

Governing Board Meeting October 13, 2011

South Miami-Dade County Seasonal Operations

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Overview

- **What are seasonal operations?**
- **Constraints on seasonal operations**
- **Issues associated with seasonal operations**
- **District activities to address area issues**
- **Operational implementation**

What are Seasonal Operations?

- **Area specific drainage actions implemented to provide flood protection along with providing farmers access to fields for row crop planting and harvesting**
- **History**
 - Climate creates market niche for winter vegetables however fall and spring rains can make fields unworkable
 - Early 1900's farmers created and maintained local drainage networks of ditches, canals, pumps and structures to control water levels
 - Operations shifted to SFFCD in 1960's
 - USACE C&SF Project Master Control Manual, East Coast Canals, Optimum Water Control and Design Elevations

What are Seasonal Operations?

- **Structures involved**

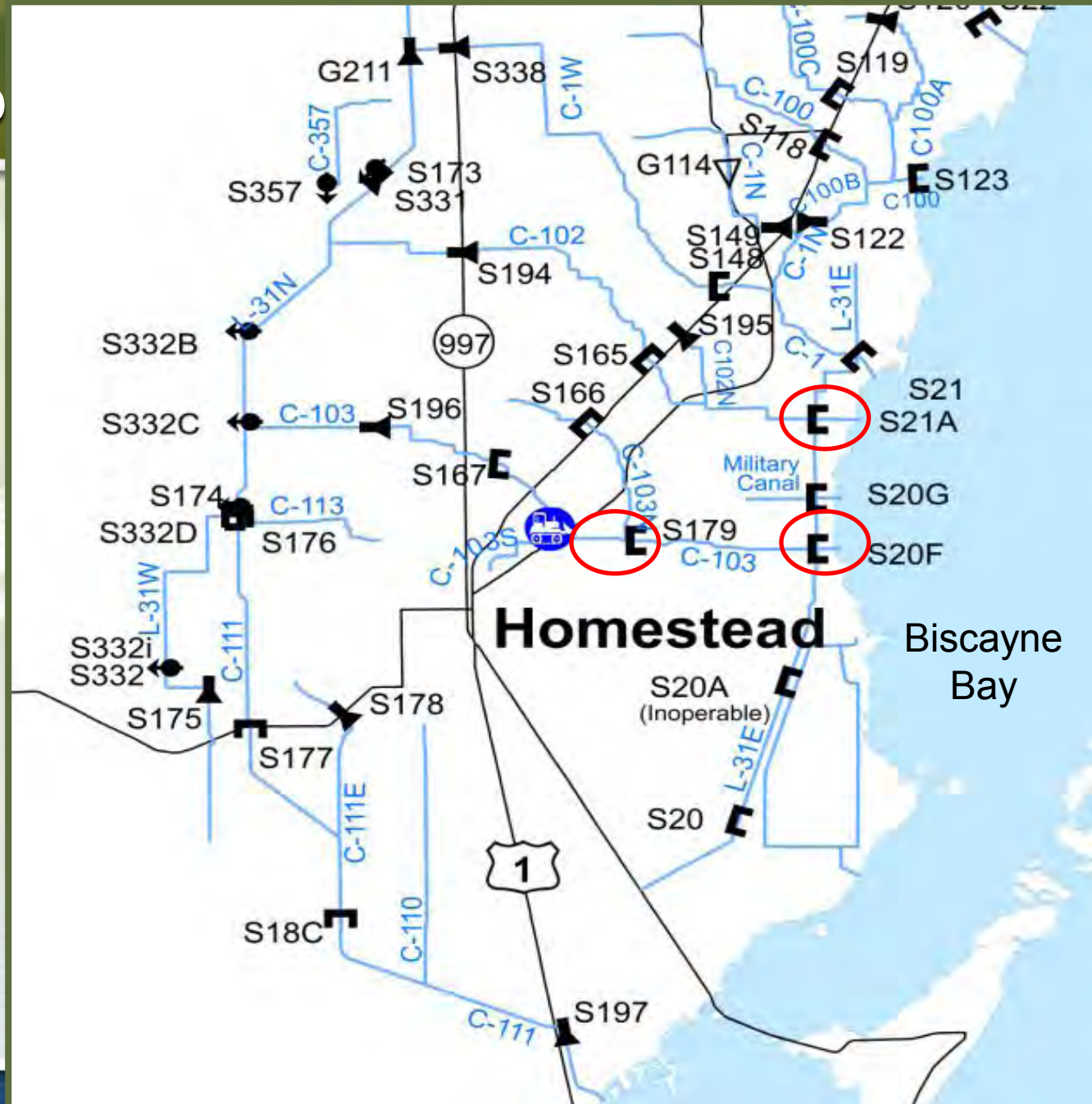
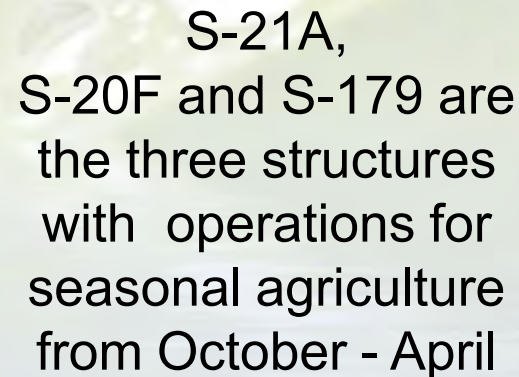
- S21A, S20F and S179

- **When are the seasonal operations implemented?**

- October 15th through April 30th

- **What is done**

- Structure gates are set at lower settings to facilitate drainage consistent with the Corps' Master Water Control Manual
- Selection of operating ranges depends on field conditions and agricultural needs



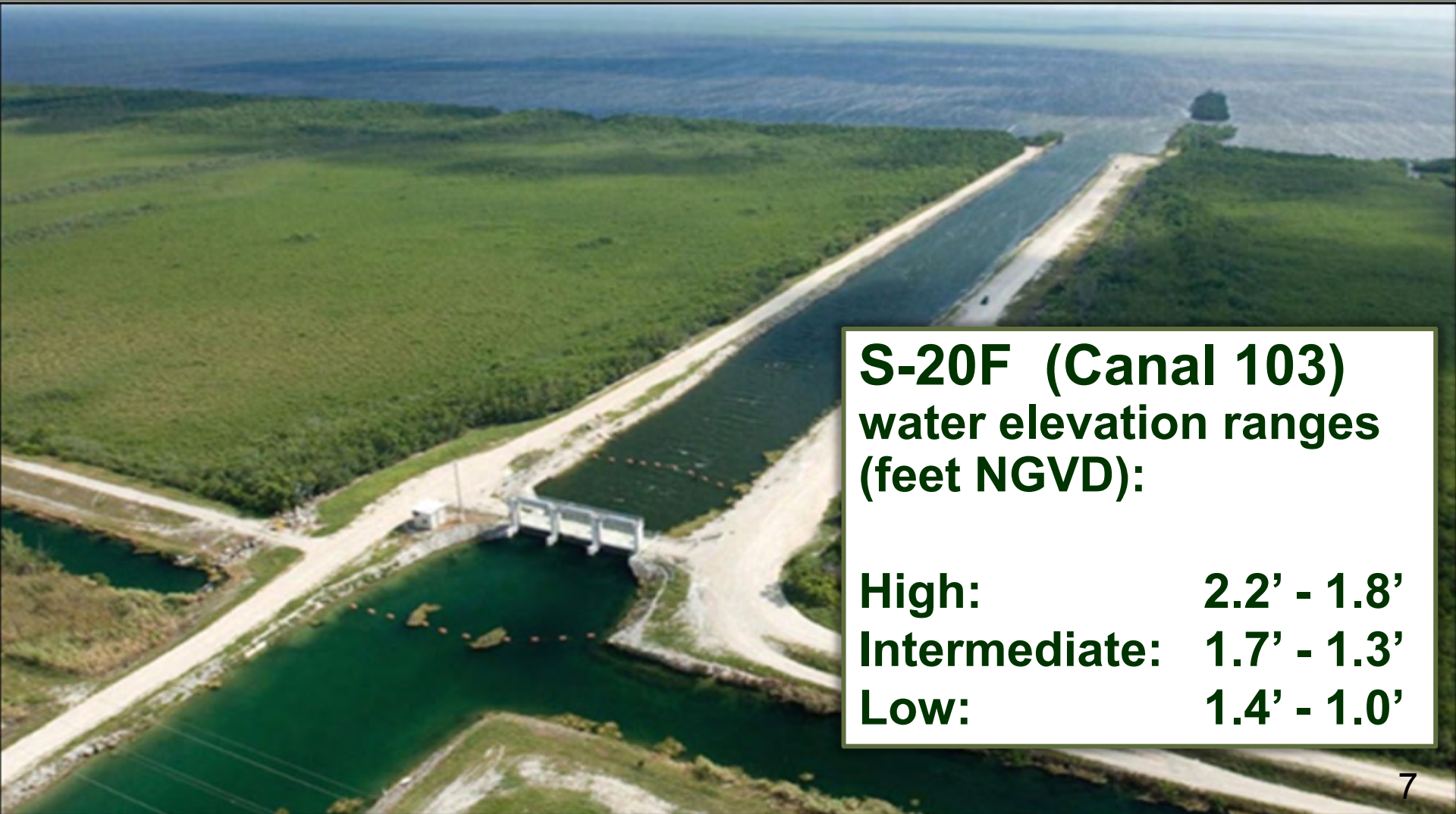
S21A Operations

S21A (Canal 102)
water elevation ranges
(feet NGVD):

High:	2.2' - 1.8'
Intermediate:	1.8' - 1.4'
Low:	1.4' - 1.0'



S-20F Operations



S-20F (Canal 103)
water elevation ranges
(feet NGVD):

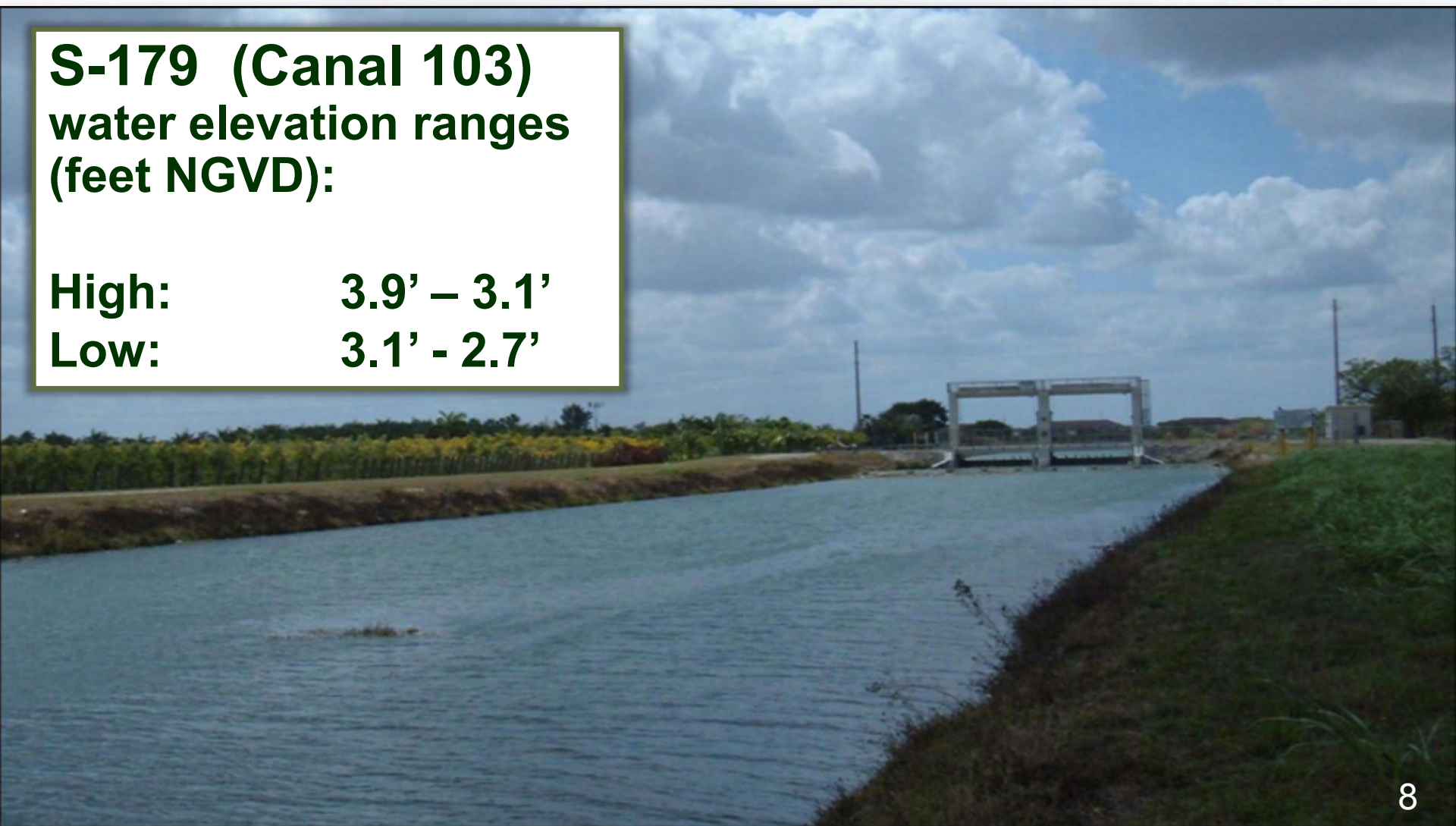
High:	2.2' - 1.8'
Intermediate:	1.7' - 1.3'
Low:	1.4' - 1.0'

S-179 Operations

S-179 (Canal 103)
water elevation ranges
(feet NGVD):

High: 3.9' – 3.1'

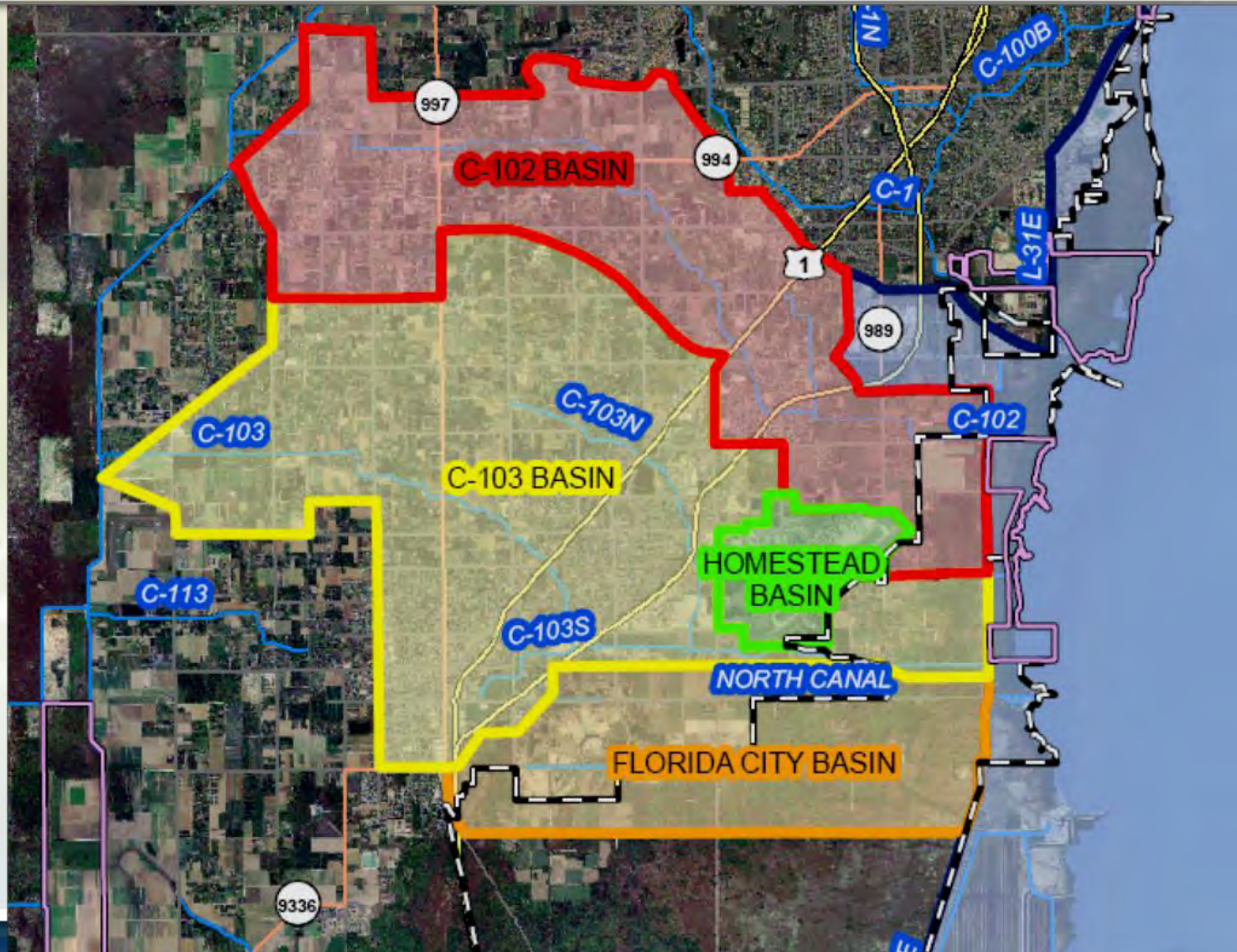
Low: 3.1' - 2.7'



Constraints on Seasonal Operations

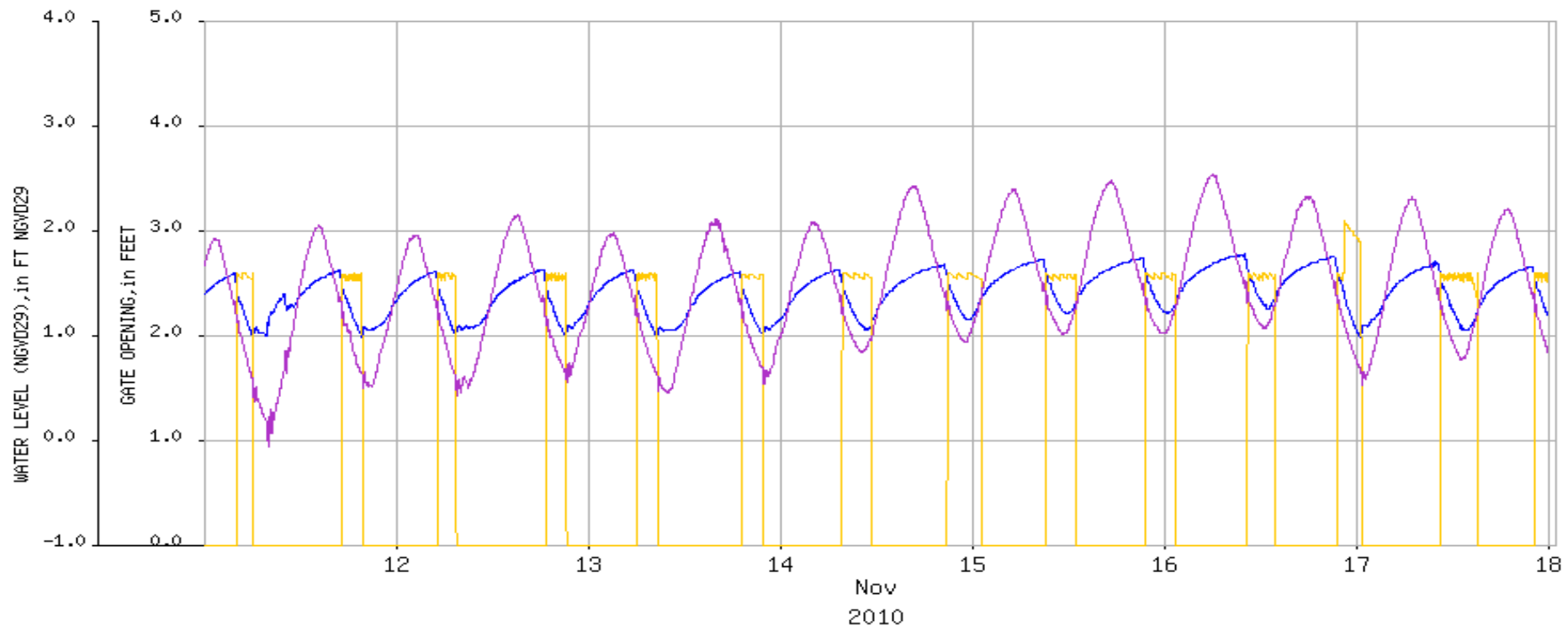
- **Low lying land elevations**
 - Three to eight foot land surface elevations
 - Thin unsaturated zone
- **Gravity based drainage system**
 - Low gradients mean slow drainage
- **Coastal structures must drain local runoff plus upstream runoff and base flow**
- **Water levels in Bay (tailwater) exceed canal operational target levels at high tide**
- **Area vulnerable to saltwater intrusion**

Operational Constraints (cont.)



Operational Constraints (cont.)

Headwater/Tailwater Relationship at S21A



	Station	Freq	DataType	Statistic	Agency	Recorder	OpNum	DBKEY	Provisional Data After
—	S21A_H	BK	STG	INST	WMD	TELE		06603	17-NOV-2010 23:59
—	S21A_S	BK	GATE	INST	WMD	TELE	1	LT194	17-NOV-2010 23:59
—	S21A_T	BK	STG	INST	WMD	TELE		06604	17-NOV-2010 23:59

Issues Associated with Seasonal Operations

■ Agriculture/flood control

- Area prone to standing water during moderately heavy rainfall events
- Lowering of area water table takes weeks without rainfall but increases rapidly
- High probability of ground water penetrating crop root zone resulting in root damage/crop loss
- Ability for grower to qualify for crop insurance is questionable
- Delays in growing season can impact market windows and financial returns on investment

Issues Associated with Seasonal Operations (cont.)

■ Ecological

- Timing, volume and distribution of near-shore flows to Biscayne Bay
 - Rapid fluctuations in salinity due to localized peak discharges stress animal and plant species in the Bay
 - Lowered coastal groundwater table reduces fresh groundwater seepage into the near-shore area of the Bay
 - Lack of surface water discharges into the Bay during late dry season contributes to hypersaline conditions

■ Lack of dedicated stormwater storage

- No water storage projects planned for the area
- Groundwater storage infeasible

District Activities to Address Area Issues

■ Community involvement

- Issue/opportunity identification
- Implemented additional monitoring/data analysis

■ Structural Components

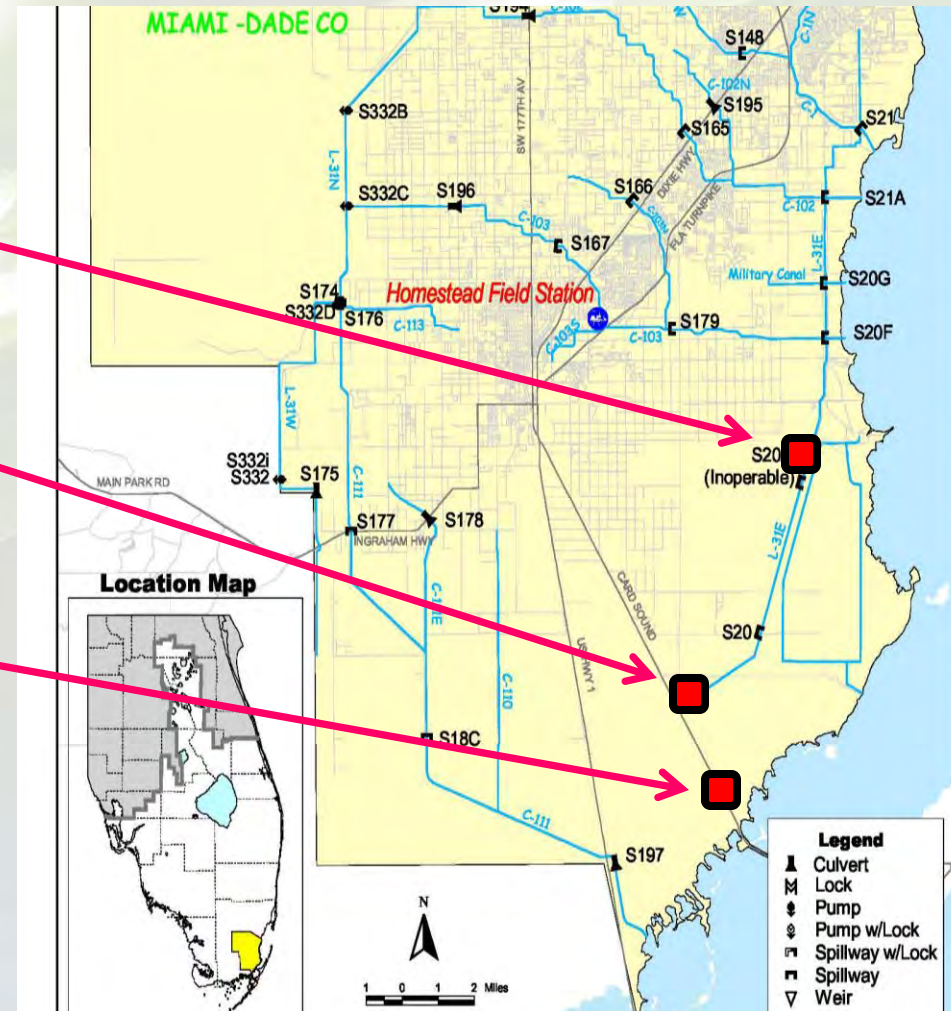
- BBCW expedited project components/Phase I project construction
 - Improve distribution of surface flows to Biscayne Bay
- FPL Card Sound Road Canal Structure
 - Saltwater intrusion barrier; improved water storage in Model Lands
- Miami-Dade DERM Card Sound Road Plug
 - Saltwater intrusion barrier; improved water storage in Model Lands
- L-31E flap gate repair and earthen plug
 - Improved surface water flows to Biscayne Bay

Canal Structures

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

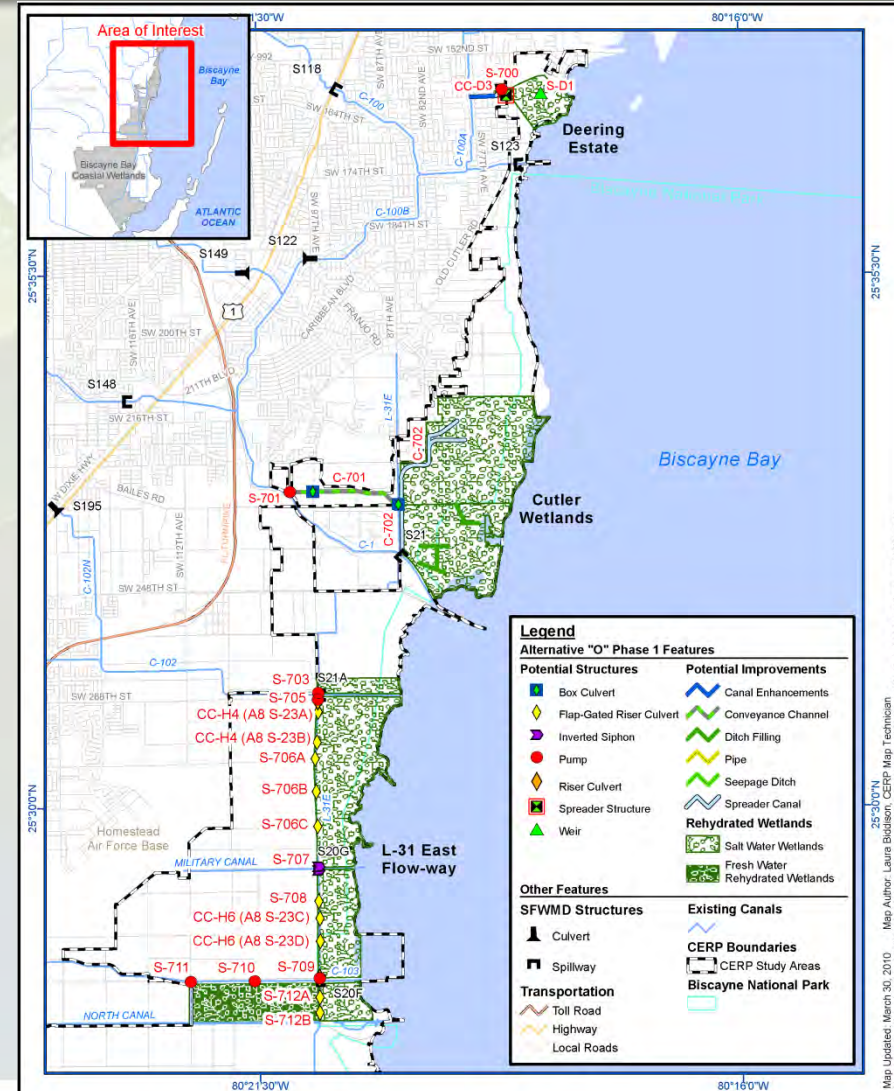
**FPL Card Sound Road Canal
Structure (operational)**

**Card Sound Road Plug
(permit issued)**



Biscayne Bay Coastal Wetland Project

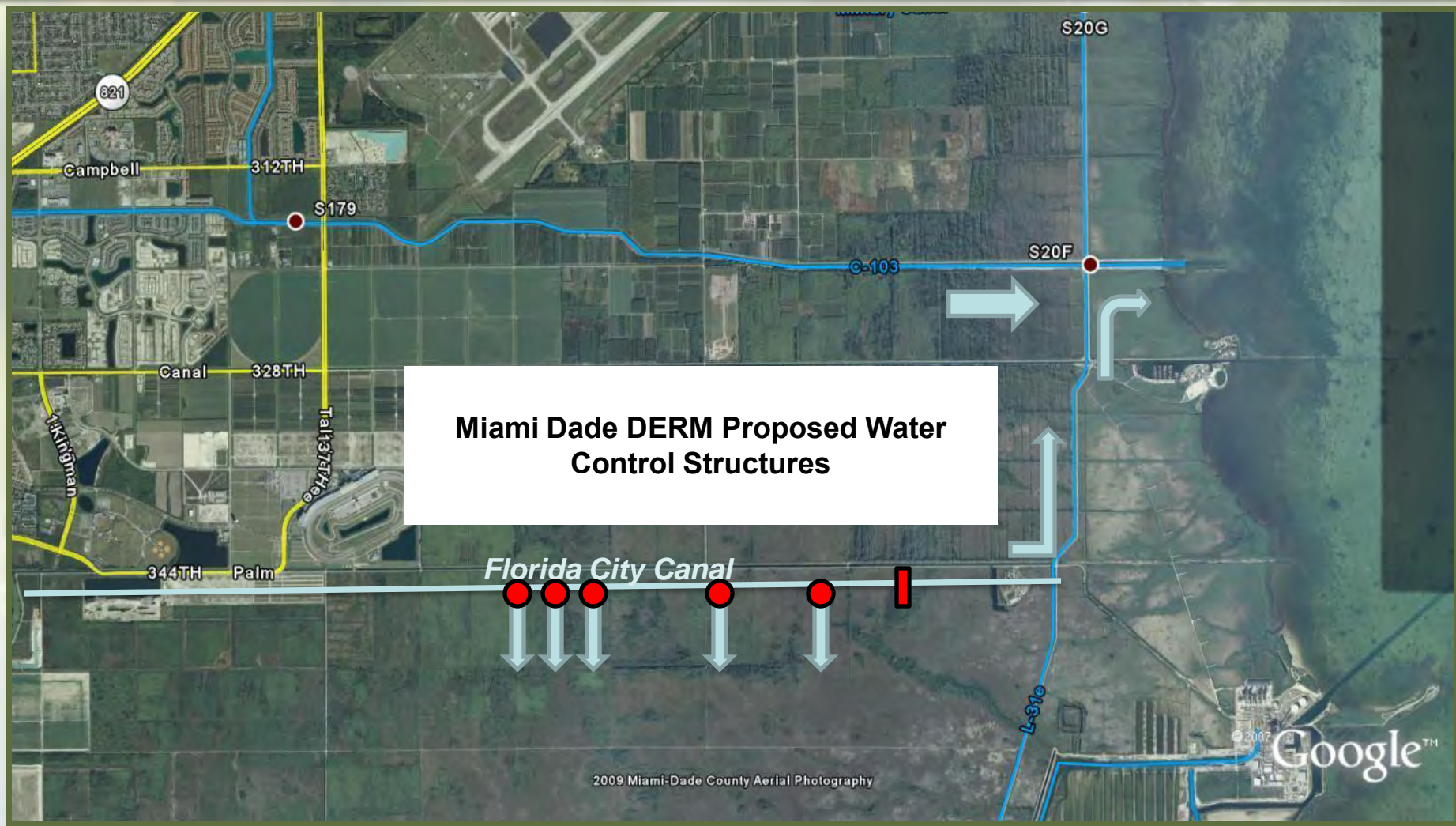
- Reduces peak discharges at coastal structures
- Better mimics the natural system by distributing freshwater near shore along the coast including BNP
- Improves hydrology and flow in historic creeks flow and tidal wetlands improving salinity conditions



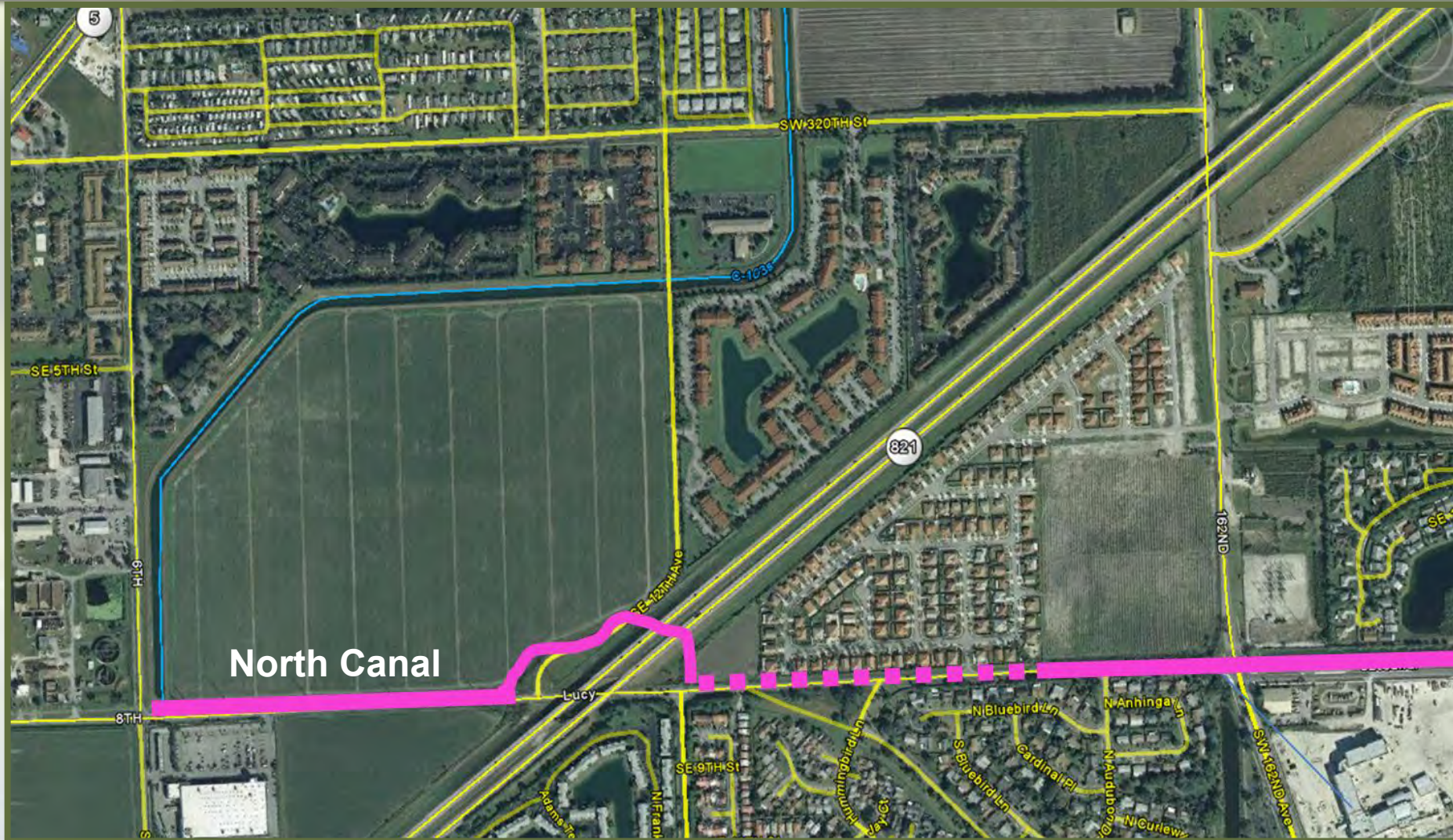
District Activities to Address Area Issues

- **Drainage enhancements**
 - Miami – Dade DERM Florida City Canal Structure
 - Improved water storage in Model Lands
 - City of Homestead North Canal Reconnect
 - Improve drainage efficiency
- **Regional dry season supplemental flows feasibility study for Biscayne Bay**

Florida City Canal Structure

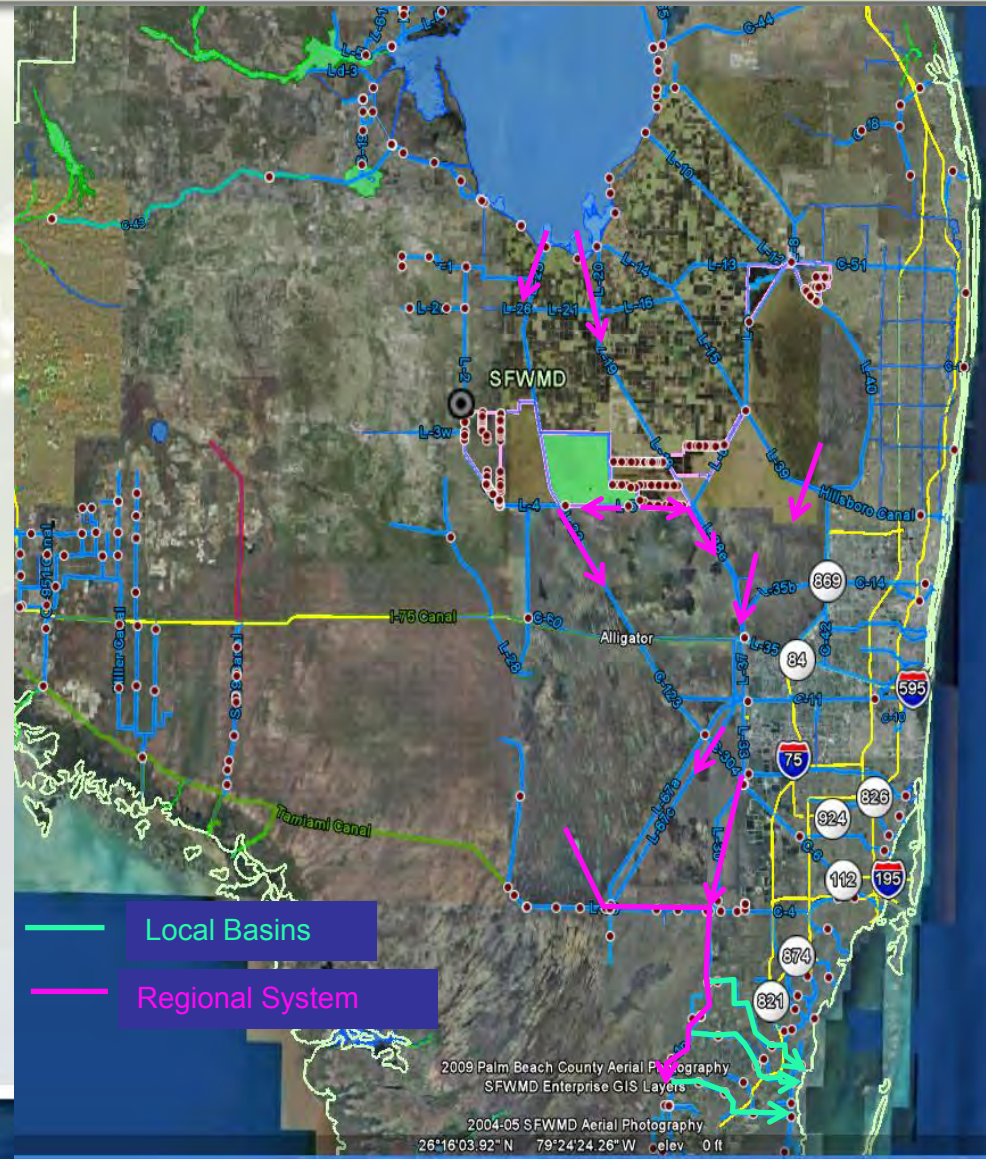


North Canal Reconnection



Potential Supplemental Water Sources for Biscayne Bay

- Coastal basin
- Inland 'ridge' basin
- WCA-3
- WCA-2
- Lake Okeechobee





Operational Implementation

How Operations are Implemented

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



C-103 Basin Pre and Post Drawdown

Field conditions before drawdown

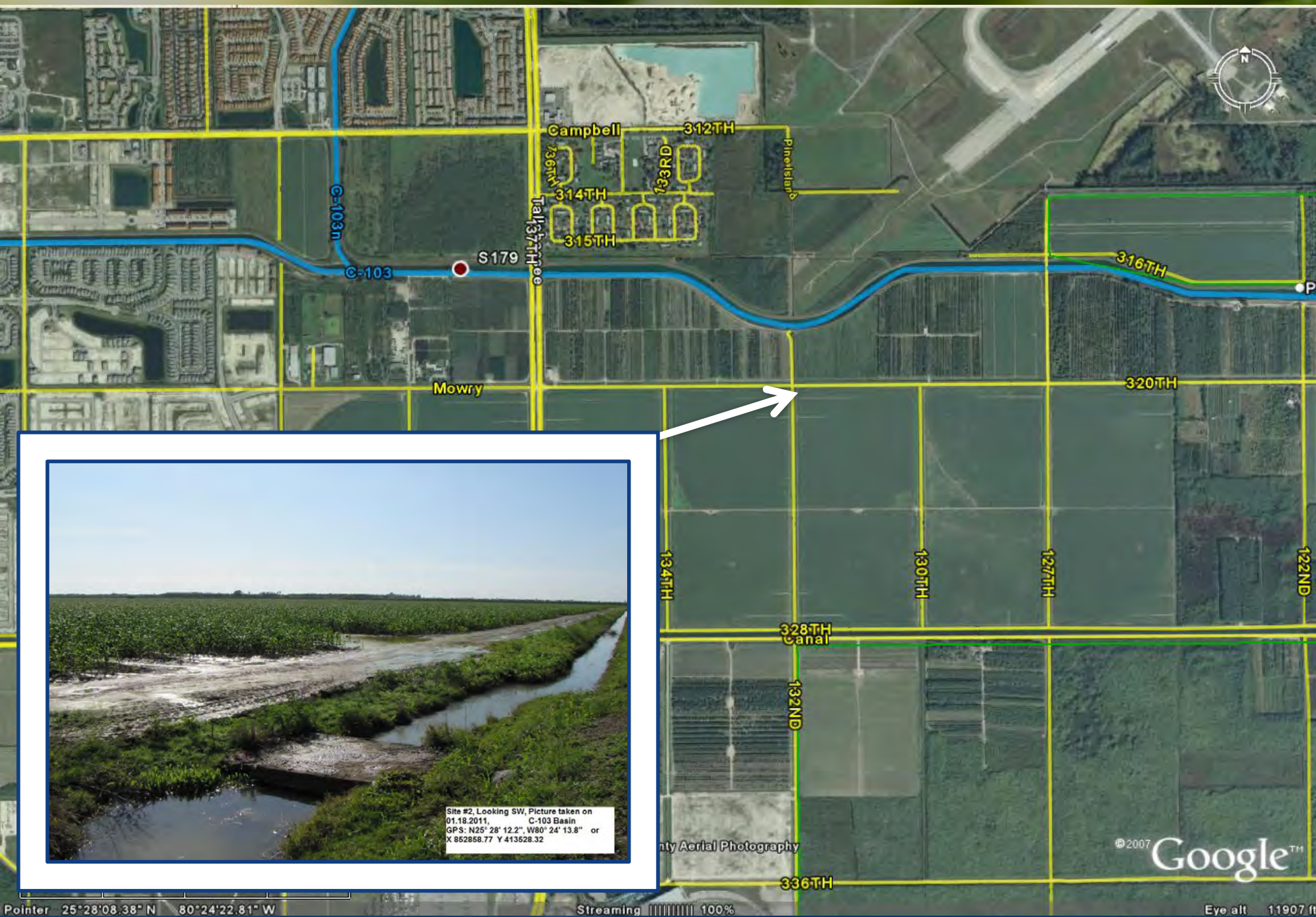


Field conditions after drawdown



Field Operation Summary

- Difference between high and low operating range less than 1 foot
- Four field sites inspected regularly, along with communication with area farmers
- Staff gauges used to evaluate unsaturated zone thickness
- Moderately heavy rainfall events can cause crop damage even during dry season



Site #2, Looking SW, Picture taken on 01.18.2011, C-103 Basin
 GPS: N25° 28' 12.2" W80° 24' 13.8" or
 X 862858.77 Y 413628.32

Staff Gauge South of Site 2



01/18/2011 09:56



01/18/2011 09:57

C-103 Basin, dry season rainfall event;1/18/11



01/18/2011 09:24

Site #1 C-102 Basin

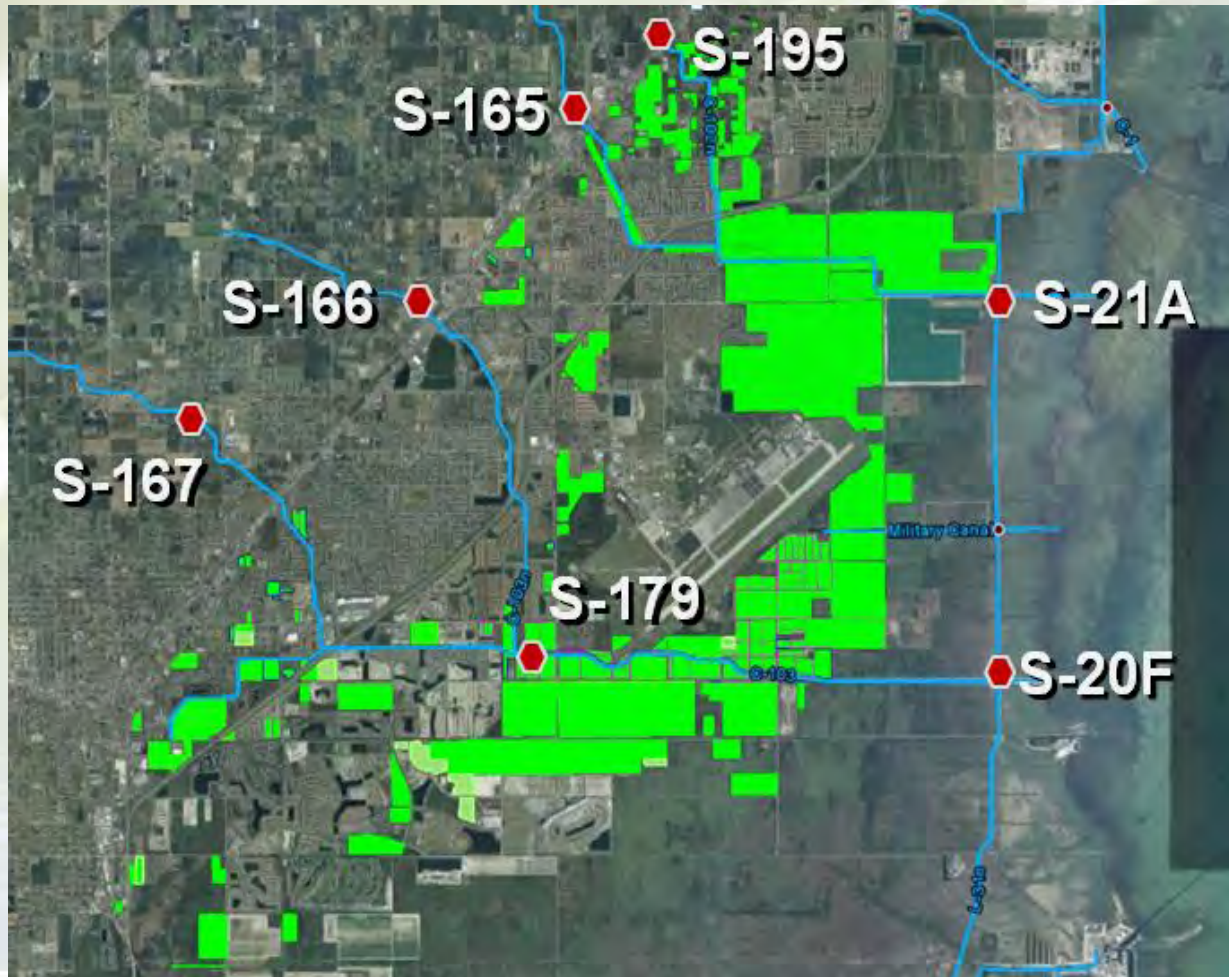




Questions?

Agricultural Land Use

- Type of agricultural land use is predicated on market conditions



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

