PENSACOLA & PERDIDO BAYS ESTUARY PROGRAM

2024 Northwest Florida Resilience Seminar
June 21, 2024

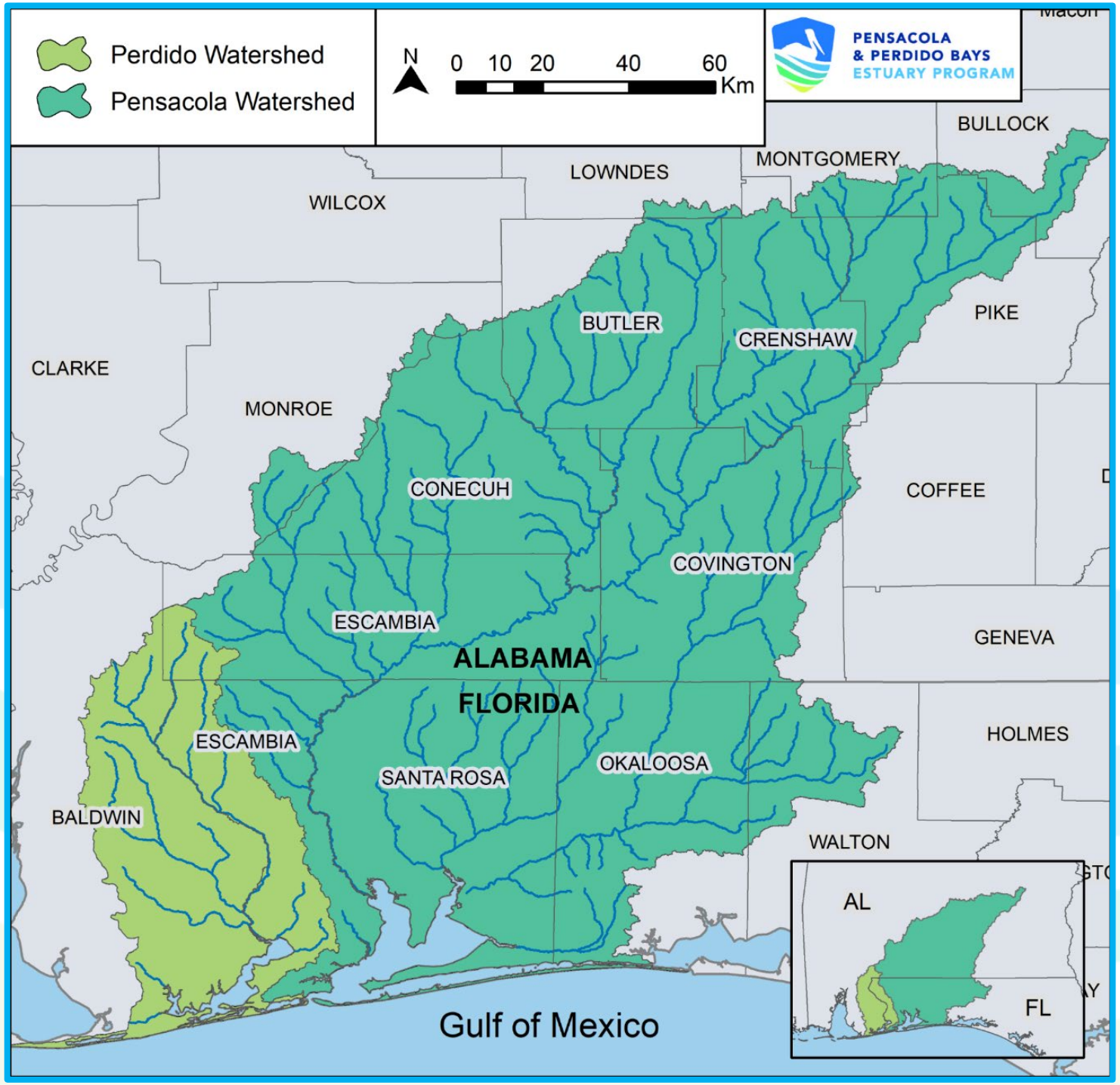
Our Mission

Restoration

Education

Monitoring

PENSACOLA
& PERDIDO BAYS
ESTUARY PROGRAM


Perdido Watershed
Pensacola Watershed
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Km
PENSACOLA
& PERDIDO BAYS
ESTUARY PROGRAM
BULLOCK
MONTGOMERY
LOWNDES
WILCOX
PIKE
BUTLER
CRENSHAW
CLARKE
MONROE
CONECUH
COFFEE
COVINGTON
ESCAMBIA
GENEVA
ALABAMA
FLORIDA
HOLMES
ESCAMBIA
OKALOOSA
SANTA ROSA
BALDWIN
WALTON
AL
FL
Gulf of Mexico

Community Values and Concerns

PPBEP partnered with the University of West Florida (UWF) Haas Center to survey residents and visitors about watershed use, values, challenges, and funding.

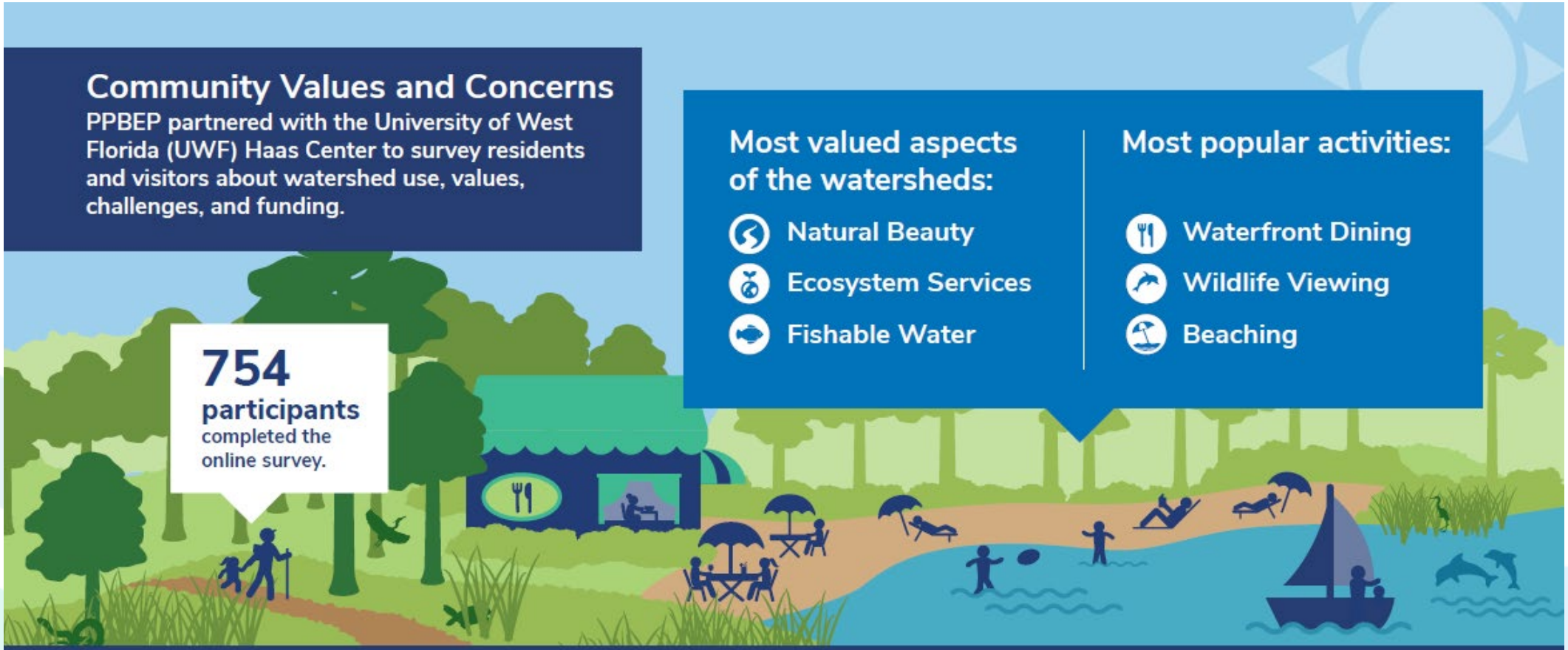
754 participants completed the online survey.

Most valued aspects of the watersheds:

- Natural Beauty
- Ecosystem Services
- Fishable Water

Most popular activities:

- Waterfront Dining
- Wildlife Viewing
- Beaching



TOP 5 Very Important Aspects of Healthy Watersheds:

- Trash Free Land and Water
- Healthy Habitats
- Wildlife Abundance
- Wildlife Diversity
- Natural Riverbanks and Shorelines

TOP 5 Environmental Challenges:

- Industrial Discharges
- Coastal Development
- Municipal Sewage Treatment Discharges
- Population Increase
- Upstream Development

TOP 5 Investment Priorities:

- Water Quality Improvements
- Natural Habitat Restoration
- Resilience
- Green Infrastructure
- Community Outreach and Education

Explore the CCMP

Scan Me!

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CCMP Goals

GOAL 1
SOURCE OF WATERSHED INFORMATION

GOAL 2
STRENGTHEN COMMUNITY RESILIENCE

GOAL 3
IMPROVE WATER QUALITY

GOAL 4
REDUCE SEDIMENT SOURCES

GOAL 5
CONSERVE AND RESTORE CRITICAL HABITAT

GOAL 6
RESTORE AND CONSERVE FISH AND WILDLIFE

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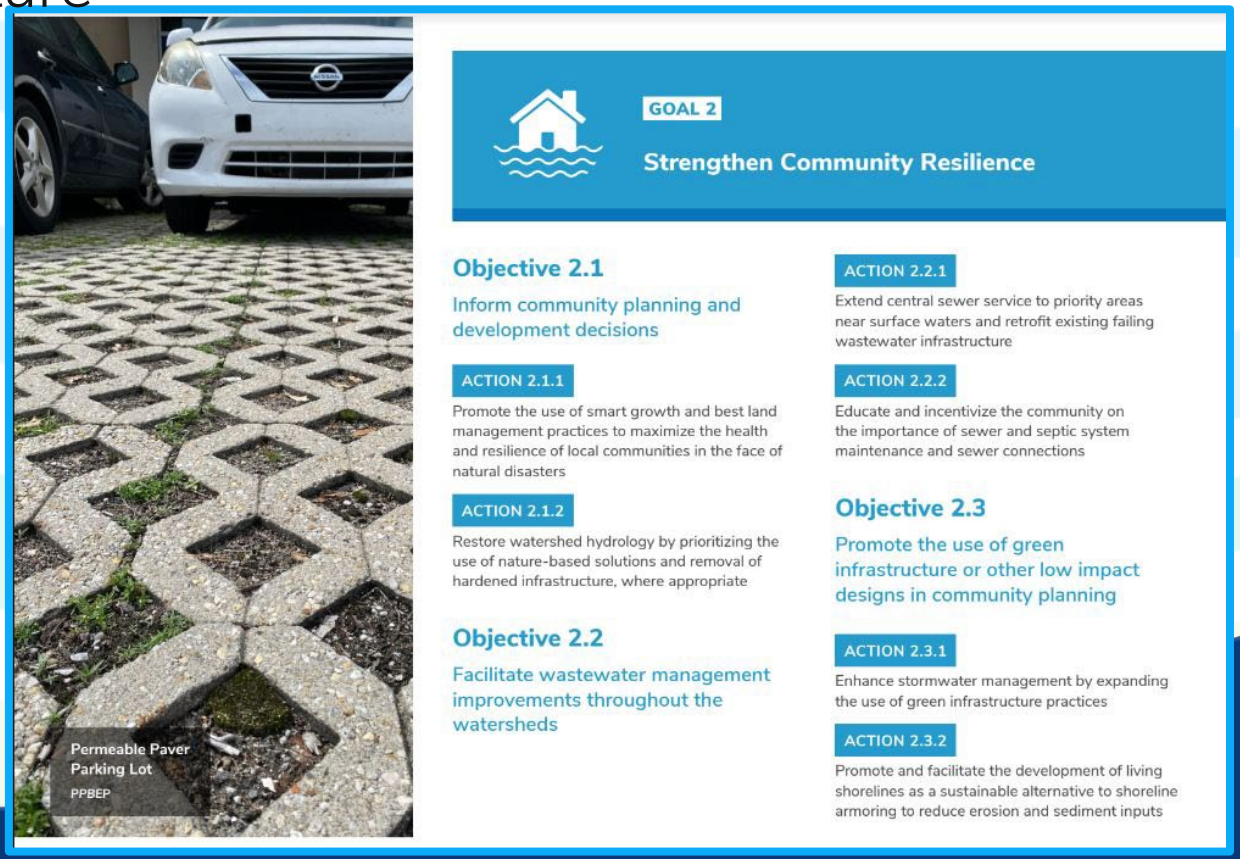
Strengthen Community Resilience

- 2.1: Inform Community Planning
- 2.2: Facilitate Wastewater Management Improvements
- 2.3: Promote the Use of Green Infrastructure
- 2.4: Identify Compound Flooding Risks
- 2.5: Stormwater Awareness
- 2.6: Assess Social Vulnerability



Regional Vulnerabilities

- Storm Surge and Sea Level Rise
- Inland Flooding
- Compound Flooding

Community Needs

Community Priorities

Local Ecosystem Resilience

Affordable Utilities

Affordable Housing

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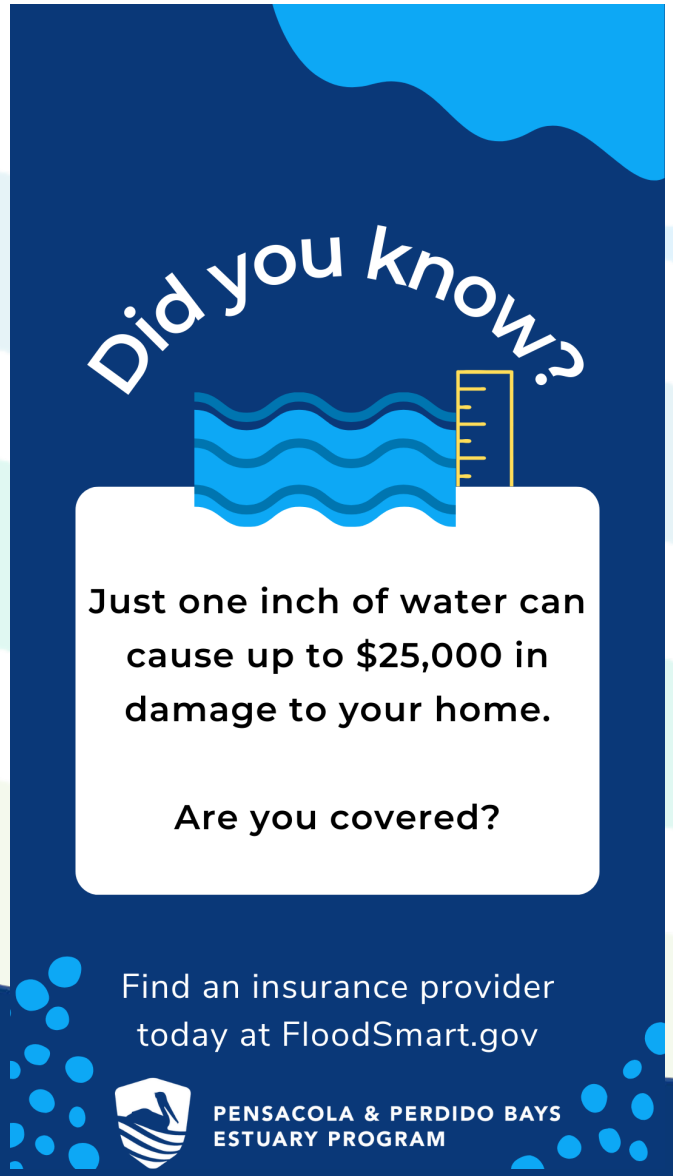
Resilience Readiness



Protecting What Matters

Businesses within ½ mile of the watershed had nearly **$8 billion in sales in 2020** and supported **more than 84 thousand workers**.

The estuaries are estimated to contribute $2.7 billion to property values in the area...

and nearly $81 million to consumer spending.

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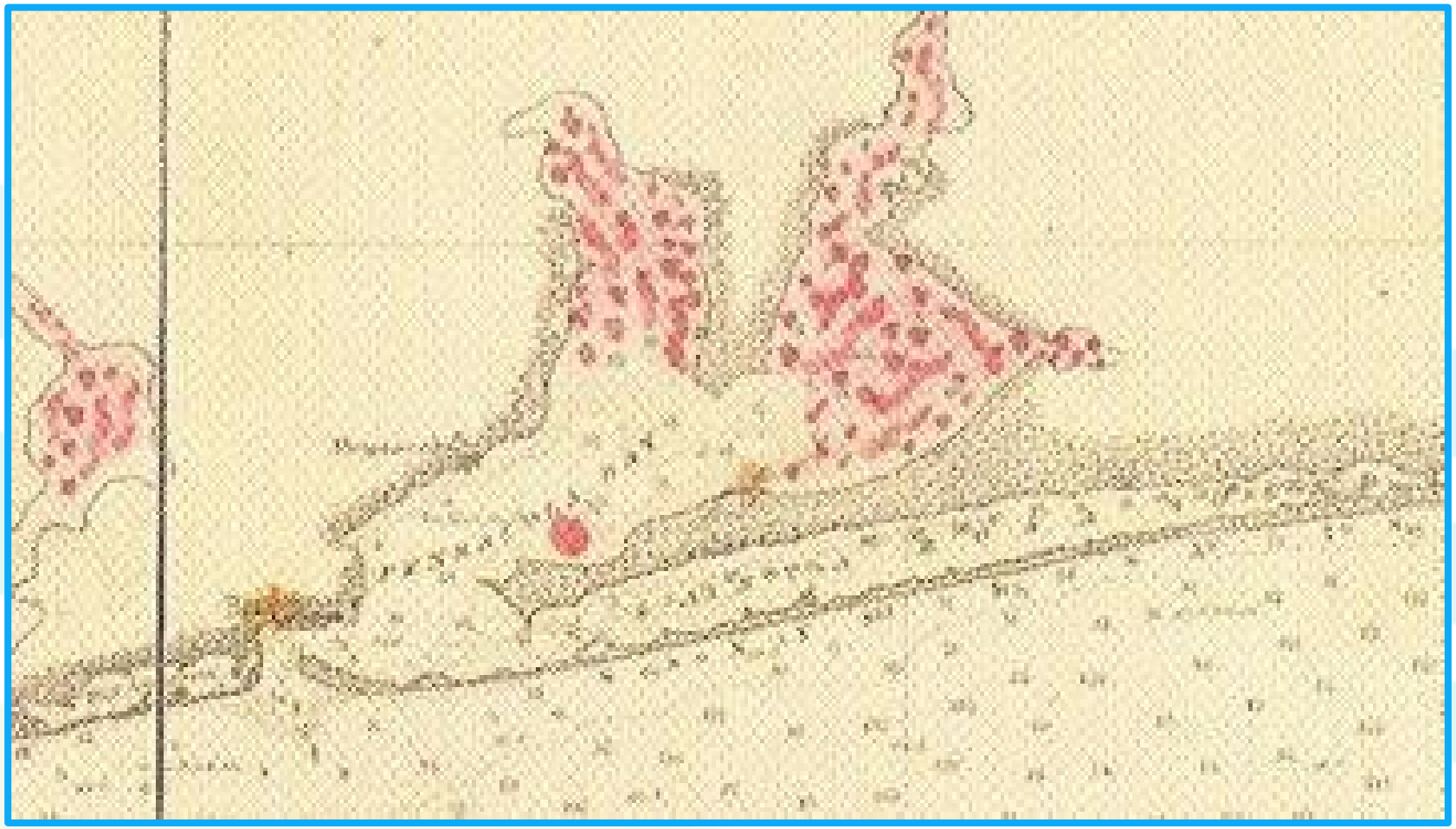
Regional Resilience

- Collaborative Science
- Whole-Ecosystem Resilience
- Whole-Community Resilience

Interlocal Agreement Parties

Historical Oyster Reefs



US Fish Commission 1883

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Oyster Reefs in Critical Condition

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Pensacola Bay Oyster Restoration Initiative

Funding Source: NOAA Transformational Habitat Grant
Award: $11M
Project Components:

- Oyster Restoration Design and Permitting
- Oyster Restoration Phase I Implementation
- Sediment Load Assessment
- Sandy Hollow Gully Restoration
- Living Shoreline Assistance Program

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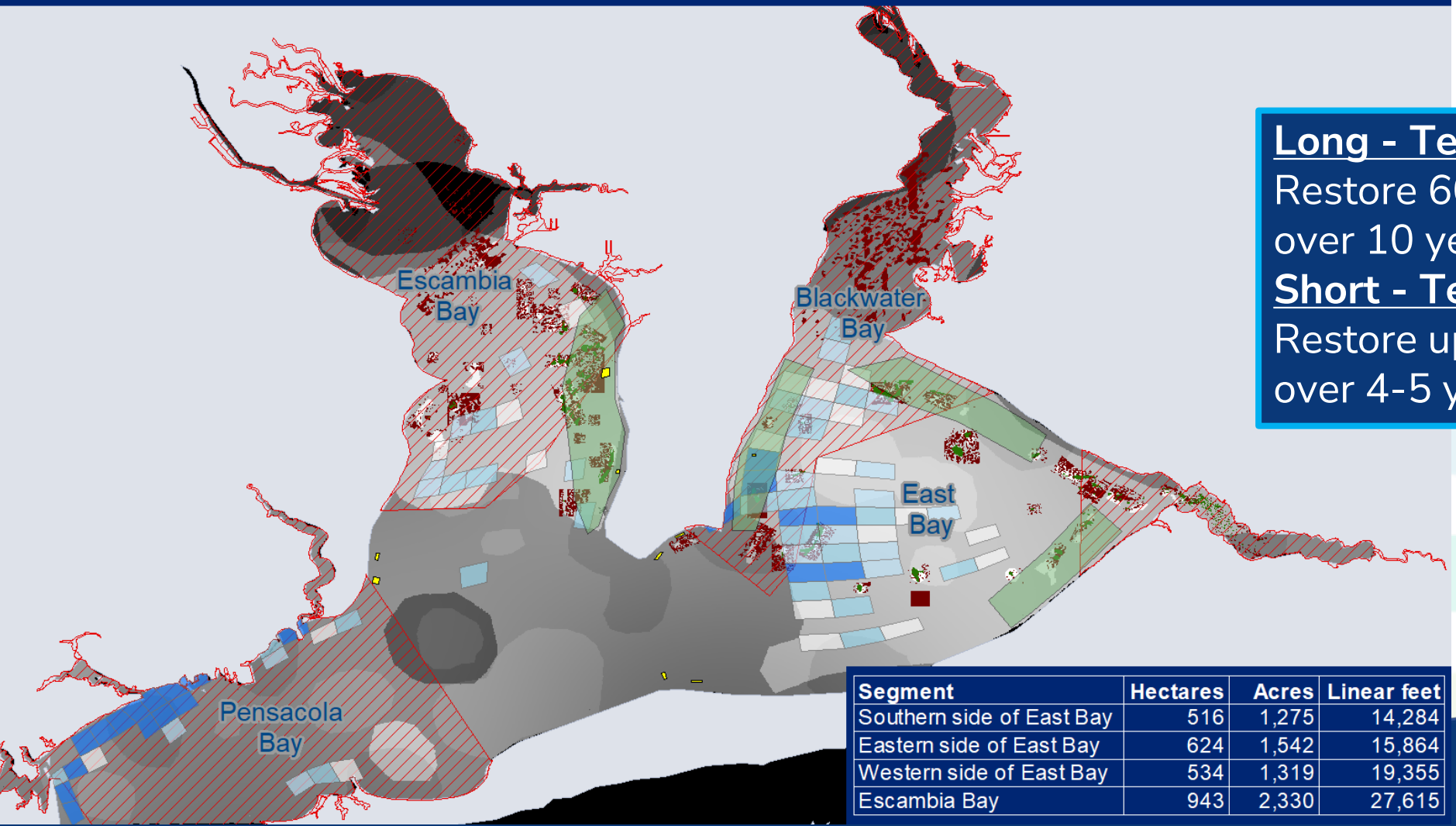

Long - Term Target

Restore 600 ha (~1,500 acres) over 10 years

Short - Term Target

Restore up to 100 ha (~250 acres) over 4-5 years

Segment	Hectares	Acres	Linear feet
Southern side of East Bay	516	1,275	14,284
Eastern side of East Bay	624	1,542	15,864
Western side of East Bay	534	1,319	19,355
Escambia Bay	943	2,330	27,615

RESTORE AMERICA'S ESTUARIES

Oyster Shell Recycling

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
U.S. DEPARTMENT OF COMMERCE

OYSTER CORPS
of the forgotten and emerald coasts
oystercorps.org

SANTA ROSA COUNTY FLORIDA
IN GOD WE TRUST

ESCAMBIA COUNTY
FLORIDA

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Living Shoreline Assistance Program

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FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Sandy Hollow Gully Restoration

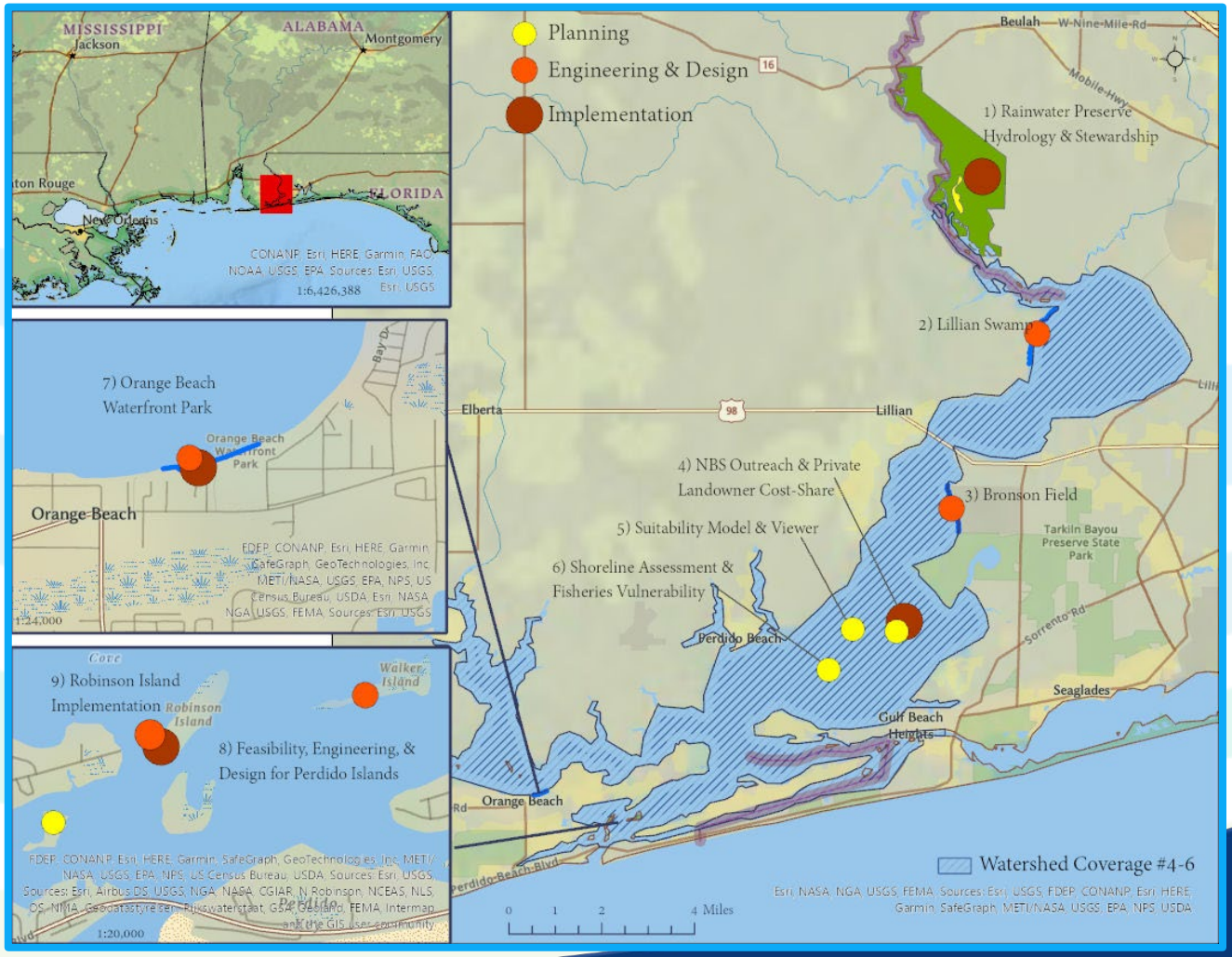
Perdido Watershed Initiative

Funding Source: NOAA Transformational Habitat Grant

Award: $12.8 M

Project Components:

- Orange Beach Waterfront Park
- Gilchrist, Robinson, Walker Islands
- Lillian Swamp and Bronson Field
- Living Shoreline Assistance Program
- Living Shoreline Suitability Model



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Compound Flood Model & Adaptation Plan

Funding Source: DEP Resilient Florida Grant
Awarded: $687,000
Project Components:

- Regional Compound Flood Model
  - Escambia, Santa Rosa, Okaloosa
  - 2040 and 2070 scenarios
  - Updated Precipitation IDF Curves
  - Hydrodynamic Modeling
  - Flood Inundation Modeling
  - Adaptation Plan
  - Builds on Existing VAs

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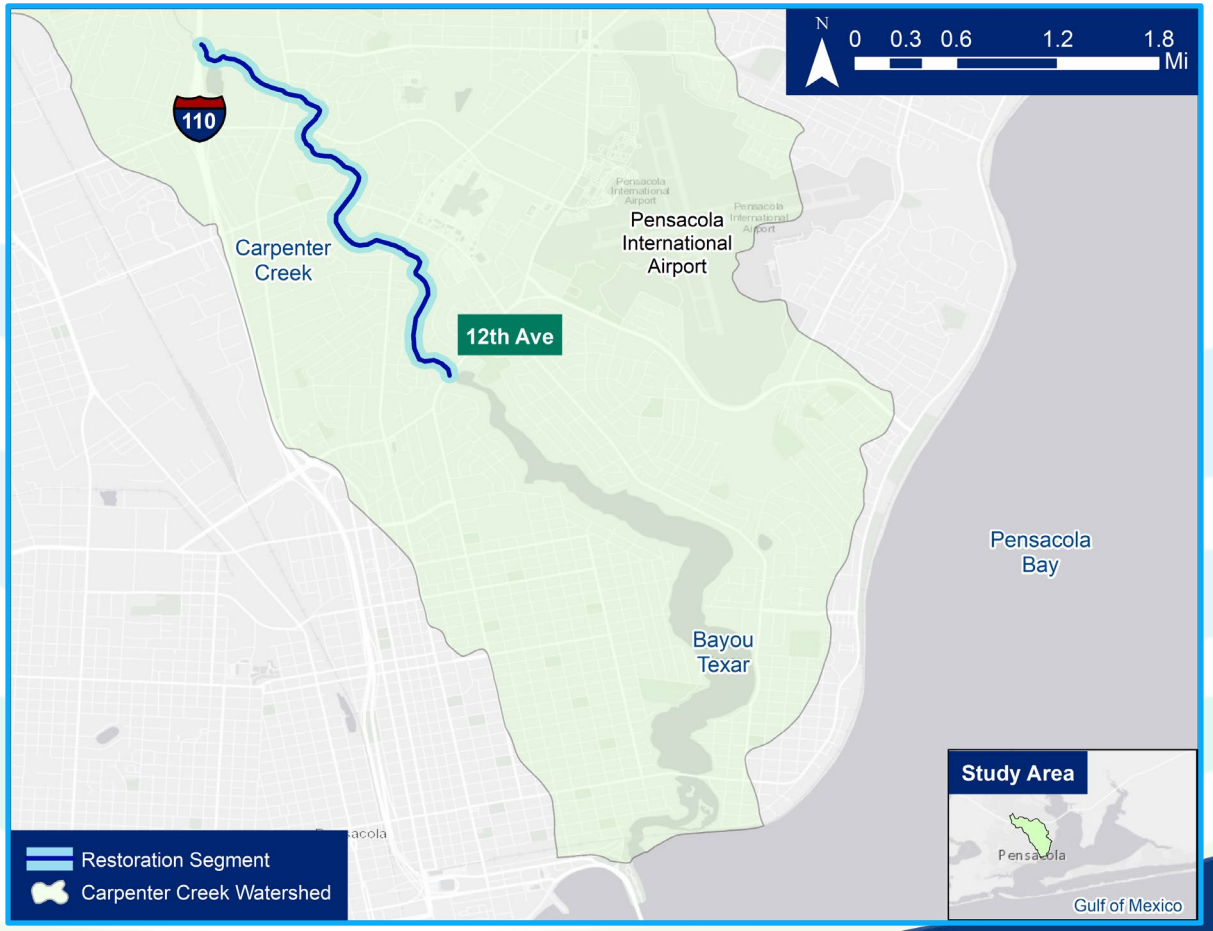
Carpenter Creek Restoration

Funding Source: DEP RESTORE FPL3b
Awarded: $2.2M
Impact:

- 2.5 mi-long stream restoration
- Reduction of 2,000 tons of sediment and remove 2,500 lbs. of nitrogen
- Restore 20 acres of wetlands
- Reduce flood staging by 1-foot



PENSACOLA
FLORIDA'S FIRST & FUTURE

ESCAMBIA COUNTY FLORIDA

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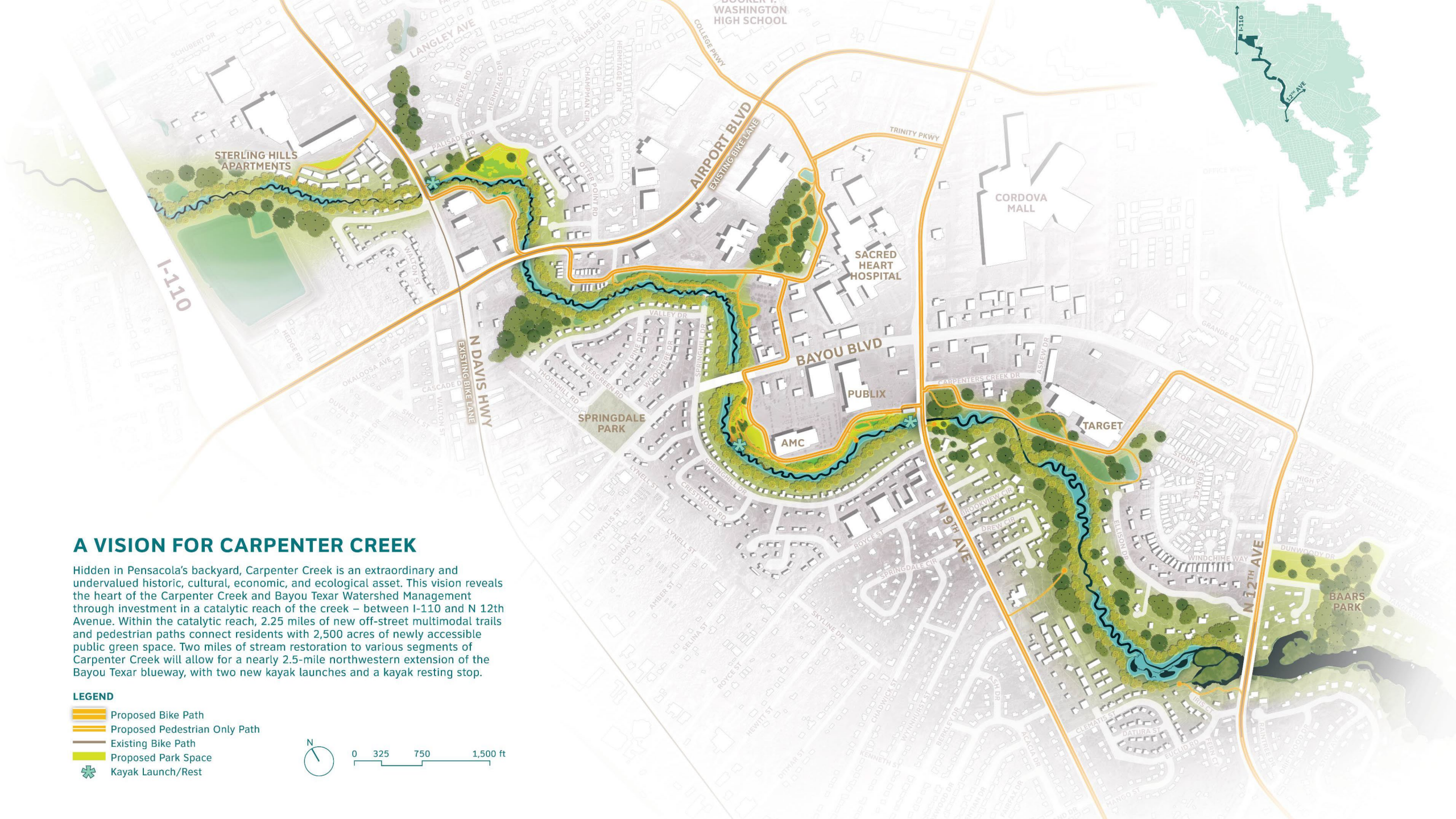


A VISION FOR CARPENTER CREEK

Hidden in Pensacola's backyard, Carpenter Creek is an extraordinary and undervalued historic, cultural, economic, and ecological asset. This vision reveals the heart of the Carpenter Creek and Bayou Texar Watershed Management through investment in a catalytic reach of the creek – between I-110 and N 12th Avenue. Within the catalytic reach, 2.25 miles of new off-street multimodal trails and pedestrian paths connect residents with 2,500 acres of newly accessible public green space. Two miles of stream restoration to various segments of Carpenter Creek will allow for a nearly 2.5-mile northwestern extension of the Bayou Texar blueway, with two new kayak launches and a kayak resting stop.

LEGEND

- Proposed Bike Path
- Proposed Pedestrian Only Path
- Existing Bike Path
- Proposed Park Space
- Kayak Launch/Rest

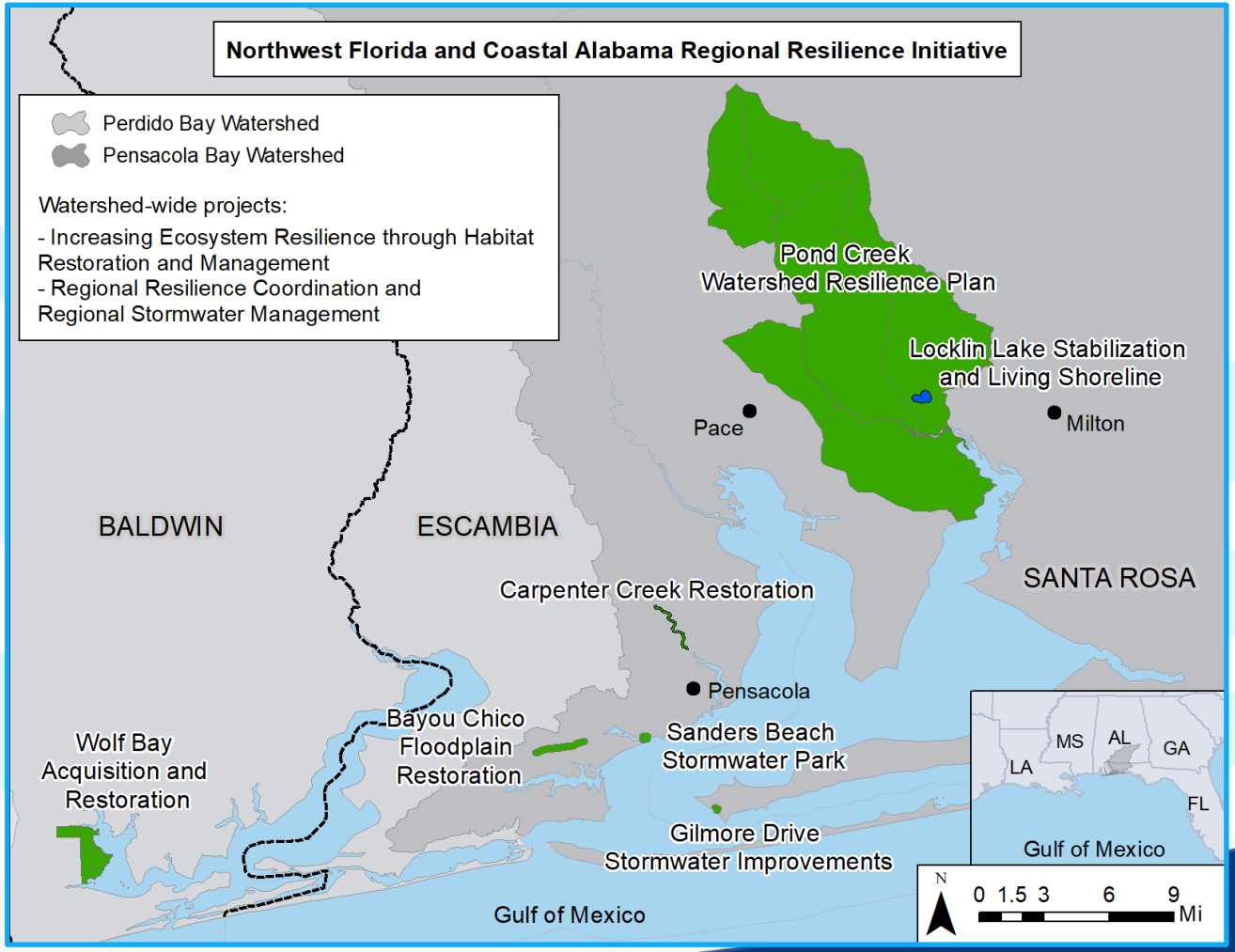
N

0 325 750 1,500 ft

Northwest Florida & Coastal Alabama Regional Resilience Initiative

NOAA Regional Resilience Challenge
Request: $50.9 Million
Impact:

- 260,000 Acres of Prescribed Fire
- 160 Acres of Invasive Management
- Acquire 1,600 Acres
- 40 Acres of Restored Floodplain
- 3.5-Miles of Stream Restoration
- ~600 Properties Protected from Flooding
- Develop 2 Regional Stormwater Parks
- 1 Watershed Resilience Plan



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SANTA ROSA COUNTY FLORIDA

Thank You!

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RESILIENT FLORIDA

Krista Slyter, Planning and Policy Administrator
Resilient Florida Program
Office of Resilience and Coastal Protection
Florida Department of Environmental Protection

Hot Topics in Floodplain Management | June 5, 2024

RESILIENT FLORIDA (RF)
LEADING THROUGH ACTION

2021:

- "Always Ready Bill" Establishing the program, section 380.093, Florida Statutes (F.S.).
- Unanimously passed in both chambers.

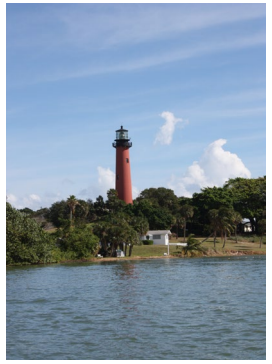
"The state is particularly vulnerable to adverse impacts from flooding resulting from increases in frequency and duration of rainfall events, storm surge from more frequent and severe weather systems and sea level rise. Such adverse impacts pose economic, social, environmental, and public health and safety challenges to the state."

Legislative Intent, section 380.093(1)(a), F.S.

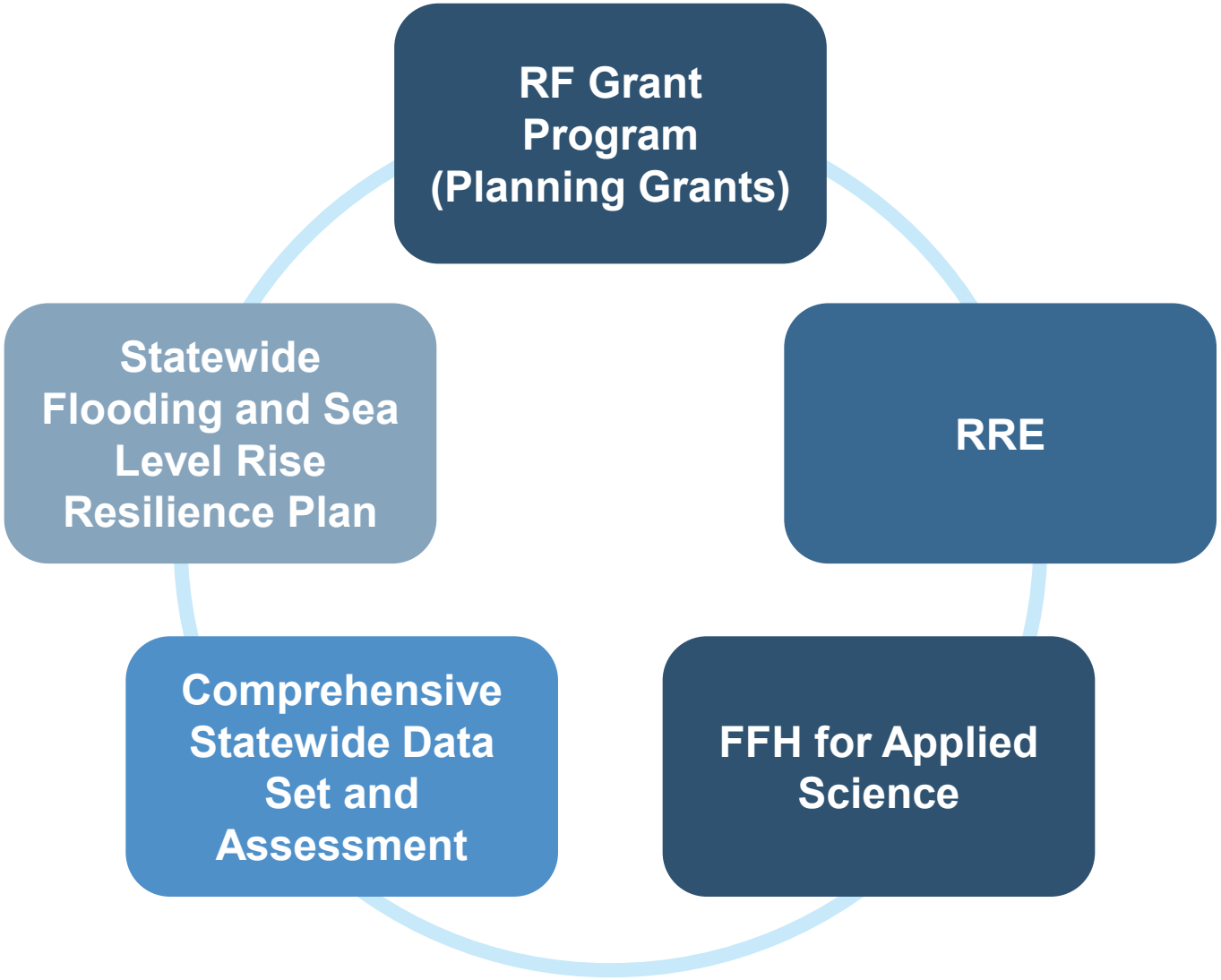
2022-2024 LEGISLATIVE HIGHLIGHTS

- Added or modified definitions, eligible entities and due dates.
- Statewide Resilience Plan (Statewide or State Plan) must include funding amount not less than $100 million.
- Expanded planning grant activities.
- More support for small and/or financially disadvantaged communities.
- Updates requirements for local government Vulnerability Assessments (VAs).
- Updates requirements for the Statewide Flood Vulnerability and Sea Level Rise Assessment.
- Revises eligibility requirements for the Statewide Plan:
- Clarifies entities and activities allowed for Regional Resilience Entities (RRE) funding.



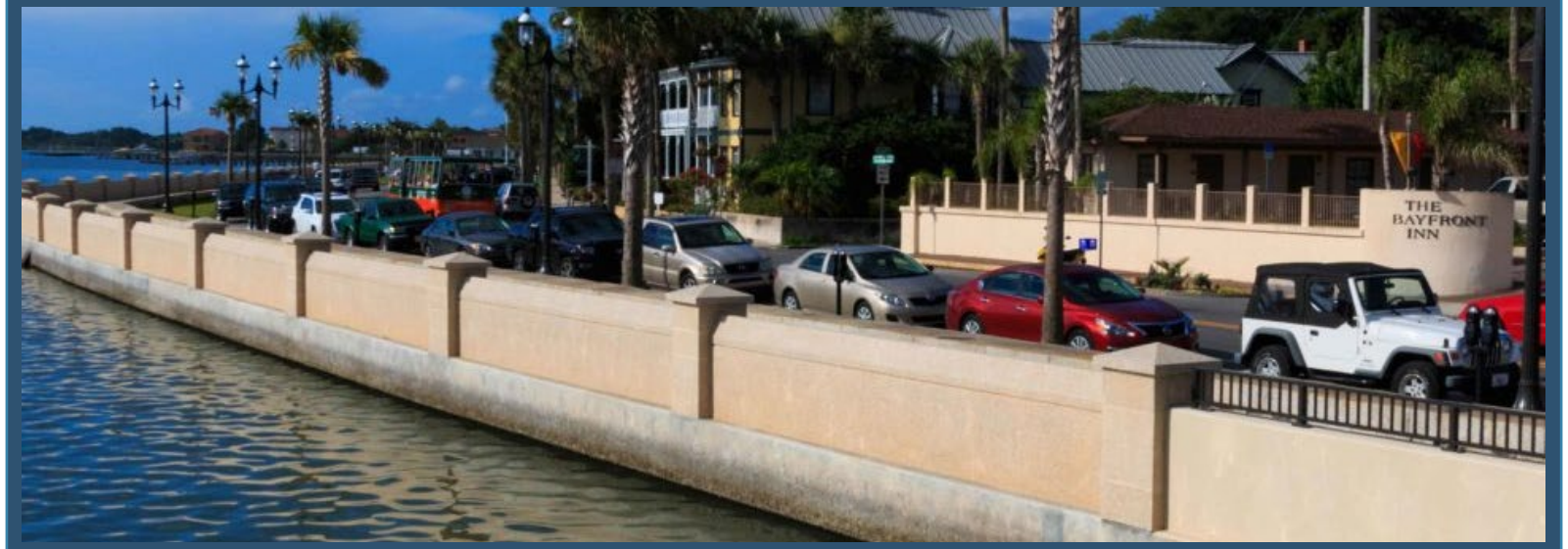


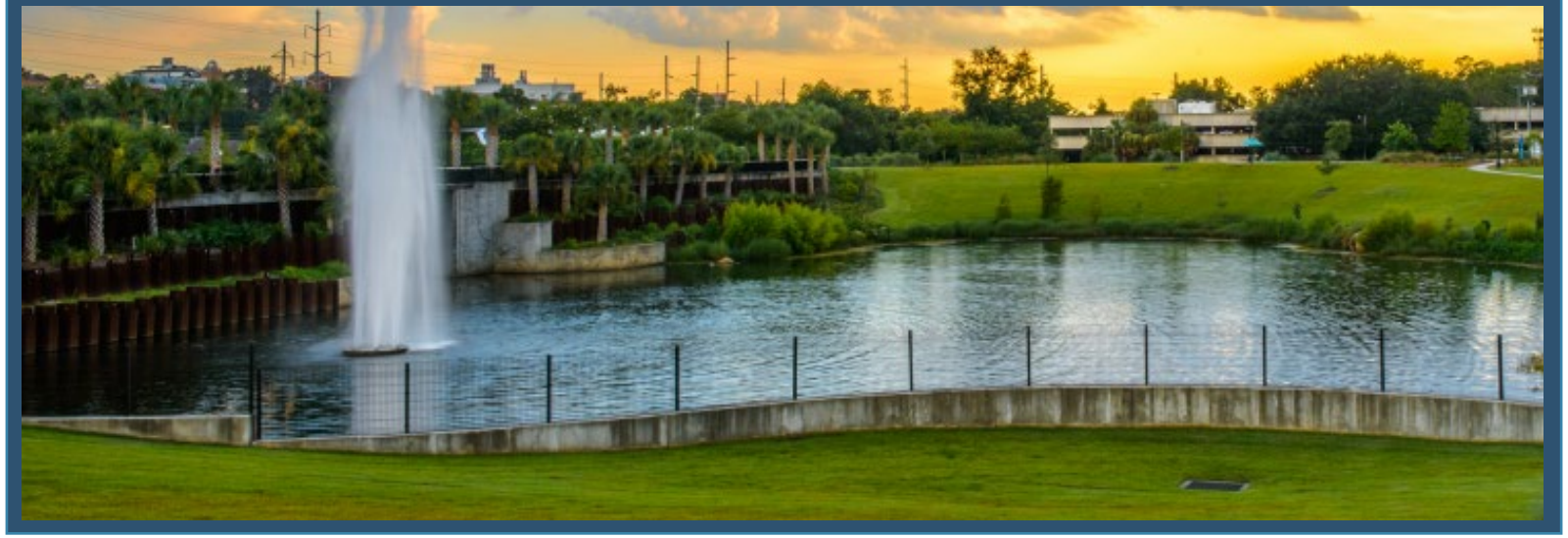
PROGRAM ELEMENTS



RESILIENT FLORIDA GRANT PROGRAM

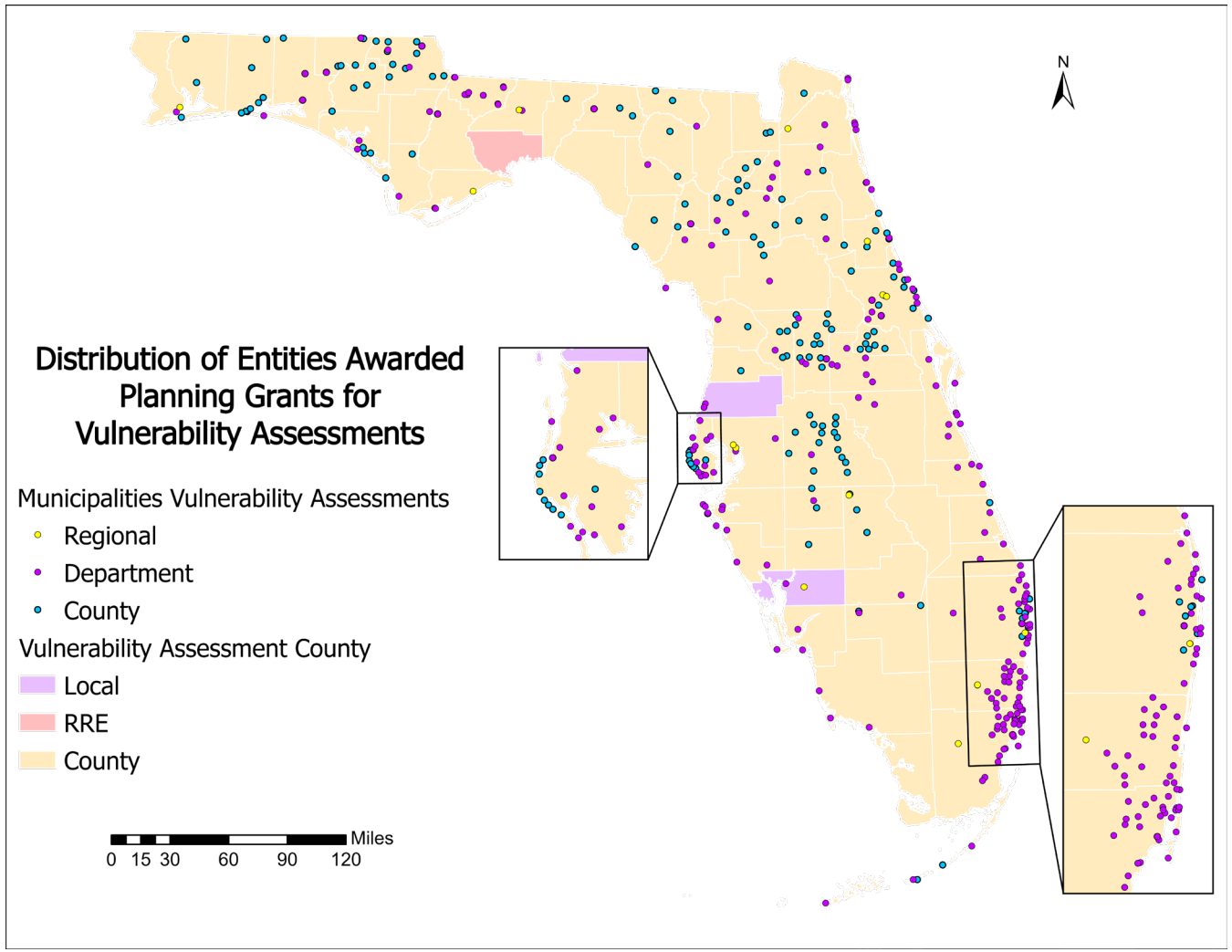
PLANNING GRANTS





- Fully funded, no match.
- VAs consistent with statute, using standard planning horizons and sea level rise projections.
- Adaptation/resilience plans for projects to adapt critical assets.
- Comprehensive plan amendments.
- Compliance with the Peril of Flood statute.
- Feasibility and permitting for nature-based solutions.
- WMDs to address FFH data gaps.

RF PLANNING GRANTS



- RF funding supporting VAs for 65 counties and 372 municipalities total.
- RRE funding supporting VAs some counties and municipalities.
- Two counties submitting data on their own.

RRE

Funding for RRE to assist communities and coordinate intergovernmental solutions:

- Technical assistance.
- Coordinate multijurisdictional VAs.
- Develop project proposals/applications for planning grants and the Statewide Plan.

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

EAST CENTRAL FLORIDA REGIONAL RESILIENCE COLLABORATIVE

TAMPA BAY REGIONAL RESILIENCY COALITION

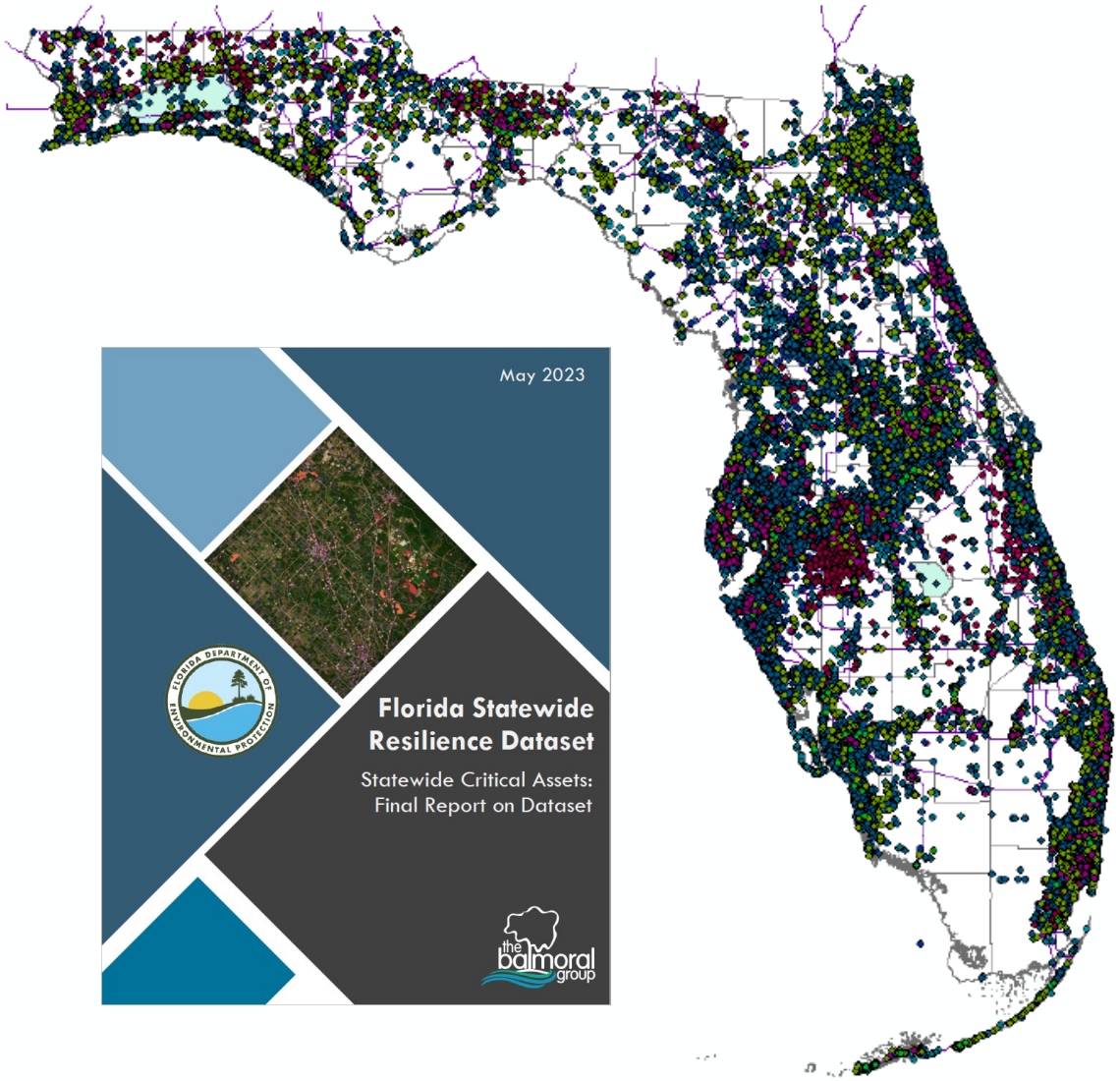
FFH

- Focused on Florida's most pressing environmental challenges.
- Goal to improve flood forecasting; inform science-based policy, planning and management.
- Working with the program, the FFH supports statewide efforts to protect people, businesses, natural resources and coastal infrastructure.

USF UNIVERSITY OF SOUTH FLORIDA
COLLEGE OF MARINE SCIENCE

Join Flood Hub mailing list for future news!
https://lp.constantcontactpages.com/su/DIWmPoB

COMPREHENSIVE STATEWIDE DATA SET AND ASSESSMENT



- Initially compiled 155 datasets, later refined to 63 datasets from local, state and federal sources.
- 3.3 million points, polygons and lines representing critical assets.
- Coordinate with FFH for review and hosting.
- Data will be used to develop Statewide VA.

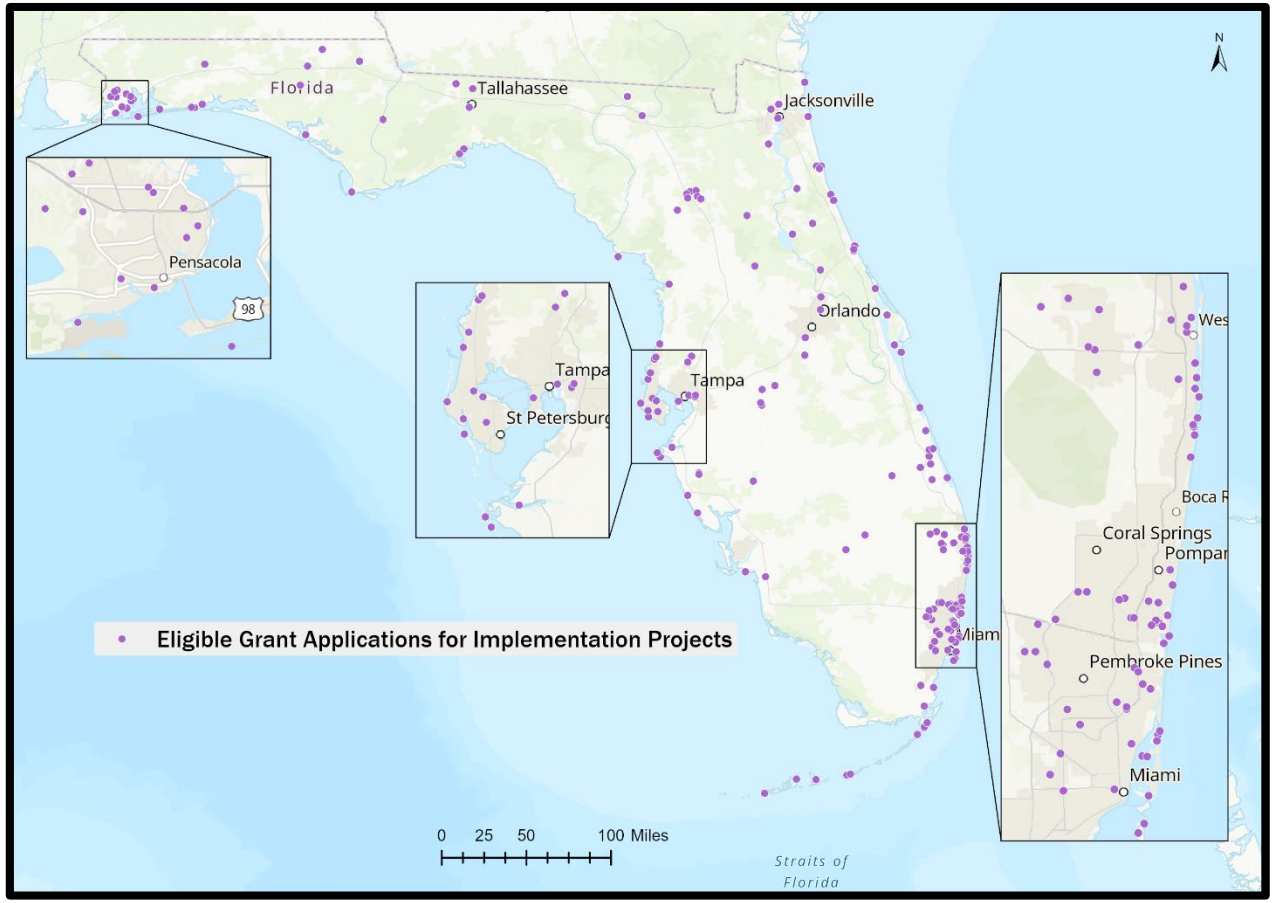
STATEWIDE FLOODING AND SEA LEVEL RISE RESILIENCE PLAN

- Prioritized based on criteria in statute and implemented via rule 62S-8, Florida Administrative Code (F.A.C.).
- Three-year rolling plan of projects:
  - Fully-fund projects to completion.
- 50% match funding required unless community is a financially disadvantaged small community.*
- Must include at least $100 million of projects each year.

*Pending legislative update.

FISCAL YEAR 2024-25 STATEWIDE PLAN

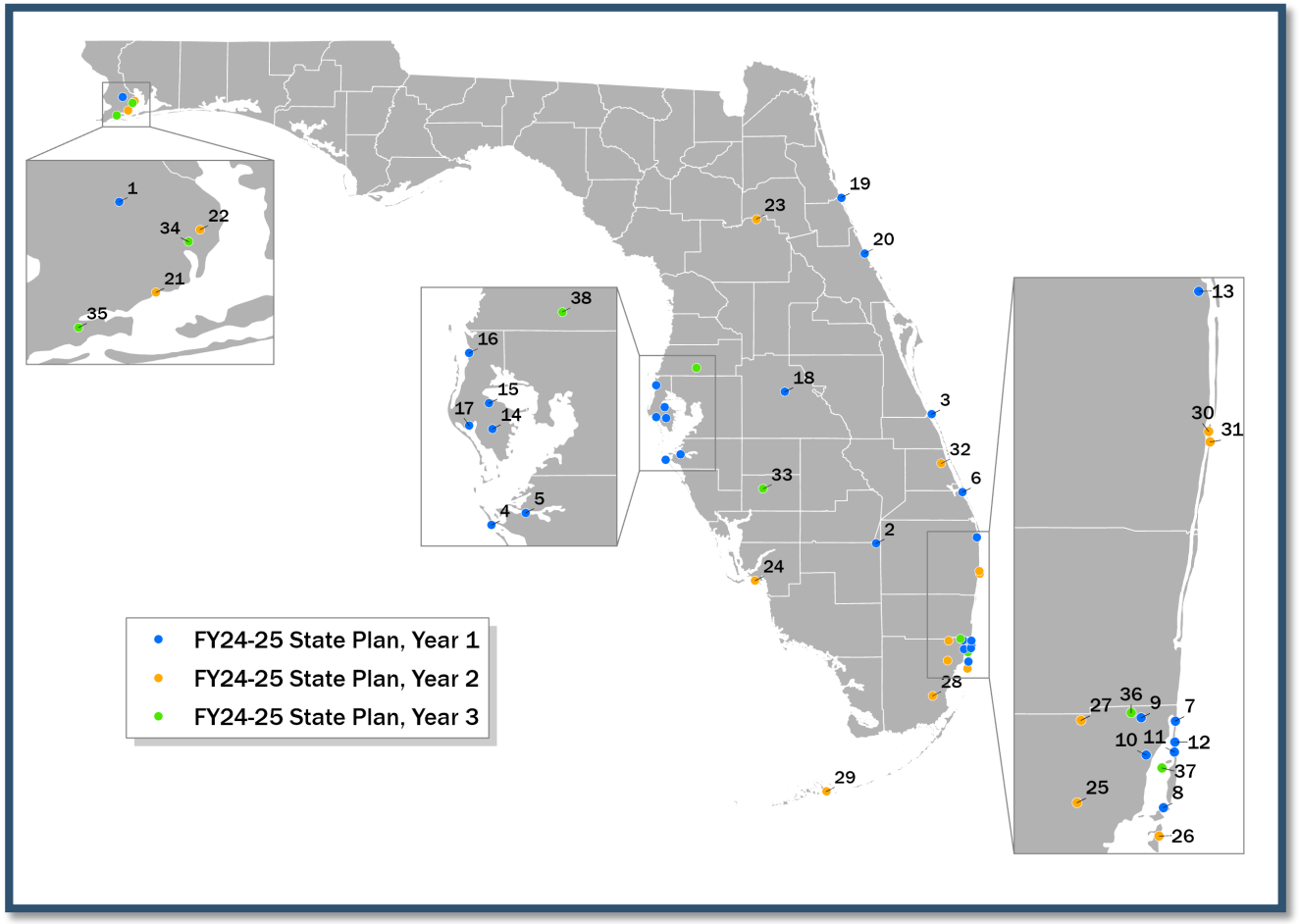
ELIGIBLE APPLICATIONS



- 196 eligible applications for over $865 million in state funding requested.
  - Total project cost: Nearly $1.8 billion.

FY24/25 STATEWIDE PLAN
(POTENTIAL) FUNDED PROJECTS

- Statewide Plan included $300M in project funds over 3 years.
- FY24/25 proposed budget includes $225M for Statewide Plan.
  - Appropriation language: Funding for Year 1 and Year 2 projects.

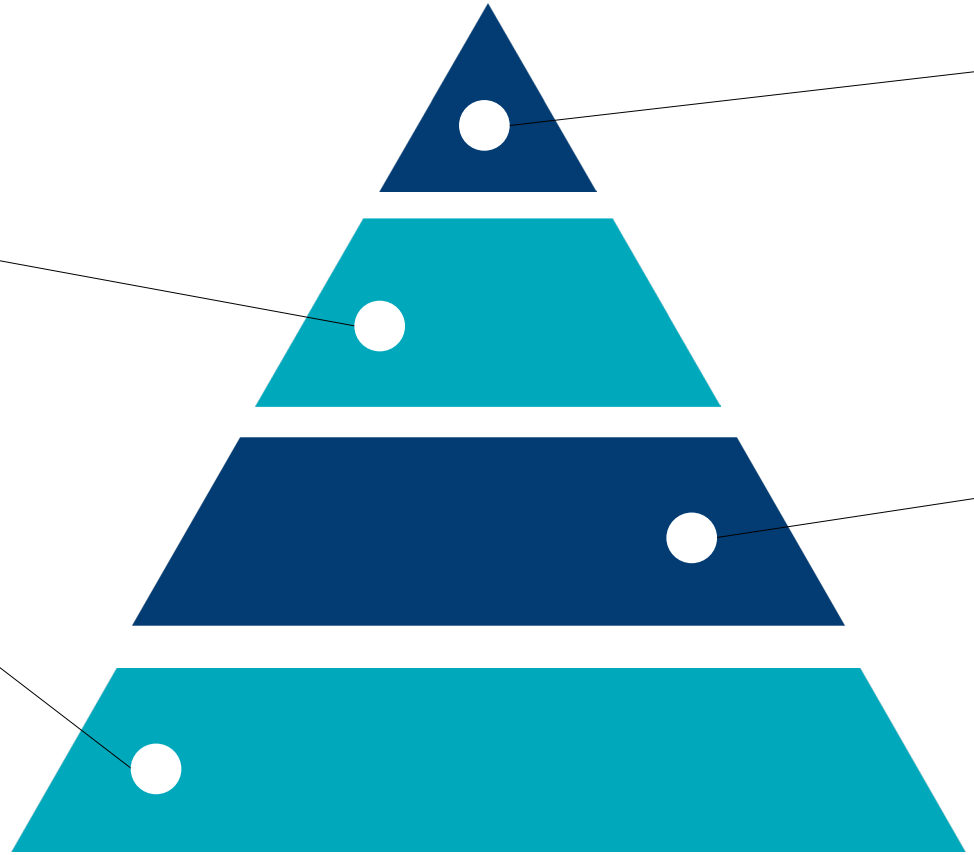


RF
STATEWIDE FLOODING AND SEA LEVEL RISE RESILIENCE PLAN

A tiered review process for the plan was created in SB 1954
and codified in section 380.093, F.S., and incorporated in DEP Rule 62S-8, F.A.C.

TIER 4 (10%)
Innovation to reduce costs, regional collaboration, and financially disadvantaged communities.

TIER 3 (20%)
Local match, previous commitment and exceeding minimum requirements.



TIER 2 (30%)
Existing flooding conditions, readiness to proceed, environmental options and exceeding minimum requirements.

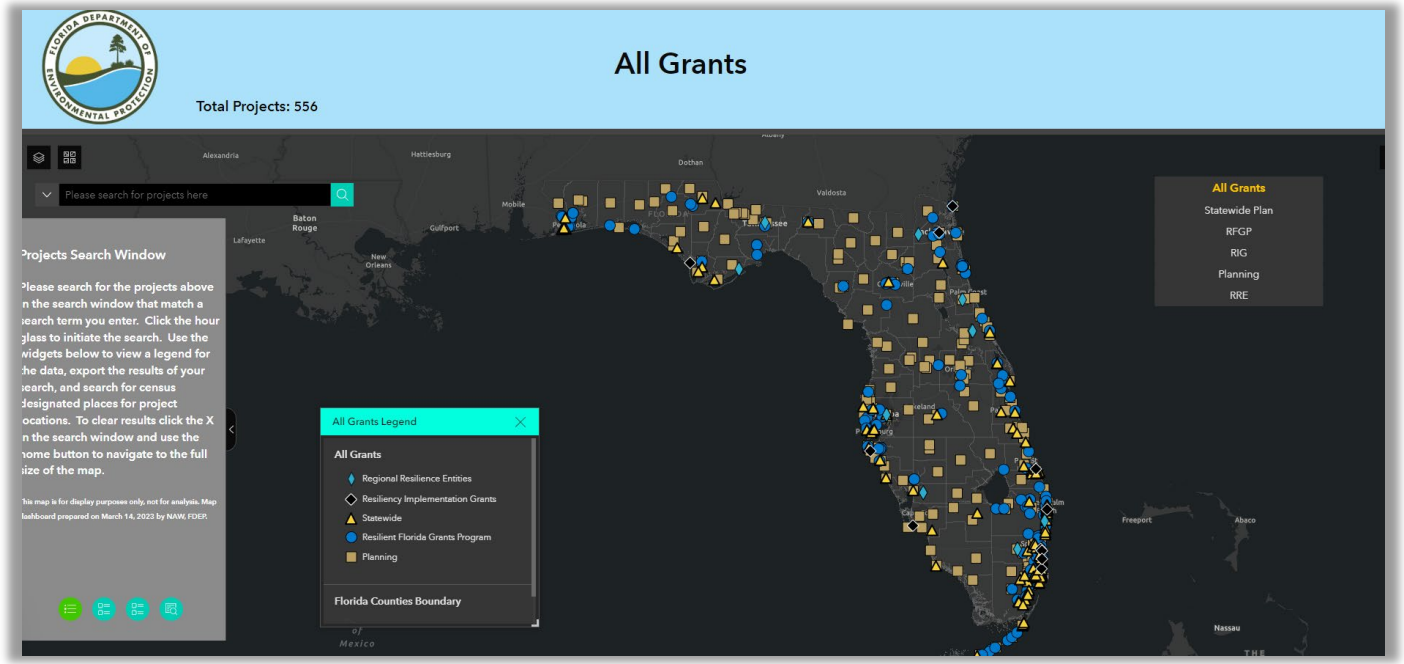
TIER 1 (40%)
Addressing risks to critical assets and regionally significant assets, as well as existing efforts to reduce upland costs.

RF PROGRAM AWARDS

New Public GIS Dashboard

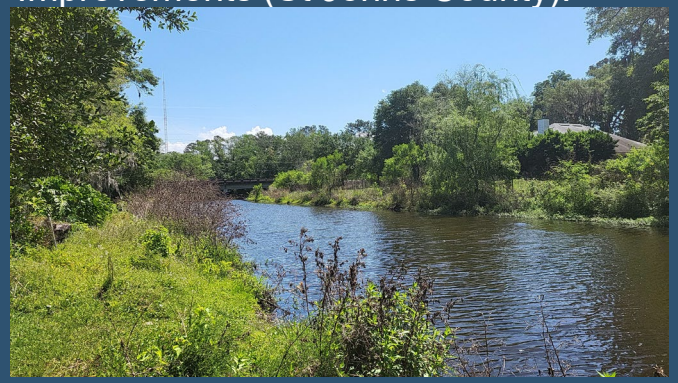
- All grants in system for the program.
- View, sort, filter and export general project information.

Access the Dashboard by scanning the QR Code.



FUTURE PROJECTS

Pre-construction San Julian Drainage Improvements (St Johns County).



Pre-construction Wills Branch Dredge (City of Jacksonville).

55 projects estimated to start construction April – July 2024.
Total DEP funding: $167,992,483.08.

Project Types:

- Stormwater: 25.
- Living shorelines and natural systems restoration: eight.
- Coastal infrastructure: six.
- Emergency Facilities: five.
- Wastewater: four.
- Transportation: three.
- Drinking Water: two.
- Natural/Cultural Resources: one.
- Land Acquisition and Conservation: one.

Six Completed Projects as of March 2024.

San Julian Drainage Improvements:
Upgrading culverts to increase drainage capacity and reintroduce natural flushing.

Wills Branch Dredge: Dredge built up sediment and vegetation from bottom/banks and include rip rap replacement and plantings.

OTHER PROJECTS

RESILIENT FLORIDA PROGRAM 2024

- Living shoreline suitability model.
- Updating Florida Adaptation Planning Guidebook and other resources based on statutory changes.
- Updating application resources.
- Florida Estuarine Restoration Team (FLERT):
  - Establishment initiated in November 2023.
  - Focus on statewide restoration efforts and collaboration between regional estuarine restoration teams.
  - First project: statewide coastal restoration plan.

PUBLIC OUTREACH

RESILIENT FLORIDA PROGRAM 2024

Webinar series:

- Program and Legislative Changes Overview.
- Application Portal Navigation overview and Q&A.
- Florida Adaptation Planning Guidebook Updates.

Pre-application and application assistance:

- Pre-application assistance period April 1 – June 15.
- Virtual office hours, direct emails/phone calls, April 1 – Sept. 1.
- In-person office hours around the state, July – Aug.

FloridaDEP.gov/ResilientFlorida.

THANK YOU

Krista Slyter
Resilient Florida Program
Office of Resilience and Coastal Protection
Florida Department of Environmental Protection

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850-245-8378

RESILIENCE IN TRANSPORTATION

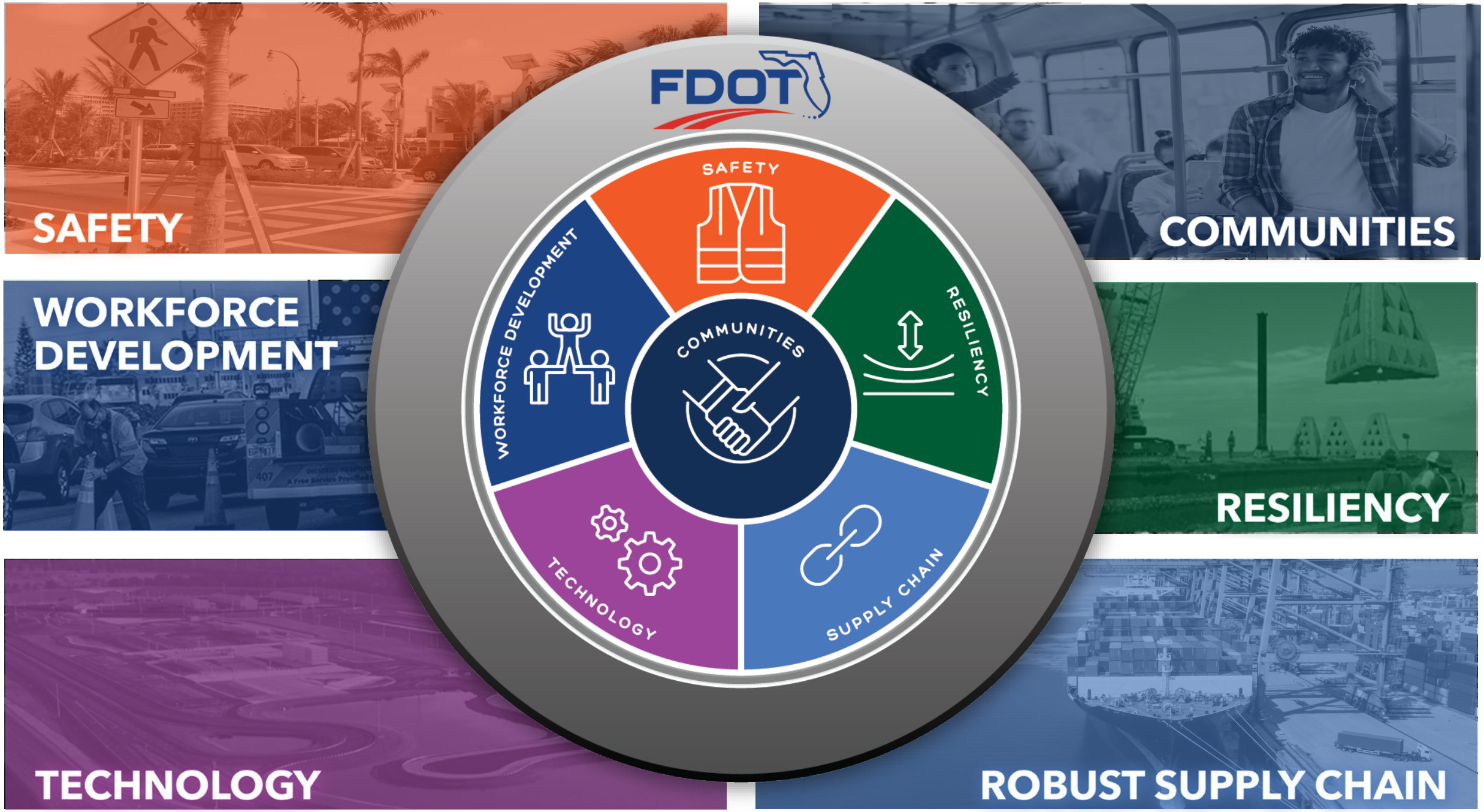
presented to

NW Florida Resiliency Seminar

presented by

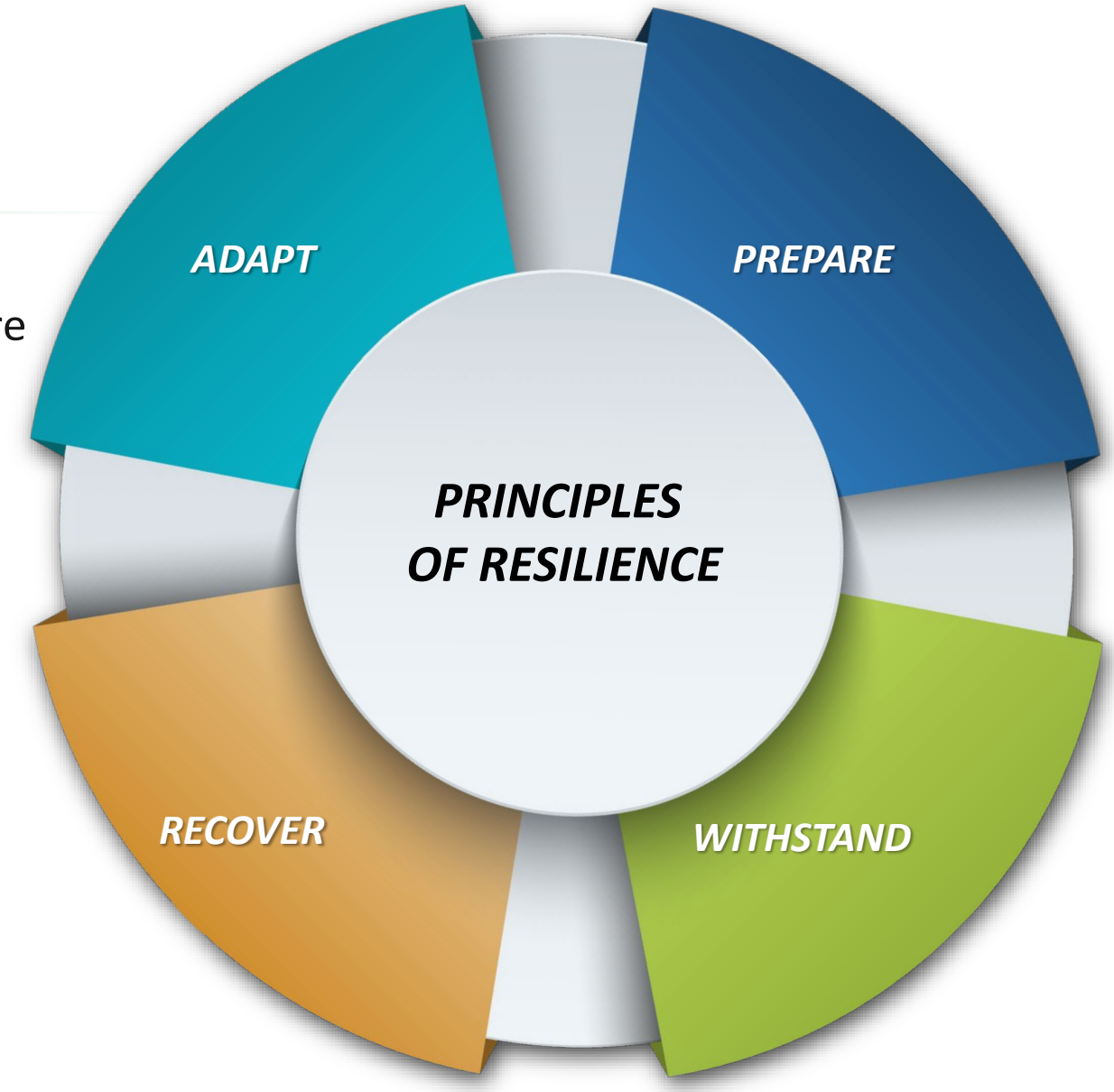
Jennifer Z. Carver, AICP
Statewide Resilience Planning Coordinator
Jennifer.carver@dot.state.fl.us

June 21, 2024


SAFETY
COMMUNITIES
WORKFORCE DEVELOPMENT
RESILIENCY
TECHNOLOGY
ROBUST SUPPLY CHAIN
FDOT
SAFETY
WORKFORCE DEVELOPMENT
COMMUNITIES
RESILIENCY
TECHNOLOGY
SUPPLY CHAIN

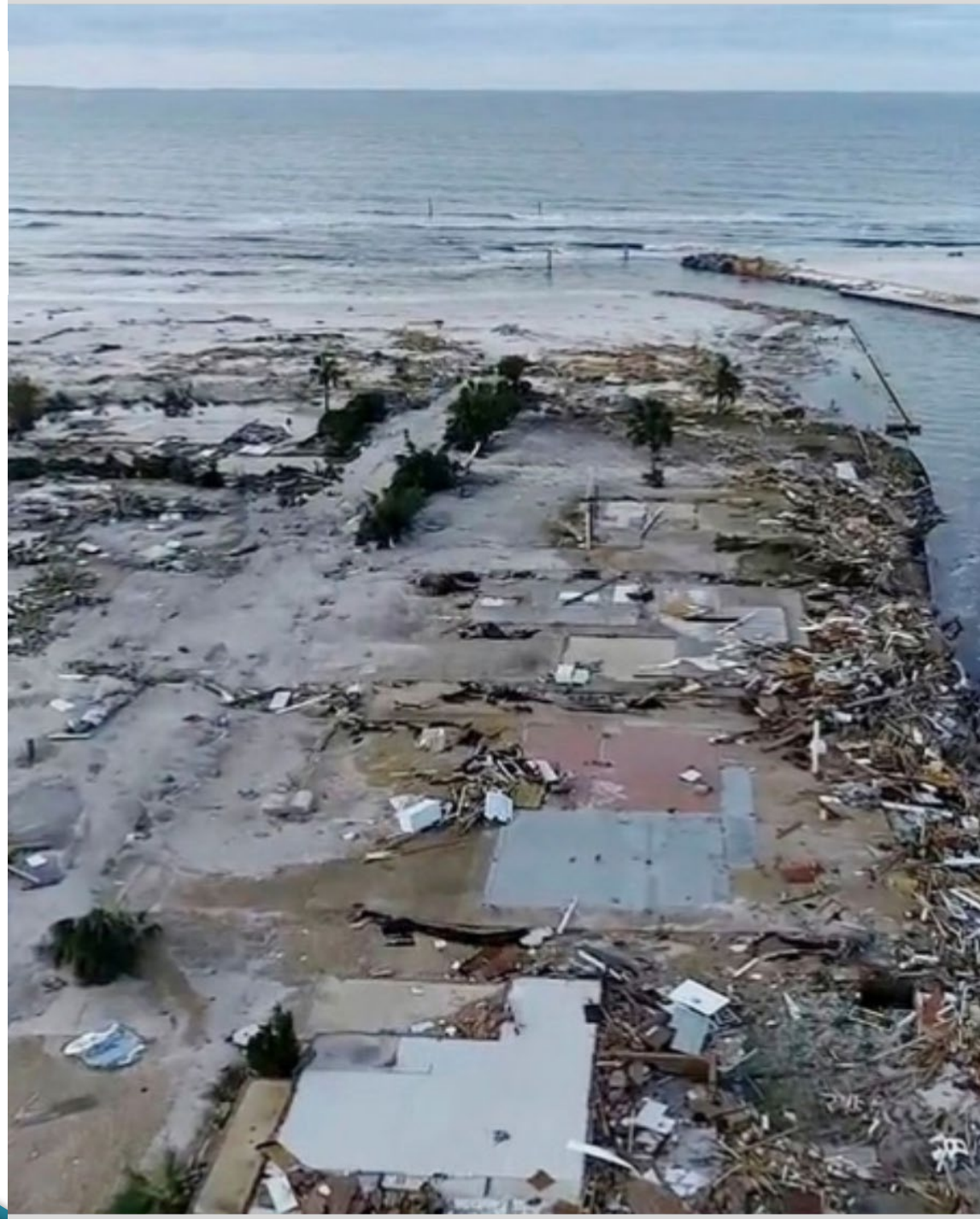
RESILIENCE POLICY

- Ability to adapt to changing conditions and prepare for, withstand, and recover from disruption
- Identify risks, particularly related to:
  - Storms
  - Flooding
  - Sea level rise
- Assess potential impacts
- Employ strategies to avoid, mitigate, or eliminate impacts



RESILIENCE ACTION PLAN (RAP)

- Section 339.157, F.S. directs FDOT:
  - Infrastructure and Operational Resilience; Design Facilities; Enhance Partnerships to Address Multijurisdictional Needs
  - Hazards Encompassed: Coastal and Inland Flooding and Storm Surge
  - Assets Included: State Highway System
  - Resilience Action Plan Data Viewer

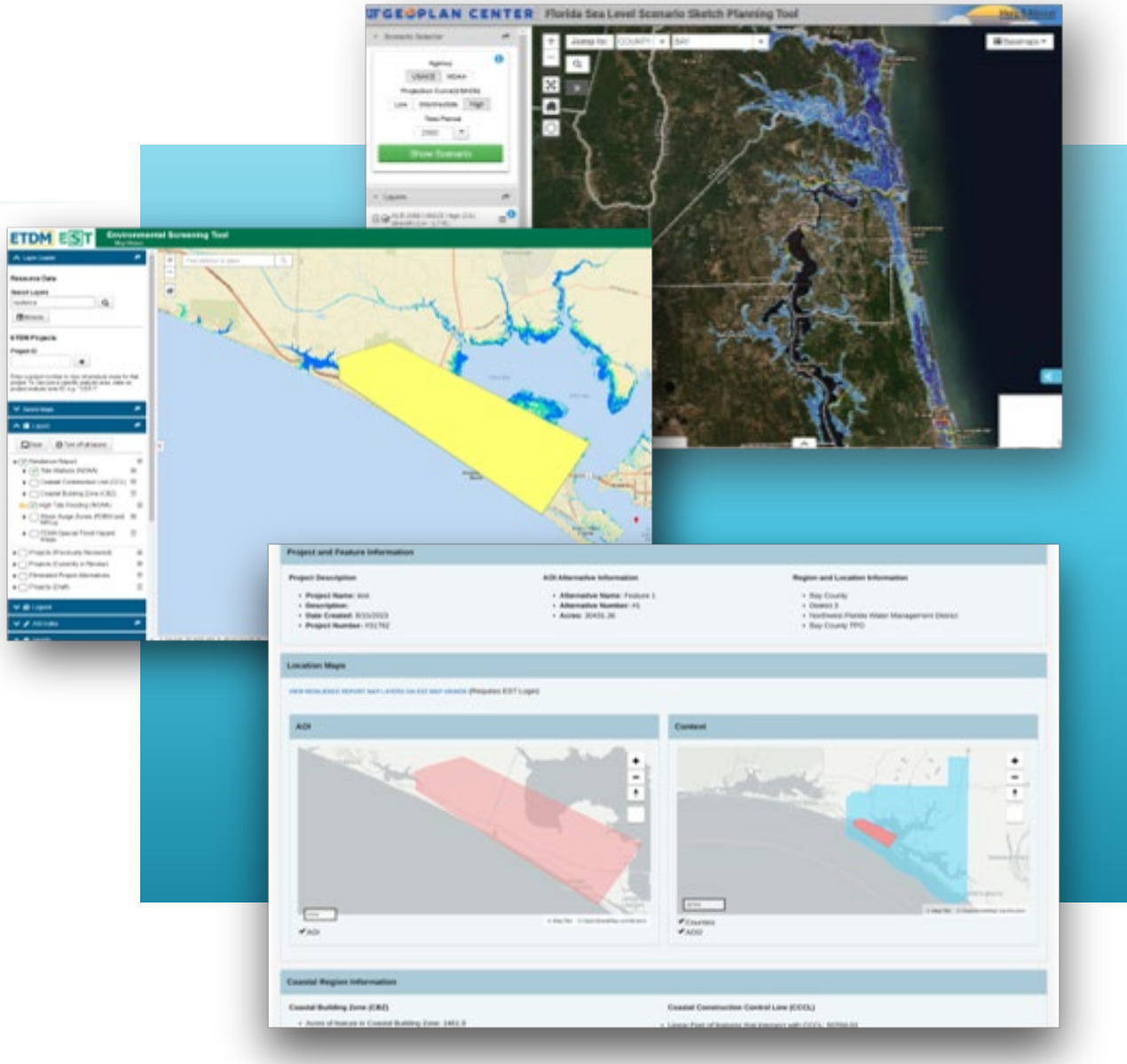


INHERENT RESILIENCE

- Design criteria
- Stormwater/drainage design procedures
- Nature-based solutions
- Context sensitive, complete streets
- Local partner coordination

RESILIENCE TOOLS

- Sea Level Scenario Sketch Planning TooL
  - https://sls.geoplan.ufl.edu/
- Environmental Screening Tool(EST) Area of Interest (AOI) Tool Resilience Report
  - Upcoming Training: August 13, 3:00-4:30 pm EDT
- Project Suite (PSEE) Resilience Tracker Module
- PD&E Manual Resilience Chapter (2025)



FEDERAL PROTECT PROGRAM

- Formula and discretionary funding
- Approximately $70 Million Allocated to FL Per Year– Nearly $600 M Available From FY24 to FY30
  - Planning (2% Set Aside)
  - Preconstruction (10% Cap)
  - Construction (Limited to 40% for New Capacity)
- Emphasis on incremental improvements and natural hazards
- Optional resilience improvement plan per 23 U.S.C. 176(e)

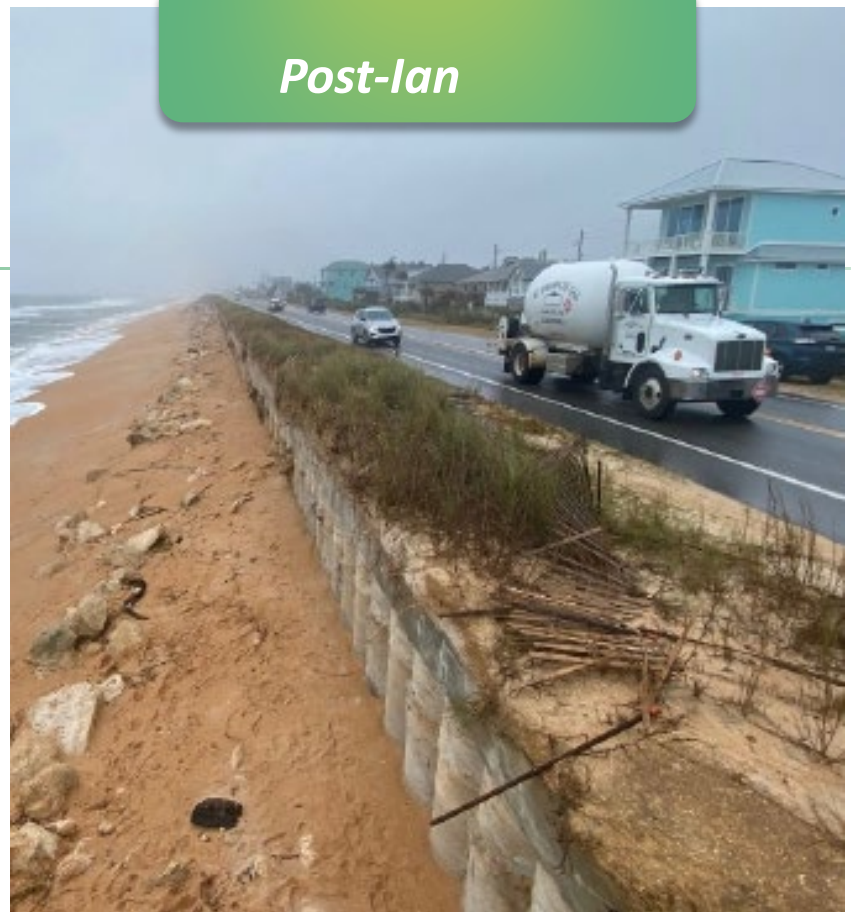
RESILIENCE IMPROVEMENT PLAN

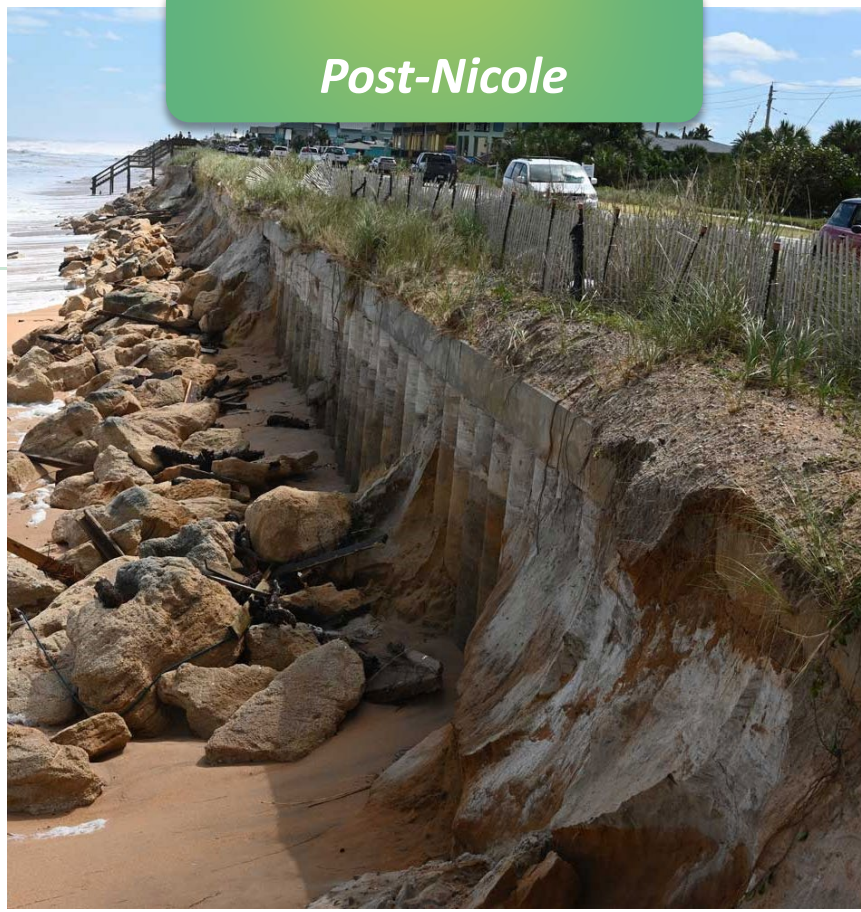
HAZARDS

- Flooding (Inland)
- Tropical Cyclone (Storm Surge)
- Wildfire
- Sinkhole
- Extreme Heat
- Severe Thunderstorm
- Sea Level Rise (Coastal Flooding)

ASSETS

- State Highway System
- National Highway System
- Federal Aid System (major rural and urban collectors and higher)
- SIS Highway Corridors
- SIS rail
- SIS connectors
- Freight Highway Network
- STRAHNET/ STRACNET
- SUN Trail
- Evacuation Routes





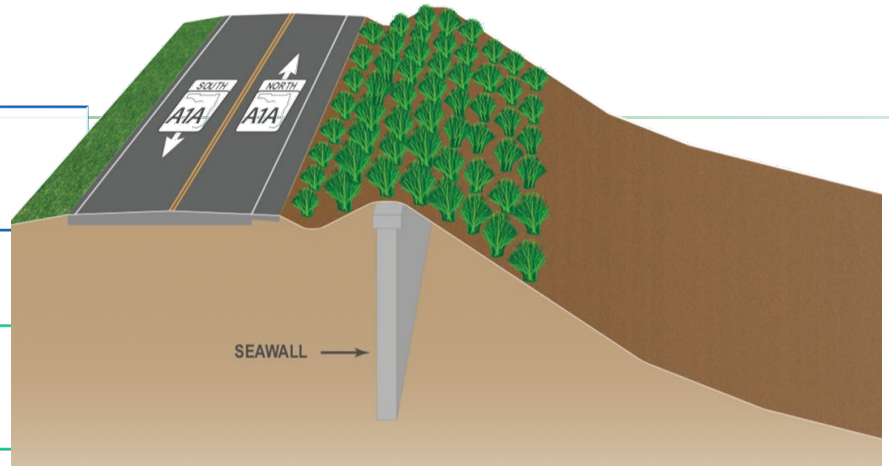
SR A1A *HURRICANES IAN & NICOLE*

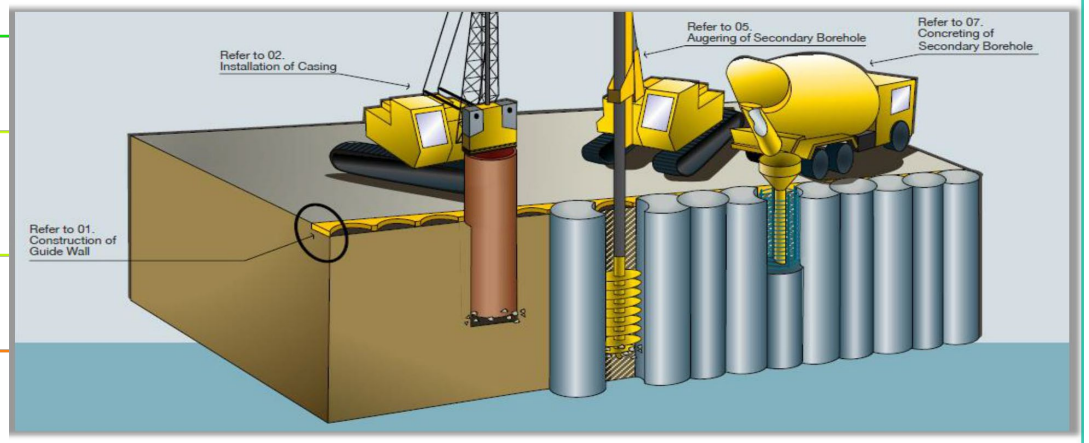
- Nature-based hybrid solution
- Dune washed away, but buried secant-pile bulkhead/seawall
- Protect transportation facility from storm-related wave action and erosion

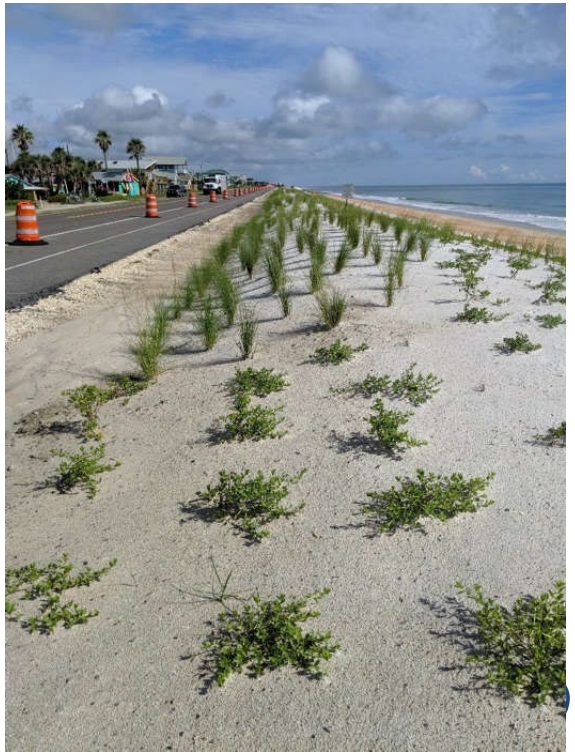
SR A1A *Hurricane Nicole*

SR A1A *Resiliency Project*

- Phased-Design Build Contract – April 2023
- Design & Permitting – April – December 2023
- Work Begin Flagler County – Early 2024
- Work Begin Volusia County – Spring 2024
- Work Completion – Summer 2025







RESILIENCE FOCUS IN FLORIDA

- Sea Level Impact Projection (SLIP) Studies
- Resilient Florida Program
- Florida Flood Hub
- Statewide Office of Resilience and Chief Resilience Officer
- Resilience Action Plan (RAP)
- Resilience Improvement Plan (RIP)

2055 Florida Transportation Plan

2055 Florida
Transportation Plan

FDOT

2055 Florida Transportation Plan Update

- SINGLE, OVERARCHING **PLAN**
- GUIDES FLORIDA'S TRANSPORTATION **FUTURE**
- **FOUNDATION** FOR FLORIDA'S WORK PROGRAM
- UPDATED EVERY **5 YEARS**
- COLLABORATIVE EFFORT WITH **PUBLIC AND PRIVATE PARTNERS**

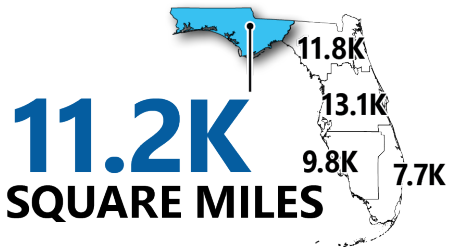
2055 FTP Approach

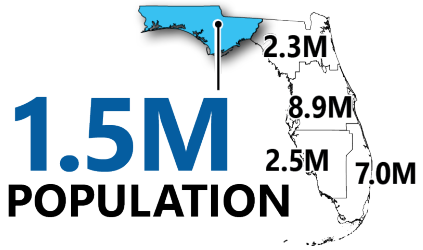
Statewide and Regional Trends

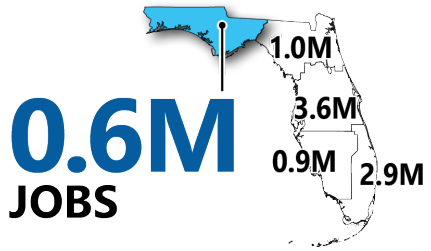
The FTP will recognize the uniqueness of Florida's regions

The 2055 FTP will include statewide goals and regional objectives, empowering our communities to adopt unique local strategies that align with the FTP

Northwest Region



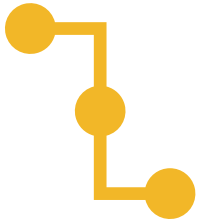




Northwest Region Key Issues

Population Growth and New Development adding to Traffic Congestion

Freight Movement North-South



Technology and Broadband Expansion for Economic Growth

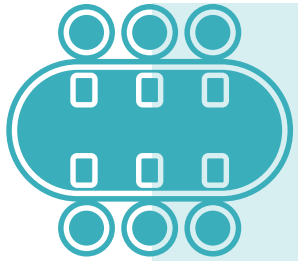
Statewide and Regional Collaboration

Building our Transportation Future Together

Visioning	Statewide Goals & Regional Objectives	Implementation Framework/ Plan Development	FTP Final Adoption
May-August 2024	*August 2024 – February 2025*	*February 2025 – November 2025*	

The FTP guides our transportation future, but it is *not* a list of projects

Opportunities for Engagement



Steering Committee

16 key partners and stakeholders who provide input and guide the 2055 FTP

Statewide Webinars

Community webinars structured to receive public and partner feedback

Focus Groups

5 Focus Groups will provide input to the Steering Committee at key milestones

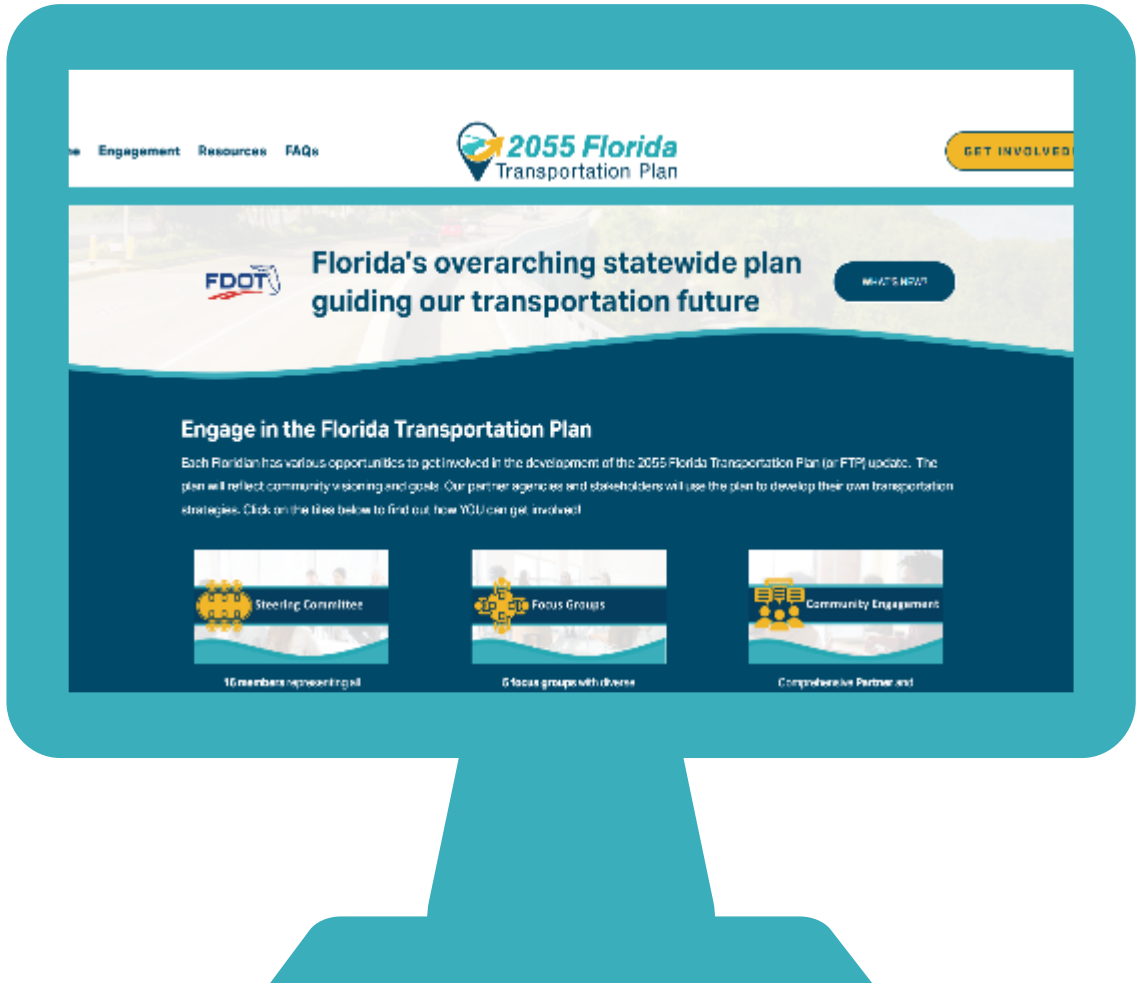
Safety, Resilient Infrastructure, Economic Development/Supply Chain, Technology, & Workforce Development

Regional Workshops + Virtual Open Houses

In-person and online open houses structured to receive regionally-focused public and partner feedback

2055 Florida Transportation Plan

Get Engaged Today!



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Woodcraft Artisans
155
THE SPICE & TEA EXCHANGE

ESCAMBIA + SANTA ROSA 2040

Protecting Water Quality and Improving Communities Through Better Land-Use Patterns

Christian Wagley

healthy gulf

Pensacola and Perdido Bay Watershed/The Nature Conservancy

PENSACOLA & PERDIDO BAYS ESTUARY PROGRAM

This project was supported by funding from the Pensacola and Perdido Bays Estuary Program's Community Grant Program. The content of the report does not necessarily represent the official views of the Estuary Program.

1000 Friends' Policy Priorities

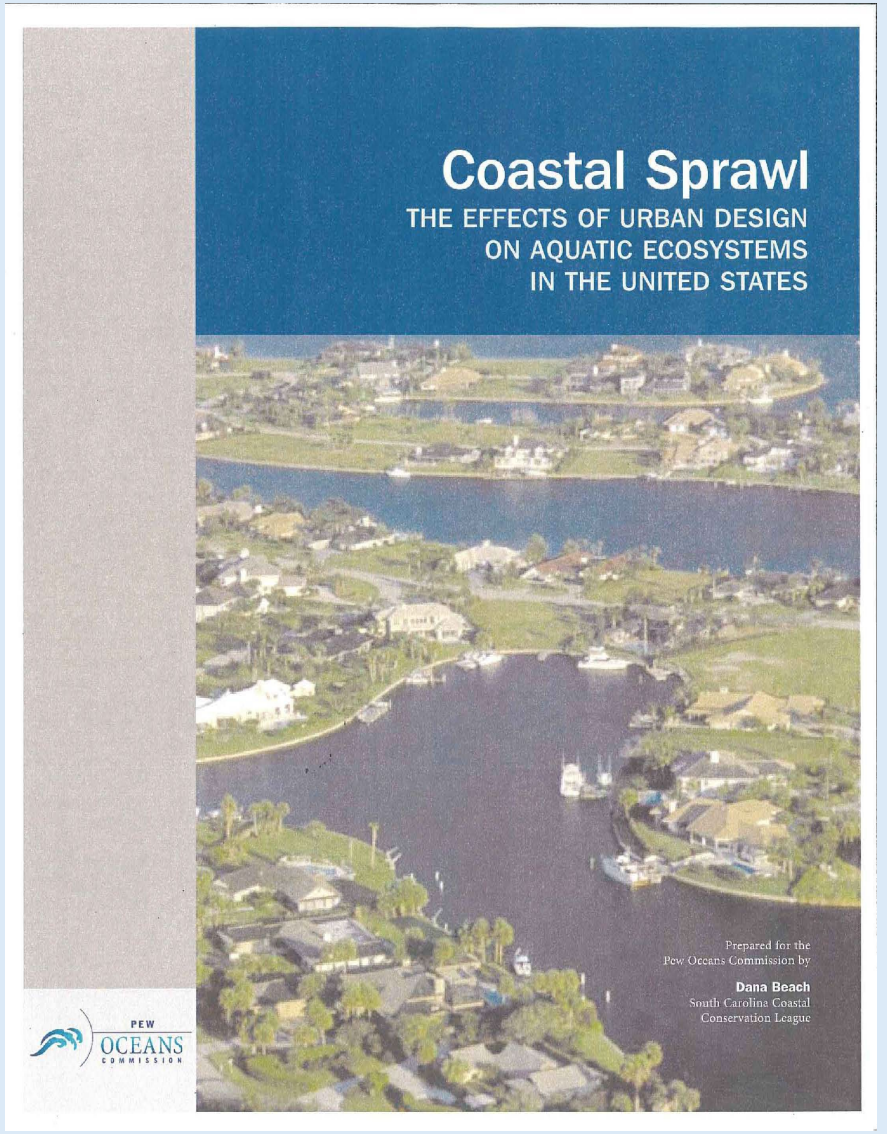
- Preserving natural and agricultural land from development
- Restoring and protecting environmental treasures
- Defending the planning process
- Expanding the supply of affordable workforce housing
- Promoting transportation alternatives
- Fighting climate change and preparing for sea-level rise

1000 FRIENDS of FLORIDA


92%
245%

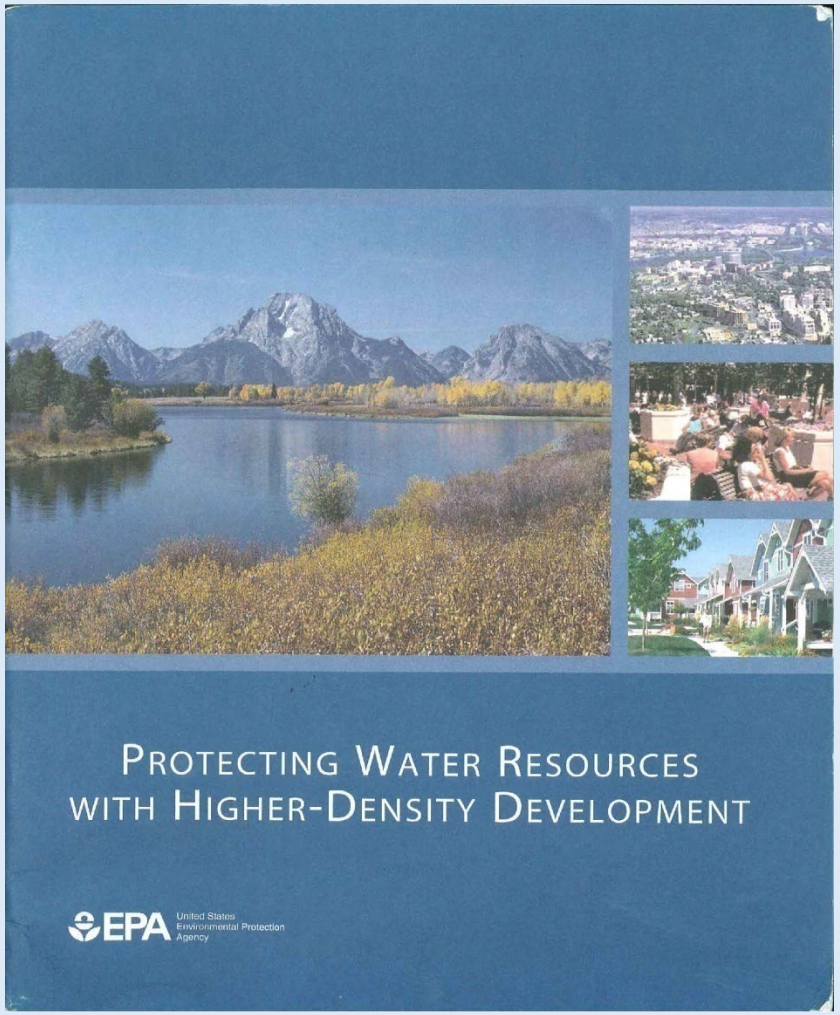

Firestone
COMPLETE AUTO CARE
291

"...most regulatory programs focus exclusively on site-level practices, ignoring necessary changes that must take place at the neighborhood and regional scales...abundant research over the past three decades has proven that site-level practices, in the absence of land-use reforms, cannot protect aquatic ecosystems from decline (Cohn-Lee and Cameron, 1992)."



Beach, D. 2002. *Coastal Sprawl: The Effects of Urban Design on Aquatic Ecosystems in the United States*. Pew Oceans Commission, Arlington, Virginia.

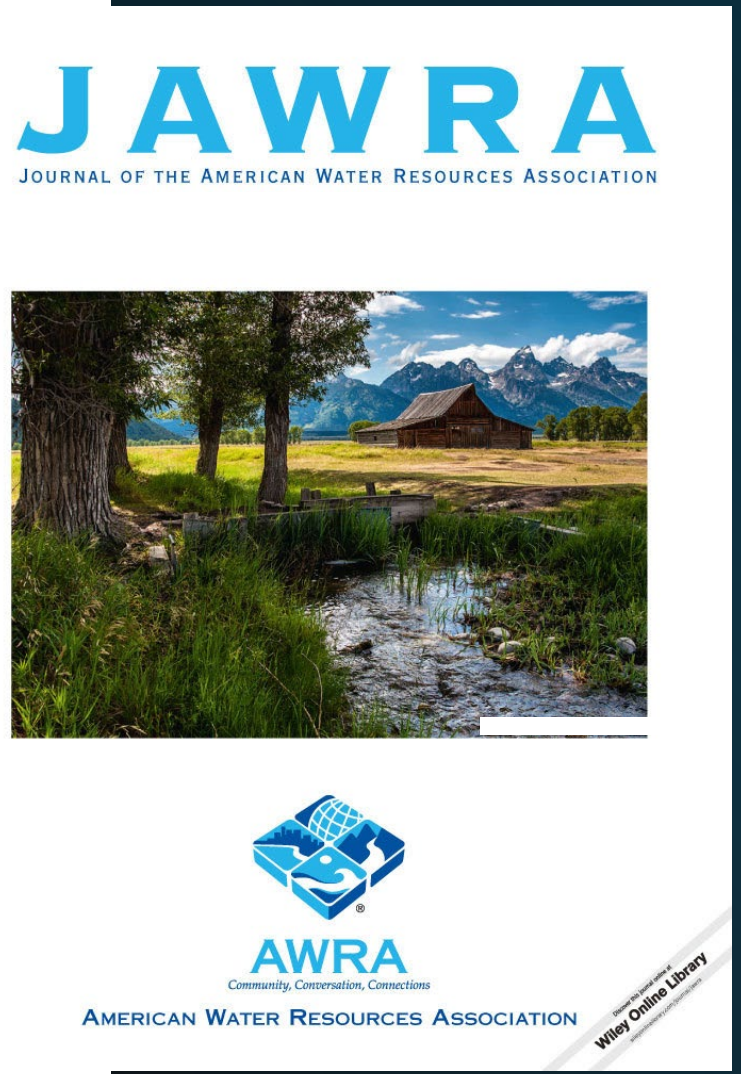
“Many communities assume that low-density development automatically protects water resources. This study has shown that this assumption is flawed and that pursuit of low-density development can in fact be counterproductive, contributing to high rates of land conversion and stormwater runoff and missing opportunities to preserve valuable land within watersheds.”



- ***"The model showed that a simple doubling of standard suburban densities [to 8 dwelling units per acre (DUA) from about 3 to 5 DUA] in most cases could do more to reduce contaminant loadings associated with urban growth than many traditional stormwater best management practices (BMPs)... Because higher density is associated with vibrant urban life, building a better city may be the best BMP to mitigate the water quality damage that will accompany the massive urban growth expected for the next several decades."***

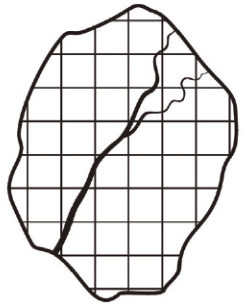
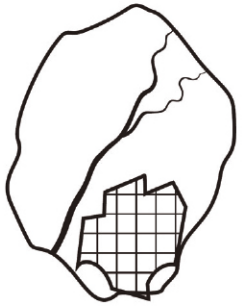
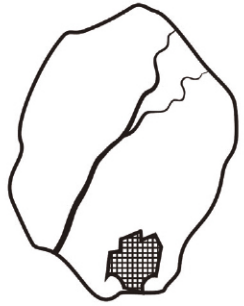
- ***IS DENSER GREENER? AN EVALUATION OF HIGHER DENSITY DEVELOPMENT AS AN URBAN STORMWATER-QUALITY BEST MANAGEMENT PRACTICE***

Journal of the American Water Resources Association, June, 2009



Compact Development Reduces Runoff

EXHIBIT 1: 10,000-Acre Watershed Accommodating 10,000 Houses

Scenario A	Scenario B	Scenario C
		
10,000 houses built on 10,000 acres produce: 10,000 acres x 1 house x 18,700 ft^3/yr of runoff = 187 million ft3/yr of stormwater runoff Site: 20% impervious cover Watershed: 20% impervious cover	10,000 houses built on 2,500 acres produce: 2,500 acres x 4 houses x 6,200 ft^3/yr of runoff = 62 million ft^3/yr of stormwater runoff Site: 38% impervious cover Watershed: 9.5% impervious cover	10,000 houses built on 1,250 acres produce: 1,250 acres x 8 houses x 4,950 ft^3/yr of runoff = 49.5 million ft^3/yr of stormwater runoff Site: 65% impervious cover Watershed: 8.1% impervious cover

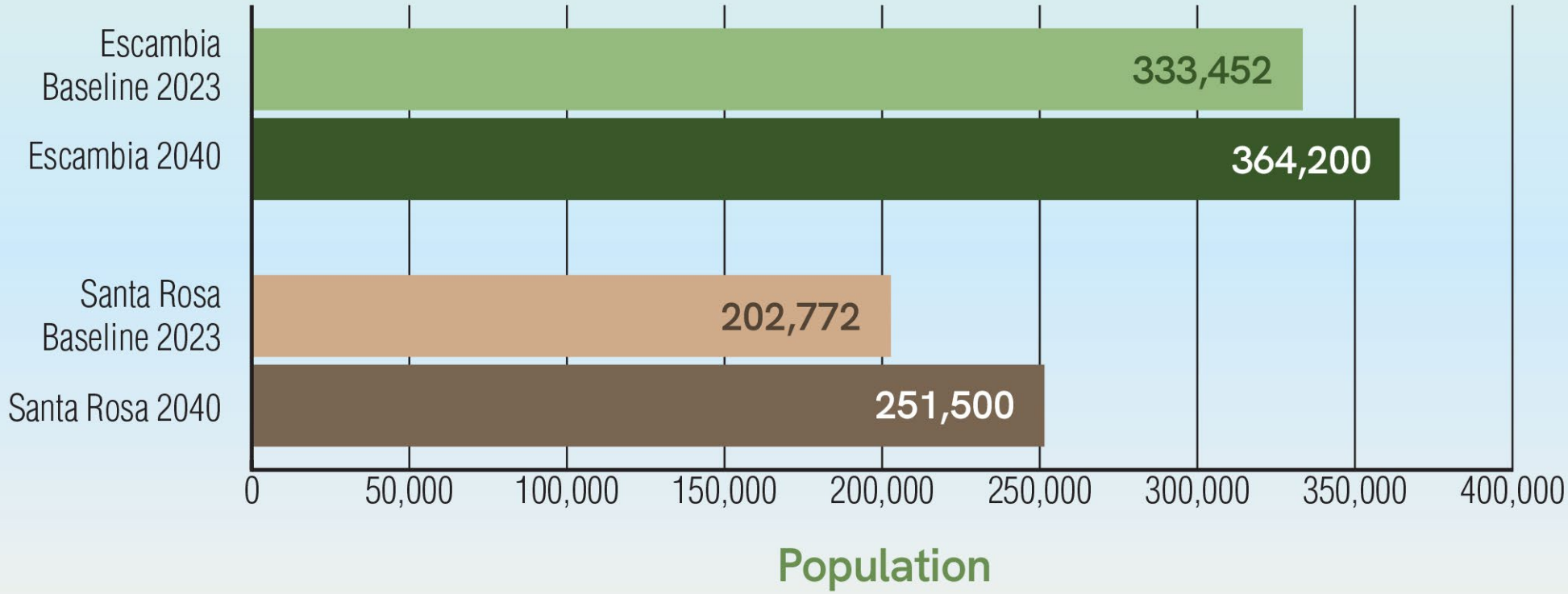
Protecting Water Resources With Higher Density Development, USEPA, 2006

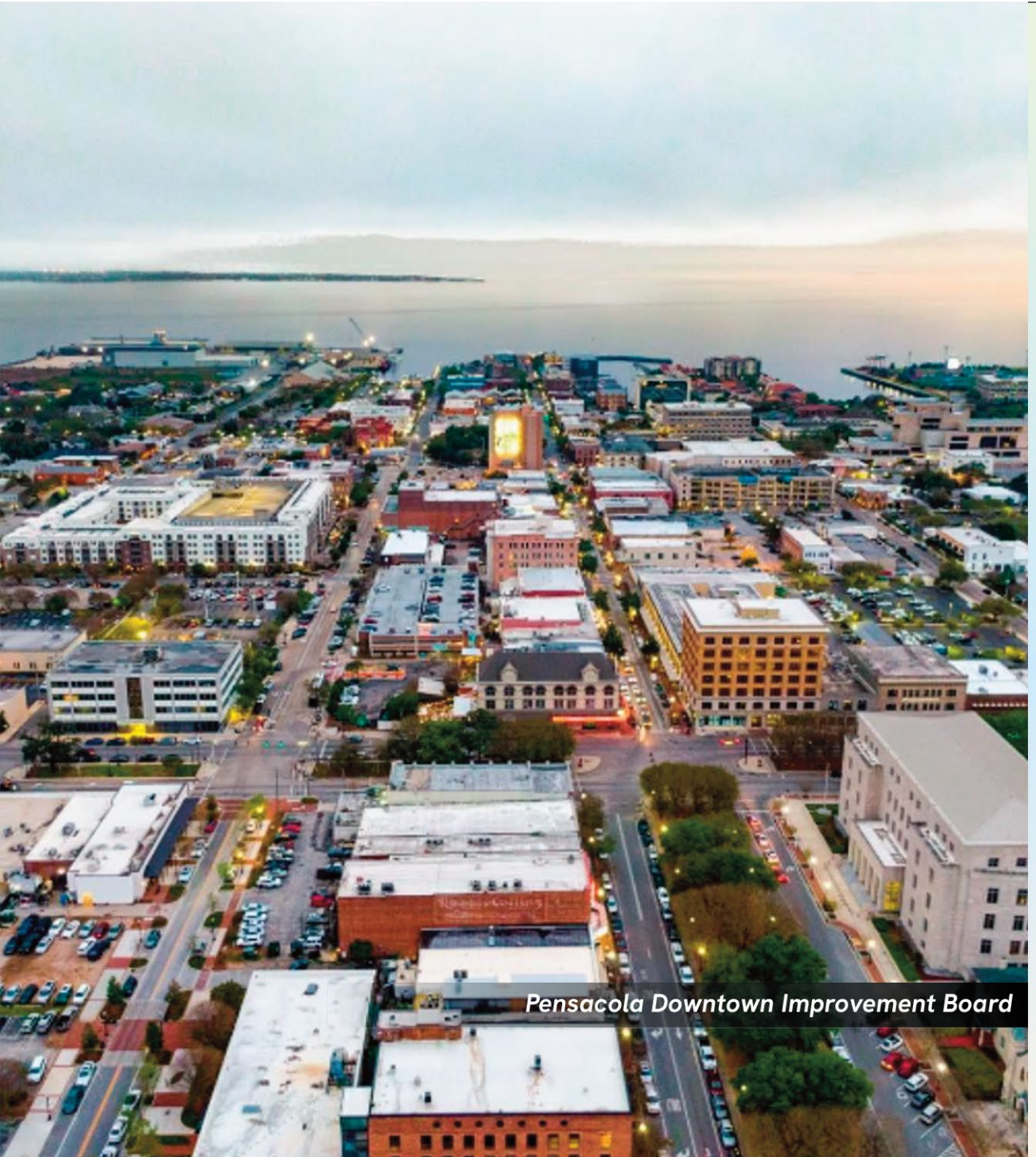
70 feet

eet

8 dwelling units per acre

Growth is Here to Stay in Florida, Including in Escambia and Santa Rosa counties





Pensacola Downtown Improvement Board

The way these two counties absorb these additional residents will determine the health of their environments, their quality of life and ultimately the strength of their economies.

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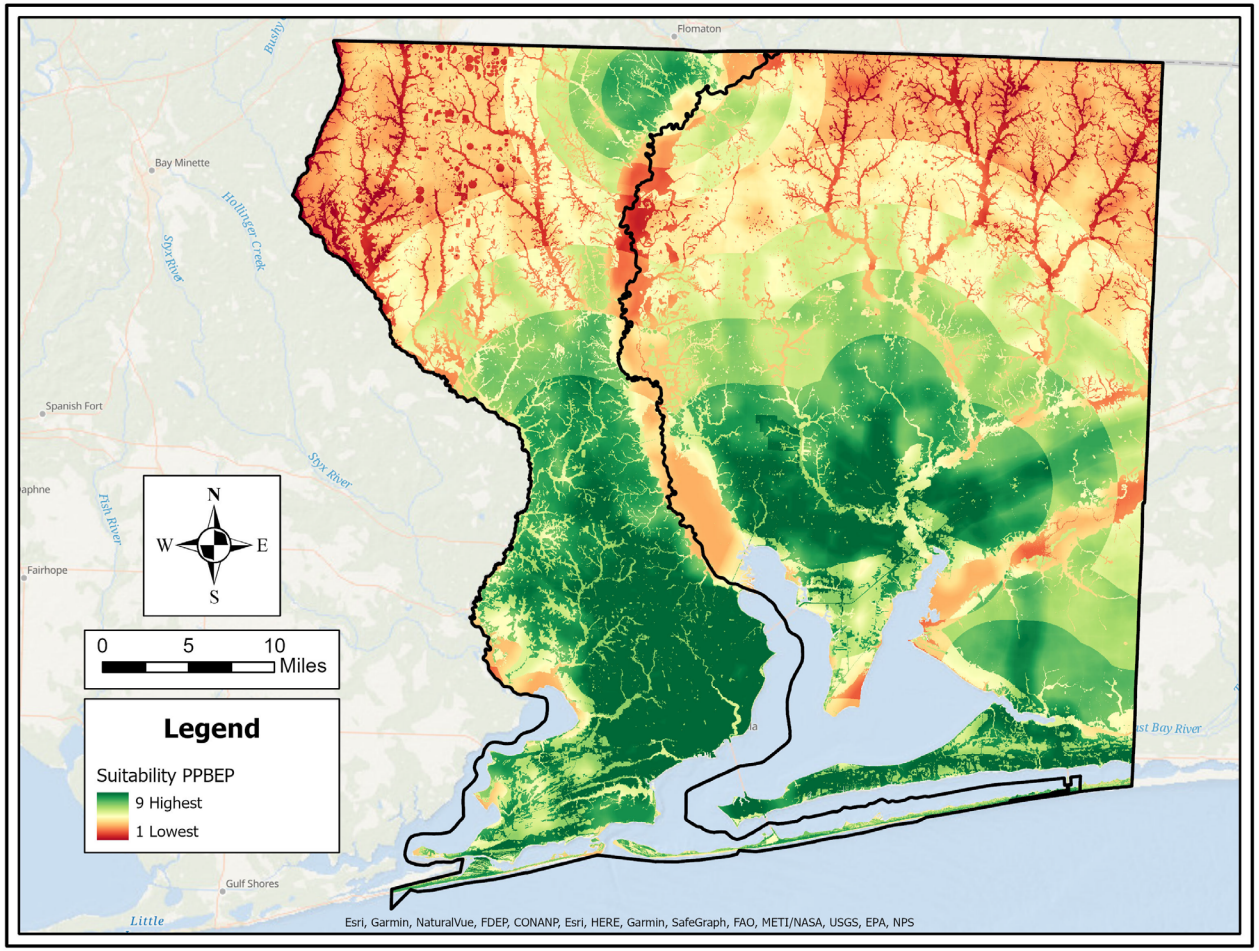
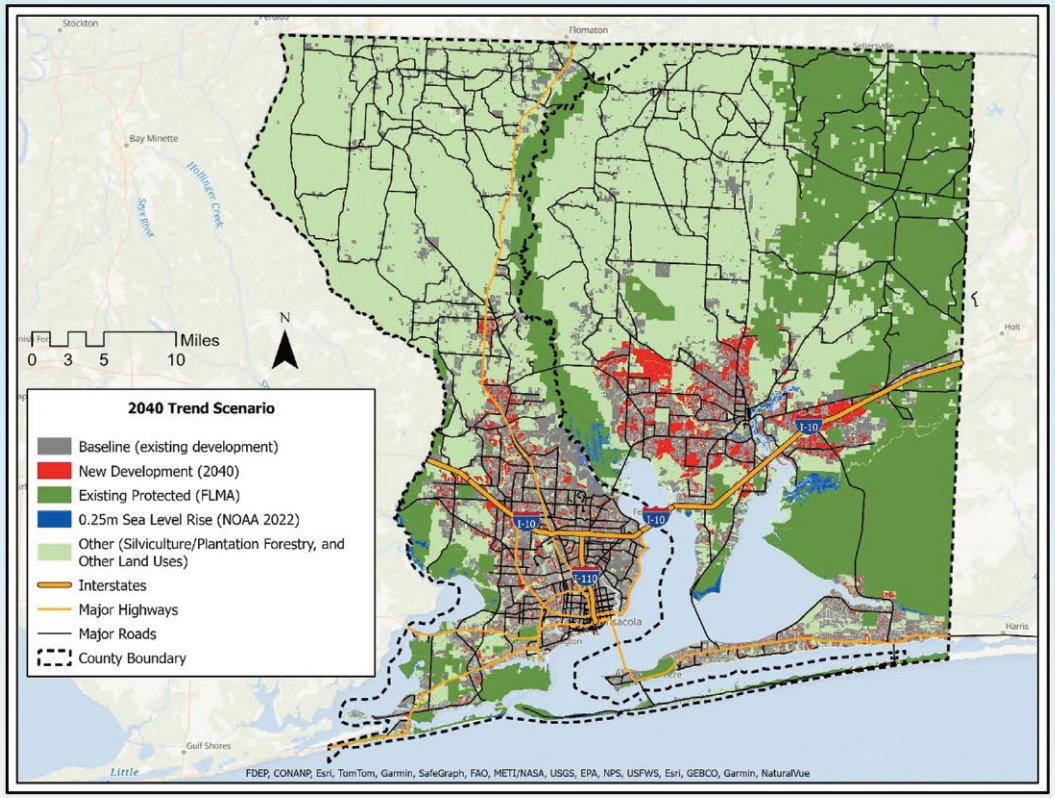
Suitability Criterion

Urban Suitability Criterion	Rational for Use	Weight
Proximity to Large Urban Areas (over 50,000 people)	Major urban areas tend to accommodate more additional population than do smaller urban areas.	5%
Proximity to All Urban Areas (over 2,500 people)	New urban development tends to occur in close proximity to existing urban development.	27%
Proximity to coastline	The coast has historically been an attractor for urban development. However future sea level rise is expected to make these areas less attractive in 2040.	9%
Preliminary Development Approvals	Areas within approved DRIs and DSAPs are highly likely to develop. The only DSAP that was used, however, was West Bay in Bay County, because the other existing DSAPs fell in the path and pattern of new urban development and their boundaries did not affect the pattern or timing of new urban development.	8%
Road density	New urban development tends to occur in areas of relatively higher road density.	12%
Presence/absence of wetlands	Urban development on lands without wetlands is often less costly than lands with wetlands.	16%
Proximity to open water	Access to the view of water has historically been an attractor for development.	2%
Proximity to major roads	Roads facilitate new urban development.	5%
Absence of USDA/NRCS Soils within FSAID 2045 Projected Irrigated Agricultural Lands	There is an economic incentive to convert poorer agricultural soils to urban development before good agricultural soils.	16%

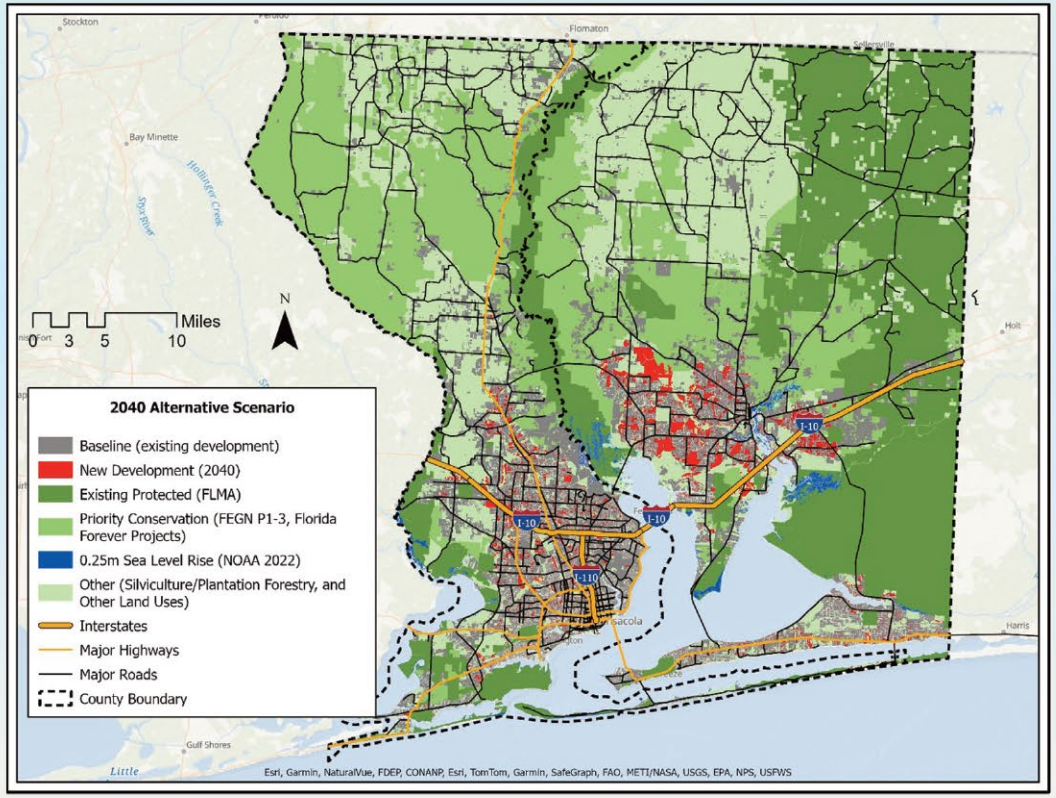


Escambia/Santa Rosa 2040: Status Quo Vs. Sustainable

2040 Trend



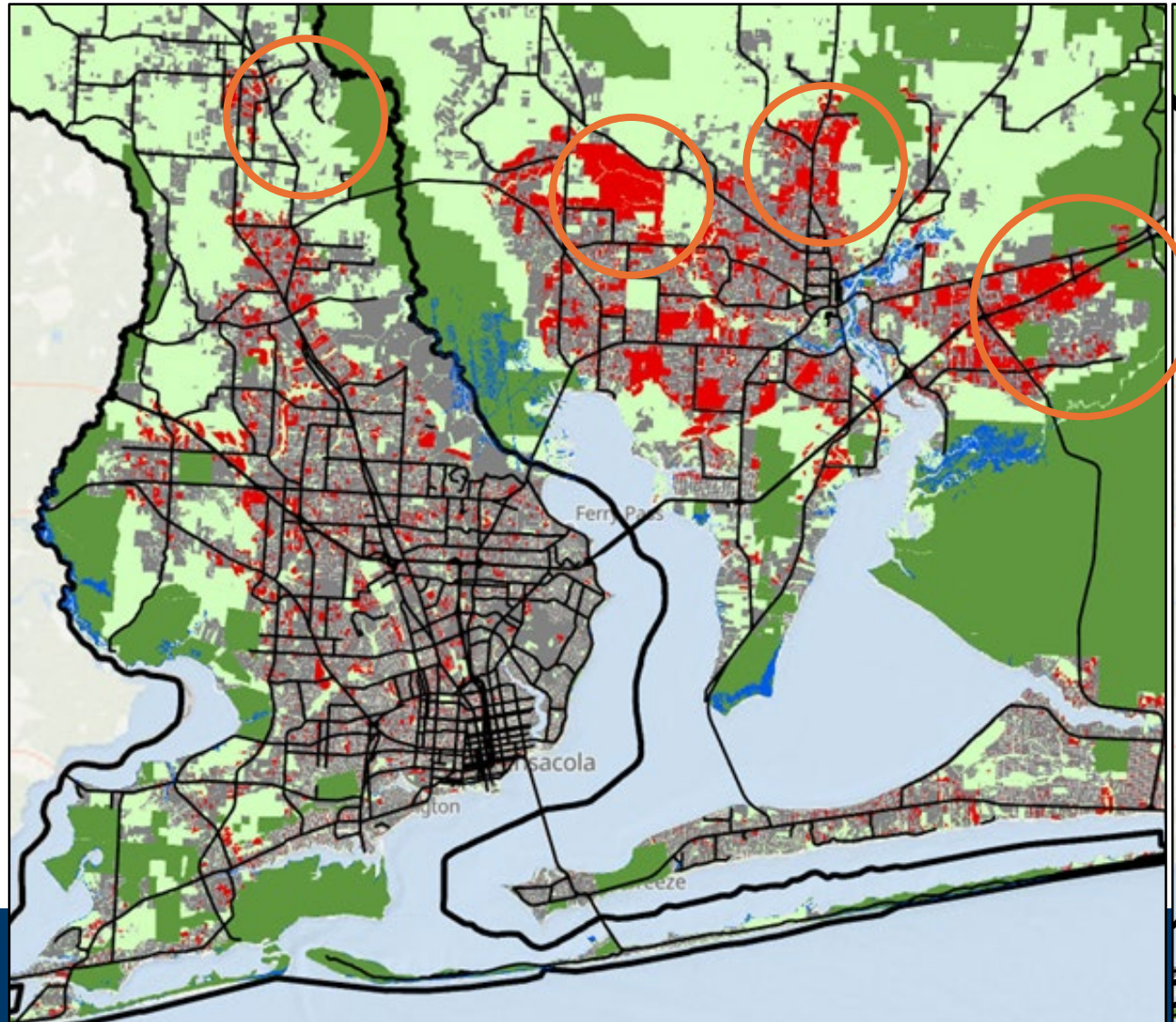
2040 Alternative

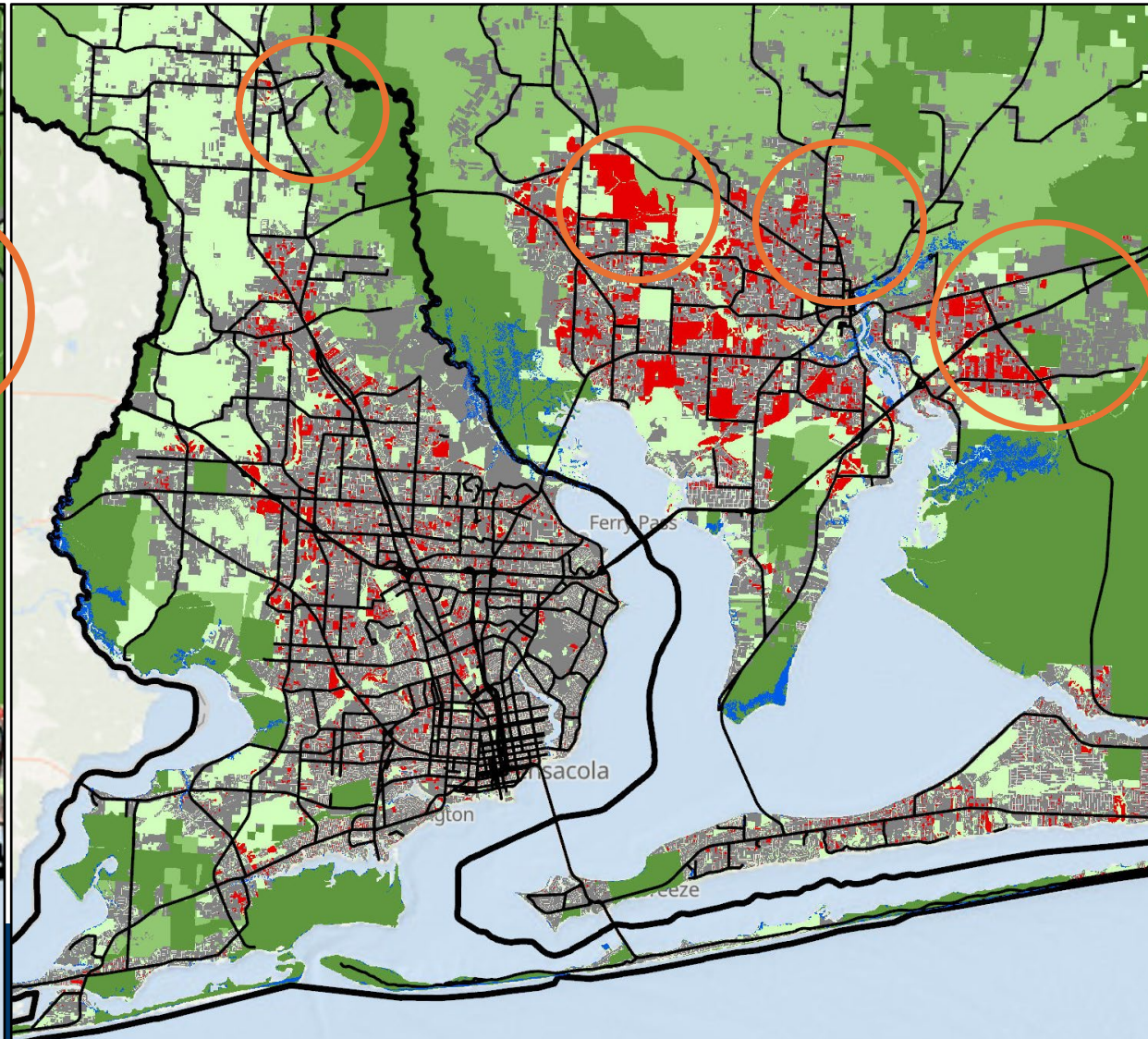


Comparison

Trend

Alternative

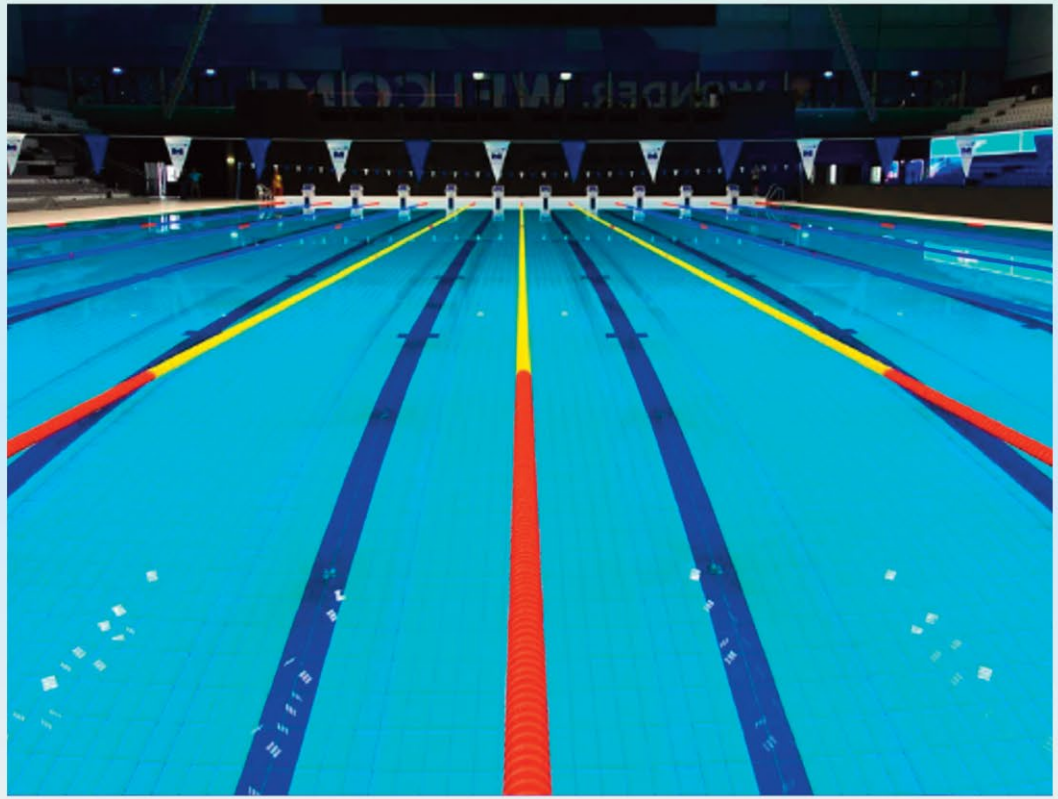




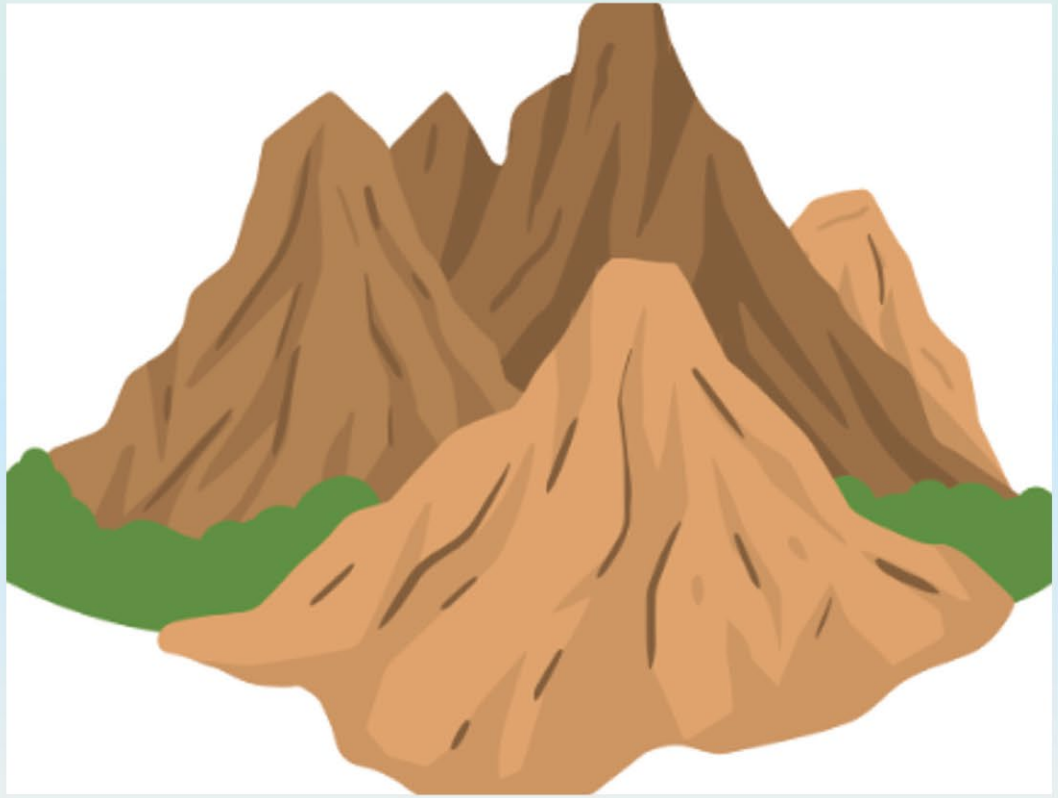
	Developed Acres		Acre-Feet of Runoff		# Olympic Swimming Pools*	Annual Mass Loading (lb/yr)			
						TN		TP	
	Total	%↑	Total	%↑		Total	%↑	Total	%↑
Baseline	202,170		477,885		317,794	2,368,393		417,033	
Escambia	108,848		280,640			1,365,786		242,819	
Santa Rosa	93,321		197,244			1,002,607		174,213	
Trend	211,553	4%	500,065	4%	332,544	2,478,321	4%	436,389	4%
Escambia	113,900		293,666			1,429,179		254,090	
Santa Rosa	97,653		206,399			1,049,142		182,299	
Alternate	204,074	1%	482,387	1%	320,788	2,390,706	1%	420,961	1%
Escambia	109,874		283,284			1,378,653		245,107	
Santa Rosa	94,201		199,102			1,012,053		175,855	

Table 8. Water quality and runoff (volume) comparisons between the current (baseline) development and the Trend and Alternative future development scenarios for Santa Rosa and Escambia Counties combined. *An Olympic Swimming Pool is equal to 490,000 gallons. This column shows how many Olympic Swimming Pools would be filled by the amount of Acre-Feet Runoff.

The Cost of Business as Usual for Escambia and Santa Rosa Waterways



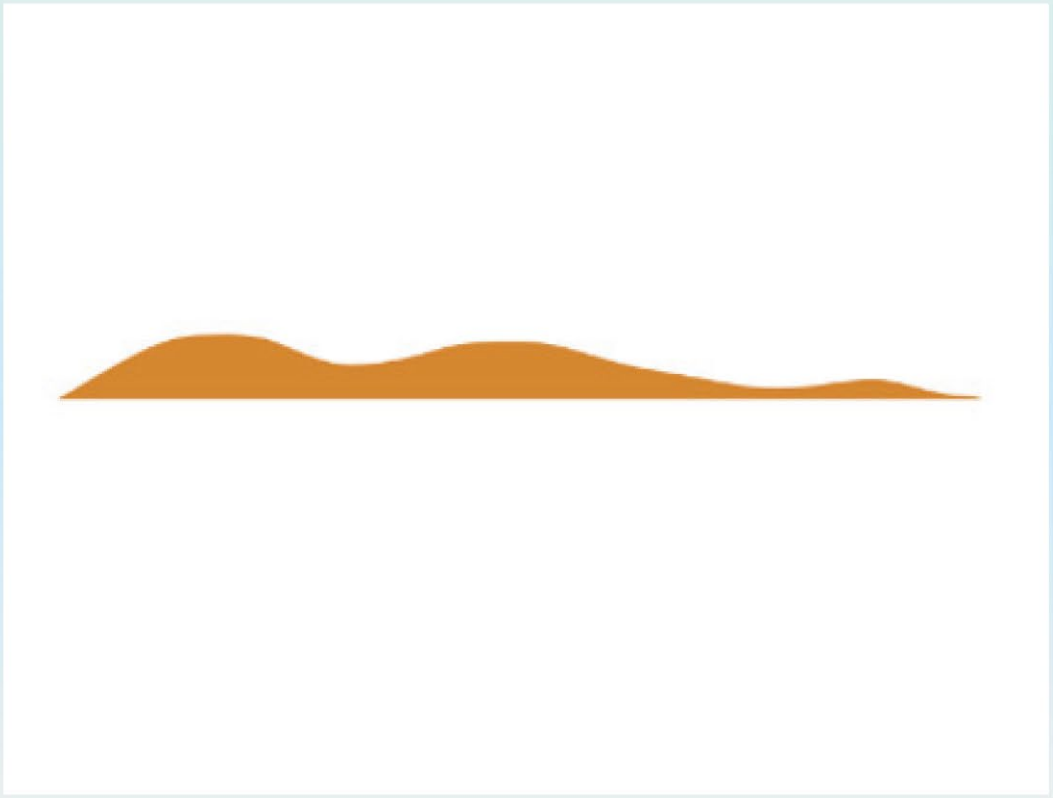
15,000 more Olympic swimming pools worth of stormwater runoff



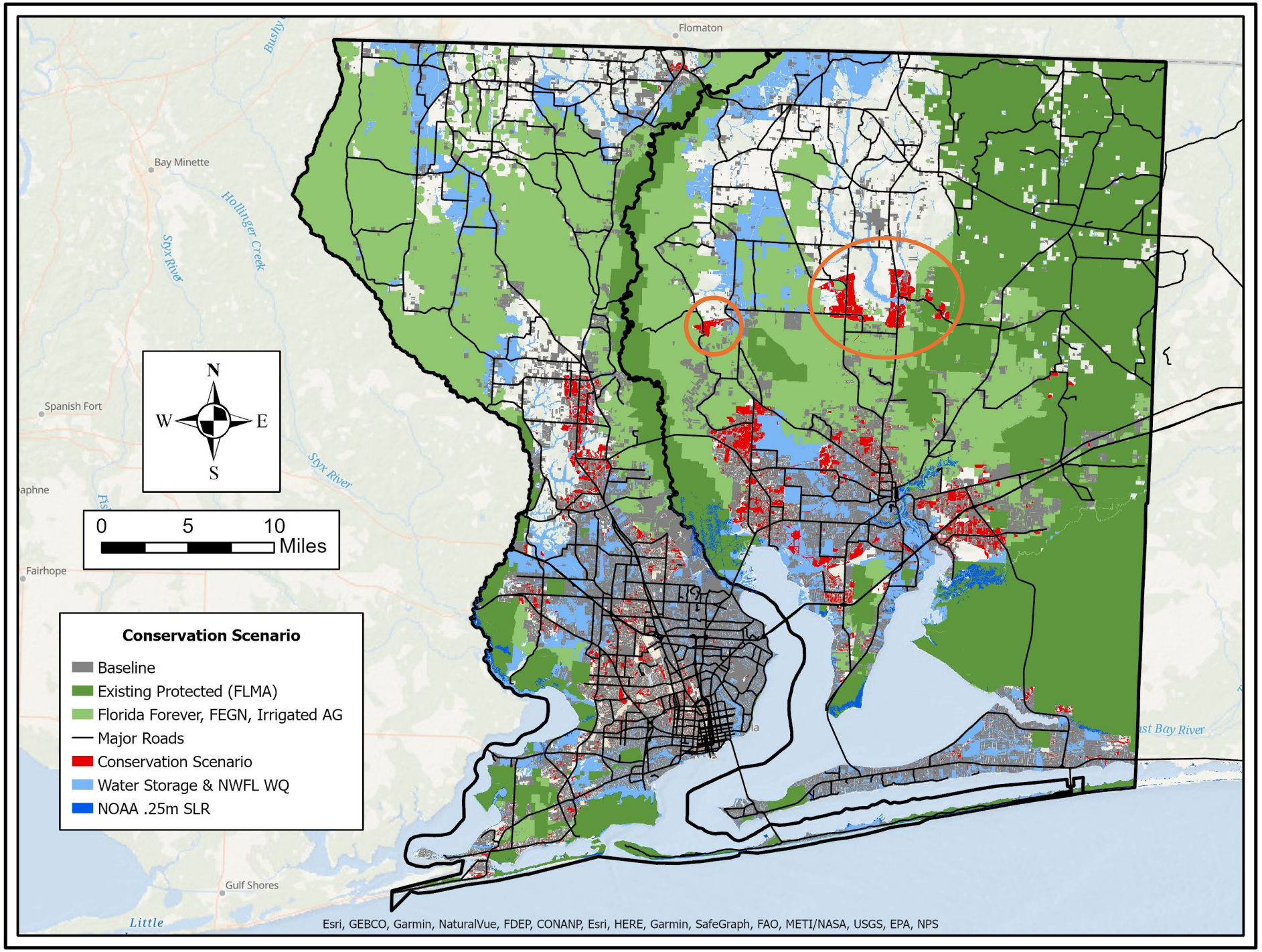
100k pounds a year of additional nitrogen, 20,000 more pounds of phosphorous

Benefits for Region's Waterways of Compact Development and Land Conservation

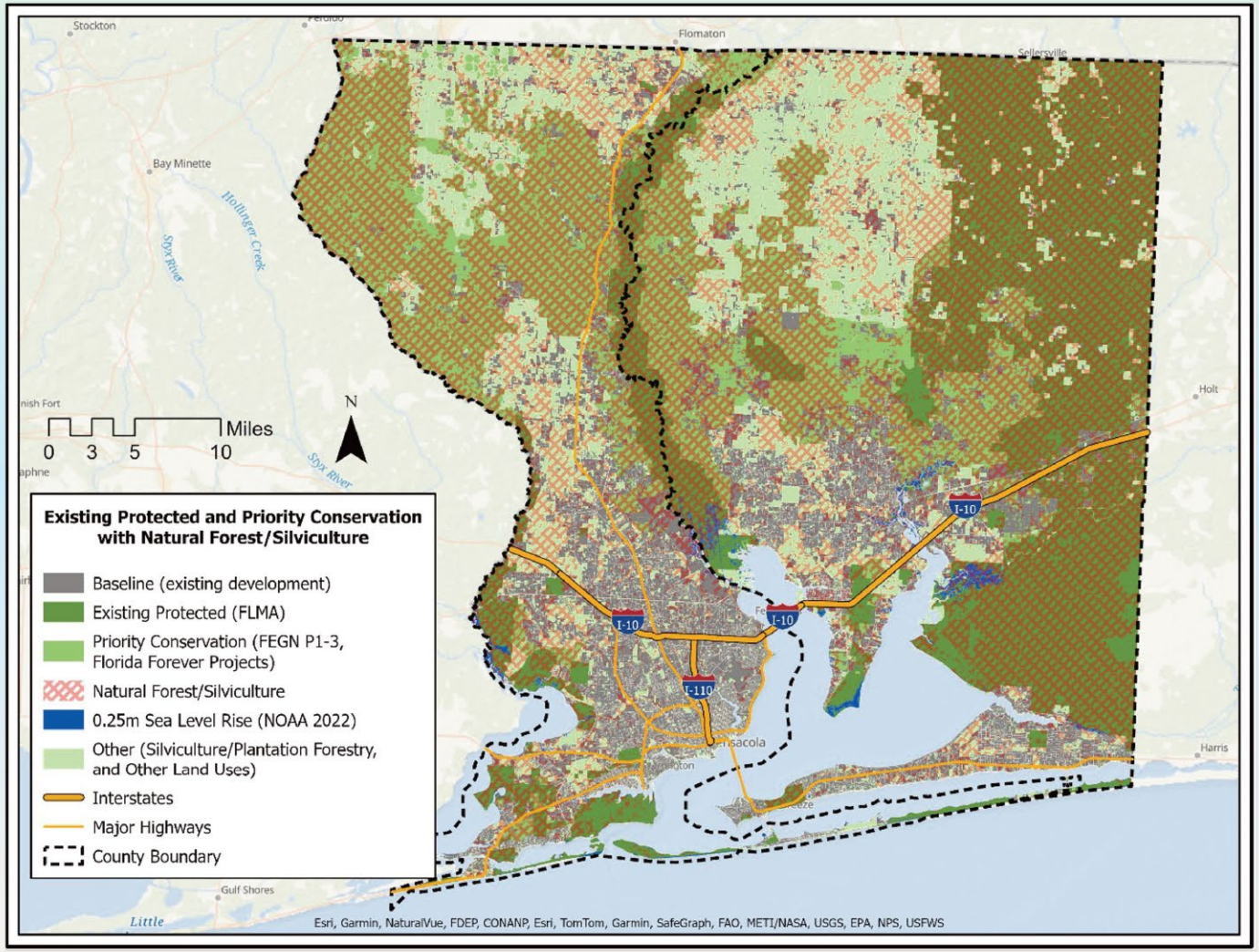
75 % Less Runoff



75% Less Nitrogen and Phosphorous


Flomaton
Bay Minette
Hollinger Creek
Styx River
Spanish Fort
Styx River
Fairhope
Gulf Shores
Little
N
W
E
S
0
5
10
Miles
Conservation Scenario
Baseline
Existing Protected (FLMA)
Florida Forever, FEGN, Irrigated AG
Major Roads
Conservation Scenario
Water Storage & NWFL WQ
NOAA .25m SLR
Esri, GEBCO, Garmin, NaturalVue, FDEP, CONANP, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS

- Forests cover almost half of Escambia County, and almost two-thirds of Santa Rosa County
- Forests naturally purify water and reduce erosion and sediment



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- Escambia County lost more than 45 square miles of forested land between 1996 and 2016
- Santa Rosa County lost nearly 77 square miles of forested land during that same period

SOURCE: NOAA Coastal Change Analysis Program (C-CAP)

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Why Protect Undeveloped Land?

Land conservation provides multiple benefits

- Recharges drinking water supply
- Naturally cleanses runoff, protecting surface and ground water
- Reduces flood risk
- Maintains land for agriculture
- Preserves wildlife habitat and biodiversity
- Absorbs carbon
- Provides recreation for residents and tourists

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Additional Benefits from Compact Development

Downtown Pensacola/Christian Wagley

- More opportunities to walk, bike, live healthier lifestyles
- More viable transit
- Less air, water pollution
- More housing choices
- Lower costs for taxpayers for public services
- More vibrant communities

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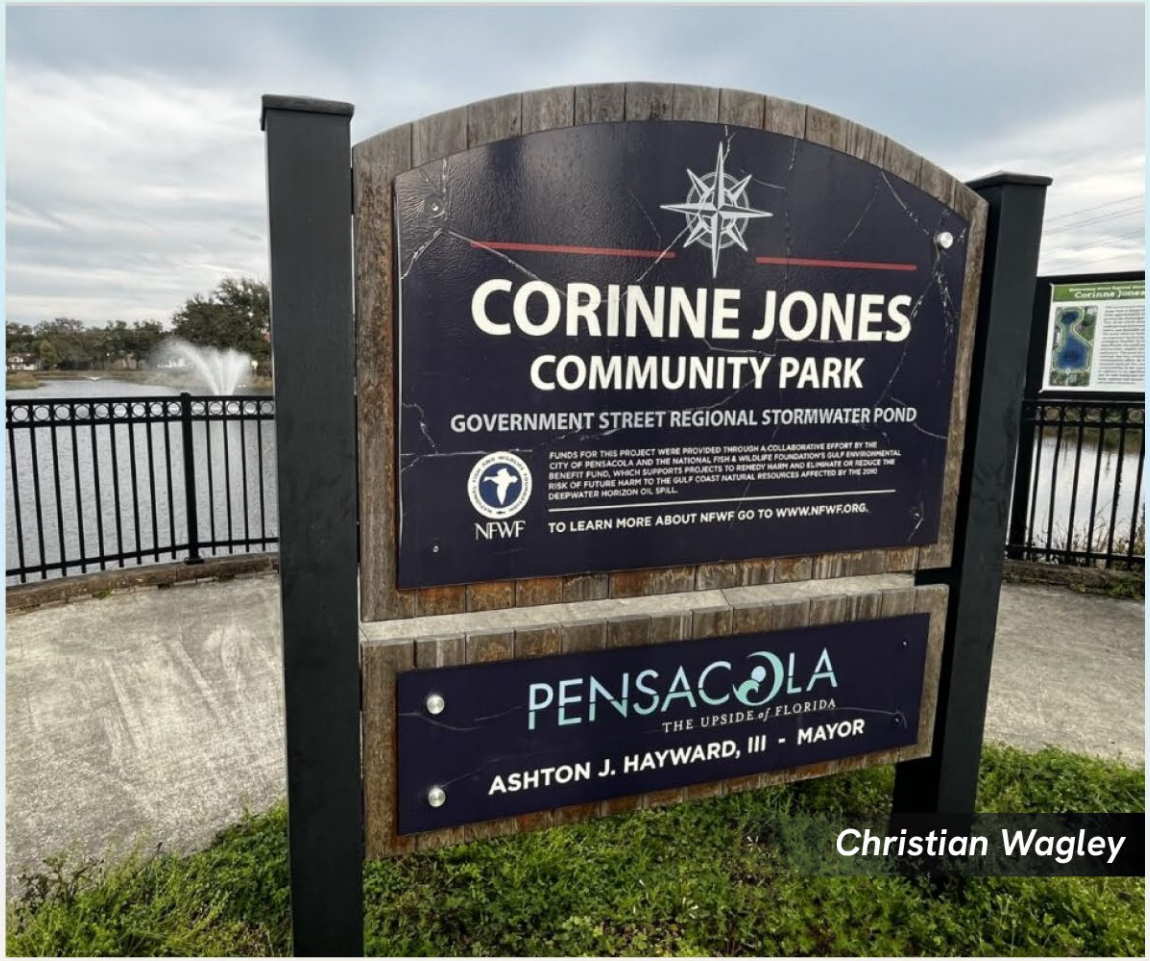
What Now?



Christian Wagley

Short-term options

- Review local growth plans and LDRs for alignment of conservation, transportation, land-use objectives
- Create interagency working group on planning to preserve Bay watersheds
- Establish and finance local land conservation programs
- Utilize offsite stormwater treatment

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What Now?

More short-term options

- Routinely consider adaptation strategies in any LDR changes
- Reconsider policies exempting infill projects in Pensacola from stormwater management rules
- Require sidewalks in developments

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What Now?

Medium-term options

- Amend local comp plans, LDRs to align with PPBEP's conservation and management plan
- Adopt form-based codes in key commercial areas
- Prioritize nature-based solutions for stormwater management and flood mitigation

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What Now?

Traditional Grid
Design (Pre-1900)

Curvilinear Loop
Design (~1930 - 1950)

Beginning of Cul-De-Sac
(~1930 - 1950)

Conventional Cul-De-Sac
(Since1950)

Congress for the New Urbanism

More medium-term options

- Allow accessory dwelling units
- Reduce or eliminate parking requirements
- Offer density bonuses
- Require connected street networks in new developments

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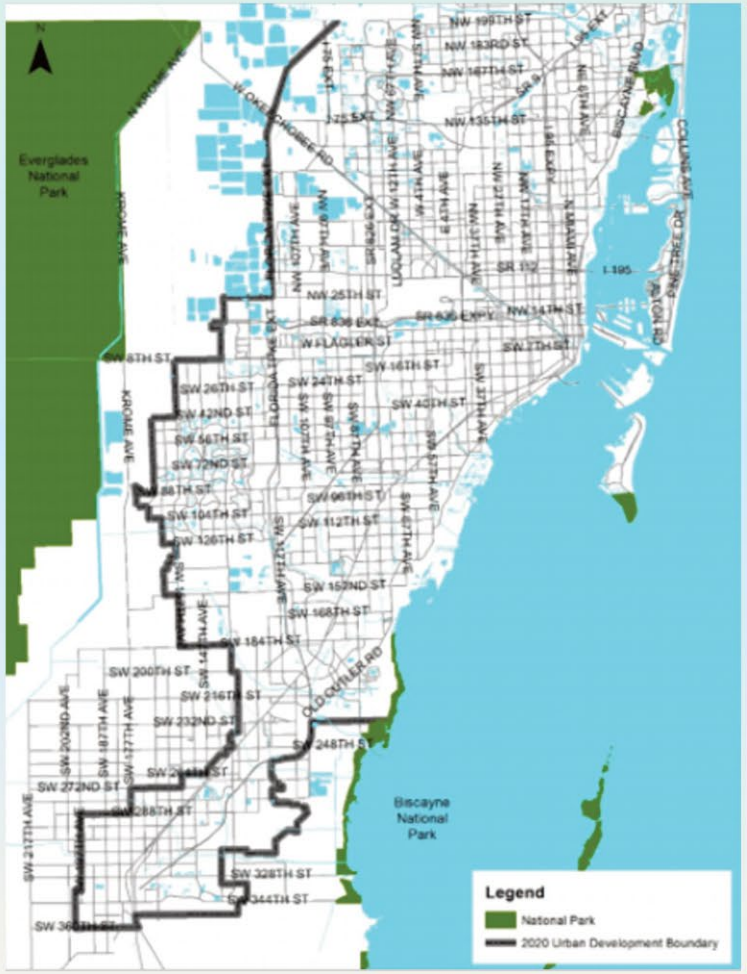
What Now?



Long-term options

- Establish urban growth boundary for the Pensacola Metropolitan Statistical Area

Urban Development Boundary, Miami-Dade County/Tropical Audubon Society

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- “The solution to pollution is dilution.”

Support

1000 FRIENDS of FLORIDA

www.1000friendsofflorida.org

NORTHWEST FLORIDA RESILIENCY SEMINAR

FEDERAL OPPORTUNITIES FOR RESILIENCE / USACE PROGRAMS

21 JUNE 2024

Working Today to Build a Better Tomorrow

US Army Corps of Engineers®

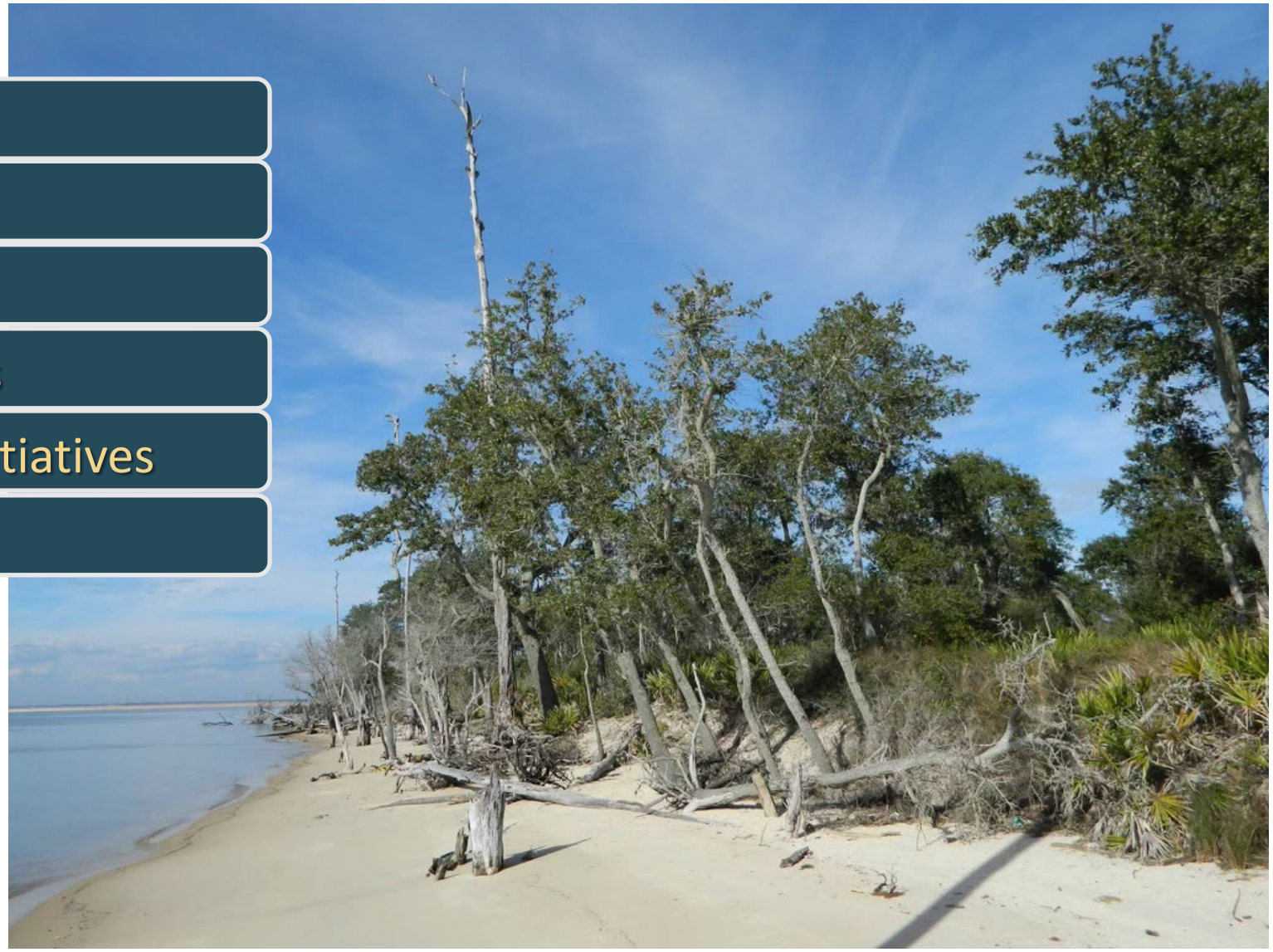
File Name

AGENDA

- Who We Are…
- What We Do…
- What We've Done…
- Partnering Opportunities
- Environmental Justice Initiatives
- Open Discussion

MOBILE DISTRICT
U.S. ARMY CORPS OF ENGINEERS

COASTAL RESILIENCY PROGRAM



MOBILE DISTRICT COASTAL RESILIENCY PROGRAM

WHO WE ARE…

MISSION: Deliver vital engineering solutions in collaboration with partners that reduce coastal storm risks and increase ecosystem and community resilience by incorporating a system of measures including natural and nature-based features, nonstructural, and structural solutions.

OBJECTIVE: Improve resilience by reducing risk to our coastlines and nearshore communities while preserving and protecting the natural habitat.

- Specialized team formed in the aftermath of Hurricane Katrina (2005)
- Oversaw what would become the Mississippi (MS) Coastal Improvements Program (MSCIP), one of the largest coastal storm risk management programs in USACE
- Utilized a system-wide approach to coastal risk reduction and fostered collaboration to successfully address coastal storm damages
- The Coastal Resiliency Program has evolved to include study, design, and construction efforts in coastal MS, AL, and the FL Panhandle
- Mobile District is a Regional Sediment Management Implementation Champion and Engineering with Nature Proving Ground

WHAT WE DO…

- Build innovative, climate resilient infrastructure to protect communities and ecosystems through natural or nature-based features such as wetlands, beaches, and dunes
- Leverage nonstructural interventions through updated policies, building codes, and emergency response; and utilize structural interventions such as seawalls and breakwaters when applicable

Working Today to Build a Better Tomorrow

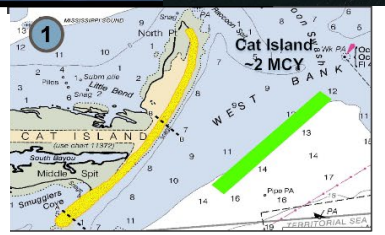
MOBILE DISTRICT
COASTAL RESILIENCY PROGRAM

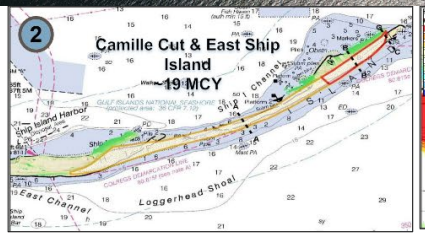
WHAT WE'VE DONE…

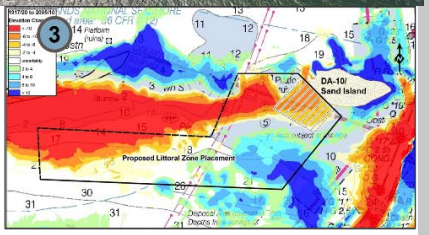
MISSISSIPPI BARRIER ISLANDS RESTORATION

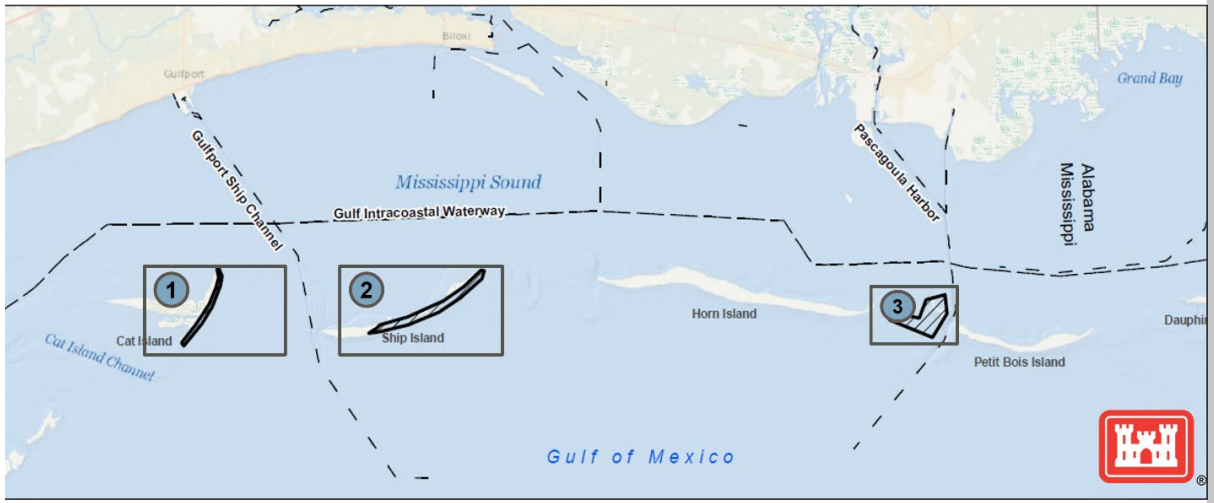
The MS barrier islands of Petit Bois, Horn, East Ship, West Ship, and Cat are dynamic landforms and the first line of defense between the Gulf of Mexico and Mississippi mainland coast.

- Authorized as a coastal storm risk management and ecosystem restoration project under the MSCIP Comprehensive Plan.
- Objectives: 1) maintain estuarine ecosystem and resources of the MS sound, 2) preserve natural and cultural resources of barrier islands, and 3) restore structure to reduce coastal storm impacts on the mainland
- Revitalized 1,150 acres of critical coastal zone habitat by restoring sediment and island structure
- Ensures sustainability of the Mississippi Sound ecosystem by maintaining salinity inflows from the Gulf of Mexico.









Working Today to Build a Better Tomorrow

MOBILE DISTRICT
COASTAL RESILIENCY PROGRAM

COASTAL STORM RISK MANAGEMENT

WHAT WE'VE DONE…

PANAMA CITY BEACH CSRM

- Originally Constructed 16.5 miles of beach between 1998 - 1999 and Carillon Beach and Pinnacle Port was constructed in 2011
- Restored the beach berm that sits near 6.5 ft in elevation along 17.5 miles of shoreline
- Berm maintains a 50-ft width and transitions to a 30-ft top width before tying back into the natural shoreline
- The authorized project provides periodic renourishment at an estimated 10-year interval

BAY ST. LOUIS SEAWALL CSRM

- Originally constructed by local interest between 1915 and 1928 to protect the upland against erosion due to low to moderate waves.
- The Bay St. Louis Seawall Reconstruction Project was authorized as a coastal storm risk management project under MSCIP
- The seawall elements consist of an approximate 5,600 ft stepped concrete seawall founded on concrete piles. Approximately 510 ft is a concrete tee wall with a vinyl sheet pile cutoff, and the remainder is a vinyl sheet pile wall with a concrete cap.

MOBILE DISTRICT
COASTAL RESILIENCY PROGRAM

AQUATIC ECOSYSTEM RESTORATION

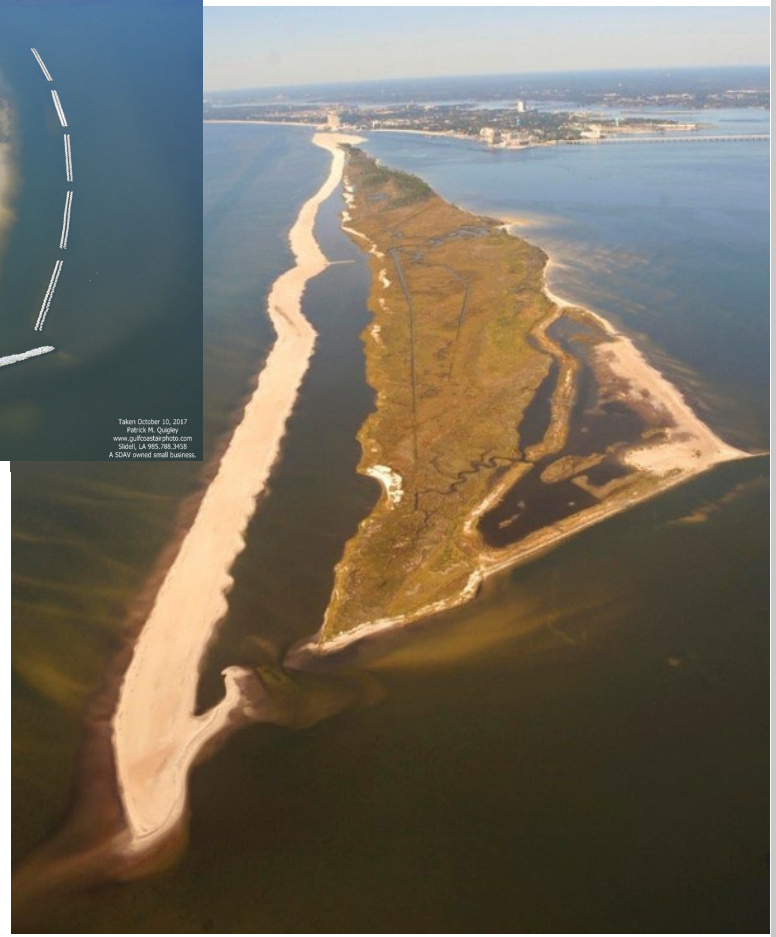
WHAT WE'VE DONE…

BAYOU CADDY AQUATIC ECOSYSTEM RESTORATION

- Active dredged material placement site using a living shoreline to create salt marshes and restore wetland habitat
- Dredged material placement and salt marsh restoration site is confined with geotubes and offshore breakwater to reduce wave energy in its lee
- Breakwater buffers the geotube structure during critical water level and wave conditions for containment purposes and provides erosion control for the restored wetlands

DEER ISLAND AQUATIC ECOSYSTEM RESTORATION

- Located in the MS Sound, Deer Island is a narrow, 4.5 mi long landmass that buffers the City of Biloxi from wind and wave energy
- Hurricane Katrina (2005) breached parts of the island, reduced elevations, eroded the beach, and impaired forested areas
- Restored the island and creates long-term beneficial use capacity for material dredged from the nearby Biloxi Harbor Navigation Project
- Minimized biodiversity fracturing and resulted in an additional 400 acres of highly productive estuarine wetlands, restored beach and dune habitat, reduced coastal erosion, and restoration of the coastal maritime forest



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MOBILE DISTRICT
COASTAL RESILIENCY PROGRAM

BENEFICIAL USE

WHAT WE'VE DONE…

DAUPHIN ISLAND CAUSEWAY

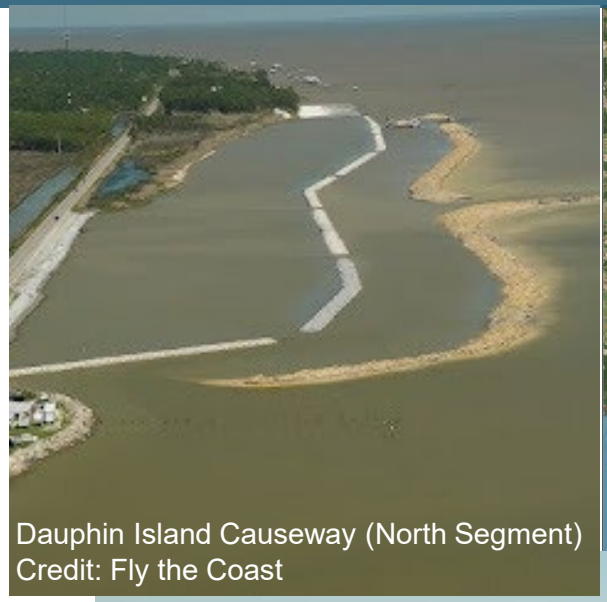
- Non-federal Interest: Mobile County, Alabama
- Dredged material from Mobile Harbor Deepening to create marshes
- Protects 3.3-miles of the Dauphin Island Causeway
- Protects nearly 300 acres of healthy, productive salt marsh habitat to the west side of the Dauphin Island Causeway
- Mobile County designed and permitted site and constructed breakwaters.
- Approximately 1MCY from Phase 6 creating up to 60 acres of habitat

DEER RIVER

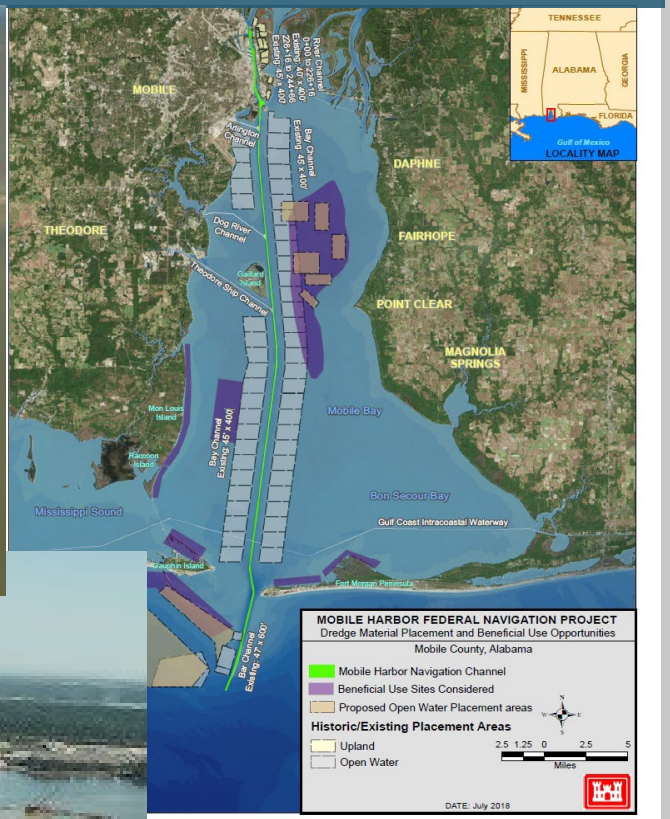
- Non-federal Interest: Mobile Bay National Estuary Program (MBNEP)
- Dredged material from Mobile Harbor Deepening to create marshes
- Protects nearly 275 acres of healthy, productive salt marsh habitat
- MBNEP designed and permitted site and constructed containment.
- Approximately 200k cubic yards from Phase 6 creating 20 acres of habitat

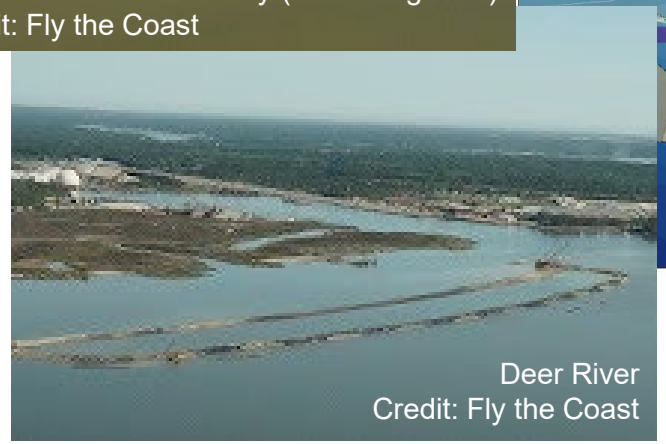
MOBILE BAY RELIC SHELL SITES

- Dredged material from Mobile Harbor Deepening to improve bay substate in historically mined areas Over 5.5 MCY beneficially used from Phase 5 and Phase 6



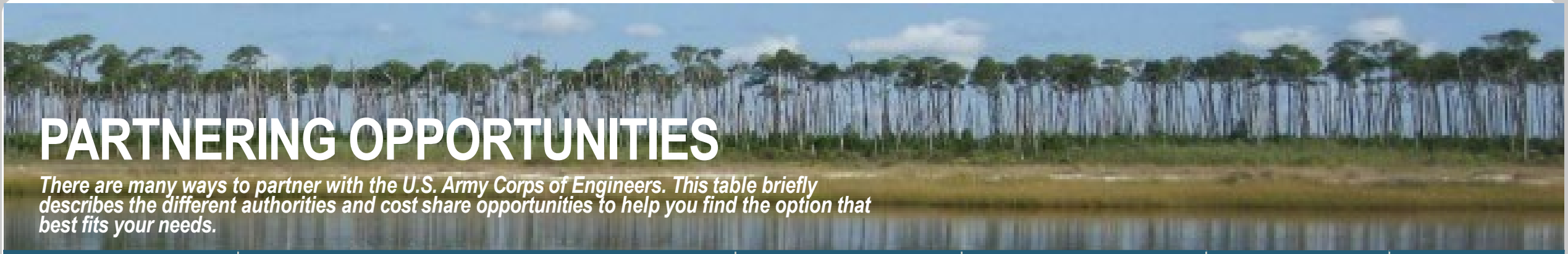
Dauphin Island Causeway (North Segment)
Credit: Fly the Coast





Deer River
Credit: Fly the Coast

Working Today to Build a Better Tomorrow



PARTNERING OPPORTUNITIES

There are many ways to partner with the U.S. Army Corps of Engineers. This table briefly describes the different authorities and cost share opportunities to help you find the option that best fits your needs.

PURPOSE	TYPES OF STUDIES AND PROJECTS	AUTHORITY	FEASIBILITY PHASE COST SHARE FEDERAL/ NON-FEDERAL	IMPLEMENTATION PHASE COST SHARE FEDERAL/ NON-FEDERAL	FEDERAL PER PROJECT LIMIT
CONTINUING AUTHORITIES PROGRAM					
Beach Erosion and Hurricane and Storm Damage Reduction	Projects related to public infrastructure (e.g. utilities, roadways) protection on small beaches against erosion and storm damages	Section 103 1962 River and Harbor Act, as amended	100% / 0% for initial $100,000; 50% / 50% remaining cost	65% / 35%	$10 Million
Mitigation of Damages Caused by Federal Navigation Projects	Projects for the prevention/mitigation of shoreline erosion damages to public/private shores when damage results from a Federal Navigation Project	Section 111 Rivers and Harbors Act of 1968, as amended, or 33 USC 426i	Shared in same proportion as original project causing damage	Shared in same proportion as the original project causing damage	$12.5 Million
Beneficial Use of Dredge Material	Creation of aquatic and wetland habitats in conjunction with construction or maintenance dredging of Federal Navigation Projects	Section 204 Water Resources Development act of 1992, as amended	100% / 0%	65% / 35%	$10 Million
Aquatic Ecosystem Restoration	Projects can include restoring floodplain, channel modification, or modification of structures to restore conditions conducive to native aquatic species	Section 206 Water Resources Development act of 1996, as amended	100% / 0% for first $100,000; 50% / 50% remaining cost	65% / 35%	$10 Million

Working Today to Build a Better Tomorrow

PARTNERING OPPORTUNITIES *(CONTINUED)*

PURPOSE	TYPES OF PROJECTS	AUTHORITY	COST-SHARE AND FUNDING
PLANNING ASSISTANCE TO STATES			
Assistance to States, local governments, Native American Tribes Territories, non-profit entities, and other non-Federal entities in preparation of comprehensive plans for water and related land resources, or technical services for hydrologic, economic and environmental data and analysis	Water supply/demands, water quality, environmental restoration, wetland evaluation, dam and levee safety/ failure, flood risk management, floodplain management, and other water related issues or technical analysis. Studies initiated at the request of communities, accomplished on a smaller scale than larger feasibility studies; utilize existing data; and align with other established community plans.	Section 22, Water Resources Development Act of 1974, as amended	**50% / 50%** Cost-share waiver for Tribes and Territories per Section 1156, Water Resources Development Act of 1986, as amended Non-Federal cost share for comprehensive plans can include 100% work-in-kind No work-in-kind for technical services ($5M per State)
FEASIBILITY INVESTIGATIONS			
Before USACE can participate in design and construction, planning studies must be conducted to determine feasibility	Flood risk management (FRM) feasibility studies to determine federal interest and support Congressional authorization for proceeding to project construction. Studies may also be multi-purpose, covering additional areas such as ecosystem restoration, emergency response, or recreation.	Each study needs to be specifically authorized and funded by Congress. (33 USC 426)	**50% / 50%** Design and construction cost-share depend on mission area Work-in-kind can be part of the cost-share

PARTNERING OPPORTUNITIES *(CONTINUED)*

PURPOSE	TYPES OF PROJECTS	AUTHORITY	COST-SHARE AND FUNDING
WATERSHED STUDIES			
Focuses on multiple objectives and tradeoffs, accounts for uncertainty, stakeholder collaboration, and adaptive management. Results are recommended strategies and actions that can be implemented at a watershed-scale or smaller scales by the Corps or other partners.	Examine the changing water resource needs relating to ecosystem protection & restoration, flood damage reduction, navigation & ports, watershed protection, water supply, and drought preparedness.	Section 729, Water Resources Development Act of 1986, as amended	**75% / 25%** Work-in-kind can be part of the cost-share.
MEMORANDUM OF AGREEMENT (MOA)			
May be executed for the placement of dredged material in connection with dredging of a Federal navigation project.	Projects use placement alternative other than the Federal standard. The non-Federal interest pays all additional costs associated with such placement.	The non-Federal interest must meet the definition of section 221 of the Flood Control Act of the 1970, as amended (42 U.S.C. 1962d-5b),	Sponsor pays all additional costs that exceed the Federal Standard.

[1] USACE ability to participate in these different partnering programs is dependent on the availability of funds appropriated in any given year.

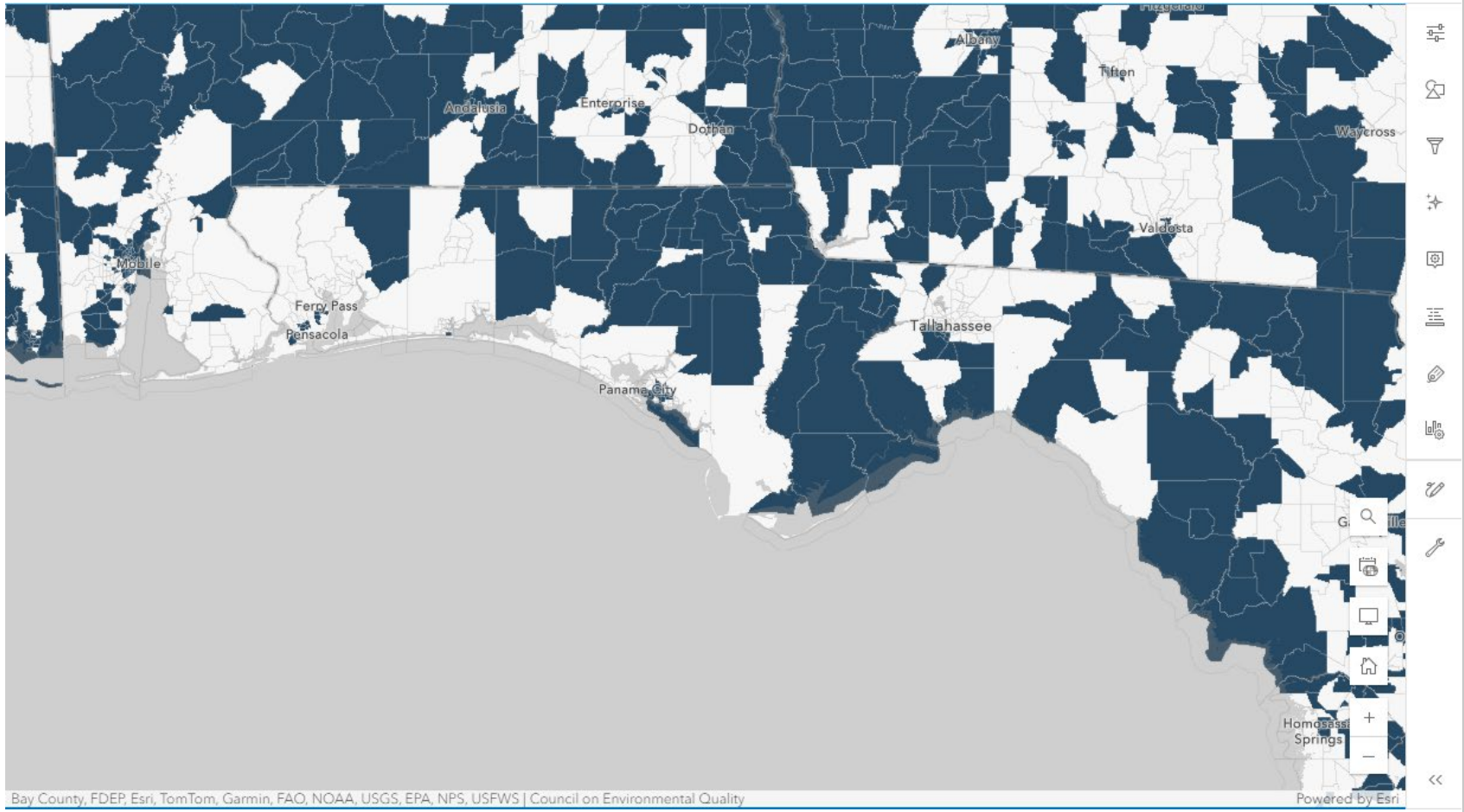
[2] For structural flood damage reduction purposes, non-Federal share is 35% up to 50% (based on cost of land, easements, rights of way, reallocations, disposal sites). 5% of the non-federal share must be in cash.

[3] For non-structural flood damage reduction purposes, non-Federal Share limited to 35%, with no 5% cash requirement

JUSTICE40 INITIATIVE

What is the Justice40 Initiative?

For the first time in our nation's history, the Federal government has made it a goal that 40% of the overall benefits of certain Federal climate, clean energy, affordable and sustainable housing, and other investments flow to disadvantaged communities that are marginalized by underinvestment and overburdened by pollution. President Biden made this historic commitment in Executive Order 14008 on Tackling the Climate Crisis at Home and Abroad. To continue delivering on the environmental justice vision, President Biden signed Executive Order 14096 on Revitalizing Our Nation's Commitment to Environmental Justice for All in April 2023.



Website: https://www.whitehouse.gov/environmentaljustice/justice40/

Website Map: https://www.arcgis.com/home/item.html?id=bdac3e391cd04d2396983fc67c23bf1c

SAMPLE Letter of Intent for a General Investigation (Feasibility) Study

(LETTERHEAD OF LOCAL SPONSOR)

(CURRENT DATE)

Colonel xxxx
Commander, xxxx District
City, State <for a full list of Districts and mailing addresses, see: http://www.usace.army.mil/Locations.aspx>

Dear Colonel xxxx:

The **(Name of Sponsor)** is willing and able to participate as the Sponsor for the **(name of study)**, in partnership with the U.S. Army Corps of Engineers (USACE), to cooperatively investigate **(briefly state the water resources problems and opportunities**) in the **(name of location, such as watershed or city/county)**.

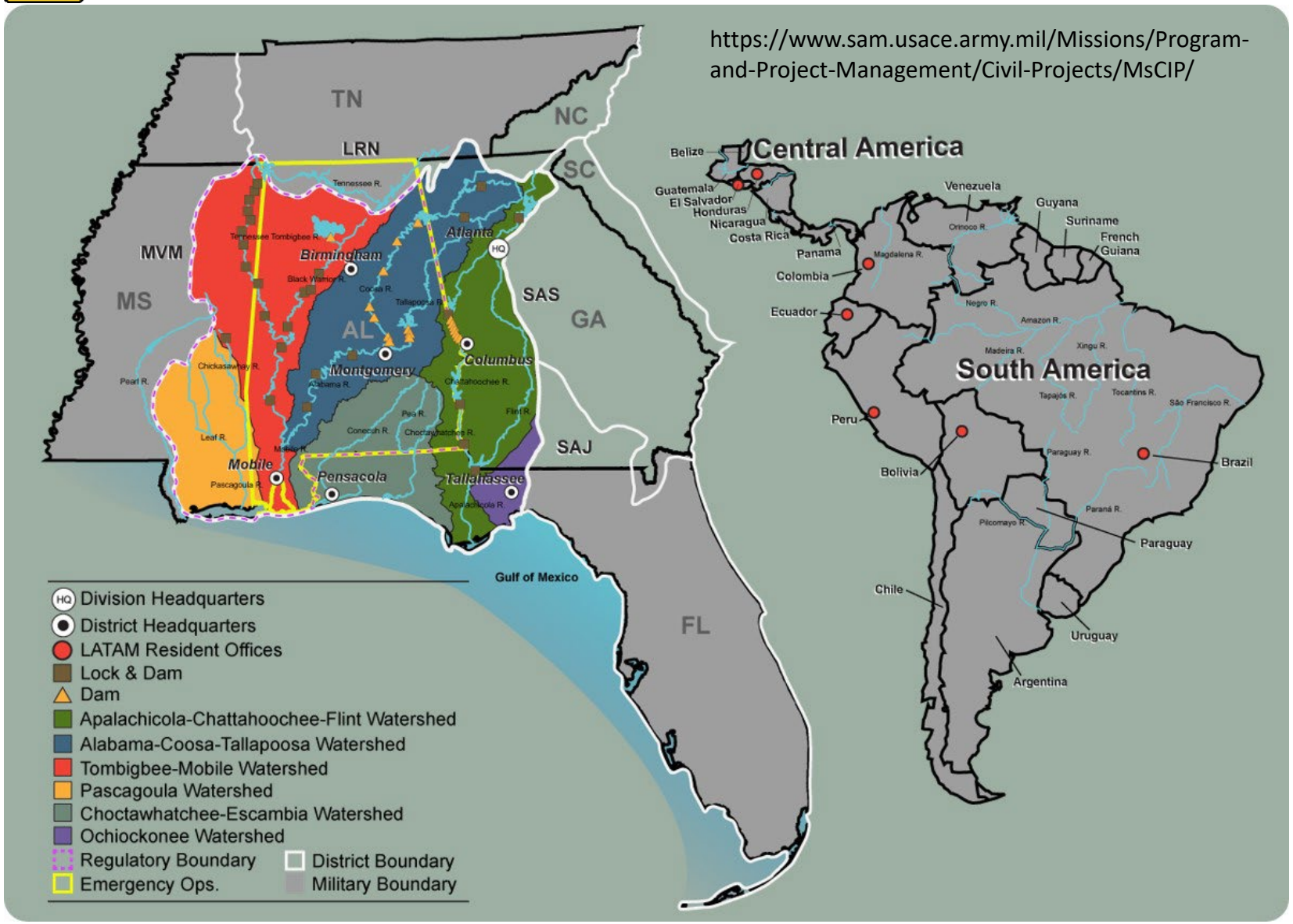
Our agency **(or Name of Sponsor)** understands that a study cannot be initiated unless it is selected as a new start study with associated allocation of Federal funds provided through the annual Congressional appropriations process. If selected, we intend to sign a Feasibility Cost Sharing Agreement (FCSA) to initiate the study with USACE. It is our understanding the FCSA targets completion of the feasibility study within 3 years at a total cost of no more than $3 million. After signing the FCSA, a Project Management Plan will be developed and agreed upon by our agency **(or Name of Sponsor)** and USACE. The study will be conducted and managed by USACE. The cost-sharing for the study is based on a 50% contribution by the Federal government, with our agency's 50% contribution provided in cash, or by a portion or all of the contribution provided through in-kind non-monetary services.

Our agency **(or Name of Sponsor)** is aware that this letter constitutes an expression of intent to initiate a study partnership to address the specified water resources problems and is not a contractual obligation. We understand that work on the study cannot commence until it is included in the Administration's budget request, funds are appropriated by the Congress, and an FCSA is signed. It is understood that we or USACE may opt to discontinue the study at any time after the FCSA is signed but will commit to work together as partners from the scoping phase, and subsequent decision points throughout the feasibility study, on providing the necessary support to risk-informed decision making. If it is determined that additional time or funding is necessary to support decisions to be made in order to complete the study, our agency will work with USACE to determine the appropriate course of action.

If you require additional information, please contact: **(Designee)** at (**Telephone Number and/or Email)**.

(Signed by Individual or Group with Appropriate Decision Making Authority)

COASTAL RESILIENCY PROGRAM CONTACT INFORMATION



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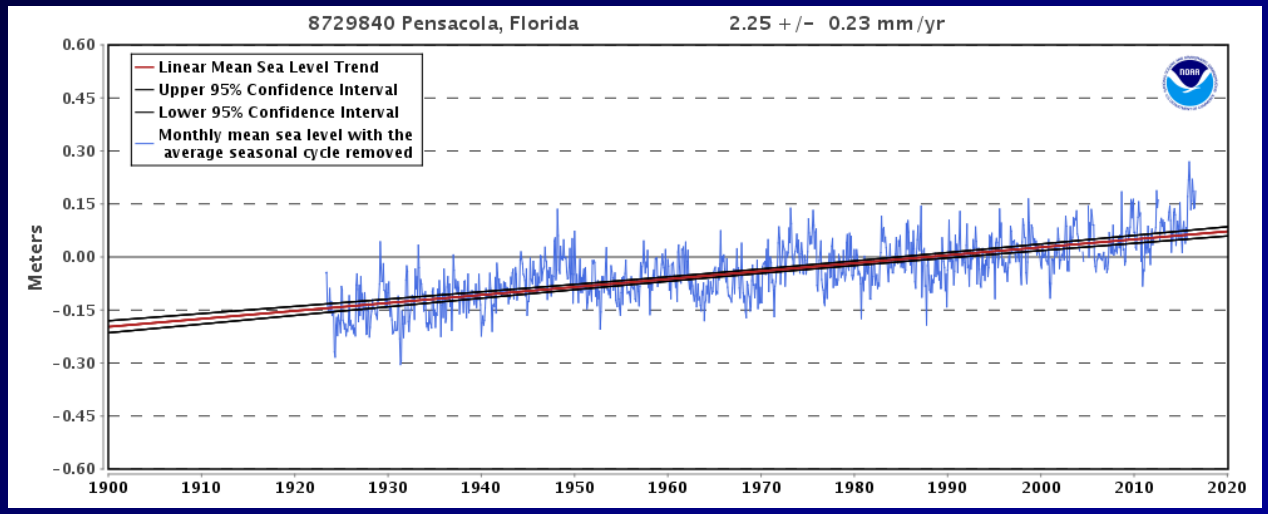
Northwest Florida Regional Resilience Seminar

June 2024



Escambia County

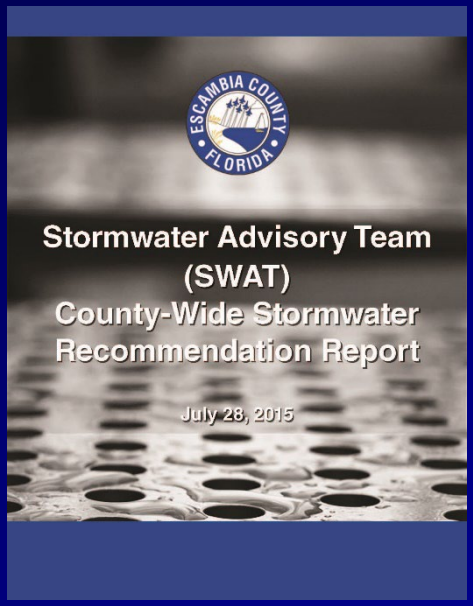
Natural Resources Management Department

Resilience History

- 2015 – Modeling Scenarios for Flood Loss Reduction in Escambia County, Fl – Texas A&M
- 2015 – Stormwater Advisory Team (SWAT) Report
- 2016 - Coastal Vulnerability Assessment – Florida Department of Economic Opportunity
- 2016 - Escambia County Low Impact Design Manual
- 2024 – Vulnerability Assessment and Adaptation Plan underway

SWAT Recommendations

1. Infrastructure priorities that feature high-impact, cost effective projects
2. Policy enhancements including more precise design requirements, updates to storm water basin data, and adoption of LID standards
3. Needs Assessment List included 228 flood reduction projects with over a $400 million price tag



April 2014 - Blue Springs Drive

Developing Priorities for Resilient Florida

- Flood priorities came from the SWAT recommendations
- NAS Pensacola Living shoreline project developed in coordination with the Navy
- Community improvement came from community driven documents

Resilient Florida funding in Escambia County

- Escambia County has received 13 Resilient Florida grants to date
- Planning/Modeling (3)
- Flood Mitigation (7)
- Sea Level Rise (1)
- Community (2)*

*Flood Mitigation is a component of the project

Resilient Florida funding in Escambia County

Project	Resilient Florida	Total
• Vulnerability Assessment - Planning	$277K	$277K
• Adaption Plan - Planning	$300K	$330K
• Frinchez Heights – Flood Mitigation	$485K	$980K
• Muldoon – Flood Mitigation	$2.5M	$5.0M
• Gulf Beach Highway Outfall – Flood Mit	$477K	$477K
• Beach Haven – Flood Mitigation / Community Enhancement	$4.2M	$18M
	$3.8M	$7.6M
• Wedgewood Stormwater Park – Flood Mitigation / Community Enhancement	$2.25M	$4.5M
• Bayou Grande Villas – Flood Mitigation	$788K	$1.6M
• Belle Meade - Flood Mitigation	$5.2M	$43.8M
• Pensacola Bay Living Shoreline – SLR	$425K	$850K
• Chandler – Flood Mitigation	$688K	$688K
• Pens and Perdido Bay rain/tide flood under future climate change		

Leveraging Resilient Florida

• Total Resilient Florida Grants	$24,008,350
• Total Federal Matching Grants	$16,721,011
• National Fish and Wildlife Foundation	$23,998,349
• Total Local Matching Funds	$38,753,250
Project Total	$103,460,960

Escambia County was able to leverage $3 for each $1 of Resilient Florida grant funds

Spotlight Beach Haven Community

- Pre-project condition
- Impacts almost 700 residential properties
- Drainage was by open ditch system with a direct discharge into a tributary of Bayou Chico, a 303d listed waterbody
- All properties on septic tanks
- Justice 40 community
- Significant Code Enforcement activity

Spotlight Beach Haven Community

- Improvements
- Curb and gutter drainage system
- Stormwater treatment train including pre-treatment with vortex boxes prior to discharge into new ponds
- Removal of a direct storm water discharge into surface waters
- Previous issues with standing water in the roads alleviated, reduced flood risk

Spotlight Beach Haven Community

- Improvements
- Sidewalks installed
- Sewer installed with funding assistance for residents to connect (removal of nearly 700 septic tanks)
- Residents taking pride in their community
- Reduced Code Enforcement calls
- Redevelopment occurring on vacant lots
- Encourages infill development

Spotlight Beach Haven Community

Mills Avenue

Spotlight Beach Haven Community

Wayne Avenue

Spotlight Beach Haven Community

Drainage Infrastructure

Spotlight Beach Haven Community

Pond adjacent to Jones Swamp w/access to trails

Engineered Level-Spreader

Spotlight NAS Pensacola Living Shoreline

- Funding Partners
- Resilient Florida
- National Fish and Wildlife Foundation
- Department of Defense
- Gulf Coast Ecosystem Restoration Council
- National Coastal Resilience Fund
- Department of Economic Opportunity
- Escambia County

Spotlight NAS Pensacola Living Shoreline

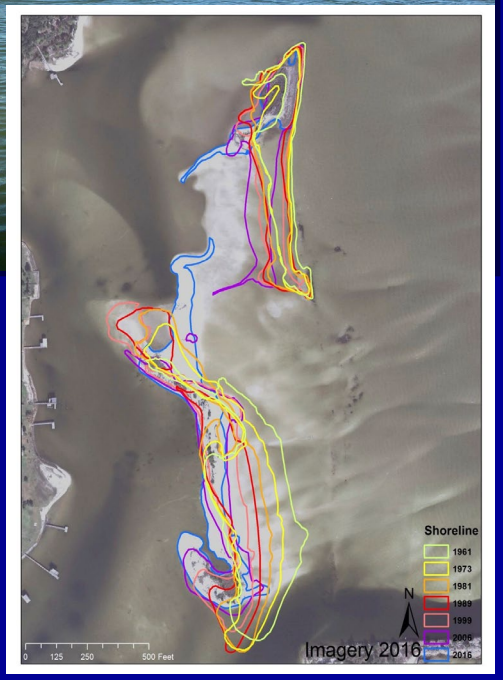
- Project Goals
- Improve Coastal Resiliency for NAS Pensacola regarding coastal erosion, storm protection, and SLR
- Enhance “force protection” and delineation of military exclusion zone
- Enhance habitats that provide support for invertebrates, coastal birds, finfish, and shellfish
- Promote regeneration of submerged aquatic vegetation and coastal marsh

Spotlight NAS Pensacola Living Shoreline

- 15,000 linear feet of breakwater
- Engineered breakwaters with considerations of sea level rise
- 71 Acres of marsh habitat created
- 50 Acres of natural recruitment of seagrasses
- Sand platforms designed to be able to roll shoreward
- Sand utilized is a beneficial reuse project from Admirals Island

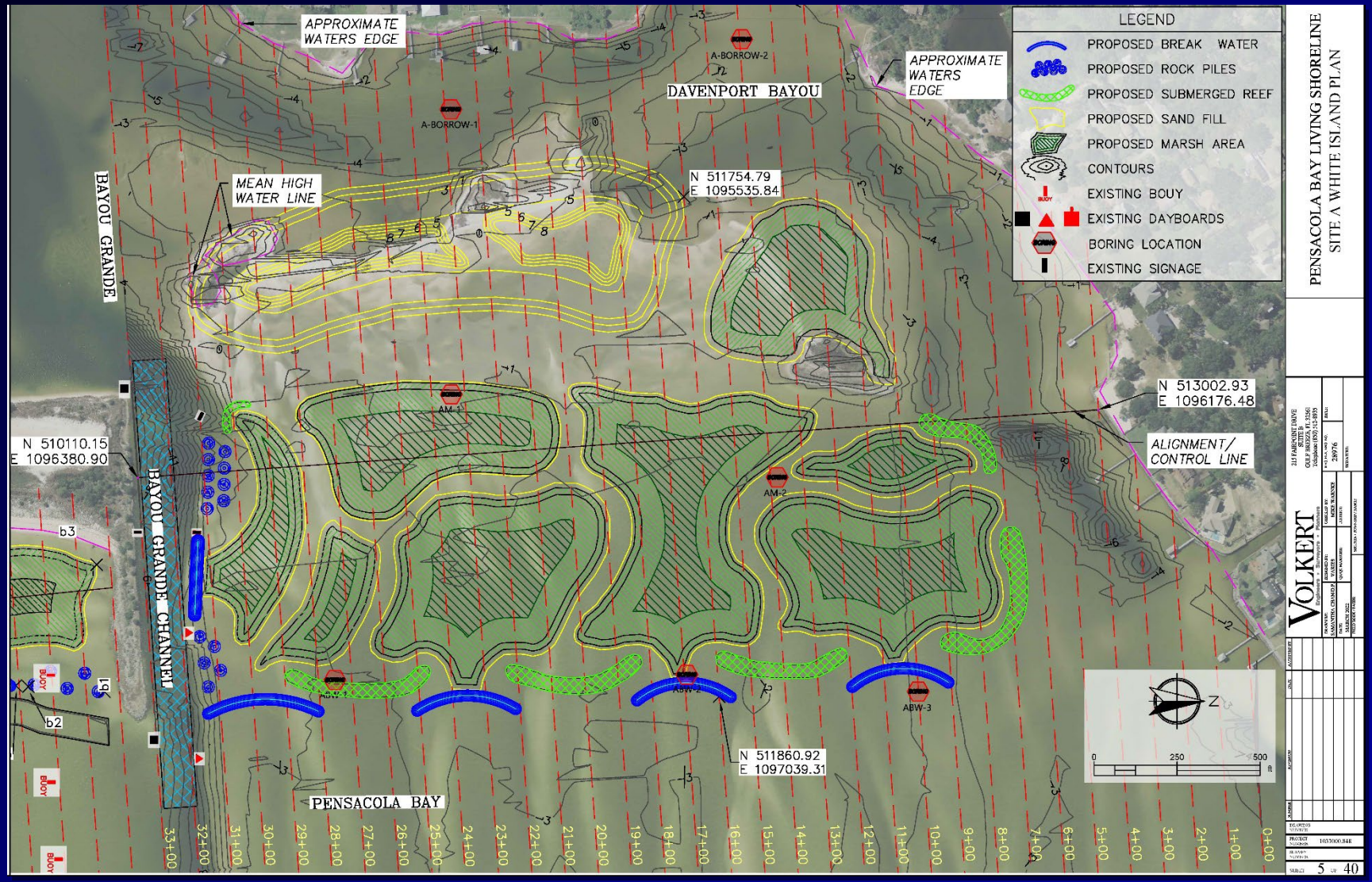
Site A – White Island

- Dredge 400,000 cubic yards (20,000 dump trucks) of sand from immediate area to accomplish the following:
- Restore White Island (13.4 acres)
- Create 8 marsh cells (38.3 acres) with plantings
- 7,700 tons of rock
- Construct 5 breakwaters (1.3 acres)
- Construct 6 submerged reefs (0.33 acres)
- Construct 14 rock piles (2.4 acres)



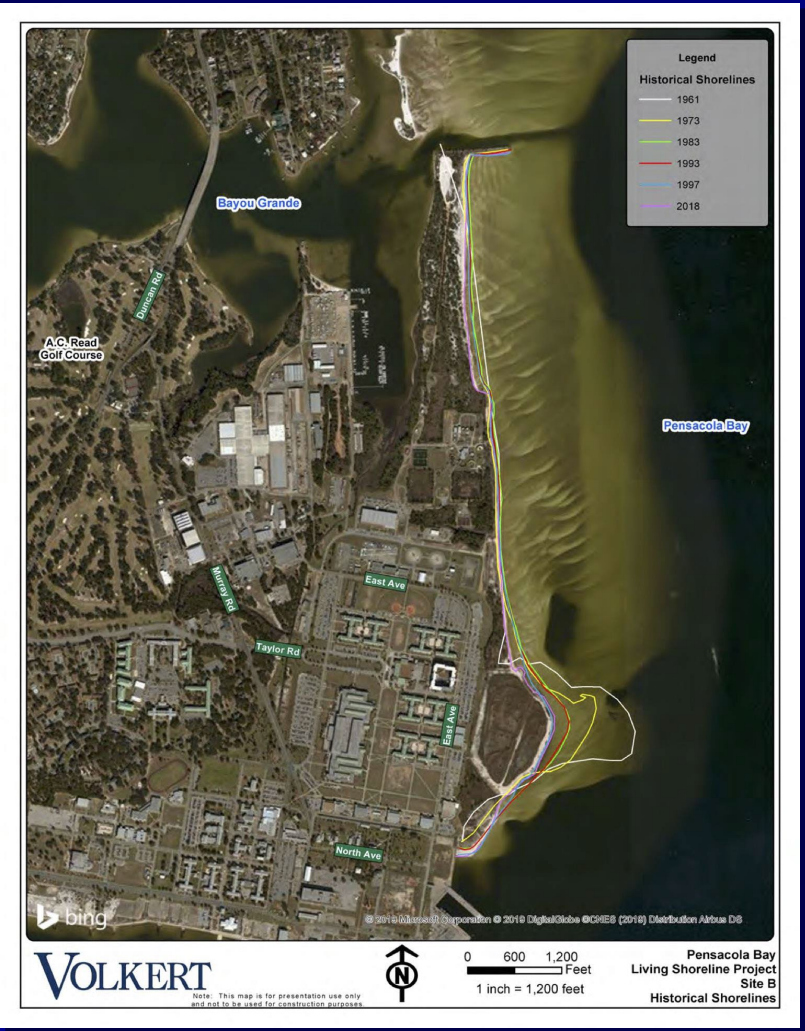
Spotlight NAS Pensacola Living Shoreline

Site A – White Island



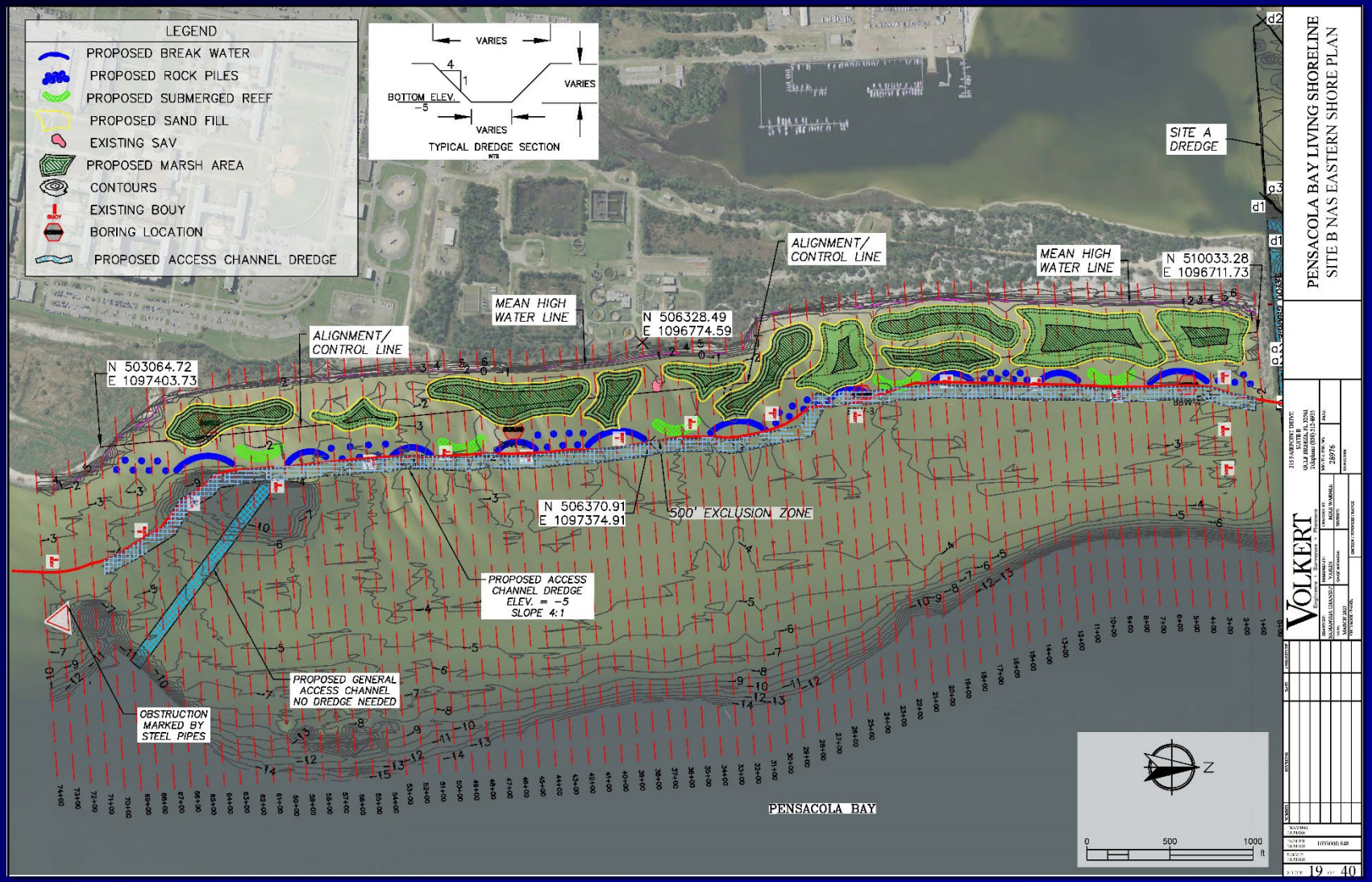
Site B – Magazine Point

- Construct 11 marsh cells (32.8 acres) including plantings
- Construct 10 breakwaters (2.4 acres)
- Construct 5 submerged reefs (1.93 acres)
- 13,500 tons of rock
- Construct 40 rock piles (0.95 acres)
- Sand volume ~140,000 cubic yards (7,000 dump trucks)



Spotlight NAS Pensacola Living Shoreline

Site B – Magazine Point

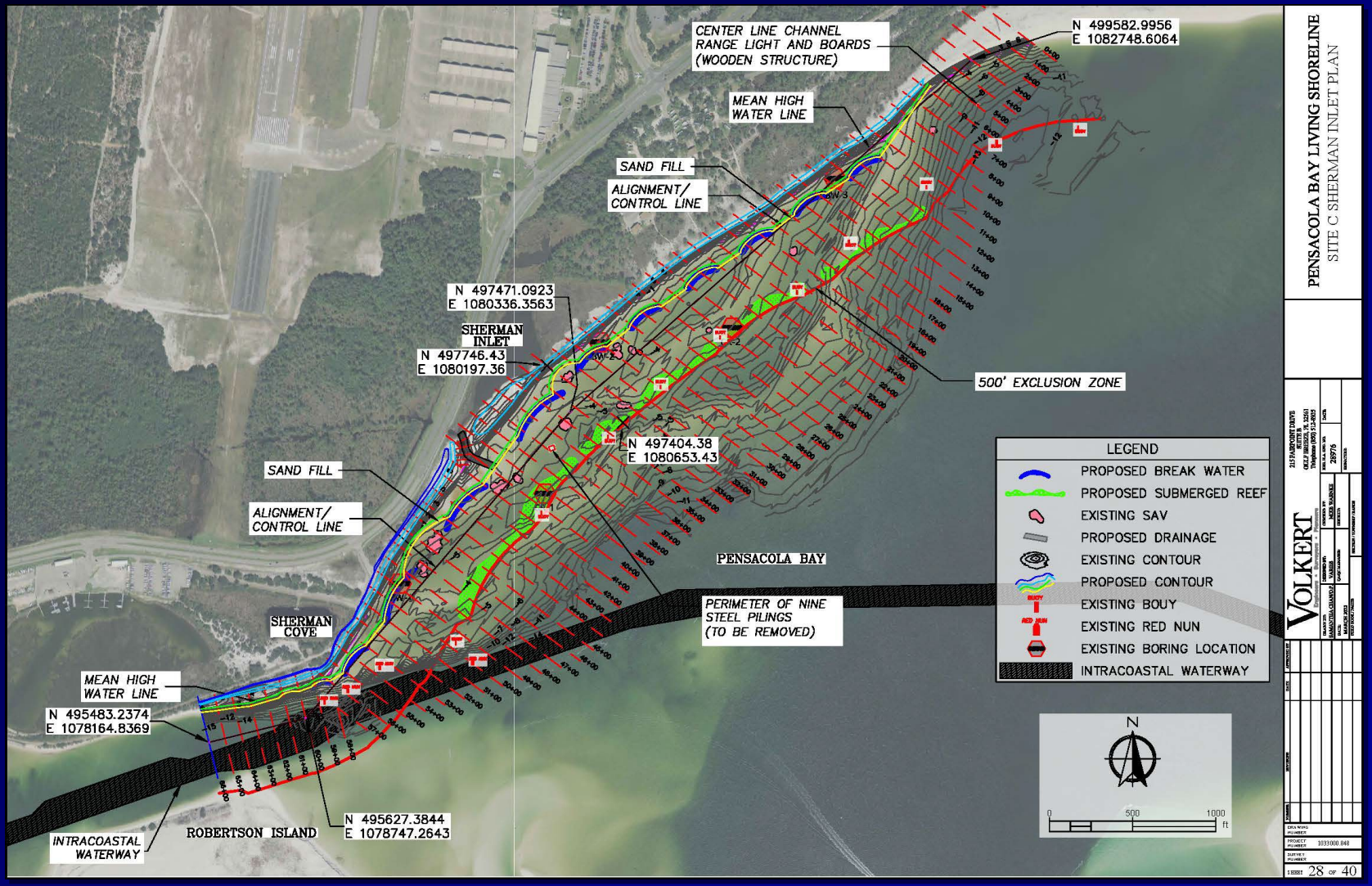


Site C – Sherman Inlet

- Placement of sand to restore the shoreline (9.95 acres)
- 11,200 tons of rock
- Construct 12 breakwaters (2.6 acres)
- Construct 4 submerged reefs (4.6 acres)
- Natural recruitment of up to 25 acres of submerged aquatic vegetation
- Sand volume – 100,000 cy
- Due to proximity to the active runways, emergent structure and other bird attractants were minimized in this phase

Spotlight NAS Pensacola Living Shoreline

Site C – Sherman Inlet



Questions

Timothy Day, Deputy Director
Natural Resources Management Department
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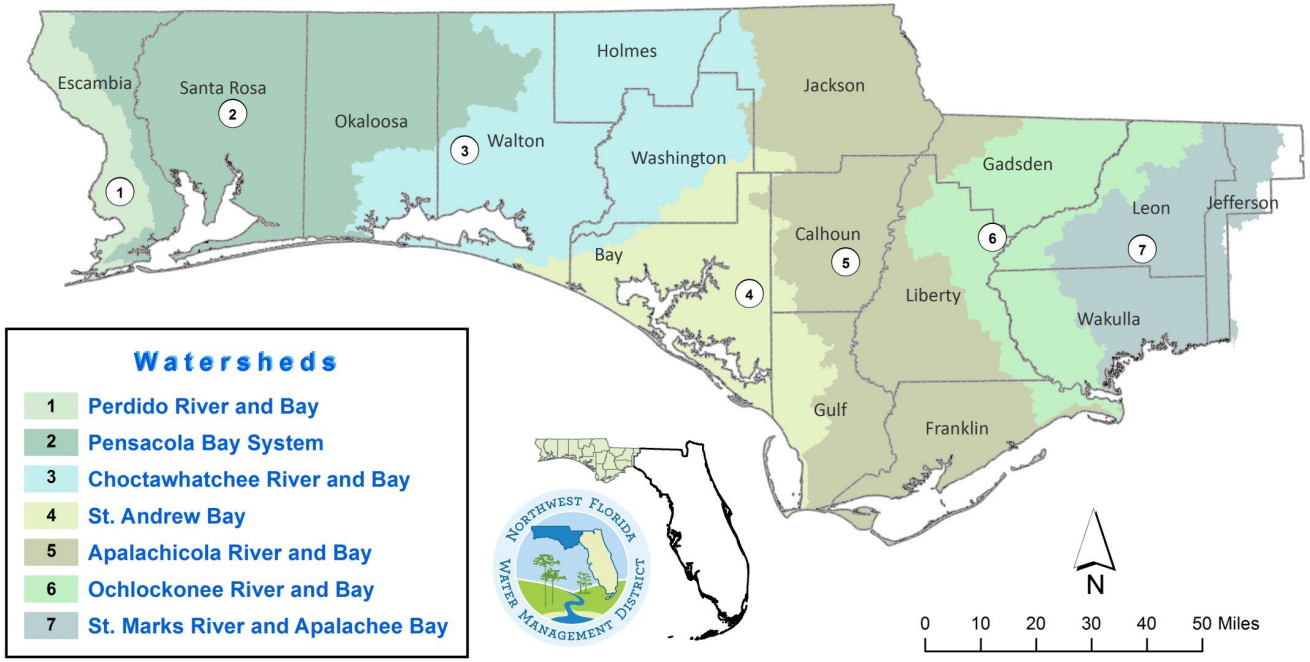
(850) 554-3073 (c)
trday@myescambia.com

Resilience Strategies and Initiatives for Northwest Florida

June 21, 2024

"Celebrating 50 Years of Preserving Water Resources in Northwest Florida"

Northwest Florida Water Management District



Watersheds

1	Perdido River and Bay
2	Pensacola Bay System
3	Choctawhatchee River and Bay
4	St. Andrew Bay
5	Apalachicola River and Bay
6	Ochlockonee River and Bay
7	St. Marks River and Apalachee Bay

- **1.5 million residents across 16 counties**
- **2020 water use of 342 million gallons per day**
- **225,811 acres (352 square miles) of land** acquisition
- **Some of Florida's largest rivers and most diverse and productive estuaries**
- **Rich in surface and groundwater resources**

Areas of Responsibility

Water Supply

Ensure sufficient water for all existing and future reasonable-beneficial uses and natural systems.

Flood Protection and Floodplain Management

Maintain natural floodplain functions and minimize harm from flooding.

Water Quality

Protect and improve the quality of the District's water resources.

Natural Systems

Protect and enhance natural systems.

Future Stressors/Drivers

- Sea-level Rise
- Changes in rainfall patterns and intensity
- Tropical weather (stronger and faster developing)
- Population Growth
- Unknowns

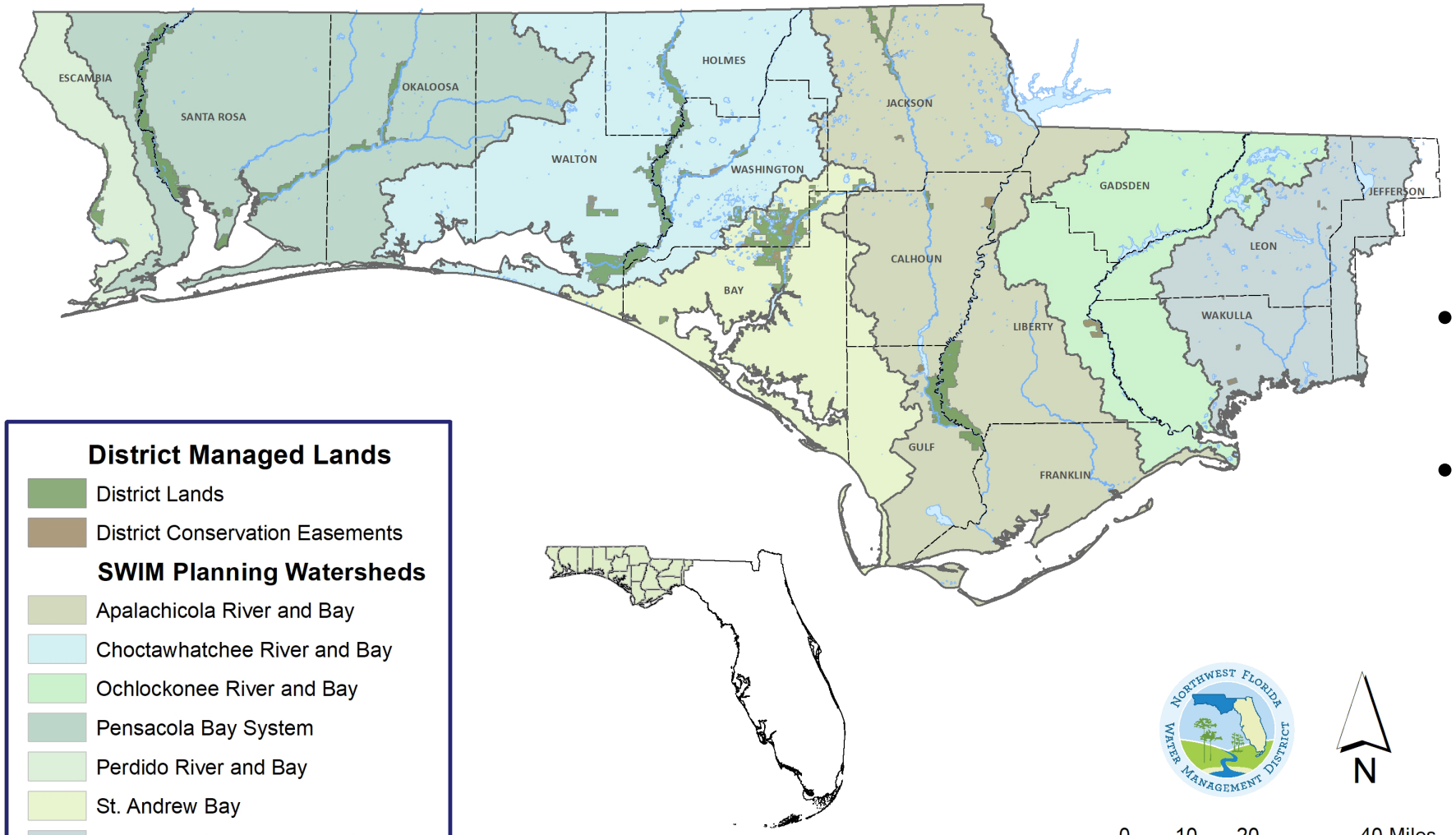
Floodplain Protection and Floodplain Management

- Land Acquisition and Management
- Watershed Planning
- Environmental Resource Permitting (ERP)
- Storm Assessment and Recovery

Jelk Property Acquisition – Econfina Creek WMA

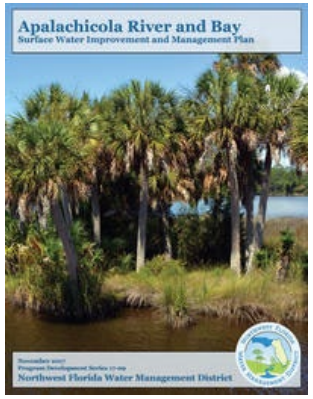
Maintain natural floodplain functions and minimize harm from flooding.

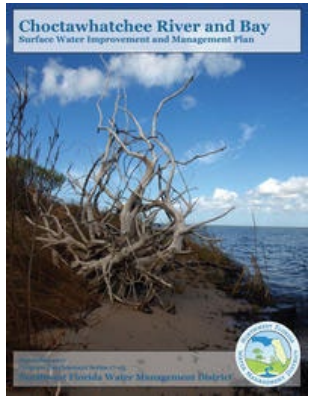
Floodplain Protection and Floodplain Management

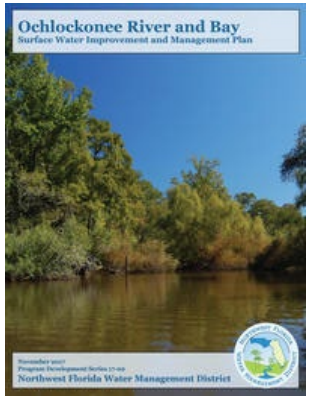


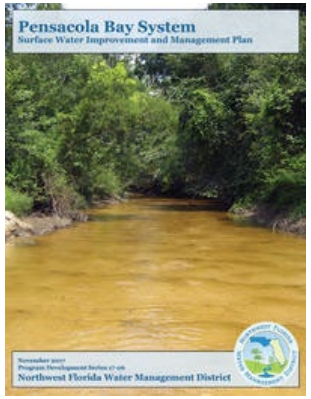
- **District Lands: 225,811 acres**
- **75% are within the floodplain**

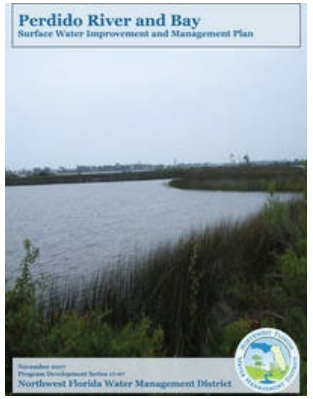
Floodplain Protection and Floodplain Management

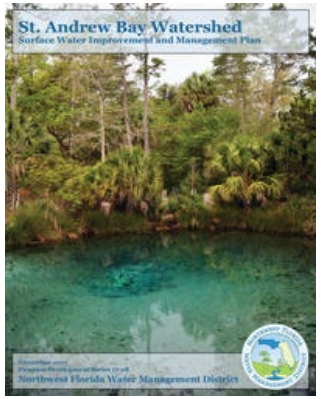












PENSACOLA & PERDIDO BAYS
ESTUARY PROGRAM

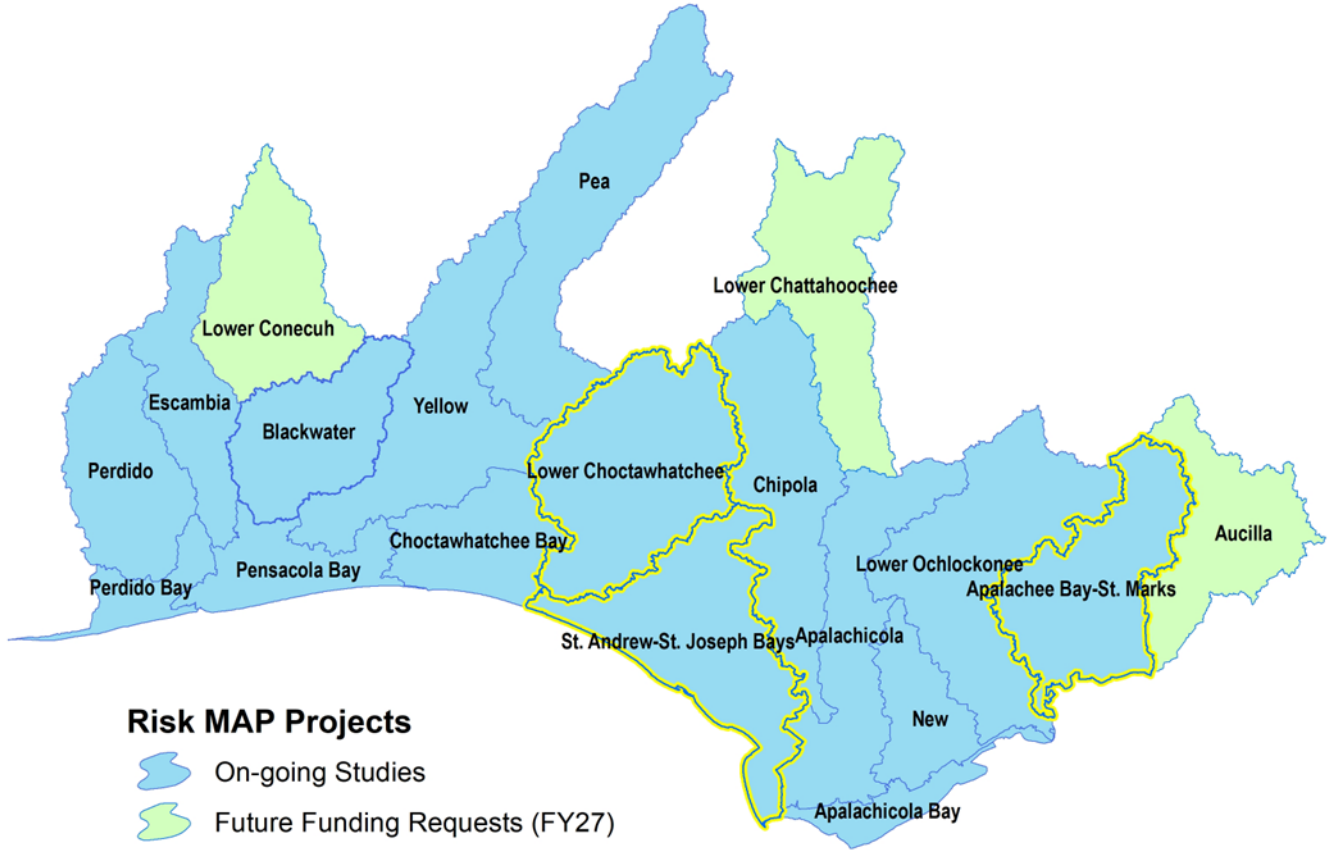
CHOCTAWHATCHEE BAY
ESTUARY PROGRAM

Updated SWIM Plans between 2015 and 2017 and worked closely with the three Panhandle Estuary Programs during their CCMP development.

Floodplain Protection and Floodplain Management

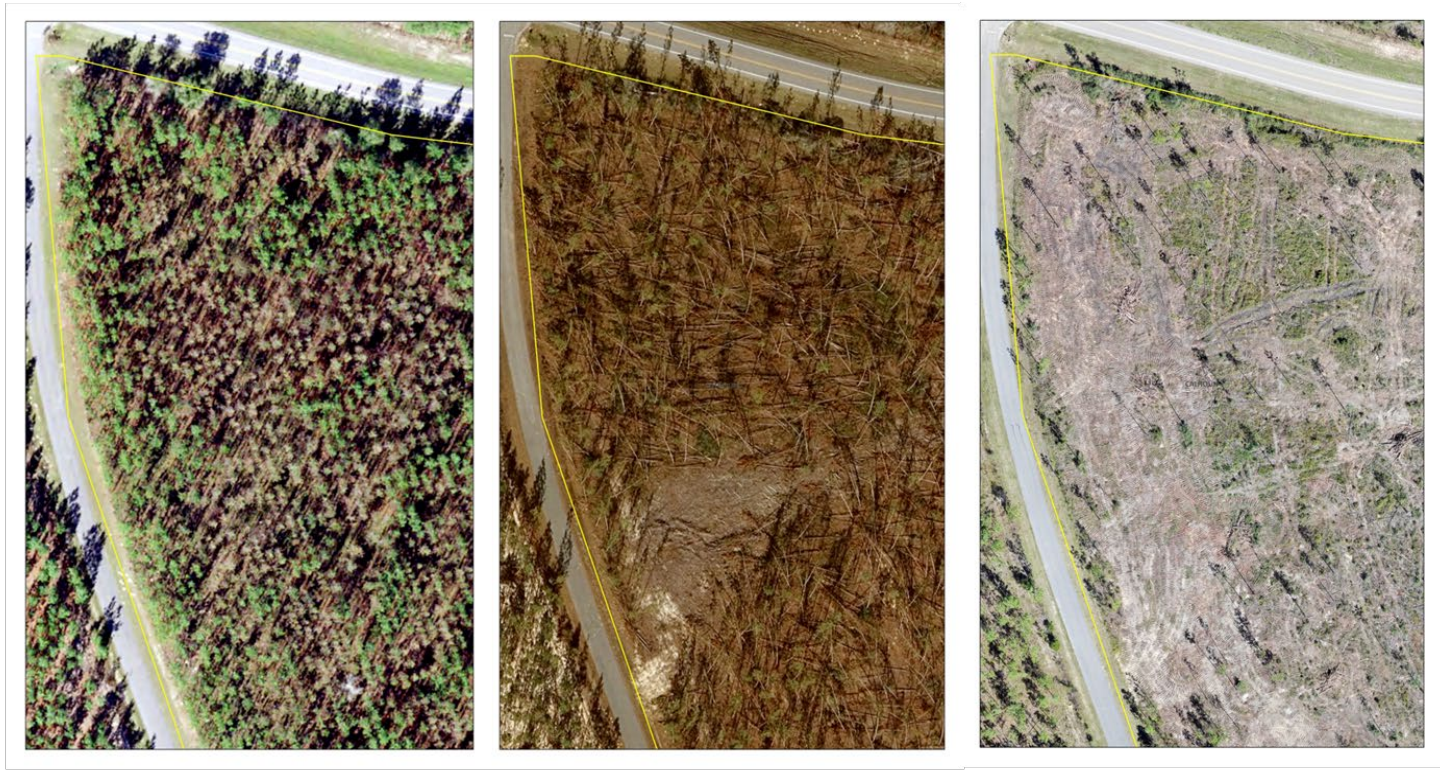
Cooperating Technical Partner with FEMA to improve and update flood hazard maps

NWFWMD FEMA FY 2023 - 2024 FUNDING ALLOCATIONS		
Activity	County/Watershed	Funding Plan
Risk MAP Project to Improve and Update Flood Hazard Maps	Lower Choctawhatchee	$800,000
	St. Andrew – St. Joseph Bays Watershed	$700,000
	Apalachee Bay – St. Marks	$45,000
Project Management	All	$90,000
Community Outreach and Mitigation Strategies	All	$100,000
Total Award		$1,735,000



Floodplain Protection and Floodplain Management

- Extreme Storm Event Response and Recovery
  - Washington County (Piney Lake)
  - Hurricane Michael – Tree Loss
- Improved data and technology to assess flooding risks and impacts
  - High-resolution Light Detection and Ranging (LiDAR) Data
  - Drone Reconnaissance
  - Real-time hydrologic data

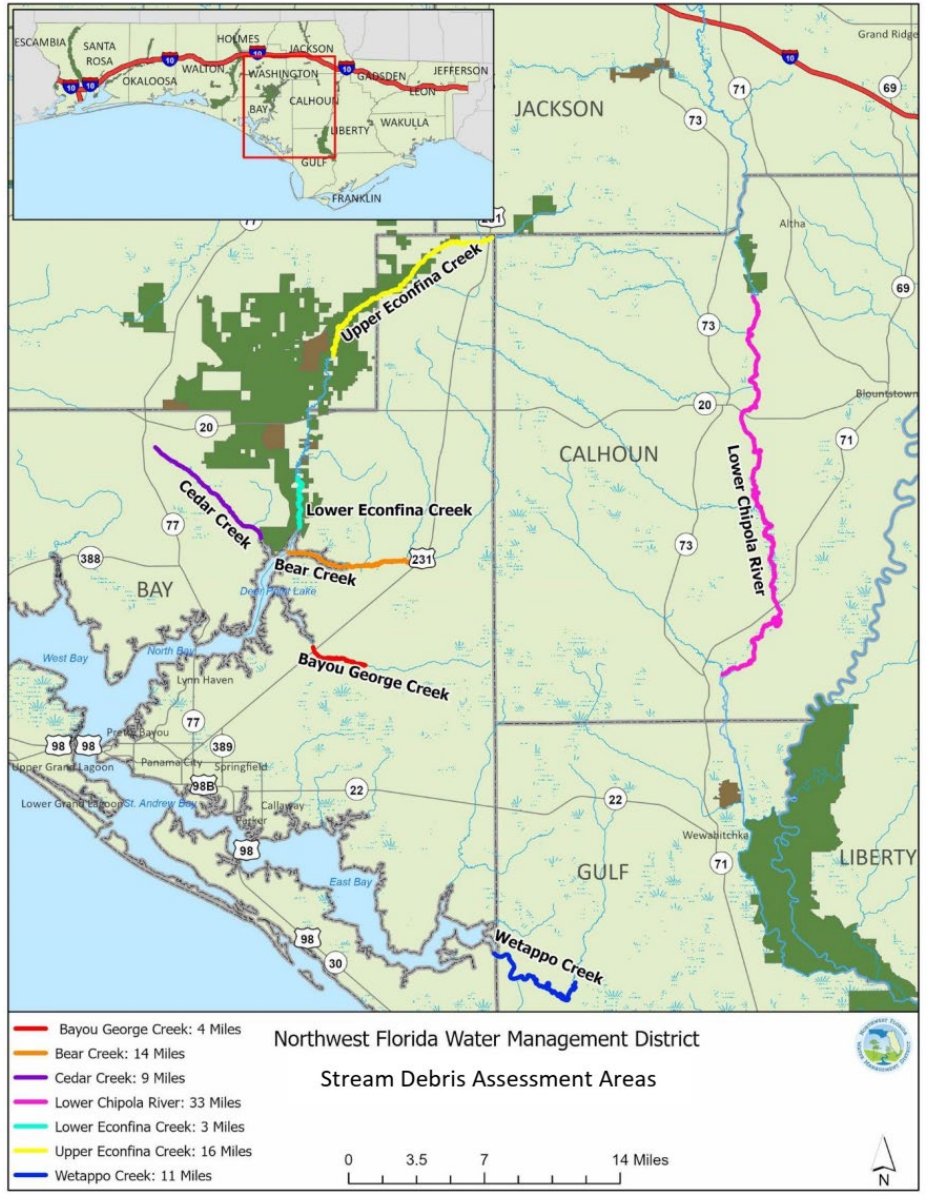


Pre-Hurricane Michael (2016)

Post-Hurricane Michael (2018)

Hurricane Michael Clean-up (2020)

Floodplain Protection and Floodplain Management



Floodplain Protection and Floodplain Management

Resilience Strategies:

- Floodplain Map Updates
- Regional Partnerships
- Technology Improvements
- Project Development

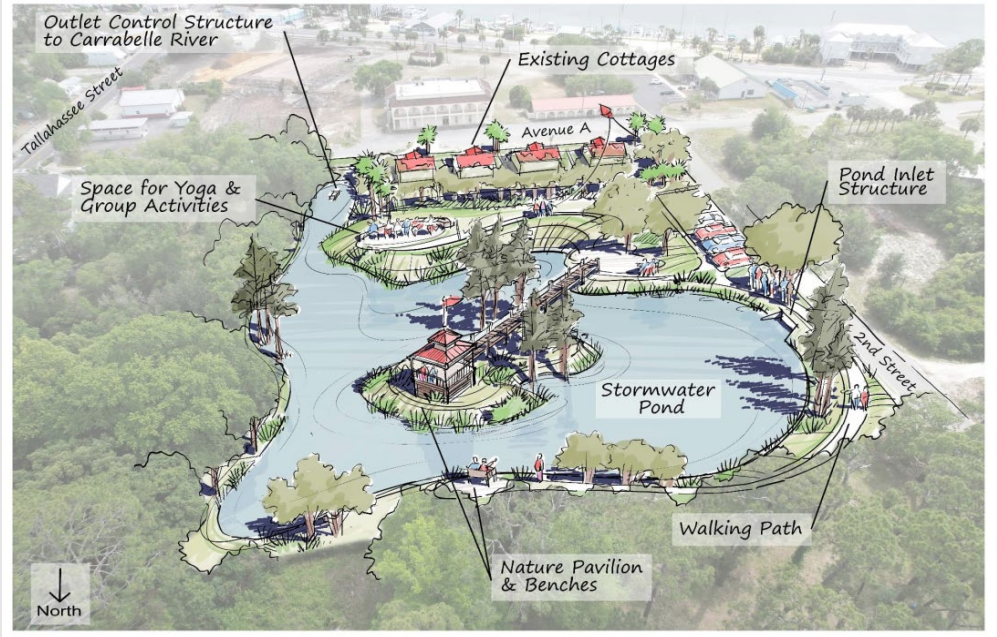
Springfield Floodplain Restoration

Water Quality

- Springs Restoration and Protection Grants Program ($125 million, through FY23)

- Pilot Distributed Wastewater Grant Program

- Water quality monitoring and analysis (e.g. saltwater intrusion to coastal wells)

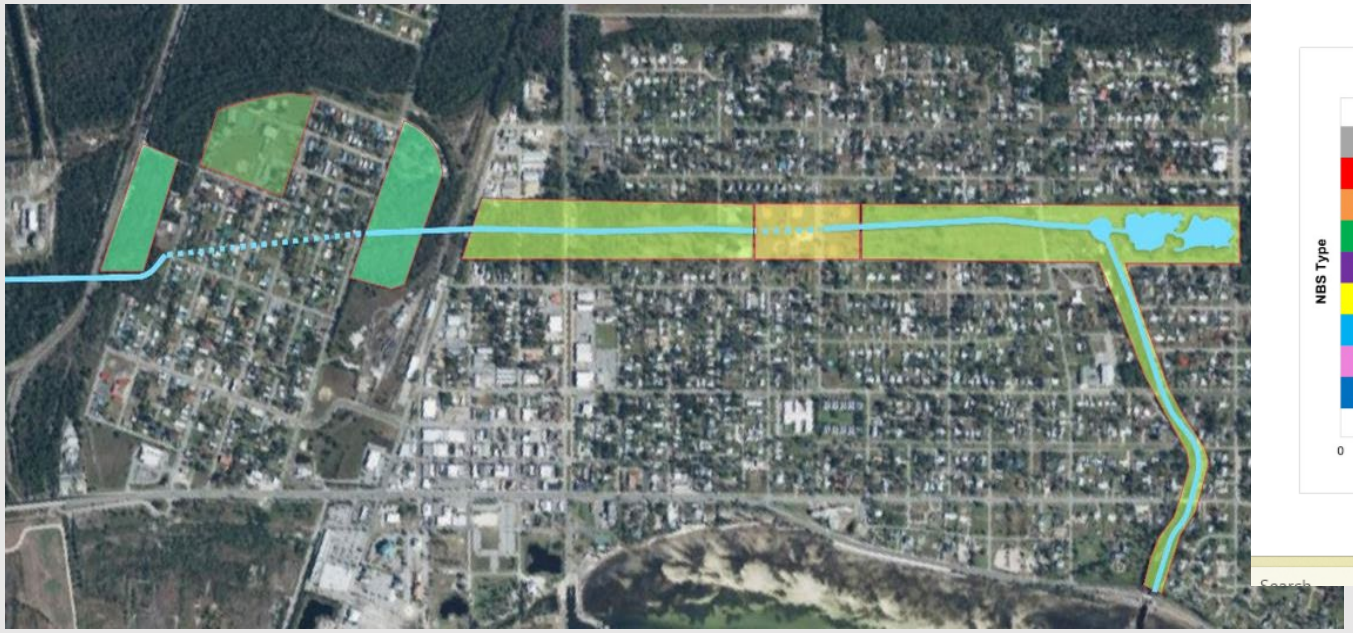


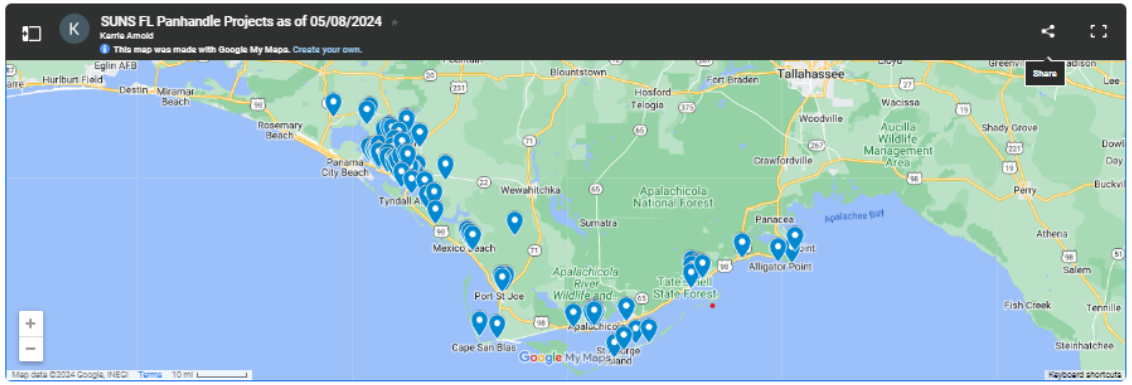
Ensure sufficient water for all existing and future reasonable-beneficial uses and natural systems.

Water Quality

Resilience Strategies:

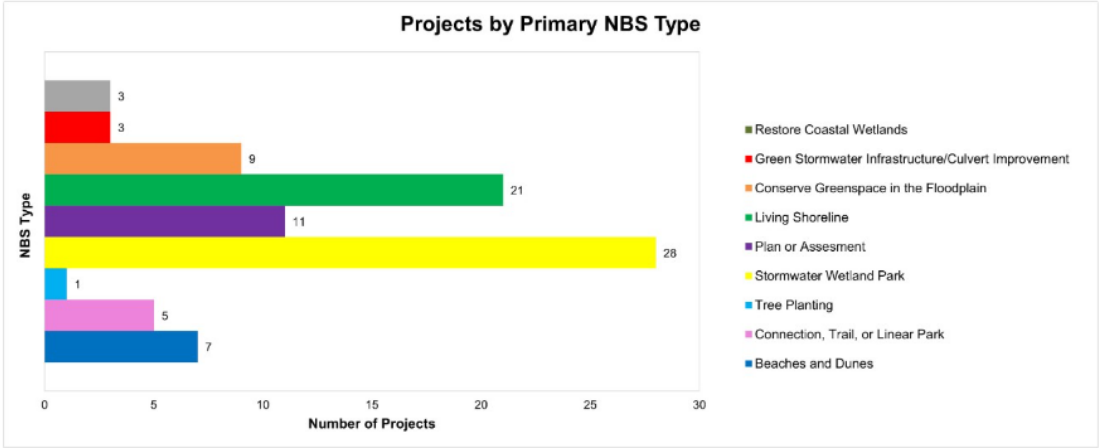
- Scaling Up Nature-based Solutions (SUNS)
- Innovative Technology Development
- BMP Implementation





Types of Nature-based Solutions Projects in the Portfolio

The SUNS Portfolio consists of 73 nature-based solution projects, 11 plans or assessments, and 5 connector projects such as linear parks and trails. The graph below depicts the primary NBS type for each project concept, however many of the projects will involve multiple types of nature-based solutions being implemented in a layered approach.



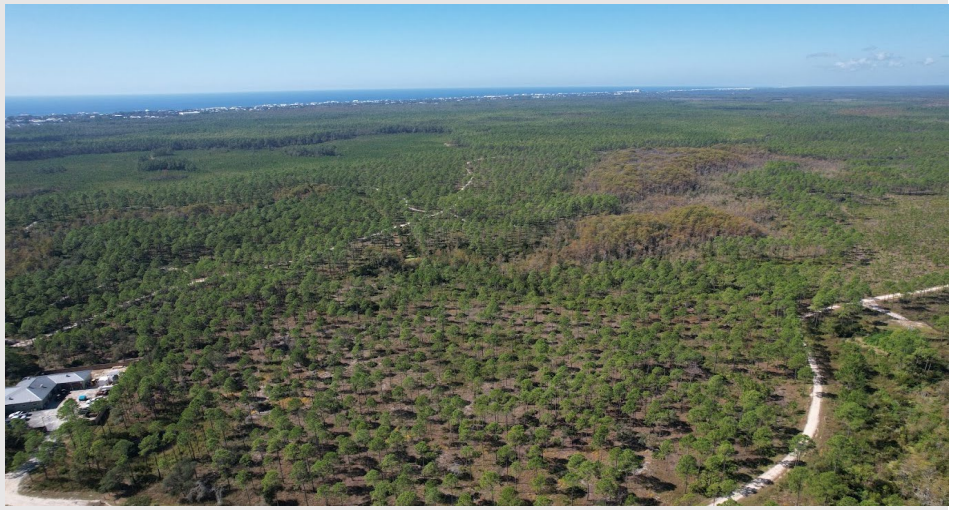
Moving from Planning to Implementation

Protect and improve the quality of the District's water resources.

Water Supply

- Regional Water Supply Planning
  - Water Supply Assessment – Five Year Updates
  - Alternative Water Supply Development
  - Water Resource Development
- Consumptive Use Permitting
- Water Supply Development Assistance Grants
- Alternative Water Supply Grants

Pace Water System



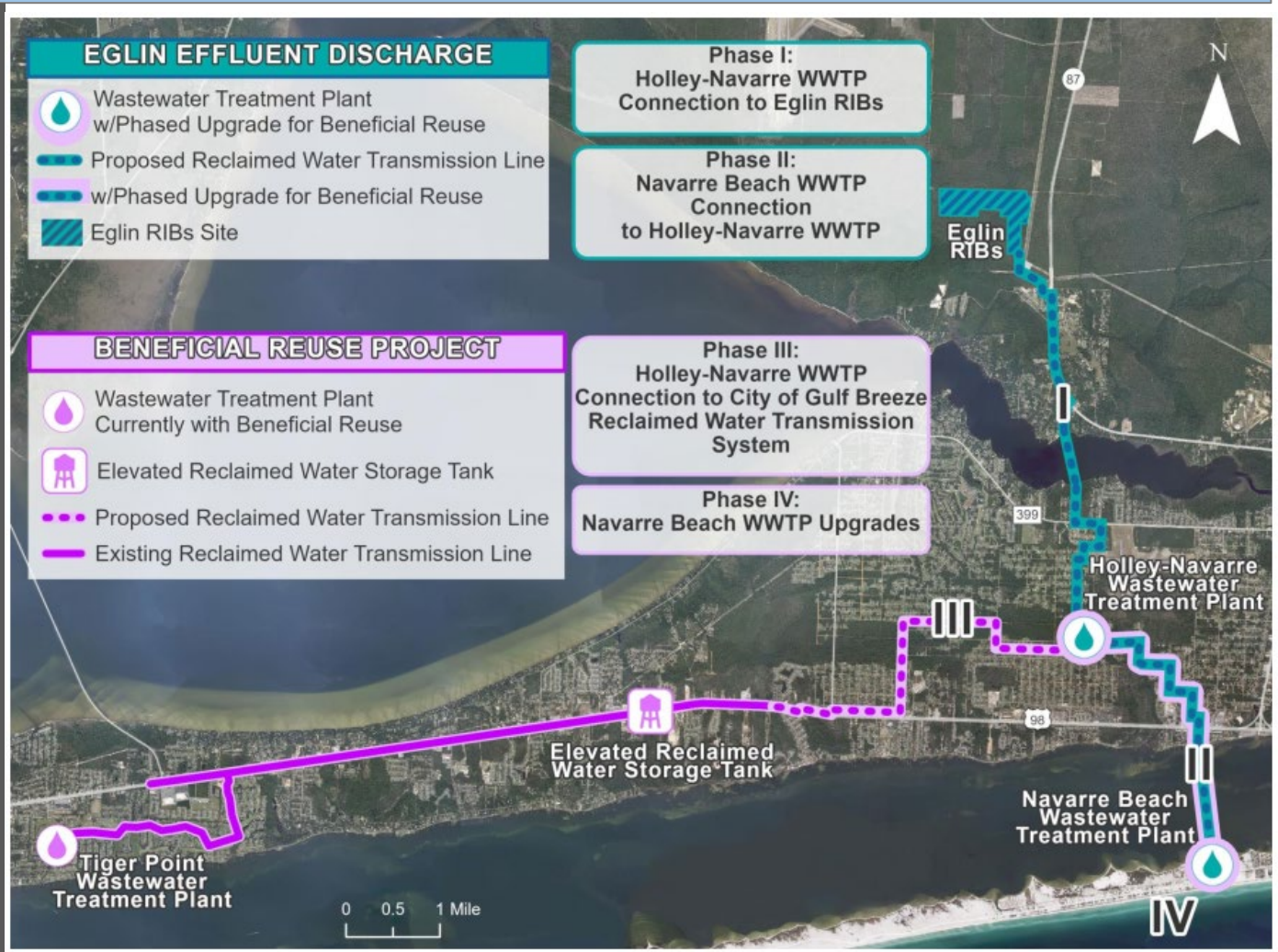
Conservation Park

Ensure sufficient water for all existing and future reasonable-beneficial uses and natural systems.

Water Supply

Resilience Strategies

- Alternative Water Supply Grants Program
- Data collection and scientific investigations
  - Hydrologic and water quality monitoring
  - Hydrogeologic investigations
  - Groundwater flow and transport modeling



South Santa Rosa Beneficial Reuse Plan

Natural Systems

Natural Systems

- Establish Minimum Flows and Minimum Water Levels
- Habitat restoration and protection
  - Living shorelines
  - Hydrologic restoration projects
- Land acquisition and management for water resources protection

Live Oak Point

Natural Systems

Confluence of Pea and Choctawhatchee Rivers – Watershed Level Restoration

Highway 30A Living Shoreline site

Resilience Strategies

- Collect data, perform scientific evaluations, and provide technical support

- Leverage local and regional partnerships to implement at-scale restoration

Darryl Boudreau

Resource Planning Program Manager

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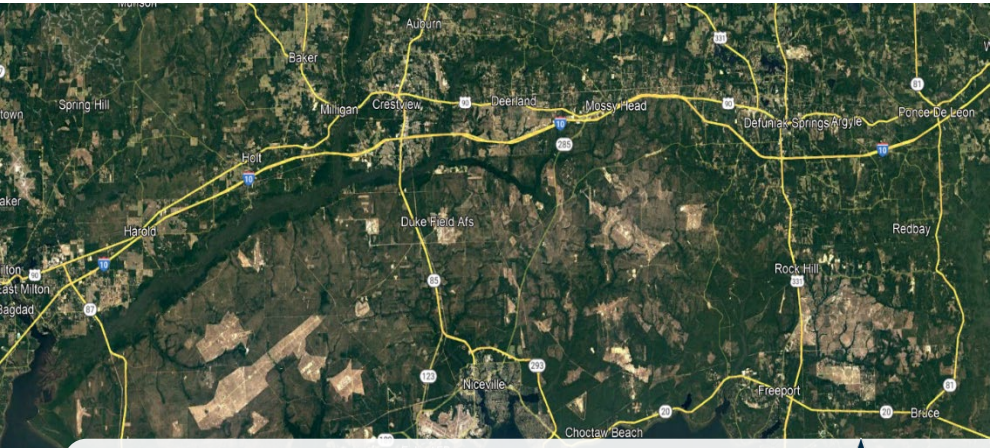
www.nwfwater.com

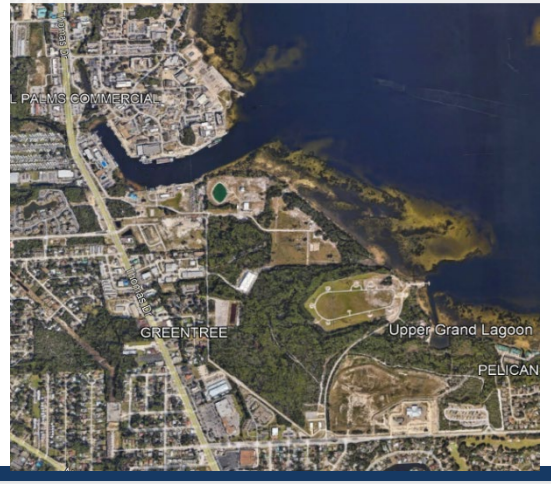


EMERALD COAST MILITARY INSTALLATION

RESILIENCY REVIEW

Resiliency Workshop

June 21, 2024



Funded in part by DOD - OLDCC

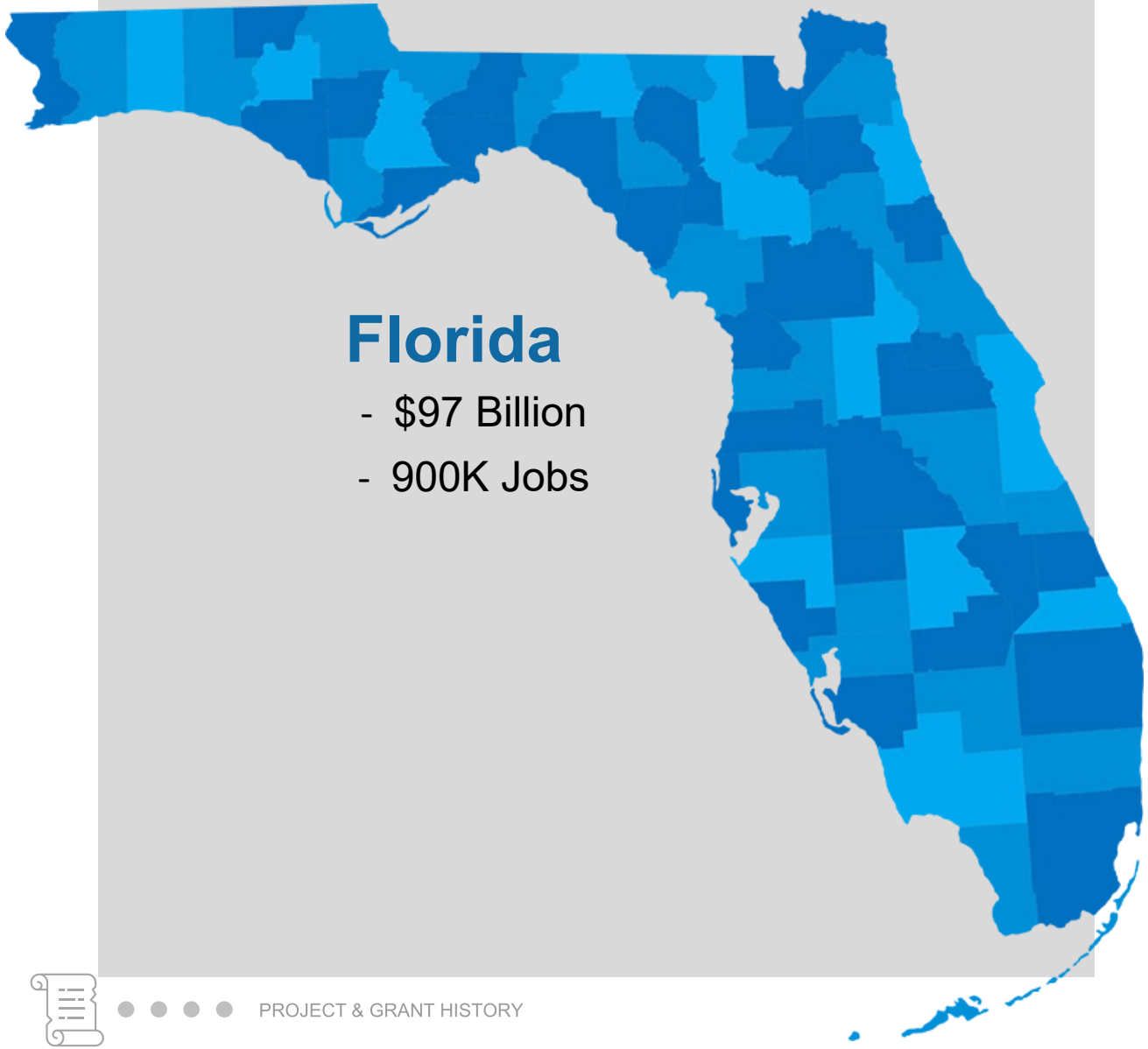
MIRR OVERVIEW & BACKGROUND

- Two-Year (+) Journey for Northwest Florida
- Recognized Need to Align & Coordinate Civilian/Military Community Resilience Efforts
- Unique Assets & Interdependencies
  - Naval Air Station Pensacola
  - Naval Air Station Whiting Field
  - Eglin Air Force Base
  - Hurlburt Field
  - Naval Support Activities
  - Tyndall Air Force Base
- State & DoD Partnership
  - Florida Defense Support Task Force
  - Office of Local Defense Community Cooperation
- Regional Council Model Replicated
  - Tampa Bay RPC – MacDill AFB
  - South Florida RPC
  - East Central Florida RPC
  - Northeast Florida RPC

PROJECT PURPOSE

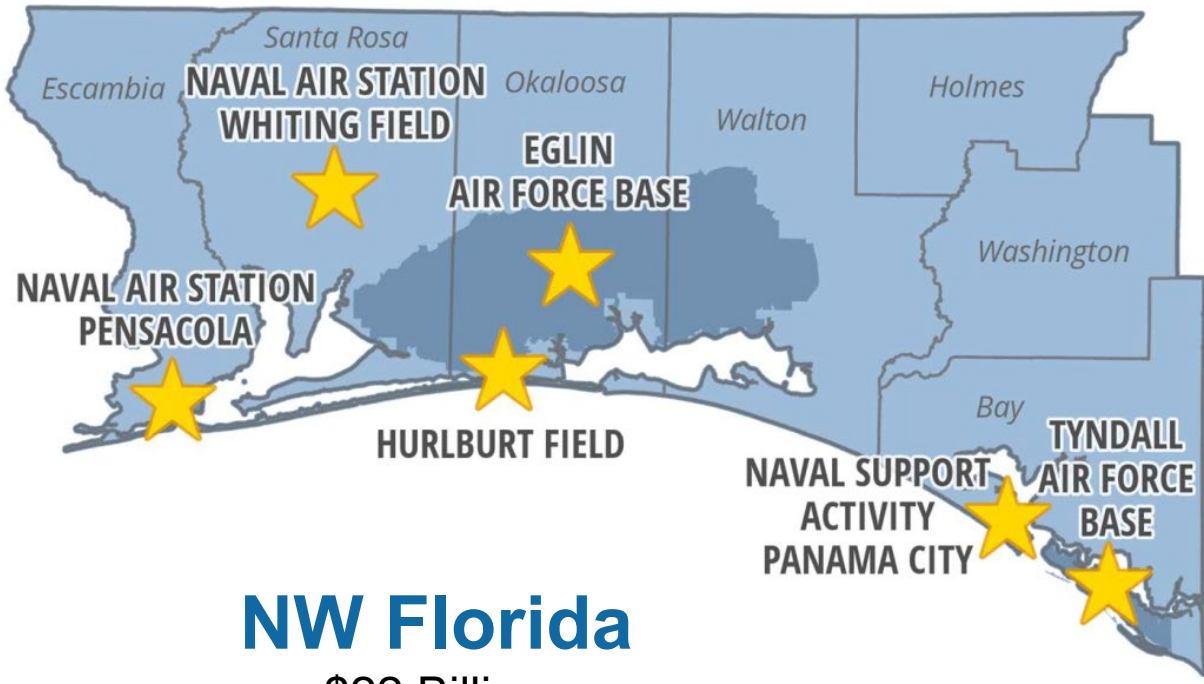
The purpose of the MIRR is to identify the risks, hazards, and vulnerabilities of concern as it relates to the ability of the military to carry out its missions on the installation that could be mitigated through investments and solutions ***outside the fence line in the community.***

ANNUAL DEFENSE ECONOMIC IMPACTS



Florida

- $97 Billion
- 900K Jobs



NW Florida

- $22 Billion
- 200K Jobs
- 33% of GRP in Region

MIRR PATHWAY TO IMPLEMENTATION

U.S. Department of Defense
Office of Local Defense
Community Cooperation

EMERALD COAST REGIONAL COUNCIL

Jacobs

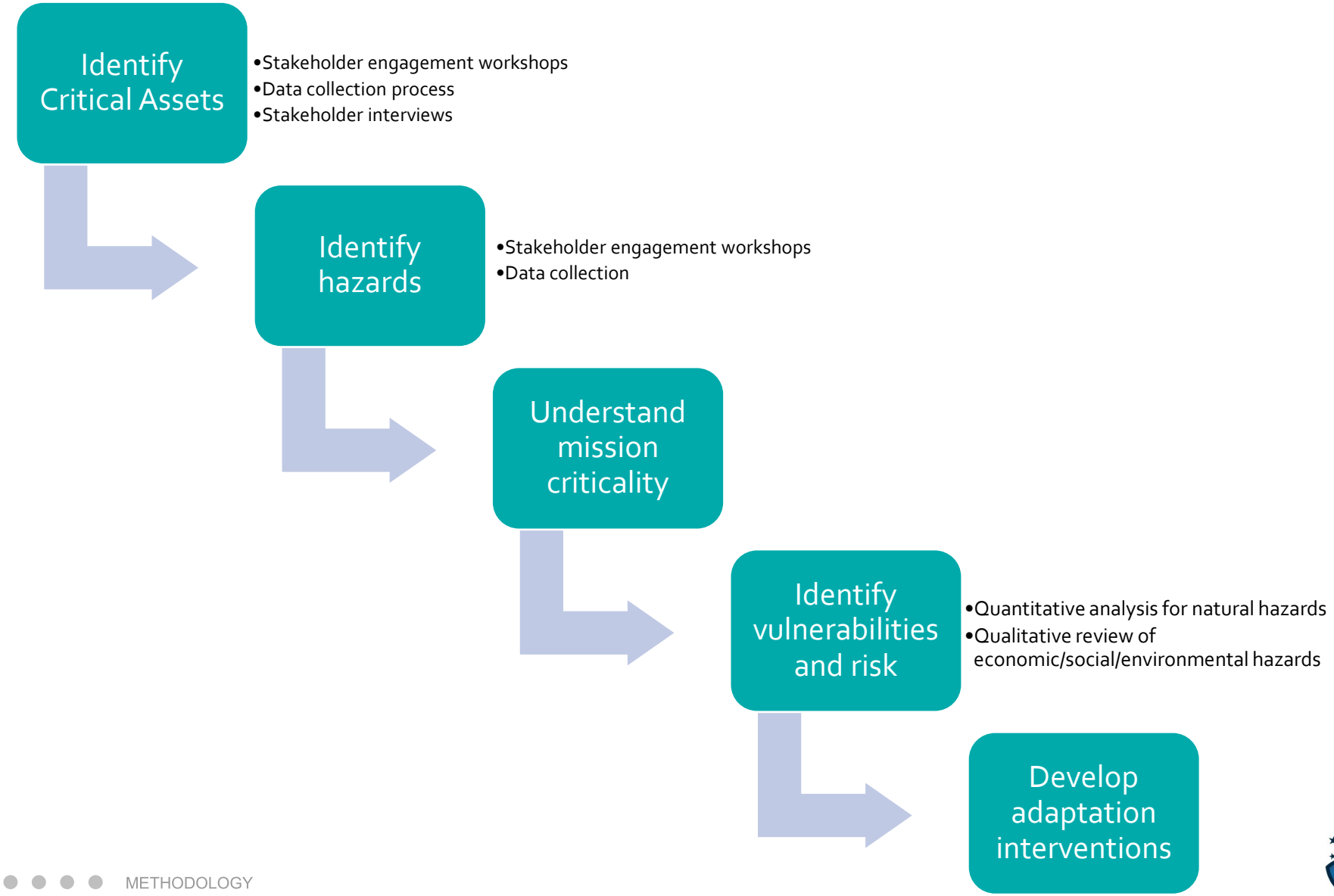
MIRR

Clearly defined
Opportunities
= Implementation
$$$

Others

Risk and Vulnerability Assessment Methodology Review

METHODOLOGY OVERVIEW



HAZARD TYPOLOGIES

1. Natural Hazards

- Flooding
- Extreme Heat
- Sea Level Rise
- Wildfire
- Extreme Wind (Hurricanes)
- Lightning

2. Social/Economic/Environmental Shocks & Stresses

- Lack of Childcare
- Lack of Attainable Housing
- Lack of school capacity
- Encroachment
- High cost of living
- Water Quality
- Endangered Species

3. Infrastructure Shocks & Stresses

- Aging Infrastructure
- Utility service capacity
- Lack of redundant utility service
- Power and Communications Outages

METHODOLOGY FOR CATEGORIZING ASSETS

Primary Mission Critical Assets : Assets specifically identified as crucial for the primary mission by stakeholders and experts

Secondary Mission Critical Assets: Assets specifically identified as being crucial for the installation's secondary mission by stakeholders and experts

Mission Supportive Assets: Assets that support the community and installation personnel within the community

- Health care facilities, hospitals, emergency operation centers, emergency medical facilities
- Law enforcement, local government facilities, and state government facilities
- Airports, railroads, and non-installation adjacent streets
- Community infrastructure assets (local water systems, private lift stations, neighborhood roads)

Additional Vulnerabilities: Any additional general vulnerabilities noted by stakeholders

Vulnerability Assessment Methodology Review

- Asset **EXPOSURE** to Natural and Operational Threats based on Proximity
- Asset **SENSITIVITY** based on Effects from Exposure

→ Asset **VULNERABILITY** (Exposure to assets may result in Impacts and service Interruptions)

Once vulnerable assets are identified, a risk score is calculated for high-vulnerability assets.

High Vulnerability Asset →

- **LIKELIHOOD of Hazard Occurring**
- **CONSEQUENCE of Hazard Event Occurring**
- **IMPACT ON MISSION**

→ Cumulative Asset Score: RISK TO MISSION

ADAPTATION METRICS

MISSION CRITICALITY

Supports the execution of the mission(s) of the Installations and aligns with stakeholders-stated priorities.

35%

FUNDING OPPORTUNITIES

Avenues are available to obtain money for the intervention. If there is an existing project that needs support and elevation, funding opportunities are available.

25%

FEASIBILITY

The owner is committed to the project and has necessary staff and resources available to support implementation, the readiness of the project for implementation (shovel-readiness), and the project has been previously identified as a need.

20%

LONG-TERM COSTS

The intervention will not have monumental long-term O&M cost.

10%

Community Resilience Benefits

Benefits outside of the primary benefit tied to community priorities (e.g., environmental, social, economic) can be achieved.

10%

ADAPTATION: ORGANIZING POTENTIAL PROJECTS/BENEFITS BY TYPOLOGY

PHYSICAL INFRASTRUCTURE

- Transportation & Transit
- Power (Electric, Natural Gas & Alternatives)
- Communications
- Shoreline Structures
- Potable Water & Wastewater
- Stormwater

SOCIAL INFRASTRUCTURE

- Community & Emergency Response Services
- Affordable Housing, Mobility & Ease of Access
- Public Policy & Design
- Health, Safety & Welfare
- Education & Childcare
- Recreation, Conservation & Open Space

NATURAL INFRASTRUCTURE

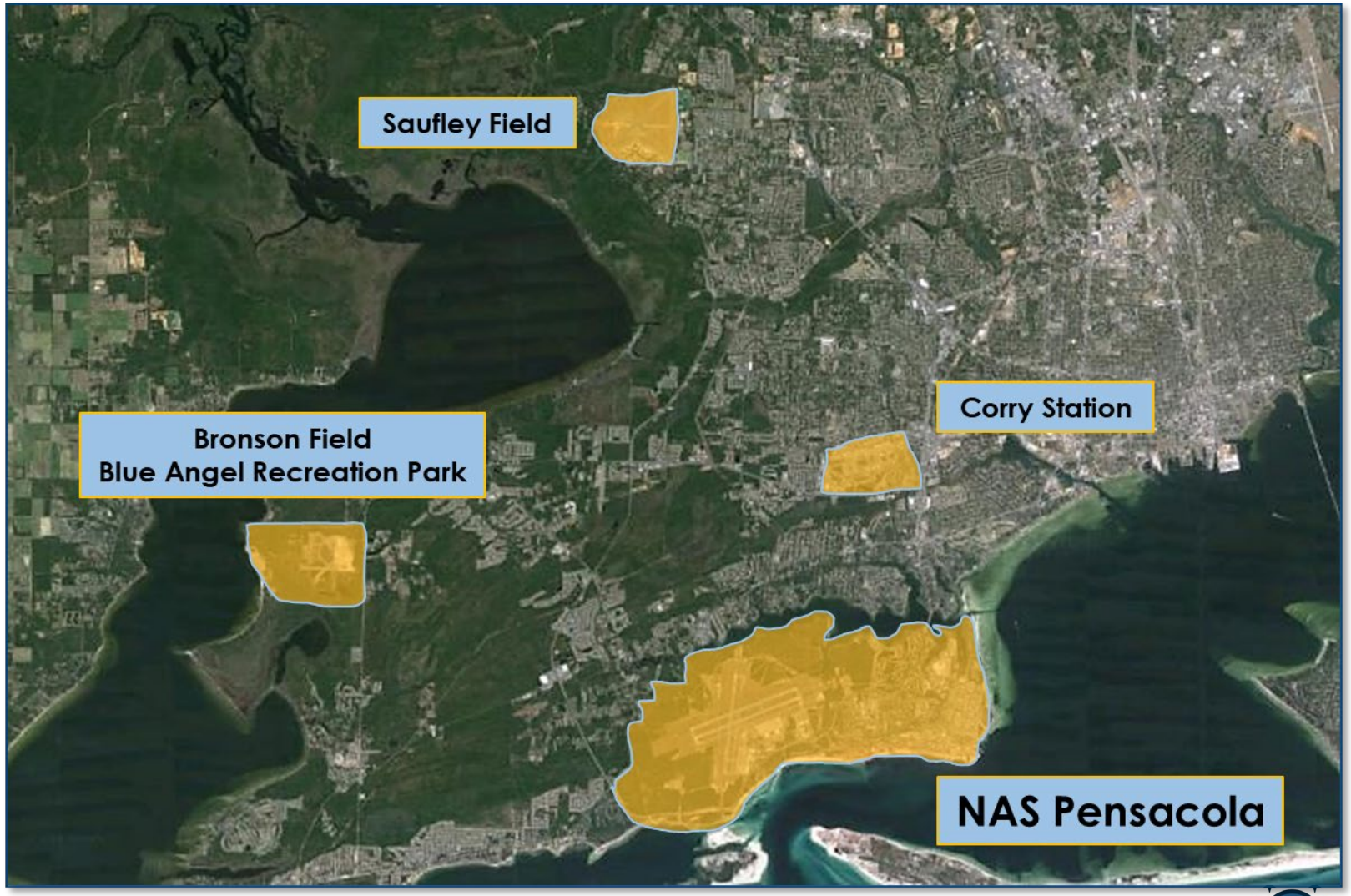
- Geology: Coastal Texture
- Geology: Topography
- Ecology: Bays, Marshes & Rivers
- Ecology: Water Quality & Availability

ECONOMIC INFRASTRUCTURE

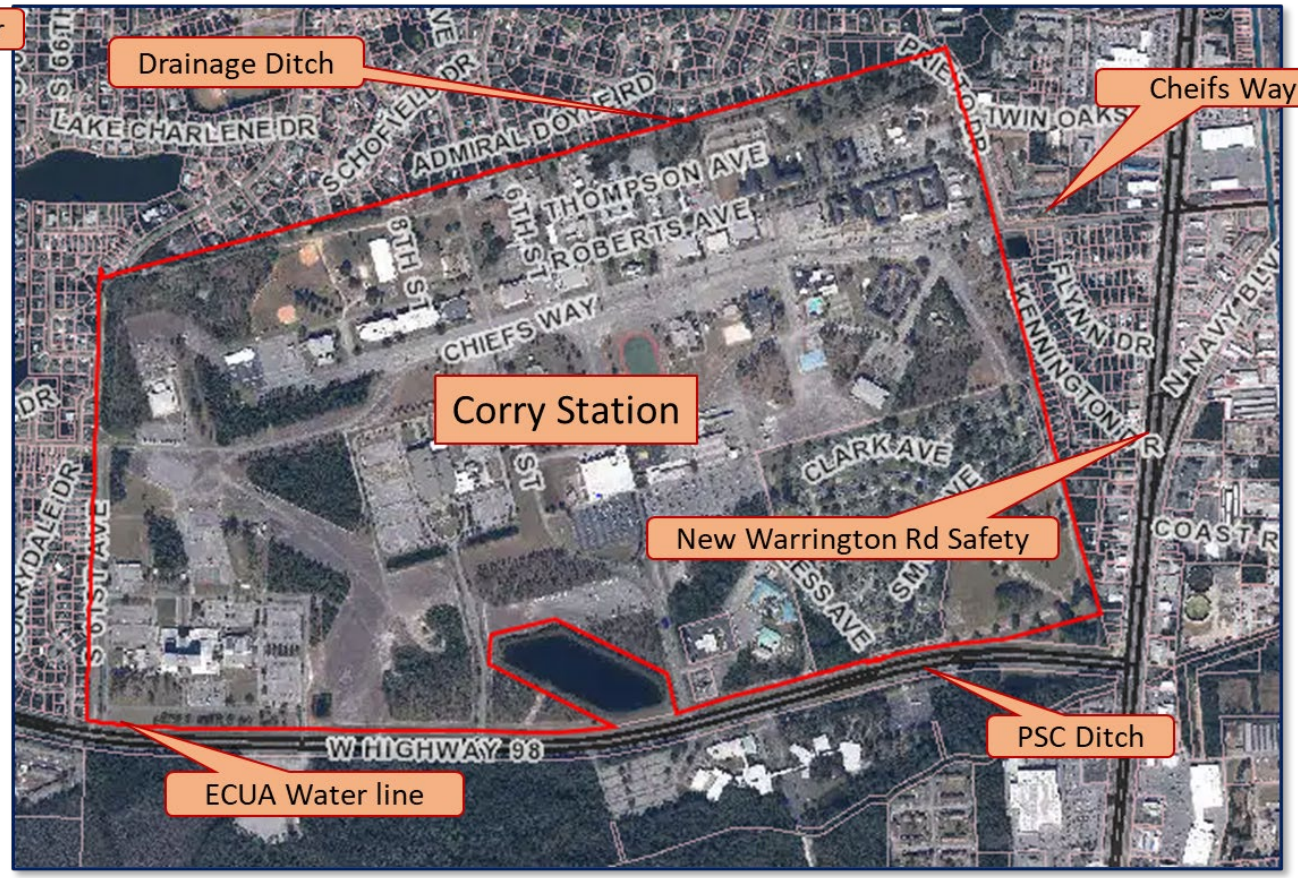
- Thriving Business (Retail, Restaurants & Entertainment)
- Job Market / Living Wage
- Resilient Supply Chain
- Commercial Corridors

NAS PENSACOLA

NAS PENSACOLA - AREA OF RESPONSIBILITY



NAS PENSACOLA - RESILIENCE FOCUS AREAS

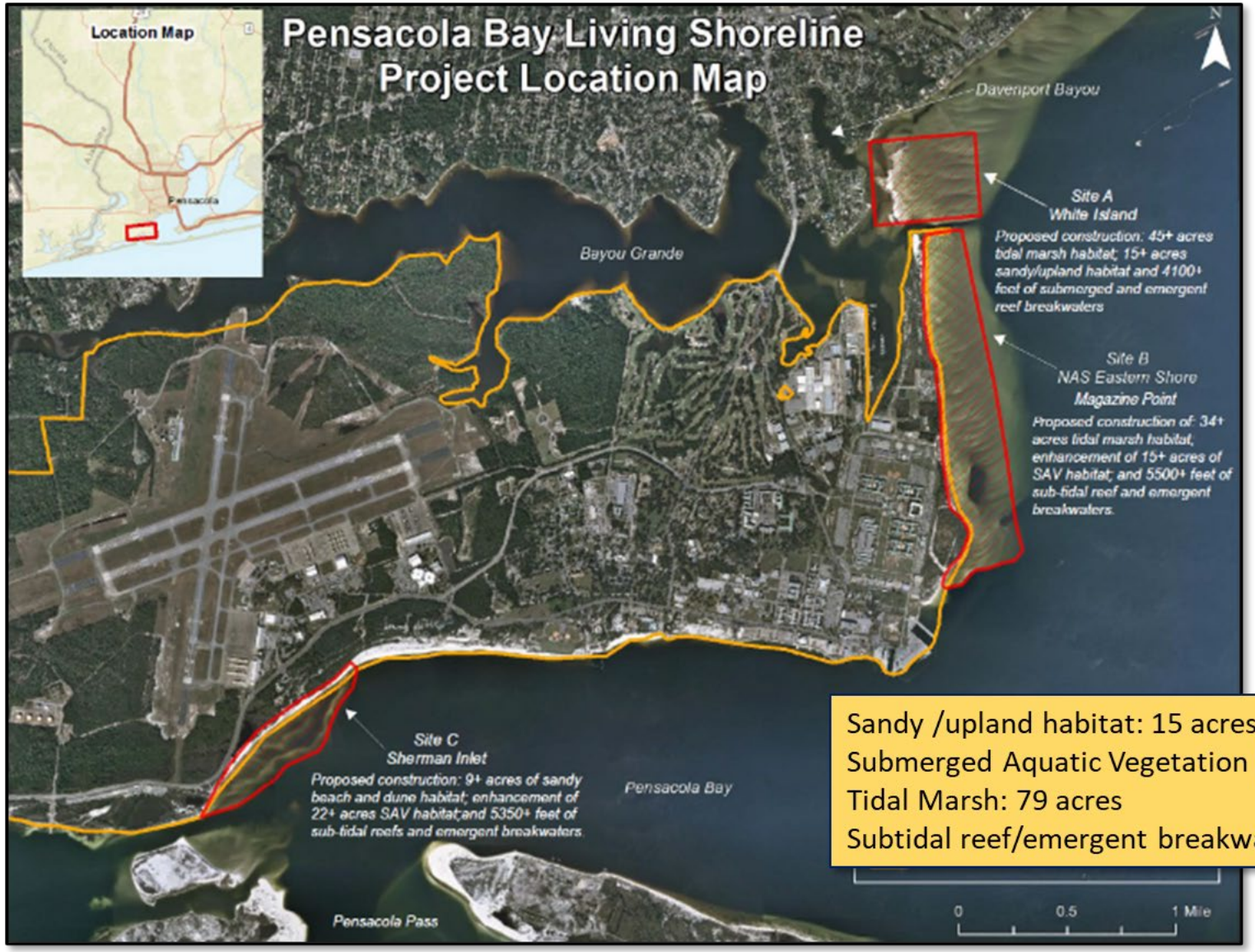


NAS PENSACOLA

- **Resiliency Projects Planned/Underway**
  - Pensacola Bay Living Shoreline, $33M
  - P806 Resiliency 115kv Substation $25M
  - Corry Station Water line – ties WTP to ECUA

- **Energy Conservation**
  - 2018 SECNAV Platinum Energy Award
  - 2019 Federal Energy Management Program Award
  - 2019 & 2020 SECNAV Energy and Water Conservation Gold Award
  - 2021 SECNAV Energy and Water Conservation Blue Award
  - Energy reduction of 18% from the 2015 baseline
  - 65 MW Solar Photovoltaic Project at Saufley Field/Lease with FP&L

NAS PENSACOLA - LIVING SHORELINE



Sandy /upland habitat: 15 acres
Submerged Aquatic Vegetation (SAV): 37 acres
Tidal Marsh: 79 acres
Subtidal reef/emergent breakwaters: 14,950 ft

NAS PENSACOLA

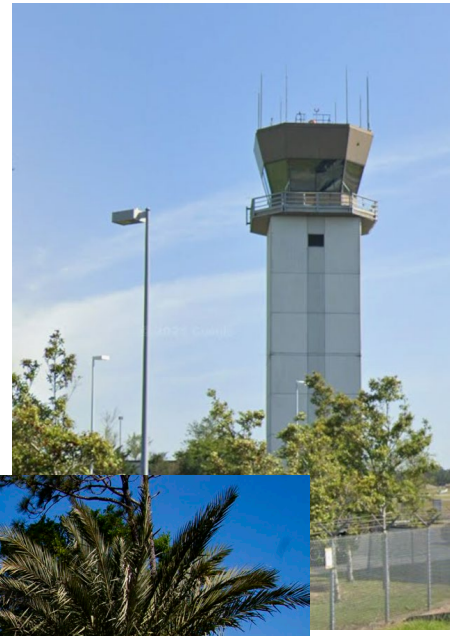
Project	Metric Ranking	Installation Priority
Erosion Control at NASP	7.7	High
Tower improvements at PNS	7.0	Medium
ECUA Resilience Improvements	6.5	Medium
Blue Angel Parkway Improvements	5.7	High
Corry Station Flood Risk Reduction	5.5	High
Navy Boulevard Improvements	5.1	Medium
Gulf Beach Highway	4.9	Low
Navy Point Community Improvements	3.9	Low
Trout Bayou Encroachment	3.4	Low
Alternative Water Line for Corry Station	2.5	Medium

ADAPTATIONS STRATEGIES WORKSHOP – NAS PENSACOLA

Erosion Control at NAS Pensacola	
SHOCKS & STRESSORS	• Coastal erosion along shorelines at NAS Pensacola
EXISTING PROJECTS	• Shoreline Protection
BENEFITS	• Reduces shoreline erosion • Protects against storm surge
PROJECT LEAD	• Escambia County
PARTNERS	• Pensacola and Perdido Bays Estuary Program • NAS Pensacola

ADAPTATIONS STRATEGIES WORKSHOP

PNS Tower Improvements	
SHOCKS & STRESSORS	• Aging infrastructure
EXISTING PROJECTS	• DCIP Grant - Military Aircraft Apron
BENEFITS	• Improve communication • 20% of all tower communications is military related
PROJECT LEAD	• Pensacola Airport



ADAPTATIONS STRATEGIES WORKSHOP – NAS PENSACOLA

Corry Station Flood Risk Reduction	
SHOCKS & STRESSORS	• Corry Station flooding • Warrington area flooding
EXISTING PROJECTS	
BENEFITS	• Improved area stormwater management and flood mitigation
PROJECT LEAD	• FDOT • Escambia County
PARTNERS	• NAS Pensacola

Thank You

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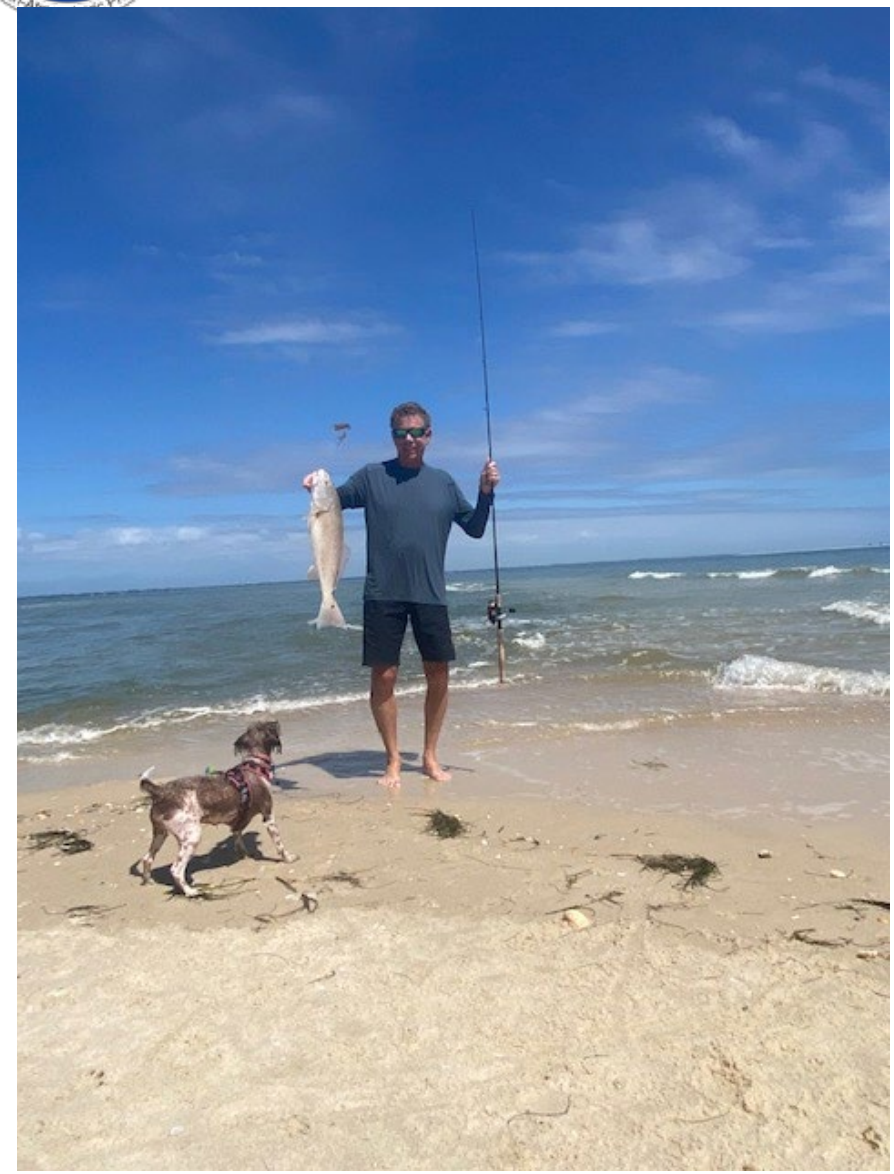
Florida Climate Recap: 2023 and Beyond



David F. Zierden

Florida State Climatologist

Center for Ocean Atmospheric Prediction Studies

The Florida State University

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Northwest Florida Regional Resiliency Seminar

June 21, 2024

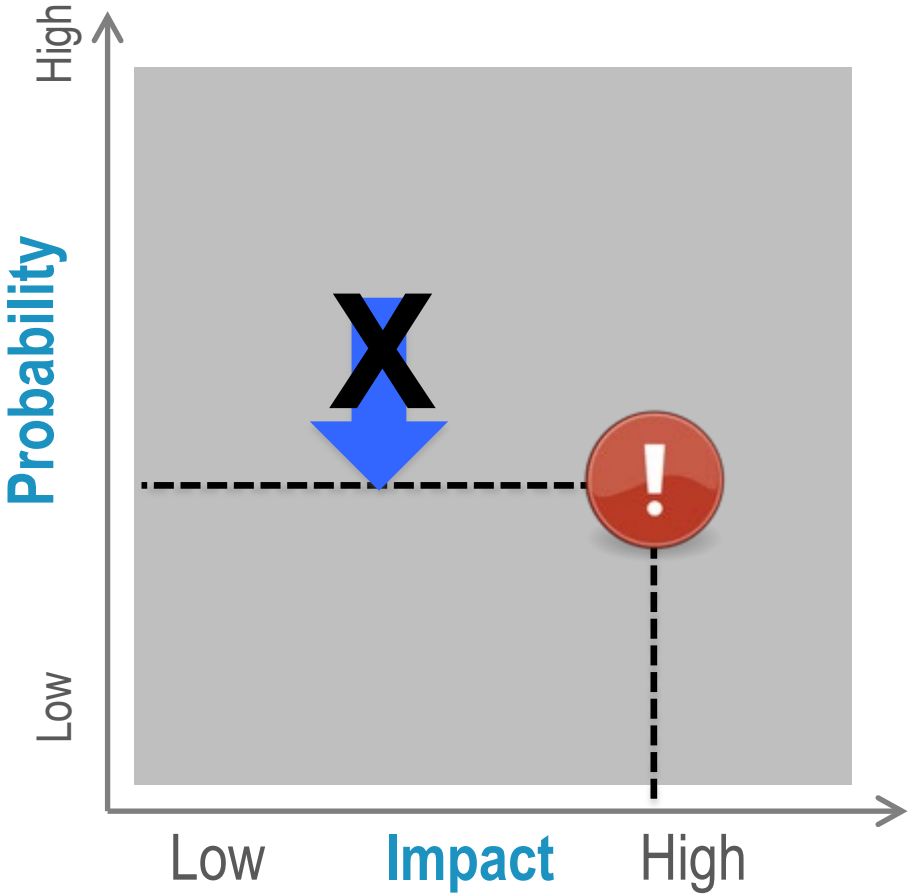
Climate/Weather Threats

- Changes in temperature, extreme temperature
- Extreme rainfall and flooding
- Drought
- Sea level rise
- Hurricanes and tropical storms
- Severe weather

Defining Risk

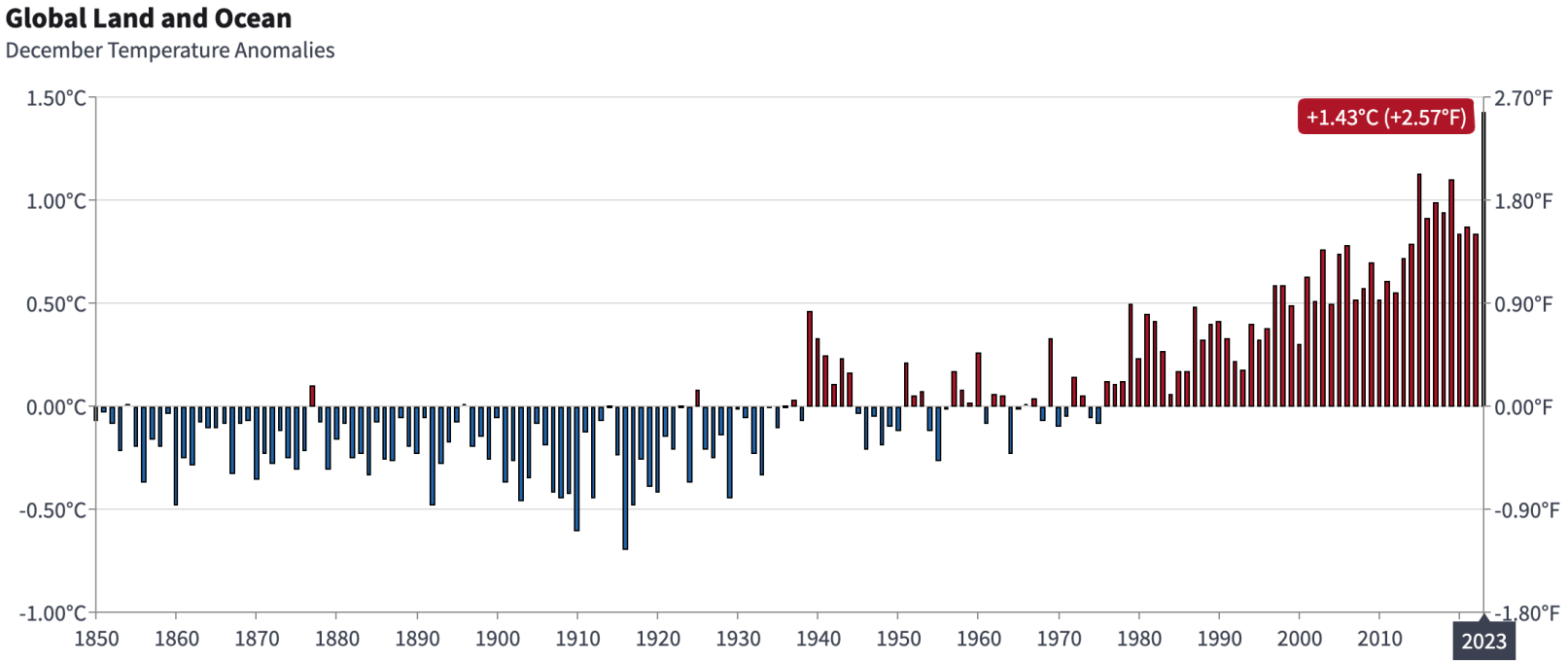
Risk = Threat X Exposure

(Probability) (Impact, vulnerability)



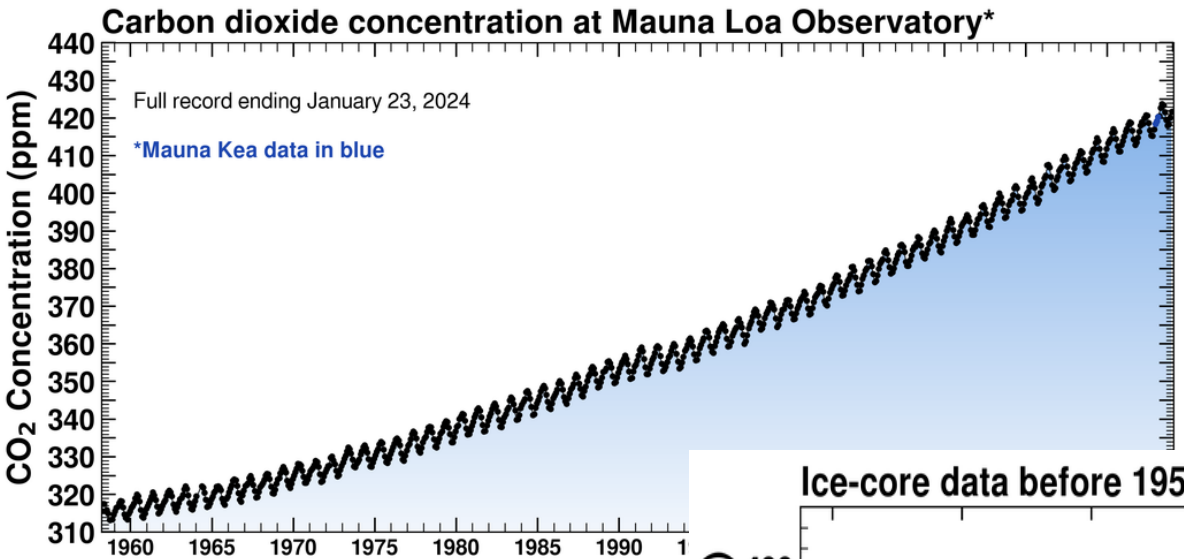
Resilient Florida Grant Program - $235 million in 2022/2023

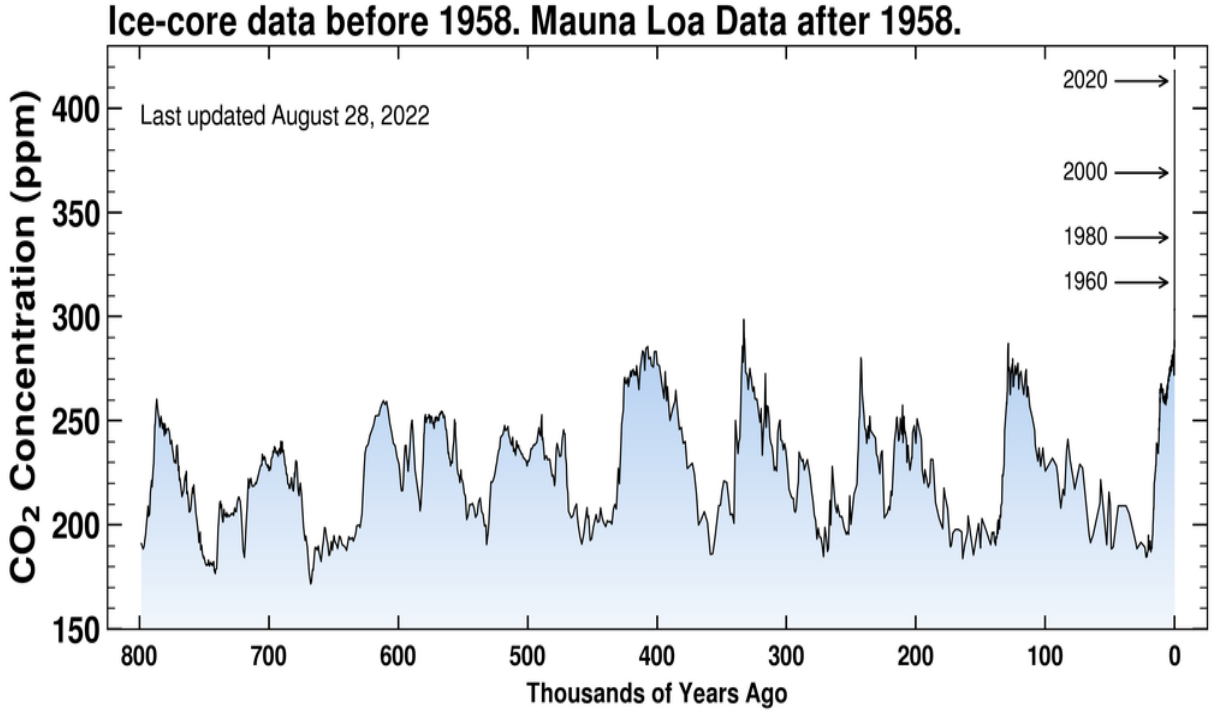
Global Average Temperature



- July 2023 warmest month on record by 0.2 C
- Both land and ocean temperatures contributing
- 12 consecutive months of record temperature, including January-May of 2024

Carbon Dioxide Concentrations

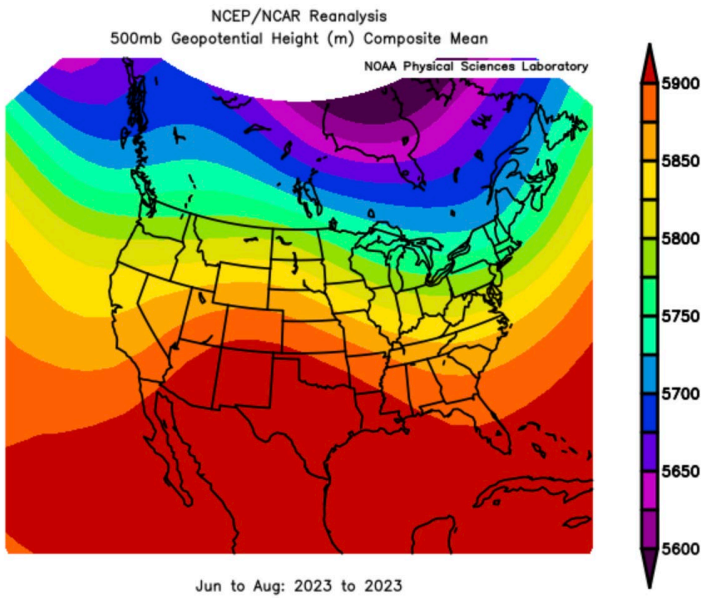


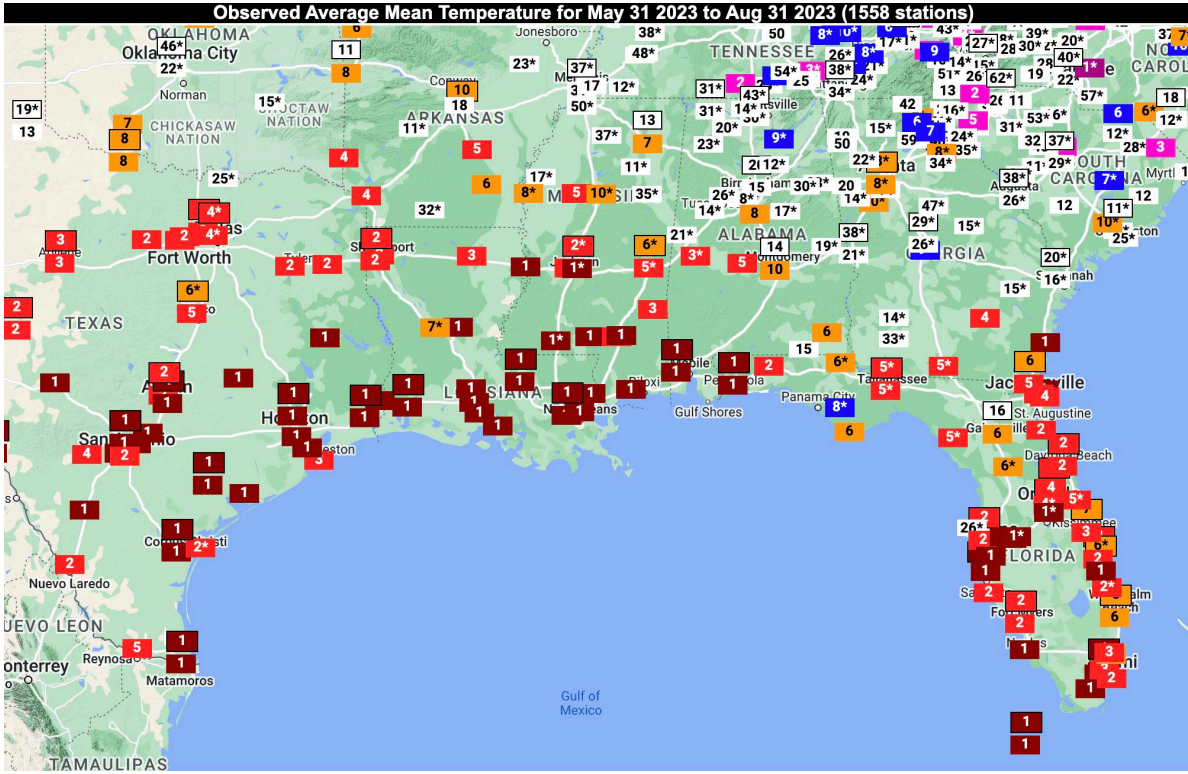



Florida State University
COAPS
Center for Ocean-Atmospheric Prediction Studies

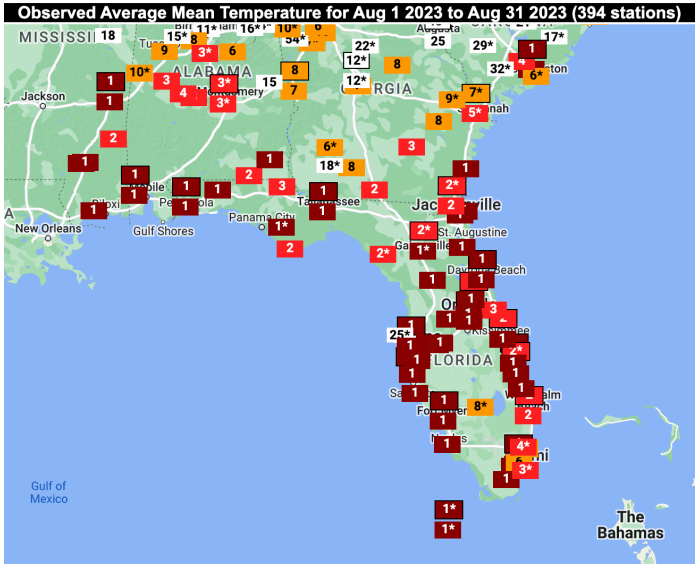
Summer Heat

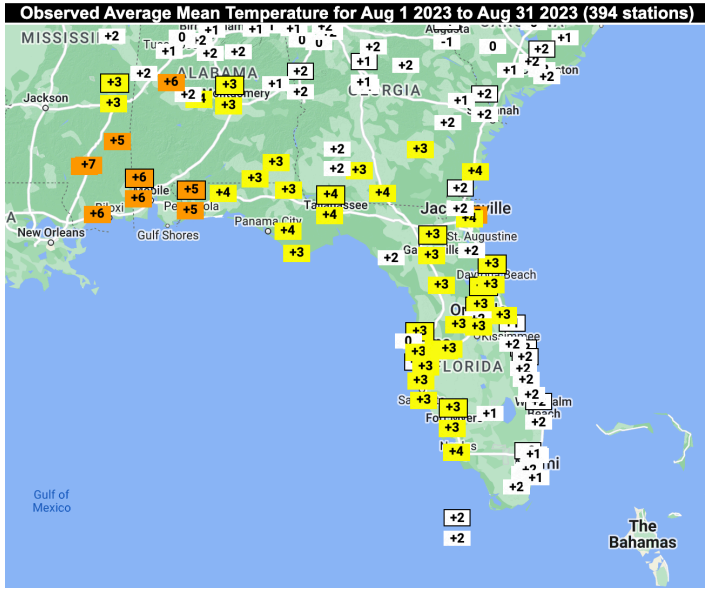
Southeast Summer (JJA) Rankings





Florida Summer Rankings

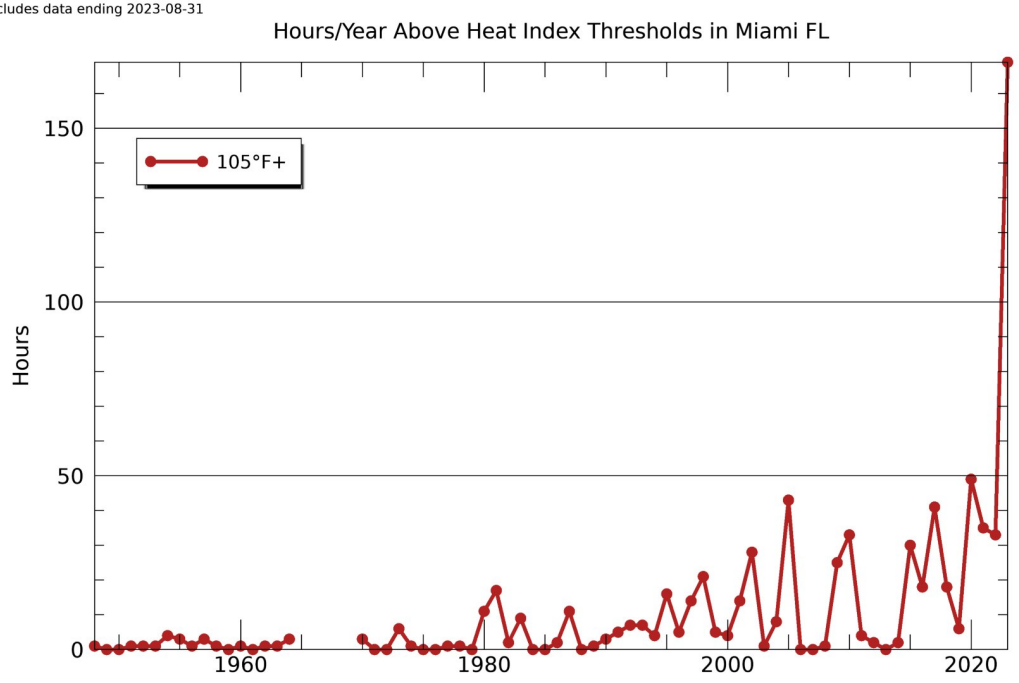




- Florida statewide average temperature was hottest on record in July at 84.2 degrees F. (June 1998, 84.1)
- August average temperature crushes the record at 85.0
- Summer average temperature tied for second warmest (1998, 2010)

Miami Heat

Includes data ending 2023-08-31



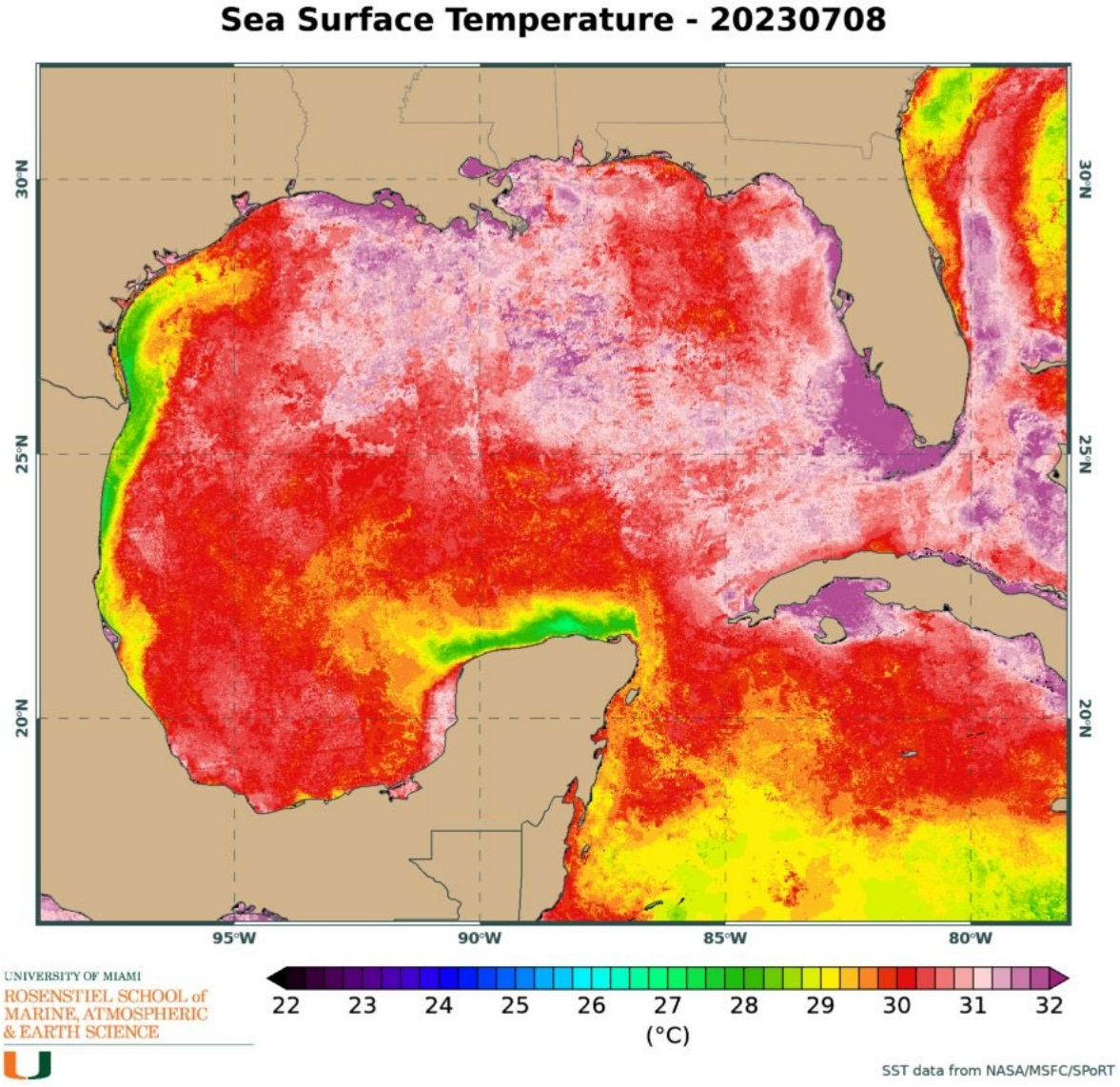
Brian McNoldy – University of Miami RSMAS

Jane Gilbert – Extreme Heat Officer Miami

National Integrated Heat Health Information System

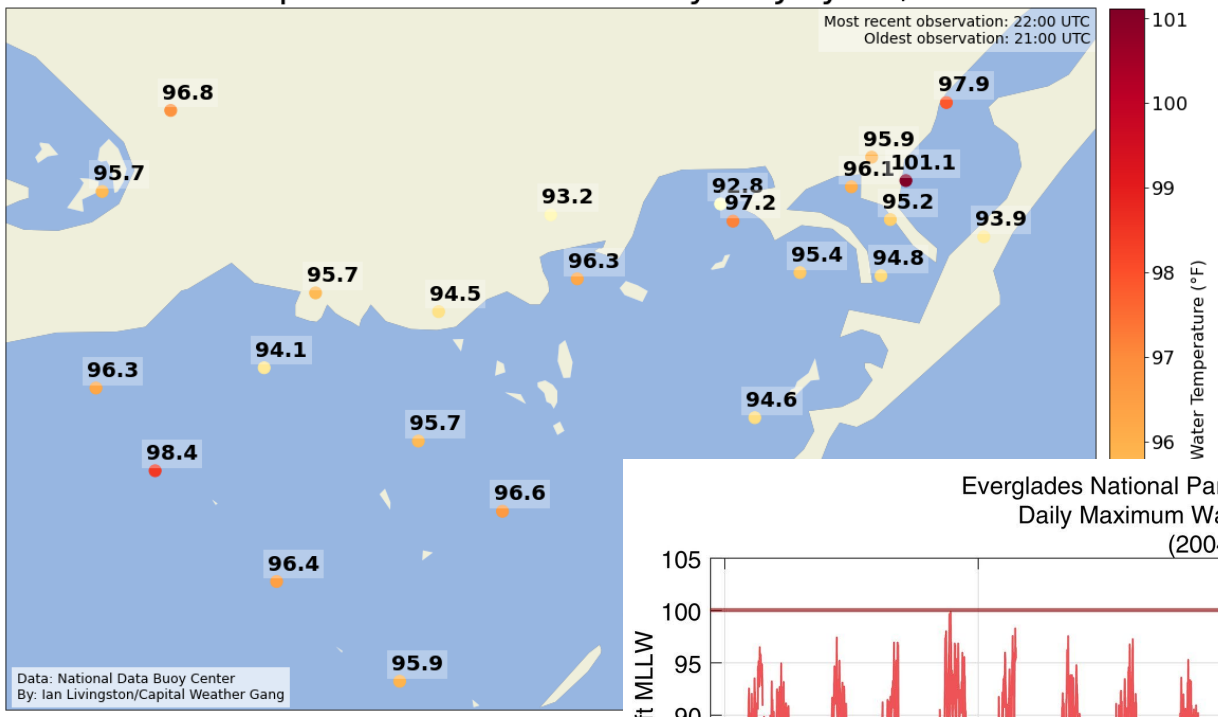
Heat Index Threshold	Consecutive Days (1st)	Ending Date	Consecutive Days (2nd)	Ending Date	Consecutive Days (3rd)	Ending Date
100°F+	***38***	***20230718***	32	20200906	30	20170730
101°F+	***22***	***20230718***	21	20200905	21	20110811
102°F+	***22***	***20230718***	20	20200711	17	20170730
103°F+	20	20200711	***17***	***20230718***	13	20170908
104°F+	***16***	***20230717***	13	20170908	6	20220822
105°F+	***16***	***20230717***	8	20170908	6	20220822
106°F+	***13***	***20230717***	4	20220820	3	20220911
107°F+	***5***	***20230711***	3	20220911	3	20170905
108°F+	***3***	***20230711***	***2***	***20230717***	***2***	***20230624***
109°F+	***2***	***20230717***	***2***	***20230710***	***1***	***20230713***
110°F+	***2***	***20230710***	***1***	***20230716***	1	20210703

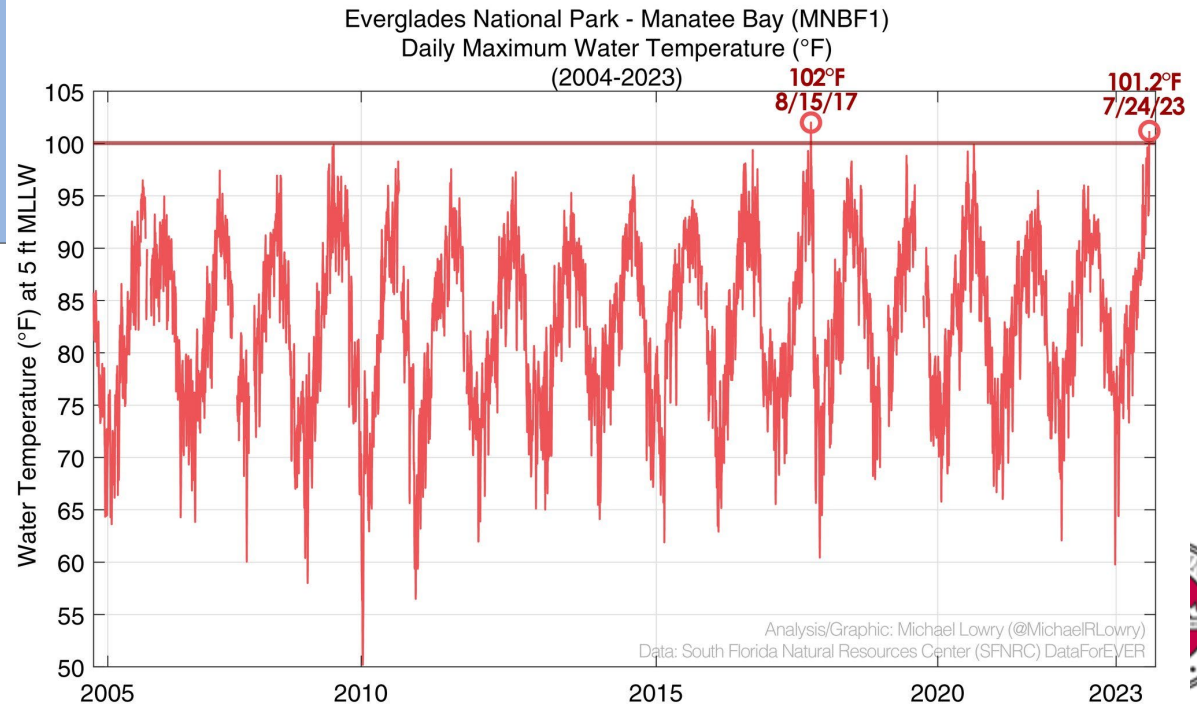
July Sea Surface Temperatures



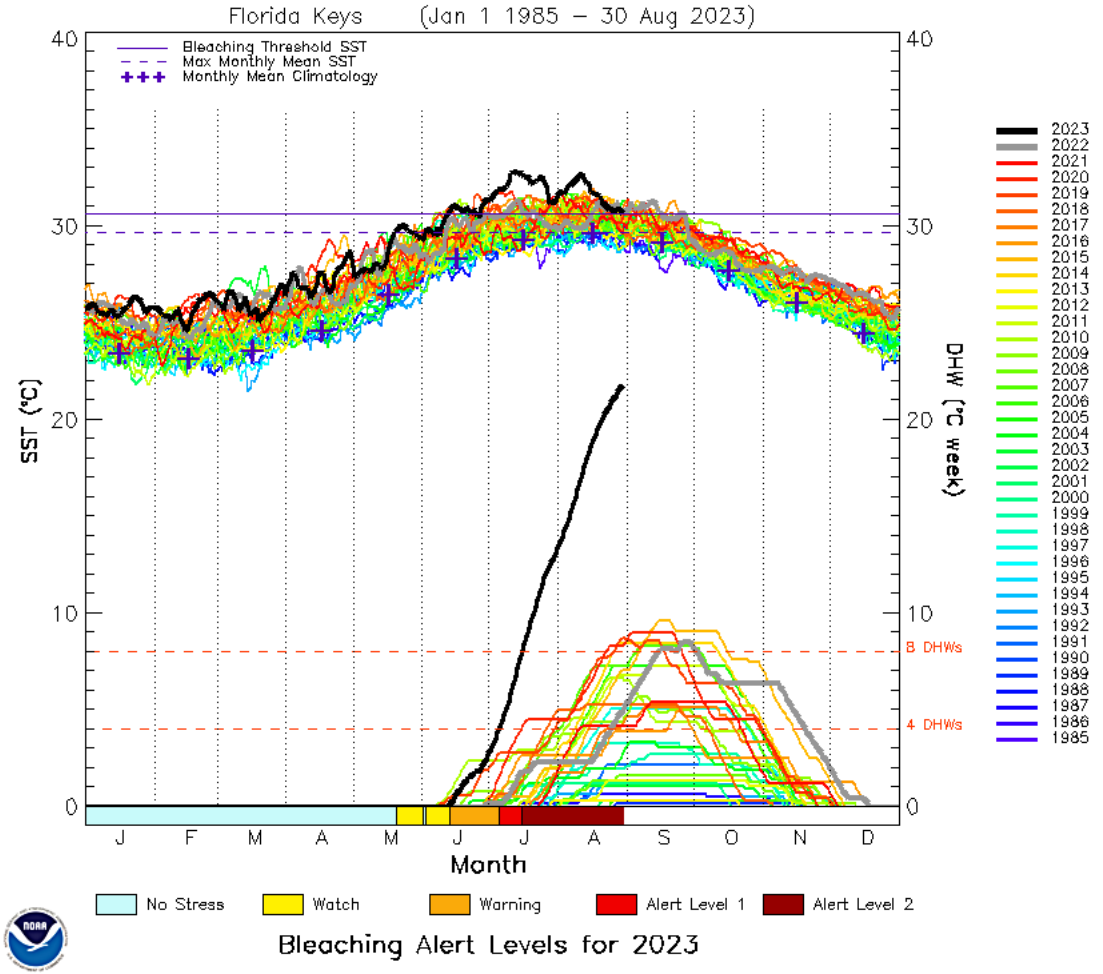
Florida Bay Water Temperatures

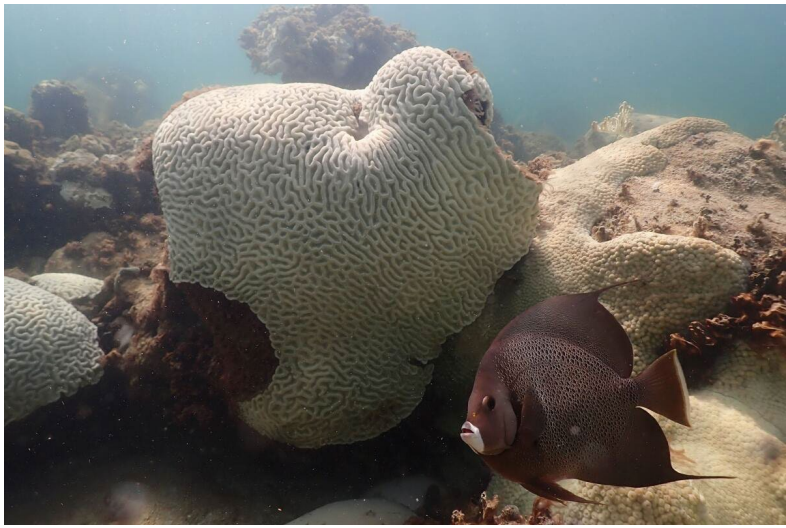
Water temperatures in Florida Bay on July 24, 2023





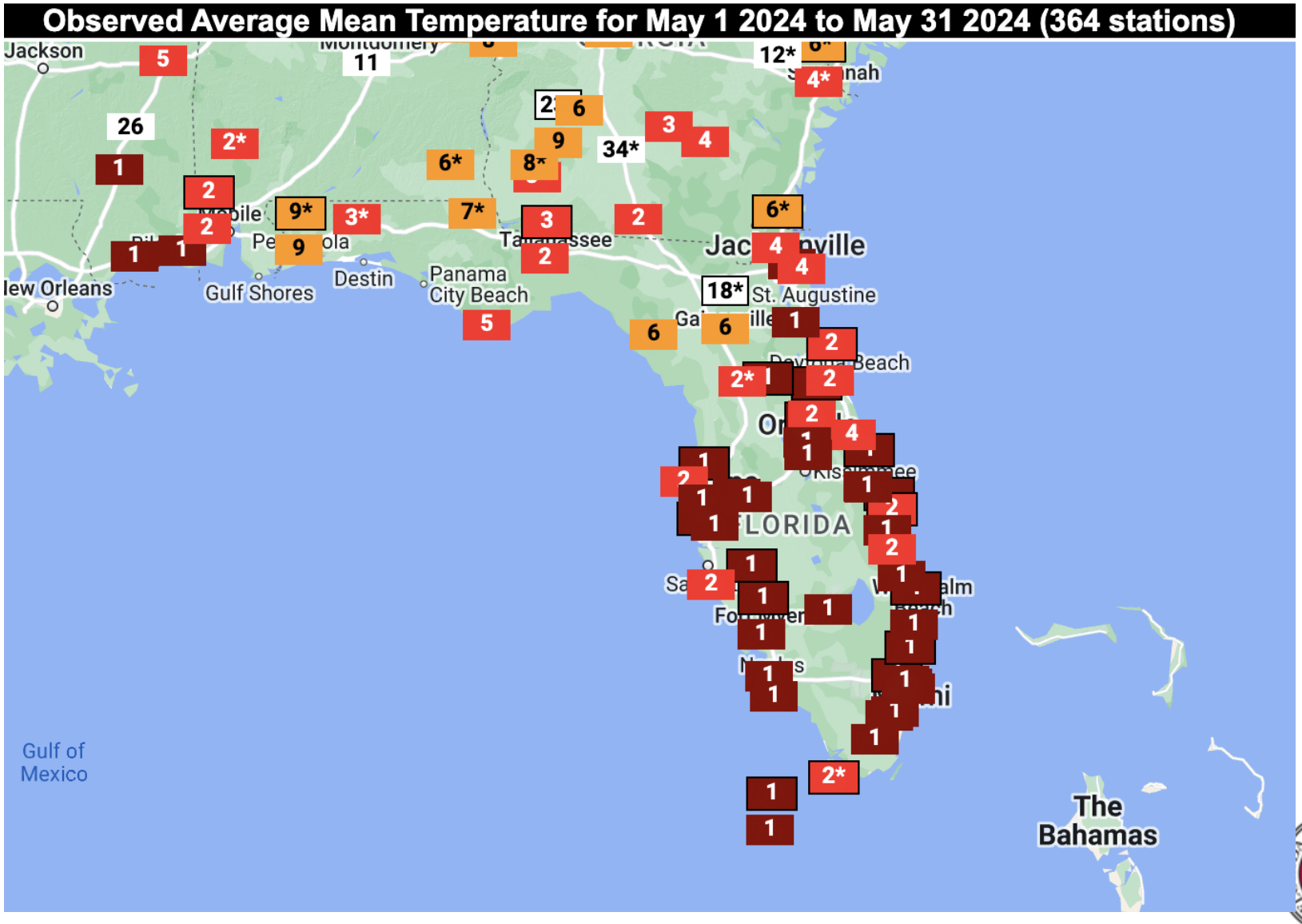
Coral Bleaching





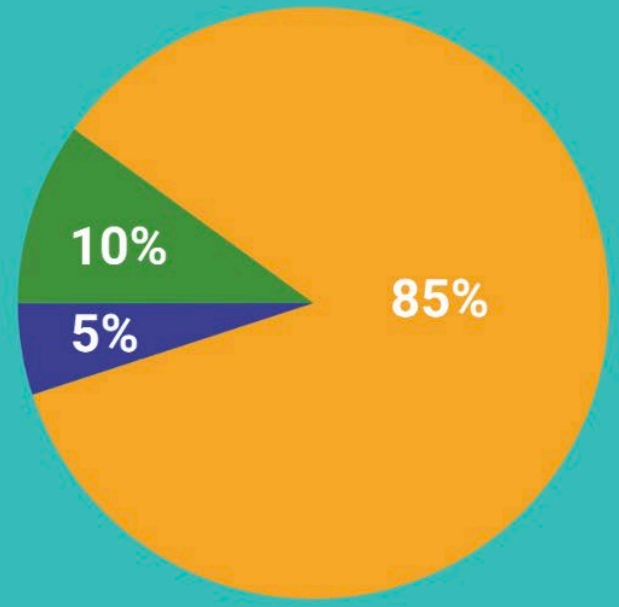
Degree Heating Weeks (DHW) – 12 week running sum of water temperatures over the bleaching threshold (NOAA Coral Reef Watch)

May Heat


Observed Average Mean Temperature for May 1 2024 to May 31 2024 (364 stations)
Jackson
Montgomery
Mobile
Pensacola
Tallahassee
Jacksonville
New Orleans
Gulf Shores
Destin
Panama City Beach
St. Augustine
Daytona Beach
Orlando
Kissimmee
FLORIDA
Fort Myers
Naples
Miami
West Palm Beach
Gulf of Mexico
The Bahamas

Hurricane Season

2024 Atlantic Hurricane Season Outlook



Above normal Near normal Below normal

Season probability

Named storms
17 - 25

Hurricanes
8 - 13

Major hurricanes
4 - 7

Be prepared: Visit hurricanes.gov and follow @NWS and @NHC_Atlantic on X.

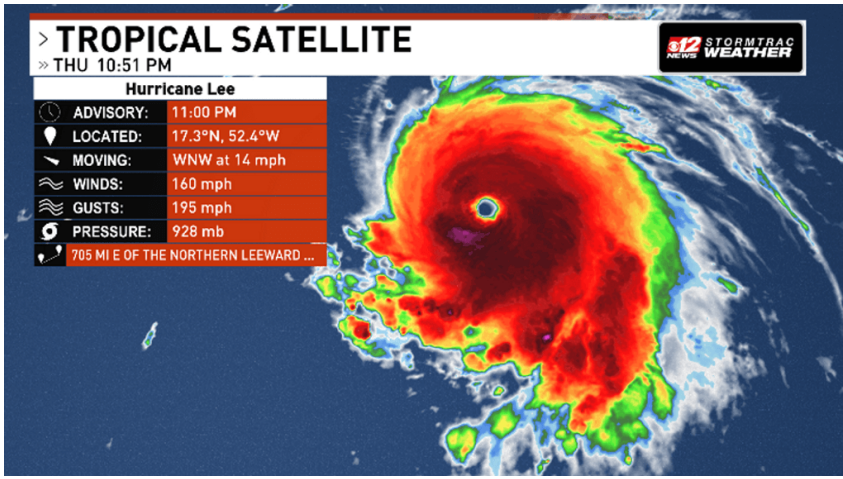
May 2024

Rapid Intensification

Rapid intensification - an increase in the maximum sustained winds of a tropical cyclone of at least 30 knots (35 mph; 55 km/h) in a 24-hour period.

"…we would expect a significant increase in extremes of storm intensification, including those that happen just before landfall." – Emanuel, 2017

"…a detectable increase of Atlantic intensification rates with a positive contribution from anthropogenic forcing" Bhatia, et al. 2019



maximum sustained winds doubled from 80 mph to 165 mph in a matter of 24 hours. 3rd highest increase on record since 1982 (Felix, Wilma)

Other Examples

Hurricane Idelia (2023) – 46 mph in 24 hours

Hurricane Ian (2022) – 55 mph in 24 hours

Hurricane Ida (2021)

Hurricane Laura (2020)

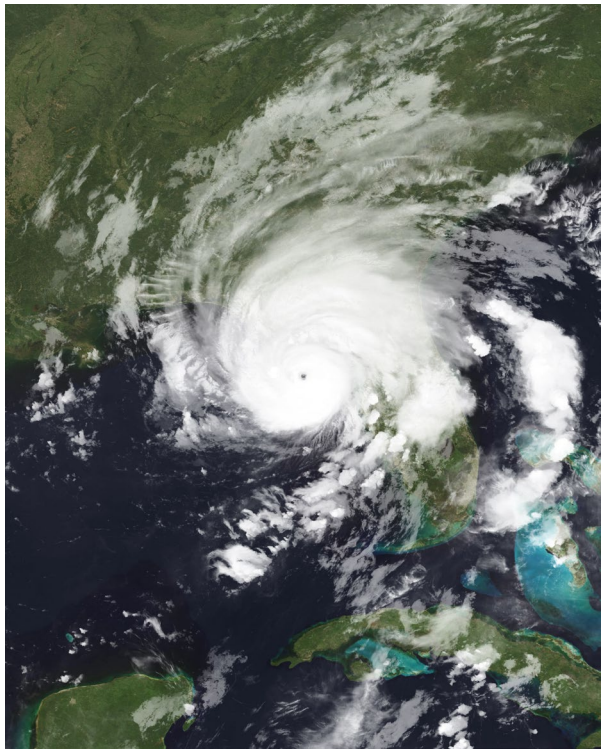
Hurricane Michael (2018) – two consecutive days of rapid intensification

Hurricane Maria (2017)

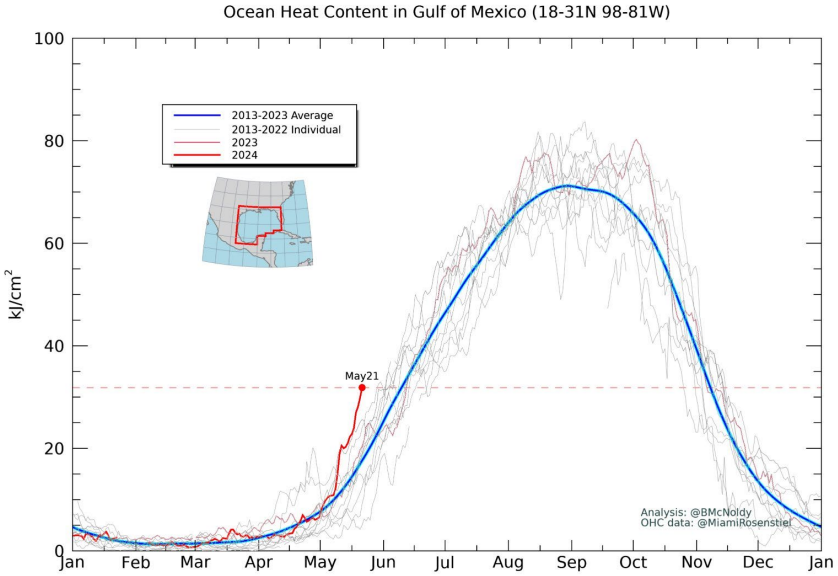
Hurricane Irma (2017)

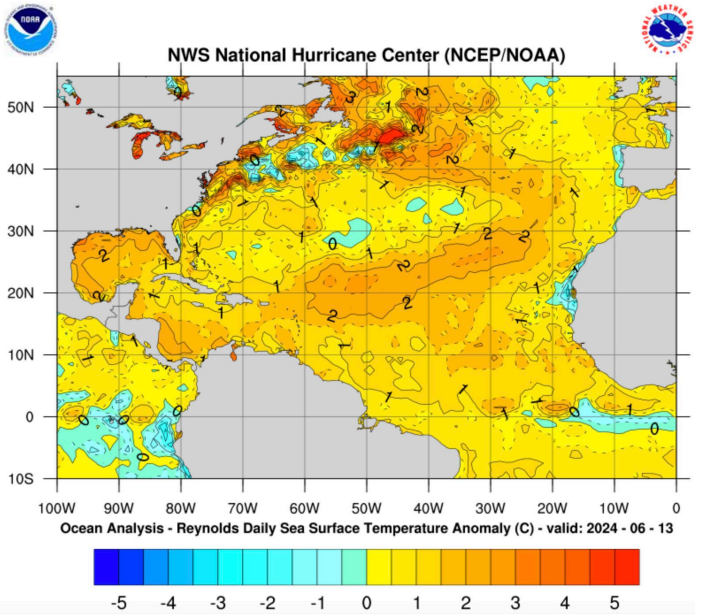
Hurricane Harvey (2017)

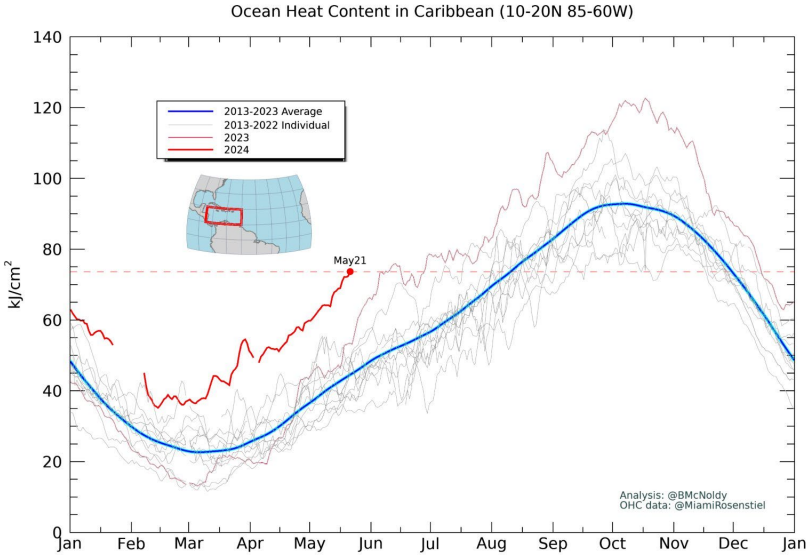
**Pacific* – Hurricane Otis, tropical storm to Cat. 5 in 24 hours

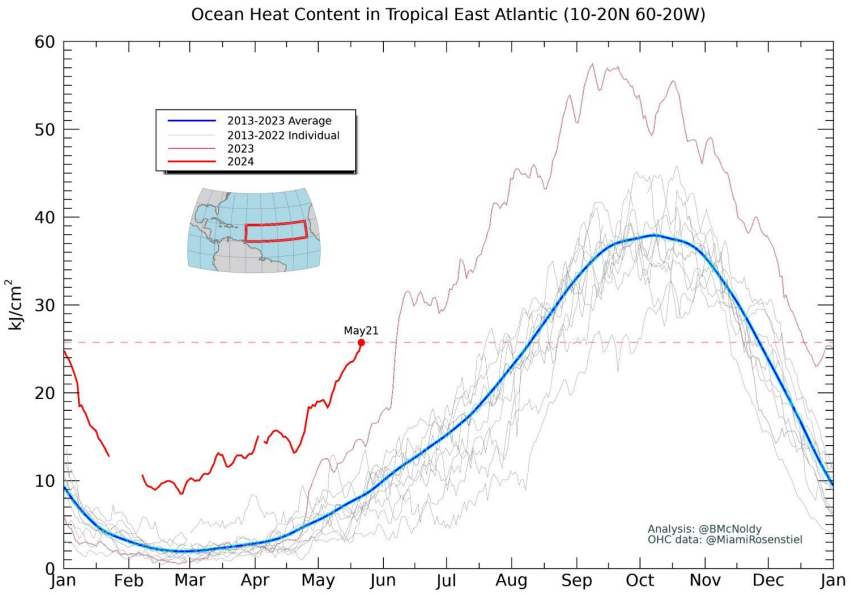


Warming Ocean



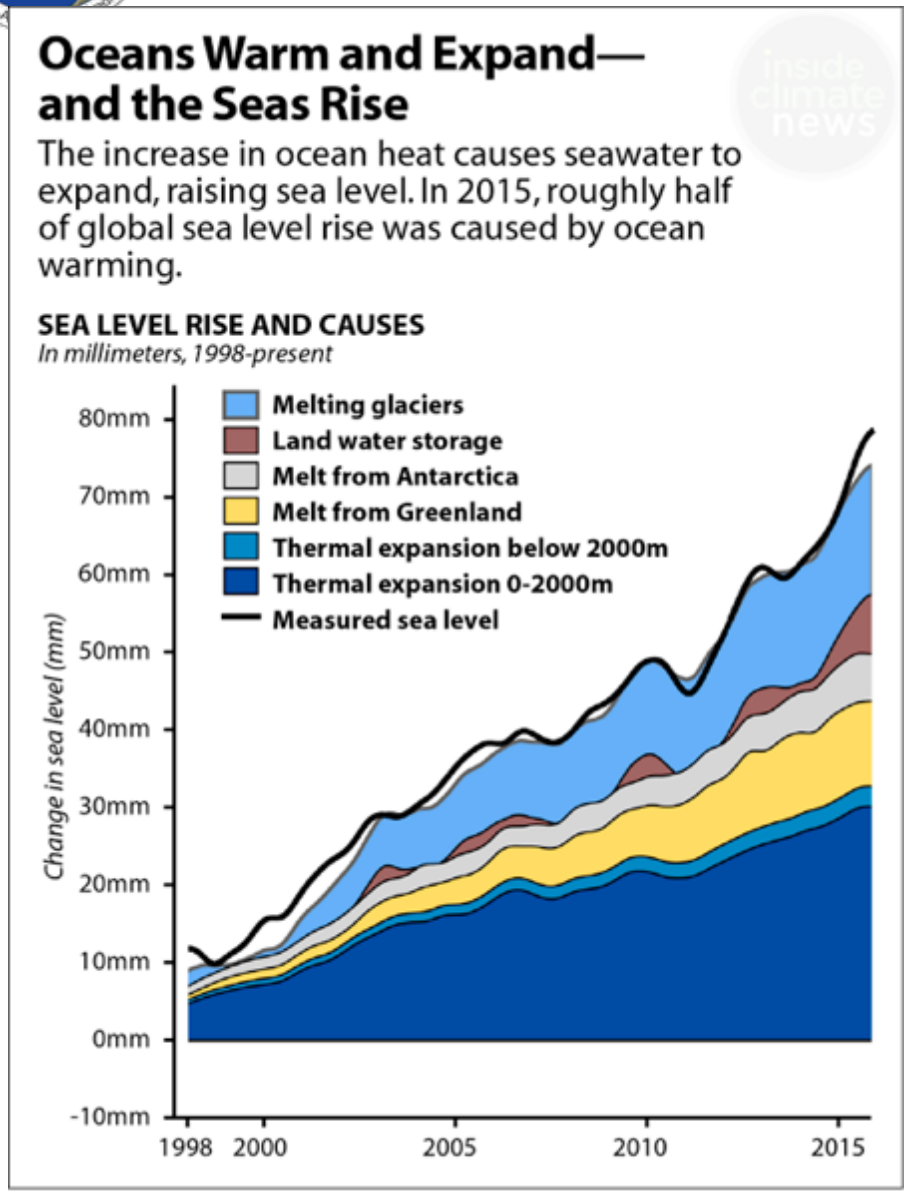






Sea Level Rise

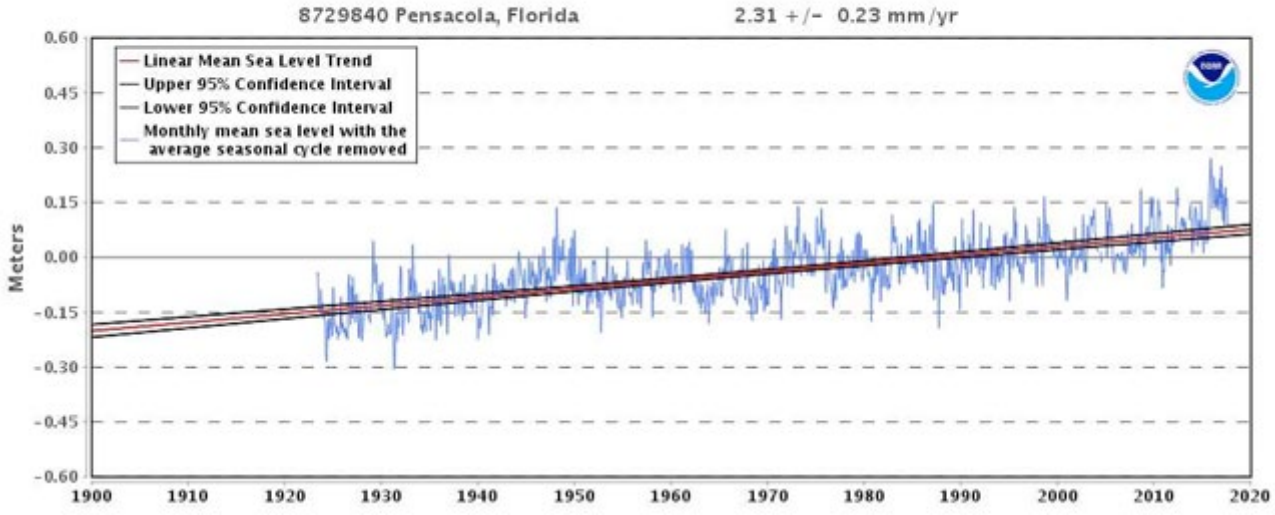
Causes of Sea Level Rise



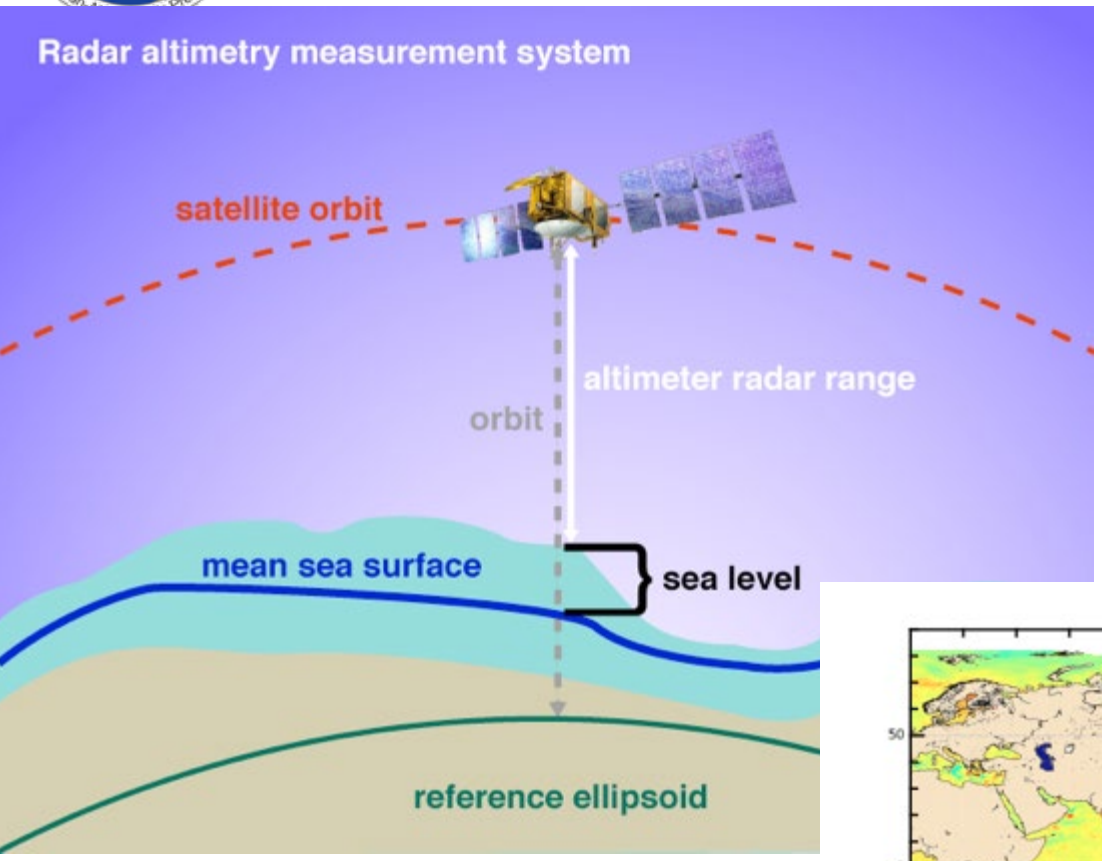
- Thermal expansion of ocean water (steric)
- Melting of glaciers and continental ice sheets
- NOT from melting sea ice

Measuring Sea Level – Tide Gauges

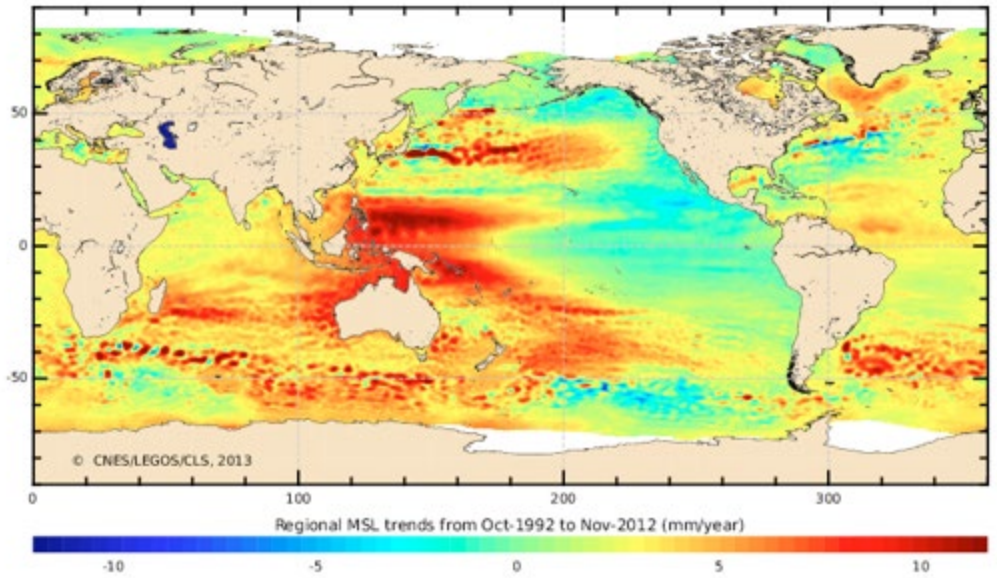
Mean Sea Level Trend
8729840 Pensacola, Florida



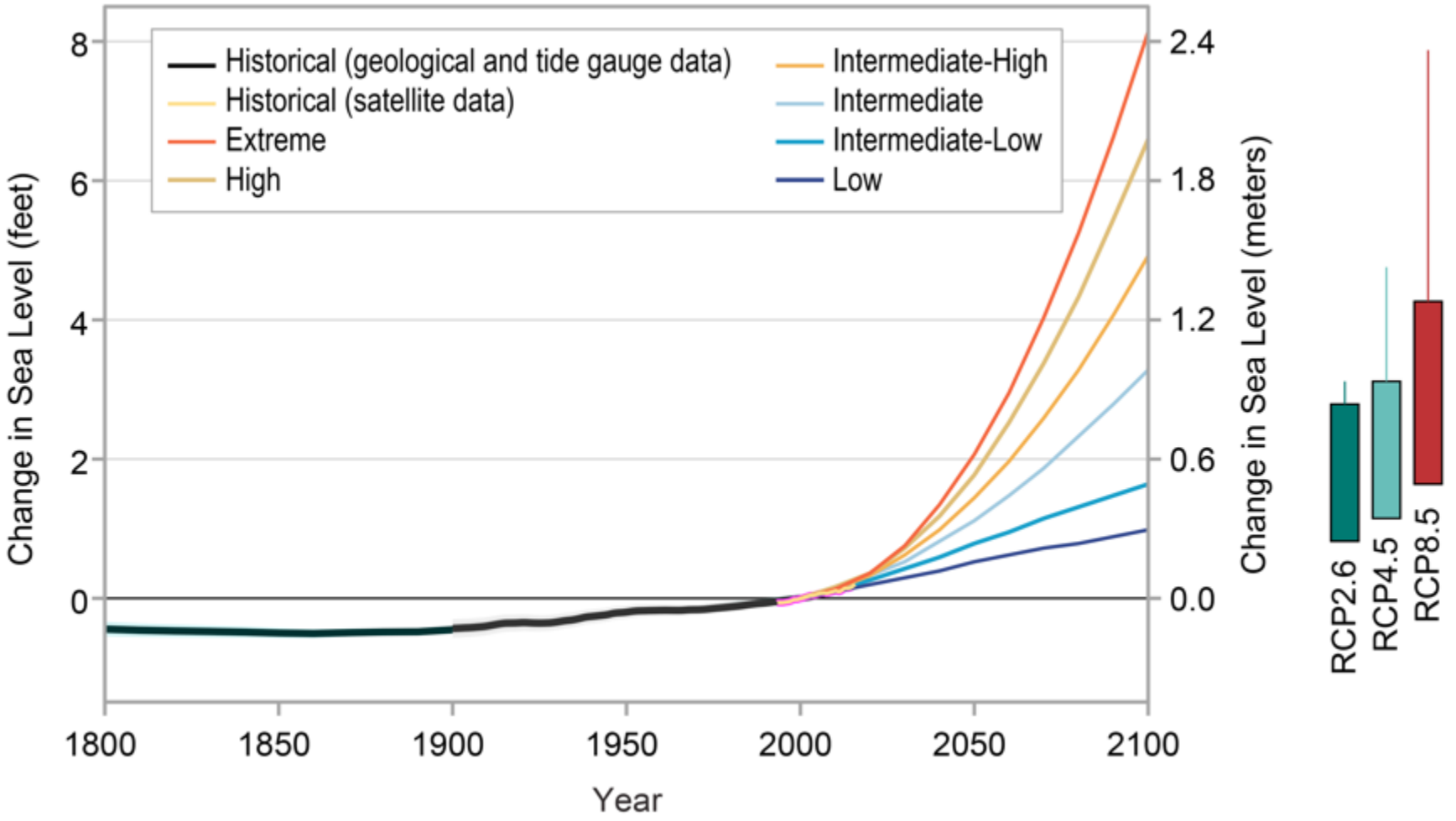
Measuring Sea Level - Altimeters



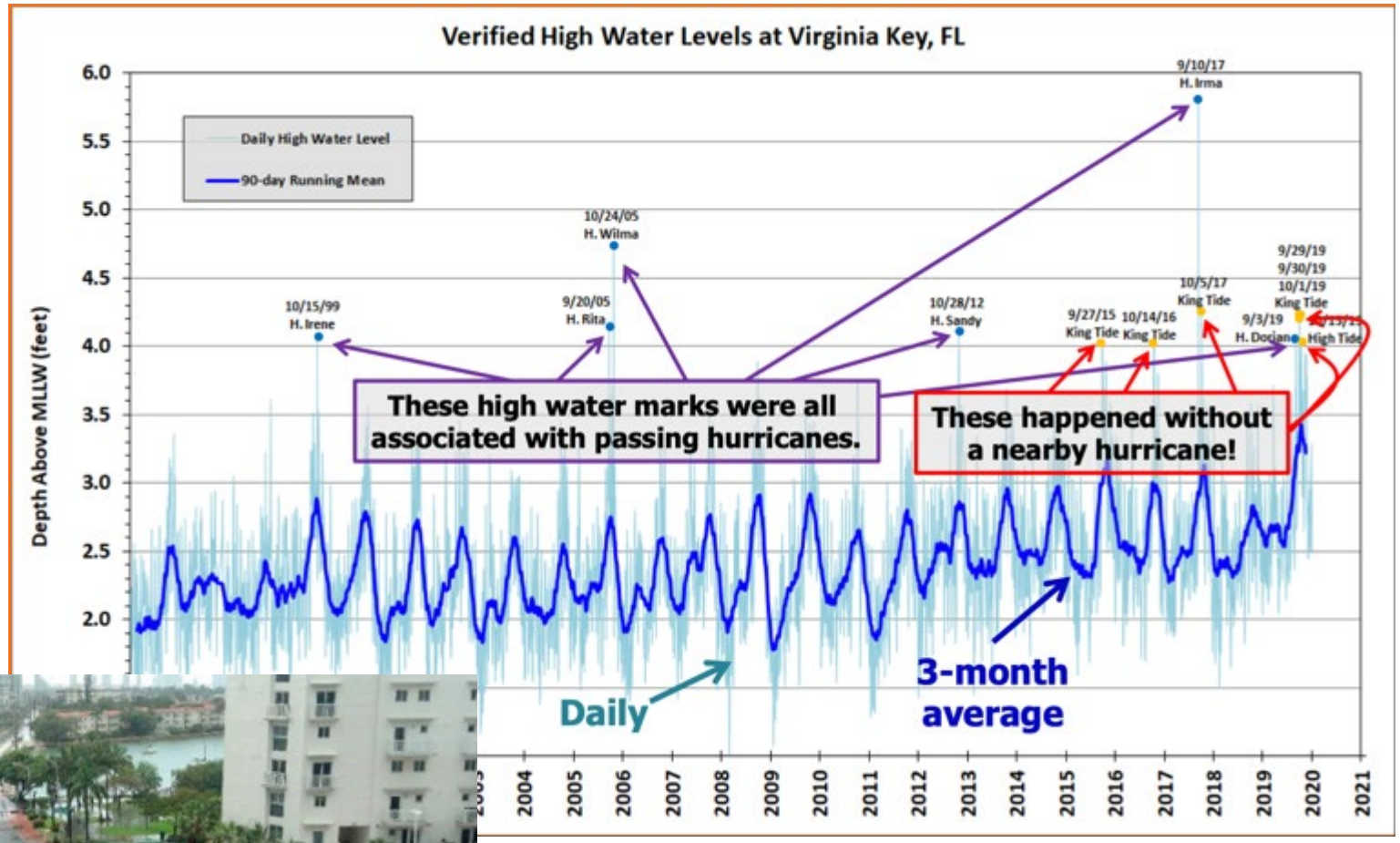
- Reliable observations since 1992
- Precision to within a few millimeters



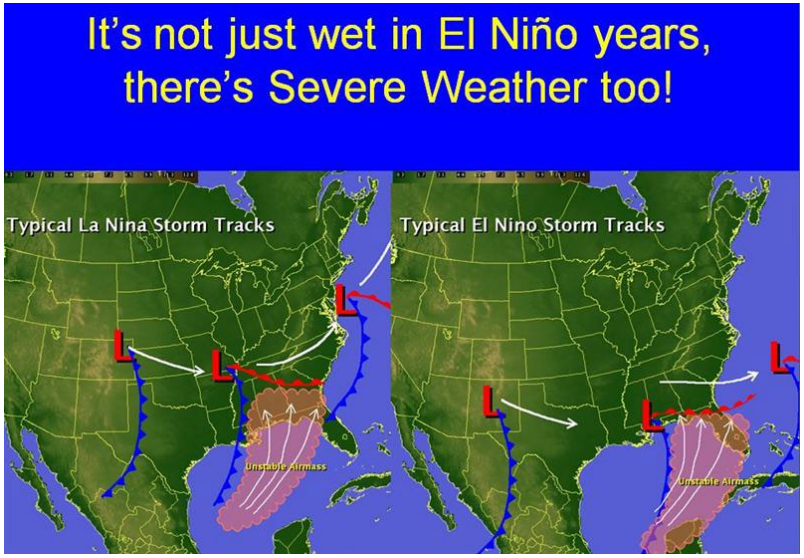
Sea Level Rise

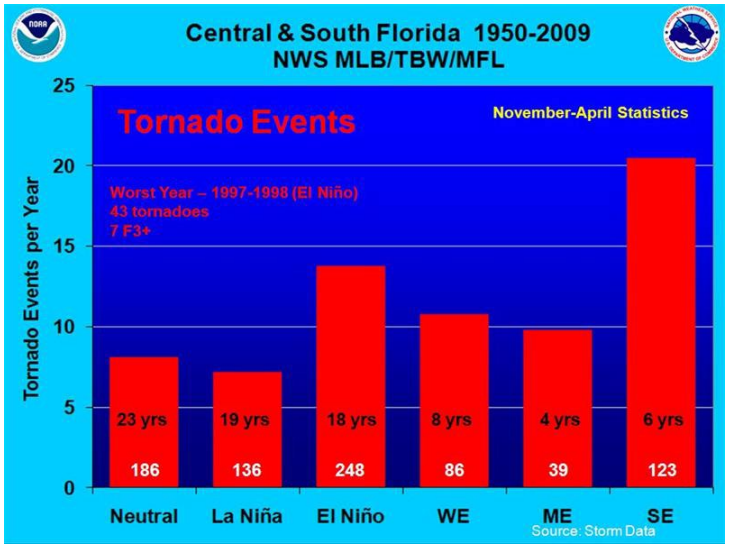


Miami Sea Level Rise



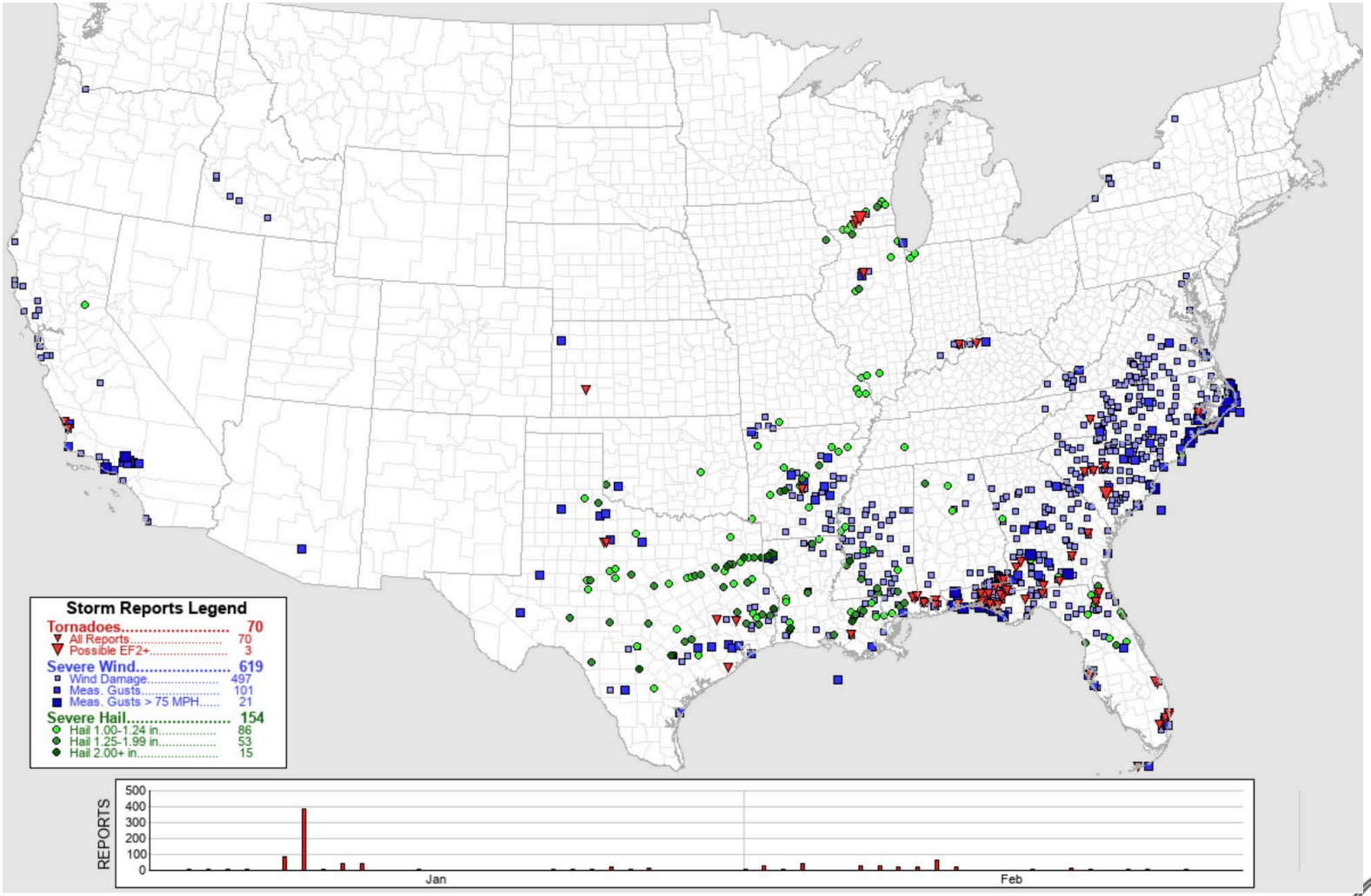
El Nino and Severe Weather





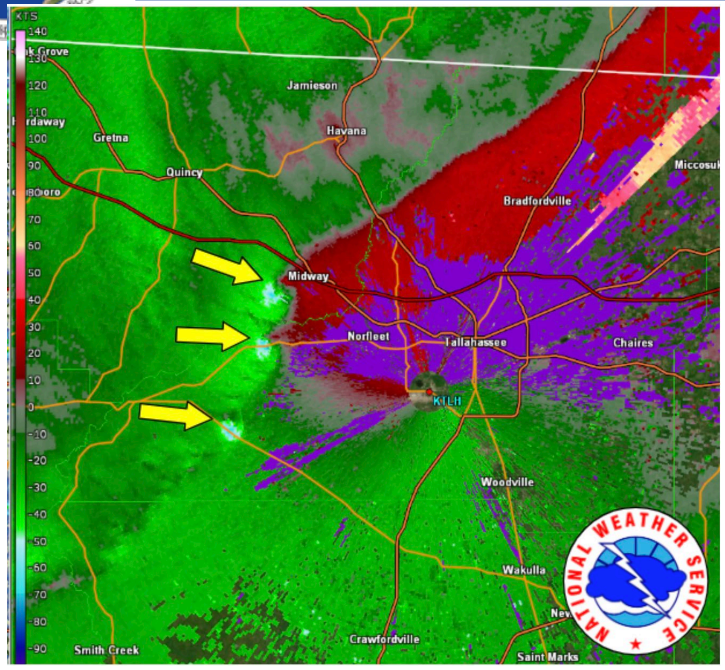
- February 22-23, 1998 – 42 deaths, 260 injuries in central Florida
- February 2, 2007 – 21 deaths, 76 injuries
- Both events occurred in the overnight hours and impacted mobile home parks

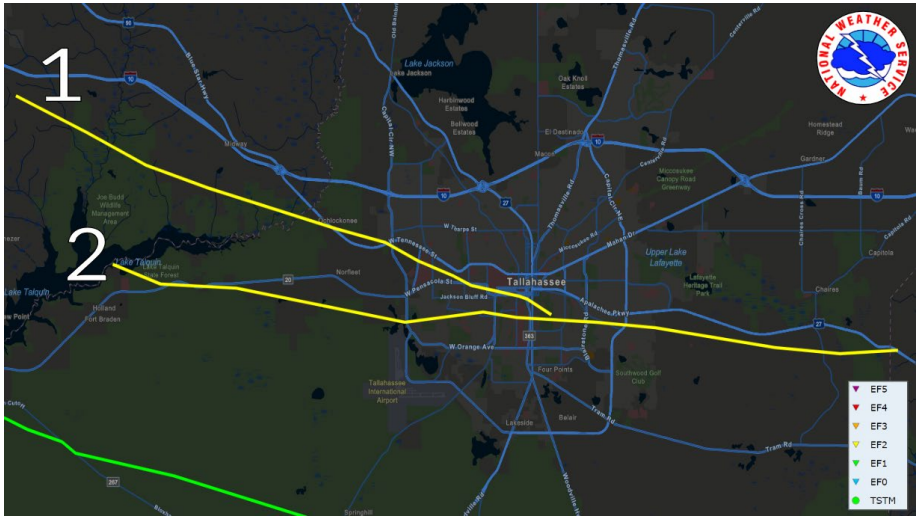
Severe Weather Reports

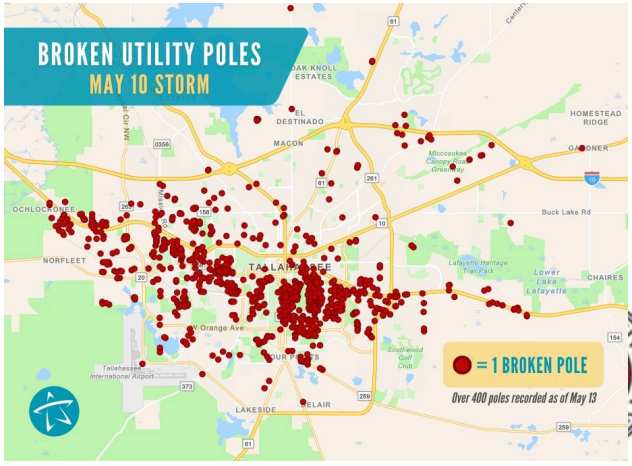


https://www.spc.noaa.gov/climo/online/

May 10 Tornadoes







Lessons in Climate Communication

- Effective communication is about sustained relationships
- Avoid advocacy, stick to the science
- Neither “denialism” nor “doomerism” are helpful
- Storytelling and free form communication vs journal articles
- Speak in layman’s terms, avoid complex terms and especially acronyms
- How does it affect you?