SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Everglades Restoration Strategies

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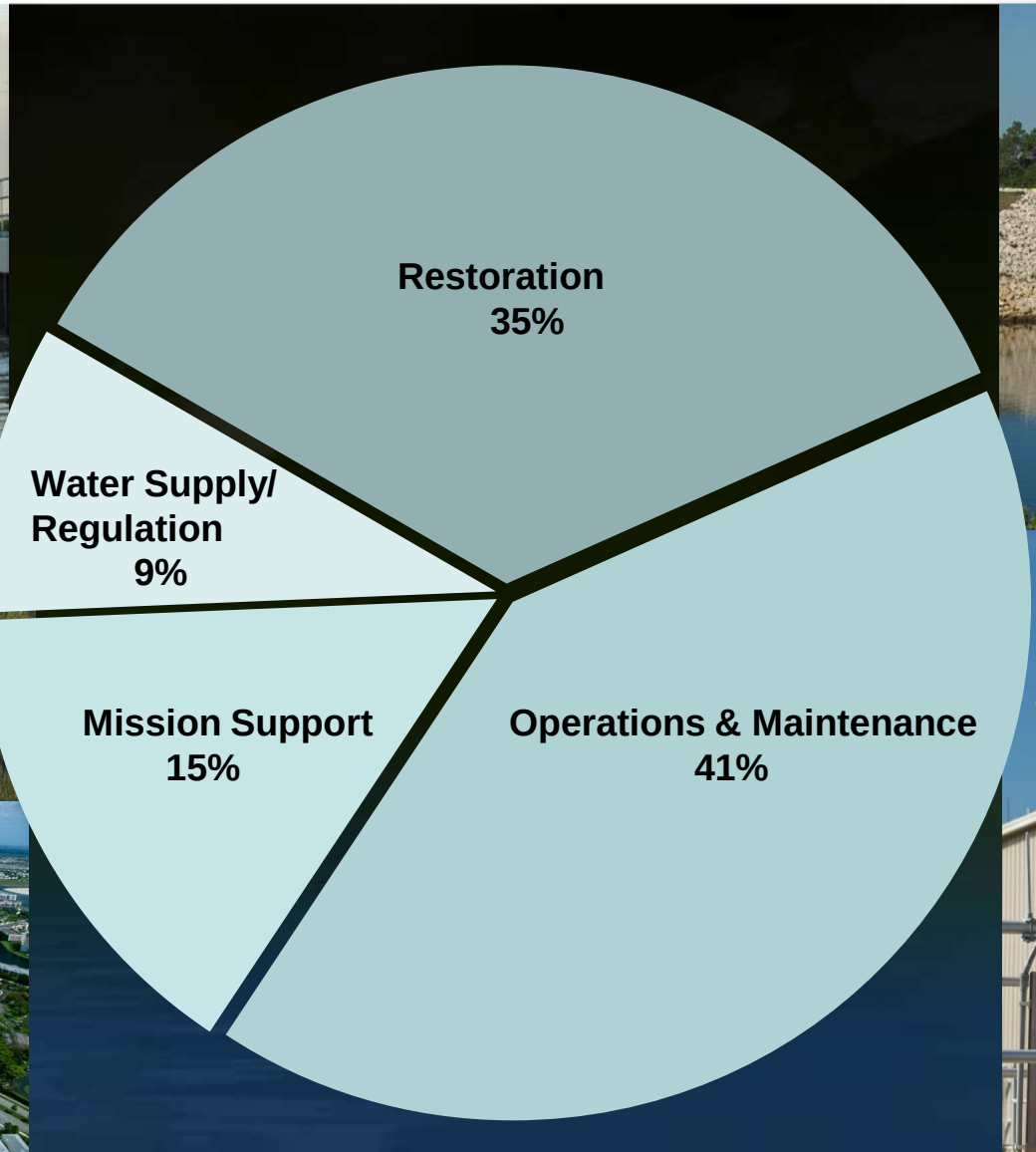
sfwmd.gov

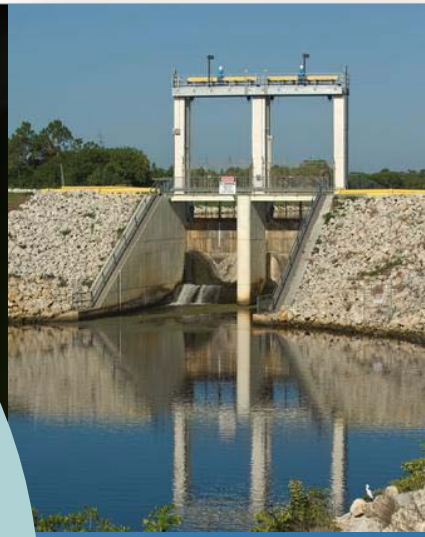
Today's Presentation

- **Everglades Water Quality**
  - Background
  - Key Projects
  - Regulatory Framework
  - Funding
  - Implementation Schedule
  - Next Steps
  - Governing Board Discussion

Background & Status

Core Mission Responsibilities





Restoring America's Everglades
Three-Part Strategy

Part 1: State-Federal Partnership

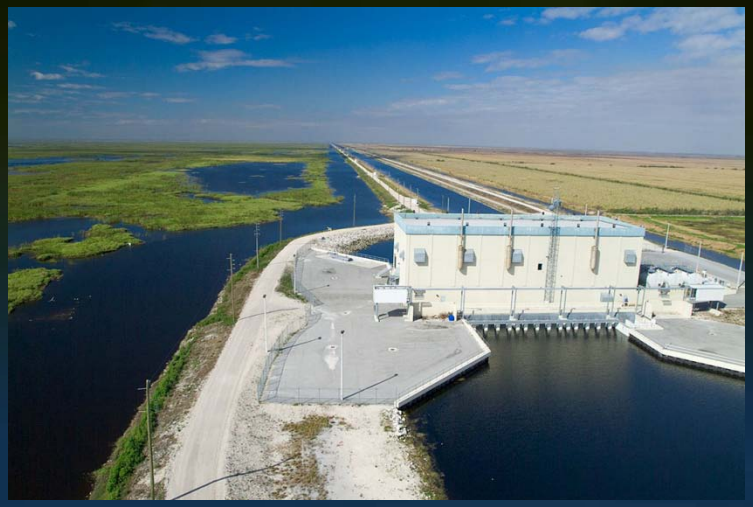
- Comprehensive Everglades Restoration Plan (CERP)
- Kissimmee River Restoration

Part 2: State Projects and Programs

- Northern Everglades and Estuaries Protection Program (source controls, Dispersed Water Management, construction projects, Alternative Treatment Technologies)

Part 3: Water Quality

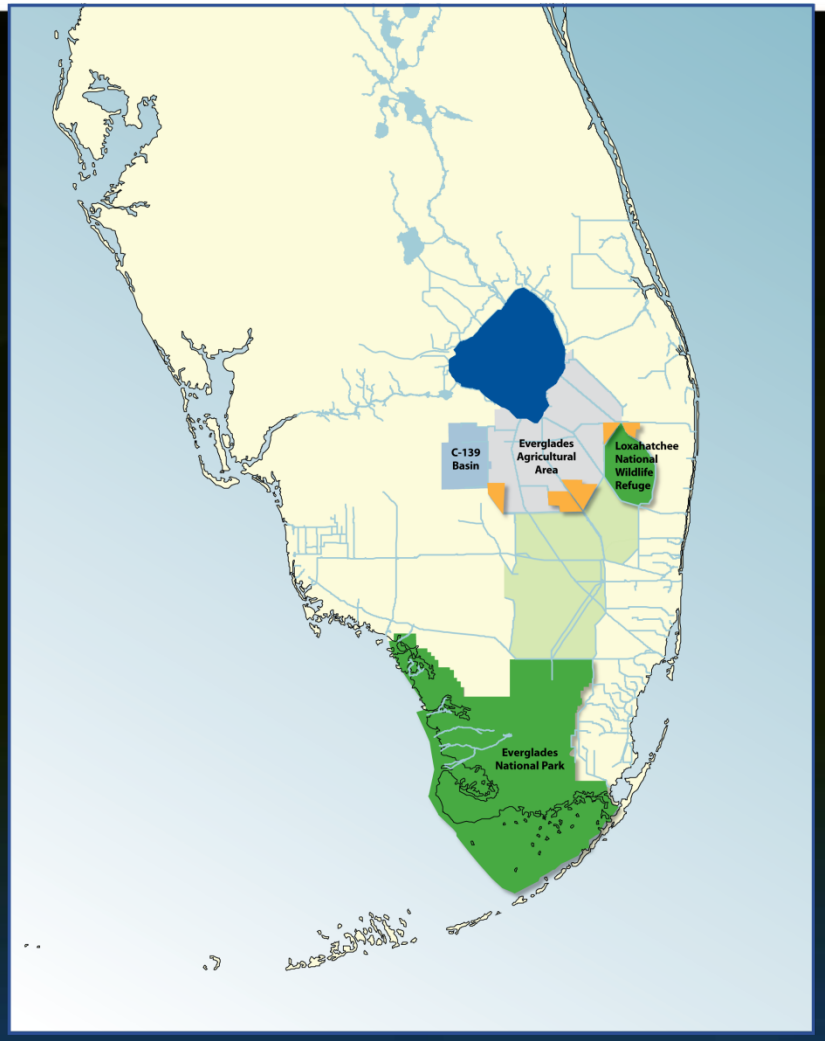
- Stormwater Treatment Areas (57,000 acres)
- Best Management Practices



Water Quality
Background & Status

- **July 2008**: Judge Alan Gold enjoined EPA and DEP from issuing new NPDES permits for Stormwater Treatment Areas
  - Ordered EPA to review State's Phosphorus Rule for compliance with Clean Water Act (a "Determination Letter")

- **September 3, 2010:** EPA issues "Amended Determination" with water quality-based effluent limits (WQBEL) for Stormwater Treatment Area discharges; projects and timeframe for achieving WQBEL
  - Invites alternative proposals from the District



Water Quality
Background & Status

- **2011 to Date**: Ongoing dialogue with USEPA
- Development of a technical plan, including:
  - Water Quality-Based Effluent Limit
  - Projects to achieve WQBEL
    - Stormwater Treatment Areas
    - Flow Equalization Basins
    - Science Plan
  - Implementation Schedule
- Draft NPDES permits and Consent Order incorporating components of the technical plan

Key Projects

Technical Plan
Water Quality Based Effluent Limit

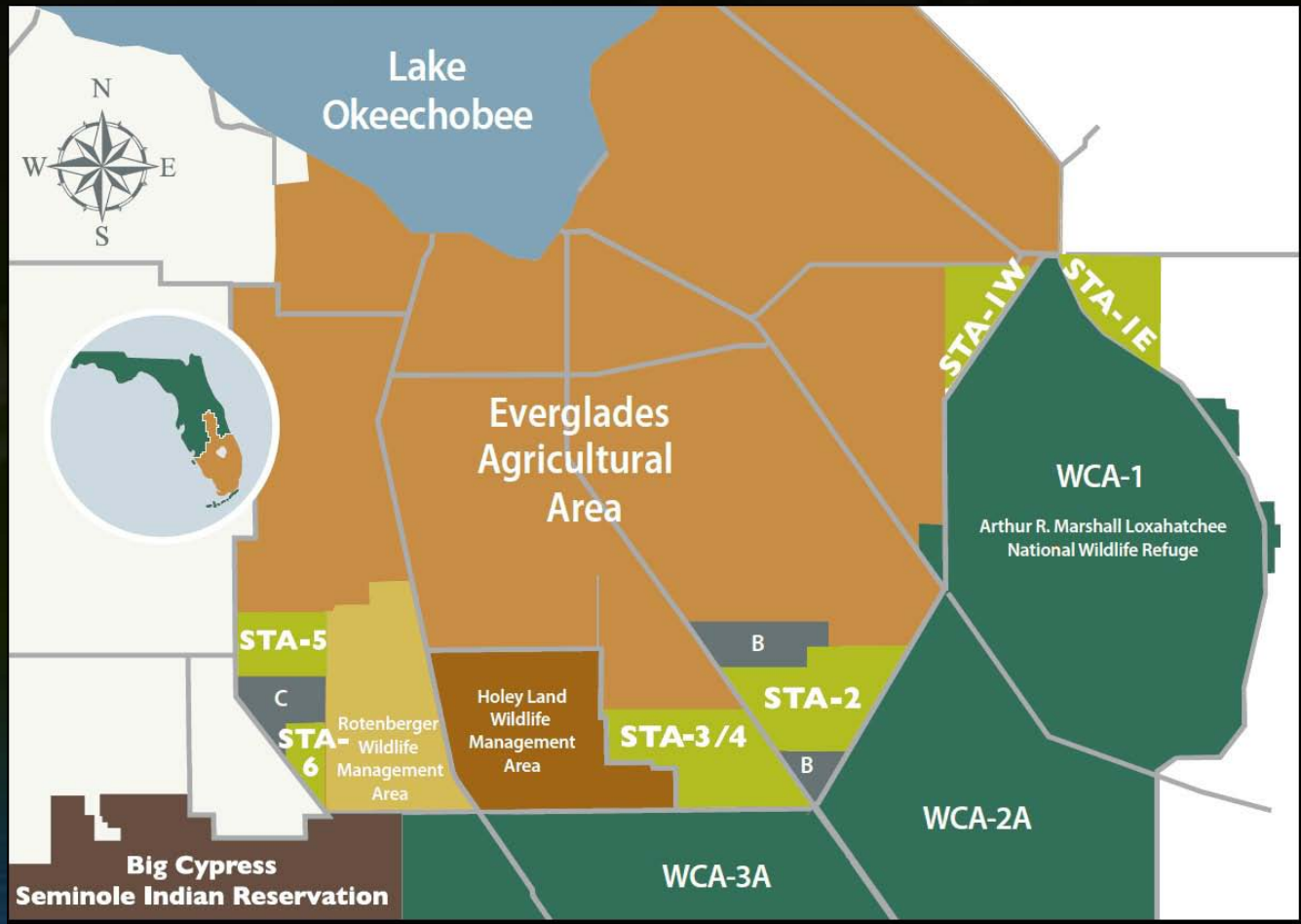
- Existing Phosphorus Criterion for Everglades Protection Area
  - 10 parts per billion (ppb) measured as a long-term geometric mean
  - Established to prevent an imbalance of flora or fauna
- WQBEL
  - Establish a phosphorus discharge limit for projects (STAs) that will achieve the 10 ppb marsh criterion
  - Derived a statistical equivalent of 10 ppb geometric mean that could be expressed as a flow weighted mean

Water Quality
Key Projects

- Proposed projects developed to meet discharge limit necessary to achieve 10 parts per billion ambient water quality criterion established in rule for Everglades Protection Area
  - More than 100 modeling simulations
- Project Types
  - STA expansions
  - Flow equalization basins (FEBs)
- Additional Components
  - Sub-regional source controls
  - Habitat restoration

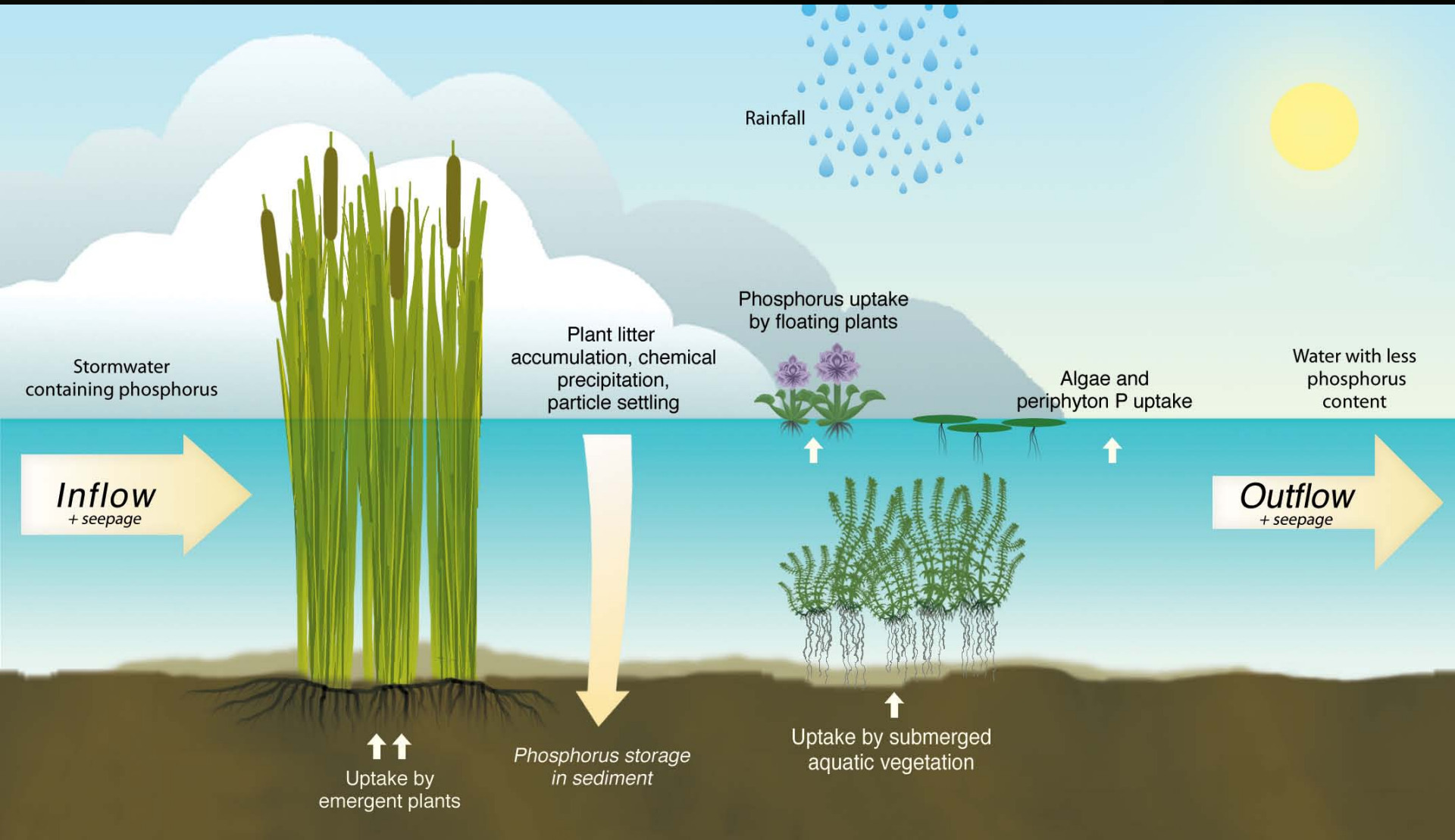
Key Projects
Existing Treatment

- 5 Stormwater Treatment Areas
- 57,000 acres of effective treatment
- 11,500,000 acre-feet (3.75 Trillion gallons) of water treated
- 1,470 Metric Tons of phosphorus removed
- Total phosphorus discharge concentrations for best performing STA (3/4) is 17 ppb for period of record

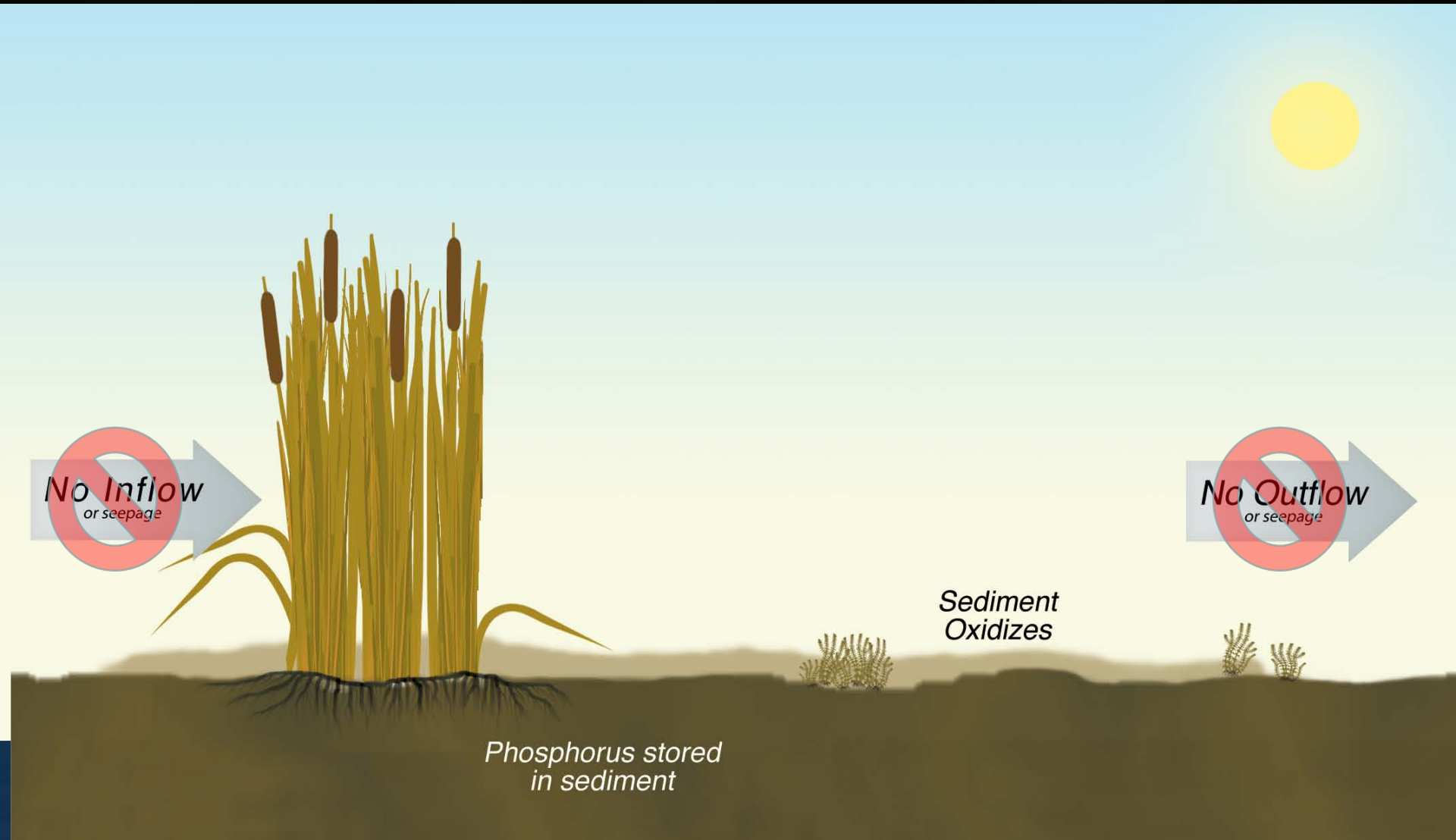


Areas in gray marked with a "B" or "C" represent the current expansion of existing Stormwater Treatment Areas

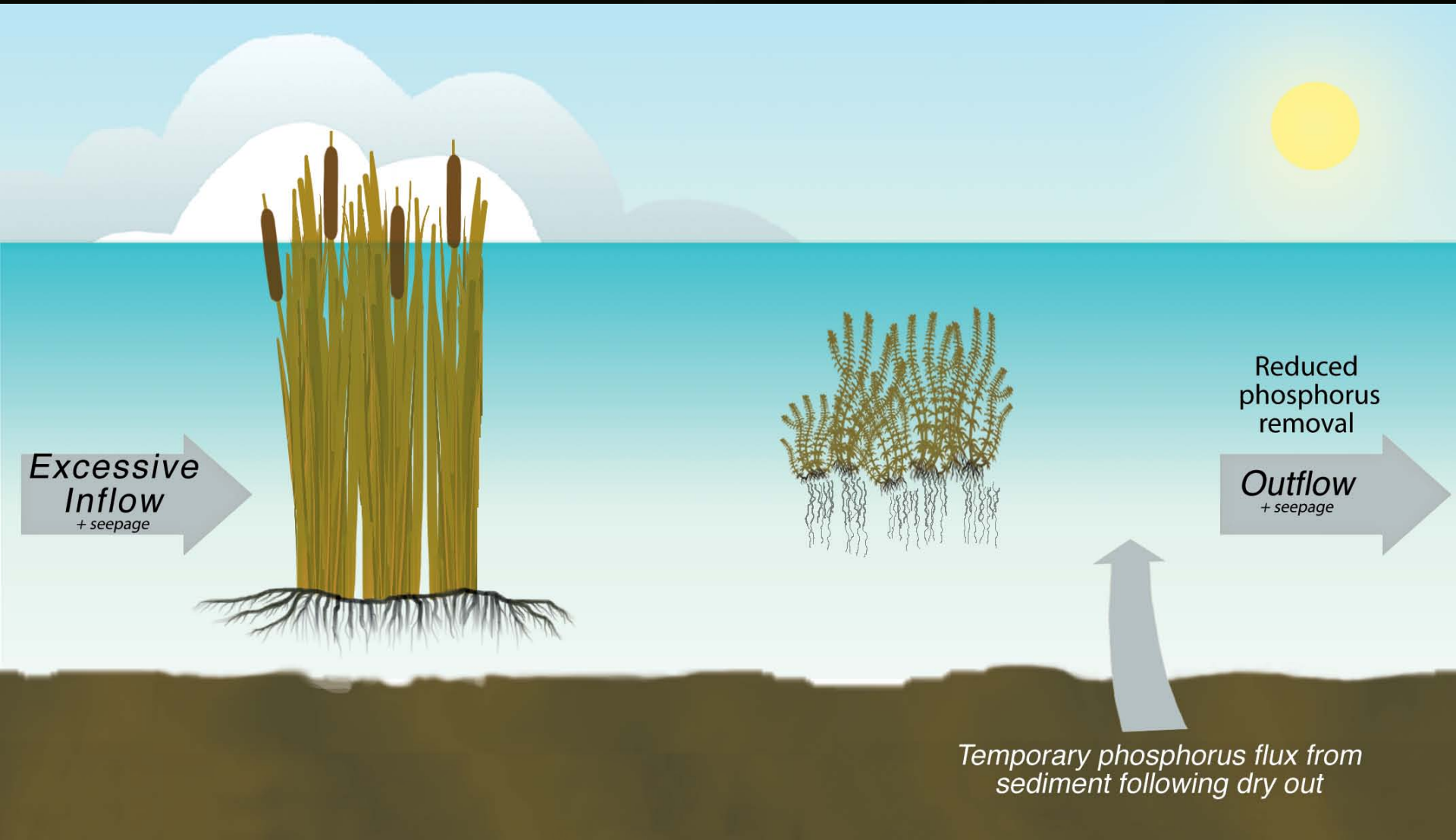
Stormwater Treatment Areas
Optimized Conditions



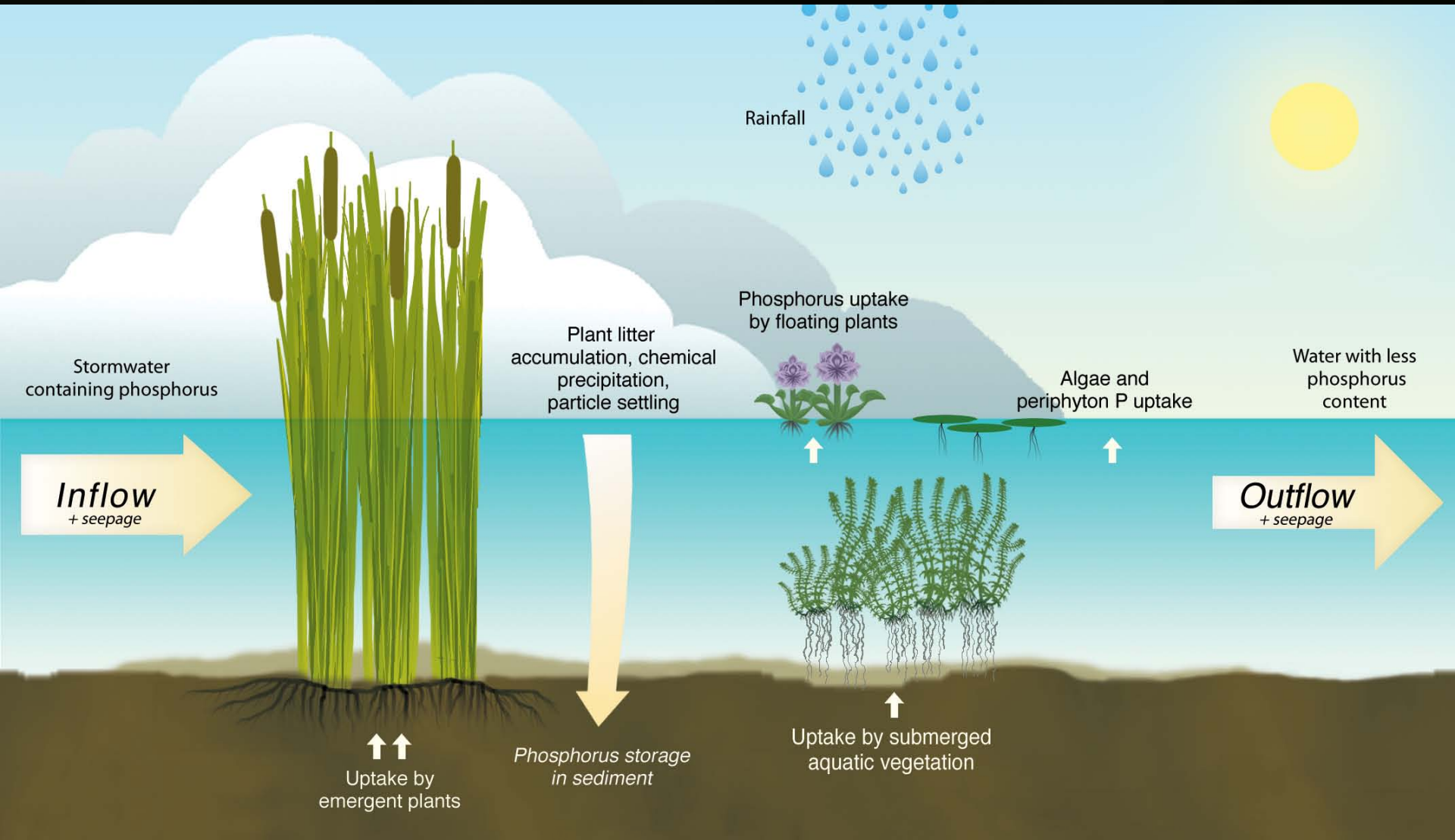
Stormwater Treatment Areas
Dry Out - No Flow Conditions



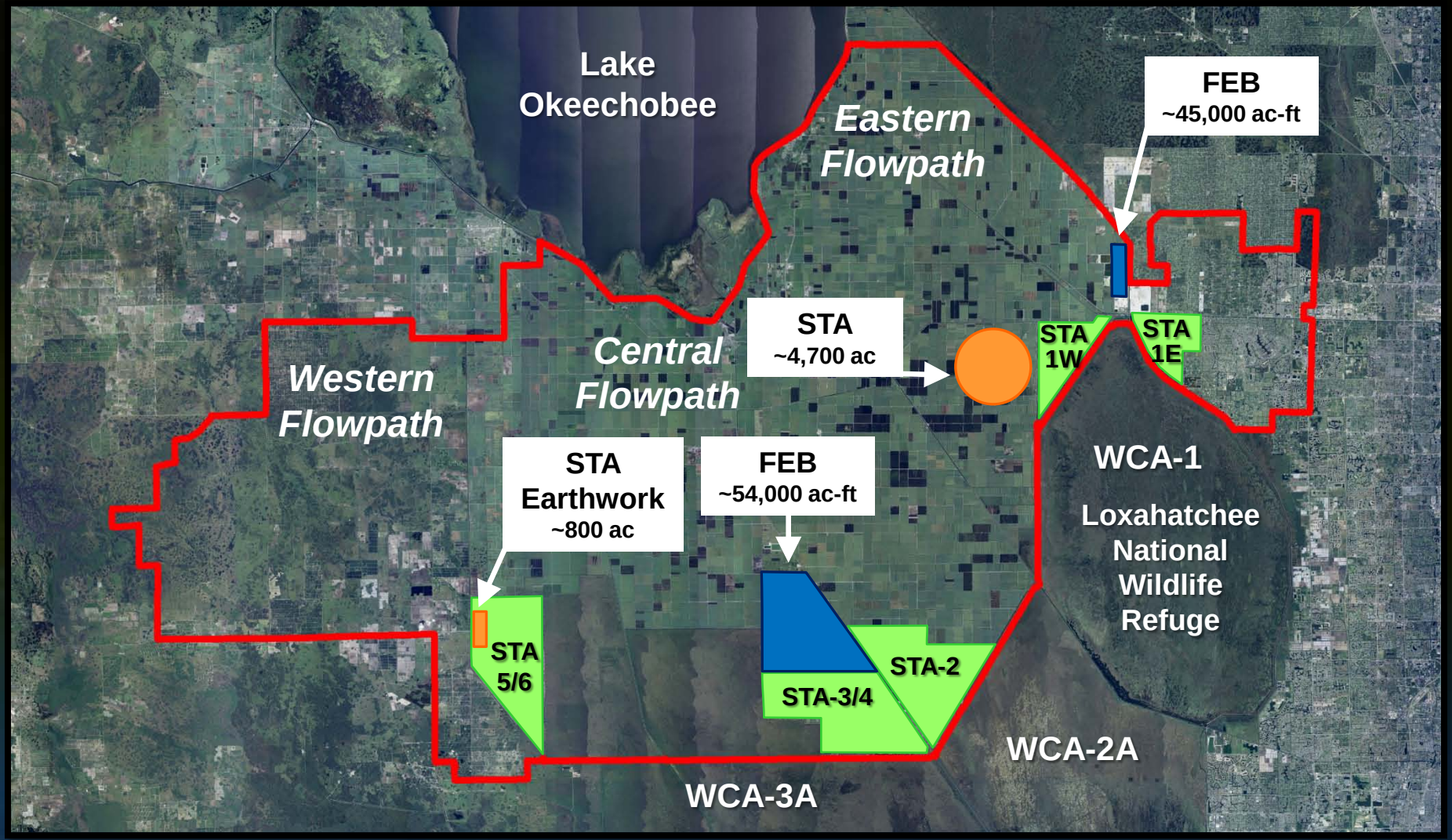
Stormwater Treatment Areas
Deep Water or Rewetting after Dry Conditions



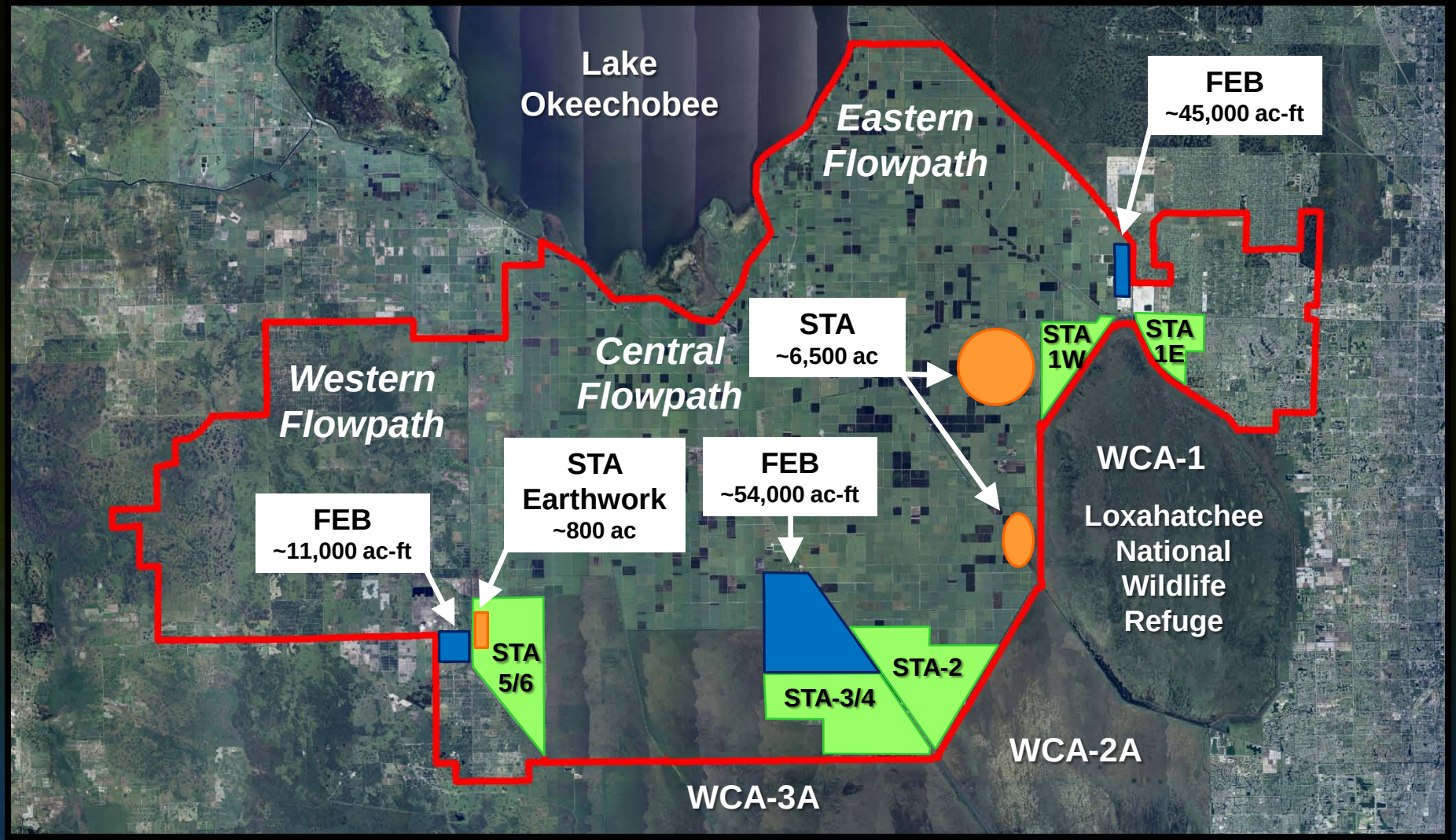
Stormwater Treatment Areas
Optimized Conditions



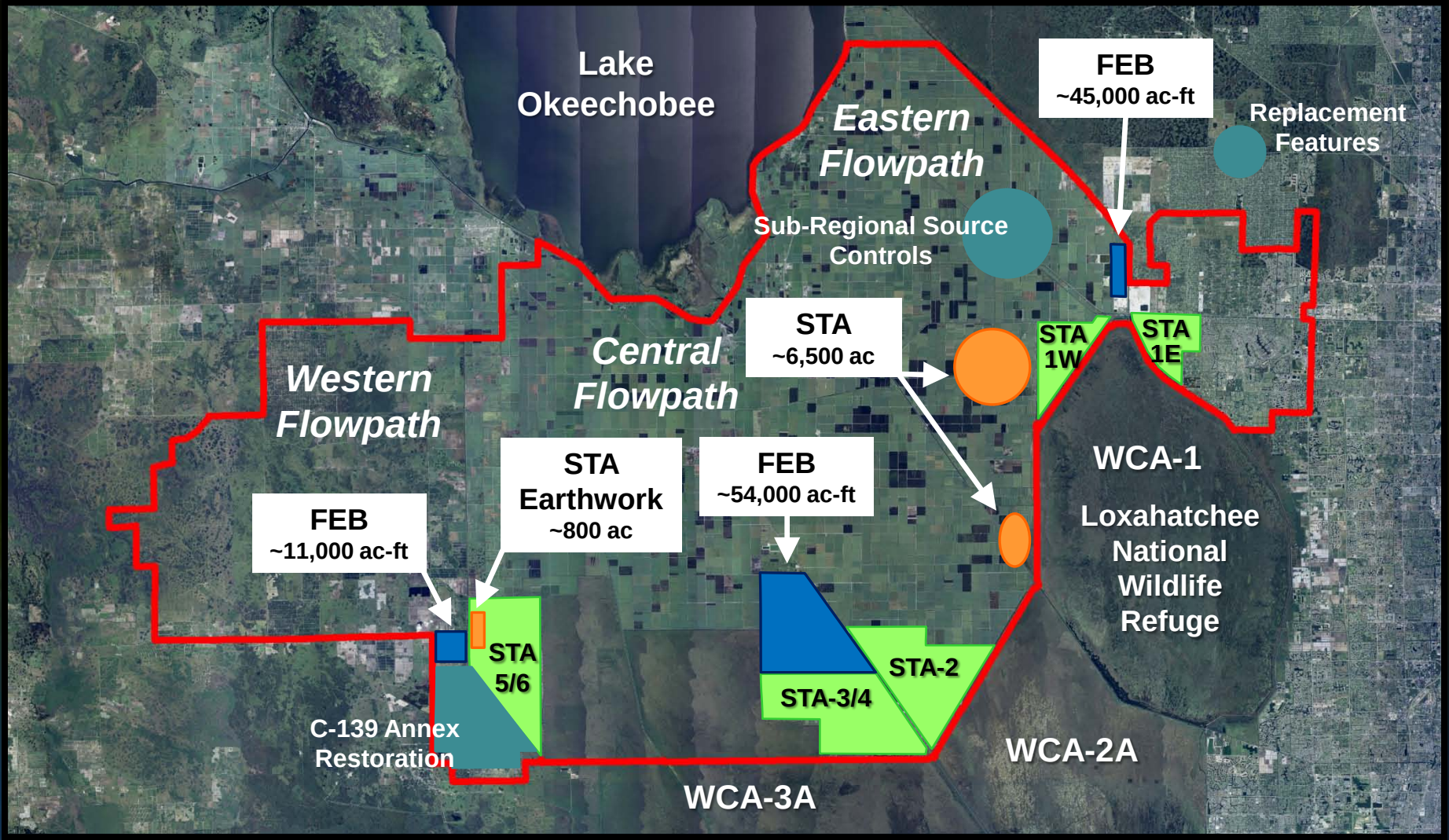
Key Projects
State Proposal – October 2011



Key Projects
Proposed Projects – May 2012

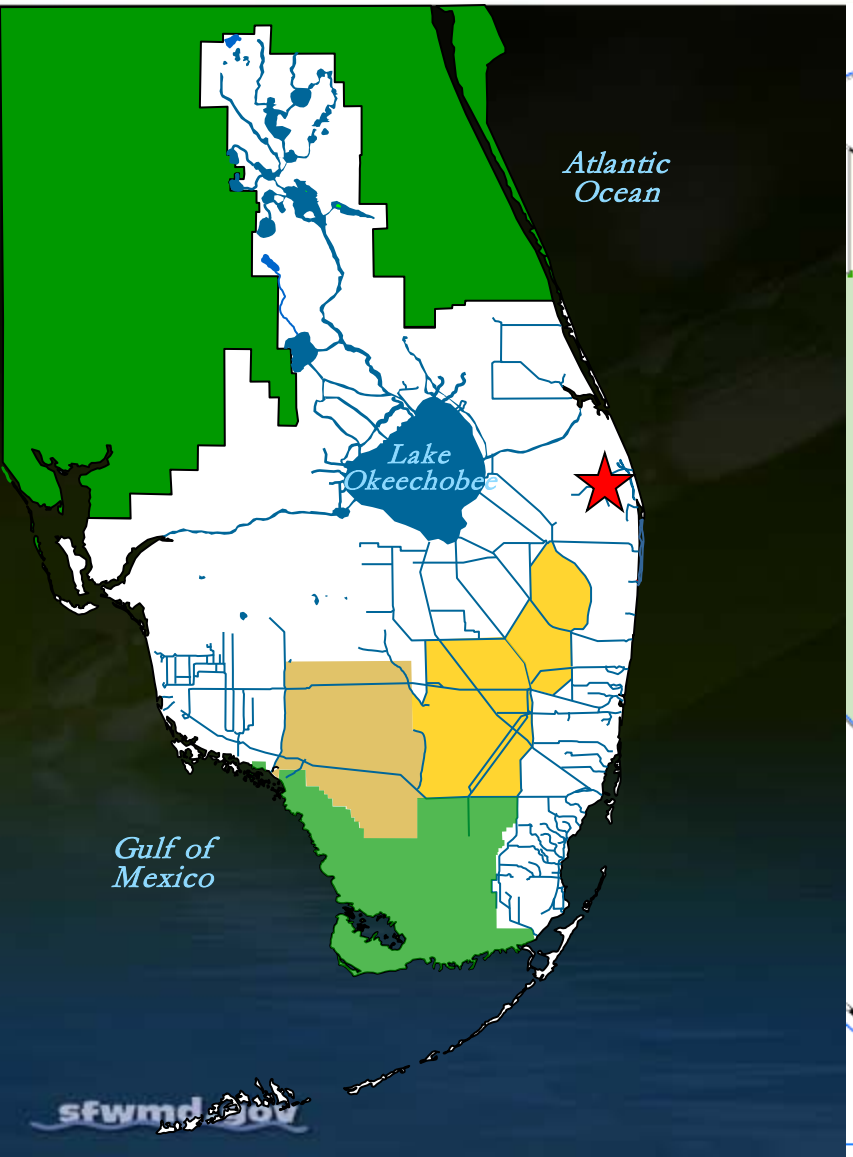


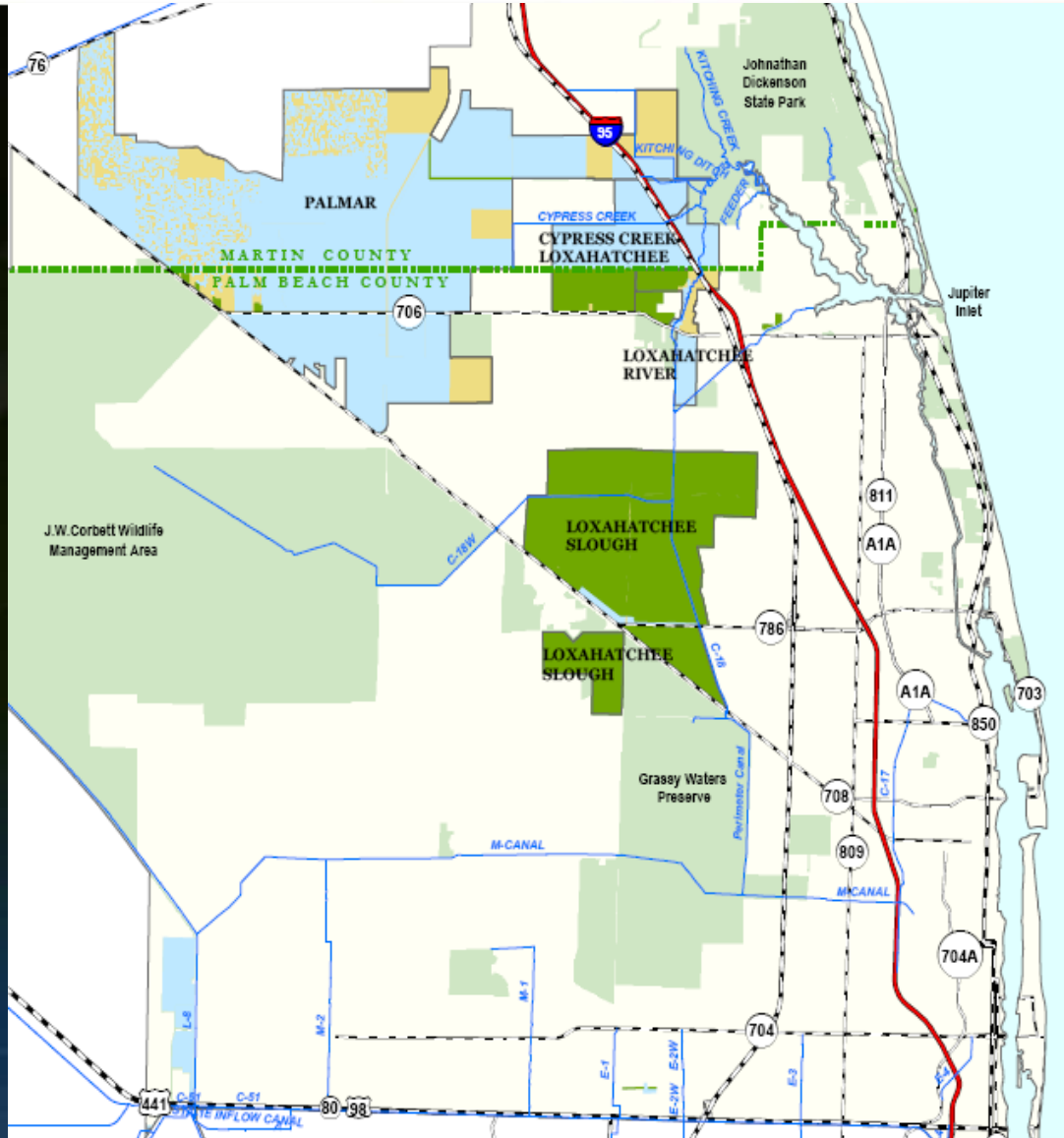
Additional Components
Proposed Projects – May 2012



Replacement Features

Loxahatchee River Watershed Restoration





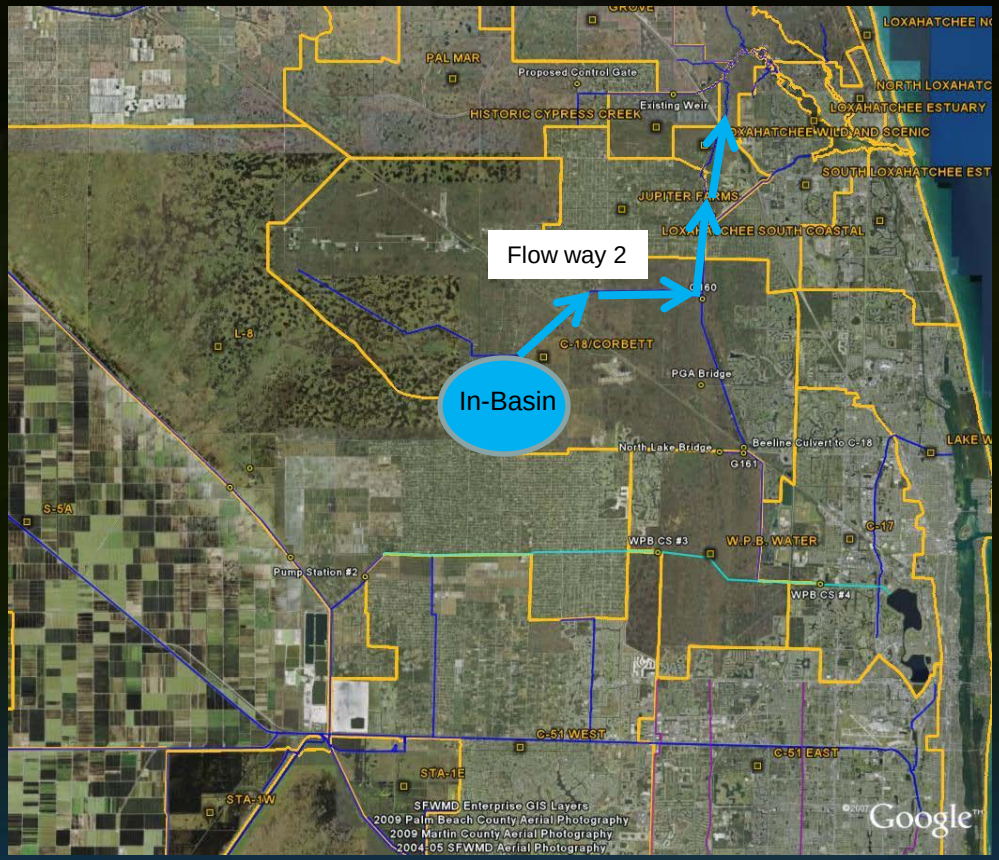
Replacement Features

Loxahatchee River Watershed Restoration

- Comprehensive Everglades Restoration Plan (CERP) Project
- Designed to capture, store and treat excess water that is currently discharged to the Lake Worth Lagoon and use that water to enhance the Loxahatchee River and Slough
- CERP project is the MFL recovery plan for the Loxahatchee River

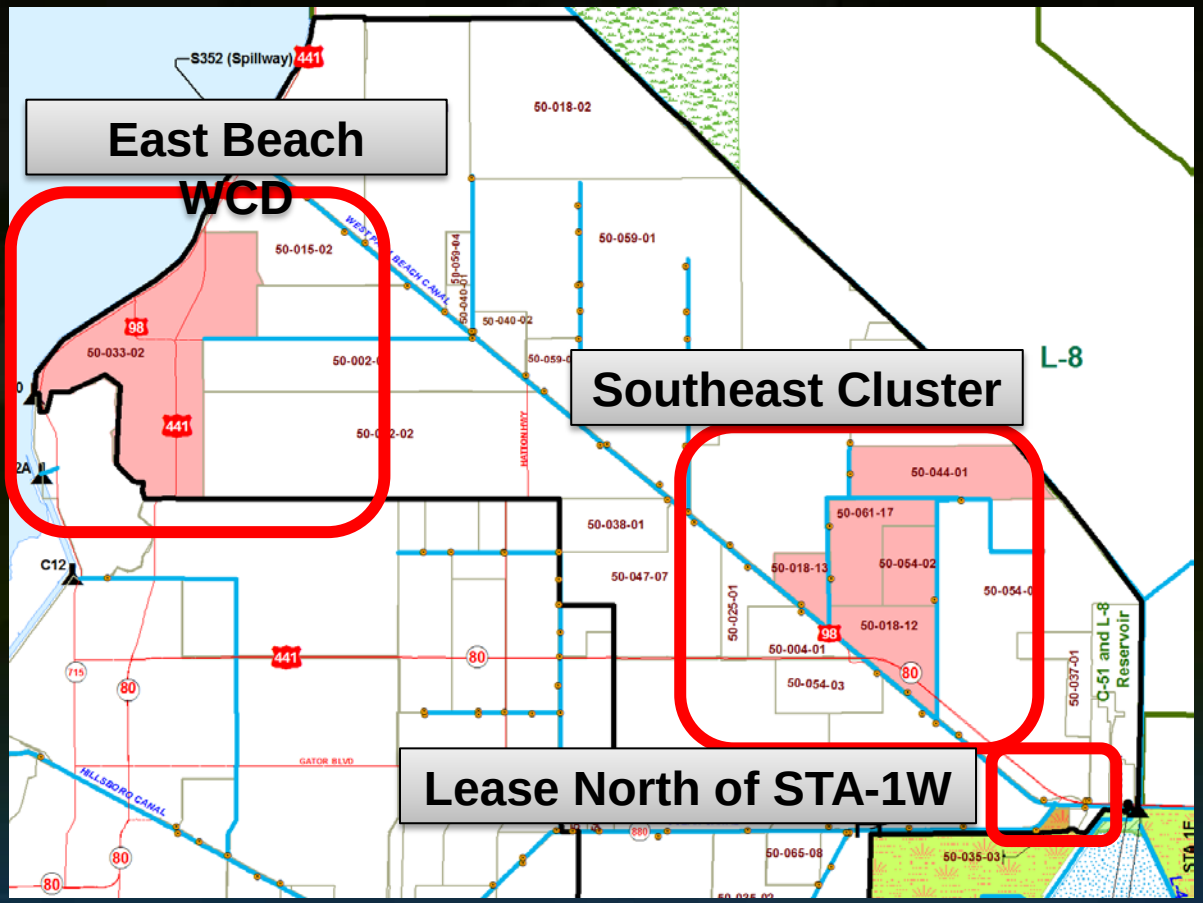
Additional Components
Replacement Features

- Acquire and construct replacement storage to capture flows from C-18 western basin and then discharge those flows down Flow-way 2 to the Loxahatchee River
- Non-binding letter of Intent to Negotiate submitted to Palm Beach County
- Initiate discussions regarding Mecca property
- Utilize L-8 reservoir as Flow Equalization Basin



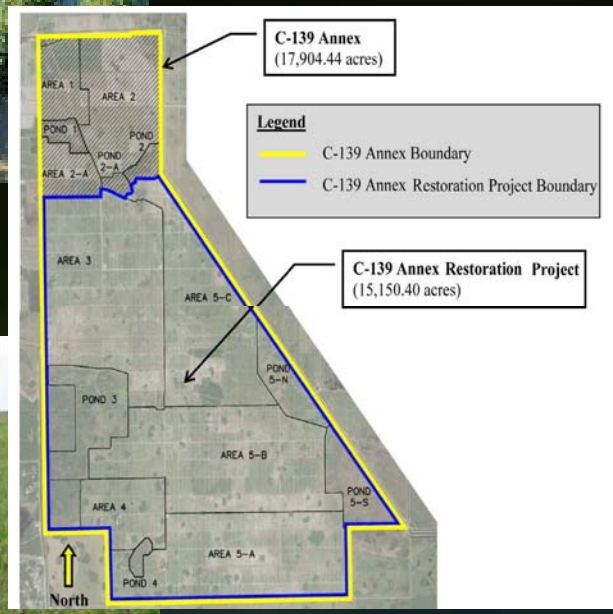
Additional Components
Sub-regional Source Controls

- Identify opportunities for additional cost effective sub-regional source control projects in S5A Sub-Basin to reduce total phosphorus inputs to STA-1 West & 1 East
- Considerations - water quality, willing participants, proximity/impact on STAs
- Three conceptual projects
  - Increase retention
  - Reduce runoff rates
  - Improve canal bank stabilization
  - Sediment sumps
  - Aquatic vegetation control



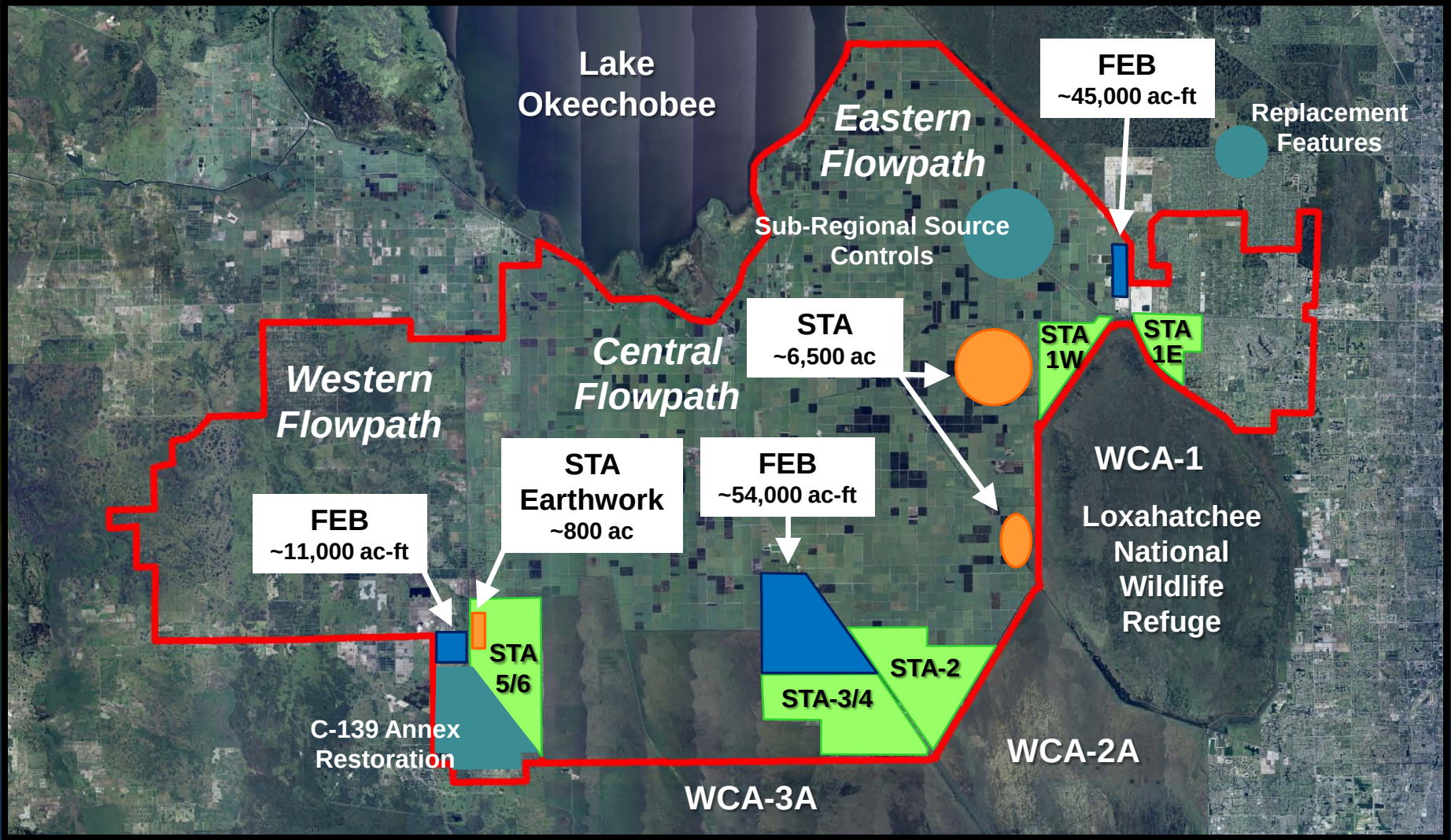
Additional Components
C-139 Annex Restoration Mitigation Project

- Restore historic Everglades hydrologic conditions to 15,000 acres of former citrus grove
- Contribute to the improvement of water quality in the Everglades
- Restore historic wetlands and upland habitat
- Expand habitat area for listed plant and animal species
- Promote the restoration of a self-sustaining ecosystem
- Maintain the current level of flood protection for surrounding properties



Key Projects
Science Plan

- Objectives:
  - Requires research regarding STA and FEB performance
  - Evaluate factors influencing phosphorus treatment performance
    - Investigate factors such as hydraulic loading rates, phosphorus and vegetation speciation, microbial activity, soil flux
    - Gain a better understanding of design and operations that sustain low phosphorus outflow concentrations (< 20 ppb)
  - Determine how information from the science plan can be implemented to improve treatment performance of existing projects


Lake Okeechobee
Eastern Flowpath
FEB
~45,000 ac-ft
Replacement Features
Sub-Regional Source Controls
STA
~6,500 ac
STA 1W
STA 1E
Central Flowpath
Western Flowpath
WCA-1
Loxahatchee National Wildlife Refuge
STA
Earthwork
~800 ac
FEB
~54,000 ac-ft
FEB
~11,000 ac-ft
STA 5/6
STA-2
STA-3/4
C-139 Annex Restoration
WCA-2A
WCA-3A

Regulatory Framework

Regulatory Framework

- Regulatory package to include:
  - Everglades Forever Act (EFA) Permit
  - EFA Consent Order
  - National Pollutant Discharge Elimination System (NPDES) Permit
  - NPDES Consent Order
- Each document will cover the entire watershed including eastern, central, and western flow-paths

Regulatory Framework
Permits & Consent Orders

- Key Components:
  - Non-severability
  - Discharge limits
  - New projects & milestones
  - Performance and reporting
  - Science Plan
  - Authorize operation of existing STAs (including Compartments B and C)
- Prior to final action, permits and consent orders will be brought back to the Governing Board for authorization to accept and execute

Funding

Funding Considerations

- **Project costs**
- **Implementation schedule**
  - Balance ongoing mission-critical responsibilities with fiscal and economic realities
  - Recognize challenges and limitations of:
    - Engineering & construction
    - Regulatory requirements (NEPA, Corps 404, EFA construction permits)
    - Science
  - Allows for adaptive management if all parties agree
- **Proposes utilizing combination of sources**
  - Cash reserves
  - Ad Valorem revenue
  - State appropriations

Funding
Estimated Project Costs

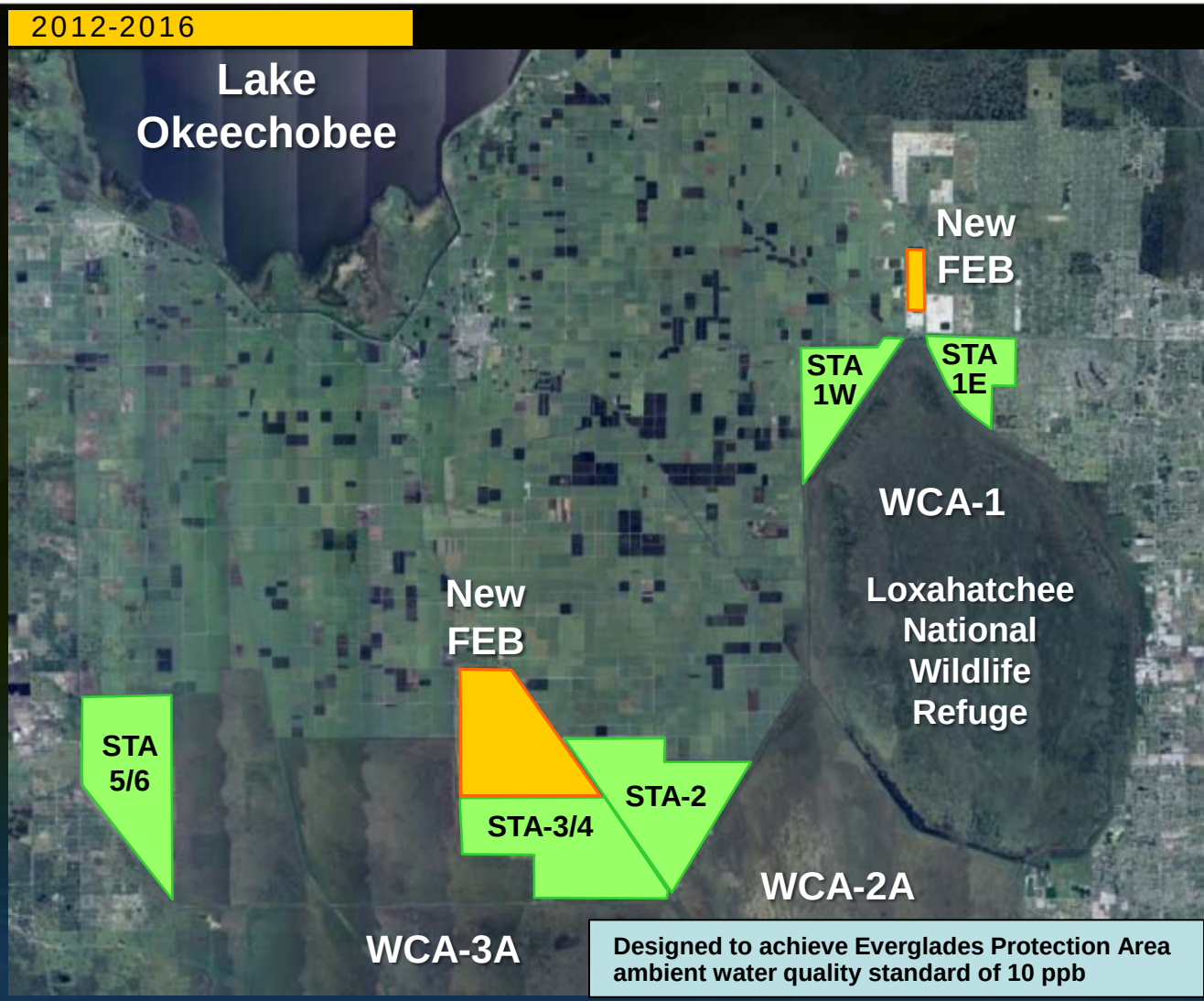
Flow Path	Projects	Cost
Eastern Flow Path	FEB & STAs	$365M
Central Flow Path	FEB	$120M
Western Flow Path	FEB & Earthwork	$130M
	Replacement Features	$180M
	Science Plan	$ 55M
	Source Controls	$ 30M
	Total	**$880M**

Key Projects
Construction Schedule

Key Projects
Construction Schedule

2012-2016

- Eastern Flow-Path: 45,000 acre-foot Flow Equalization Basin
- Central Flow-Path: 54,000 acre-foot Flow Equalization Basin



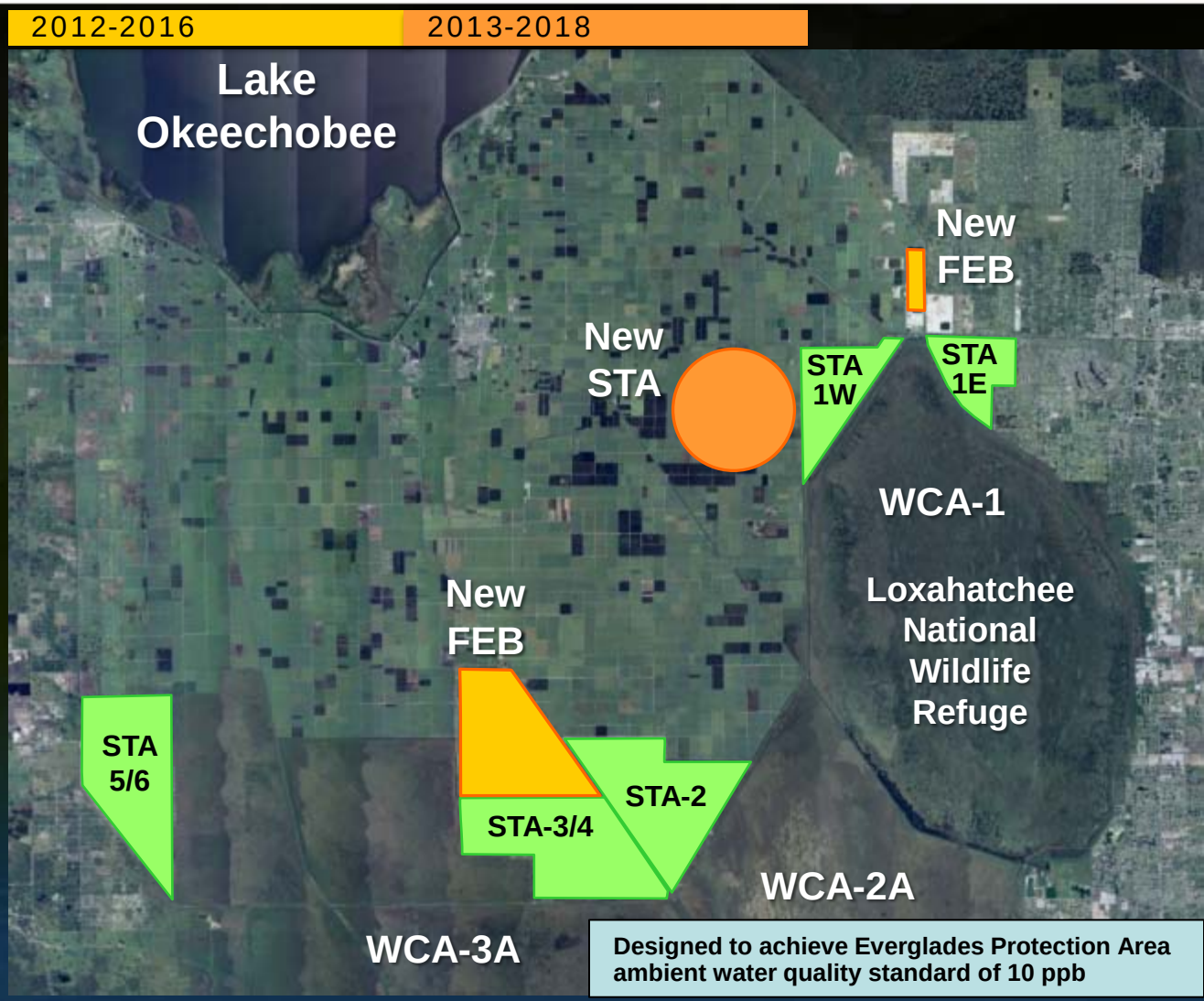
Key Projects
Construction Schedule

2012-2016

- Eastern Flow-Path: 45,000 acre-foot Flow Equalization Basin
- Central Flow-Path: 54,000 acre-foot Flow Equalization Basin

2013-2018

- Eastern Flow-Path: 4,700 acres of Stormwater Treatment Area (STA)



Key Projects
Construction Schedule

2012-2016

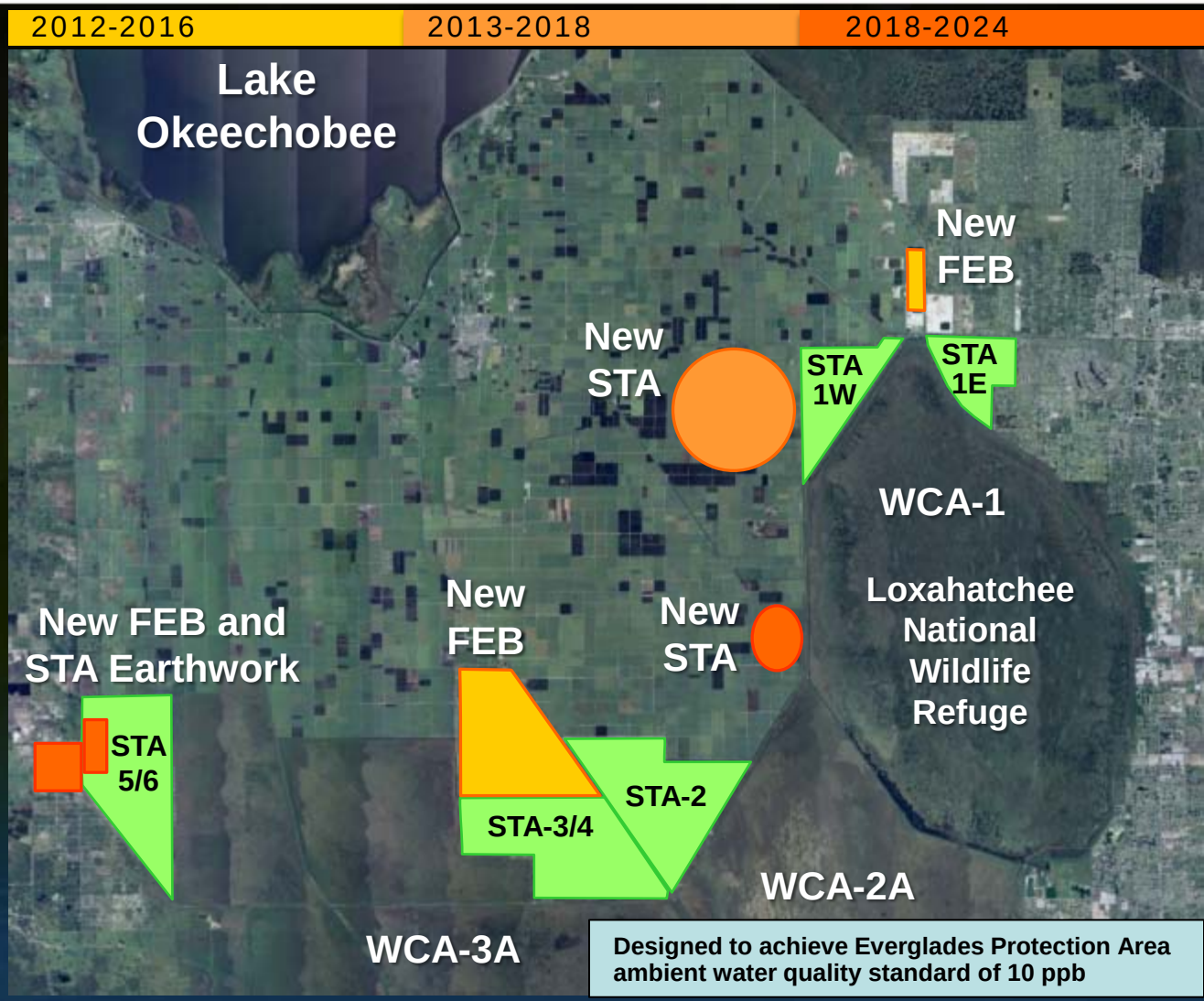
- Eastern Flow-Path: 45,000 acre-foot Flow Equalization Basin
- Central Flow-Path: 54,000 acre-foot Flow Equalization Basin

2013-2018

- Eastern Flow-Path: 4,700 acres of Stormwater Treatment Area (STA)

2018-2024

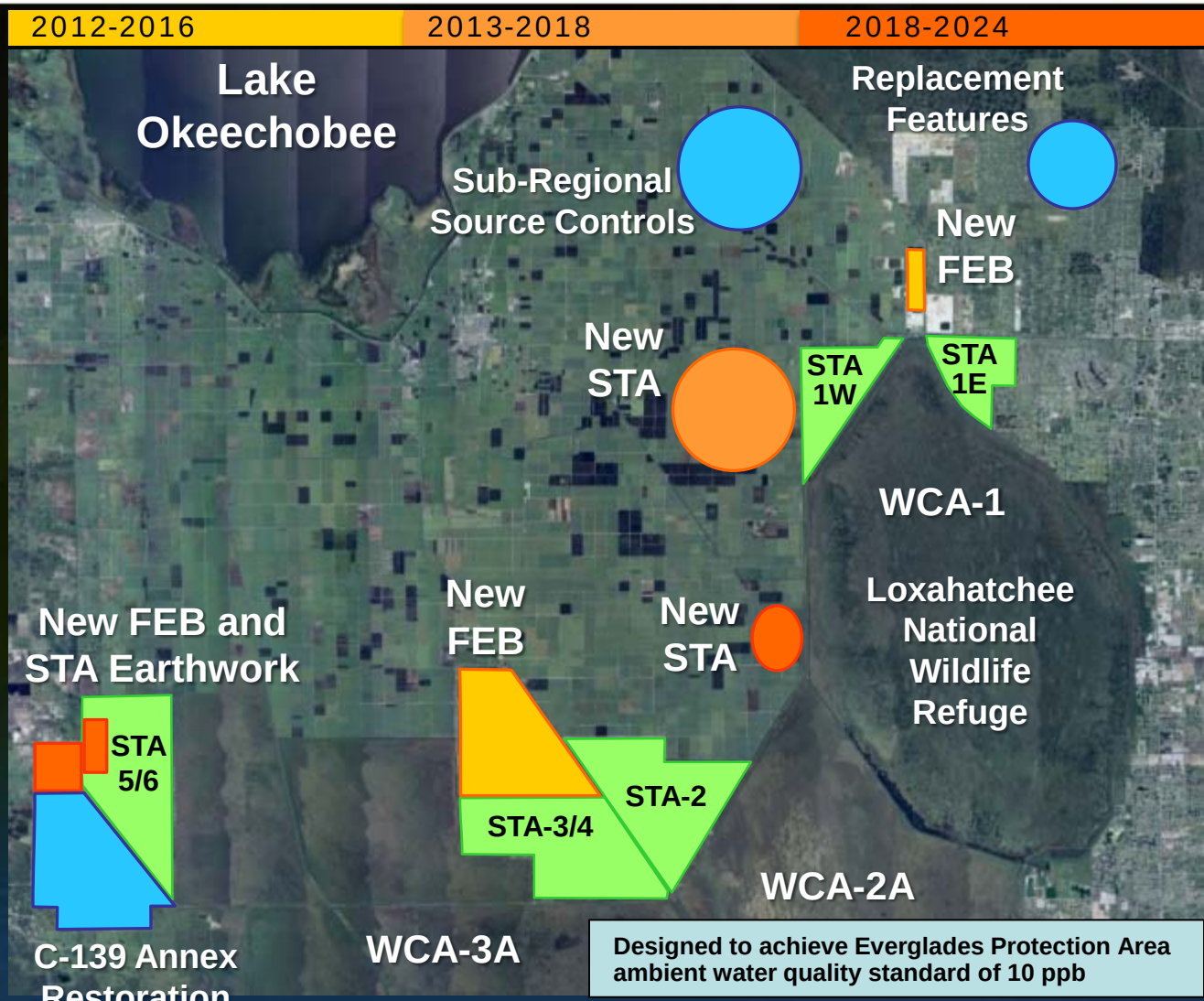
- Eastern Flow-Path: 1,800 acres of STA (*2018-2022*)
- Western Flow-Path: 11,000 acre-foot Flow Equalization Basin (*2018-2023*)
- Western Flow-Path: 800 acres of earthwork within existing STAs to maximize effective treatment area (*2019-2024*)



Key Projects
Construction Schedule

Summary

- **Storage and Treatment Facilities** *(2012-2024)*
  - 6,500 acres of Stormwater Treatment Area (STA)
  - 110,000 acre-feet of shallow storage (Flow Equalization Basins)
  - 800 acres of earthwork within existing STAs to maximize effective treatment area
- **Sub-Regional Source Controls** *(2015 – 2020)*
- **Replacement Features**
  - Phase 1 *(2015 – 2020)*
  - Phase 2 *(2019 – 2024)*
- **C-139 Annex Restoration Mitigation Project** *(2014-2018)*



Next Steps

Next Steps

- Move forward with key projects and additional components (L-8 Request for Proposals, Central FEB design, C-139 Annex project, replacement storage)
- DEP to submit revised permits and consent orders to USEPA by June 6
  - DEP issues “Notice of Draft”
  - USEPA has up to 30 days to object
  - DEP issues “Notice of Intent to Issue”
- Key Legal Dates
  - Notice to federal courts
  - Status Conference with Special Master (June 25)
  - USA case abated until July 2

Governing Board Discussion