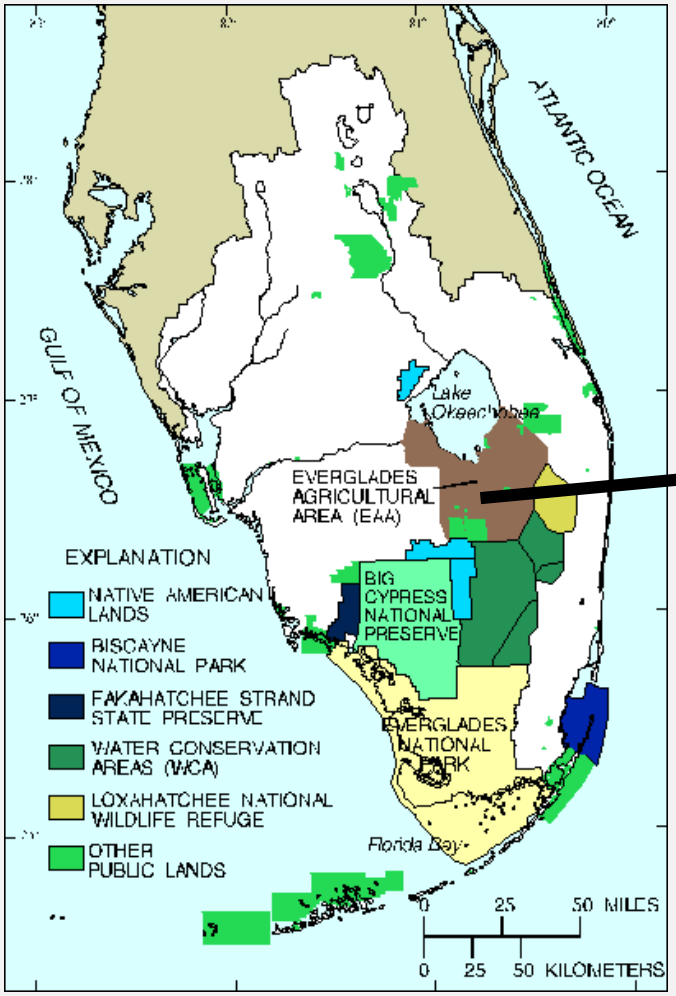
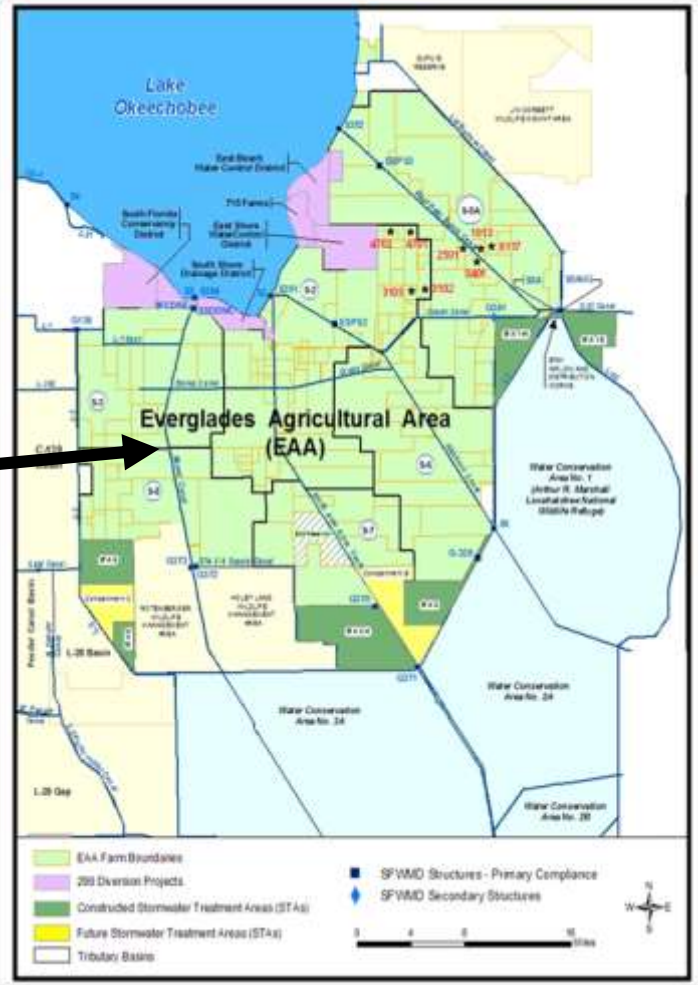
Influence of Floating Aquatic Vegetation on Environmental Parameters Affecting Phosphorus Removal in the Everglades Agricultural Area

Jennifer Cooper, Anne Sexton, Timothy Lang and Samira Daroub

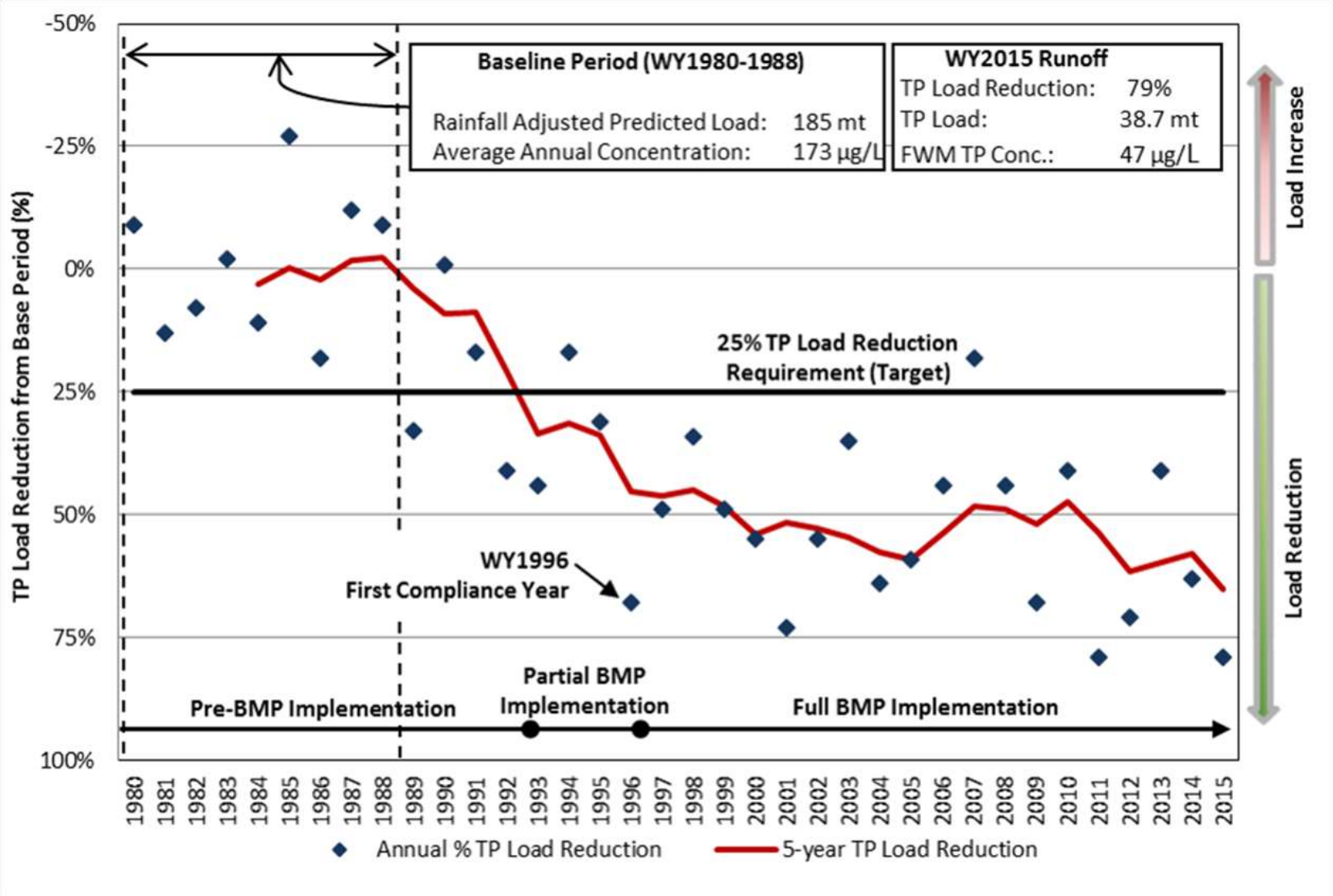
University of Florida – Everglades Research and Education Center
Belle Glade, FL

Study Area


ATLANTIC OCEAN
GULF OF MEXICO
Lake Okeechobee
EVERGLADES AGRICULTURAL AREA (EAA)
BIG CYPRESS NATIONAL PRESERVE
EVERGLADES NATIONAL PARK
Florida Bay
EXPLANATION
NATIVE AMERICAN LANDS
BISCAYNE NATIONAL PARK
FAKAHATCHEE STRAND STATE PRESERVE
WATER CONSERVATION AREAS (WCA)
LOXAHATCHEE NATIONAL WILDLIFE REFUGE
OTHER PUBLIC LANDS
0 25 50 MILES
0 25 50 KILOMETERS


Lake Okeechobee
Everglades Agricultural Area (EAA)
EAA Farm Boundaries
298 Diversion Projects
Constructed Stormwater Treatment Areas (STAs)
Future Stormwater Treatment Areas (STAs)
Tributary Basins
SFWMD Structures - Primary Compliance
SFWMD Secondary Structures

Success of the BMP Program

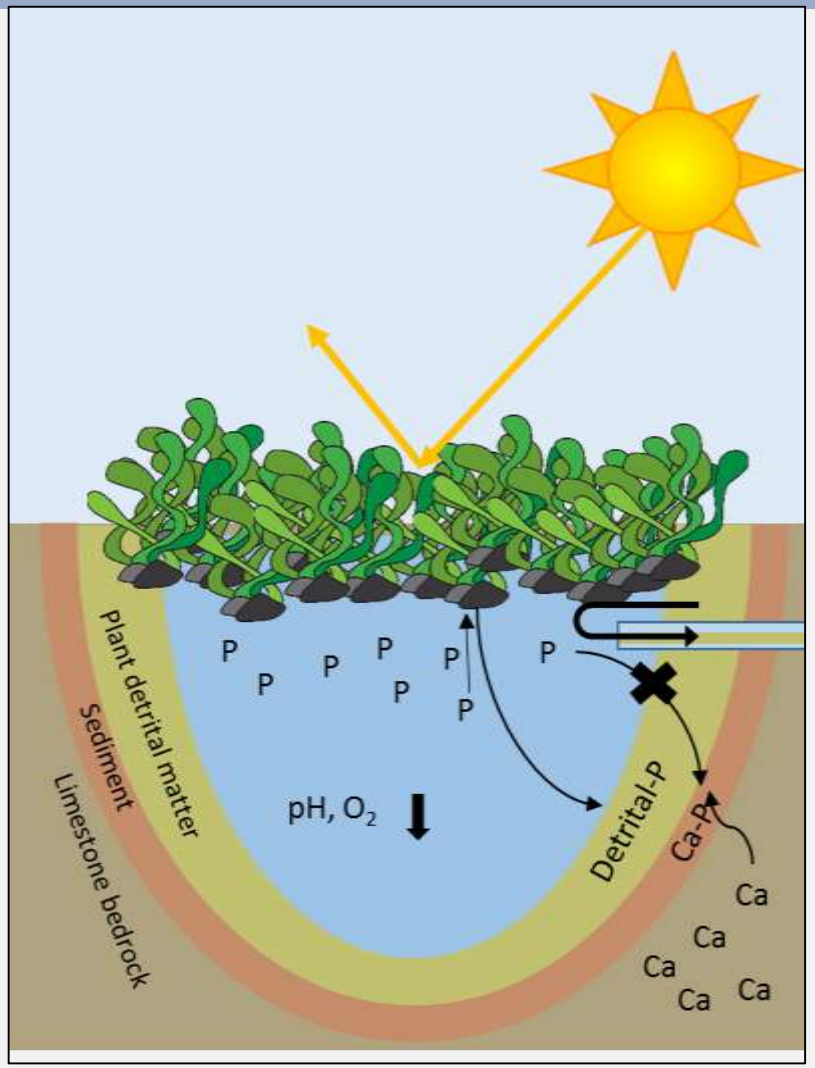


Current BMP Research: Suppression of Floating Aquatic Vegetation (FAV)

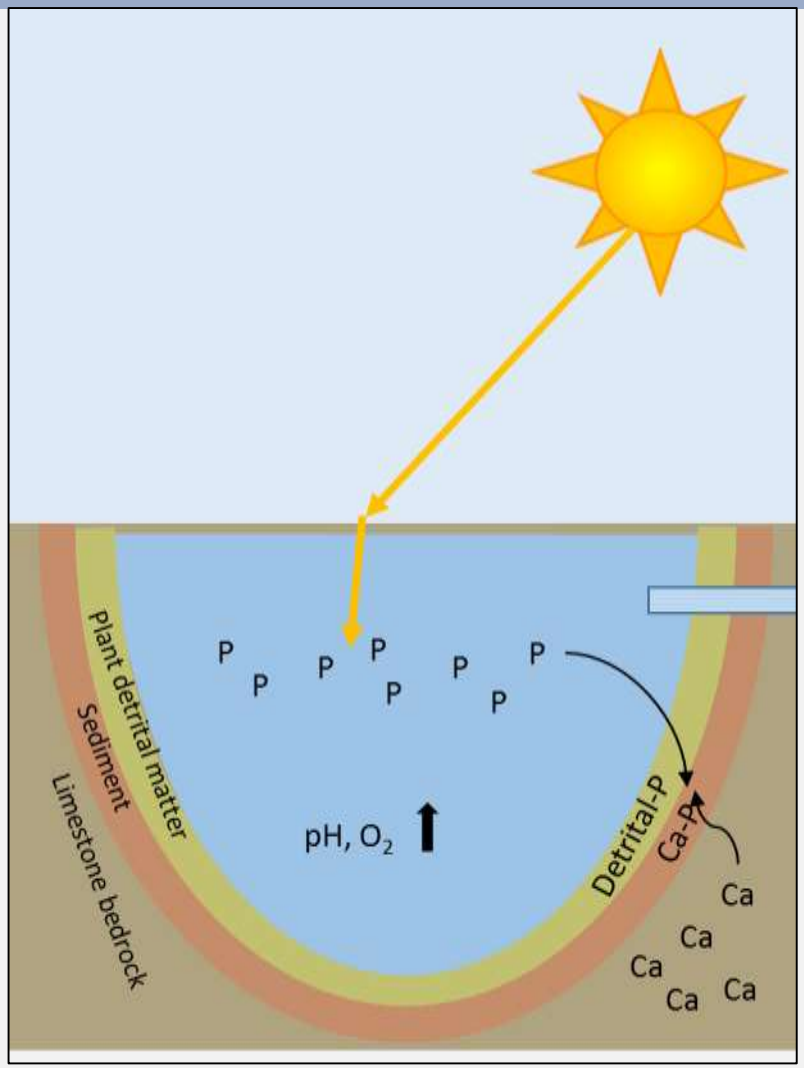
FAV control by farmer

Suppression of FAV

Justification: Denser sediments formed with FAV Suppression

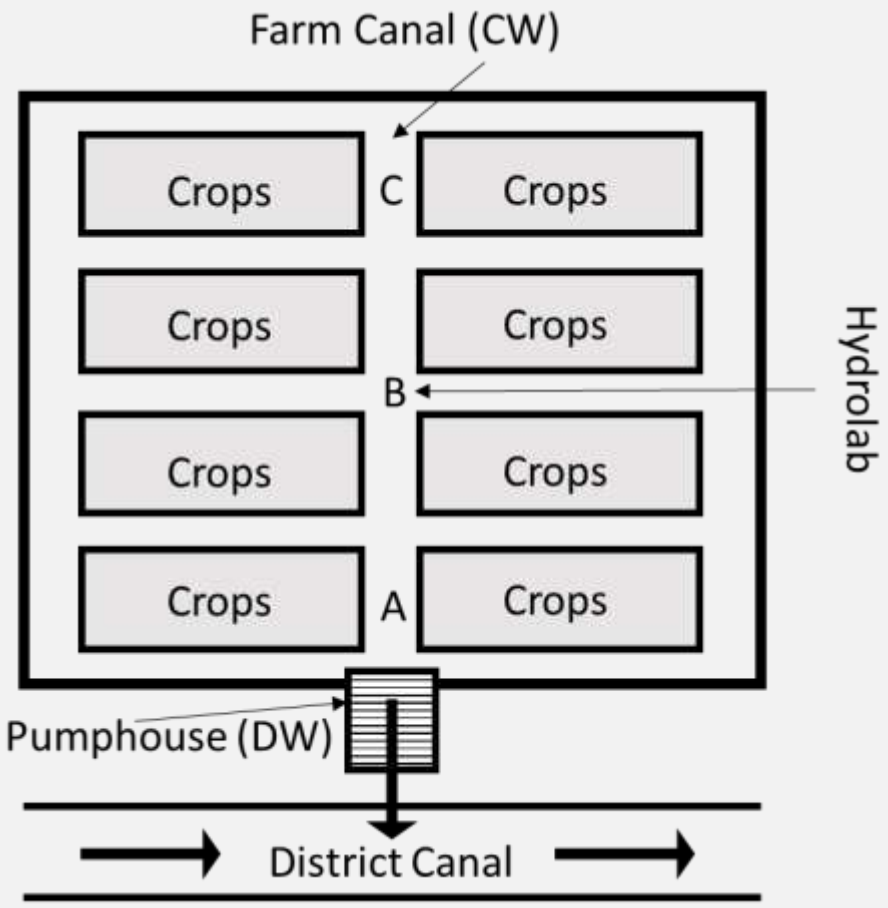


Light weight/labile P-sediments



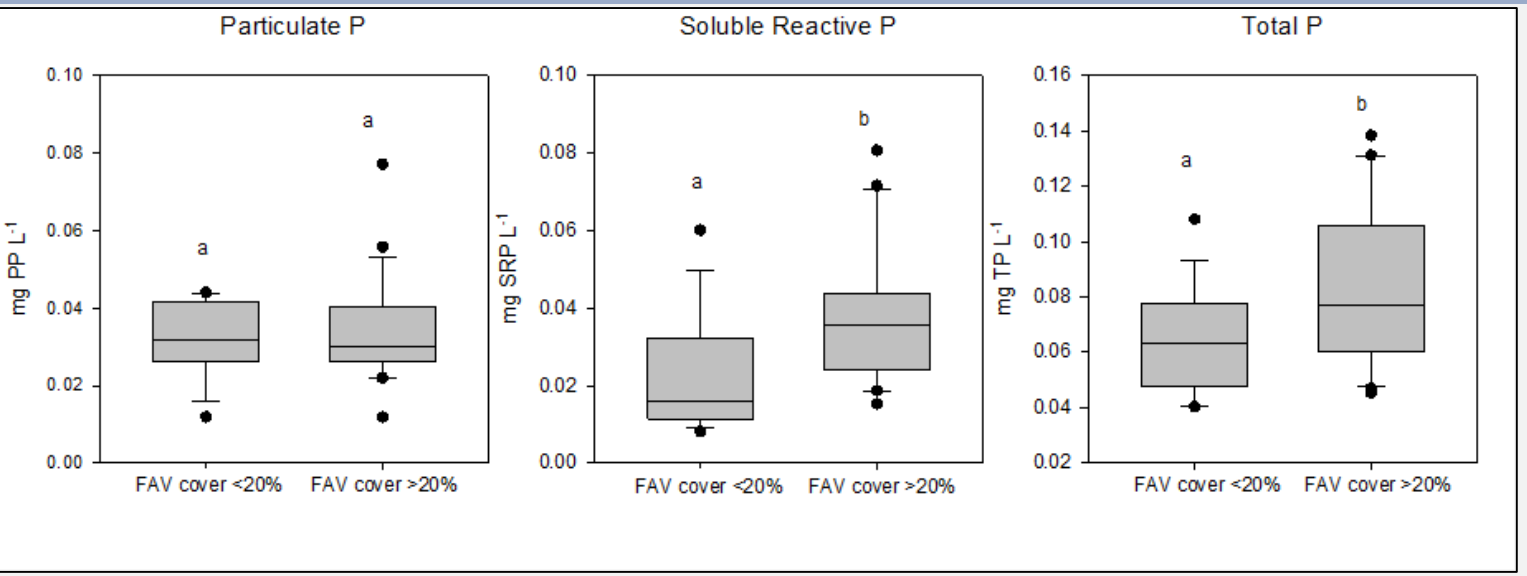
Denser/recalcitrant P-precipitates

Methods

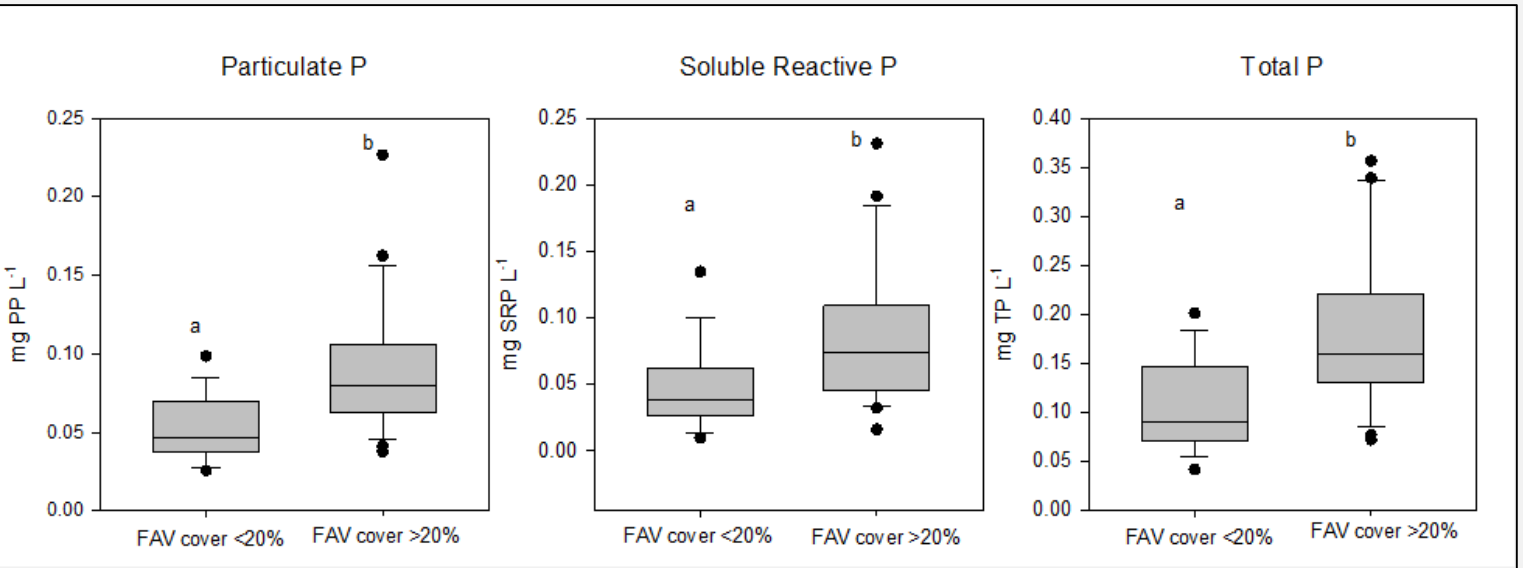


- Eight experimental farms
- Four with FAV suppression <25% cover, four with FAV cover controlled by farmers
- Two sample types:
  - Ambient canal conditions
  - Drainage water

Results: Threshold of FAV effect on Phosphorus



Ambient canal water



Discharge water

Correlations: Ambient Canal Water

	FAV	TSS	Ca	Temp	pH	ORP
TP	0.257	**0.339**	**0.363**	0.168	**-0.606**	-0.258
	0.114	**0.033**	**0.021**	0.299	**<0.001**	0.108
PP	-0.044	**0.677**	0.185	**0.365**	-0.271	-0.039
	0.788	**<0.001**	0.252	**0.021**	0.090	0.810
SRP	**0.358**	-0.049	0.271	0.062	**-0.624**	-0.278
	0.025	0.762	0.091	0.705	**<0.001**	0.082

Correlation coefficient (R)
P-value, significant at 0.05

- Total P(TP) correlated to TSS, Ca and pH
- Particulate P(PP) correlated to TSS and temp
- Soluble Reactive P(SRP) correlated to FAV and pH

Correlations: Discharge Water

	FAV	TSS	Ca	Temp	pH	ORP
TP	**0.489**	**0.701**	-0.047	0.006	-0.263	-0.071
	0.002	**<0.001**	0.773	0.971	0.101	0.665
PP	**0.515**	**0.790**	-0.036	0.121	**-0.440**	-0.286
	<0.001	**<0.001**	0.825	0.459	**0.005**	0.073
SRP	**0.346**	**0.519**	-0.034	-0.105	-0.067	0.064
	0.031	**<0.001**	0.833	0.518	0.684	0.696

Correlation coefficient (R)
P-value, significant at 0.05

- Total P(TP) correlated to FAV and TSS
- Particulate P(PP) correlated to FAV TSS and pH
- Soluble Reactive P(SRP) correlated to FAV and TSS

Conclusions

- Preliminary results suggest management of FAV coverage may be an effective new BMP for reduction of P
- Suppression of FAV cover to less than 20% will significantly reduce both ambient and discharge total P
- Ambient canal P significantly correlated to Ca and pH
- Discharge water P significantly correlated to FAV coverage and TSS

Questions

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