

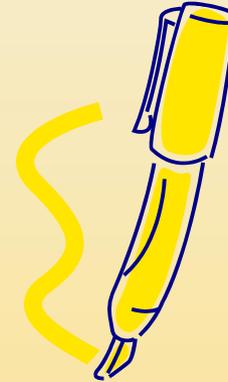


Overview of South Florida Water Management District Source Control Programs Overview

Pamela Wade, PE, Bureau Chief
Everglades Regulation
March 15, 2012, Governing Board Meeting

Presentation Highlights

- Benefits
- Coordinated Efforts
- Essential Components
- Status of the District's Source Control Programs in the Southern and Northern Everglades Watersheds



What are Pollutant Source Controls?



Pollutants:

Phosphorus & Nitrogen

Sources:

Point

Non-point

Controls:

Minimizing pollutant outputs

Managing transport of pollutants

Water Quality Restoration Strategies

**Stormwater Projects
Sub-Regional and Regional**



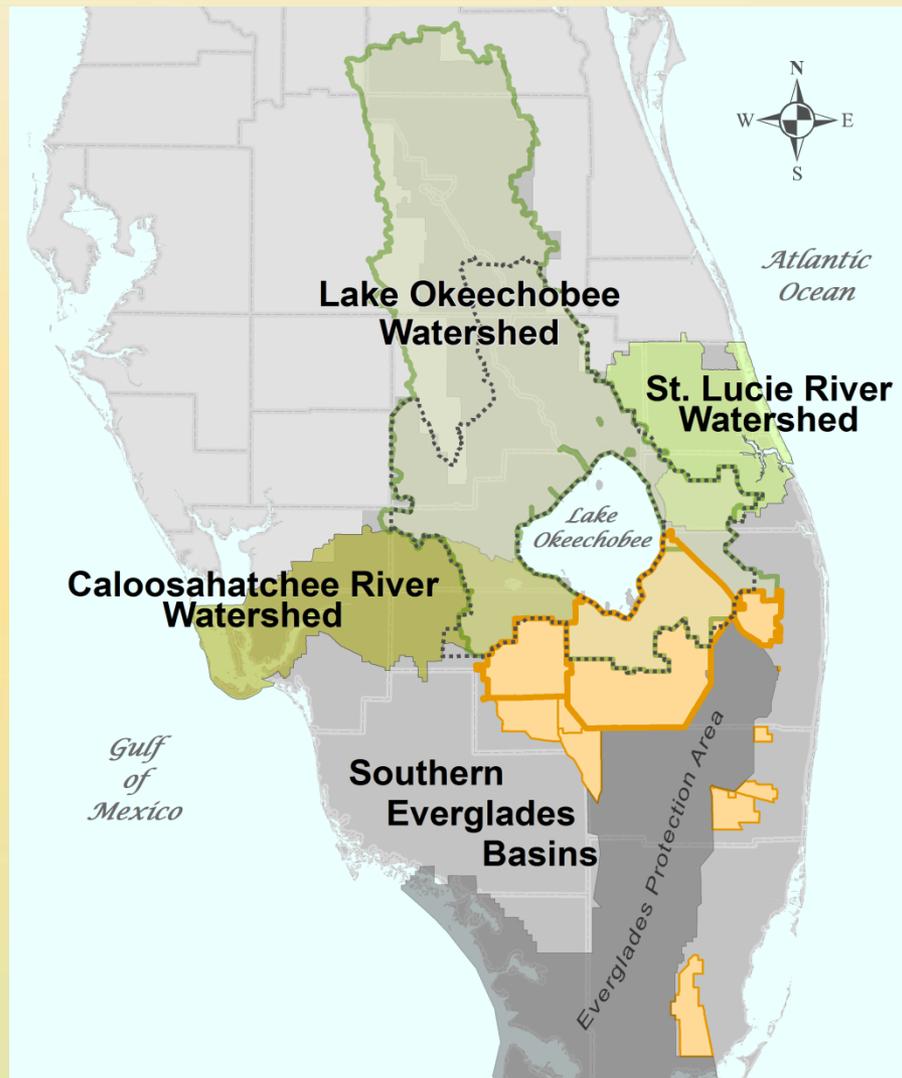
**Ecosystem
Restoration**



Source Controls



Why does SFWMD have Non-point Source Control Programs?



- Legislative intent drives how programs are implemented
- Southern Everglades
 - Everglades Forever Act (EFA)
 - Long-Term Plan
- Northern Everglades
 - Northern Everglades and Estuaries Protection Program (NEEPP)
 - Lake Okeechobee Protection Plan
 - St. Lucie River Protection Plan
 - Caloosahatchee River Protection Plan

Other SFWMD Source Control Requirements

- Consent Decree
- Cooperative Agreements
 - Tribal
 - Landowner
- Permits issued to the District
 - Lake Okeechobee Operating Permit
 - Stormwater Treatment Area (STA) Operating Permits



Complementary Source Control Programs

- Florida Department of Environmental Protection (FDEP)



- Florida Department of Agriculture and Consumer Services (FDACS)



- South Florida Water Management District (SFWMD)

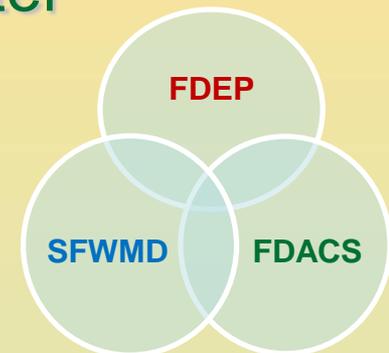


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Interagency Agreement

NEEPP Requirements:

- Assure development of Best Management Practices (BMPs) that complement existing regulatory programs
- Specify how BMPs are implemented and verified
- Address measures to be taken during any BMP reevaluation that is triggered when water quality goals are not being achieved



FDEP Source Control Programs

- State Water Quality Standards
 - Statewide Point Source (e.g. NPDES permits)
 - Stormwater/Wastewater infrastructure master planning
 - Comprehensive planning
 - Domestic Wastewater Residuals
 - Concentrated Animal Feeding Operations (e.g. dairies)
 - Construction/ Operating Permits (Lake Okeechobee, STAs)
 - Statewide Non-Point Source
 - Initial determination of appropriate BMPs
 - State-wide Stormwater Rule and Permits



FDACS Source Control Programs

- Statewide voluntary/incentive-based non-point Source Control Programs specific to agriculture
 - Complement existing regulatory programs
 - Develop, adopt, and implement agricultural Best Management Practices (BMPS)
 - Provide technical & financial assistance for agricultural BMPs when funds are available
 - Develop revised nutrient application rates for agricultural soil amendments
 - Develop an Animal Manure Application Rule
- Urban Turf Fertilizer Rule

SFWMD Source Control Programs

- Implement Regulatory Non-Point Source Control Programs for nutrients for all land uses
 - Issue Source Control (Works of the District) permits
 - Evaluate monitoring data at representative sites to verify effectiveness of Source Control Programs in achieving water quality goals
 - Identify areas for BMP optimization and resources

- Regulate *new* activities altering surface water flows under Environmental Resource Permits

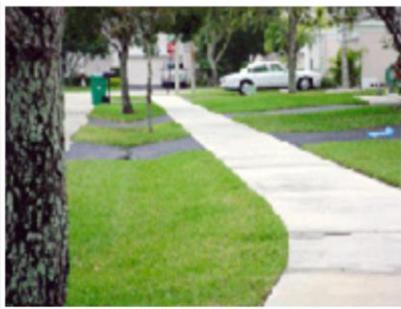


Essential Components of Successful Source Control Programs

1. Comprehensive BMP Plans
2. Deadlines for Implementation
3. Verification of BMP Implementation
4. Water Quality Monitoring
5. Performance Metrics
6. Research and Demonstration Projects
7. Cost Effectiveness

Comprehensive BMP Plans

Nutrient Management



Fertilizer ordinances



Fertilizer spill prevention



Fertilizer in root zone

Particulate Matter and Sediment Control



Systematic canal/ditch cleaning



Weed boom upstream of structure



Street Sweeping

Water Management



Stormwater management projects



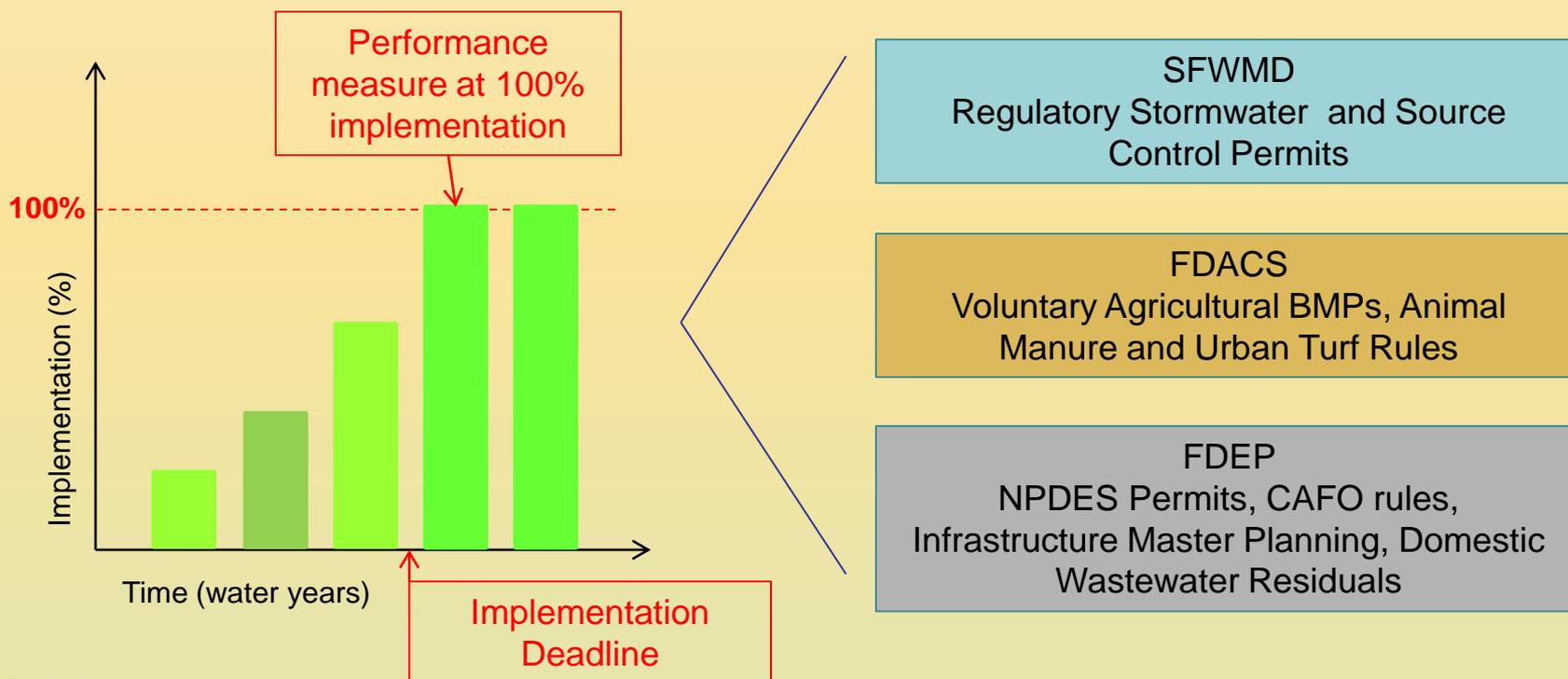
Control structures



Reservoirs

Deadlines for Implementation

Phased and expedited schedule for full implementation of source control programs



BMP Verification by Field Visits

Records review
and field
observation



STRUCTURE ID :
STATION NAME : FARM EAST PUMP STATION
NORTH - NORTH : 6160

COMMENT CODES
ACTIVITY: CRCP
1 - HARVEST A - CANE
2 - PLANTING B - VEGETABLES
3 - LAND PREP C - RICE
4 - FLOOD WARNING
5 - SEEPAGE
6 - RAIN
7 - START ELEVATION REACHED

Operating
Log for a
Pump

MONTH: November YEAR: 2007 CONTROL ELEVATION START: STOP:

DATE	START				STOP				RAIN	COMMENTS
	TIME	RPM	GAUGE INSIDE	GAUGE OUTSIDE	TIME	RPM	GAUGE INSIDE	GAUGE OUTSIDE		
1	7:45AM	N/A	9.0	13.1						
2	11:42AM	N/A	9.1	13.2					.0	
3	7:27AM	N/A	8.8	13.5					.0	
4	8:13AM	N/A	8.6	13.6					.0	
5	7:30AM	N/A	9.1	13.2					.0	
6	7:59AM	N/A	9.3	13.1					.0	
7	7:35AM	N/A	8.9	14.1					.0	
8	7:40AM	N/A	9.0	13.5					.0	
9	10:23AM	N/A	9.3	13.2					.0	
10	7:30AM	N/A	9.5	13.1					.0	
11	7:22AM	N/A	9.1	13.4					.0	
12	9:18AM	N/A	8.8	13.6					.0	
13	10:38AM	N/A	8.7	13.4					.0	
14	9:28AM	N/A	8.8	13.5					.0	
15	7:35AM	N/A	8.6	13.5					.0	
16	7:40AM	N/A	8.5	13.6					.0	
17	7:45AM	1500	8.8	13.5	12:45AM	1500	8.5	16.5	.0	
18	7:48AM	N/A	8.4	12.7					.0	2-A

Source Control Water Quality Monitoring

■ Tier I:

- Measure collective performance and progress of coordinating agencies' source control programs
- Watershed level (concentrations, volume, rainfall)
- Provide data to evaluate and enhance downstream regional treatment projects

■ Tier II:

- Internal to watershed
- Identify priority areas for optimization/sub-regional projects

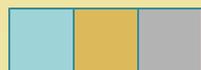
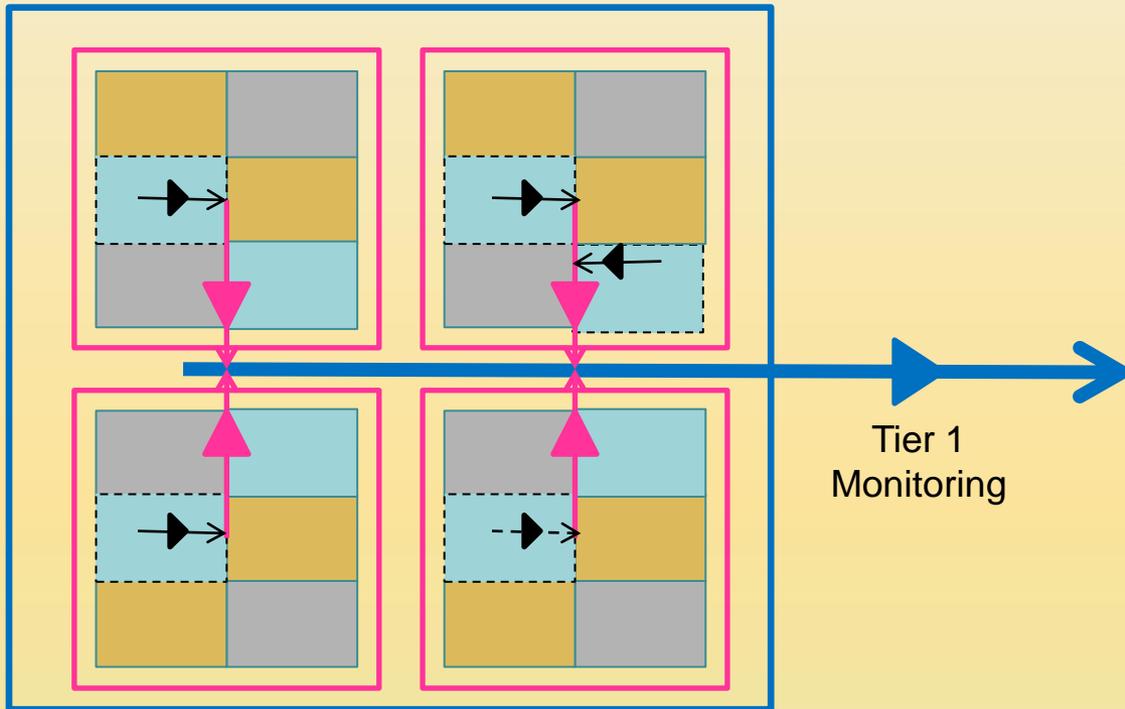
■ Individual Monitoring

- Demonstrate compliance at the individual level



Source Control Monitoring Network

Hydrologic Unit



Collective Source controls



Tier 2 Monitoring

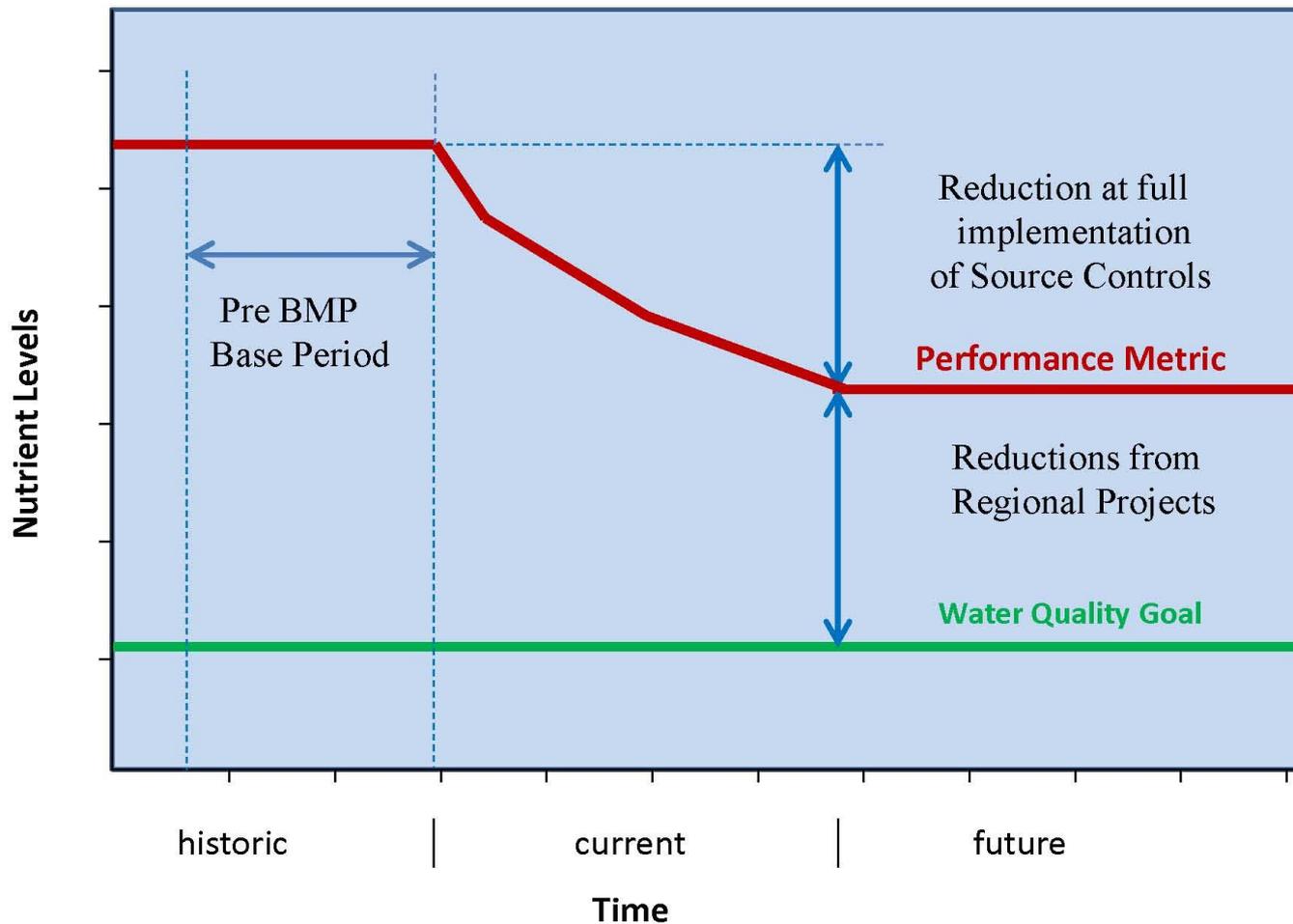


Individual Monitoring

Performance Metrics

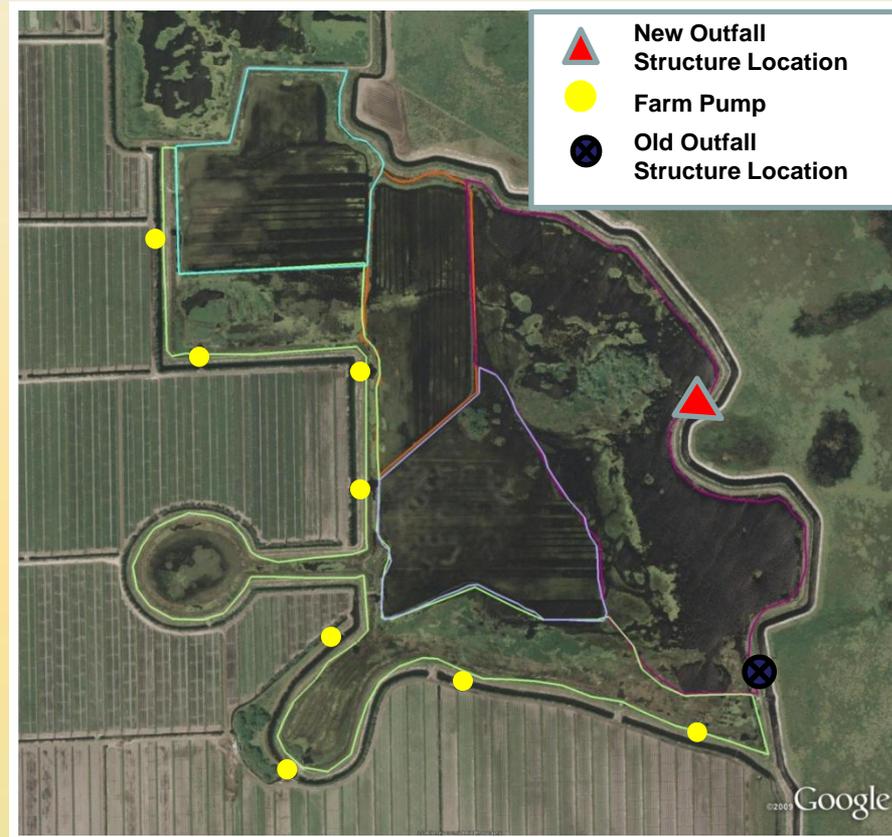
- Measure progress toward meeting collective Source Control Program goals
- Maximum nutrient reductions technically achievable from source controls and BMPs
- Establishes a base design condition for regional and sub-regional projects
- Triggers coordinating agencies to reassess their respective programs if water quality goals are not met

Performance Metrics



Research and Demonstration Projects

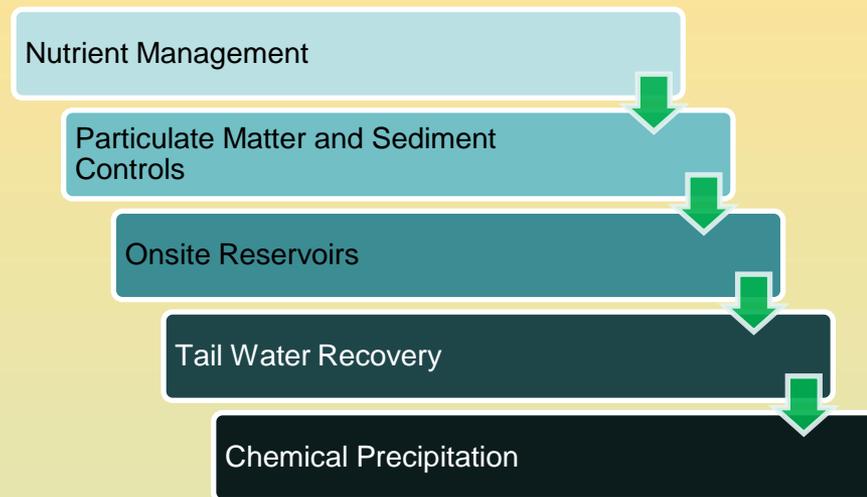
- Improve the performance of BMPs
- Develop new source control technology



- Cost-sharing agreements with landowners and agencies

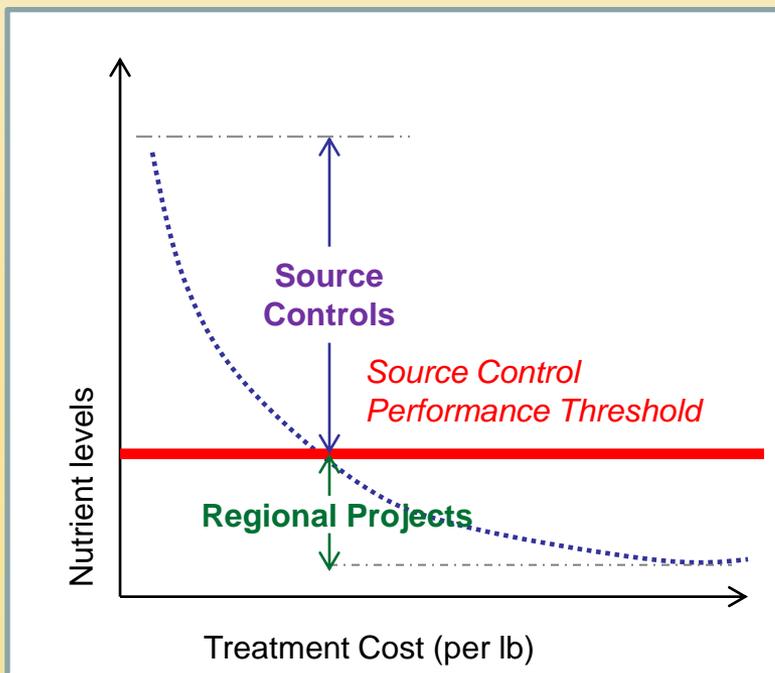
Research and Demonstration Projects

- Optimize phosphorus application rates for vegetables
- Develop alternatives for controlling vegetation in farm canals
- Improving the efficiency of reservoirs for water quality treatment
- Retrofitting stormwater systems with tailwater recovery and chemical precipitation to reduce phosphorus loads



Cost Effectiveness

Identify most effective strategies and use of tax \$

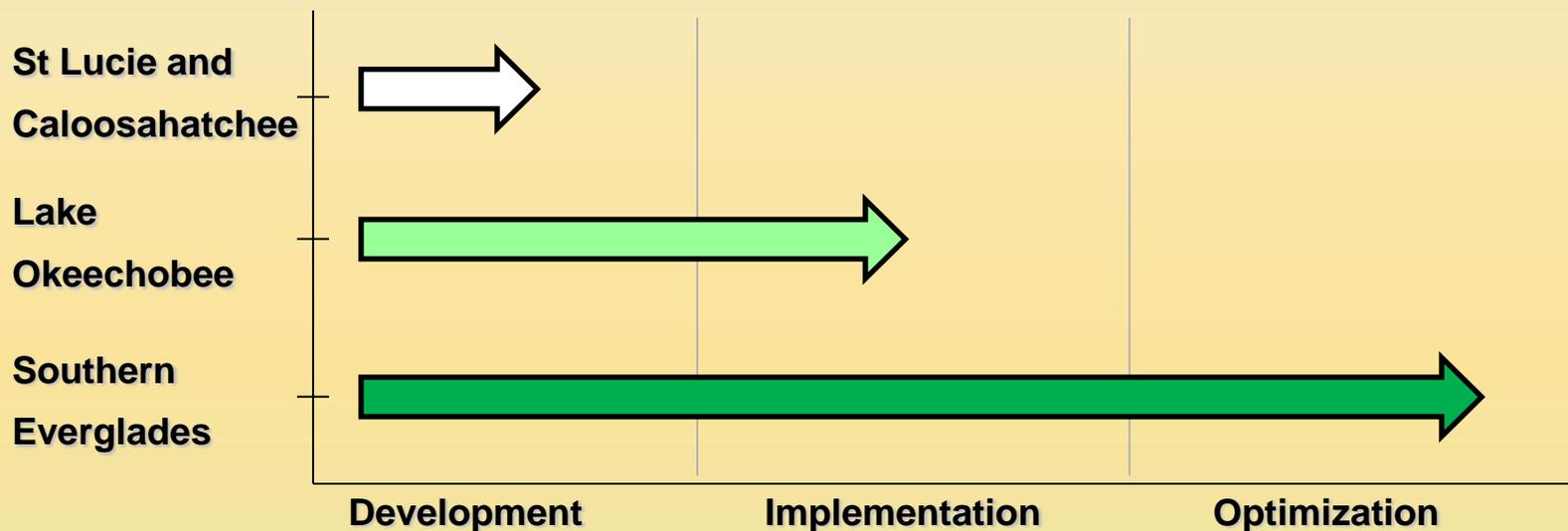


Source Controls	EAA and C-139 Basins 1994 – 2011
Phosphorus Reductions	2,626 mtons
District Everglades Regulation*	\$23 million
Average District Cost per Phosphorus Reduced	\$3 - 20 per pound

*Mandatory, Incentive, and Research Programs
Costs do not include landowner/stakeholder costs

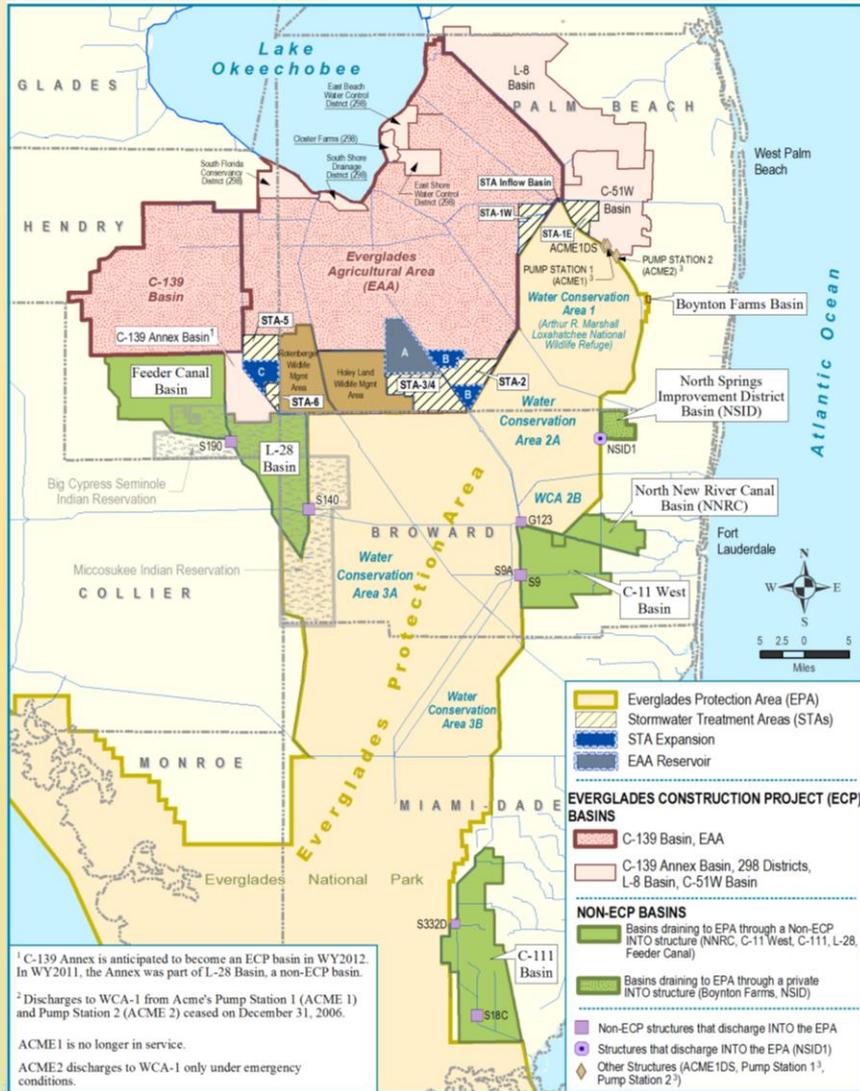
Supplement with regional and sub-regional projects

Status by Watershed



SFWMD Source Control Regulatory Program Phases

Southern Everglades Source Control Program



Everglades Agricultural Area (EAA) and the C-139 Basins

- Comprehensive BMP plans on 640,000 acres primarily agriculture
- Deadlines for implementation
- BMP verification visits
- Monitoring Networks
- Performance measures
- Research & demonstration
- Agricultural Privilege Tax

Other Tributary Basins

- Cooperative Agreements
- Cost Share Incentives

Southern Everglades Performance Measures

- Performance Measures
- EAA → 25% Phosphorus Reduction
- C-139 → Maintain Historic Levels



2011 EAA Basin Phosphorus Results

Reduction Goal	➔	25%
Observed	➔	79%

**EAA Basin
In Compliance**



16 Years of BMPs averaging a 55% Load Reduction
BMPs have prevented 2,411 mtons of P from leaving the EAA

2011 C-139 Basin Phosphorus Results

Goal: Maintain Historic Loads

Target Load → 12.8 mtons

Upper Limit → 30.6 mtons

Observed → 20.2 mtons

Achieved Water Quality Performance Goal

- Rule Amendments Effective November 2010
- Permits Renewed and Updated



Southern Everglades Status: Implementation



1. Verify implementation of all permitted BMP Plans & renew EAA permits
2. Adaptive Management & Optimization
 1. Research and Demonstration Projects
 2. Sub-regional Source Control Projects
 - Tier II Monitoring to enhance understanding of nutrient transport and cycling processes
 - Ensure the effectiveness of downstream regional projects

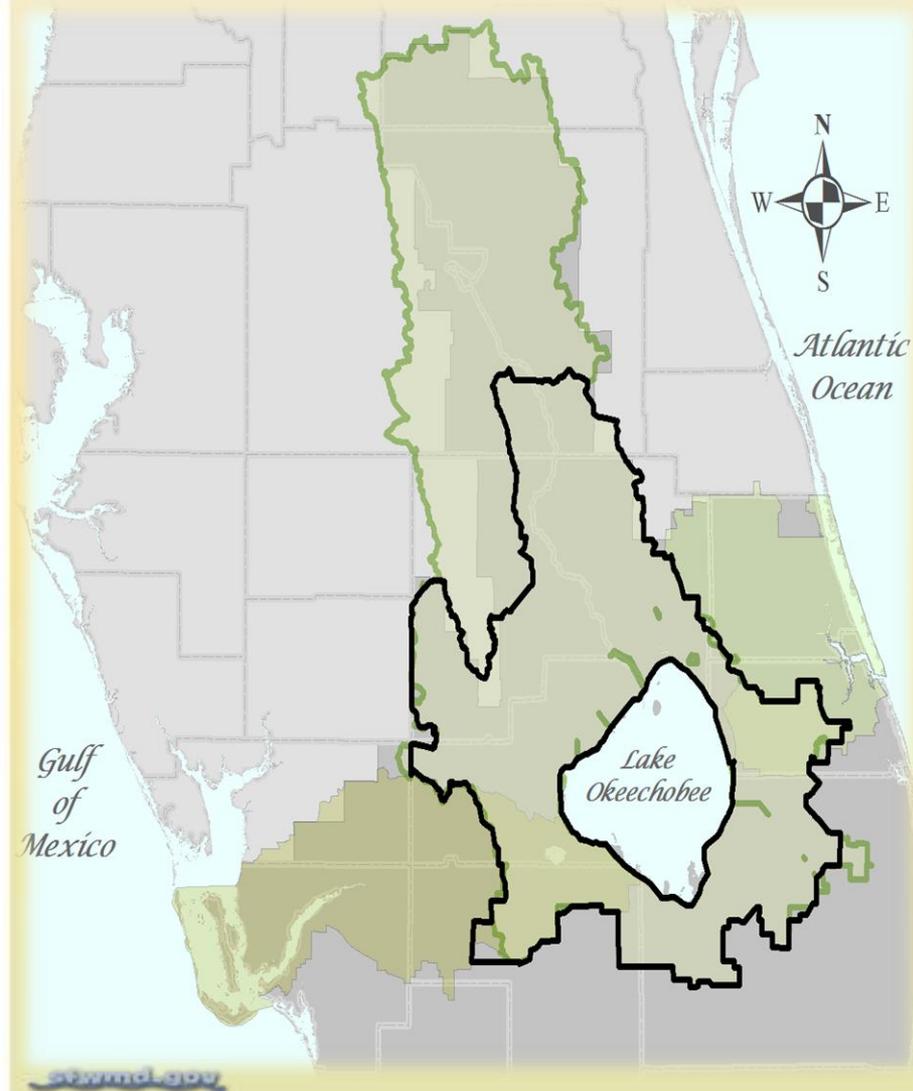
Northern Everglades Source Control Programs



Approximate acres

- Lake Okeechobee Watershed
 - 3,400,000 acres
- St. Lucie River Watershed
 - 650,000 acres
- Caloosahatchee River Watershed
 - 1,080,000 acres

Northern Everglades – Existing SWFMD Lake Okeechobee Watershed Source Control Program



- Smaller Watershed Boundary under 1989 Rules
- Phosphorus Control Plans (BMPs) for Agricultural and Urban Areas to be Permitted by SFWMD
- Concentration Based Performance Metrics for Individual Landowners
- Monitoring Network Established to Determine Compliance

Northern Everglades - Source Control Programs Described by NEEPP



- Expanded boundaries
 - Lake Okeechobee Watershed
 - Upper Kissimmee
 - Lake Istokpoga
 - St Lucie River Watershed
 - Caloosahatchee River Watershed
- Phosphorus and Nitrogen
- Mix of SFWMD Mandated and DACS Incentive Based BMPs
 - Implement BMPs for all land uses
 - Monitor under SFWMD Permit if no agricultural BMPs

Gulf

Northern Everglades: Phases for Regulatory Program Development

Phase 1:

Analyze existing water quality monitoring data

- Is the historic monitoring data sufficient for developing quantitative performance metrics?
- Data are representative

Phase 2:

Optimize the monitoring network

- Is the monitoring network adequate to assess future water quality progress?
- Concentration, flow and rainfall at Tier I sites

Phase 3:

Performance metrics development

- Recommend performance metrics.
- Input from stakeholders and technical experts

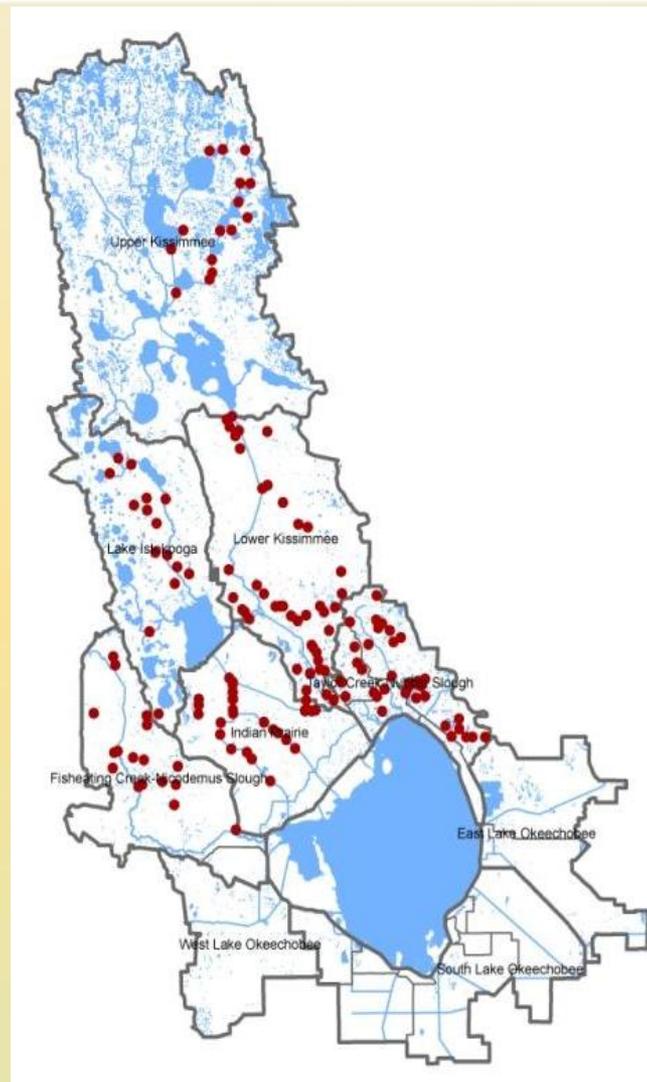
Phase 4:

Rule development and public review

- Develop draft rule text incorporating performance measures.
- Hold Public Workshops

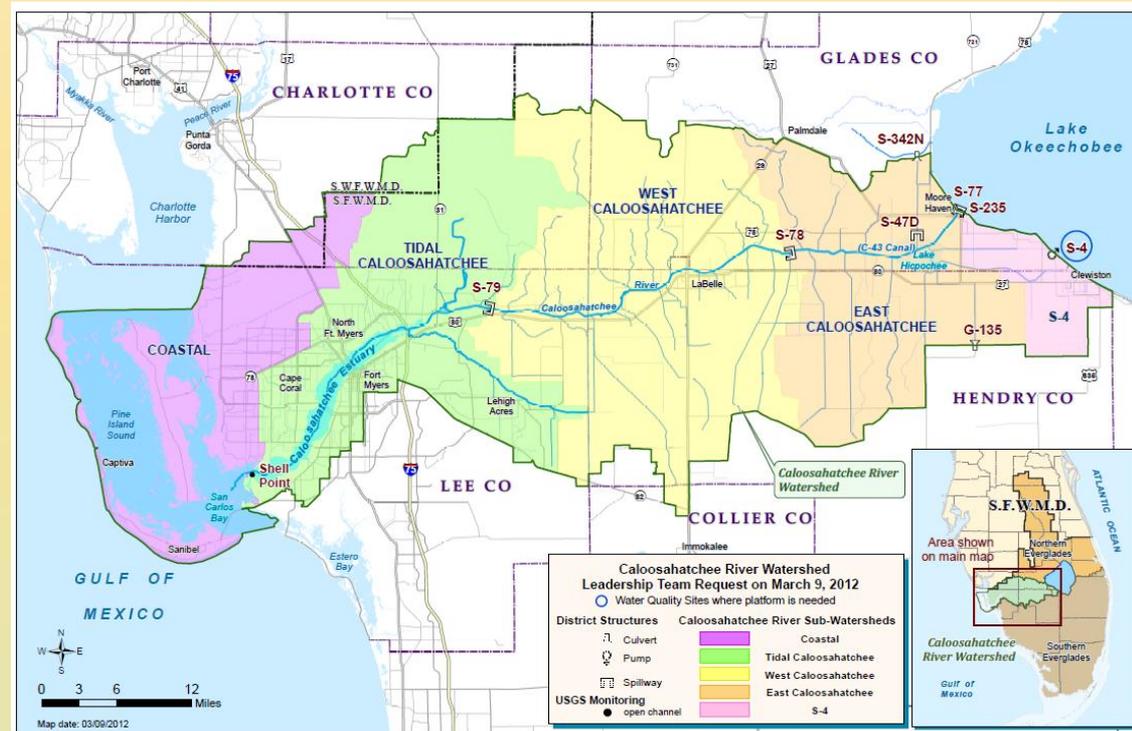
Northern Everglades Status: Lake Okeechobee Watershed

1. On-going BMP implementation and prioritization via Tier II monitoring network (LOWA)
2. Tier I sites identified, including opportunities for optimization
3. Data analyses and preliminary performance metric development near completion
4. Stakeholder and public review of technical support documents to be initiated in July 2012



Northern Everglades Status: Caloosahatchee Watershed

1. Tier I sites identified for the S4, East and West Caloosahatchee sub-watersheds
2. Tributary monitoring, in cooperation with local governments, in Tidal and Coastal sub-watersheds
3. Existing data have been analyzed
4. Performance metrics are under development



Summary

- Non-point source controls are a cost-effective and an essential foundation for water quality restoration.
- Reductions that cannot be achieved through source controls require regional projects.
- SFWMD, DEP, and DACS have unique and complementary roles. SFWMD is mandated to implement regulatory programs.
- Source Control Programs are in various stages of development and implementation within the watersheds



Questions?

