

# Monitoring Water Quality in Impaired Watersheds

Bayou Bartholomew, Lake Conway Point  
Remove, Lower Ouachita-Smackover, and  
L'Anguille

Presented by:

Dan DeVun, Equilibrium

[devun@equilibrium-ar.org](mailto:devun@equilibrium-ar.org)

[www.equilibrium-ar.org](http://www.equilibrium-ar.org)

09/27/2017



# Acknowledgements and Special Thanks

- EPA Region 6
- ANRC; Tony Ramick and Robbie Alberson
- Wesley Griffin
- Ouachita Baptist University
- Dr. Tim Knight
- Clark Kyper
- Dr. Joe Nix
- Ecological Design Group
- HDR, Inc.
- TNC



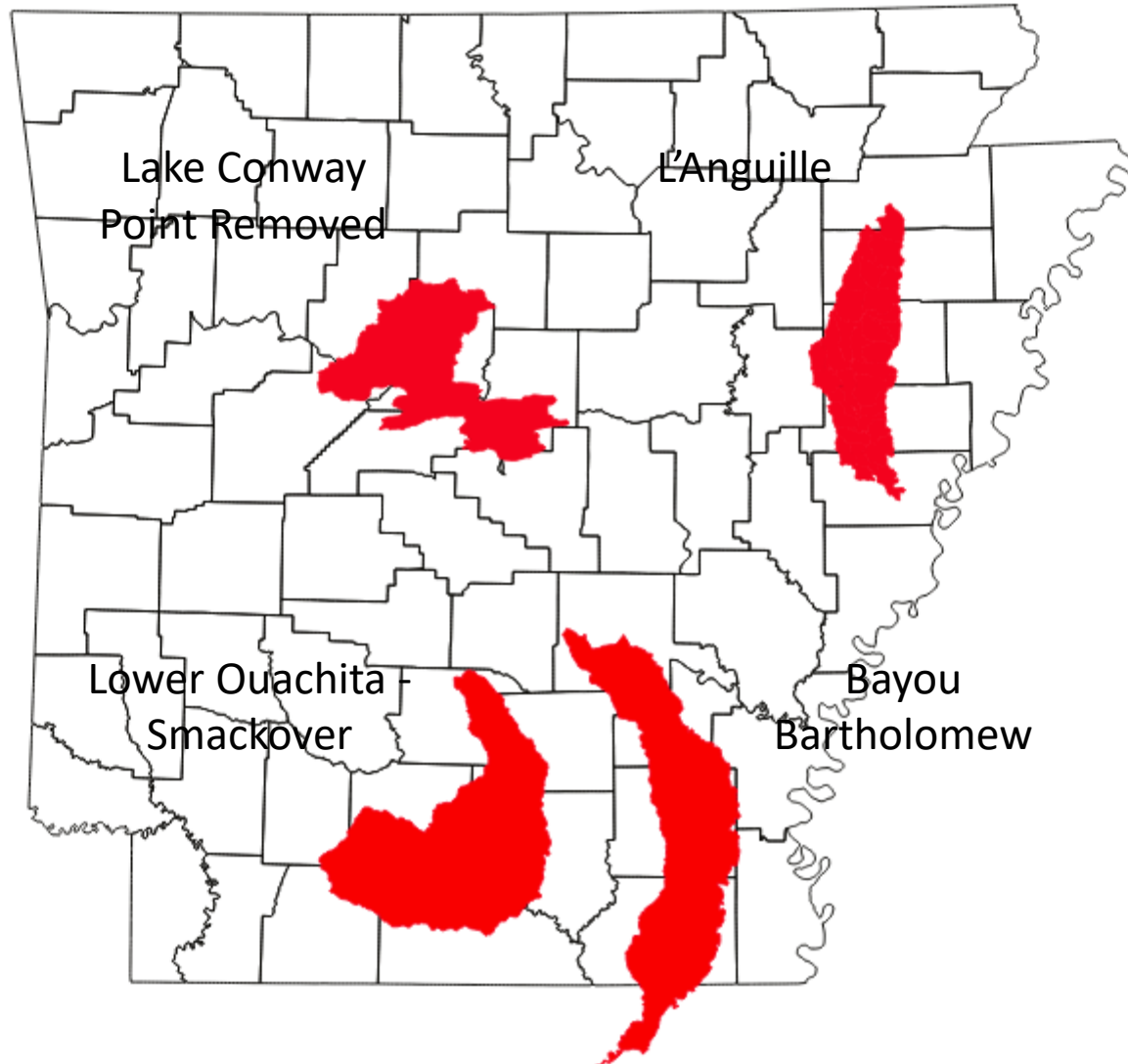
# Projects' Ultimate



Provide monthly and annual parameter loadings, as well as unit area loadings in numerous 12 digit HUCs.

The long-term goal of the priority watershed program is to reduce pollutants to levels that will restore all designated uses.

- **Monitoring Structure** – Similar activities are implemented in each monitored watershed that support the projects' primary goal.
- **Water Quality Requirements** – Incorporates project design, collection and analytical methodologies to generate representative data and allow for an evaluation of water chemistry within the selected watersheds.
- **Discharge Requirements** – Estimate the volume of water that passes the monitoring station during the sampling period.
- **Data Compilation and Statistical Analysis** – Compile and statistically analyze the collected data to provide monthly, annual, and unit area loadings, as well as, compare results between monitoring stations.
- **Reporting Requirements** – Provide project partners with the project outcomes and make the results readily available to the natural resource professionals and to the general public.



Lake Conway  
Point Removed

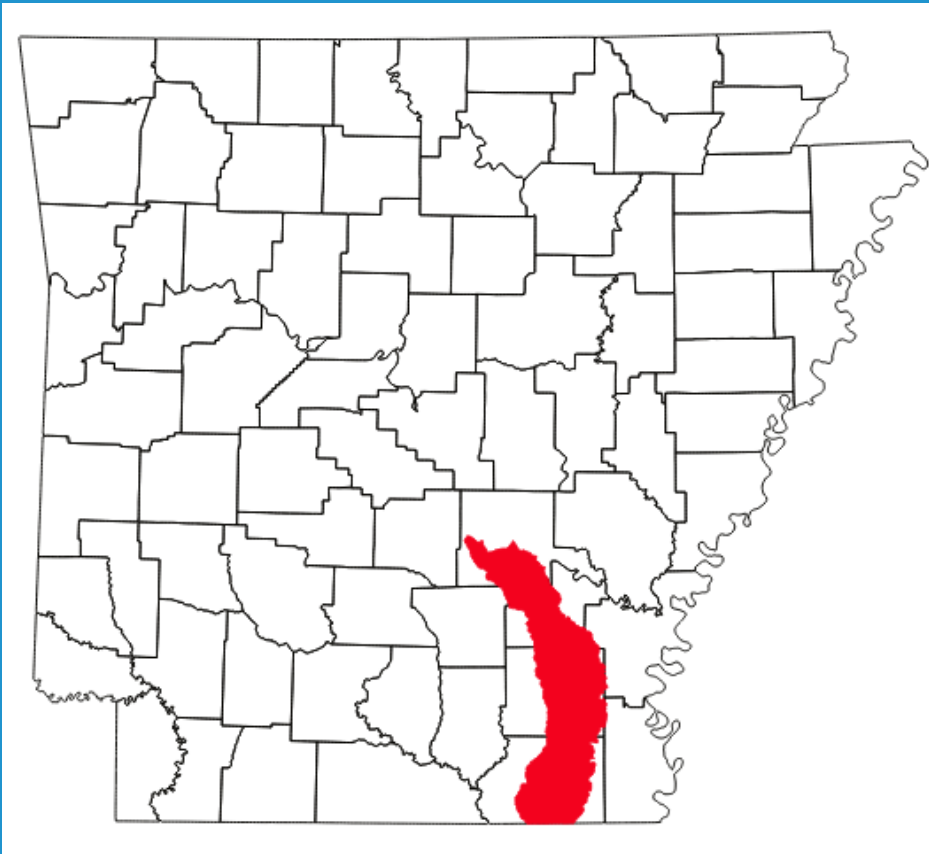
L'Anguille

Lower Ouachita  
Smackover

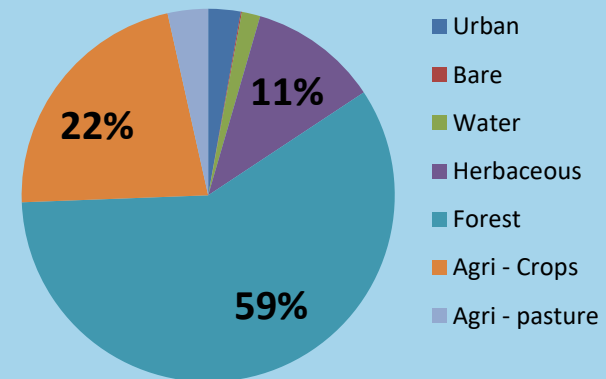
Bayou  
Bartholomew

# Bayou Bartholomew Watershed

Focusing on the Cousart Bayou and Deep Bayou Sub-watersheds



Bayou Bartholomew

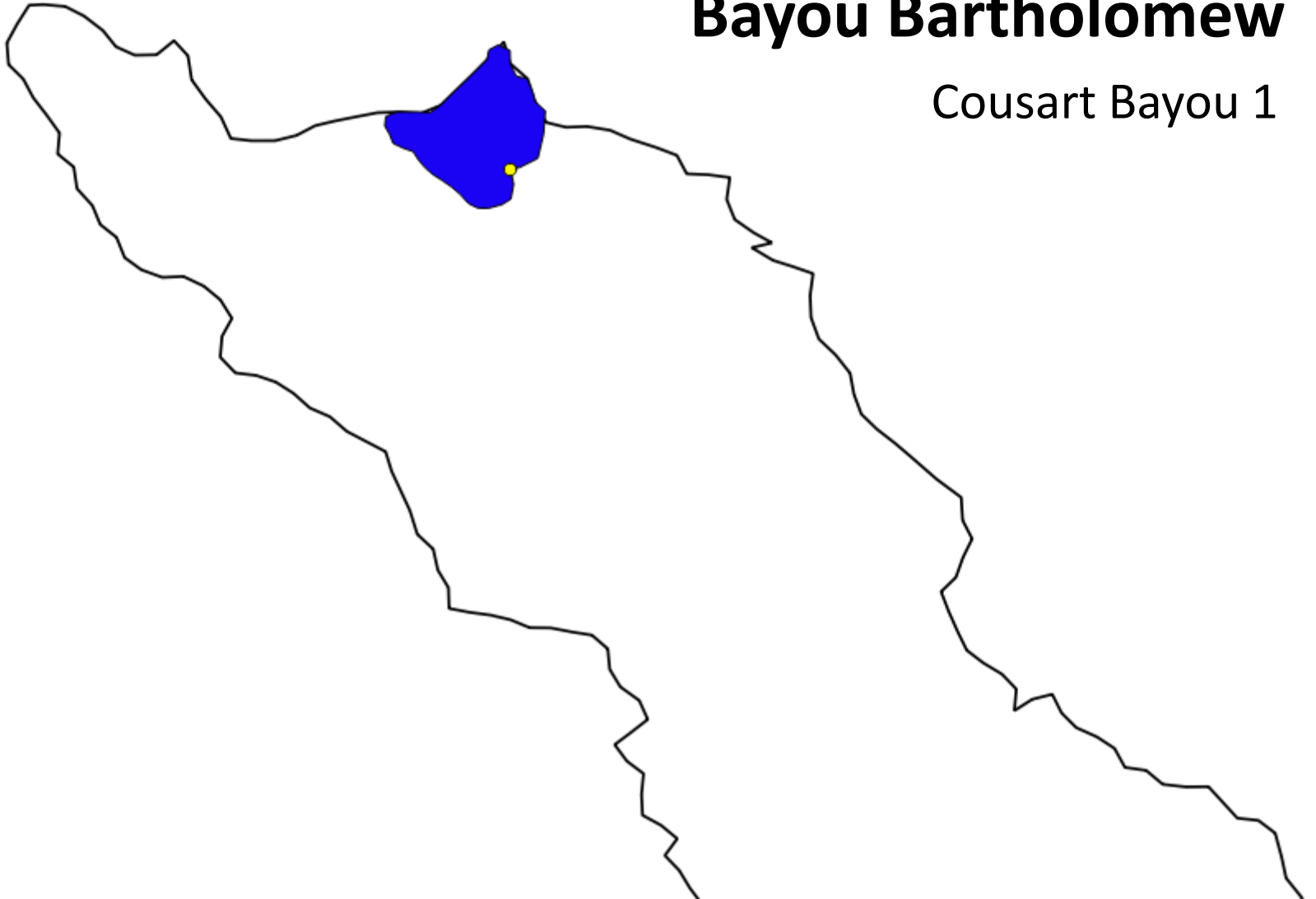


- The Bayou Bartholomew was included on the Arkansas 2014 303(d) for not supporting designated uses.
- ANRC has designated the watershed as a priority watershed.
- NRCS also identified the Bayou Bartholomew as a priority in the Mississippi River Basin Healthy Watershed Initiative.



# Bayou Bartholomew

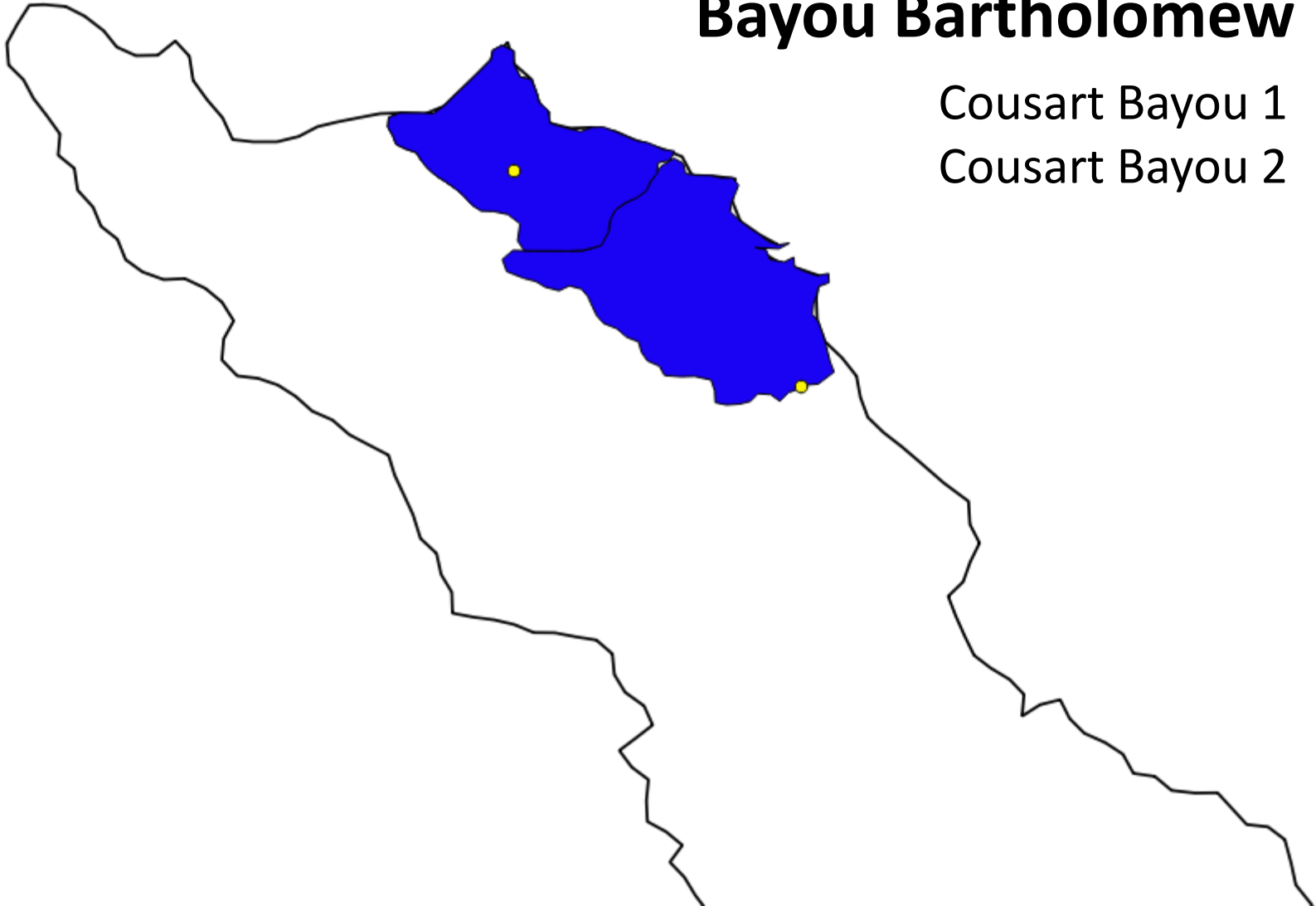
Cousart Bayou 1



# Bayou Bartholomew

Cousart Bayou 1

Cousart Bayou 2



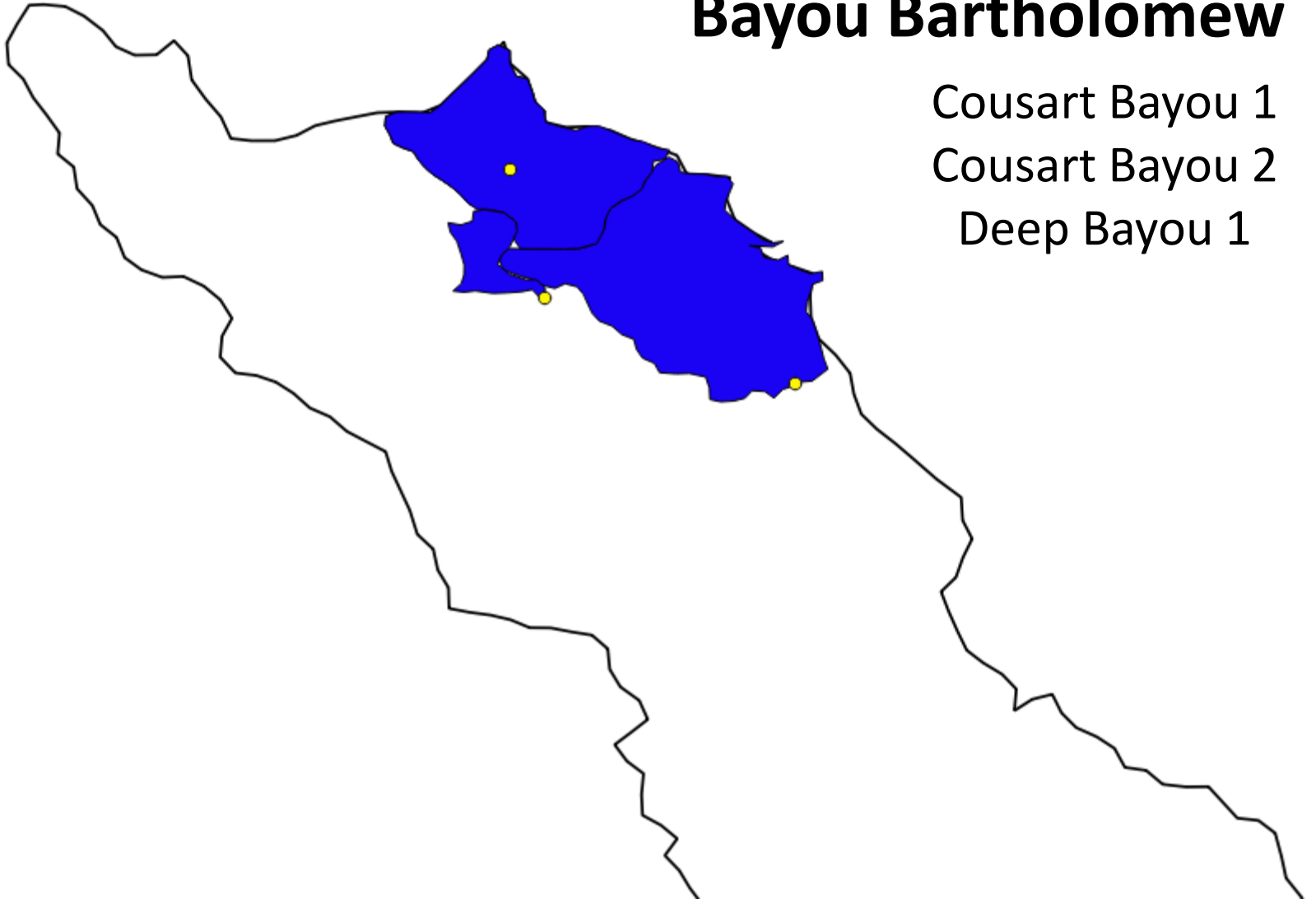


# Bayou Bartholomew

Cousart Bayou 1

Cousart Bayou 2

Deep Bayou 1



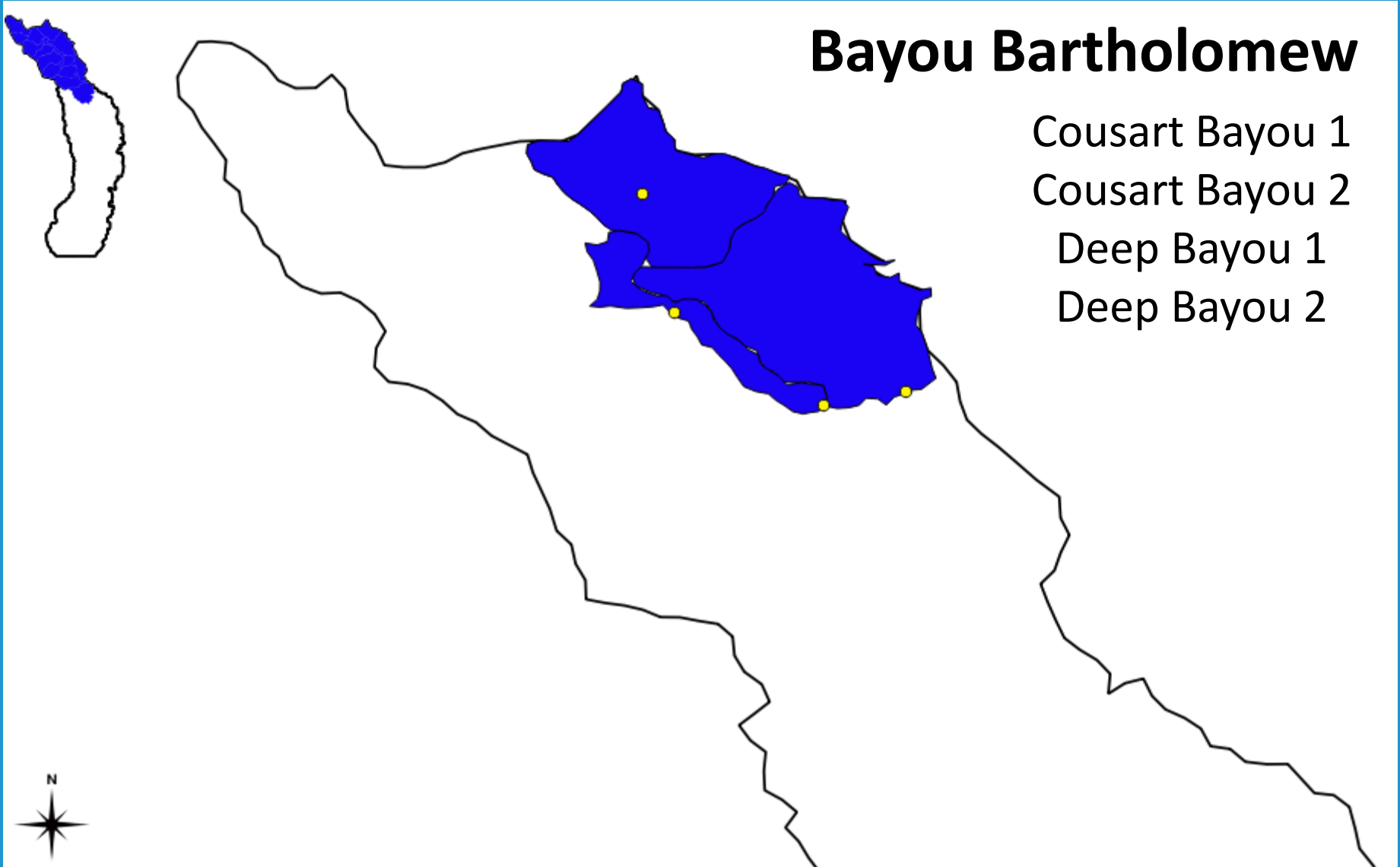
# Bayou Bartholomew

Cousart Bayou 1

Cousart Bayou 2

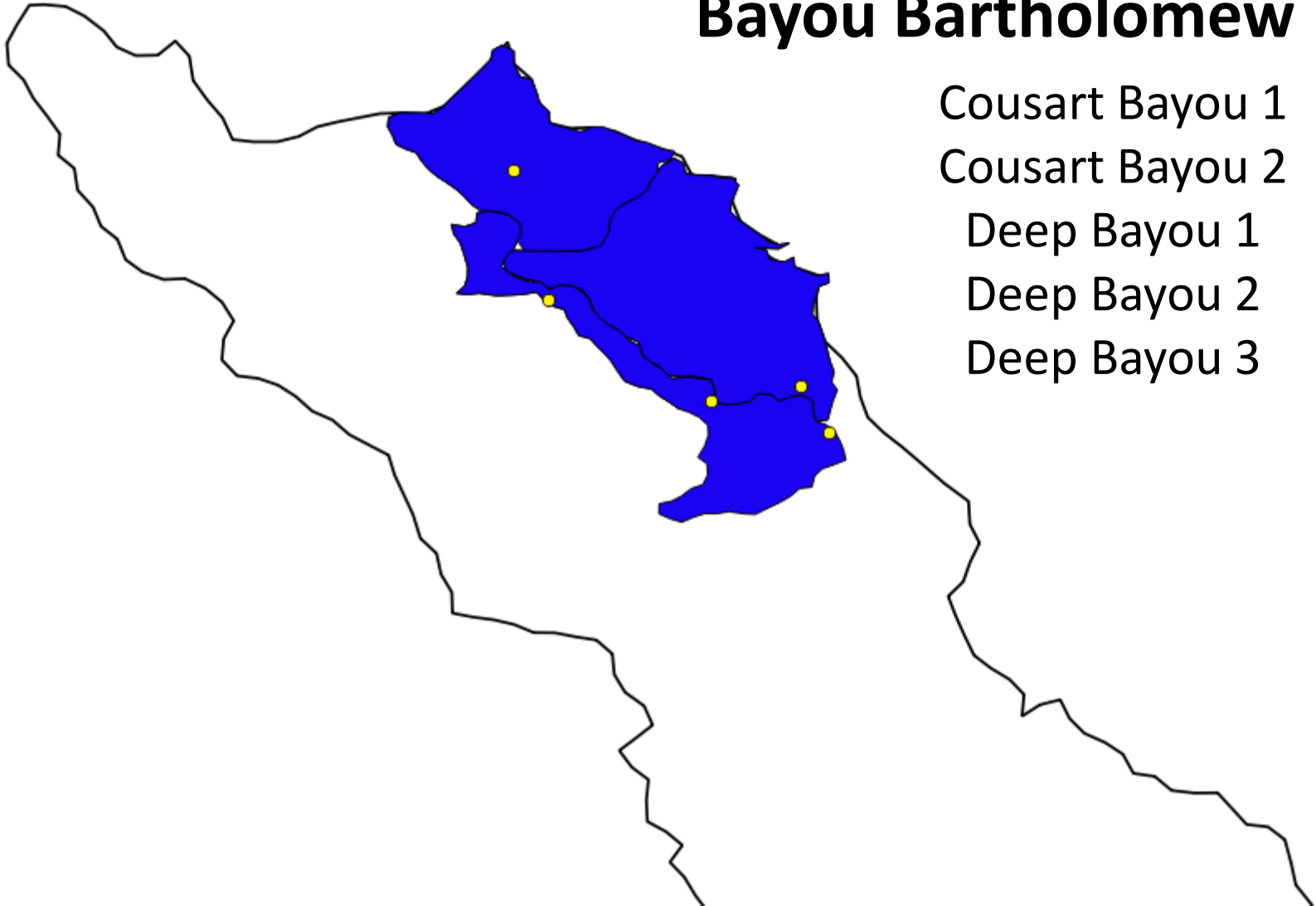
Deep Bayou 1

Deep Bayou 2



# Bayou Bartholomew

- Cousart Bayou 1
- Cousart Bayou 2
- Deep Bayou 1
- Deep Bayou 2
- Deep Bayou 3



# Bayou Bartholomew

Cousart Bayou 1

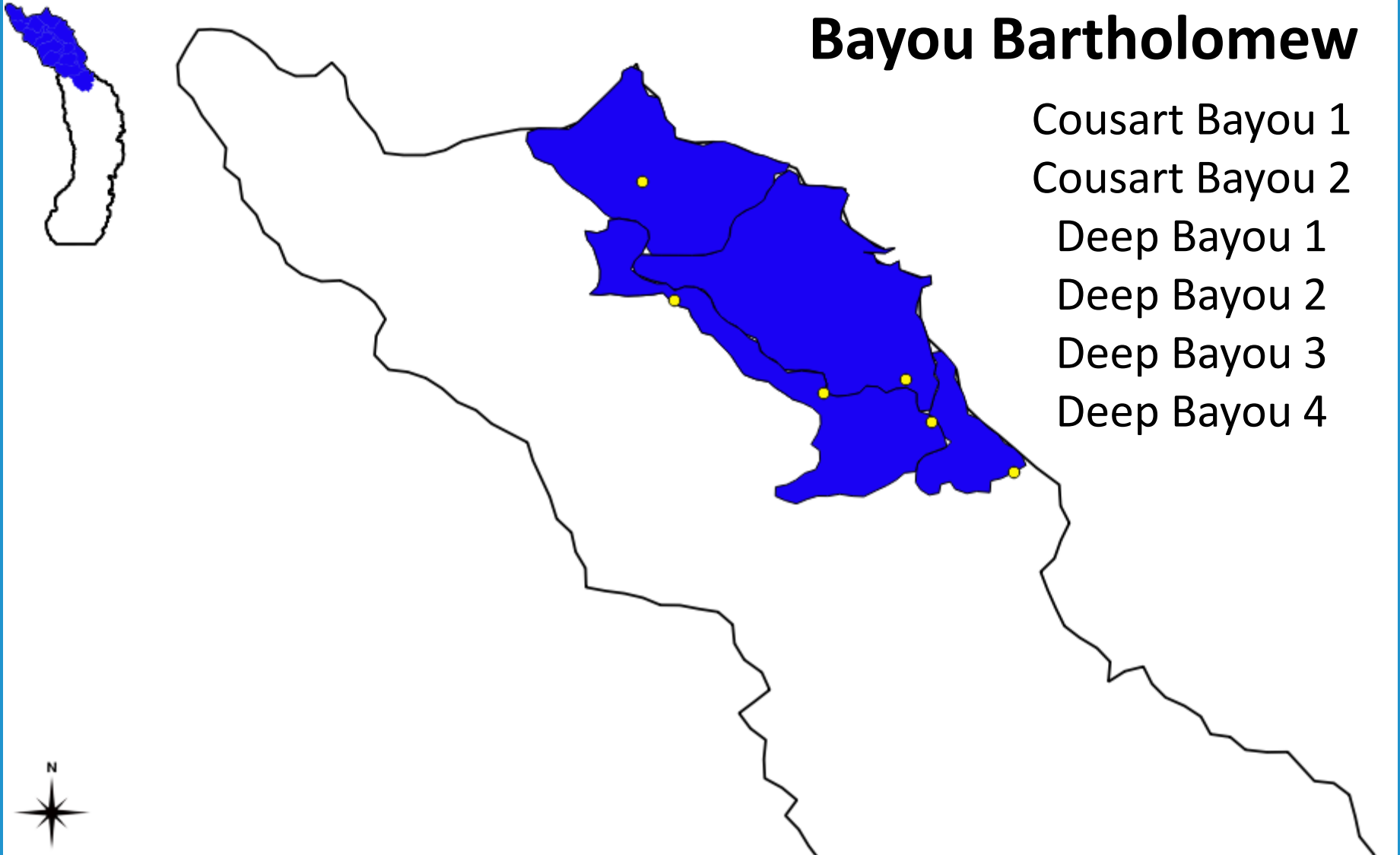
Cousart Bayou 2

Deep Bayou 1

Deep Bayou 2

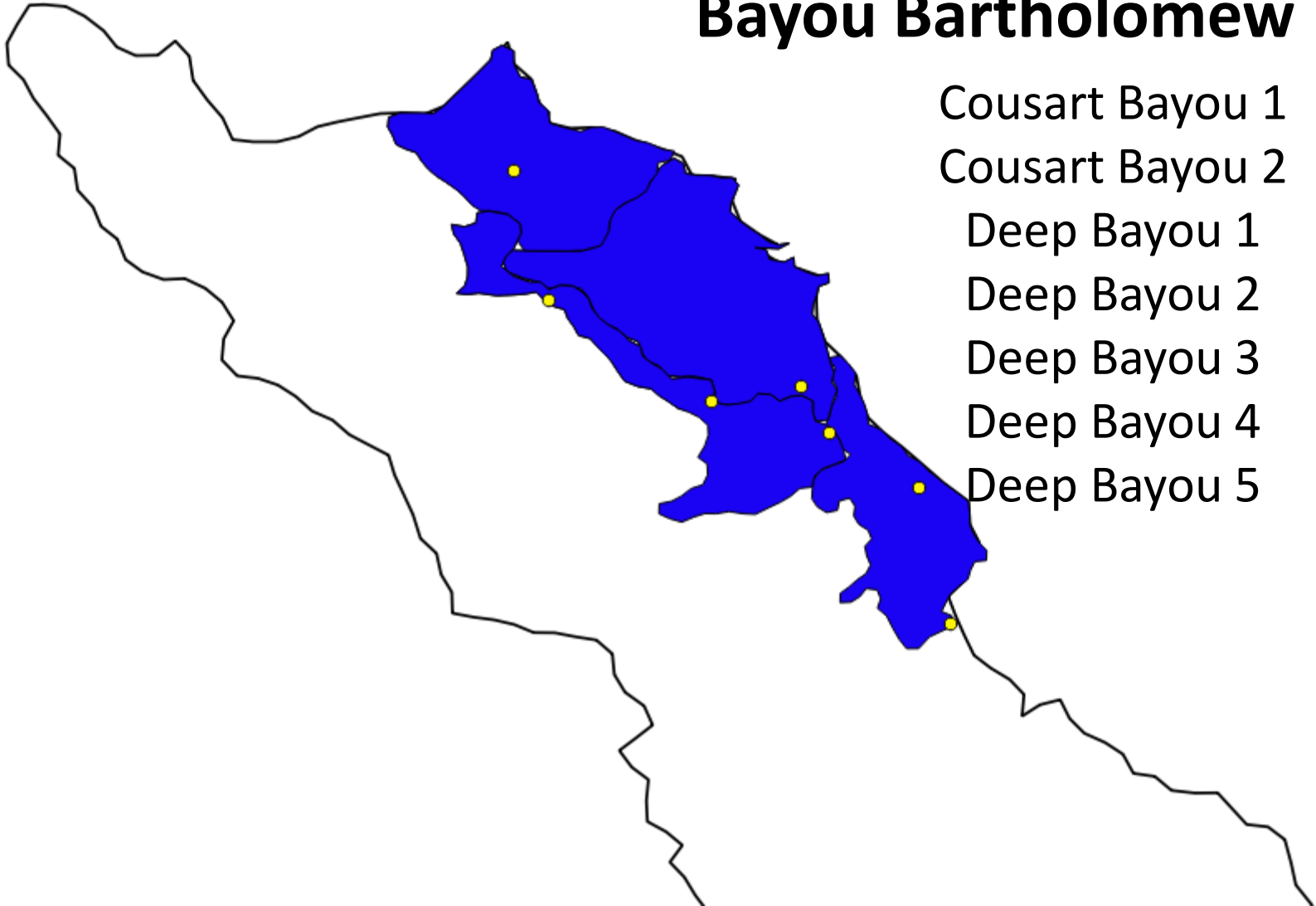
Deep Bayou 3

Deep Bayou 4



# Bayou Bartholomew

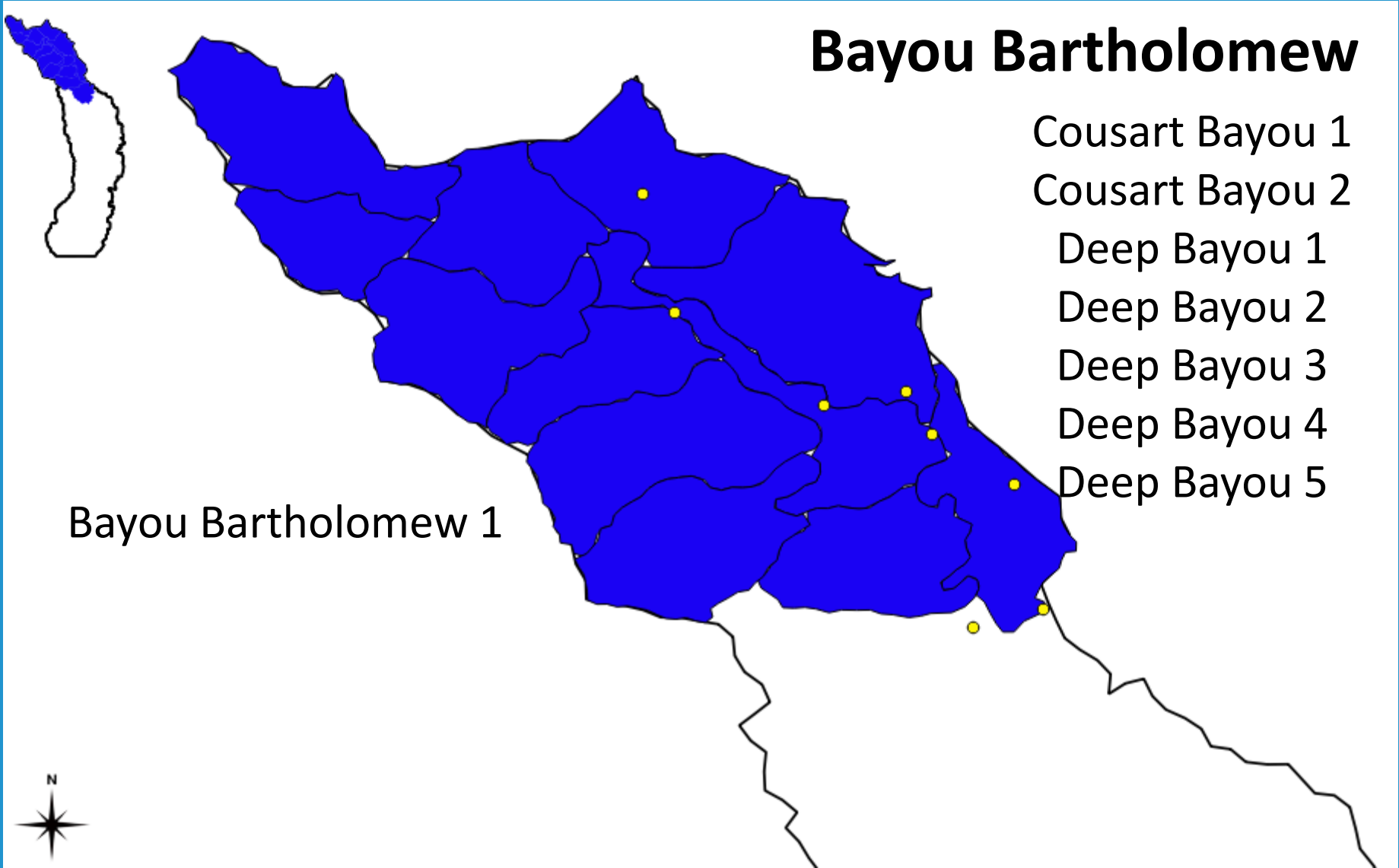
- Cousart Bayou 1
- Cousart Bayou 2
- Deep Bayou 1
- Deep Bayou 2
- Deep Bayou 3
- Deep Bayou 4
- Deep Bayou 5



# Bayou Bartholomew

- Cousart Bayou 1
- Cousart Bayou 2
- Deep Bayou 1
- Deep Bayou 2
- Deep Bayou 3
- Deep Bayou 4
- Deep Bayou 5

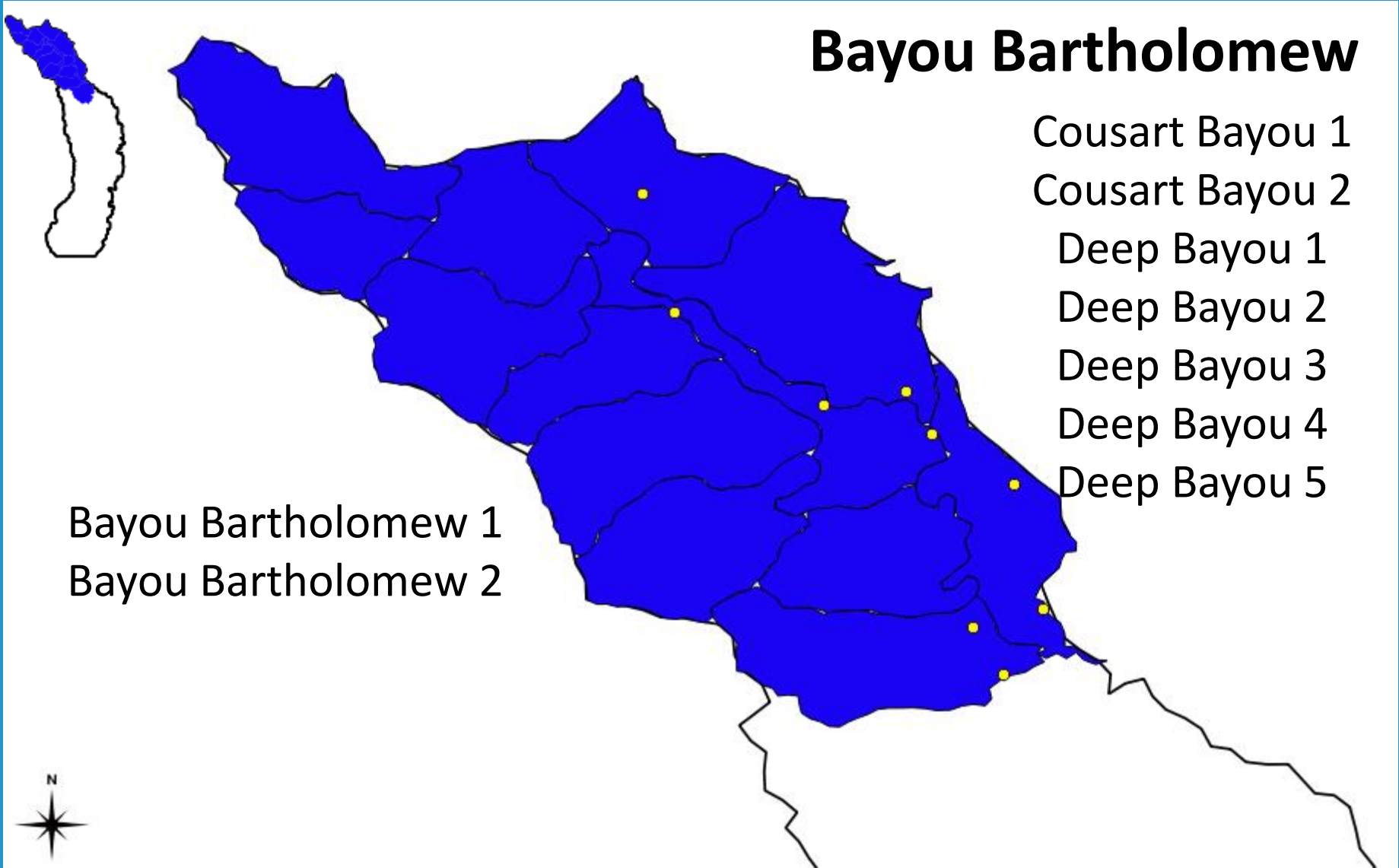
Bayou Bartholomew 1



# Bayou Bartholomew

- Cousart Bayou 1
- Cousart Bayou 2
- Deep Bayou 1
- Deep Bayou 2
- Deep Bayou 3
- Deep Bayou 4
- Deep Bayou 5

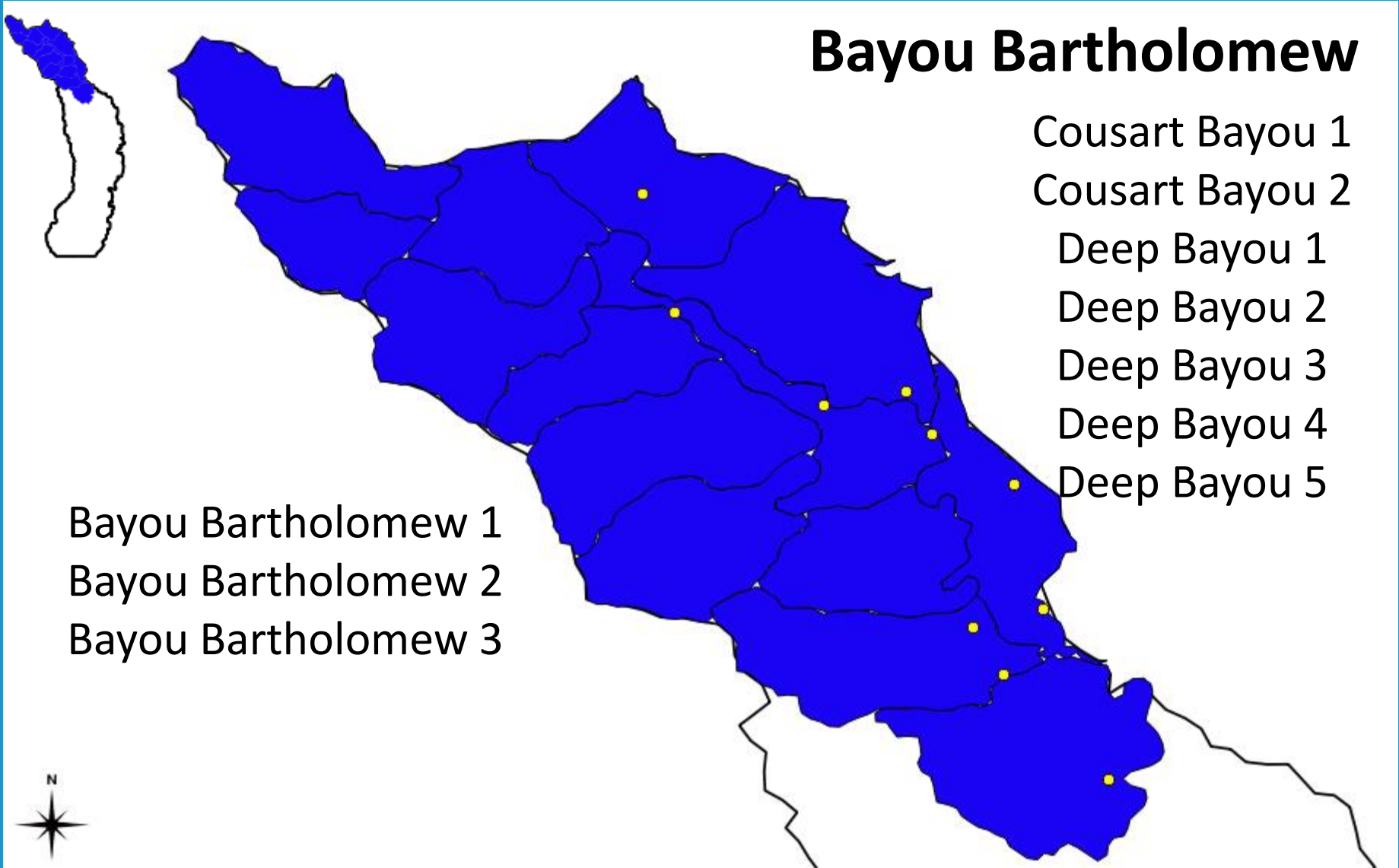
Bayou Bartholomew 1  
Bayou Bartholomew 2



# Bayou Bartholomew

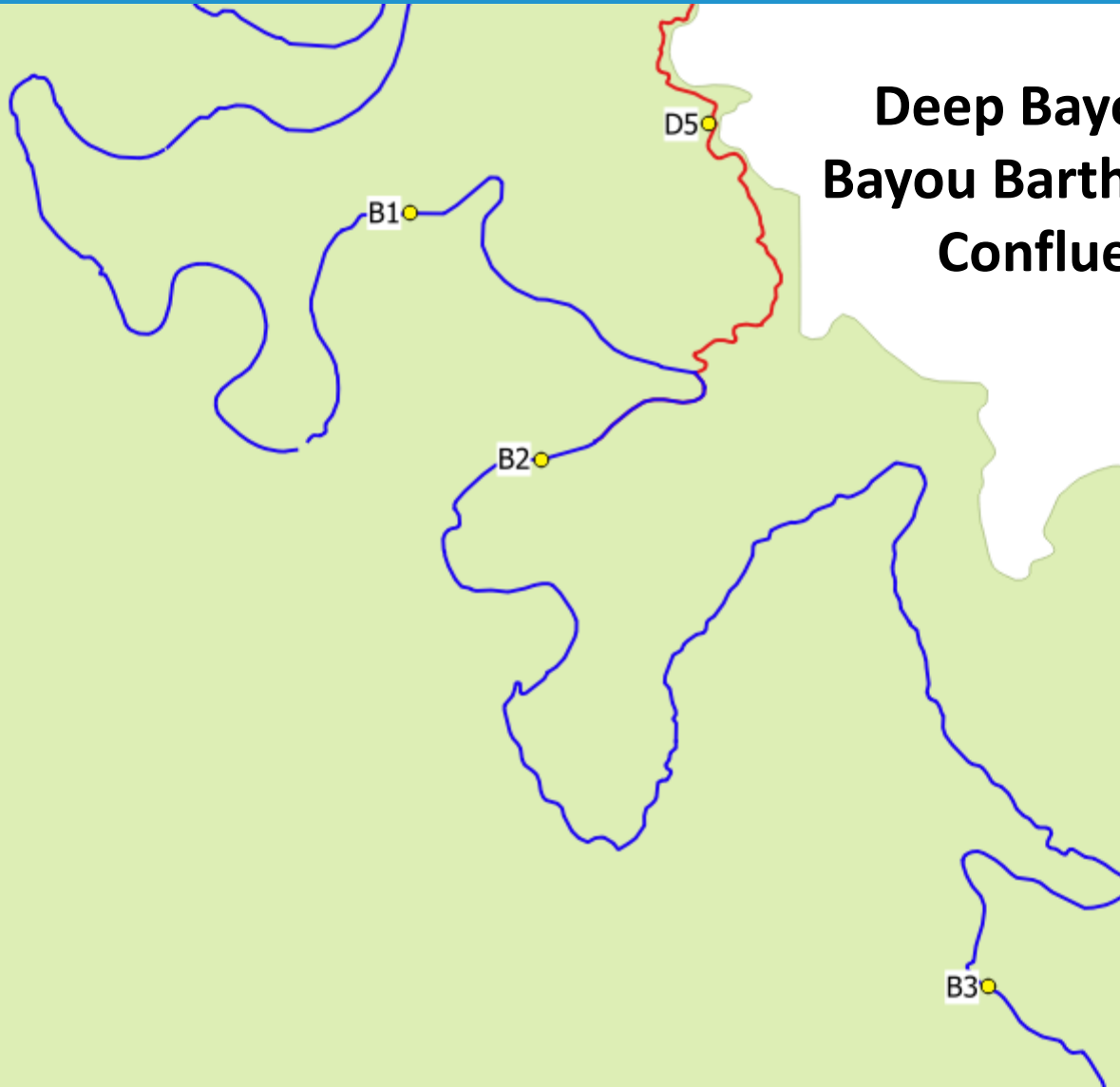
- Cousart Bayou 1
- Cousart Bayou 2
- Deep Bayou 1
- Deep Bayou 2
- Deep Bayou 3
- Deep Bayou 4
- Deep Bayou 5

- Bayou Bartholomew 1
- Bayou Bartholomew 2
- Bayou Bartholomew 3

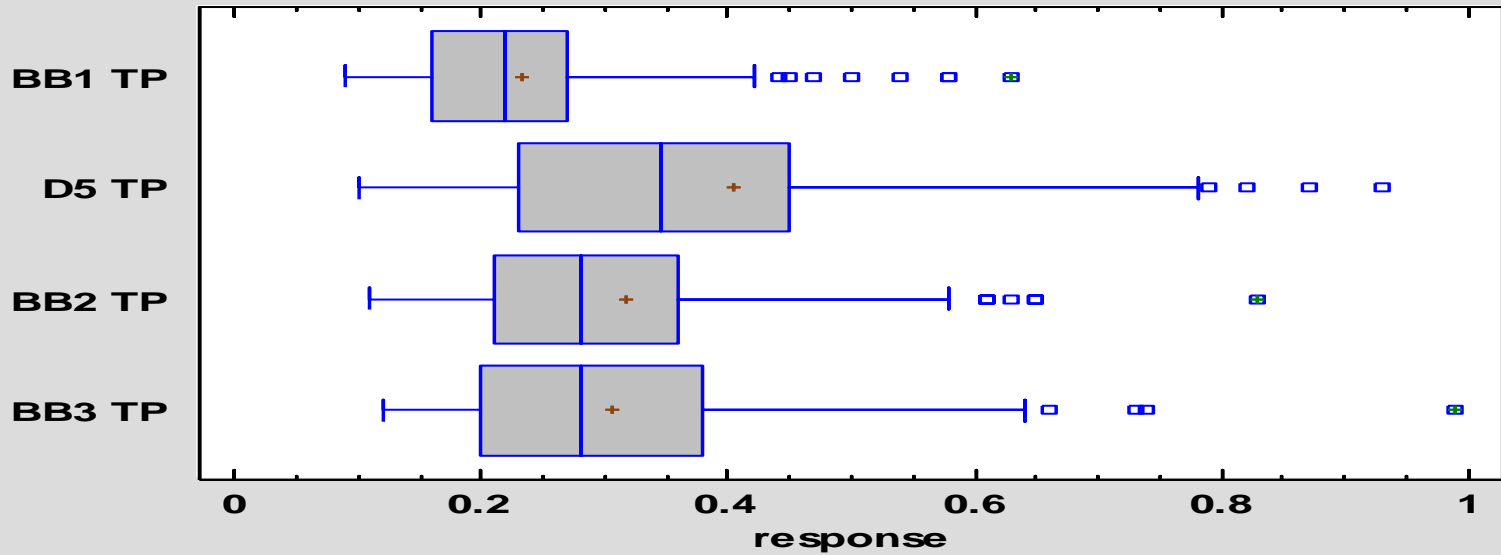




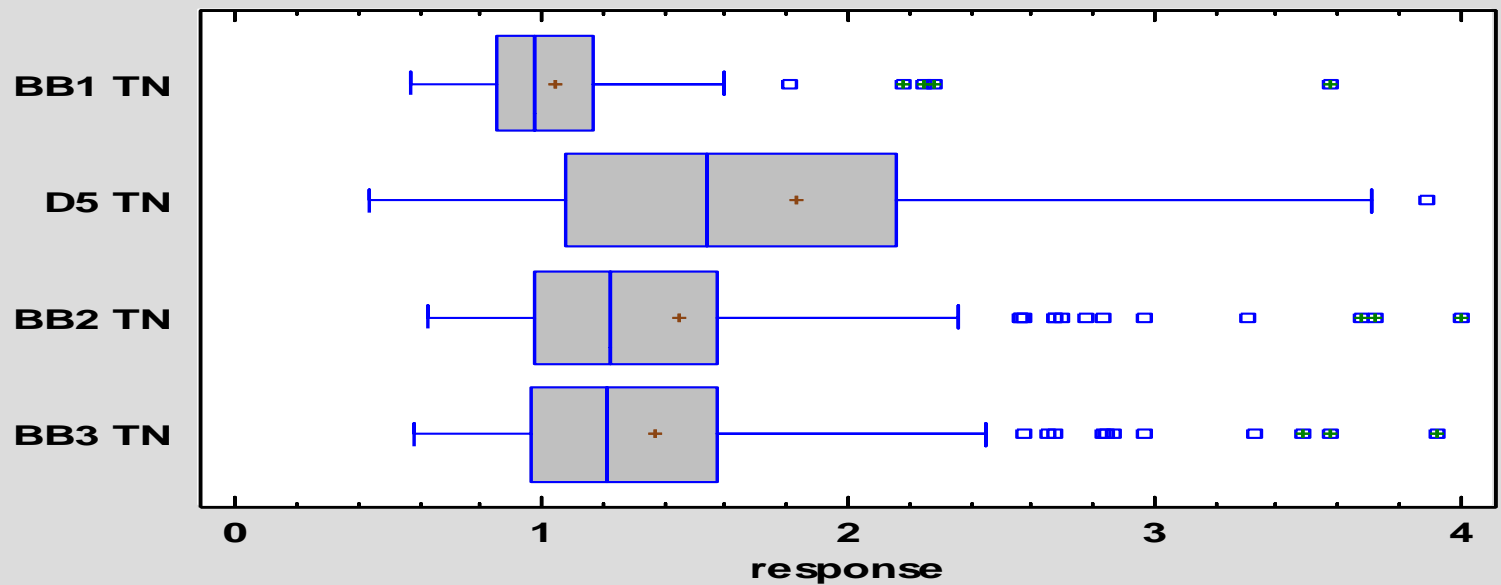
# Deep Bayou and Bayou Bartholomew Confluence



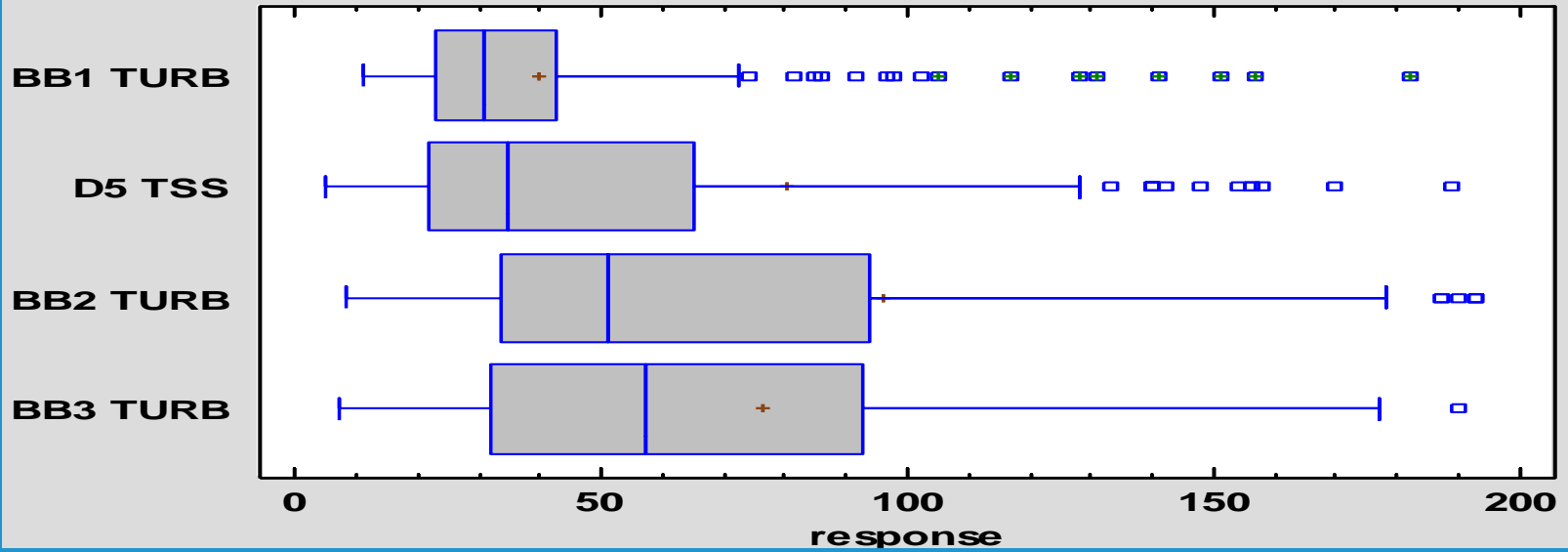
Bayou Bartholomew Total Phosphorus 2013 - 2017



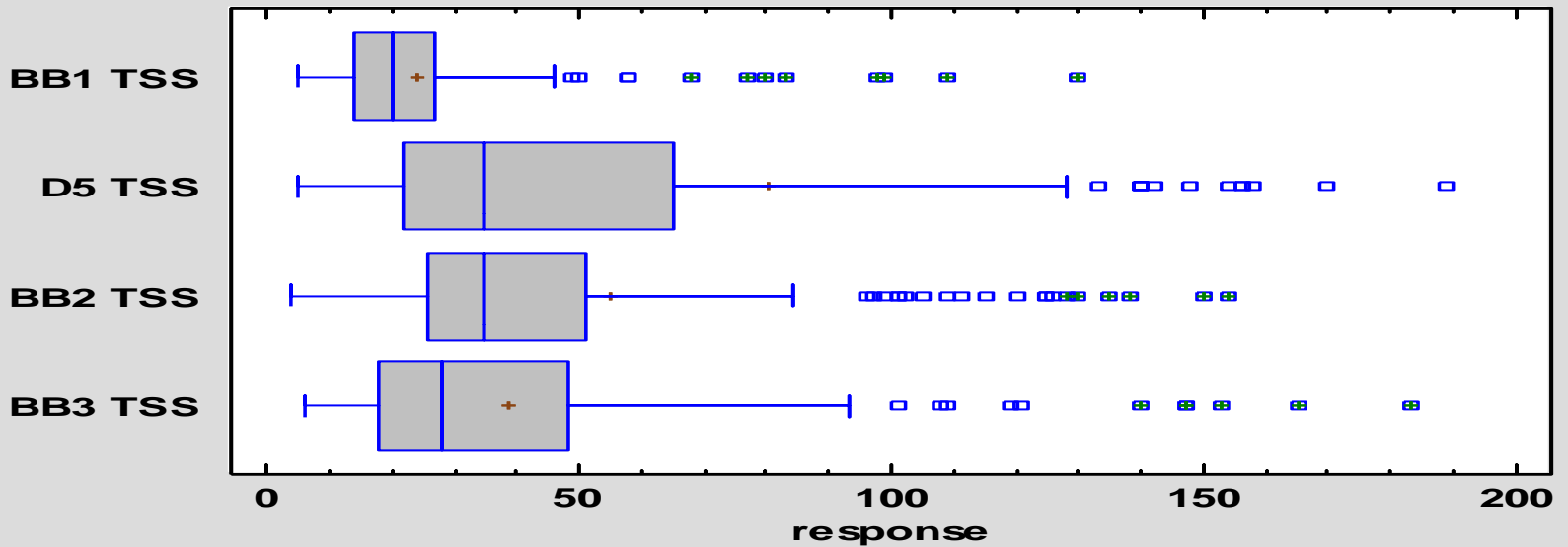
Bayou Bartholomew Total Nitrogen 2013 - 2017

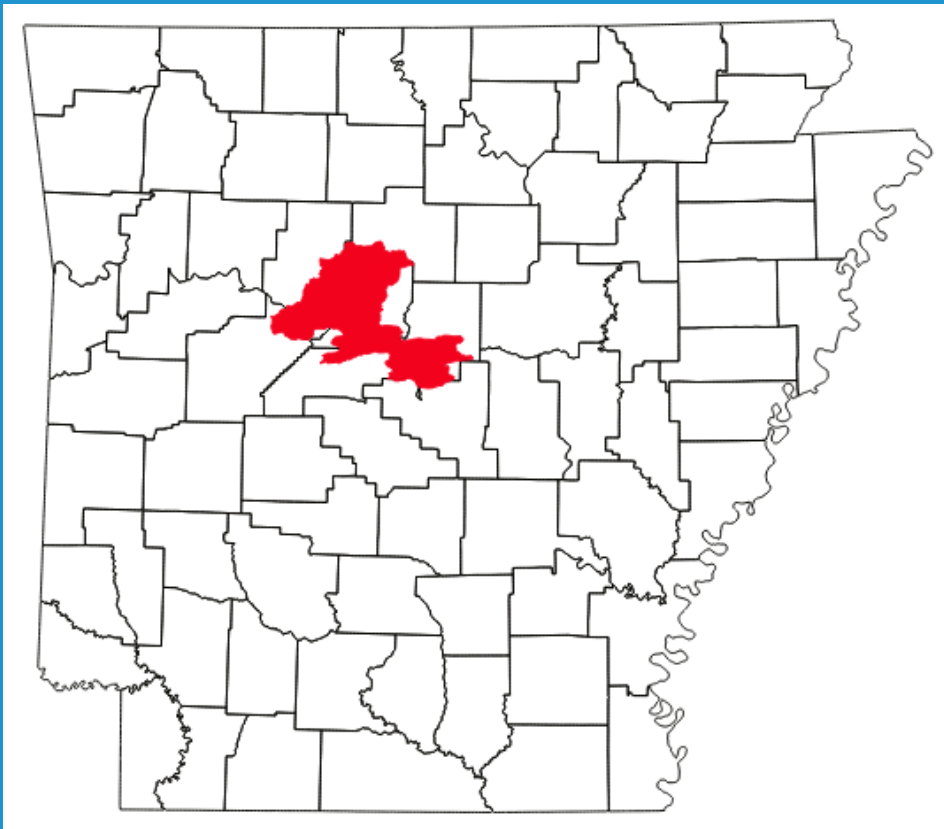


**Bayou Bartholomew Turbidity 2013 - 2017**



**Bayou Bartholomew TSS 2013 - 2017**

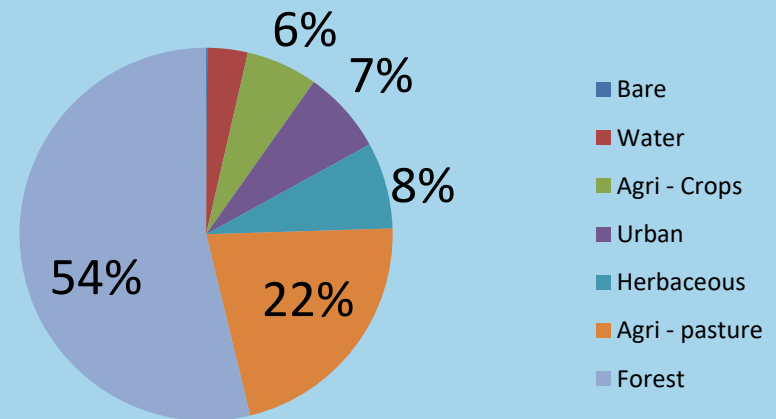




# Lake Conway Point Remove Watershed

Primary focus is East Fork and West Fork of Point Remove Creek

### Lake Conway Point Remove HUC



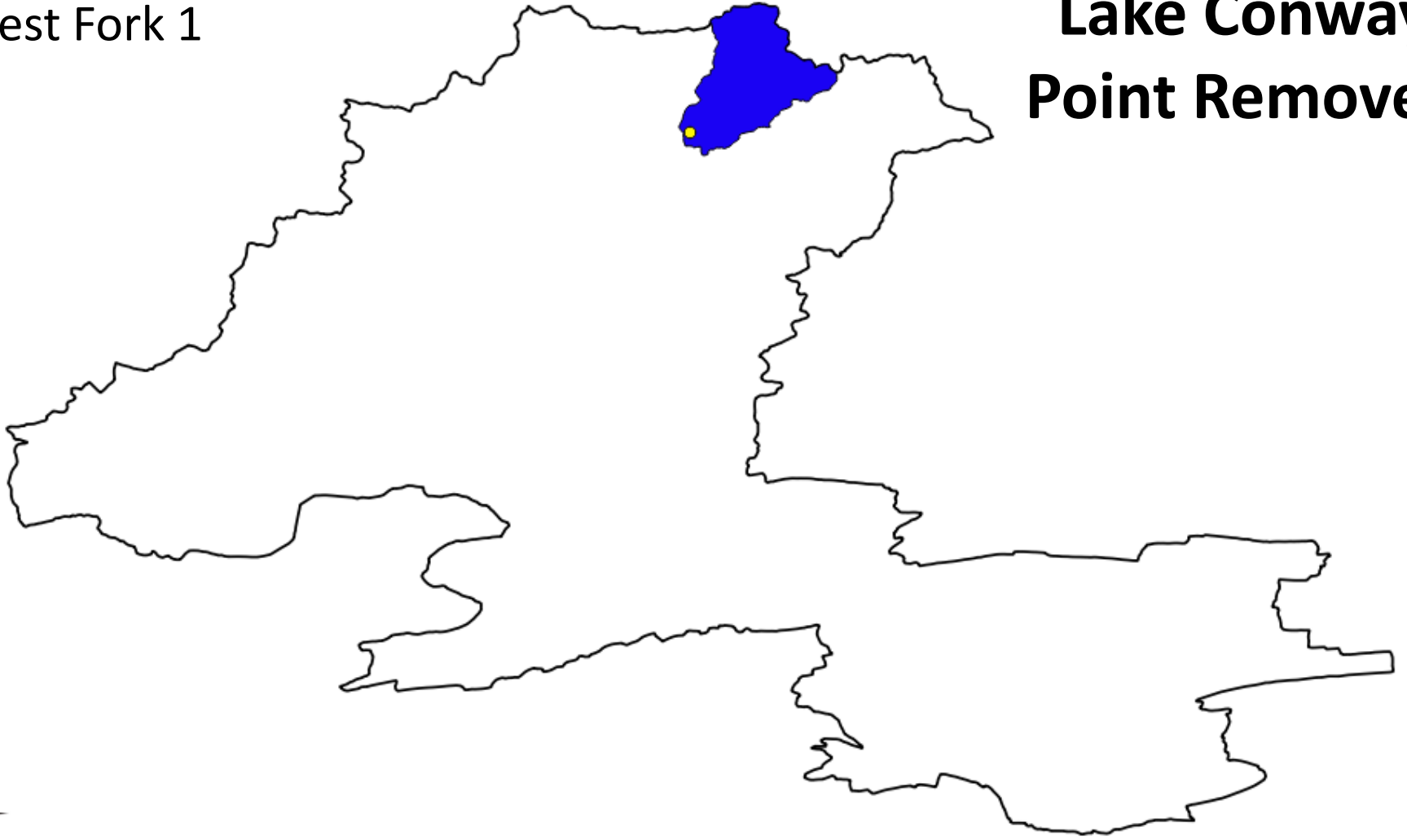
LCPR scored 91 in the Final Risk Assessment Matrix Percentile of the Arkansas' Nonpoint Source Pollution Watershed Risk Matrix and has been selected as a priority watershed.

NRCS identified LCPR as a priority in the Mississippi River Basin Healthy Watershed Initiative.



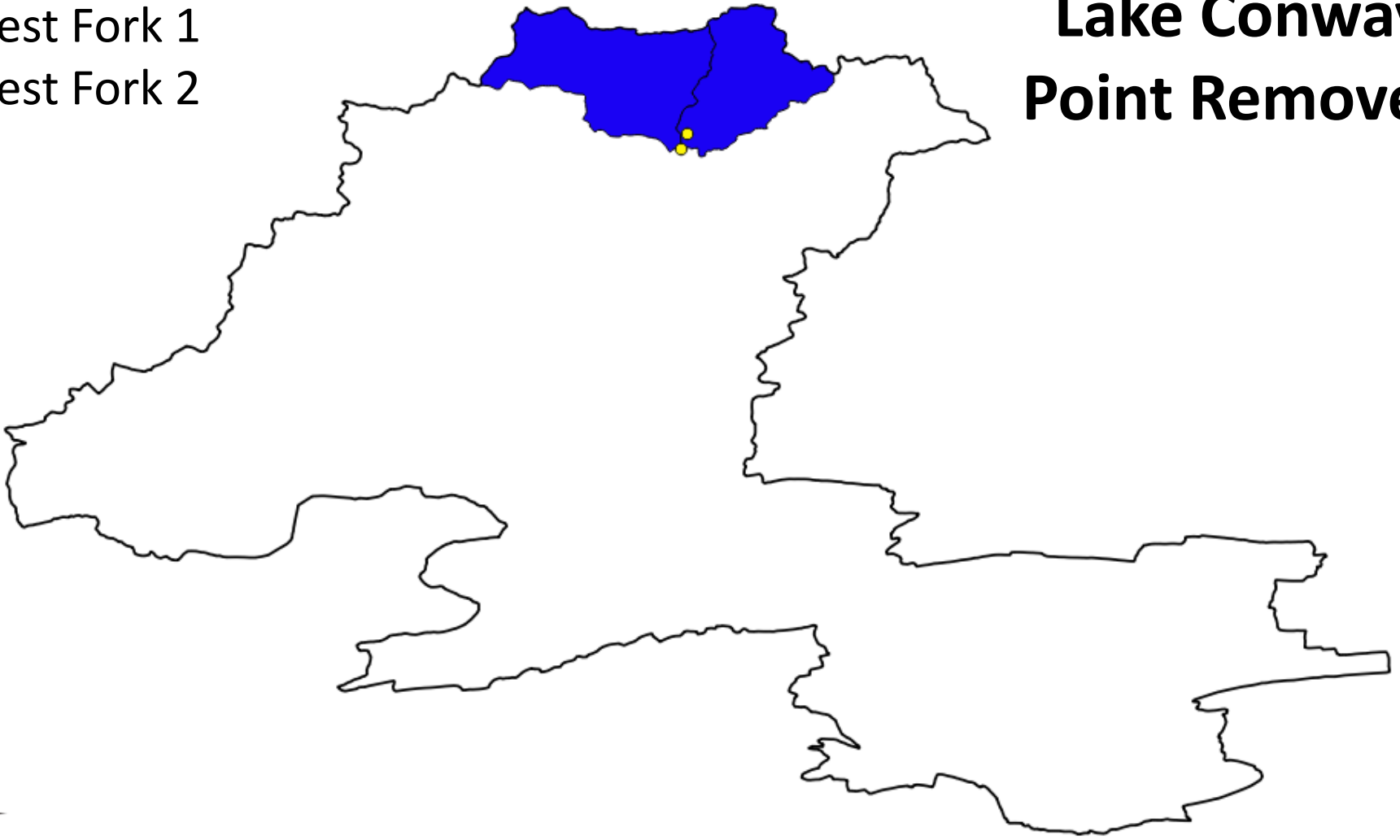
West Fork 1

**Lake Conway  
Point Removed**



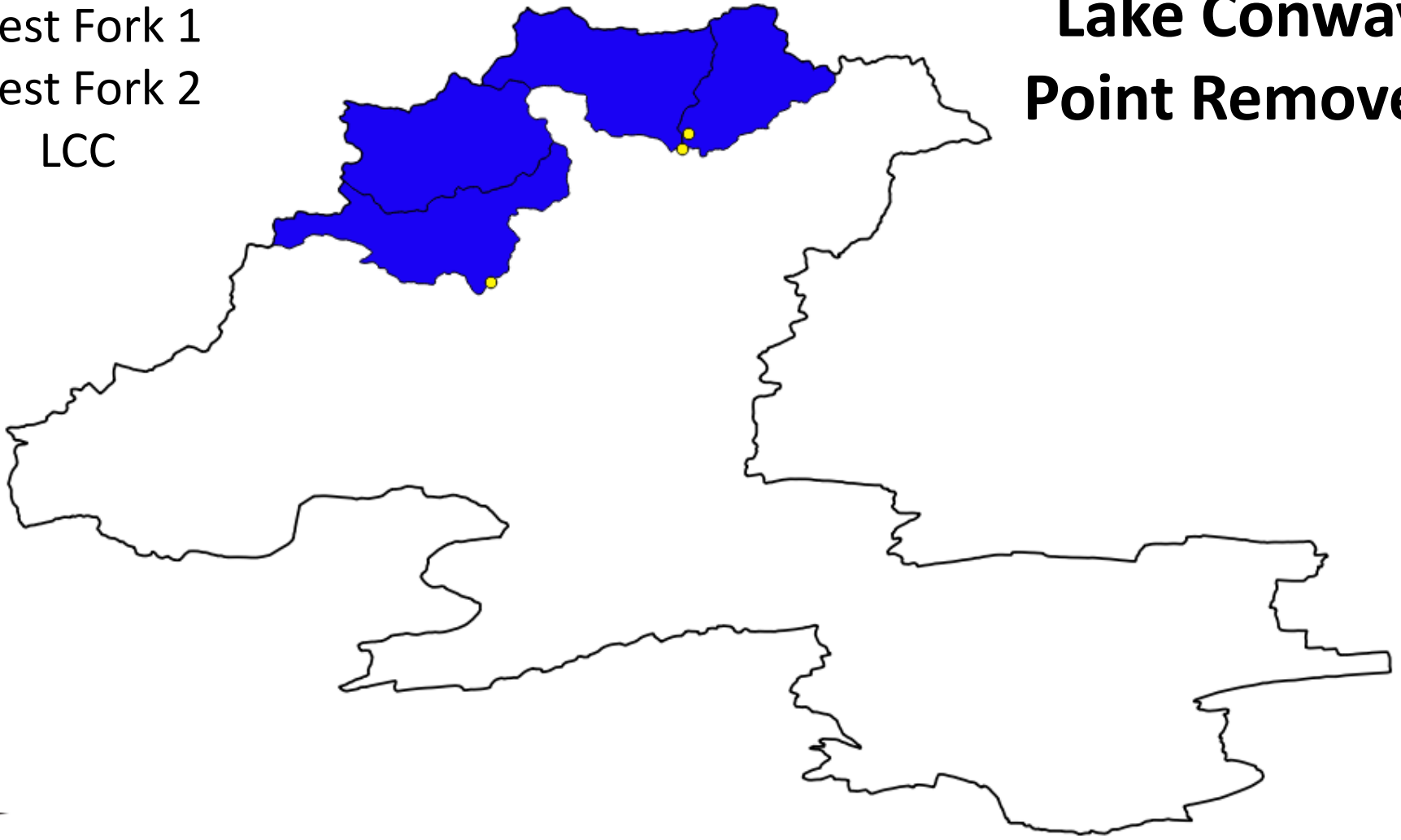
West Fork 1  
West Fork 2

**Lake Conway  
Point Removed**



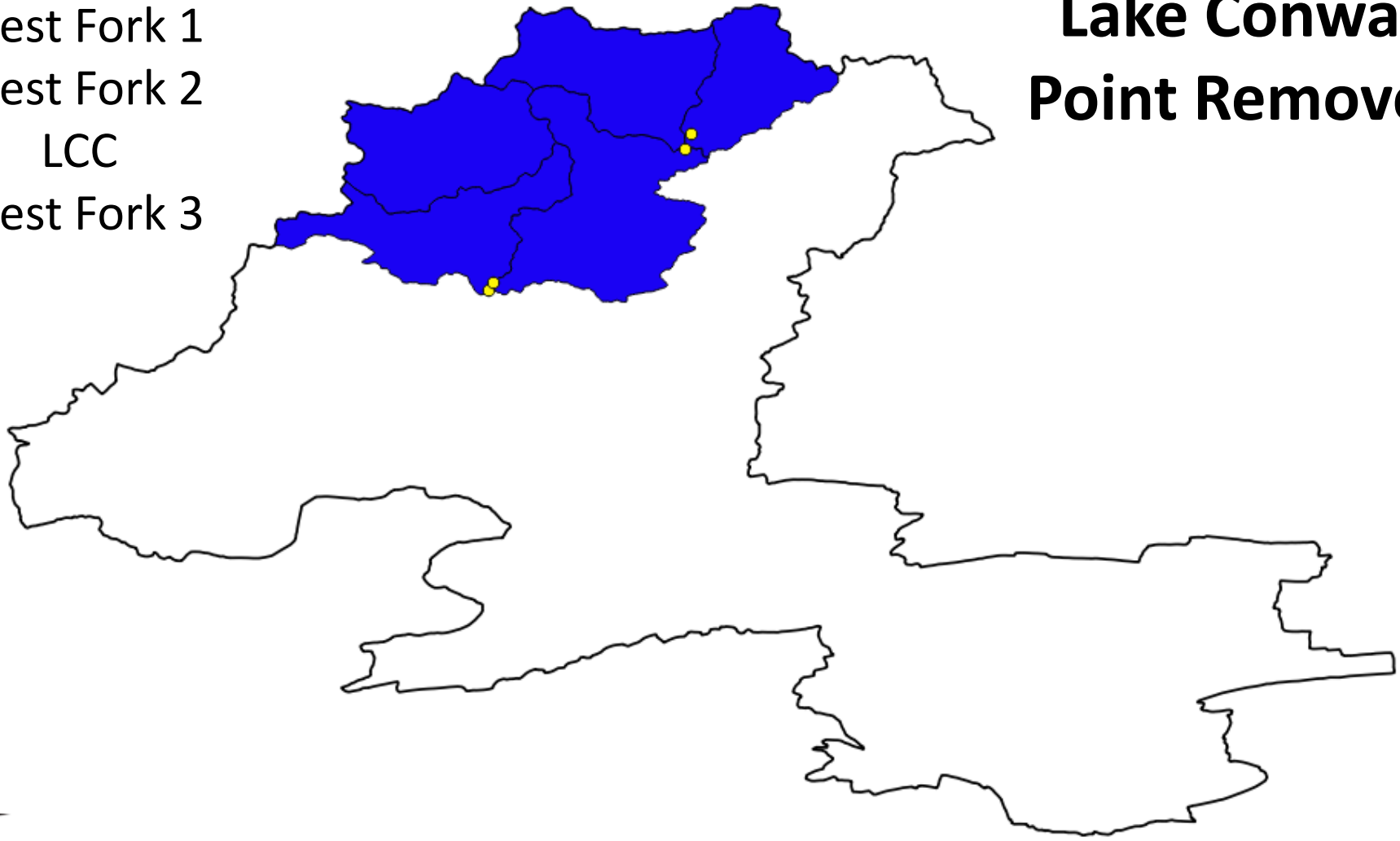
West Fork 1  
West Fork 2  
LCC

**Lake Conway  
Point Removed**



West Fork 1  
West Fork 2  
LCC  
West Fork 3

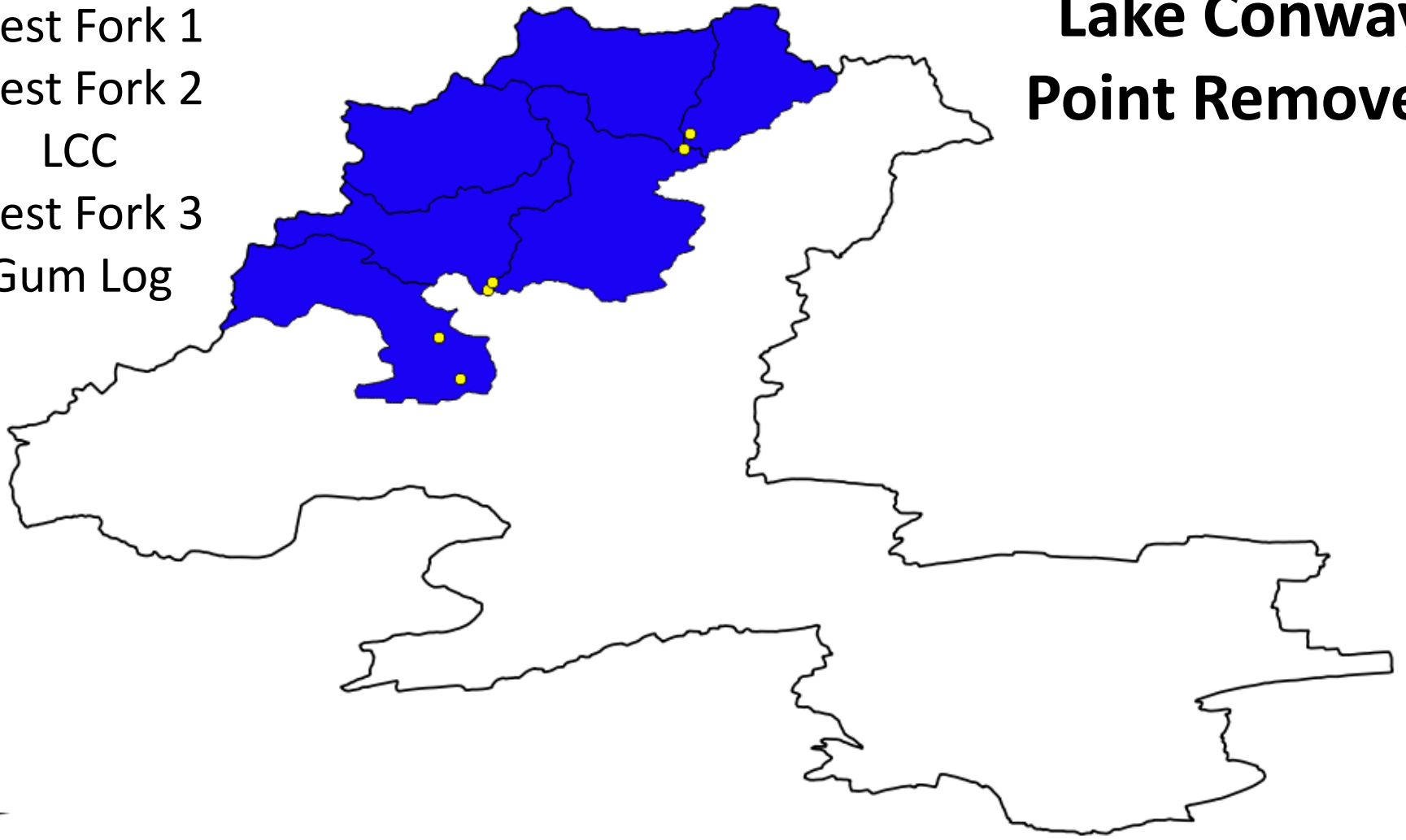
# Lake Conway Point Removed





West Fork 1  
West Fork 2  
LCC  
West Fork 3  
Gum Log

# Lake Conway Point Removed



West Fork 1

West Fork 2

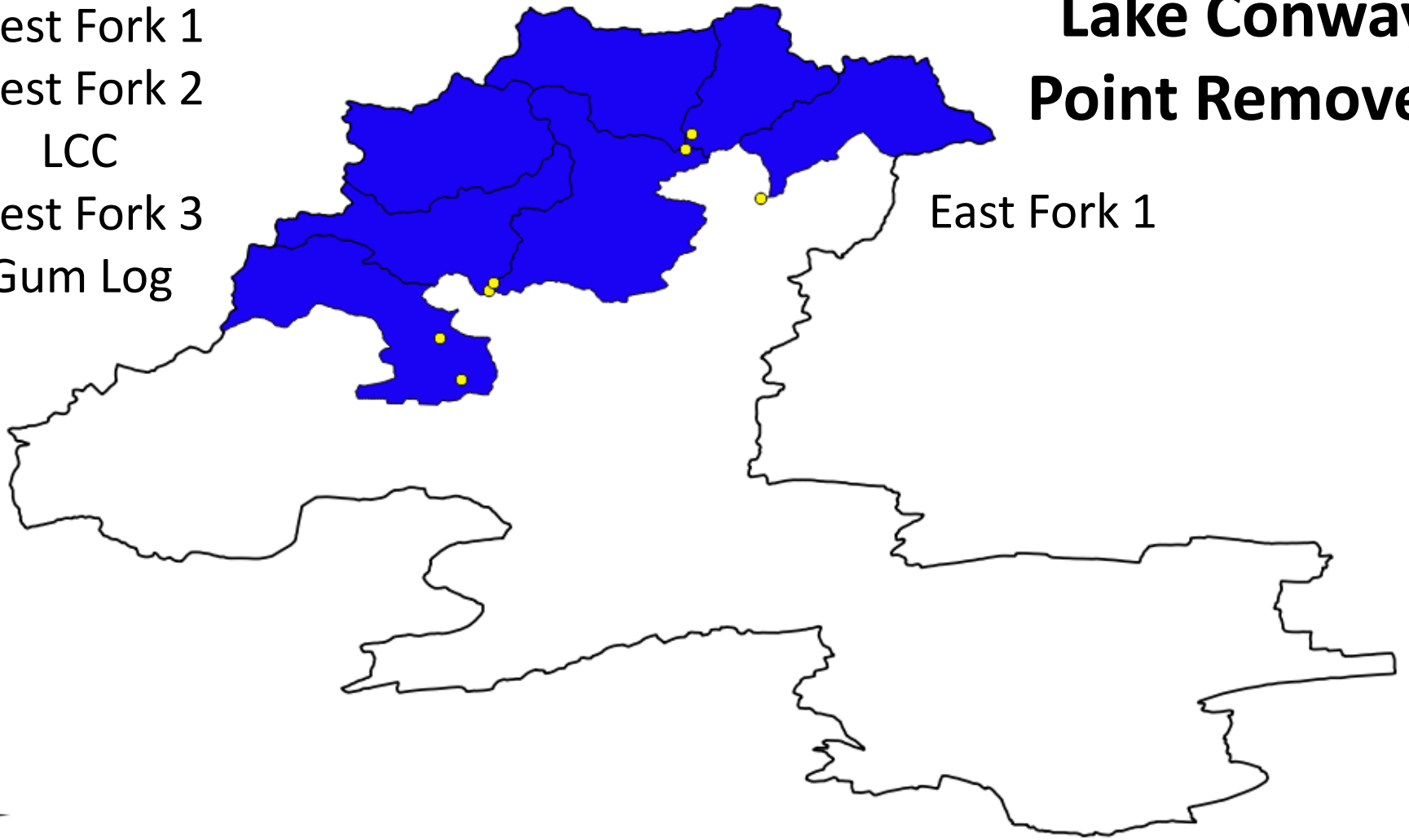
LCC

West Fork 3

Gum Log

# Lake Conway Point Removed

East Fork 1



West Fork 1

West Fork 2

LCC

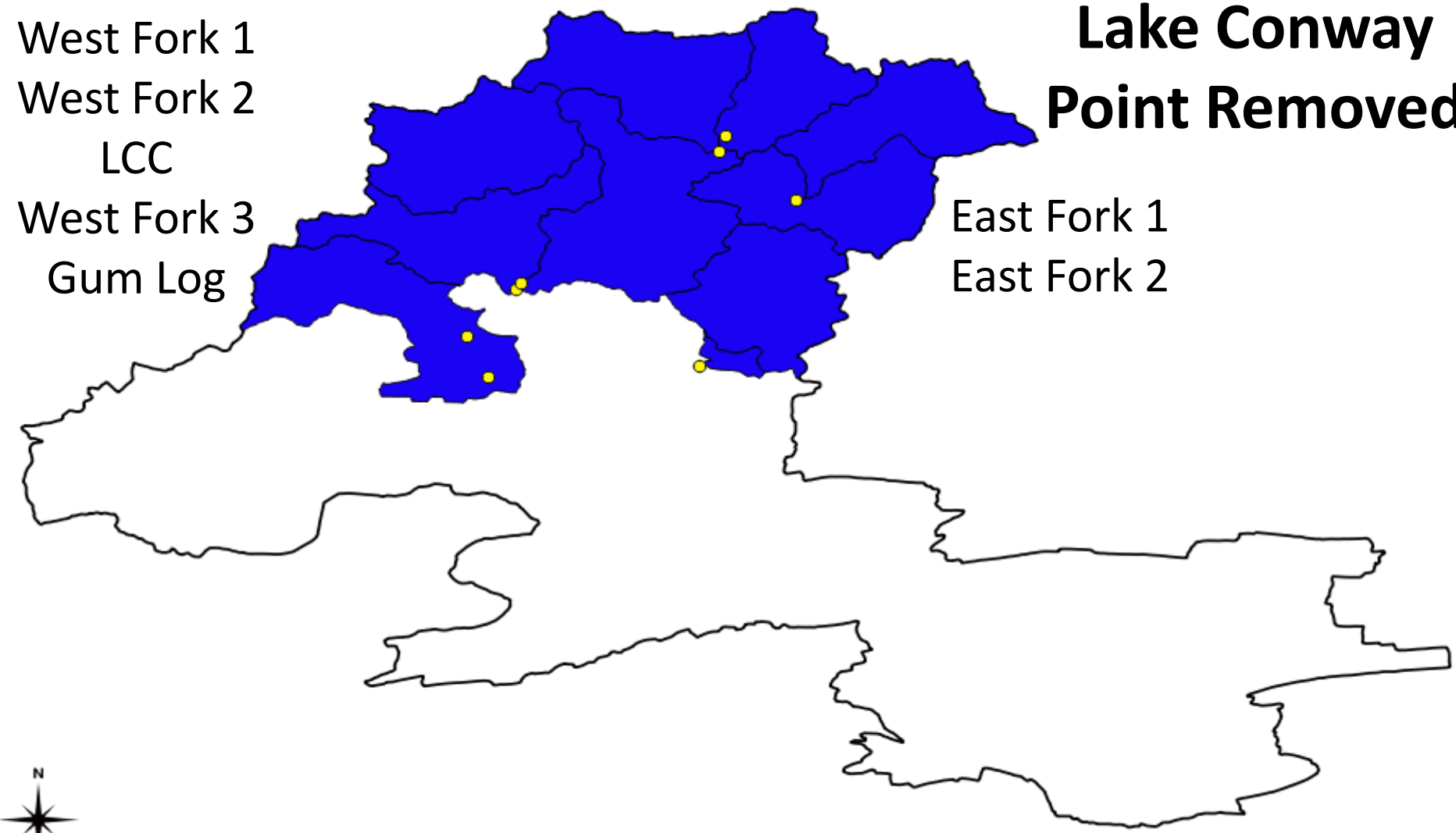
West Fork 3

Gum Log

# Lake Conway Point Removed

East Fork 1

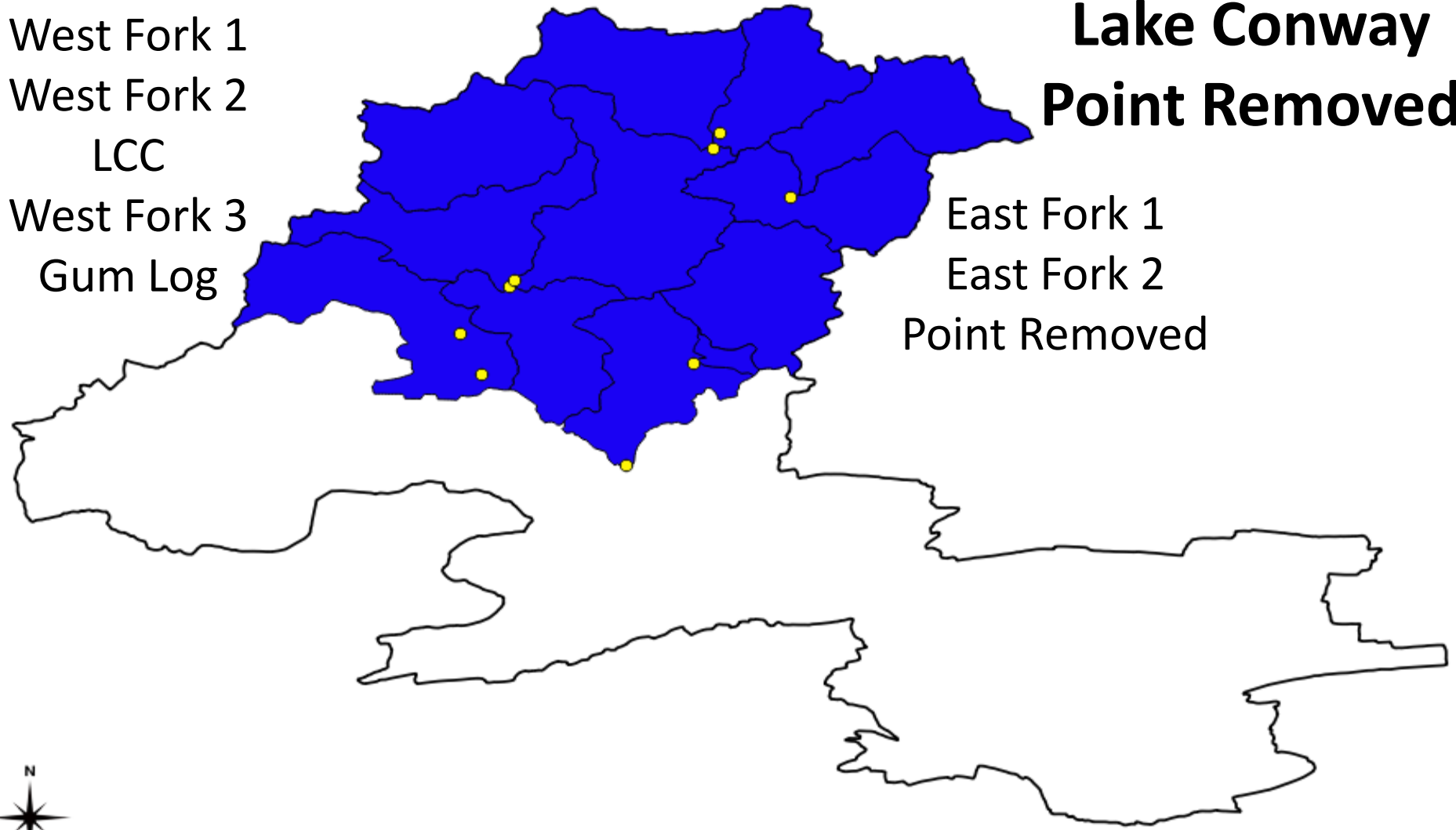
East Fork 2



West Fork 1  
West Fork 2  
LCC  
West Fork 3  
Gum Log

**Lake Conway  
Point Removed**

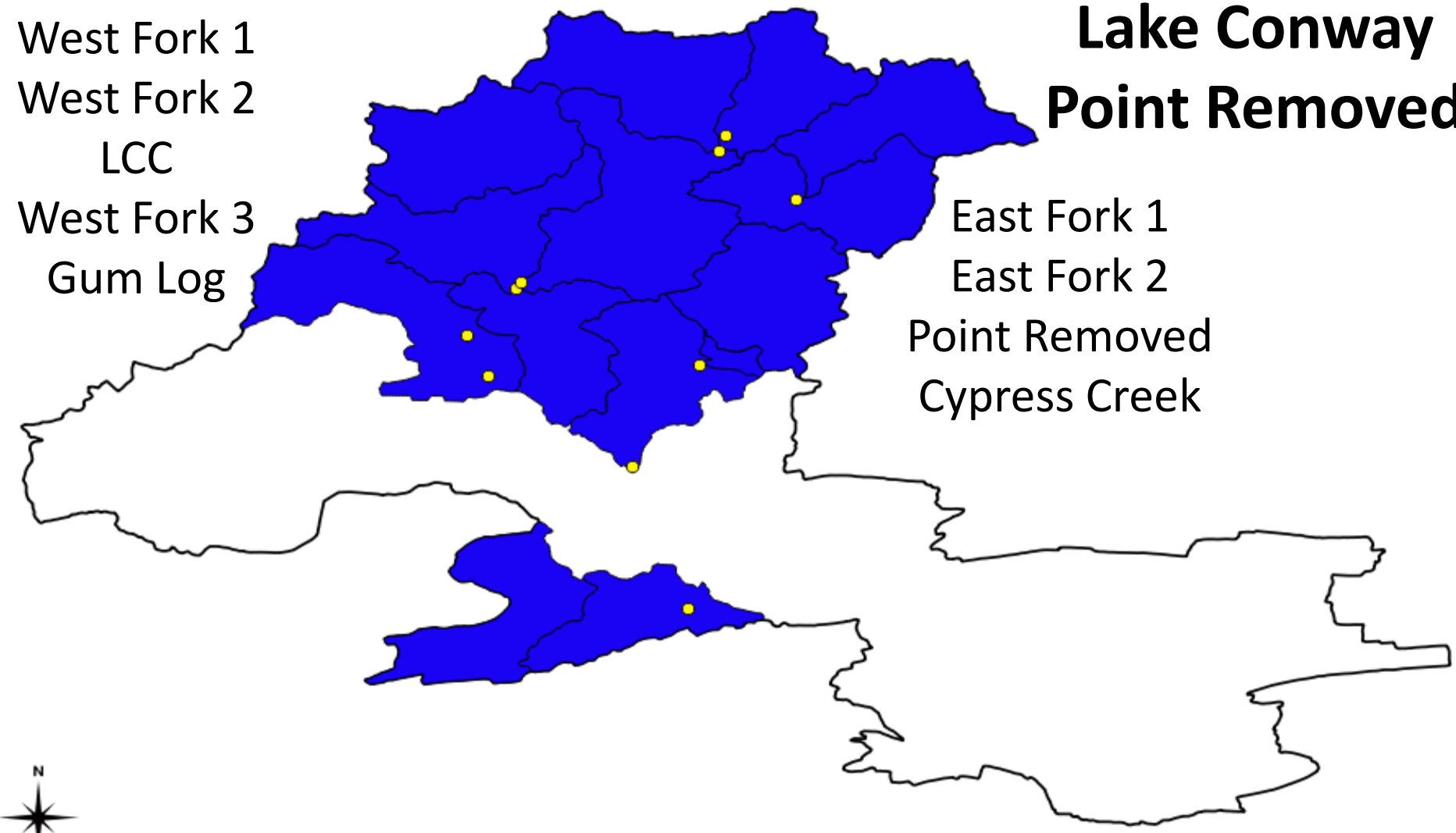
East Fork 1  
East Fork 2  
Point Removed



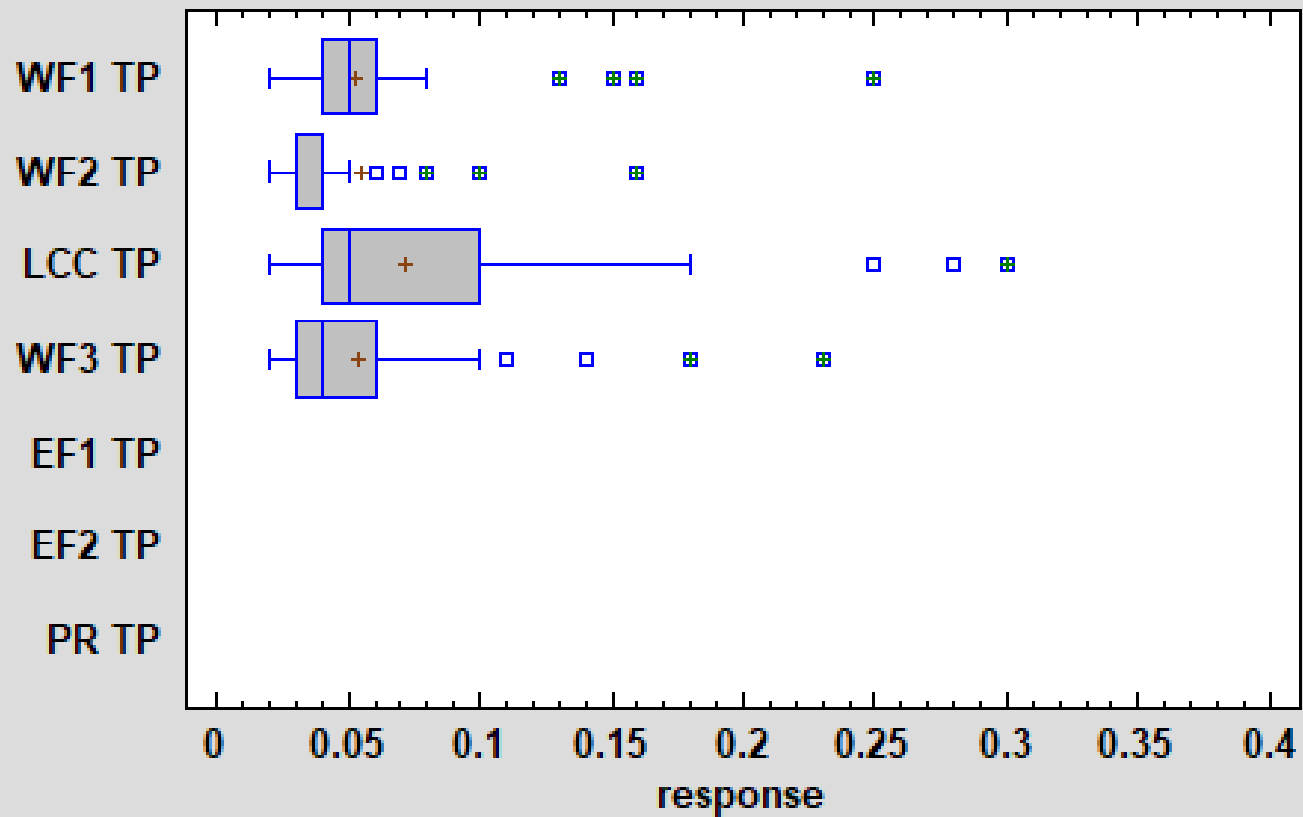
West Fork 1  
West Fork 2  
LCC  
West Fork 3  
Gum Log

# Lake Conway Point Removed

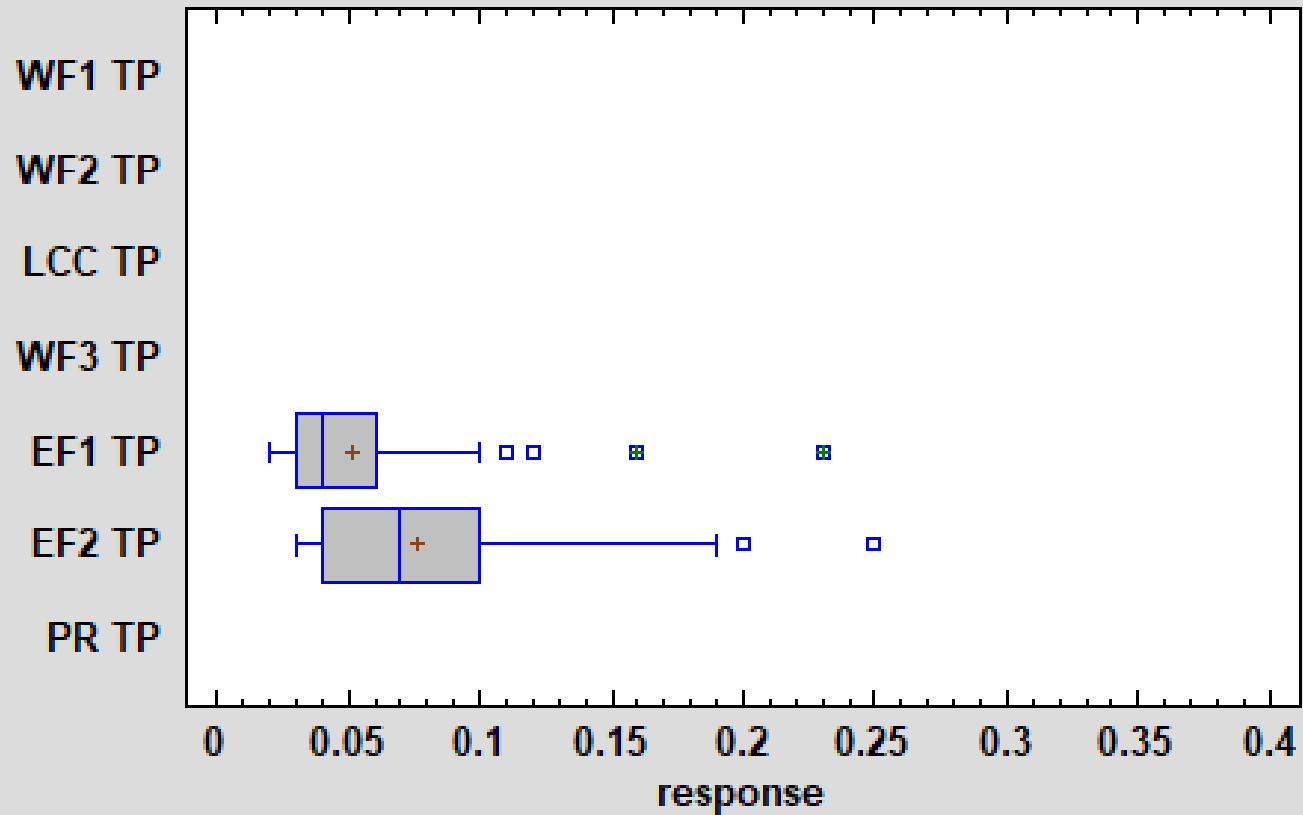
East Fork 1  
East Fork 2  
Point Removed  
Cypress Creek



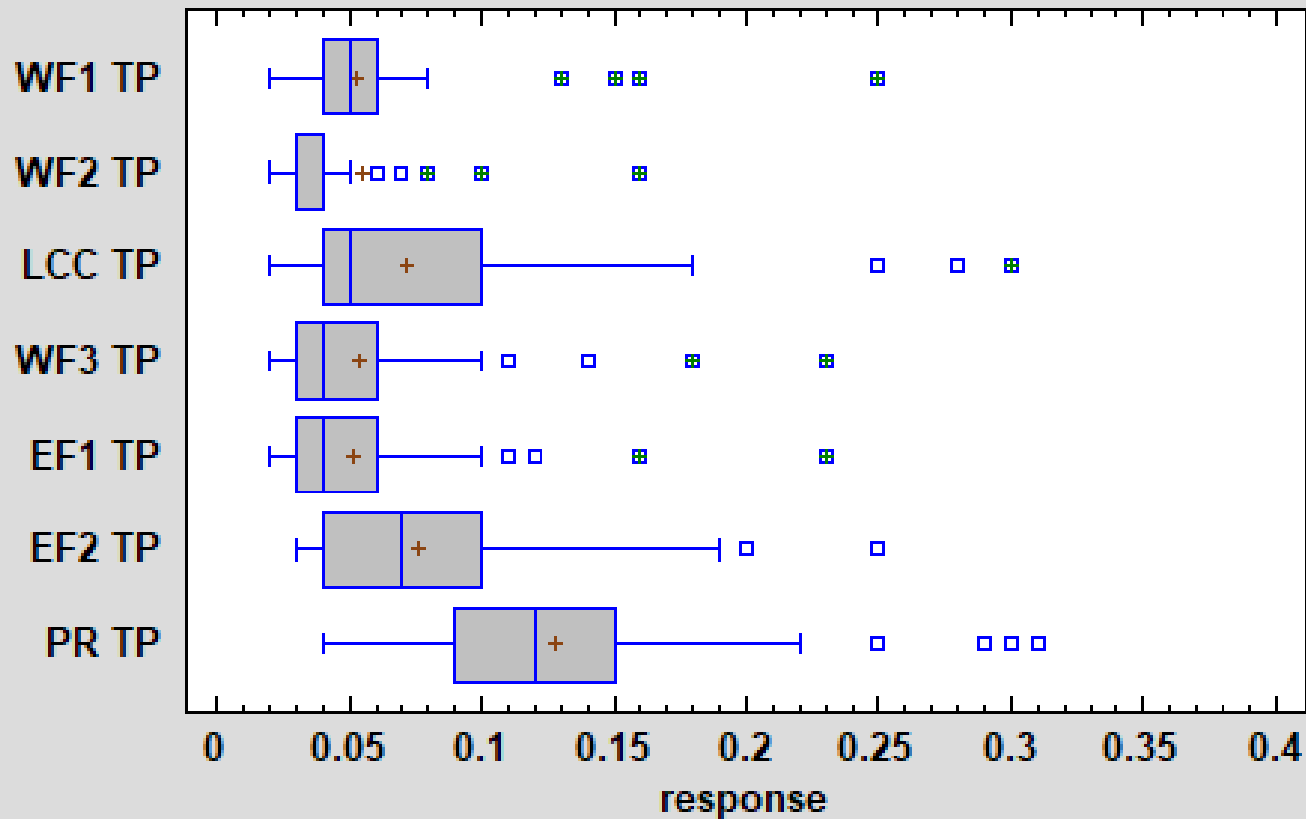
### Lake Conway Point Removed Total Phosphorus



### Lake Conway Point Removed Total Phosphorus

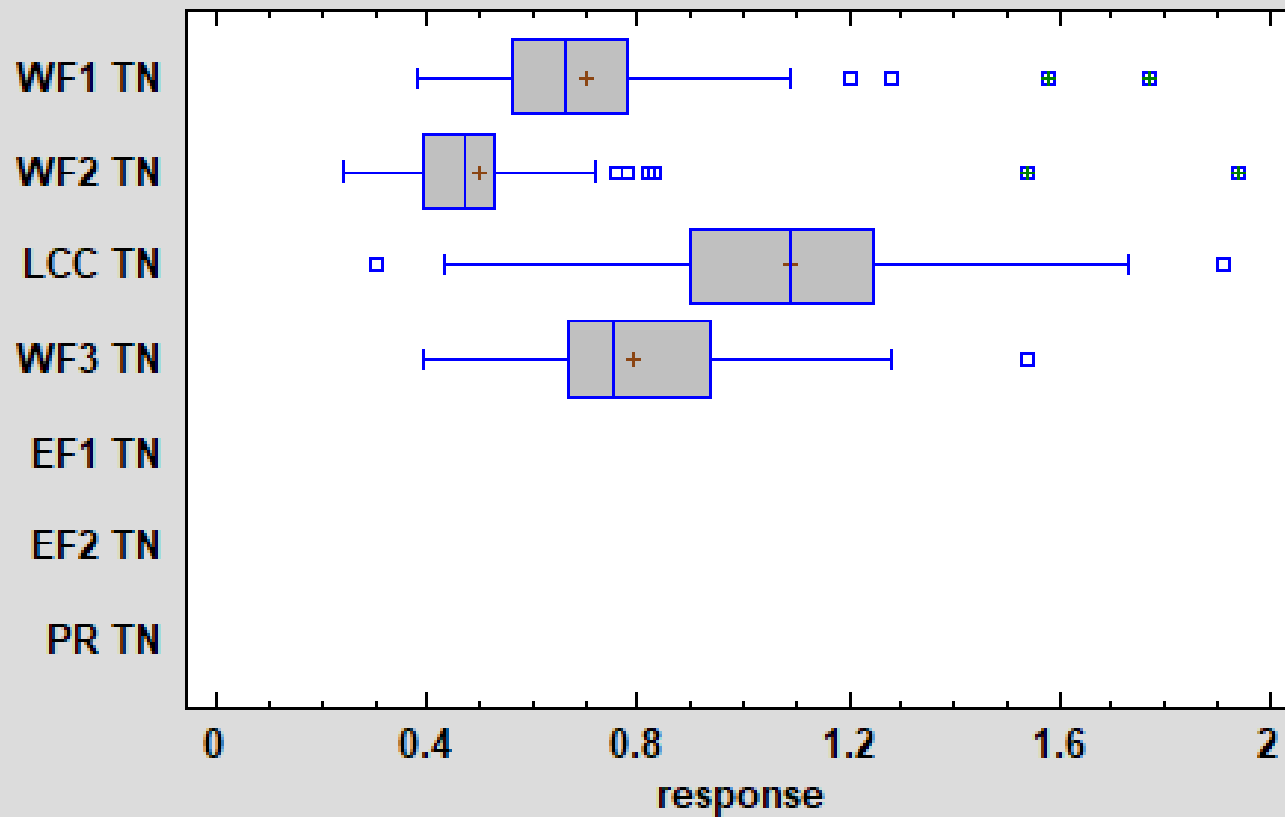


### Lake Conway Point Removed Total Phosphorus

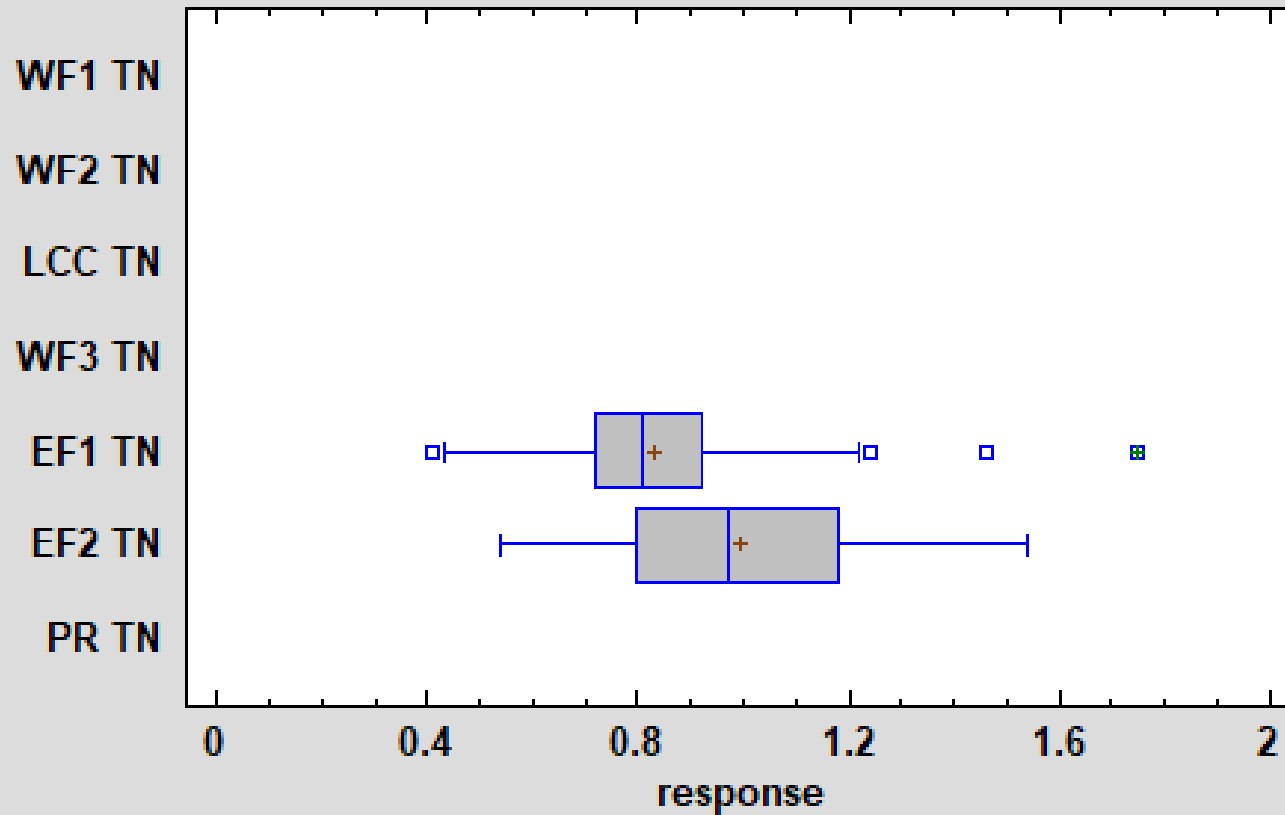




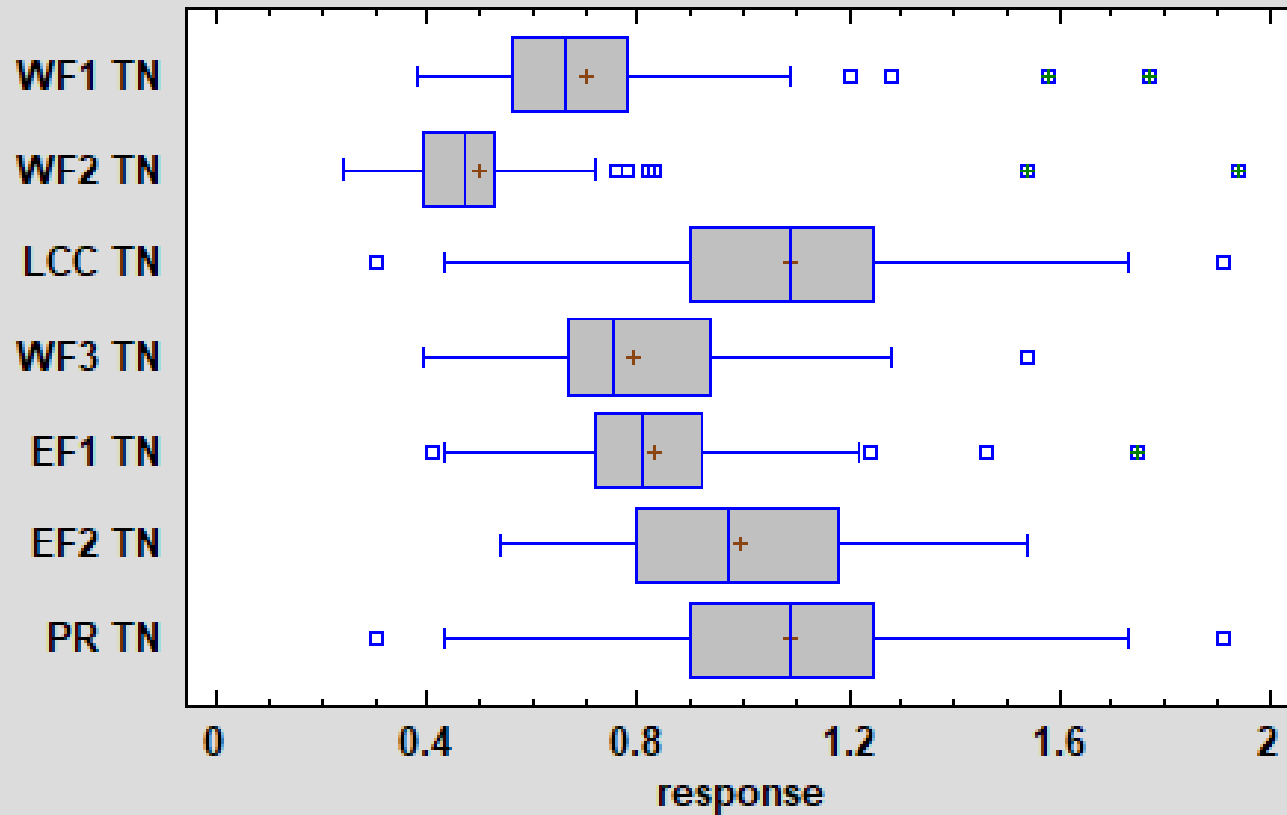
### Lake Conway Point Removed Total Nitrogen



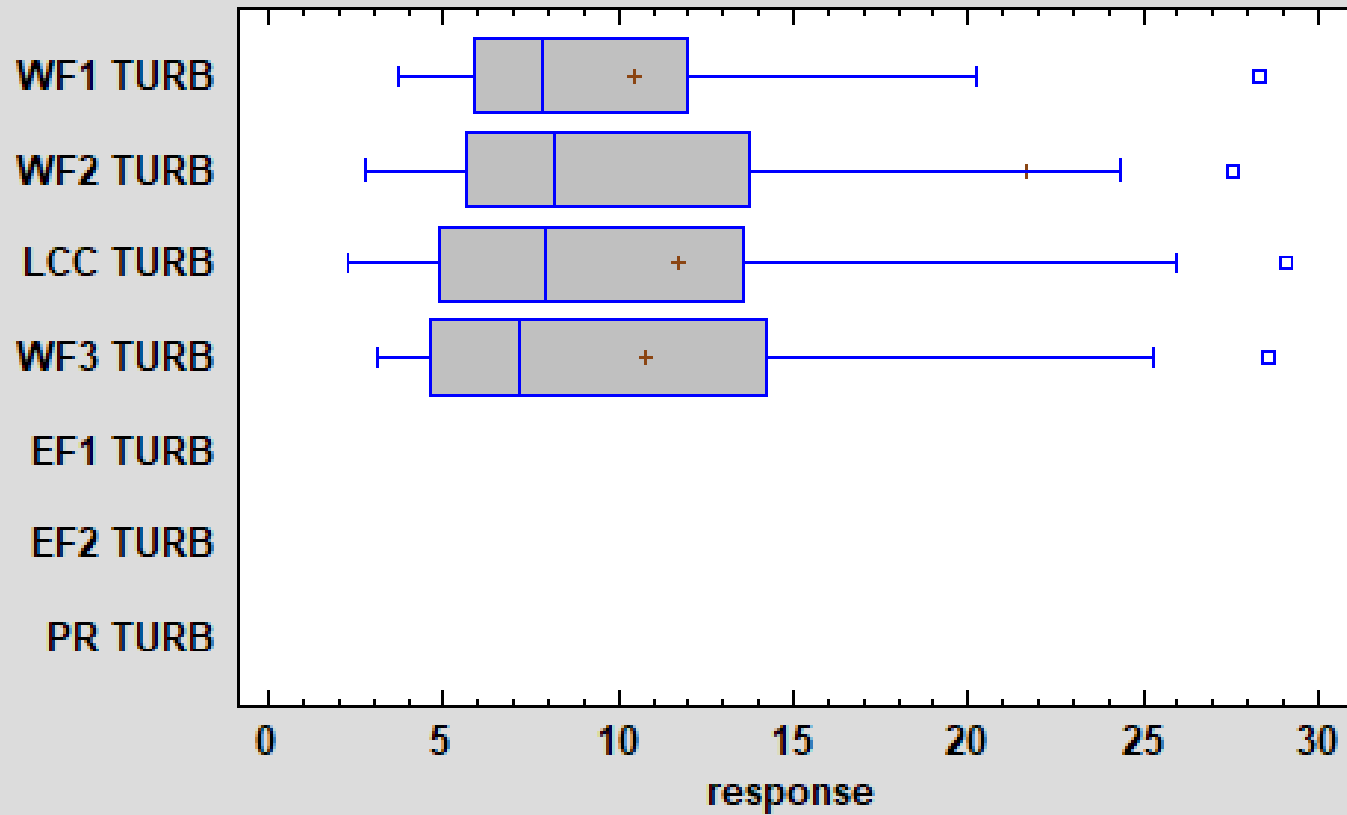
### Lake Conway Point Removed Total Nitrogen



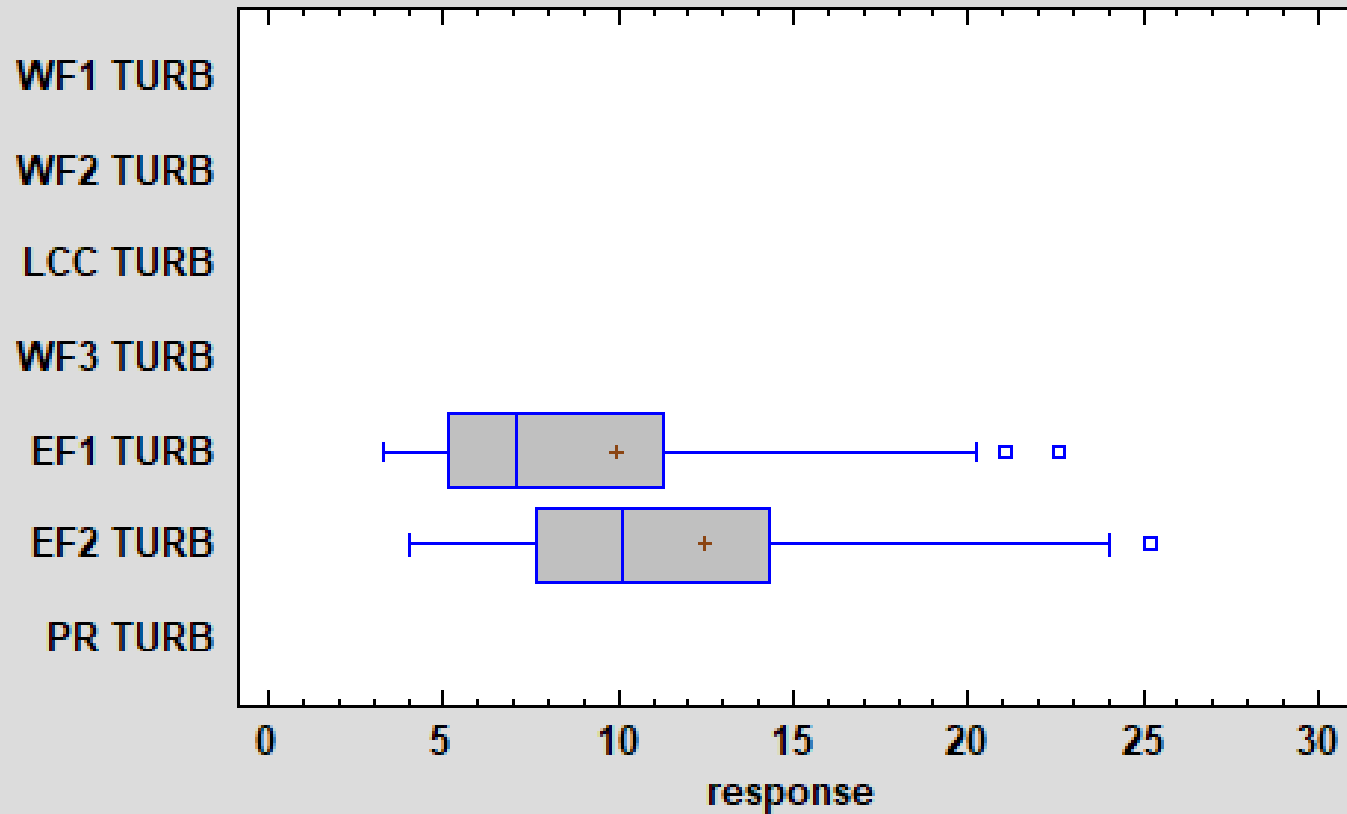
### Lake Conway Point Removed Total Nitrogen



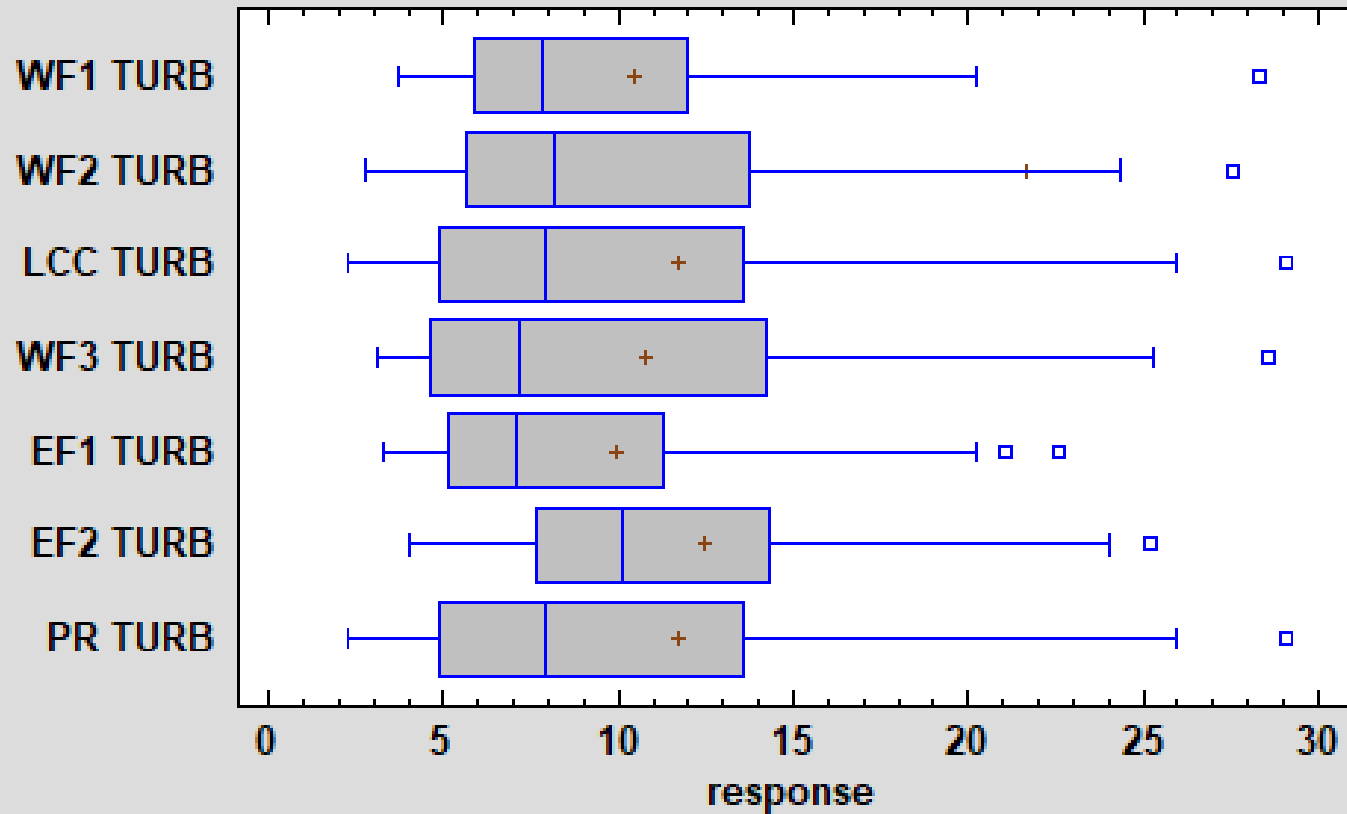
### Lake Conway Point Removed Turbidity



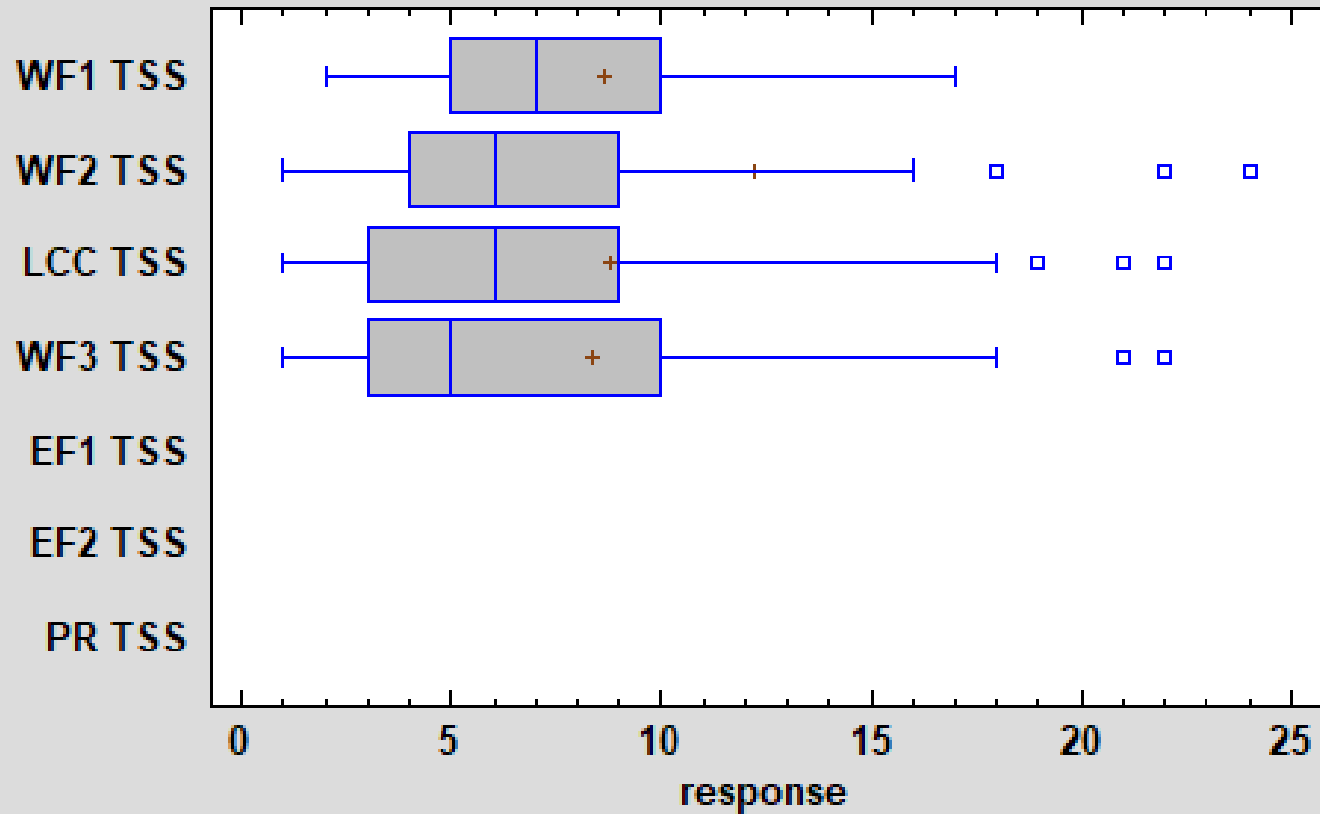
# Lake Conway Point Removed Turbidity



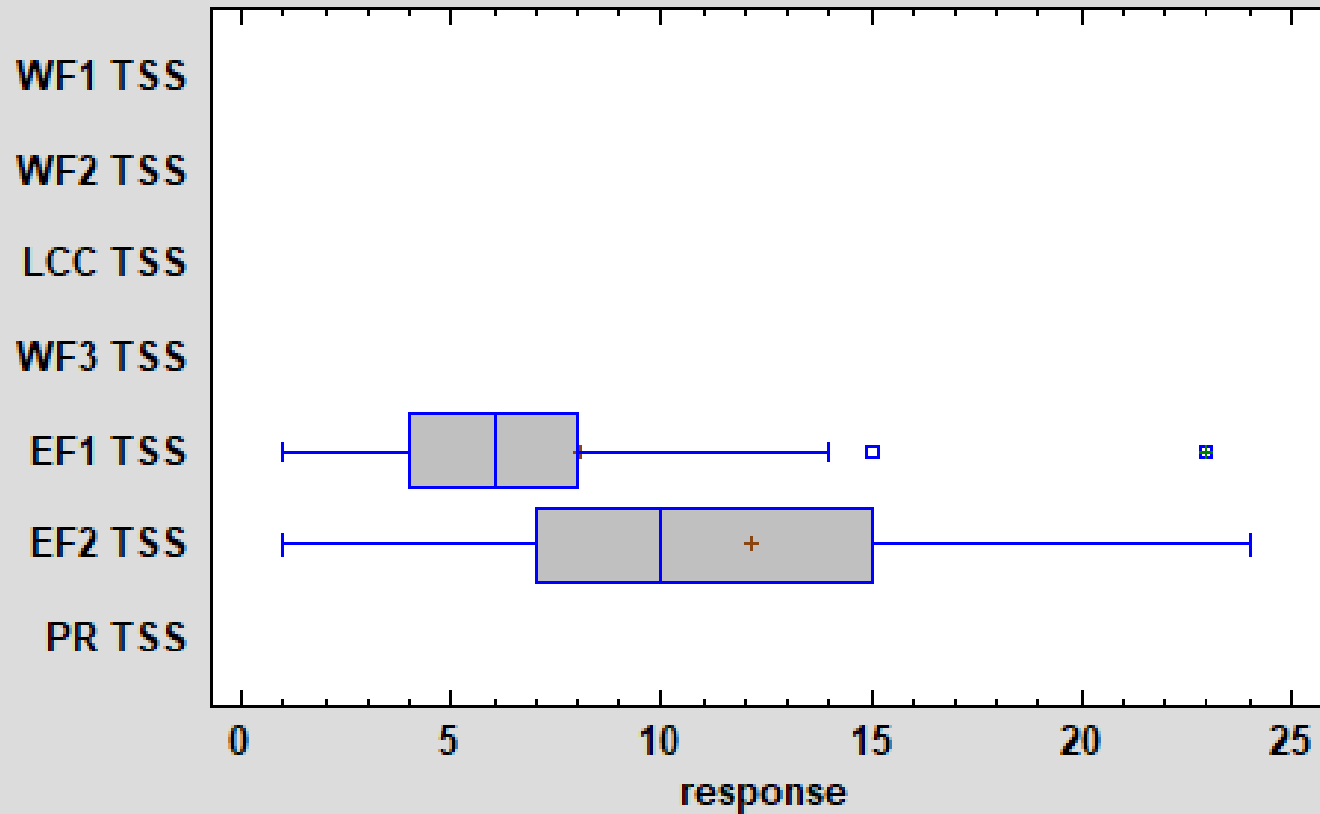
### Lake Conway Point Removed Turbidity



### Lake Conway Point Removed TSS

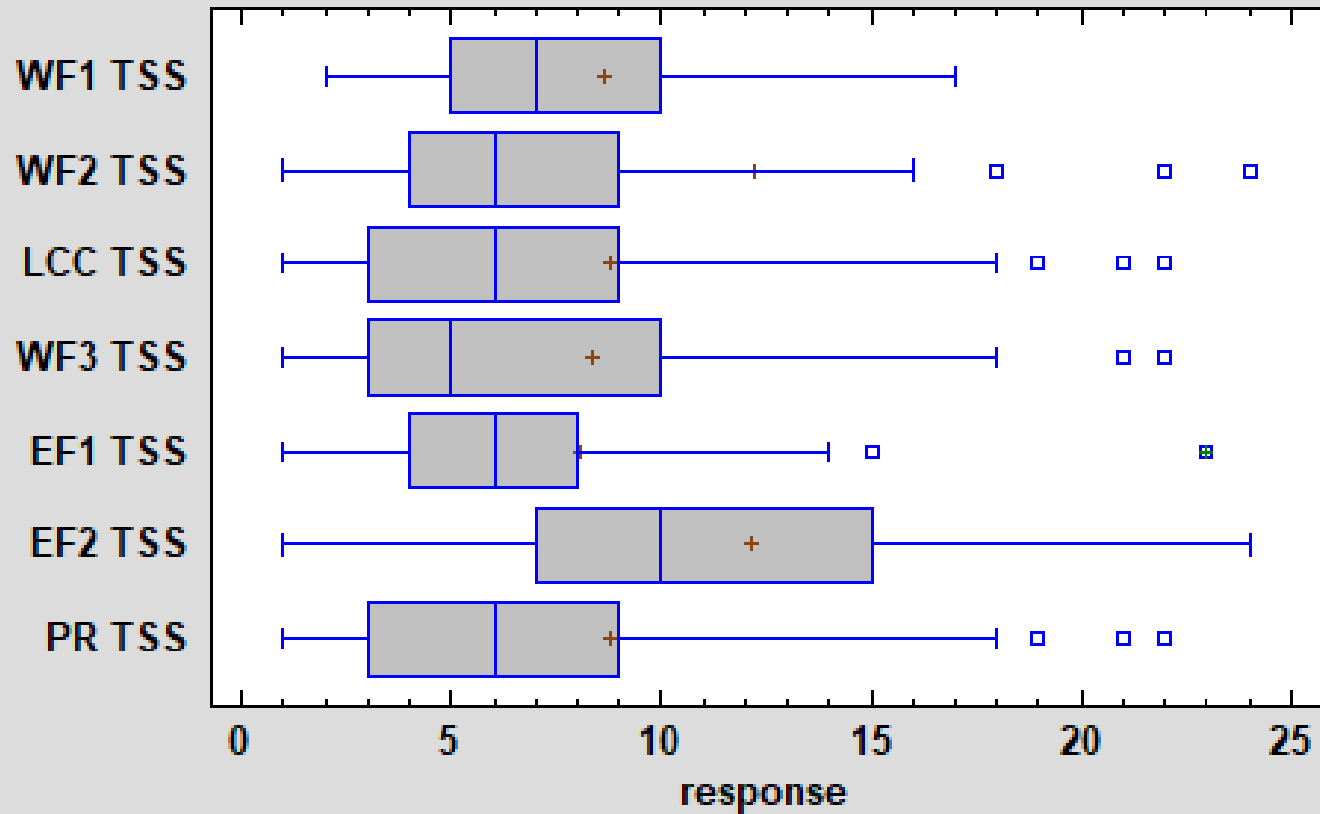


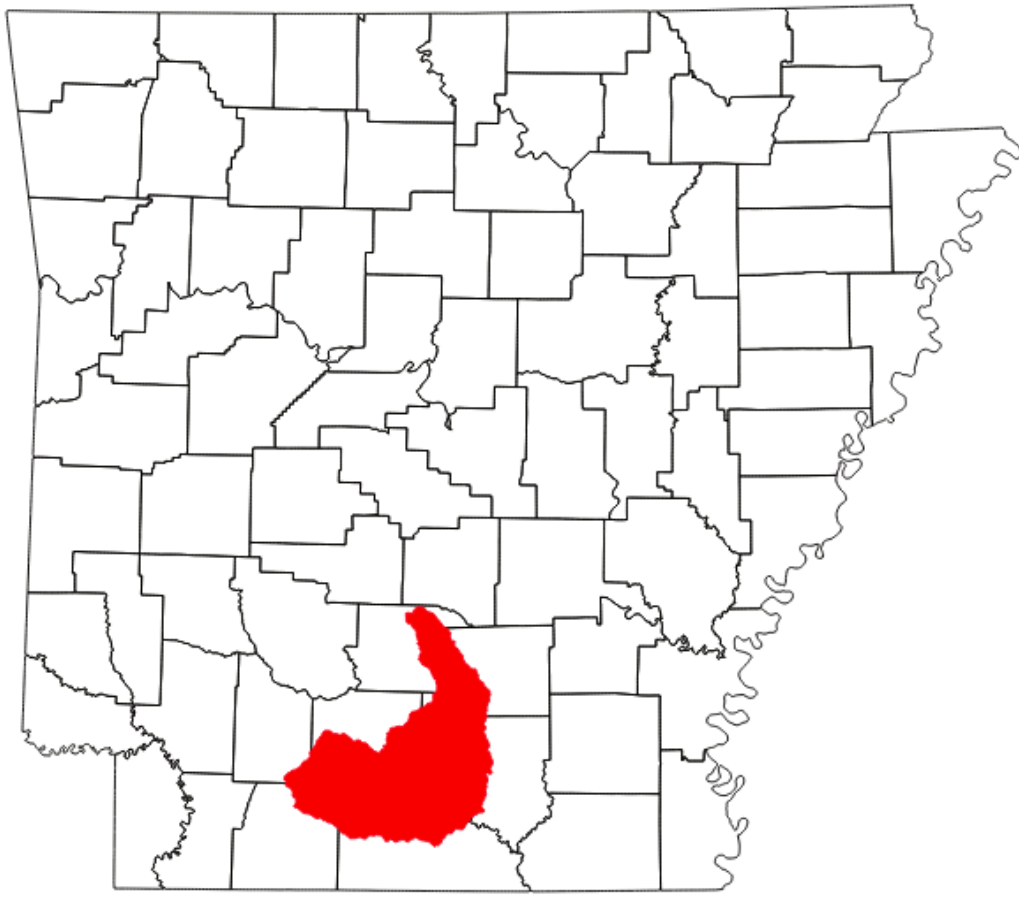
### Lake Conway Point Removed TSS





### Lake Conway Point Removed TSS

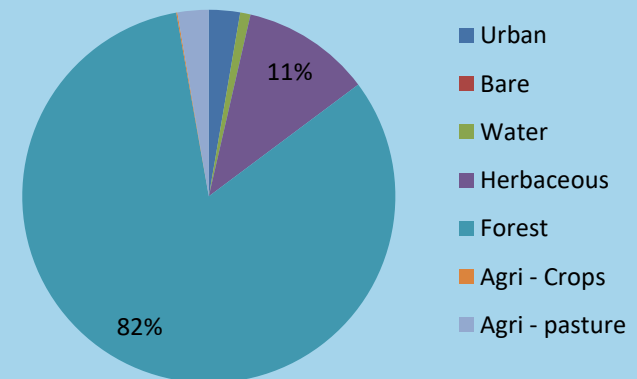




# Lower Ouachita – Smackover Watershed

Focused on the “outfalls” of 12 digit HUC

Lower Ouachita – Smackover HUC



- Portions of the Lower Ouachita –Smackover HUC have been included on the Arkansas 303(d) list for not supporting aquatic life and drinking water designated uses and has been on each subsequent 303(d) list.
- ANRC has designated the watershed as a priority watershed.



# Lower Ouachita - Smackover

Bryant Creek

Guice Creek

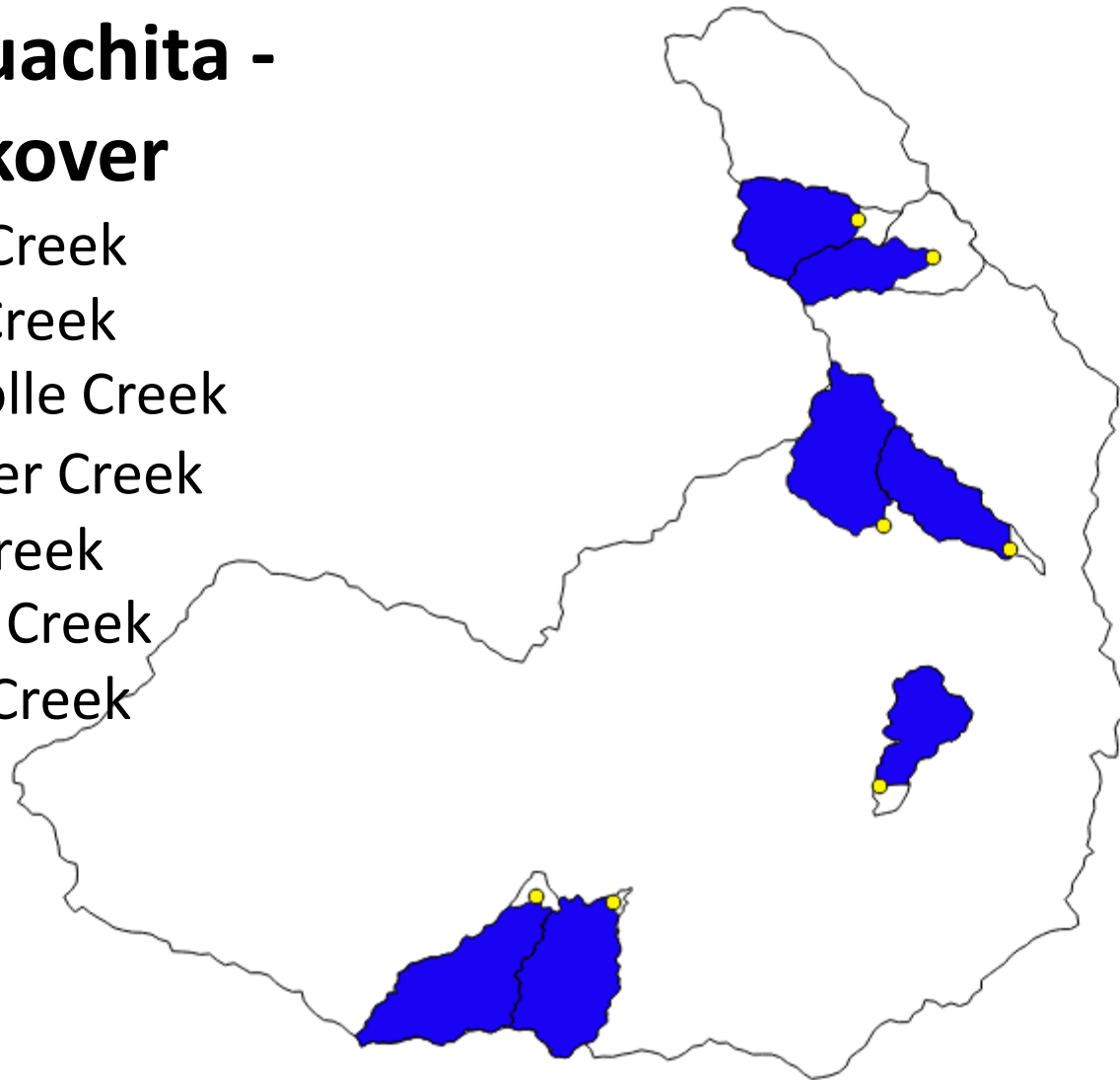
Champagnolle Creek

Whitewater Creek

Loyd Creek

Holmes Creek

Sandy Creek



# Lower Ouachita - Smackover

Bryant Creek

Guice Creek

Champagnolle Creek

Whitewater Creek

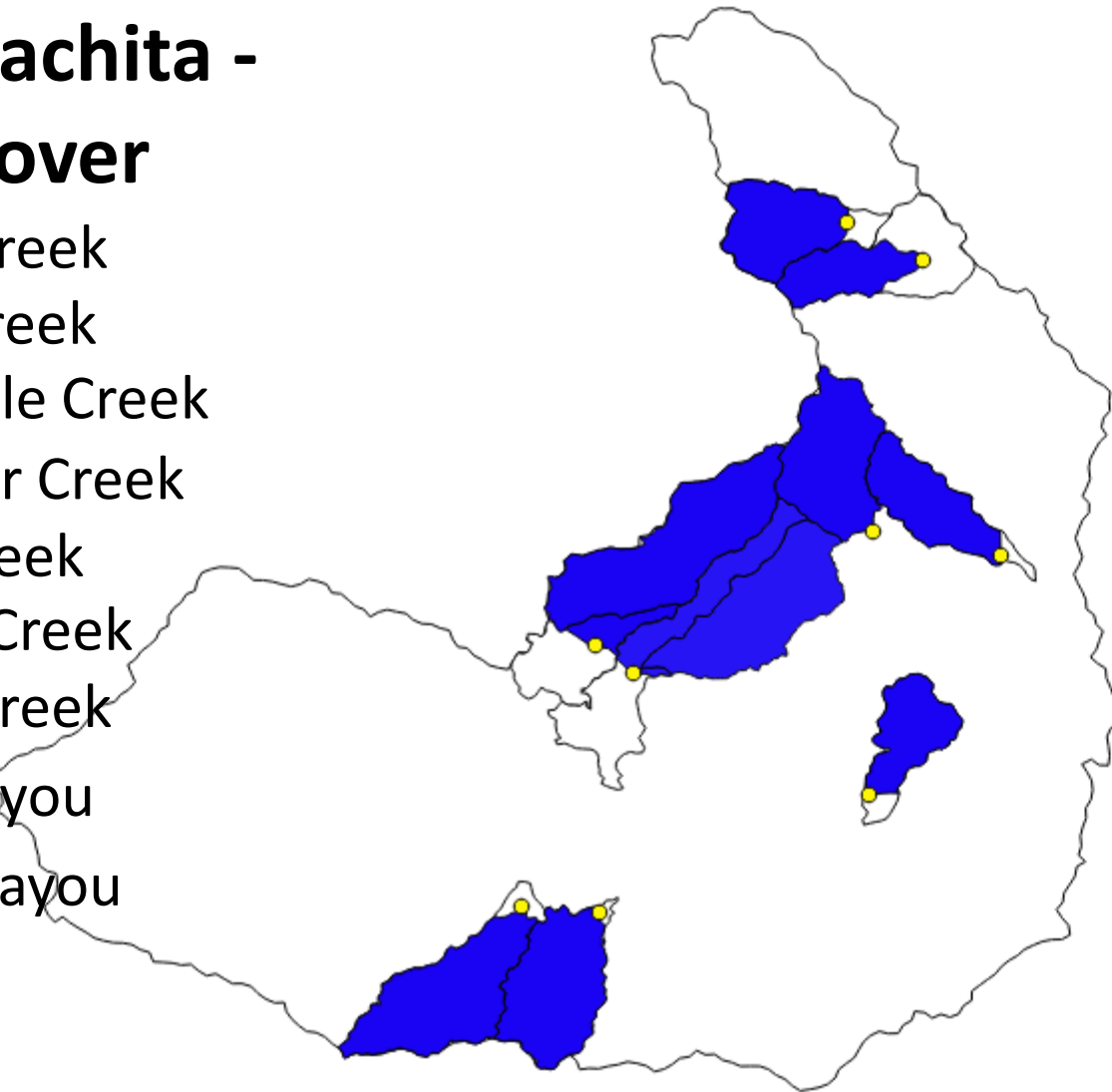
Loyd Creek

Holmes Creek

Sandy Creek

Two Bayou

Locust Bayou



# Lower Ouachita - Smackover

Bryant Creek

Guice Creek

Champagnolle Creek

Whitewater Creek

Loyd Creek

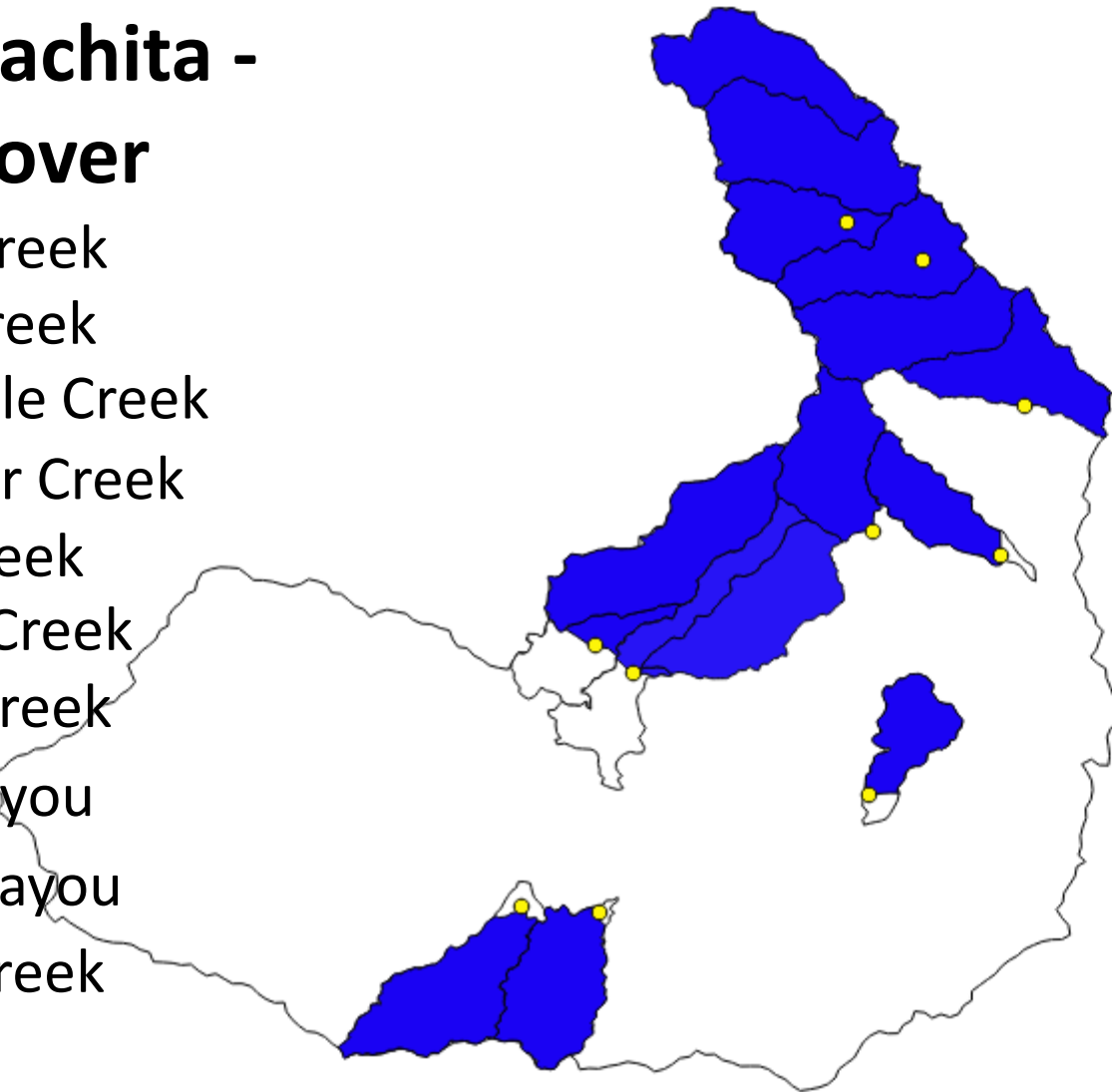
Holmes Creek

Sandy Creek

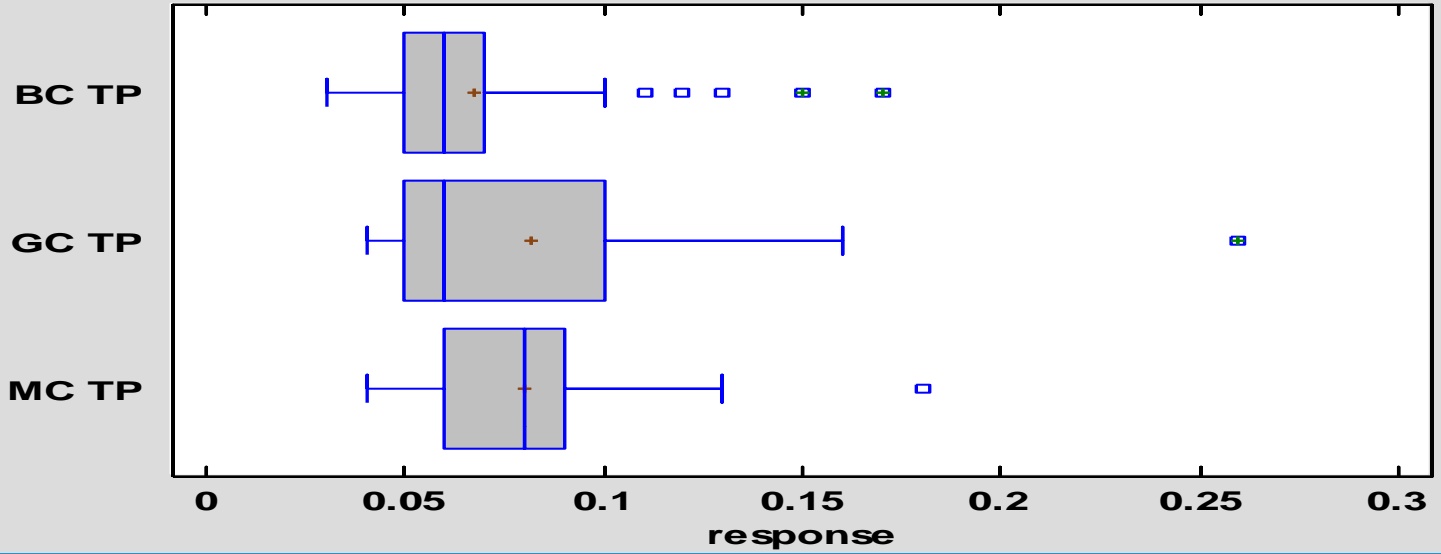
Two Bayou

Locust Bayou

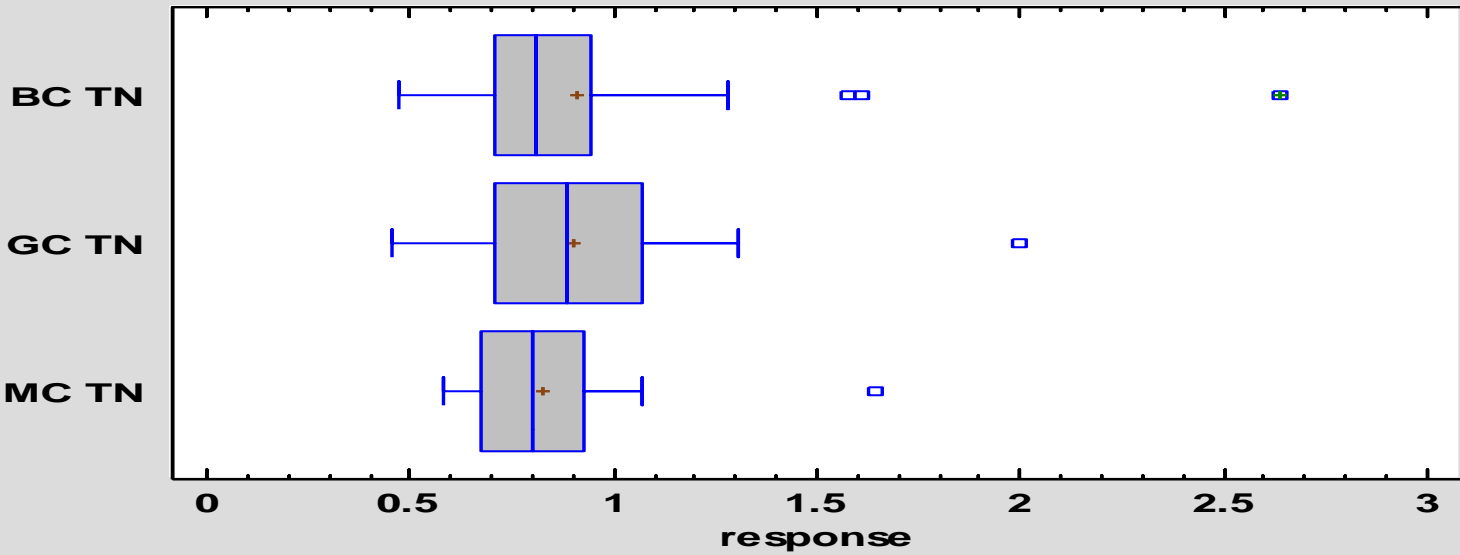
Moro Creek



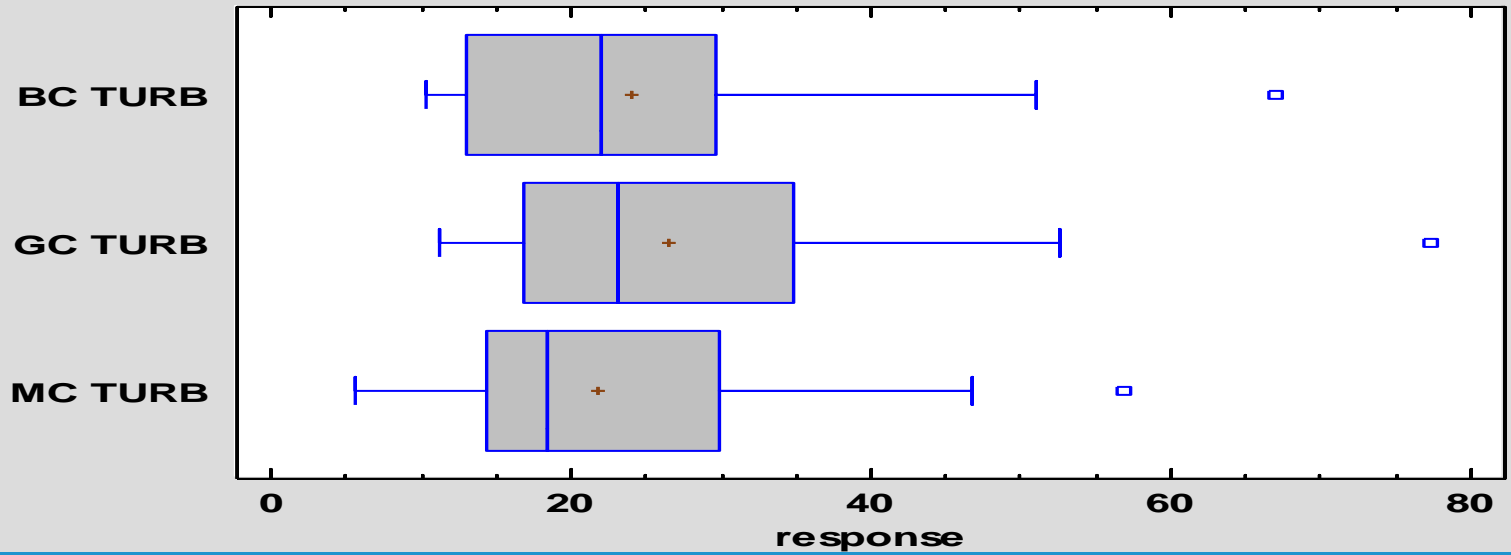
Lower Ouachita - Smackover Total Phosphorus



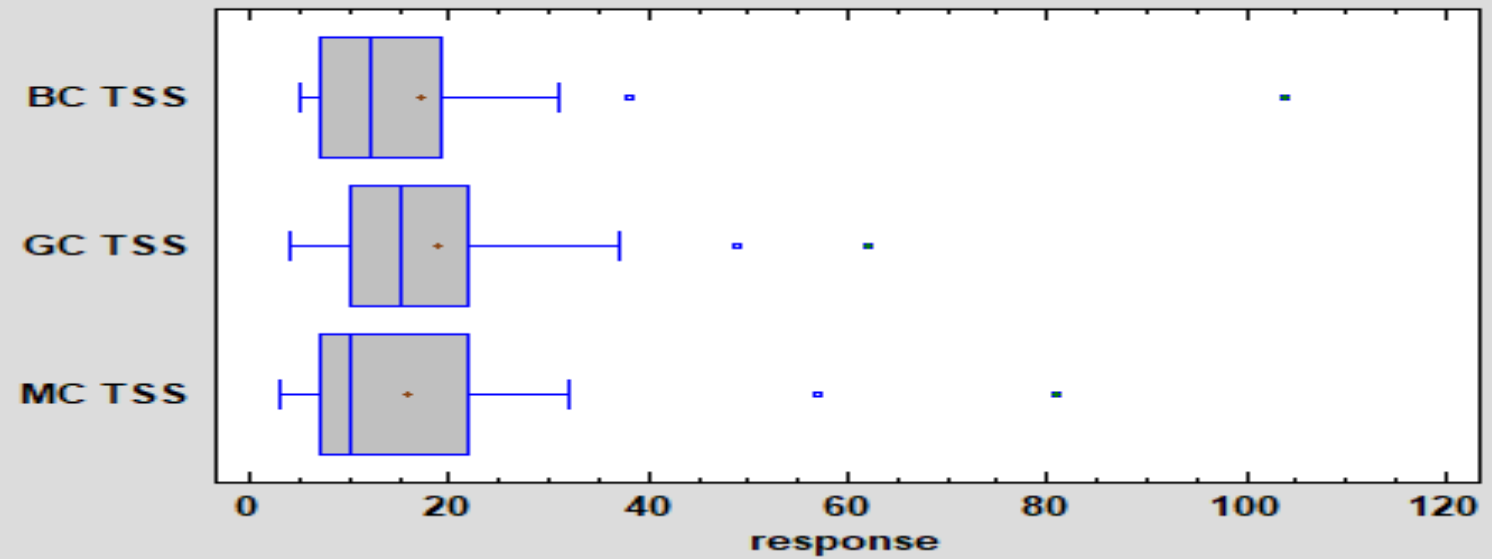
Lower Ouachita - Smackover Total Nitrogen



Lower Ouachita - Smackover Turbidity



Lower Ouachita - Smackover TSS

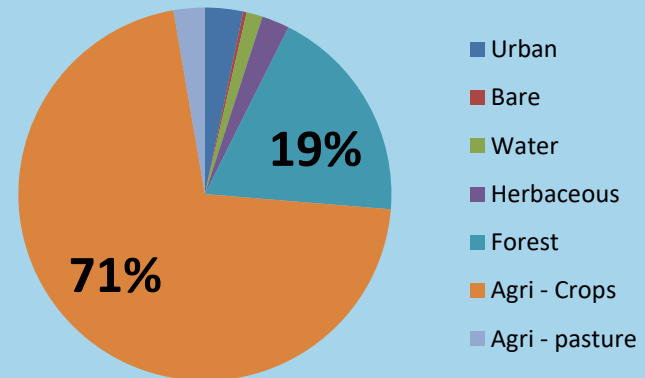


# L'Anguille River Watershed

Focused on the “outfalls” of  
12 digit HUC



L'Anguille Watershed



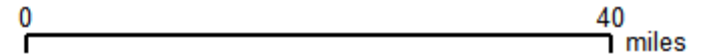
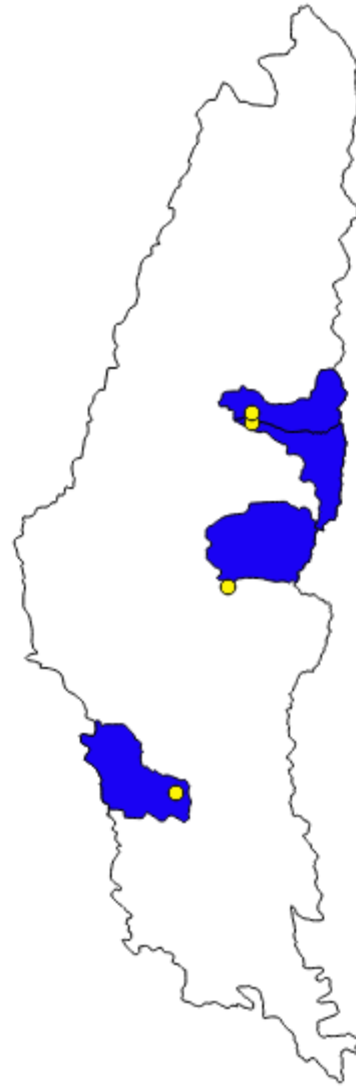
- The L'Anguille River was included on the Arkansas 1998 303(d) list for not supporting aquatic life due to siltation/turbidity and has been on each subsequent 303(d) list.
- ANRC has designated the watershed as a priority watershed.
- NRCS also identified the L'Anguille River as a priority in the Mississippi River Basin Healthy Watershed Initiative.





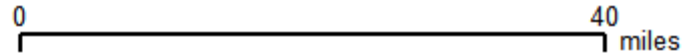
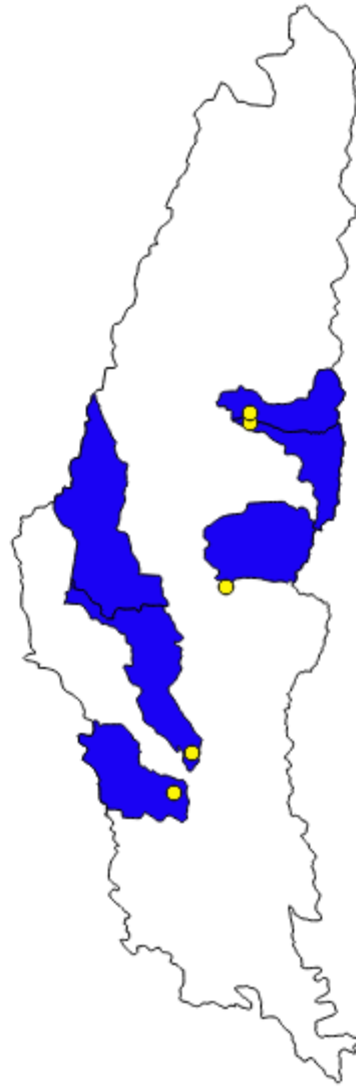
# L'Anguille River

Copper Creek  
Prairie Creek  
Indian Creek  
Cypress Creek



# L'Anguille River

Copper Creek  
Prairie Creek  
Indian Creek  
Cypress Creek  
First Creek



# L'Anguille River

Copper Creek

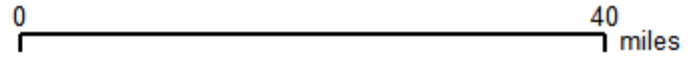
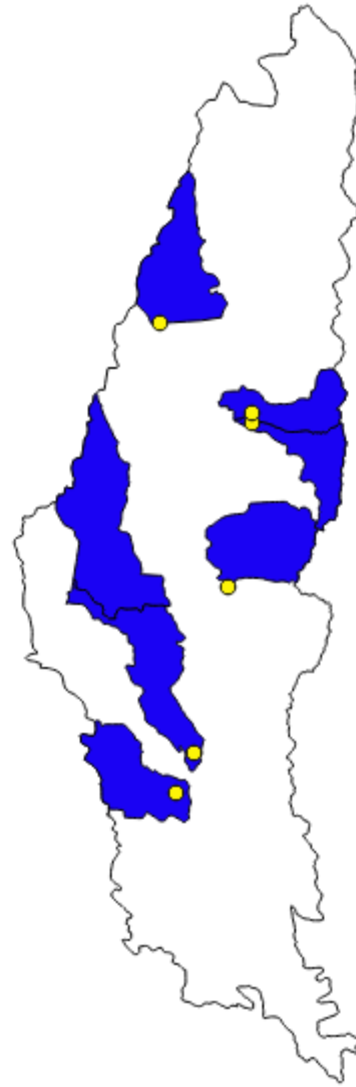
Prairie Creek

Indian Creek

Cypress Creek

First Creek

Upper Brushy Creek



# L'Anguille River

Copper Creek

Prairie Creek

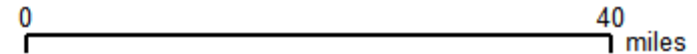
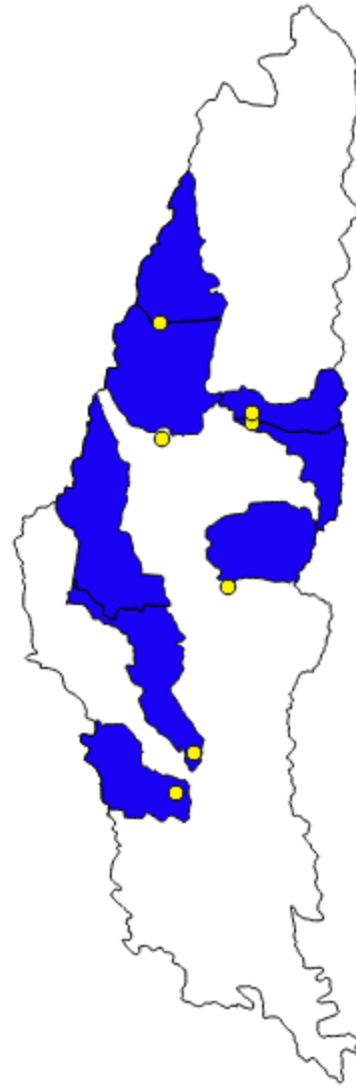
Indian Creek

Cypress Creek

First Creek

Upper Brushy Creek

Middle Brushy Creek



# L'Anguille River

Copper Creek

Prairie Creek

Indian Creek

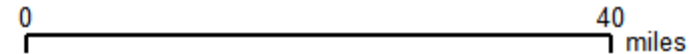
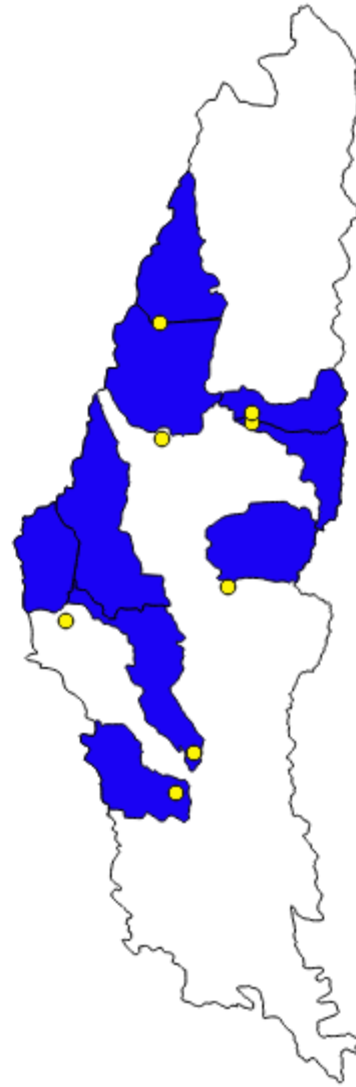
Cypress Creek

First Creek

Upper Brushy Creek

Middle Brushy Creek

Upper Second Creek



# L'Anguille River

Copper Creek

Prairie Creek

Indian Creek

Cypress Creek

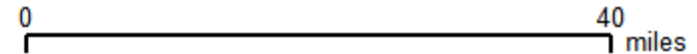
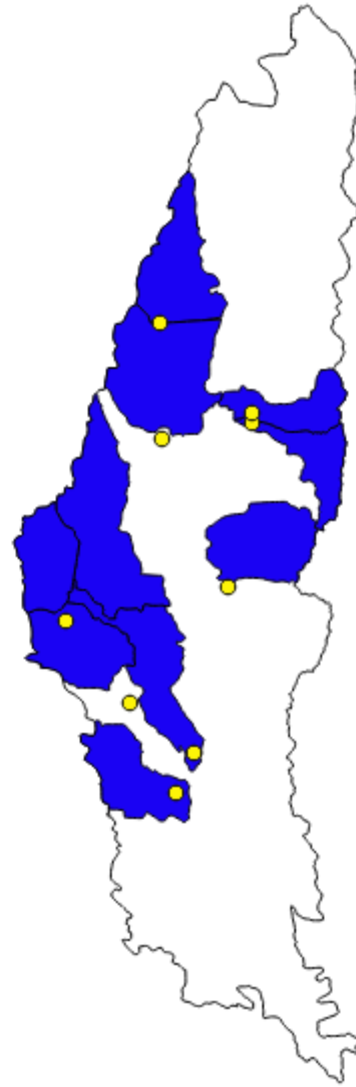
First Creek

Upper Brushy Creek

Middle Brushy Creek

Upper Second Creek

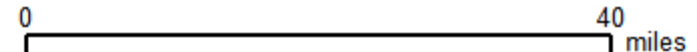
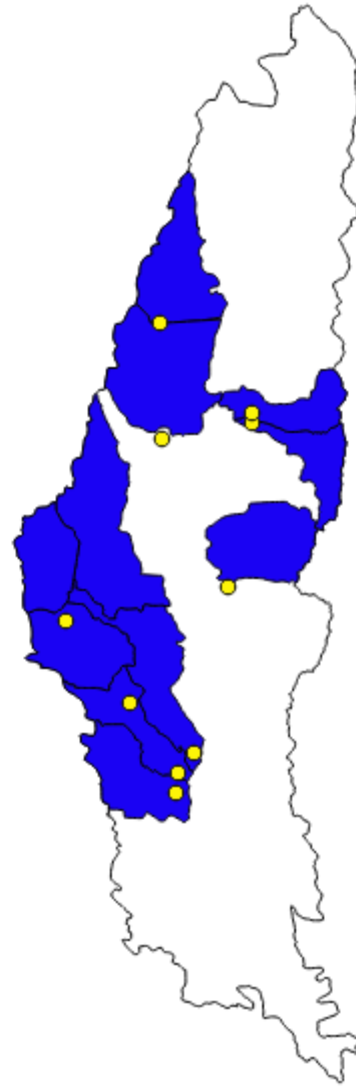
Middle Second Creek



# L'Anguille River

Copper Creek  
Prairie Creek  
Indian Creek  
Cypress Creek  
First Creek

Upper Brushy Creek  
Middle Brushy Creek  
Upper Second Creek  
Middle Second Creek  
Lower Second Creek

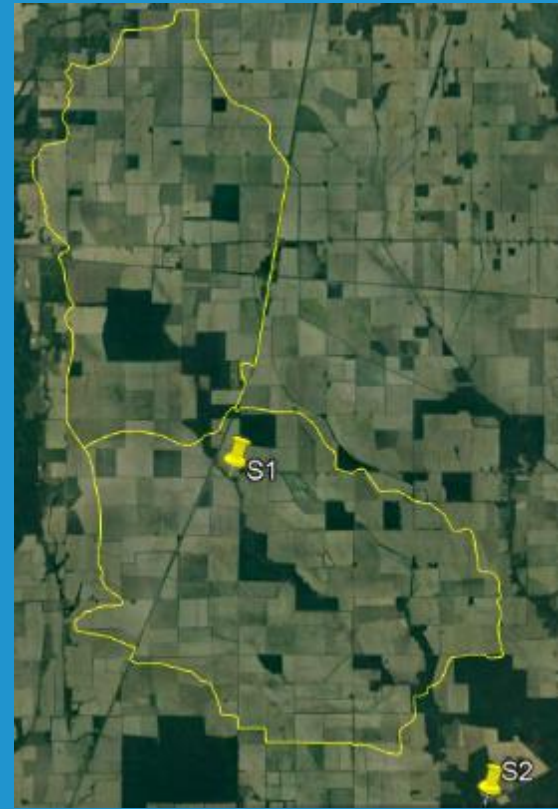


Upper  
Brushy  
Creek



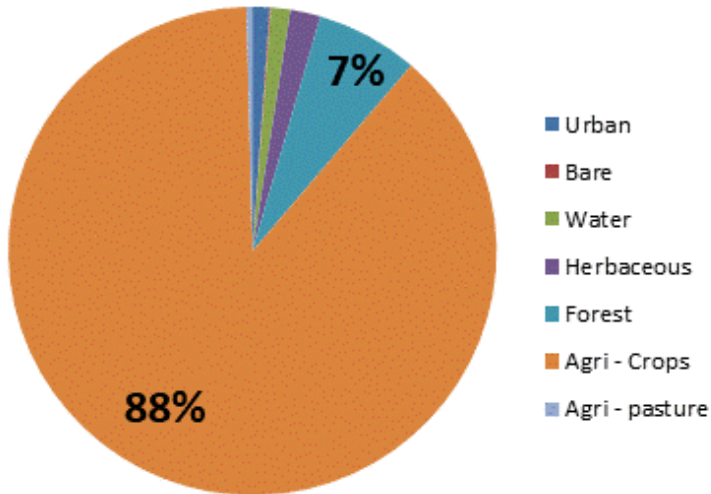
Middle  
Brushy  
Creek

Upper  
Second  
Creek

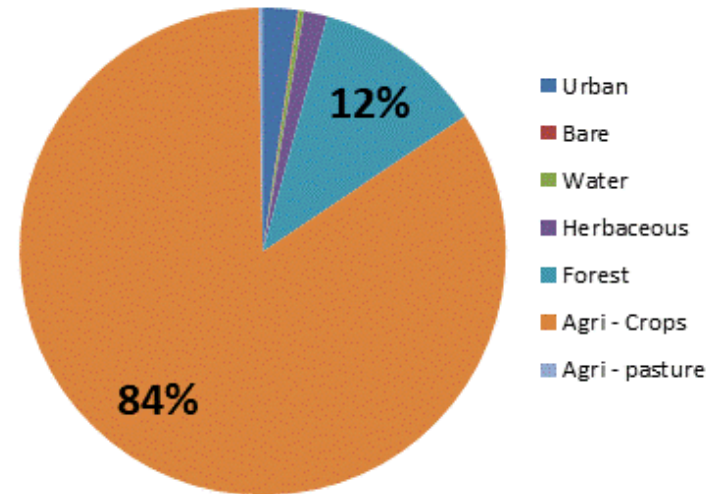


Middle  
Second  
Creek

Upper and Middle Brushy Creek Watersheds

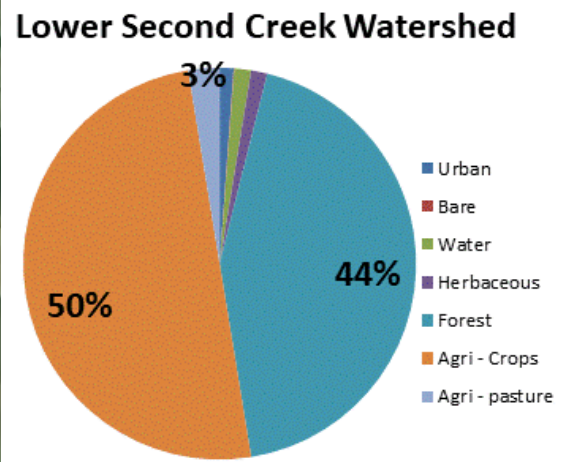


Upper and Middle Second Creek Watersheds





# Lower Second Creek

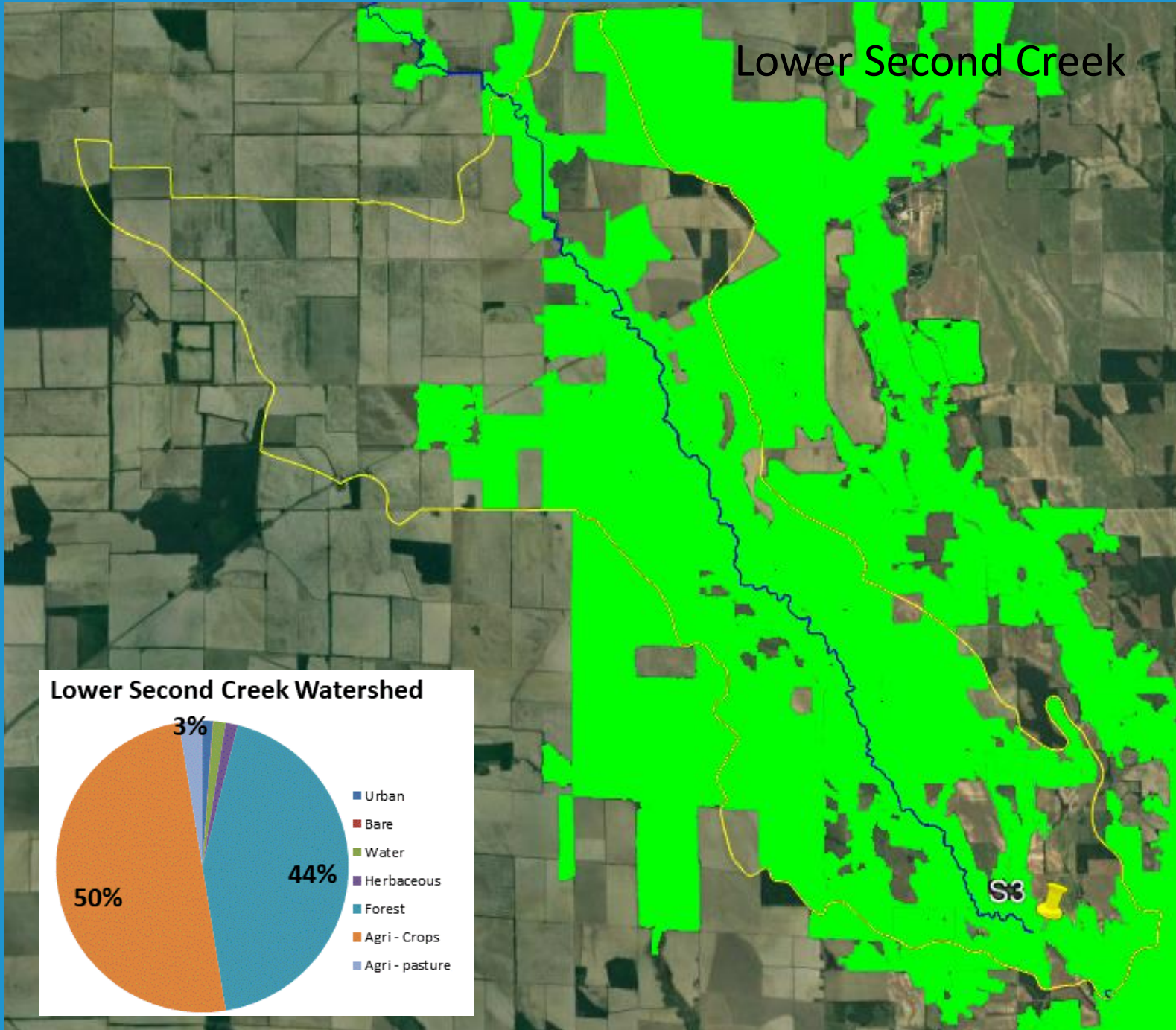
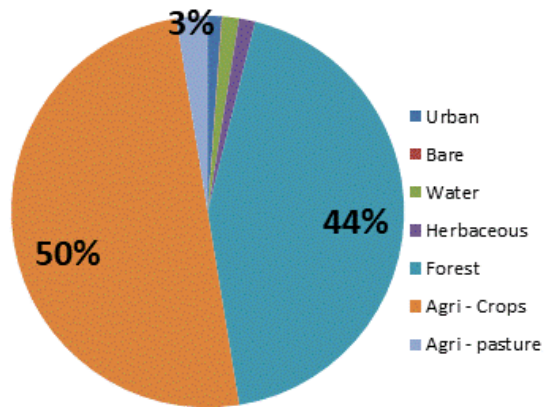


S3

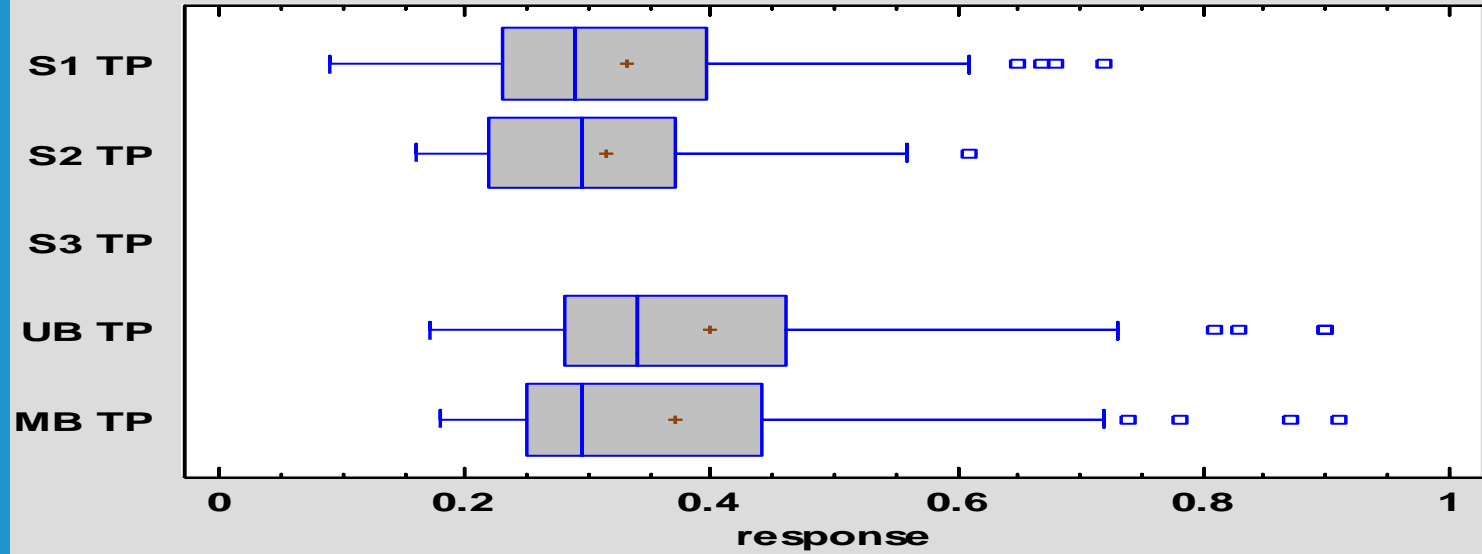


# Lower Second Creek

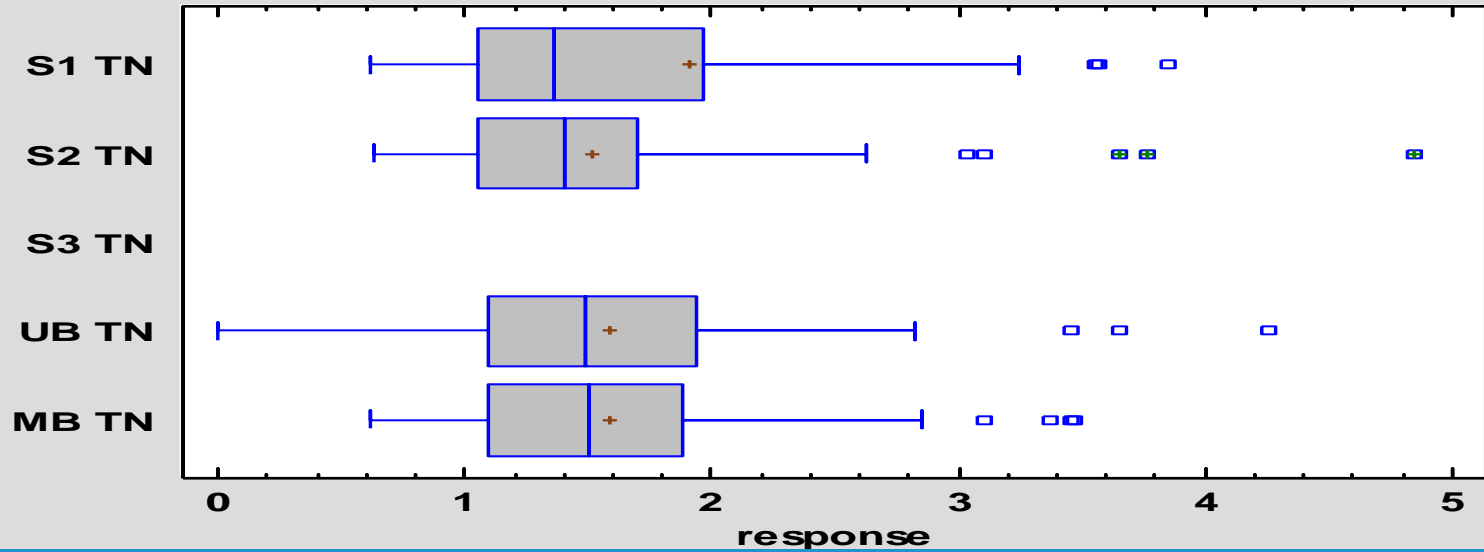
## Lower Second Creek Watershed



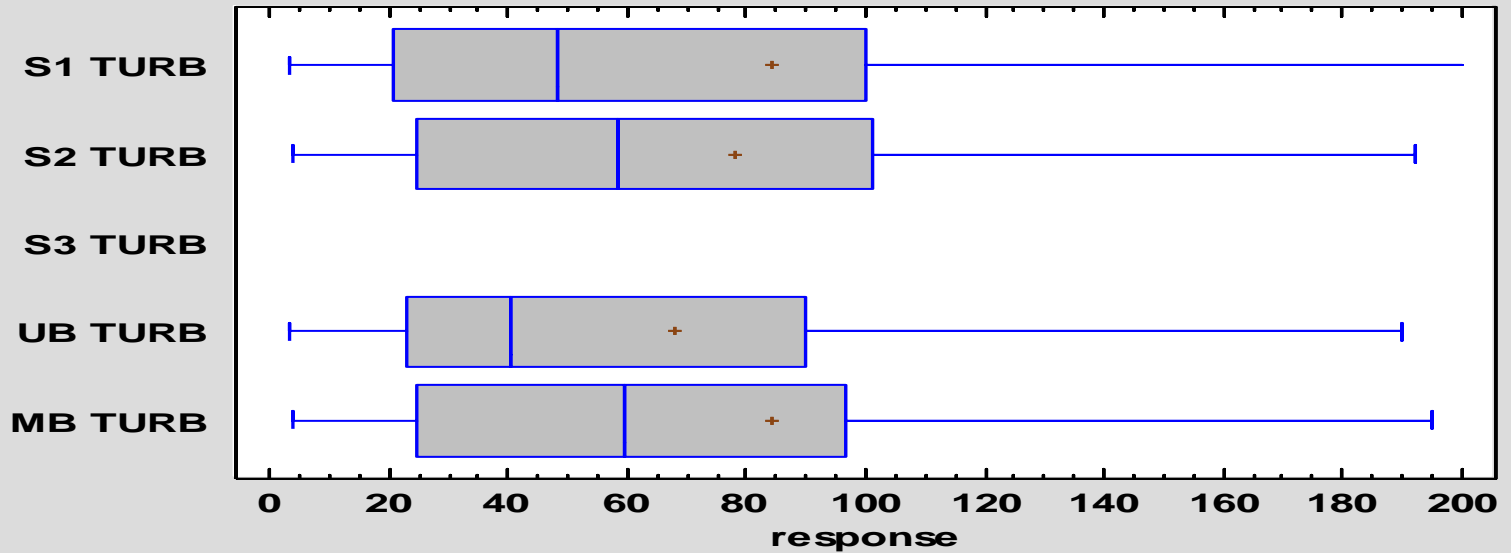
### L'Anguille Watershed Total Phosphorus



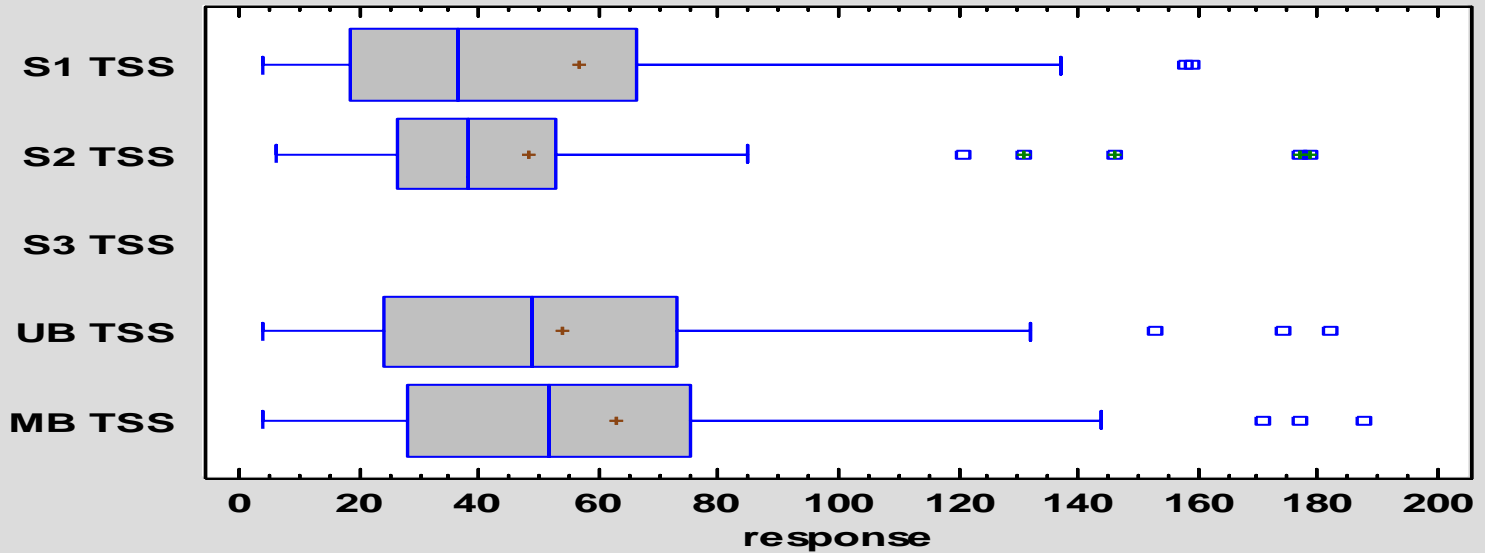
### L'Anguille Watershed Total Nitrogen



### L'Anguille Watershed Turbidity



### L'Anguille Watershed TSS





# Thank You



[www.equilibrium-ar.org](http://www.equilibrium-ar.org)