South Florida Water Management District

RESILIENCY COORDINATION FORUM
AGENDA

October 21, 2026
9:30 AM
District Headquarters, B-1 Auditorium
3301 Gun Club Road
West Palm Beach, FL 33406
FINAL

1. Welcome and Introduction - Drew Bartlett, Executive Director, SFWMD

2. Statewide Office of Resilience - Eddy Bouza, Chief Resilience Officer, State of Florida

3. Florida Flood Hub - Charles Jacoby, Ph.D., Associate Director, The Florida Flood Hub for Applied Research and Innovation

4. Flood Control, Water Supply Planning and Resiliency Updates - Carolina Maran, Ph.D., P.E., Division Director of Flood Control and Water Supply Planning, Chief of District Resiliency, SFWMD

5. Minimum Flow and Levels Analysis for Water Supply Planning - Anushi Obeysekera, Flood Control and Water Supply Planning Bureau Chief, SFWMD

6. Break

7. Orange County's Orlo Vista Projects
   A. Flood Mitigation Project: Project Overview - Liliana Ramirez, Assistant Project Manager, Orange County
   B. Integrated Water Resource Project Updates: Project Overview, Progress, and Next Steps - Lucy Gassaway, P.E., Chief Engineer, Orange County

8. Working with Nature: Flood Resilience Blueprint - Carrie Schuman, Ph.D., Climate Resilience Advisor, Conservancy of Southwest Florida

9. Florida Department of Transportation (FDOT) District 6 Update - Steven Craig James, District Environmental Manager, FDOT; Victoria Vogt, Environmental Supervisor, FDOT; Victoria Ortiz, Environmental Specialist, FDOT; and Ben Moore, Environmental Stewardship and Resilience Leader, RS&H

10. USACE Program Updates - Tim Gysan, P.E., Chief of the Everglades Restoration and C&SF Resilience Section, District Resilience Coordinator, USACE

11. Around the Table Updates from Local, State, Federal and Tribal Partners

12. Public Comment

13. Closing Remarks - Carolina Maran, Ph.D., P.E., Division Director of Flood Control and Water Supply Planning, Chief of District Resiliency, SFWMD

14. Adjourn

Final Presentations

Agenda Item Background:

03 Jacoby Florida Flood Hub
04 Maran District Resiliency Updates
05 Obeysekera Minimum Flow and Levels Analysis for Water Supply Planning
07a Ramirez Flood Mitigation Project
07b Gassaway Integrated Water Resource Project Updates
08 Schuman Working with Nature: Flood Resilience Blueprint
09 James, Vogt, Ortiz FDOT District 6 Update
10 Gysan USACE Program Updates
13 Maran Closing Remarks

FLORIDA FloodHub
FOR APPLIED RESEARCH AND INNOVATION

Update on the Florida Flood Hub



October 21, 2026

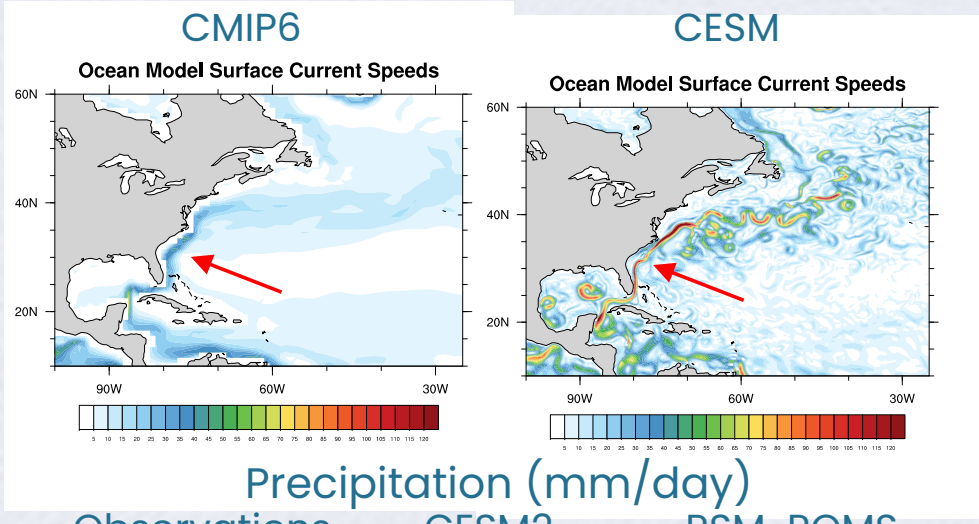
Resiliency Coordination Forum

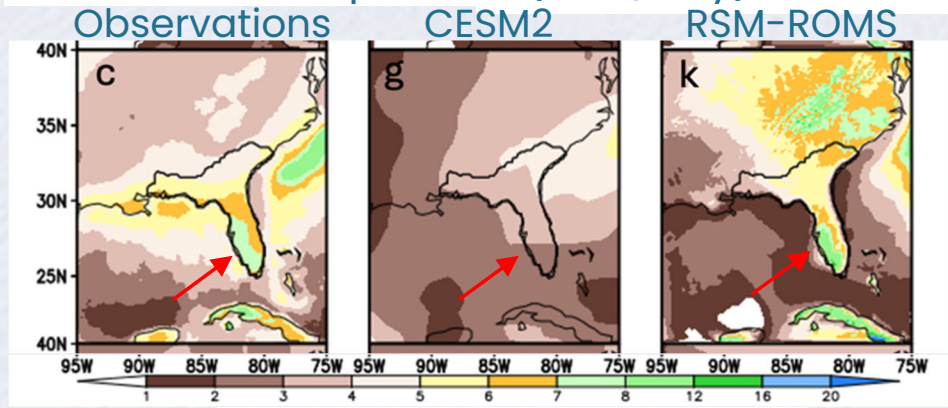
Regional modeling

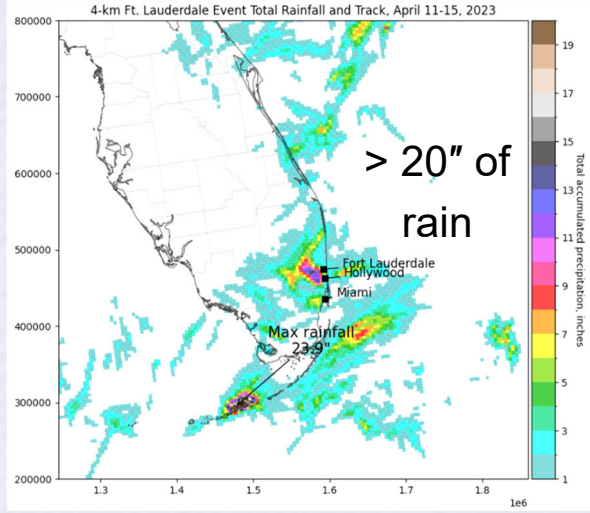
1) Community Earth System Model (CESM)
   atmospheric grid ~25 km
   oceanic grid ~ 10 km

2) Regional Spectrum Model–
   Regional Ocean System Model (RSM-ROMS)
   atmospheric and oceanic grids ~10 km

3) Weather Research & Forecasting Model (WRF)
   oceanic grid statistically downscaled to 4 km
   atmospheric grid ~4 km with 1 km for events







FLORIDA FloodHub

Presenter: Dr. Jacoby

Regional modeling

1) Establish reference period = 10 years centered on 2015 ✓
2) Complete historical ensemble = 5 × 10-year simulations
3) Complete 2°C warming ensemble = 5 × 10-year simulations
4) Complete 3°C warming ensemble = 5 × 10-year simulations
5) Process data ⇒ changes in extremes

UM completed runs
FSU tested
UM checking data

FLORIDA FloodHub

Presenter: Dr. Jacoby

Reanalysis of weather

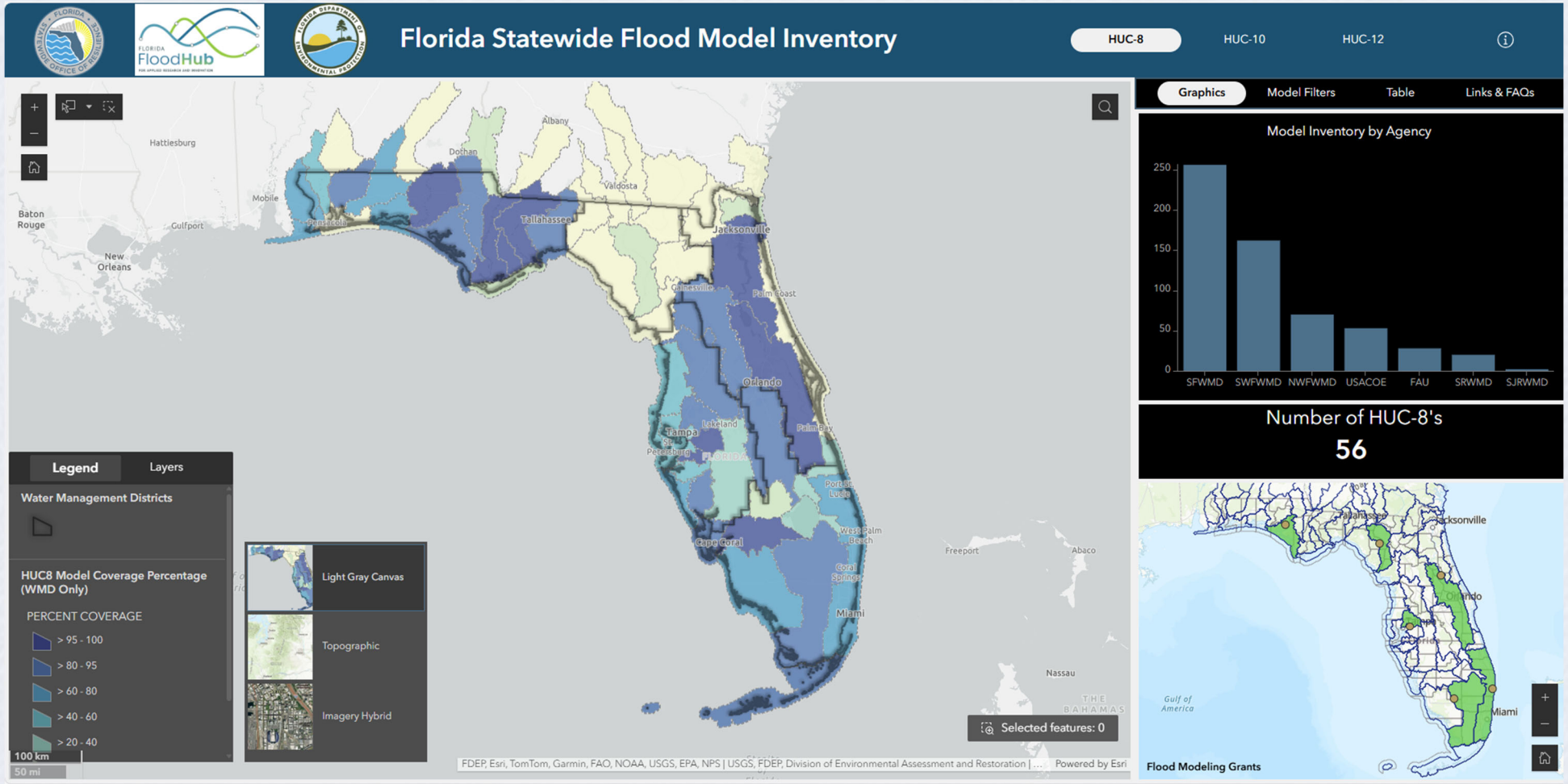
- USGS effort
- Weather Research and Forecasting (WRF) model
- 50-year period (1975–2024)
- Broad domain that can be parsed
- 4-km spatial resolution
- Key hourly and daily values being extracted
- Data release planned



FLORIDA FloodHub

Presenter: Dr. Jacoby

Collaborations with the Florida Silver Jackets



Presenter: Dr. Jacoby

Collaborations with the Florida Silver Jackets

Instructions: For each topic, rate your interest in including it in the workshop.

Scale: 1 = Not important, 2 = Low interest, 3 = Moderate interest, 4 = High interest, 5 = Essential

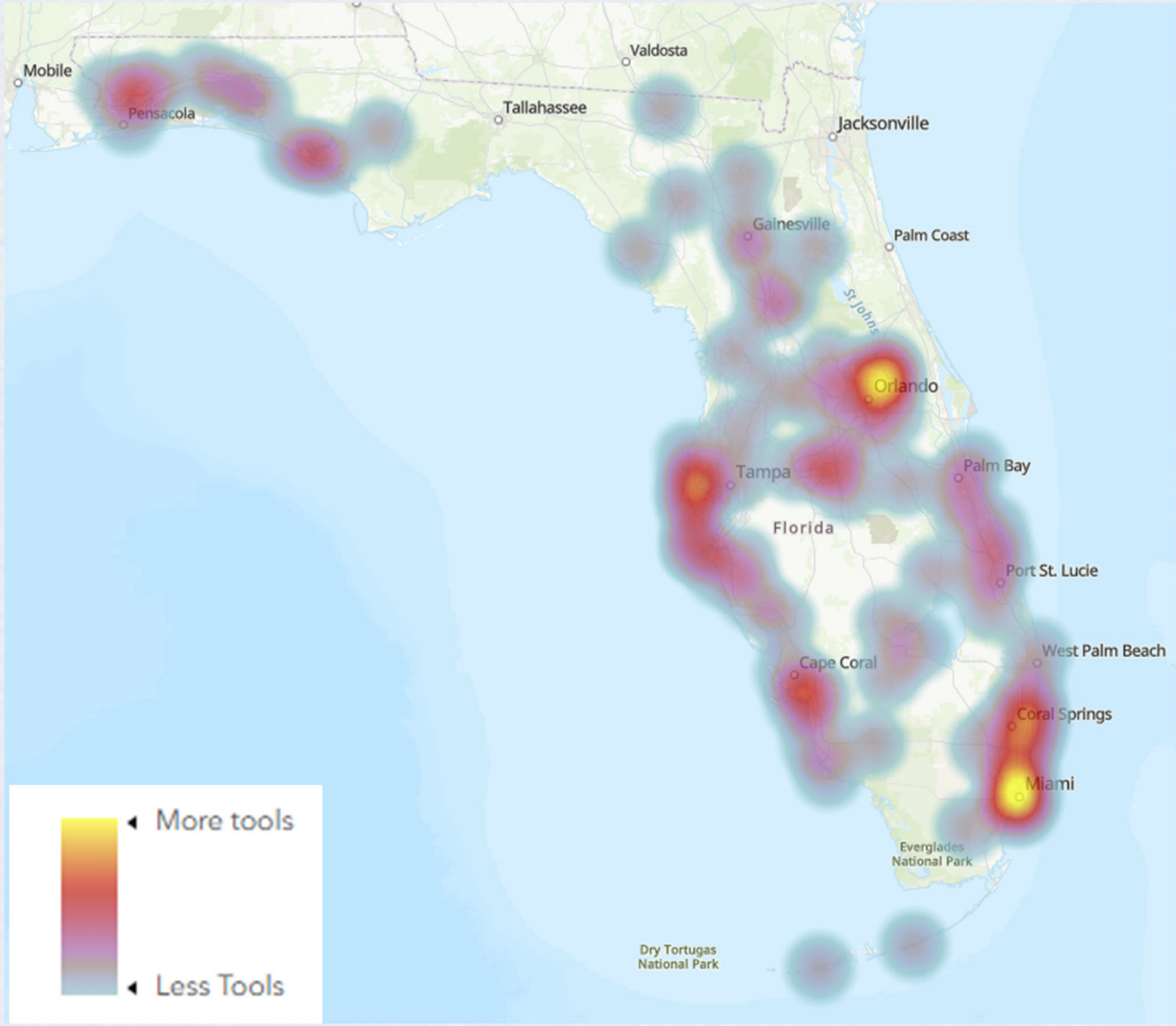
Topic	1	2	3	4	5
Flood cleanup and debris management	☐	☐	☐	☐	☐
Mold prevention and indoor air quality	☐	☐	☐	☐	☐
Drinking water and wastewater impacts	☐	☐	☐	☐	☐
Road closures and access to services	☐	☐	☐	☐	☐
Power outages and utility disruptions	☐	☐	☐	☐	☐
Contamination from floodwaters	☐	☐	☐	☐	☐
Health and mental health impacts	☐	☐	☐	☐	☐
Insurance, recovery aid, and claims	☐	☐	☐	☐	☐
Infrastructure repair and resilience	☐	☐	☐	☐	☐
Community recovery coordination	☐	☐	☐	☐	☐

FLORIDA FloodHub

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Collaborations with the Florida Silver Jackets



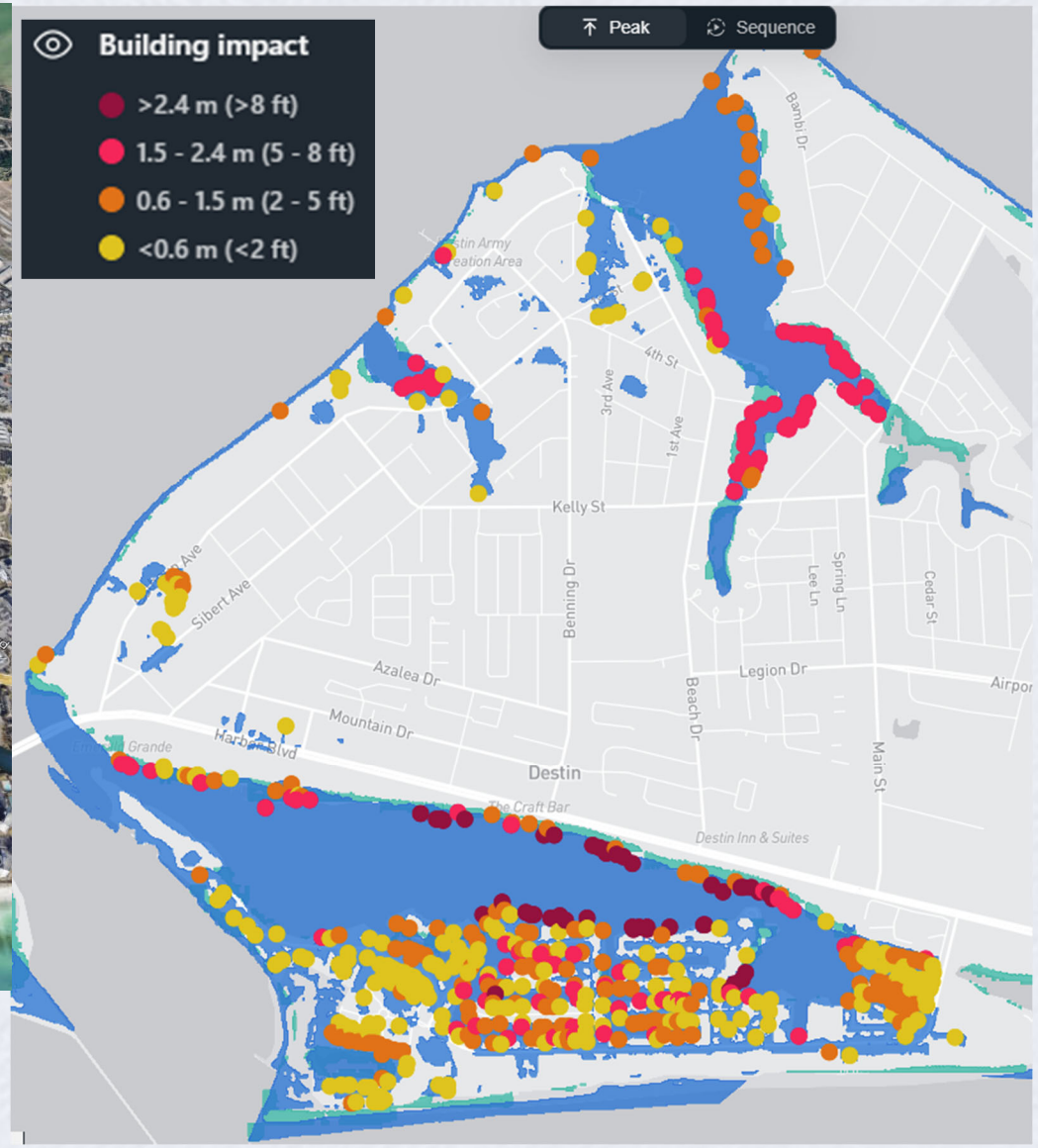


FLORIDA FloodHub

Presenter: Dr. Jacoby

ICEYE subscription and Isaias





Presenter: Dr. Jacoby

Thank you

Chuck Jacoby
Associate Director
Florida Flood Hub for Applied Research & Innovation
cajacoby@usf.edu



FLORIDA FloodHub FOR APPLIED RESEARCH AND INNOVATION



FloWS and Resiliency Updates

Resiliency Coordination Forum – October 21, 2026

Carolina Maran, Ph.D., P.E.

Division Director, Flood Control and Water Supply Planning

Chief of District Resiliency

South Florida Water Management District



Organizational Update

Division Short Name: FloWS

The Division of **Flo**od Protection and **W**ater **S**upply Planning advances planning and implementation efforts, working closely with internal teams and with local, state, tribal and federal partners. Our team advances water supply and flood control planning, integrating resiliency planning to support risk-informed decision making. It also coordinates resiliency projects implementation through funding applications and managing resiliency grants.







Team Updates



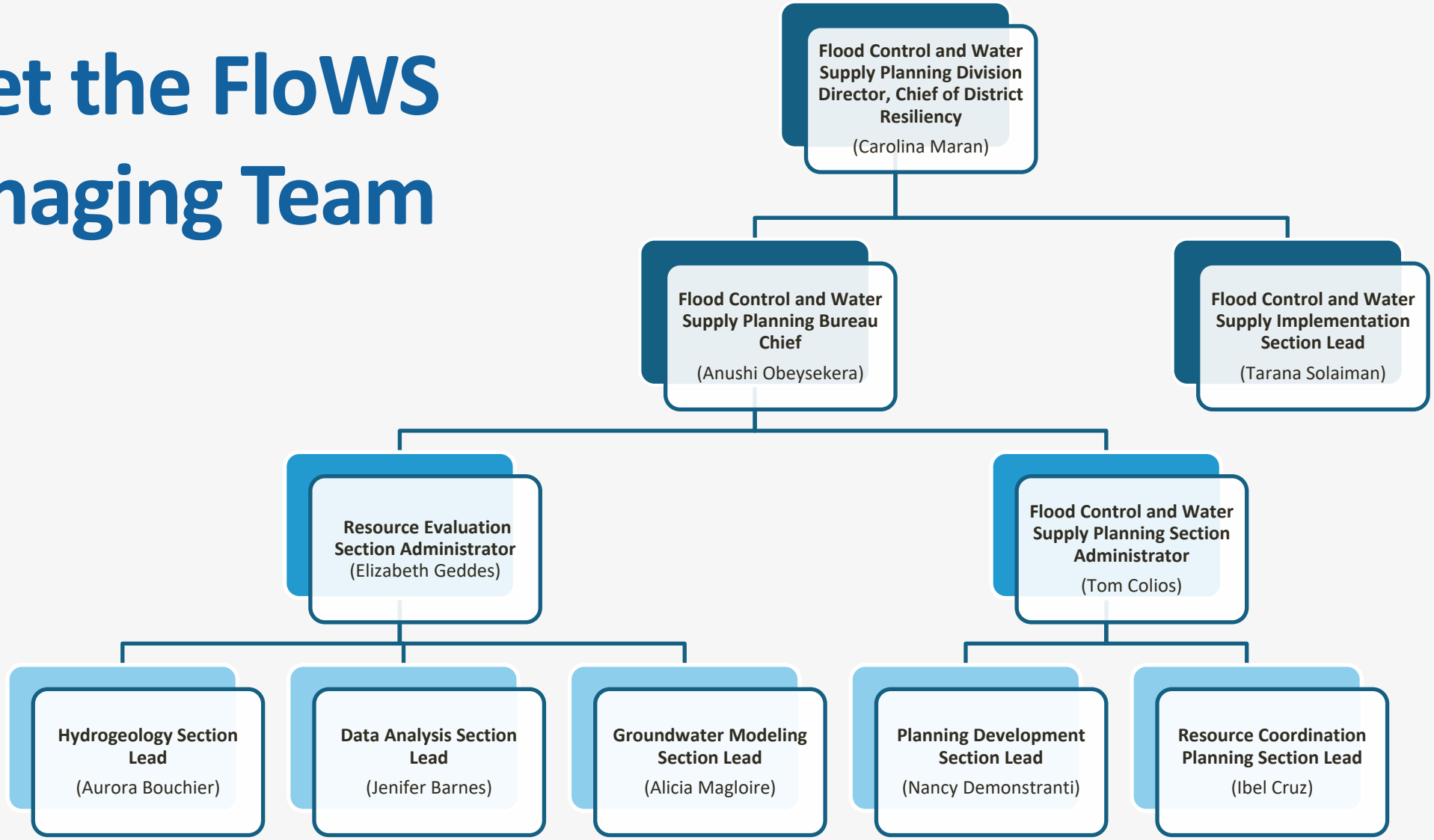
Jenifer Barnes

Section Leader, Data Analysis Unit

Jenifer joins the team with more than 30 years of experience at the District, including four years as Systems Data Modeler 4 for the Water Resources Systems Modeling Bureau. She has led the Dynamic Position Analysis and Conditional Position Analysis, Recalibration of the Everglades Agricultural Area for the RSMBN, and worked on the South Florida Water Management Model. Her background spans technical oversight, interagency coordination, scripting, data analysis, hydrologic modeling, and GIS support.

With her strong technical foundation, deep understanding of South Florida's hydrology and water management challenges, Jenifer is well-positioned to lead the Data Analysis Unit and support our work in water supply, flood control, and resiliency planning.

Meet the FloWS Managing Team



Water and Climate Resilience Metrics

2027 South Florida Environmental Report (SFER)

Chapter 2A: South Florida Hydrology and Water Management

- Water Year 2026 (May 1, 2025 – April 30, 2026)
  - Hydrology
  - Water Management
  - Event Summaries

Chapter 2B: Water and Climate Resilience Metrics

- Long-term Trends
  - Sub-daily Rainfall
  - Flooding Events
  - Water Quality
  - Algal Blooms

Key Dates

Public Review Period: November 3 – 23, 2026

Publication Date: March 1, 2027



Access the Entire Report:

2026 South Florida Environmental Report

Poster Exhibitions:

View the Posters

Water and Climate Resilience Metrics Training

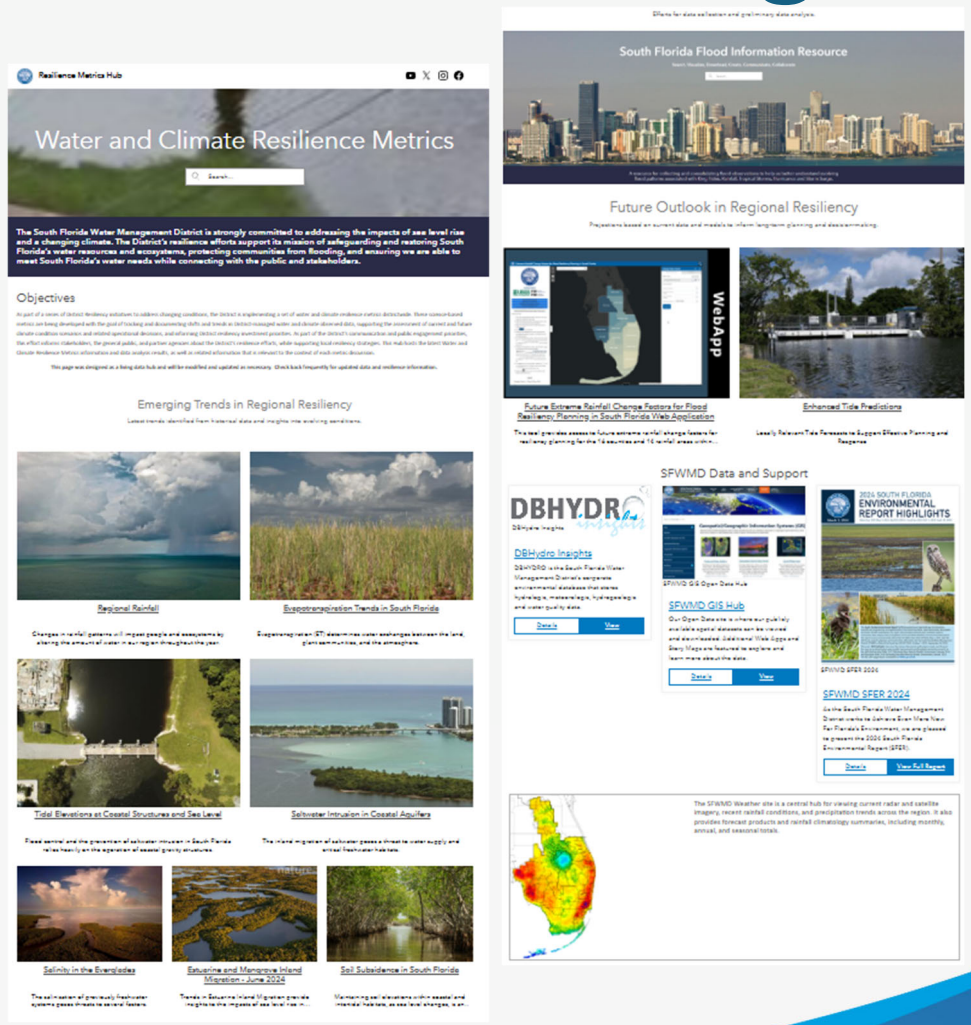
Accessing and interpreting Water and Climate Resilience Metrics data and information to support regional resiliency planning

- Training Presentation

85 total participants from throughout the region

- Counties
- Municipalities
- 298 Water Control Districts
- WMDs
- State agencies
- Federal agencies
- Tribal Nations
- Academic partners
- NGOs
- Private sector

To be offered annually!



FPLOS Program Updates

Phase I: Flood Vulnerability Assessment

Western Basins
(Hendry & Collier Counties)

- Future Conditions LOS assessment – completed

Taylor Creek / Nubbin Slough
(Okeechobee & Martin Counties)

- Calibration and Validation – ongoing

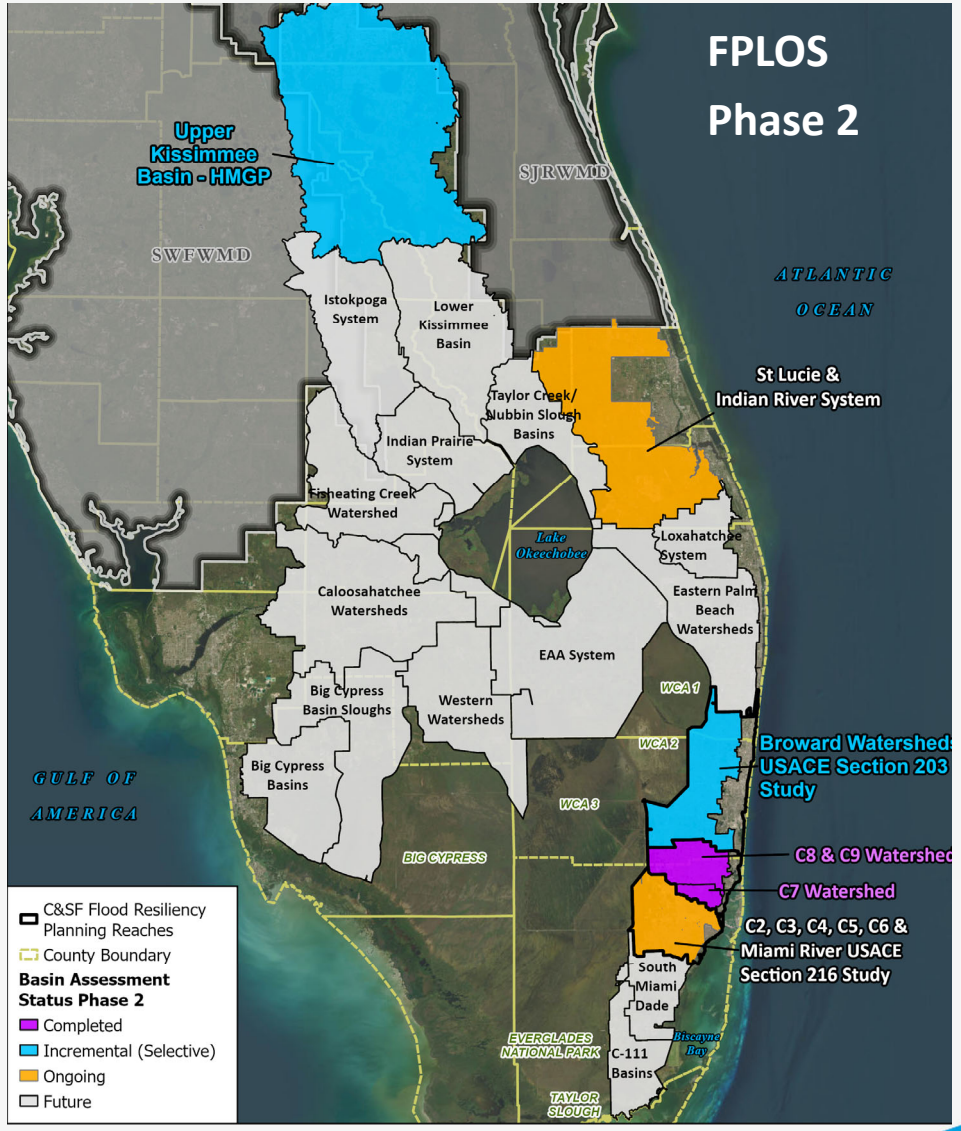
Caloosahatchee
(Charlotte, Lee, Glades and Hendry Counties)

- initiated

Combined Phase I and Phase II (Adaptation Planning) Study

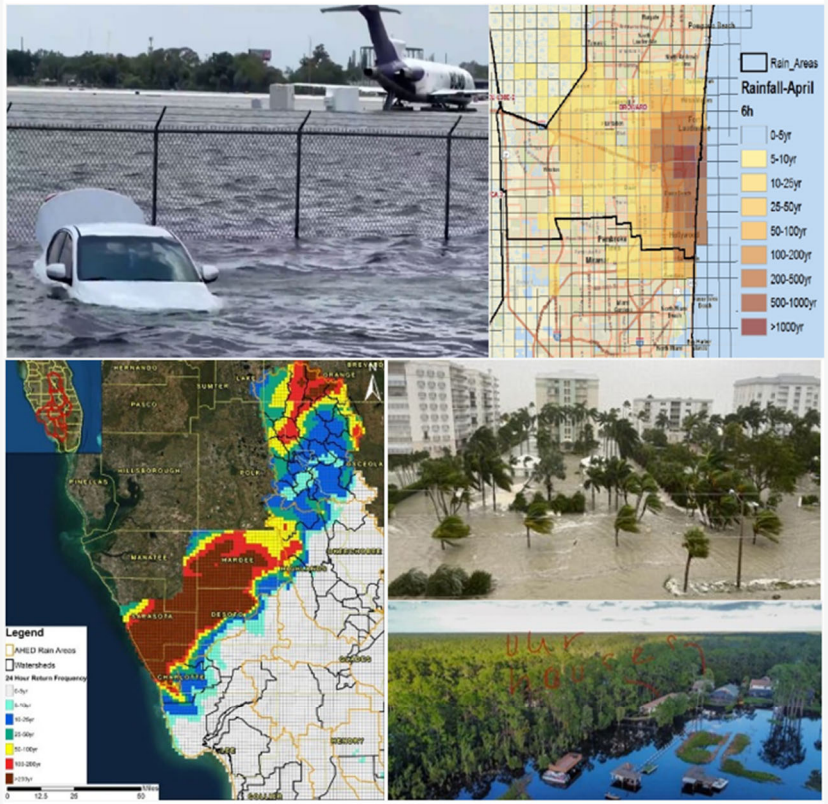
St. Lucie-Martin Counties

- Loxahatchee Current Conditions LOS – under review
- St. Lucie Calibration and Validation – under review



Aligning Hydrologic, Hydraulic, and Coastal Hydrodynamic Tools to Assess Unique Aspects of Compound Flooding from Inland and Coastal Hazards in South Florida

ERDC funded Study on Compound Flooding



Scope:

- Assess compound flooding in S FL through coupling using CoP-preferred modeling tools
- Use joint probability (copulas) to better represent compound flooding
- Make recommendations for future H&H tool development efforts
- Leverage working group to support short- and long-term strategies for compound flooding modeling efforts

Project Location:

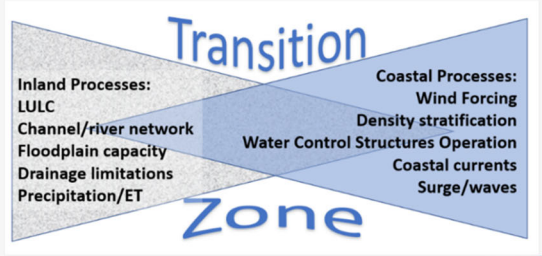
- South Florida Coast (Palm Beach, Broward and Miami-Dade Counties' basins TBC)

Partners:

- USACE-SAJ, Tulane University, University of Central Florida and Deltares USA

Tasks and Duration:

- 9 Tasks for a 5-Year period (Total = $2.18M)



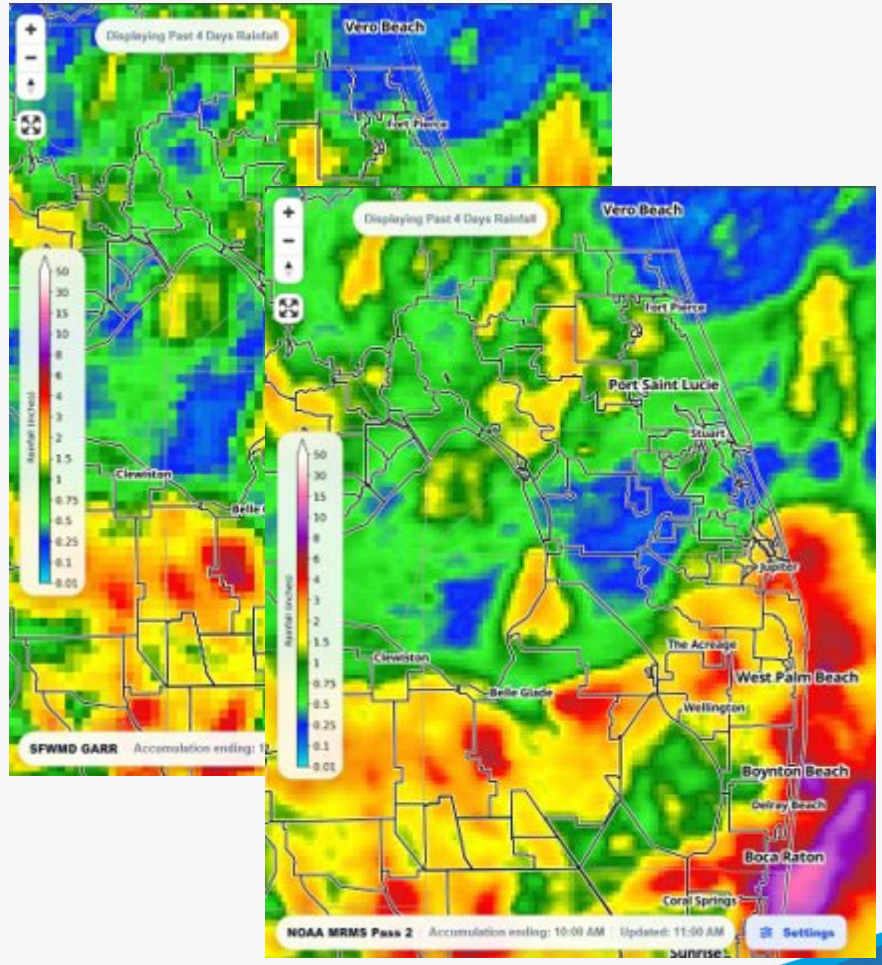
Gauge-Adjusted Radar Rainfall (GARR) Considerations to Support Flood Risk Management Efforts

Migrating from ~2km to a 1km resolution to better capture localized convective storm dynamics, represent local peak rainfall intensity, and eliminate data dilution

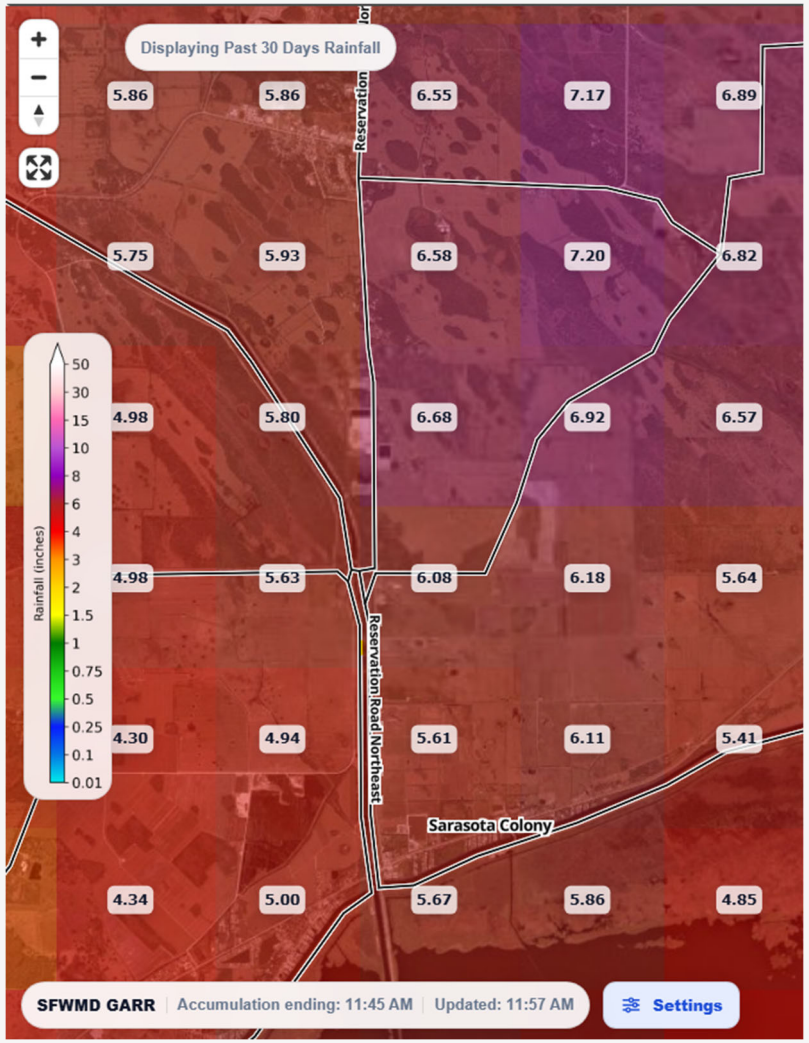
Prevents distributed hydrological models from under-predicting overland flooding

Aligning with the NOAA Multi-Radar/Multi-Sensor (MRMS) standard grid, "gold standard" for real-time precipitation analysis

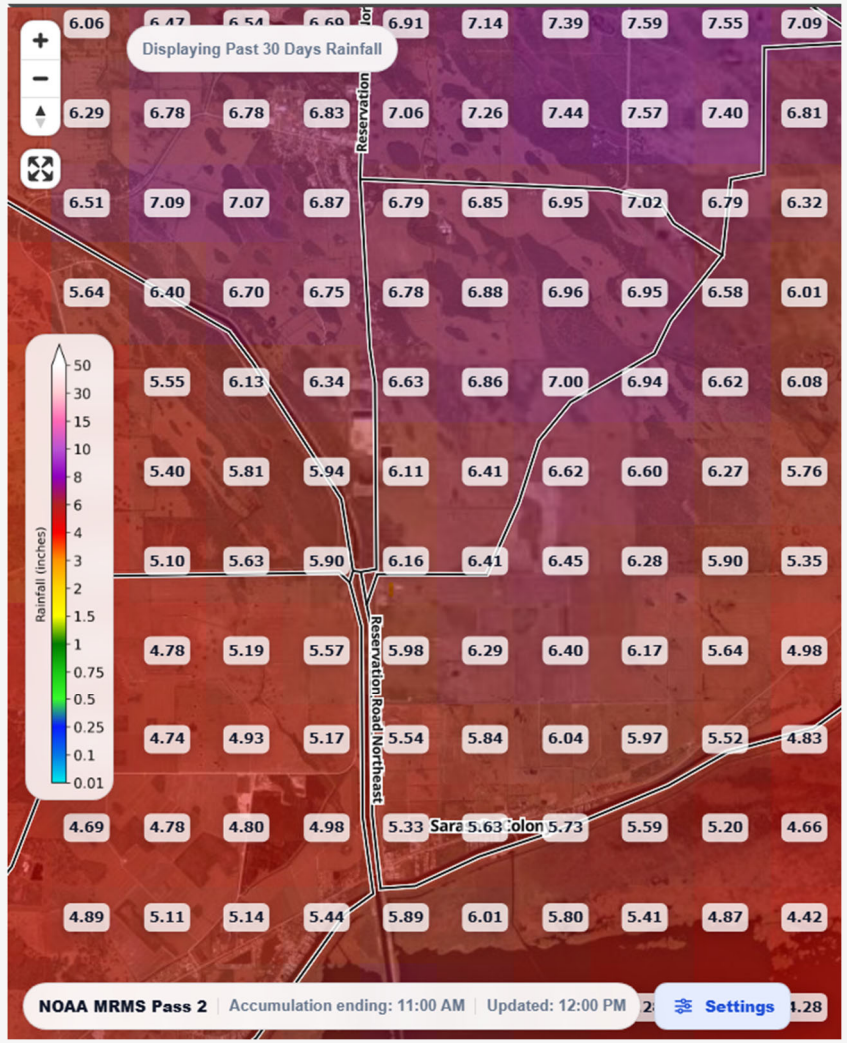
Seamless Multi-Sensor Data Integration



Current GARR Grid (~2km)



Standard MRMS Grid (~1km)

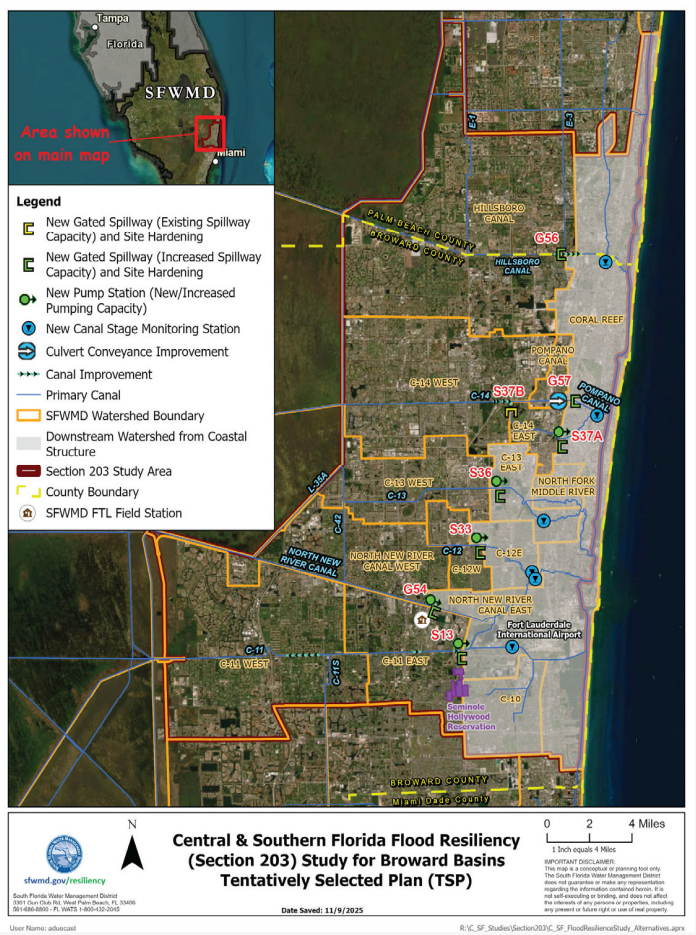


Presenter: Carolina Maran

C&SF Flood Resiliency Studies – Broward Basins (Section 203)

Feasible, Federally Compliant Plan Under Consideration for WRDA 2026

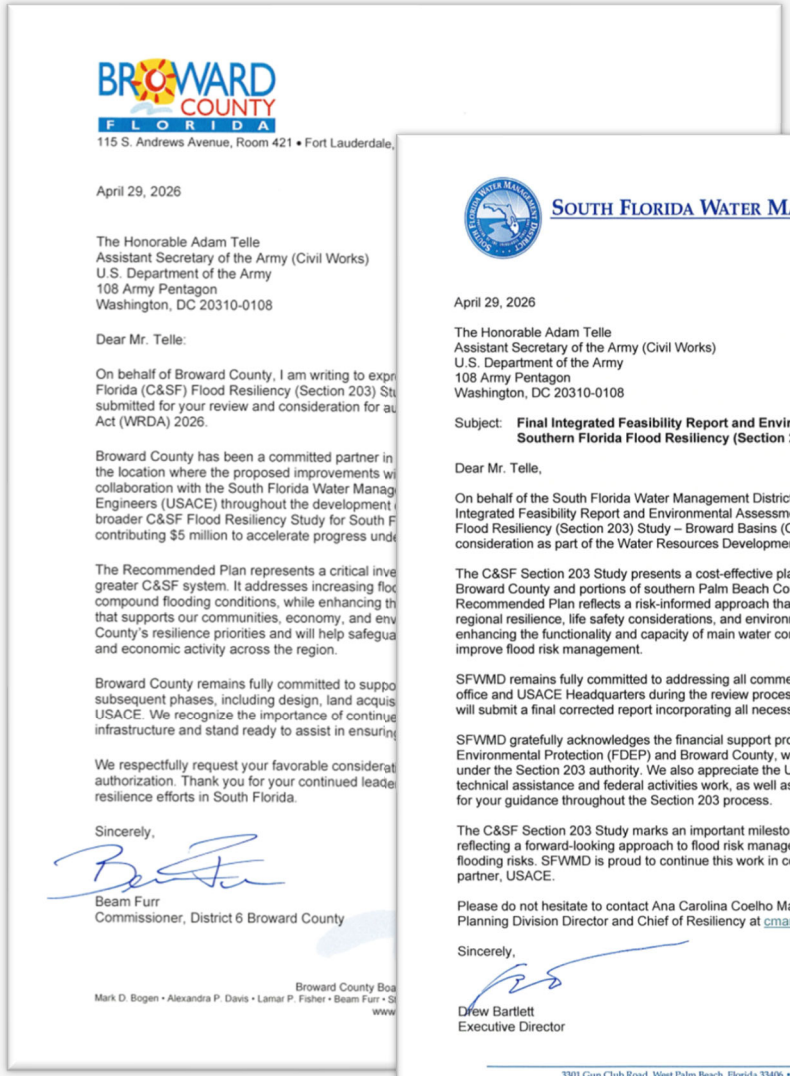
- Recommended Plan & 35% Design Plans, cost certified
- FONSI signed by SAJ Commander, September 2026
- Secretary of the Army for Civil Works determined that recommended plan is feasible and complies with applicable Federal laws and regulations
- Final Report submitted to the Federal Administration for clearance and submission to Congress for authorization in the WRDA 2026











BROWARD COUNTY
FLORIDA

115 S. Andrews Avenue, Room 421 • Fort Lauderdale,

April 29, 2026

The Honorable Adam Telle
Assistant Secretary of the Army (Civil Works)
U.S. Department of the Army
108 Army Pentagon
Washington, DC 20310-0108

Dear Mr. Telle:

On behalf of Broward County, I am writing to expr
Florida (C&SF) Flood Resiliency (Section 203) St
submitted for your review and consideration for au
Act (WRDA) 2026.

Broward County has been a committed partner in
the location where the proposed improvements wi
collaboration with the South Florida Water Manag
Engineers (USACE) throughout the development
broader C&SF Flood Resiliency Study for South F
contributing $5 million to accelerate progress und

The Recommended Plan represents a critical inve
greater C&SF system. It addresses increasing floo
compound flooding conditions, while enhancing th
that supports our communities, economy, and env
County's resilience priorities and will help safegua
and economic activity across the region.

Broward County remains fully committed to suppo
subsequent phases, including design, land acquis
USACE. We recognize the importance of continue
infrastructure and stand ready to assist in ensurin

We respectfully request your favorable considerat
authorization. Thank you for your continued leade
resilience efforts in South Florida.

Sincerely,

Beam Furr
Commissioner, District 6 Broward County

Broward County Boa
Mark D. Bogen • Alexandra P. Davis • Lamar P. Fisher • Beam Furr • St
www

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

April 29, 2026

The Honorable Adam Telle
Assistant Secretary of the Army (Civil Works)
U.S. Department of the Army
108 Army Pentagon
Washington, DC 20310-0108

Subject: **Final Integrated Feasibility Report and Environmental Assessment of the Central and Southern Florida Flood Resiliency (Section 203) Study - Broward Basins**

Dear Mr. Telle,

On behalf of the South Florida Water Management District (SFWMD), I am pleased to transmit the Final Integrated Feasibility Report and Environmental Assessment of the Central and Southern Florida (C&SF) Flood Resiliency (Section 203) Study – Broward Basins (C&SF Section 203 Study) for your review and consideration as part of the Water Resources Development Act (WRDA) 2026.

The C&SF Section 203 Study presents a cost-effective plan to reduce inland flood risks within eastern Broward County and portions of southern Palm Beach County under current and future conditions. The Recommended Plan reflects a risk-informed approach that balances economic performance, long-term regional resilience, life safety considerations, and environmental outcomes. The plan focuses on enhancing the functionality and capacity of main water control structures within the C&SF system to improve flood risk management.

SFWMD remains fully committed to addressing all comments and providing additional information to your office and USACE Headquarters during the review process. Upon completion of this review, SFWMD will submit a final corrected report incorporating all necessary revisions.

SFWMD gratefully acknowledges the financial support provided by the Florida Department of Environmental Protection (FDEP) and Broward County, which was instrumental in advancing this effort under the Section 203 authority. We also appreciate the USACE Jacksonville District for their technical assistance and federal activities work, as well as to USACE Headquarters and your office for your guidance throughout the Section 203 process.

The C&SF Section 203 Study marks an important milestone in the evolution of the C&SF Project, reflecting a forward-looking approach to flood risk management under changing conditions and compound flooding risks. SFWMD is proud to continue this work in collaboration with our long-standing federal partner, USACE.

Please do not hesitate to contact Ana Carolina Coelho Maran, Ph.D. P.E., Flood Control and Water Supply Planning Division Director and Chief of Resiliency at cmaran@sfwmd.gov or 561-682-6868.

Sincerely,

Drew Bartlett
Executive Director

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • 1-800-432-2045 • www.sfwmd.gov

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

SEP 16 2026

Mr. Drew Bartlett
Executive Director
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

Dear Mr. Bartlett:

I am responding to the submittal from your office transmitting the Broward Basins, Section 203, Feasibility Report and Environmental Assessment (FR/EA), for review and processing under the provisions of Section 203 of the Water Resources Development Act (WRDA) of 1986, as amended.

In accordance with Section 203 of WRDA 1986, I am responsible for determining whether the report, and the process under which the report was developed, comply with Federal laws and regulations applicable to feasibility studies of water resources development projects. I have determined that the recommended plan is feasible and complies with applicable Federal laws and regulations. While there are no concerns with the plan or design of the project, further design and construction shall continue to follow all relevant policies and procedures governing implementation of water resources development projects undertaken by the U.S. Army Corps of Engineers. This determination and the results of the issue resolution process are contained within the enclosed Review Assessment.

I have simultaneously submitted these documents and the Broward Basins FR/EA to the Administration for clearance and submission to Congress. Therefore, I respectfully request that no further distribution of the assessment be made until the Administration completes its review.

My staff will keep you regularly informed of our progress to complete the clearance process and submit your study and my Review Assessment to Congress.

D. Lee Forsgren
Senior Official Performing the Duties of the
Assistant Secretary of the Army
(Civil Works)

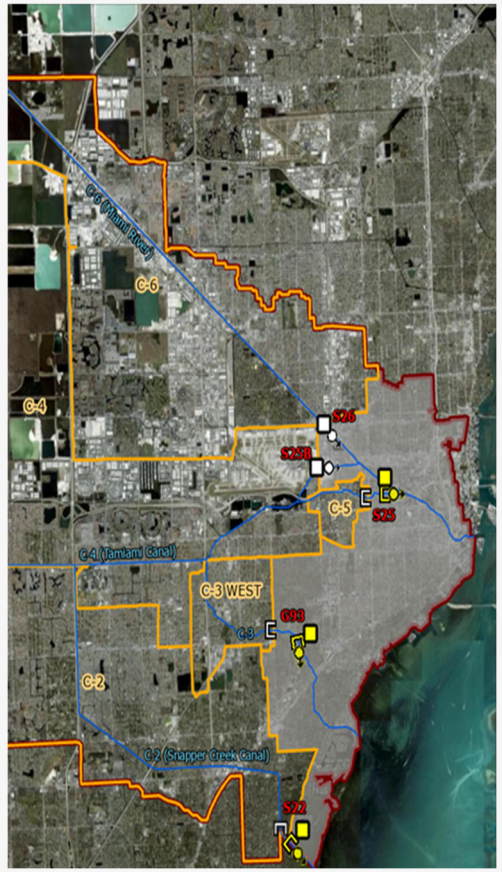
Enclosure

C&SF Flood Resiliency Studies – Miami Basins (Section 216)

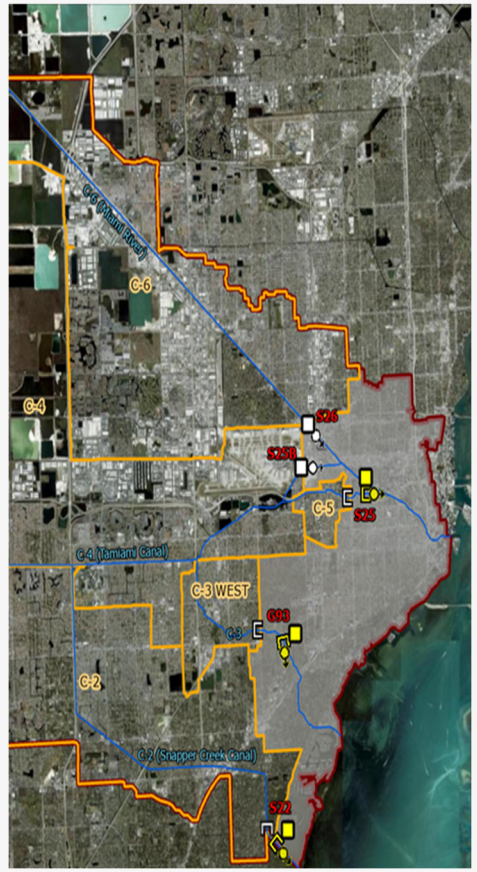
Finalizing the Preliminary Tentatively Selected Plan (TSP)

- Modeling efforts ongoing for the project alternatives in all five basins within the study area
- Decision Support tool utilized to test iterations of each alternate's cost, benefits and efficiency to inform selection of Preliminary TSP
- Upcoming Meetings with Project Stakeholders to review the Preliminary TSP

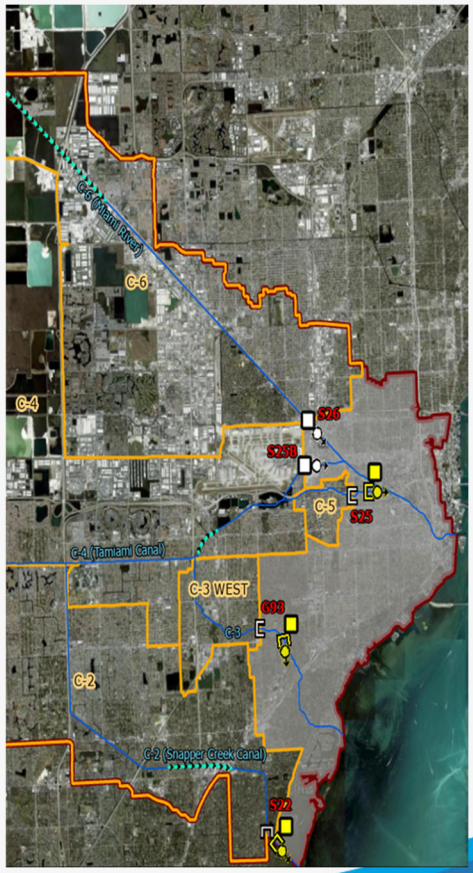
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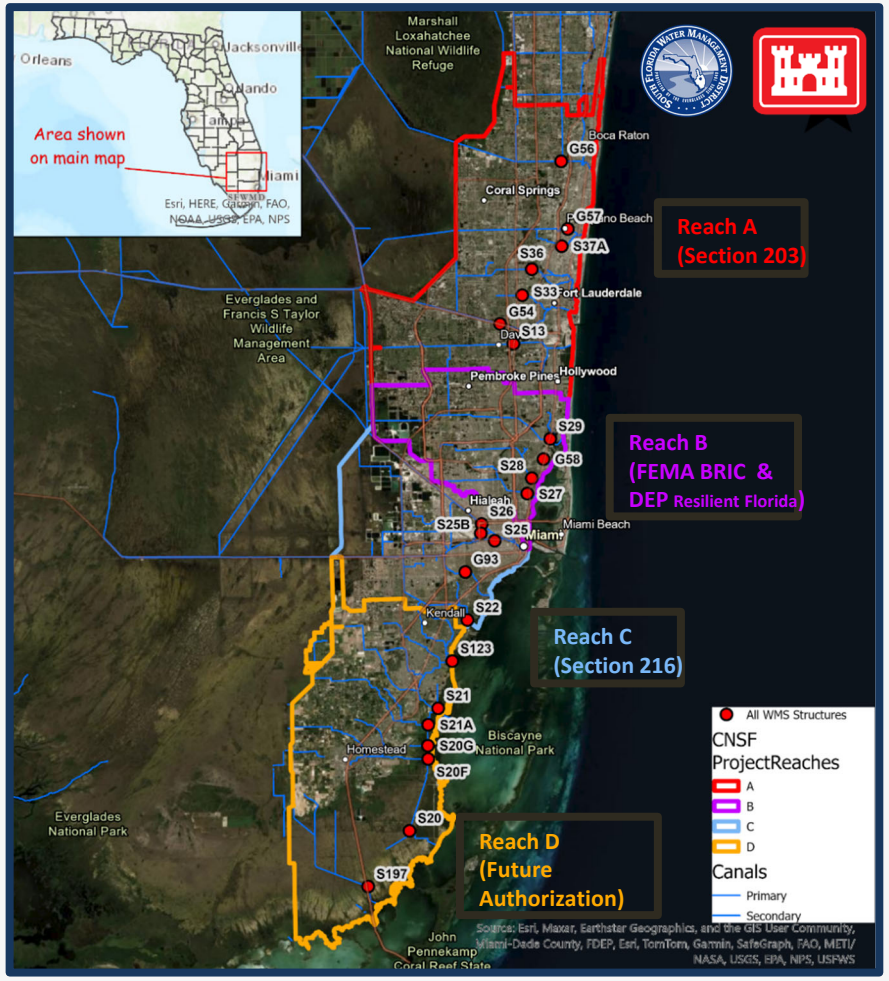
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C&SF Flood Resilience Projects – Integrated Strategy



Planning Reach A - Broward Basins

- Section 203 Feasibility Study Submitted to WRDA 2026
- Funding support from FDEP and Broward County

Planning Reach B - C-7, C-8, C-9 Basins

- Design Completed, Permit undergoing, construction estimated to begin in 2027
- Funding from FEMA BRIC Grant, Resilient Florida Grant

Planning Reach C – Miami River Basins

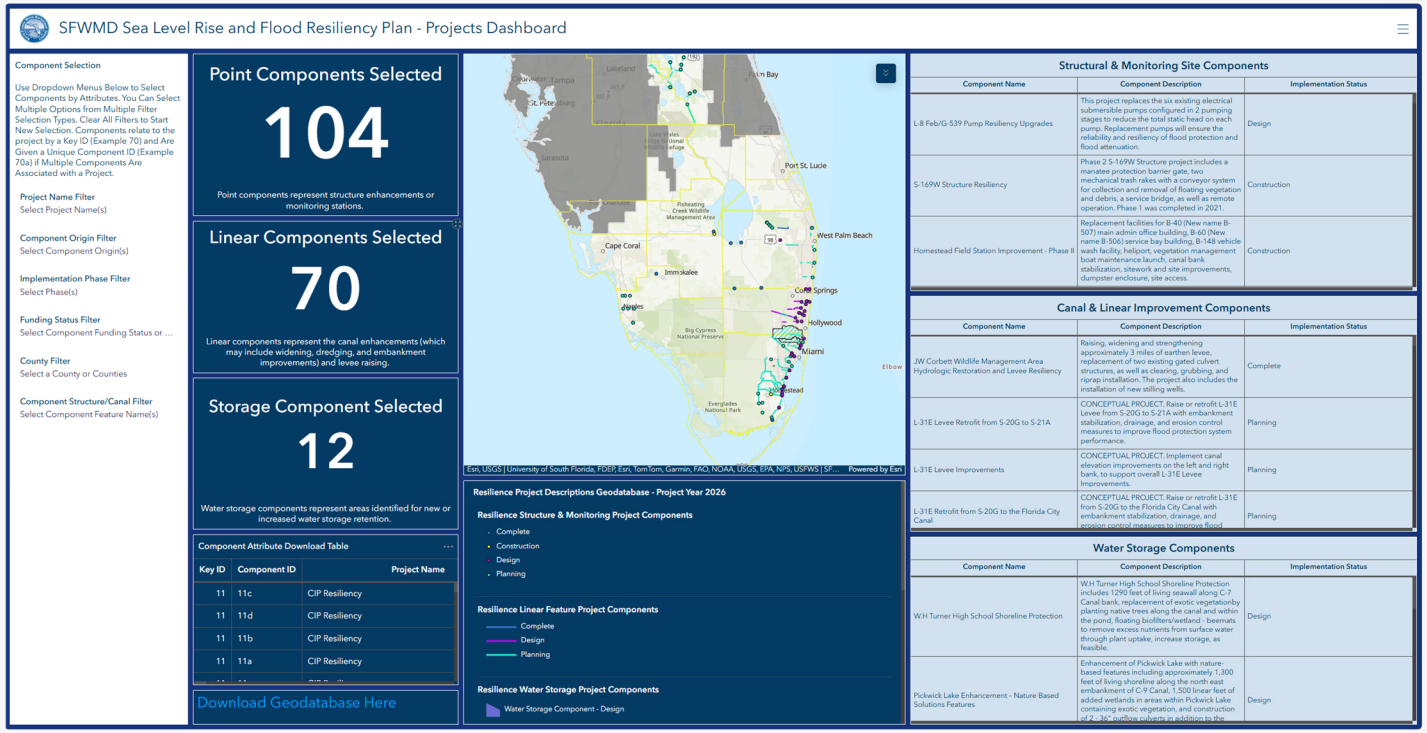
- C&SF Flood Resiliency Study – Section 216 Authorization
- Preliminary TSP milestone by March 2027

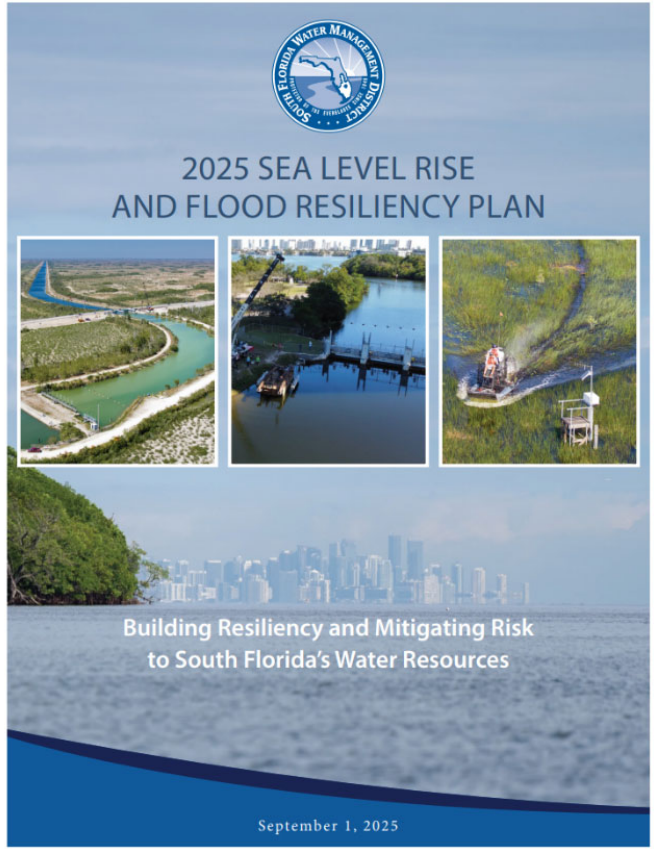
Planning Reach D - South Dade Basins

- CS&F Comprehensive Study or future planning studies

2026 Priority Resiliency Projects Update

SFWMD Sea Level Rise and Flood Resiliency Plan – Projects Dashboard





Submitted 30 Priority Projects to Miami-Dade County
Currently working on Broward County project submittals

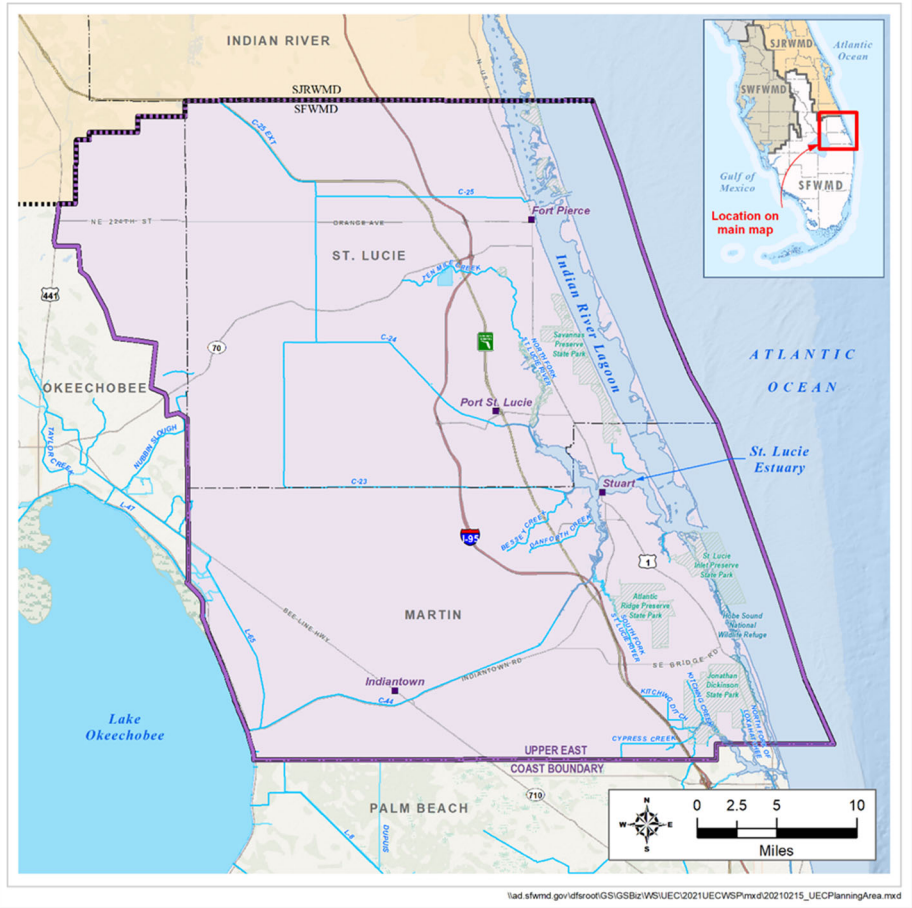
Access the document
(outdated project scopes)
2025 SLR and Flood Resiliency Plan

Upper East Coast Water Supply Plan

- Five-year update with demand projections to 2050
- 17 public supply utilities
- Major agricultural industry
- Important natural and water resources
  - C-23, C-24, and C-25 canals
  - St. Lucie River and Estuary
  - Indian River Lagoon
  - North Fork of the Loxahatchee River

- **Conclusions**
  - Future water needs can be met through 2050 with implementation of the proposed projects

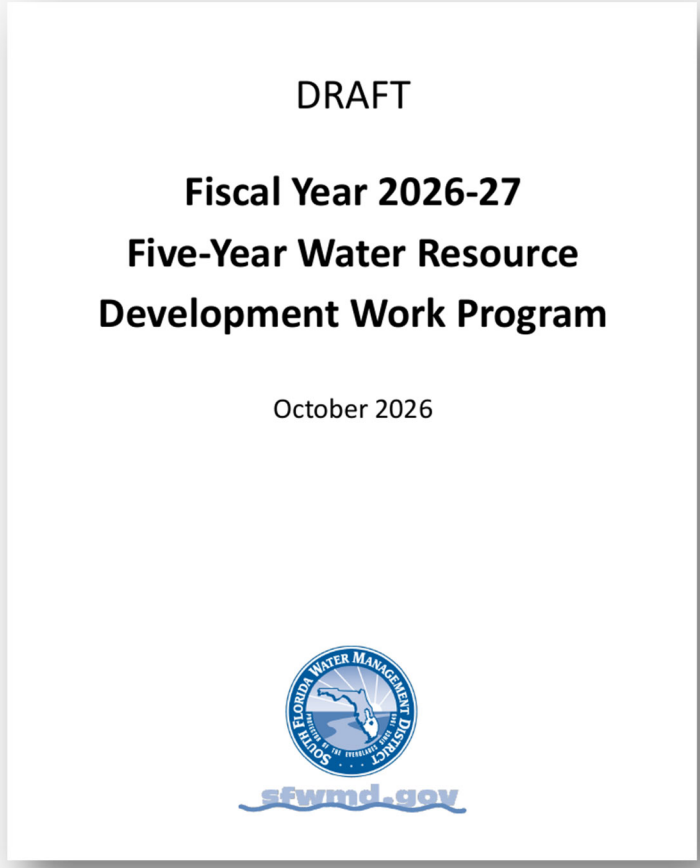
- **Draft plan posted for public review**
  - Comments due October 29, 2026



Martin and St. Lucie Counties and the northeastern portion of Okeechobee County

Draft Five-Year Water Resource Development Work Program

- Ensures sufficient water is available for current and future water supply needs
- Identifies current and anticipated funding for next 5 years
- Includes planned or proposed projects for:
  - MFL recovery or prevention strategies
  - Restricted Allocation Areas and Water Reservations
  - Basin Management Action Plans
  - Dispersed Water Management
- Estimated funding identified for the next 5 years is $4.56 Billion
- Work Program estimates more than 1,943 mgd of water available annually
  - 1,639 mgd is delivered from the C&SF Project



Grant Implementation Project Updates

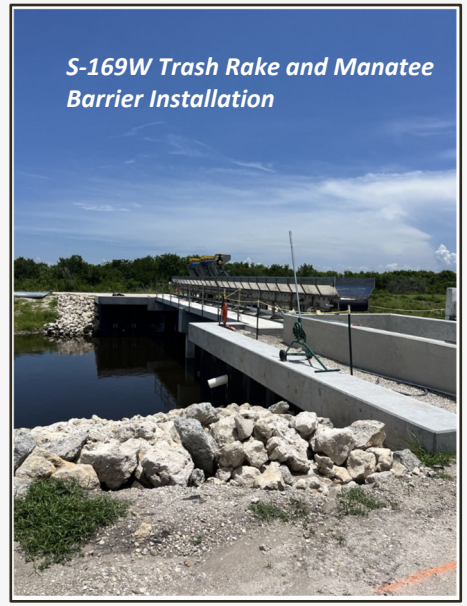
Implementation Grants

- **FDEM/FEMA HMGP and FDEP RF Grants for C-7 Basin (S-27); C-8 Basin (S-28) and C-9 Basin (S-29 Structure):** Planned Construction early 2027
  - Final FEMA Review for design continues; FEMA/FDEM Design Grant Closeout to follow next
  - Draft MOAs/ILAs and Land Negotiations ongoing
- **FDEP Resilient Florida Grants Implementation:**
  - 2 grant funded projects from FY22-23 have been successfully completed
  - 3 new grant awards received for FY25-26
    - 2 grant agreements have been fully executed
- **FDEP Innovative Tech Grant Implementation:**
  - WIPE OUT project at C-9 Canal, in collaboration with Miami-Dade County (MDC): Construction completed. WQ Monitoring to initiate by MDC this month.
- **DOT/FHWA PROTECT:** 3 Implementation grant applications under review.









Energization at C-9 Canal

Planning Grant Implementation Project Updates

- **FDEM HMGP:**
  - Awarded WMP Grant (Planning) for Lee County FPLOS Study
  - 2 additional WMP grants currently being closed out
- **USACE ERDC:**
  - Awarded ERDC Compound Flooding South Florida grant in collaboration with USACE JAX, UCF, Tulane University, and Deltares.



S-169W Site – Newly Completed Trash Rake and Manatee Barrier Structure

Construction Completion – Innovative Technology at C-9 Canal





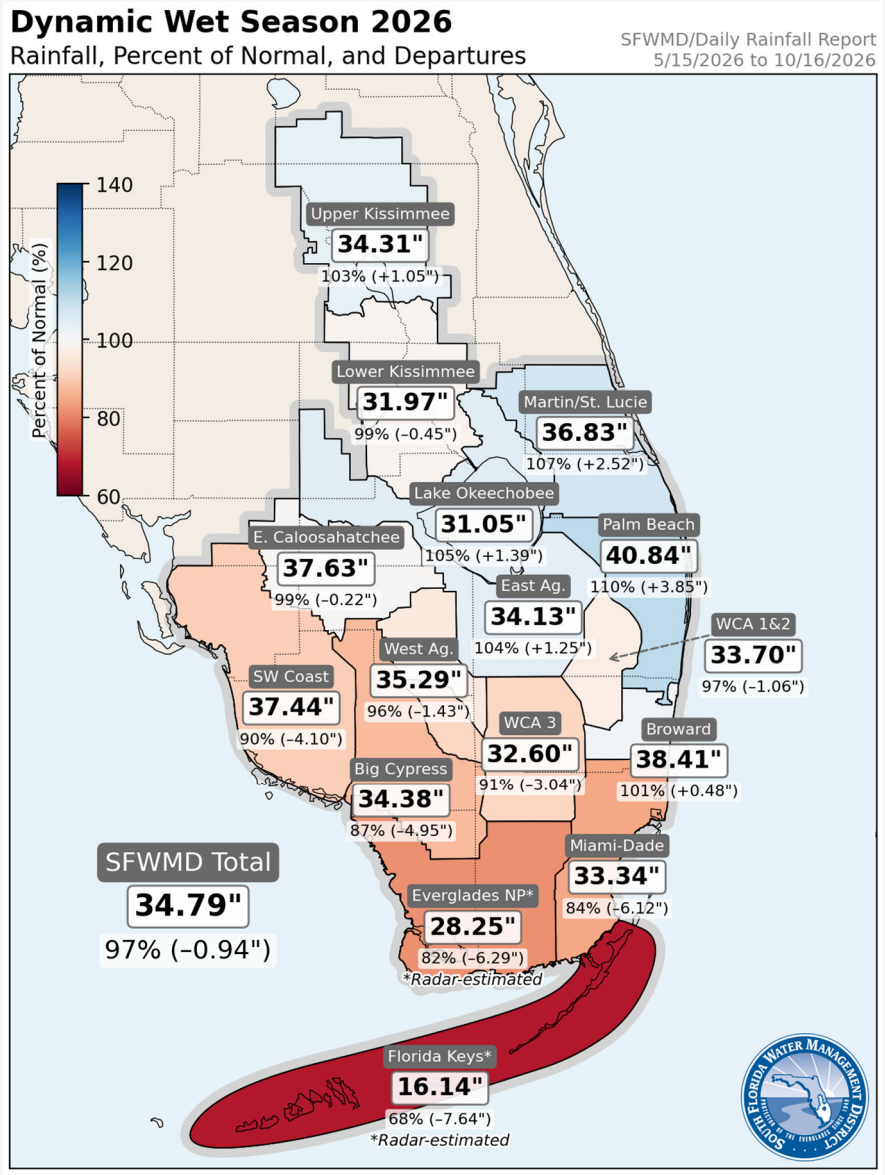
Energization at C-9 Canal



Constructed Channels with Installed Technologies



Post Construction Completion Site Walkthrough



2026 Wet, Hurricane, and King Tide Seasons

Key Dates

- **Wet Season:** May 15, 2026 – October 16, 2026
- **Hurricane Season:** June 1 - November 30, 2026
- **King Tide Season:** August 10 - December 27, 2026

2026 King Tide Season

Weekly King Tide Forecasts

During these periods, high tides may exceed one or more National Weather Service (NWS) flood thresholds in parts of the region.

East Coast

Maximum Peak: October 27

- October 22 - November 12
- November 22 - 29
- December 22 - 27

Florida Keys

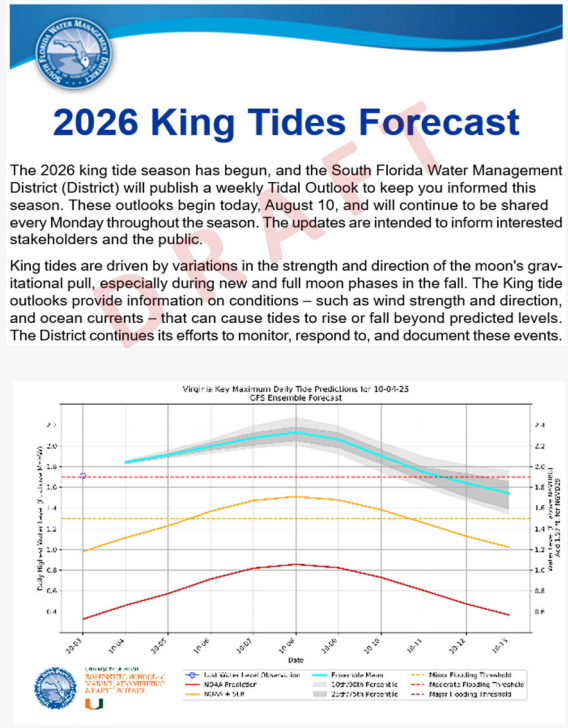
Maximum Peaks: October 28 & 30

- August 24 - November 17
- November 19 - December 1
- December 4 - 13
- December 21 - 27

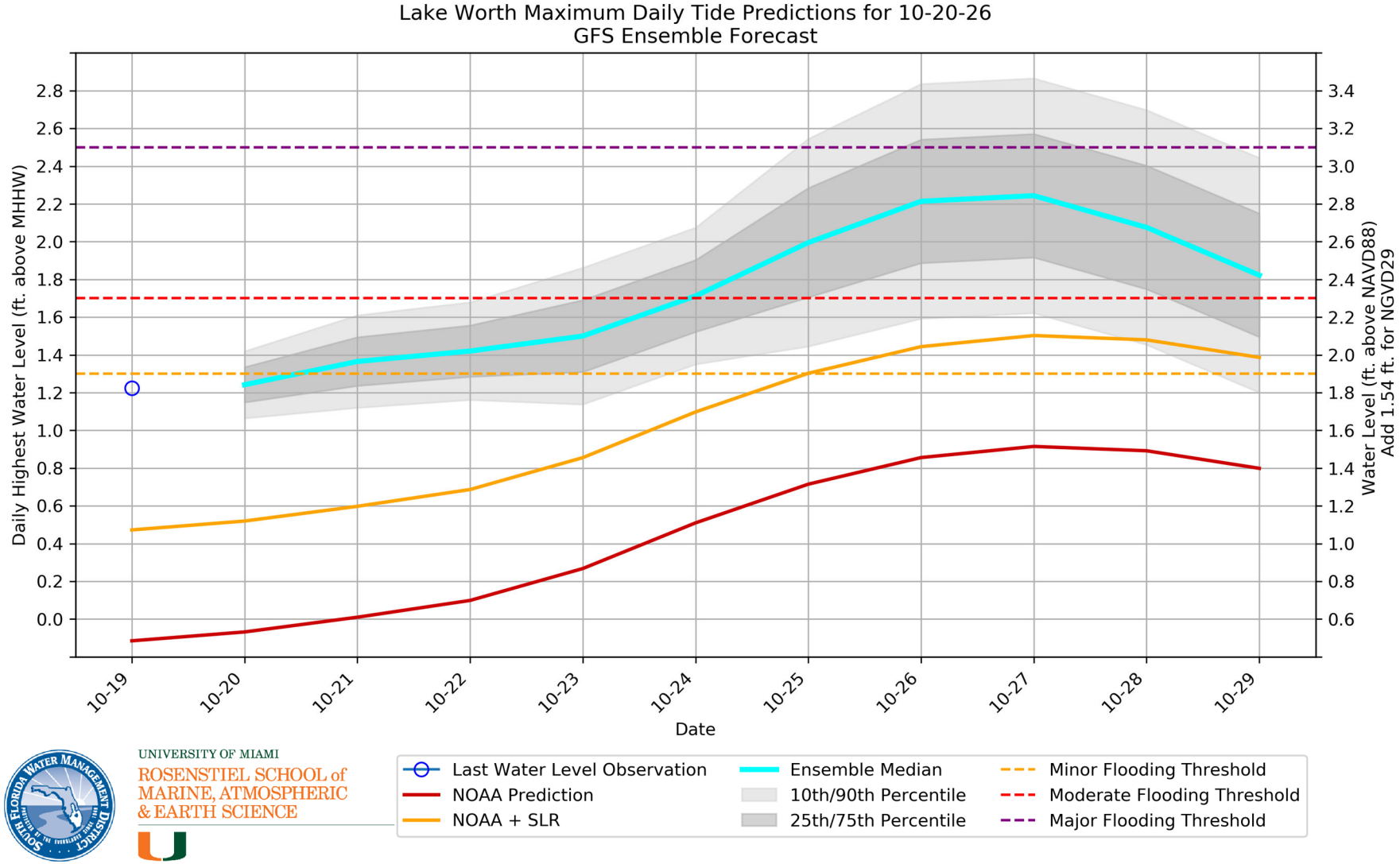
West Coast

Maximum Peak: August 12

- October 27-29

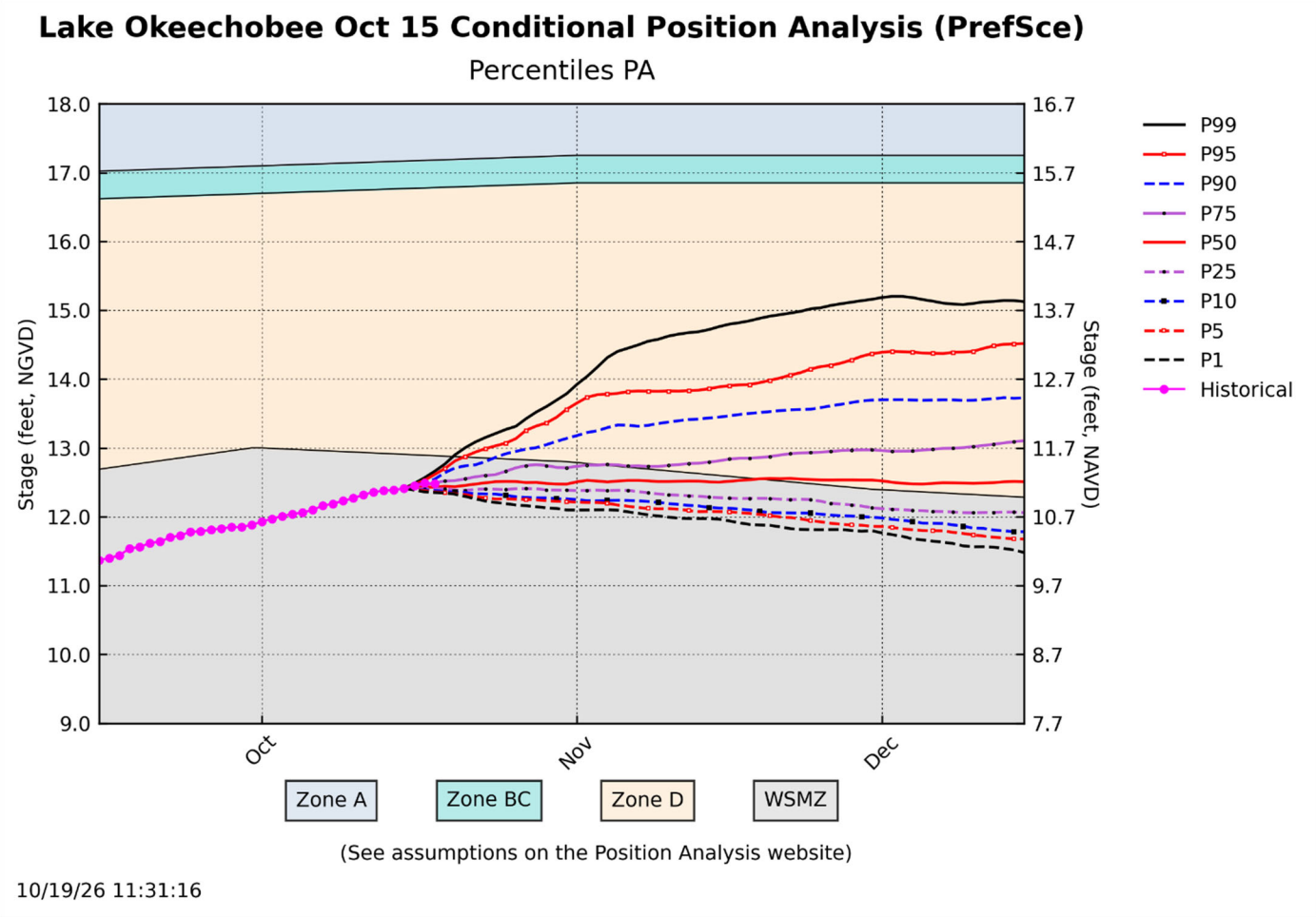


Enhanced Tide Predictions

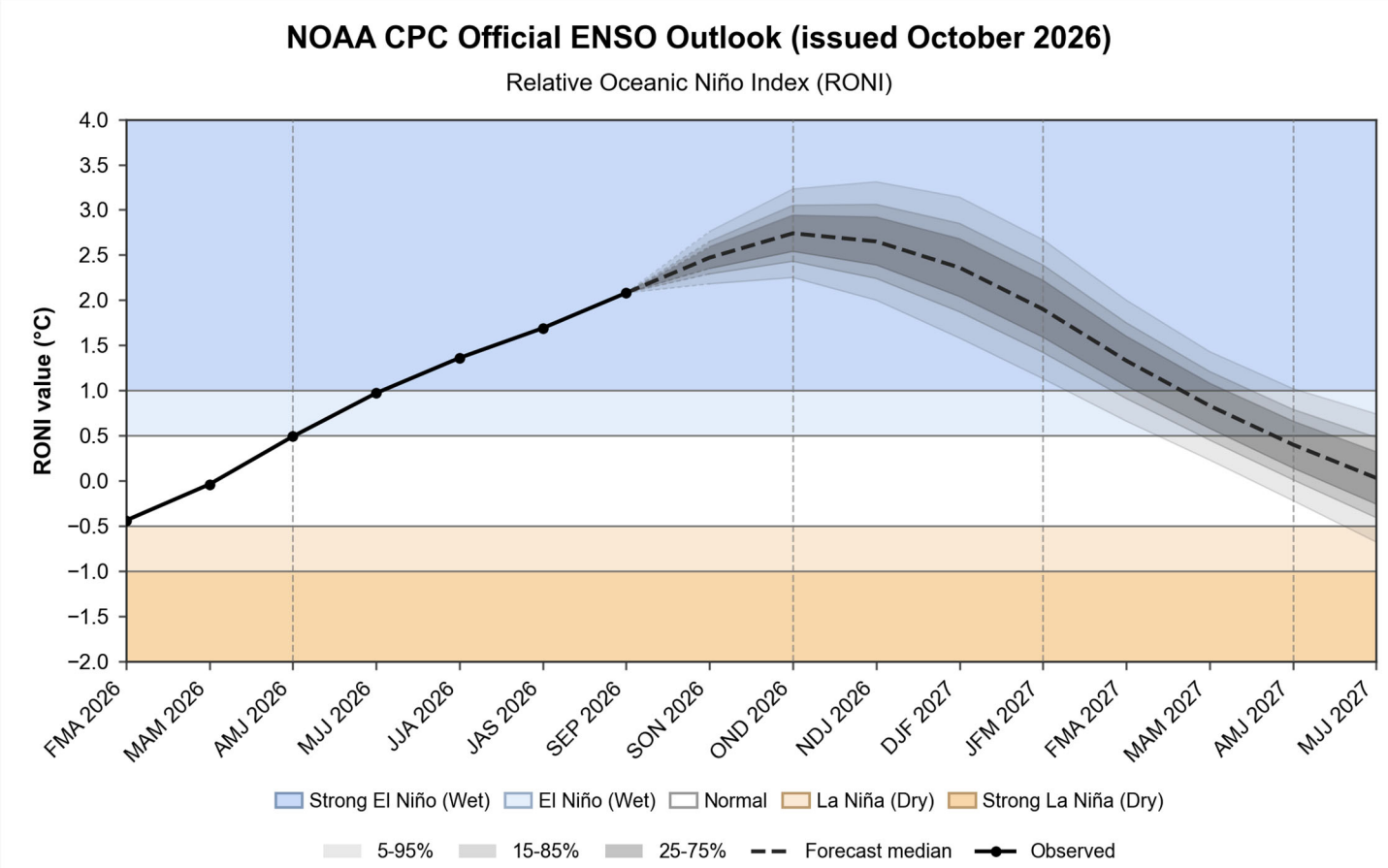


Presenter: Carolina Maran

Lake Okeechobee Stage Projection

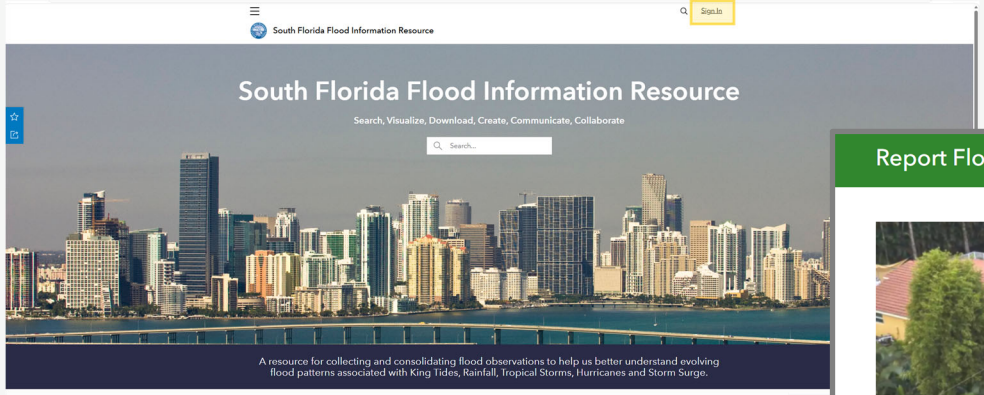


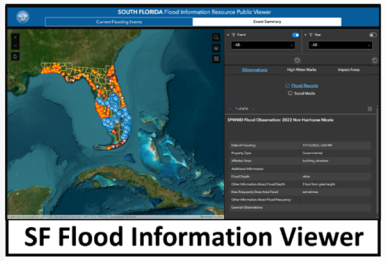
Current Climate and Forecast



Forecast shading spans NOAA CPC RONI percentiles for nine upcoming 3-month seasons (issued 2026-10-08).
(https://cpc.ncep.noaa.gov/products/analysis_monitoring/enso/roni/outlook/)
Observed line shows seasonal RONI values from NOAA CPC. (https://www.cpc.ncep.noaa.gov/data/indices/RONI.ascii.txt)

Flood Observations & South Florida Flood Information Resource





South Florida Flood Information Resource Public Viewer:

To access: Click on the image to the left. This application is designed for exploration of publicly shared Flood Information Repository content. Data for this application was compiled from a variety of sources.



South Florida Flood Information Resource Application (aka Stakeholder Dashboard):

Click on the image to the left. This application provides a variety of options to view, filter and download flood observations and high water mark records and photos.

Report Flooding and Early Concerns



Quick Link: sfwmd.gov/FloodingApp

QR Code:

Access: Survey123 application (recommended) or web browser on a computer or mobile device

Availability: Public

Sign in Required: No

SFWMD HWM Survey



Quick Link: N/A

QR Code

Access: Survey123 application (recommended) or web browser on a computer or mobile device

Availability: Trained personnel only

Sign in Required: Yes

Thank you!

Minimum Flow and Level Analysis for Water Supply Planning

Resiliency Coordination Forum

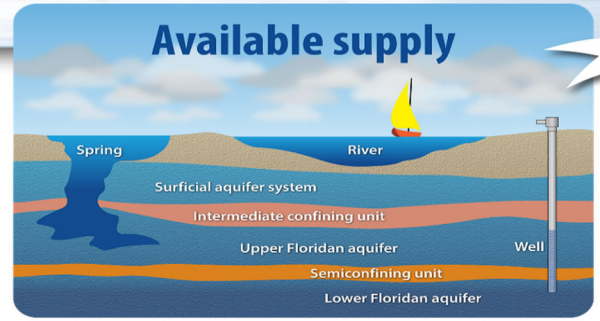


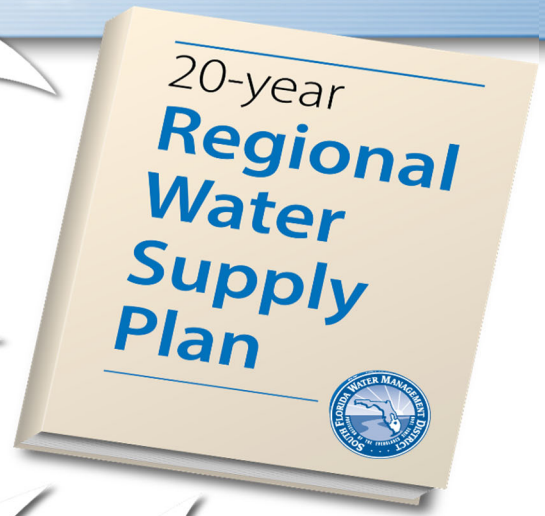
Anushi Obeysekera
Chief, Flood Control and Water Supply Planning Bureau
October 21, 2026

Water Supply Planning

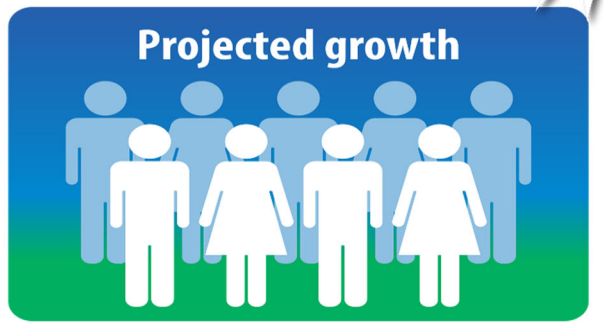
Statutory Goal of Water Supply Plans (Section 373.709, Florida Statutes)

To identify sufficient water supply sources and future projects to meet existing and future reasonable-beneficial uses during 1-in-10-year drought conditions through 2050 while sustaining water resources and related natural systems.





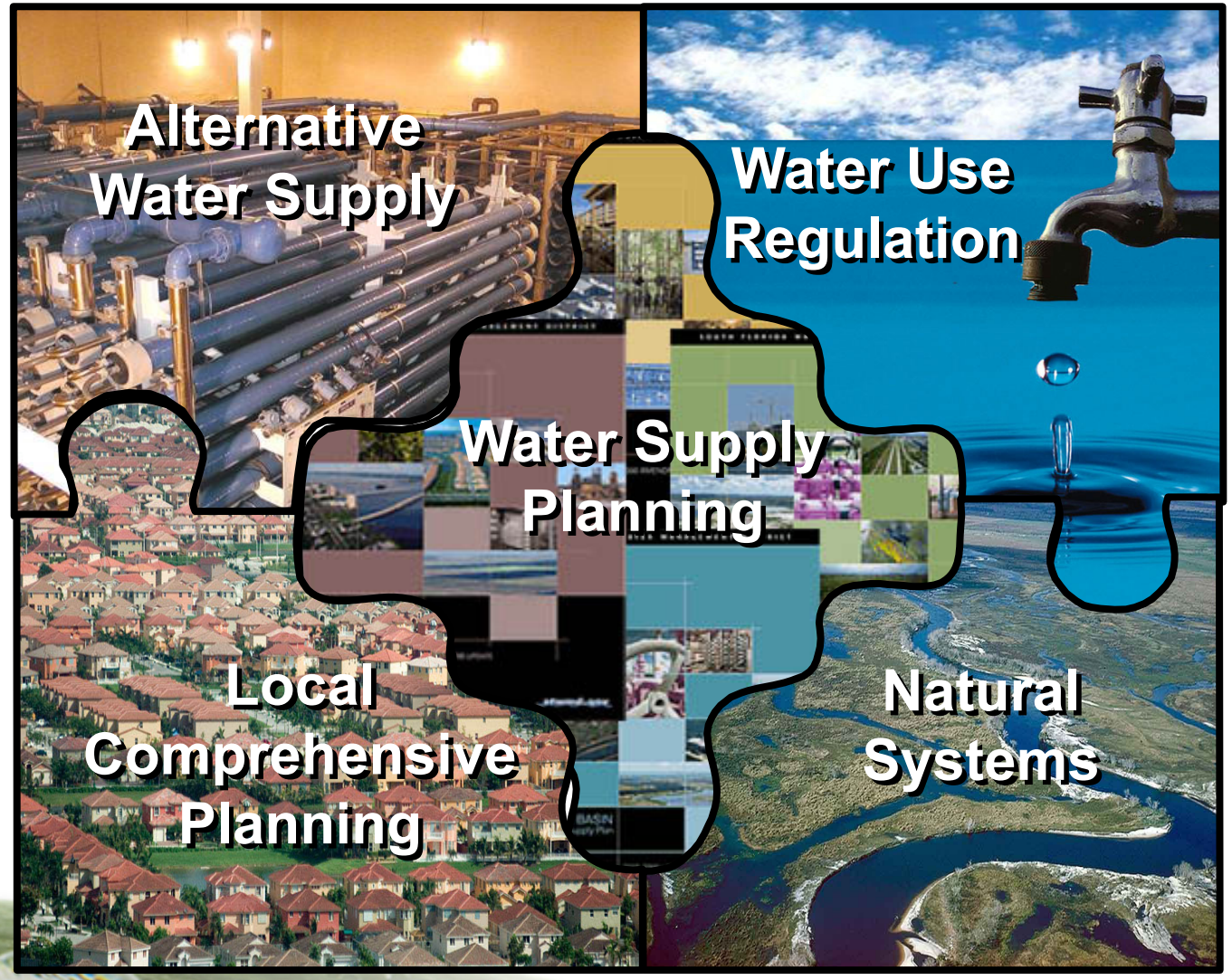






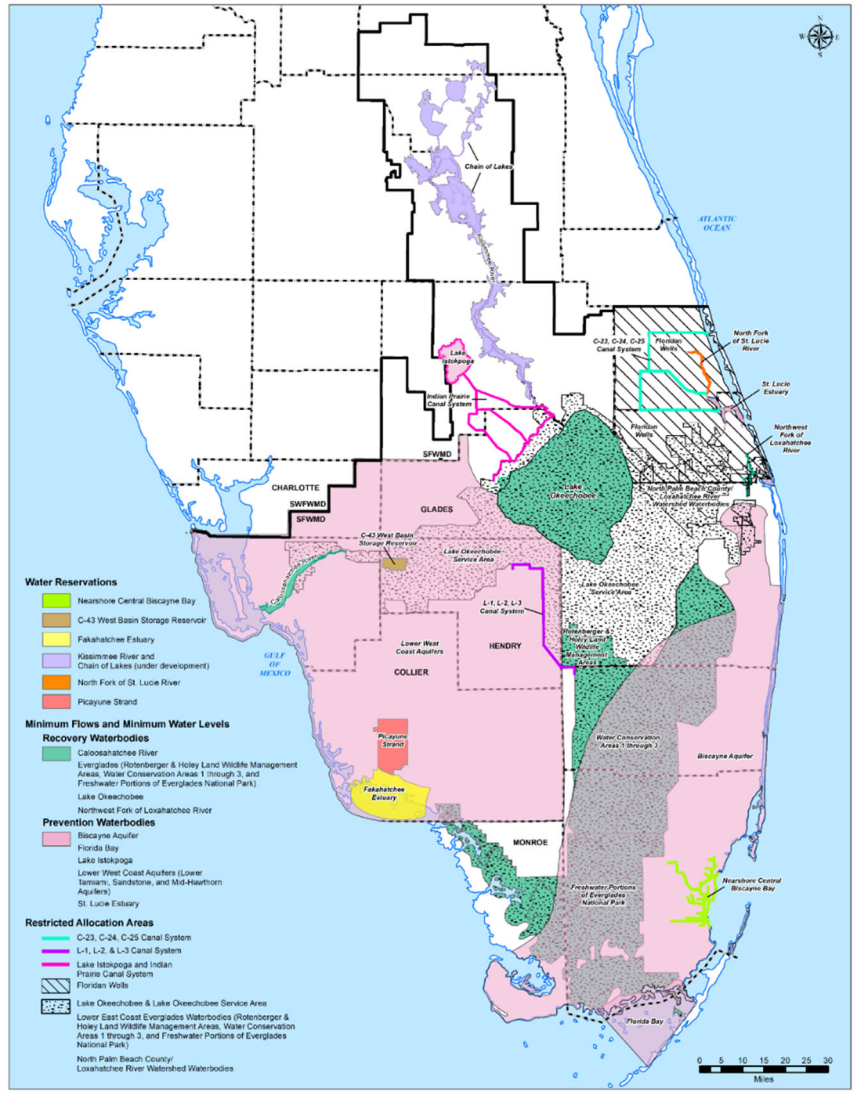
Presenter: Anushi Obeysekera

Water Supply Planning Linkages



Limitations on Traditional Water Sources

- Resource protection tools
  - Water use permitting
  - Minimum Flows and Minimum Water Levels
  - Water Reservations
  - Restricted Allocation Areas
- More than one resource protection tool can apply to a water body



Presenter: Anushi Obeysekera

Minimum Flows and Minimum Levels (MFLs)

Statutory Authority: Chapter 373, Florida Statutes (F.S.)

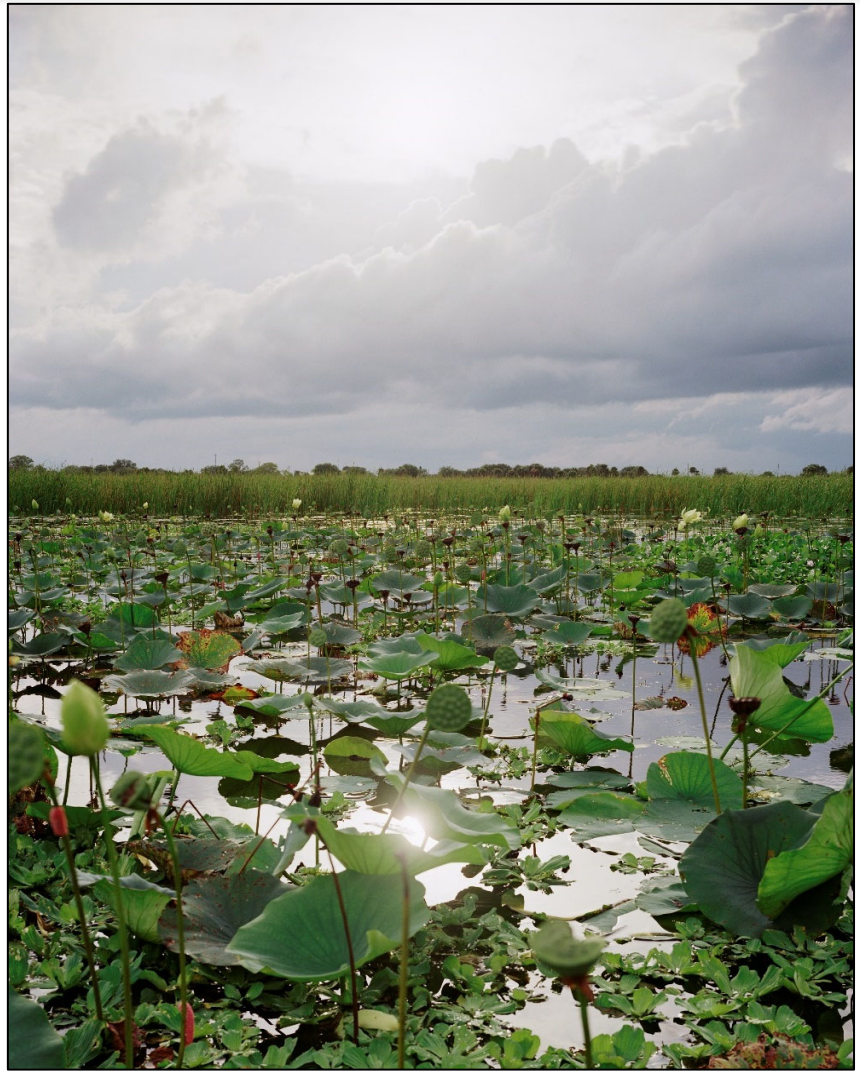
MFL Defined in Rule 40E-8.021(31), F.A.C. and Section 373.042(1)(a) and (b), F.S.

- Point at which further withdrawals will cause "significant harm" to the water resources or ecology of an area

Significant Harm Defined in Rule 40E-8.021(31), F.A.C.

- Temporary loss of water resource functions that takes more than two years to recover, but is less severe than serious harm

May be adopted for both surface waters and groundwaters



Lotus pads on Lake Okeechobee
Source: Katherine Wolkoff at https://www.audubon.org

Presenter: Anushi Obeysekera

MFL Recovery and Prevention Strategies

Section 373.0421(2), F.S.

Recovery Strategy

- For waterbodies *not* meeting the MFL at the time of adoption
- Achieve recovery to the established MFL as soon as "practicable"

Prevention Strategy

- For waterbodies that *are* meeting the MFL but *are not* expected to meet it in 20 years
- Prevent the existing flow or level from falling below the adopted MFL



Great Egret (*Ardea alba*) and American Alligator (*Alligator mississipiensis)*
Source: https://naturetime.wordpress.com

Presenter: Anushi Obeysekera

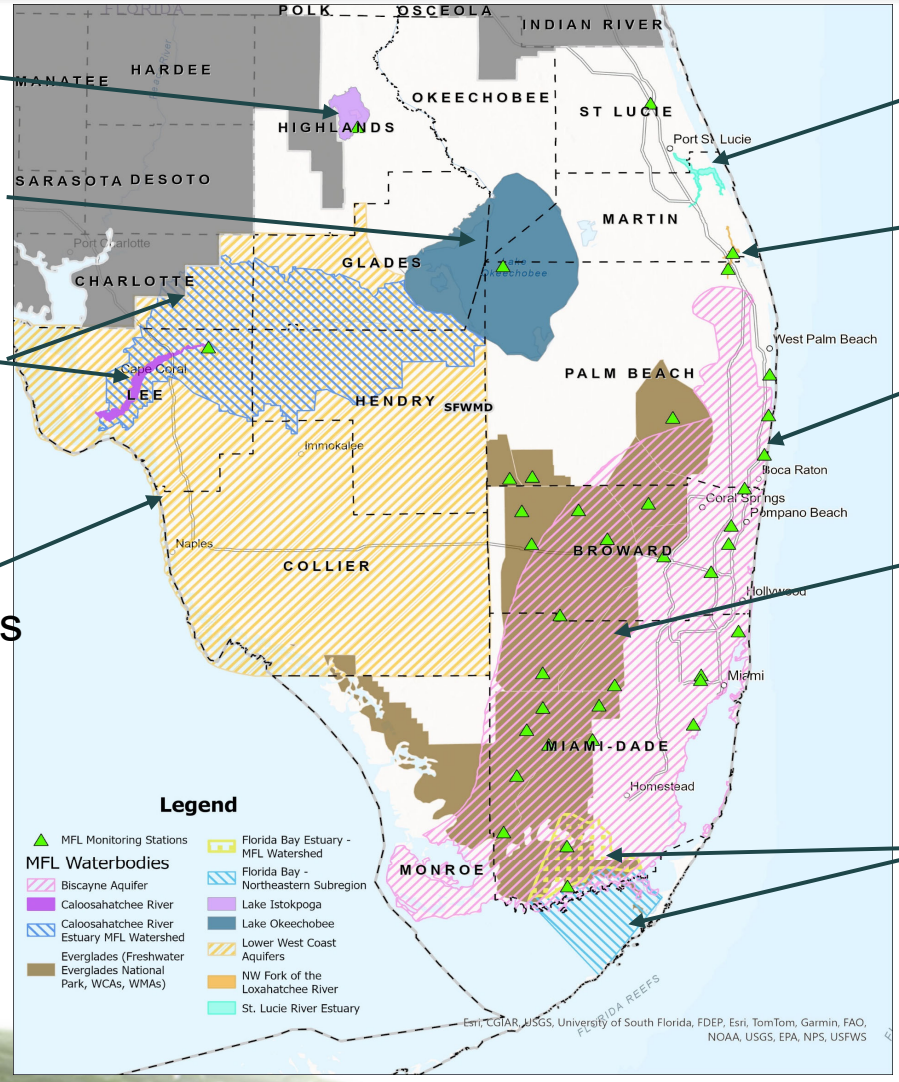
MFLs Across SFWMD

Lake Istokpoga

Lake Okeechobee

Caloosahatchee River

Lower West Coast Aquifers



St. Lucie River Estuary

NW Fork of the Loxahatchee River

Biscayne Aquifer

Everglades

Florida Bay

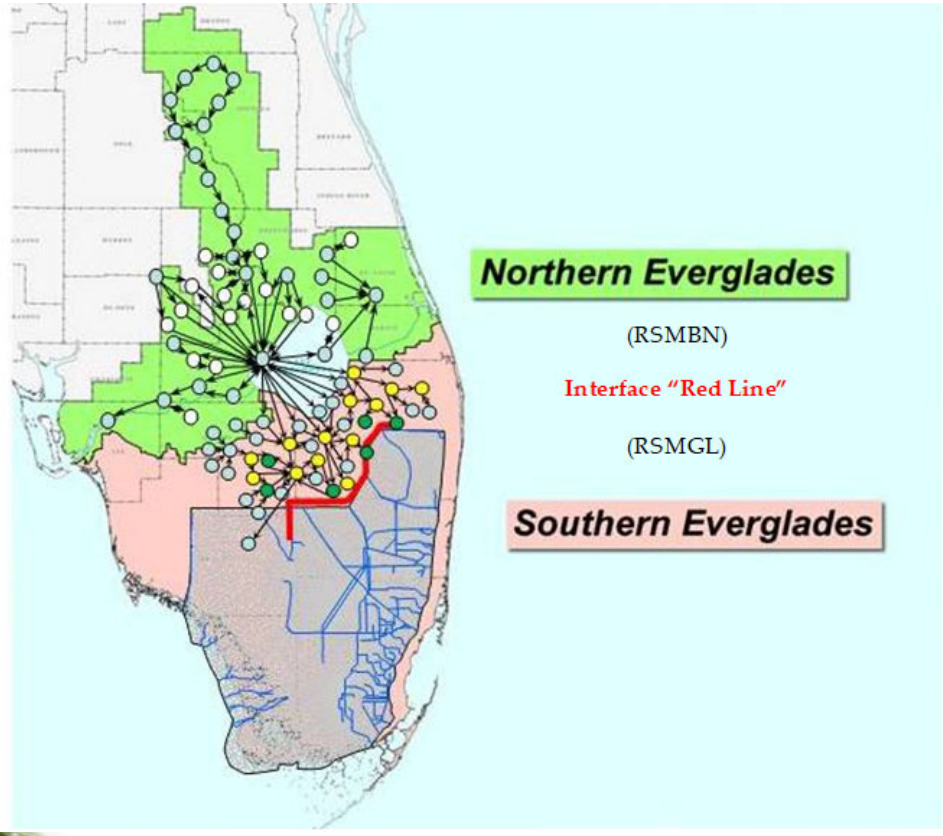
Presenter: Anushi Obeysekera

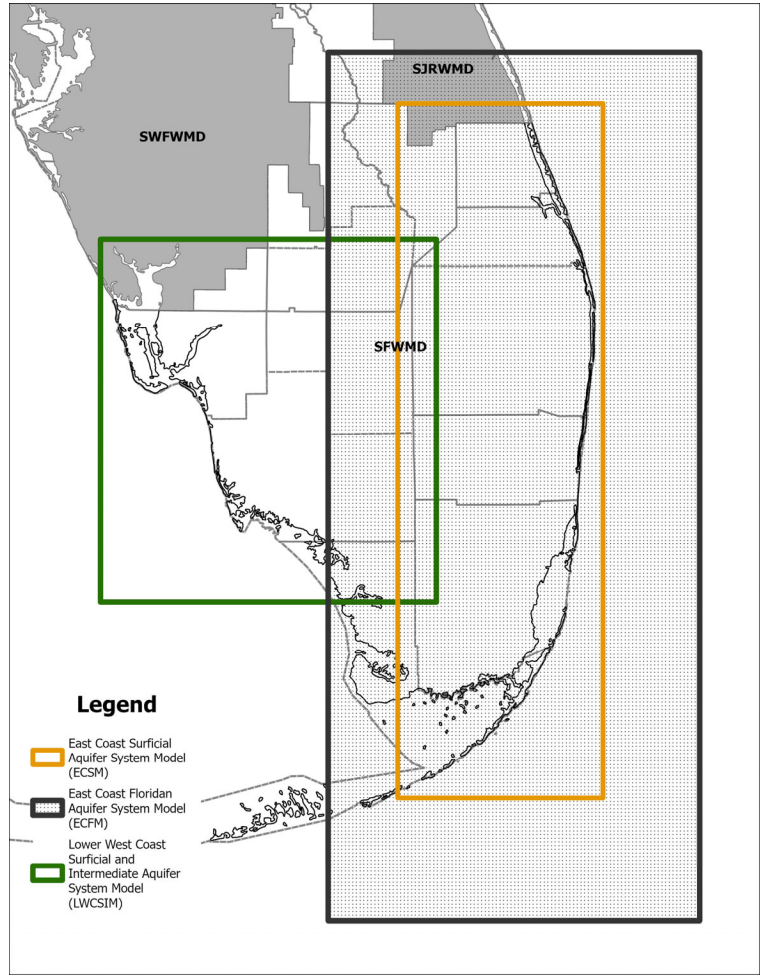
Existing MFLs

MFL Waterbody	Water Supply Plan	MFL Criteria	Recovery or Prevention Strategy
Northwest Fork of Loxahatchee River	Lower East Coast	Subsection 40E-8.221(4), F.A.C.	**Recovery** Subsection 40E-8.421(6), F.A.C.
Lake Okeechobee	Lower East Coast	Subsection 40E-8.221 (1), F.A.C.	**Recovery** Subsection 40E-8.421(2), F.A.C.
Biscayne Aquifer	Lower East Coast	Subsection 40E-8.231, F.A.C.	**Prevention** Subsection 40E-8.421(3), F.A.C.
Lower West Coast Aquifers	Lower West Coast	Subsection 40E-8.331, F.A.C.	**Prevention** Subsection 40E-8.421(4), F.A.C.
St. Lucie Estuary	Upper East Coast	Subsection 40E-8.341, F.A.C.	**Prevention** Subsection 40E-8.421(5), F.A.C.
Lake Istokpoga	Lower Kissimmee Basin	Subsection 40E-8.351, F.A.C.	**Prevention**, Subsection 40E-8.421(7), F.A.C.
Florida Bay	Lower East Coast	Subsection 40E-8.221(5), F.A.C.	**Prevention** Subsection 40E-8.421(8), F.A.C.
Everglades	Lower East Coast	Subsection 40E-8.221(3), F.A.C.	**Recovery** Subsection 40E-8.421(2), F.A.C.
Caloosahatchee River	Lower West Coast	Subsection 40E-8.221(2), F.A.C.	**Recovery** Subsection 40E-8.421(2), F.A.C.

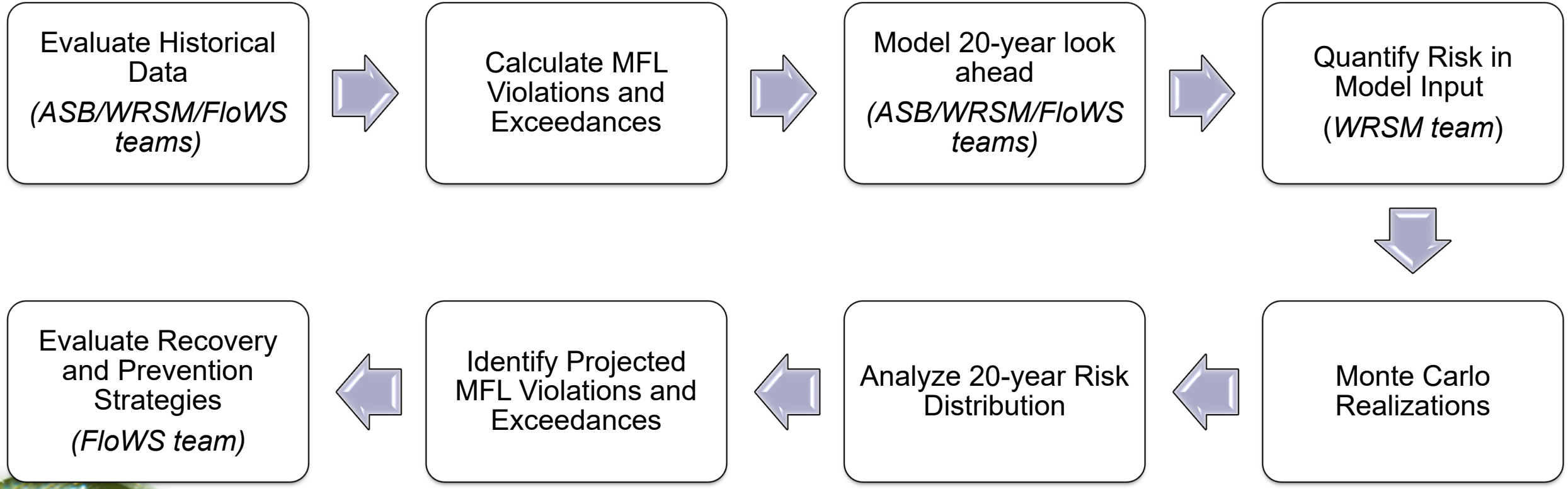
Presenter: Anushi Obeysekera

Models for MFL Analysis





MFL Status Assessment Process



Presenter: Anushi Obeysekera

Future Work

- Reevaluate MFLs identified in the Priority Water Body List
  - Approved by the Governing Board in September 2026
  - Northwest Fork of the Loxahatchee River, Florida Bay, and Biscayne Aquifer by 2029
- Assess the performance of the Caloosahatchee River MFL as part of the Lower West Coast Water Supply Plan

Orlo Vista Flood Mitigation Project

SFWMD Resiliency Coordination Forum

October 21, 2026

Liliana Ramirez, CFM

ORLO VISTA FLOOD MITIGATION PROJECT

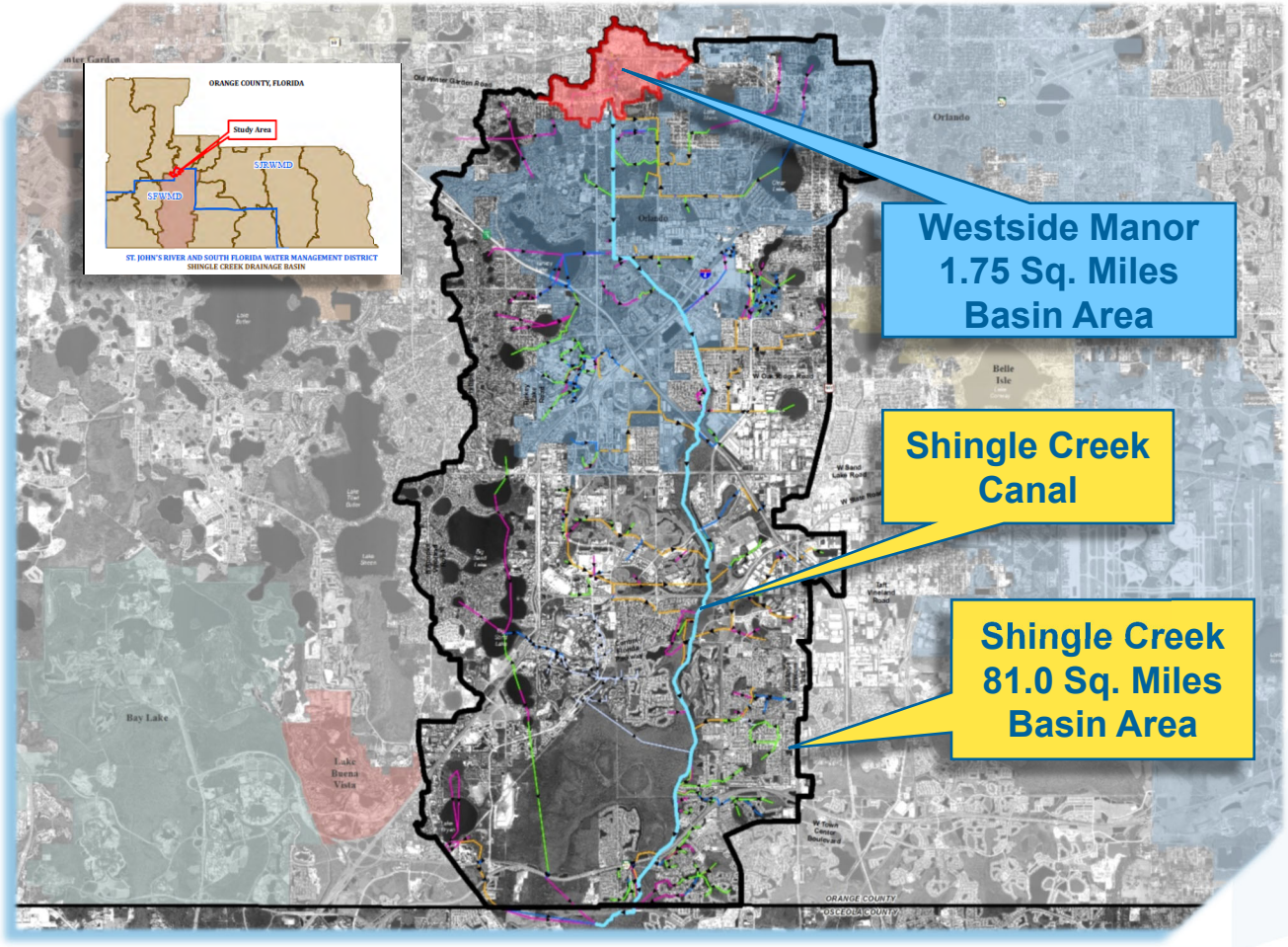


Aero Photo
727.520.8181
www.aerophoto.com

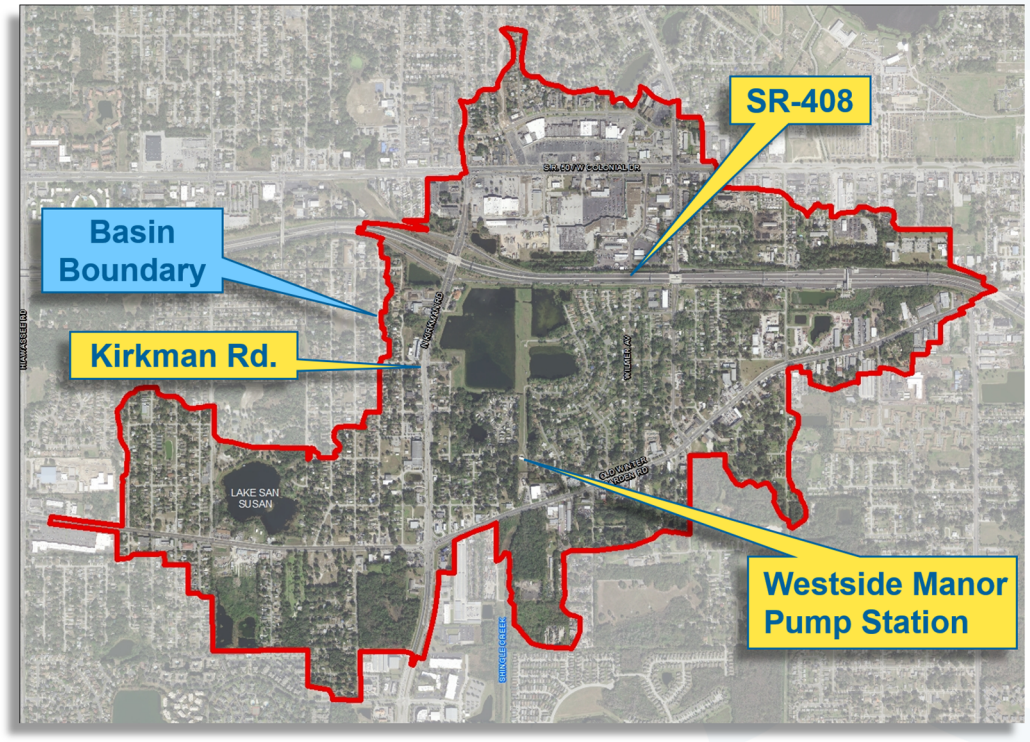
Orlo Vista Flood Mitigation Y227009

Image # 08
Date 11.11.25

PROJECT LOCATION



Shingle Creek Watershed



Orlo Vista Sub-Basin

HURRICANE IRMA – SEPTEMBER 10, 2017

IRMA

- Irma produced 9.1 inches of rainfall in 28 hours exceeding the capacity of the pumps.
- Widespread flooding impacted homes throughout the Orlo Vista and Westside Manor communities, with some residents requiring rescue.



HURRICANE IAN – SEPTEMBER 28, 2022

IAN

- Ian produced 13.2 inches of rainfall in 40 hours exceeding the capacity of the pumps.
- Estimated 148 Structure Finished Floors were Impacted.

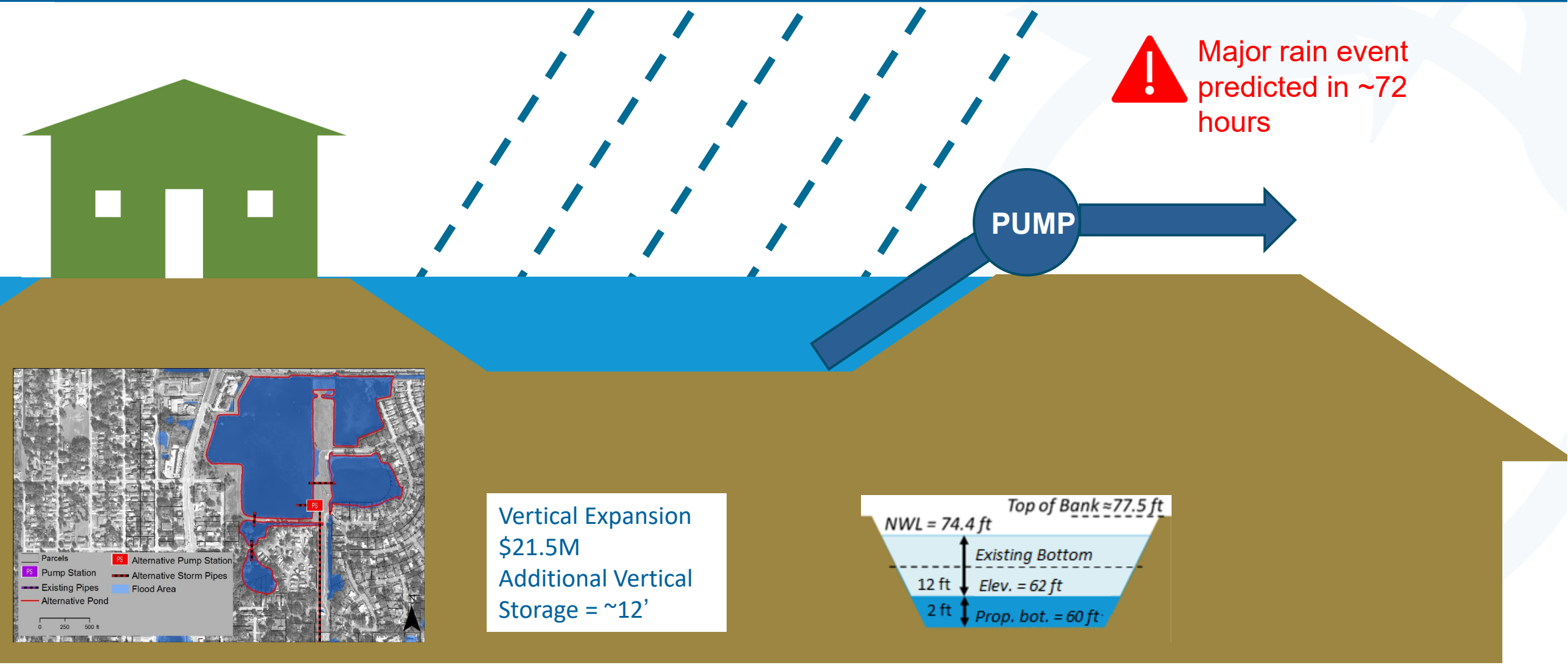


ALTERNATIVES EVALUATION

Alternatives

- Parcel Acquisition
- Horizontal Pond Expansion
- Increase Pumping Rate
- Bermed Impoundment
- Vertical Pond Expansion – Selected Alternative

VERTICAL EXPANSION



Major rain event predicted in ~72 hours

Vertical Expansion
$21.5M
Additional Vertical Storage = ~12’

HURRICANE MILTON – OCTOBER 9-10, 2024

Hurricane Ian 2022



Hurricane Milton 2024



- Hurricane Milton produced 9.46 inches of rainfall over 34 hours, demonstrating the effectiveness of the completed pond improvements.
- Orlo Vista / Westside Manor residents can look forward to a safer and more resilient future.

FUNDING SOURCES

FEMA - HMGP

$17.4 M

FEMA

HUD-CDBG-MIT

$2.5 M

ORANGE COUNTY

$3.3 M

ORANGE COUNTY FLORIDA

TOTAL COST = $23.2M

Orlo Vista Project Photos

ORLO VISTA PONDS BEFORE IMPROVEMENTS

The ponds were very shallow, with limited storage capacity, making it difficult for the drainage system to handle major storm events.



ORLO VISTA PONDS AFTER IMPROVEMENTS

The improved ponds are deeper, have erosion-protected banks, and provide nearly three times the storage capacity to better manage future storms.



NEW PUMP STATION

The new pump station was built next to the ponds to control water levels by pumping stormwater into the Shingle Creek Canal, creating additional storage before major storms and helping reduce flooding during heavy rainfall.



NEW SUBMERGIBLE PUMPS

The new pump station has three submersible pumps with a combined capacity of approximately 40,000 gallons per minute.

Depending on the pond water levels and stormwater conditions, the system can operate one, two, or all three pumps at the same time.



NEW ELECTRICAL BUILDING





The new electrical building houses the equipment and control systems needed to safely operate and monitor the pump station.

NEW BACKUP GENERATOR

The project also includes a backup generator with a 5,000-gallon fuel tank to keep the pump station operating during power outages.



NEW PUMP STATION FACILITIES

Together, the new pump station, electrical building, and backup generator provide a strong flood protection system, making the Orlo Vista and Westside Manor communities better prepared for future storms.



ORLO VISTA PROJECT VIDEO SUMMARY



ORLO VISTA FLOOD MITIGATION PROJECT

Questions?

Liliana Ramirez, CFM

Assistant Project Manager

Orange County, Stormwater Management Division

Liliana.Ramirez@ocfl.net

407-836-7744

SFWMD Resiliency Coordination Forum

Orlo Vista Integrated Water Resources Project

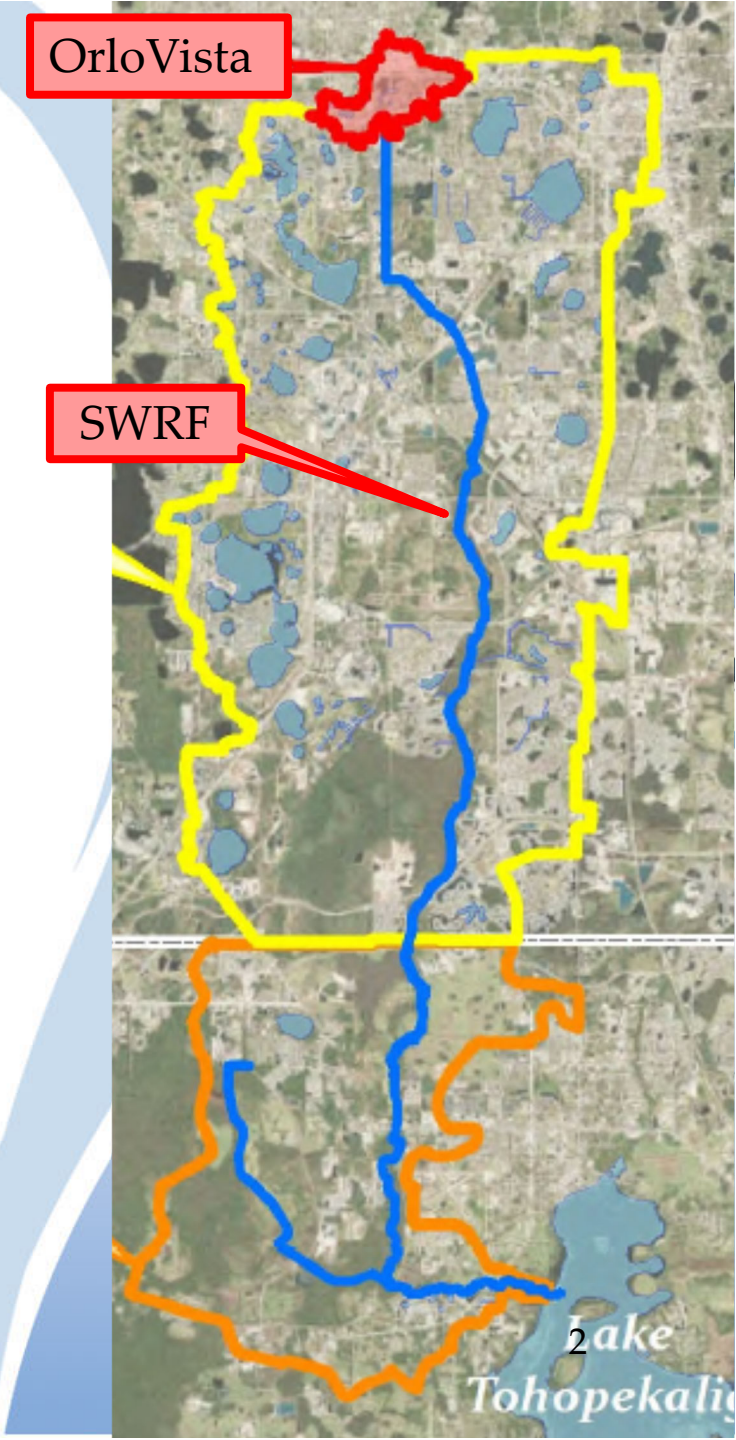
Project Overview, Progress & Next Steps

Lucy Gassaway, P.E.

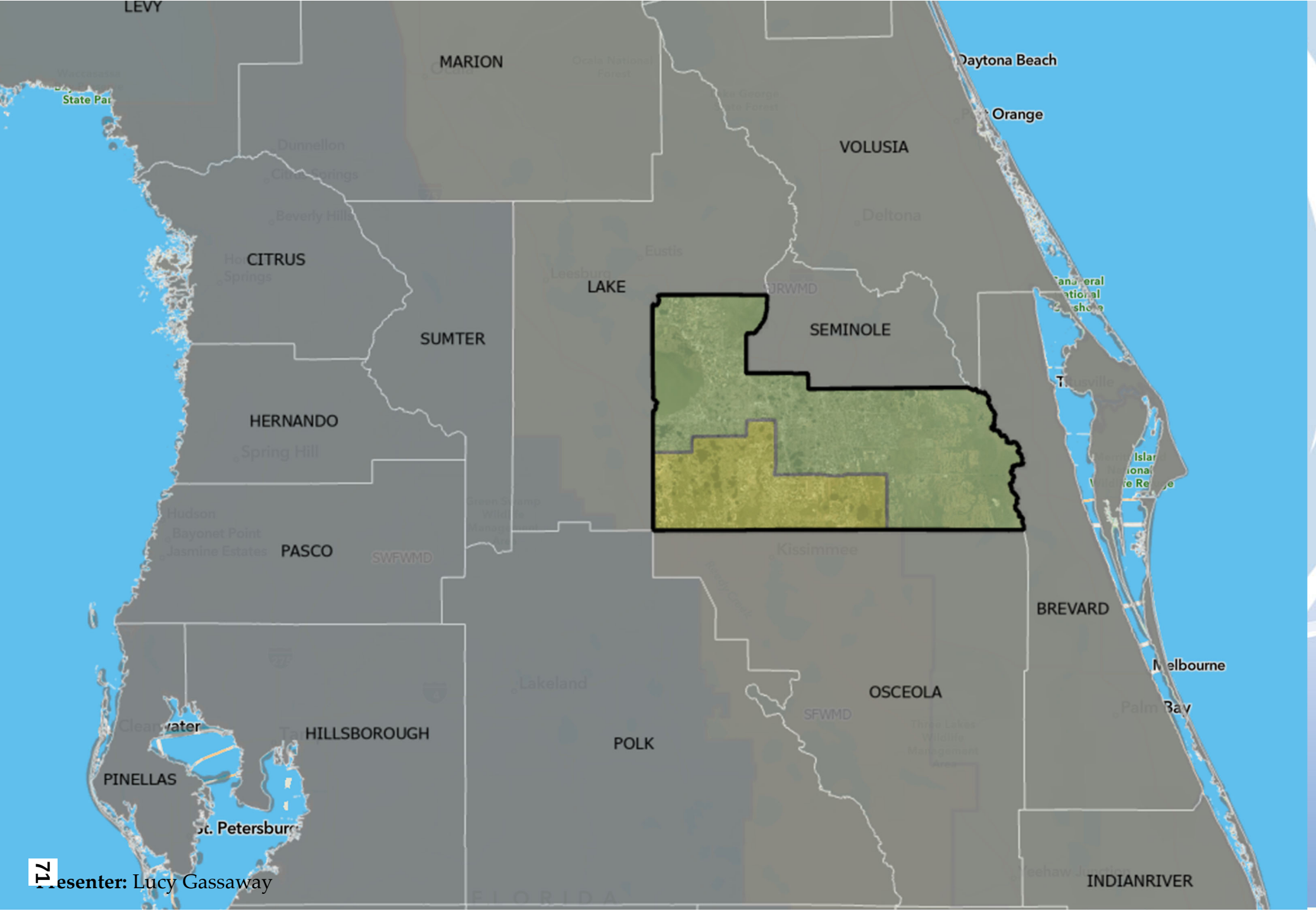
October 21, 2026

Presentation Outline

- Project Background Information
- Completed Milestones and Efforts
- Project Timeline

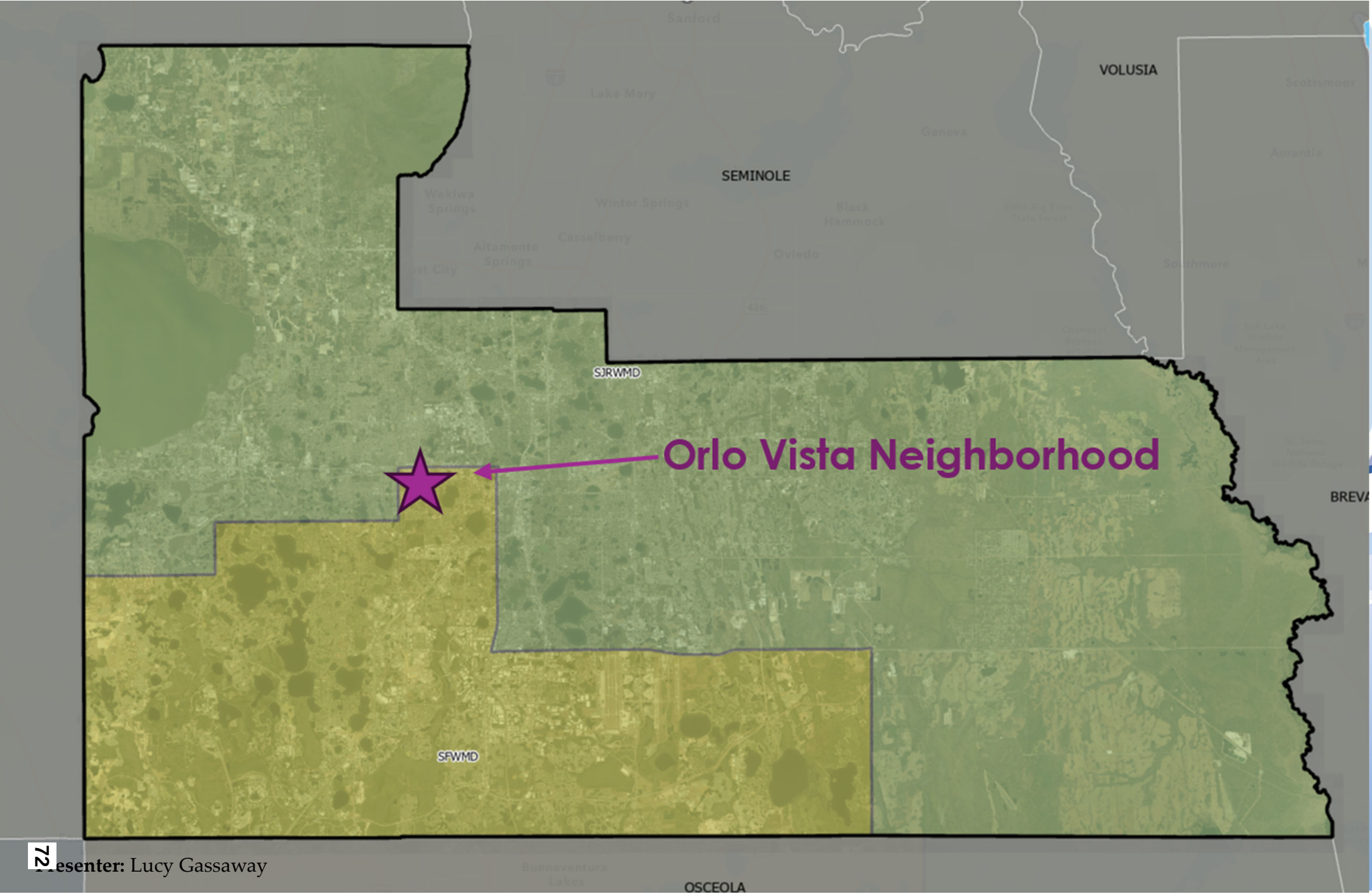


Presenter: Lucy Gassaway



ORANGE COUNTY FLORIDA

Presenter: Lucy Gassaway

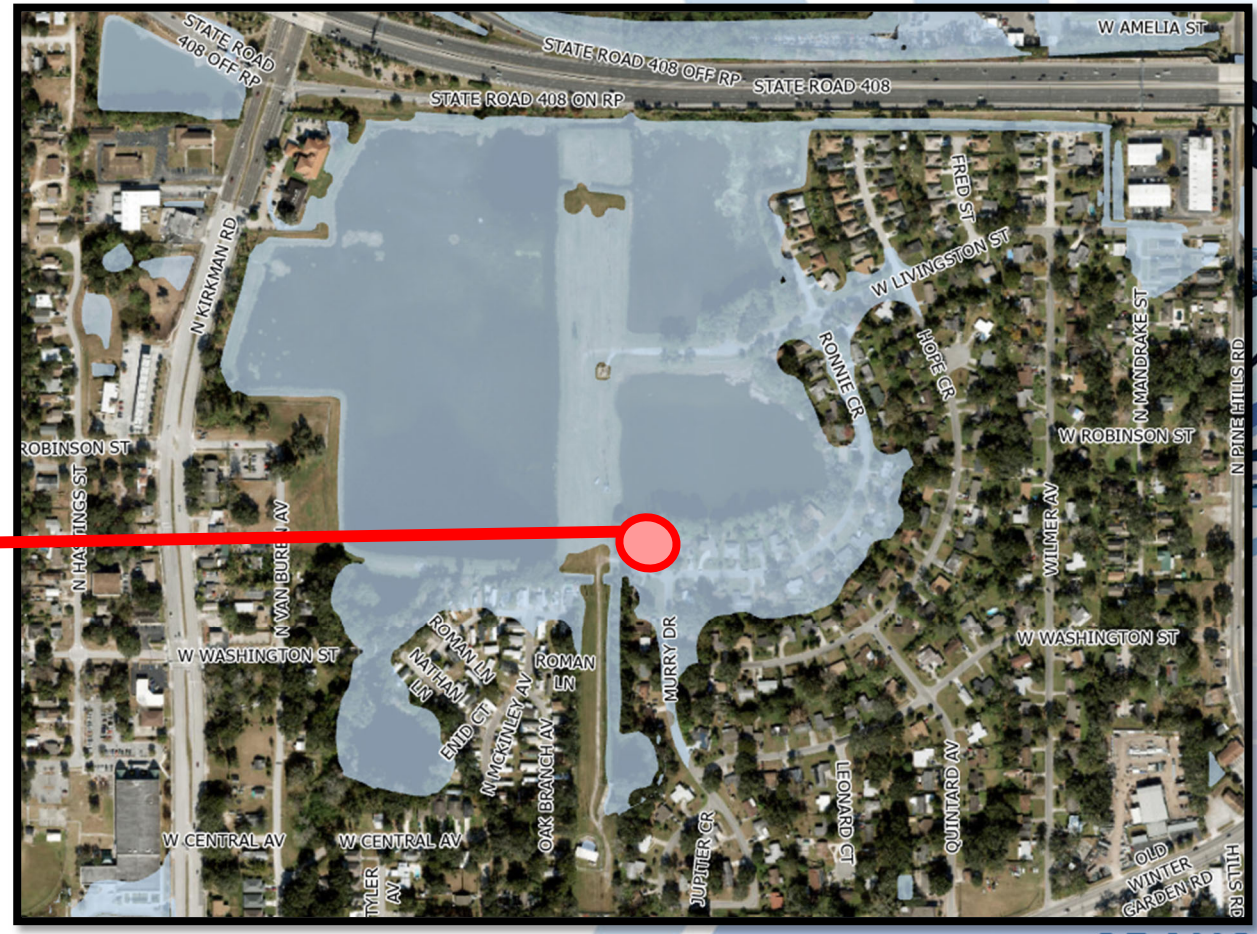


ORANGE COUNTY FLORIDA

Presenter: Lucy Gassaway

Orlo Vista: The Public Works Project

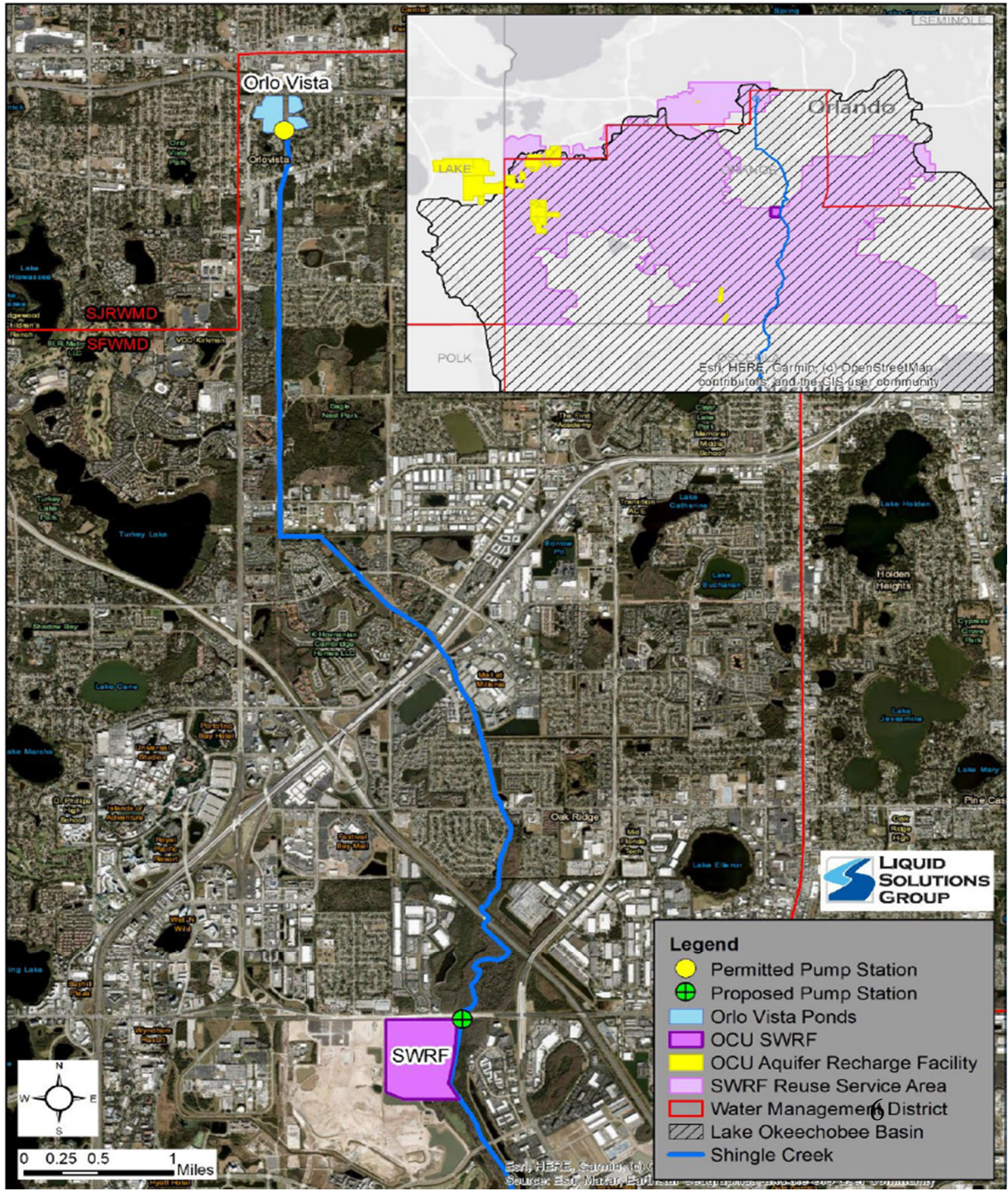




Presenter: Lucy Gassaway

From Innovative Ideas to Projects:
Orlo Vista Integrated Water Resource Project (IWRP)

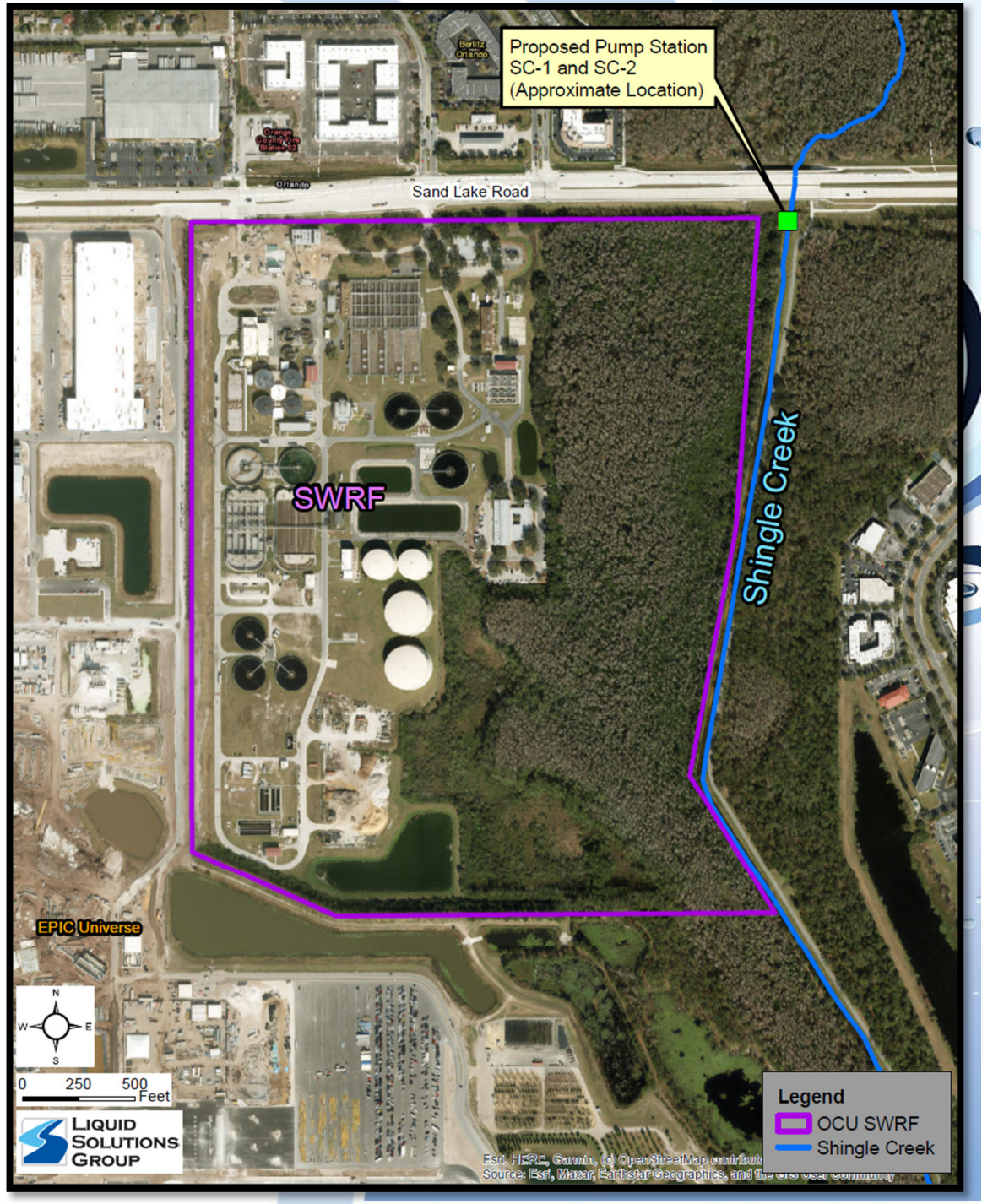
- Lowering normal water level in ponds by pumping a baseflow throughout the year
- Provides additional pond flood attenuation volume
- Pumped baseflow is discharged to Shingle Creek
- Flows are recovered 7 miles downstream at the South Water Reclamation Facility (SWRF)
- Flows are recovered prior to reaching Osceola County, mitigating downstream flood concerns
- Flows treated at SWRF to meet reclaimed water standards and used for irrigation and aquifer recharge
- Reduction in nutrient load to enhance water quality within Shingle Creek



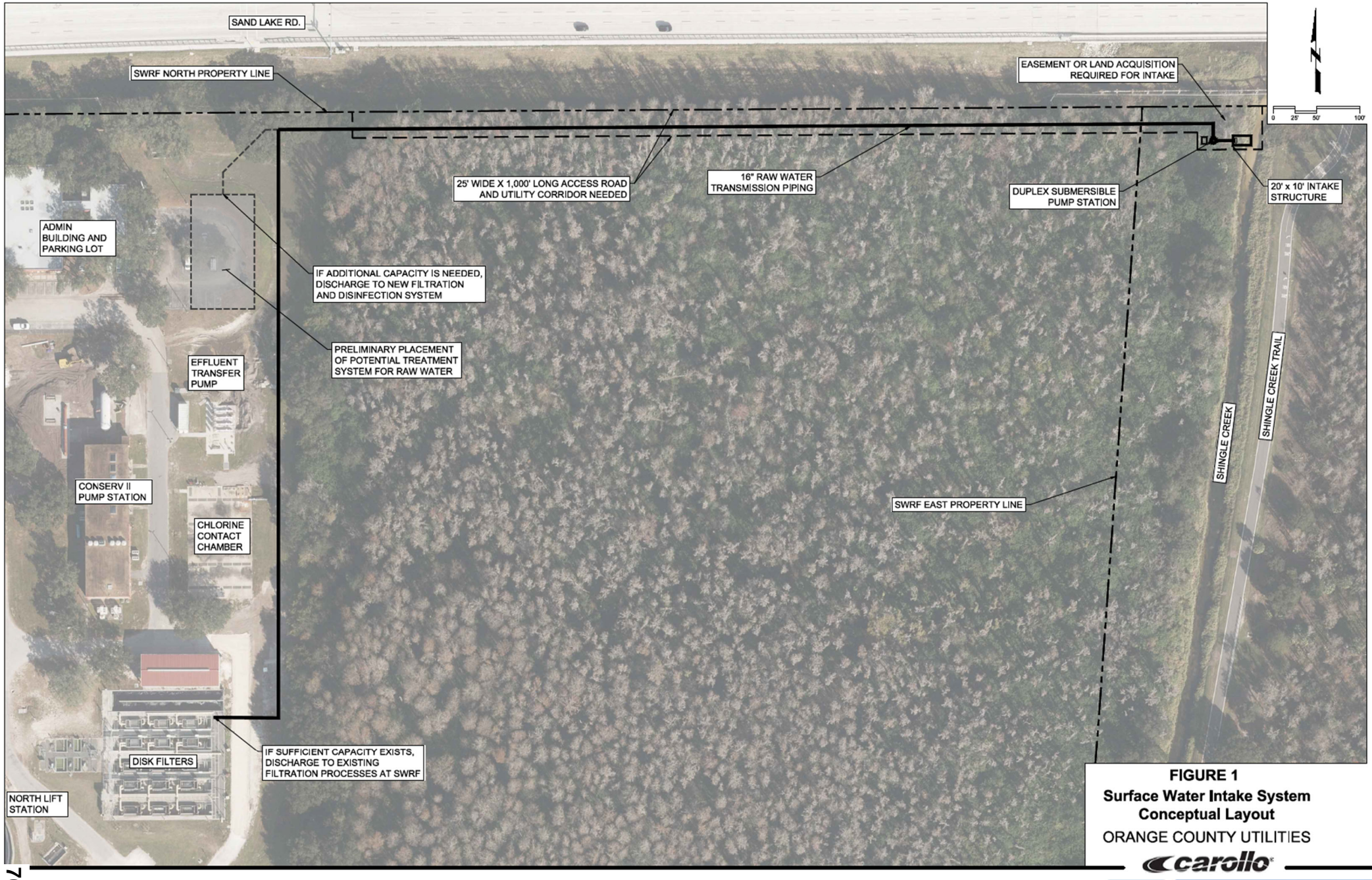
Presenter: Lucy Gassaway

Conceptual Layout and Cost

- Conceptual Level OPCC (2023): $10.5 M for 2.0 MGD
- Major Components:
  - Intake Structure
  - Treatment system components
  - Easement or purchase of land for the intake system
  - Access road and utility corridor from SWRF to the intake.
  - Raw water transmission piping from the intake to the treatment system.
  - Finished water piping from treatment to the SWRF North reclaimed water system.
  - Backwash piping from the treatment system to the in-plant drain/recycle system.
  - Various valves, meters, and control equipment.
  - Electrical power and instrumentation for all system components.
  - Mitigation for wetland impacts, as needed.

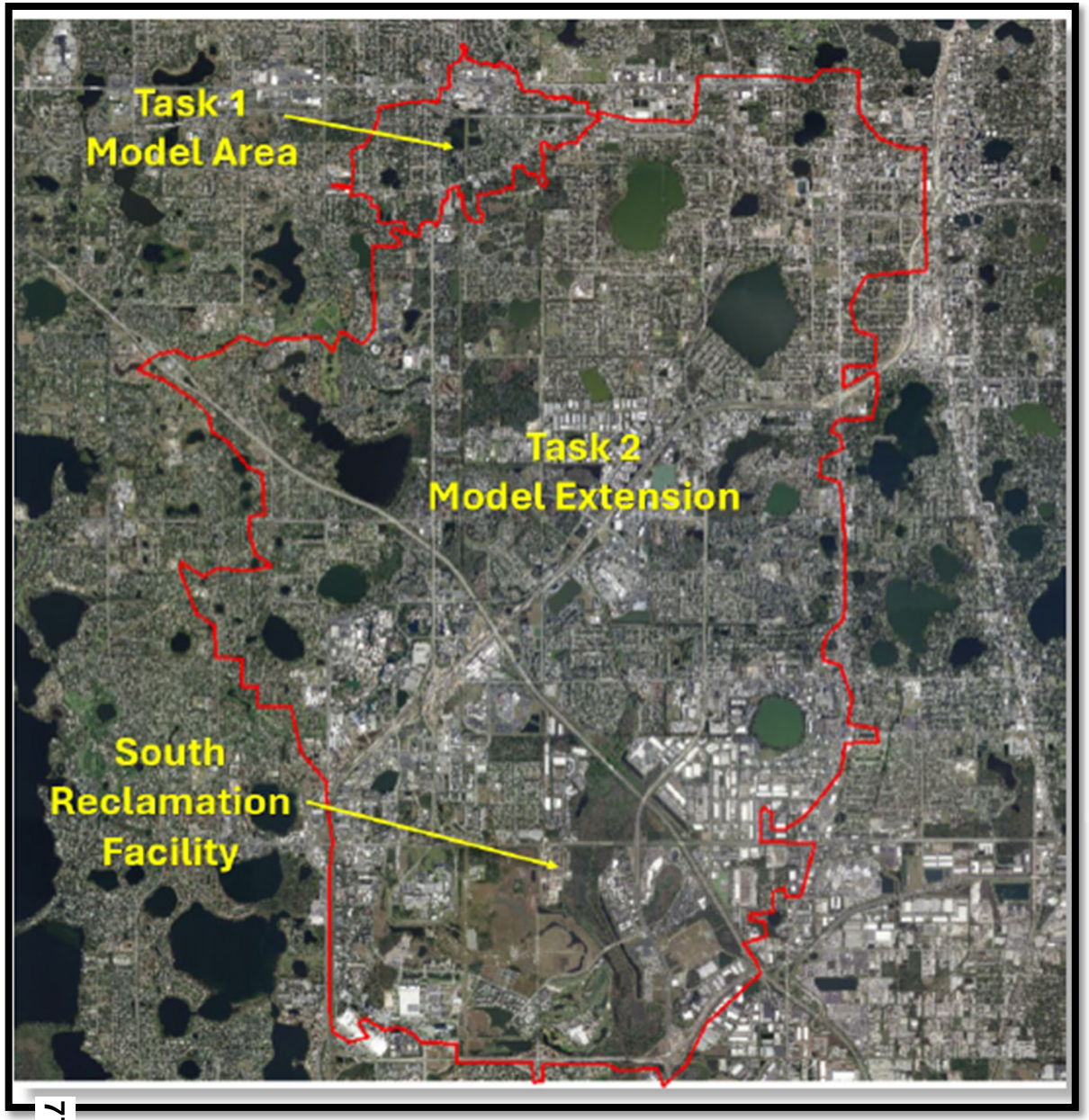


Presenter: Lucy Gassaway



Presenter: Lucy Gassaway

Yield Analysis-Task 1

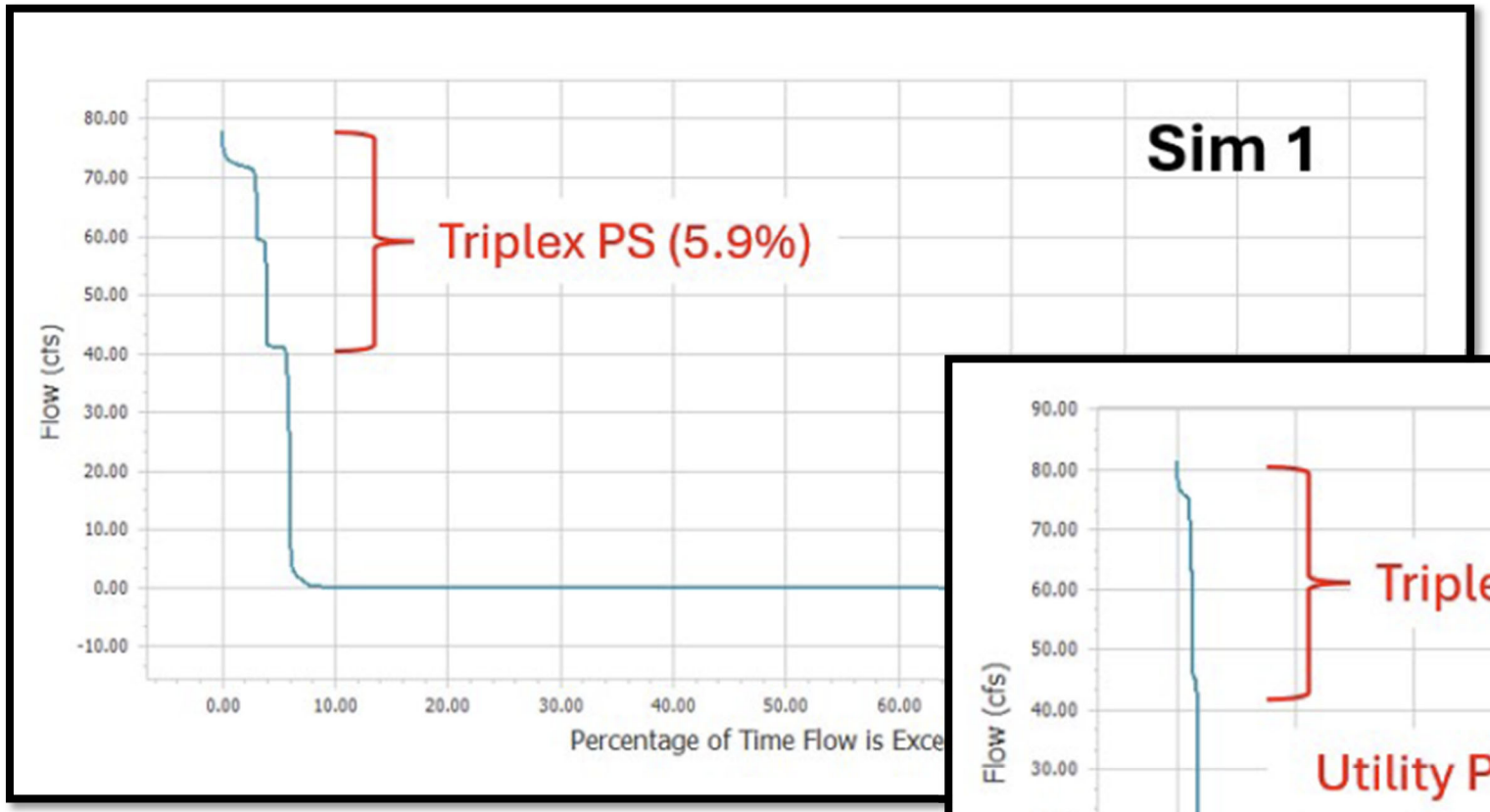


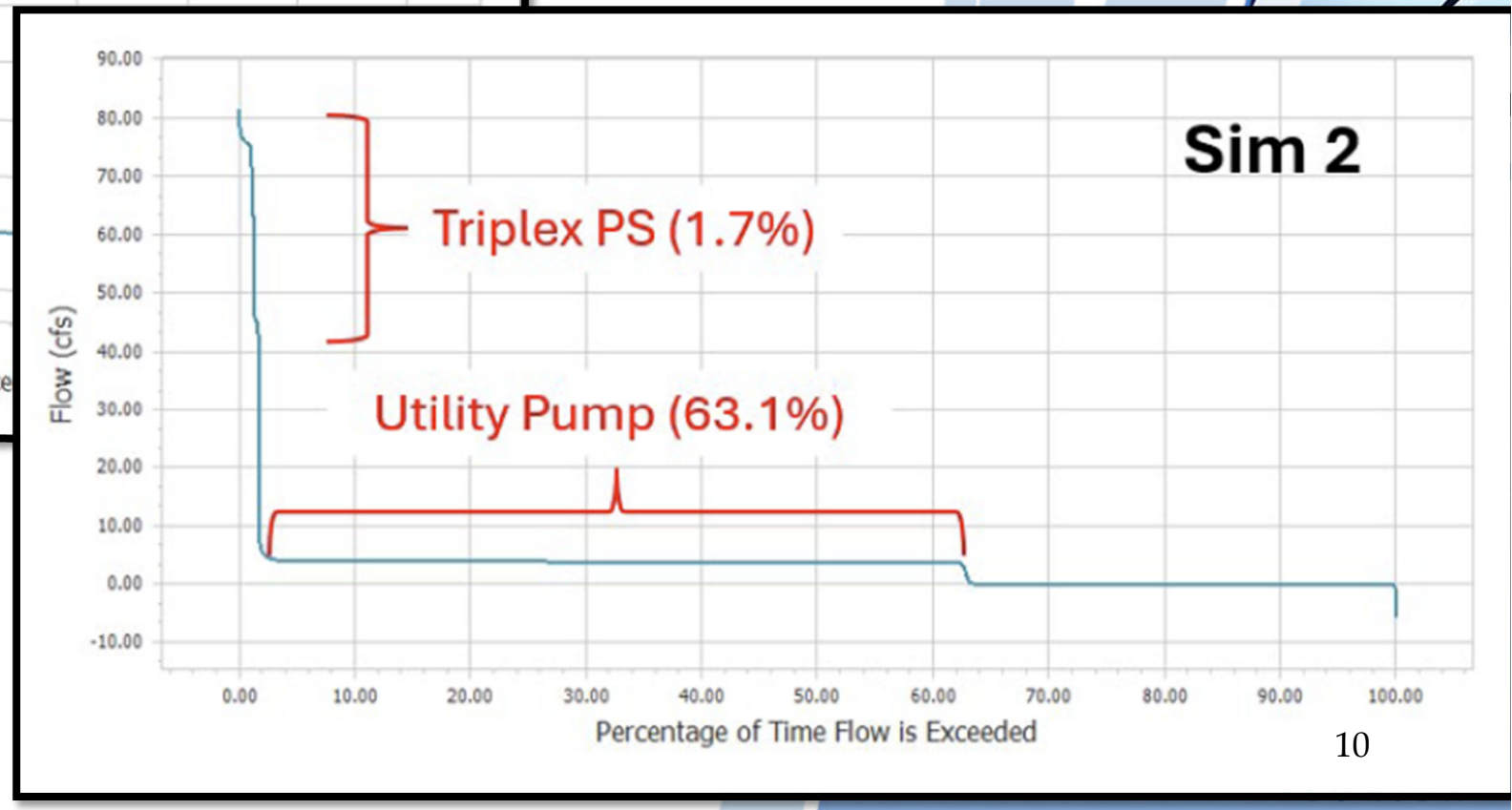
Exceedance Probability →	10%	25%	50%	75%	90%
Low Control @ 74.4' (NAVD)					
Average Annual Flows	2.92	2.56	2.51	2.21	1.77
Average Wet Season Flows	4.88	4.06	3.68	3.51	2.72
Average Dry Season Flows	2.14	1.96	1.51	1.00	0.75
Low Control @ 73.0' (NAVD)					
Average Annual Flows	2.95	2.56	2.49	2.20	1.75
Average Wet Season Flows	5.03	4.15	3.66	3.54	2.74
Average Dry Season Flows	2.11	1.93	1.47	0.99	0.73
Low Control @ 72.0' (NAVD)					
Average Annual Flows	2.94	2.55	2.48	2.20	1.76
Average Wet Season Flows	4.96	4.19	3.62	3.50	2.82
Average Dry Season Flows	2.08	1.89	1.52	1.02	0.72
Low Control @ 71.0' (NAVD)					
Average Annual Flows	2.93	2.54	2.48	2.20	1.76
Average Wet Season Flows	4.94	4.10	3.60	3.49	2.90
Average Dry Season Flows	2.07	1.88	1.45	1.03	0.70

Table 1. Average flows (mgd) to Shingle Creek based on the proposed pump/storage configuration.

Presenter: Lucy Gassaway

Yield Analysis-Task 2





Presenter: Lucy Gassaway

Water Quality Sampling

- In-House Water Quality Sampling at Shingle Creek

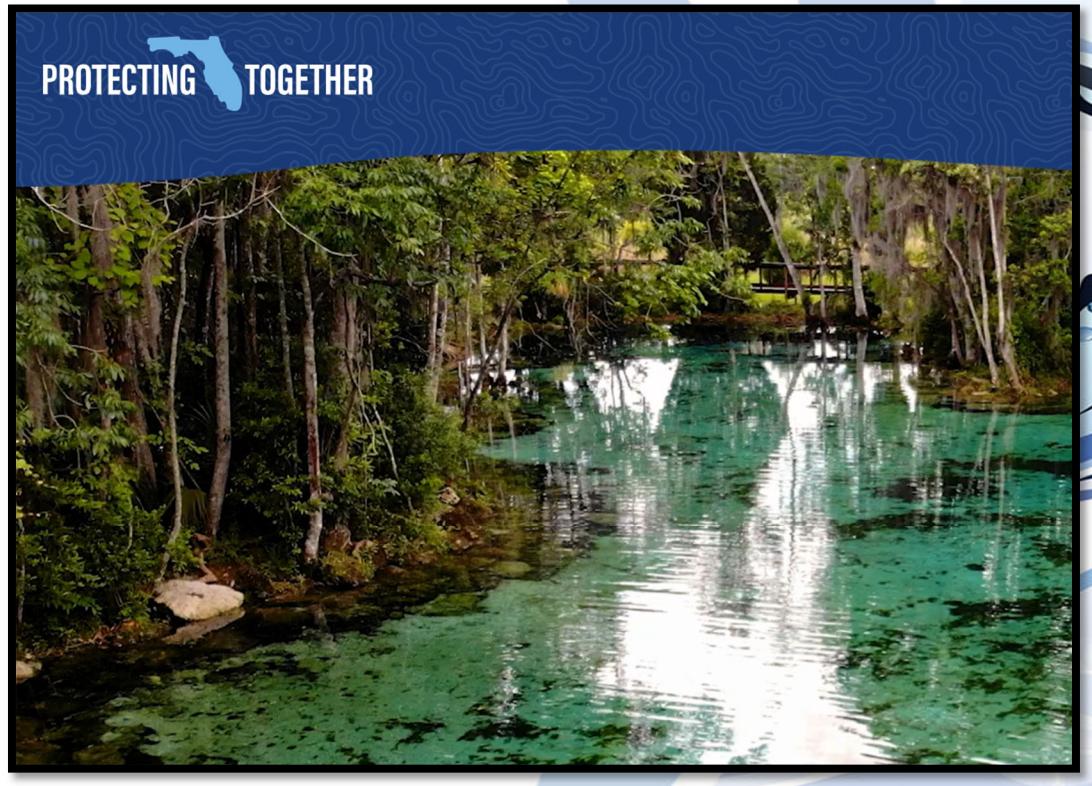
	Date	TN	TP	TSS	Rain
		mg/L	*mg/L*	*mg/L*	*inches*
Dry Weather Sampling Event	6/2/2024	0.73	0.087	2	0.00
	6/3/2024	0.76	0.076	2	0.00
	6/4/2024	0.71	0.083	1	0.00
	6/5/2024	0.84	0.084	2	0.00
	6/6/2024	0.77	0.085	<1	0.55
July	7/1/2024	0.85	0.1	11	0.00
August	8/20/2024	0.6	0.044	1	0.07
September	9/2/2024	0.81	0.077	4	0.18
Wet Weather Sampling Event	9/8/2024	ERR	0.077	3	1.00
	9/9/2024	0.77	0.086	16	1.32
	9/10/2024	0.82	0.091	2	1.19
	9/11/2024	0.83	0.061	2	0.03
	9/12/2024	0.9	0.071	1	0.02



Presenter: Lucy Gassaway

Permitting & Funding

- **Awarded Grants ($17.6M)**
  - FDEP Alternative Water Supply Grant: $5M
  - CDBG-DR Grant $12.6M
- **Water Use Permit** (WUP): Carollo
- **Environmental Resource Permit** (ERP) **Modification**: Geosyntec



Presenter: Lucy Gassaway

January 2023
- Carollo TM: Conceptual Layout and Cost

May 2023
- Orlo Vista Idea presented at BCC

August 2025- December 2025
- RFP for design services

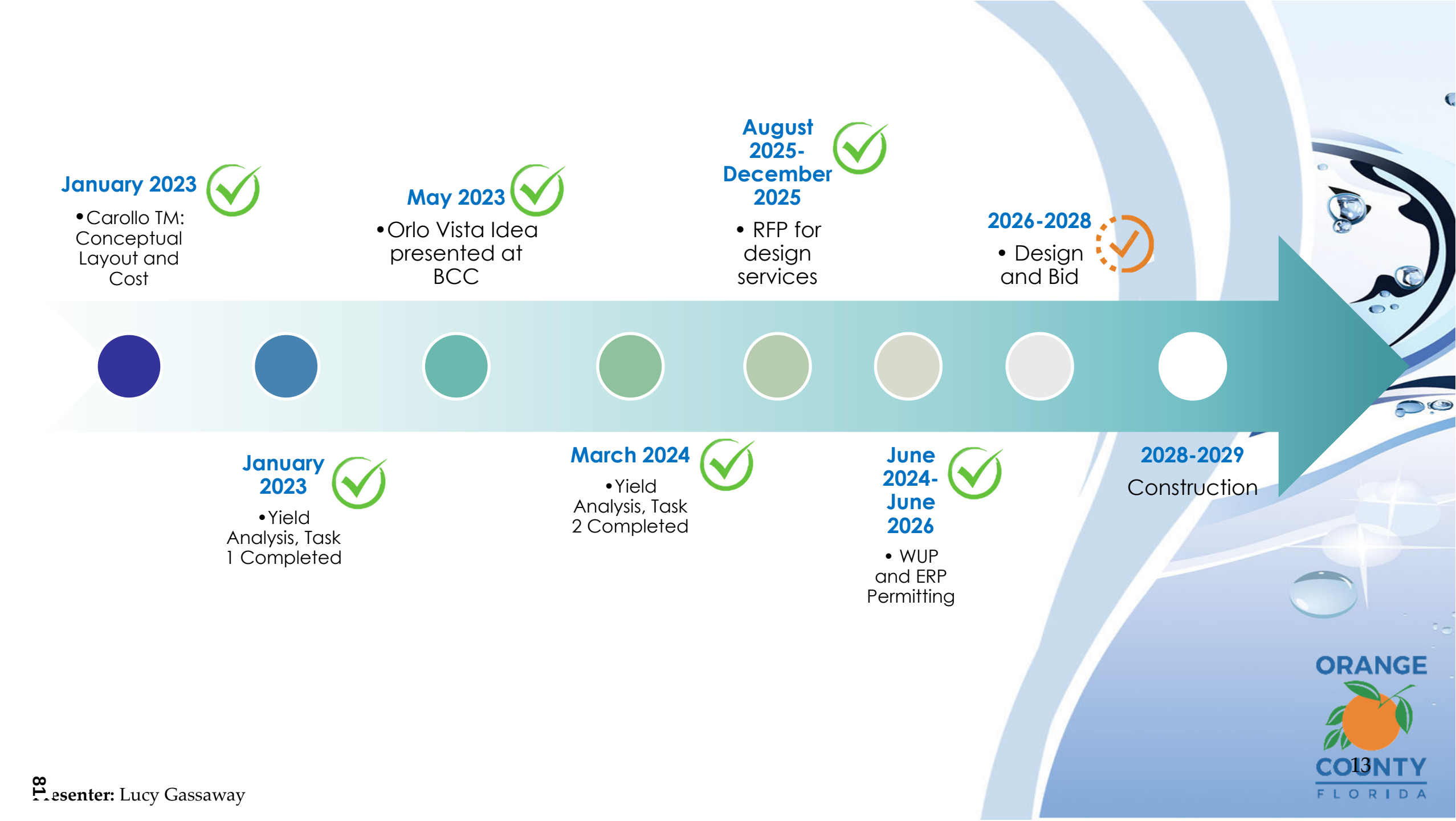
2026-2028
- Design and Bid

2028-2029
Construction

January 2023
- Yield Analysis, Task 1 Completed

March 2024
- Yield Analysis, Task 2 Completed

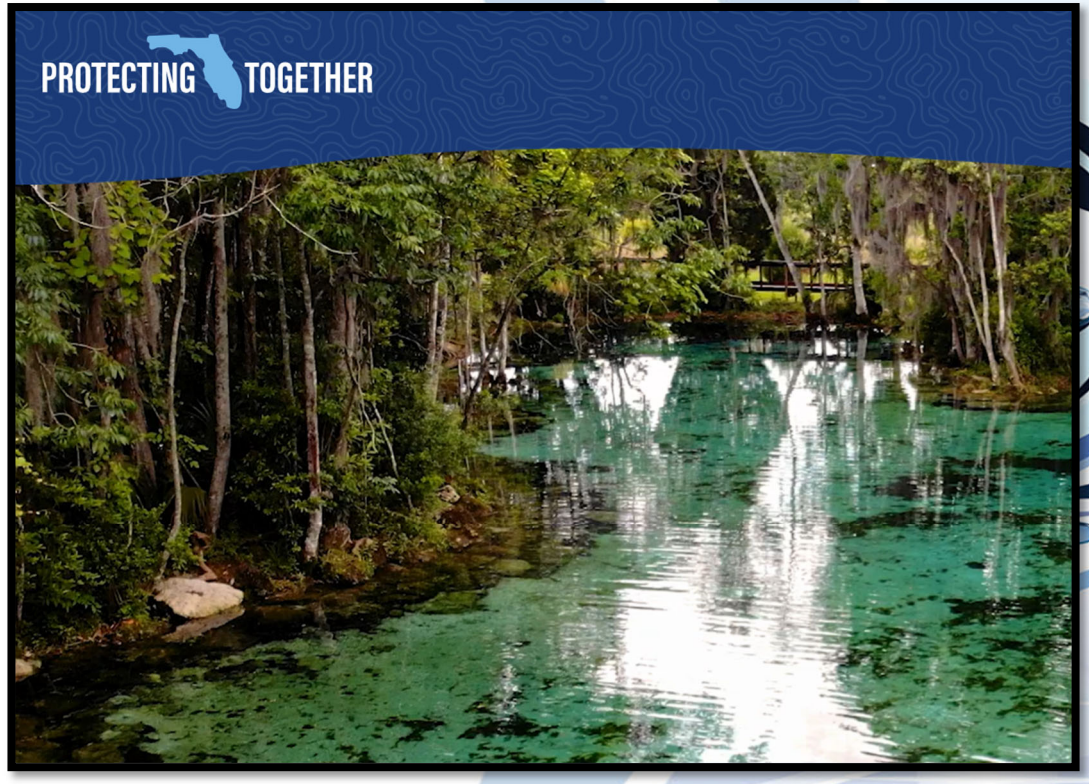
June 2024- June 2026
- WUP and ERP Permitting



Presenter: Lucy Gassaway

Summary of Project Benefits

- Reduced flood risk
- Reduced frequency and magnitude of peak flows during extreme storms
- New water resource development project within CFWI
- Aquifer recharge for regional environmental benefit
- Reduced nutrient load to Kissimmee system



Presenter: Lucy Gassaway

Questions and Open Discussion

- Contact Information:
  - Lucy Gassaway
  - Lyudmila.Gassaway@ocfl.net
  - 407-254-9785



CONSERVANCY of Southwest Florida
OUR WATER, LAND, WILDLIFE, FUTURE.

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eco SPHERE
Restoration Institute, Inc.
a nonprofit organization

Working with Nature:
Flood Resilience Blueprint

Carrie Schuman, PhD – Conservancy of SWFL, Climate Resilience Advisor
SFWMD Resiliency Coordination Forum Oct 2026

Outline

- Context for the “Working with Nature: Flood Resilience Blueprint” Project

- Exploring the Project
  - Design Considerations
  - Public Engagement
  - Project Concepts
  - Permitting

- What’s Next?

- Accessing the Blueprint



Conservancy NBS Focus

- Advocating for balanced adaptation, making sure NBS at the table
  - Proven value
  - Co-benefits
- Creating a pragmatic position
  - Balance w/ thoughtful use of gray & hybrid options
  - Part of multiple lines of defense, multi-layered strategic approach
  - Realistic expectations about protection, maintenance
- Some foundational work occurred before the Blueprint Project

Working with Nature Symposium

WELCOME

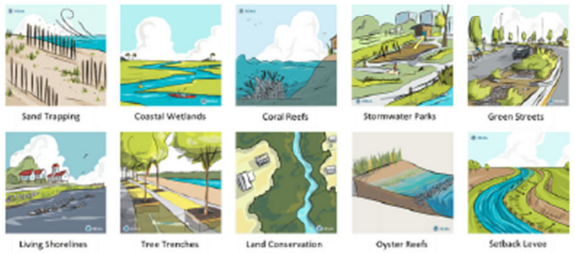
Working with Nature

Nature-Based and Hybrid Solutions for Resilient Communities

Tuesday, December 3, 2024 • 9 am - 5 pm • Conservancy of Southwest Florida

Nature-based solutions refer to strategies that use natural systems (such as mangrove forests, salt marshes, and beach dunes), or living or natural elements (such as plantings, coconut fiber logs, and other sustainable materials) to address challenges such as flooding, high heat days, and worsening water quality. Hybrid solutions combine these aforementioned elements with hardened engineered options like seawalls, levees, and culverts.

Incorporating these options into local adaptation planning can support our local nature-based economy, provide significant amounts of ecological services our communities depend on, and contribute to a multiple lines of defense approach to managing risk.



Conservancy of Southwest Florida
Our Water, Land, Wildlife, Future.
Preserving Our Paradise for 80 Years

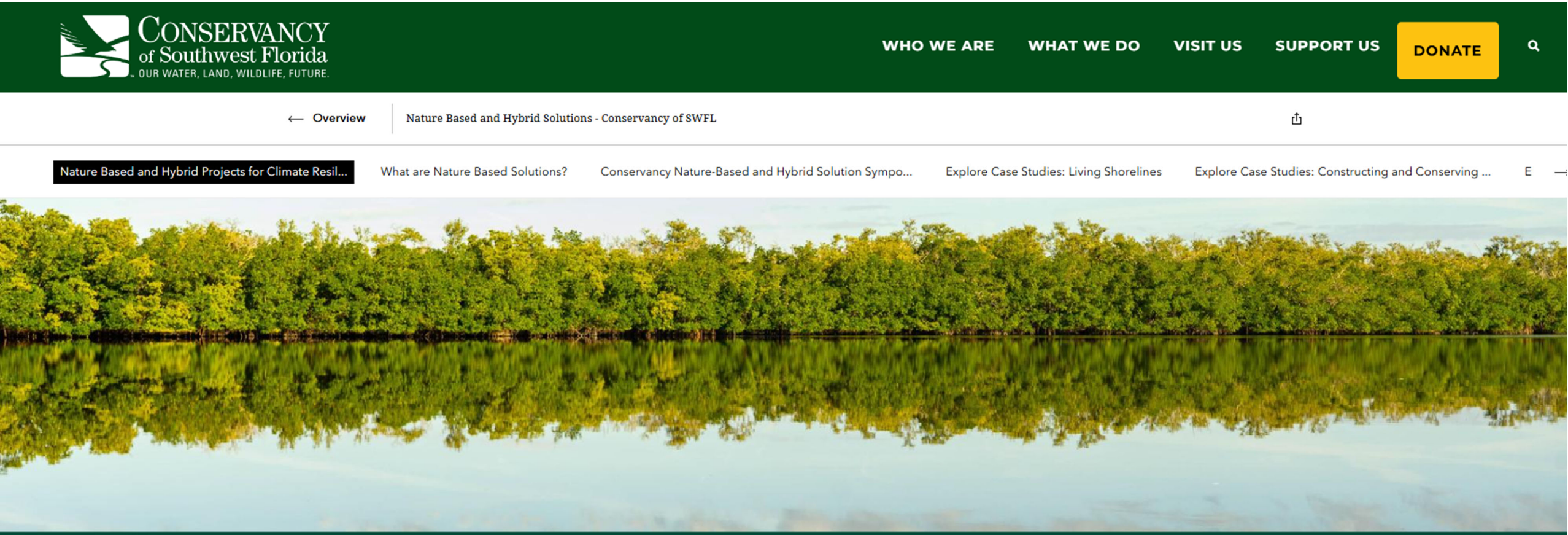






Presenter: Dr. Carrie Schuman

NBS Interactive Tool



Case Study Library

Working with Nature
Nature-Based and Hybrid Solutions for Resilient Communities

Case Study: Dinner Key Marina Resiliency



Design, permitting, and marine resource surveying are ongoing for enhancing the break around Dinner Key Marina to increase protection from storm surge

Problem: Dinner Key Marina is located in Miami's Coconut Grove Neighborhood and operated by the City. The Marina has 587 slips, making it the largest wet slip marina (kept in the water rather than stored on dry land) in Florida and on the Eastern Coast States. The Marina is located next to Miami's City Hall and is also a point of access fo activities like fishing charters or trips out to Biscayne National Park.

In September of 2017, Hurricane Irma affected Florida, including the Southeastern p State. An estimated 32 boats sank in the Marina, and many others were damaged. Ap 60% of the Marina experienced significant damage.

The Solution/Project: The City of Miami committed to both repairing the damage to pursuing and implementing strategies – especially aimed at strengthening surroundi – that would increase its resilience to future storm damage. The islands were origina in 1951 and are relatively low-lying, resulting in impacts to the marina from waves ar during extreme storm events.

Their main project objectives around this latter goal were to: protect the Marina; dev comprehensive island shoreline protection measures through armoring and/or natur solutions; and increase overall resilience and protection the islands offer to the Mar

Cummins Cederberg was chosen as the lead coastal and marine engineering team.

Working with Nature
Nature-Based and Hybrid Solutions for Resilient Communities

Case Study: Naples Botanical Gar Stormwater Treatment System



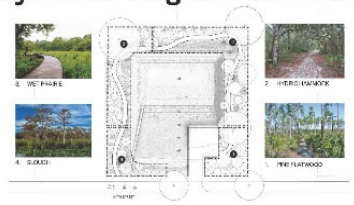
The Garden's stormwater features include native plantings around the storm and the Hamilton Avenue bioswale

Problem: Southwest Florida waters are prone to nutrient pollution, a result of sc nitrogen and phosphorus carried over the landscape in runoff or as introduced Caloosahatchee River, a discharge outlet for Lake Okeechobee. These nutrients blooms, making them bigger, more concentrated, and longer-lasting. Southwest periodic red tide and blue-green algae outbreaks, among other impairments, impacting residents and wounding the critically important tourism industry. As of 2022, the state listed nearly half of all Lee County waterbodies and almost 30 percent of Collier County waterbodies as impaired.

The Solution/Project: A stormwater management system is the backbone of Naples Botanical Garden, a nature-based infrastructure around which the 170-acre campus was designed. The system purifies runoff and recharges groundwater by capturing, slowing, and filtering the approximately 55 inches of rain that fall in the Big Cypress Basin watershed each year. An additional bioswale was installed in 2023 in collaboration with Collier County to manage runoff generated by an expanded county parking area. Both features serve as demonstration areas for urban planners, landscapers, homeowner associations, policymakers, and others seeking a nature-based solution to the persistent challenge of nutrient pollution.

Working with Nature
Nature-Based and Hybrid Solutions for Resilient Communities

Case Study: Good Neighbor Stormwater Park



Problem: Much of the City of North Miami is in a low-lying basin prone to flooding. These worsened over time with climate change-induced impacts, including sea level rise. The C proactively used grant funding, including through FEMA's Hazard Mitigation Grant Progra purchase parcels of land that have experienced repeated flooding problems. These lots, vacant and remained flood-prone.

The Solution/Project: In 2018, City planners began focusing on these lots as sites for: reg flood mitigation, including public art, establishing native vegetation, and providing addit amenities. They submitted a winning proposal focused on repurposing these sites to the Van Alen Institute's Keeping Current: A Sea Level Rise Challenge for Greater Miami initiat Institute then put out an international call for architects and designers to submit concep imagining these spaces. Dept. Landscape Architecture and Urban Design (Dept.) provide selected concept. A lot in the City's Sunny Acres Neighborhood that had sat untouched since purchase was selected as the initial pilot site, and the project also called for a mast would outline how to replicate these ideas in other similar city properties.

Project Goals:

- Convert unused, repetitive flood loss lots into safe, usable community spaces
- Adapt to climate impacts over time, especially flooding
- Contribute to reduced local flood insurance premiums through the National Flood In Program's Community Rating System
- Implement a project that was forward-thinking and scalable across the City
- Re-establish biomes that were originally in the City
- Provide education regarding flooding
- Create a first pilot project that was shaped by feedback from the residents in the neig where it was sited

Working with Nature
Nature-Based and Hybrid Solutions for Resilient Communities

Case Study: South Cove Natural Area



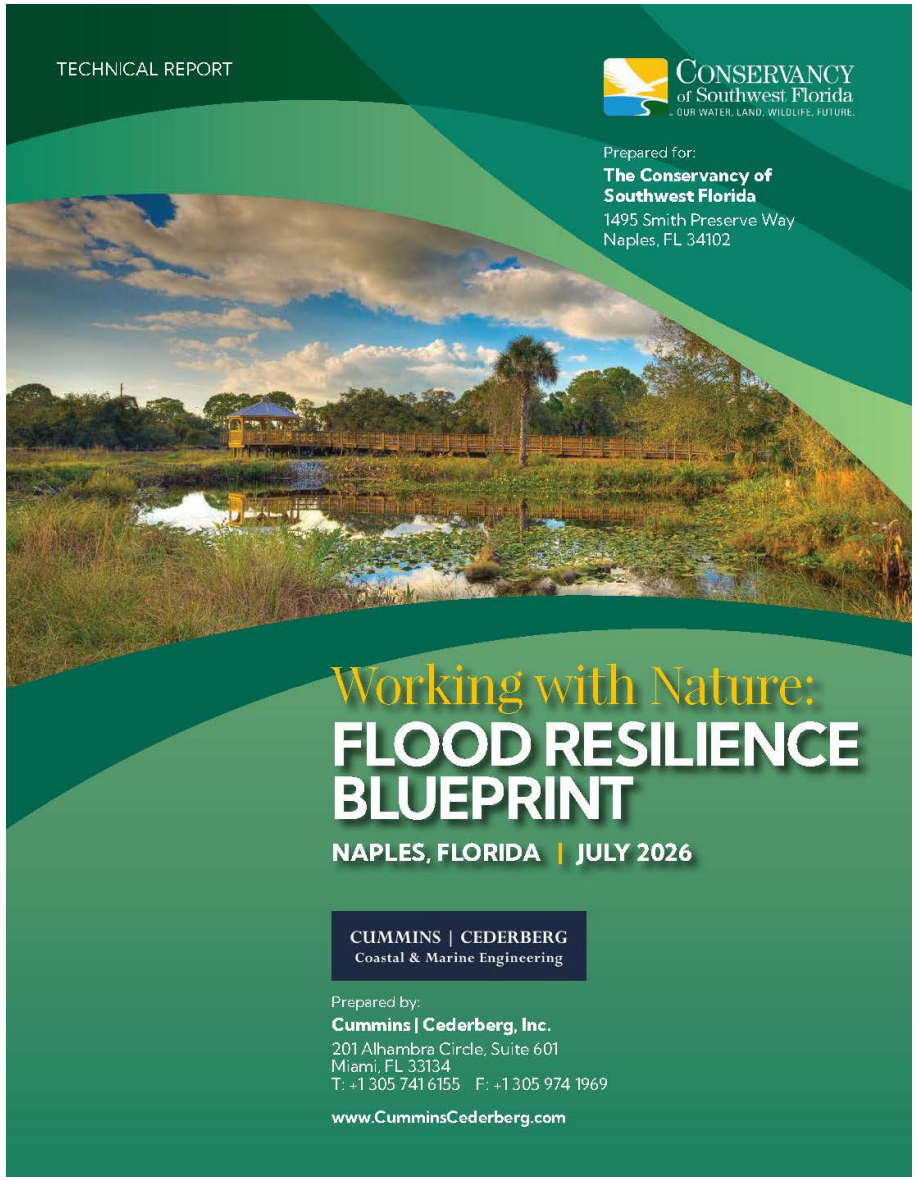
Plan view of the South Cove Natural Area as well as an October 2023 aerial image

Problem: Lake Worth Lagoon is a 20-mile-long estuarine system on the southeast coast of Palm Beach County, Florida. The Lagoon is connected to the Atlantic Ocean by two maintained inlets. In the last century, the Lagoon suffered extensive habitat loss and water quality degradation due to shoreline armoring, dredging, filling, and pollution. These impacts have resulted in the Lagoon's designation as a priority water body requiring restoration (Chapter 373.453, Florida Statutes).

During the 1950s and 60s, many areas of the Lagoon were dredged to generate fill for nearby properties, including the 20-foot deep South Cove dredge hole. Over time, this hole accumulated up to 12-feet-thick deposits of fine-grained sediment, also known as muck, which causes low dissolved oxygen conditions that support very little life. These sediments are easily resuspended in the water column, resulting in poor water clarity.

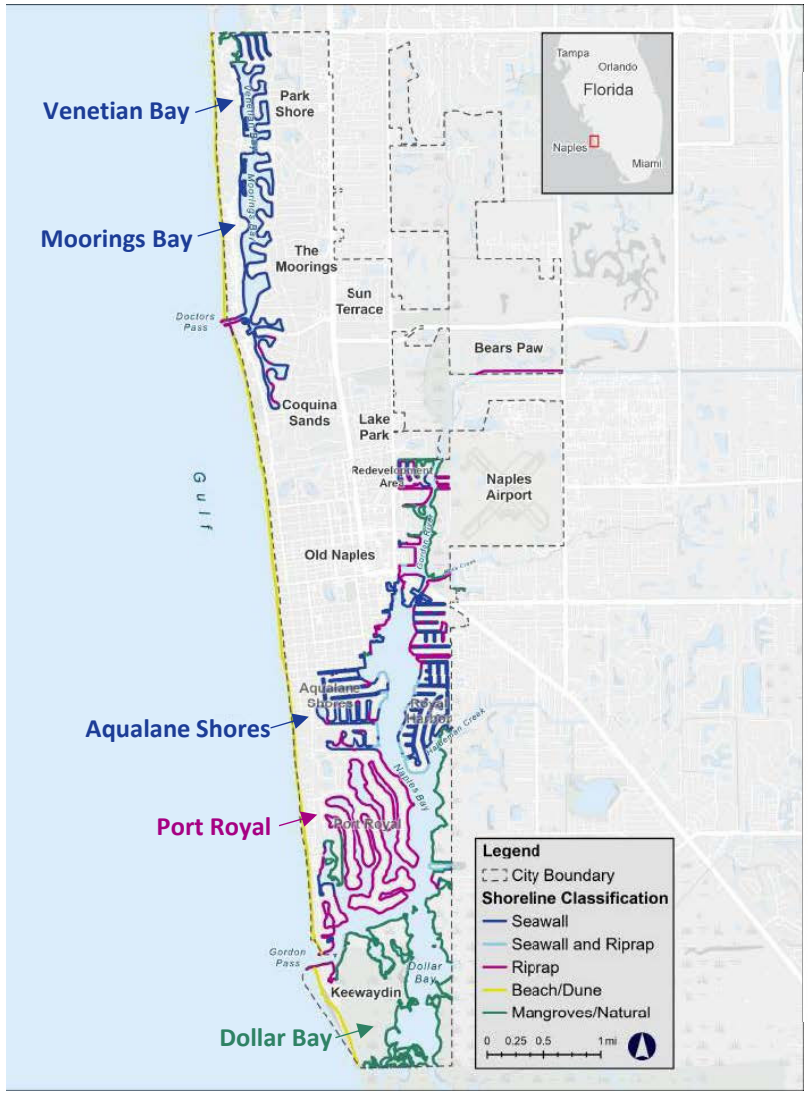
The Solution/Project: In 1998, Palm Beach County collaborated with other governmental agencies, municipalities, businesses, non-profit groups, and citizens to develop the first Lake Worth Lagoon Management Plan. The mission of the Plan is "*to restore, conserve, and manage the Lake Worth Lagoon ecosystem; improve the Lagoon's water and sediment quality; provide habitat for native plants, fish, and wildlife, and, recreational, and economic benefits for the residents and visitors of Palm Beach County; and to encourage, develop, and promote a partnership of public and private interests to manage the Lagoon*". The South Cove Natural Area was a high-priority restoration project identified in the Management Plan that Palm Beach County Department of Environmental Resources Management was able to implement with the help of many partners, utilizing donated sand from various marine dredging projects to restore estuarine habitats and acquiring grants to fund the public-use components and construct the project.

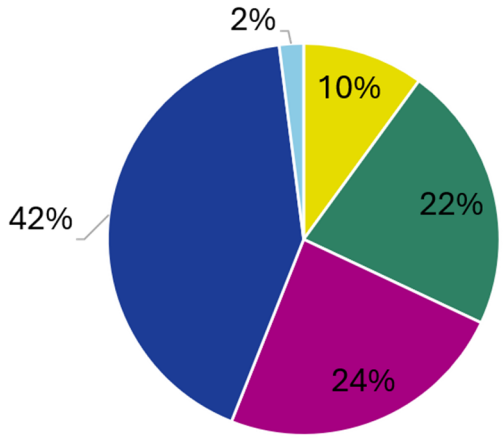
Working with Nature: Flood Resilience Blueprint



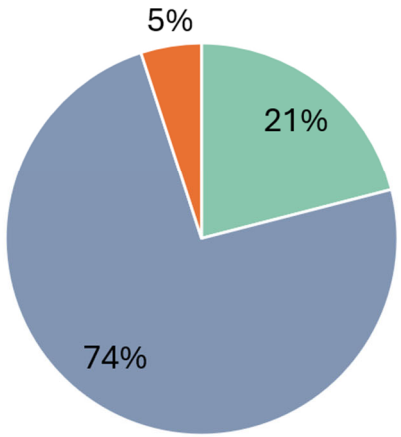
Presenter: Dr. Carrie Schuman

Defining the Typologies





- Beach/Dune
- Natural/Mangrove
- Riprap
- Seawall
- Seawall and Riprap



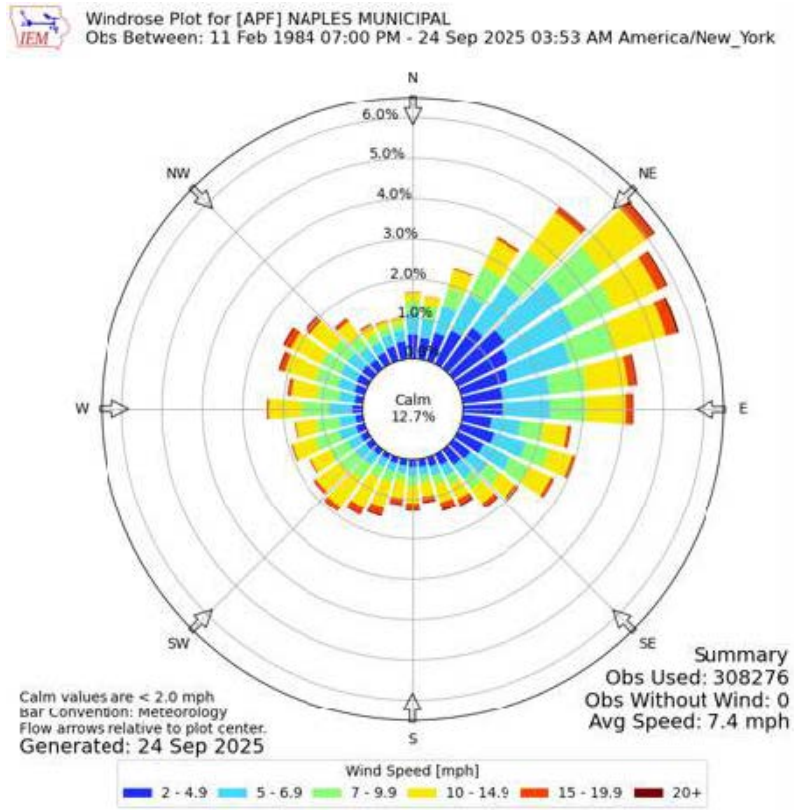
- Public
- Residential
- Commercial

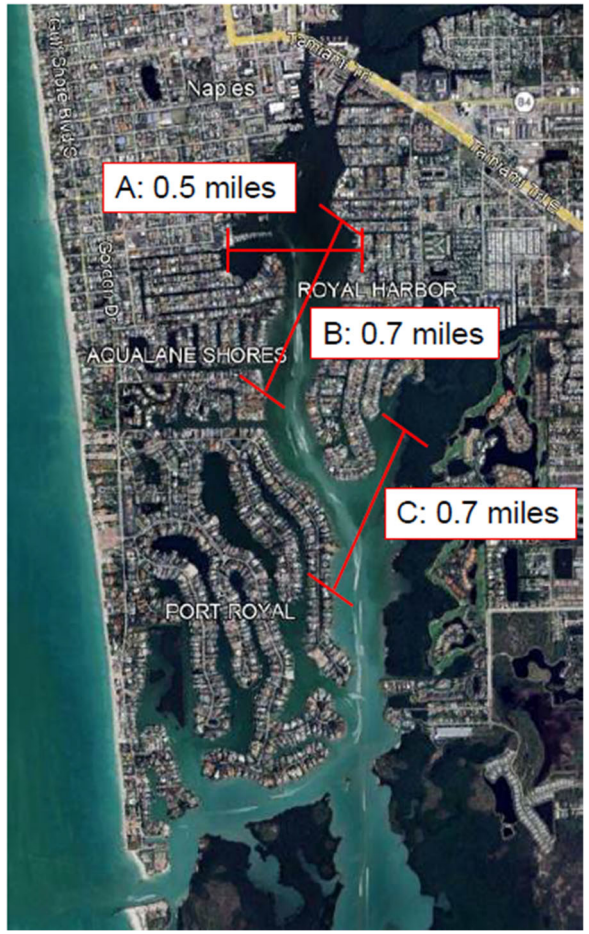


Shorelines, too!

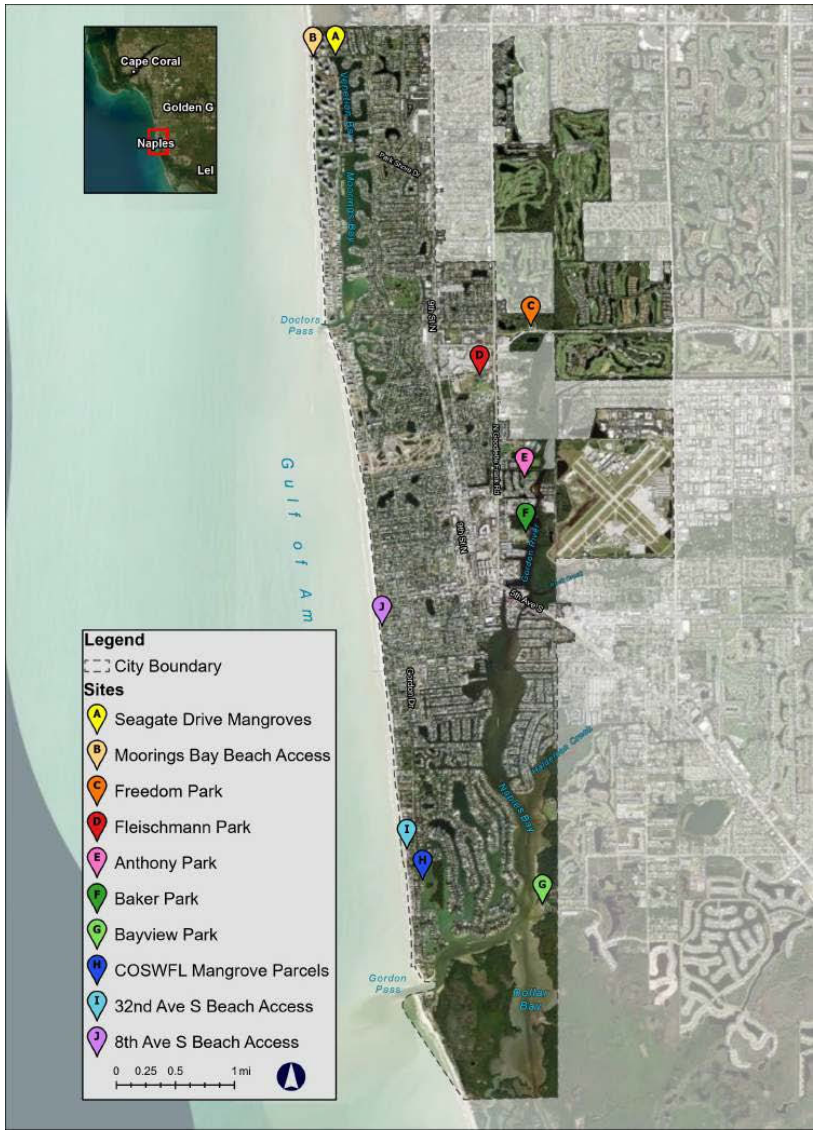
Design Considerations – Conditions Analysis

- Coastal conditions considered in concepts:
  - Water depths
  - Existing water levels
  - Sea level rise
  - Winds
  - Fetches
  - Wind-generated waves
  - Vessel-generated waves
  - Available space
  - Shoreline type and armoring





Design Considerations – Site Visits













Public Engagement

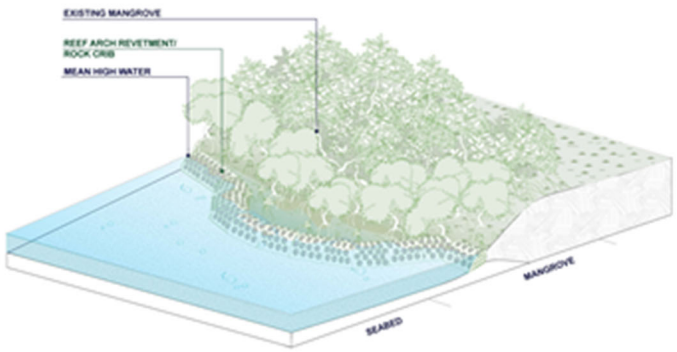




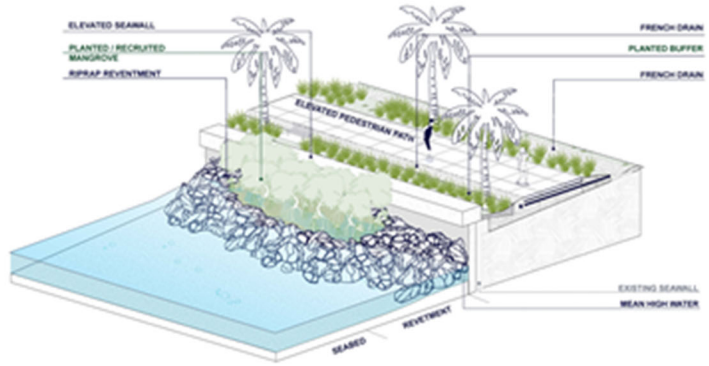
Presenter: Dr. Carrie Schuman

Working With Nature : Flood Resilience Blueprint Concepts

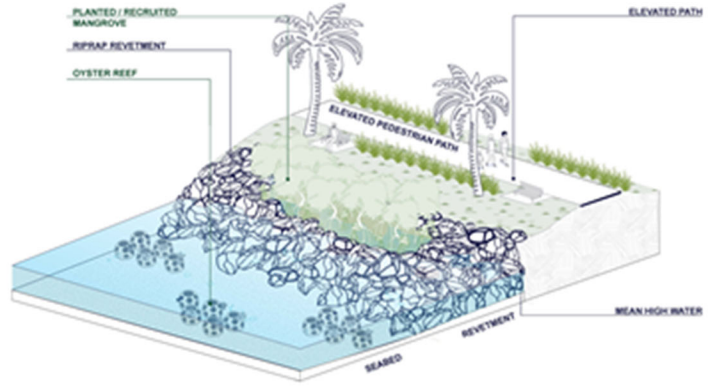
MANGROVE PROTECTION



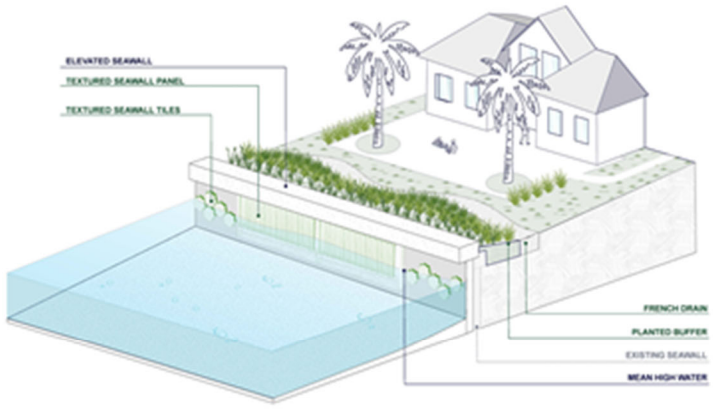
MANGROVE PLANTER



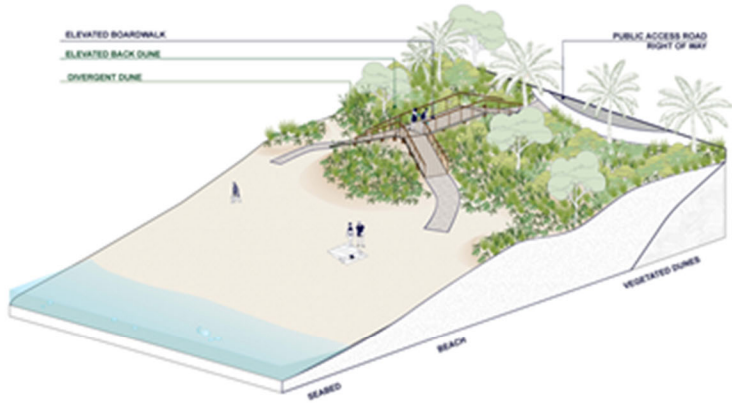
LIVING RIPRAP



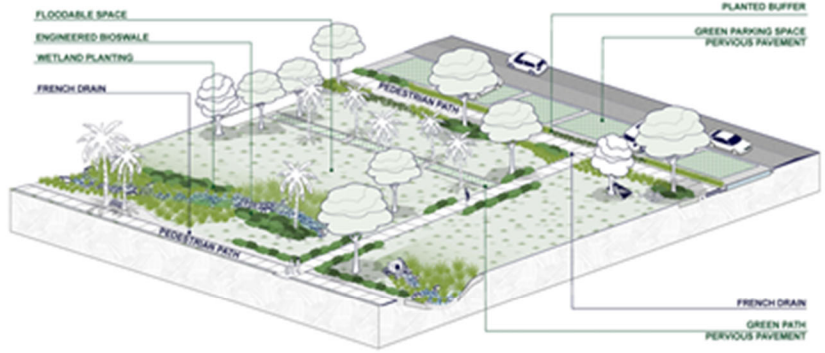
LIVING SEAWALL



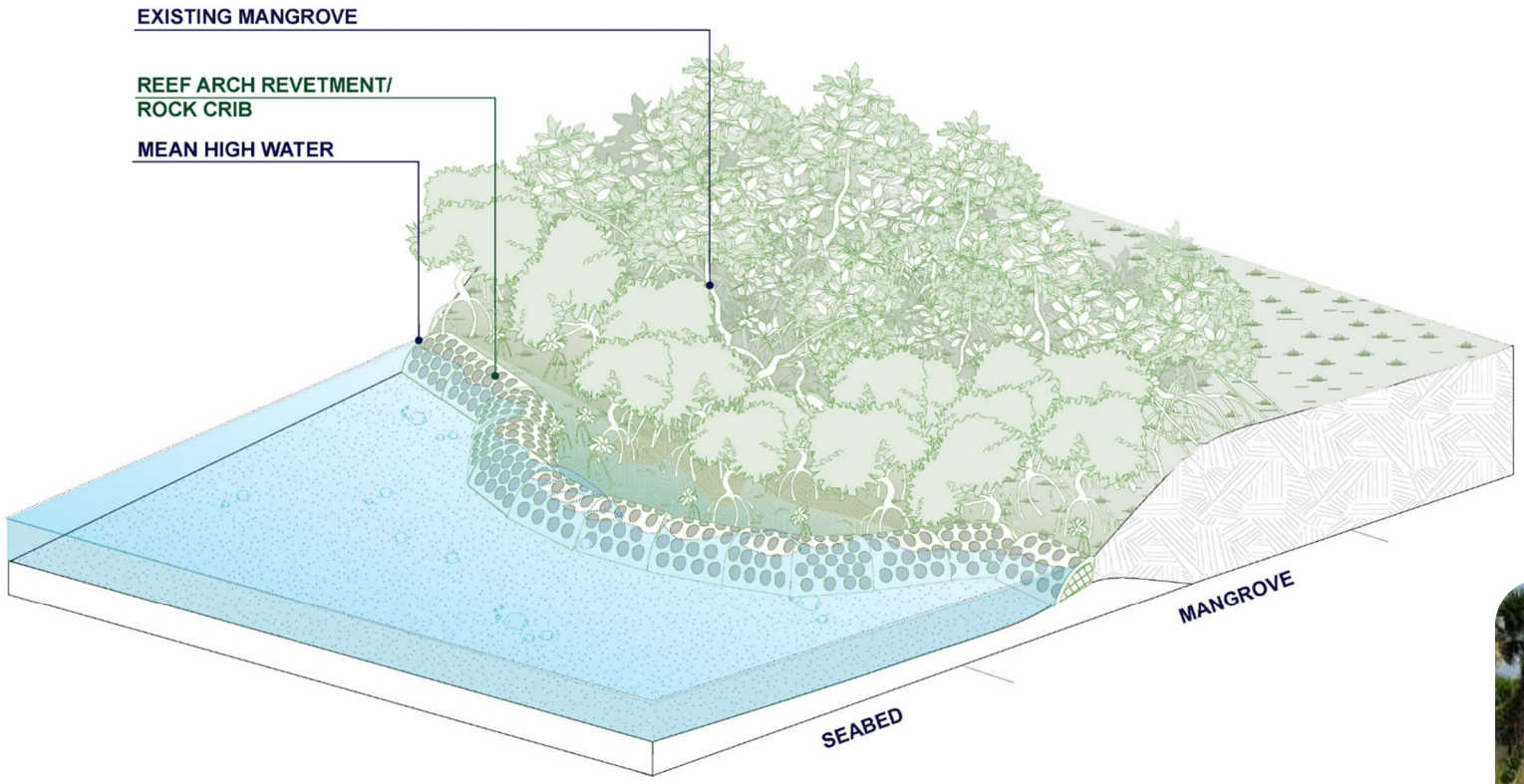
BEACH ACCESS



PARK



Mangrove Protection

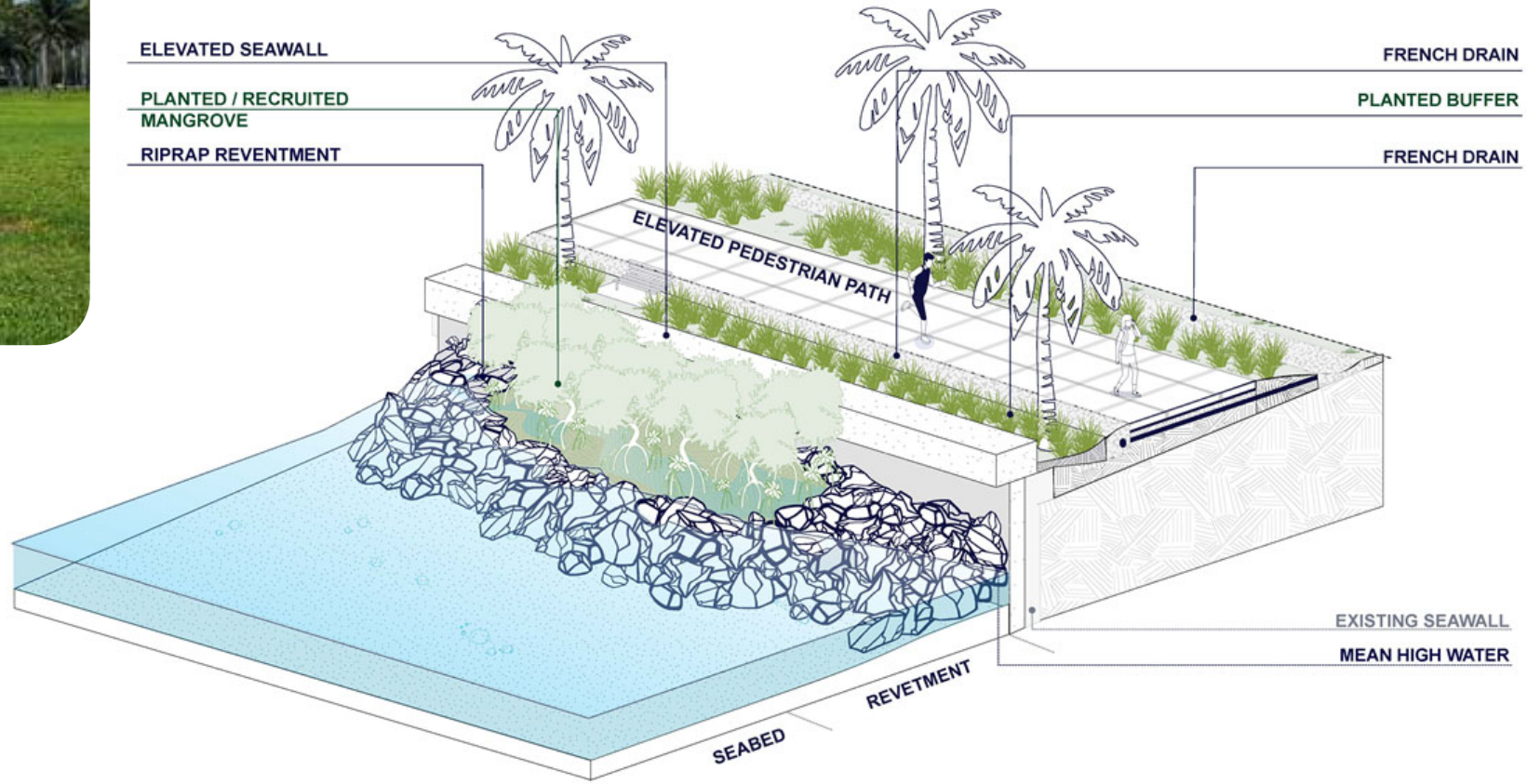






Mangrove Planter

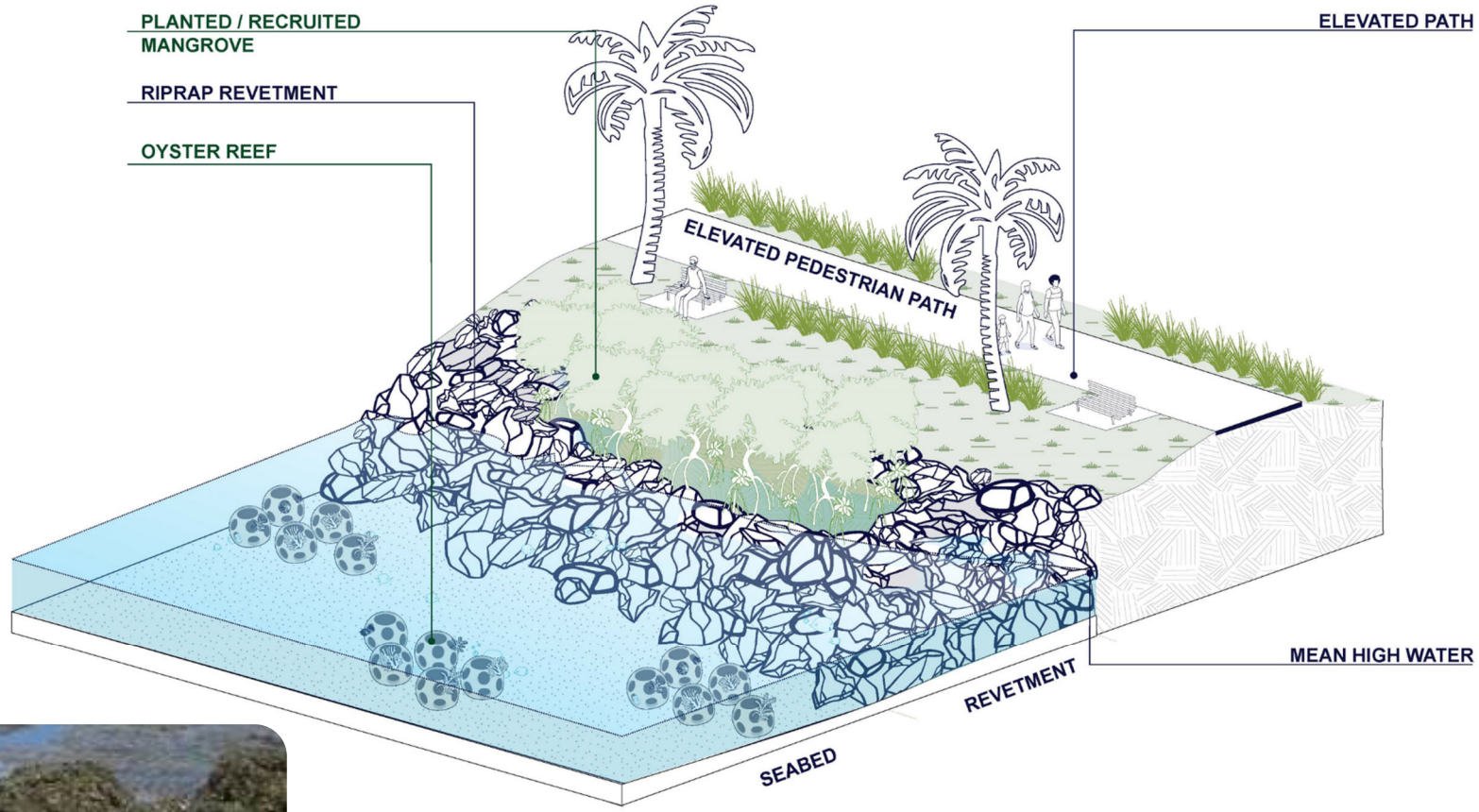




Living Riprap


Mangrove planter


Reef balls

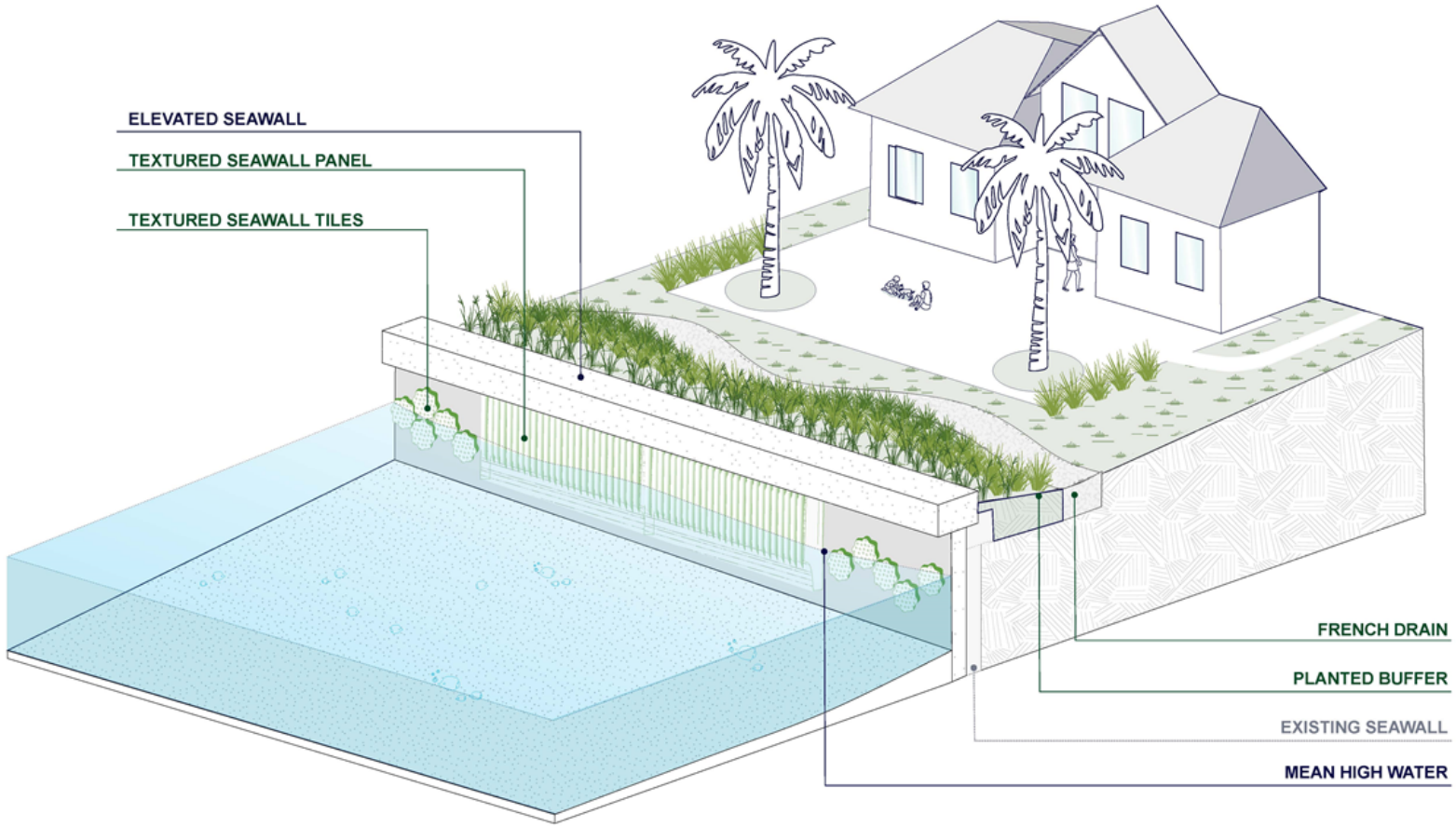


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Living Seawall

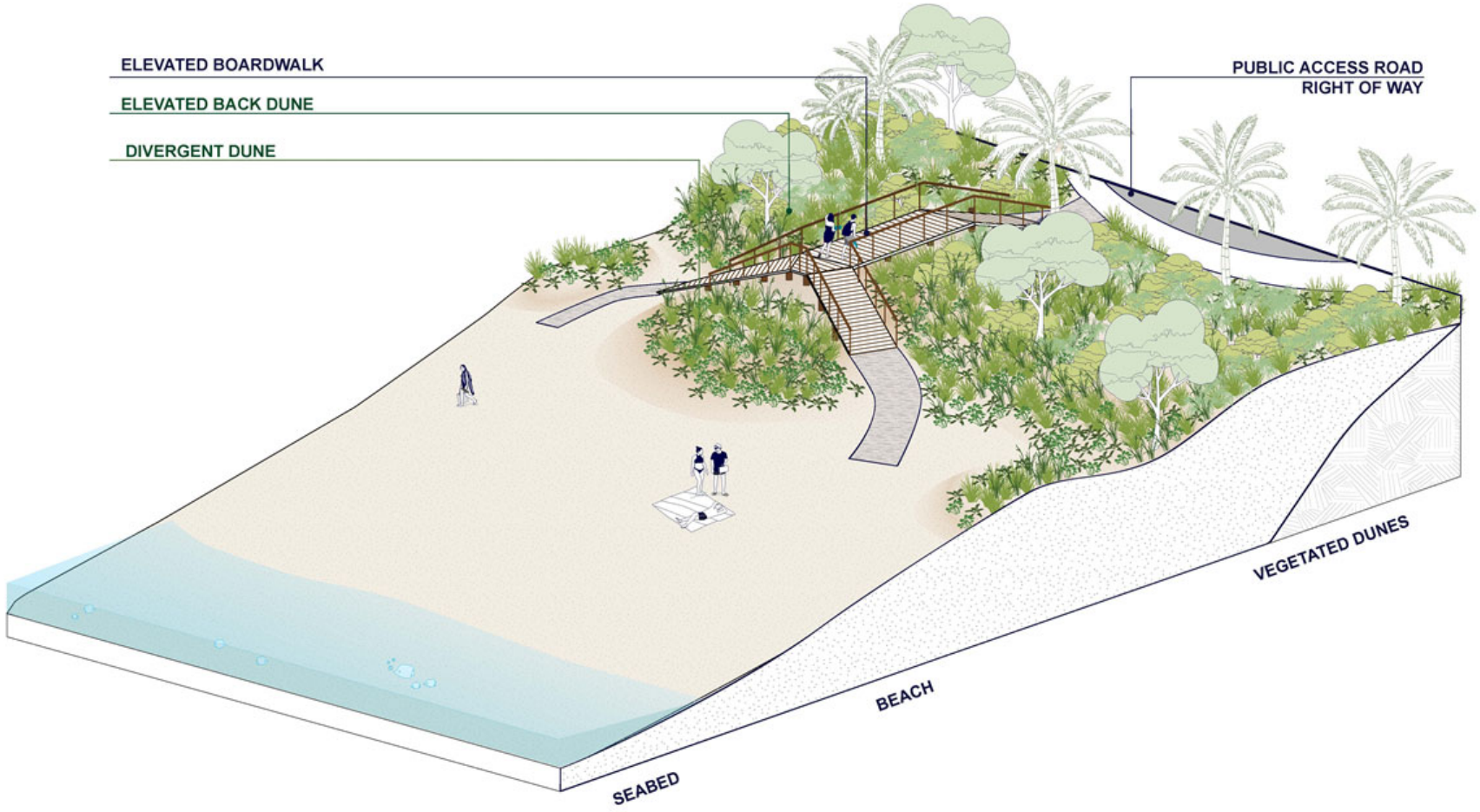






Textured seawall and tiles images from https://www.kinddesigns.com/living-seawalls/

Beach Access



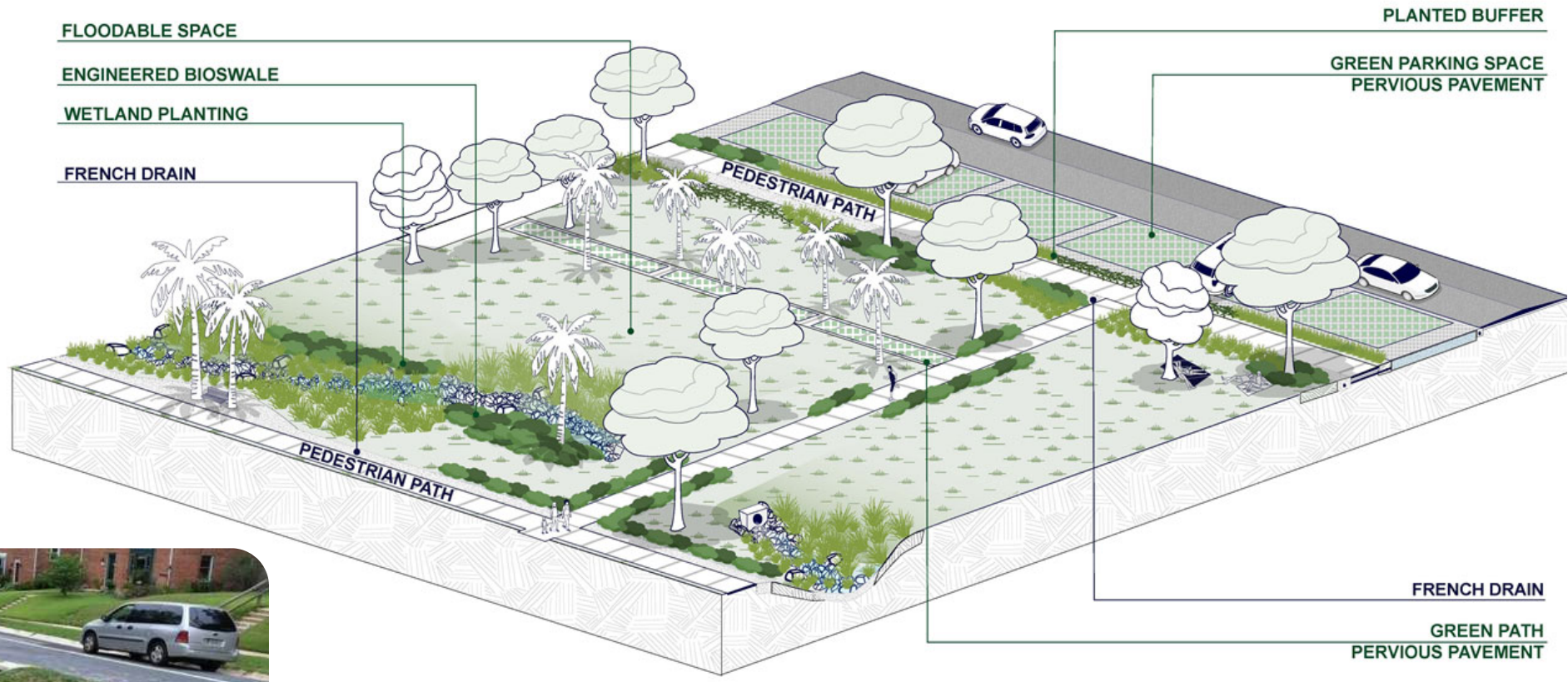






Parks


Pervious pavement


FLOODABLE SPACE
ENGINEERED BIOSWALE
WETLAND PLANTING
FRENCH DRAIN
PEDESTRIAN PATH
PEDESTRIAN PATH
PLANTED BUFFER
GREEN PARKING SPACE
PERVIOUS PAVEMENT
FRENCH DRAIN
GREEN PATH
PERVIOUS PAVEMENT


ngineered bioswale

Permitting

TABLE 7. POTENTIALLY APPLICABLE PERMITTING AUTHORIZATIONS FOR PROJECT CONCEPTS

Agency	Authorization	Code/Statute Type	Potentially Applicable Concepts*
USACE	NWP	NWP 13 – Bank Stabilization	Mangrove Protection, Mangrove Planter, Living Riprap
	NWP	NWP 27 – Aquatic Habitat Restoration, Enhancement, and Establishment	All Except Park and Beach Access
	NWP	NWP 54 – Living Shorelines	All Except Park and Beach Access
	Letter of Permission	33 CFR 325.2(e)(1)	All Except Beach Access
	Standard Permit	33 CFR 325.2(a)	All Except Beach Access
FDEP	Exemption	62-330.051(12)(b), F.A.C. – Seawall/Riprap Restoration	Living Seawall, Seawall/Riprap Restoration
	Exemption	62-330.051(12)(e), F.A.C. – Plantings on Eroded Shorelines	Mangrove Planter
	General Permit	62-330.631, F.A.C. – Governmental Entities for Limited Environmental Restoration or Enhancement	Mangrove Protection, Living Riprap, Mangrove Planter
	Mangrove Planter	62-330.632, F.A.C. – Low Profile Oyster Reefs	Living Riprap
	General Permit (DRAFT)	62-330.604, F.A.C. – Installation, Construction, and Maintenance of Living Shorelines	Mangrove Protection, Living Riprap, Living Seawall, Mangrove Planter
	Individual Permit	62-330.054, F.A.C. – Individual Permit	All Except Beach Access
	CCCL Permit	62B-33.005, F.A.C. – Areawide and Individual Permits	Beach Access

*Dependent on project location, size, and design.

Presenter: Dr. Carrie Schuman

Additional Report Items

- Stand-alone Executive Summary
- Rough Order of Magnitude Costs
- Further Permitting Guidance

TABLE 6. ROUGH ORDER OF MAGNITUDE COSTS PER CONCEPT ELEMENTS

Concept Element	Price(s)	Unit*
Reef arches	$300 – $3,750	EA
Rock crib	$1,209	LF
Mangrove plants	$6 – $195	EA
Concrete mangrove planters	$1,480 – $4,300	EA
Riprap revetment	$120 – $180	LF
New seawall	$1,200 – $2,400	LF
French drain system	$25 – $55	LF
Elevated dune walkover – composite decking	$200 – $450	SF
Elevated dune walkover – ADA boardwalk ramps	$70 – $277	SF
Beach Access Mats	$44 – $50	SF
Beach/dune fill	$88 – $250	CY
Dune vegetation – railroad vine	$2.50 – $21.60	EA
Dune vegetation – sunshine mimosa	$2.75	EA
Dune vegetation – sea purslane	$3.50 – $24	EA
Dune vegetation – sea oat grass	$4 – $36	EA
Dune vegetation – dune sunflower	$2.25 – $43	EA
Dune vegetation – inkberry	$3 – $7.50	EA
Dune vegetation – bitter panicum grass	$3 – $11.50	EA
Dune vegetation – beach elder	$2.25 – $3	EA
Dune vegetation – silver buttonwood	$6 – $350	EA
Dune vegetation – golden beach creeper	$5.50	EA
Dune vegetation – cabbage palm	$250 – $860	EA
Dune vegetation – sea grape	$15 – $1,200	EA
Dune vegetation – pandanus palm	$500	EA
Oyster reef balls	$55 – $1,200	EA
Wave Attenuation Devices	$350 – $450	LF
Living seawall panels	$500 – $1,500	EA
Living seawall tiles	$150 – $300	EA
Bioswales	$5.56 – $24.21	SF
Pervious pavers	$5.01 – $12.23	SF
Pervious asphalt/concrete	$5.59 – $12.23	SF

*EA = Each, LF = Linear Feet, SF = square feet, and CY = cubic yards

Pathway to Implementation



Presenter: Dr. Carrie Schuman

What's Next?

- Will be doing lots of engagement around the Blueprint outcomes
- We'd love to see implementation, pilot projects come online
- Pursuing partnerships, developing understanding of best kinds of support



Contact, Check Out the Project!

Carrie Schuman, Ph.D. (*she/her/hers*)
Climate Resilience Advisor

Conservancy of Southwest Florida
1495 Smith Preserve Way
Naples, FL 34102
conservancy.org
O: (239) 430-2461 | carries@conservancy.org

Thomas F. Ries
President
Ecosphere Restoration Institute
A Non-Profit Organization
13801 Walsingham Rd., Unit A-416
Largo, Florida 33774
(TEL) 813.376.9076
www.ecosphererestoration.org

Danielle H. Irwin, MSc, CFM, PWS, WEDG, LEED AP
Associate Principal

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Miami | Fort Lauderdale | Jupiter | Sarasota | St. Petersburg | Gainesville | Jacksonville | **Tallahassee**
336 E College Avenue, Suite 201, Tallahassee, FL 32301
T: +1 305-741-6155 **F:** +1 305-974-1969
dirwin@CumminsCederberg.com

Conservancy.org/blueprint

October 21st, 2026

SFWMD Resilience Coordination Forum: FDOT District 6 Update

Steven Craig James
Victoria Ortiz
Victoria Vogt
Ben Moore

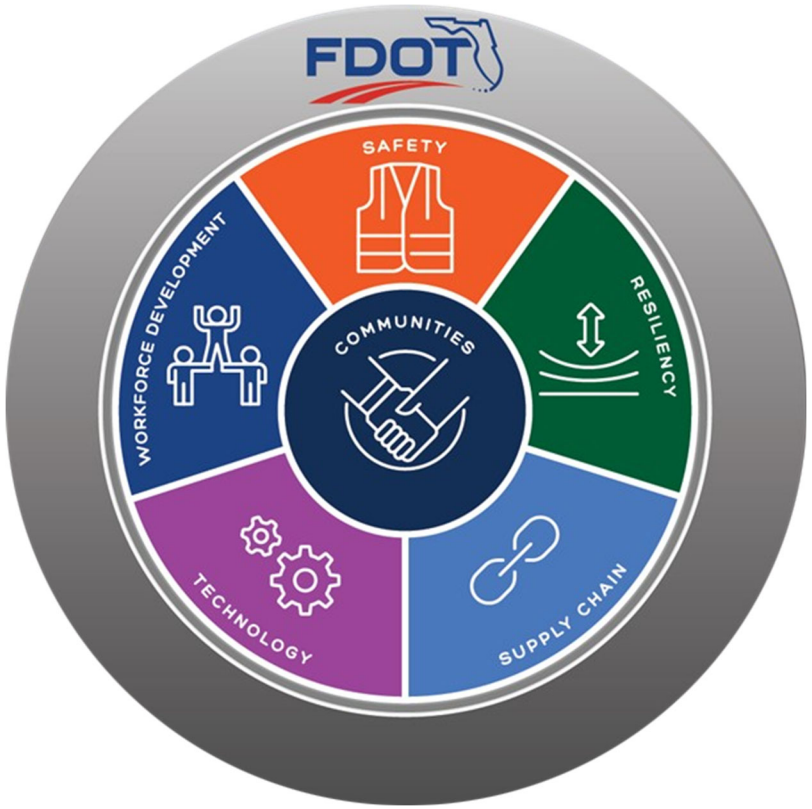
Agenda

1. District 6 Context
2. Framework & Tools
3. Stakeholder Coordination
4. Project Highlights
5. Future Outlook

District 6 Context

Guiding Principles

- FDOT is committed to maintaining a safe transportation system that can withstand, adapt to, and recover from disruptions.
- These considerations are incorporated throughout planning, project development, operations, and asset management to reduce risks from hazards that can affect communities.



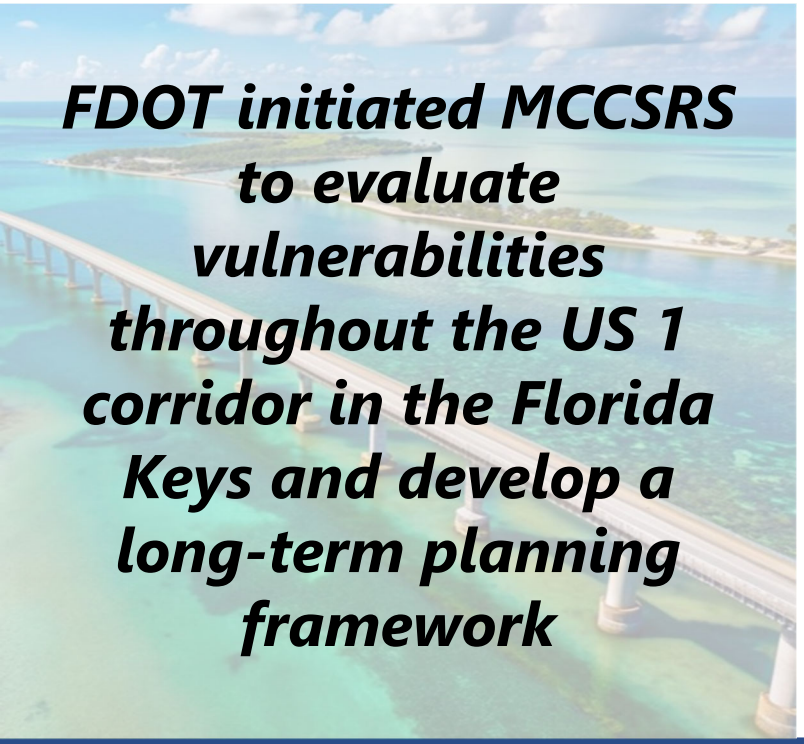
District 6 Context

District 6 Challenges	District 6 Initiative
• Dense urban coastal transportation network	• Implementation of large-scale flood mitigation projects
• Bounded by environmentally sensitive, protected lands, e.g., Marine Sanctuary National Parks	• Development of pump station and shoreline solutions
• Right-of-way constraints	• Regional base-clearance studies
• Recurring king tide and nuisance flooding	• Developed drainage guidance and design practices
• Increasing roadway vulnerability	• Corridor-wide vulnerability assessments and planning frameworks



Framework and Tools

Case Study: Monroe County Coastal Storm Risk Study (MCCSRS)



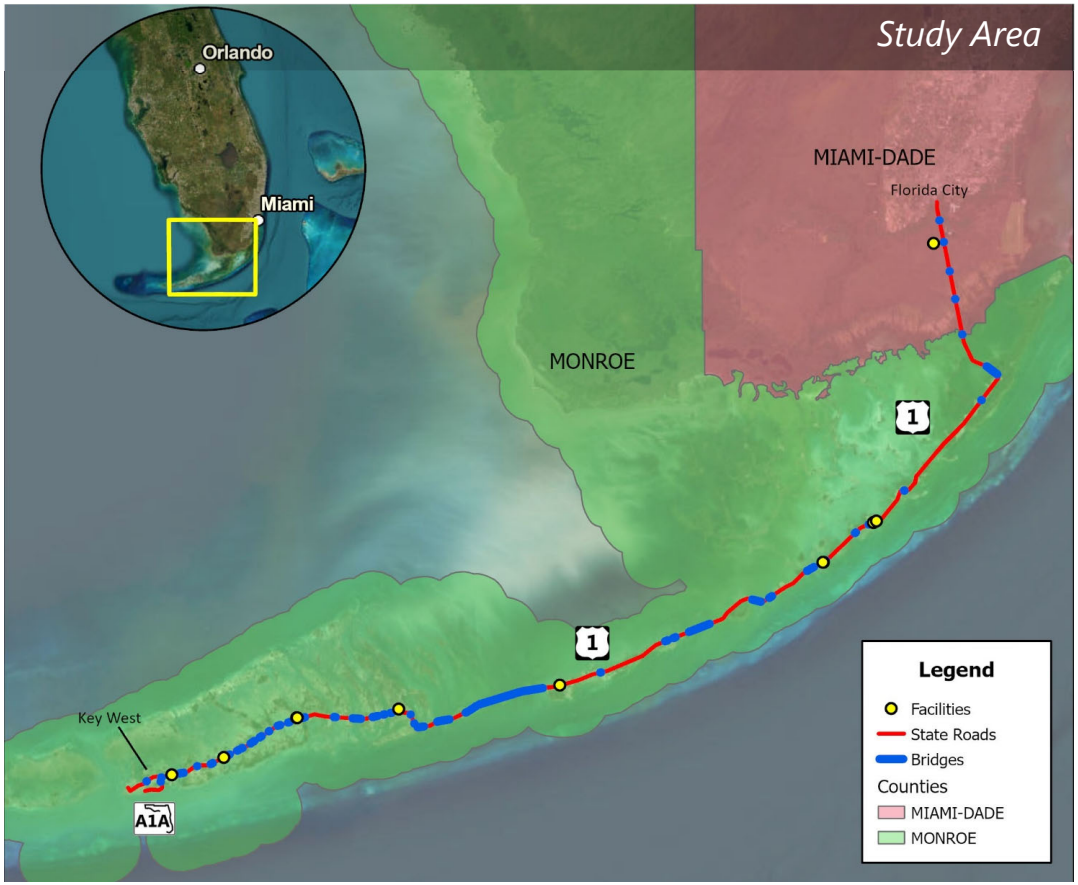
Need:

- Hurricanes such as Irma (2017) Damages
- Findings from Base Clearance Assessment (2018)
- Concurrent U.S. Army Corps of Engineers (USACE) Project (2021)
- Ongoing maintenance-related issues
- Consistent planning framework to prioritize investments

MCCSRS Study Area

FDOT owned and maintained roads, bridges, and facilities from Florida City to Key West

- 116 miles of roadways, including US 1 and SR A1A
- 61 Bridges
- 13 facilities



MCCSRS Timeline

Vulnerability Assessment:

Assess FDOT asset vulnerability to flooding and other hazards within the study area.

FY25

Adaptation Concept Development:

Develop solutions to address asset's vulnerabilities

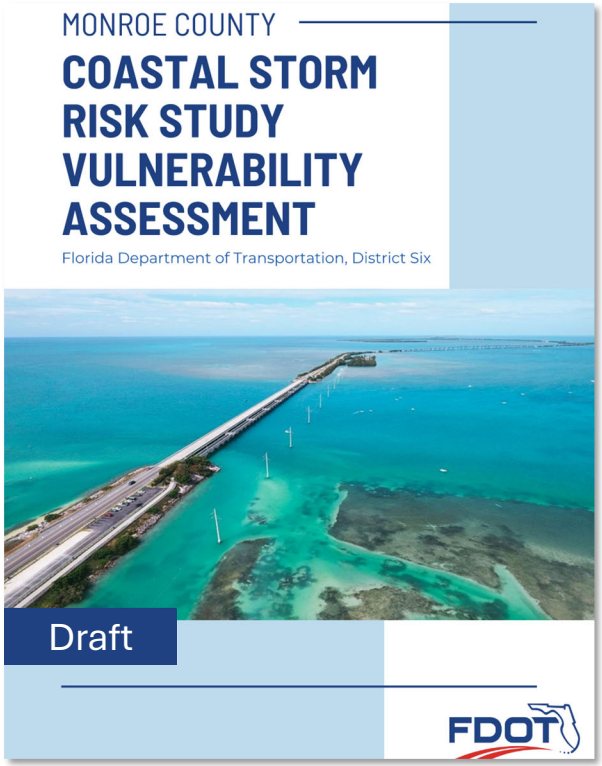
FY26

Adaptation Guidebook:

Provide a framework for standardization for FDOT D6's

FY27

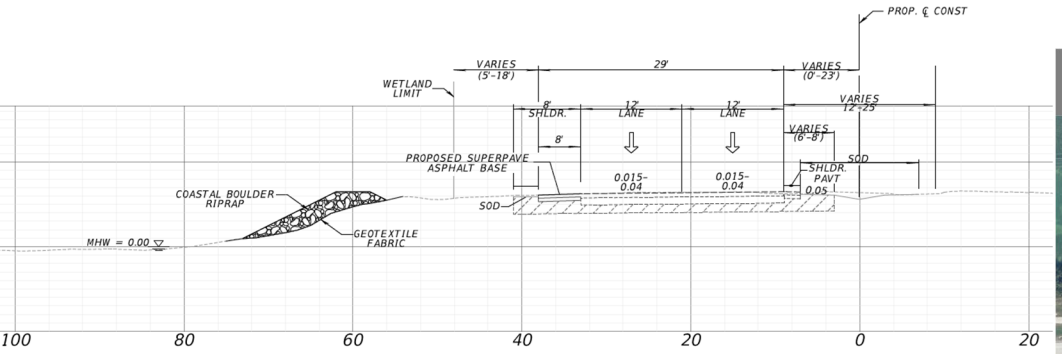
MCCSRS Vulnerability Assessment

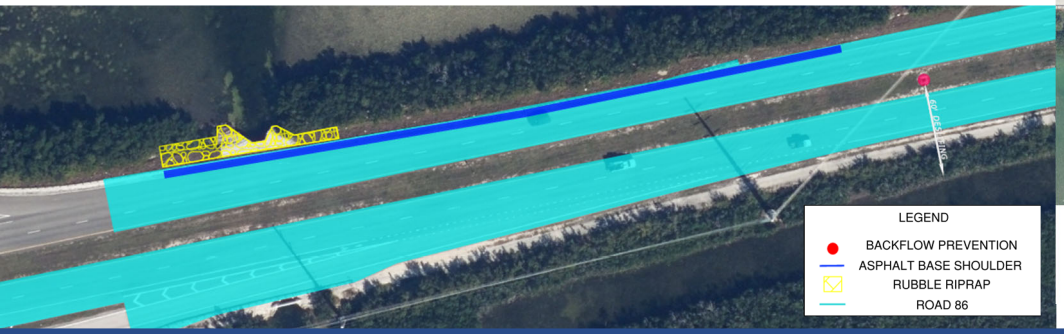




MCCSRS Adaptation Concept Examples

NAS Key Road Segment





Channel No. 2 Bridge





MCCSRS Preliminary Adaptation Guidance

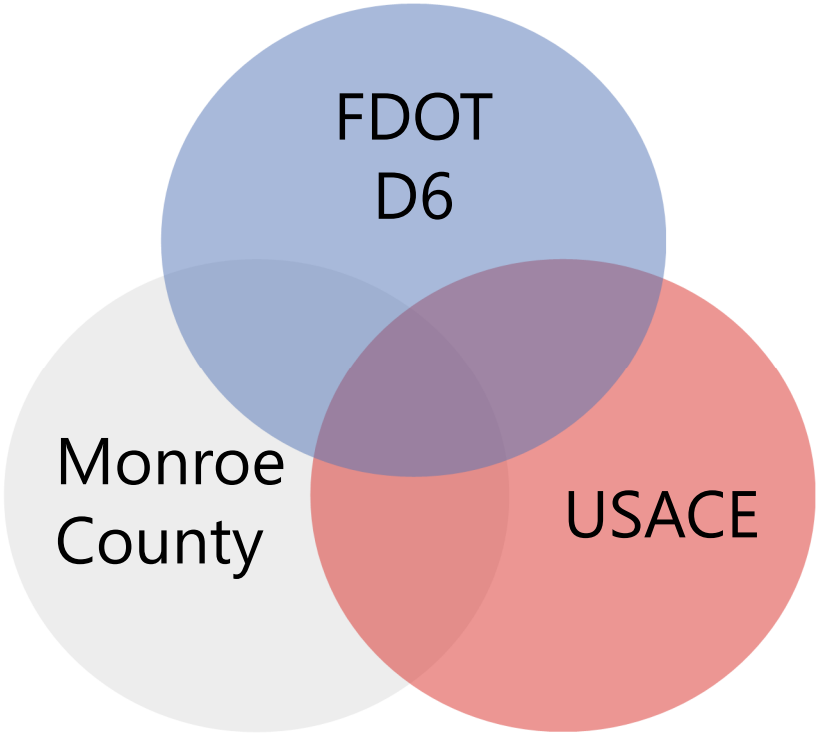
Roads		Bridges	
Vulnerability	**Adaptations**	**Vulnerability**	**Adaptations**
Tidal Flooding	Raise Roadway, Drainage Improvements, etc.	**Wave Impact**	Vent Holes, Pier Shear Keys, Tie Downs, etc.
Storm Surge Hazard	Raise Roadway, Nature-based Solutions, etc.	**Storm Surge Hazard**	Recurve Seawall, WADs, Nature-based Solutions, etc.
Base Clearance	Raise Roadway, Asphalt Base Improvements, Geogrid Improvements, etc.	**Elevation**	Full Reconstruction
Shoreline Stabilization	Riprap, ACB, Marine Mattress, Nature-based Solutions, etc.	**Shoreline Stabilization**	Riprap, ACB, Marine Mattress, Nature-based Solutions, etc.

Stakeholder Coordination

The Department actively collaborates with local governments, regional organizations, and federal agencies to identify shared challenges, develop solutions, and move projects from planning to implementation.

Case Study: Florida Keys Coastal Storm Risk Management (CSRM)

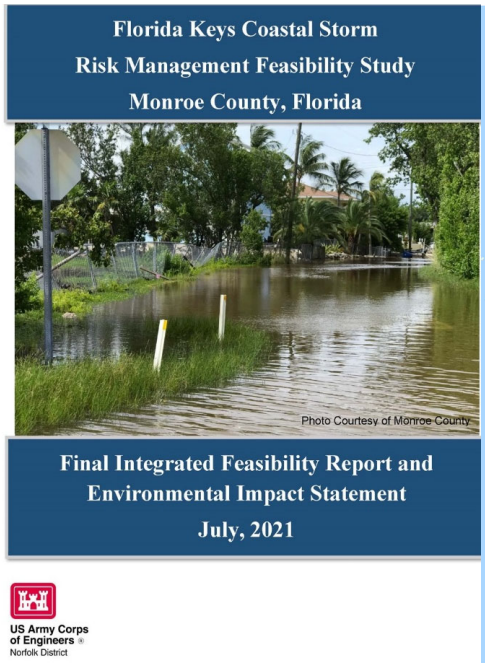
Joint effort by USACE, Monroe County, and FDOT D6 to promote resiliency & reduce risks of coastal damage

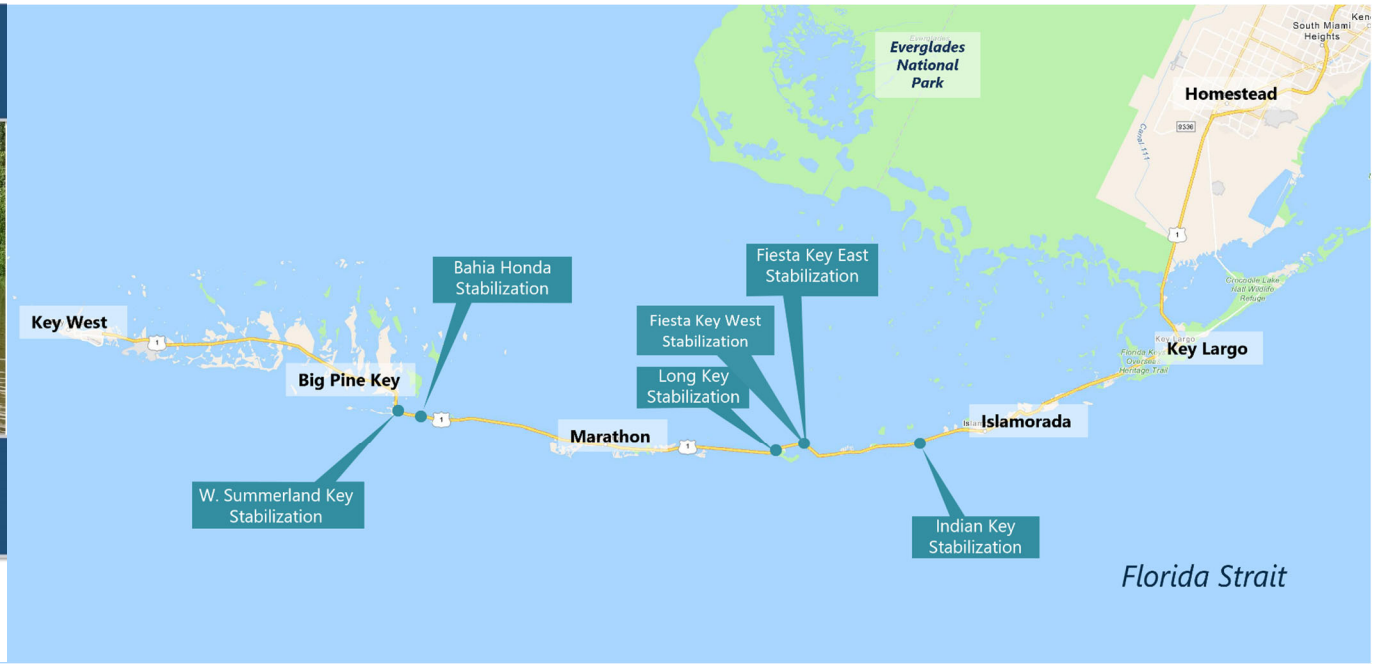


CSRM Case Study Stakeholders

Case Study: CSRM

USACE recommended shoreline stabilization at 6 locations along the Atlantic side of US 1





Case Study: CSRM

Feasibility Study

2018-2021

- Scoping & Planning Strategy
- Alternative Formulation & Analysis
- Site Selection

PED Phase

2024-2026

- Value-Based Design Charrette
- Shoreline Stabilization Concepts: West Summerland & Tea Table Key
- State & Agency funding/design reviews

Construction Phase

Pending

- Construction FY2029

Project Highlights

Completed Resilience Projects (2020-2026)
(non-exhaustive)

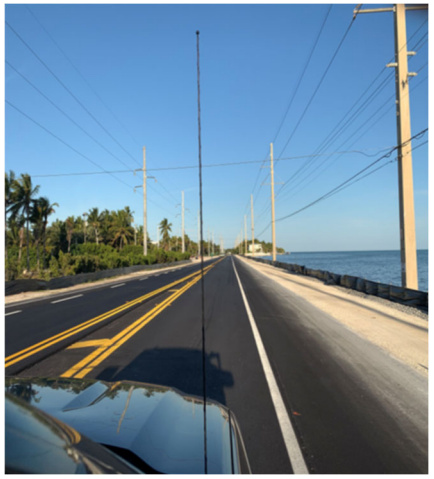
- D6 Overseas Highway Road Raising
- Lake Pancoast Living Shoreline Stabilization
- SR 860/Miami Gardens/NW 186 St from E of I-75/SR 93 to NW 79th Pl
- SR 826/Palmetto EXPY from US-1/S Dixie HWY to NW 25th St
- SR 934/Normandy Dr from W of Bay Drive West to W of Rue Versailles
- SR 860/Miami Gardens Drive from W of NW 27th Ave to W of NW 2nd Ave
- SR 394/NE 79 St from W of Pelican Harbor Dr to E of Adventure Ave
- Mosquito Creek Bridge Replacement
- Card Sound Rd over Tubby's Creek Bridge Replacement
- SR 5/US-1/Biscayne Blvd from S of NE 203rd St to S of NE 207 St
- SR 27/Okeechobee Rd from Broward County Line to W of Heft
- SR 5/Overseas Hwy from MM 75.02 to MM 81.44
- SR 916/NW/NE 135 St from NW 2 Ave to NE 17 Ave/Tressler St
- SR 5/US-1/Overseas HWY Seven Mile Br over Moser Channel Bridge
- SR 934/NE/NW 79 St from W of 1-95 to End of SR 934/1 Way
- SR 934/NE/NW 81/82 St from West of I-95 to End of SR 934/1 Way
- SR 953/Lejeune Rd/NW 42 Ave from N of NE 103rd St to S of NW 135th St
- SR 5/US-1/Overseas HWY from MM 108.426 to MM 112.953
- SR 916/NW 135th St from NW 47th Ave to NW 30th Ave
- SR 90/US-41/SW 7th St from E of 27th Ave to W of 2nd Ave
- SR 90/US-41/SW 7th St from E of 27th Ave to W of 2nd Ave
- SR 9 and NW 22nd Ave
- SR A1A/N Roosevelt Blvd at Jose Marti Dr
- SR 934/71st from Collins Ave to Bay Dr E
- I-195/SR 112 from NW 12 Ave to SR 907/Alton Rd

Overseas Highway Road Raising - Sea Oats Beach (2023)

FM # 443893-1

- Roadway elevation increased.
- Base clearance deficiencies corrected to improve long-term roadway resilience.
- Shoreline stabilization measures at Sea Oat Beach tied into existing ACB revetment system for enhanced coastal protection.
- Reduces risk of roadway damage from storm surge, erosion, and coastal flooding.
- Preserves critical transportation infrastructure while extending roadway service life.











Indian Creek Seawall Construction

Indian Creek (2023)

- Replaced and raised the existing seawall.
- Reduces overtopping of Indian Creek onto the roadway during high tides, storm events, and elevated water levels.
- Integrated with the corridor's stormwater improvements, including the new drainage system and pump station.

Alton Road (2026)

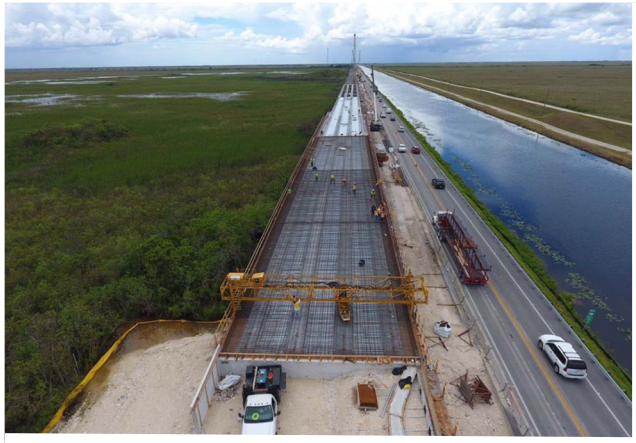
FM # 429193-1







- Increasing the roadway elevation 6-12”
- Installing a barrier wall
- Adjusting manholes
- Adding two new pump stations with new inlets and upgrades to the existing drainage
- Upgrading lighting along the road to LED
- Relocating landscape encroaching the road
- Preservation of existing cultural resources









Tamiami Trail (2026)

FM #444444-2

- Project initiated to support USACE and SFWMD CERP restoration objectives
  - Planned water level increases north and south of the corridor threatened road integrity
- Construction of bridges
  - Enhanced connectivity and sheet flow between the water storage areas to the North and Everglades National Park to the South
- Elevated 6 miles of roadway
  - Improved road base and pavement
- Successful construction example of hardened infrastructure
  - Reduces future impacts from SLR

Future Outlook

Future Outlook

- D6 continues to integrate infrastructure hardening considerations into transportation planning, project development, and asset management.
- Upcoming District-wide Transportation Infrastructure Service Life Assessment
- Refine tools and data to better assess transportation vulnerabilities.
- Invest in infrastructure that supports reliable mobility and facilitates community recovery.



USACE JACKSONVILLE DISTRICT PROGRAMS UPDATE



SFWMD RESILIENCY COORDINATION FORUM

21 October 2026





E. Timothy Gysan, P.E.,PMP

Chief, Everglades and C&SF Resilience Projects Section and Resilience Coordinator

Jacksonville District

U.S. Army Corps of Engineers

US Army Corps of Engineers®

WHAT'S NEW?
CIVIL WORKS TRANSFORMATION

Building Infrastructure Not Paperwork!

27 Initiatives – 5 Categories

- ✓ *Maximizing* the Ability to ***Deliver National Infrastructure***
- ✓ *Cutting* **Red Tape**
- ✓ *Focus* on ***Efficiency***
- ✓ ***Transparency*** & ***Accountability***
- ✓ ***Prioritization***



Mr. Adam R. Telle
Assistant Secretary of the Army for Civil Works

"The U.S. Army's Civil Works program has been an invaluable cornerstone for more than 200 years. 'Building Infrastructure, Not Paperwork' will return USACE to a focus on its core missions and ensure the enterprise continues to be the most trusted national resource delivering water resources solutions," added Telle. "This is only possible with President Trump's leadership that has enabled our team to maximize our ability to deliver national infrastructure and cut red tape for the American people." **Assistant Secretary of the Army for Civil Works Adam R. Telle**

Presenter: E. Timothy Gysan

IMPLEMENTING *RAPID* PLANNING!



Why We're Changing? ***There's an enterprise-wide need to be faster and more effective in delivering high-quality, authorizable water resources projects.***

What We're Changing? ***We are modernizing our feasibility study process by applying a streamlined and scalable decision-making framework.***

How We're Changing? ***Our Policies, procedures, and guidance must evolve to meet current needs.***

RAPID Delivers More Engineering in the Feasibility Phase?
The RAPID framework ensures USACE completes the right level of engineering at the right time to support study decisions and deliver a quality, authorizable project with 35% design maturity, 3-years study completion and $3M total study cost.

RAPID FRAMEWORK

Presenter: E. Timothy Gysan

ENTERPRISE DREDGING DELIVERY CENTER

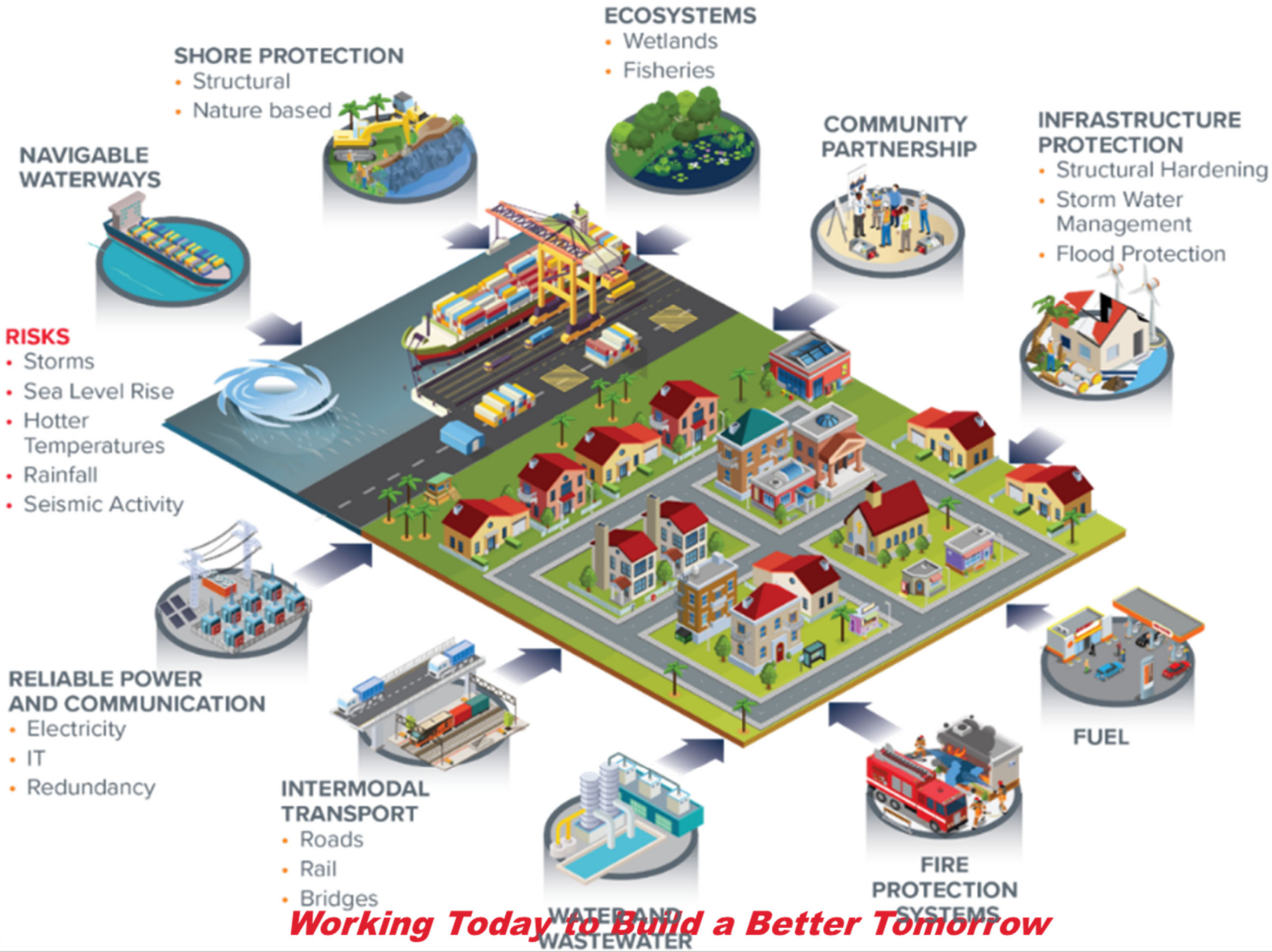
(INITIATED LATE FY26 – STEADY STATE FY29)

MG Kelly Directive: Implement a HQUSACE led, SAD executed enterprise dredging solution for approximately ***190 contracts*** at an ***estimated volume of 210 MCY*** of material by establishing a ***production center to optimize contracting structures*** and ***standardizing plans and specifications*** directly **driving down overall dredging costs, stabilizing project delivery and streamlining national-level resource utilization**.

- ✓ **We must rethink how we deliver our dredging mission to maximize our national buying power and benefit the nation.**
- ✓ **Seek to contract the largest package possible to enable our dredge program delivery while maximizing our buying power.**
- ✓ **Evaluate the use of contracting tools and innovations and new contract/delivery structures to improve resource utilization.**
- ✓ **Elevate dredge contracting for national visibility of dredging market factors.**
- ✓ **End State Vision: National dredging program with HQ Direction and SAD Execution/Delivery.**

Presenter: E. Timothy Gysan

SUSTAINABLE AND SUCCESSFUL OUTCOMES
LONG TERM VISION FOR COMMUNITY RESILIENCY



Presenter: E. Timothy Gysan

Working Today to Build a Better Tomorrow

RESILIENCY THROUGH PROJECT INTEGRATION

USACE PROJECTS IN CENTRAL AND SOUTH FLORIDA



C&SF FLOOD RESILIENCY STUDIES

Authorized CSRM* Projects

CSRM* Studies (+ Back Bay)

Authorized Navigation Projects (DEEP DRAFT)

Authorized Navigation Projects

SOUTH FLORIDA ECOSYSTEM RESTORATION (SFER) PROJECTS, STUDIES, AND REGULATION SCHEDULES

4)C-111 South Dade
5)Kissimmee River Restoration (KRR)
6)Herbert Hoover Dike (HHD)
7)Lake Okeechobee System Operating Manual (LOSOM)
8) Shingle Creek & Kissimmee River Study
10)Picayune Strand Restoration Project (PSRP)
11)Indian River Lagoon – South (IRL-S) C-44 Reservoir and STA
12)C-111 Spreader Canal Western Project
13)Biscayne Bay Coastal Wetlands (BBCW) – Phase 1
14)Caloosahatchee River C-43 Reservoir
15)Broward County Water Preserve Areas (BCWPA)
17)Central Everglades Planning Project (CEPP)
18)Loxahatchee River Watershed Restoration Project (LOWRP)
19)Lake Okeechobee Watershed Restoration Project (LOWRP)
20)Western Everglades Restoration Project (WERP)
21) Southern Everglades Restoration


Captiva Island Beach CSRM


C&SF Water Management | LOSOM Operations


EAA Reservoir Seepage Inflow/Outflow


2020 Flooding | Ft. Lauderdale


Port Miami

Presenter: E. Timothy Gysan

Working Today to Build a Better Tomorrow

C&SF AND CERP: OPTIMIZING BENEFITS THROUGH OPERATIONS

Critical Final Step Getting the Water Right: Ongoing Operations and Operational Planning:

- Lake Okeechobee System Operating Manual (LOSOM) - Lake Recovery AAR
- Kissimmee River Restoration (KRR) Headwaters Revitalization Operational Planning
- CEPP 1.0 Operational Planning
- C-43 West Basin Storage Reservoir Operational Planning
- EAA Reservoir Initial Fill Plan





Presenter: E. Timothy Gysan

QUESTIONS?

13. Closing Remarks

Carolina Maran, Ph.D., P.E.
Division Director, Flood Control and Water Supply Planning
Chief of District Resiliency
South Florida Water Management District

Reminders

Public Comment

- Partners, stakeholders and the public are encouraged to provide written comments on the DRAFT 2026 Upper East Coast Water Supply Plan
- The public comment period closes **October 29, 2026**
- Emailed to cbrcka@sfwmd.gov

Flood Observations

- Please continue sharing reports from **both past and upcoming flood events**, including photos and documentation
  - Past events: help document flood extent, frequency, and duration
  - Upcoming/active events: support real-time response and long-term risk planning
- **Submit observations:** sfwmd.gov/FloodingApp
- **View submitted observations:** sfwmd.gov/FloodResource

Presenter: Carolina Maran

2026 Consolidated Annual Report on Flood Resiliency

Central and Southern Florida Flood Resiliency Studies

Sea Level Rise and Flood Resiliency Plan

October 2026

sfwmd.gov

Upcoming Events

FDEP Quarterly Resiliency Forum

- November 4, 2026
- Webinar

18th Annual Southeast Florida Climate Leadership Summit

- November 4-6, 2026
- Broward County Convention Center, Fort Lauderdale, FL

6th Annual CAC Florida Climate Conference

- November 12, 2026
- Selby Auditorium, New College of Florida, Sarasota, FL

National Disaster Resilience Conference

- November 17-19, 2026
- Wyndham Grand Clearwater Beach, Clearwater, FL

Flood Control and Water Supply Resiliency Coordination Forum

- **Flood Control and Water Supply (FloWS) Resiliency Coordination Forum** - reflecting focus on flood control and water supply resiliency related topics
- Goals: Fact-finding and information-sharing forum to foster collaboration between **SFWMD and local, state, federal, and tribal partners**
- Advance flood control and water supply resiliency planning by facilitating coordination on water management initiatives, sharing technical knowledge, assessing hydrologic and climate conditions, and identifying **risk-informed, tangible, asset-level solutions.**



2027 Flood Control and Water Supply Resiliency Coordination Forum Schedule

The **Flood Control and Water Supply Resiliency Coordination Forum** is a fact-finding and information-sharing forum designed to foster collaboration between the South Florida Water Management District and local, state, federal, and tribal partners. The forum focuses on advancing flood control and water supply resiliency planning by facilitating coordination on water management initiatives, sharing technical information, and assessing hydrologic and climate conditions. Visit **SFWMD.gov/Meetings** for more information.

2027 Meeting Dates

- Wednesday, March 24
- Wednesday, July 21
- Wednesday, November 17

All of these forums will be held at the South Florida Water Management District's Headquarters Complex at:
3301 Gun Club Road
West Palm Beach, FL 33406

JANUARY

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Flood Control and Water Supply Resiliency Coordination Forum

Presenter: Carolina Maran

Flood Control and Water Supply Resiliency Coordination Forum

Help Us Plan Upcoming Meetings

- What topics would you like to see covered in future forum meetings?
- Do you have a topic, study, or project you would like to present at a future forum meeting?

- **Share your ideas via the feedback survey:** https://forms.office.com/g/MkZuHNhCPZ
- **Email suggestions to:** resiliency@sfwmd.gov



Presenter: Carolina Maran

Feedback Survey

- We want to hear from you: https://forms.office.com/g/MkZuHNhCPZ

Upcoming Meetings

- Wednesday, March 24, 2027
- Wednesday, July 21, 2027
- Wednesday, November 17, 2027



Presenter: Carolina Maran



Thanks!

Carolina Maran, Ph.D., P.E.

Division Director, Flood Control and Water Supply Planning, Chief of District Resiliency, SFWMD

cmaran@sfwmd.gov

www.sfwmd.gov/resiliency



Photo by Paul Krashefski