

# Coastal Resilience in Louisiana

## Transportation Research Board

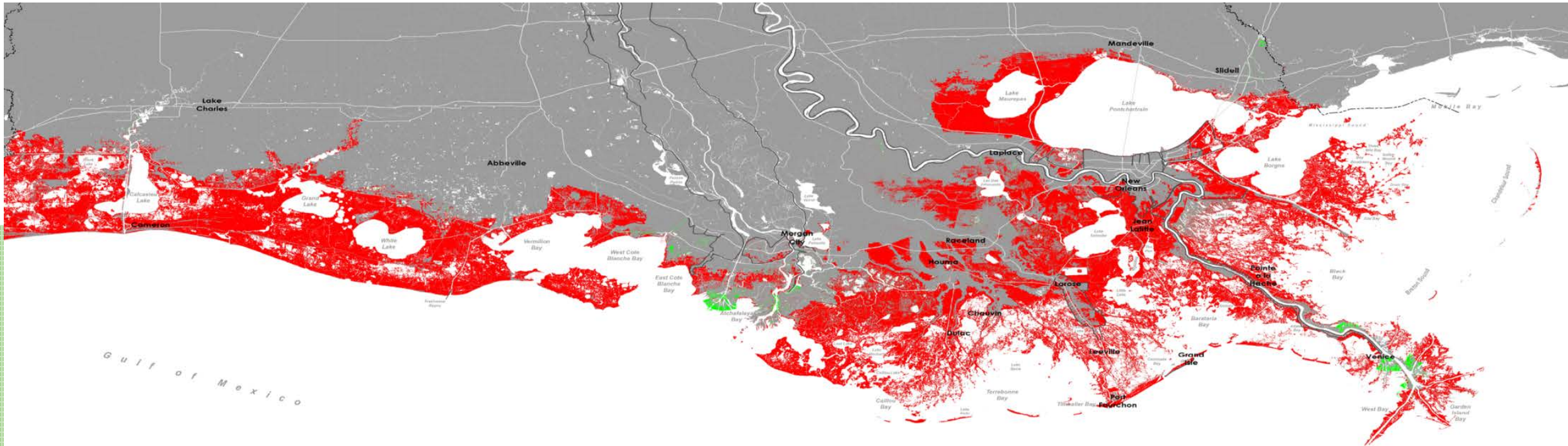
CHARLES SUTCLIFFE



GOVERNOR'S  
OFFICE OF  
COASTAL  
ACTIVITIES

SINCE 1930 + YEAR 50

6,206 square miles

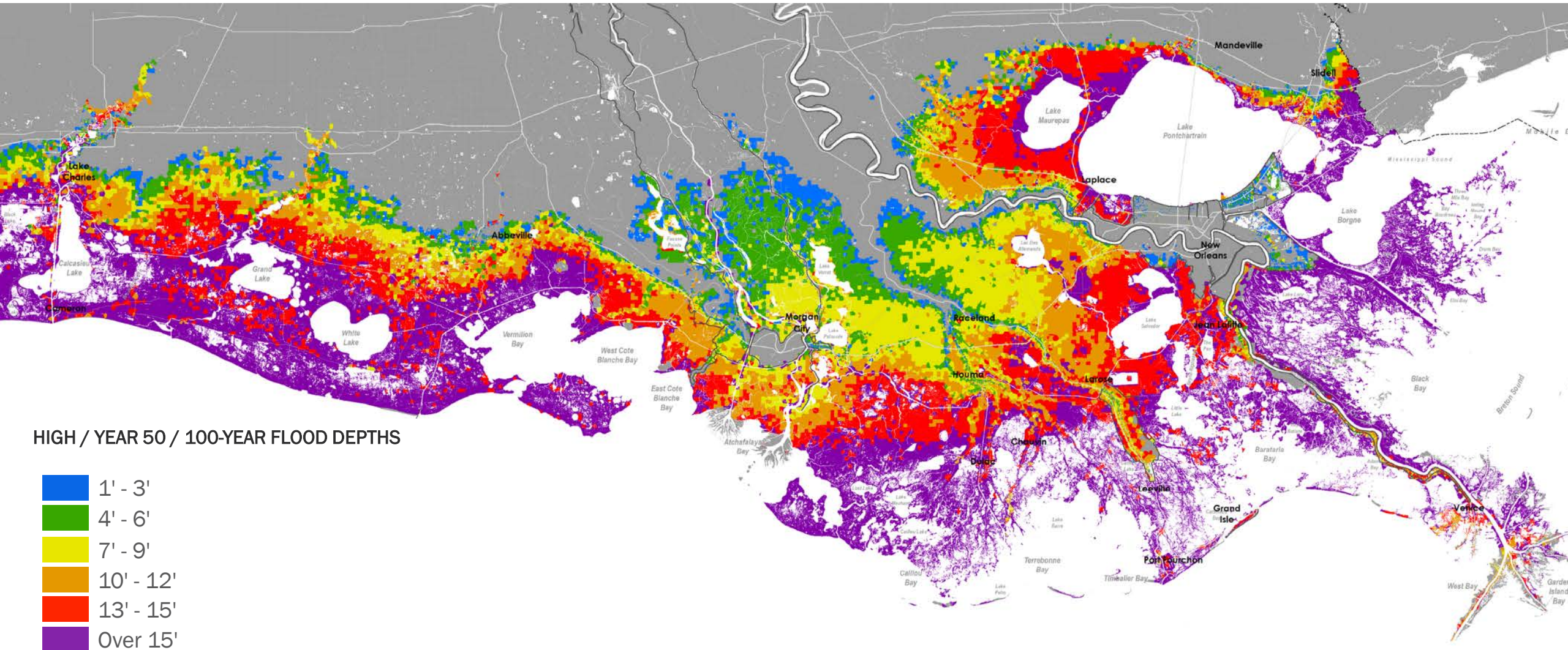


■ LAND LOST ■ LAND GAINED



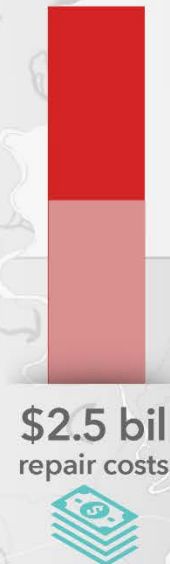
# Predicted Flood Depths

## Future Without Action Year 50, *High Scenario, 100-Year Event*






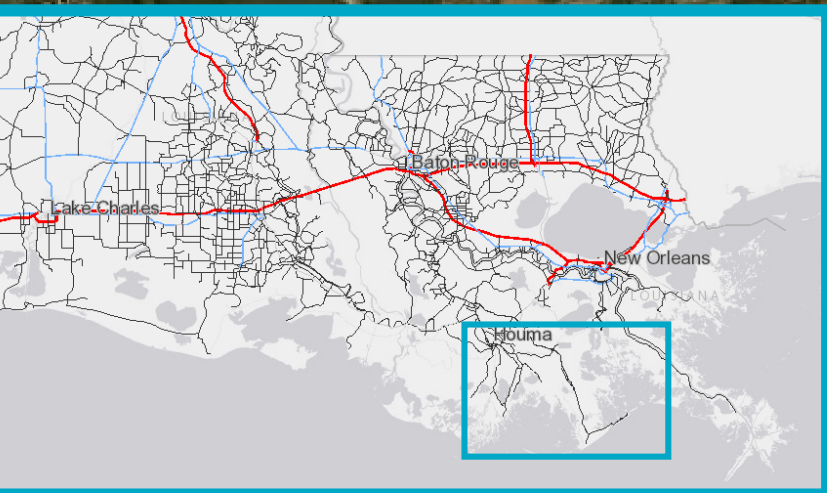


# Future Coastal Flood Risk to Roadways

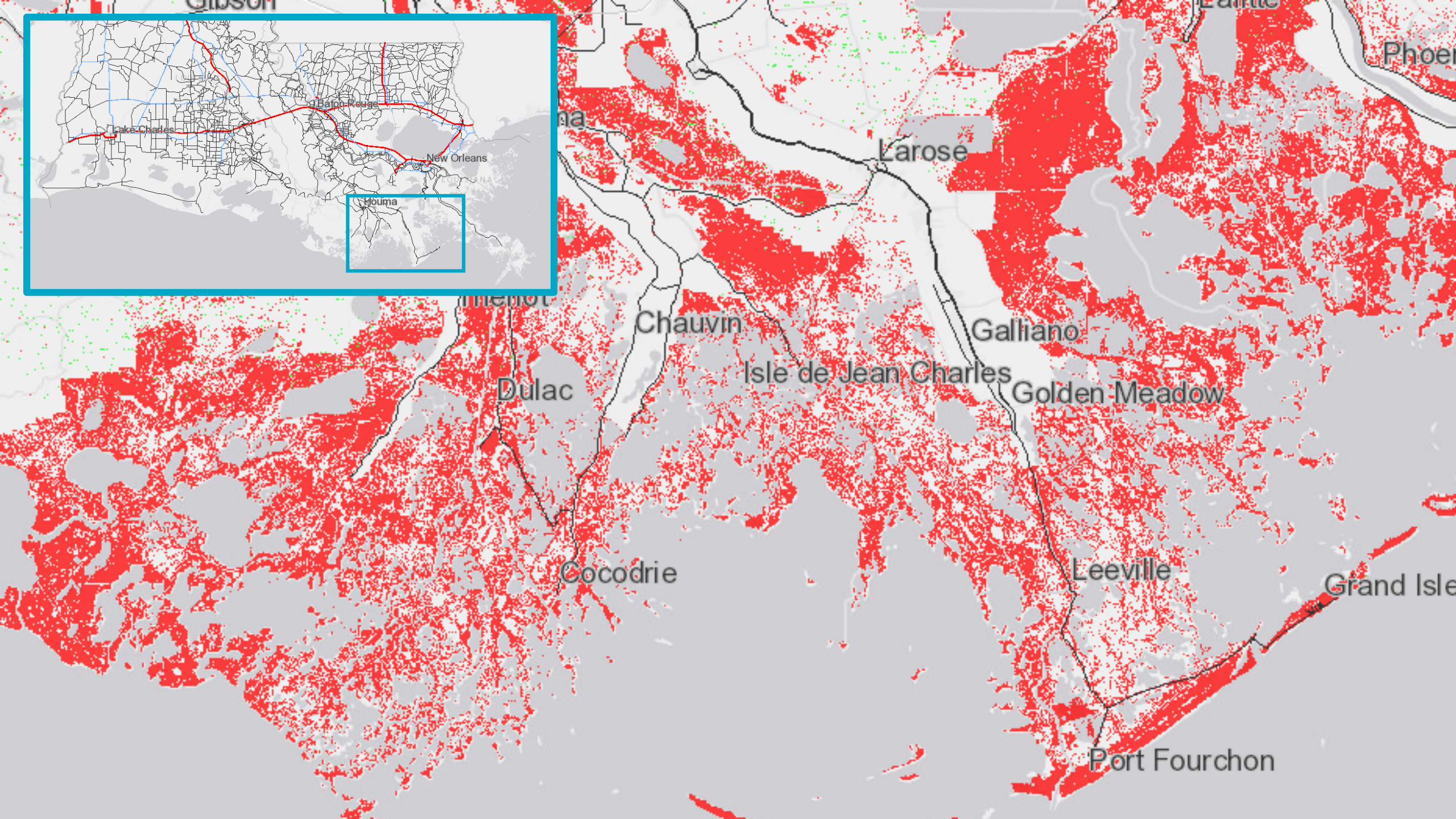
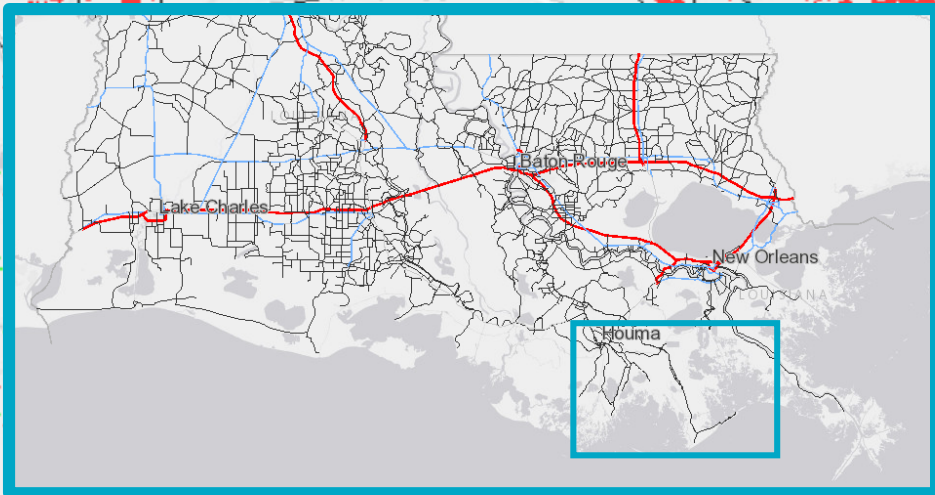


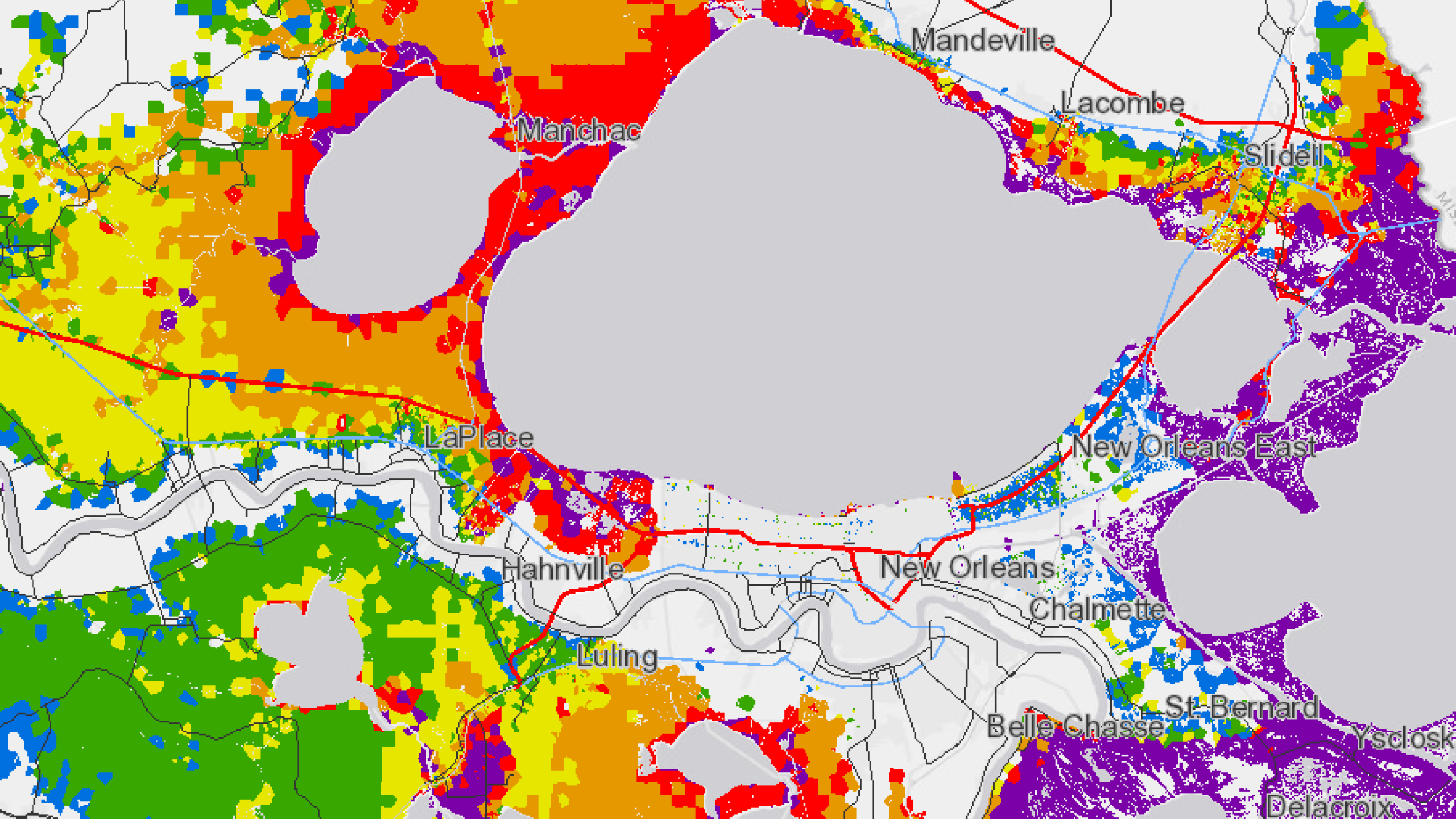
## COASTAL FLOOD RISK

-  1-16+ feet of coastal flooding
-  Roadways at risk of coastal flooding
-  Roadways at higher risk of coastal flooding









# Coastal Master Plan: A Framework to Make Decisions

## THE ANALYTICAL CHALLENGE

- Complex Coastal Environment
- 50 Year Planning Horizon
- Uncertain Future Scenarios
- Multiple Project Types
- Diverse Community Needs

## NO OPTIMAL SOLUTIONS

- Risk Reduction (Structural or Nonstructural) vs. Restoration
- Near-Term Benefits vs. Long-Term Sustainability
- Different Stakeholder Preferences



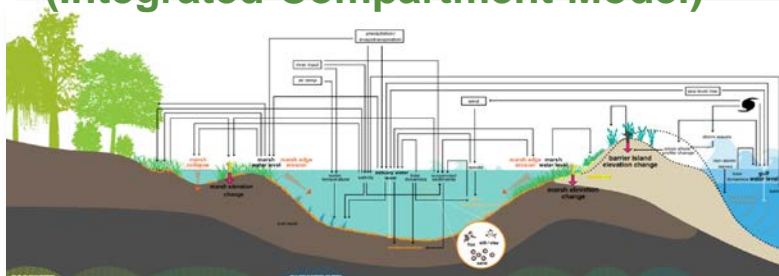
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# Flood Damage Reduction

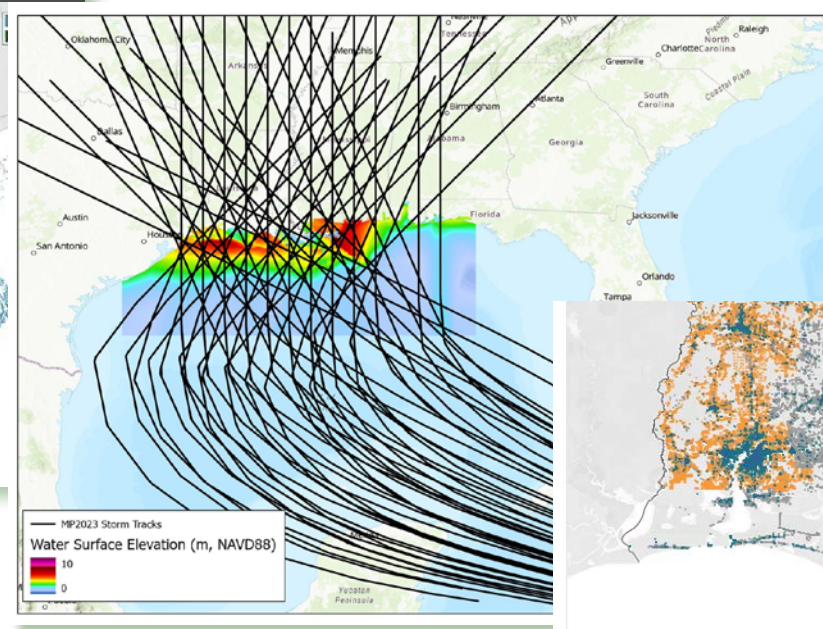
9

# Predictive Models

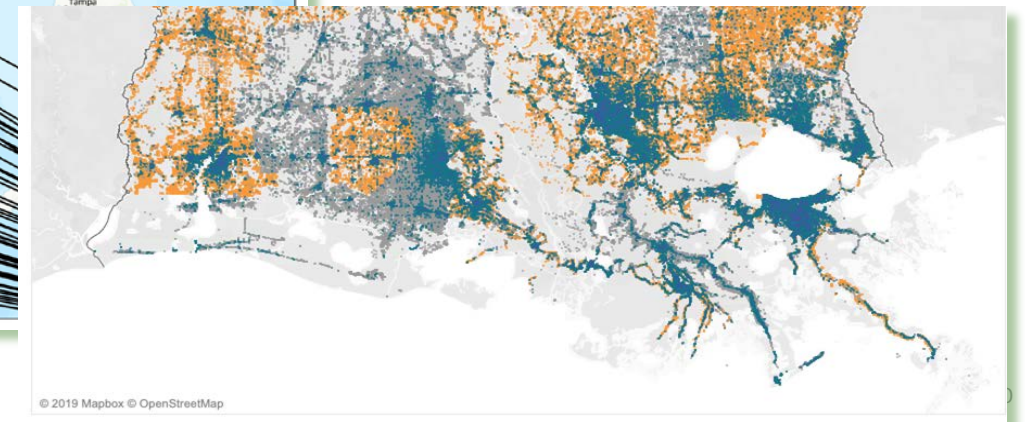
## Landscape Model (Integrated Compartment Model)



## Surge and Wave Models



## Risk Model





# PLANNING TOOL APPROACH

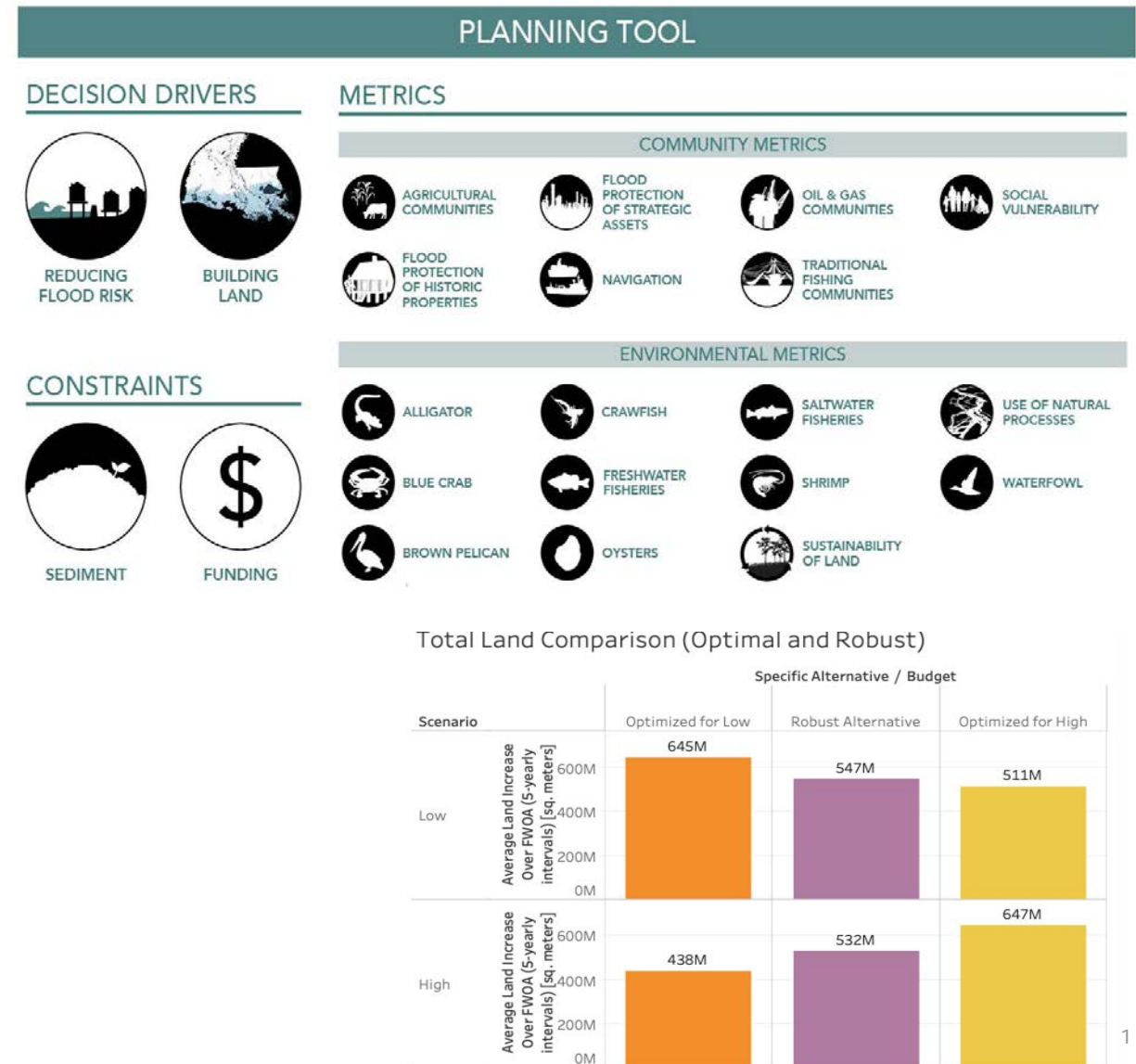
## PROJECT PRIORITIZATION

### Projects prioritized based on:

- Building and maintaining land
  - Expected Annual Damage (EAD\$)
  - Expected Average Structure Damage (EASD) by asset class
- Metrics are used as checks and potential constraints
  - Impacts on habitat of key species
  - Impacts on traditional fishing communities, agriculture, the navigation industry, etc.

### Robust Project Selection

- Identify projects that perform well across a range of future environmental scenarios
- Limiting the 'cost' of planning for an uncertain future

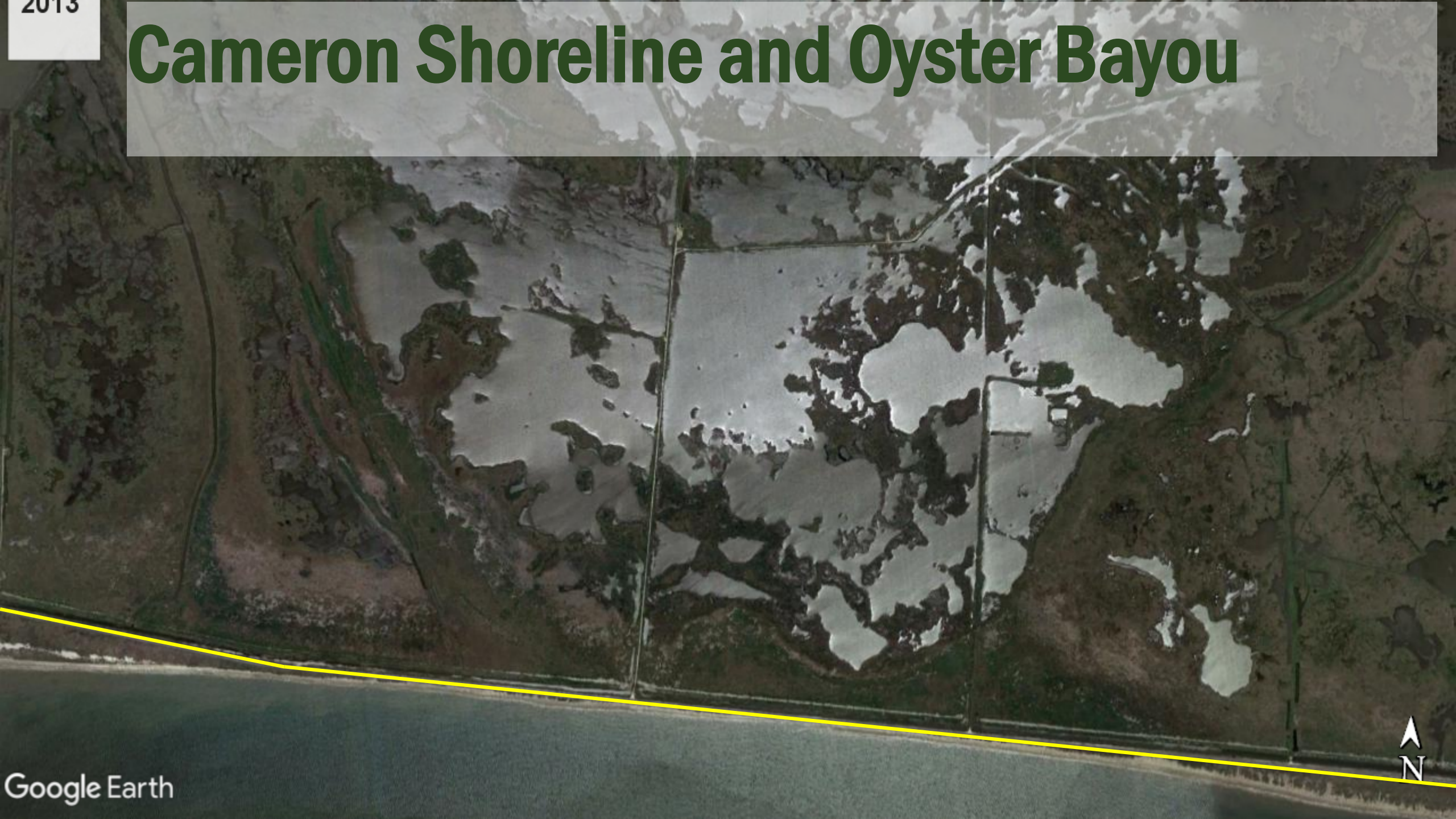






2013

# Cameron Shoreline and Oyster Bayou





2017

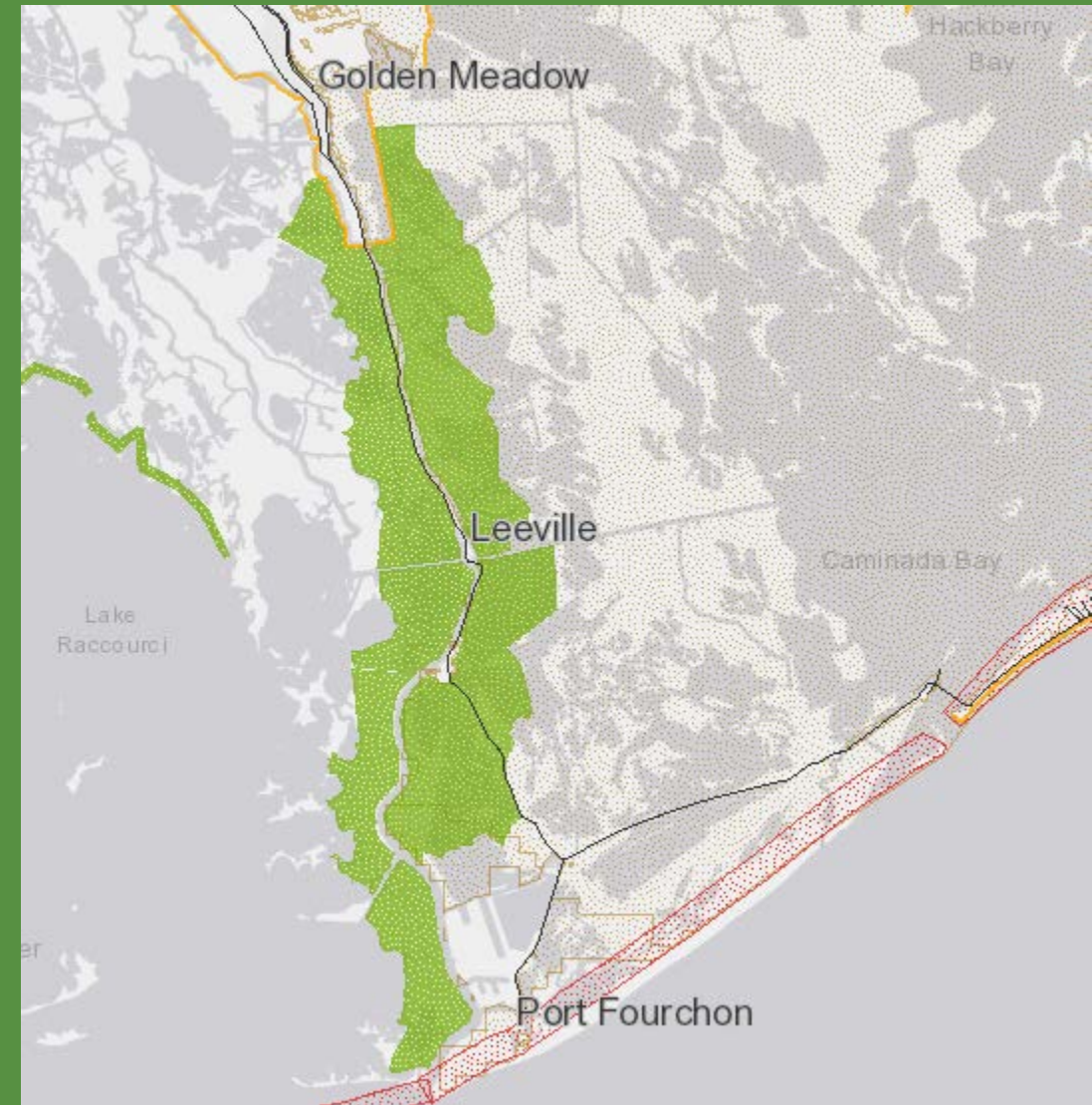
# Cameron Shoreline and Oyster Bayou



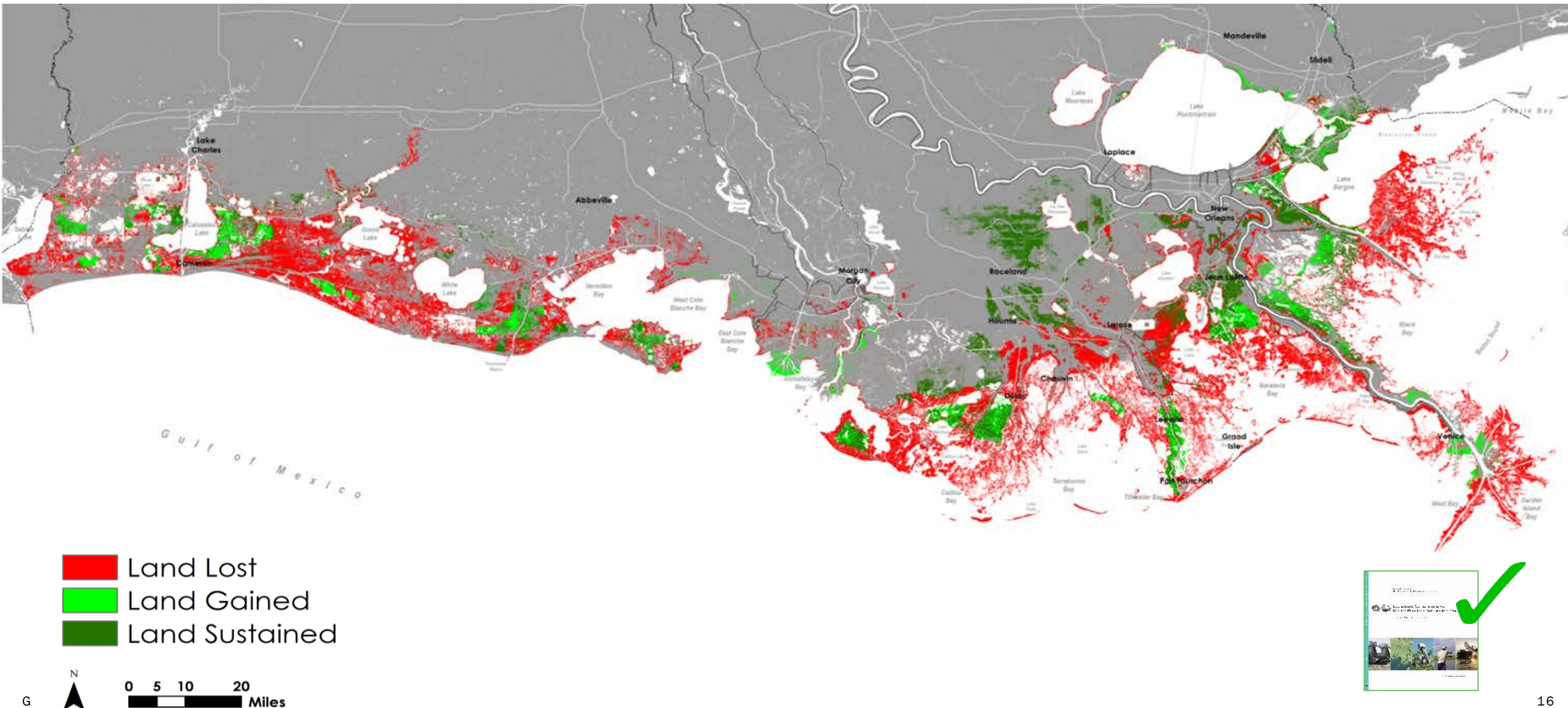


# Natural and Built Resilience around LA 1

- Elevated LA 1
- 13 miles of beach/dune restoration; barrier islands to the West
- Future: 23,000 acres of marsh creation and \$33 million in home elevations and flood proofing



# Medium Scenario | Year 50





*Coastal change*

COASTAL STORMS

SEA LEVEL RISE

LAND COVER CHANGE

SALINITY PENETRATION

*Impact category*

INFRASTRUCTURE  
DAMAGE

SOCIAL  
DISRUPTION

ECONOMIC  
DISRUPTION

ENVIRONMENTAL  
DAMAGE

*State agency*

DOTD

LDWF

AG

DEQ

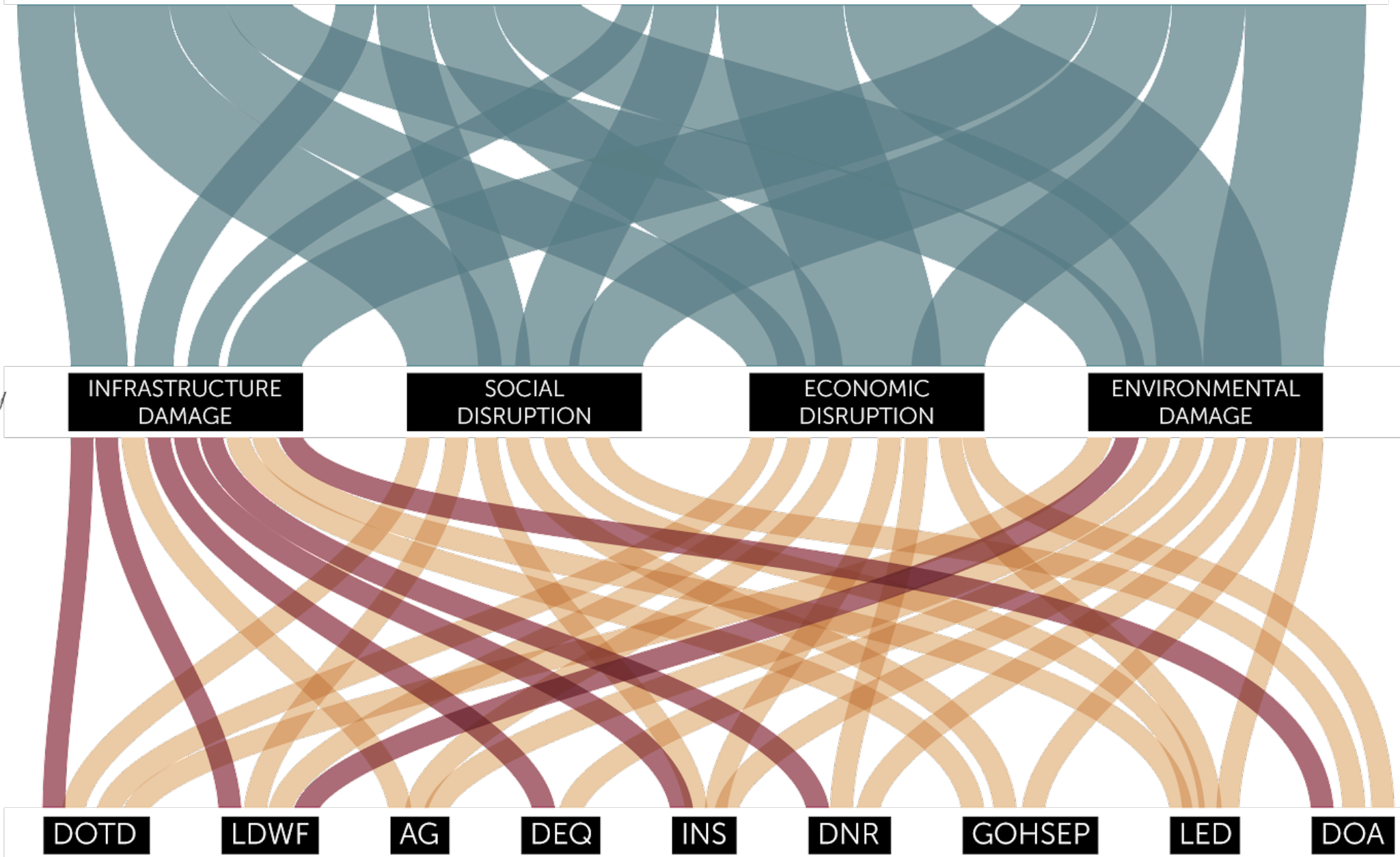
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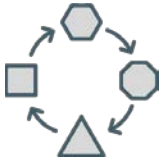
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# Elements of a Resilient Coast



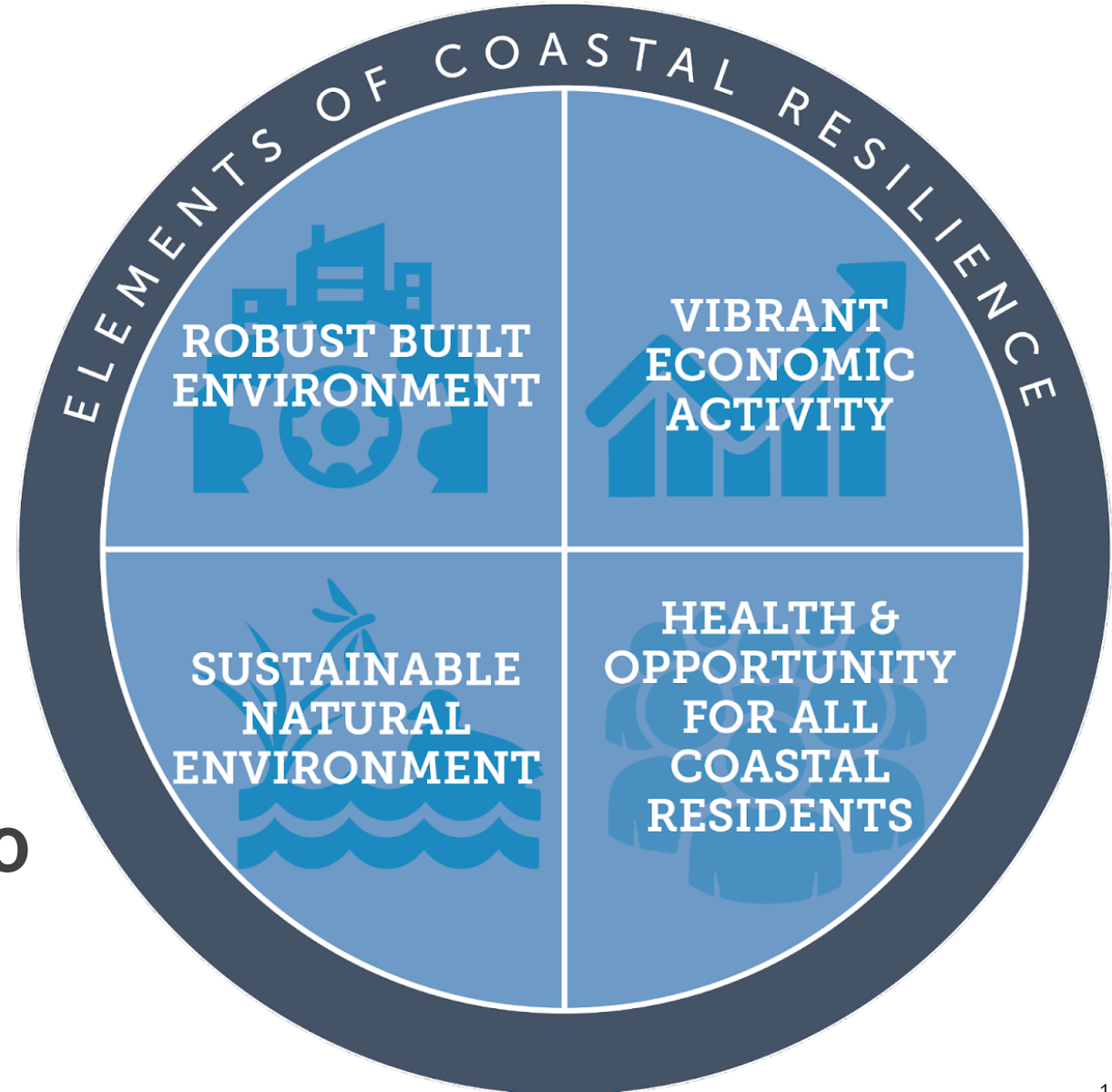
**Assessing agency  
vulnerabilities**



**Identifying adaptation  
actions**



**Incorporating results into  
strategic plans**





# Principles of Adaptive Governance

## Information

- Having resources to make data-driven decisions

## Integration

- Aligning agency objectives and efforts

## Participation

- Engaging a spectrum of perspectives to inform approach

## Innovation

- Mobilizing resources to deal with new conditions

### ASSESS AGENCY VULNERABILITIES

#### INFORMATION

- How will future coastal conditions be different?
- How will your assets, services, and constituents be impacted by coastal change?
- What data would help your agency understand the breadth of coastal impacts?

#### INTEGRATION

- How will impacts of coastal change affect the way your agency carries out its mission?
- How do other agencies' efforts intersect with your activities?
- How does change in one part of the coast impact your work in other areas?

#### PARTICIPATION

- Who is affected by your agency's activities that are in or have impact on the coastal area?
- Who is impacted by your vulnerabilities to coastal change?
- How can you better understand the impacts to those you serve?

#### INNOVATION

- How does coastal change challenge your established management processes?
- Do your agency's coastal vulnerabilities have implications for funding or other agency resources?
- What are the constraints on your agency's ability to adapt allocation of resources or management processes?



### DEVELOP ADAPTATION OPTIONS

#### INFORMATION

- What data would help your agency plan for changing coastal conditions?
- What information would help you prioritize adaptation options?
- How could data be collected to measure the effectiveness of adaptation interventions?

#### INTEGRATION

- Will adaptation actions impact other agency operations?
- Does the success of your agency's adaptation options depend on coordination with or support from other agencies?
- Does success depend on support/coordination from other jurisdictions?

#### PARTICIPATION

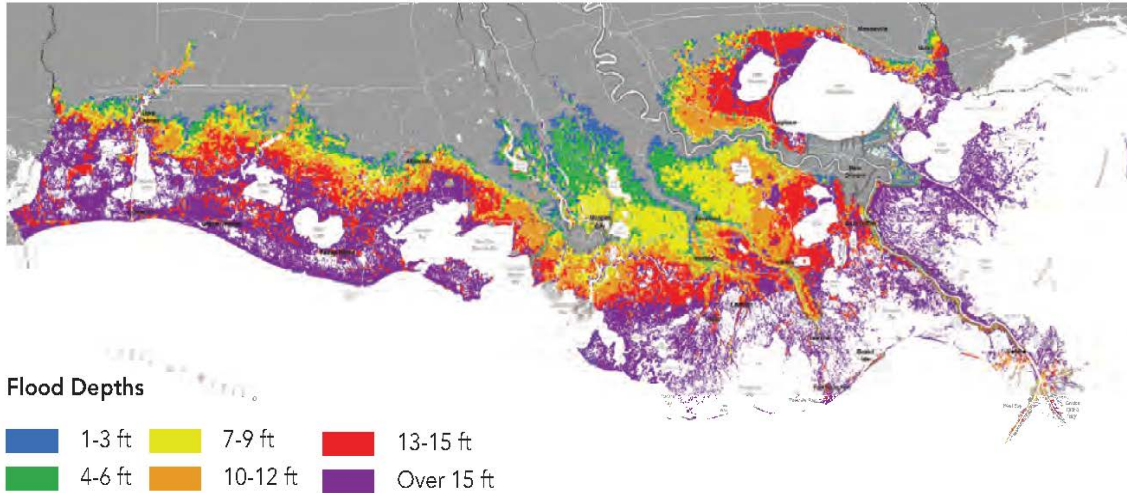
- Who will be affected by the adaptation options identified?
- How can you ensure a wide spectrum of input when identifying and prioritizing adaptation options?
- How is future use of agency assets and services impacted by your adaptation options?

#### INNOVATION

- Will adaptation options require a different level of funding and/or resource allocation?
- Are there new partnerships that could help leverage funds for adaptation?
- What catalytic projects could serve as a pilot for advancing innovative collaborations and funding mechanisms?



# Understanding Agency Vulnerabilities



- **Current and Future Impacts** to Agency's Programs and Assets
- **Agency Focus**—But must involve considering how the coastal crisis impacts their constituencies and ability to fulfill their mission
- Lays **foundation for adaptation** options and for them to better meet needs of Louisiana people and businesses



Assess agency vulnerabilities

Develop adaptation options

Institutionalize resilience



# VA Example: Department of Corrections

1	Agency Name	This worksheet is to document Future vulnerabilities, whether they exist currently, their impacts and significance to the agency. Use columns K & L for explanatory notes							
2									
3	Impacts to Assets	Current Impact	Future Impacts (decades into the future)						
4	Asset Description (Assets are physical things - built or natural infrastructure, or facilities)	Is the Asset Currently Impacted? (Yes/No)	Exposure Causing Impact (pulldown list)	Location/ Extent	Description of Impact/Consequences	Impact Score (1-10) <i>Sheet D</i>	Significance Rating (for Impact Scores >5) <i>Sheet H</i>		Significance Assumptions
5							Within Agency	Across Govt.	
6	State facilities (prisons)	Yes	Wind	statewide	Storm damage results in costs for repairs, evacuation of inmates	5	Moderate	Minimal	Storm surge going to remain problematic
7	Transportation vans/buses	No	Temporary flooding	statewide		4	Moderate	Minimal	Storm surge going to remain problematic
8	Mississippi Levee	No	Temporary flooding	West Feliciana		10	High	High	Storm surge going to remain problematic
9	Local Jails operated by sheriffs	Yes	Temporary flooding	facilities south of I-10		7	Low	High	Storm surge going to remain problematic
10	COGYM and Program buildings	Yes	Temporary flooding	facilities south of I-10		8	Moderate	Minimal	Storm surge going to remain problematic
11									



GOVERNOR'S  
OFFICE OF  
COASTAL  
ACTIVITIES

# Thank you.