An Overview of C-111 Spreader Canal Western Project Implementation and Restoration Progress

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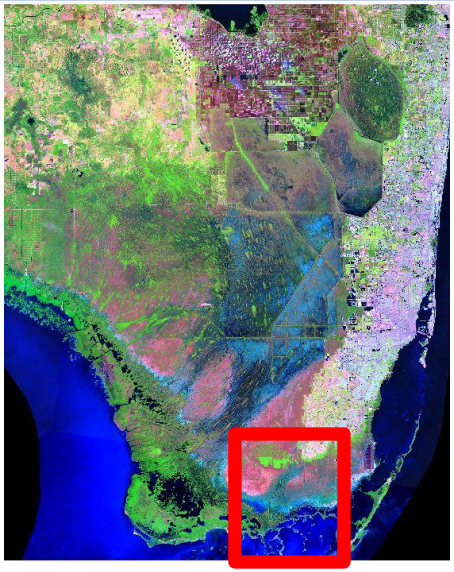
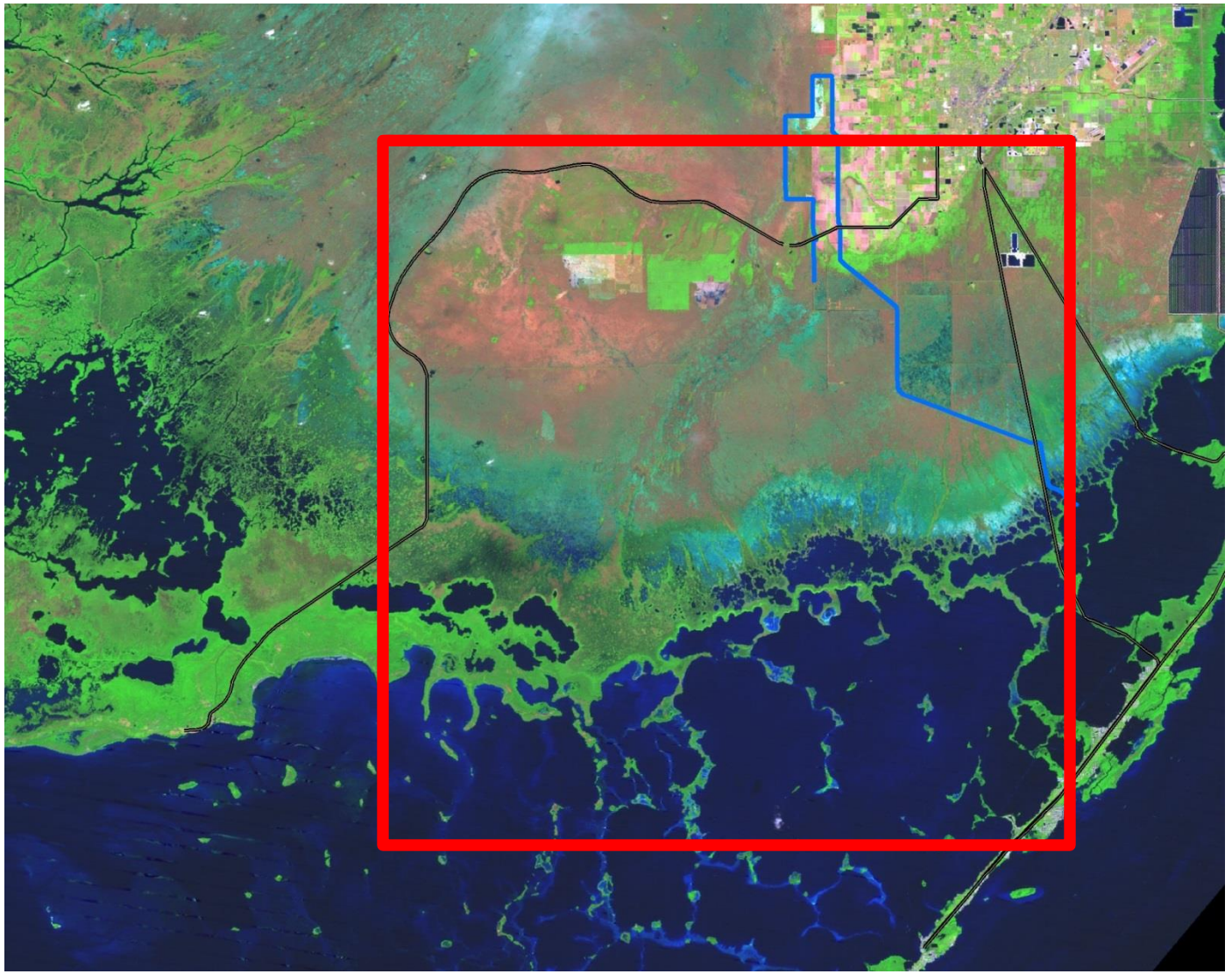
C-111 Spreader Canal Western Project: Key Points

- C-111 SCW is an operational CERP project
- Preliminary assessment: results are promising, but inconclusive
- C-111 SCW restoration limitation: water redistribution only
- Future projects for southern Everglades and estuaries restoration: Modified Water Deliveries, CEPP, Biscayne Bay Coastal Wetlands, and C-111 SC Phase 2

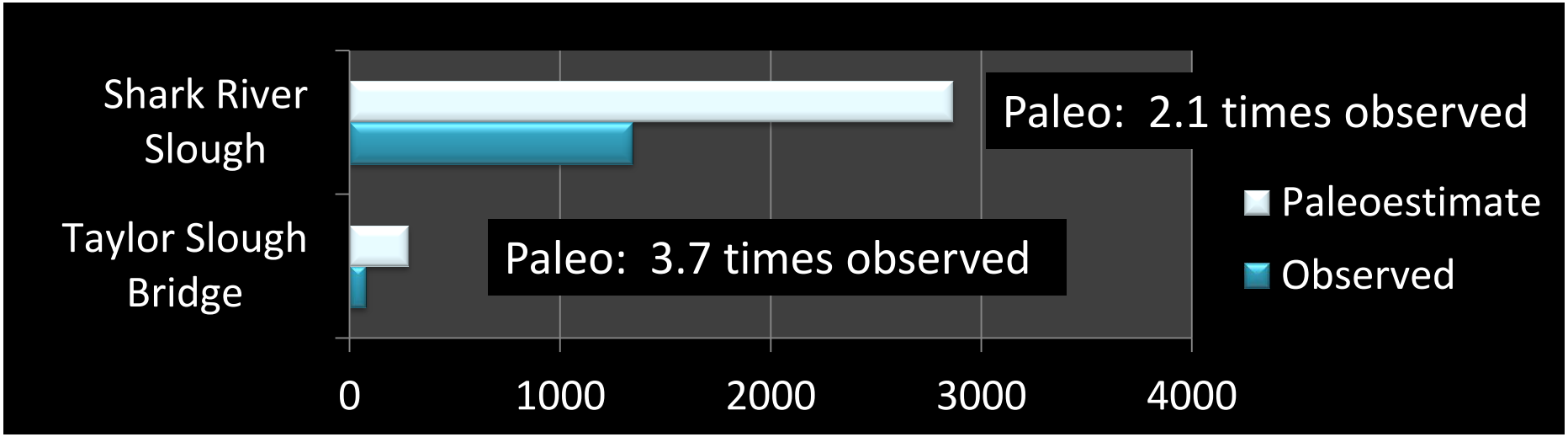
C-111 Spreader Canal Western Project Location





Current Observed Flow Compared to Estimated Pre-drainage

Pre-drainage flow through the Everglades was more than double present flow

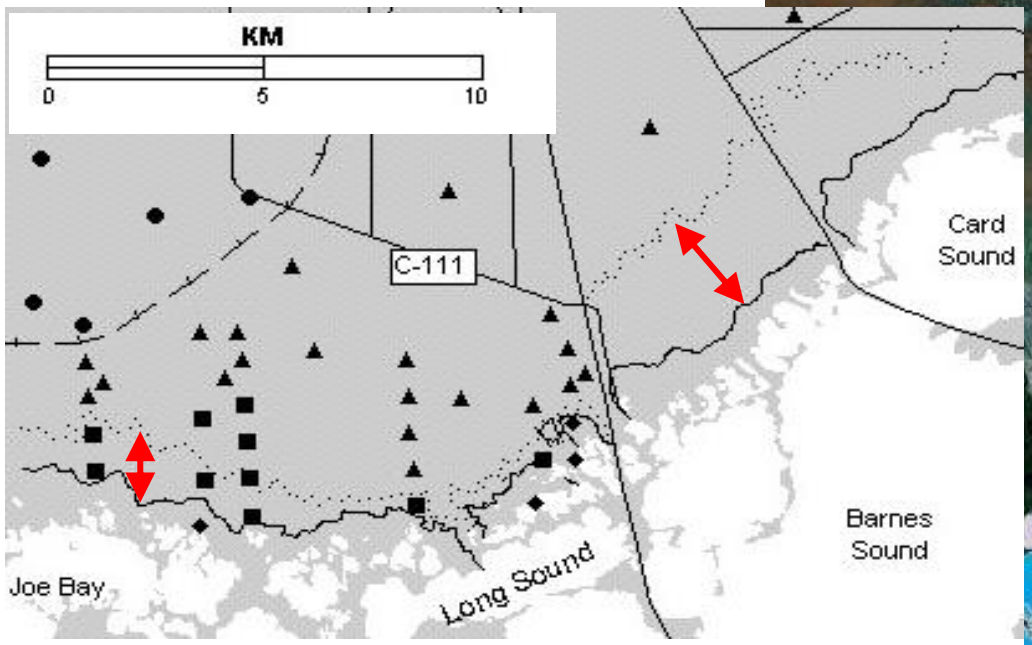


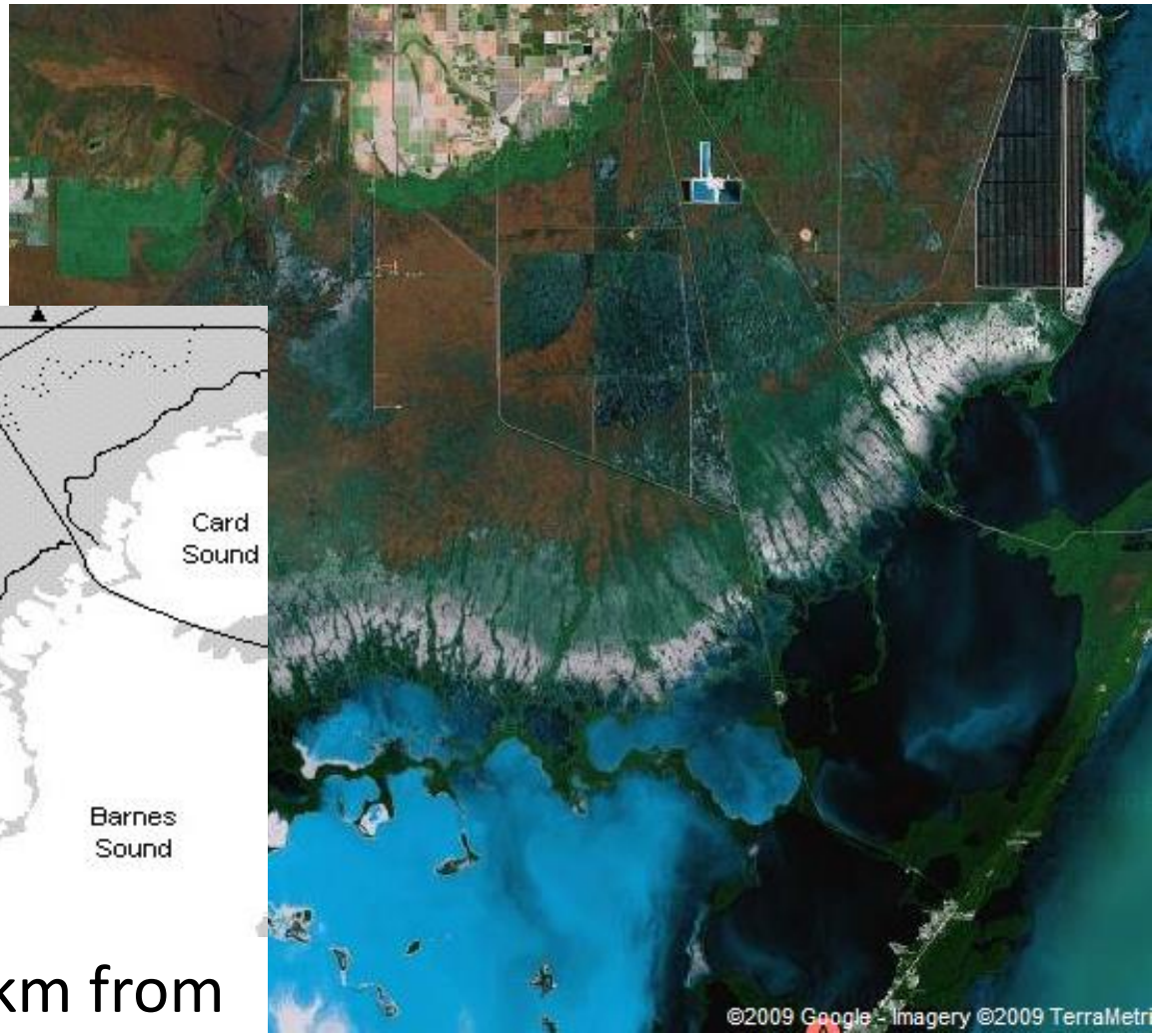
Flow (million m^3 per year)

Marshall, Wingard & Pitts 2014. Estuaries & Coasts v 37

Need for Restoration: Long-term Expansion of the Coastal Saline "White Zone" with Saltwater Intrusion

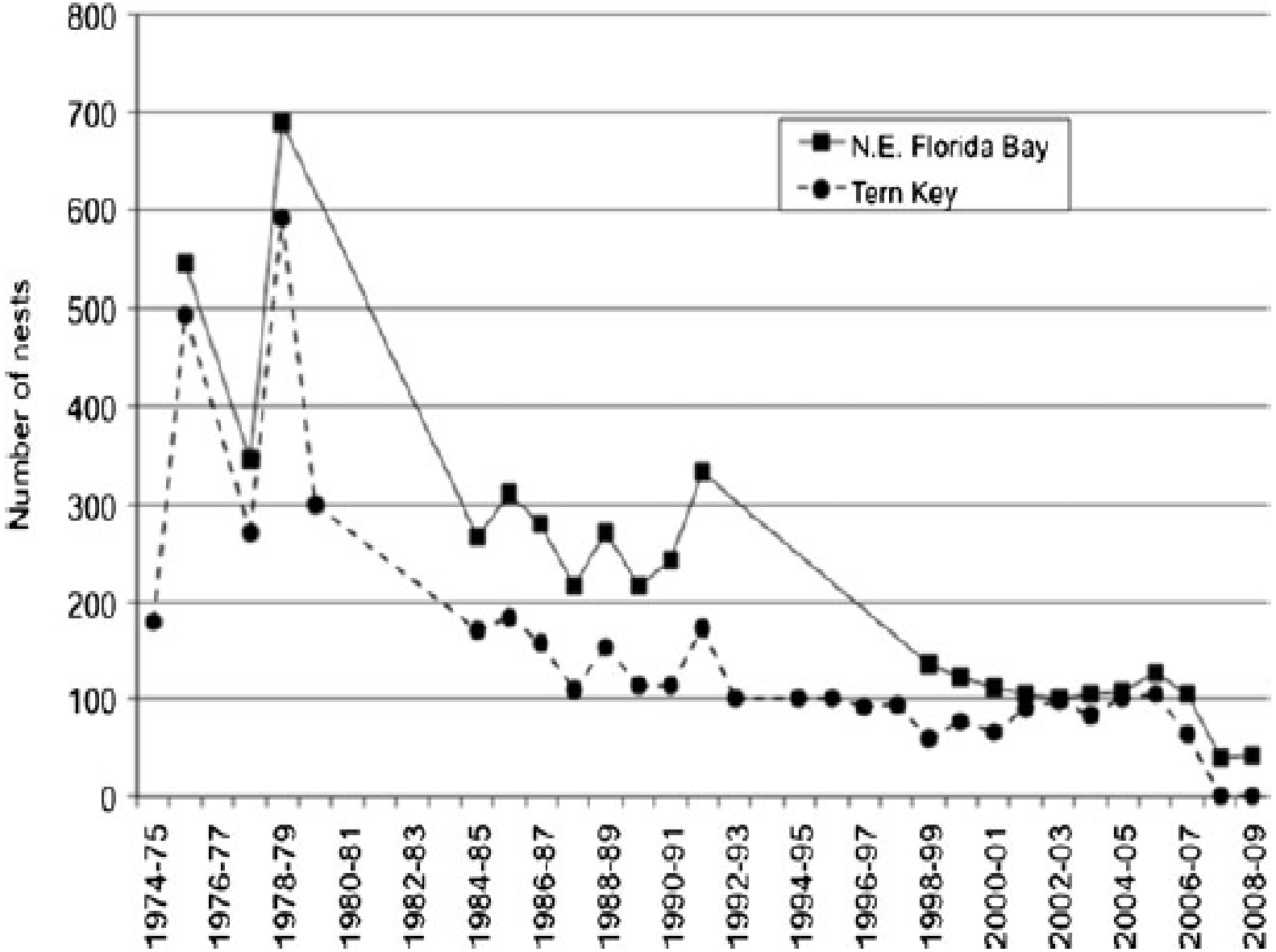
The white zone is wider east of Everglades National Park





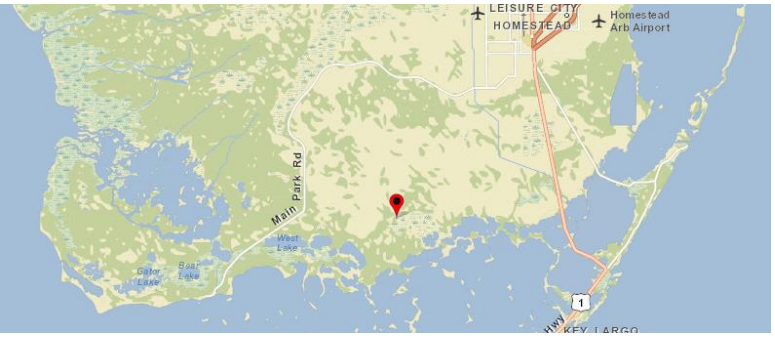
White zone expanded 1-3 km from 1940-1994 (from Ross et al. 2000)

Roseate Spoonbill Nests on Northeastern Florida Bay Islands

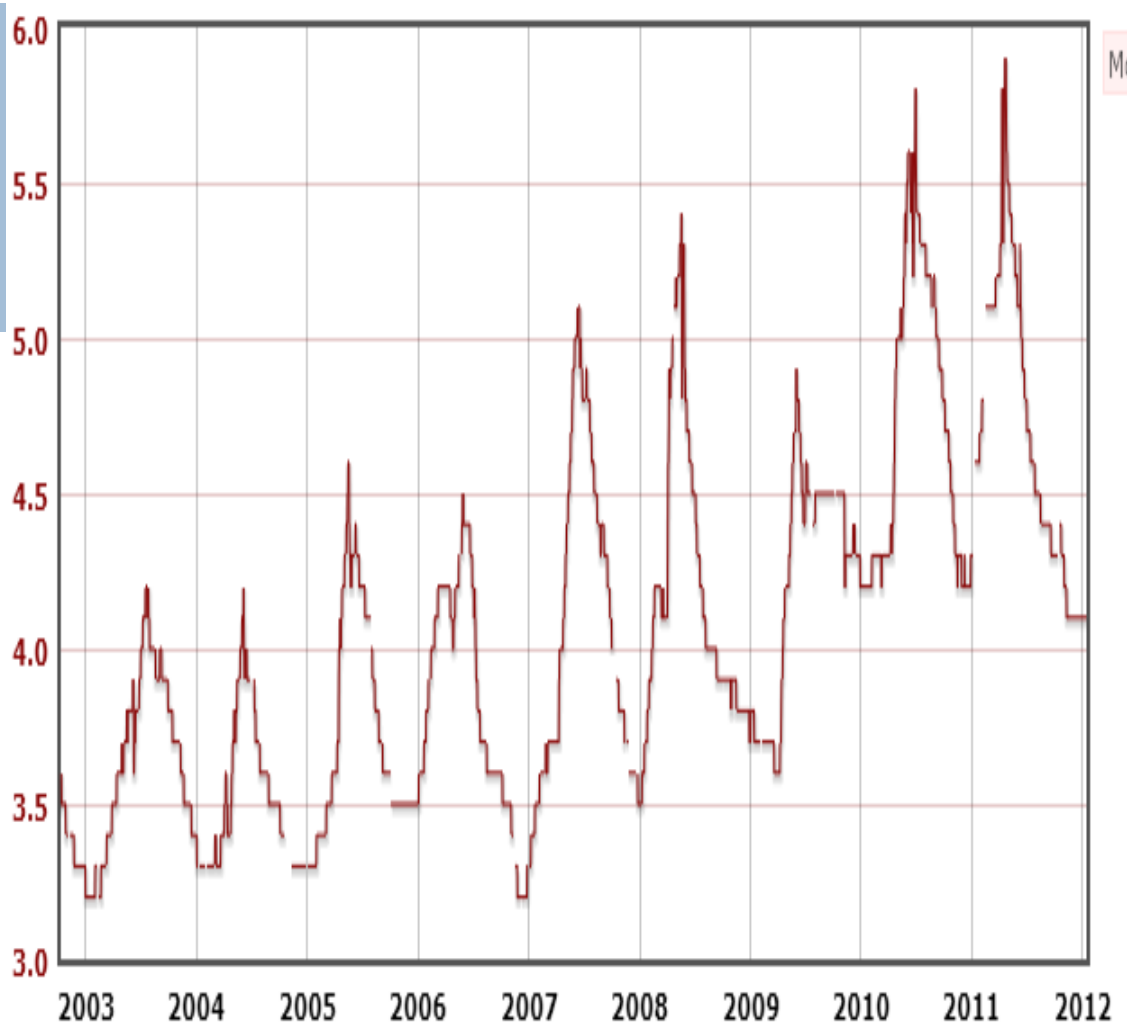


From Lorenz in 2014 RECOVER Systems Status Report

Groundwater Salinity Trend in Southern Taylor Slough

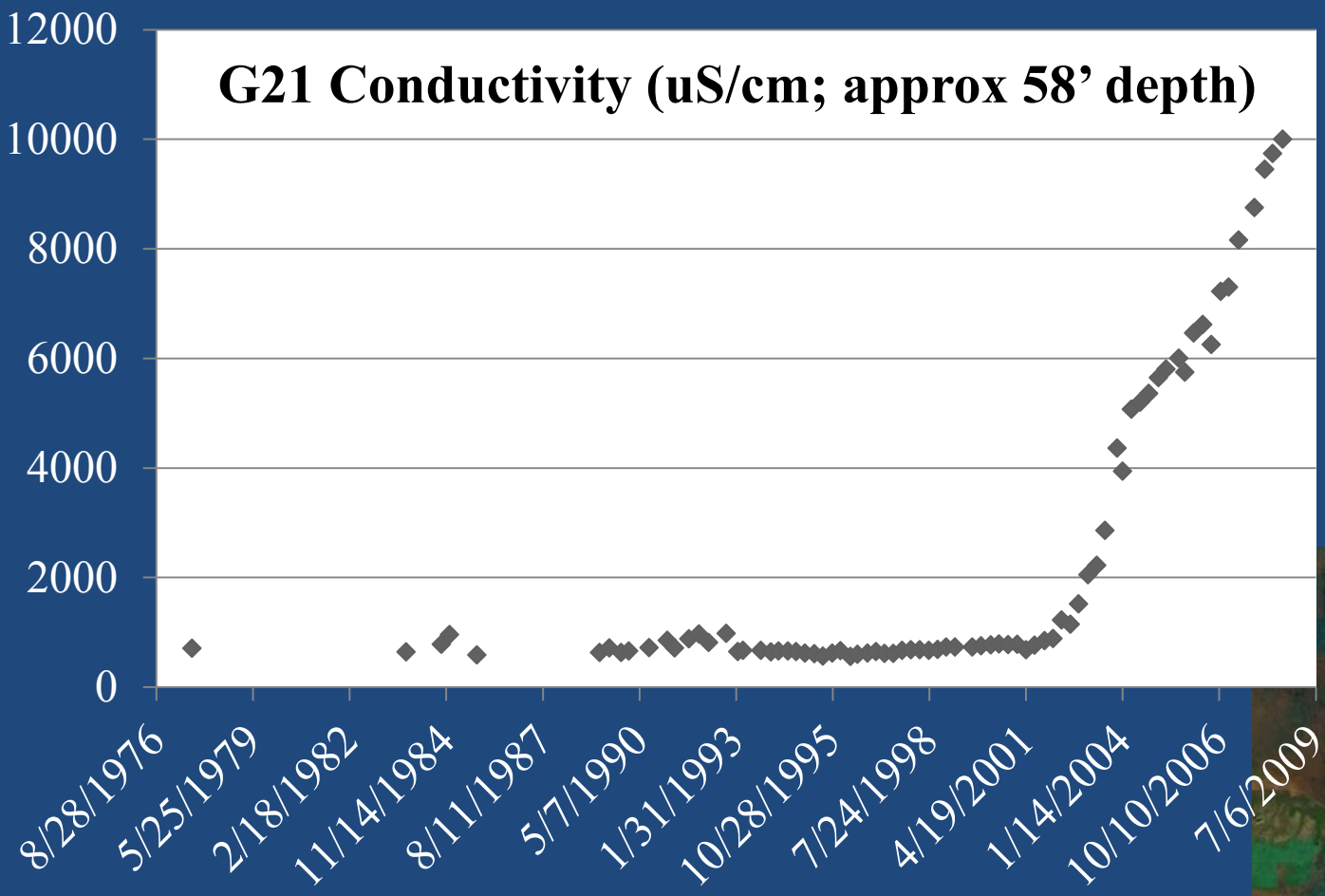


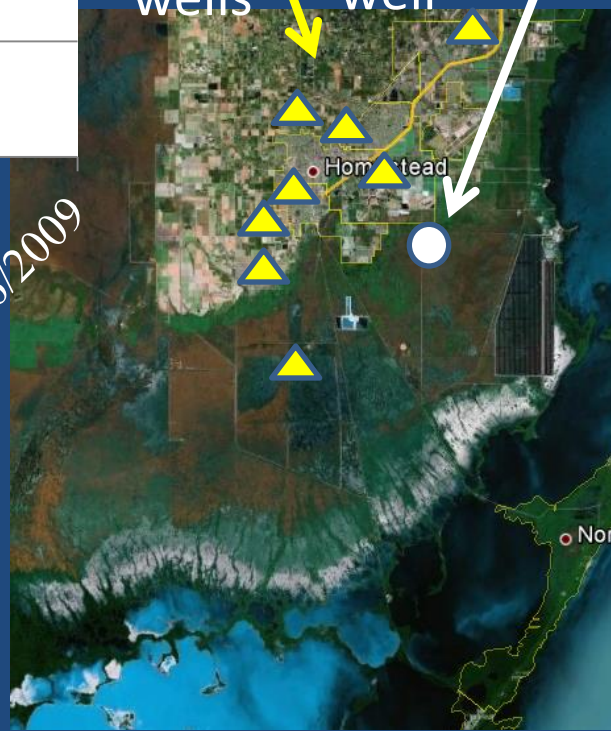
Salinity
(PSU)

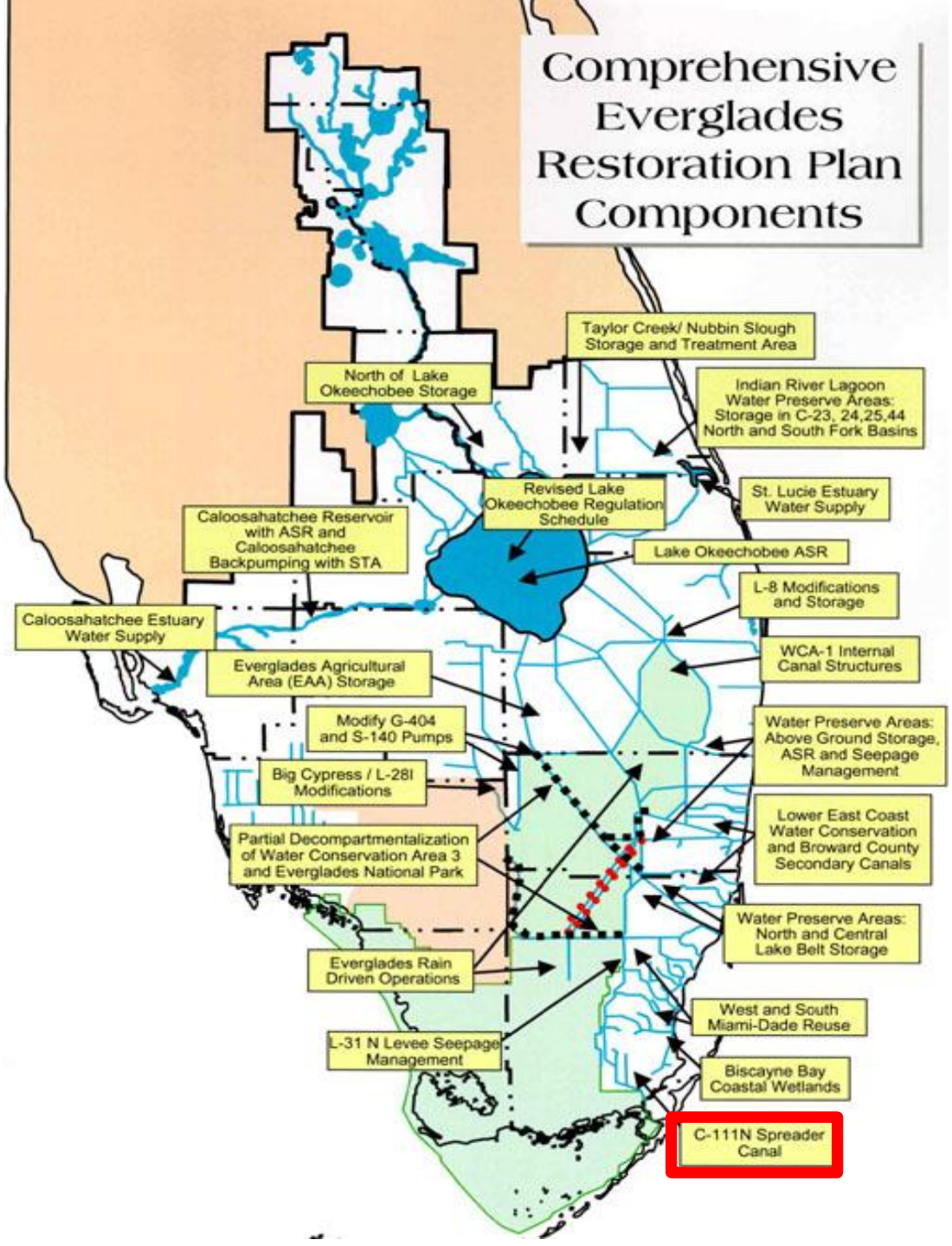


From Zucker et al. (2013)

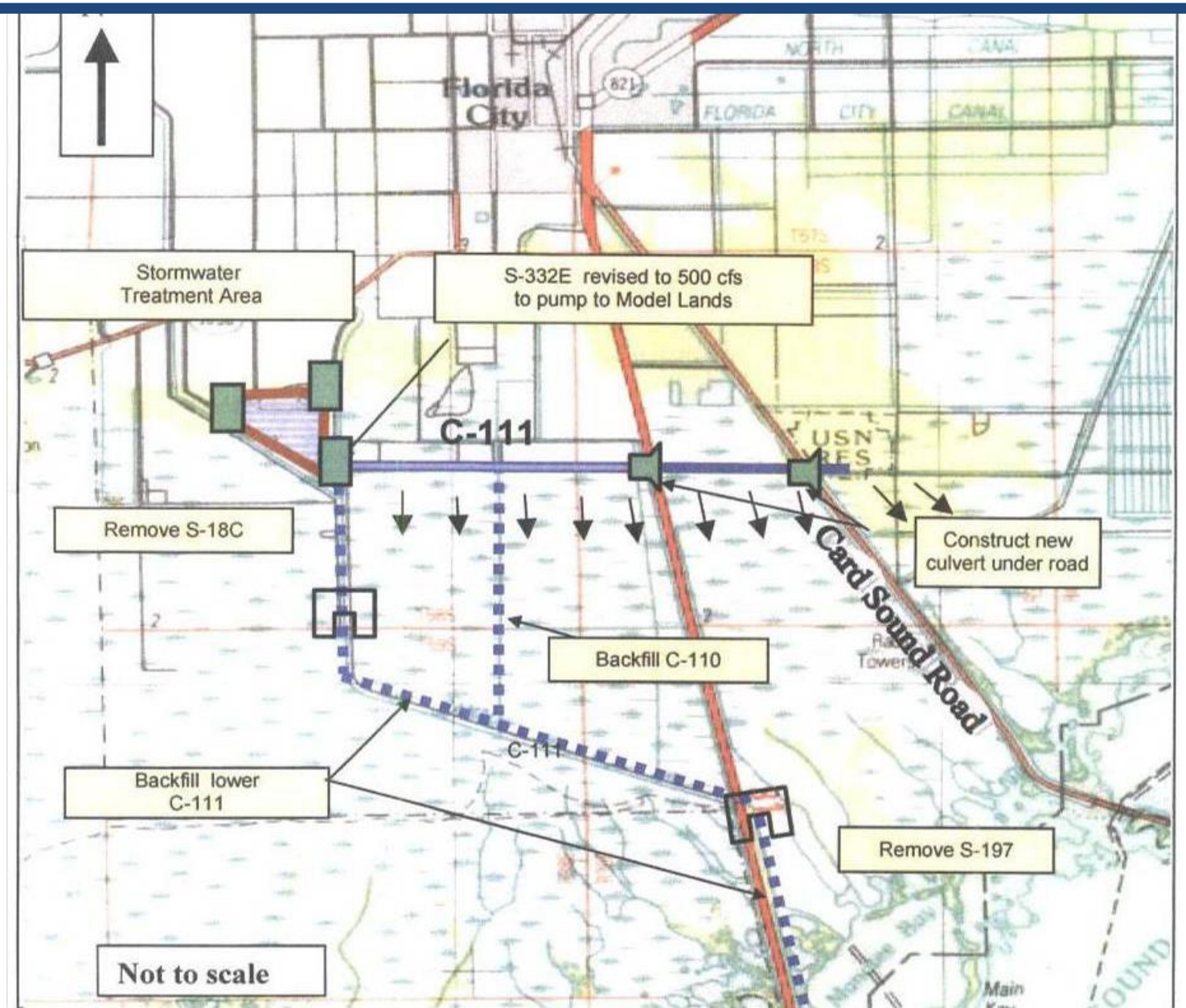
Saltwater Intrusion in Southeastern Groundwater Well






Comprehensive Everglades Restoration Plan Components
Taylor Creek/ Nubbin Slough Storage and Treatment Area
North of Lake Okeechobee Storage
Indian River Lagoon Water Preserve Areas: Storage in C-23, 24,25,44 North and South Fork Basins
Revised Lake Okeechobee Regulation Schedule
St. Lucie Estuary Water Supply
Caloosahatchee Reservoir with ASR and Caloosahatchee Backpumping with STA
Lake Okeechobee ASR
L-8 Modifications and Storage
Caloosahatchee Estuary Water Supply
WCA-1 Internal Canal Structures
Everglades Agricultural Area (EAA) Storage
Modify G-404 and S-140 Pumps
Water Preserve Areas: Above Ground Storage, ASR and Seepage Management
Big Cypress / L-28I Modifications
Lower East Coast Water Conservation and Broward County Secondary Canals
Partial Decompartmentalization of Water Conservation Area 3 and Everglades National Park
Water Preserve Areas: North and Central Lake Belt Storage
Everglades Rain Driven Operations
West and South Miami-Dade Reuse
L-31 N Levee Seepage Management
Biscayne Bay Coastal Wetlands
C-111N Spreader Canal

Original Plan (aka “Restudy”, “Yellow Book”)
C-111 Spreader Canal Project (CERP Final Feasibility Report 1999)



C-111 SC Design Change and Objectives

In 2006:

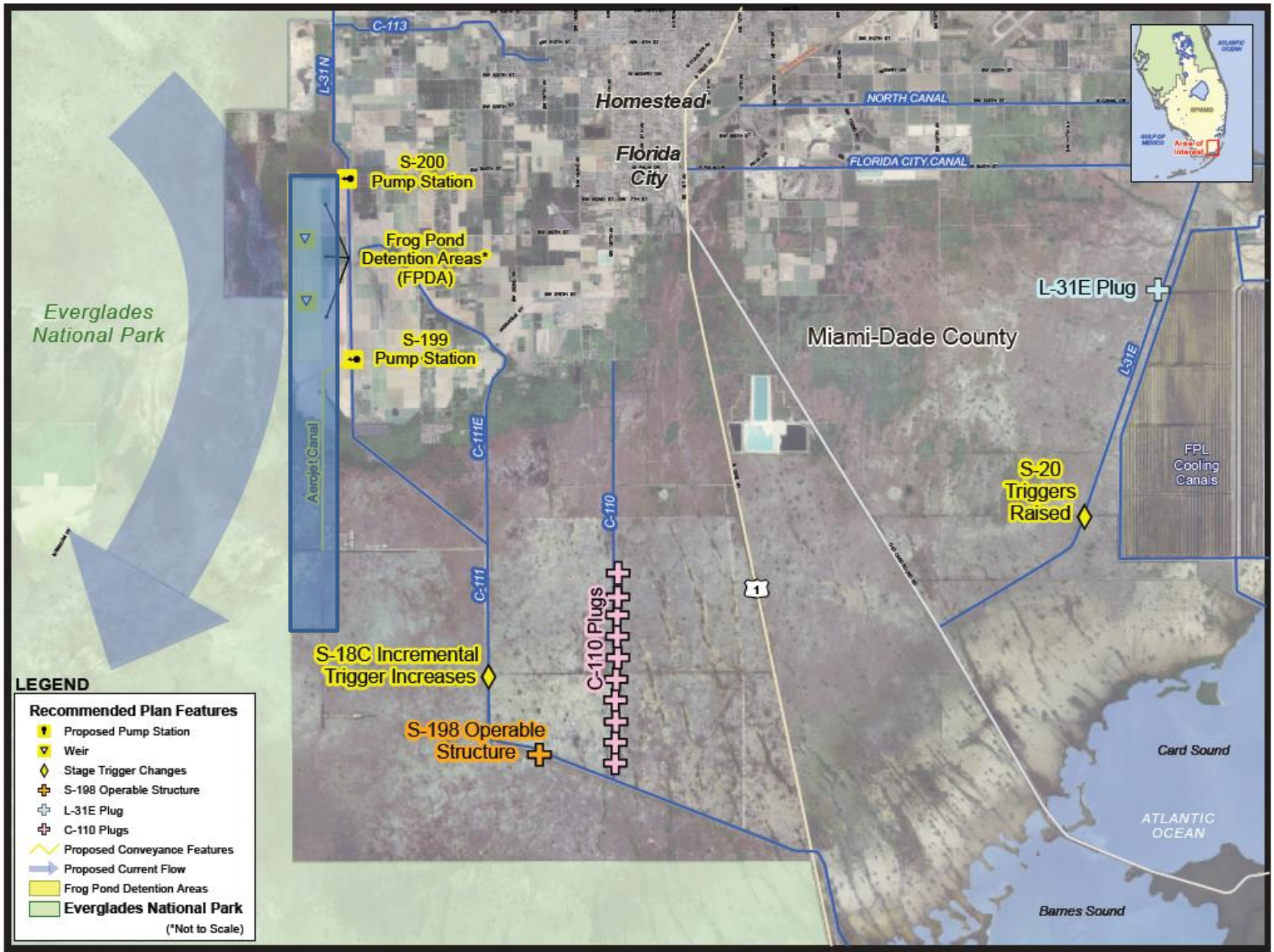
- DOI presented concerns that C-111SC would harm Taylor Slough
- NRC review called for CERP progress via “Incremental Adaptive Restoration

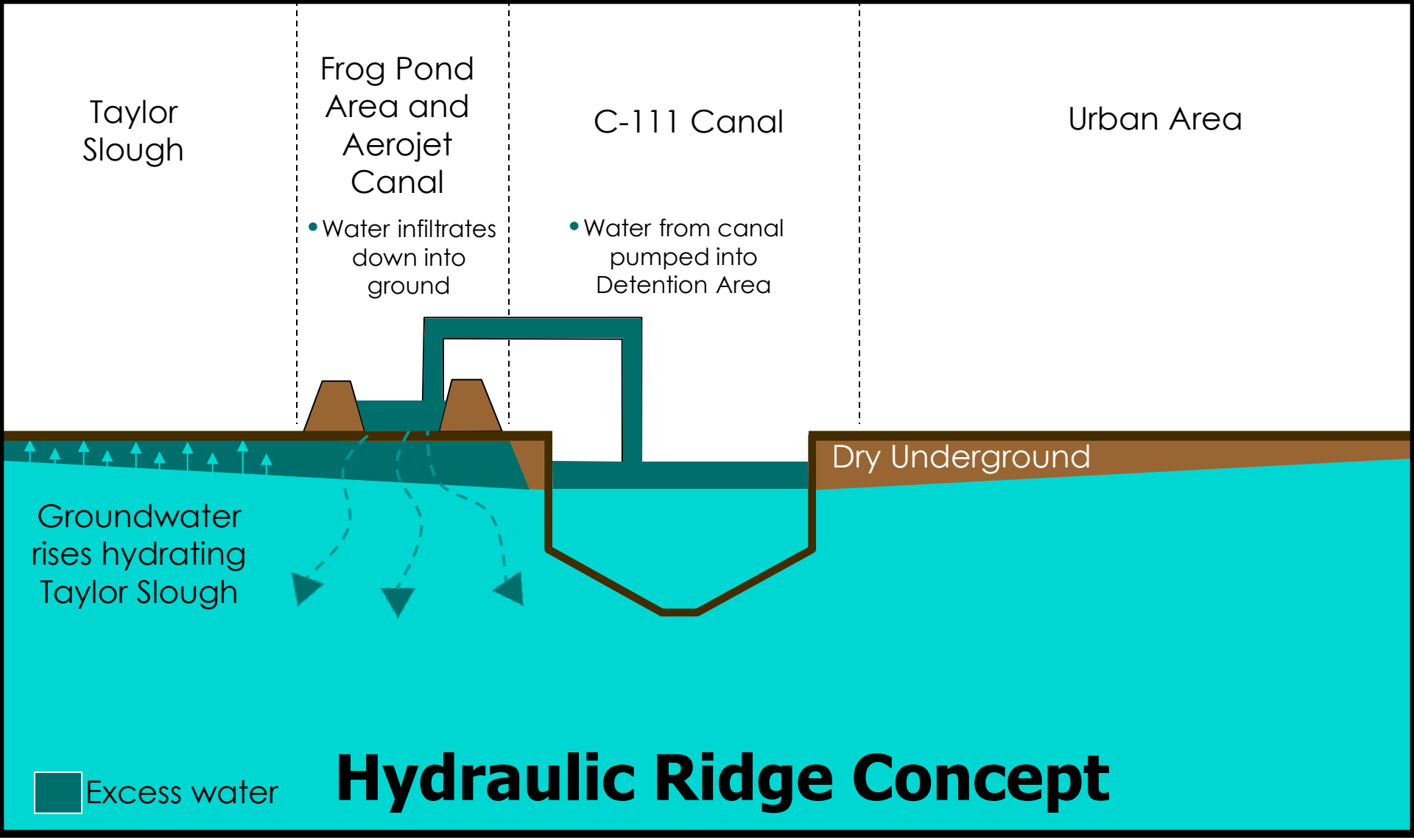
In 2007: new Phase I of C111SC (=Western Features) design began

Project Objectives:

- Restore water delivery to Florida Bay via Taylor Slough as close as possible to estimated pre-drainage flow
- Restore coastal zone salinity levels in Florida Bay as close as possible to estimated pre-drainage levels.
- Improve hydroperiods and hydropatterns to support historical vegetation patterns

C-111 Spreader Canal Western Project Features



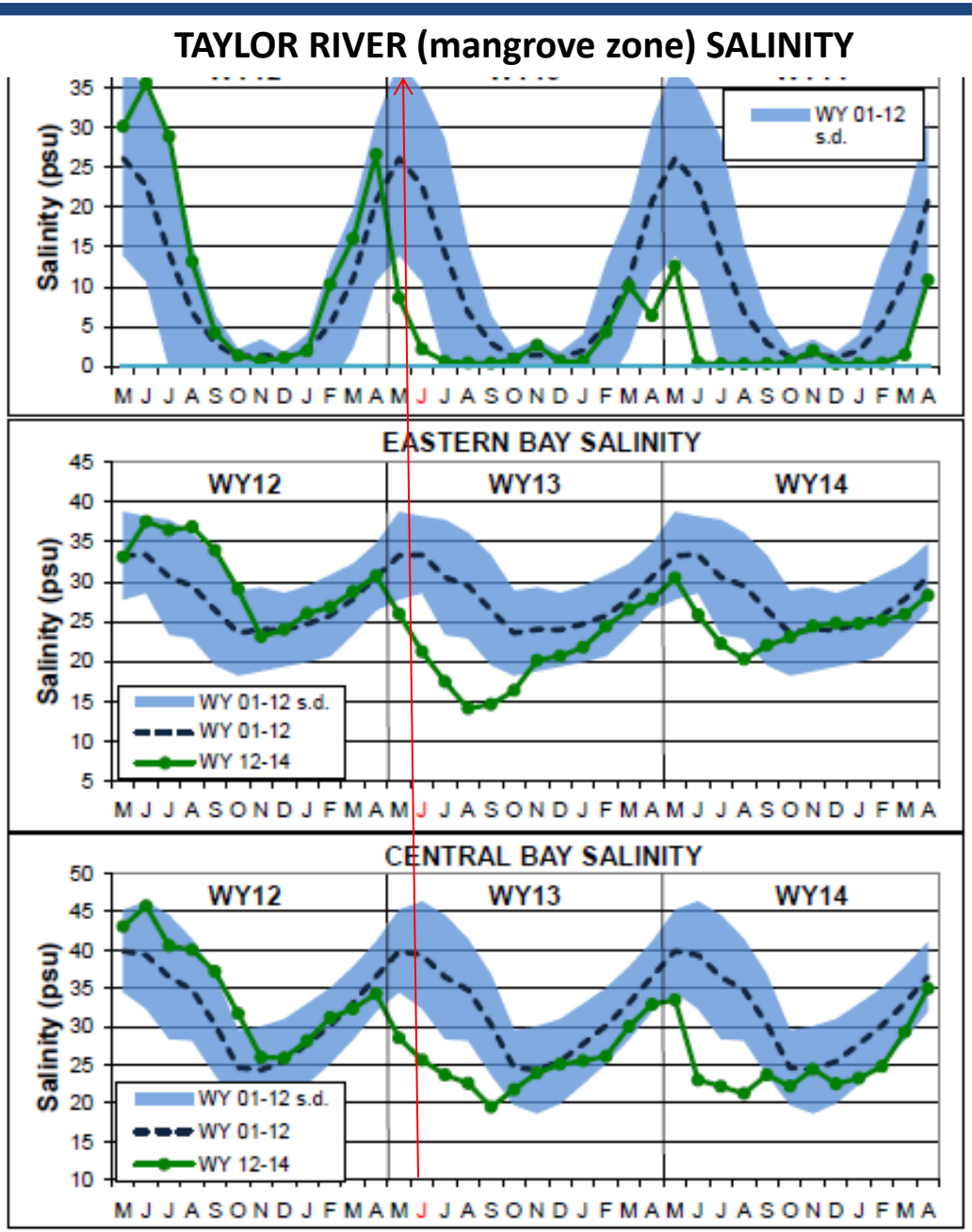


Detention area used to infiltrate water into ground and artificially raise groundwater table

From A. Loschiavo

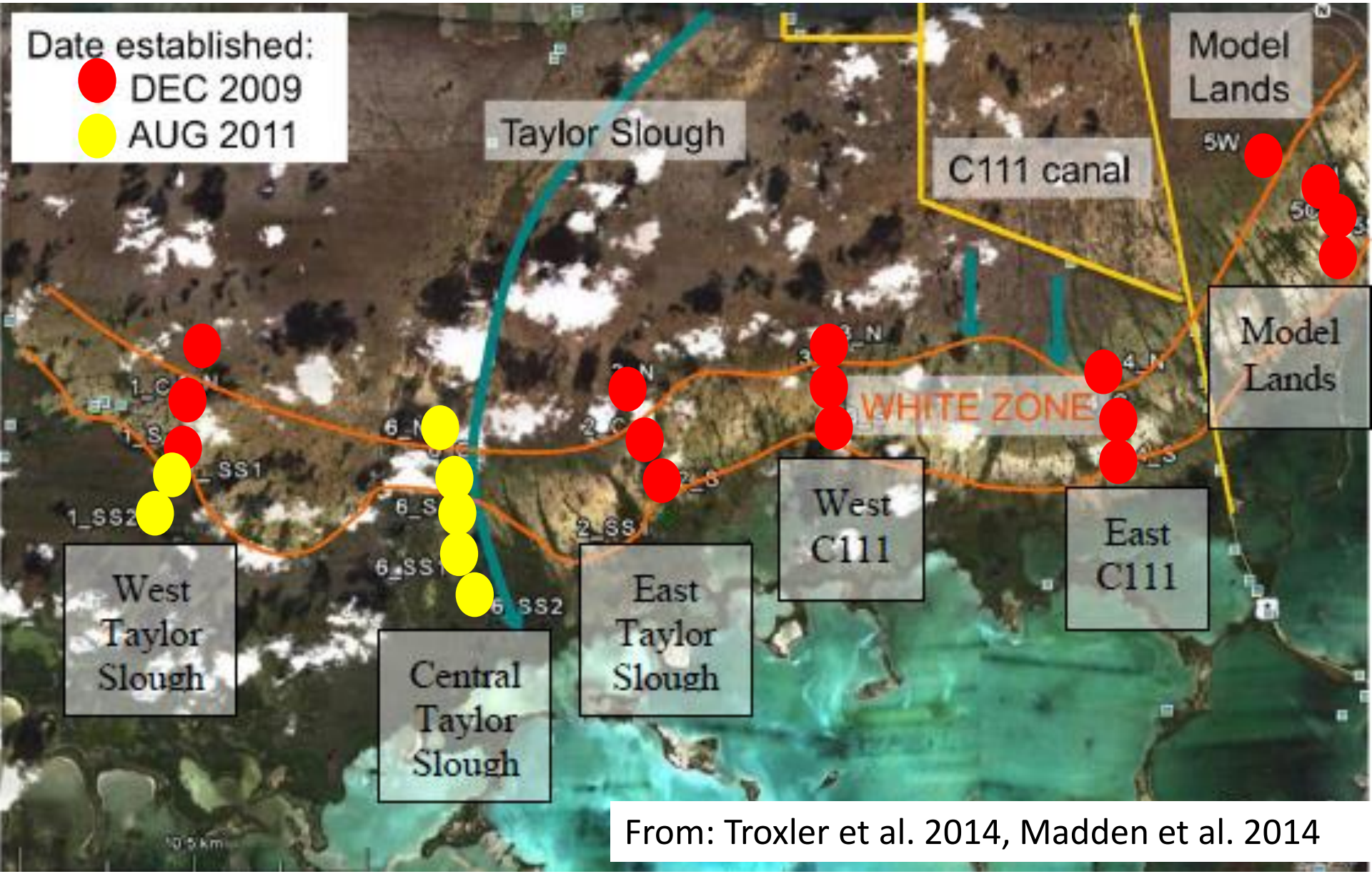
C-111 SCW Construction Expedited by SFWMD (complete in 2012)

Initial Florida Bay Salinity Results



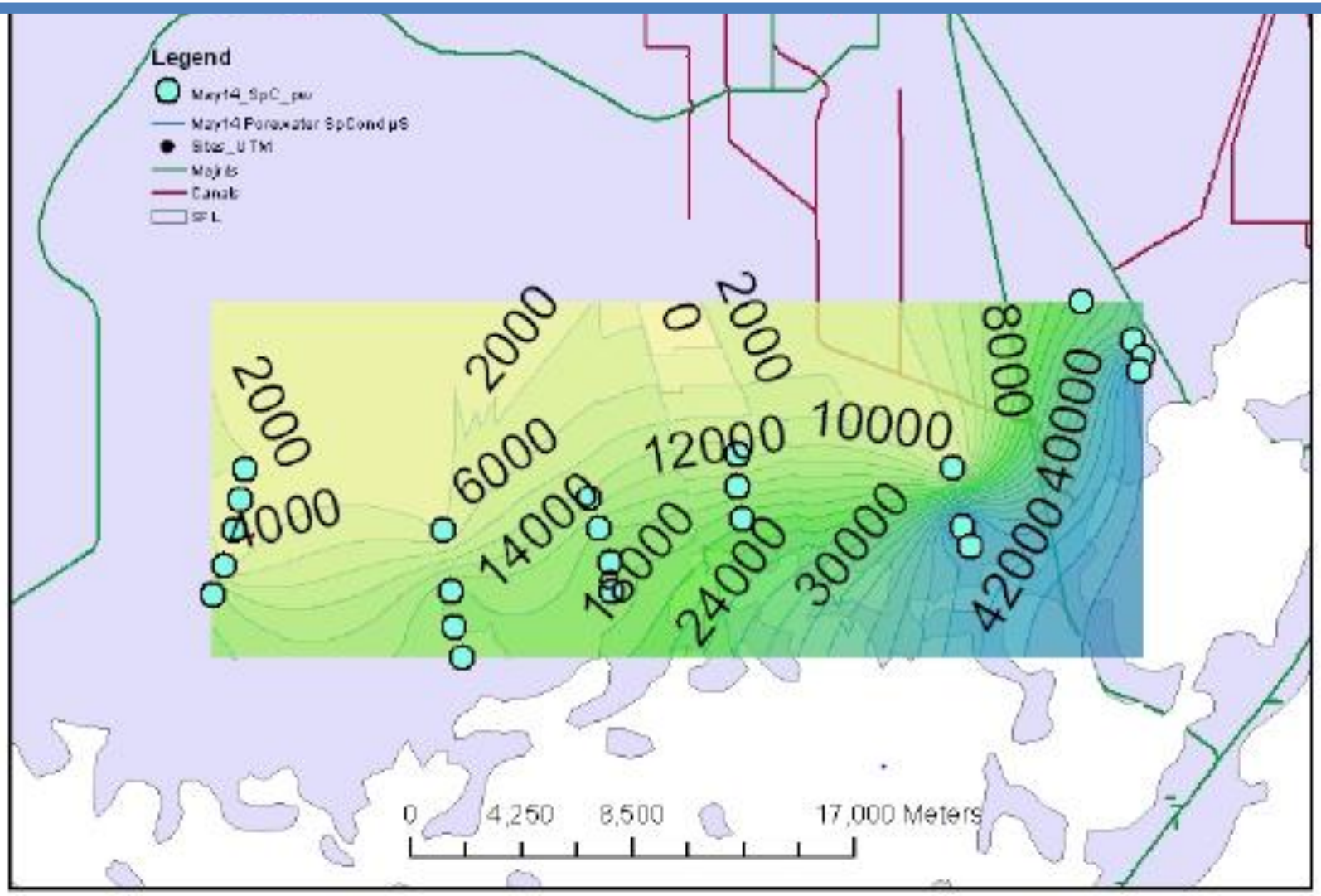
From Kelly et al. in Sklar and Dreschel 2014 SFER Ch 6

Porewater salinity: an integrative metric



From: Troxler et al. 2014, Madden et al. 2014

Soil Porewater Specific Conductivity (µS/cm), May, 2014



From Troxler et al. 2014

Conclusions and Adaptive Management Perspectives

- Importance for CERP to demonstrate restoration progress and competence
- Review C-111SCW monitoring and data analysis sufficiency
- Given system variability, long-term assessment needed to document / understand response. How long?
- Optimize operations at S-18C and hydrologic ridge for marsh hydroperiods, flow to Florida Bay, and salinities
- Avoid and minimize unintended consequences (Sparrow, Agriculture, Nutrients Florida Bay)
- Additional C-111 canal structure?
- Is C-111 Spreader Canal Phase 2 still needed?