City of St. Augustine –

Resiliency and Stormwater Program

St. Johns County Civic Round Table

February 13, 2023

Jessica L. Beach, P.E.
Chief Resilience Officer
Public Works Department




CITY OF ST AUGUSTINE EST. 1565

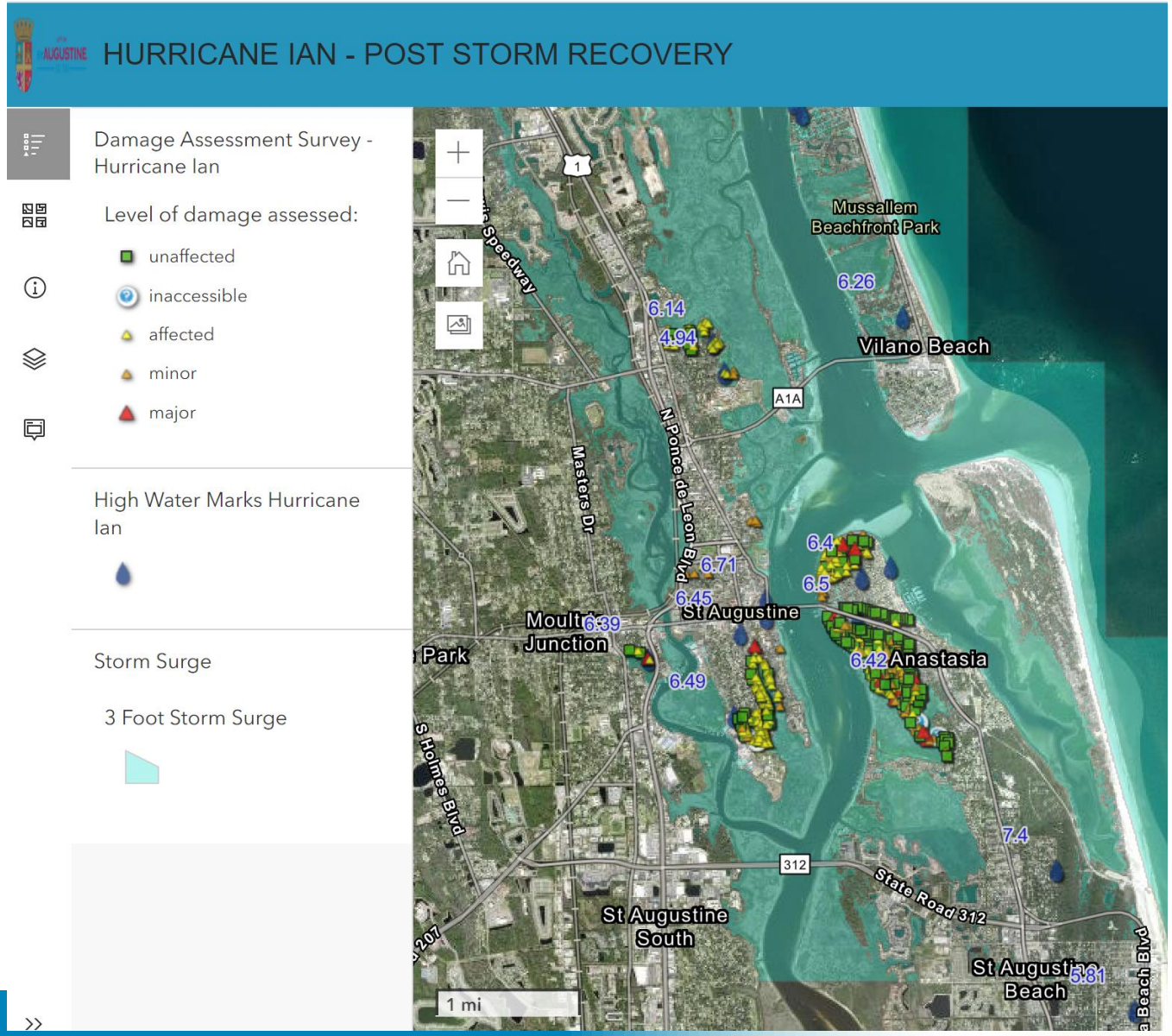
Presentation Outline

- Recap of the Hurricane Season
- Why do we flood? A look at our challenges…
- Overview of the Resilience Program and Strategy

CITY OF ST AUGUSTINE EST. 1565

A Recap of Hurricane Season

- City wide flooding from Hurricane's Ian and Nicole
- Map shows high water marks (HWM) – ranged from 4.94 – 7.4
- Preliminary assessment of impacted homes



A Recap of Hurricane Season

High Water Marks (HWM) at O'Steens Restaurant – Anastasia Blvd (Island)

Matthew (7.07 NAVD88)

Ian (6.5 NAVD88)
Nicole (6.53 NAVD88)

Irma (4.9 NAVD88)

A Recap of Hurricane Season

- Affected = water under the house/garage, not in living space
- Minor = less than 18" in living space
- Major = more than 18" in living space

Properties Impacted by Hurricane Ian			
Affected	**Minor**	**Major**	**Subtotal**
330	157	19	506
65	31	4	%
Neighborhood			
Fullerwood			10%
Abbott Tract			1%
Flagler Model Land			2%
Lake Maria Sanchez			13%
Lincolnville			12%
Oyster Creek			1%
North Davis Shores			13%
South Davis Shores			48%

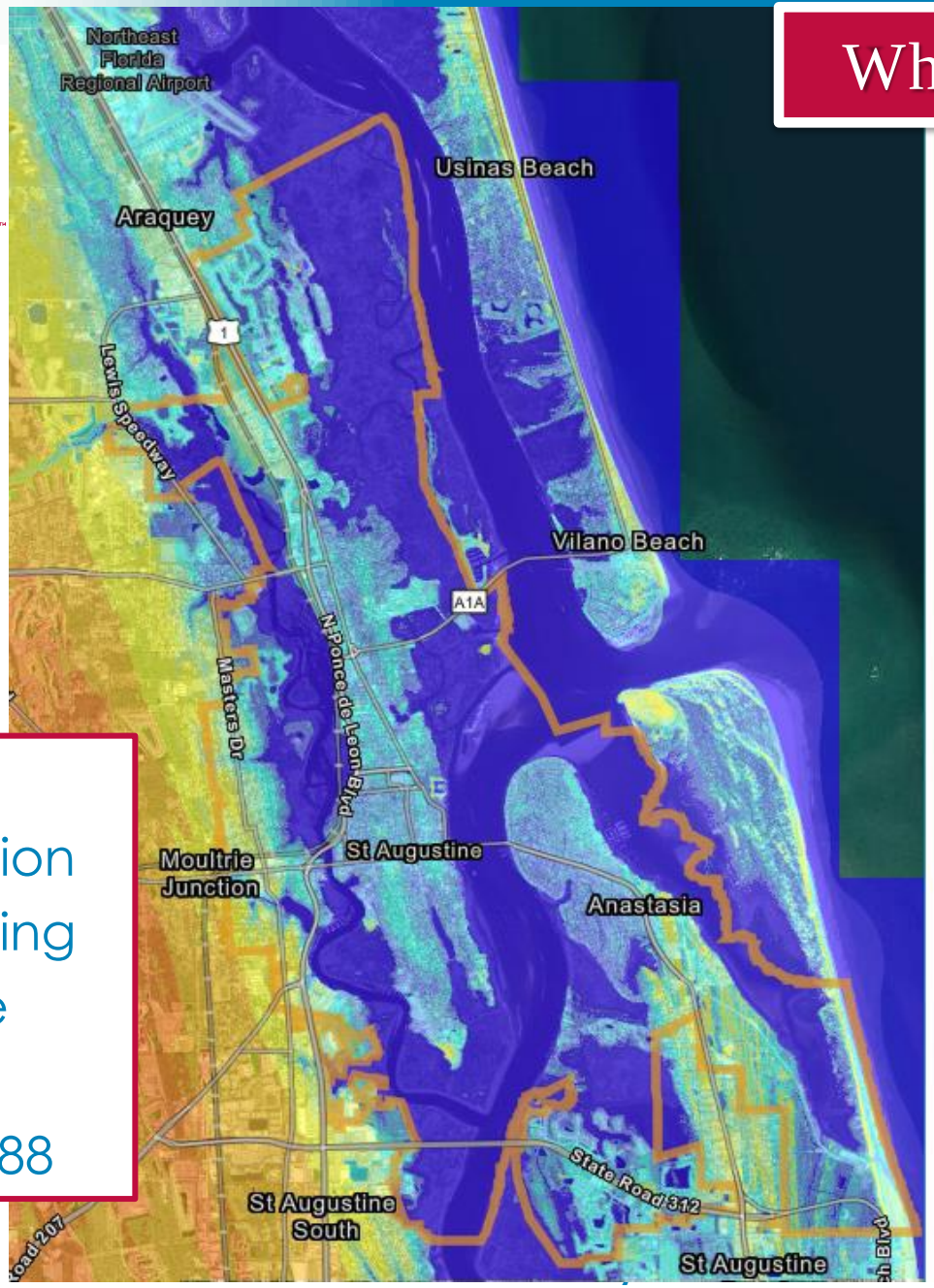
CITY OF ST AUGUSTINE EST. 1565

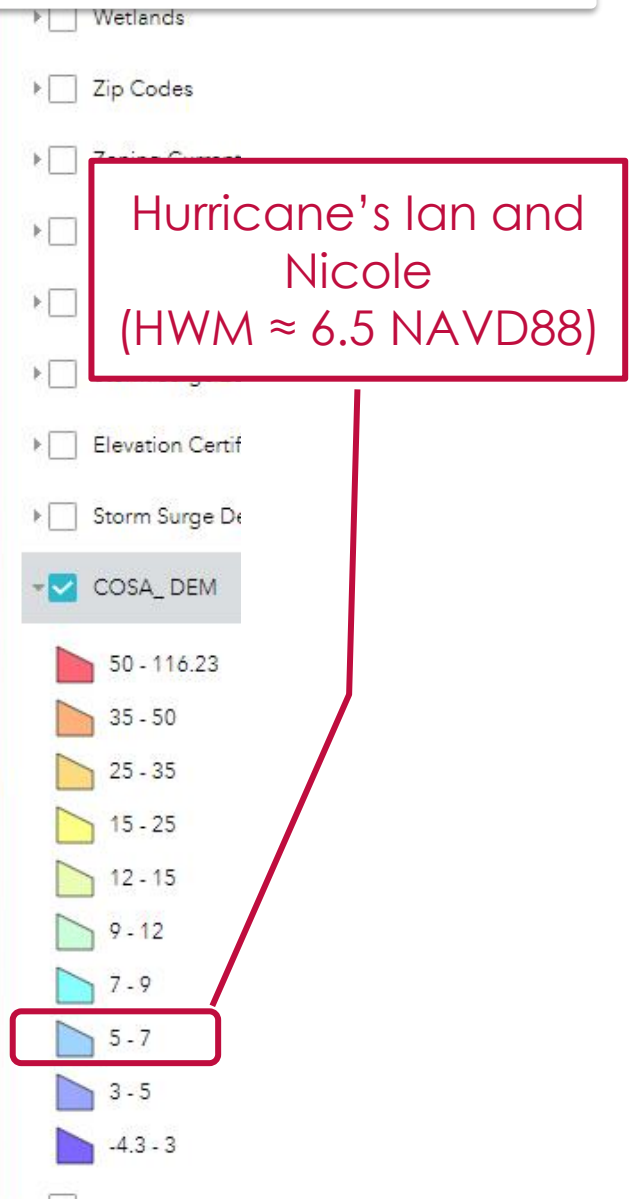
Why Do We Flood ?

Flooding is not new to the City

However, the frequency of "sunny day" flooding is on the rise

Why Do We Flood ?





Hurricane's Ian and Nicole (HWM ≈ 6.5 NAVD88)

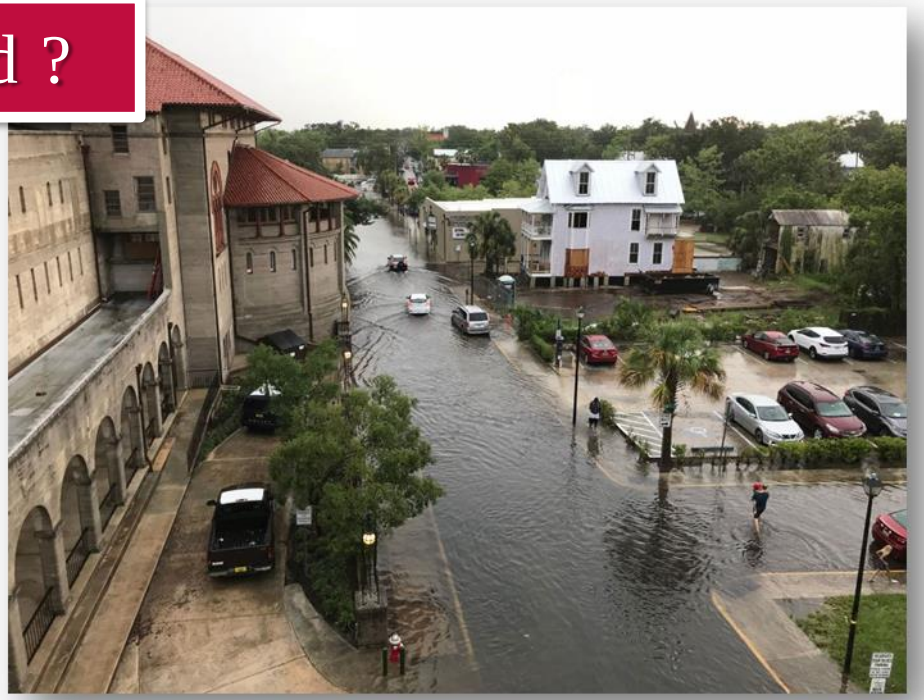
- Digital Elevation Mapping for the City in NAVD88

CITY OF ST AUGUSTINE EST. 1565

Why Do We Flood ?

Current City Challenges (stormwater):

- Aging infrastructure
- Undersized collection system
- Low-lying and coastal location
  (90% of the City is within a flood zone)
- Highly developed (high impervious area)
- **Subject to flooding – both from rainfall and tidal/coastal influence (compound flooding)**

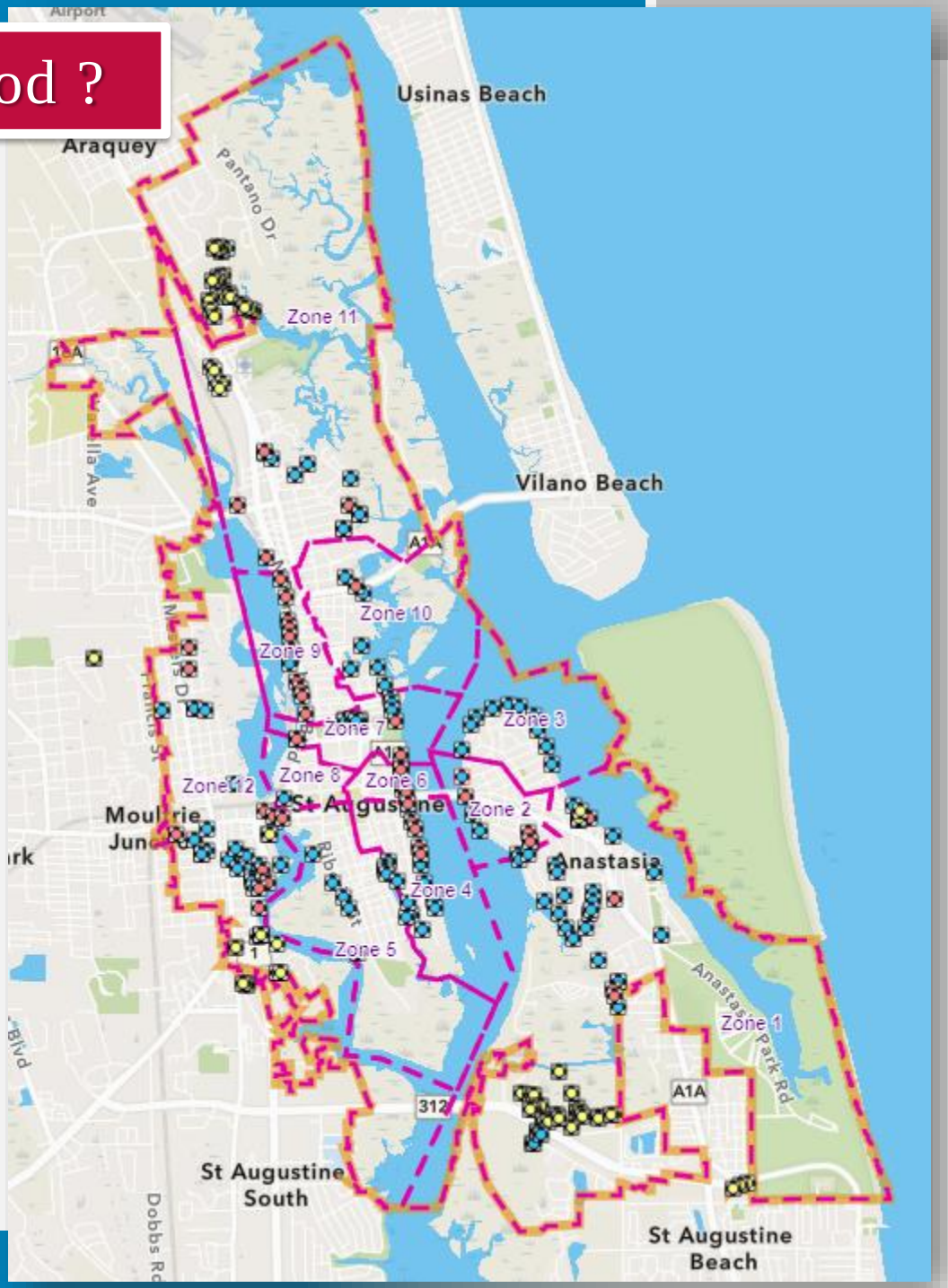


Why Do We Flood ?

CITY OF ST AUGUSTINE EST. 1565

Stormwater Infrastructure:

- 103 Outfalls Tidally Influenced (not including FDOT)
- 949 Storm Inlets
- 20 miles of pipe
- Twelve (12) maintenance zones



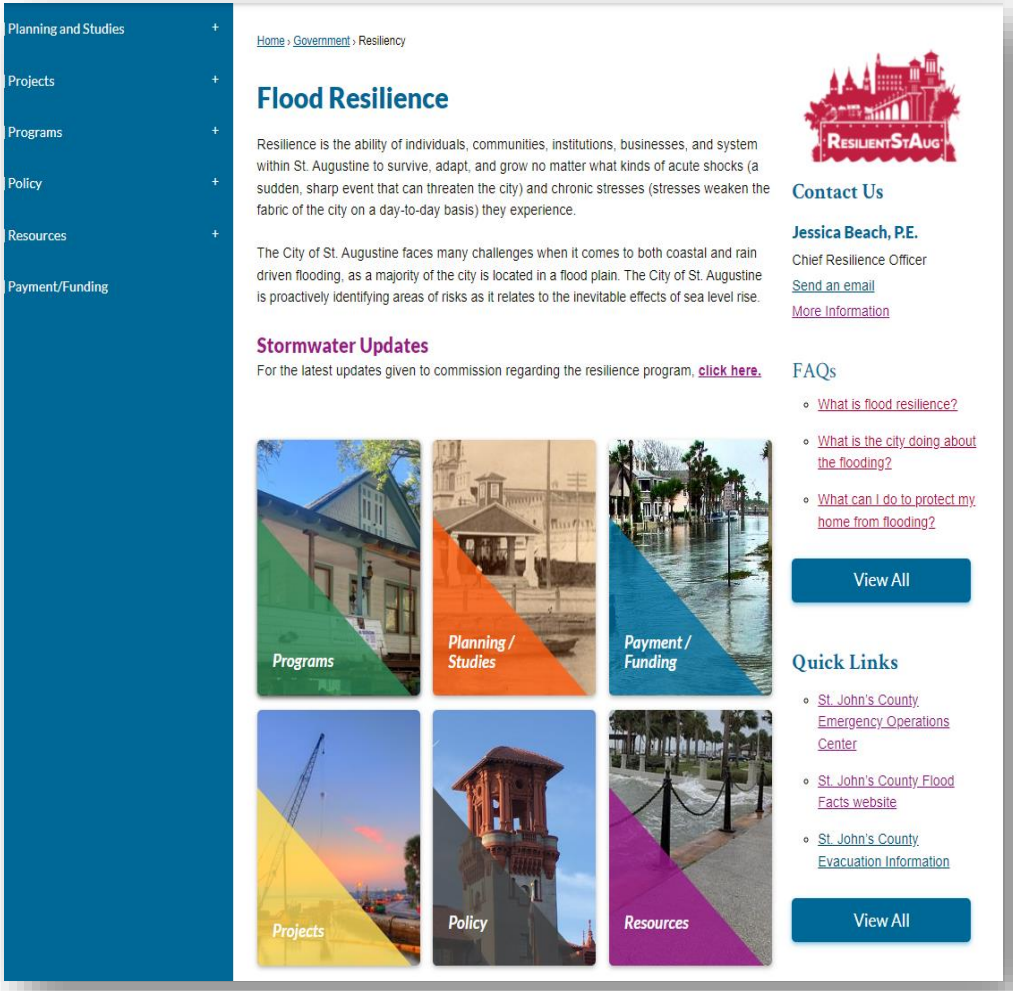
Overview of the Resilience Program and Strategy

www.citystaug.com/resiliency

Overview of the Resilience Program and Strategy

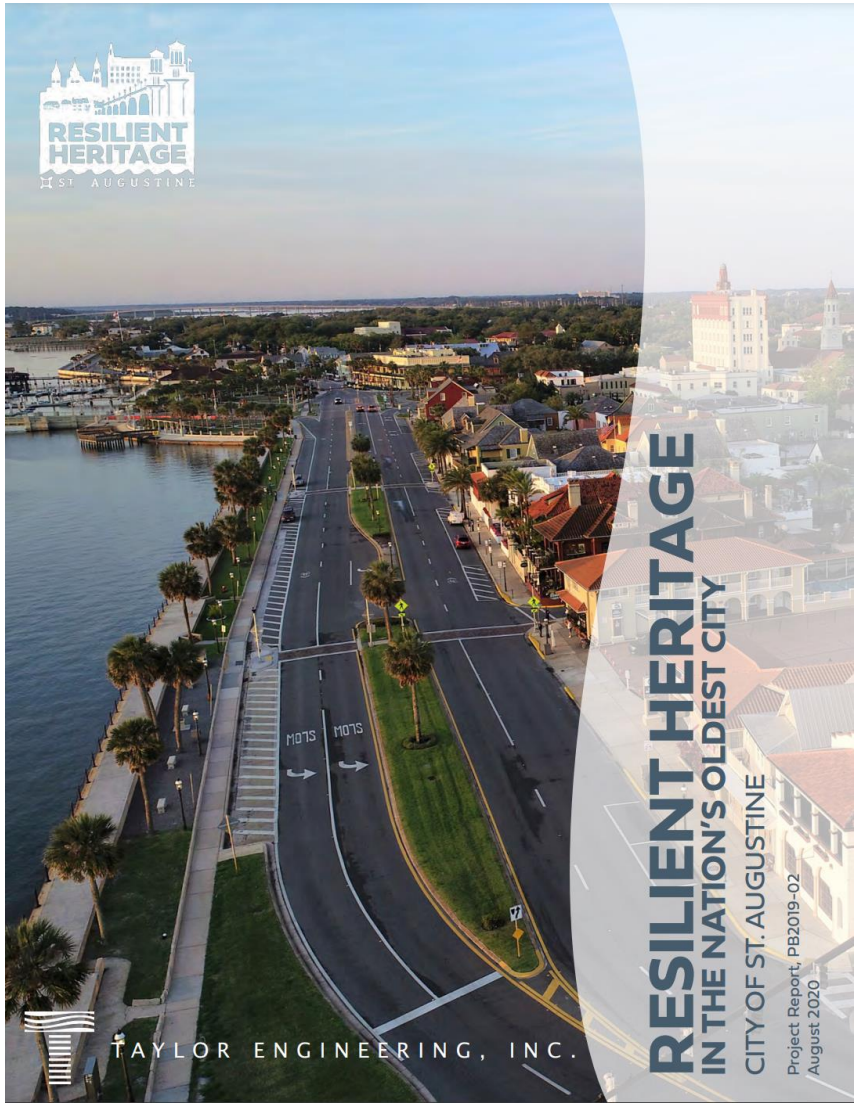
- **Outreach and Education**
- **"One Stop Shop":**
  - ✓ Programs
  - ✓ Projects
  - ✓ Planning / Studies
  - ✓ Payment / Funding
  - ✓ Policy
  - ✓ Resources for Residents

www.CityStAug.com/Resiliency



Overview of the Resilience Program and Strategy

- Resources Available for Historic Properties
- Flood Mitigation Guidance for Historic Properties
- Resilient Heritage in the Nation's Oldest City



https://www.citystaug.com/905/Flooding-and-Historic-Properties

CITY OF ST AUGUSTINE EST. 1565

RESILIENTSTAUG

www.citystaug.com/FMA
for more info

❖ Flood Mitigation Assistance (FMA) Program

- ✓ Cost share program with FEMA to elevate and/or reconstruct flood prone, at-risk structures
- ✓ FY21 – Application Cycle Completed (25 applications), but not selected
- ✓ FY 22 – Application Cycle:
  - Over 80 properties interested in the program, 62 properties had complete applications that met the program requirements
  - City submitted its applications to the State November 14th and is currently under State review, eligible applications will then be submitted to FEMA
  - Total funding request of $12,353,474 submitted that would be cost shared with FEMA if selected
  - Late August – estimated timeframe to know if selected

CITY OF ST AUGUSTINE
EST. 1565

CITY OF ST AUGUSTINE
EST. 1565

RESILIENT STAUG

CITY OF ST. AUGUSTINE

Project Map Key

1. Lake Maria Sanchez Flood Mitigation
2. South Whitney/West King Street Drainage
3. Inlet Drive Shoreline Stabilization
4. South Davis Shores Drainage
5. Court Theophelia Neighborhood Drainage
6. Avenida Menendez Seawall

City Wide Projects

- Tidal Backflow Prevention Program
- Groundwater Monitoring Network

City Planning Studies

- Back Bay Feasibility Study (Federal)
- Vulnerability Assessment Update (State)

City Programs

- Flood Mitigation Assistance (FMA) Program

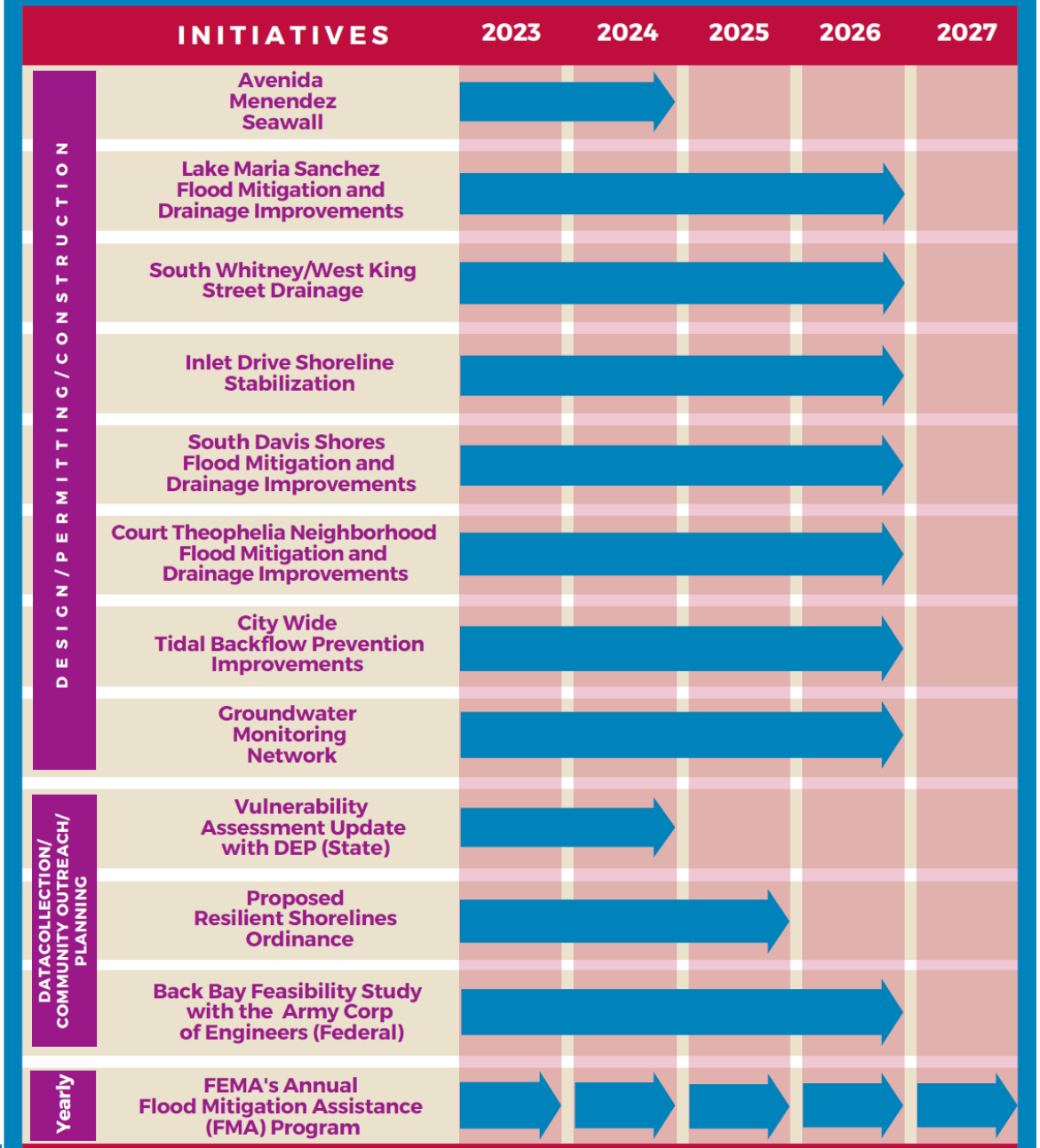
City Ordinances

- Proposed Resilient Shorelines Ordinance

RESILIENCE STRATEGIES

CITY OF ST AUGUSTINE
EST. 1565

RESILIENCE EFFORTS TIMELINE

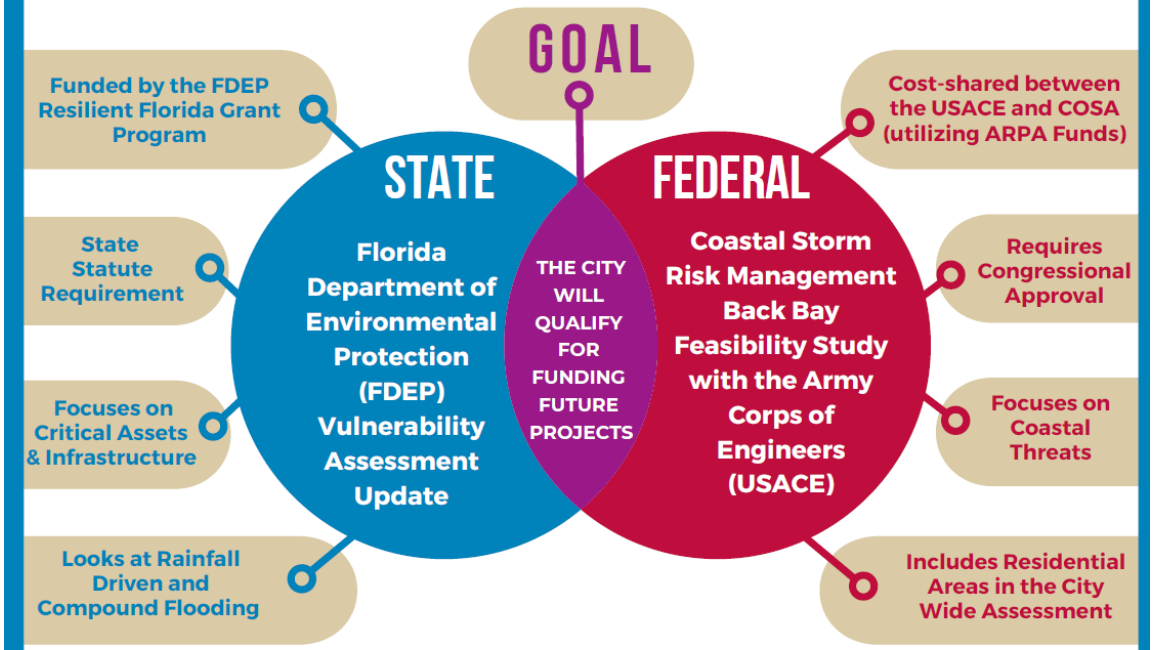


www.CityStAug.com/Resiliency | 904-825-1040 | Stormwater@CityStAug.com

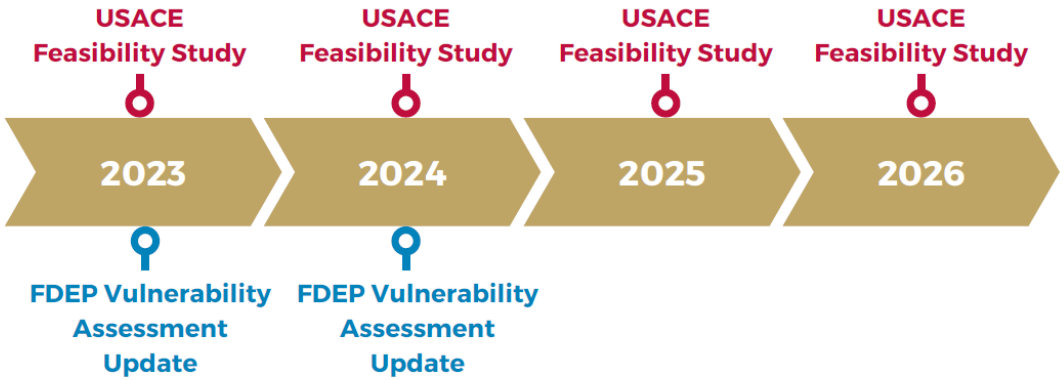
ResilientStAug

CITY OF ST AUGUSTINE EST. 1565

CITY OF ST. AUGUSTINE STUDIES BREAKDOWN



STUDIES TIMELINE



www.CityStAug.com/Resiliency | 904-825-1040 | Stormwater@CityStAug.com

VULNERABILITY ASSESMENT UPDATE

With The Florida Department of Environmental Protection

What is this study?

Vulnerability Assessments (VA) identify or address risks of flooding and sea level rise and help development of adaptation/resilience plans, projects, and policies that allow for preparation for threats from flooding and sea level rise. The final report does include an adaptation plan with recommendations for identified projects to be implemented.

Why is this study needed?

Previous studies, including a coastal vulnerability assessment, were completed in 2016, which identified major flood pathways in the city. However that previous VA does not meet the current criteria outlined in section 380.093 of Florida statutes. By completing the FDEP VA it qualifies the city for the 50% cost-share for implementation projects and the city is eligible for future funding.

How will this study benefit the community?

A Vulnerability Assessment helps a community determine which structural and social assets are likely to be impacted by future coastal flooding and sea level rise and help create an adaptation plan for future mitigation projects. By integrating scientific methods and developing awareness of different structural and social assets that may be vulnerable to future coastal flooding, the community may ensure that the most useful basis for planning is established.

How is this study being funded?

The City of St. Augustine has been awarded funding from the Resilient Florida Grant Program in the estimated total assessment cost of $500,000.

ESTIMATED ASSESMENT COST: $500,000

Resilient Florida Grant 100%

STUDY SCHEDULE 2023-2024

PHASE	STATUS
PHASE 1	DATA COLLECTION & ANALYSIS
PHASE 2	COMMUNITY OUTREACH
PHASE 3	REPORTING

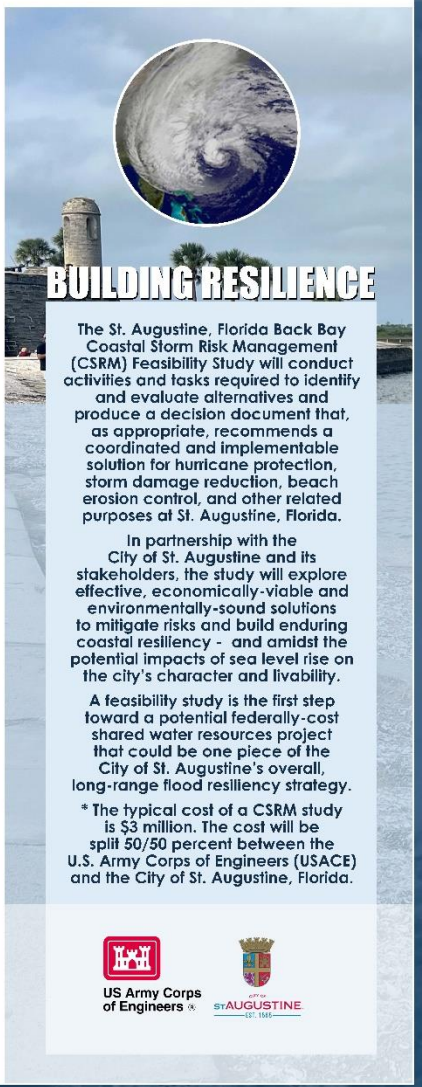
City of St. Augustine | Public Works Department | 904.825.1040 | Stormwater@CityStAug.com

CITY OF ST AUGUSTINE EST. 1565

RESILIENT ST AUG

- Public input is important !
- 1st Public Meeting **Wed. Feb. 22nd @ 6-8 PM,** Alcazar Room
  - Poster sessions
  - Presentation
  - Public Comment
  - Live streamed and recorded

www.citystaug.com/BackBay



STUDY AREA

Through the planning process, the study will assess the multi-faceted landscape within the city limits of St. Augustine. Maintaining St. Augustine's unique and rich multi-layered sense of place will be a priority of the team as they develop and evaluate alternatives to reduce coastal storm risk.

PHOTO CREDITS (LEFT TO RIGHT): CITY OF ST. AUGUSTINE; CITY OF ST. AUGUSTINE; VISITSTAUGUSTINE.COM; CRAIG SWAIN; T.TAUGHER

TRANSPARENT PLANNING PROCESS

Feasibility studies use a transparent 6-Step Planning Process that pursues alternatives to reduce economic damages from storms over a 50-year project life, consistent with environmental statutes. In addition to economic and environmental conditions, regional economic development and social effects are addressed during the planning process. There are a variety of approaches, both quantitative and qualitative, to assist with multi-criteria decision making and plan selection.

Public input is paramount in the decision process. Multiple public/stakeholder meetings will occur throughout the study.

1	2	3	4	5	6
IDENTIFY PROBLEMS AND OPPORTUNITIES	INVENTORY AND FORECAST CONDITIONS	FORMULATE ALTERNATIVE PLANS	EVALUATE ALTERNATIVE PLANS	COMPARE ALTERNATIVE PLANS	SELECT RECOMMENDED PLAN

MULTI-DISCIPLINARY PROJECT DELIVERY TEAM

The project delivery team (PDT) is the workgroup tasked with conducting the study and consists of varied experts including planners, engineers, biologists, geologists, hydrologists, surveyors, archaeologists, economists, real estate specialists, and more to address problems and opportunities. Each team member is responsible for identifying water resources problems and assisting in formulating solutions to those problems within their area of expertise. This interdisciplinary approach to problem solving is key to a successful feasibility study.

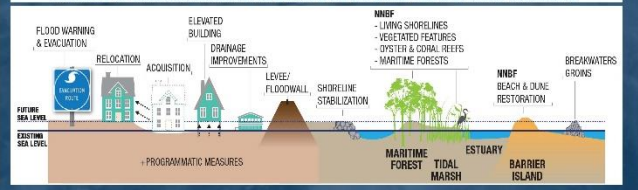
PHOTO CREDITS (LEFT TO RIGHT): CITY OF ST. AUGUSTINE AND WWW.FACEBOOK.COM/CITYSTAUG/PHOTOS.

INTEGRATED FEASIBILITY REPORT AND NATIONAL ENVIRONMENTAL POLICY ACT ANALYSIS

The National Environmental Policy Act (NEPA) is a Federal law enacted in 1969. As required by NEPA, USACE will assess the potential environmental effects of the study alternatives, including a no action alternative. The report also documents coordination with the varied resource agencies that help to shape the final recommendation. Examples of NEPA effects categories include:

PHOTO CREDITS (LEFT TO RIGHT): T.TAUGHER (FIRST THREE); WWW.FACEBOOK.COM/CITYSTAUG/PHOTOS; U.S. FISH AND WILDLIFE SERVICES.

FULL ARRAY OF MEASURES INCLUDING NATURAL AND NATURE-BASED FEATURES (NNBF) CONSIDERED



TYPICAL SCHEDULE | PLANNING MILESTONES FOR A 3-YEAR STUDY *

STUDY INITIATION AND SCOPING	PLAN FORMULATION	TENTATIVELY SELECTED PLAN (TSP) MILESTONE	DRAFT REPORT AND NEPA	AGENCY DECISION MILESTONE	FINAL REPORT WASHINGTON-LEVEL REVIEW	CHIEF OF ENGINEERS REPORT	PROJECT ENGINEERING AND DESIGN **
ALTERNATIVES MILESTONE	ENGINEERING AND ECONOMIC MODELING		PUBLIC, TECHNICAL, AND POLICY REVIEW				CONSTRUCTION **
Jan 2023 to May 2023	May 2023 to May 2024	May 2024	Jul 2024 to Sep 2024	Nov 2024	Jul 2025	Jan 2026	

3 YEARS

** Contingent Upon Congressional Authorization and Appropriations

* The study schedule, scope, and budget can vary depending upon the complexity of the study area and corresponding problems identified throughout the study process; changes to the 3-year, $3 million parameters require documentation and approval of division and Headquarters USACE and concurrence of the local sponsor. A specific schedule and budget for this study will be developed after the Feasibility Cost Sharing Agreement (FCSA) is signed.

ST. AUGUSTINE, FLORIDA BACK BAY CSRM FEASIBILITY STUDY

U.S. ARMY CORPS OF ENGINEERS | JACKSONVILLE DISTRICT | FOR ADDITIONAL INFORMATION: WWW.SAJ.USACE.ARMY.MIL

CITY OF ST AUGUSTINE EST. 1565

CITY OF ST AUGUSTINE EST. 1565 — RESILIENT STAUG

PROPOSED RESILIENT SHORELINES ORDINANCE

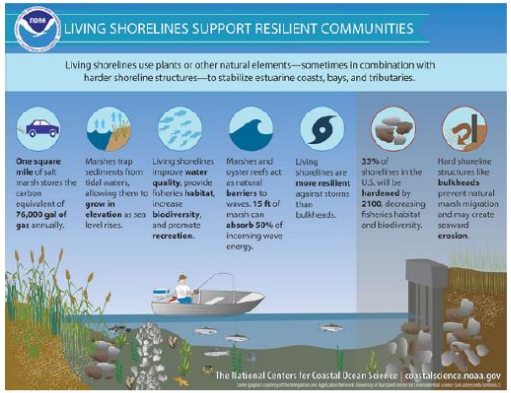
What is this proposed ordinance?

The City of St. Augustine is working on implementing a Resilient Shorelines Ordinance to help combat sea level rise and coastal storm surge threats to the city. A Resilient Shoreline Ordinance will help promote nature-based designs that create/protect habitat & improve water quality.

Why is this proposed ordinance needed?

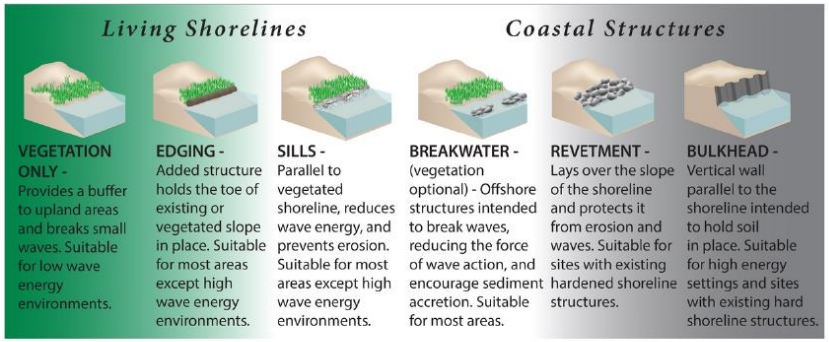
Sea level rise increasingly threatens both public and private infrastructure. The development of a resilient shoreline ordinance will provide the city and its residents guidance and opportunities for protective infrastructure such as seawalls, living shorelines, and hybrid approaches. The proposed ordinance will allow for a consistent approach to inform both public and private stakeholders on appropriate shoreline policy, infrastructure construction, maintenance and repair, and methodology and account for future flood risk.

SCHEDULE 2023-2025



PHASE	STATUS
PHASE 1	DATA COLLECTION
PHASE 2	DRAFT RESILIENT SHORELINE ORDINANCE
PHASE 3	COMMUNITY OUTREACH & ENGAGEMENT SUPPORT

GREEN - SOFTER TECHNIQUES — GRAY - HARDER TECHNIQUES



City of St. Augustine | Public Works Department | 904.825.1040 | Stormwater@CityStAug.com

RESILIENT STAUG

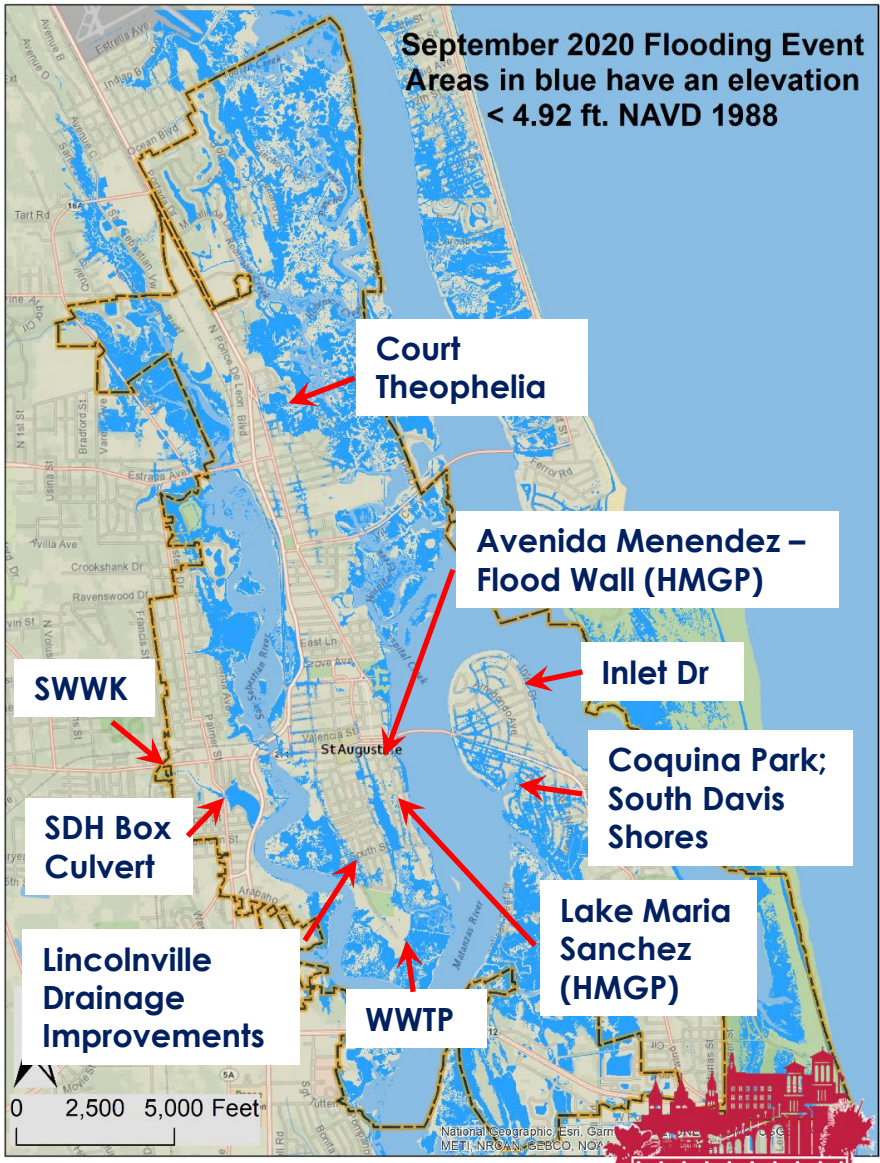
In Summary

*Denotes Federally Funded Project (FEMA –PA, HMGP; HUD/DEO-CDBG-NR)

Denotes State Funded Project (SJRWMD, **FDEP)

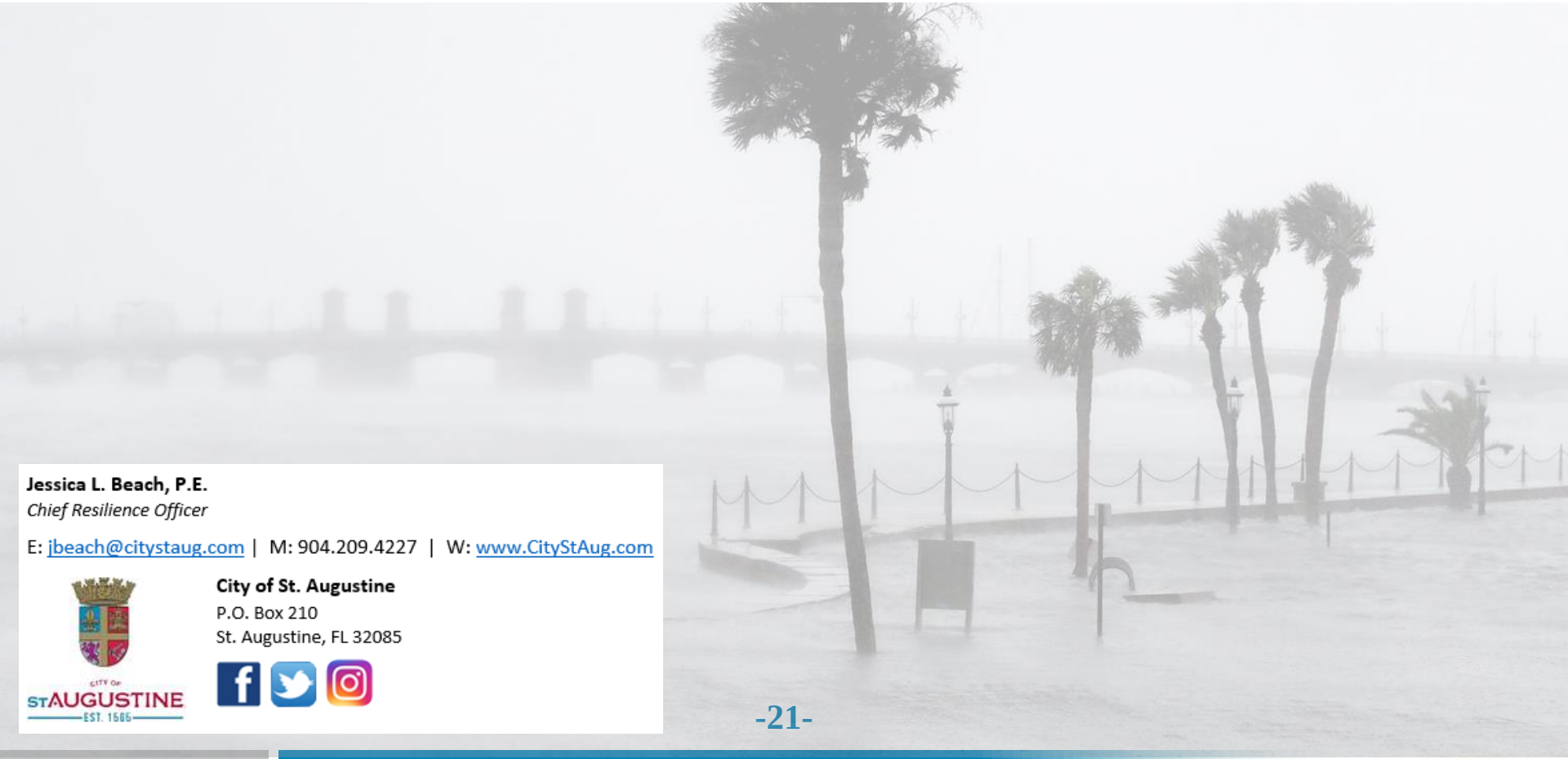
Current Flood Mitigation Investments ≈ $69,741,833 ($58,218,292, grant funded, 83%):

- **Lake Maria Sanchez*, ****
- FEMA 13 Lift Station Hardening and Flood Proofing*
- Wastewater Treatment Plant (WWTP) Flood Proofing
- **South Whitney/West King (SWWK) Flood Mitigation*, ****
- **Avenida Menendez Flood Wall***
- **City-wide tide check valves (43 installed, 20 future)****
- Coquina Park
- South Dixie Highway Culvert Replacement**
- Lincolnville Utility and Drainage Improvements*, **
- **South Davis Shores Flood Mitigation and Drainage Improvements *, ****
- **Inlet Drive Shoreline Resiliency Improvements *, ****
- **Flood Mitigation and Drainage Improvements for the Court Theophelia Neighborhood *, ****
- **Updated Vulnerability Assessment (State)****
- **USACE Back Bay Feasibility Study (Federal)****



Thank you for your time!

www.CityStAug.com/Resiliency



Jessica L. Beach, P.E.
Chief Resilience Officer

E: jbeach@citystaug.com | M: 904.209.4227 | W: www.CityStAug.com

City of St. Augustine
P.O. Box 210
St. Augustine, FL 32085