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

MONTHLY PROGRESS MEETING
MAY 2024

PLEASE MUTE YOUR PHONE AND COMPUTER TO AVOID BACKGROUND DISRUPTIONS.

WE WILL START PROMPTLY AT 1:05

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)

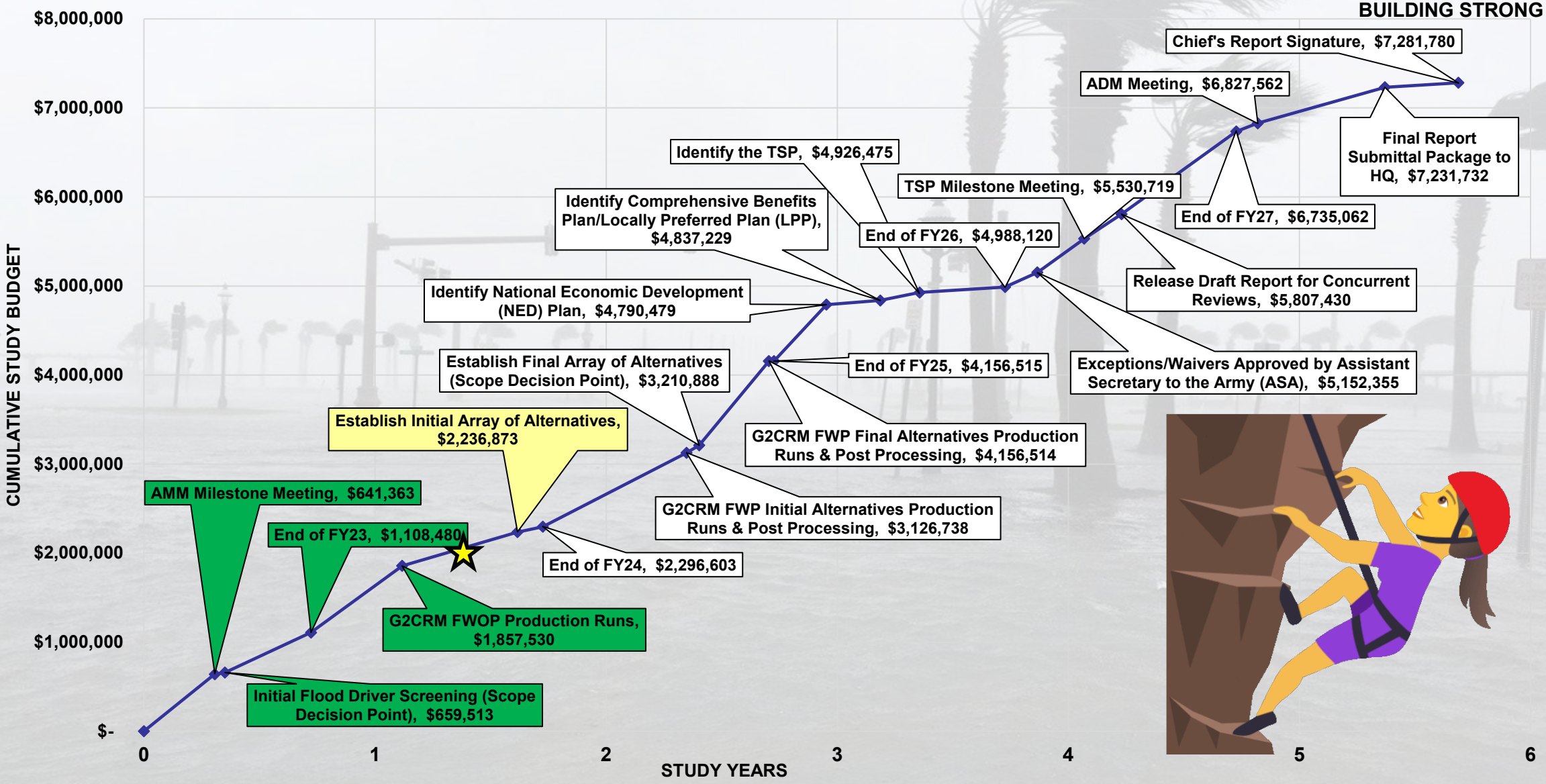
CITY OF ST AUGUSTINE EST. 1565

AGENDA

- Opening Remarks
- Overall Study Schedule & Budget
- Study Overview
- Future Without Project (FWOP) Engineering & Economic Modeling
- Environmental Resources Update
- Cultural Resources Update
- Visual Resources Assessment Procedures (VRAP) Update
- Alternative Considerations
- Future Without Project (FWOP) Damages
- Key Activity Look Ahead
- Upcoming Public Engagements
- Sponsor Remarks
- Agency Questions/Comments
- Public Comments
- Closing Remarks

STUDY SCHEDULE & BUDGET

BUILDING STRONG



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STUDY SCHEDULE & BUDGET

We Are Here

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Schedule & Budget Overview: **5 years & 9 months, $7.3M, Cost Share ~50% Fed, 50% Sponsor**

Total Study Costs to Date: $1,253,918.74 (as of Jan 2024)

Scoping
(4 months, $650,000)

Alternative Evaluation & Analysis
(3 years & 9 months, $4.9M)

Feasibility-Level Analysis
(9 months, $1.3M)

Chief's Report
(11 months, $450,000)

- **FCSA (1/9/2023)**
- **AMM (5/1/2023)**
- ***SAD VTAM to HQ (5/9/2023)***
- **FWOP Modeling Complete (2/21/2024)**
- Establish Final Array of Alternatives (6/4/2025)
- Identify the TSP (5/18/2026)
- **TSP (2/2/2027)**
- Release Draft Report (4/2/2027)
- **ADM (11/3/2027)**
- Final Report Submittal (5/22/2028)
- **Chief's Report Signature (9/15/2028)**

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

Acronyms:
FCSA = Feasibility Cost Share Agreement
AMM = Alternatives Milestone Meeting
FWOP = Future Without Project
SAD = South Atlantic Division
VTAM = Vertical Team Alignment Memo
HQ = Headquarters
TSP = Tentatively Selected Plan
ADM = Agency Decision Milestone

STUDY OVERVIEW

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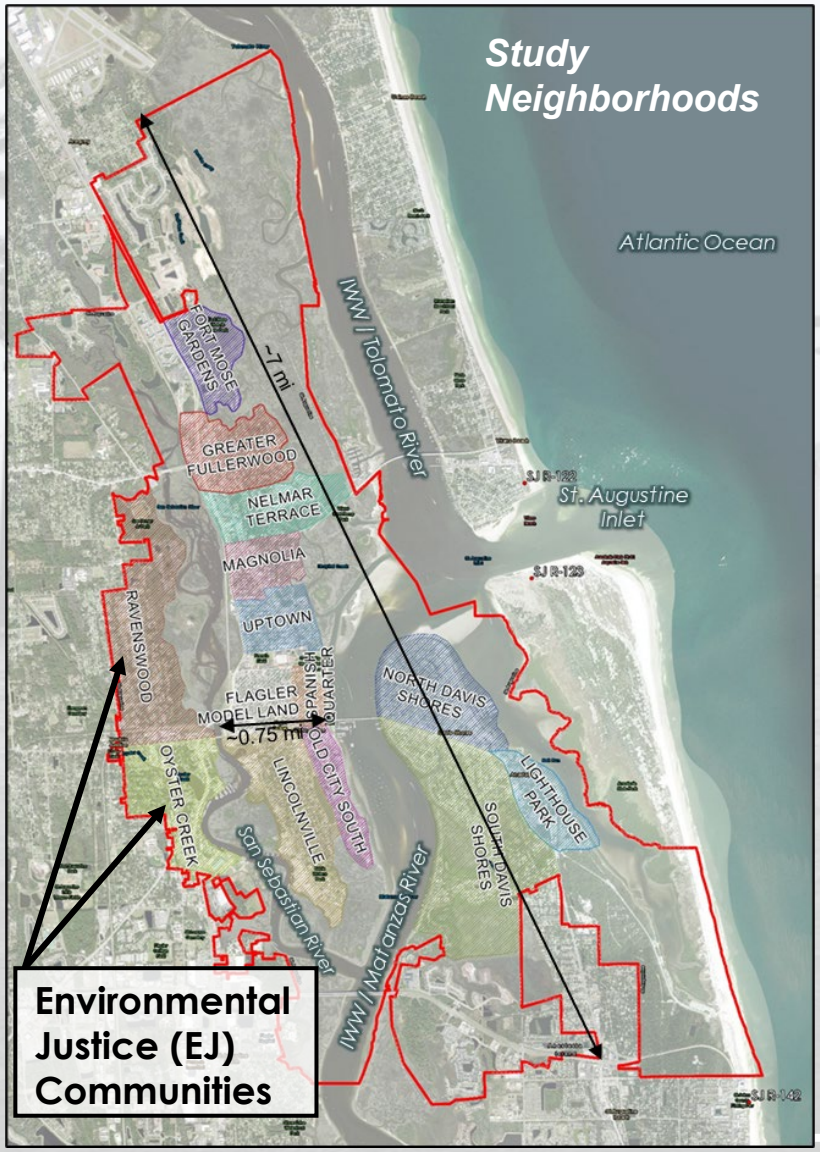

Study Authority: House Resolution 2646 (June 21, 2000): St. Johns County, Florida

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. Manage risk to cultural and natural resources.
4. Manage flooding impacts to the local economy.

STUDY MODEL REACHES

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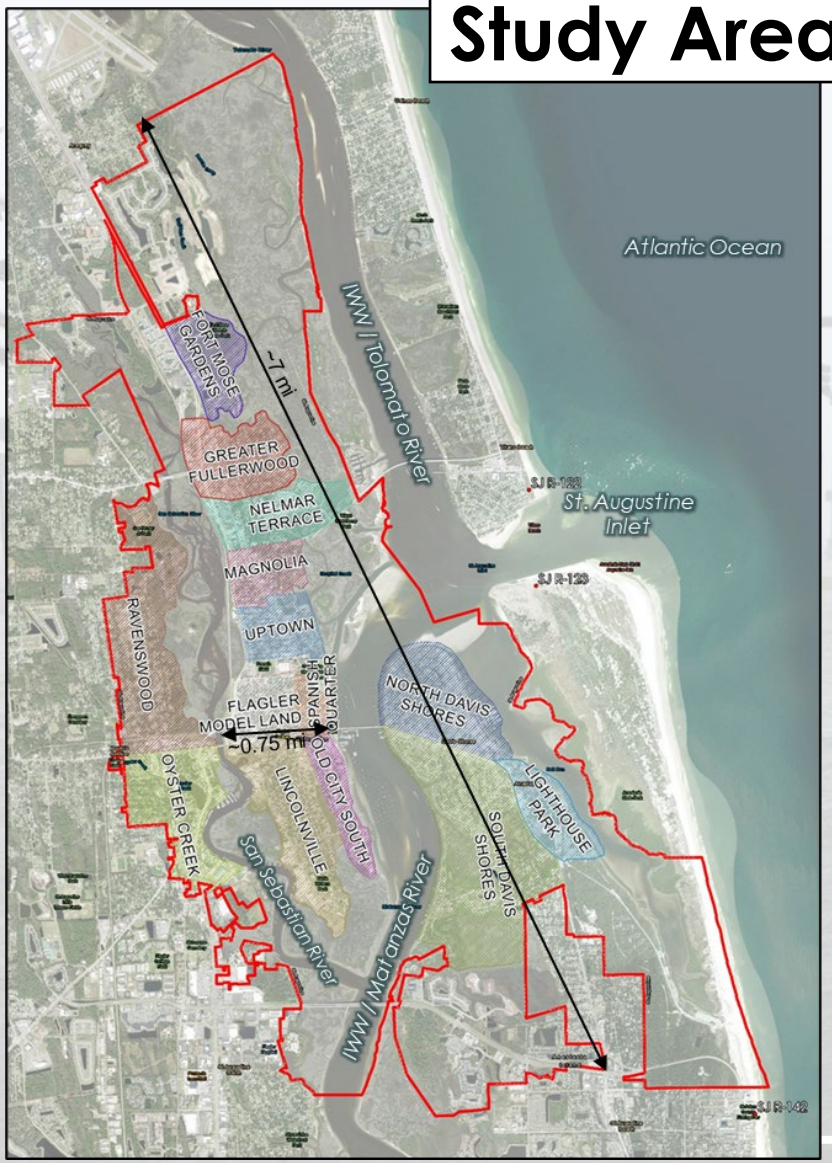
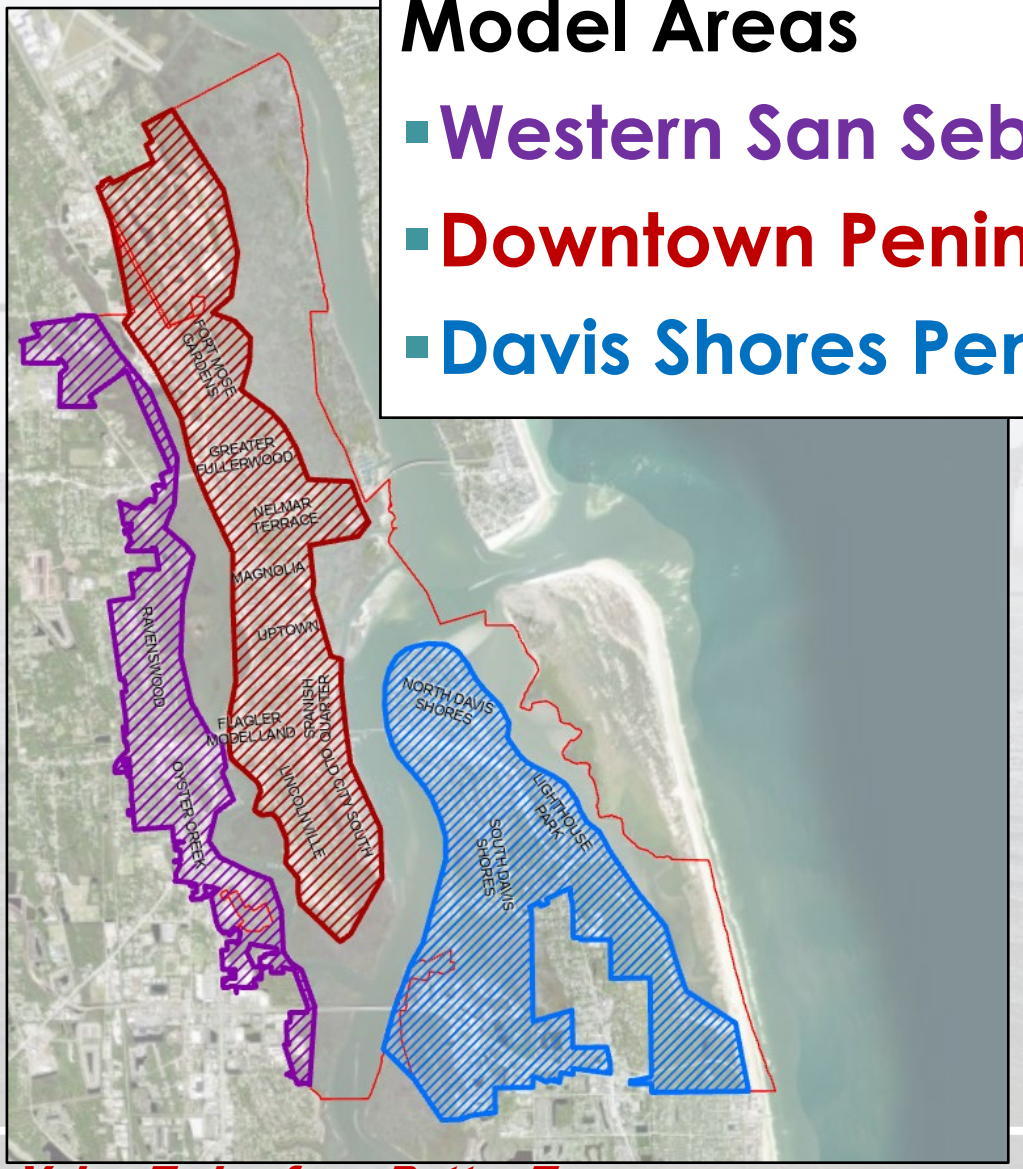
Study Area



Model Areas

- Western San Sebastian
- Downtown Peninsula
- Davis Shores Peninsula



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REPRESENTATIVE COASTAL STORMS

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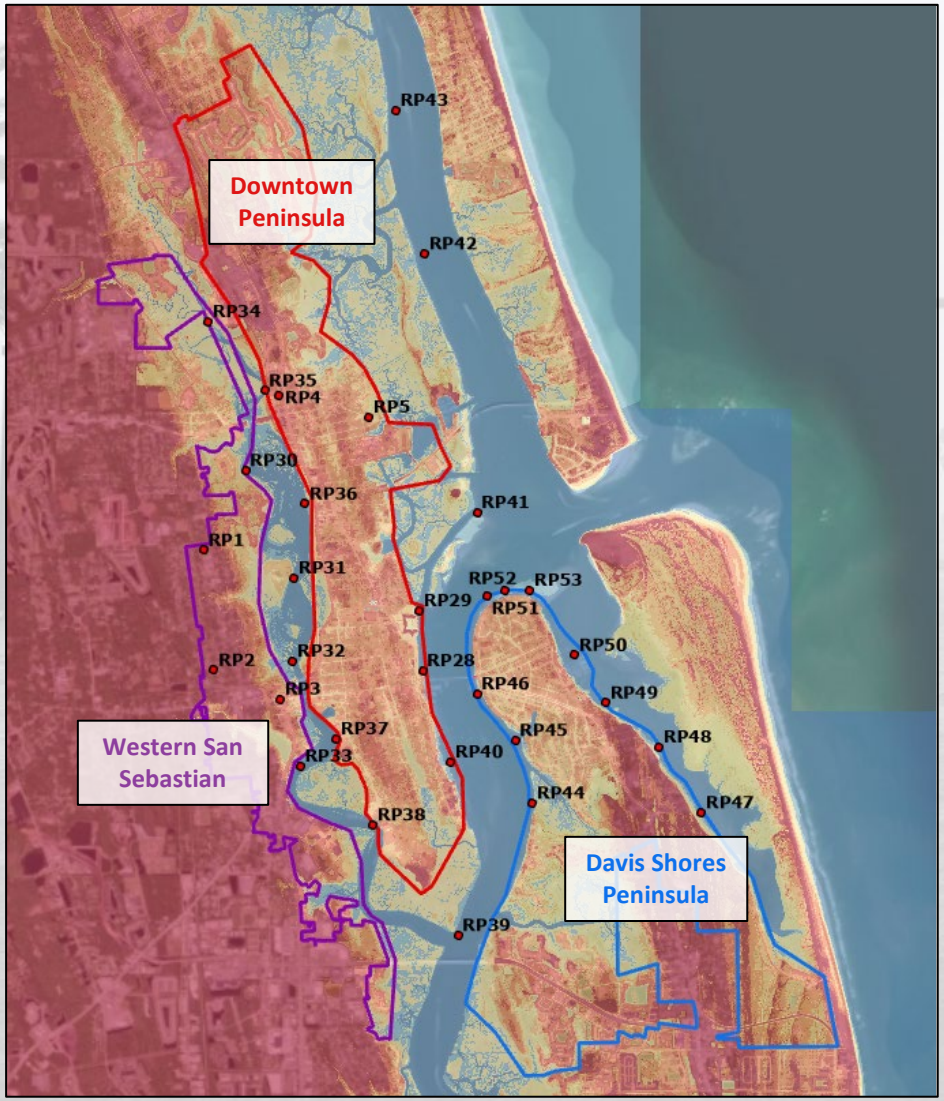

Development of Representative Storms

- **Compound flooding** modeling approach that includes total water level from **coastal surge** and **rainfall driven riverine flooding**.
- **36 individual storm scenarios** that include a comprehensive range of events for both coastal surge from the Coastal Hazards System (CHS) and rainfall from National Oceanic and Atmospheric Administration (NOAA) Atlas 14.
- Storm selection based on the historical coastal storm occurrences and the study area's sensitivity to inundation.
- Compound flooding scenarios modeled in USACEs Hydrologic Engineering Center's River Analysis System (HEC-RAS) software.
- Two Representative Points (RP) containing the water level results were selected based on dominant flood driver and the most conservative peak water levels.

REPRESENTATIVE COASTAL STORMS

DAVIS SHORES PENINSULA

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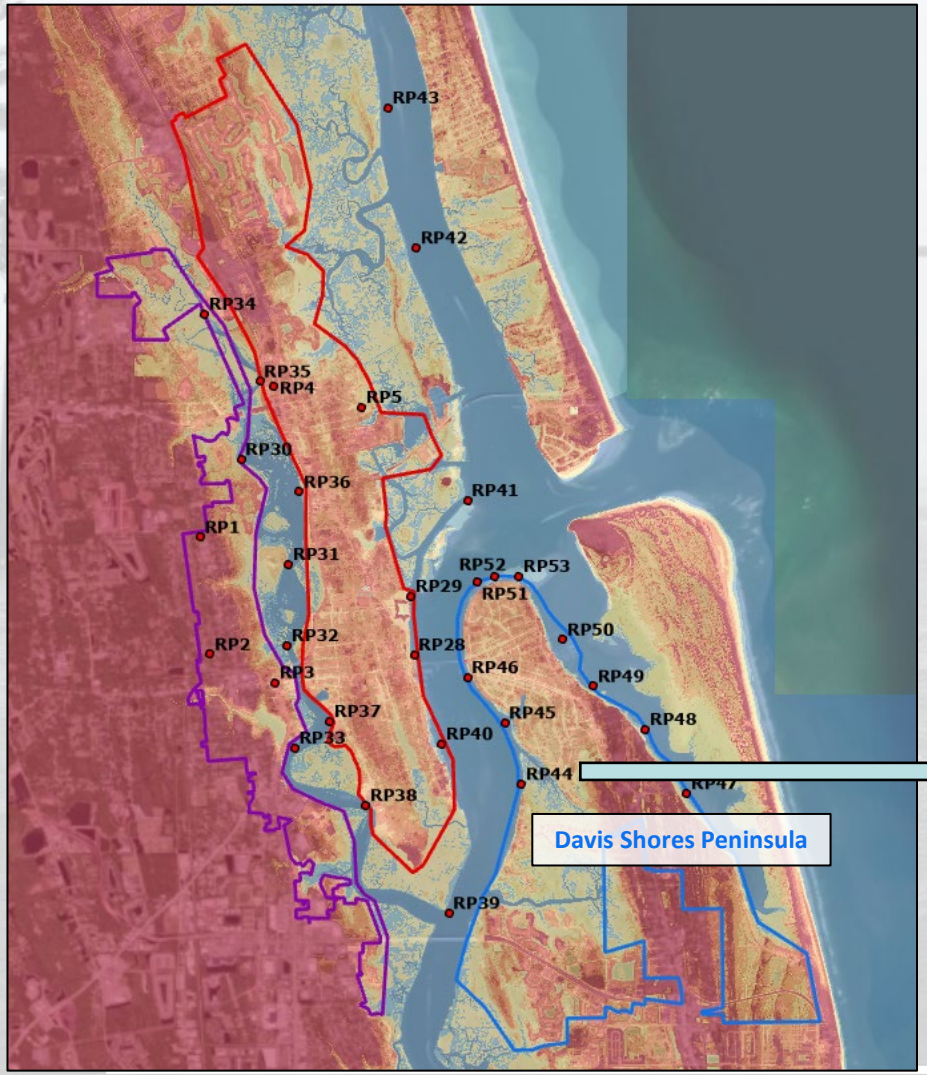

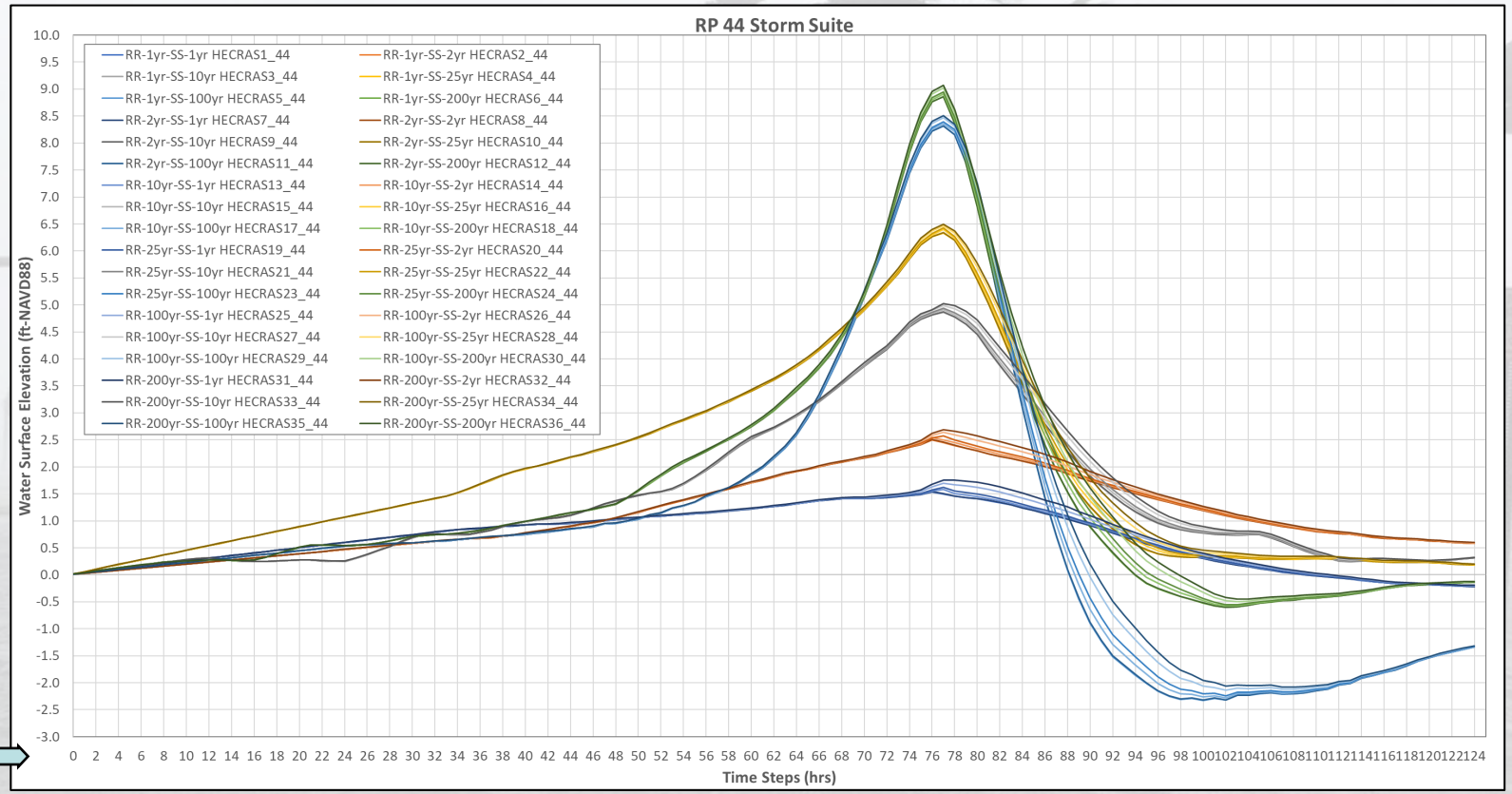

Representative Storm Overview

- Peaks range from 1.54 to 9.07 ft-NAVD88.
- Predominately coastally influenced.

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REPRESENTATIVE COASTAL STORMS

DOWNTOWN PENINSULA & WESTERN SAN SEBASTIAN

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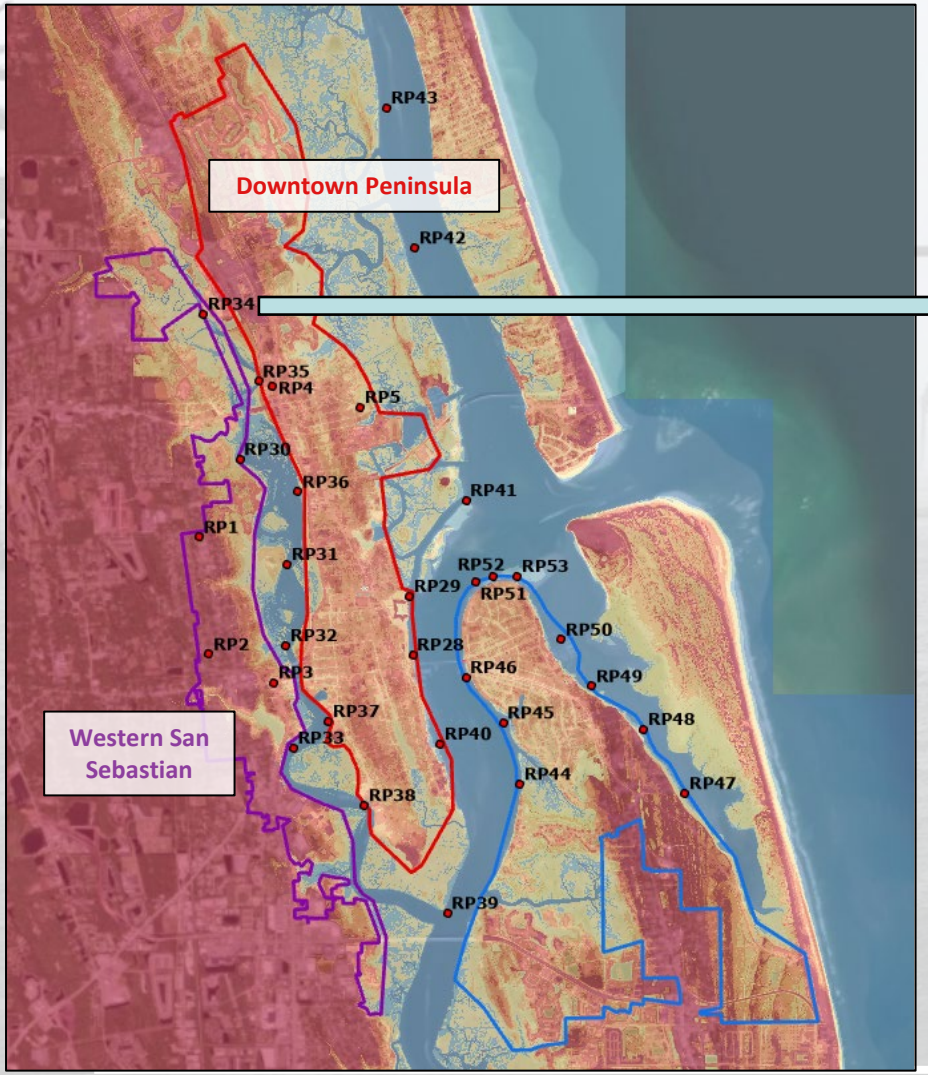

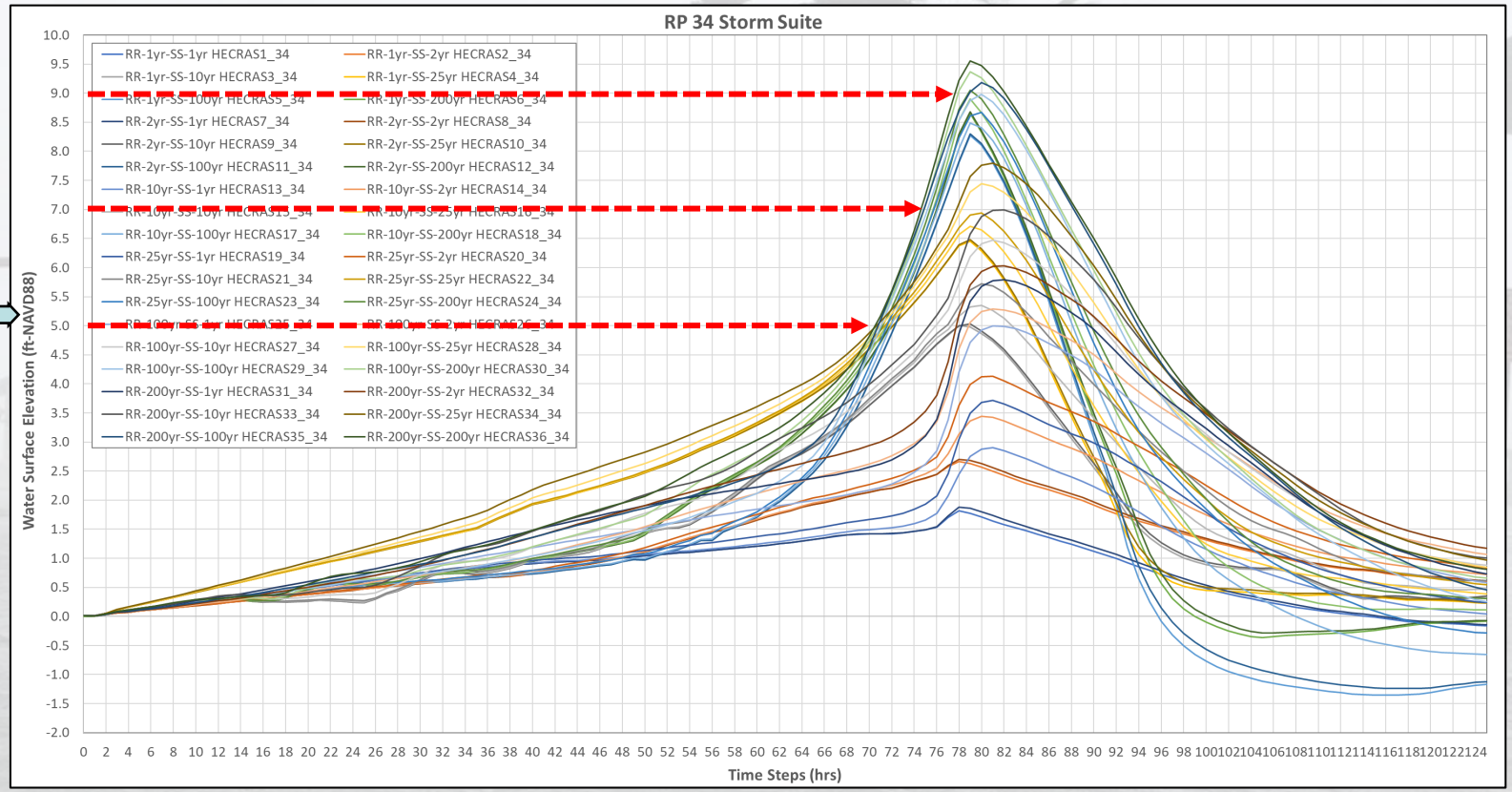

Representative Storm Overview

- Peaks range from 1.82 to 9.55 ft-NAVD88.
- Heavily influenced by rainfall-riverine.

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REPRESENTATIVE COASTAL STORMS

EXTENT OF COASTAL STORM FLOODING

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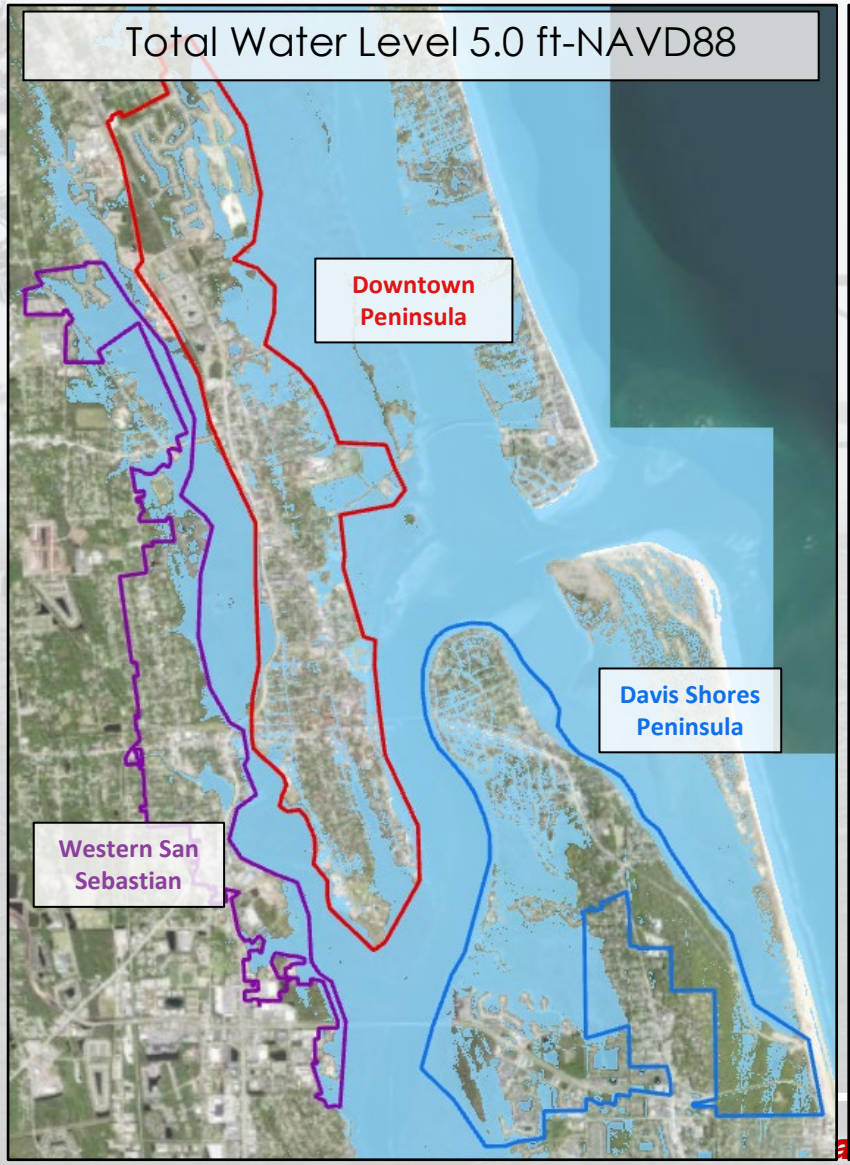

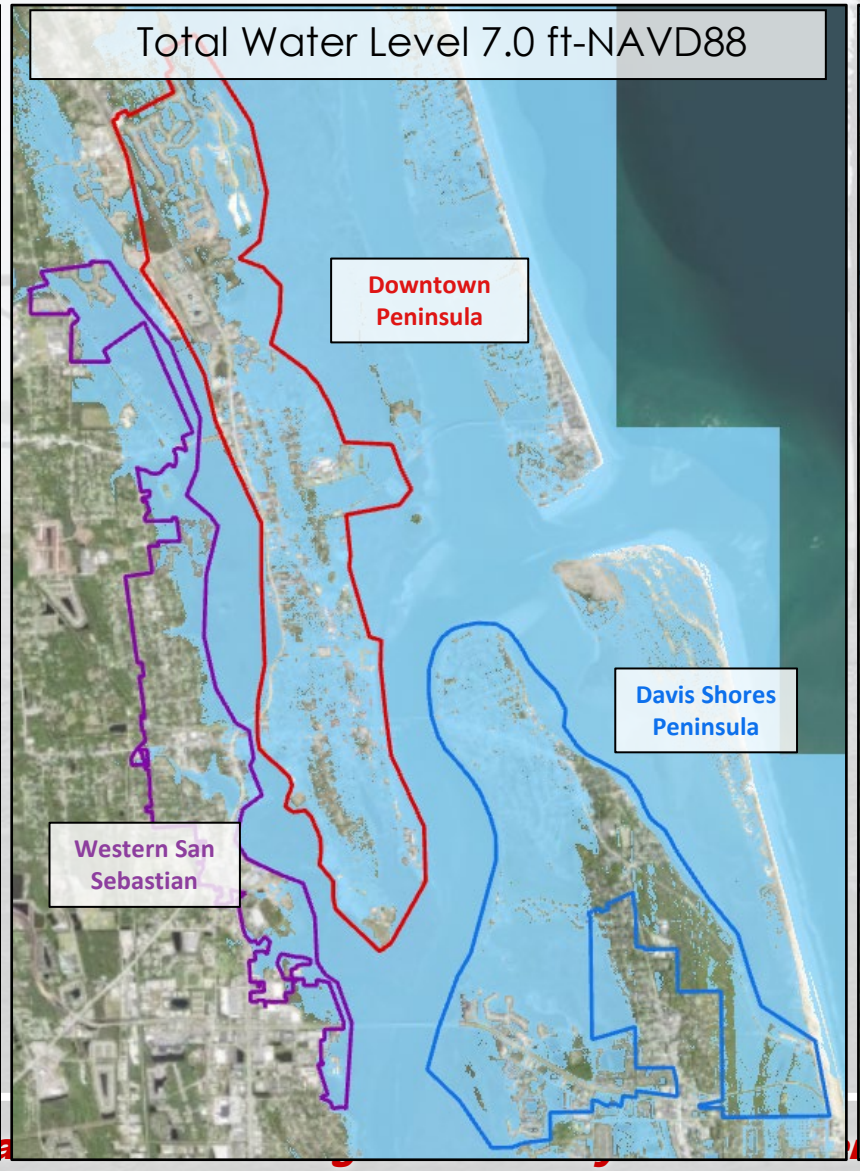

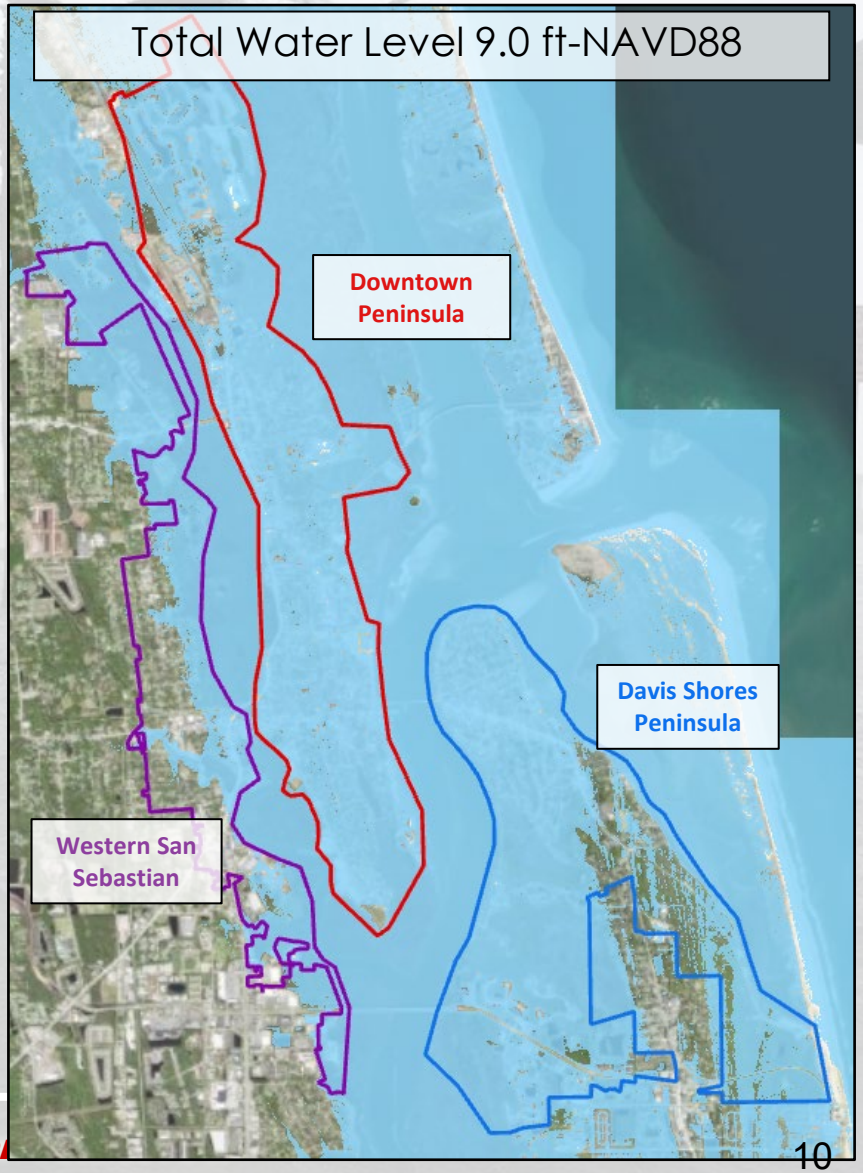

FUTURE COASTAL STORM SIMULATION

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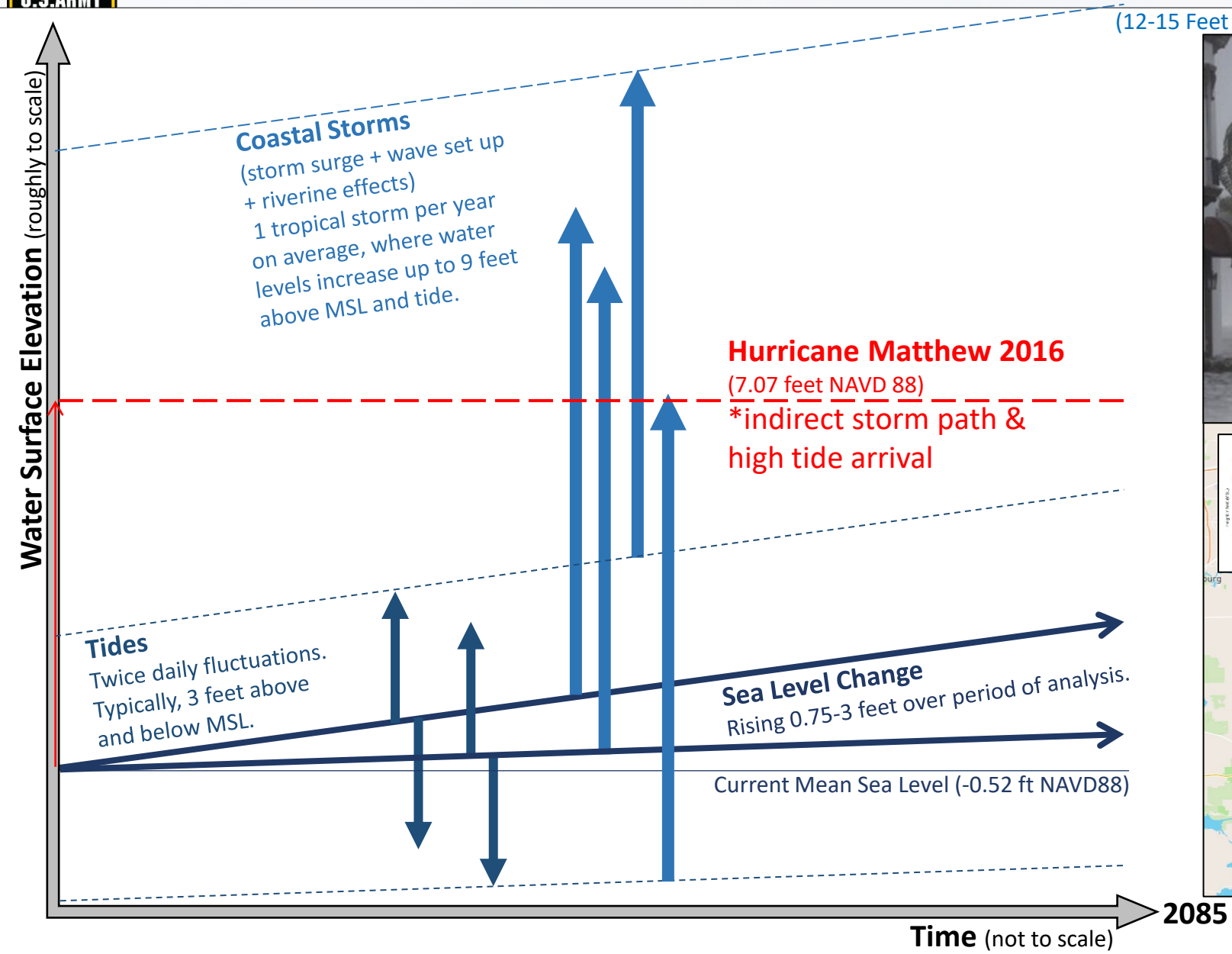
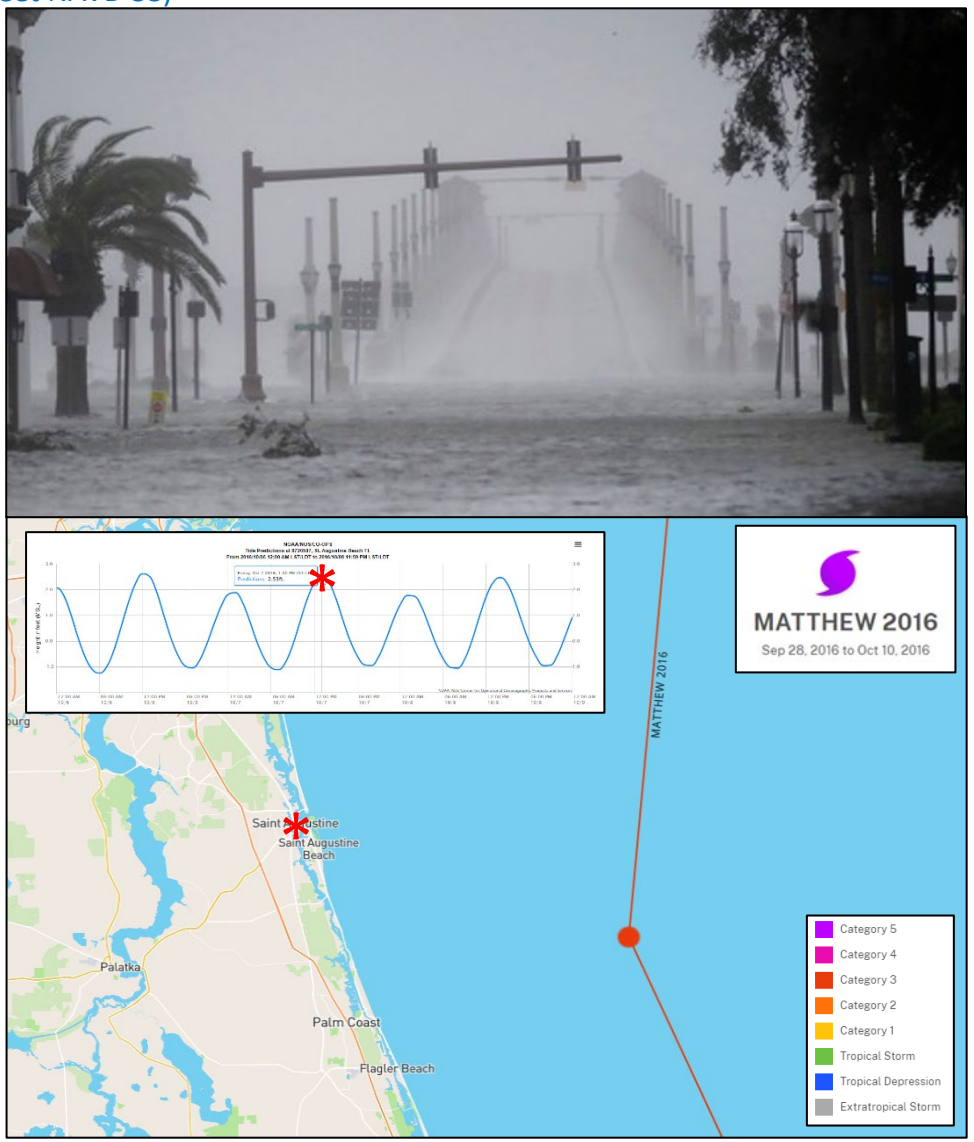




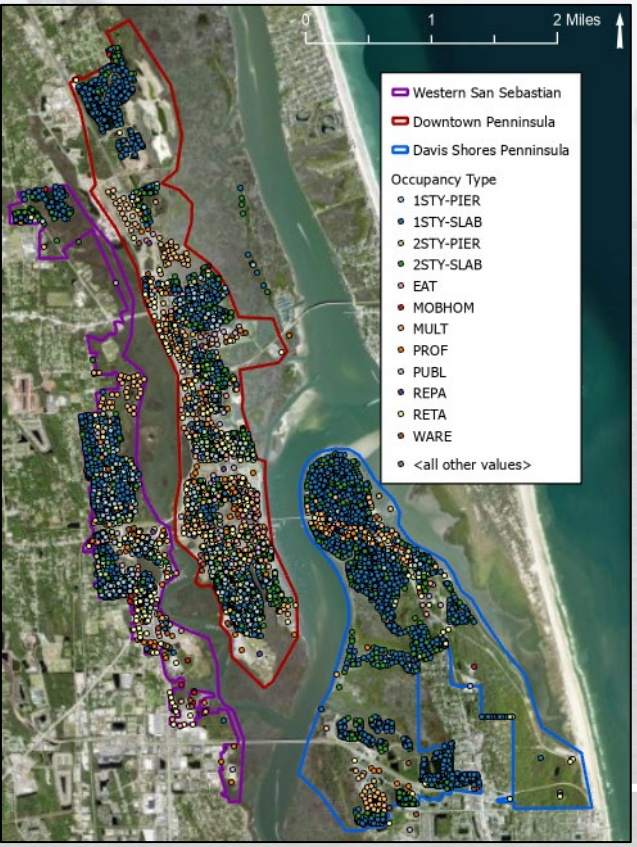
FUTURE WITHOUT PROJECT (FWOP) MODELING

ECONOMICS – ASSET INVENTORY

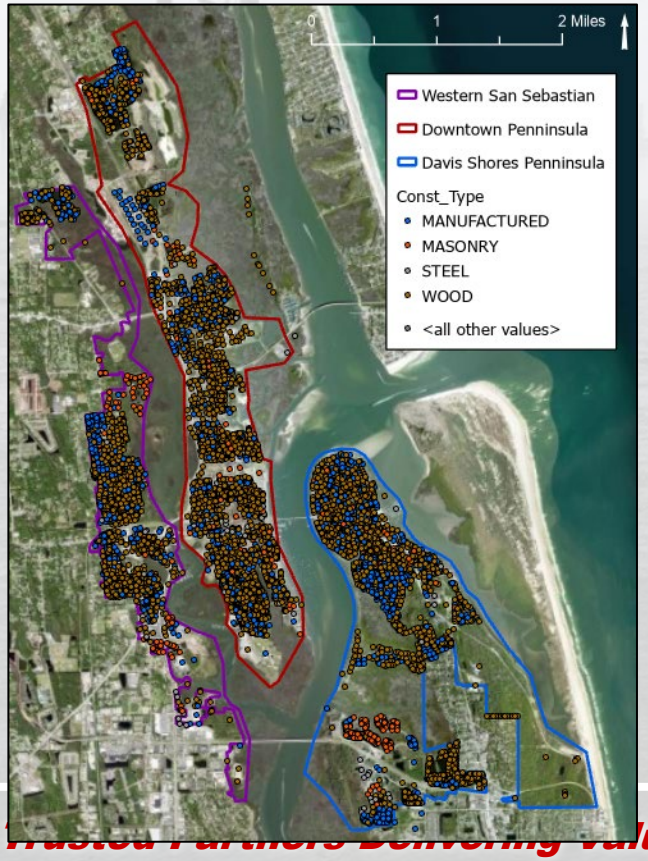
Area	Count	Structure Value	Content Value	Total
City of St. Augustine	8,264	$ 3.3 Billion	$ 2.1 Billion	**$ 5.4 Billion**
Western San Sebastian	1,891	$ 535 Million	$ 356 Million	$ 891 Million
Downtown Peninsula	3,856	$ 1.9 Billion	$ 1.2 Billion	$ 3.1 Billion
Davis Shore Peninsula	2,517	$ 876 Million	$ 523 Million	$ 1.4 Billion
Auto	9,653	$ 100 Million		

Structure distribution by …

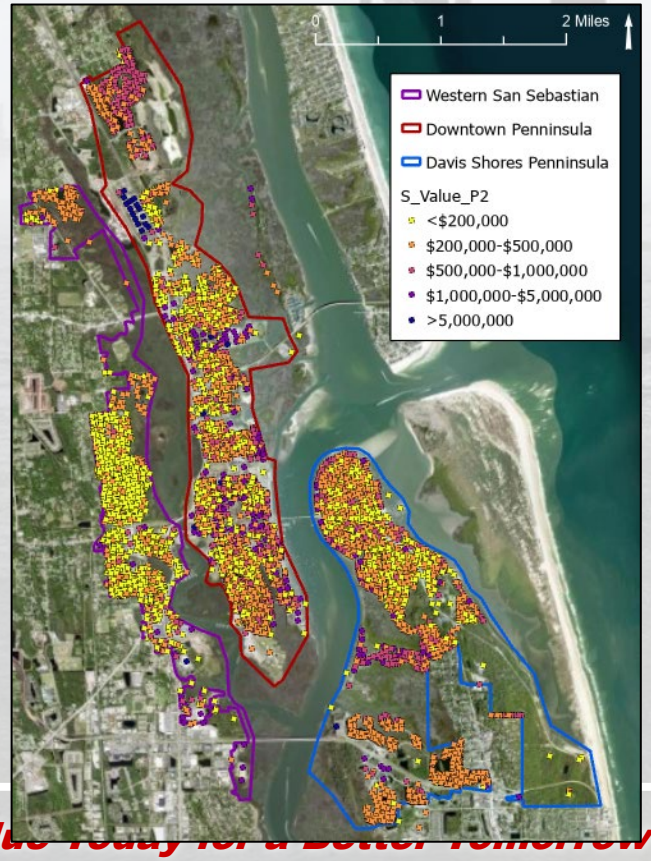
Occupancy Type



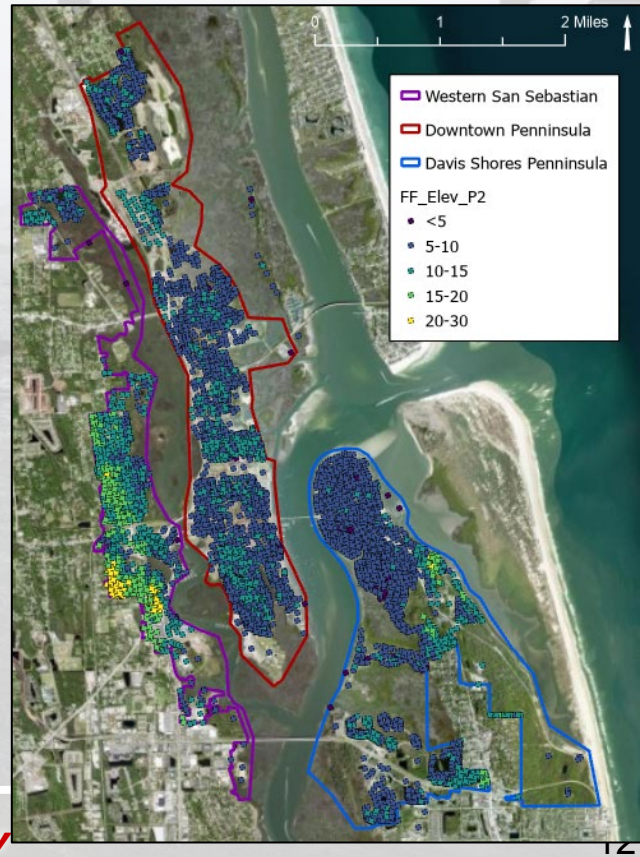
Construction Type



Replacement Value



First Floor Elevation



FUTURE WITHOUT PROJECT (FWOP) MODELING

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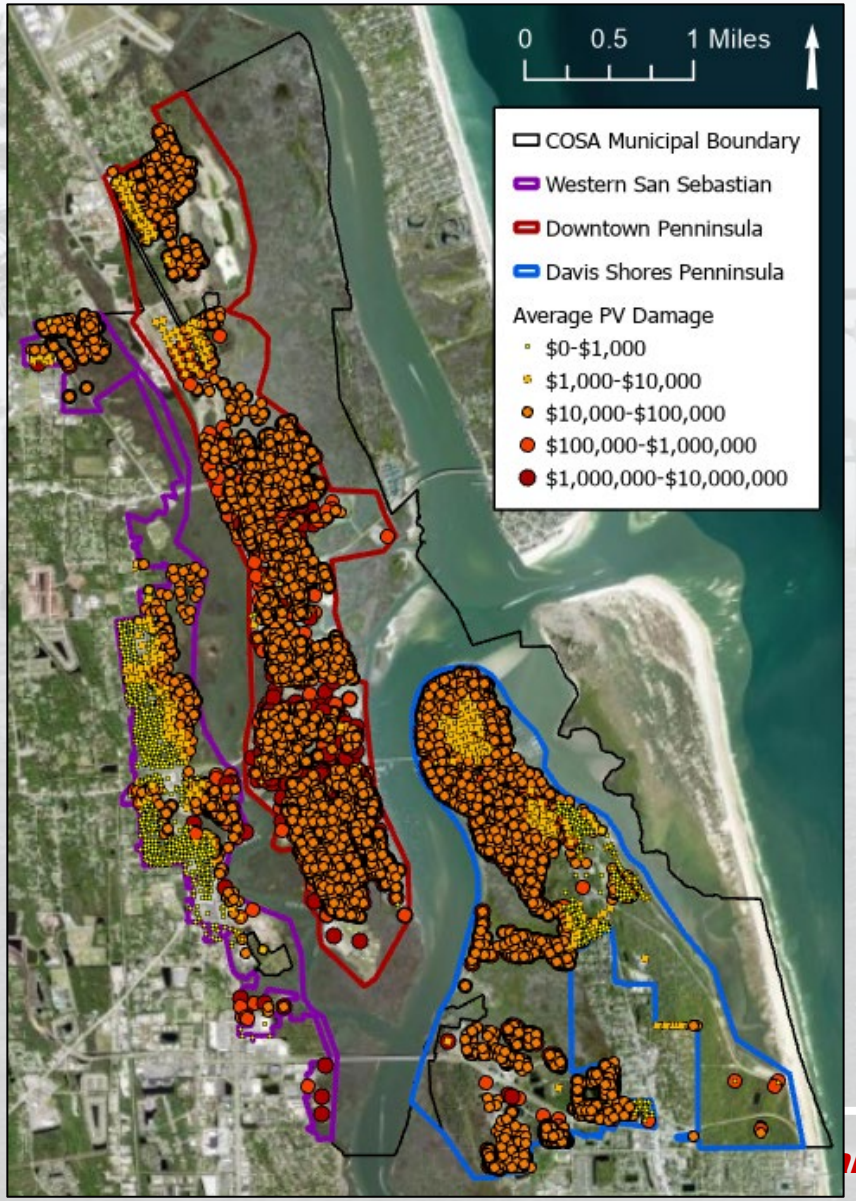
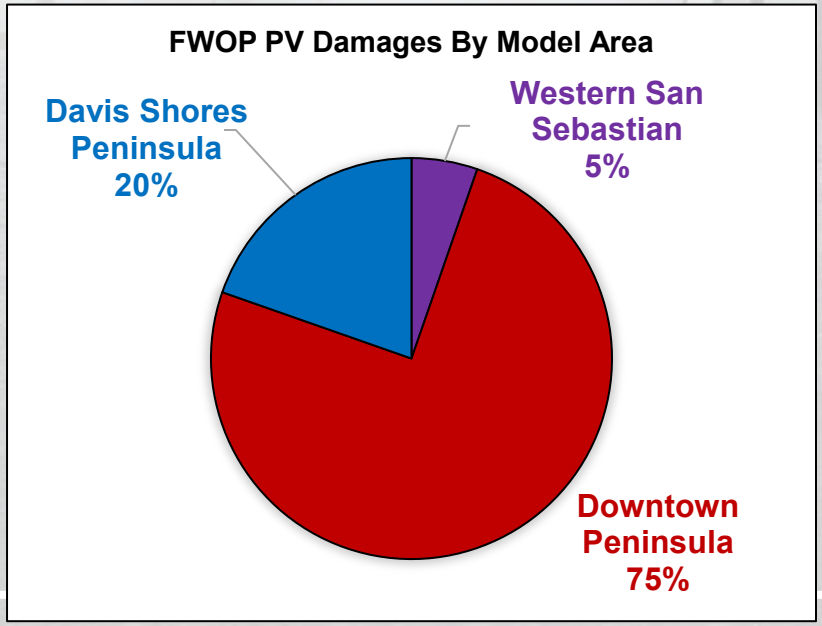
ECONOMICS – FWOP RESULTS OVERVIEW

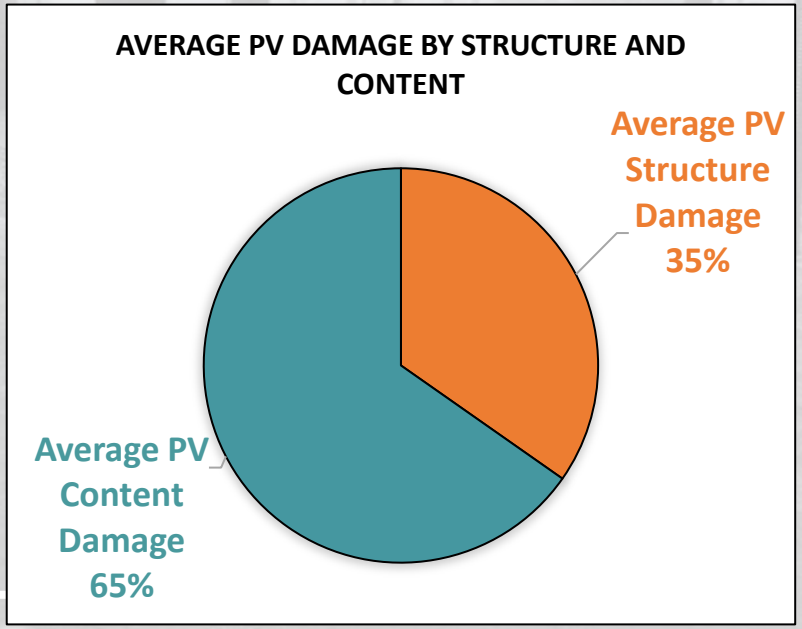


FWOP NED Damages Through 2084 in the City of St. Augustine

Sea Level Change Scenario	Low	Intermediate	High
Estimated **Average** Present Value (PV) Damage	**$ 3.3 Billion**	**$ 4.1 Billion**	**$ 8.3 Billion**
Estimated Minimum PV Damages	> $ 600 Million	> $ 800 Million	> $ 3 Billion
Estimated Maximum PV Damages	< $ 9 Billion	< $ 11 Billion	< $ 16 Billion

Note: Values based on 100 iterations simulated in G2CRM.



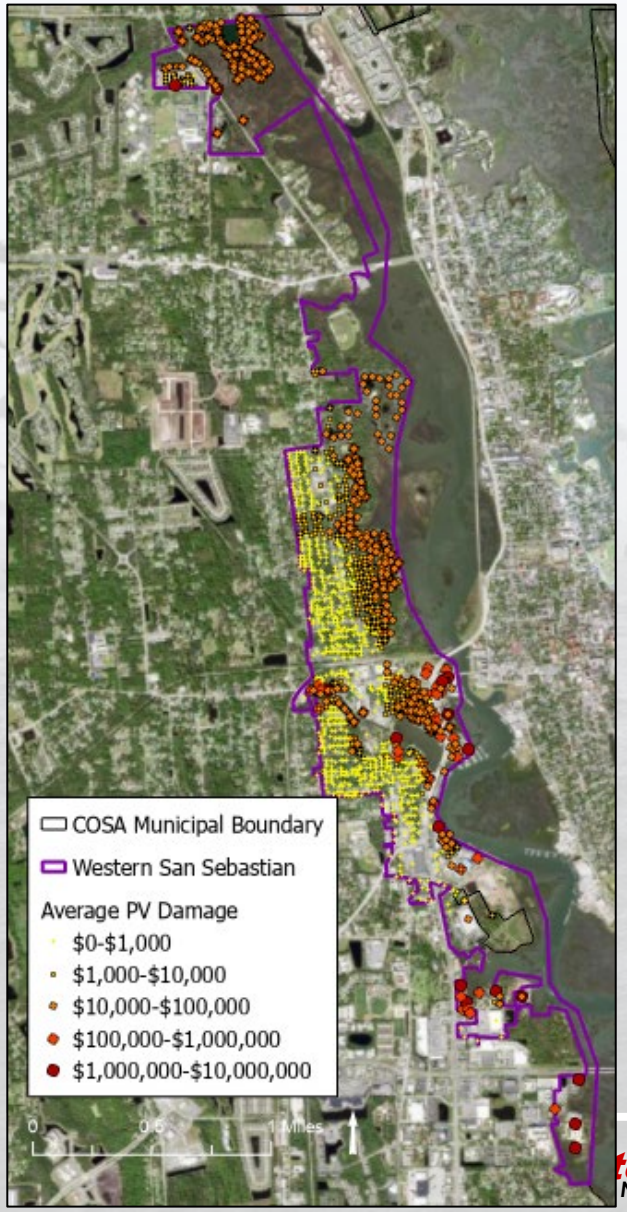


Note: Values in figures based on USACE Intermediate SLC scenario and 100 iterations simulated in G2CRM.

FUTURE WITHOUT PROJECT (FWOP) MODELING

BUILDING STRONG

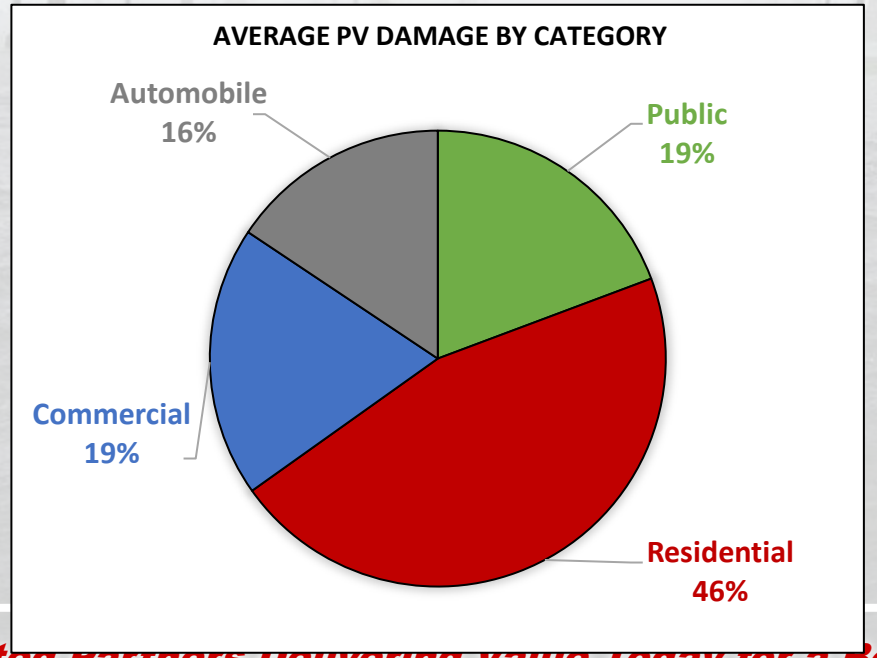
ECONOMICS – WESTERN SAN SEBASTIAN FWOP RESULTS

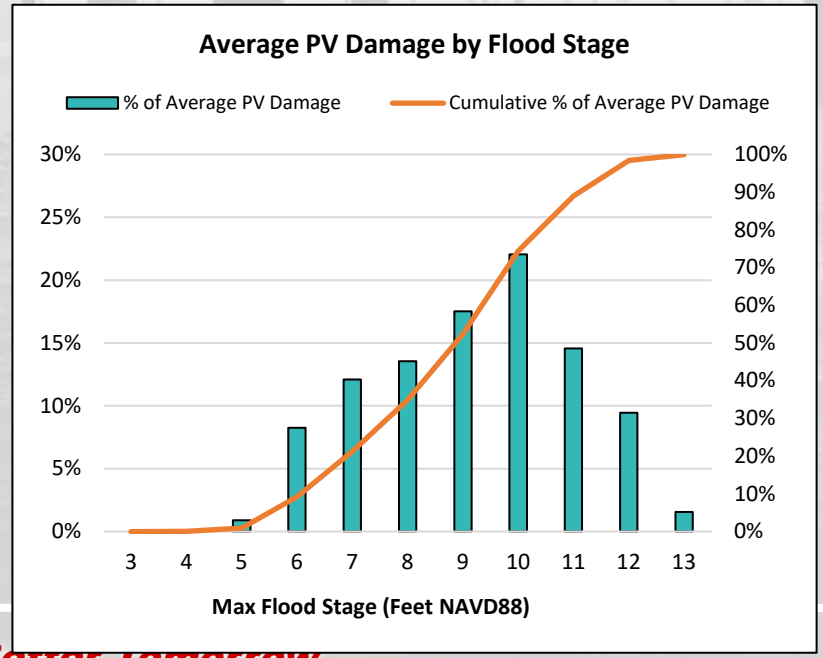


FWOP NED Damages Through 2084

Sea Level Change Scenario	Low	Intermediate	High
Estimated **Average** Present Value (PV) Damage	**$ 182 Million**	**$ 225 Million**	**$ 441 Million**
Estimated Minimum PV Damages	> $ 33 Million	> $ 46 Million	> $ 145 Million
Estimated Maximum PV Damages	< $ 420 Million	< $ 480 Million	< $ 800 Million

Note: Values in above table based on 100 iterations simulated in G2CRM.



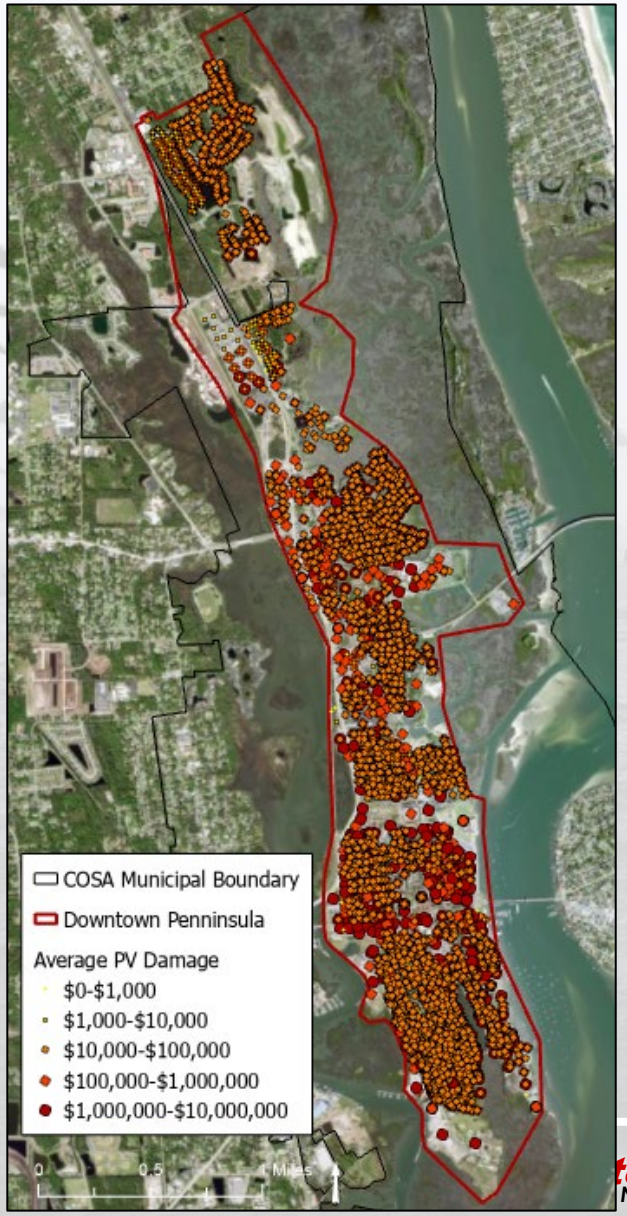


Note: Values in figures based on USACE intermediate SLC scenario and 100 iterations simulated in G2CRM.

FUTURE WITHOUT PROJECT (FWOP) MODELING

BUILDING STRONG

ECONOMICS – DOWNTOWN PENINSULA FWOP RESULTS

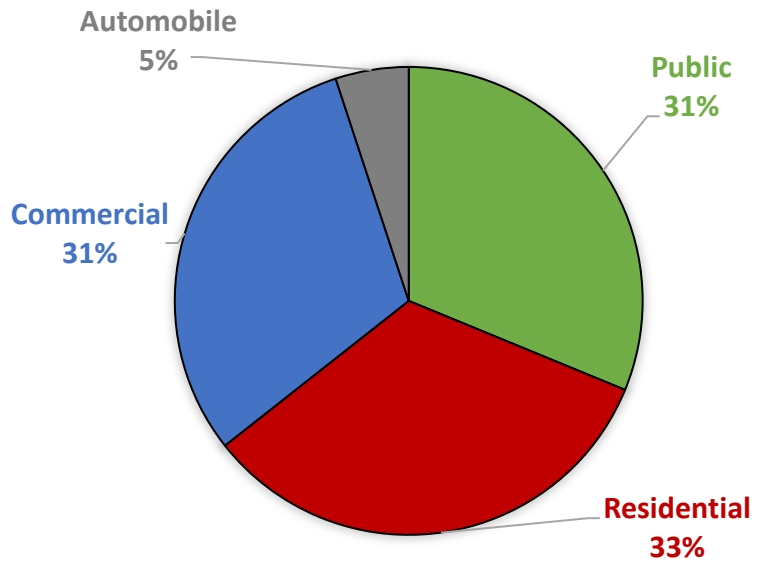


FWOP NED Damages Through 2084

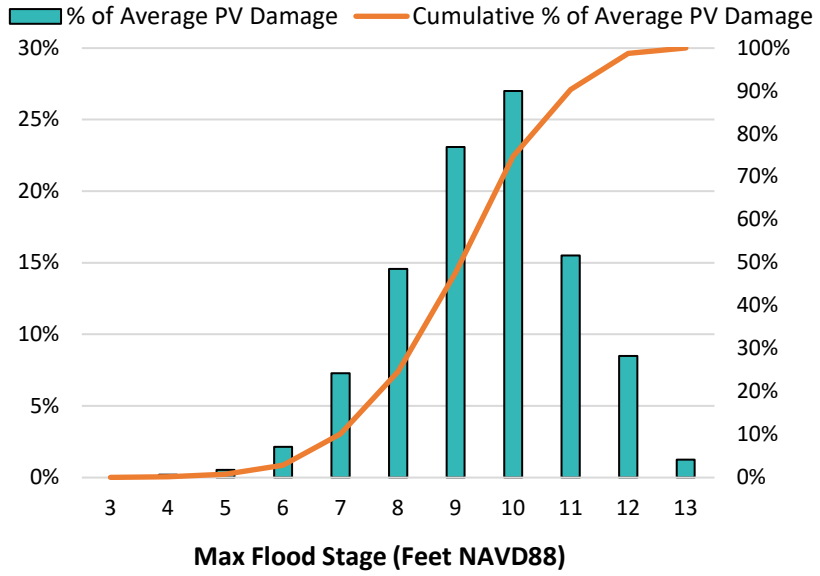
Sea Level Change Scenario	Low	Intermediate	High
Estimated **Average** Present Value (PV) Damage	**$ 2.5 Billion**	**$ 3.1 Billion**	**$ 6.3 Billion**
Estimated Minimum PV Damages	> $ 470 Million	> $ 600 Million	> $ 2 Billion
Estimated Maximum PV Damages	< $ 6.7 Billion	< $ 8 Billion	< $ 12 Billion

Note: Values based on 100 iterations simulated in G2CRM.

AVERAGE PV DAMAGE BY CATEGORY



Average PV Damage by Flood Stage



Note: Values in figures based on USACE intermediate SLC scenario and 100 iterations simulated in G2CRM.

FUTURE WITHOUT PROJECT (FWOP) MODELING

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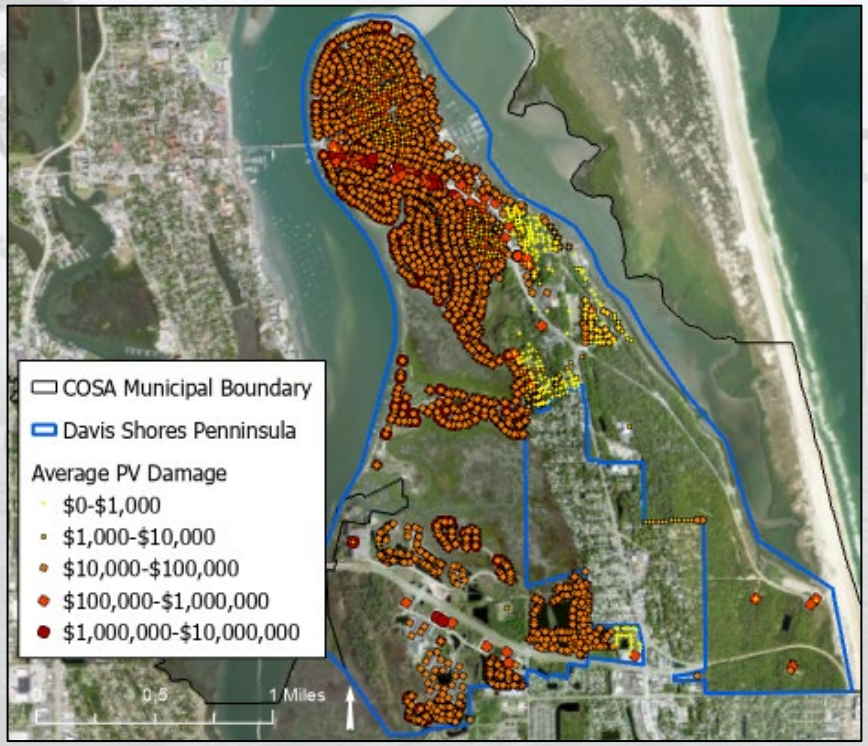
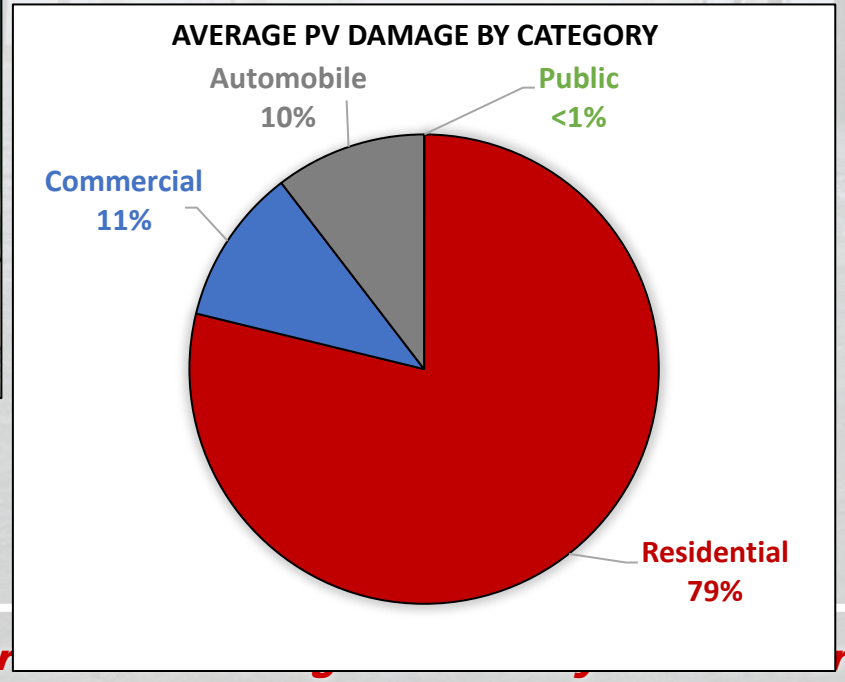
ECONOMICS – DAVIS SHORES PENINSULA FWOP RESULTS

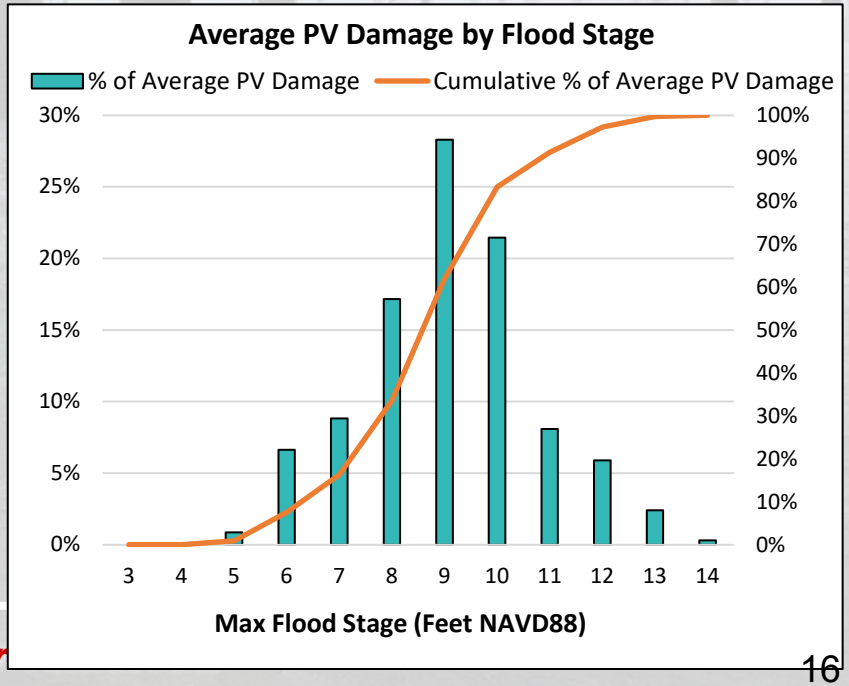


FWOP NED Damages Through 2084

Sea Level Change Scenario	Low	Intermediate	High
Estimated **Average** Present Value (PV) Damage	**$ 656 Million**	**$ 811 Million**	**$ 1.6 Billion**
Estimated Minimum PV Damages	> $100 Million	> $ 160 Million	> $ 800 Million
Estimated Maximum PV Damages	< $ 1.5 Billion	< $ 2 Billion	< $ 3 Billion

Note: Values based on 100 iterations simulated in G2CRM.





Note: Values in figures based on USACE intermediate SLC scenario and 100 iterations simulated in G2CRM.

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ENVIRONMENTAL RESOURCES UPDATE

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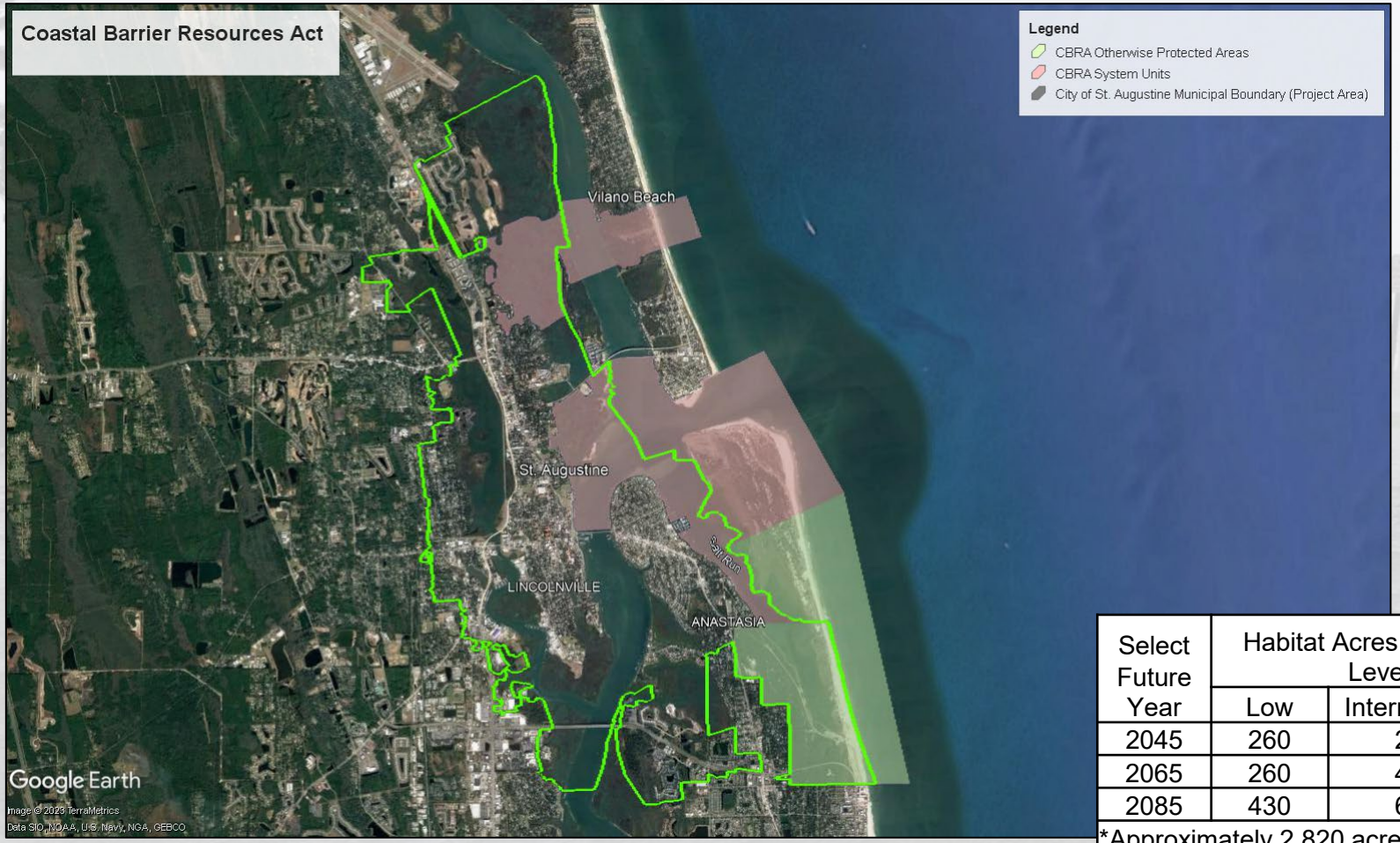
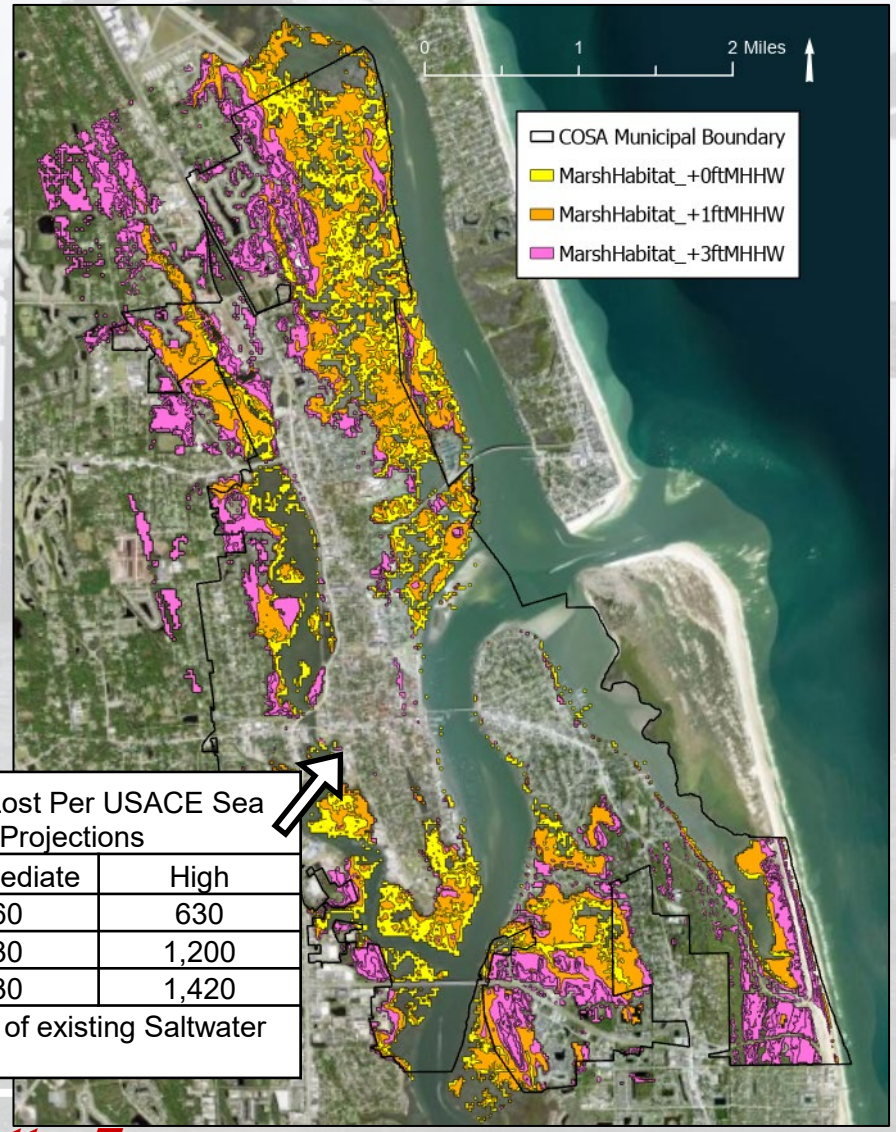
Coastal Barrier Resources Act (CBRA) Considerations



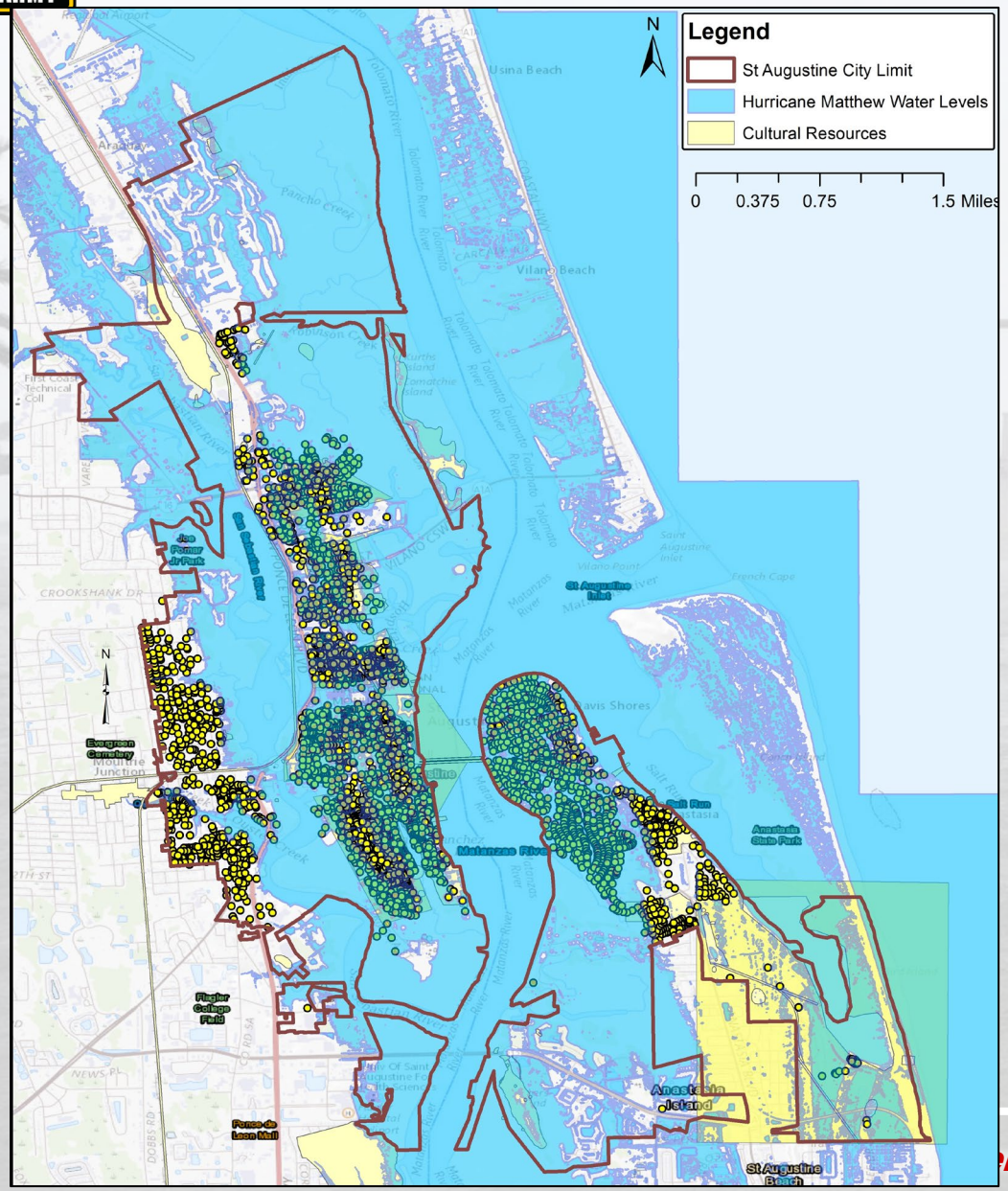
Marsh Migration Analysis



Select Future Year	Habitat Acres Lost Per USACE Sea Level Projections		
	Low	Intermediate	High
2045	260	260	630
2065	260	430	1,200
2085	430	630	1,420

*Approximately 2,820 acres of existing Saltwater Marsh in the Study Area.

CULTURAL RESOURCES UPDATE



- Utilized Florida Master Site File (FMSF) to review various types of cultural resources to create an inventory of existing resources within study area
  - Including archaeological sites, cemeteries, structures, bridges and National Historic Landmarks and Districts
- Utilized St. Johns County Tax Appraisal date to review additional structures built prior to 1982 (50 years + estimated construction) that may be eligible for listing in the National Register of Historic Places (NRHP) and not listed in the FMSF
- Results allow us to:
  - Illustrate existing condition of resources that will be impacted in the future without project (FWOP)
  - Evaluate damages to historic properties

A TWO-PART PROCEDURE

- Management Classification System (MCS)
  - Identify the regional landscape and similarity zones.
  - Select assessment points for the MCS.
  - Inventory/assess existing visual resource conditions.
  - Determine the MCS class.

- Visual Impact Assessment (VIA)
  - Select viewpoints for the VIA procedure.
  - Forecast without project conditions to assess any changes from existing visual resource conditions.
  - Forecast with project conditions.
  - Use simulations to show designs of alternatives.
  - Assess visual impacts to obtain a single VIA Value for the landscape components and the landscape modifiers.

REPRESENTATIVE ASSESSMENT POINTS

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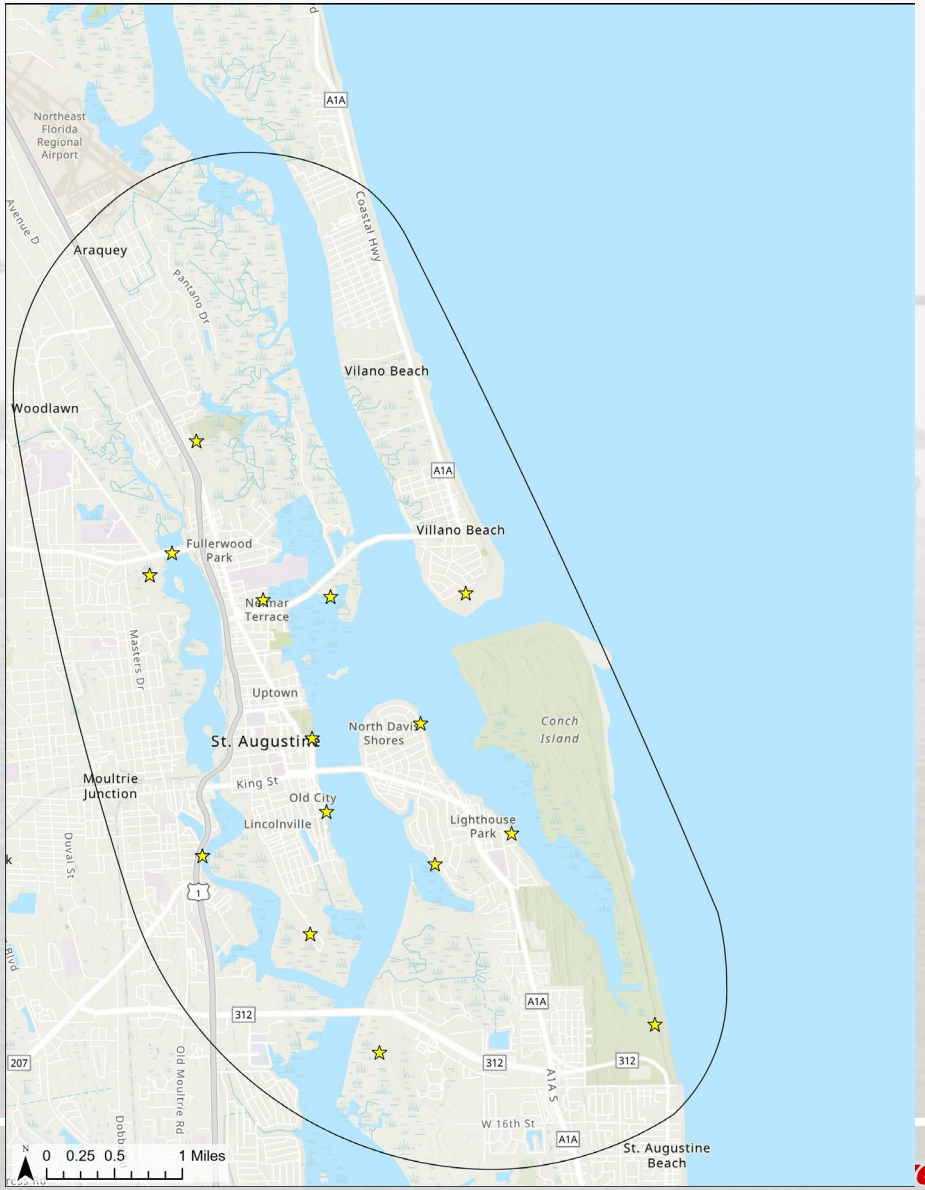

- Team
  - 2 City Representatives
  - 3 US Army Corps of Engineers
- Team Identified Zones
- Identified Representative Assessment Points
- On Site Views of Baseline Conditions

VISUAL OF ASSESSMENT POINTS

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Fort Mose

Nelmar Terrace Park

Castillo de San Marcos National Monument

Avenida Menendez

Avenida Menendez

Dr. Robert B. Hayling Freedom Park

VISUAL OF ASSESSMENT POINTS

Charles Usinas Memorial Hwy Bridge

Joe Pomar, Jr. Park

River Road Dining Area

Inlet Drive

Coquina Park

Lighthouse Park Boat Ramp

VISUAL OF ASSESSMENT POINTS

BUILDING STRONG

Fish Island Preserve

Anastasia State Park

Vilano Beach

Vilano Boat Ramp

SIMILARITY ZONES AND ASSESSMENT POINTS

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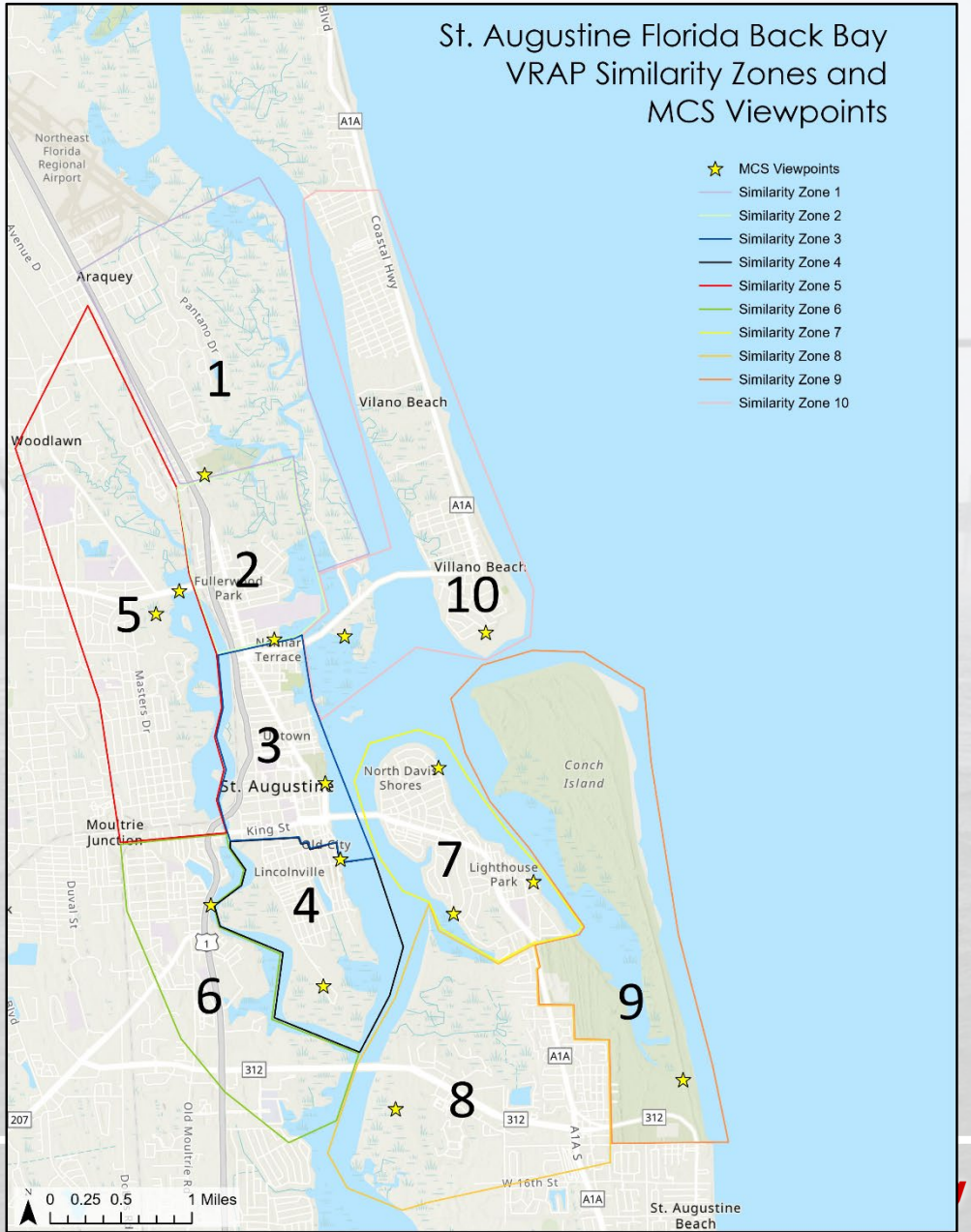
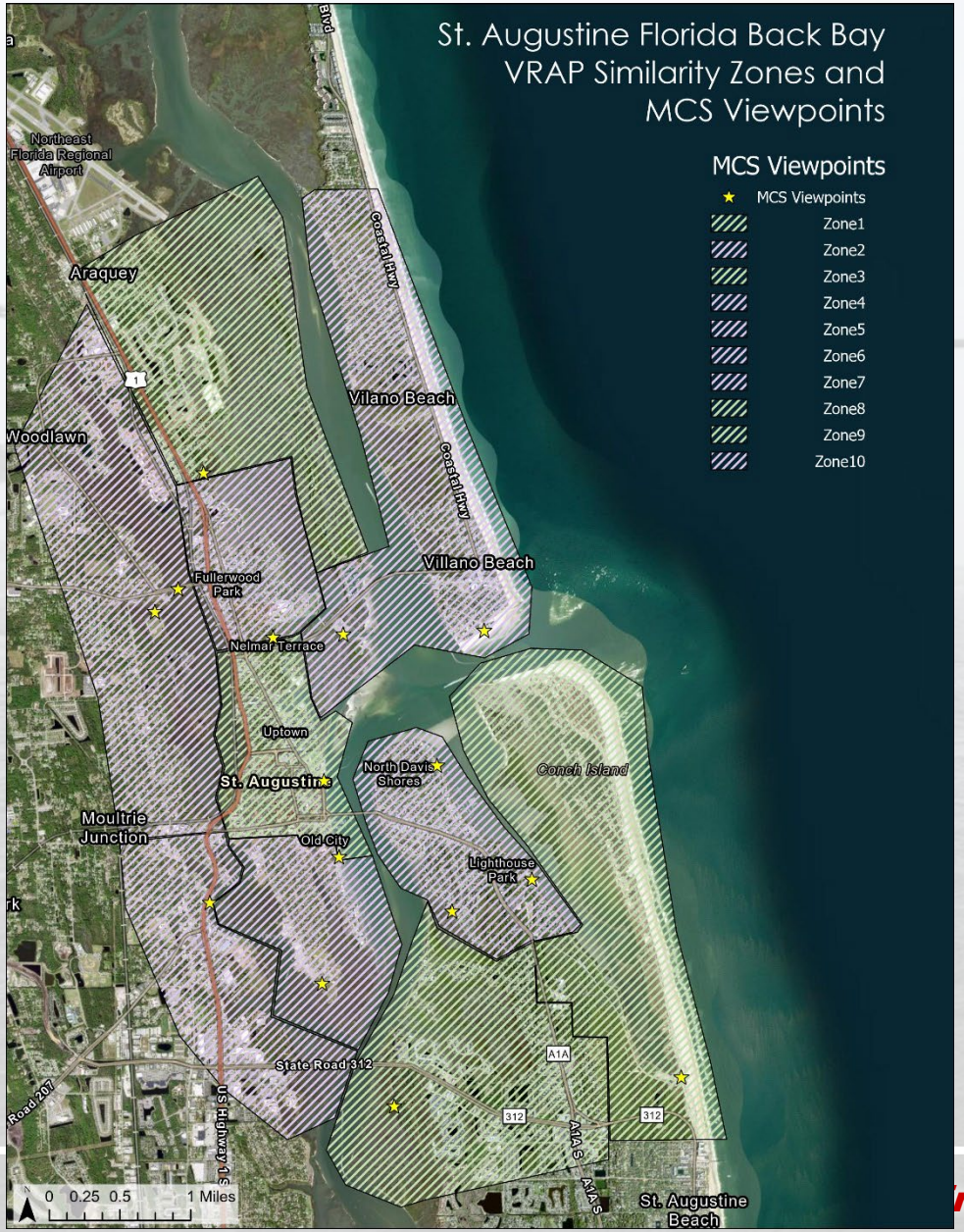


- Water Resources
- Landform
- Vegetation
- Land Use
- User Activity
- Special Considerations
  - Cultural or Historic Landmarks
  - Distinct Visual Quality or Wildlife Observation
  - Pollution Free

RESULTS



Representative Assessment Points	Similarity Zones	Final Scores	MCS Classifications
Fort Mose	Zone 1	17	Preservation
Nelmar Park	Zone 2	15	Retention
The Fort Avendia Menendez	Zone 3	17	Preservation
RB Hayling	Zone 4	15	Retention
16A Polmar	Zone 5	14	Retention
River Road	Zone 6	14	Retention
Coquina Lighthouse Inlet Drive	Zone 7	16	Retention
Fish Island	Zone 8	17	Preservation
Anastasia Park	Zone 9	18	Preservation
Vilano Beach Vilano Boat Ramp	Zone 10	16	Retention

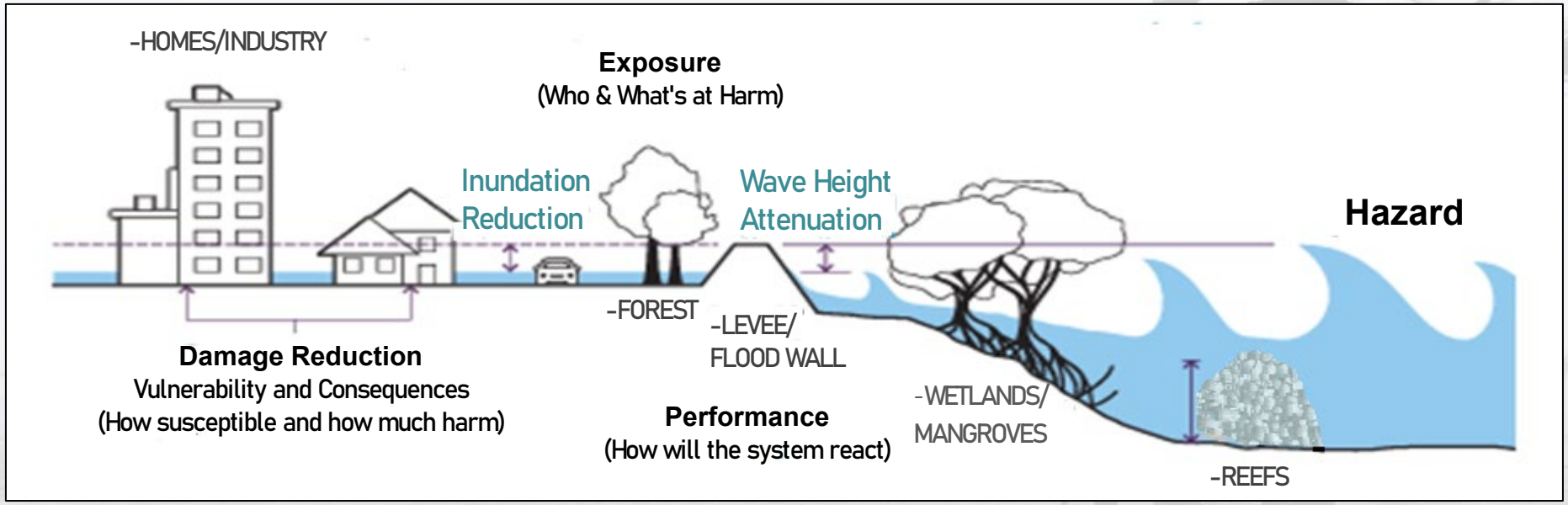
Preservation:
- Highly valued and are often protected by Federal and State policies and laws.
- **Project activity should not be readily evident**

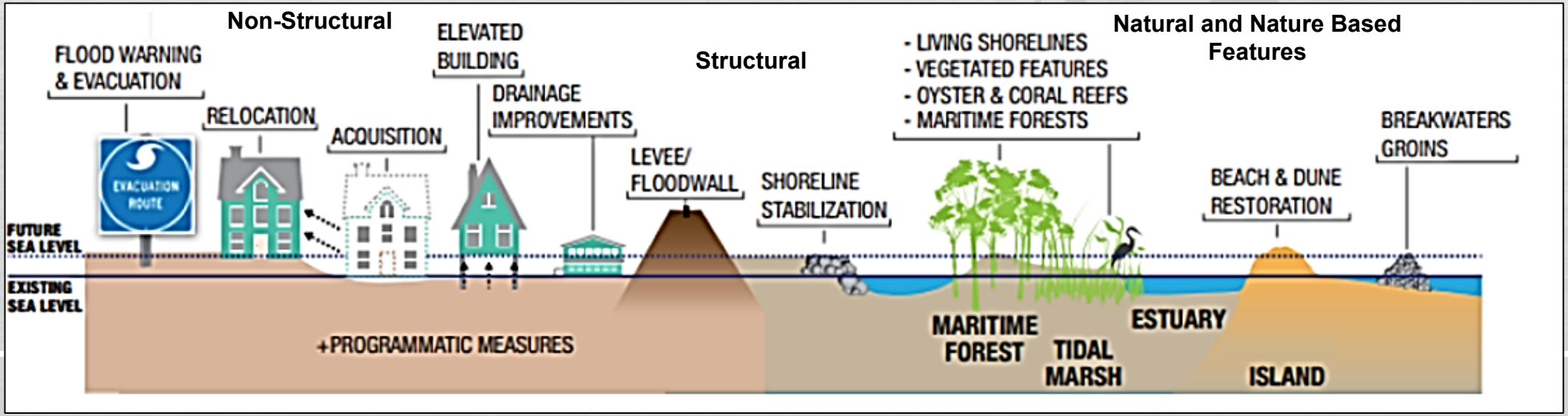
Retention:
- Regionally recognized as having distinct visual quality but may not be institutionally protected
- **Project activity may be evident but should not attract attention**

ALTERNATIVE CONSIDERATIONS

BUILDING STRONG

Hazard Pathway



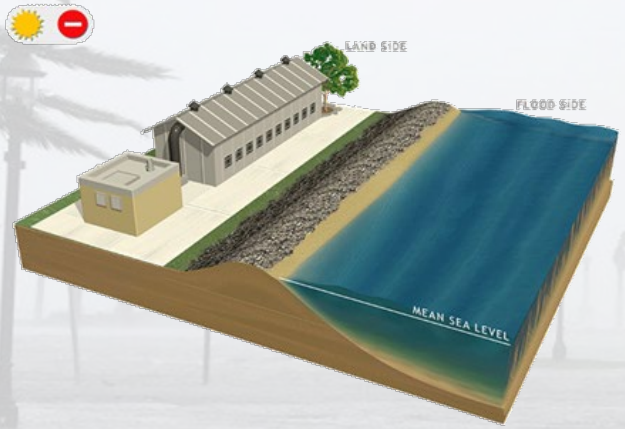


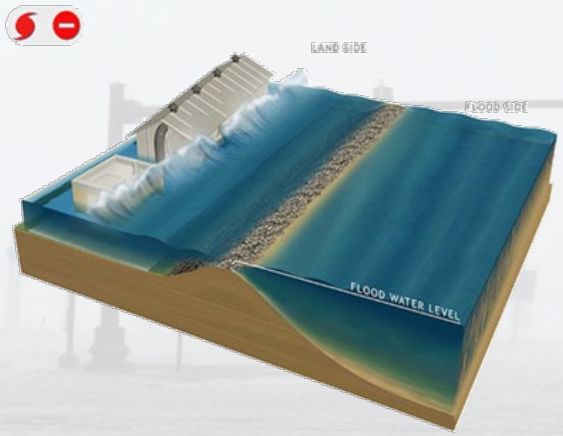
ALTERNATIVE CONSIDERATIONS

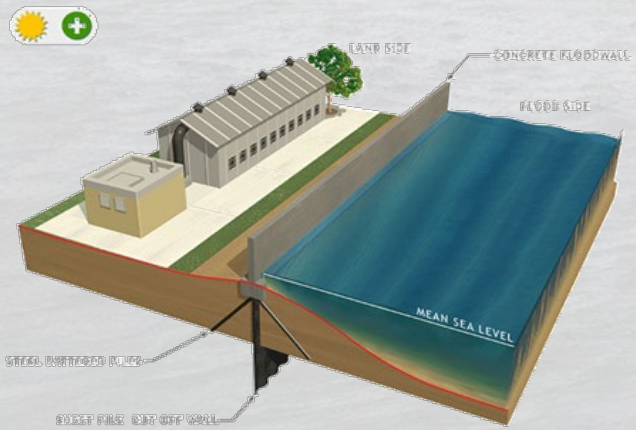
BUILDING STRONG

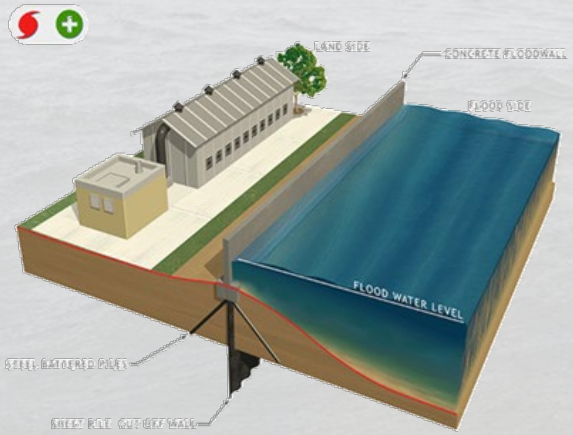
Structural Examples: Flood Walls and Levees

Flood Walls

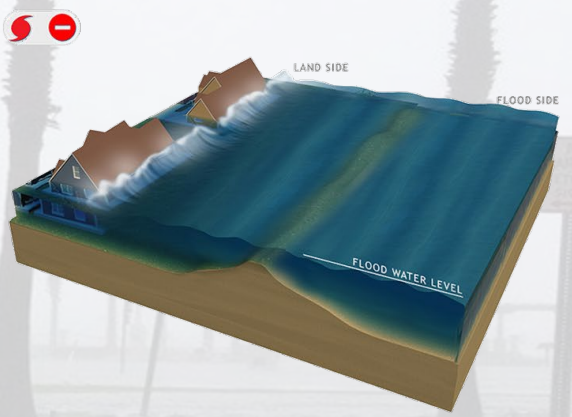


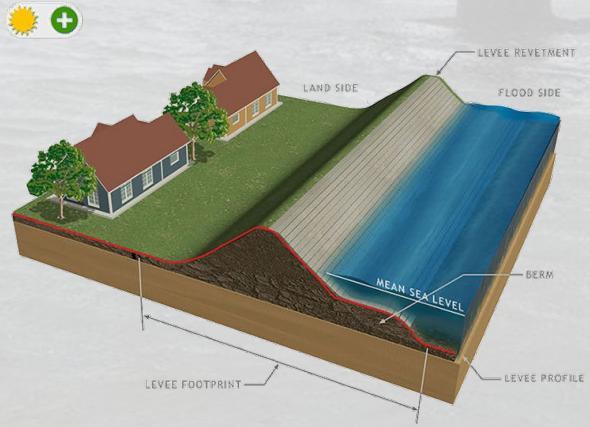


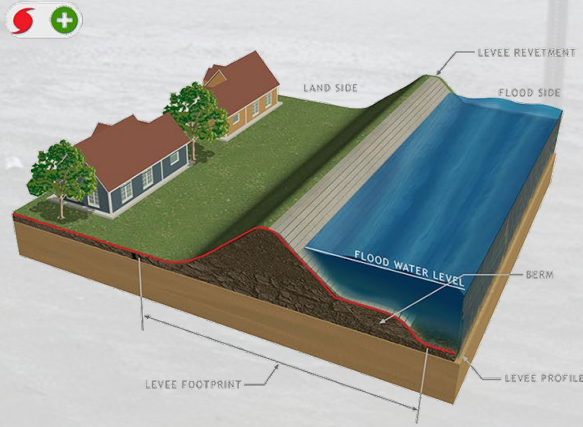




Levees



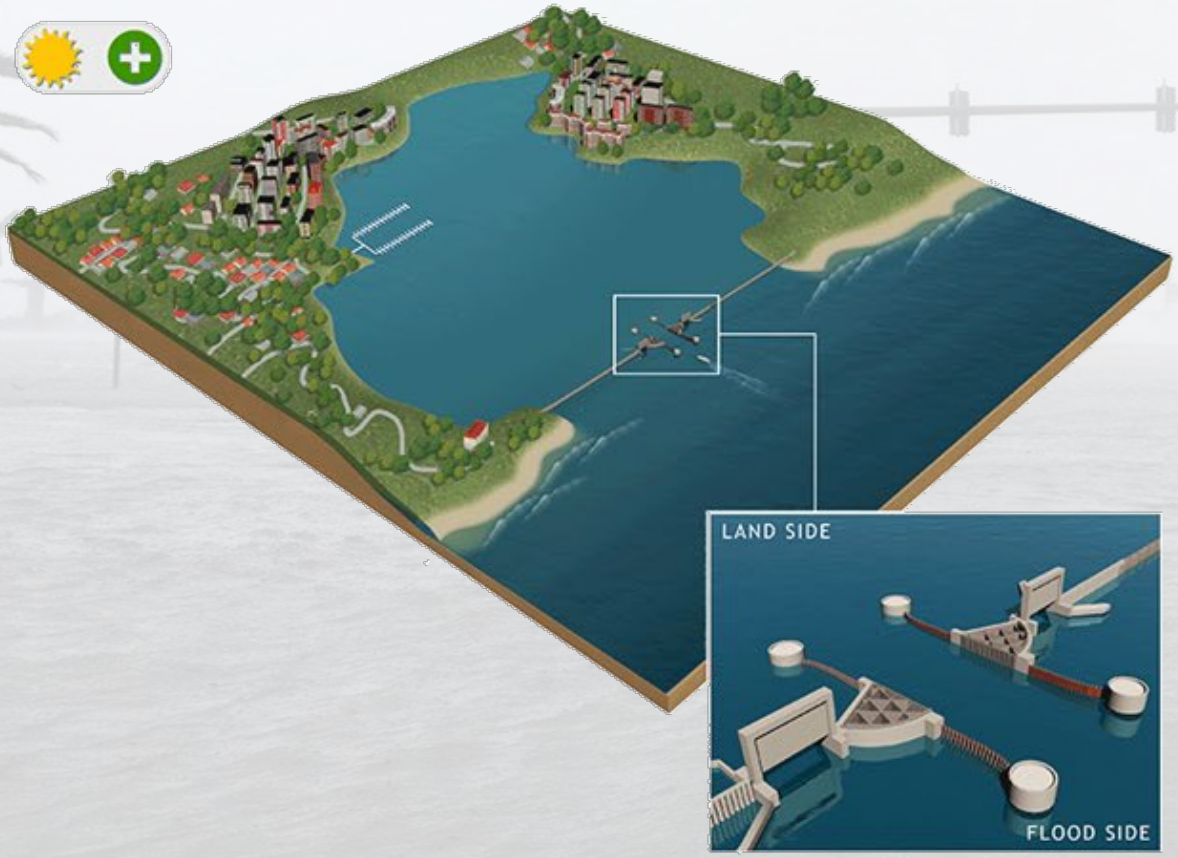


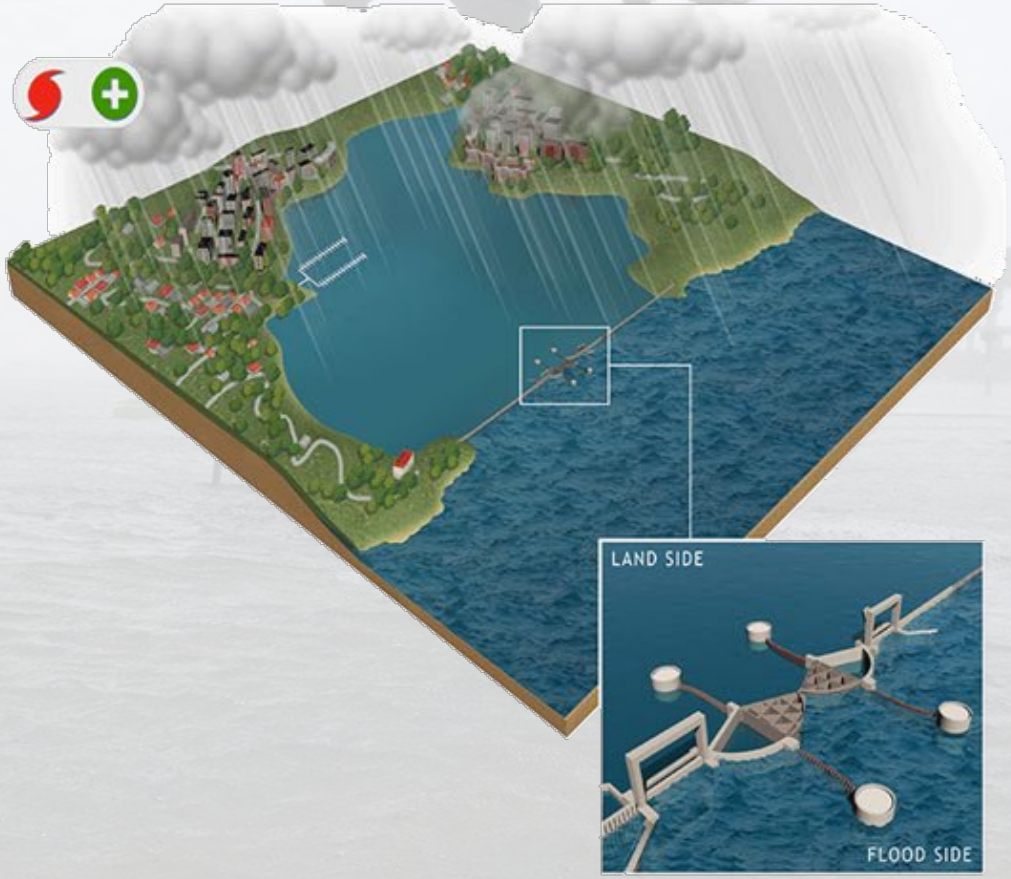


ALTERNATIVE CONSIDERATIONS

BUILDING STRONG

Structural Examples: Storm Surge Barriers and Flood Gates



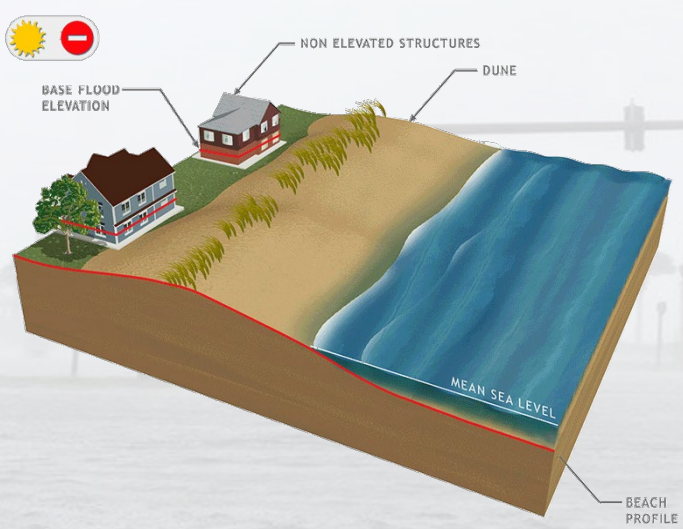


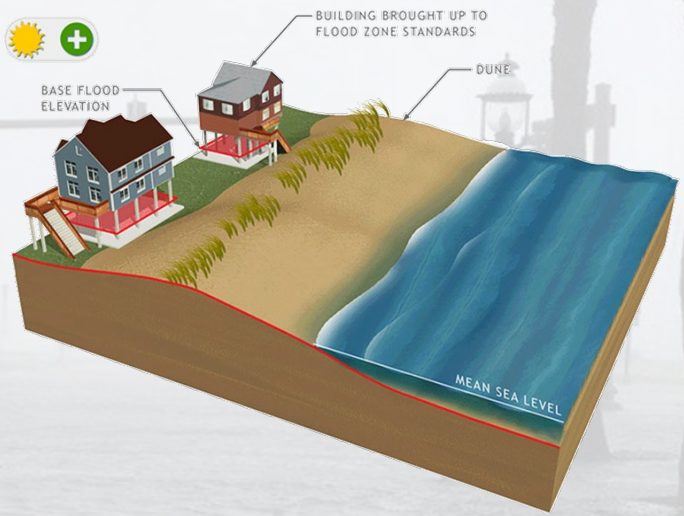
ALTERNATIVE CONSIDERATIONS

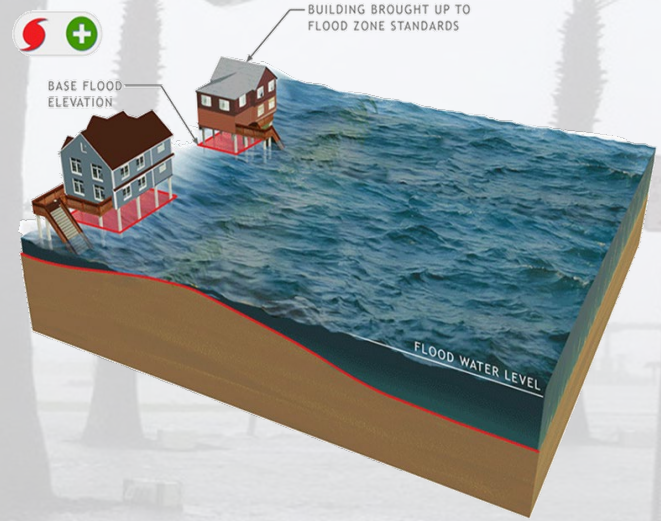
BUILDING STRONG

Non-Structural Examples: Elevating Structures, Floodproofing, Ring Walls, Acquisition/Relocation

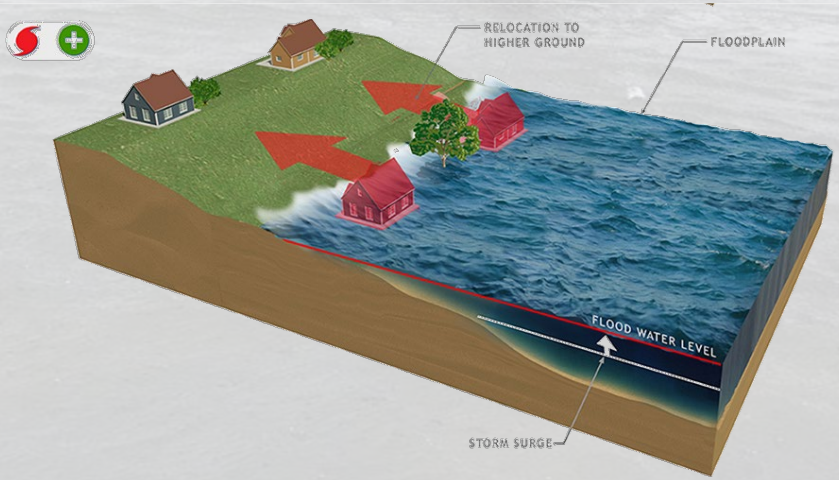
Elevating and Floodproofing Structures







Acquisition/ Relocation

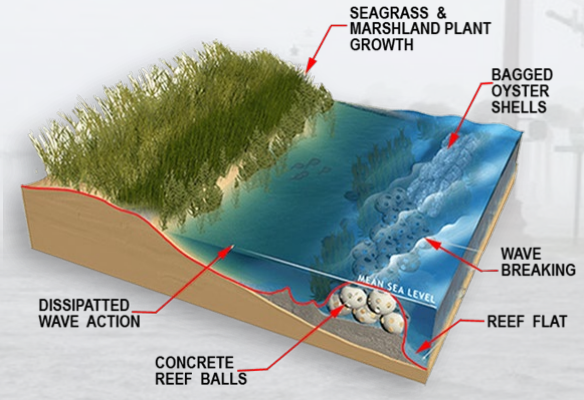


ALTERNATIVES EVALUATION

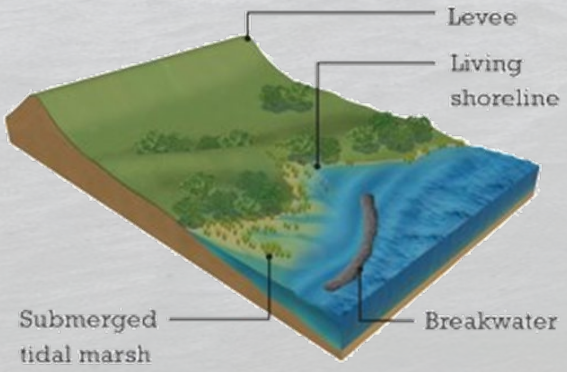
BUILDING STRONG

Natural and Nature Based:

...are landscape features that are used to provide engineering functions relevant to flood risk management, while producing additional economic, environmental, and/or social benefits.



CALM BEFORE THE STORM
PREPARE • RESIST
Combine nonstructural and structural measures to deliver a full array of ecosystem goods and services.



THE STORM
RECOVER • ADAPT
NNBF features can help attenuate waves offering improved flood protection during storms

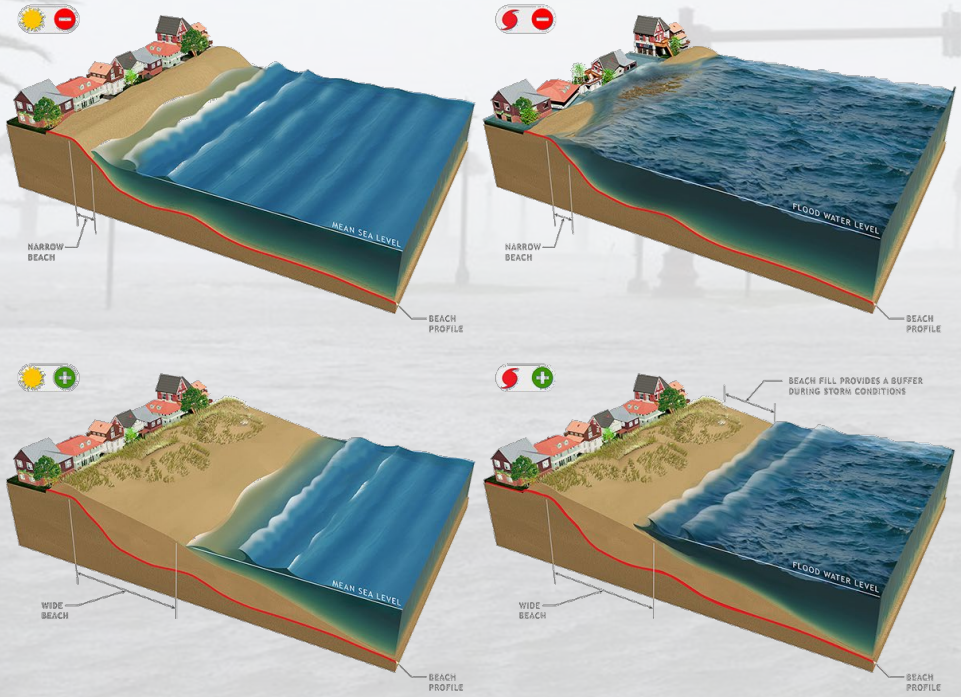
https://ewn.erdc.dren.mil/natural-nature-based-features/

ALTERNATIVE CONSIDERATIONS

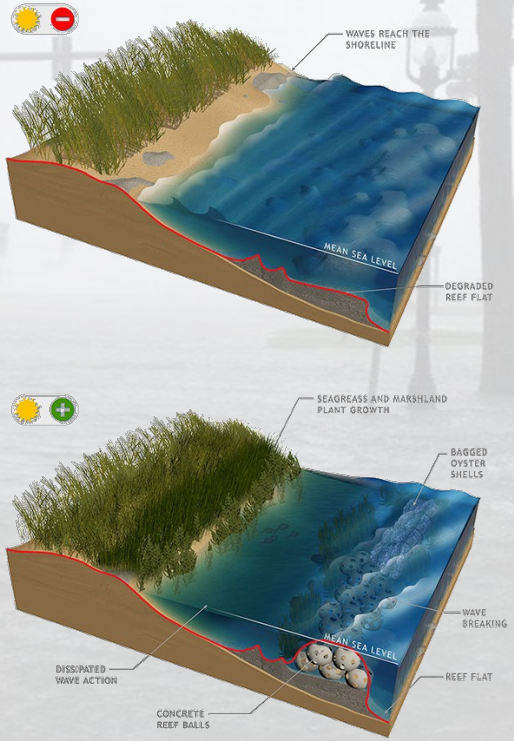
BUILDING STRONG

Natural and Nature Based Examples: Beaches and Dunes, Reefs, Tidal Flats, Wetlands/Mangroves, Coastal Forest

Beaches and Dunes



Tidal Flats and Reefs



Wetlands/Mangroves

PATH FORWARD

KEY SCHEDULE ACTIVITIES - LOOK AHEAD

BUILDING STRONG

Key Activities	Finish Date
FCSA Executed	1/9/2023
AMM Milestone Meeting	5/1/2023
Initial Flood Driver Screening (Scope Decision Point)	5/17/2023
End of FY23	9/30/2023
G2CRM FWOP Production Runs	2/21/2024
Establish Initial Array of Alternatives	8/21/2024
End of FY24	9/30/2024
G2CRM FWP Initial Alternatives Production Runs & Post Processing	5/15/2025
Establish Final Array of Alternatives (Scope Decision Point)	6/4/2025
G2CRM FWP Final Alternatives Production Runs & Post Processing	9/22/2025
End of FY25	9/30/2025
Identify National Economic Development (NED) Plan	12/22/2025
Identify Comprehensive Benefits Plan/Locally Preferred Plan (LPP)	3/17/2026
Identify the TSP	5/18/2026
End of FY26	9/30/2026
Exceptions/Waivers Approved by Assistant Secretary to the Army (ASA)	11/20/2026
TSP Milestone Meeting	2/2/2027
Release Draft Report for Concurrent Reviews	4/2/2027
End of FY27	9/30/2027
ADM Meeting	11/3/2027
Final Report Submittal Package to HQ	5/22/2028
Chief's Report Signature	9/15/2028

Complete

Ongoing

UPCOMING PUBLIC ENGAGEMENT

BUILDING STRONG

Dates	Events
April 24th, 2024 Starts @ 6:00pm	**In Person Public Workshop @ Willie Galimore Recreation Center – 399 Riberia St, St. Augustine, FL 32084**
May 16th, 2024 @ 1:00pm	Monthly Webinar
June 20th, 2024 @ 1:00pm	Monthly Webinar
July 18th, 2024 @ 1:00pm	Monthly Webinar
August 15th, 2024 @ 1:00pm	Monthly Webinar
September 19th, 2024 @ 1:00pm	Monthly Webinar
October 2024	**In Person Public Workshop Location TBD**

APRIL 24 WORKSHOP INPUT

BUILDING STRONG

Western San Sebastian

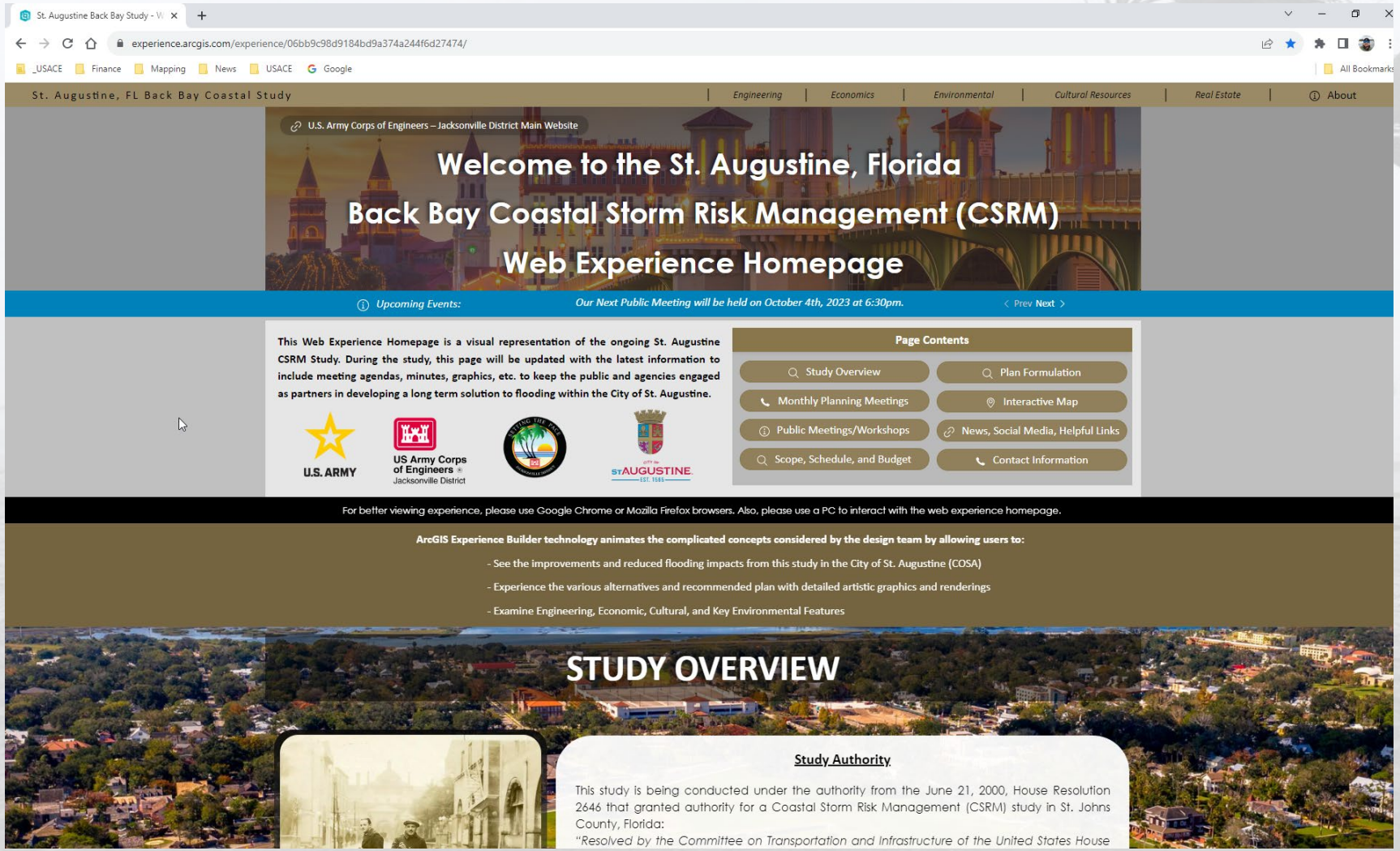
Downtown Peninsula

Davis Shores Peninsula

- Wall/Levee
- Surge Barrier/Flood Gate
- Nonstructural
- Natural & Nature Based Features (NNBF)

PUBLIC OUTREACH (STUDY WEBSITE)

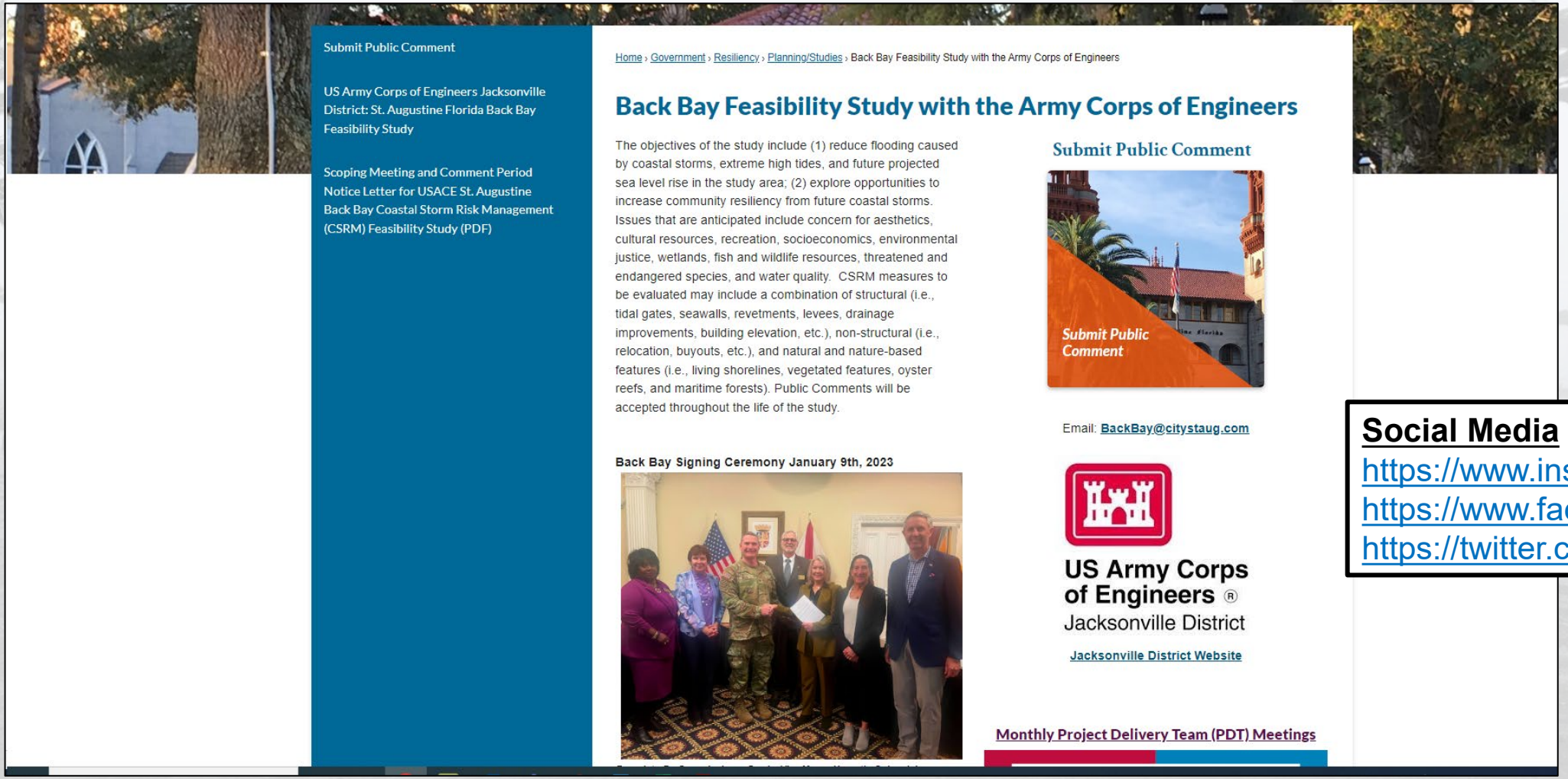
BUILDING STRONG



https://experience.arcgis.com/experience/06bb9c98d9184bd9a374a244f6d27474/

PUBLIC OUTREACH (SPONSOR SITES)

BUILDING STRONG



Social Media

https://www.instagram.com/citystaug/
https://www.facebook.com/citystaug
https://twitter.com/citystaug

https://www.citystaug.com/1046/Back-Bay-Feasibility-Study-with-the-Army

PUBLIC OUTREACH

BUILDING STRONG

U.S. Army Corps of Engineers, Jacksonville District
1 d ·

Join USACE Jacksonville and the City of St. Augustine Thursday, Sept. 21, from 1-2:30 p.m. for the monthly St. Augustine Back Bay Study planning meeting. Join online at https://usace1.webex.com/meet/jason.s.harrah or dial in at 1-844-800-2712; enter access code 199 927 9909 when prompted. @CityStAug

CLOSING REMARKS/QUESTIONS

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