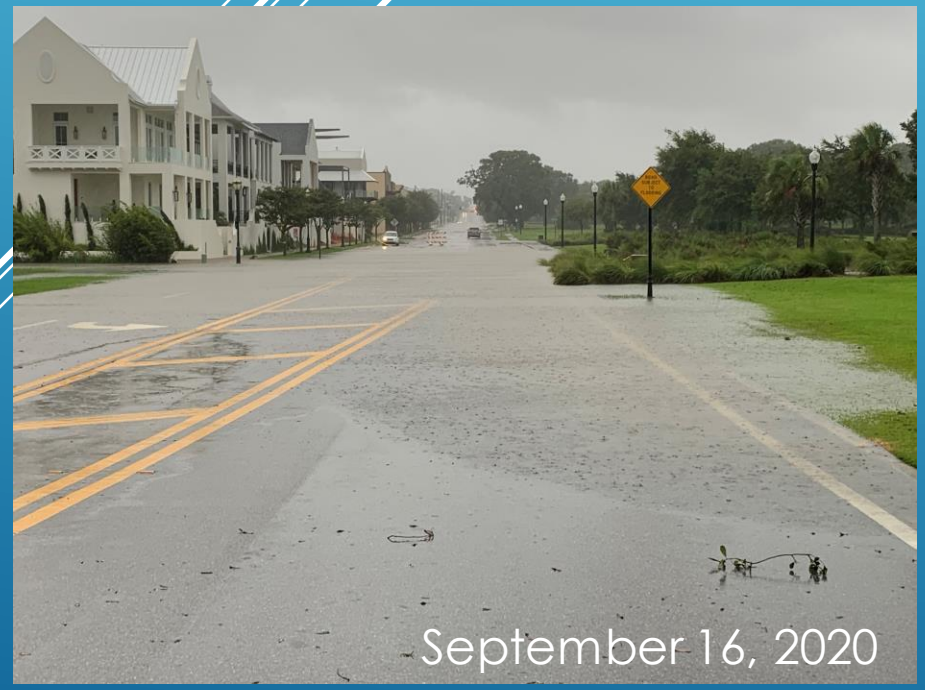
CITY OF PENSACOLA RESILIENCY PLANNING

Resiliency Planning Grants R2116

City Council Presentation

May 24, 2021

Erin L. Deady



OVERVIEW OF PRESENTATION

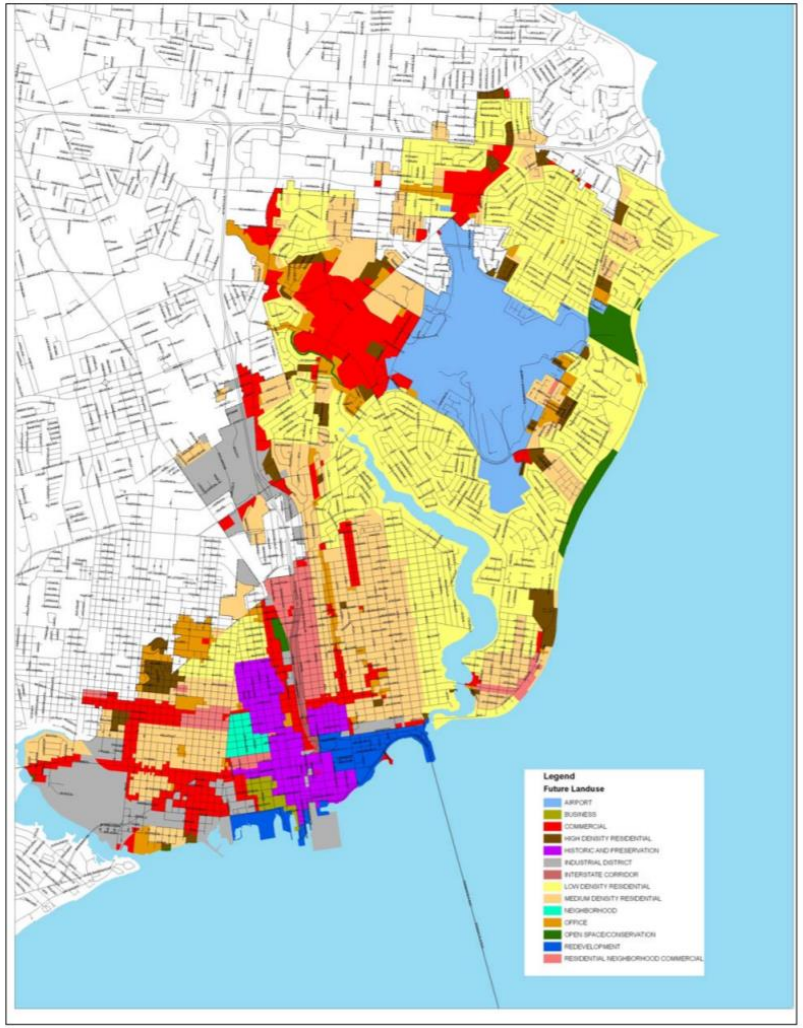
Part 1: Introductions (5 minutes)

1. Background
2. Consulting Team
3. Brief overview of Project Tasks/Subtasks

Part 2: Vulnerability Planning, Assessment and Approaches (45 minutes)

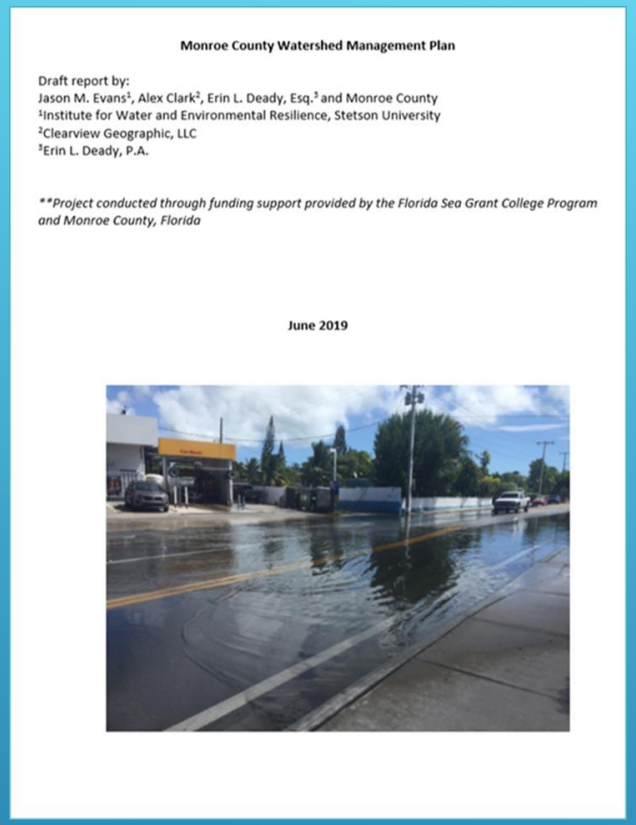
1. Scope of sea level rise modeling: The approach & tools used
2. Data requests (discussion on availability and compilation)
   a. Data requested, received and future recommendations
   b. Accessing current CRS Information
3. Initial output/assessments from project team- overview of all mapping output
4. Peril of flood amendments
5. Example of story map

Part 3: Next Actions



PROJECT TEAM

1. Erin L. Deady, P.A. (Project Management, Resilience Planning, Implementation)
2. Clearview Geographic/Stetson University (Data collection, Modeling)
3. Lori Lehr, Inc. (FEMA's Community Rating System)
4. Jeff Needle, P.E., Climate Resiliency Engineering & Design, Inc. (CRED) (Stormwater functionality and modeling)

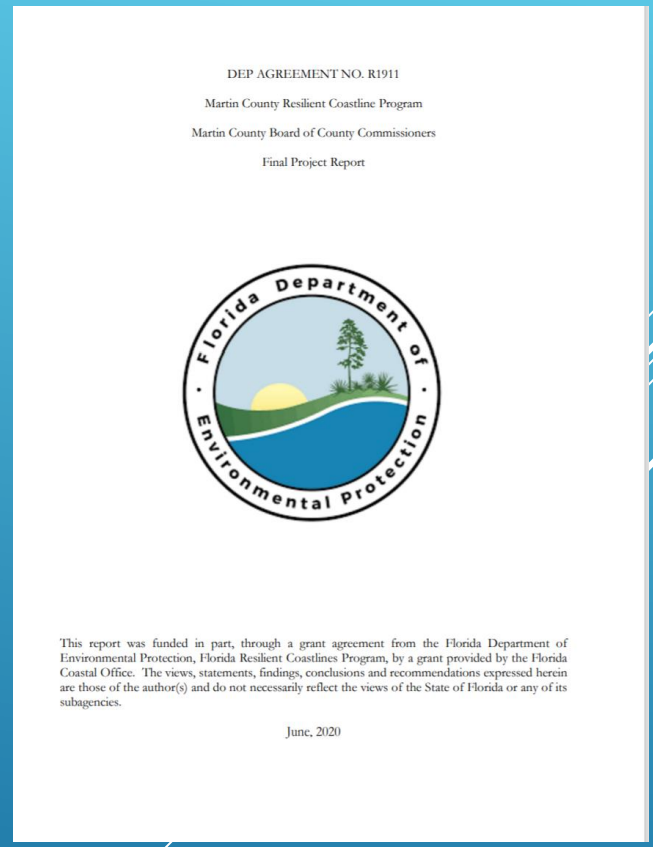


Monroe County Watershed Management Plan

Draft report by:
Jason M. Evans[1], Alex Clark[2], Erin L. Deady, Esq.[3] and Monroe County
[1]Institute for Water and Environmental Resilience, Stetson University
[2]Clearview Geographic, LLC
[3]Erin L. Deady, P.A.

***Project conducted through funding support provided by the Florida Sea Grant College Program and Monroe County, Florida*

June 2019



DEP AGREEMENT NO. R1911

Martin County Resilient Coastline Program

Martin County Board of County Commissioners

Final Project Report

This report was funded in part, through a grant agreement from the Florida Department of Environmental Protection, Florida Resilient Coastlines Program, by a grant provided by the Florida Coastal Office. The views, statements, findings, conclusions and recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the State of Florida or any of its subagencies.

June, 2020

ERIN L. DEADY, P.A.

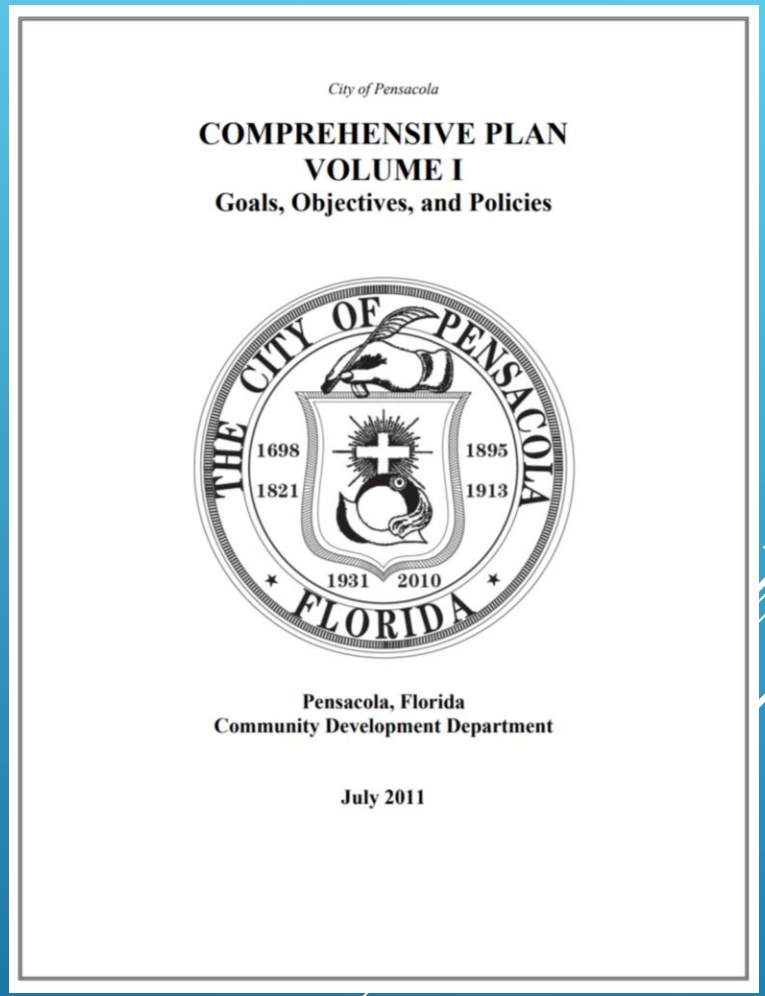
CLEARVIEW GEOGRAPHIC STETSON UNIVERSITY

Lori Lehr, Inc.

CLIMATE RESILIENCY ENGINEERING & DESIGN, INC.

RESILIENCY PLANNING GRANT R2116

- DEPs Resiliency Planning Grant (RPG) program has awarded 4 cycles of grant funding designed to:
  - Help local governments plan to address vulnerabilities
  - Update Comprehensive Plans
- DEP awarded RPG R2116 from 7/29/20-6/30/21
- Scope of Pensacola's RPG is to develop:
  - **Vulnerability Assessment**
  - Develop Comprehensive Plan language to comply with "**Peril of Flood**" requirements in Section 163.3178(2)(f), F.S. (Coastal Management Element)
  - Note: this is preliminary language that will be incorporated into the overall Comprehensive Plan (grant doesn't require actual adoption)



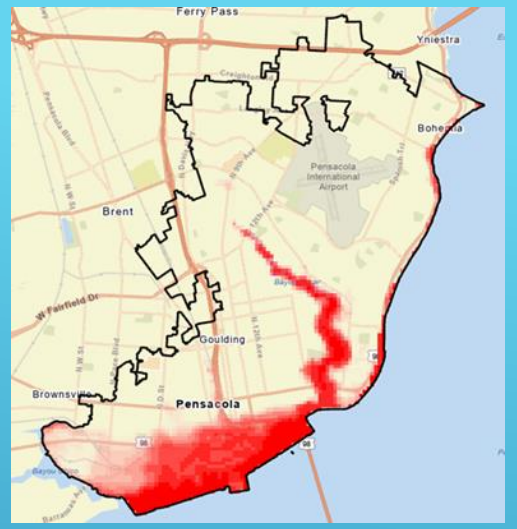
City of Pensacola

COMPREHENSIVE PLAN
VOLUME I
Goals, Objectives, and Policies

Pensacola, Florida
Community Development Department

July 2011

THE EVALUATION AND MODELING TOOLS

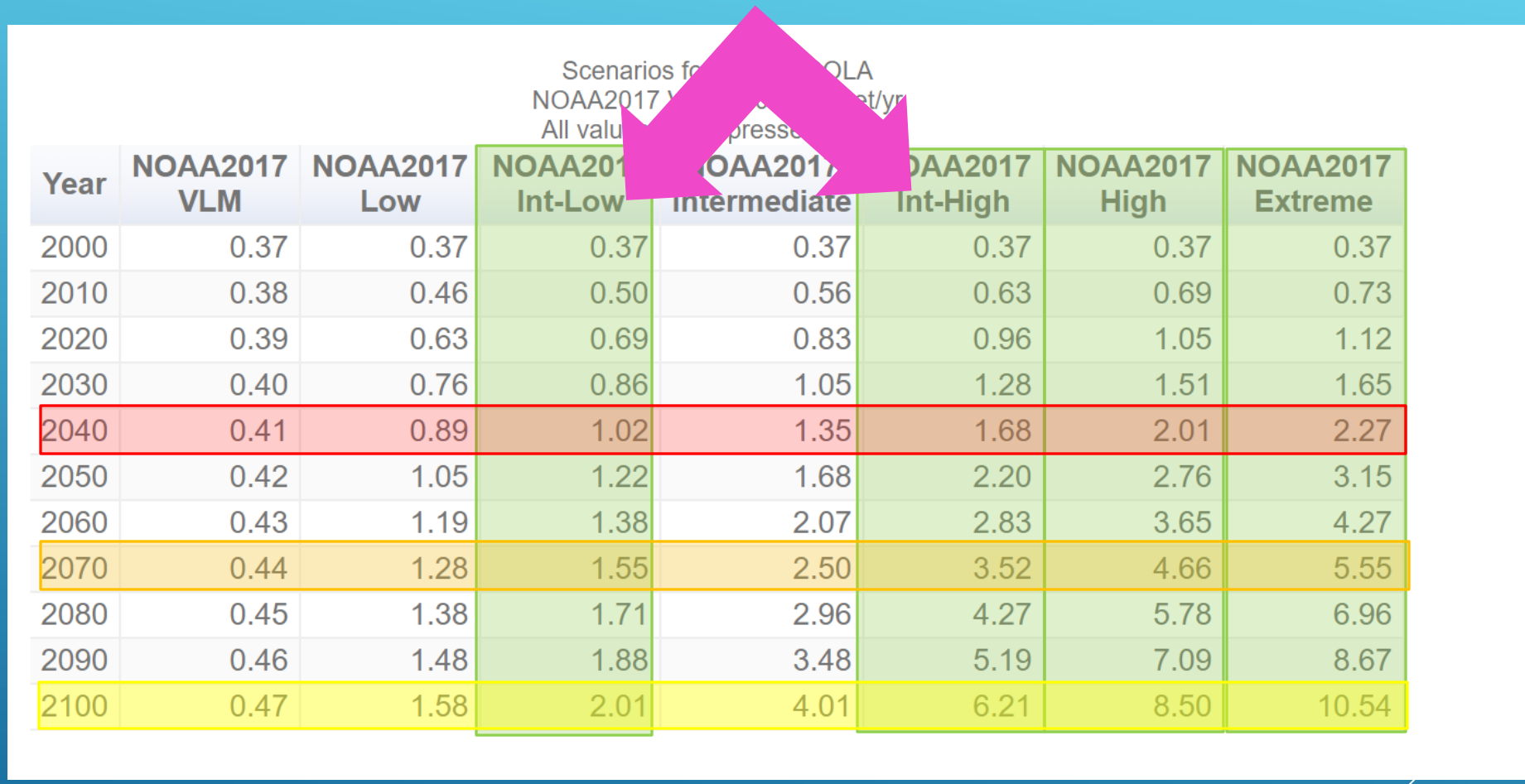


- Data visualization using ESRI ArcGIS Pro (Environmental Systems Research Institute, 2020)
  - Utilize a modified bathtub modeling approach, in concert with several proprietary analytical functions, potential flood severity and extent is projected throughout the study area and datasets.
  - Can be transferred/built within other GIS and/or public platforms
  - Geographic domain
  - Limited to City of Pensacola
  - Prioritizing coastal zones
  - Vulnerability to regular tidal inundation
  - *Does not include storm surge, rainfall, or hydrologic functions such as stormwater drainage capacities
- Proprietary model utilized in ArcGIS
  - Flexibility to input "custom" data
  - Estimated water depths & timeline
- Data provided by City or collected from public online resources
  - Only as accurate as what is provided/found

Methods expanding on work previously approved and accepted by:

FEMA

SEA LEVEL RISE PROJECTIONS



Scenarios fo… …OLA
NOAA2017 V… …et/yr
All valu… …presse…

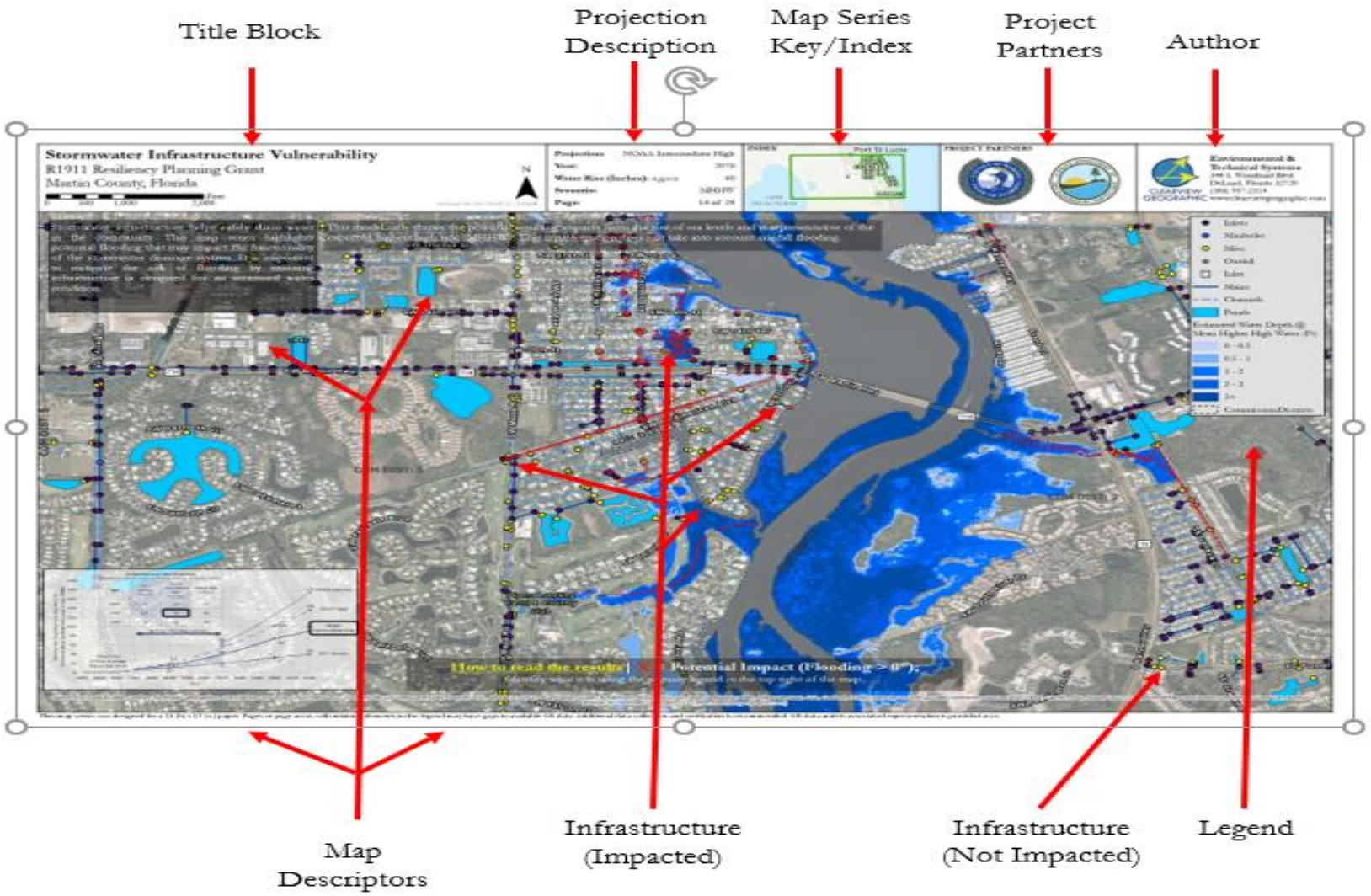
Year	NOAA2017 VLM	NOAA2017 Low	NOAA201… Int-Low	…OAA2017… Intermediate	…AA2017 Int-High	NOAA2017 High	NOAA2017 Extreme
2000	0.37	0.37	0.37	0.37	0.37	0.37	0.37
2010	0.38	0.46	0.50	0.56	0.63	0.69	0.73
2020	0.39	0.63	0.69	0.83	0.96	1.05	1.12
2030	0.40	0.76	0.86	1.05	1.28	1.51	1.65
2040	0.41	0.89	1.02	1.35	1.68	2.01	2.27
2050	0.42	1.05	1.22	1.68	2.20	2.76	3.15
2060	0.43	1.19	1.38	2.07	2.83	3.65	4.27
2070	0.44	1.28	1.55	2.50	3.52	4.66	5.55
2080	0.45	1.38	1.71	2.96	4.27	5.78	6.96
2090	0.46	1.48	1.88	3.48	5.19	7.09	8.67
2100	0.47	1.58	2.01	4.01	6.21	8.50	10.54

NOAA, 2017 (2040, 2070 and 2100)

EXAMPLE MAP SERIES OUTPUT

Description of Final Map Series

The projected footprint of tidal inundation, corresponding water depths, and detected impacts to various infrastructures and socioeconomic indicators will be depicted on a map series with a similar layout and function to the example included below.

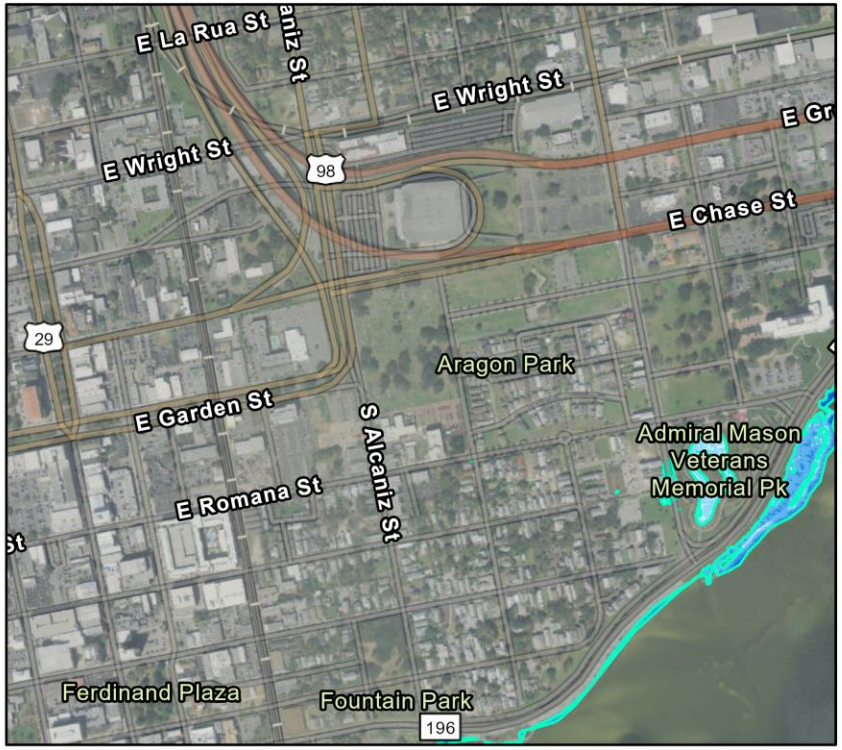


MAP SERIES OUTPUT

The final map deliverables will contain much of the GIS enabled data we gathered during the data collection phase (approximately 200+ pages of maps)

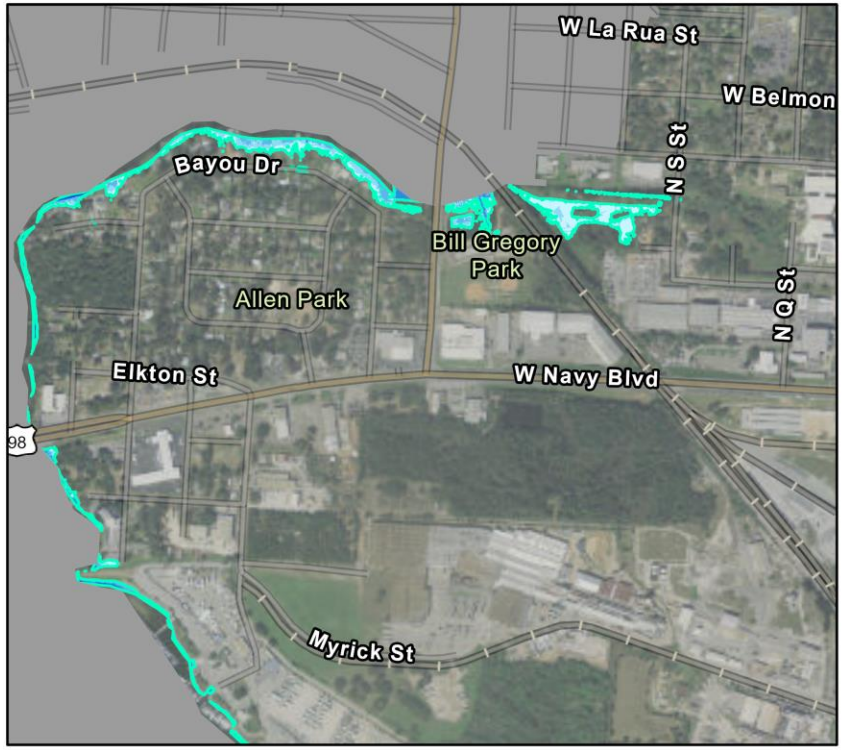
Map Title	Map Page Count	Description
Generalized Inundation	33	SLR Tidal flooding on land surface x 3 (2040/2070/2100)
Stormwater (2040-specific structures	22 + 14	SLR Tidal flooding impacts on STW structures (2040/2070/2100-combined)
Land use	11	SLR Tidal flooding impacts with land use designations (2040/2070/2100-combined)
Transportation	20	SLR Tidal flooding impacts on roads (2040/2070/2100-combined)
Potable Water	11	SLR Tidal flooding impacts on potable water structures (2040/2070/2100-combined)
Sanitary Sewer	18	SLR Tidal flooding impacts on sanitary sewer structures (2040/2070/2100-combined)
SLR + FEMA Flood zones- compared	33	SLR Tidal flooding compared to FEMA flood zones (2040/2070/2100)
Critical Infrastructure	11	SLR Tidal flooding impacts on critical facilities (2040/2070/2100-combined)
Emergency Management	1	SLR Tidal flooding impacts on Emergency Management (Fire, Police, Hospitals, Shelters) (2040/2070/2100-combined)
Hydric Environment	11	SLR Tidal flooding impacts on wetlands, etc. (2040/2070/2100-combined)
Social Vulnerability	7	SLR Tidal flooding on land uses, properties and CDC SVI Metrics (2040/2070/2100-combined)

2040 Projected Sea Level Rise (MHHW NIH)



Admiral Mason Veterans Memorial Park

W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

Outside Study Area

Approx. Tide Limit

Estimated Water Depth (Ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3+

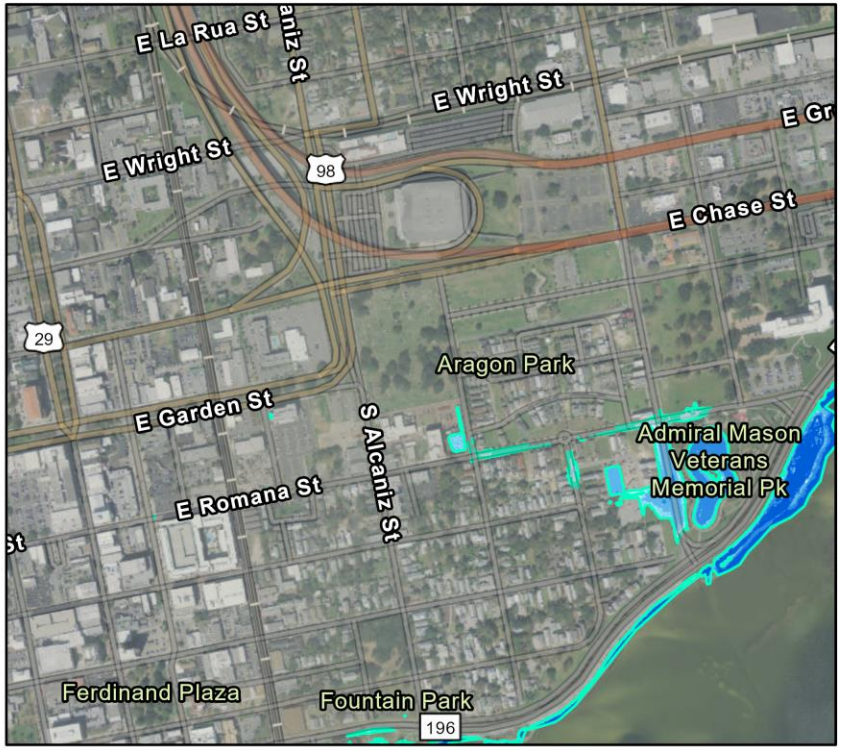
Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

Infrastructure NOT impacted by tidal SLR modeling

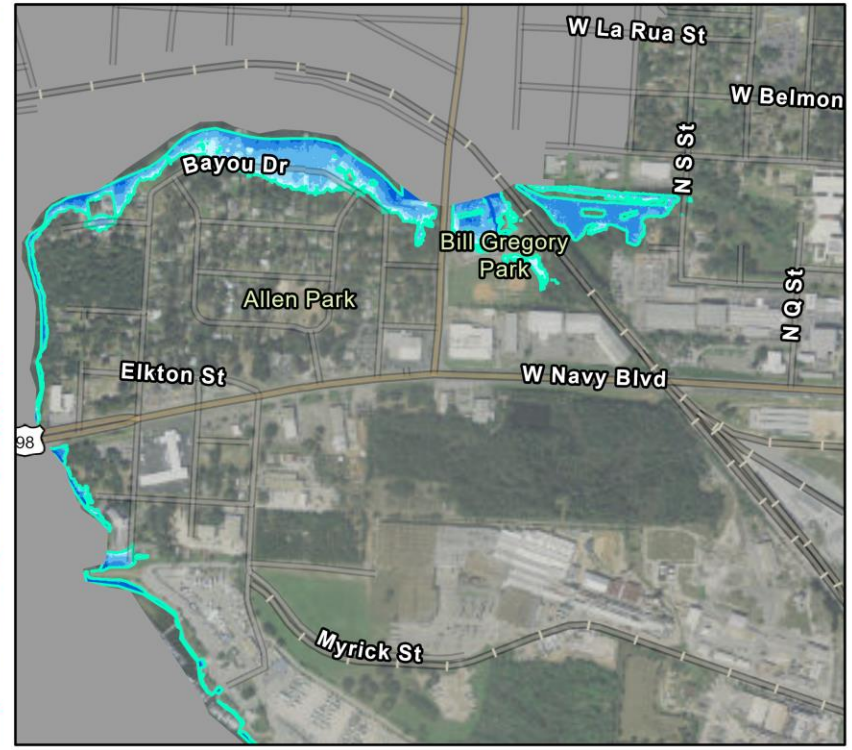
Infrastructure IMPACTED by 2040 tidal SLR modeling

2070 Projected Sea Level Rise (MHHW NIH)



Admiral Mason Veterans Memorial Park

W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

Outside Study Area

Approx. Tide Limit

Estimated Water Depth (Ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3+

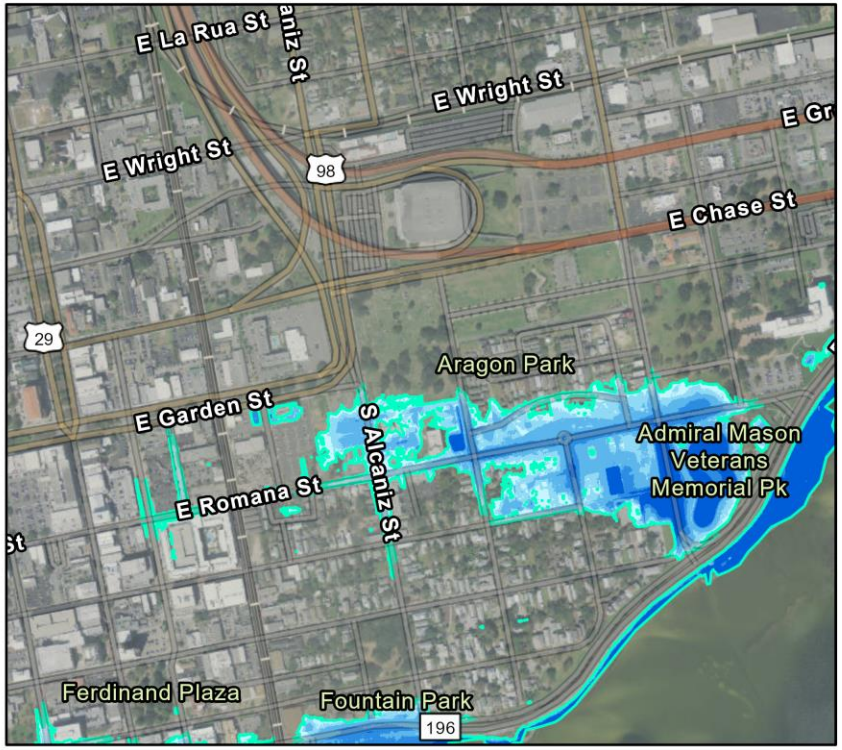
Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

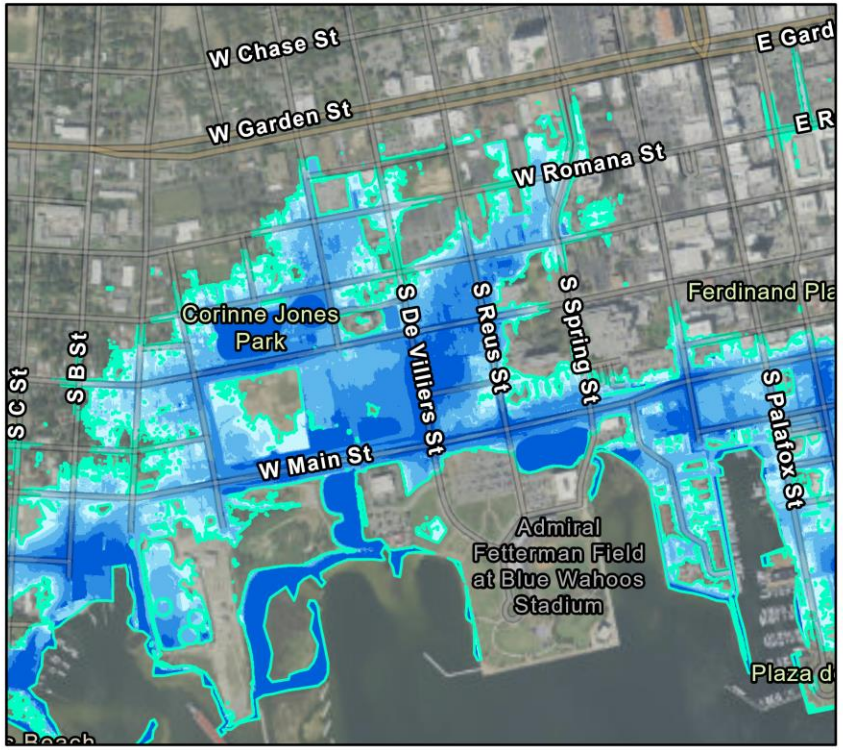
Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

2100 Projected Sea Level Rise (MHHW NIH)



Admiral Mason Veterans Memorial Park



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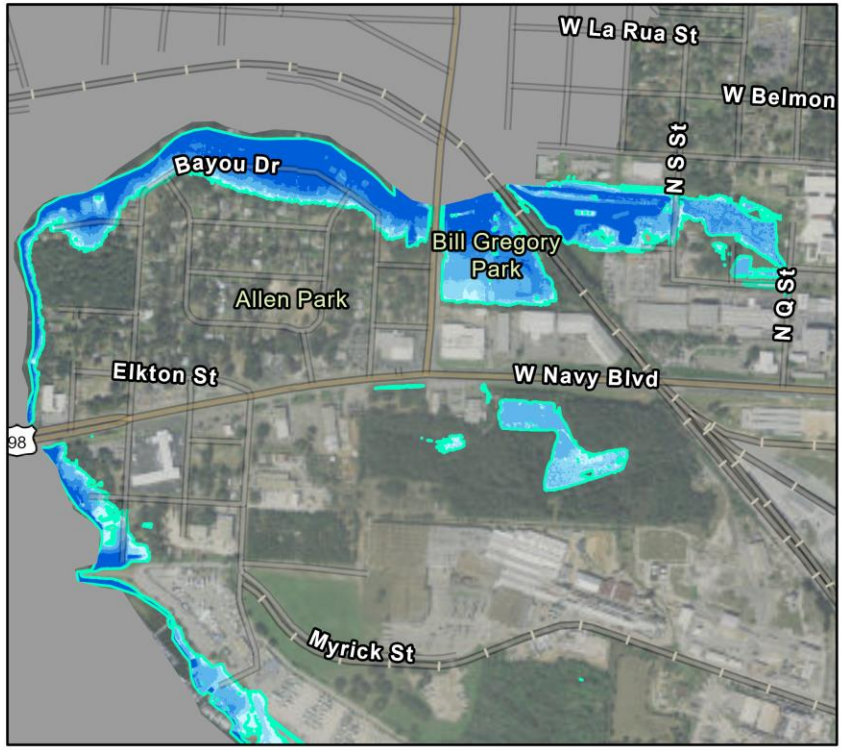


Bayou Dr & Bill Gregory Park

Outside Study Area

Approx. Tide Limit

Estimated Water Depth (Ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3+

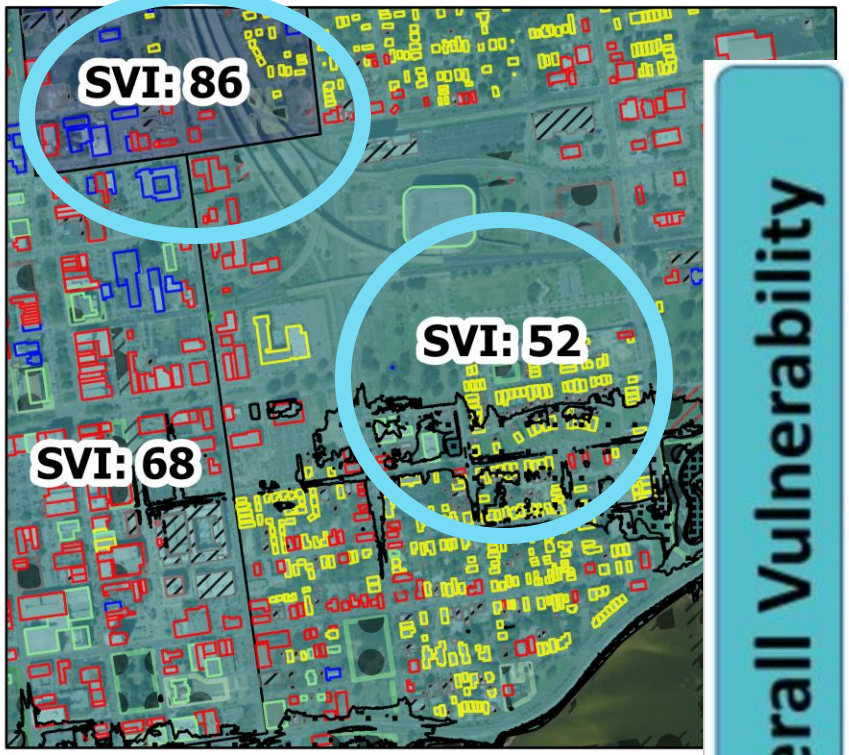
Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

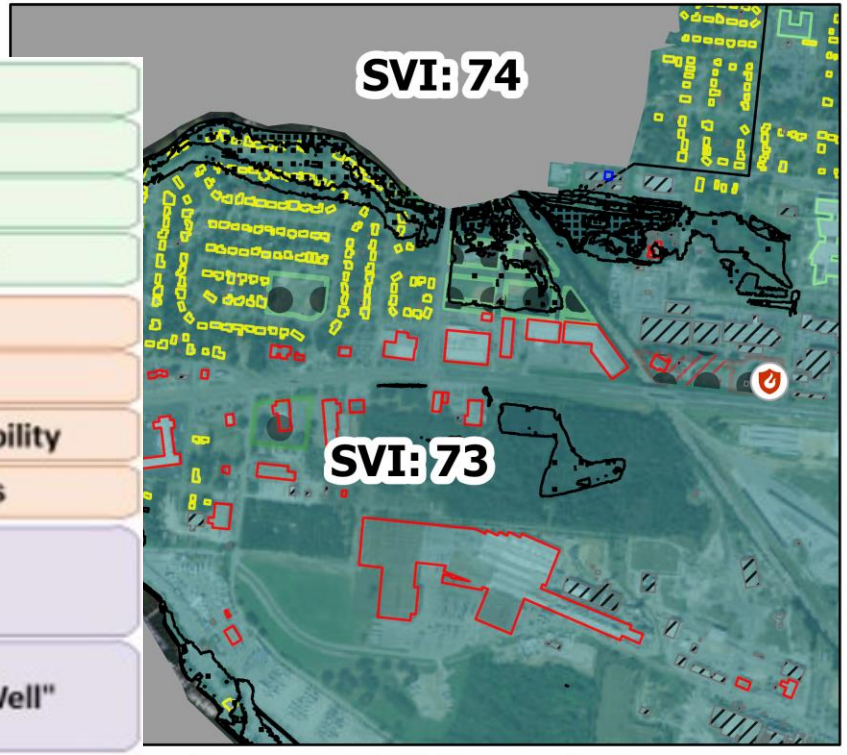
Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

Social Vulnerability



Admiral Mason Veterans Memorial Par



Bayou Dr & Bill Gregory Park

Overall Vulnerability

Socioeconomic Status	Below Poverty
	Unemployed
	Income
	No High School Diploma
Household Composition & Disability	Aged 65 or Older
	Aged 17 or Younger
	Older than Age 5 with a Disability
	Single-Parent Households
Minority Status & Language	Minority
	Speaks English "Less than Well"
Housing Type & Transportation	Multi-Unit Structures
	Mobile Homes
	Crowding
	No Vehicle
	Group Quarters

Potential Tidal Inundation

- 2040
- 2070
- 2100

CDC SVI

- 0% - 25%
- 25% - 50%
- 50% - 75%
- 75% - 100%

First Responders

- Fire Station
- Police Station
- Hospitals
- Court Houses
- Community Centers

Building Type

- Commercial
- Gov/Public
- Commercial
- Commercial Vacant
- Gov/Public
- Industrial
- Institutional
- Misc
- DOT
- State of Florida
- Escambia County
- City of Pensacola
- Outside Study Area

2100

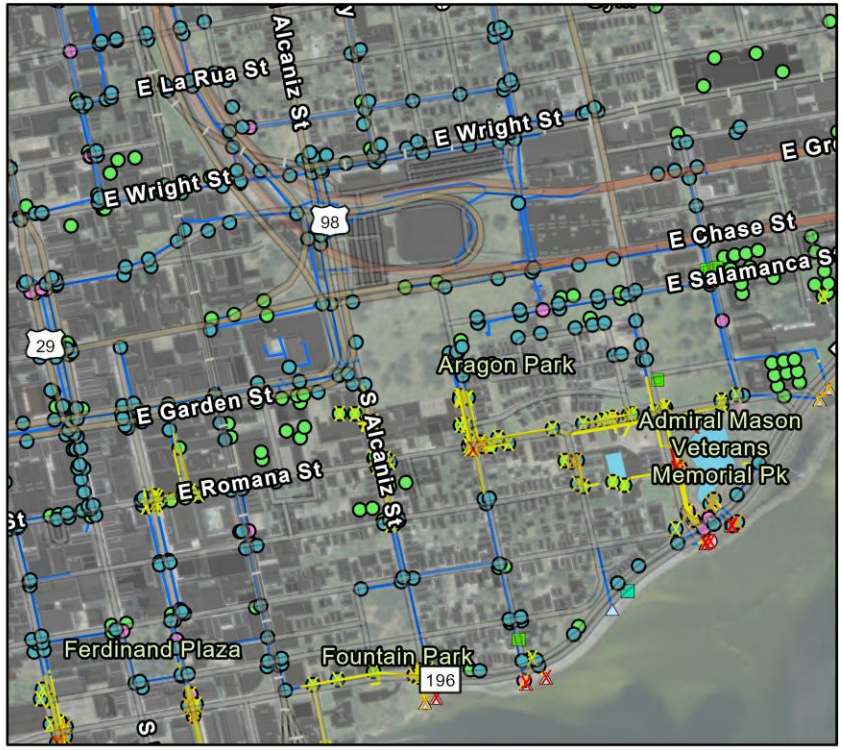
->	Rise	->	Symbol
->	16 inches	->	red x
->	38 inches	->	orange x
->	70 inches	->	yellow x

Example Output

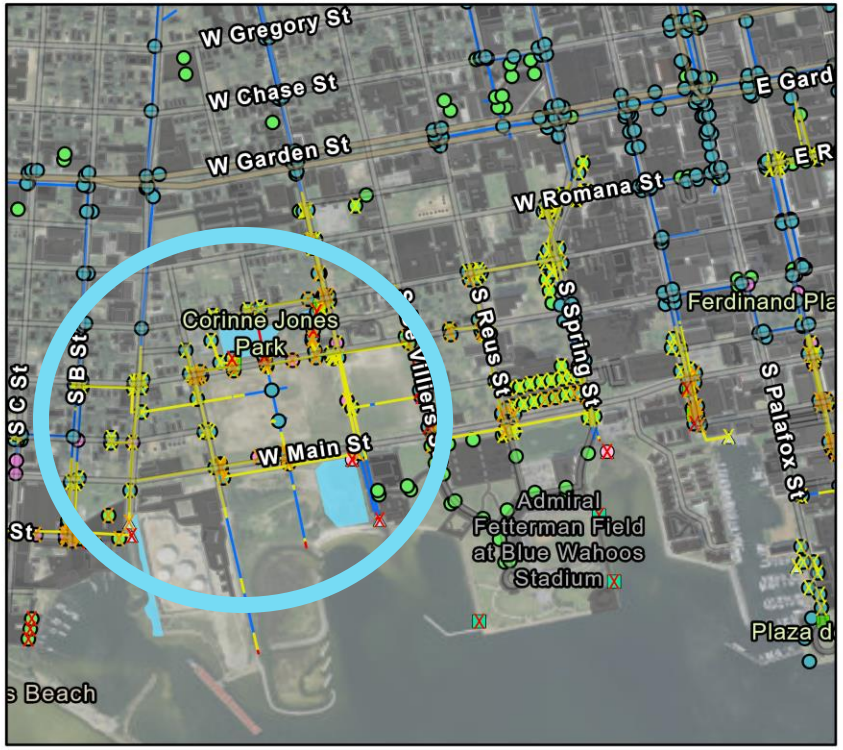
Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

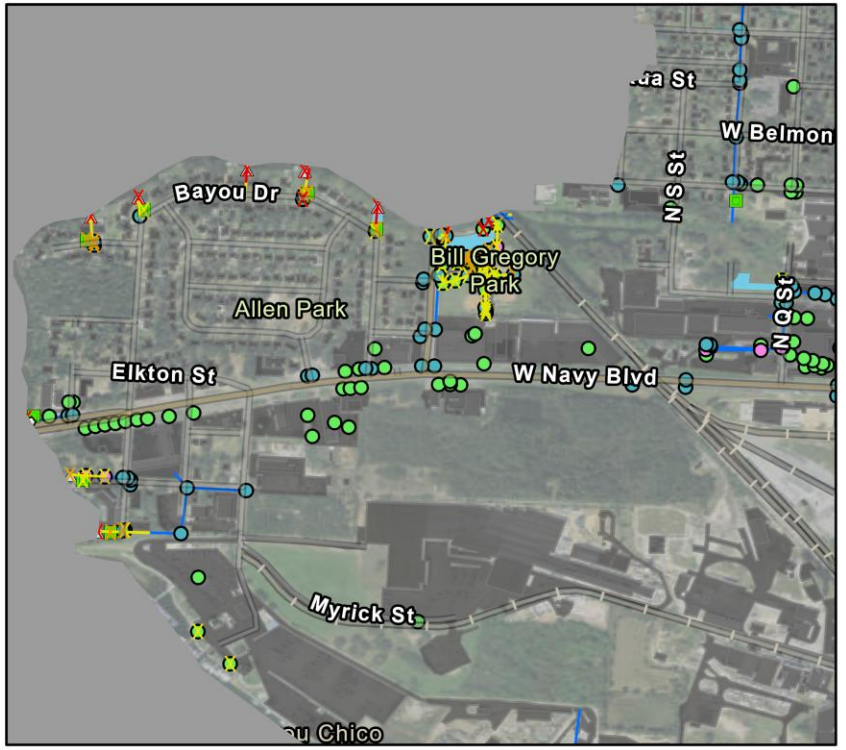
Stormwater



Admiral Mason Veterans Memorial Park



W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

Structure Type

- Inlet/Grate
- Manhole
- Misc SW Structures
- Outfall Node Weirs
- Outfall Node Pipe
- Outfall Node Drop Start
- Treatment Units
- Pipes
- Impervious Surface
- Major_Pavement
- Building_Footprints
- Retention Ponds
- Vaults
- Outside Study Area

Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

TIDAL FLOODING AREAS BY 2040

- Choosing the 2040 planning horizon for this effort is reasonable for **stormwater facilities** and small coastal protection infrastructure projects. For larger scale coastal resiliency protects longer term planning horizons should be used.

- The analysis establishes "Tidal Flooding Areas" (TFA) for the 2040 planning horizon. A GIS application of DEM model of the City's topography, roadways and storm pipe outfalls was used and an overlay of the 5.0 ft tidal elevation is performed.

- The 2040 planning horizon elevation of 5 feet NAVD is used to determined two types of tidal flooding areas:
  - 1) Coastal Shoreline Flooding (overtopping of shoreline protection).
  - 2) Street Flooding (due to tidal back flowing through stormwater pipes).

- The Tidal Flooding Areas = less than 5 ft NAVD. The TFAs will require different design solutions; either enhanced shoreline protection/stabilization or back flow prevention devices for the storm pipes.

- Seawall elevations were not available, so LiDAR topography was used to identify lower coastal locations. The accuracy of the topography is generally within 7 inches. The conditions of the City's seawalls were not available, so it is recommended to complete of a visual or structural and topographic survey of the City's coastal protection seawalls to identify any leaks or potential failures as well as cap elevations.

- Based on the analysis, **by 2040 sea level rise will cause tidal flooding to occur at 39 locations** through the City based on the elevations of low-lying coastal areas. This will require shoreline protection improvements and **back-flow prevention devices at up to 21** of the City's 116 stormwater pipes that discharge to tide.

EXAMPLE COST ESTIMATES *17 IN LINE CHECK VALVES

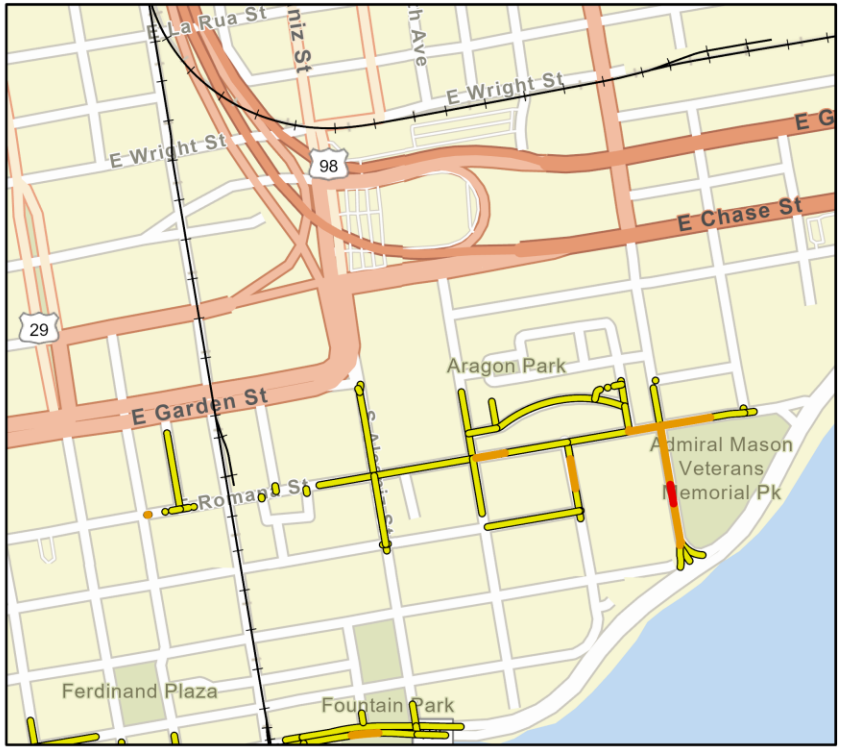
- **Twenty-two (21)** of the City pipes will contribute to street flooding without backflow prevention. Table 2 includes Wapro valves with dimensions and costs for the **17 circular pipe sizes.**
- The other 4 conveyances are elliptical or rectangular and may require a custom design to prevent tidal backflow (therefore no cost information in chart).

Table 2. Wapro Wastop Valve Table

	City Pipe Desigantion	Length	Pipe Diam.(“)	Valve Length(")	Storm Inlet Box Type	Valve Cost*
1	N-3348	164.62	15	28.7	D	$ 6,920.00
2	N-397	177.01	12	23.6	D	$ 4,110.00
3	N-2105	87.89701	24	47.2		$ 11,590.00
4	NA-2500	147.01	18	33.1	E	$ 8,560.00
5	N-5198	77.35	36	66.9		$ 20,710.00
7	N-5199	5.68	36	66.9		$ 20,710.00
8	NZA-S0290	117.56	18	33.1	E	$ 8,560.00
9	N-2516	62.36	30	55.1		$ 16,880.00
10	N-2518	92.93	30	55.1		$ 16,880.00
11	NA-0890	75.73	18	33.1	E	$ 8,560.00
12	N-1269	89.05	18	33.1	E	$ 8,560.00
13	N-2097	91.81	24	47.2		$ 11,590.00
14	N-2983	357.7779	54	102		$ 67,760.00
15	N-3037	222.6423	60	110.2		$ 88,680.00
16	NTZ-1170	144.04	30	55.1		$ 16,880.00
17	NTZ-1180	43.6	18	33.1	E	$ 8,560.00
18	N-2924	60	32 X 68			NA
19	N-3677	42.94	10' x 6'			NA
20	N-5127	148.40	7.25' X 8'			NA
21	NTZ-0980	51.88	48 X54			NA
					Total	**$325,510.00**

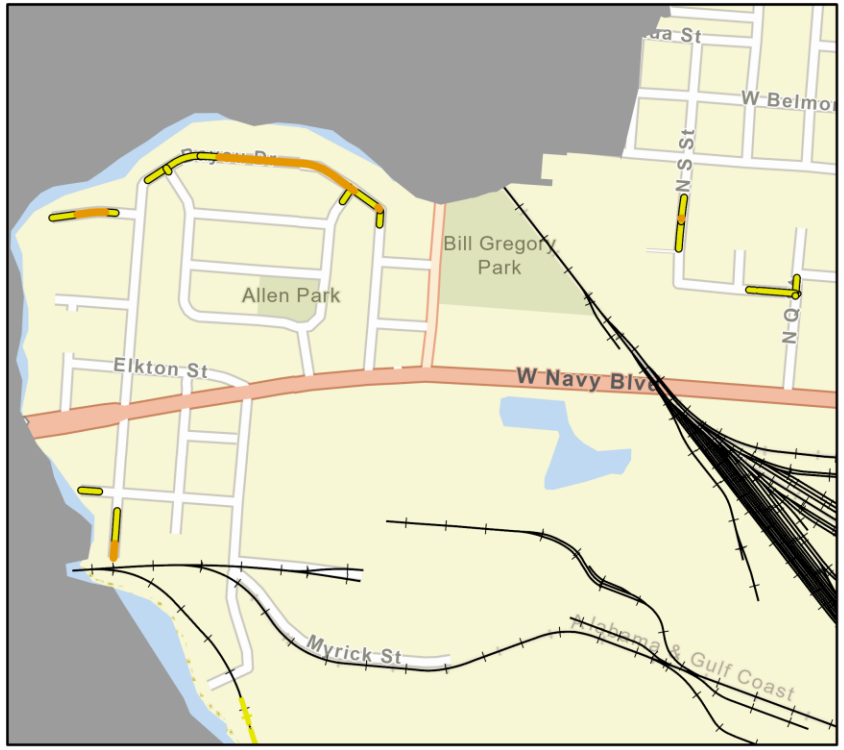
*WASTOP 316 SS

Transportation



Admiral Mason Veterans Memorial Park

W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

- Railroads
- Streets
- Airport
- Outside Study Area

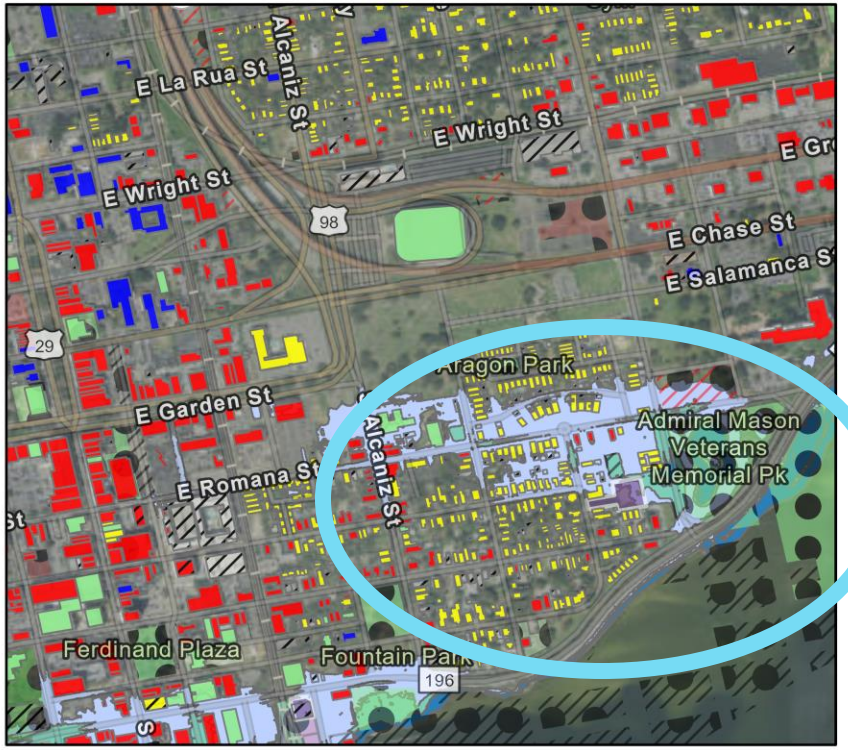
Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

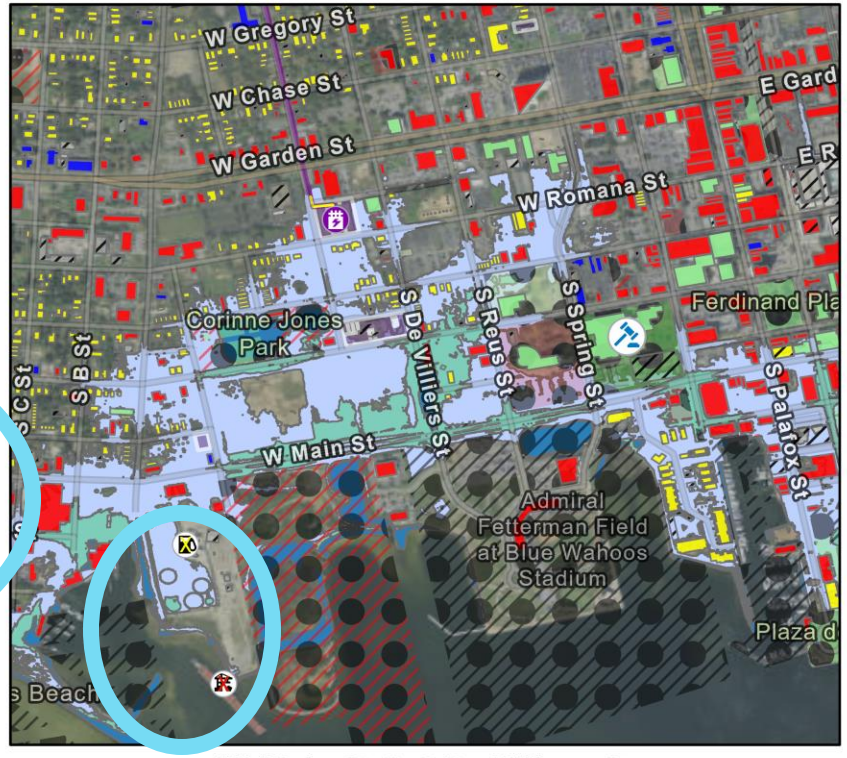
Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

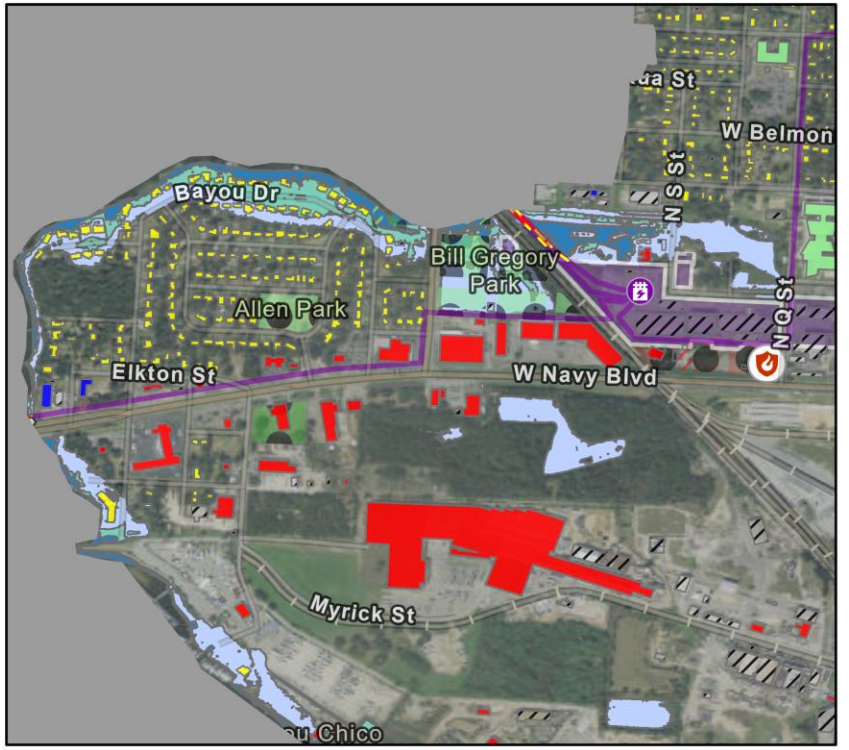
Critical Infrastructure



Admiral Mason Veterans Memorial Park



W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

- Hospitals
- Court Houses
- Fire Station
- Police Station
- Petroleum Terminals
- Petroleum Ports
- Community Centers
- Substations

Sanitation & Staging Areas

- Port of Pensacola
- Public Works & Facilities
- Roger Scot Vickery Center Recreational Area
- Transmission Lines
- Power Facilities
- Port
- Airport

Public Infrastructure

- Commercial
- Commercial Vacant
- Gov/Public
- Industrial
- Institutional
- Misc
- Residential
- Residential Vacant

Building Types

- Commercial
- Gov/Public
- Institutional
- Misc
- Residential

Federal Property

- U.S.A.
- DOT
- State of Florida
- Escambia County
- City of Pensacola

Potential Tidal Inundation

- 2040
- 2070
- 2100
- Outside Study Area

Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

PERIL OF FLOOD AMENDMENTS

- Mark up of **Coastal Management Element overall** to incorporate resiliency principles
- Suggest new **Goal** to address Peril of Flood (ease of review for DEO)
  - Objective: …principles, strategies, and engineering solutions that reduce flood risk in coastal areas **across the community**
  - Objective: use of best practices development and redevelopment principles, strategies, development techniques and engineering solutions at **the site level**
  - Objective: maintain regulations consistent with, or more stringent than, the **flood-resistant construction requirements in the Florida Building Code and applicable floodplain management regulations set forth in 44 C.F.R. part 60**
  - Objective: participate, and seek to enhance participation, in the National Flood Insurance Program **Community Rating System** administered by the Federal Emergency Management Agency to achieve flood insurance premium discounts
    - Suggested 31 new policies to support the new Goal and 4 Objectives
    - Further public input and adoption will be after this grant closes

WHY PLAN NOW?

- SLIP requirements
  - Essentially any resiliency-related adaptation projects receiving state funds will require sea level impact projection (SLIP) studies
- Example project:
  - Planning and implementation of inline check valves cost shared in the new Resilient Florida Program (~$325,510 receiving a 50% cost share from the State.

- Federal and state funding:
  - BRIC
  - American Rescue
  - Resilient Florida
  - Others

NEXT STEPS

Task	Description/Date
Goals, Objectives and Policies for Peril of Flood amendments.	• Draft comprehensive plan language in strike-through and underlined format which satisfies the Peril of Flood requirements in Section 163.3178(2)(f) Florida Statutes • ** Meet with staff for review ** • Final Goals, Objectives and Policies for Peril of Flood amendments. • Submitted to and approved by DEP
Draft Vulnerability Assessment	• Draft report of preliminary vulnerability assessment with map series and analysis of integration with FEMA's CRS program • ** Meet with staff for review ** • Final Preliminary Vulnerability Assessment with Map Series. • Due 6/30/21
Public Engagement Meetings including visualization tools.	• Public workshop on Vulnerability Assessment and Comprehensive Plan language **May 25** • City Council workshop on Vulnerability Assessment and Comprehensive Plan language **May 24** • Story map / other web tools on project **In process** • Due 6/30/21

- Finalize modeling output and map series
- Narrative on vulnerability assessment (in process)
- Story map
- Public engagement

DISCUSSION

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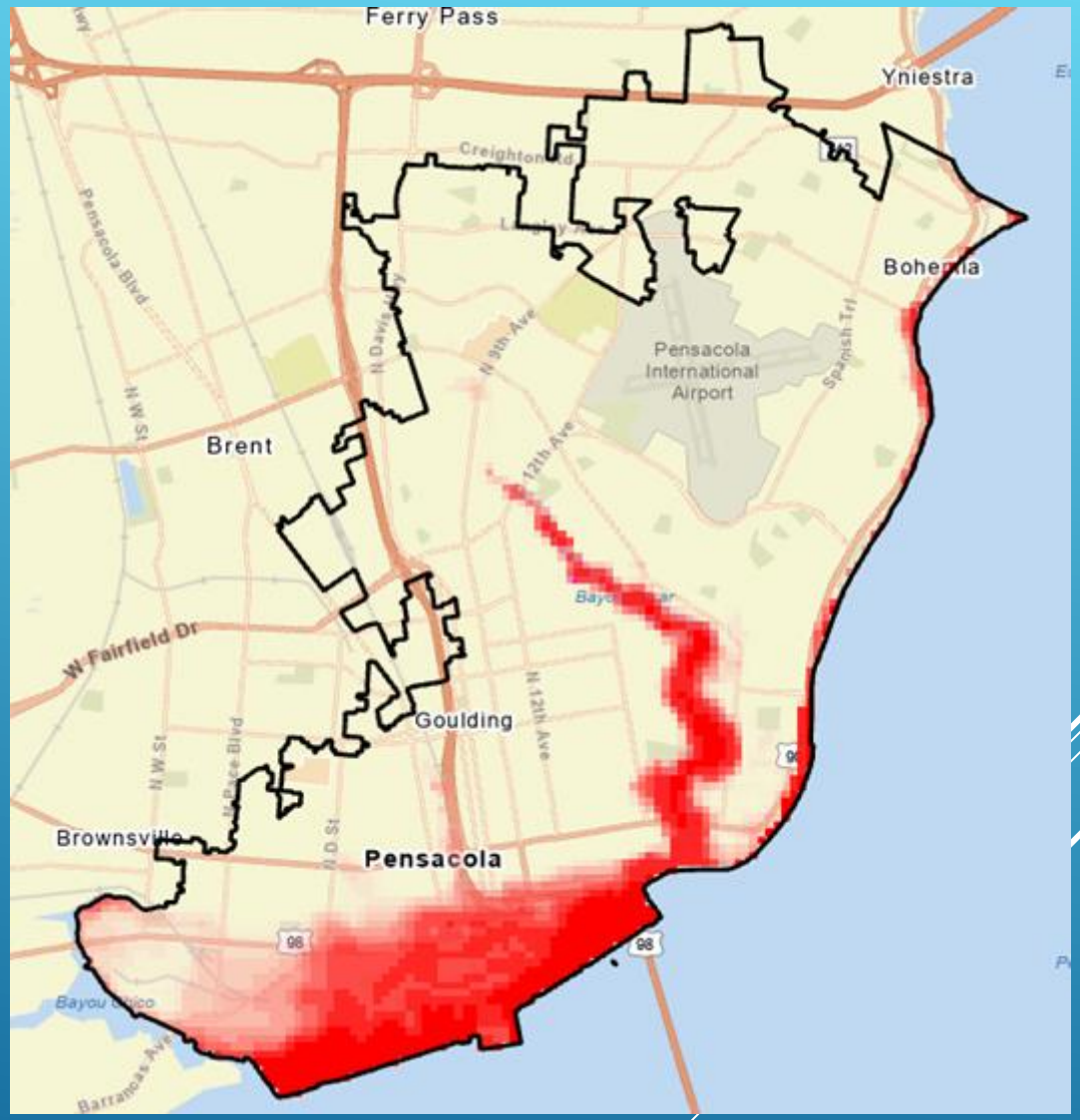
954.593.5102

Climate Mitigation Task Force Findings

- Reestablish Sustainability Coordinator
- Green House Gas Reduction
- Effectively Monitoring Energy Usage & Reduce Consumption
- International Council for Local Environmental Initiatives (ICLEI)
- ***Conduct Vulnerability Assessment***
- Update Coastal Management Element of the Comprehensive Plan
  - Peril of Flood Act

City of Pensacola Vulnerability Assessment

- Just the beginning!
- FDEP – Resilient Coastlines Grant
- Future Presentations:
  - Monday May 24 - Agenda Conference 3:30PM
  - Tuesday May 25 – Virtual Presentation (TBD)
- Story Map



City of Pensacola Resiliency Story Map

PENSACOLA
FLORIDA'S FIRST & FUTURE

Flood information and your safety

Evacuation Zones, Flood Zones, and Storm Surge - what you need to know.

When it comes to safety and storms there are many confusing terms. The City of Pensacola would like to clear up any confusion and provide information and valuable links regarding what flood zone you are in, your evacuation zone, and information about storm surge.

What you need to know (need to update image)

Evacuation Zones - Designated low lying areas used to ensure evacuations prior to storms.
- Know your zone before a storm event

Flood Zones - Used by insurance companies as well as building officials that govern building construction.
- The location of a building in a flood zone can determine required insurance
- Florida Building Code outlines how to build in a flood zone
- Contact the City's Floodplain Manager for additional questions

Storm Surge - Rise in seawater level during a storm. Used to determine evacuations.

A Community Self Assessment

How well is your community prepared for a disaster?

What does it mean to be resilient?

Interpreting the resilience index results

RESILIENCY PLANNING GRANT R2116

Task	Work Products:
Final Analysis of Existing Data Resources for Preliminary Vulnerability Assessment	• Draft Analysis of Existing Data Resources for Preliminary Vulnerability Assessment, Best Practices and Case Studies and Peril of Flood amendments. • ** Meet with staff for review ** • Final Analysis of Existing Data Resources for Preliminary Vulnerability Assessment, Best Practices and Case Studies and Peril of Flood amendments. • **Task submitted and accepted by DEP 11/20/20**
Recommended Policy Alternatives for the Peril of Flood amendments	• Draft Memorandum of recommended policy alternatives for the Peril of Flood amendments. • ** Meet with staff for review ** • Final Memorandum of Recommended Policy Alternatives for the Peril of Flood amendments • **Task submitted and accepted by DEP 12/10/21**
Goals, Objectives and Policies for Peril of Flood amendments.	• Draft comprehensive plan language in strike-through and underlined format which satisfies the Peril of Flood requirements in Section 163.3178(2)(f) Florida Statutes • ** Meet with staff for review ** • Final Goals, Objectives and Policies for Peril of Flood amendments. • **Task submitted and accepted by DEP 4/19/21**
Draft Vulnerability Assessment	• Draft report of preliminary vulnerability assessment with map series and analysis of integration with FEMA's CRS program • ** Meet with staff for review ** 2/5 + additional date for larger cross-departmental presentation • Final Preliminary Vulnerability Assessment with Map Series. • **Due 6/30/21**
Public Engagement Meetings including visualization tools.	• Public workshop on Vulnerability Assessment and Comprehensive Plan language • City Council workshop on Vulnerability Assessment and Comprehensive Plan language • Story map / other web tools on project • **Due 6/30/21**

SLR/VULNERABILITY MODEL OUTPUT

DOES NOT/IS NOT

- Is NOT intended for individual homeowners
- Does NOT account for property level improvements
- Does NOT account for future mitigation projects
- Does NOT account for stormwater engineering projects

DOES/IS

- Does provide macro view of what sea level rise may look like
- Does inform decision-makers and elected officials
- Does inform planners of potential future conditions
- Allows for project prioritization
- Does inform work to mitigate future flood risk

TIDAL FLOODED AREAS BY 2040

PDF Page #	Tidal Flooded Areas	1) Coastline Shoreline Flooding: Overtopping Shoreline Protection	2)Street Flooding Stormwater Pipe Backflow (Outfall Pipes, City Designation)
3	1	Encroach Homes east and west of Scenic Hwy	
	2		(NTZ-0980) Encroaches under Scenic Hwy approach property on Langley Ave
4	3	Encroaches homes, may overtop seawall	
	4		(NA-0890)
6	5	Encroaches south of channel, east of N 12th St.	
	6	West of Channel, west of Mendez Dr.	
	7	West of Channel, east of Severin Dr.	
8	8	Encroaches east of N.18th St.	
	9	Encroaches west of N.18th St.	(N-2518) Intersection north Blackshear Ave
	10	North of Blackshear Ave.	(N-2516)
10	11	Encroaches between N-1988 and NL-0620 South of Endor Rd	
	12	West end of Hyde Park Rd	Road Flooding
	13	South of N-2514 east of Osceola	(N-2514) Inlet at E Scott Road
11	14	Encroaches east of Yates St, south of N-2689	
	15	East of end of E. Mallory St.	
	16	South of E Mallory St., Bayview Parking lot	
	17	Encroaches property	(N-2097) floods south end Bayou Blvd.
13	18	Encroaches at NTZ-SO190	
	19	East end of E La Rue St.	
	20	East of Channel by N-3569	
	21		(N-1269) south end Bayou Blvd

TIDAL FLOODED AREAS BY 2040

PDF Page #	Tidal Flooded Areas	1) Coastline Shoreline Flooding: Overtopping Shoreline Protection	2) Street Flooding Stormwater Pipe Backflow (Outfall Pipes, City Designation)
14	22	Encroaches south across Bayou Blvd	(N-3348, NA-2500, N-397) Bayou Blvd
	23		(N-3677) need to survey confirm
	24	Encroaches south towards Briarcliff Dr. Between N-400 and N-409	
15	25	Encroaches Wayside Park East	(NZA-S0290)
	26	Encroaches east end of La Rue	
	27	N 17th Ave. under rail bridge	(N-2105)
16		SAME AS PAGE 14	
17	28	Bartram Park	(N-5127) S. Barrack St.
	29		(N-5199, N-5198) S 9th Ave. south of E Romana and E. Intensenia St. east of Cevellos St. to S.9th Ave
18	30	East of S. C St.	
	31	Marina Inlet south of S. Pace Blvd.	
	32	Parking south of McLeod St. east of S. R St.	
	33	S. K St Past north past Sonia St.	
	34		(N-2924) S. I St. and Sonia St. intersection
19	35	East of S. C St	
	36	W. Main St. from S. Chubbs St. to S. Rues St.	
	37		(N-3037) east end of W. Gimble St.
	38		(N-2983) south end of S. B St.
20	39		(NTZ-1180, NTZ-1170)

Emergency Management

Admiral Mason Veterans Memorial Park

W Main St & S De Villers St

Bayou Dr & Bill Gregory Park

No "x" = no impact for these locations!

- Fire Station
- Police Station
- Hospitals
- Shelters
- Evacuation Routes
- Outside Study Area

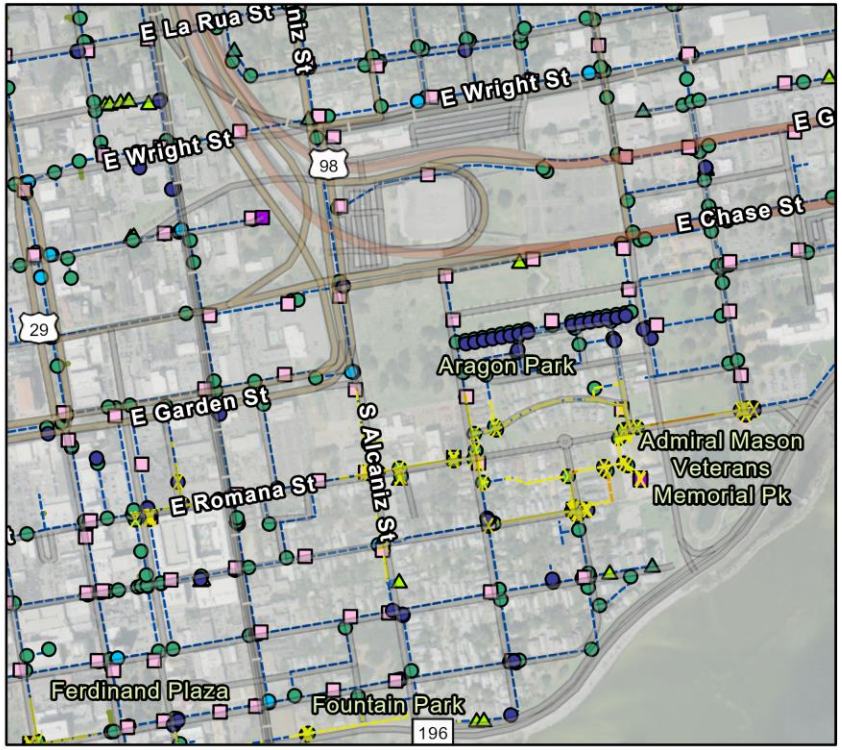
Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

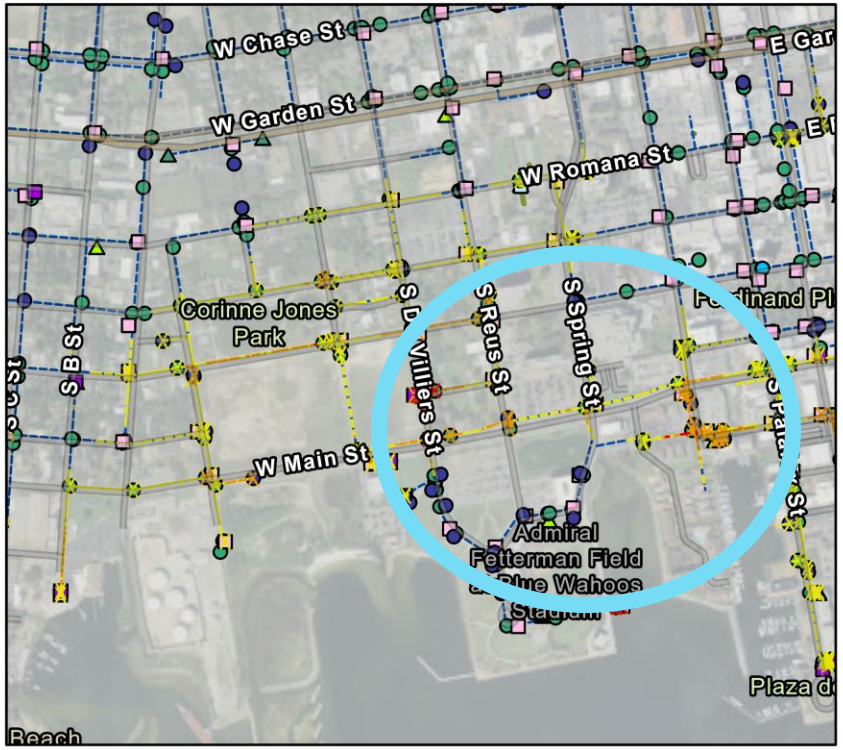
Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

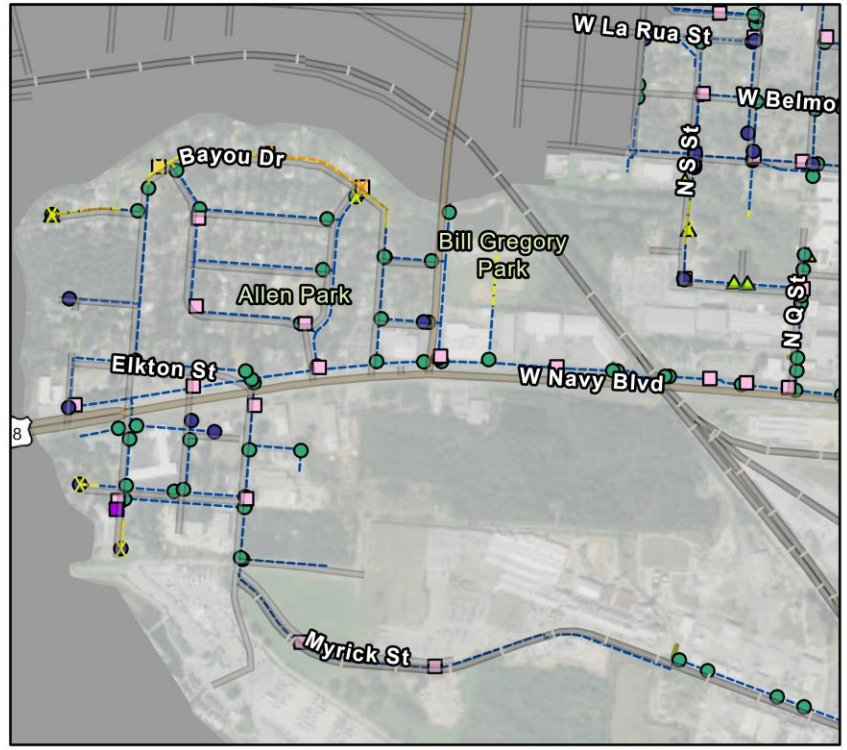
Potable



Admiral Mason Veterans Memorial Park



W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

- Dead End
- Fitting
- Flush Point
- Hydrant
- Manhole
- Valve System
- Valve Control
- Service Point
- Wells
- Casing
- Drain
- Main Distribution
- Service Line
- Zone
- Tank
- Outside Study Area

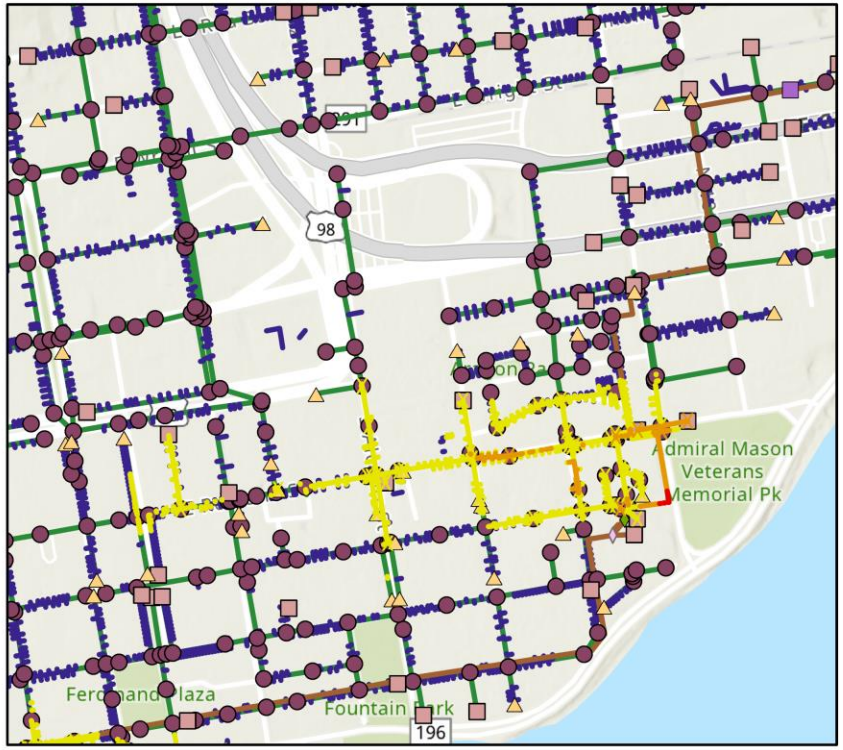
Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

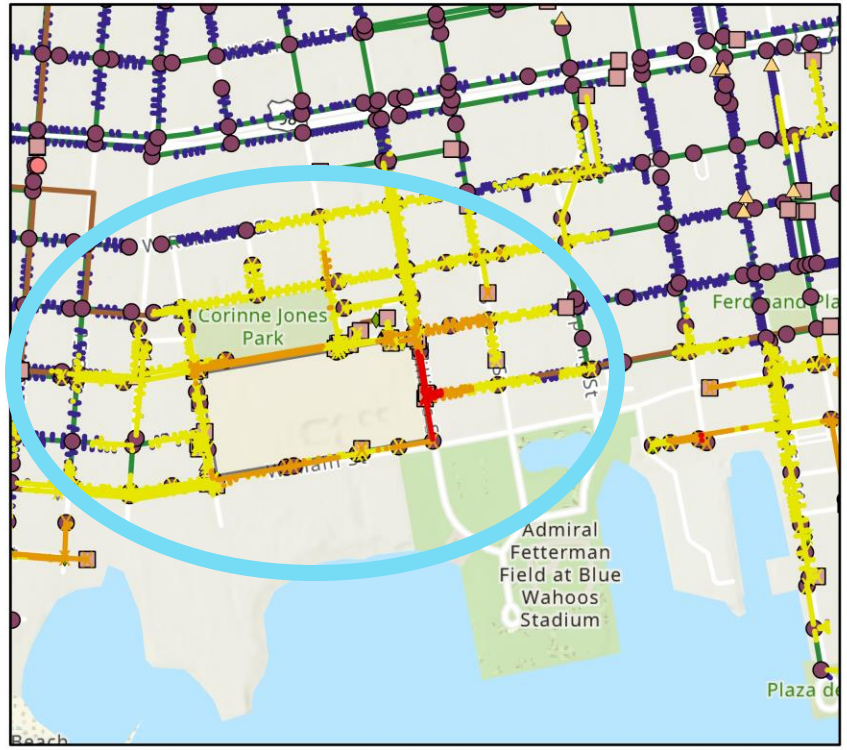
Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

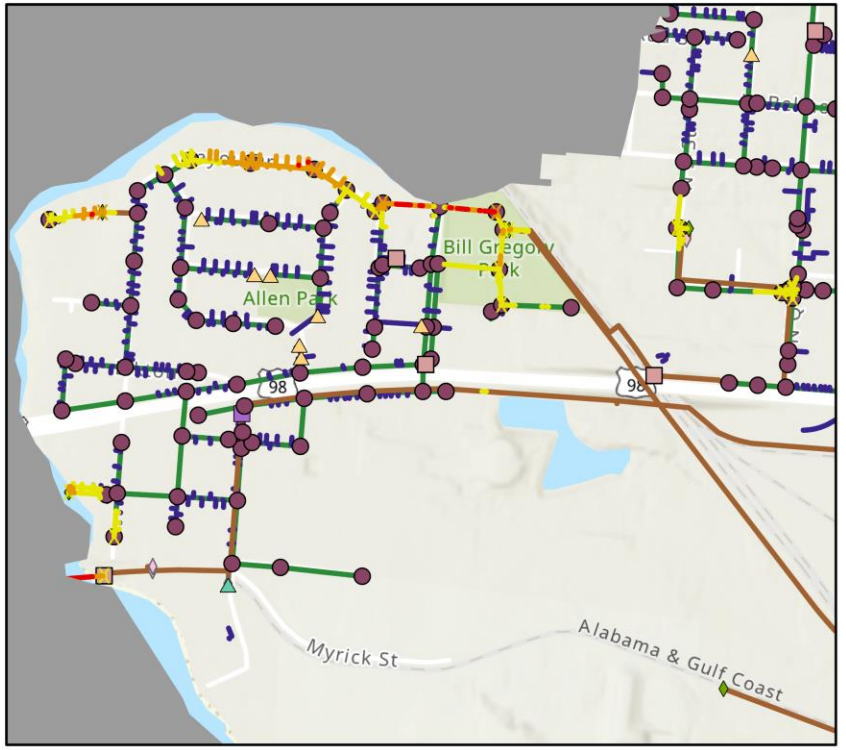
Sanitation



Admiral Mason Veterans Memorial Park



W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

- ARV Vent
- Cleanout
- Fitting
- Gate Valve Flush
- Liftstation
- Manhole
- Valve Control
- Valve Control ARV
- Valve Horizontal Bevel Gear Nut
- Valve System
- Mainforce
- Casing
- Gate Valve Flush
- Lateral
- Main Gravity
- Valve Horizontal Stem
- Treatment Plant
- Outside Study Area

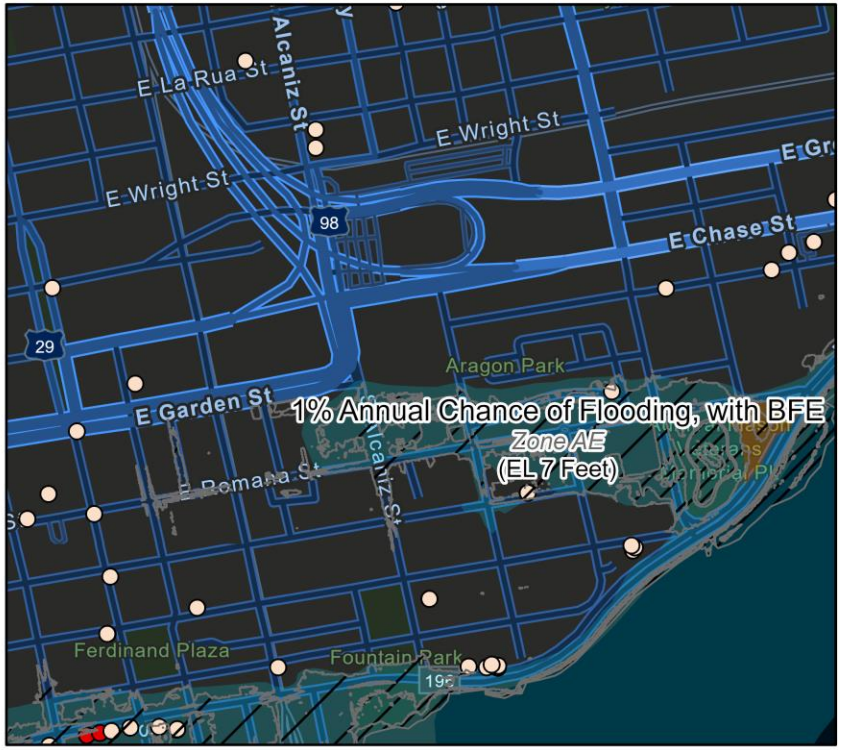
Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

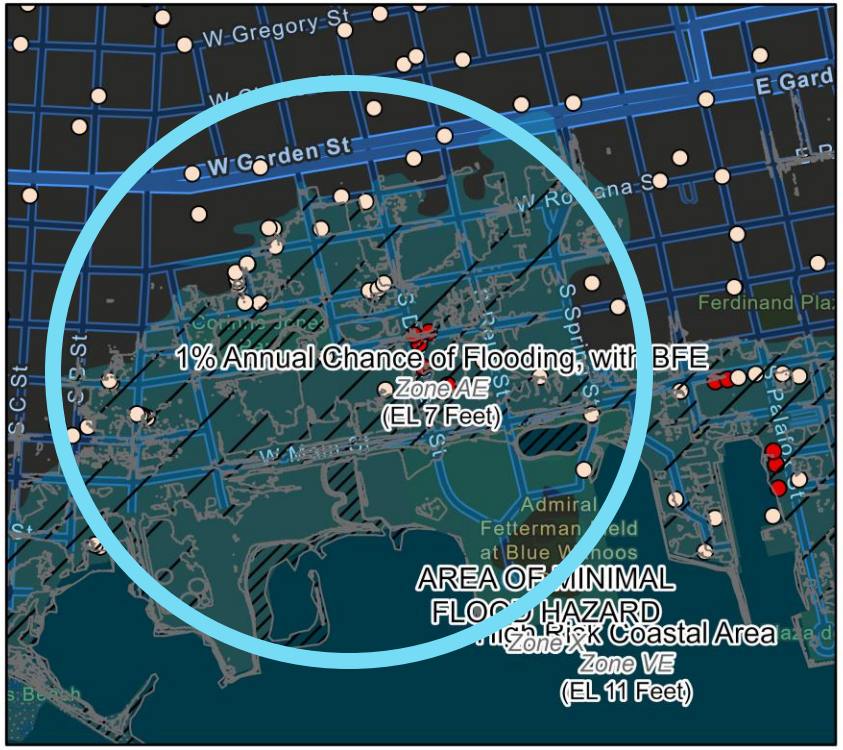
Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

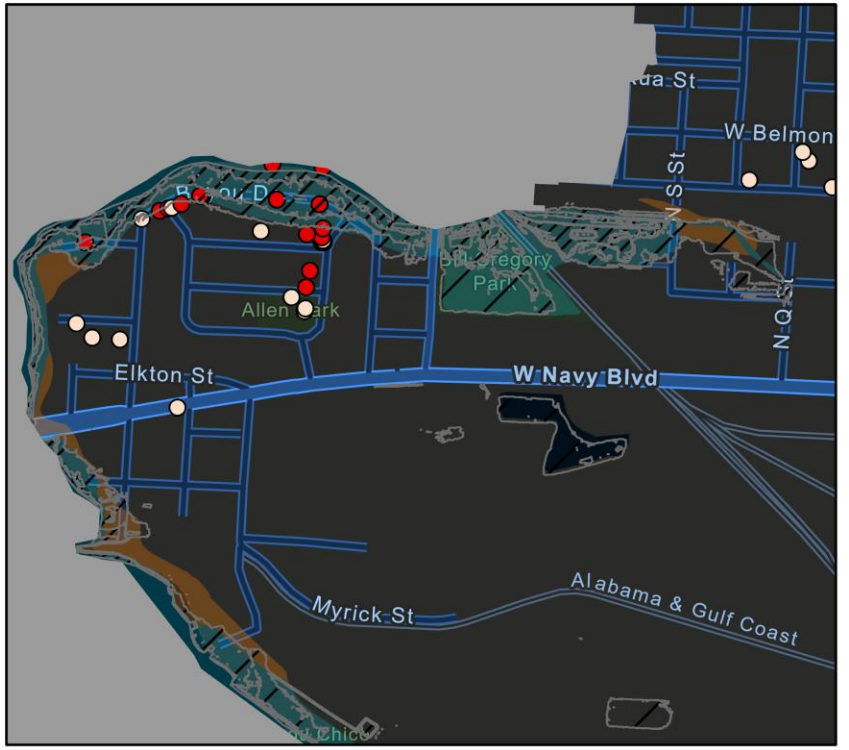
Sea Level Rise and FEMA



Admiral Mason Veterans Memorial Park



W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

Outside Study Area

SLR by Year

- 40
- 70
- 100

Hurricane Sandy Damage Assessments

- Wind Damage
- Water Damage
- Unknown

Flood Hazard Zones

- 1% Annual Chance of Flooding
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee

Example Output

Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

WHY PLAN NOW? HB 7019/SB 1954

- On April 8, 2021, the State of Florida solidified its commitment to planning for resiliency and funding. The 18 page bill creates the a major program in Florida to address the future risks of sea level rise and flooding by authorizing up to $100 million annually for a new grant program focused on local and state government, subject to legislative appropriation.
- **Resilient Florida Grant Program**. DEP is now authorized to fund grants for planning, data collection and projects to address future flood risks including sea level rise. The grant program can fund vulnerability assessments to determine a community's risks to these threats, but those vulnerability assessments must meet certain parameters outlined in the legislation.
- **Comprehensive Statewide Flood Vulnerability and Sea Level Rise Dataset and Assessment**. The legislation also requires DEP to develop a statewide plan (not just at the local government level) to address flood vulnerability and sea level rise. It also requires DEP to develop a statewide dataset to create this assessment and update it periodically. The Assessment must focus on critical assets and other regionally significant assets at the State level.
- **Statewide Flooding and Sea Level Rise Resilience Plan**. Annually, DEP must now create and update a Statewide Flooding and Sea Level Rise Resiliency Plan which is comprised of ranked projects that mitigate or eliminate risks from flooding and sea level rise. The bill contains requirements for project submittals and evaluation including a 50% cost share unless the project is within a financially disadvantaged small community, then the cost share requirement may be reduced. Projects must be submitted by a county, municipality, regional resilience entity, water management district or flood control district or have been identified in the statewide assessment previously outlined. Certain project expenses are prohibited such as those that focused on just recreation, aesthetics or project not directly tied to a resiliency benefit. The section includes a scoring system for ranking projects.

WHY PLAN NOW? HB 7019/SB 1954

- **Funding**. The bill authorizes up to $100 million annually subject to a legislative appropriation. This is important because while the legislation creates the Resilient Florida program, it does not include a dedicated funding source and additional action by the Legislature will be required for funding. This issue is not without divergent perspectives. Companion to this effort, SB 2512 revises documentary stamp tax allocations for the Affordable Housing Guarantee Program and shifts those funds to the Water Protection and Sustainability Trust Fund (for this program) thus impacting existing desperately needed affordable housing programs across the state.
- **Regional Resilience Entities**. The bill also authorizes funding for regional resilience entities such as the Southeast Florida Regional Climate Compact or the Coastal Resources Partnership in Palm Beach County for technical assistance, coordination or projects.
- **Florida Flood Hub for Applied Research**. The bill establishes the University of South Florida College of Marine Science (or its successor entity) as the lead academic and research institution to address flooding and sea level rise challenges of the state. The charge of the hub is to coordinate data, modeling, research, establish community programs and cooperate with other governmental entities.
- **Inland and Coastal Flood Control**. The bill requires the State's Office of Economic and Demographic Research to assess the need for future expenditures and costs related to sea level rise, flooding and storm surge. Importantly, the assessment must also identify any "gaps" between estimated revenues and expenditures for these purposes.