

South Dade Investigation Workshop #4

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South Florida Water Management District

February 2, 2016

South Dade Investigation: Goal

Identify options to reduce flood risks in urban and agricultural areas, while providing much-needed water to natural areas



What's Happening Today

Today's Goal:

Through information sharing and discussion at today's meeting,
continue creating a common understanding of the hydrology in
South Dade, and
identify options that have the potential to make improvements.

The options from today's workshop will be presented at February's
WRAC and Governing Board workshops.

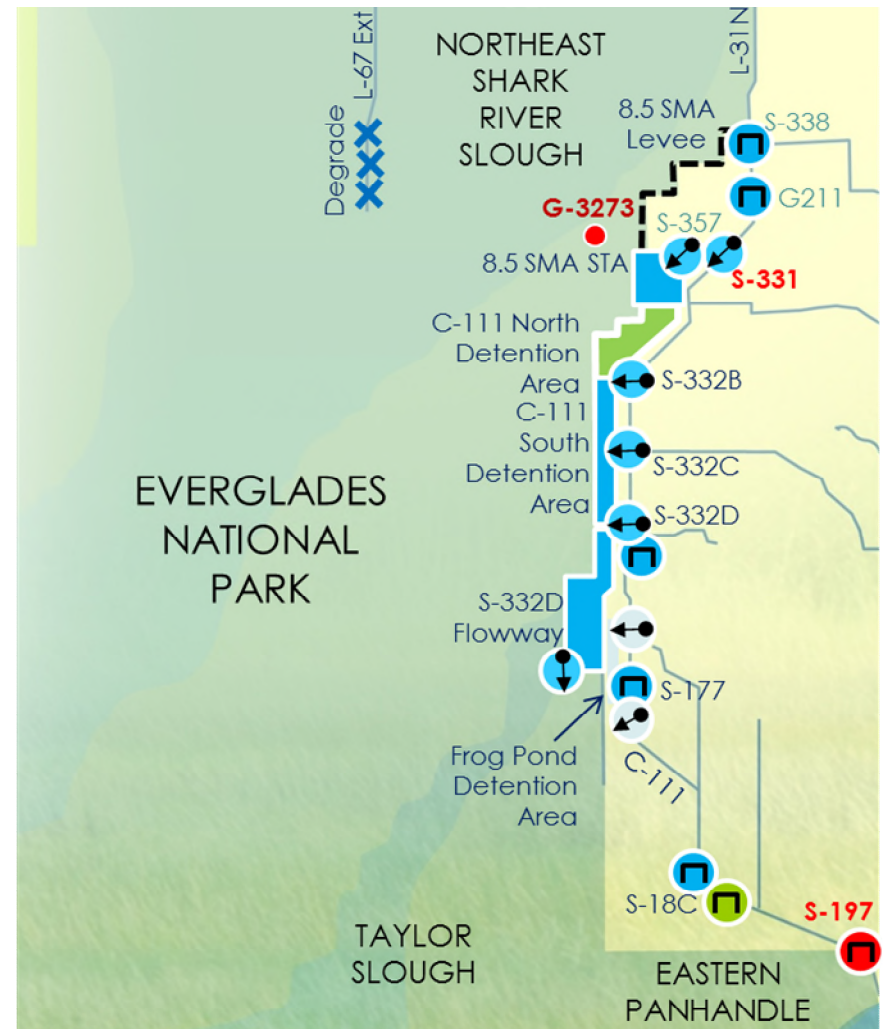


INFORMATION SHARING: WHAT WE'VE LEARNED



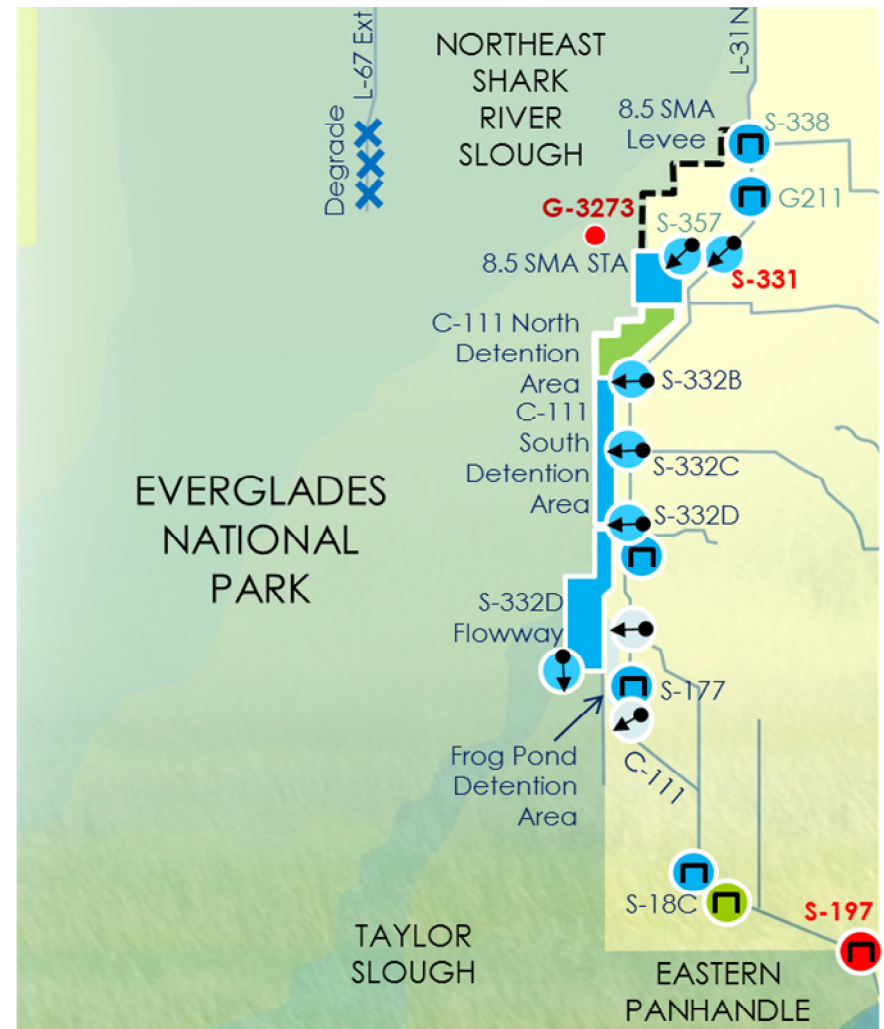
RECAP - Topics of Interest (Slide 1 of 2)

- Getting water to Taylor Slough and Eastern Florida Bay
- Reducing water levels in agricultural areas during the early dry season
- Getting water to Biscayne Bay
- Getting water to the Model Lands, Manatee Bay & Barnes Sound
- Providing habitat and breeding opportunity for the endangered Cape Sable Seaside Sparrow (CSSS)
- Considering the effects of sea level rise and saltwater intrusion



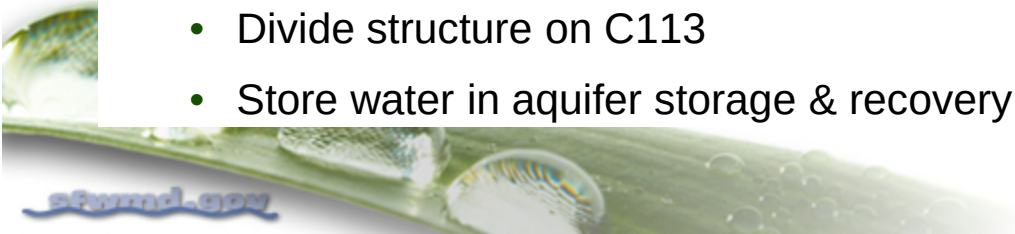
RECAP - Topics of Interest (Slide 2 of 2)

- Reducing flows at S-331 / increasing flows to NE Shark River Slough
- Considering opportunities to provide water for municipal use
- Understanding how ongoing projects (e.g. ModWaters / C111) will improve performance
- Improving seepage management efficiency
- Understanding on-farm practices and considerations



RECAP - Summary of Some Proposed Options...

- Focus on completing or expediting existing planned projects
- Investigate operational changes
 - Optimize use of pumped systems (S332s, S199, S200)
 - Optimize structure criteria (S176, S177, S18C, S197, etc...)
 - Develop seasonal operations for canals
 - Explore “strategic” versus “reactionary operations”
 - Refine existing L31E drawdown operations
- Improve or enhance the function or efficiency of the system through infrastructure changes
 - Addition of pump capacity and/or better dispersion of pumped water
 - Addition of drainage canals
 - Seepage walls or refined detention areas
 - Divide structure on C113
 - Store water in aquifer storage & recovery (ASR) systems or recharge wellfields



NEW INFORMATION: ADDITIONAL INVESTIGATIONS

C111 Project: Pump Replacement S332 B&C

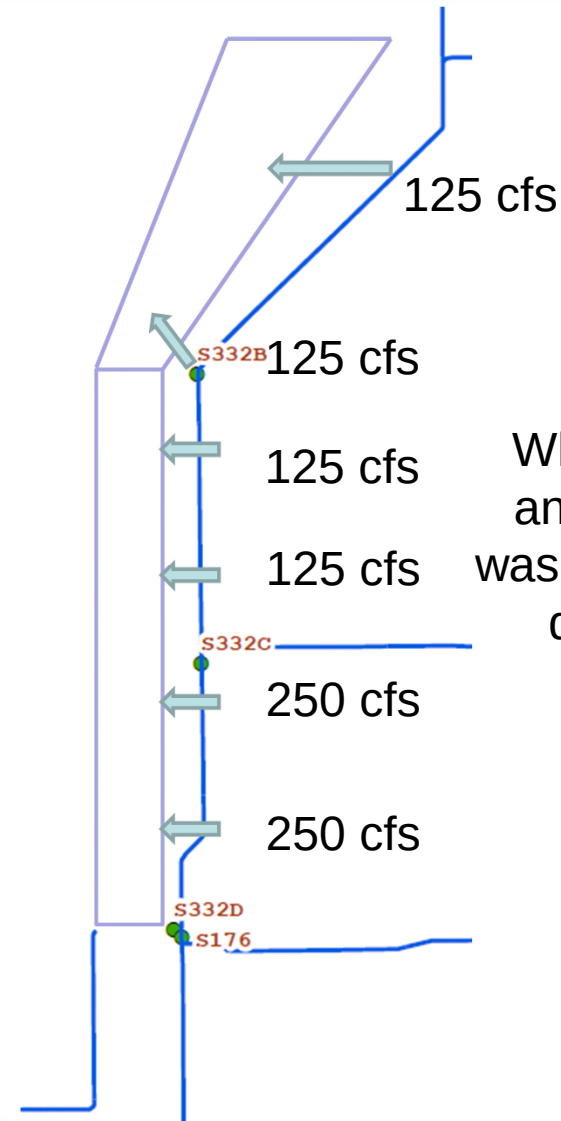
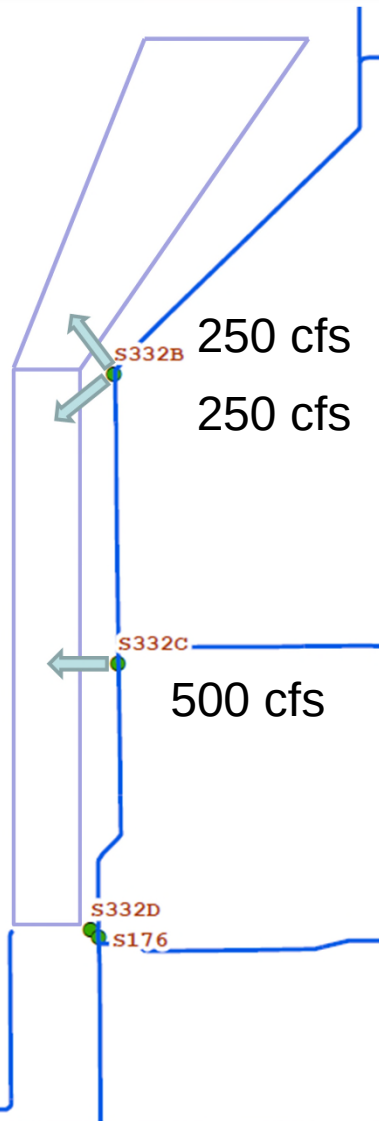
C113 Divide Structure

C111 Spreader Canal Western Project Operations



Spatial Distribution of C111 Project S332 B and C Capacity

Current System +
Anticipated North
Detention Area
(Contracts 8 And 8A)



What if S332 B
and C capacity
was more spatially
distributed?

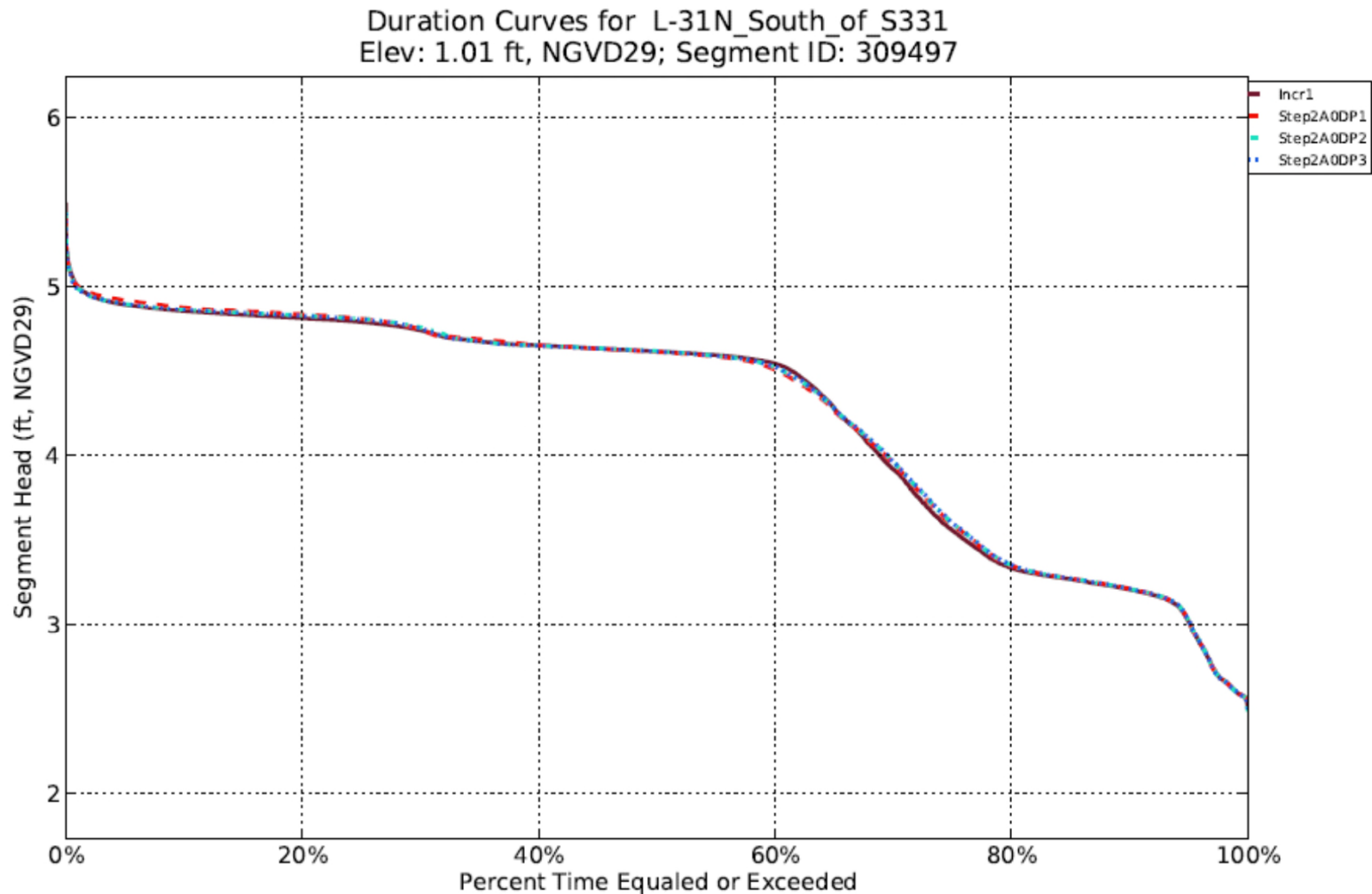


Potential Changes When Distribute S332 B and C Capacity

- CAVEAT: The regional model used for this evaluation is likely too coarse to draw definitive conclusions, but can give a indication of potential changes that could be further explored.
- Distributing S332 B and C capacity spatially shows very little effect on L31N canal performance, but some localized hydrologic changes may be observed in Everglades National Park.
 - Sparrow ramifications?
 - Enhance connectivity to Northeast Shark River Slough in wetter times?

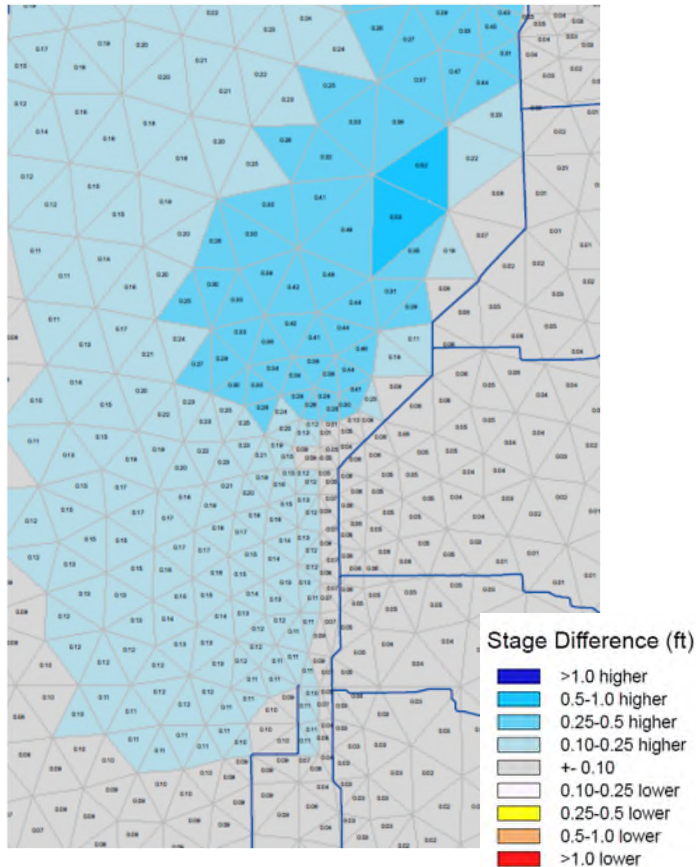


Potential Changes When Distribute S332 B and C Capacity: L31N Canal Stages

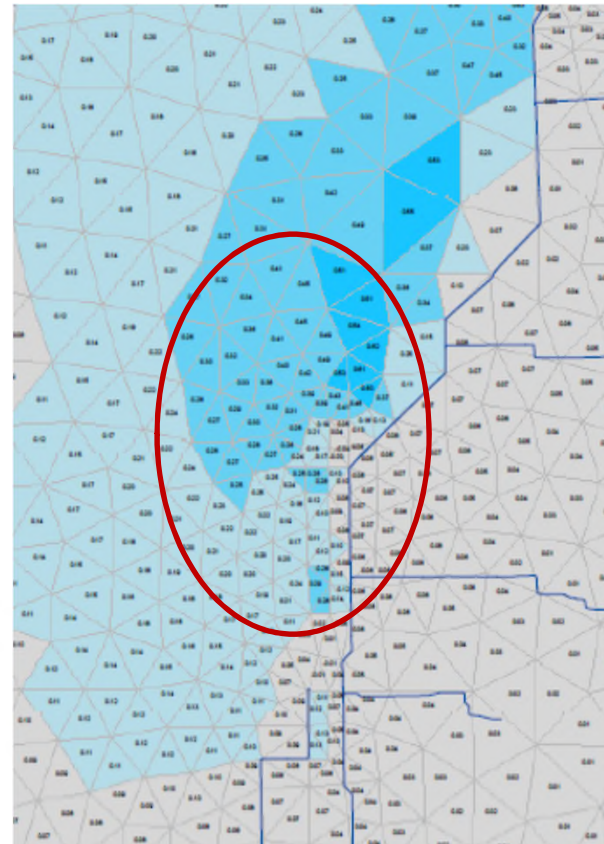


Potential Changes When Distribute S332 B and C Capacity: ENP Average December Stage Relative to Increment 1

“Increment 2 – Like”
Scenario with Current
Pump Capacity
Distribution



“Increment 2 – Like”
Scenario with S332
Pump Capacity Spatially
Distributed

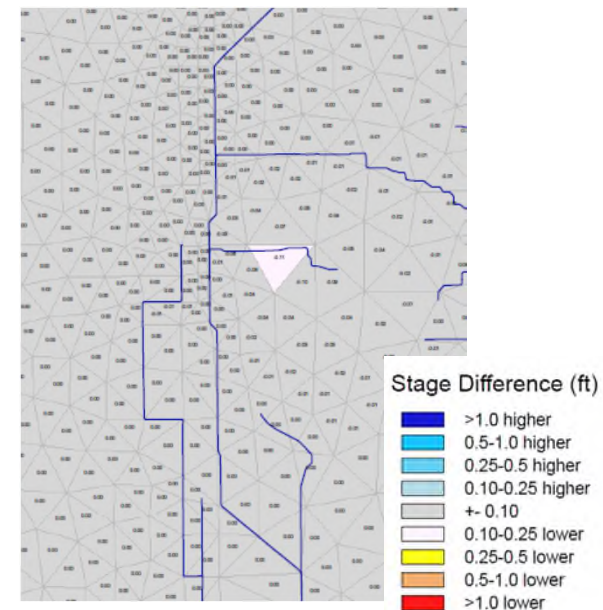


Note:
Significantly
Smaller Changes
Observed in April

Add Divide Structure on C113 Canal



Example: Average October 1970 Stage Difference Relative to Increment 1



Conclusion: Addition of a control structure can help to reduce water levels, but to small area east of the structure. Broader operational changes have a similar effect over a larger area.

Current Relationship Between S18C and S197

S18C HW Stage (ft NGVD) Criteria	S197 flows* (cfs)
Equal or less than 2.80 ft	up to 500cfs
> 2.80 ft	Level 1(one-third open, 800 cfs)
> 3.1 ft	Level 2 (two-third open, 1600 cfs)
> 3.3 ft	Level 3 (full open, 2400 cfs)

***Subject to additional considerations
including S177 HW, S178 TW and
WCA-3A Action Line**



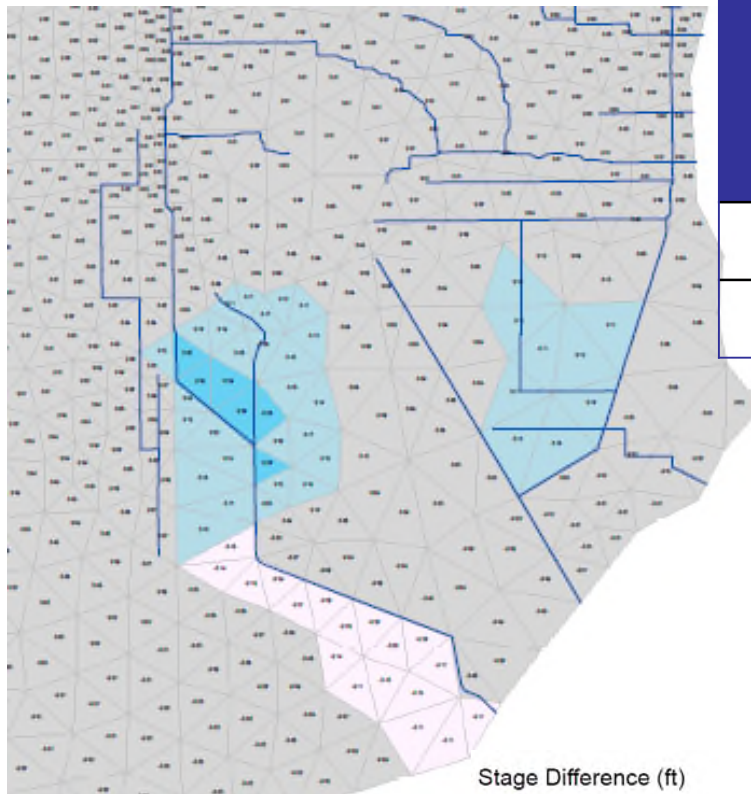
Hydrologic Challenges in the Vicinity of S18C

Raising water levels at S18C as contemplated in the C111 Spreader Canal Western Project has the potential to

- raise water levels in upstream canals (C111 & C111E) and
- simultaneously trigger additional discharges through S197.



Example: Increment 1 with S18C Raised 0.4 ft and S20 Raised 0.5 ft



October:
41 year average

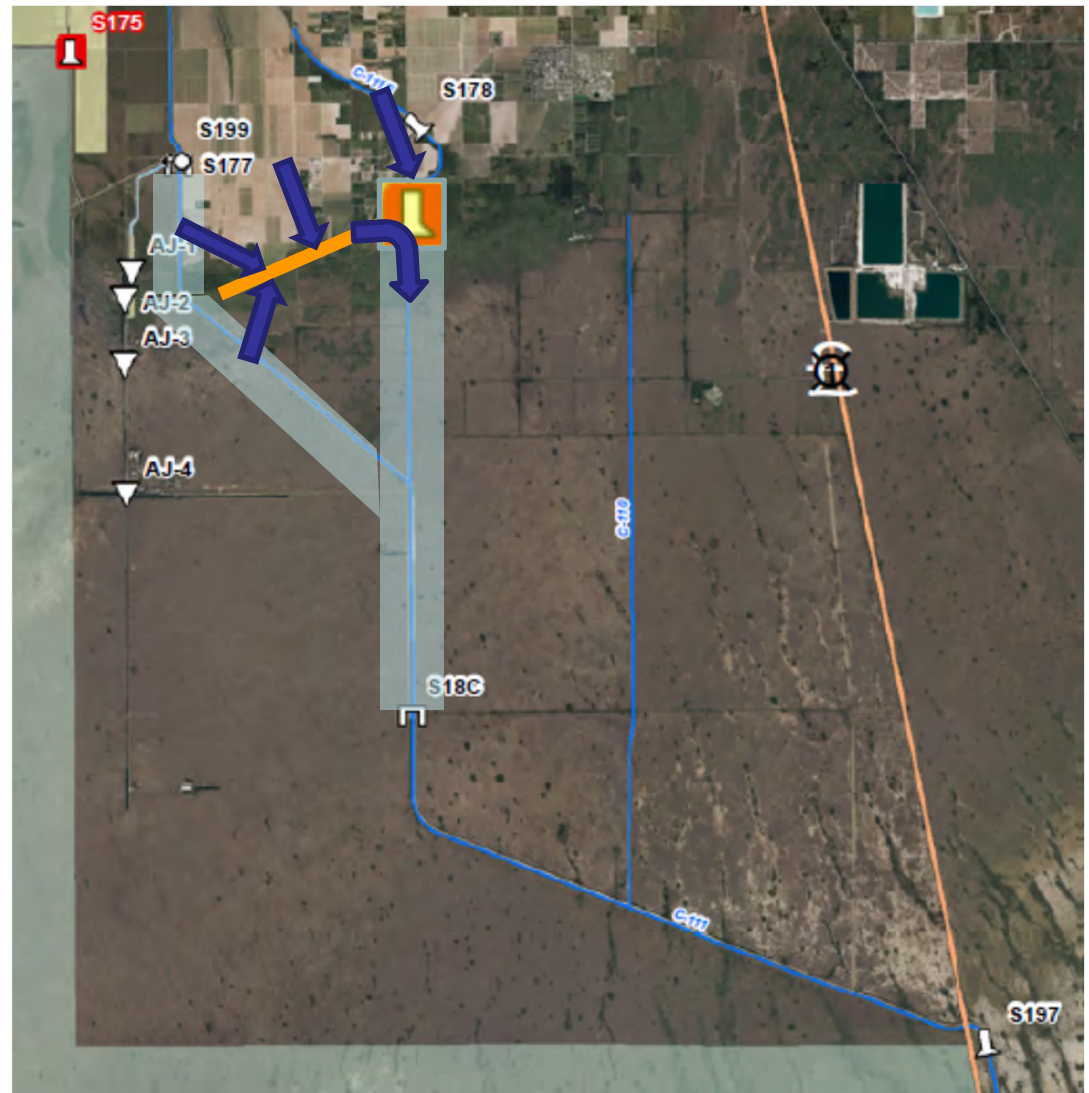
Structures	41-year average flows (K ac-ft)	
	Increment 1	Increment 1 + Raise S18C + No Change to S197
S18C	138	107
S197	20	79

- Raising S18C operating criteria as contemplated in the C111 Spreader Canal Western Project, but without corresponding changes at S197 or other improvements can improve some wetland areas in the Southern Glades, but also cause some undesirable impacts.
- Raising S20 criteria as contemplated in the C111 Spreader Canal Western Project can improve wetlands in the Model Lands

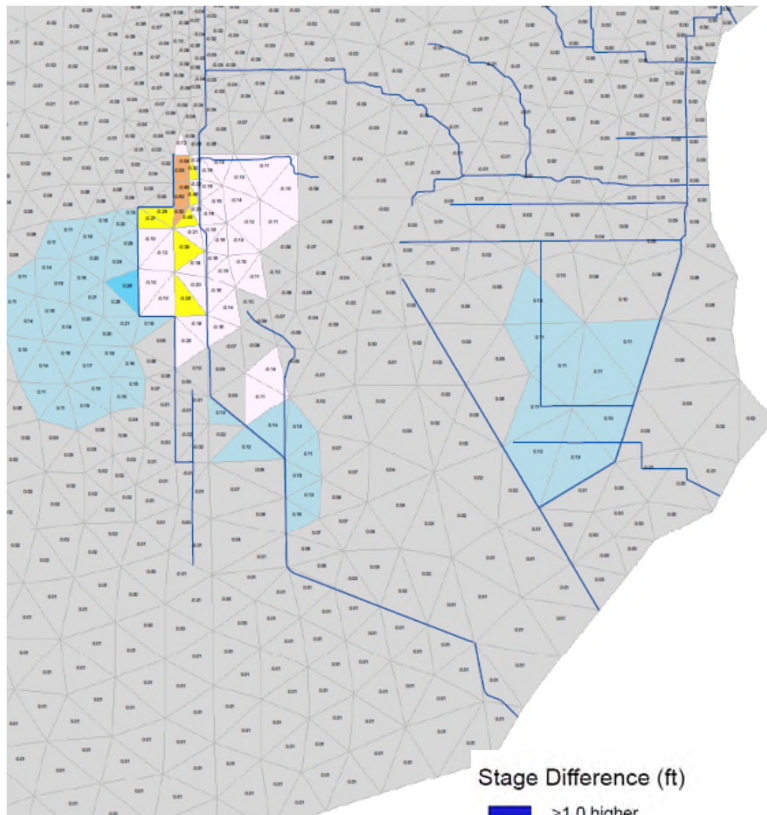
Hydrologic Challenges in the Vicinity of S18C: One Possible Engineering Solution

Increased discharges at S197 can be addressed by modifying operational criteria, but effects of raising S18C in canals upstream may require infrastructure improvements.

For example: The addition of a pump station downstream of S178 and a seepage collection canal



Example: Increment 1 with S18C Raised 0.2 ft and S20 Raised 0.5 ft



October:
41 year average

- In this example, raising S18C operating criteria is combined with infrastructure improvements as shown on the previous slide (pump downstream of S178 and seepage canal) along with corresponding operational changes to S197 and other operational changes upstream of S177.
- This outcome demonstrates improvement in wetland areas in the Southern Glades, while simultaneously maintaining or lowering water levels in agricultural areas.

ORGANIZING THE OPTIONS...

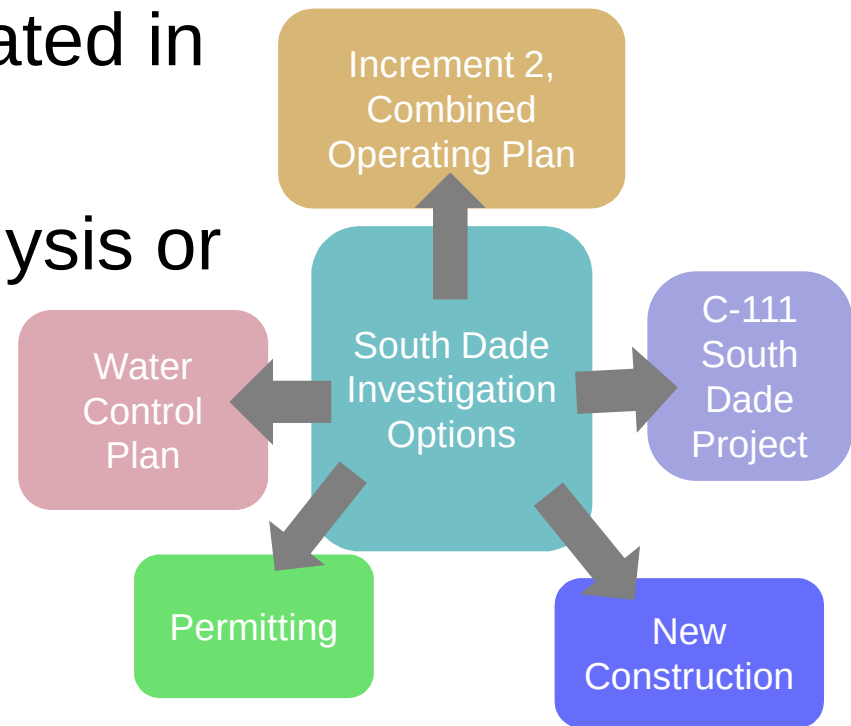


Moving Forward: Organizational Strategy

Step 1: Easier to implement

Step 2: Could be incorporated in upcoming projects

Step 3: Require more analysis or authorization



Moving Forward: Organizational Strategy, Cont.

- Steps are not sequential; can be implemented in parallel
- Options not necessarily dependent on completion of specific projects
- Organization of options may change as implementation becomes clearer during future discussions



Questions and Discussion



What We Have Achieved!

Thanks to your collective efforts, South Dade Investigations has accomplished many important outcomes:

- Technical assessment has demonstrated that it is indeed possible relief to flooded agricultural lands while retaining water in or delivering water to Everglades National Park, Florida Bay and other natural systems.
- Knowledge gained during this effort is already available to water managers who are utilizing this information to help manage the system response to unprecedented El Nino rainfall.
- A list of options to further improve conditions has been identified and will be reported back the Governing Board and WRAC.
- Future implementation efforts will benefit from the analysis performed in this forum and will likely be able to move more quickly toward desired outcomes.