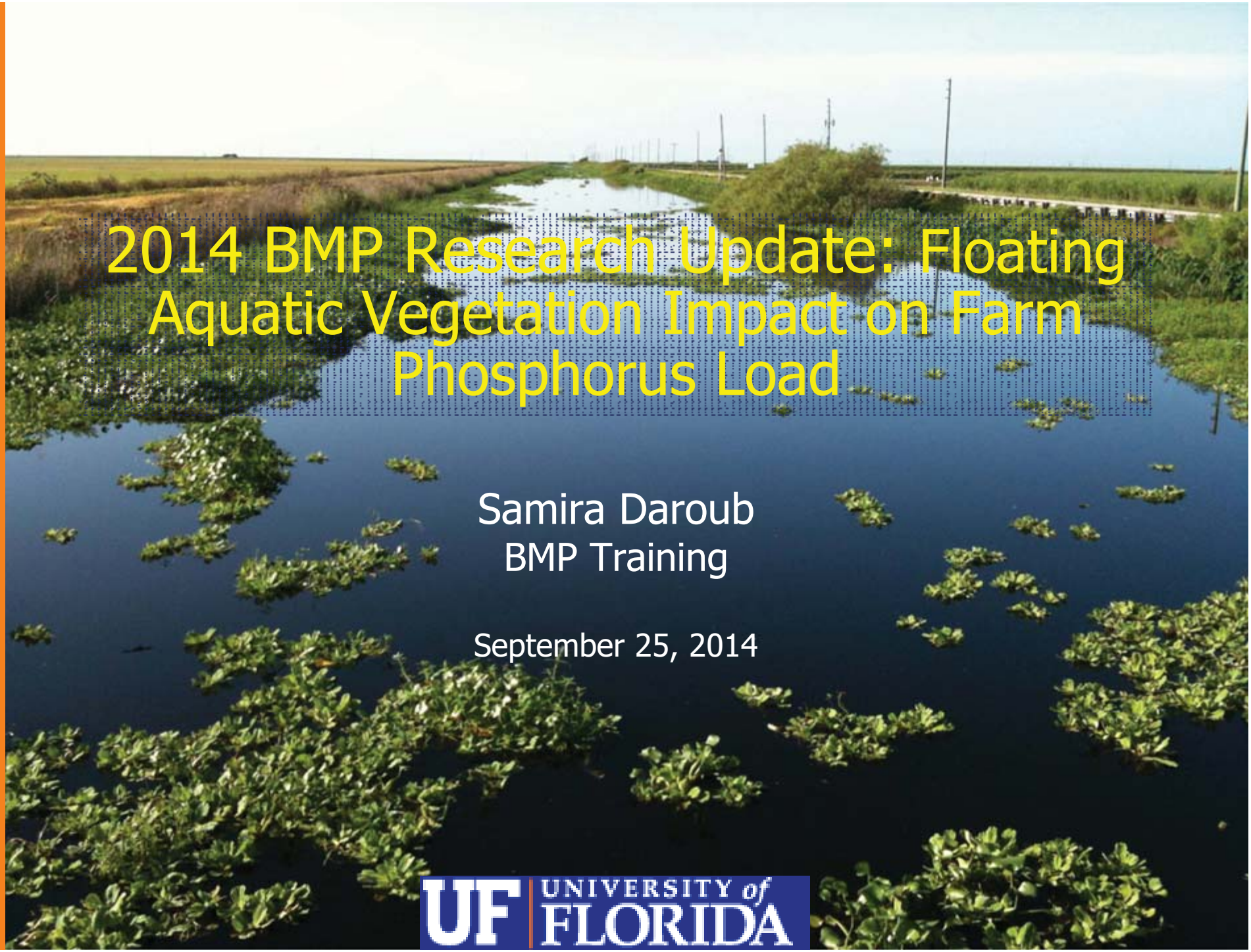


2014 BMP Research Update: Floating Aquatic Vegetation Impact on Farm Phosphorus Load

Samira Daroub
BMP Training

September 25, 2014

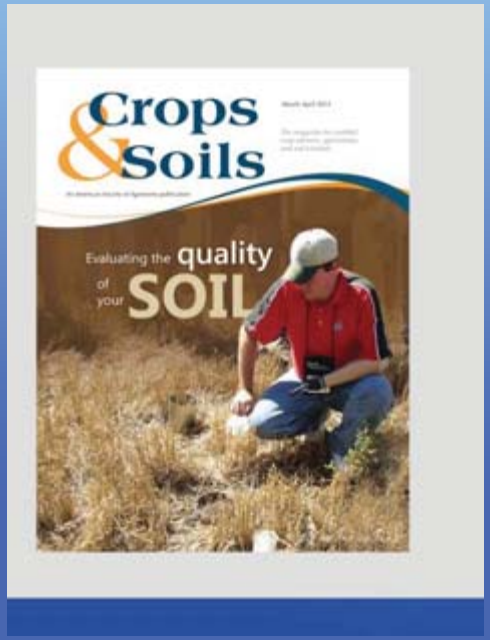
UF UNIVERSITY of FLORIDA

Presentation Outline

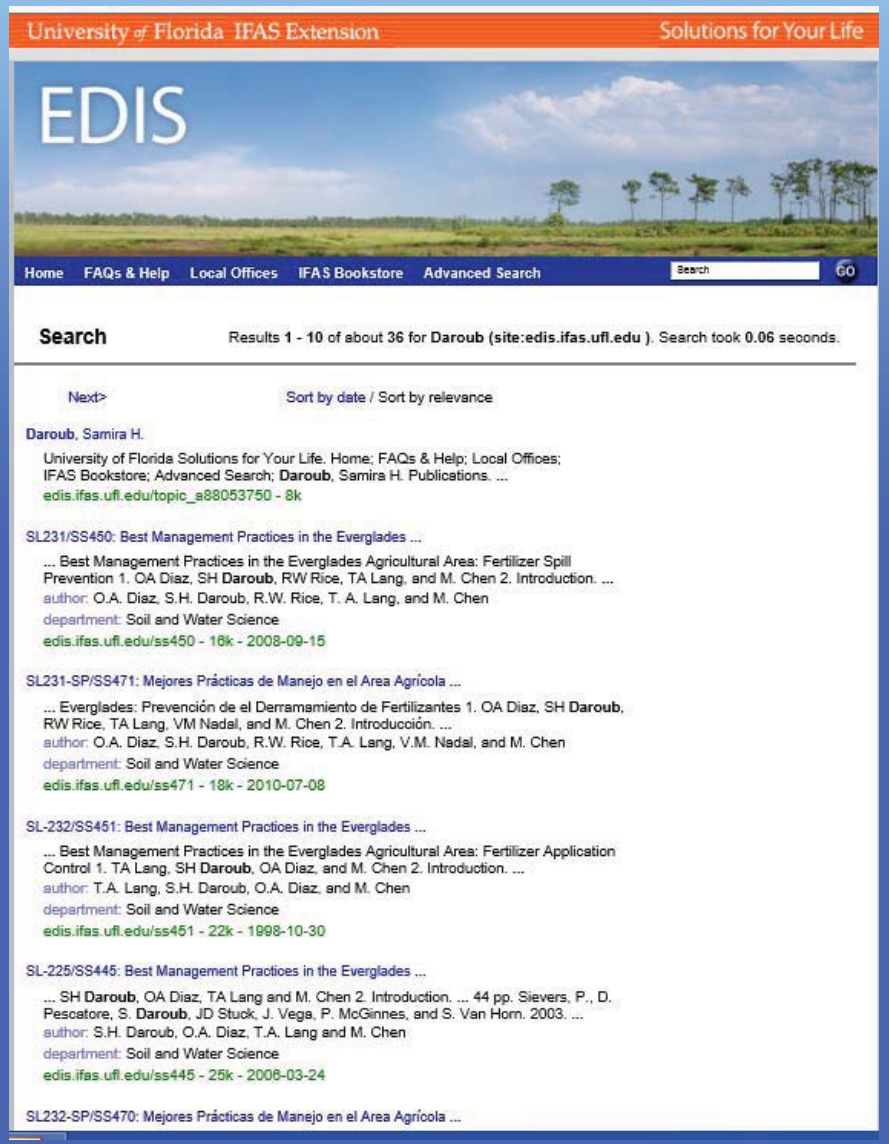
- Introduction
- Project Update: Floating Aquatic Vegetation (FAV) Impact on Farm P Load
  - FAV Biomass
  - Farm Treatment and Control Selection
  - Farm Drainage Water
  - Ambient Farm Canal Water
  - Farm Canal Sediments
- 2014/15 Preview

National attention to the EAA and BMP program

- Upcoming featured article in National magazine *Crops & Soils* and about success of the BMP program in the EAA
- *"The cooperative, science-based approach to the BMP program is at the core of its success, says Rick Roth. In fact, it's made him a better farmer."*

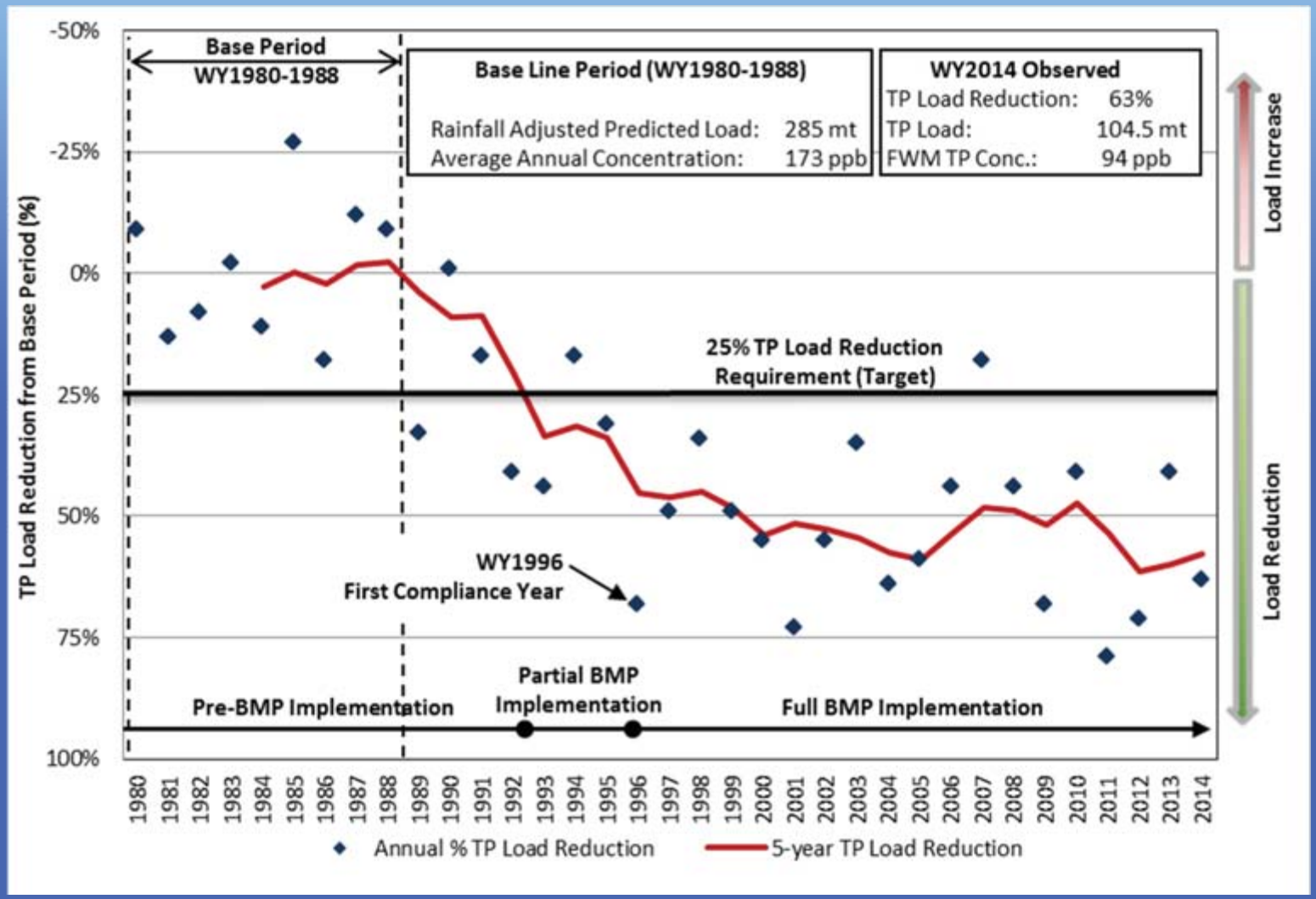


Extension publications: http://edis.ifas.ufl.edu/



http://erec.ifas.ufl.edu

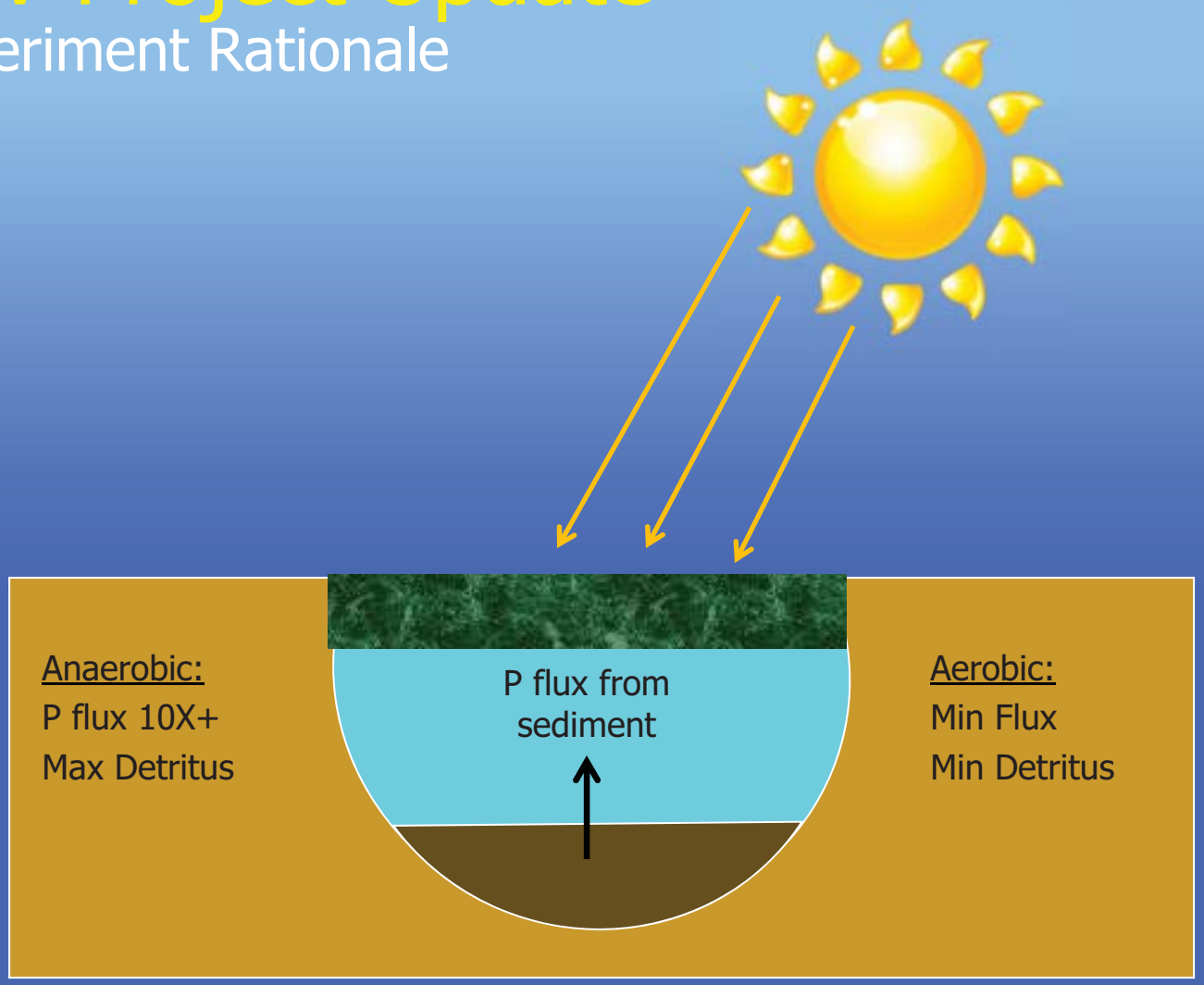
EAA Basin BMP Performance (courtesy SFWMD)



Floating Aquatic Vegetation Impact on Farm Phosphorus Load

FAV Project Update

Experiment Rationale



FAV Project Update

Objectives

1. Evaluate FAV management practices in the EAA farm canals for impact on
   a) farm drainage water phosphorus (P) load
   b) P speciation of farm drainage water
   c) canal sediment properties
2. Use research results to develop a BMP for managing FAV in farm canals that further lowers farm P loads.

The goal is to provide growers an additional tool in their efforts to reduce off-farm P loading in the Everglades Agricultural Area.

FAV Project Update
Methods

Paired farms study (4 pairs)

- Two pairs each in S-5A and S-6 sub basins
- 2-yr calibration and 3-yr treatment periods
- Calculate changes after initiation of practices
- Improved vs. typical FAV control practices

FAV Project Update

Farm Descriptions and Locations

S-5A Sub-basin

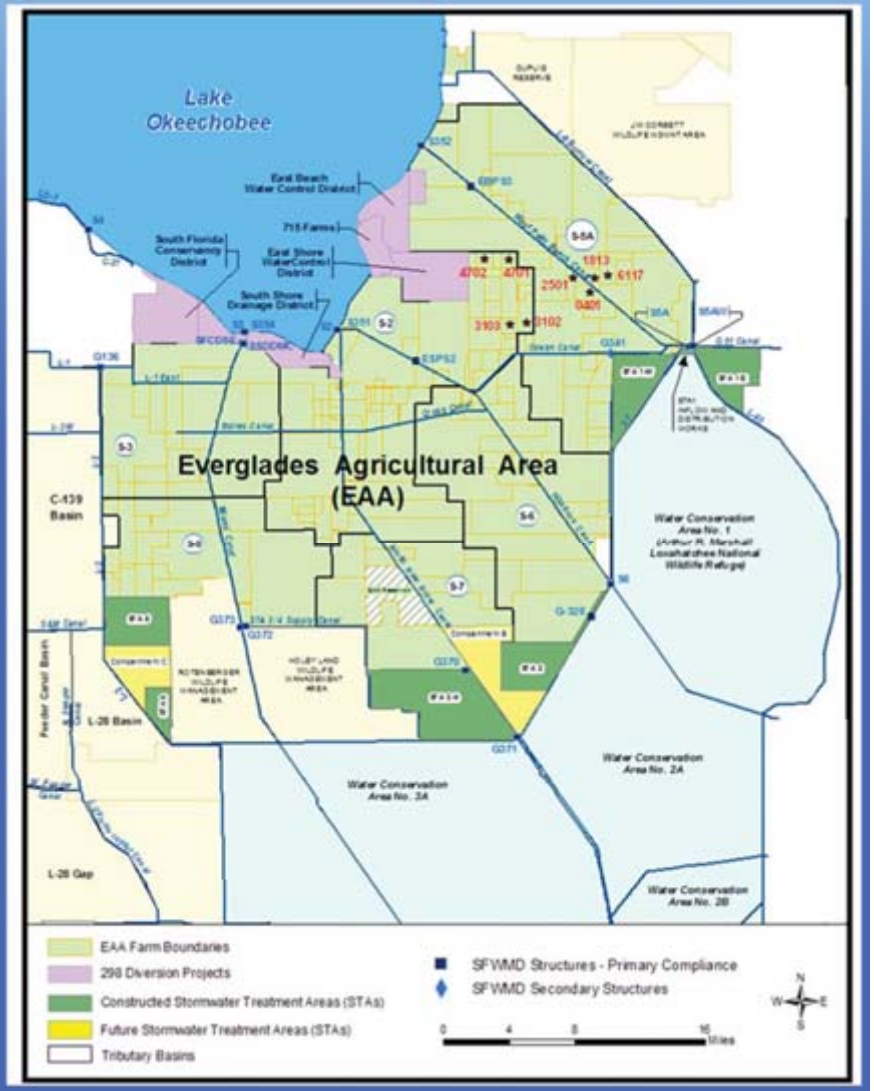
Farm 0401: 908 acres- cane w/corn
Farm 2501: 823 acres- cane w/corn

Farm 1813: 594 acres- cane w/corn
Farm 6117: 800 acres- cane

S-6 Sub-basin

Farm 3102: 1608 acres- cane w/corn
Farm 3103: 602 acres- cane+veg w/corn

Farm 4701: 630 acres- cane
Farm 4702: 640 acres- cane w/rice

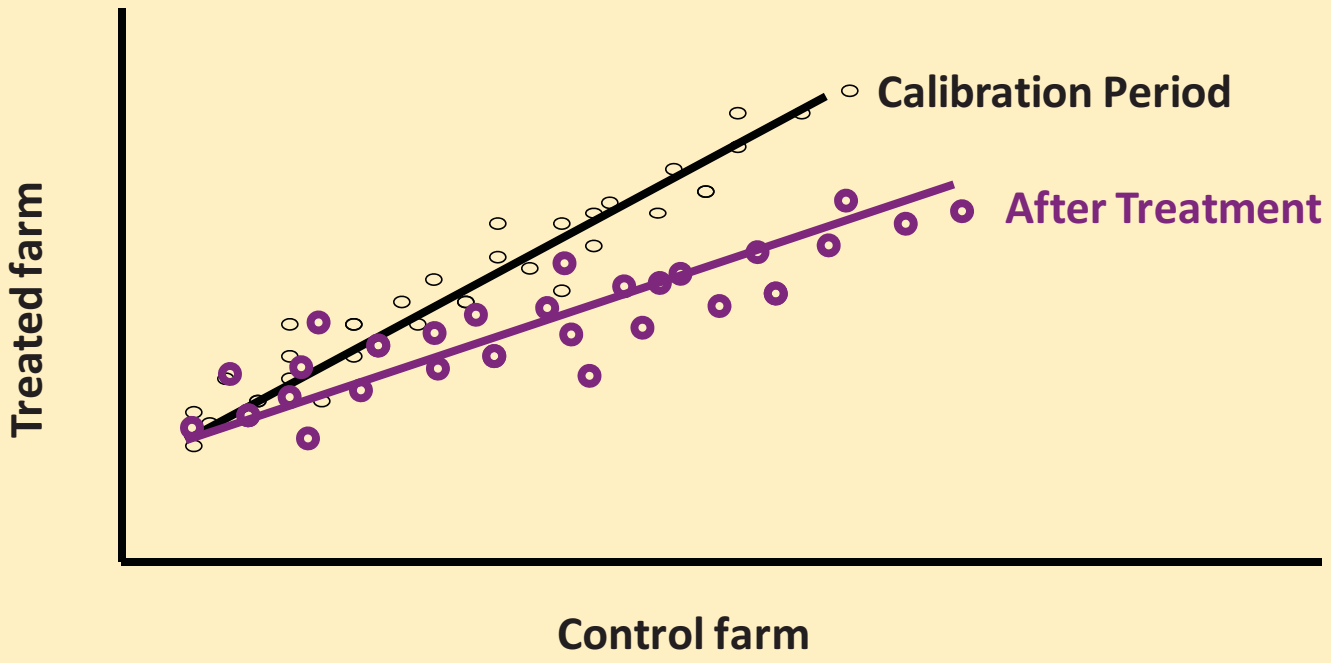


Example: Farm Pair Aerial View

FAV Project Update

Comparative Regression Analysis For P Load

$$Treated_i = b_0 + b_1 (Control_i) + e$$



Calibration Period

- For Farm Pair 4701/4702 three years data:
  - May 1, 2011 – April 30, 2014 (calibration)
  - Started treatment May 1, 2014
- Stepwise multiple linear regression analysis conducted on P loads between 4701/4702 to determine the relationship and its significance

FAV Project Status

- Treatment Farms: 3103 0401 6117 4702
- Control Farms: 3102 2501 1813 4701
- Treatment Initiation: May 1, 2013 for 3 farm pairs
- Treatment Initiation: May 1, 2014 for farm pair 4 (4701/4702)
- Monitoring of FAV growth
- Biweekly spot spraying if needed, with approved aquatic weed herbicides

FAV Project Update

Data Collection

FAV Biomass:

- Species composition, Aerial Coverage, P Content, Biomass

Drainage Water:

- Flow volume, velocity
- TP/TDP/SRP (PP/DOP), Ca, DOC, pH, TSS

Ambient Canal Water:

- TP/TDP/SRP (PP/DOP), Ca, DOC, pH, TSS
- Hydrolab *in situ:* Temp, DO, ORP, SpCond

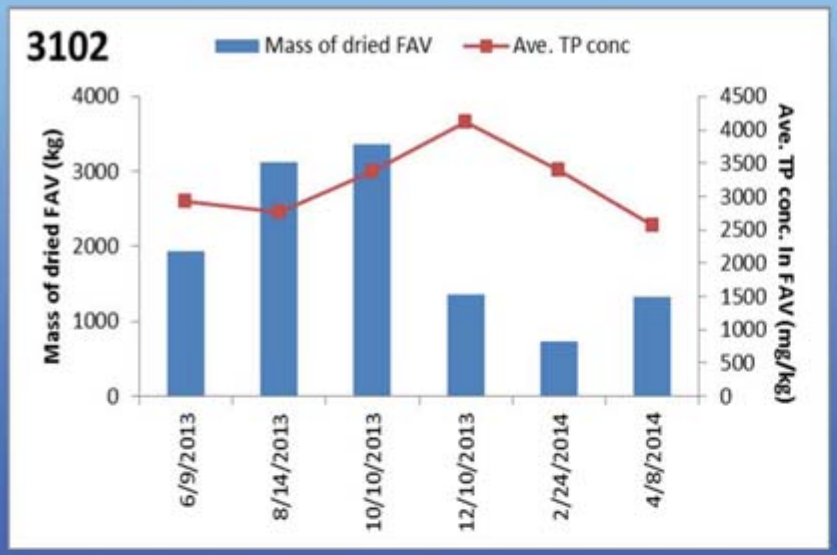
Canal Sediments:

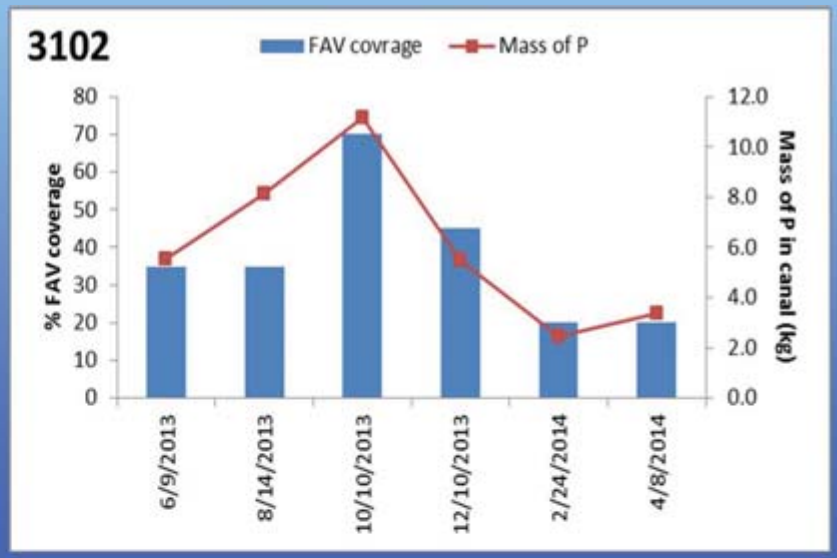
- TP, Wet Density, Dry Density, OM (LOI), ash content
- Sediment depth surveys

FAV Project Update

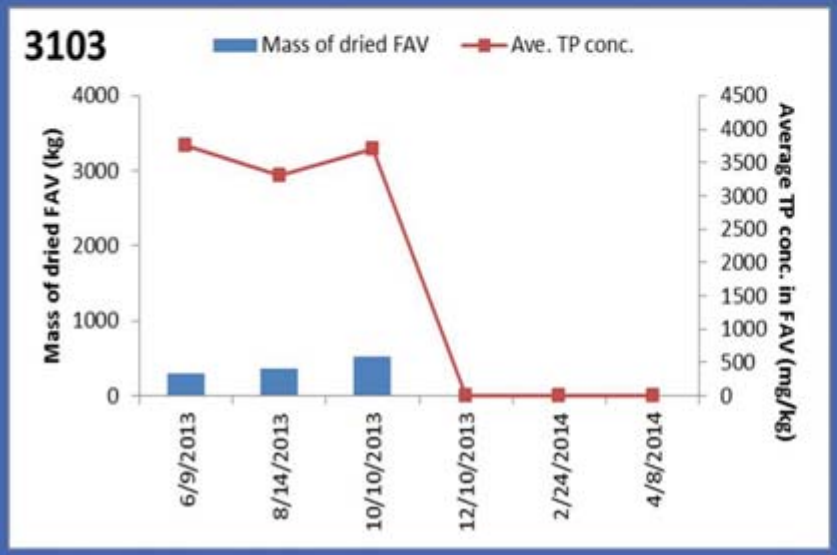
FAV Coverage and Biomass

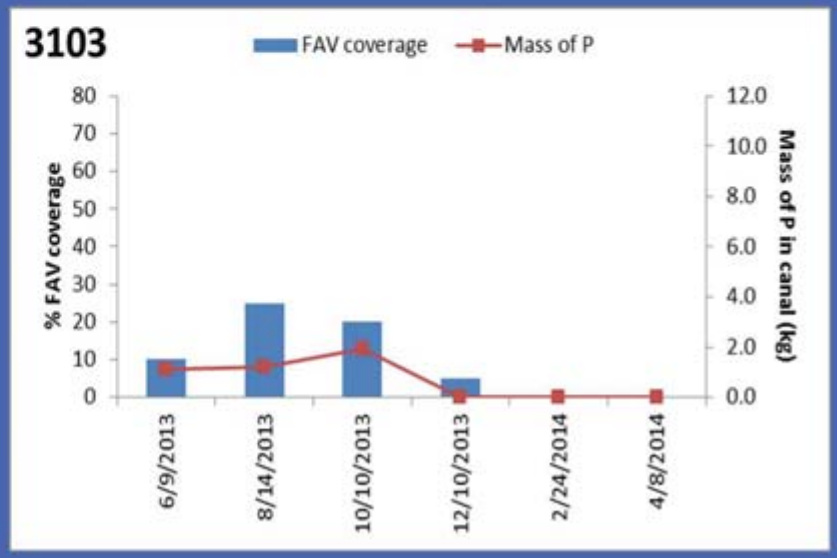
Control





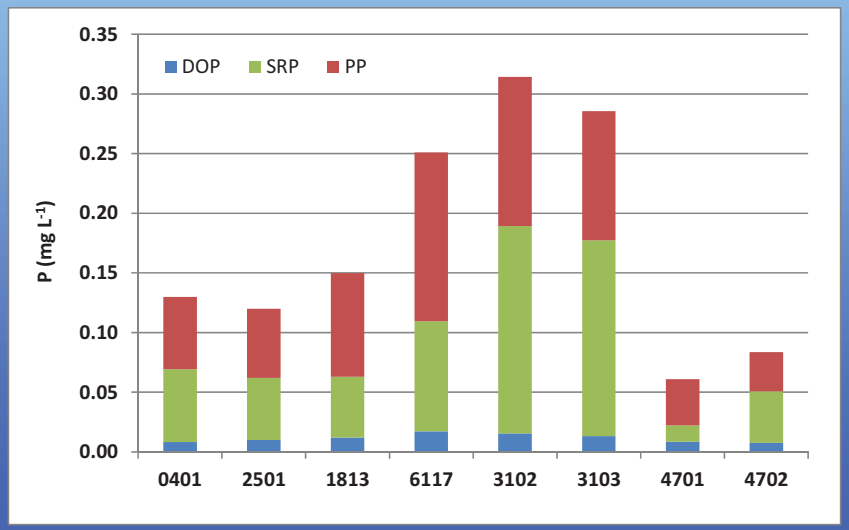
Treatment

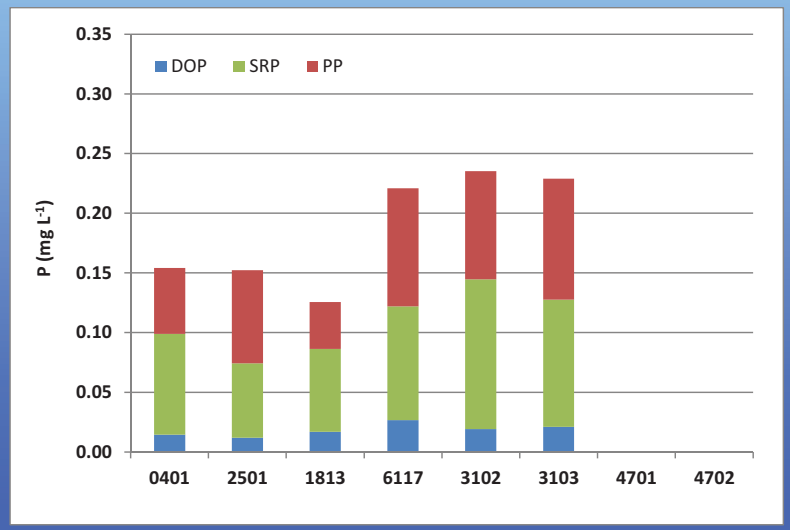




FAV Research Project

Farm Drainage Water





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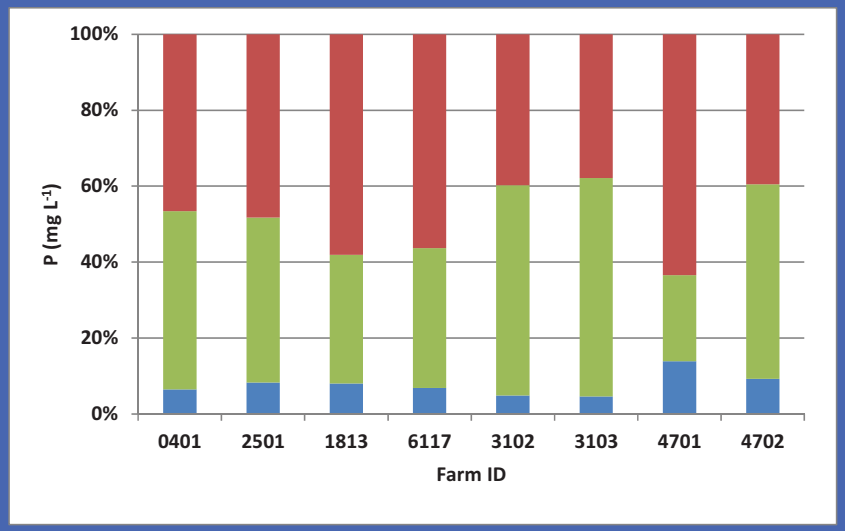

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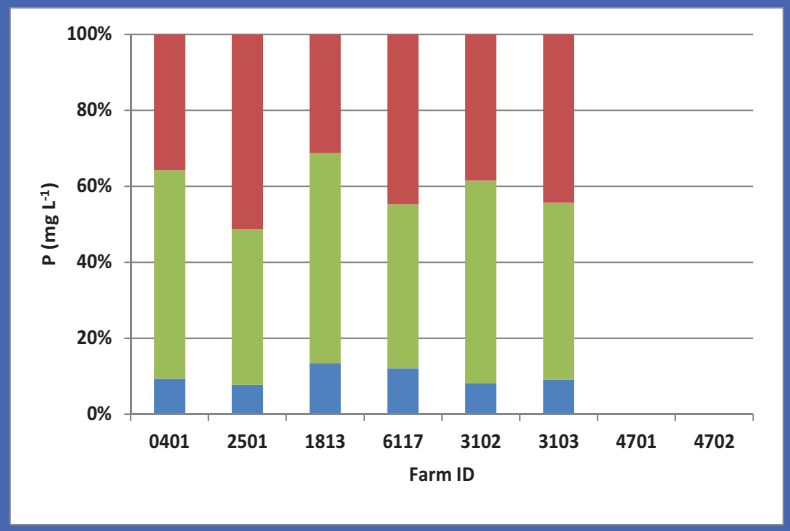
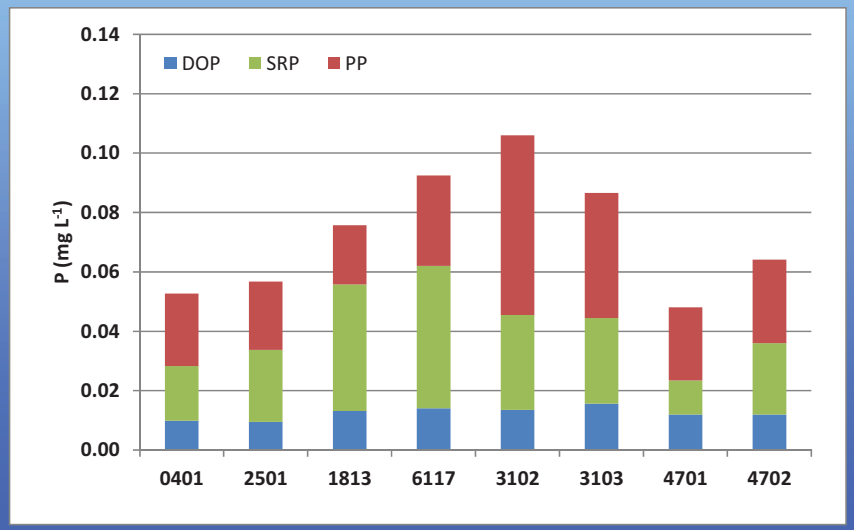
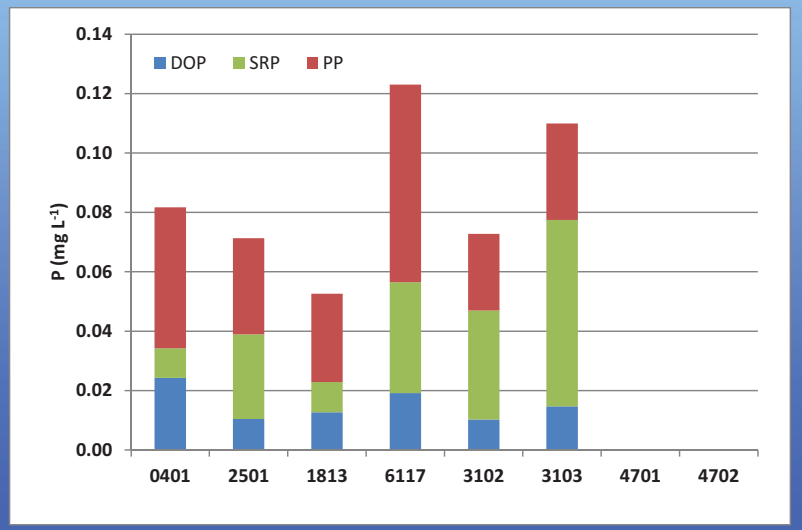


FAV Research Project

Ambient Canal Water





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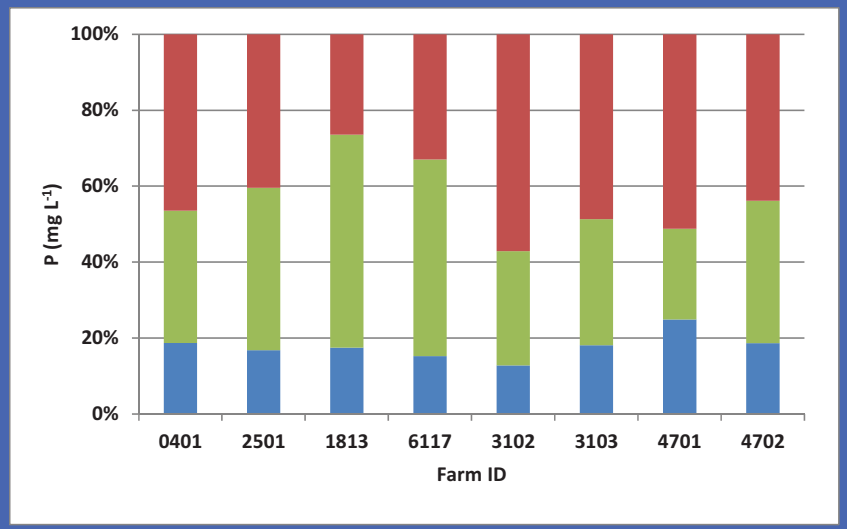
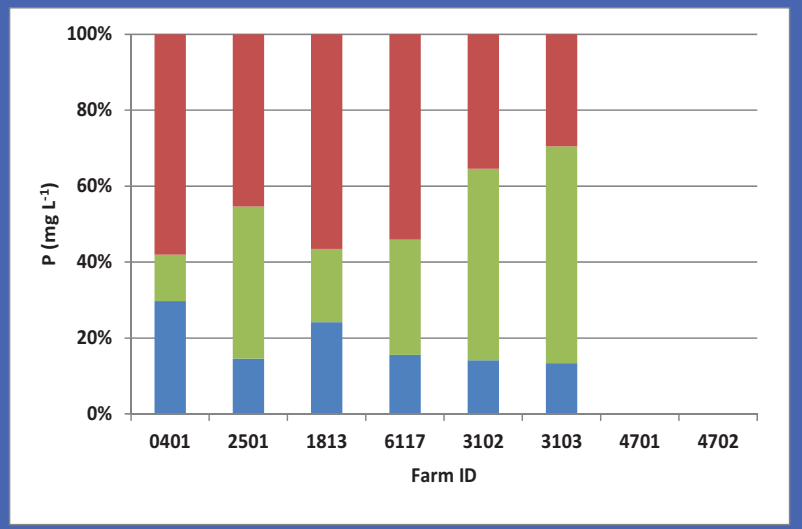


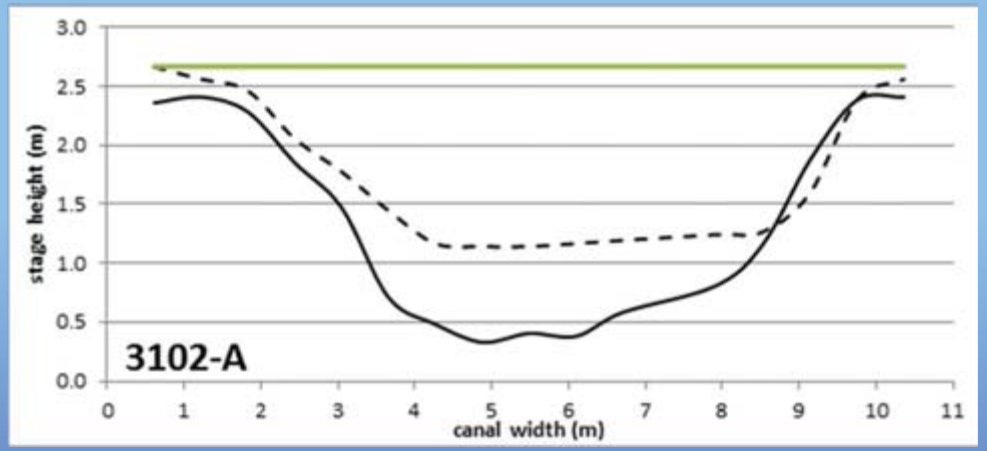
Treatment Period

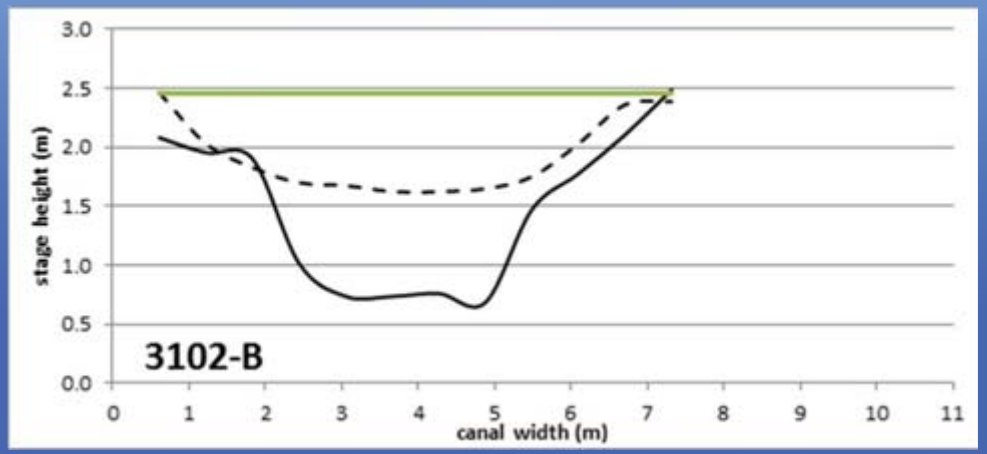


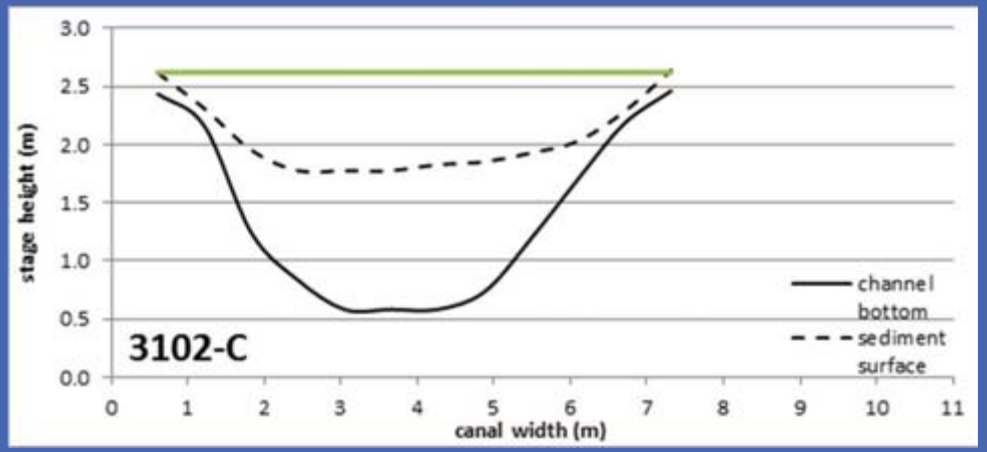
FAV Research Project

Sediment Surveys

Sediment profile of main canal of farm 3102 at three transects, A, B, and C, surveyed in April 2014. Green line corresponds to height of water.







Sediment properties – April 2014

Farm	Location 0-2.5 cm	Mean Depth (m)	Organic matter (%)	Bulk Density (g cm^{-3})	Total P (mg kg^{-1})
3102	A	0.37	32.6	0.44	830
	B	0.45	42.9	0.26	1906
	C	0.67	38.7	0.24	1581
3103	A	0.44	29.5	0.36	926
	B	0.82	38.5	0.25	1259
	C	0.43	37.4	0.17	1401

Preview 2014/2015
Planned Activities

Continue Sample Collection, Monitoring, and Analyses:

- Farm drainage waters: flow volume and WQ
- Complete sediment analyses and surveys: fall 2014 and spring 2015
- Collect ambient canal waters: biweekly
- FAV biomass survey/composition analysis: bimonthly
- Survey FAV on TMT/CTRL farms: biweekly
- Spot spray FAV on TMT farms: as needed

BMP training workshops: Sep 25th, 2014 and Apr 16th, 2015

Annual report to SFWMD and EPD: July 2015

Final Project Report – Fall 2016

Personnel

Samira Daroub, PhD	Principal Investigator
Timothy Lang, PhD	Project Manager
Jehangir Bhadha, PhD	Lead Scientist
Vivianna Nadal, MS	Head Chemist
Irina Ognevich, BS	Chemist
Odiney Alvarez-Campos	Grad Student
Pablo Vital, AA	Field Technician
Miguel Diaz, AA	Field Technician


Thank You!
Questions?