

Disentangling long-term and short-term temperature response of carbon fluxes in a subarctic grassland ecosystem exposed to long-term, geothermal warming

Linsey M. Avila₁, Bjarni D. Sigurdsson₂, Jesper Riis Christiansen₁, and Klaus Steenberg Larsen₁

¹ Department of Geosciences & Natural Resource Management, University of Copenhagen, Denmark

² Faculty of Environmental and Forest Sciences, Agricultural University of Iceland, Iceland



Horizon 2020
European Union Funding
for Research & Innovation

UNIVERSITY OF COPENHAGEN





Long-term warming:

Geothermal gradient

+0 to +75 degrees

13 years old

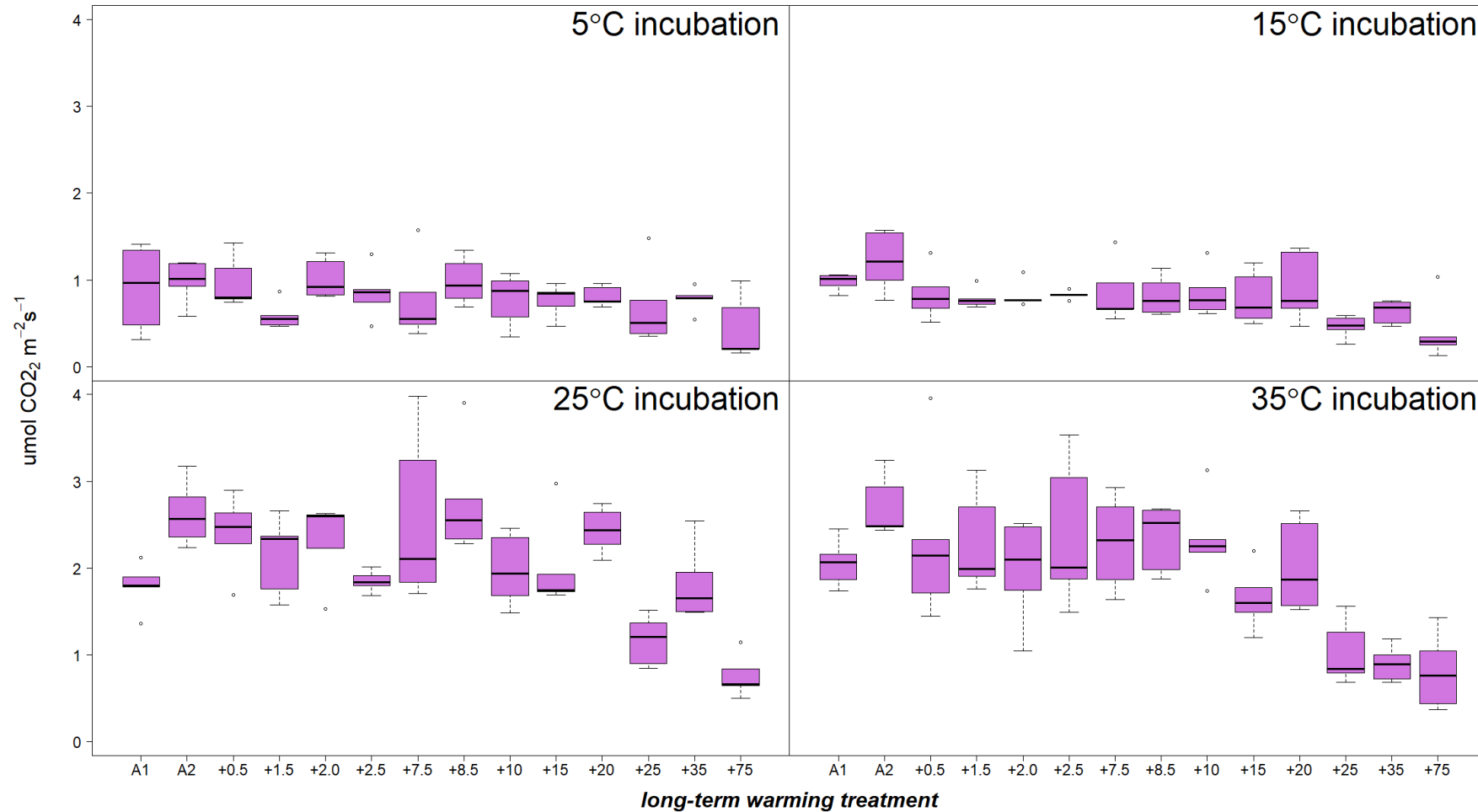
Short-term warming:

Laboratory incubations

+5 to +35 degrees

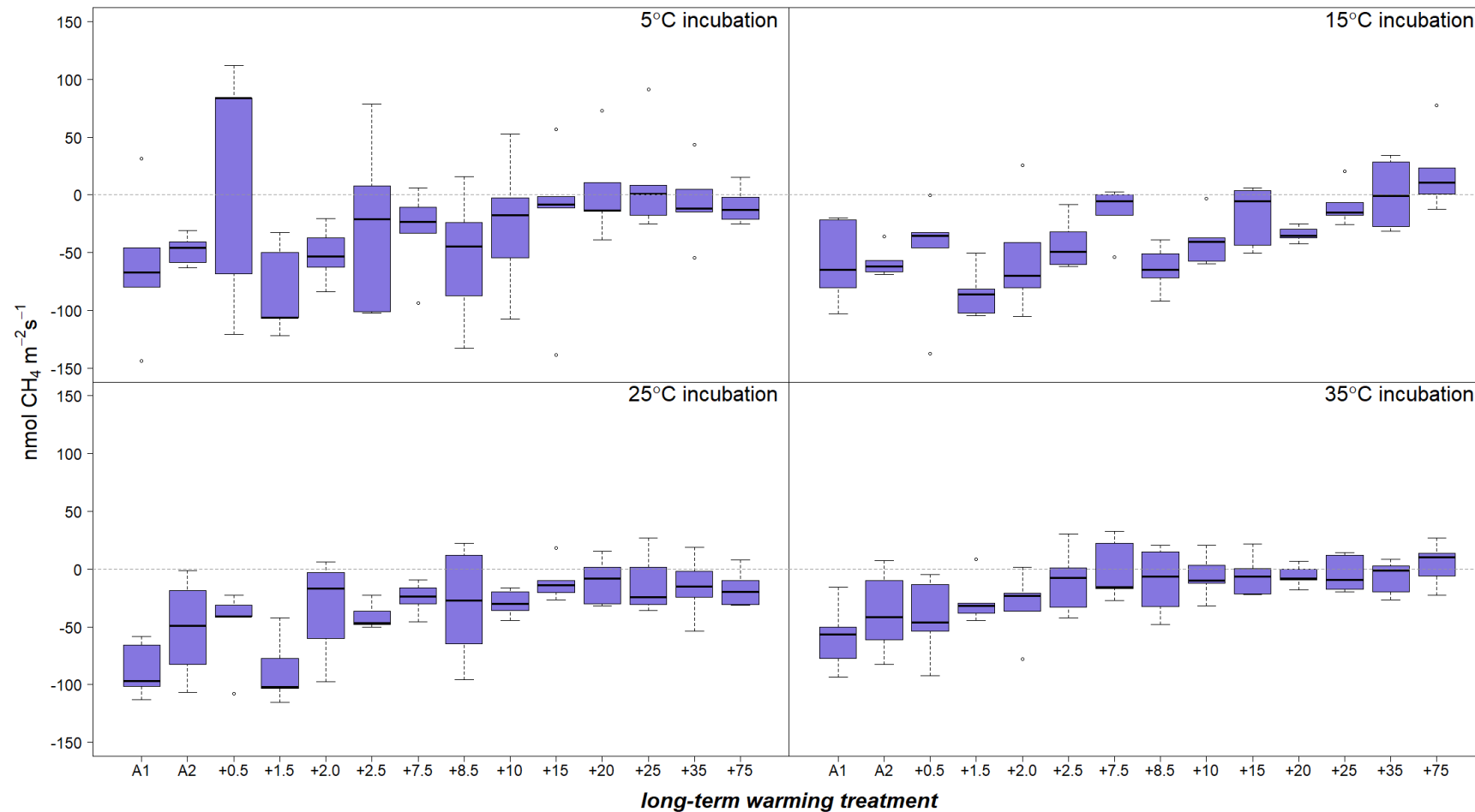
24 hour response

Incubation response, CO₂



- CO₂ responsive to long-term and short term warming
- Wide spread response to incubation between both plot treatments and incubation intervals
- Shape in all suggests flux dependency on quality and abundance of substrate medium present in the soil
- Nutrient/carbon loss along the long-term transect

Incubation response, CH₄



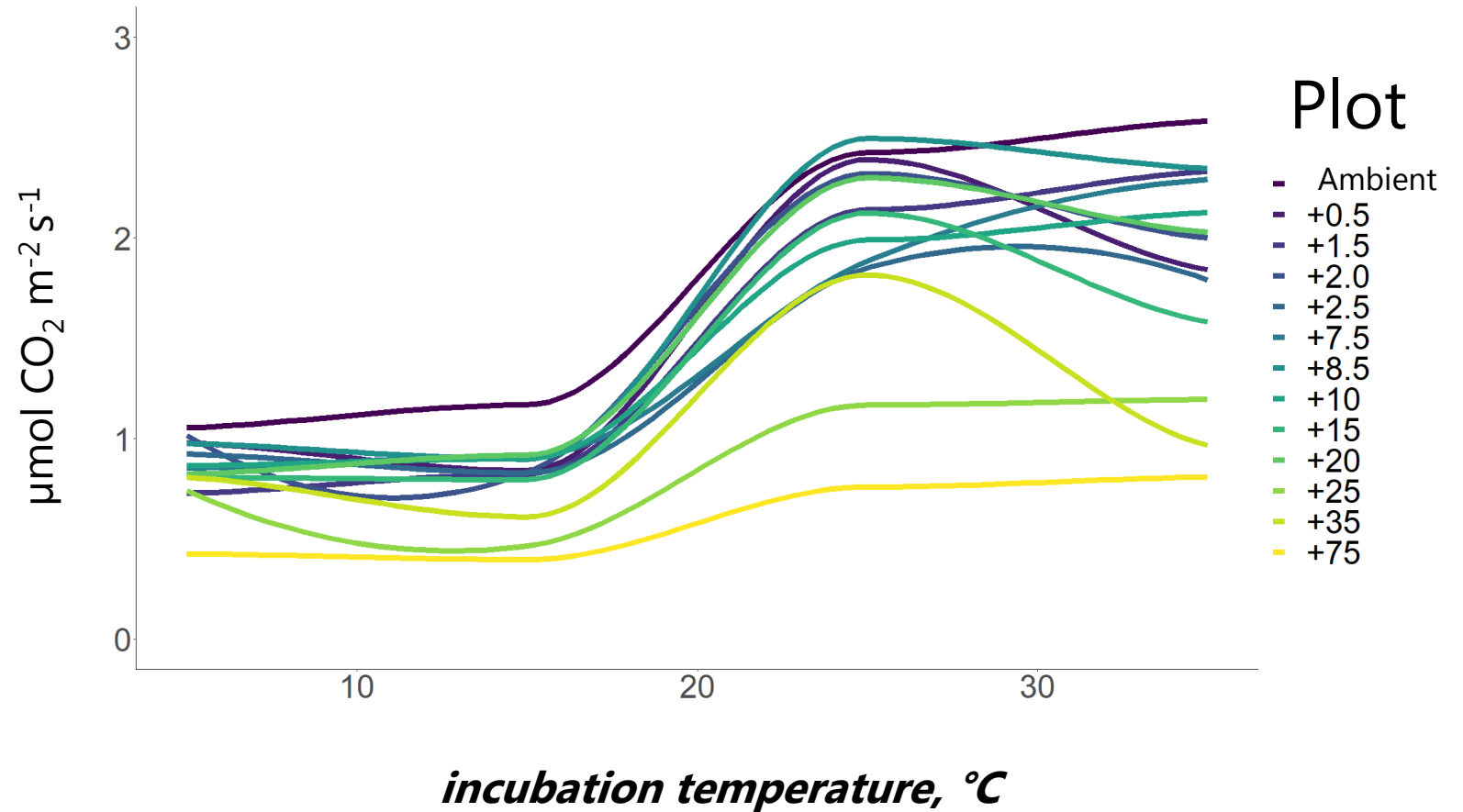
- Other than at the 5°C incubation level, fluxes did not differ much within plot set between short-term warming treatments
- The short-term lack of temperature response supports CH₄ processes being less dependent on temperature than CO₂
- However, shape of all curves along long-term warming transect is indicative of structural and functional changes to the microbial communities in addition to other soil limiting factors

CO₂ temperature response curves

-Curves showcase short-term temperature response to soil warming

-Naturally, plots with less quality, available substrate (high, long-term warming) are less responsive to increasing temperatures

-Most plots reaching peak fluxes at the 25°C warming level before plateauing which reflects a likely optimal temperature threshold for CO₂ soil production



Thank You!



liav@ign.ku.dk



[@linsey_avila](https://twitter.com/linsey_avila)

[@FutureArcticITN](https://twitter.com/FutureArcticITN)



<https://www.futurearctic.be/>

QR Code

