

Plant functional groups: friends or foes?

The effect of forb, graminoid and bryophyte removal on biomass compensation along a temperature gradient

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1 Background

- Warmer climate is likely to affect plant community composition, e.g. by changing the proportions of functional groups.
- In alpine grasslands these **plant functional groups (PFGs)** dominate:



Knowledge gap: Does one PFG compensate in biomass when the other two are removed?

Current knowledge:

- Some forb species benefit from the removal of graminoids
- Graminoids are strong competitors

2 Facilitation vs. Competition

$\Delta \text{Biomass} = \text{PFG biomass (g)} - \text{control biomass (g)}$
This tells us if there are facilitative or competitive interactions

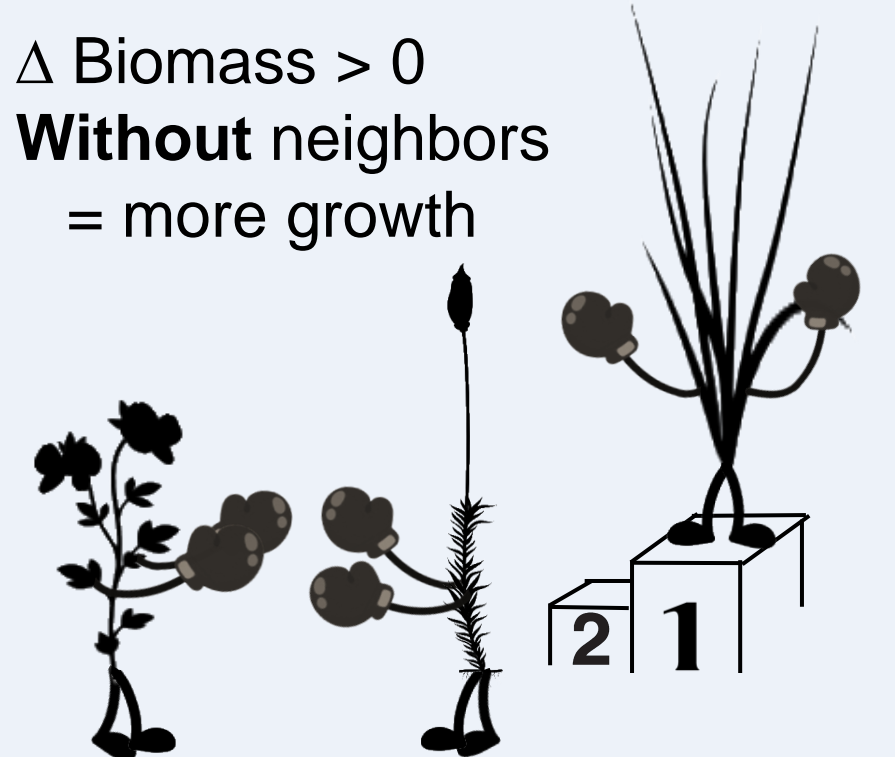
Facilitation

- $\Delta \text{Biomass} < 0$
- With** neighbors = more growth



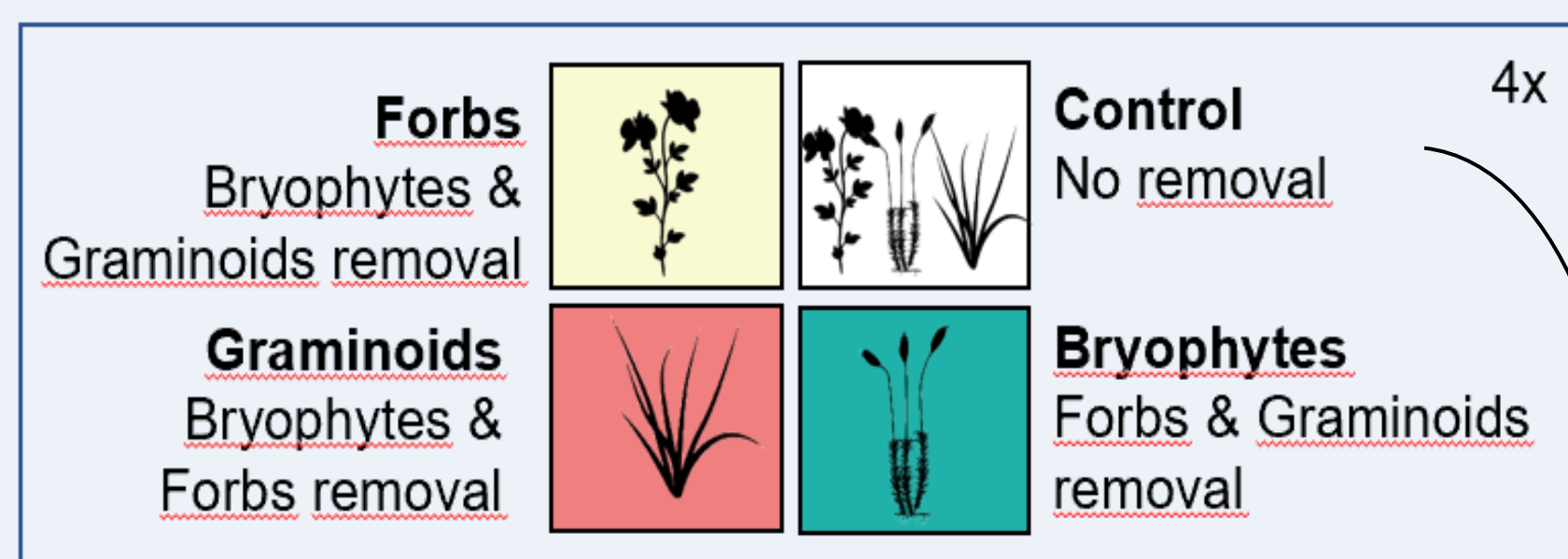
Competition

- $\Delta \text{Biomass} > 0$
- Without** neighbors = more growth

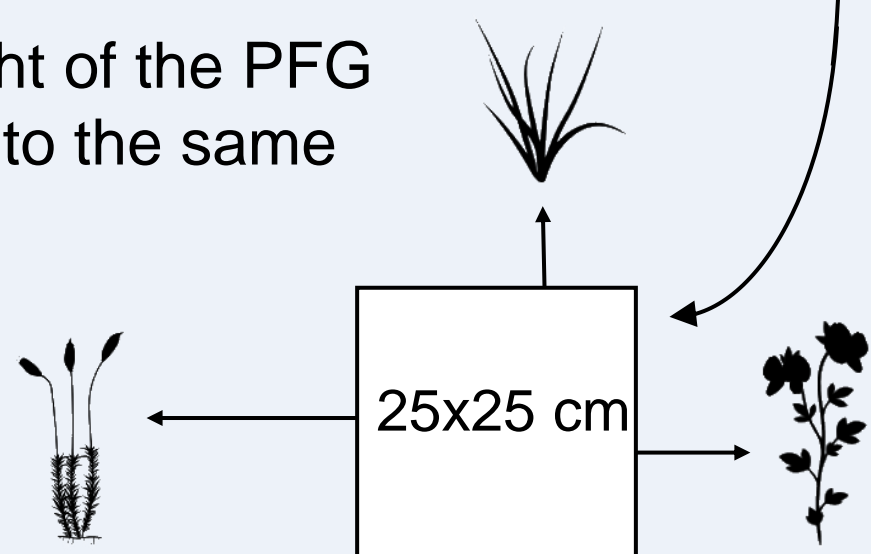


3 Setup & hypotheses

- 3 sites in southwestern Norway
 - ↳ 4 blocks per site and 4 plots per block
- We acquired knowledge about PFG interactions, by:
 - ↳ Using manual removal treatment for 7 years;



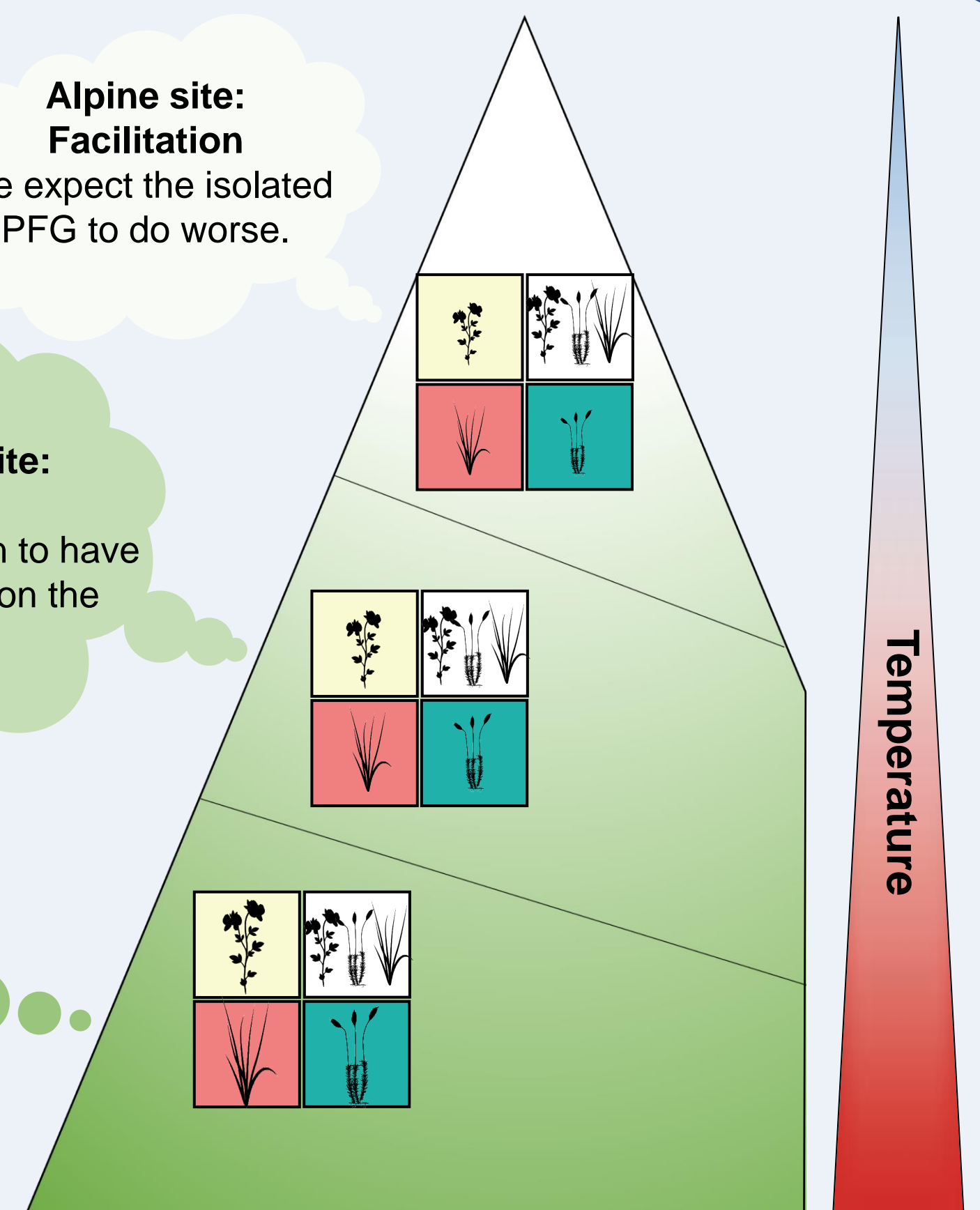
↳ Comparing the dry weight of the PFG left in the treatment plot to the same PFG in the control.



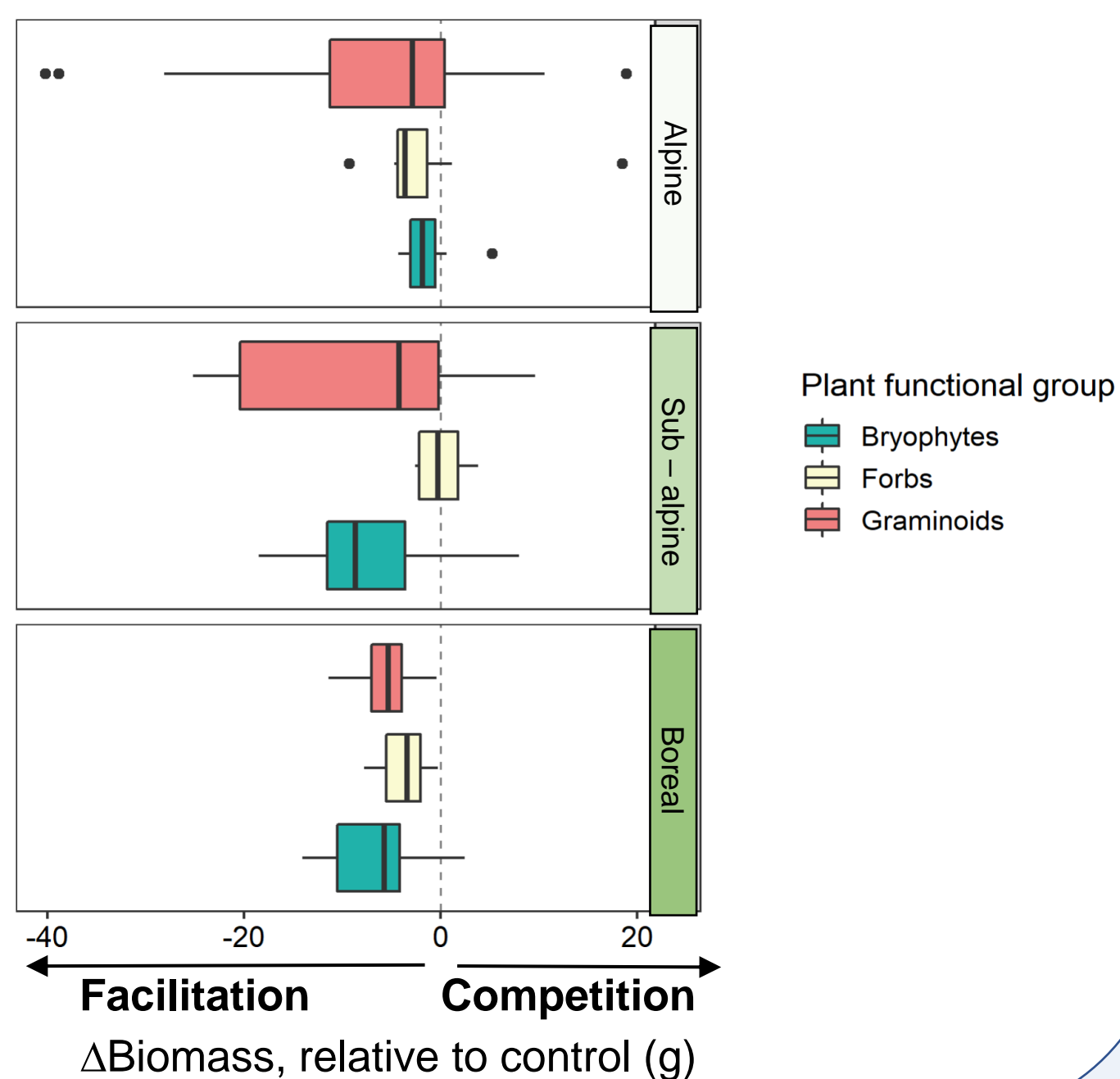
Alpine site: Facilitation
We expect the isolated PFG to do worse.

Sub-alpine site: Neutral
We expect isolation to have no to little effect on the PFG

Boreal site: Competition
We expect the isolated PFG to benefit.



4 Biomass response of isolated PFGs



Key results

Contrary to our hypotheses, the results indicates facilitative interactions among the PFGs for all sites.

- Large variation in graminoid biomass at low temperature
- Forb biomass displayed consistent variation
- No temperature effect detected

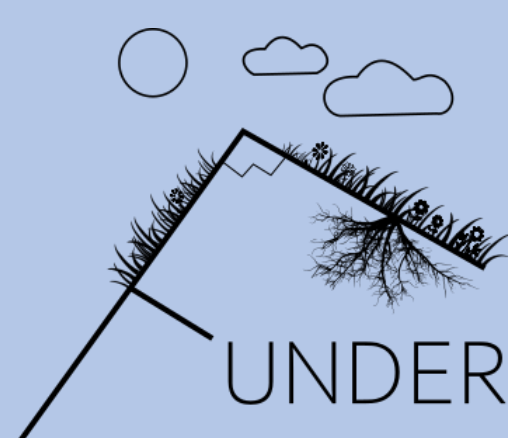


This study highlights the importance of facilitative interactions in alpine grassland ecosystems, and helps us better understand how vegetation composition will change in a warming climate



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For more information about the FUNDER project:
<https://betweenthefjords.w.uib.no/funder/>



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