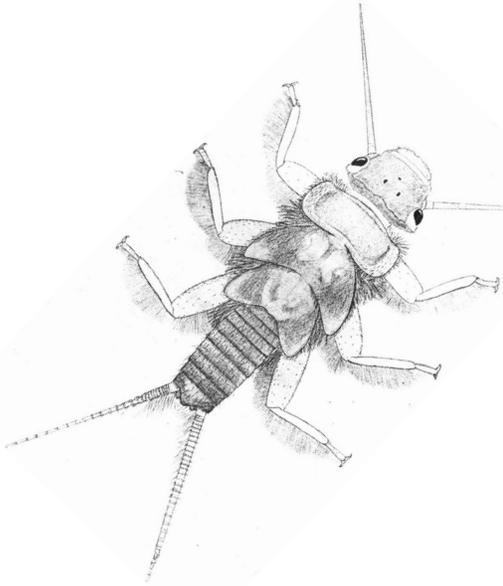




Columbia Environmental Research Center

## Missouri River Benthic Macroinvertebrates



### Introduction

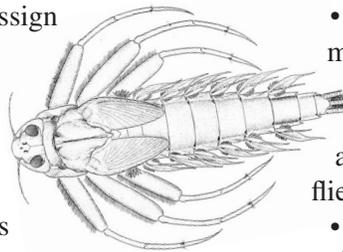
Macroinvertebrates are organisms without a backbone (vertebrae), and are visible to the naked eye. Most macroinvertebrates are insects, but worms, clams, snails, and all of our crustaceans (crayfish, shrimp) are also included. Benthic organisms are those which live on the bottom substrates or sediments in all water bodies.

Macroinvertebrates are the primary food base for many fishes, birds, amphibians, and reptiles. They process organic matter by breaking down leaves and woody material that fall into water. Macroinvertebrates are part of all aquatic food webs, representing every major feeding type (predators, scrapers, collectors, shredders, and filterers), and are often the most abundant and diverse group of animals found in water.

### Biological Assessments

In recent years, scientists survey aquatic communities as a measure of ecological condition or “health”. By looking at number of species, abundance, and the relative proportion of different feeding types, scientists are able to evaluate the quality of water, individual habitats, or of entire systems. These types of studies are referred to as biological assessments.

Aquatic macroinvertebrates are the most frequently used community for biological assessments, but other communities are also being studied, including fishes, algae, vascular plants, and zooplankton. All of these aquatic communities provide indicators related to the past history of exposure to environmental stressors such as degraded water quality, effects of habitat loss, and declines in substrate quality. By combining these indicators, scientists can assign a relative score to individual sites, and relate these scores to known stressors in aquatic ecosystems.



### Preliminary Findings

In the Lower Missouri River, scientists at CERC have been studying aquatic macroinvertebrates for almost 12 years. Listed below are preliminary findings based on these studies:

- About 263 species have been found in the Lower Missouri River
- About 135 species are found in main channel habitats
- About 167 species are known in off-channel wetlands, 128 of which are unique to wetlands
- Several species are restricted to very large rivers
- Several species are unique to only one type of substrate or individual habitat
- A total of 8 species of burrowing mayflies are known to exist in the mainstem
- The largest mayfly hatch is *Tortopus*, which burrows into clay bank habitat
- Abundances of over 100,000 animals per square meter can be found in rock habitats
- Habitats with rock substrate and flow are dominated by caddisflies, mayflies, and stoneflies
- Unique species are found in the soft mud substrate behind large wing dikes
- Highest diversity and abundance occurs in the most stable substrates
- Biological assessments can be conducted successfully in large rivers
- Sites directly below Kansas City have lower biotic condition than other sites evaluated.

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