

## What is SERA-46?

The Mississippi and Atchafalaya rivers contribute freshwater to the Gulf of Mexico, in addition to excess nitrogen (N) and phosphorus (P) from the landscape, ultimately contributing to hypoxia in the Gulf. The Gulf hypoxic zone, commonly known as the “dead zone,” is the second largest in the world.

Efforts to reduce nutrients entering the Gulf are coordinated through the Gulf of Mexico Hypoxia Task Force (HTF), a formal partnership of representatives from five federal agencies, the National Tribal Water Council, and environmental quality, agricultural, and conservation agencies from twelve of the Basin states. SERA-46 works alongside the HTF to utilize the research and extension capacities of the land grant universities (LGUs) in the 12 Mississippi River mainstem states.

### Purpose

The purpose of SERA-46 is to promote the implementation of science-based approaches to nutrient management and conservation practices. Project members work with farmers, farm advisors, watershed practitioners, and other landscape managers to increase adoption of conservation practices and apply knowledge gained through applied research.

### Goals

Key elements of the project include strengthening relationships among LGUs, HTF members, and other partners; communications and outreach activities such as publications and digital media; and strengthening the knowledge base for discovery of new tools and practices in support of nutrient reduction strategies.



## Join our Research Network

### Join the SERA-46 Researcher Database

Become a **SERA-46 Research Affiliate** in our database of researchers in the 12 Mississippi River mainstem states.



### Contribute to a Literature Review



Contribute to literature reviews on the current state of the research on the seven research priority areas identified by the GHP Research Needs Task Force.

### Get in Touch

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USDA NIFA  
Multistate Project

# SERA-46

Framework for Nutrient Reduction  
Strategy Collaboration:  
The Role for Land Grant Universities

## Mississippi-Atchafalaya River Basin (MARB)



### The Role of Land Grant Universities

LGUs are uniquely positioned to assist each state within the basin and the HTF in developing and implementing state-level nutrient reduction strategies.

The LGUs conduct research ranging from basic discovery to on-the-ground applications of the science of soil conservation, nutrient movement, water quality, and human behavior.

Extension specialists and educators put the science into practice by educating farmers and agribusinesses, conducting on-farm research, and understanding farm-level economics and farmer decision making.

LGUs in each state have expertise in the local soils, climates, people, and solutions, and are a highly trusted source of objective research-based information helpful to all entities actively exploring solutions to nutrient pollution. In addition, faculty at LGUs regularly collaborate on multi-state research and extension education projects that address state and regional nutrient reduction needs.

## Building a Research Agenda for SERA-46



A recent cooperative agreement between SERA-46 and the US EPA seeks to create a network of faculty and extension personnel that coordinate, communicate, and execute research and outreach activities advancing the Gulf Hypoxia Action Plan and goals of the EPA Gulf Hypoxia Program (GHP).

### Advancing Research to Support Nutrient Reduction Strategies

Strategic Outcome 3 of the Cooperative Agreement aims to engage researchers from LGUs within HTF states to address research needs that support nutrient reduction strategies.

To start, activities that will support research agenda development to improve water quality will include:

- 1) Develop literature reviews on the current state of the research on the seven research priority areas identified by the GHP Research Needs Task Force.
- 2) Establish a network and database of researchers in MARB states working on conservation and water quality issues to facilitate cross-state collaboration.

## Research Priority Areas

### #1 - Conservation Practices

Support research on the performance and effectiveness of individual and/or suites of conservation practices in improving water quality to inform implementation

Practices may include, but are not limited to:

- Cover Crops
- Conservation Tillage Practices
- Drainage Management
- Buffer Management
- Stacked Practices

### #2 - Assessment Tools

Continue to develop easy-to-use, field-scale conservation assessment tools that incorporate estimates of nutrient reduction benefits

### #3 - Conservation Intensity

Enhance estimates of levels of conservation intensity required to see a quantifiable change in water quality

### #4 - Field to Stream

Edge-of-field to stream nutrient transport and relationship to overall water quality trends at both local and regional scales

### #5 - Legacy Nutrients

Impact of legacy nutrients on water quality

### #6 - Lag Times

Improve understanding of underlying processes causing a lag between BMP implementation and change in water quality in streams; incorporate lag response into regional and basin-scale models

### #7 - Fertilizer Efficiency Metrics

Development of a fertilizer efficiency metric that quantifies nutrient reduction to the environment in terms of water quality related to the 4Rs.

