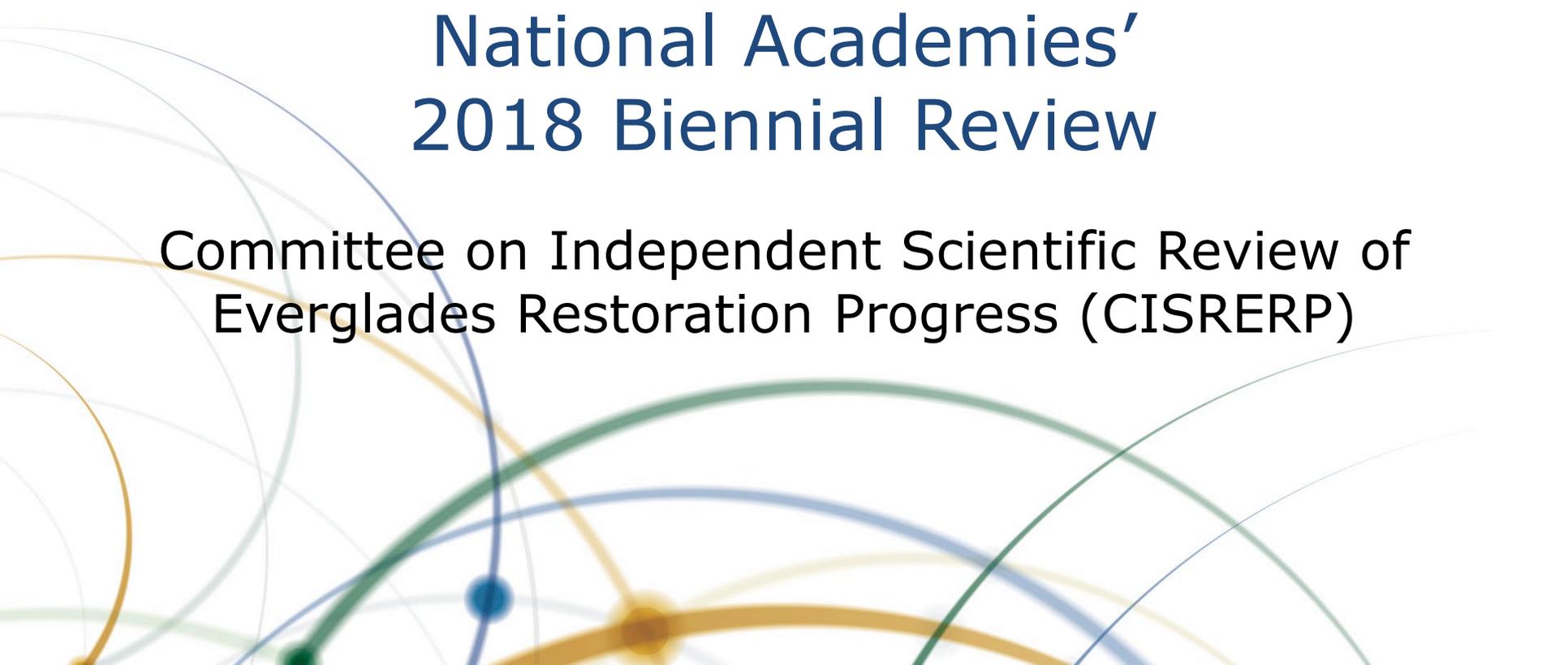


# National Academies' 2018 Biennial Review

Committee on Independent Scientific Review of  
Everglades Restoration Progress (CISRERP)



# The National Academies of Sciences, Engineering, and Medicine



- Provide independent scientific advice to the nation
- Inform decision making and public policy
- Independent, nongovernmental, non-profit organization

# Study Origin: Water Resources Development Act of 2000

- ❖ “The Secretary, the Secretary of the Interior, and the Governor, in consultation with the South Florida Ecosystem Restoration Task Force, shall establish an independent scientific review panel convened by a body, such as the National Academy of Sciences, to review the Plan’s progress toward achieving the natural system restoration goals of the Plan.”
- ❖ “The panel ... shall produce a biennial report to Congress, the Secretary, the Secretary of the Interior, and the Governor that includes an assessment of ... measures of progress in restoring the ecology of the natural system, based on the Plan.”



# CISRERP Statement of Task

The committee will produce biennial reports providing:

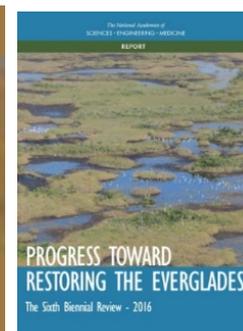
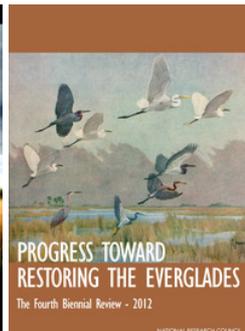
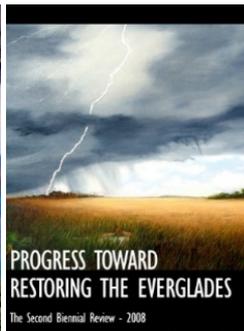
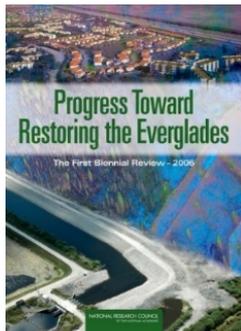
1. An assessment of progress in restoring the natural system
2. Discussion of significant accomplishments of the restoration
3. Discussion and evaluation of specific scientific and engineering issues that may impact progress in achieving the natural system restoration goals of the plan
4. Independent review of monitoring and assessment protocols to be used for evaluation of CERP progress



# CISRERP Biennial Reviews 2006-2018

(available at [nap.edu](http://nap.edu))

- Progress Toward Restoring the Everglades: The First Biennial Review, 2006 (*incremental adaptive restoration*)
- The Second Biennial Review, 2008 (*Lake Okeechobee, Mod Waters*)
- The Third Biennial Review, 2010 (*water quality and quantity*)
- The Fourth Biennial Review, 2012 (*ecosystem trajectories*)
- The Fifth Biennial Review, 2014 (*CEPP, climate change, invasive species*)
- The Sixth Biennial Review, 2016 (*knowledge gained, CERP update*)
- The Seventh Biennial Review, 2018 (*monitoring, Lake O., mid-course assessment*)



# CISRERP VII Membership

- WILLIAM BOGGESS (*Chair*), Oregon State
- MARY JANE ANGELO, University of Florida
- CHARLES DRISCOLL, Syracuse University
- SIOBHAN FENNESSY, Kenyon College
- WENDY GRAHAM, University of Florida
- KARL HAVENS, University of Florida
- FERNANDO MIRALLES-WILHELM, Univ. of Maryland
- DAVID MOREAU, Univ. of North Carolina,
- GORDON ORIAN, University of Washington
- DENISE REED, University of New Orleans
- JAMES SAIERS, Yale University
- ERIC SMITH, Virginia Tech
- DENICE WARDROP, Pennsylvania State Univ.
- GREG WOODSIDE, Orange County Water District



# Session Organization: 2018 Biennial Report Focal Topics

- [Review of restoration progress](#)—Stephanie Johnson, National Academies
- [CERP monitoring](#)—Eric Smith, Virginia Tech
- [Water Depth and Ecol. Attributes in Lake Okeechobee](#)—Karl Havens, Univ. of Florida
- [CERP mid-course assessment](#)—Wendy Graham, Univ. of Florida

*The National Academies of*  
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# The National Academies' 2018 Review of Everglades Restoration Progress

Committee on Independent Scientific Review of  
Everglades Restoration Progress (CISRERP)

Stephanie Johnson, Study Director



# CISRERP Statement of Task

The committee will produce biennial reports providing:

1. An assessment of progress in restoring the natural system
2. Discussion of significant accomplishments of the restoration
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4. Independent review of monitoring and assessment protocols to be used for evaluation of CERP progress



# Non-CERP Restoration Progress

- Recent completion of Mod Waters and C-111 expected to provide important restoration benefits to ENP
  - Major achievement
  - Benefits dependent on final operational plan
- Impressive advances toward water quality objectives
  - Lowest mean outflow (15 ppb) concentrations in 23 years



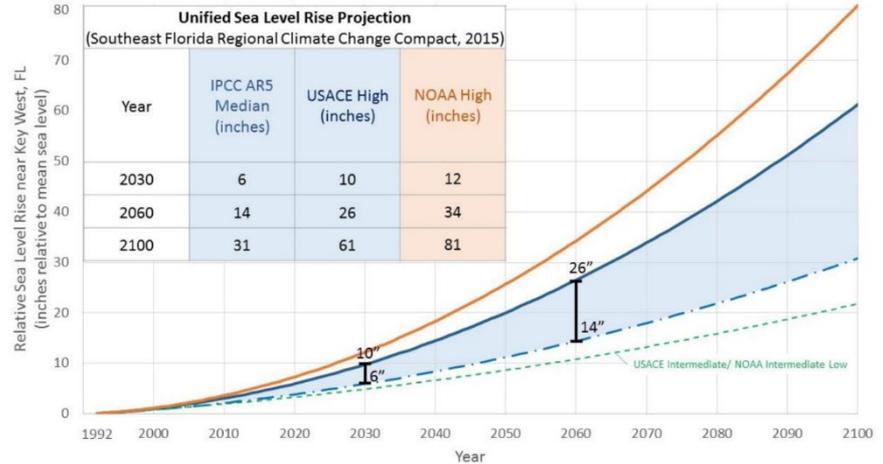
# CERP Restoration Progress

- One CERP project completed
  - Melaleuca biocontrol mass rearing facil.
- One CERP project nearing completion
  - C-111 Spreader Canal (#6)
- Four CERP projects ongoing
  - Picayune Strand (#2)
  - Biscayne Bay Coastal Wetlands (#7)
  - C-44 Reservoir (#4)
  - C-43 Reservoir (#8)
- Impressive efforts in project planning (4 projects; #10, 12, 14, 15: EAA Reservoir now authorized)



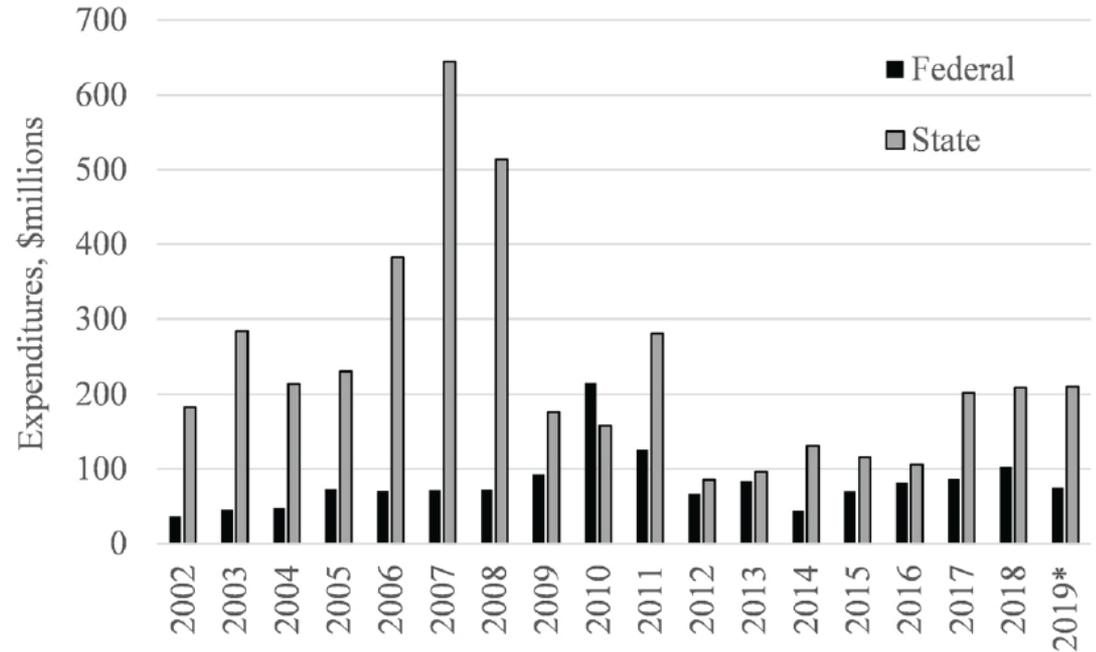
# CERP Planning

- Planning efforts have advanced the vision for CERP storage
- But a holistic understanding of combined benefits systemwide are lacking
  - Does not adequately examine their resilience to changing climate and sea level rise



# Funding for CERP Implementation Progress

- At FY18 levels, will take 30 years to construct currently authorized projects (incl. CEPP, EAA)
  - 65 years with 5-yr avg. funding
- Increases importance of future conditions
- Challenges for prioritization



# Analysis of Natural System Restoration Progress

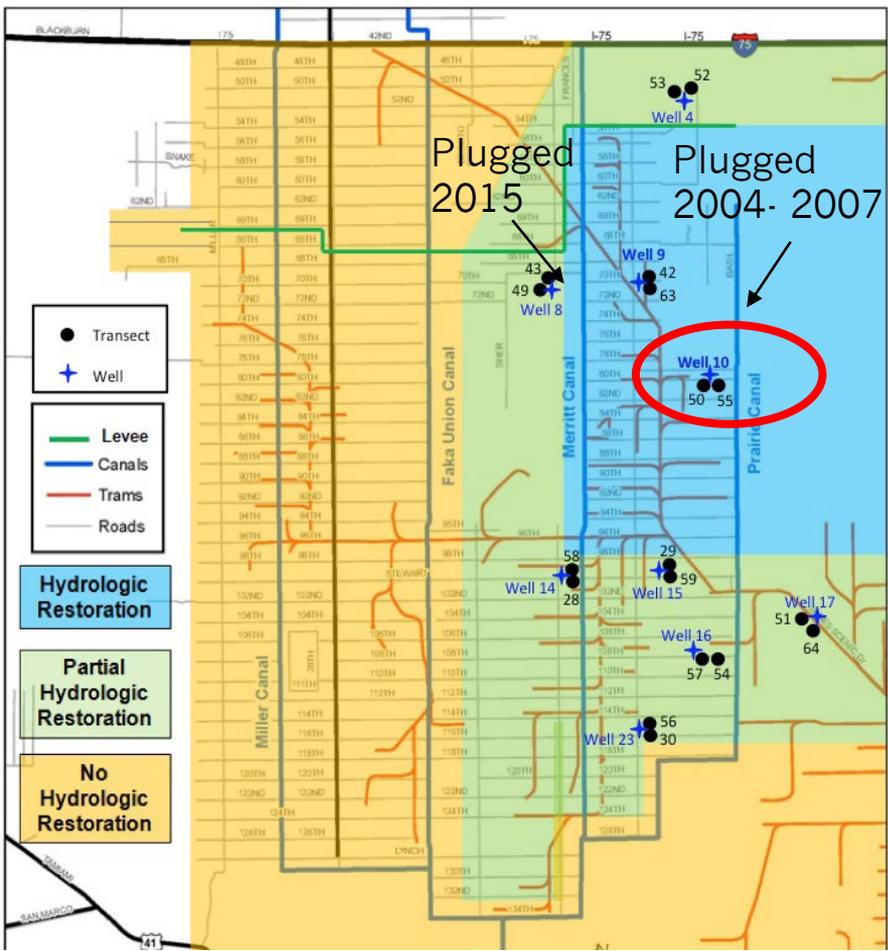
- Picayune Strand (#2)
- Biscayne Bay Coastal Wetlands (#7)
- C-111 Spreader Canal (#6)



# Picayune Strand

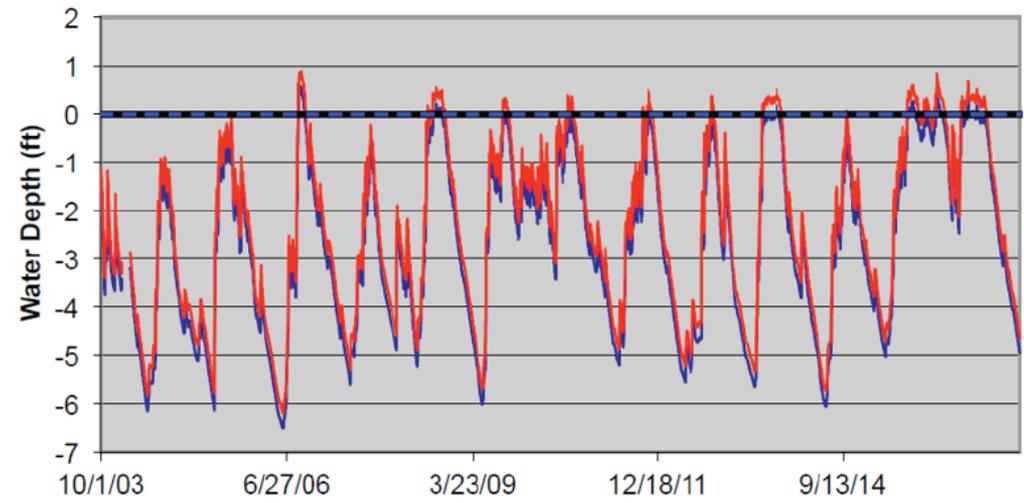


# Picayune Strand: Hydrologic Progress

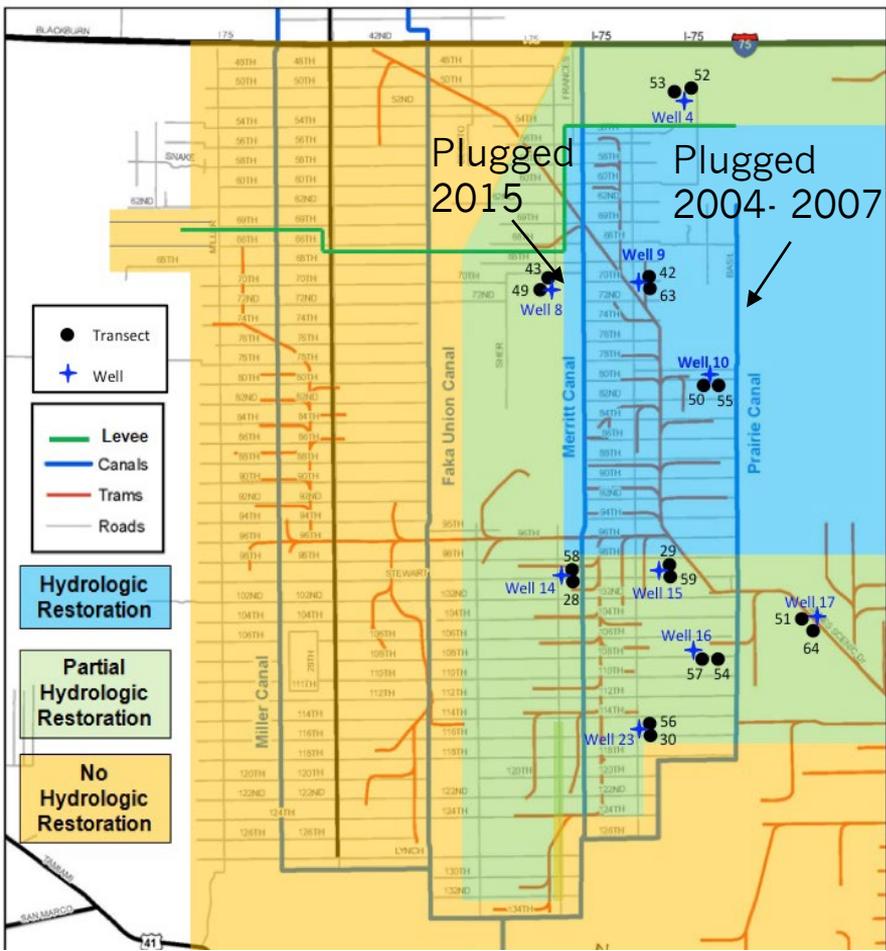


Increased water levels in full and partially restored areas (qualitative analyses)

Water Depth at SGT2W6 (Well 10)



# Picayune Strand: Ecological Progress



Few definitive conclusions from ecological monitoring to date

- Target conditions reached groundcover in wet prairie
- Faunal indicators (fish, macroinvertebrates, tree frogs) showed high variability between sites
- Invasive species complicate analysis
- Few statistically significant responses

# Biscayne Bay Coastal Wetlands: Deering Estate

- Operating under discontinuous pumping since 2012
- Decreased surface water and groundwater salinity in wetland
- No significant changes to vegetation
- Near-shore salinity remain above target

Change to continuous 25 cfs pumping in 2019; hydrate 19 acres

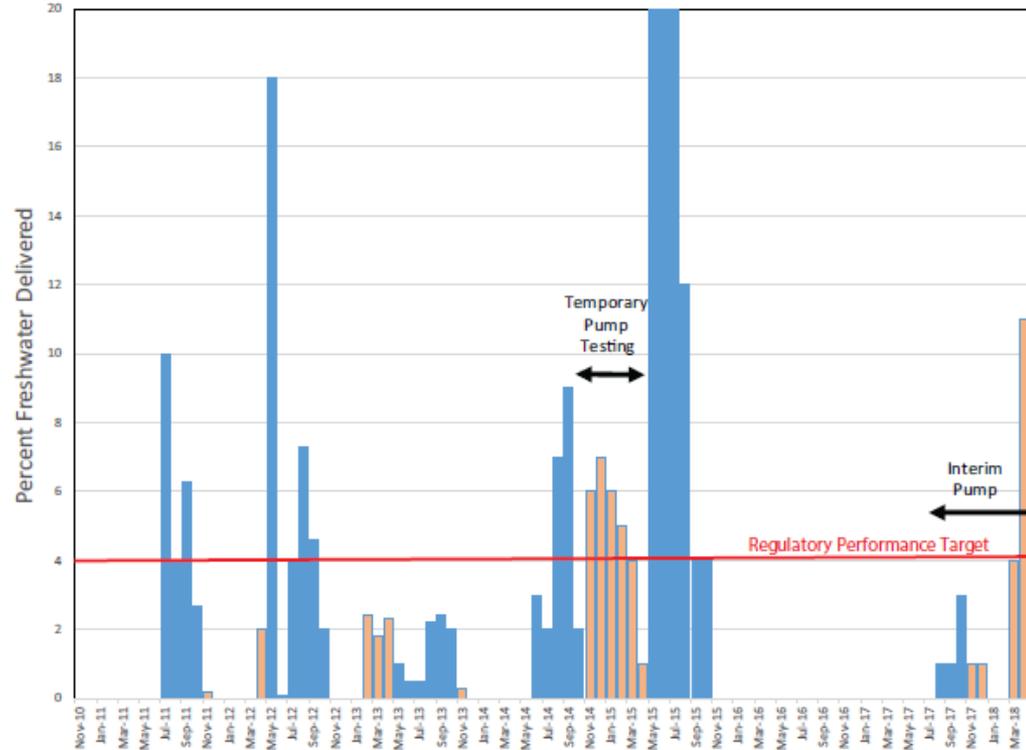
- Warrants evaluation of effect on goals



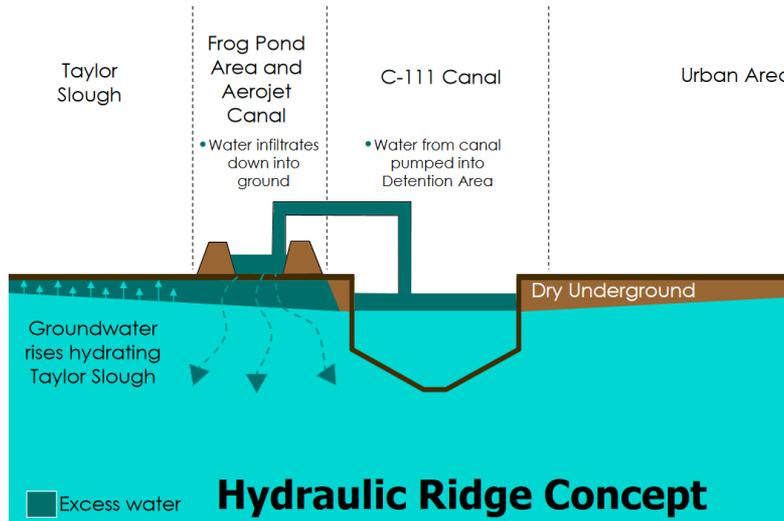
# Biscayne Bay Coastal Wetlands: L-31E

4 culverts (2012), 6 culverts (2016), interim pump (2017)

- Volumetric target not specified
- Regulatory target only met in 24 out of 84 months
- Dry season flows mainly require pumps
- Marginal responses in wetland vegetation, species
- Lack of analysis of performance vs. expectations



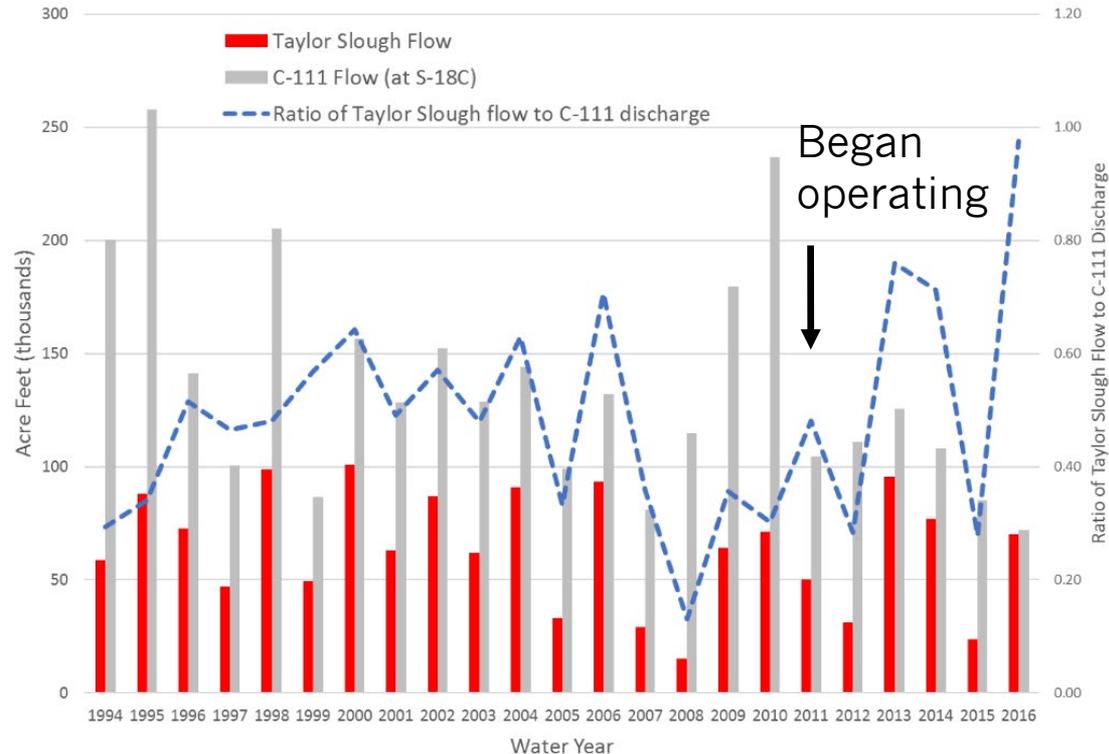
# C-111 Spreader Canal



# C-111 Spreader Canal

(Began operating in 2011)

- Largest effects in wet years
- Project more efficient in dry season (73%) vs wet (7%)
- Project-specific effects not clear amidst hydrologic variability





# Key Findings

- Substantial advancements in project planning in last 2 years; two major non-CERP projects completed
- Incremental CERP restoration progress difficult to evaluate based on existing data analysis
  - Lack of rigorous assessment of outcomes relative to goals/expectations