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2023 COASTAL MASTER PLAN  
*COMMITTED TO OUR COAST*

## 2023 COASTAL MASTER PLAN UPDATE STORM SURGE AND RISK MODELING



**APRIL 20, 2022**

# 2023 COASTAL MASTER PLAN UPDATE

## CLOSING AND NEXT STEPS

- Future without action risk projections

Activity	2018	2019	2020	2021	2022	2023
New Project Development						
Model Updates and Cal/ Val						
Update Scenarios and FWOA List						
<b>New FWOA Runs</b>						
Project Attributes (projects)						
New Project Modeling						
Project Attributes (alternatives)						
Alternatives Modeling (draft plan)						
Document Development (draft)						
Formal Public Meetings						
CPRA Board Meeting						
Final Master Plan to Legislature						

# MASTER PLAN OVERVIEW

## CPRA BOARD UPDATE

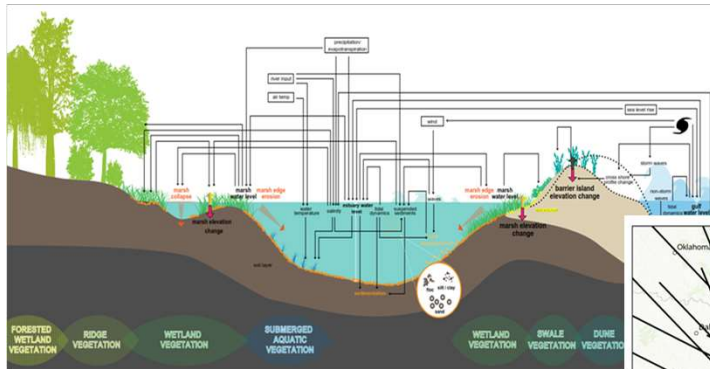
- Prioritization effort. How can the state spend its money most cost-effectively over the next 50 years to reduce storm surge based flood risk and restore and maintain coastal wetlands
- Built on world class science and engineering
- Illustrates how the coast is going to change
- Required by law to be updated every six years
- Incorporates extensive public input and review
- Advances a comprehensive and integrated approach to protection and restoration
- Identifies investments that will pay off, not just for us, but for our children and grandchildren



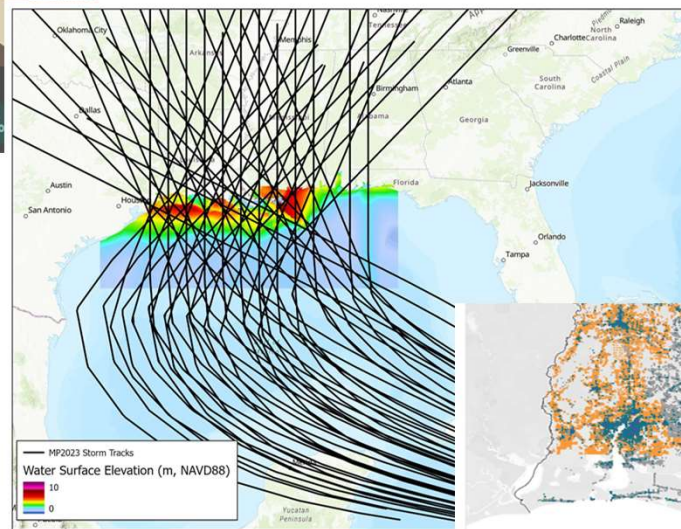
# LOUISIANA COASTAL MASTER PLAN

## PREDICTIVE MODELS

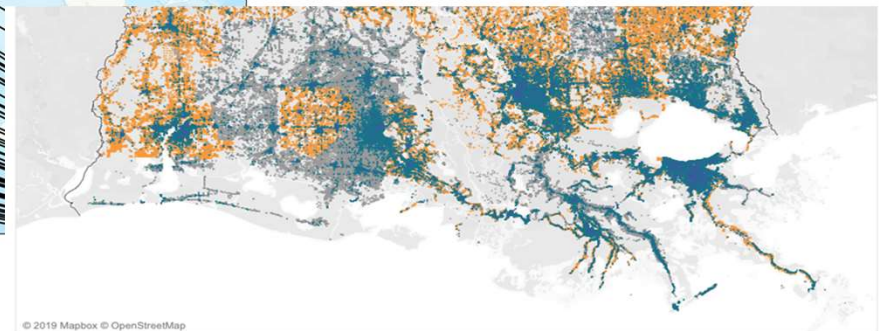
### Landscape Model (ICM)



### Surge and Wave Models



### Risk Model





# STORM SURGE AND WAVE MODELING

## MODEL IMPROVEMENTS

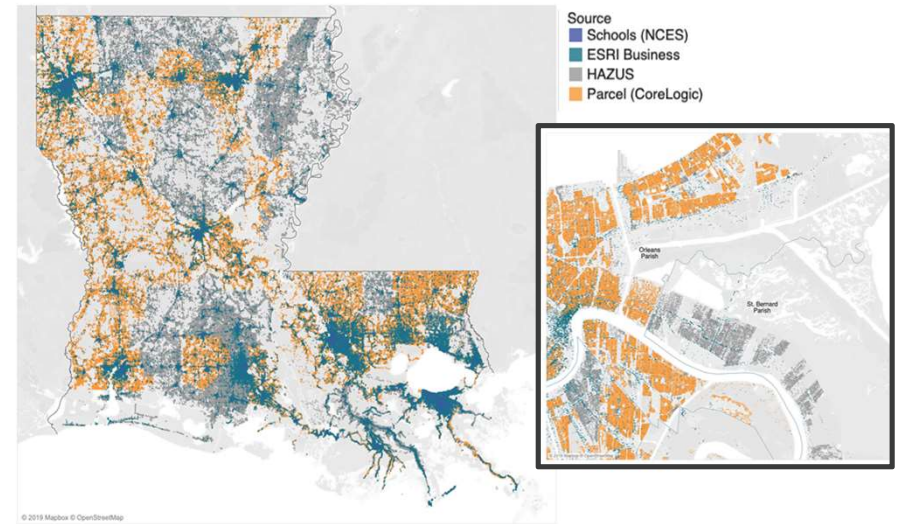
- Storm Surge and Waves (ADCIRC +SWAN)
  - updated landscape
  - **new storm suite**
  - updated parameter values consistent in coordination with USACE



# RISK MODELING

## MODEL IMPROVEMENTS

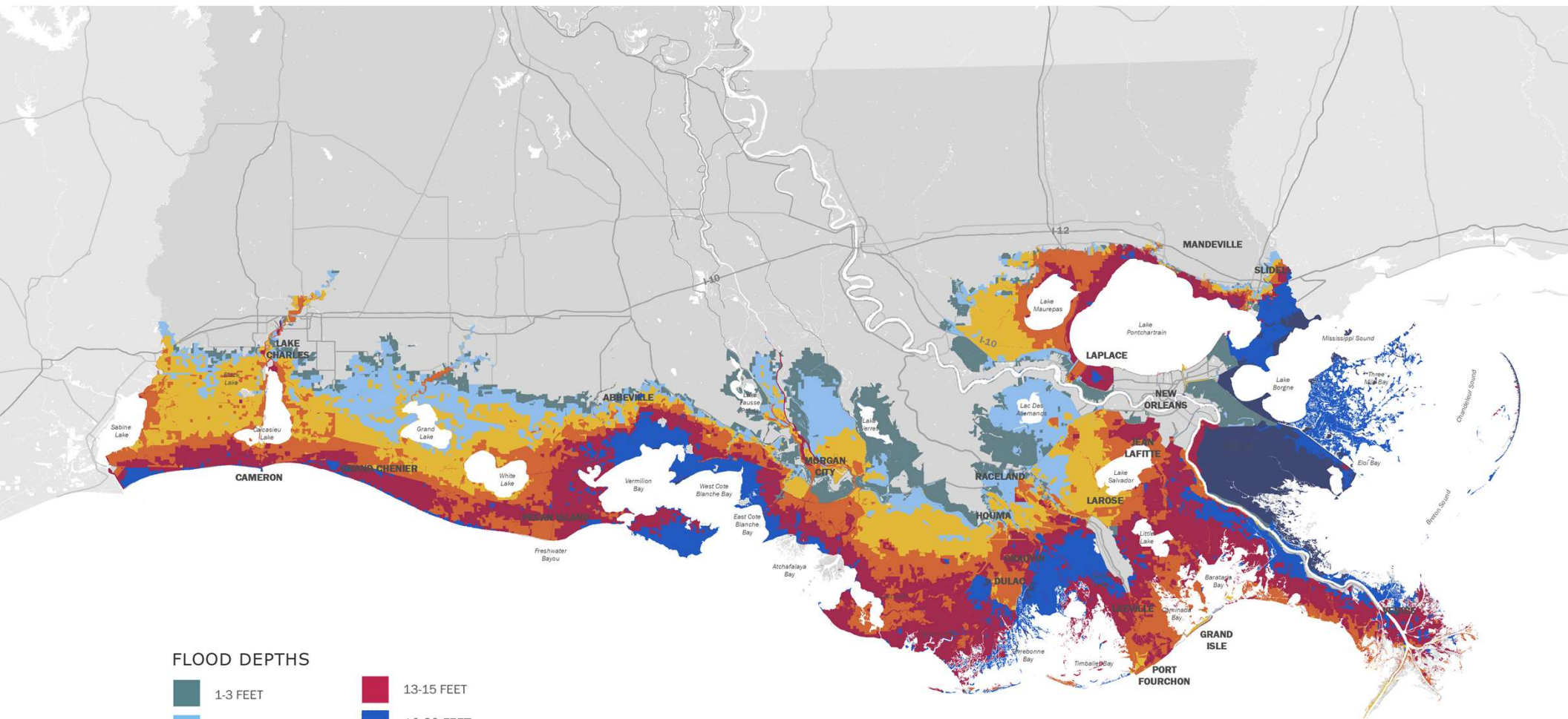
- Risk Assessment (CLARA)
  - **community boundaries redefined**
  - **structure inventory data**
  - asset growth model using population projections
  - new approach for system fragility



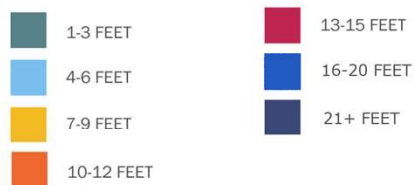


A photograph of a flooded marsh or coastal area. In the foreground, there is a body of blue water with some ripples. To the left, there is a patch of tall, dry, yellowish-brown reeds or grasses. In the middle ground, a white boat with a green canopy and some equipment is moving through the water, leaving a small wake. The background consists of a line of green trees under a blue sky with scattered white clouds. A dark green rectangular box is superimposed over the center of the image, containing white text.

# **INITIAL CONDITION FLOOD DEPTHS**



#### FLOOD DEPTHS



## 2023 COASTAL MASTER PLAN INITIAL CONDITIONS - DRAFT

FLOOD DEPTHS - 1% AEP

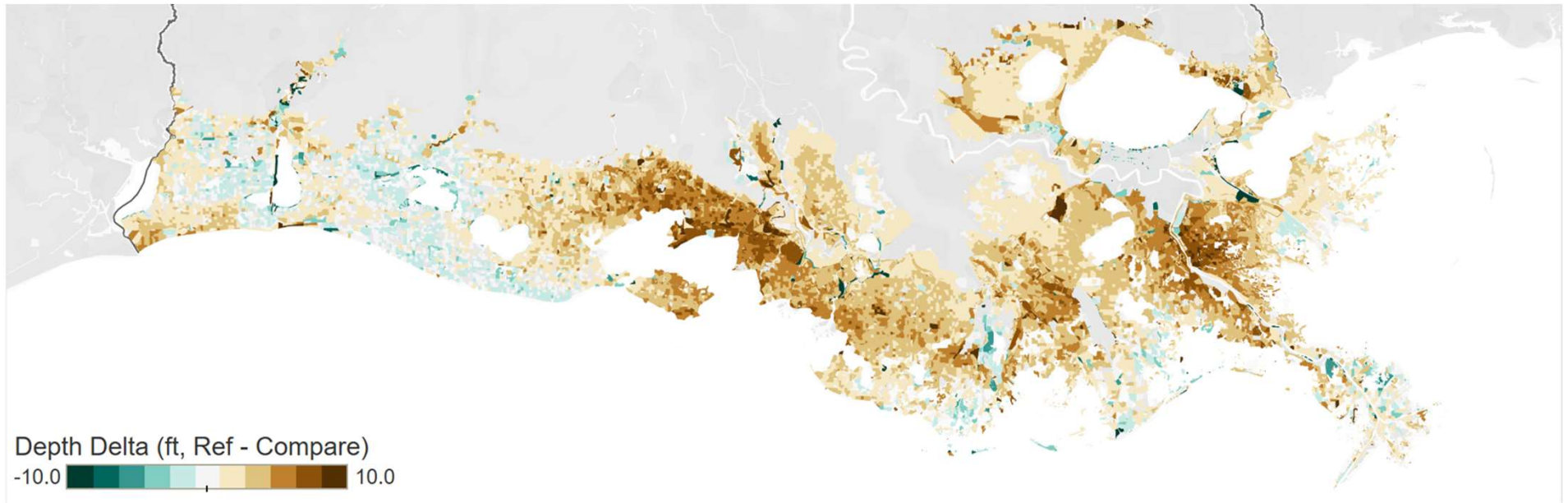




## 2023 MP INITIAL CONDITION FLOOD DEPTH – 2017 MP

FLOOD DEPTH DIFFERENCE – 1% AEP FLOOD DEPTH

Projected flood depths are generally greater than 2017 Master Plan projections.



A scenic view of a flooded landscape. In the foreground, a white boat with a green canopy is moving through blue water, leaving a white wake. To the left, there is a large clump of tall, dry, yellowish-brown reeds. The background features a line of green trees under a blue sky with scattered white clouds. A dark green rectangular box is overlaid in the center of the image, containing white text.

# **FUTURE WITHOUT ACTION FLOOD DEPTHS**

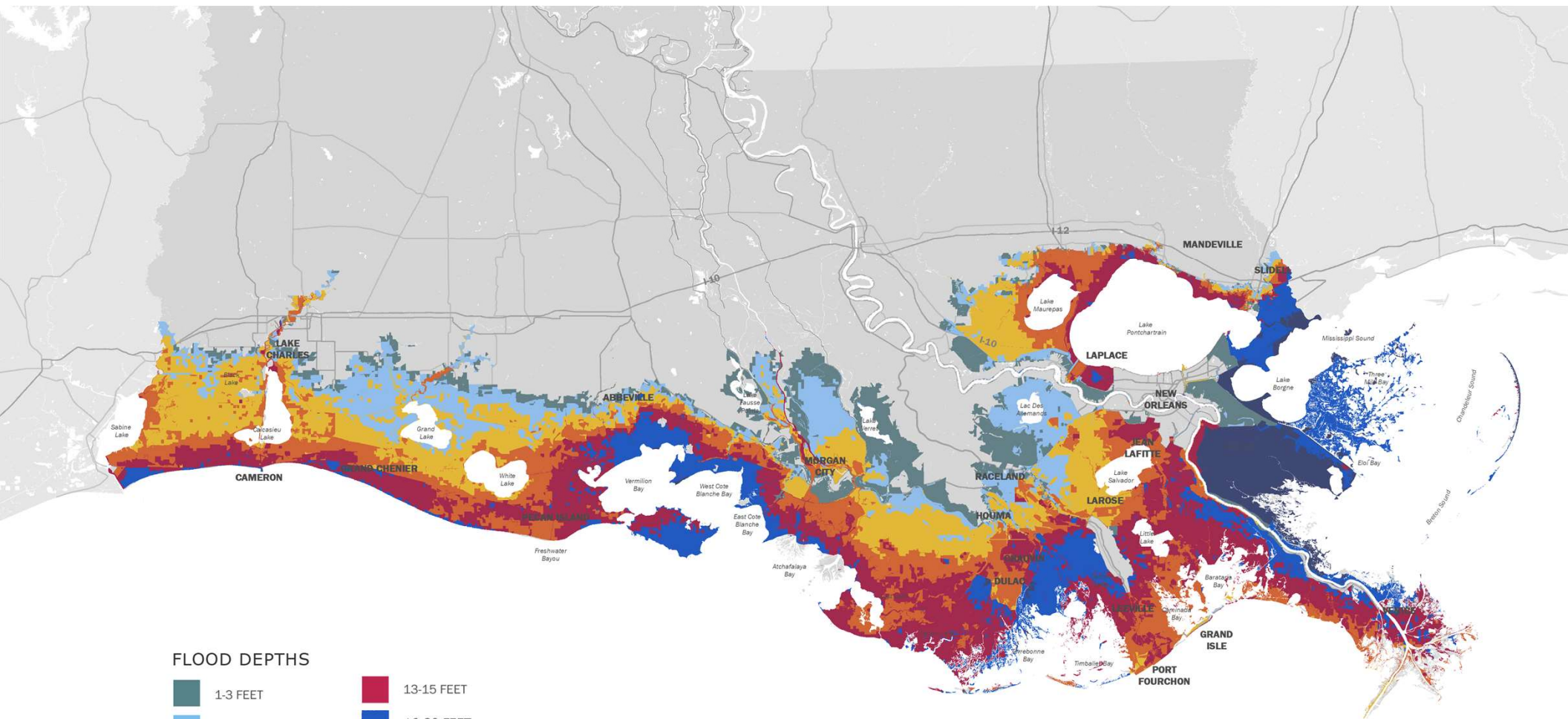
## FUTURE WITHOUT ACTION – FLOOD DEPTHS

What is changing over time?

- Landscape
  - Land/water
  - Vegetation
  - Elevation
- Sea level
- Storm Intensity

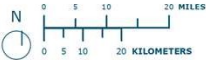
	Lower - S07 ✓	Higher - S08 ✓
Sea level rise (regionally adjusted)	NOAA Intermediate (~0.50 m by 2070; ~1.07 m by 2100)	NOAA Intermediate High (~0.77 m by 2070; ~1.75m by 2100)
Temperature and Evapotranspiration	following <u>RCP 4.5</u> 50th percentile	following <u>RCP 8.5</u> 50th percentile
Precipitation and Tributary flows	following <u>RCP 4.5</u> 50th percentile	following <u>RCP 8.5</u> 50th percentile
Subsidence	low: deep subsidence + <u>1st quartile</u> shallow subsidence by ecoregion	high: deep subsidence + <u>median</u> shallow subsidence by ecoregion
MR hydrograph (does not vary)	projections based on RCP 4.5	projections based on RCP 4.5
Storm Intensity	+5% over 50 years	+10% over 50 years

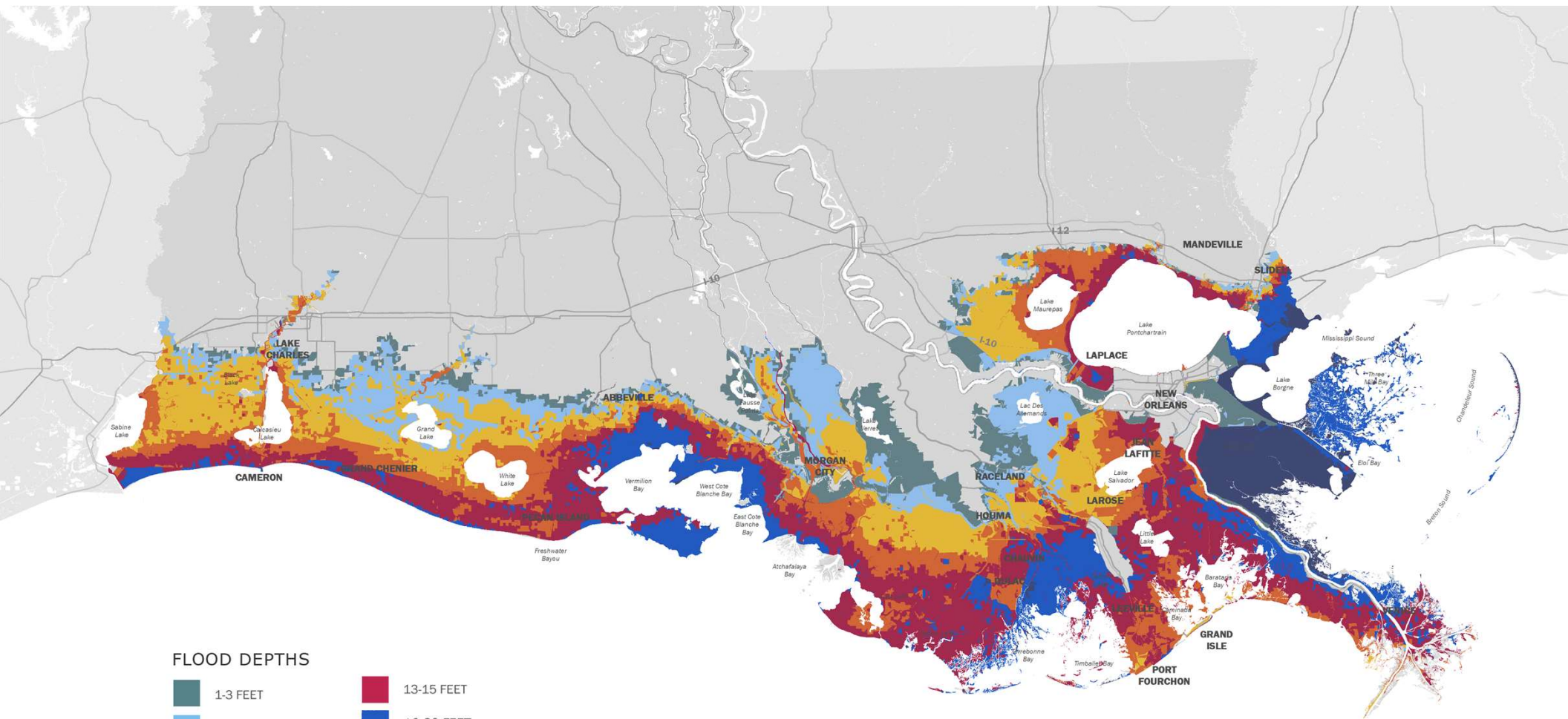




# 2023 COASTAL MASTER PLAN INITIAL CONDITIONS - DRAFT

FLOOD DEPTHS - 1% AEP





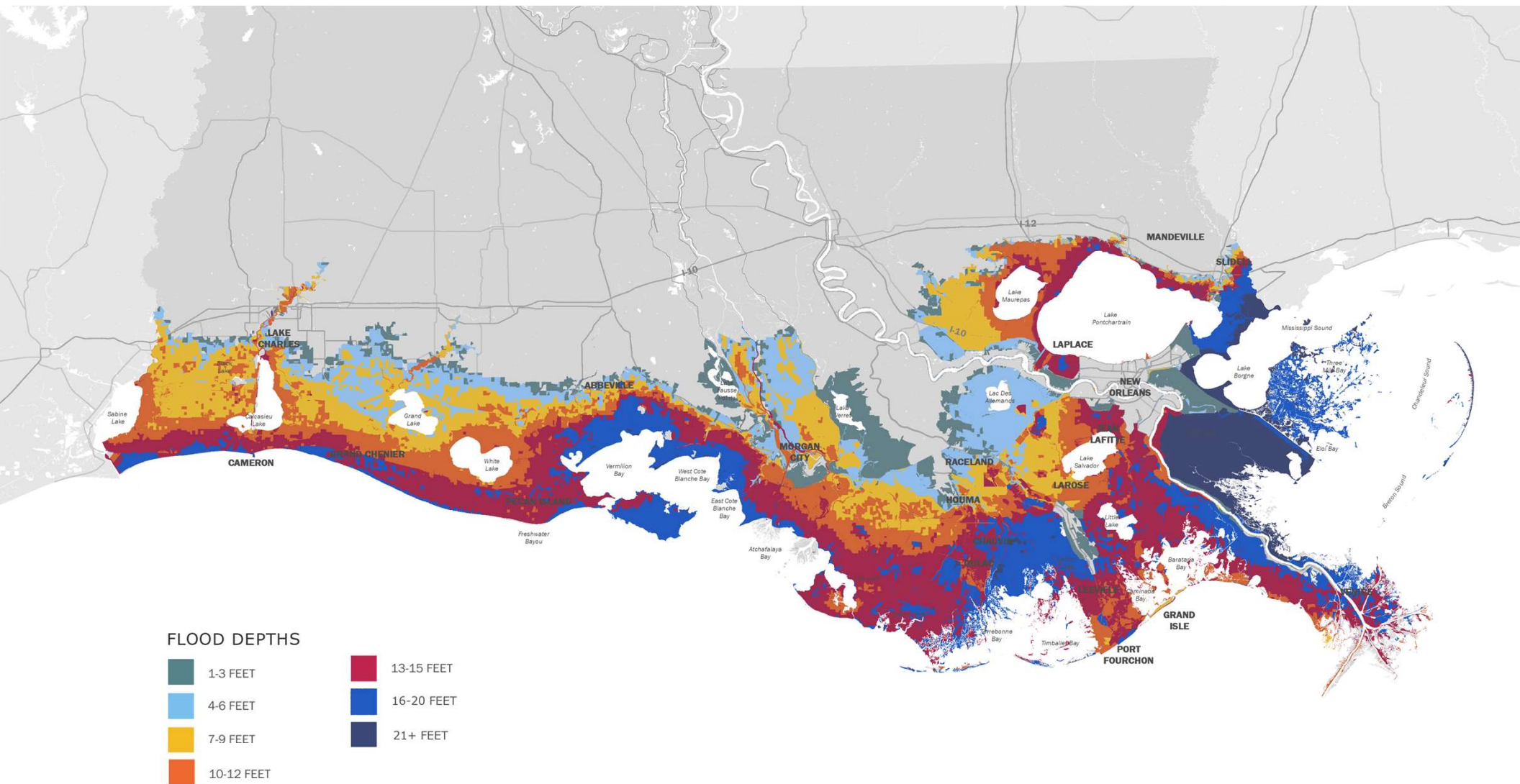
# 2023 COASTAL MASTER PLAN

## FUTURE WITHOUT ACTION - DRAFT

LOWER PROJECT SELECTION SCENARIO - S07  
FLOOD DEPTHS - 1% AEP - YEAR 10



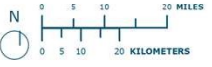




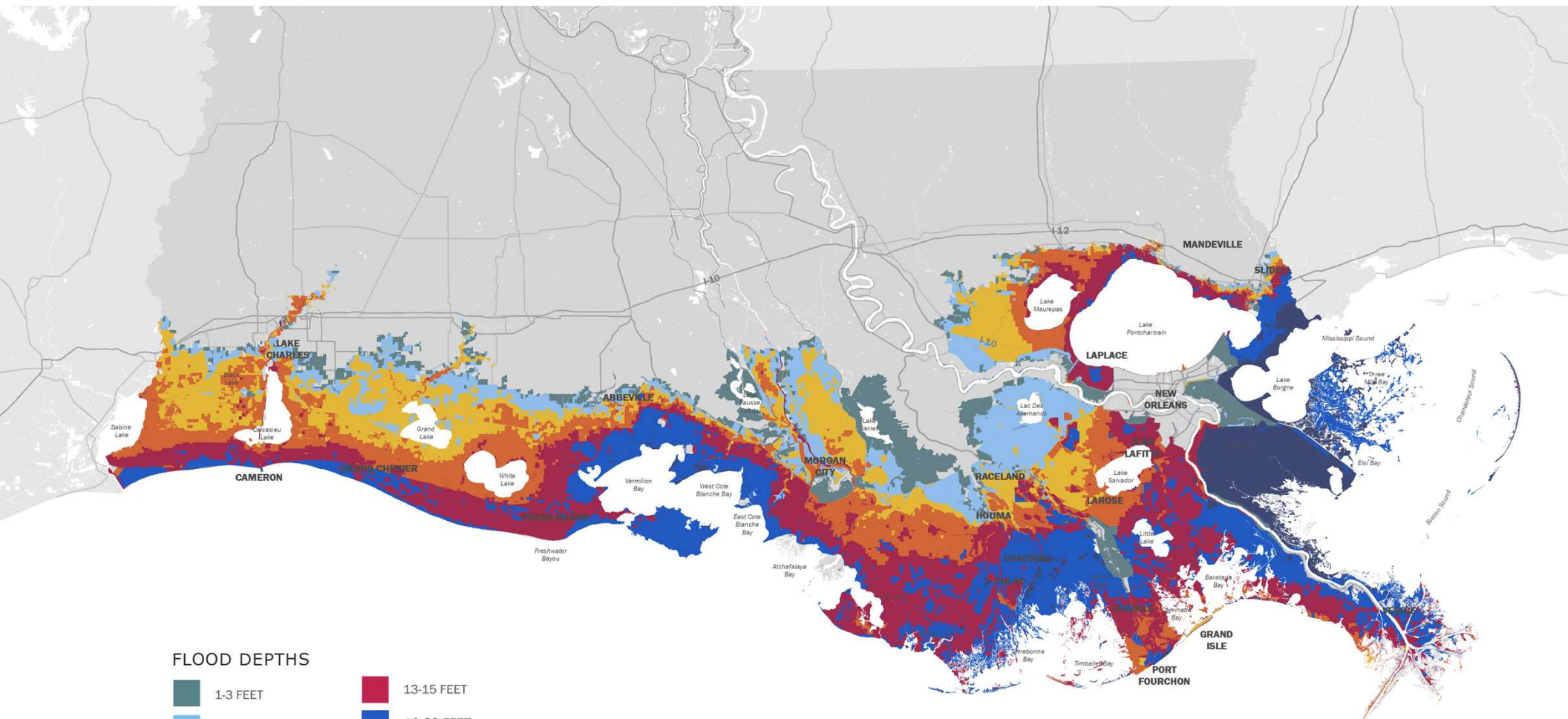
# 2023 COASTAL MASTER PLAN

## FUTURE WITHOUT ACTION - DRAFT

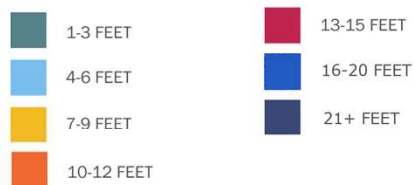
LOWER PROJECT SELECTION SCENARIO - S07  
FLOOD DEPTHS - 1% AEP - YEAR 20







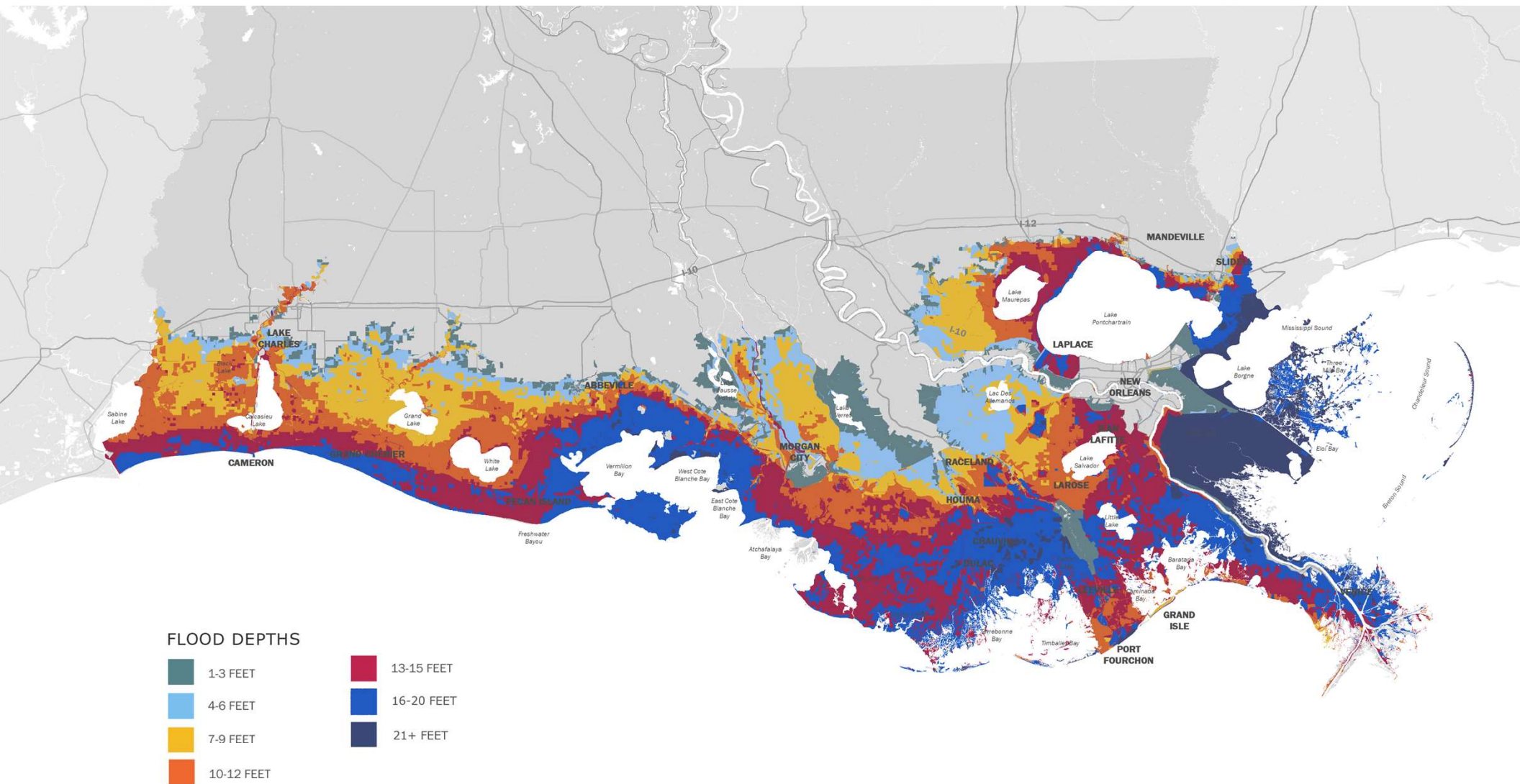
#### FLOOD DEPTHS



## 2023 COASTAL MASTER PLAN FUTURE WITHOUT ACTION - DRAFT

LOWER PROJECT SELECTION SCENARIO - S07  
FLOOD DEPTHS - 1% AEP - YEAR 30



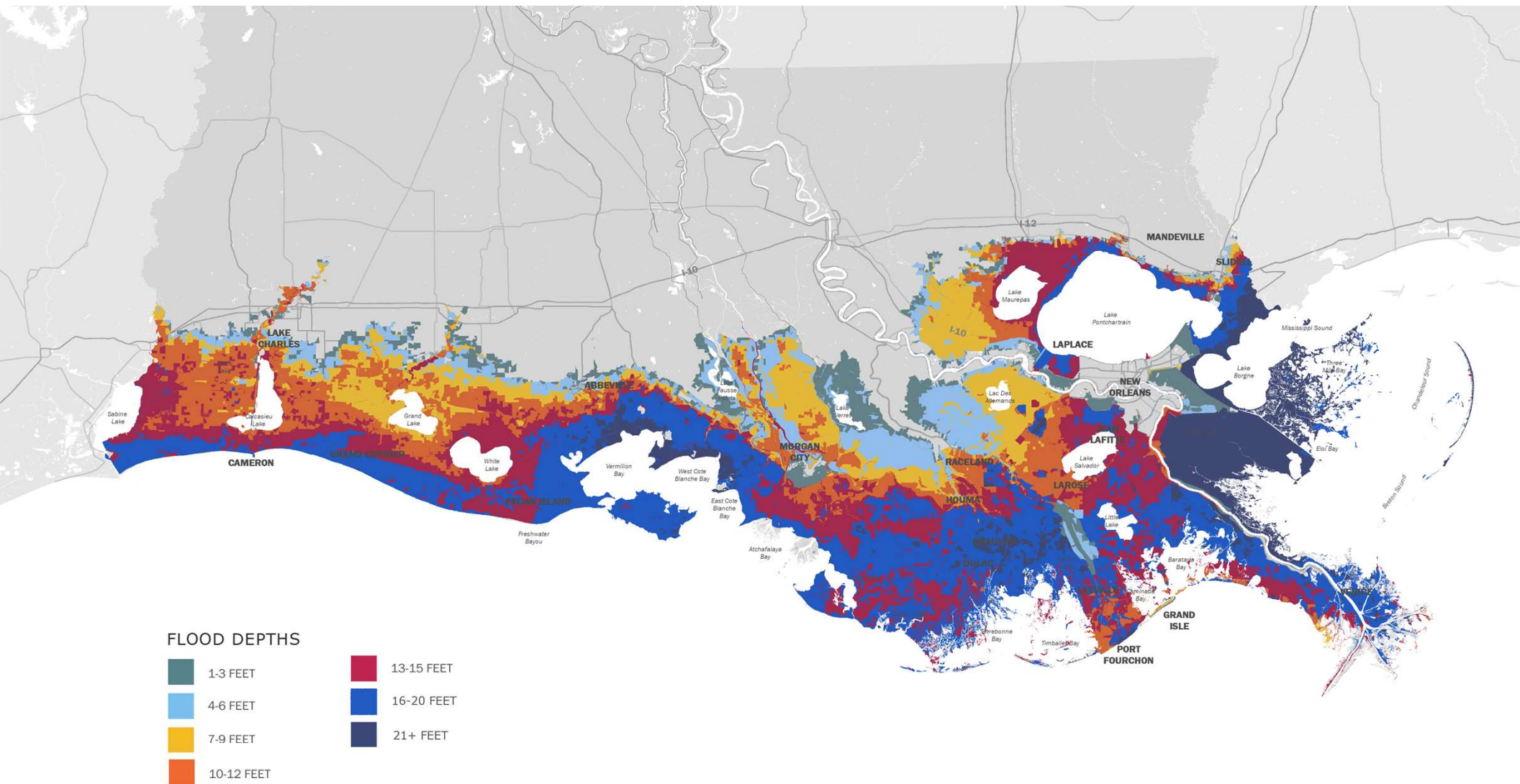


## 2023 COASTAL MASTER PLAN FUTURE WITHOUT ACTION - DRAFT

LOWER PROJECT SELECTION SCENARIO - S07  
FLOOD DEPTHS - 1% AEP - YEAR 40



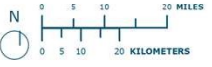




# 2023 COASTAL MASTER PLAN

## FUTURE WITHOUT ACTION - DRAFT

LOWER PROJECT SELECTION SCENARIO - S07  
FLOOD DEPTHS - 1% AEP - YEAR 50









A scenic photograph of a coastal wetland. In the foreground, there is a body of blue water with some ripples. To the left, there is a large clump of tall, dry, yellowish-brown reeds. In the middle ground, a white boat with a green canopy and a metal frame is moving across the water, leaving a small wake. The background features a line of green trees and a clear blue sky with some light clouds. A dark green rectangular box with the text "RISK MODELING" in white is centered over the image.

# **RISK MODELING**

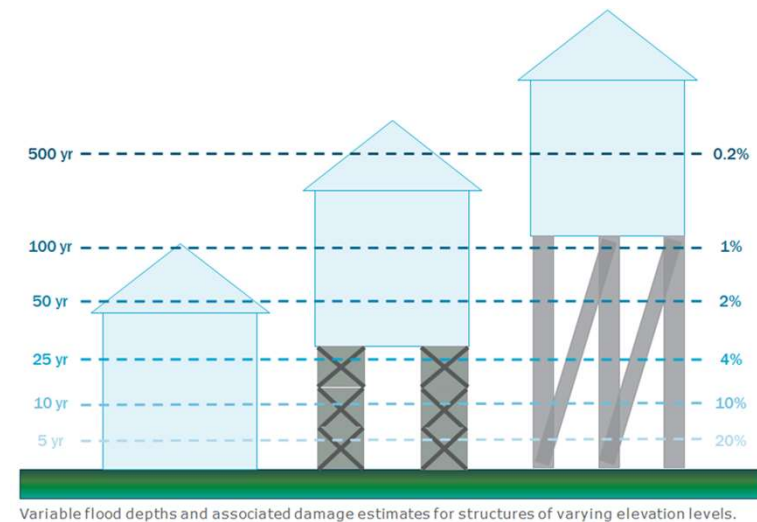
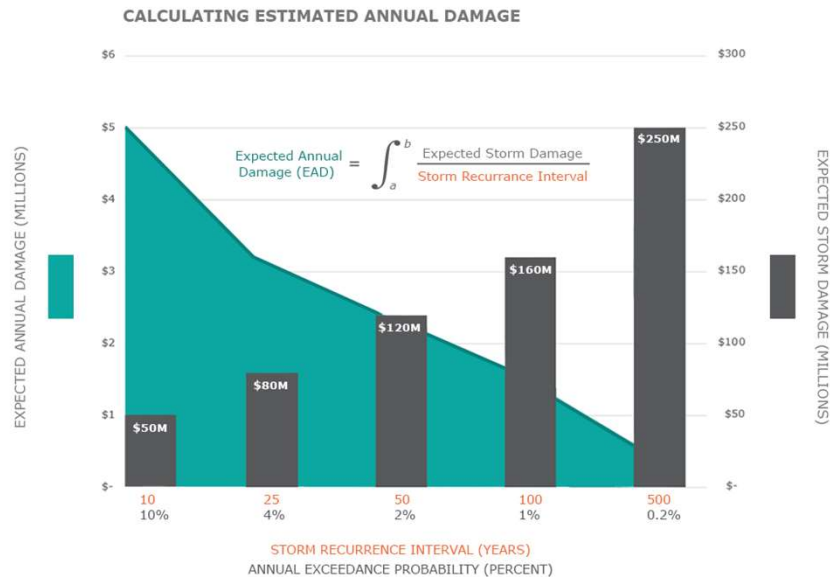
## RISK METRICS

- EAD\$ - Expected Annual Damage \$

**EAD\$** = Annual probability of flood elevations \* Damage (% of Replacement cost) \* Asset Value

- EASD - Expected Annual Structure Damage

**EASD** = Annual probability of flood elevations \* Damage (% of Replacement cost) \* Asset Value





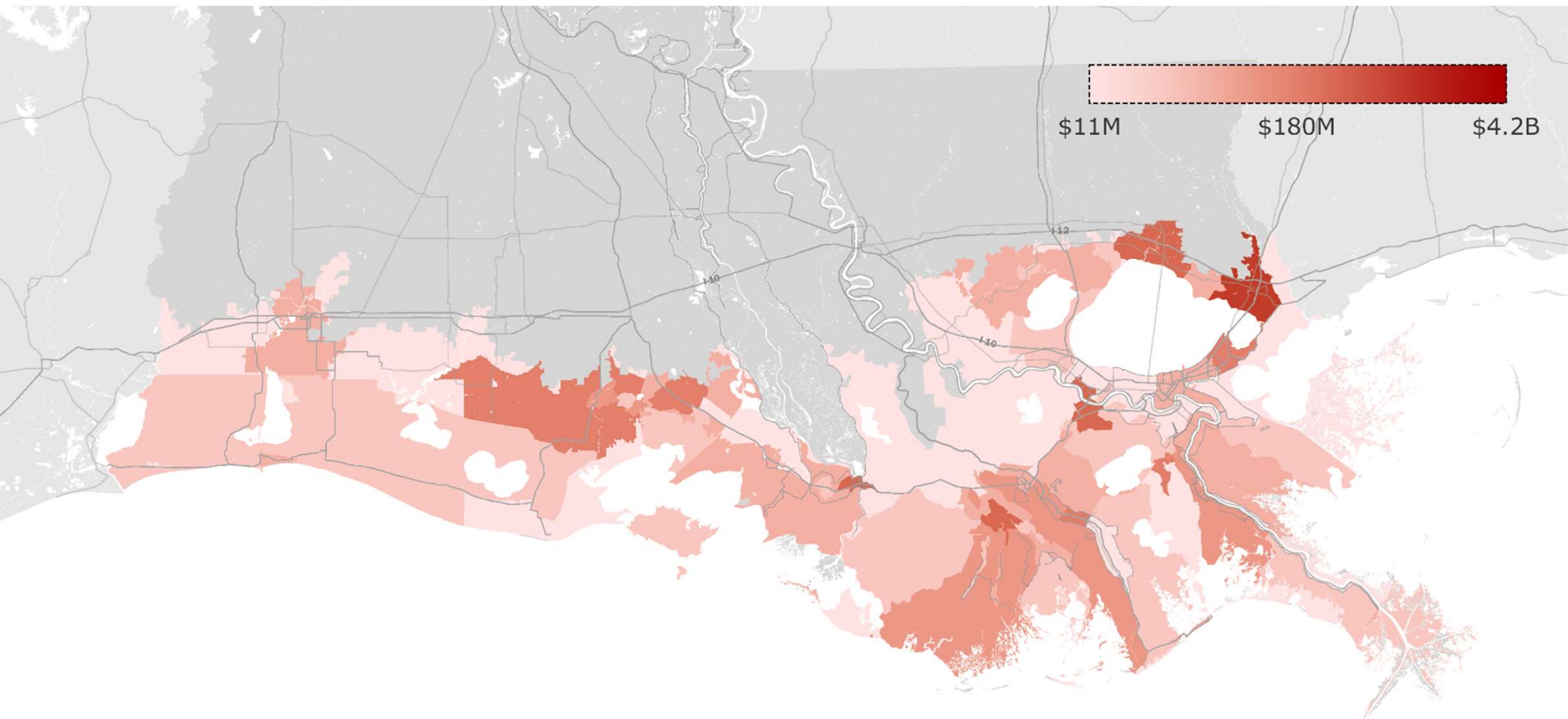
## INITIAL CONDITION FLOOD RISK IN EAD\$

What are we measuring?

- Total EAD includes other damage categories:
  - Structure damage (~**32%**)
  - Damage to contents and inventory
  - Damage to nonstructural assets (e.g., roads, vehicles, crops)
  - Lost wages, sales, rents during repair/reconstruction
  - Displacement costs of temporary relocation
  - Cleanup costs to clear debris and repair landscaping

### 2023 Initial Conditions EAD\$ by Asset Type

Asset Type	EAD\$	% of Damage	
Single-family residences	\$3,586M	65%	
Multi-family residences	\$40M	1%	
Commercial and industrial	\$1,469M	26%	
Public and educational	\$127M	2%	
Roads, vehicles, crops	\$323M	6%	
TOTAL	\$5,545M		
* 2017 Current Conditions EAD \$2.7B			



## 2023 COASTAL MASTER PLAN INITIAL CONDITIONS - DRAFT

RISK - EAD\$ - INITIAL CONDITIONS



## EAD\$ SUMMARY

### ENTIRE MODEL DOMAIN

~50% of the total EAD\$ is  
in these 10 communities

Community Name	EAD\$
Slidell/Eden Isle/Pearl River	\$845M
Destrahan/New Sarpy/Norco	\$294M
Luling/Boutte	\$271M
Morgan City/Berwick	\$245M
Mandeville/Covington/Madisonville/Abita Springs	\$234M
Houma	\$189M
Lafitte/Jean Lafitte/Barataria	\$165M
New Iberia	\$156M
Vermilion-UNC	\$139M
Larose	\$106M



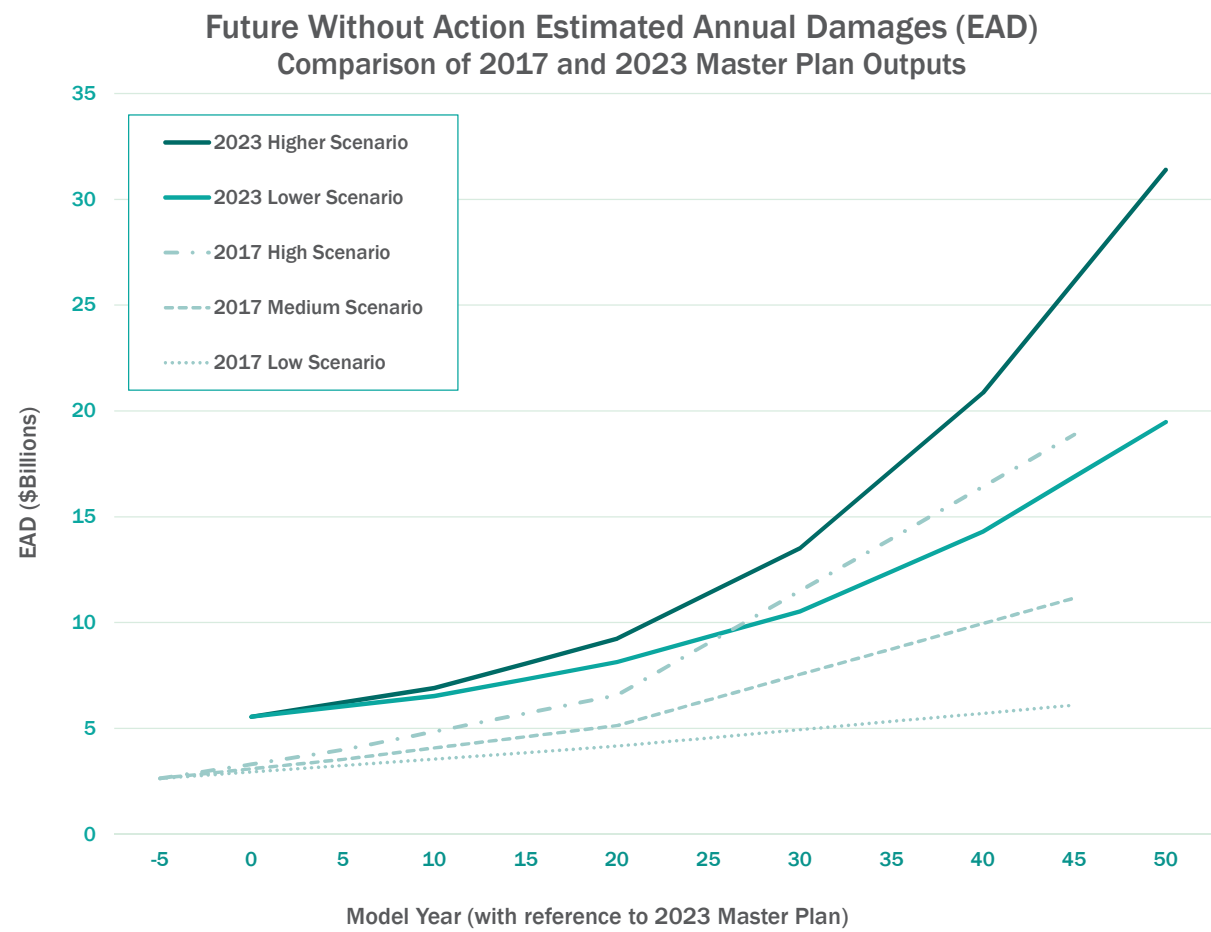
## FUTURE WITHOUT ACTION – RISK

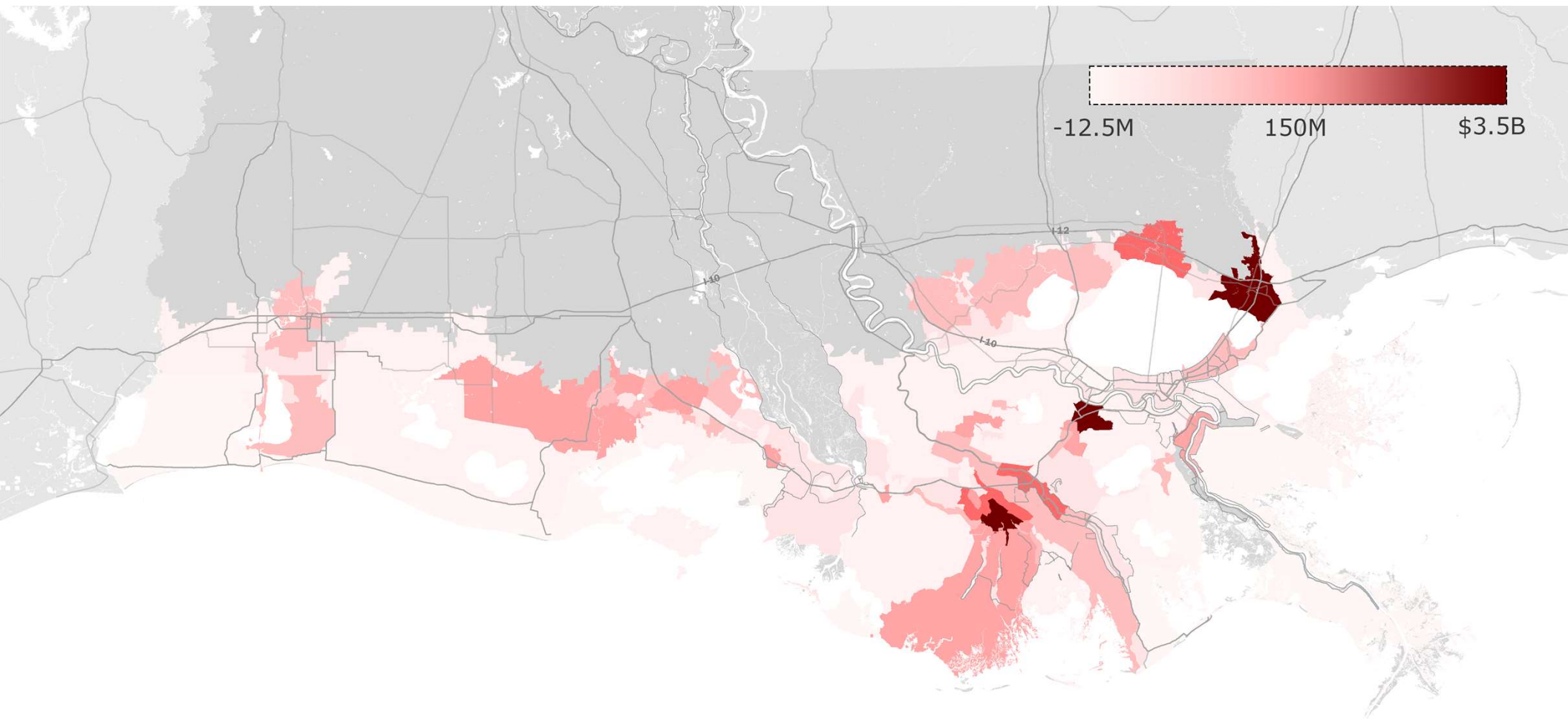
What is changing over time?

- Landscape
  - Land/water
  - Vegetation
  - Elevation
- Sea level
- Storm Intensity
- **Population/Assets**

	Lower - S07 ✓	Higher - S08 ✓
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Storm Intensity	+5% over 50 years	+10% over 50 years

# FUTURE WITHOUT ACTION – RISK - EAD



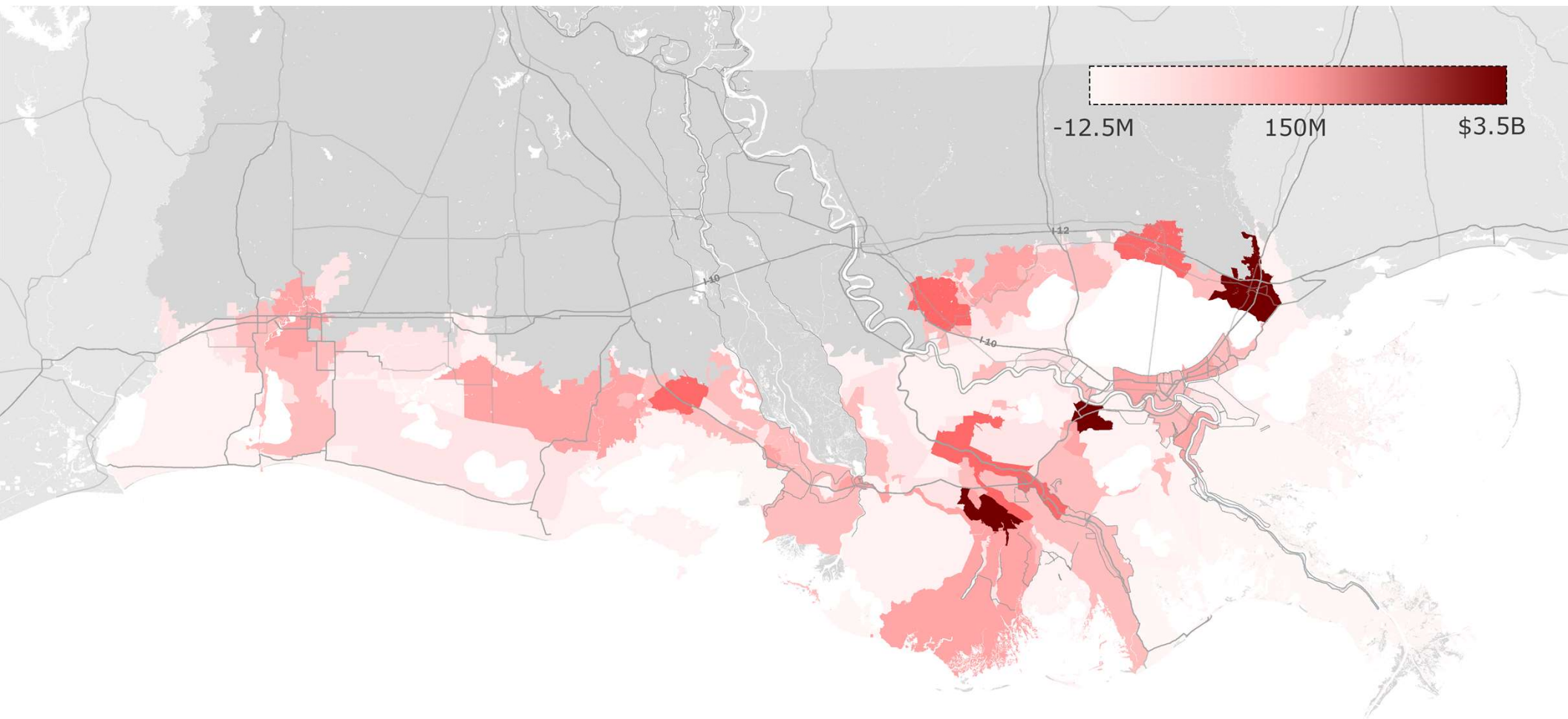


## 2023 COASTAL MASTER PLAN FUTURE WITHOUT ACTION - DRAFT

RISK - DIFFERENCE IN EAD\$ FROM INITIAL CONDITIONS TO YEAR 50  
LOWER PROJECT SELECTION SCENARIO - S07







## 2023 COASTAL MASTER PLAN FUTURE WITHOUT ACTION - DRAFT

RISK - DIFFERENCE IN EAD\$ FROM INITIAL CONDITIONS TO YEAR 50  
HIGHER PROJECT SELECTION SCENARIO - S08



## STORM SURGE AND RISK MODELING

### Takeaways

- Projected flood risk and flood depths are greater than 2017 Master Plan projections.
- There are projects in varying stages of planning and engineering that we expect can significantly reduce this risk.
- This modeling shows the risk reduction systems in place are effective.

### Next Steps

- Future with action modeling is ongoing (both restoration and risk reduction projects)
- Board updates and public outreach

### Resources

- <https://coastal.la.gov/our-plan/2023-coastal-master-plan/outreach>
- Storm surge and wave modeling, risk modeling, population modeling presentations



A scenic landscape featuring a body of water in the foreground. On the left, there are tall, golden-brown reeds. In the center, a dense line of green trees separates the water from the background. To the right, a white boat with a green canopy and a metal frame is moving across the water, leaving a white wake. The sky is a clear blue with some light, wispy clouds. Overlaid on the center of the image is a dark green rectangular box containing the text "THANK YOU" in white, bold, sans-serif capital letters.

**THANK YOU**