Ecological and Hydrological Response of the Everglades to Restoration Flows

C-111 Spreader Canal Project

Christopher J. Madden
SFWMD
Applied Science
NCER
April 19, 2016
C-111 Project Objectives

- Improve hydroperiods and hydropatterns in the southern Everglades
- Restore the quantity, timing, and distribution of water delivered to Florida Bay via Taylor Slough
- Improve coastal zone salinities in Florida Bay
- Ecosystem to follow
C-111 Project Features
Project in Relation to Florida Bay
Ecological Monitoring

Salinity Monitoring Results

Taylor River Mouth (TM) vs historical (2002-2011)

Terrapin Bay or McCormick (TB) vs historical (2002-2011)
Rainfall in the Project Area

The chart illustrates the rainfall in the Project Area from WY2012 to WY2015. It categorizes the rainfall into wet and dry seasons, with specific data points for April. The chart shows the median rainfall for each year, with the wet season typically having higher rainfall compared to the dry season.
USGS Creek stage, discharge, and salinity sites
Discharge to Florida Bay

5 Creek Total

Flow ($10^3$ ac-ft/month)

-40 -20 0 20 40 60 80 100 120


WY13  WY14  WY15

WY 01-12 s.d.
WY 01-12
WY 13-15

Mark Zucker
TP & TN at Downstream Discharge Sites

TP

TN

Tiffany Troxler
Chl α
POR Median: WY2001-2012

TP
POR Median: WY2001-2012

TN
POR Median: WY2009-2012

Chla, TP & TN at Coastal Water Quality Monitoring Sites
Dataflow Mapping - Salinity
Pre-Post Salinity
Dataflow Mapping - Chlorophyll
Pre-Post Chlorophyll

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Pre C–111

Post C–111

SFWMD
Emergent Macrophyte Vegetation: C-111 Basin

Eleocharis

Eleocharis stem density (culms m^-2)

- W1  Near C111
- W3  Downstream

Tiffany Troxler
Groundwater Elevation Western Slough

Groundwater Elevation

- West Lake
- Cuthbert Lake
- Long Lake

Elevation NAVD88 (mm)

Jul-14 Sep-14 Nov-14 Dec-14 Feb-15 Apr-15 May-15

Rene Price
Surface and Groundwater Salinity

Dean Whitman
Benthic Macrophyte Vegetation: Florida Bay

Thalassa 1995 to 2014

Rankin

Tohnson

Rabbit

Manatee

Barns

Blackwater

Penny Hall
Summary

• Hydrologic and salinity effects show positive trends based on the limited data set

• No apparent nutrient enrichment attributable to the project

• Flows from C-111 project toward the southwest indicate positive directionality for enhancing flow into central Florida Bay

• The ecological effects are complicated by both natural variability and multiple stressor responses
Questions