Planning for a South Dade Curtain Wall

Public Workshop
June 5, 2020

OVERVIEW OF TODAY'S WORKSHOP

Akin Owosina, P.E.

Bureau Chief, Hydrology and Hydraulics, SFWMD

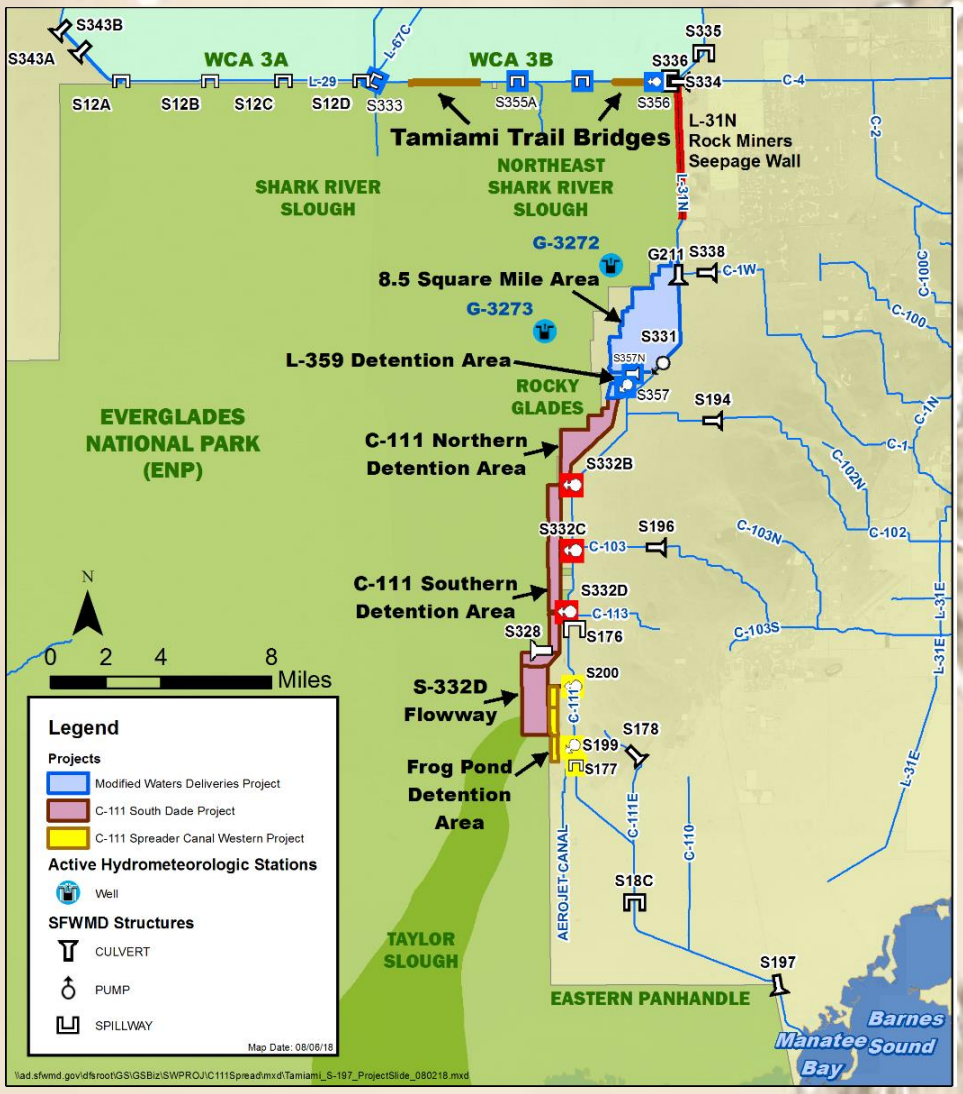
Public Engagement with Zoom

- Opportunities to submit questions or comments after each agenda topic
- Submit your questions or comments through Zoom Q & A feature. It is found on task bar near bottom.
  - All questions can be seen by all attendees
  - If you have the same question as someone else, you can vote to move it up in the order
- We'll respond the best we can today

Planning for a Potential South Dade Curtain Wall

Topics to cover today

- Planning and Data Collection
- Prior Assessments in South Dade
- Experiences and Expectations
- Wrap Up



Presenter: Akin Owosina

Today We'll be Hearing from:

- Overview, Zoom Instructions
- Opening Remarks
- Planning and Data Collection
- Prior Assessments

- SFWMD
  - Akin Owosina
  - Jennifer Reynolds
  - Brenda Mills and Mark Wilsnack
  - Walter Wilcox

- Experiences and Expectations

- Bill Baker, M-D Limestone Products Assn
- Charles LaPradd, Miami-Dade County
- Erik Stabenau, National Park Service
- Jason Engle, USACE

OPENING REMARKS

Jennifer Reynolds

Division Director, Ecosystem and Capital Projects, SFWMD

QUESTIONS?

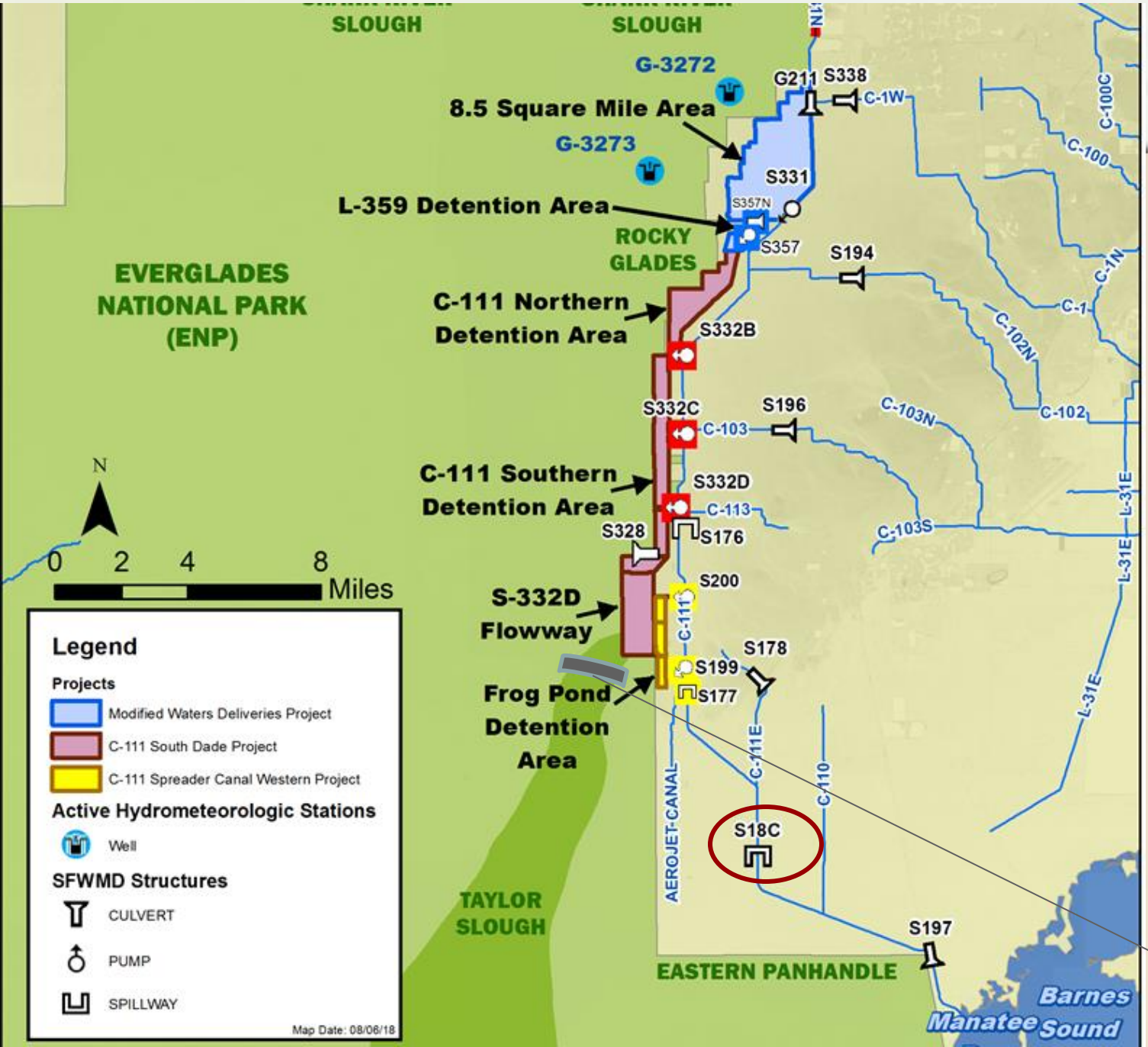
Submit questions or comments through Zoom Q & A feature

PLANNING FOR A POTENTIAL SOUTH DADE CURTAIN WALL

Brenda Mills

Principal Project Manager, Ecosystem Restoration Planning, SFWMD

Water Management in South Dade



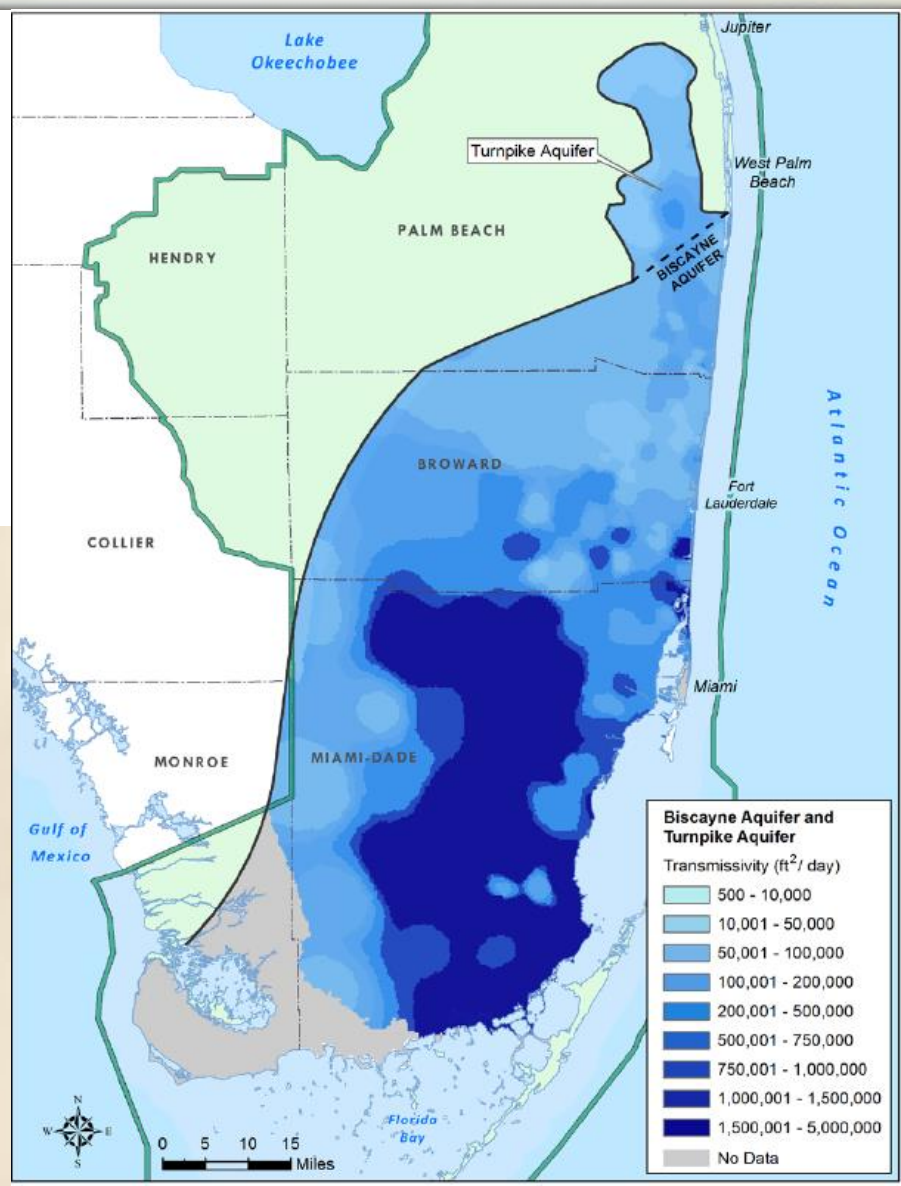
- USACE, DOI, and SFWMD have finished construction of C-111 South Dade, Modified Water Deliveries to ENP, and C-111 Spreader Canal Western Projects.
- Two options to move water: pump or spillways
- Biscayne aquifer characteristics
- Changed conditions

Taylor Slough Bridge

Presenter: Brenda Mills

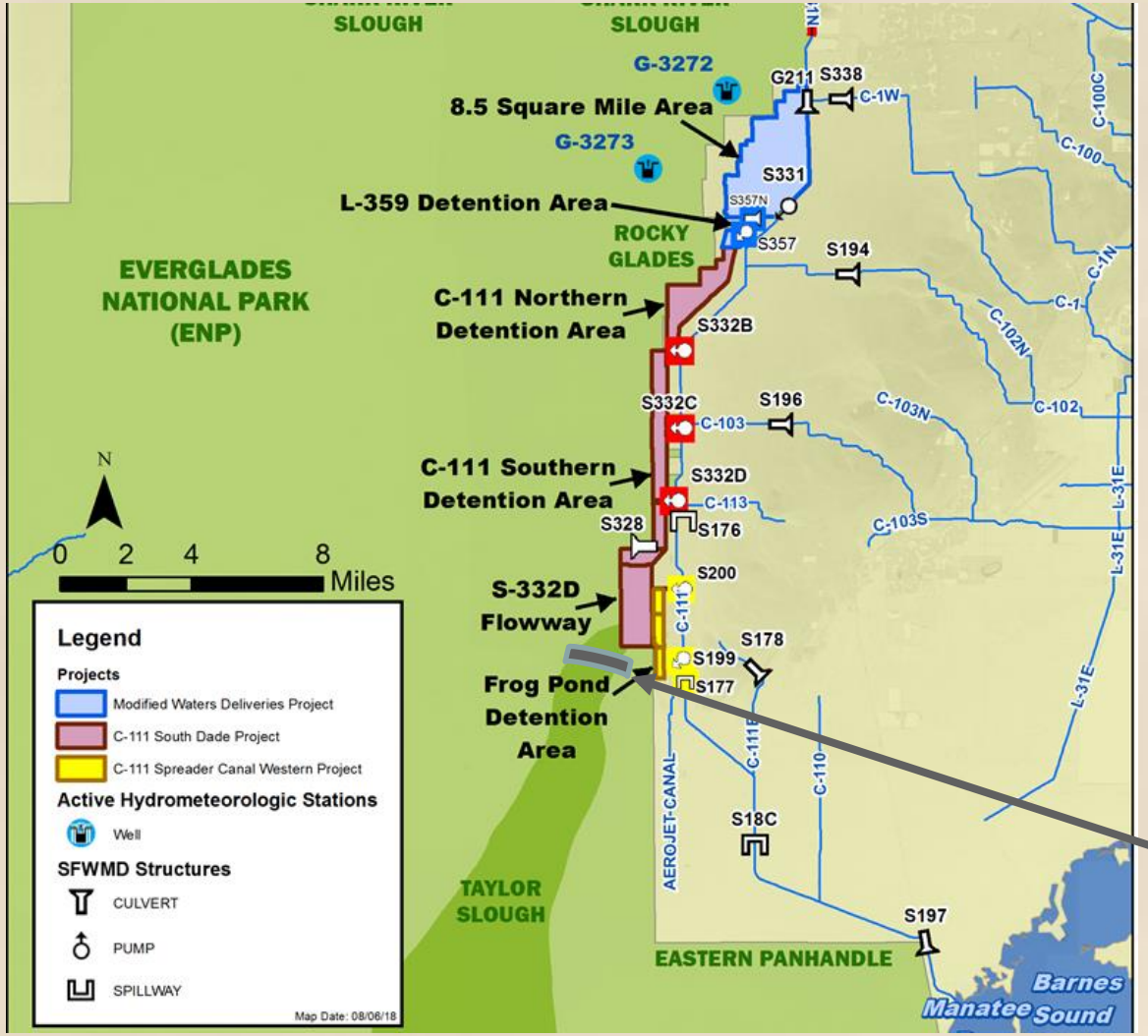
Characteristics of Biscayne Aquifer in South Dade

- Unconfined aquifer
- Porosity
- Flow or transmissivity



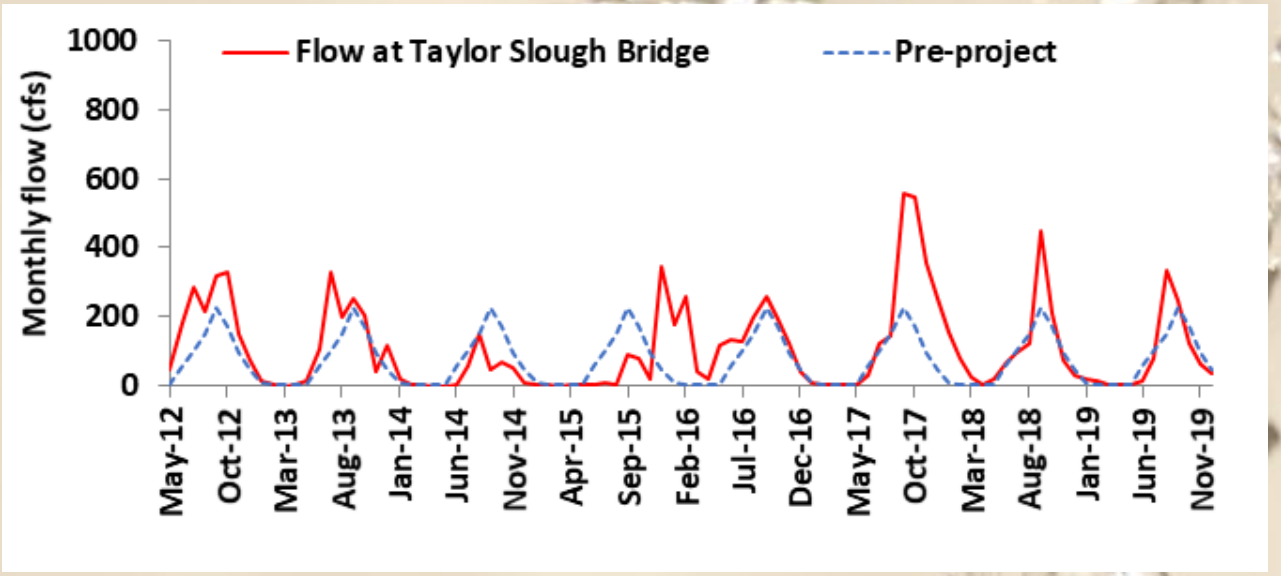
Presenter: Brenda Mills

Changed conditions in ENP



Monthly Flows at Taylor Slough Bridge

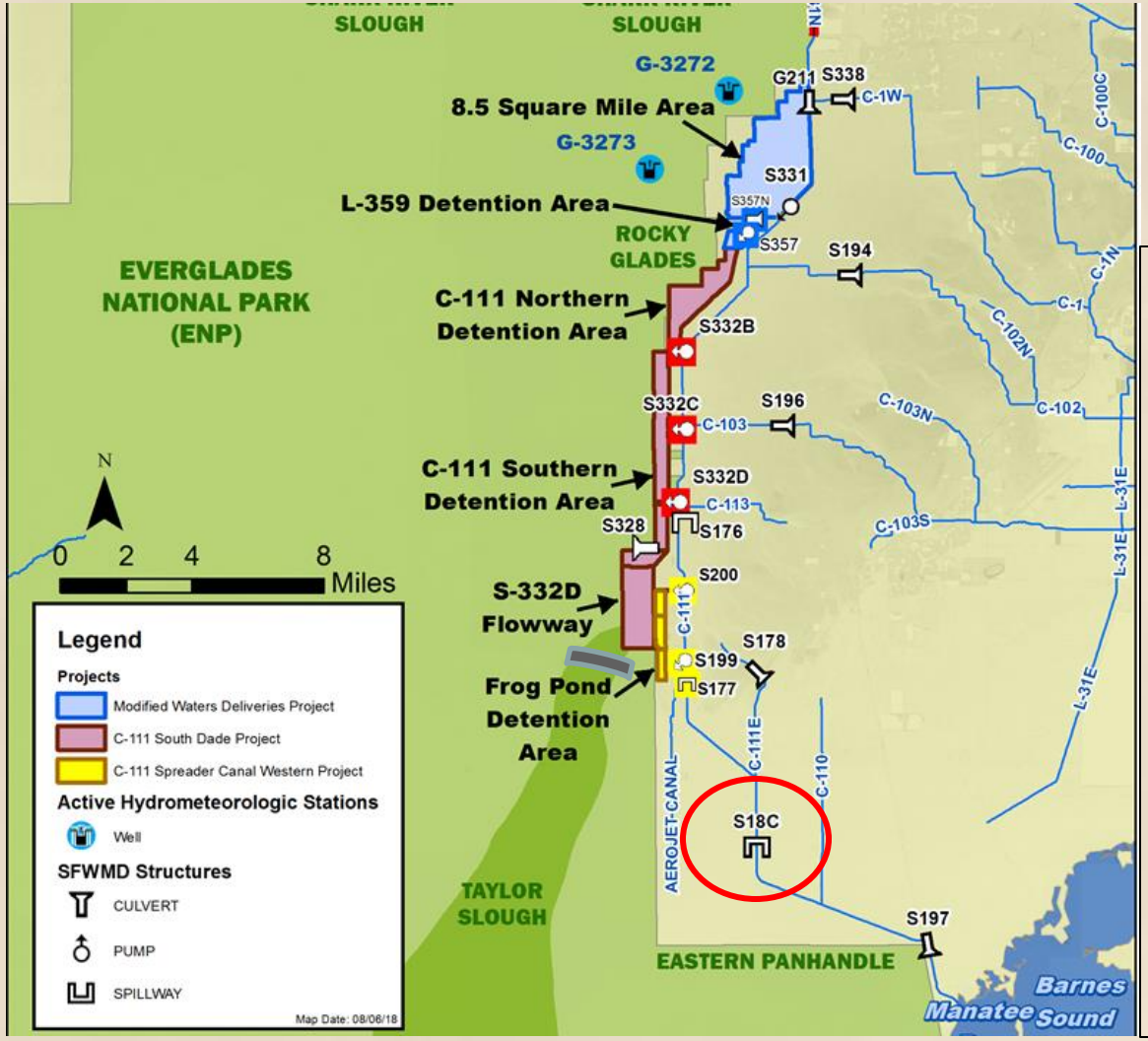
- Monthly flows (red) starting in May 2012 to 2019
- Historical period (blue) 2003-2012



Taylor Slough Bridge

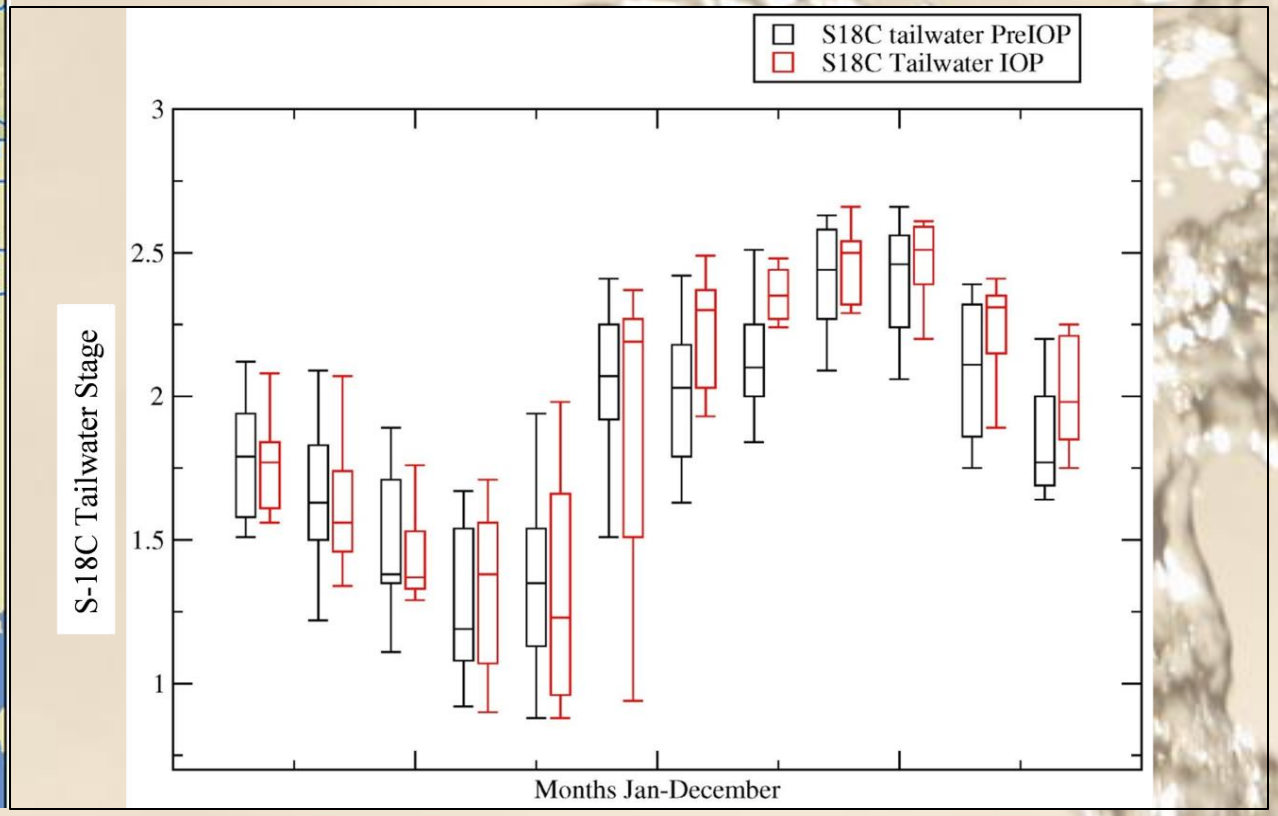
Presenter: Brenda Mills

Changed conditions in C-111 Canal

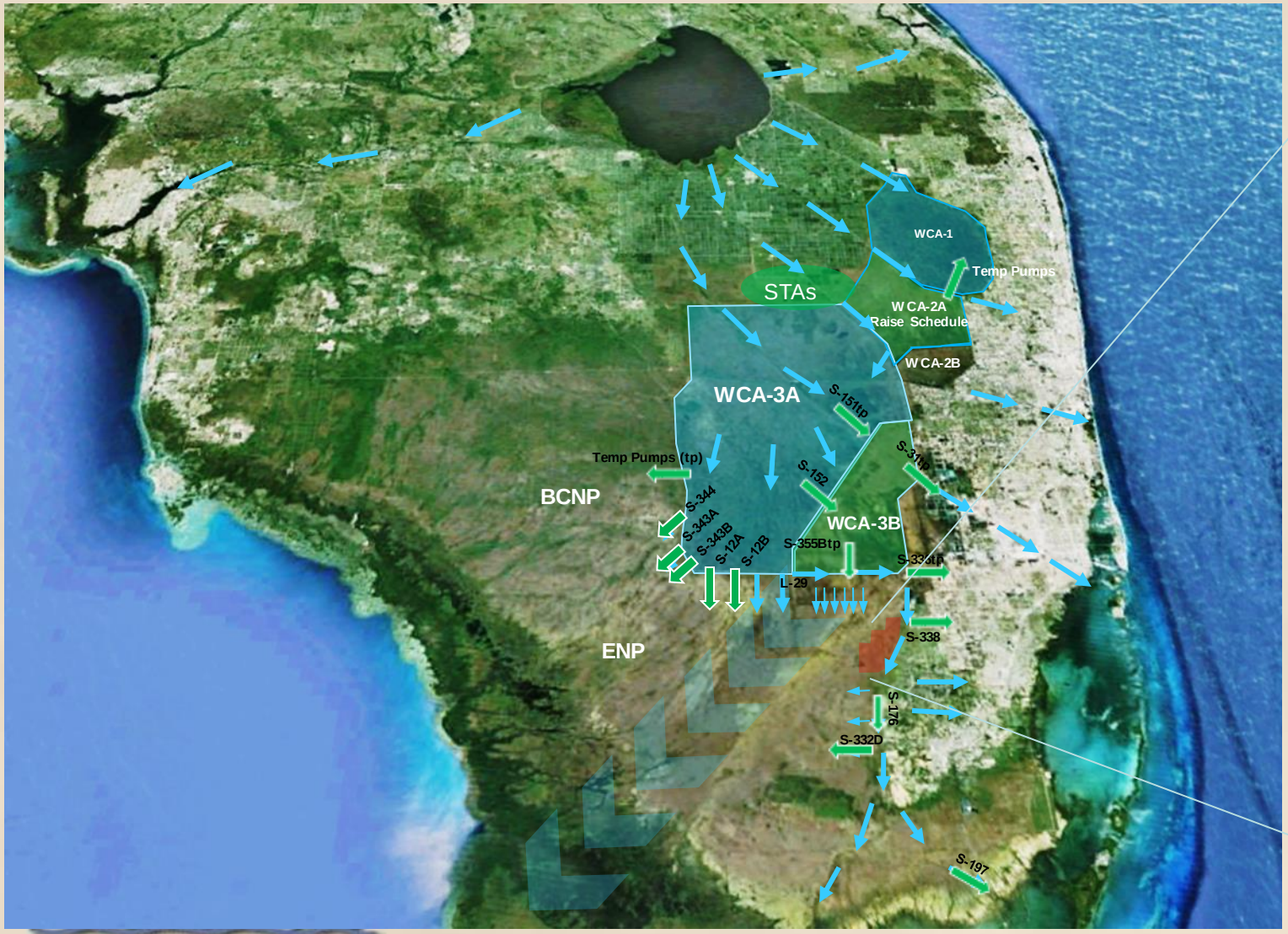


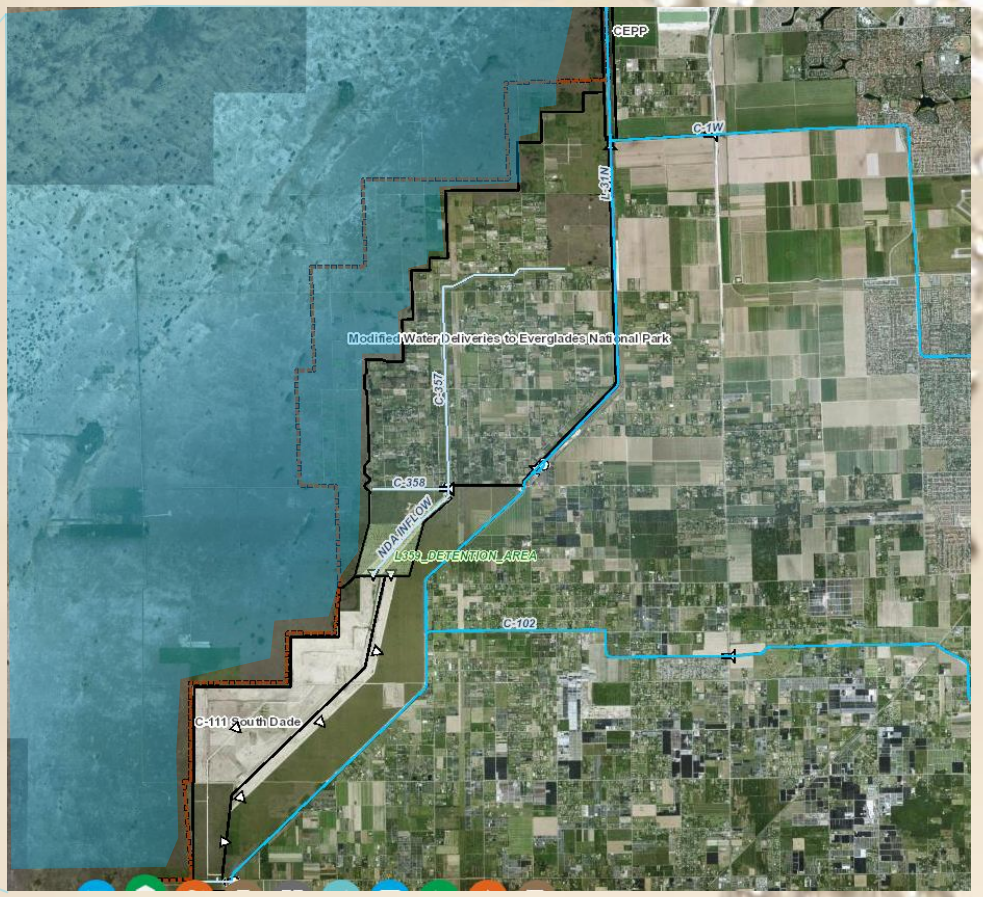
S-18C tailwater stages as monthly box-and-whisker plots

- pre-IOP (1991–1999 in **black**)
- IOP (2000–2012 in red) box-and-whisker plots.



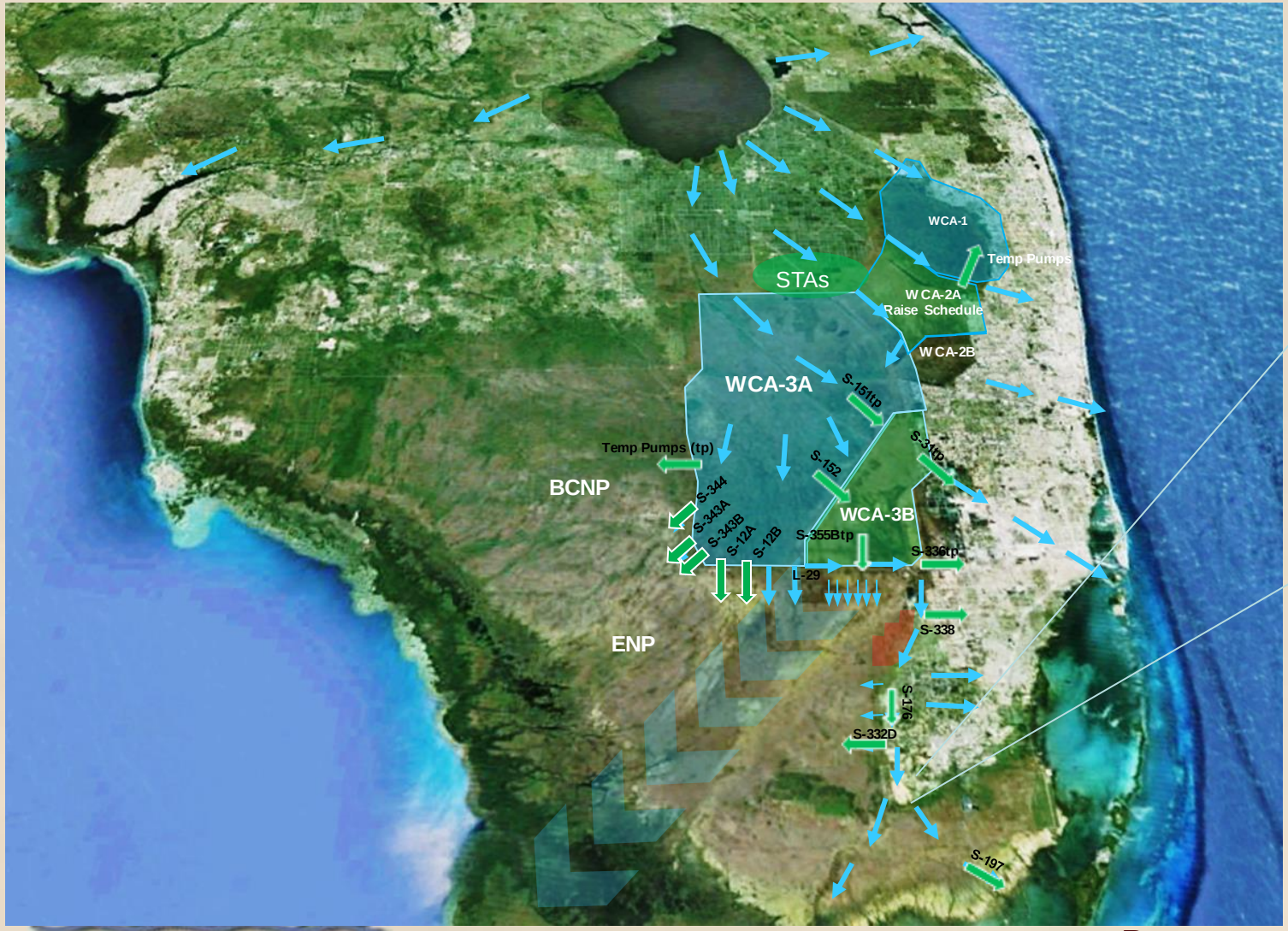
Tracking Restoration Flow to Shark River Slough





Presenter: Brenda Mills

Flooding is an issue further South



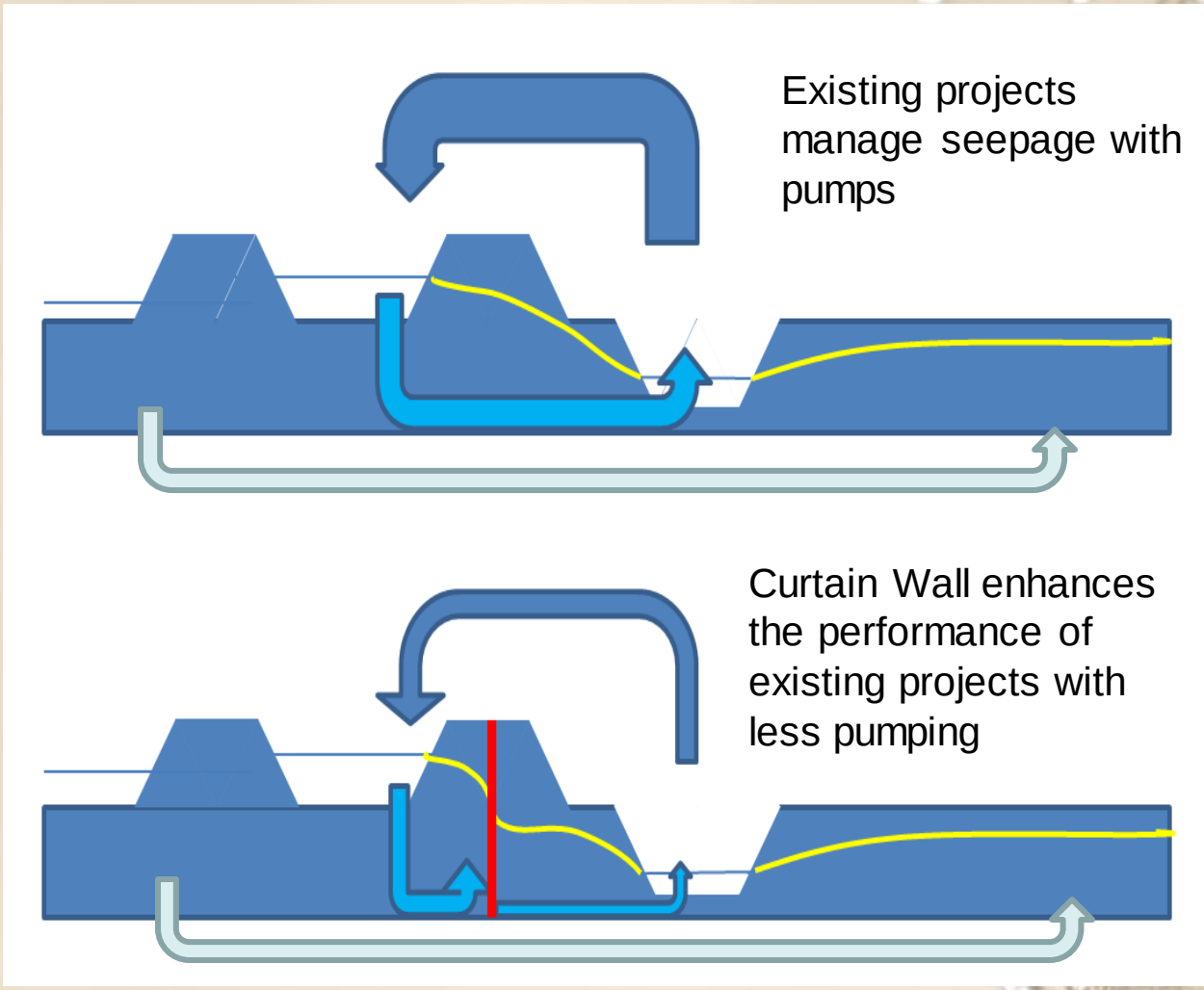
Street flooding, Villages of Homestead

Crop flooding near C-111 at S-177 and S-199

Presenter: Brenda Mills

Curtain Walls - Part of Comprehensive Flood Control Strategy

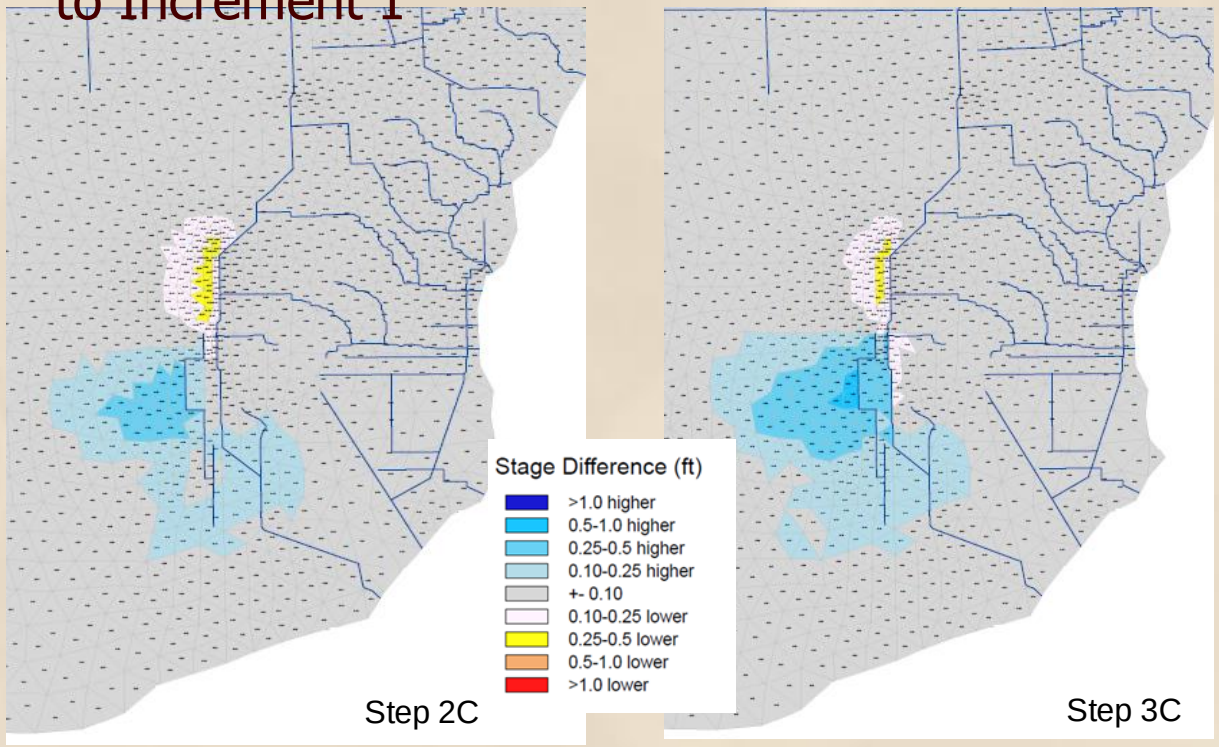
- Goal is to allow a little higher water level in the natural areas (to the west), while achieving a little lower water table in the developed areas (to the east)
- A less permeable material, placed in the flow path helps to manage groundwater
- Groundwater still flows under the curtain wall
- Passive groundwater management solution that is typically not operated (switched on and off)
- Effective solution to providing flood protection in conjunction with other management measures including pumping



Potential Effects of A Curtain Wall: Experience and Analysis

Promising Results from South Dade Study

Average December Stage Difference Maps Compared to Increment 1



Step 2C

Step 3C

Presenter: Brenda Mills

Opportunity to Study and Construct a Flood Protection Solution

- Multiple requests from stakeholders, legislators and other interested parties to implement a comprehensive flood protection strategy for South Dade
- Request to consider a flood control focused study
- Protect property, mitigate flooding concerns of South Dade farmers while sustaining broad support for restoration initiatives in the region

Planning Activities

Goals:

- Integrate information garnered during public engagement, data collected, and prior assessments
- Identify key concepts to support design
- Develop conceptual project for subsequent design and refinement

Planning Activities:

- Public Engagement – details on next slide

Data acquisition and site-specific details – Next presentation:

- Collect Field Data of Aquifer characteristics
- Assess Existing Canal System

Public Engagement Aspect of Planning Process

- Public engagement will bring in multiple perspectives on outstanding issues prior to initiating design
  - Directly address previously highlighted risks to Biscayne Bay and water supply
  - More rigorously examine saltwater intrusion and sea level rise
  - More closely examine potential length, depth, and location of seepage barrier
  - Identify sequence and dependencies for implementation, including operating with existing infrastructure and future restoration, and
  - Explore options for funding and partnerships

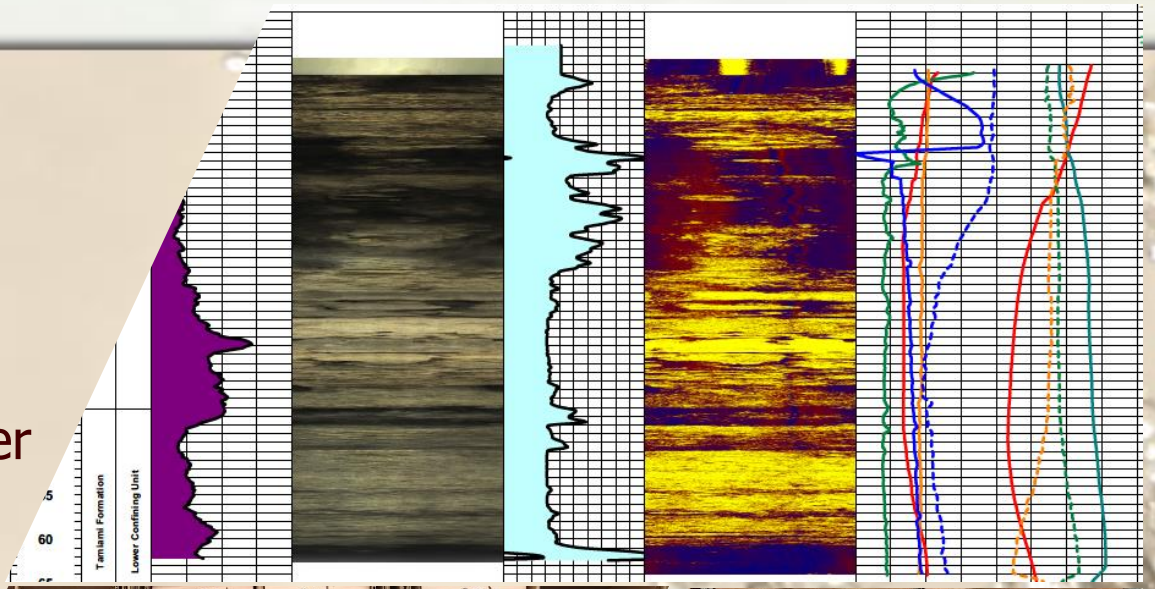
Public Engagement

- Two workshops and a series of one-on-one meetings
- To discuss a potential curtain wall in South Dade, including requesting a one-on-one meeting, contact:
  - Brenda Mills, bmills@sfwmd.gov
  - Walter Wilcox, wwilcox@sfwmd.gov

Schedule

Schedule:

- Collect Aquifer Field Data: November 2019 – November 2020
- Assess Existing Canal System: January – September 2020
- Public Engagement: March – November 2020
- Complete Planning Process: February 2021

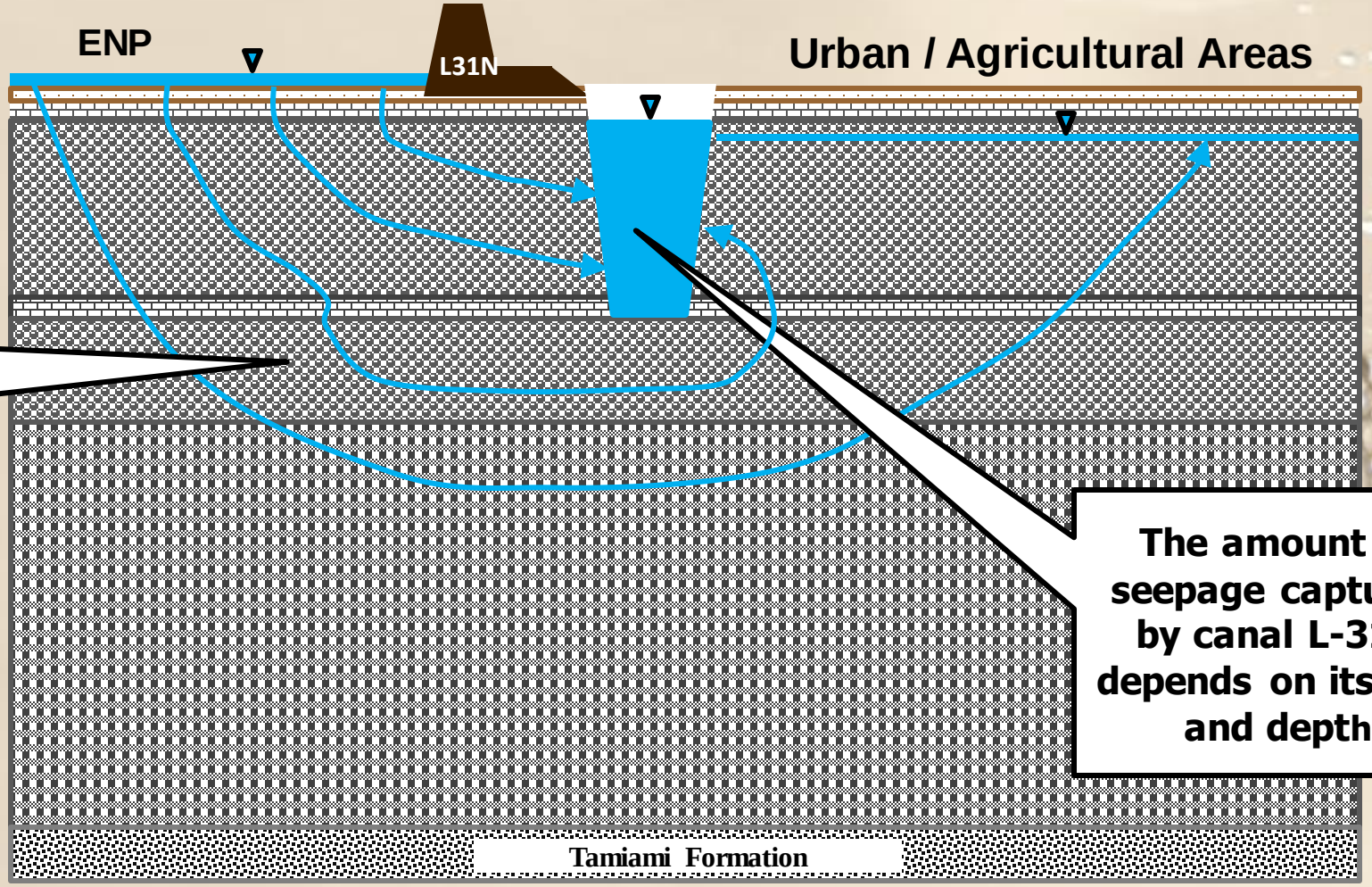


GEOTECHNICAL AND CANAL GEOMETRIC DATA ACQUISITION TO SUPPORT A SOUTH DADE CURTAIN WALL

Mark Wilsnack

Section Leader, Hydraulic Design, SFWMD

Background



The rates of seepage depend on the aquifer properties

The amount of seepage captured by canal L-31N depends on its size and depth

Background

Seepage rates depend on:

- Water Levels
- The L-31N Borrow Canal or C-111 Canal Geometry
- The hydrostratigraphy of the aquifer
- The hydraulic properties of the aquifer

Background

A reliable curtain wall design depends on:

- Comprehensive knowledge of the surficial aquifer within the vicinity of L-31N
- An accurate description of the depth and geometry of the L-31N borrow canal

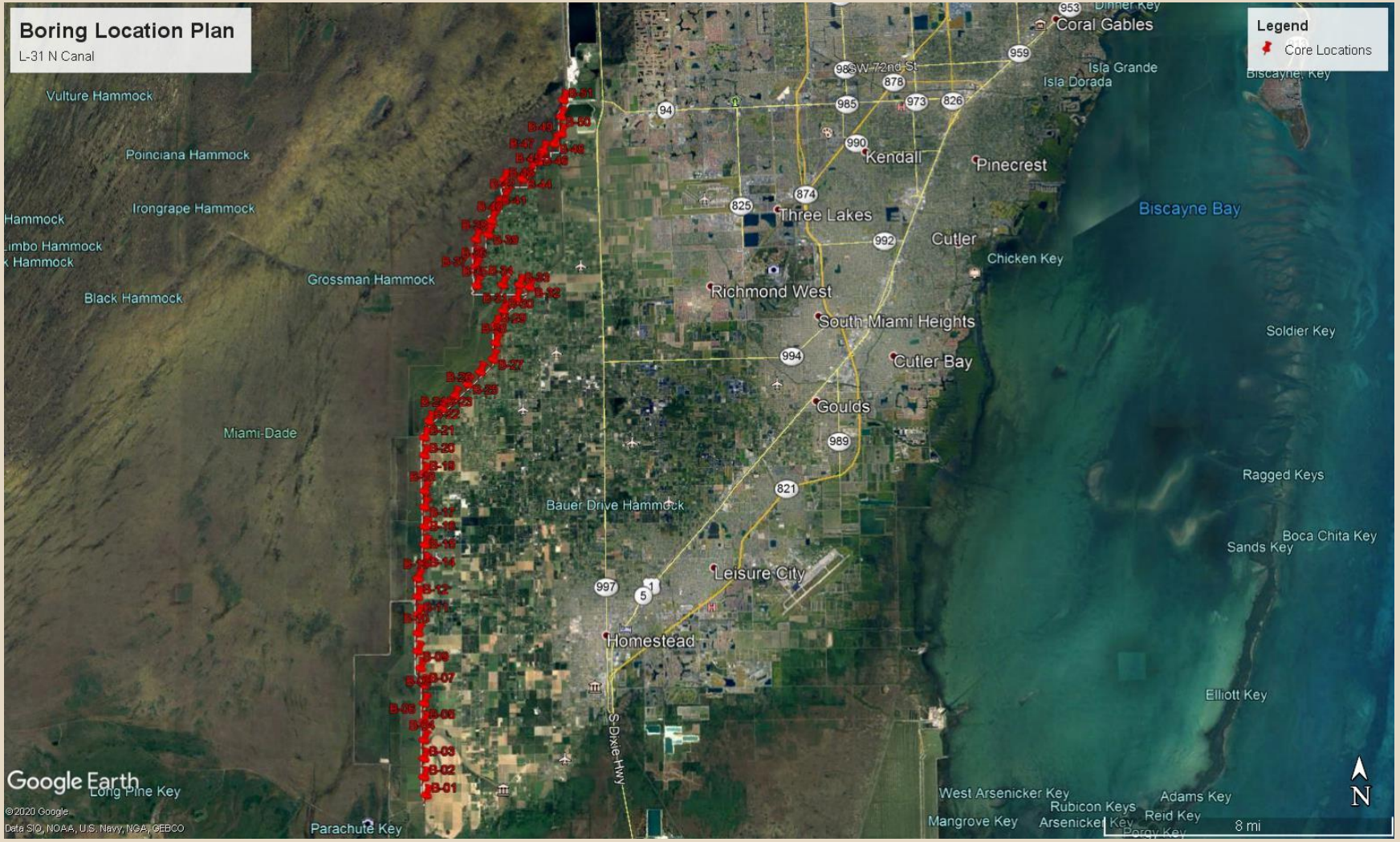
Data Collection Objectives

- Survey the geometric cross sections of the L-31N and C-111 canals
- Characterize the hydrostratigraphic layering of the surficial aquifer within the vicinity of the levee corridor
- Quantify the hydraulic properties of the surficial aquifer that affect seepage

Geotechnical and Geophysical Data

- Borings located every 0.5 Miles, starting to the north near SR 94 and extending south to S-177
- Includes both geotechnical borings and geophysical logs
- Expect completion of drilling work by September 2020

Location Map – L31N Seepage Barrier Geotechnical Exploration



Presenter: Mark Wilsnack

Boring Locations – L31N Seepage Barrier Geotechnical Exploration

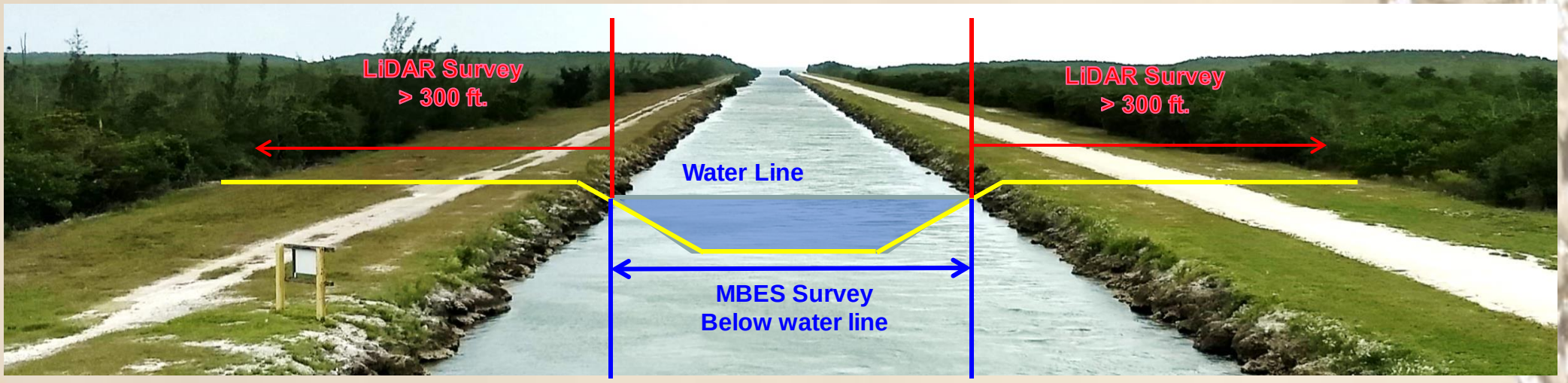
Presenter: Mark Wilsnack

Boring Locations – L31N Seepage Barrier Geotechnical Exploration

Presenter: Mark Wilsnack

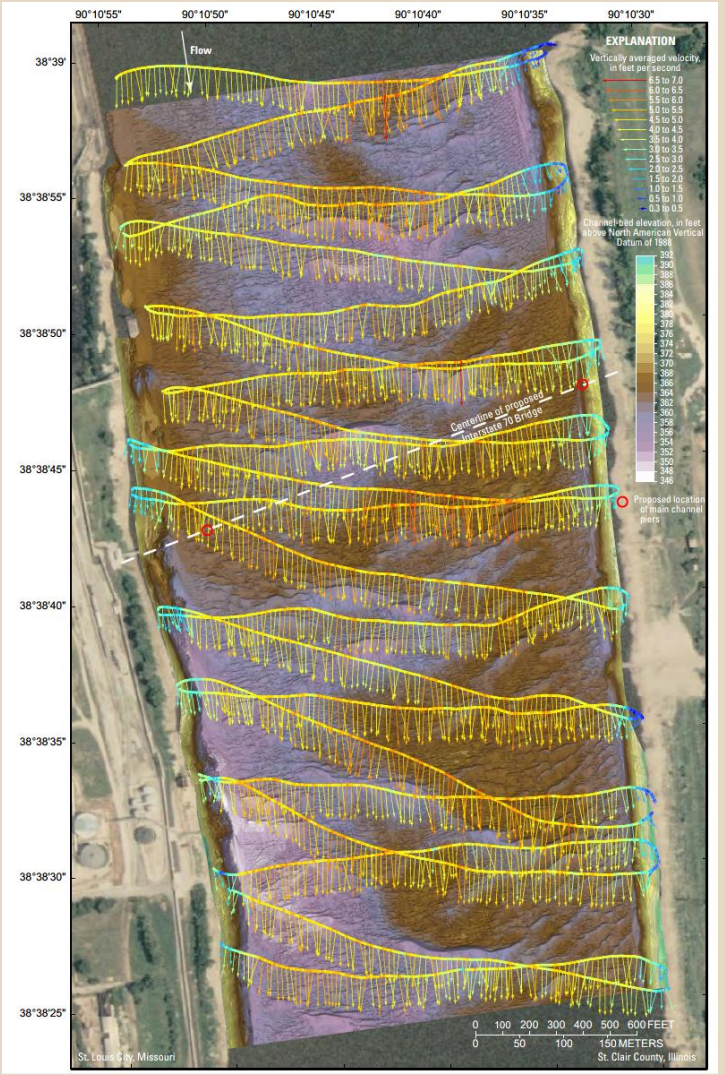
Canal Bathymetric Survey

- Acquisition of bathymetric and topographic data along the reaches of Canal L-31N and C-111 to determine the current cross section geometry (July 2020).
- Topographic survey methods:
  - Multibeam Echosounder (MBES) method (below water line)
  - Light Detection and Ranging (LiDAR) method above the water line, to approximately 300 feet on each side of the canal.



Standard Requirements for a MBES Hydrographic Survey

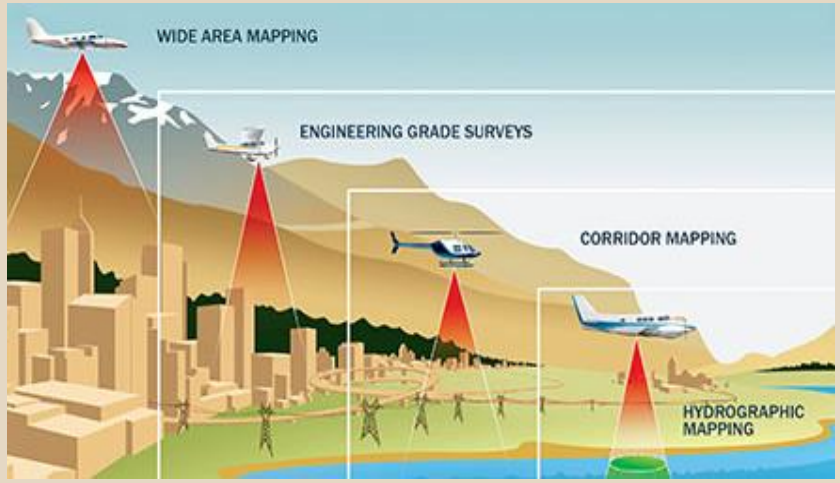
1. Collect data from water's edge to water's edge of the canal.
2. Sufficient overlap of the multibeam passes.
3. Adequate number of independent verification shots to prove the data is acceptable.
4. Record the water surface elevation at the beginning and end of every hydrographic survey.
5. No data voids between MBES and LiDAR survey data

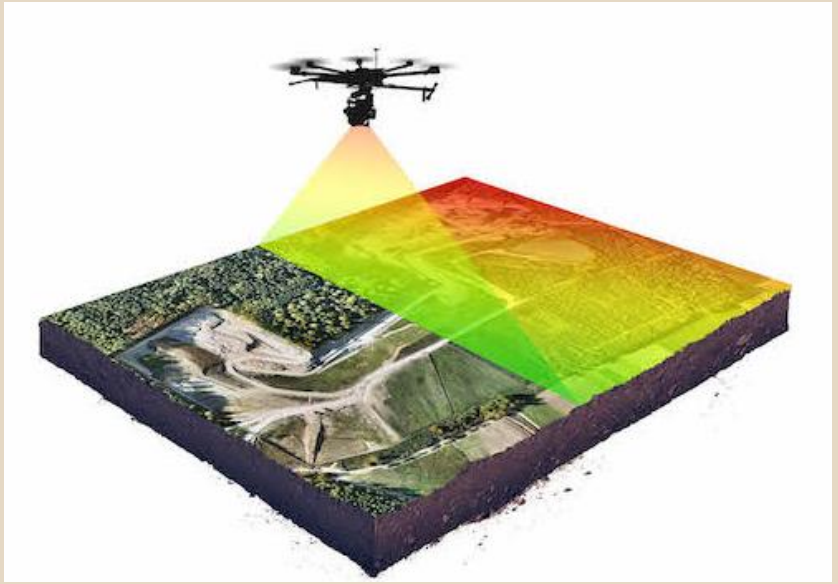


Presenter: Mark Wilsnack

Standard Requirements for LiDAR Survey w/ Aerial Photography

- Levee and Canal Corridors from right-of-way line to right-of-way line
- Minimum of 30 points per square meter (with overlap).
- 3-inches or better high-resolution, distortion-free aerial photogrammetry





Summary of Data Collection

- Survey the geometric cross sections of the L-31N and C-111 canals.
  - Complete - July 2020
- Acquire geotechnical borings and geophysical logs
  - Complete - September 2020
- Quantify the hydraulic properties of the surficial aquifer that affect seepage
  - Complete - November 2020

Acknowledgements

Vijay Mishra, Project Manager

Jeong Park, Senior Engineer

QUESTIONS?

Submit Comments through Zoom Q & A Feature

PRIOR ASSESSMENTS OF CURTAIN WALLS IN SOUTH DADE

Walter Wilcox, P.E.

Section Administrator, Modeling,

Hydrology & Hydraulics Bureau, SFWMD

Curtain Wall Concept is Not New

- Ideas Date back to at least the 1990's
- Included in Comprehensive Everglades Restoration Plan (CERP)
- Evaluated in the 2015-2016 SFWMD's South Dade Study

GENERAL
FEASIBILITY AND COST EVALUATION ANALYSIS

FOR

THE CURTAIN WALL CONCEPT

IN SOUTH DADE COUNTY

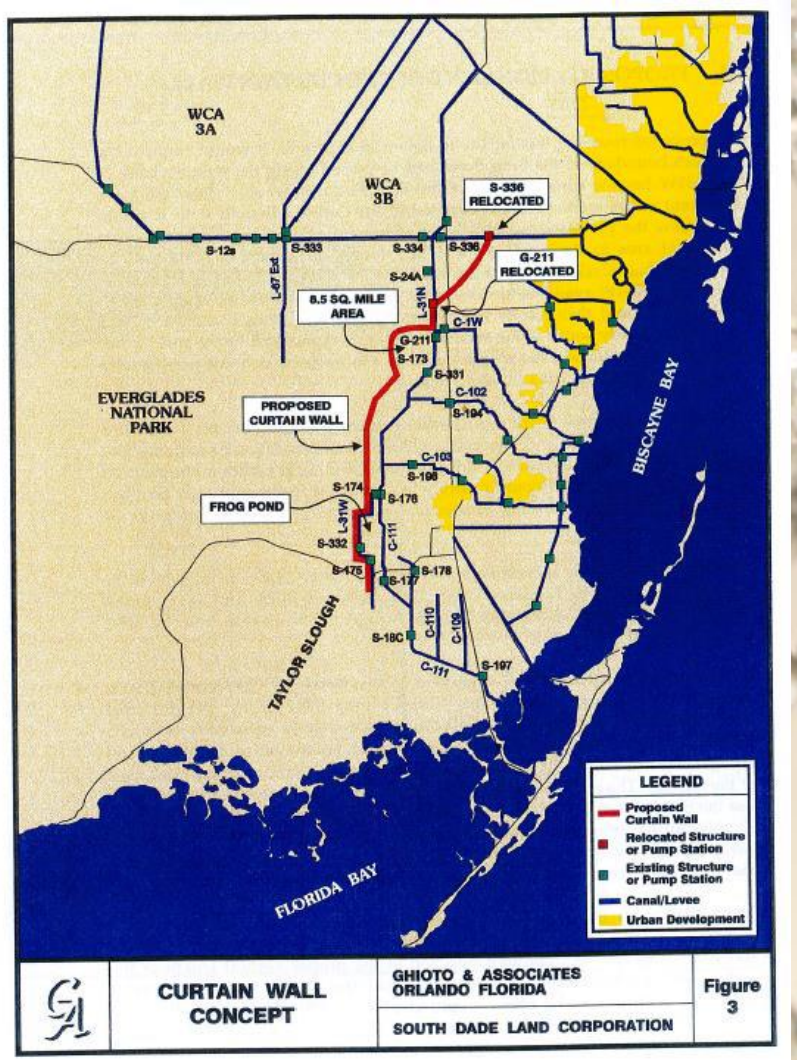
May 26, 1994

Prepared for

SOUTH DADE LAND CORPORATION

by

GHIOTO & ASSOCIATES
Water Resources and Civil Engineering
Orlando Florida



Presenter: Walter Wilcox

Curtain Walls in Everglades Restoration

Comprehensive Everglades Restoration Plan (CERP) contemplated seepage control along L31N in adjacent to NE Shark River Slough

4-mile Seepage Barrier included in the Central Everglades Planning Project

C&SF Comprehensive Review Study – Alternative D13R

Component V4

Geographic Region: Water Preserve Area - Miami-Dade County

Component Title: L-31N Levee Improvements for Seepage Management (Same as Alternatives 4 and 5) – SEE COMPONENT MAP 7

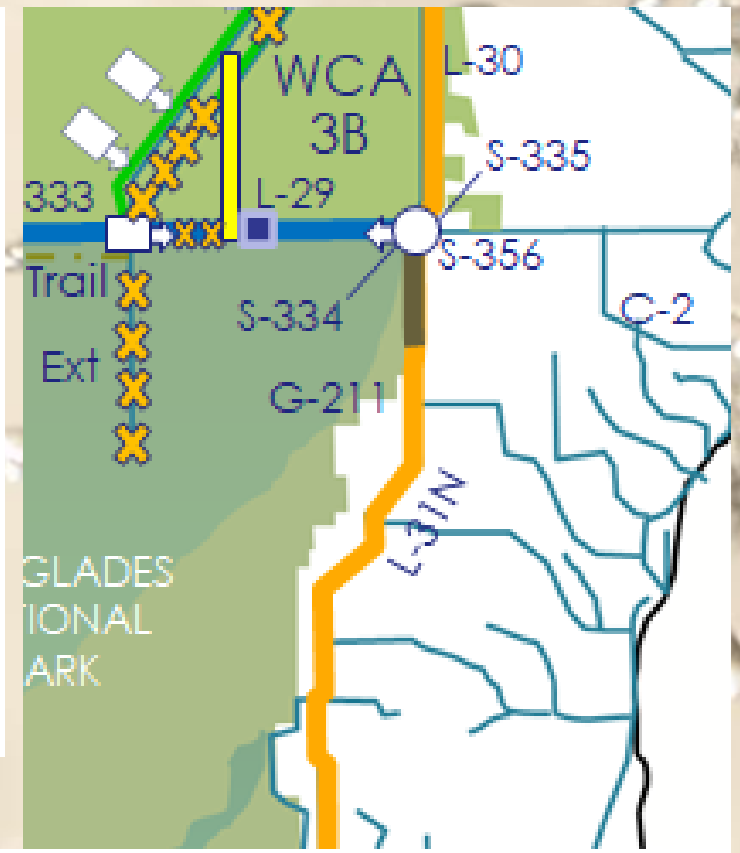
Purpose: Levee seepage management along the eastern edge (L-31N) of Everglades National Park to eliminate losses due to levee seepage to the East Coast. An additional feature has been added to reduce all wet-season seepage/ground water flows to the east. Feature will help restore hydropatterns in Everglades National Park.

Operation: 100% reduction in levee seepage flow from Everglades National Park year-round (to be achieved via Component FF4). Further 100% reduction in all groundwater flows during the wet-season. Bird Drive Recharge Area and North Lake Belt Storage Area will be used to recharge aquifers to the east.

Design:
Levee Seepage: Refer to Component FF4.

Wet-Season Ground Water Seepage: Distributed ground water wells adjacent to L-31N and return flows to Everglades National Park.
If needed, aquifer recharge will occur from deliveries from Bird Drive Recharge Area and North Lake Belt Storage Area.

Location: Along the existing eastern protective levee (L-31N) adjacent to Everglades National Park.
Counties: Miami-Dade



SEEPAGE MANAGEMENT

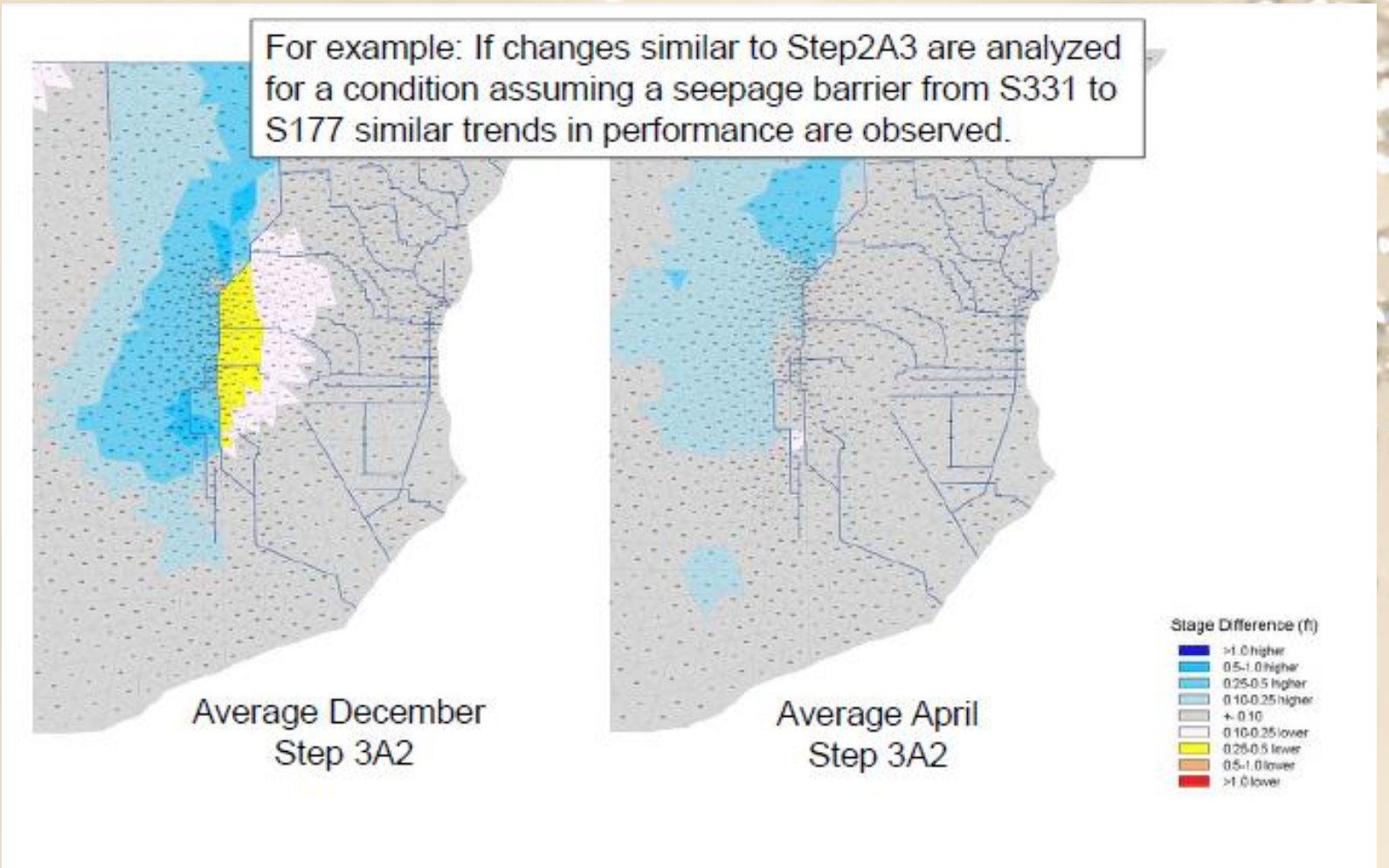
- Increase S-356 pump station to ~1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail (along L-31N)
- G-211 operational refinements; use coastal canals to convey seepage

South Dade Study

SFWMD's South Dade Study in 2016 consolidated information from many sources:

- MDLPA Wetland Mitigation Wall
- Observed flooding events
- Modeling & tool updates

Evaluated seepage barriers and concluded they could improve system performance



Assessment of Curtain Walls as Part of a Comprehensive Flood Protection Strategy

Comprehensive study outside the scope of any one ongoing study or project

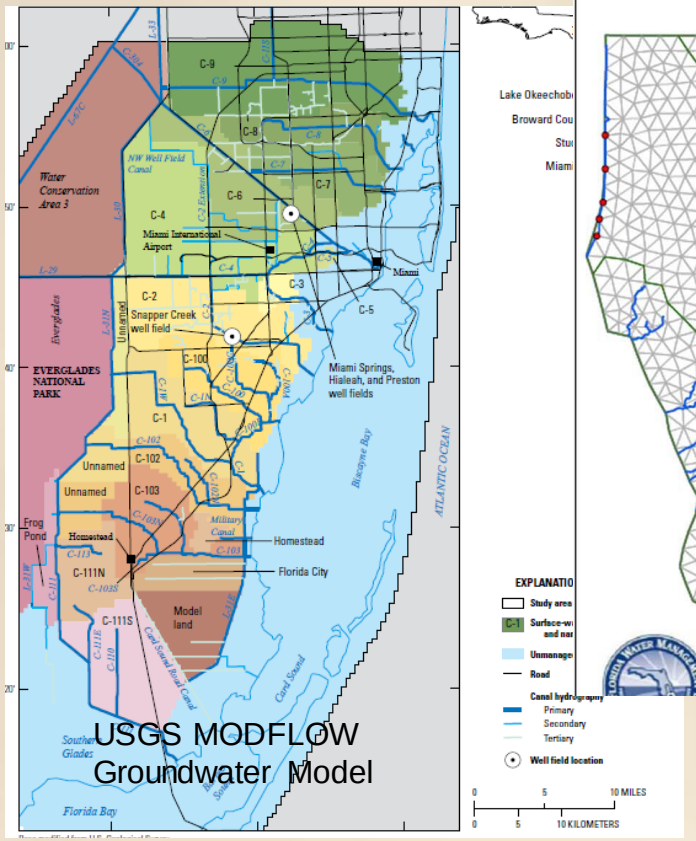
- Provide flood protection to homeowners and agriculture east of ENP
- Integrates and functions seamlessly with existing efforts
- Preserves existing water supply and salt water intrusion protection
- Ensures the continuation of significant investment in managing ecosystem restoration benefits

Presenter: Walter Wilcox

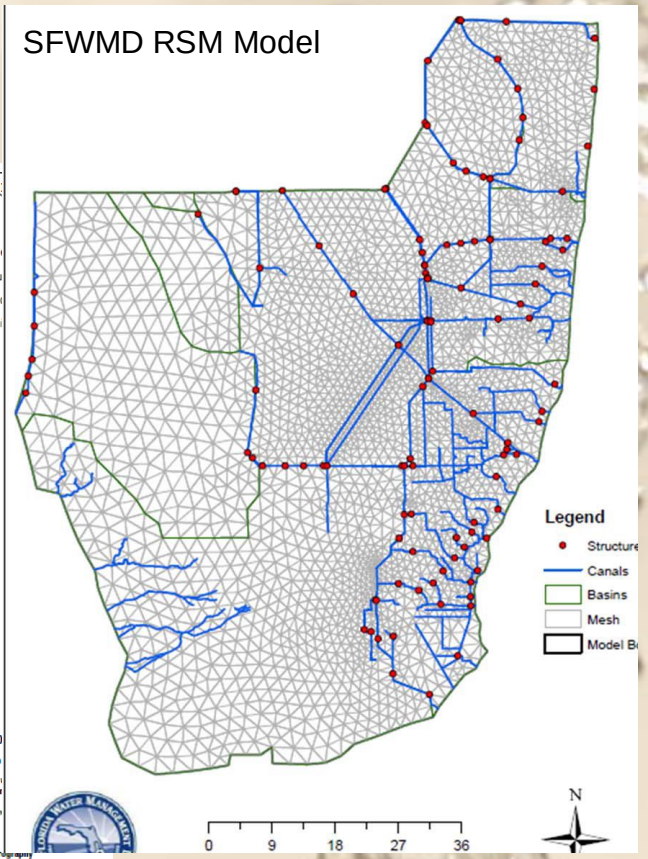
Curtain Wall Assessment Methodology

Companion models used for evaluation:

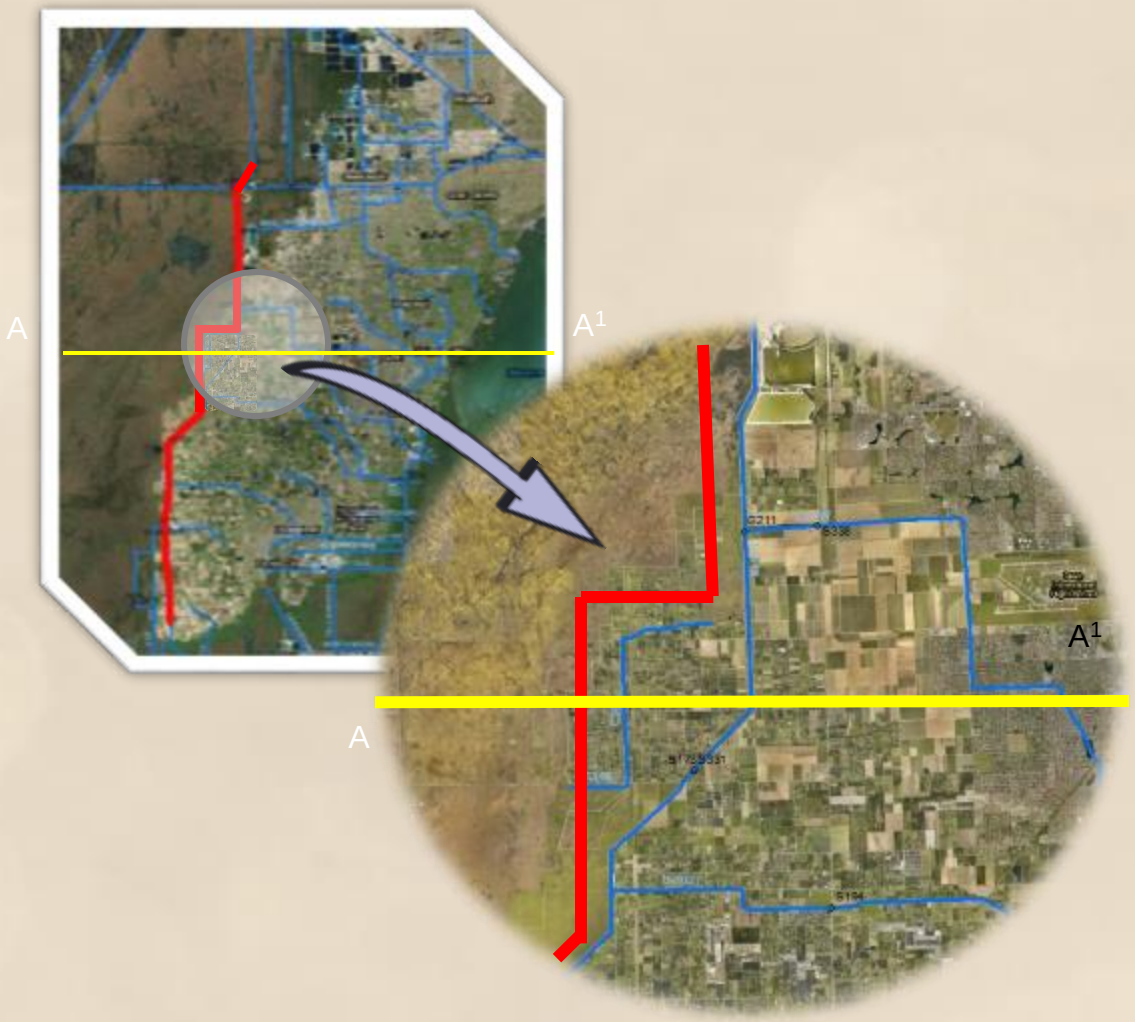
- SFWMD's Regional Simulation Model Glades-LECSA for curtain wall alignment, regional impacts, operations, surface water and shallow groundwater effects
- USGS MODFLOW model for curtain wall depth, water supply at wells and other groundwater related effects
- Several Curtain Wall alignments simulated with different operations of the South Dade system representing current and future conditions

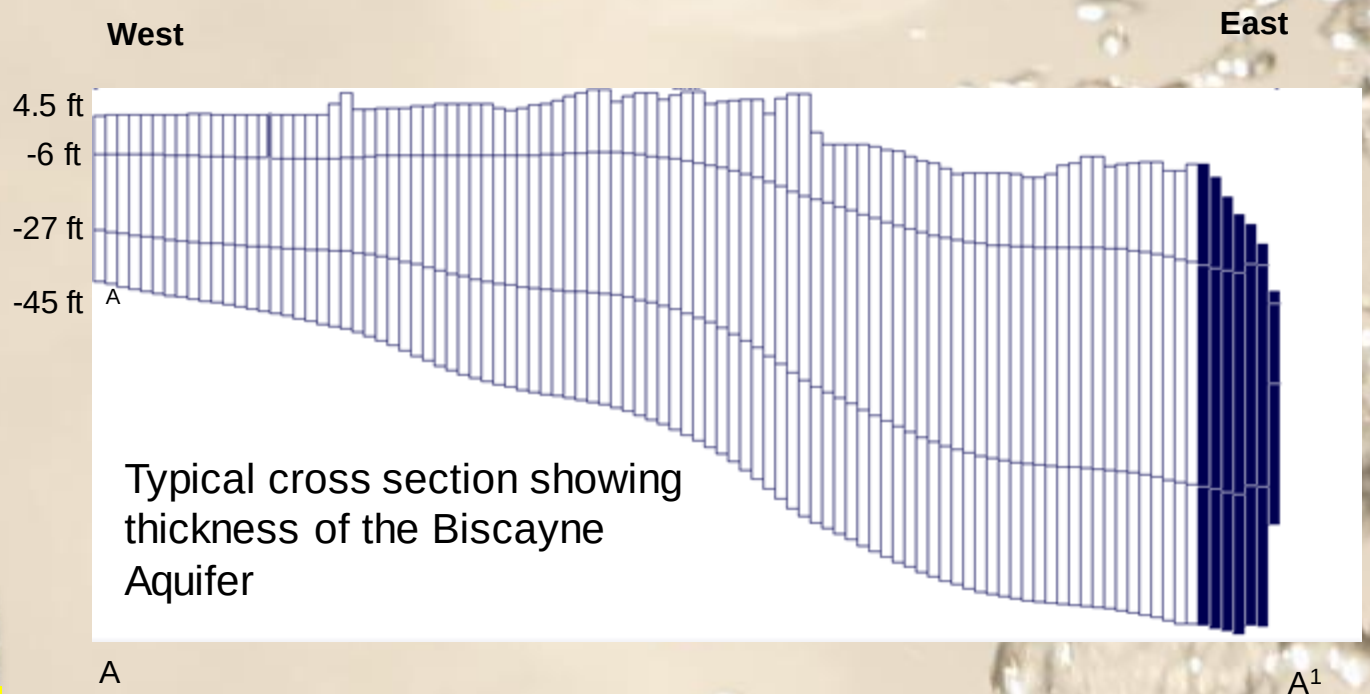


USGS MODFLOW Groundwater Model



Scope and Design Conceptualization





Typical cross section showing thickness of the Biscayne Aquifer

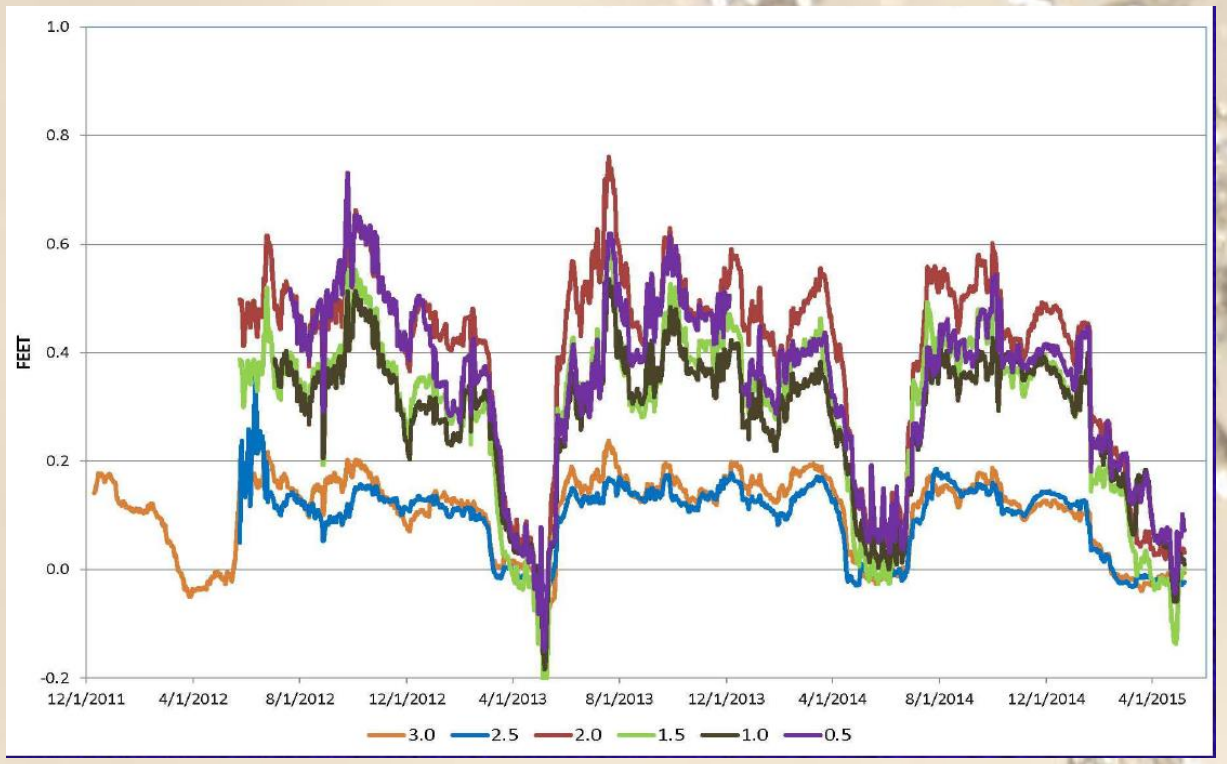
"Partially" penetrating curtain walls appear to best achieve desired outcomes

(Not to scale)

Effective at Achieving Larger Head Difference Across The Seepage Barrier

- Monitoring sites 0.5, 1.0, 1.5, and 2.0 show a difference between 0.3 and 0.6 feet with the seepage barrier.
- Monitoring sites 3.0 and 2.5 (orange and blue) without a barrier show minimal difference in water stages – less than 0.2 ft
- Also demonstrated how ground water continues to move under and around barrier.

Stage Difference With and Without Barrier



Presenter: Walter Wilcox

Refining Models with Observed Data

	No Rockminer wall	2 miles of Rockminer wall		5 miles of Rockminer wall	
Well Pair	Field Data (DBHYDRO) (1996 – 2012)	Field Data (DBHYDRO) (2012 - 2015)	Increase from no wall	Field Data (DBHYDRO) (2015 - 2018)	Increase from 2 mi wall
G3576 & KROME	0.88 ft	1.04 ft	0.16 ft	1.30 ft	0.34 ft
G3272 & G3554	1.27 ft	1.49 ft	0.22 ft	1.95 ft	0.57 ft

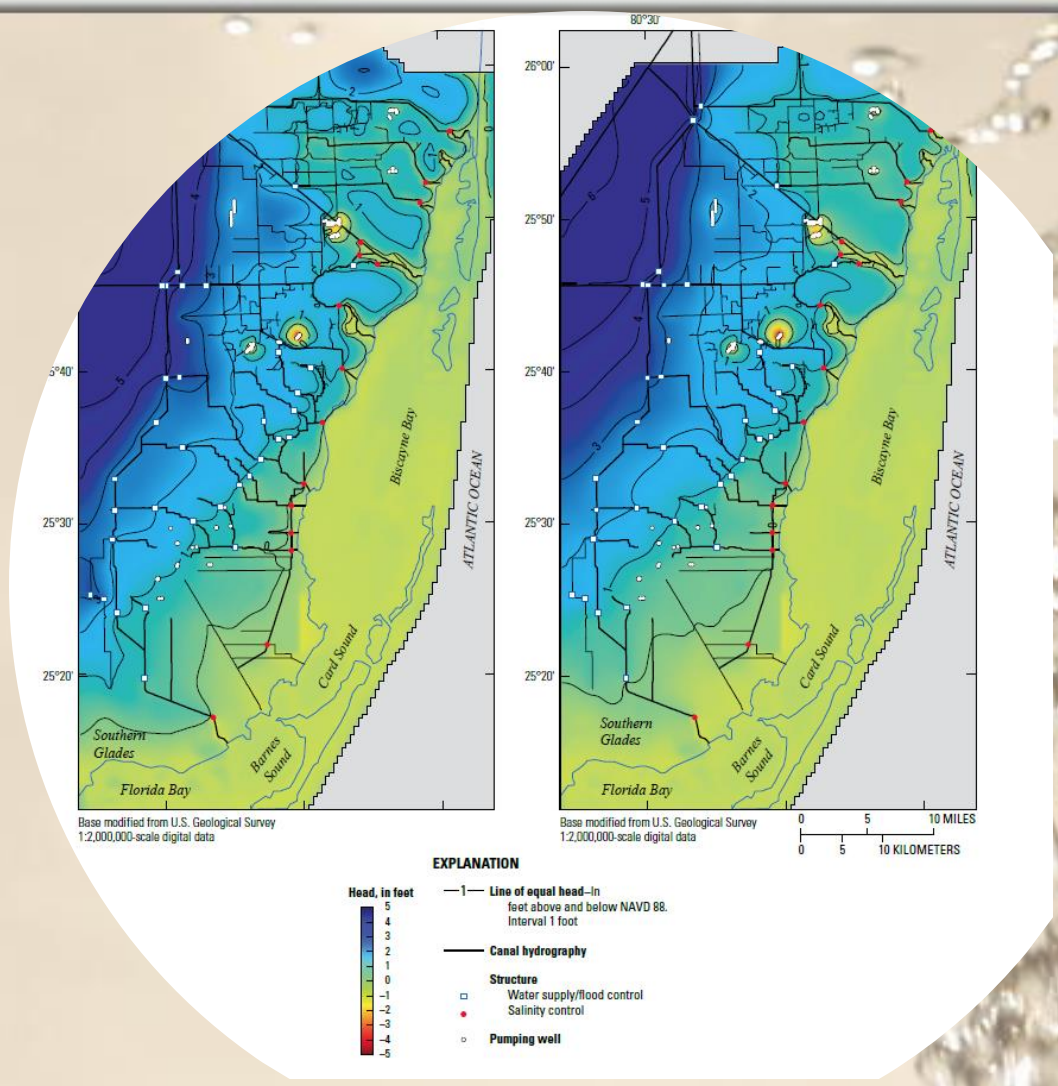
MODFLOW Groundwater Model

Hydrologic Conditions in Urban Miami-Dade County, Florida, and the Effect of Groundwater Pumpage and Increased Sea Level on Canal Leakage and Regional Groundwater Flow

Version 1.2, July 2016

Scientific Investigations Report
2014–5162

U.S. Department of the Interior
& U.S. Geological Survey



Presenter: Walter Wilcox

SDCW: Hydrostratigraphy - Biscayne Aquifer represented as 3 model layers

Hydrostratigraphy of the Biscayne Aquifer

Represented as three model layers

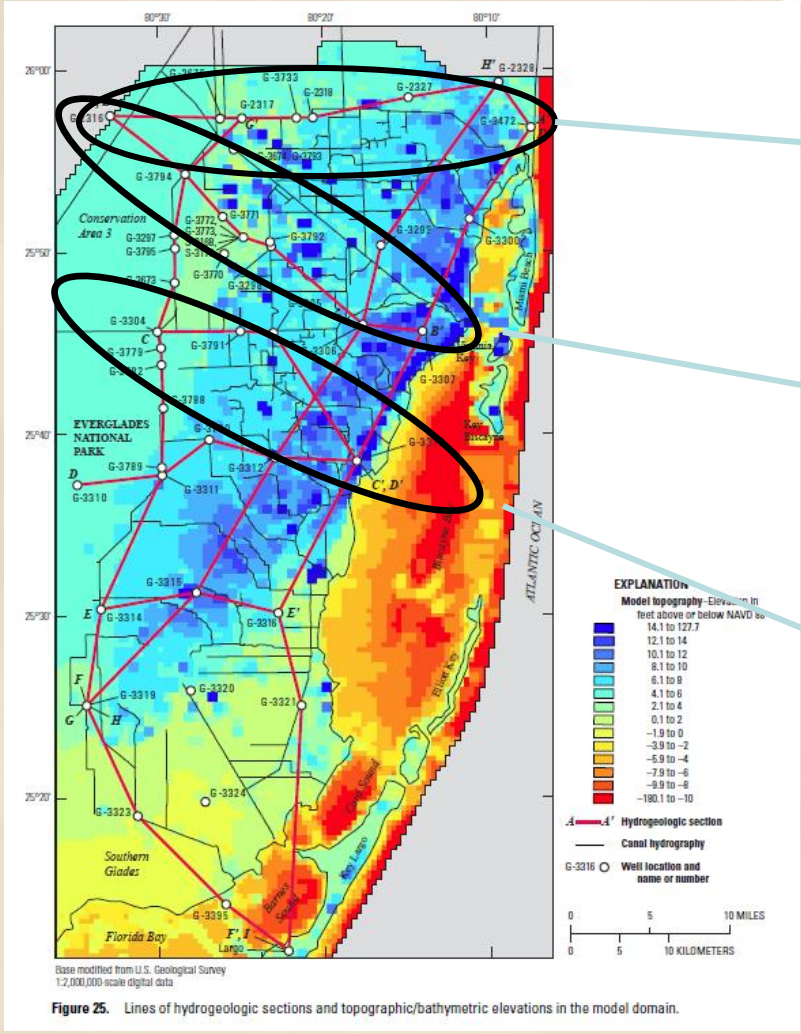


Figure 25. Lines of hydrogeologic sections and topographic/bathymetric elevations in the model domain.

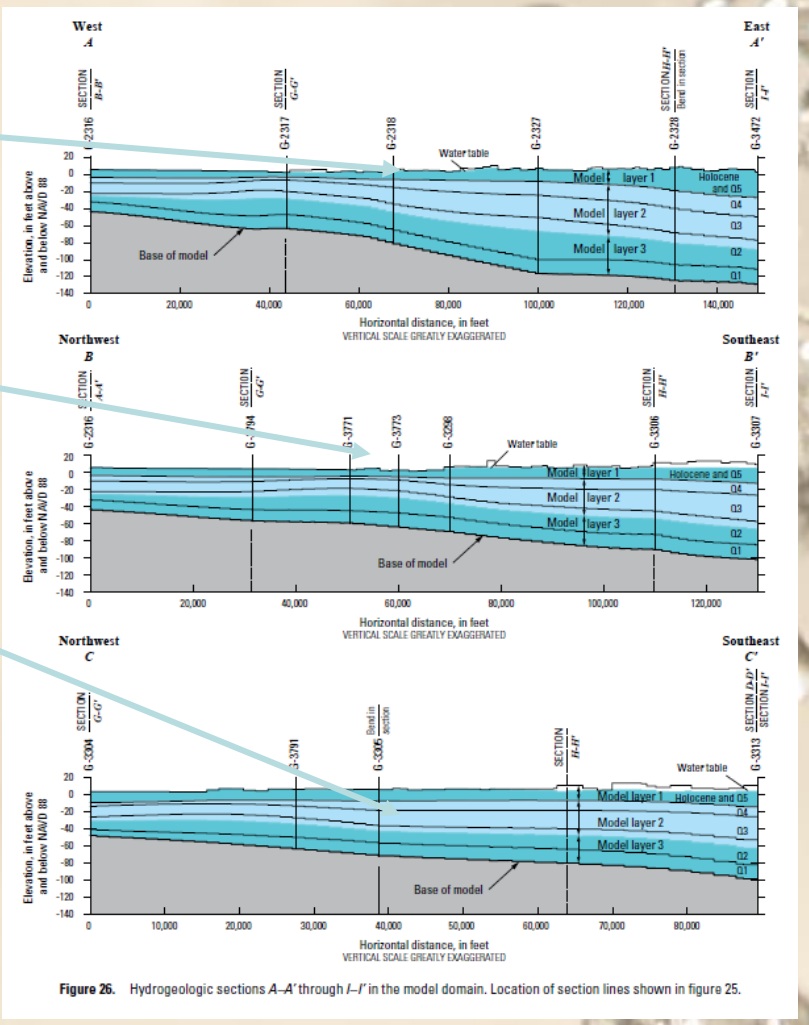
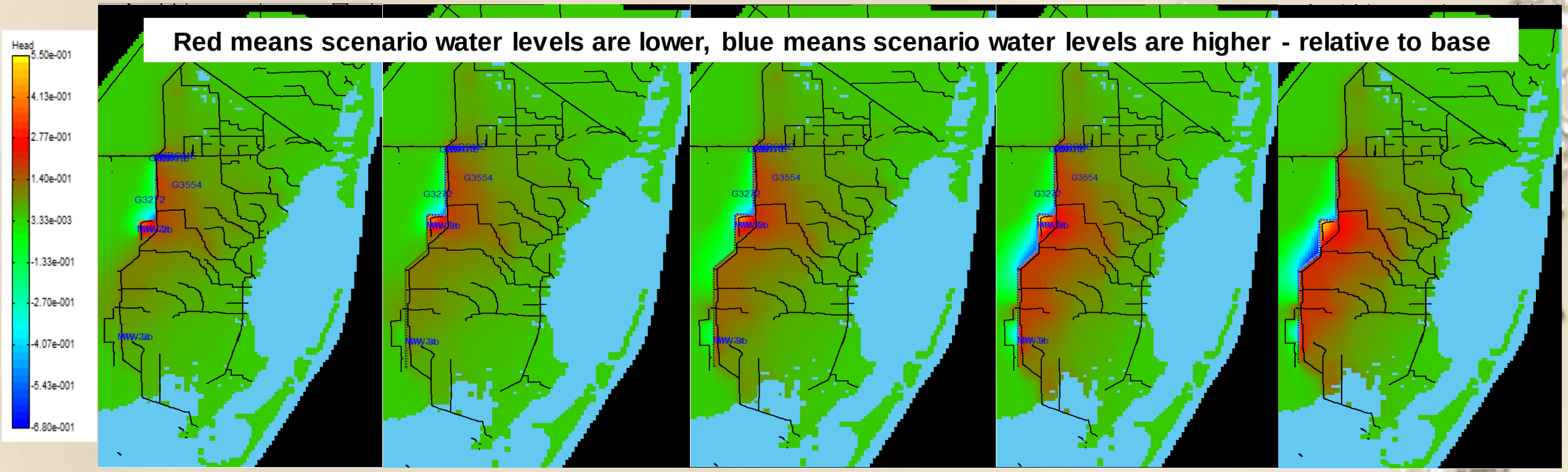


Figure 26. Hydrogeologic sections *A*–*A*′ through *I*–*I*′ in the model domain. Location of section lines shown in figure 25.

Presenter: Walter Wilcox

Example MODFLOW Model Application

SDCW: Comparison of GW Model runs with different wall depths
Difference Maps – shows difference from base (5/1/96, TS 275)



Shallow Wall (3 layers S335-S331, 2 layers S331-S177)

Shallow (3 layers S335-S331, 2 layers same as original, Khkv/2 original in layer 3)

Shallow (3 layers S335-S331, 2 layers same as original, Khkv/10 original in layer 3)

Shallow (3 layers S335-S331, 2 layers same as original, Khkv/100 original in layer 3)

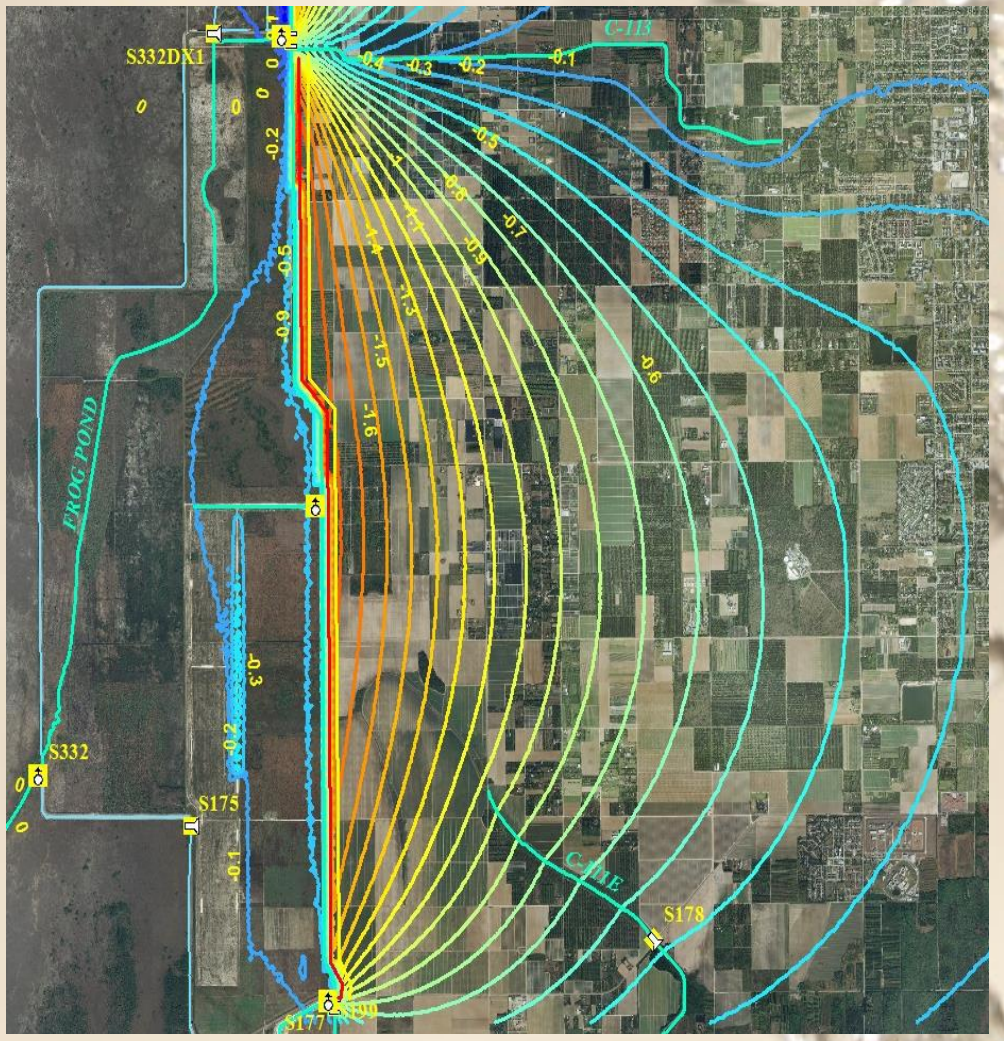
Fully penetrating wall (All 3 layers S335 – S177)

Presenter: Walter Wilcox

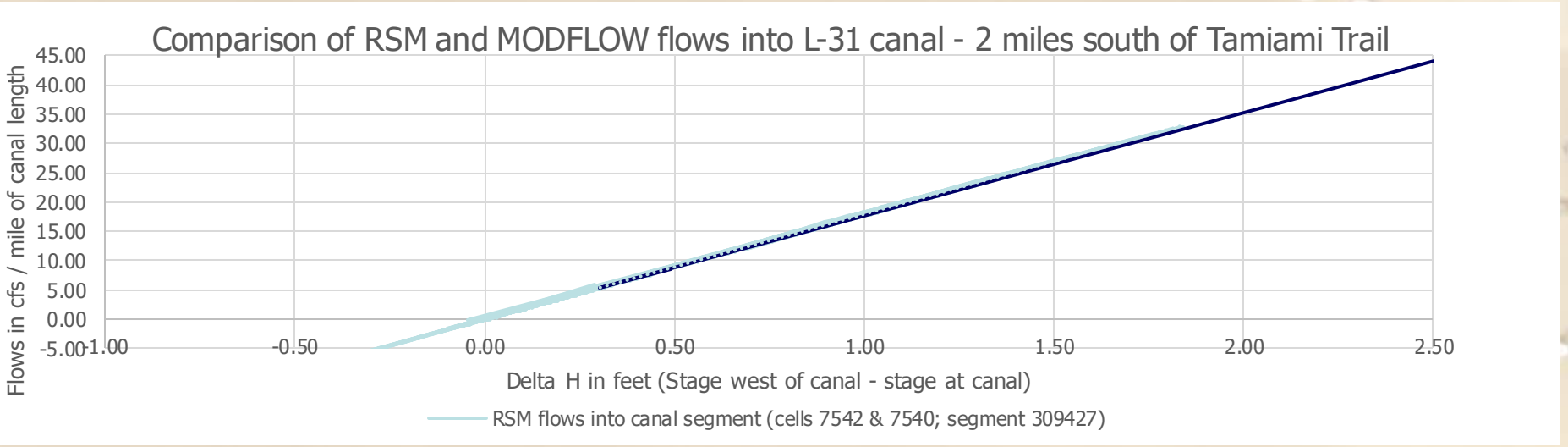
Local Curtain Wall Effects

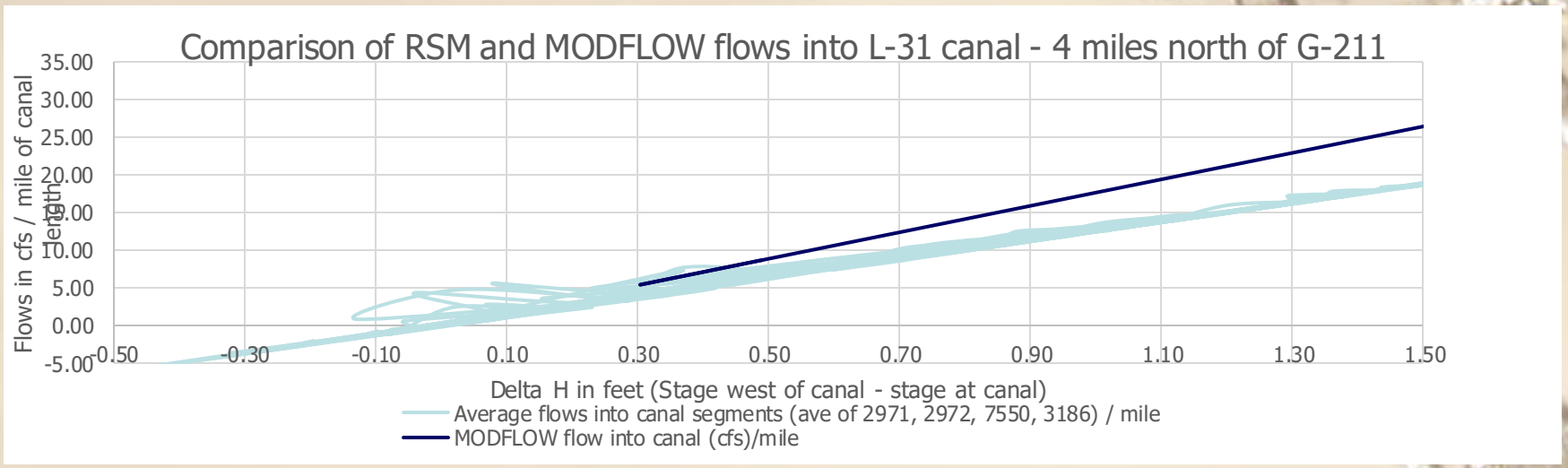
Use of MODFLOW groundwater model and other tools (e.g. GFLOW analytical element method) help to examine design details and local effects such as movement around the wall edge.

These outcomes also help to improve the RSM model to improve estimates of regional effects.



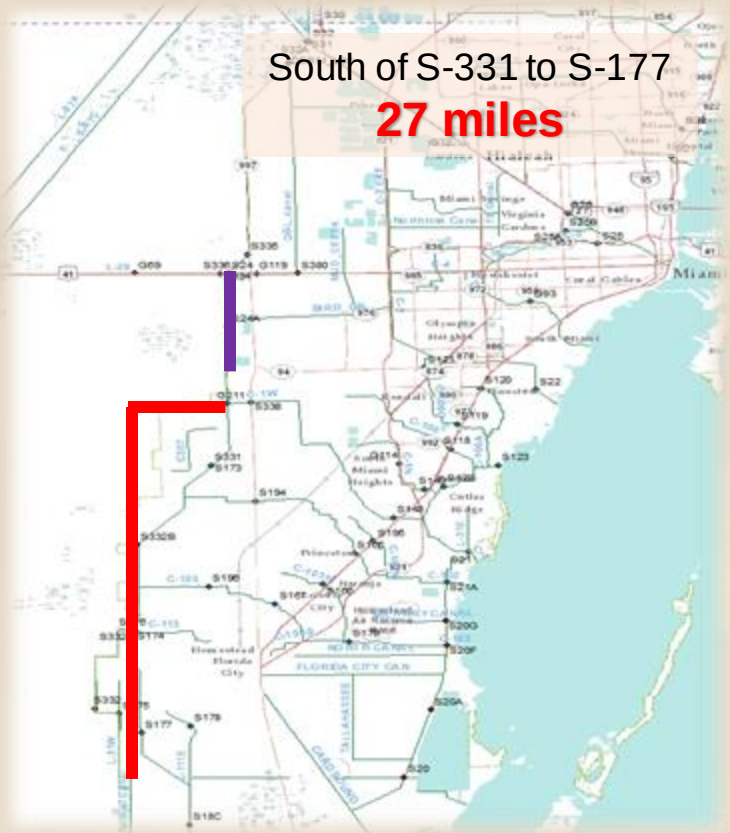
Refining Regional Models



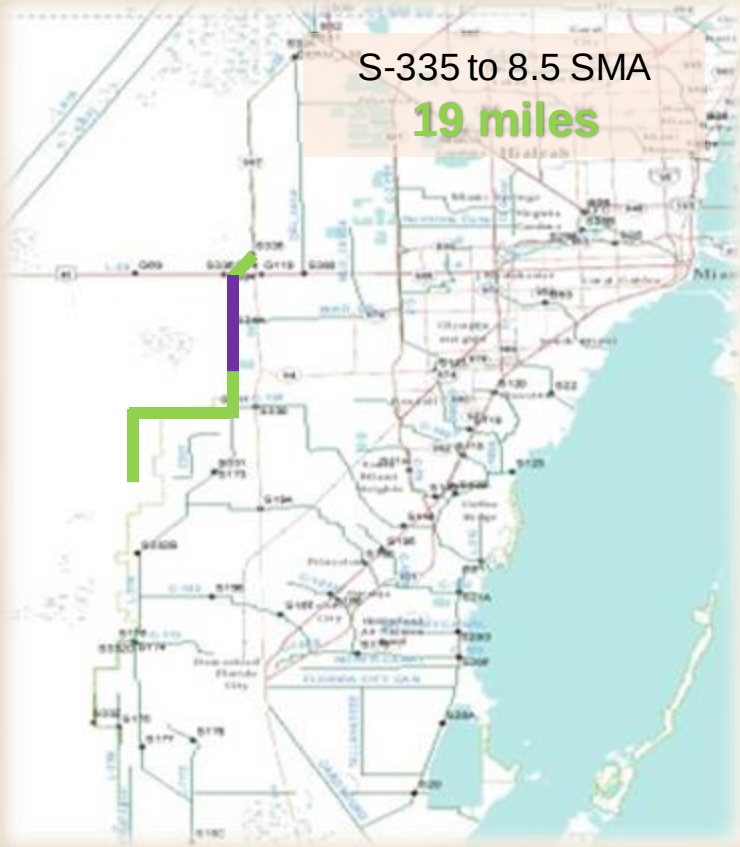


Initial Curtain Wall Configurations Examined

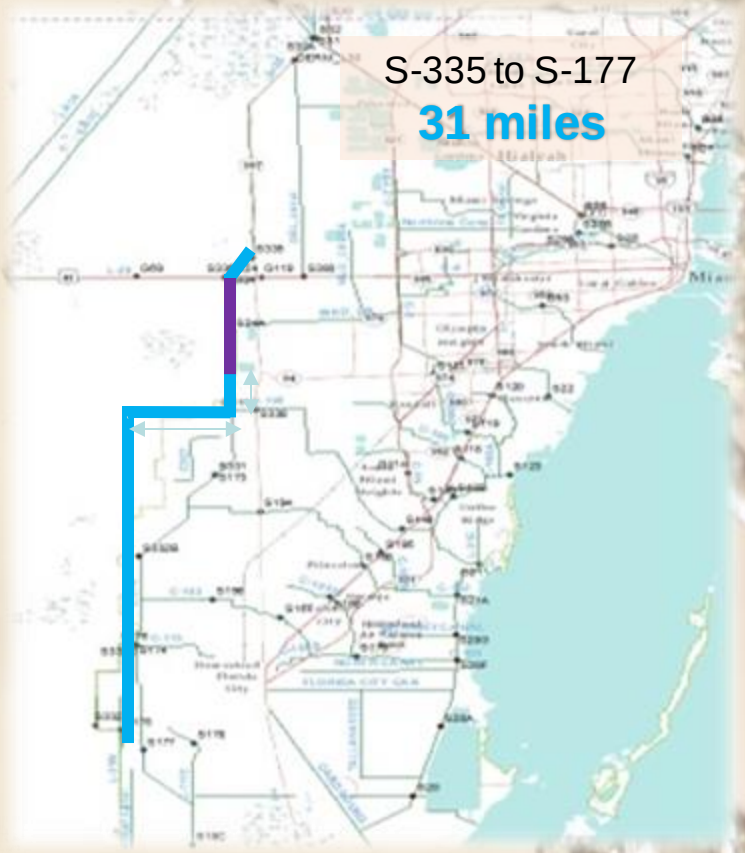
South: including portion of 8.5 SMA



North: Stops after 8.5 SMA



Full: Full extent



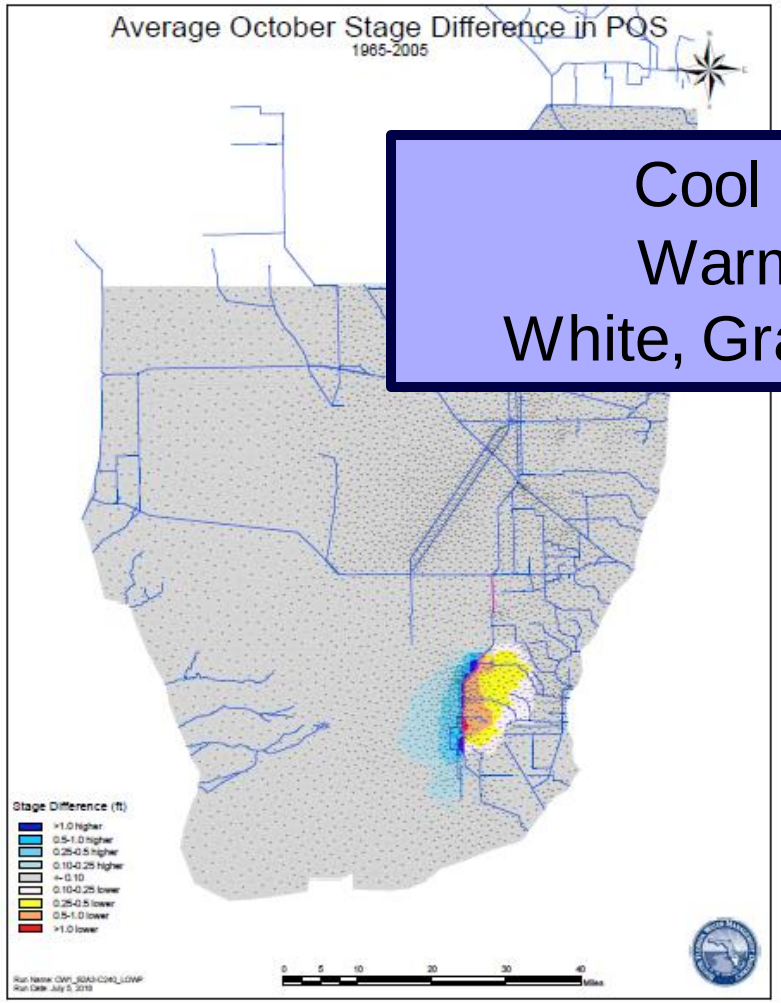
Presenter: Walter Wilcox

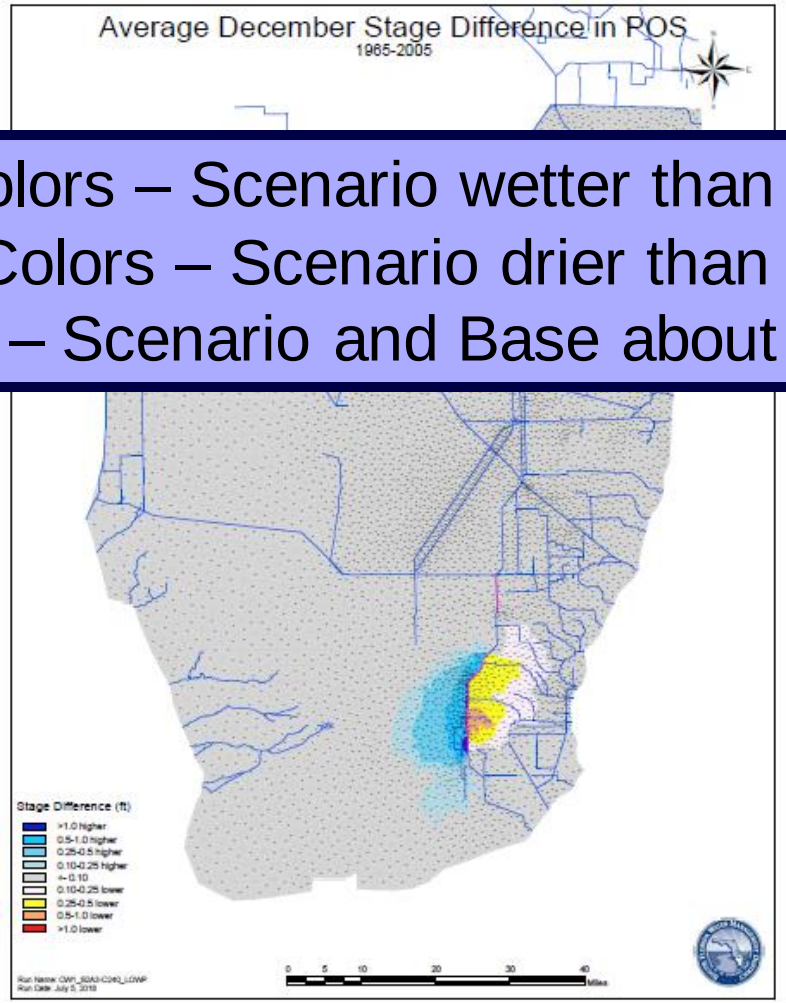
Performance Metrics Evaluated

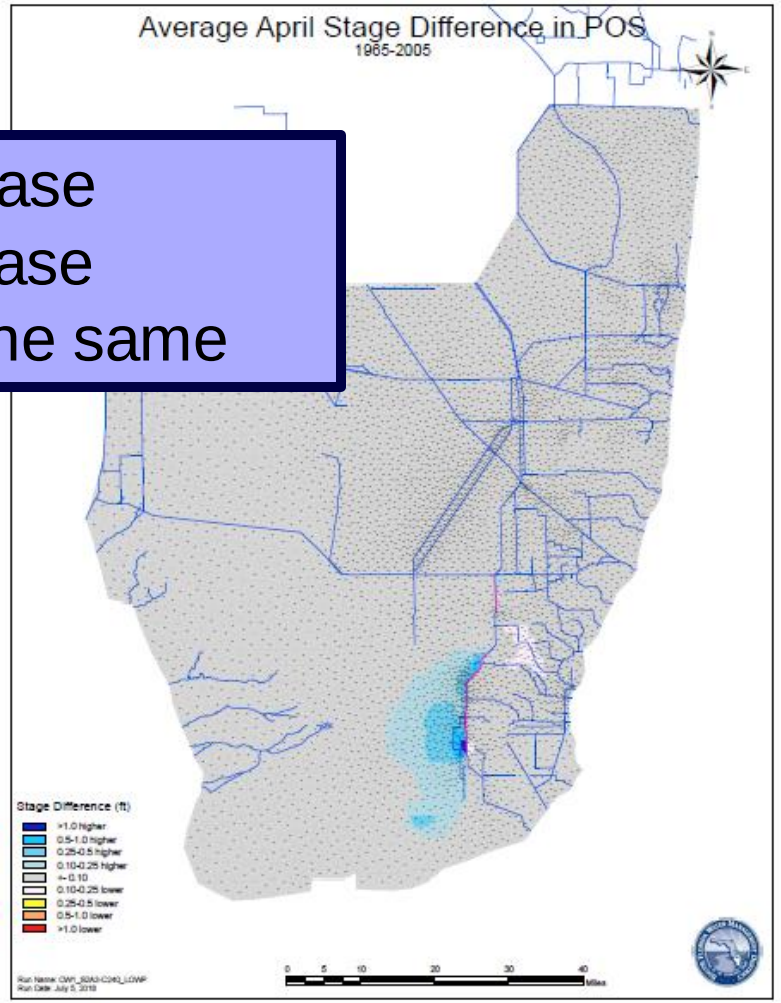
Evaluated typical suite of planning performance metrics:

- Seasonal water table reduction in developed areas
- Seasonal and annual depths and overland flow improvements
- Water supply risk
- Far-field impacts
  - Flows to Taylor Slough (eastern Florida Bay)
  - Flows to Biscayne Bay

Visual Key to Difference Maps



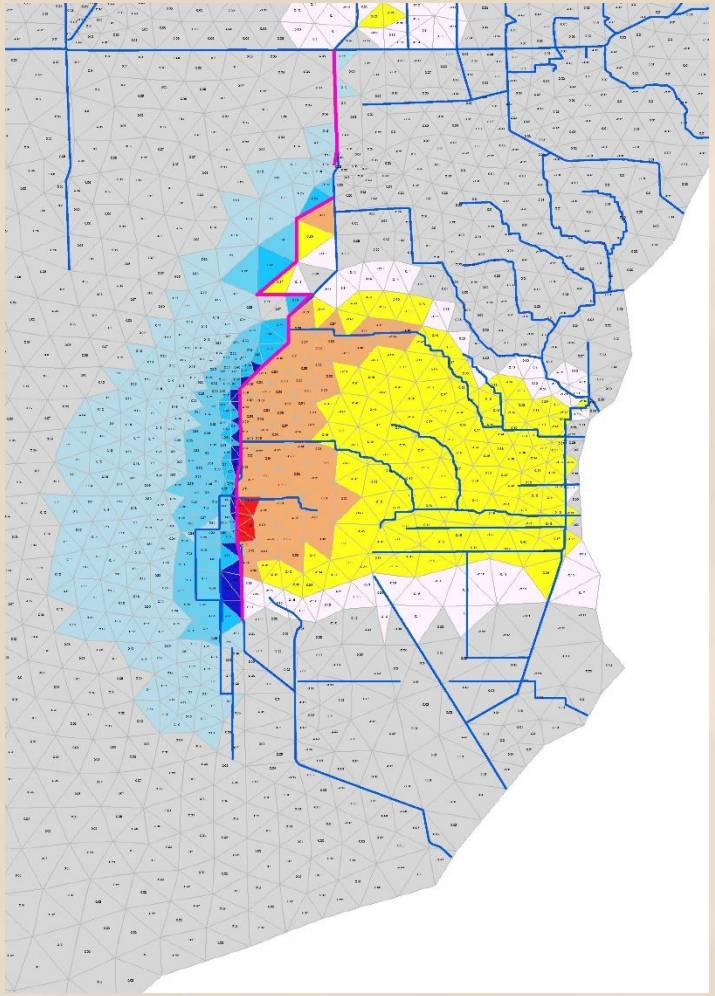




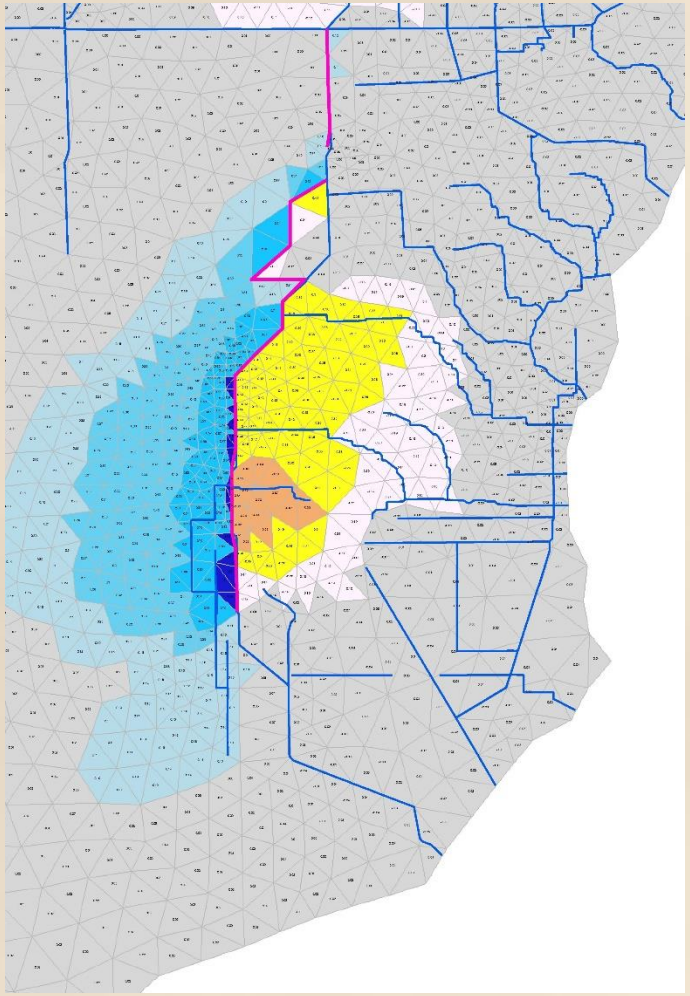
Cool Colors – Scenario wetter than base
Warm Colors – Scenario drier than base
White, Gray – Scenario and Base about the same

South Wall Scenario
Difference maps – with and without curtain wall

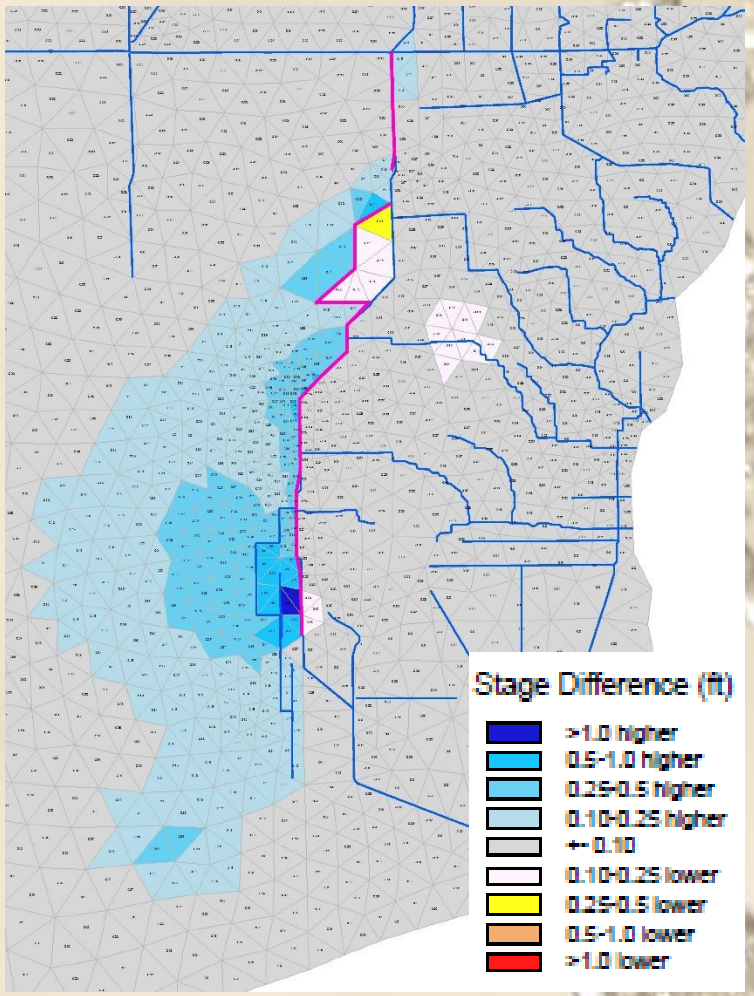
Avg OCTOBER Stage Difference
1965-2005



Avg DECEMBER Stage Difference
1965-2005



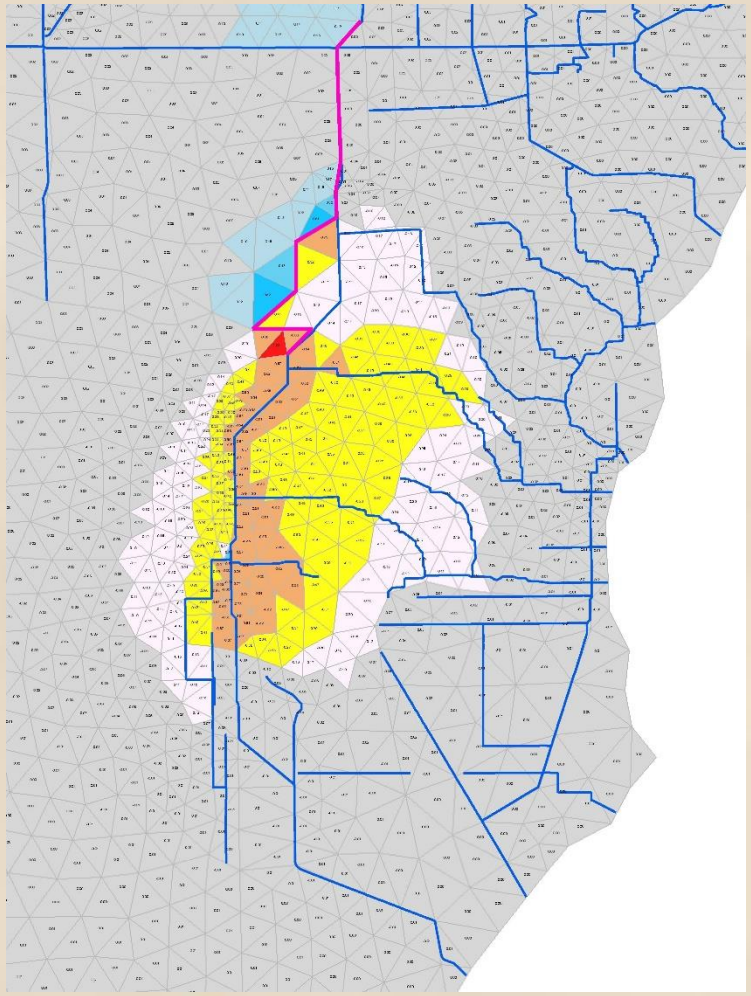
Avg APRIL Stage Difference
1965-2005



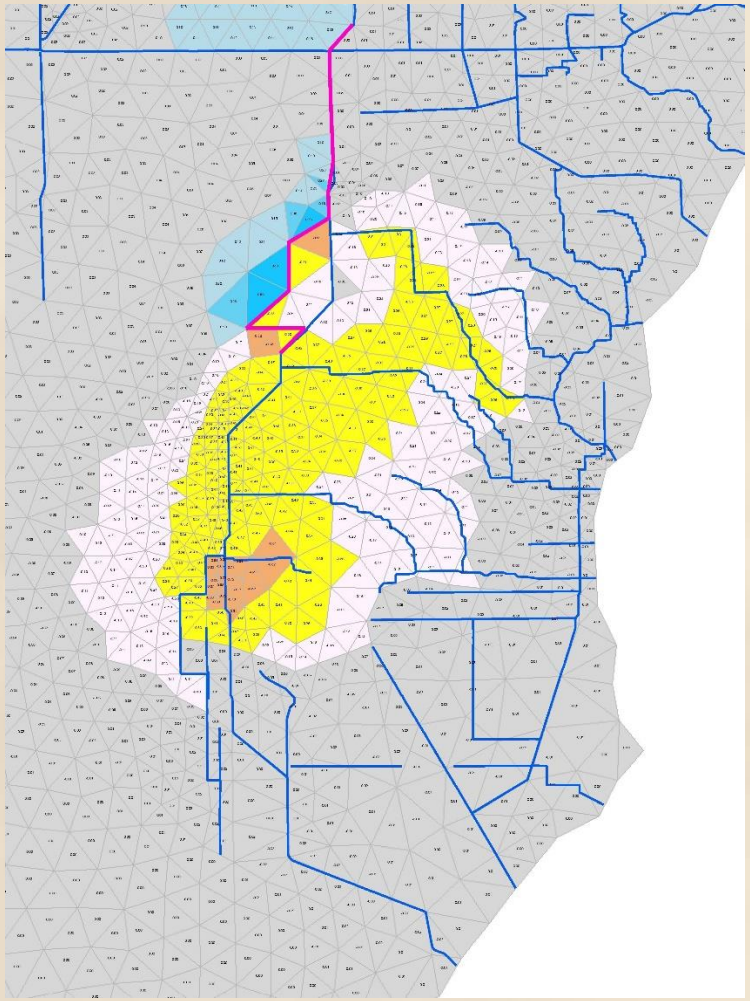
Presenter: Walter Wilcox

North Wall Scenario
Difference maps – with and without curtain wall

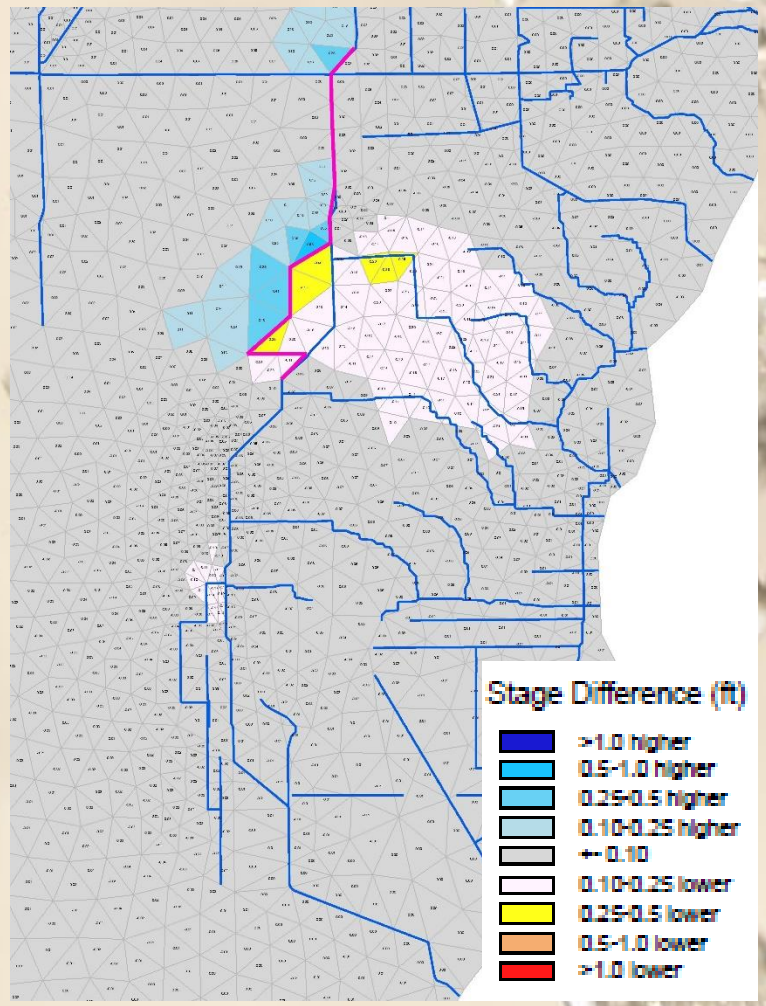
Avg OCTOBER Stage Difference
1965-2005



Avg DECEMBER Stage Difference
1965-2005



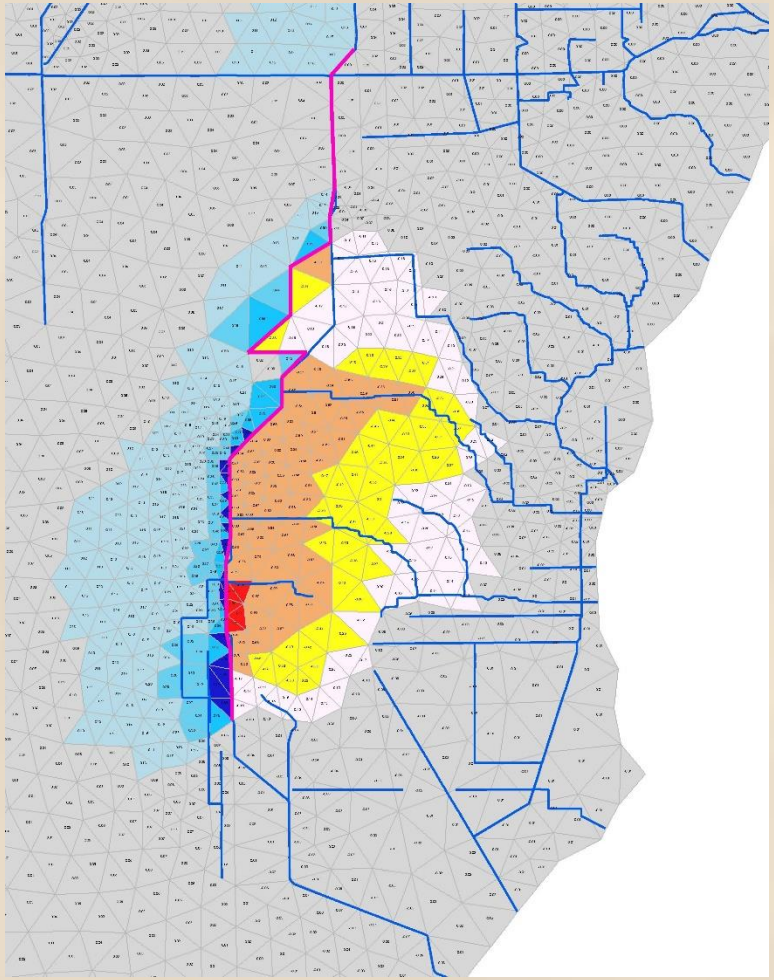
Avg APRIL Stage Difference
1965-2005



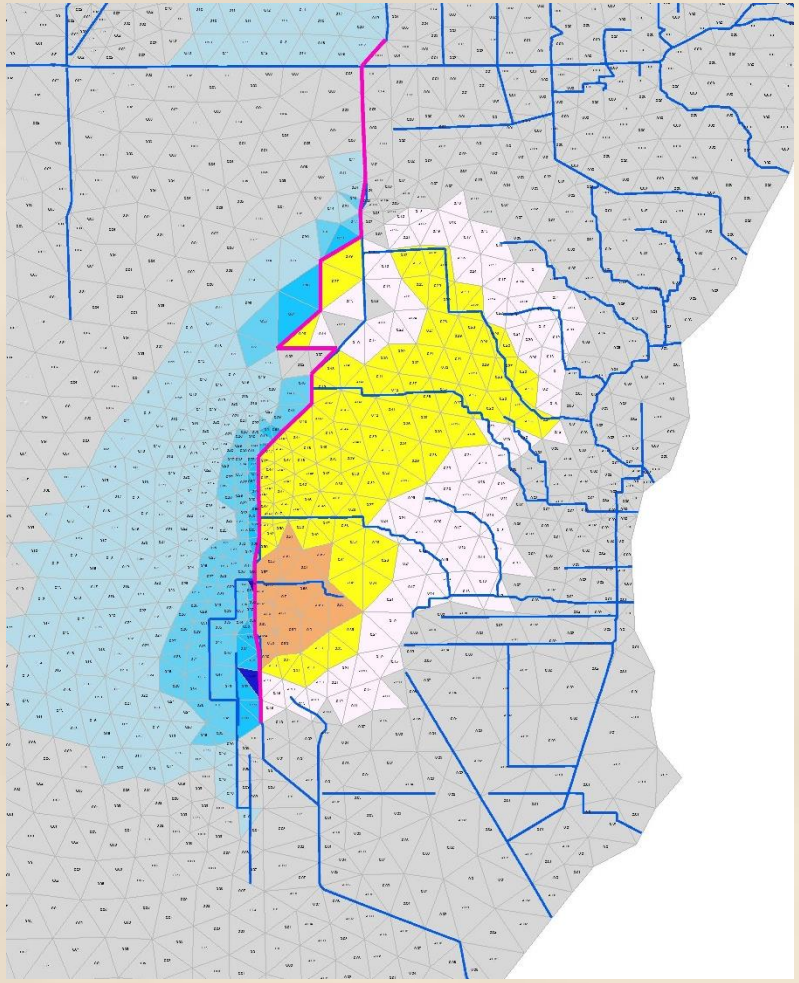
Presenter: Walter Wilcox

Full Wall scenario
Difference maps – with and without curtain wall

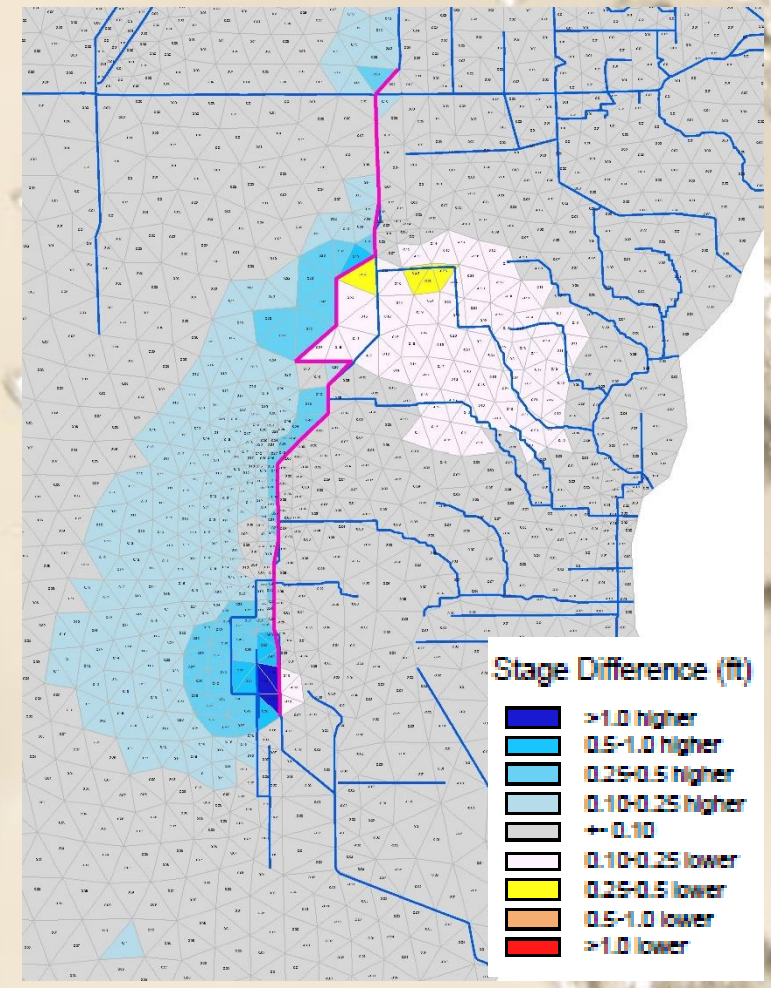
Avg OCTOBER Stage Difference
1965-2005



Avg DECEMBER Stage Difference
1965-2005



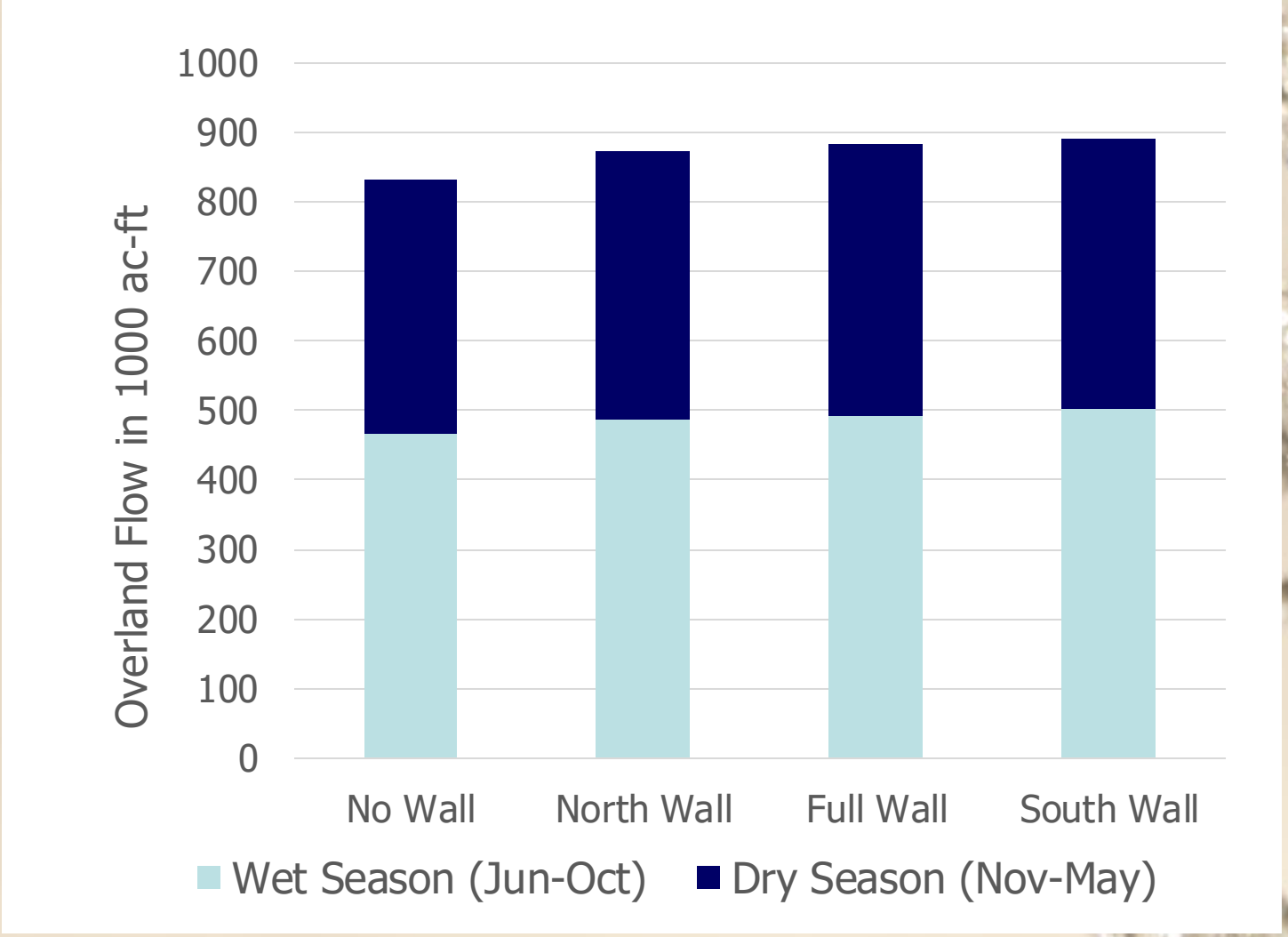
Avg APRIL Stage Difference
1965-2005



Presenter: Walter Wilcox

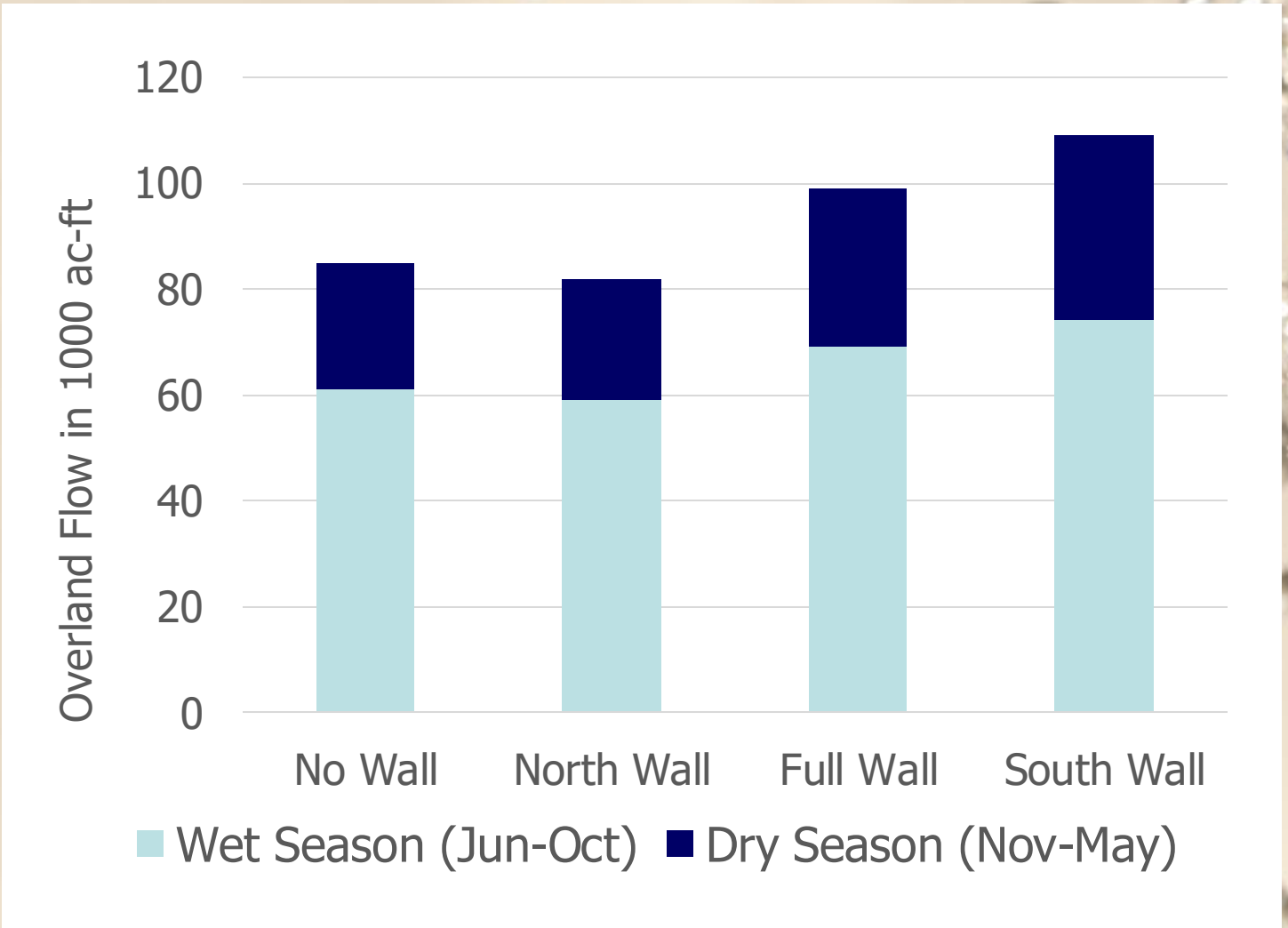
Flows to Shark River Slough

- Average Annual Overland Flow across Shark River Slough
- More flows stay in natural areas with all curtain wall configurations



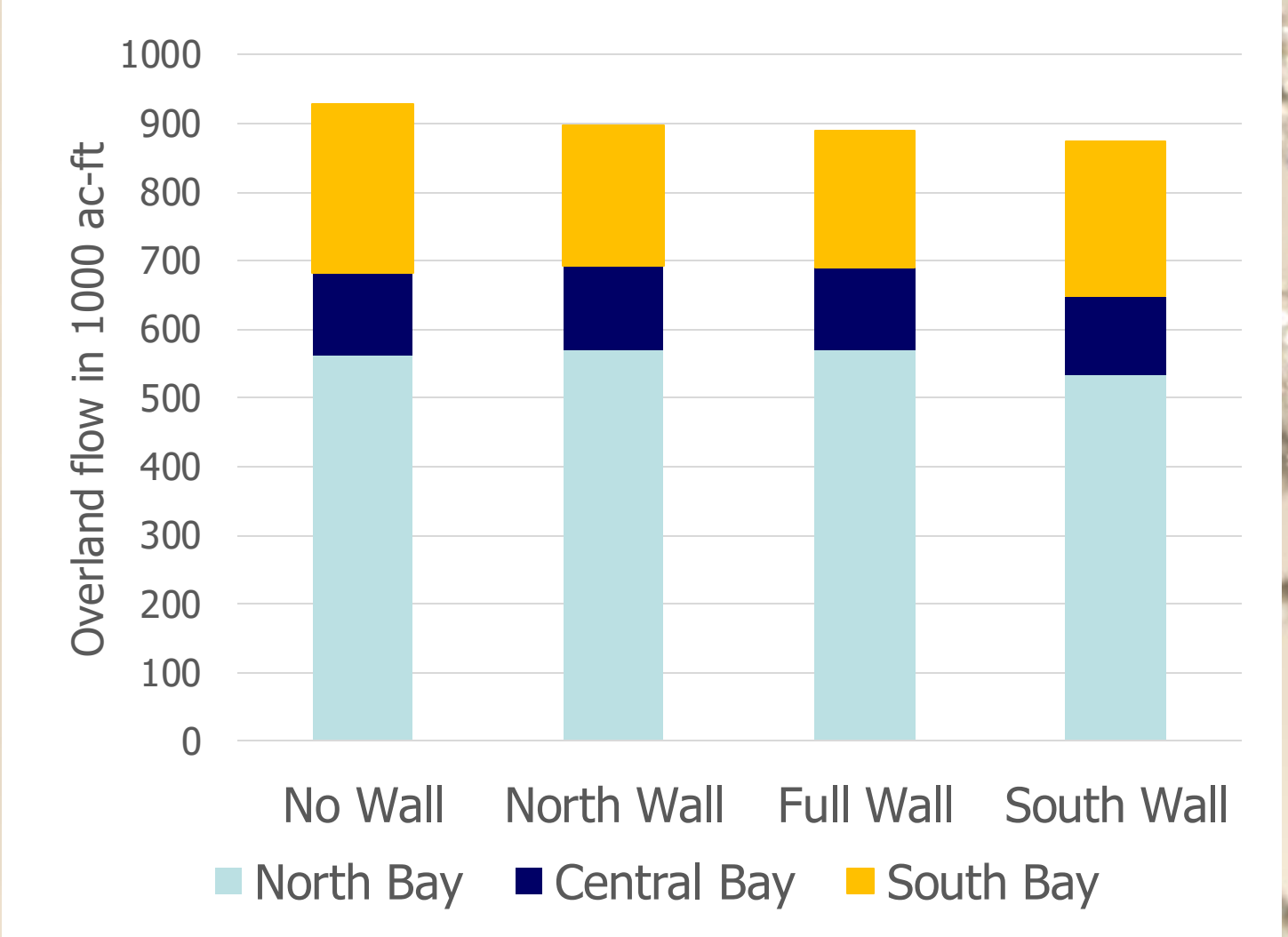
Flows to Taylor Slough

- Average Annual Overland Flow across Taylor Slough (flow towards Eastern Florida Bay)
- Flows to Taylor Slough improve with Full and South curtain walls when seepage and/or regional flows into the SDCS continue
- Maintaining connection near Rocky Glades (S331) is key

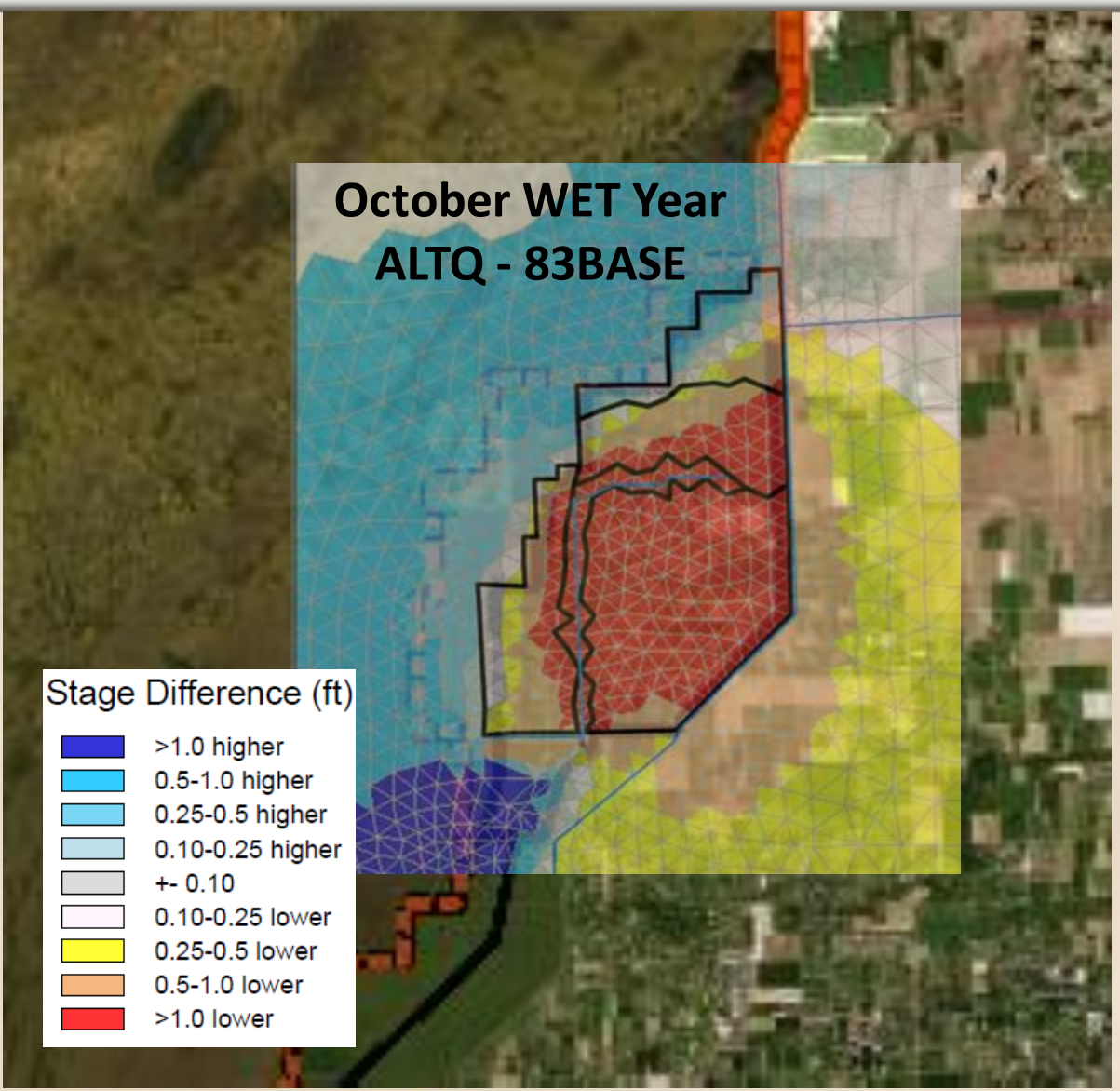


Flows to Biscayne Bay

- Successfully intersecting and redirecting flows back into ENP reduces availability of regional water to Biscayne Bay
- To ensure flows to Biscayne Bay continue, ongoing studies and future opportunities need to be vigilantly explored



COP Operations and Performance at 8.5 SMA



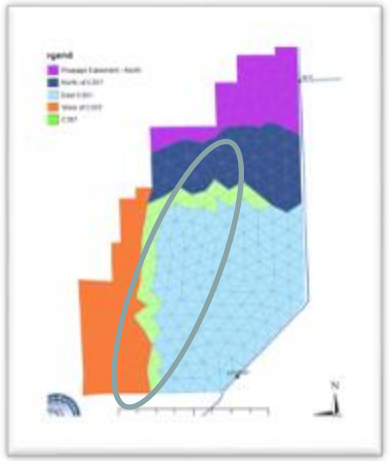
To operate the current system

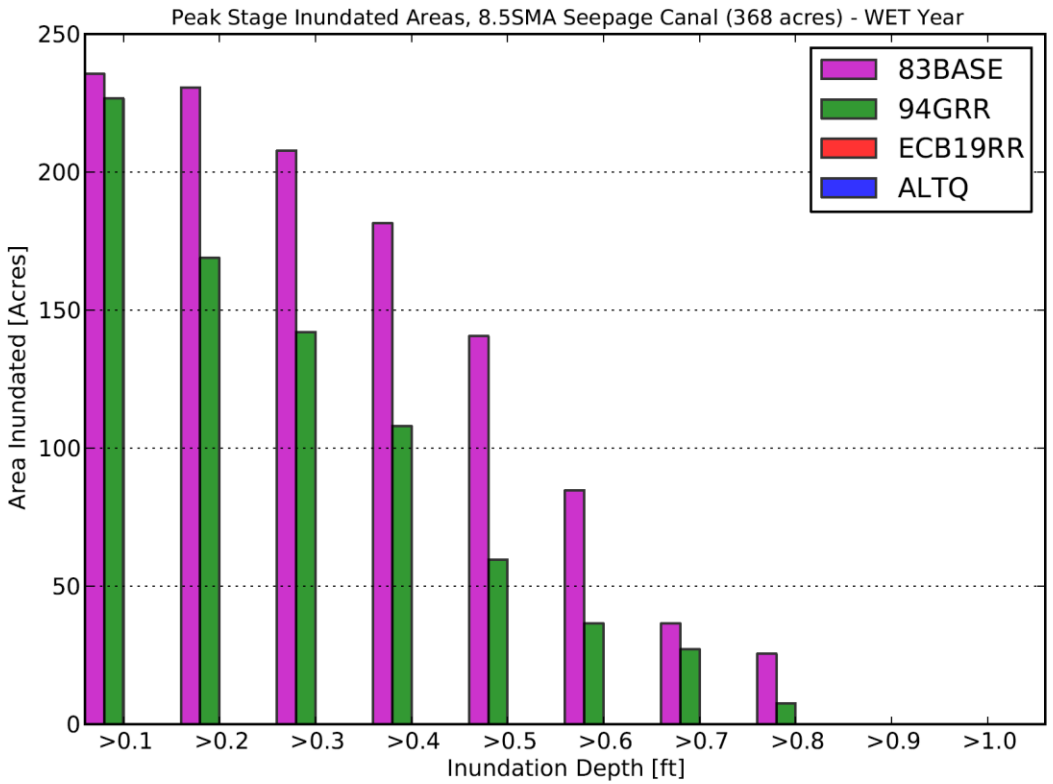
- COP compared flooding metrics in 8.5 SMA between current conditions and conditions prior to implementation of MWD (1983)
- Looked at conditions in a wet, average or dry year

Presenter: Walter Wilcox

COP Operations and Performance Summary

8.5 SMA Area Inundated Area Near Seepage Canal WET WATER YEAR (May05 – Apr06)





- COP able to achieve goal of restoration at ENP without making 8.5 SMA flooding worse at a regional scale.
- At a sub-regional scale, some areas got wetter with restoration while some got better
- Important note, COP evaluation was for L-29 elevation up to 8.3 feet NGVD raised to 8.5 feet NGVD for up to 90 days in a water year
- With full restoration and L-29 at 9.7 feet NGVD considerations for 8.5 SMA may become limiting

Presenter: Walter Wilcox

Key Findings (So Far)

- These configurations show the potential of a well-designed curtain wall to maintain or improve flood protection to the residential and agricultural lands in South Dade allowing for restoration flows from Water Conservation Area 3 to be sent to and retained in Everglades National Park and Florida Bay
- Flood control with passive curtain walls must be paired with operations to ensure desirable flows continue to Biscayne Bay and for Water Supply
- Design of curtain wall and operations that allow some flows through S-331 South will improve flows through Taylor Slough to eastern Florida Bay
- Generally positive reception in public discussion (e.g., at WRAC) highlighting the need for further investigation and discussion

QUESTIONS?

Submit questions or comments through Zoom Q & A feature

Experience and Expectations for a South Dade Curtain Wall

William Baker, P.E., Miami-Dade Limestone Products Association

Charles LaPradd, Agriculture Manager, Miami-Dade County

Eric Stabenau, Physical Resources Branch Chief, National Park Service

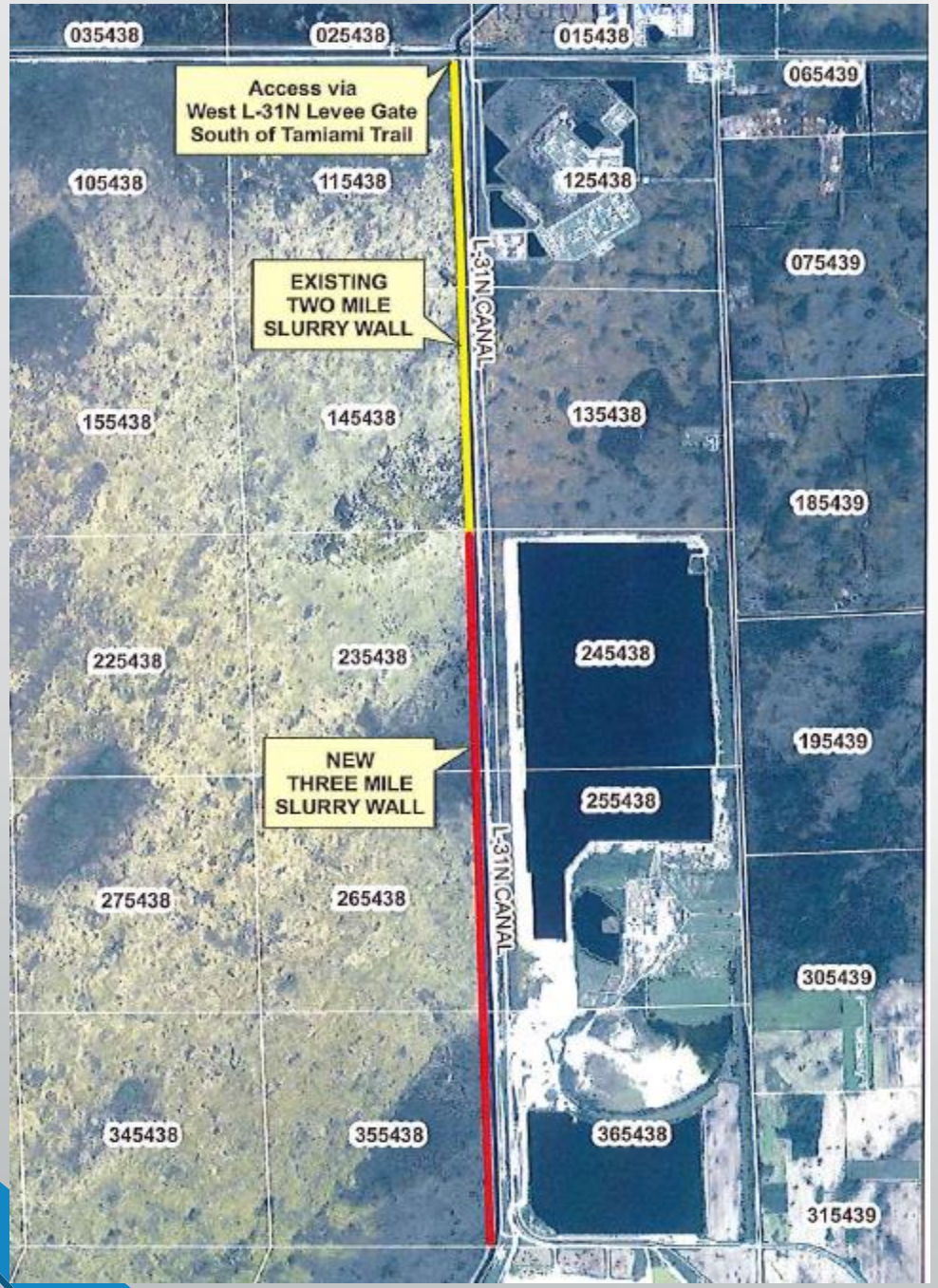
Jason Engle, Chief, Water Resources Engineering Branch, Jacksonville, USACE

William Baker, P.E.

Seepage Walls in the South Dade Region

Miami Dade Limestone Products Association at L-31N for Everglades Seepage

SDI Aggregates, Inc. to Prevent Salt Front Intrusion



MDLPA Wetland Mitigation Project for Lake Belt Mining Impacts

west side of L-31N Canal between Everglades National Park and canal

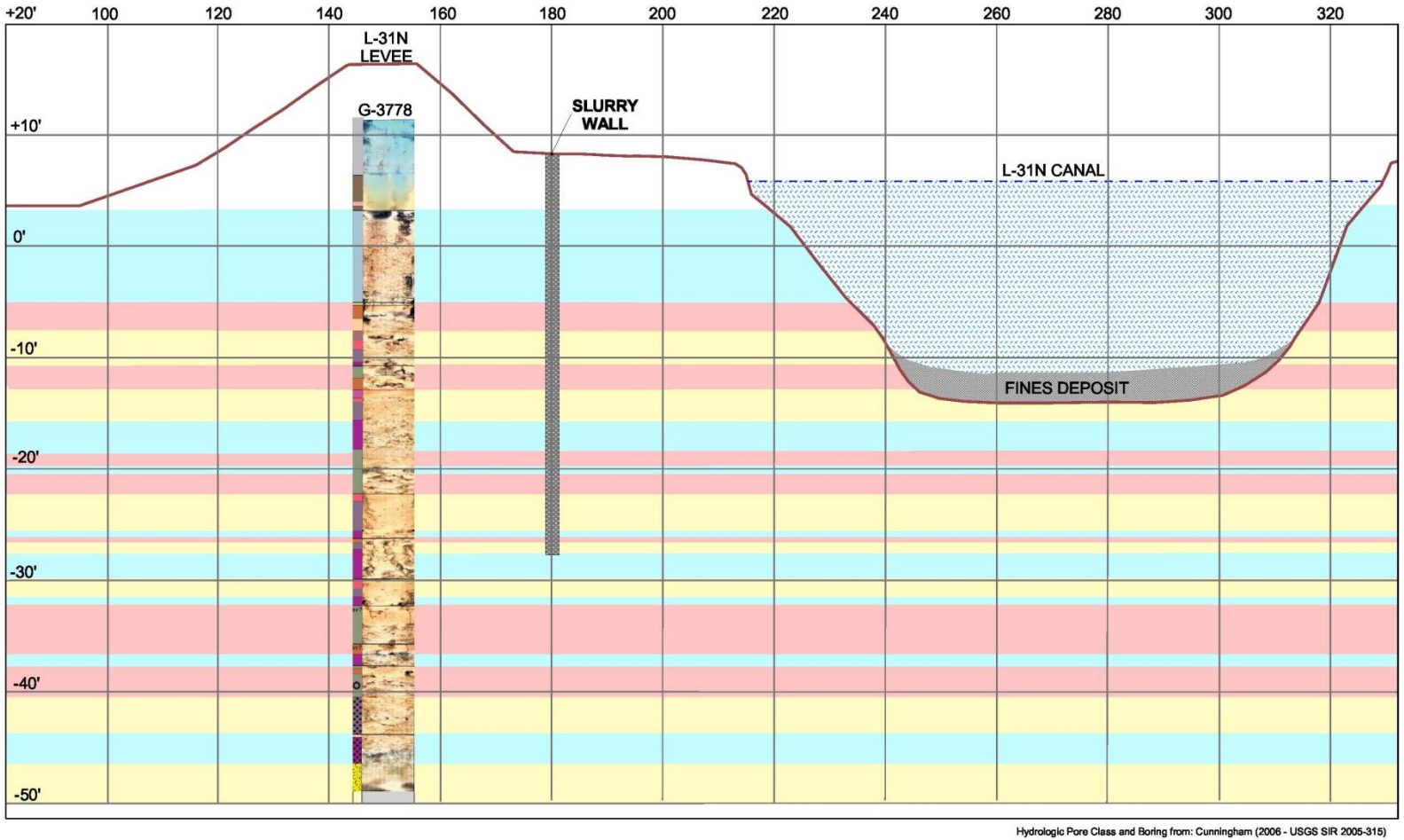
2012: 2 miles completed

2016: additional 3 miles

35 feet deep,
cement and bentonite slurry seepage barrier

Presenter: William Baker, P.E.

Schematic of Barrier Installation: 35 feet deep; 5 miles long



Presenter: William Baker, P.E.

L-31N Construction Process

- Trencher cuts 32" wide by 35' deep trench moving from south to north ahead of slurry placement
- Trench is backfilled with cuttings to stabilize the trench and allow for slurry to be placed in daily sections
- Cuttings are excavated and replaced with slurry which is pumped from a batch plant on east side of the canal
- New sections are tied into previous day's section by ~ 5'
- Batch plant is moved north in 3,000' increments as construction proceeds to minimize pumping distance

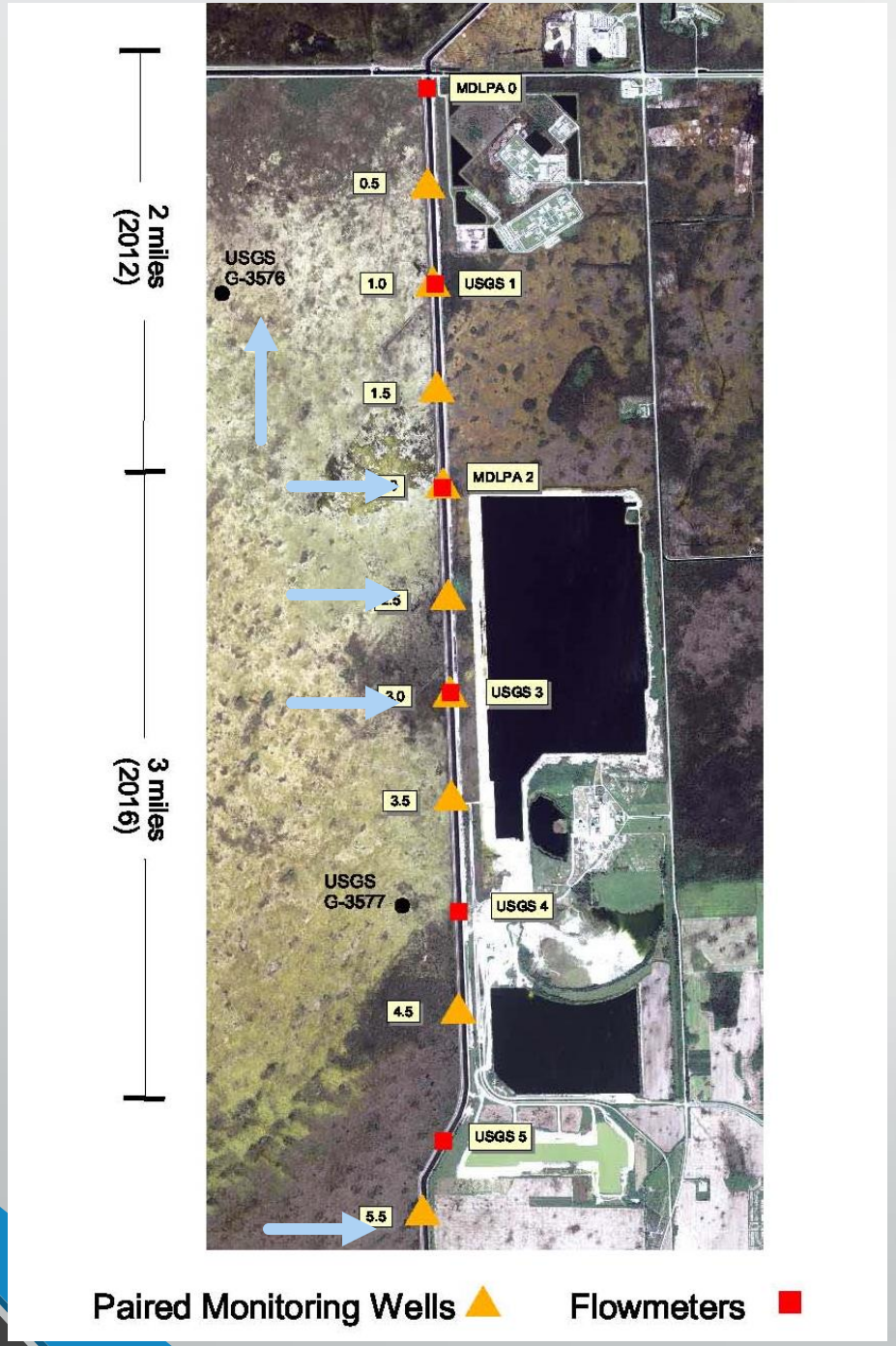
Presenter: William Baker, P.E.

Trenching

Slurry Placement

Presenter: William Baker, P.E.

L-31N Updated Monitoring Program



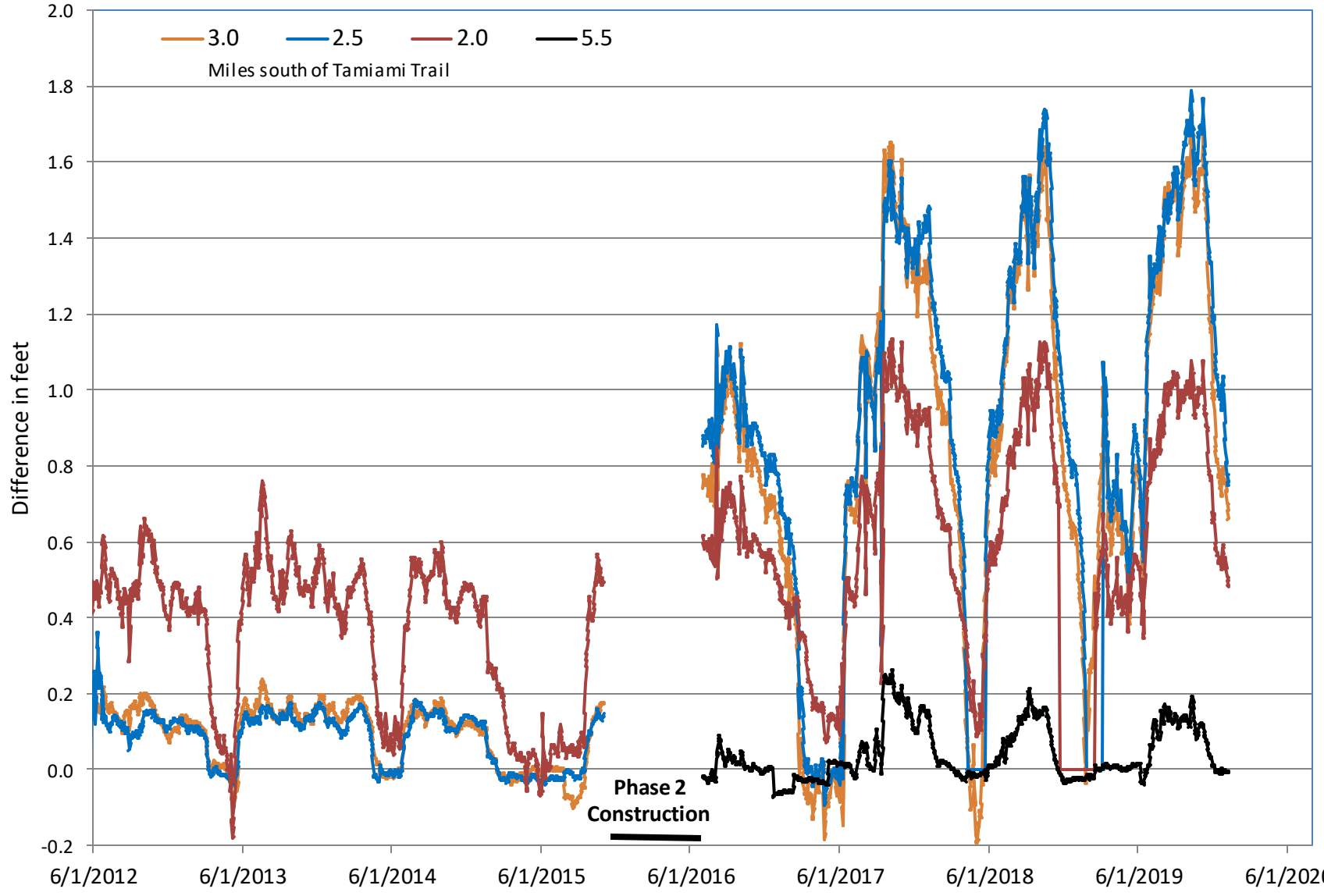
- 3 years of monitoring after completion of 2-mile barrier
  - plus
- 4 years of monitoring after completion of 5-mile barrier

Presenter: William Baker, P.E.

Groundwater Stage Difference Across Barrier

(Difference between paired water table wells upstream and downstream of the barrier at each specified location)

The northern 2 miles of barrier were completed in 2012. The remaining 3 miles were completed in April 2016.



Presenter: William Baker, P.E.

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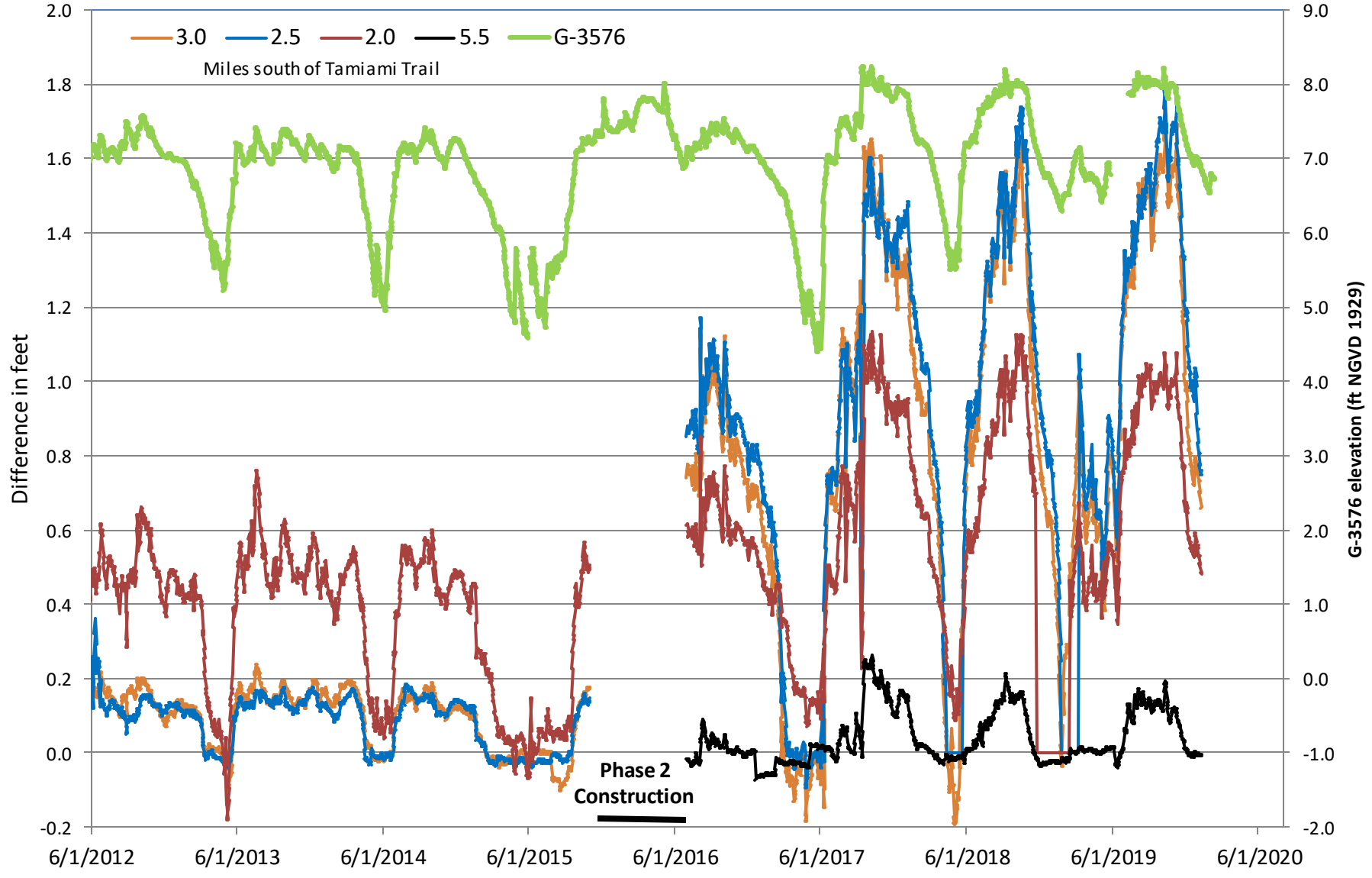
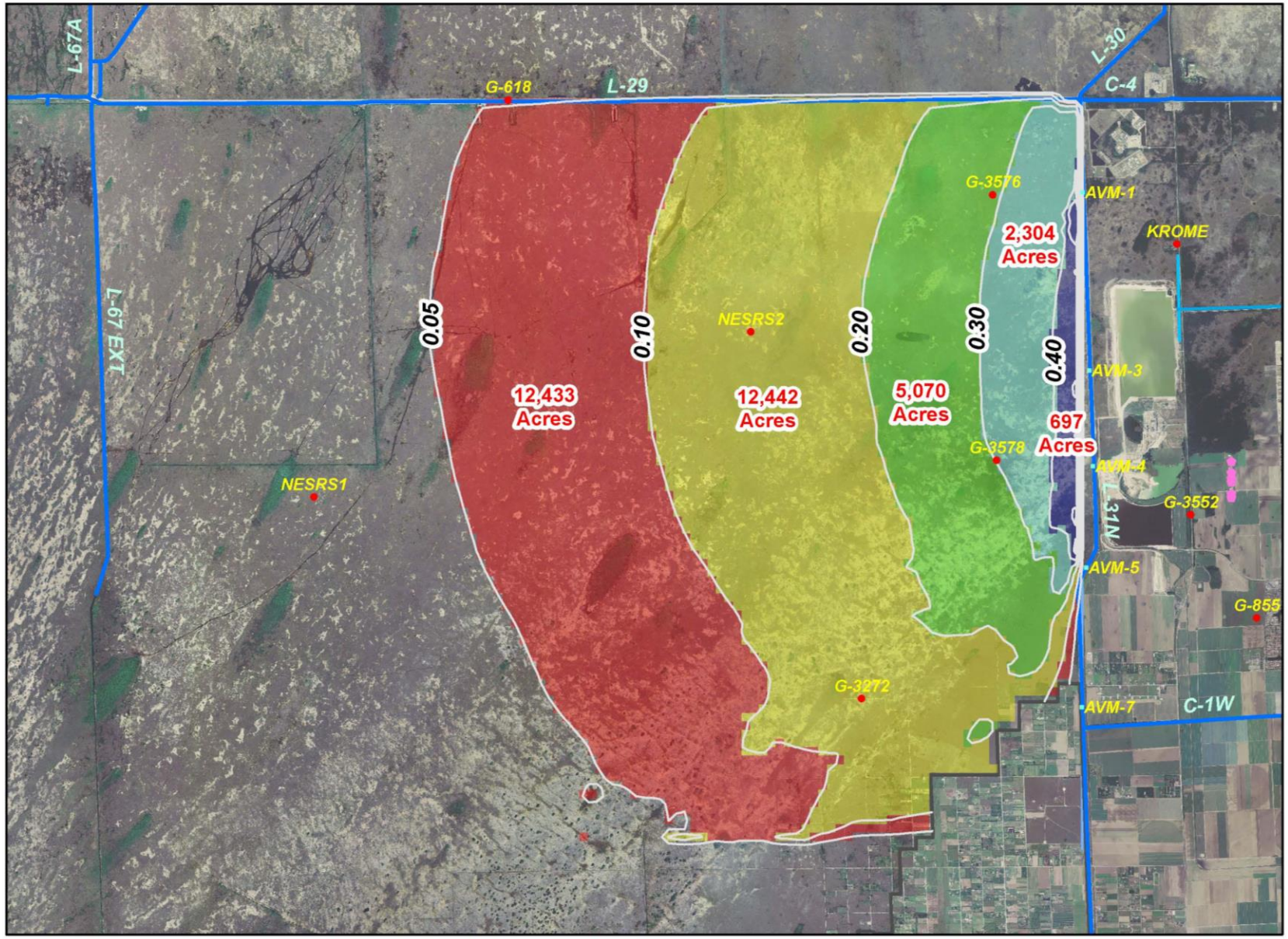


Presenter: William Baker, P.E.



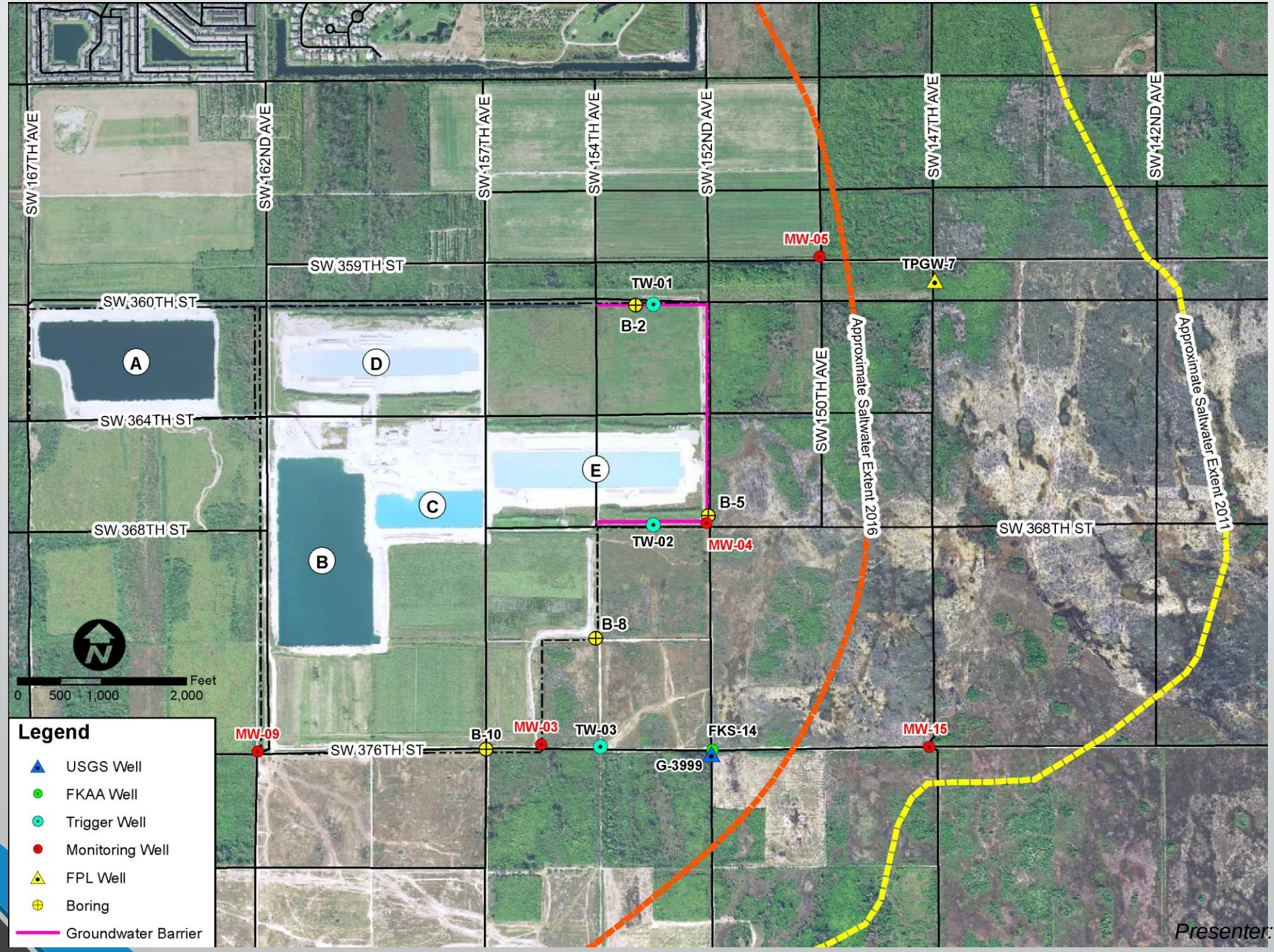
Effect of a 5-Mile Barrier Wall on Groundwater Levels Inside the ENP
Barrier Depth: 30 ft; Daily Average: 7/1/2008-10/31/2008 (Wet)

2013 modeling

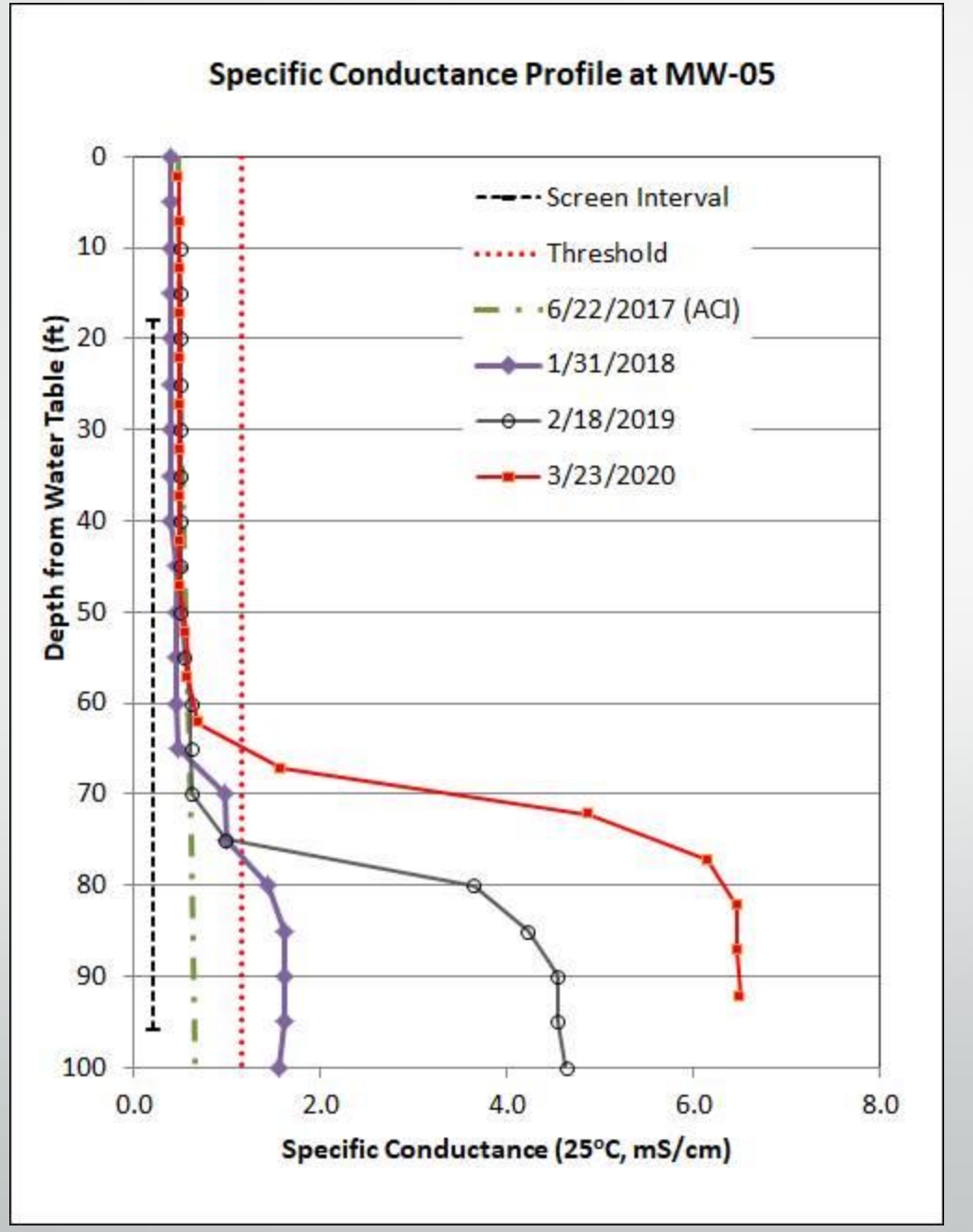
Presenter: William Baker, P.E.

SDI Aggregates, Inc.

Presenter: William Baker, P.E.



Presenter: William Baker, P.E.



Presenter: William Baker, P.E.

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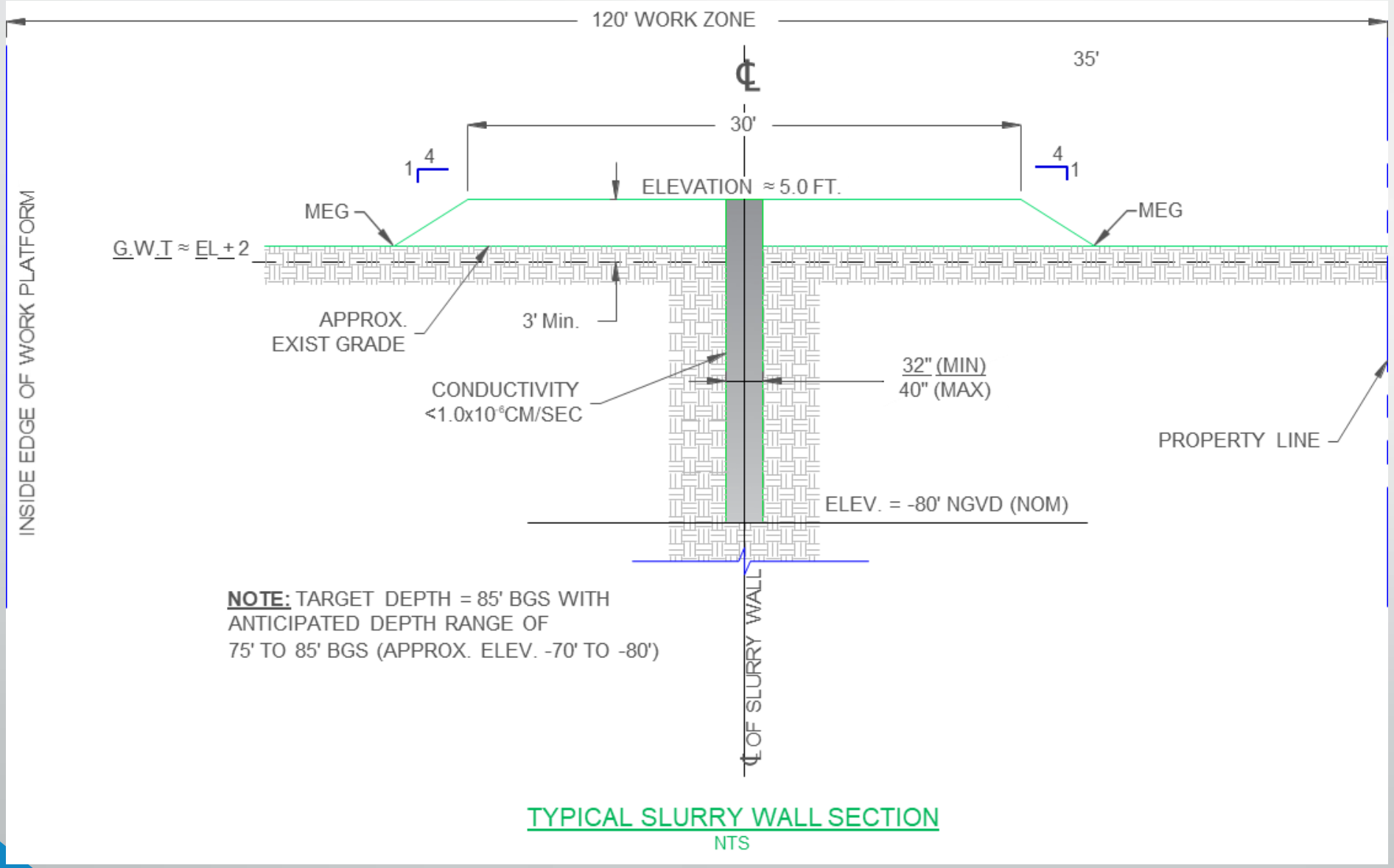
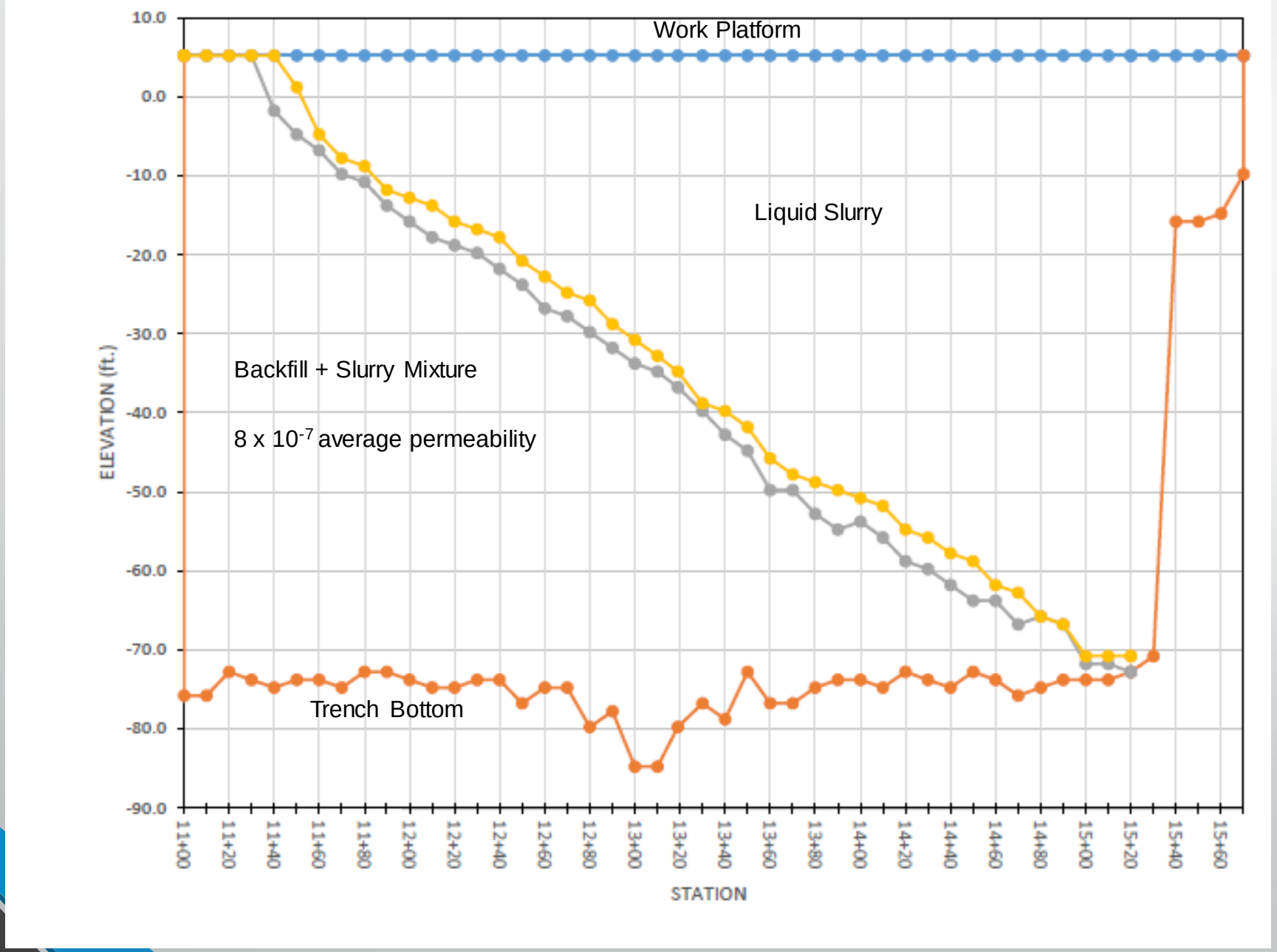


TYPICAL SLURRY WALL SECTION

NTS

Presenter: William Baker, P.E.

Construction Profile



Presenter: William Baker, P.E.

South Miami-Dade Curtain Wall
&
Agriculture

Charles LaPradd

June 5, 2020

- Recommended years ago to contain the additional water
- Supported by the Agricultural Industry
- Agriculture's groundwater issues
- Northern segment already in place
- Septic tank issues
- Storm surge issues
- Concerns

MIAMI-DADE COUNTY

Presenter: Charles LaPradd

Groundwater Issues for Agriculture

While agricultural operation need water for irrigations, increased water flows into Miami-Dade County elevate groundwater levels. The pumps and impoundment areas cannot be operated in such a way as to alleviate this issue with the amount of water folks want to “send south”. Crops cannot survive increased water tables as this greatly erodes the natural ability of the land to absorb rain which in turn creates significant damage from normal rain fall.

MIAMI-DADE COUNTY

Presenter: Charles LaPradd

Presenter: Charles LaPradd

Presenter: Charles LaPradd

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Presenter: Charles LaPradd

Presenter: Charles LaPradd

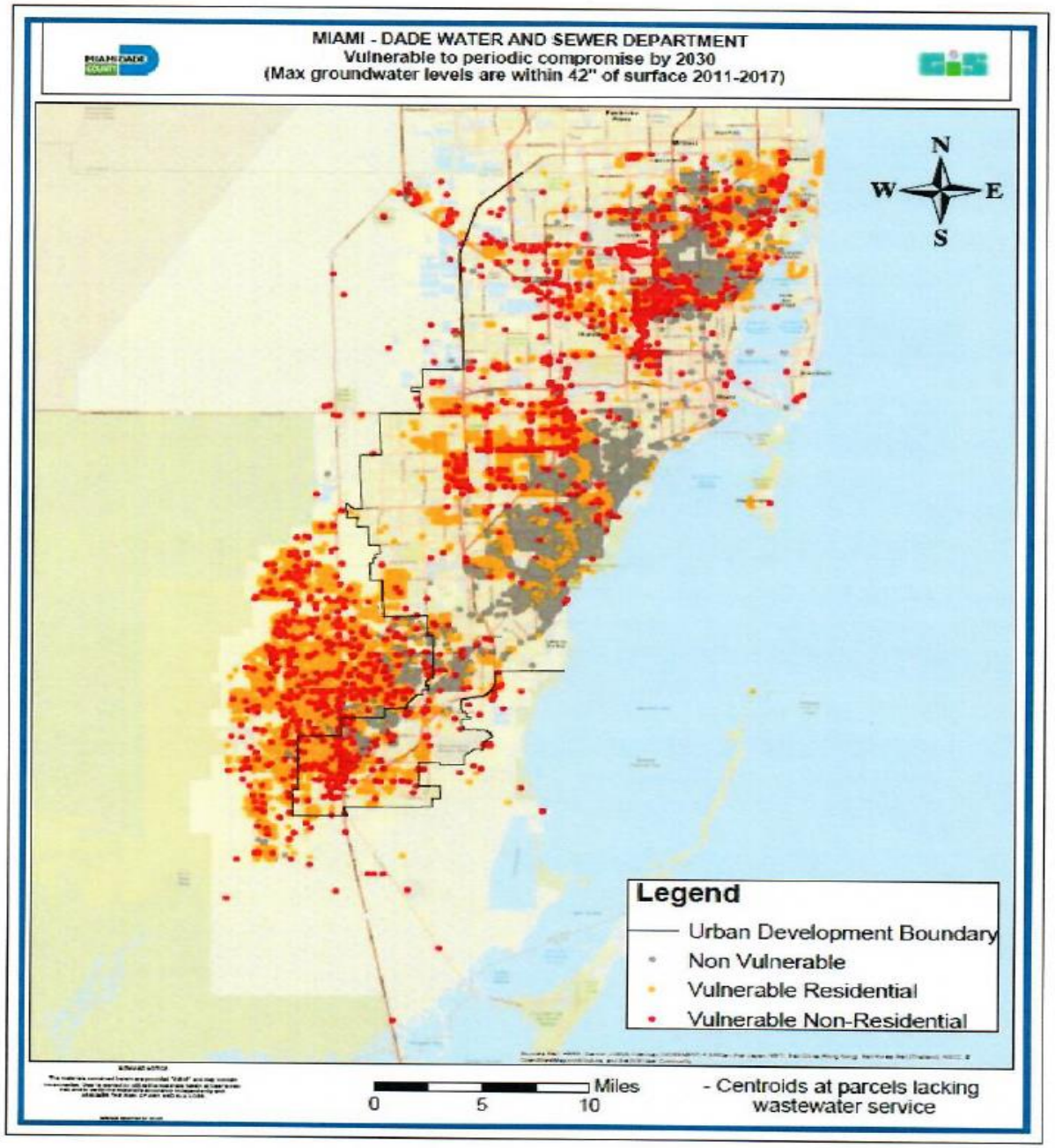
Septic Issues Without it

To achieve unsaturated flow conditions, a minimum vertical separation must be maintained between the bottom surface of the drainfield and the wet season high water table year round. The Environmental Protection Agency's Design Manual, Onsite Wastewater Treatment and Disposal Systems (EPA 625/1-80-012), recommends a minimum separation between the bottom surface of the drainfield and the wet season high water table of 24 to 48 inches. The minimum separation required by the Florida Department of Health (FDOH) is 24 inches (Chapter 64E-6, Florida Administrative Code). Furthermore, the FDOH defines the wet season water table as the highest water table elevation determined, based on a site specific soil survey and soil-based features (e.g., redoximorphic features). This water table elevation is typically higher than the physical measurement of the water table in a bore or well.

MIAMI-DADE COUNTY

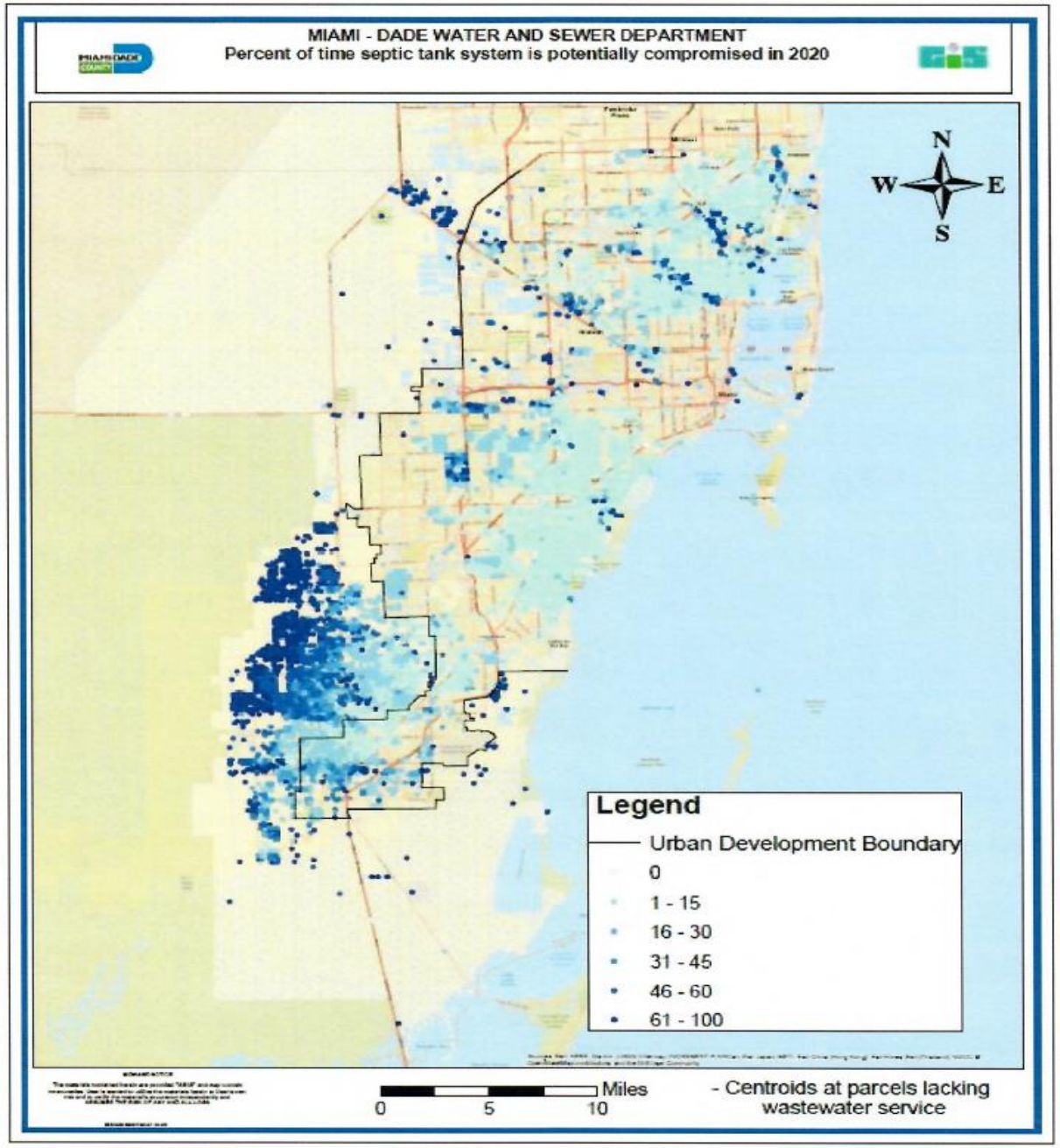
Presenter: Charles LaPradd

Figure 13: Areas vulnerable to periodic compromise by 2030 (maximum groundwater levels within 42" of surface)



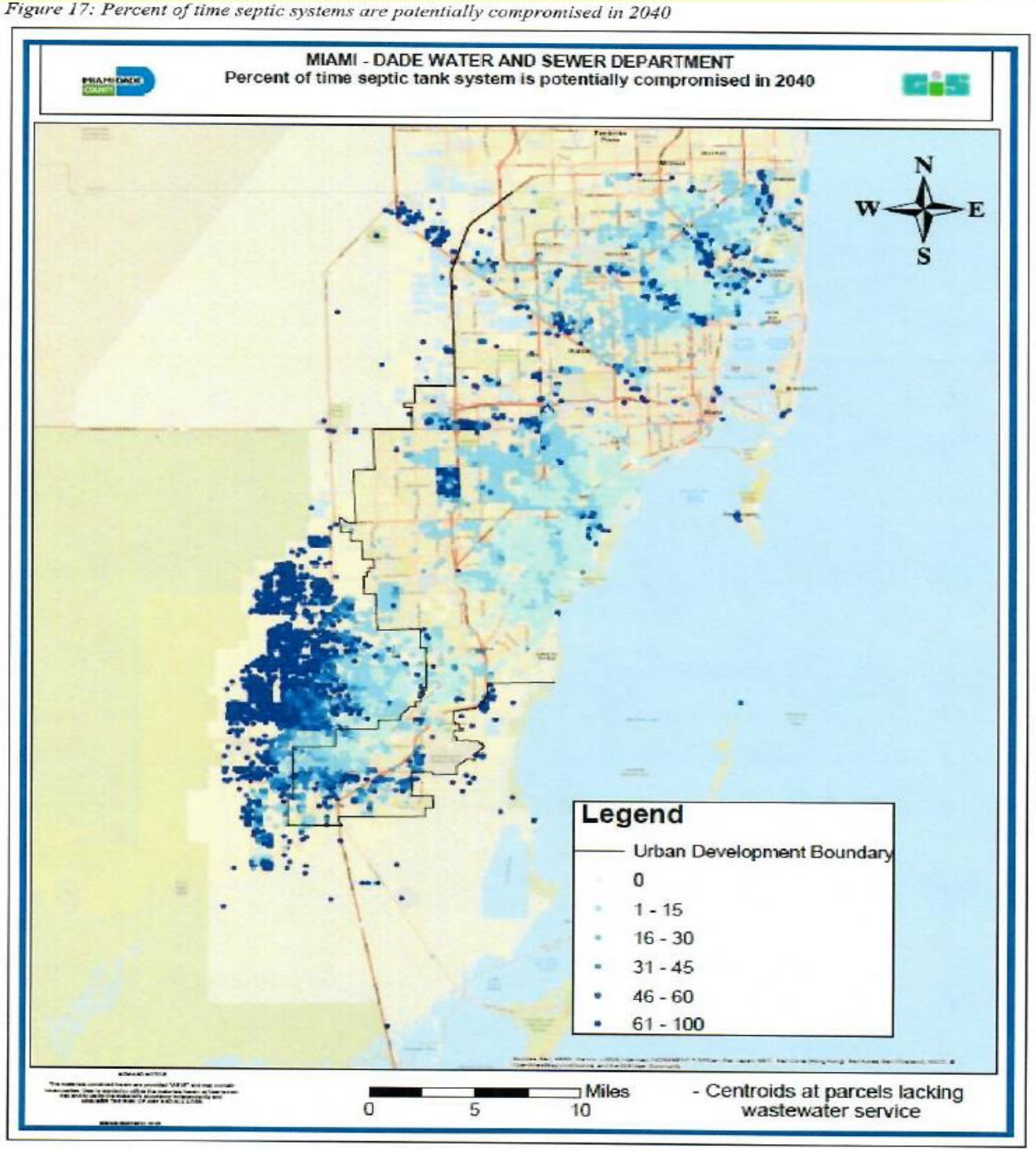
Presenter: Charles LaPradd

Figure 16: Percent of time the septic systems are potentially compromised in the near-term (2020)



Presenter: Charles LaPradd

Figure 17: Percent of time septic systems are potentially compromised in 2040



Presenter: Charles LaPradd

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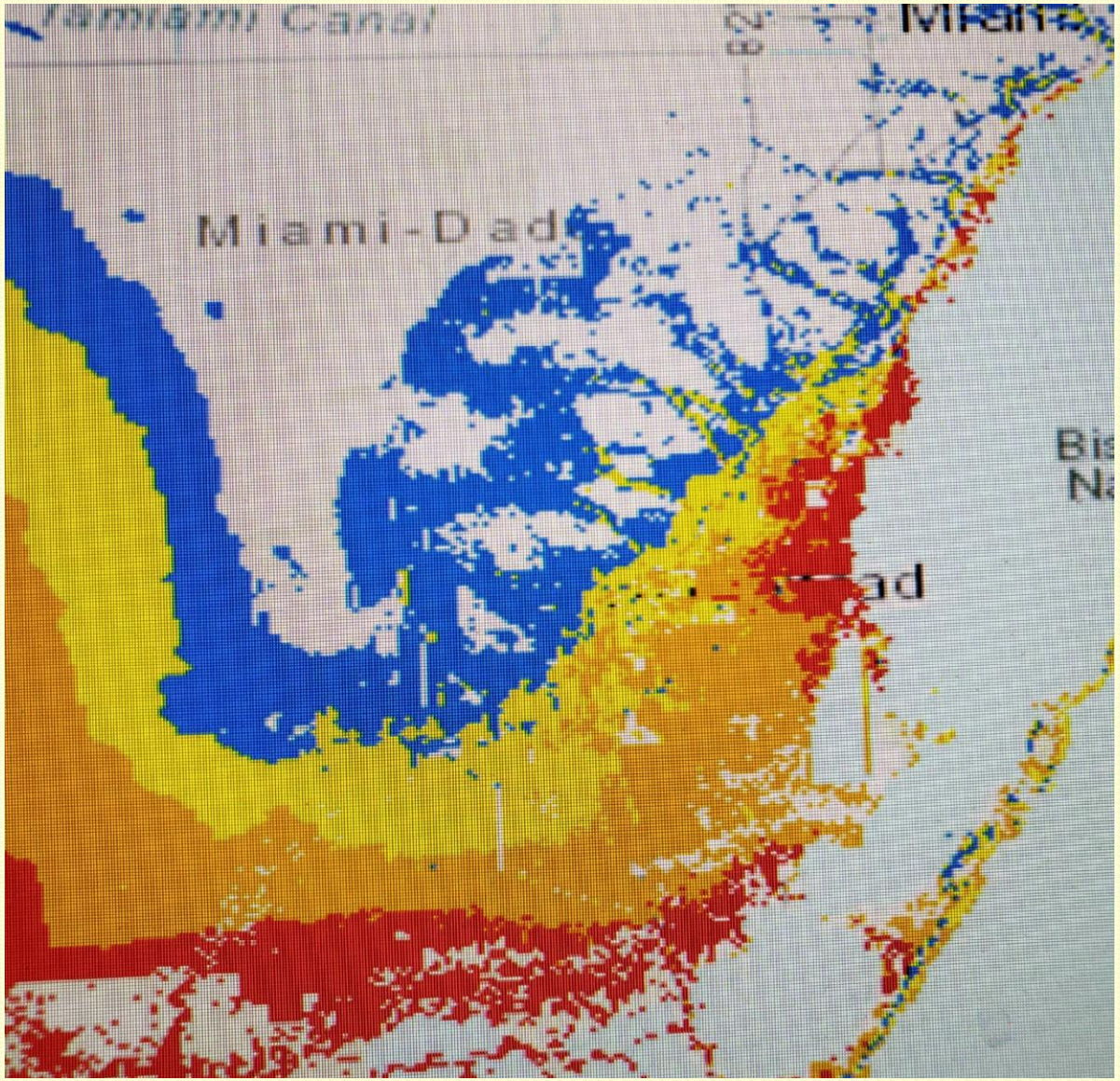
Projected Storm Surge



Presenter: Charles LaPradd

Concerns

- Adequate water supply for irrigation
- Adverse impacts to drainage
- Are gaps needed
- Location, length and depth
- Thorough modeling
- Funding and Timely implementation

MIAMI-DADE COUNTY

Presenter: Charles LaPradd

The Seepage Management Solution Space

Everglades & Biscayne National Parks
Erik Stabenau, Physical Resources Branch Chief
South Florida Natural Resources Center
Physical Sciences Branch

NPS Goals

- **The NPS will consider the *range of effects* that a curtain wall could have, and evaluate what *solutions* they could provide for park needs.**

- Natural resources in Biscayne National Park and Everglades National Park will be affected by a South Dade Curtain Wall, as well as the Greater Everglades and related systems

- Our goal is to consider the full range of effects on the natural system to insure there will not be any detrimental effects on the resources we are responsible to protect.

NPS Perspectives

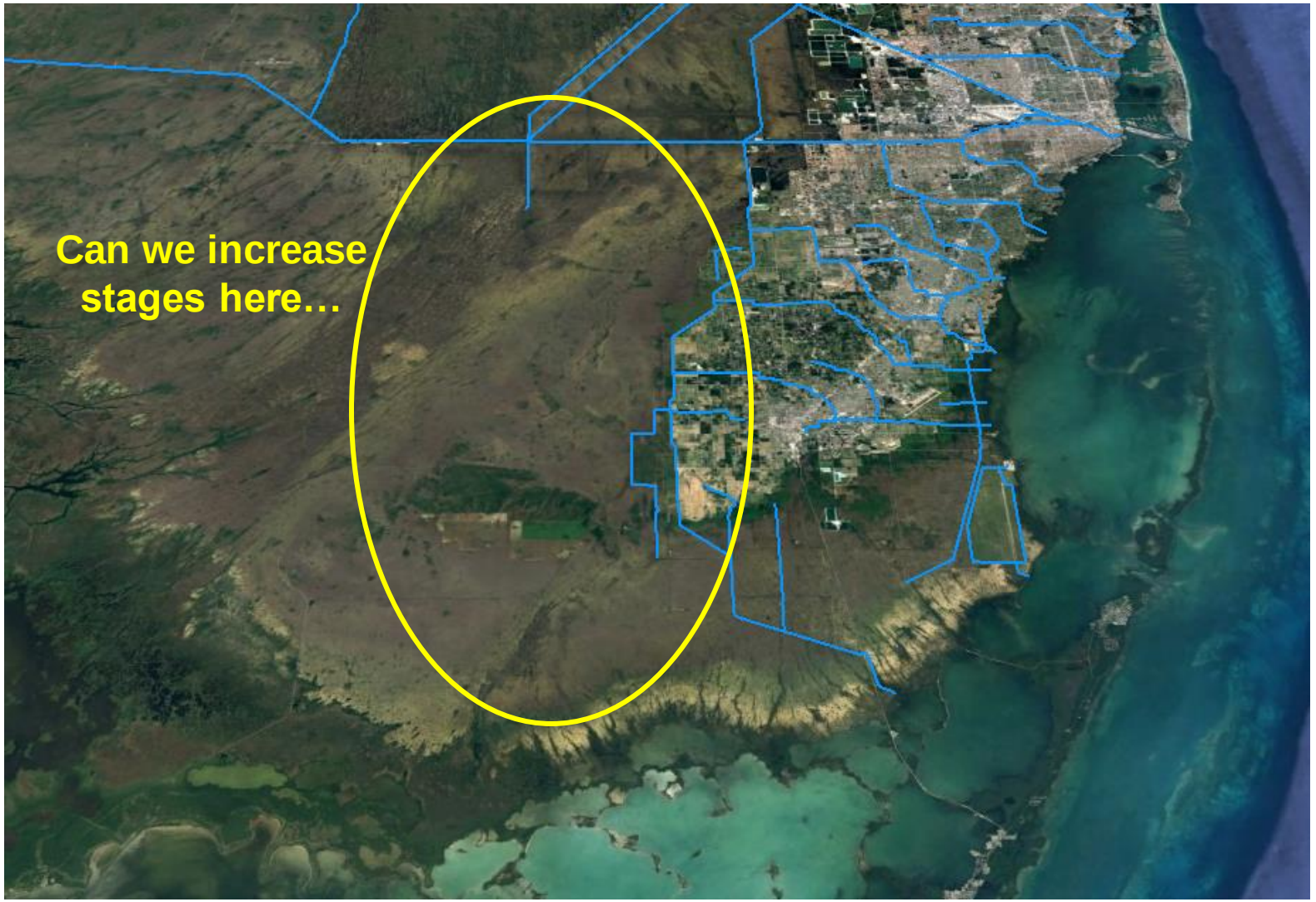
- Seepage barriers have been historically considered as part of the long-term water management solution

- As restoration progresses and more water is delivered to the south, a seepage barrier is increasingly seen as a solution to maintain higher stages in ENP while maintaining flood control in the developed areas

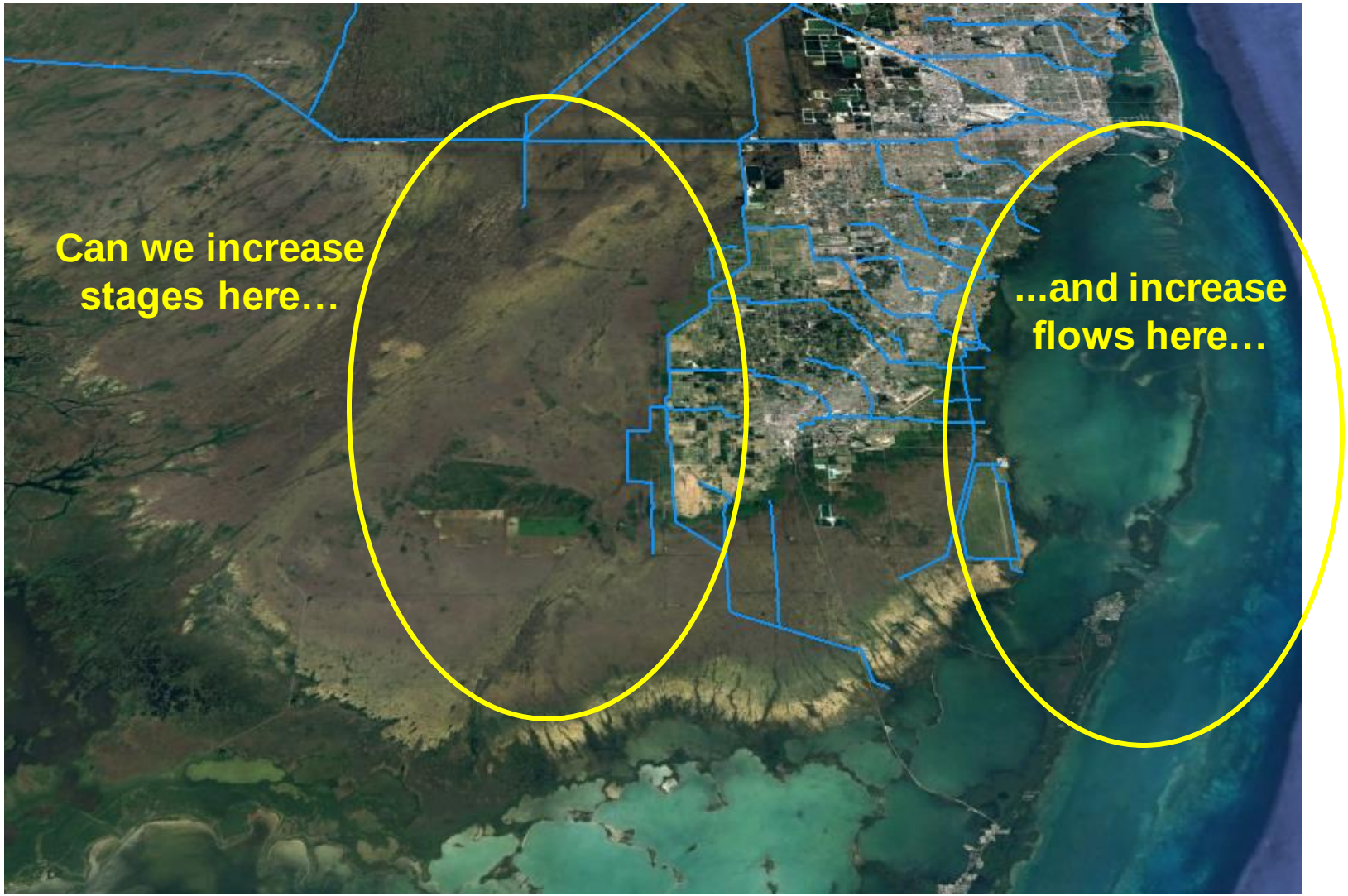
- We anticipate the following outcomes:
  - Ability to **maintain higher stages** in Everglades NP
  - **Improved flow** to Biscayne NP
  - Improved **management** of seepage
  - Improved **flexibility in operations**
  - Evaluation of benefits in the context of changing climate

- The **science** will tell us if these outcomes can be achieved

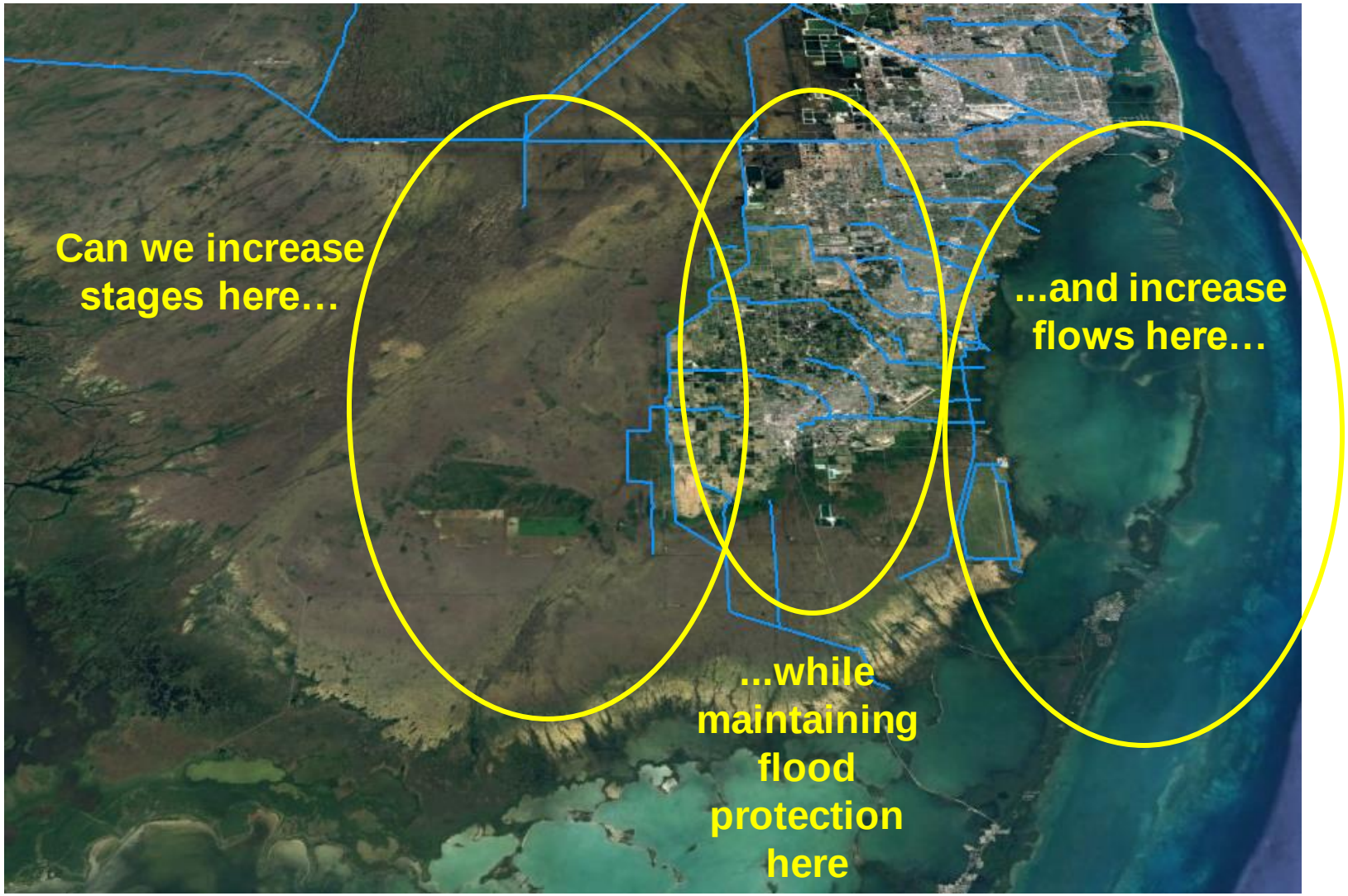
Progressive Challenge



Progressive Challenge

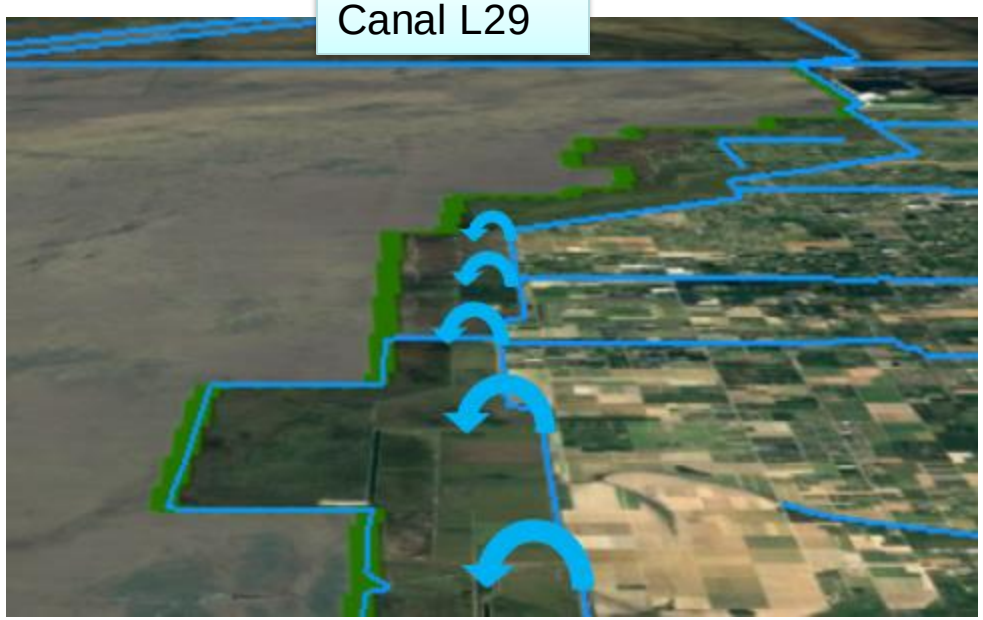


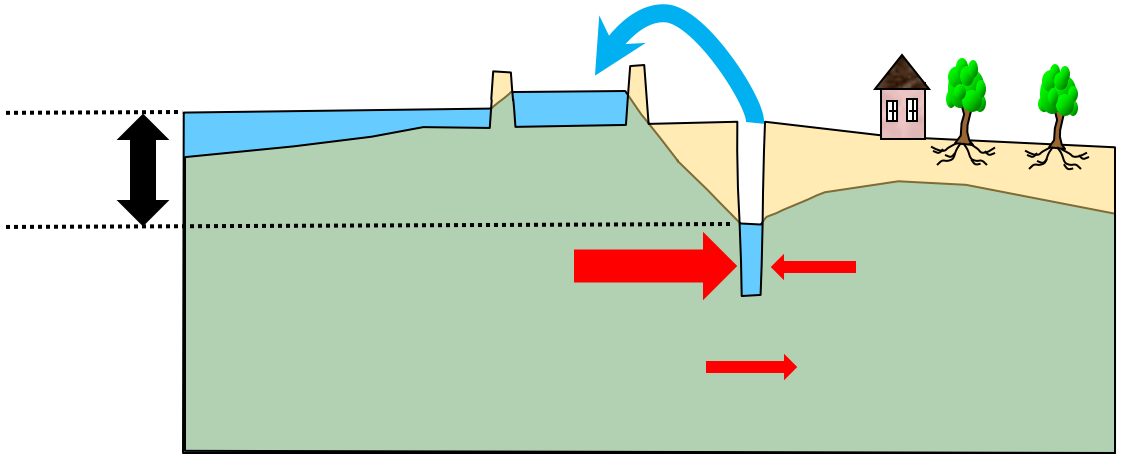
Progressive Challenge



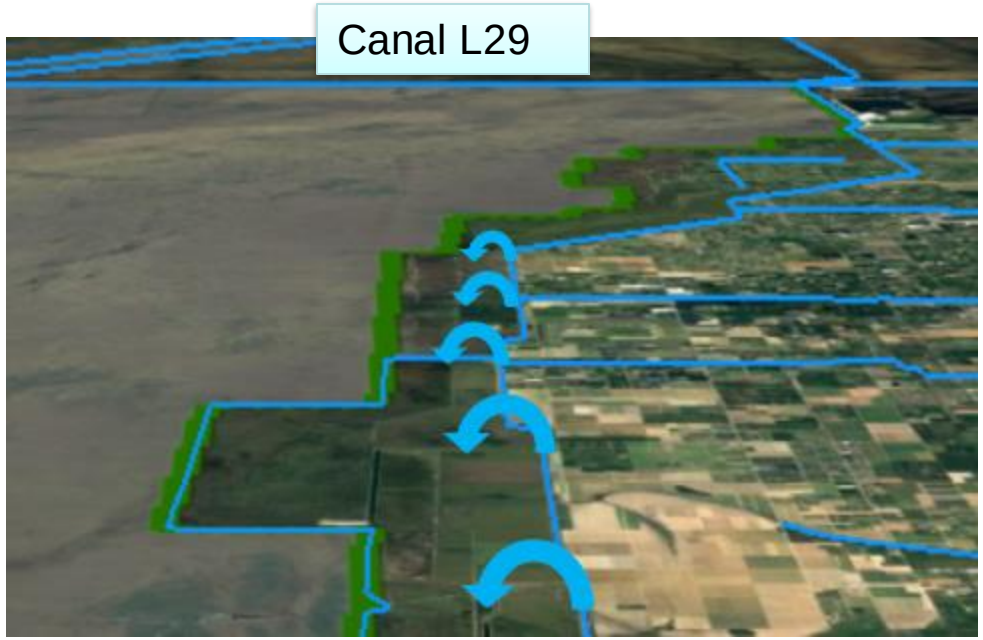
Hydraulic Ridge and Curtain Wall Together

With increasing stages in the park …





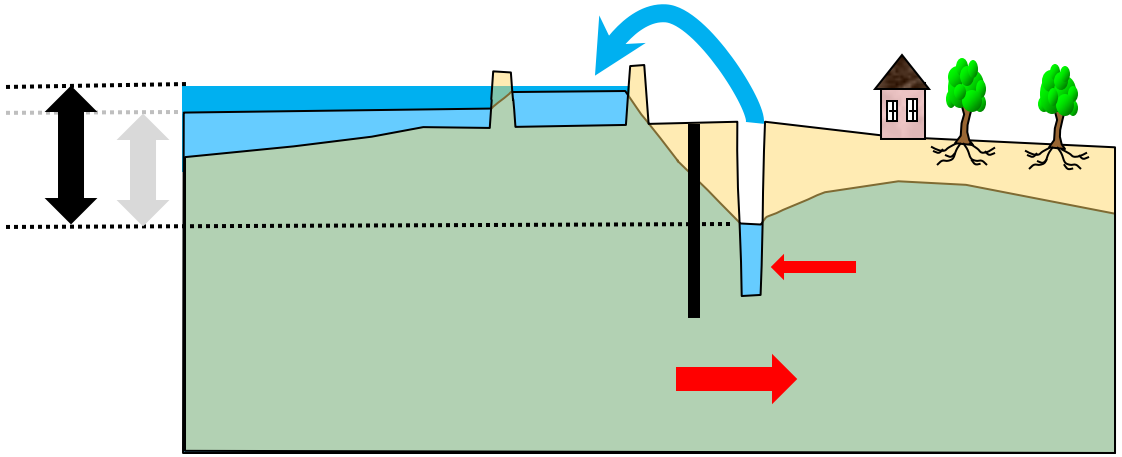
Hydraulic Ridge and Curtain Wall Together



With increasing stages in the park … the challenge grows

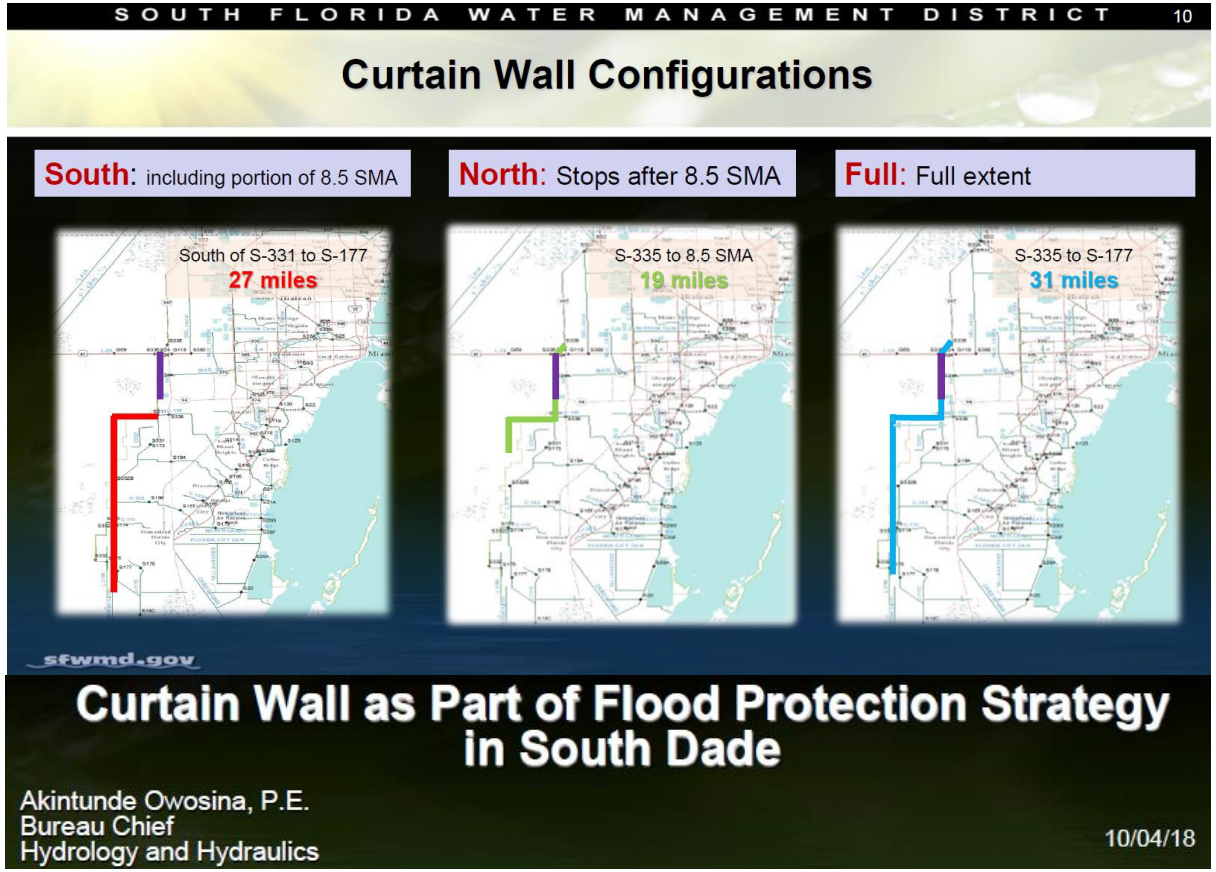
But so does the opportunity:

- The park itself becomes part of seasonal storage
- Flow under the barrier is reduced but not eliminated



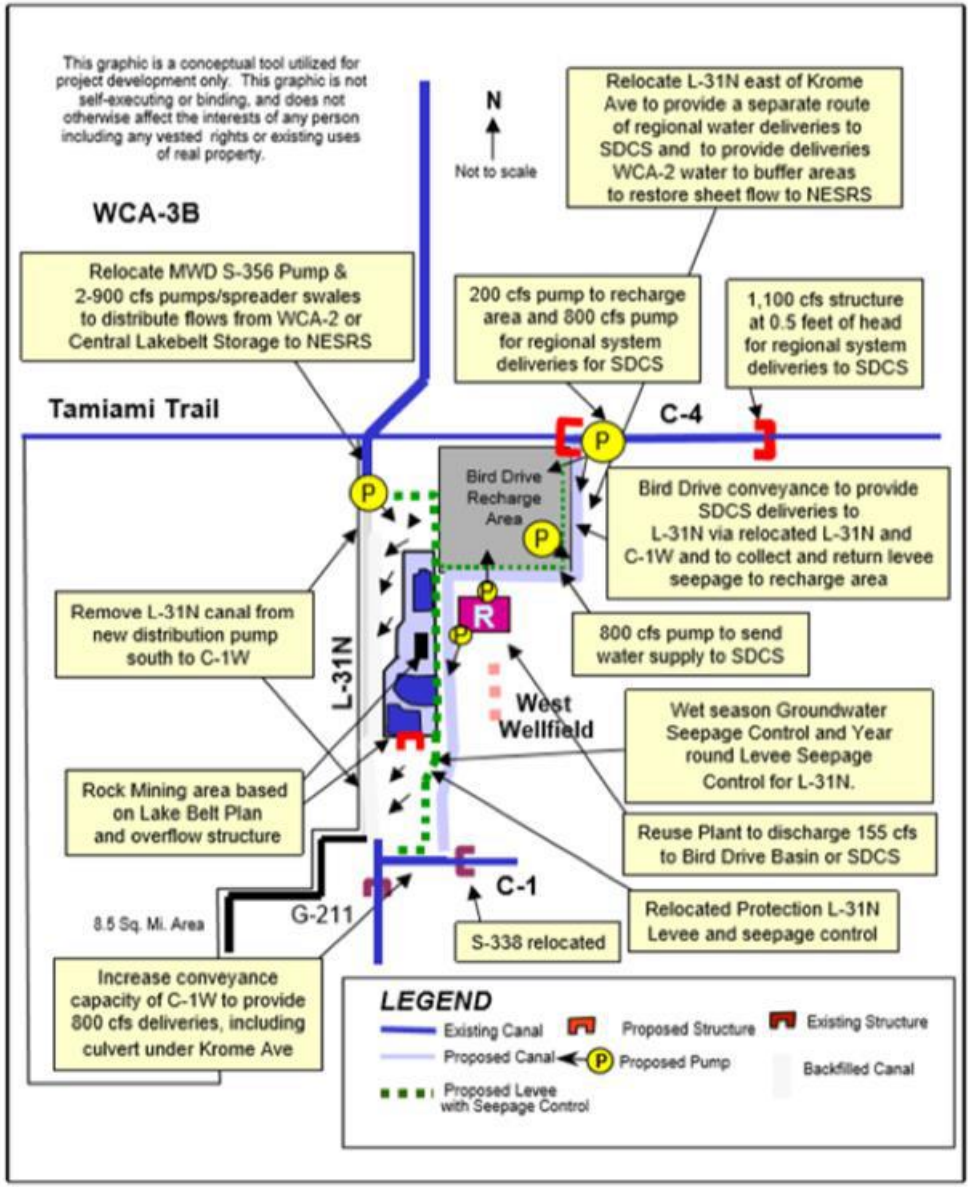
Strategy

- Flow to Biscayne NP will be a primary driving concern
- Optimize conveyance into southeastern natural areas
- Leverage the latest datasets to investigate impacts. (Available data now includes extensive measurements taken around existing seepage barrier)
- Include consideration of other opportunities that may arise

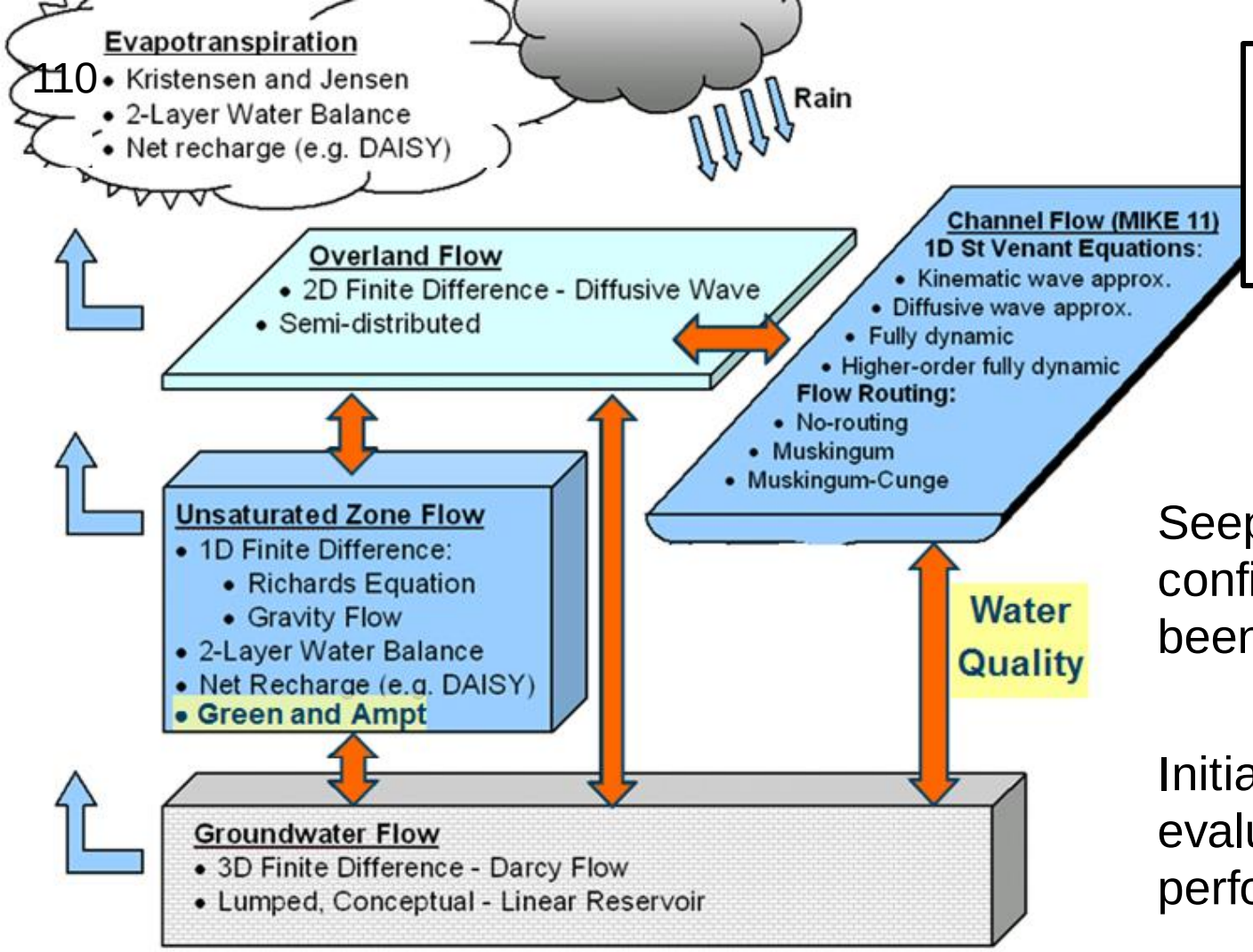


Regional Opportunities

- Seepage control can't be considered in isolation
- Opportunities include rethinking use of existing and planned features
- Current objectives as well as original intent



M3ENP Model



Seepage barrier configurations have been developed

Initial runs complete – evaluating model performance

Key Topic: Managing uncertainty

NPS Participation

- **Staff** at SFNRC (Bahm, Stabenau, others)
- **Modeling** evaluation and assessment including scenarios on M3ENP
- **Technical analysis** of current conditions, evaluation of alternatives, or specific studies
- **Community** connections through our interaction with our partners

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SOUTH FLORIDA ECOSYSTEM RESTORATION (SFER) PROGRAM

Project Update

SFWMD Public Workshop: Planning for South Dade Curtain Wall

Jason Engle

U.S. Army Corps of Engineers, Jacksonville District

5 June 2020

SOUTH FLORIDA ECOSYSTEM RESTORATION PROGRAM

Purpose and Agenda

The purpose of this briefing is to provide participants with an overview and update on the status of the South Florida Ecosystem Restoration (SFER) projects within the southern part of the system and to provide USACE perspective on the curtain wall study

Agenda:

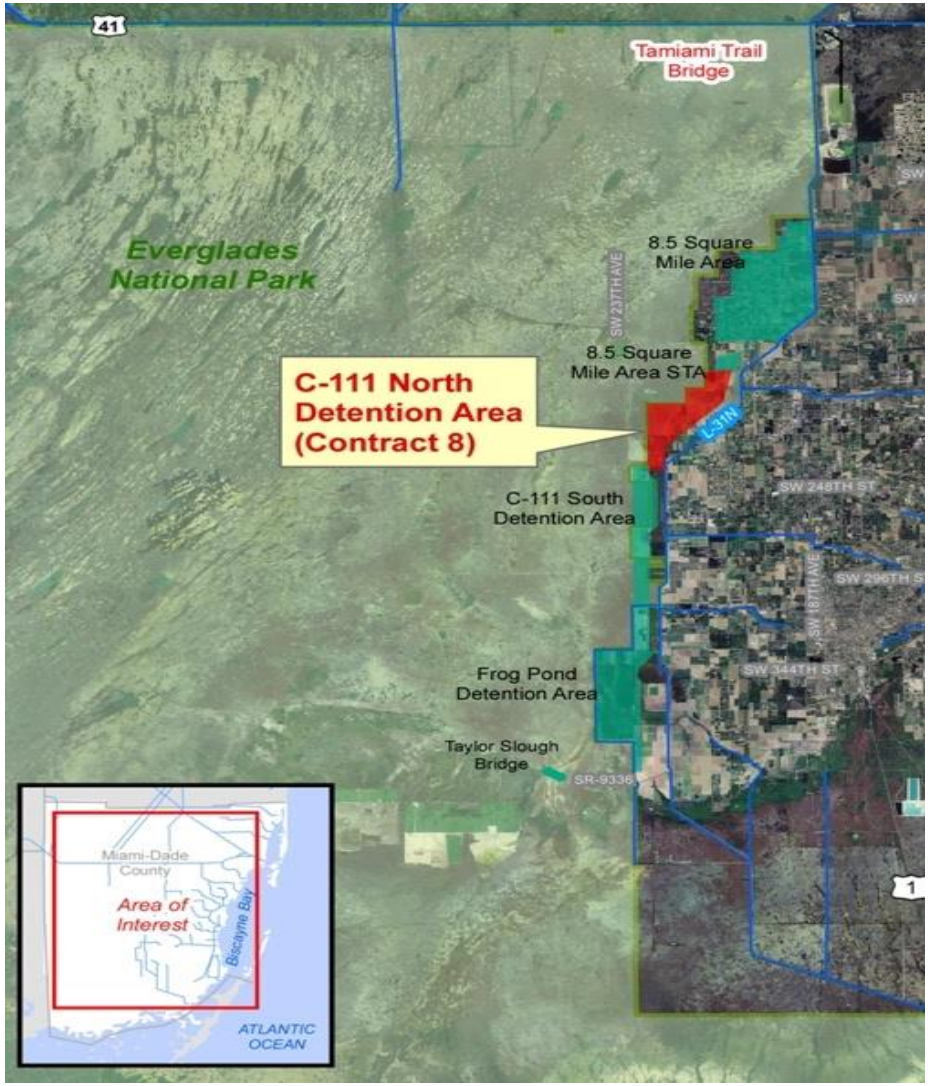
- Project Items
  - C-111 South Dade
  - Combined Operational Plan (COP)
  - Central Everglades Planning Project (CEPP)
  - Biscayne Bay and Southeastern Everglades Ecosystem Restoration project (BBSEER)
  - USACE perspective on SFWMD South Dade Curtain Wall study

Presenter: Jason Engle

US Army Corps of Engineers

SOUTH FLORIDA ECOSYSTEM RESTORATION PROGRAM

C&SF: Canal 111 (C-111) South Dade



Reduces water losses from Everglades National Park and improves freshwater flow to Taylor Slough and Florida Bay. Provides for 9,500 acre-feet of storage & seepage that reduces damaging canal discharges to Barnes Sound, reduces seepage losses from ENP, and maintains flood protection for commercial, residential, and agricultural properties to the east

Status:

- Construction complete!
- Conducting post authorization change report (PACR) to address temporary pump stations and O&M Cost Share
  - Public Review currently underway
  - Report completed in May
  - WRDA 2020 Consideration

Presenter: Jason Engle

US Army Corps of Engineers

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

U.S. ARMY

SOUTH FLORIDA ECOSYSTEM RESTORATION PROGRAM

Modified Water Deliveries to Everglades National Park

Restores water deliveries to Northeast Shark River Slough in Everglades National Park. Storage, conveyance and seepage management improve natural water flows to Everglades National Park, provide flood mitigation for residential areas, re-connect freshwater flows, and reduce seepage losses

Status:

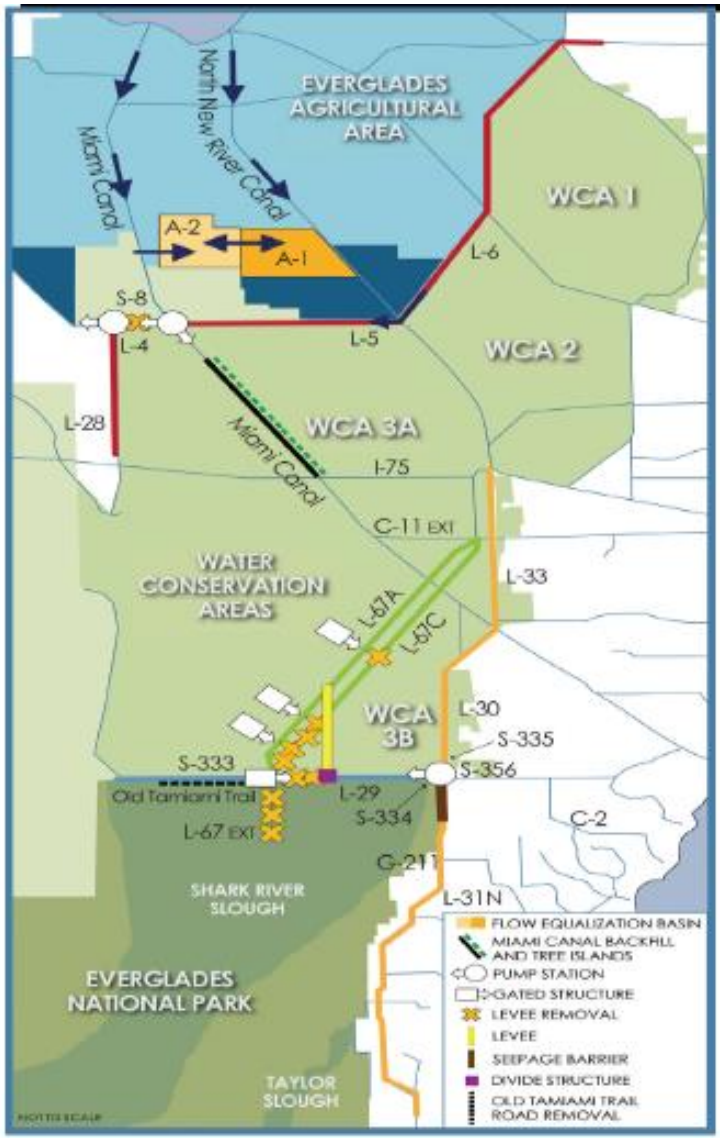
- Construction complete!
- Combined Operational Plan (COP)
  - Scheduled for completion in August
  - Draft EIS published in the Federal Register on January 31 for agency and public review
  - Public meetings conducted February 18-20
  - Final EIS scheduled for completion in June
  - Progress and completion required to support CEPP implementation

Presenter: Jason Engle

US Army Corps of Engineers

SOUTH FLORIDA ECOSYSTEM RESTORATION PROGRAM

CERP: Central Everglades Planning Project (CEPP)



CEPP focuses restoration on more natural flows into and through the central and southern Everglades by increasing storage, treatment and conveyance of water south of Lake Okeechobee; removing canals and levees within the central Everglades, and retaining water within Everglades National Park

Status:

- CEPP PPA execution in July 2020
- CEPP South
  - SFWMD engaging design and construction of features
  - SAJ construction contract award in September
- CEPP New Water
  - EAA Reservoir authorized by WRDA 2018 (Section 1308) as a part of CEPP New Water; SAJ completing Section 1308 Follow-up Report in May
  - Design of features ongoing
- SAJ scheduled to award construction contracts in 2020, 2021, and 2022
- COP progress and completion required for implementation

Presenter: Jason Engle

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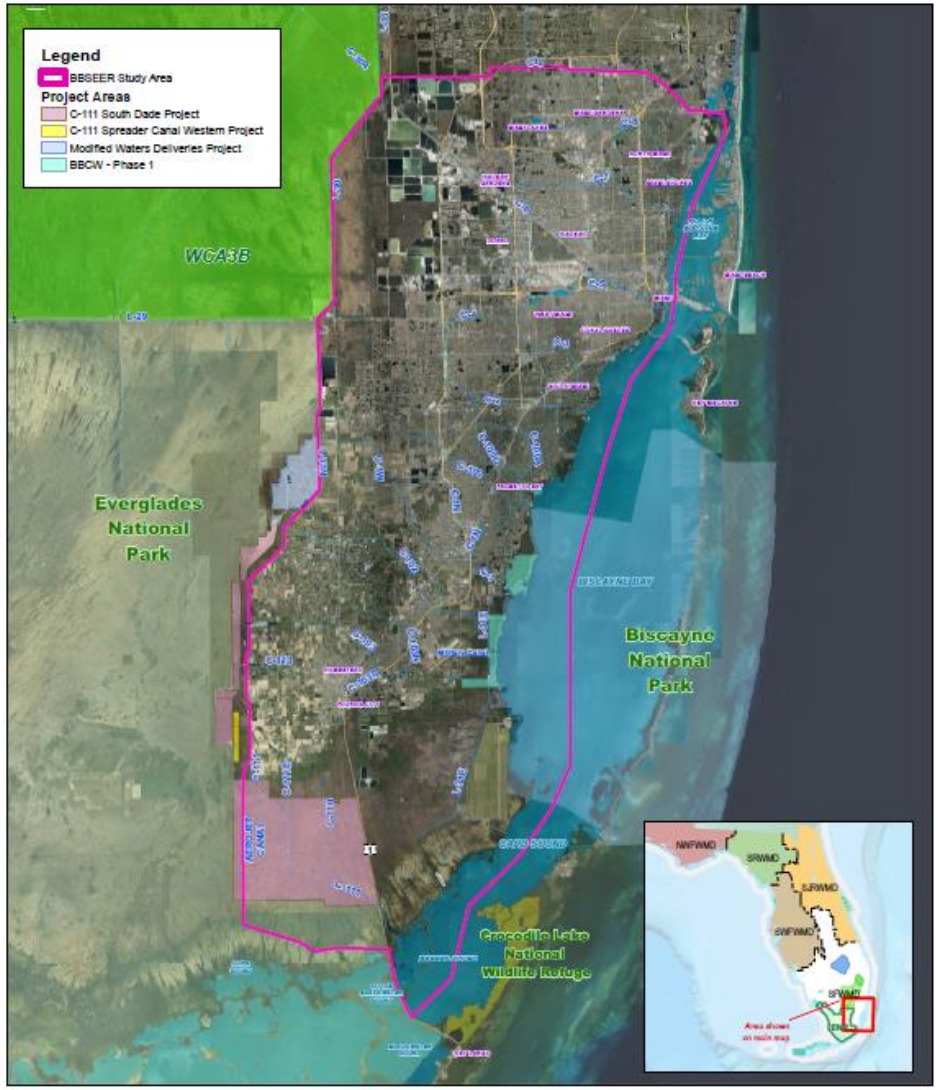
U.S.ARMY

SOUTH FLORIDA ECOSYSTEM RESTORATION PROGRAM

CERP: Biscayne Bay Southeastern Everglades Ecosystem Restoration project (BBSEER)



The BBSEER project will restore wetland and estuarine habitats. The purpose of the project is to improve the quantity, potential quality, timing and distribution of freshwater to Biscayne Bay, including Card Sound and Barnes Sound and Biscayne National Park, to improve of natural coastal glades habitat in the Model Lands and Southern Glades, and to improve resiliency of these coastal habitats in light of seal level change. An objective of this project is to restore estuarine habitat.

- Project Management Plan completed May 2020
- Study kickoff in July 2020
- Study public scoping meetings summer/fall 2020
- The final product will be an Integrated Project Implementation Report and NEPA document.

Presenter: Jason Engle

US Army Corps of Engineers

USACE Perspective

- USACE supports the SFWMD South Dade Curtain Wall study; USACE team being assembled
- Although the South Dade Curtain Wall is not CURRENTLY a part of a federally-authorized project, potential existing for it to be brought in under a PACR or a new feasibility study
- If it remains non-Federal, then USACE would be able to review under a Section 408 review as a modification of the Central and Southern Florida Project
- The objectives of the South Dade Curtain Wall study are in alignment with the federal interests in the Combined Operational Plan and CERP projects
- It is important to make sure that the South Dade Curtain Wall considers the following:
  - Maintaining benefits in COP
  - Doing no harm or providing benefits to Biscayne Bay and the Southeastern Everglades

Presenter: Jason Engle

US Army Corps of Engineers

QUESTIONS?

Submit questions or comments through Zoom Q & A feature

WRAP UP OF TODAY'S WORKSHOP

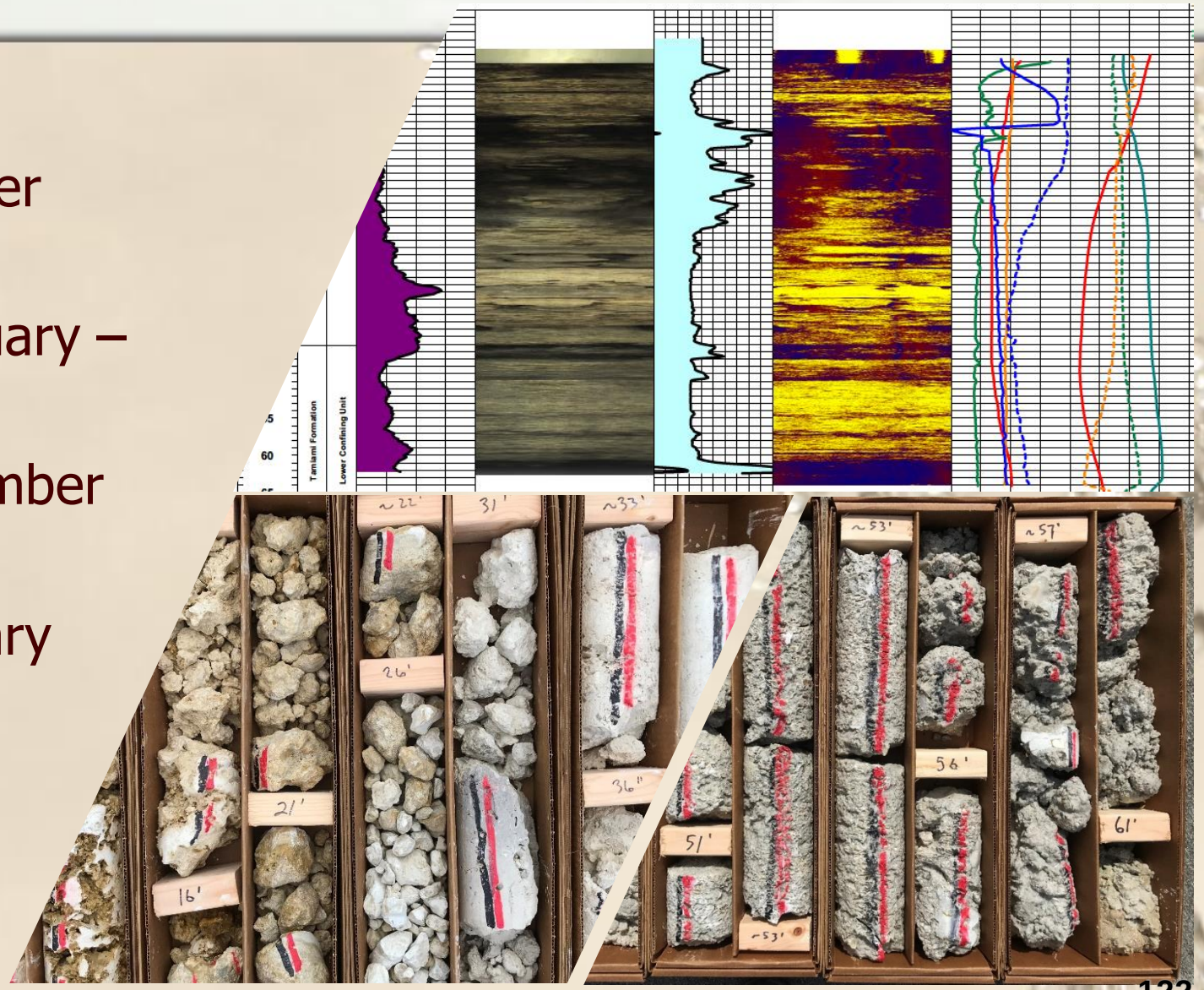
Akin Owosina, P.E.

Bureau Chief, Hydrology and Hydraulics, SFWMD

Schedule

Schedule:

- Collect Aquifer Field Data: November 2019 – November 2020
- Assess Existing Canal System: January – September 2020
- Public Engagement: March – November 2020
- Complete Planning Process: February 2021



Presenter: Akin Owosina

Public Engagement

- To discuss plans for a potential curtain wall in South Dade, including requesting a one-on-one meeting, contact:
  - Brenda Mills, bmills@sfwmd.gov
  - Walter Wilcox, wwilcox@sfwmd.gov
- New web page to host related materials including today's presentations:
  - https://www.sfwmd.gov/our-work/south-dade-projects