

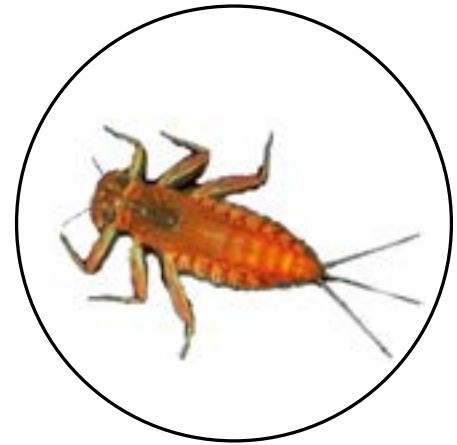
MACROINVERTEBRATES



Biological indicators show mixed trends

What are Macroinvertebrates?

Macroinvertebrates are animals without backbones that can be seen with the naked eye and live at least part of their life cycles in or on the bottom of a waterbody. Macroinvertebrates (macros) include aquatic insects like mayflies, stoneflies, caddisflies, midges, and beetles as well as crayfish, worms, mussels and snails. They spend most or all of their life cycle in water and inhabit all types of moving water from rushing mountain streams with rocky bottoms to sluggish, meandering streams with sand and mud bottoms. A community is classified as different types of macroinvertebrates living in the same habitat areas in a river.



North American Benthological Society

Macroinvertebrate: Heptageniidae

Minnesota River Assessment Project Report

Published in January of 1994, this report offered the following findings on macroinvertebrate sampling in the basin:

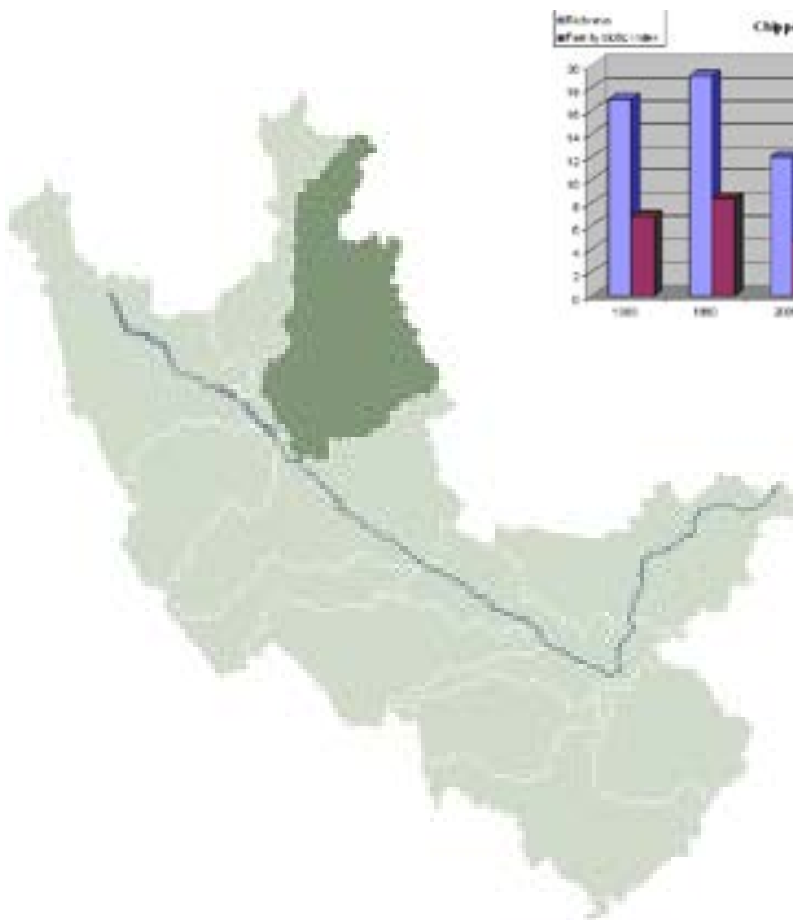
- Macroinvertebrate communities were assessed at approximately 40 sites along the main stem of the MN River, its tributaries, and small-watershed streams. Most sites sampled had been adversely affected by pollution, and had fewer species than would be desirable.
- All macroinvertebrate communities at the sites studied on the main stem were judged as moderately to severely affected by pollution. Main stem sites at Henderson and Lac qui Parle were the most severely affected.
- Macroinvertebrate communities in the larger tributaries were considered moderately affected by pollution. Chippewa River was the most affected tributary.
- For the small to intermediate streams, physical characteristics and composition of bottom-dwelling communities varied greatly. Most of these sites are moderately affected and some severely affected by pollution.
- Habitat modification and excessive amounts of organic material were factors affecting macroinvertebrate communities.

Macroinvertebrates as Indicators

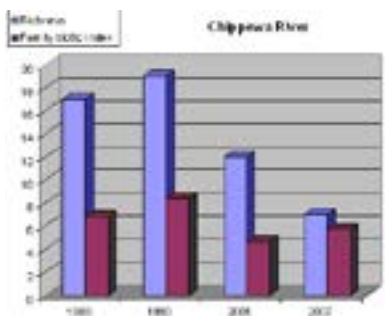
- Represent important links in the food chain as recyclers of nutrients and food for fish.
- Cannot swim from pollution like fish and can be affected by even subtle levels of pollution, showing the effects of both short- and long-term pollution events.
- Some are intolerant and others tolerant of pollution. Taken together, the presence or absence of tolerant and intolerant types can indicate the waterbodies' overall health.
- Because each has a different tolerance to pollution any alteration to a river may have an impact on their abundance and distribution and may show the cumulative impacts of pollution.
- They have short life cycles – usually one season or less in length – meaning a water quality problem could be detected quicker.
- May show the impacts from habitat loss not detected by traditional water quality assessments.
- Relatively easy to sample and identify to a level that provides meaningful information about a stream's health.

MACROINVERTEBRATES

Chippewa River Macroinvertebrate Study



Chippewa River Watershed



Scott Matteson

Macroinvertebrates on underside of rock.



Scott Kordelka

Paul Wymar from the Chippewa River Watershed Project collecting macroinvertebrates

Macroinvertebrate Collection

Macroinvertebrate communities and family richness can be affected by a number of factors including pollution along with changes in habitat and substrate. A decline of macroinvertebrate diversity and numbers in the Chippewa River could have been a result of major flooding in 1997 and lesser flooding in 2001. Deposition of silt and clay most likely has also impacted them in non-flood years. Macroinvertebrate sampling has been conducted in the Chippewa River Watershed by MPCA and the Chippewa River Watershed Project. Methods for sampling has evolved and changed over the years with no consistent protocol. Currently, no state standard has been set for sampling macroinvertebrates.

“Ask an Expert about the Minnesota River” project profiles scientists and citizens answering questions about the health of the Minnesota River. More answers to questions about the Minnesota River can be found at: mrbdc.mnsu.edu/learn
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