

USACE Resiliency Projects: Integrating Resilience Efforts and Solutions in South Florida

Treasure Coast and South Florida Regional
Planning Councils Joint Meeting

17 February 2023

E. Timothy Gysan, PE. PMP
Resiliency Senior Project Manager
Jacksonville District
U.S. Army Corps of Engineers

Working Today to Build a Better Tomorrow



US Army Corps
of Engineers®





BUILDING COMMUNITY RESILIENCE

A COMPREHENSIVE AND COLLABORATIVE APPROACH



SHARED RESPONSIBILITY

An Effective Resilience-focused Strategy Requires a Coordinated and Integrated Approach Across All Levels of the Public and Private Sectors

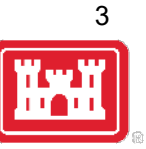
- The problems related to climate change are uncertain, broad, and complex
- It is essential to survey and assess relationships among all public and private sector deliverables and capabilities – at local, regional, state and federal levels – to determine the most appropriate and effective packaging of programs, projects, and services to accomplish resilience and sustainability objectives





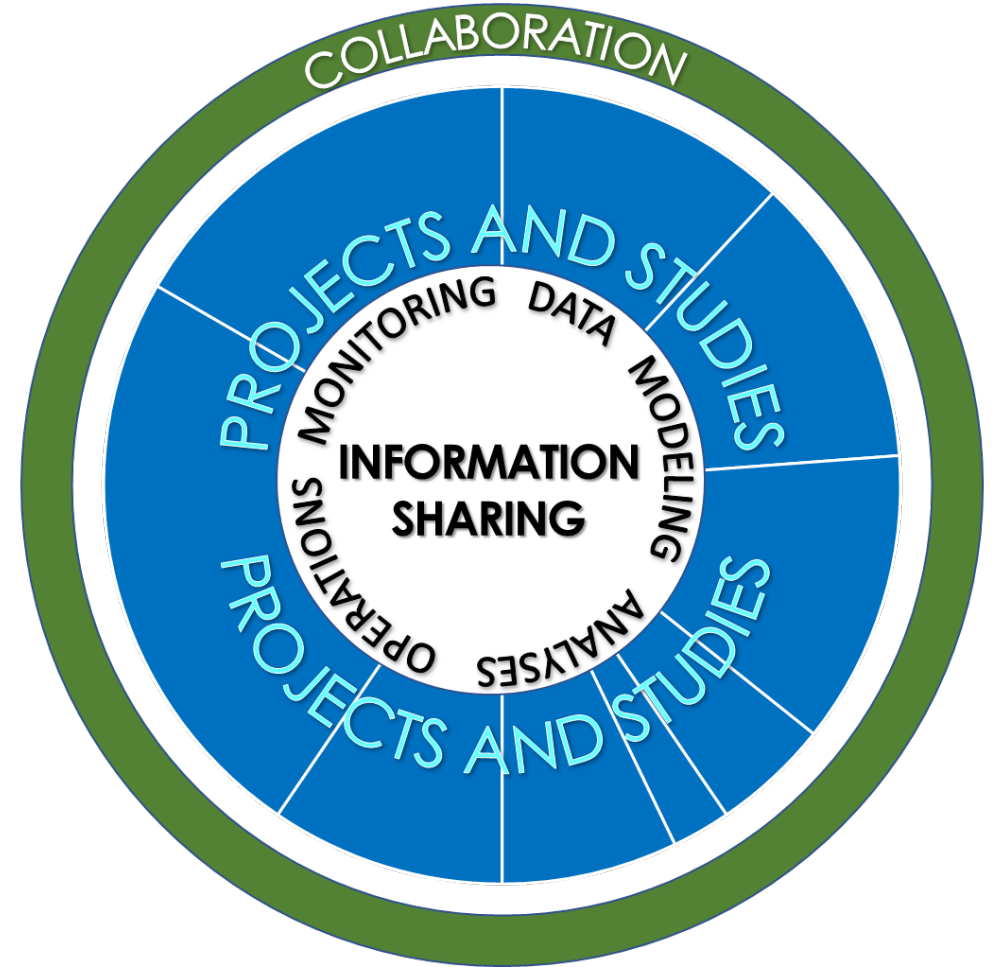
BUILDING COMMUNITY RESILIENCE

A COMPREHENSIVE AND COLLABORATIVE APPROACH



HOW DOES IT ALL FIT TOGETHER?

Collaboration is key to identify and assess impacts, connections, dependencies, relationships, causes, economies of scale, etc. – that are needed to more fully and adaptively plan, implement, integrate, and operate programs and projects for more resilient and sustainable communities in the long term, and in the face of climate change.



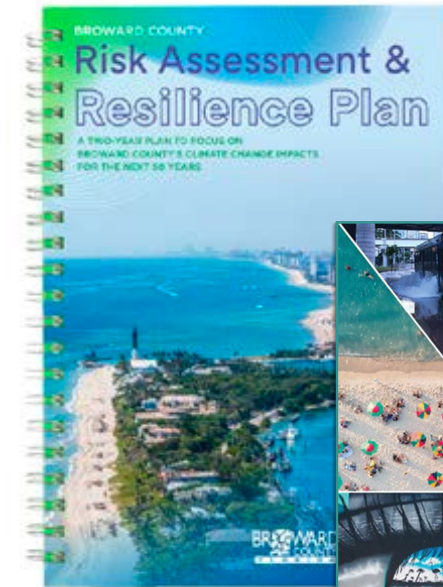
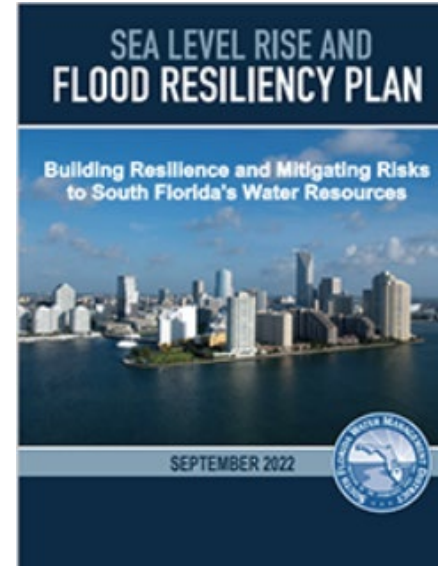
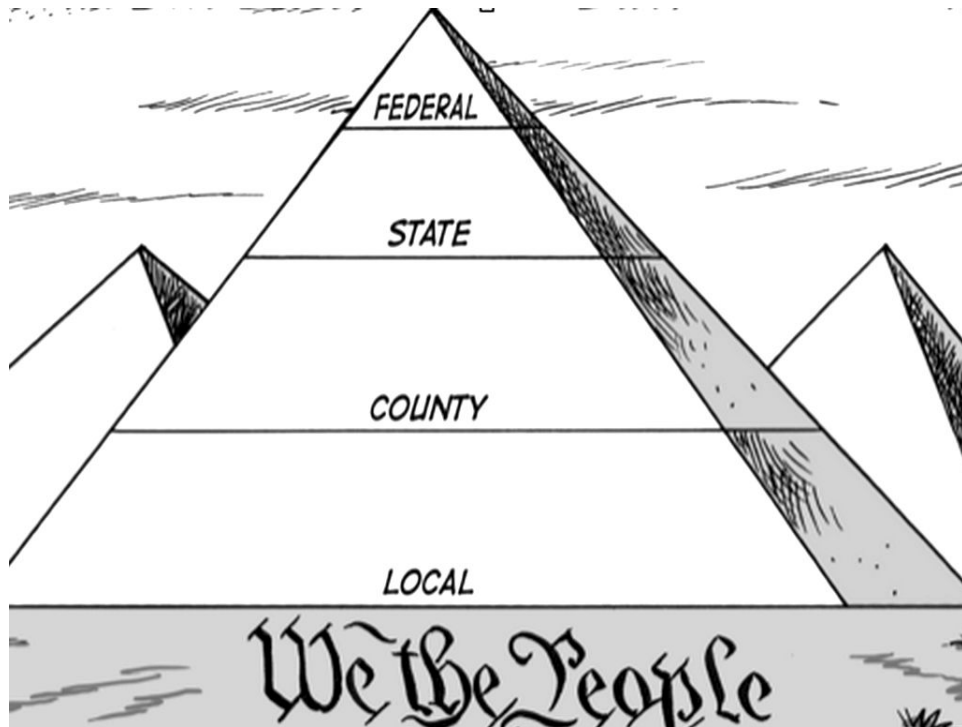
Water Resource infrastructure is the connector

Working Today to Build a Better Tomorrow



BUILDING COMMUNITY RESILIENCE

A COMPREHENSIVE AND COLLABORATIVE APPROACH

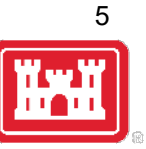


Working Today to Build a Better Tomorrow



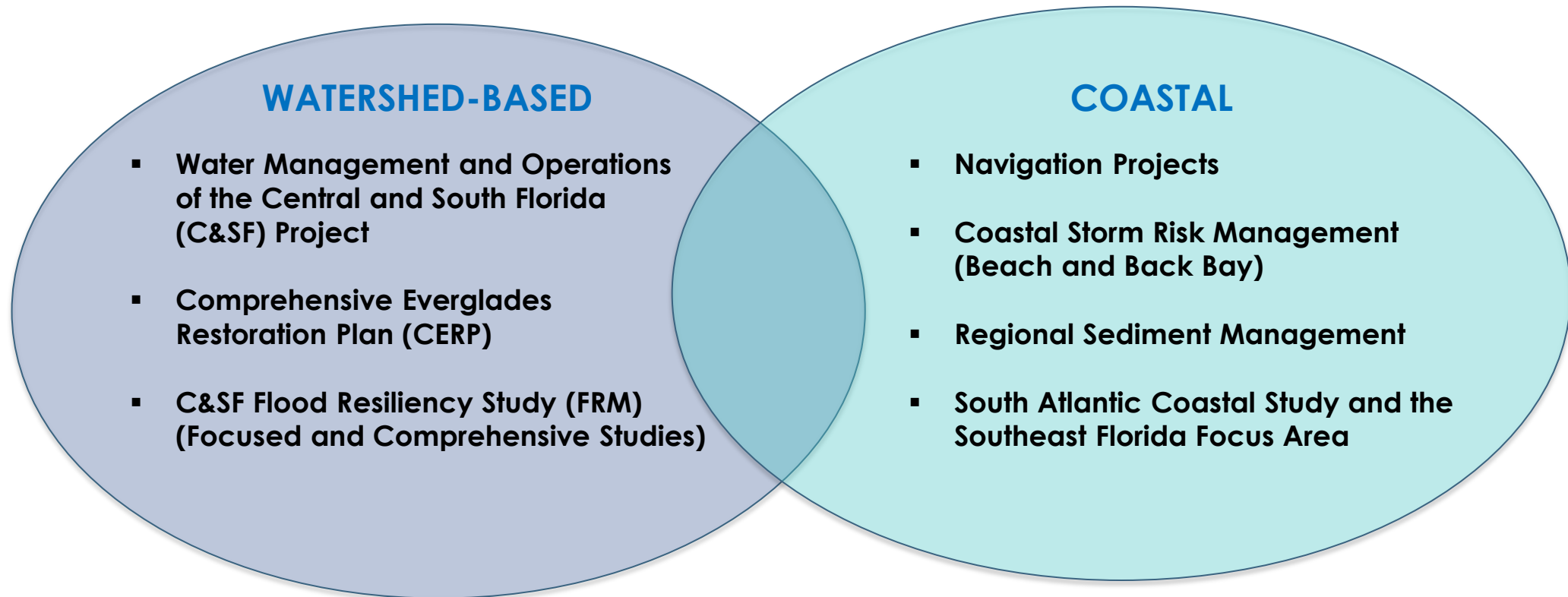
USACE SOUTHEAST FLORIDA PROJECT INTEGRATION

USACE Role in Building Community Resilience



HOW DOES IT ALL COME TOGETHER TO BUILD COMMUNITY RESILIENCE?

The conditions and operations of the C&SF system, the benefits of CERP, and climate change science form the context of the integration of USACE projects



NEIGHBORHOOD DRAINAGE SYSTEM*Tertiary Drainage System***DRAINAGE GRATES**

After a heavy rain, excess "surface water" slowly drains to community lakes and ponds via street and drainage grates, swales, ditches or neighborhood canals. Maintenance of community drainage facilities is typically the responsibility of residents or homeowner associations.

**CULVERTS**

The water then drains from the neighborhood or "tertiary" system through culverts or underground pipes to the "secondary system," usually operated by special drainage districts or the county/city.

SECONDARY DRAINAGE SYSTEM*Local Drainage District/County or City***LOCAL STRUCTURE**

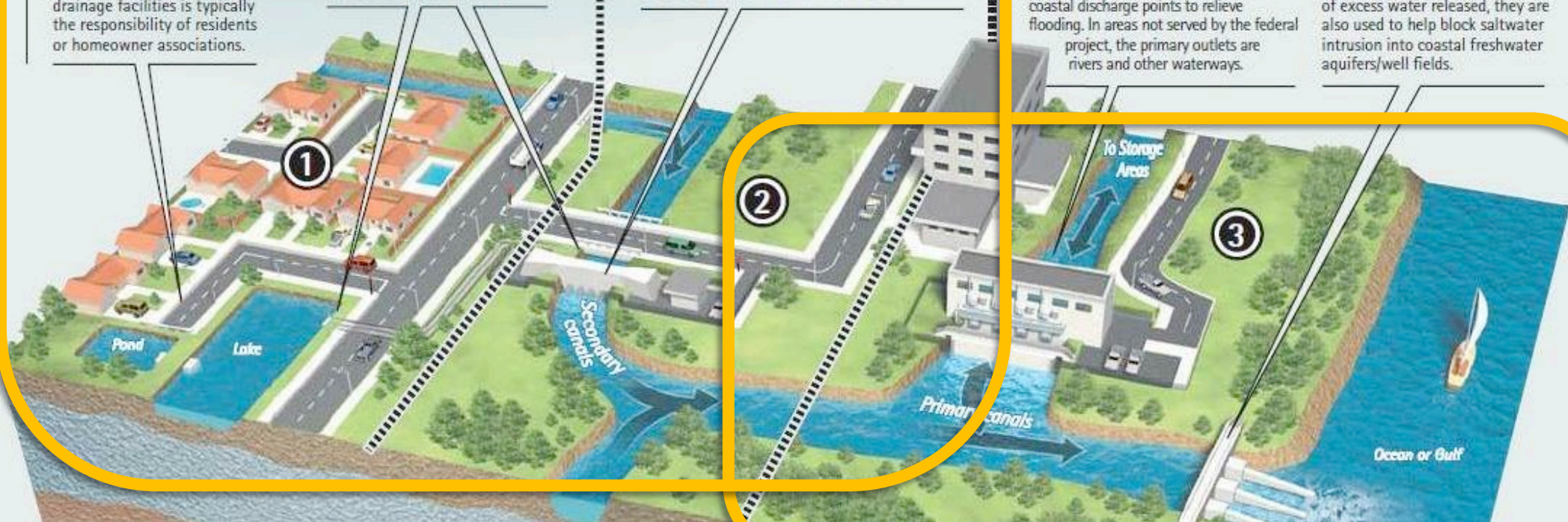
Usually a network of local gates, pump stations and storage areas, "secondary" drainage systems can cover several hundred square miles and serve a number of communities. The secondary system's canals typically discharge water into the "primary" flood control system.

PRIMARY DRAINAGE SYSTEM*South Florida Water Management District (SFWMD) Canals and Natural Rivers/Other Waterways***PUMP STATIONS**

The SFWMD operates and maintains the "primary" drainage system built by the federal government along with other flood control facilities. During and after heavy rains, excess water is routed through primary waterways using pump stations and other structures to storage areas or coastal discharge points to relieve flooding. In areas not served by the federal project, the primary outlets are rivers and other waterways.

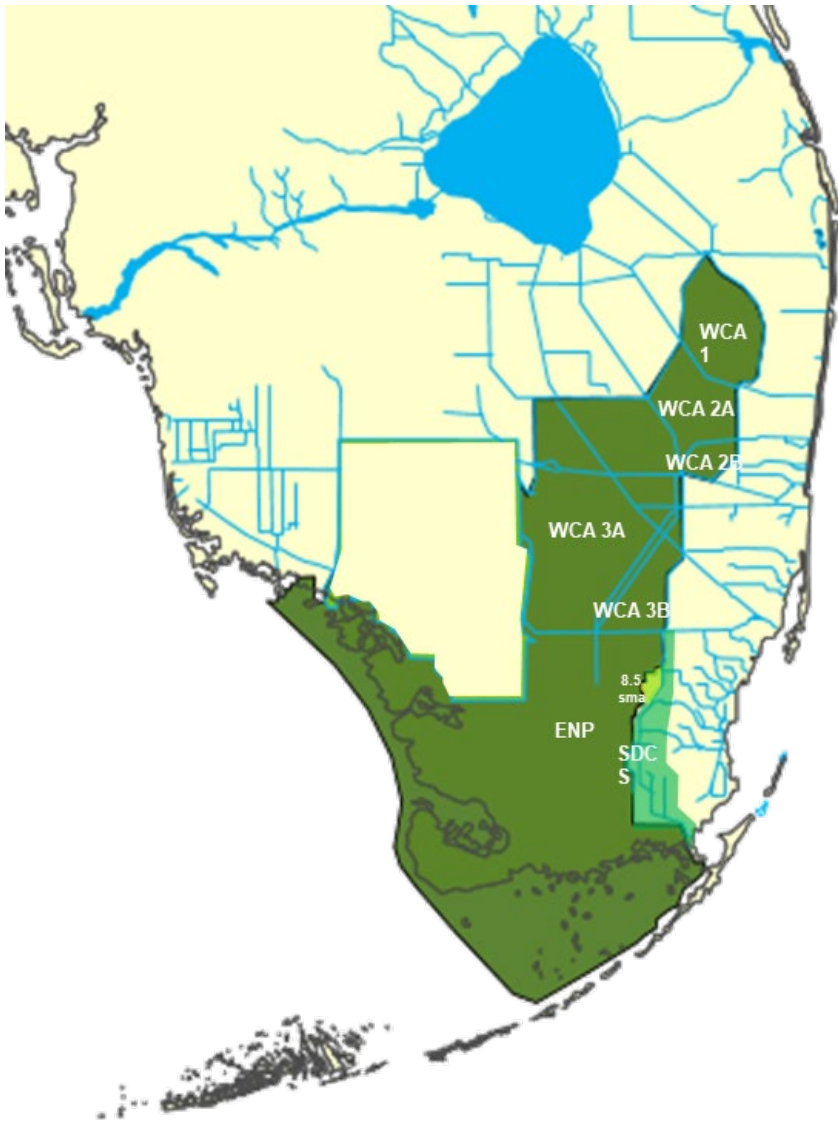
**GATED SPILLWAYS**

Huge gravity-operated gated spillways help control the amount of excess water discharged to the ocean or gulf as quickly and safely as possible. Because these large-volume spillways can control the quantity of excess water released, they are also used to help block saltwater intrusion into coastal freshwater aquifers/well fields.





CENTRAL & SOUTHERN FLORIDA (C&SF) PROJECT



- Congressionally authorized by the Flood Control Acts of 1948 and 1954
- Large multi-purpose water resources project
- System includes canals, levees/berms, pump stations and water control structures











Balance multiple congressionally-authorized project purposes:

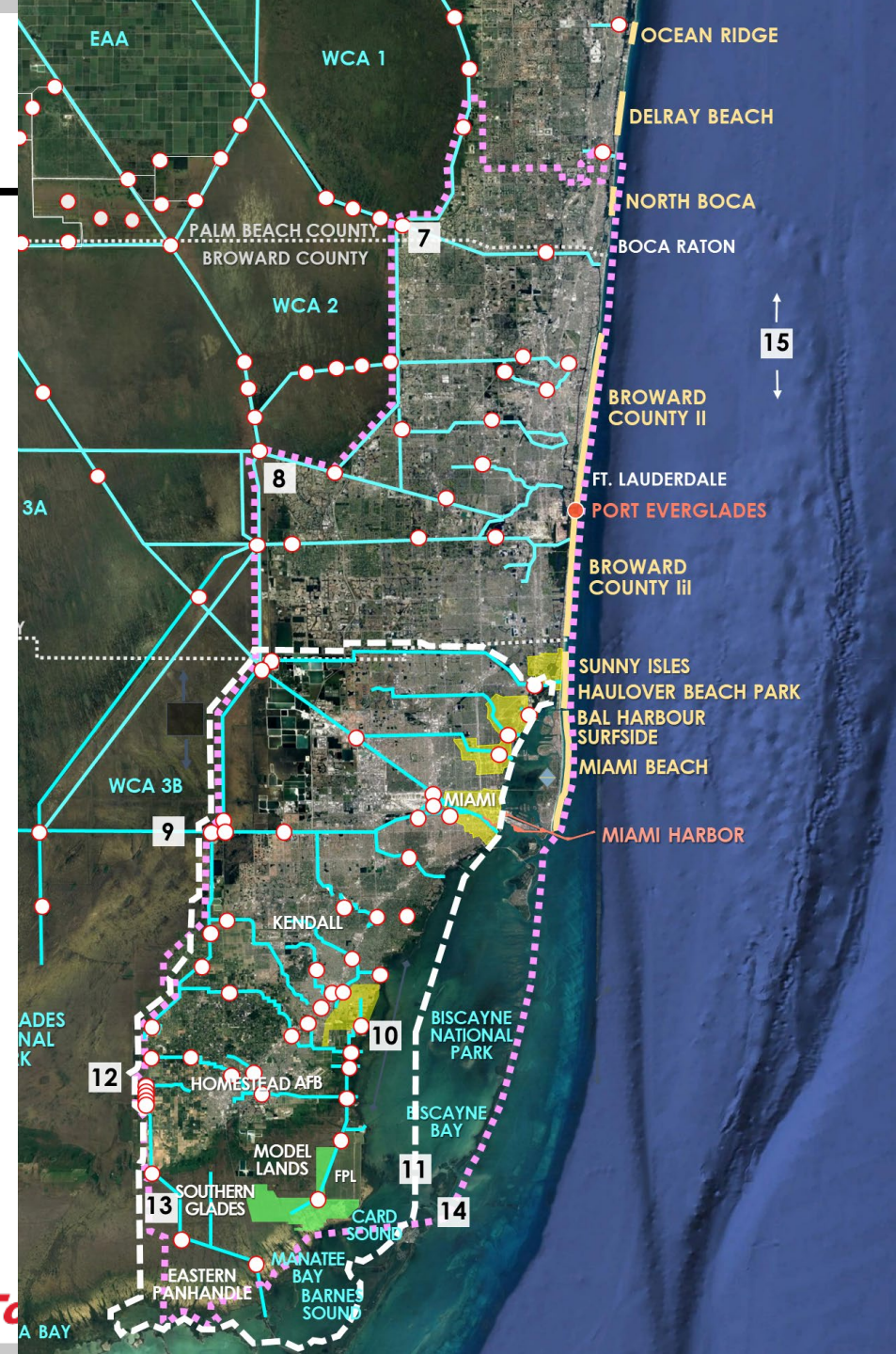
- Flood control
- Navigation
- Water supply
- Enhancement of fish and wildlife
- Recreation



USACE PROJECT INTEGRATION

MIAMI-DADE | BROWARD | PALM BEACH COUNTIES (Not All Inclusive)

-  COASTAL STORM RISK MANAGEMENT (CSRM)
-  NAVIGATION
-  CSRM | MIAMI BACK BAY STUDY
-  CONTINUING AUTHORITIES PROGRAM (CAP) | SECTION 14 (Mt. Sinai)
-  FPL MITIGATION BANK
-  CENTRAL AND SOUTHERN FLORIDA (C&SF) CANALS
-  CENTRAL AND SOUTHERN FLORIDA (C&SF) STRUCTURES
-  SOUTH FLORIDA ECOSYSTEM RESTORATION (SFER) PROJECTS AND STUDIES
 - 7) Site 1 Impoundment
 - 8) Broward County WPAs
 - 9) Tamiami Trail Next Steps – Phase 2
 - 10) Biscayne Bay Coastal Wetlands (BBCW)
 - 11) Biscayne Bay and Southeastern Everglades Ecosystem Restoration (BBSEER) – STUDY BOUNDARIES 
 - 12) S-332 Pump Replacements
 - 13) C-111 Spreader Canal Western Project
 - 14) C&SF Flood Resiliency (Section 216) Study - STUDY BOUNDARIES 
 - 15) Melaleuca Eradication



Working Today to Build a Better Tomorrow



USACE SOUTHEAST FLORIDA PROJECT INTEGRATION



All Projects Under One Umbrella

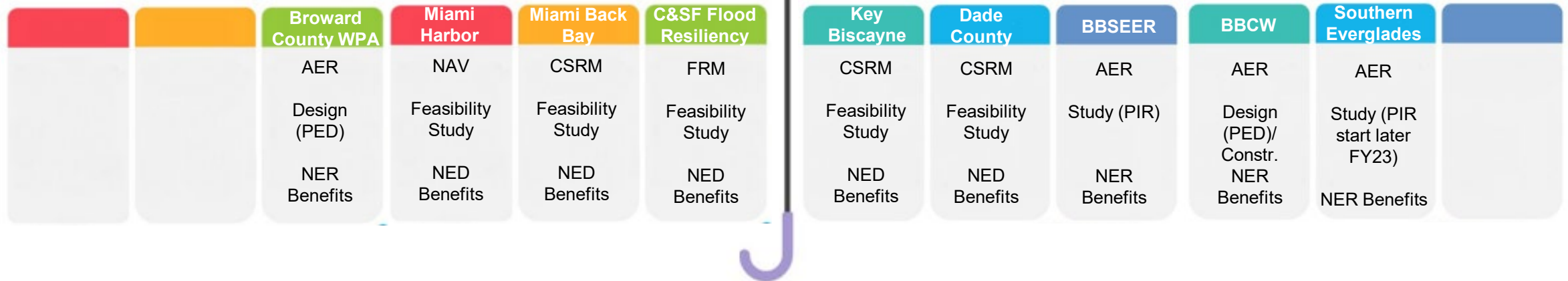
Integration Themes:

- Communication
 - Internal both between teams and with leadership
 - External with sponsors and stakeholders
- Technical
 - During Formulation including model assumptions and known features
 - After Formulation including comprehensive benefits

SAD & NAD

Program Oversight

Project Integration



Working Today to Build a Better Tomorrow



USACE SOUTHEAST FLORIDA PROJECT INTEGRATION

Coordinating Multiple Lines of Defense

Everglades
(CERP & BBSEER)

Miami-Dade Back Bay CSRM Study

CS&F (216) Resiliency Study

Dade County Beach
CSRM Reauthorization



PARKS &
CONSERVATION
LANDS



AGRICULTURE



WESTERN &
SOUTHERN SUBURBS



SLOUGHS



THE RIDGE



MAINLAND
BAYFRONT



ISLAND
BAYFRONT



ISLAND
OCEANFRONT



WATER



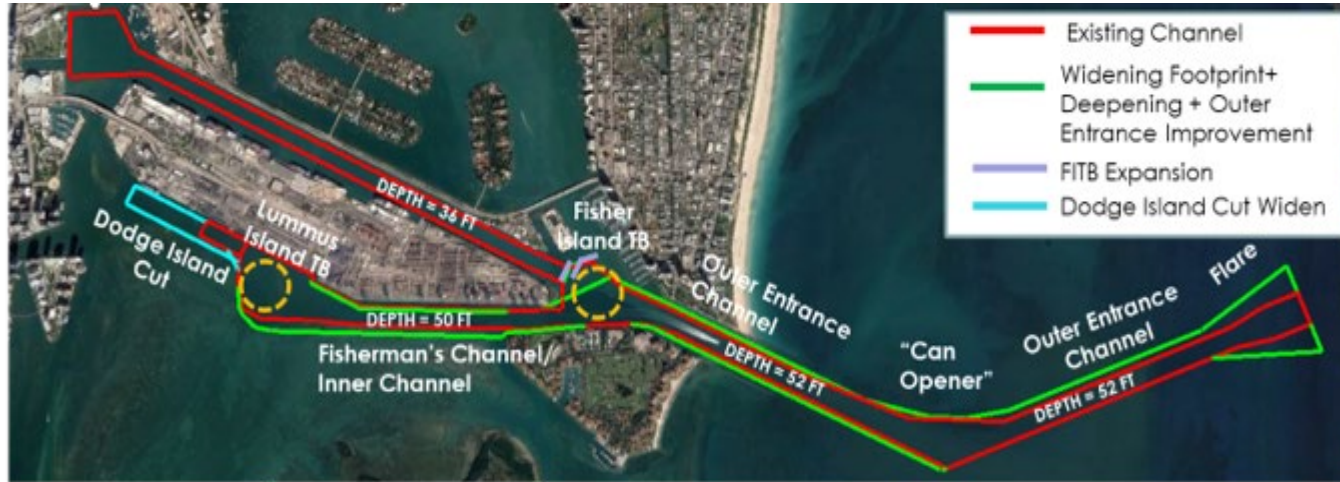
Working Today to Build a Better Tomorrow



MIAMI HARBOR NAVIGATION STUDY



Overview



*COST/BENEFIT RATIO PRELIMINARY ESTIMATE FOR ALTS. REFINEMENTS UNDERWAY.

Scope –

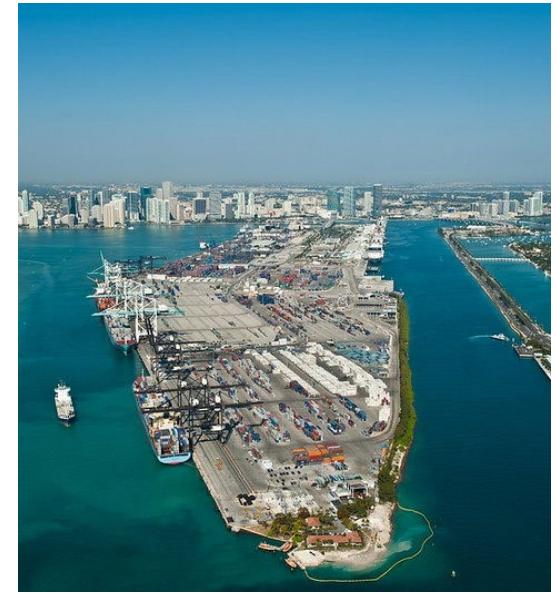
- The purpose of this study is to achieve transportation cost savings through increased economic efficiencies within Miami Harbor. Miami Harbor is Miami-Dade County’s second most important economic engine contributing \$41.4 billion annually to the local economy and supporting more than 324,352 jobs in South Florida. It is recognized as the Cruise Capital of the World and Cargo Gateway of the Americas. Miami Harbor has two main types of vessels, container ships and passenger (cruise) ships. This study focuses on the present needs for both vessels.

Sponsor and USACE Business Line –

- Port Miami
- Navigation (NAV) Business line

Key Features

- Widening: Footprint (shown in green)
- Deepening: Inner Channel deepening from 51 ft up to 55 ft (shown in green)
- Outer Entrance Channel: Improvements from 56 ft up to 60 ft
- Fisher Island Turning Basin (FITB): Expansion (shown in gray)
- Dodge Island Cut: Widening (shown in blue)



Miami Harbor, Florida.

Current Status -



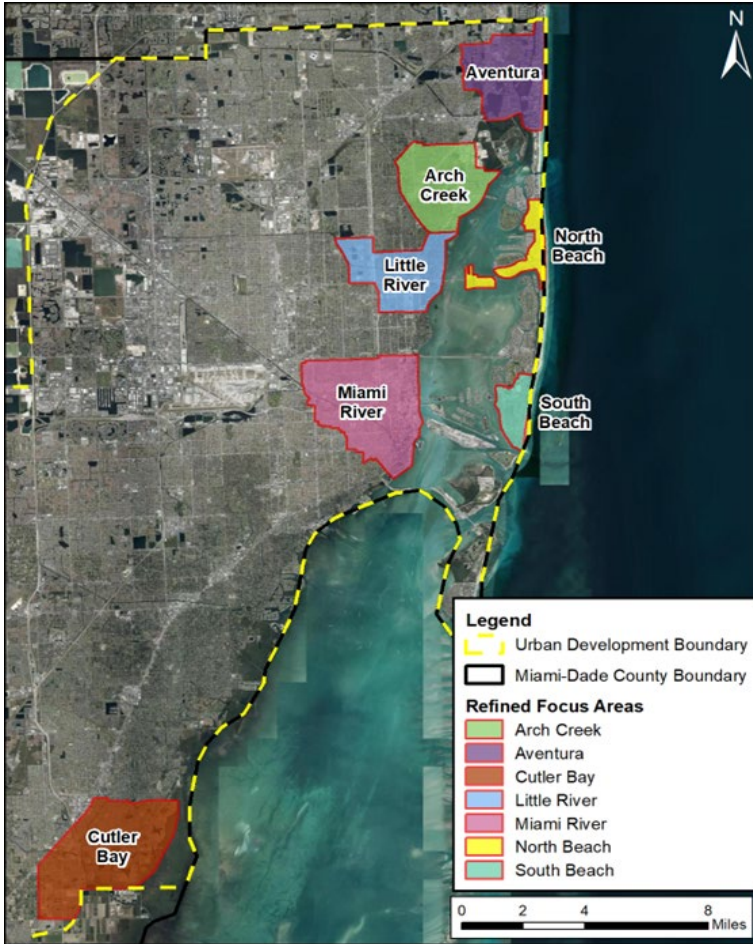
Working Today to Build a Better Tomorrow



MIAMI-DADE BACK BAY CSRM STUDY



Overview



Sponsor and USACE Business Line –

- Miami-Dade County
- Coastal Storm Risk Management (CSRM) business line

Scope –

- Miami-Dade County has high levels of risk and vulnerability to coastal storms which will be exacerbated by sea level rise over the study period
- Due to the large geographic scale of the study and the inability to provide a comprehensive recommendation under this study effort, the team determined a process to refine the study area by identifying the most vulnerable areas based on flooding potential and social vulnerability resulting in the seven refined focus areas shown on the right
- Residential and non-residential structures as well as critical infrastructure is at risk to damage from coastal storm events
- There is a life safety risk caused by coastal storm events
- Plans were formulated and evaluated to determine which measures can be implemented to address coastal storm surge and flood risk to vulnerable populations, property, and infrastructure



Hurricane Irma Striking Miami, Florida.

Schedule/Upcoming Efforts –

- Exemption approved August 2022 - Total study time increased by sixty months; first 12-month effort for alternative development, resource agency and community collaboration
- Planning charrette completed 14 – 18 November 2022; Public meeting 14 November 2022
- Planning charrette 1-3 March 2023
- Go/No-Go milestone on 03AUG23 which will trigger the start of Part Two: Feasibility phase pending OASA's approval

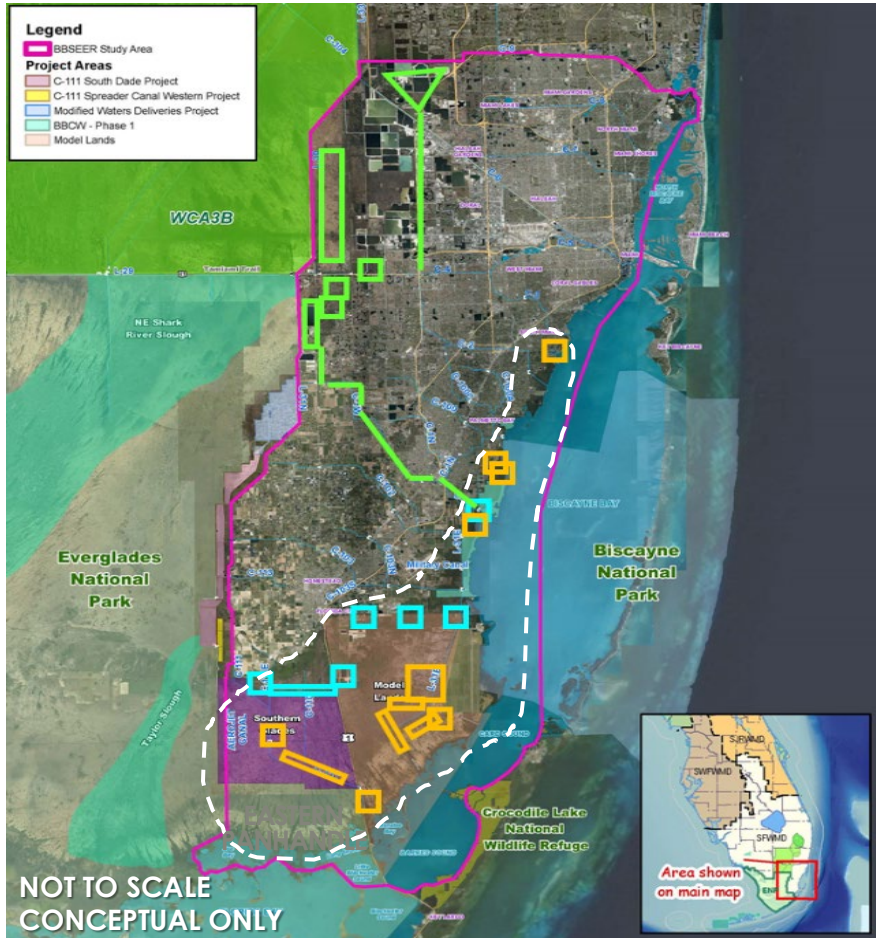
Working Today to Build a Better Tomorrow



BISCAYNE BAY AND SOUTHEASTERN EVERGLADES ECOSYSTEM RESTORATION PROJECT (BBSEER)



Overview



- Sponsor and USACE Business Line –**
- South Florida Water Management District
 - Aquatic Ecosystem Restoration (AER) business line

Scope –



1) RESTORE SALINITY REGIMES, MINIMIZE UNNATURAL CANAL RELEASES

Improve quantity, timing, and distribution of freshwater to estuarine and nearshore subtidal areas, including mangrove and seagrass areas.

5-18 practical salinity units (psu) gradient in 500-meter zone throughout year w/ natural variations

- Biscayne Bay
- Biscayne National Park
- Manatee Bay
- Barnes Sound
- Card Sound

2) FRESHWATER WETLAND WATER DEPTH, PONDING DURATION AND FLOW TIMING

Restore freshwater depths, hydroperiods, & flows, for dry and wet seasons in terrestrial wetlands

- Eastern Panhandle of Everglades National Park
- Model Lands & potentially areas further north
- Southern Glades

3) RESTORE ECOLOGICAL AND HYDROLOGICAL CONNECTIVITY

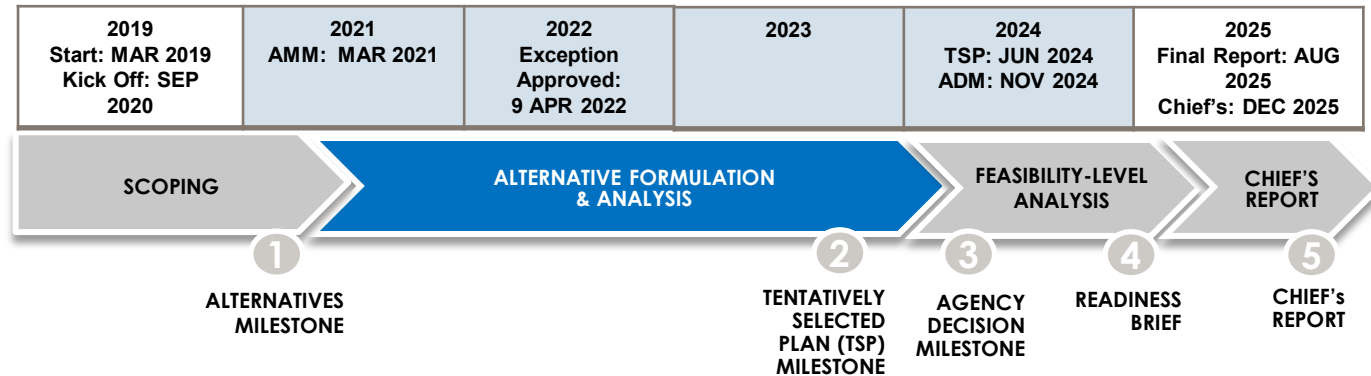
Restore connectivity and habitat gradients in areas compartmentalized by federal and state canal system (C&S System) in Southern Everglades, Model Lands, Biscayne Bay Coastal Wetlands: Connected flow from sawgrass marsh, through saltwater wetlands, seagrass, to open water (0-35 psu gradient) to restore life cycle functions of these ecosystems.



4) SEA LEVEL CHANGE RESILIENCY

Increase and restore ecological resilience in coastal habitats in southeastern Miami-Dade County

Current Status -



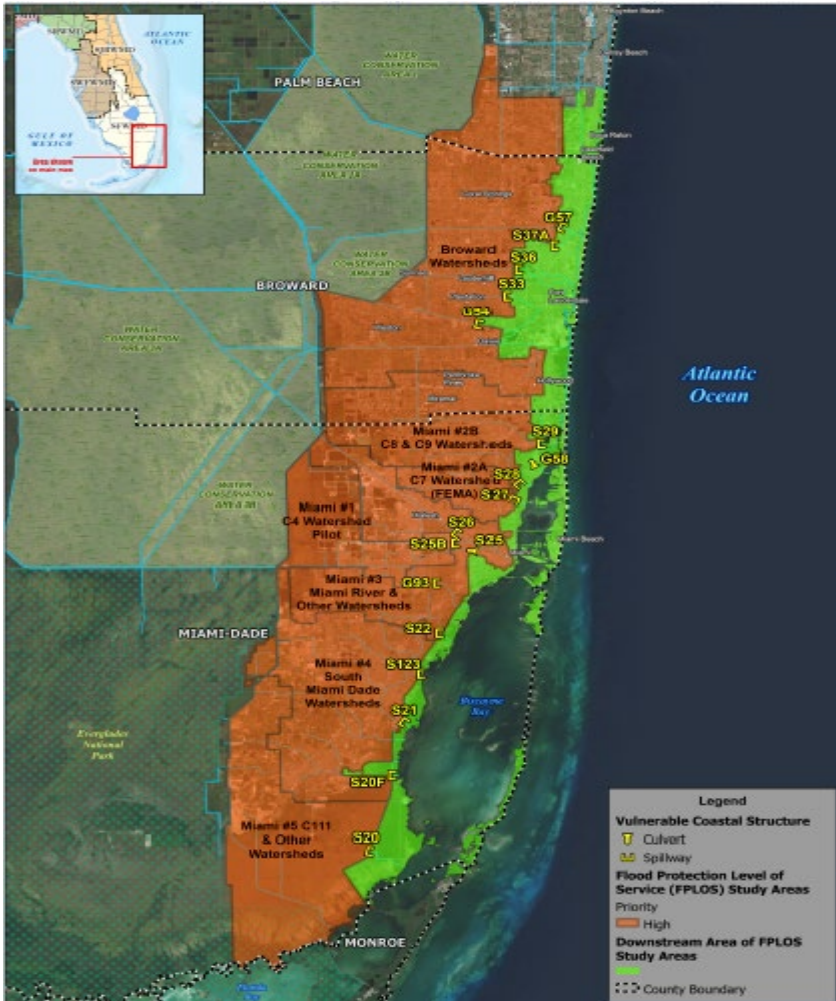
Working Today to Build a Better Tomorrow



C&SF FLOOD RESILIENCY (SECTION 216) STUDY



Overview



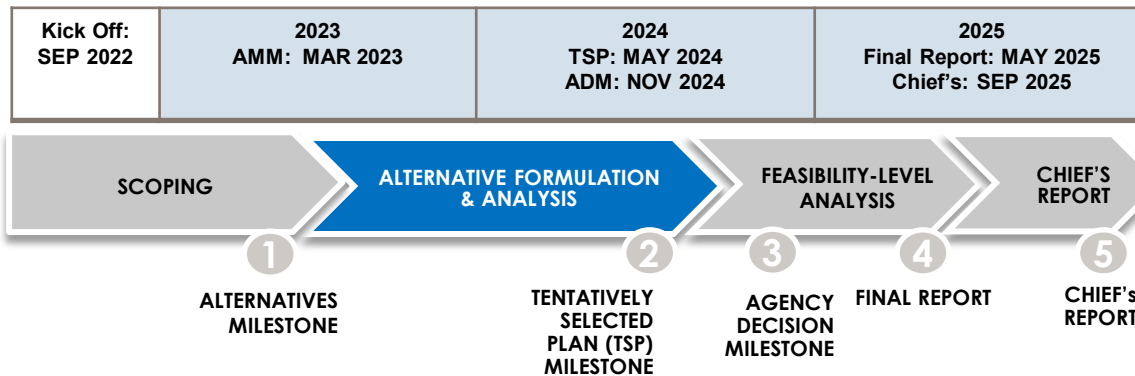
Scope –

- Address C&SF system resiliency in the highest risk areas in Lower East Coast – Palm Beach, Broward and Miami-Dade counties.
- Focus on most immediate needs due to effects from climate change, sea level rise, land development, and population growth
- Primary focus is Flood Risk Management (FRM) benefits; will evaluate benefits to the other C&SF project purposes (Comprehensive Benefits)
- Utilize grey and green (NNBF) solutions as available



G-54 Structure (Sewell Lock) and flooding in Ft Lauderdale 2020.

Current Status -



Sponsor and USACE Business Line –

- South Florida Water Management District
- Flood Risk Management (FRM) business line

Website:

www.saj.usace.army.mil/CSFFRS

Working Today to Build a Better Tomorrow



COMPREHENSIVE CENTRAL AND SOUTHERN FLORIDA STUDY



Overview

Authority –

- Division H Section 8214 of the National Defense Authorization Act for Fiscal Year 2023.

Scope –

- Feasibility study for **resiliency** and **comprehensive improvements** or modifications to existing water resources development projects in the central and southern Florida area
- Purposes of flood risk management, water supply, ecosystem restoration (including preventing saltwater intrusion), recreation, and related purposes.



INLAND FLOOD RISK



COASTAL FLOOD RISK



WATER SUPPLY



RESTORATION



RECREATION

- Recommend cost-effective structural and nonstructural projects for implementation that provide a **systemwide approach** to solutions

Key themes –

- Increase system-wide community resiliency
- Strategic long-term planning through collaboration with Federal, state, and local entities
- Focus on comprehensive benefits
- Address effects from compound flooding, climate variability, and land use changes
- Incorporate natural and nature-based features to enhance benefits



QUESTIONS?

Working Today to Build a Better Tomorrow