

# Year Two Review of Water Quality Monitoring on the Upper Strawberry River Project 07-1000

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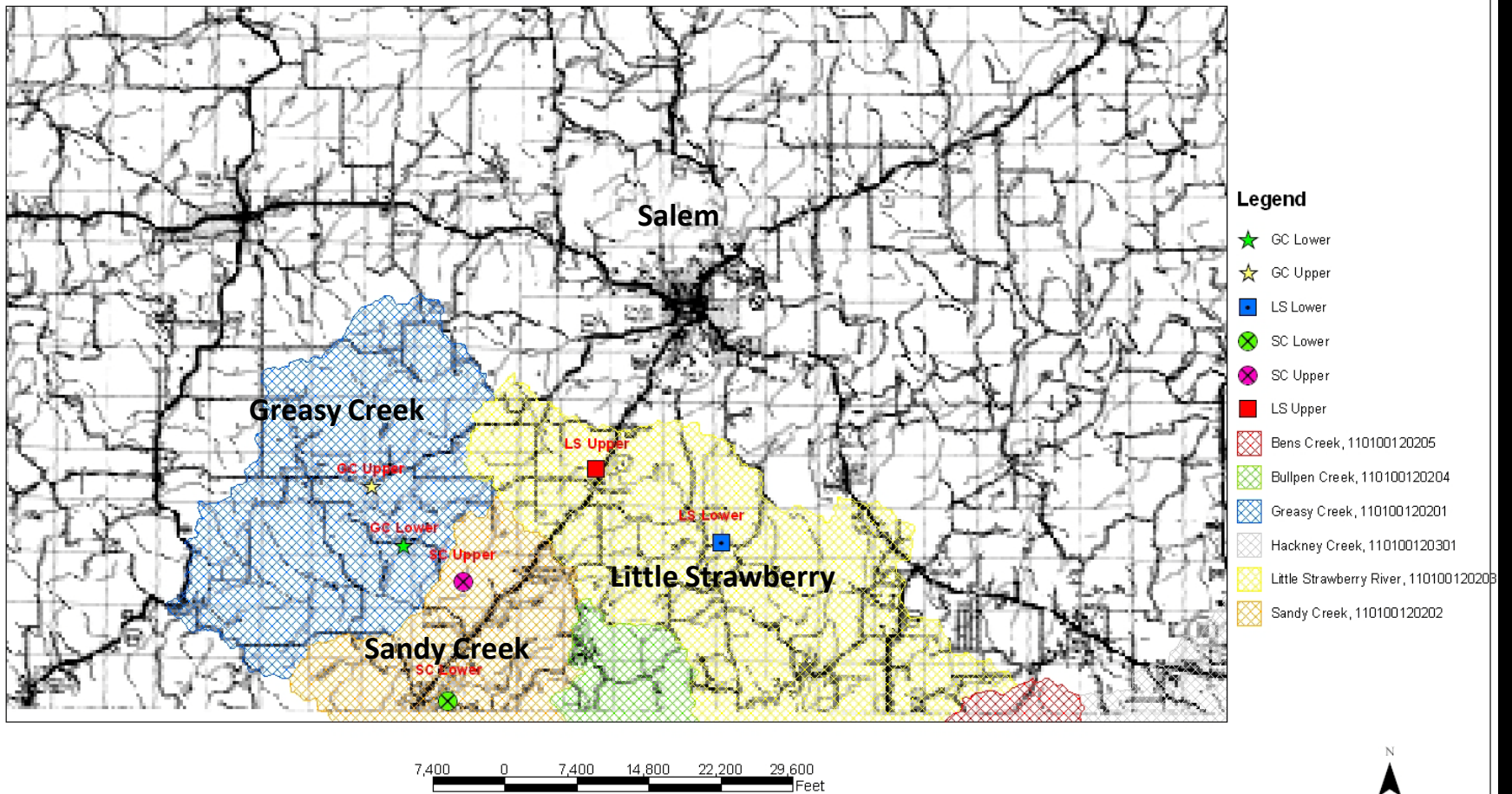
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University, State University, AR 72467*

<sup>2</sup> *Department of Biological Sciences, Arkansas State  
University, State University, AR 72467*

# Sampling sites

Strawberry River Sub Watersheds Monitoring Points

Fulton County



# Overview

- Major headwater streams in the upper Strawberry River watershed
  - Little Strawberry (LS)
  - Sandy Creek (SC)
  - Greasy Creek (GC)
- Above and below BMP implementation
- Surface Water Quality Tests
  - Nutrients
    - Nitrites
    - Nitrates
    - Ortho-Phosphates
  - Total Suspended Solids

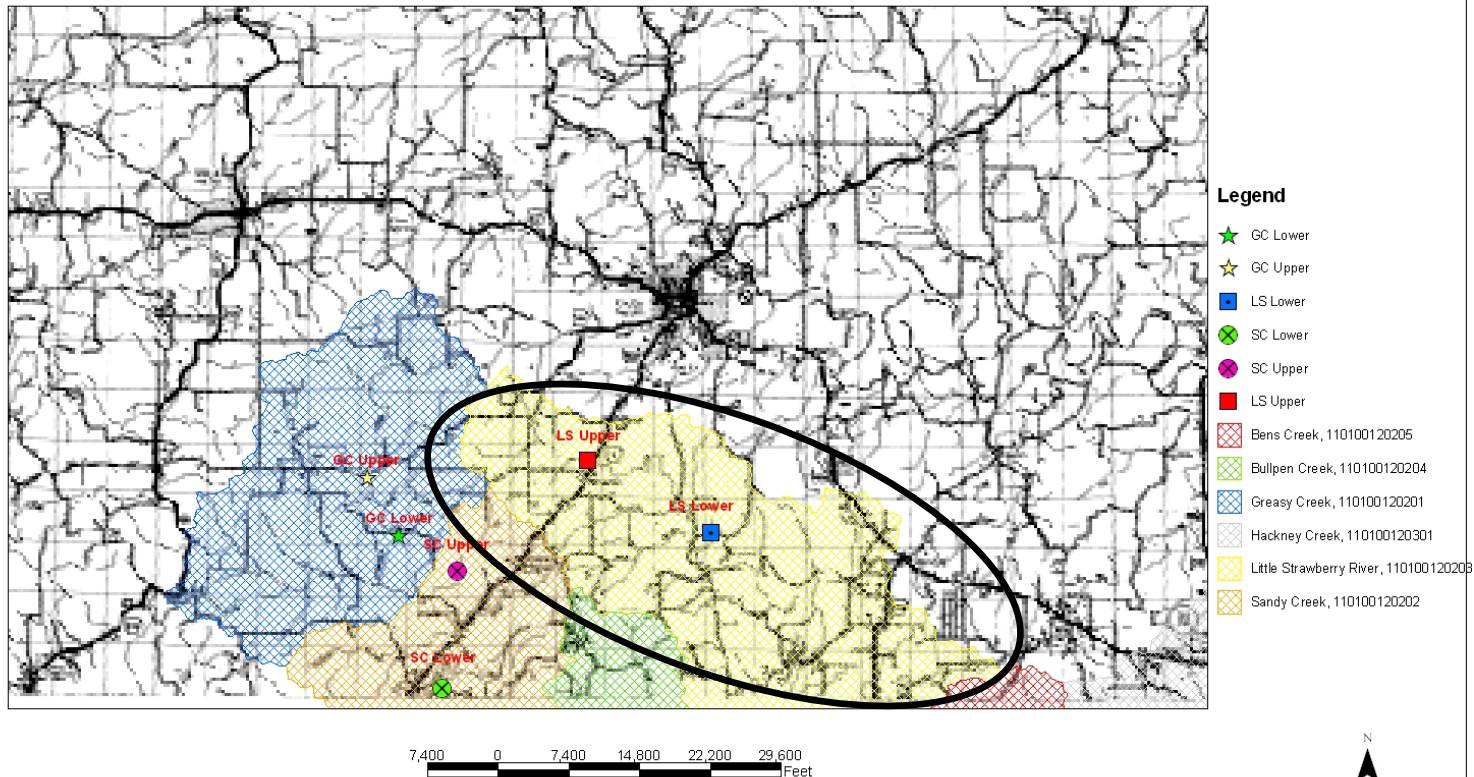


<http://arkansas-dnr.org/strawberryriver.htm>

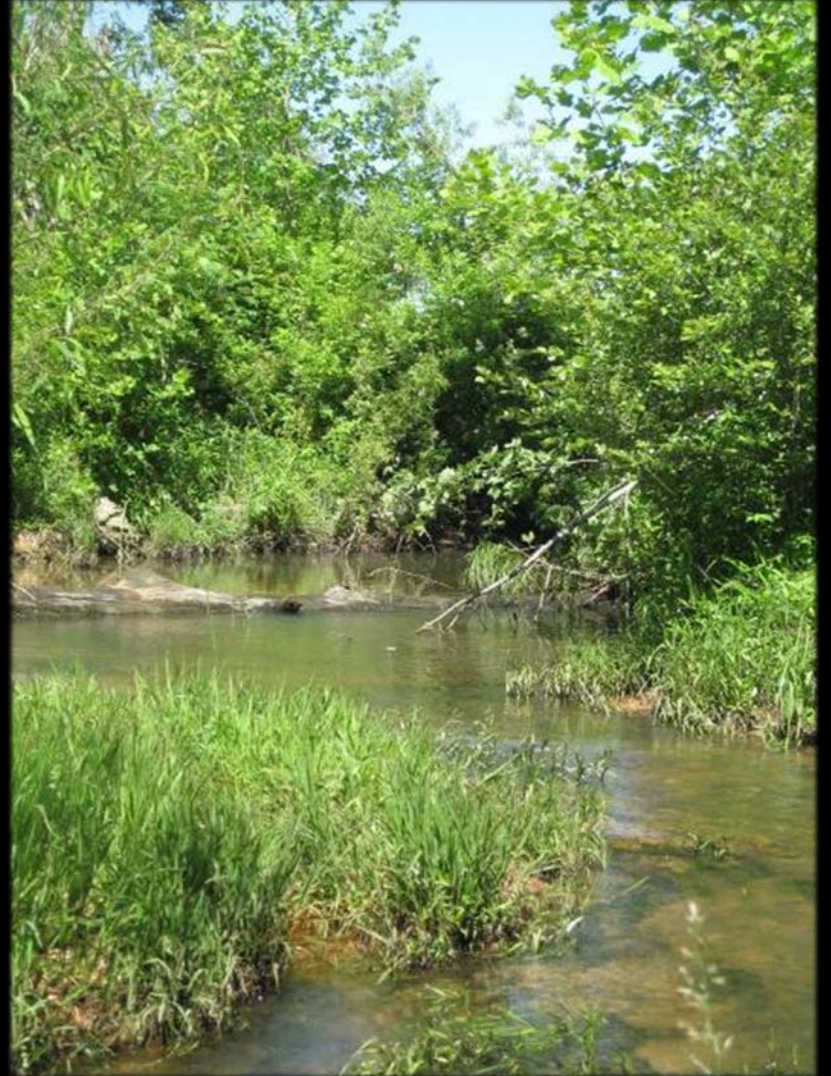
# Little Strawberry River Subwatershed

- Largest subwatershed of the Strawberry River

Strawberry River Sub Watersheds Monitoring Points



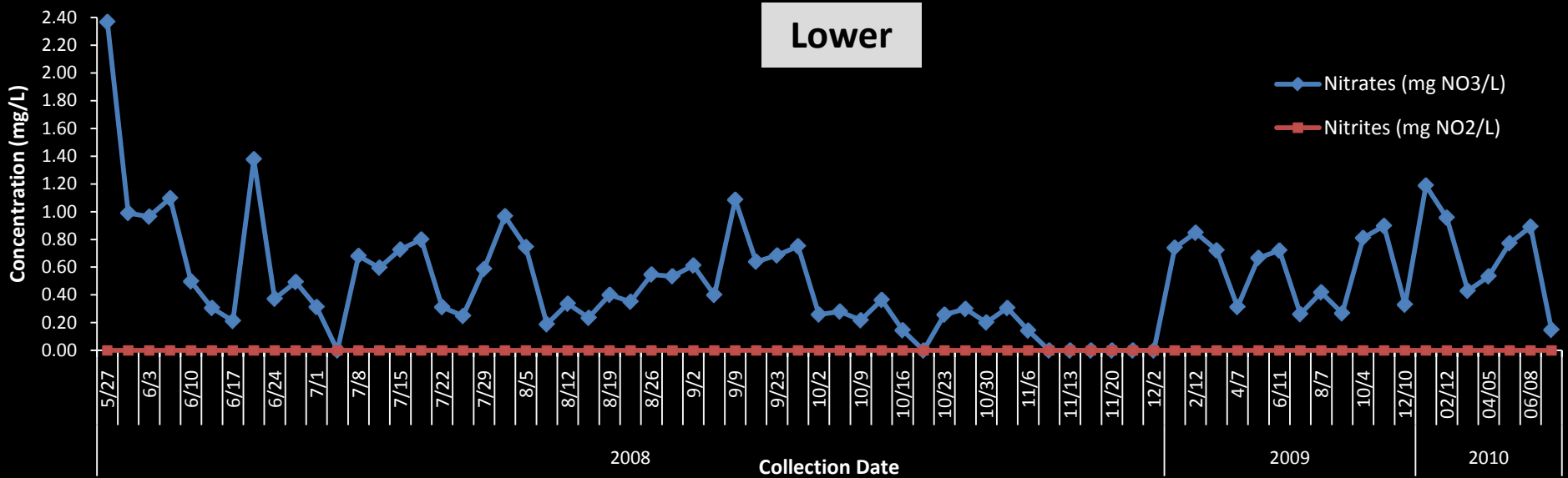
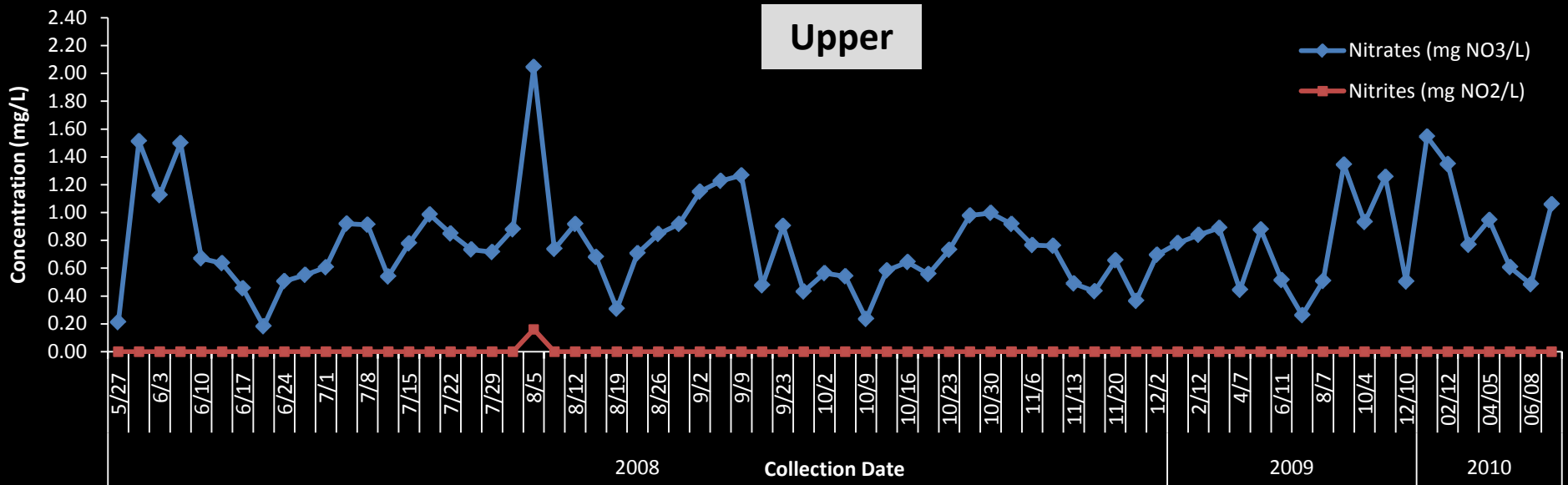
# Little Strawberry Upper



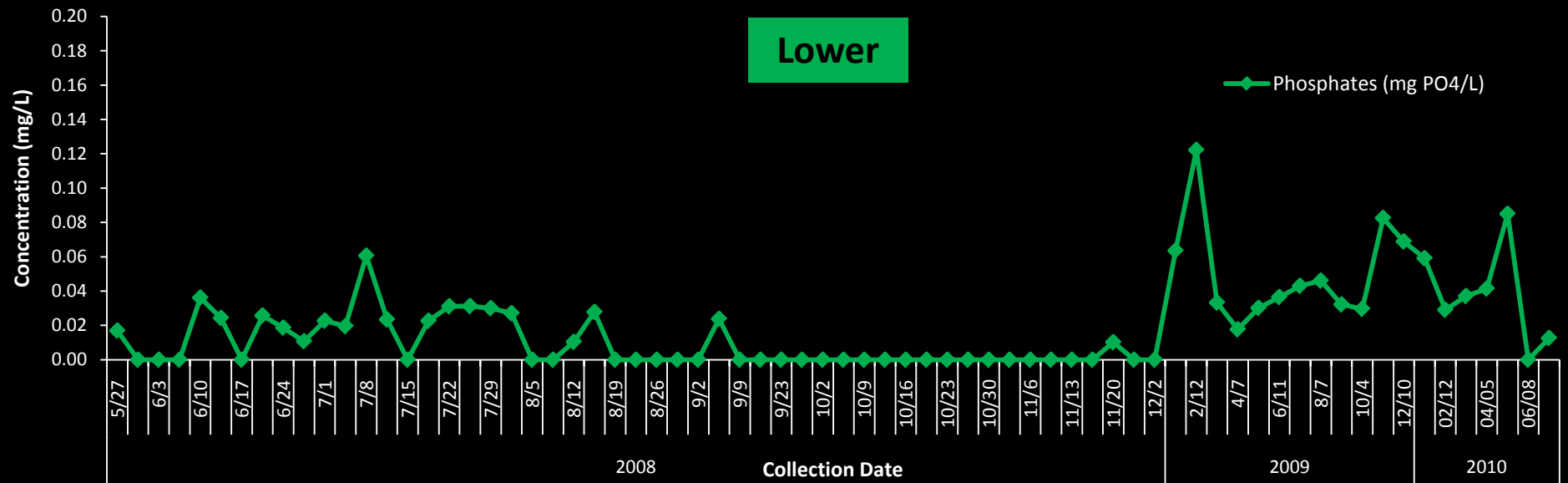
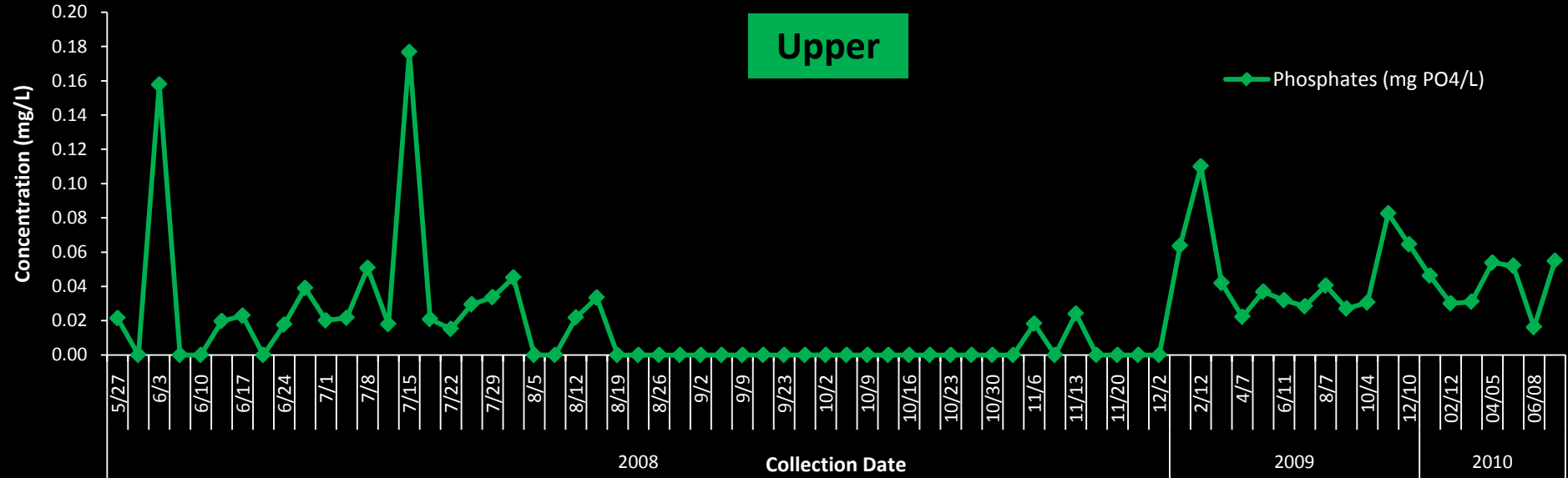
**Little  
Strawberry  
Lower**



# Little Strawberry (LS) NO<sub>x</sub> Data



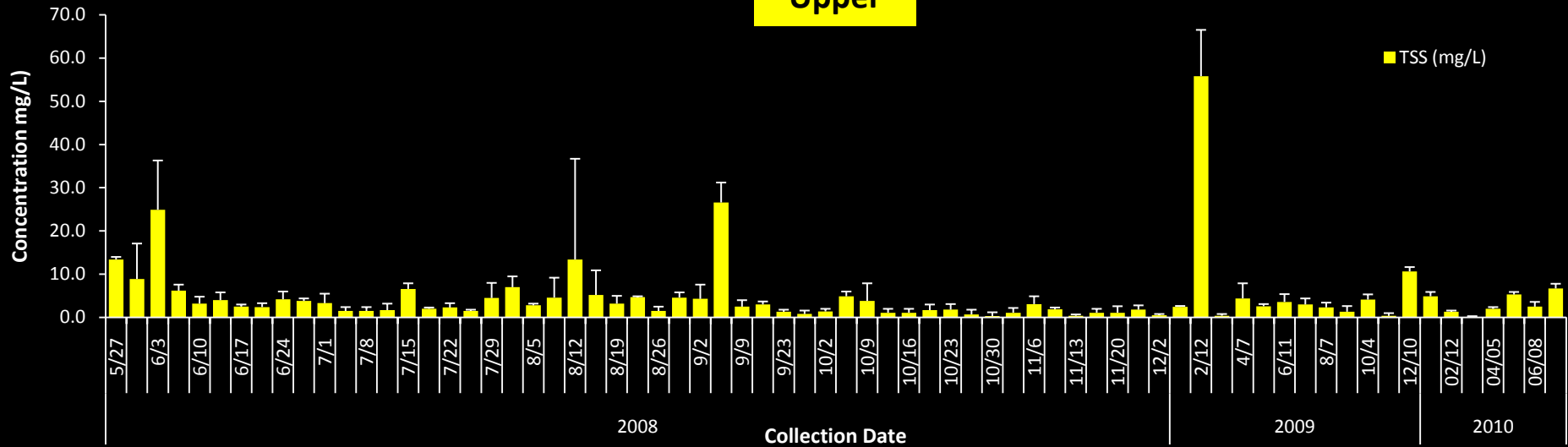
# Little Strawberry (LS) Ortho-Phosphate Data



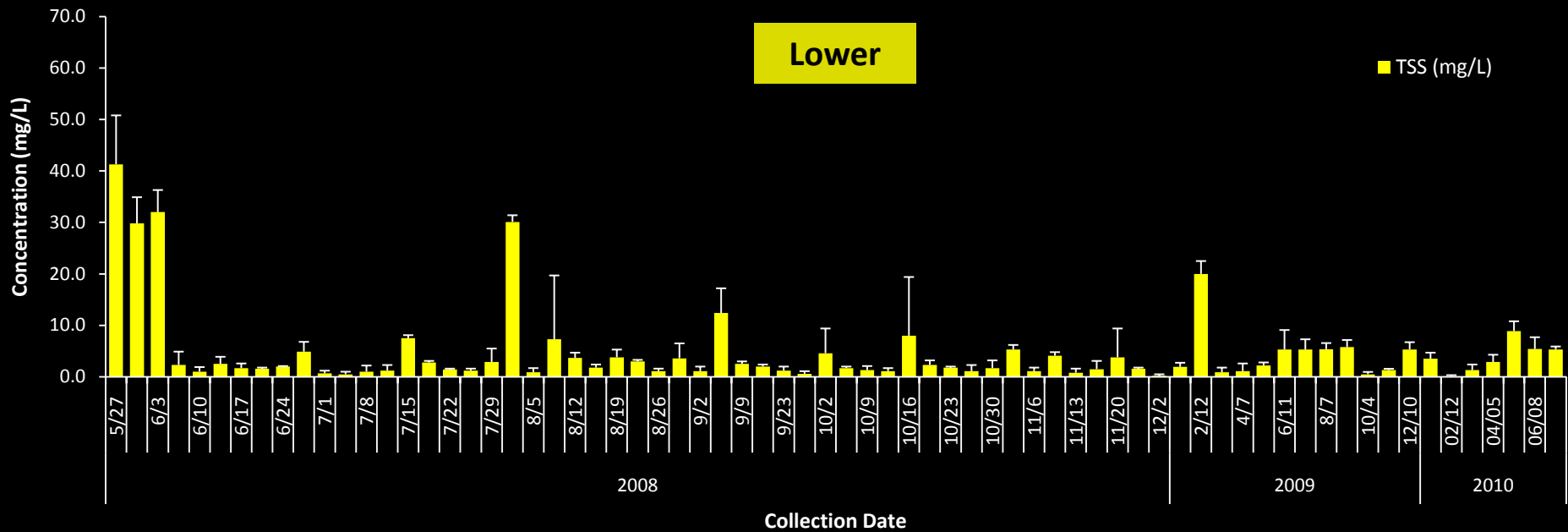


# Little Strawberry Total Suspended Solid (TSS) Data

Upper



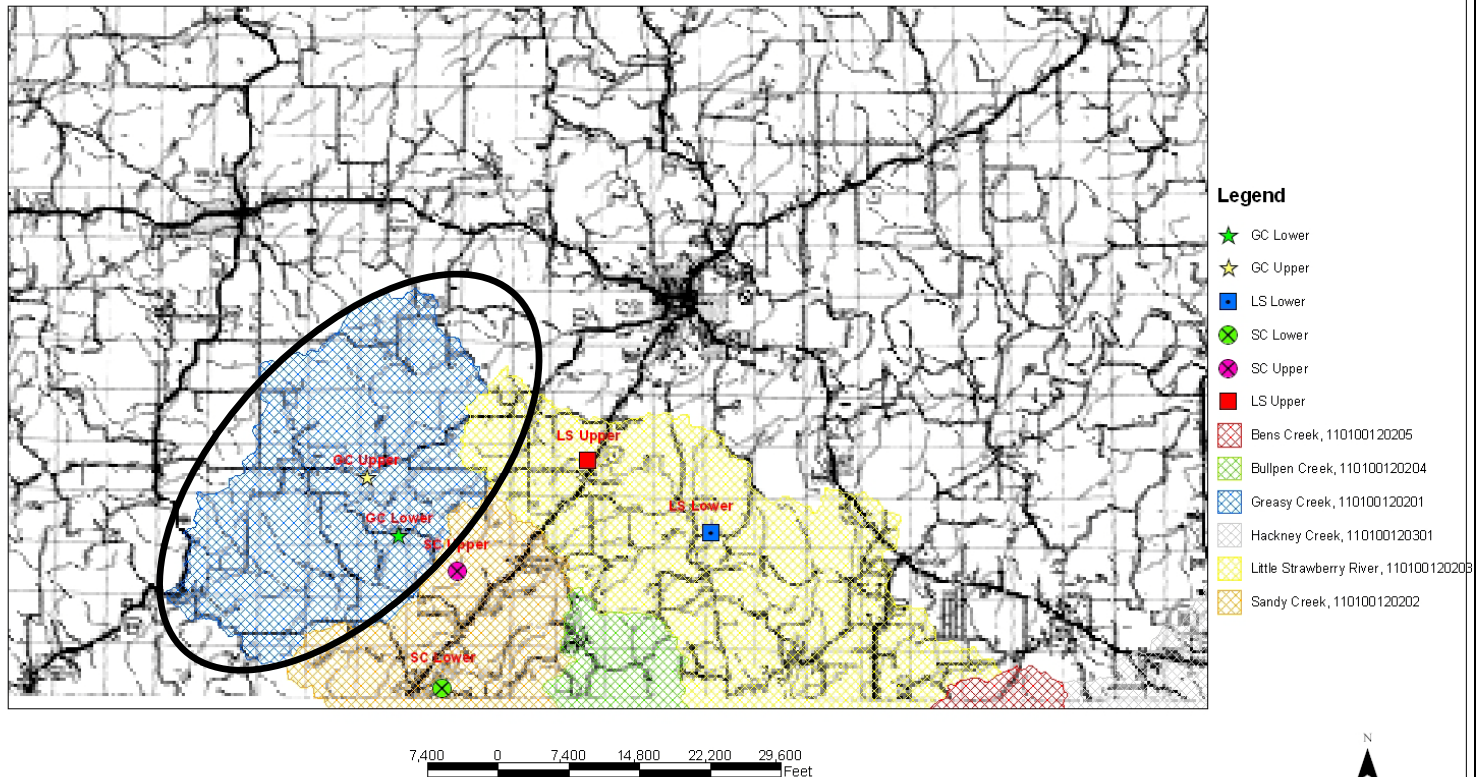
Lower



# Greasy Creek Subwatershed

- 2<sup>nd</sup> largest subwatershed of the Strawberry River

Strawberry River Sub Watersheds Monitoring Points





# Greasy Creek Upper

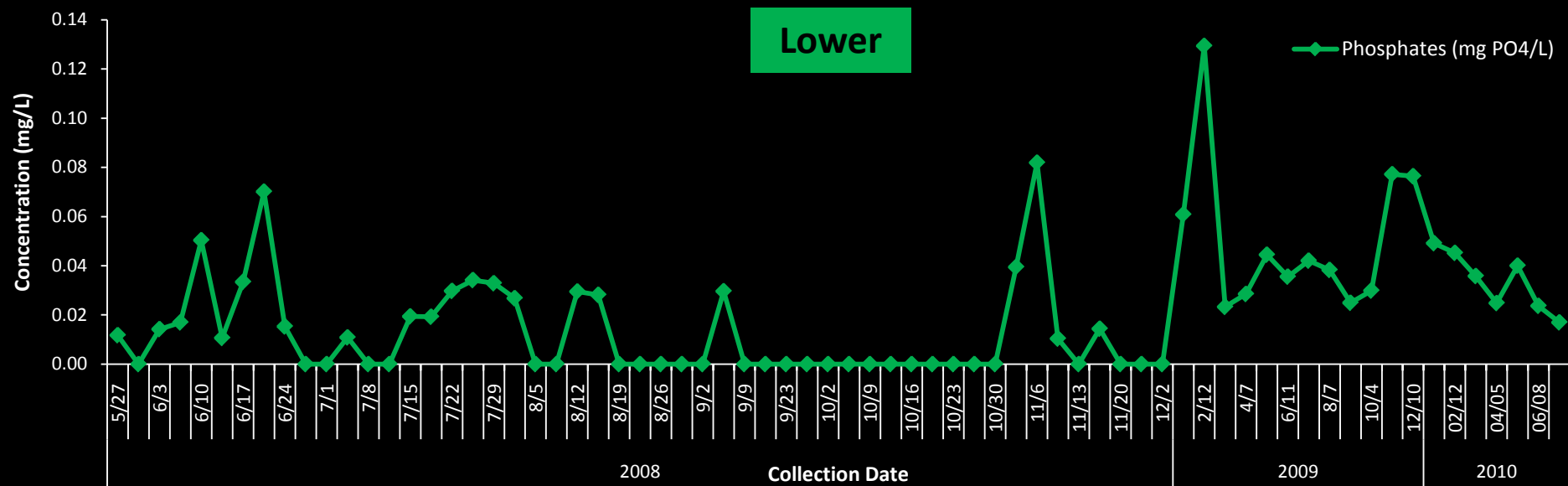
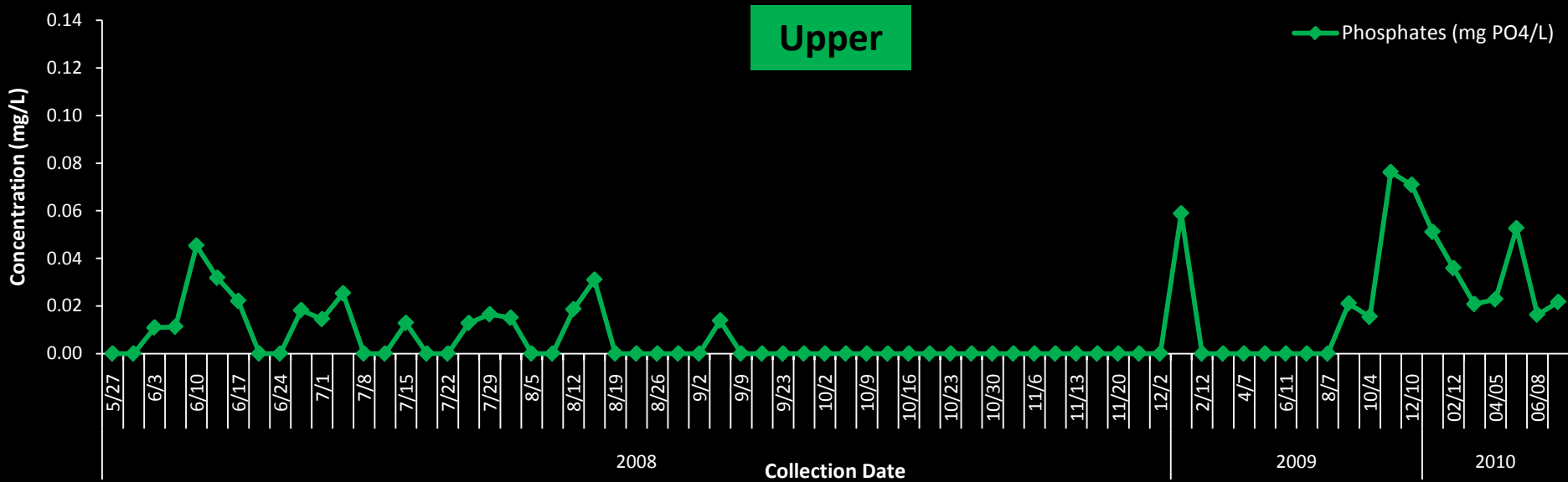


# Greasy Creek Lower



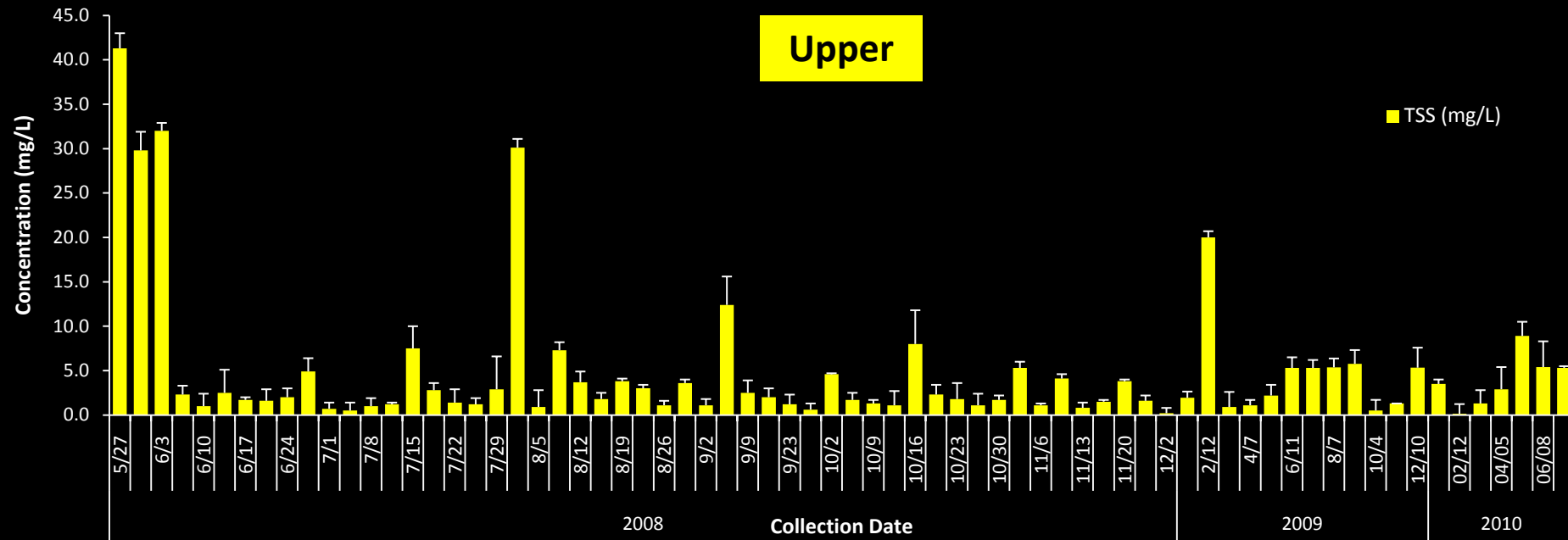


# Greasy Creek (GC) Ortho-Phosphate Data

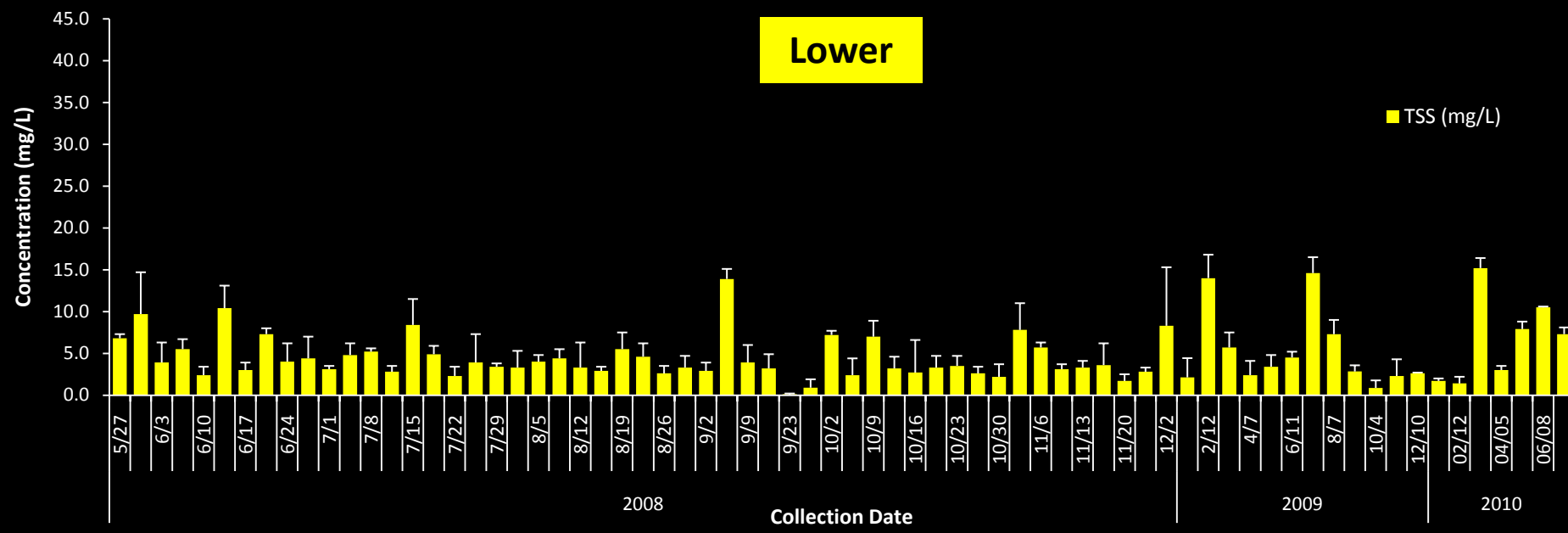


# Greasy Creek (GC) Total Suspended Solid (TSS) Data

Upper



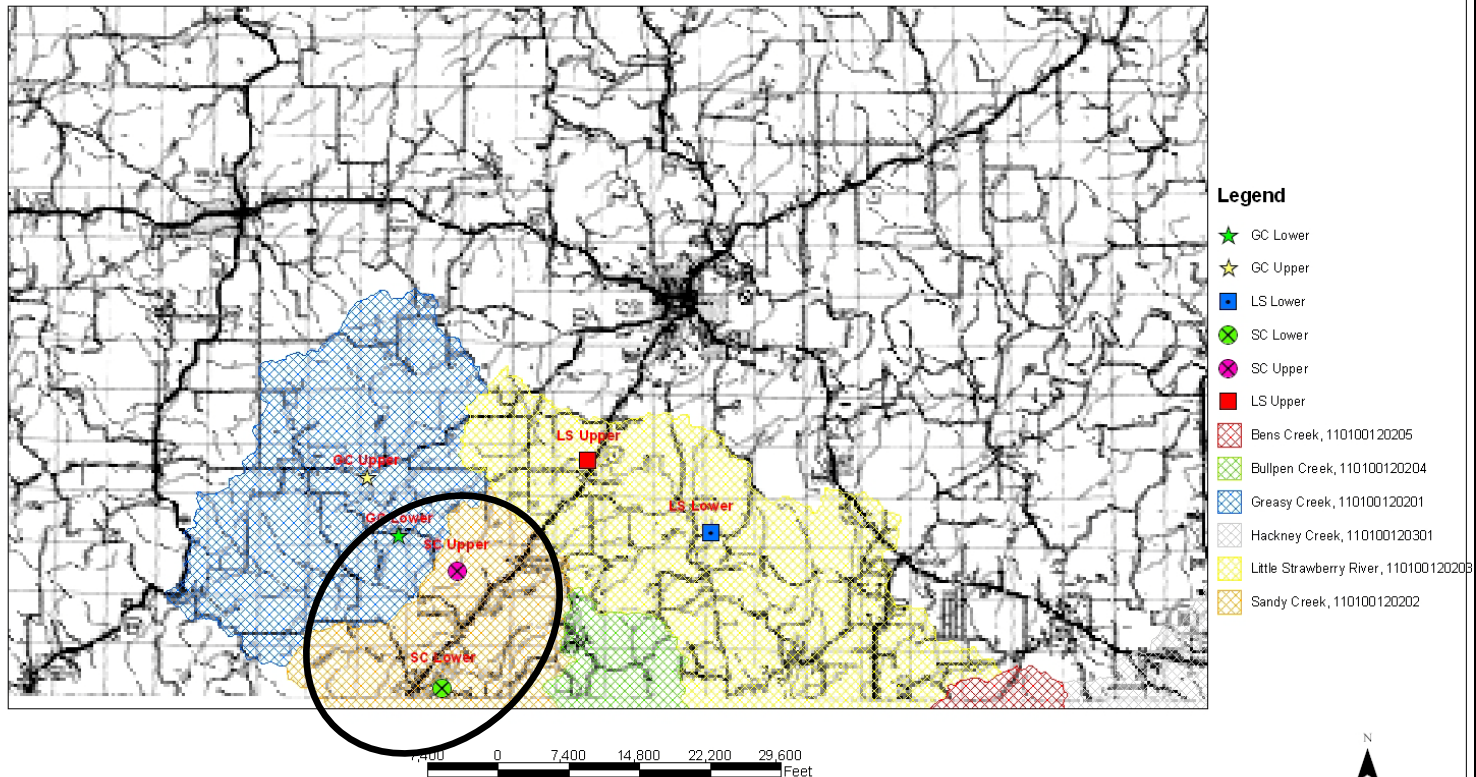
Lower



# Sandy Creek Subwatershed

- Smallest subwatershed of the Strawberry River

Strawberry River Sub Watersheds Monitoring Points







# Sandy Creek Upper

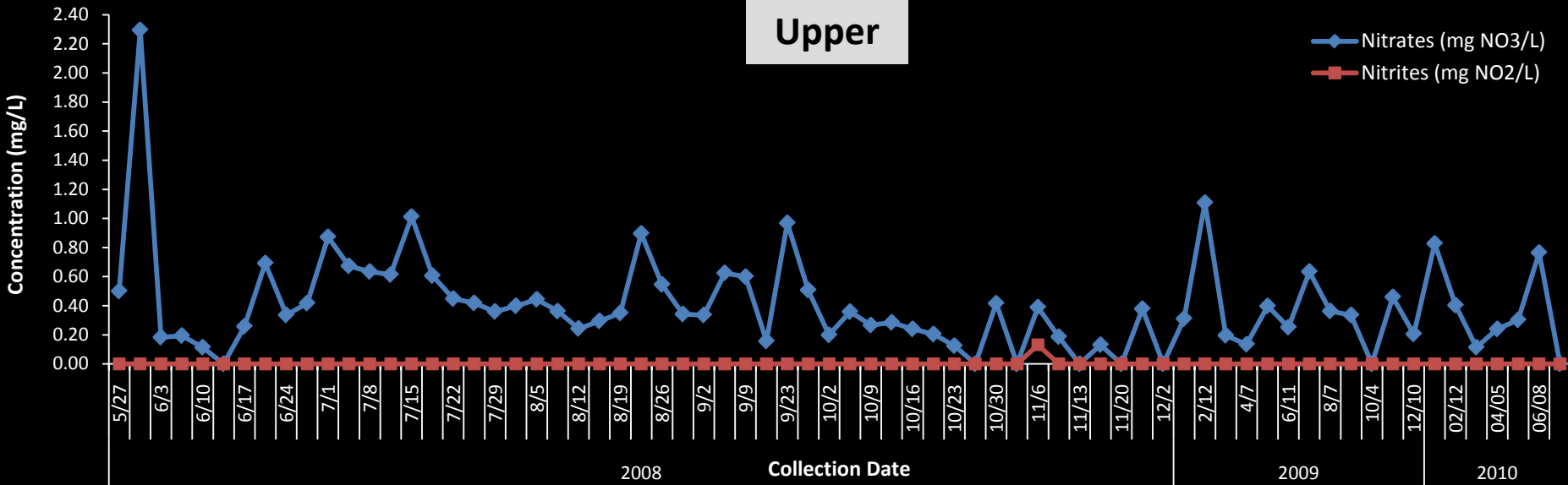


# Sandy Creek Lower

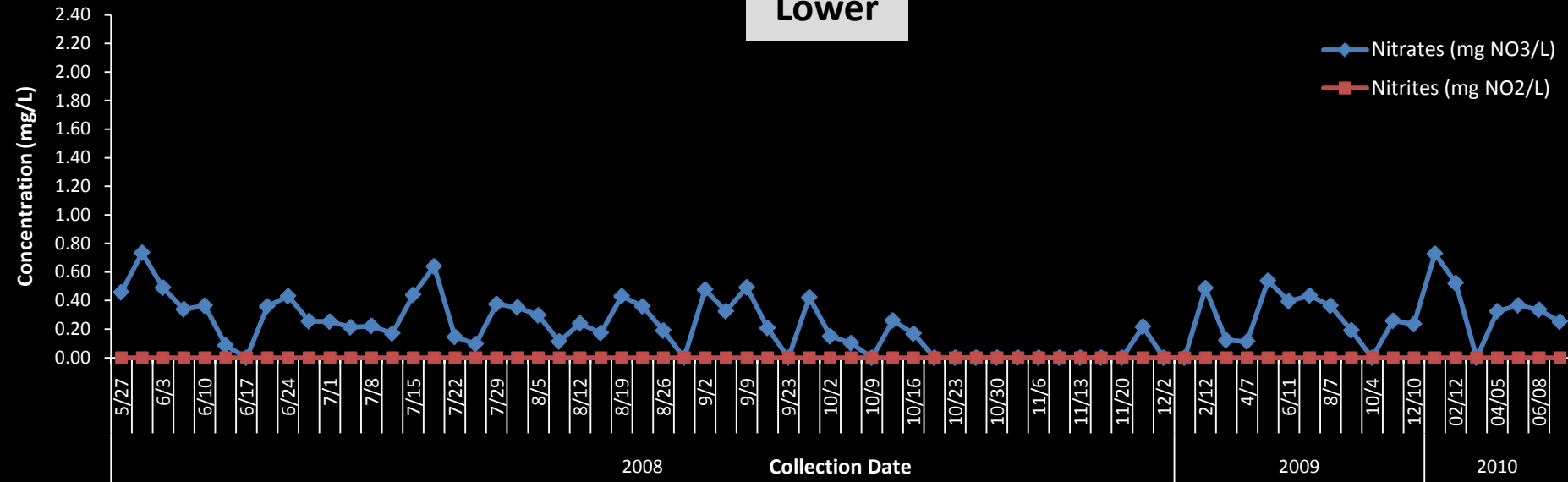


# Sandy Creek (SC) NO<sub>x</sub> Data

## Upper

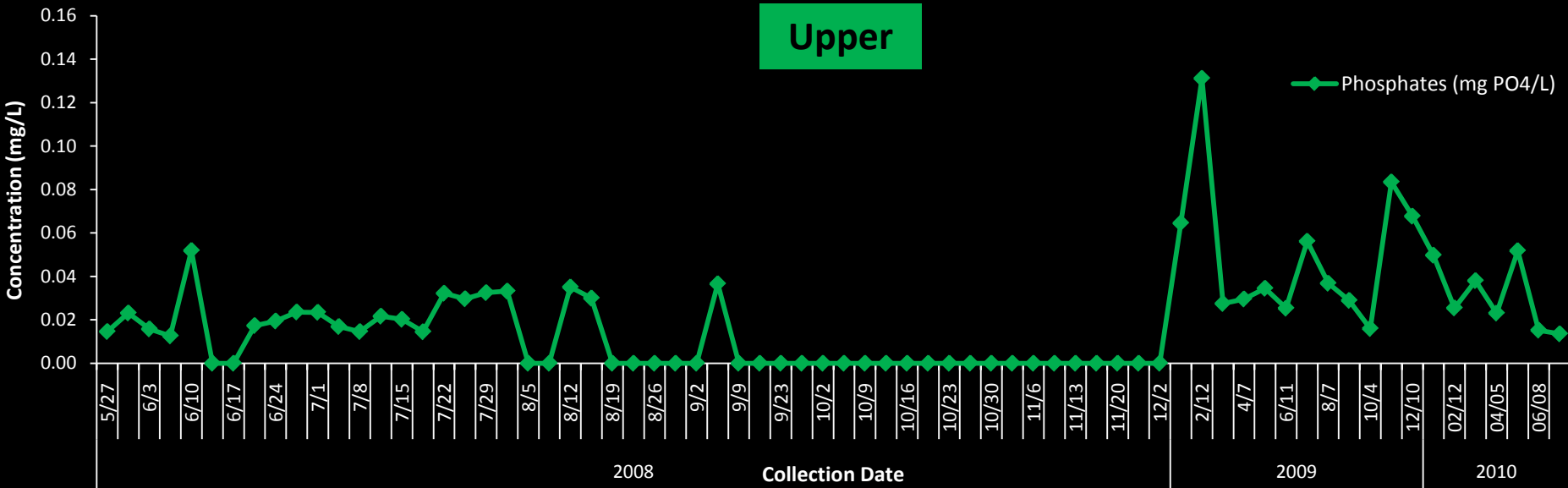


## Lower

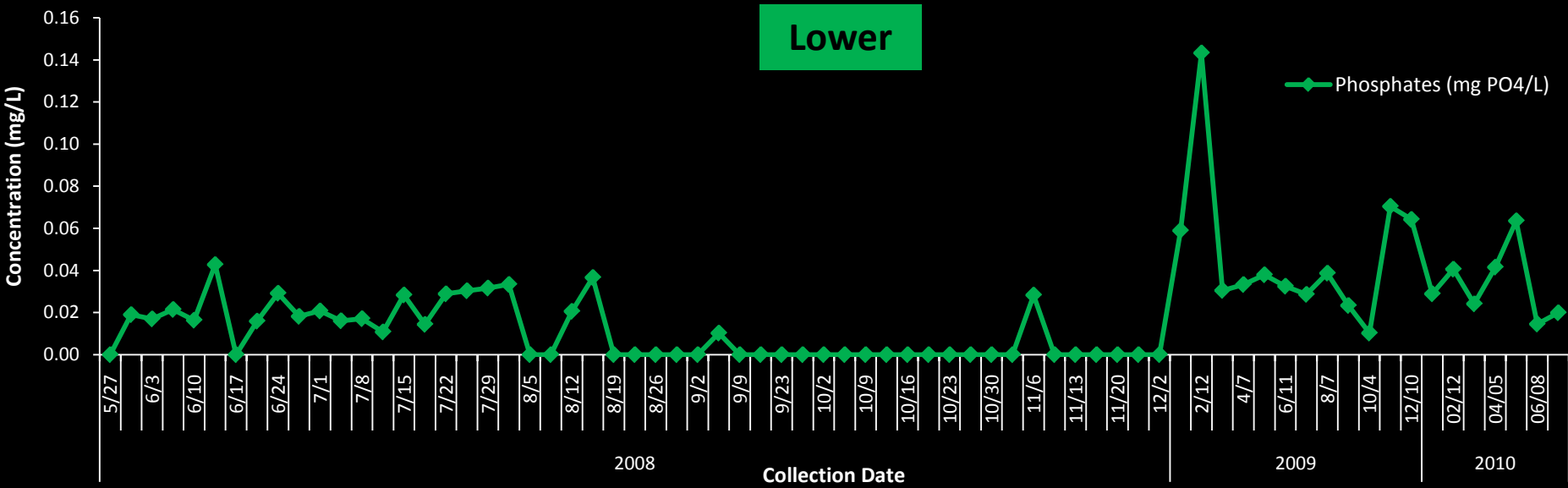


# Sandy Creek (SC) Ortho-Phosphate Data

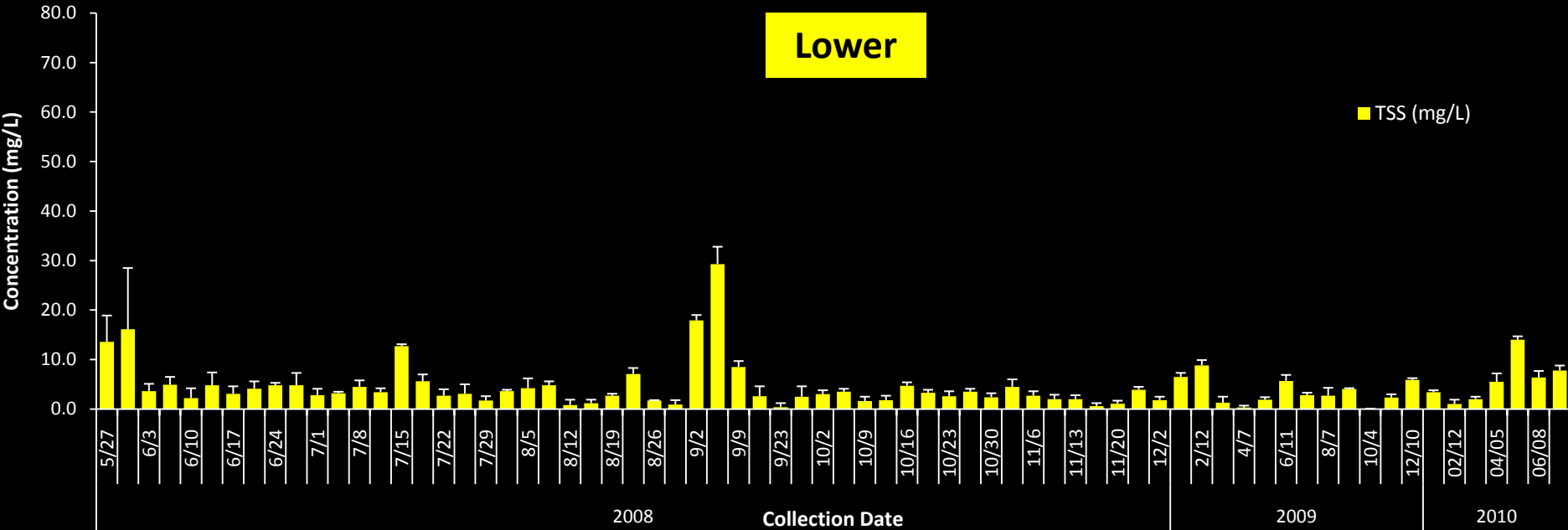
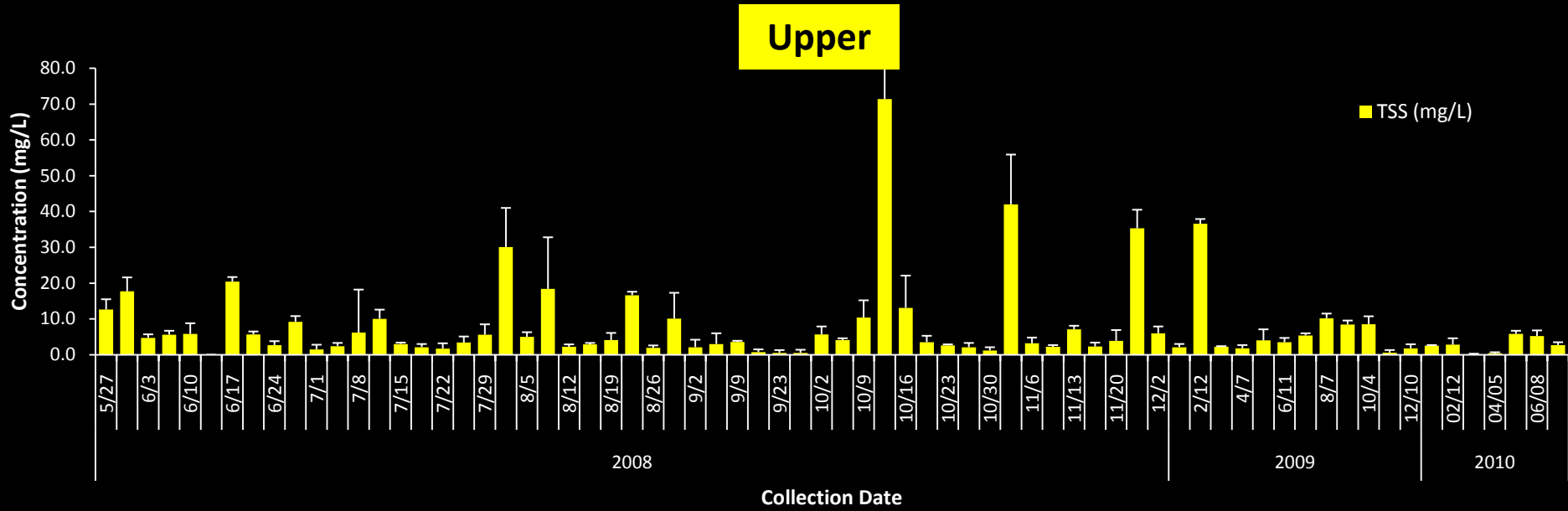
Upper



Lower



# Sandy Creek (SC) Total Suspended Solid (TSS) Data



# High and Mean Values: Pre-BMP 2008, 2009, 2010

Nitrate (mg/L)						
	Pre-BMP		2009		2010 (thru July)	
Site	High	Mean	High	Mean	High	Mean
LSUP	2.05	<b>0.76</b>	<b>1.34</b>	<b>0.67</b>	<b>1.54</b>	<b>0.97</b>
LSLO	<b>2.37</b>	0.56	0.90	0.58	1.18	0.70
GCUP	0.67	0.29	0.69	0.30	0.48	0.29
GCLO	1.28	0.29	0.73	0.34	0.71	0.44
SCUP	2.30	0.46	1.11	0.40	0.83	0.44
SCLO	0.74	0.31	0.54	0.27	0.73	0.42

# High and Mean Values: Pre-BMP 2008, 2009, 2010

Nitrite (mg/L)						
	Pre-BMP		2009		2010	
Site	High	Mean	High	Mean	High	Mean
LSUP	0.16	0.16	BDL	BDL	BDL	BDL
LSLO	BDL	BDL	BDL	BDL	BDL	BDL
GCUP	BDL	BDL	BDL	BDL	BDL	BDL
GCLO	BDL	BDL	BDL	BDL	BDL	BDL
SCUP	0.13	0.13	BDL	BDL	BDL	BDL
SCLO	BDL	BDL	BDL	BDL	BDL	BDL

# High and Mean Values: Pre-BMP 2008, 2009, 2010

Ortho-phosphate (mg/L)						
	Pre-BMP		2009		2010	
Site	High	Mean	High	Mean	High	Mean
LSUP	<b>0.18</b>	<b>0.04</b>	0.11	0.05	0.06	0.04
LSLO	0.06	0.01	0.12	0.05	<b>0.09</b>	0.04
GCUP	0.05	0.02	0.08	0.02	0.05	0.03
GCLO	0.08	0.03	0.13	0.05	0.05	0.03
SCUP	0.05	0.03	0.13	0.05	0.05	0.03
SCLO	0.04	0.02	<b>0.14</b>	0.05	0.06	0.03



# High and Mean Values: Pre-BMP 2008, 2009, 2010

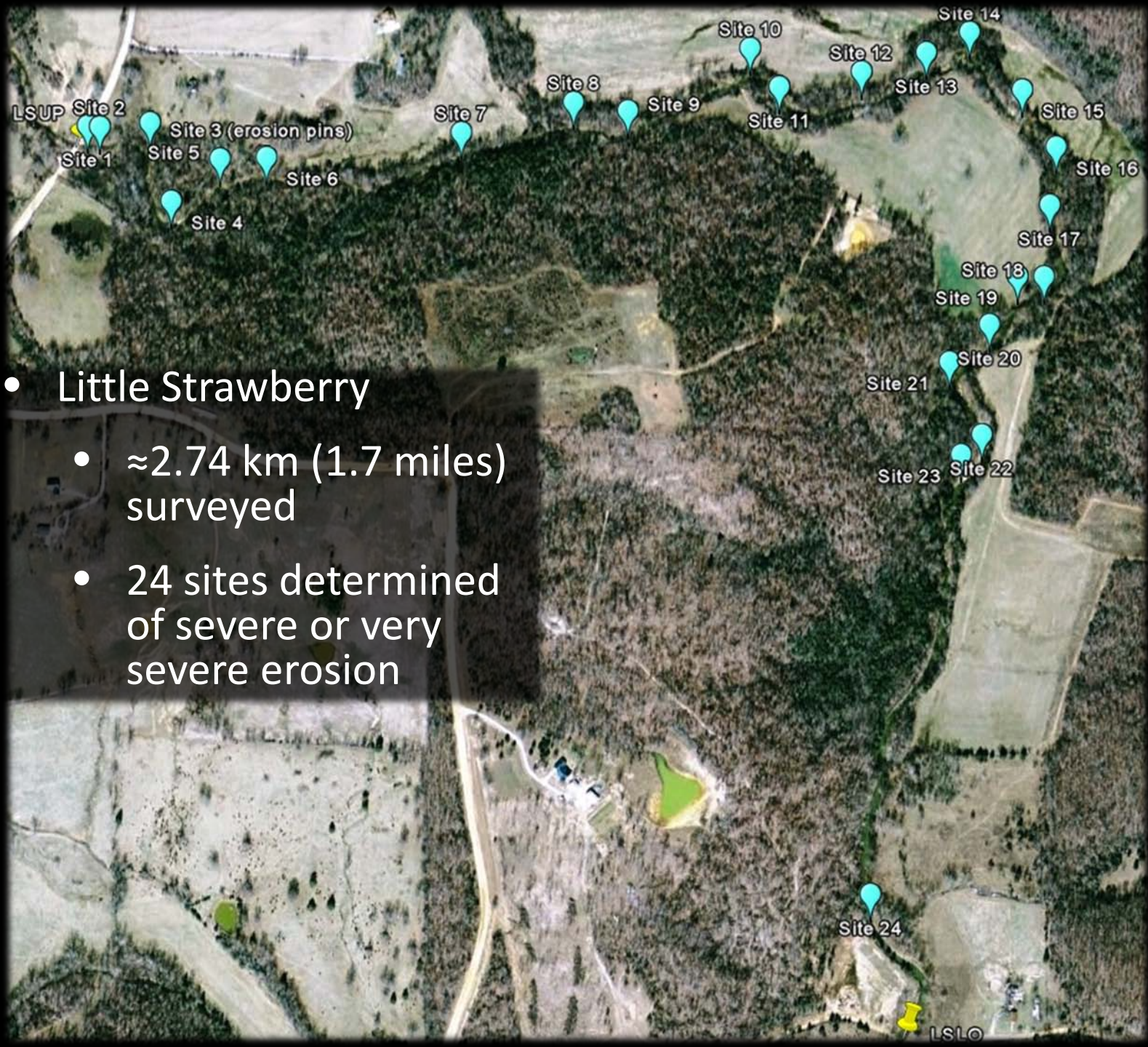
TSS (mg/L)						
	Pre-BMP		2009		2010	
Site	High	Mean	High	Mean	High	Mean
LSUP	26.6	4.2	<b>55.8</b>	<b>7.6</b>	6.7	3.3
LSLO	41.3	5.0	20.0	4.6	8.9	3.9
GCUP	14.3	2.4	16.6	4.4	4.4	3.1
GCLO	13.9	4.4	14.6	5.2	<b>15.2</b>	<b>6.7</b>
SCUP	<b>71.4</b>	<b>8.8</b>	36.6	7.1	5.8	2.8
SCLO	29.3	4.6	8.8	3.5	14.0	5.7

# Other Analyses

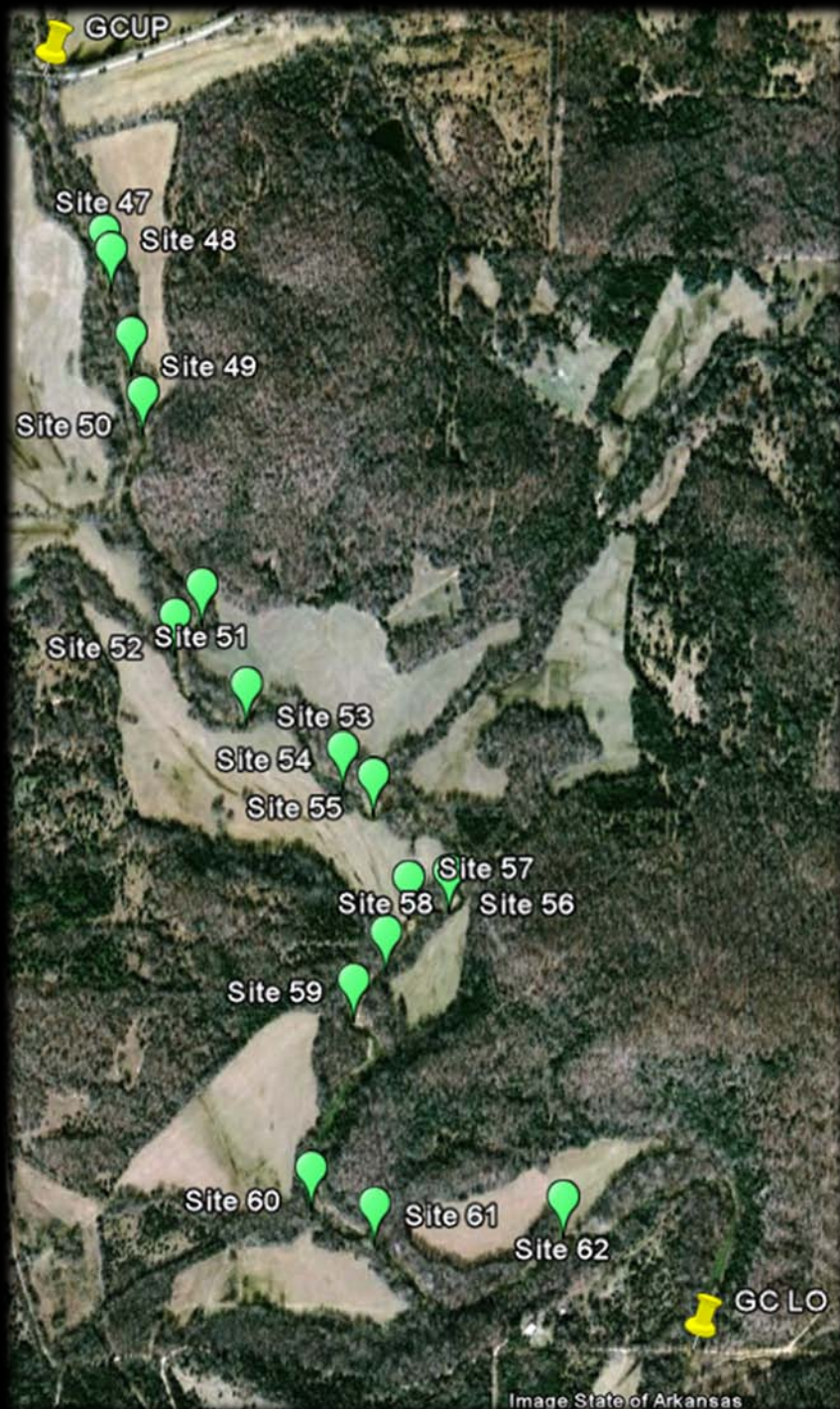
- Stream bank erosion
- Benthic macroinvertebrate survey
- *Escherichia coli*

Supported by 104-B Grant: AWRC and Arkansas State University





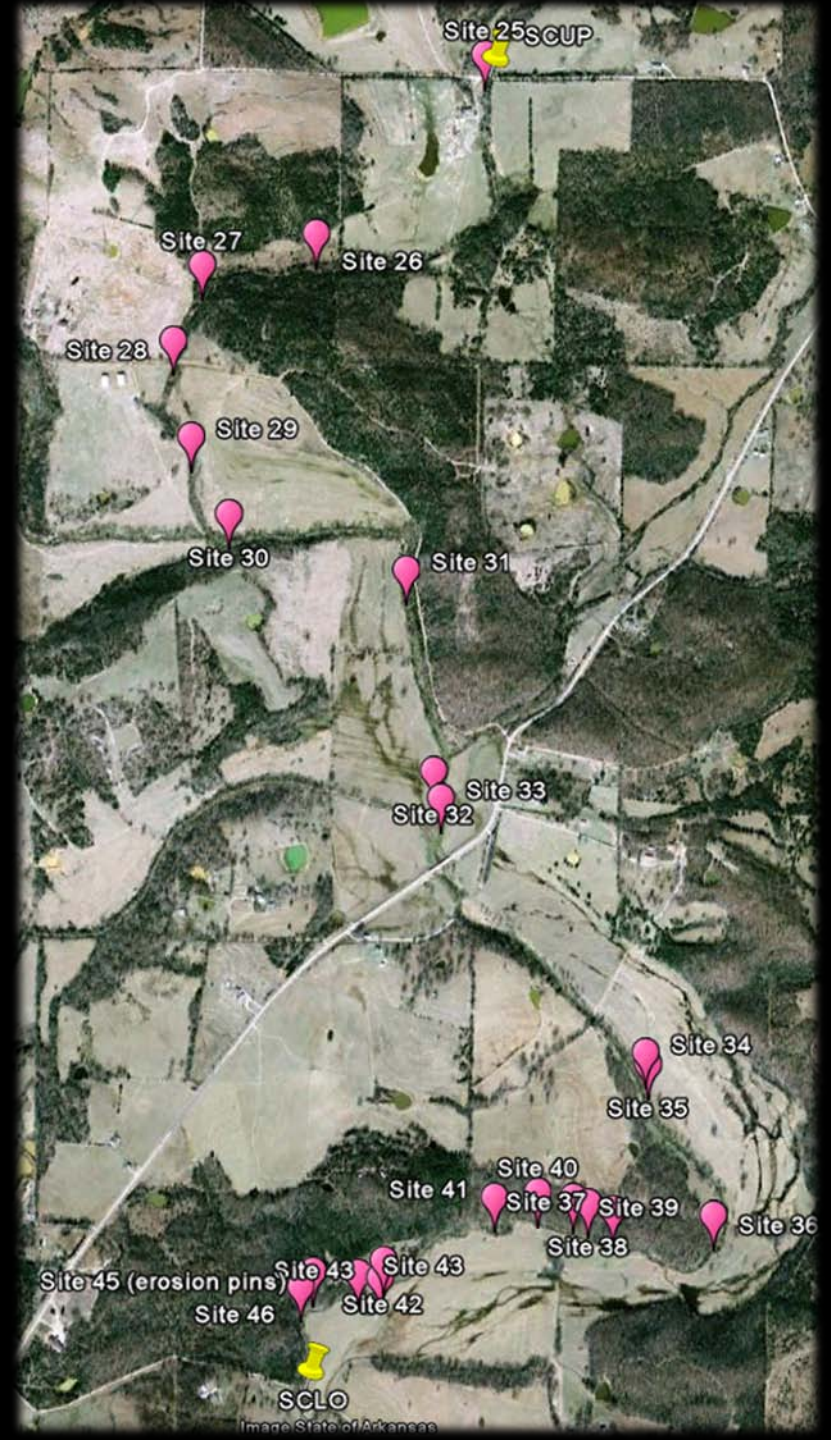
- Little Strawberry
  - ≈2.74 km (1.7 miles) surveyed
  - 24 sites determined of severe or very severe erosion



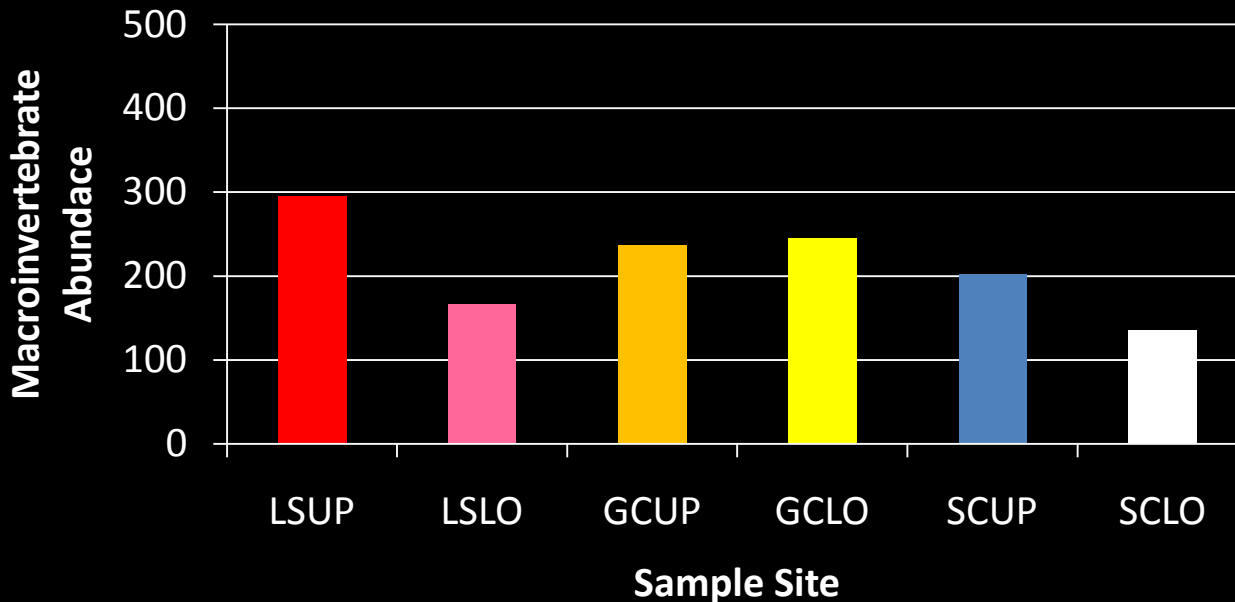
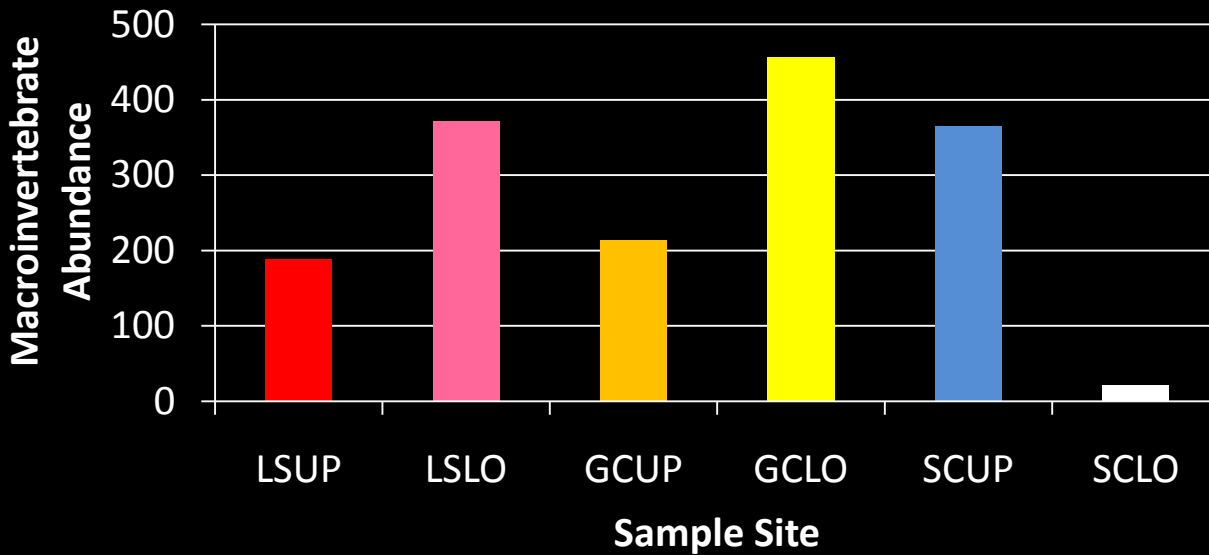
- Greasy Creek

- $\approx 3.17$  km (2.0 miles) surveyed
- 16 sites determined of severe or very severe erosion

- Sandy Creek
  - ≈6.63 km (4.1 miles) surveyed
  - 22 sites determined of severe or very severe erosion



# Benthic Macroinvertebrates Abundance



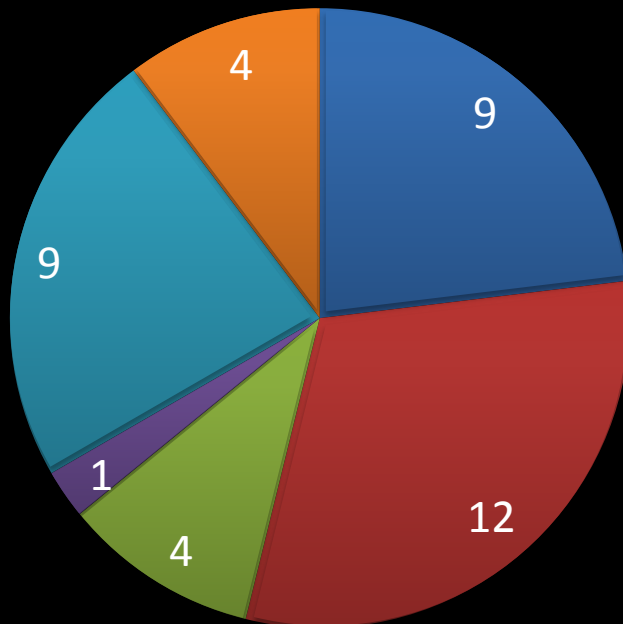
# Ephemeroptera, Plecoptera and Trichoptera (EPT)

1 or less: POOR

Between 2 and 5: MODERATE

More than 5: GOOD

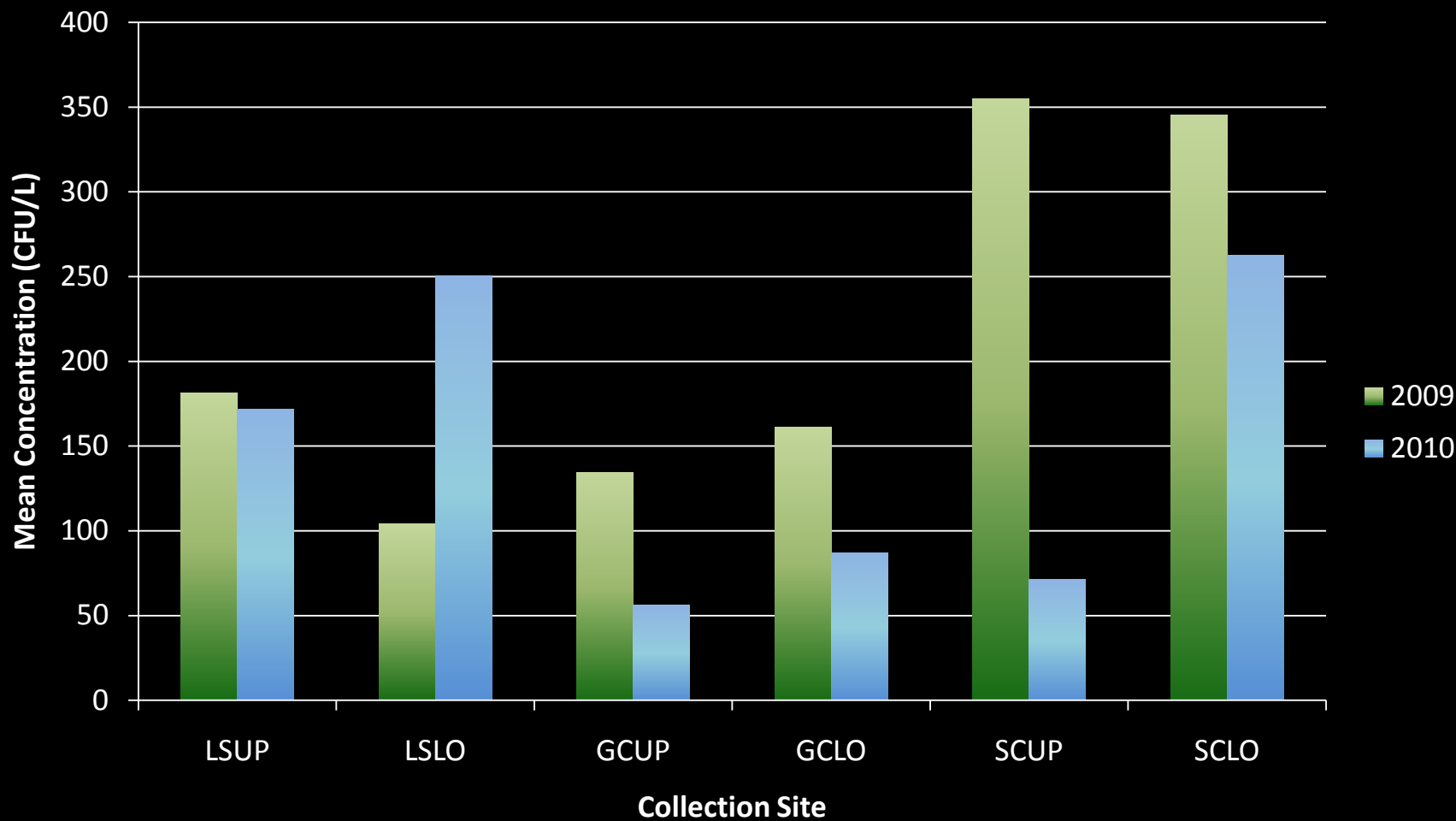
## Spring 2009



## Fall 2009



# *Escherichia coli*





**Strawberry River  
Sub Watershed  
Project**



Arkansas Natural Resource Commission  
Arkansas State University

**Fulton County  
Conservation District**

870-895-3201 ext 3

Questions?