Role of Sea Level Rise Projections in the Flood Protection Level of Service Program

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Who we are and what we do

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

- Oldest and largest of the state's five regional water management districts
- Protecting water resources in the southern half of the state since 1949
- Our mission: To safeguard and restore South Florida's water resources and ecosystems, protect our communities from **flooding**, and meet the region's water needs while connecting with the public and stakeholders



Water Management System

- 2,060 miles of canals
- 2,028 miles of levees
- 160 major drainage basins
- 1,413 water control structures
- 71 pumping stations
- 60,000 acres of regional wetland Stormwater Treatment Areas
- Lake Okeechobee
 - 450,000 acre water storage area
- Water Conservation Areas
 - 959,000 acre water storage

Coastal Structures and Flood Protection





Potentially impacted gravity coastal structure in Miami-Dade County



Aerial Map of Coastal Miami



- Gravity Coastal structures on primary canals (also known as Salinity Barriers") showing inefficiency during high tide
 - Designed and built in the 1950s
 - Finding from initial screening: Miami-Dade County most potential to be impacted
- Future potential rise in water table due to sea level rise will further impact flood protection
- Future potential increase in extreme rainfall and the projected increase in intensity and frequency of hurricanes will exacerbate sea level rise impacts

Exposure Screening and Vulnerability Assessment

- > Vulnerability to higher tides, storm surge and sea level rise
- Loss in efficiency measured by structure closure resulting from high tailwater
- Screened all district structured based on original designs
- Most vulnerable structures are in Miami-Dade / Broward counties
- > Reassessing in vulnerability using current data and operations



Flood Protection Level of Service Program

- Identify and prioritize long-term District infrastructure needs.
- Assess level flood protection throughout the 16counties of the SFWMD – relative to design
- Identify at-risk structures and needed improvements to operations, canal conveyance or structures
- Provide a formal process to initiate retrofit and adaptation efforts for future infrastructure improvements and/or modification of regulatory criteria
- Incorporate resilient design standards and construction
- Coordinated with SFWMD Operations, local government entities, drainage districts and other agencies with flood control or related responsibility



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Three Roles

FPLOS Assessment:

- Lends itself to nontraditional approach
- Framing the problem
- Assessment of the problem, and
- Defining timeframe for action
- FPLOS Resilience Study and Adaptation Design
 - More traditional approach
- Resilient Infrastructure Implementation
 - More traditional approach



Application of Unified Sea Level Rise Projection in FPLOS Program



Traditional Approach

- Pick a planning horizon
- Establish a sea level to plan and design for
- Plan, design, implement projects
- Subject to uncertainties in projections

FPLOS Approach

- Find the limiting or threshold conditions for the flood controls assets
- Use the curve to establish timeframes for action
- Helps overcome analysis paralyses and inertia that often accompanies high cost projects with uncertainty in input

Conceptual Adaptive Resilience Model

- Establish sea level at which existing infrastructure can no longer provide flood protection
- Based on the time to build replacement, establish the conditions that trigger initiation of replacement infrastructure

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- Monitor conditions and initiate adaptation strategy once conditions are realized
- Flood Protection Level of Service program provides the framework to realize this concept for SFWMD assets.



Adaptive Resilience Planning





