

St. Augustine, Florida Back Bay Coastal Storm Risk Management (CSRM) Feasibility Study

**USACE PLANNING TEAM PRESENTATION
MAY 2023**



Presented by:

Jason Harrah, Senior Project Manager (Jacksonville District, USACE)
Marty Durkin, Planning Technical Lead (Jacksonville District, USACE)
Jessica Beach, Chief Resiliency Officer (City of St. Augustine)





AGENDA



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- Opening Remarks
- Study Overview
- Alternatives Milestone Meeting Recap (from 1 May 2023)
- Discipline Specific Updates
 - Engineering – Patrick Snyder
 - Planning – Marty Durkin
 - Environmental – Darren Pecora
 - Cultural
 - Real Estate
- Schedule/Budget – 60 Day Look Ahead
- Sponsor Remarks
- Agency Questions/Comments
- Public Comments
- Closing Remarks



House Resolution 2646 (June 21, 2000): St. Johns County, Florida

Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That in accordance with Section 110 of the River and Harbor Act of 1962, the Secretary of the Army, acting through the Chief of Engineers, is **requested to survey the shores of St. Johns County, Florida**, with particular reference to the advisability of providing beach erosion control works in the area north of St. Augustine Inlet, the shoreline in the vicinity of Matanzas Inlet, and adjacent shorelines, as may be necessary in the interest of **hurricane protection, storm damage reduction, beach erosion control, and other related purposes**.

Non-Federal Sponsor: City of St. Augustine (COSA)

POC: Jessica Beach, P.E., Chief Resilience Officer, jbeach@citystaug.com

Study Area

- Entire COSA Municipal Boundary
- 17 Distinct Neighborhoods
- 3 Separate Land Masses
- Interconnected Water Bodies

Objectives to be achieved within the City of St. Augustine over a 50-year period of analysis from 2035-2085 are to...

1. Manage risk of coastal flood damages.
2. Manage risk to health and life-safety.
3. Preserve cultural and natural resources and maintain aesthetic quality.
4. Manage flooding impacts to the local economy.

Local Considerations include...

1. Avoid or minimize adverse effects to cultural resources.
2. Consideration of local affordability.
3. Consider local responsibilities for technical operations and maintenance.
4. Avoid or minimize designs that do not conform to the city's historic character.
5. Avoid or minimize encroaching on navigational or recreational features.
6. Avoid environmental impacts.
7. Avoid or minimize impacts to community cohesion.

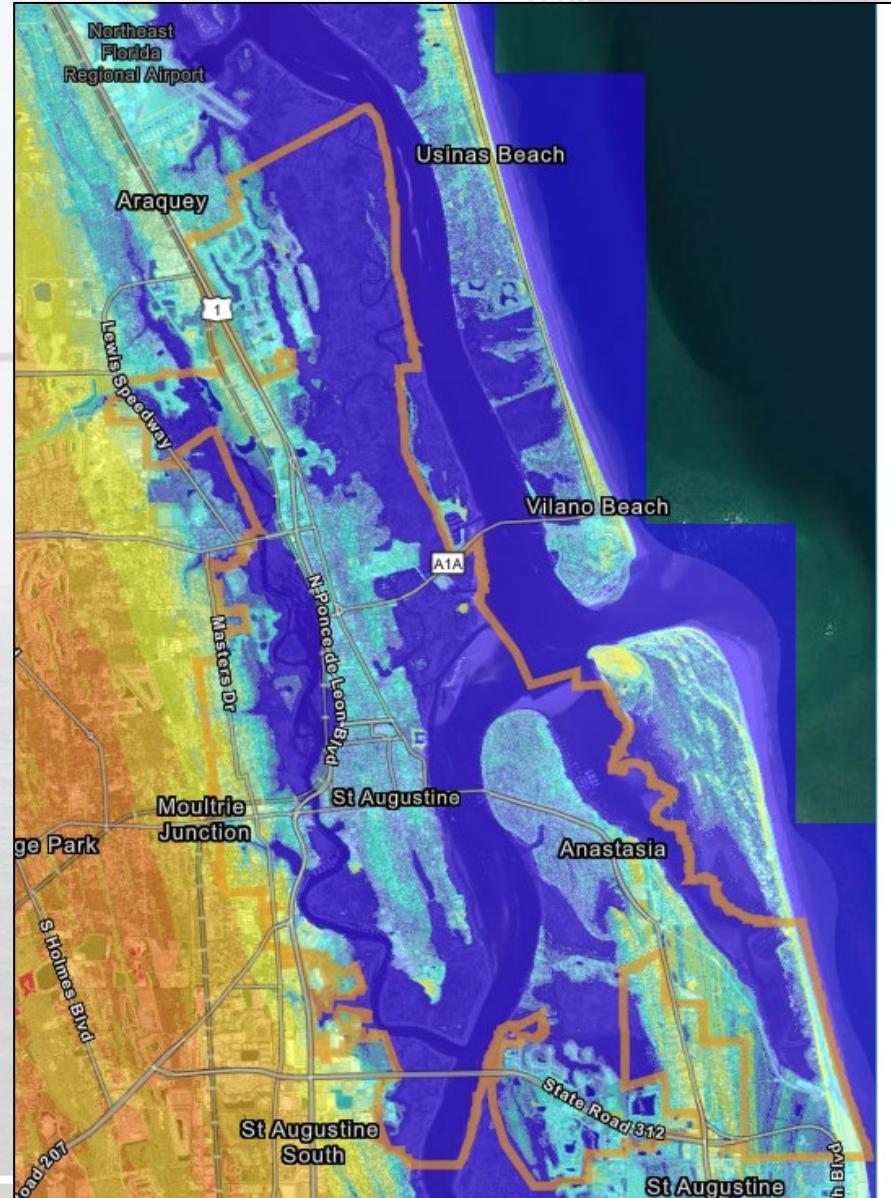




INVENTORY OF EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS GEOLOGY & TOPOGRAPHY



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NAVD 88

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INVENTORY OF EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS FLOODING SCENARIOS (PRELIMINARY WATER LEVEL REPRESENTATIONS)



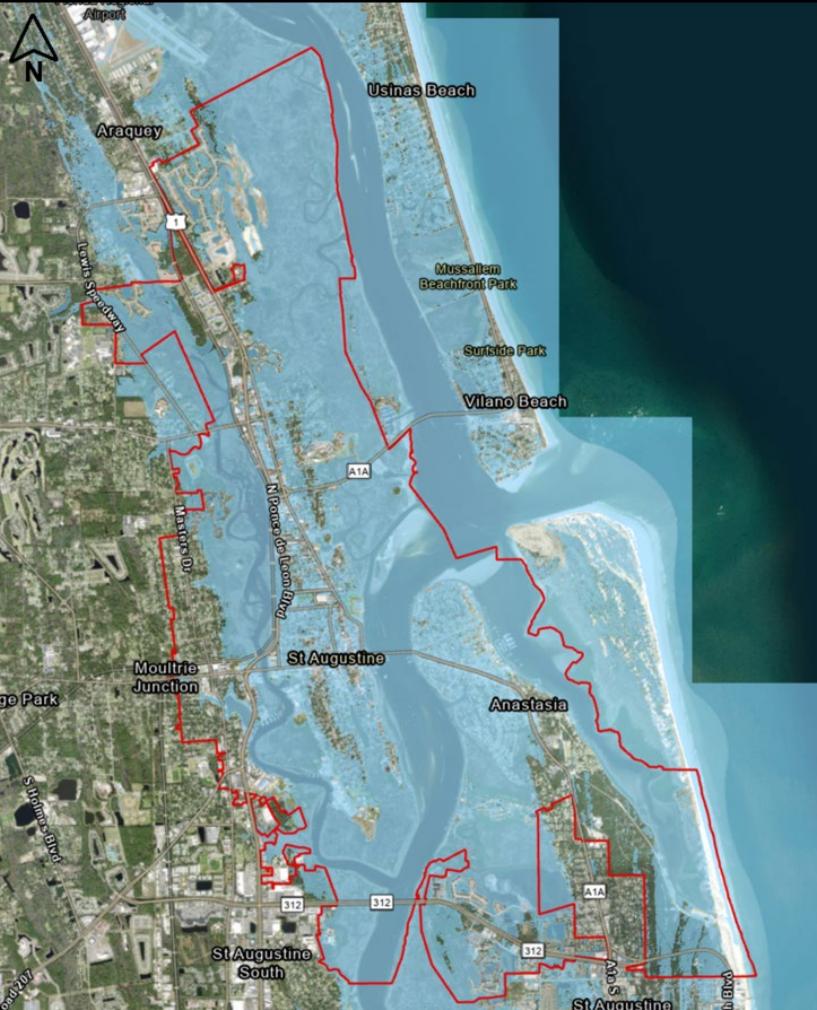
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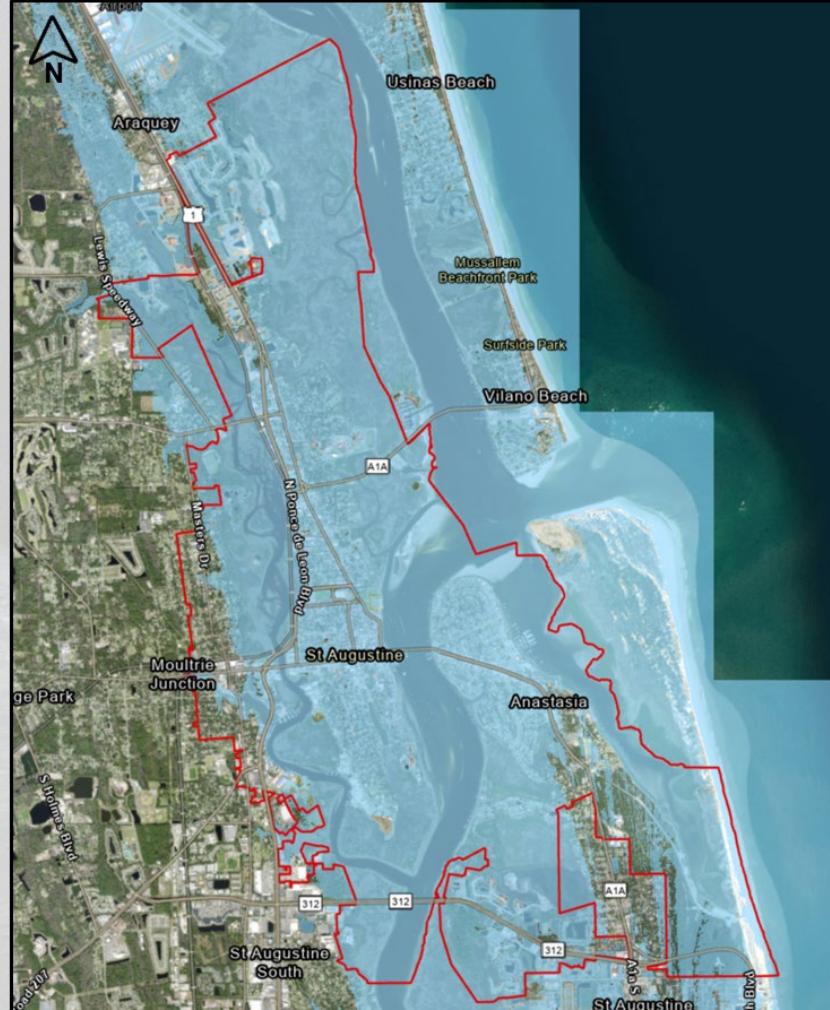
< 4.5 ft NAVD88: MHHW + High SLC 2073 OR
HAT + Int SLC in 2073



< 7 ft NAVD88: CHS "5-year" Surge OR
City Planning Flood Level



< 9 ft NAVD88: CHS "50-year" Surge



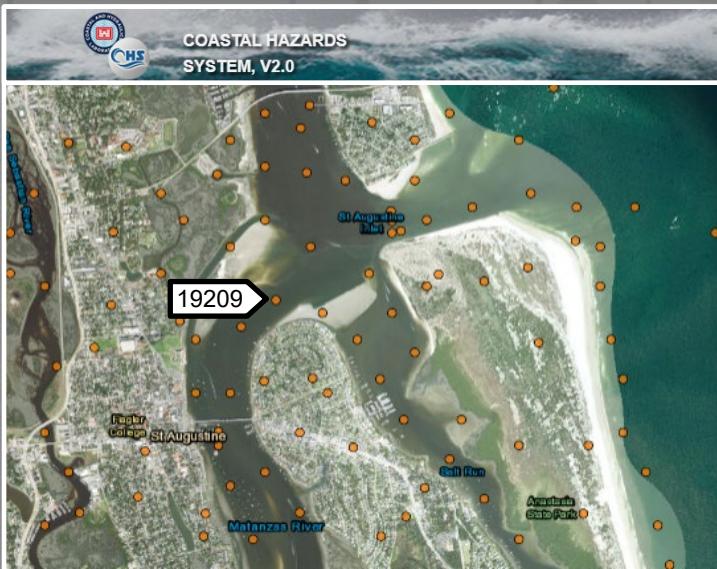
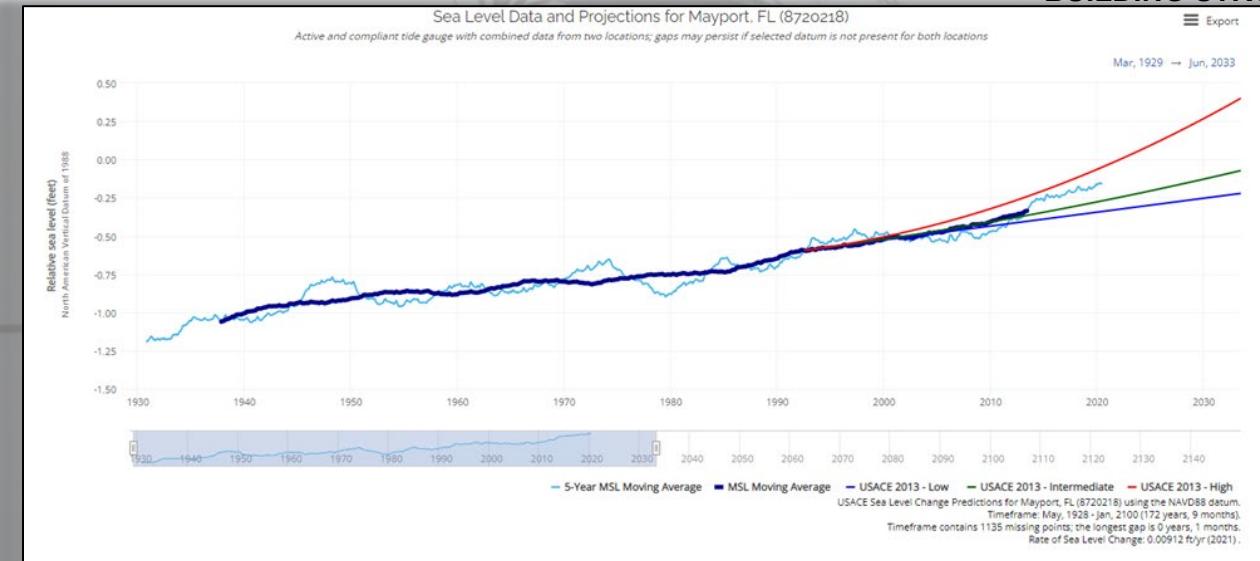
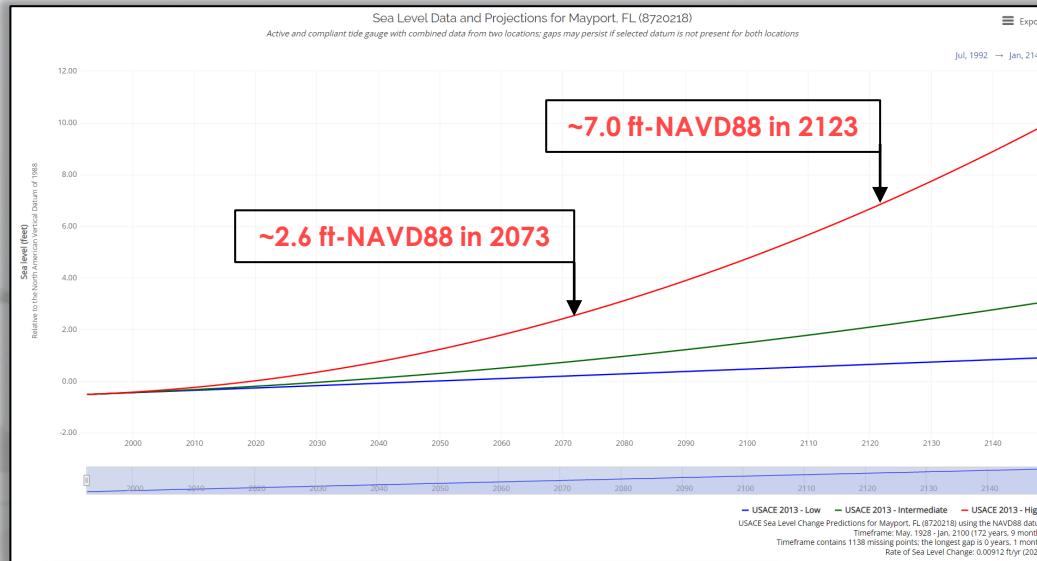


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SEA LEVEL CHANGE CONSIDERATIONS



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Result Type	CHS Save Point 19209									
	Annual Exceedance Frequency (1 per x years) [SWL in ft-NAVD88]									
	0.5	1	2	5	10	20	50	100	200	500
Best Estimate AEF	4.11	5.33	6.15	7.03	7.69	8.35	9.22	9.93	10.64	11.62
50 Year Planning Horizon Best Estimate AEF + USACE SLC Low	4.56	5.78	6.60	7.48	8.14	8.80	9.67	10.38	11.09	12.07
50 Year Planning Horizon Best Estimate AEF + USACE SLC Intermediate	5.07	6.29	7.11	7.99	8.65	9.31	10.18	10.89	11.60	12.58
50 Year Planning Horizon Best Estimate AEF + USACE SLC High	6.65	7.87	8.69	9.57	10.23	10.89	11.76	12.47	13.18	14.16
100 Year Planning Horizon Best Estimate AEF + USACE SLC Low	5.02	6.24	7.06	7.94	8.60	9.26	10.13	10.84	11.55	12.53
100 Year Planning Horizon Best Estimate AEF + USACE SLC Intermediate	6.47	7.69	8.51	9.39	10.05	10.71	11.58	12.29	13.00	13.98
100 Year Planning Horizon Best Estimate AEF + USACE SLC High	11.03	12.25	13.07	13.95	14.61	15.27	16.14	16.85	17.56	18.54



INVENTORY OF EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS CULTURAL RESOURCES



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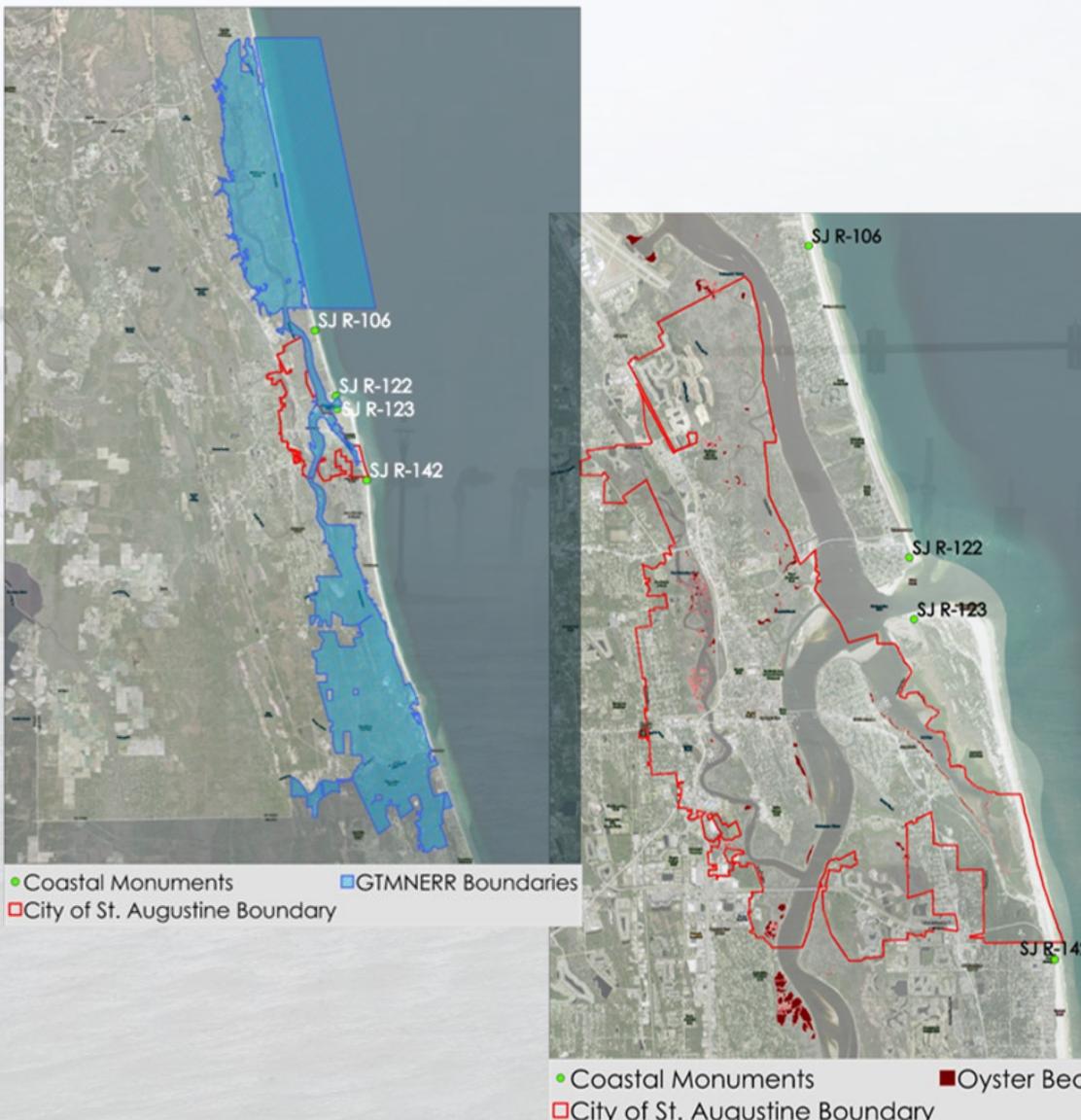
- **St. Augustine is a culturally significant city with numerous cultural resources**
 - ▶ Diverse resources (above & below ground) representing millennia of occupation by a range of ethnic/cultural groups
 - ▶ Anticipate working with large group of stakeholders
 - ▶ Identify and evaluate effects (Direct impacts & Viewshed)
- **Summary of preliminary data**
 - ▶ 6 National Historic Landmarks
 - ▶ 4 Historical Bridges
 - ▶ 12 Historical Cemeteries
 - ▶ 39 National & State Historic Districts
 - ▶ 3400+ National & State Structures/Buildings
 - ▶ Numerous Archaeological Sites (not illustrated) and other Historic Properties & Cultural Resources



INVENTORY OF EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS ENVIRONMENTAL RESOURCES



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- *Fish and Wildlife Resources
 - ▶ Recreational and commercial fishing
 - ▶ Ecotourism
- Marine Mammals
 - ▶ Resident Dolphins
- *Migratory Birds
- *Aesthetics
 - ▶ Tourism
- *Wetlands (EFH)
 - ▶ Estuarine marsh (*Spartina, Juncus*)
 - ▶ Mangroves (Black Mangrove)
- *Benthic Resources: Oyster Reefs (EFH)
 - ▶ Oyster reefs – harvesting areas
- *Water Quality
 - ▶ Monitored by stakeholders
- *Guana Tolomato Matanzas National Estuarine Research Reserve (GTMNERR)
 - ▶ Protects 76,760 acres spanning nearly 40 miles of coast
 - ▶ Network of conservation areas managed by 7 stakeholders



INVENTORY OF EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS ENVIRONMENTAL RESOURCES



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■ Endangered Species Act

- ▶ Designated Critical Habitat
 - North Atlantic Right Whale (NARW)
 - *Loggerhead Sea Turtle

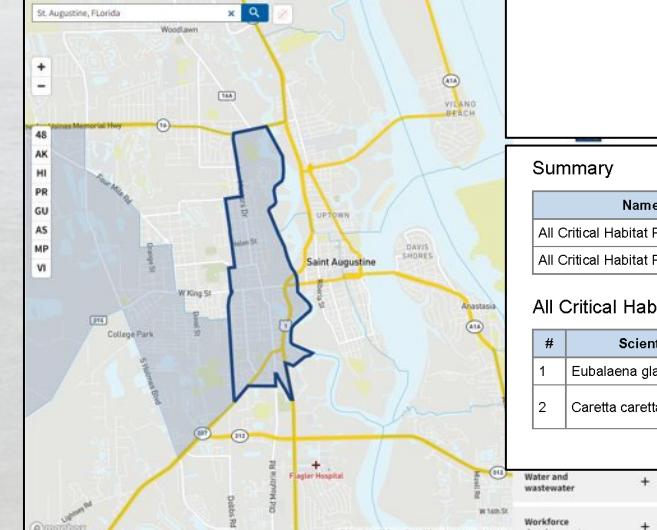
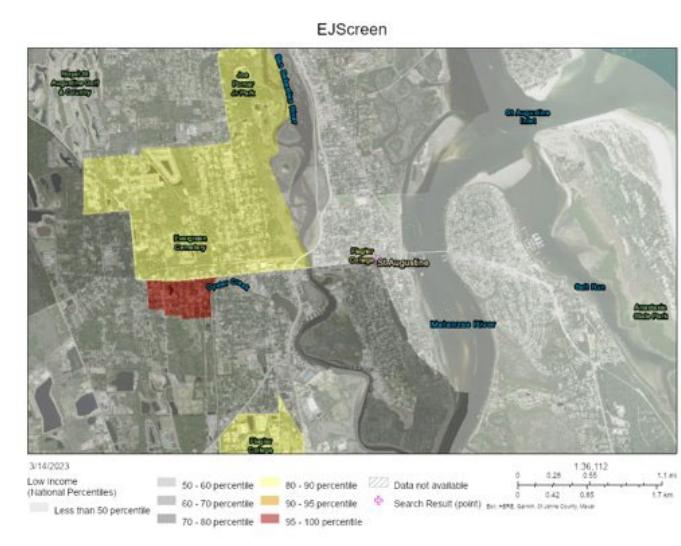
- ▶ NMFS
 - NARW
 - Atlantic Sturgeon
 - Swimming Sea Turtles
 - Giant Manta Ray
 - Smalltooth Sawfish

- ▶ USFWS
 - *Nesting Sea Turtles
 - *Piping Plover & Rufa Red Knot
 - *Anastasia Island Beach Mouse
 - Florida Manatee
 - *Eastern Indigo Snake
 - *Eastern Black Rail

■ *Environmental Justice Community

- ▶ West St. Augustine

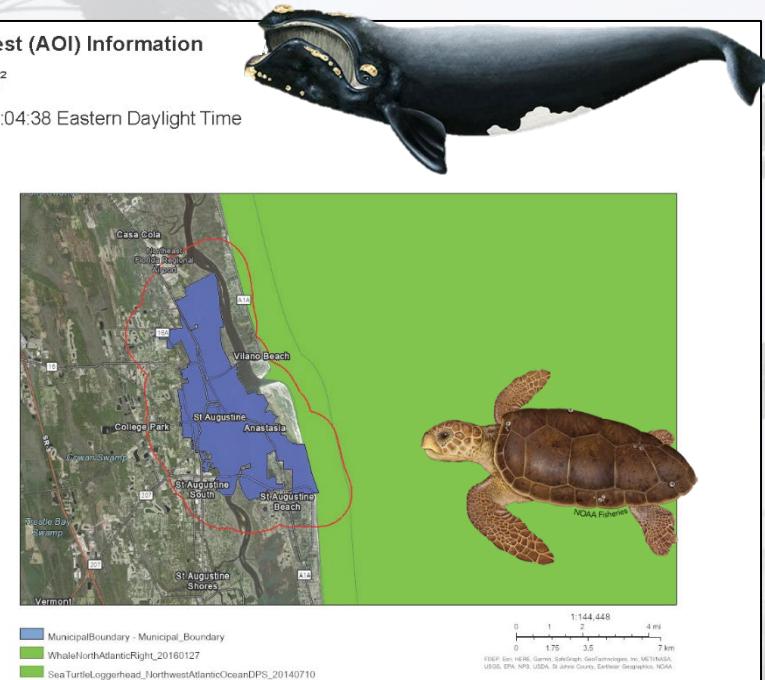
FWOP - * Indicates resource likely impacted by Storms/SLR



Area of Interest (AOI) Information

Area : 95.66 km²

Mar 14 2023 22:04:38 Eastern Daylight Time



Summary

Name	Count	Area(km ²)	Length(m)
All Critical Habitat Polyline	0	N/A	0
All Critical Habitat Polygon	2	23.39	N/A

All Critical Habitat Polygon

#	Scientific Name	Common Name	Listed Entity	Area(km ²)
1	Eubalaena glacialis	Whale, North Atlantic right	Whale, North Atlantic right	11.61
2	Caretta caretta	Sea turtle, loggerhead	Sea turtle, loggerhead [Northwest Atlantic Ocean DPS]	11.78

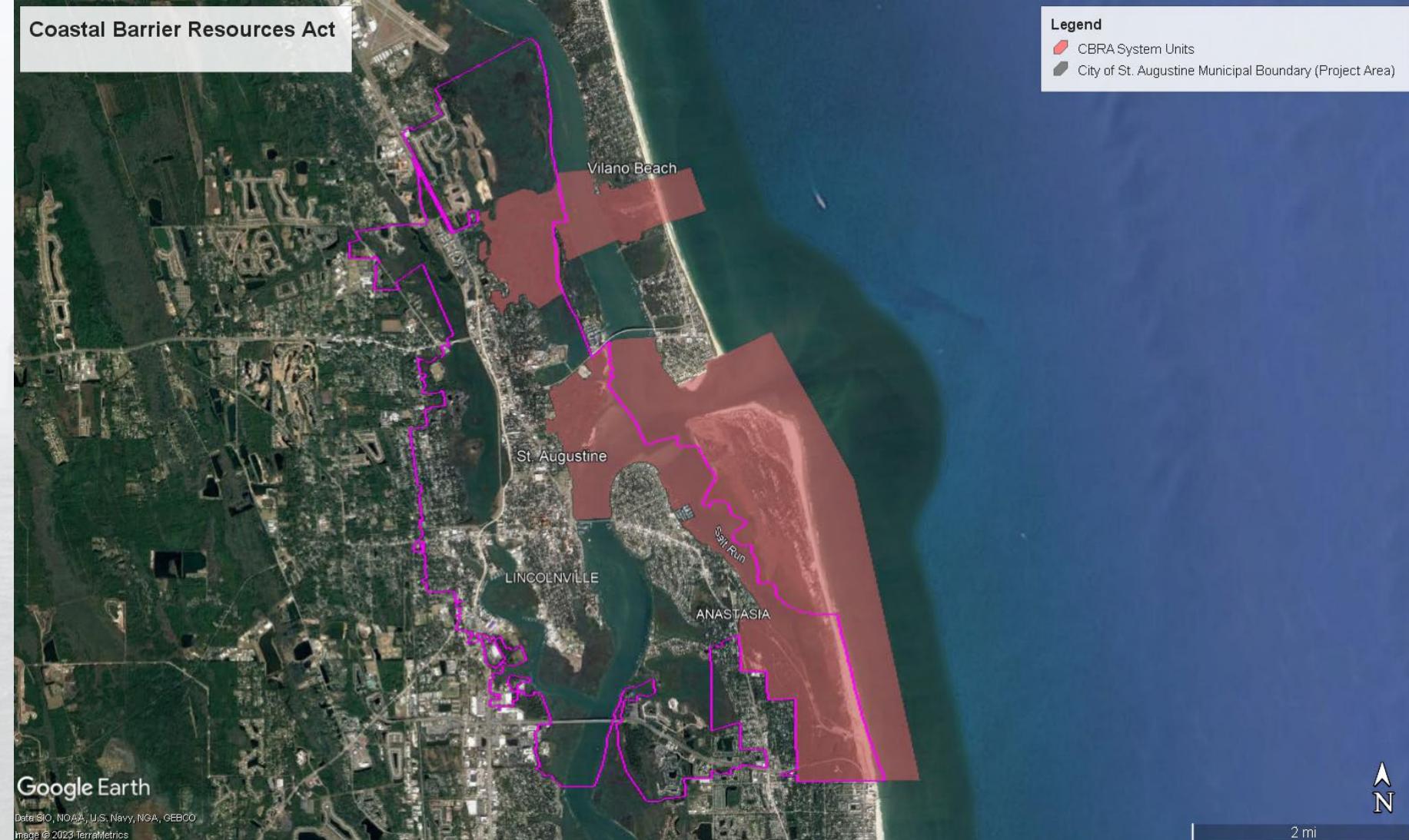


INVENTORY OF EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS COASTAL BARRIER RESOURCES ACT (CBRA)



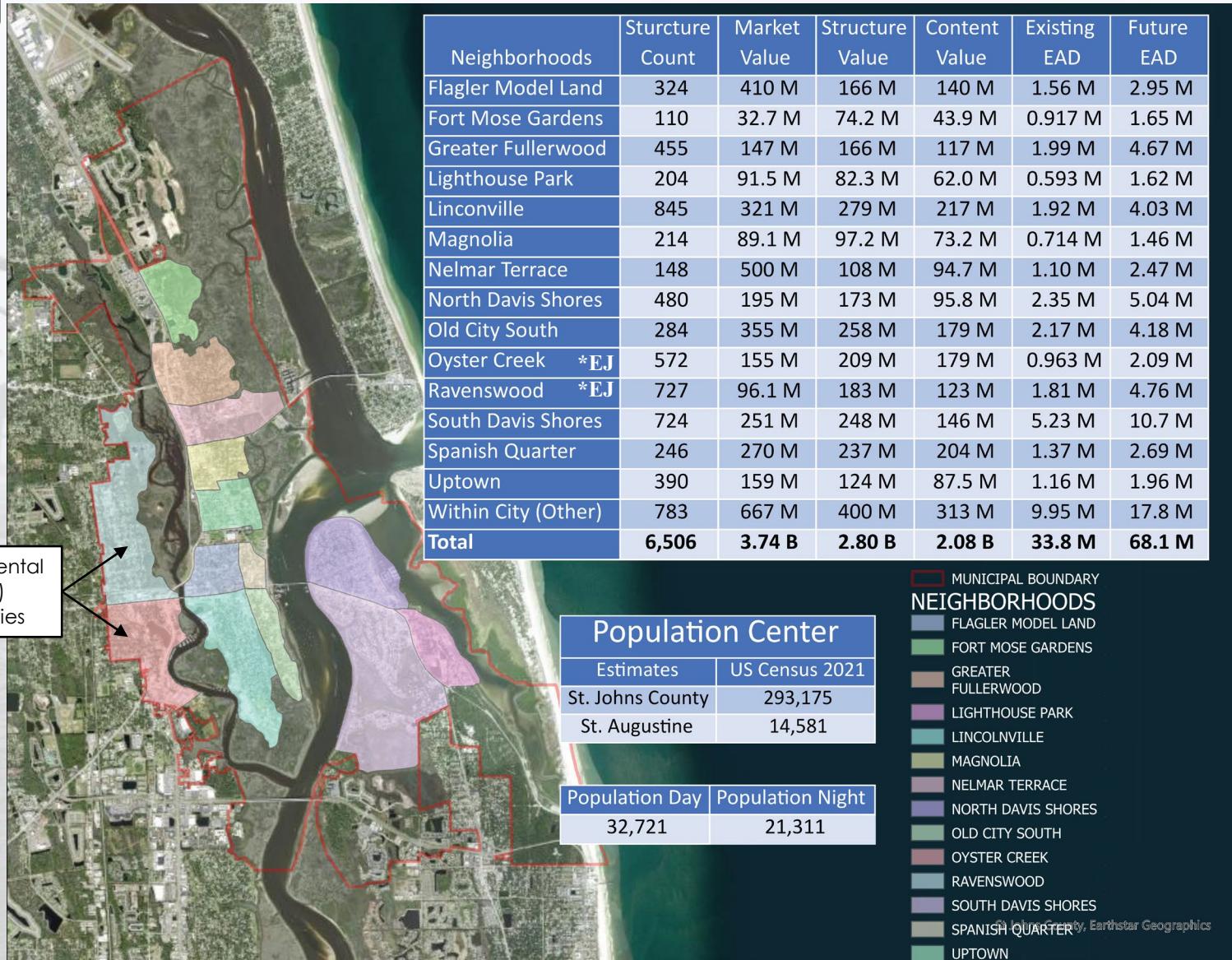
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CBRA System Units:
"are predominately comprised of privately owned areas, though they may also contain areas that are held for conservation and/or recreation. Most new Federal expenditures and financial assistance, including Federal flood insurance, are prohibited within System Units."





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- Population estimates reflect those living in the area from US Census.
- Population Day and Night estimates includes those in temporary lodging, in schools, and working in COSA.
- Structure Count and Depreciate Replacement Value estimates from the National Structure Inventory (NSI).
- Market Value estimates from COSA Tax Assessor Database.
- Existing and Future Expected Annual Damages (EAD) are from the South Atlantic Coastal Study Tier 2 Economic Risk Assessment.



INVENTORY OF EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS CRITICAL INFRASTRUCTURE



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INVENTORY OF EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS LOCAL RESILIENCY EFFORTS



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COSA Efforts

- Lake Maria Sanchez Flood Mitigation
- South Whitney/West King St. Drainage
- Inlet Drive Shoreline Stabilization
- South Davis Shores Drainage
- Court Theophelia Neighborhood Drainage
- Avenida Menendez Seawall
- Tidal Backflow Prevention Program
- Groundwater Monitoring Program
- Flood Mitigation Assistance (FMA) Program
- Proposed Resilient Shoreline Ordinance



FDOT Efforts

- King St from SR A1A to Bay Drainage Improvement
- King St Bridge Replacement & Pedestrian Improvements
- Seawall replacement from Bridge of Lions to Charlotte St



Key FWOP Assumptions

- Ongoing COSA and FDOT projects will be completed within the next 5 years.
- Structure elevations based on FEMA rules.



INITIAL ALTERNATIVES



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Measure Function

Initial Array of Alternatives

Wall/Levee/Dune features stop flooding at the back bay shoreline.

Surge Barrier/Gate features stop flooding before it gets into the back bay waters.

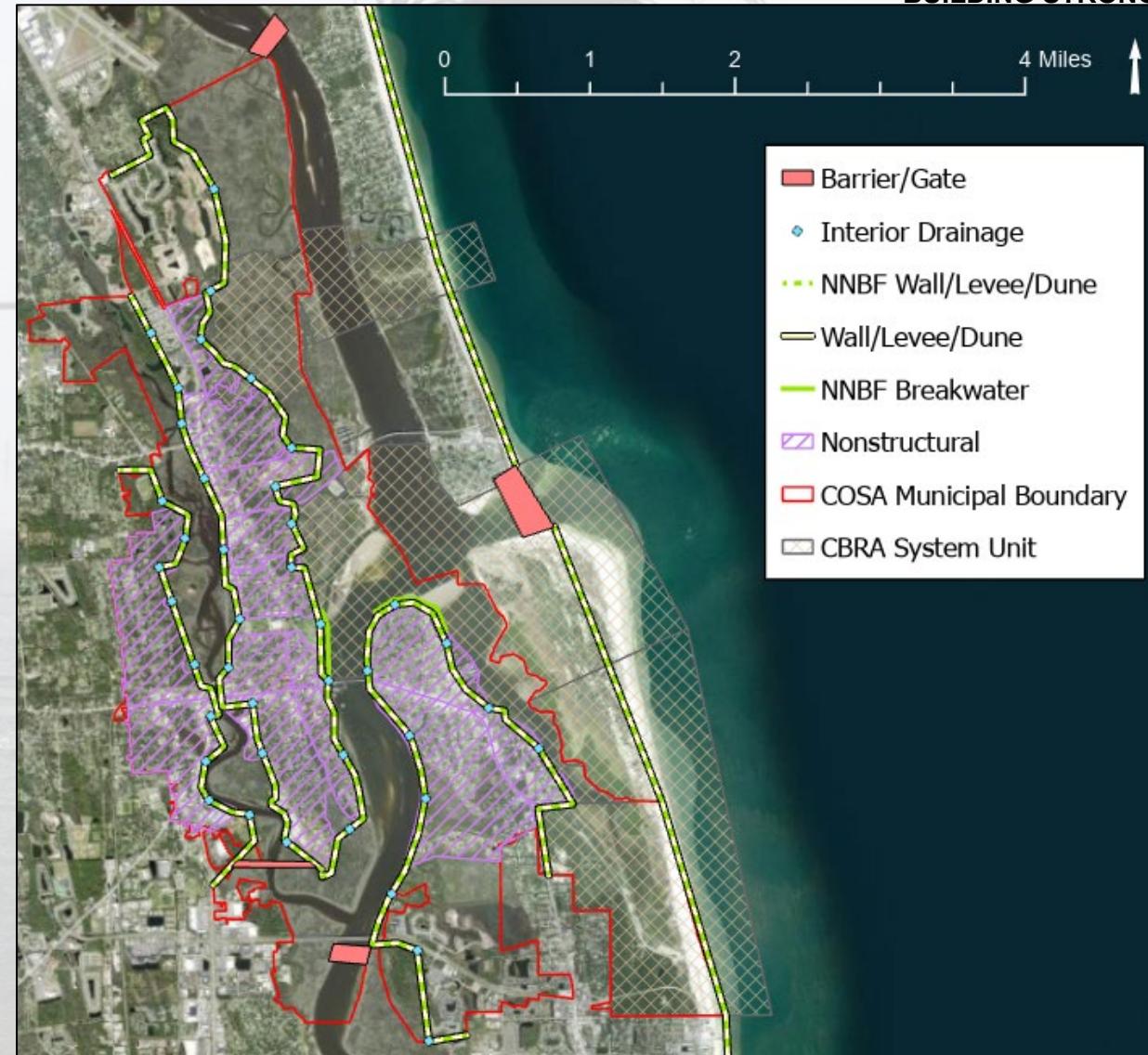
Interior Drainage features get flooding out of upland areas.

Nonstructural features reduce flood risk without directly effecting flooding processes.

Breakwaters/NNBFS can reduce wave energy before it gets to the back bay shoreline.

0. No Action

1. Wall/Levee with Interior Drainage Features & Breakwaters/NNBFS
2. Storm Surge Barrier at Inlet(s)/IWW with Wall/Levee/Dune tiebacks
3. San Sebastian River Flood Gate with Wall/Levee & Interior Drainage Features & Breakwaters/NNBFS
4. All Nonstructural
5. Wall/Levee with Interior Drainage Features & Breakwaters/NNBFS & Nonstructural
6. Storm Surge Barrier at Inlet(s)/IWW with Wall/Levee/Dune tiebacks & Nonstructural





PATH FORWARD PLAN FORMULATION STRATEGY



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Flooding

Coastal (Storm Surge + Wave) Flooding

Sea Level Rise

Tidal Flooding

Rainfall Flooding

Riverine Flooding

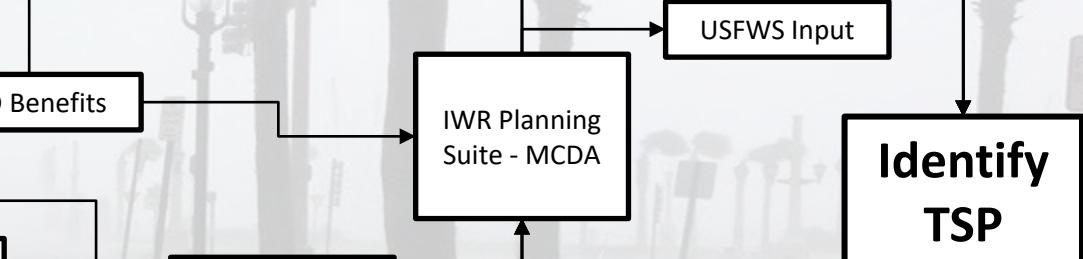
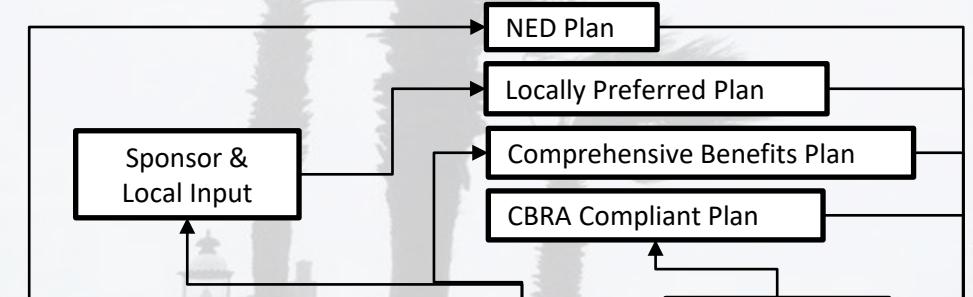
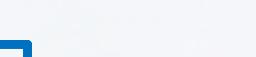
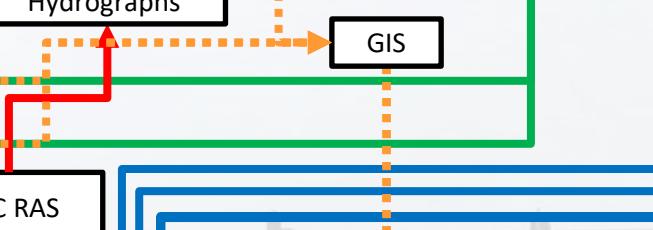
Objectives

1. Manage risk of flood damages in the City of St. Augustine over 50-year period of analysis from 2035-2085.

2. Manage health and life-safety risk in the City of St. Augustine over 50-year period of analysis from 2035-2085.

3. Preserve cultural and natural resources and maintain aesthetic quality in the City of St. Augustine over 50-year period of analysis from 2035-2085.

4. Manage flooding impacts to the local economy in the City of St. Augustine over 50-year period of analysis from 2035-2085.



**Identify
TSP**



PATH FORWARD

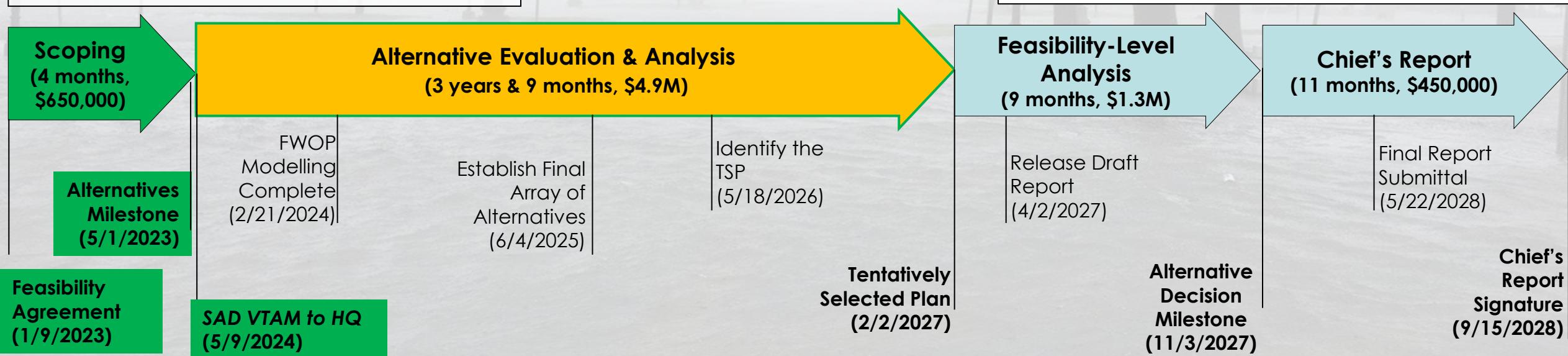
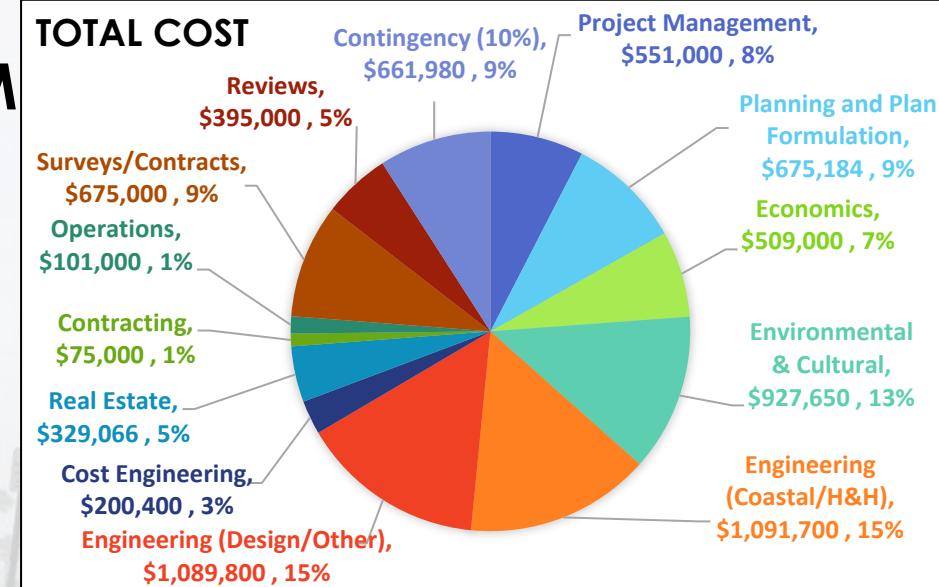
STUDY SCOPE, SCHEDULE, & BUDGET



Schedule & Budget Overview: 5 years & 9 months, \$7.3M

Key Components of the Study Scope:

- Entire City of St. Augustine (COSA)
- Compound Flooding
- Full Array of Alternatives & Comprehensive Benefits
- Environmental Impact Statement (EIS) Likely
- Robust Community Outreach





PATH FORWARD

60-DAY LOOK AHEAD



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Activities Completing in the next 60 Days

Initial Flood Driver Screening	17 May 2023
Develop Environmental and Cultural Resource Subgroups	26 May 2023
Data Gathering and Digital Elevation Model (DEM) Creation	30 May 2023

Activities Starting in the next 60 Days

Delineate Study Area into Model Areas	17 May 2023
Develop Modeling Strategy for Comprehensive Benefits	17 May 2023
Engineering Inputs for G2CRM Modeling (including Coastal Hazards System (CHS))	17 May 2023



CLOSING REMARKS/QUESTIONS



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- Sponsor Remarks
- Federal Agency Questions/Comments
- State Agency Questions/Comments
- Local Agency Questions/Comments
- Public Comments