# Benthic Invertebrate Distribution in Relation to Current Velocity in Little Niagara Creek

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## Introduction

The distribution of benthic macroinvertebrates is an important factor underlying stream function and health. Invertebrates are a critical component of aquatic food webs and provide food for aquatic and terrestrial organisms (Cuffney et al. 1993). They also break down dead organic matter, recycle nutrients, and are indicators of pollutants (Voshell & Bartlett 2002). Stream current influences a variety of ecological processes that can affect benthic invertebrates performance, distribution, and abundance. These processes include dispersal, resource acquisition, habitat use, and the outcome of biotic interactions (Hart & Finelli 1999).

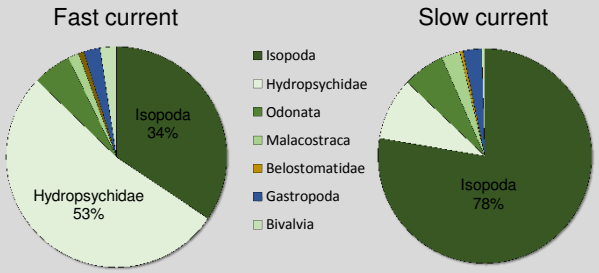
We did this study to learn how current velocity influenced macroinvertebrate distributions in Little Niagara Creek.

## Methods

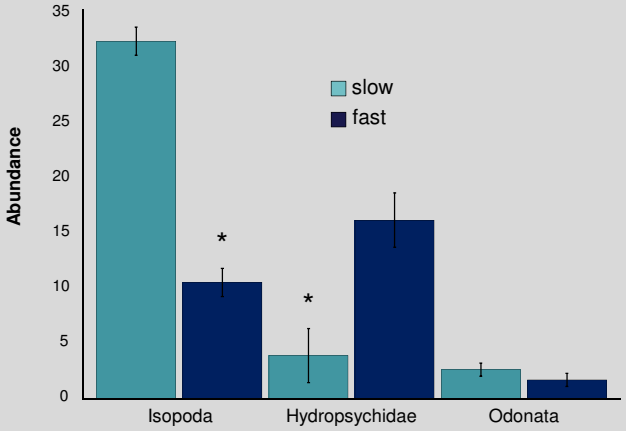
- We established two sites in Little Niagara Creek that had mean current speeds of 64 cm $s^{-1}$ (fast) and 6 cm $s^{-1}$ (slow).
- Ten, 45 x 15 cm, cylindrical, plastic mesh cages were constructed and filled with a gravel substrate.
- Five replicate cages were placed in each current velocity site and left in the stream for two weeks to allow time for macroinvertebrate colonization.
- Macroinvertebrates were then sorted, identified and counted.

Alyssa measures current velocities at the slow and fast sample sites.

## Results




The fast (left) and slow (right) sampling sites in Little Niagara Creek.




Mean (± SEM) abundance of the three most common macroinvertebrates found in our study. T-tests were used to determine differences between the two current velocity treatments. "*" indicates significant differences (Isopoda p = 0.049; Hydropsychidae p = 0.01; Odonata p = 0.07).

Mesh cages after two weeks in Little Niagara Creek, awaiting analysis.

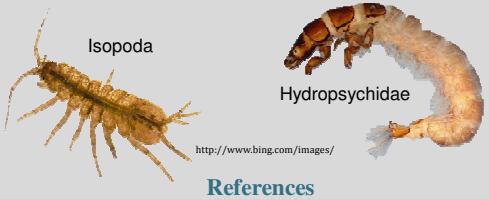
## Discussion

The abundance of Hydropsychidae (net-spinning caddisflies) and Isopoda (pill-bugs) on rocky substrate differed between fast and slow current. Hydropsychidae abundance was greater in the fast current, Isopoda were more abundant in slow current.

We hypothesized Hydropsychidae abundance would be greater in fast current because of its feeding behavior. Net-spinning caddisflies capture food particles with their silken nets. Fast flow allows these caddisflies to obtain more food per unit time (Williams & Hynes 1973).

We hypothesized pill-bugs would be more abundant in slow current velocity because they are detritivores that feed on fine particulate organic matter found in depositional areas (Last et al. 2000).

Our findings suggest that current has an important influence on the distribution of benthic invertebrates by influencing their food resources. Further experiments could examine how flows impact ecological interactions among macroinvertebrates, such as predation and competition.




## References

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