BROWARD PLANNING COUNCIL: BROWARD NEXT RESILIENCY AND SEA LEVEL RISE 2024

OCTOBER 17, 2024

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RESILIENCY-RELATED STATE LAW AND POLICY

- EO 07-127: Reduction of emissions to 2000 levels by 2017, to 1990 levels by 2025, and by 80% of 1990 levels by 2050& California vehicle emission standards reductions (22% by 2012 and 30% by 2016).
- Building Efficiencies/Energy Code, Chapter 553, F.S. increasing standards
- HB 7123: Model Green Building Code (2007)
- HB 697 (GHG reduction strategies in local government's Comprehensive Plan). Some requirements later eliminated.
- HB 7135 (State and Local Government Buildings "greener" and FF landscaping) (Section 255.2575 & 255.259, F.S.)- many don't realize this is law
- HB 7179 (PACE)- financing wind resistance/energy efficiency initiatives
- Adaptation Action Areas (2011) for local government Comprehensive Plans
- 2015- 5 Bills Passing Related to flood insurance, wind insurance, construction standards/building codes, Citizen's insurance, Peril of Flood (Section 163.3178, F.S.)
- 2020 & 2023 Section 161.551, F.S. Sea Level Impact Projection Studies for state-funded projects (Rule 62S-7, F.A.C.) and expansion of affected areas
- 2021 & 2022 & 2023 - Section 380.093, F.S. Always Ready and Resilient Florida program (Chapter 62S-8, F.A.C. rulemaking 2022)
- 2024- New SLR projections and other programmatic elements

AAA'S AND PERIL OF FLOOD

Section 163.3177(6)(g)10.: At the option of the local government, develop an adaptation action area designation for those low-lying coastal zones that are experiencing coastal flooding due to extreme high tides and storm surge and are vulnerable to the impacts of rising sea level. Local governments that adopt an adaptation action area may consider policies within the coastal management element to improve resilience to coastal flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and related impacts of sea-level rise. Criteria for the adaptation action area may include, but need not be limited to, areas for which the land elevations are below, at, or near mean higher high water, which have a hydrologic connection to coastal waters, or which are designated as evacuation zones for storm surge

Section 163.3178(2)(f): A redevelopment component that outlines the principles that must be used to eliminate inappropriate and unsafe development in the coastal areas when opportunities arise. The component must:

1. Include development and redevelopment principles, strategies, and engineering solutions that reduce the flood risk in coastal areas which results from high-tide events, storm surge, flash floods, stormwater runoff, and the related impacts of sea-level rise.

2. Encourage the use of best practices development and redevelopment principles, strategies, and engineering solutions that will result in the removal of coastal real property from flood zone designations established by the Federal Emergency Management Agency.

3. Identify site development techniques and best practices that may reduce losses due to flooding and claims made under flood insurance policies issued in this state.

4. Be consistent with, or more stringent than, the flood-resistant construction requirements in the Florida Building Code and applicable flood plain management regulations set forth in 44 C.F.R. part 60.

5. Require that any construction activities seaward of the coastal construction control lines established pursuant to s. 161.053 be consistent with chapter 161.

6. Encourage local governments to participate in the National Flood Insurance Program Community Rating System administered by the Federal Emergency Management Agency to achieve flood insurance premium discounts for their residents.

APPROACHES TO AAA'S AND PERIL OF FLOOD

AAA Examples:

1. Make the whole jurisdiction an AAA
2. Make specific areas AAAs based on importance of area or goal
3. Tie AAAs to your most vulnerable areas
4. Reflect your drainage or stormwater priorities (drainage basins or prioritized projects)
5. Develop different types of AAAs: environmental, neighborhood or infrastructure (* benefit distinguishes different types of adaptation priorities)

Peril of Flood Approaches:

1. The "minimalist" = stick to the 6 basic elements of the statute
   - Provide basic data and analysis for support
2. The "optimist" = utilize the peril of flood requirements to "bake" resiliency into your coastal element

Are these the only tools a planner has to build resiliency policy in a local government? Far from it…..

WHAT ELSE TO CONSIDER ABOUT COMPREHENSIVE PLANS RELATIVE TO RESILIENCY POLICY

Look at ALL of the elements of your Comprehensive Plan: Capital Improvements, Transportation, Utilities, Housing, Future Land Use

What types of policies can be included:

- Resiliency/adaptation project priorities and factors for capital improvement project considerations
- Road elevation in areas impacted by tidal flooding or protecting transit corridors
- Stormwater, drainage, water/wastewater: siting and building to higher resiliency standards or adopting innovative level of service standards (drainage inland vs. tidally influenced areas)
- Housing incentive programs that prioritize resiliency features
- Don't allow certain uses in vulnerable locations or discourage them there

WHAT ELSE TO CONSIDER ABOUT COMPREHENSIVE PLANS RELATIVE TO RESILIENCY POLICY

Are there policies and provisions that could ***constrain adaptation projects***? Examples:

1. Conservation policies that prohibit land acquired by the local government from having a stormwater structure sited in ***the only location left to site it***.
2. An existing LOS policy that constrains implementation of a drainage project to accommodate a higher design storm event (3-day 25-year rainfall versus a ***100-, 500- or higher storm event***).
3. A policy that broadly says "we will adapt to whatever mother nature throws as us" when there may be areas where its just not practical to make those investments (or ***maintaining versus "increasing" infrastructure capacity in vulnerable locations***).
4. Codes where drainage or infrastructure design is tied to periods of record in the past and requires design based on very antiquated or minimal environmental conditions could actually limit a grant funded adaptation project that is designing to a HIGHER design storm event: "Thou shall build drainage systems to accommodate the 3-day, 25-year design storm event". Get a grant to build a stormwater project to accommodate a 100-year storm and tidal flooding, can you implement it? ***Change your Code there may be people that hate that shiny adaptation road elevation project and want to challenge it.***

WHAT ELSE TO CONSIDER ABOUT CODES RELATIVE TO RESILIENCY POLICY

Are there provisions that could ***be opportunities or constraints to resiliency policy and adaptation projects***? Examples:

1. Look holistically: Floodplain Management, LDRs (landscaping, stormwater, road design, etc.)
2. Are there opportunities to account for tidal flooding in the water management system for infrastructure or projects?
3. Can you incentivize good project outcomes with specific resiliency criteria?
4. Can you maximize onsite retention (in an era of new increasing water quality regulation) and higher volume more frequent storm events?
5. Remove barriers for projects that increase resiliency to flooding impact (make sure Code doesn't prohibit project implementation- example: adopting FDOT Greenbook standards for road design could be a constraint on a road elevation project)

HOW DOES ALL THIS RELATE TO A VULNERABILITY ASSESSMENT?

HOW IS THIS EVEN RELEVANT TO PLANNING?

STATUTORY FRAMEWORK

Section of the Law	Significance
Intent and definitions	• Coastal and inland communities can participate • Critical assets defined
Resilient Florida Grant Program	• Items that can be funded (planning and projects) • **Standards for vulnerability assessments**
Comprehensive Statewide Flood Vulnerability and Sea Level Rise Dataset and Assessment	Dataset to support a comprehensive statewide flood vulnerability and sea level rise assessment (inland and coastal infrastructure, geographic areas and vulnerable communities and their risk).
Statewide Flooding and Sea Level Rise Resilience Plan (local governments, flood control districts, regional resilience entities or WMDs).	Due to Legislature 12/1, 3-year planning horizon & ranked projects that address risks of flooding and sea level rise to coastal and inland communities. First one submitted for this year, December 1, 2021, will be a "preliminary plan" to address risks already identified in existing local government vulnerability assessment. 50% cost share unless disadvantaged community. Includes ranking criteria.
Regional Resilience Entities	(a) providing technical assistance to counties and municipalities, (b) coordinating multijurisdictional vulnerability assessments and (c) developing project proposals to be submitted for inclusion in the Statewide Flooding and Sea Level Rise Resilience Plan.
Florida Flood Hub for Applied Research and Innovation (USF)	Lead institution and engage other academic and research institutions, private partners, and financial sponsors to coordinate efforts to support applied research and innovation to address the flooding and sea level rise challenges of the state
Annual assessment of Florida's water resources and conservation lands	Expand the requirements of the existing annual assessment of Florida's water resources and conservation lands (conducted by the Office of Economic and Demographic Research) to now include flooding information

REQUIRED COMPONENTS OF VULNERABILITY ASSESSMENTS FOR FLORIDA

- Required assets for evaluation prioritized by area or immediate need and identify the flood scenario impacting the assets (can be determined by local community because the flood scenarios may differ for inland v. coastal)
- 2040/2070 NOAA Intermediate Low and High Sea Level Rise
  - Tidal flooding (+ future high tide)
  - Current/future storm surge > or = to 100-year flood event,
  - Rainfall for 100-year and 500-year + future conditions (to extent practicable)
  - Combination flooding (to extent practicable)
- Compliance with FDEP Checklist is a requirements for VAs and Grant Agreements

Appendix E: Vulnerability Assessment Compliance Checklist

VULNERABILITY ASSESSMENT COMPLIANCE CHECKLIST

In accordance with subsection 380.093(3), F.S., the following components, scenarios, data, and information are required for a comprehensive Vulnerability Assessment (VA). The checklist must be completed and submitted with the final VA Report deliverable, pursuant to Attachment 3, Grant Work Plan. The Grantee must abide by the Department's GIS Data Standards found on the Resilient Florida Program webpage at the link below:

https://floridadep.gov/rcp/resilient-florida-program/documents/resilient-florida-program-gis-data-standards

Part 1 – Subparagraph 380.093(3)(c)2., F.S.

Item ID	Check if Included	Item Description	Page Reference in VA Report (if applicable)
a	☐	Final Vulnerability Assessment Report that provides details on the results and conclusions, including illustrations via maps and tables.	
All electronic mapping data used to illustrate flooding and sea level rise impacts that are identified in the VA must be provided in the format consistent with the Department's GIS Data Standards and include the following three (3) items:			
b	☐	Geospatial data in an electronic file format.	
c	☐	GIS metadata.	
d	☐	List of critical assets for each jurisdiction, including regionally significant assets, that are impacted by flooding and sea level rise. The list must be prioritized by area or immediate need and must identify which flood scenario(s) impacts each asset	

Part 2 – Subparagraphs 380.093(3)(d)1. and 380.093(3)(d)2., F.S.

Item ID	Check if Included	Item Description	Page Reference in VA Report (if applicable)
e		Peril of Flood Compliance Plan amendments developed that address paragraph 163.3178(2)(f), F.S., if applicable. ☐ Not applicable ☐ Already in compliance	
f		Depth of tidal flooding, including future high tide flooding, using thresholds published and provided by the Department.	
g		To the extent practicable, analysis geographically displays the number of tidal flood days expected for each scenario and planning horizon. *(optional)*	
h		Depth of current and future storm surge flooding using publicly available NOAA or FEMA storm surge data. (*check one*) ☐ NOAA data ☐ FEMA data	
i		Initial storm surge event equals or exceeds current 100-year flood event.	
j		Higher frequency storm analyzed for exposure of a critical asset. *(optional, but must provide additional detail if included)*	

Exhibit I
2 of 4

Rev. 6/1/2022

EVALUATING ASSETS

Definition: "Critical asset" includes:

1. Transportation assets and evacuation routes, including airports, bridges, bus terminals, ports, **major roadways**, marinas, rail facilities, and railroad bridges.
2. Critical infrastructure, including wastewater treatment facilities and lift stations, stormwater treatment facilities and pump stations, drinking water facilities, water utility conveyance systems, **electric production and supply facilities**, solid and hazardous waste facilities, military installations, communications facilities, and disaster debris management sites.
3. Critical community and emergency facilities, including schools, colleges, universities, community centers, correctional facilities, disaster recovery centers, **emergency medical service facilities**, emergency operation centers, fire stations, **health care facilities**, hospitals, law enforcement facilities, local government facilities, logistical staging areas, **affordable public housing**, risk shelter inventory, and state government facilities.
4. Natural, cultural, and historical resources, including conservation lands, parks, shorelines, surface waters, **wetlands**, and historical and cultural assets.

Definition: "Regionally significant assets" means critical assets that support the needs of communities spanning ***multiple geopolitical jurisdictions***, including, but not limited to, water resource facilities, regional medical centers, emergency operations centers, regional utilities, major transportation hubs and corridors, airports, and seaports.

CHALLENGES FOR: VULNERABILITY ASSESSMENTS & ASSETS AND SAMPLE OUTPUT

Best available data on assets is important:

- GIS locations
- Top of structure elevations
- Invert elevations
- Locations of controls and supporting components

Severity of impacts to system

- How many structures?
- How many impacted v. overall total?
- What is the projected year of impact?
- How many days of flooding anticipated under what scenario/condition?

Figure 14: Potable Water Analysis Example

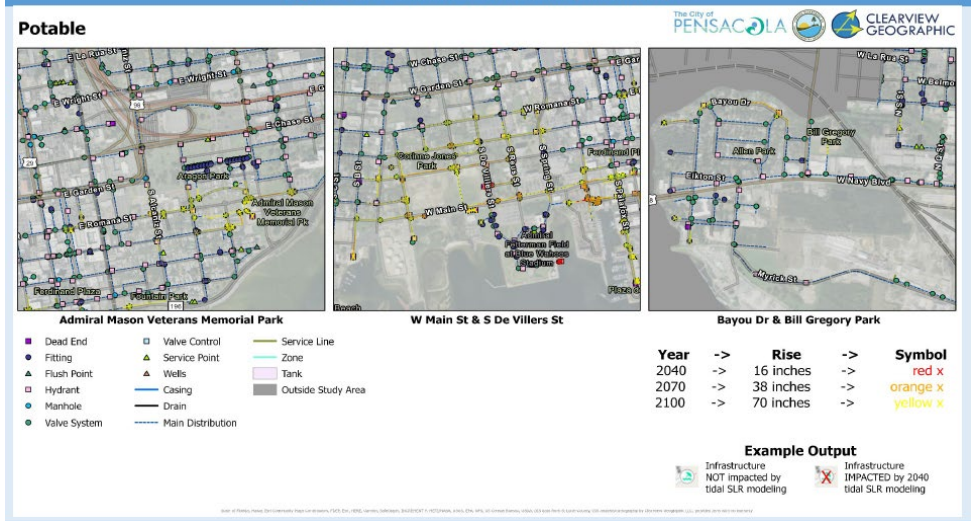


Table 18: Vulnerable Potable Water Infrastructure

Potable Water Infrastructure	Infrastructure Impacted by Year at MHHW			Total Features in Dataset
	2040 (16")	2070 (38")	2100 (70")	
Dead End	2 (1.65%)	4 (3.31%)	10 (8.26%)	121
Fitting	5 (0.35%)	18 (1.25%)	51 (3.53%)	1443
Flush Point	2 (0.47%)	4 (0.94%)	7 (1.64%)	427
Hydrant	2 (0.08)	10 (0.40%)	50 (2.01%)	2493
Manhole	0	0	6 (18.75%)	32
Service Point	0	0	22 (2.22%)	992
Valve System	8 (0.11%)	31 (0.44%)	159 (2.25%)	7073
Valve Control	0	0	1 (9.09%)	11
Wells	0	0	0	11

Table 19: Vulnerable Potable Water Infrastructure (Linear Miles)

Potable Water Infrastructure	Infrastructure Impacted by Year at MHHW			Total Length of Features in Dataset
	2040 (16")	2070 (38")	2100 (70")	
Casing	0	0	0.001 (0.04%)	2.32
Drain	0	0	0	0.47
Main Distribution	1.5 (0.27%)	6.3 (1.12%)	32.1 (5.70%)	562.72
Service Line	0	0.2 (1.82%)	1.2 (10.95%)	10.96
Zone	0.3 (3.26%)	0.3 (3.26%)	0.3 (3.26%)	9.21

Not all of this may exist. . .

Stock Island

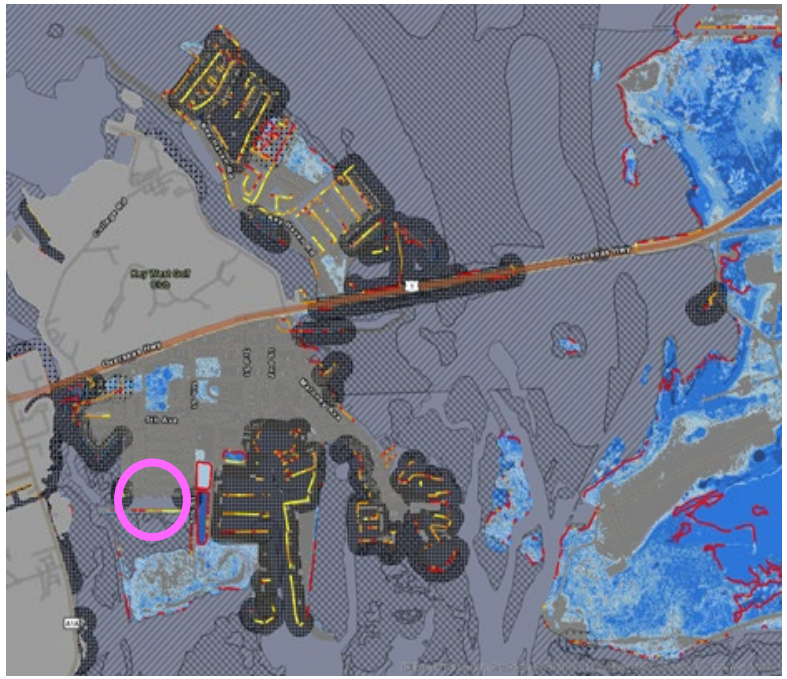
Duck Key

Port Largo

DRAFT STORMWATER IMPACTS
THE YEARS OF IMPACT ARE:
RED X = 2040
ORANGE X = 2070
YELLOW X = 2100

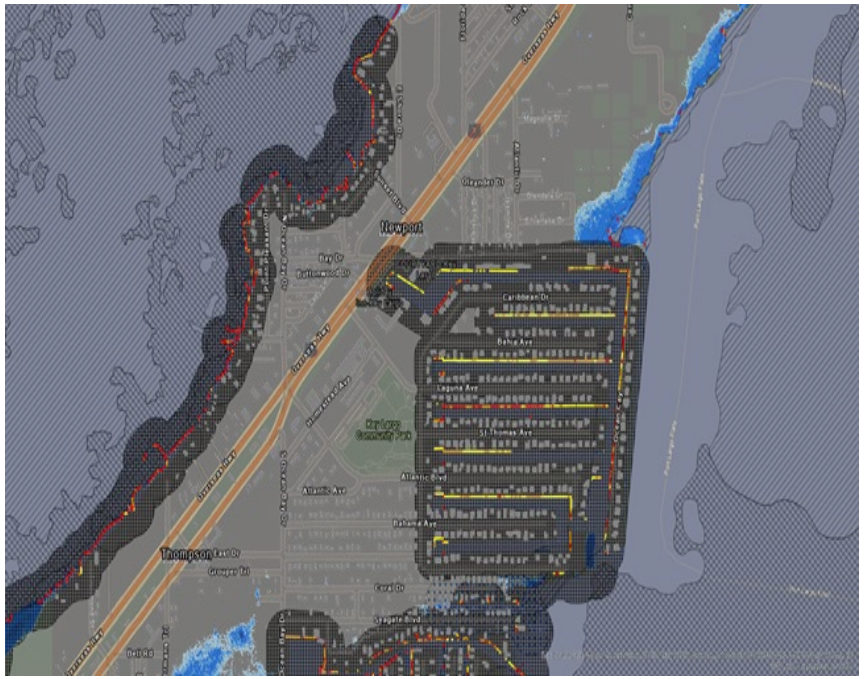
- Catch_Basins
- Injection_Wells
- Manholes
- Outfalls
- Trench_Drains
- Beyond Study Area

Stock Island



Duck Key

Port Largo

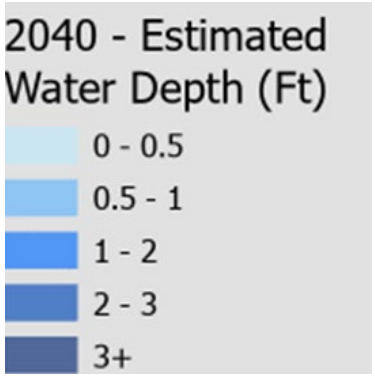


DRAFT SHORELINE IMPACTS/GAPS

RED X = 2040 (17”)

ORANGE X = 2070 (40”)

YELLOW X = 2100 (74”)

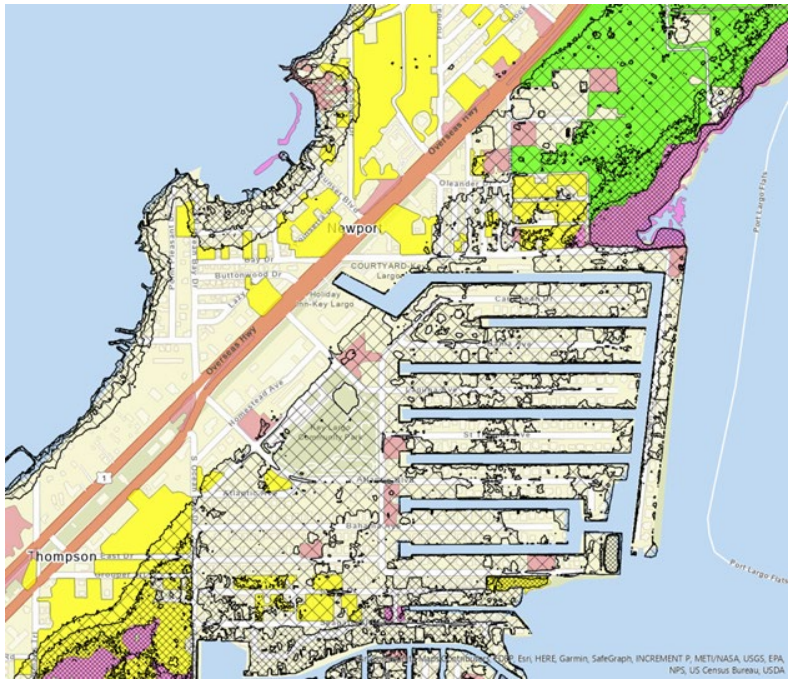


What shoreline solutions might work where?

Stock Island

Duck Key

Port Largo



DRAFT SPECIES FOCUS AREAS

RED X = 2040 (17”)

ORANGE X = 2070 (40”)

YELLOW X = 2100 (74”)

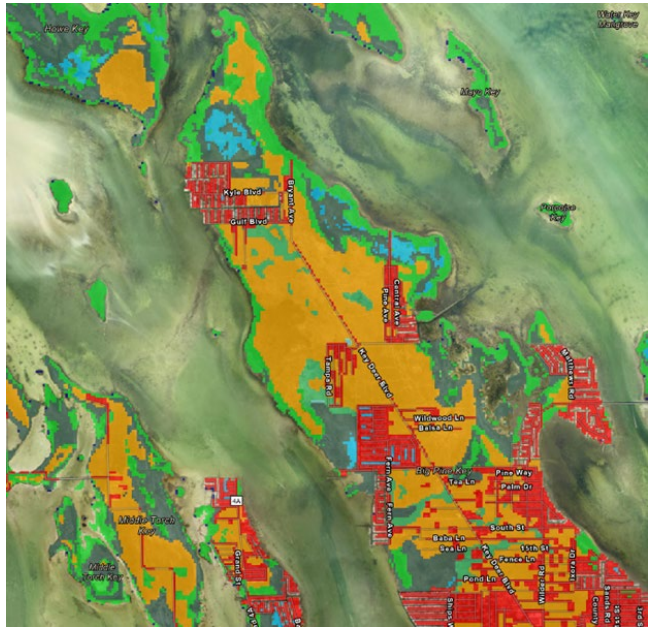
- Eastern Indigo Snake
- Cape Sable Thoroughwort
- Tree Cactus
- Woodrat
- Marsh Rabbit
- Beyond Study Area

Year

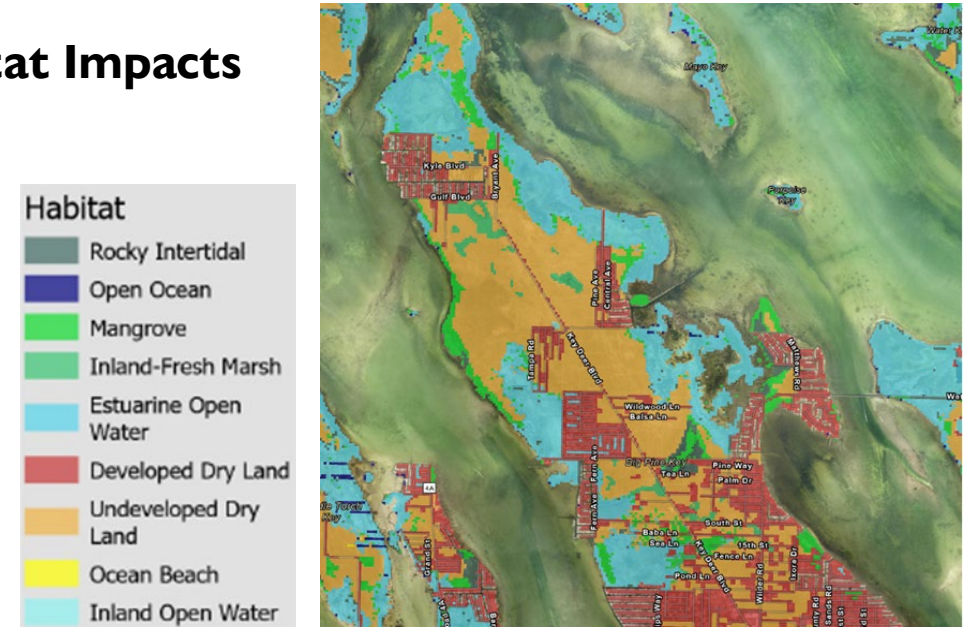
- 2040
- 2070
- 2100

Vulnerable species depend on geographic locations throughout the County

Big Pine
Current Habitat
2019 FWC



Big Pine
Projected Habitat Impacts
2100 - SLAMM



DRAFT HABITAT CHANGES FROM SEA LEVEL RISE IMPACTS

2040 -> 10 INCHES
2070 -> 33 INCHES
2100 -> 67 INCHES

ALIGNING VULNERABILITY ASSESSMENT OUTPUT WITH POLICY AND LAW

OTHER REASONS VULNERABILITY PLANNING IS VALUABLE: ESTABLISHING POLICY PRIORITIES

1. Position the community for future grant opportunities by having a plan of action (and its required in Section 380.093(5), F.S. to qualify for capital project funding after 2024)

2. Establish adaptation project priorities, examples:
   - Road elevation, drainage and infrastructure
   - Protection of shorelines and policies (natural and hardening)

3. Establish other implementing policies, examples:
   - Addressing vulnerable neighborhoods
   - Framing infrastructure LOS commitments (deficiencies, maintenance and enhancements/upgrades)

4. Priorities for land acquisition (not buying land going under water)

5. Flexibility in development/design criteria that better captures individualized risk of areas

6. Integration of adaptation response fully into Comprehensive Plan / Code (example infrastructure design criteria)

TYPICAL VULNERABILITY ASSESSMENT OR ADAPTATION PLAN RECOMMENDATIONS

Vulnerability Assessments and Adaptation Plans can make ***recommendations that should be implemented through your existing policy tools: the Comp Plan and Code***. Examples:

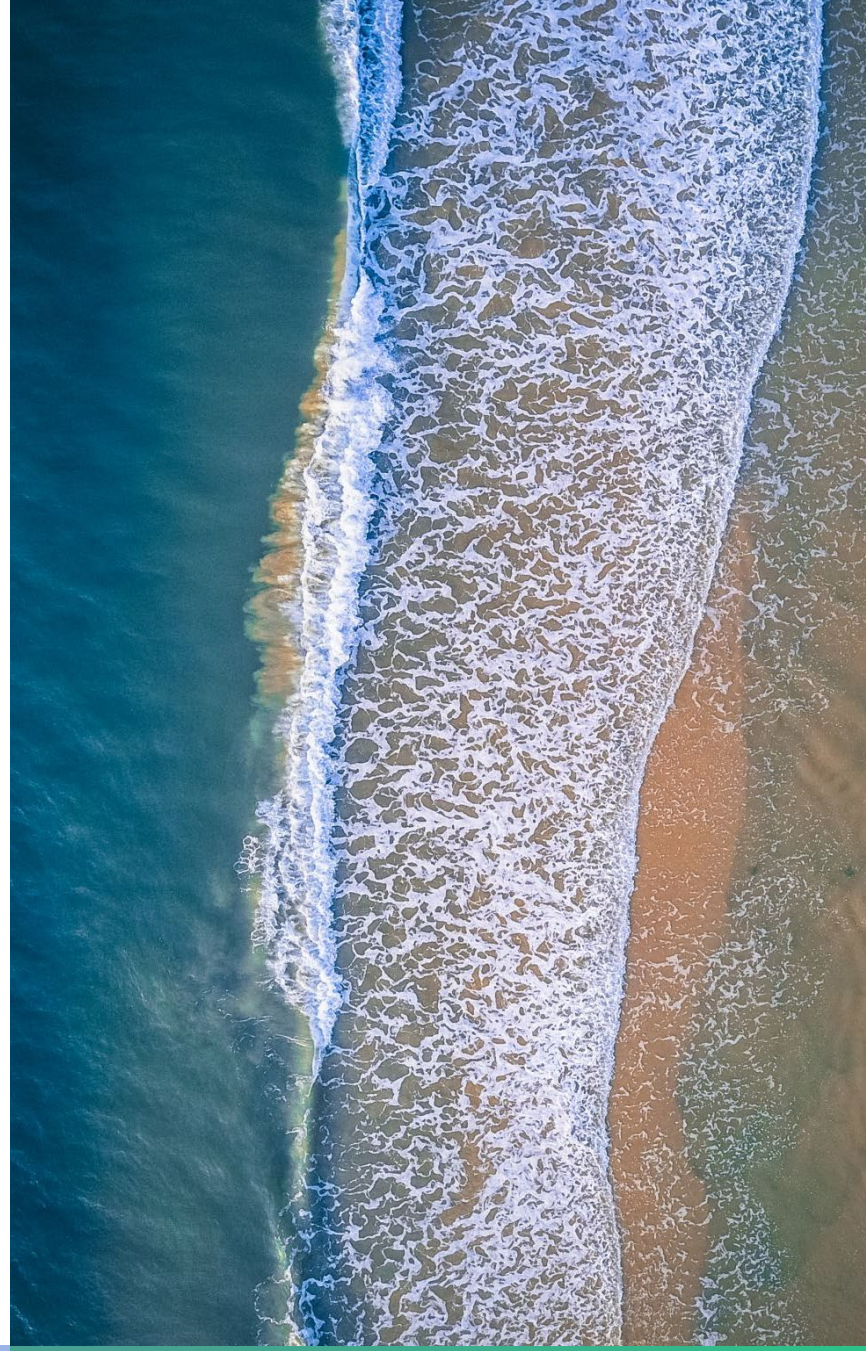
- Project priorities from an Adaptation Plan that are incorporated into the CIE (example: actual projects or policies that identify factors for CIP priorities)
- Recommendations to account for tidal flooding in stormwater design in tidally influenced areas (example: LOS east of a certain boundary to incorporate 2040 or 2070 sea level rise)
- Recommendations to build infrastructure accounting for certain FEMA or freeboard standards (example: design of pump or lift stations)
- Recommendations to reduce demand on regional stormwater management systems by retaining more water onsite (example: impervious surface ratios, landscaping and LDRs in Codes)

DOES ALL THIS REALLY HAPPEN IN THE REAL WORLD????

CASE STUDIES

CITY OF DANIA BEACH: MULTI-PRONGED APPROACH WITH RESOLUTION, CODE AND COMP PLAN UPDATES

1. Text amendment to Regional Activity Center was a catalyst for a larger resiliency discussion
2. Area located in Broward Priority Planning Area which required a heightened review due to its eastern location and tidal/sea level rise vulnerability
3. City had stormwater master plan underway and Vulnerability Assessment was being completed by a consultant to the SFRPC
4. City adopted a Resolution that:
    a. Recognizes the 2019 Unified Sea Level Rise Projections and recognizes Section 380.093 F.S. that requires the use of 2040 and 2070 and NOAA Intermediate Low and Intermediate High for state-funded vulnerability assessments. The City had a grant to perform a vulnerability assessment and that effort is ongoing.
    b. Recognizes the County's Priority Planning Areas.
    c. Agrees to include the above projections in the ongoing City's Stormwater Master Plan.
    d. Acknowledges upcoming work in the City's Comprehensive Plan Evaluation and Appraisal Report process to address Section 163.3178, F.S. related to the requirement of the "Peril of Flood" Amendments to the City's Comprehensive Plan.
    e. Adopts a city-wide "interim design standard" for new construction projects in accordance with existing stormwater regulations incorporating future groundwater conditions into the pre-development vs. post-development. Eventually this was done through an Ordinance.
    f. Requires upon completion of the Stormwater Master Plan, a final updated standard to be recommended and brought to the Commission.
5. City was about to initiate a full rewrite of its Comp Plan which provided an opportunity to incorporate resiliency concepts across the entire plan holistically. ***Comp Plan adopted earlier this year and yes resiliency was really "baked in that cake".***



MONROE COUNTY ROADS ADAPTATION PLAN AND COSTS

$1.6 Billion* (Avg $9.6 Million / Mile)

$3.0 Million (Annual Operation & Maintenance)

49 Neighborhood areas	10 Neighborhood areas	10 Neighborhood areas	28 Neighborhood areas
Areas for 2025	Areas for 2025	Areas for 2035	Areas for 2035
$888,825,245	$179,591,227	$159,316,236	$378,007,456
$1,630,803 (O&M)	$339,356 (O&M)	$307,851 (O&M)	$683,432 (O&M)

Projected **SLR + King Tides** will affect the following:

(SLR Condition: NOAA 2017 Intermediate-High + King Tides)

	2045	Unincorporated Countywide %
Miles of Vulnerable and Critical County Maintained Roadways	166 MI	53%
# of Residential Units along County Maintained Roadways	13,399 Res. Units	76%

* Cost estimate is conceptual and does not include design, right-of-way acquisition, harmonization/cost to cure, and legal fees. Cost estimates are preliminary and subject to change. Cost Estimate is based on 2020 Dollars.

IMPLEMENTATION / POLICY STRATEGY FOR ROADS ELEVATION

1. A policy in the Comp Plan stating generally (Transportation or Capital Improvements or both): Local government will design new and retrofitted roads that are tidally influenced to an elevation that incorporates the useful life of the road (25 years) and the sea level rise impacts that will occur in that timeframe based on the most recent projections by NOAA or other appropriate entity.
2. A LOS for drainage that is not just tied to the generic 3-day 25-year rainfall event but one that includes an element of tidal impact (Capital Improvements and Stormwater Elements)
3. A Code provision relative to road design that requires inclusion of a rainfall design storm event and tidal flooding. Current Code standard is FDOT Greenbook (not high enough).
4. An MSBU for neighborhood scale road improvements that attributes to the costs to those that benefit directly from that project.

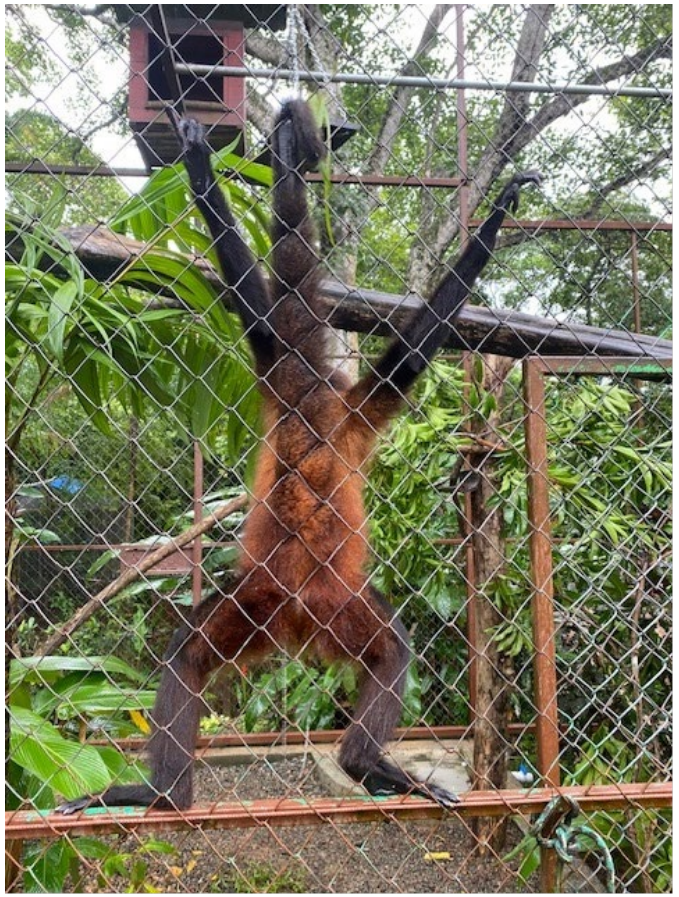
A KEY POLICY TOOL & RECOMMENDATION: ENVIRONMENTALLY CHALLENGING LOCATIONS

- What is it? A designation of areas where elevations are low, right of way is constrained, flooding conditions are occurring now, routinely, and road designs (elevation and drainage) may not be able to meet service expectations.
- Why do it? A policy tool to clarify how the community will evaluate projects in those "constrained" areas and manage future obligations and liability.
- Where would it apply? In locations where the properties are low elevation and the ROW is constrained (estimated less than 10 areas countywide).
- Why? Jordan v. St. Johns County

The "opposite" of an Adaptation Action Area

A KEY POLICY TOOL & RECOMMENDATION: BE CAREFUL ABOUT YOUR STORMWATER ASSESSMENTS

- What is the issue? Chapter 403 is where typical authority for stormwater assessments originates and it is narrowly focused on stormwater not tidewater. Section 403.031(18): "Stormwater management system" means a system designed and constructed or implemented to control discharges that are necessitated by rainfall events, incorporating methods to collect, convey, store, absorb, inhibit, treat, use, or reuse water to prevent or reduce flooding, overdrainage, environmental degradation and water pollution or otherwise affect the quantity and quality of discharges from the system.
- The solution? Don't use a stormwater utility to pay for tidal flooding projects
- Stay tuned At least two examples in play for addressing the issue:
    1. Monroe County SLR MSBU
    2. Town of Lantana Stormwater and Flood Improvement Assessment (adopted 9/9/24)



THANK YOU

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QUESTIONS?