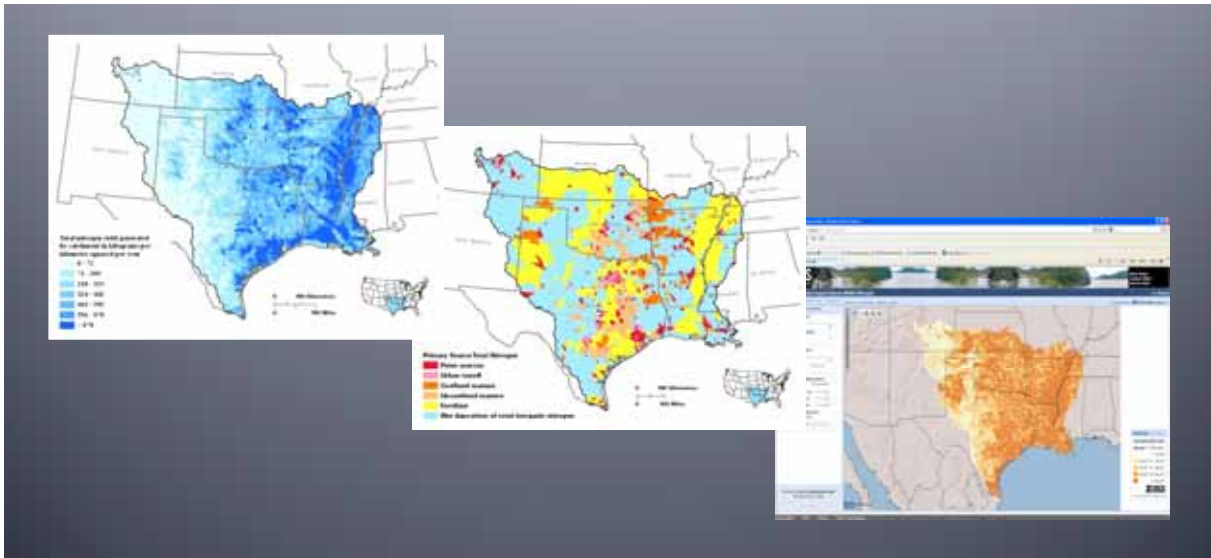


Results of Regional SPARROW Models for Selected Watershed in Mississippi

Richard Rebich, U.S. Geological Survey, Mississippi Water Science Center

Mississippi Water Resources Conference, April 3, 2012



National Water Quality Assessment Program *Surface Water Status and Trends Regions*

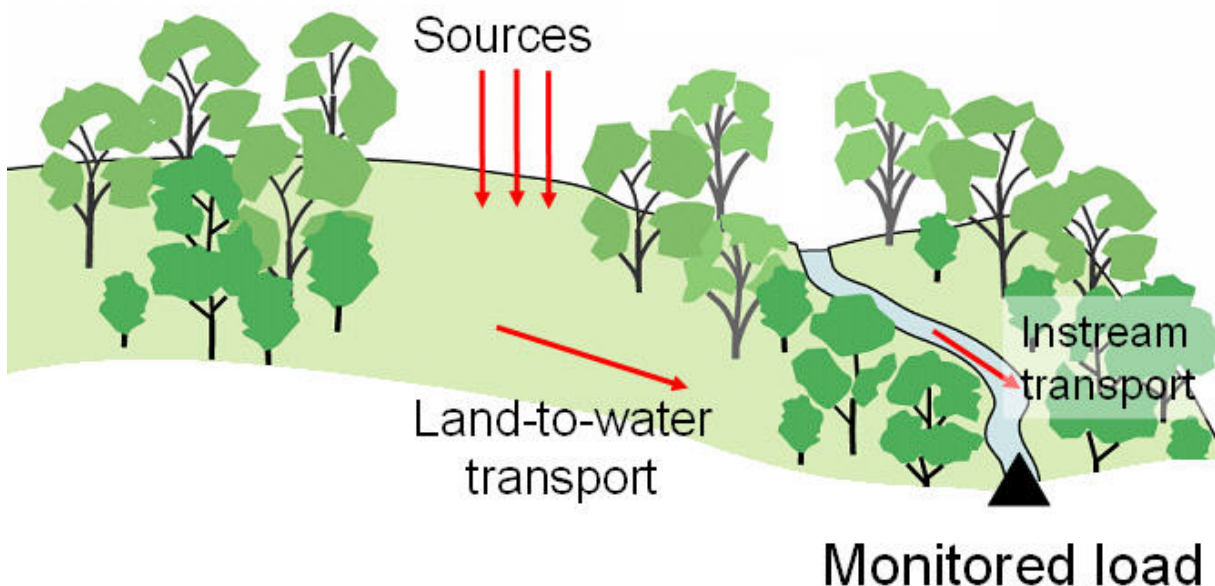


Study Area

- South-Central United States – Lower Mississippi, Arkansas-White-Red, and Texas-Gulf Basins
- 11 States
- USGS Study Area Team:
 - Richard Rebich, MSWC
 - Natalie Houston, Patty Ging, and Evan Hornig, TWSC
 - Scott Mize, LWSC

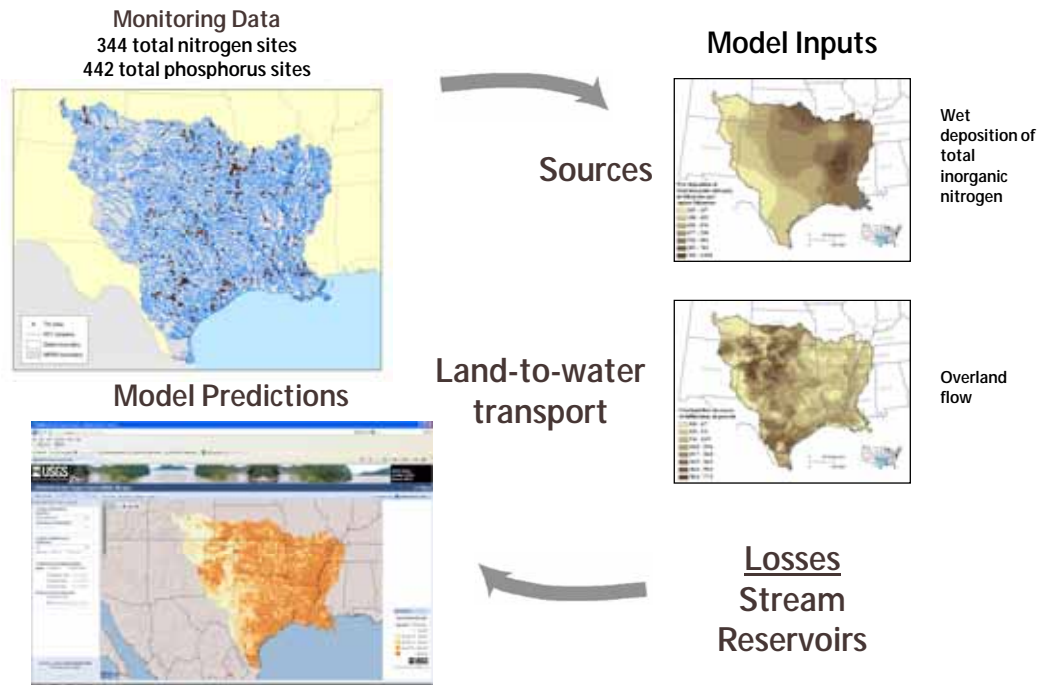


SPARROW* Model Concept



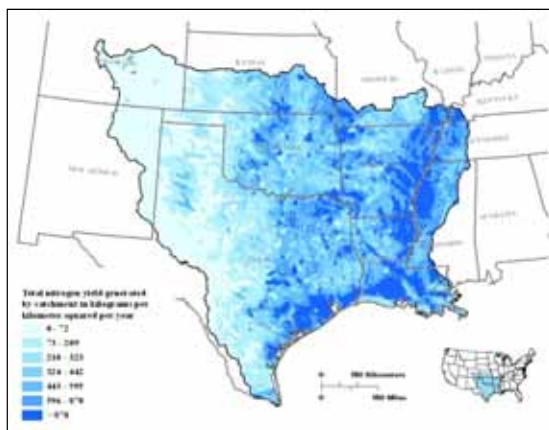
*SPAtially Referenced Regression On Watershed Attributes

SPARROW Modeling Process

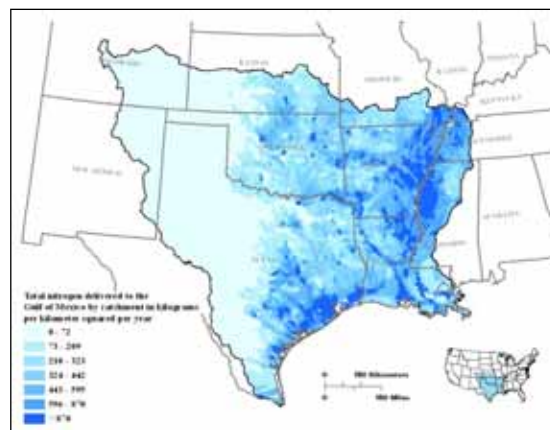


Total Nitrogen Yield Results

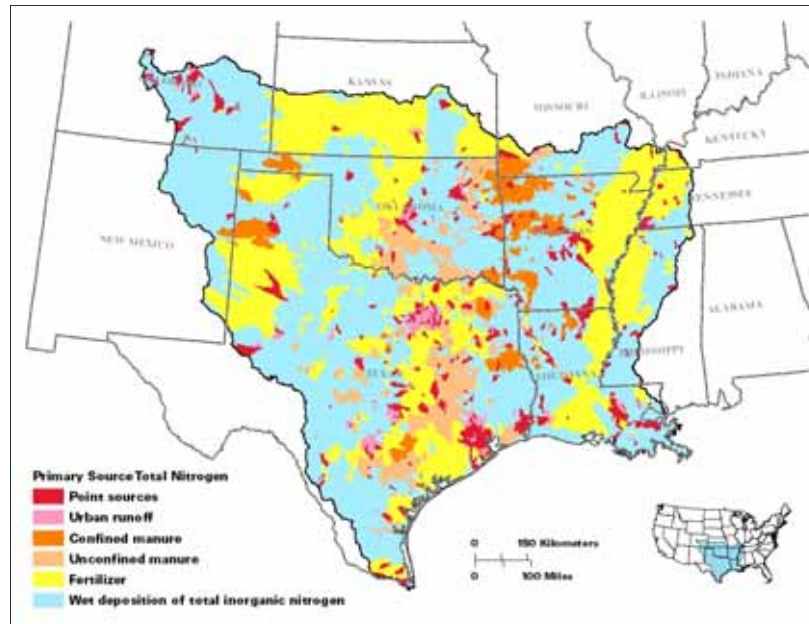
Delivered to local streams



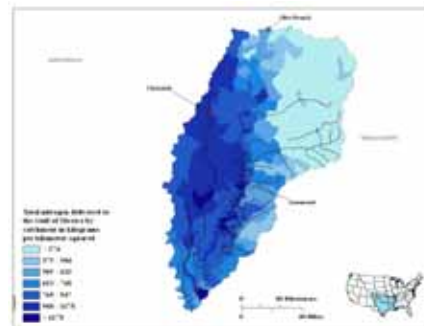
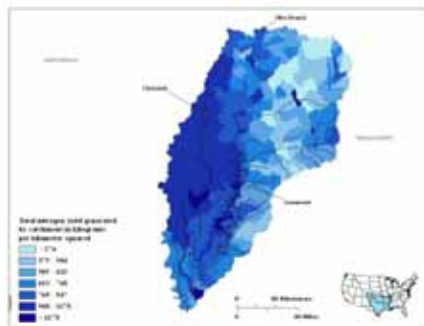
Delivered to the Gulf of Mexico



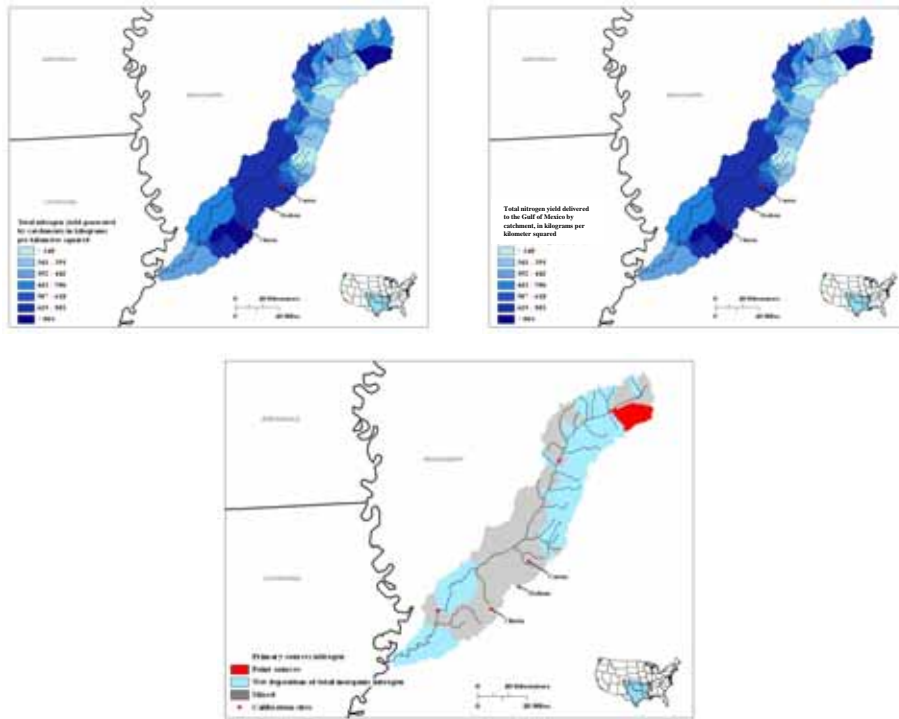
Primary Sources of Nitrogen



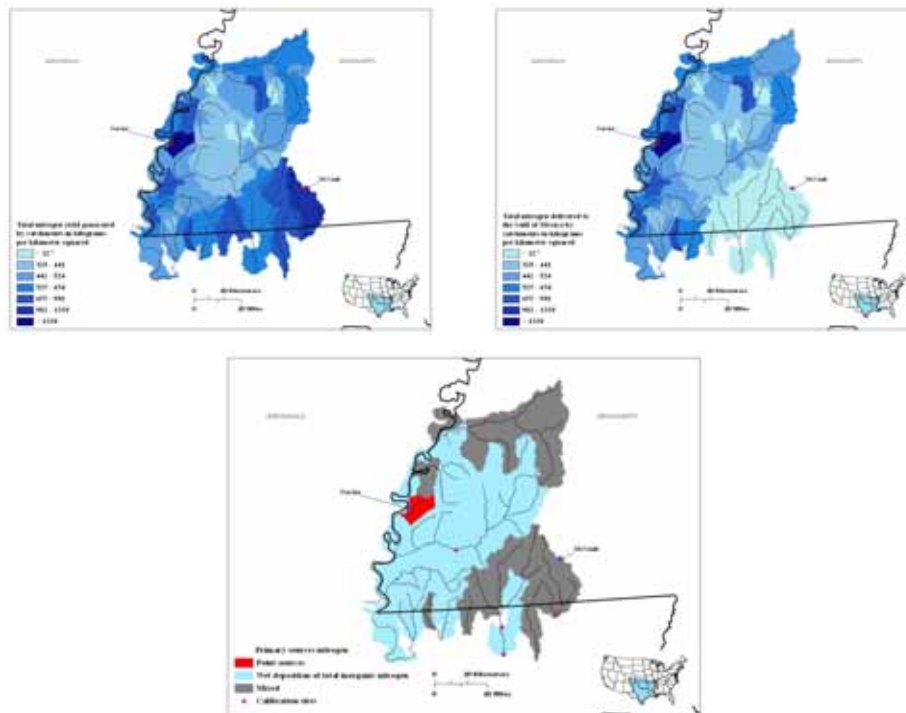
Yazoo River Basin - Nitrogen



Big Black River Basin - Nitrogen

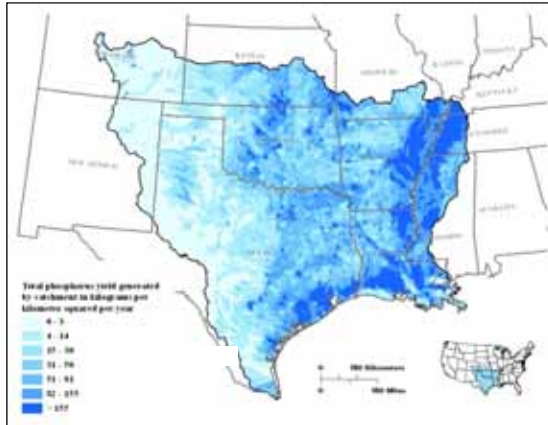


South Independent Streams - Nitrogen

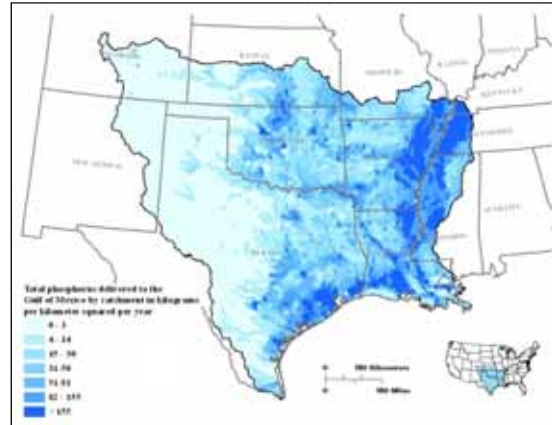


Total Phosphorus Yield Results

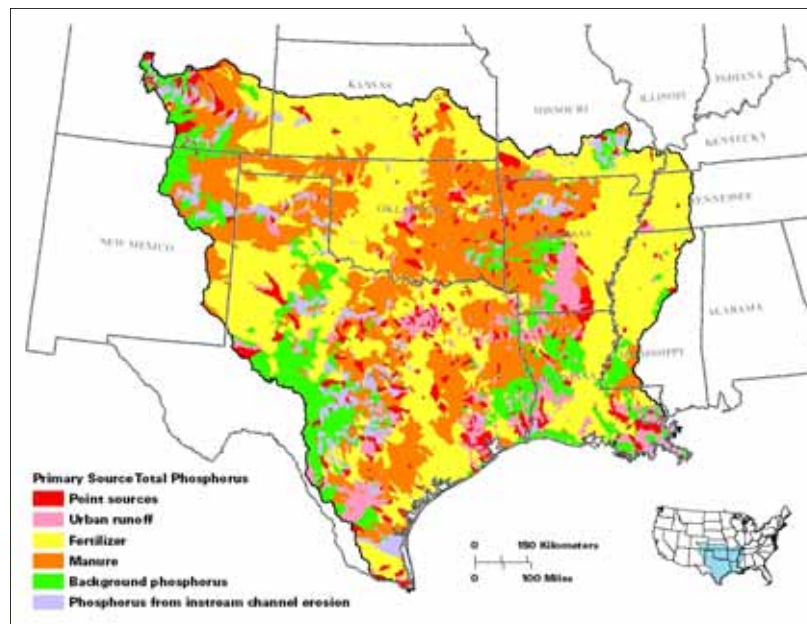
Delivered to local streams



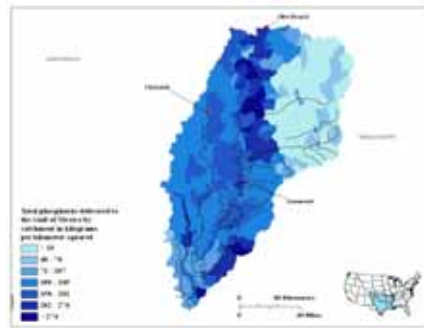
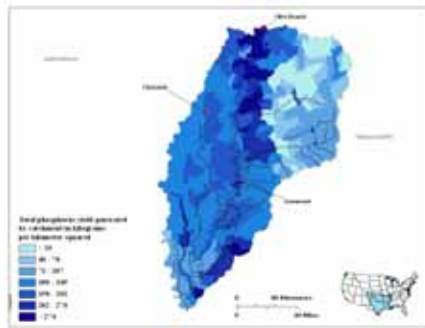
Delivered to the Gulf of Mexico



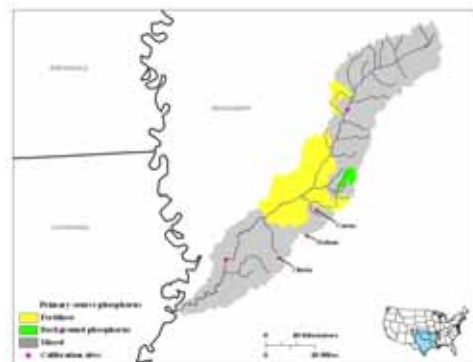
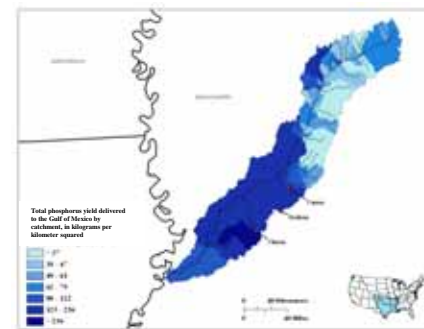
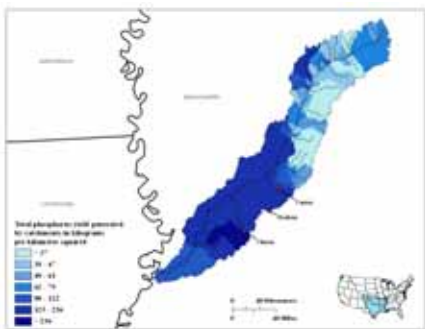
Sources of Phosphorus



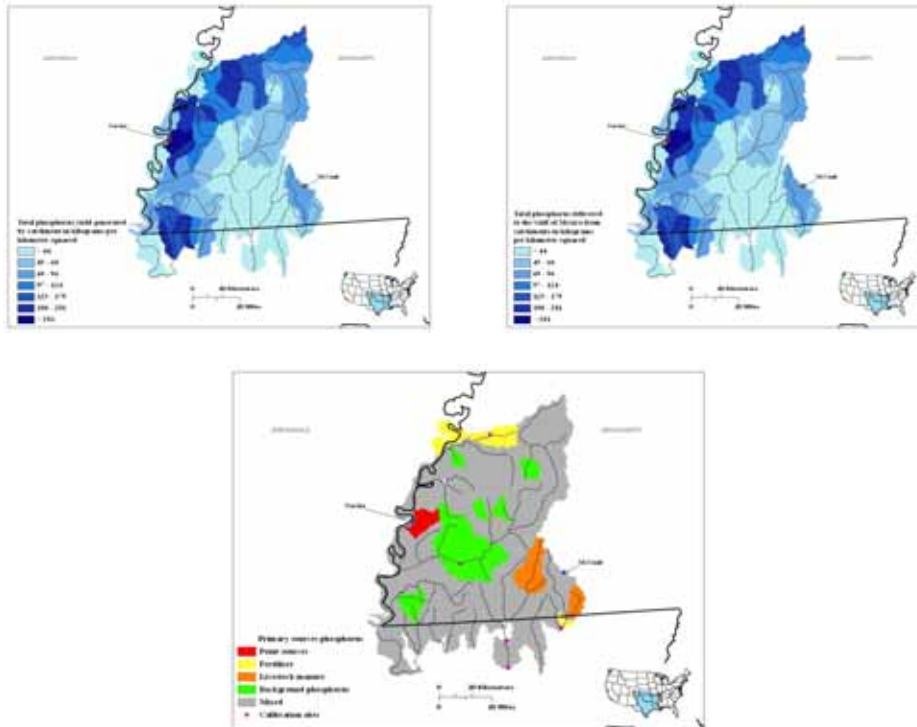
Yazoo River Basin - Phosphorus



Big Black River Basin - Phosphorus



South Independent Streams - Phosphorus



How can I get more information?



- SPARROW Information:
<http://water.usgs.gov/nawqa/sparrow/>
- New Regional Models:
<http://water.usgs.gov/nawqa/sparrow/mrb/>
- Decision Support System
<http://water.usgs.gov/nawqa/sparrow/dss/>
- Contacts:
Richard Rebich (rarebich@usgs.gov)

Lower Mississippi Texas-Gulf SPARROW Models

USGS National Water-Quality Assessment (NAWQA) Program

Regional SPARROW Model Assessments of Streams and Rivers

Lower Mississippi, Arkansas-White-Red, and Texas Gulf (More Regional Models)

Sources and Delivery of Nutrients to the Northwestern Gulf of Mexico from Streams in the South-Central United States

By Richard A. Stepien, Richard A. Stepien, Scott Y. Mao, Daniel R. Parsons, Patricia B. Gray, and C. Ross Boyer

Online Decision Support System -- Informing Nutrient Management Decisions

The regional nitrogen and phosphorus (SPARROW) models have been incorporated into an interactive, online decision support system to assist managers, researchers, and the general public. Use access SPARROW models and map predictions of long-term average water quality conditions. Data supported by Streamwater Inventory System, and available management scenario-reduction scenarios.

Related Links

- [Nutrients and Delivery Tools](#)
- [Interactive Model Input Data](#) [Point Sources](#) [Stream Loads](#) [Input Exchange](#) [Report](#)

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Sources and Delivery of Nutrients to the Northwestern Gulf of Mexico from Streams in the South-Central United States

Richard A. Stepien, Richard A. Stepien, Scott Y. Mao, Daniel R. Parsons, Patricia B. Gray, and C. Ross Boyer

Abstract: SPARROW (Spatially Referenced Regression on Watershed attributes) (SPARROW) models were developed to estimate nutrient inputs from nitrogen (N) and total phosphorus (TP) to the northwestern part of the Gulf of Mexico from streams in the South-Central United States (SCUS). They were modeled throughout of the Lower Mississippi, Arkansas-White-Red, and Texas-Gulf headwater regions. The models were constructed to predict nutrient inputs and stream conditions during 2002. Model predictions of nutrient loads range from 0.00 to 0.10 mg/L for nitrogen and 0.00 to 0.10 mg/L for phosphorus. The models were constructed to predict nutrient inputs and stream conditions during 2002. Model predictions of nutrient loads range from 0.00 to 0.10 mg/L for nitrogen and 0.00 to 0.10 mg/L for phosphorus.

JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION

SOURCES AND DELIVERY OF NITROGEN TO THE NORTHWESTERN GULF OF MEXICO FROM STREAMS IN THE SOUTH-CENTRAL UNITED STATES¹

Richard A. Stepien, Richard A. Stepien, Scott Y. Mao, Daniel R. Parsons, Patricia B. Gray, and C. Ross Boyer

ABSTRACT: Spatially Referenced Regression on Watershed attributes (SPARROW) models were developed to estimate nutrient inputs from nitrogen (N) and total phosphorus (TP) to the northwestern part of the Gulf of Mexico from streams in the South-Central United States (SCUS). They were modeled throughout of the Lower Mississippi, Arkansas-White-Red, and Texas-Gulf headwater regions. The models were constructed to predict nutrient inputs and stream conditions during 2002. Model predictions of nutrient loads range from 0.00 to 0.10 mg/L for nitrogen and 0.00 to 0.10 mg/L for phosphorus. The models were constructed to predict nutrient inputs and stream conditions during 2002. Model predictions of nutrient loads range from 0.00 to 0.10 mg/L for nitrogen and 0.00 to 0.10 mg/L for phosphorus.

SPARROW Decision Support System

USGS National Water-Quality Assessment (NAWQA) Program

Regional SPARROW Model Assessments of Streams and Rivers

Lower Mississippi, Arkansas-White-Red, and Texas Gulf (More Regional Models)

Sources and Delivery of Nutrients to the Northwestern Gulf of Mexico From Streams in the South-Central United States

By Richard A. Smith, Robert A. Johnson, Scott Y. Hsu, Daniel A. Peterson, Patricia S. Gray, and C. Eversong

Health and environmental policy

Online Decision Support System -- Informing Nutrient Management Decisions

The regional nitrogen and phosphorus SPARROW models have been incorporated into an interactive, online decision support system to assist managers, researchers, and the general public. Use access SPARROW models and map predictions of long term average water quality conditions, data support by stream-reach receiving system, and available management action-reduction scenarios.

Related Links

- Nutrient and Sediment Trends
- SPARROW Model Input Data: [Point Sources](#), [Stream Loads](#), [Region Exchange](#), [Basins](#)

SPARROW Decision Support System

SPARROW Decision Support System

Find a Model by Geographic Location:

Select a region or state. When a state is selected, all models containing that state are listed.

My Region or State:

Find a Model by Modeled Constituent:

Models matching your criteria (click a model to view details)

- Chesapeake Bay Total Nitrogen Model - 2003
- Chesapeake Bay Total Phosphorus Model - 2002
- National Suspended Sediment Model - 1993
- National Total Nitrogen Model - 1993
- National Total Phosphorus Model - 1992
- National Total Phosphorus Model - 1992
- Total Suspended Solids Model for the Rio Grande, Colorado, and Great Basin Region - 2004
- Total Nitrogen Model for the Great Lakes, Ohio, Upper Mississippi, and South Red Basin Region - 2002
- Total Nitrogen Model for the Lower Mississippi, Arkansas-White-Red, and Texas Gulf Region - 2003
- Total Nitrogen Model for the Missouri River Basin - 2002
- Total Nitrogen Model for the New England and Mid-Atlantic Region - 2002

Documentation and Further Reading

- What is SPARROW?
- What is SPARROW Decision Support?
- SPARROW Applications & Documentation
- SPARROW 4.0p

Feedback

Found a bug or have a comment? Please send bugs, suggestions and comments to the SPARROW Decision Support System Administrator.

Select a Model

No model selected

Use the filter and selection list to the left to select a model.

SPARROW Decision Support System

USGS
SPARROW Decision Support System

Find a Model by Geographic Location:
Select a region or state. When a state is selected, all models containing that state are listed.

Find a Model by Modified Constituent:
Models matching your criteria (click a model to view details)

- National Suspended Sediment Model - 1992
- National Total Nitrogen Model - 1992
- National Total Organic Carbon Model
- National Total Phosphorus Model - 1992
- Total Nitrogen Model for the Lower Mississippi, Arkansas White Red, and Texas Gulf Basins - 2002
- Total Nitrogen Model for the South Atlantic Gulf and Tennessee Basins - 2002
- Total Phosphorus Model for the Lower Mississippi, Arkansas White Red, and Texas Gulf Basins - 2002
- Total Phosphorus Model for the South Atlantic Gulf and Tennessee Basins - 2002

Documentation and Further Reading

- What is SPARROW?
- What is SPARROW Decision Support?
- SPARROW Applications & Documentation
- SPARROW Help

Spatial Views

Selected Model

No model selected
Use the filter and selection list to the left to select a model.

Yazoo River Basin nutrients

SPARROW Decision Support System

USGS
SPARROW Decision Support System

Find a Model by Geographic Location:
Select a region or state. When a state is selected, all models containing that state are listed.

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Documentation and Further Reading

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Spatial Views

Selected Model

2002 MBBS Total Nitrogen Model

Explore this model in the Decision Support System

Modified Constituent: Nitrogen

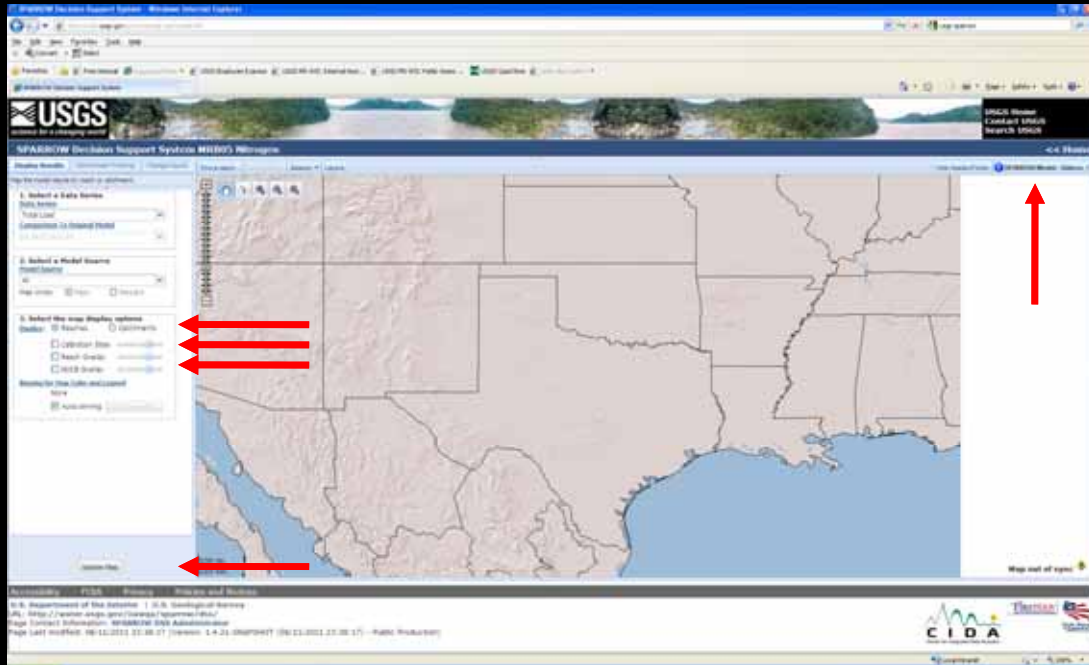
Base Year: 2002

Stream Network: Entrenched four basin TSS

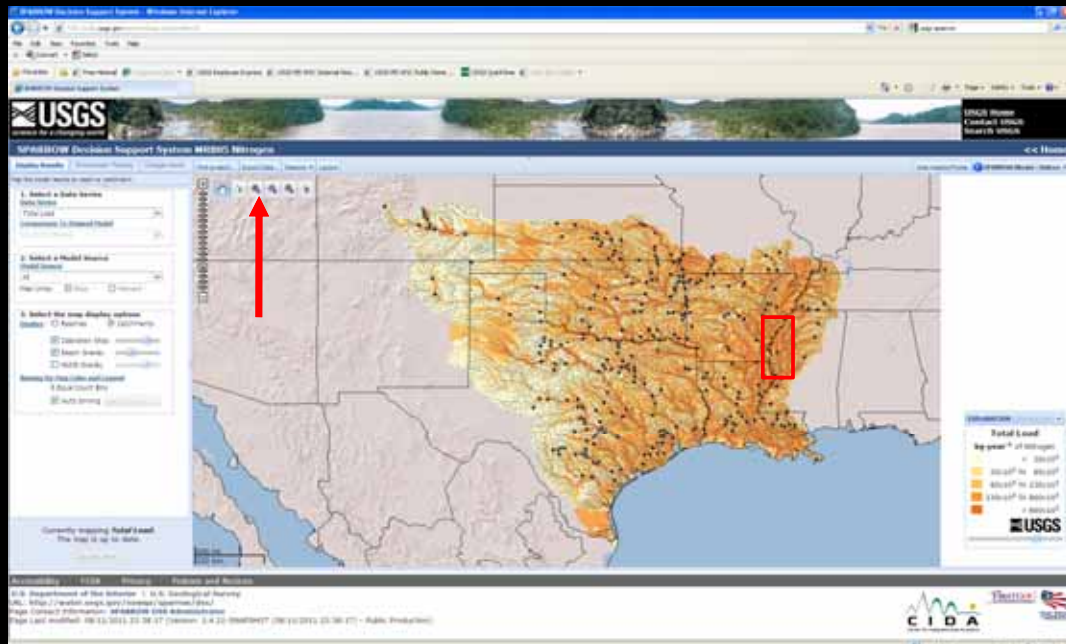
Watershed Based Scenarios

Scenario Based Scenarios

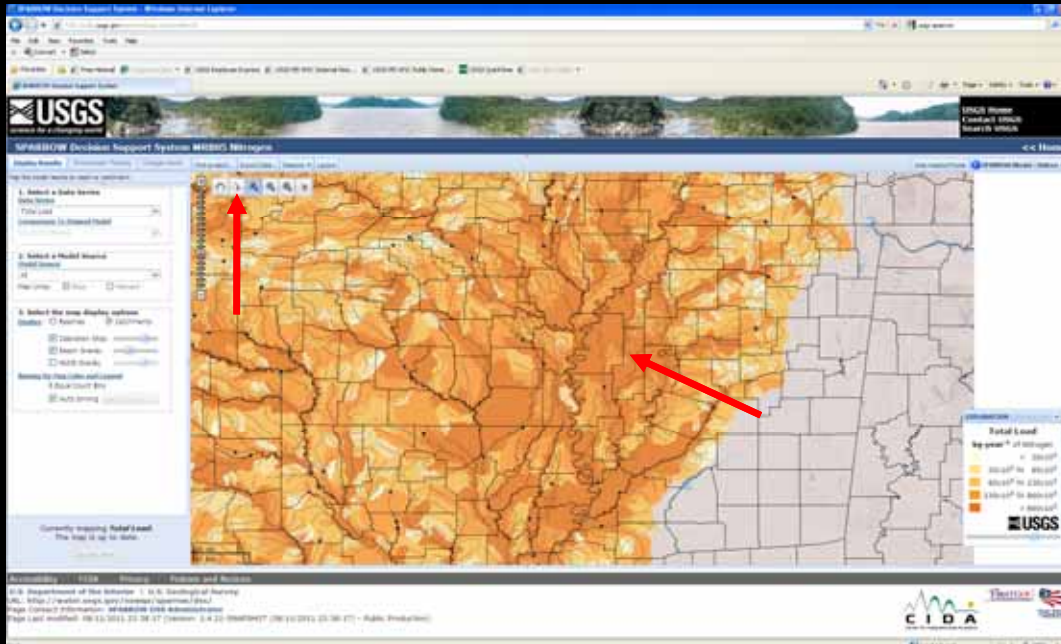
SPARROW Decision Support System



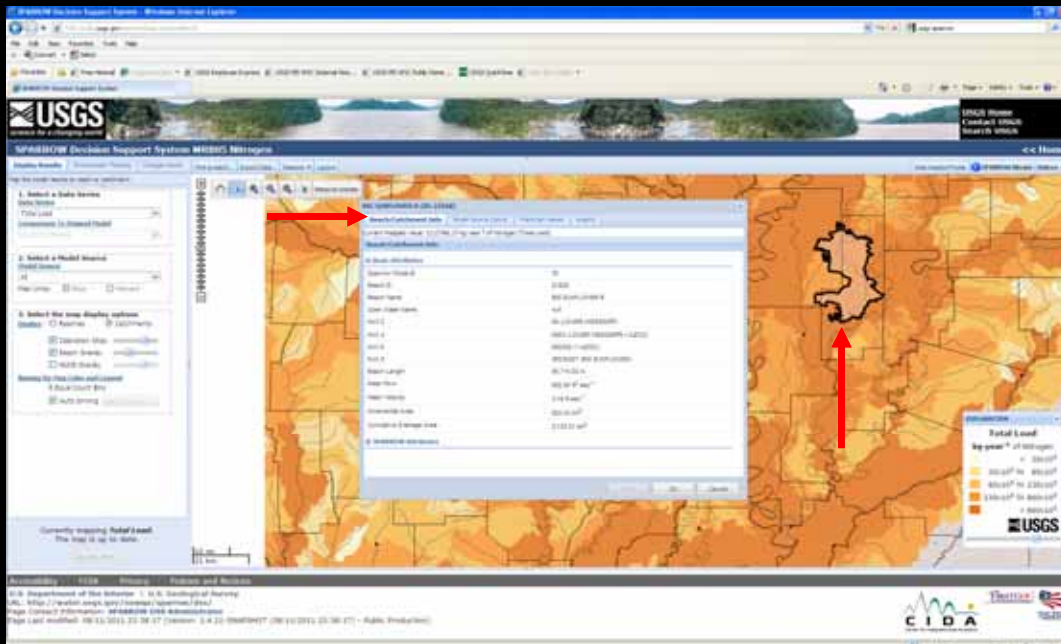
SPARROW Decision Support System



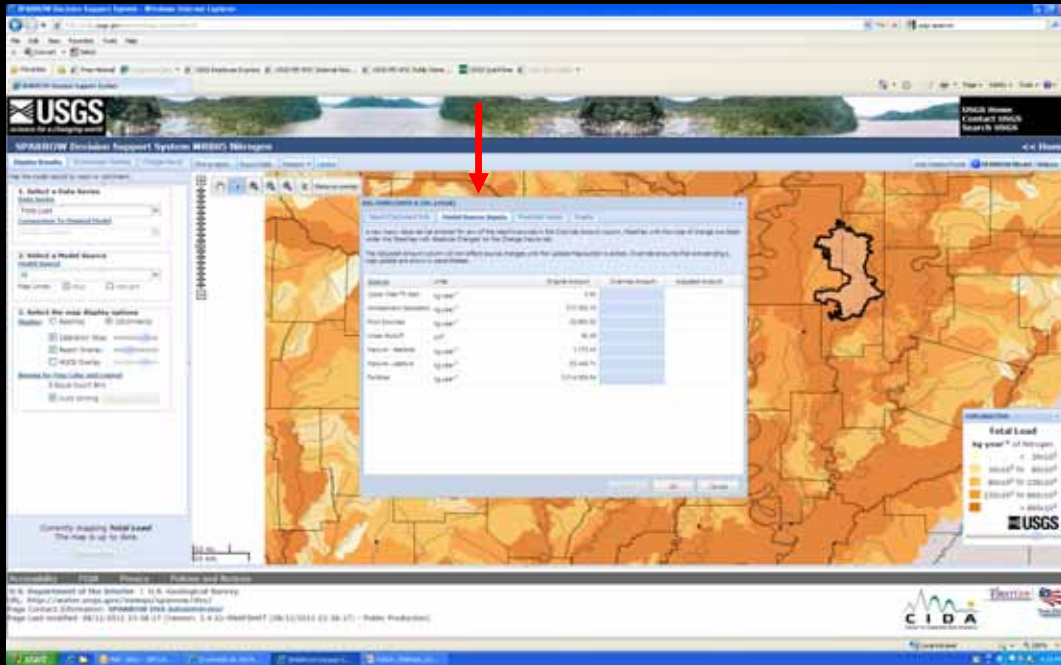
SPARROW Decision Support System



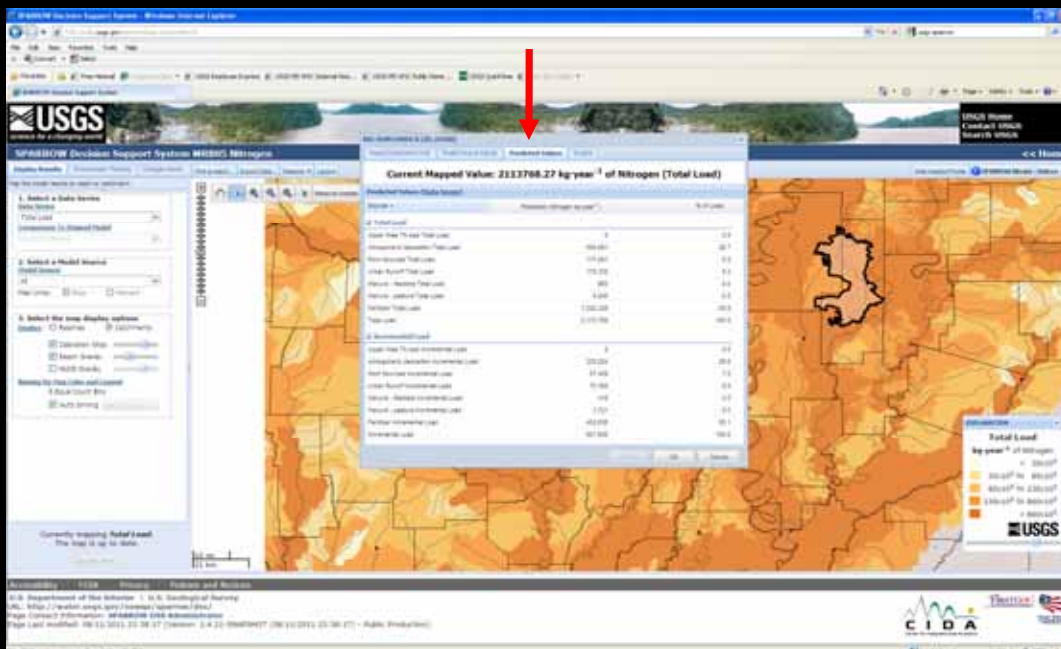
SPARROW Decision Support System



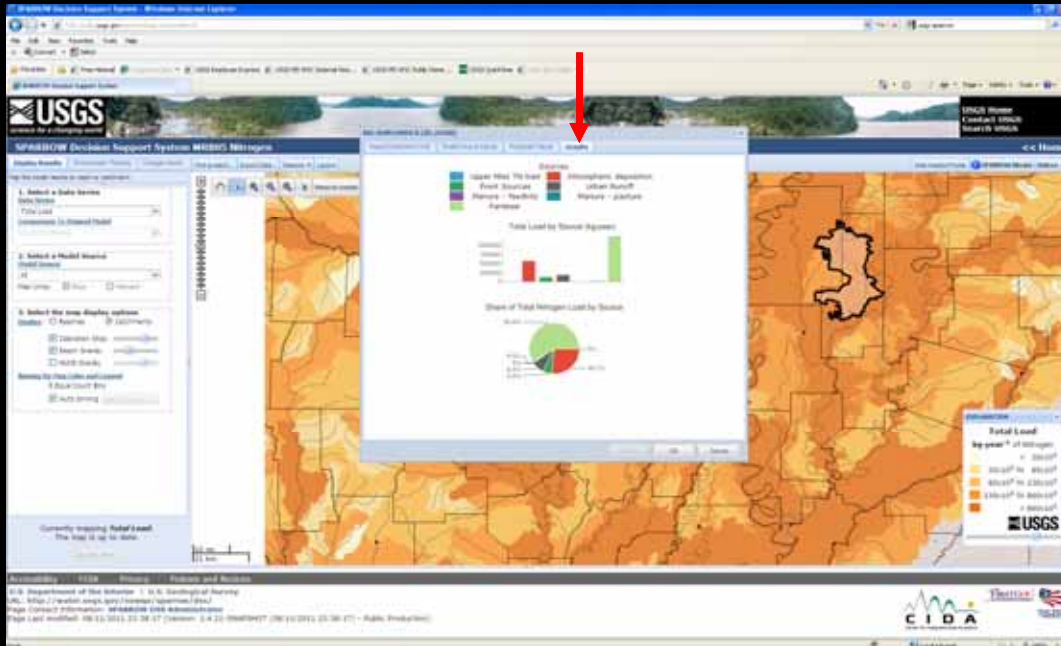
SPARROW Decision Support System



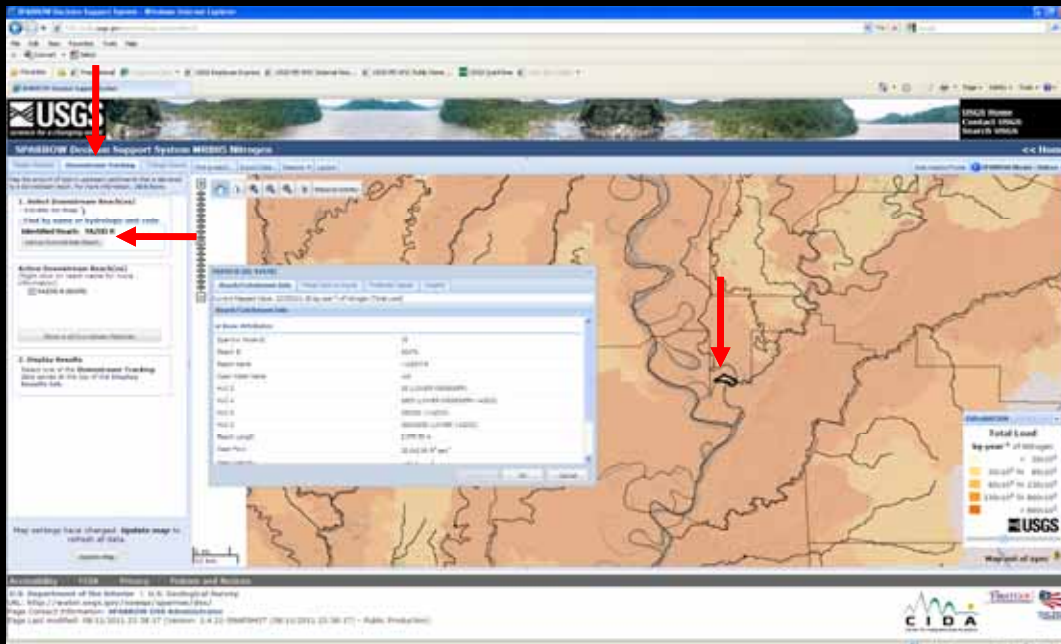
SPARROW Decision Support System



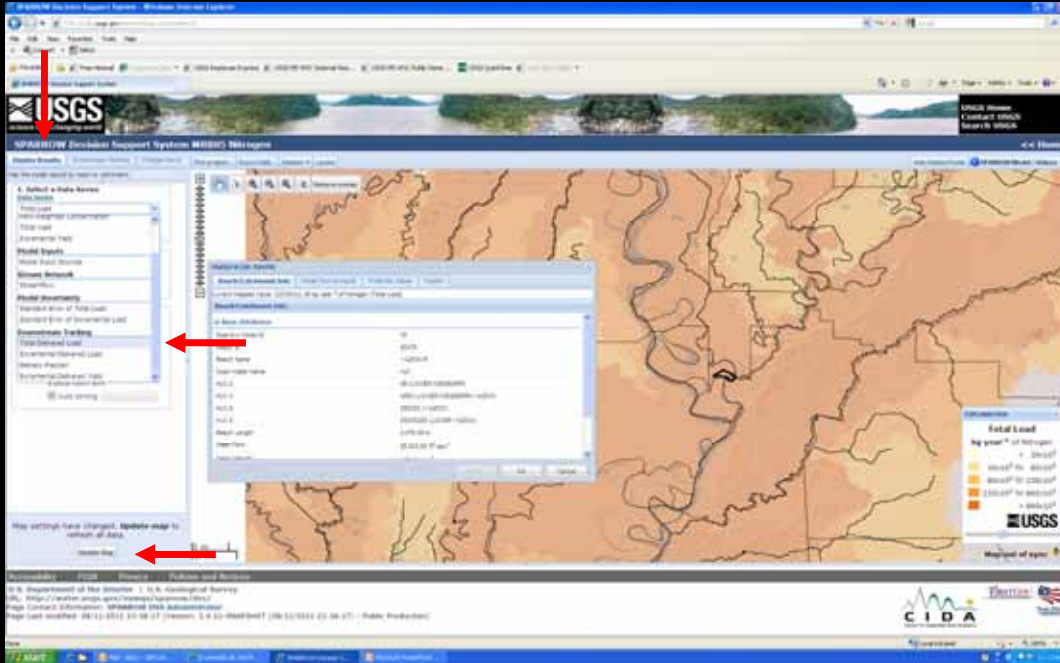
SPARROW Decision Support System



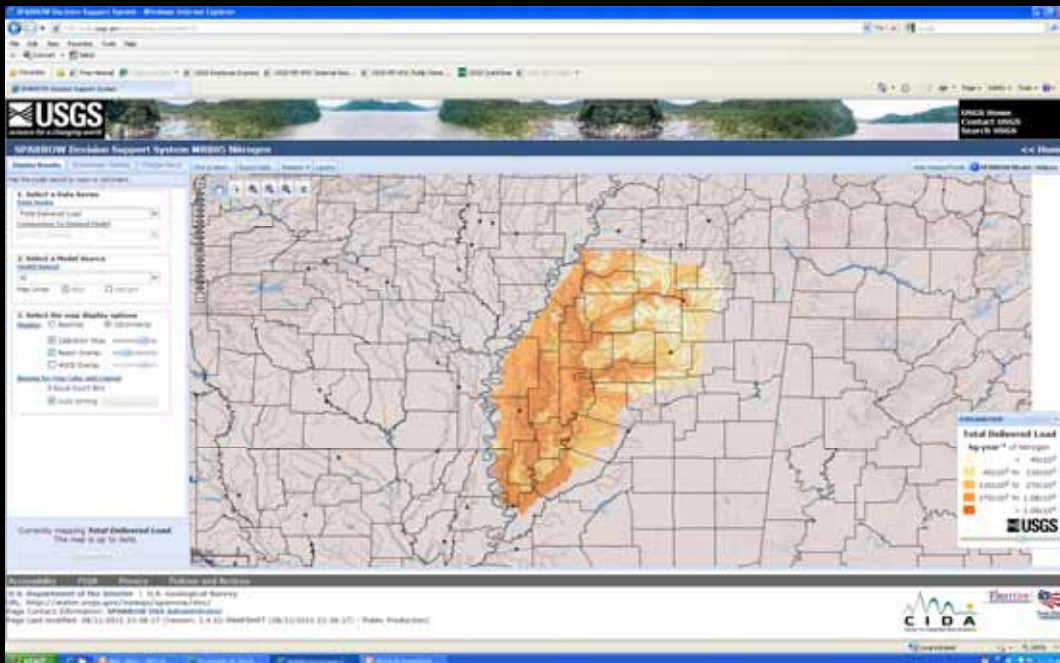
SPARROW DSS – Scenario Testing



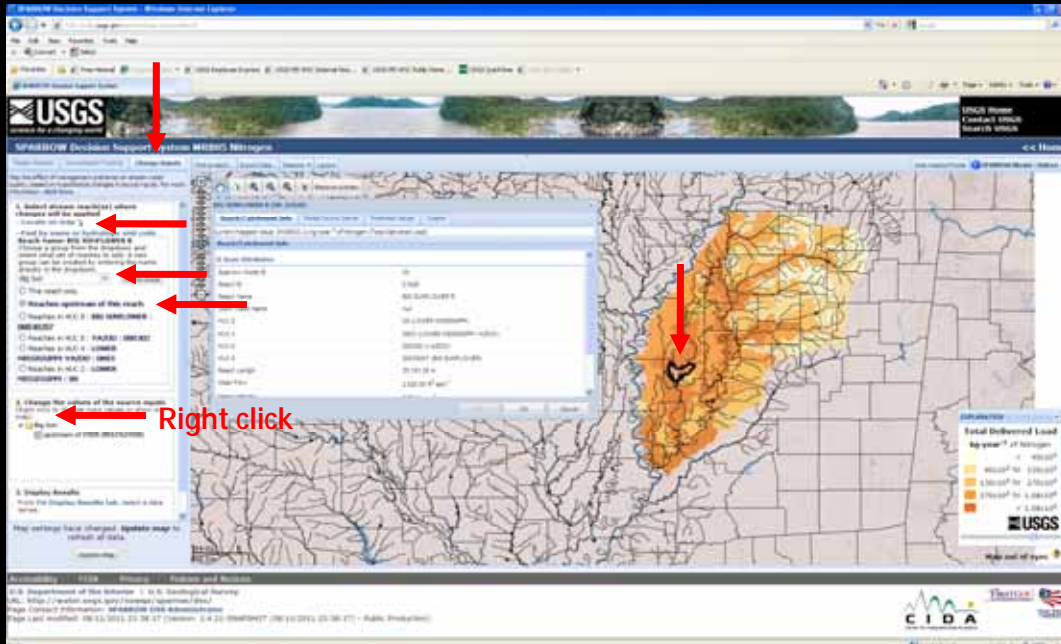
SPARROW DSS – Scenario Testing



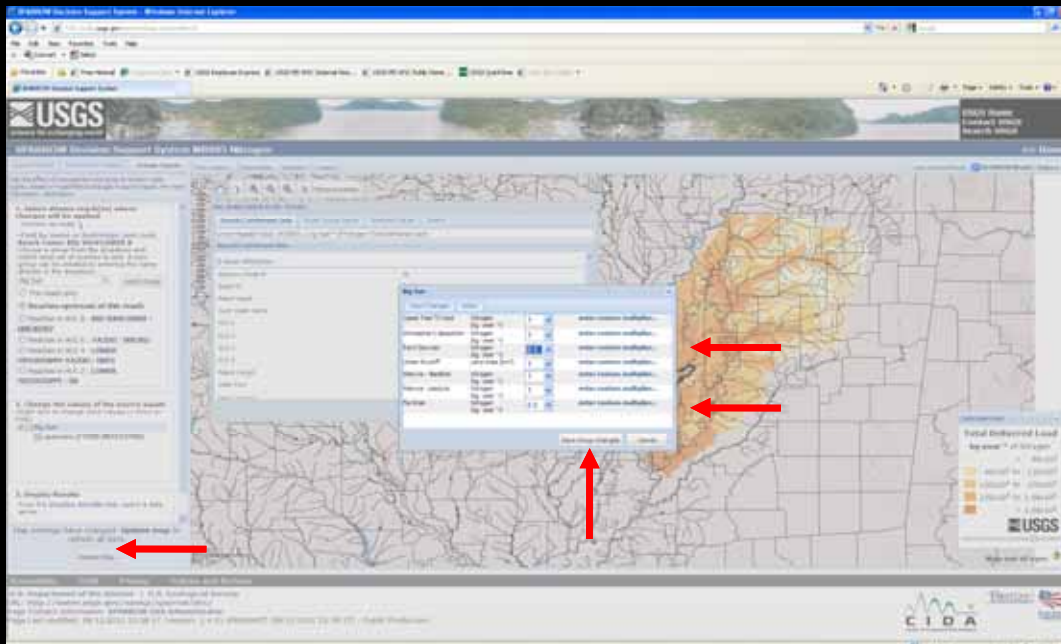
SPARROW DSS – Scenario Testing



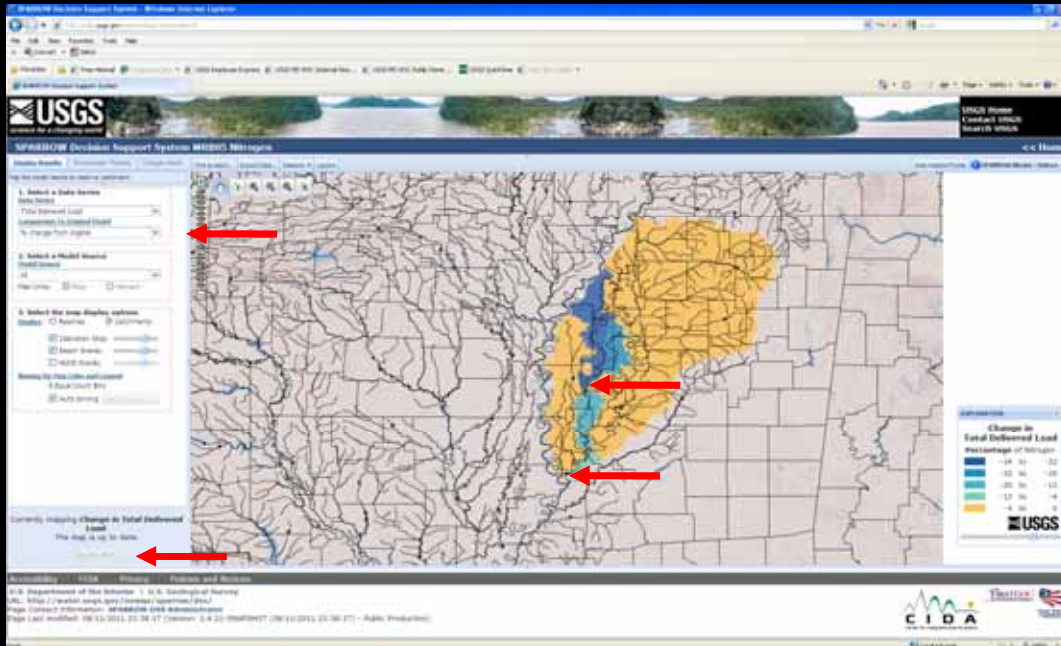
SPARROW DSS – Scenario Testing



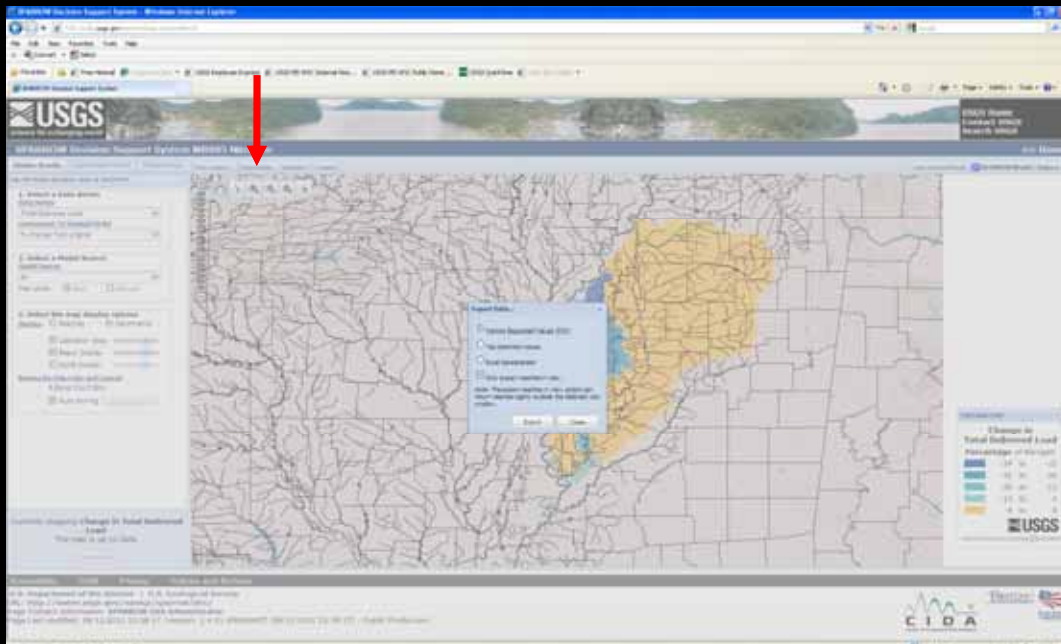
SPARROW DSS – Scenario Testing



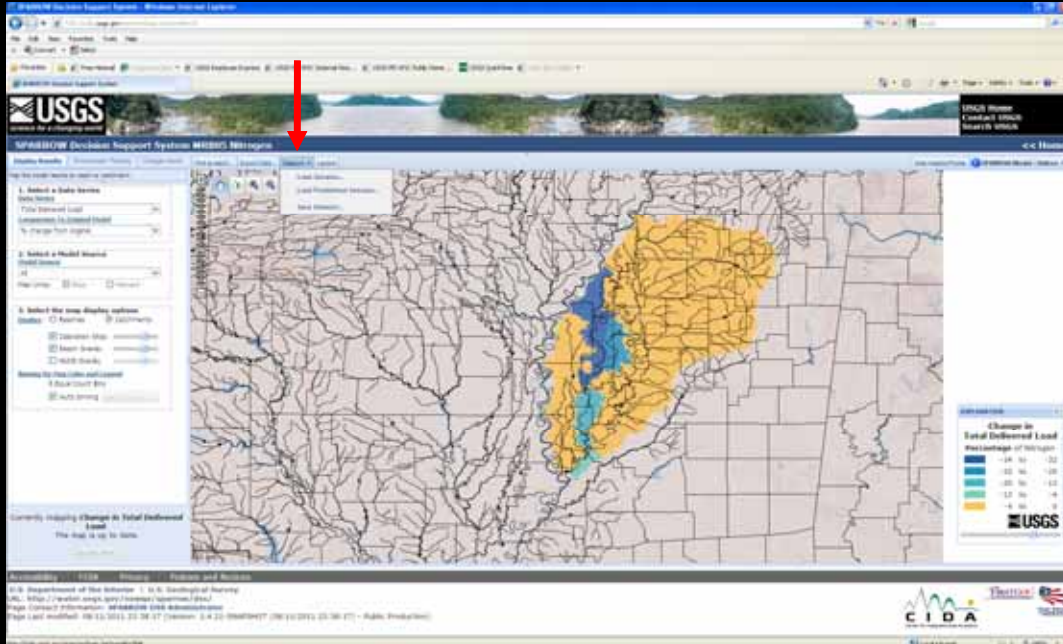
SPARROW DSS – Scenario Testing



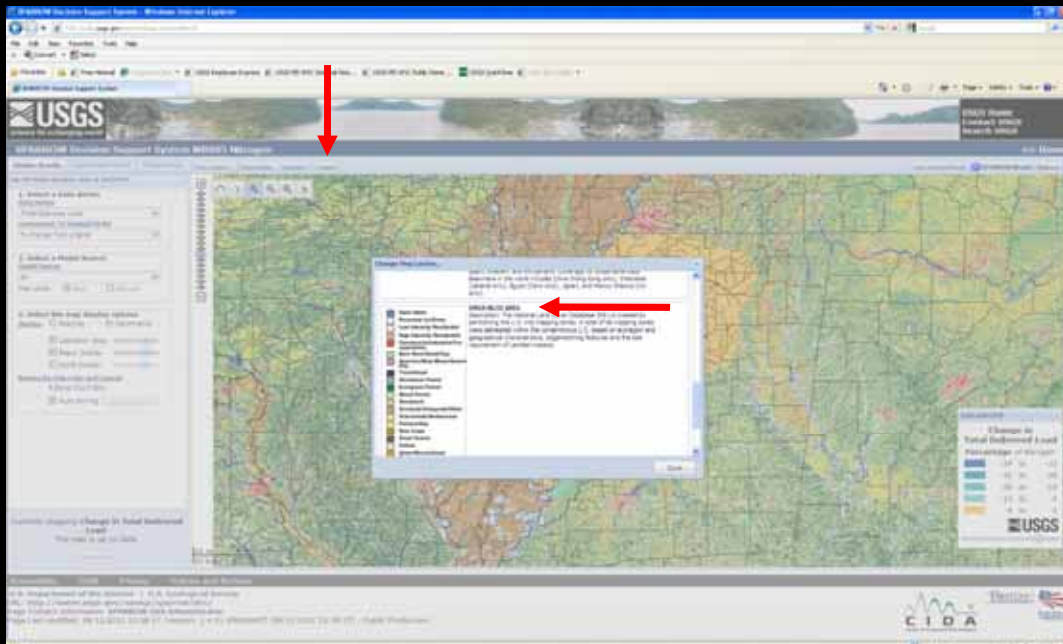
SPARROW DSS - Output



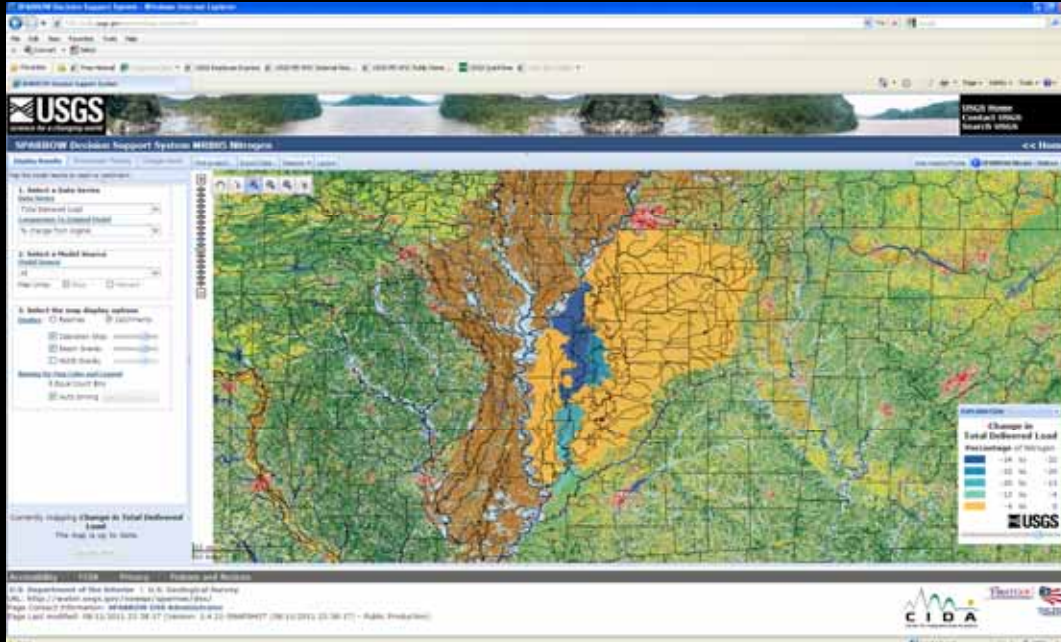
SPARROW DSS – Saved Sessions



SPARROW DSS – Background Layers



SPARROW DSS – Background Layers



Questions?

Richard Rebich
601-933-2928
rarebich@usgs.gov