



# The Art and Science of Designing Living Shorelines



Presented by

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# Components of a Restoration Process

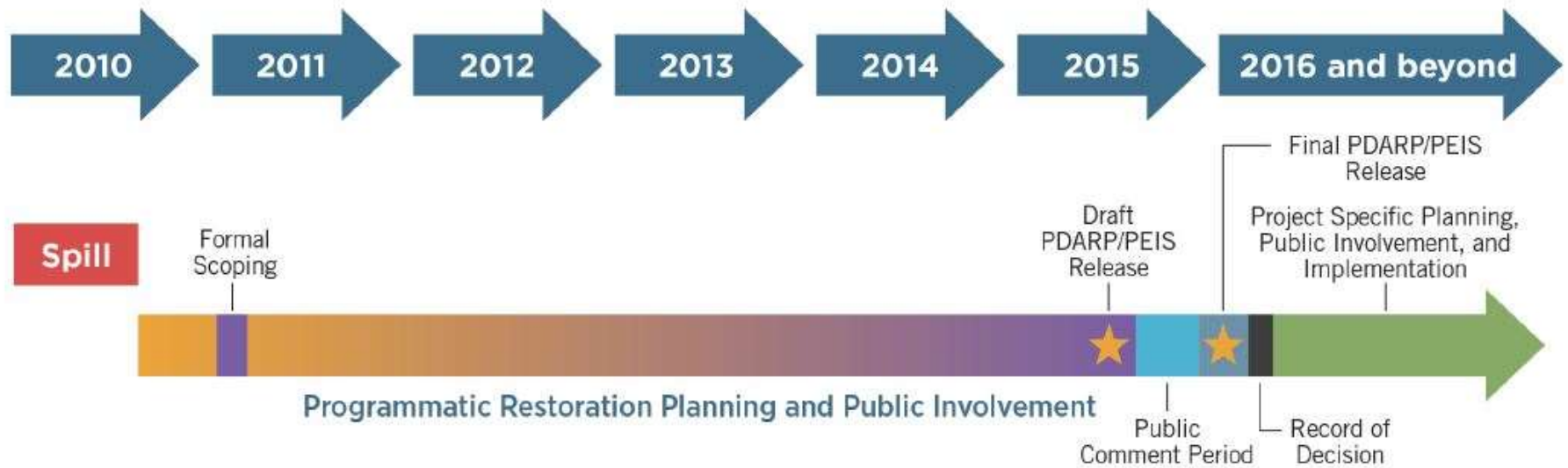
- Conceptual planning
- Preliminary tasks
- Implementation planning
- Implementation tasks
- Post-implementation tasks
- Evaluation and publicity

# 2011 Early Restoration Agreement for Deepwater Horizon Oil Spill

- Contribute to making the environment and the public whole
- Address one or more specific injuries to natural resources or services associated with the incident
- Seek to restore natural resources, habitats, or natural resource services
- Be consistent with the anticipated long-term restoration needs and anticipated final restoration plan
- Be feasible and cost-effective

# Generalized Timeline for Phased Restoration Planning

(from NOAA Final Programmatic Damage Assessment and Restoration Plan)



# Early Planning

- Public process
  - Public meetings
  - Website
  - Tweets
  - Texts
- Review and negotiation
- Technical assessments
- Conceptual design

# Early Restoration Projects: Living Shoreline

- Hancock County Marsh Living Shoreline
- Restoring Living Shorelines and Reefs in Mississippi Estuaries

# Hancock County Marsh Living Shoreline Purpose

- Early Restoration Project (Phase III)
  - Protect shoreline and marsh from erosion
    - Breakwater
    - Marsh creation
  - Support secondary productivity
    - Subtidal reef
    - Breakwater (over time)

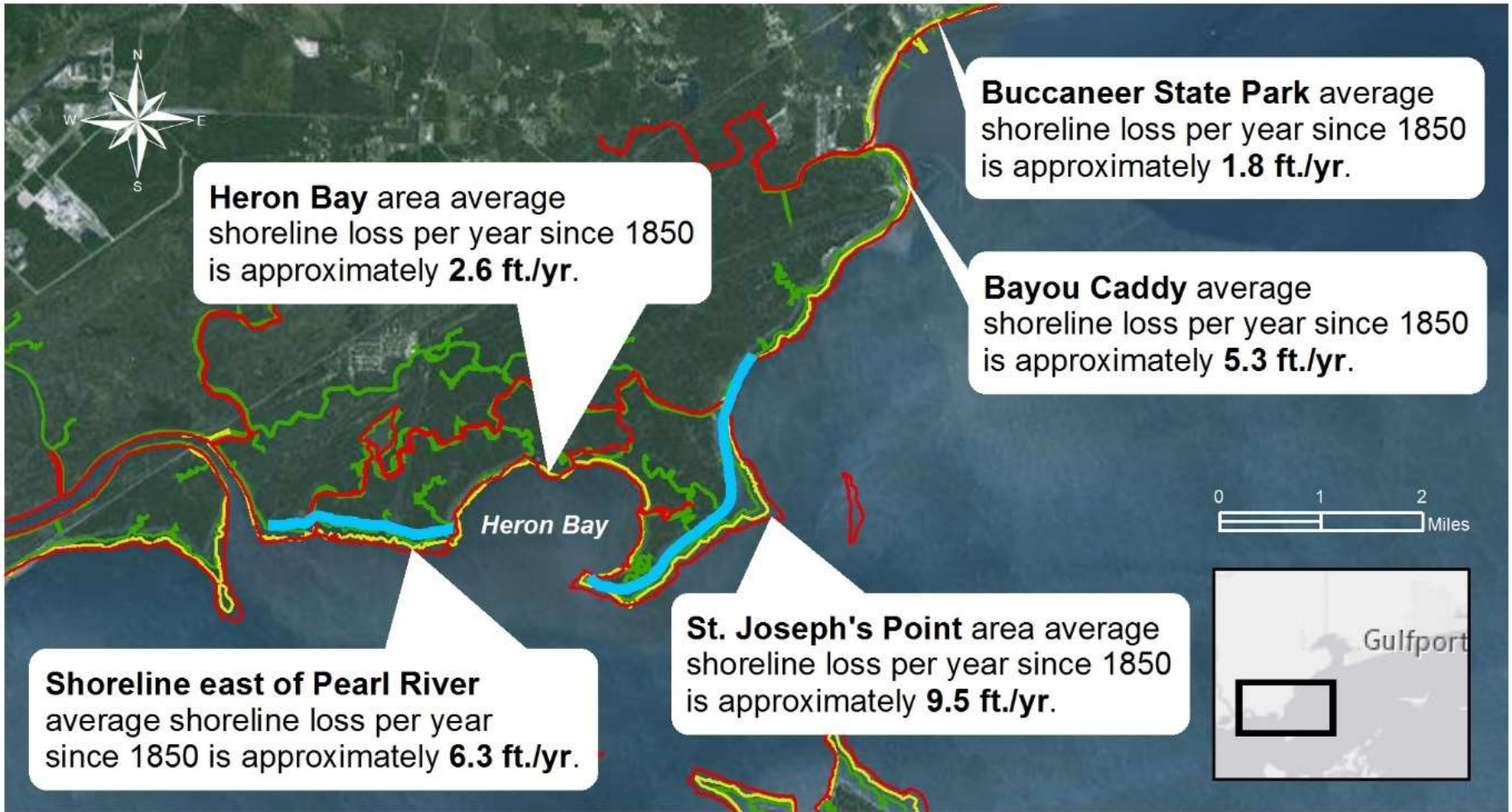


# Project Components

- 46 acres of created marsh
- 46 acres of subtidal reef
- ~ 6 miles of breakwater
- Monitoring







**Heron Bay** area average shoreline loss per year since 1850 is approximately **2.6 ft./yr.**


**Buccaneer State Park** average shoreline loss per year since 1850 is approximately **1.8 ft./yr.**

**Bayou Caddy** average shoreline loss per year since 1850 is approximately **5.3 ft./yr.**

**St. Joseph's Point** area average shoreline loss per year since 1850 is approximately **9.5 ft./yr.**

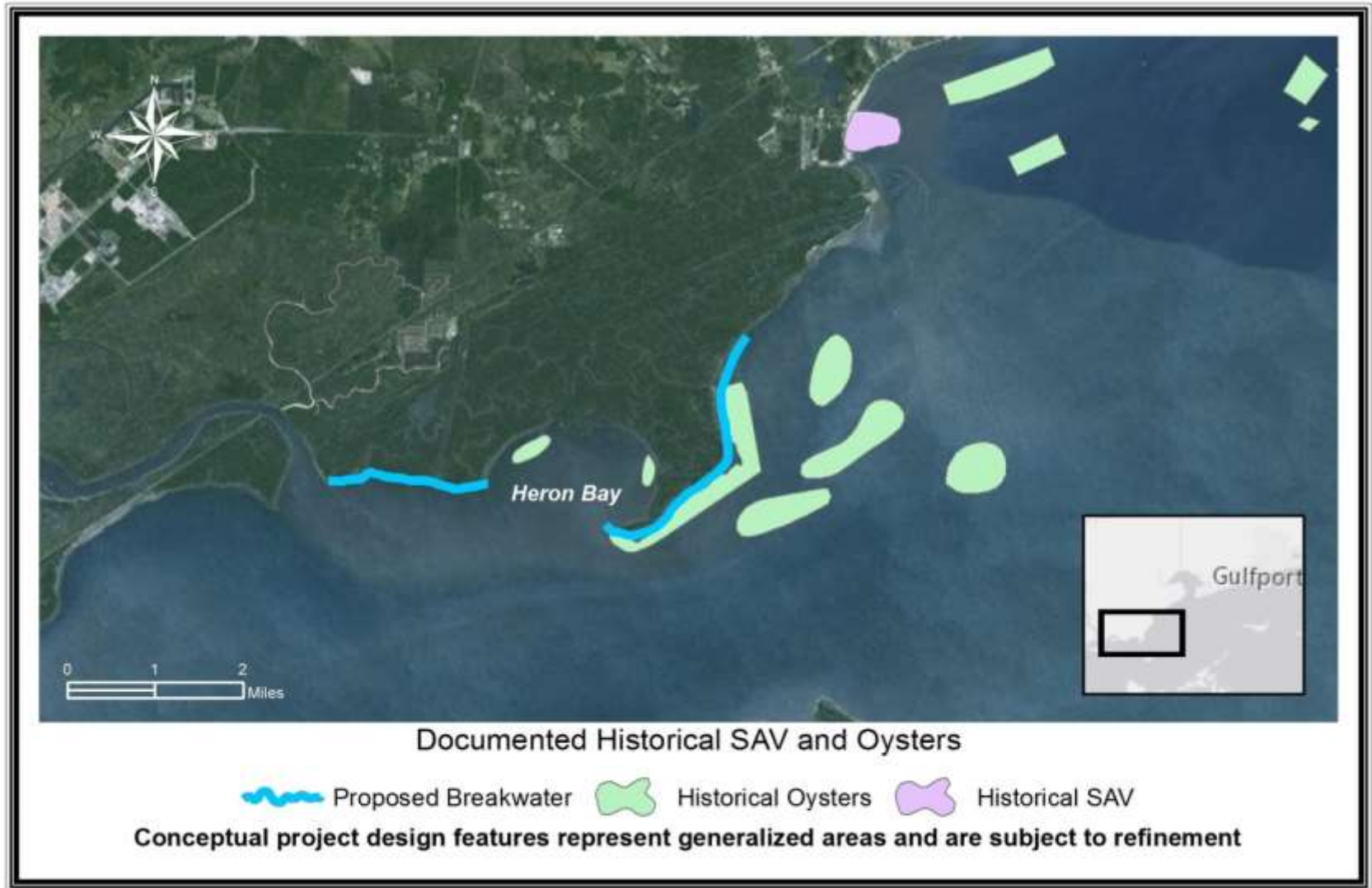
**Shoreline east of Pearl River** average shoreline loss per year since 1850 is approximately **6.3 ft./yr.**

**HCMLS Shoreline Erosion**

 Proposed Breakwater  1850 Shoreline  1917 Shoreline  1950 Shoreline

**Conceptual project design features represent generalized areas and are subject to refinement**

# Studies and Investigations



# Studies and Investigations

- Submerged aquatic vegetation
- Shellfish
- Hydrodynamic modeling
- Geotechnical
- Cultural resource

# Restoring Living Shorelines and Reefs in Mississippi Estuaries

- Early Restoration Project (Phase IV)
  - Restore intertidal and subtidal reefs using living shoreline
    - 4 miles of breakwaters
    - 5 acres of intertidal reef
    - 267 acres of subtidal reef
  - Support secondary productivity



Graveline Bay



HARRISON COUNTY  
JACKSON COUNTY

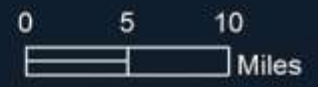
HANCOCK COUNTY

### Restoring Living Shorelines and Reefs in Mississippi Estuaries

## Overview

 Project Area

Conceptual project design features represent generalized areas and are subject to refinement



# Living Shoreline = *Opportunities*

- Shoreline protection and resiliency
- Ecosystem restoration or creation
- Enhanced recreational resources

# Lessons Learned: Human Dimension

- Map stakeholders
- Hold roundtable listening sessions
- Understand expectations
- Address challenges
- Incorporate traditional knowledge where appropriate

# Lessons Learned: Living Shorelines

- It's not just the habitat
- Identify potential issues early
- Stakeholder communication is important at many levels



# Lessons Learned: Restoration

- Keep the client informed
- Investigate baseline and reference conditions
- Communicate with regulatory agencies early
- Cheap construction is not always best
- Use adaptive management
- Take photos
- Write it up

# Questions/Discussion

