



# Monitoring for Success of Mississippi's Delta Nutrient Reduction Strategies

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## Nutrient Reduction Strategies

- Cooperative Effort
  - Began with Delta
  - Strategic Planning
  - Outlined
    - Water and land practices to conserve and reduce nutrient inputs to receiving waters
  - Monitoring Key Component



# Monitoring Strategy

- Key Element – Site Selection

- Tiered Approach

- Edge of field – Tier 1
    - In-stream, small integrator – Tier 2
    - Downstream integrator – Tier 3



# Leverage Funding

- Existing Funding Sources

- Co-op Program - USGS
  - MDEQ
    - 319 Program
    - Others
  - Direct Federal Funding
    - USACE
    - USDA/ARS
    - EPA – Region 4, Gulf of Mexico Program
  - MRBI and GOMI – USDA
  - MSWCC, Delta FARM, TNC, YMD, others



# Implementation

## ■ Mississippi Delta

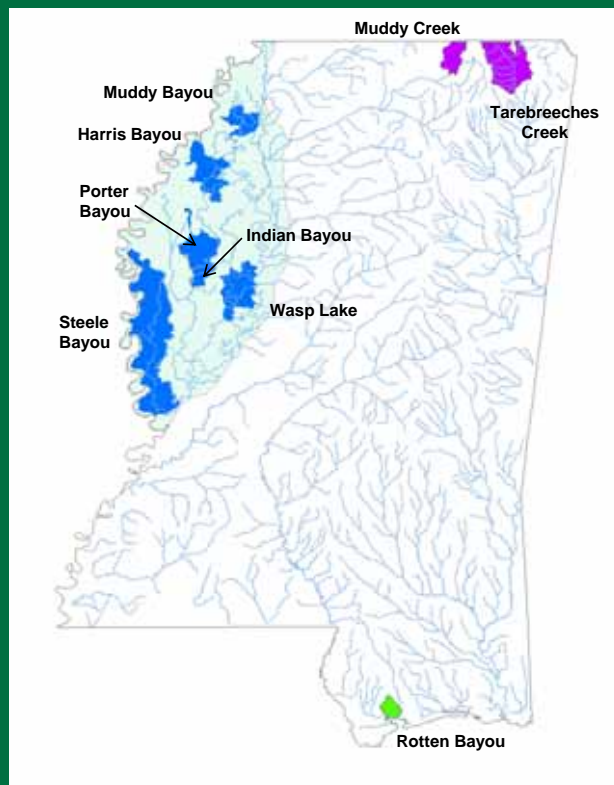
- Muddy Bayou
- Harris Bayou
- Porter Bayou
- Indian Bayou
- Wasp Lake
- Steele Bayou

## ■ Uplands

- Muddy Creek
- Tarebreeches Creek

## ■ Coastal

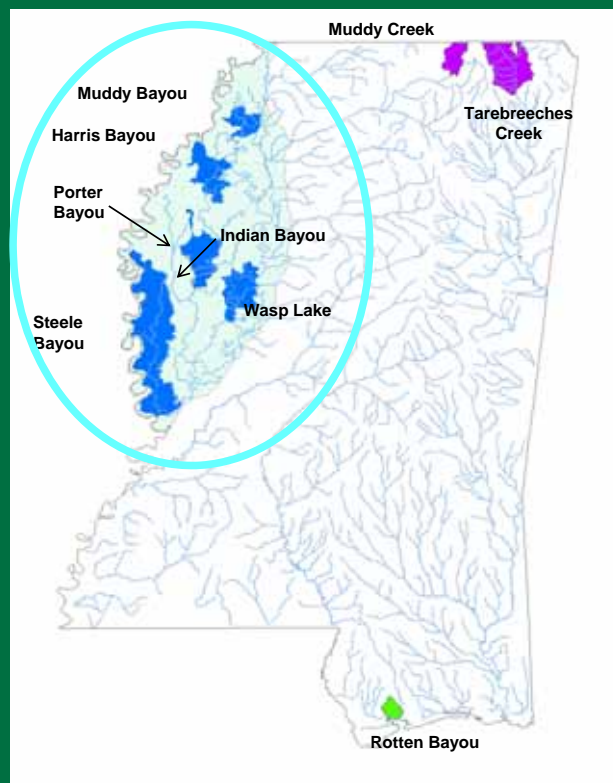
- Rotten Bayou



# Implementation

## ■ Mississippi Delta

- **Muddy Bayou**
  - ARS, Cow Oak Bayou, tier 2
- **Indian Bayou**
  - ARS, Beasley Lake, tier 1
- **Wasp Lake**
  - USGS, Bee Lake, tier 1
  - MSU, Tchula Lake, tier 1
  - MSU, Wolf Lake, tier 1
- **Steele Bayou**
  - USGS, tier 2 and 3 (poster in this conference, please visit!)
  - Lake Washington, tier 1
- **Harris Bayou**
  - ARS, Howden Lake Bayou and Roundaway Lake Bayou, tier 2
  - MSU, Harris Bayou, tier 1
  - USGS, Harris Bayou, tier 2 and 3
- **Porter Bayou**
  - MSU, tier 1 monitoring
  - USGS, Harris Bayou, tier 2 and 3



# Harris and Porters Bayous

- Harris Bayou/Porter Bayou
  - Spatial Scales
    - Both relatively small in size
- Site Locations
  - Paired watershed approach
    - Harris
  - Before-after
    - Porters
- What is being monitored
  - Nutrients, sediment, flow, physicochemical, biological



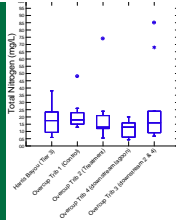
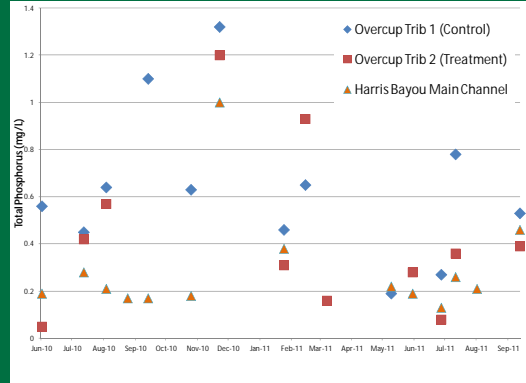
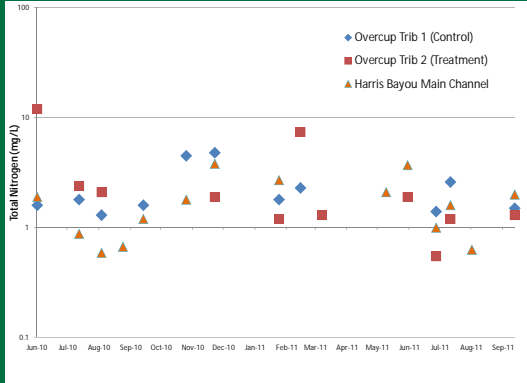
# Harris Bayou Watershed

- USGS and MSU
  - Overcup Slough
    - Tier 1 – 7 sites, MSU
    - Tier 2 – 4 sites, USGS
  - Upper Harris Bayou
    - Tier 3 – 1 site, USGS

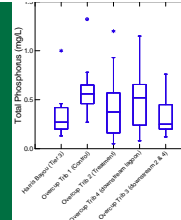


# USGS Monitoring Status – Harris Bayou

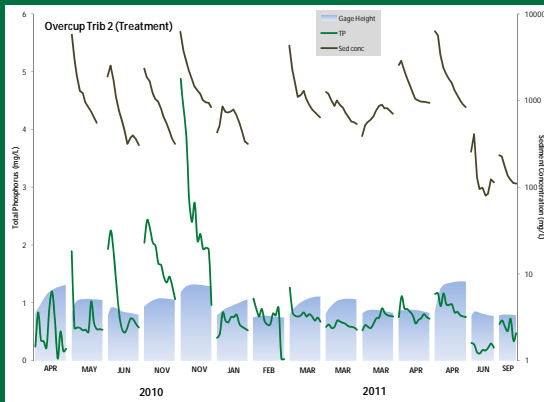
- In cooperation with Mississippi Department of Environmental Quality
- Tier 2 and 3 monitoring – includes control site
- Routine and high-flow samples
- Pre-BMP monitoring completed, Post-BMP monitoring has begun



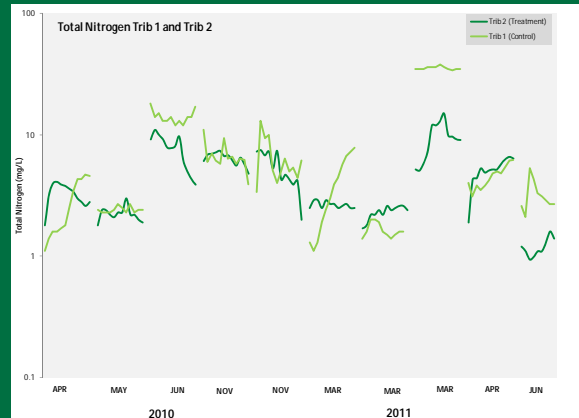
## Routine Monitoring



# USGS Monitoring Status – Harris Bayou



## High-flow Monitoring



# Porters Bayou Watershed

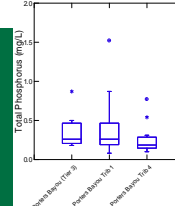
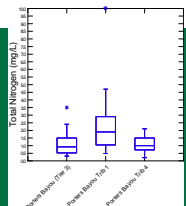
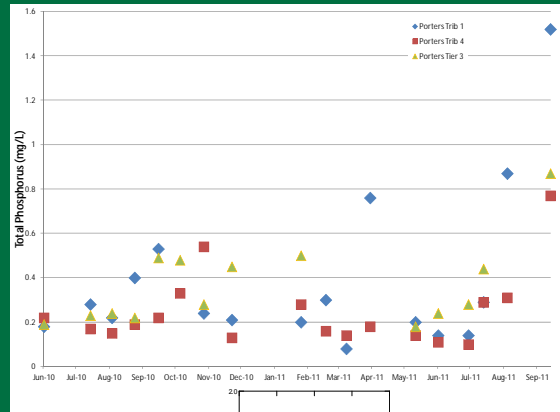
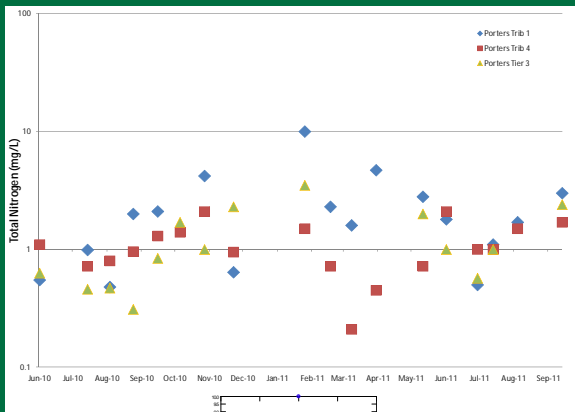
## USGS and MSU

- Porters Bayou
  - Tier 1 – 7 sites, MSU
  - Tier 2 – 2 sites, USGS
  - Tier 3 – 1 site, USGS



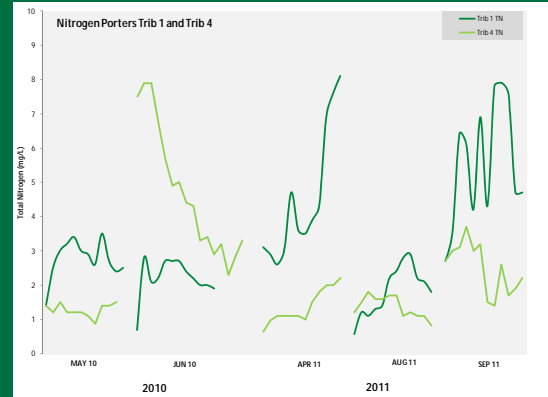
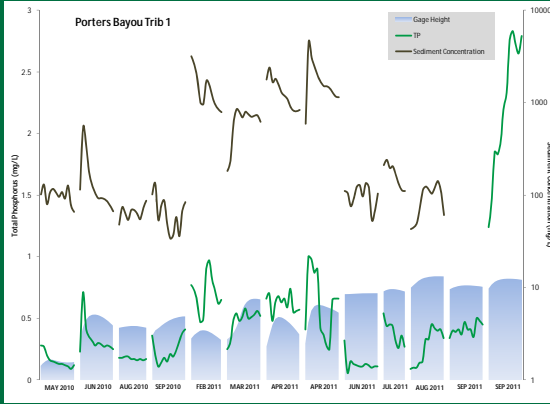
## USGS Monitoring Status – Porters Bayou

- In cooperation with Mississippi Department of Environmental Quality
- Tier 2 monitoring
- Routine and high-flow samples; diel monitoring
- BMPs are in the process of being installed



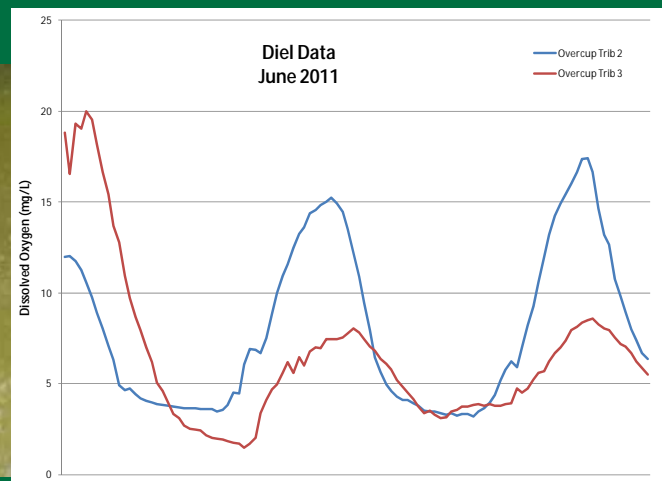
**Routine Monitoring**

# USGS Monitoring Status – Porters Bayou



## Additional Monitoring in Porters and Harris Bayous

- 72 hour – diel in-situ monitoring



# Additional Monitoring in Porters and Harris Bayous

## ■ Biological Monitoring



# Delta Nutrient Reduction Strategy Monitoring

## ■ Summary

- Developing large database (Tier 1 and 2)
- Foundation built on Partnerships and Cooperation
  - Federal, State and local land owners
- Solid “pre” database at multiple scales
- Data collected thus far suggest reductions are very possible
  - Monitoring design should be able to detect nutrient reductions in local watersheds over time
  - However, the length of time may be long
- Continued funding and long term monitoring, at all scales, will be critical for detecting change





**Questions?**