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Great Rivers Reference Condition Workshop

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Sponsored by

The U.S. Environmental Protection Agency and The Council of State Governments

U.S. EPA Office of Research and Development

Environmental Monitoring and Assessment Program

Mississippi Department of Environmental Quality's Non-wadable Streams Bioassessment Methods Development Project

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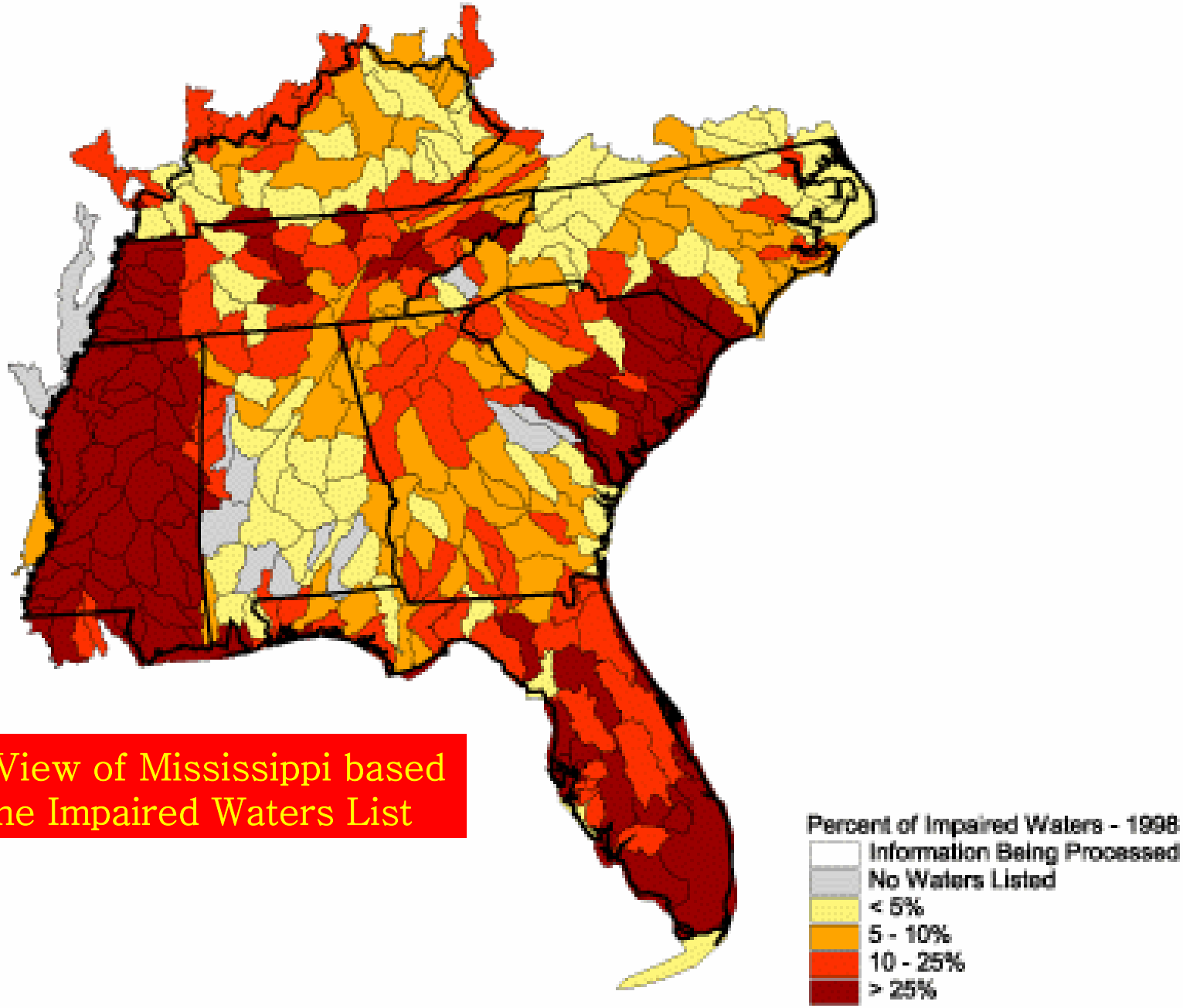
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

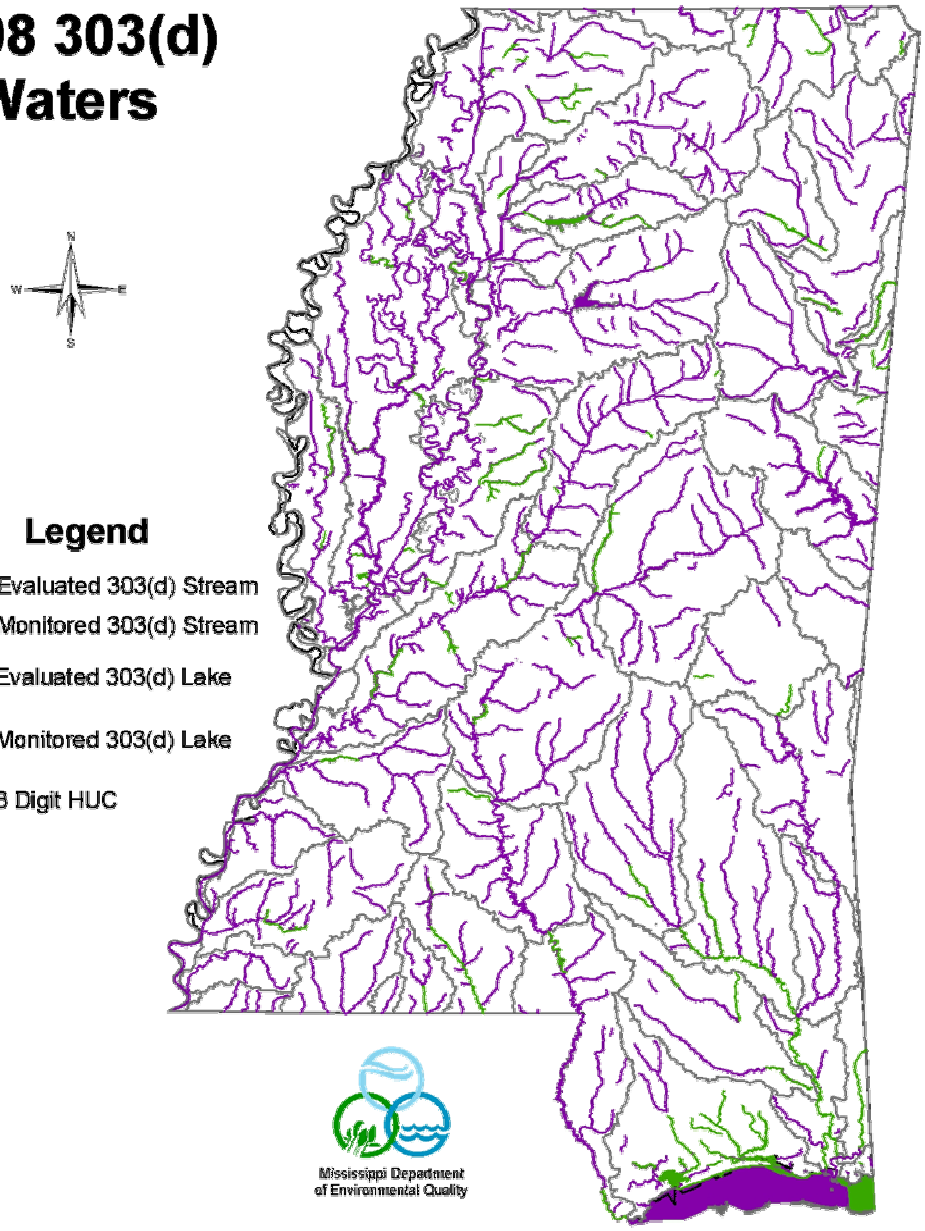
Early 1980's environmental groups file lawsuits forcing EPA to establish impaired water bodies list a.k.a. 303(d) and declare TMDL's

1997 the Sierra Club sued EPA for not developing TMDL's



1998 View of Mississippi based on the Impaired Waters List

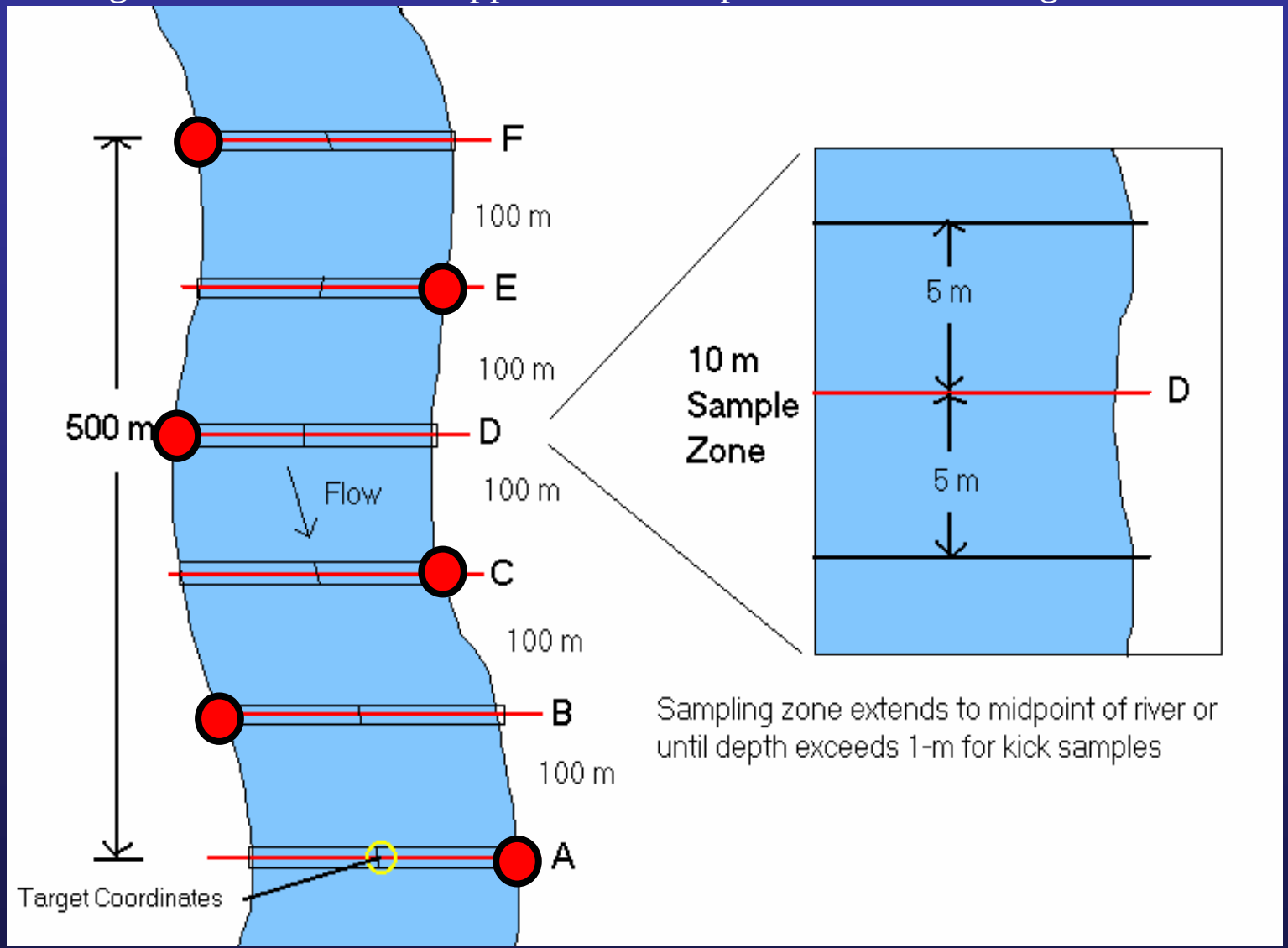
1998 303(d) Waters



Large River Method Development

- Wanted to collect nutrient samples for nutrient criteria development and other physical/chemical water quality parameters
- Wanted to develop a method to be used in non-wadeable streams and rivers
  - Biological Assessment using Benthics
  - Physical Habitat Assessment
  - Substrate Composition
  - Began to review Joe Flotemersch's work
    - Very involved
    - Too much work for our limited resources

Example of the 6 transects and 6 sample zones for collection of benthic macroinvertebrates in the Pascagoula river of Mississippi. This example starts on river-right.

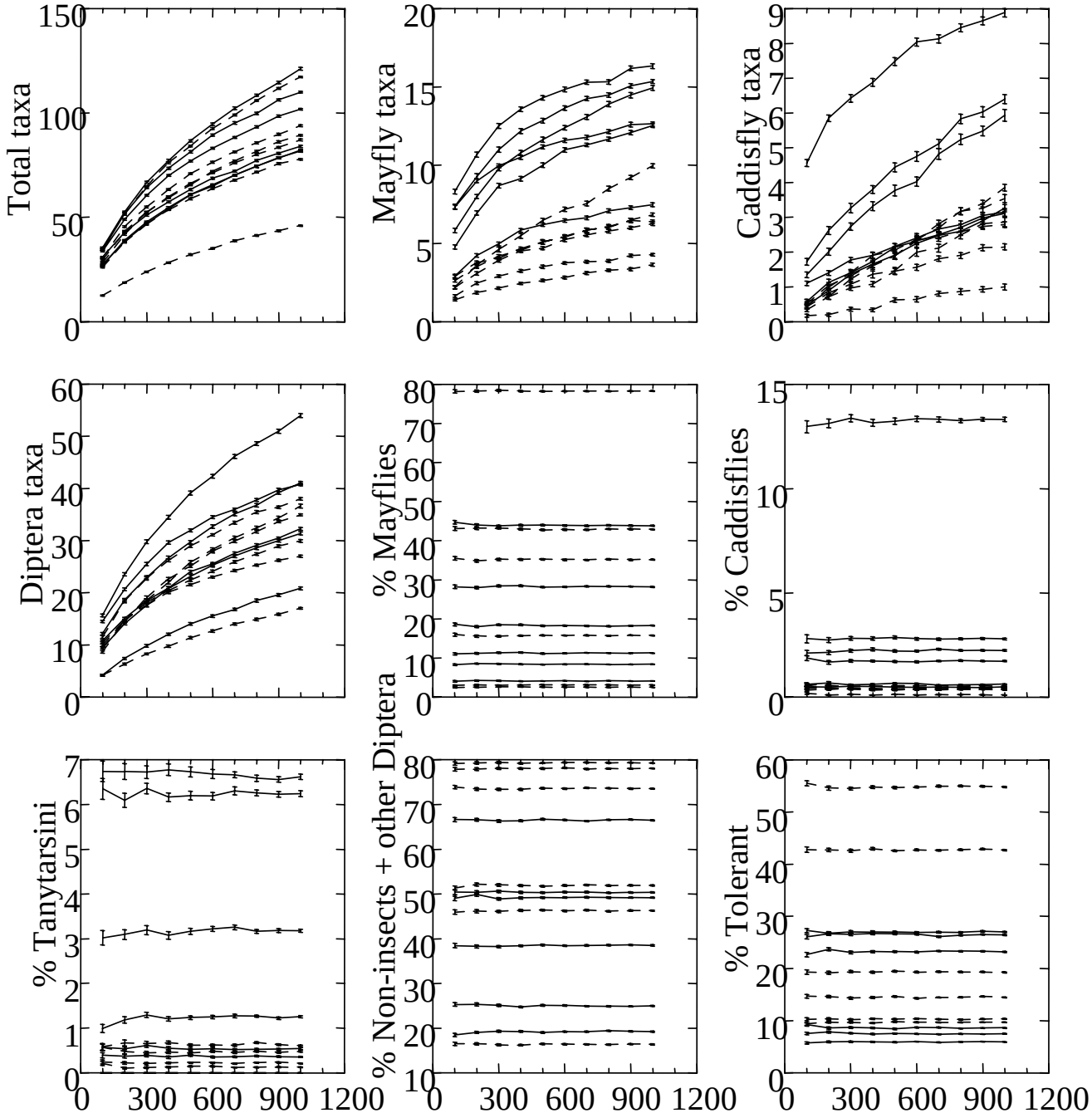


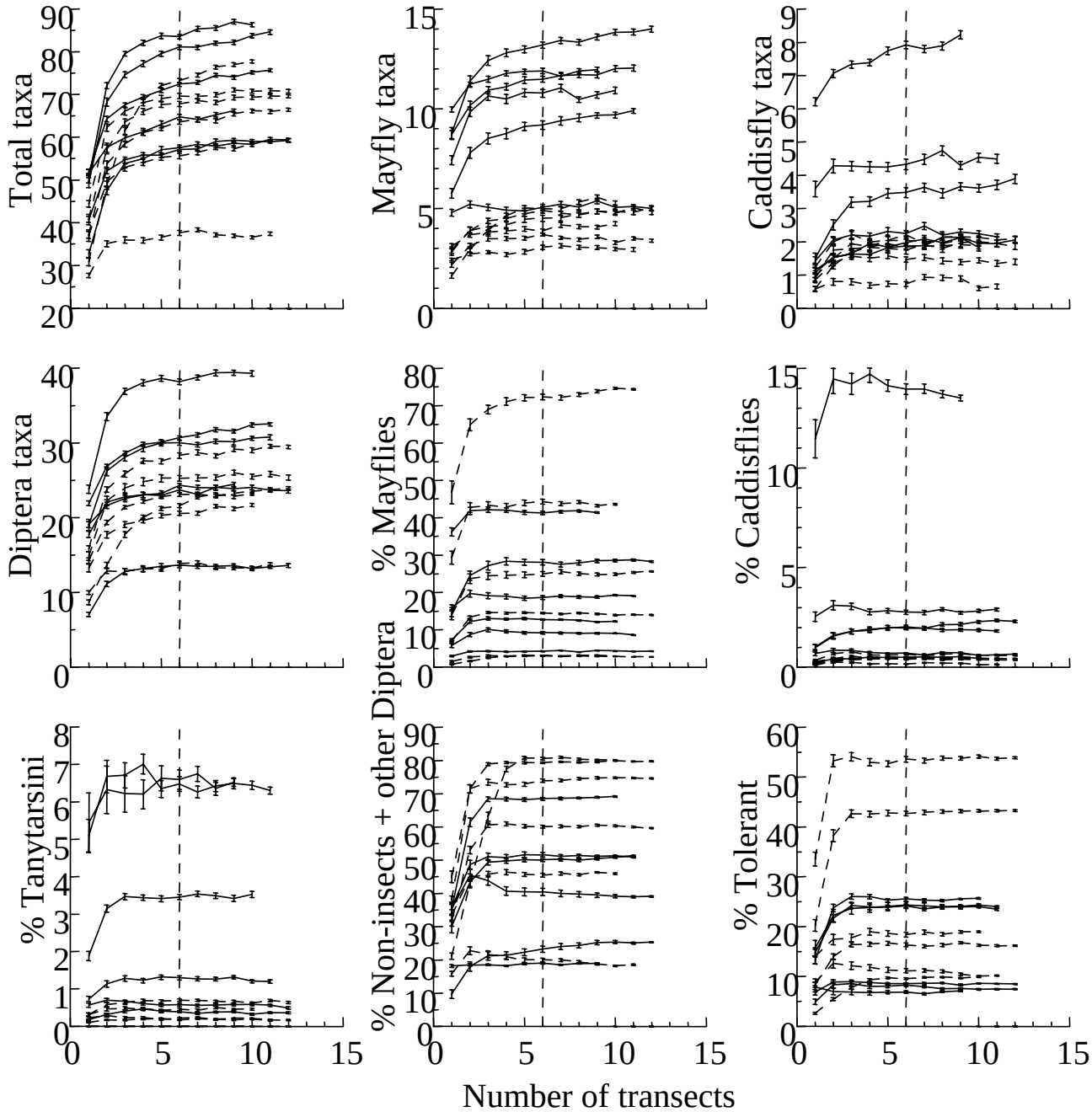
Modifying the Sampling Protocol

- Shorten the reach by 1/2 (i.e. 200 m) and sample both banks at all transects
- Establish the 500 m reach specified, then randomly select 3 of 6 transects to sample on both banks
- Establish the 500 m reach specified, then randomly select L or R bank and sample at all 6 transects
- Establish the 500 m reach specified, then randomly select L or R bank at lowermost reach and alternate banks for entire reach

Number of Organisms

- 500 specified
- What if this is reduced from 500 to 300?
- What if this is reduced from 500 to 200?


Total taxa
Mayfly taxa
Caddisfly taxa
Diptera taxa
% Mayflies
% Caddisflies
% Tanytarsini
% Non-insects + other Diptera
% Tolerant
Subsample size


Total taxa
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Diptera taxa
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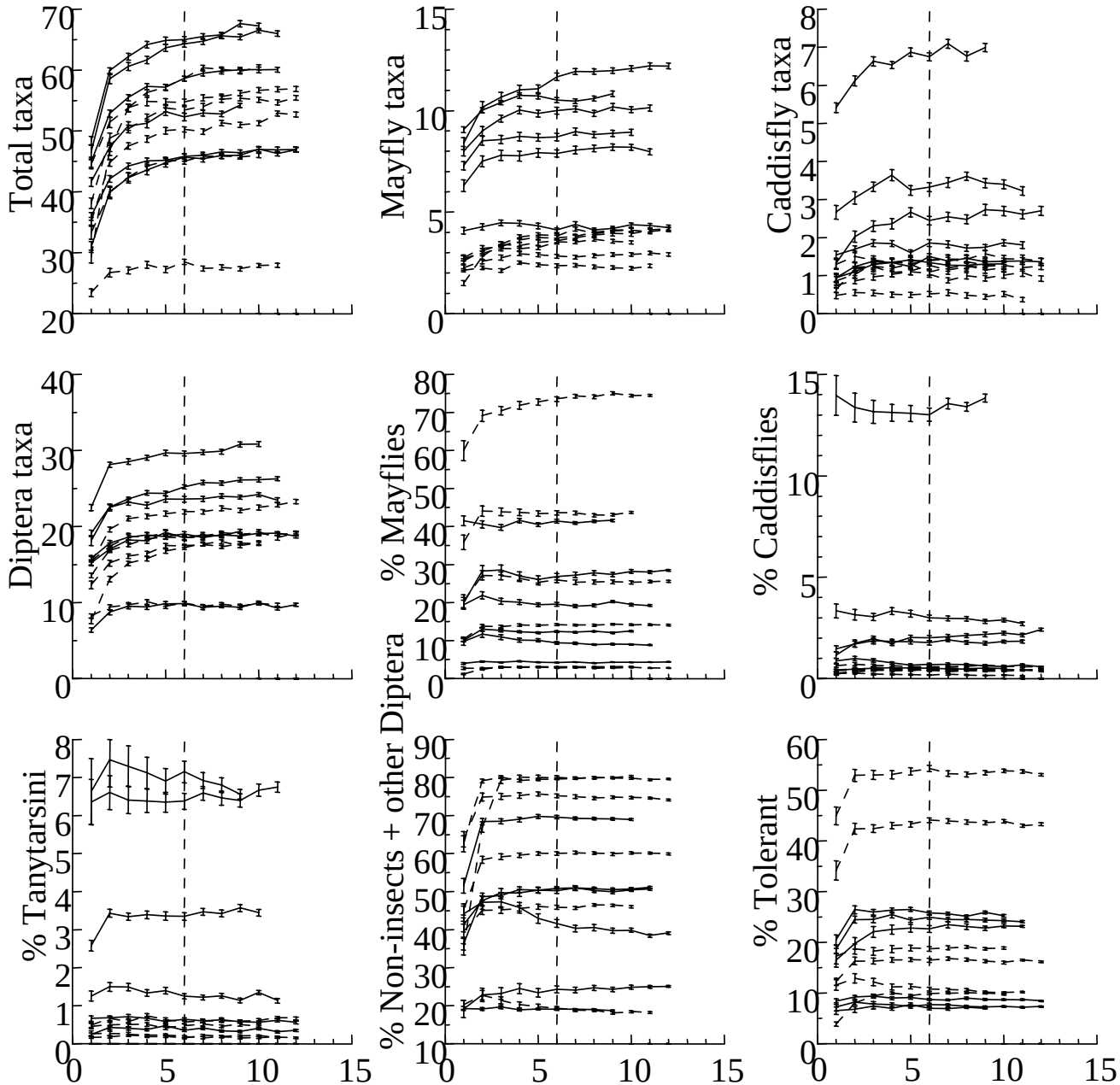
% Caddisflies
% Tanytarsini
% Non-insects + other Diptera
% Tolerant
Number of transects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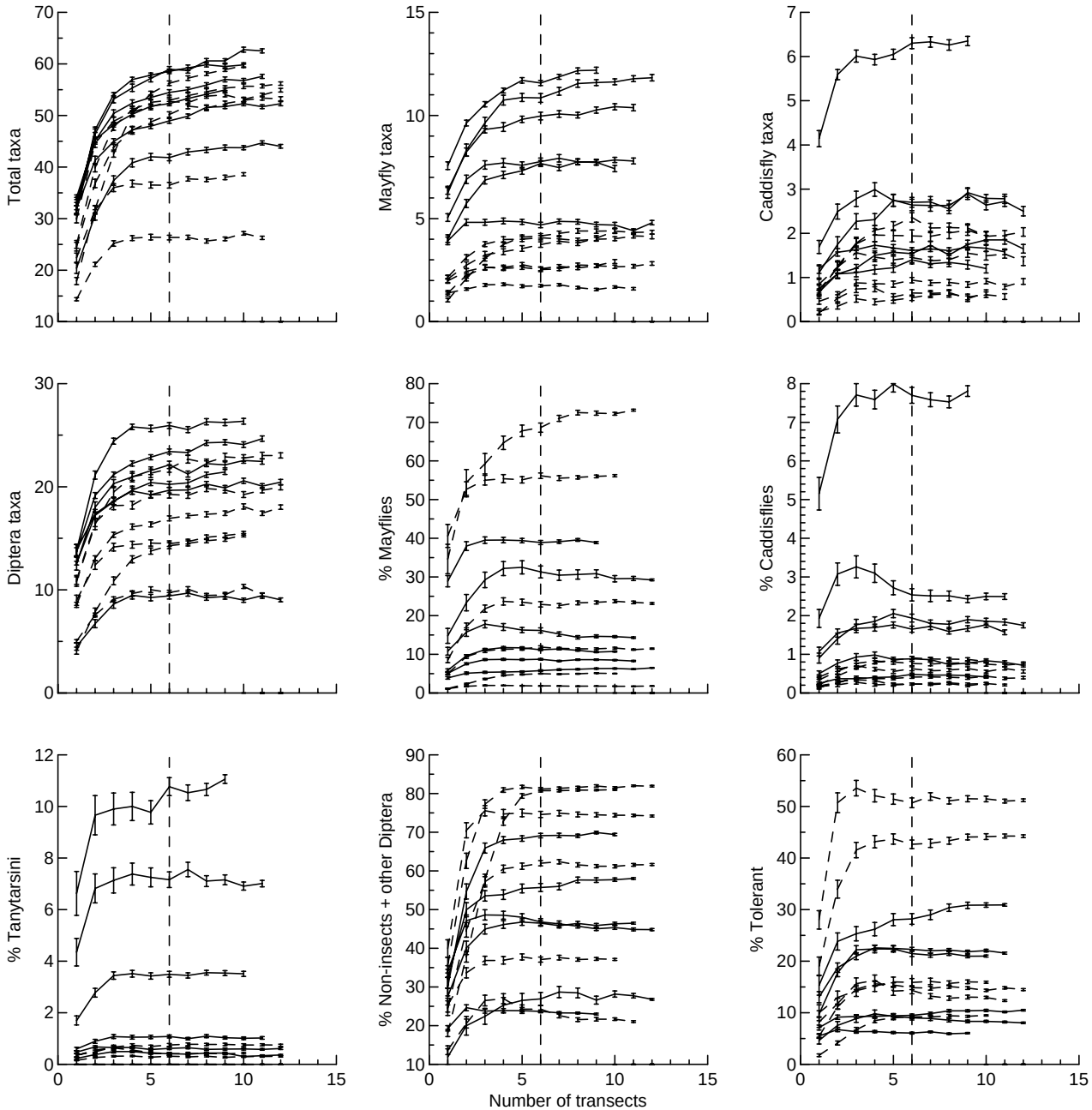
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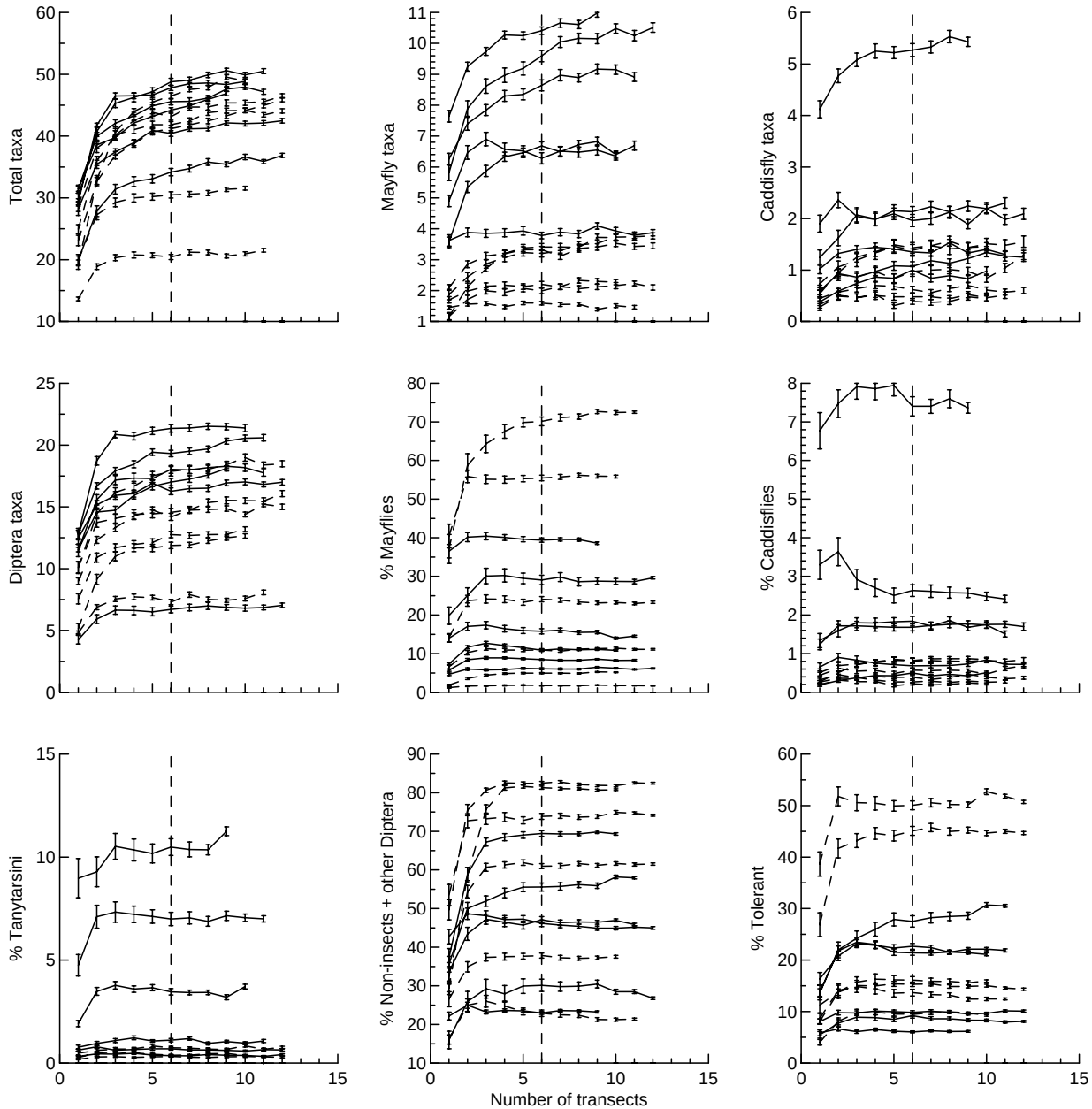
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% Non-insects + other Diptera
% Tolerant
Number of transects

Choices

6 transects/both banks/500 organisms

↓

6 transects/ both banks/300 organisms

↓

6 transects/ alternative banks/300 organisms

↓

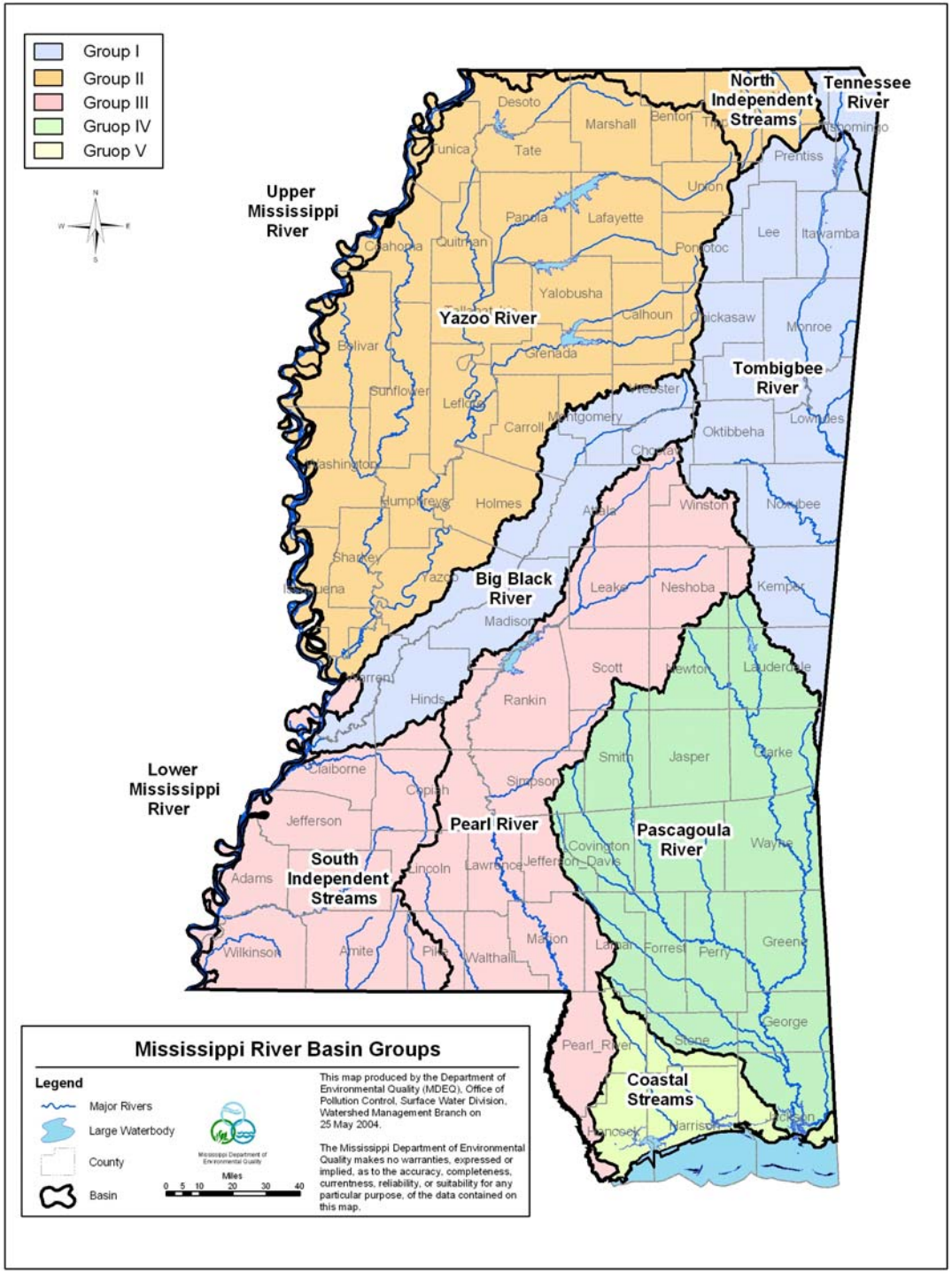
6 transects/ alternative banks/200 organisms

Summary of the MDEQ Methodology

- 500 meter reach
- 6 transects, randomly select L or R bank at lowermost reach, then alternate through entire reach
- 300 organism sub-sample
- Habitat assessment (as per Joe's methods)
- Depth composited samples for nutrient criteria development collected at the lower-most reach only (USGS recommendation)
- In-situ measurements at the lower-most reach only
- Particle size distribution
- Phytoplankton sample collection
- Begin sampling 2005 (August, September, October(?)

MDEQ Methodology continued

- Data Generated to be used to develop an IBI (Biocriteria?)
- Data /IBI to be reported in states 305(b) report


Group I
Group II
Group III
Gruop IV
Gruop V
Upper Mississippi River
Lower Mississippi River
North Independent Streams
Tennessee River
Yazoo River
Tombigbee River
Big Black River
Pearl River
Pascagoula River
South Independent Streams
Coastal Streams
Desoto
Marshall
Benton
Tunica
Tate
Prentiss
Union
Panola
Lafayette
Lee
Itawamba
Calhoun
Chickasaw
Monroe
Bolivar
Grenada
Sunflower
Carroll
Montgomery
Oktibbeha
Lowndes
Washington
Humphreys
Holmes
Winston
Noxubee
Yazoo
Leake
Neshoba
Kemper
Madison
Scott
Newton
Lauderdale
Warren
Hinds
Rankin
Smith
Jasper
Clarke
Claiborne
Copiah
Simpson
Jefferson
Covington
Wayne
Adams
Lincoln
Lawrence
Jefferson Davis
Wilkinson
Amite
Pike
Walthall
Marion
Lamar
Forrest
Perry
Greene
George
Stone
Pearl River
Hancock
Harrison
Mississippi River Basin Groups
Legend
Major Rivers
Large Waterbody
County
Basin
Miles
0 5 10 20 30 40
This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Watershed Management Branch on 25 May 2004.
The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.

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“Where are we now”

- Will sample the Pascagoula River(22 sites) in 2006
- Possibly another river within this basin
- Processing of samples from the other sites continues at our lab
  - All samples thus far have met the targeted number of organisms
  - Taxonomy to begin soon
  - Phytoplankton samples to be shipped to taxonomist’s lab for identification
- After all samples are processed and identified (late 2006/mid 2007) development of IBI’s and site assessments
- Sampling additional non-wadeable water bodies and using the IBI tool to assess (2007and beyond)

“Additional Issues”

- What about expanding the sampling zone from 10 to 20 or 30 meters to allow more woody debris to be sampled?
- Will this change the “answer”?
- What about allocating the 36 jabs throughout the entire reach proportionally as we now do for wadeable streams?
- What effect will this have on the data?