

Larkin Creek Phase II Project 11-1800

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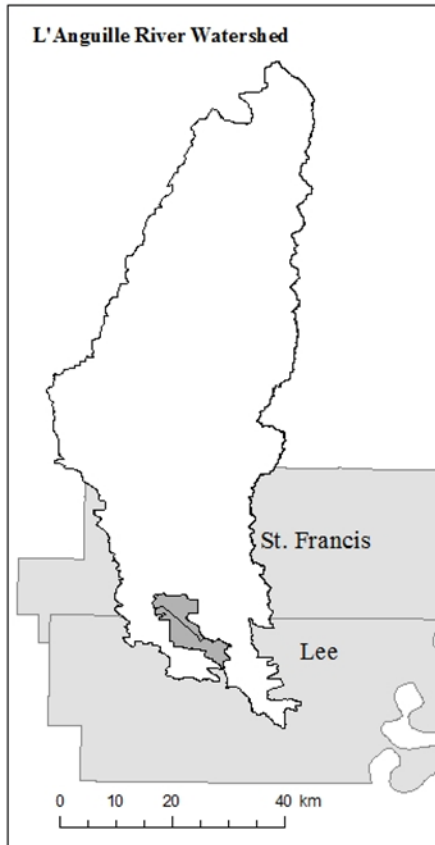
Background

- Larkin Creek
 - tributary of the L'Anguille River
 - dominated by row crop agriculture
- L'Anguille River
 - tributary of the St. Francis River
 - in the Delta ecoregion
 - 303d list for sedimentation and pathogens
- ADEQ authorized the St. Francis County Conservation District to implement BMPs to reduce pollutant loading to L'Anguille

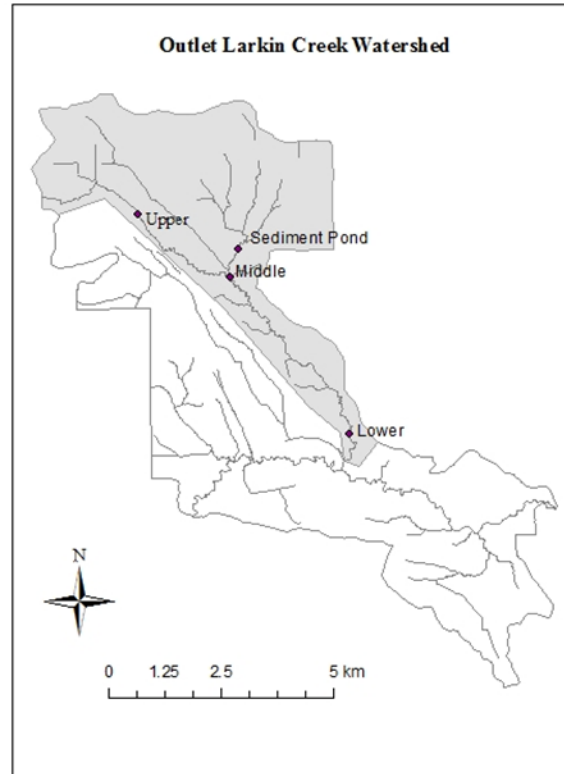
A.



B.



C.



Site description

Lateral 1-A of Larkin Creek

- Tributary of the L'Anguille River
- HUC#080202050506

Middle Site ~ 0.48 km downstream of Sedimentation Pond

BMPs

St. Francis County Conservation District

- sediment pond construction
- plant riparian buffers
- plant cover crops
- remove sediment
- restore the channel
 - Lateral 1-A of Larkin Creek

L'Anguille River

- Agricultural activities cited as major cause of the impairment within watershed
 - excessive turbidity from silt, suspended solids loading, sedimentation

Larkin Creek



Upper 34°55'15.50"N 90°54'34.30"W



Middle 34°54'30.00"N 90°53'18.30"W



Lower 34°52'37.10"N 90°51'35.20"W

Measured Parameters

- pH
- Dissolved Oxygen
- Total Suspended Solids (TSS)
- Turbidity
- Dissolved Nitrate, Nitrite, Orthophosphate

- Weekly sampling concluded Sept 2014
- Samples categorized as rainfall (>2 cm) and baseflow events (Lon Mann Cotton Research Station, Marianna, AR)

Annual mean TSS and turbidity

	2012		2013		2014	
	TSS	Turb	TSS	Turb	TSS	Turb
Upper Site	37.0	56.9	33.1	78.5	21.1	58.8
Middle Site	57.1	82.6	60.0	124.2	38.8	104.0
Lower Site	44.1	86.5	40.8	88.7	32.3	69.7

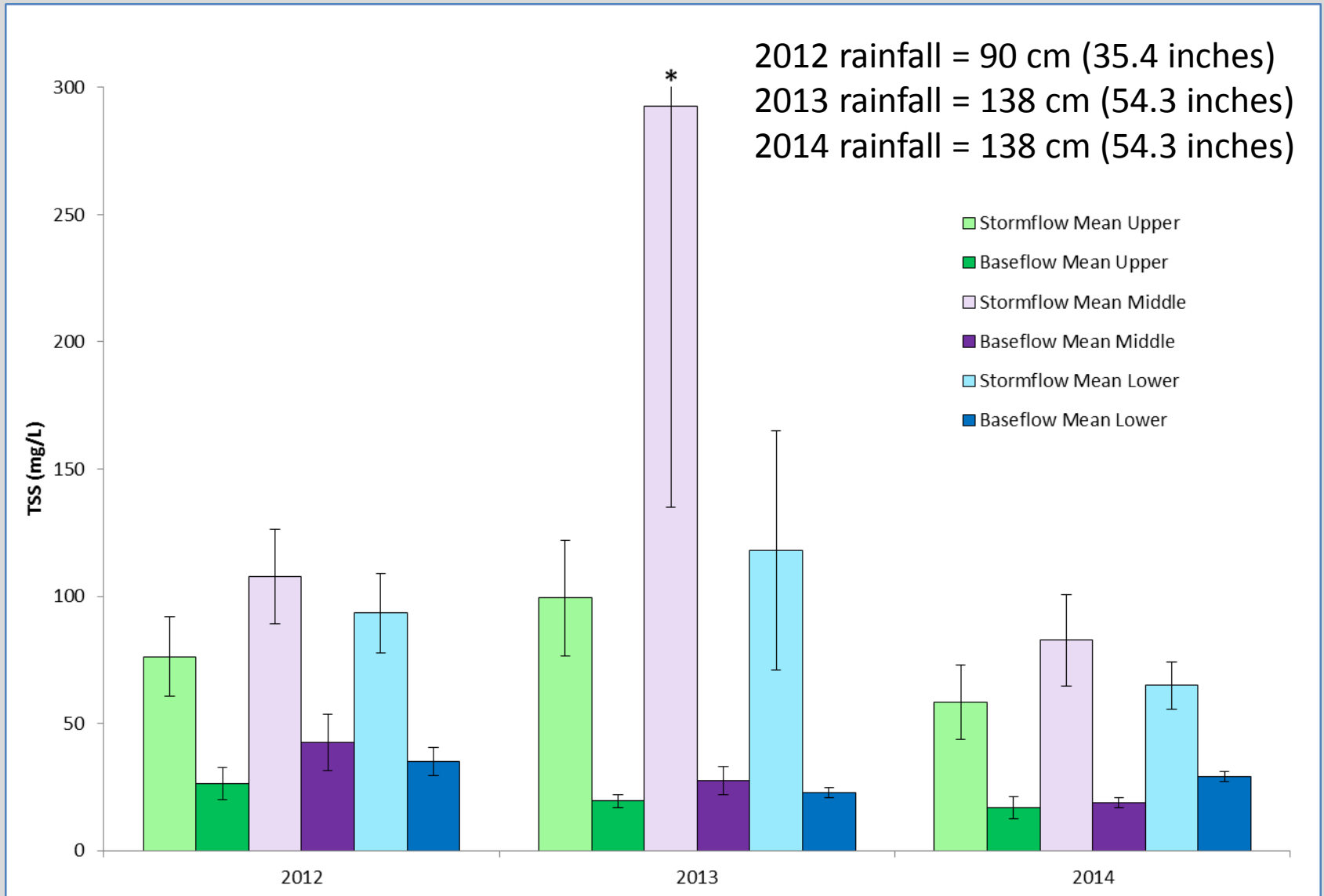
Mean TSS and turbidity 2012-2014

	TSS	Turb
Upper Site	31.4	70.4
Middle Site	50.9	93.3
Lower Site	40.3	84.4

TSS (mg/L)

Turbidity (NTU)

TSS - rainfall and baseflow



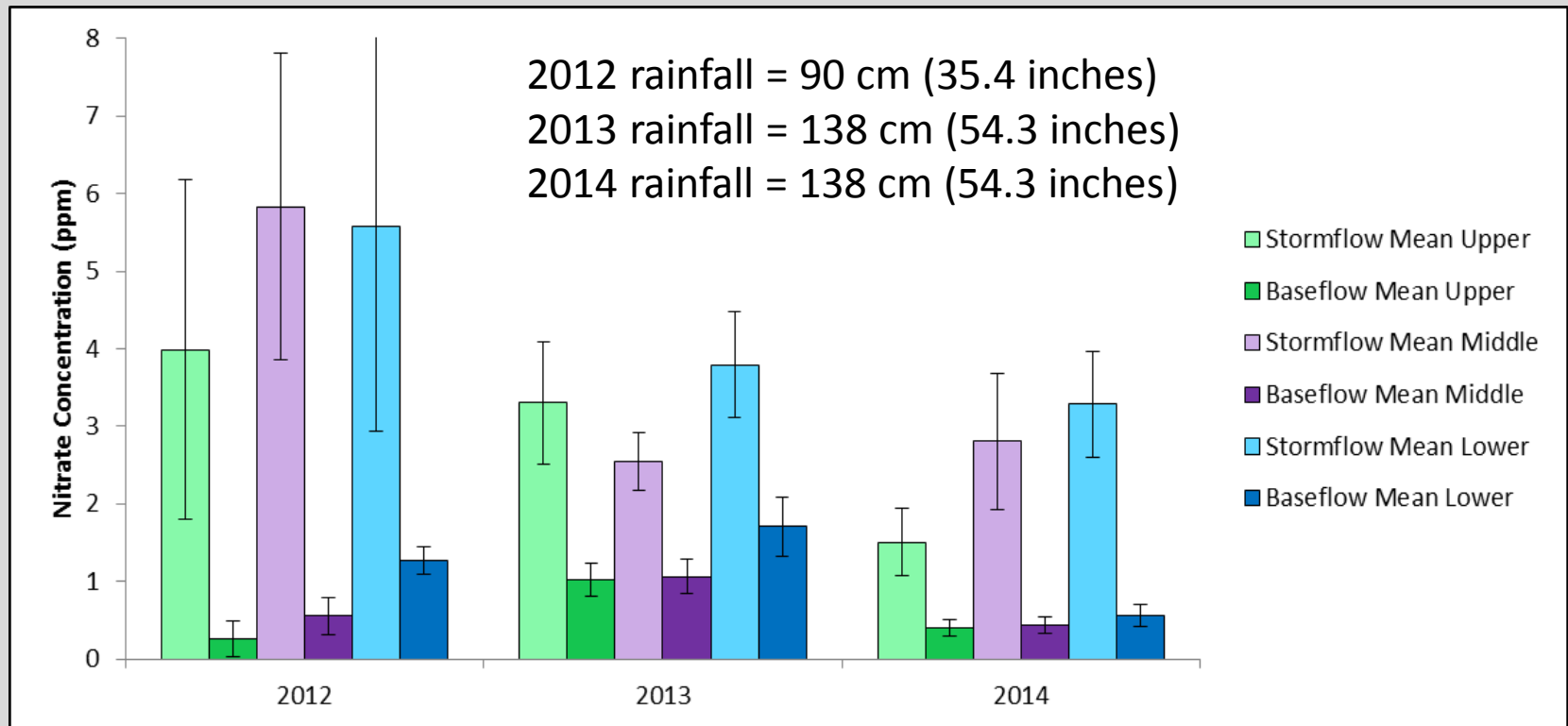
Annual mean dissolved nutrients (ppm)

	2012			2013			2014		
	NO ₂	NO ₃	PO ₄	NO ₂	NO ₃	PO ₄	NO ₂	NO ₃	PO ₄
Upper Site	0.068	1.065	0.144	0.086	1.540	0.810	0.097	0.187	0.351
Middle Site	0.154	1.864	0.150	0.049	1.432	0.425	0.130	0.651	1.120
Lower Site	0.122	1.699	0.205	0.079	2.257	0.422	0.093	1.059	0.214

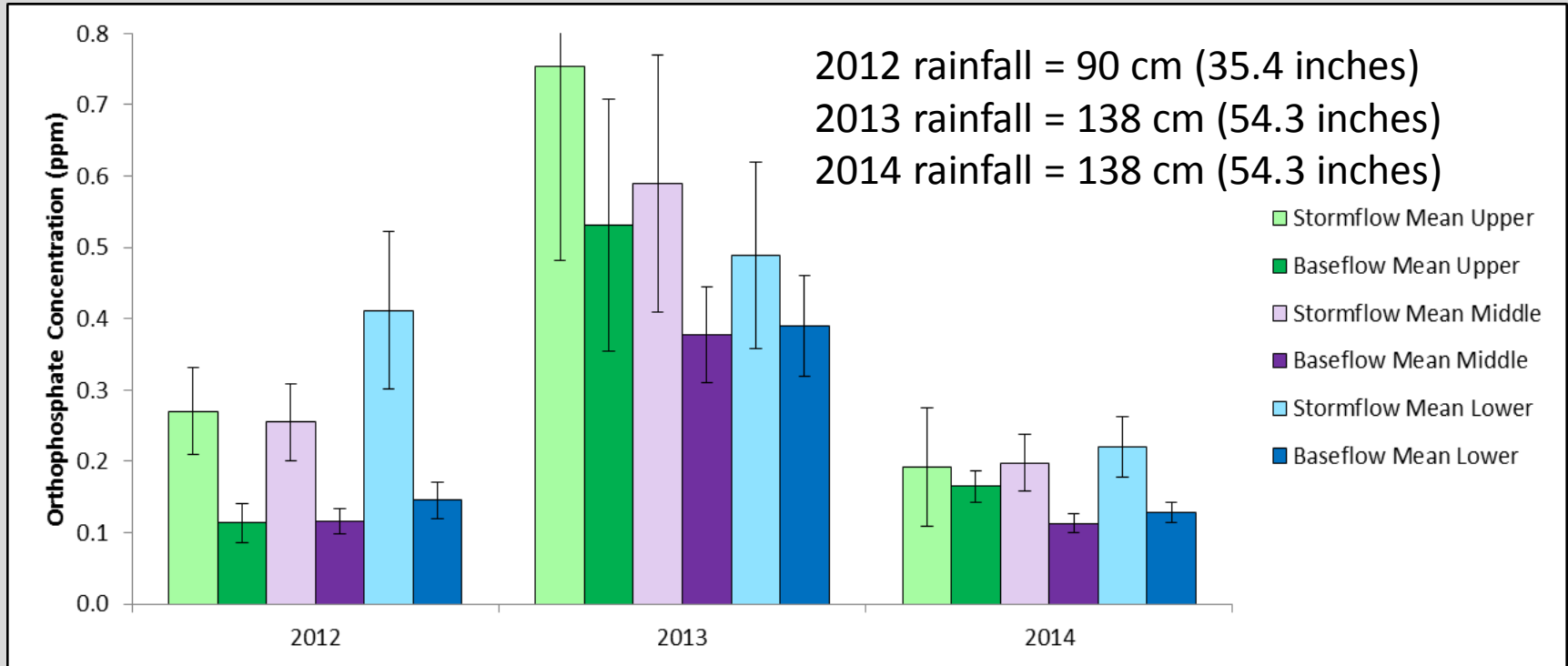
Mean dissolved nutrients (ppm) 2012-2014

	NO ₂	NO ₃	PO ₄
Upper Site	0.084	1.104	0.307
Middle Site	0.086	1.595	0.240
Lower Site	0.088	1.726	0.262

NO₃ - rainfall and baseflow



PO₄ - rainfall and baseflow

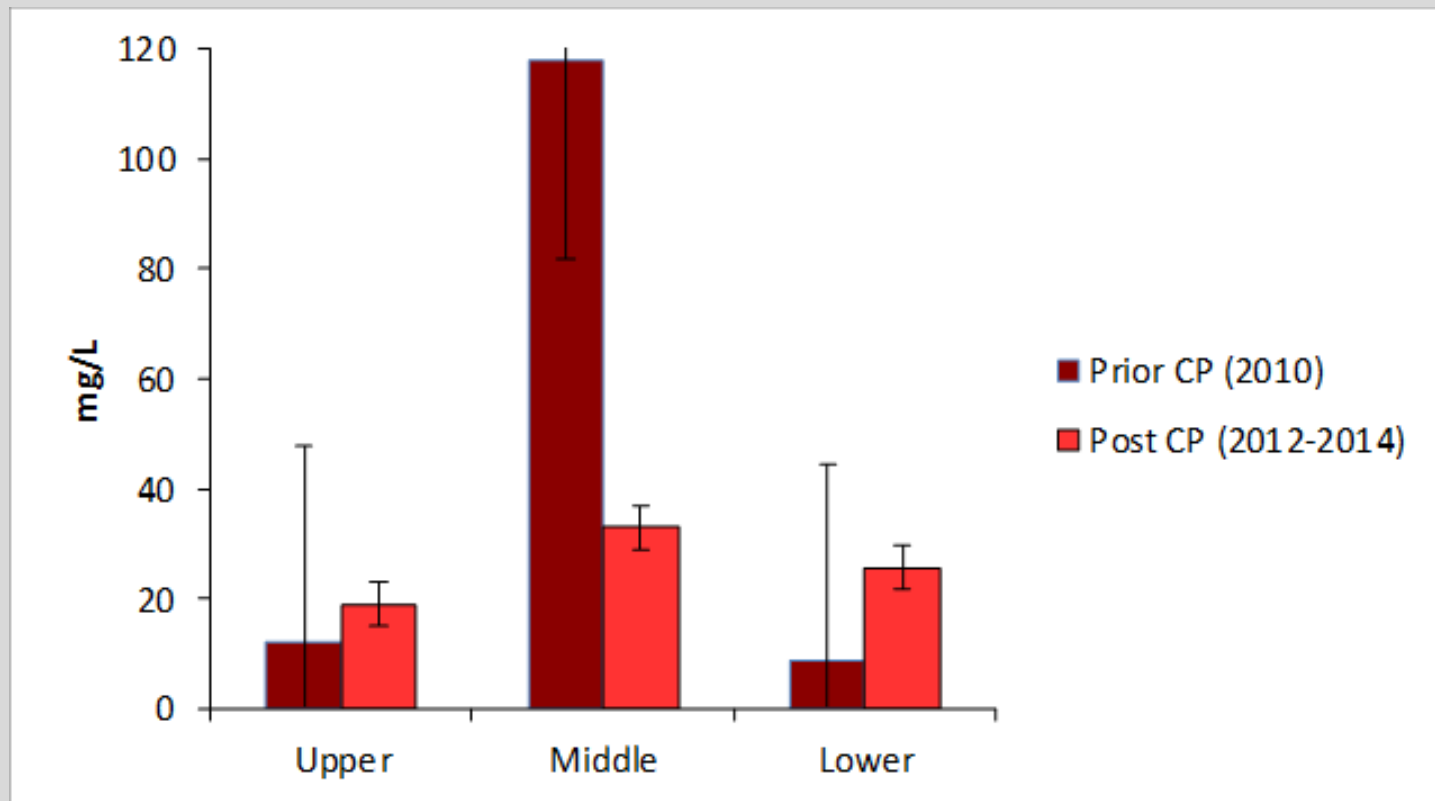


Pre-conservation practices (2010)

- 16 week sampling period
 - June – Sept 2010
- June – Sept 2012-2014 comparisons
- 2010 extremely dry year
 - (Lon Mann Cotton Research Station, Marianna, AR)

June – Sept (16 weeks)	Rainfall (cm)
2010	3.40
2012	5.97
2013	6.22
2014	10.80

June – Sept TSS means prior to (2010) and post (2012-2014) conservation practices

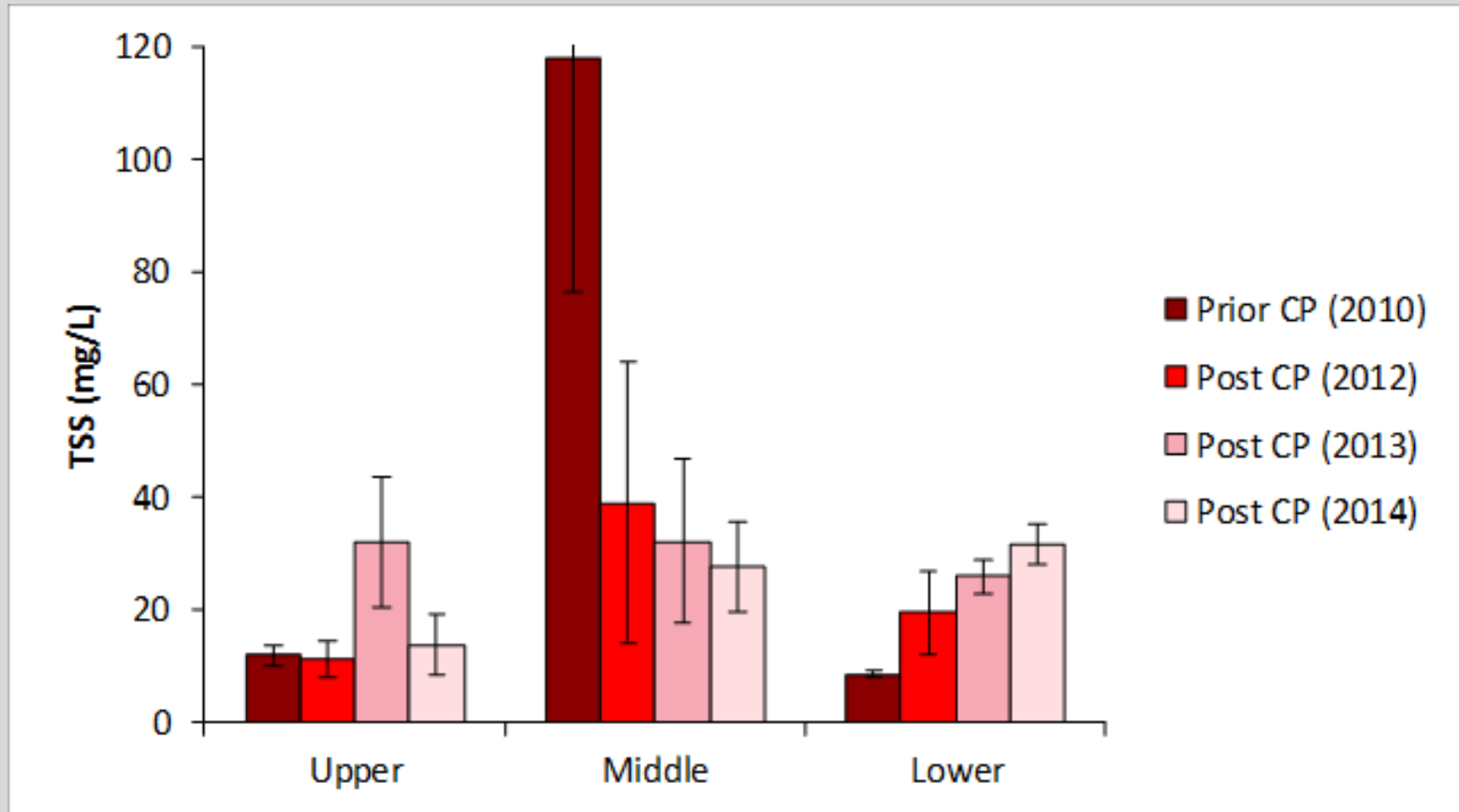


Mean TSS 2010 = 117.9 mg/L

Mean TSS 2012-2014 = 32.9 mg/L

72% reduction

June – Sept TSS means prior to (2010) and post (2012-2014) conservation practices



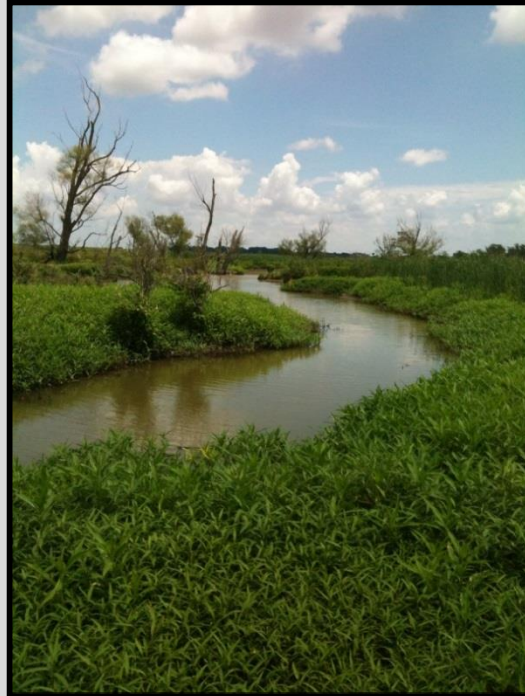
Conclusions

- TSS remains greatest at Middle Site
 - Especially following rain events
- Nutrient spikes following applications and rainfall events
 - Greater values at lower site
- Data following conservation practice implementation may show continued improvement over time
 - Pre- and post-implementation shows improvement
 - Drought year (2012) and wet years (2013 & 2014)
 - Separating rain and baseflow events
- Sarah's MS thesis complete – graduated May 2015

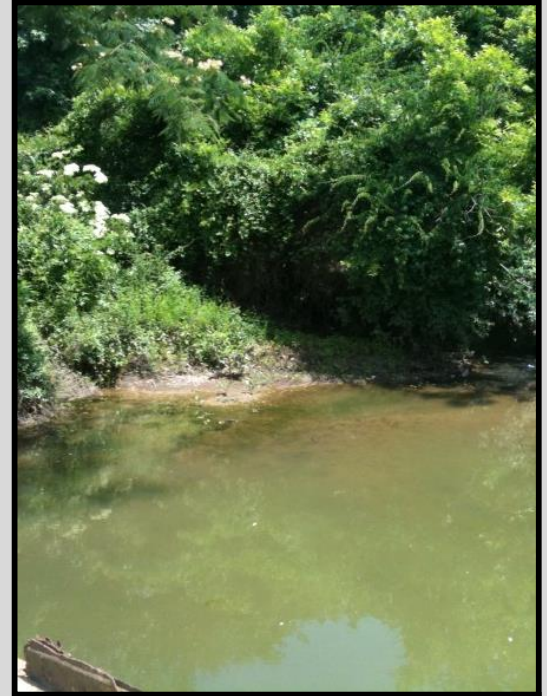
Questions?



Upper Larkin Creek



Middle Larkin Creek



Lower Larkin Creek



Thanks to ANRC, Sarah Frasier, students and technicians at Ecotox