



# Everglades Restoration Strategies

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# Today's Presentation

- **Everglades Water Quality**
  - Background
  - Technical Analysis
  - Regulatory Package
  - Funding
  - Next Steps
  - Governing Board Discussion



# Background

# Water Quality Background

- **2004:** Miccosukee Tribe sues U.S. Environmental Protection Agency (EPA) claiming Everglades Forever Act amendments violate Clean Water Act (Judge Gold)
- **July 2008:** Judge Alan Gold agrees with Tribe
  - Enjoins DEP from issuing new NPDES permits with moderating provisions and compliance schedules
  - Orders EPA to conduct a review of 2003 Everglades Forever Act amendments and Phosphorus Rule to determine if they comply with Clean Water Act (a "Determination Letter")

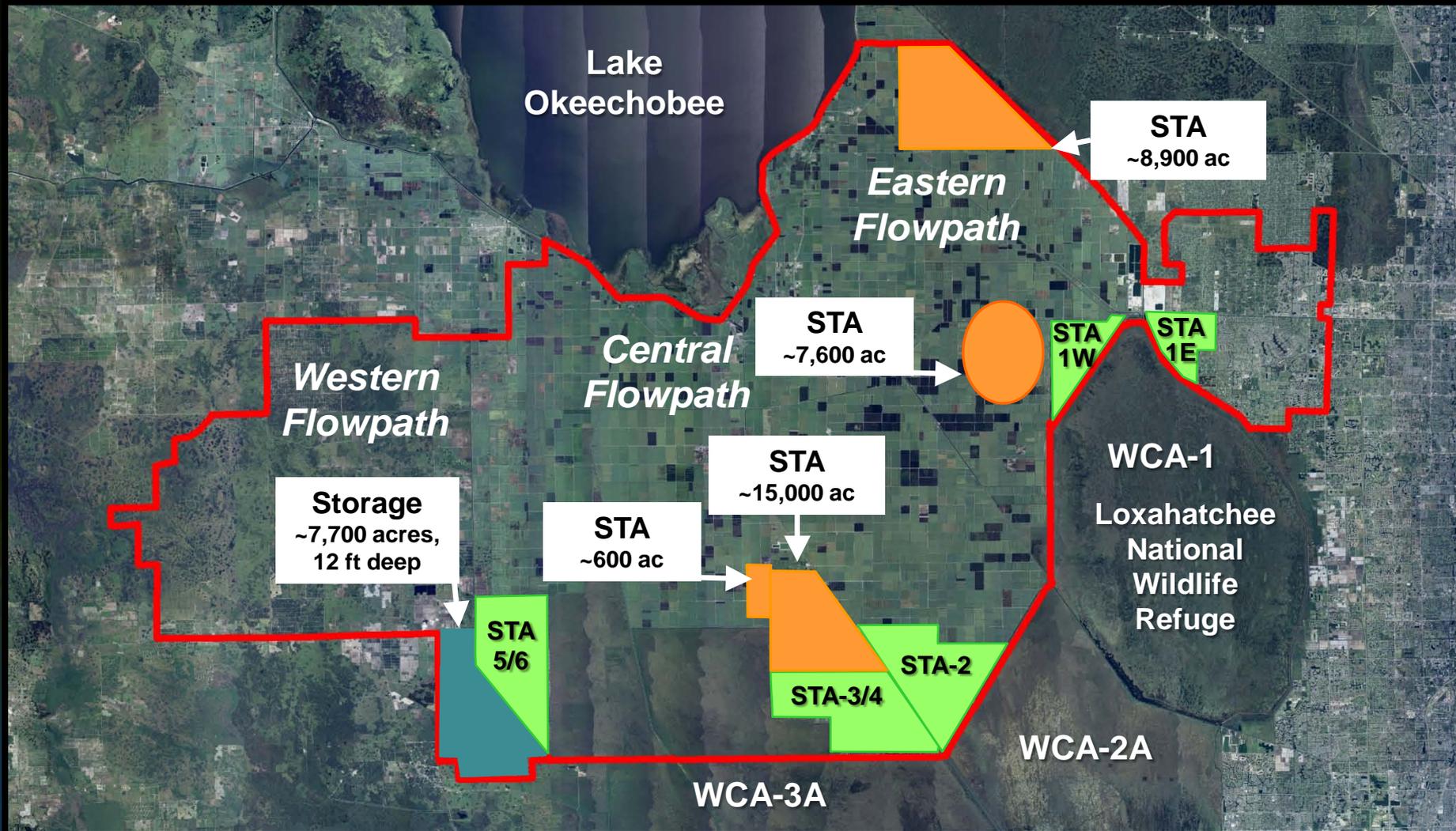


# Water Quality Background (continued)

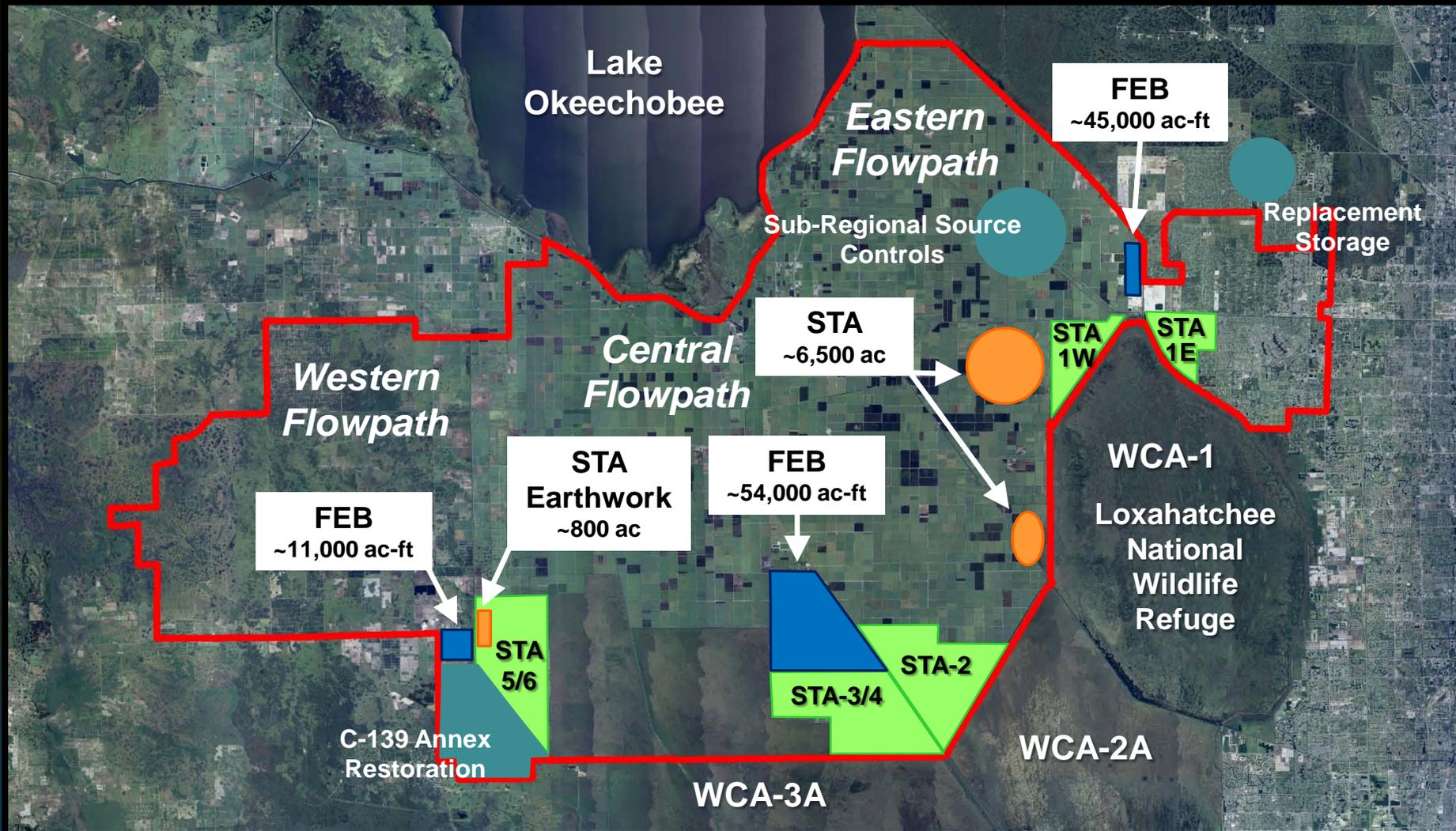
- **September 2010:** EPA issues “Amended Determination”
  - Proposes water quality-based effluent limits (WQBEL) for Stormwater Treatment Area discharges
  - Proposes to expand STAs by an additional 33,700 acres and build 7,700-acre Flow Equalization Basin (FEB) by 2018
  - Invites alternative proposals
- **October 2011:** Governor Scott meets with federal principals and proposes comprehensive, feasible approach for achieving water quality standards with suite of projects and state-issued permits
- **June 2012:** FDEP and District, in consultation with EPA, finalize alternative plan
- **July 2012:** Judge Gold issues Order allowing FDEP to issue NPDES permits with WQBEL under USEPA Memorandum of Agreement for discharges to the Everglades Protection Area



# EPA Proposal Amended Determination – Sept. 2010



# Final State Proposal Key Projects & Additional Components



# Amended Determination v. Final Plan Estimated Project Costs

Flow Path	Amended Determination Projects (Sept. 2010)		Final Projects (June 2012)	
	Eastern Flow Path	STAs	\$900M	FEB & STAs
Central Flow Path	STAs	\$500M	FEB	\$120M
Western Flow Path	FEB	\$500M	FEB & Earthwork	\$130M
			Replacement Features	\$180M
			Science Plan	\$ 55M
			Source Controls	\$ 30M
	<b>Total*</b>	<b>\$1.9B</b>		<b>\$880M</b>

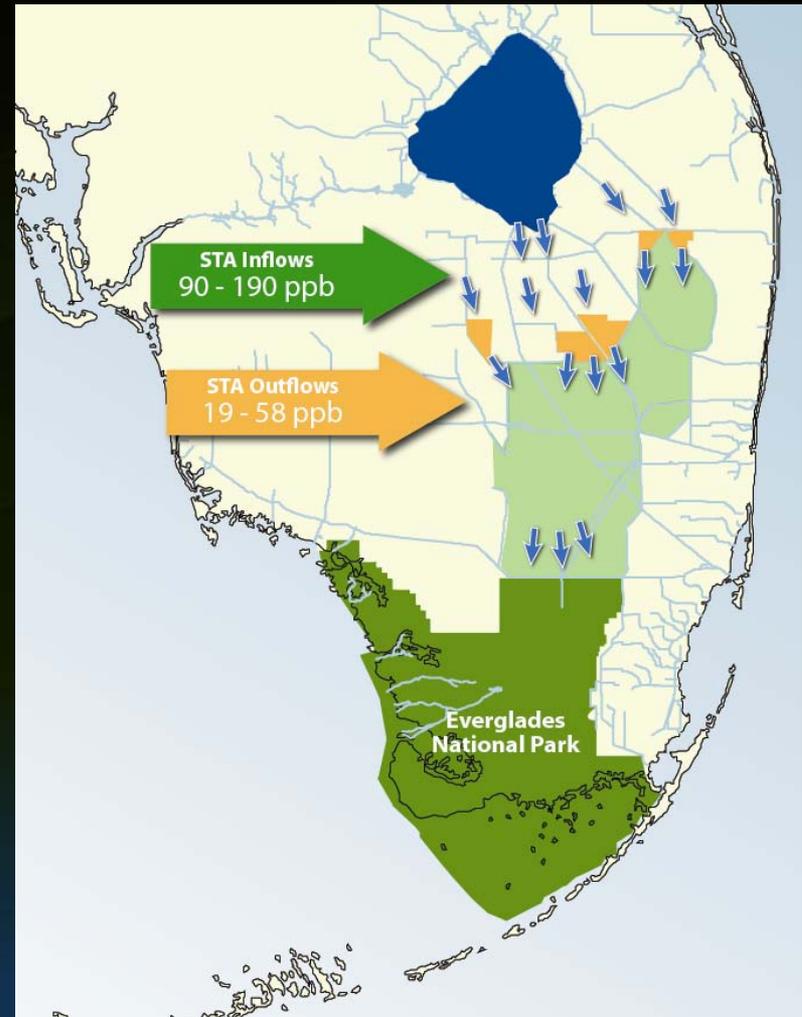
\*totals do not include sunk costs



# Technical Analysis

# 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



# Technical Analysis Key Projects

- Projects developed to meet discharge limit necessary to achieve 10 parts per billion long-term geometric mean for total phosphorus ambient water quality criterion established in rule for Everglades Protection Area
- Project Types
  - STA expansions
  - Flow equalization basins (FEBs)
- Technical Analysis
  - More than 100 modeling simulations
  - Analyzed pulse flow effect on STAs; performance improvements provided by FEBs

# Technical Analysis

## Improving STA Performance Using FEBs

- STAs rely on physical, biological and microbial processes to reduce phosphorus concentrations
- Performance of existing STAs affected by variety of factors:
  - vegetation type
  - inflow water quality
  - hydraulic loading
  - intensity, duration and timing of flow events
    - STA-3/4: avg. daily flow of 1,450 cfs; Max. of 6,500 cfs
    - STA-6: >160 days per year of extended periods of dry-out



Dryout of STA-1E Cell 5 in 2009



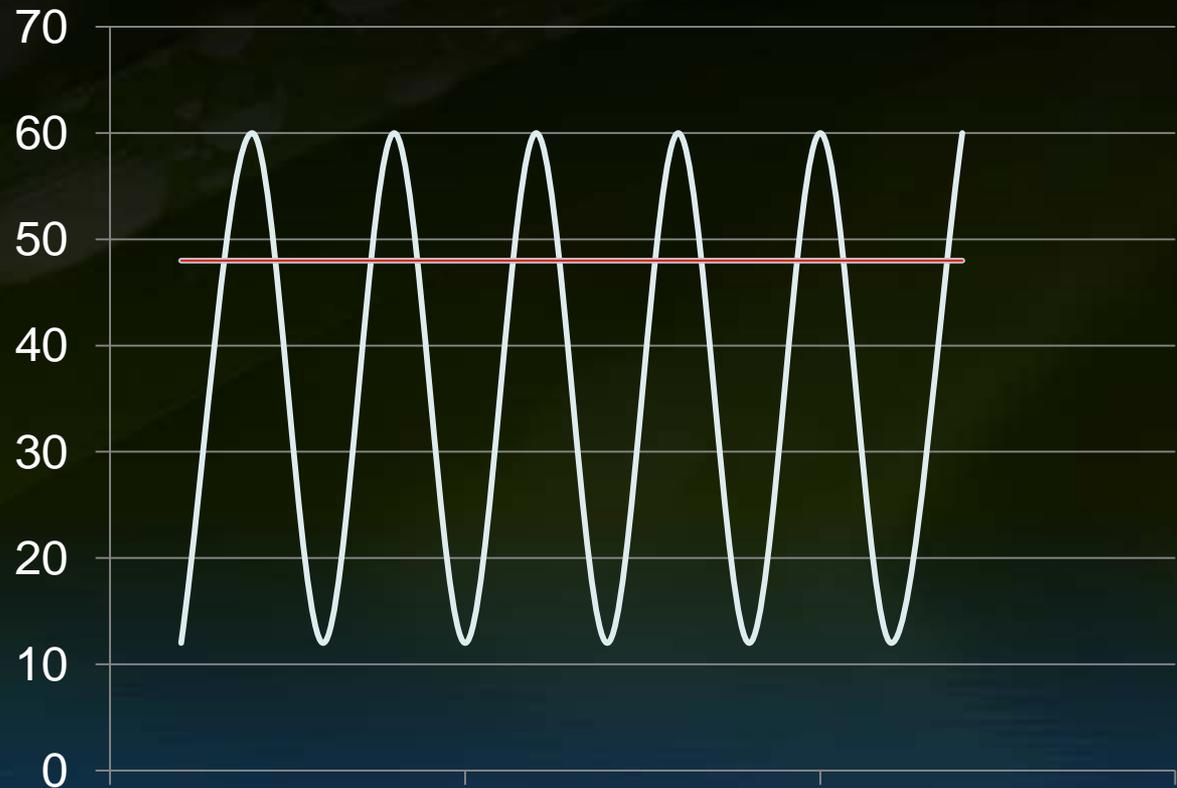
Cattail stress from high water levels

# Technical Analysis

## Improving STA Performance Using FEBs

- Existing STAs experience pulse stormwater flows
- Pulse flows identified as a significant factor affecting STA treatment performance

### Pulse Flow

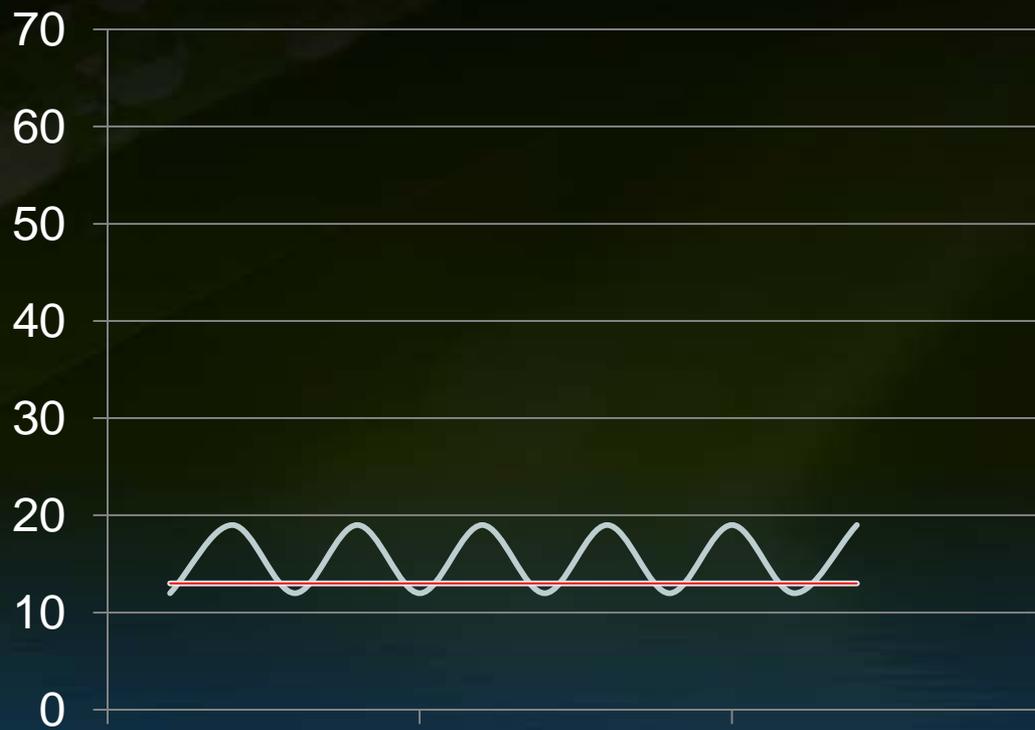


# Technical Analysis

## Improving STA Performance Using FEBs

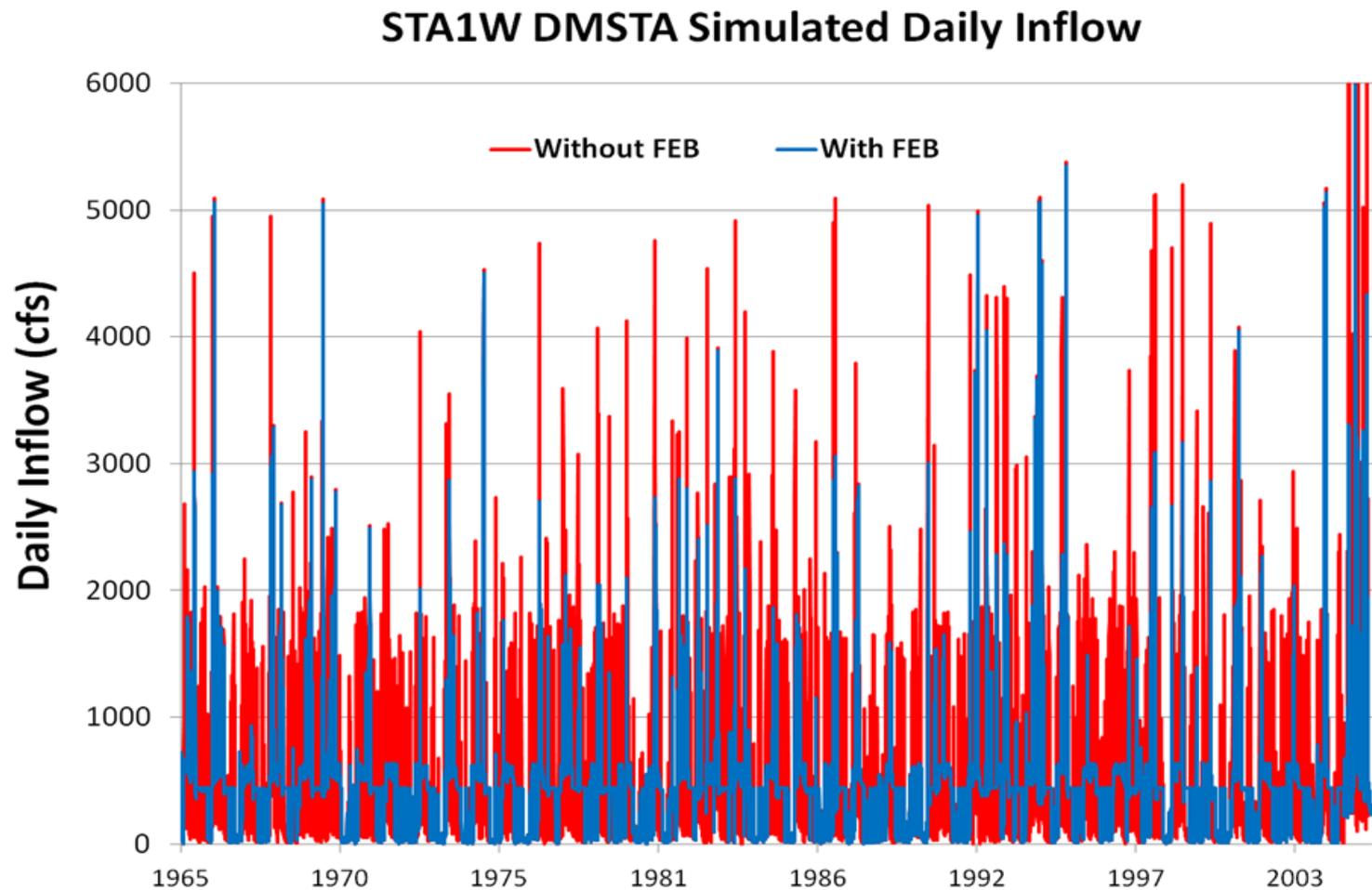
- STAs remove more phosphorus when they receive less variable flows and do not experience dry-out periods
- With an FEB upstream, analysis shows STA experiences more stable stormwater flows

### Steady Flow



# Technical Analysis

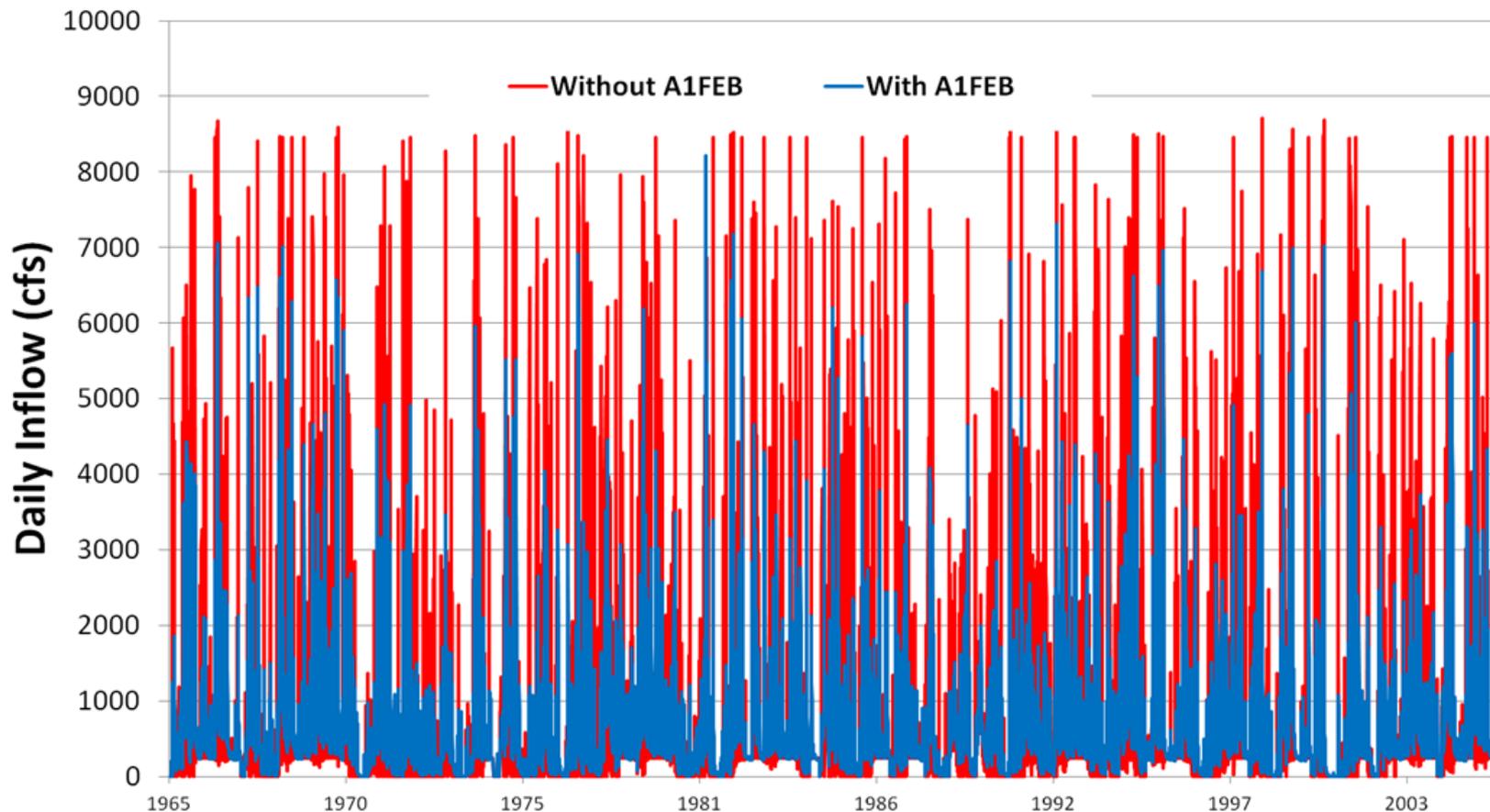
## STA 1-West with L-8 FEB flows



# Technical Analysis

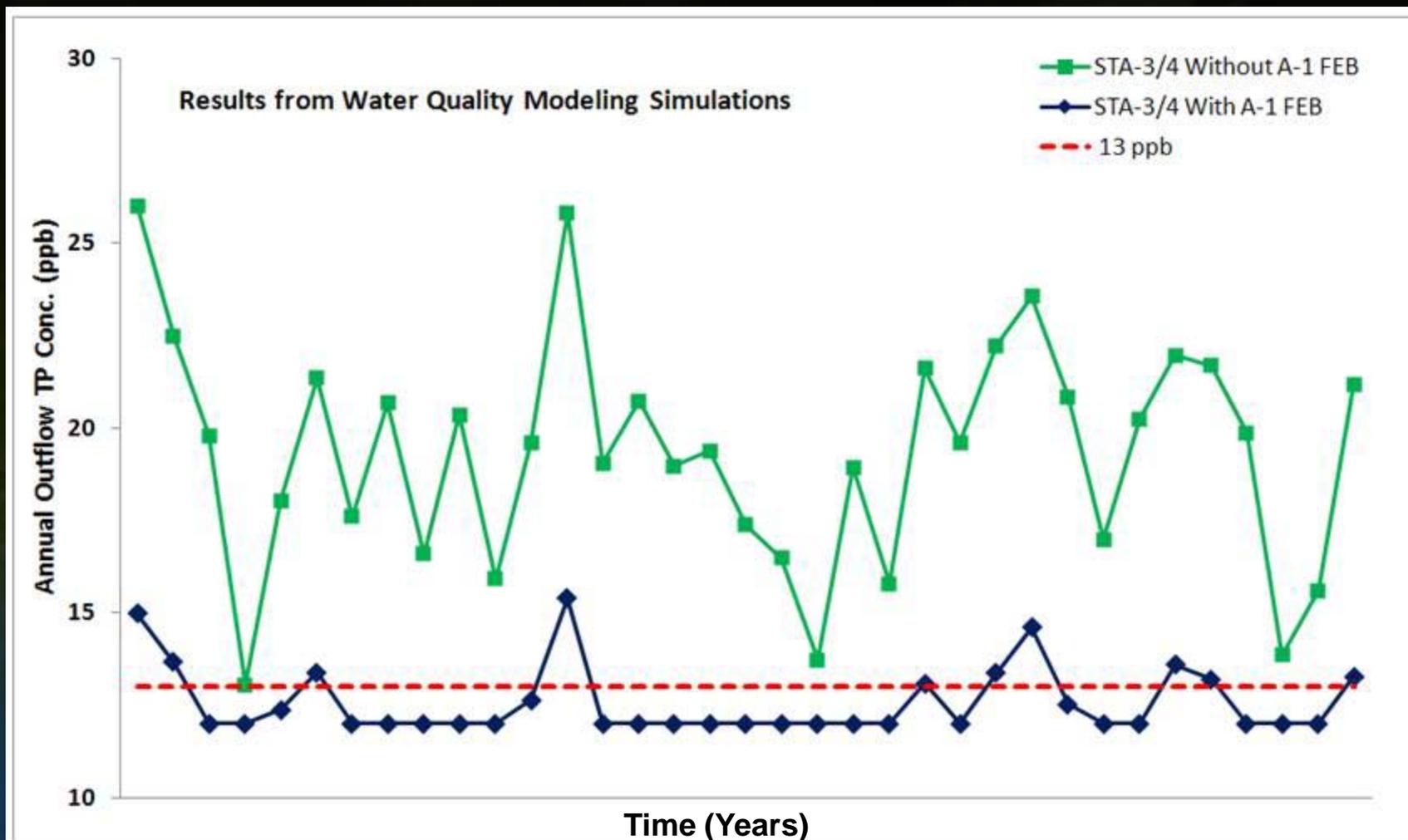
## STA 3/4 with A1 FEB flows

### STA 3/4 DMSTA Simulated Daily Inflow



# Technical Analysis

## STA Performance with FEB



# Technical Analysis

## Summary of FEB Benefits

- Provides supplemental source of water and reduces STA dryout
  - Frequency of STA-3/4 water depths below 20 cm are projected to decrease by 50% once the A-1 FEB is constructed
- Additional water quality improvement within FEB
  - Shallow FEBs, like A-1 FEB, contain emergent vegetation which reduces the phosphorus concentrations prior to going into an STA
  - Potentially 30-40% TP concentration reduction
  - Deep FEBs may provide minimal level of phosphorus reduction
- Reduces total footprint needed to achieve WQBEL
  - Eastern flowpath with FEB = 7,450 total acres
  - Eastern flowpath without FEB = 15,000 total acres
- Reduces construction, operations & maintenance, and monitoring costs



# Regulatory Package

# Regulatory Framework

- State-Issued Permits and Consent Orders:
  - Everglades Forever Act (EFA) Permit
  - EFA Consent Order
  - National Pollutant Discharge Elimination System (NPDES) Permit
  - NPDES Consent Order
- Each document covers the entire watershed including eastern, central, and western flow-paths
- Restoration Framework Agreement between USEPA and FDEP

# Regulatory Framework

## Permits

### ■ Permits:

- Authorize operation, maintenance and construction of existing STAs (including Compartments B and C)
- Include WQBEL
- Require STA compliance monitoring and reporting

# Regulatory Framework

## Consent Orders

- **New Projects & Milestones** – Consent Orders and permits identify new projects for construction and associated implementation schedule; contain a series of compliance actions and dates by which they must be achieved (e.g. initiate design; complete construction, etc.)
  - Consent Orders recognize that WQBEL will be achieved when all compliance actions (captured in the milestones) are complete
- **Interim Targets/Performance** – Consent Orders require that phosphorus concentration reductions be maximized while compliance actions are underway; requires District to consult with DEP and EPA on a semi-annual basis to evaluate STA performance

# Regulatory Framework

## Consent Orders

- **Science Plan** – Requires research regarding STA and FEB performance, factors effecting phosphorus reduction
- **Consent** – Any material change to permits or Consent Orders would require District consent
- **Consent Orders** – applicable until last milestone is complete for all flow-paths
  - Eastern Flow-path - 2024
  - Central Flow-path - 2024
  - Western Flow-path – 2025



# Funding Strategy

# Funding Three-Part Strategy

- **Three-Part Strategy:**
  - Cash Reserves
  - Ad Valorem Revenue
  - State Appropriations
- **Requires no new taxes**
  - District has lowered taxes by >30% over the last 2 years
- **Cash Reserves**
  - ~\$220 million identified for water quality remedies
    - Represents 50% of total “Spend Down” of cash reserves

# Funding Three-Part Strategy

## ■ Ad Valorem Revenue

- New ad valorem revenues from increased property values resulting from new construction
- **New construction estimates in the plan:**
  - 1.0% increase in new construction value FY2014-2017
  - 1.5% increase in new construction value FY2018-2025
- **16-year historical trend: 2.74% in annual new construction**
- **Economic and Demographic Research estimates:**
  - FY2014-FY2017: 1.08% to 1.71%
  - FY2018-FY2020: 2.09% to 2.70%
- **Generates estimated revenues of ~\$290 million**

# Funding Three-Part Strategy

## ■ State Appropriations

- **Maximum annual appropriation request of \$32 million**
- **Annual appropriation request sized to:**
  - Meet ongoing project funding needs
  - Accumulate funds for years with high cash-flow needs
  - Account for current state and national economic conditions
- **Consistent annual state appropriation**
  - Aids long-term budgetary planning
  - Increases fiscal certainty
- **Appropriations >\$32M/year available for other restoration efforts**



# Next Steps

# Next Steps

- Move forward with key projects and additional components (L-8 Request for Proposals, Central FEB design, C-139 Annex restoration, replacement features)
- Execute Consent Orders
- Notice of Intent to Issue NPDES Permit
  - Material changes resulting from administrative process, if any, subject to review by the Governing Board
- Final permit issued 21 days subsequent to publication of the Notice of Intent to Issue



# Governing Board Discussion

# DRAFT Governing Board Resolution

A Resolution of the Governing Board of the South Florida Water Management District approving, subject to Governing Board review in the event of material changes during the Chapter 120 process, draft Everglades Forever Act and National Pollutant Discharge Elimination System permits and Consent Orders from the Florida Department of Environmental Protection authorizing discharges from the Everglades Stormwater Treatment Areas; directing the Executive Director to execute the Consent Orders; and providing an effective date.