



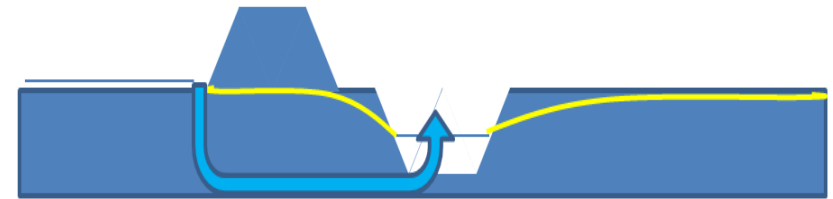
South Dade Seepage Update Water Resources Advisory Commission

May 4, 2017

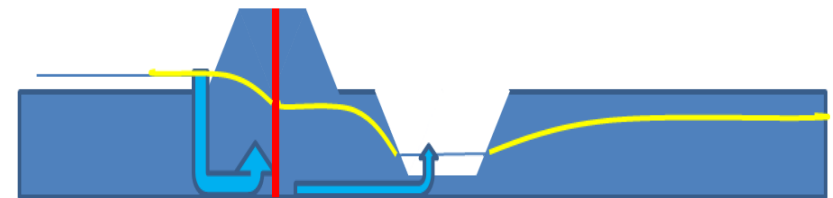
Akintunde Owosina P.E.
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Operations, Engineering & Construction Division

Seepage Barriers or Curtain Walls

- The use of a less permeable material, placed in the flow path to stop or reduce seepage.
- In South Dade the goal is reducing seepage loss from natural areas promoting flows to Florida Bay.



Typical section through a levee showing impact of seepage wall on water levels

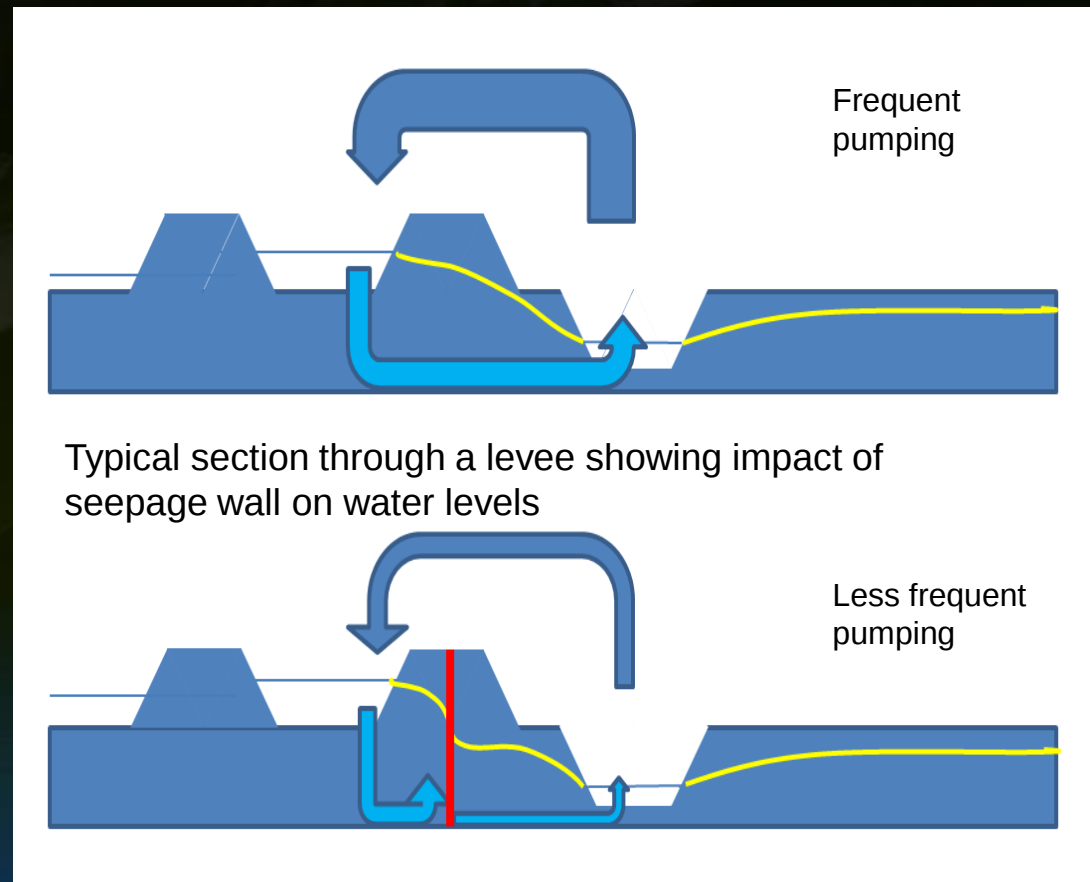


Characteristics of Seepage Barriers

- Passive seepage management solution that can typically not be switched on and off
- Non-selective in function in that it blocks flows in both directions including potentially recharge to water supply sources
- Effective solution to reduce pumping frequency and by extension operation cost
- Little to no maintenance cost post construction

Continued Need for Seepage Barriers

- In combination with operations and other features
- Increasing need for this option as restoration progresses

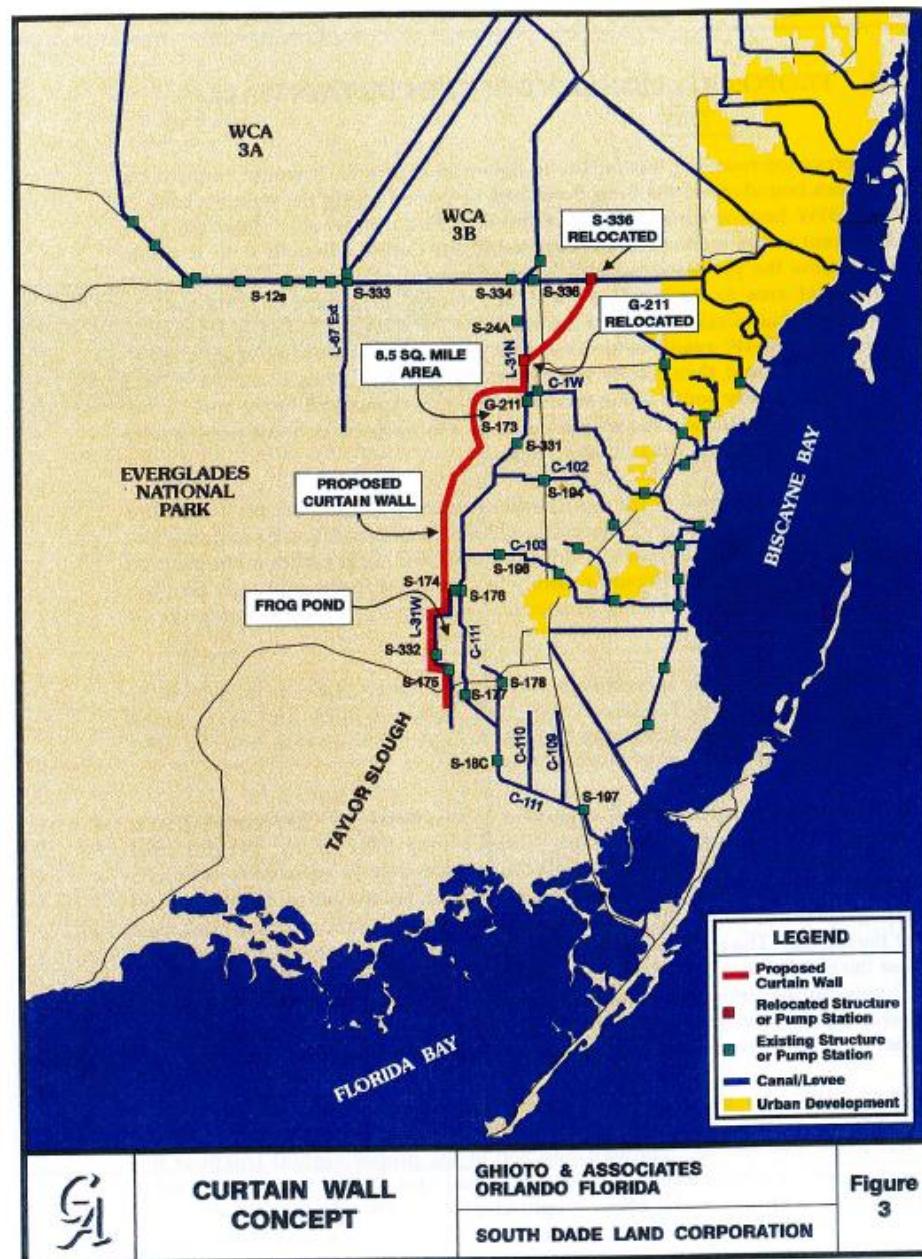


GENERAL
FEASIBILITY AND COST EVALUATION ANALYSIS
FOR
THE CURTAIN WALL CONCEPT
IN SOUTH DADE COUNTY

May 26, 1994

Prepared for
SOUTH DADE LAND CORPORATION

by
GHIOTO & ASSOCIATES
Water Resources and Civil Engineering
Orlando Florida



History in Everglades Restoration

- The RESTUDY and resulting Comprehensive Everglades Restoration Plan (CERP)
- Central Everglades Planning Project (CEPP)
- Miami Dade Limestone Products Association Seepage Projects – ENP Seepage Control Project
- South Dade Study



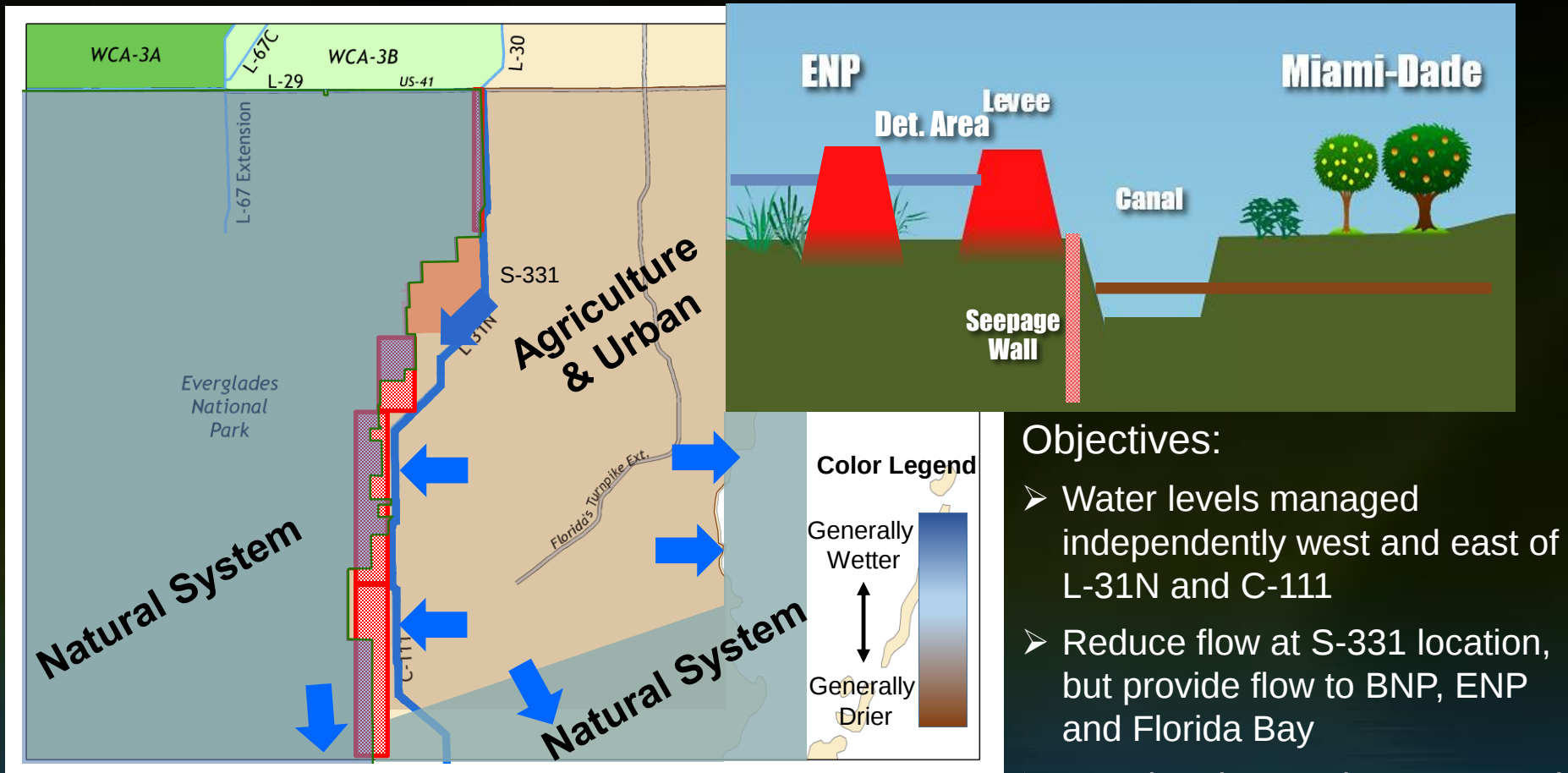
MDPLA Seepage Project

Spatial Orientation



- **Upper reach** between S-331 and S-176 (About 10 miles)
- **Lower reach** between S-176 and S-177 (About 5 miles)

South Dade Study Objectives



Note: Graphics are conceptual and intended to show general performance, not all of the system details or variations in spatial performance.

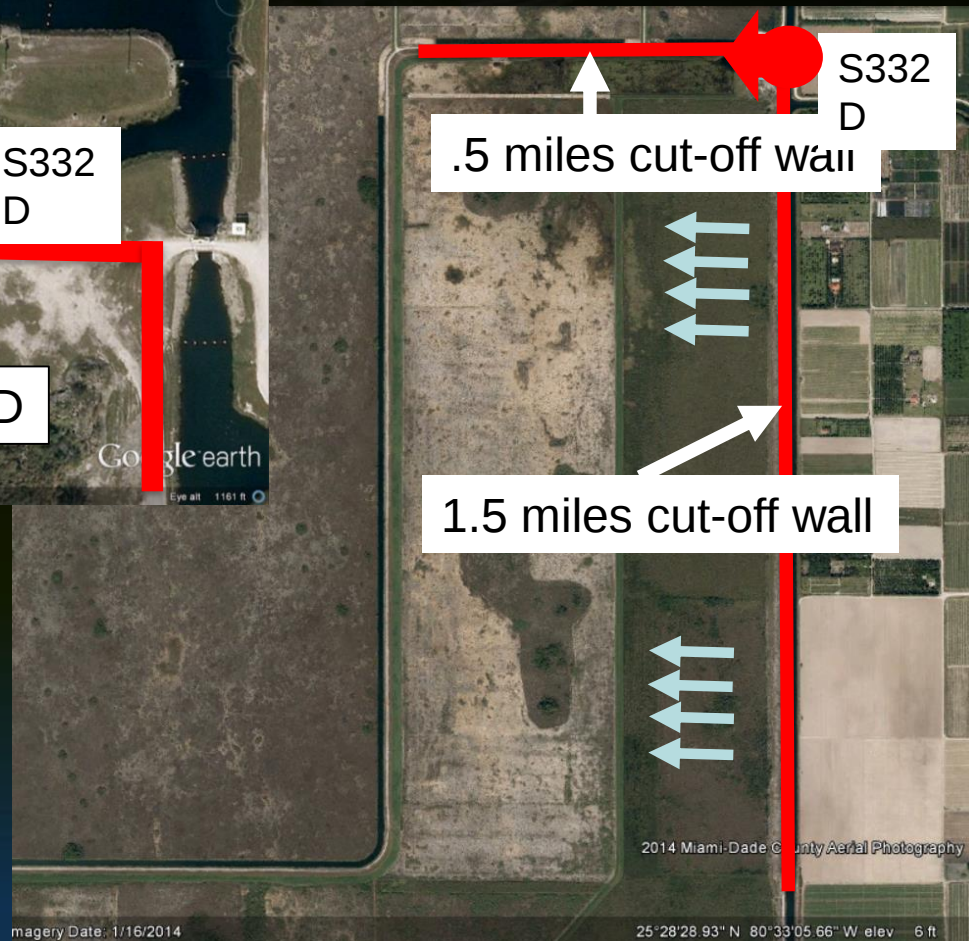
Objectives:

- Water levels managed independently west and east of L-31N and C-111
- Reduce flow at S-331 location, but provide flow to BNP, ENP and Florida Bay
- Canal and Detention Areas and **Seepage Walls** buffer connectivity between west and east

South Florida Ecosystem Restoration Task Force – Florida Bay Strategy



- Presented at Task Force November 2015
- Full-Extent Evaluated during South Dade Study
- Initial Project configuration to be refined.



Seepage Barrier Recommendations from South Dade Study

Location and Length of Seepage Barrier

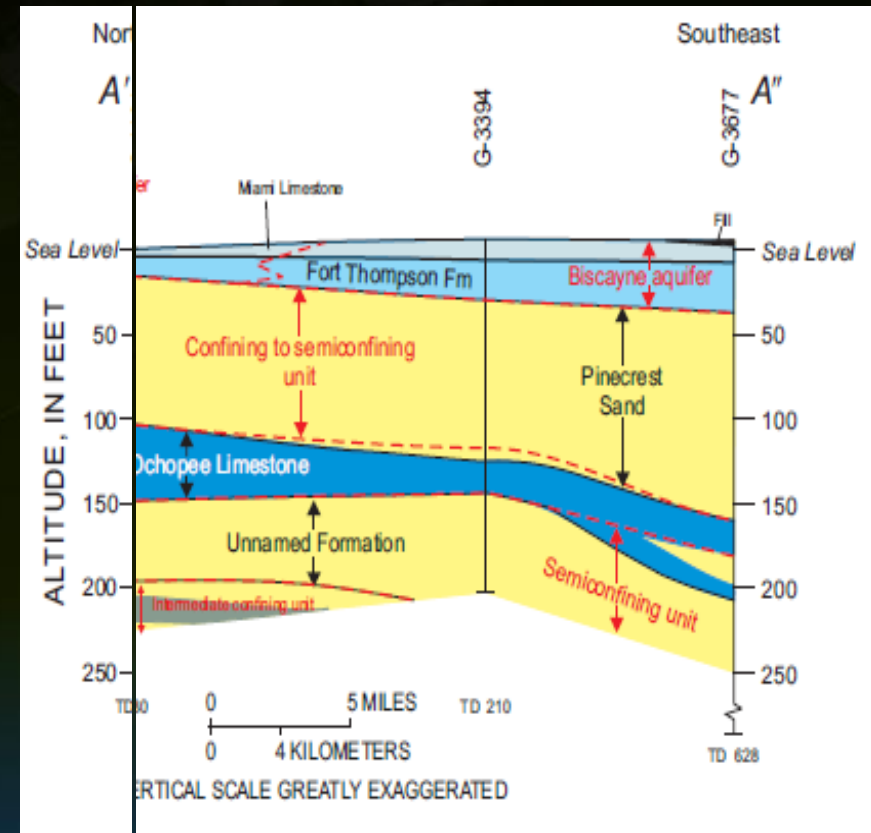
- About 15 miles (from S-331 to S-177)
- About 5 miles (from S-176 to S-177)
- Actual placement will require further detailed analyses



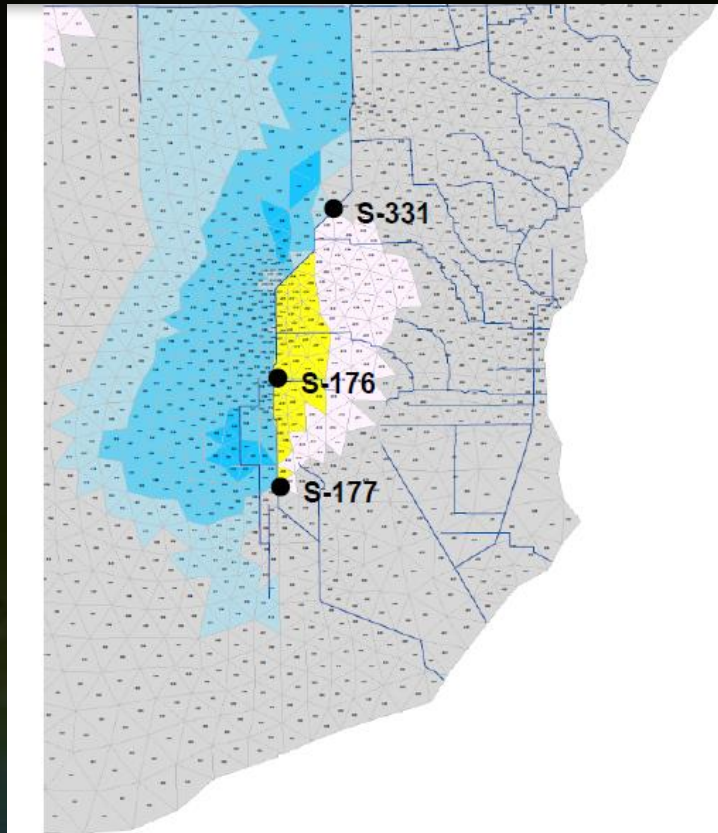
Seepage Barrier Recommendations from South Dade Study

Depth of Seepage Barrier

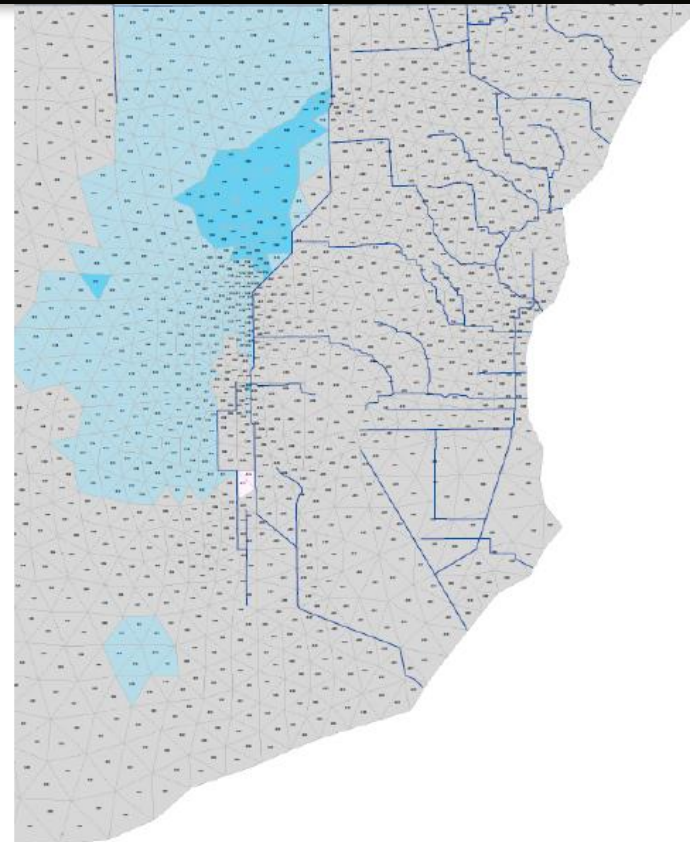
- About 35 feet to 45 feet deep
- Shallower to the north and deeper to the south based on geology
- Actual depth will require detailed site investigation and engineering



Stage Difference Compared to Current Operations

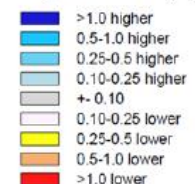


Average December Stage Difference
compared to Increment 1
Step 3A2



Average April Stage Difference
compared to Increment 1
Step 3A2

Stage Difference (ft)

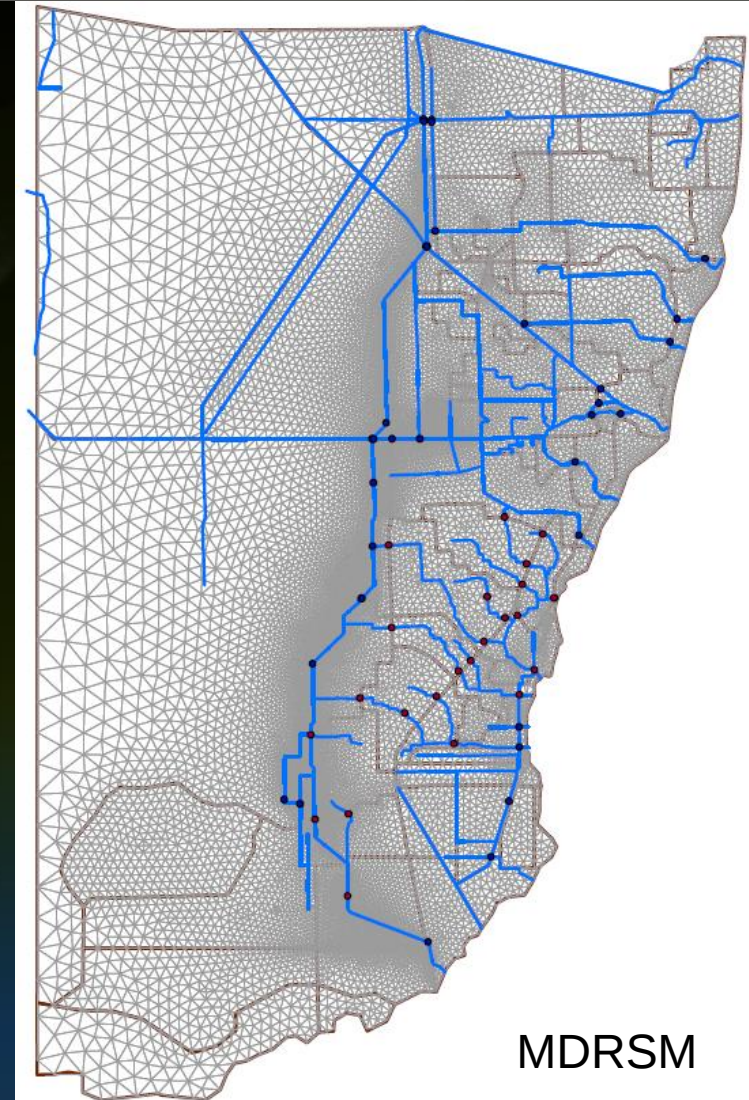
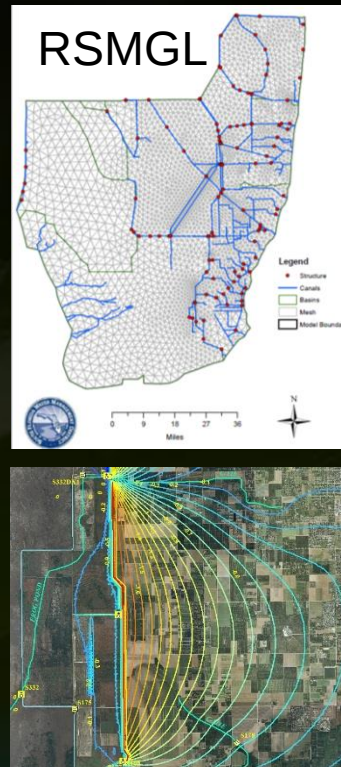


Related Looks in South Dade

- MIKE Marsh Model of Everglades National Park (M3ENP) Application to Seepage Barrier
- Presented at 2017 Greater Everglades Ecosystem Restoration (GEER) Conference by Kiren Bahm
- Three sensitivity scenarios
- Results consistent with South Dade Study findings
- Seepage barrier in the lower reach most affected flows towards Florida Bay through Taylor slough

Tool Development

- Effort is underway in collaboration with partner agencies to develop an operations based model for Miami Dade using Regional Simulation Model (MDRSM)
- Analytical tools for seepage assessment
- Collaboration with Everglades National Park team using the MIKE Marsh Model of Everglades National Park (M3ENP) to look in more details at benefits to the park



Potential Approach and Considerations

Two Phases to Implement

- Initial Project
- Full-Extent Barrier

Initial Project

- 2 miles in length, to make mobilization cost-effective
- Depth to semi-confining layer
- Start with the lower reach (where no secondary, managed buffer area exists)
- Stay within District owned land

Goal

- Scale test the concept
- Evaluate effectiveness
- Generate information to reduce uncertainty on impacts
- Confirm costs

Seepage Barriers in South Dade

- Full Extent Barrier

- Up to 15 miles in length, S-331 to S-177
- Between \$4 and \$4.5 million/mile – to be confirmed with initial Phase
- Detailed analyses
- Design and permitting up to 24 months
- Planned start to be determined

Florida Bay Project Video

Questions?