SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Seasonal Operations

South Miami-Dade Issues Coordination Team
October 4, 2010

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Everglades Restoration and Capital Projects

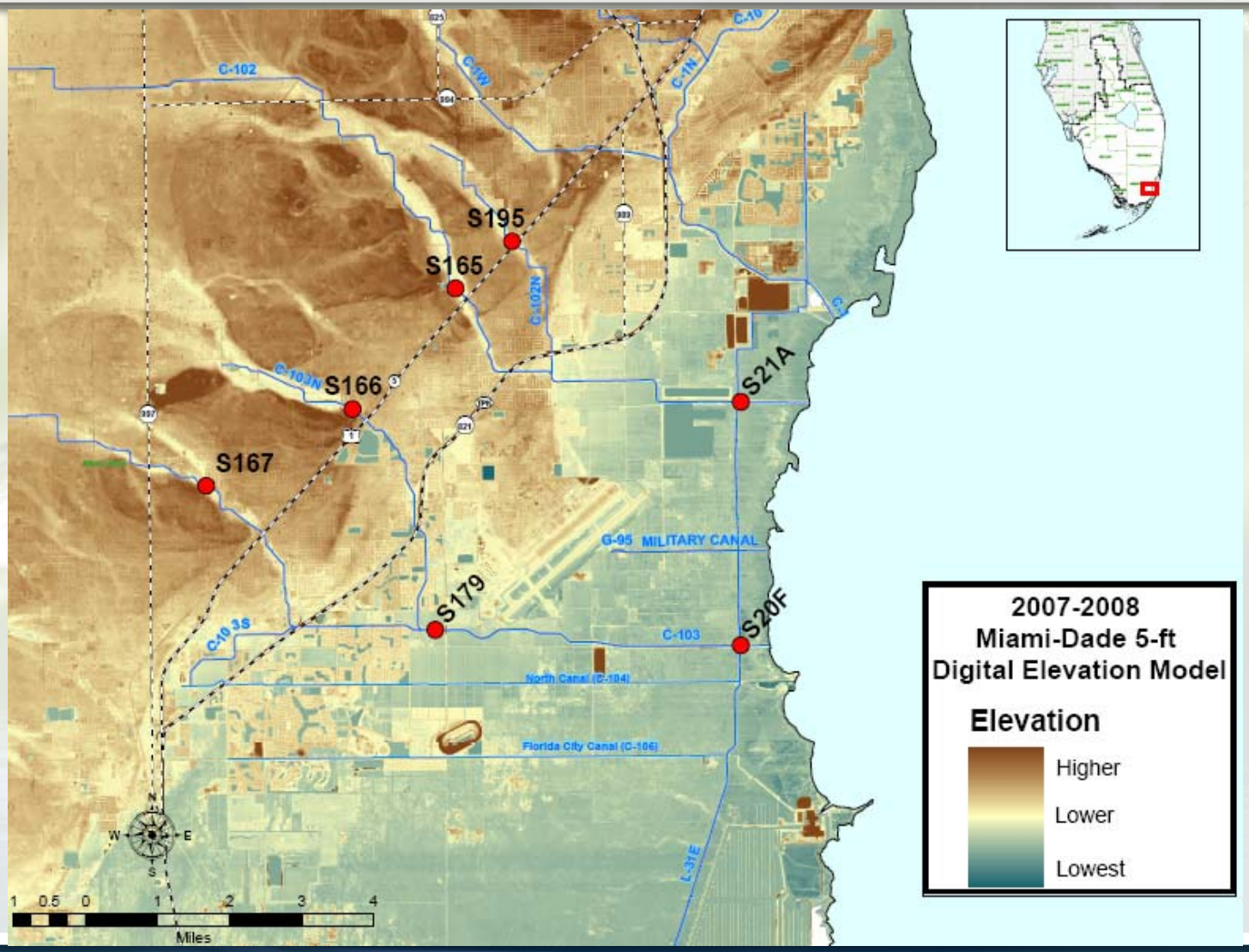
Seasonal Operations

- What are Seasonal Operations?
- Where do Seasonal Operations occur?
- When do Seasonal Operations occur?
- What are the reported impacts on agriculture without Seasonal Operations?
- What are the reported impacts on the environment with Seasonal Operations?
- What actions have already been completed and are presently under way to better balance water-related needs?
- What other considerations should we be looking at to better balance water-related needs?

What are Seasonal Operations?

- Management of farm fields for row crop planting and harvesting
  - Began in the early 1900's by farmers that created and maintained local drainage ditches and canals
- South Florida's moderate climate and soil conditions promote an early row crop harvest and competitive market advantage
- Canals expanded and upgraded by C&SF project in 1960's to further support agricultural commerce and improve overall conveyance
- USACE C&SF Project Master Control Manual, East Coast Canals, Optimum Water Control and Design Elevations - "Selection of an operating range depends on field conditions and agricultural needs"

Where do Seasonal Operations Occur?



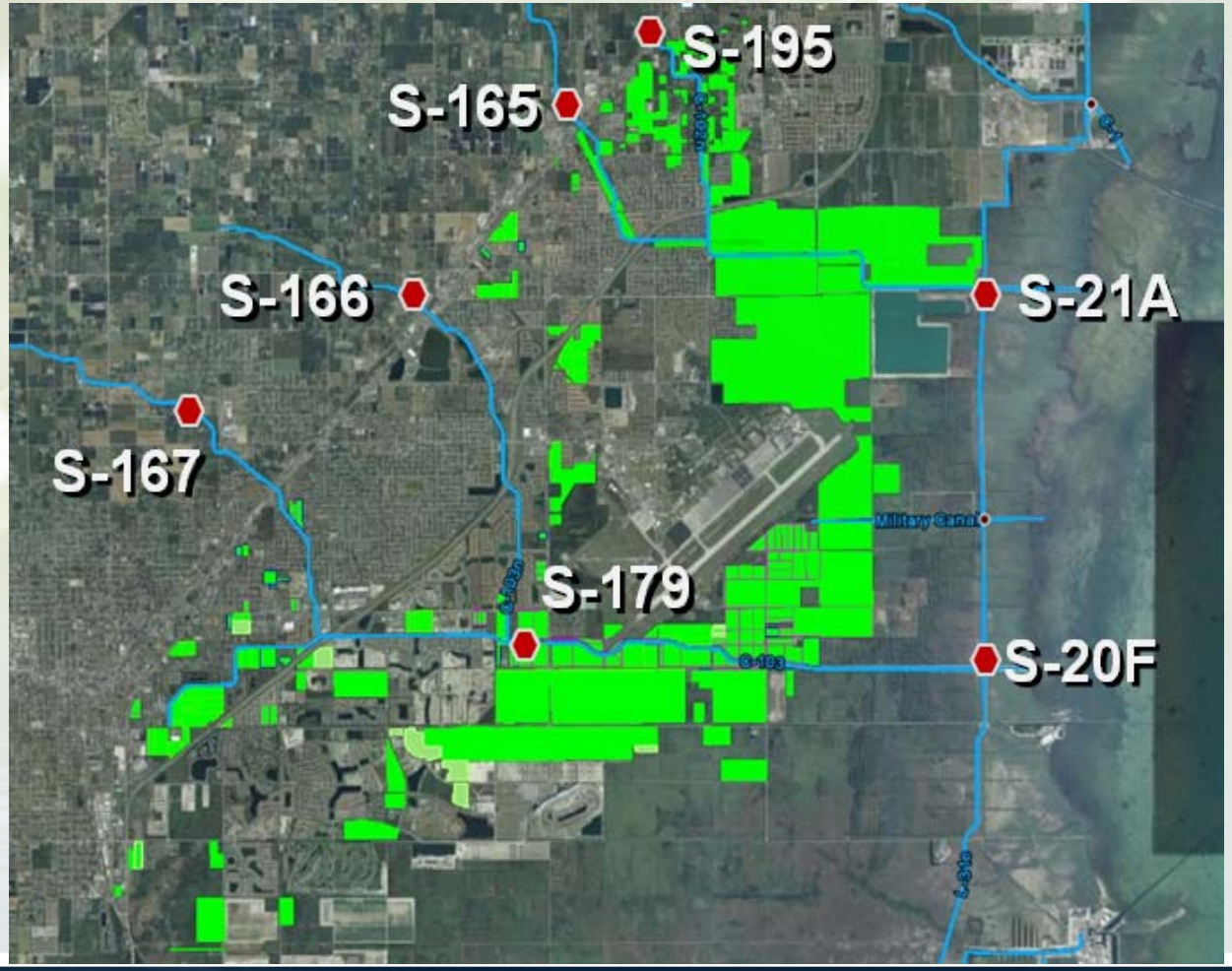
When do Seasonal Operations Occur?

Structure	Low Oct 15 – Dec 30	Intermediate Dec 30 - April 30	High April 30 - Oct 15
S-21A	1.4’-1.0‘	1.8’-1.4’	2.2’-1.8’
S-20F	1.4’-1.0’	1.7’-1.3’	2.2’-1.8’
S-179	3.1’-2.7’ (1)	3.9’-3.1’	

(1) Oct 15 - Nov 15 and wet conditions if needed to end of April

Agricultural Land Use

- Type of agricultural land use is predicated on market conditions



Reported Impacts on Agriculture Without Seasonal Operations

- Field accessibility highly limited under common agricultural planting practices, methods and standards
- High probability of ground water penetrating crop root zone for periods long enough to force crop damage or crop loss
- Ability for grower to qualify for crop insurance is questionable
- Shift in growing season producing missed market timing and opportunities that may result in financial loss

Reported Environmental Impacts With Seasonal Operations

- Less volume of fresh water stored (surface and ground water) upstream of structures
- Timing and distribution of near-shore flows
  - Rapid fluctuations in salinity due to localized peak discharges
  - Large volume freshwater pulses adversely effect animal and plant species in the Bay
  - Less effective at maintaining favorable salinity (mesohaline conditions)
  - Contributes to hypersaline conditions during the dry season

Public Health and Safety Concerns

- Flood control considerations
  - Eastern basin land elevations near sea level
  - Groundwater elevations are near surface – very low basin storage
  - Gravity discharge during storms hampered by tidal influence/conditions
  - High discharges to Bay are directly linked to storm events

Projects and Activities Completed to Better Balance Water Resource Related Needs

Items Completed to Better Balance Water Related Needs

- Operations
  - Seasonal Operations Optimization
  - Completed 2009/2010 Seasonal Operations Report
- Structural Components
  - BBCW Expedited L-31E Culverts – Construction Complete
  - BBCW Expedited Cutler Flow Way Component - Design Complete
  - L-31E Plug south of Florida City Canal – Construction Complete
  - L-31E and Card Sound Road Canal Structure – Construction Complete
  - Card Sound Road Plug – Permit Issued to Construct
- Monitoring and Analysis
  - Implemented additional ground water monitoring

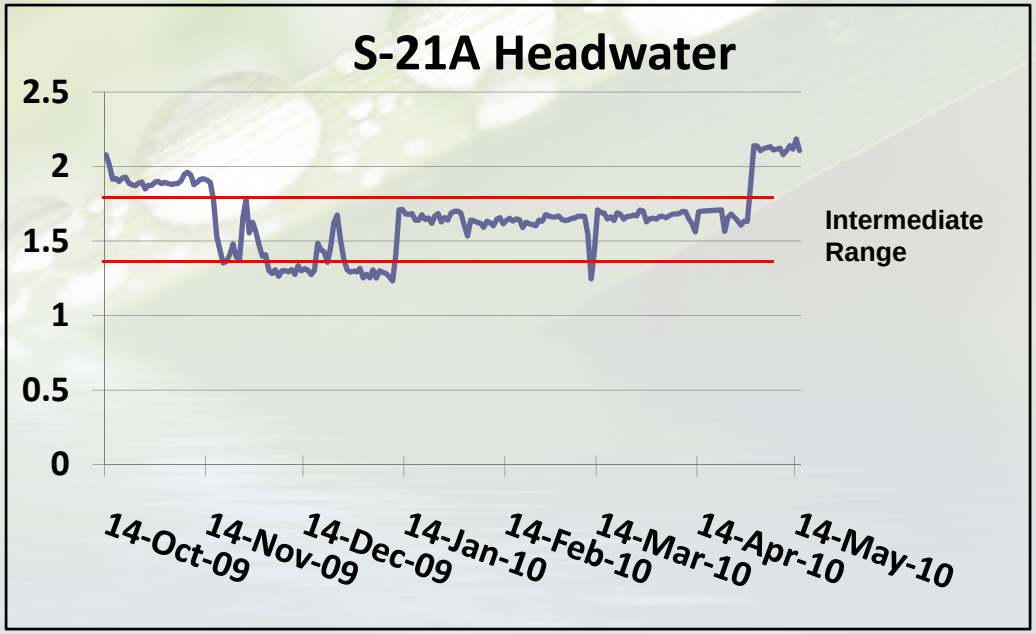
Seasonal Operations Optimization

- Homestead Field Station Director conducts regular site visits and field investigations
- Identifies current hydrologic conditions, cultivation and planting activities
- Analyzes forecasted weather conditions and water elevations
- Recommends appropriate actions
- Operations Manager directs operational changes as necessary

Seasonal Operations Optimization – S21A

Structure	Low Oct 15 – Dec 30	Intermediate Dec 30 - April 30	High April 30 - Oct 15
S-21A	1.4'-1.0'	1.8'-1.4'	2.2'-1.8'

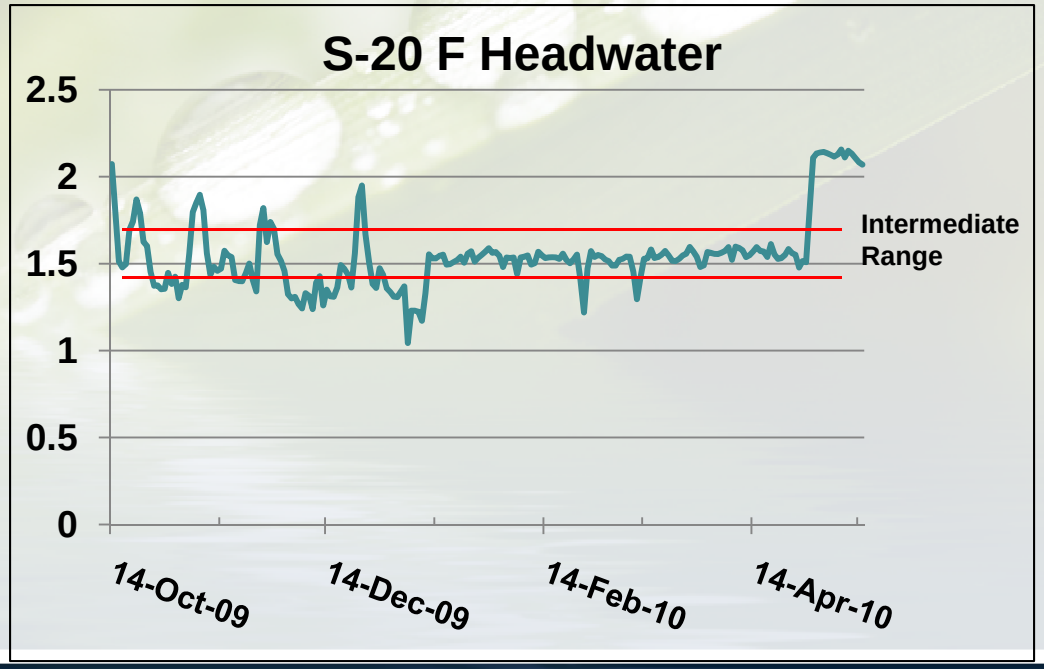
Modified S-21A operations to minimize discharges while accommodating agricultural, environmental and flood protection needs



Seasonal Operations Optimization – S20F

Structure	Low Oct 15 – Dec 30	Intermediate Dec 30 - April 30	High April 30 - Oct 15
S-20F	1.4’-1.0’	1.7’-1.3’	2.2’-1.8’

Modified S-20 F operations to minimize discharges while accommodating agricultural, environmental and flood protection needs



Seasonal Operation Report 2009/2010 "Scope"

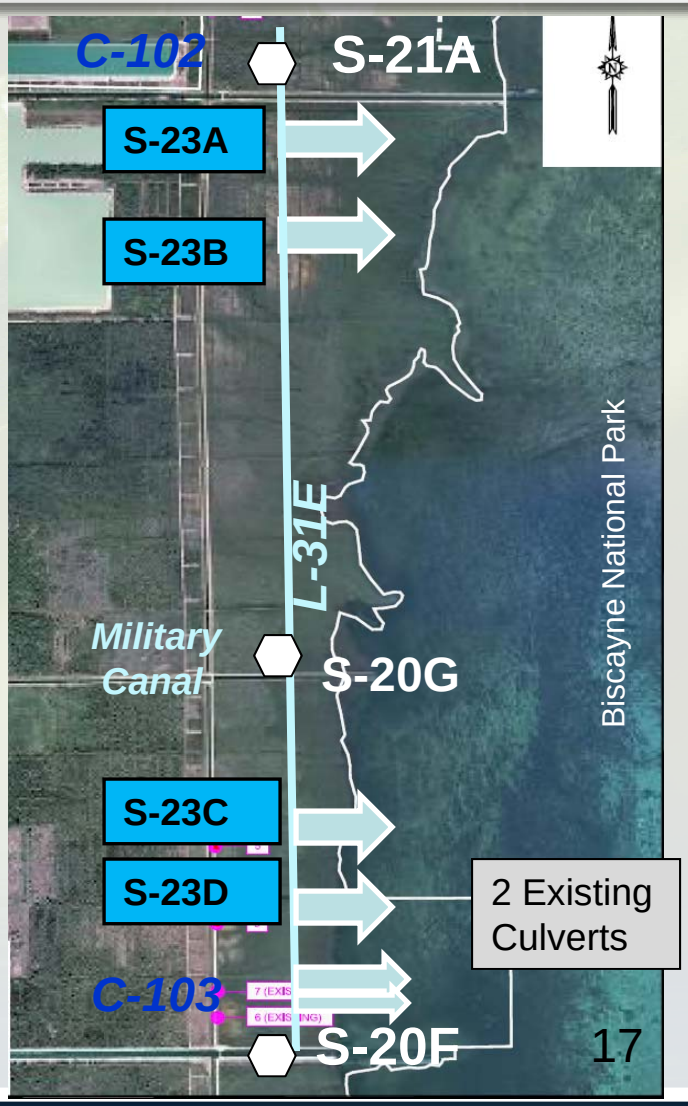
- Identify operational performance of the canal system during the 2009/2010 dry season in relation to implementation of the seasonal drawdown criteria
  - Collect water level and flow data at key structures
  - Evaluate hydrologic information
  - Evaluate water management effectiveness
  - Identify any unusual or unexpected outcomes
  - Document performance and findings

Seasonal Operation Report 2009/2010 "Findings"

- District was able to accommodate the needs of the growers with a minimal drawdown amount in the C-102 Basin and C-103 Basin (i.e. maintain in intermediate range)
- District visited the key agricultural areas 8 times during the dry season and provided input to the operational staff as to the need for water level adjustments
- The rainfall from the preceding wet season was significantly below normal which contributed to the reduced need for a major drawdown of levels at the beginning of the season
- The rainfall during the dry season was above normal

New BBCW Expedited L-31E Culverts

- Four new 36-inch culverts with flap gates designed to convey ~40cfs
- Two existing culverts ~ 20 cfs
- Diverts water away from S-20F and S-21A
- Delivers water to remnant tidal creeks
- Hydrates areas (tidal wetlands) susceptible to hypersaline conditions during extended dry periods
- Improves delivery efficiency by distributing flows along the coast and nearshore including BNP



BBCW Expedited Cutler Flow Way Component - Design Complete

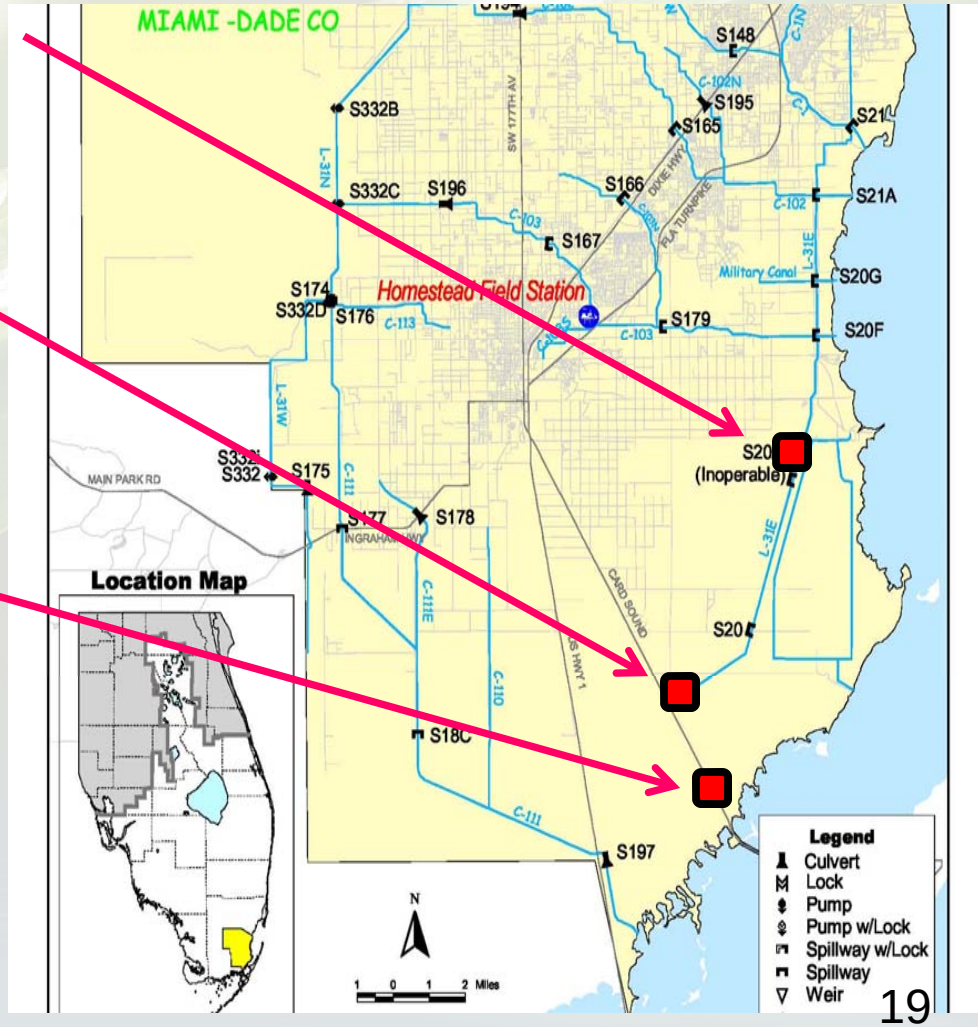
- 400 CFS Pump Station (S-701) on the C-1 Canal
- 1.3 mile long lined conveyance canal to deliver water from the pump station to a proposed spreader
- Culverts under SW 97 Ave, SW 87 Ave, and L-31E
- 2-mile-long spreader canal

Canal Structures

L-31E Plug south of Florida City Canal (operational)

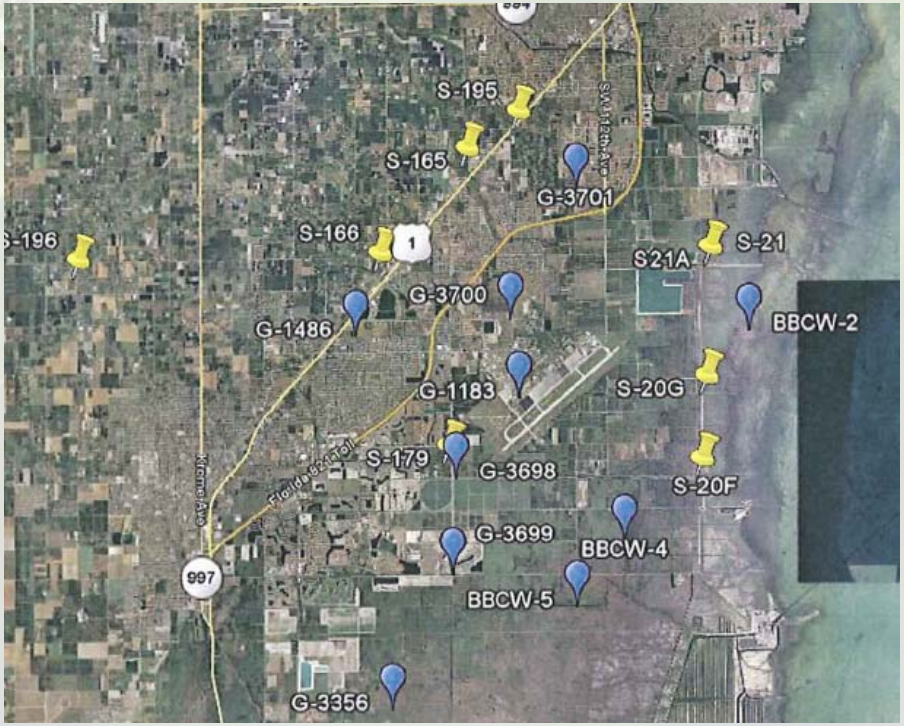
Card Sound Road Canal Structure (operational)

Card Sound Road Plug (permit issued)



Surface and Groundwater Monitoring

- Implemented additional surface water and groundwater monitoring in FY 2009
- Continued accumulating data from the expanded monitoring network through the remainder FY 2010
- AECOM Study under review (gather data and look for operational response patterns)
- South Miami Dade Issues database data QA/QC (data “scrub”)



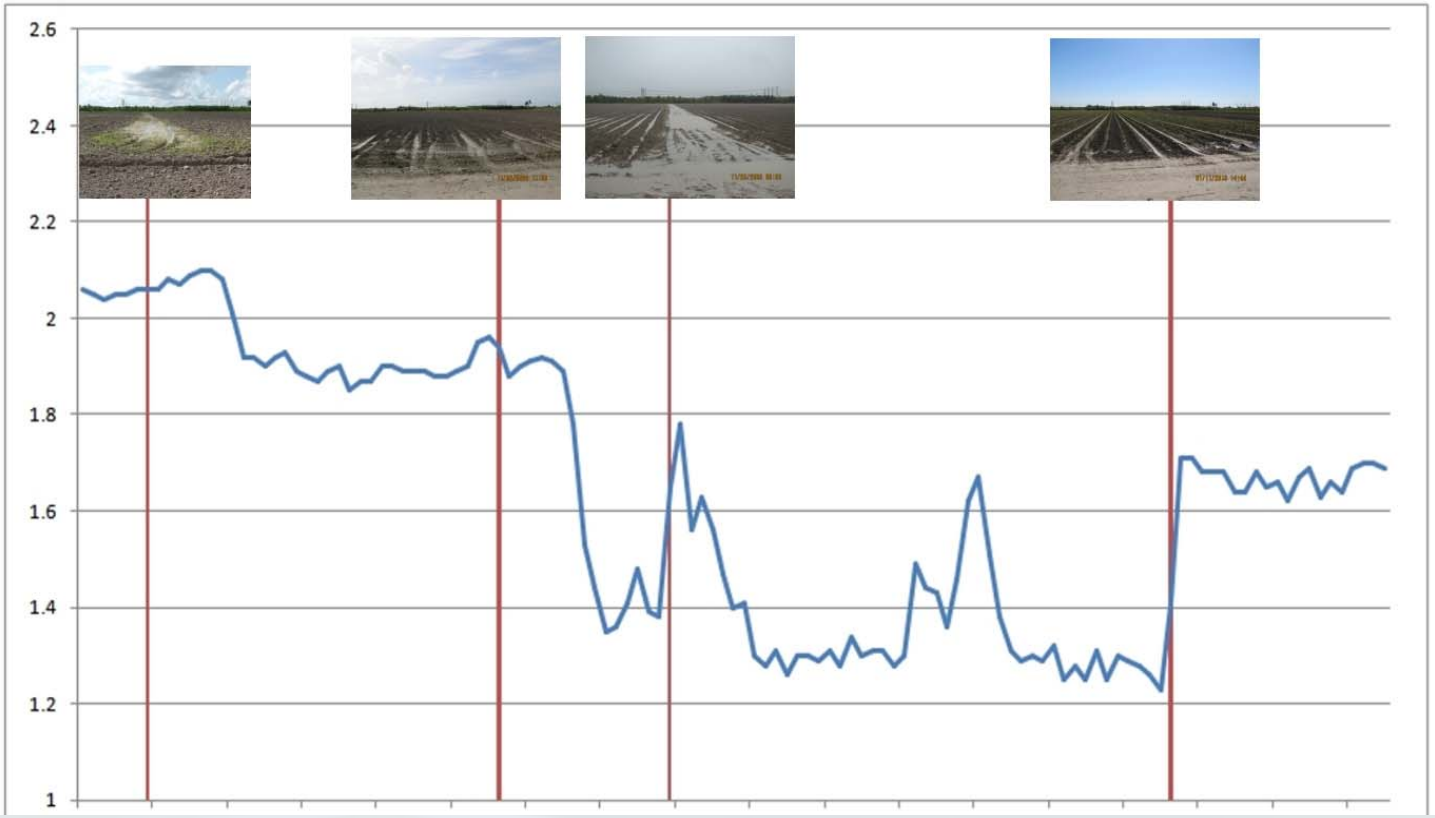
Projects and Activities Under Way to Better Balance Water Related Needs

Items Under Way to Better Balance Water Related Needs

- Operations
  - Seasonal Operations Optimization - Continued field investigations and site visits to determine field conditions and promote water conservation
  - Opened lines of communication between National Park Service, Farmers, Environmental Community and Operations Staff in South Dade Conditions Reports (Oct. 7 and Oct. 21)
- Structural Components
  - BBCW Expedited Deering Estate Feature - Under Construction
  - Published Draft BBCW Project Implementation Report
  - Miami-Dade and SFWMD Cooperative Agreement for the design, permitting, construction and operation of Florida City Canal intermediate structures
- Monitoring and Analysis
  - Completing Regional Statistical Analyses to better correlate and understand the relationship between surface, groundwater and salinity in the study area

Field Investigations to Optimize Operations

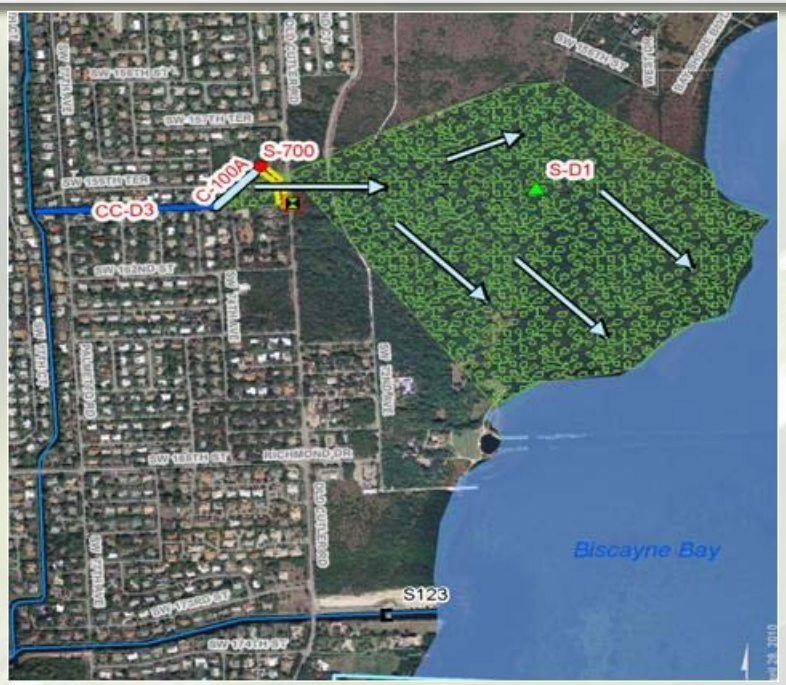
- Seasonal Operations Optimization
  - Continue field investigations and site visits by operations staff to determine field conditions and optimize water conservation



South Dade Water Conditions

- Open lines of communication between National Park Service, Farmers, Environmental Community and Operations staff
- South Dade Conditions Reports Meeting Room
- Oct. 7 and Oct. 21 1:00 – 2:00 pm
- Nationwide Toll Free: 866-433-6299
- Pass Code 6083#

BBCW Expedited Deering Estate Features Under Construction



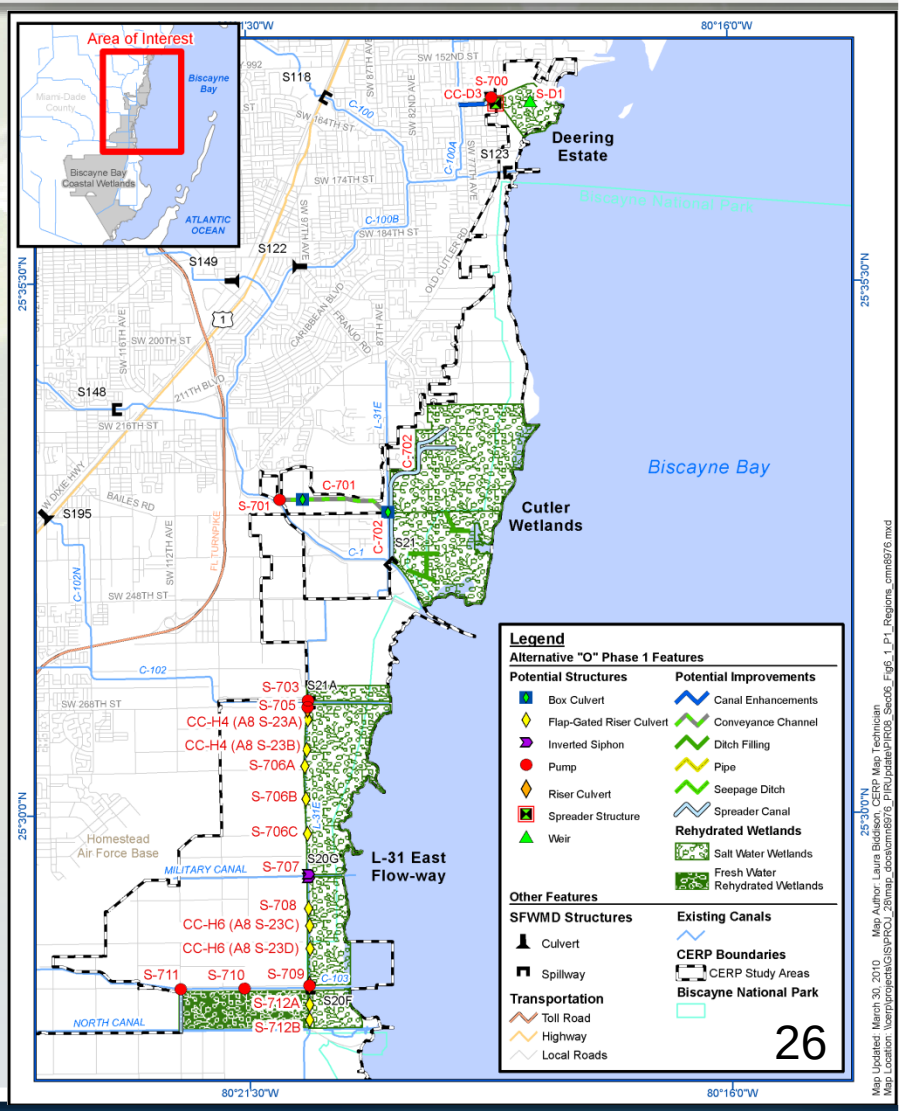

Pump Intake Canal


Distribution Piping Backfill

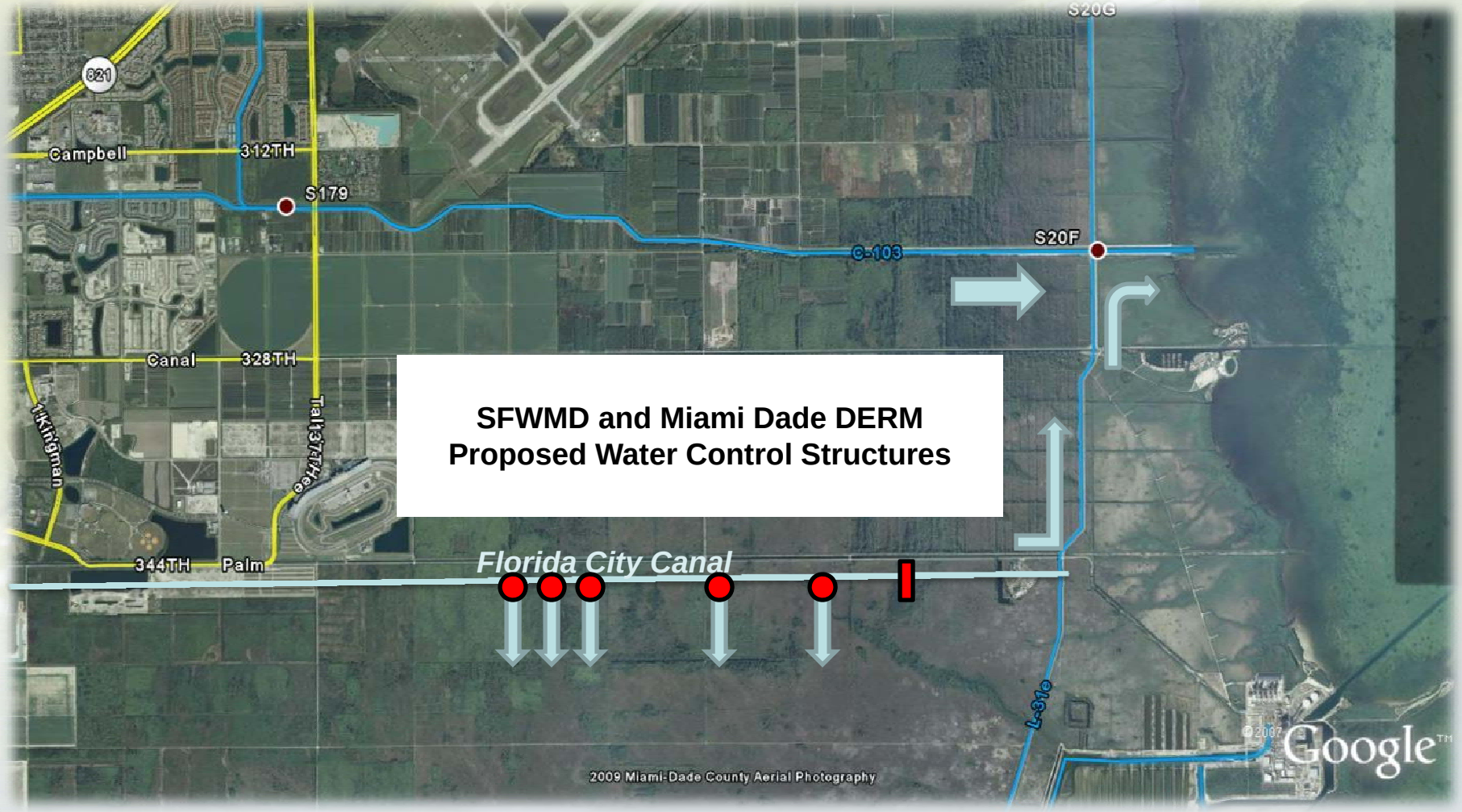

Pump Station Cofferdam Sheet Pile

BBCW PIR - Redistribution Components

- Reduces peak discharges at coastal structures
- Better mimics the natural system by distributing freshwater near shore along the coast including BNP
- L-31E Component spans nearshore areas of C-102, C-103 and Florida City Canal Basins
- Improves hydrology and flow in historic creeks flow and tidal wetlands improving salinity conditions



Florida City Canal Intermediate Structures



Regional Statistical Analyses

- Purpose is to identify temporal and spatial correlations to better understand the relationship between surface , groundwater and salinity
- Groundwater
  - Level - 300 stations
  - Salinity - 250 stations
- Surface water
  - Stage - 200 stations
  - Flow - 50 stations
  - Salinity - 250 stations
- Rainfall – 50 stations
- Preliminary analyses – Under Review
- Final Analysis Complete Late December 2010

Other Suggested Considerations "What We Have Heard"

- Initiate Seasonal Operations and start soil dry out earlier, reduce discharge rates and lower canal levels over a longer period of time
- Improve efficiencies with existing infrastructure in C-103 basin when hydrologic conditions allow it
- Utilize new expedited L-31E culverts as long as possible prior to opening gates
- Construct an intermediate structure in the North Canal
- Connect east and west reached of North Canal
- Build an above ground reservoir
- Use Aquifer Storage and Recovery (ASR)
- Hold higher stages on Public Lands
- Raise farm field elevations by importing material
- Pump sea water west to reduce hypersalinity

Pre and Post Field Conditions
Tropical Storm Sept 29, 2010

Questions?