Aquatic Community Surveys and Prey Tissue Mercury Results

Progress Report

Phase I System Characterization

south river SCIENCE TEAM

URS

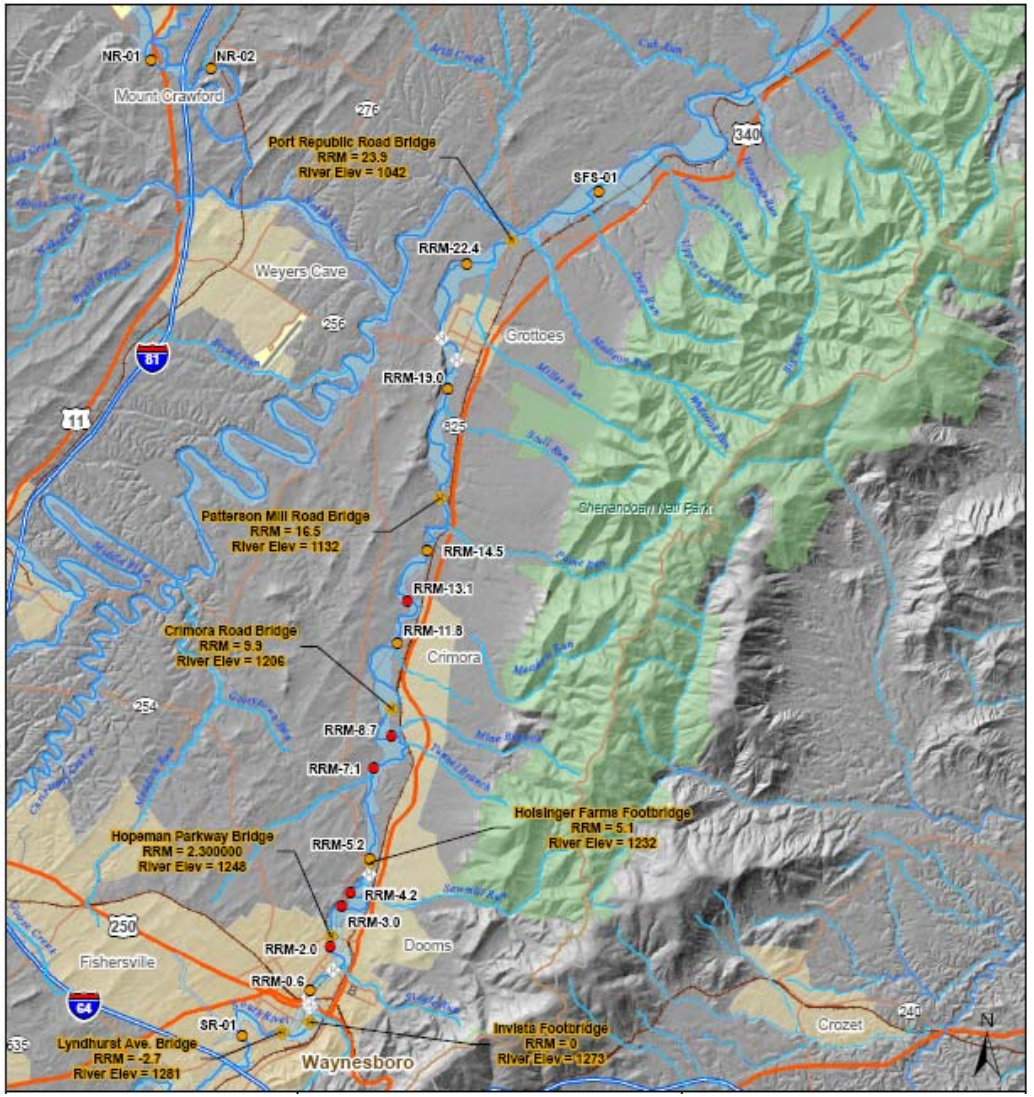
Study Objectives

- Gather baseline aquatic community and prey tissue data along the South River and at reference areas, coincident with data for physical media
- Provide data to aid in the development of a food web model

Baseline Biological Characterization

Sampling Goals:

- Quarterly assessments of biological communities (fish biannually) at 7 baseline stations in study area; 3 reference stations
- Prey tissue collections at 13 baseline stations in study area; 3 reference stations
  - Monthly collections of crayfish tissue
  - Quarterly collections of algae and other invertebrate tissue
  - Biannual collection of prey fish tissue



Baseline Biological Characterization

Aquatic Community Sampling Procedures:

- Invertebrate assessment in riffle and pool using RBP collection techniques
- Fish assessment using electrofishing and block nets for approx. 150-meter reach (riffle and pool)

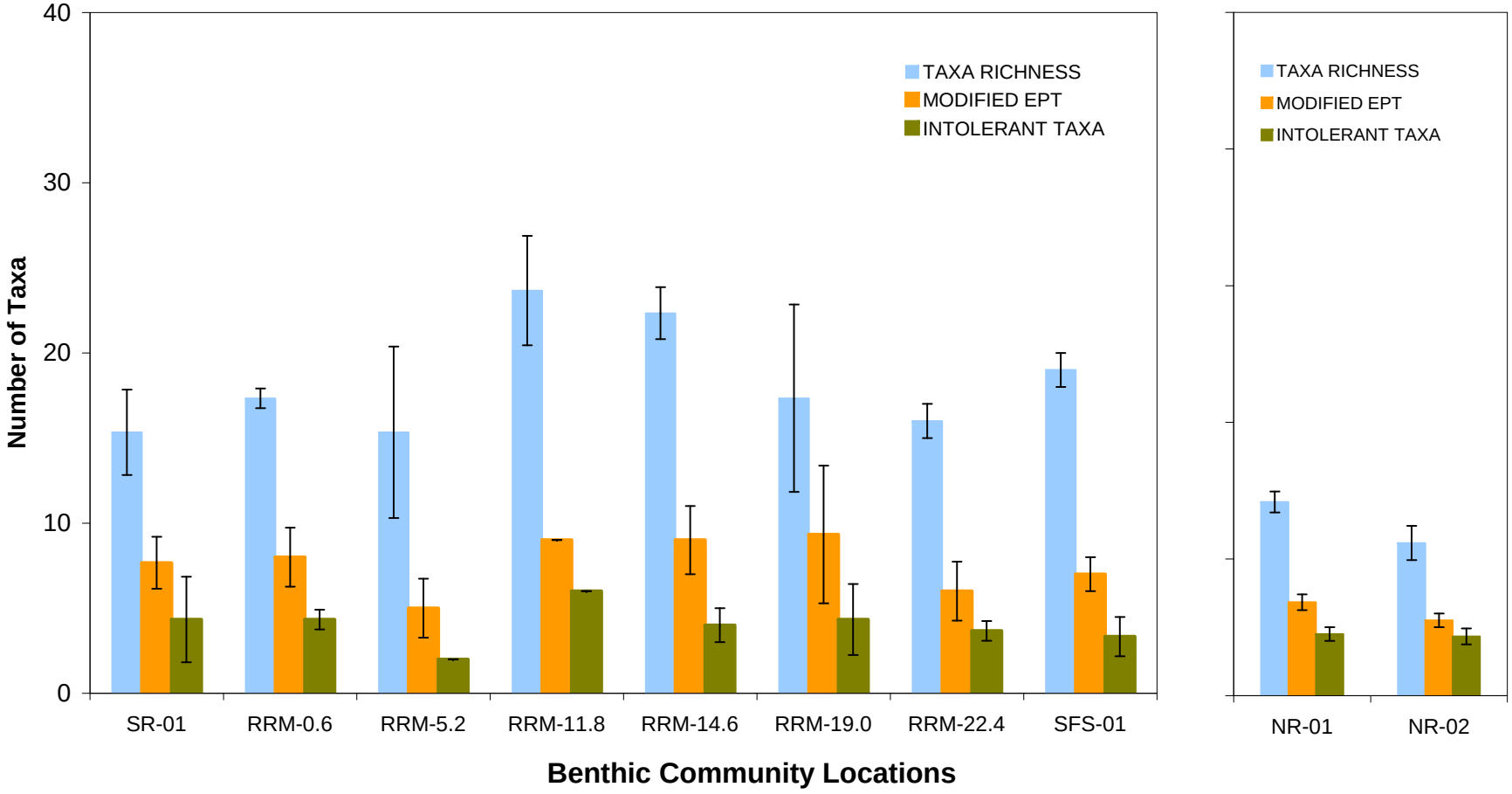
Biota Sampling Procedures:

- Composite samples with controlled size ranges
- Insects and prey fish types targeted from Greg Murphy fish diet study; fish targeted from riffle and pools habitat

Invertebrate and Fish Community Assessments

May and August 2006

Benthic Invertebrate Richness Metrics
Phase I System Characterization
Ecological Study May



Benthic Invertebrate Density
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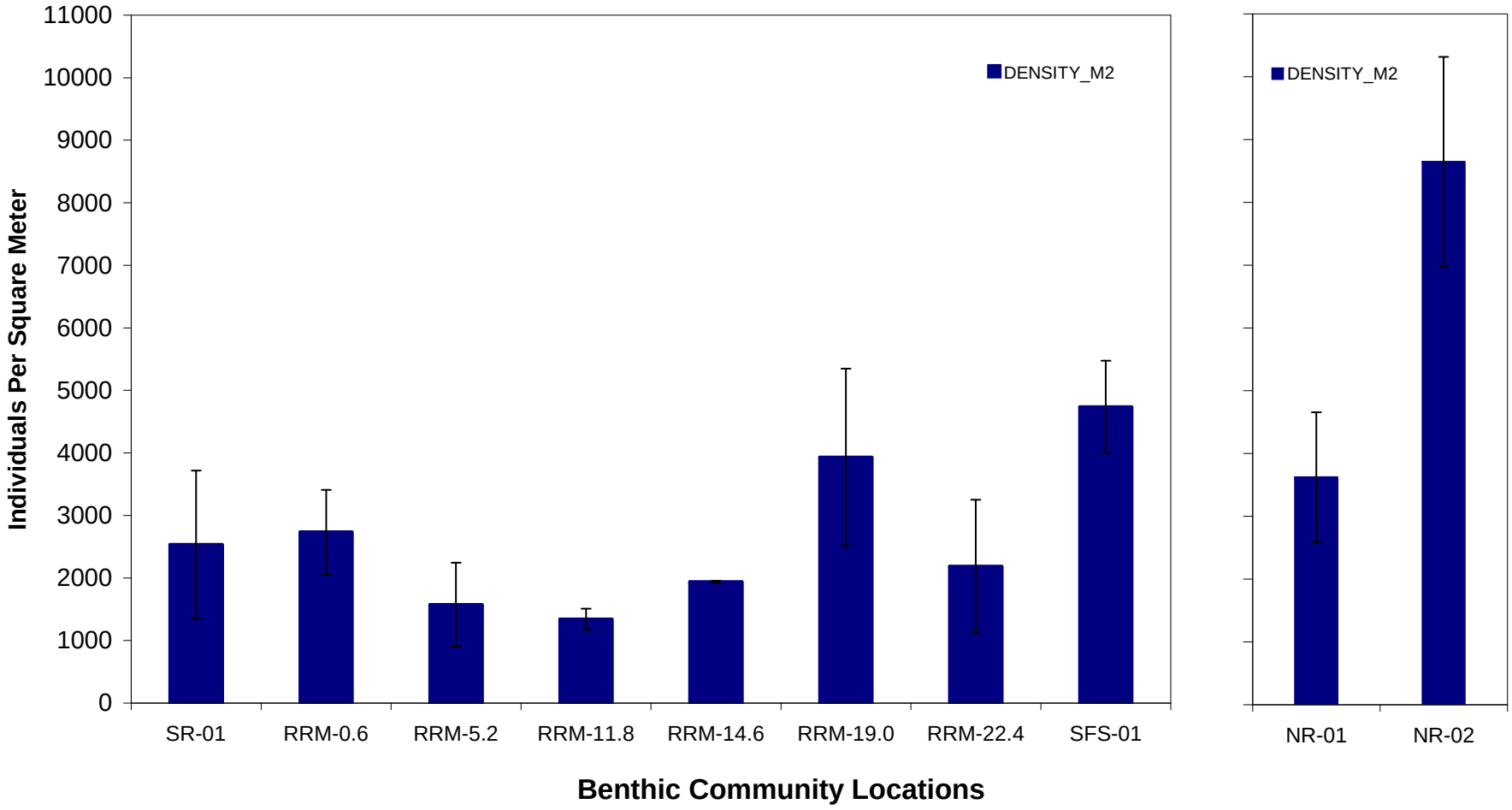

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Percent Composition of Benthic Invertebrate Trophic Feeding Groups
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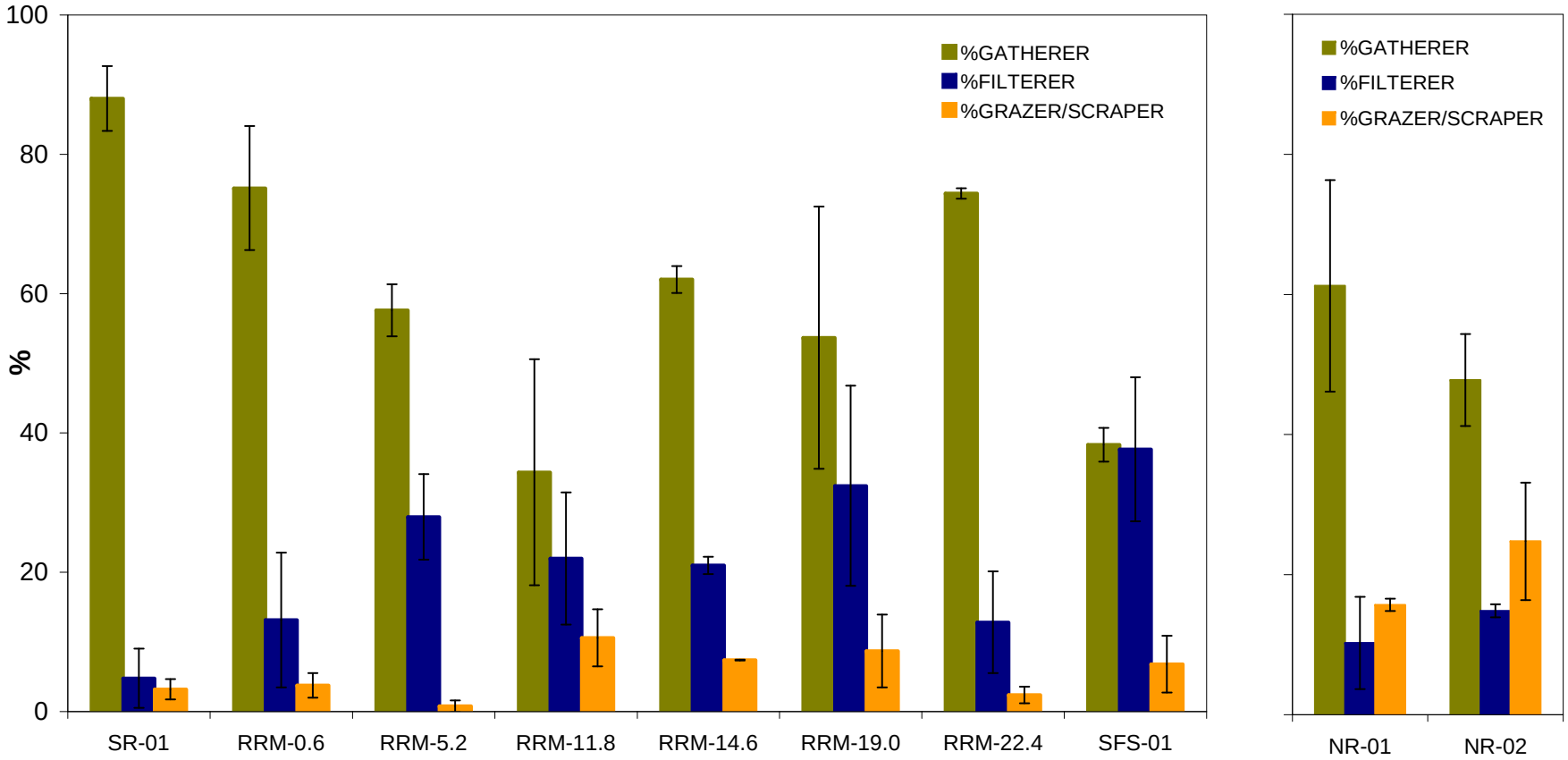
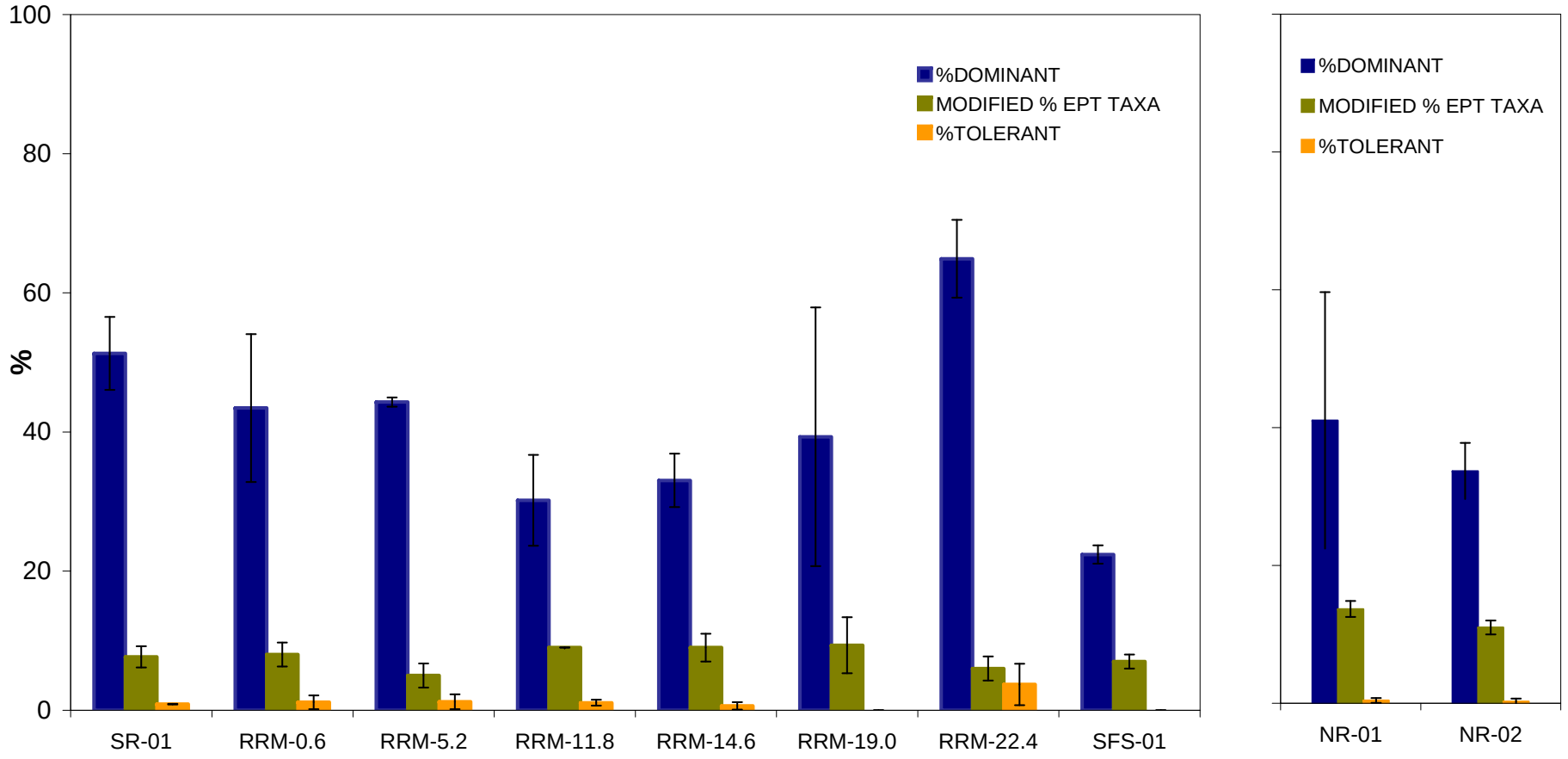


Percent Dominant, Modified EPT, and Tolerant Taxa
Phase I System Characterization
Ecological Study May



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Fish Community Taxa Richness (May & August)
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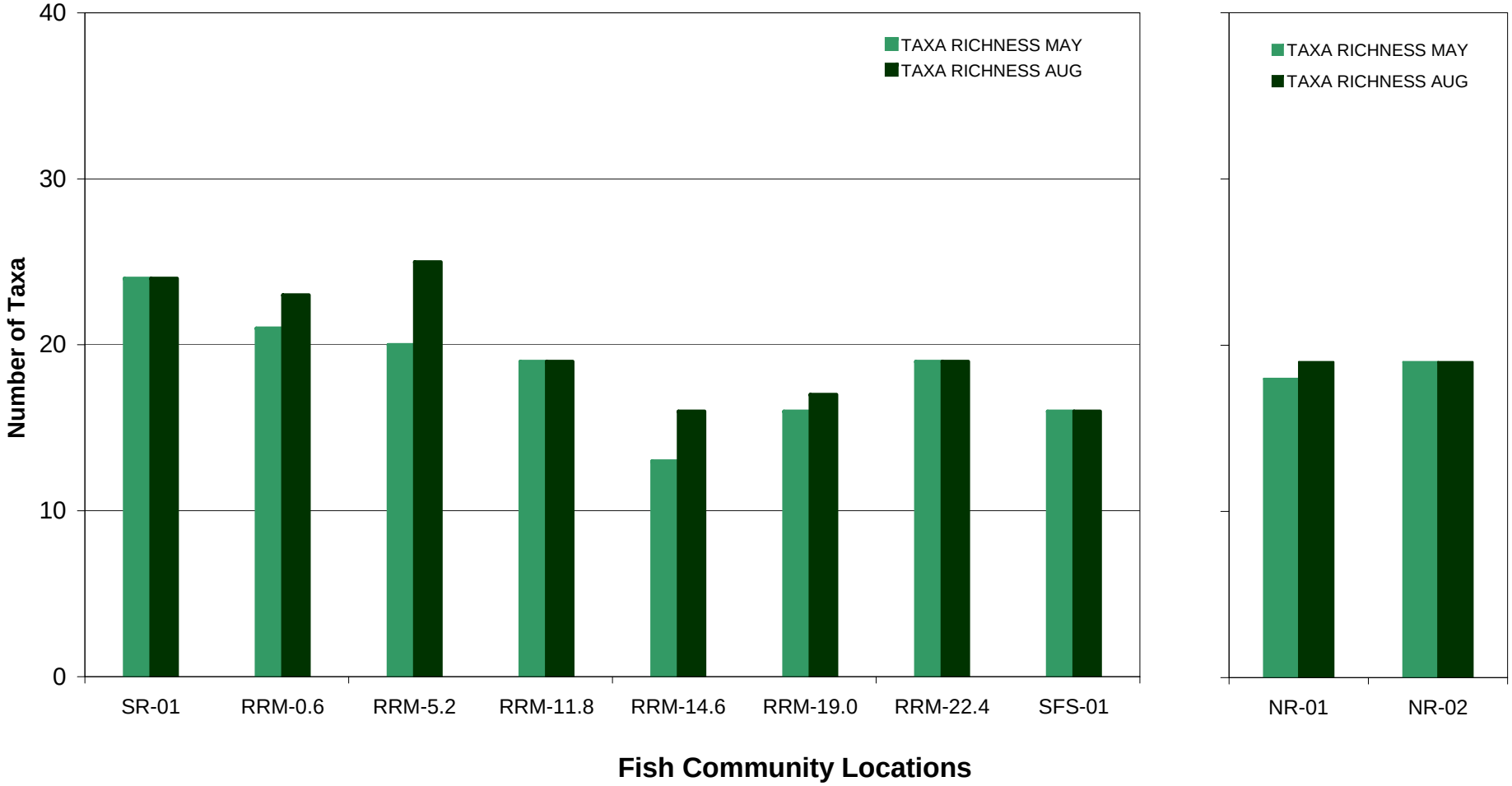
Ecological Study



Fish Community Sampling Efficiency (May and August)
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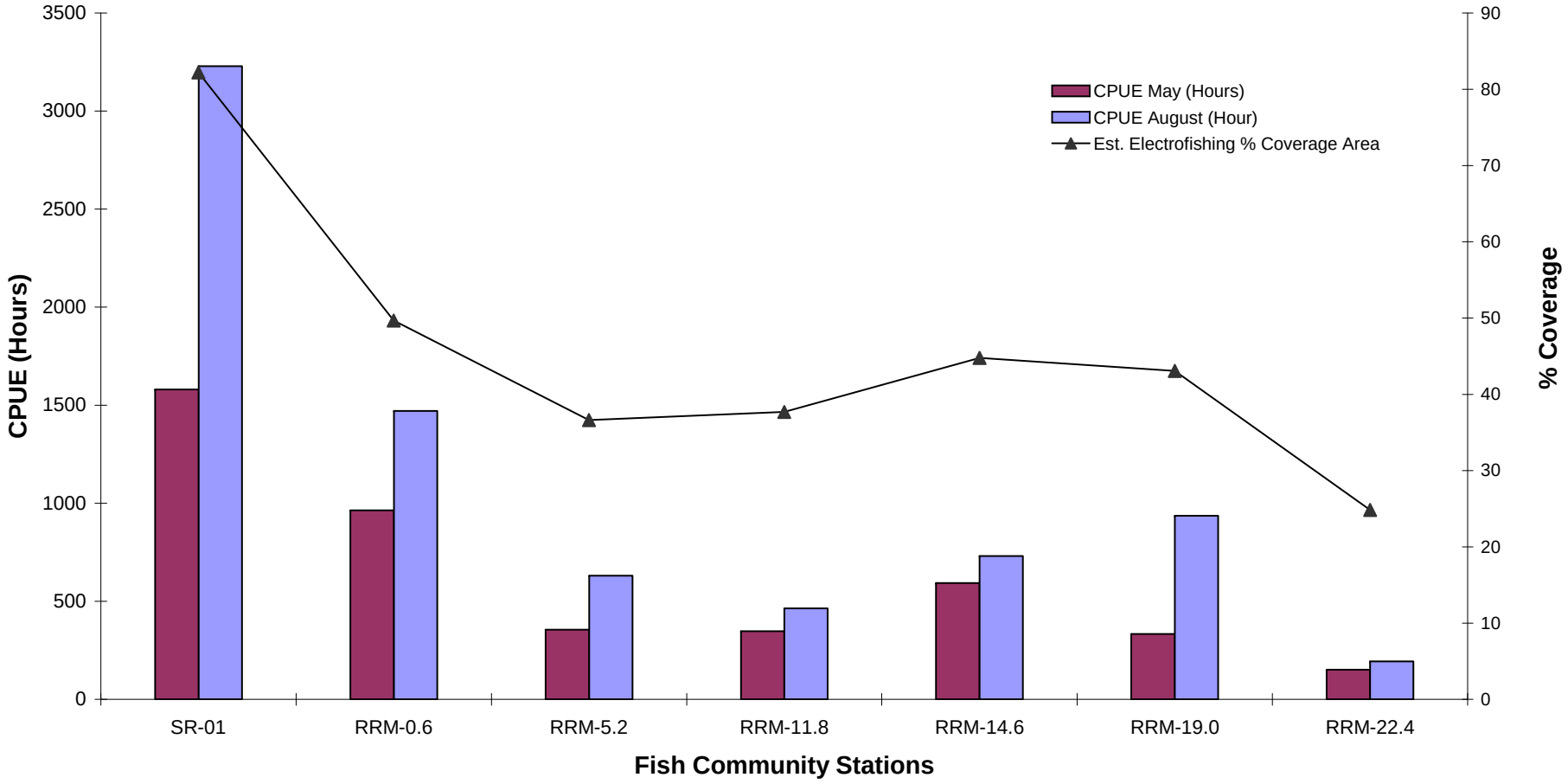

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Percent Cottidae, Catostomidae, Centrarchidae, Cyprinidae Families
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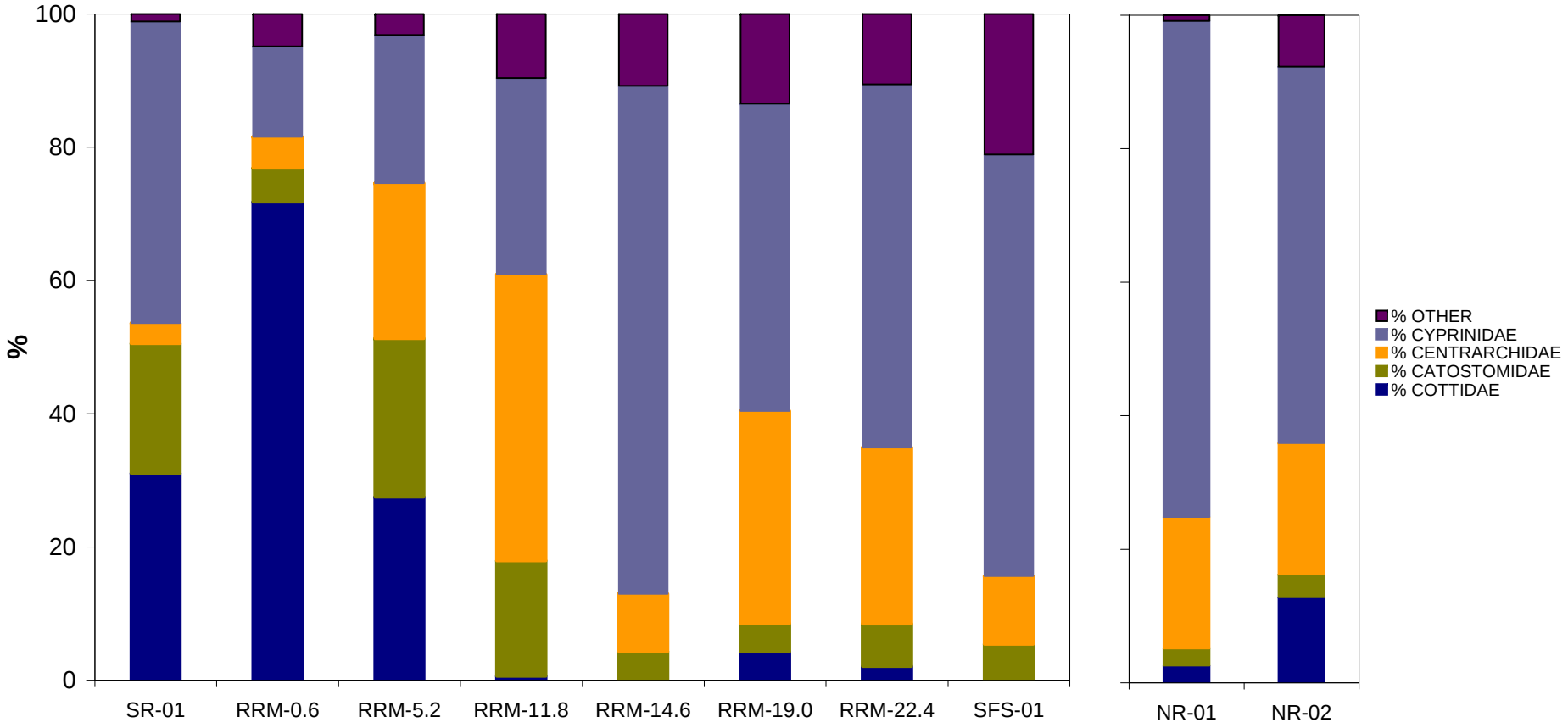
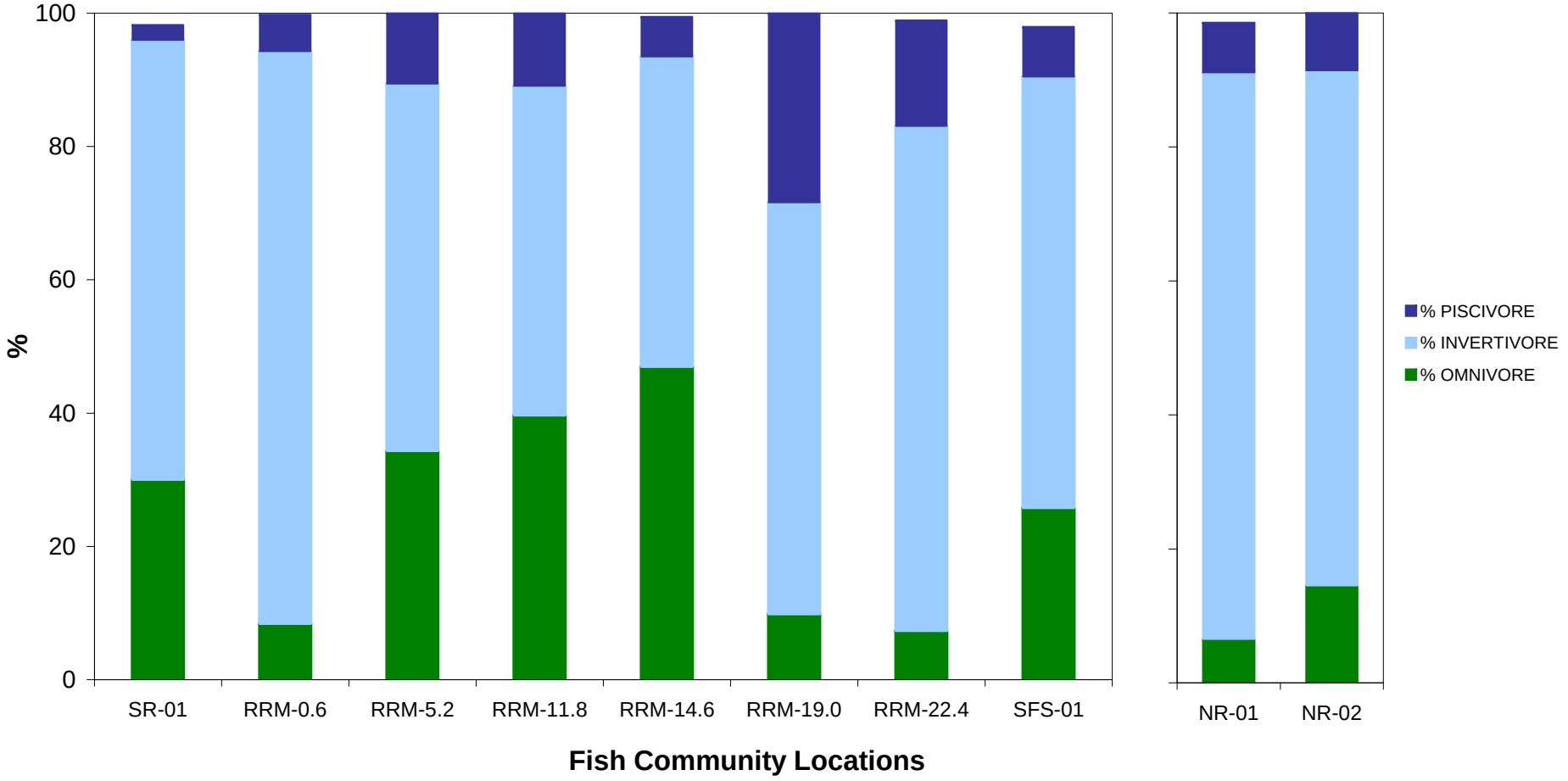


Percent Functional Feeding Groups in the Fish Community
Phase I System Characterization
Ecological Study May



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Percent Intolerant Fish Species (May and August)
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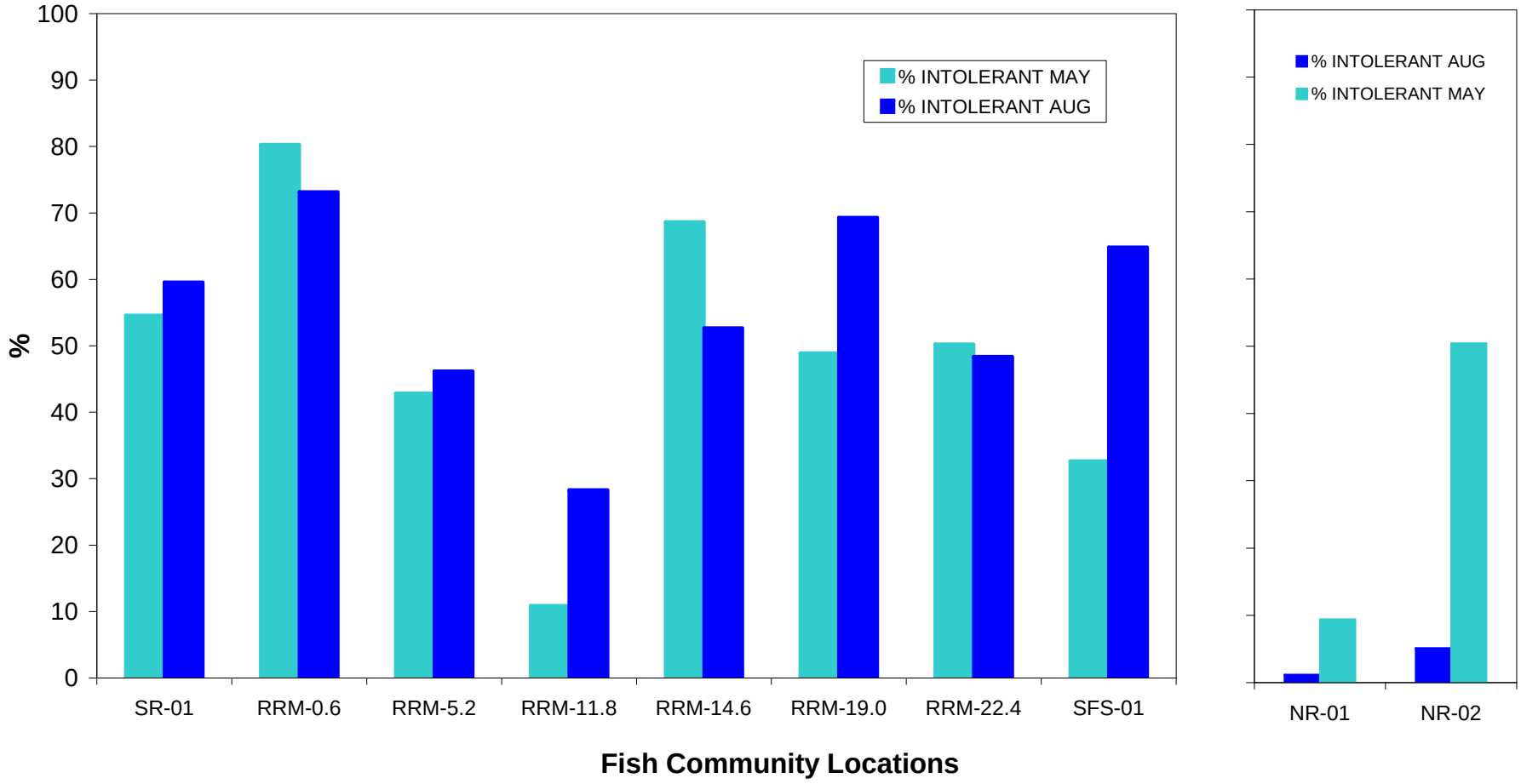


Invertebrate and Fish Community Preliminary Data

Invertebrate Community:

- May data and three more data sets to come
- Taxa richness and invertebrate densities generally consistent within riffles along the South River; higher densities were observed at sampling station NR-02 in the North River
- Community trophic structure is dominated by gatherers and filterers
- Community tolerance metrics remained relatively constant

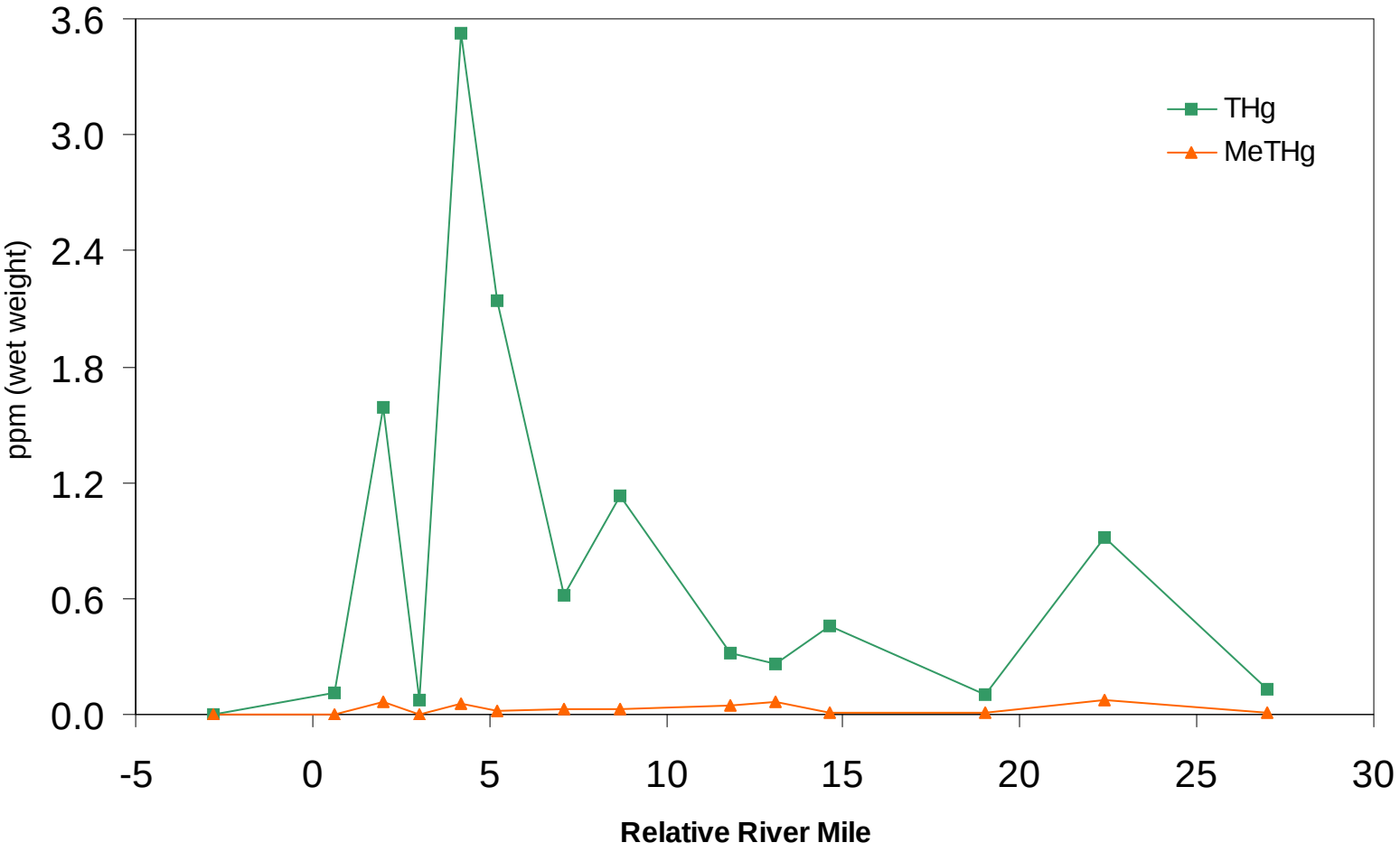
Fish Community:

- Species richness generally consistent; CPUE highest at upriver stations (SR-01)
- Electrofishing efficiency and river habitat influence total catch
- The fish community shifts above Waynesboro to downstream
- Invertivores dominate the feeding groups at most stations and intolerant fish species account for the highest percentage of catch at most stations

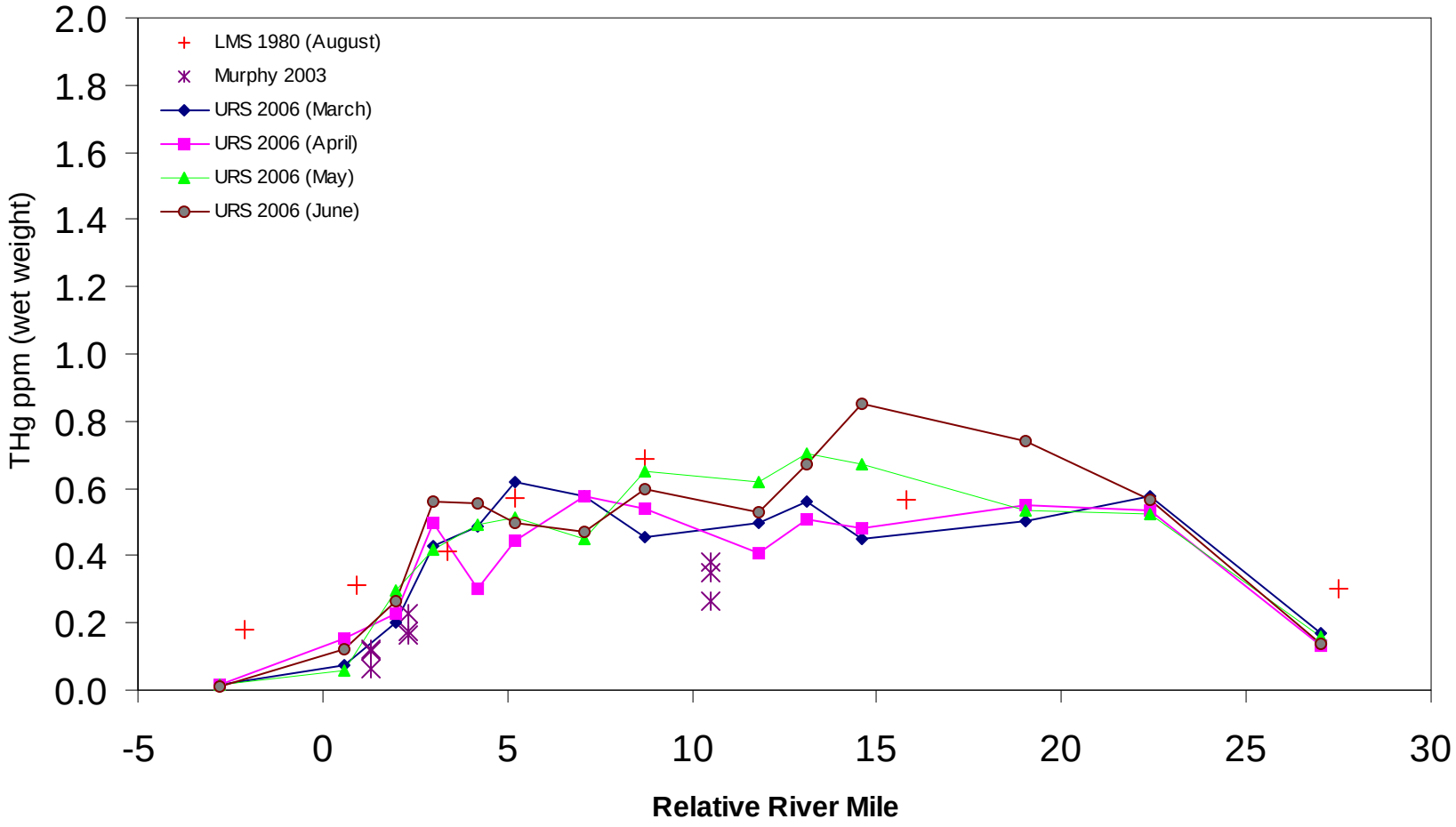
Biota Tissue Mercury Data

March - June 2006

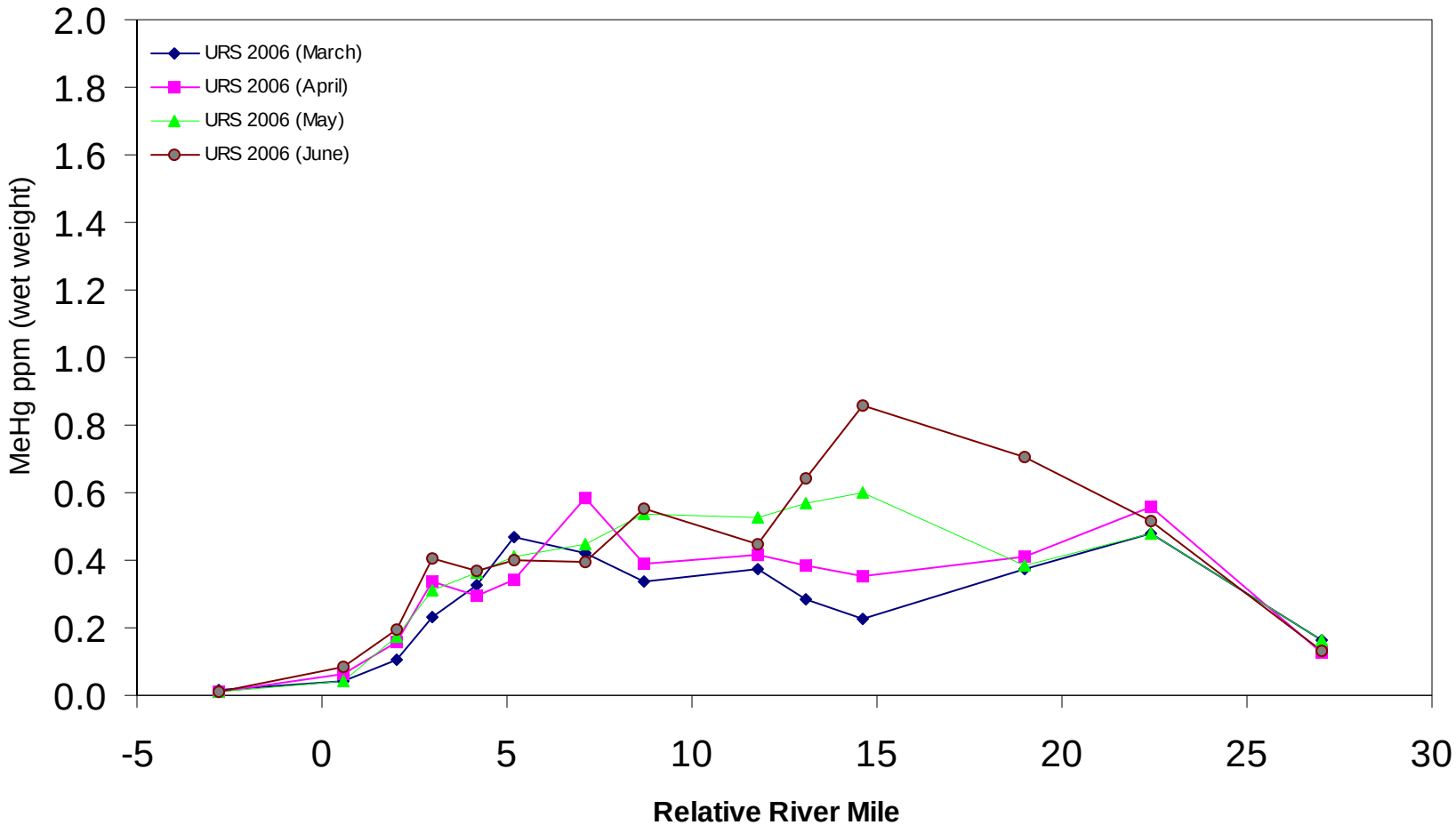
Algae THg and MeHg - May 2006



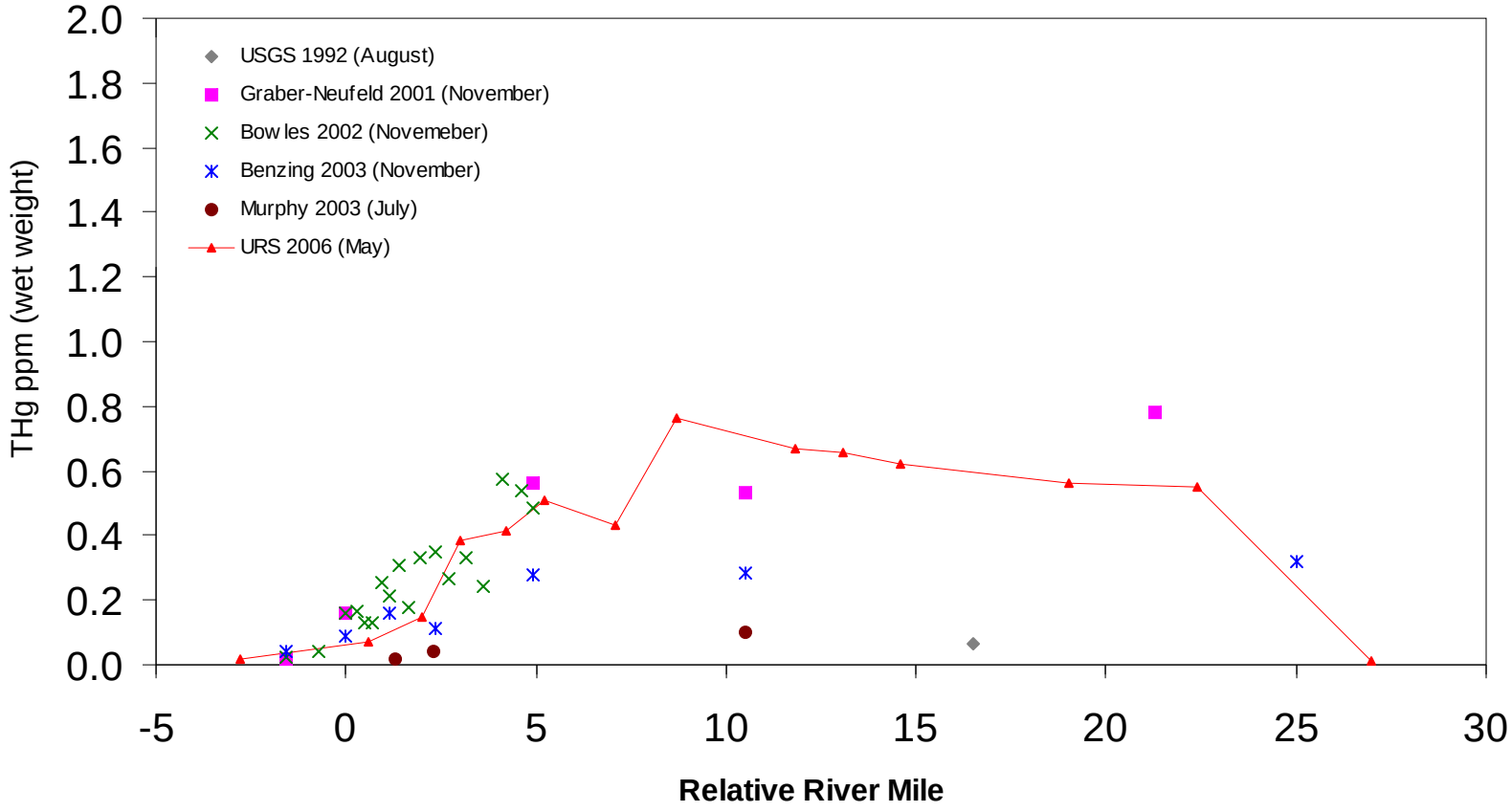
Crayfish THg



Crayfish MeHg



Corbicula THg



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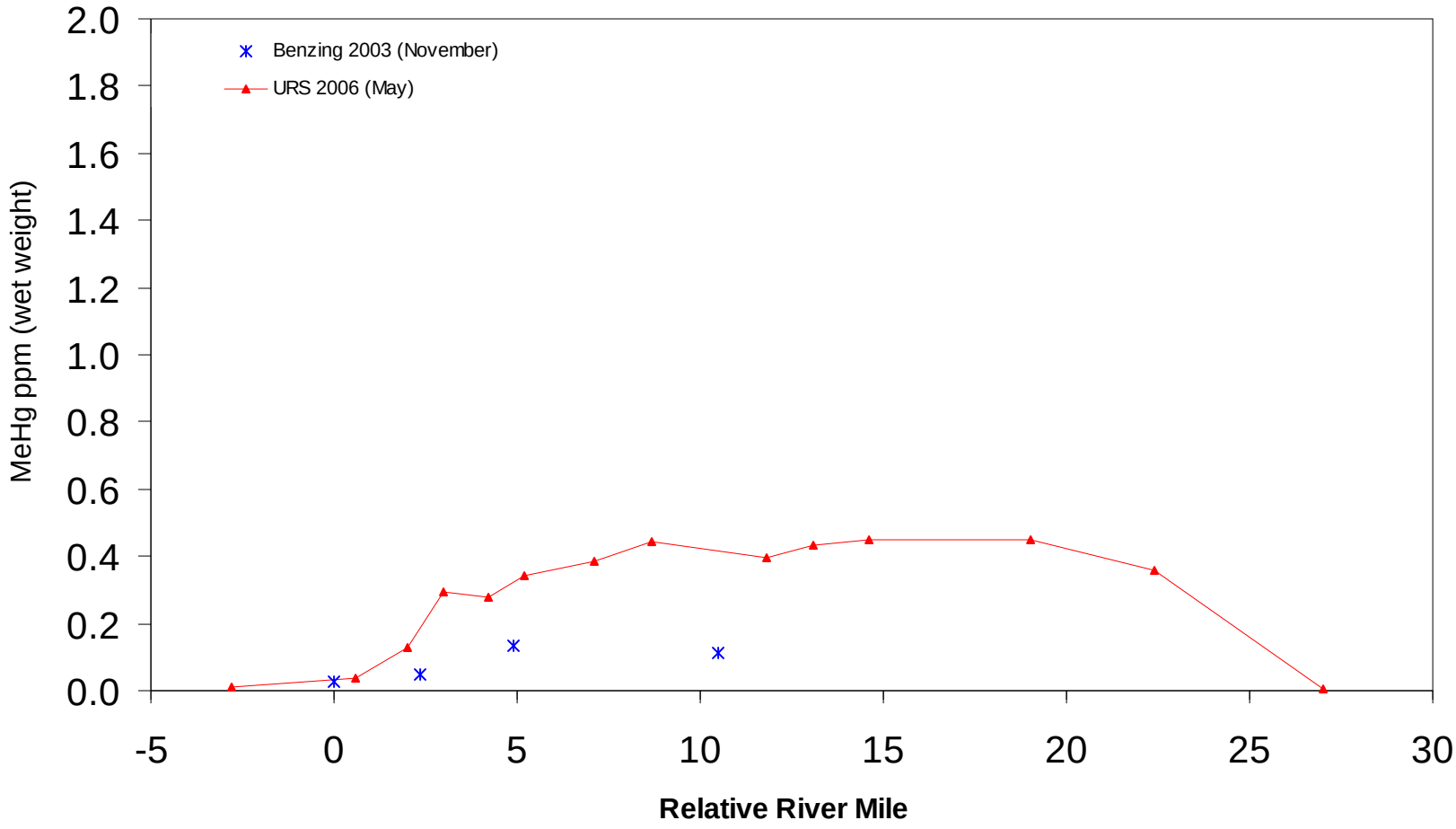
Corbicula MeHg



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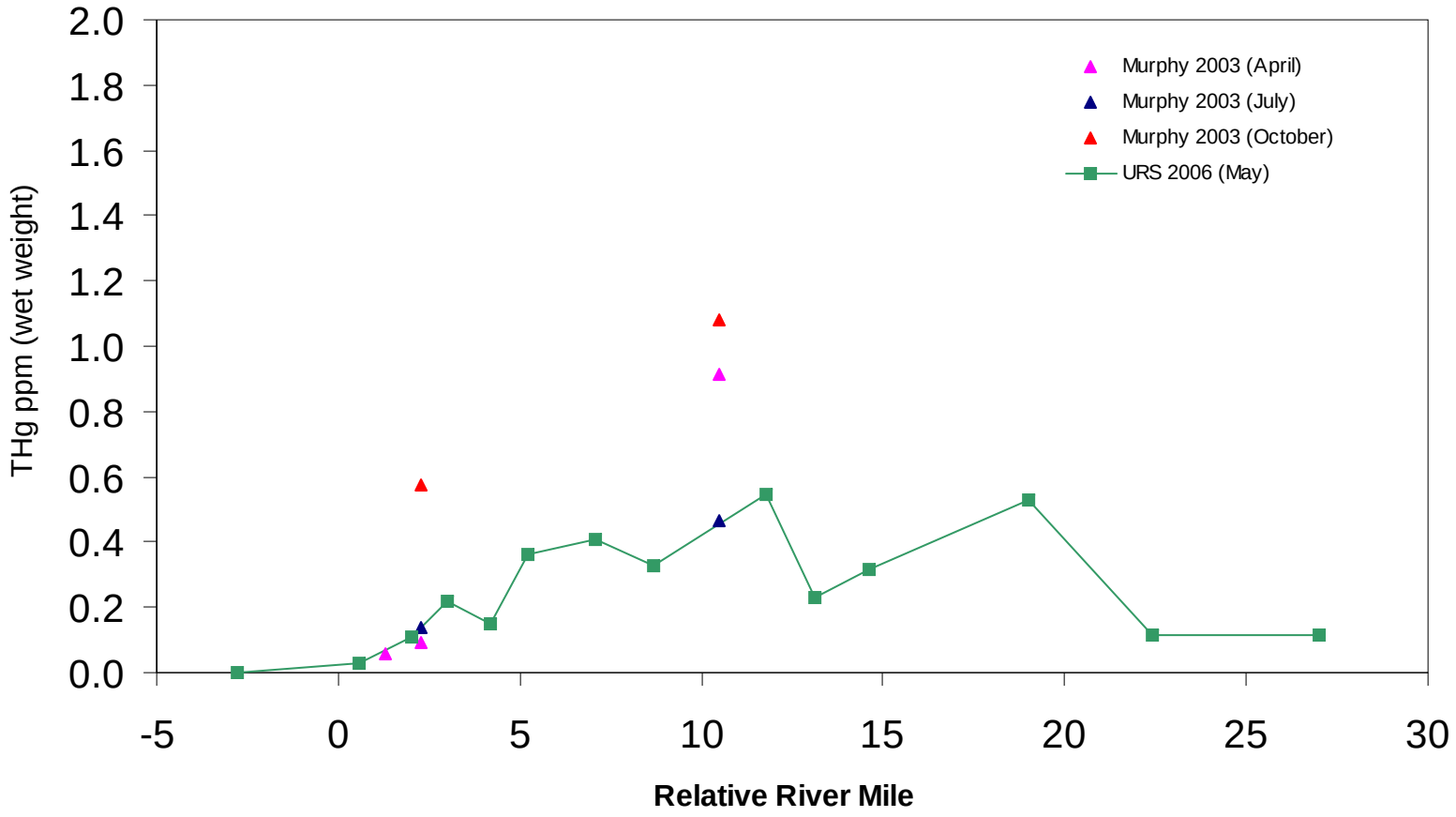
Diptera THg



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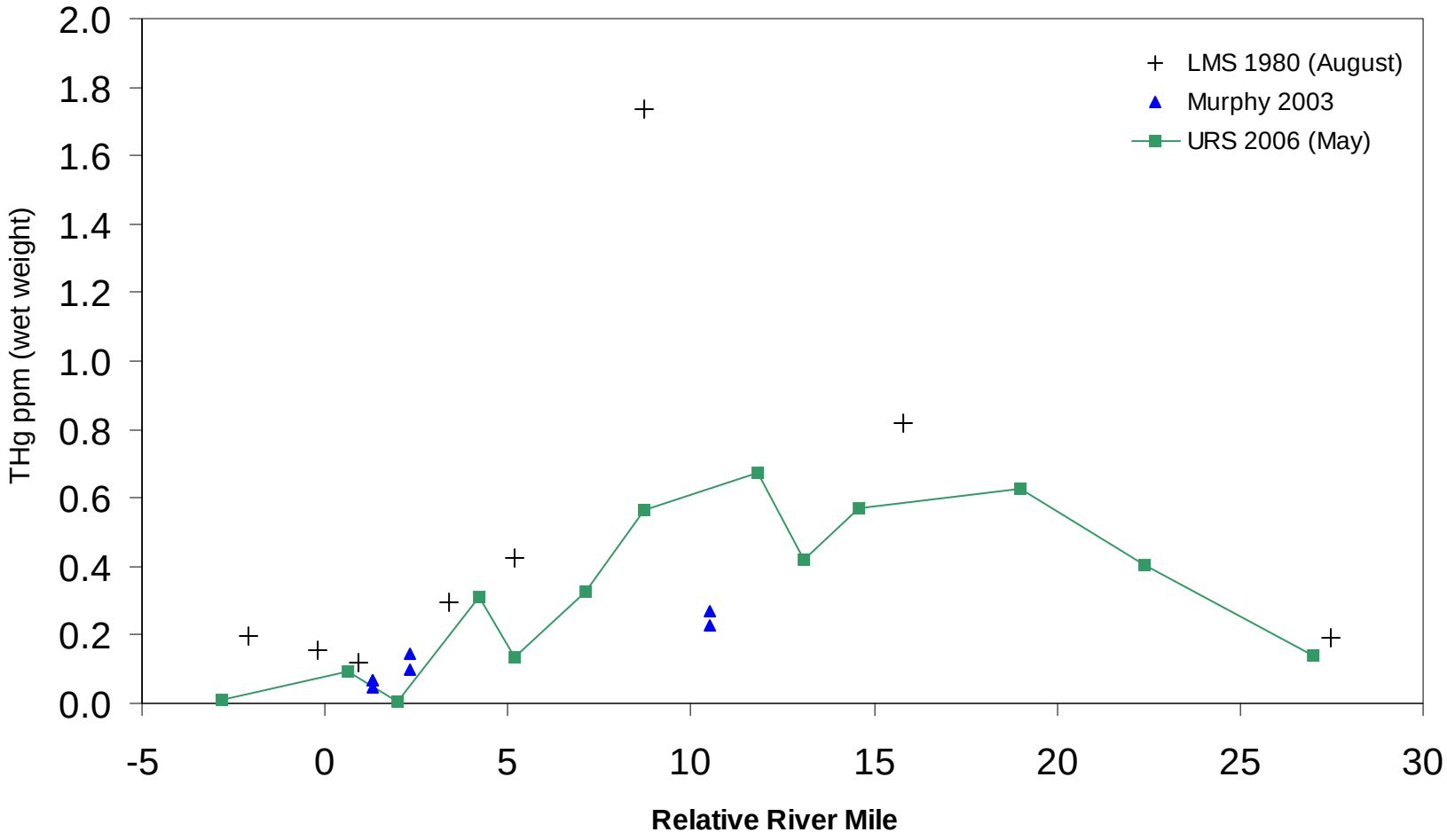
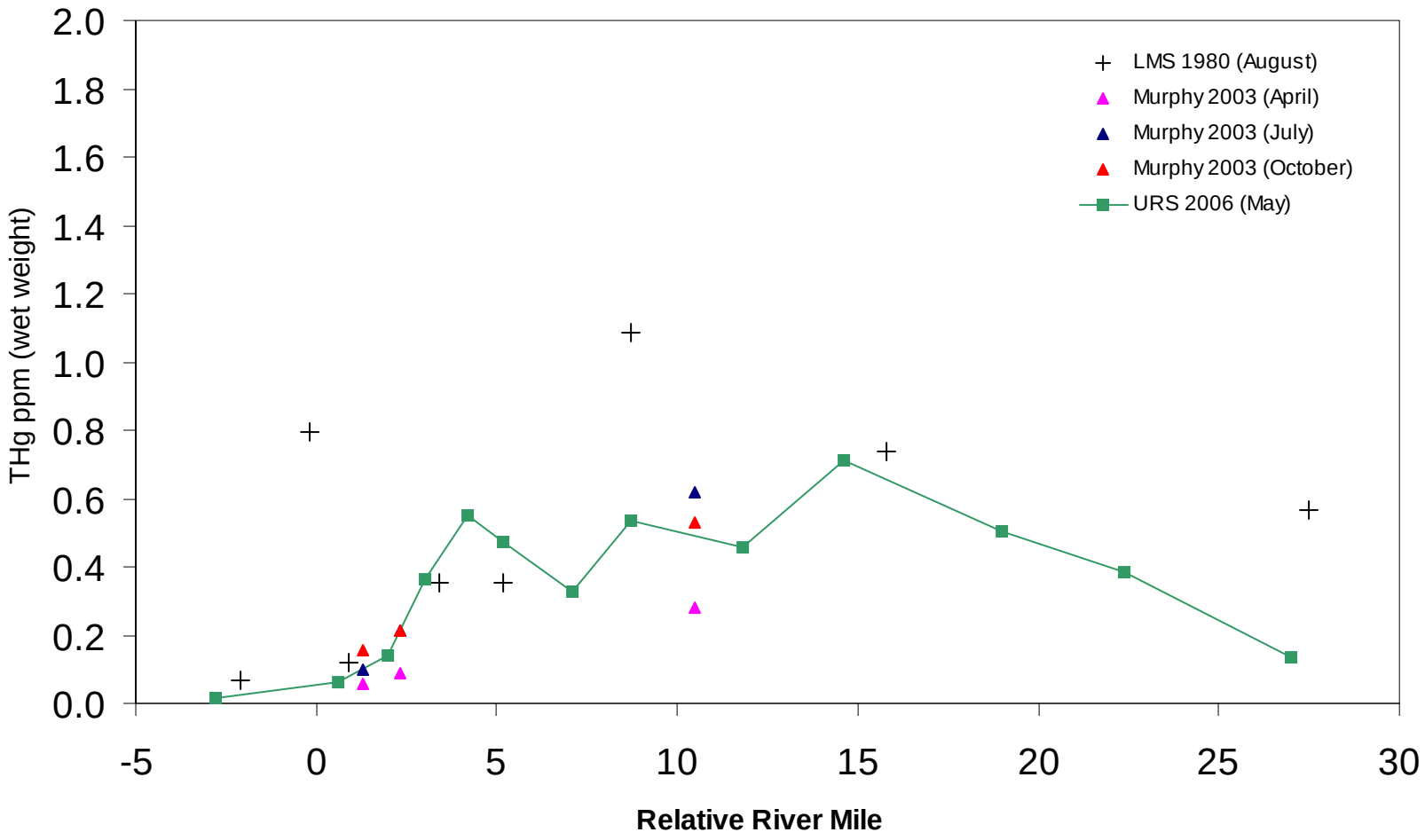
Ephemeroptera THg



Trichoptera THg



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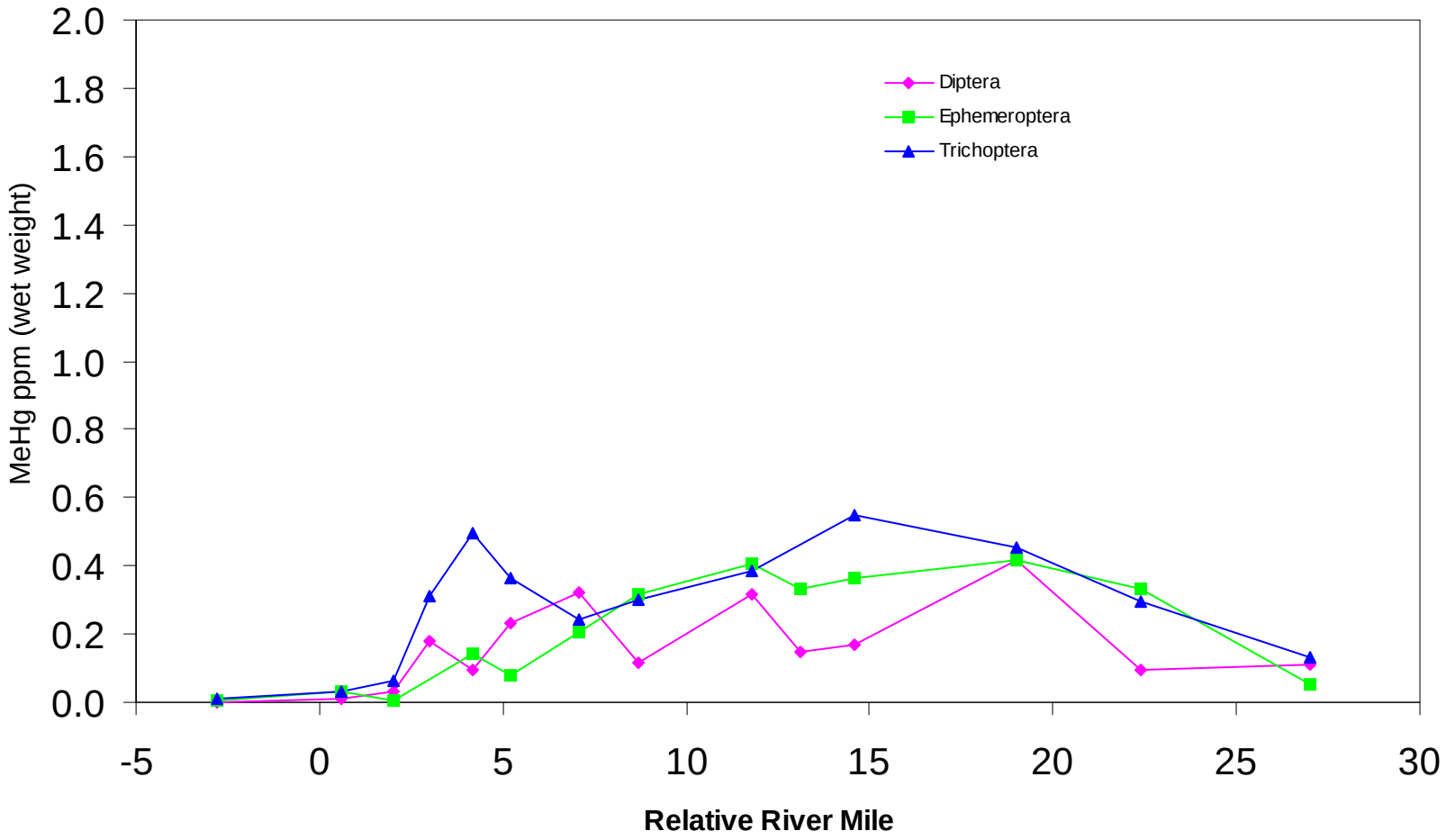
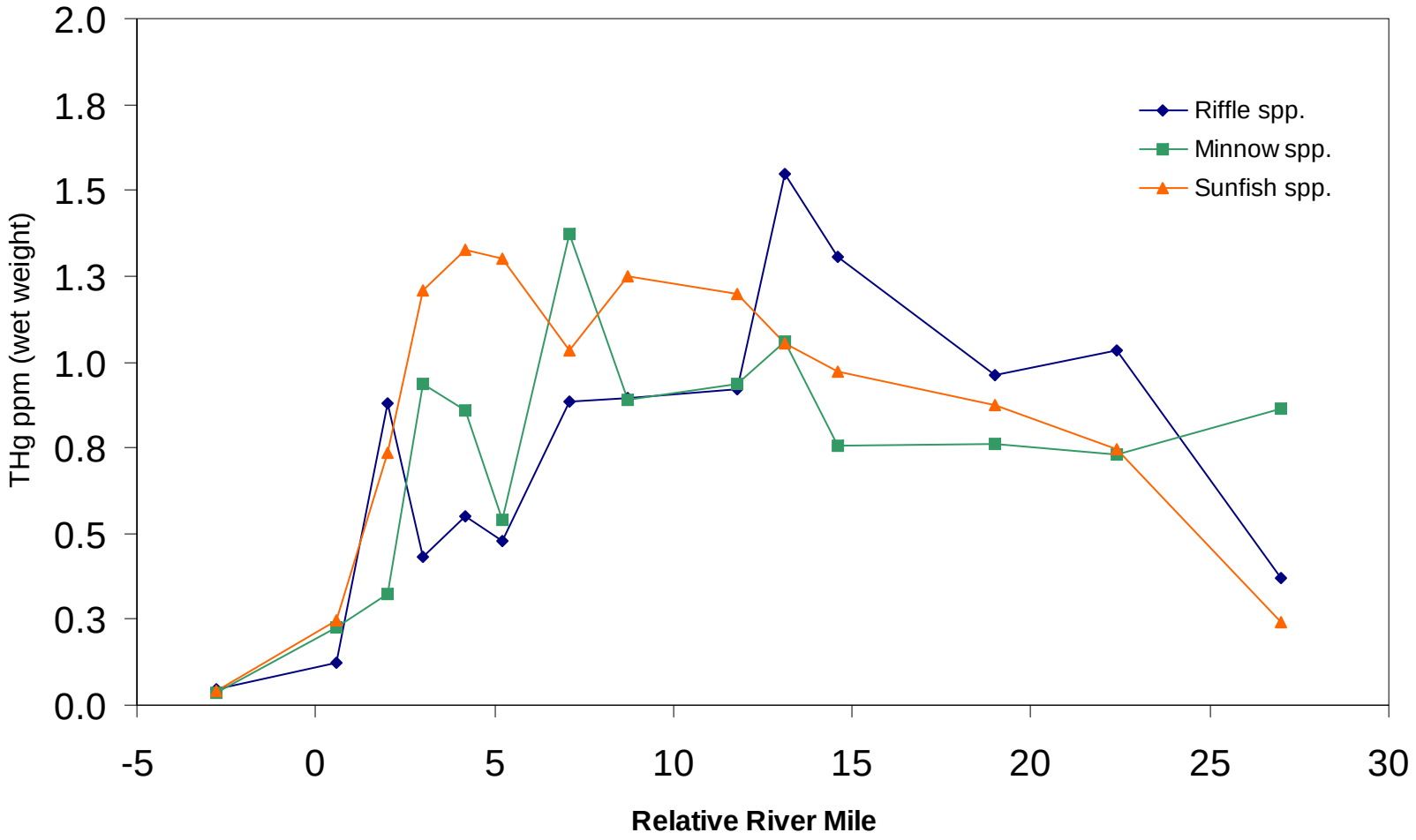
Aquatic Insects MeHg - May 2006



Prey Fish THg - May 2006



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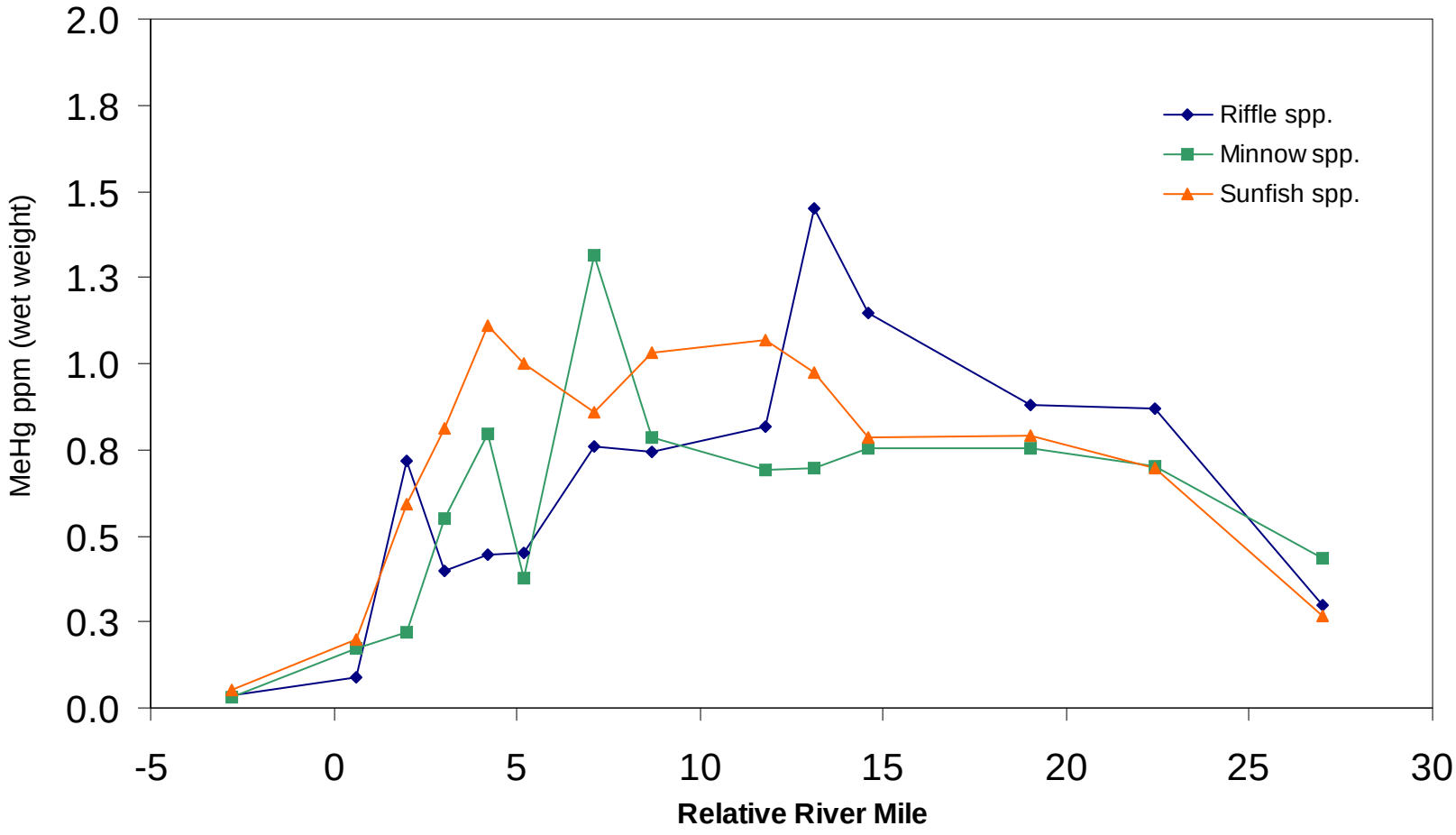
Prey Fish MeHg - May 2006



Biota Tissue Discussion Results

- Data intended to provide baseline measures of THg and MeHg along the South River
- Reference locations along the North and South Rivers have similar biota tissue concentration
- Algae results highly variable (differences in algal types and sediment THg)
- Concentrations of THg and MeHg display similar trends among invertebrate tissue types and fish; concentrations in fish are generally 2X higher compared to invertebrate tissue