



GÖTEBORGS
UNIVERSITET

Increased methane consumption following 25 years of warming treatment

Mats P. Björkman¹, Mabel Gray², Mario Rudner¹, Argus Pasqueda¹, Haldor Lorimer-Olsson¹, Robert G. Björk¹, Jeremy May³, Ji Young Jung⁴ & Sung Jin Nam⁴

¹Dep. of Earth Sciences, University of Gothenburg, Sweden. ²Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, The Netherlands. ³College of Arts, Science & Education, Florida International University.

⁴Arctic Research Centre, Korean Polar Research Institute, Incheon

Do you remember...

My fridge



Photo: Mats Björkman

Do you remember...

My fridge

~~a~~ Permafrost

- Easy / hard to eat?



Do you remember...

My fridge

~~a~~ Permafrost

- Easy / hard to eat?
- How well packed is the food?



Do you remember...

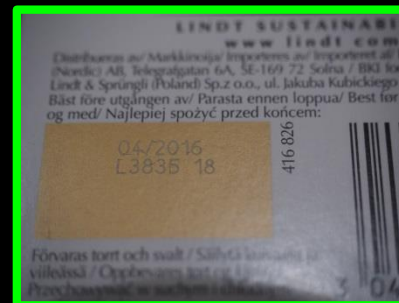
My fridge

~~a~~ Permafrost

- Easy / hard to eat?
- How well packed is the food?
- Expiring date?



Photo: Mats Björkman

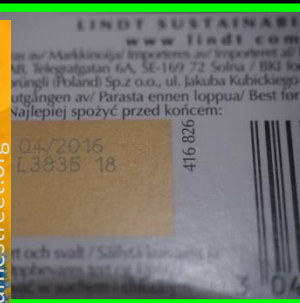


Do you remember...

My fridge

~~a~~ Permafrost

- Easy / hard to eat?
- How well packed is the food?
- Expiring date?
- Who's eating?



Do you remember...

My fridge

~~a~~ Permafrost

- Easy / hard to eat?
- How well packed is the food?
- Expiring date?
- Who's eating?
- Who's eating what?



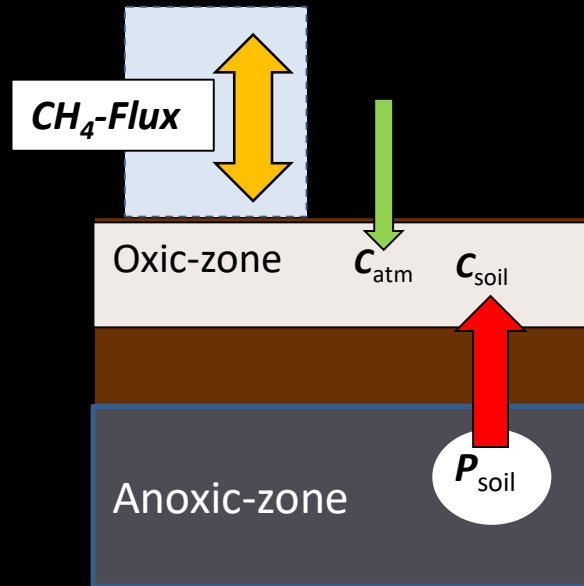
Do you remember...

My fridge

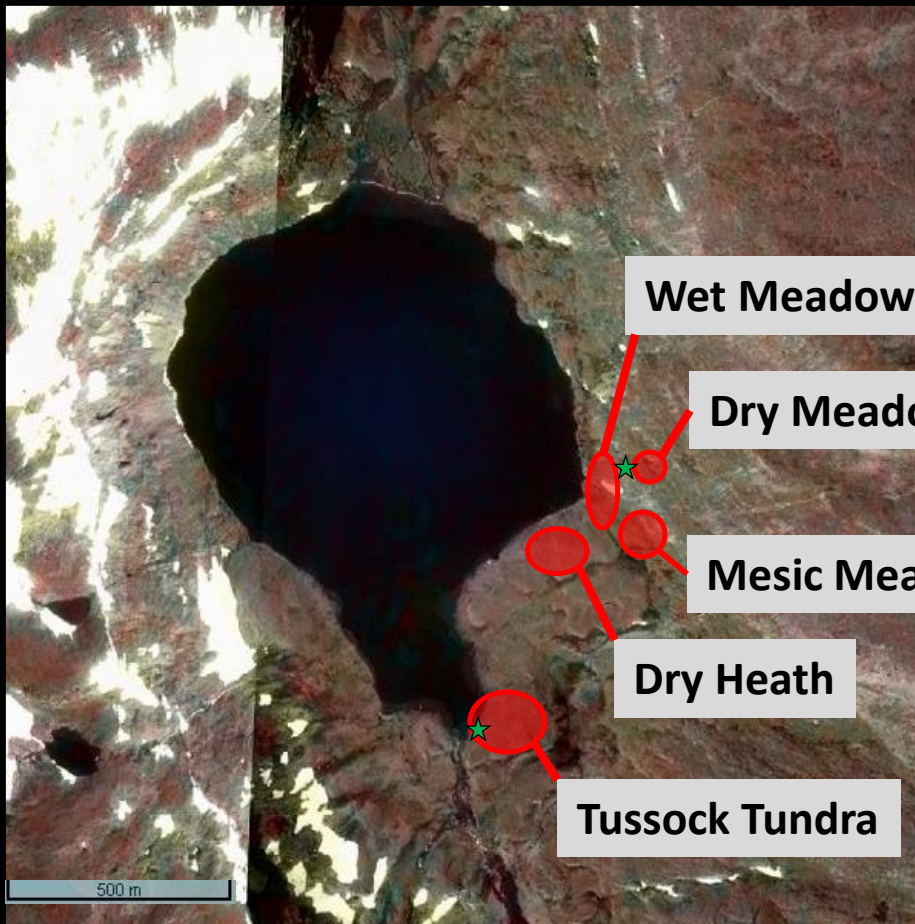
~~a~~ Permafrost

- Easy / hard to eat?
- How well packed is the food?
- Expiring date?
- Who's eating?
- Who's eating what?
- How much faster will they eat?



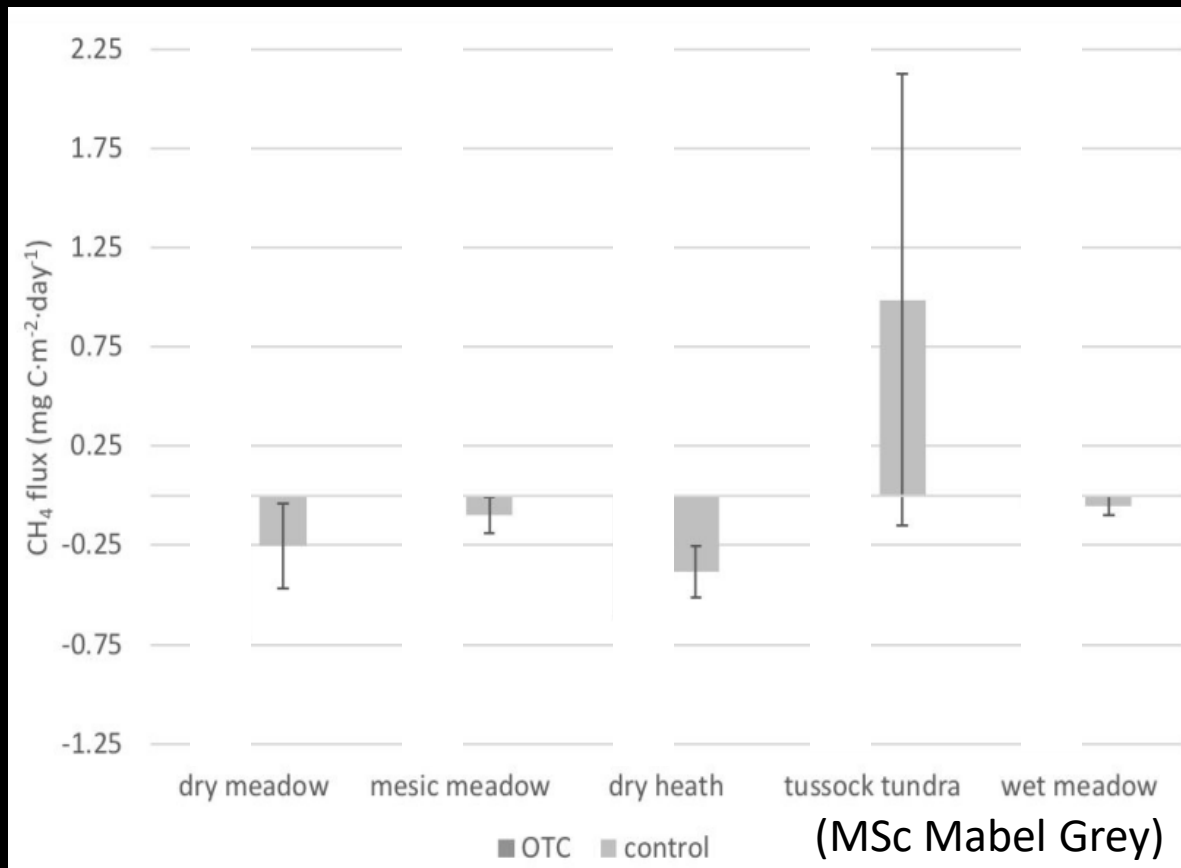


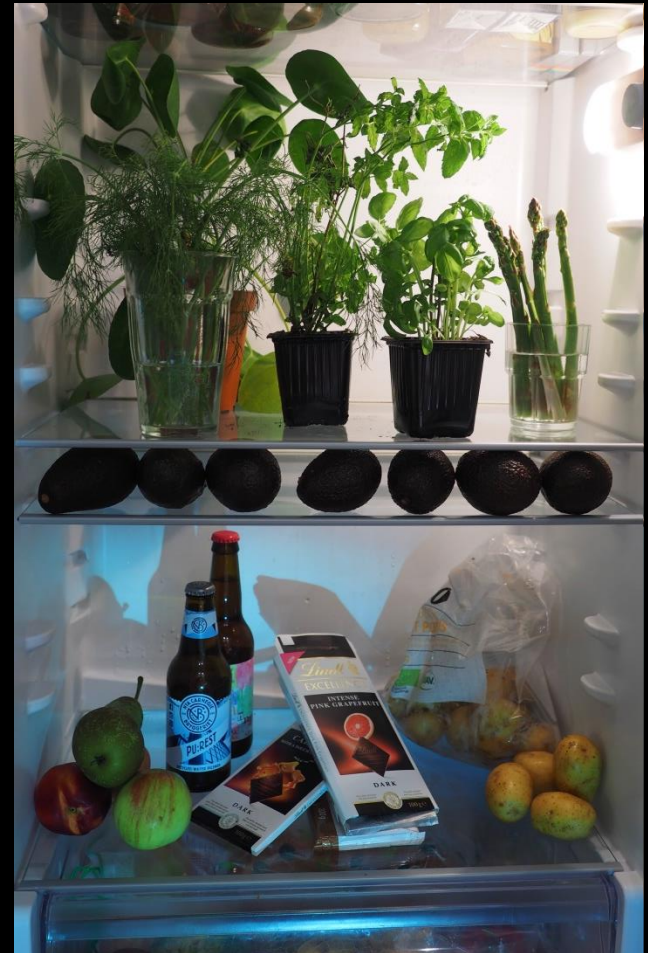
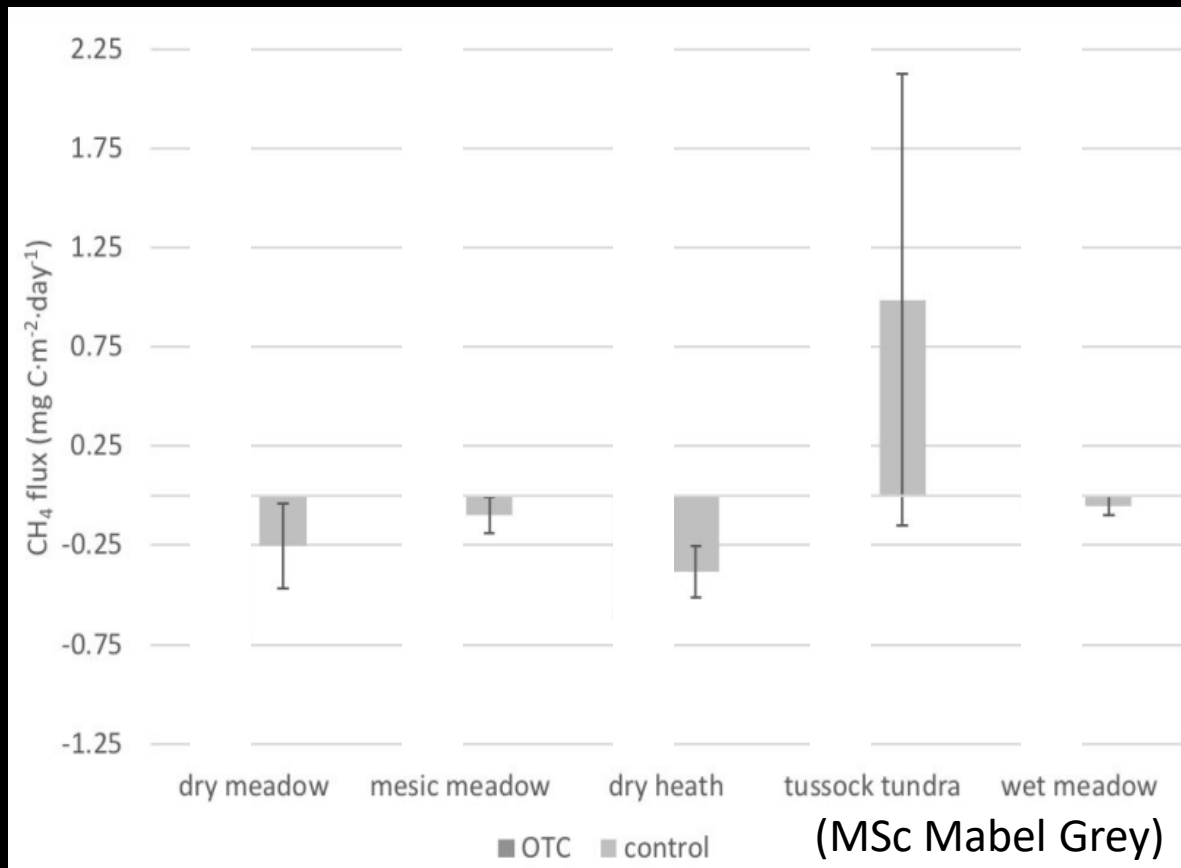
Latnjajaure Field Station

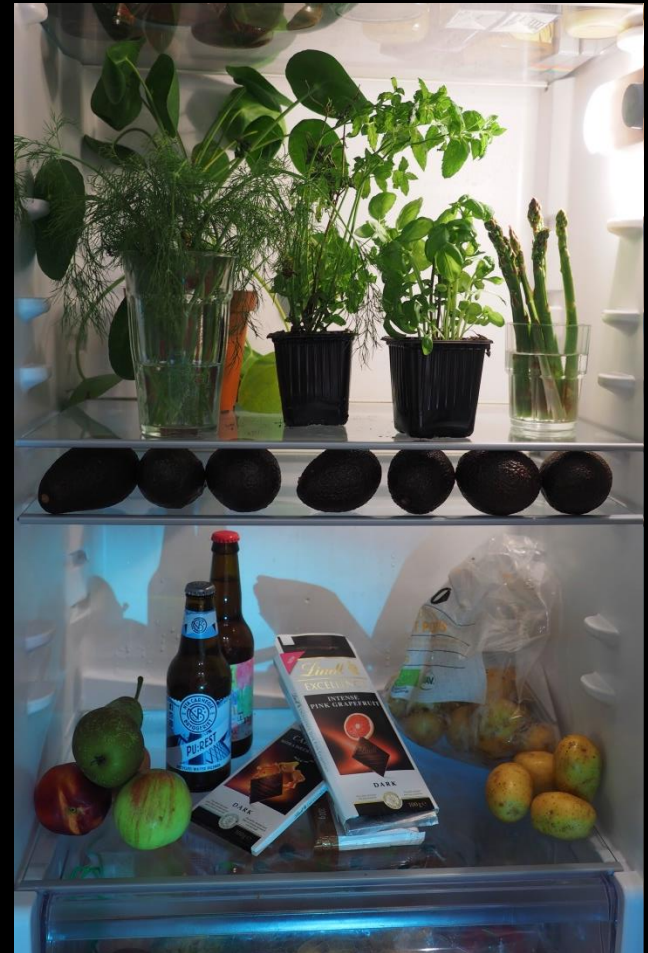
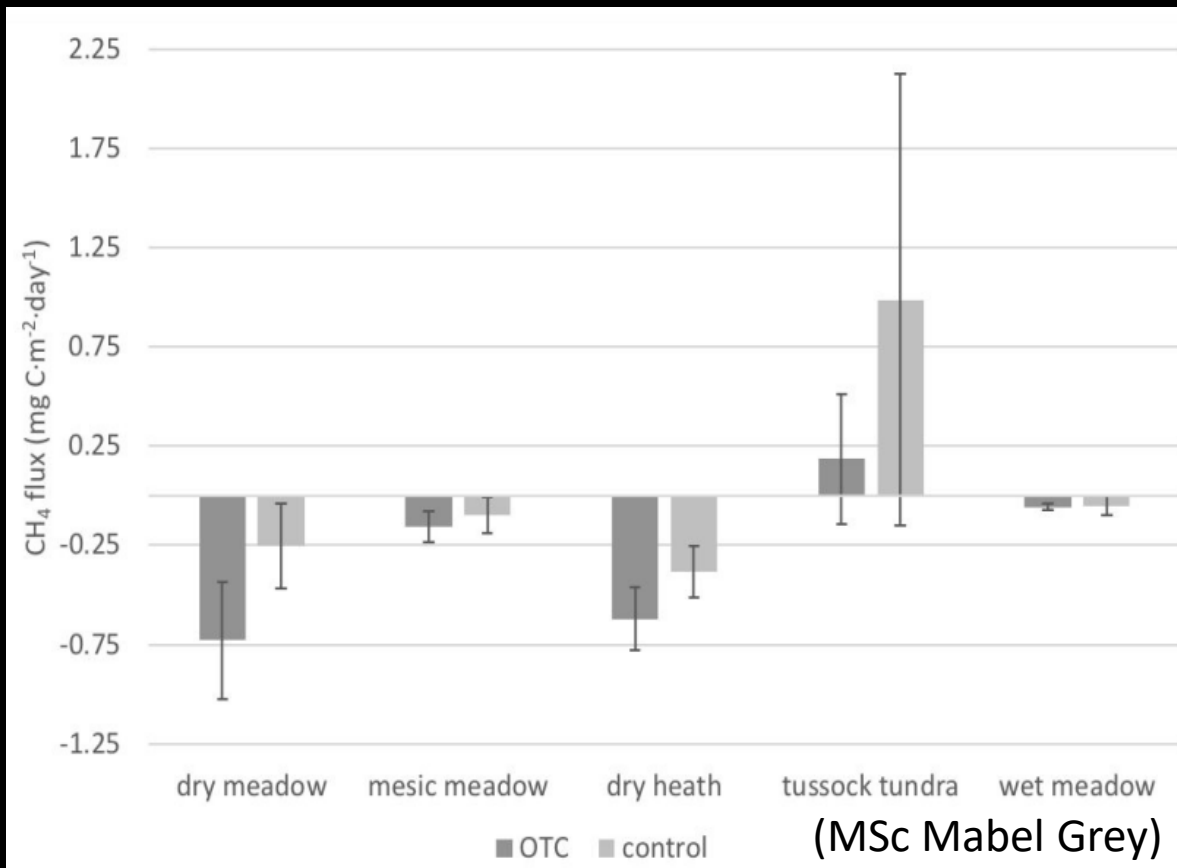


★ Climate stations

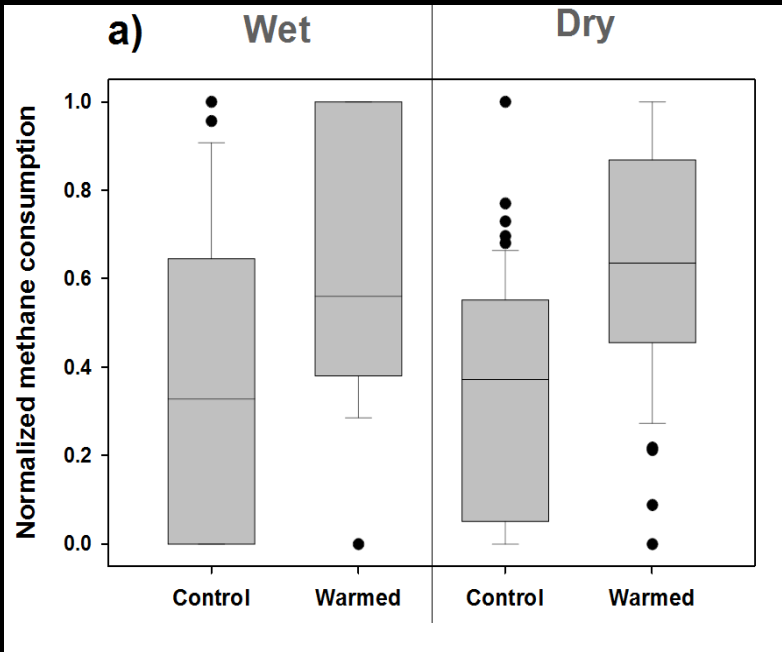
● ITEX Experiments



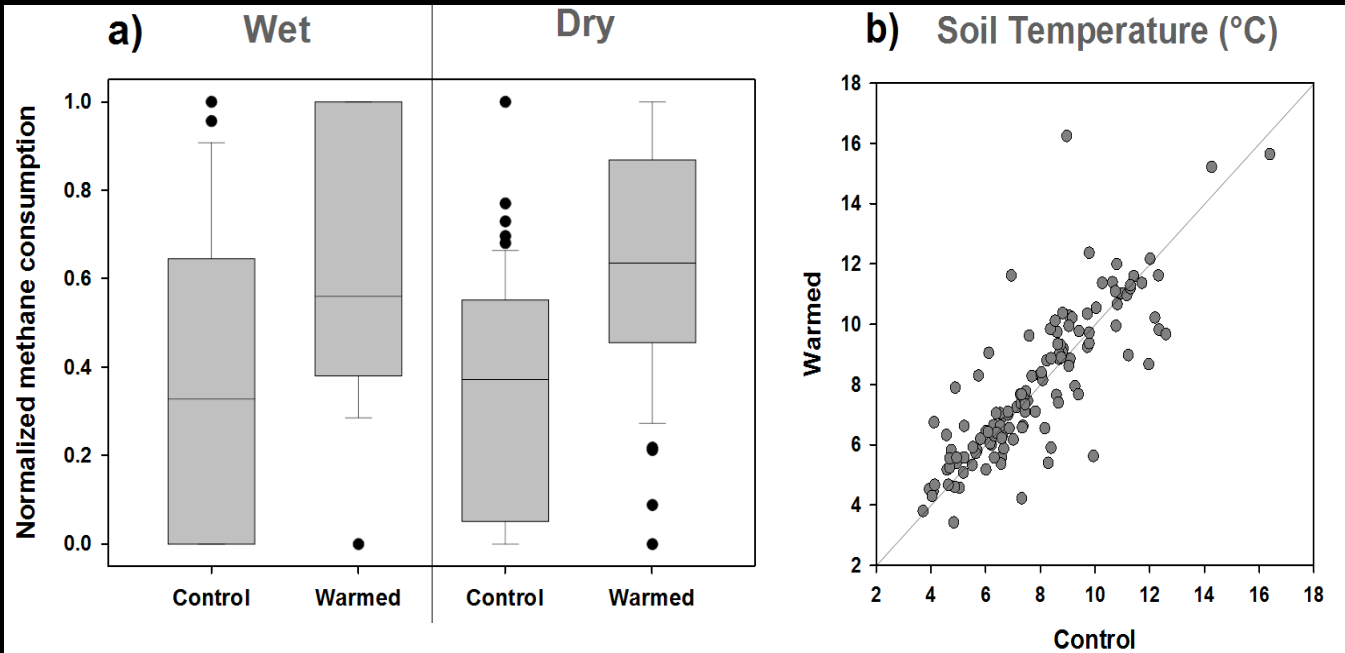




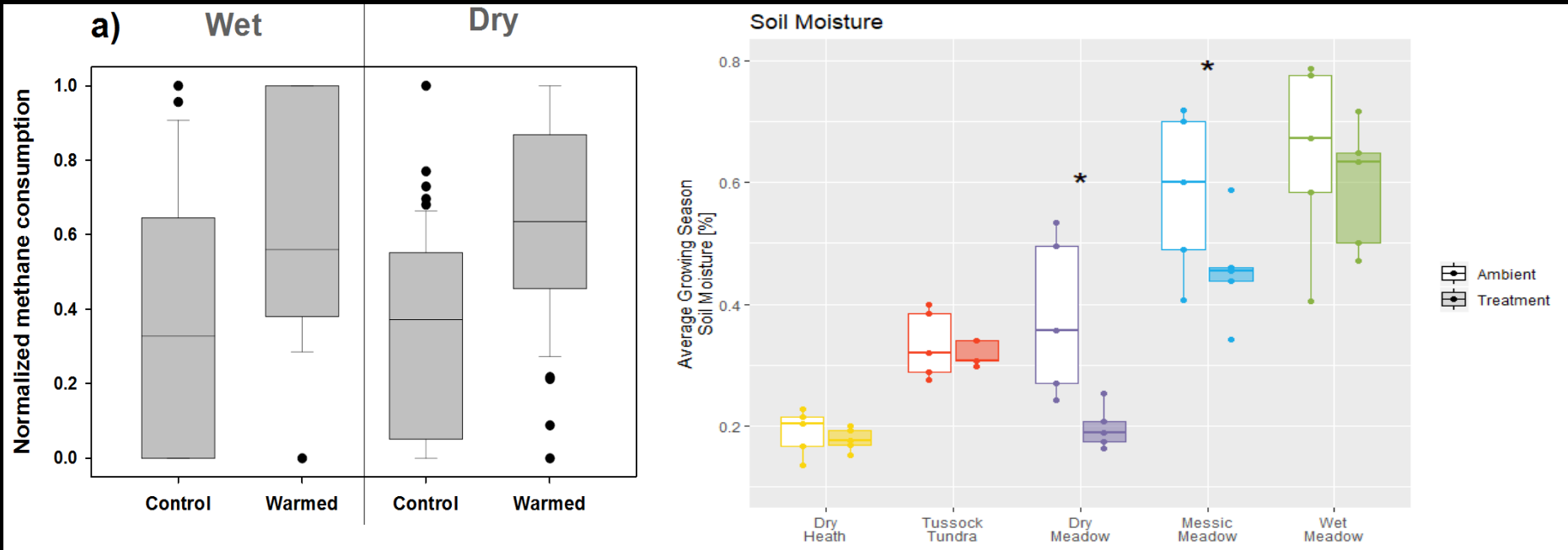
25-30 % increase in CH₄ consumption

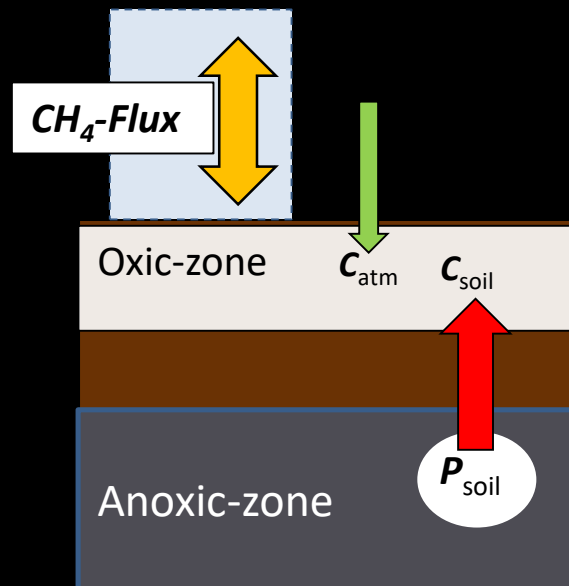


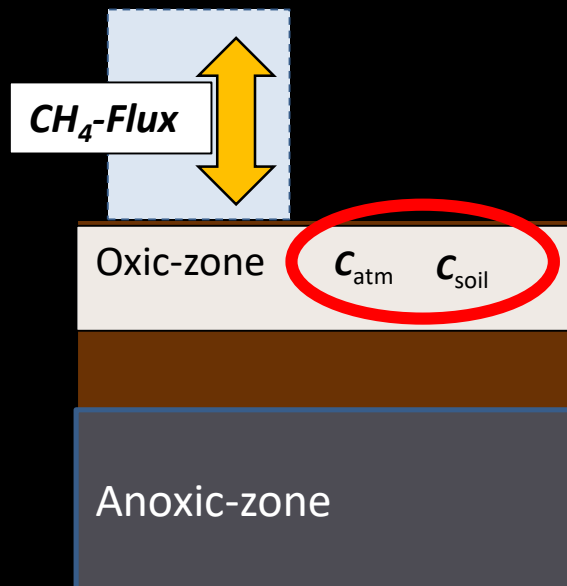
25-30 % increase in CH₄ consumption



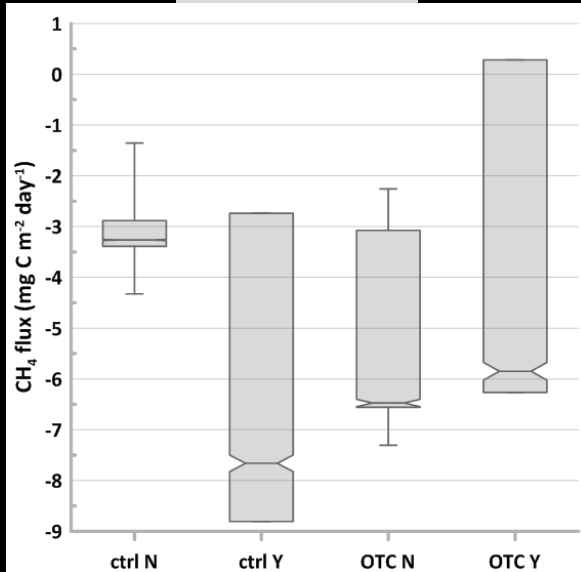
25-30 % increase in CH₄ consumption



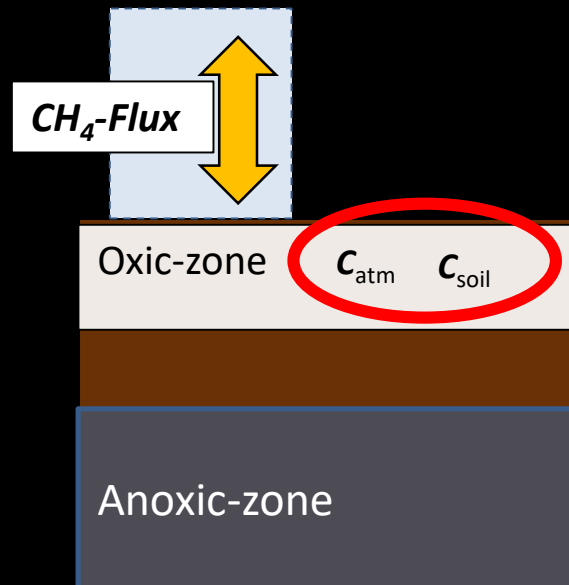
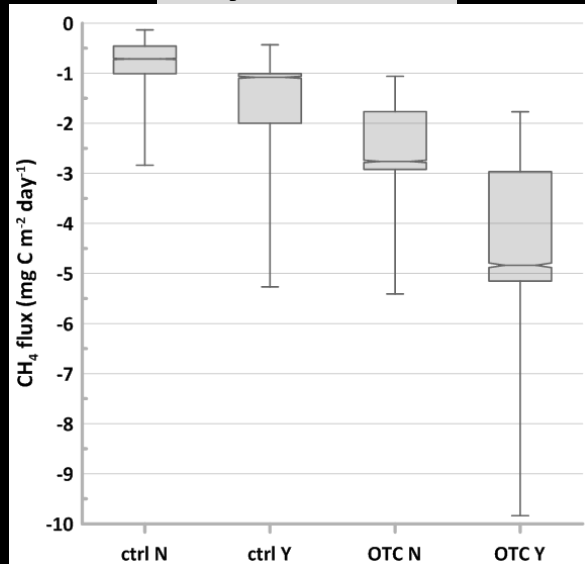




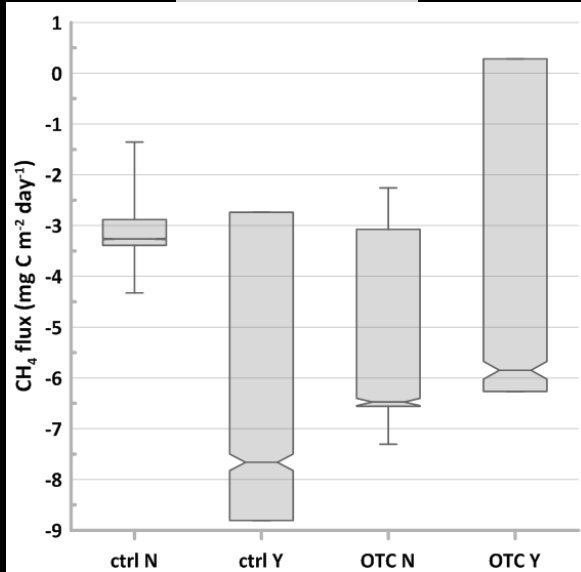
Dry Heath



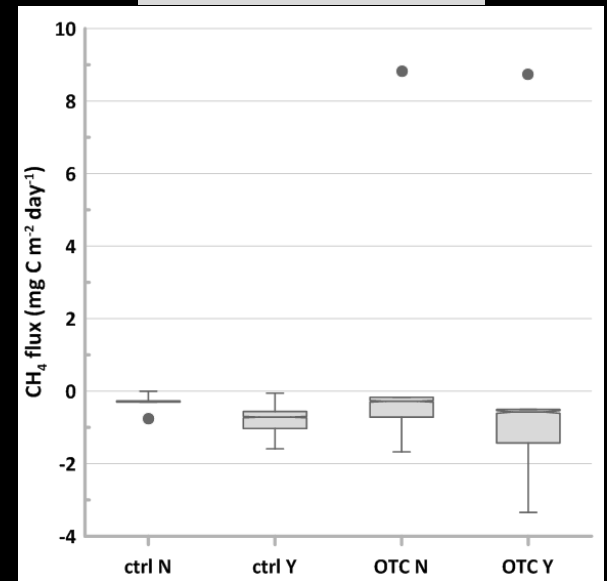
Dry Meadow



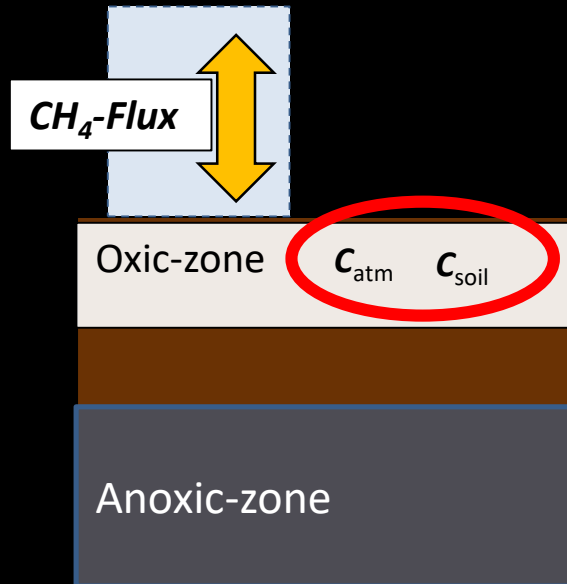
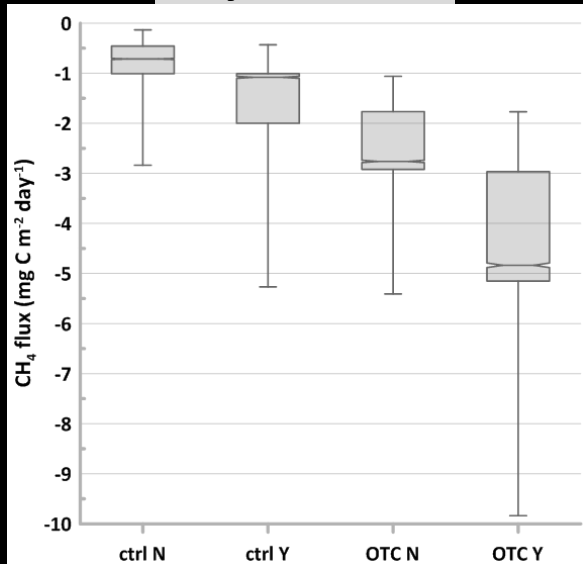
Dry Heath



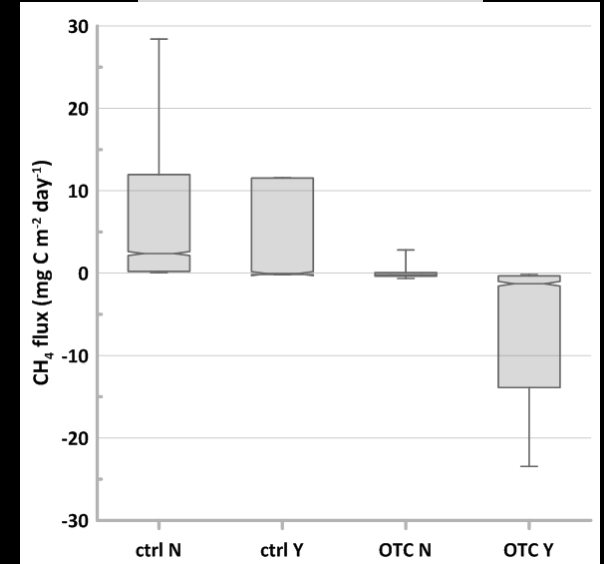
Mesic Meadow



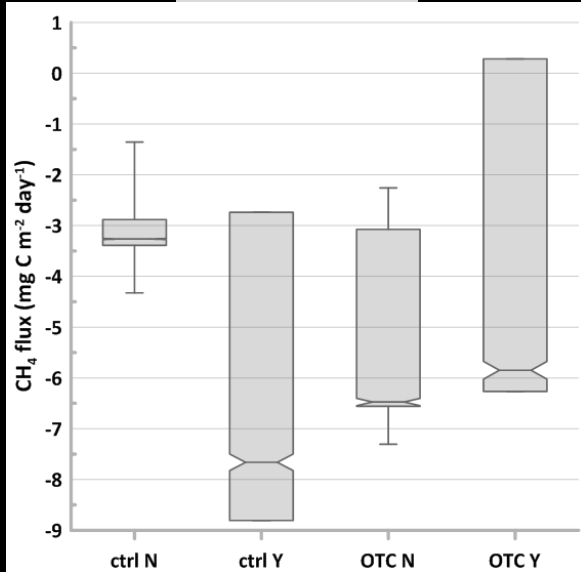
Dry Meadow



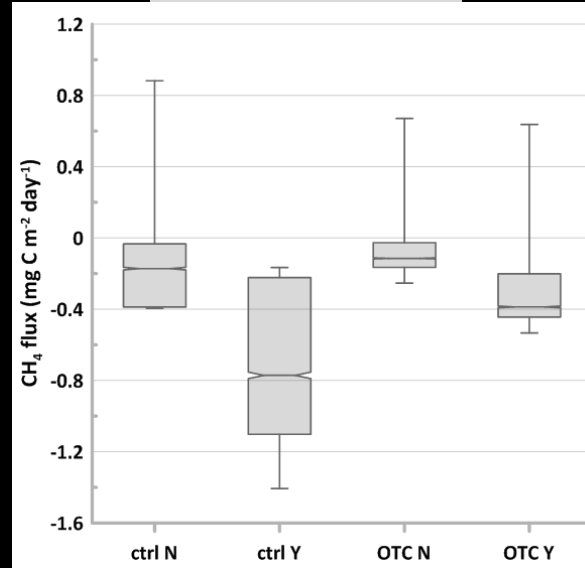
Tussock Tundra



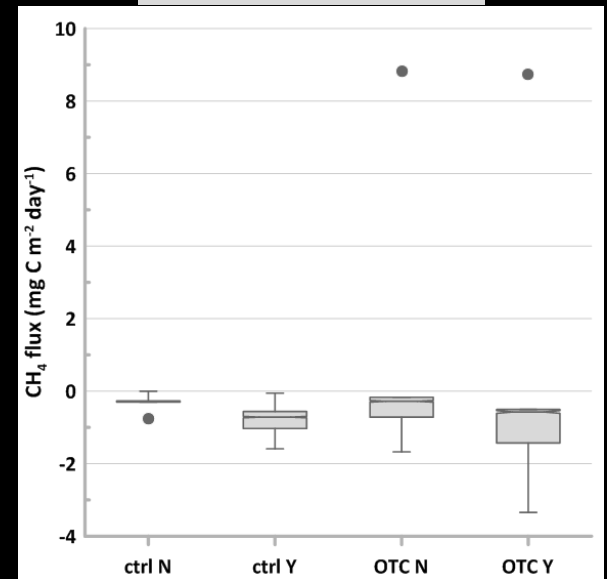
Dry Heath



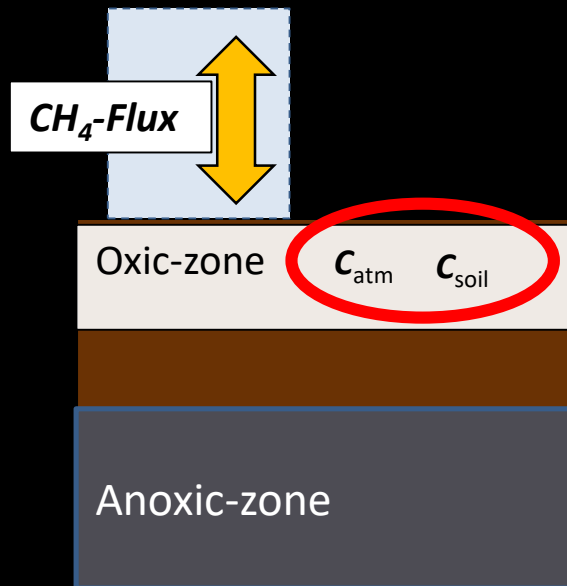
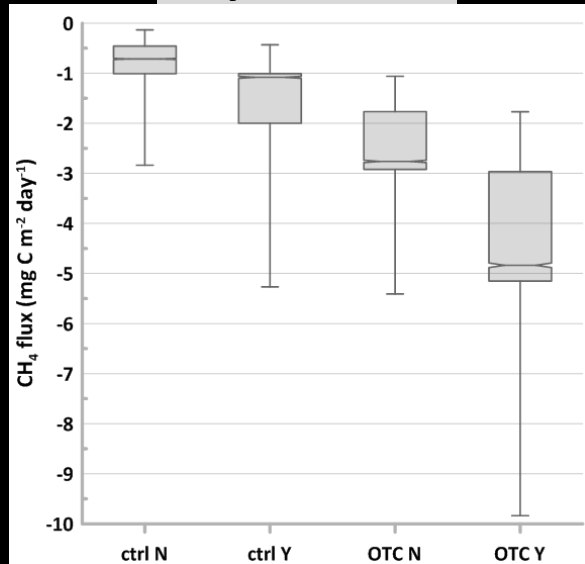
Wet Meadow



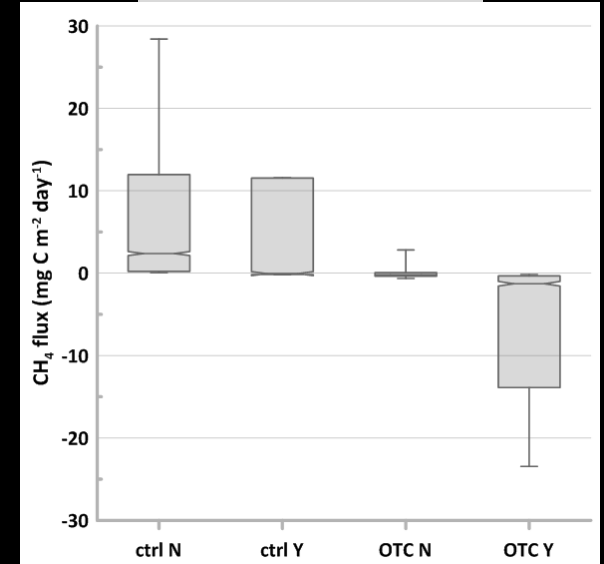
Mesic Meadow



Dry Meadow

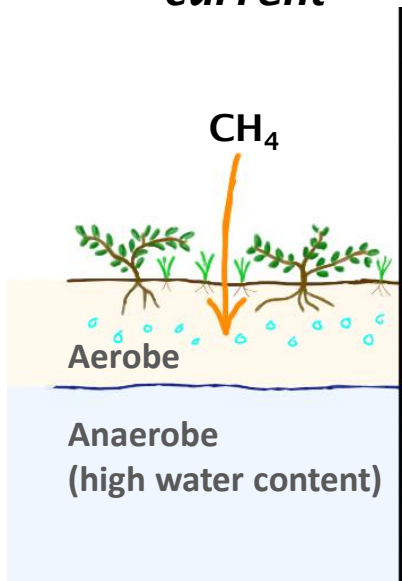


Tussock Tundra



DRY-ECOSYSTEM

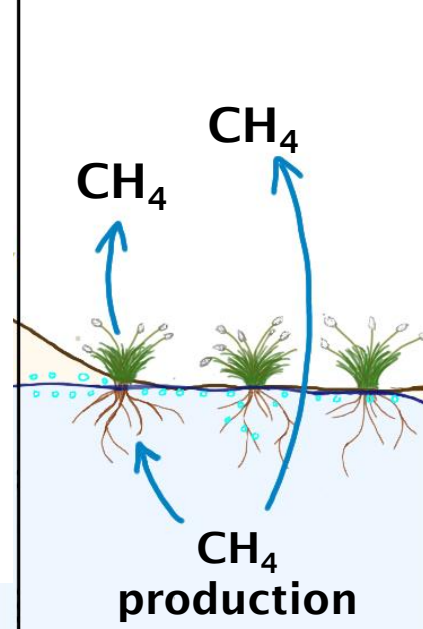
current



 = methane consumption activity

WET-ECOSYSTEM

current



DRY-ECOSYSTEM

current


future

CH_4

CH_4

Aerobe

Anaerobe
(high water content)

 = methane consumption activity

WET-ECOSYSTEM

current

future

CH_4

CH_4

CH_4

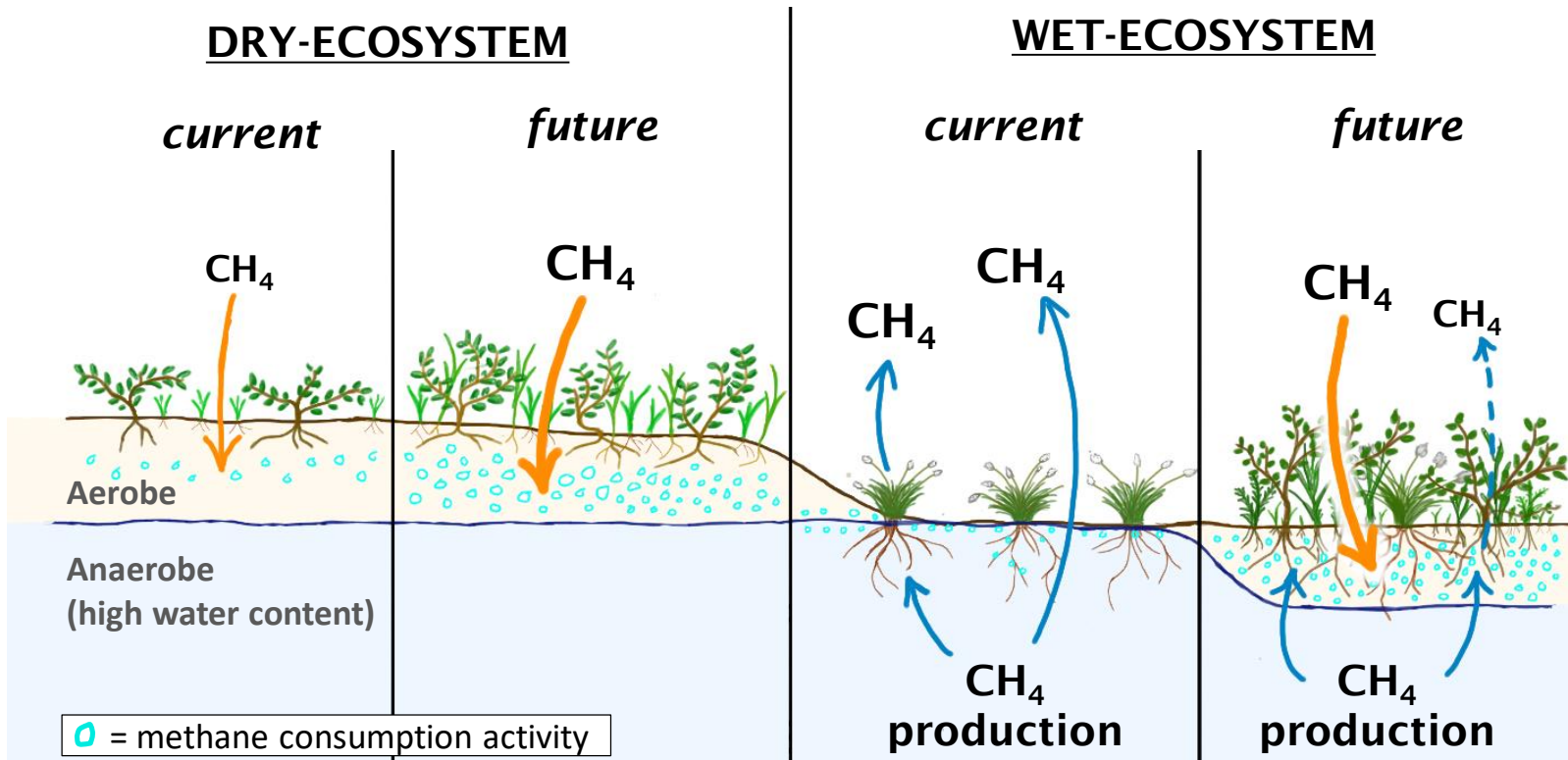
CH_4

CH_4

production

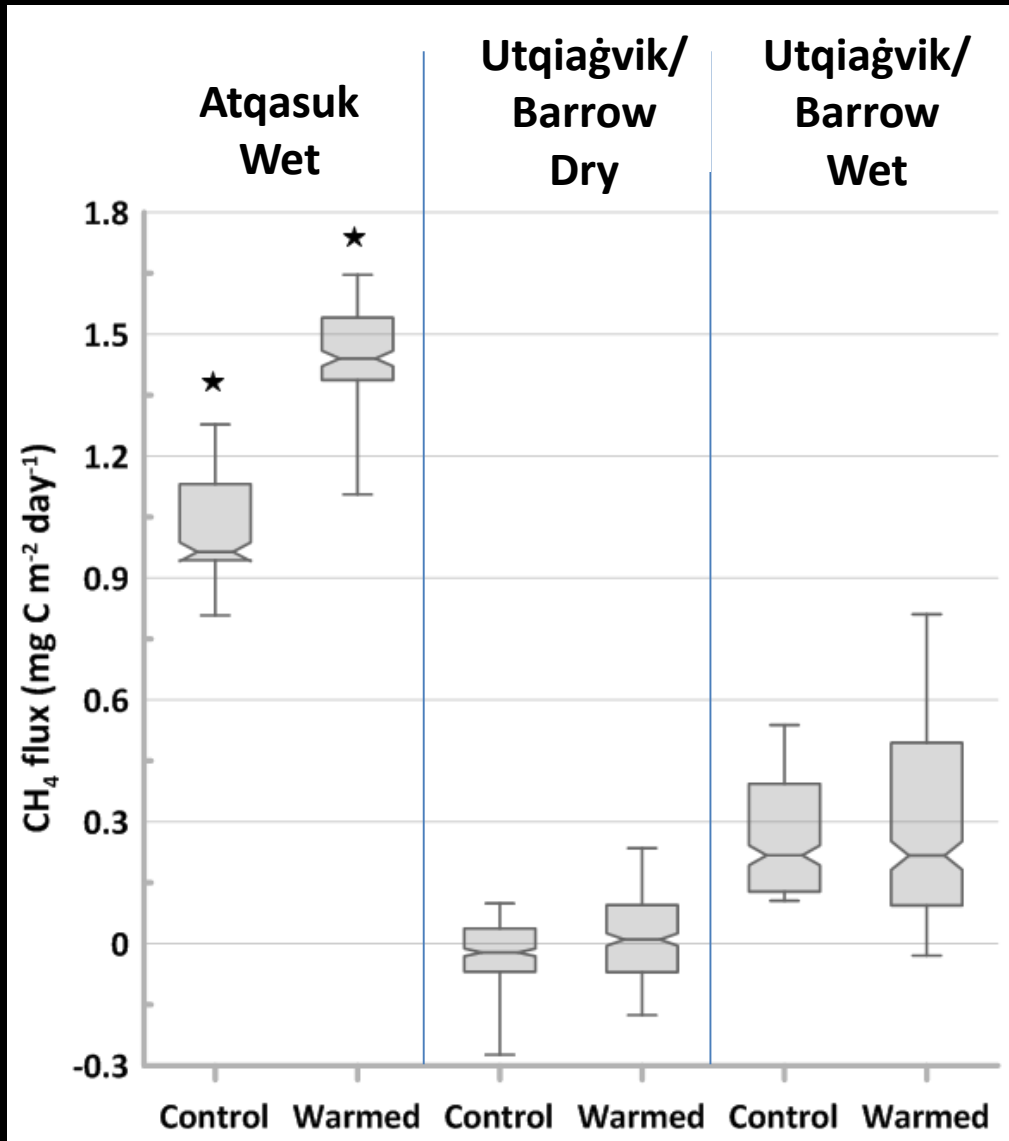
CH_4

production

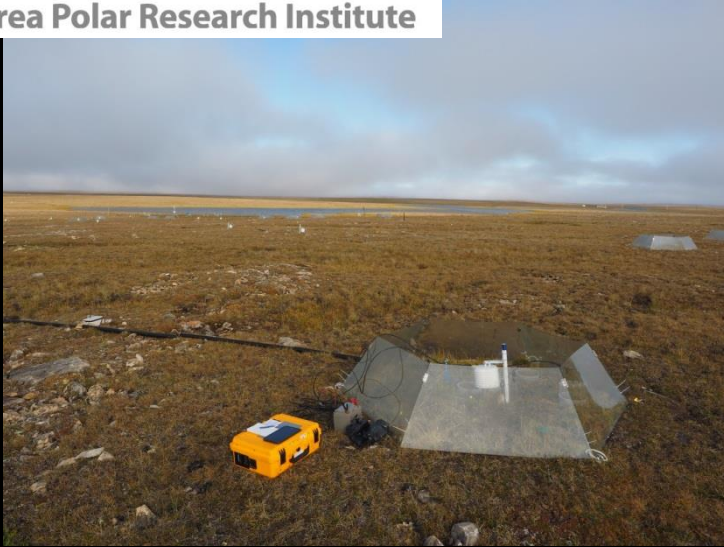


Please, please help me...

Utqiagvik/Barrow & Atqasuk



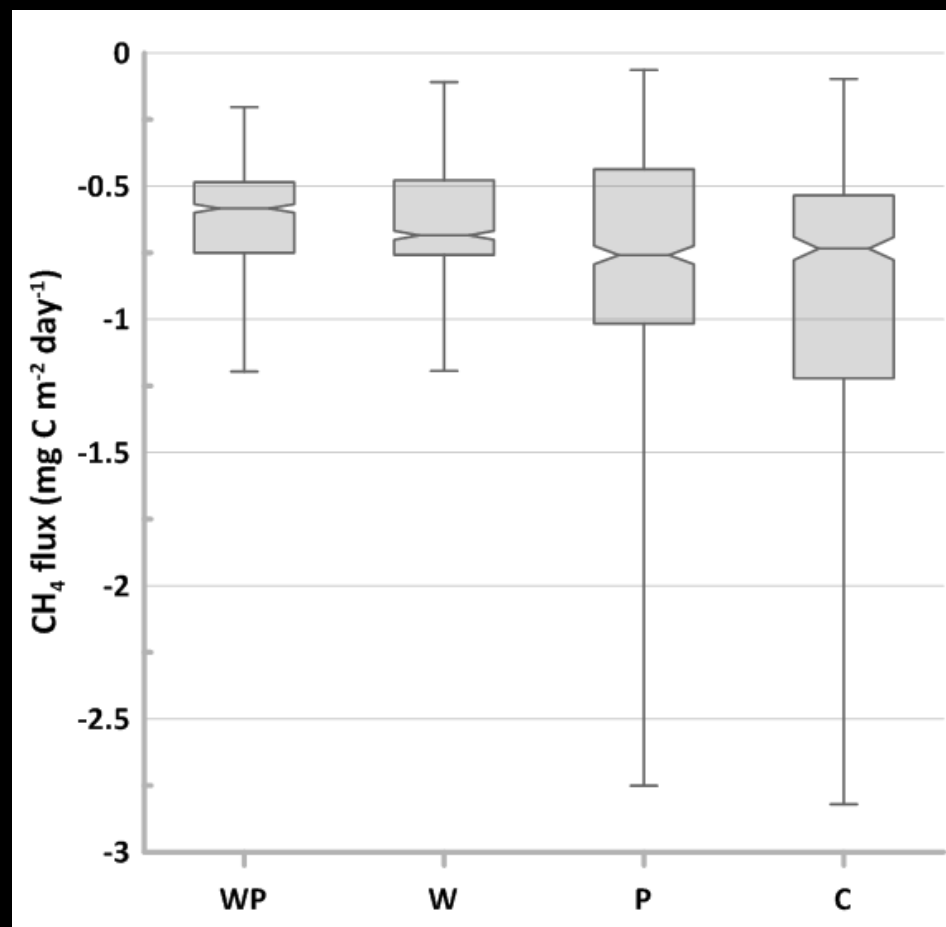
CHARS – Cambridge Bay



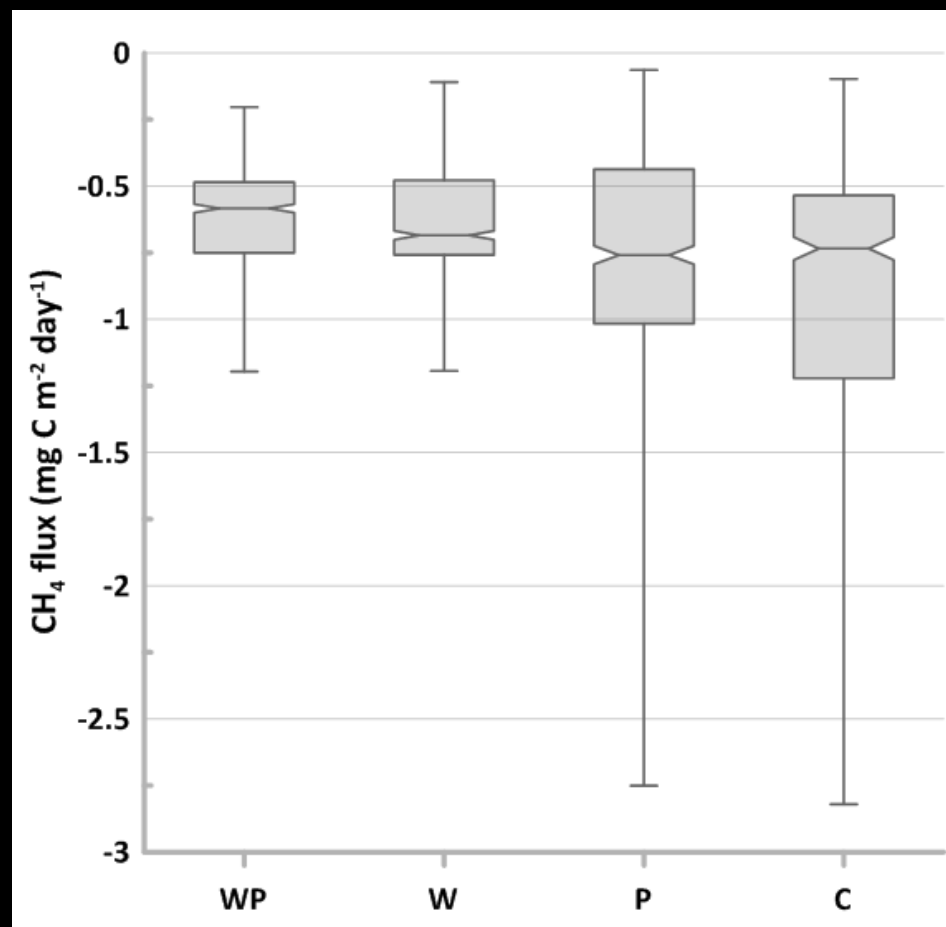
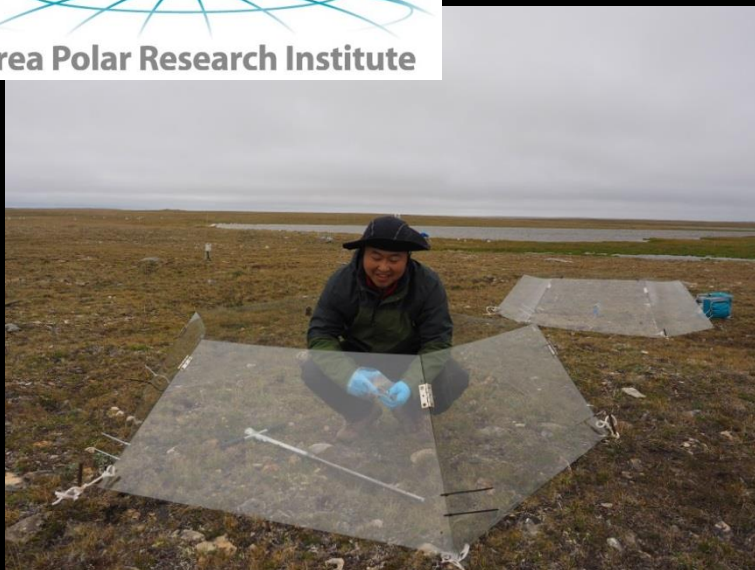
Warming + Precipitation (WP)
Warming (W)
Precipitation (P)
Control (C)



CHARS – Cambridge Bay

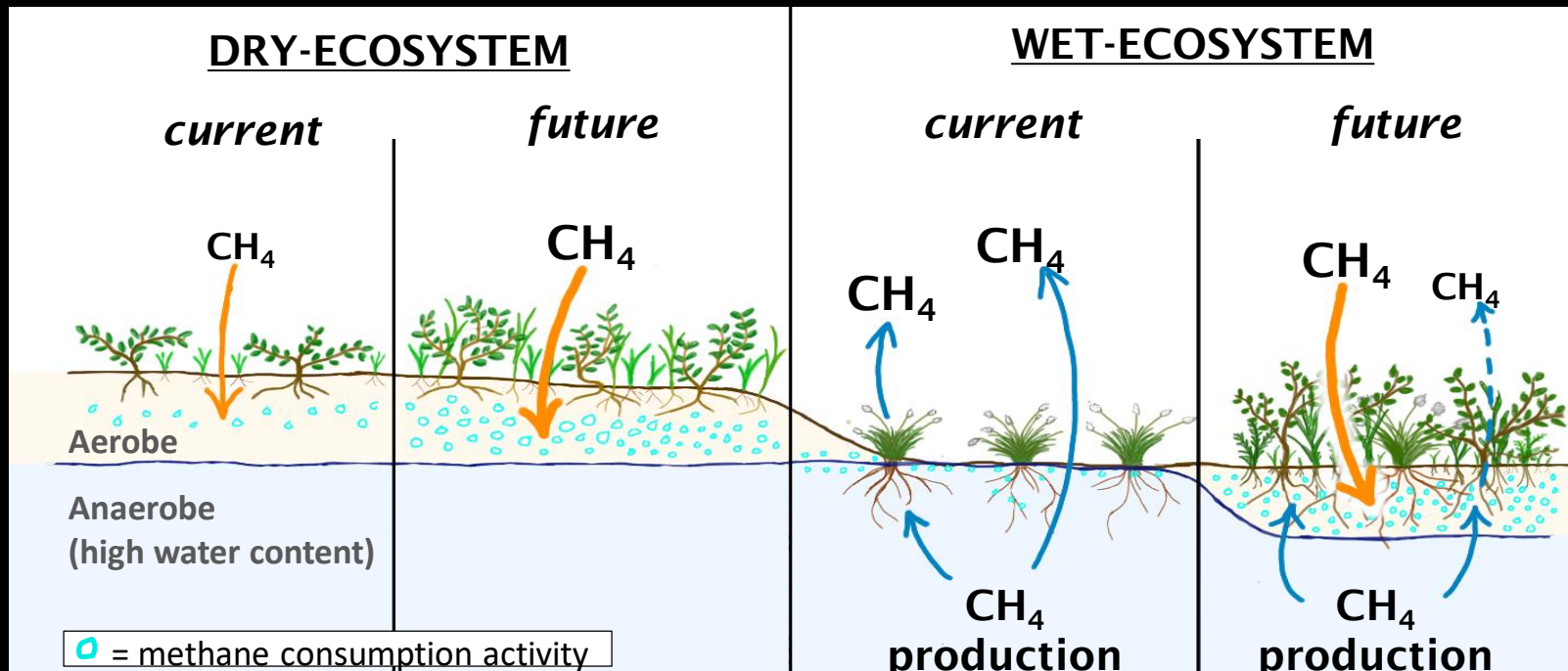


CHARS – Cambridge Bay



No conclusion - only more questions

- Is the Latnja conceptual model valid outside Latnja?
- What biotic and abiotic factors drives our Latnja changes?
- Can we use ITEX as a frame work for CH₄ consumption work?
- Would a ITEX CH₄ synthesis be a good thing?





GÖTEBORGS
UNIVERSITET



The END



FORMAS 