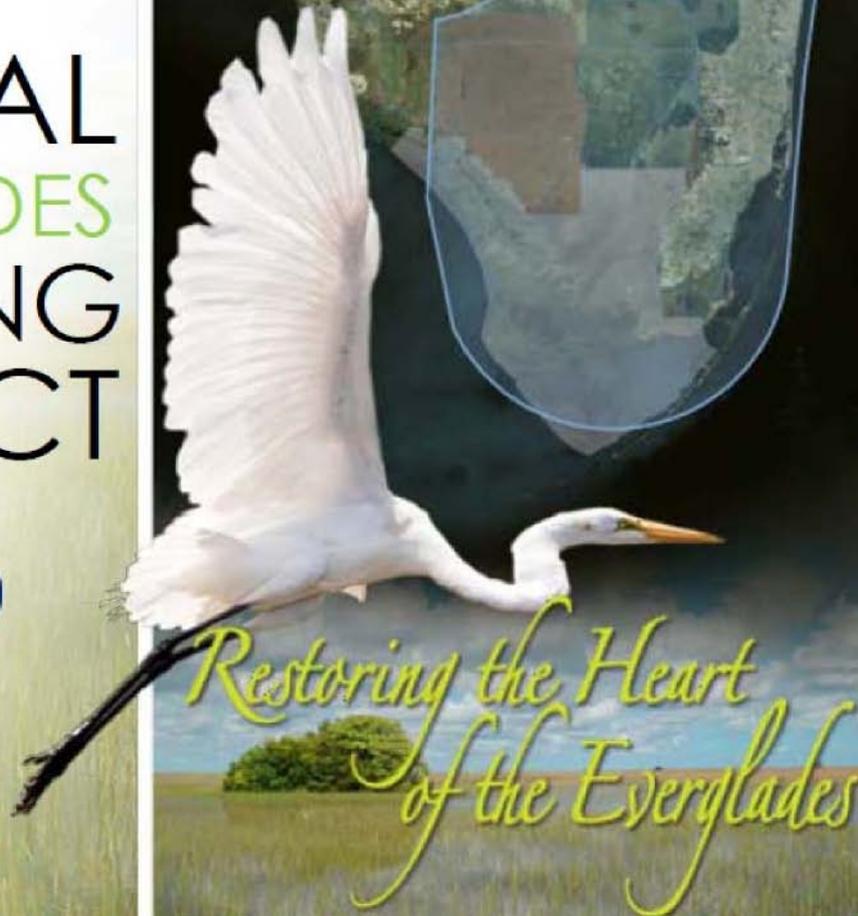


CENTRAL EVERGLADES PLANNING PROJECT



Central Everglades Planning Project (CEPP)

Proposed Final Array of Alternatives

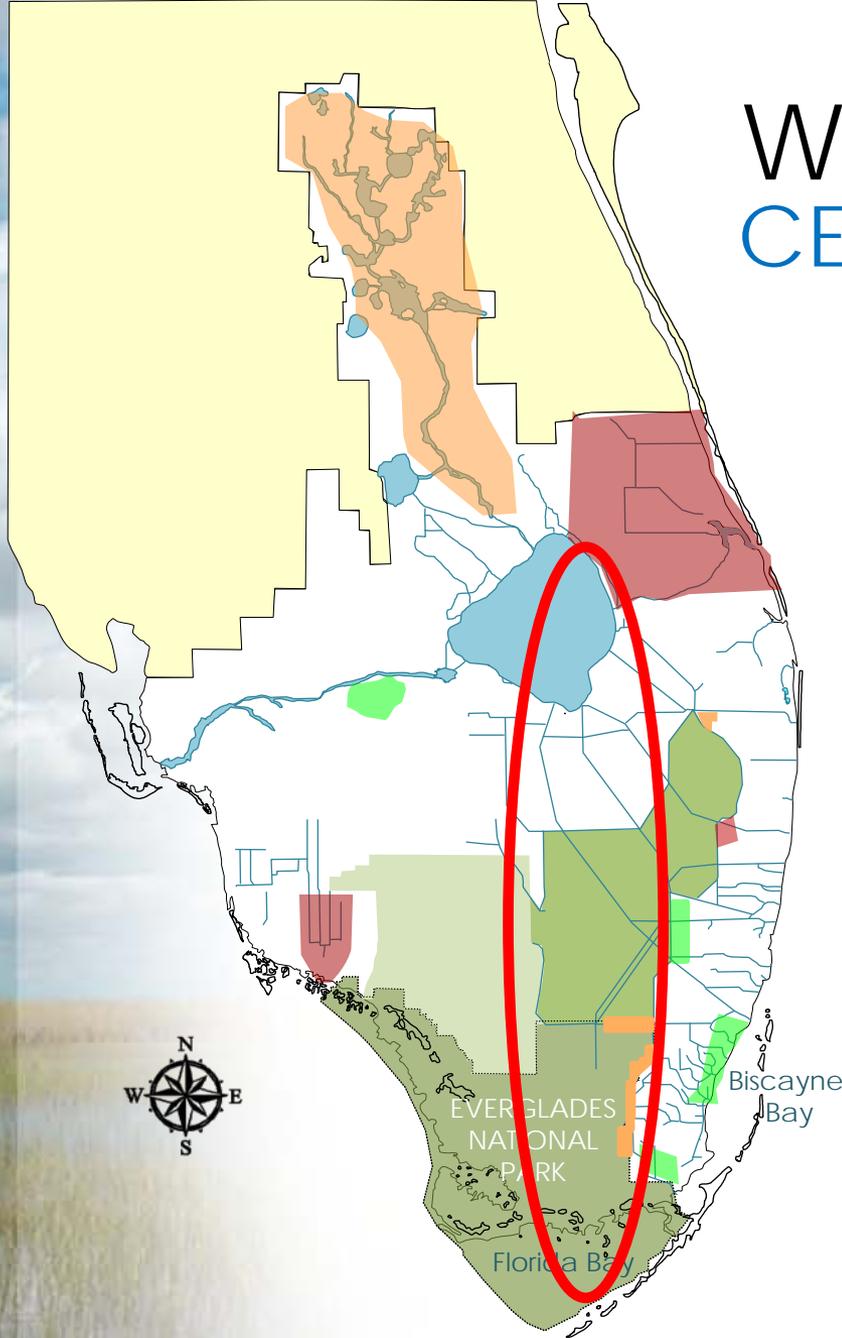
Kim Taplin, Chief
Central Everglades Branch

U.S. Army Corps of Engineers
Jacksonville District

December 7, 2012

WHAT'S NEXT?

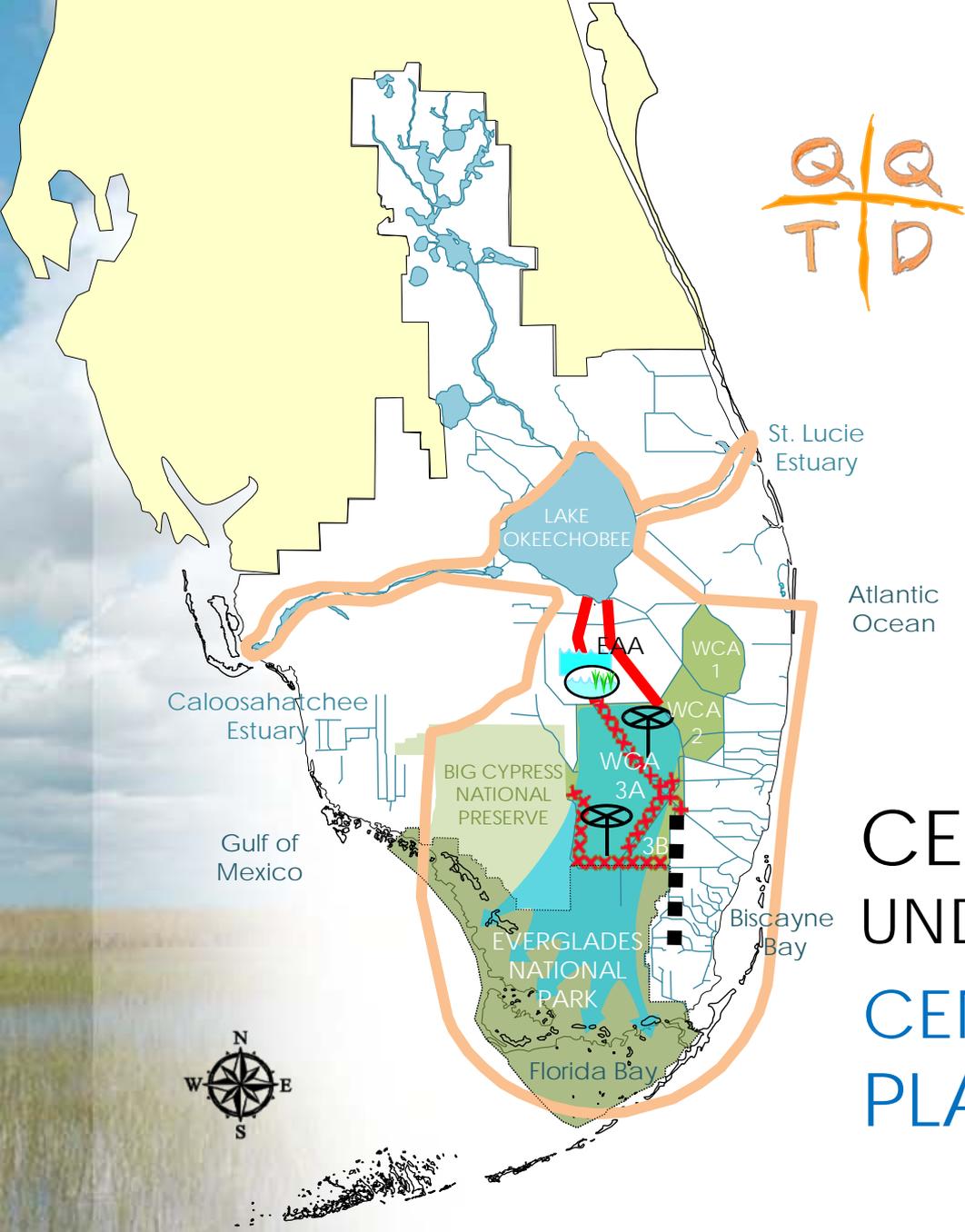
CENTRAL EVERGLADES



- Reduce undesirable discharges to east and west coast estuaries
- Deliver "new" sources of clean water to the Central Everglades and Everglades National Park
- To restore habitat in the Central Everglades and Everglades National Park, focusing on the "River of Grass"

GOALS AND OBJECTIVES

- **GOAL: Enhance Ecological Values**
- **Increase the total spatial extent of natural areas**
- **Improve habitat and functional quality**
 - Restore seasonal hydroperiods and freshwater distribution to support a natural mosaic of wetland and upland habitat in the Everglades system
 - Improve sheetflow patterns and surface water depths and durations in the Everglades system in order to reduce soil subsidence, the frequency of damaging peat fires, the decline of tree islands, and salt water intrusion
 - Reduce high volume discharges from Lake Okeechobee to improve the quality of oyster and SAV habitat in the northern estuaries
- **Improve native plant and animal species abundance and diversity**
 - Reduce water loss out of the natural system to promote appropriate dry season recession rates for wildlife utilization
 - Restore more natural water level responses to rainfall to promote plant and animal diversity and habitat function
- **GOAL: Enhance Economic Values and Social Well Being**
- **Increase availability of fresh water (agriculture/municipal/industrial)**
- **Reduce flood damages (agricultural/urban)**
- **Provide recreational and navigation opportunities**
- **Protect cultural and archeological resources and values**



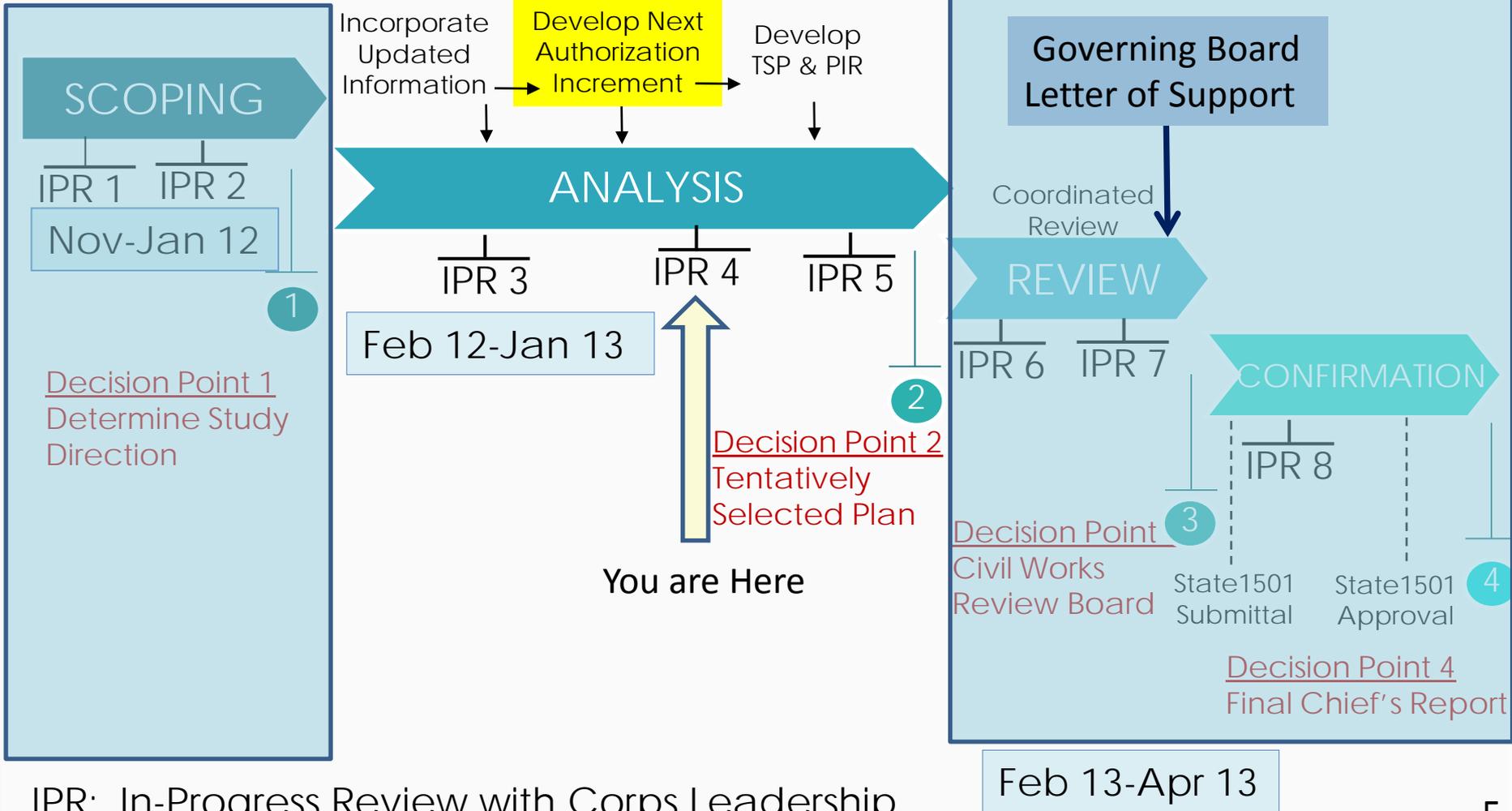
-  Central Everglades Planning Project Study Area
-  Storage, Treatment, and Conveyance in the EAA
-  Decompartmentalization and Sheetflow Enhancement
-  Seepage Management
-  Operational Changes

CERP COMPONENTS UNDER CONSIDERATION

CENTRAL EVERGLADES PLANNING PROJECT

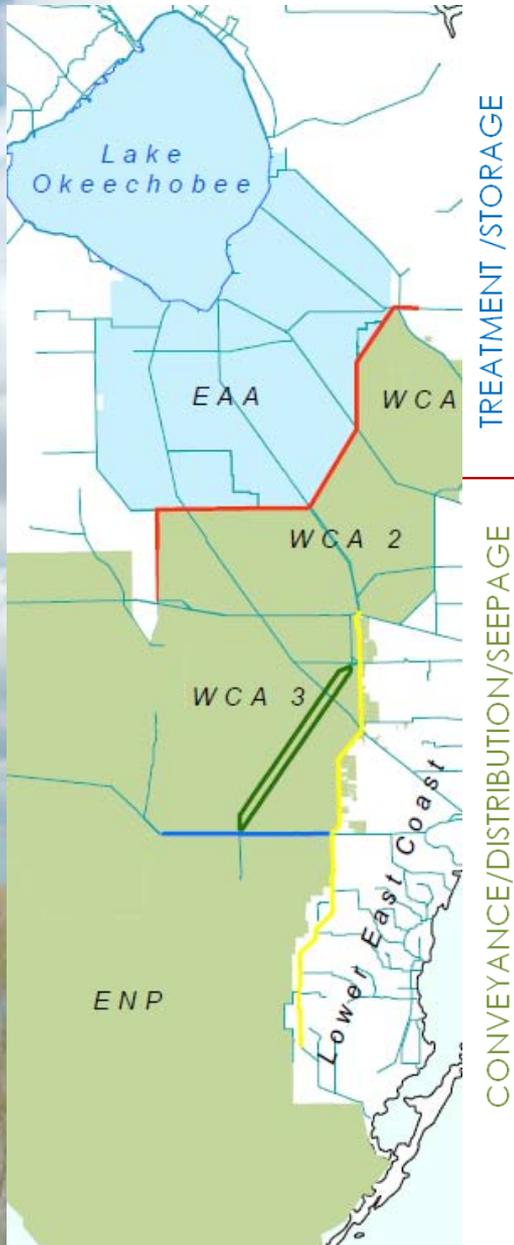
CENTRAL EVERGLADES PROCESS

TARGET - 18 MONTHS



IPR: In-Progress Review with Corps Leadership

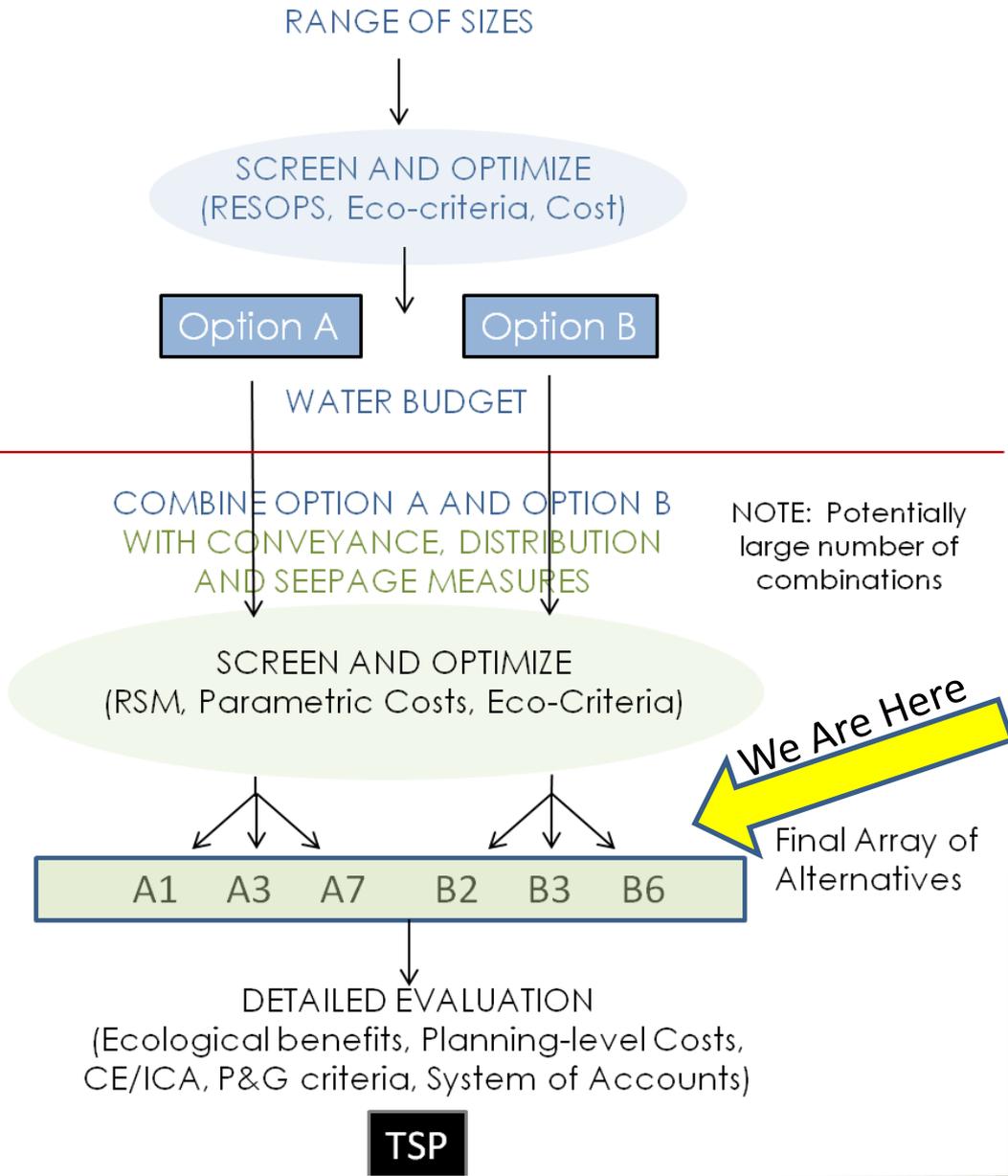
CEPP PLAN FORMULATION FRAMEWORK



TREATMENT / STORAGE

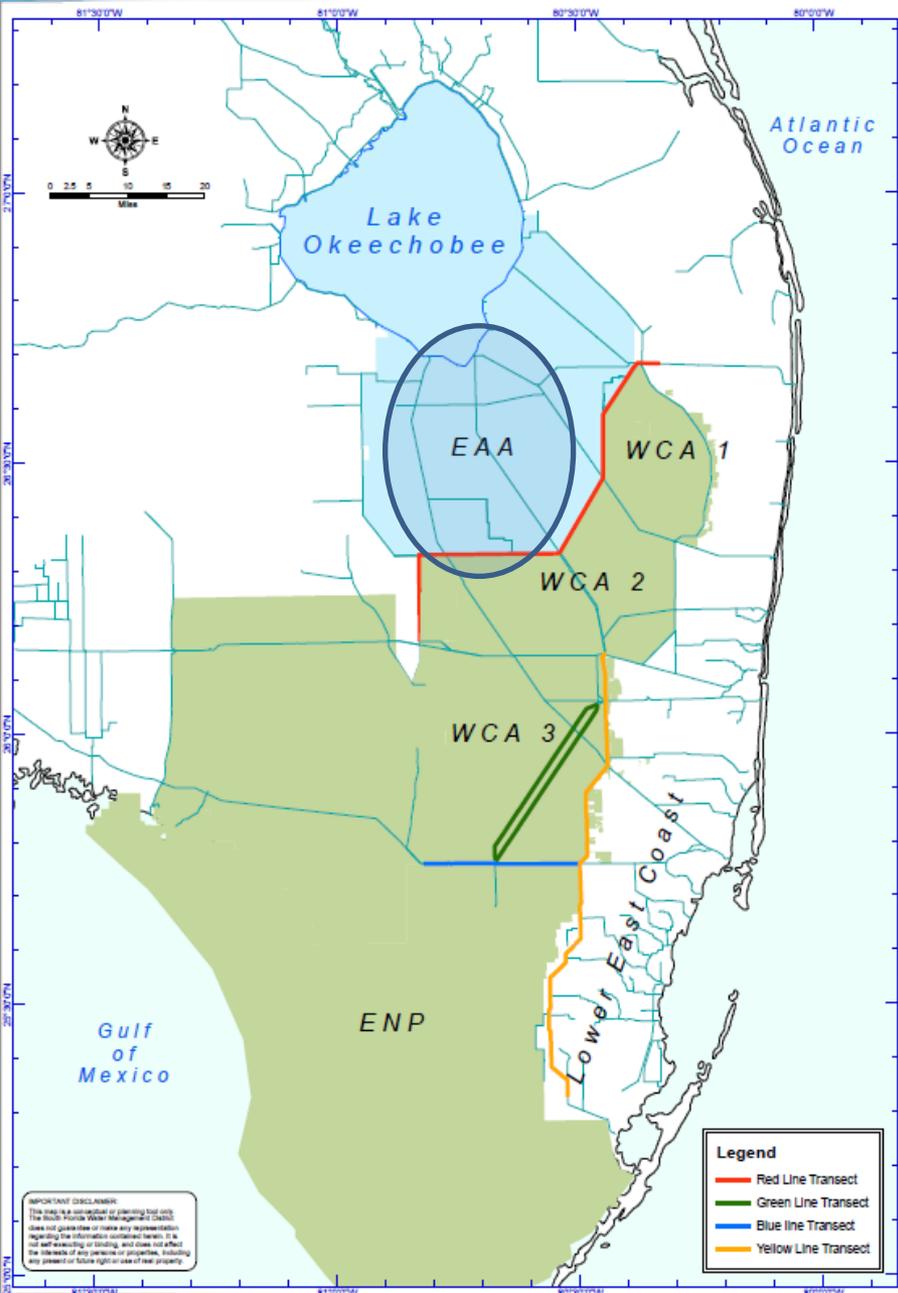
CONVEYANCE/DISTRIBUTION/SEEPAGE

INITIAL SCREENING



NOTE: Potentially large number of combinations

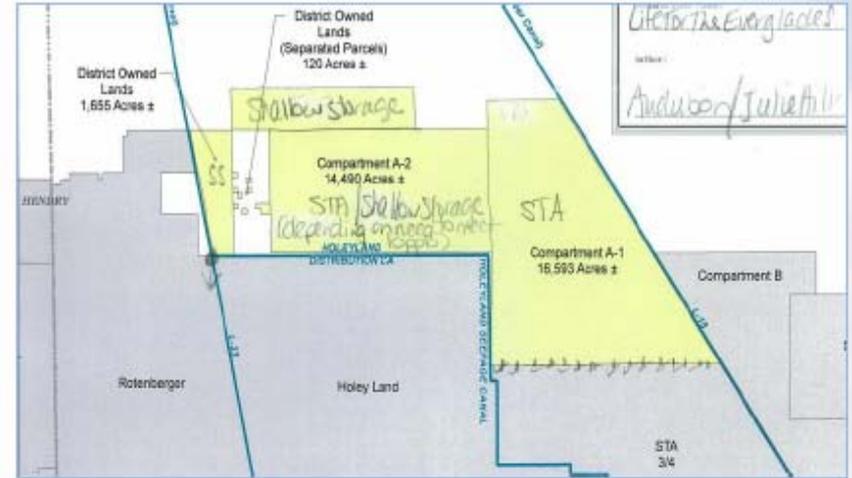
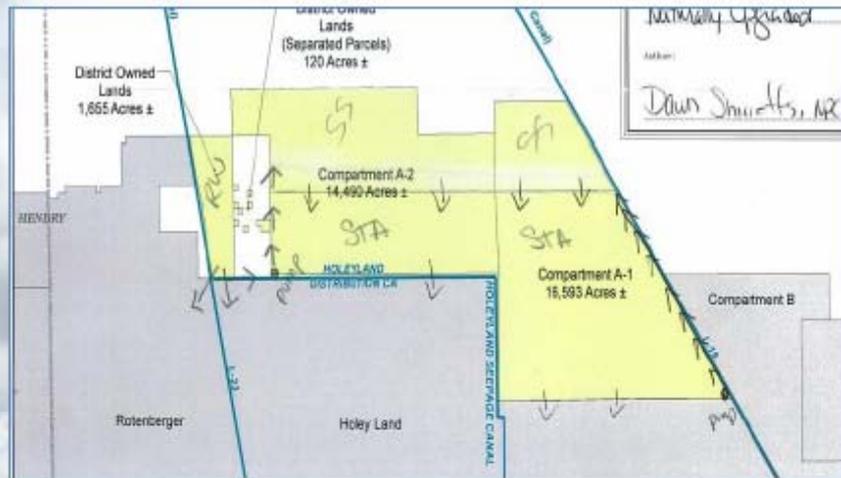
We Are Here
Final Array of Alternatives



STORAGE AND TREATMENT

(North of Redline)

Examples: Configuration Development Exercise WG Sponsored Public Meeting & PDT

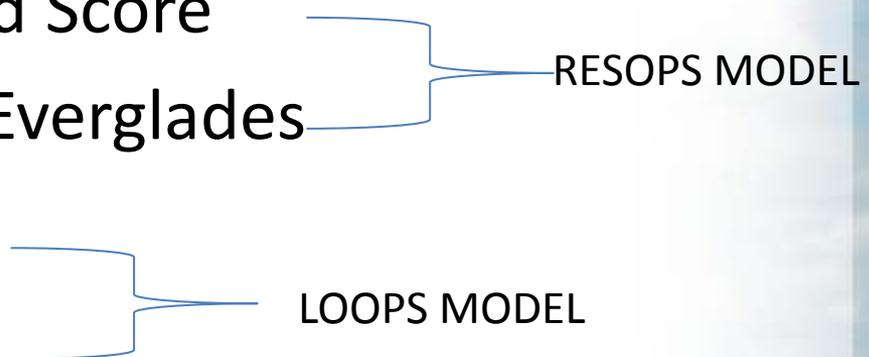


Storage and Treatment: “What We’ve Heard”

- ▶ Flow Equalization Basin access and recreational opportunities should not be limited to restrictions imposed on STAs
- ▶ Provide deep water refugia to support fish and wildlife during dry periods
- ▶ Deep water reservoir and additional storage in Lake Okeechobee should be included in final array of alternatives for Ag water supply purposes
- ▶ Holeyland should be included
- ▶ Should consider an alternative without A-2 FEB since FEB will not provide Ag water supply
- ▶ Consider canal improvements in the EAA as alternative means to deliver more water to the Everglades
- ▶ Closely coordinate elements of both the CEPP and Restoration Strategies
- ▶ Re-initiate formal scoping once the final array of alternatives is selected
- ▶ Should consider options to connect western basins to Lake Okeechobee to restore natural areas in Seminole Big Cypress Reservation and Big Cypress National Preserve

Storage and Treatment: Screening Criteria

■ Level 1 – Criteria based on CEPP objectives

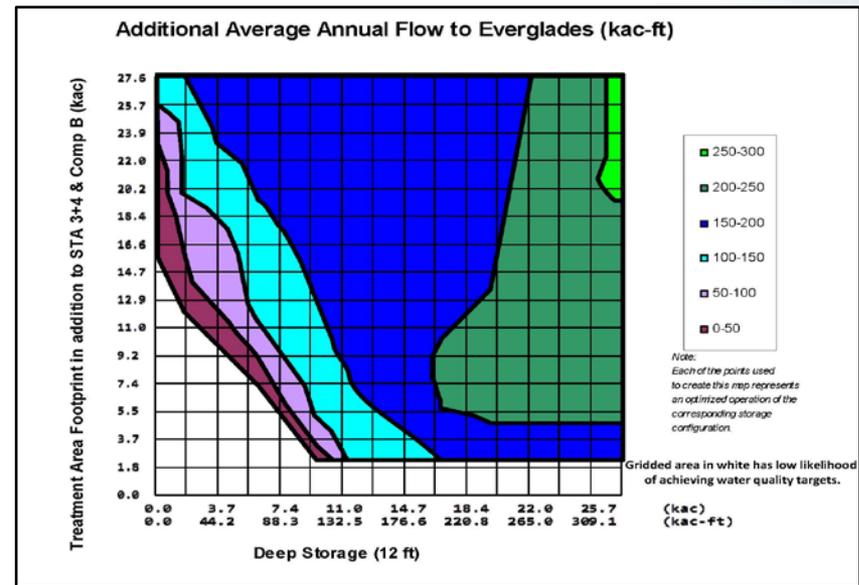
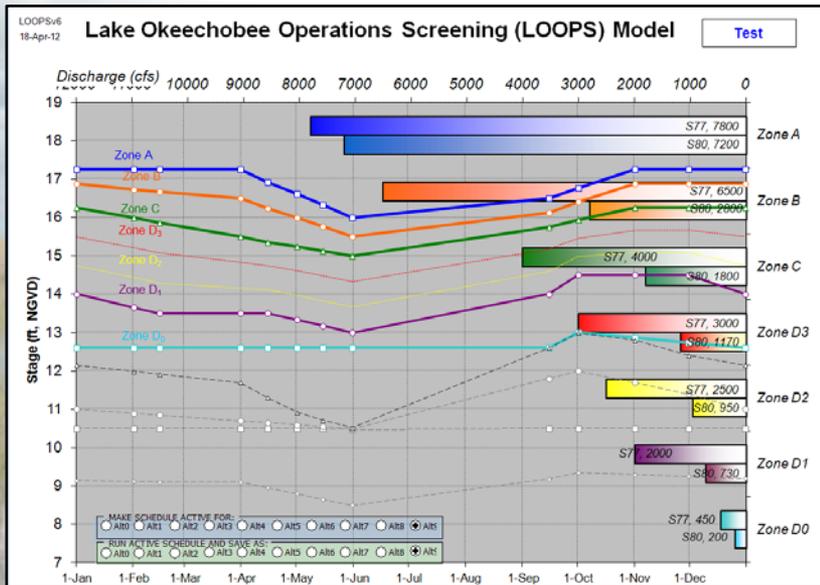
- ▶ Everglades Dry Standard Score
 - ▶ Additional Flow to the Everglades
 - ▶ Estuary Performance
 - ▶ Water Supply
- RESOPS MODEL
- LOOPS MODEL
- 

■ Level 2 – Other important considerations

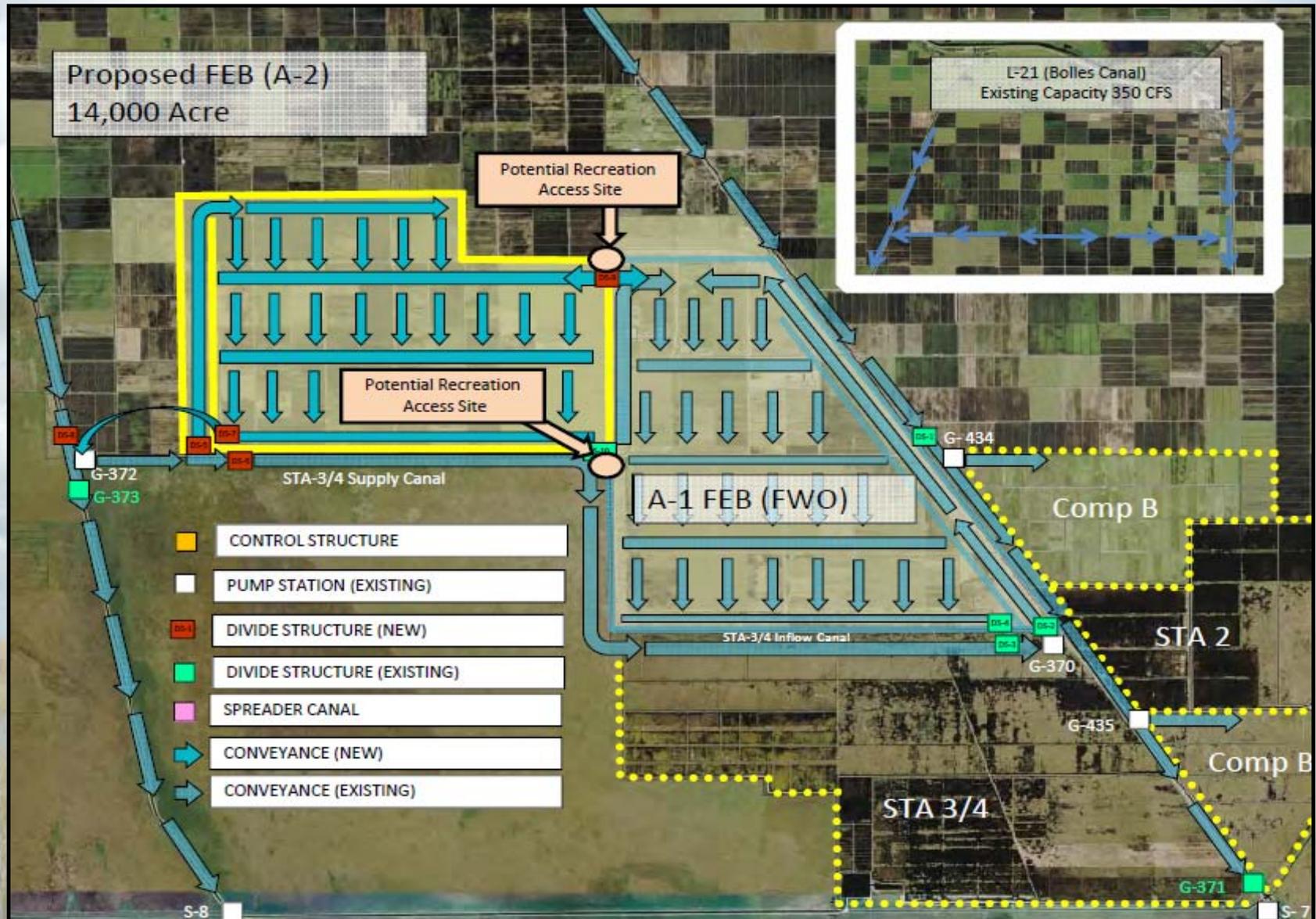
- ▶ Lake Okeechobee Performance
- ▶ Adaptability
- ▶ Onsite Habitat Value

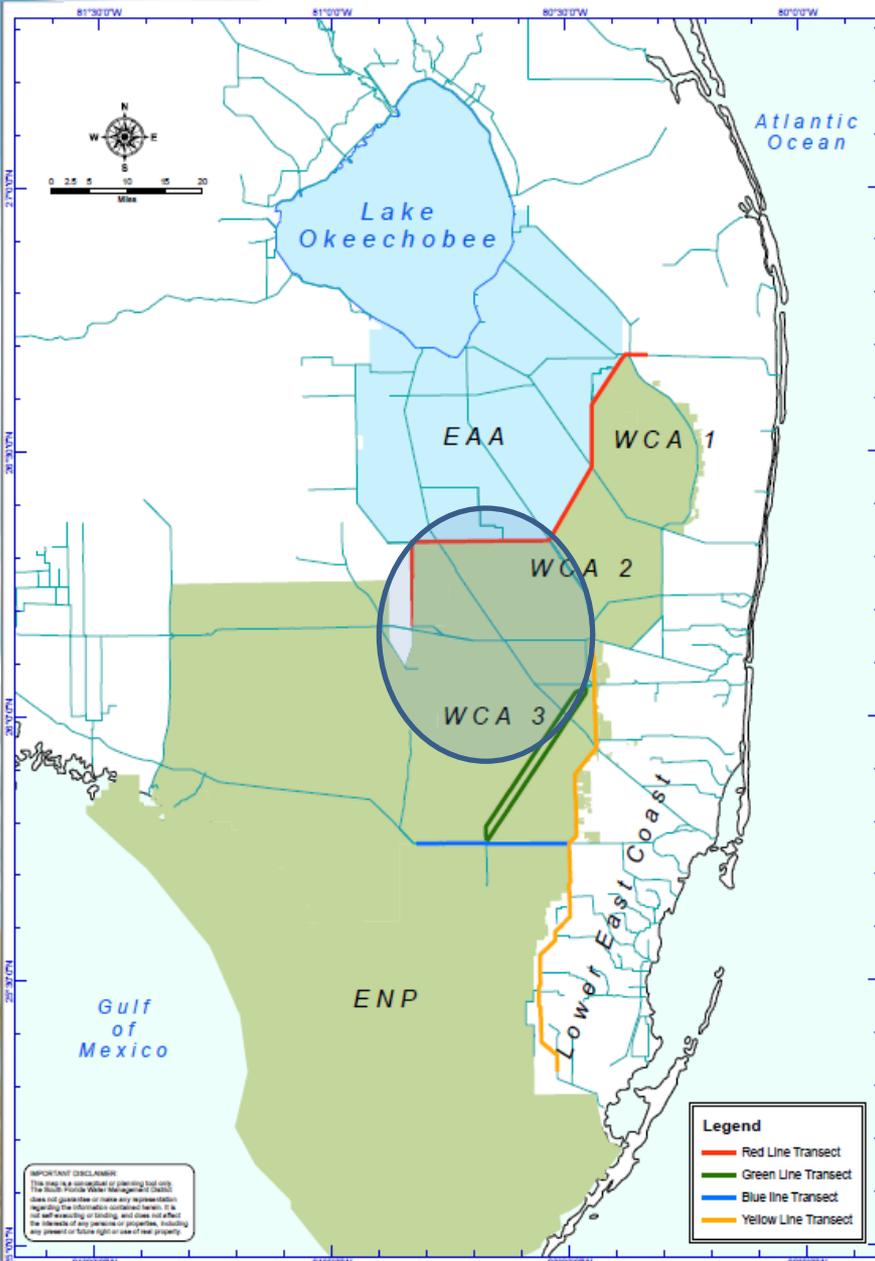
Storage and Treatment Screening

- RESOPS and LOOPS models identified the most effective/highest performing storage and treatment sizes based on ecological performance criteria from thousands of potential combinations



Storage and Treatment: Results

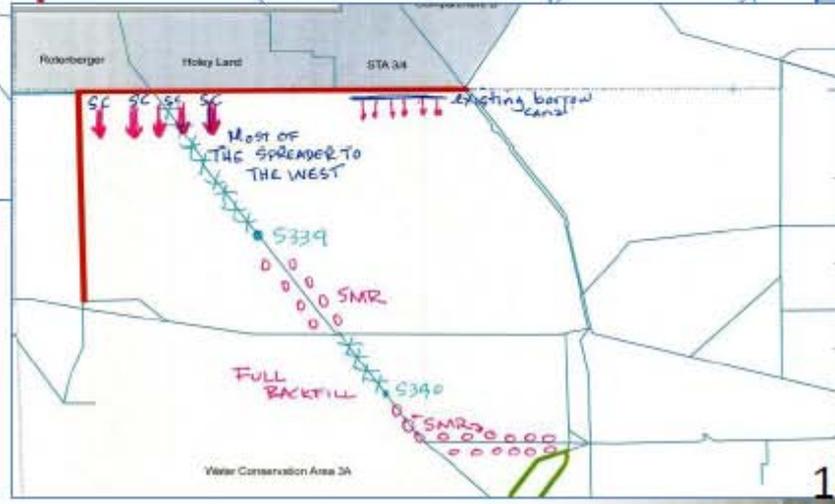
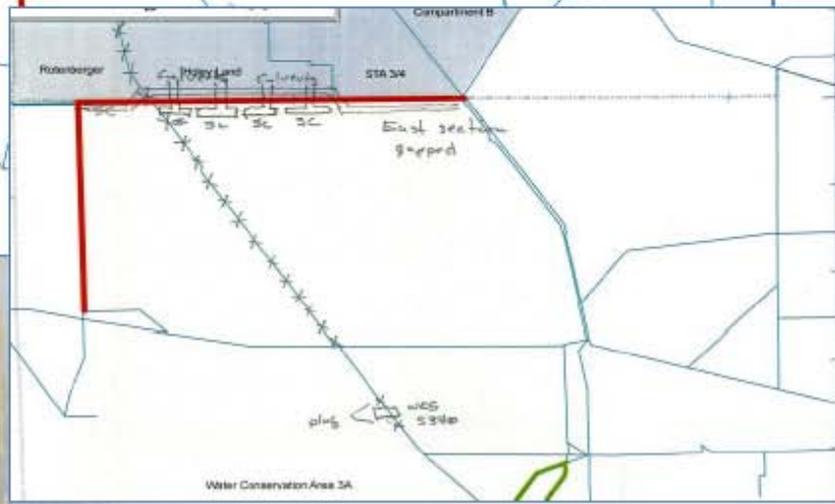
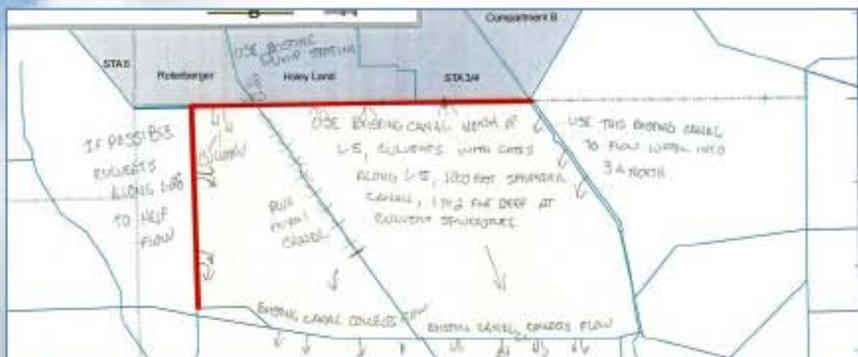




NORTHERN WCA 3A CONVEYANCE & DISTRIBUTION

South of Redline

Examples: Configuration Development Exercise WG Sponsored Public Meeting & PDT



NORTHERN WCA-3A CONVEYANCE & DISTRIBUTION: Screening Results “What We’ve Heard”

- Allow fishing in spreader canals to offset impacts due to Miami Canal backfilling
- Provide deep water refugia to support fish and wildlife during dry periods
- Consider recreation access from US 27 to the L-5 Canal
- Allow vehicle access across new water control structures
- Include boat ramps in Recreation Plan
- Maintain refuge areas for fur bearing animals (FWC enhanced spoil mounds should not be used for backfilling or impacted during construction)
- Performance measures in northern 3A should mimic sawgrass plains
- Spreader canals should be eliminated/minimized due to impacts to deer habitat (wax myrtle refuge areas) and access to levee in high water conditions

NORTHERN WCA-3A CONVEYANCE & DISTRIBUTION

Screening Criteria and Tools Used

Level 1 : Primary Ecological Objectives

- Regional Simulation Model (RSM) Results-Performance Measures
 - PM 1 Inundation Duration
 - PM 2 Sheetflow in the Ridge and Slough Landscape
 - PM 3 Soil Oxidation
 - PM 5 Slough Vegetation Suitability
- Regional Simulation Model (RSM) Results - Mapping
 - Overland Flow Vector Maps
 - Overland Flow Across Transects
 - Hydroperiod Distribution Maps
 - Ponding Depth Maps

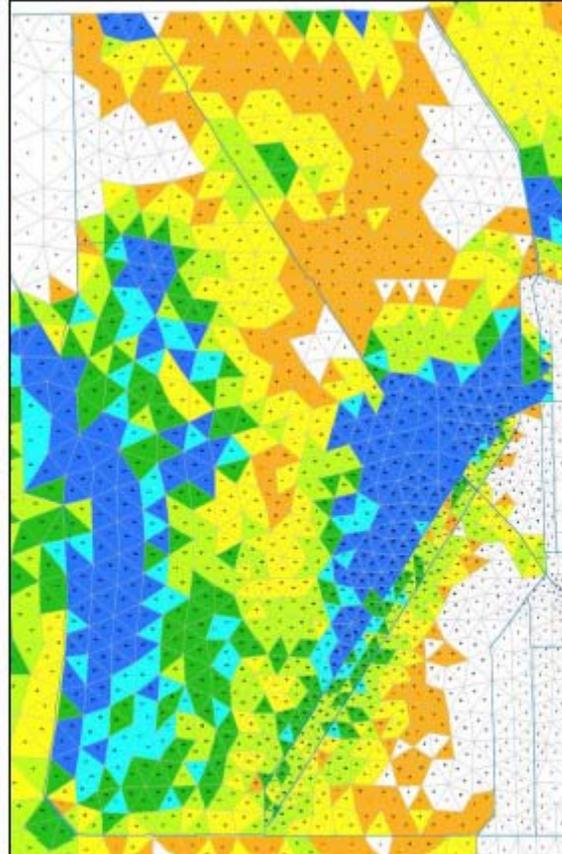
Level 2 : Other Important Considerations

- Excessive Ponding
- Adaptability
 - Operational Flexibility
 - Future Compatibility
 - Robustness
- Recreational Impacts
 - Motorized Boaters and Swamp-Geared Vehicles
- Ecologic Connectivity
 - Miles of Marsh Reconnected
 - Acres of Marsh Restored

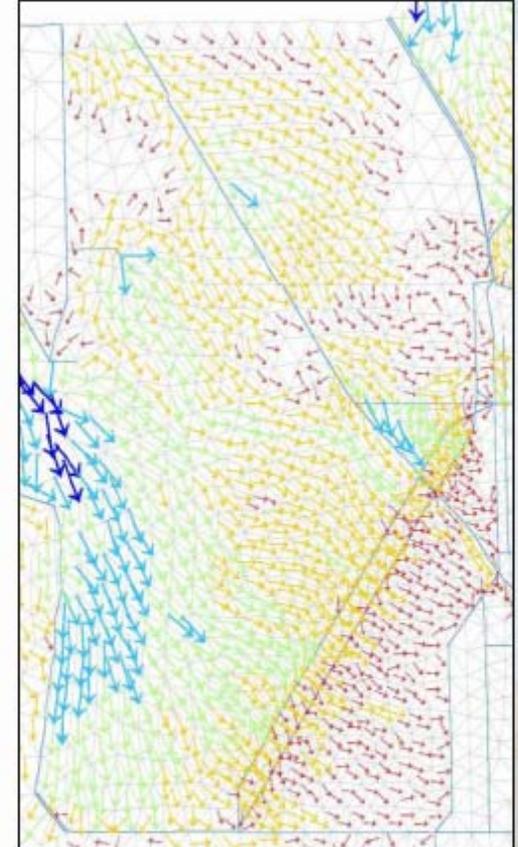
Example: Screening Graphics



Ponding
Depth

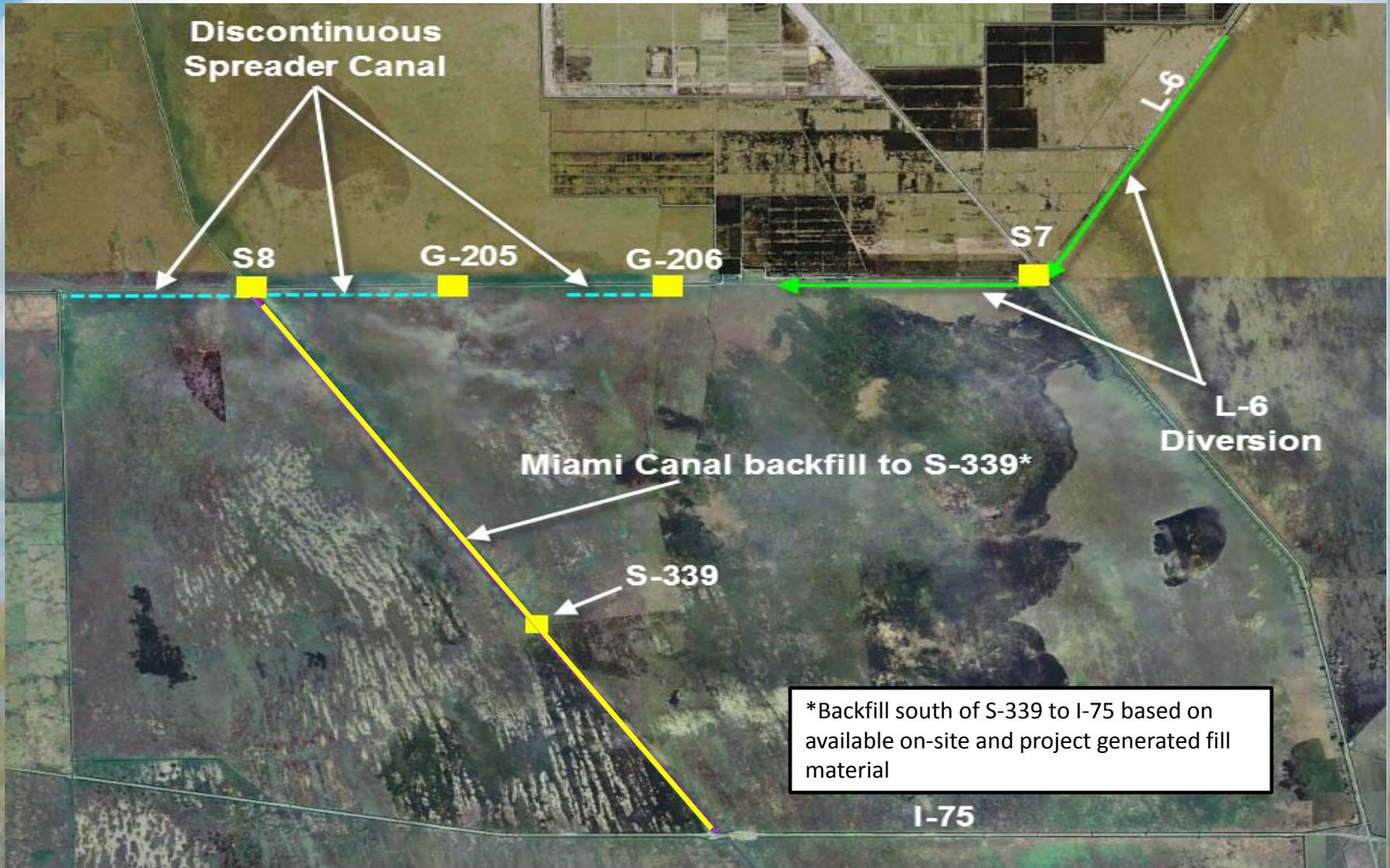


Hydroperiod



Flow
Vectors

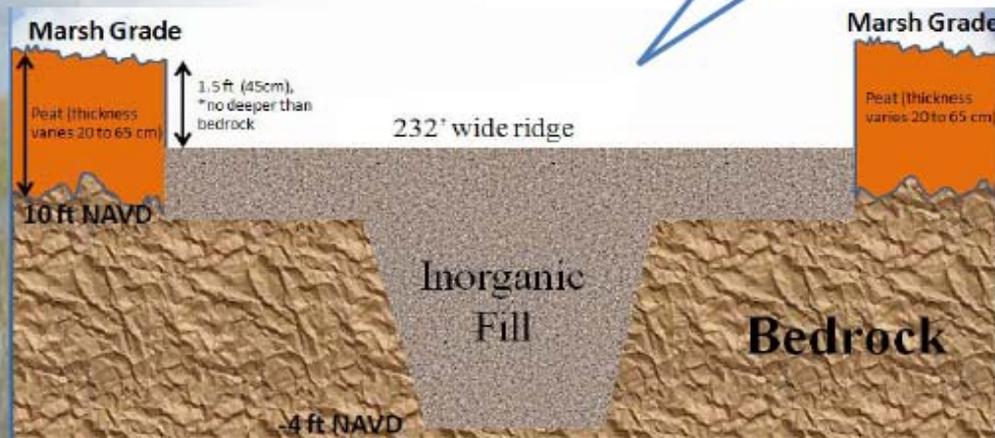
NORTHERN WCA-3A CONVEYANCE & DISTRIBUTION : Screening Results



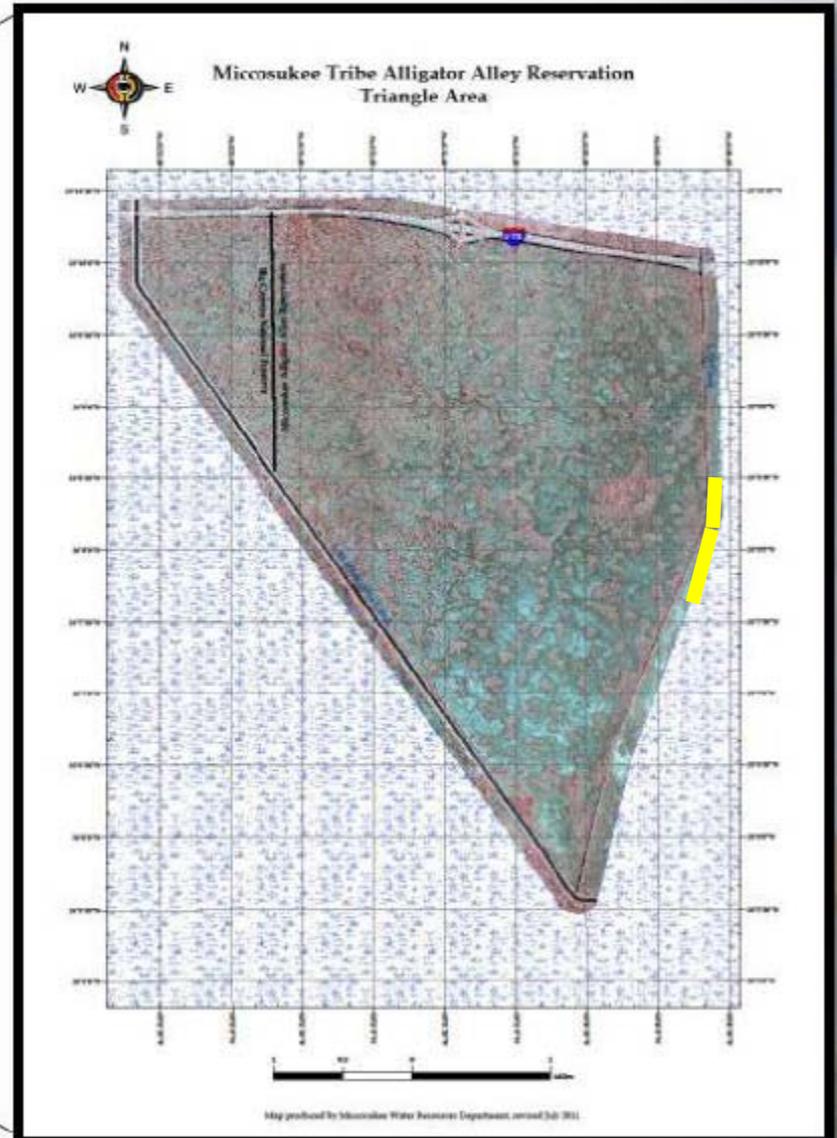
Miami Canal Backfill (Conceptual Plan)



1 mile average from head to head

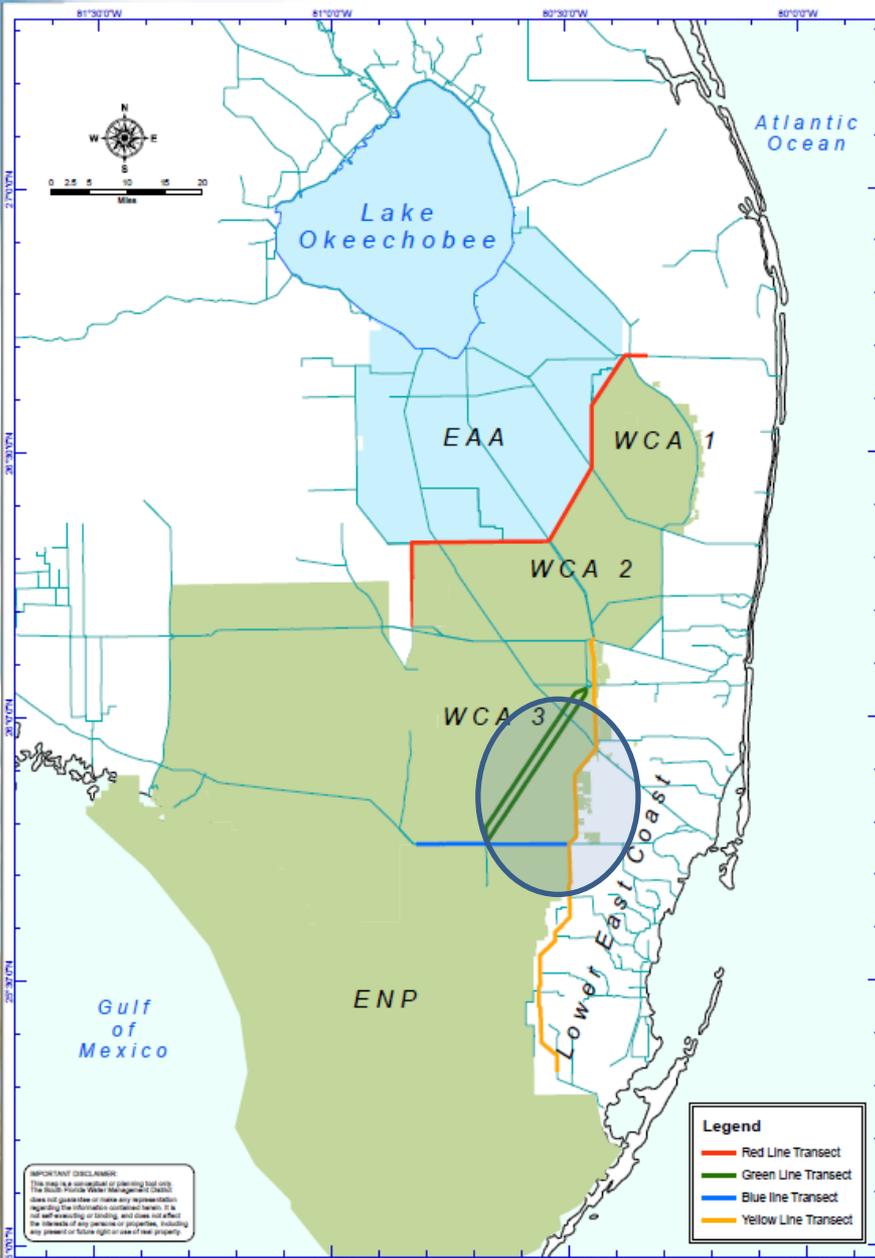


L-28 Triangle Rehydration



CONVEYANCE & DISTRIBUTION WCA 3A to WCA-3B to ENP

Greenline & Blueline

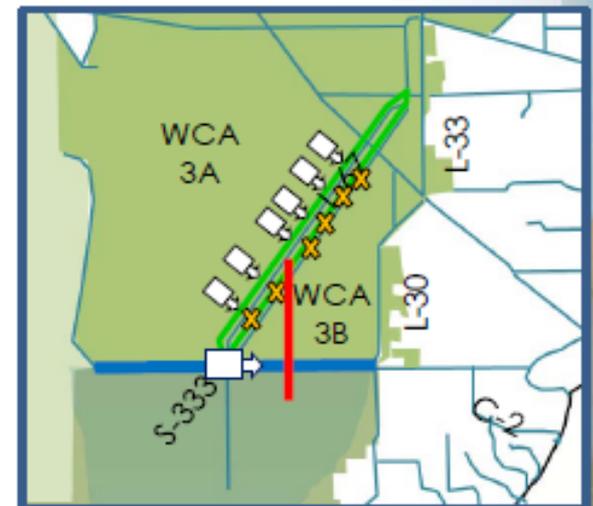
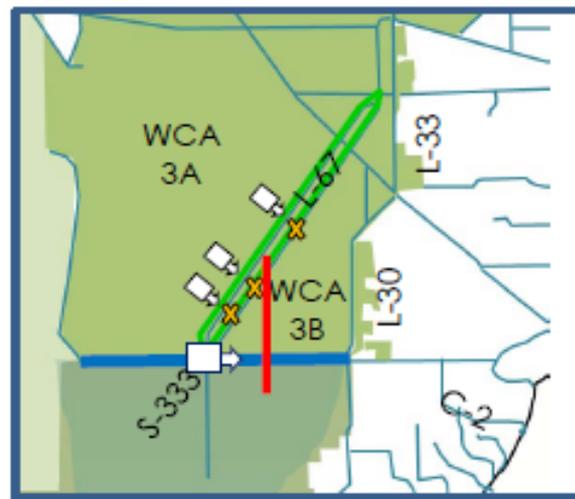
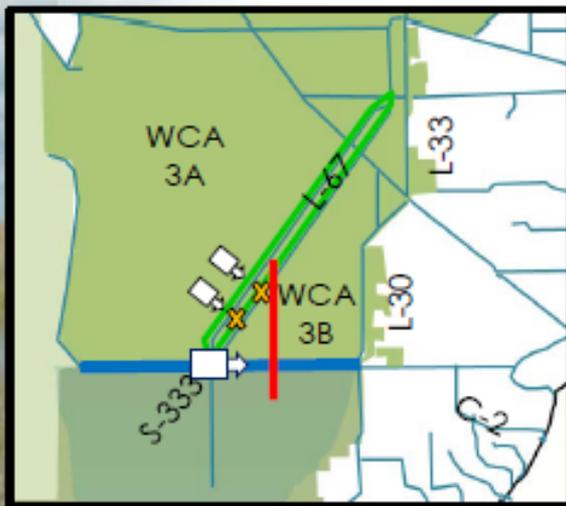
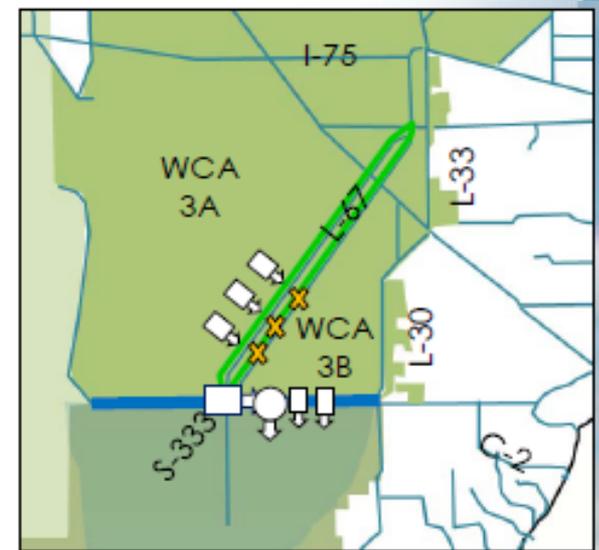
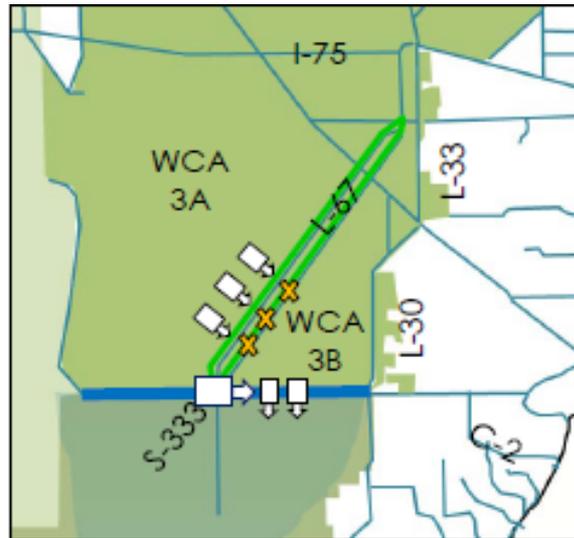
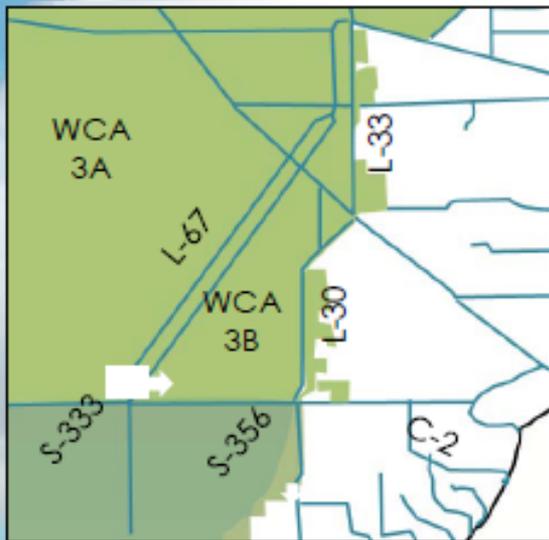


BLUELINE AND GREENLINE: Screening Results

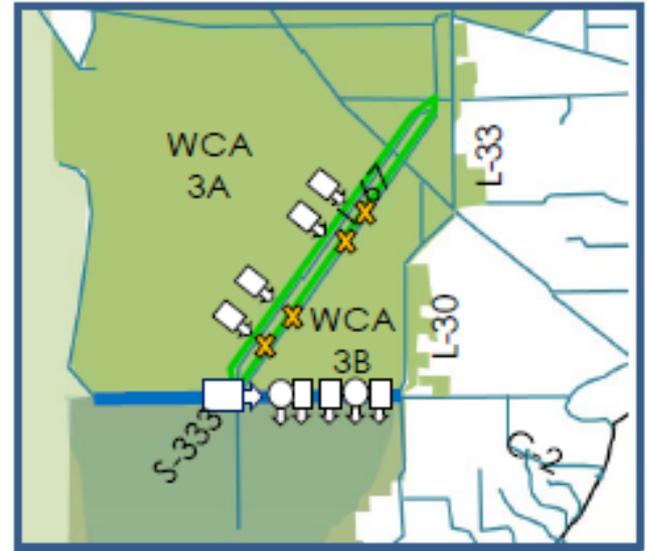
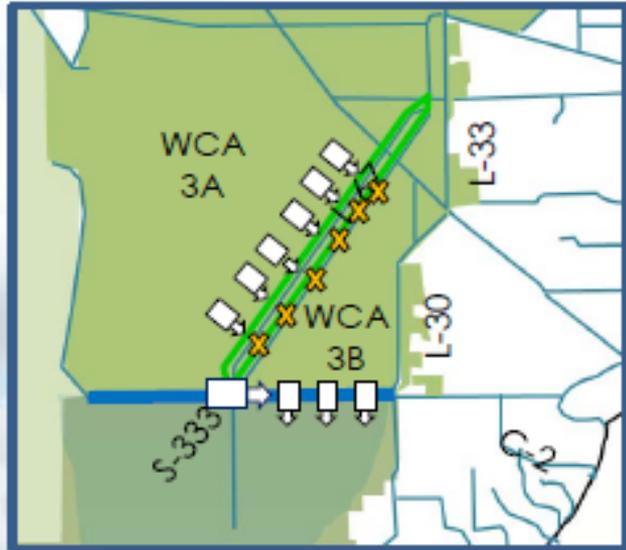
“What We’ve Heard”

- L-67 A canal should not be obstructed, should await results of Decomp Physical Model to demonstrate backfilling necessary
- Inflows to WCA-3B must take into account soil subsidence and resources within WCA-3B
- Construction of levee in WCA-3B further compartmentalizes the system and not consistent with restoration
- Options to pump water out of WCA-3B not consistent with restoration, concerns over long-term costs and carbon footprint
- An alternative should be considered that does not include additional bridging along Tamiami Trail
- Need more time to discuss options for final array

Infrastructure Options



Infrastructure Options

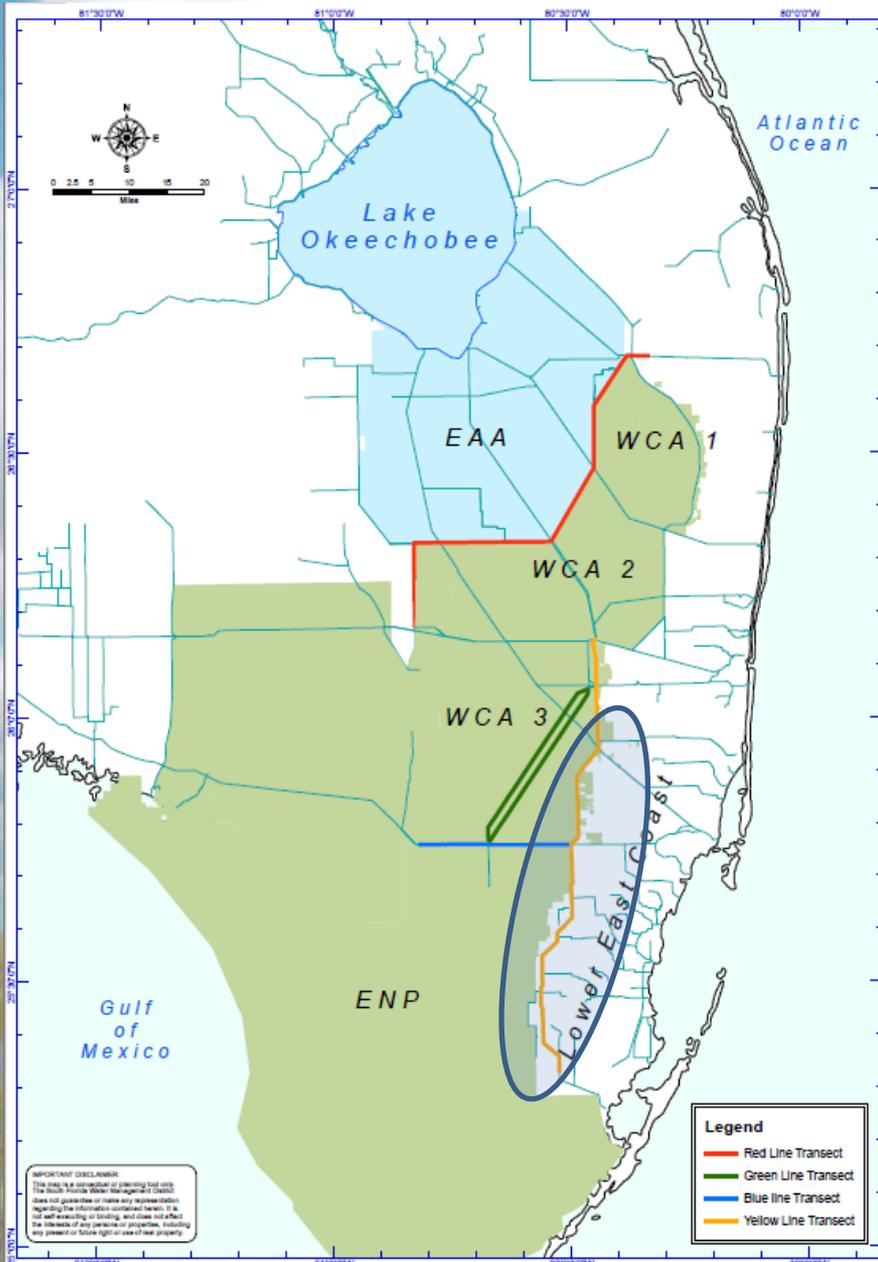


Infrastructure Options Evaluation – Criteria Hierarchy

- **Level 1 – Primary CEPP Ecological Objectives**
 - ▶ Hydro-ecological target evaluation of iModel results
- **Level 2 – Other important considerations**
 - ▶ **Connectivity**
 - ▶ Ecological connectivity vs. hydrologic connectivity
 - ▶ **Adaptability: Adaptive Management considerations**
 - ▶ Robustness
 - ▶ Future Compatibility
 - ▶ **Recreational Impacts**
 - ▶ Hunting/Fishing Impacts

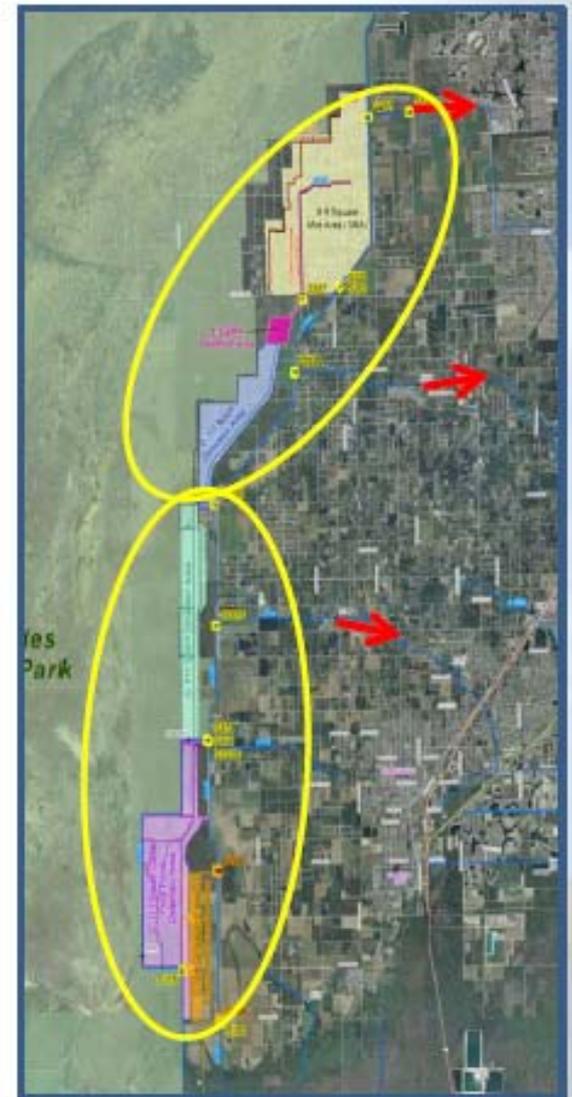
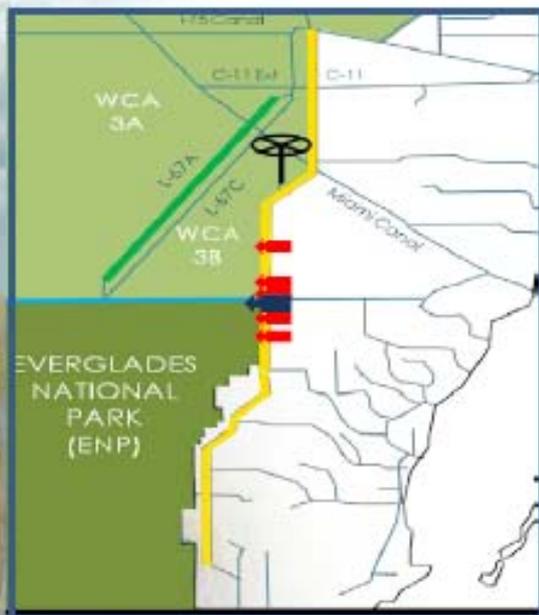
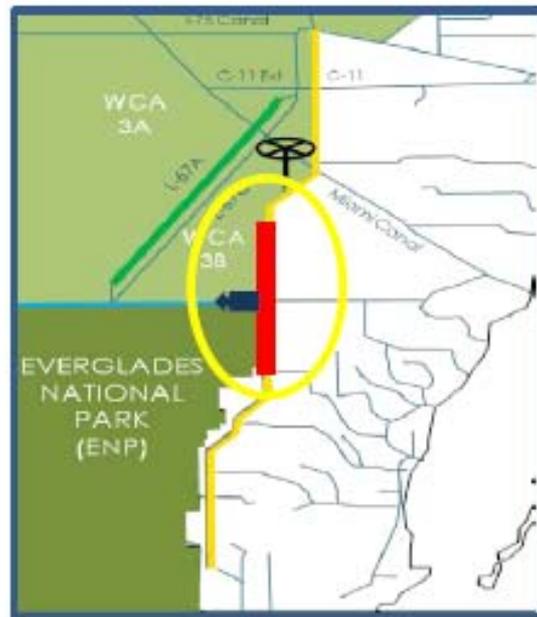
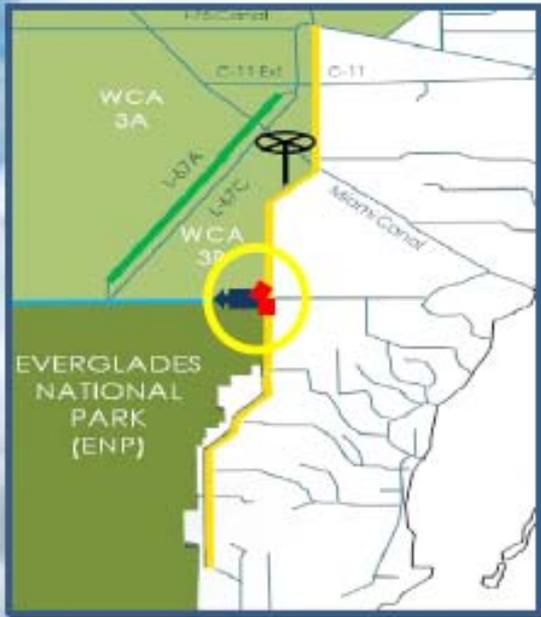
GREENLINE and BLUELINE: Screening Results

- Screening effort resulted in 3 cost-effective groupings of options to be further consolidated and refined into the final array
 - I. Minimal structure on L-67A and increase S-333
 - Increase S-333 to 3,000cfs since structure frequently reached 2,000cfs capacity
 - Include minimal structure on L-67A to minimize further degradation in WCA 3B and utilize existing S-355 A and B
 - II. Increase S-333 and install gated structures on the L-67A with gravity outflow from WCA 3B
 - Increase S-333 to 3,000cfs since structure frequently reached 2,000cfs capacity
 - Including two 500cfs and one 750cfs on the L-67A (flow distribution from iModel)
 - Include one additional outlet structures on L-29 west of S-355 A and B
 - III. Increase S-333 and install gated structures on the L-67A with pumped outflow from WCA 3
 - Increase S-333 to 3,000cfs since structure frequently reached 2,000cfs capacity
 - Including four 500cfs structures on the L-67A, to achieve greatest distribution of flow and benefits in WCA 3B (four smaller structures approximately equivalent in cost to three larger structures)
 - Include two 500cfs pumps in additional to S-355A and B to achieve the greatest distribution and flexibility (two smaller pumps approximately equivalent in cost to one larger pump)



SEEPAGE MANAGEMENT

Yellowline



SEEPAGE MANAGEMENT: Screening Results

“What We’ve Heard”

- Detention Area in Everglades National Park would take too long to work out – agreements with FPL, Congressional authorization for land swap, significant controversy over benefits and impacts
- Concern about seepage barrier effects on well-fields and Biscayne Bay
- Concern about costs and carbon footprint for options that include extensive pumping
- Need more time to discuss and review screening results

RANGE OF SIZES

SCREEN AND OPTIMIZE
(RESOPS, Eco-criteria, Cost)

Option A

Option B

WATER BUDGET

COMBINE OPTION A AND OPTION B
WITH CONVEYANCE, DISTRIBUTION
AND SEEPAGE MEASURES

NOTE: Potentially
large number of
combinations

SCREEN AND OPTIMIZE
(RSM, Parametric Costs, Eco-Criteria)

A1

A3

A7

B2

B3

B6

We Are Here

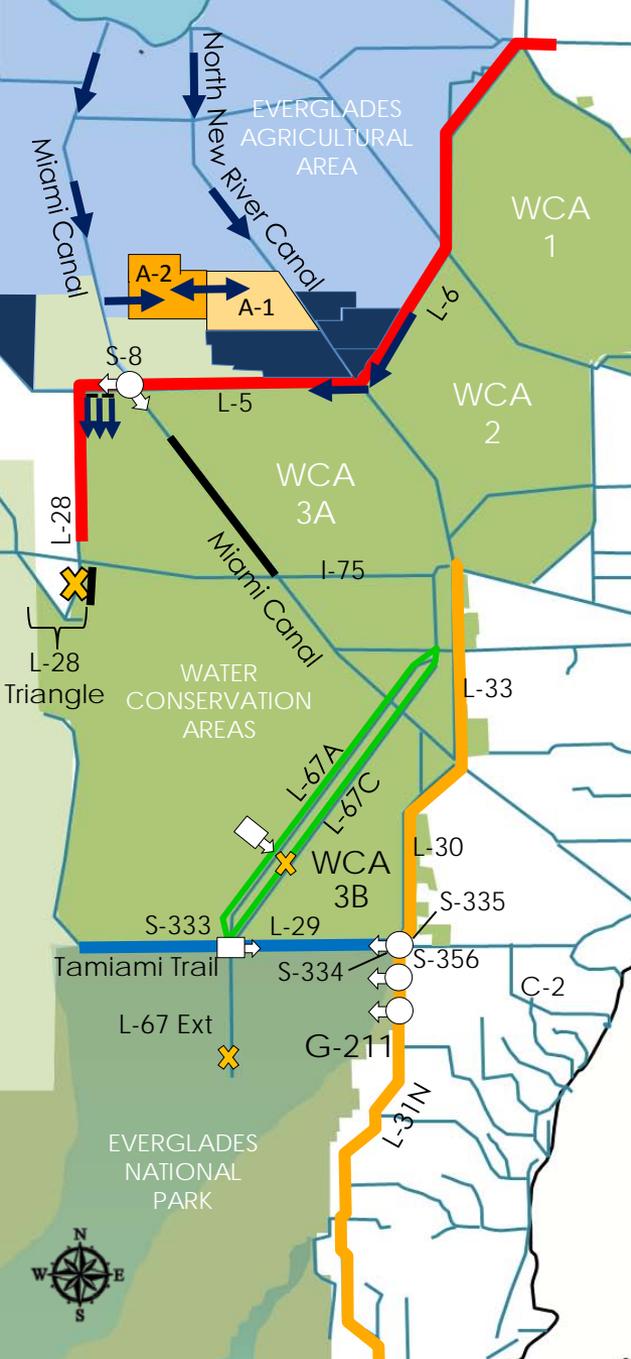
Final Array of
Alternatives

DETAILED EVALUATION
(Ecological benefits, Planning-level Costs,
CE/ICA, P&G criteria, System of Accounts)

TSP

FINAL ARRAY OF ALTERNATIVES

PROPOSED ALTERNATIVE 1



STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

DISTRIBUTION/CONVEYANCE

- Diversion of L-6 flows and L-5 canal improvements
- Spreader canal ~3 miles west of S-8 (3,000 cfs)
- Backfill Miami Canal from ~1.5 miles south of S-8 to I-75
- L-28 Triangle – gap levee

DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 3,000 cfs
- One 750 cfs gated structure in L-67A, 0.5 mile spoil removal west of L-67A north and south of structures
- One 6000-ft gap in L-67C levee
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Degrade southern 1.5 miles of L-67 extension levee

SEEPAGE MANAGEMENT

- Increase S-356 to 1,000 cfs
- Two 250 cfs pumps on L-31N
- G-211 operational refinements and use coastal canals to convey seepage



PROPOSED ALTERNATIVE 2

STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

DISTRIBUTION/CONVEYANCE

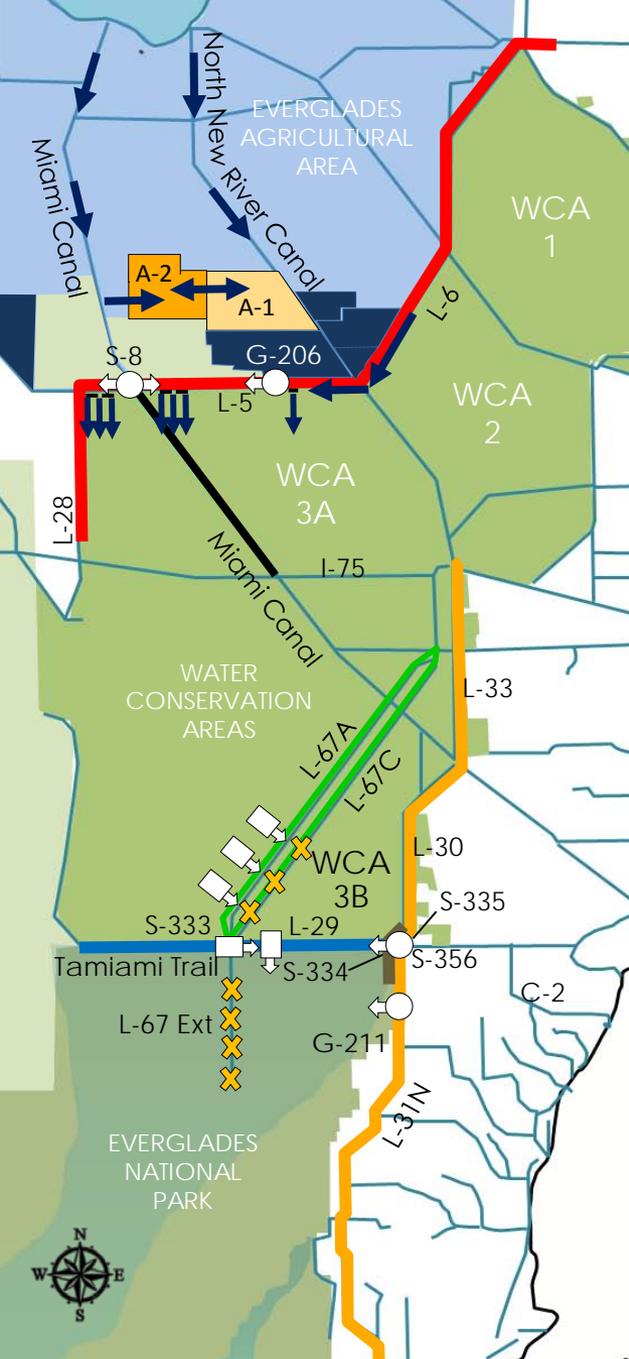
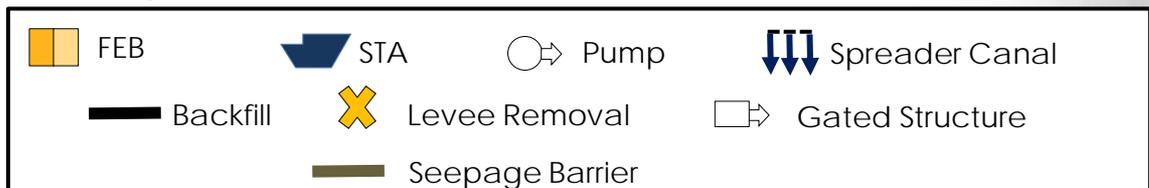
- Diversion of L-6 flows and L-5 canal improvements
- Spreader canal: ~3 miles west of S-8 (3,000 cfs), ~3 miles east of S-8 (800 cfs) and ~1.5 miles east of G-206 (400 cfs)
- Backfill Miami Canal from S-8 to I-75

DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 3,000 cfs
- One 750 cfs and two 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A north and south of structures
- 6,000-ft gaps in L-67C levee at each structure
- One additional 500 cfs gravity structure out of WCA-3B
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Degrade entire L-67 extension levee

SEEPAGE MANAGEMENT

- Increase S-356 to 1,000 cfs
- Full depth penetrating seepage barrier from S-335 to S-334
- Partial depth seepage barrier south of Tamiami Trail 2 miles along L-31N
- One 250 cfs pump on L-31N into ENP
- G-211 operational refinements and use coastal canals to convey seepage



PROPOSED ALTERNATIVE 3

STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

DISTRIBUTION/CONVEYANCE

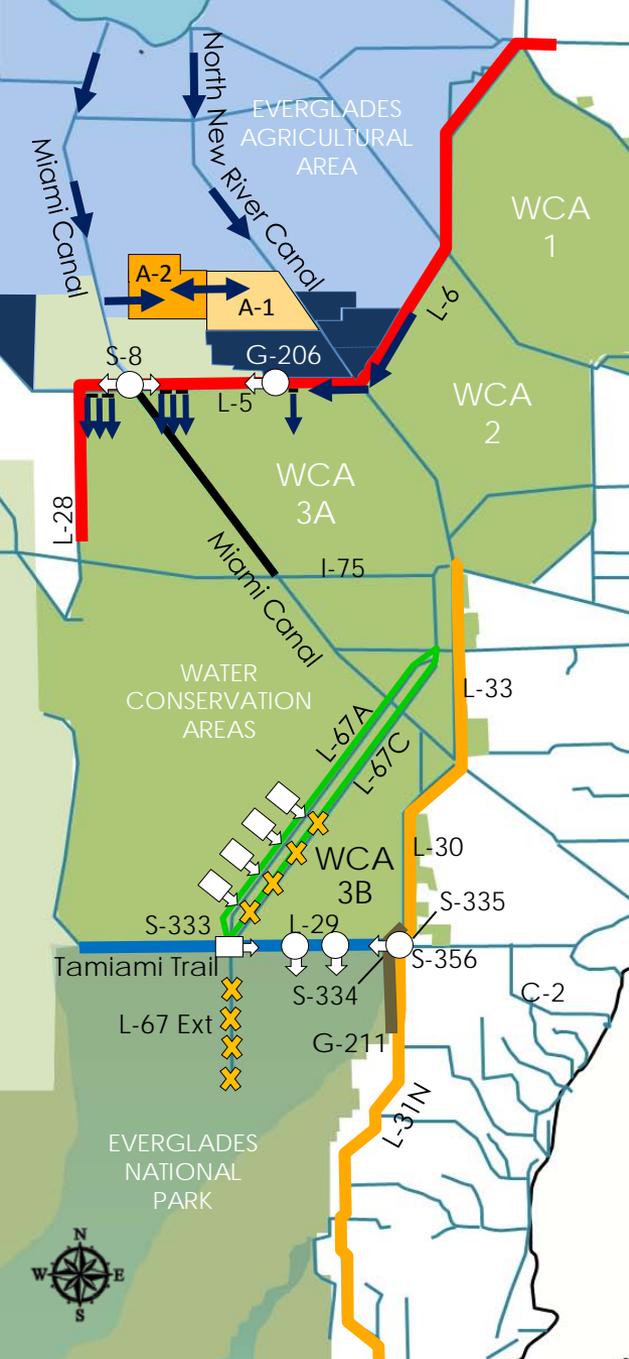
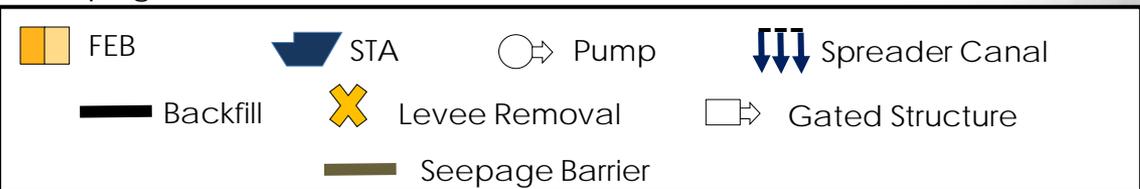
- Diversion of L-6 flows and L-5 canal improvements
- Spreader canal: ~3 miles west of S-8 (3,000 cfs), ~3 miles east of S-8 (800 cfs) and ~1.5 miles east of G-206 (400 cfs)
- Backfill Miami Canal from S-8 to I-75

DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 3,000 cfs
- Four 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A north and south of structures
- 6,000-ft gaps in L-67C levee at each structure
- Two 500 cfs pumps out of WCA-3B at existing agricultural canals with improvements to agricultural canals in WCA-3B
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Degrade entire L-67 extension levee

SEEPAGE MANAGEMENT

- Increase S-356 to 1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail 5 miles along L-31N
- Full depth penetrating seepage barrier from S-335 to S-334
- G-211 operational refinements and use coastal canals to convey seepage



PROPOSED ALTERNATIVE 4

STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

DISTRIBUTION/CONVEYANCE

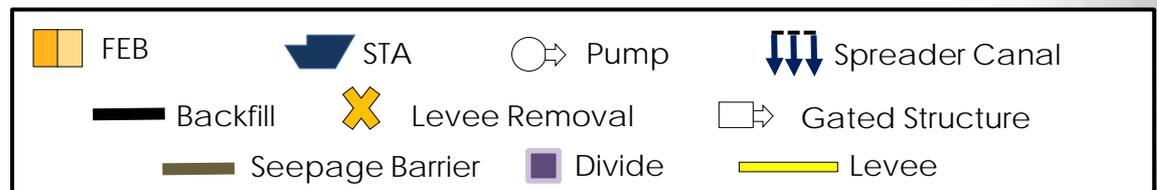
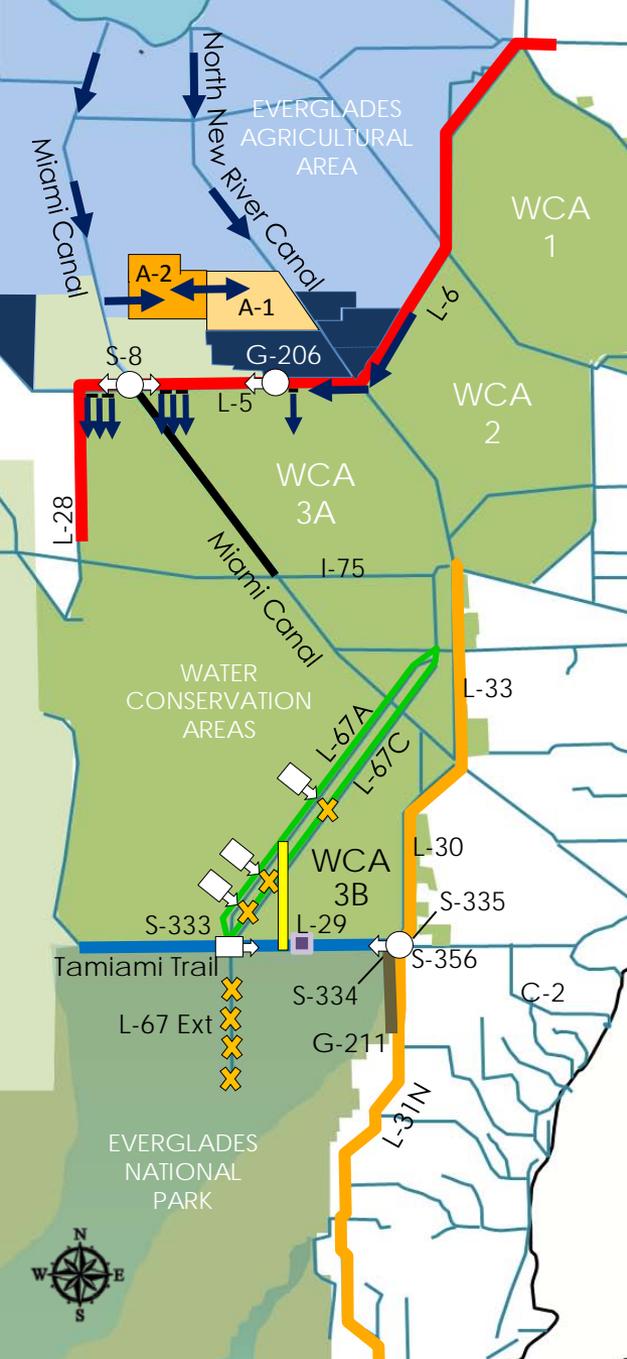
- Diversion of L-6 flows and L-5 canal improvements
- Spreader canal: ~3 miles west of S-8 (3,000 cfs), ~3 miles east of S-8 (800 cfs) and ~1.5 miles east of G-206 (400 cfs)
- Backfill Miami Canal from S-8 to I-75

DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 3,000 cfs
- Two 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A north and south of structures
- Include levee in WCA 3B
- Degrade L-67C levee in Blue Shanty flowway
- One 500 cfs gated structure north of Blue Shanty levee and 6,000-ft gap in L-67C levee
- Degrade L-29 levee in Blue Shanty flowway, divide structure east of Blue Shanty levee at terminus of western bridge
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Degrade entire L-67 extension levee

SEEPAGE MANAGEMENT

- Increase S-356 to 1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail 5 miles along L-31N
- G-211 operational refinements; use coastal canals to convey seepage



Next Steps



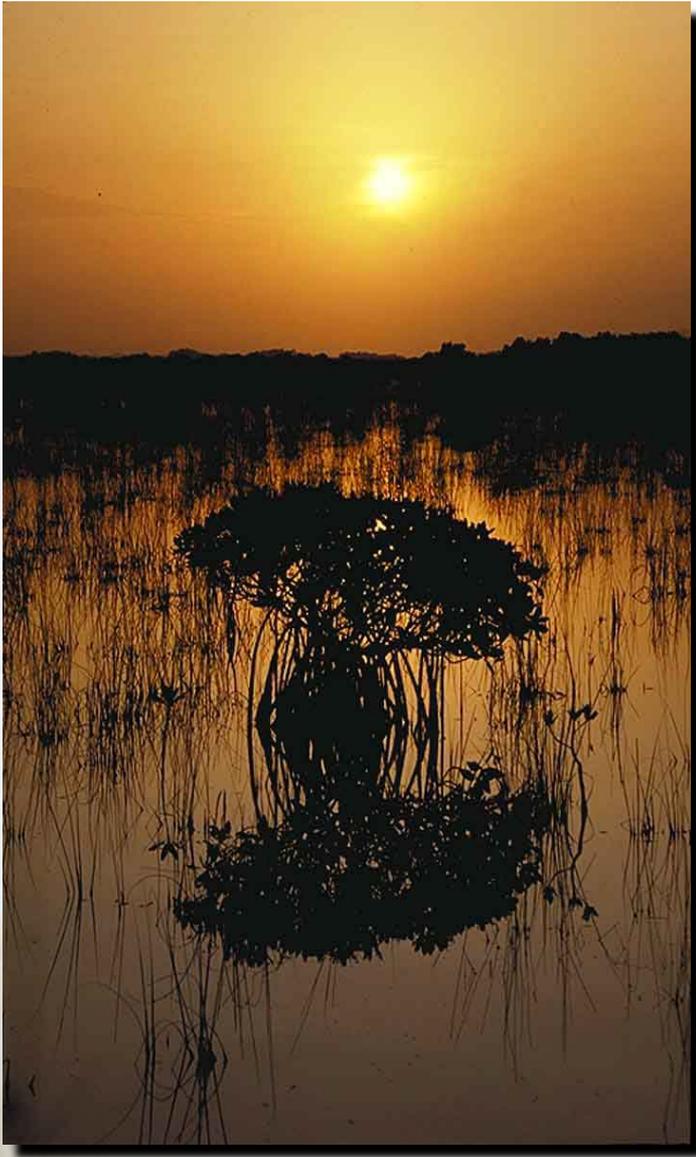
- Detailed RSM Modeling of Final Array of alternatives
 - ▶ EAA Storage and Treatment
 - ▶ Northern 3A Hydropattern Restoration Features
 - ▶ WCA 3A/3B/ENP Conveyance Features
 - ▶ Seepage Management Measures
- Continue design of project features
- Maintain engagement with the public and Project Delivery Team

Next Steps

- Evening public meetings to present array of alternatives, week of December 10 -13 + 18th
- SFWMD Governing Board Meeting, December 13
- PDT Workshop, SFWMD Auditorium, Wednesday, December 19, 9:00 am
- SFWMD Water Resources Advisory Committee, January 3, 2013

CEPP Public Meetings on Array of Alternatives: 6:30 pm – 9:00 pm

- December 10: Ft. Myers – Embassy Suites Fort Myers-Estero, 10450 Corkscrew Commons Drive, Estero
- December 11: Homestead - John D. Campbell Agricultural Center 18710 SW 288th St, Homestead
- December 12: Clewiston- John Boy Auditorium, 1200 South W.C. Owen Avenue, Clewiston
- December 13: Stuart – Susan H. Johnson Auditorium, Wolf High Technology Center, Indian River State College's Chastain Campus, 2400 SE Salerno Rd, Stuart
- December 18th: Broward County - Fern Forest Nature Center, 201 Lyons Road South, Coconut Creek



Questions?