Comparing invertebrate herbivory in arctic and alpine tundra following experimental warming

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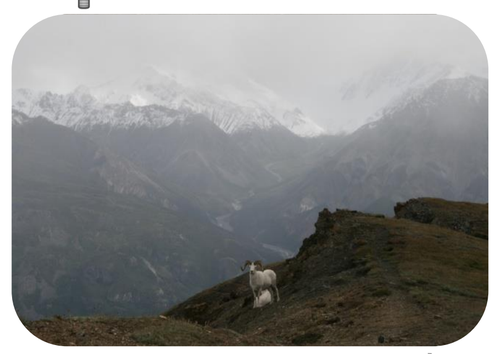
tundra ecosystems

- Temperature-limited systems, with strong seasonality
- Distributed worldwide, at high latitude (arctic tundra) and high elevations (alpine tundra)
- Sensitive to ongoing environmental changes

arctic tundra

Vs.

alpine tundra



Many ecological **similarities** but some **differences** that can lead to divergent responses to environmental changes[1]

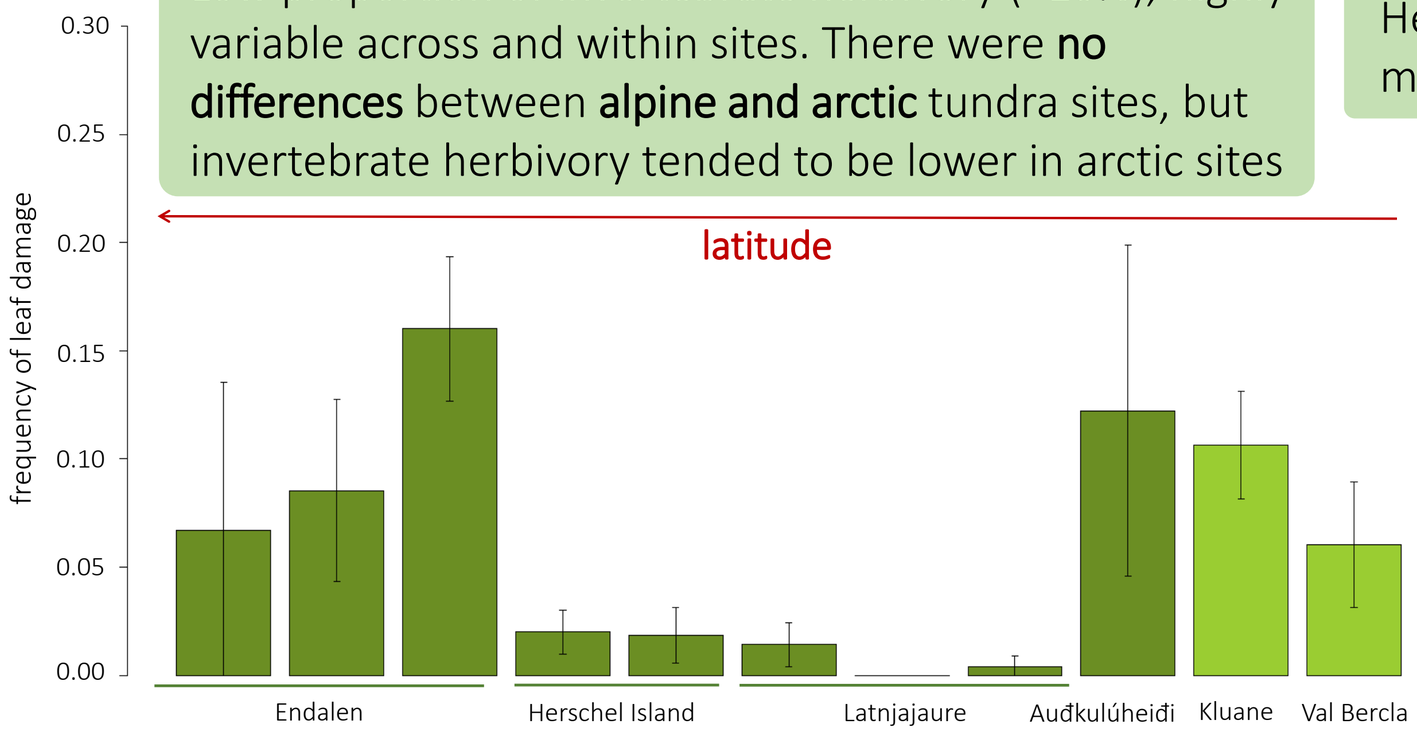
do the responses of invertebrate herbivory to experimental warming differ in arctic vs alpine tundra?

invertebrate herbivory

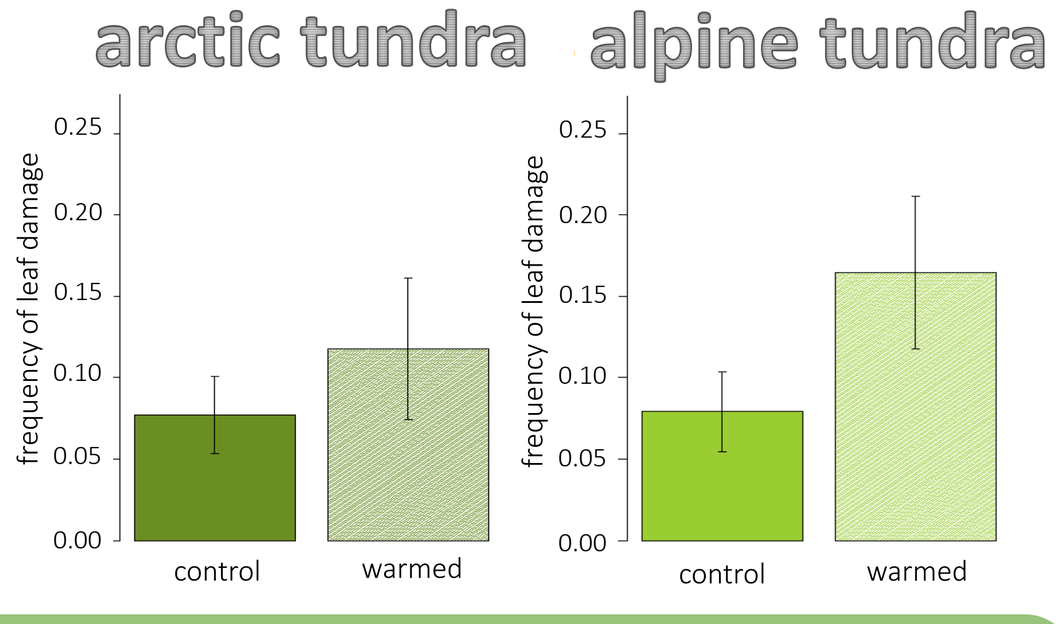
- Poor knowledge in tundra ecosystems, especially for non-outbreak situations[2]
- Invertebrate herbivores may respond more quickly to warming[3]
- Higher diversity and abundance of invertebrate herbivores in alpine sites[4]

*We compared the **frequency of leaf damage** by invertebrates during summer 2014 in plots subjected or not to long-term passive warming at 6 sites participating in the International Tundra Experiment (ITEX) using a standardized protocol[5]. **Presence of leaf damage was assessed at the plant community level using a modified point-intercept method.***

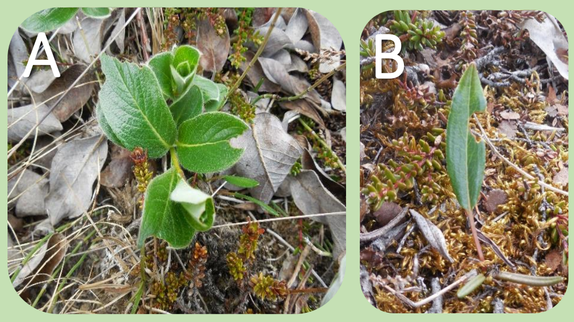
Low proportion of invertebrate herbivory (~10%), highly variable across and within sites. There were **no differences** between **alpine and arctic** tundra sites, but invertebrate herbivory tended to be lower in arctic sites



Herbivory was consistently higher in **warmed plots**. The magnitude of change was similar in arctic and alpine sites



Most damage was due to leaf chewers (vs miners and gallers) on *Salix* spp., *Betula nana* and *Bistorta vivipara*



Leaf damage on *Salix arctica* (A) and *Bistorta vivipara* (B)

similar responses to experimental warming for the intensity of invertebrate herbivory across a wide range of tundra communities

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Herbivory Network: http://herbivory.biology.ualberta.ca

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