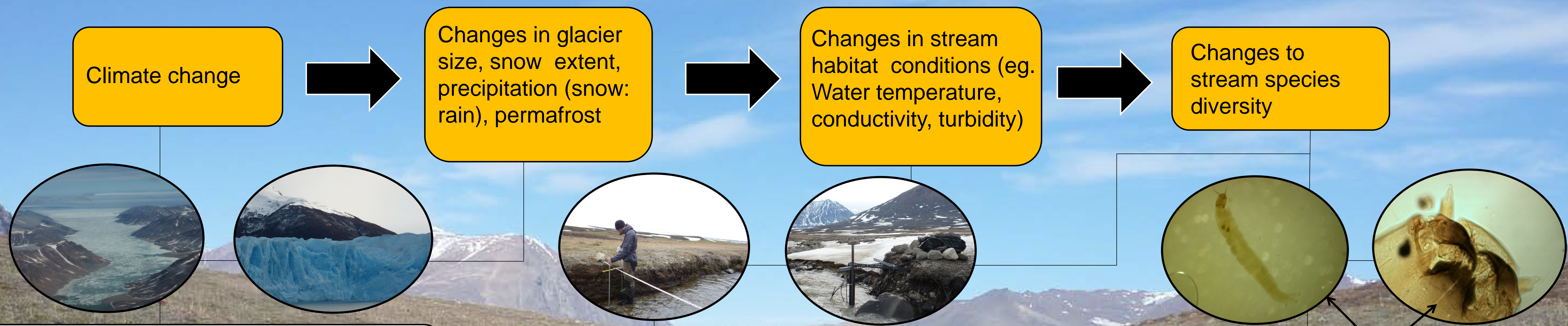


The role of water source in high Arctic stream biodiversity: a study from Northeast Greenland



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Aim

To identify how different water sources affect stream biodiversity through altering stream habitat conditions. This will allow us to predict how climate change will alter Arctic stream ecosystems in the future.

Introduction

- Due to its isolation and logistical difficulties, stream ecology research has been sparse in Greenland (but see 1 & 2). This is the first stream hydroecology project in Northeast Greenland, an area expected to be greatly impacted by climate change in the upcoming decades (3).
- Meltwater streams are known for being instable and having low temperatures.
- Groundwater streams are generally more stable environments and have warmer water temperatures, meaning these usually have more species living in them.
- We predict more groundwater sourced streams in the future with more species present. With less meltwater streams, some cold-adapted species may become locally extinct.

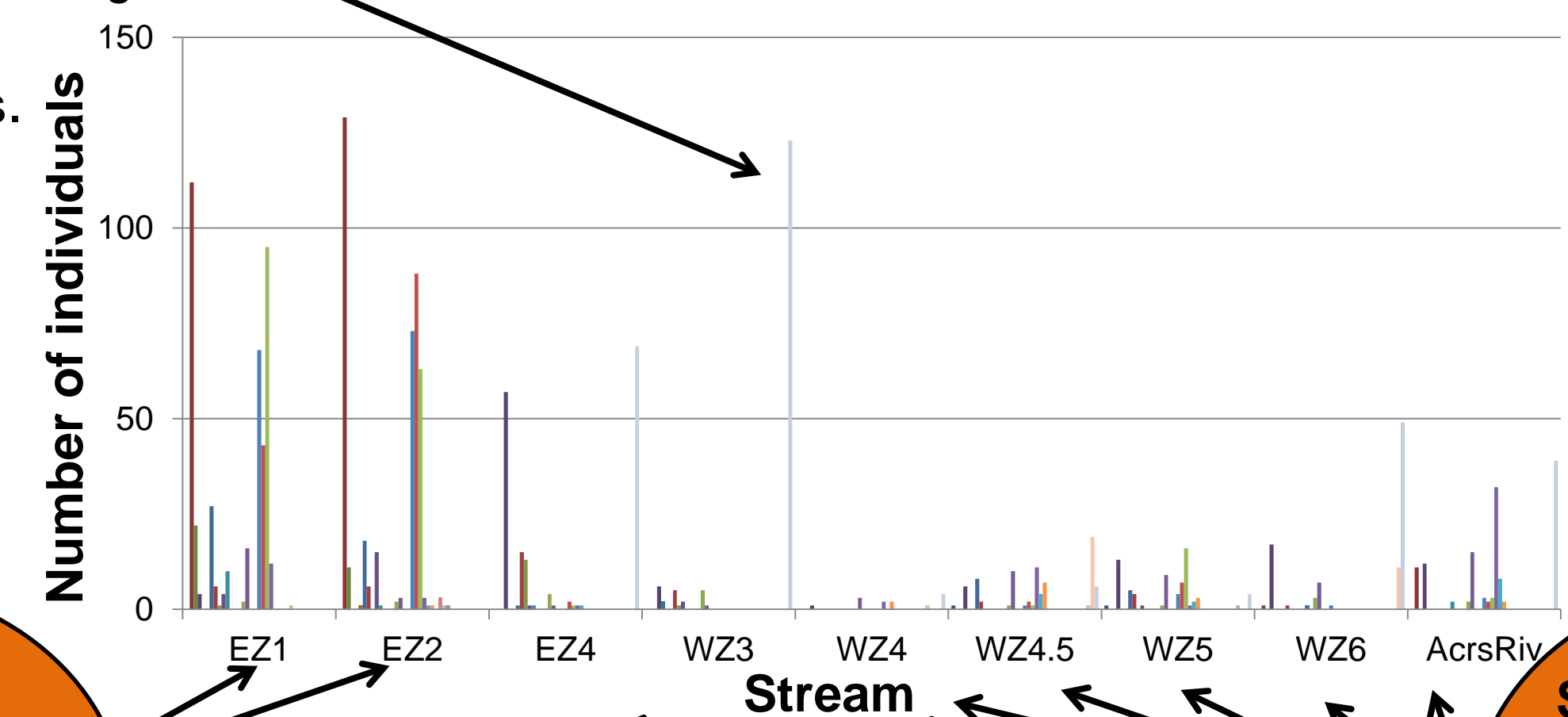
Methods

- 5 streams were selected with varying water sources incorporating groundwater and snow and ice meltwater streams.
- Analysis for silica content in water samples determined water source.
- Habitat conditions were monitored by installing gauging stations in each stream to record variables such as temperature and conductivity, every 15 minutes.
- Species diversity was measured by collecting samples at each site. Species were identified to the lowest possible level in the laboratory.

Results

Dominant species adapted to cold waters. Not found in ground water Streams.

Chironomidae species 2013



Chironomidae- non biting midge larvae

Different species present in groundwater and meltwater streams

Groundwater streams

- More individuals
- More species

Snow and ice meltwater streams

- Less individuals
- Less species

References

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Conclusions

- With a changing climate we expect to see more groundwater than meltwater influences to streams in the Arctic.
- Groundwater influenced streams have higher water temperatures, lower turbidity and high channel stability.
- Local extinctions of species adapted to cold water environments are expected.
- As streams become less diverse in their water source characteristics, we expect stream biodiversity to be higher in the overall area, but for there to be less differences between streams.