

RESILIENT CEDAR KEY/PORT ST. JOE

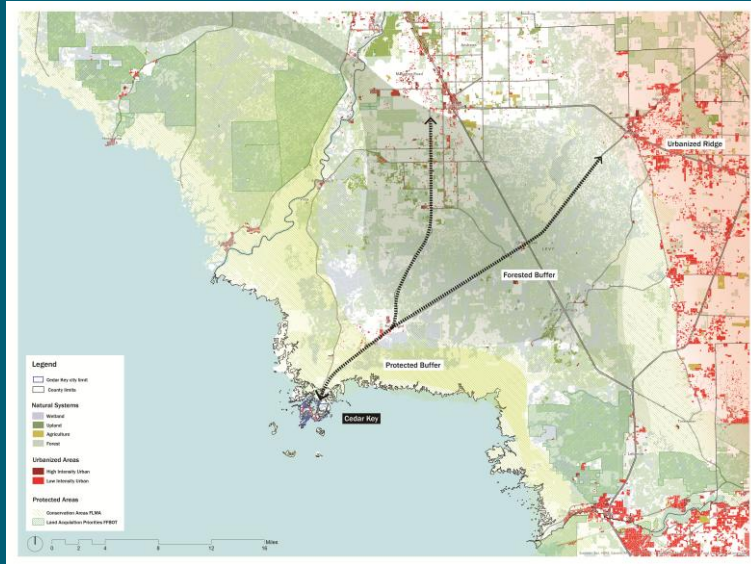
Digital Outreach And Placed-based Approaches For Flood Resilience Planning

Webinar: Navigating the Atlantic Hurricane Season: Science, Strategies, and Successes



Case Studies - Cedar Key / Port St. Joe

The Context



Cedar Key



Port St. Joe

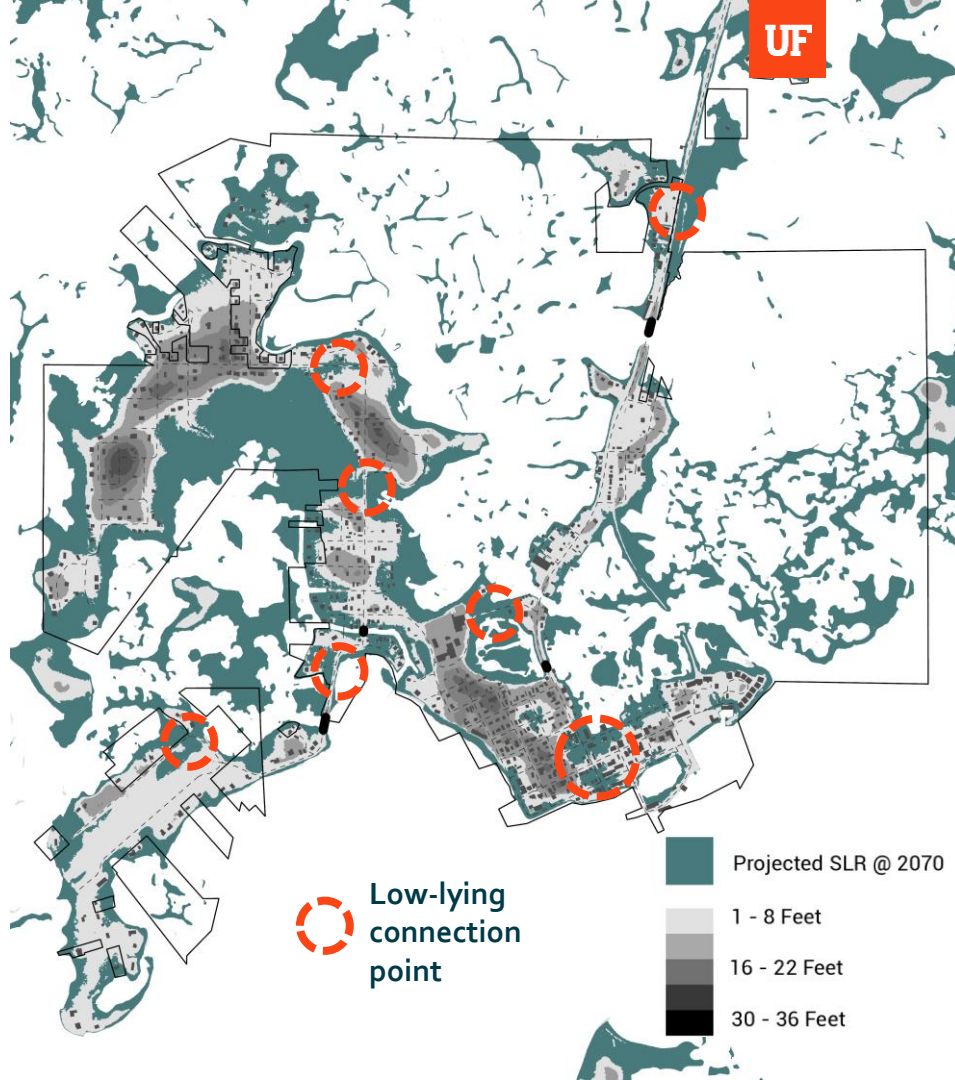
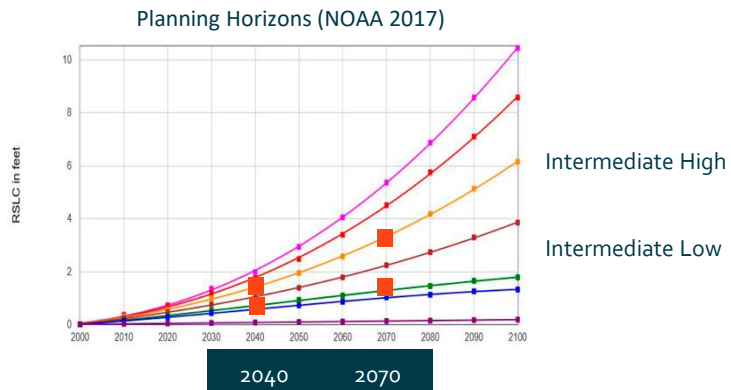
FDEP Vulnerability Assessment

Exposure and sensitivity of critical assets to different types of flood sources:

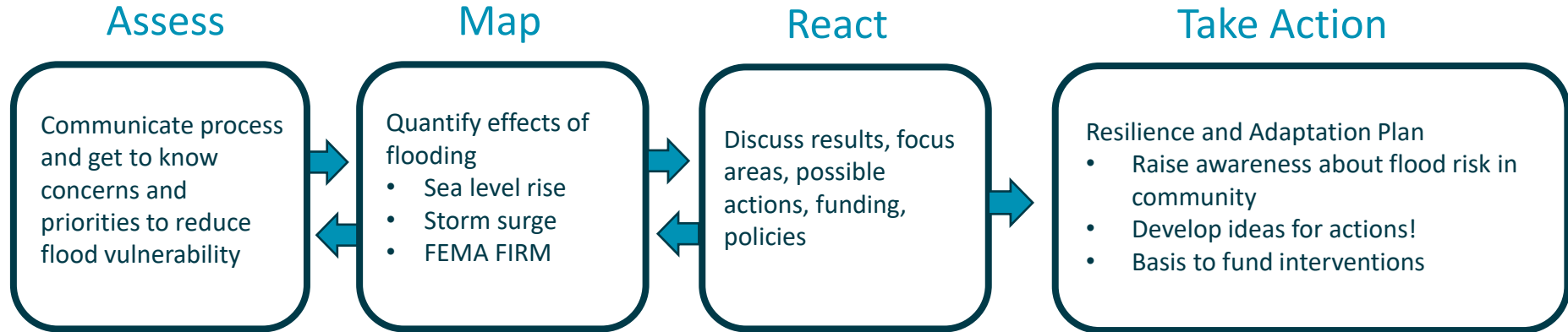
- Tidal flooding
- Coastal Flooding FEMA 100-year, Storm Surge
- Rainfall flooding

Sea Level Rise Planning Horizons

NOAA Intermediate-Low and High, 2040/2070



Action-Focused Planning Process



Collective Mapping

Resilient Cedar Key / Port St. Joe WebApp

Adaptation Plan Spatial Framework
Adaptation Overlays

Digital Tools for Outreach

Community Input

Collective Mapping

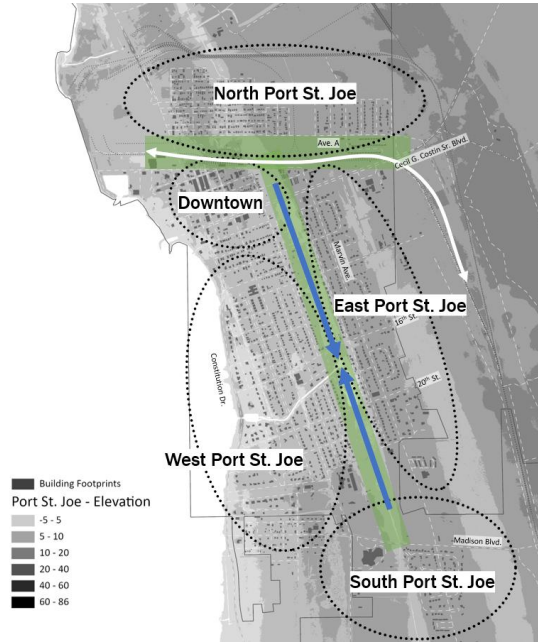


| | |
|---|---|
| Category | Asset |
| Housing | Complementary spaces |
| | Assisted Housing Inventory - Levy City |
| | Hotels and existing affordable housing (DHAS) |
| Transportation | FDR Requirements |
| | airports |
| | bridges |
| | bus terminals |
| | ports |
| | major roadways |
| | trains |
| | rail facilities |
| | raised bridges |
| | FDR Requirements |
| Critical Infrastructure | wastewater treatment facilities and lift stations |
| | stormwater treatment facilities and pump stations |
| | drinking water facilities |
| | water utility conveyance systems |
| | electric production and energy facilities |
| | solid and hazardous waste facilities |
| | military installations |
| | communications facilities |
| | disaster debris management sites |
| | FDR Requirements |
| Critical community and emergency facilities | schools, colleges and universities |
| | community centers |
| | convention centers |
| | disaster recovery centers |
| | emergency medical service facilities |
| | emergency operation centers |
| | fire stations |
| | health care facilities |
| | hospitals |
| | senior center facilities |
| | local government facilities |
| | regional airport areas |
| | affordable public housing |
| | tax shelter inventory |
| | state government facilities |
| FDR Requirements | |
| Natural, cultural, and historic resources | conservation lands |
| | parks |
| | shorelines |
| | wetlands |
| | surface waters |
| | wetlands |
| | historical and cultural assets |



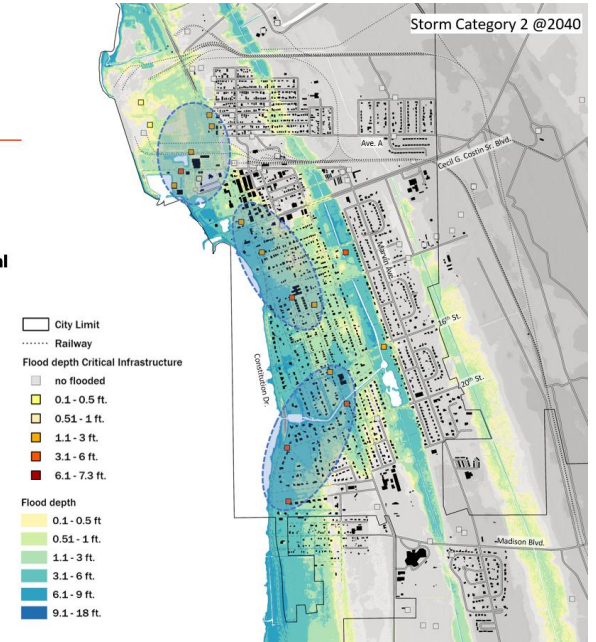
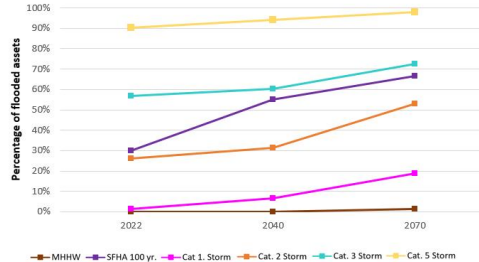


Vulnerability Assessment Results



Critical Infrastructure Exposure Analysis

- By 2040, a Category 2 storm will flood over **30% of critical infrastructure**, by 2070 this percentage rises to over **50%** (almost **double of flooded assets** in 2022).
- By 2040, a Category 3 storm will flood almost **60% of critical infrastructure**, with several assets including lift stations, hazardous waste facilities, and communication facilities getting over 3ft and even 6ft of water.



Vulnerability Assessment Results

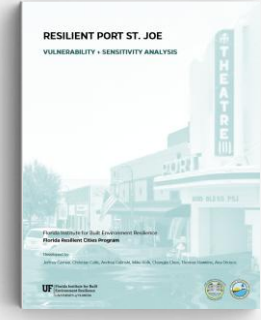
Zone 1, Downtown Critical assets inventory, exposure levels

| Asset Name | Address | Asset Type | Asset Mileage | CURRENT | 2040 Scenarios | | | | | 2070 Scenarios | | | | | | | | | | | | | | | | |
|-----------------------|---------------|------------|---------------|---------|----------------|-----------|-----------|-----------|-----------|----------------|-----------|-----------|-----------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | SLR | SLR + LF1 | SLR + LF2 | SLR + LF3 | SLR + LF4 | SLR | SLR + LF1 | SLR + LF2 | SLR + LF3 | SLR + LF4 | | | | | | | | | | | | |
| PORT OF JEA MARINA | JEA MARINA ST | CI | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | 0.500 | | |
| PORT OF JEA MARINA BR | JEA MARINA BR | CI | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 |
| PORT OF JEA MARINA BR | JEA MARINA BR | CI | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 |
| PORT OF JEA MARINA BR | JEA MARINA BR | CI | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 |
| PORT OF JEA MARINA BR | JEA MARINA BR | CI | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 |
| PORT OF JEA MARINA BR | JEA MARINA BR | CI | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 |

Transportation Street Network, including 1/2 Mile and 1/4 Mile buffers are displayed only as summary of the critical assets categories below.

Zone 1, Downtown Critical assets categories, exposure levels

| Asset Category | Current | | | | | | | | | |
|--|---------|-----------|-----------|-----------|-----------|--------|-----------|-----------|-----------|-----------|
| | SLR | SLR + LF1 | SLR + LF2 | SLR + LF3 | SLR + LF4 | SLR | SLR + LF1 | SLR + LF2 | SLR + LF3 | SLR + LF4 |
| Zone 1 - Downtown - Housing | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Low | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 25.0% | 0.0% | 0.0% | 0.0% | 23.5% |
| Medium | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 55.0% | 0.0% | 0.0% | 0.0% | 57.5% |
| High | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% | 7.5% |
| Florida Housing Buildings | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Zone 1 - Downtown - Transportation | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Low | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Medium | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| High | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Florida Transportation Assets | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Zone 1 - Downtown - Critical Infrastructure | 100.0% | 64.7% | 100.0% | 76.6% | 23.9% | 5.9% | 100.0% | 23.9% | | |
| Low | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Medium | 0.0% | 0.0% | 0.0% | 5.9% | 11.9% | 0.0% | 0.0% | 11.9% | 0.0% | 11.9% |
| High | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Florida Critical Infrastructure Assets | 0.0% | 35.3% | 0.0% | 20.4% | 76.1% | 94.1% | 0.0% | 76.1% | | |
| Zone 1 - Downtown - Critical Community and Emergency Facilities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Low | 0.0% | 35.7% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Medium | 0.0% | 35.7% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| High | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Florida Critical Community and Emergency Fac. | 0.0% | 35.7% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Zone 1 - Downtown - Natural, Cultural and Historical Resources | 78.4% | 21.6% | 64.6% | 36.7% | 0.0% | 0.0% | 78.4% | 21.6% | | |
| Low | 0.0% | 73.1% | 0.0% | 73.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Medium | 0.0% | 7.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| High | 21.6% | 64.6% | 35.7% | 57.1% | 78.4% | 100.0% | 21.6% | 73.4% | | |
| Florida Natural, Cultural and Historical Resour. | 21.6% | 78.4% | 35.7% | 64.6% | 100.0% | 100.0% | 21.6% | 73.4% | | |



Partnerships for a Blue Environment
Florida Resilient Coasts Program

UF
University of Florida

Partners: Florida Dept. of Transportation, Florida Dept. of Environmental Protection, Florida Dept. of Banking and Finance

Resilient Cedar Key

A Dashboard to explore the impacts of compound flooding with different storm events under different sea-level rise scenarios.



GET STARTED

Disclaimer

The data and maps in this tool illustrate the scale of potential flooding, not the exact location, and do not account for erosion, subsidence, or future construction. Although every effort has been made to ensure that information is comprehensive and accurate, errors and omissions may exist. The data and the information included therein is provided on an "as is" basis. The Florida Institute for Built Environment Resilience (FIBER), Florida Sea Grant, the University of Florida, or any of their respective faculty, staff, or administration specifically disclaim any warranty, either expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular use. The entire risk as to quality and performance is with the user. This tool should be used strictly as a planning reference tool and not for navigation, permitting, or other legal purposes.

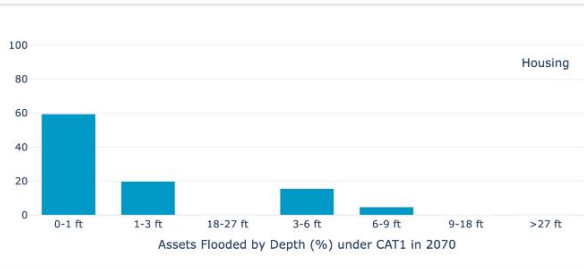
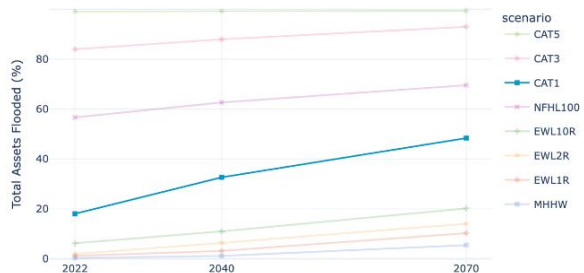
<https://resilientcedarkey.web.app/>

<https://resilientpsj.web.app/>

Affordable Housing

Overview: Cedar Key is a historic community with a range of housing stock, ages, construction types, and economic values. This housing stock traditionally supported a diverse community across race, age, and economic status.

Challenges: Like many coastal communities in Florida, Cedar Key has seen property values rise substantially in recent years, making housing unaffordable to many people. Coupled with increased risk from rising tides/coastal flooding, structure age, and costs of upkeep, Cedar Key's housing stock is vulnerable to storm damage as well as conversion to short-term rental properties.



Projection Year

2022

2040

2070

Scenario

CAT5

CAT3

CAT1

NFHL100

EWL10R

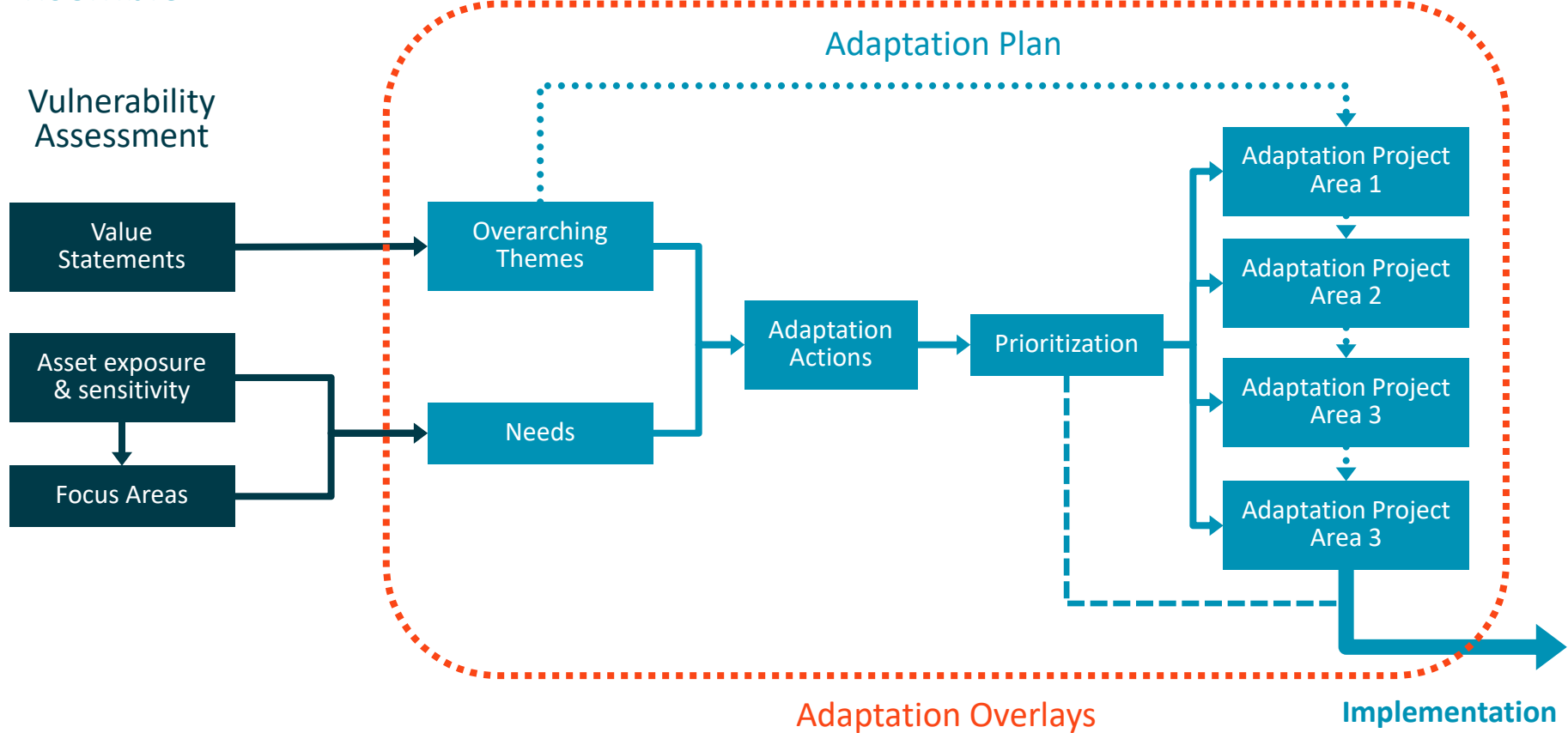
EWL2R

EWL1R

MHHW

Place-Based Flood Resiliency Planning

Adaptation Plan Ensemble



Cedar Key Overarching Themes

Theme:
**Cedar Key is
an
archipelago.**



Approach:
**Restore
Hydrologic
Connectivity**

Theme:
**Cedar Key
depends on its
transportation
network.**



Approach:
**Strengthen
Transportation
Network**

Theme:
**Cedar Key is a
collection of
diverse districts.**



Approach:
**Tailor Adaptation
Actions for
Diverse Districts**

Theme:
**Cedar Key's natural
systems have defined its
identity and will sustain
its future.**



Approach:
**Preserve Natural
Systems and
Functions that
Sustain the Local
Economy**

Cedar Key Adaptation Action Areas



Zone 1, Downtown
Connect and Redevelop



Zone 2, Mid
Hydrologic Connectivity



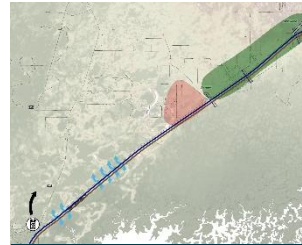
Zone 3, West
Land Conservation



Zone 4, North
Local and Bypass



Zone 5, South
Infrastructure & Shorelines



Zone 3, Influence Area
Protect and Plug-In



Port St. Joe Overarching Themes

Theme:
Port St. Joe's Land Morphology Role in Flood Mitigation



Approach:
Enhance Hydrologic Conditions

Theme:
Vulnerability of Main Transportation Routes to Severe Flooding

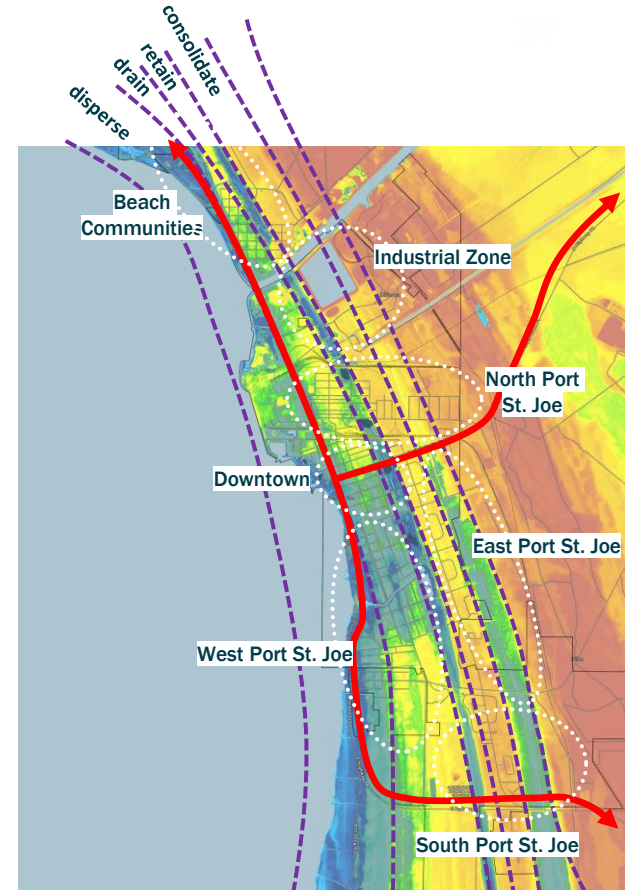


Approach:
Strengthen Transportation Network

Theme:
Diversity of Districts in Port St. Joe



Approach:
Tailor Adaptation Actions for Diverse Districts



Port St. Joe Flood Protection Layers



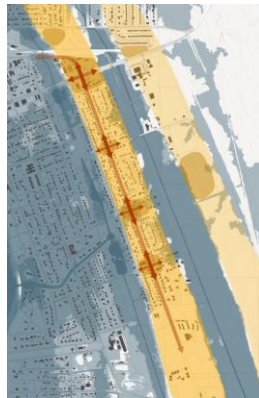
Disperse
Storm surge buffer



Drain
Swales and public spaces



Retain
Pond system
& large retention



Consolidate
Future growth



Adaptation Project Areas

Restoring Hydrologic Connectivity

Cedar Key

- Focus on let water to flow through the island at 3 vulnerable locations. Establish a replicable process for other emergent areas of the island.
- New bridge from Indiana Ave. to Cemetery access will restore the hydro- and road connectivity at extreme high tide scenarios.
- Elevate section Gulf Blvd. at Hodges Ave., re-structure Andrews Circle section to allow through traffic in days of extreme high tides.

Legend

- City Limit
- Building Footprints
- Parcel Structure
 - Parcels
 - Municipal Parcels
 - Vacant Parcels
- Flood Extent
 - Extreme Water Level 2yr-return @2040
 - 100-year
 - Cat. 1 Hurricane
- Adaptation Zone
 - Flood Protection
 - Redevelopment, Community Facilities Relocation
 - Hydroconnectivity Restoration
 - Land Conservation
- Structural Interventions
 - Elevate Housing
 - Street Section Re-structure
- Non-Structural Interventions
 - Hydroconnectivity Restoration
 - Groin Field+Beach Nourishment
 - Maintain Beach OR Offshore Breakwaters +Beach Nourishment (vegetation optional)
 - Maintain or Enhance Marsh/Mangrove
 - Plant Marsh/Mangrove with Sill
 - Revetment (Rip-Rap)





Upland housing
protected from impounded
water

Select Properties
converted to conservation
land

Rebuild bridge to allow
for hydrologic flow during
storms

Improved Access for
bikes and pedestrians

Adaptation Project Areas

Lighthouse Park > Disperse

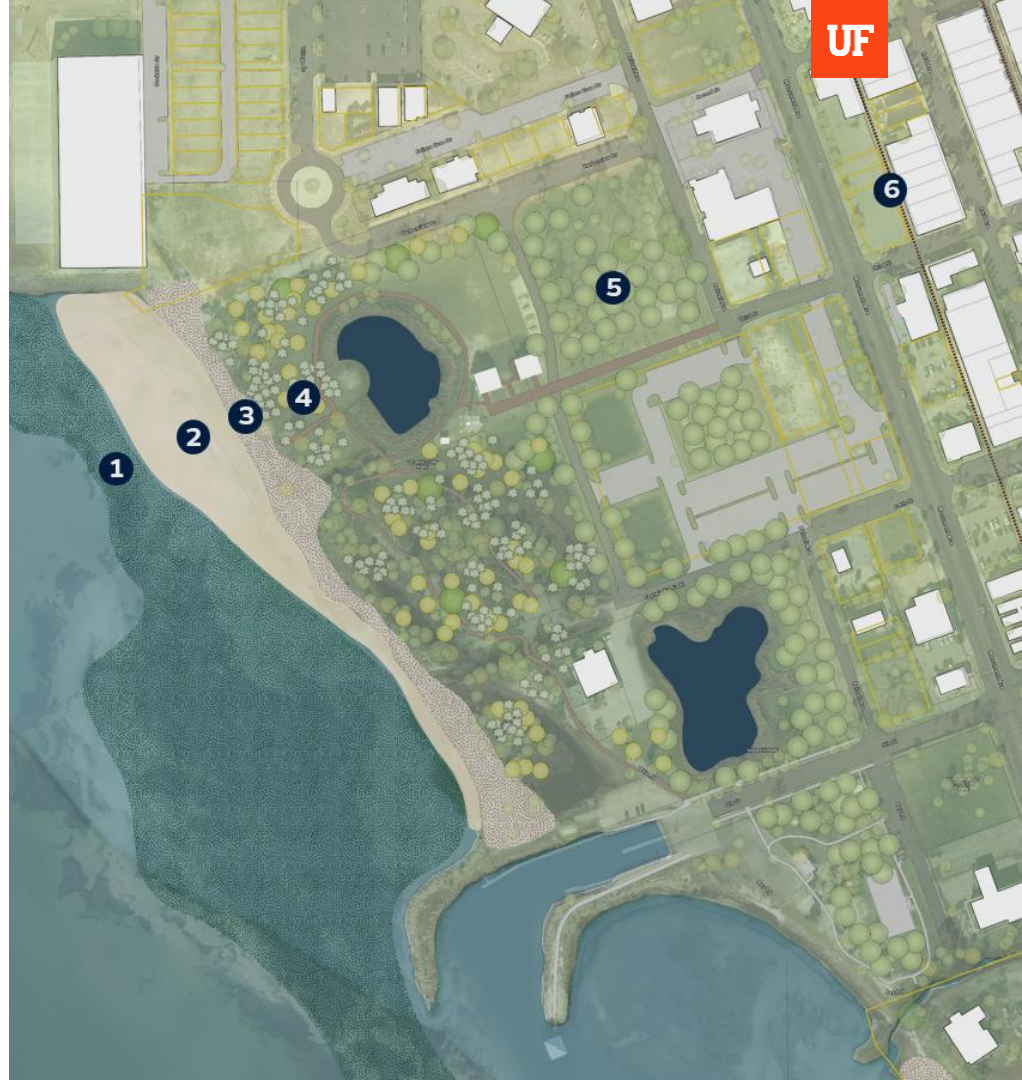
Port St. Joe

Re-structure Marina Drive, ensure connectivity

Sand Hills Pond Park, Shipyard Cove, and Maddox Park

1. marsh restoration
2. beach nourishment
3. dune restoration and retrofit revetment
4. mix low vegetation and deciduous trees
5. high vegetation

6. Dry floodproof Reid Ave.



Dry floodproof
historical core

High vegetation

Low-High vegetation

Dune restoration

Beach nourishment

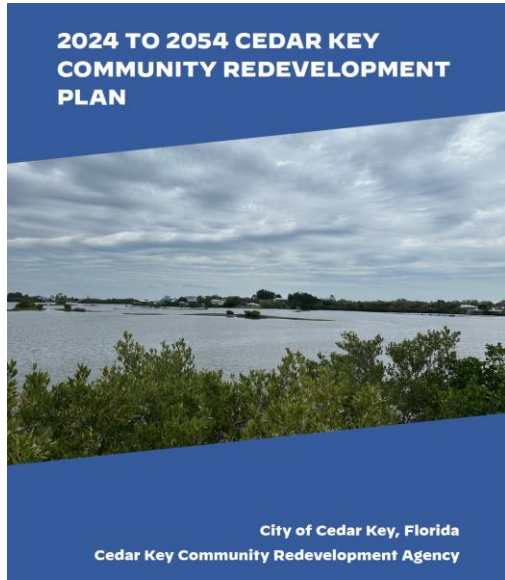
Marsh restoration



Legal Frameworks

Implementing the Adaptation Plan

Cedar Key



- Linking adaptation plan with City's CRA plan
- Catalyzing mitigation projects:
 - Relocation of City Hall & other city departments
 - Land acquisition grants
 - Prioritization of FEMA relief funds
 - Identifying target properties for buyout offers
- Preparing future applications for infrastructure funds

Legal Frameworks

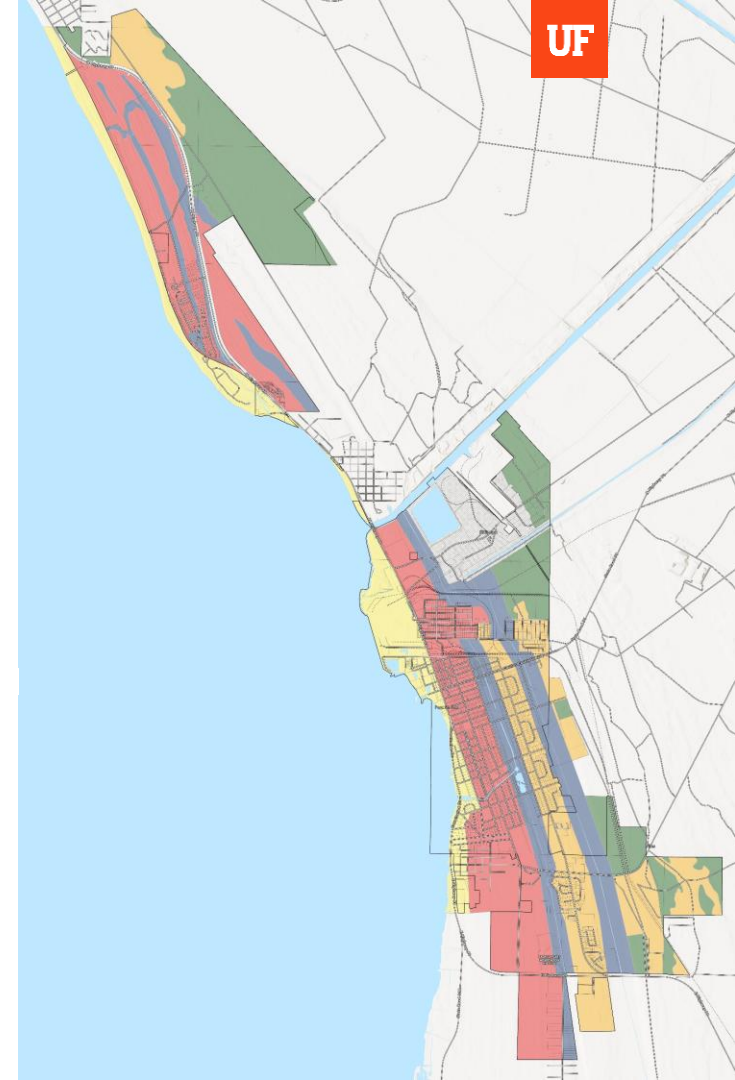
Adaptation Overlays, Coastal Management Element Comprehensive Plan

Port St. Joe

- The **disperse** overlay. Land closest to the coast, bolstering natural defenses and infrastructure for surge, tidal waters, and extreme storm events.
- The **drain** overlay. Low-elevation areas, enhance drainage.
- The **retain** overlay. Increase water retention capacity and natural condition restoration.
- The **consolidate** overlay. Future growth in high-elevation areas with low flood vulnerability and good accessibility.
- The **conserve** overlay. Preserving ecosystem functions and managing building development.
- The **“special conditions”**. Improving stormwater drainage and retention for certain facilities with preexisting nonconforming uses.

Legend

| | |
|---------------------|--------------------|
| | City Limits |
| | Parcels |
| | Railway |
| Adaptation Overlays | |
| | disperse |
| | drain |
| | retain |
| | consolidate |
| | conserve |
| | special conditions |



THANK YOU

resilientcedarkey.web.app

resilientpsj.web.app

