



City of Pensacola

ENVIRONMENTAL ADVISORY BOARD

Minutes

May 6, 2021

2:00 pm

Hagler/Mason Conference Room,
2nd Floor

Members Present: Kristin Bennett, Chair, Kelly Hagen, Vice Chair, Neil Richards, Blase Butts, Katie Fox, Alex Kozmon, Kyle Kopytchak, P. Jay Massey

Members Absent: Michael Lynch

Others Present: Council Executive Don Kraher, Sustainability Coordinator Mark Jackson, Michael Ziarnek, Cynthia Cannon, Assistant Planning Director, Keith Wilkins, City Administrator, Christian Wagley

1. Call to Order/Quorum

The meeting was called to order by Chair Bennett. A quorum was established.

2. Approval of Meeting Minutes:

a) April 1, 2021

Chair Bennet mentioned there was a typo. Member Kopytchak moved for the approval of the April 1, 2021 minutes, seconded by Member Fox. The motion was approved 8 – 0 with one member absent.

3. Add-on Presentation—Vulnerability Assessment

Cynthia Cannon provided an update on the vulnerability assessment they have been working on over the past year through a FDEP Resilient Coastlines Grant. She pointed out two of the recommendations made by the Climate Mitigation and Adaptation Task Force. One was to conduct a vulnerability assessment and the other was to update the Coastal Element of the Comprehensive Plan – Peril of Flood Act. This is the base line for the resiliency efforts moving forward. The assessment will include interactive maps to use as a tool. There will be future presentations on the vulnerability assessment—one on Monday, May 24th at the Council Agenda Conference and again a larger community wide virtual presentation.

Ms. Erin L. Deady, P.A. joined the meeting via teams and reviewed her project team members—Clearview Geographic/Stetson University, Lori Lehr, Inc. FEMA's Community Rating System and Jeff Needle, P.E. Climate Resiliency

Engineering and Design, Inc. (CRED) (Stormwater functionality and modeling). The scope of Pensacola's RPG is to develop a vulnerability assessment, develop Comprehensive Plan language to comply with "Peril of Flood" requirements in Section 163.3178(2)(f), F.S. (Coastal Management Element). She reviewed the tasks and work products to date that have been submitted to and accepted by DEP. She explained the resources and modeling tools they used in the mapping to determine sea level rise and tidal flooding. It will help with determining potential future conditions, project priorities, and work to mitigate future flood risks. She reviewed the gap analysis, that is divided into four major categories—Flood Understanding/Emergency Response, Build Environment, Natural Environment and Socio-Economic Data. She reviewed FEMA's Community Rating System data requirements that must project out at least to the Year 2100 and also reviewed NOAA's Sea Level Rise Projections. The assessment will include a map series that contains much of the GIS enabled data that was gathered during the collection phase. Also discussed was the tidal flooding areas—coastal shoreline flooding and street flooding by 2040. 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. She reviewed the goal, objectives and policies of the proposed Peril of Flood amendments in the Coastal Management Element of the Comprehensive Plan.

Board members had several questions about the data comparisons between Pensacola and Delray Beach and the use of NOAA Sea Level projections and the effects of greenhouse gas emissions on sea level rise.

Assistant City Planner stated that if there were further questions, there will be a frequently asked questions page, with those questions going through the Planning Department, so that there will be an answer in writing for everyone to see. The email address to submit questions is: planningquestions@cityofpensacola.com. Put FDEP Coastal Resiliency Program in the subject line.

Chair Bennett thanked Cynthia and Erin for their presentations and indicated that as this resiliency program moves forward, she would be interested in having further updates on the progress made to the Board.

Council Executive indicated that he had requested a copy of the presentation and once received, would send out to all the board members.

3. Goal Setting—2021

Chair Bennett opened discussion and asked if Board members or Council Executive had any thoughts on how to proceed with establishing the goals. There were 21 items submitted, with some overlapping.

Council Executive suggested that there be some consensus from the Board as a body as to what the top five priorities are and set those as the top five for the current year and as time goes, readdress them in the next year.

Member Richards stated that he thought at the last meeting, that the number one priority would be the establishment of an application form and process for community organizations to use in obtaining funds from the Tree Trust Fund. Member Butts indicated that he would look into gathering information on any existing municipal tree grant applications and processes and didn't know if he was ready to make a presentation to the Board today.

Council Executive indicated that he had received some information from Member Butts and there was some additional information that he suggested to be looked at as well. This meeting was to prioritize the goals. Sustainability Coordinator also had some thoughts about the application and process. At the next meeting, perhaps a presentation can be made. The Board may want to consider having six priorities, with the application and process being one of the six, since work is already underway on this.

Chair Bennett read over the list of submitted Goals for 2021. She indicated that several of the goals involved having someone make presentations to the Board on different topics. She has met with the Sustainability Coordinator to have some kind of educational presentations made to the board and asked how the Board felt about having them added at the beginning of the meetings.

Board discussed benefits of having these educational type presentations made so that it would provide background information for discussion and consideration by the board on the various goals, once finalized.

Also, Member Massey asked that walk-ability, ride-ability as it affects greenhouse gas emissions be added to the list of goals.

Council Executive suggested that items 2, 7, 8, and 12 be eliminated from the list as the City already has existing language in the code on some of the items;

Sustainability Coordinator is already providing updates regularly to the Board, staff does try to provide available information to the EAB for their review and comment, and the City Council did take action on the EAB's recommendation to reduce usage of Styrofoam and plastic straws, installed water refill stations in City Hall and provided reusable water bottles to City employees. There are certain limitations that the legislature has imposed on what City's can and can't regulate.

Discussion occurred on item 14 with regard to recommend a sustainability action plan. Member Kozmon indicated that it was one of his items and that based on the action the Board took at the April meeting when he presented the plan, it's been satisfied.

There was also discussion on item 18, with regard to using Tree Trust Funds for matching federal or state grants to plant trees and item 20 with regard to educating and promoting the installation of "rooftop" solar for residential and City of Pensacola. Council Executive informed the Board he was not sure if the Tree Trust Funds could be used as "matching funds" and would have to look into that. Also with regard to Item 20, he informed the Board that a City Council Member has already requested information from staff on the status of roof replacements on city buildings and if, when replaced, they could look at installing "rooftop" solar.

Christian Wagley explained what Solar United Neighbors does. They set up Co-ops where the community comes together to pool their purchasing power as individuals to get the best deal on solar. What Solar United Neighbors does as a non-profit is they bring the neighbors together, have public education sessions, get everyone signed up who wants to get solar for their rooftop and then they help them through the RFP process as technical experts. They make sure the right information goes out, help collect the bids from companies in the area who bid, and help the members of the co-op make their choice. They have no stake in the game as far as who gets selected.

Member Fox offered a recommendation on how to move forward with the process of establishing the goals. She has heard as priorities, trees, solar and sustainability. Based on the authority that the EAB has, the initiatives have to be actionable for the Board and the terminology the Board has to use is the Board can support, understand and recommend. Once the Board understands an issue, then they can take action to support or make a recommendation.

Member Richards mentioned that item 5 needs to be considered along with the solar items. The ultimate goal would be to have the charging station powered by solar canopy. That is a significant budget item.

City Administrator Keith Wilkins addressed the Board with regard to electric vehicles and charging. Two solar trees have been installed at city hall by Gulf Power, and they are completing a solar canopy at Sanders Beach Community Center. There will be recharging stations associated with it. They are going to do the same thing at City Hall and will have ten vehicle charging stations. The City does not have any electric vehicles in the fleet.

Sustainability Coordinator indicated that if there is an opportunity to add an electric vehicle and it falls within the replacement, there is nothing preventing it other than having the infrastructure like charging stations and that is something they are working on.

Member Kozmon made a suggestion that since this is something that is already being addressed by administration, that it does not need to be included as a priority.

Items 6 and 9 could be included under education/presentations. There was further discussion on item 9--dark sky lighting with Sustainability Coordinator providing information on street light replacement upgrades. He's been told they are dark sky compliant lights. Within the City, the City only owns about 1500 lights of the over 6,000 lights. The others are owned by Gulf Power or FDOT. The lights the City has put in are LED. They are an efficient bulb, it's just the coloration or the way it projects that is different.

Council Executive also indicated that the City has recently changed some of the standards and addressed neighborhood concerns with 5K lights. The lights that get put in neighborhoods are substantially different than those on major streets like 9th Avenue and Bayou Boulevard.

Chair Bennett indicated there were three outstanding items listed and that she was not sure where the Board's authority lies. She wondered how Item 17 to reduce/eliminate pollution from stormwater runoff including Escambia County watershed could be a priority item, since that issue is already being addressed in the City and County with their stormwater projects.

Member Butts indicated that he was satisfied. The city is doing everything they can, with the funds that are available.

Sustainability Coordinator stated they are doing as many projects as they can to capture stormwater or to divert it from flooding where ever they can and also treat it.

Member Richards also mentioned item 11 and item 19. They relate in some ways to stormwater and specifically to educate the public on placement of yard waste debris to help eliminate clogging stormwater drains. The goal should be long term, on-going education. One person from the EAB could go to a neighborhood association meeting to educate the neighborhoods on various environmental issues.

Sustainability Coordinator informed the Board that a recent flyer was enclosed with gas/sanitation bills on stormwater and placement of debris.

Member Fox indicated that it could be categorized as waste management or stormwater management or water quality. Another item not included on the list is the continued understanding of the IPM Plan.

Item 15 with regard to invasive plants was discussed. This could be something the Board follows up on without including it as a priority item. Member Kozmon provided a little background information on why he submitted this item. The damage that invasive plants do, he would be willing to put together some information on invasive plants and the effects on the environment in general to be able to help formulate a recommendation.

Item 16 could also be put in with trees, since it is about preserving ecology, tree canopy preservation/restoration and it may be possible to build wildlife habitation and preservation. Member Kozmon indicated it was an important issue with him, but felt it was too much for the Board to take on and would not be offended if it was removed.

Chair Bennett asked for clarification on item 3. Member Butts indicated that was one of his items with all the projects that wastewater and water treatment plants are starting to do with this. He pointed out a project that the City of Alabaster, AL is doing. It could go under sustainability.

Member Kopytchak indicated he received a text message from a citizen watching

the EAB meeting and asked that consideration be given to addressing storm-water and infrastructure. Address flooding issues downtown before more building permits are issued and impact fees.

Sustainability Coordinator suggested that the Board consider a category of Reduction of Greenhouse Gas Emissions, because a lot of the topics discussed fall under that category.

Member Hagen indicated that education should be a category to include presentations to the Board as education as well as the Board members doing public outreach to educate neighborhoods on various environmental issues.

Council Executive cautioned the Board on public outreach. The Board would have to agree to any individual member going to an individual place and they would have to agree on any information presented. Individual bias can come into play that may not be reflective of the Board's position.

Member Kozmon indicated that a presentation could be put together for review by the Board and then once approved by the board, then could be used as public education.

With reference to the IPM Plan and having an overall citywide IPM plan as it relates to the Public Works Department, the Council Executive informed the Board that the Public Works Director recently retired and David Forte has been appointed interim director.

Chair Bennett indicated that she would work with the Council Executive to re-categorize the goals and priorities and come back next month for a quick re-cap and discussion.

4. Board Member Comments/Updates, Reports and Announcements
There were no Board Member Comments
5. Public Comments—Open Forum

Christian Wagley expressed his appreciation to the Board on how engaged they are. He announced an on-line event he is hosting with Chris Castro, Sustainability and Resiliency Director for the City of Orlando on Monday, from 5 – 6 p.m. He has a meeting set up in late June with a woman from the Audubon Society of Florida to do a budget session. In order to make the renewable energy goals, they are going

to be pushing hard to have money spent on some of the projects that will help meet the 30% goal. He also thanked the Board for staying focused on the greenhouse gas emissions reduction goals.

Sustainability Coordinator introduced Mike Ziarnek, Complete Streets Coordinator with the Planning Department.

Chair Bennett thanked the Michael Singer and Ryan Miller for their participation on the IPM plan during the last EAB meeting. The next meeting of the EAB will be June 3, 2021.

6. Adjourn

There being no further business to come before the Board, the meeting was adjourned at 4:40 p.m.

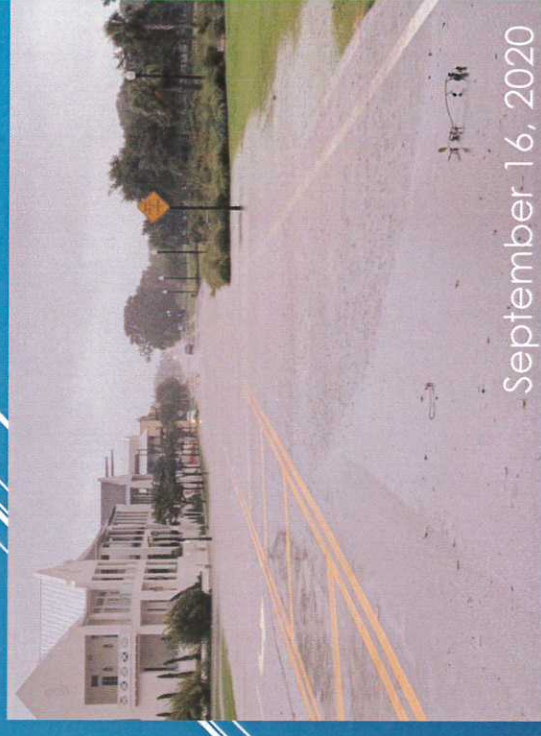


CITY OF PENSACOLA RESILIENCY PLANNING

Resiliency Planning Grants R2116
Environmental Advisory Board

May 5, 2021

Cynthia Cannon & Erin L. Deady



OVERVIEW OF PRESENTATION

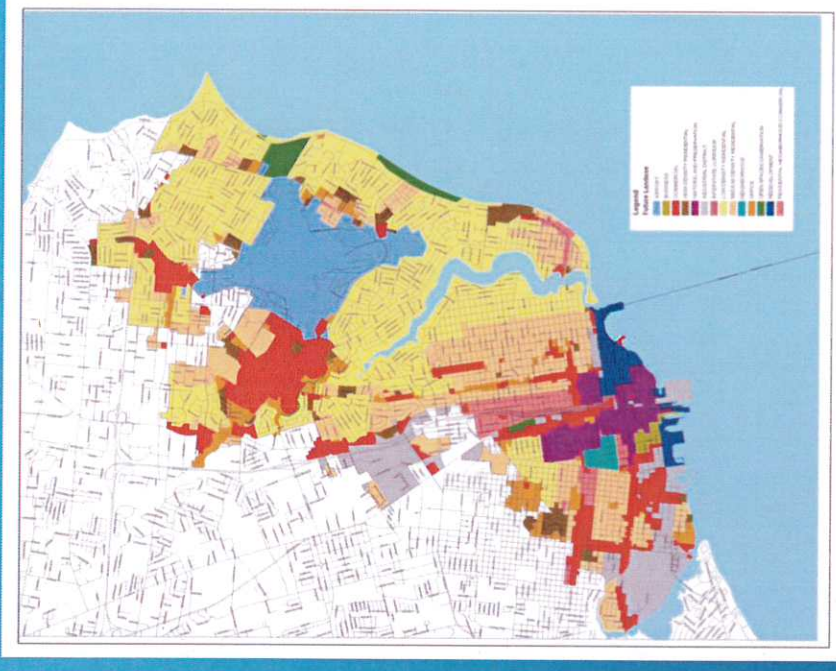
Part 1: Introductions (5 minutes)

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



Climate Mitigation Task Force Findings

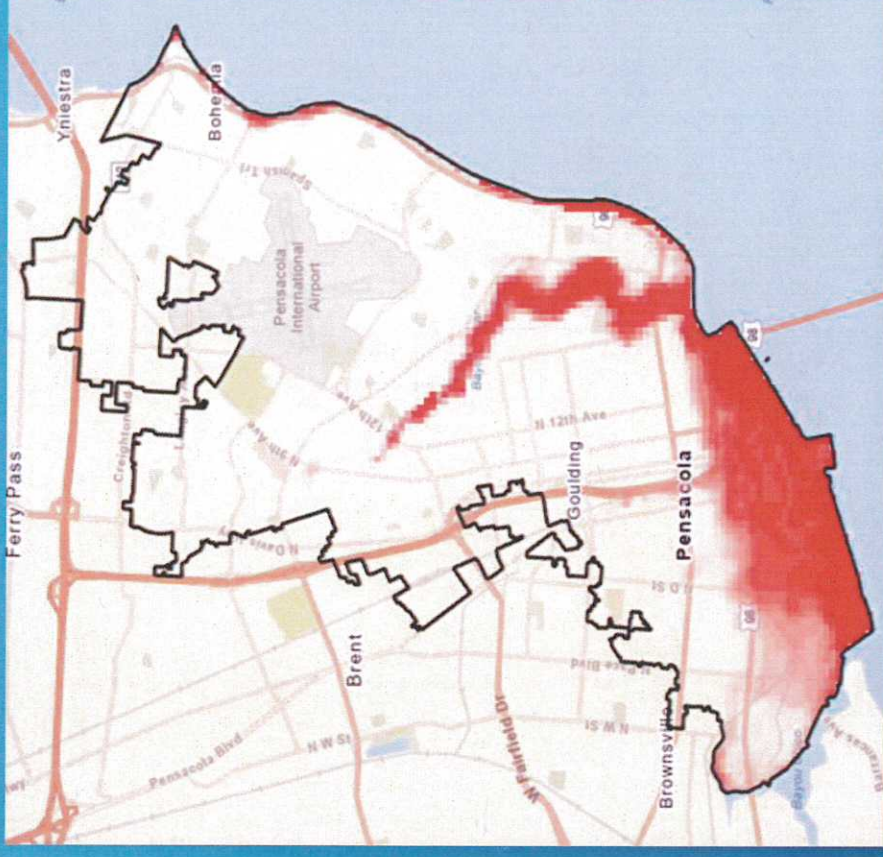


- Reestablish Sustainability Coordinator
- Green House Gas Reduction
- Effectively Monitoring Energy Usage & Reduce Consumption
- International Council for Local Environmental Initiatives (ICLEI)
- **Conduct Vulnerability Assessment**
- Update Coastal Management Element of the Comprehensive Plan
 - Peril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



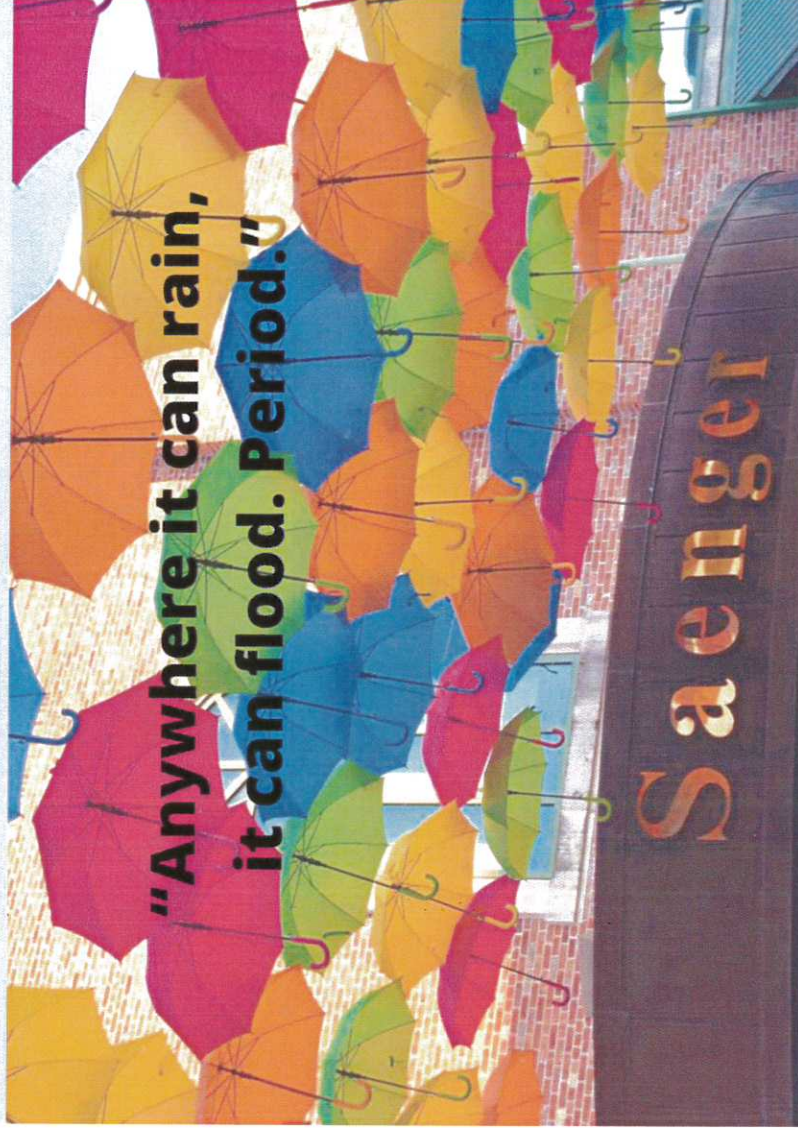
City of Pensacola Resiliency Story Map



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.

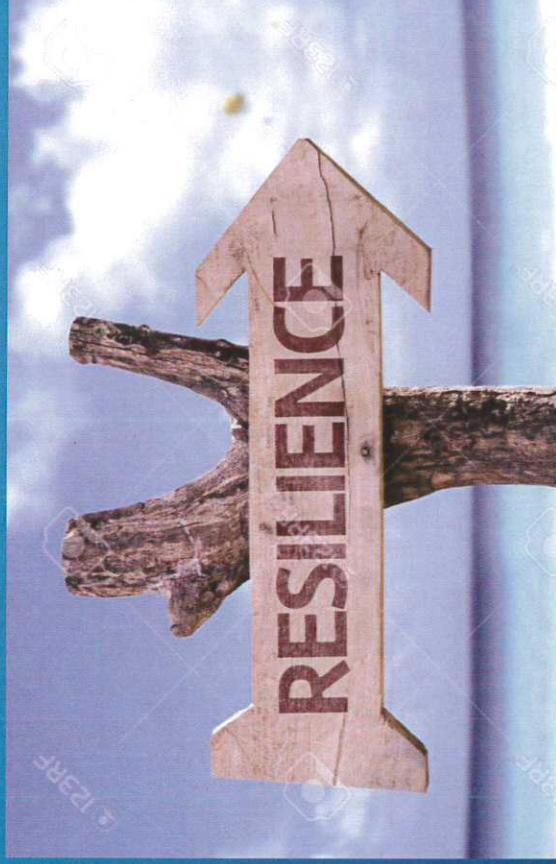


A Community Self Assessment

How well is your community prepared for a disaster?

What does it mean to be resilient?

Interpreting the resilience index results



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)



Lori Lehr, Inc.

CLIMATE RESILIENCY ENGINEERING & DESIGN, INC.

Monroe County Watershed Management Plan

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

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

June 2019



DRAFT MONROE COUNTY REPORT
Monroe County Resilience Coordinator, Program
Monroe County Board of County Commissioners
Final Project Report

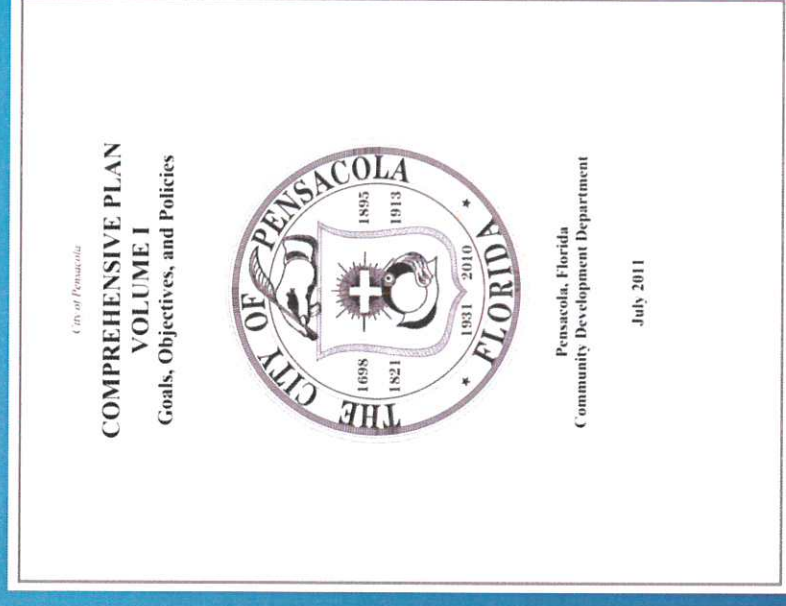


This report was funded in part through a grant agreement from the Florida Department of
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recommendations are those of the author(s) and do not necessarily reflect the views of the State of Florida or any of its
agencies.

June 2019

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)



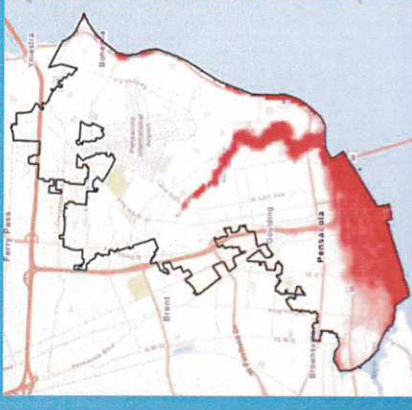
RESILIENCY PLANNING GRANT R2116

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

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:

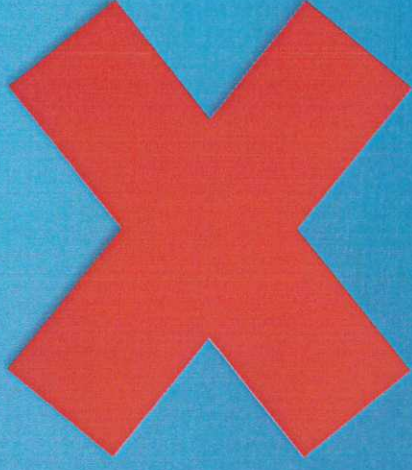


FEMA

SLR/VULNERABILITY MODEL OUTPUT

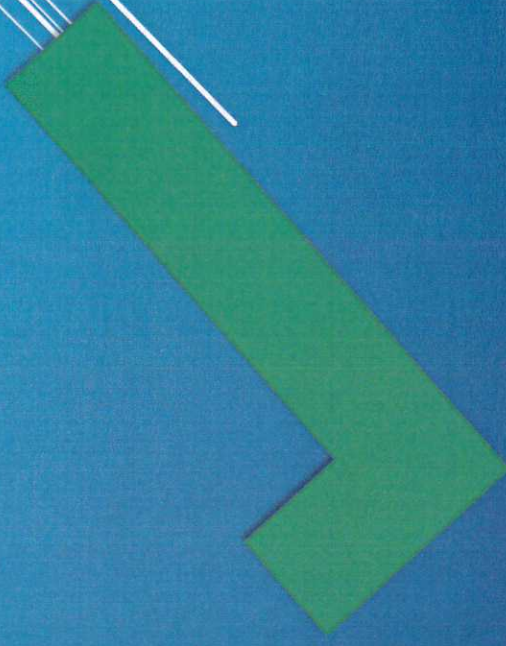
DOES NOT/IS NOT

- 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



GAP ANALYSIS

Flood Understanding/Emergency Response

Flood insurance study

Flood insurance rate maps

Elevations of tidal range

Evacuation routes

First responders

July 2019 Stormwater Master Plan

Built Environment

Capital improvement projects

Hurricane Sally damage
assessment

Stormwater infrastructure

Stormwater infrastructure design

Impervious surface

Green infrastructure

Watersheds

Transportation networks

Critical facilities

Utilities (water, power, wastewater,
trash)

Parcel GIS database

Natural Environment

LIDAR elevation model

Wetlands

Watersheds

Land Use/Land Cover

Depth to water table

Public Parks/Natural Land

Tree canopy

Threatened/Endangered

Shoreline

Socio-Economic Data

Property value

Possible: CDC Social Vulnerability
Index

GAP ANALYSIS: OUTSTANDING DATA OR FUTURE ANALYSIS

Flood Understanding/Emergency Response

Data of properties acquired or relocated / repetitive loss list

An analysis of active NIP policy locations compared with the projected sea level rise impacts would provide additional insight towards community vulnerability

(Geo-tagged) Photos; Surveyed/GPS of flood extents

Emergency Operations Center

An analysis providing staged, est. surge heights (e.g., Category 1-5) can be utilized to provide insight into the community vulnerability for various storm surge severities

Built Environment

An analysis pertaining to the distinction of natural/hardened shorelines and a projection of tidal flooding extent and severity compared to top elevation of seawalls

Protecting water pumps from failing under increased tidal inundation is critical to community safety

Identifying additional high priority facilities is critical to a more comprehensive study

Natural Environment

An analysis pertaining to the rates of coastal erosion is recommended; Obtain bathymetric data and assess how erosion effects coastline.

Socio-Economic Data

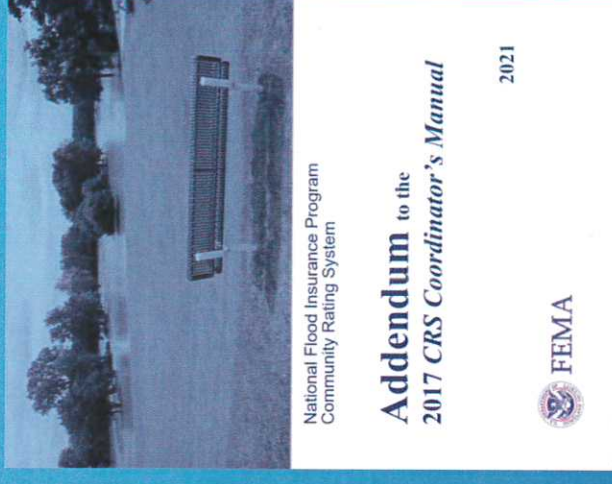
An analysis pertaining to projection of tidal flooding extent and severity compared to the physical locations and the associated community: DEO/Tax Collector

An analysis pertaining to projection of tidal flooding extent and severity compared to the various vulnerable demographic compositions within a community beyond CDC Social Vulnerability Index.

CRS DATA

- Final submittals by City
- CRS file being reviewed by our Team now
- Why is this important? **Analysis required by grant**

We are analyzing the City's most recent CRS file in the context of the sea level rise vulnerability assessment (and recent 2021 CRS Coordinator's Manual Addendum) to determine additional areas where the City can increase points within the CRS program



The CRS incorporates the consideration of sea level rise into a number of elements, including element HHS credit for higher study standards under Activity 410 (Flood Hazard Mapping); CEOS credit for coastal erosion open space under Activity 420 (Open Space Preservation); CAZ credit for Coastal A Zones under Activity 430 (Higher Regulatory Standards); and WMP credit for a watershed master plan under Activity 450 (Stormwater Management). Including sea level rise in WMP is required for coastal communities to meet the Class 4 prerequisite. The CRS uses and recommends the U.S. Army Corps of Engineers' "Sea-Level Change Curve Calculator," an online-tool available at <https://coast.noaa.gov/digitalcoast/tools/curve.html>

For information, outreach, and planning elements (including those under Activities 410, 450, and 510) and meeting CRS Class prerequisites, the community must project **out at least to the year 2100** using the intermediate-high projection from the latest-available National Climate Assessment projection at the time of its planning process.

SEA LEVEL RISE PROJECTIONS

Sea Level Rise Projections & Water Depth

Utilizing a bathtub modeling approach that has been accepted by both State and Federal regulatory agencies (NOAA, 2017), Clearview Geographic will assess the City of Pensacola for its vulnerability to sea level rise (SLR) inundation using several analytical functions provided by Clearview Geographic LLC that are built within the ArcGIS Pro platform (Environmental Systems Research Institute, 2020).

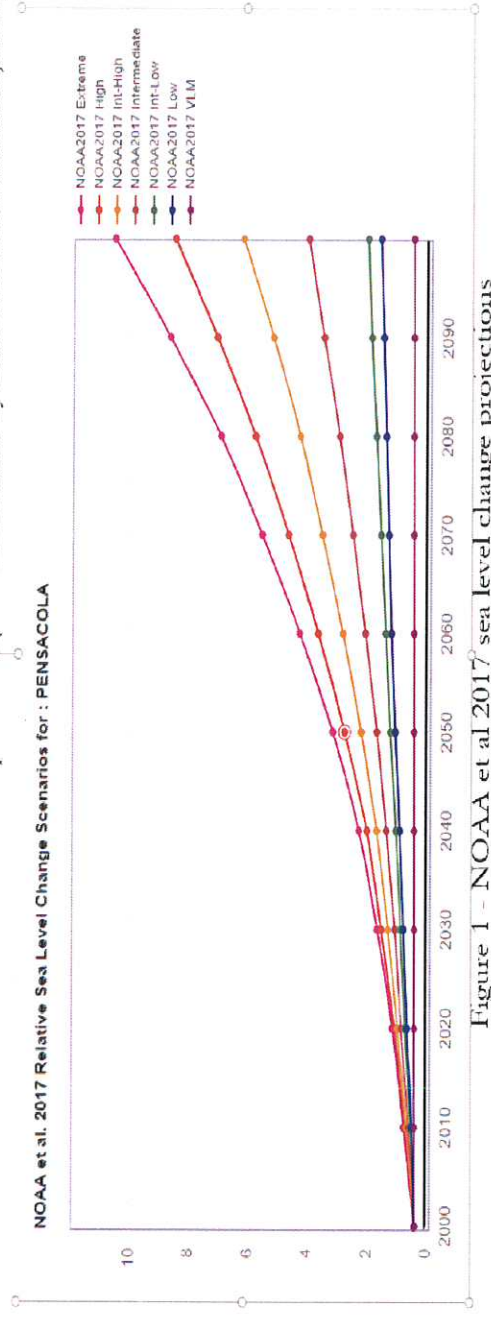


Figure 1 - NOAA et al 2017 sea level change projections

By 2100 sea levels are expected to rise 10.24 feet above local mean sea level (83-01) due to climate change, Figure 1, (USACE, 2017) when factoring in local tide gauge records (Pensacola, FL - Station ID: 8729840, 2020) under the National Oceanic and Atmospheric Administration Technical Report NOS CO-OPS 083 extreme scenario (NOAA et al, 2017); this is 3.26 feet higher than the 2100 high scenario cited in the USACE 2013/NOAA 2012 curve utilized in the 2016 Florida Department of Economic Opportunity Escambia County Vulnerability Study.

SEA LEVEL RISE PROJECTIONS

Scenarios for PENSACOLA
NOAA2017 VLM: 0.00102 feet/yr
All values are expressed in feet

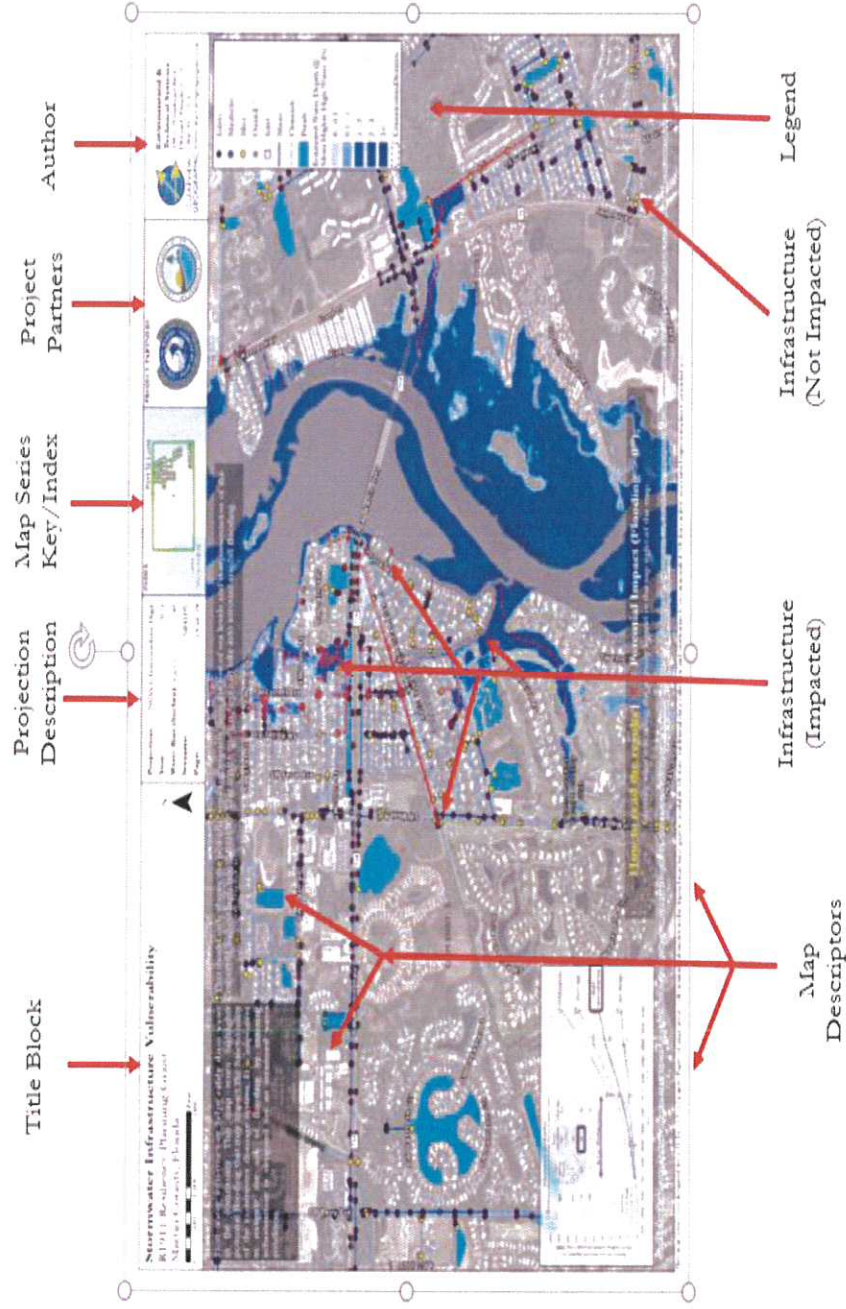
Year	NOAA2017 VLM	NOAA2017 Low	NOAA2017 Int-Low	NOAA2017 Intermediate	NOAA2017 Int-High	NOAA2017 High	NOAA2017 Extreme
2000	0.37	0.37	0.37	0.37	0.37	0.37	0.37
2010	0.38	0.46	0.50	0.56	0.63	0.69	0.73
2020	0.39	0.63	0.69	0.83	0.96	1.05	1.12
2030	0.40	0.76	0.86	1.05	1.28	1.51	1.65
2040	0.41	0.89	1.02	1.35	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.

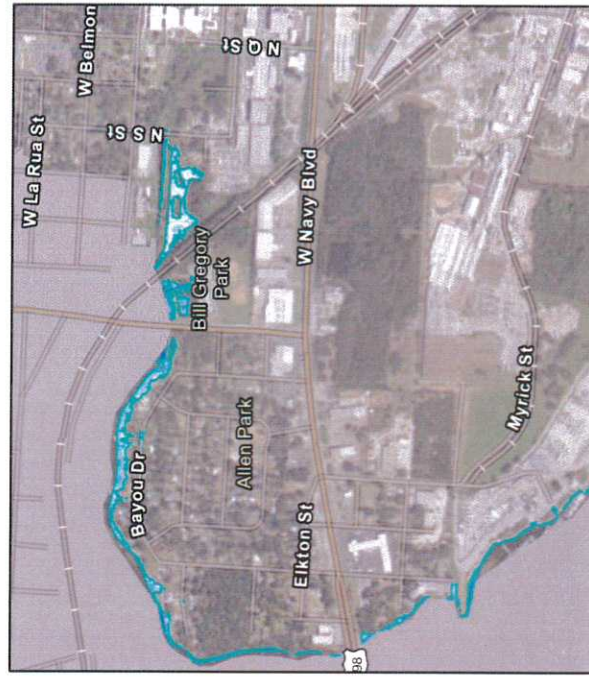
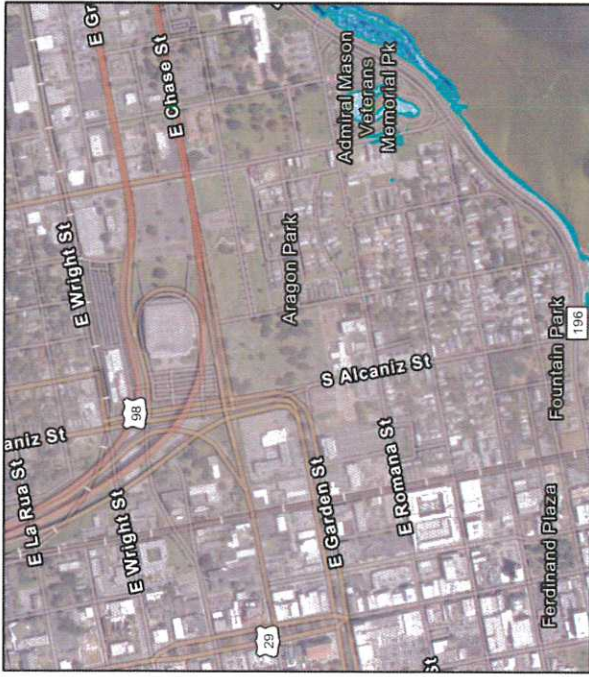


MAP SERIES OUTPUT

The final map deliverables will contain much of the GIS enabled data we gathered during the data collection phase.

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)

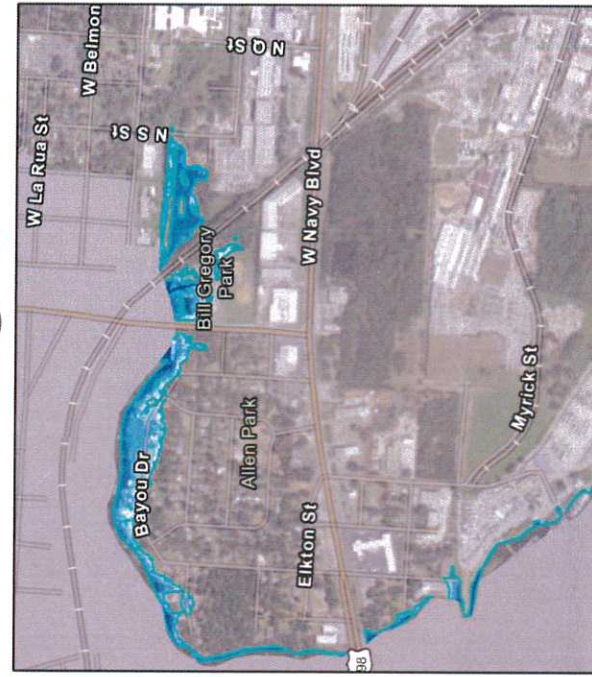


Year	Rise	Symbol
2040	16 inches	red x
2070	38 inches	orange x
2100	70 inches	yellow x

Example Output

Infrastructure NOT impacted by tidal SLR modeling	Infrastructure IMPACTED by 2040 tidal SLR modeling
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2070 Projected Sea Level Rise (MHHW NIH)



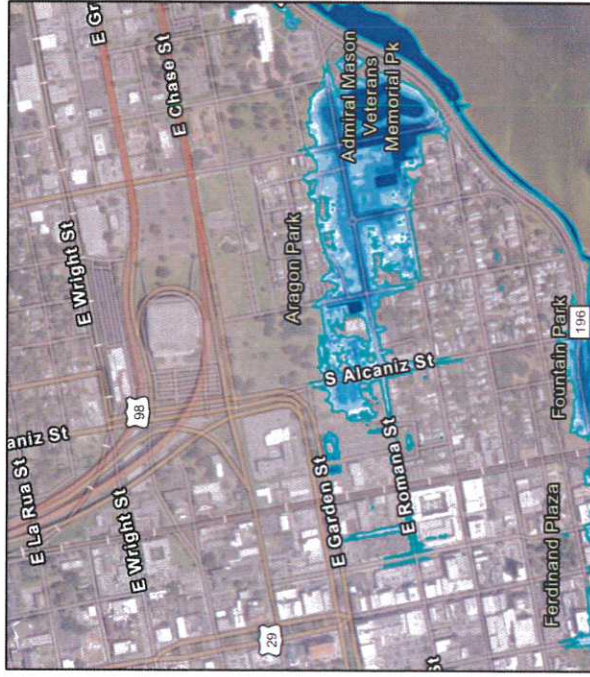
Year	->	Rise	->	Symbol
2040	->	16 inches	->	red x
2070	->	38 inches	->	orange x
2100	->	70 inches	->	yellow x

Example Output

Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

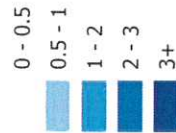
2100 Projected Sea Level Rise (MHHW NIH)



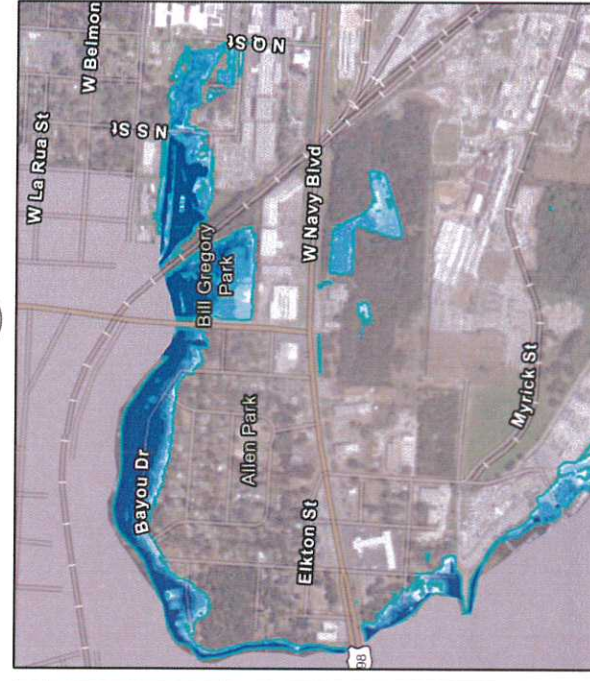
Admiral Mason Veterans Memorial Park

- Outside Study Area
- Approx. Tide Limit

Estimated Water Depth (Ft)



W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

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
---	--

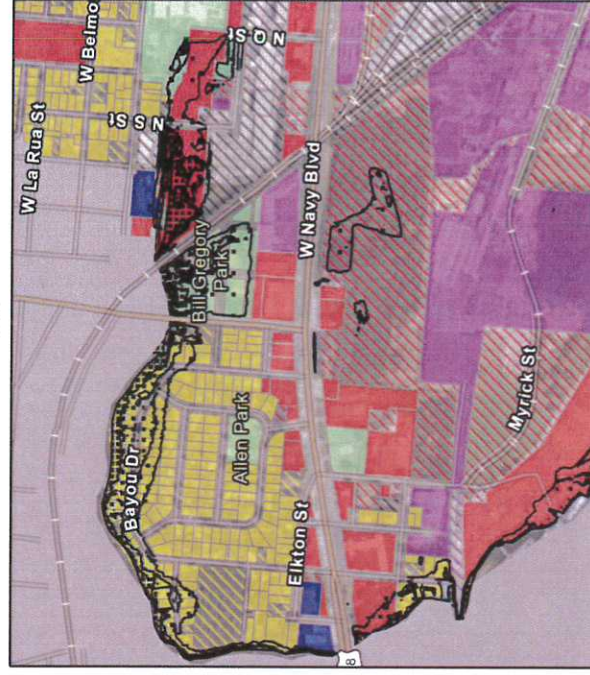
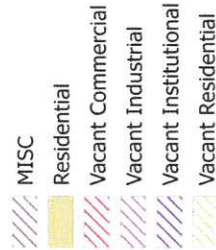
Land Use



Admiral Mason Veterans Memorial Park



W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

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

Example Output

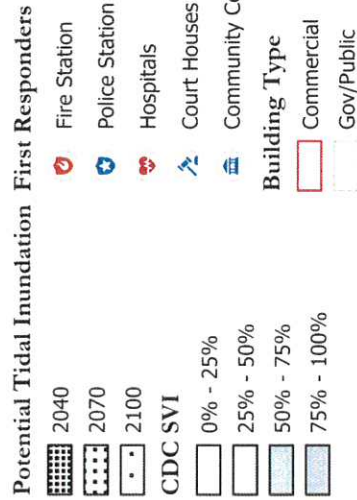
Infrastructure
NOT impacted by
tidal SLR modeling

Infrastructure
IMPACTED by 2040
tidal SLR modeling

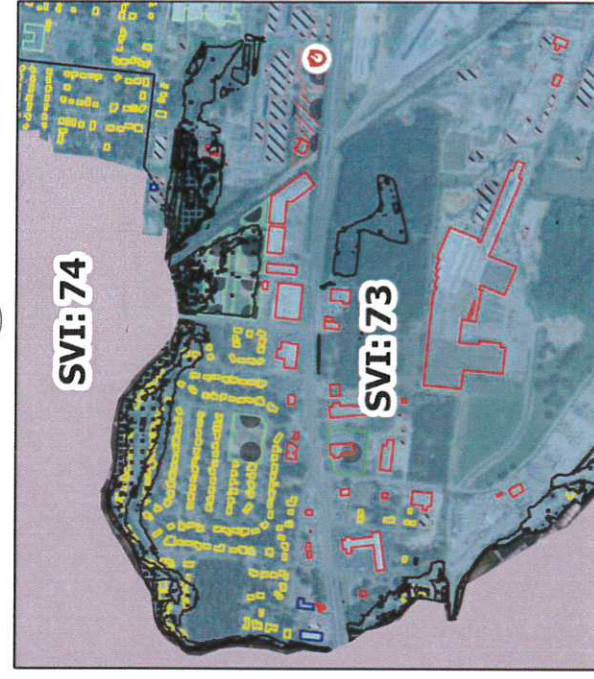
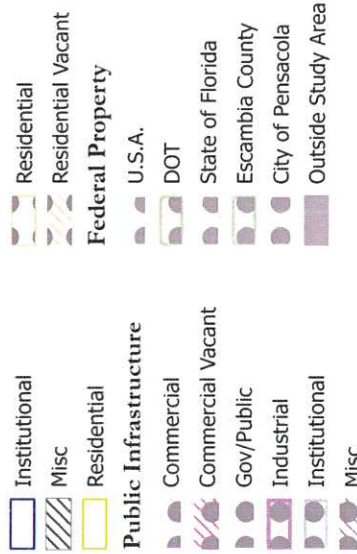
Social Vulnerability



Admiral Mason Veterans Memorial Park



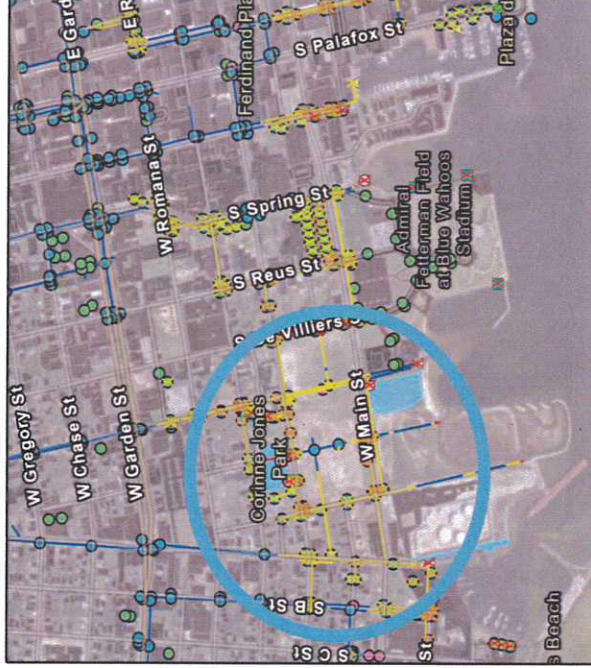
W Main St & S De Villers St



Bayou Dr & Bill Gregory Park



Stormwater



Admiral Mason Veterans Memorial Park

- | | | | |
|--|--------------------|--|-------------------------|
| | Inlet/Grate | | Outfall Node Pipe |
| | Manhole | | Outfall Node Drop Start |
| | Misc SW Structures | | Treatment Units |
| | Outfall Node Weirs | | Pipes |
| | | | Impervious Surface |
| | | | Major Pavement |
| | | | Building Footprints |
| | | | Retention Ponds |
| | | | Vaults |
| | | | Outside Study Area |

W Main St & S De Villers St

Bayou Dr & Bill Gregory Park

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.**

TIDAL FLOODED AREAS BY 2040

PDF Page #	Tidal Flooded Areas	1) Coastal Shoreline Flooding: Overlapping Shoreline Protection	2) Street Flooding: Stormwater Pipe Backflow (Outfall Pipes, City Designation)
3	1	Encroach Homes east and west of Scenic Hwy	
4	2		(NTZ-0980) Encroaches under Scenic Hwy approach property on Langley Ave
6	3	Encroaches homes, may overtop seawall	(NA-0890)
	4		
	5	Encroaches south of channel, east of N 12 th St.	
8	6	West of Channel, west of Mendez Dr.	
	7	West of Channel, east of Severin Dr.	
	8	Encroaches east of N.18 th St.	(N-2518) Intersection north Blackshear Ave
	9	Encroaches west of N.18 th St.	(N-2516)
10	10	North of Blackshear Ave.	
	11	Encroaches between N-1988 and NL-0620	
		South of Endor Rd	
	12	West end of Hyde Park Rd	Road Flooding
11	13	South of N-2514 east of Osceola	(N-2514) Inlet at E Scott Road
	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	
	18	Encroaches at NTZ-SO190	
13	19	East end of E La Rue St.	(N-2097) floods south end Bayou Blvd.
	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 23 24	Encroaches south across Bayou Blvd	(N-3348, NA-2500, N-397) Bayou Blvd (N-3677) need to survey confirm
15	25 26 27	Encroaches south towards Briarcliff Dr. Between N-400 and N-409 Encroaches Wayside Park East Encroaches east end of La Rue N 17 th Ave. under rail bridge SAME AS PAGE 14	(NZA-S0290) (N-2105)
16	28 29	Bartram Park	(N-5127) S. Barrack St. (N-5199, N-5198) S 9 th Ave. south of E Romana and E. Intensenia St. east of Cevallos St. to S. 9 th Ave
17			
18	30 31 32 33 34 35 36 37 38 39	East of S. C St. Marina Inlet south of S. Pace Blvd. Parking south of McLeod St. east of S. R St. S. K St Past north past Sonia St. East of S. C St W. Main St. from S. Chubbs St. to S. Rues St.	(N-2924) S. I St. and Sonia St. intersection (N-3037) east end of W. Gimble St. (N-2983) south end of S. B St. (NTZ-1180, NTZ-1170)
19			
20			

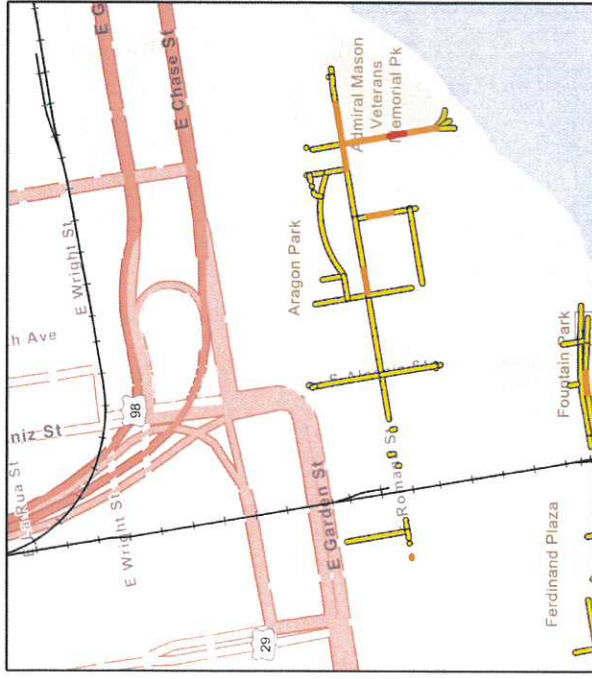
EXAMPLE COST ESTIMATES *17 IN LINE CHECK VALVES

- **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).

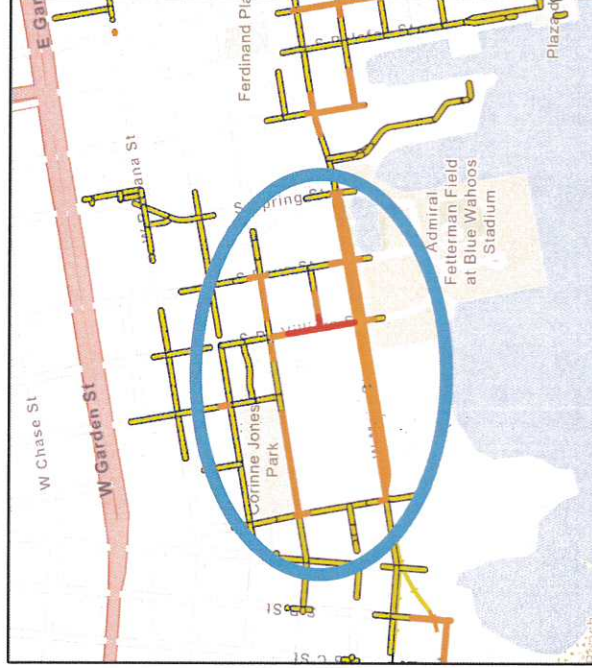
Table 2. Wapro Wastop Valve Table

	City Pipe Designation	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
	*WASTOP 316 SS				Total	\$325,510.00

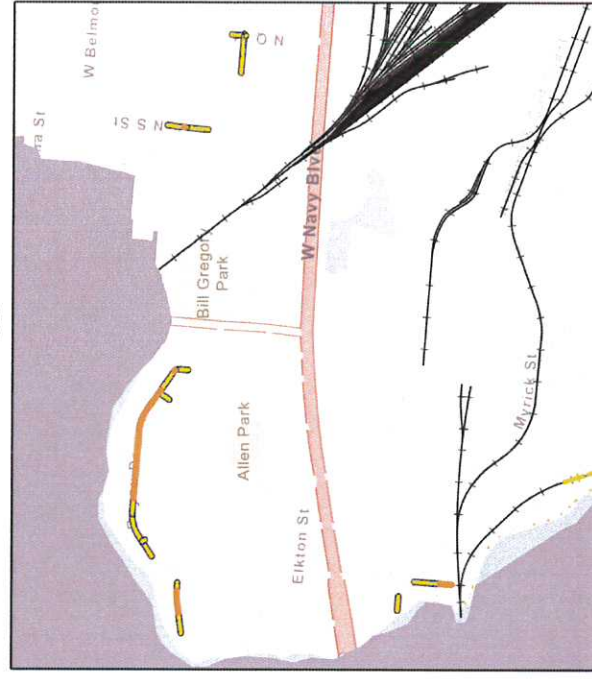
Transportation



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
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Critical Infrastructure



Admiral Mason Veterans Memorial 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 Scott Vickery Center Recreational Area
- Transmission Lines
- Power Facilities
- Port
- Airport
- Public Infrastructure
- Commercial
- Commercial Vacant
- Gov/Public



W Main St & S De Villers St

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



Bill Gregory Park

- Federal Property
- U.S.A.
- DOT
- State of Florida
- Escambia County
- City of Pensacola
- Potential Tidal Inundation
- 2040
- 2070
- 2100
- Outside Study Area

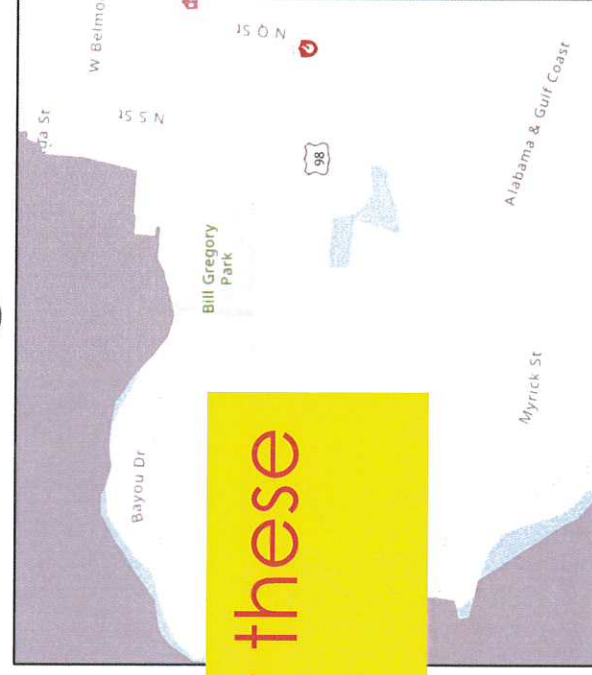
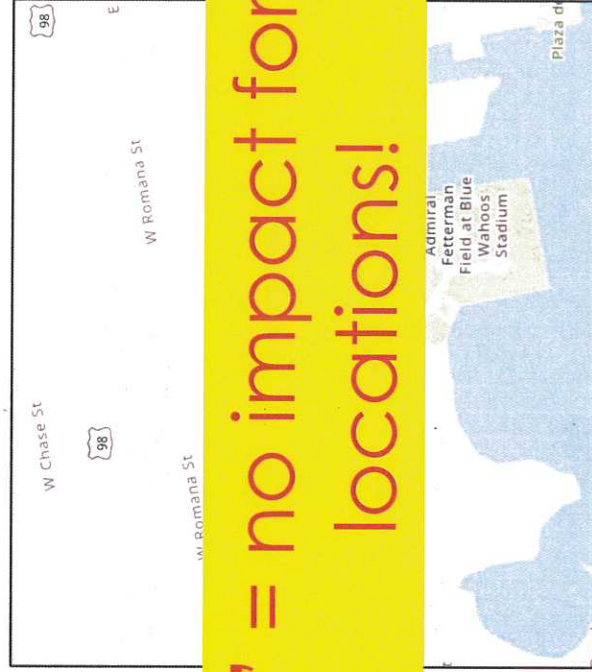
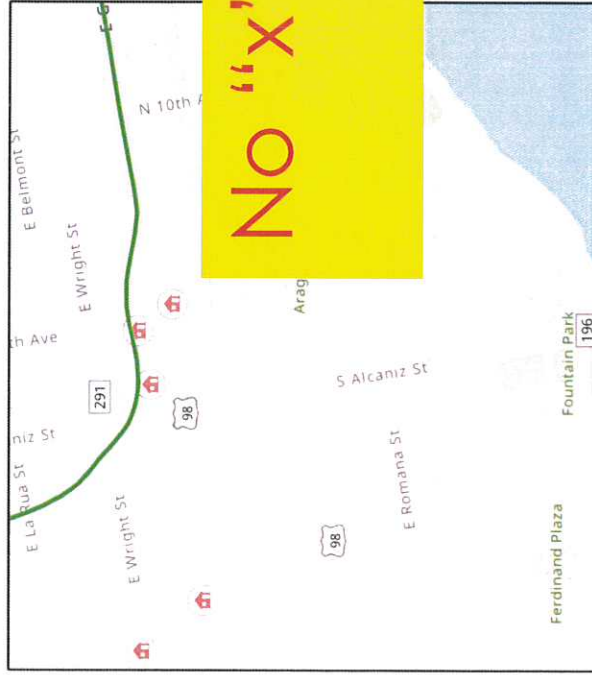
Year	Rise	Symbol
2040	16 inches	red x
2070	38 inches	orange x
2100	70 inches	yellow x

Example Output

Infrastructure
NOT impacted by
tidal SLR modeling

Infrastructure
IMPACTED by 2040
tidal SLR modeling

Emergency Management



Admiral Mason Veterans Memorial Park

W Main St & S De Villers St

Bayou Dr & Bill Gregory Park

- 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

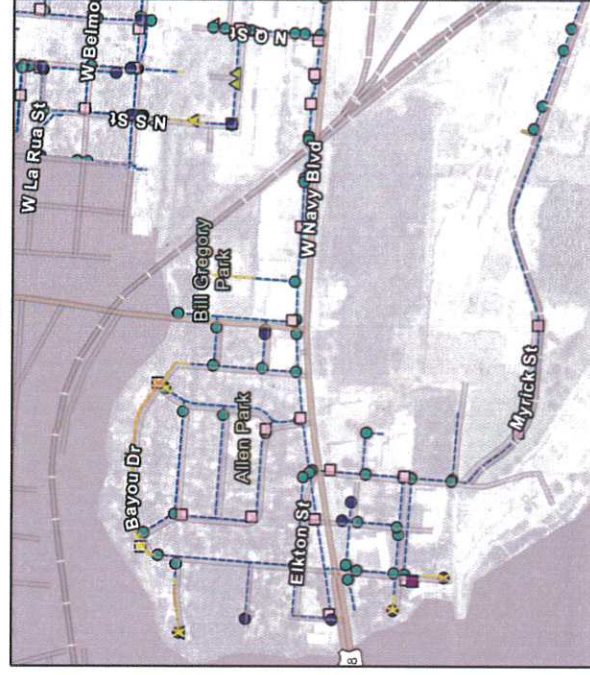


Admiral Mason Veterans Memorial Park

- 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



W Main St & S De Villers St



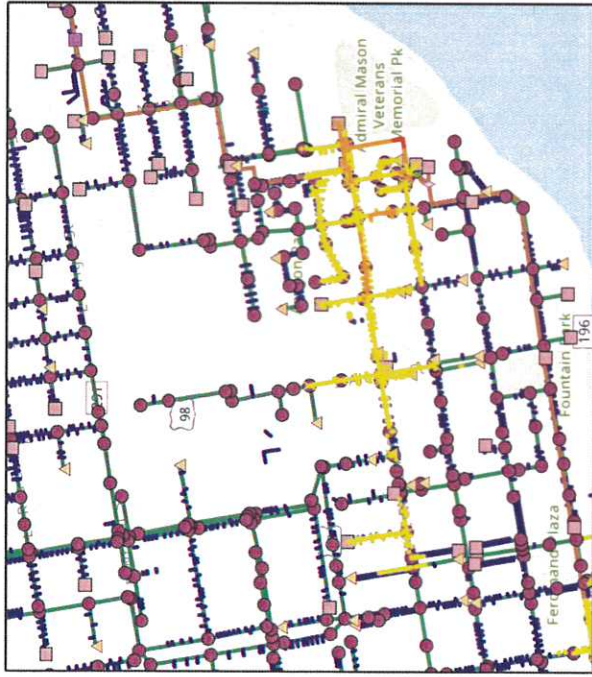
Bayou Dr & Bill Gregory Park

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

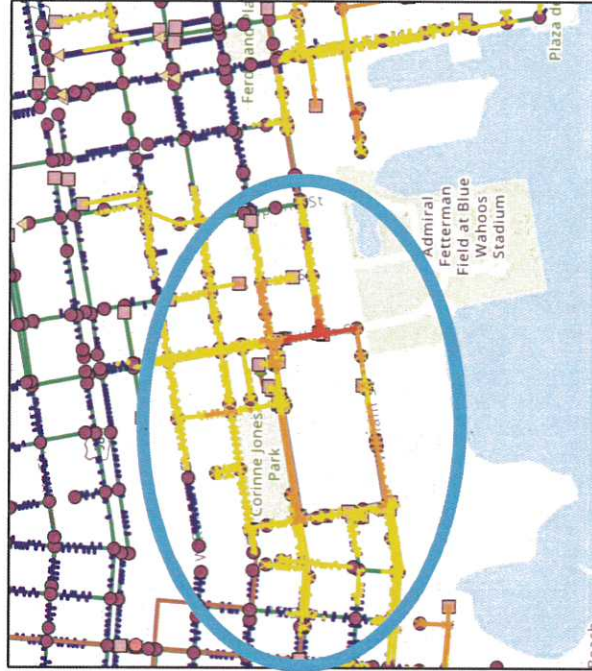
Example Output

- Infrastructure NOT impacted by tidal SLR modeling
- Infrastructure IMPACTED by 2040 tidal SLR modeling

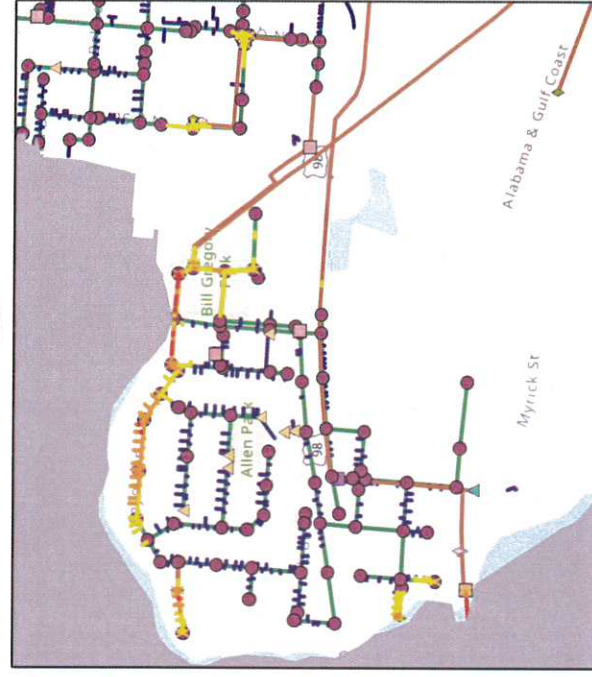
Sanitation



Admiral Mason Veterans Memorial Park



W Main St & S De Villers St



Bayou Dr & Bill Gregory Park

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

Example Output

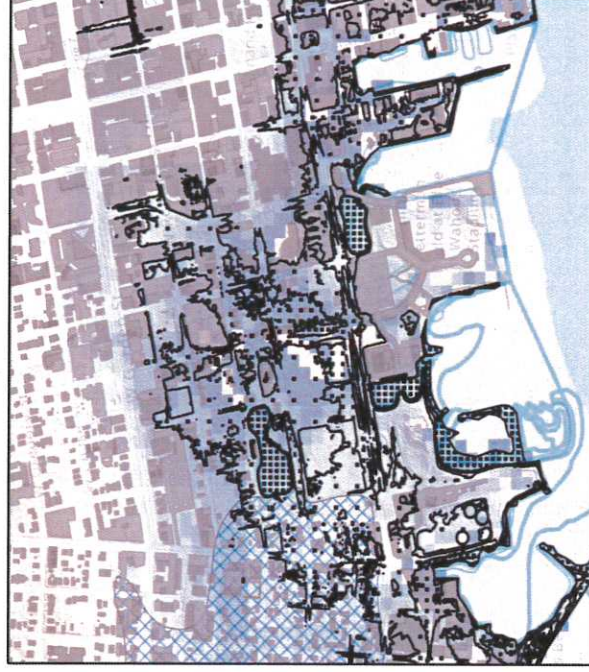
Infrastructure
NOT impacted by
tidal SLR modeling

Infrastructure
IMPACTED by 2040
tidal SLR modeling

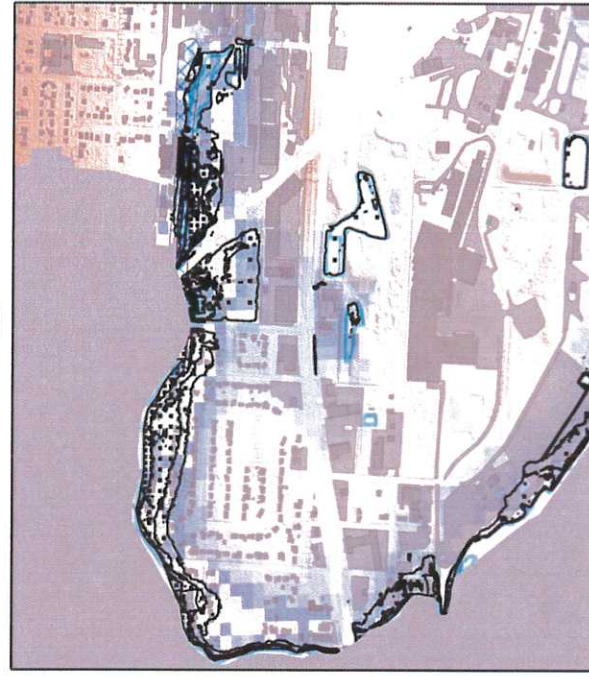
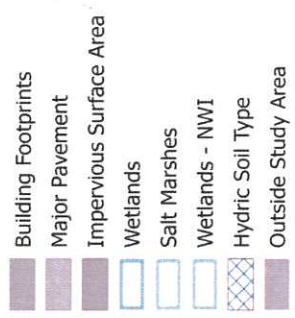
Hydric Environment



Admiral Mason Veterans Memorial Park



W Main St & S De Villers St



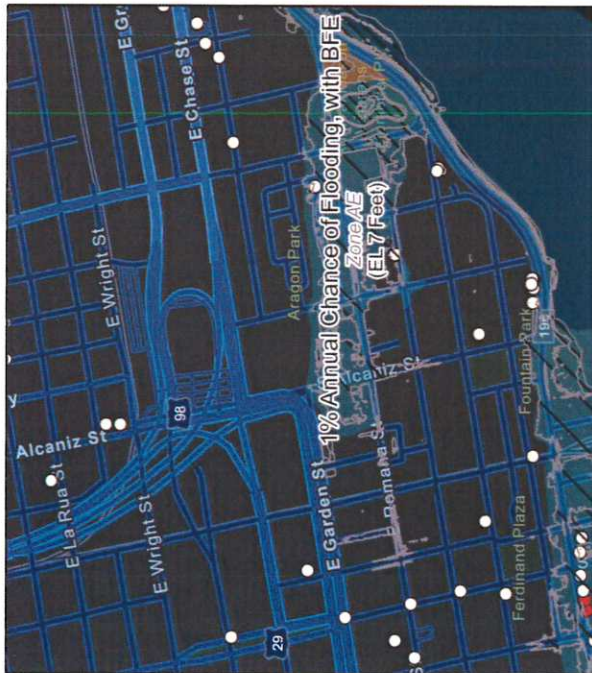
Bayou Dr & Bill Gregory Park

Example Output

Infrastructure NOT impacted by tidal SLR modeling

Infrastructure IMPACTED by 2040 tidal SLR modeling

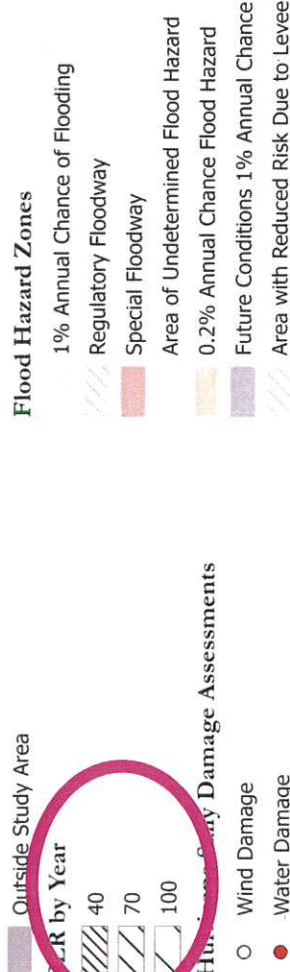
Sea Level Rise and FEMA



Admiral Mason Veterans Memorial Park

W Main St & S De Villers St

Bayou Dr & Bill Gregory Park



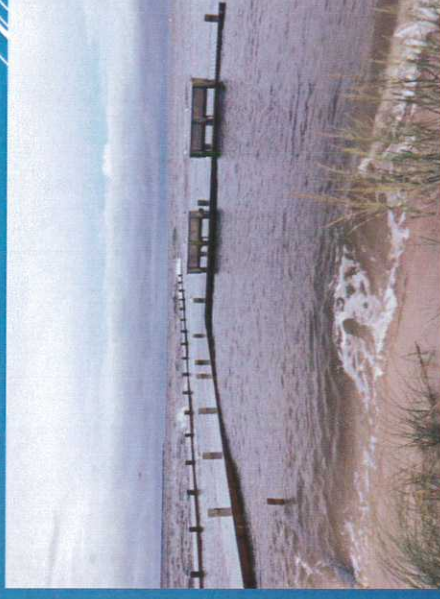
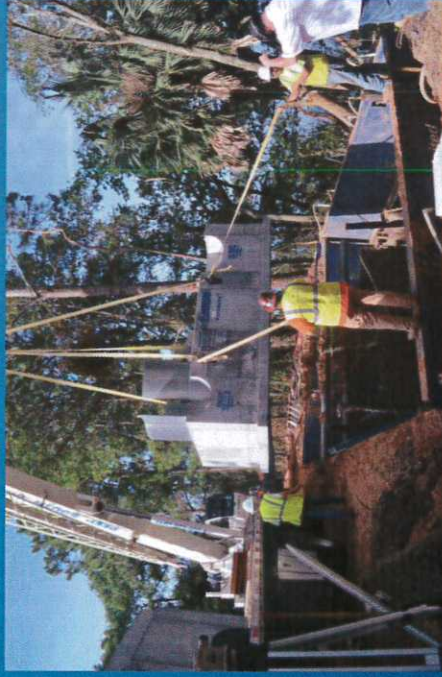
Example Output

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



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.



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