2023 COASTAL MASTER PLAN
COMMITTED TO OUR COAST

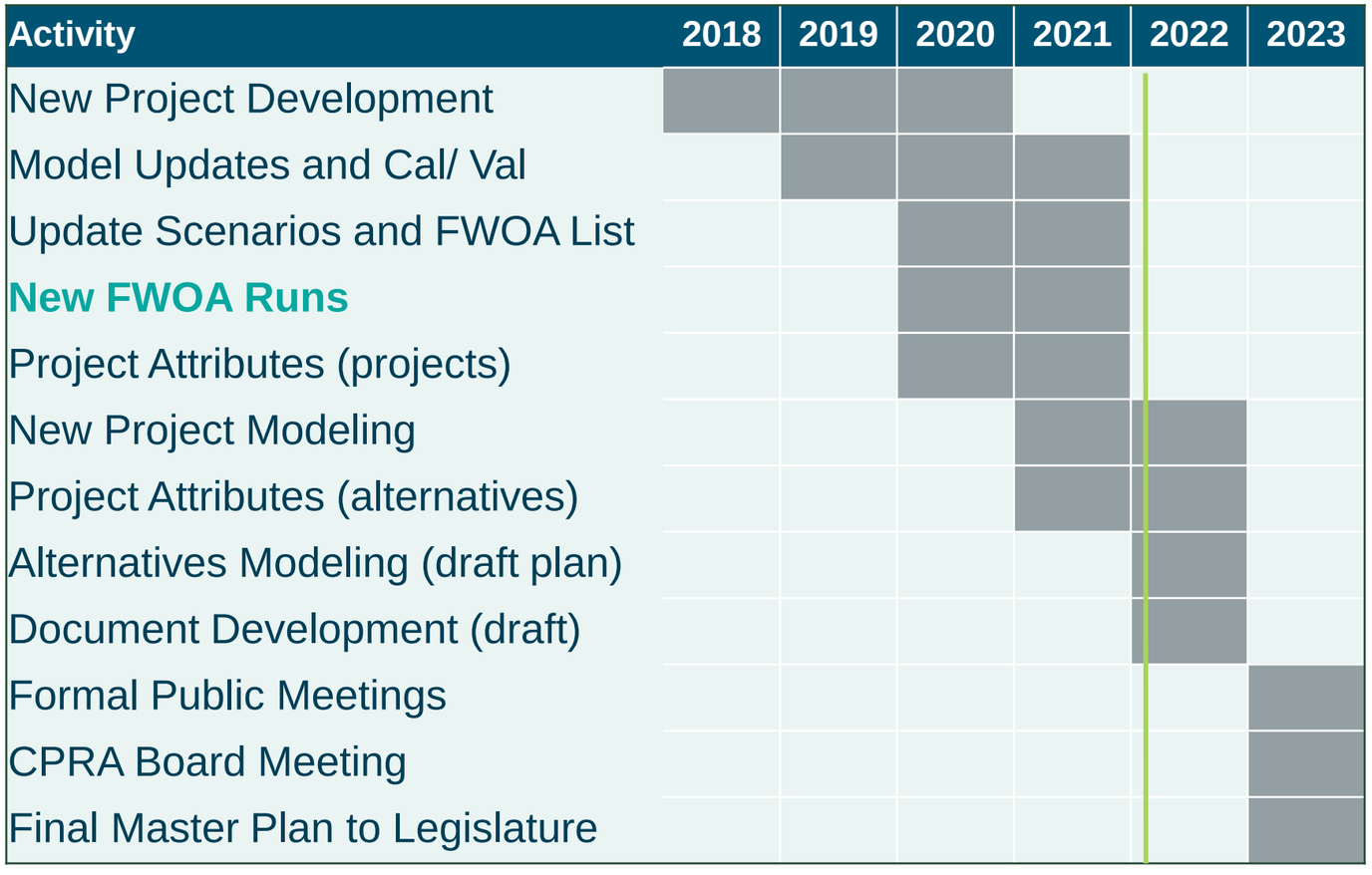
2023 COASTAL MASTER PLAN UPDATE
STORM SURGE AND RISK MODELING

MARCH 16, 2022

2023 COASTAL MASTER PLAN UPDATE

CLOSING AND NEXT STEPS

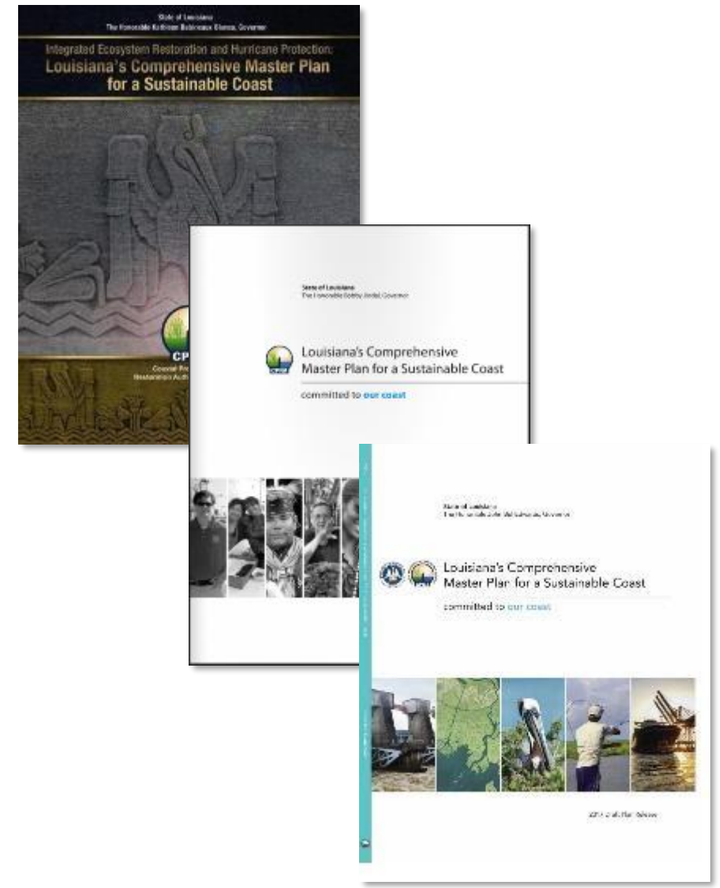
- Future without action risk projections



MASTER PLAN OVERVIEW

CPRA BOARD UPDATE

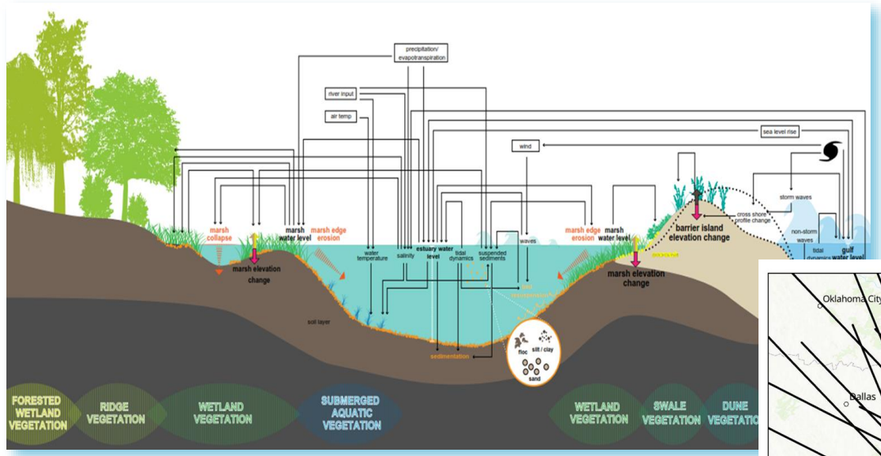
- Prioritization effort. How can the state spend its money most cost-effectively over the next 50 years to reduce storm surge based flood risk and restore and maintain coastal wetlands
- Built on world class science and engineering
- Illustrates how the coast is going to change
- Required by law to be 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



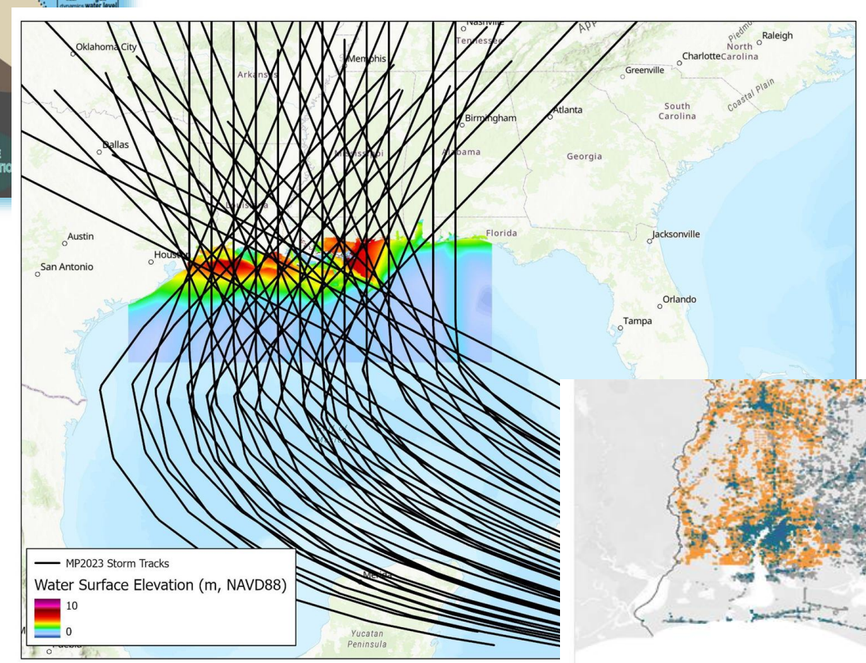
LOUISIANA COASTAL MASTER PLAN

PREDICTIVE MODELS

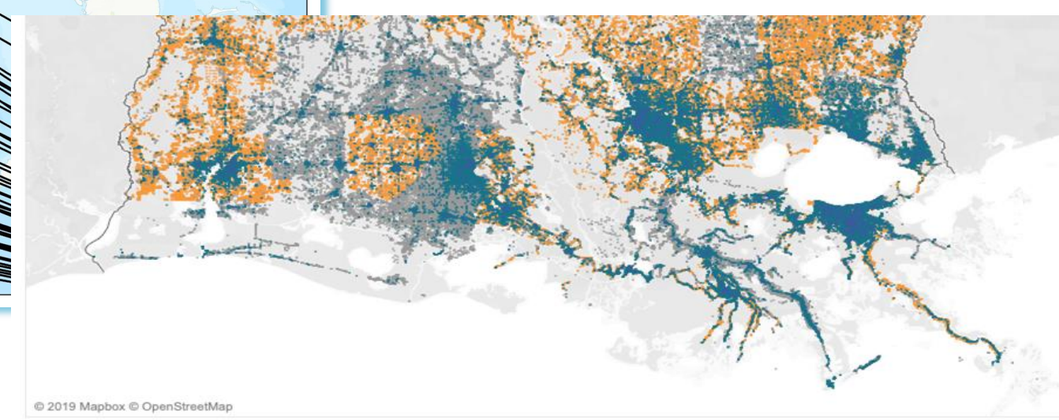
Landscape Model (ICM)



Surge and Wave Models



Risk Model



STORM SURGE AND WAVE MODELING

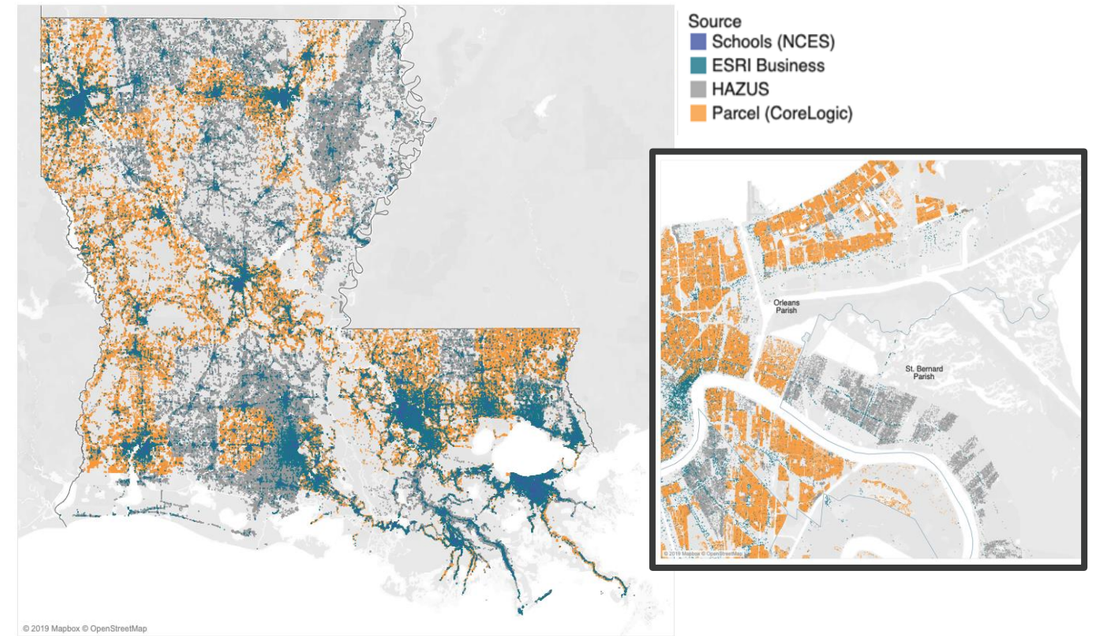
MODEL IMPROVEMENTS

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

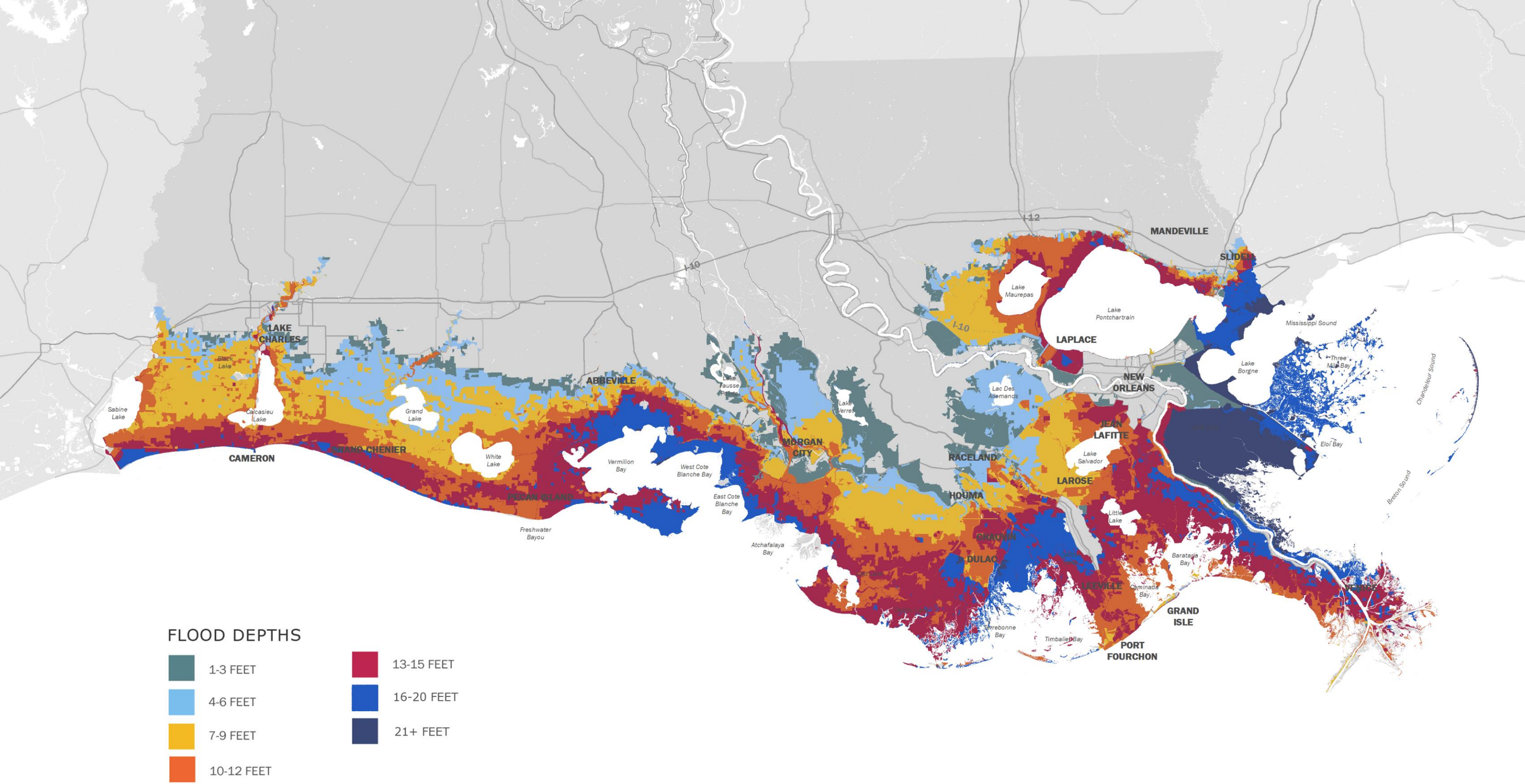
RISK MODELING

MODEL IMPROVEMENTS

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



INITIAL CONDITION FLOOD DEPTHS



FLOOD DEPTHS

- 1-3 FEET
- 4-6 FEET
- 7-9 FEET
- 10-12 FEET
- 13-15 FEET
- 16-20 FEET
- 21+ FEET

2023 COASTAL MASTER PLAN
INITIAL CONDITIONS - DRAFT

FLOOD DEPTHS - 1% AEP

N

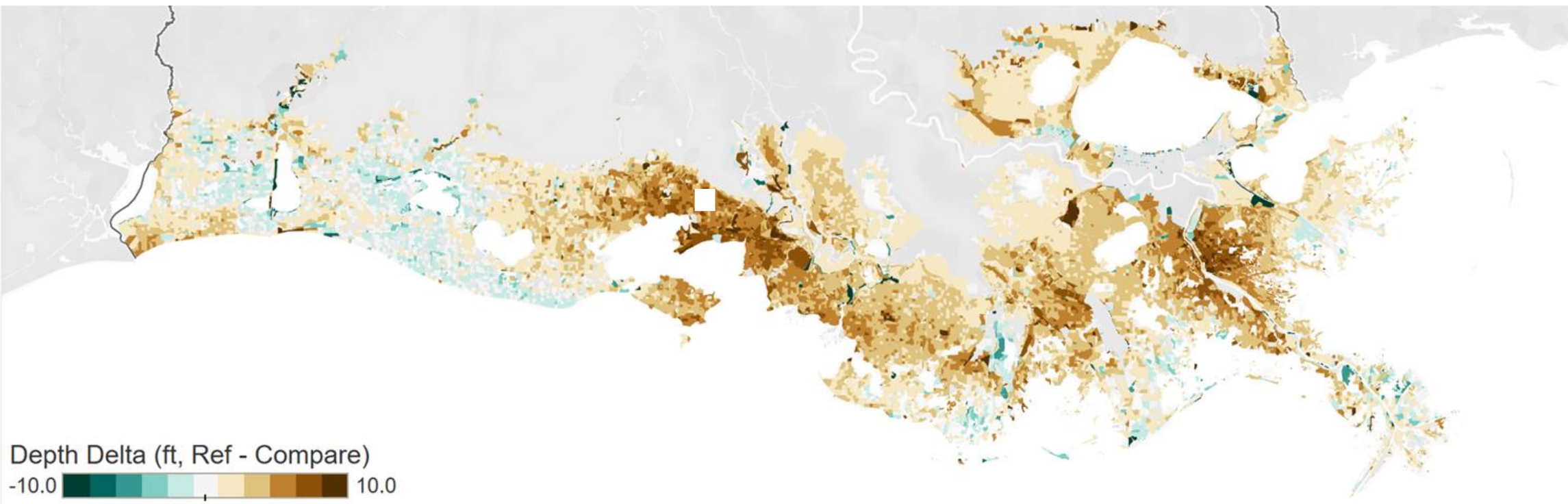
0 5 10 20 MILES

0 5 10 20 KILOMETERS

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.



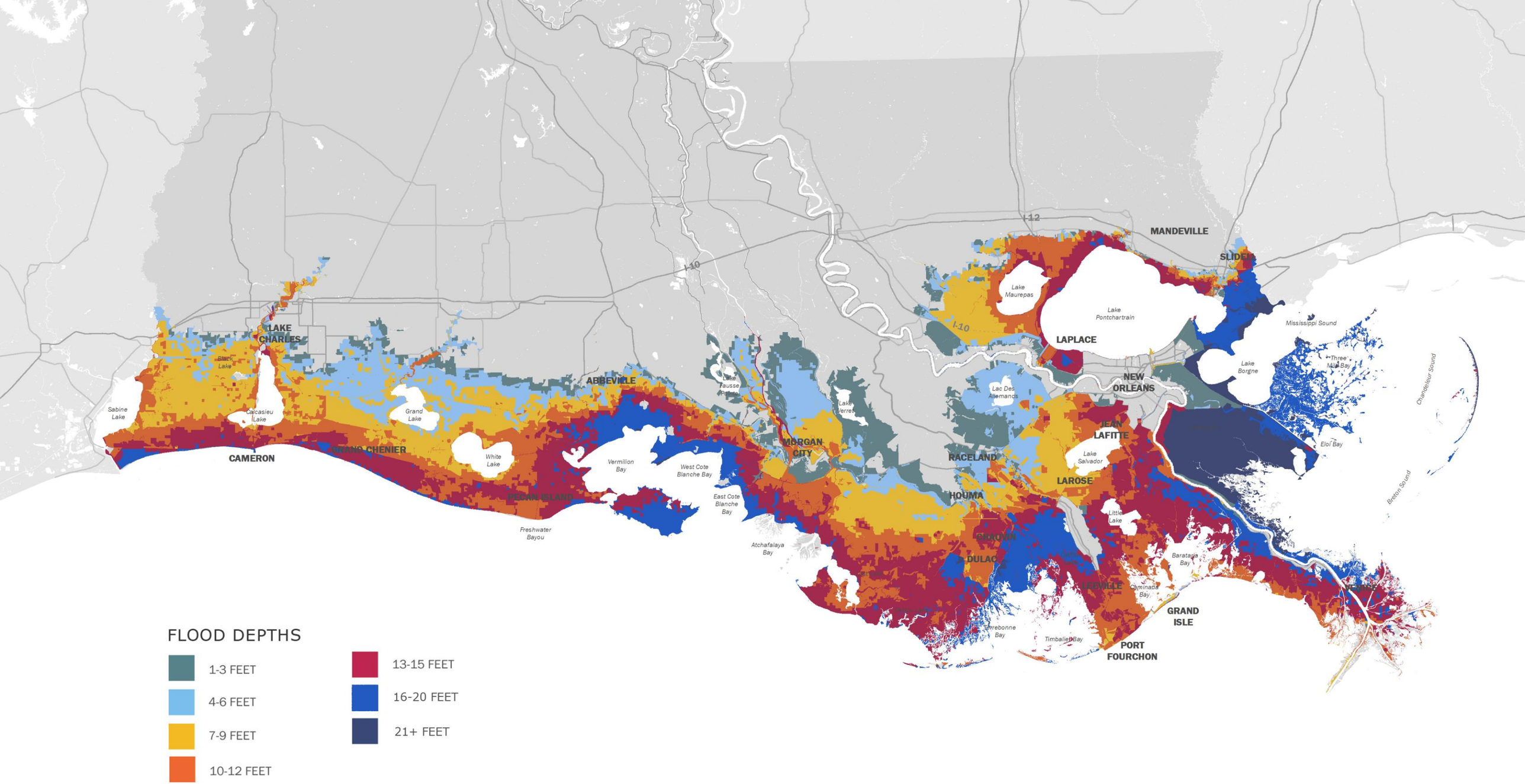
FUTURE WITHOUT ACTION FLOOD DEPTHS

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 RCP 4.5 50th percentile	following RCP 8.5 50th percentile
Precipitation and Tributary flows	following RCP 4.5 50th percentile	following RCP 8.5 50th percentile
Subsidence	low: deep subsidence + 1st quartile shallow subsidence by ecoregion	high: deep subsidence + median 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



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INITIAL CONDITIONS - DRAFT

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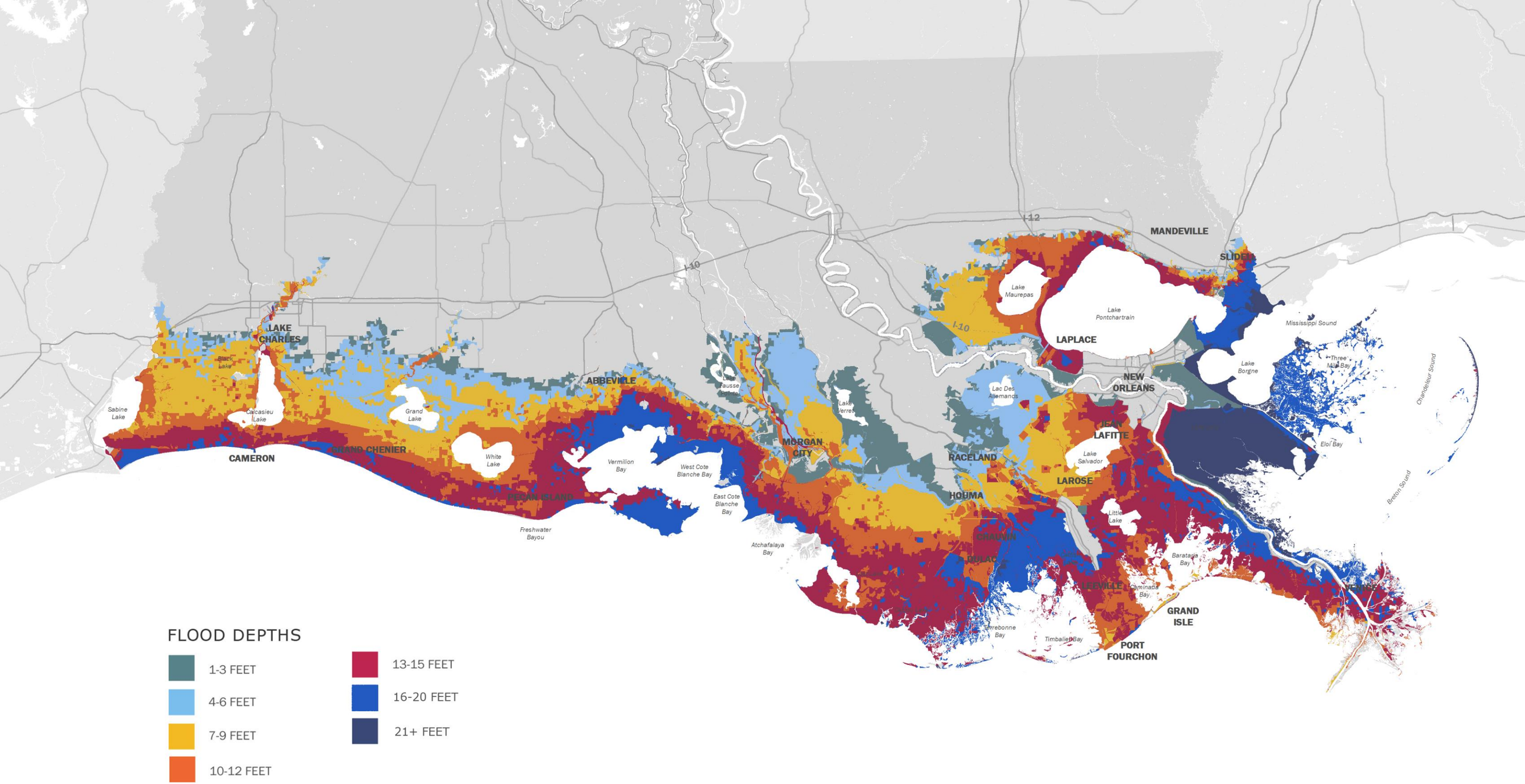
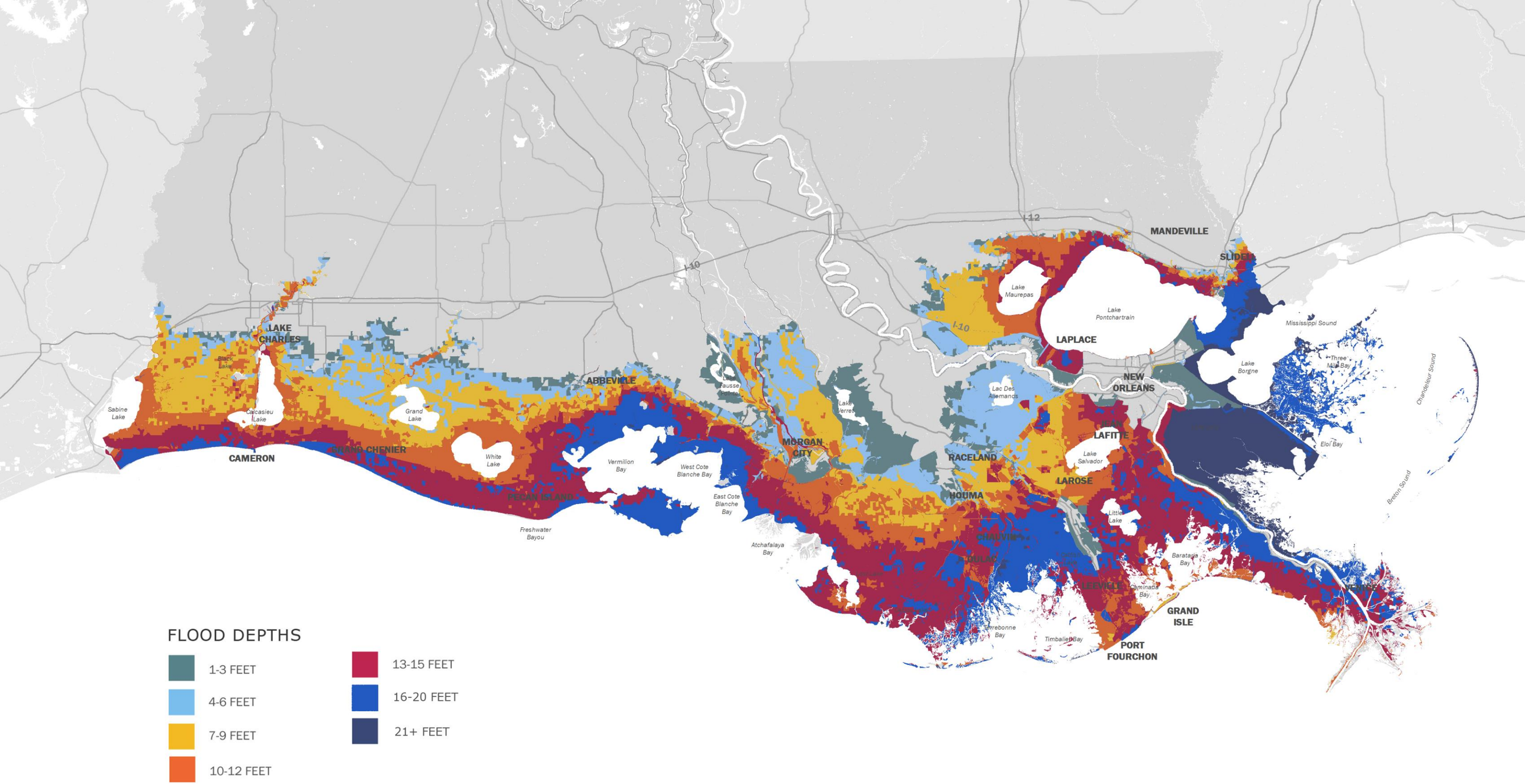


2023 COASTAL MASTER PLAN
FUTURE WITHOUT ACTION - DRAFT

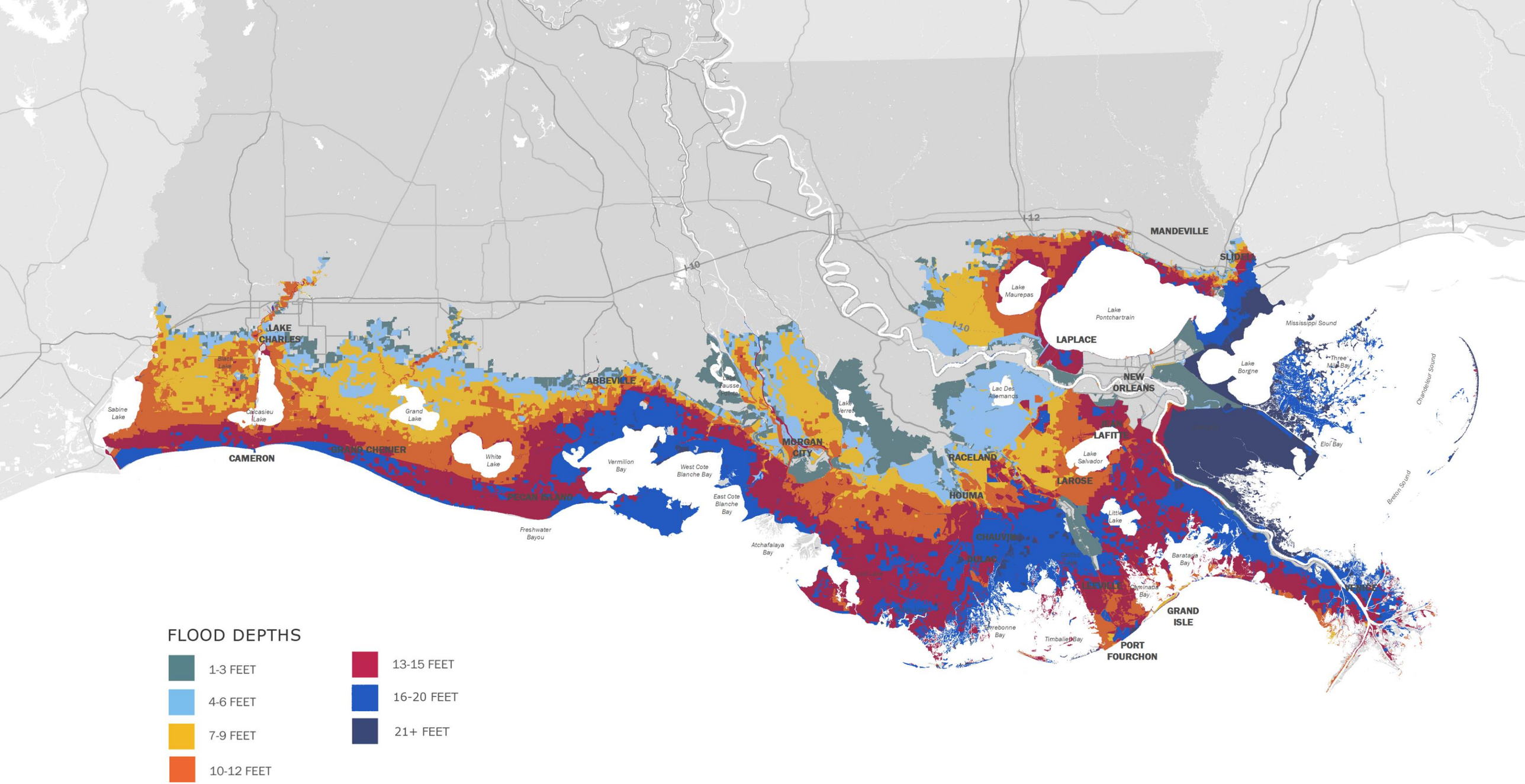
LOWER PROJECT SELECTION SCENARIO - S07
FLOOD DEPTHS - 1% AEP - YEAR 10

N
0 5 10 20 MILES
0 5 10 20 KILOMETERS



2023 COASTAL MASTER PLAN
FUTURE WITHOUT ACTION - DRAFT

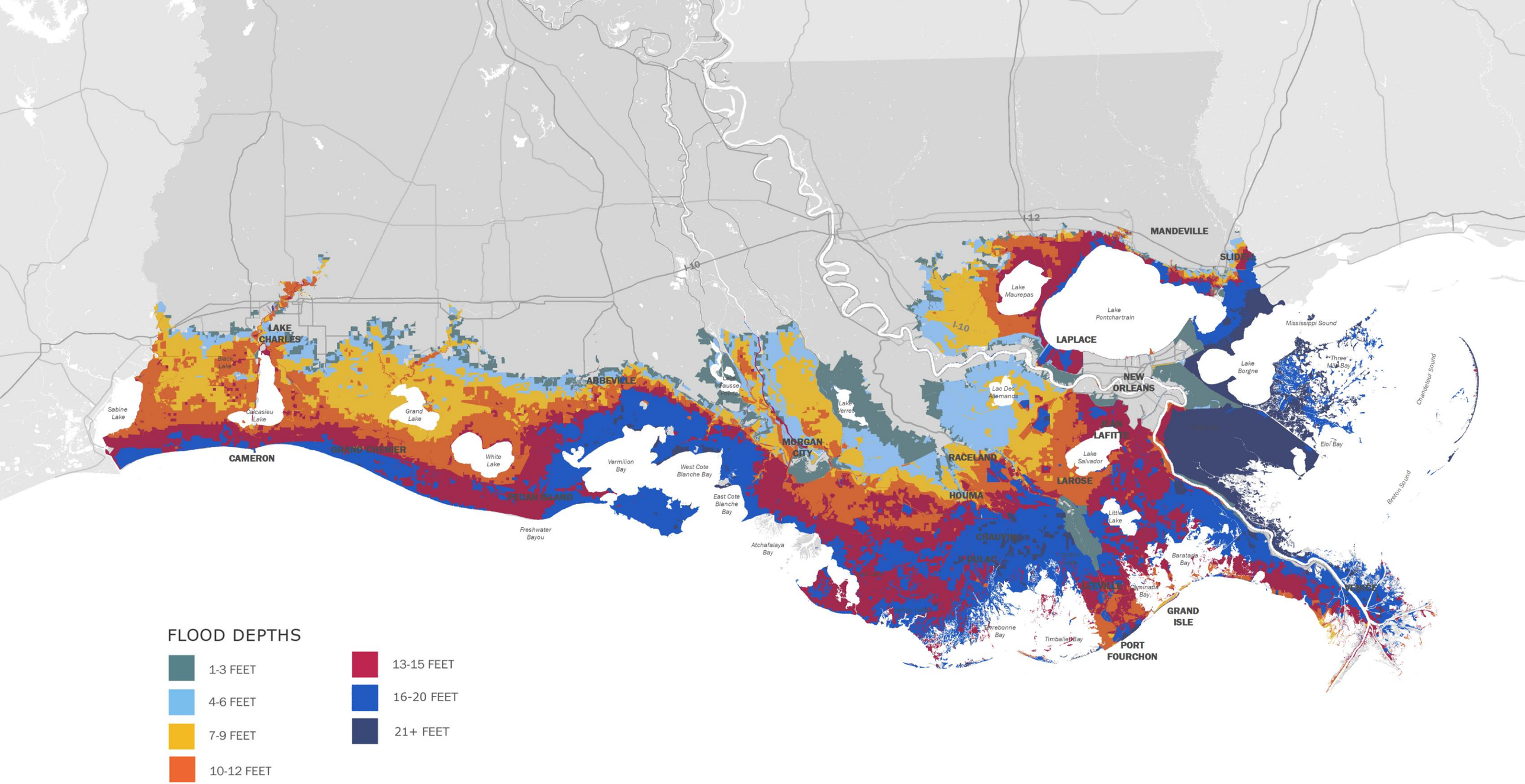
LOWER PROJECT SELECTION SCENARIO - S07
FLOOD DEPTHS - 1% AEP - YEAR 20



2023 COASTAL MASTER PLAN
FUTURE WITHOUT ACTION - DRAFT

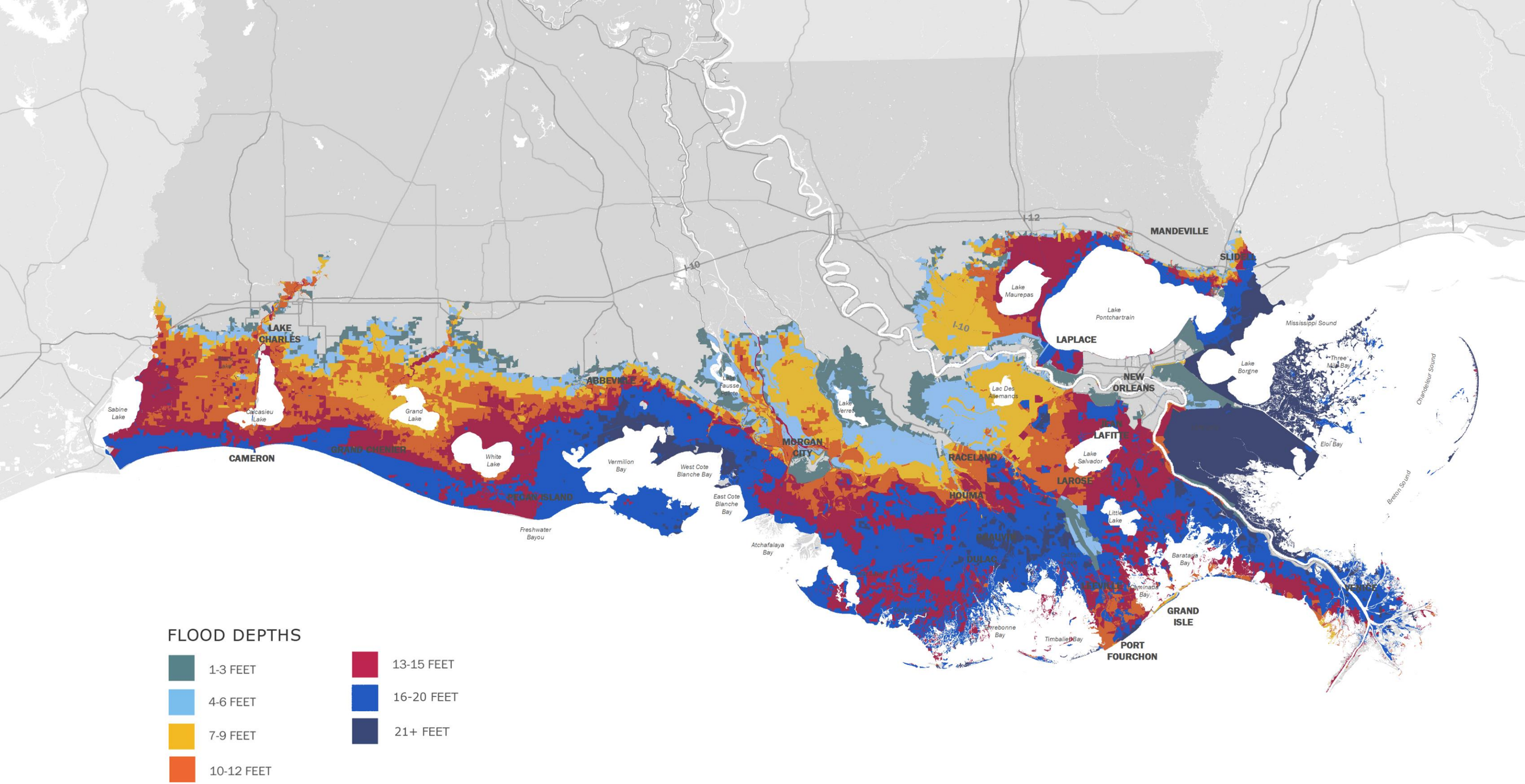
LOWER PROJECT SELECTION SCENARIO - S07
FLOOD DEPTHS - 1% AEP - YEAR 30

N
0 5 10 20 MILES
0 5 10 20 KILOMETERS



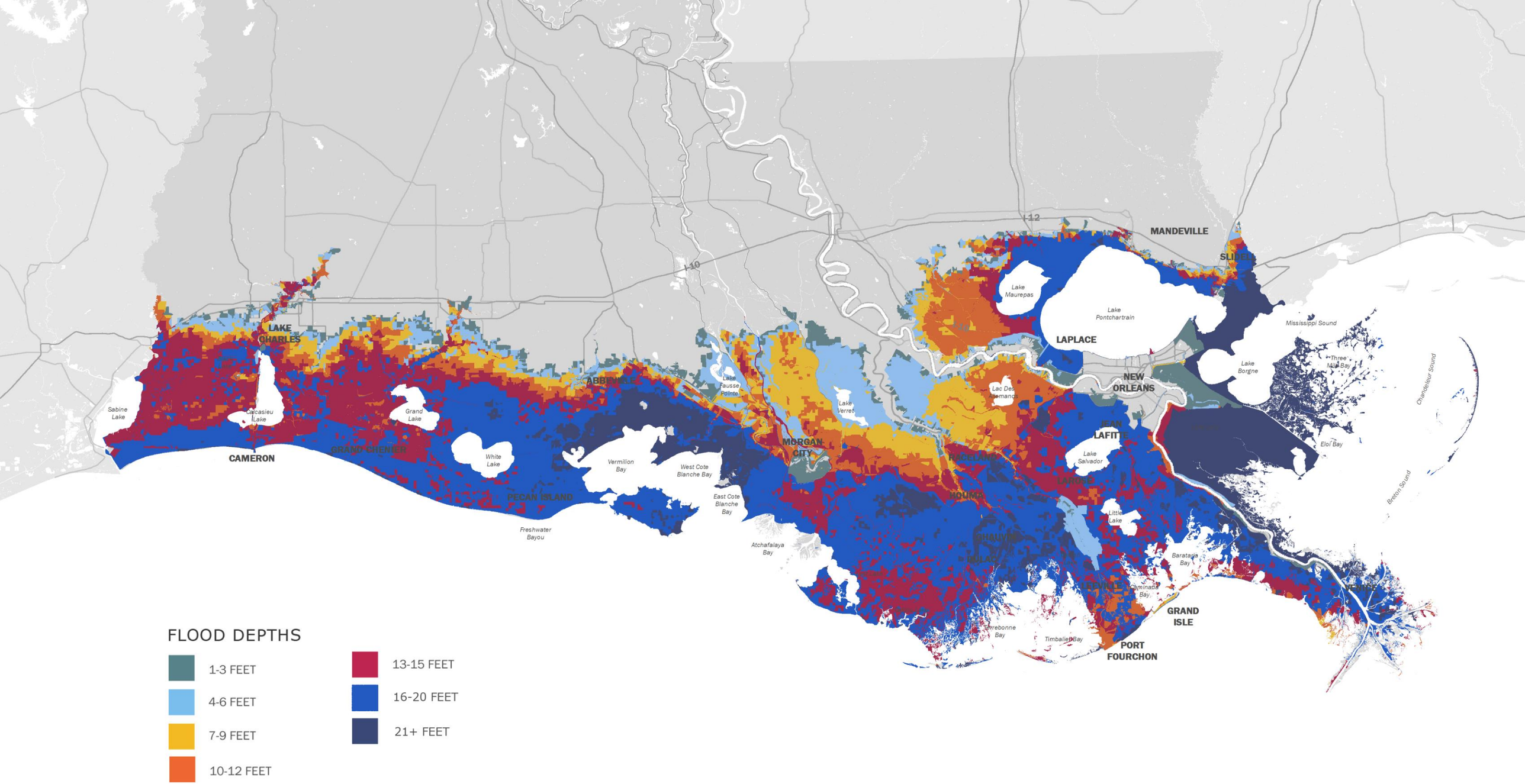
2023 COASTAL MASTER PLAN
FUTURE WITHOUT ACTION - DRAFT

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



2023 COASTAL MASTER PLAN
FUTURE WITHOUT ACTION - DRAFT

HIGHER PROJECT SELECTION SCENARIO - S08
FLOOD DEPTHS - 1% AEP - YEAR 50

N
0 5 10 20 MILES
0 5 10 20 KILOMETERS

RISK MODELING

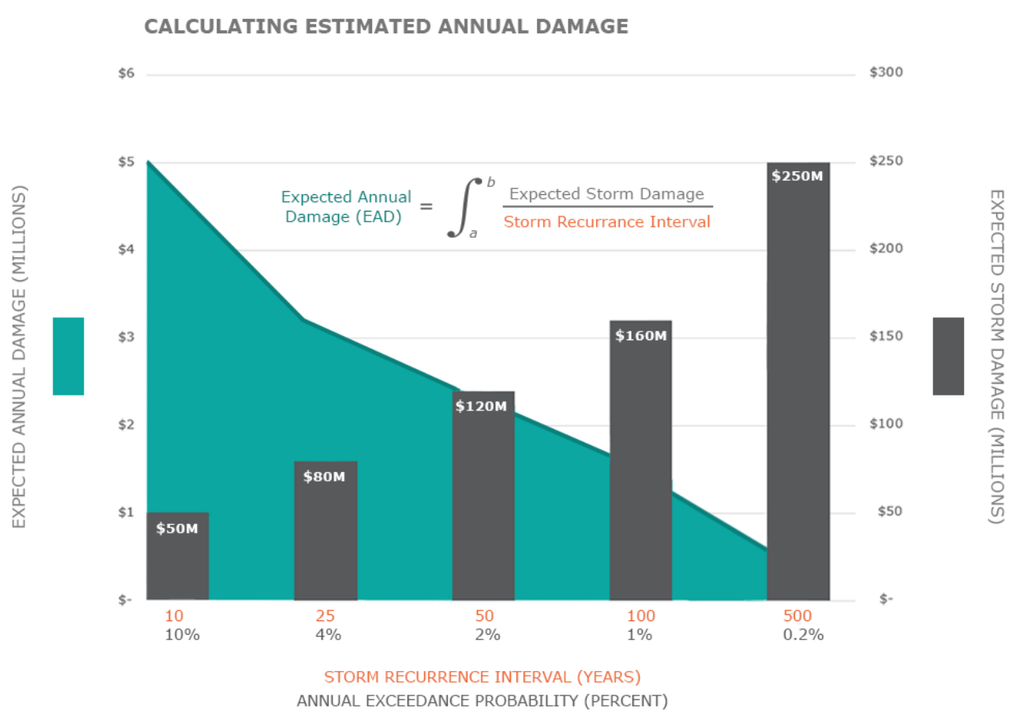
RISK METRICS

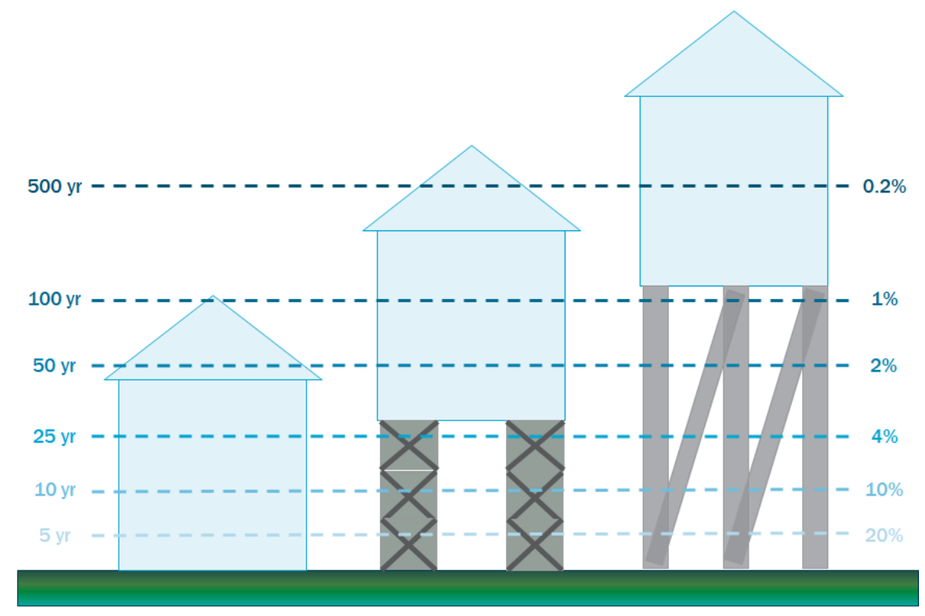
- EAD$ - Expected Annual Damage $

  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~~





Variable flood depths and associated damage estimates for structures of varying elevation levels.

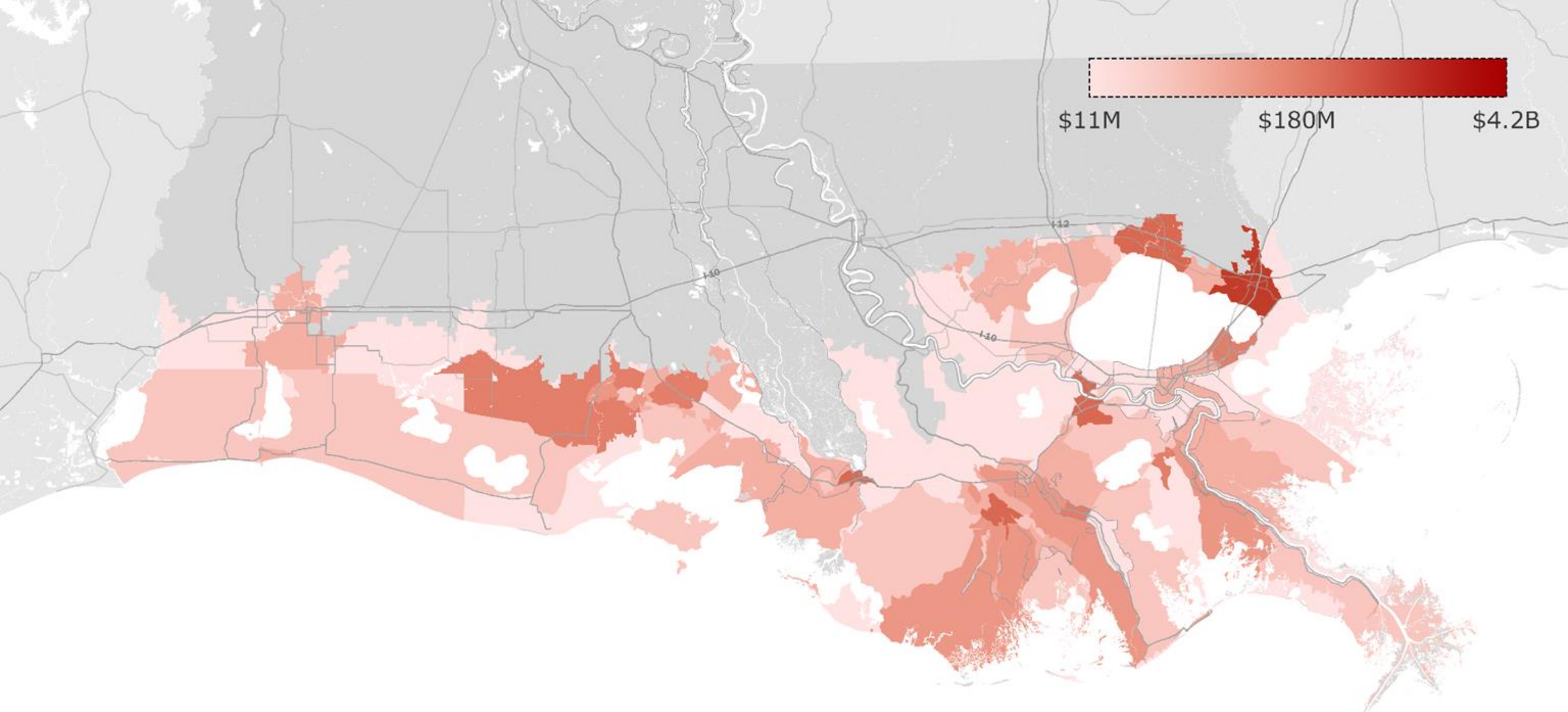
INITIAL CONDITION FLOOD RISK IN EAD$

What are we measuring?

- Direct structure damage
- Contents/inventory damage; vehicle damage; lost income, wages, sales, and rent; and relocation expenses

Asset Type	EAD
Single-Family	$3,586M
Multi-Family	$40M
Com/Ind/Ag	$1,469M
Other Structural	$127M
Roads, Vehicles, Crops	$323M
Grand Total	$5,545M

* 2017 Current Conditions EAD $2.7B



2023 COASTAL MASTER PLAN
INITIAL CONDITIONS - DRAFT

RISK - EAD$ - INITIAL CONDITIONS

N
0 5 10 20 MILES
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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

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- **Population/Assets**

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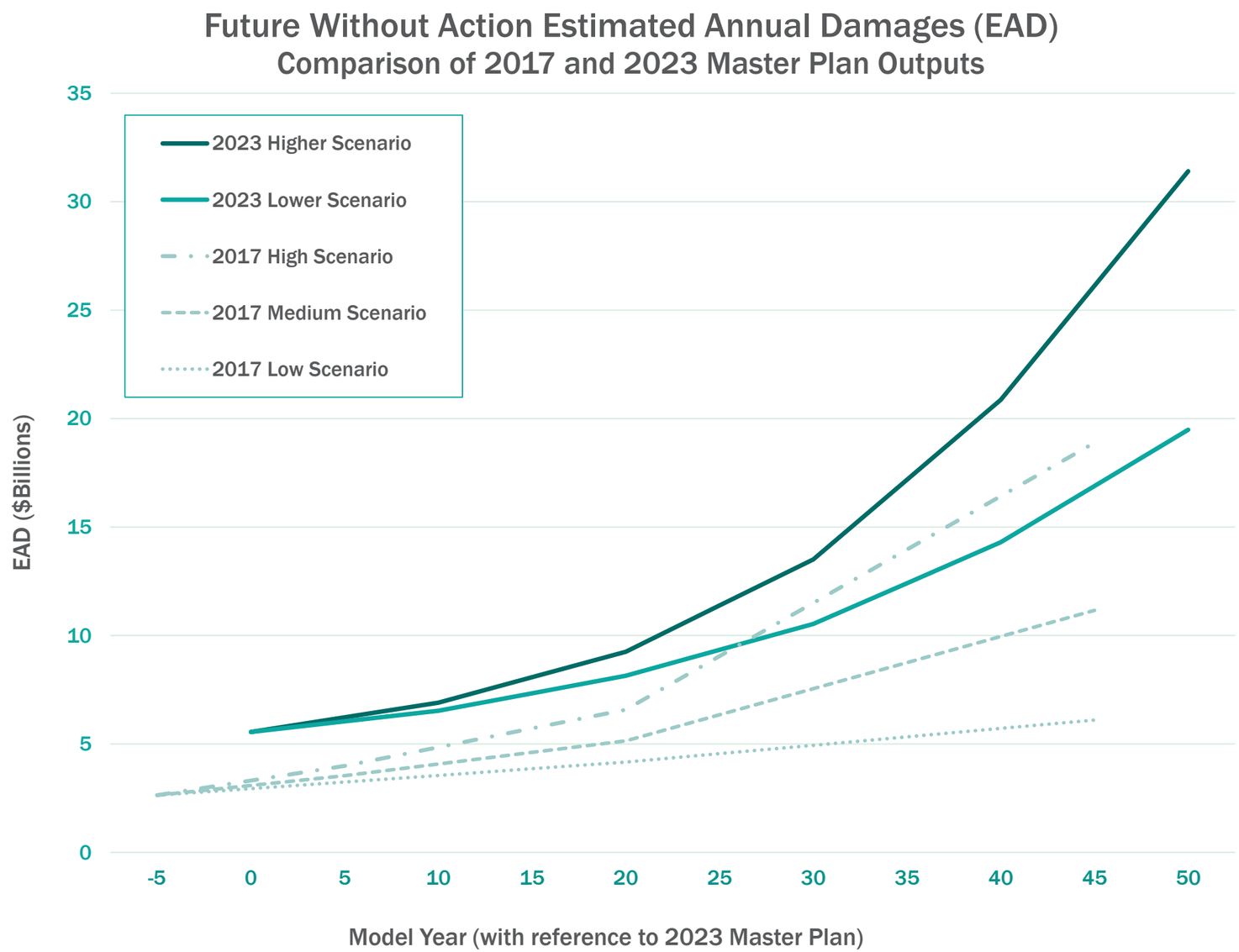
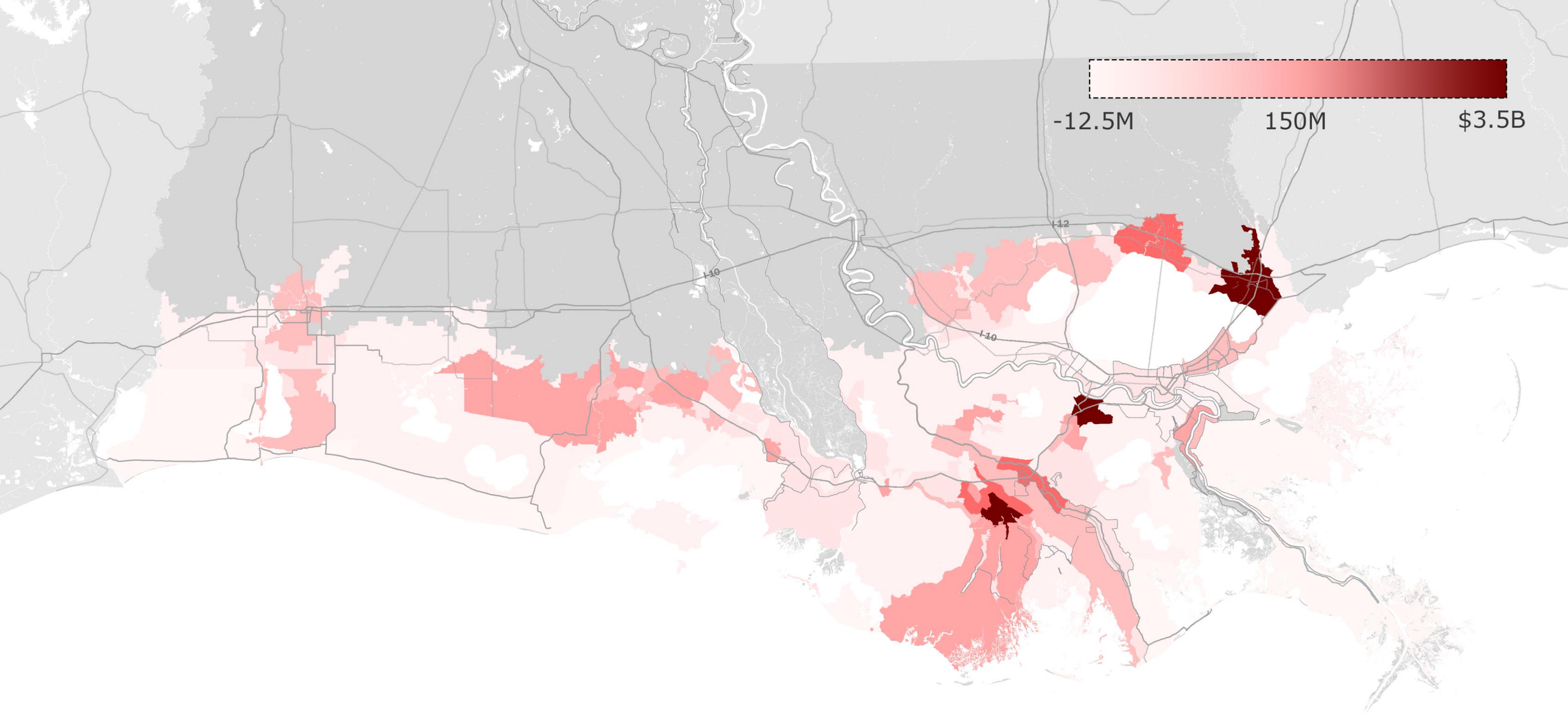
FUTURE WITHOUT ACTION – RISK - EAD





2023 COASTAL MASTER PLAN
FUTURE WITHOUT ACTION - DRAFT

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

N
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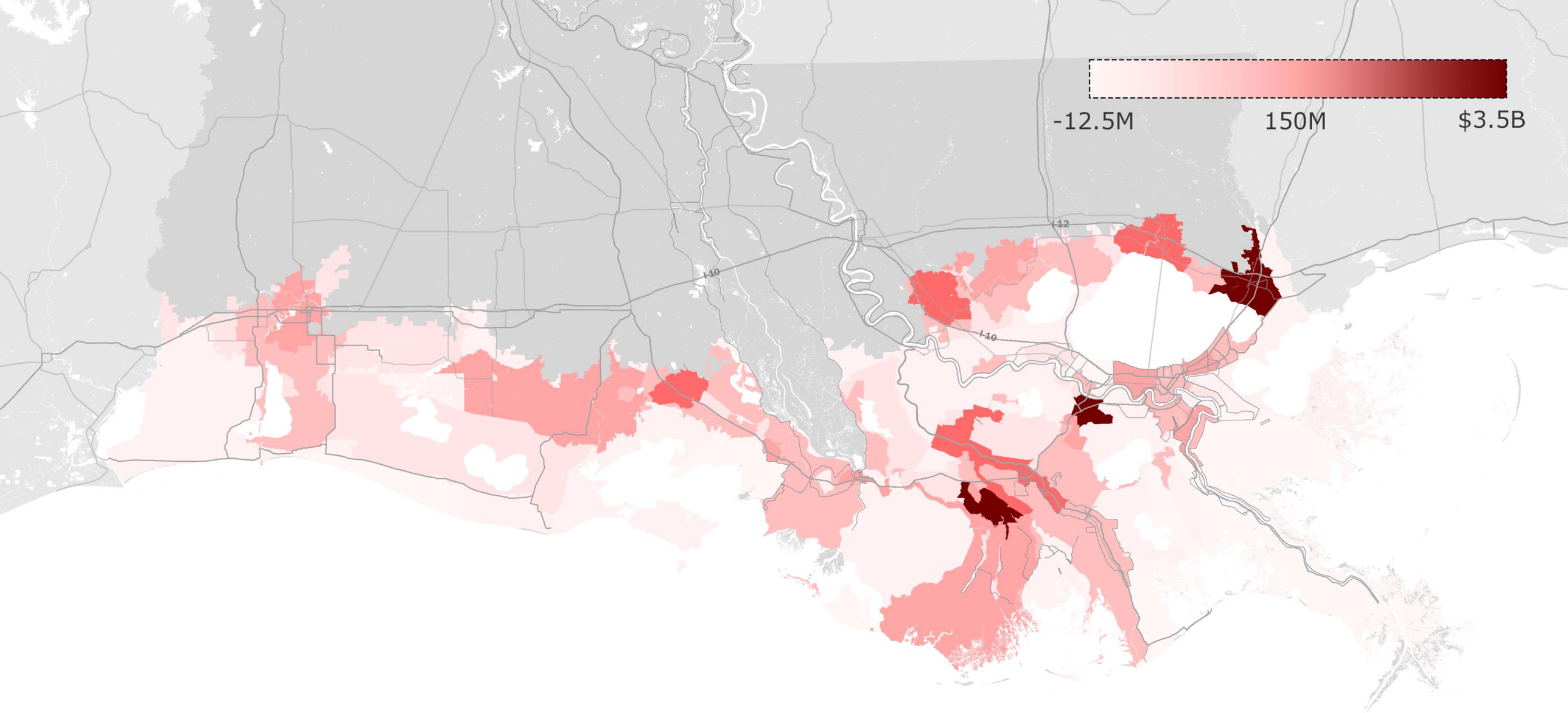
0 5 10 20 KILOMETERS



2023 COASTAL MASTER PLAN
FUTURE WITHOUT ACTION - DRAFT

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

N
0 5 10 20 MILES
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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

THANK YOU