

# Water Quality Monitoring Results:

Bayou Bartholomew  
L'Anguille River  
Upper Saline River  
Galla Creek

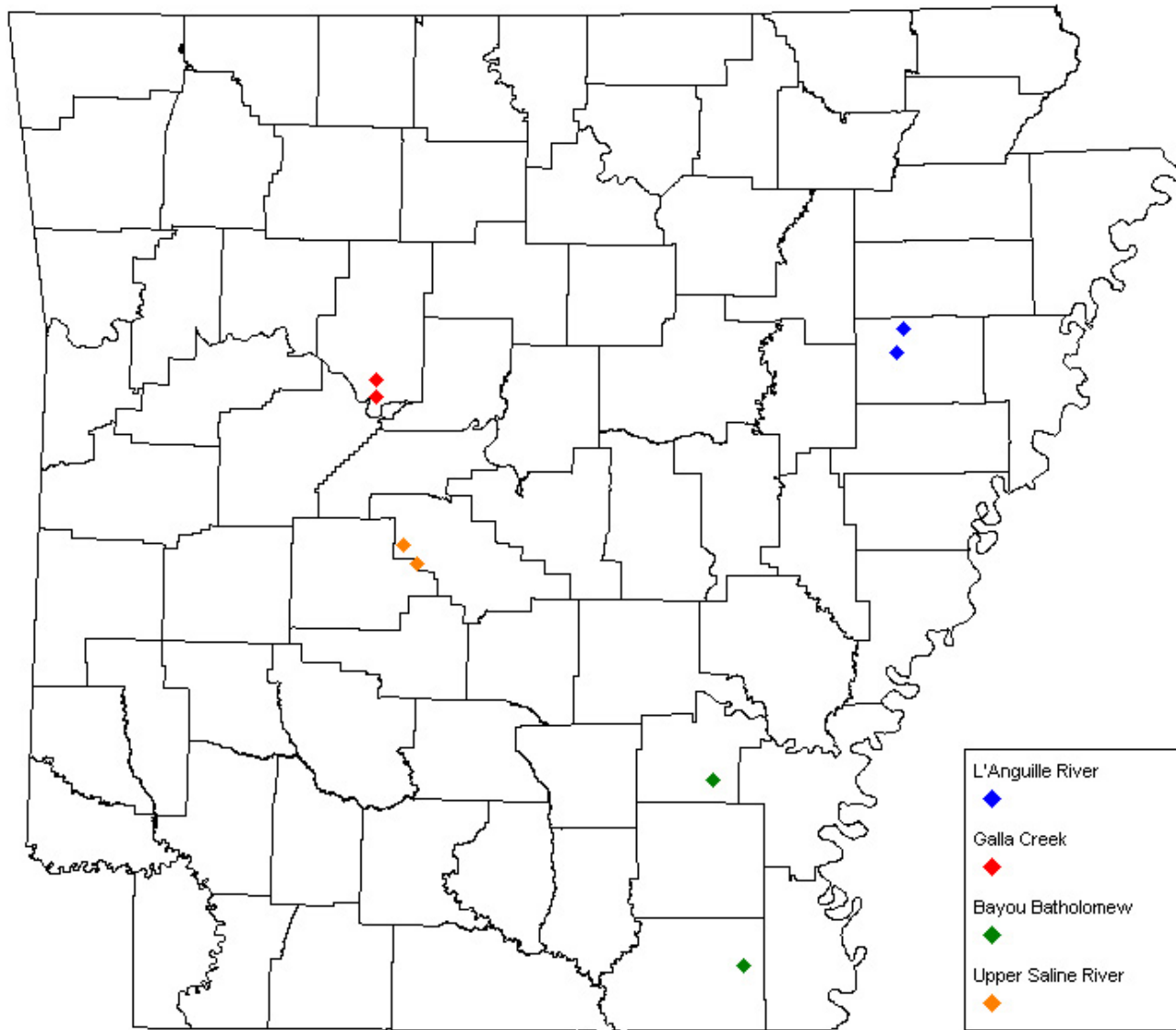
Presented By: The Ecological Conservation Organization



eco

Ecological Conservation Organization

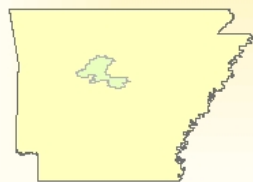
# Site Locations



# Introduction



# Galla Creek Monitoring Sites Lake Conway Point Remove Watershed



## Legend

- ▲ ECO Sites
- ◆ ADEQ Sites
- Rivers and Streams
- City Limits
- Water Bodies
- Lake Conway Point Remove



# Introduction

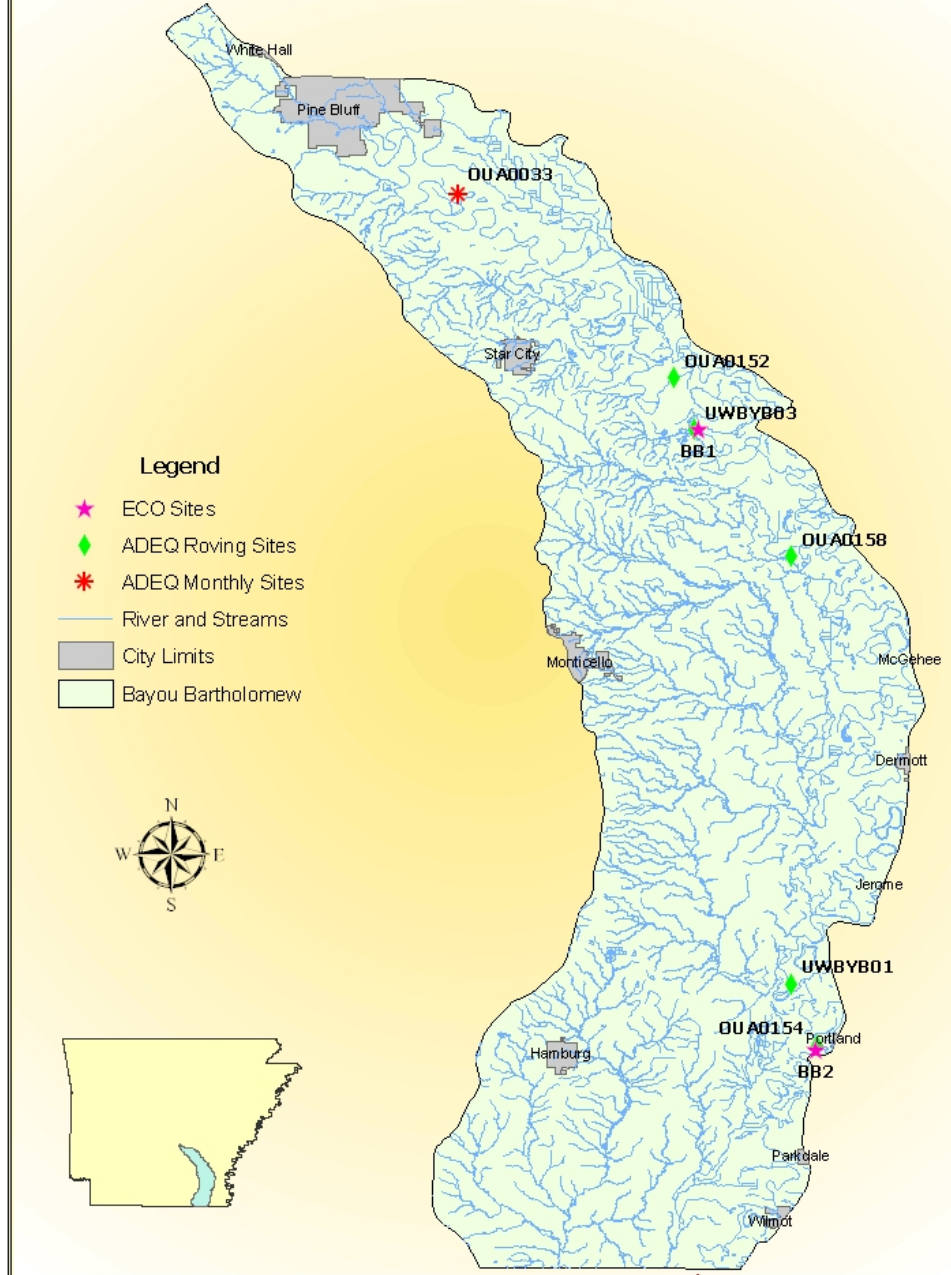




# Introduction



# Monitoring Sites in Bayou Bartholomew



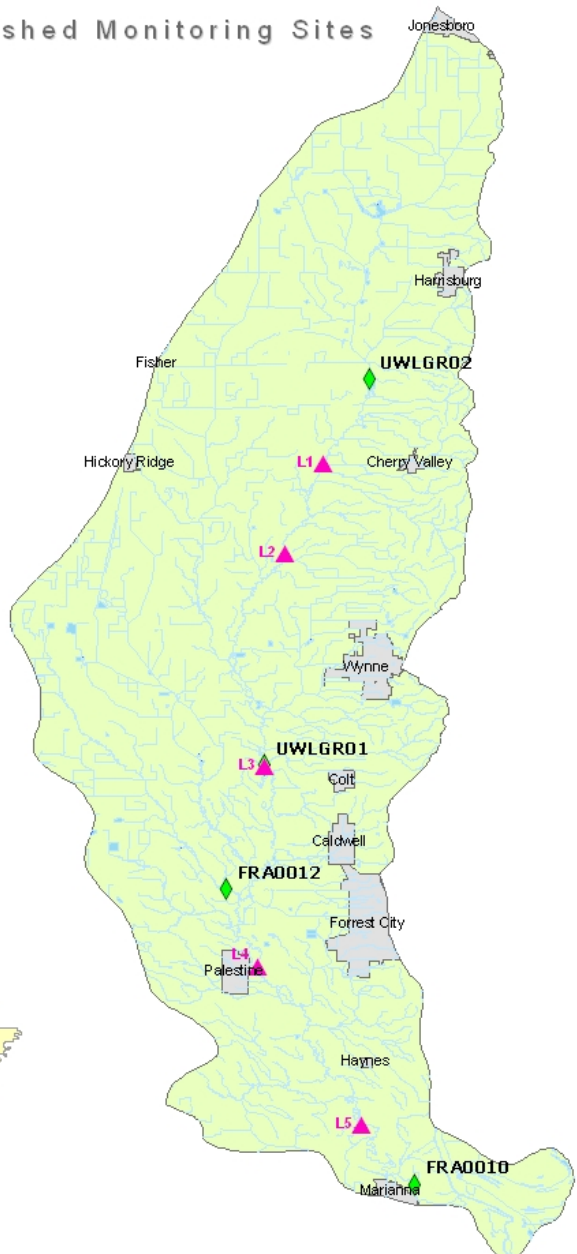
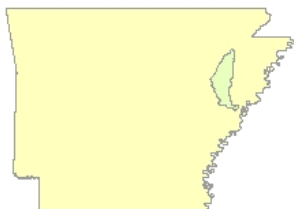


# Introduction



# L'Anguille Watershed Monitoring Sites

- Legend**
- ▲ ECO Sites
  - ◆ ADEQ Sites
  - Rivers and Streams
  - Water Bodies
  - City Limits
  - L'Anguille Watershed



# Goals

- To determine concentrations of parameter through routine and storm event sampling
- Collect baseline data for previously unmonitored watersheds
- Provide statistical analysis to better understand the dynamics of pollutants in the watershed
- Determine if TMDL was met where previously established

# Methods

## Field

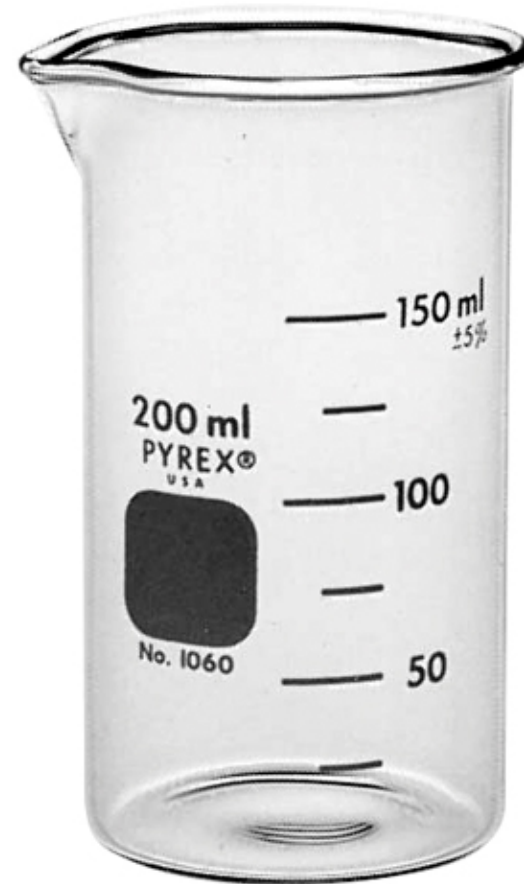
- Routine Collection of samples every 47 hours
- Grab sample Collection every 2 weeks
- Storm sample collection on Upper Saline River
- Monitor Stage of river to develop discharge rating curve
- In situ Sondes to record turbidity, temp, and Sp. Cond.



# Parameters Analyzed

## Parameters Analyzed

- Nitrate + Nitrite-Nitrogen
- Ammonia-Nitrogen
- Total Kjeldahl Nitrogen
- Total Phosphorus
- Total Suspended Solids
- Turbidity



# Methods

## Loading

### Regression Approach:

Develop a relationship between log transformed concentration and log transformed flow

May underestimate the total load (Cohn, 1989 and Richards, 1999)

### Numeric Integration:

Simple approach of time interval \* Flow interval \* Concentration

Requires high number of Samples (Richards, 1999)

# Results

## Bayou Bartholomew

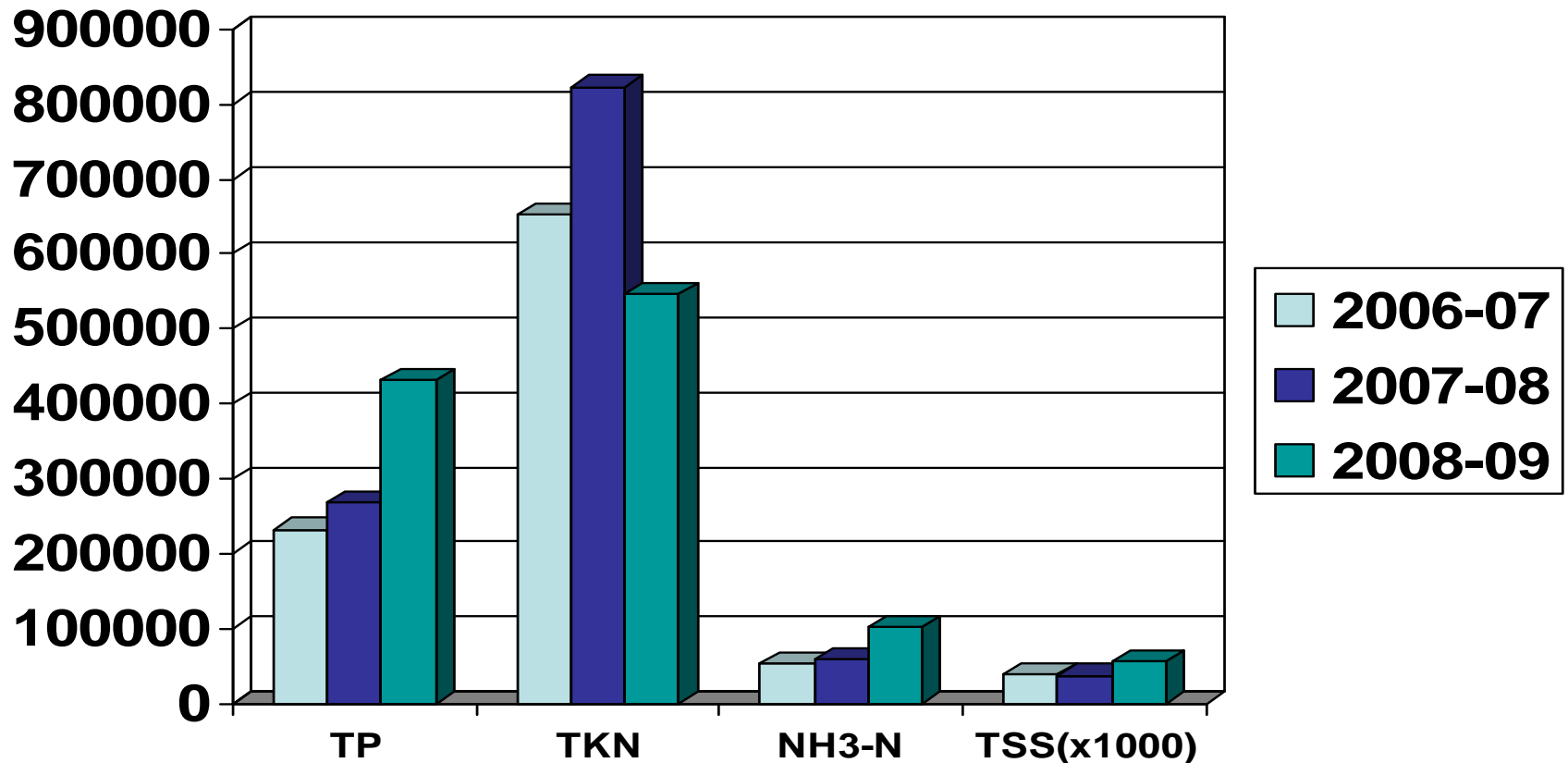
### Total Samples Mean Concentrations ( $\pm$ St Deviation)

Parameter	BB-1 (N=132) (Mean)	BB1 (Std Dev)	BB-2 (N=140) (Mean)	BB2 (Std Dev)
TP (mg/l)	0.37	0.16	0.29	0.11
TKN (mg/l)	0.99	0.31	0.87	0.19
TSS (mg/l)	39.37	42.62	25.05	35.34
NH <sub>3</sub> -N(mg/l)	0.09	0.05	0.1	0.07
Turbidity (NTU)	103.26	119.62	70.83	82.21

# Results

## Bayou Bartholomew (BB-1)

Loading at BB-1

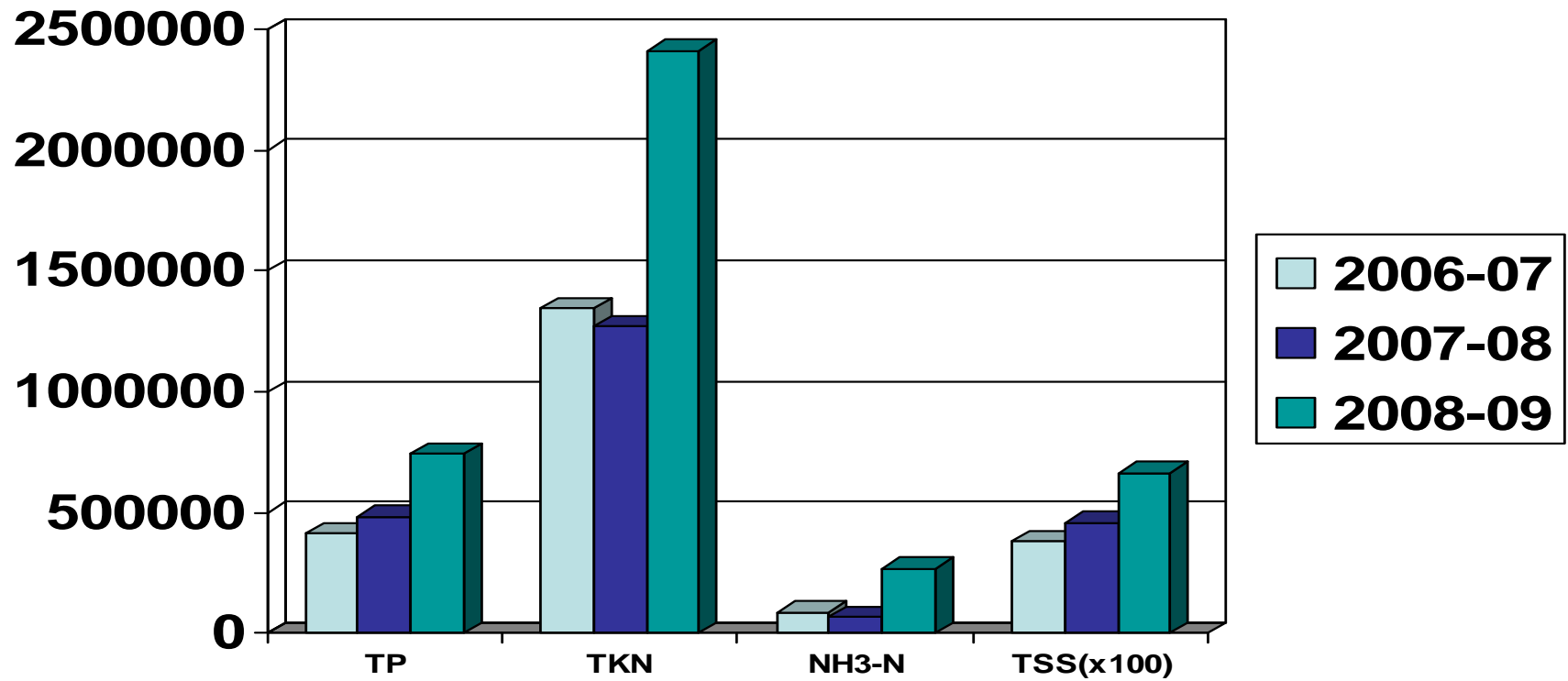




# Results

## Bayou Bartholomew (BB-2)

Loading at BB-2



# Results

## Bayou Bartholomew

Exceeding Total Maximum  
Daily Load for TSS (numeric  
integration)

BB1 – 73%

3,496 lbs/day (July-Nov)

14,478 lbs/day (Dec-June).

BB2 – 65%

30,629 lbs/day (July-Nov)

66,836 lbs/day (Dec-June).



# Results

## L'Anguille River

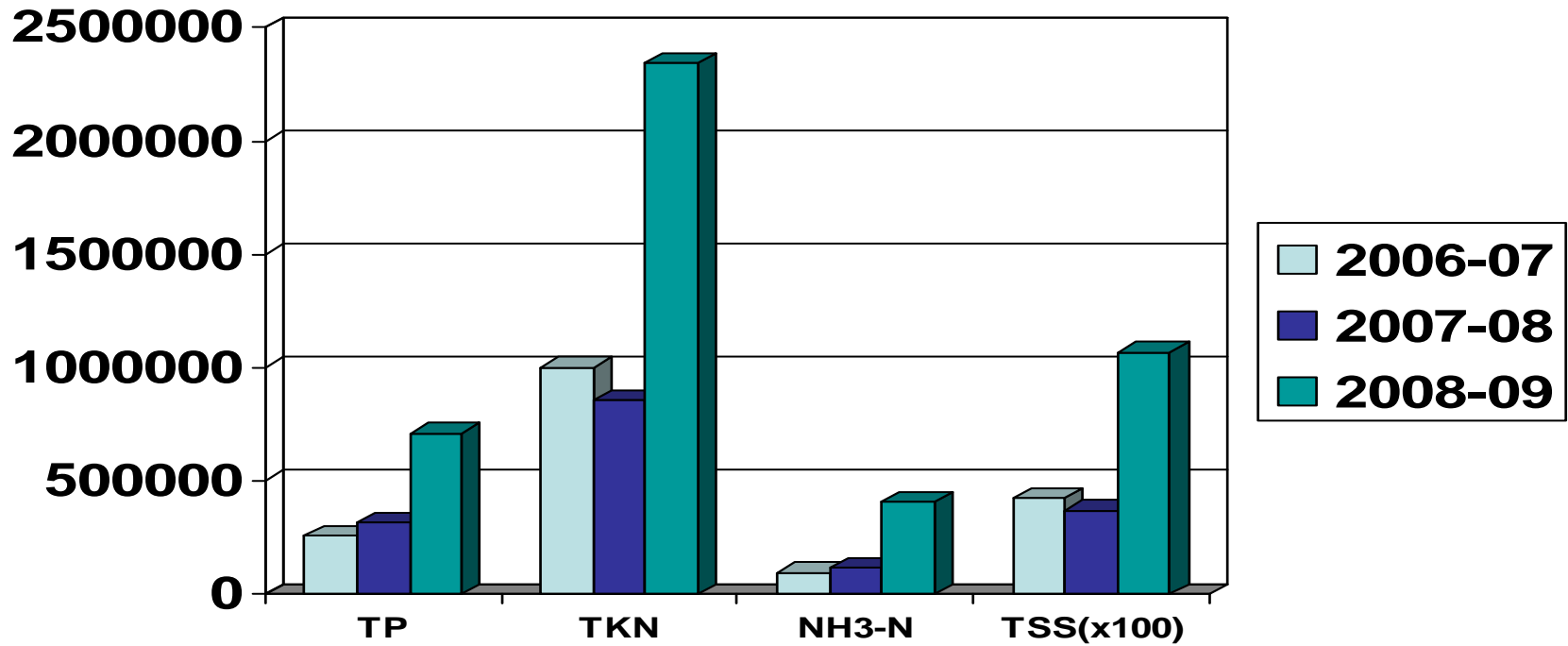
Total Samples Mean Concentrations ( $\pm$  St Deviation)

	L1 (n=109)		L2 (n=158)	
Parameter	Mean	St Dev	Mean	St Dev
TP (mg/l)	0.46	0.49	0.38	0.16
TKN (mg/l)	3.9	7.28	1.3	0.29
TSS (mg/l)	89.31	252.38	54.08	44.76
NH <sub>3</sub> -N (mg/l)	2.49	6.79	0.22	1.11
Turbidity (NTU)	103.34	188.23	86.93	84.80

# Results

## L'Anguille River

### Loading at L2



# Results

## L'Anguille River

### Turbidity

- L1
  - 19% of samples met the target 45 NTU for “base flow”
  - 58% of samples met the target 84 NTU for “all flow”
  - 47% of the samples met the TSS target of 40 mg/L
- L2
  - 25% of samples of 45 target NTU for “base flow”
  - 56% of samples of 84 target NTU for “all flow”
  - 41% of the samples met the TSS target of 40 mg/L

# Results

## Upper Saline River Forks

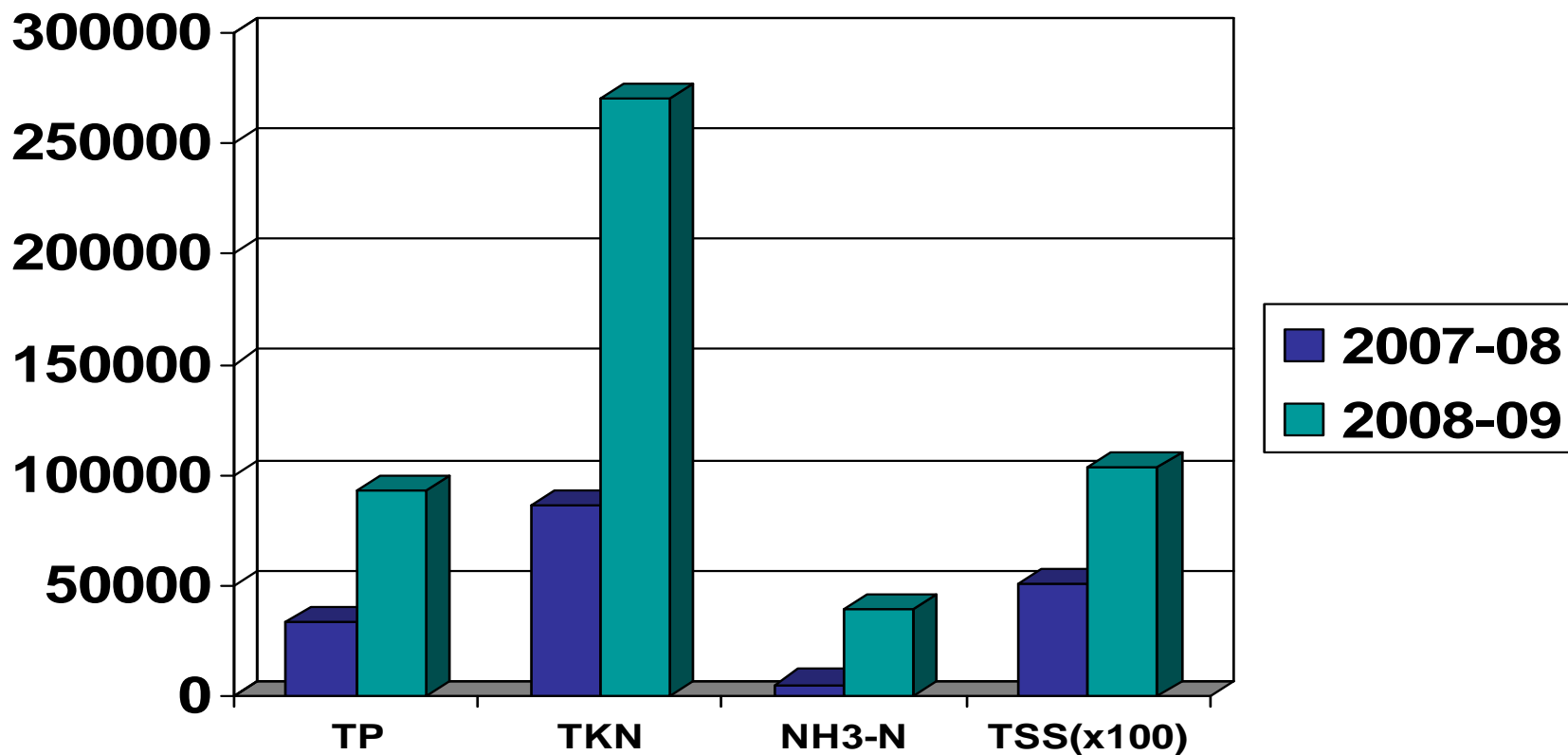
Total Samples Mean Concentrations

	SSF (n=169)		SMF (n=204)	
Parameter	Mean	St Dev	Mean	St Dev
TP (mg/l)	0.11	0.13	0.1	0.06
TKN (mg/l)	0.32	0.31	0.31	0.19
TSS (mg/l)	21.59	51.96	11.95	26.68
NH3-N (mg/l)	0.03	0.03	0.03	0.03
Turbidity (NTU)	26.66	40.37	30.66	35.58

# Results

## Saline River Middle Fork Loading

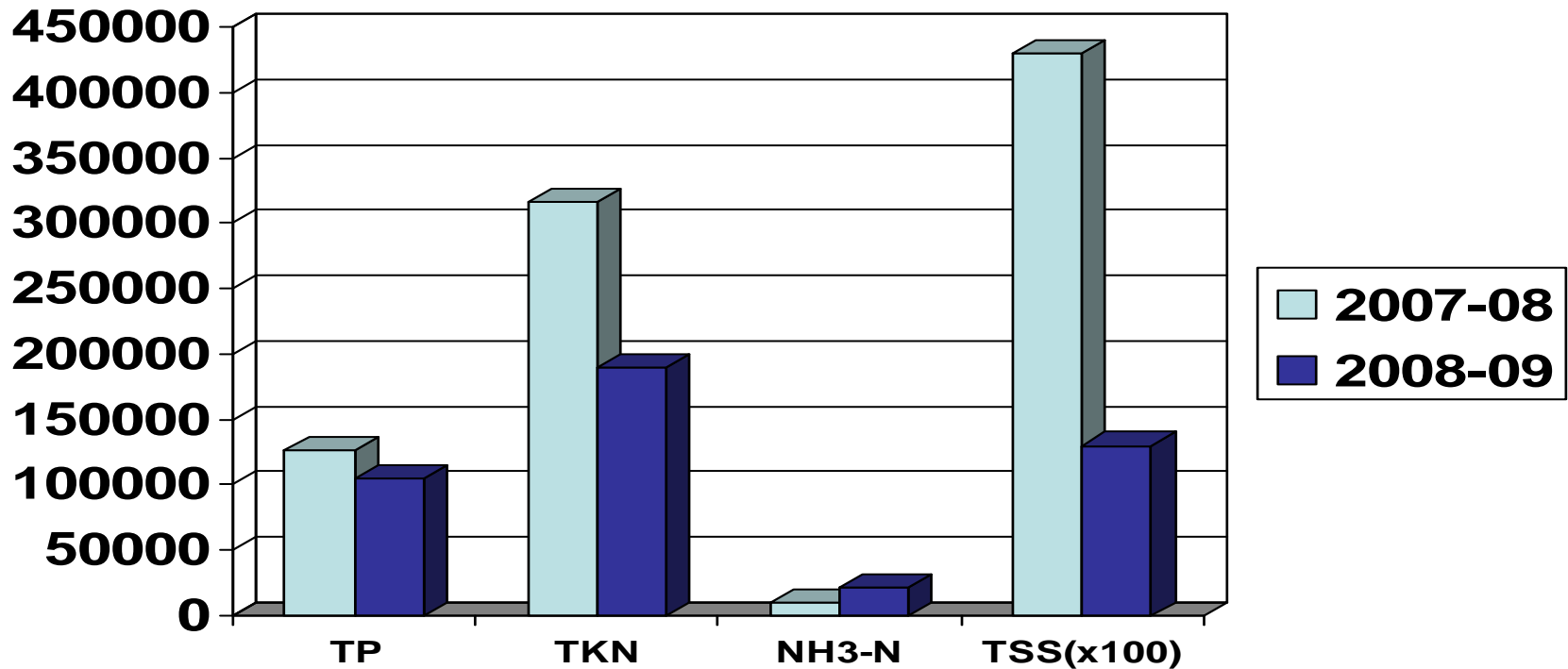
Parameter Loading at SMF



# Results

## Saline River South Fork Loading

Parameter Loading at SSF





# Results

## Reg. 2 Turbidity Standard

### SMF

- Base flow (10 NTU) met 88.9% of samples
- Storm flow (18 NTU) met 50.9% of samples

### SSF

- Base flow (10 NTU) met 94.7% of samples
- Storm flow (18 NTU) met 53.6% of samples

# Results

## Galla Creek

### Total Samples Mean Concentrations ( $\pm$ St Deviation)

Parameter	Site G-1 (N=143)	Site G-2 (N=153)
TP (mg/l)	0.062( $\pm$ 0.042)	0.16( $\pm$ 0.11)
TKN (mg/l)	0.59( $\pm$ 0.25)	0.65( $\pm$ 0.34)
TSS (mg/l)	7.5( $\pm$ 5.0)	17.5( $\pm$ 30.7)
NH <sub>3</sub> -N (mg/l)	0.12( $\pm$ 0.18)	0.14( $\pm$ 0.20)
Turbidity (NTU)	8.1( $\pm$ 5.4)	15.9( $\pm$ 12.4)

# Results

## Reg. 2 Turbidity Standard

Base Flow (NTU <21)

- G1 – 96.5% of samples met standard
- G2 – 78.3% of samples met standard

Storm Flow (NTU <40)

- G1 – 100% of samples met standard
- G2 – 96.1% of samples met standard

# Problems



# Problems



# Summary

- Upper Saline
  - SSF and SMF parameter concentrations decreased from last year except for NH<sub>3</sub>-N which stayed the same
- L'Anguille River
  - L1 parameter concentration increased from last year
  - L2 parameters TKN and NH<sub>3</sub>-N increased and TP, TSS, and NTU decreased from last year

# Summary

- Galla Creek
  - Higher mean concentrations of all parameters at G2
- Bayou Bartholomew
  - BB1 parameter concentrations decreased except for turbidity which increased
  - BB2 parameter concentrations increased except for TSS

An aerial photograph of a river with a white grid overlay. The grid is composed of small squares and covers the entire river area. The word "Questions?" is written in blue text in the center of the grid.

**Questions?**