

Meet the insects!

Non-biting midges (Family: Chironomidae)



Stoneflies (Order: Plecoptera)



Caddisflies (Order: Trichoptera)



Mayflies (Order: Ephemeroptera)



Contact us!

 midge@umn.edu

 bugsbelowzero.com

 Bugs Below Zero

Get Involved!



UNIVERSITY OF MINNESOTA



BUGS BELOW ZERO

DISCOVERING WINTER
ACTIVE INSECTS



Bugs Below Zero



Introduction

Bugs are everywhere! They are in the woods, the gardens, in our homes, and even in the water! In Minnesota, aquatic insects can be found in **lakes, rivers, and streams** every season of the year including the winter!

Certain aquatic insects are able to complete their life cycle and emerge from, or leave, open streams during winter. Winter active aquatic insects, including **stoneflies, caddisflies, mayflies, and non-biting midges** can be found crawling along snow-covered stream banks.

Who are we?

The University of Minnesota Bugs Below Zero project funded by the Minnesota Environmental & Natural Resources Trust Fund (ENRTF) aims to **research** and **raise awareness** of winter active aquatic insects.

Bugs Below Zero is an **interdisciplinary team of experts** from the agricultural and environmental sciences, science communication, entomology, fisheries, wildlife, and conservation biology disciplines.

Get involved in community science!

What is community science?

Community science occurs when members of the public collect information and share what they find with researchers. Data collected by communities can help scientists access locations and information that they couldn't get alone. Anyone can be a community scientist!

How to get involved

- Look for winter active aquatic insects!
 - Fill out the **observation sheet** or upload your insect photos to our **Anecdota** webpage.
- Raise awareness
 - Share your **knowledge** of winter-active aquatic insects with your family and friends.
- Attend a Bugs Below Zero Event!
 - Visit our **website** or follow us on **facebook** to learn more.



Why are winter aquatic insects important?

Aquatic insects are important to our **ecosystems, economy, and community**. They play an important role in maintaining healthy streams and food webs. Aquatic insects are often the **food source** for fish and other aquatic animals. Winter-active insects such as non-biting midges are vital to the winter diet of trout.

With our climate changing, aquatic insects are especially **sensitive to changes** in air or water temperature, oxygen levels, habitat modification, and other changes in water quality. If the climate continues to warm, insects that emerge in winter might decrease in abundance and diversity, **impacting food webs**. It is important that scientists and community scientists work together to document aquatic insects' presence and diversity.

