SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Everglades Restoration Strategies Overview

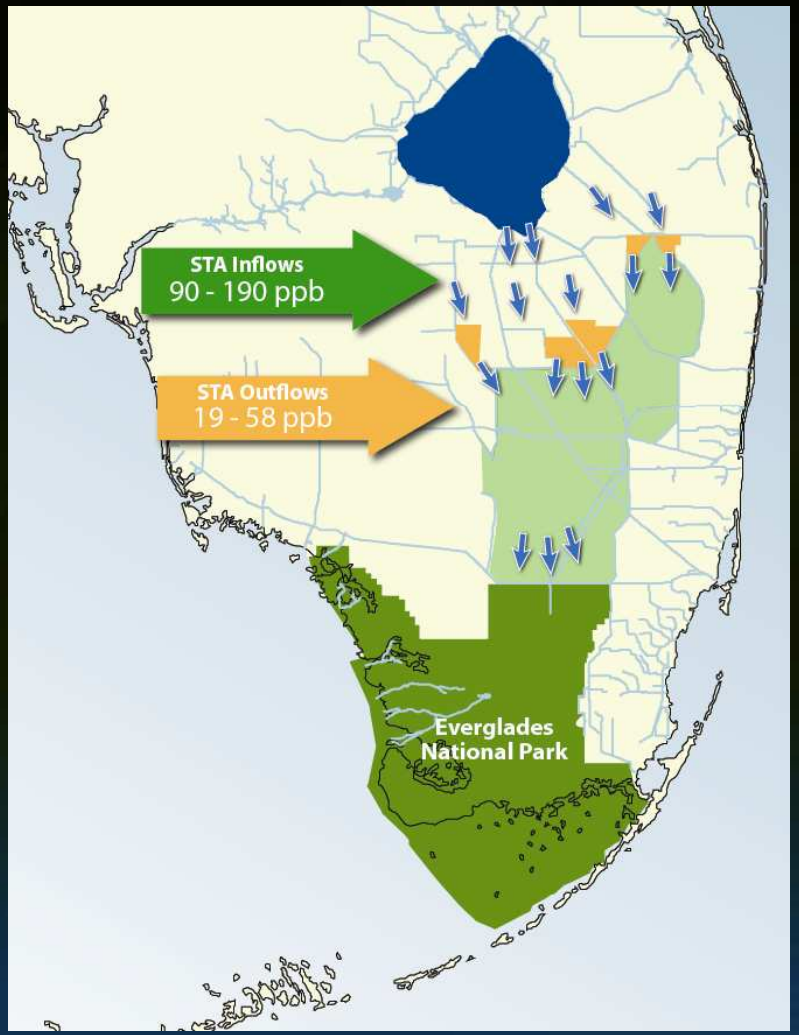
Quarterly Communications Meeting on the Long-Term Plan for Achieving Water Quality Goals for Everglades Protection Area Tributary Basins
August 22, 2012

Temperince Morgan
State Policy Chief

sfwmd.gov

Everglades Water Quality
Performance To Date

- 5 Stormwater Treatment Areas
- 57,000 acres of effective treatment
- 12,300,000 acre-feet (4.0 trillion gallons) of water treated
- 1,560 Metric Tons of phosphorus removed
- Total phosphorus discharge concentrations for best performing STA (3/4) is 18 ppb for period of record



Water Quality
Background & Status

- **September 3, 2010: EPA issues "Amended Determination"**
  - Proposes Water Quality Based Effluent Limit (WQBEL) and new projects
  - Invites alternative proposals from District
- **2011 to Date**: Ongoing dialogue with USEPA
  - Development of a technical plan, including:
    - WQBEL
    - 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

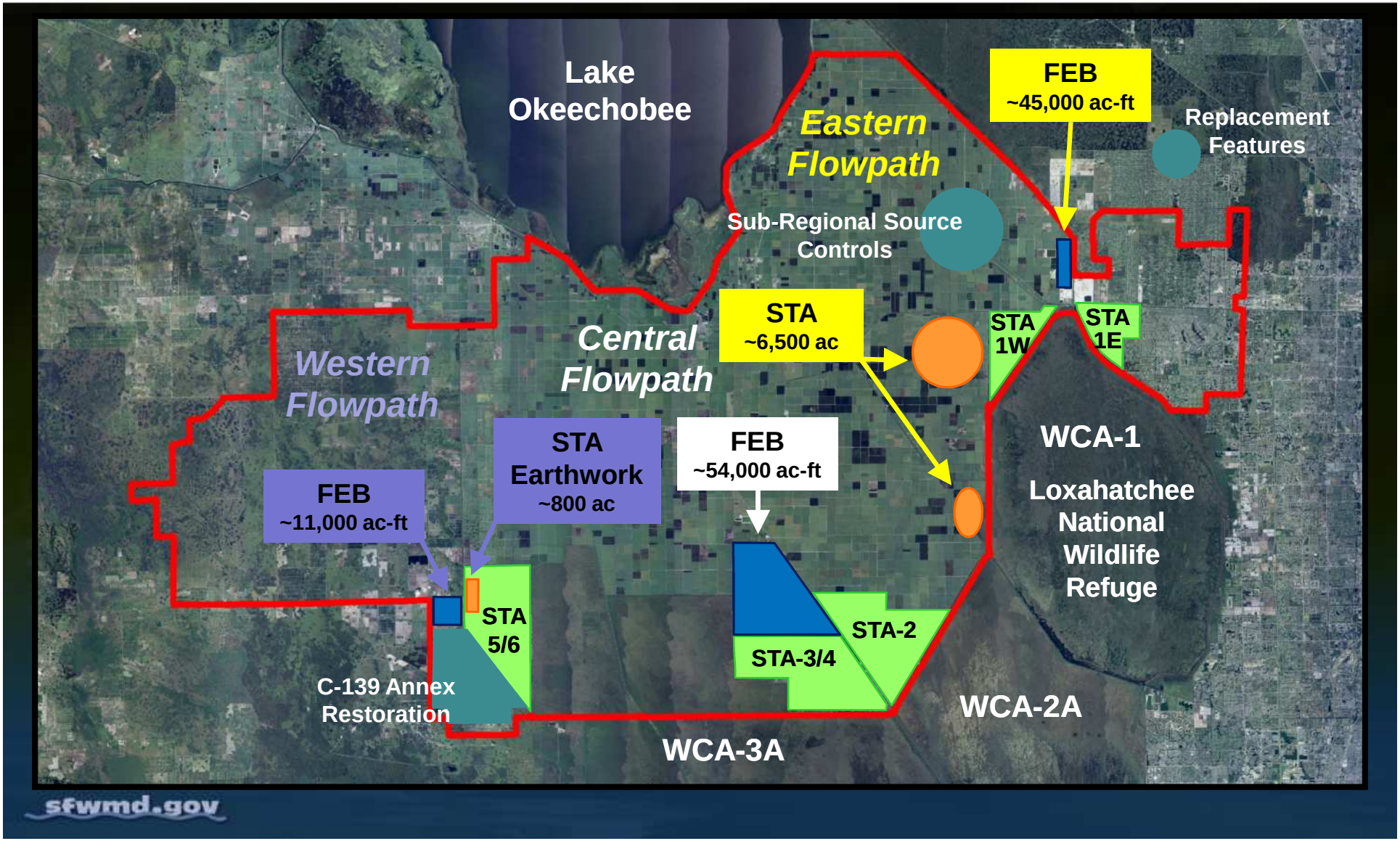
Technical Plan
Water Quality Based Effluent Limit

- Existing Phosphorus Criterion for Everglades Protection Area
  - 10 parts per billion (ppb) measured as a long-term geometric mean in the marsh
  - 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
  - Proposed phosphorus WQBEL consists of two parts, neither of which can be exceeded:
    - 13 parts per billion (ppb) as an annual flow-weighted mean concentration in more than three out of five years (long-term limit)
    - 19 ppb as an annual flow-weighted mean concentration (annual maximum limit)

Water Quality
Key Projects

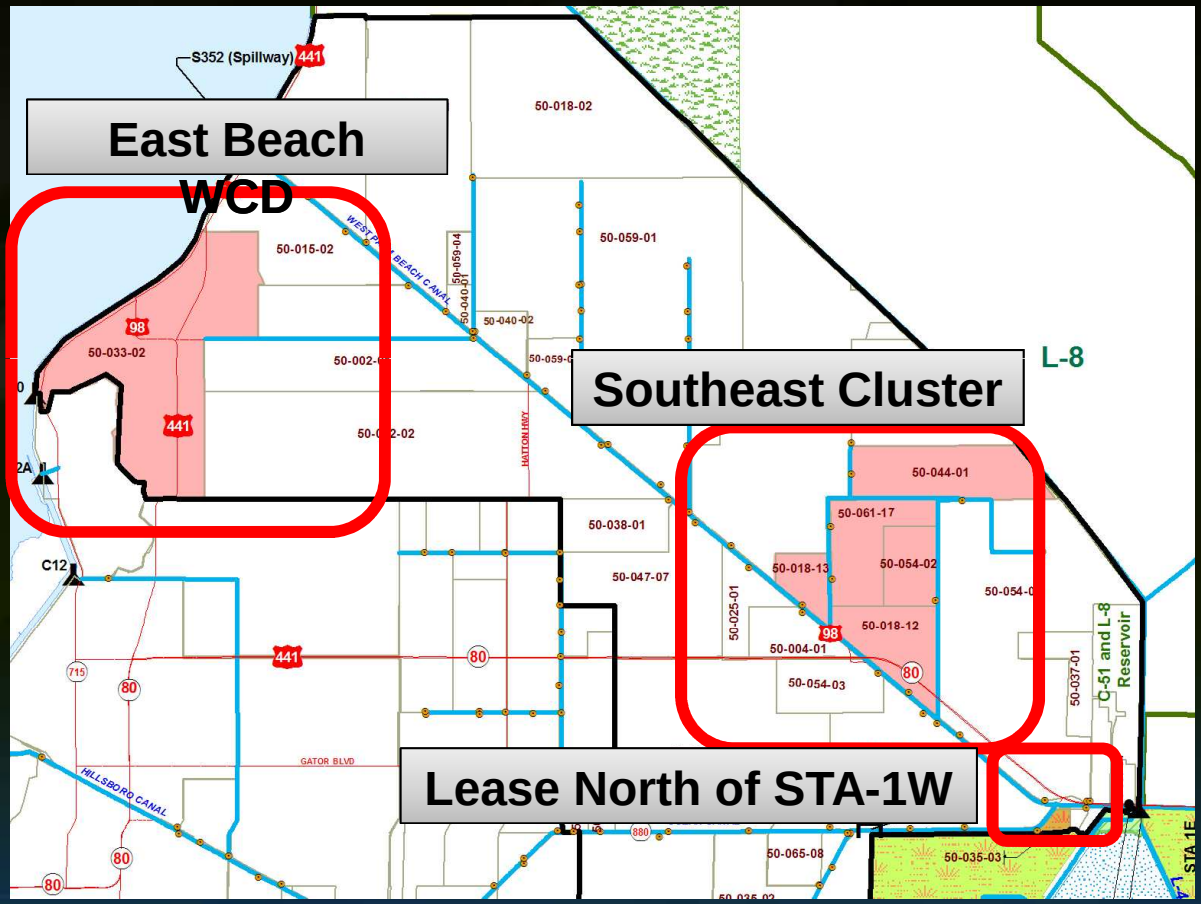
- Proposed projects developed to meet WQBEL
  - More than 100 modeling simulations
- Project Types
  - STA expansions
  - Flow equalization basins (FEBs)
- Additional Components
  - Sub-regional source controls
  - Habitat restoration

Proposed Projects – May 2012



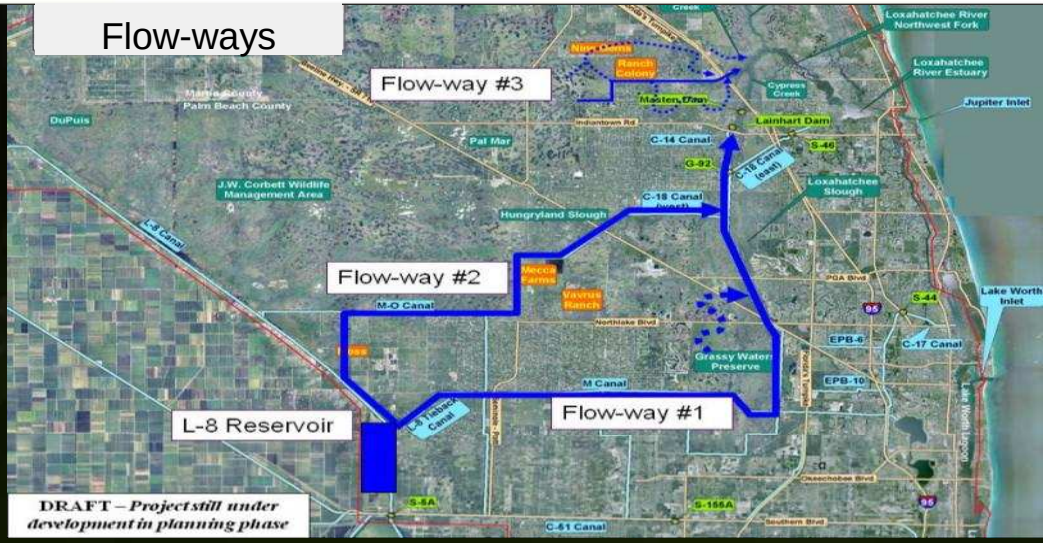
Additional Components
Sub-regional Source Controls

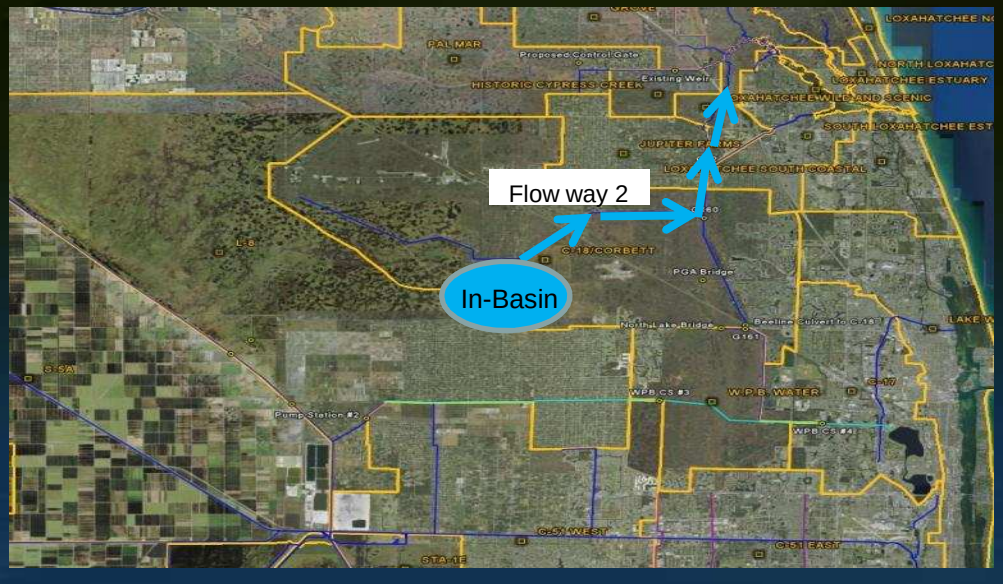
- Identify opportunities for additional cost effective sub-regional source control projects in S5A Sub-Basin to reduce total phosphorus inputs to STA-1 West & 1 East
- Considerations - water quality, willing participants, proximity/impact on STAs
- Three conceptual projects
  - Increase retention
  -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



Replacement Features
Loxahatchee River Watershed Restoration

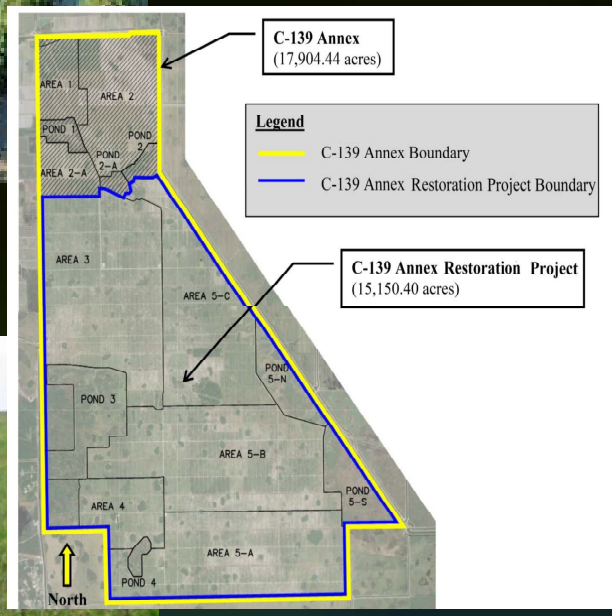
- CERP Project
  - Designed to capture, store and treat excess water that is currently discharged to the Lake Worth Lagoon and use that water to enhance the Loxahatchee River and Slough
  - MFL recovery plan for River
- Utilize L-8 reservoir as Restoration Strategies Flow Equalization Basin
- Acquire 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
  - Land negotiations with Palm Beach County underway





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



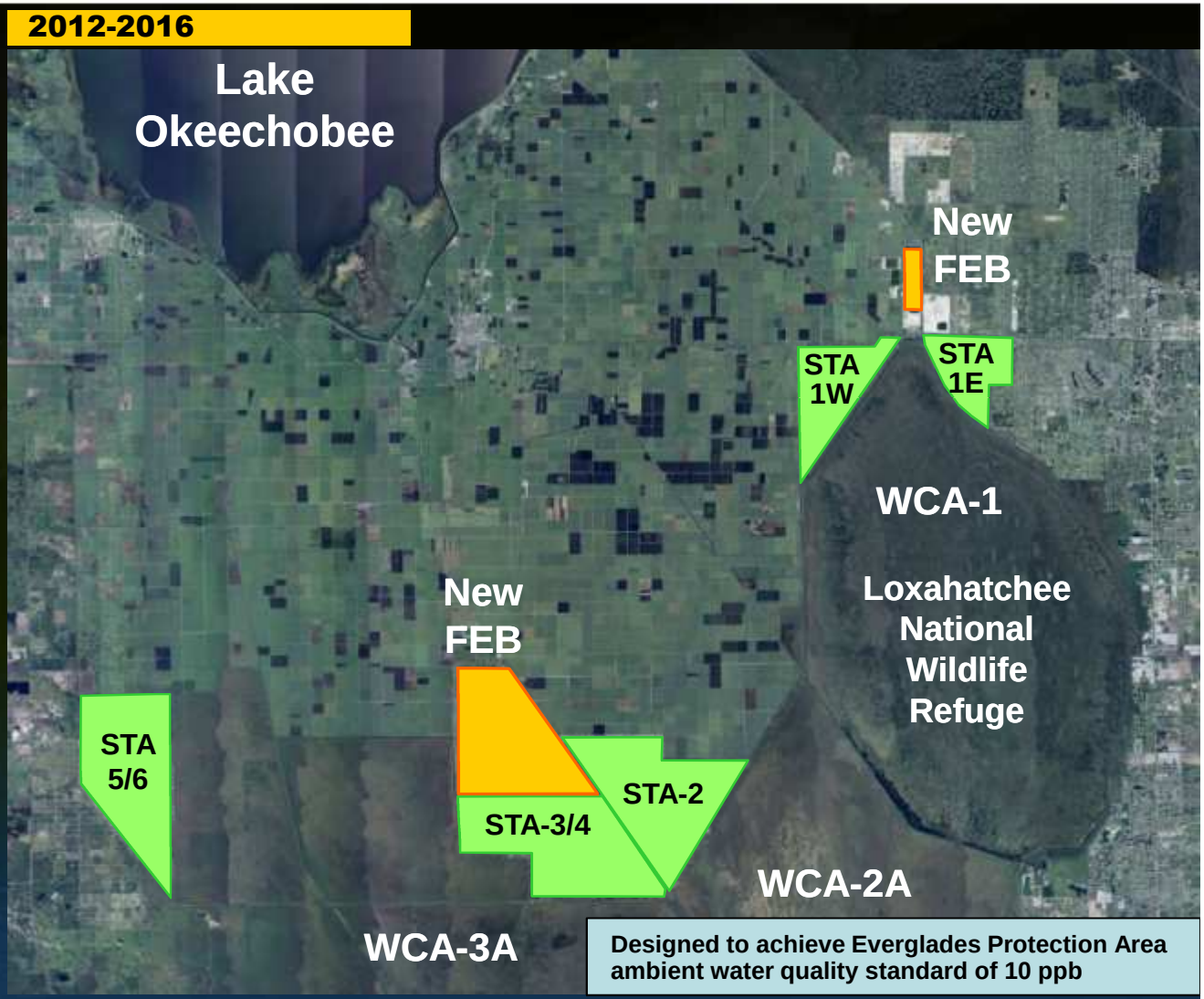
Key Projects
Science Plan

- 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

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

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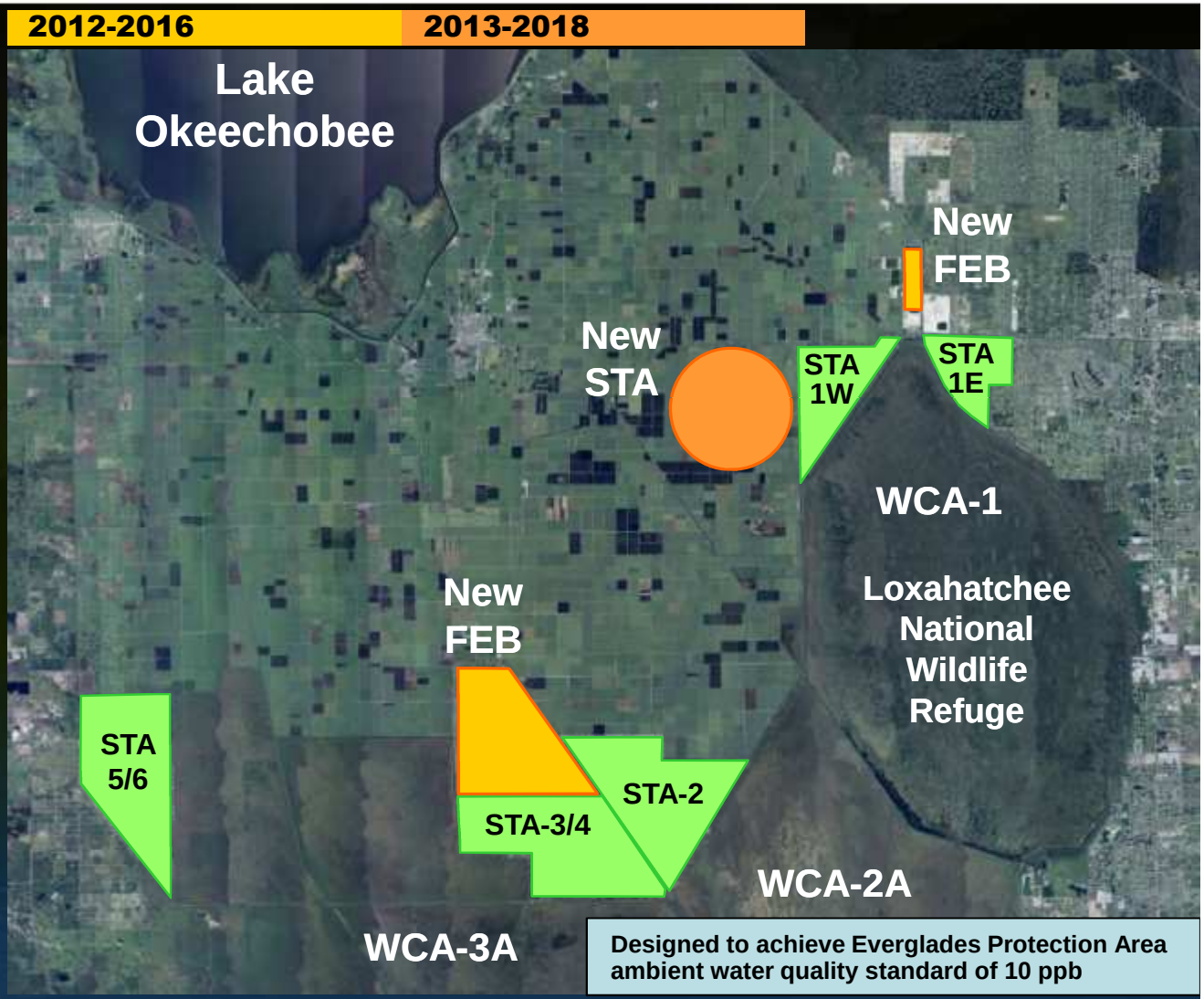
2013-2018

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



Key Projects
Construction Schedule

2012-2016

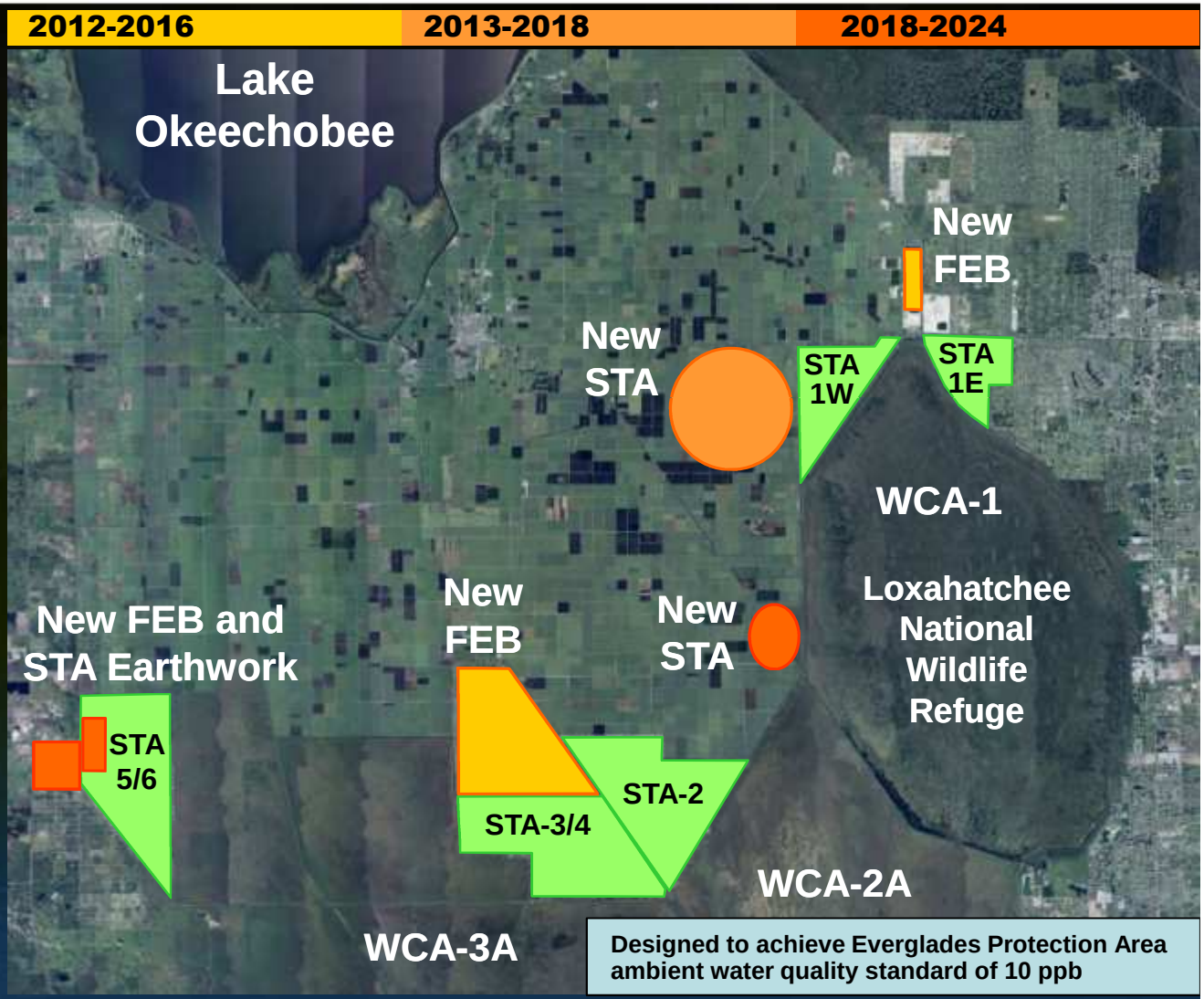
- Eastern Flow-Path: 45,000 acre-foot Flow Equalization Basin
- Central Flow-Path: 54,000 acre-foot Flow Equalization Basin

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*)



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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)*

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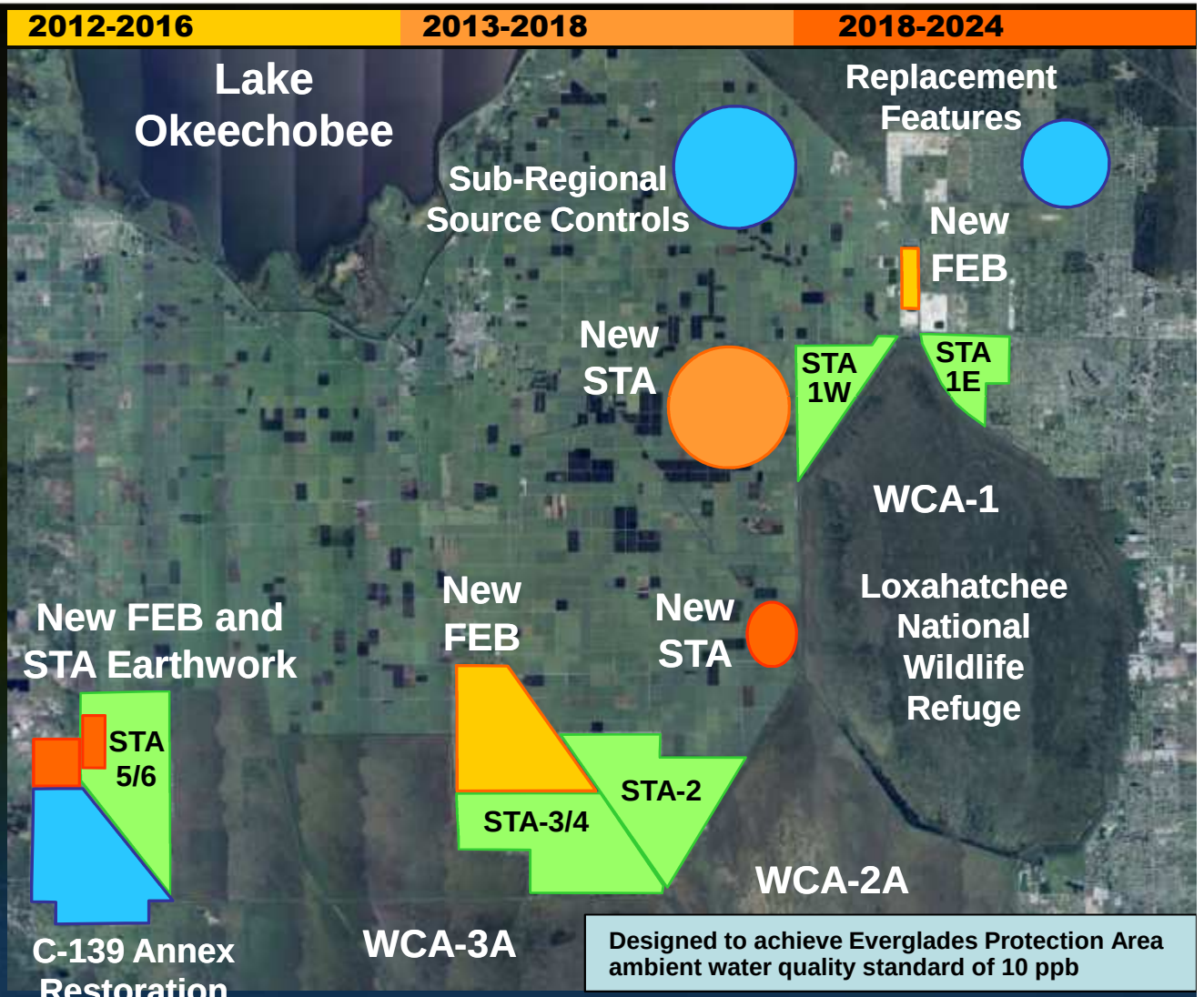


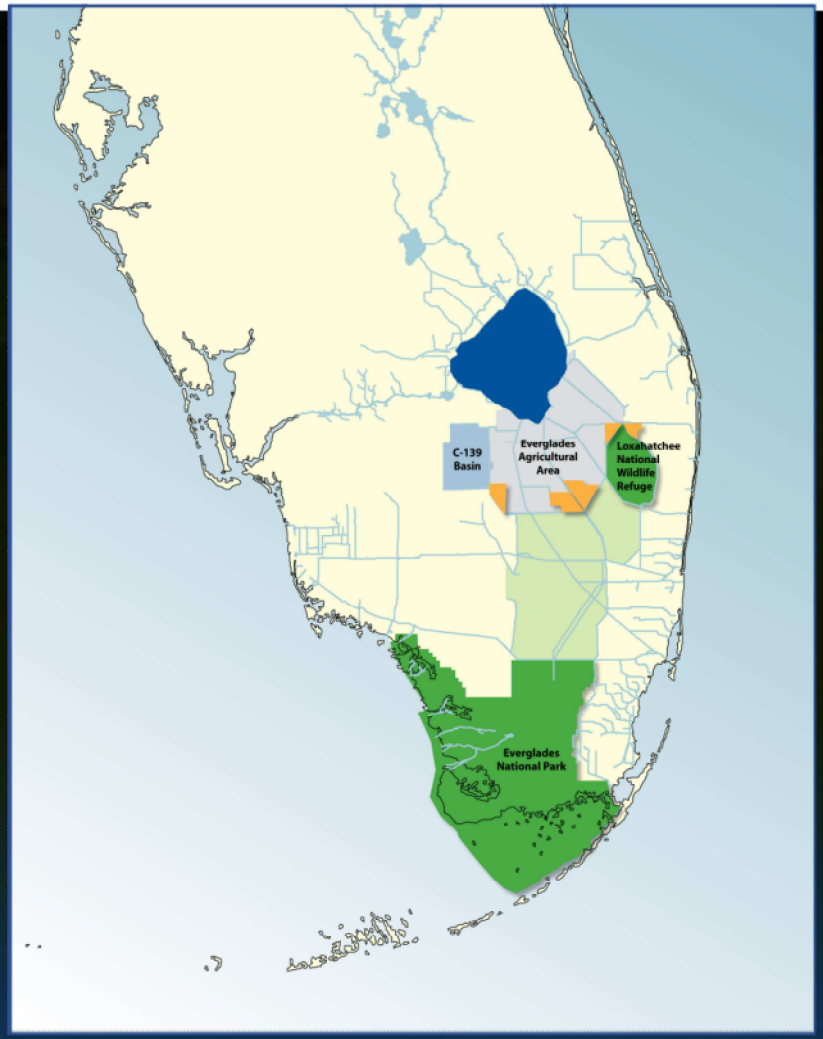
Next Steps

- Proceed with administrative process for permit issuance (notice of draft permits, notice of intent)
- Move forward with key projects and additional components (L-8 Request for Proposals, Central FEB design, C-139 Annex project, replacement storage)
- Obtain construction permits for initial phase of features (A-1 and L-8 FEBs)

Questions?

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



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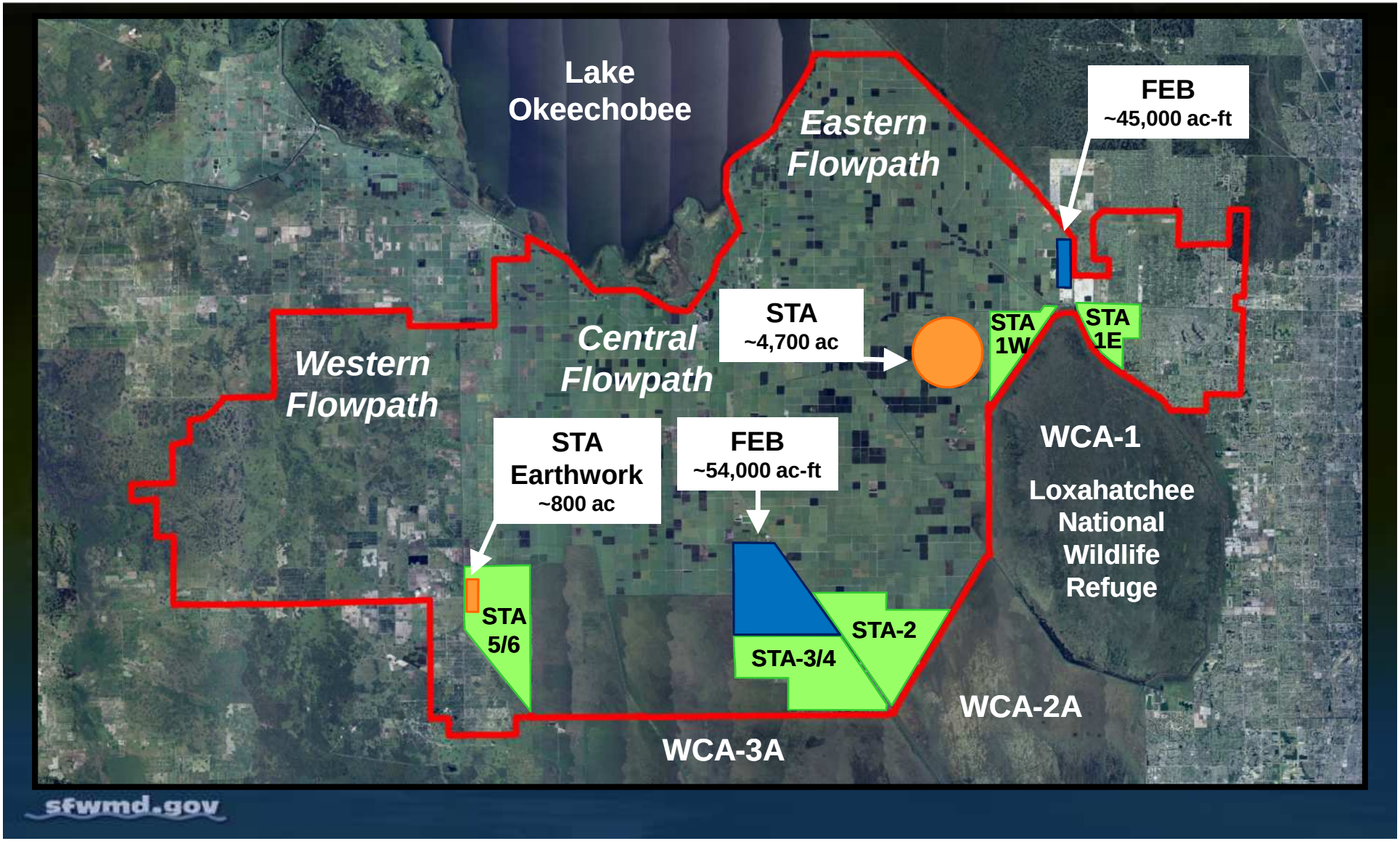
Key Projects
State Proposal – October 2011



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**