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

David Rudnick, Kevin Kotun
Everglades National Park

Christopher Madden, Stephen Kelly, Joseph Stachelek, Amanda McDonald, and Carlos Coronado
South Florida Water Management District

Tiffany Troxler
Florida International University

Jerry Lorenz
Audubon Florida

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

- **Paleo:** 2.1 times observed flow at Shark River Slough
- **Paleo:** 3.7 times observed flow at Taylor Slough Bridge

Flow (million m$^3$ per year)
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

G21 Conductivity (uS/cm; approx 58’ depth)
Original Plan (aka “Restudy”, “Yellow Book”)
C-111 Spreader Canal Project (CERP Final Feasibility Report 1999)

Map showing project details with labeled areas:
- Stormwater Treatment Area
- S-332E revised to 500 cfs to pump to Model Lands
- Remove S-18C
- Construct new culvert under road
- Backfill C-110
- Backfill lower C-111
- Remove S-197

Note: Map is not to scale.
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
Water from canal pumped into Detention Area

- Water infiltrates down into ground

- Water from canal pumped into Detention Area

Hydraulic Ridge Concept

Groundwater rises hydrating Taylor Slough

Excess water

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

Date established:
- DEC 2009
- AUG 2011

From: Troxler et al. 2014, Madden et al. 2014
Soil Porewater Specific Conductivity ($\mu$S/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?