



# LOUISIANA'S VANISHING COAST

committed to our coast

An aerial photograph showing a long, straight bridge spanning a wide body of water. The water is a deep blue, and the surrounding land is covered in green marsh vegetation. The bridge has a white road surface and blue railings. A small car is visible on the bridge. The text "Coastal Louisiana faces one of the highest land loss rates in the world" is overlaid in white on the left side of the image.

Coastal Louisiana  
faces one of the  
highest land loss  
rates in  
the world

@LindseyJaniesPhotography | Me

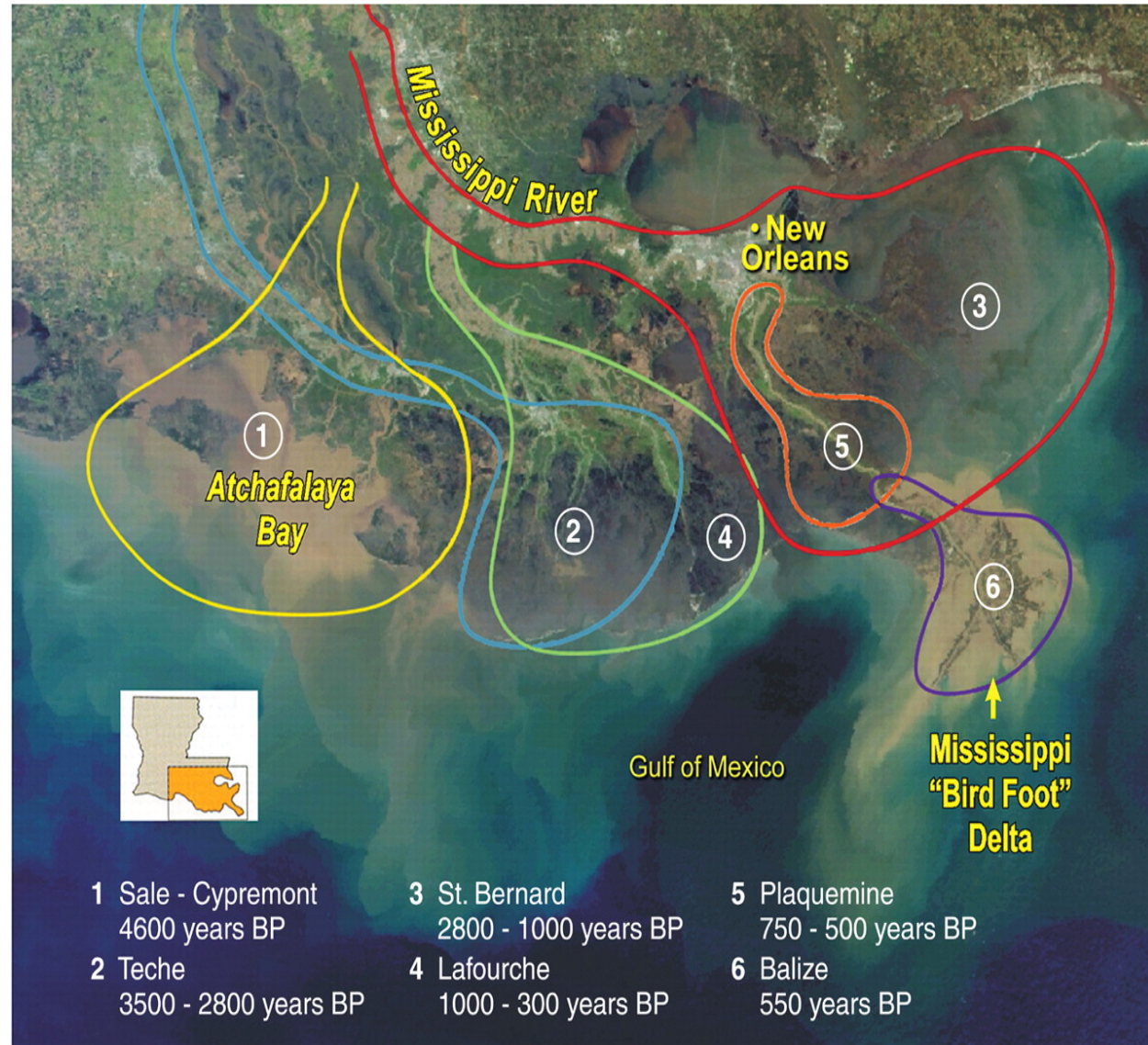
# Natural Processes Formed Louisiana Coast





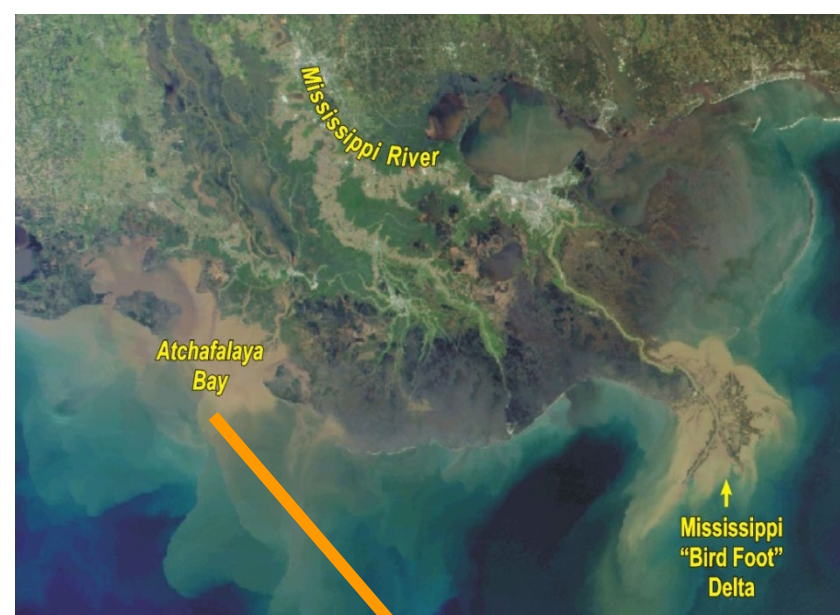
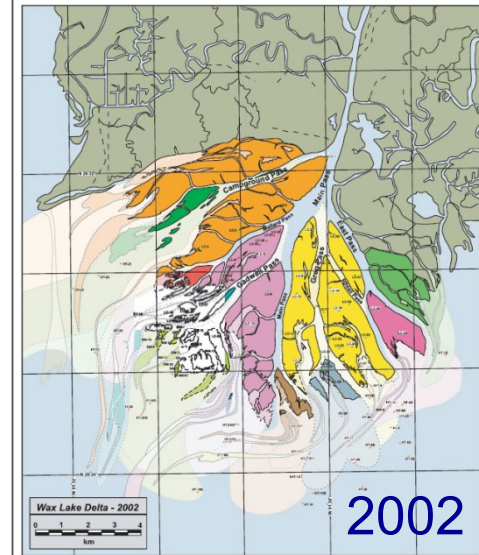
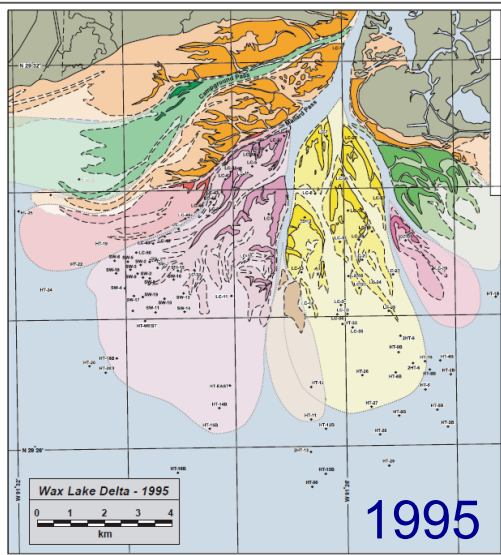
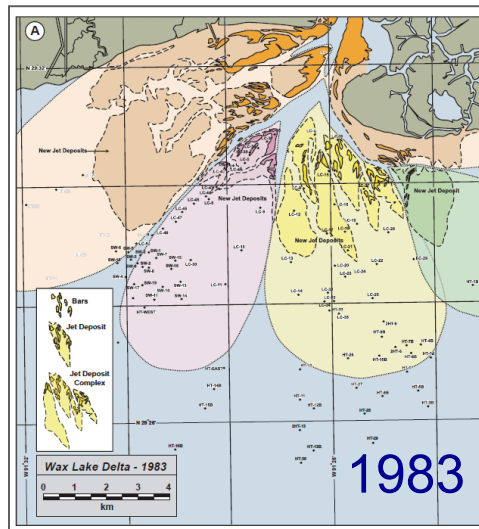
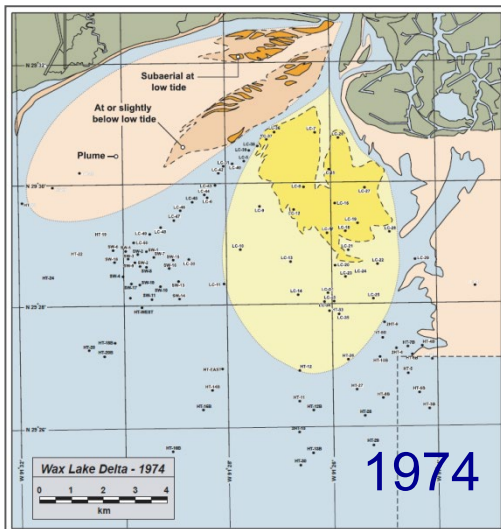
Over the past 7,500 years, the Mississippi River has changed course many times.

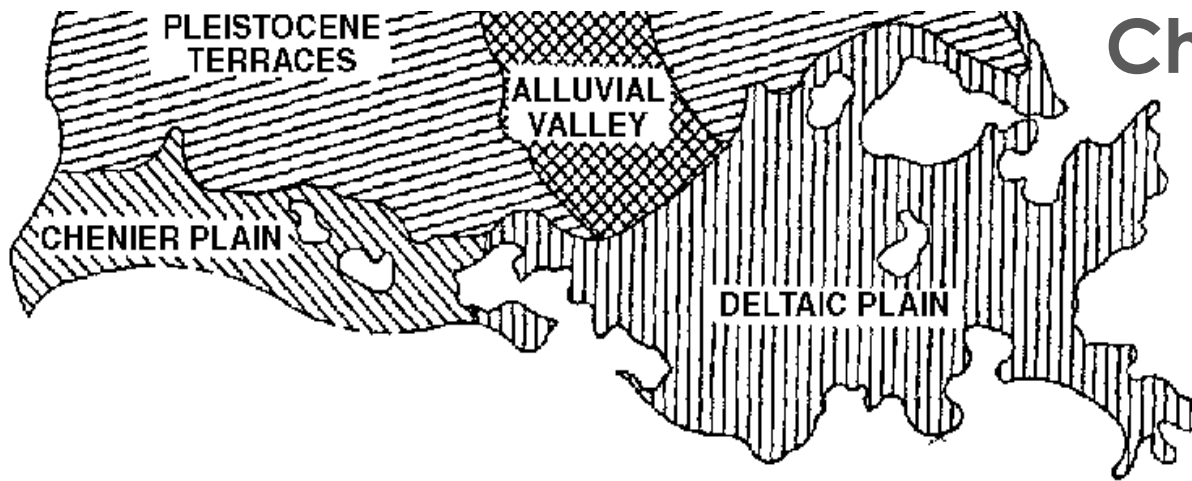
**Multiple deltaic lobes were formed** by the delivery of sediment deposited by the river.



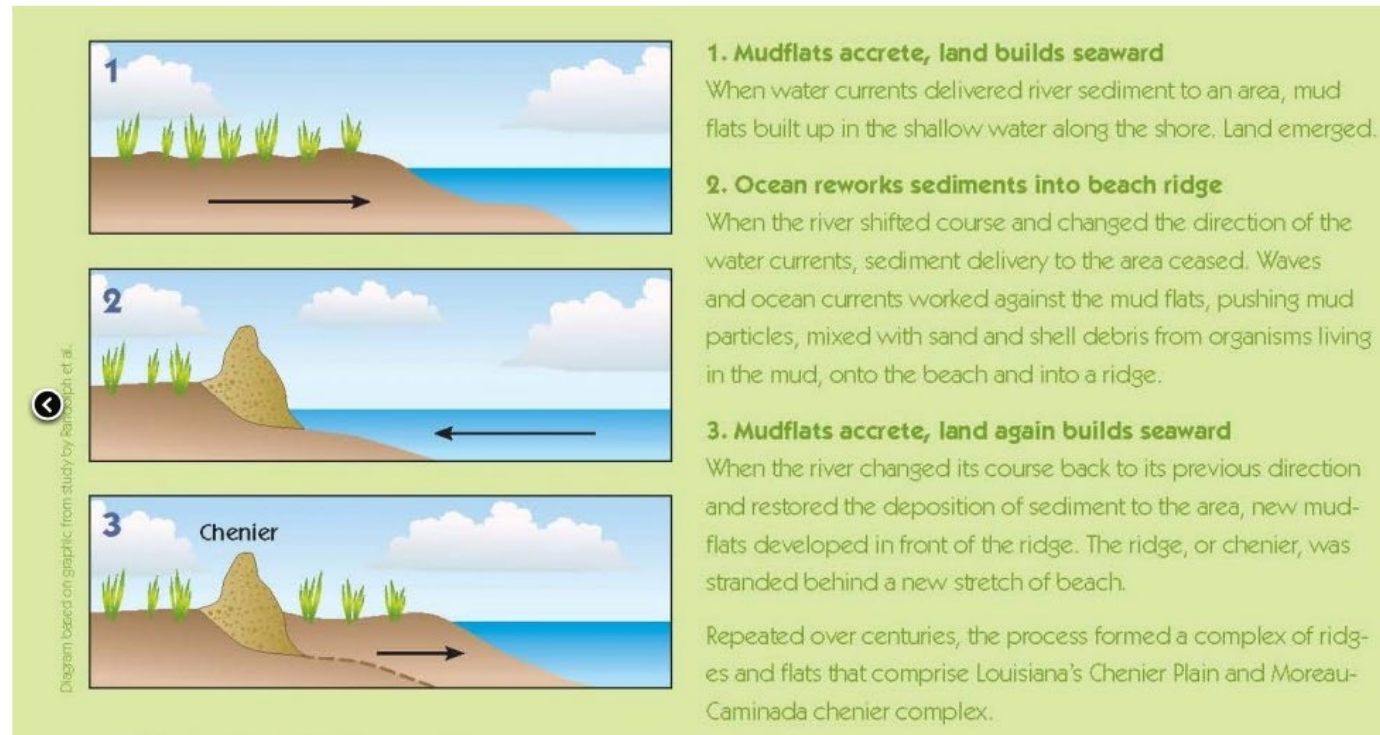


# Coastal Deltaic Floodplain

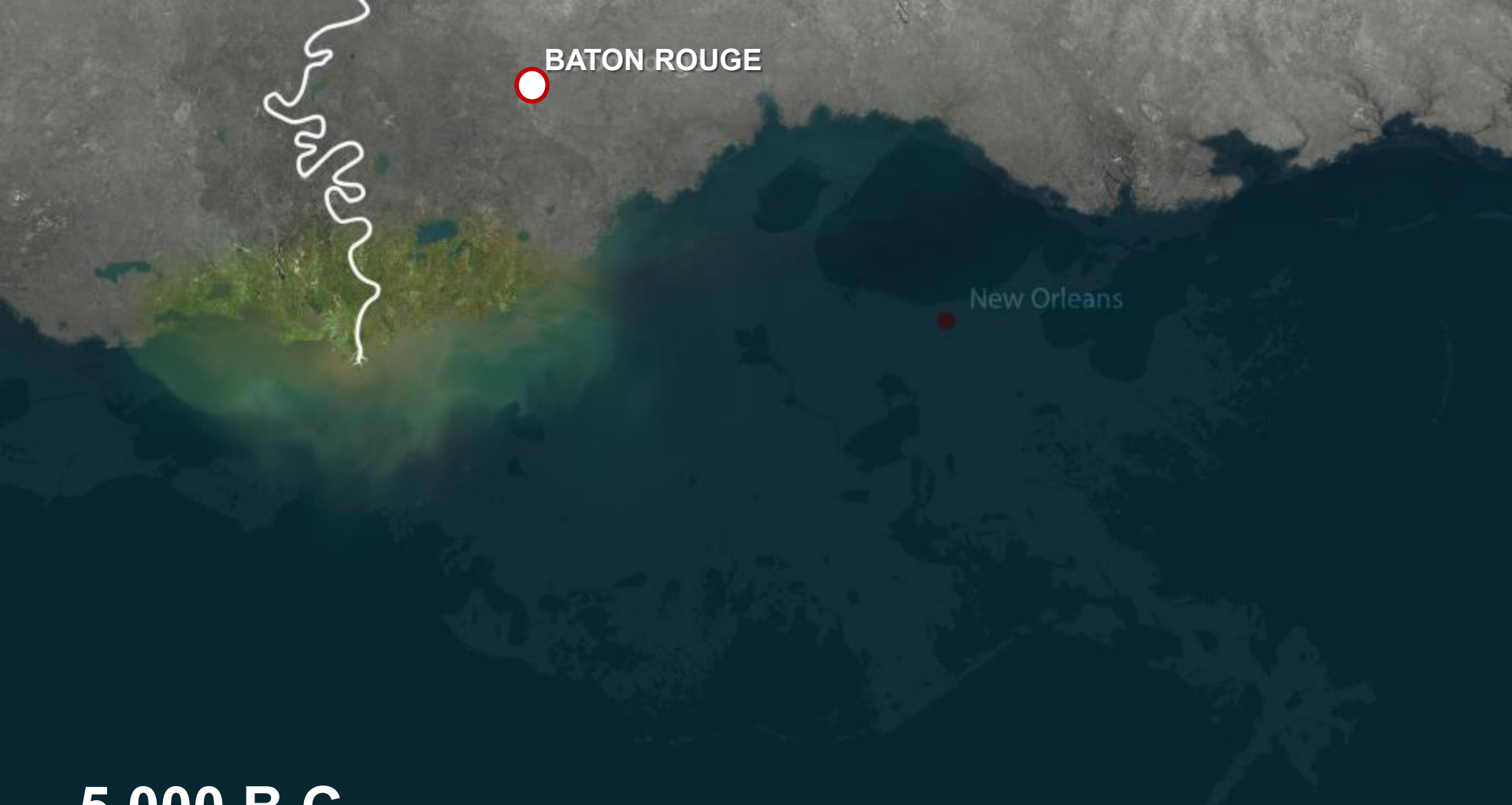




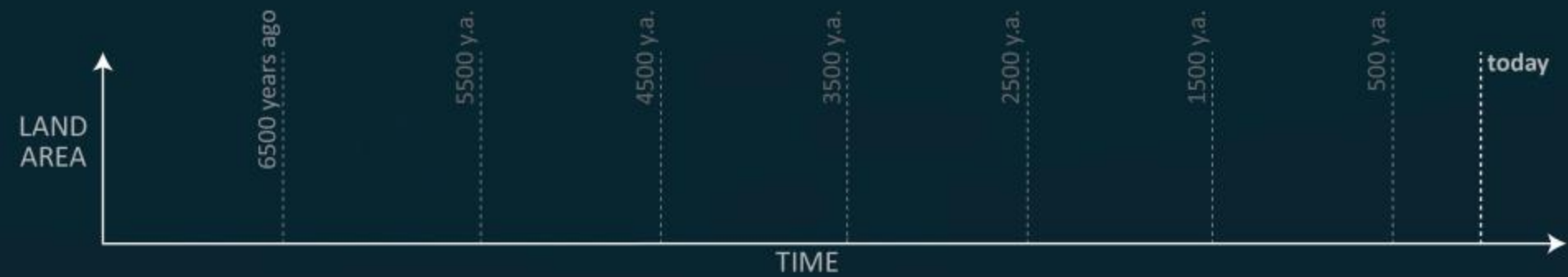
# Chenier Plain Formation





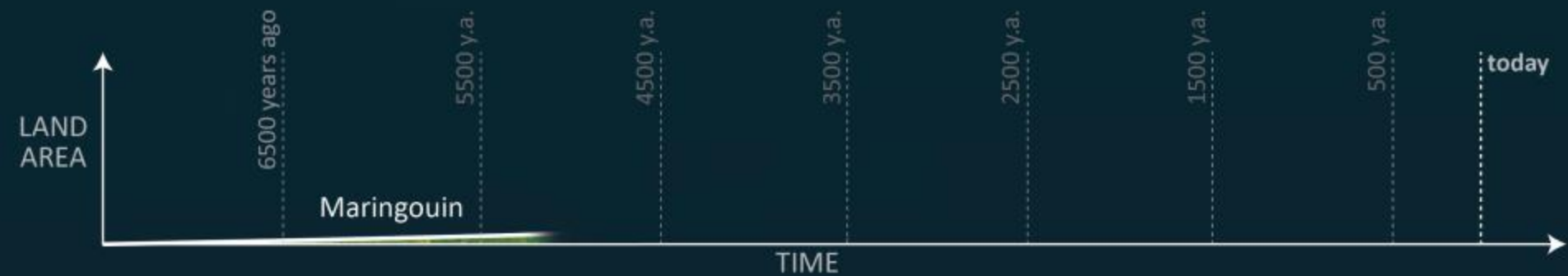


**5,000 B.C.**

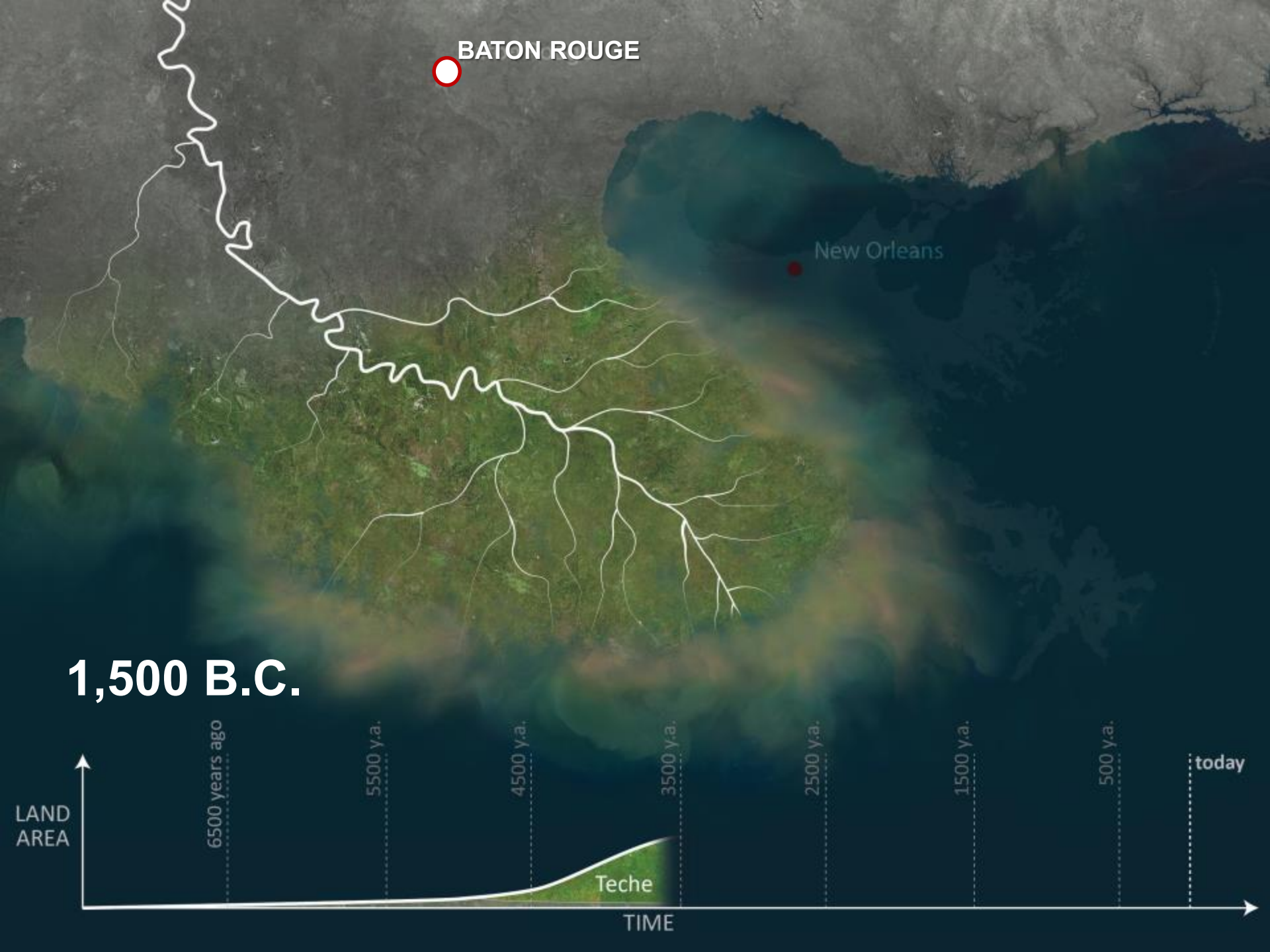




**3,000 B.C.**



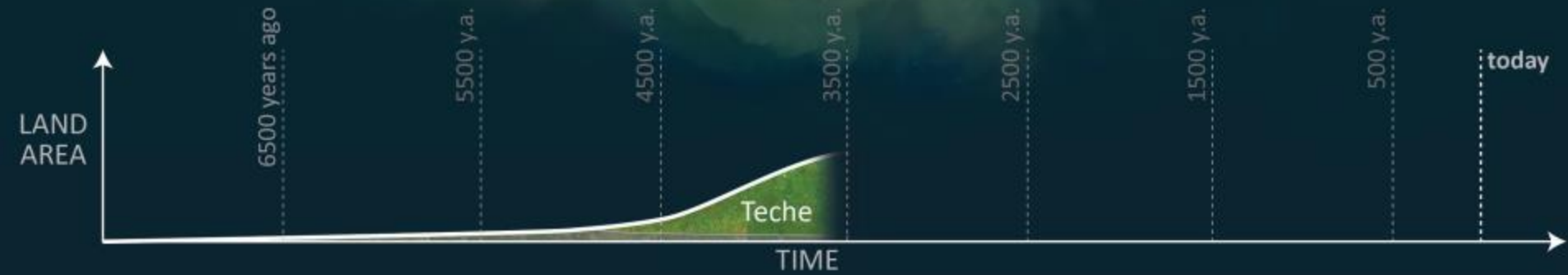




BATON ROUGE

New Orleans

1,500 B.C.

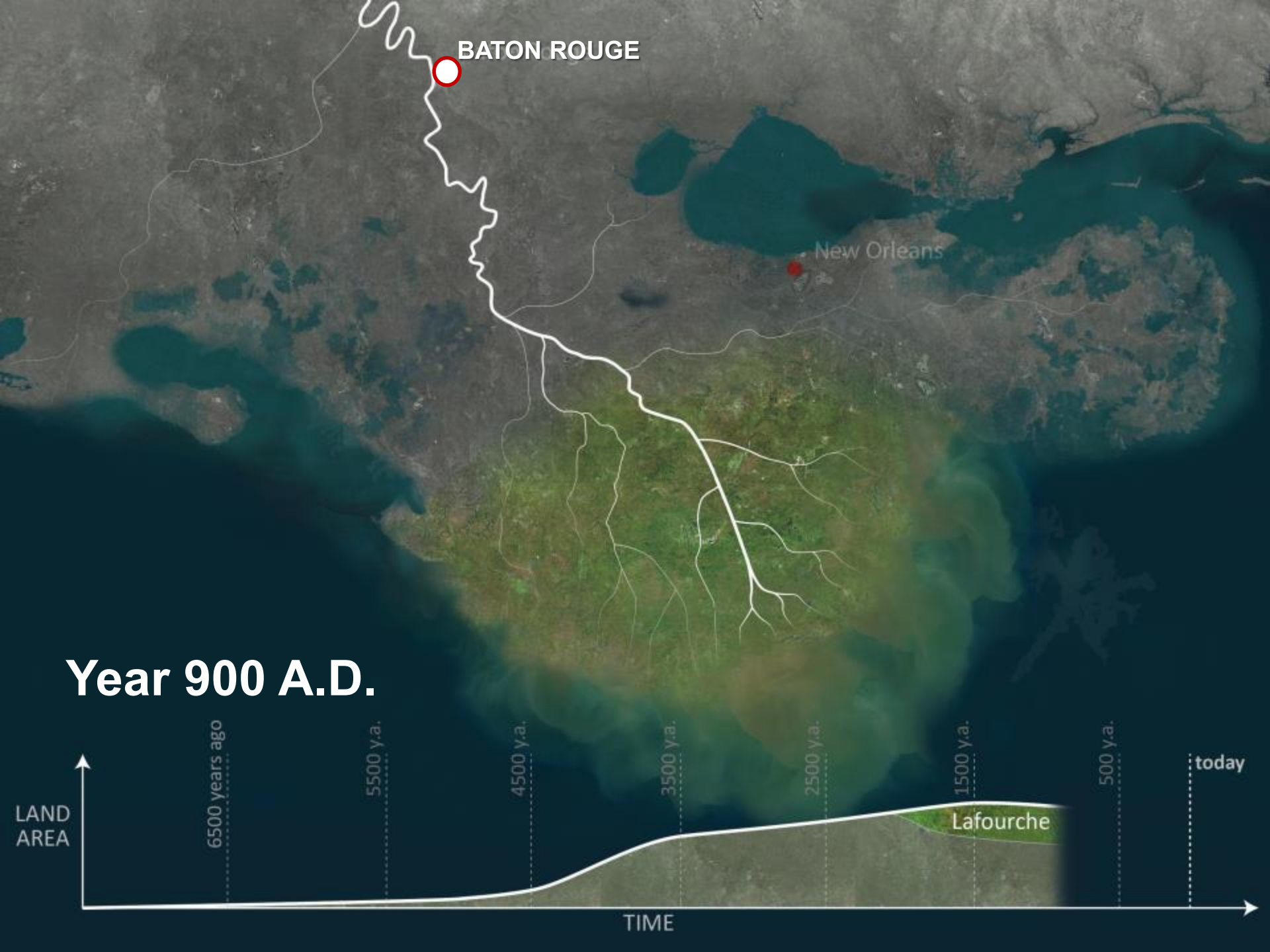




Year 1 A.D.

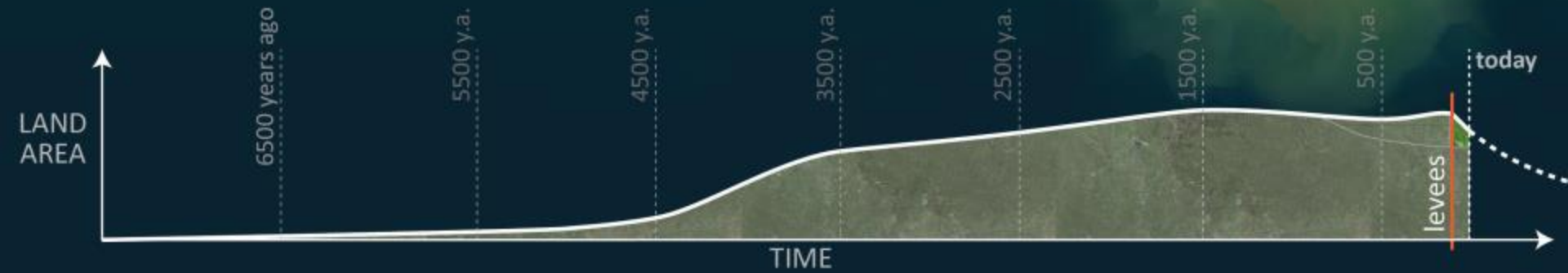






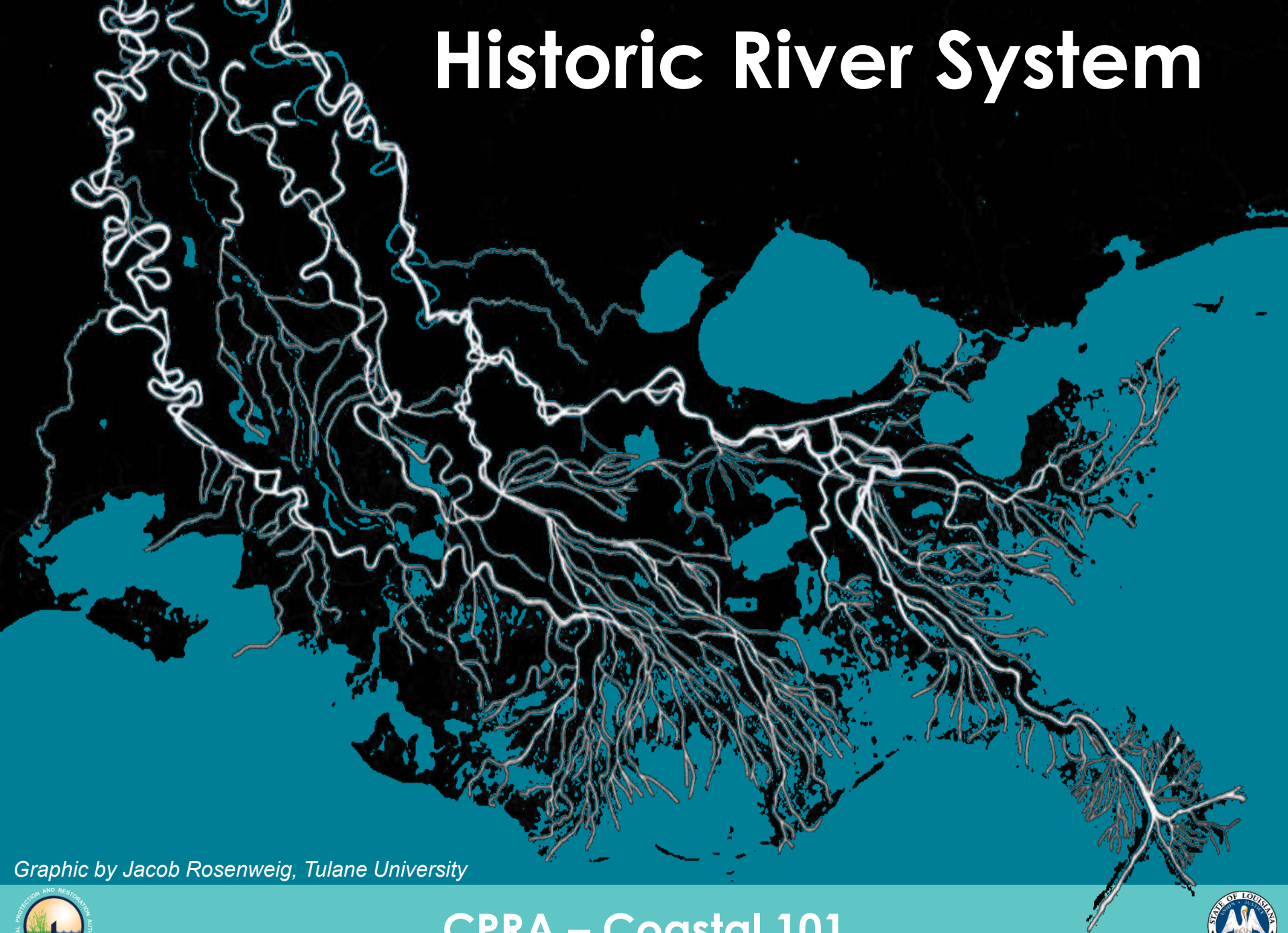


**TODAY**





# Historic River System



*Graphic by Jacob Rosenweig, Tulane University*



**CPRA – Coastal 101**



# Historic Sediment



Graphic by Jacob Rosenweig, Tulane University



CPRA Coastal 01





# ***This...***



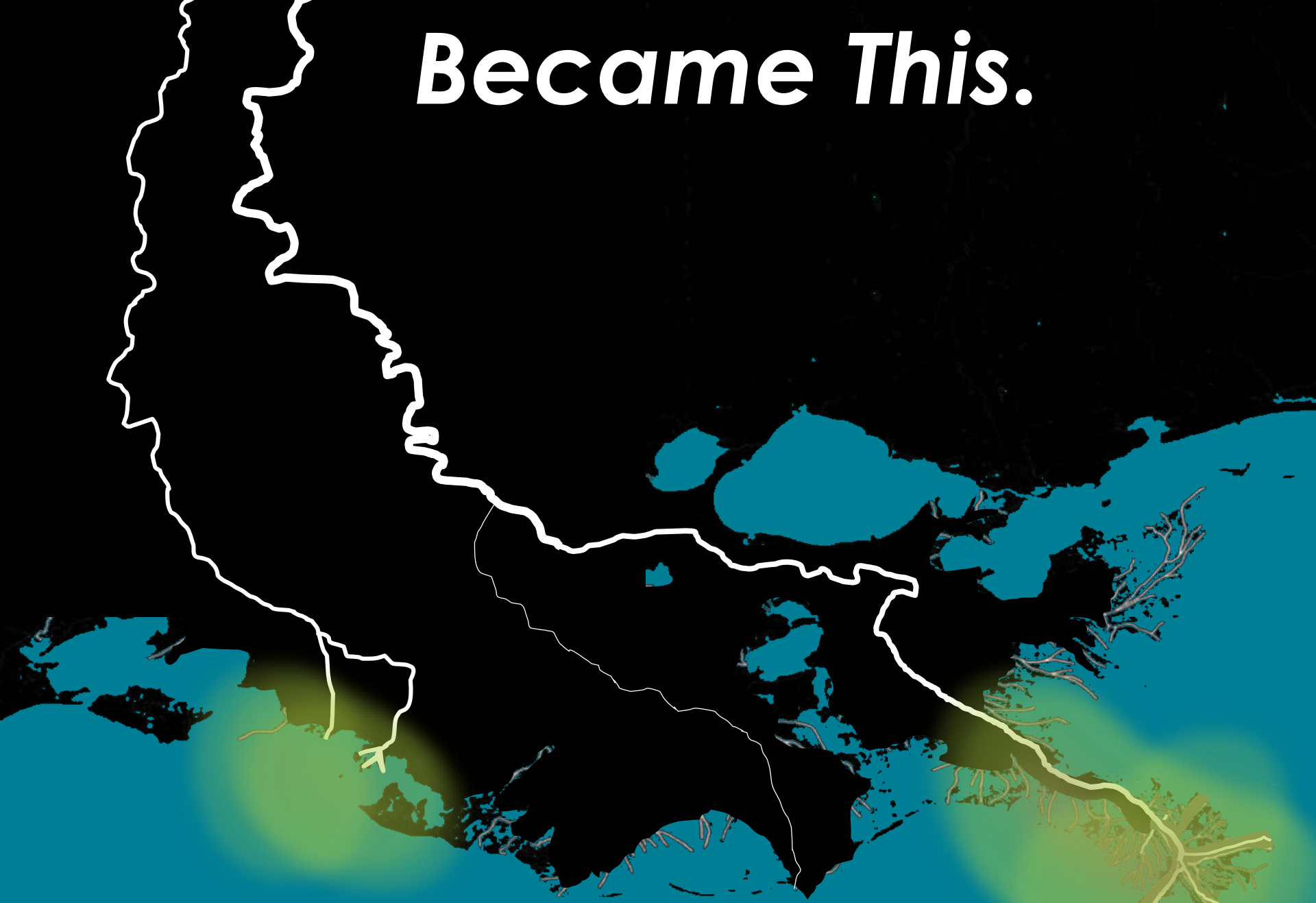
*Graphic by Jacob Rosenweig, Tulane University*



## **CPRA – Coastal 101**



# *Became This.*

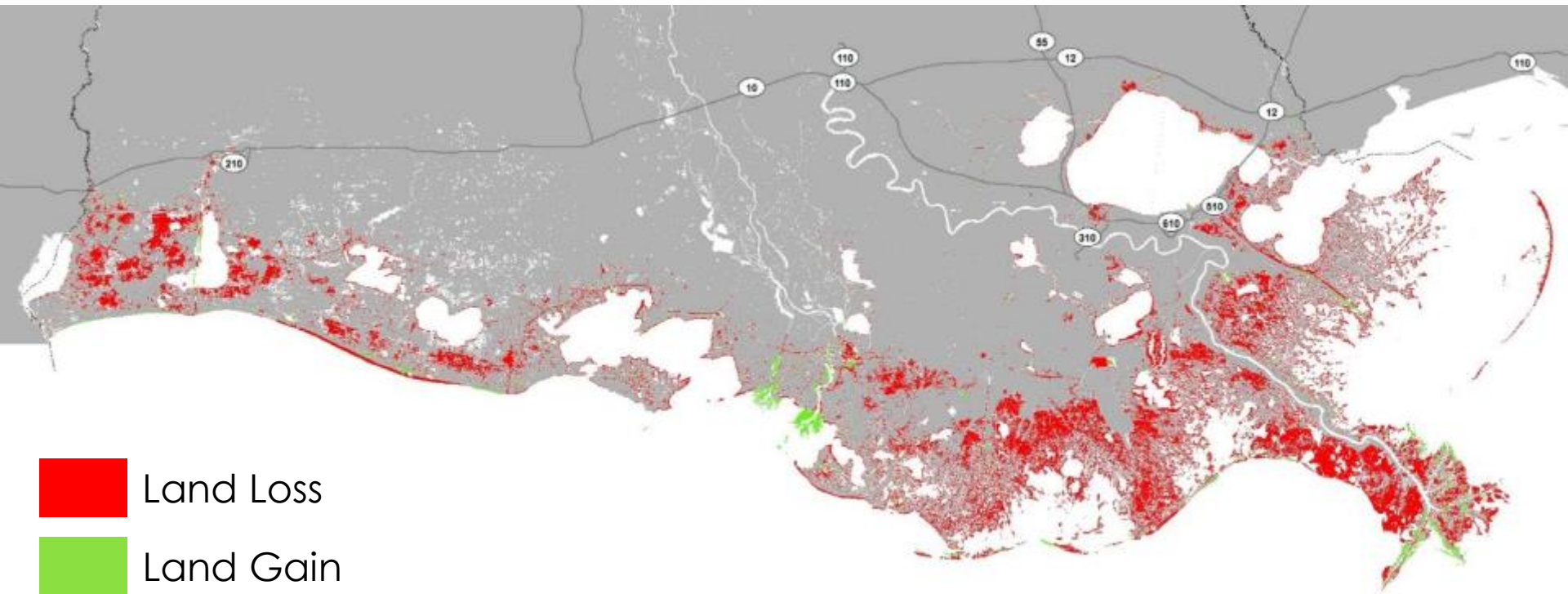


CPRA – Coastal 101



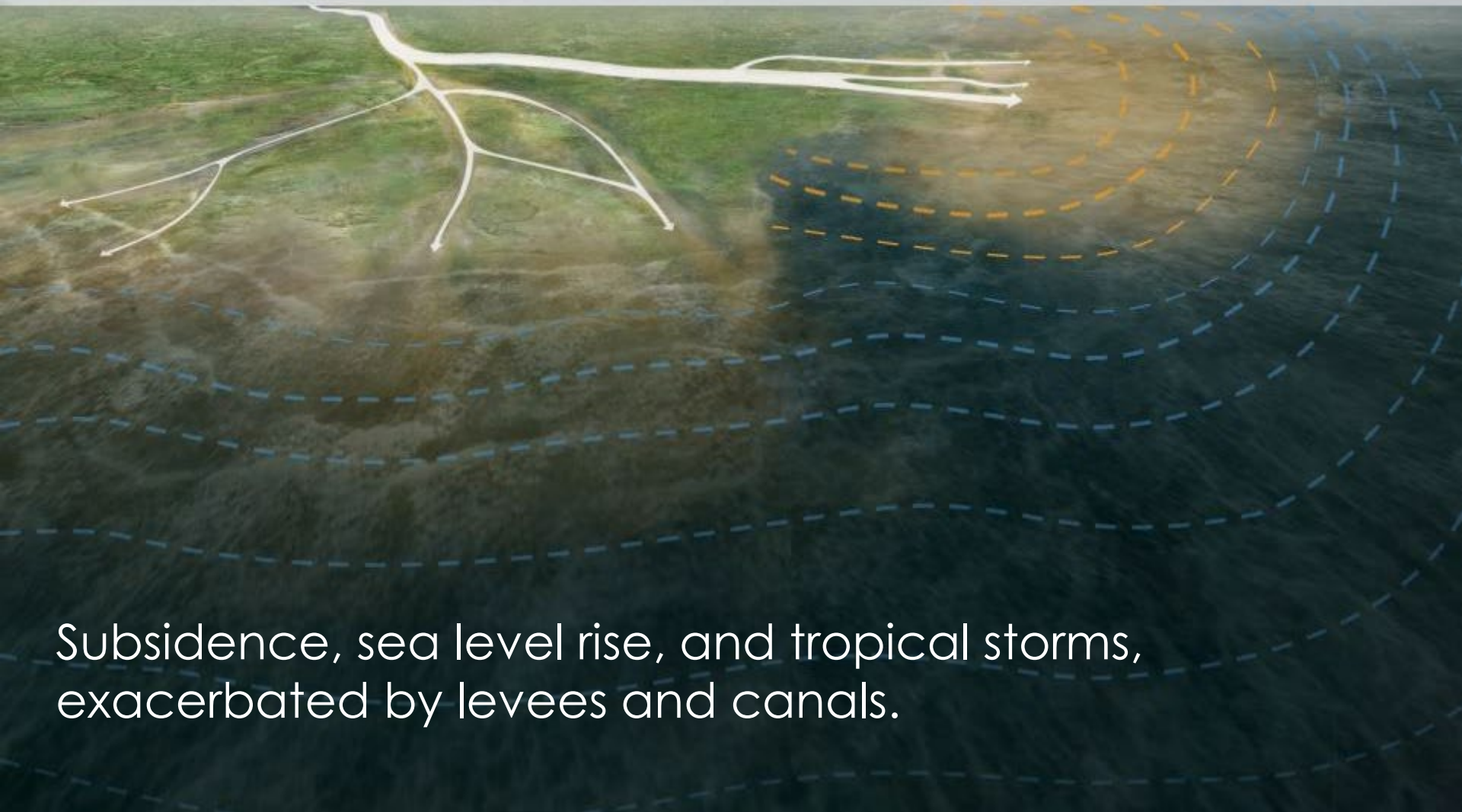


# LOUISIANA'S COASTAL PARISHES HAVE LOST 2,006 SQUARE MILES



(1932 – 2016) Couvillon, USGS, 2017

# Historic Causes of Land Loss



Subsidence, sea level rise, and tropical storms, exacerbated by levees and canals.

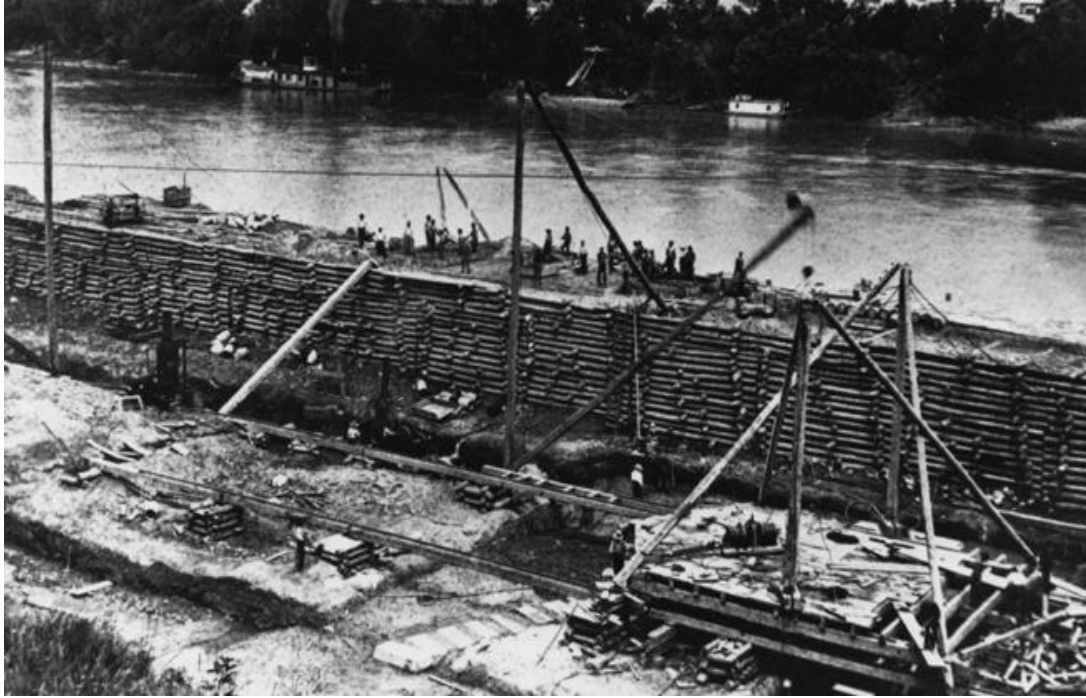


# THE GREAT FLOOD OF 1927



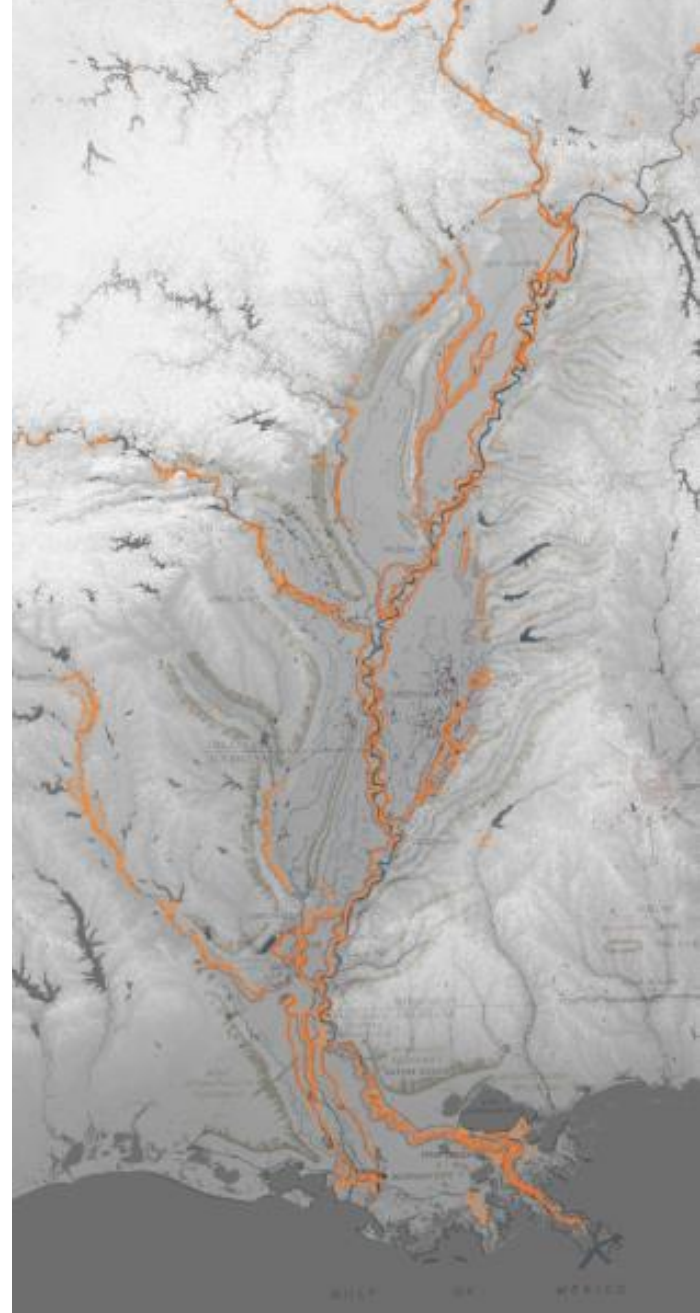
CPRA – Coastal 101

# Solution: Levee off the River!



**GOOD NEWS:** *No more flooding!*

**BAD NEWS:** *No more flooding!*





# The National Geographic Magazine

AN ILLUSTRATED MONTHLY



Editor: JOHN HYDE

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**"...A complete system of absolutely protective levees... [will create] disadvantages to future generations from the subsidence of the Gulf delta lands below the level of the sea and their gradual abandonment due to this cause."**

**"No doubt the great benefit...will be so remarkable that the people of the whole United States can well afford...to build a protective levee against the Gulf waters, as the city of New Orleans has done on a small scale."**

**Dr. E.L. CortHELL, President of the  
American Society of Civil Engineers**

**National Geographic, December 1897**



# Causes of Land Loss Today



Sea Level Rise



Storms

Oil Spill



Subsidence

Oil and Gas  
Infrastructure



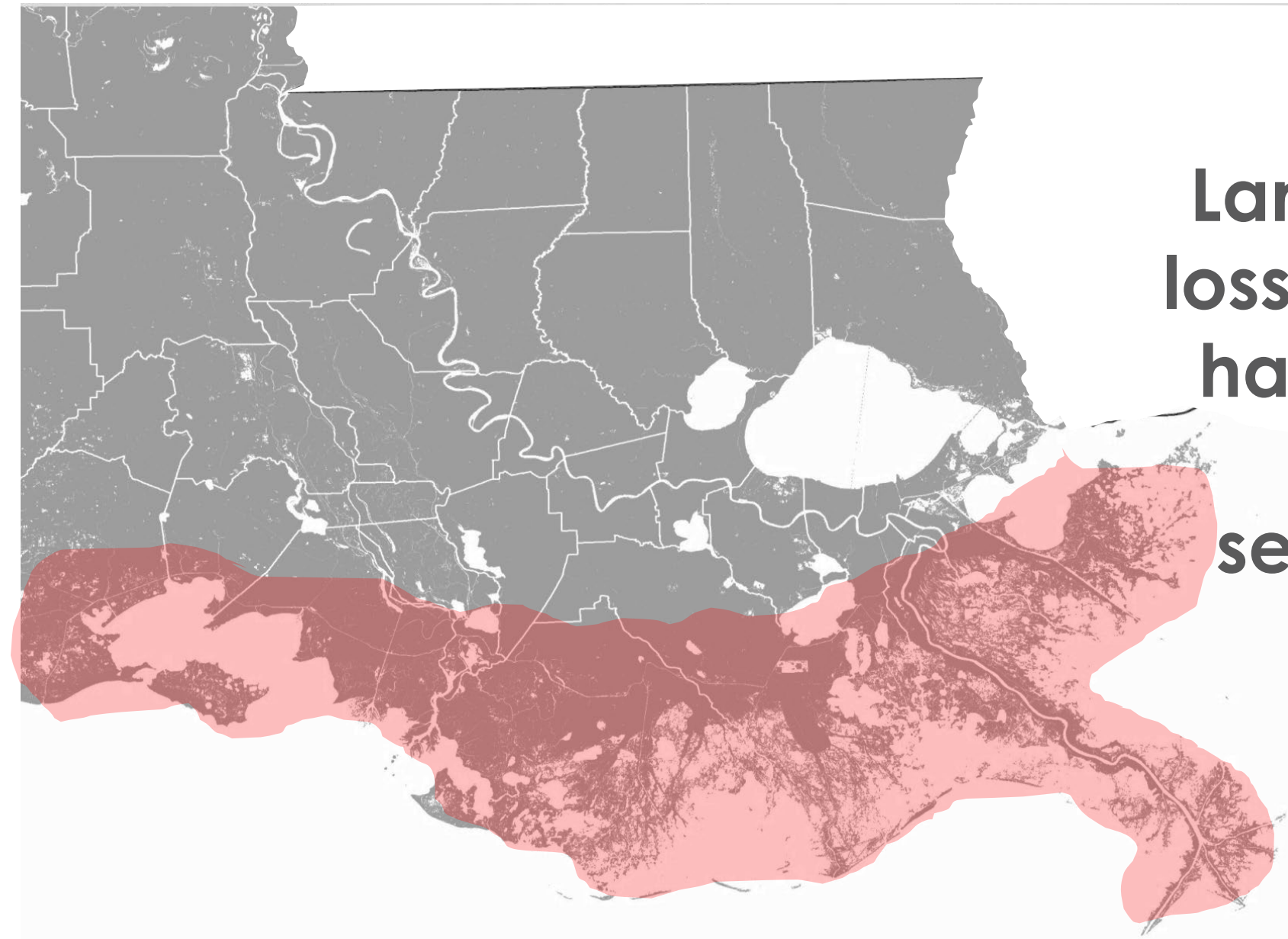
Levees



Canals



**Land  
loss is  
hard  
to  
see!**



**CPRA – Coastal 101**



The  
equivalent to  
losing the  
entire state of  
Delaware.





# New York City



The  
equivalent  
to losing  
the land  
mass of  
NYC every  
13 years.

The  
equivalent  
to losing the  
District of  
Columbia  
**31**  
times







# Bayou Dupont, 1952

CPRA – Coastal 101





# Bayou Dupont, 2005

CPRA – Coastal 101





# South Terrebonne, 1971

CPRA – Coastal 101



# South Terrebonne, 1998

CPRA – Coastal 101





# South Terrebonne, 2010

CPRA – Coastal 101





1,880

SQUARE MILES OF LAND  
HAVE BEEN LOST IN  
THE **LAST 80 YEARS**

UP TO  
4,100

SQUARE MILES OF LAND  
ARE AT RISK IN  
THE **NEXT 50 YEARS**



# WHAT'S AT STAKE?



A map of the United States with state boundaries outlined. The state of Louisiana is highlighted in black, while all other states are in a light gray color. The map includes the Gulf of Mexico to the south and the Atlantic Ocean to the east.

**Louisiana is  
important to  
those of us  
who live here,  
and a  
significant  
asset to our  
nation.**



# Wetland Productivity



Wetland density > 40%

CPRA – Coastal 101



# Mississippi Flyway

## Typical waterfowl species of the Mississippi Flyway



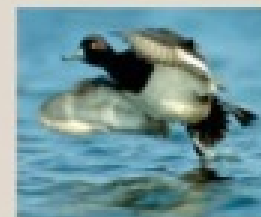
Mallard



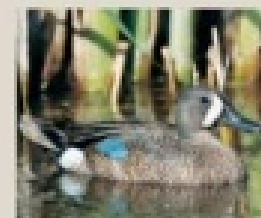
Canvasback



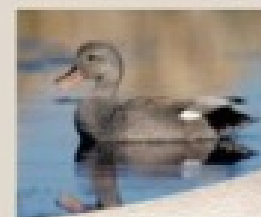
Lesser scaup



Blue-winged teal



Gadwall



# FISHERIES



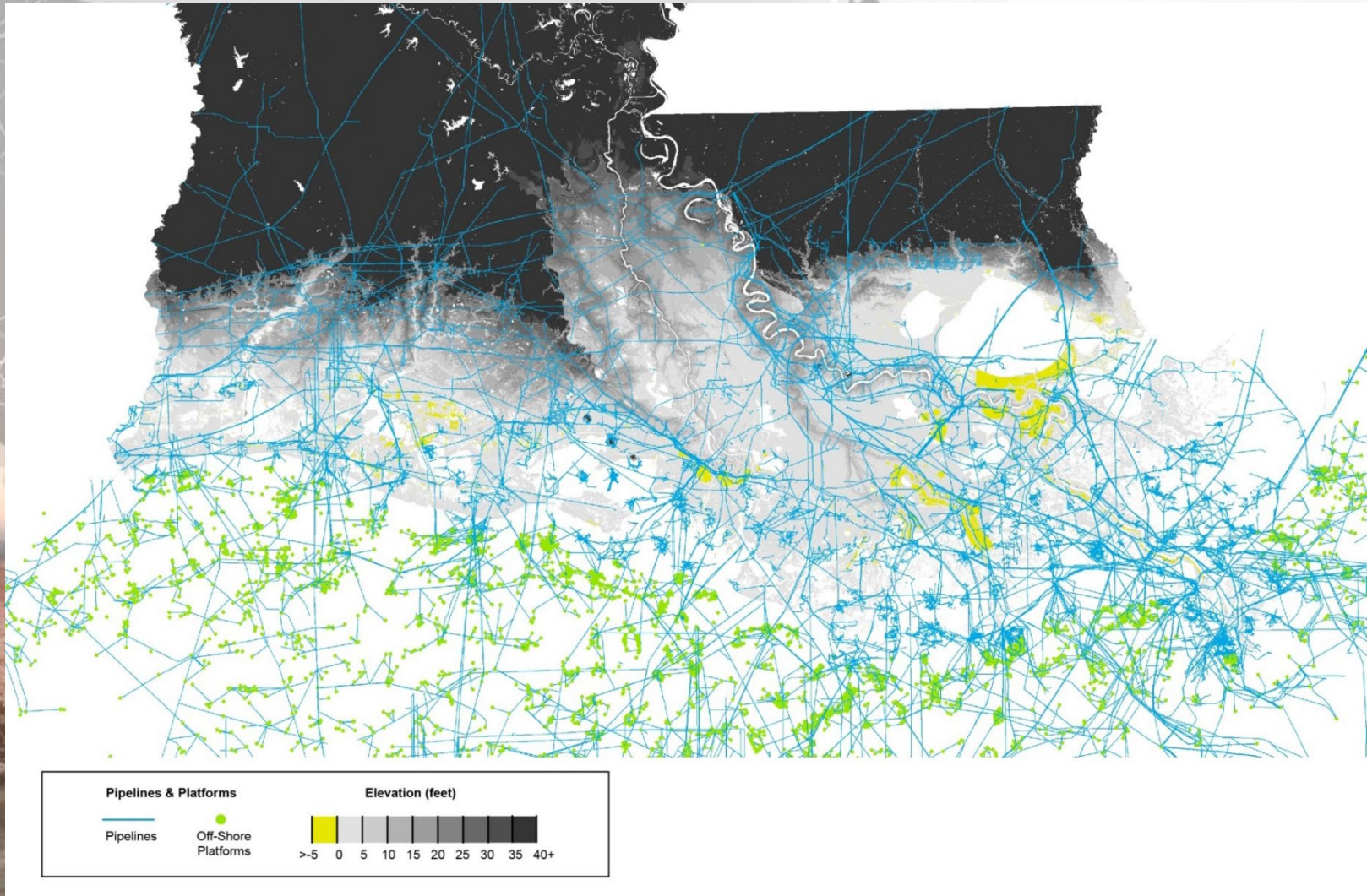
- Provides 26% by weight of the commercial fish landings in the continental United States (\$1 billion annually)
- Nation's top producer of shrimp, (oysters), crawfish, and blue crabs.
- Louisiana seafood is processed and shipped globally providing almost 30,000 Louisiana jobs.



# Oil and Gas Infrastructure



# Oil and Gas Infrastructure





# Commerce Infrastructure

2010 Freight Flows

- Interstate Highways
- Railroad
- Inland Waterway

Volume Scale (Tons/Year)

250 100 50 million



CPRA – Coastal 101



# Commerce Infrastructure

**5 of the 15 largest ports** in the U. S. are in Louisiana

**20% of the U. S. waterborne commerce** (by tonnage) was accounted for by Louisiana's ports in 2009



2010 Freight Flows -

- Interstate Highways
- Railroad
- Inland Waterway

Volume Scale (Tons/Year)

250 100 50 million





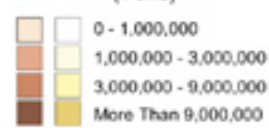
Total Combined Truck Flows  
(1998)

**NEW YORK**

**Network Flows  
(Tons)**



**BEA to State Flows  
(Tons)**



U.S. Department of Transportation  
Federal Highway Administration  
Office of Freight Management and Operations  
Freight Analysis Framework





Total Combined Truck Flows  
(1998)

**LOS ANGELES**

**Network Flows  
(Tons)**



**BEA to State Flows  
(Tons)**



U.S. Department of Transportation  
Federal Highway Administration  
Office of Freight Management and Operations  
Freight Analysis Framework





U.S. Department of Transportation  
Federal Highway Administration  
Office of Freight Management and Operations  
Freight Analysis Framework

Total Combined Truck Flows  
(1998)

**HOUSTON**

**Network Flows**  
(Tons)



**BEA to State Flows**  
(Tons)



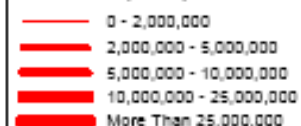


U.S. Department of Transportation  
Federal Highway Administration  
Office of Freight Management and Operations  
Freight Analysis Framework

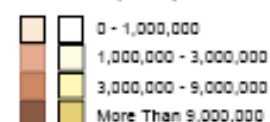
Total Combined Truck Flows  
(1998)

**NEW ORLEANS**

**Network Flows**  
(Tons)



**BEA to State Flows**  
(Tons)

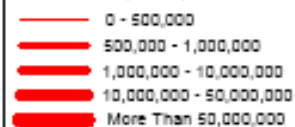




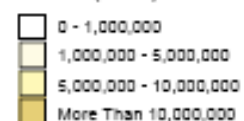
Total Combined Truck Flows  
(1998)

**LOUISIANA**

**Network Flows  
(Tons)**

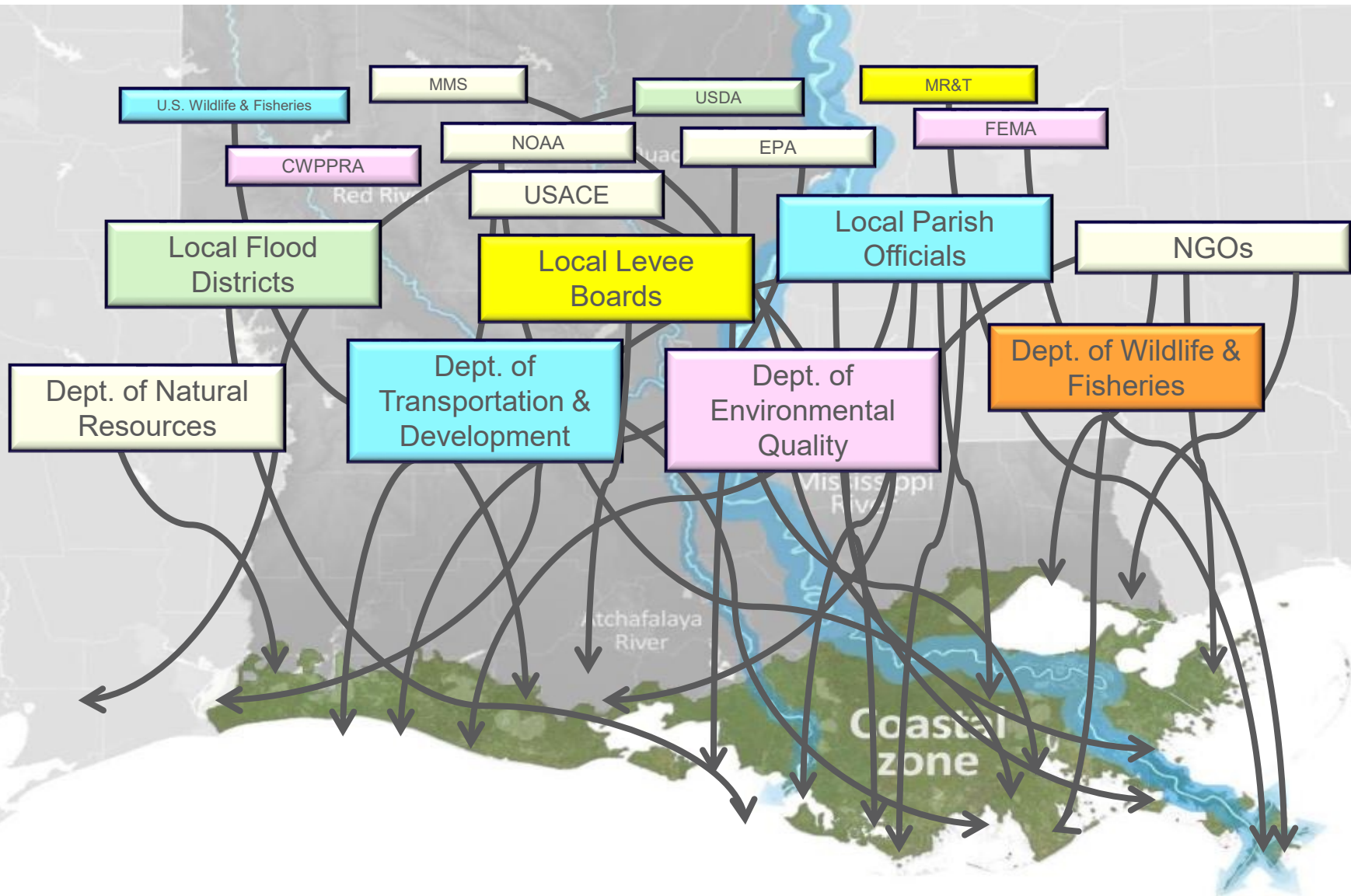


**State to State Flows  
(Tons)**





# AGENCY CONSOLIDATION



# LOUISIANA'S COASTAL MASTER PLAN





# WHAT THE PLAN DELIVERS



PROVIDES  
DIVERSITY  
OF PROJECTS



BENEFITS THE  
ECOSYSTEM



GIVES US TIME  
TO PREPARE  
AND ADAPT



REDUCES RISK



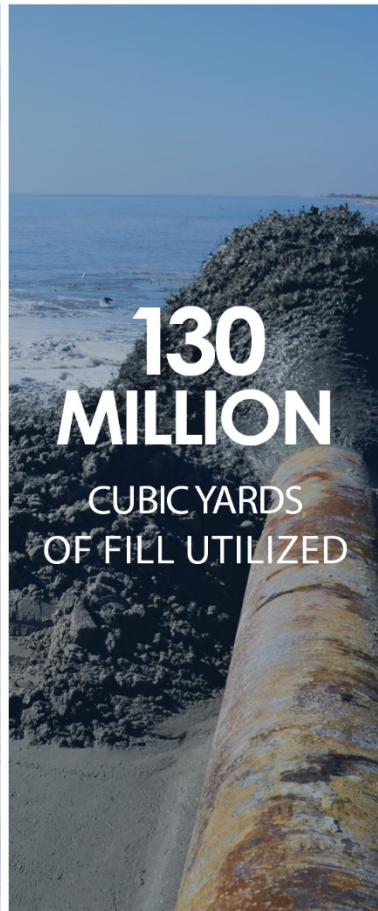
PROVIDES  
ECONOMIC  
DEVELOPMENT  
OPPORTUNITIES



BUILDS/  
SUSTAINS  
LAND



# LOUISIANA'S COASTAL PROGRAM SINCE 2007





# MISSISSIPPI RIVER SEDIMENT

- Since 2008 CPRA has dredged nearly **30 Million Cubic Yards** from Mississippi River Borrow sites
- CPRA has created, restored and nourished nearly **4,000 acres** of marsh, island, and ridge habitat utilizing Riverine Sediment
- 15-20 Year Outlook: As much as **55-65 Million Cubic Yards** of additional Mississippi River dredging



# NOTABLE PROJECTS

**CPRA  
Created**



A grey arrow points from the CPRA logo to the year 2005 on the timeline.

**GIWW West Closure Complex**  
Largest drainage pump station in world



**Shell Island**  
First line of defense and creates dune and beach habitat



**IHNC Lake Borgne Surge Barrier**  
Largest surge barrier in world constructed



**Bayou Dupont**  
Marsh created using long distance pipeline



**Caminada Beach**  
Largest restoration project in program's history

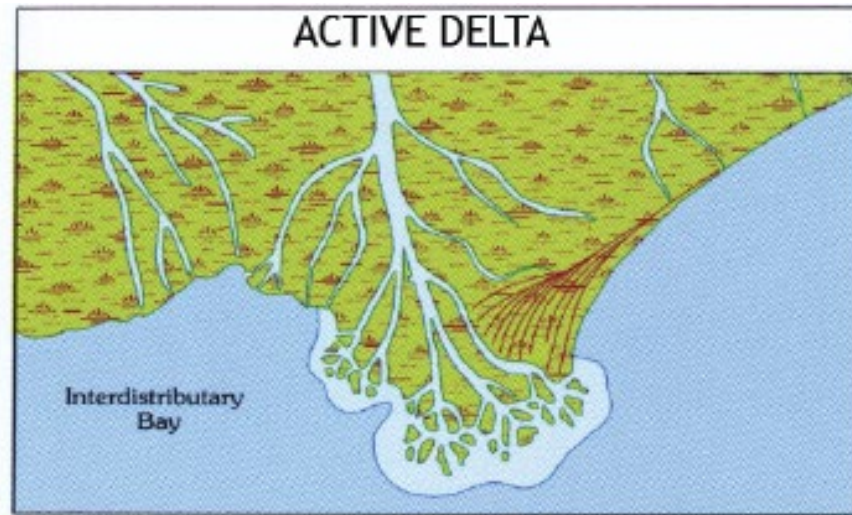


# LOUISIANA'S FIRST LINE OF DEFENSE: BARRIER ISLANDS

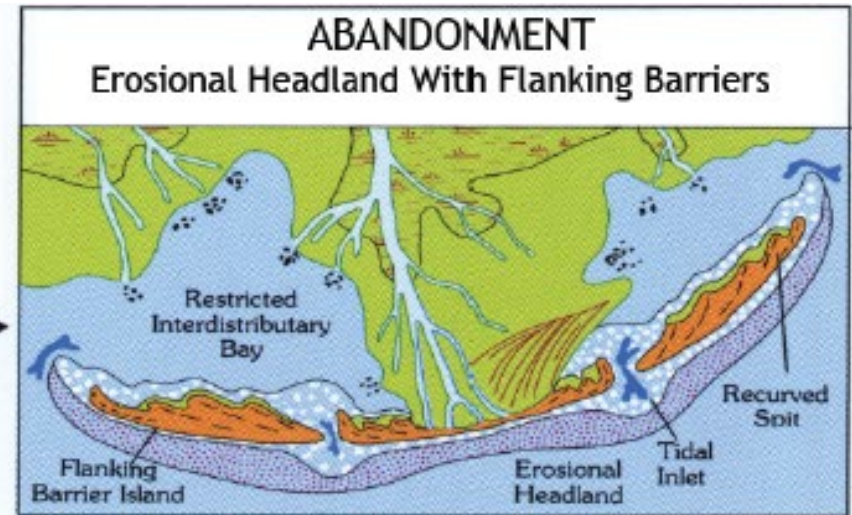




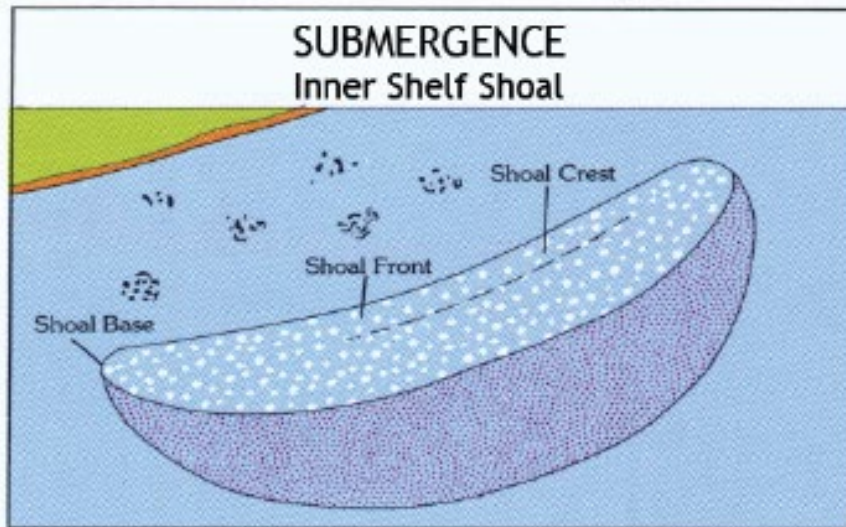
# LOUISIANA BARRIER ISLAND FORMATION



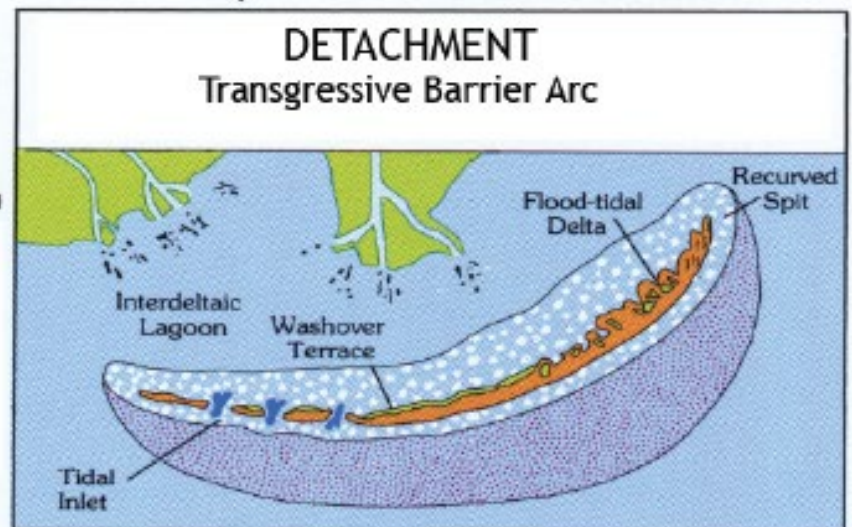
ABANDONMENT  
↓



↓  
**SUBMERGENCE**



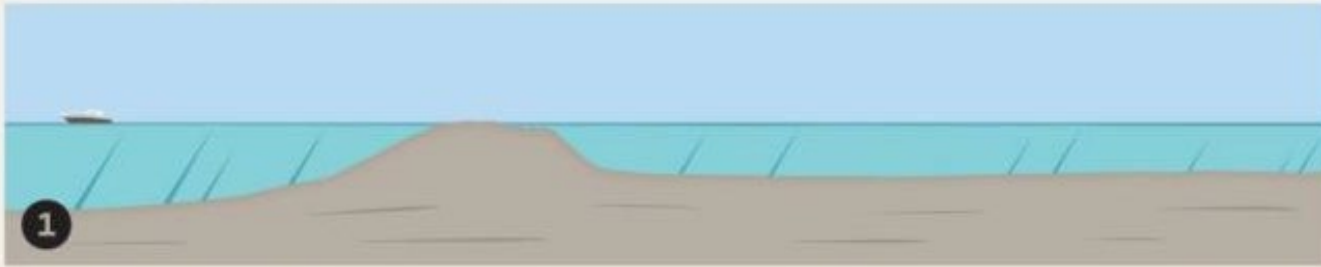
↑  
**SUBMERGENCE**



Adapted from: *A model of barrier island development* Penland and Boyd, 1981



# RESTORING BARRIER ISLANDS



In many instances a barrier island has eroded away to little more than a sand bar. The dunes have disappeared, and little, if any, vegetation remains.

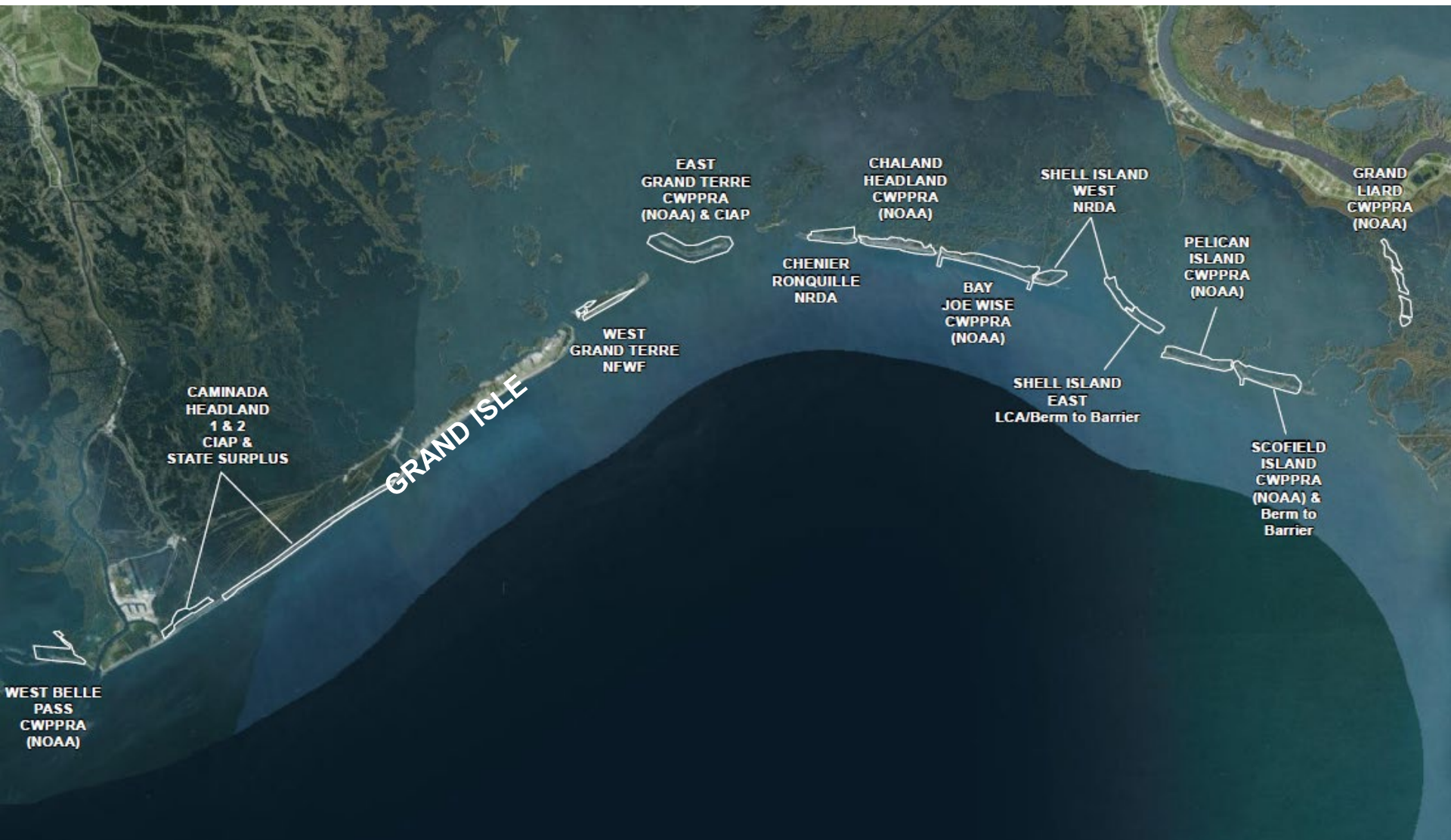


Sand is pumped in to build beach and dune, and a temporary dike is installed to contain the marsh on the coastal side (right) of the island until it fills in naturally.



Muddy sediment is pumped in to create the back marsh, and then grasses and aquatic vegetation are planted.

# Louisiana Barrier Island Chain Rebuilt Project by Project







# Pelican Island May 2010



# **Pelican Island December 2012**

**CPRA – Coastal 101**





# Shell Island August 2012



# Shell Island August 2013

CPRA – Coastal 101





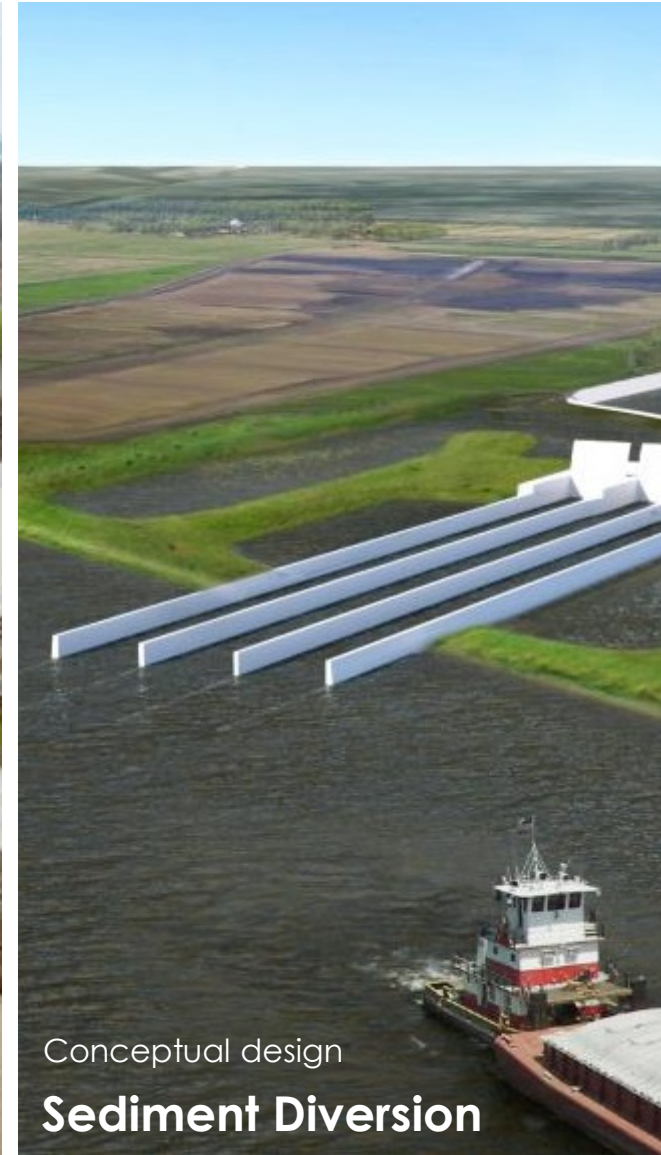
# Shell, Pelican, & Scofield Islands 2007



# Shell, Pelican, & Scofield Islands 2015



# DIVERSION PURPOSES





# FRESHWATER DIVERSION DAVIS POND





# Davis Pond (CRMS Station)

March 2008





# Davis Pond (CRMS Station)

April 2016





# Davis Pond (Sediment Core)

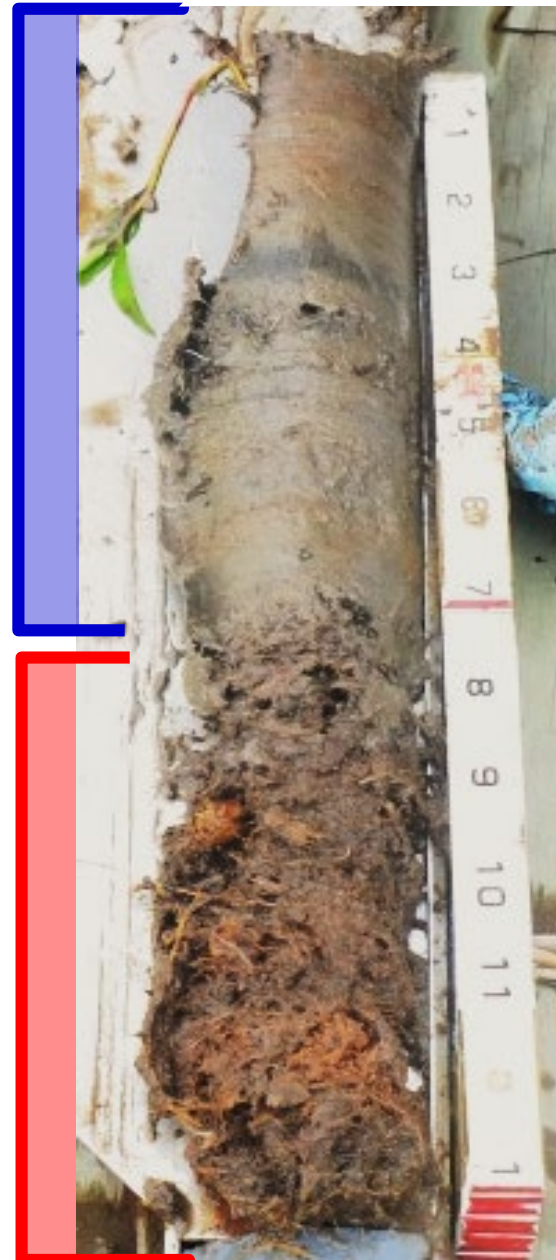
April 2016

## SINCE

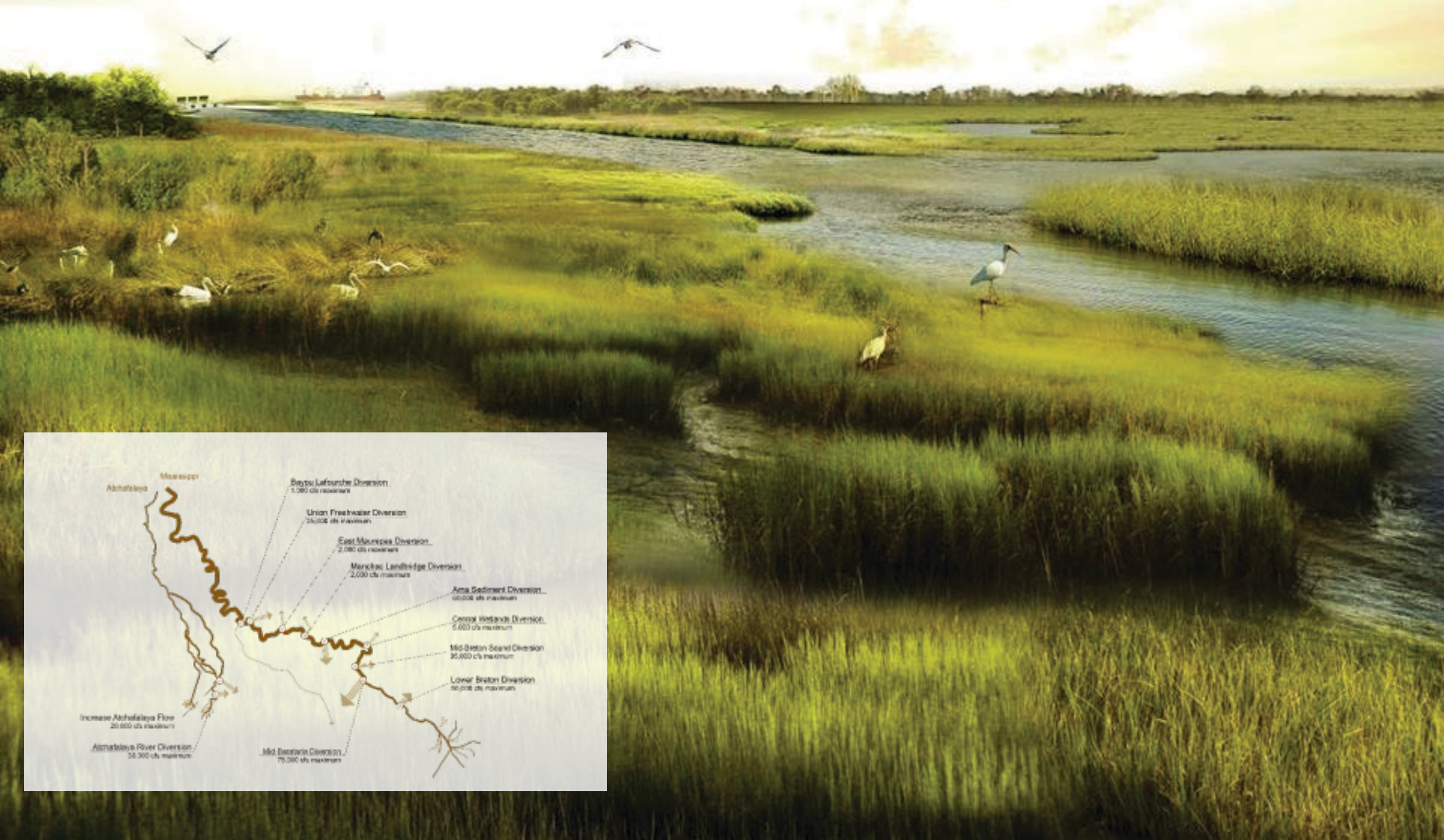
**Davis Pond Began Operations:**  
Mostly inorganic material deposited by  
the diversion

## BEFORE

**Davis Pond Began Operations:**  
Mostly organic material (plants and  
roots)



# RECONNECTING THE RIVER SEDIMENT DIVERSIONS







**Bayou Dupont, 2007**

**CPRA – Coastal 101**



# Bayou Dupont, 2012

CPRA – Coastal 101







Bayou Dupont, June 2014

CPRA – Coastal 101



Bayou Dupont, July 2015

CPRA – Coastal 101

Photo by  
www.gulfcoast.com  
Shreveport, LA 70601  
A GulfCoast.com photo





# Be an #OurCoast Advocate!



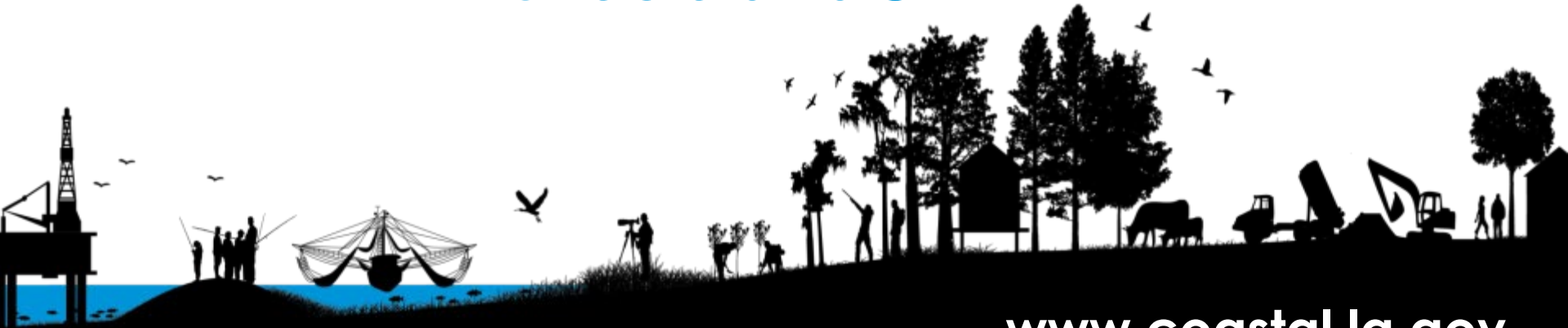
# #OurCoast



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