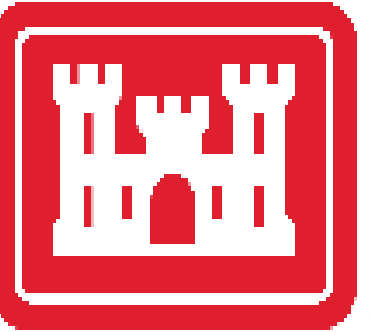




# RE-INITIATION OF THE MIAMI-DADE BACK BAY COASTAL STORM RISK MANAGEMENT (CSRM) FEASIBILITY STUDY: PARTS 1 AND 2



**Part 1 Goals:** Coordinate with stakeholders, agencies, and the public to **adapt/refine** the Recommended Plan (2021) from the original feasibility study into a **new alternative** that is determined by abbreviated analyses to be economically justified, engineeringly feasible, and **environmentally/socially acceptable**. Part 1 culminates with a Decision Point, the **Go/No Go Meeting**, where **USACE** and **Miami-Dade** will present the new alternative to the **Office of the Assistant Secretary of the Army for Civil Works**.

**Part 2 (Extended Feasibility Study) Goals:** Perform **full feasibility-level analysis and evaluation** of the **array of alternatives including the new alternative** formulated in Part 1. Part 2 culminates with a **Signed Chief's Report** that will move forward for congressional authorization.



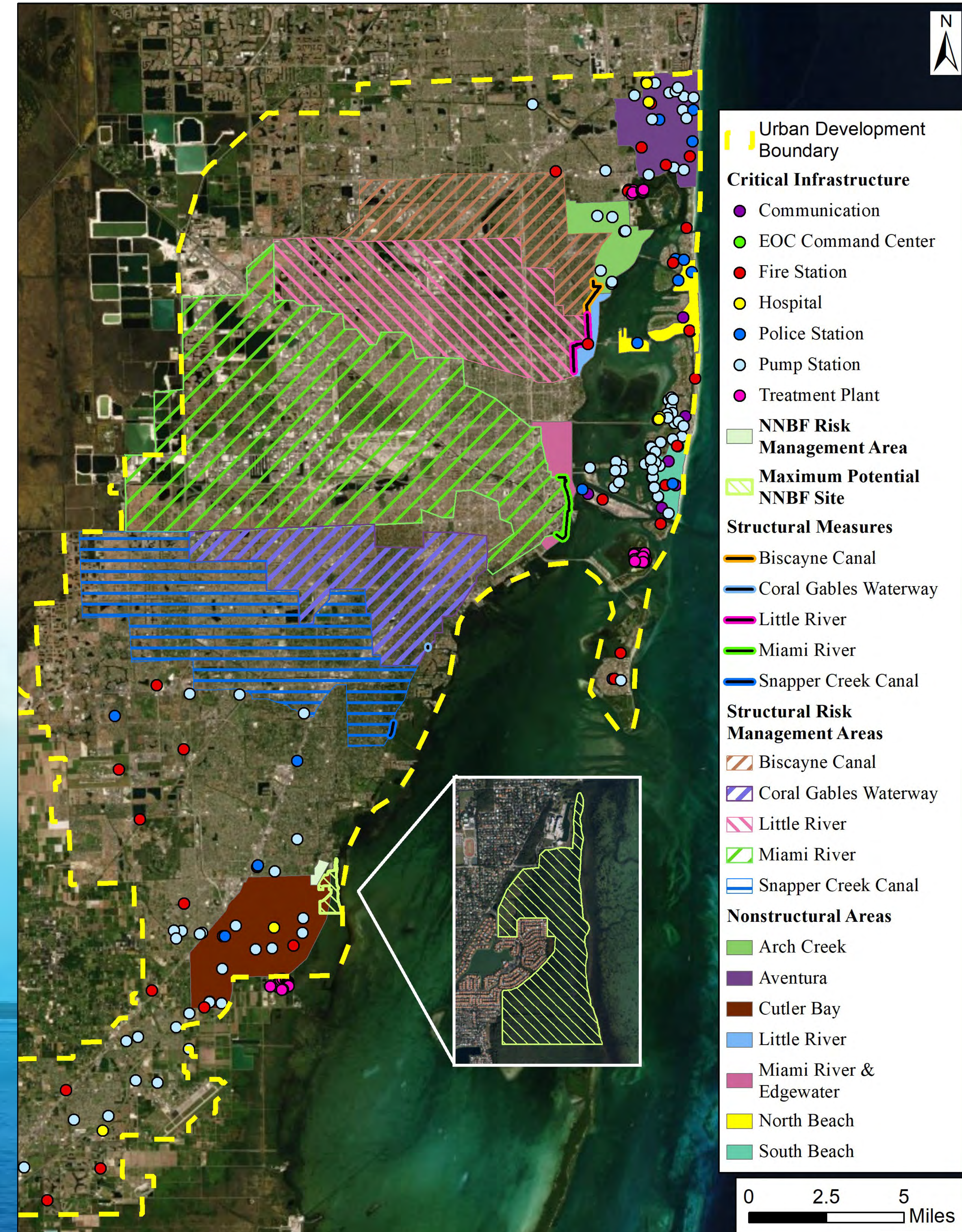


# RECOMMENDED PLAN (2021)



- **Structural Measures:** Storm surge barriers with associated floodwalls, pump stations, and tide gates at Biscayne Canal, Little River, Miami River, Coral Gables Waterway and Snapper Creek Canal.
- **Nonstructural Measures:** Elevating approximately 5,400 residential homes and floodproofing approximately 4,700 non-residential buildings
- **Dry floodproofing critical infrastructure** such as fire and police stations, medical facilities, evacuation centers, potable water facilities, and pump stations (approximately 250 locations)
- **Natural and Nature-Based Features (NNBF):** Mangrove and coastal wetland restoration at Cutler Bay

The Recommended Plan (2021) will be used as the **starting point** for new alternative formulation in Part 1 of the study. While some features of the plan are anticipated to be modified or refined, such as structural measures and increased use of NNBF, others such as the seven focus areas will remain the same.







# REFINED FOCUS AREAS

The new alternative to be determined in Part 1 will adapt/refine the 2021 Recommended Plan components using the **seven refined focus areas** which were developed using FEMA's Hazus analysis and the Centers for Disease Control and Prevention (CDC) Social Vulnerability Index.

Based on public and stakeholder feedback received to date, a new alternative **may**:

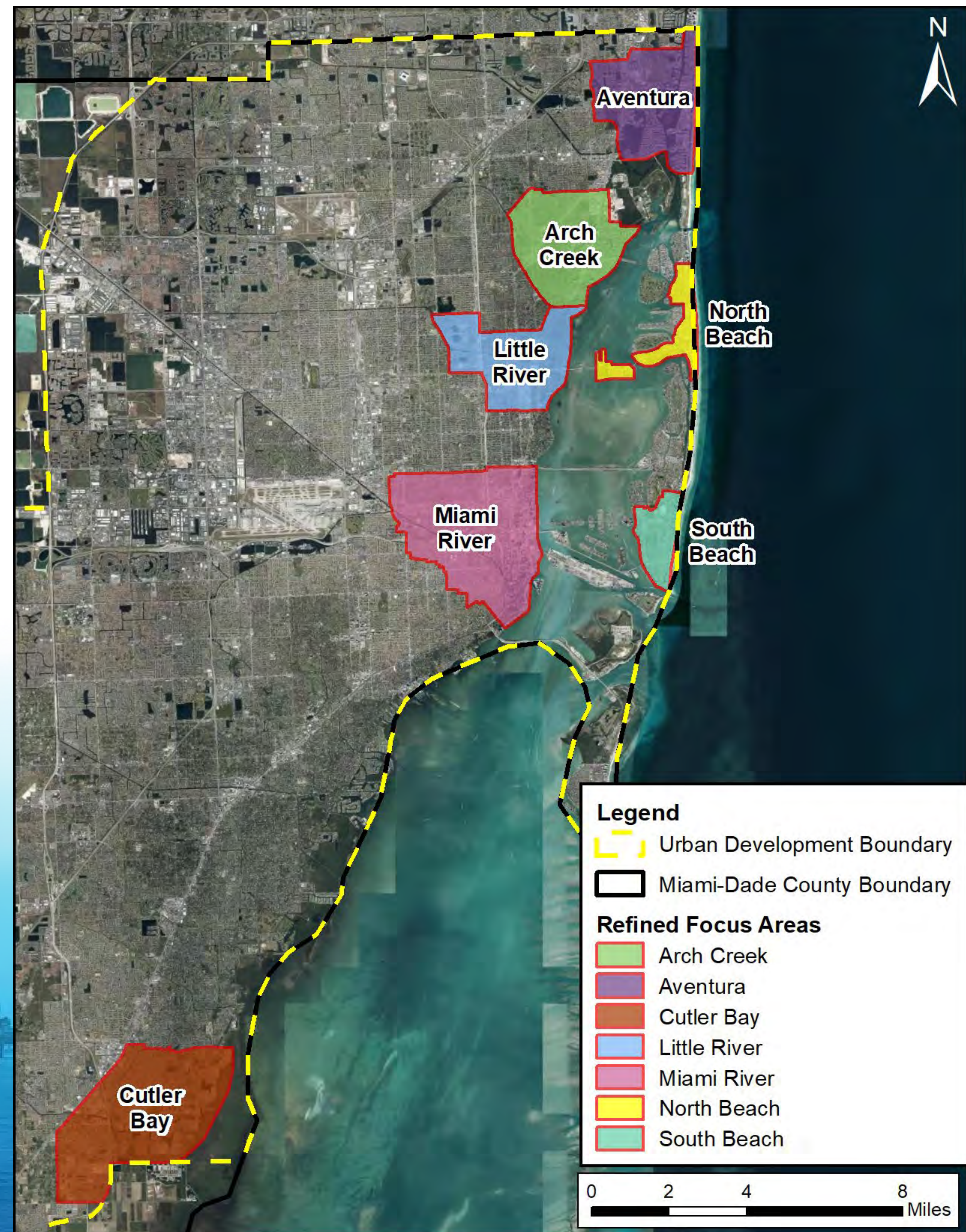
Replace structural measures with nonstructural measures

Modify structural measures design including incorporating NNBFs and/or recreation areas

Add new NNBF areas or measures

Modify nonstructural recommendation to include more buildings

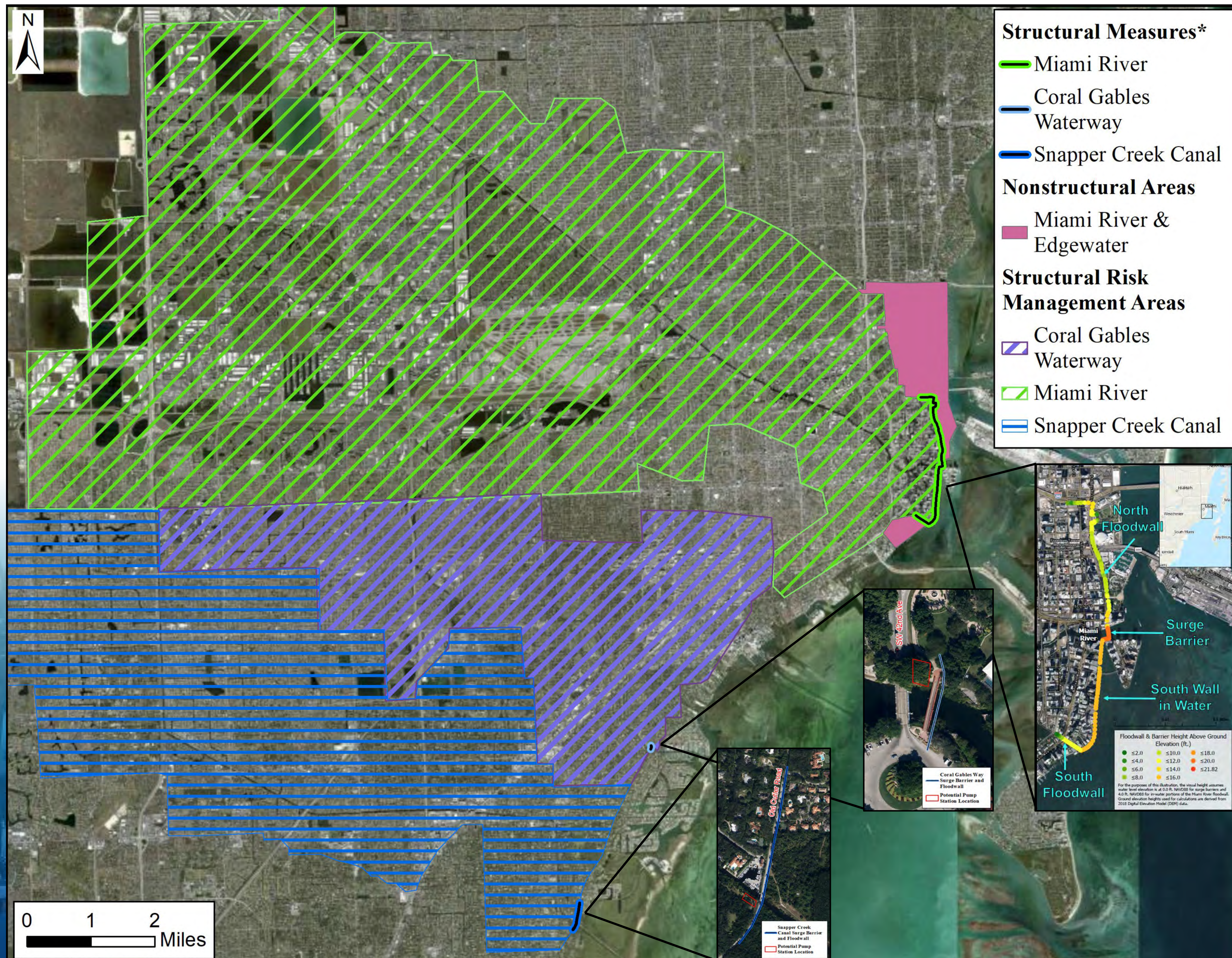
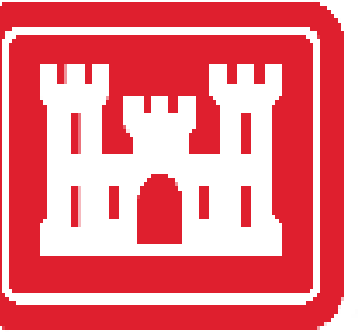
Increase critical infrastructure measures across Miami-Dade County







# RECOMMENDED PLAN (2021) – MIAMI RIVER



***Structural coastal storm risk management measures** are engineering solutions to manage flood risk and reduce damage from coastal storms by physically limiting flood water inundation.*

- **Considerations for Alternative Development:**
  - Hybrid solution
  - Multiple Lines of Defense
  - Lower design levels
  - Move structural alignment inland
- **Recommended Plan (2021)**
  - Storm surge barriers, floodwalls and pump station
  - Nonstructural measures for this area include **floodproofing** approximately **100 commercial buildings** in Miami River & Edgewater area (pink shaded) outside of structural management area
  - Approximately **400 critical infrastructure components** would be protected by structural measures

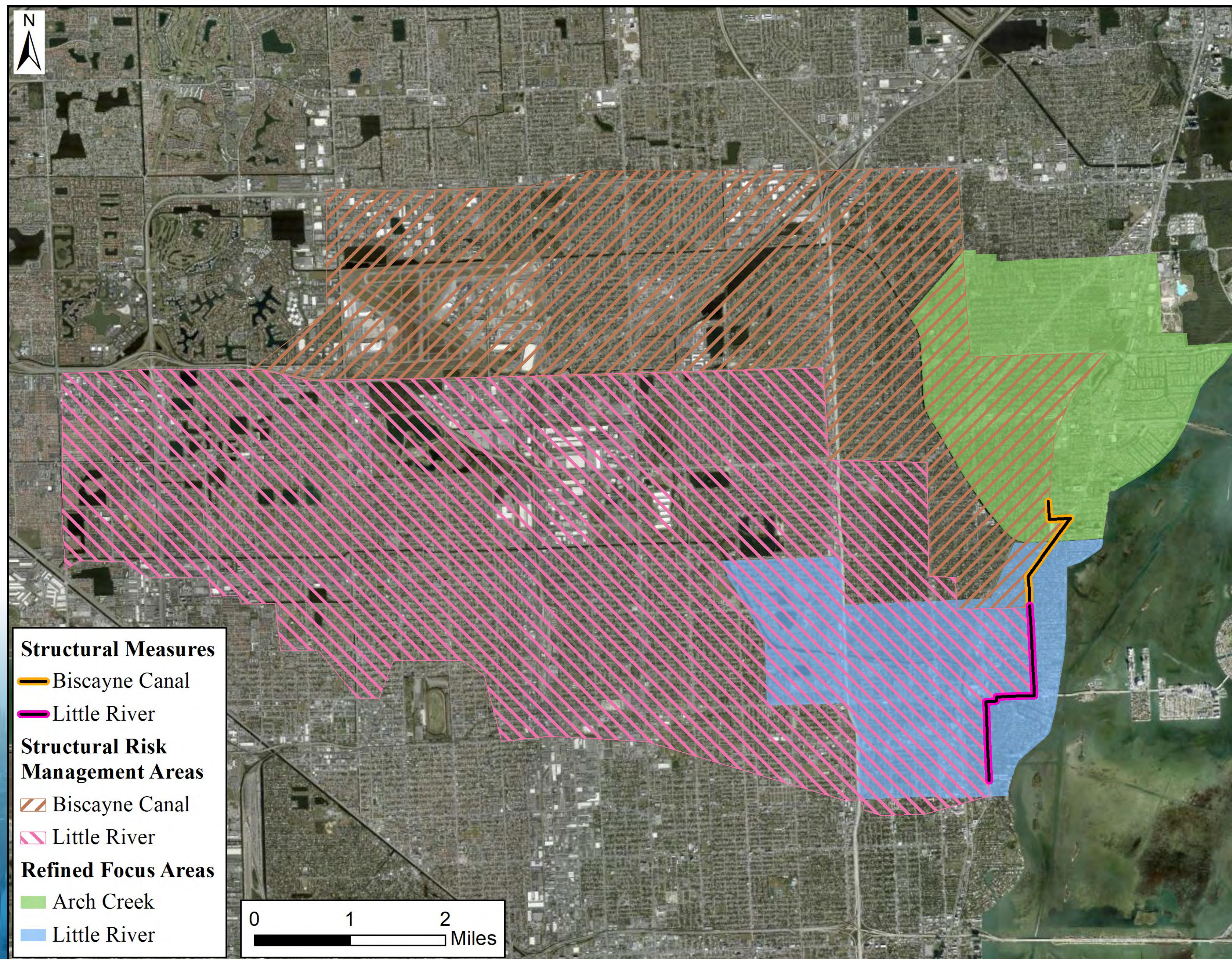
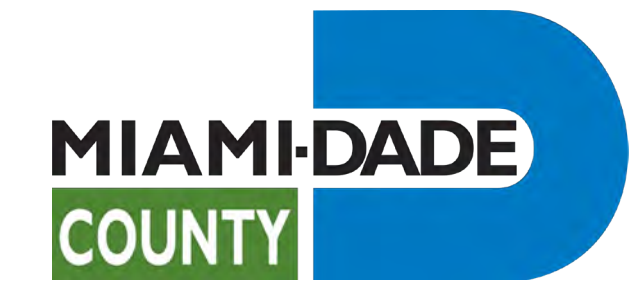
\*Estimates of locations and footprints of the structural measures (floodwalls, surge barriers/tide gates, and pump stations) have been initially determined at a mean confidence level based on the USACE derived 2084 0.5% annual exceedance probability stillwater elevation level from the FEMA South Florida Storm Surge Study (includes astronomical tide, storm surge, wave overtopping, and USACE high curve sea level rise).





# RECOMMENDED PLAN (2021) – MIAMI SHORES

## ARCH CREEK AND LITTLE RIVER REFINED FOCUS AREAS



- **Considerations for Alternative Development:**
  - Determine alternate solutions to the recommended structural features in Biscayne Canal and Little River
  - Fully nonstructural only
  - NNBF or hybrid solutions
  - Lower design levels
  - Other locations for structural measures
- **Structural Risk Management Areas** are areas of potential coastal storm risk reduction due to its associated proposed structural measure
- **Recommended Plan (2021)**
  - Approximately **80 critical infrastructure** components fall within the structural risk management areas of Biscayne Canal and Little River.
  - Tainter/slucice gates at Biscayne Canal (C-8) and Little River (C-7), floodwalls, and pump station

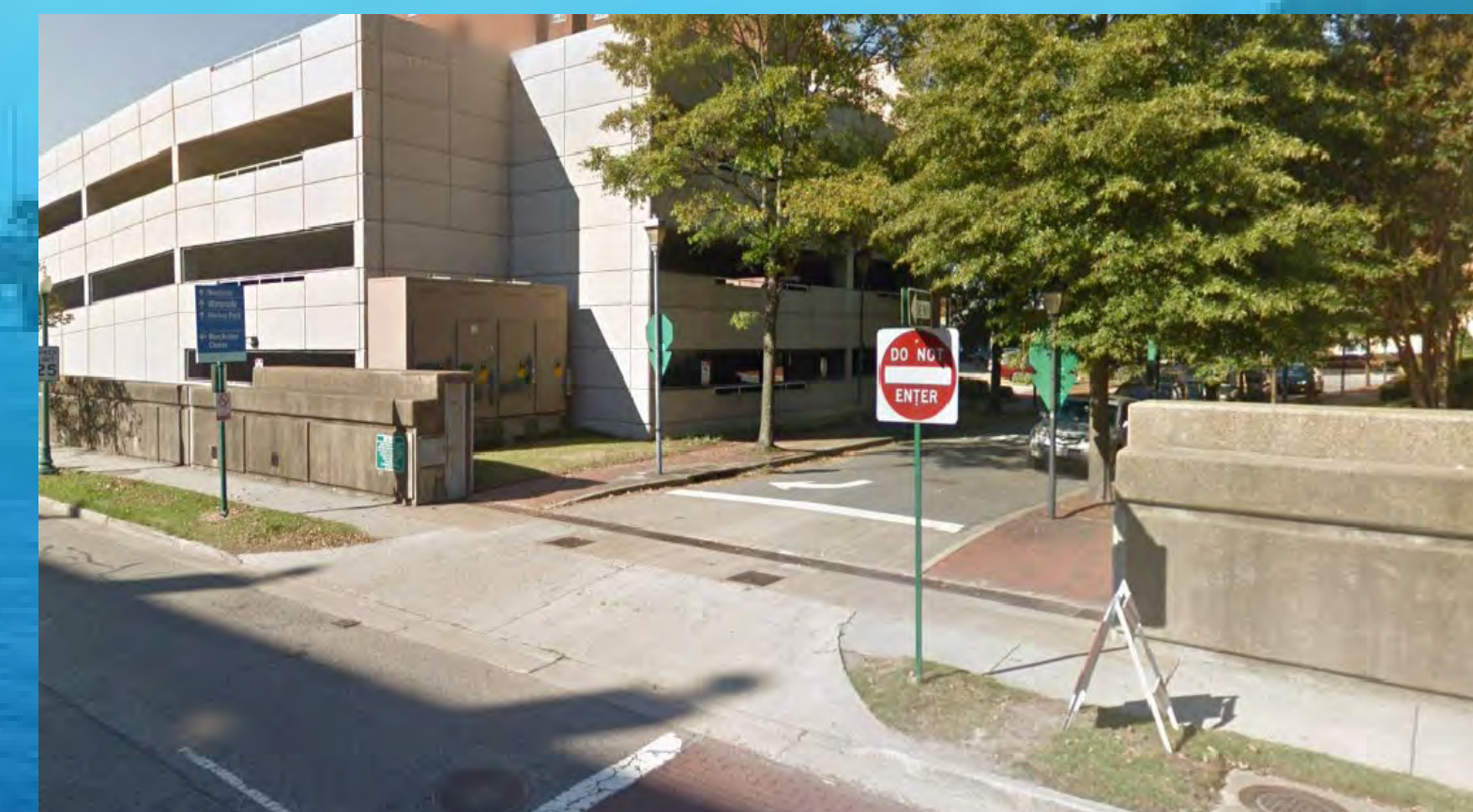
The Recommended Plan (2021) for the Arch Creek and Little River refined focus areas included:

**840**

Approximate number of  
**commercial  
floodproofings**

**2,200**

Approximate number of  
**residential elevations**



Floodwall with road closure, Norfolk, Virginia

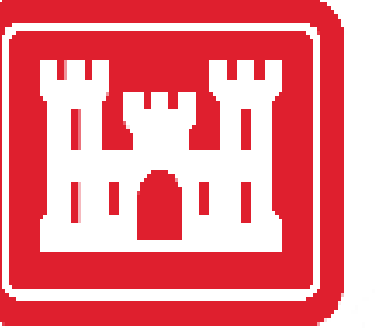
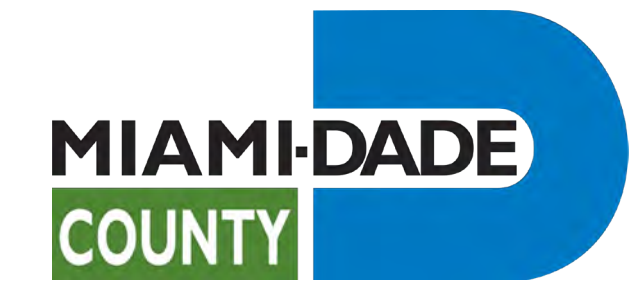


Tainter Gate, Fox Point Hurricane  
Barrier in Providence, RI





# RECOMMENDED PLAN (2021) – NONSTRUCTURAL AVENTURA, NORTH BEACH, AND SOUTH BEACH REFINED FOCUS AREAS



**Nonstructural measures** are permanent or contingent measures applied to a structure and/or its contents that prevent or provide resistance to damage from flooding. They differ from structural measures in that they focus on reducing the consequences of flooding instead of focusing on reducing the probability of flooding.

The Recommended Plan (2021) for Aventura, North Beach, and South Beach refined focus areas Included:

**2,300**

Approximate number of  
**commercial floodproofings**

**1,200**

Approximate number of  
**residential elevations**

## Examples



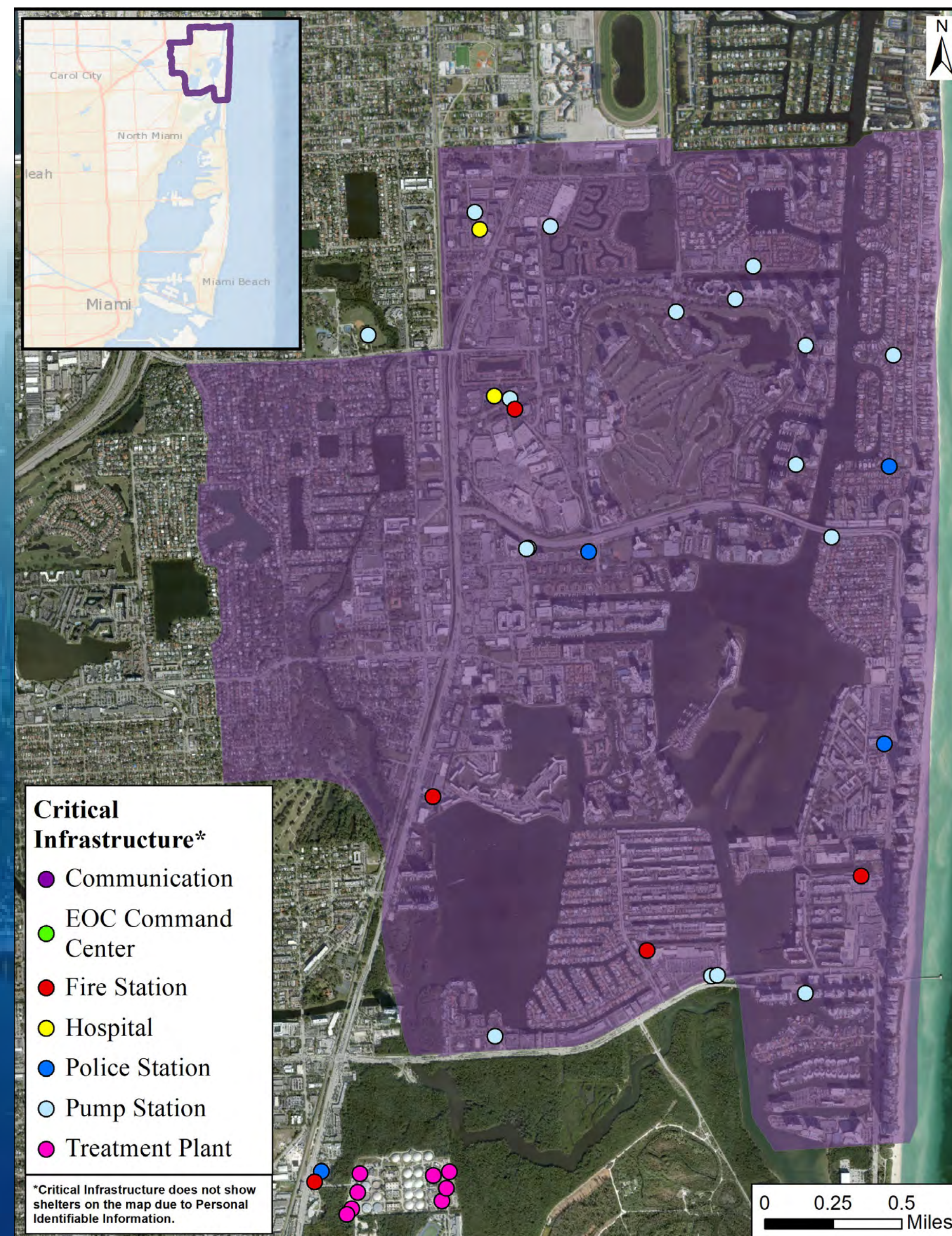
Removable flood barriers of an office,  
Bothell, Washington



Elevated home with drive under garage,  
New Orleans, Louisiana

Nonstructural measures such as floodproofing and elevations will be carried forward in the new alternative, but the total number of buildings will depend on updated analyses to be performed in Part 2 of the study.

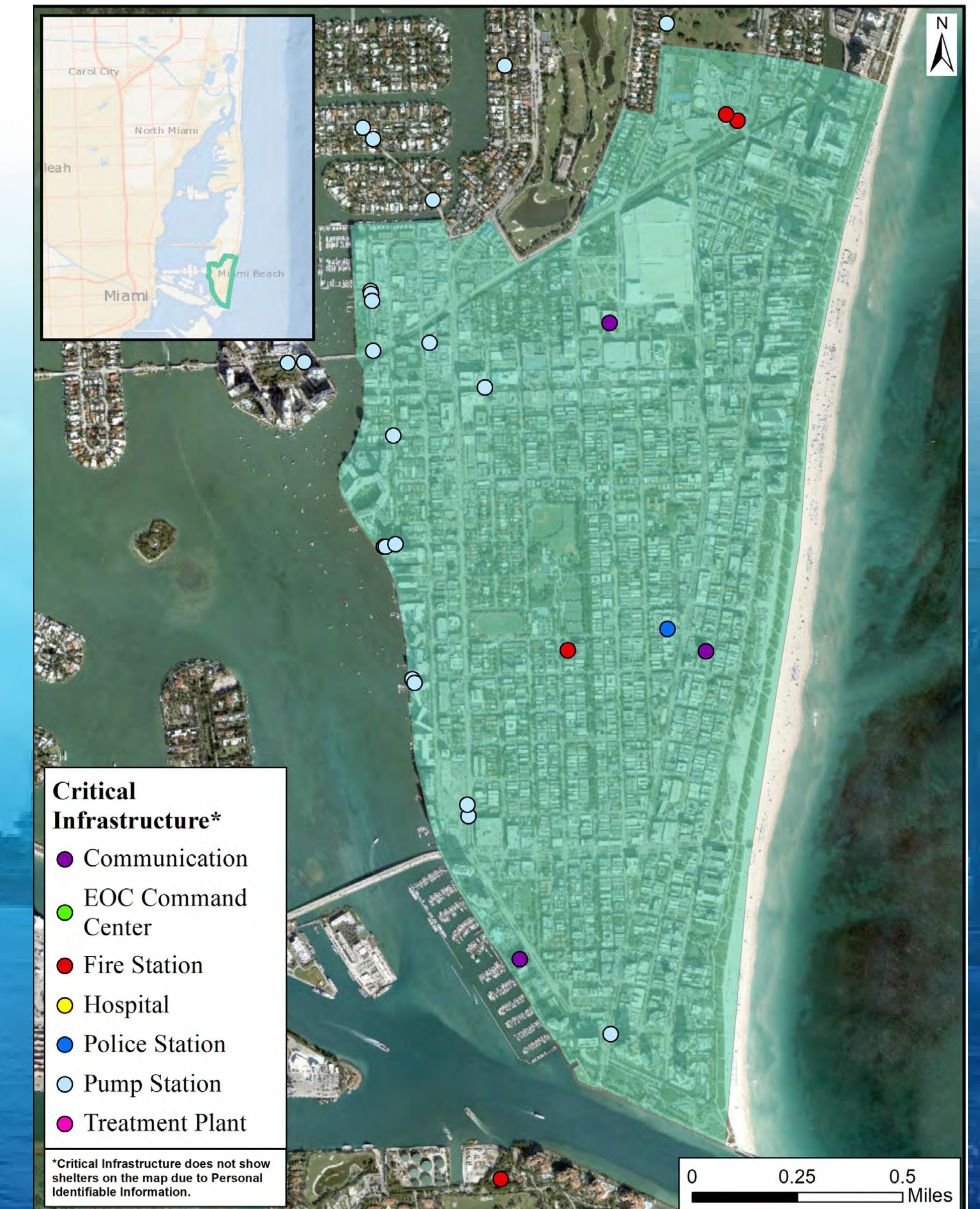
## AVENTURA



## NORTH BEACH



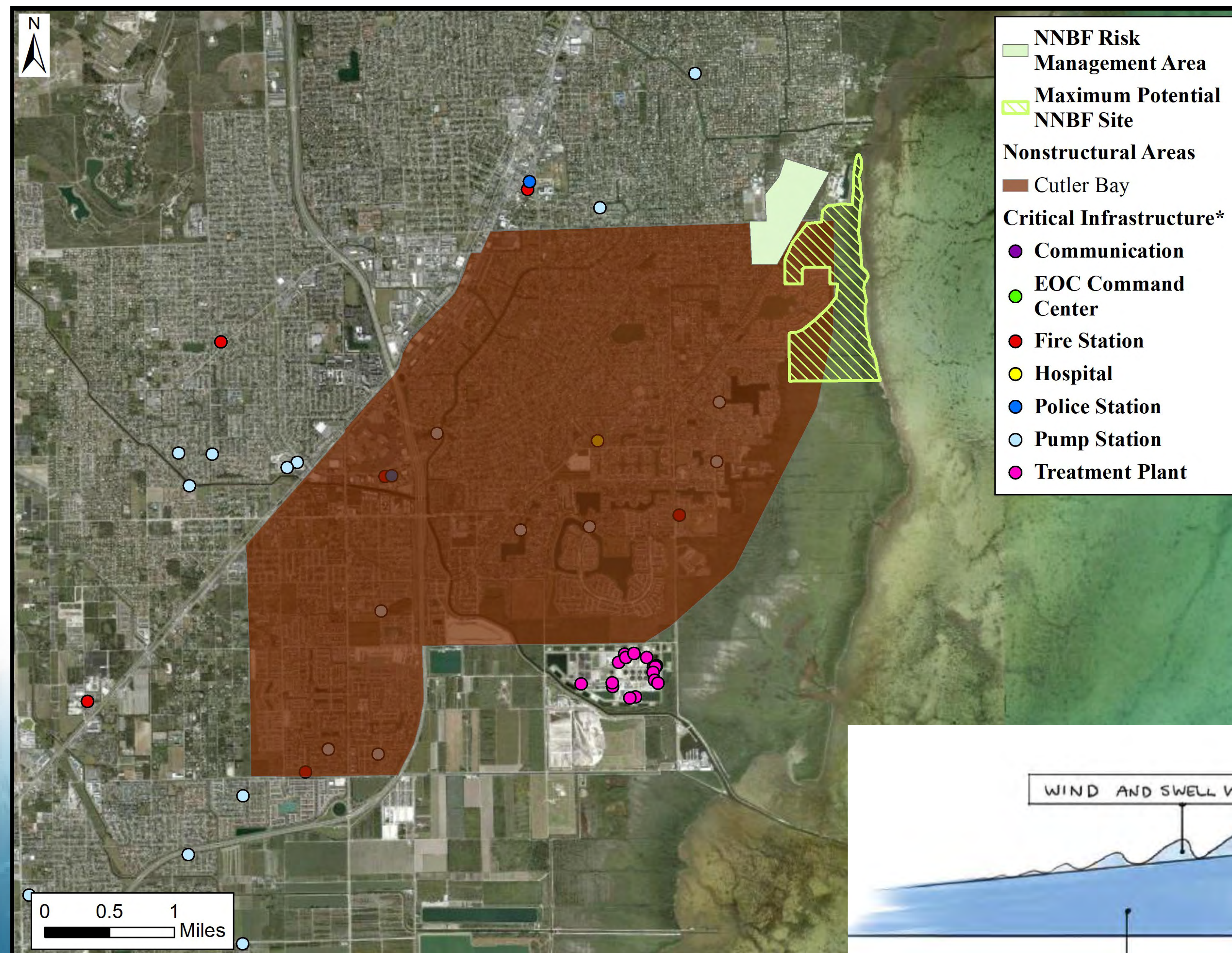
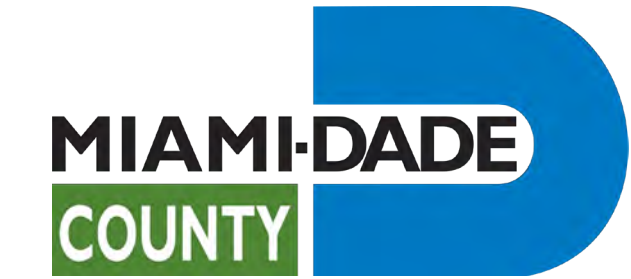
## SOUTH BEACH







# RECOMMENDED PLAN (2021) – NATURAL AND NATURE BASED FEATURES (NNBF) CUTLER BAY REFINED FOCUS AREA



## • Considerations for Alternative Development:

- Determine additional areas for NNBF not limited to Cutler Bay
- Determine if current mangrove and coastal wetland restoration at Cutler Bay can be expanded
- Determine opportunities for structural measures in Cutler Bay area

## • Recommended Plan (2021)

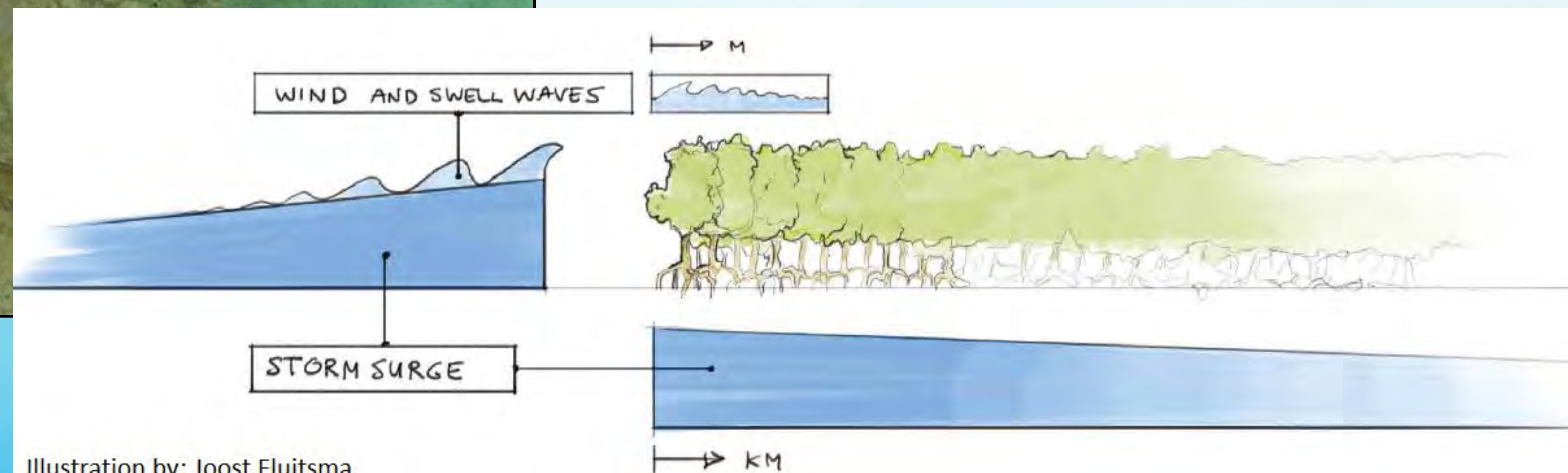
- Approximately **50 of the 250 critical infrastructure** are shown on the map to the left.
- Approximately **2,800 buildings in Cutler Bay** are included for nonstructural measures
  - **2,000 residential elevations**
  - **800 commercial floodproofings**

## Native Coastal Wetland Vegetation



The Cutler Bay NNBF would enhance the existing natural habitat and may include, but is not limited to, planting of the following at appropriate elevations to support establishment:

- Red mangroves (*Rhizophora mangle*)
- Salt marsh cordgrass (*Spartina* species)
- Sawgrass (*Cladium jamaicense*)
- Buttonwood (*Conocarpus erectus*)

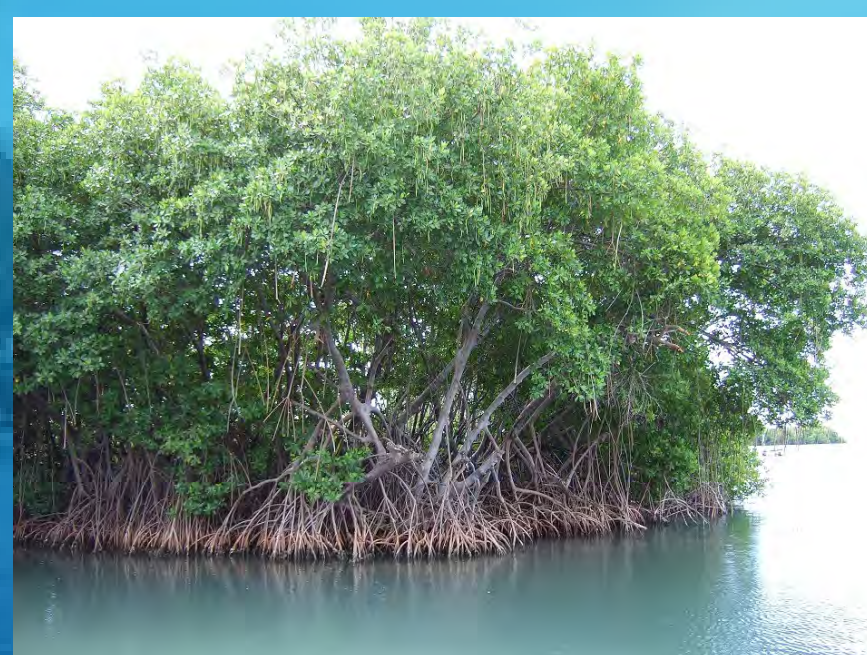


**Mangroves may contribute to reducing damage to property from storms and cyclones as they reduce the impacts of waves, storm surges and high winds.**  
**Illustration showing storm surge reduction due to mangroves.**

The Cutler Bay NNBF would expand the existing, natural coastal habitats in an area up to approximately 82 acres using native coastal vegetation plantings.



Mangroves provide important ecosystem services.

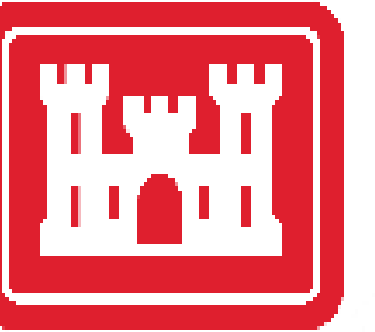


Mangroves in Salinas, Puerto Rico.





# RE-INITIATION OF THE MIAMI-DADE BACK BAY FEASIBILITY STUDY



## *What is different this time around?*

### Enhanced Coordination and Stakeholder Involvement

#### USACE Expert Involvement

Our team has expanded to include USACE leading experts from the Engineer, Research, and Development Center (ERDC) and Landscape Architecture.

#### Continued USACE Collaboration:

- Miami-Dade CSRM Study (Beach)
- Biscayne Bay and Southeastern Everglades Ecosystem Restoration Project
- Biscayne Bay Coastal Wetlands
- Miami Harbor Navigation Improvement Study
- Central and Southern Florida Flood Resiliency Study (Section 216)

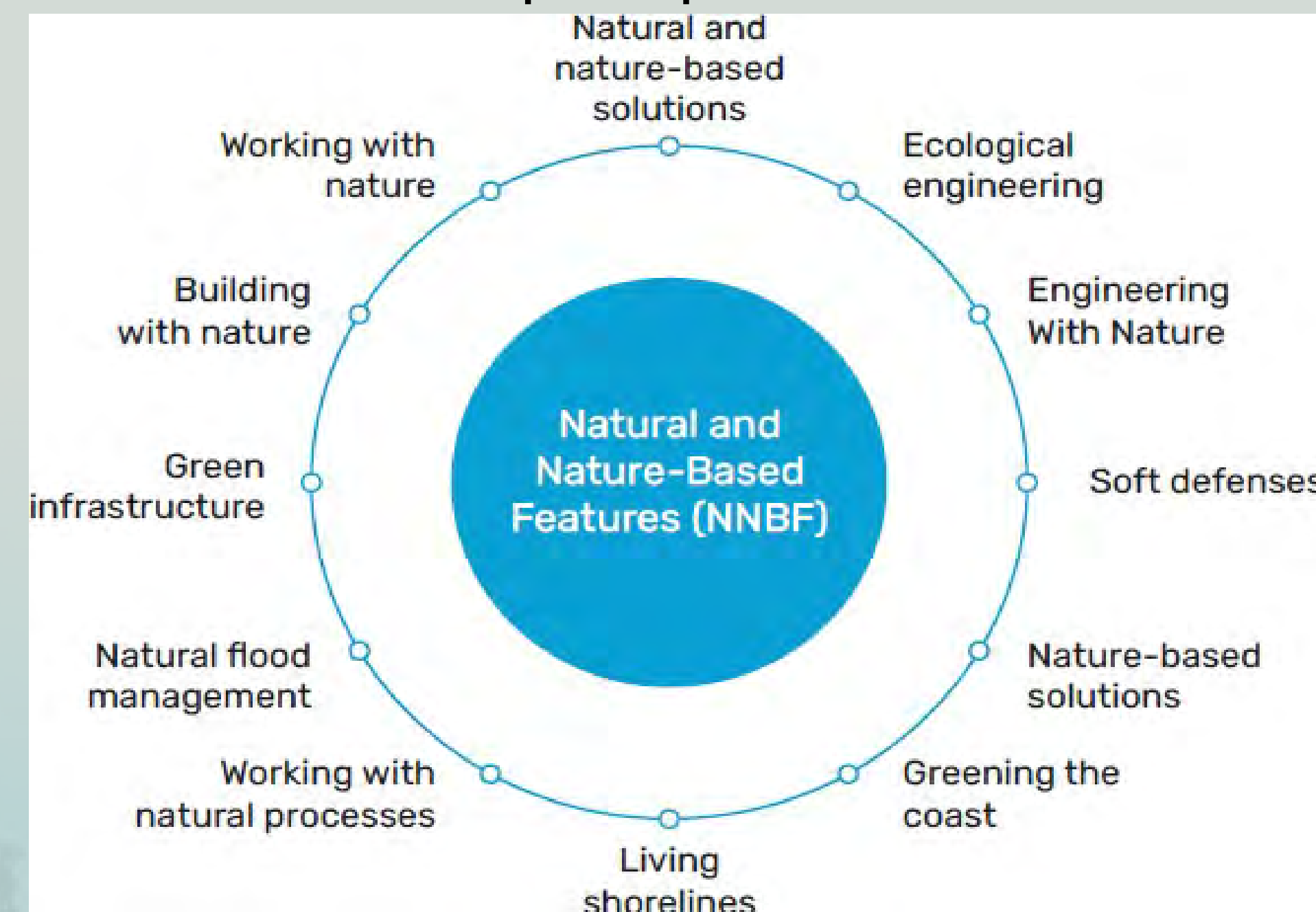
#### Extensive Public Engagement

Multiple opportunities are available for the public to provide input and stay Informed during the Process.



### Further Evaluation of Natural and Nature-Based Features

Identify, develop, and evaluate more **Natural and Nature-Based Features** that provide coastal storm surge risk benefits and incorporate Engineering With Nature principles.



**Engineering With Nature®**  
the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental, and social benefits through collaboration.

### Inclusion of Comprehensive Benefits

The team will further evaluate comprehensive benefits that considers the following:

#### Other Social Benefits:

- Social vulnerability and resiliency
- Leisure and recreational benefits
- Social connectedness and community cohesion

#### Environmental quality benefits:

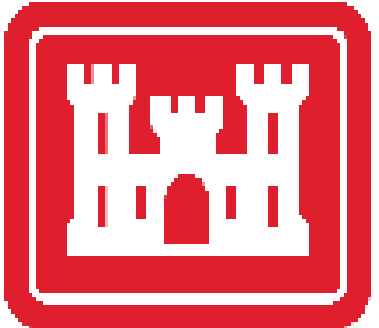
- Water quality and/or habitat enhancements or improvements
- Ecosystem services







# NATURAL AND NATURE-BASED FEATURES



NNBF refers to the use of landscape features to produce flood risk management benefits and other economic, environmental, and social benefits (known as co-benefits). E.g., beaches, dunes, wetlands, reefs, islands, other

## Opportunities to Engineer with Nature

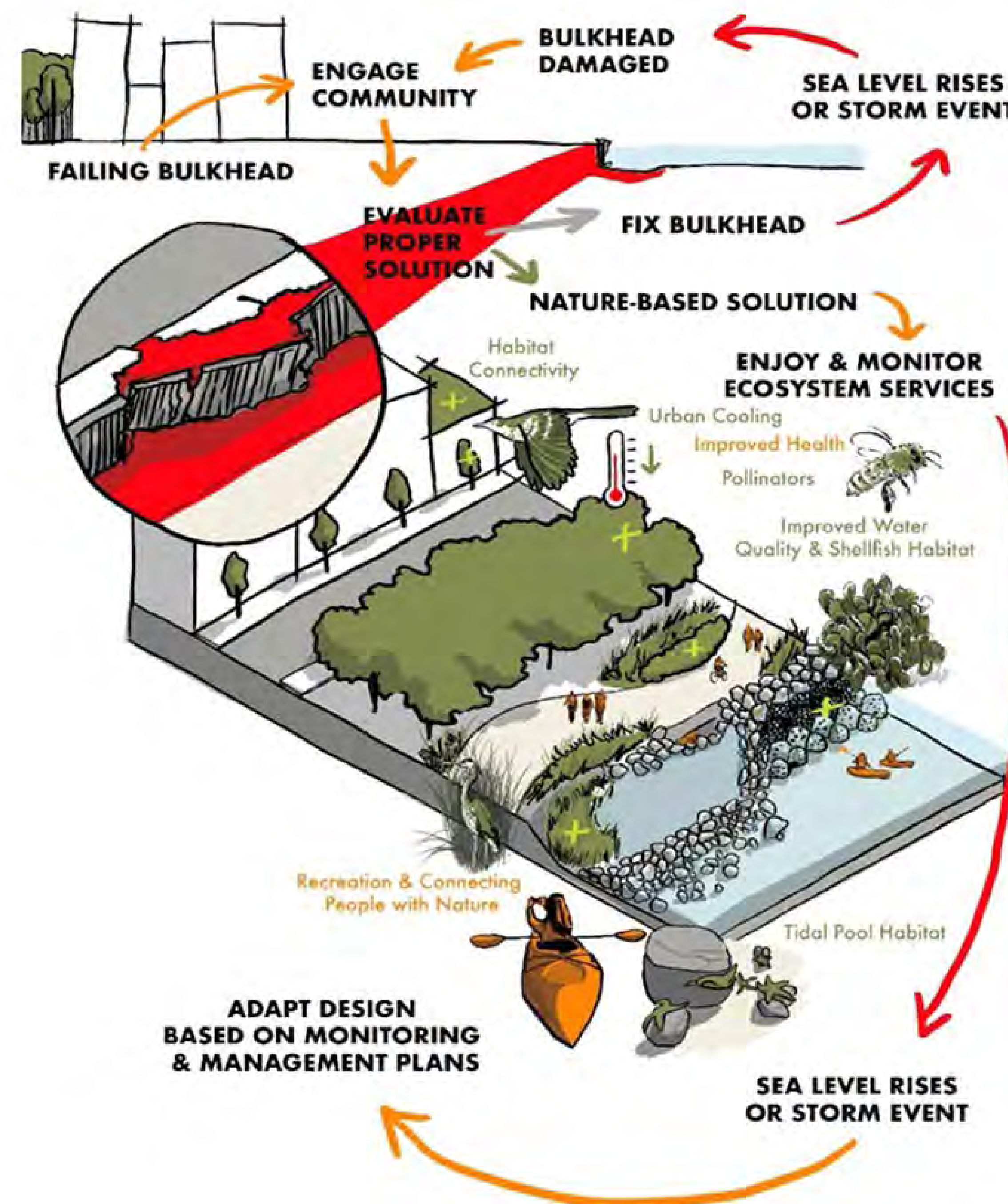
- Integrate NNBFs with structural and nonstructural measures to provide multiple lines of defense against storms and sea level rise
- Generate relevant economic, environmental, and social ecosystem services

Common **coastal infrastructure types** that can be **enhanced** to improve flood risk management (FRM) and co-benefits:

- Living Shoreline
- Seawall
- Revetment
- Bulkhead

- Sill
- Tidal Control Structure
- Detached breakwater and jetty

**“Not either/or, but and”**  
(Structural vs. Natural)



## Overarching Observations

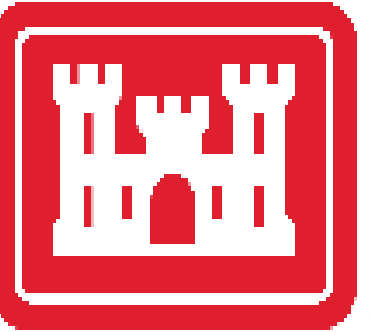
- Natural features and landscapes have always contributed to flood resilience.
- The function and success of FRM measures and systems are related to scale.
- Sustainable FRM systems will include combinations of conventional, natural, and nature-based elements.
- The flexibility and adaptability of NNBF are useful for achieving flood resilience.
- NNBF can increase and diversify the value provided by infrastructure.

Coordination,  
collaboration, and  
partnership will fuel  
successful  
implementation.





# PUBLIC COORDINATION



*The team's goal is to maximize public participation and community engagement in the alternative formulation process.*

Joint USACE/  
Miami-Dade County  
**planned** public  
meetings

Virtual  
Public Meeting  
Oct. 12, 2022

**In-person**  
Public Meeting  
Nov. 14, 2022

Virtual  
Public Meeting  
February 2023

**In-person**  
Public Meeting  
Spring 2023

Virtual  
Public Meeting  
June 2023

Virtual  
Public Meeting  
August 2023

Additional public  
involvement  
opportunities are  
anticipated

We are  
here

## How can I stay informed of important updates?

- Visit the project website
- Attend virtual and in-person public meetings
- Sign-up for the Miami-Dade County Office of Resilience email listserv
- Send an email to the team and request to be added to the project email distribution list: [MDBB-CSRStudy@usace.army.mil](mailto:MDBB-CSRStudy@usace.army.mil)

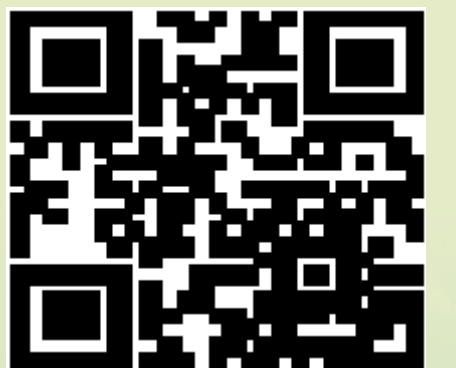
## What type of public input is the team looking for?

- Environmental or socioeconomic concerns or other project-related concerns
- Local knowledge
- Potential site locations in/near the seven focus areas for natural and nature-based features
- Specific, detailed, and focused comments are helpful to the team!



## How can I submit comments?

- Public Crowdsourcing Reporter Tool: <https://arcg.is/0ub0Cf>
- In-person Public Meetings
- Standard Mail:  
Environmental Analysis Section  
USACE Norfolk District  
803 Front Street  
Norfolk, Virginia 23510
- Email: [MDBB-CSRStudy@usace.army.mil](mailto:MDBB-CSRStudy@usace.army.mil)



Project website: <https://www.saj.usace.army.mil/MiamiDadeBackBayCSRStudyFeasibilityStudy/>  
For accessibility concerns and assistance with submitting comments, please call (757) 201-7728.