Aquatic Community Surveys and Prey Tissue Mercury Results

Progress Report

Phase I System Characterization

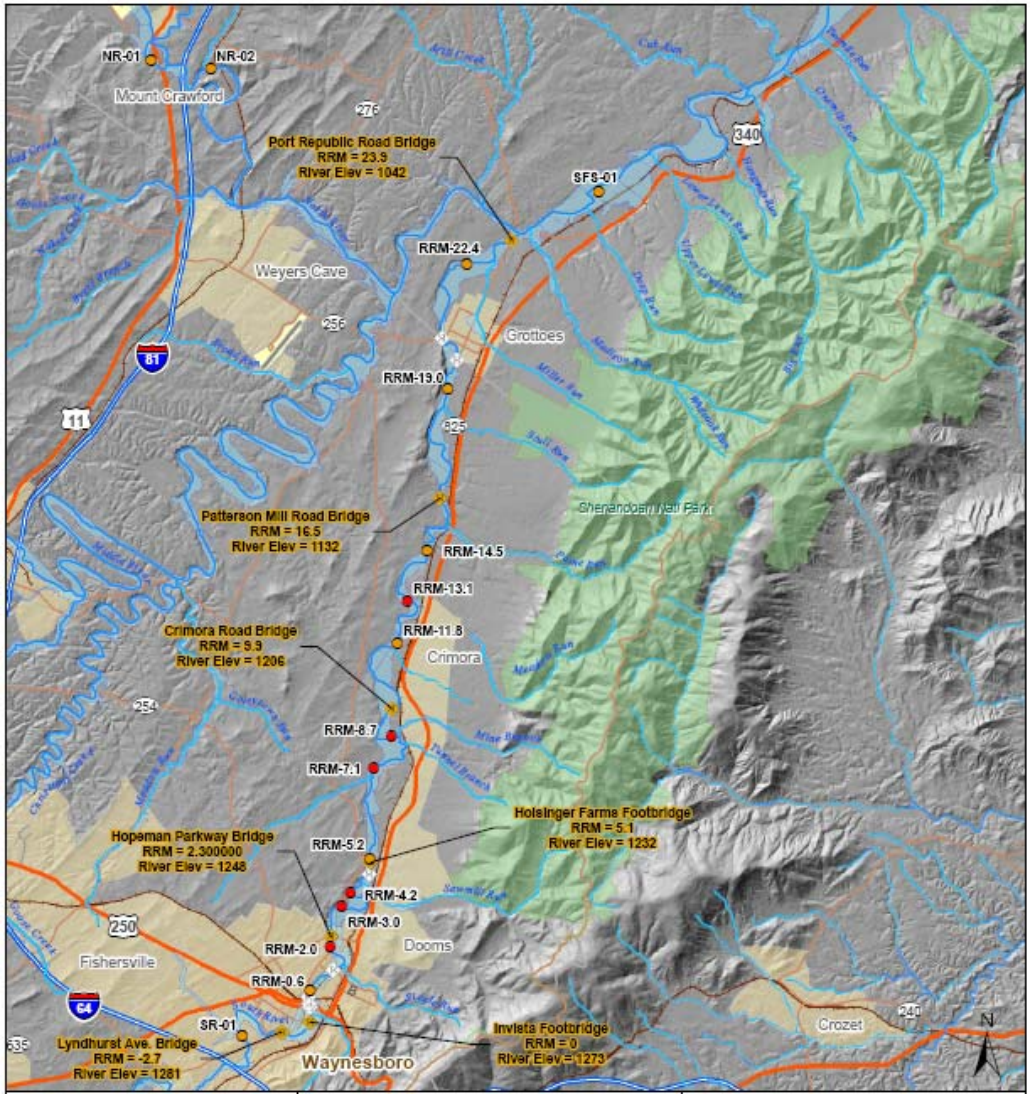
south river SCIENCE TEAM

URS

Baseline Physical and Biological Characterization

Sampling Goals:

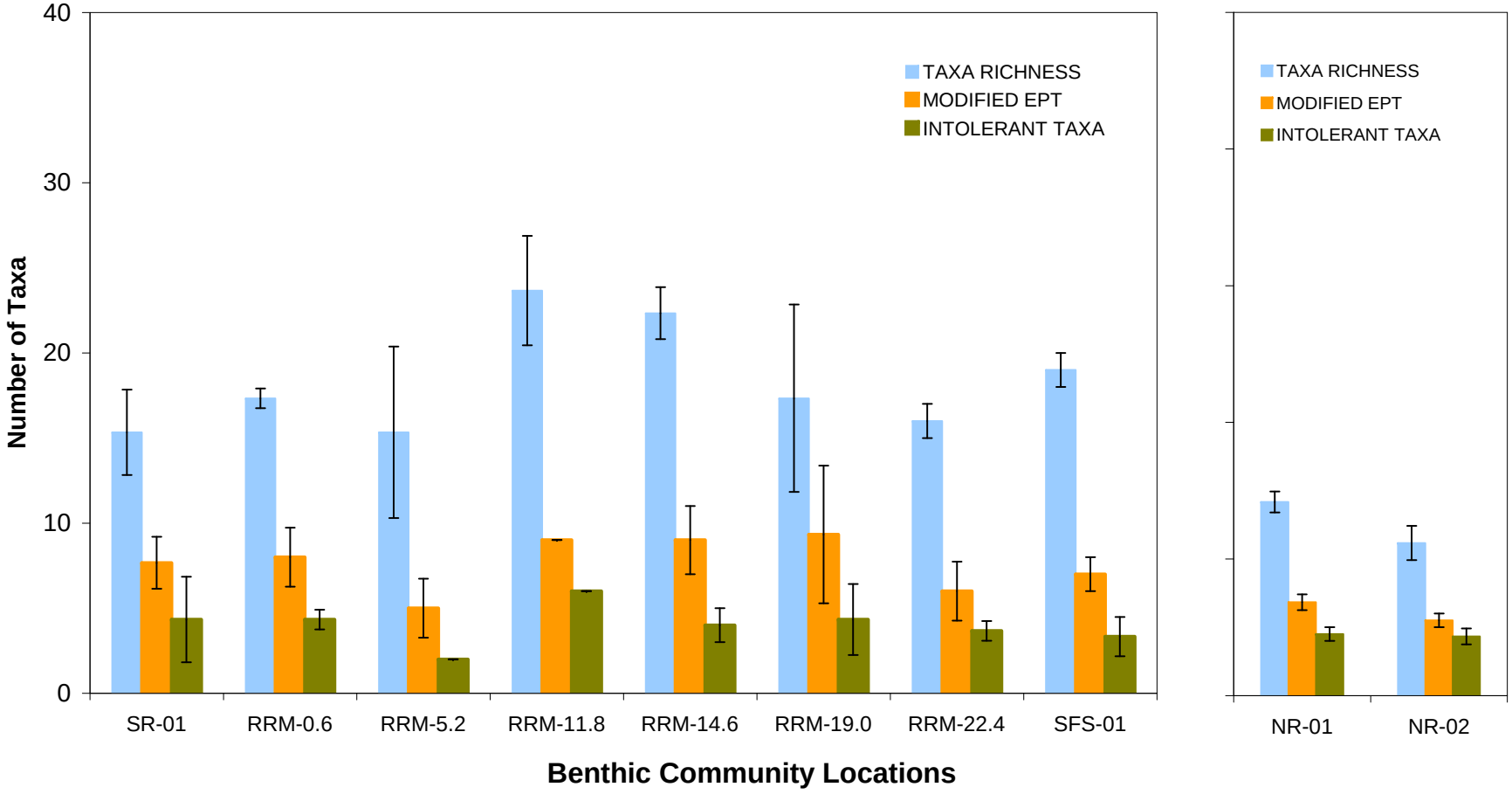
- Quarterly assessments of biological communities (fish biannually) at 7 baseline stations in study area; 3 reference stations
- Prey tissue collections at 13 baseline stations in study area; 3 reference stations
  - Monthly collections of crayfish tissue
  - Quarterly collections of algae and other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



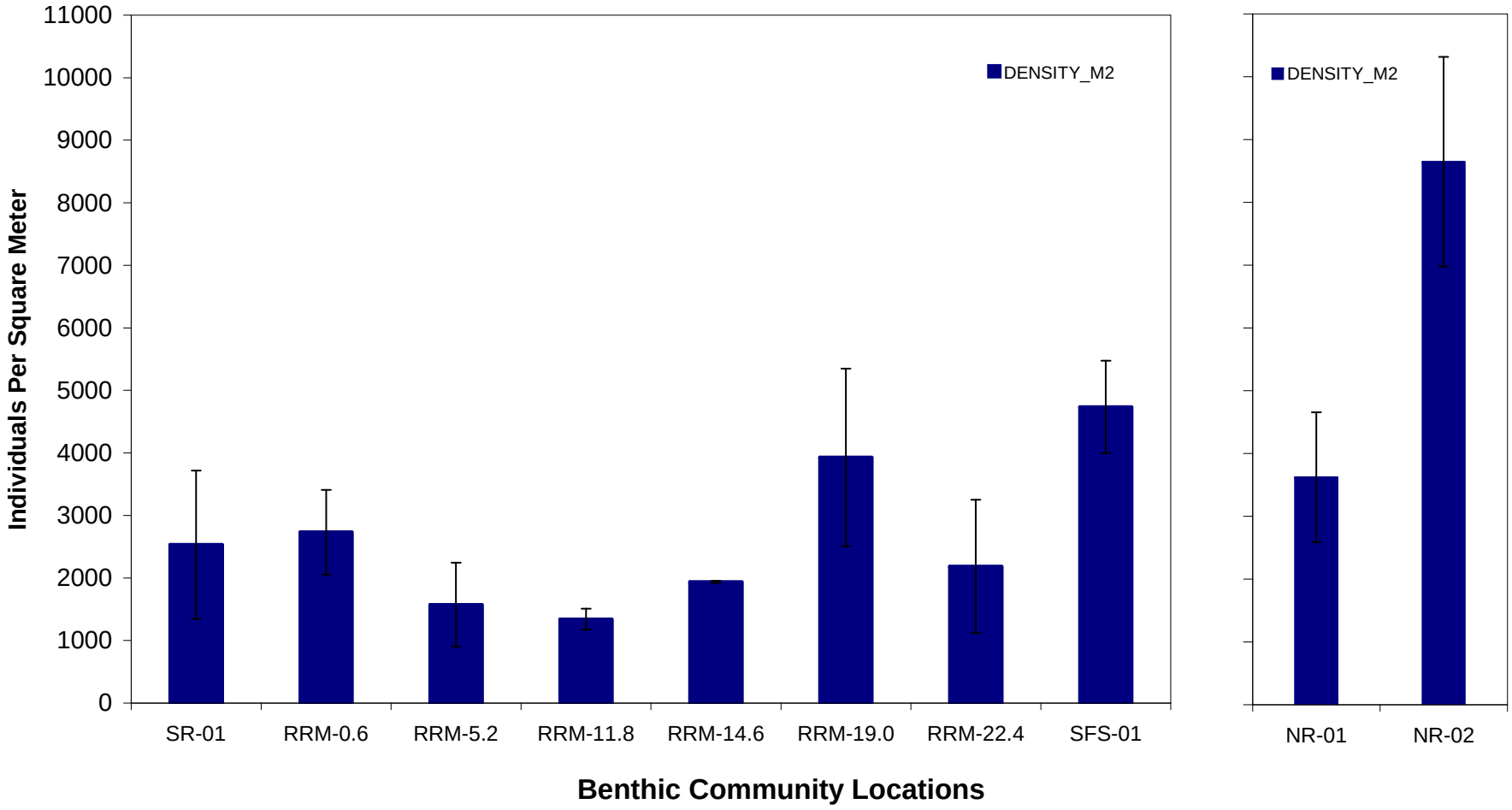
Invertebrate and Fish Community Assessments

May and August 2006

Benthic Invertebrate Richness Metrics
Phase I System Characterization
Ecological Study May



Benthic Invertebrate Density
Phase I System Characterization
Ecological Study May



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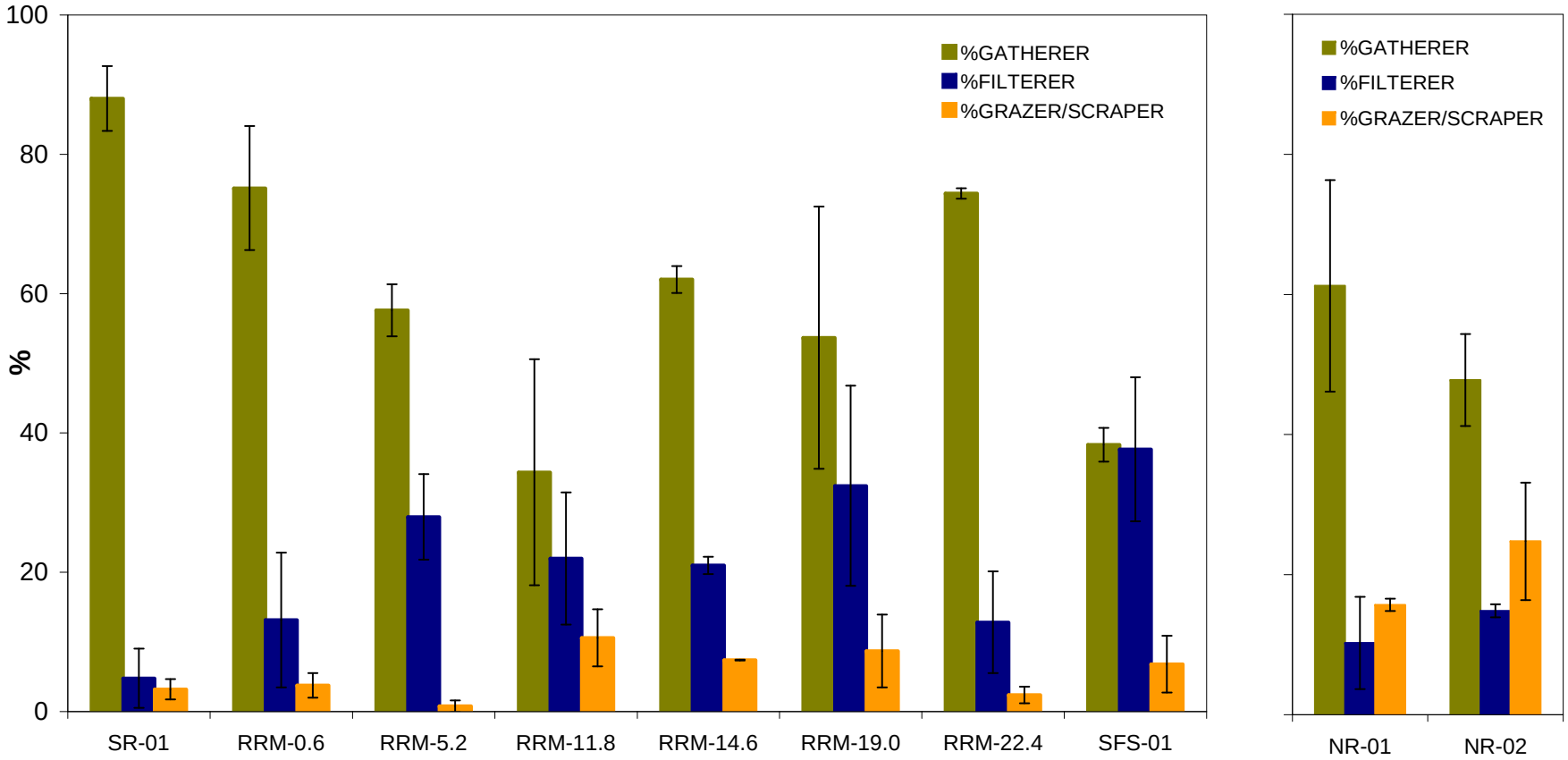
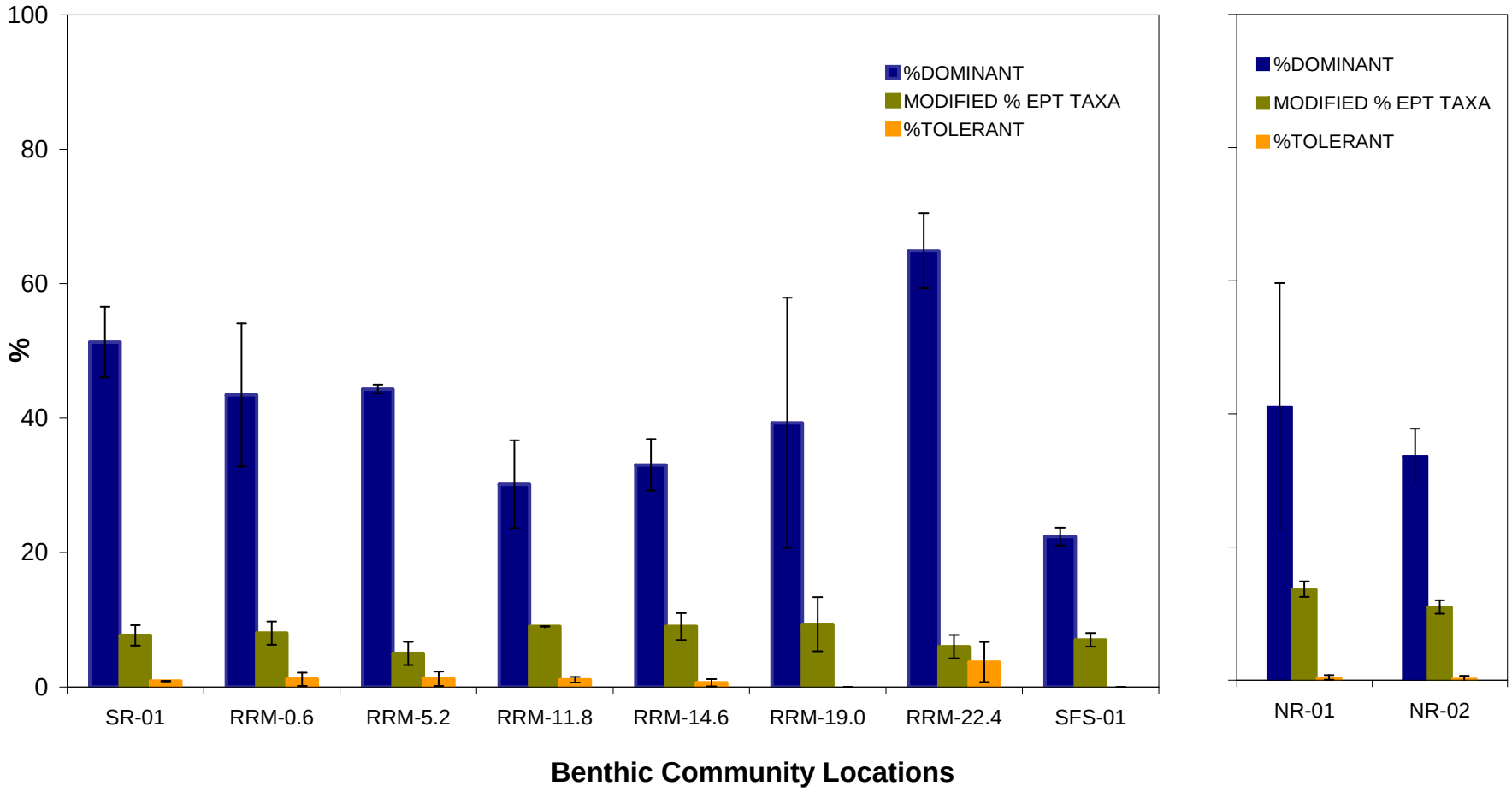
Percent Composition of Benthic Invertebrate Trophic Feeding Groups
Phase I System Characterization
Ecological Study May



Percent Dominant Species, EPT, Tolerant Species
Phase I System Characterization
Ecological Study May



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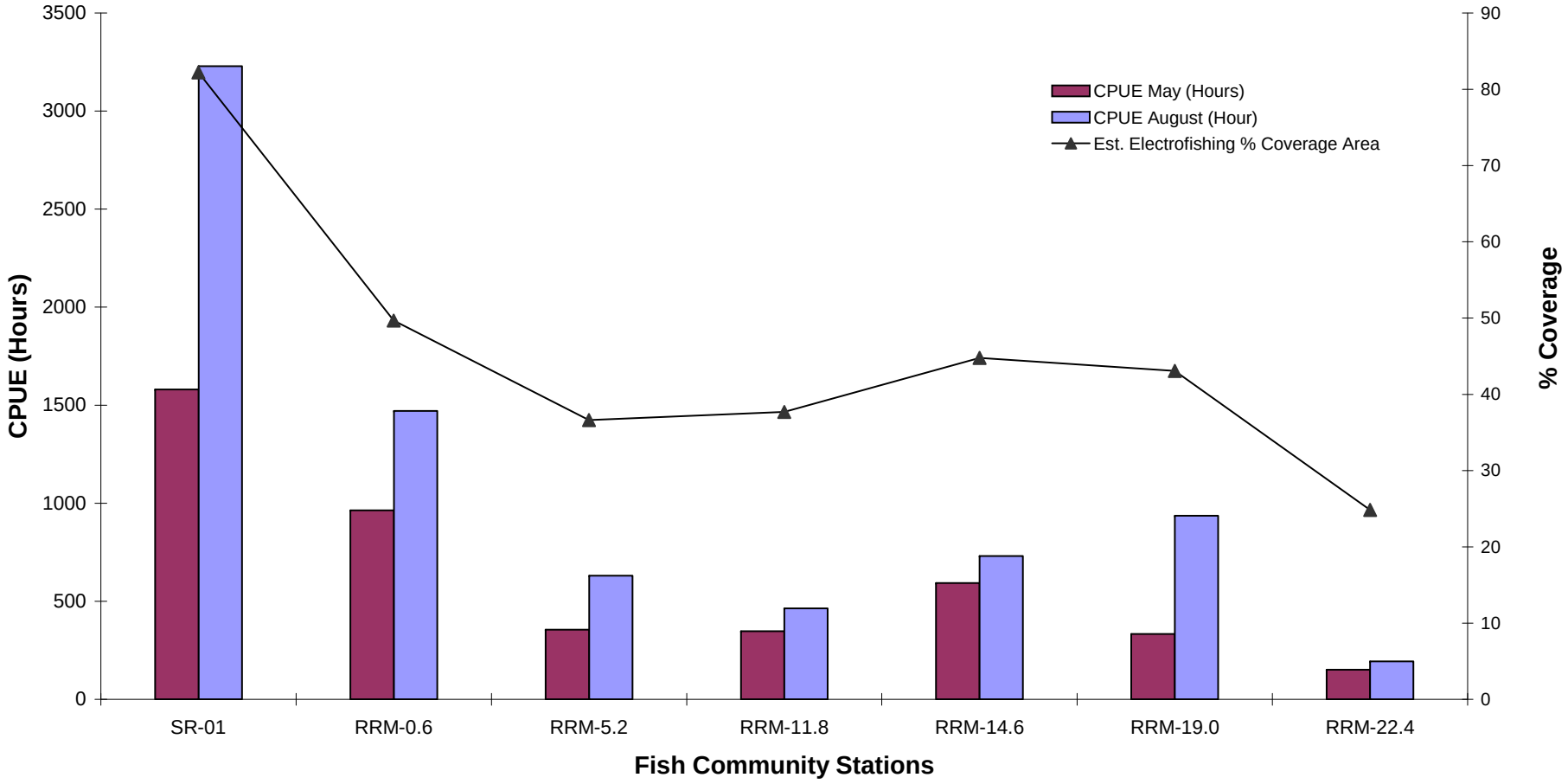
Fish Community Sampling Efficiency (May and August)
Phase I System Characterization
Ecological Study



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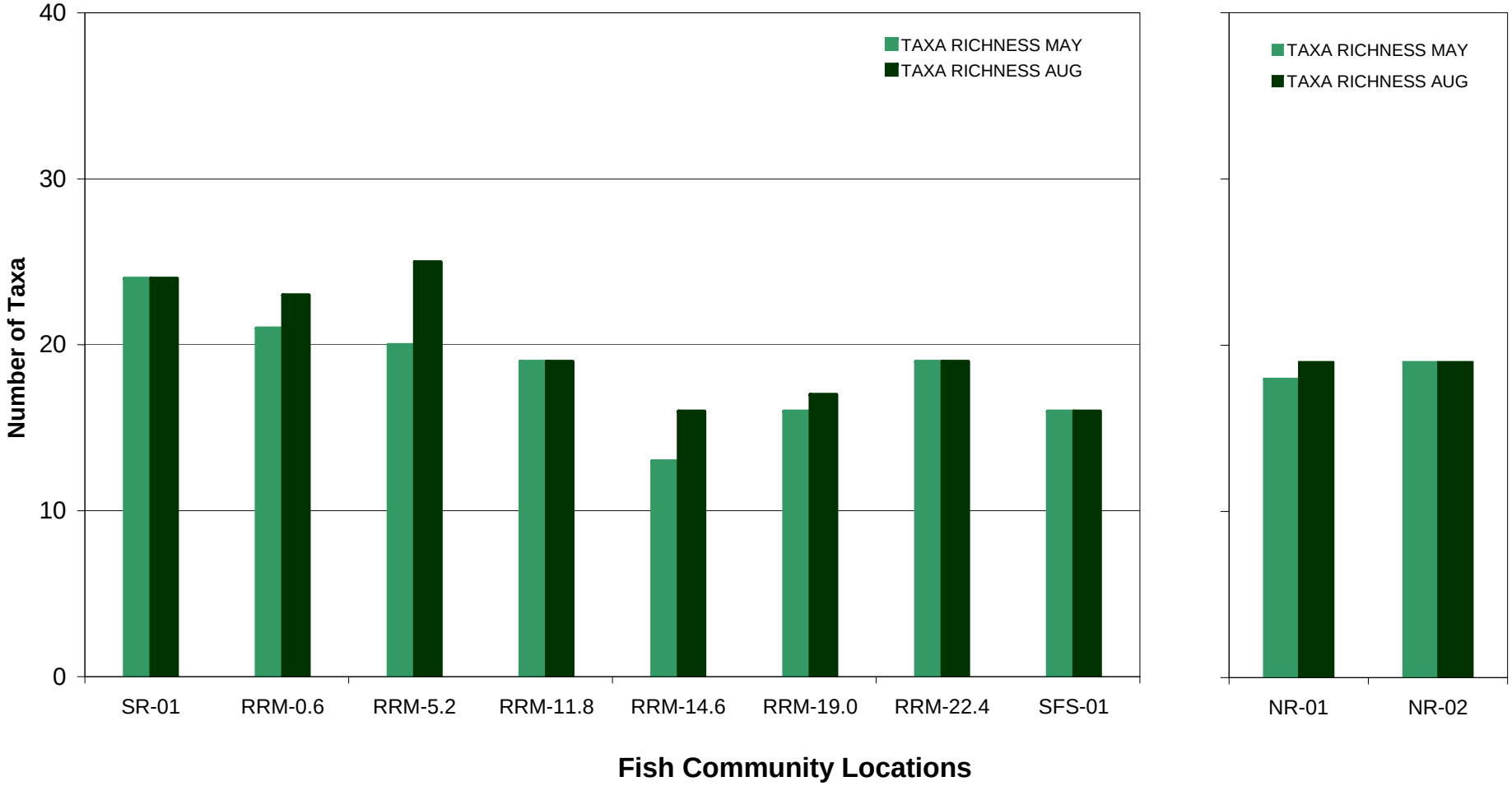
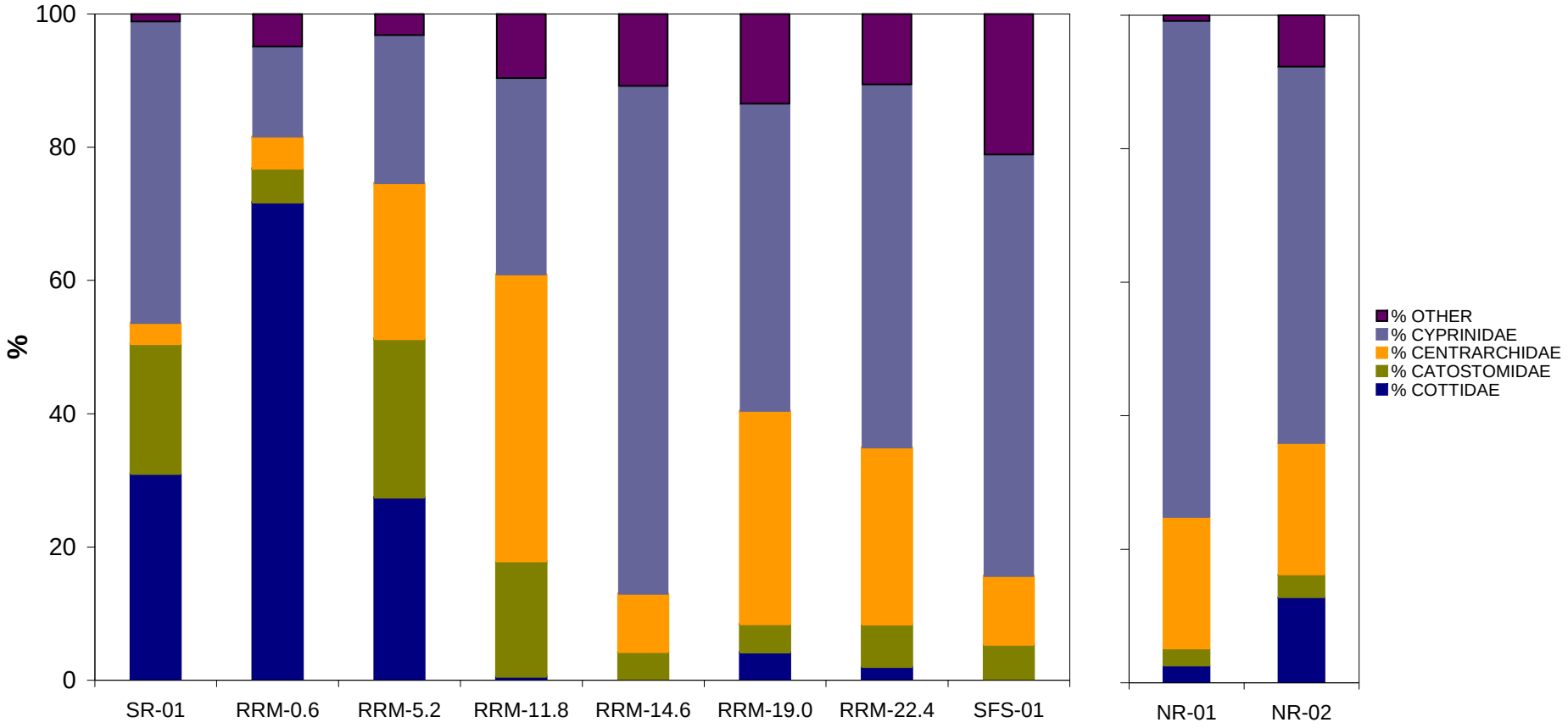
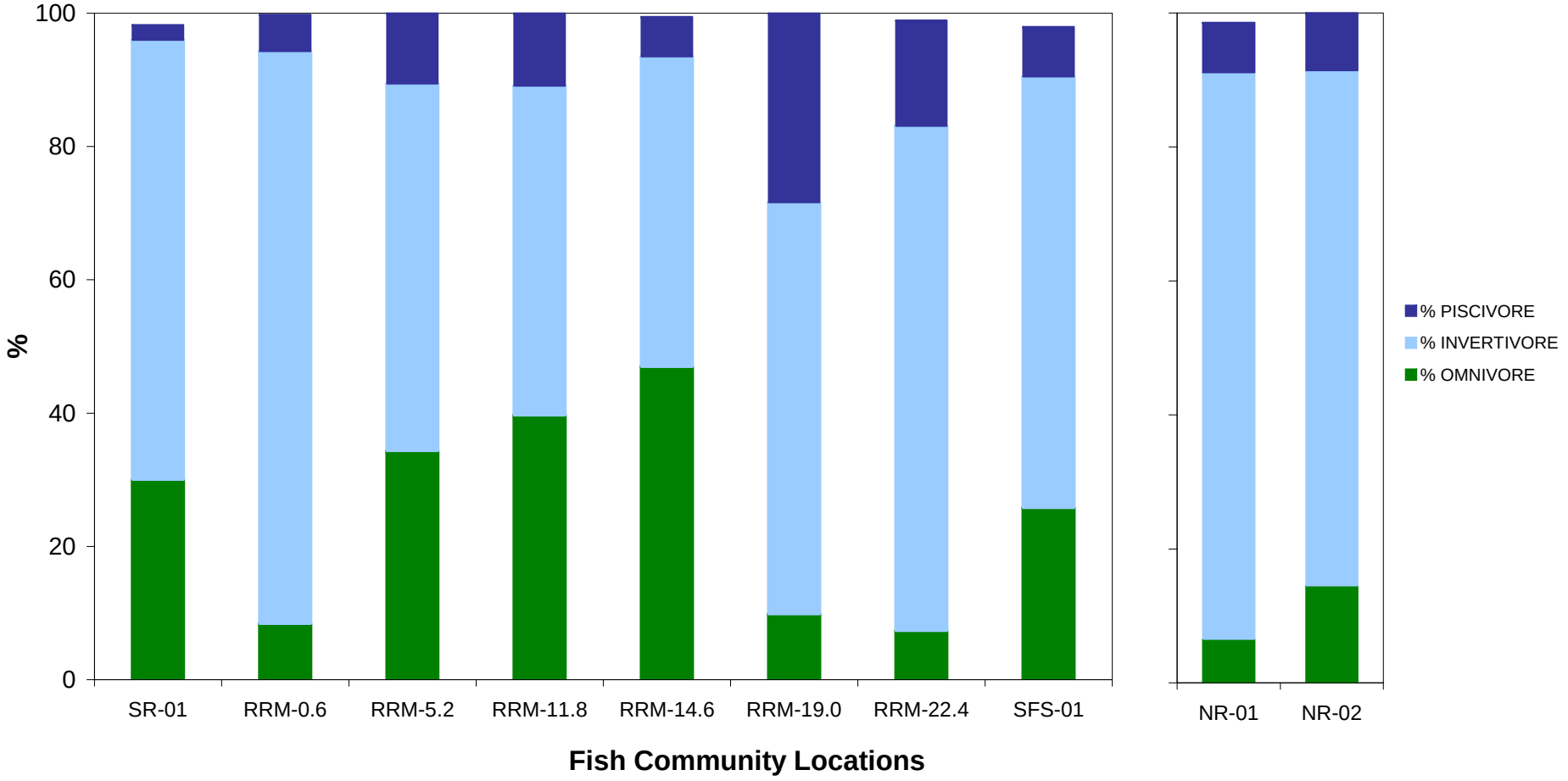
Fish Community Taxa Richness (May & August)
Phase I System Characterization
Ecological Study



Percent Cottidae, Catostomidae, Centrarchidae, Cyprinidae Families
Phase I System Characterization
Ecological Study May



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



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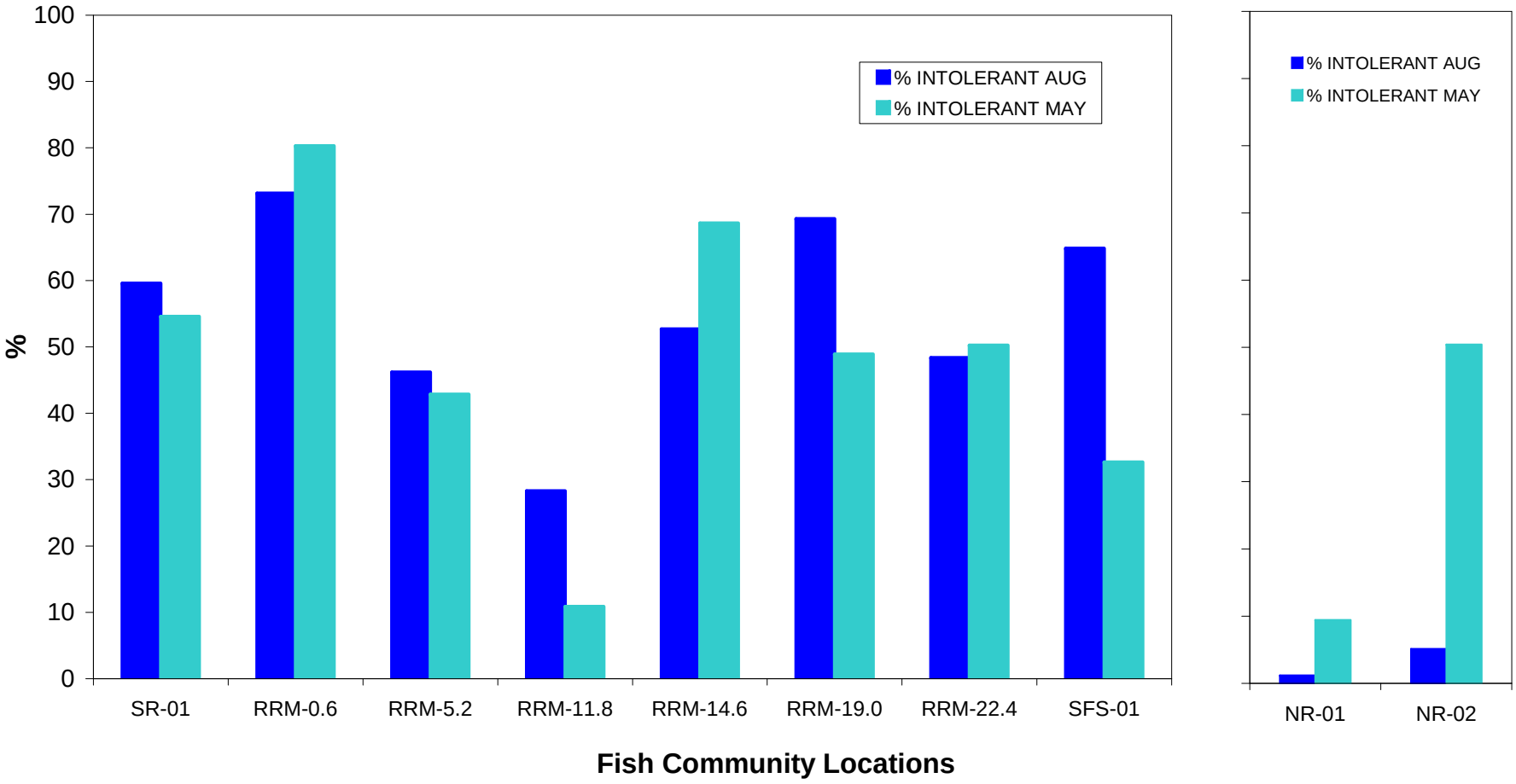
Percent Intolerant Fish Species (May and August)
Phase I System Characterization
Ecological Study



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Invertebrate and Fish Community Preliminary Data

Invertebrate Community:

- Taxa richness was consistent along the South River and South Fork Shenandoah River; richness was generally lower at North River stations
- Invertebrate densities were generally consistent in 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 consistent among all sampling stations

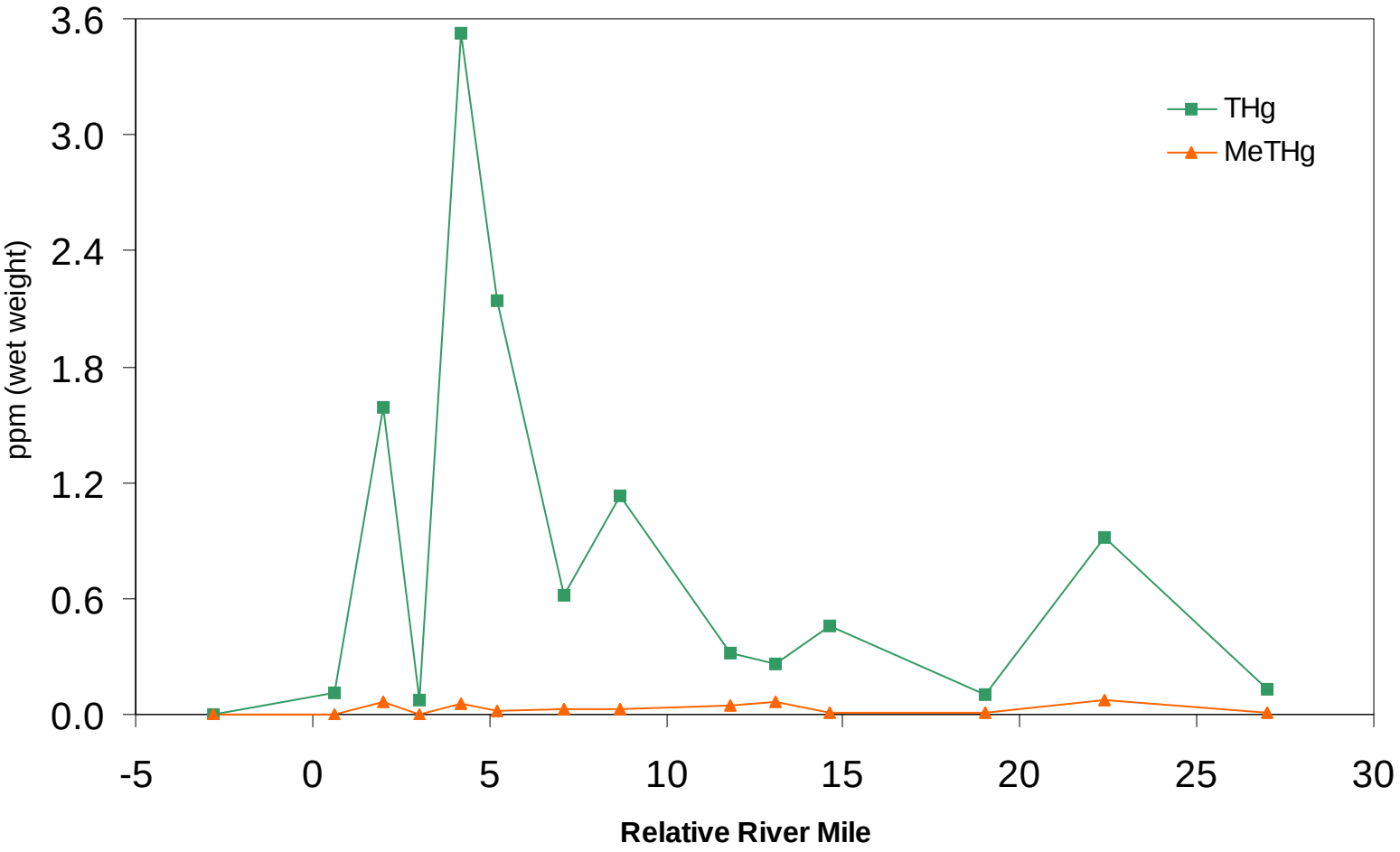
Fish Community:

- Fish abundance were highest at SR-01, however, electrofishing efficiency was also highest at this location (SR-01 has the lowest flow compared to other stations)
- The fish community shifts from primarily Cottidae and Cyprinidae above Waynesboro to Cyprinidae and Centrarchidae downstream
- Invertivores dominate the feeding groups at most stations and intolerant fish species account for the highest percentage of catch at most stations

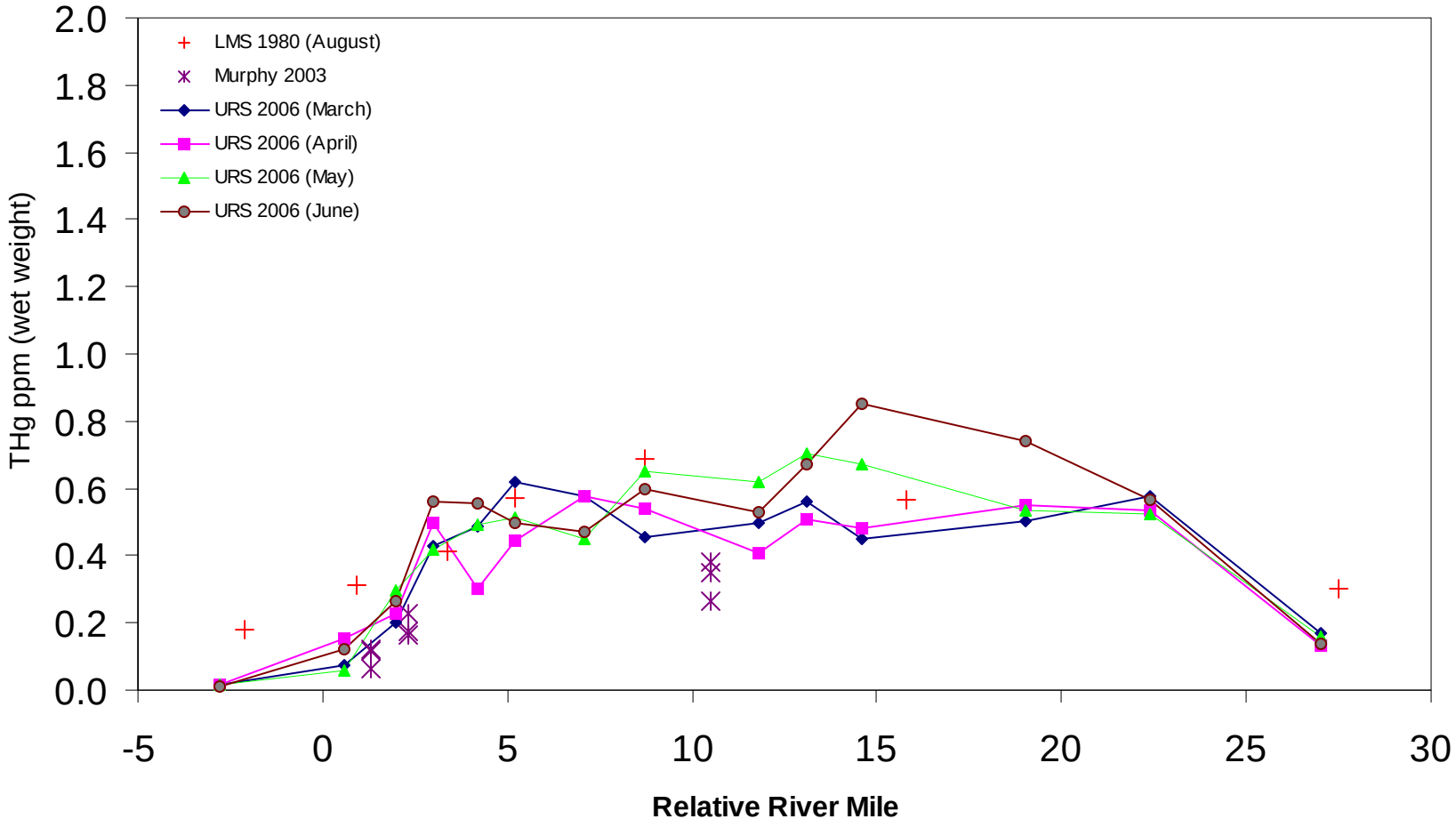
Biota Tissue Mercury Data

March - June 2006

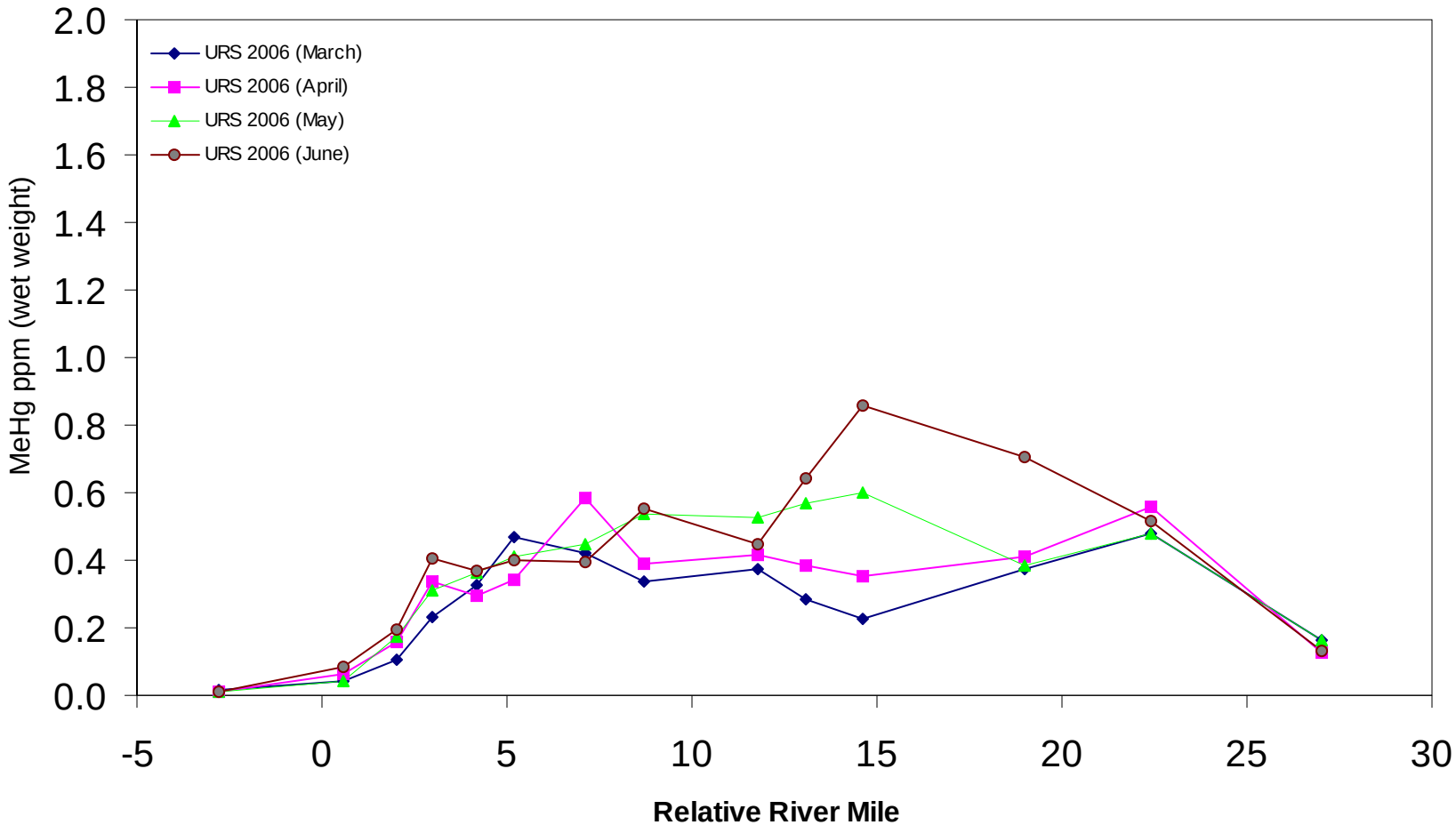
Algae THg and MeHg - May 2006



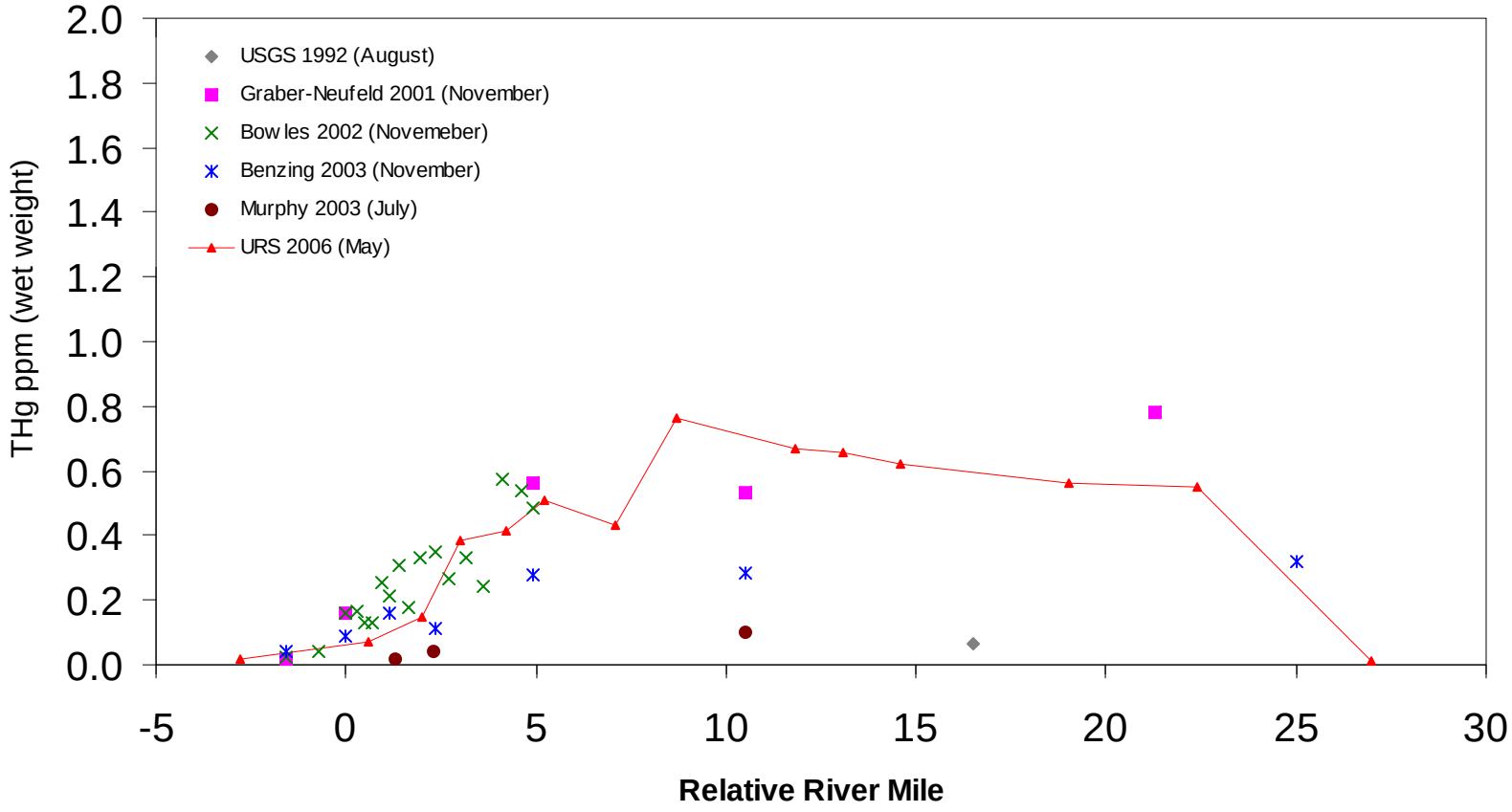
Crayfish THg



Crayfish MeHg



Corbicula THg



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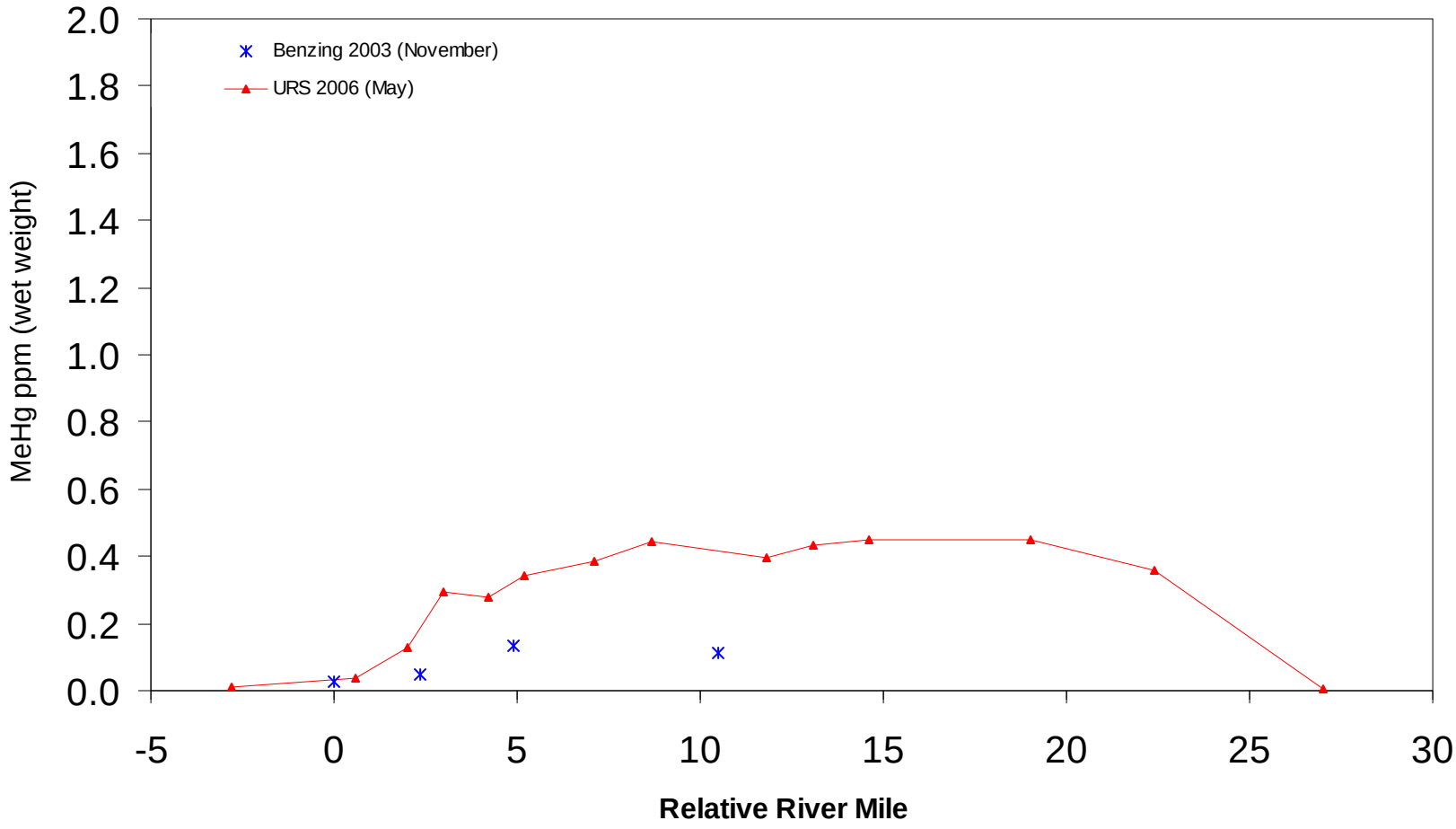
Corbicula MeHg



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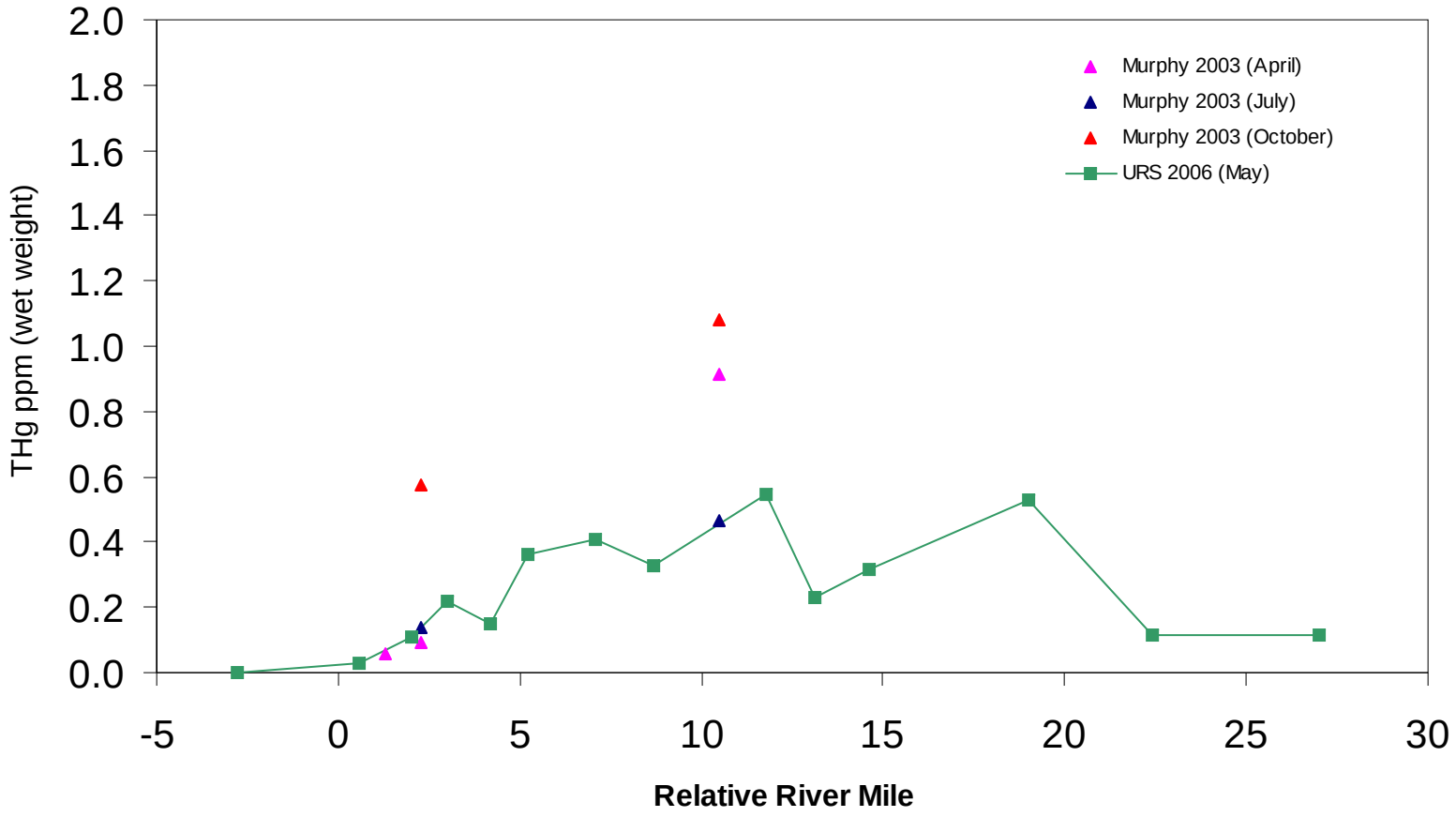
Diptera THg



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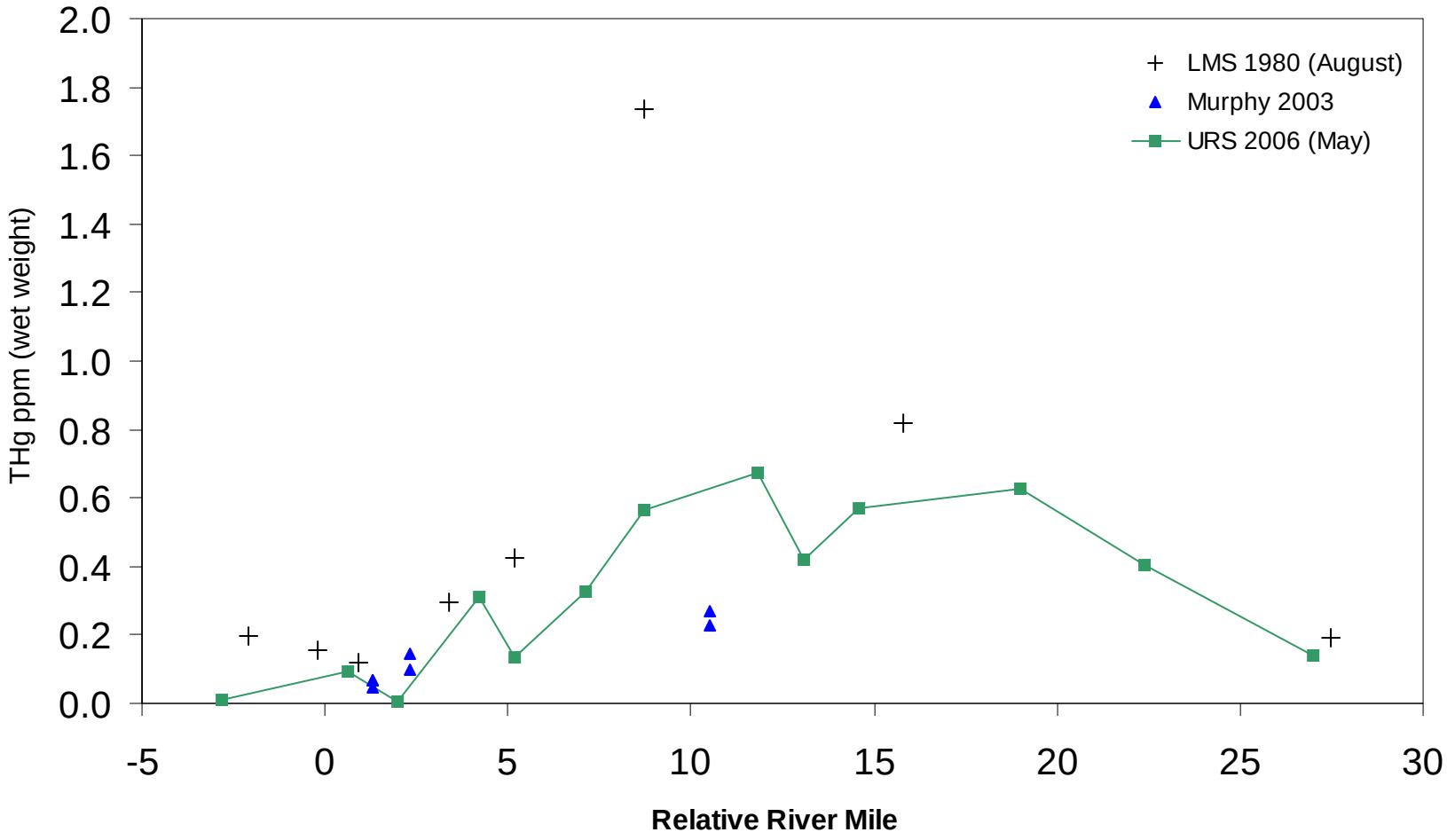
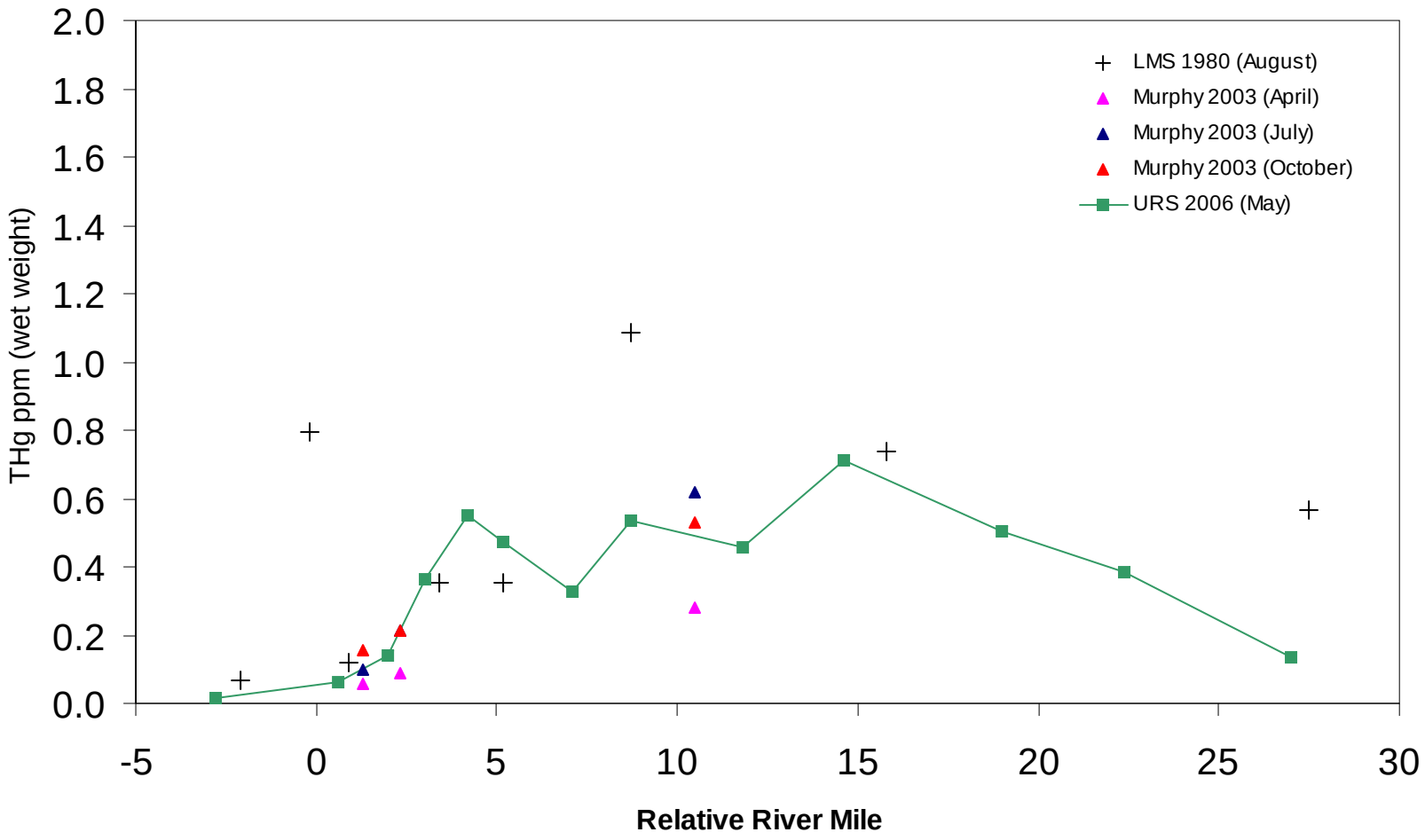
Ephemeroptera THg



Trichoptera THg



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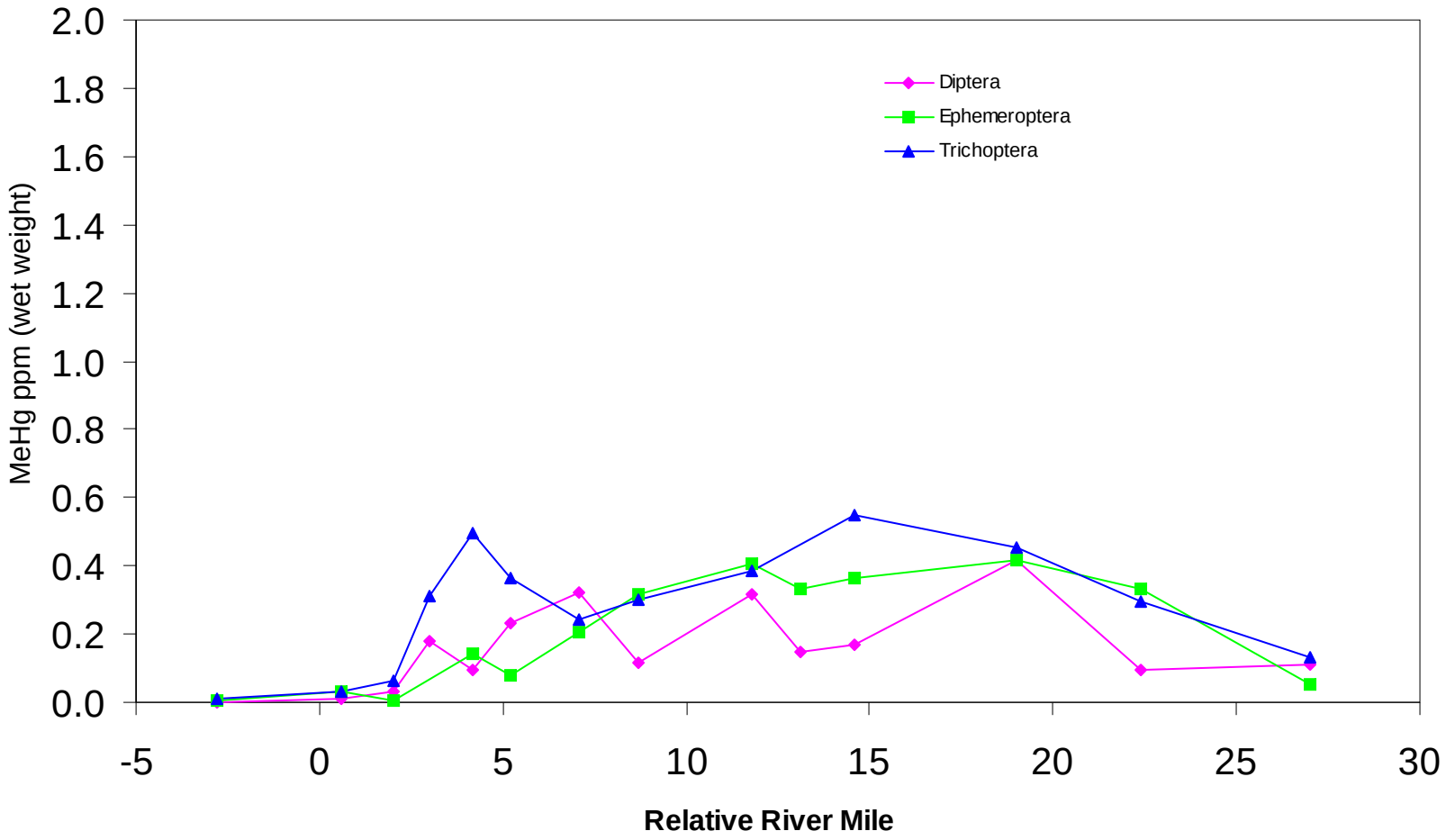
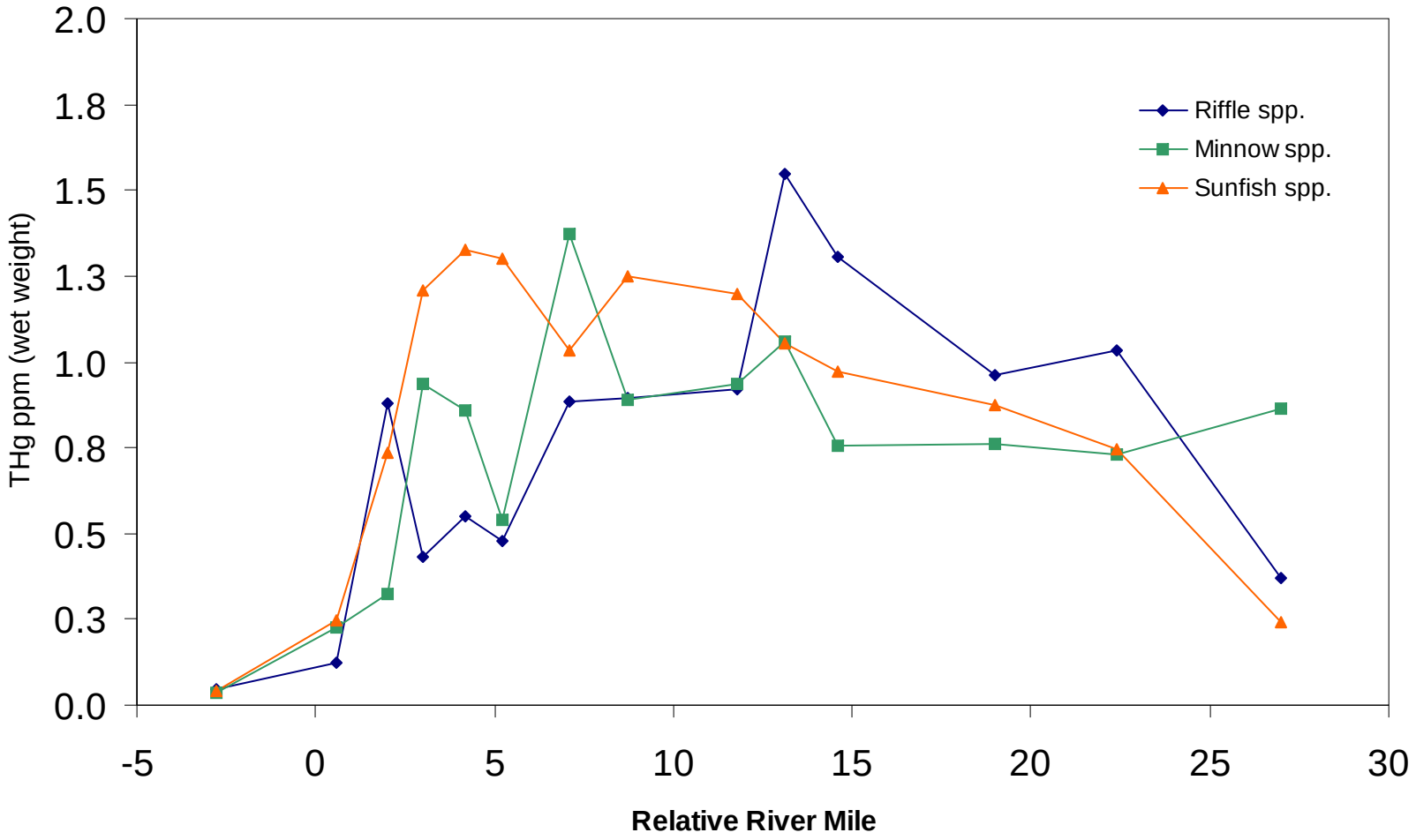
Aquatic Insects MeHg - May 2006



Prey Fish THg - May 2006



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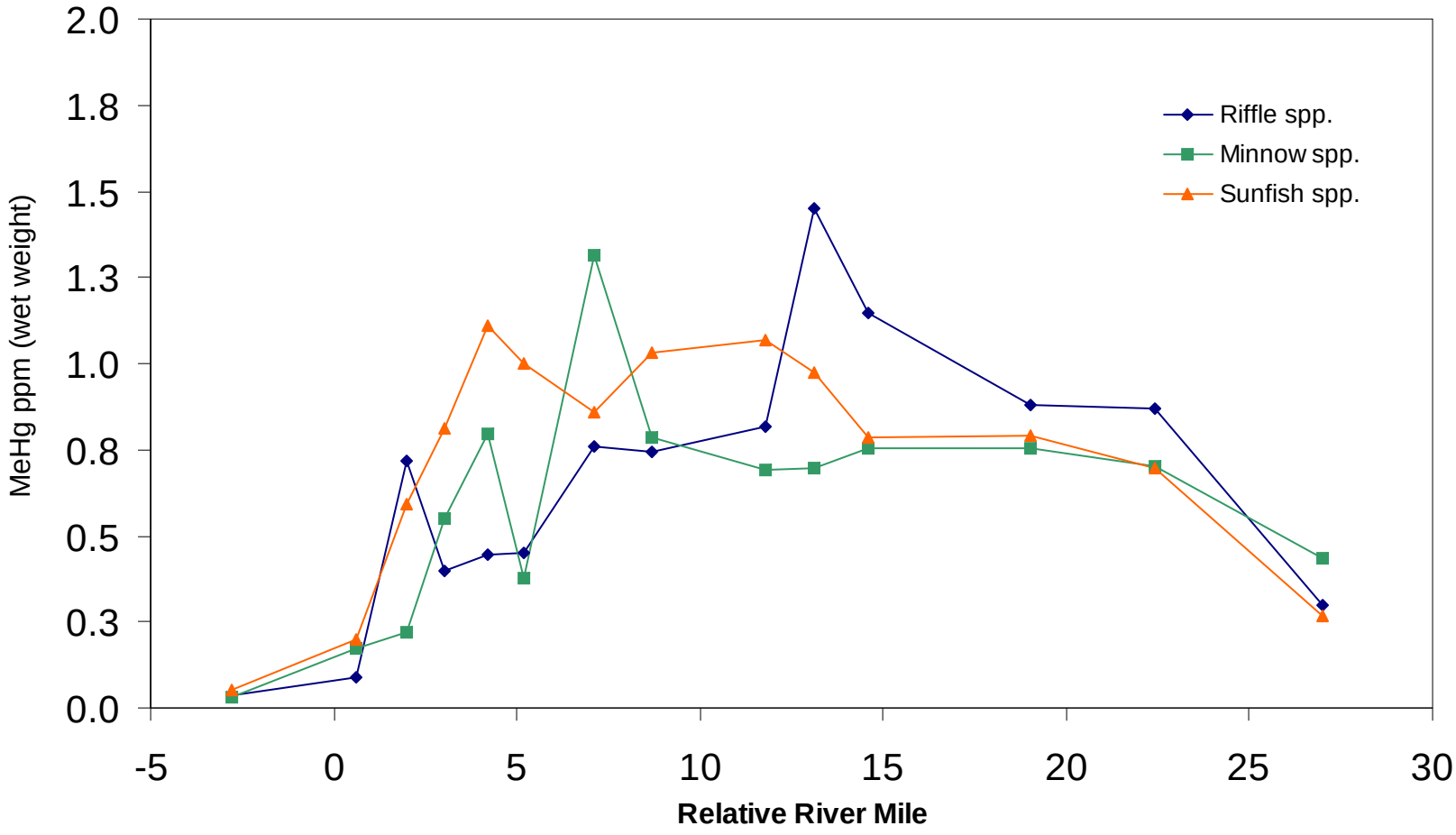
Prey Fish MeHg - May 2006



Biota Tissue Discussion Results

General:

- Although not shown, biota tissue mercury concentrations are similar at reference locations along the North and South Rivers

Algae:

- Highly variable THg results due to differences in algal types and sediment THg; low MeHg concentrations

Crayfish:

- Concentrations of THg and MeHg in crayfish tissue rise at a similar rate among months between RRM-0.6 and RRM-7.1 and then trends among months are more variable downriver

Clams:

- Concentrations of THg and MeHg increase similar to other invertebrate tissue types with seemingly less variability between stations

Insects and Forage Fish:

- The different groups of fish and insects generally display similar patterns of THg and MeHg accumulation at stations along the river
- Concentrations in fish are generally 2X higher compared to invertebrate tissue