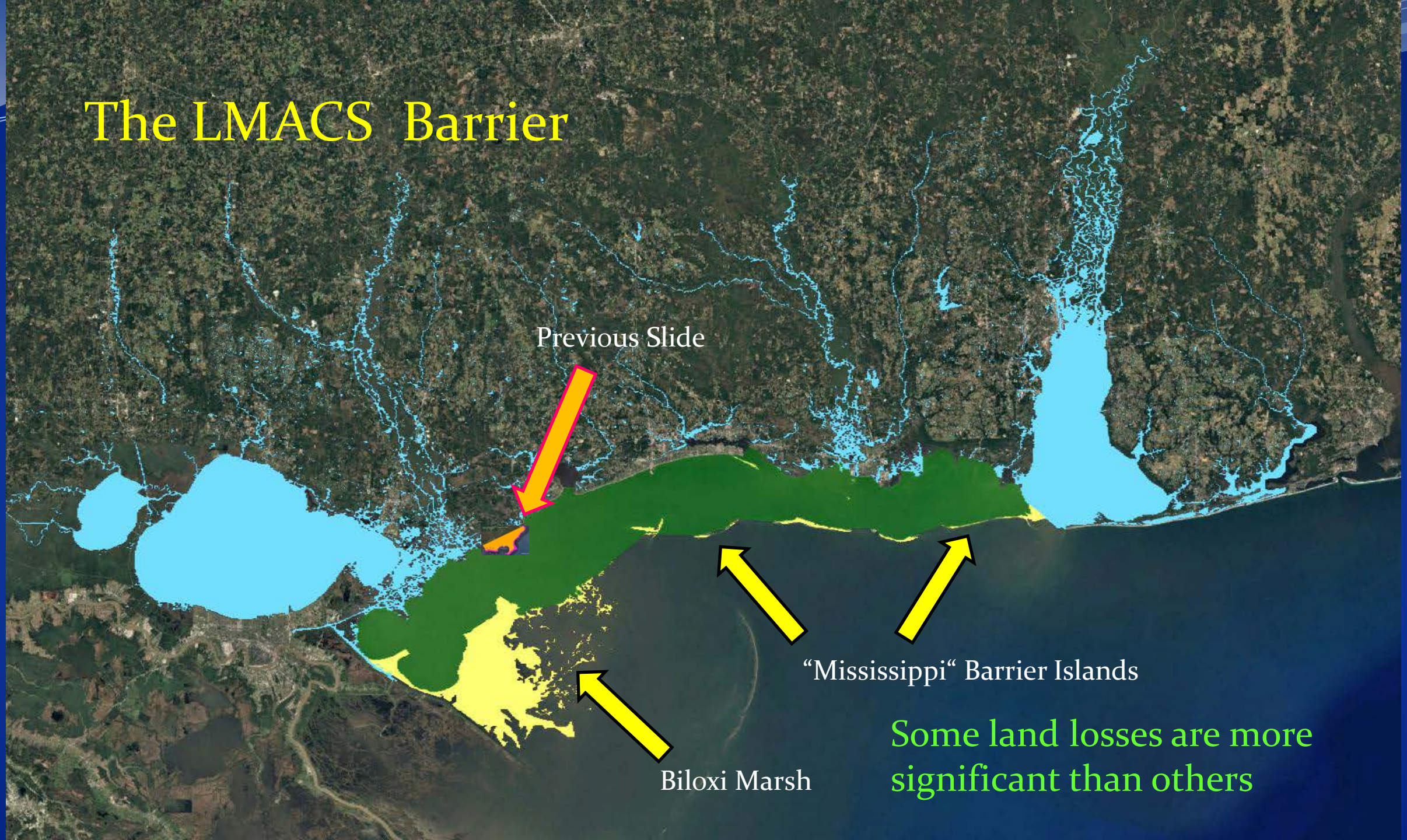
Google Earth

Polygons: Hancock County Shoreline, Campbell Inside Bayou to Bayou Caddy – 1852 to 2012 (7500 acres)

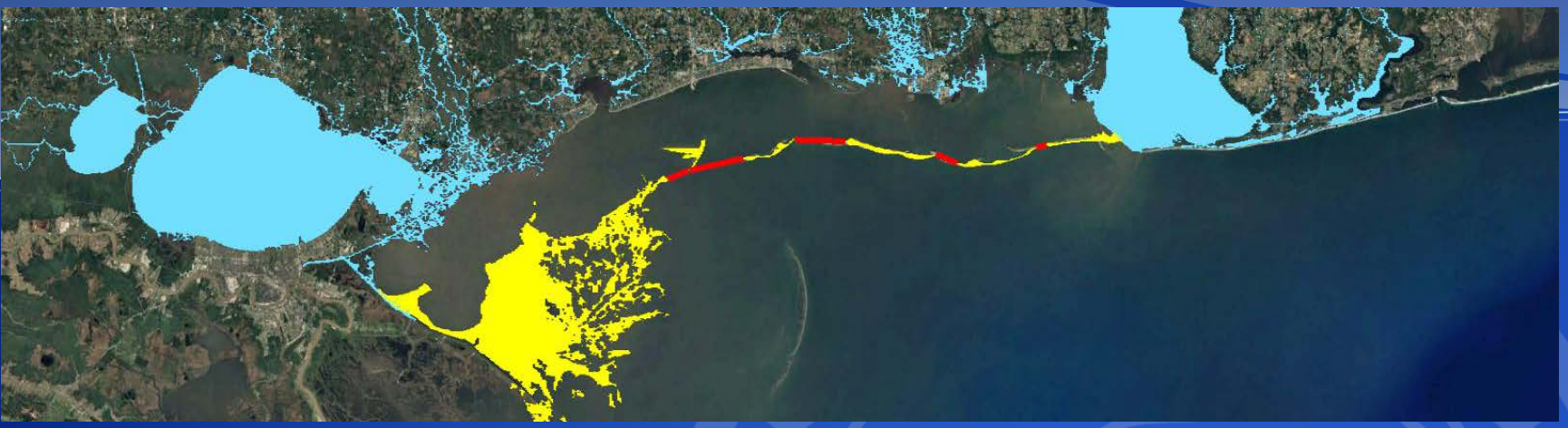
Fetch Associated Erosion



The LMACS Barrier



Rough "Gap" Analysis



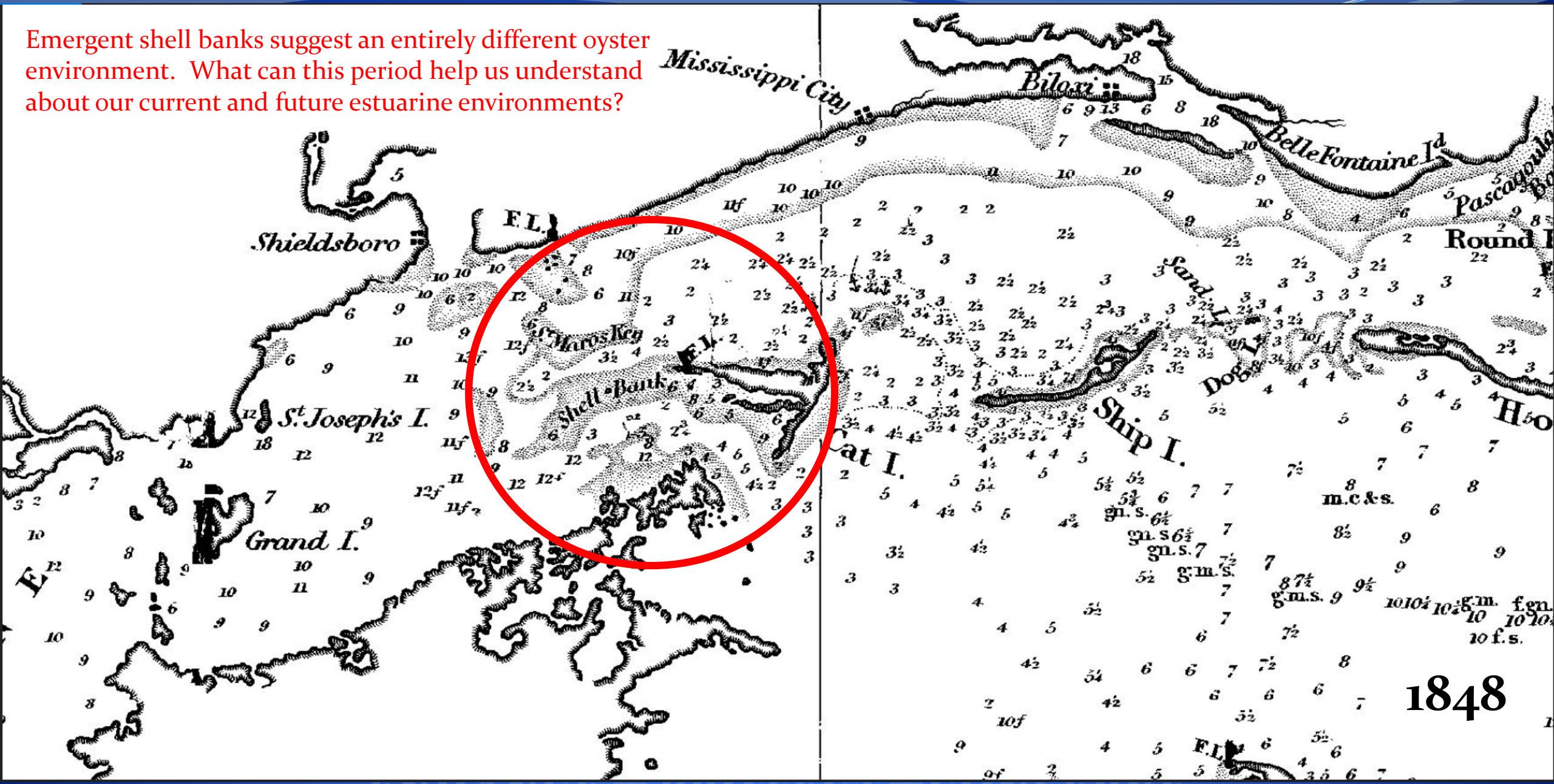
1850 -23 miles

2004 – 30 miles

2016 – 33 miles

Open water through our barrier increases with island and marsh loss

Emergent shell banks suggest an entirely different oyster environment. What can this period help us understand about our current and future estuarine environments?



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Marsh Island, Alabama

We (the three states) collectively know how to implement substantial restoration. However, Alabama and Mississippi haven't begun to work strategically in the way Louisiana has (no Master Plan!)

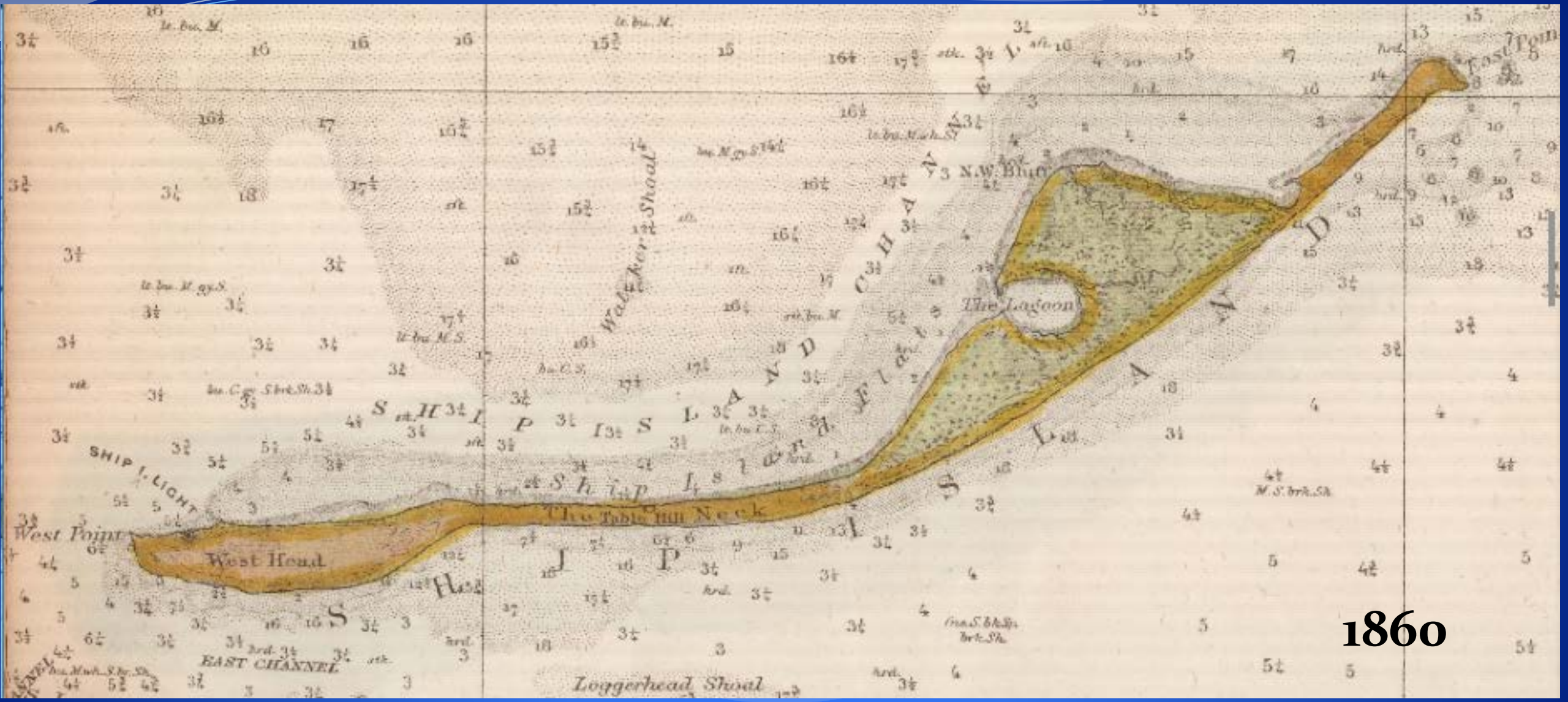
Round Island Restoration Project, Mississippi

Strategic / Functional Restoration (Estuarine Barrier, etc.)

Mississippi Coastal Improvements Plan (MSCIP)

Restoring salinity regulation and shoreline protection functions

Ship Island / Camille Cut Restoration Project


Walker's Shoal
The Lagoon
Ship Island
The Table and Neck
West Point
West Head
SHIP I. LIGHT
EAST CHANNEL
Loggerhead Shoal
1860

Interactions and Opportunities

Louisiana, Mississippi and Alabama are each conducting or planning actions that may positively or negatively influence the estuarine resources of the other states.

MISSISSIPPI DEPARTMENT OF MARINE RESOURCES
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Bonnet Carré Spillway (BCS)

MISSISSIPPI
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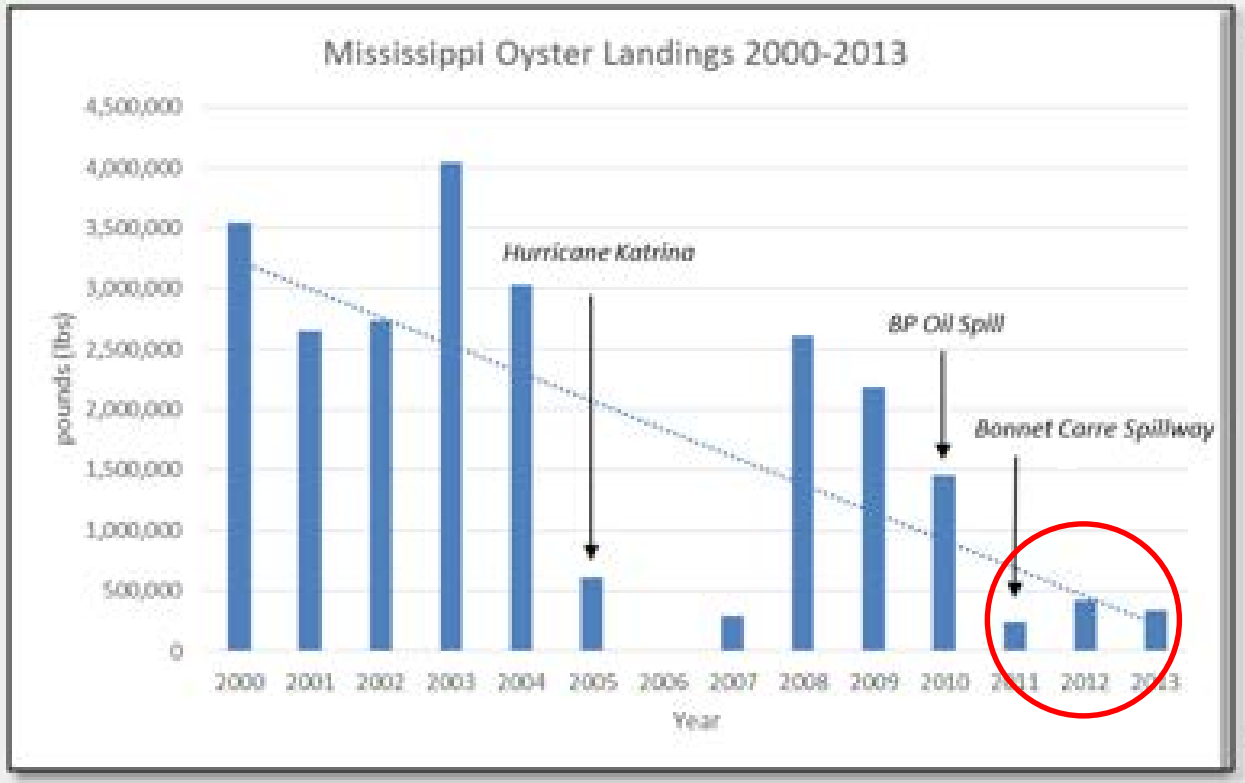
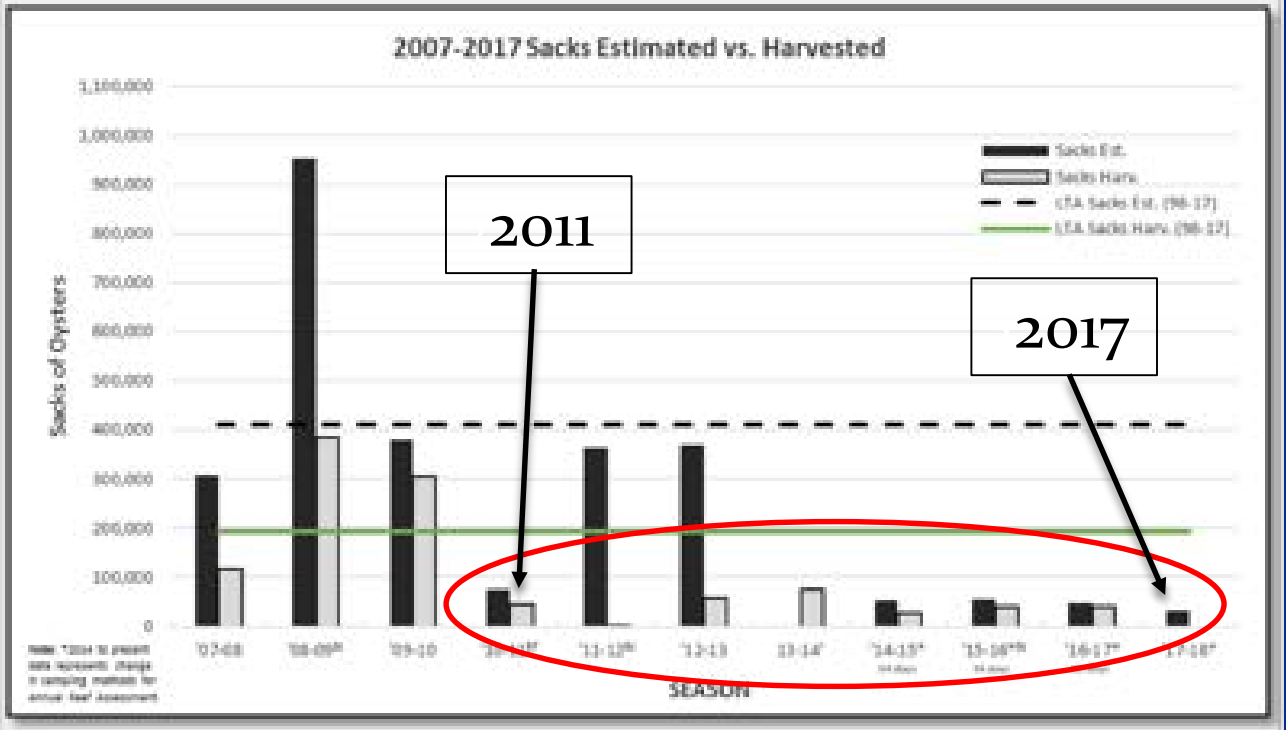
Management Action with Collateral Consequences

THE WHY OF OYSTER RESTORATION





Landings/ harvest since Bonnett Carre 2011: A tipping point?

Bonne Carre' Spillway Opening Data

Year	Days	Bays Opened	(%) Opened	Ideal flow capacity
1937	48	285	81.4%	203,571 cu ft/s
1945	57	350	100%	250,000 cu ft/s
1950	38	350	100%	250,000 cu ft/s
1973	75	350	100%	250,000 cu ft/s
1975	13	225	64.3%	160,714 cu ft/s
1979	45	350	100%	250,000 cu ft/s
1983	35	350	100%	250,000 cu ft/s
1997	31	298	85.1%	212,857 cu ft/s
2008	31	160	45.7%	114,286 cu ft/s
2011	42	330	94.3%	235,714 cu ft/s
2016	22	210	60.0%	203,000 cu ft/s
2018	30	168	48.0%	196,000 cu ft/s

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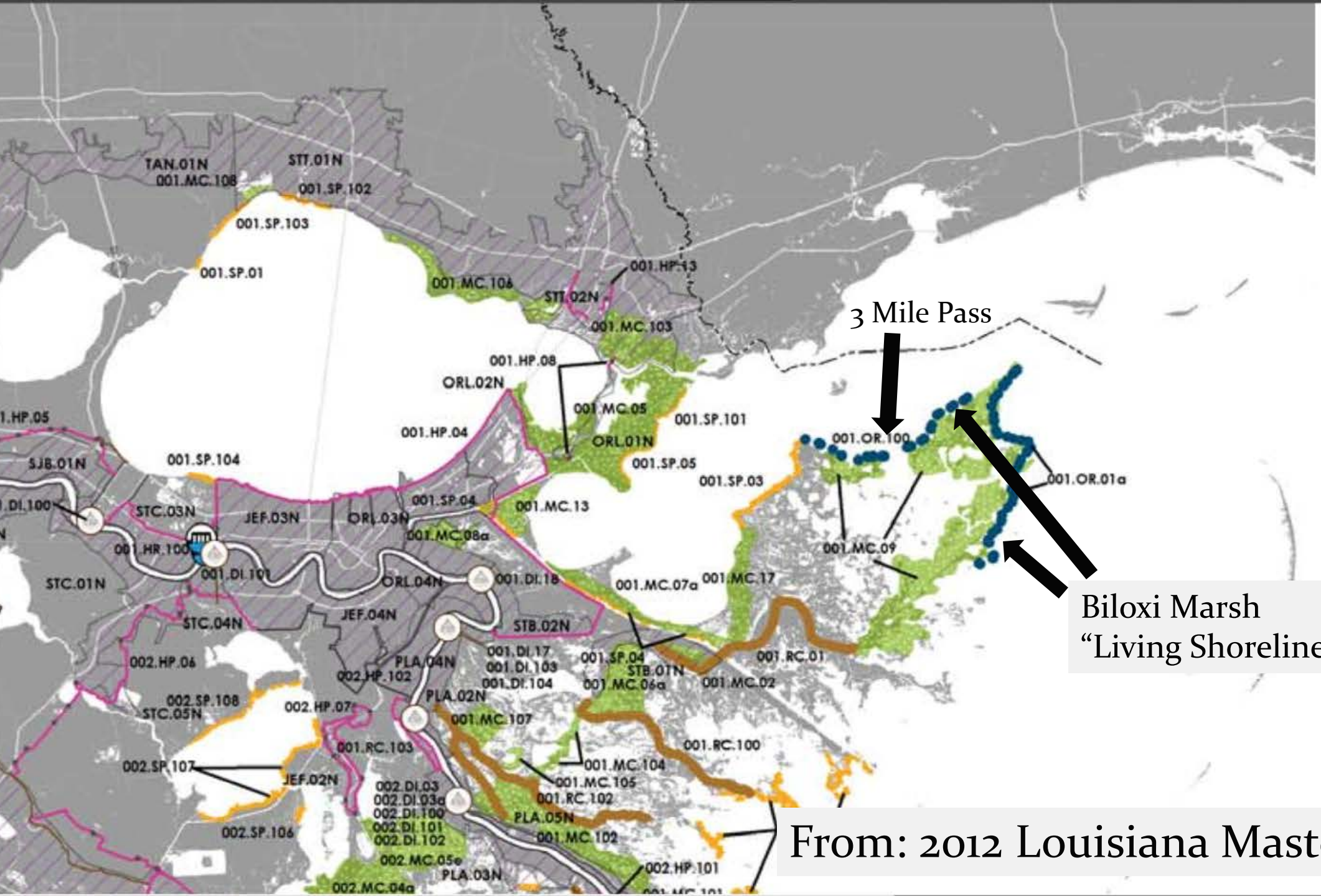

3 Mile Pass

Biloxi Marsh
"Living Shorelines" (Proposed)

From: 2012 Louisiana Master Plan

Interactions can go either way….
Proposed marsh restoration in Louisiana by Mississippi(800 acres = purple areas)

The Other Thing…. Basic Physical Protection

- The LMACS barrier buffers our coastline from the open Gulf
- This isn't about protection from major storms. However, consider the engineering and economic implications of persistent long term "offshore" conditions on communities and infrastructure that weren't designed for it.

Goals & Objectives

"Effectively extend and adapt the Louisiana Master Plan concept to cover the entire functional estuary across Mississippi and Alabama….The LMACS domain."

- Funding – Pursue federal monies compatible with an overarching multi-state, long range (50 to 100 year) planning effort
- Data development – Compile existing or planned research, monitoring and modeling relevant to the LMACS domain and identify data gaps and needed linkages
- Modeling – Initiate new or update existing physical and environmental models and link them as needed to better understand the historical, current and future "mechanics" of the LMACS system. Refine or develop new restoration strategies using this comprehensive modeling platform.
- Planning– Describe model outputs in terms of future scenarios compatible with the 2023 Louisiana Master Plan. Illustrate future "with and without "restoration action in terms of ecosystem services, economics and community resiliency

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Results Count! "Making" fish at the Round Island restoration site…

Thank you!