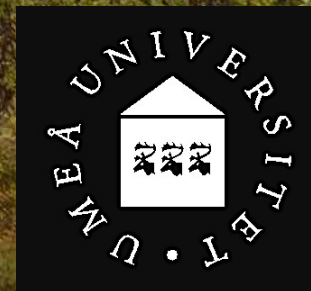


Mosses mediate effects of warmer and wetter conditions on tree seedlings at the alpine tree line

Signe Lett, Eva Krab, Laurenz Teuber,
Marie-Charlotte Nilsson, David Wardle,
Anders Michelsen, Johan Olofsson,
Ellen Dorrepaal

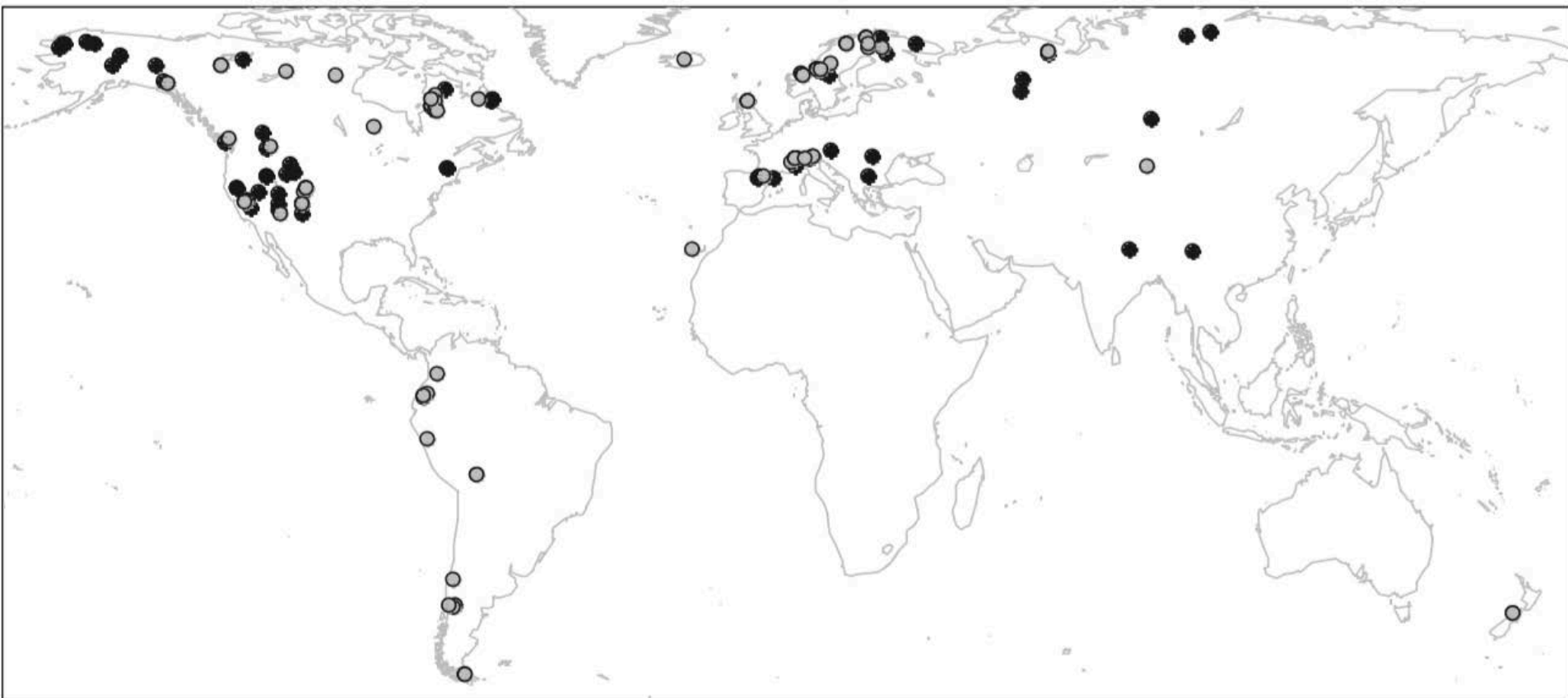


Tree line advance



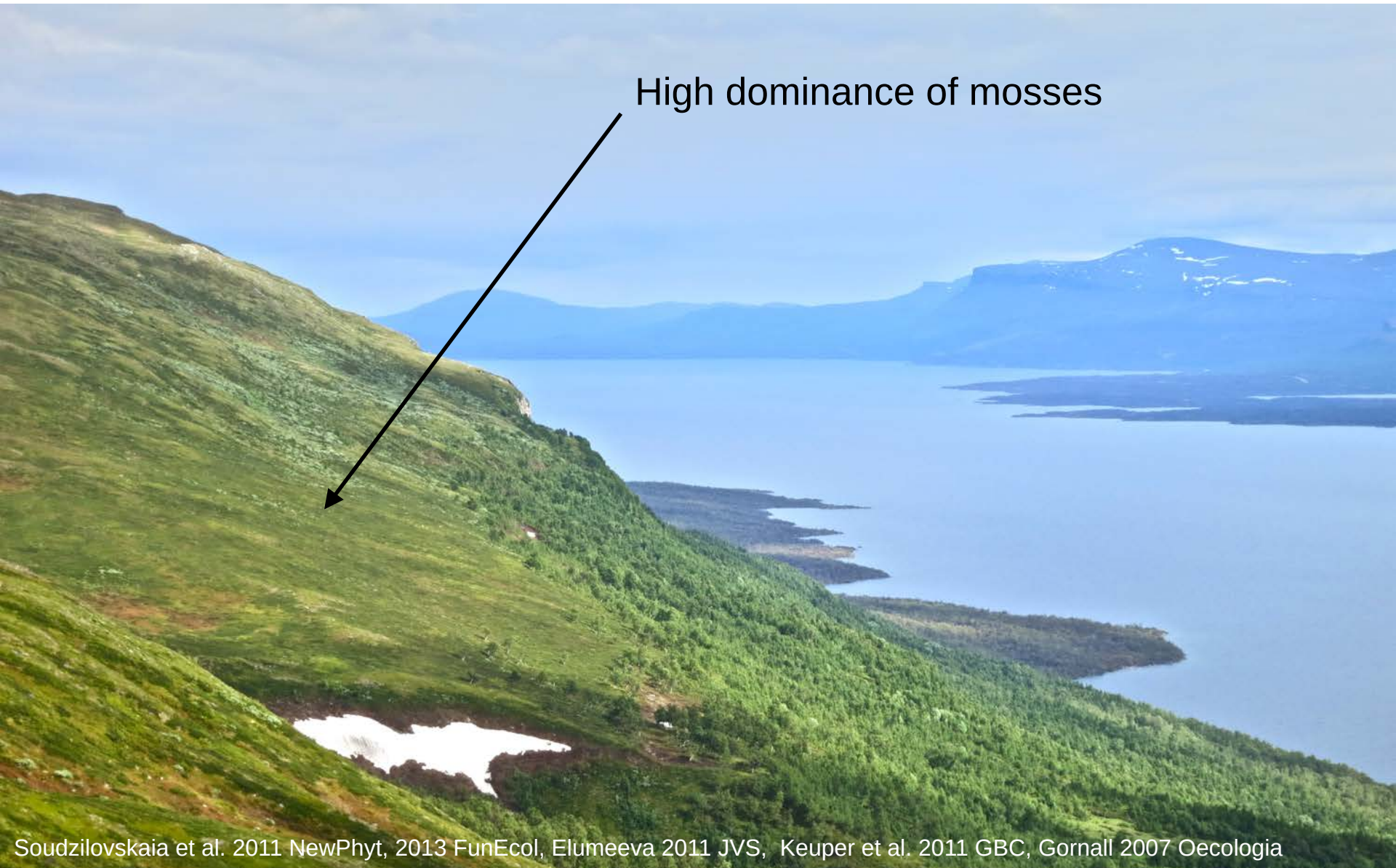
*Körner & Paulsen 2004, J. Biogeogr., Dalen & Hofgaard 2005, AAAR

Tree line advance



- Tree line advance
- No advance

Tundra vegetation



High dominance of mosses



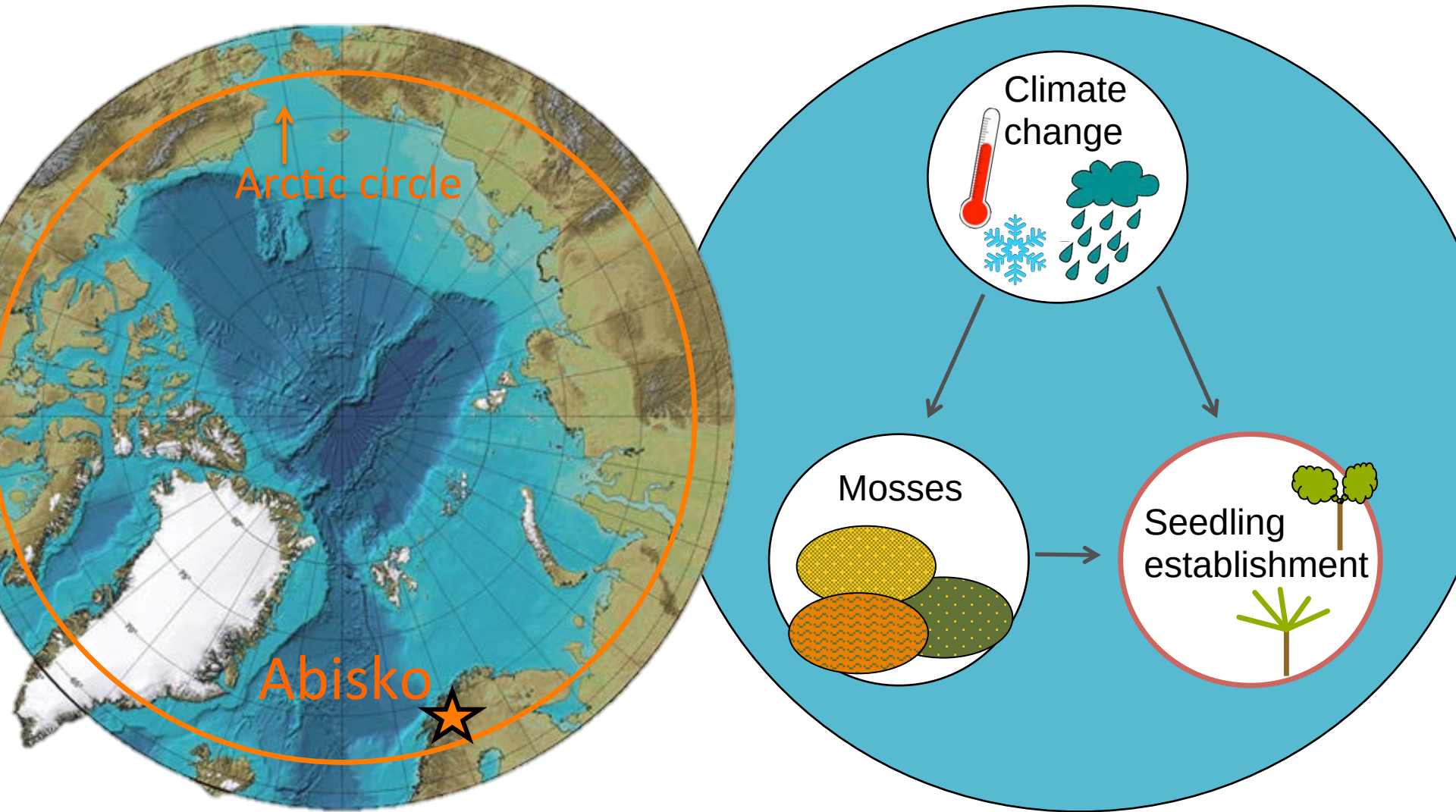
Moss effects on environment

- Temperature insulation
- Light and space
- Soil moisture
- Nutrient availability
- Allelopathic compounds
- ...

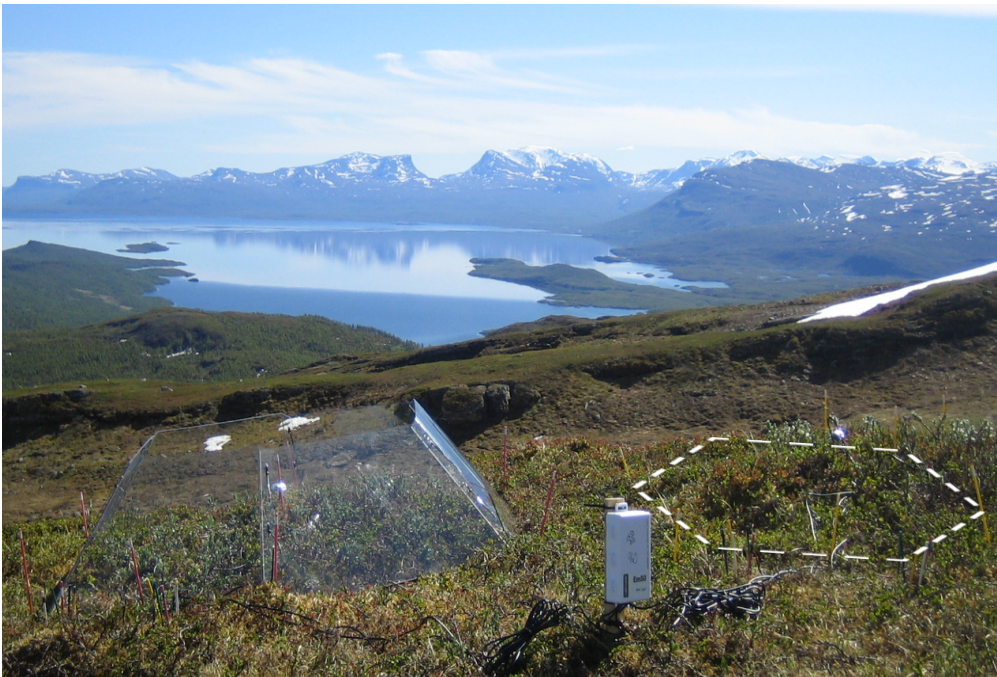
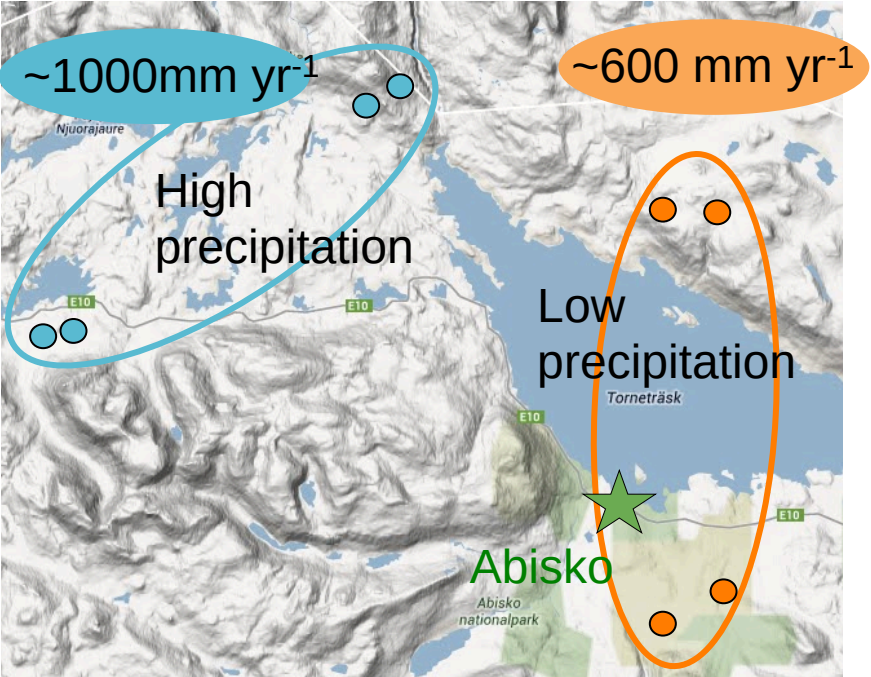
Moss species differ



Mosses – seedlings – climate



Experimental setup in Abisko



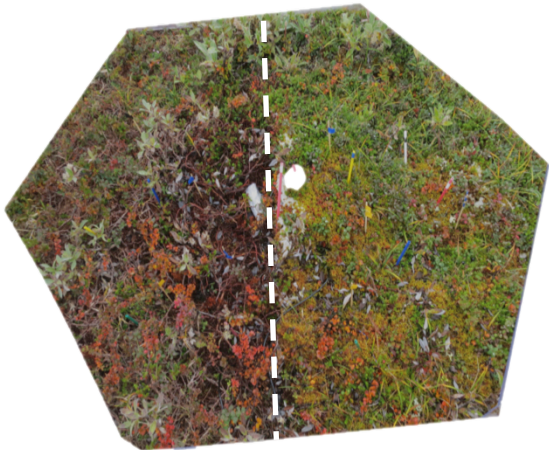
Hylocomium



Pleurozium

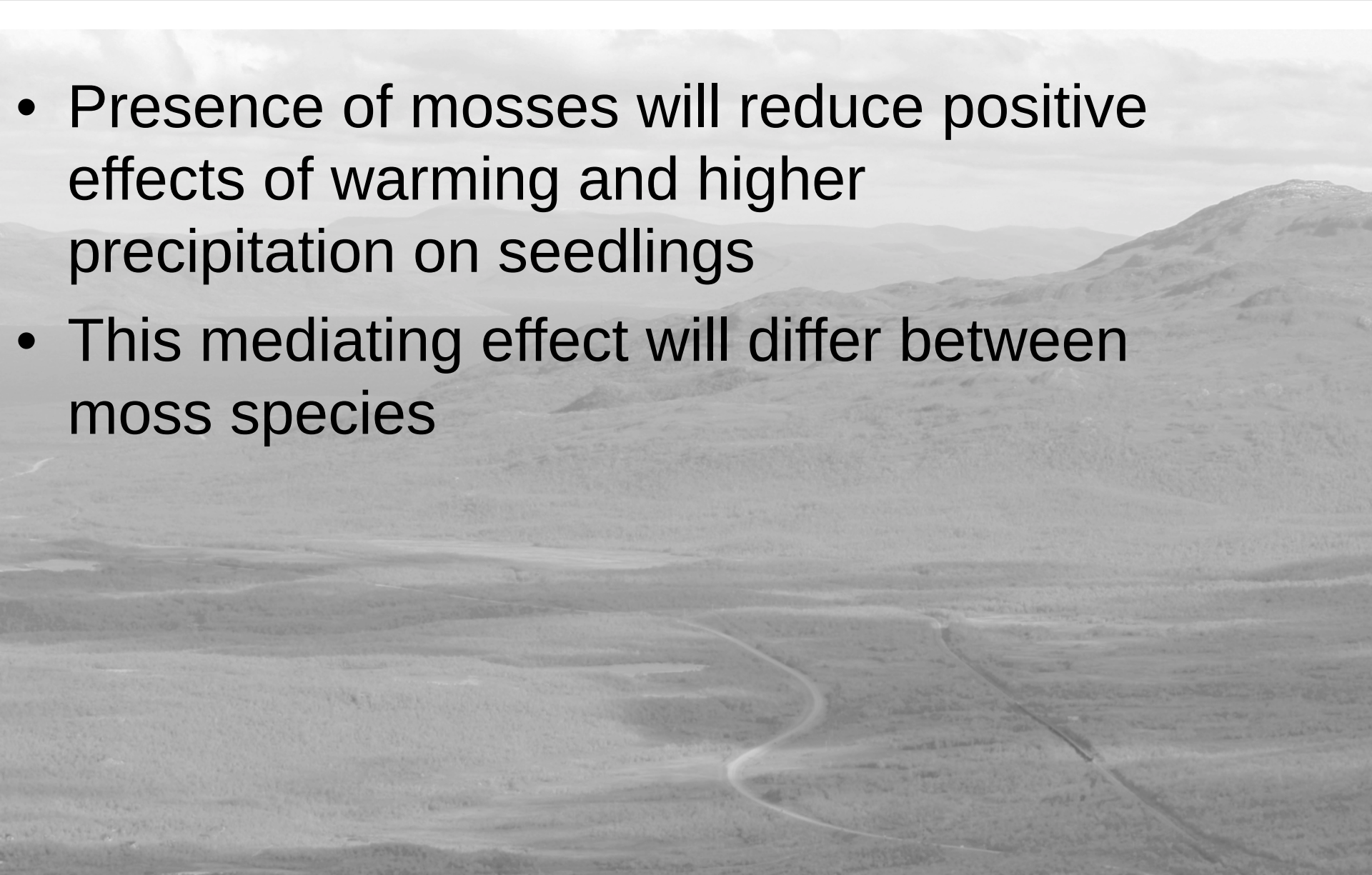


Sphagnum



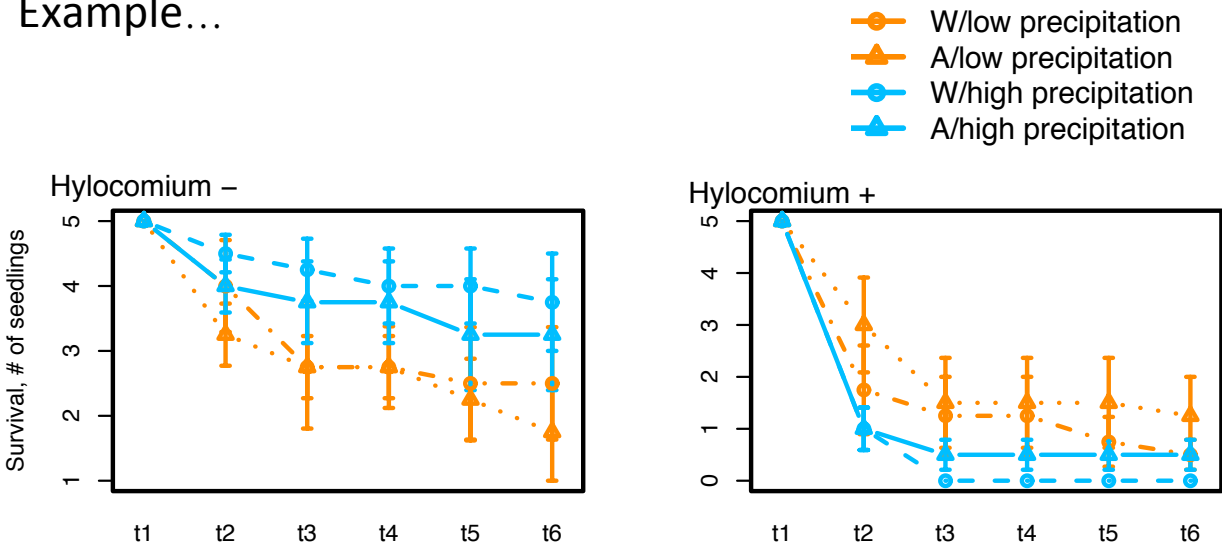
Hypotheses

- Presence of mosses will reduce positive effects of warming and higher precipitation on seedlings
- This mediating effect will differ between moss species



Seedling survival

Example...



Measured twice a year during 3 growing seasons



Moss effect on survival

Betula seedling survival was reduced by presence of *hylocomium* and *pleurozium* but not by presence of *sphagnum*.

'Coxme' output:

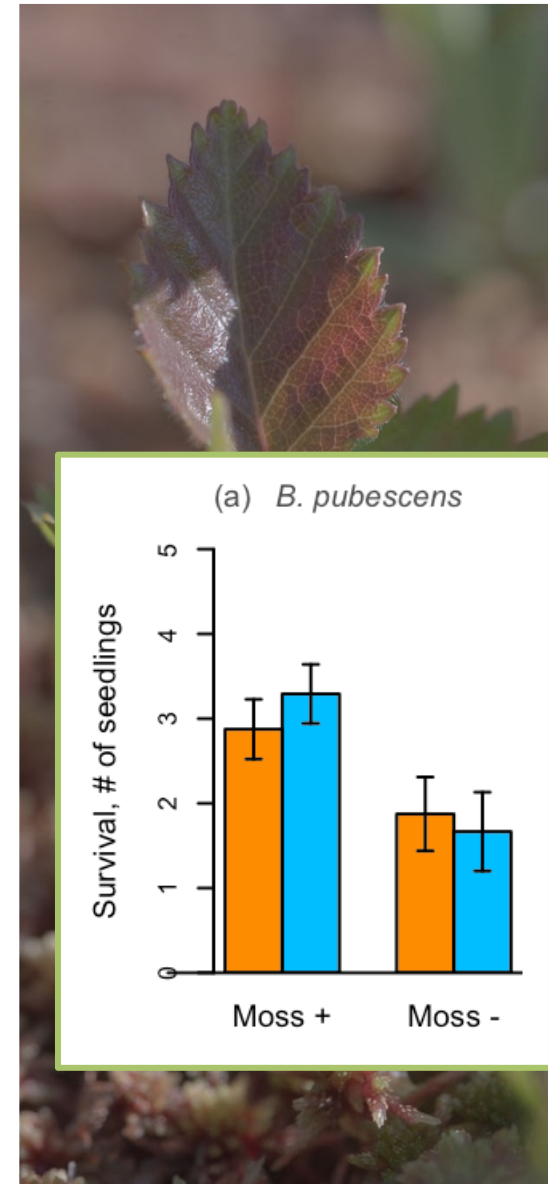
Moss removal***

Moss species***

MR x Moss sp***

P x MR***

W x MR x Moss sp**



Effect of mosses on climate

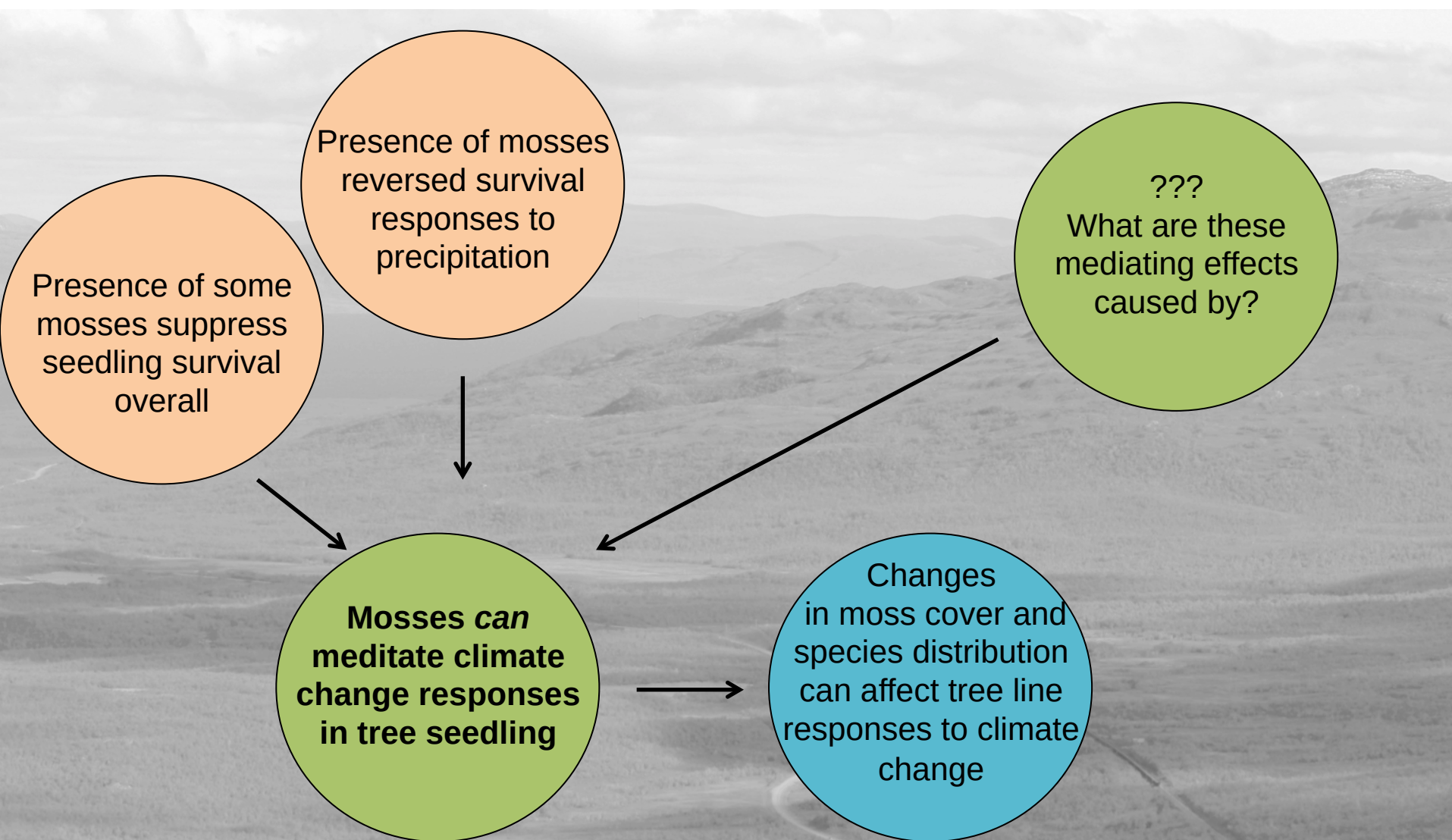
OTC increased soil temp by 0.8°C

Warming*
Moss rem***
Moss sp*

High precipitation sites had lower soil moisture

Precipitation*
Moss rem***
Moss sp***
P x MR *

Do mosses mediate climate change responses?



Thank you for listening!

Thanks to:

Laurenz Teuber

Adèle Binétruy

Eva Krab

Frida Keuper

Rahel Plüss

Gabriella Overödder

Thomas Westin

Ola Eriksson

Tyler Logan

Magnus Bohr

Maria-Theresa Jessen

Marika Makkonen

Robert Holden

Jonas Rönnefart

Daniel Karlsson

Elias Viippola

Jan Borgelt

Jonas Rönnefart

Keith Larsson

Lea Fink

Jakob Eckstein

Funding:

Center för Miljöforskning (CMF)

KEMPE

Vetenskapsrådet (VR)

Kungliga Vetenskapsakademien