



An integrated assessment was done in the South Atlantic Gulf and Tennessee Region to assess nutrient sources and transport to estuaries and other coastal waters and to build an understanding of how human activities and natural features affect nutrient conditions in streams.

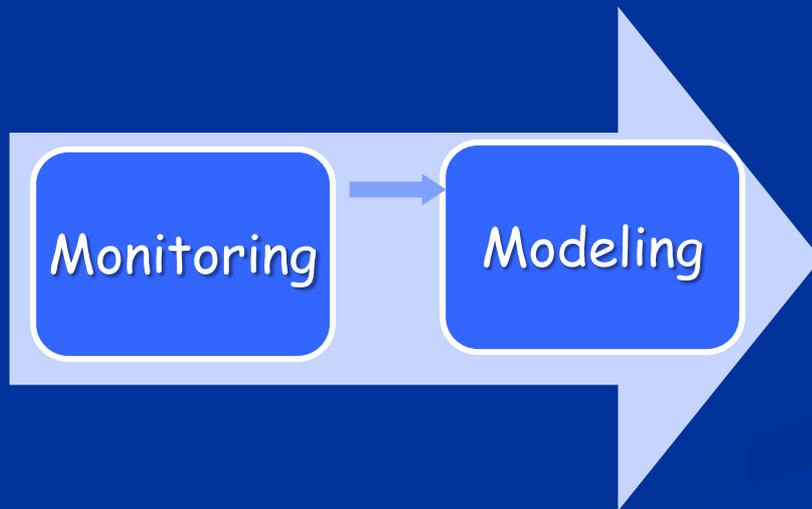
## Issues addressed in the assessment:

- **What concentrations of total nitrogen are in streams throughout the region?**
- **How do concentrations compare to the recommended nitrogen criteria (0.7 mg/L) in this region?**
- **What is the magnitude of nitrogen loads to receiving waters?**
- **What are the key sources of nutrients to streams and estuaries?**

# Approach

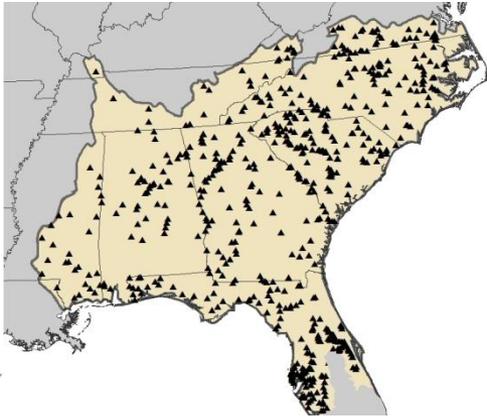
(1) Integrate monitoring data and watershed data within a regional model framework (USGS SPARROW)

(2) Integrate USGS data with data from other Federal and state agencies



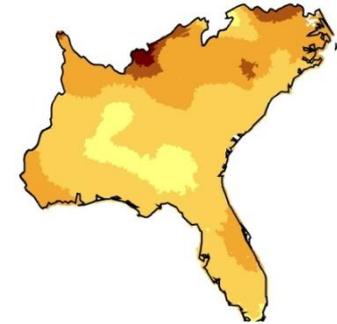
# SPARROW Model Framework

**Monitoring Data**  
804 Sites

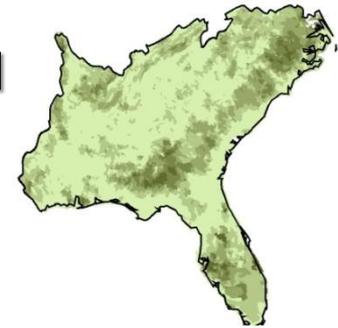


**Spatial Data Layers**

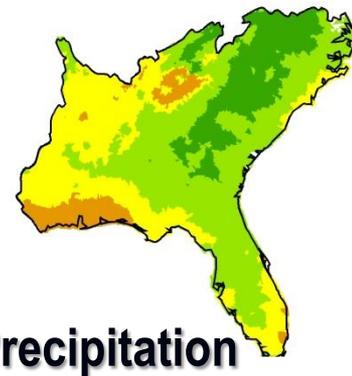
**Atmospheric  
deposition**



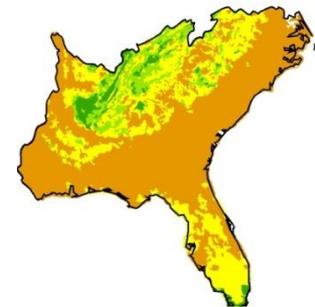
**Fertilizer applied  
to farmland**



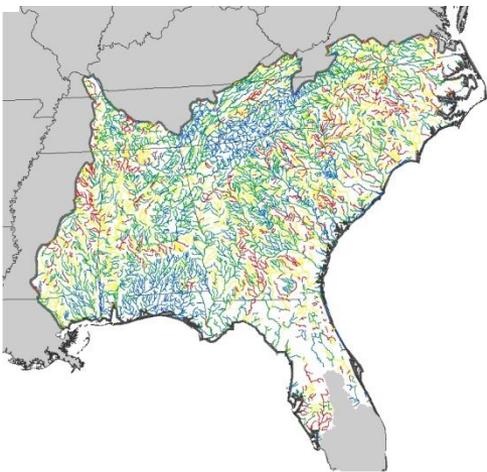
**Precipitation**

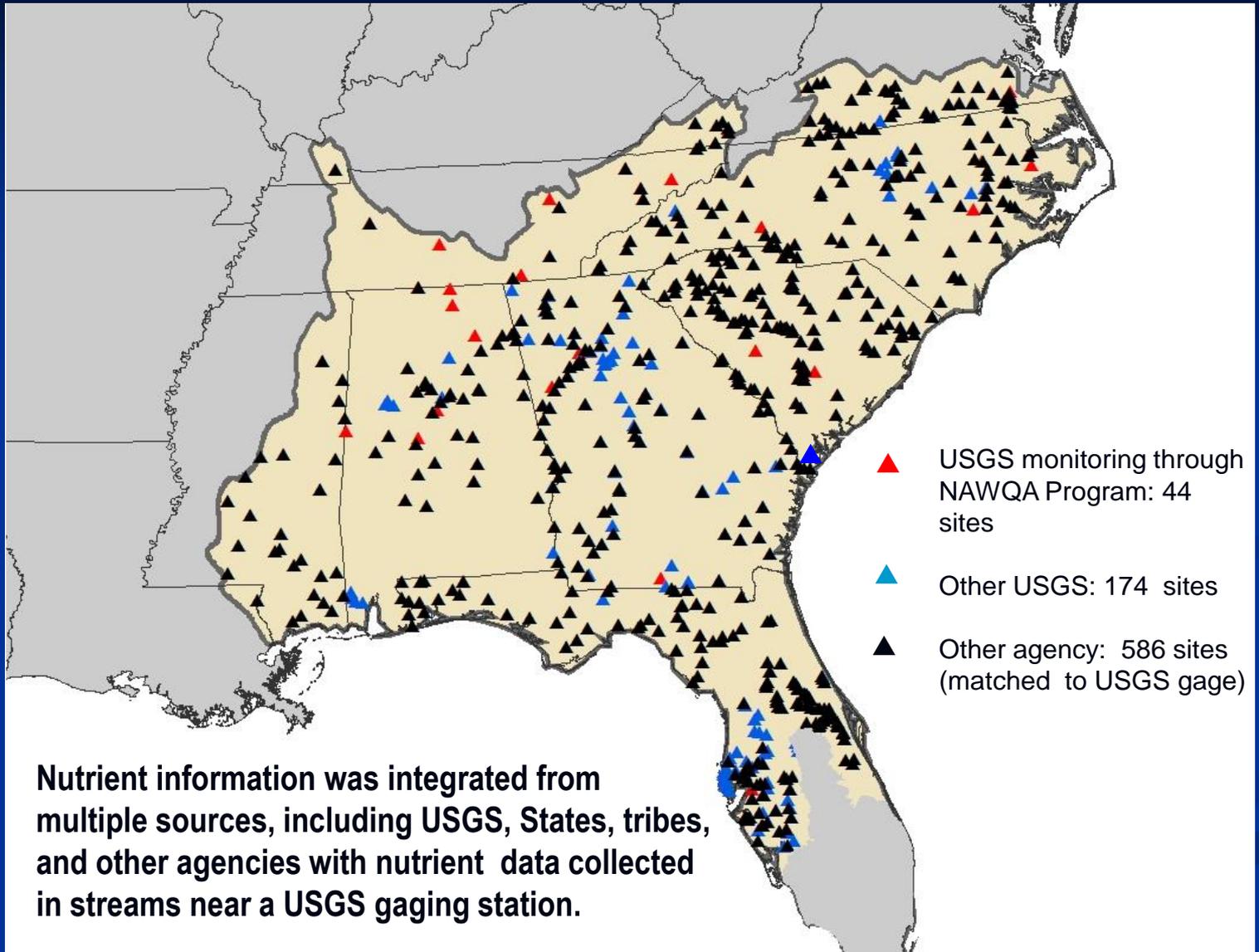


**Depth to bedrock**



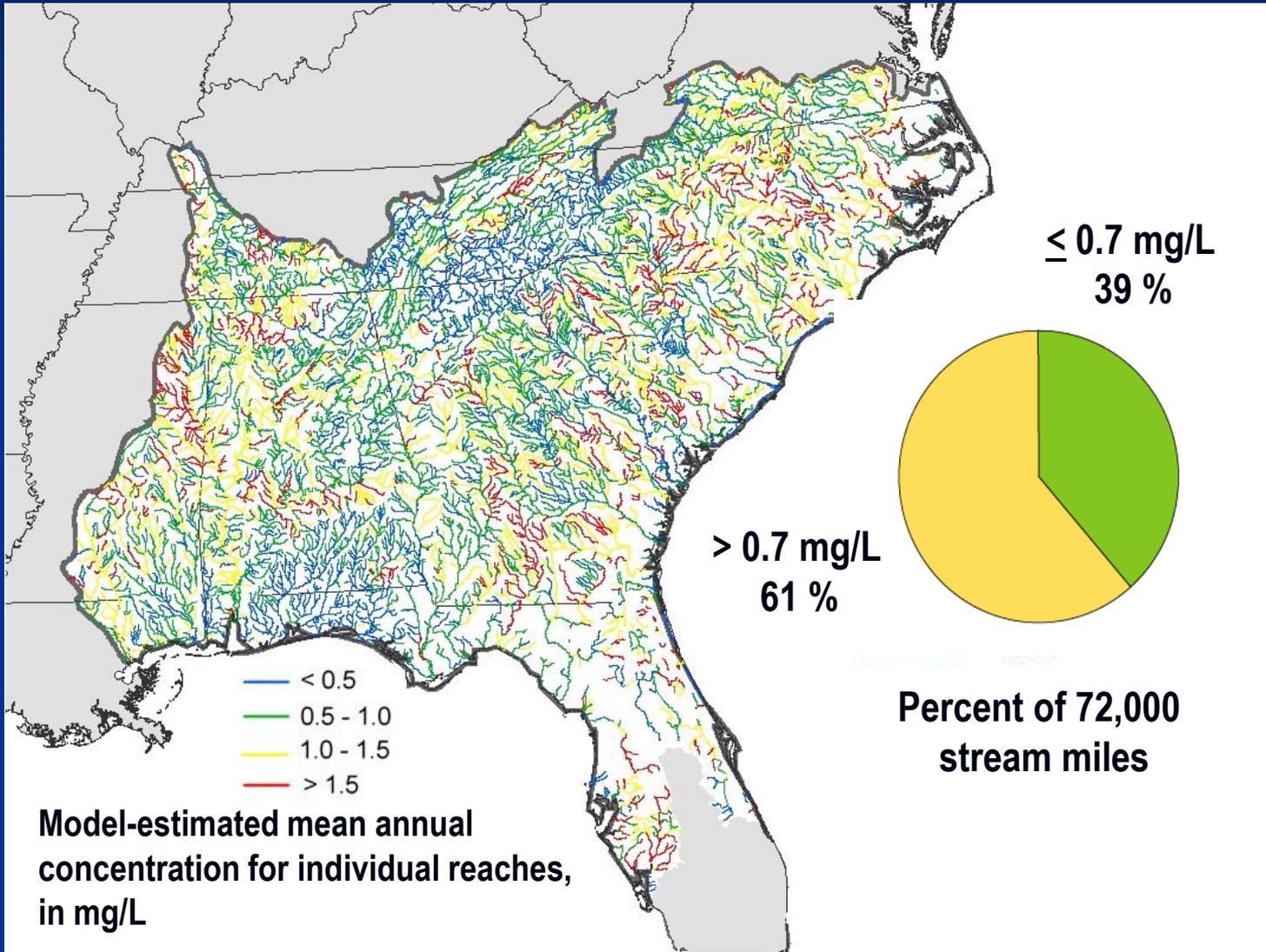
**Model Predictions**  
8,092 Stream Reaches



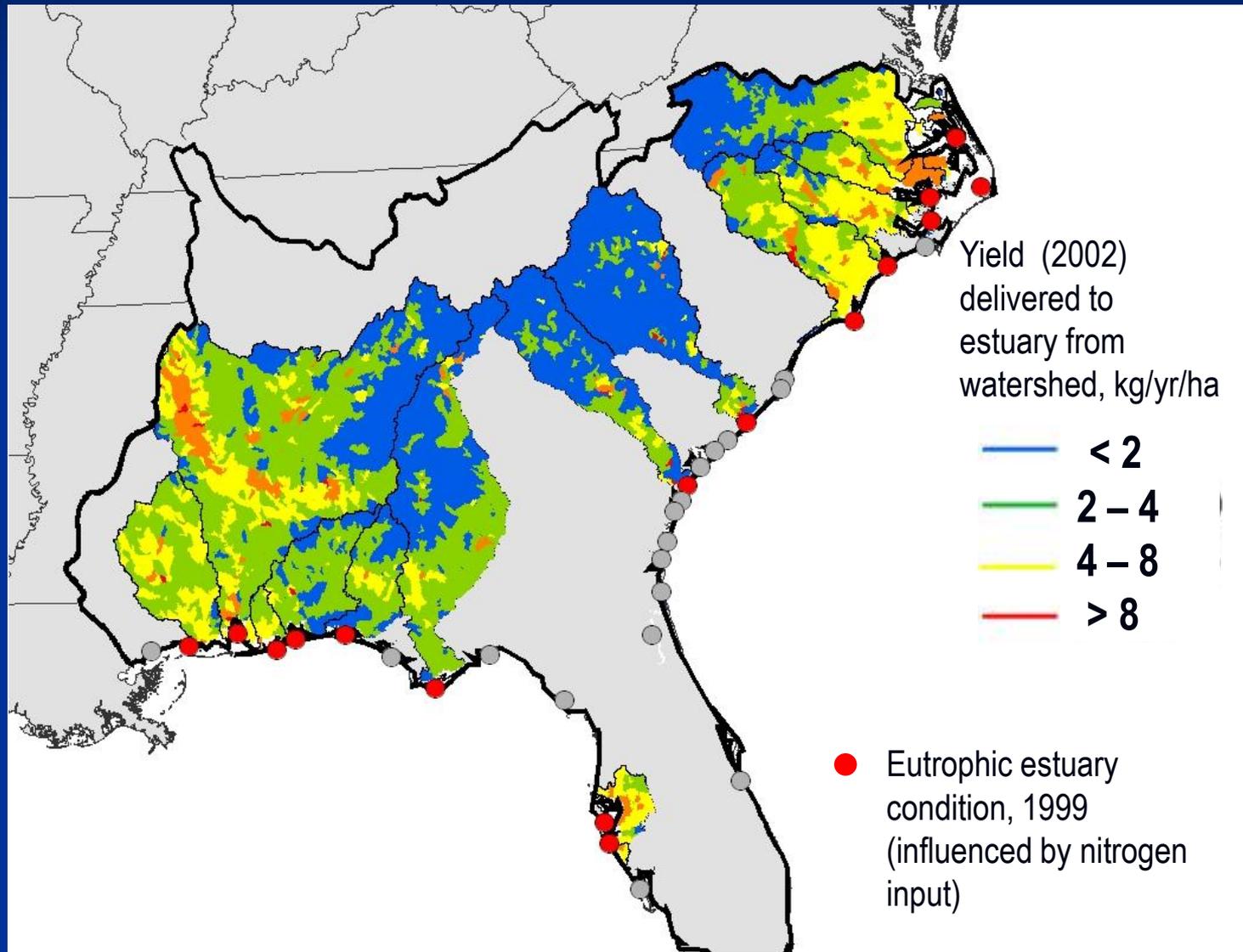


**Integration of data from diverse sources expanded geographic coverage and improved the accuracy of the SPARROW by reducing the prediction error (or “uncertainty”) by 25 percent.**

**Findings:** Total nitrogen was greater than the nutrient criteria in more than 60 percent of 72,000 streams.

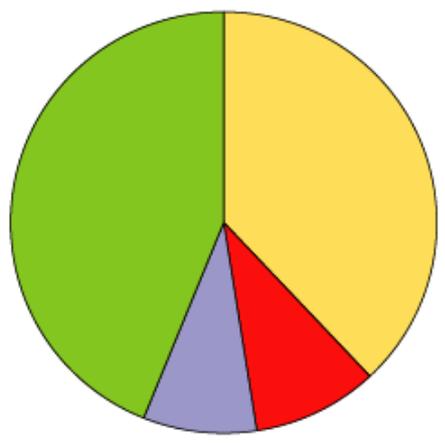


**Findings on sensitive coastal areas:** In general, the further a watershed area is from the coast, the less nitrogen is contributed to an estuary. Patterns are different in the Mobile Bay basin; watersheds contributing the highest amounts are higher up in the watershed, further away from the coast.

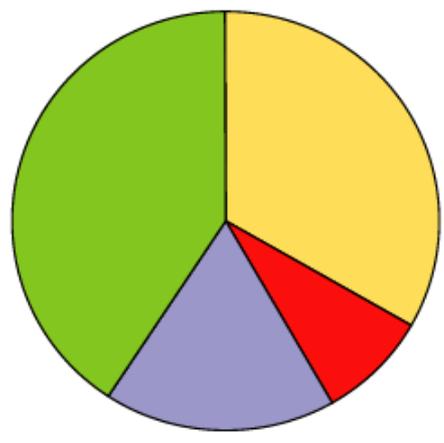


**Findings:** Source shares delivered to sensitive coastal areas vary among the different estuaries.

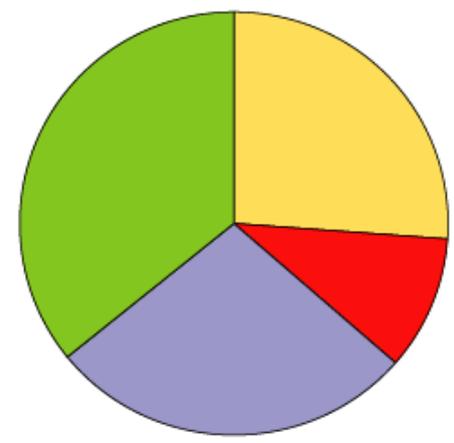
**Mobile Bay**



**Cape Fear Estuary**



**Savannah River Estuary**



-  Atmospheric deposition
-  Agricultural sources
-  Runoff from developed land
-  Point-source discharge



## Web Access:

<http://tn.water.usgs.gov/pubs/ja/ABH/index.html>

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