# Restoration Strategies Science Plan Progress

**Long Term Plan**
**Communications Meeting**
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**Larry Schwartz, Ph.D. P.W.S.**
Principal Scientist
Applied Sciences Bureau
SFWMD

# Science Plan Implementation

- Preparing and initiated detailed study plans (DSPs) for the 9 studies outlining tasks and resource needs
- Each of the studies is being led and managed by internal staff acting as Principal Investigators
- Additional staff are being utilized on all projects; however, certain tasks or aspects of the work will require support and specialized expertise from external sources
- Two private sector firms and two Florida universities with the required expertise and resources were selected through a competitive RFP process

# Initial Suite of Proposed Studies

1. Use of Soil Amendments / Management to Control P Flux
2. Evaluation of P Removal Efficacy of Water Lily and Sawgrass in Low Nutrient Environments of the STAs
3. Development of Operational Guidance for FEB and STA Regional Operation Plans
4. Evaluate P Sources, Forms, Flux, and Transformation Processes in STAs
5. Investigation of STA-3/4 PSTA Performance, Design and Operational Factors
6. Canal Conveyance Features on STA and FEB Inflow and Outflow TP Concentrations
7. Evaluation of Impacts of Deep Water Inundation Pulses on Cattail Sustainability
8. STA Water and Phosphorus Budget Improvements
9. Evaluation of Sampling Methodologies for TP

# Use of Soil Amendments/Management to Control P Flux

## Study Objective /Purpose

Determine if flux of P from the soil in an operating STA can be reduced with soil amendments or management techniques such as deep tilling or other management techniques or a limerock cap

## Progress:

- **Revised Draft DSP based on Tech Rep Input**
- **Continued work on Phase 1**
  - **Working on literature review regarding soil amendments and management techniques**
  - **Summarizing previous findings relevant to controlling P flux in wetlands**
  - **Compiling a list of issues to address in order to implement phase 2**

# Evaluate the Use of Alternative Vegetation that Occurs in Low Phosphorus Environment to Achieve Low P Discharge in STAs

## Study Objective and Purpose

Evaluate nutrient removal efficacy of vegetation that occurs under very low P conditions (downstream end of STAs) and examine major processes and mechanisms underlying P assimilation functions

## Progress:

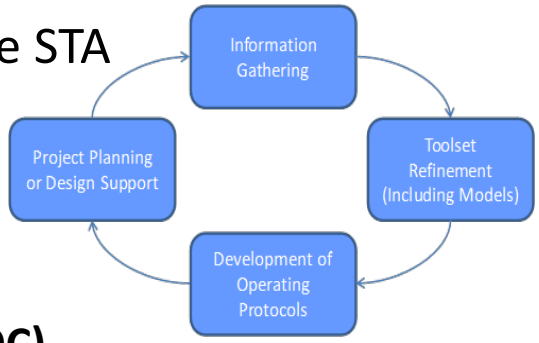
- **Summarized mesocosm results through 2013**
- **Finalizing mesocosm study report**
- **Compiling additional literature on alternative vegetation**
- **Development of Draft DSP on hold**

# Operational Guidance for FEB and STA Regional Operational Plans

## Study Objectives/Purpose

To develop modeling tools and operational protocols for FEBs/STAs to:

- Manage storage in the FEBs to minimize dry out, deep water conditions, and bypass
- Manage FEB outflow and STA inflows to minimize STA outflow phosphorus concentrations




## Progress

- **Revised Draft DSP based on Tech Rep Input**
- **Began development of operations tools (iModel-ASOC)**
- **Developed draft report on STA-2 Wave Test**
- **Conducted STA-1W test cell steady state field experiment**
- **Initiated System Control and Optimization contract**

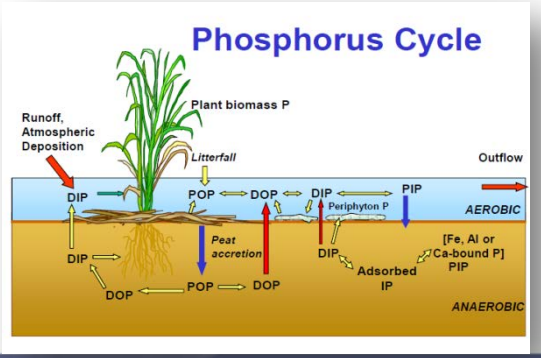
# Phosphorus Sources, Forms, Flux, and Transformation Processes in the STAs

## Study Objectives/Purpose

- Characterize P speciation, cycling and transport in STAs
- Compare the findings with natural areas (Water Conservation Areas)
- Develop recommendations to improve STA performance

## Progress

- **Finalized Draft DSP**
- **Continued literature review on P processes**
- **Contracting Organic P characterization**
- **Performed low altitude imagery trial & analyzing results**
- **Contracted data mining; finalized work plan and compiled data for the contractor**
- **Discussed approach for measuring flow velocity, microbial analysis, and conceptual model refinement**
- **Developing SOWs for contractual support**



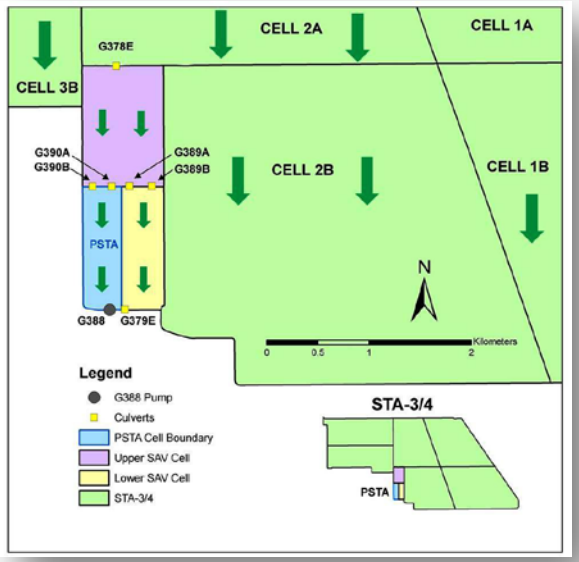
# Periphyton-based Stormwater Treatment Area (PSTA): Performance, Design & Operational Factors

## Study Objective/Purpose

Continue investigation of PSTA cell performance to determine design elements, operational factors, and biogeochemical characteristics that enable the PSTA cell to achieve ultra-low outflow TP levels

## Progress

- **Revised Draft DSP based on Tech Rep Input**
- **Continued routine monitoring**
- **Deployed two new Remote Phosphorus Analyzers (RPAs)**
- **Installed temporary pump for PSTA pulse testing**
- **Conditions for pulse test were not optimal so pulse test has not yet been initiated**



# Influence of Canal Conveyance Features on STA and FEB Inflow and Outflow TP Concentrations

## Study Objective/Purpose

- Determine whether phosphorus concentrations change when conveyed through STA inflow and outflow canals
- Evaluate phosphorus in sediments and seepage to and from canals

## Progress

- **Revised Draft DSP based on Tech Rep Input**
- **Task 1**
  - **Completing literature review and data query**
  - **Completed review of canal as-built drawings**
  - **Inspected 3 canals**
  - **Developing Task 1 report**
- **Task 2 - Initiated water quality data variability and trend analysis**
- **Task 3 - Developed seepage flow rate modeling for STA-2 inflow canal**
- **Task 4 - Initiated canal sediment and TP accumulation estimate based on mass balance**

# Impacts of Deep Water Inundation Pulses on Cattail Sustainability

## Study Objective/Purpose

- Evaluate the influence of deep water pulsing on cattails
- Provide recommendations for STA and FEB operations

## Progress

- **Revised Draft DSP based on Tech Rep Input**
- **DSP includes in situ study to be implemented in STA-1W and STA-3/4 while test cells are refurbished**
- **Developed plan for test cell refurbishment**
- **Completed one phase of historic hydrologic data analysis**

# STA Water & Phosphorus Budget Improvements

**Study Objective and Purpose**

- Determine sources of error in Water Budgets and evaluate methods to reduce the error
- Develop improved water budgets for STA cells in a phased approach for a test case (STA-3/4 Cells 3A and 3B) and to meet Science Plan needs

**Progress**

- **Revised Draft DSP based on Tech Rep Input**
- **Hydro Data Management (HDM) section working on improved flow data for POR for STA-2 structures**
- **HDM section working to improve flow ratings at STA-2 structures**
- **Work underway to improve water budget tool including ability to incorporate seepage estimates for all cells in STA-2 and STA-3/4**

$$\text{Residual} = \text{Outflow} + \text{Seepage} + \text{ET} + \Delta\,\text{Storage} - \text{Inflow} - \text{Rainfall}$$

# Sampling Methods for Total Phosphorus

## Study Objective /Purpose

To determine which sampling regime/ method provides most accurate representation of TP

## Progress

- **Revised Draft DSP based on Tech Rep Input**
- **All equipment installed at:**
  - **G390B - inflow to PSTA at STA-3/4**
  - **G310 - discharge from STA-1W**
- **Installation evaluation conducted and passed**
- **Continue with monitoring phase at G390B**
- **Entering monitoring phase at G310**
- **Some preliminary results indicate that autosampler pumping and tubing, as compared to grab samples, do not affect the results**

# Questions?