

C-111 SPREADER CANAL Western Project

Civil Works Review Board (CWRB) Briefing

Jacksonville District

December 2009



US Army Corps of Engineers
BUILDING STRONG®

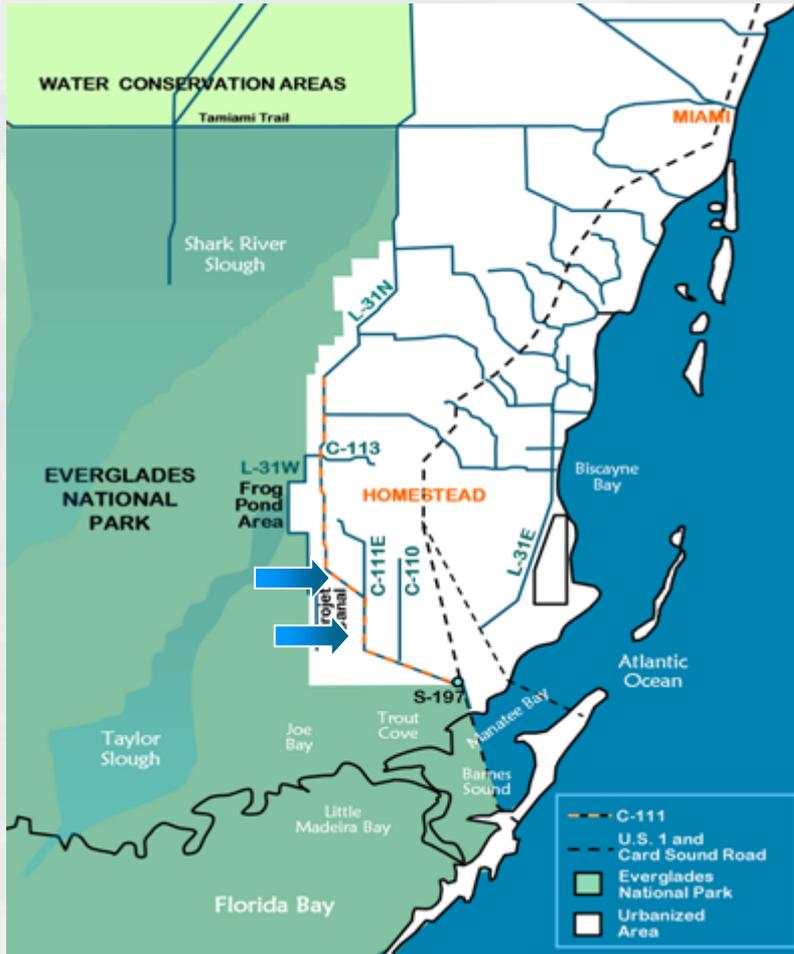


Presentation Purpose

- **Provide an overview of the C-111 Spreader Canal Western project and the Comprehensive Everglades Restoration Plan (CERP)**
- **Obtain CWRB approval to release report for State and Agency review**
- **Answer questions and address comments**
- **Discuss the next steps towards the Chief of Engineers' Report**



The Bottom Line



The C-111 Spreader Canal Western Project is about reducing unnatural and undesirable groundwater seepage out of Everglades National Park (ENP)

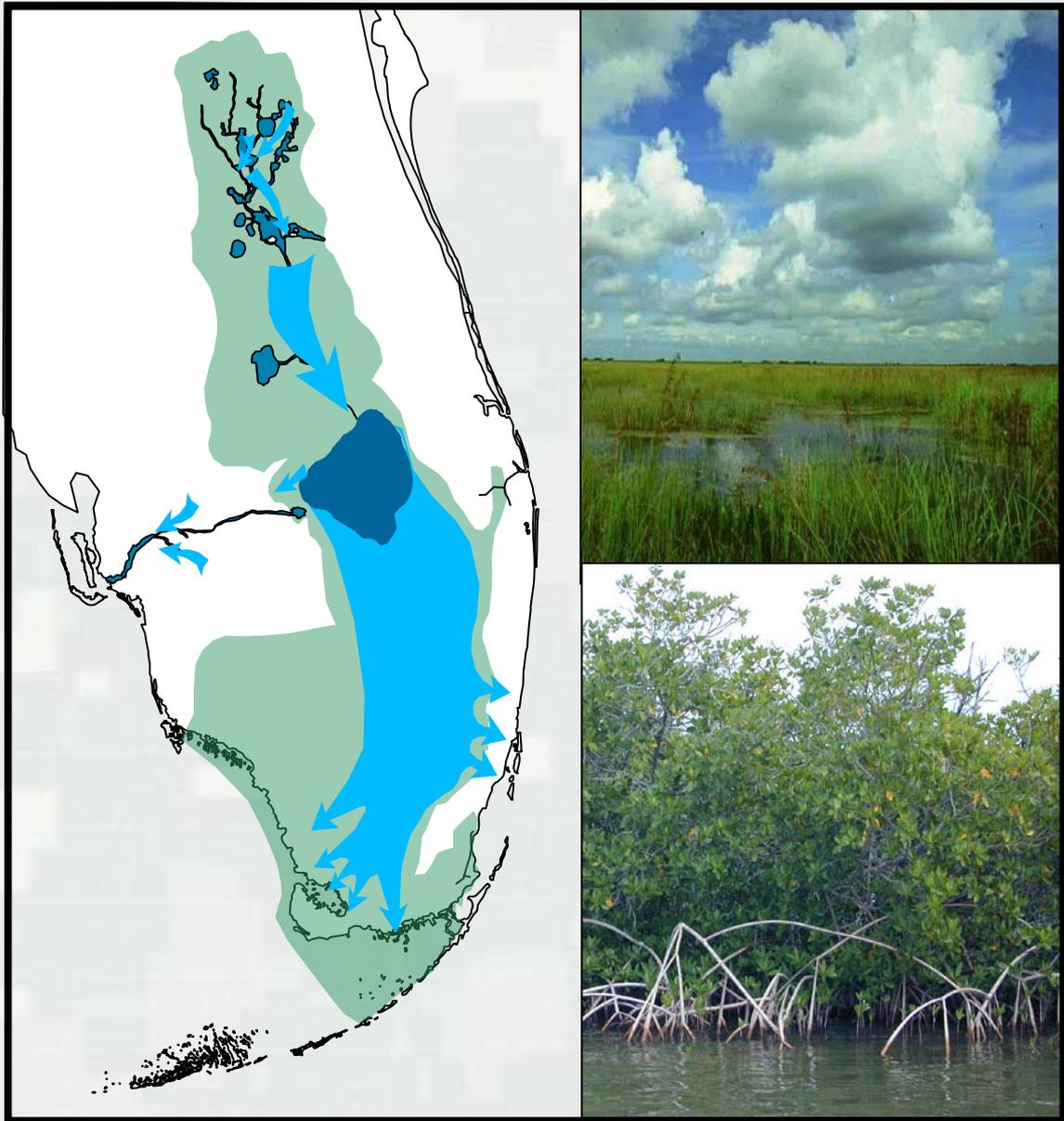
 *Seepage out of ENP*



Presentation Topics

- Historical Everglades and CERP Overview
- Project Area and Challenges
- Plan Formulation
- Recommended Plan and Costs
- Other Project Details
 - ▶ Risk and Uncertainty
 - ▶ Public Involvement
 - ▶ Peer Review
 - ▶ Campaign Plan



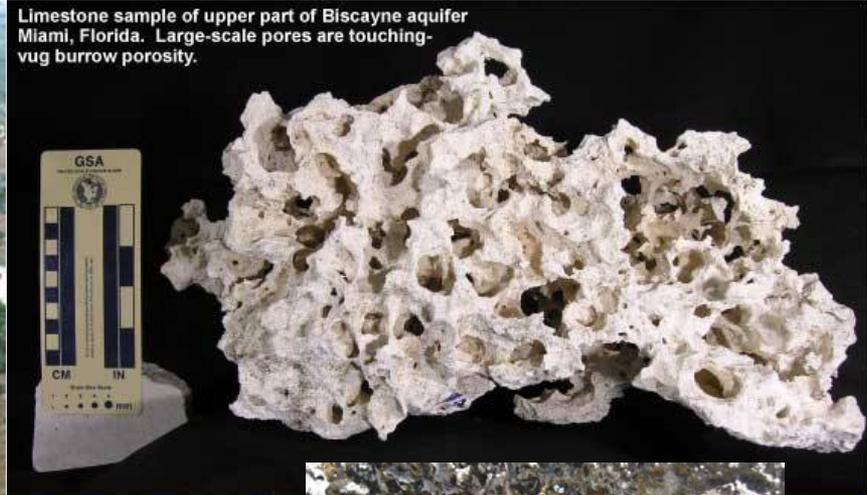


The Historical Everglades Ecosystem

- Continuous water flow from central Florida through Lake Okeechobee and south into Florida Bay
- System composed of over 9 million acres of lakes, rivers and wetlands
- Unique and diverse mosaic of habitat

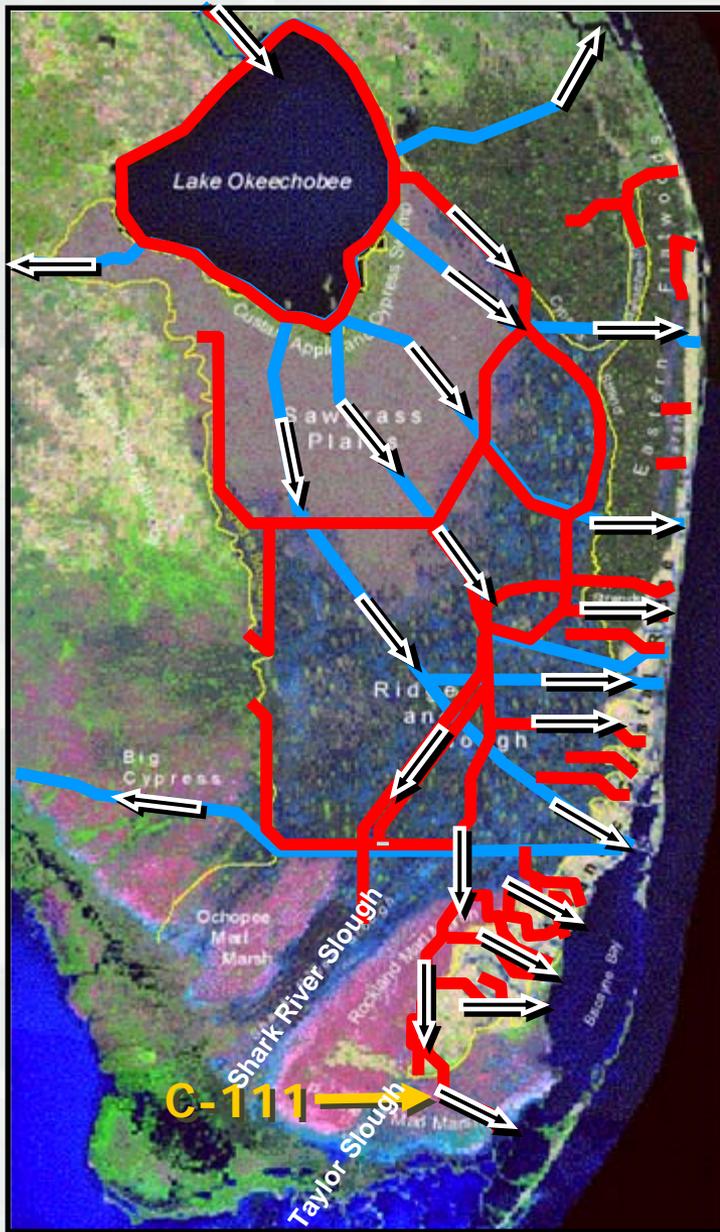


South Florida Landscape



- Minimal Relief (less than 3-feet in project area)
- Less than 1 foot of soil on top of limestone
- Limestone is extremely porous and easily drained by canals





Drainage of the System and Water Flow Alterations

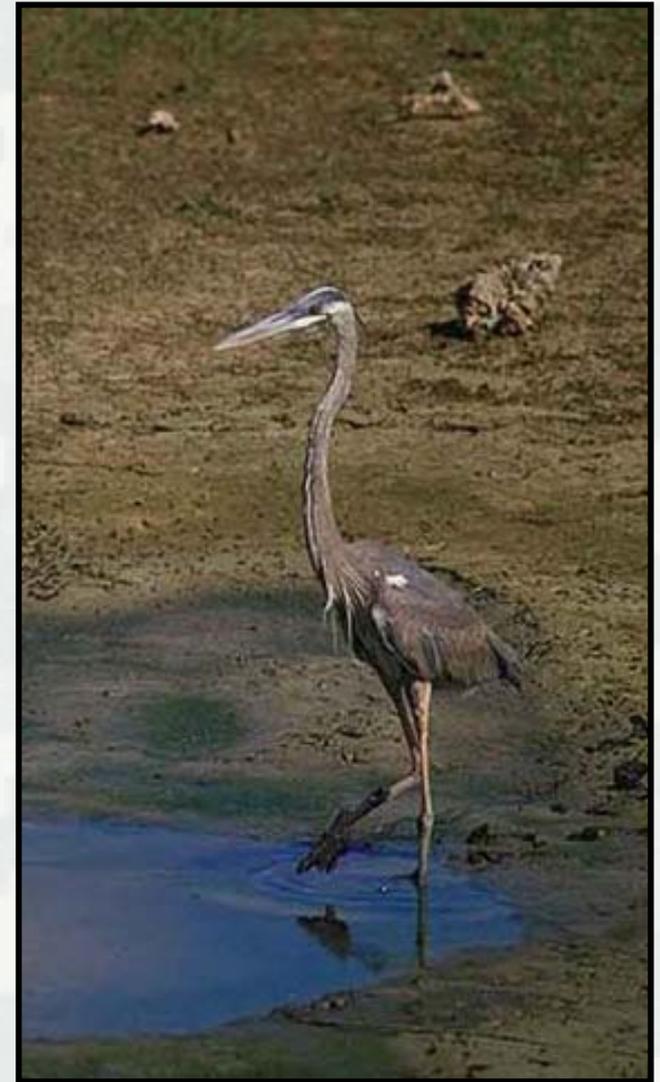
Pre-Central & Southern Florida Projects (1880 - 1948)

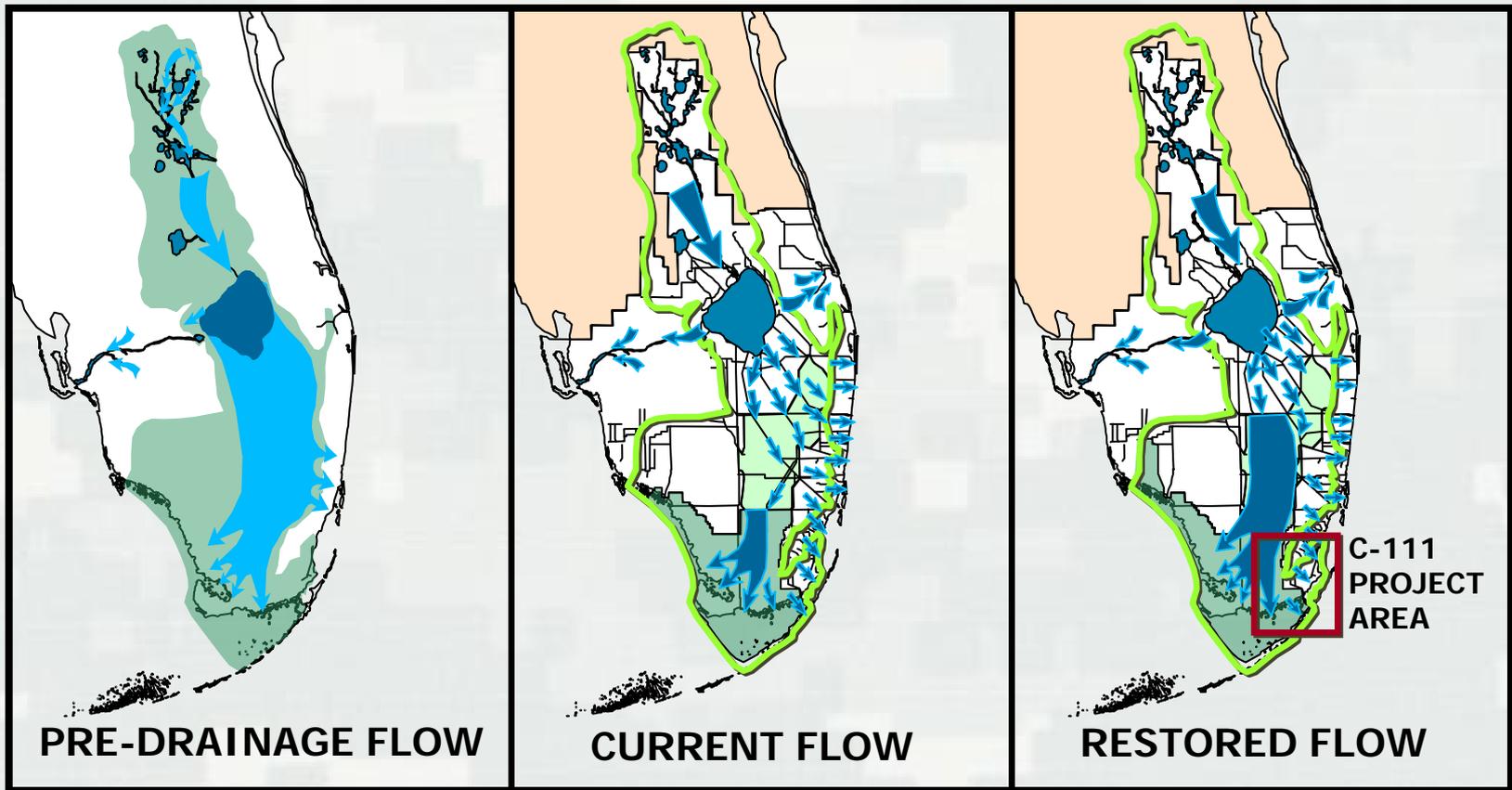
Central & Southern Florida Project (initiated in 1948)



Damage to the Ecosystem

- Extreme water fluctuations (too much/too little) in the Everglades/south Florida ecosystem
- Massive reductions in wading bird populations
- Degradation of water quality
- Salt water intrusion
- Declining estuary health
- 1.7 billion gallons of water a day wasted that could otherwise benefit the ecosystem



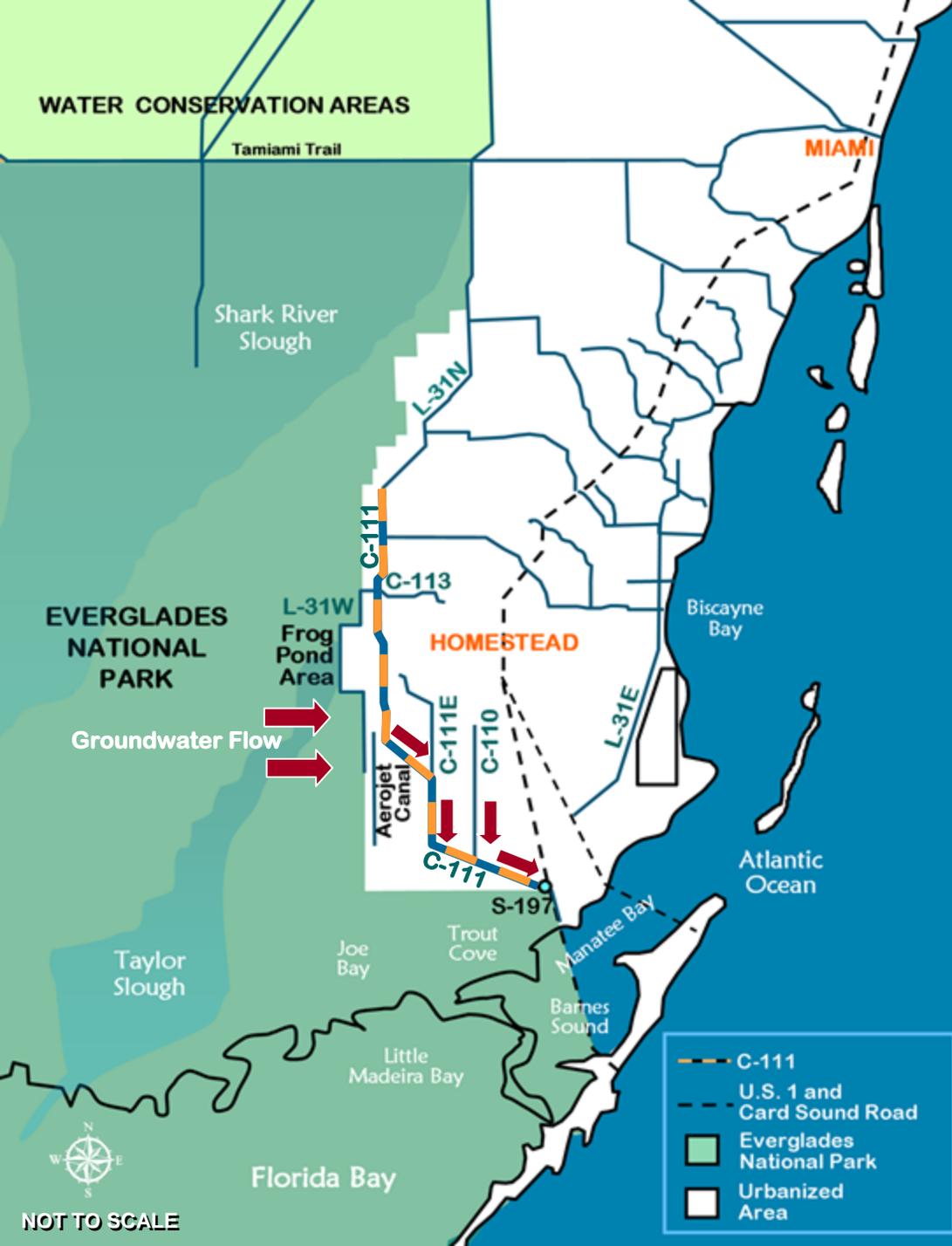


Comprehensive Everglades Restoration Plan (Yellow Book)

2000 Water Resources Development Act

▪ C-111 Spreader Canal Project



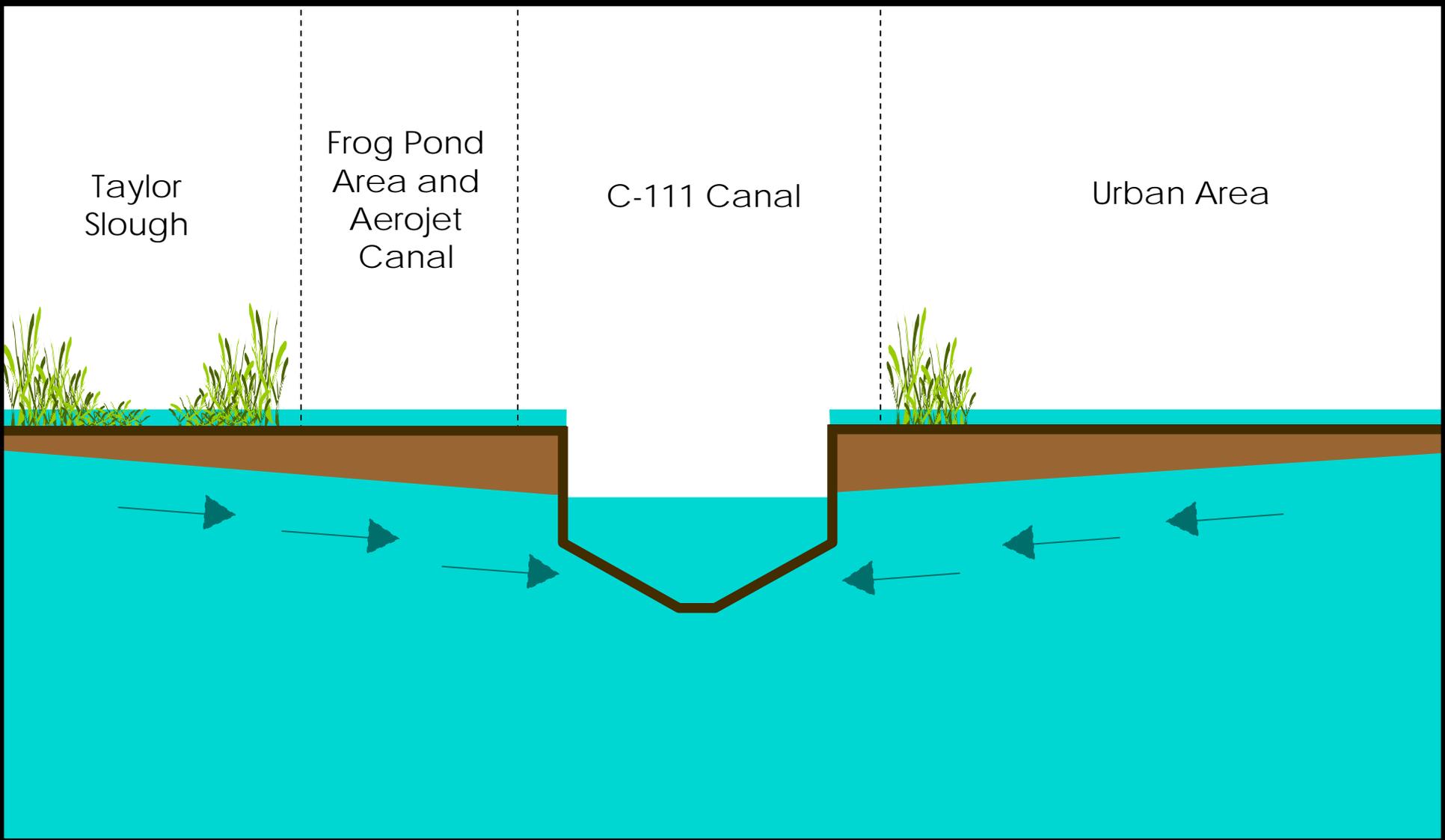


C-111 Project Area and Challenges

- C-111 is Southernmost canal of C&SF system and serves a 100 square-mile basin
- Provides flood protection and drainage for agricultural areas west and south of Homestead
- Challenges: Water seeping out of Everglades National Park (Taylor Slough) into C-111 Canal
 - Water flows east instead of southwest →
 - Causes poor health in Taylor Slough and Florida Bay



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•Water seeps out of Taylor Slough into the C-111 Canal



Current Conditions

Water seeping out of ENP has resulted in degraded habitat:



ENP Taylor Slough

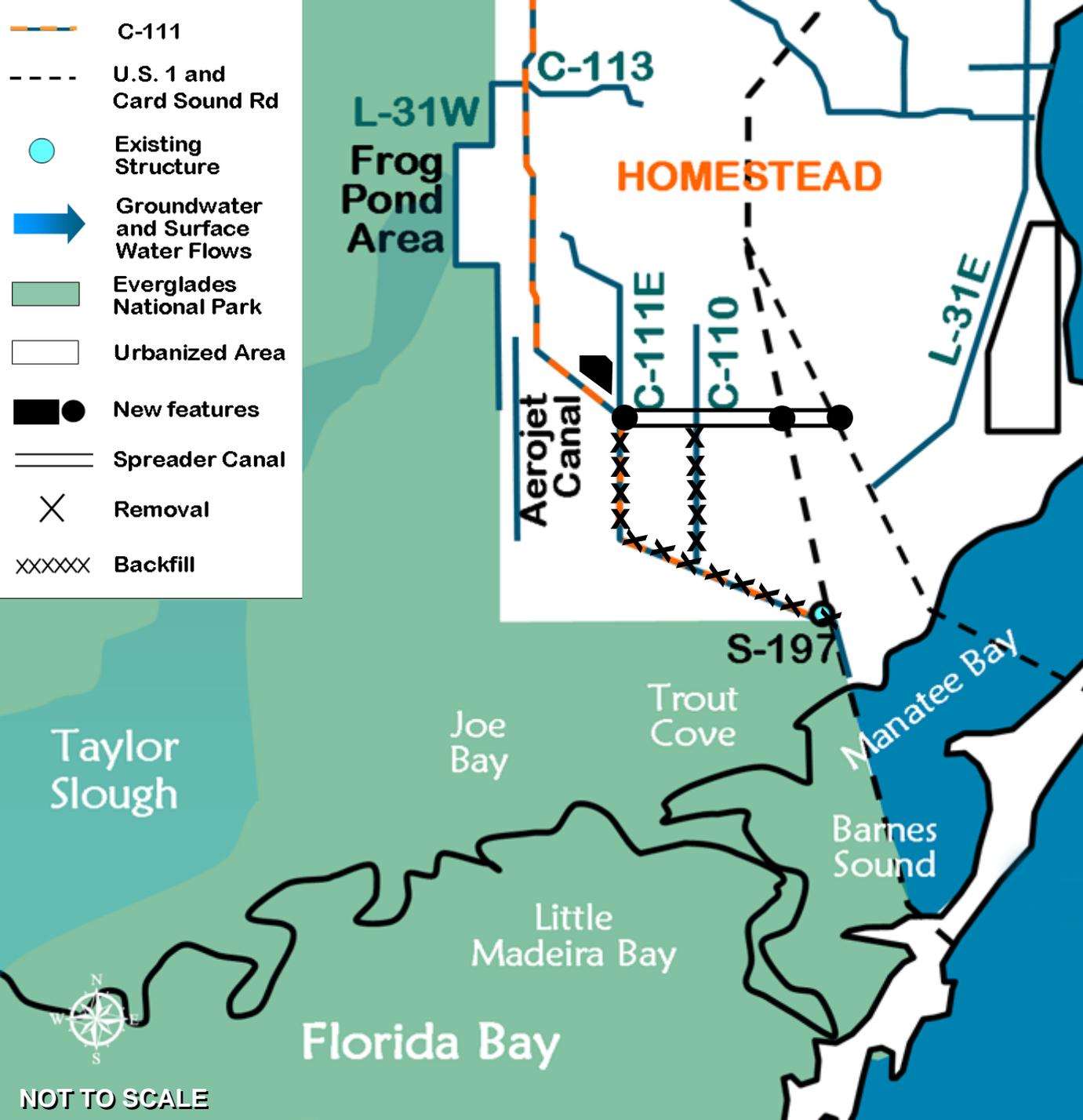
- Reduced hydroperiods
- Altered hydropatterns
- Disrupted wetting and drying cycles



Florida Bay

- Unnatural inflows
- Increased salinities



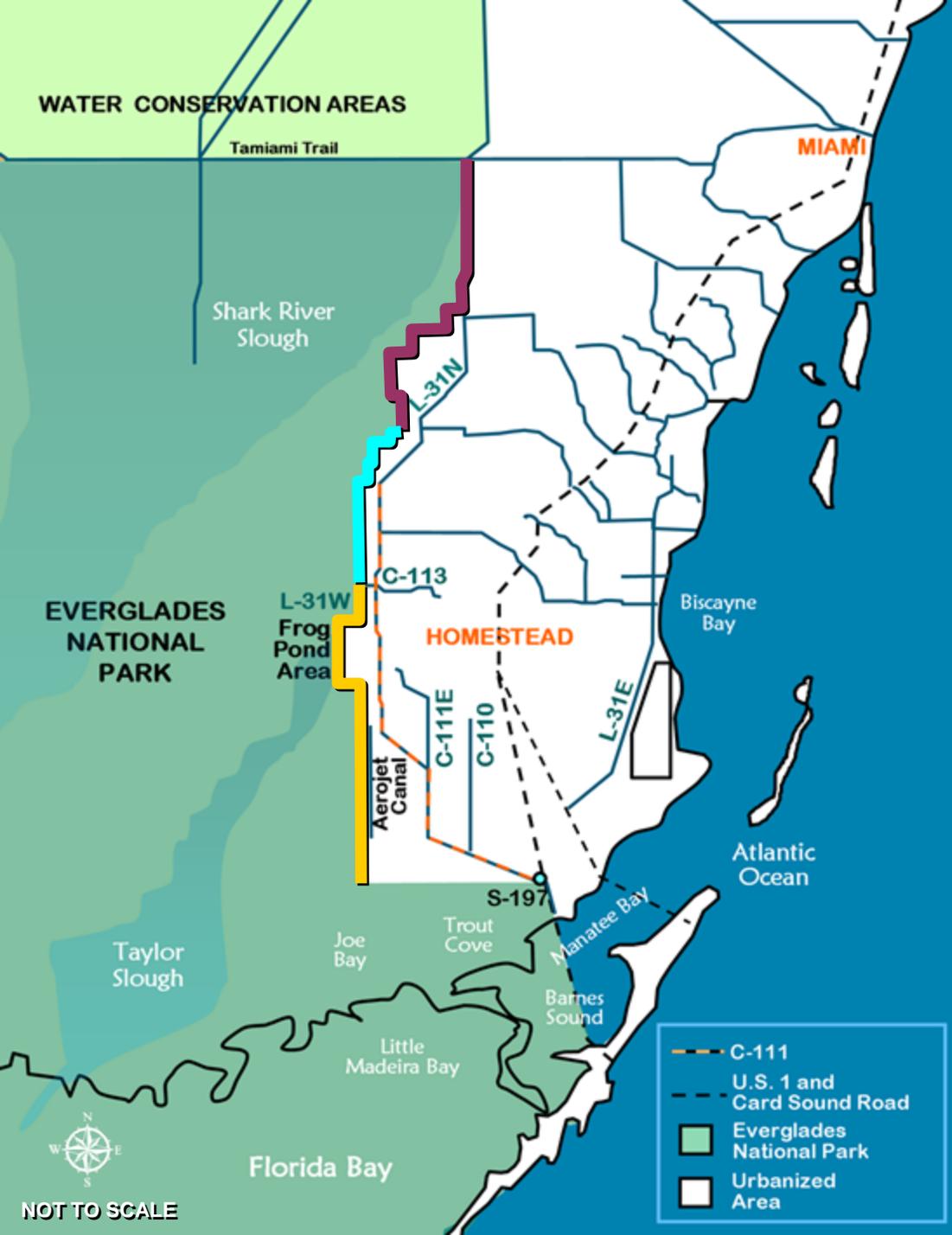


Yellow Book Plan

- Backfill lower C-111
- Backfill C-110
- Spreader canal (includes culverts under Card Sound Road and US 1)
- Enlarge S-332E pump station (never constructed) from 50 to 500 cfs
- Remove S-18C and S-197
- 3200 acre STA



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ENP Seepage Reduction Strategy

 **Modified Water Deliveries Project (non-CERP)**

 **C-111 South Dade Project (non-CERP)**

 **C-111 Spreader Canal Western Project (CERP)**

- C-111 Spreader Canal Western Project forms the southernmost increment for strategy to keep water in ENP



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Project Delivery Team

- **Lead Agency:** U.S. Army Corps of Engineers
- **Non-Federal Sponsor:** South Florida Water Management District
- **Federal Partners:** Department of the Interior
 - U.S. Fish and Wildlife Service
 - Everglades National Park
- **Other Major Contributing Members:**
 - Miami-Dade Department of Environmental Resources Management (DERM)
 - Florida Department of Environmental Protection (FDEP)



PDT Meeting Type and Frequency

- Meetings held bi-monthly to monthly for duration of planning process (2002-Present)
- Meetings held in south Florida
- Specific purposes:
 - Alternative Screening
 - Modeling
 - Benefits Quantification
 - Stakeholder Input



Plan Formulation

- Team formulated alternatives based on the scope of the CERP (Yellow Book) Plan
- Stakeholders and Agencies expressed concerns over continued seepage of water out of ENP into the C-111 Canal
- Project split:
 - Western Project addresses seepage out of ENP
 - Future Eastern PIR will address remaining Yellow Book objectives

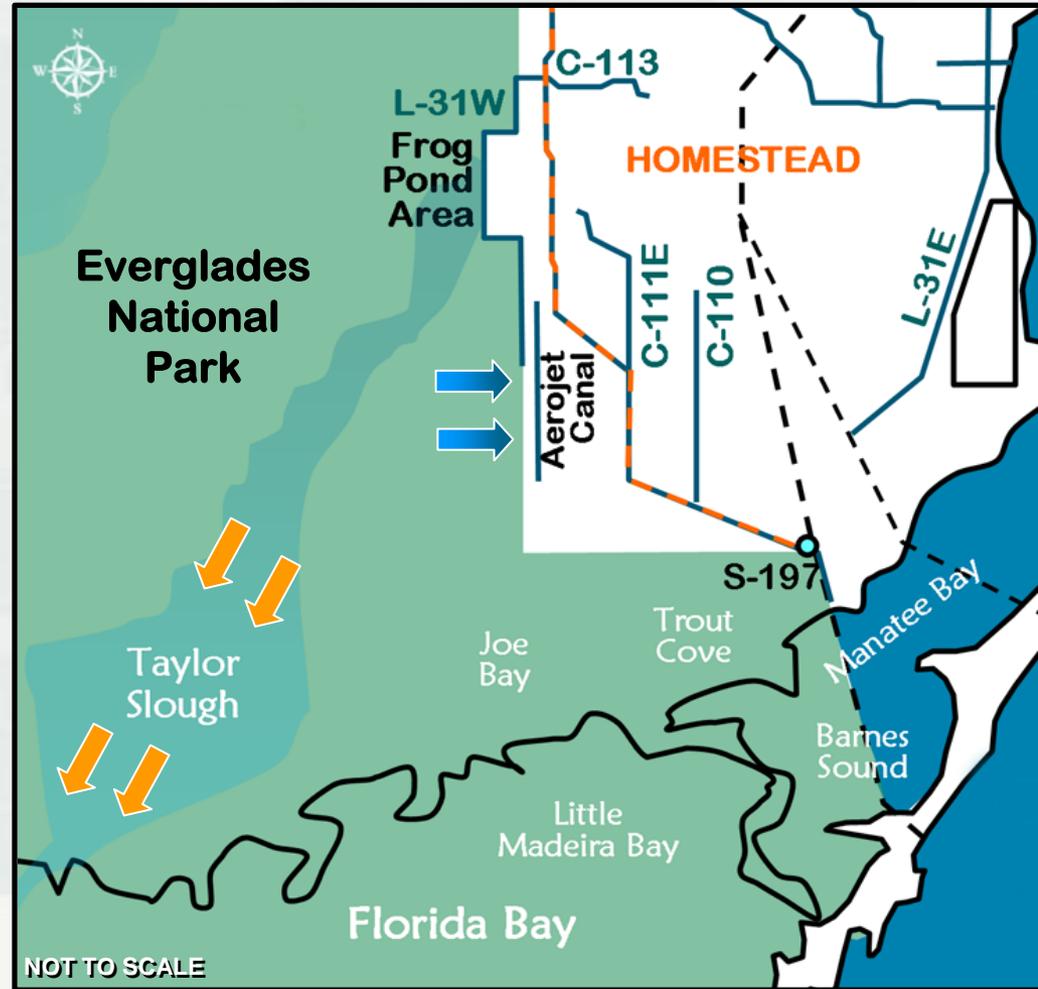


Get the Water Right!

- Focus restoration on reducing seepage out of Taylor Slough in ENP, allowing water to follow natural flowpath

➡ Current seepage

➡ Historical/Desired flow



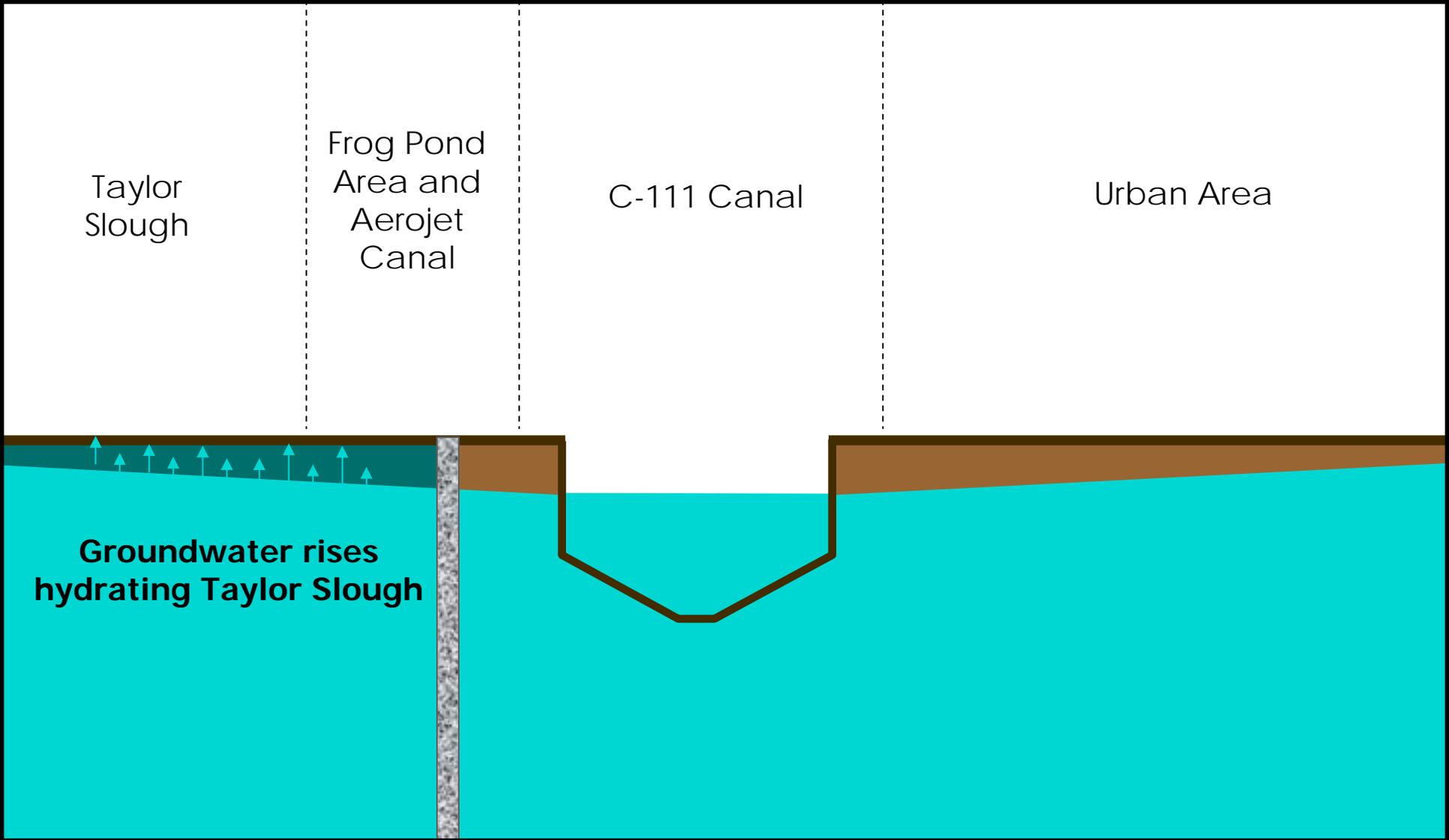
Western Project



Primary Plan Formulation Questions

- Nature of seepage reduction
- Size and location of seepage reduction feature
- Secondary project features

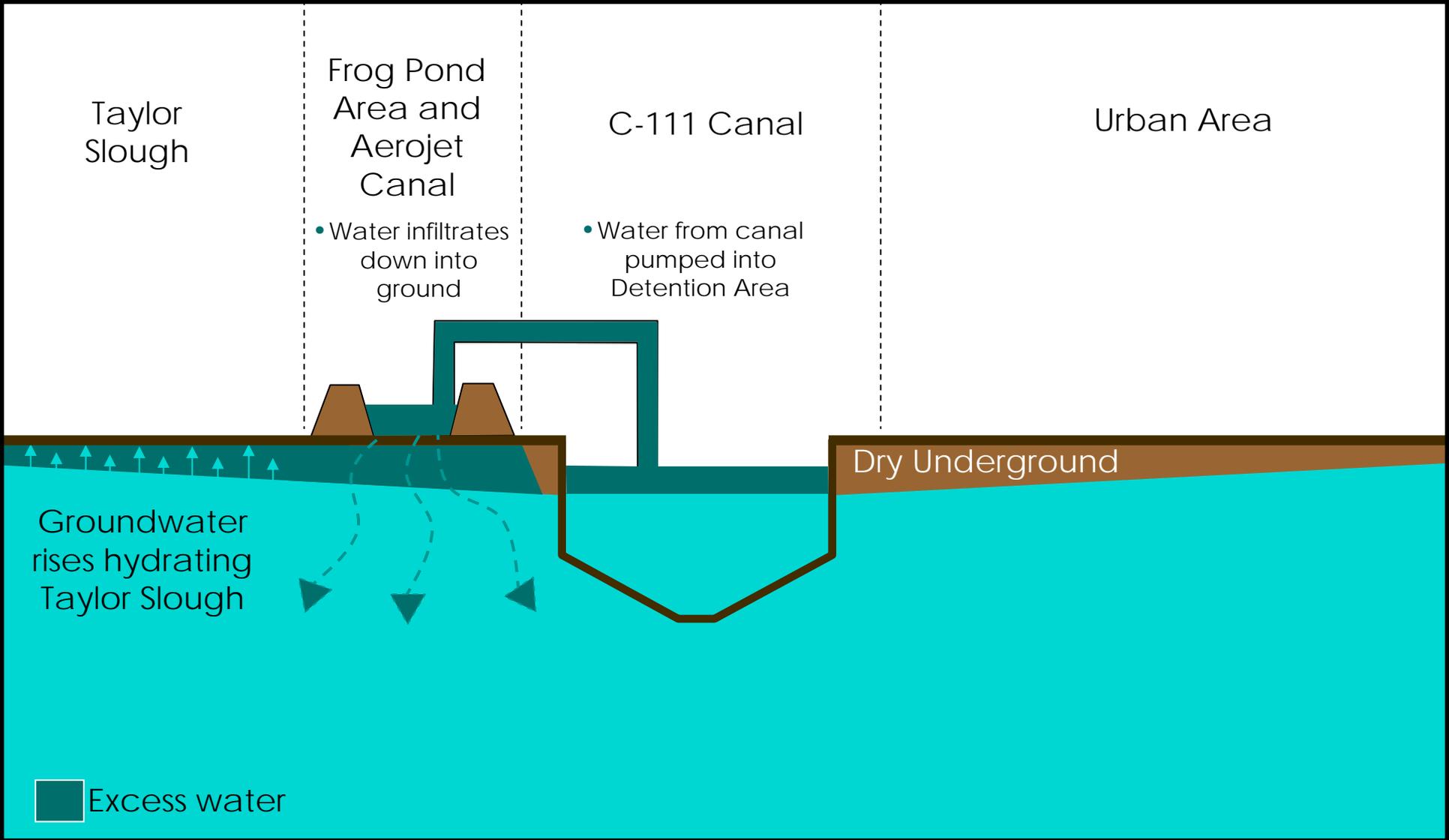




Seepage Barrier Concept

A slurry or sheet pile wall approximately 10 miles long and 100 feet deep





Hydraulic Ridge Concept

Detention area used to infiltrate water into ground and artificially raise groundwater table



Frog Pond Area

Aerojet Canal

S-197

Manatee Bay

Barnes Sound

Joe Bay

Trout Cove

Little Madeira Bay

C-111

ROADS

EXISTING STRUCTURE

ENP

PROJECT FEATURES

SEEPAGE BARRIER

Seepage Barrier

NOT TO SCALE



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Frog Pond Area

Aerojet Canal

S-197

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C-111

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-  C-111
-  ROADS
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Hydraulic Ridge

NOT TO SCALE



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- C-111
- ROADS
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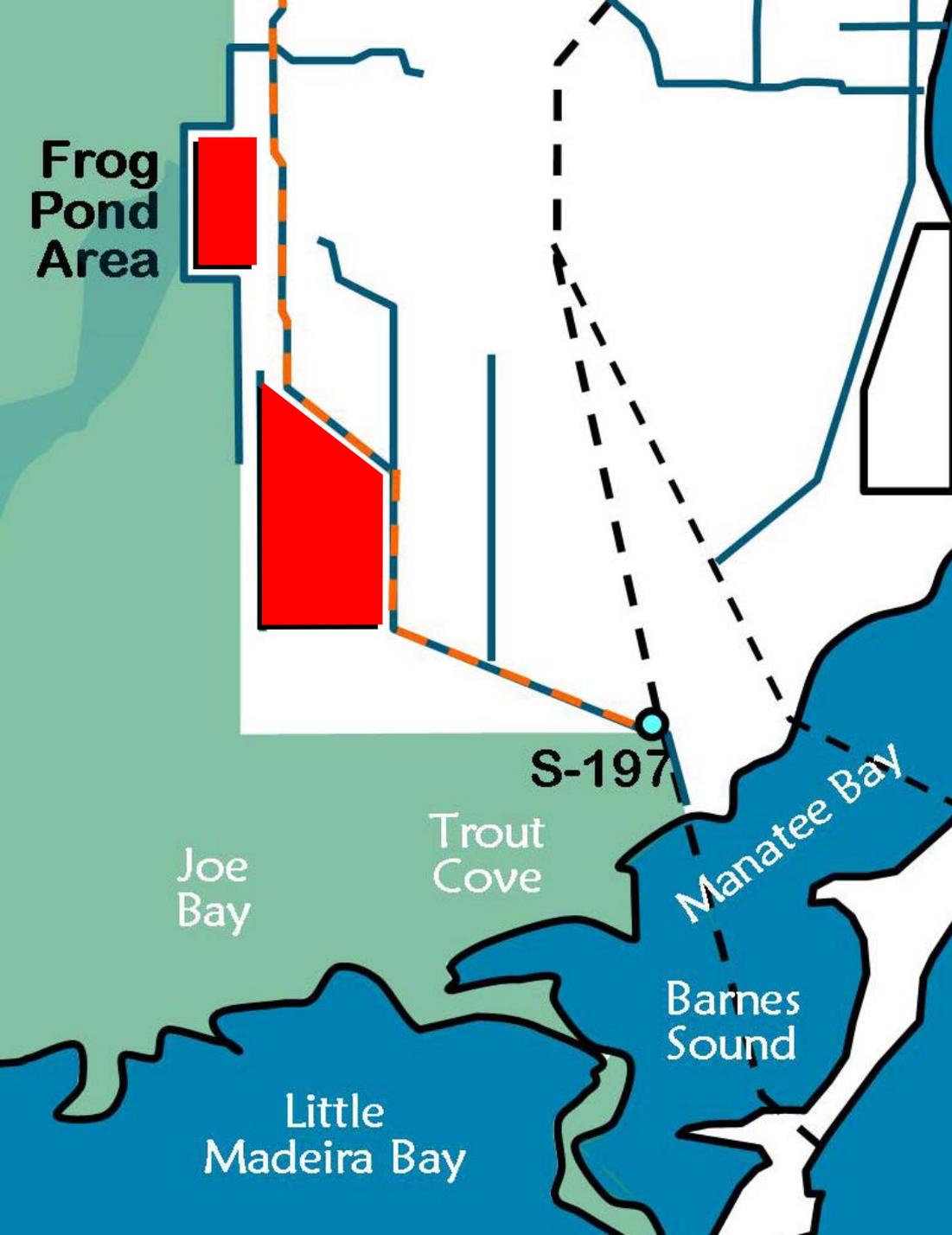
Hydraulic Ridge

NOT TO SCALE



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Frog Pond Area



C-111

ROADS

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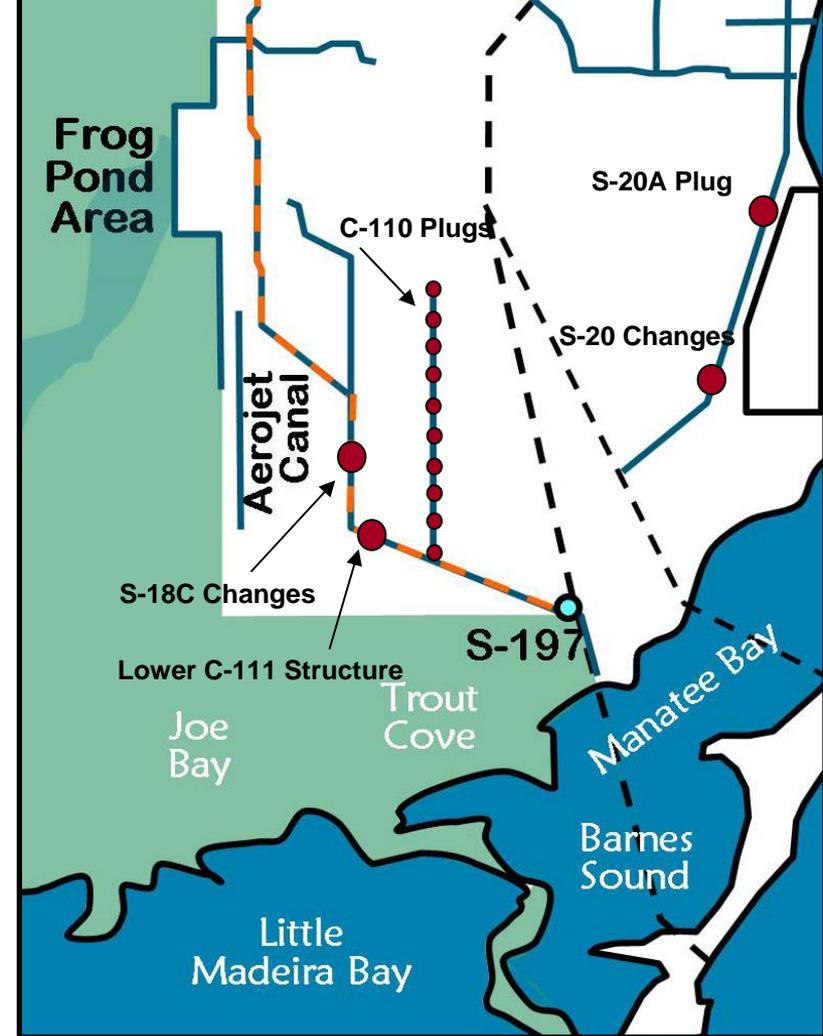


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Secondary Features

(from left to right on map)

- Incremental Operational Changes (trigger increases) at S-18C (existing Gated Spillway)
- Operable Structure (Gated Culvert) in the lower C-111
- Ten plugs in the C-110 Canal
- Operational Changes at S-20
- Plug at existing structure S-20A



- Secondary features are incrementally justified, providing approximately 40% more benefits for only a 25% increase in cost

C-111

ROADS

EXISTING
STRUCTURE

NEW OR
MODIFIED

ENP

Analysis of Final Array of Alternatives

■ Alternatives:

- No Action
- Hydraulic Ridge: 1D, 2DS, 2DL, 3D
- Seepage Barrier: 6D



■ Economic analysis

- Eliminate inefficient alternatives



■ Principles & Guidelines (P&G) System of Accounts



■ Recommended Plan



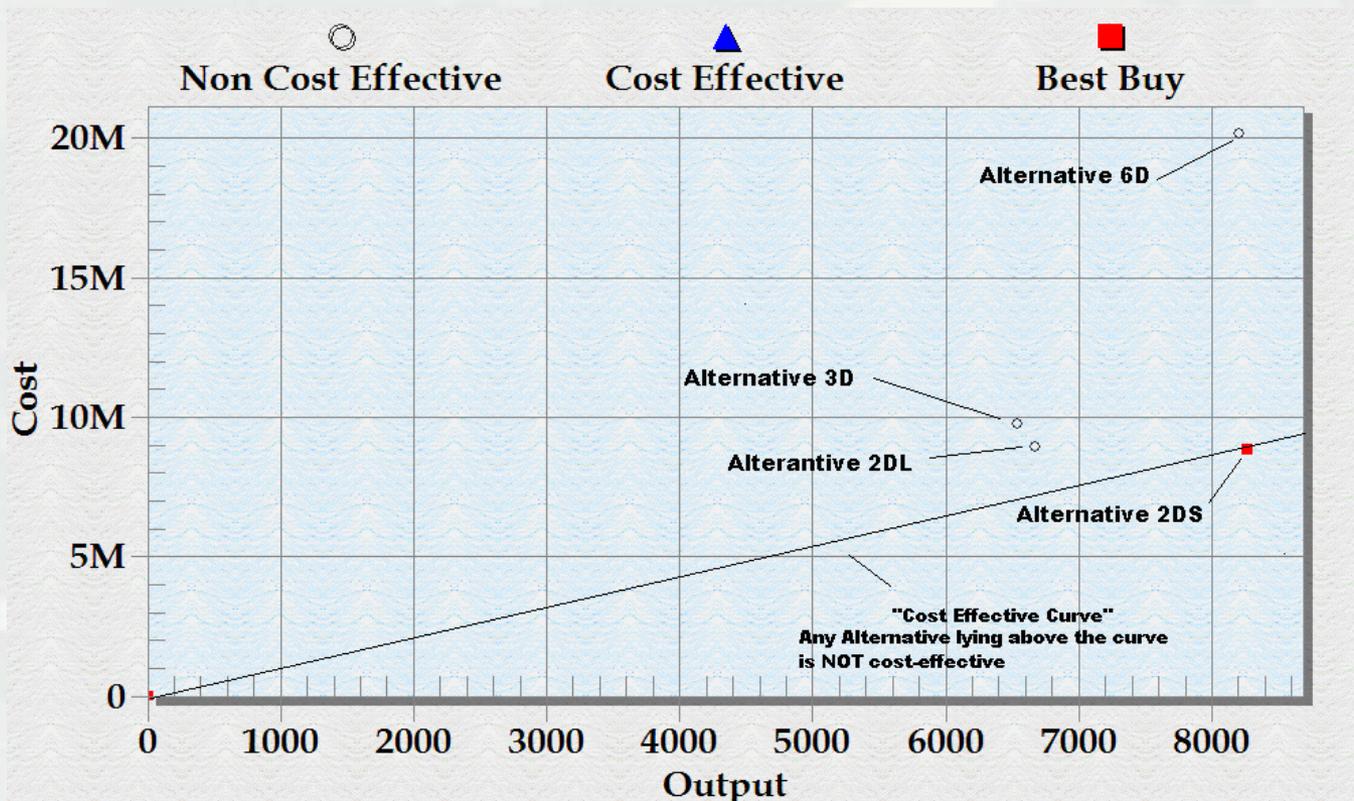
Results of Economic Analysis

	Alternative	Total Investment	Average Annual Cost (AAC)	Average Annual HU (AAHU) Lift	Average AC/ Average AHU	Cost Effective
Hydraulic Ridge	Alt 1D	\$120,720,000	\$7,633,000	None	N/A	No
Hydraulic Ridge	Alt 2DS	\$137,575,000	\$8,811,000	8,271	\$1,065	Yes
Hydraulic Ridge	Alt 2DL	\$139,555,000	\$8,933,000	6,675	\$1,338	No
Hydraulic Ridge	Alt 3D	\$151,219,000	\$9,741,000	6,543	\$1,489	No
Seepage Barrier	Alt 6D	\$359,362,000	\$20,144,000	8,205	\$2,455	No

- Above-Costs were Planning Level (Rough Order of Magnitude)
- Average Annual Cost includes O&M costs
- Period of analysis for each alternative was 40 years
- Year for first benefits - 2010



Cost Effectiveness Graph



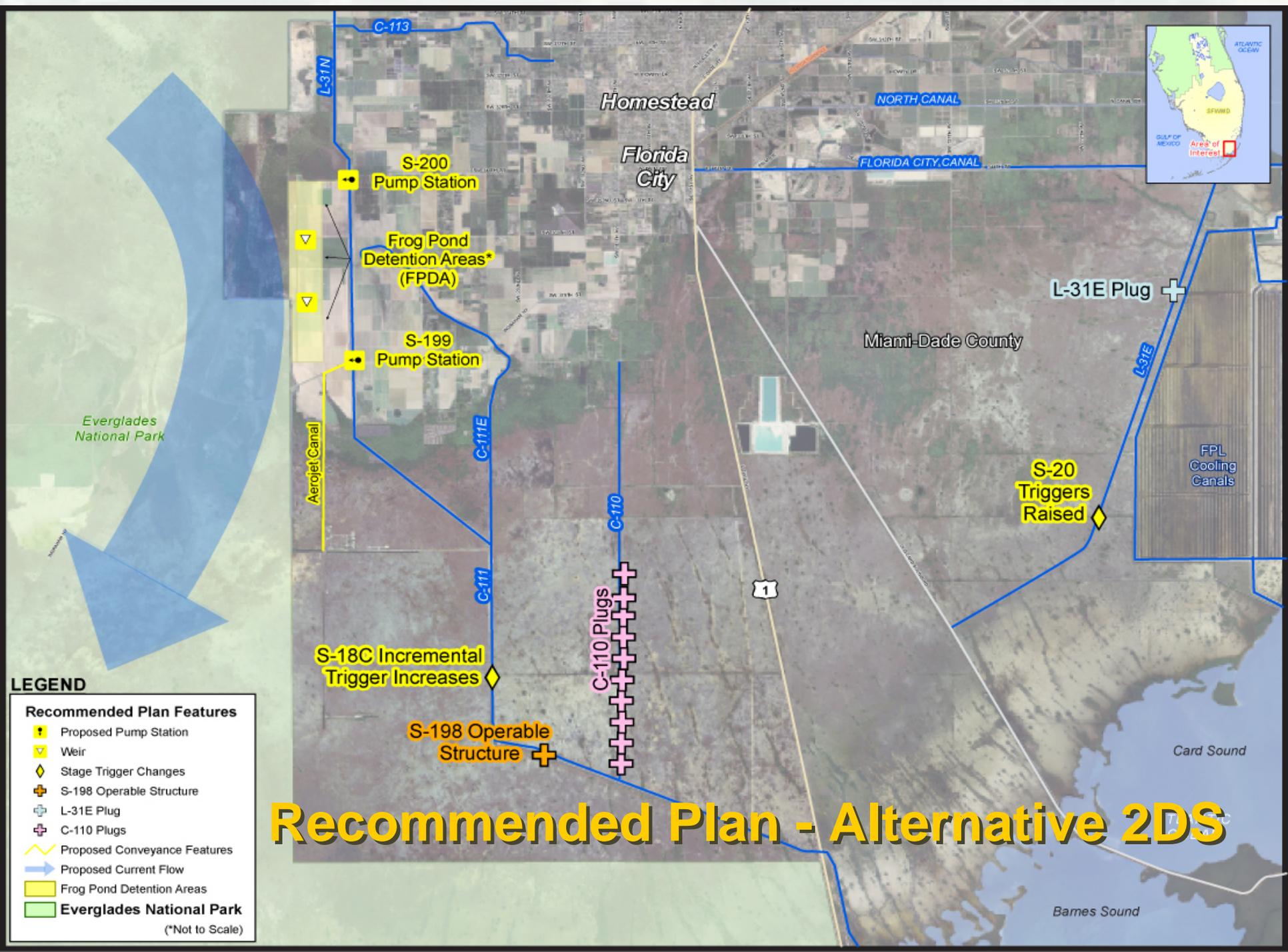
- The results demonstrate that the other Alternatives would be more expensive than 2DS while producing fewer benefits



Comparison of Alternative 2DS with No-Action

P&G System of Accounts	No-Action	2DS
National Economic Development (NED)	Not used	Not Used
Environmental Quality (EQ)	Decreases	Increases (8,271 HUs)
Regional Economic Development (RED)	None	High
Other Social Effects (OSE)	None	None





LEGEND

Recommended Plan Features

- Proposed Pump Station
- Weir
- Stage Trigger Changes
- S-198 Operable Structure
- L-31E Plug
- C-110 Plugs
- Proposed Conveyance Features
- Proposed Current Flow
- Frog Pond Detention Areas
- Everglades National Park

(*Not to Scale)

Recommended Plan - Alternative 2DS

Benefits to System

- Rehydrated sawgrass freshwater habitat
- Increased nesting success for water dependent birds
- Restoration of nursery habitat in Florida Bay
- Approximately 240,000 acres of benefited area



Recommended Plan Costs & Cost Share

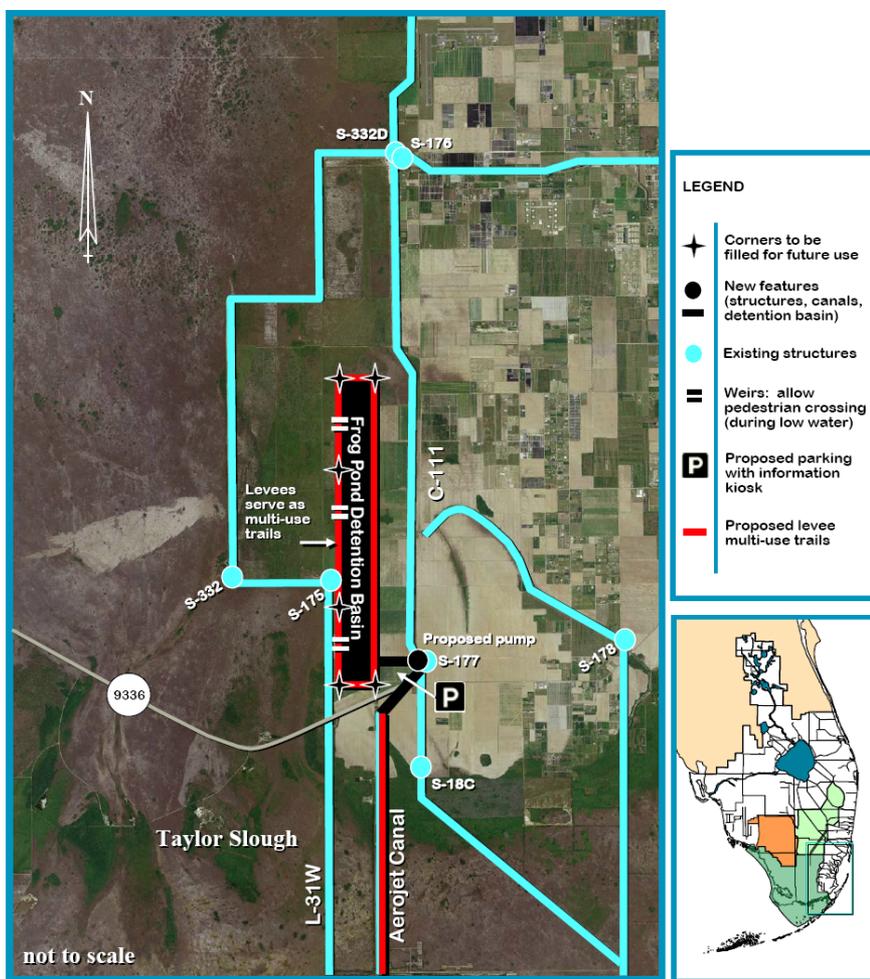
Item	Federal Cost	Non-Federal Cost	Total
Planning Engineering and Design (PED)	\$ 17,786,500	\$ 12,789,500	\$ 30,576,000
Construction Management	\$ 3,705,000	\$ 3,705,000	\$ 7,410,000
Lands, Easements, Relocations & Right-of-ways (LER&R)	\$ 623,000	\$ 67,059,000	\$ 67,682,000
Construction (Ecosystem Restoration)	\$ 61,439,000	\$ 0	\$ 61,439,000
Recreation	\$ 102,000	\$ 102,000	\$ 203,000
Total Project Cost	\$ 83,655,000	\$ 83,655,000	\$ 167,310,000
Operations, Maintenance, Repair, Rehabilitation & Replacement (OMRR&R) (includes Recreation)	\$ 840,000	\$ 840,000	\$ 1,680,000



C-111 Spreader Canal Western Project

Recreation Plan

- The Recreation Plan was formulated separately from the Recommended Plan and is incrementally justified



RECREATION CONCEPTUAL PLAN ELEMENTS
C-111 SPREADER CANAL WESTERN PROJECT



Project Assurances

(WRDA 2000 Requirement)

- Level of Service for Flood Protection
 - ▶ No adverse affect to lands that will not be acquired by the non-Federal Sponsor

- Effects on Existing Legal Source of Water
 - ▶ No elimination or transfer expected
 - ▶ More water is created for fish and wildlife

- Protection of Water for the Natural System
 - ▶ Non-Federal sponsor will use its water reservation or allocation authority to protect the water made available by the project for the natural system



Overall Project Risk and Uncertainty

- Flexibility in Hydraulic Ridge concept is a major advantage
 - Seepage and flows can be regulated based on available water
 - Pump sizes can be increased in the future
- Other opportunities to Adaptively Manage the project
 - Test small-scale changes (S-18C) and minor project features that are completely reversible
 - Monitor results to guide restoration
 - Potential to realize additional benefits
- Project Monitoring Plan
 - Eliminate possible flooding impacts
 - Ensure project benefits



Public Involvement and Issues

- Extraordinary public support of Recommended Plan
 - Public Workshops
 - Only seven comments received on the DPIR
 - No major issues



Watershed Integration

- Dual PIR approach to incorporate maximum restoration potential
- Western PIR addresses the immediate needs within Everglades National Park while addressing uncertainties about the Eastern PIR



Agency Technical Review (ATR) and Independent External Peer Review (IEPR)

ATR Completed

- Conducted for: Feasibility Scoping Meeting, Alternative Formulation Briefing, Draft PIR, Final PIR
- All comments resolved and Final PIR ATR review completed and certified

IEPR Completed

- Main comments concerned
 - Existing and future project conditions
 - Secondary effects and climatic cycles
 - Real Estate and Modeling
- Concurrence received from Panel on all comment responses

Model Certification Completed

- Panel review comments addressed within the model
- Concurrence received from Panel on all comment responses



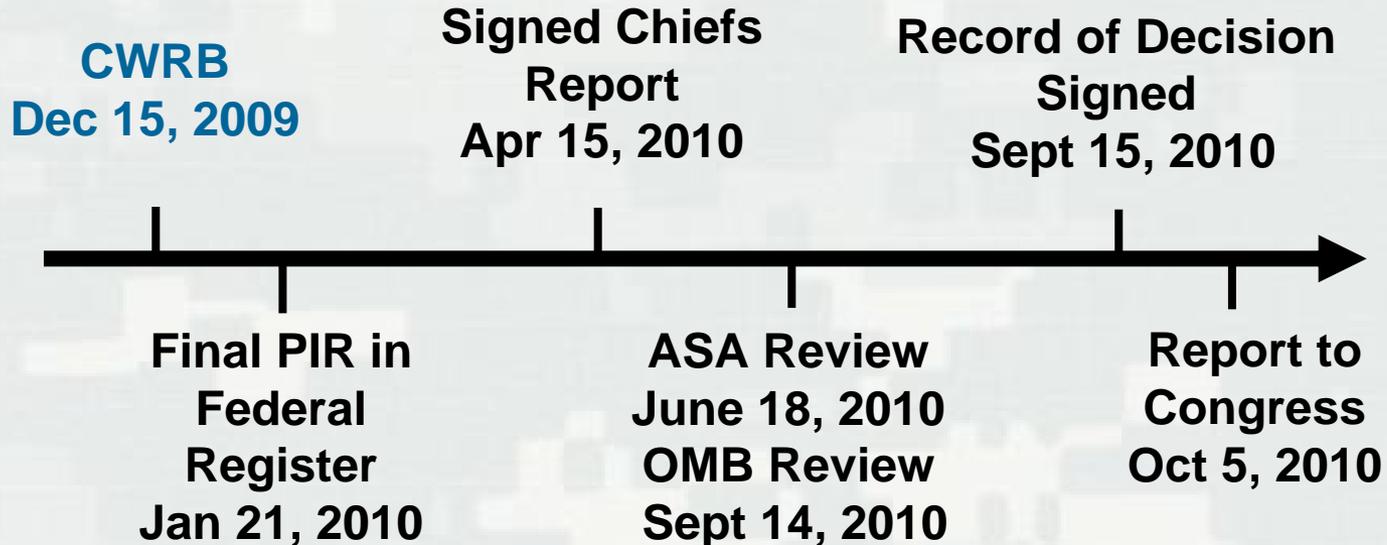
USACE Campaign Plan

Goal 2 – Engineering Sustainable Water Resources (Deliver enduring and essential water resource solutions through collaboration with partners and stakeholders)

- **Key Tasks:** (1) Advance construction on SFEER Projects, (2) Prepare projects for authorization, (3) Revise CERP Programmatic Regulations to Improve Project Delivery Processes, (4) Reestablish, strengthen and maintain an enhanced relationship with key stakeholders and partners; and provide greater leadership management of overall SFEER program, (5) Restructure & Posture for SFEER Execution.
 - ▶ C-111 Spreader Canal Project specifically identified under Key Task 2a.2.2 Prepare projects for authorization
 - HQ policy review of Draft PIR was successful and concurrent with public review
 - SAD coordination was integral in resolving issues during and after the policy compliance
 - District Team has successfully met or beat schedule dates and is on track for 15 April 2010 Chief's Report



Estimated Project Timeline



Recommendations

The Jacksonville District recommends CWRB approval to release the C-111 Spreader Canal Western Project Integrated PIR and EIS for State and Agency review



**Civil Works Review Board
December 15, 2009**

***South Florida Water Management District
Support for the C-111 Spreader Canal
Western Project Integrated Project
Implementation Report (PIR) and
Environmental Impact Statement (EIS)***

*Tommy B. Strowd, P.E.
Assistant Deputy Executive Director
South Florida Water Management
District*

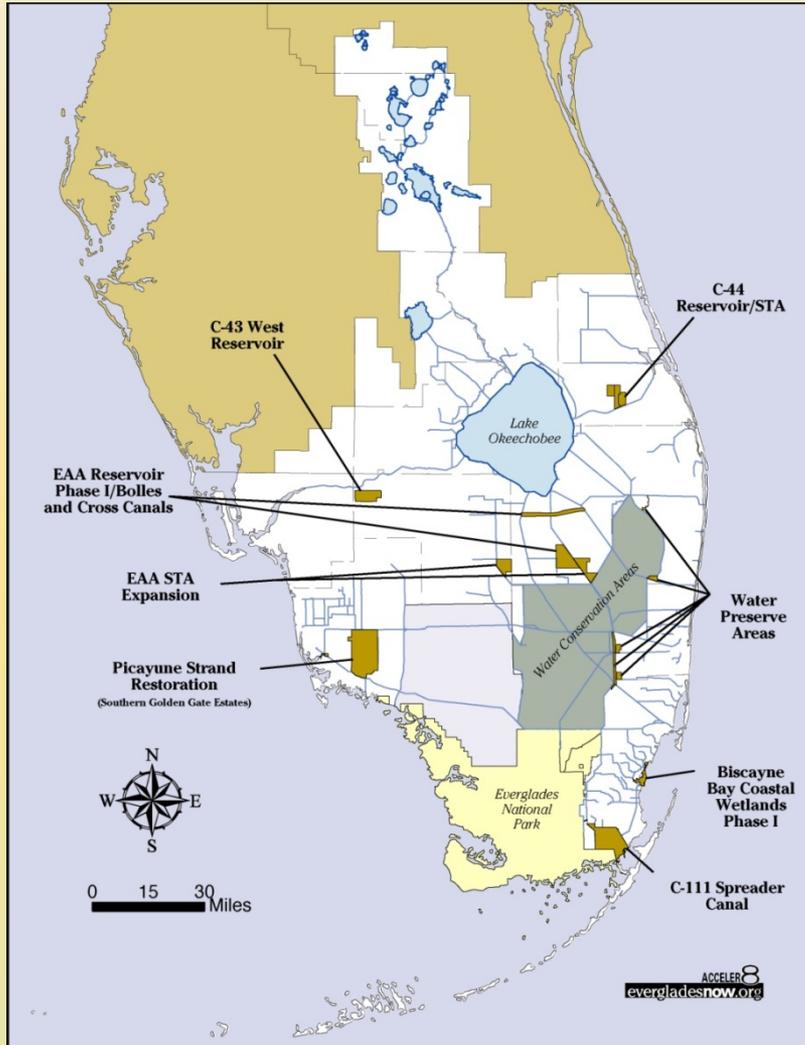


Partnerships



On October 14th 2004, in the presence of the USACE, DOI, CEQ, and other state, local, and federal partners, SFWMD entered into an agreement to expedite the implementation of eight critical CERP projects

Expedited Projects



- Consisted of eight projects which would provide immediate environmental, flood control and water supply benefits
- SFWMD began implementing a parallel design track intended to achieve Everglades restoration sooner
- The C-111 Spreader Canal Western project was identified as one of the expedited projects

C-111 Spreader Canal Stakeholder Workshops

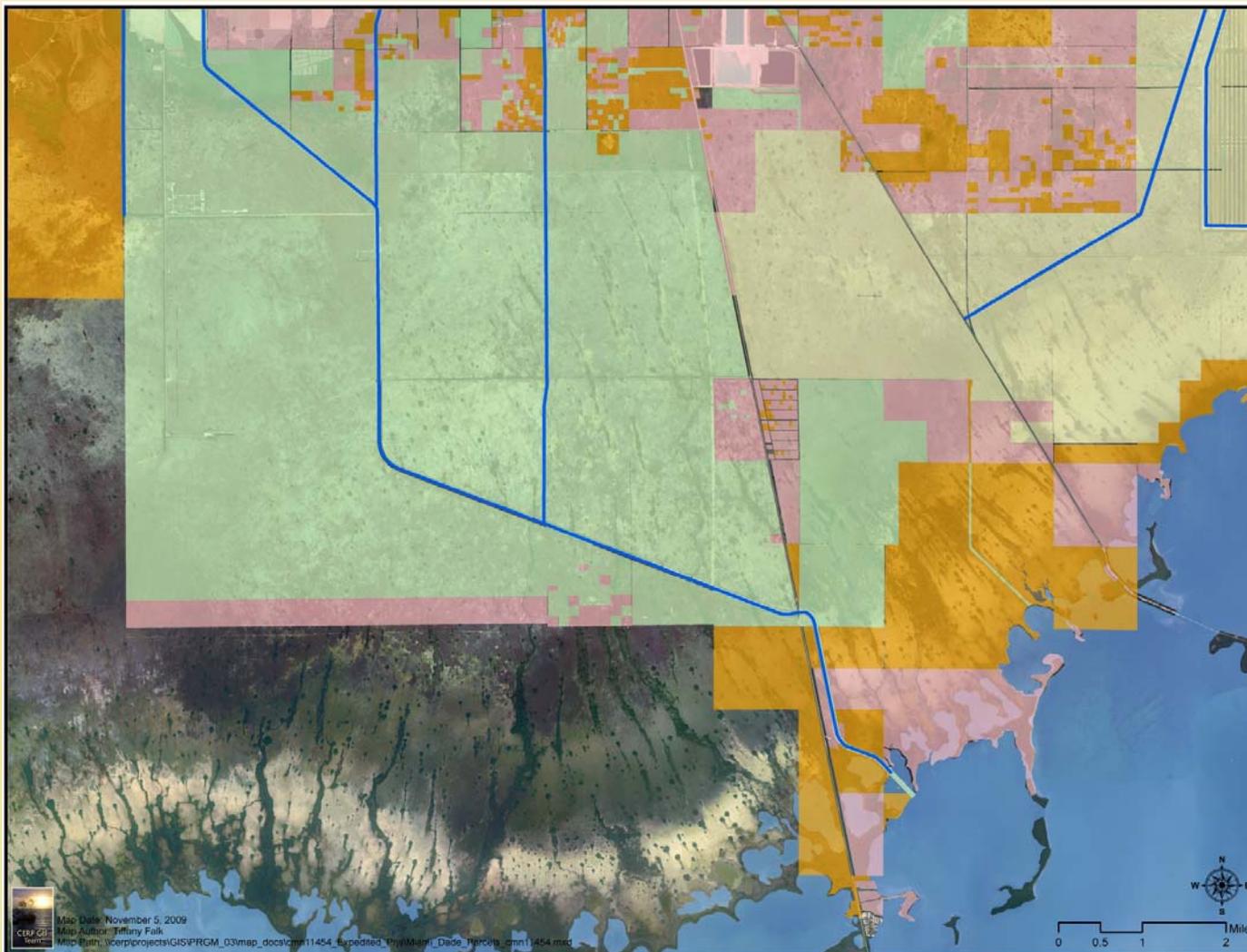
- A series of Stakeholder technical meetings were held
 - Process for input on fast tracking implementation
 - Explore general support for the Recommended Plan
 - High level interaction with PDT
 - Briefings at WRAC Issues Workshops, full WRAC and Governing Board meetings



SFWMD Project Commitments

- Acquired \$16.3 Million worth of real estate (9,688 acres)
- Committed more than \$13.3 million towards Preconstruction Engineering and Design (PED)
- Produced final design plans for all recommended plan features
- Invested over 10,000 hours of staff time since the PMP was approved in March of 2002
- Provided a signed Letter of Support signed by the Executive Director based on GB approval at the Nov. 2009 meeting
- Received Governing Board approval to award \$24.9 Million in construction contracts to construct all features except S-198
- Prepared to commit an additional \$3.7 Million for construction management, \$3.1 Million for project level monitoring, \$2.3 Million for Endangered Species mitigation, \$3.1 Million in exotic and nuisance vegetation management, and \$2.7 Million for management of soils contaminated by past agricultural activities

SFWMD Purchased Project Lands

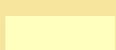
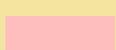


Legend

Existing Canals



Miami-Dade Parcel Ownership

-  SFWMD
-  Other Public Ownership
-  FP&L
-  Private

Florida Bay



Map Date: November 5, 2009
Map Author: Jeffrey Falk
Map Path: \\corp\projects\GIS\PRGM_03\map_docs\cm11454_4\revised\Prj\Miami_Dade_Parcels_cm11454.mxd

South Florida Water Management District Recommendation

SFWMD supports Civil Works Review Board approval of the C-111 Spreader Canal Western Project Integrated Project Implementation Report and Environmental Impact Statement

**Presentation
to the**

Civil Works Review Board

Comprehensive Everglades Restoration Plan

**C-111 Spreader Canal Western Project ,
Final Integrated Project Implementation Report
and Environmental Impact Statement**

by

MG Todd Semonite

**Commander
South Atlantic Division
15 December 2009**



Key Partners

- South Florida Water Management District (SFWMD)
- Department of Interior
- Florida Department of Environmental Protection



SFEER HQ-DC Team Members

- Steve Kopecky, HQ-DC SFEER Program Manager
- Bradd Schwichtenberg, Planning Rep, SAD-RIT
- Lee Ware, Planning & Policy Division, OWPR
- Jeanette Gallihugh, Planning & Policy Division, OWPR
- Ken Claseman, Planning & Policy Division, OWPR
- Katy Chekouras, Counsel, SAD-RIT
- Rodney Hallstrom, Real Estate
- Marilyn Benner, Planning & Policy Division



Rationale for SAD Support

- Concur with District Commander's findings & recommendations.
- Report complies with all applicable policy & laws in place at this time.
- Plan supported by sponsor and congressional delegation.
- Recognizes advance work planned by SFWMD
- Plan is consistent with Comprehensive Everglades Restoration Plan
- Plan will provide positive environmental benefits
- Anticipate favorable response to the draft Chief's Report.



Certification of Legal & Policy Compliance

- Legal certification of the final Project Implementation Report made by SAJ District Counsel.
- Technical and Policy Compliance:
 - External ATR certification complete, all ITR comments have been resolved.
 - Ecosystem PCX – MVD Certification.
 - Policy compliance issues have been resolved.



SAD Quality Assurance Activities

- Continuous involvement throughout development of the PIR.
- Worked w/EcoPCX, vertical team in establishment of peer review plan.
- Review of Policy Compliance Memo: all issues identified in draft PIR have been adequately addressed.
- Examples of policy issues resolved.
 - ▶ Work In-Kind: need for PPCA
 - ▶ Project phasing (split project; do western PIR first)



SAD Recommendation

- Approve Final Report
- Release for State and Agency Review
- Complete Chief's Report





Civil Works Review Board

HQUSACE POLICY REVIEW CONCERNS

CERP, C-111 Spreader Canal Western Project

Jeanette Gallihugh
Office of Water Project Review
Planning and Policy Division

Washington, DC – 15 December 2009



CERP, C-111 Spreader Canal, Western

HQUSACE Team Reviews:

- FSM was held Apr 05
- IPR in July 07 concerning project split
- AFB was held April 08: 37 policy comments
- Draft PIR/EIS review complete June 09:
46 new policy comments & 9 unresolved
- Final PIR/EIS: current review being completed by HQUSACE team.



CERP, C-111 Spreader Canal, Western

Policy Questions from AFB/Draft PIR

- Study and Construction Authorities.
- Period of Analysis.
- Objectives and Constraints.
- Future Without Project Conditions.
- Regulatory Environment.
- Management Measures, Screening of Alternatives.
- Pilot Projects.
- Description of Models and Assumptions.
- Full description of TSP, report clarity, figures/maps.
- Monitoring and Adaptive Management.
- Peer Review.
- MCACES costs estimate, pricing levels, risk analysis.
- Environmental Coordination and Compliance.
- Real Estate considerations.
- Legal Clarifications/Language.



CERP, C-111 Spreader Canal, Western

Areas of Policy Concern:

- Alternatives Formulation of "D Series"
- Initial Final Array of Alternatives
- Frog Pond Detention Area Sizing
- Remediation of Soils with Ag Chemicals
- Revised Ecological Modeling & CE/ICA



CERP, C-111 Spreader Canal, Western

Alternative Formulation for “D Series”

CONCERN: AFB materials did not adequately support addition of group of management measures to each alternative in the final array, creating a new “D Series” of alternatives.

REASON: The estimated cost of each measure added to the D Series and the benefits derived need to be discussed in report to ensure additional measures are cost effective and justified.

RESOLUTION: Additional information was provided in the draft and final PIRs that provided a breakdown of the D Series alternatives and justification for inclusion of the additional features.

RESOLUTION IMPACT: Concern resolved.



CERP, C-111 Spreader Canal, Western

Initial Final Array of Alternatives

CONCERN: The AFB had a flawed process to determine the final array of alternatives, which included alternatives that were not implementable due to impact on an endangered species.

REASON: The final array of alternatives need to be consistent with the Objectives and Constraints for a project.

RESOLUTION: Reanalysis of final array of alternatives was completed - during analysis other design problems emerged; re-modeling occurred; led to optimization of alternative 2D (split into 2DL and 2DS). Alternative 4D eliminated as non-implementable. Cost-effective analysis was re-run.

RESOLUTION IMPACT: Concern resolved.



CERP, C-111 Spreader Canal, Western

Frog Pond Detention Area Sizing

CONCERN: The draft report did not provide enough information to support the selected size of the 590 acre detention area.

REASON: Formulation information is required to support the recommended plan for the detention basin including rationale for the size of the detention area, water availability, and seepage data.

RESOLUTION: Further discussion regarding formulation of frog pond detention basin has been added to final PIR.

RESOLUTION IMPACT: Concern resolved.



CERP, C-111 Spreader Canal, Western

Remediation of Soils with Ag Chemicals

CONCERN: Final PIR included Federal cost-sharing for treatment of legally applied agricultural chemicals on CERP project lands.

REASON: Draft guidance concerning this issue indicates that sponsor may present information to Corps in support of making a recommendation to Congress for including treatment of ag chemicals as a project cost. If recommended, PIR must lay out the case for cost-sharing the treatment.

RESOLUTION: Upon further consideration, sponsor decided that proposal to cost share the treatment of agricultural chemicals should be removed from the Final PIR for C-111 Spreader, Western project. The Corps agreed.

RESOLUTION IMPACT: Concern resolved upon revision of final PIR. The Corps will work diligently to augment and complete guidance on this issue and will incorporate lessons learned from the current projects so that a way forward is available.



CERP, C-111 Spreader Canal, Western

Revised Ecological Modeling & CE/ICA

CONCERN: Due to new modeling, a number of changes occurred in ecological outputs and Cost Effective/Incremental Cost Analysis from draft to final report. Final PIR was only partially updated with new data.

REASON: Draft PIR had 5 cost effective alternatives, 2 best buy plans. Final PIR has 1 cost effective and best buy alternative; two alternatives in final array now cause environmental degradation. Assessment of plan formulation is needed to ensure that screening of measures and alternatives not impacted by new information, nor opportunities missed.

RESOLUTION: District clarified changes made to model and reasons for increases/decreases in outputs for different alternatives. Rationale provided for conclusion that model changes did not impact plan formulation.

RESOLUTION IMPACT: Concern resolved upon clarifying and expanded discussion being added to final PIR.



CERP, C-111 Spreader Canal, Western

HQUSACE POLICY COMPLIANCE REVIEW TEAM RECOMMENDATION

Approve release the PIR/EIS for S&A Review contingent upon HQUSACE review of revised final PIR in regards to agricultural chemicals remediation and revised CE/ICA.