

# **US EPA National Rivers and Streams Assessment (NRSA) LOWER MISSISSIPPI RIVER (Louisiana)**

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**Lower Mississippi River Conservation Committee**



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# Acknowledgements

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**U.S. Environmental Protection Agency (USEPA)  
USEPA Laboratories  
Louisiana Department of Environmental Quality  
Tetra Tech Environmental Consultants**



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# Outline

- **Introduction**
- **Objectives**
- **Study Design**
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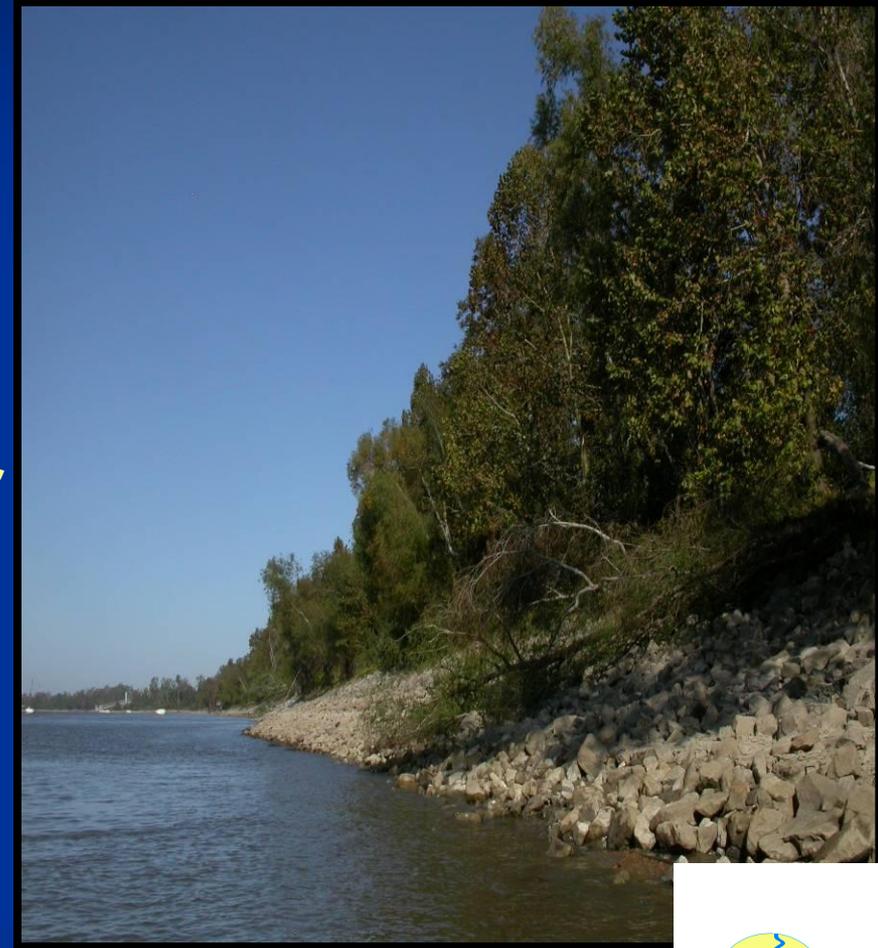


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# Introduction

- **Little widespread ecological data collection effort on large rivers throughout the United States**
- **NRSA –Large Rivers beginning of large river data collection efforts incorporating :**
  - Water and sediment quality**
  - Biological collections**
  - Fish tissue**
  - Habitat characterizations**



# Objectives

- **Evaluate environmental conditions in the Lower Mississippi River using NRSA indicators**
- **Make study data available to state to help with local large river assessments**



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# Study Design

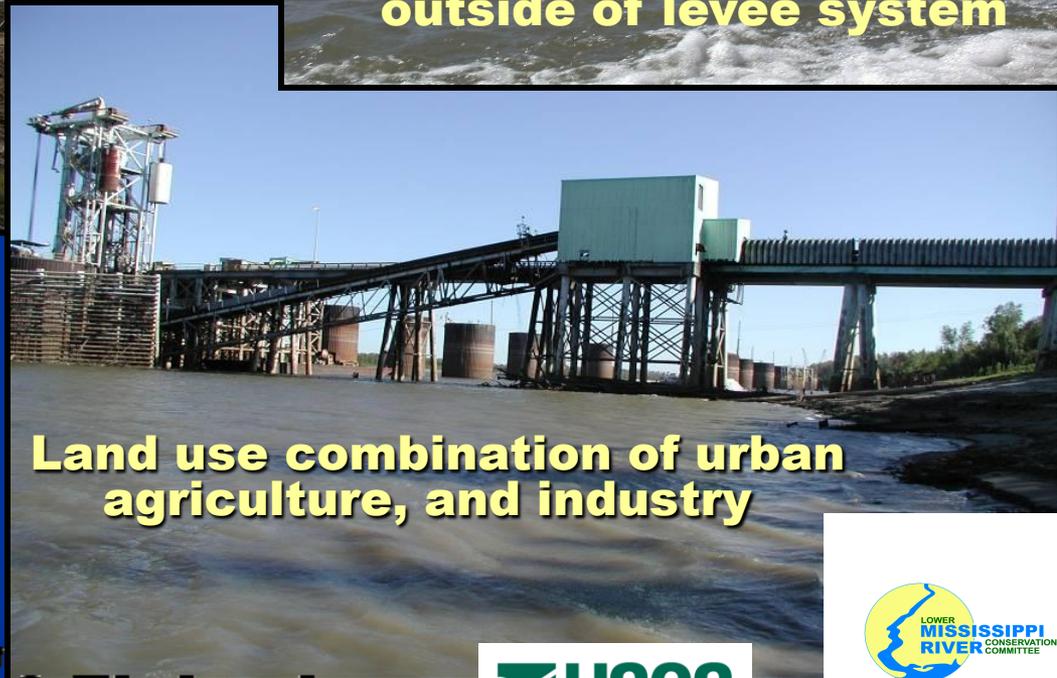
**Study area– Lower Mississippi River entirely in Louisiana**



**River bound by levee system except two most northern sites**



**Water use river intakes and outfalls count for most of water exchange outside of levee system**



**Land use combination of urban agriculture, and industry**



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# Study Design

## Heavy Industry and Transportation-

Two major port cities in study area (Baton Rouge and New Orleans)

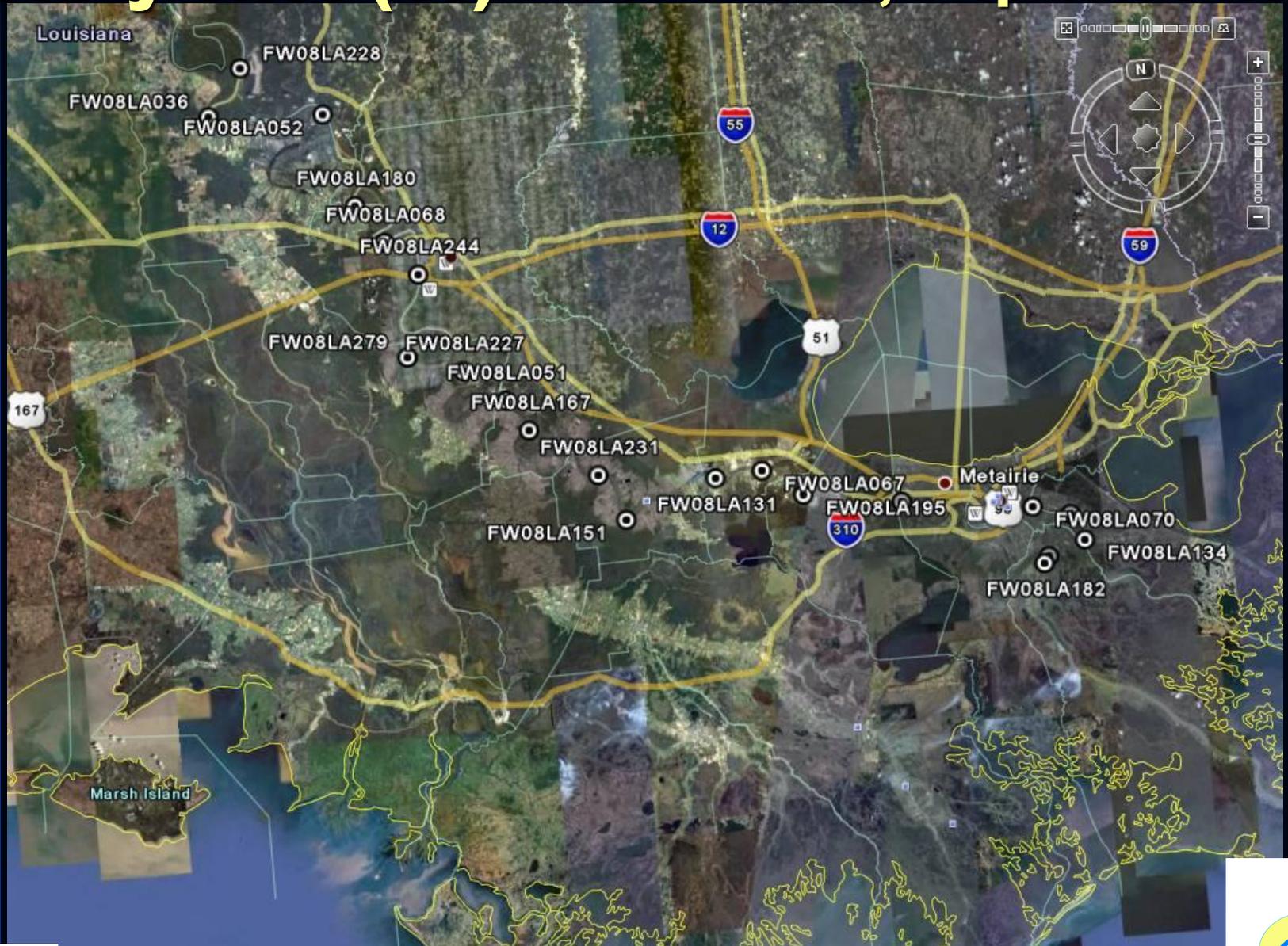
River used for transportation and storage of goods from up river and the Gulf of Mexico



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# Study Sites (16) -- 7 urban sites, 2 replicate sites



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# Data collection methods

## NRSA Data collection in the Lower Mississippi River included the following indicators:

- Field parameters (pH, DO, Temp, SpCond, Secchi)
- Water quality (TP, TN, Ions, Alk, DOC, TOC, TSS, SpCond, entero, chl a)
- PPCP water samples in urban areas (personal care products)
- Sediment enzymes
- Biological communities (identification and enumeration)
  - Phytoplankton (mid-channel)
  - Periphyton (near bank: id, chl a, biomass, and APA)
  - Benthic macroinvertebrates (near bank and snag samples)
  - Fish
- Fish tissue (contaminates in tissue)
- Physical habitat assessment (reach-level and riparian zone)
- Site characterization (GIS, desktop evaluation)



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# Water, sediment, benthic communities, and habitat

U.S. Geological Survey (USGS) LA Water Science Center-  
collection of water quality, sediment, periphyton and benthic  
macroinvertebrates communities, and habitat

Dennis Demcheck  
Stan Skrobialowski  
John Lovelace  
Mike Ross  
Chris Swarzenski  
Scott Mize



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# Water and sediment collection

Water quality sample collection and in-situ field parameters recorded from five locations along middle transect of reach



Sediment sample collection along stream bank composite into bucket, mix, and subsample to obtain sample

# Periphyton (algae) collection

Algae attached to hard substrates such as rocks, wood, or rip-rap collected by scrubbing defined surface area and rinsing into bottle

Reach-wide composite periphyton samples were subsampled for:

- identification and enumeration
- periphyton chlorophyll a
- ash-free dry mass (biomass)
- APA (Acid/Alkaline Phosphatase activity)



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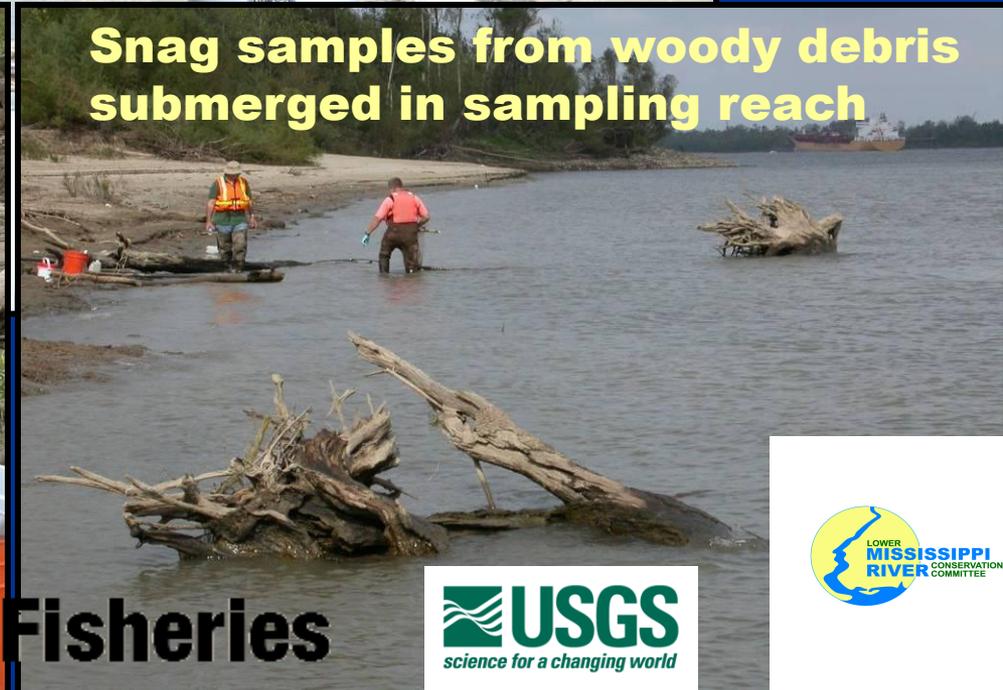
# Macroinvertebrate Collection



Near bank sample sweeps from sediment, rock, wood, or rip-rap



Snag samples from woody debris submerged in sampling reach



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# Habitat Data Collection

Near shore habitat measurements  
(i.e. canopy cover)



Articulated concrete  
mat and rip-rap –

Used for bank stabilization  
in Lower Mississippi River



Mid-channel habitat  
measurements  
(i.e. thalweg profile)



Burrowing habitat



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# Fish Collection

Louisiana Department of Wildlife and Fisheries (LDWF) -  
- collection of fish community and fish tissue

Melissa Kaintz  
Tim Ruth  
Matt Duplessis  
Jeff Thompson



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## EPA LOWER MISSISSIPPI RIVER PROJECT

- Part of national rivers/streams assessment (LA DEQ and USGS)
- Electrofished 16 sites from St. Francisville to Belle Chase, LA
- October – December 2008
- 10 – 400 m transects at each site
- Sample first 5 transects or continue until 500 fish collected (sampled entire reach at 11 sites)



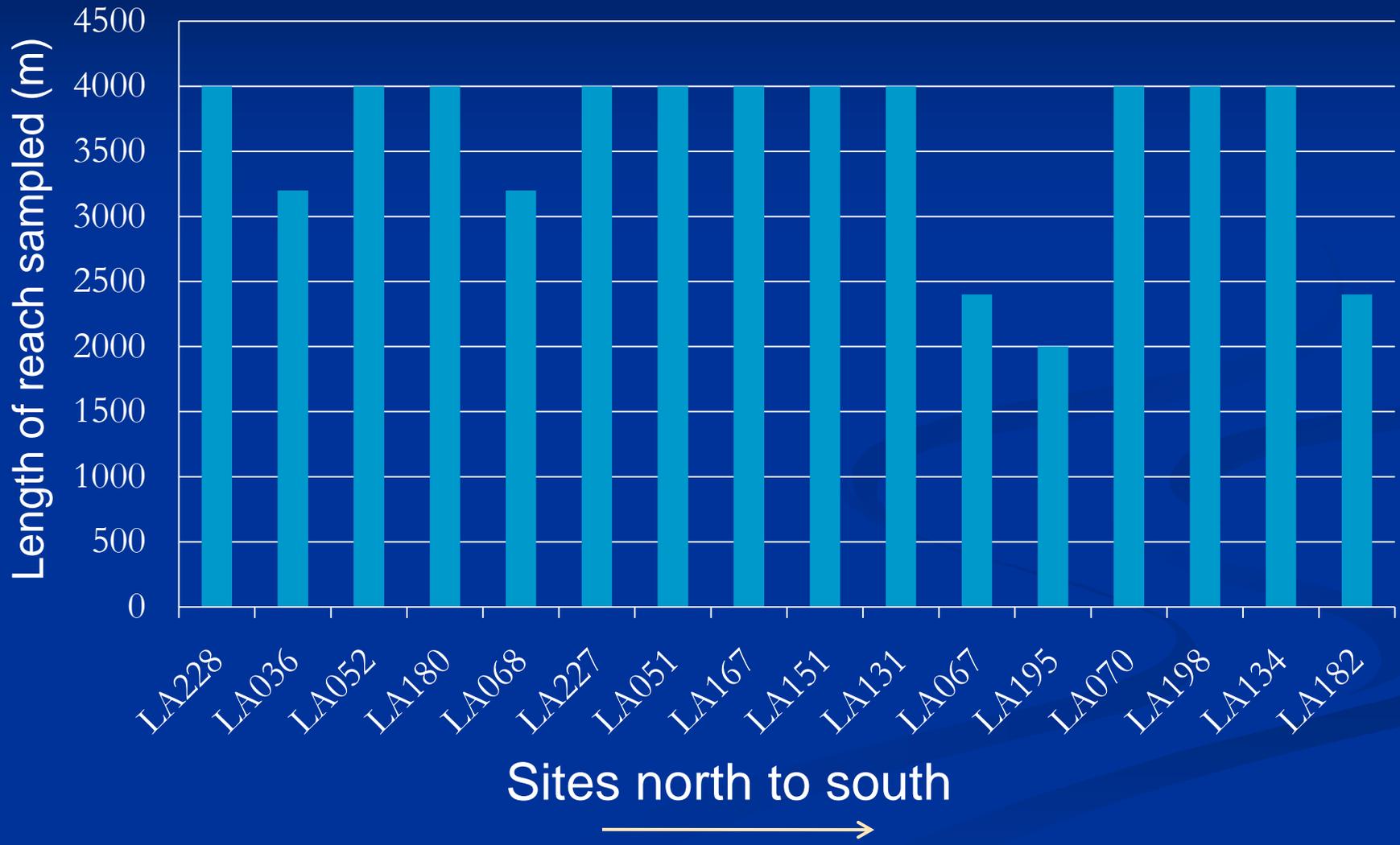


## EPA LOWER MISSISSIPPI RIVER PROJECT

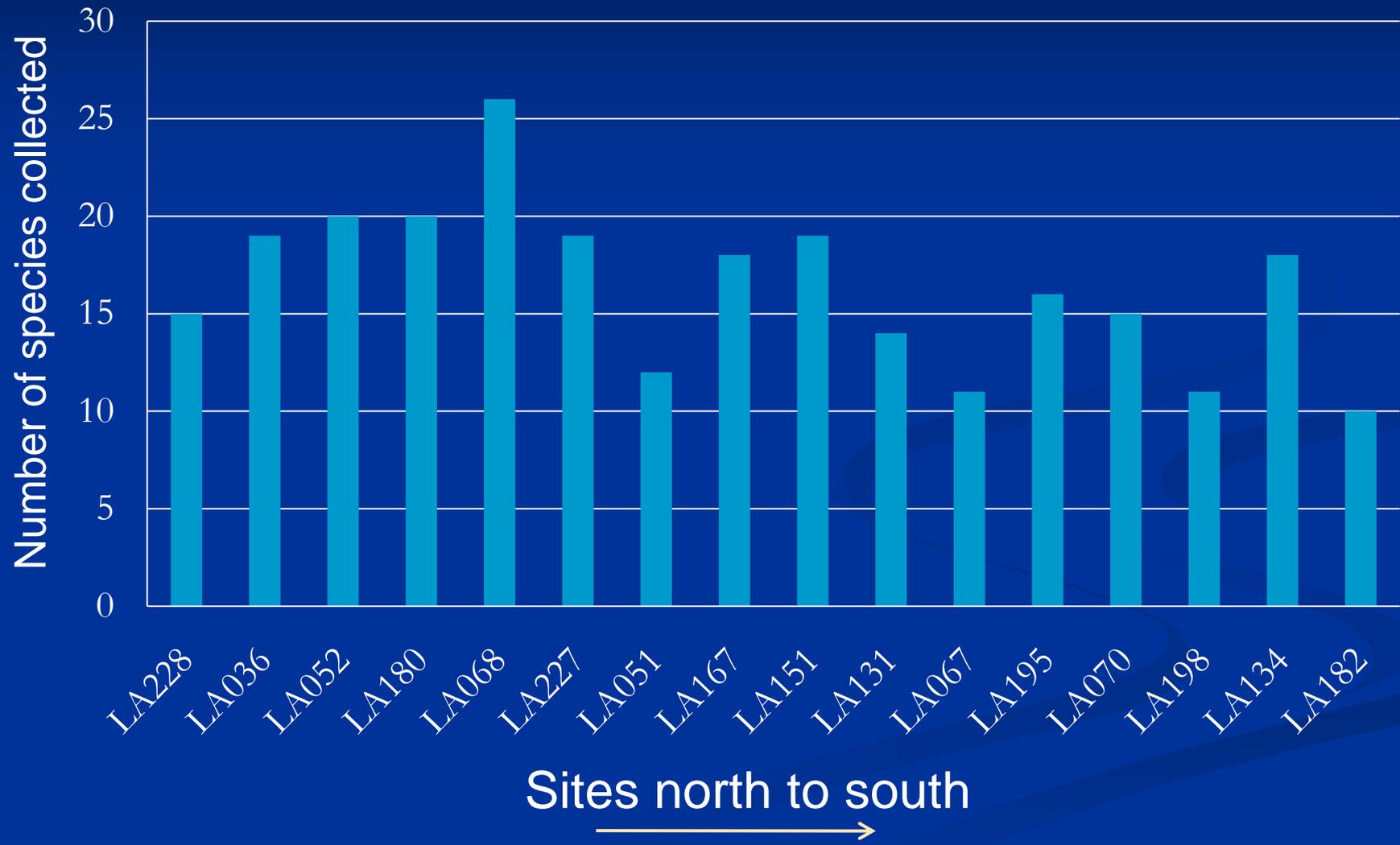
- Recorded common name, number of fish, and length of shortest and longest fish of each species
- Collected fish tissue samples at each site (LMB, catfish, etc)



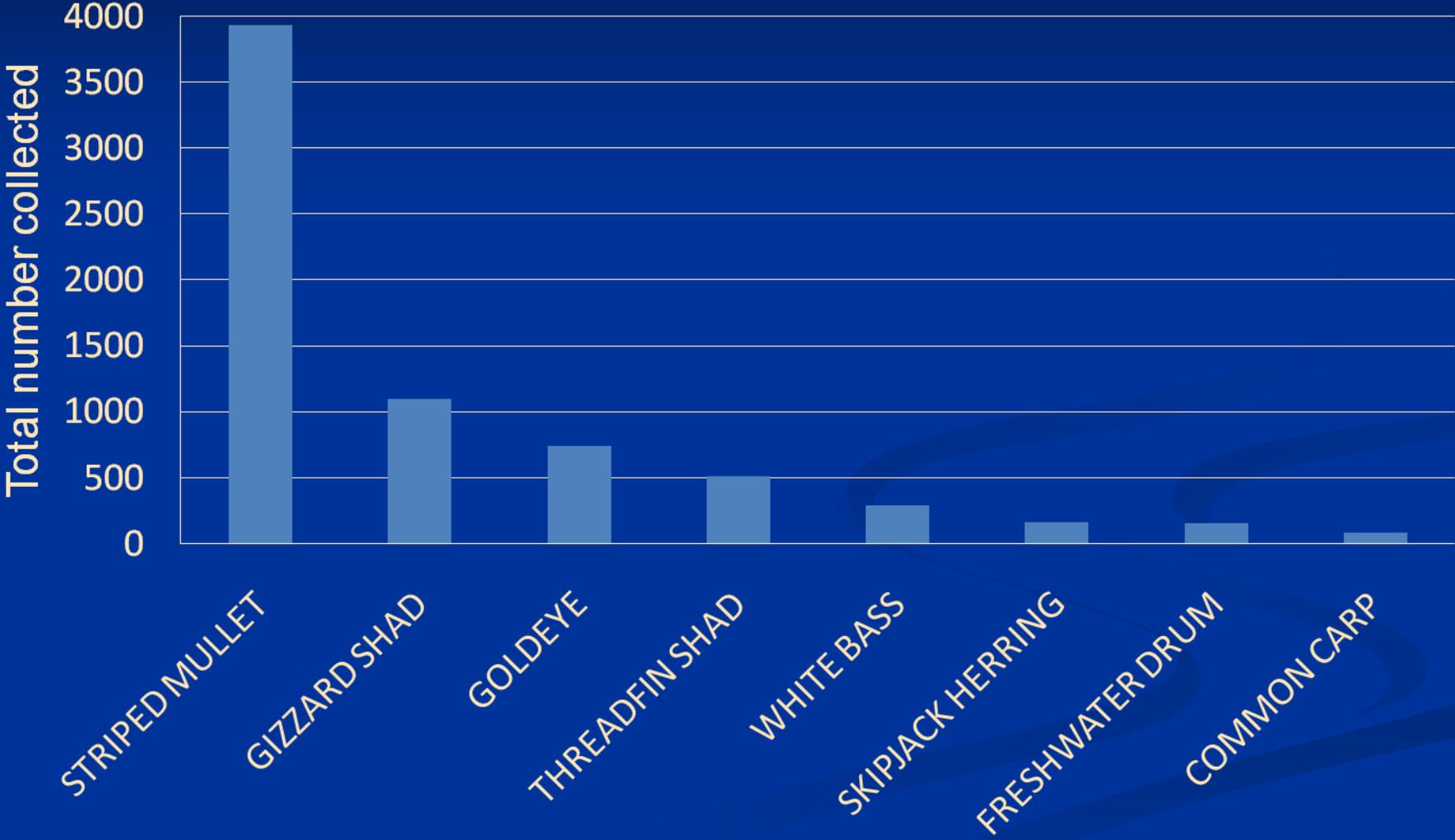
# Sample Reaches



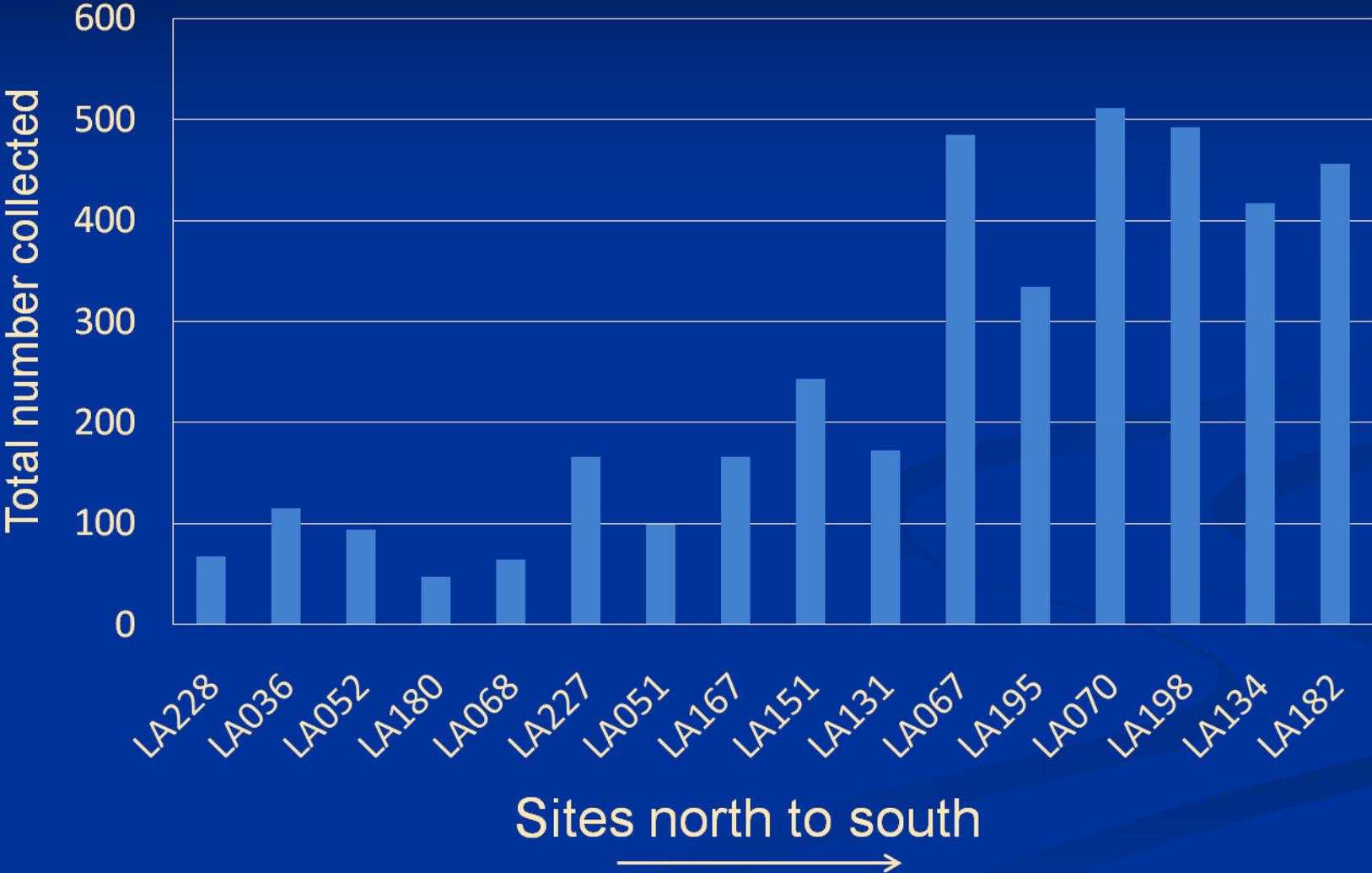
# Species Diversity



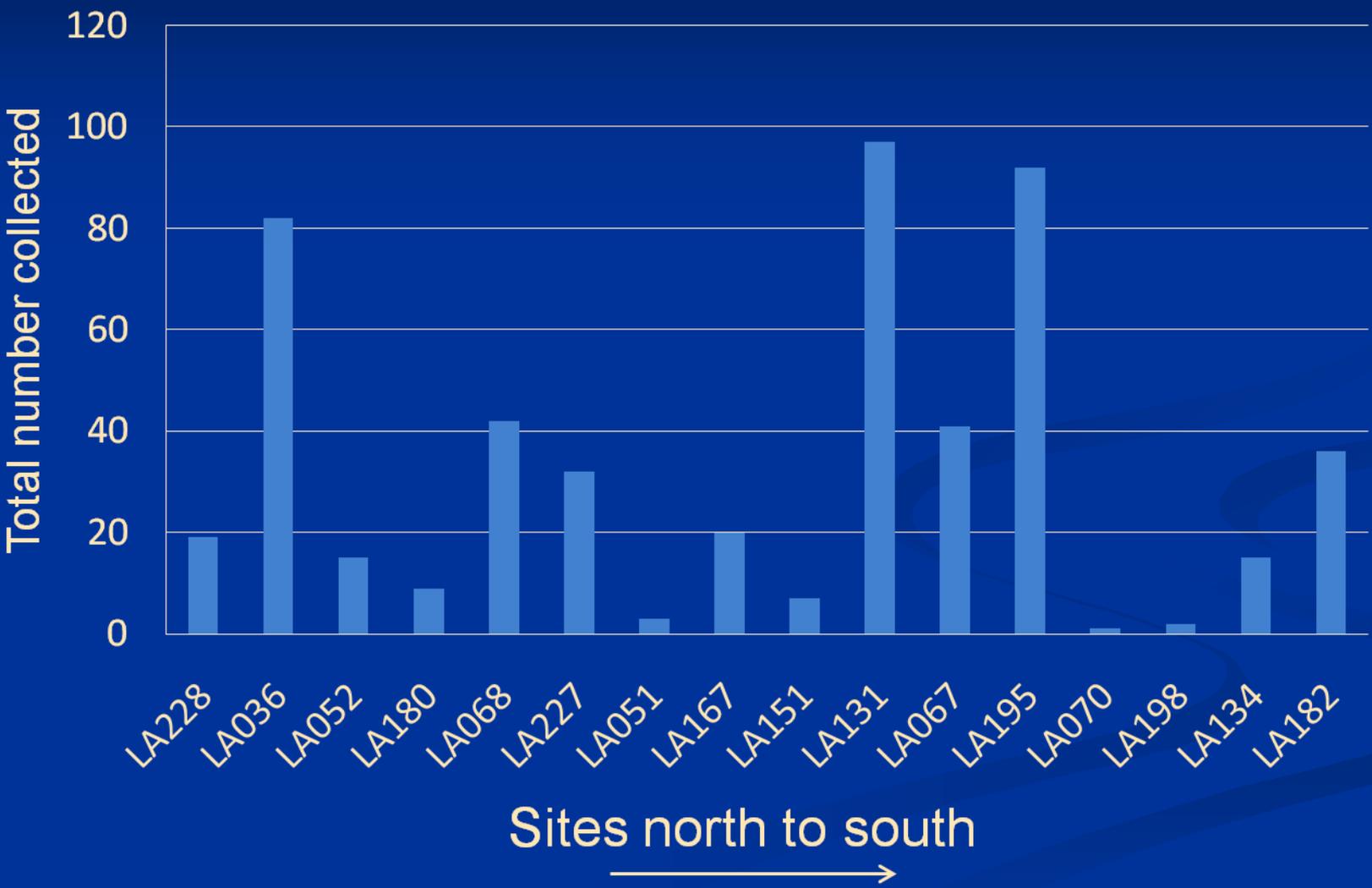
# Species Abundance



# Striped Mullet



# Threadfin Shad



# Progress to Date

## Environmental samples

- Sample collection completed December 5, 2008
- All samples processed, shipped, and received by laboratories
- Awaiting laboratory and database results

## Fish Voucher specimens

- Voucher specimens have been verified by Dr. Todd Slack, formerly with the Mississippi Museum of Natural History
- Specimens returned to LDWF awaiting direction as to where to ship for long-term storage

## Field Sheets

- Completed, reviewed, shipped to USEPA, and received April 8, 2009



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# Questions (?)



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