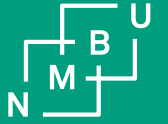
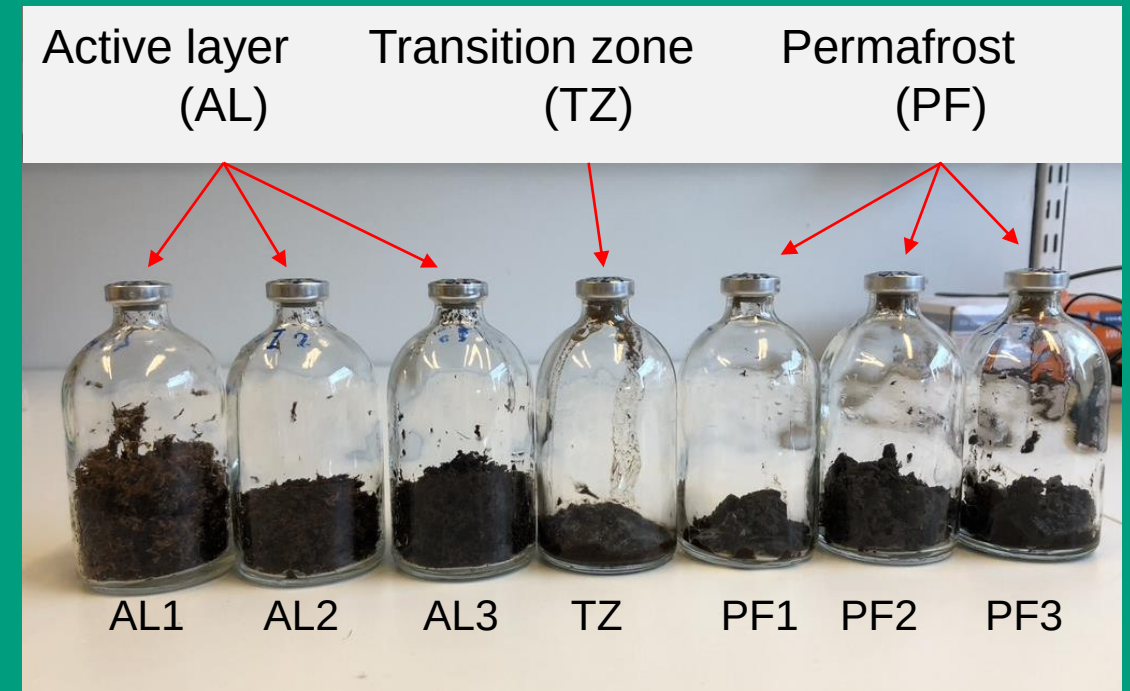
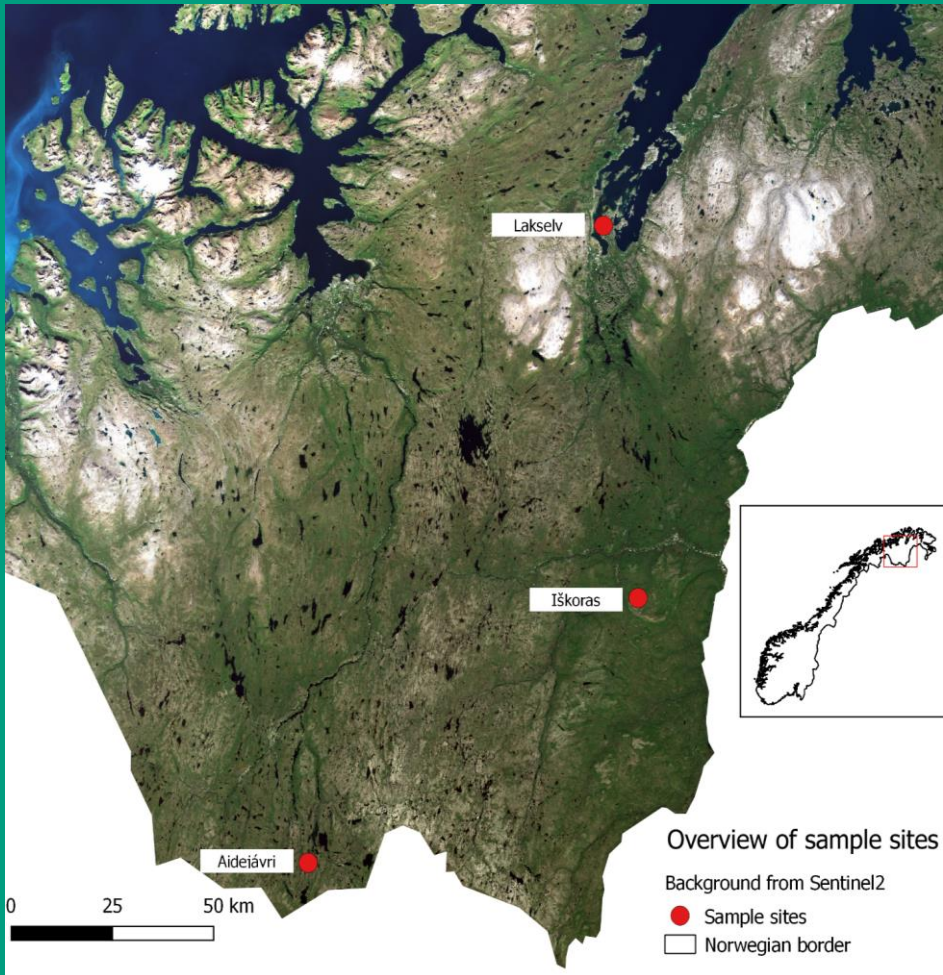


Carbon degradation in Subarctic organic permafrost (peat plateaus) after thawing



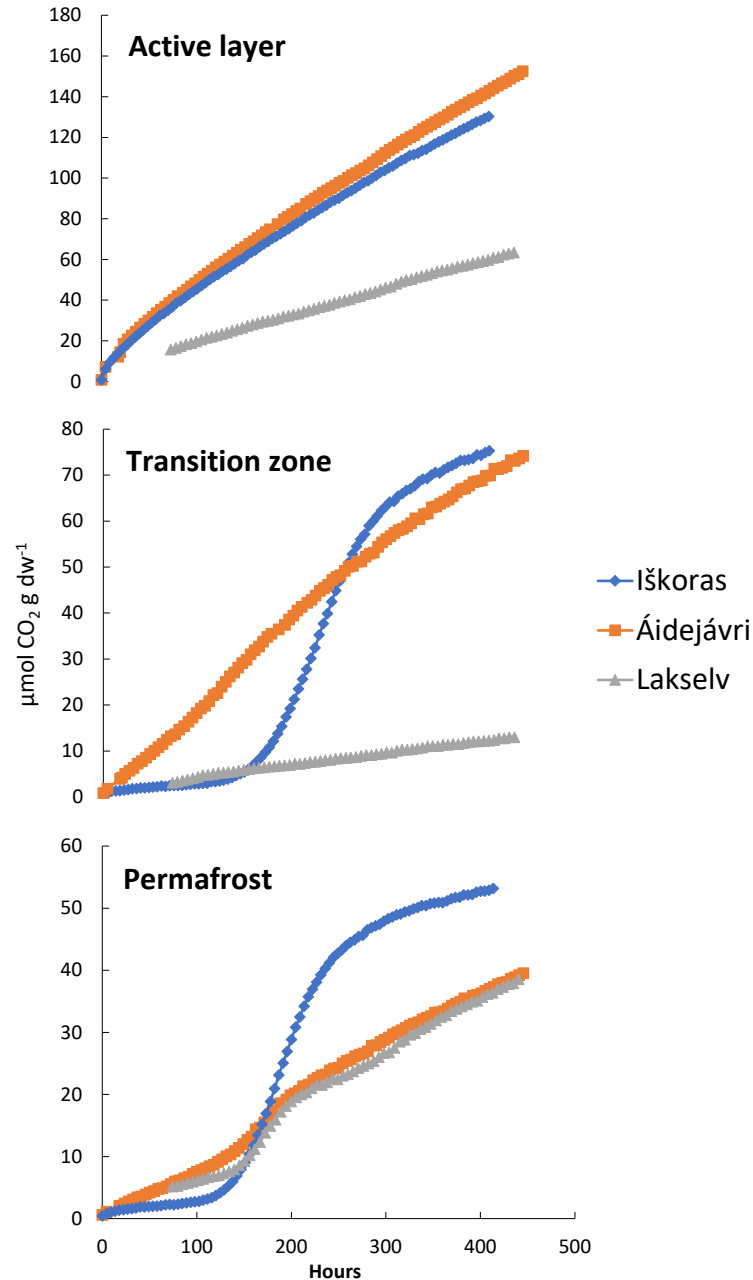
What constrains CO_2 and CH_4 production?



Sigrid Trier Kjær¹, Nora Nedkvtnine¹, Sebastian Westermann², Inge Althuizen³ and Peter Dörsch¹

¹ Norwegian University of Life Sciences; ² University of Oslo, ³ Norwegian Research Centre

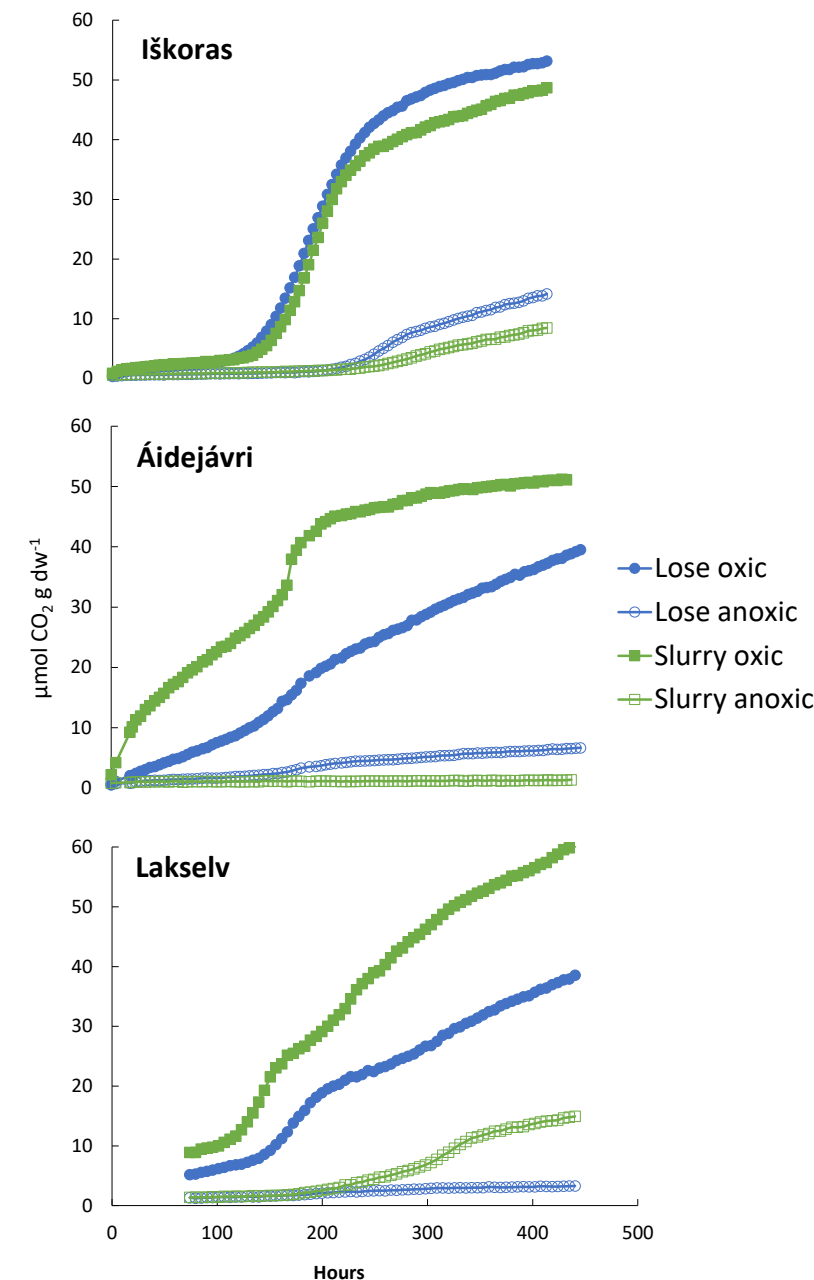
Comparison of peat plateaus in lose oxic conditions



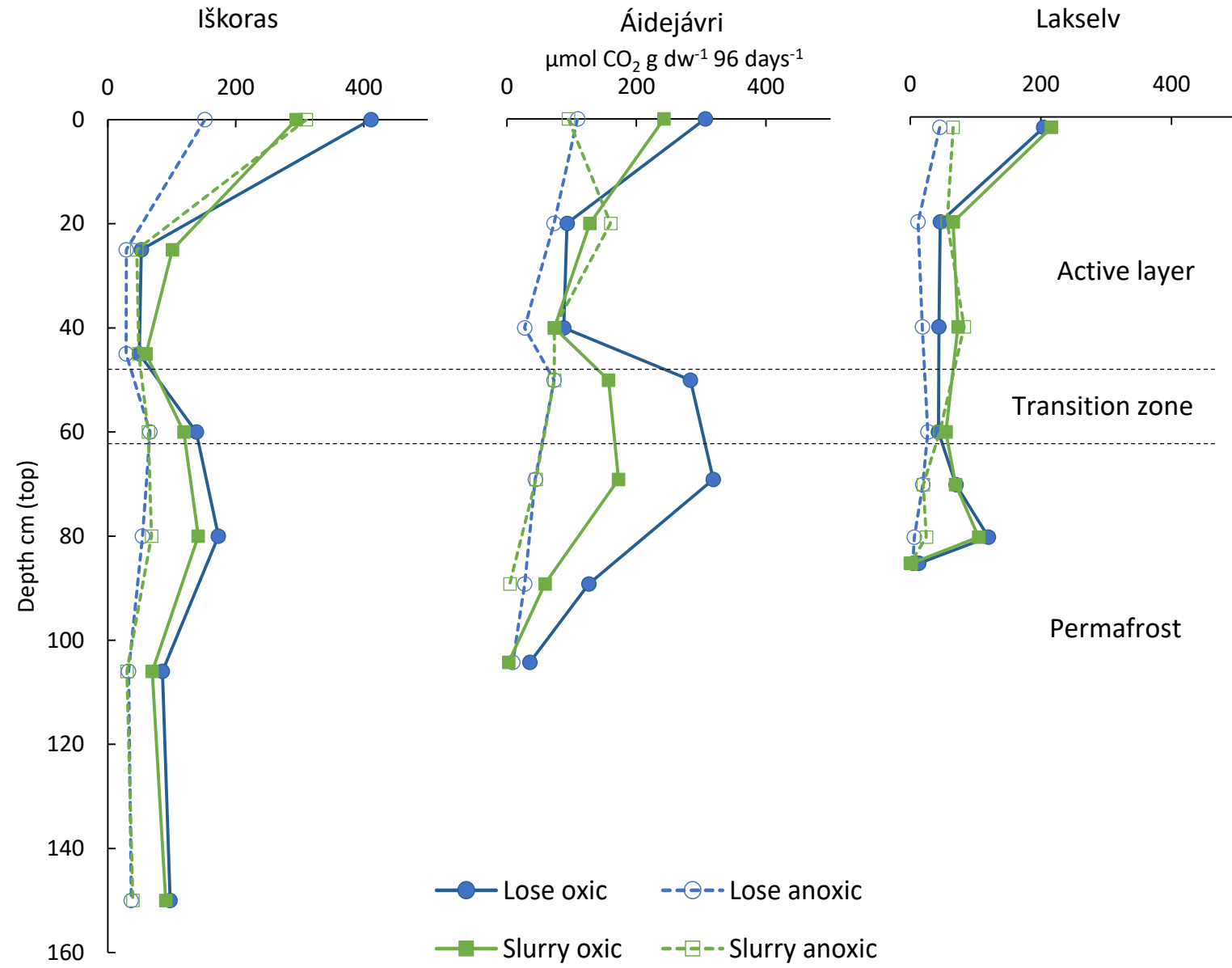
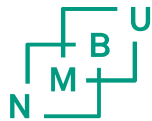
Gas kinetics (CO_2) Short-time, high-temporal resolution

- Over-all linear trend in Áidejávri and Lakselv
- Iškoras had a sigmoid product accumulation in transition zone and permafrost
- Higher CO_2 production under oxic conditions
- Higher CO_2 production under slurry oxic conditions in Áidejávri and Lakselv – not Iškoras

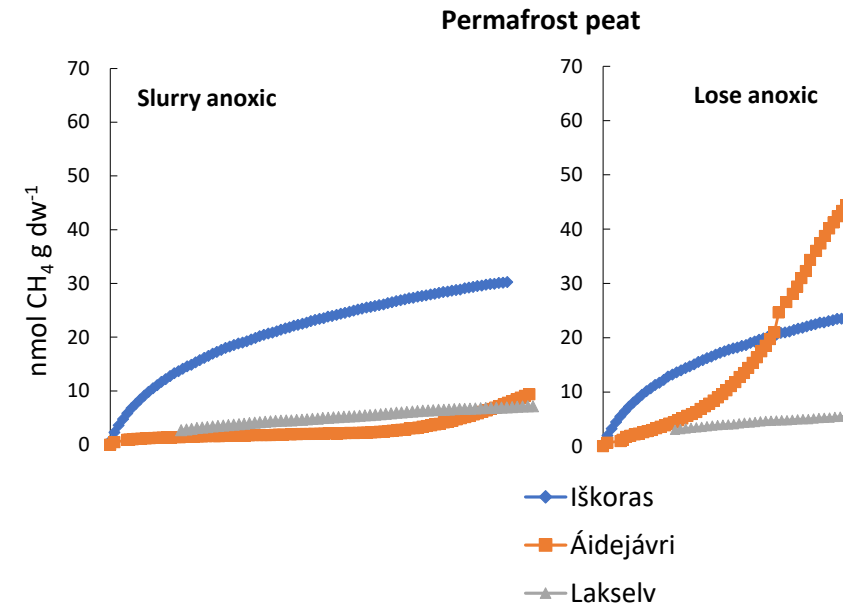
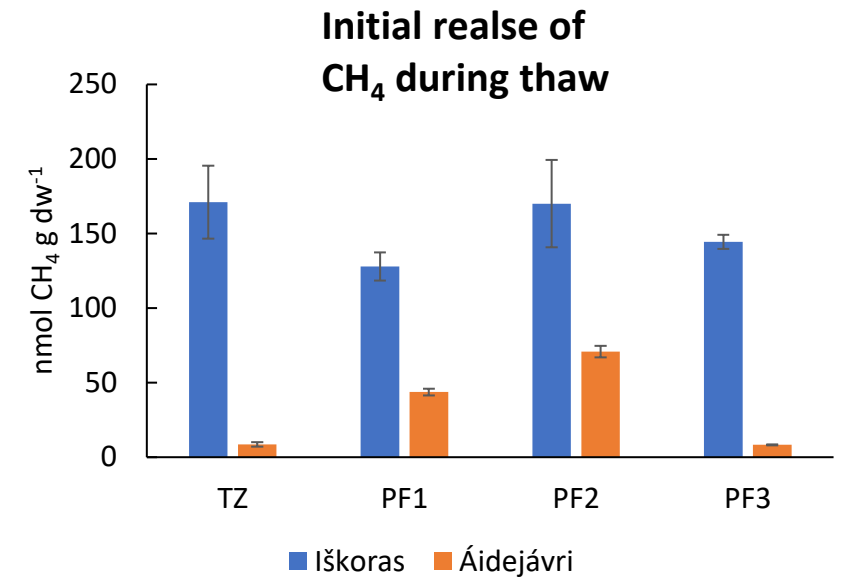
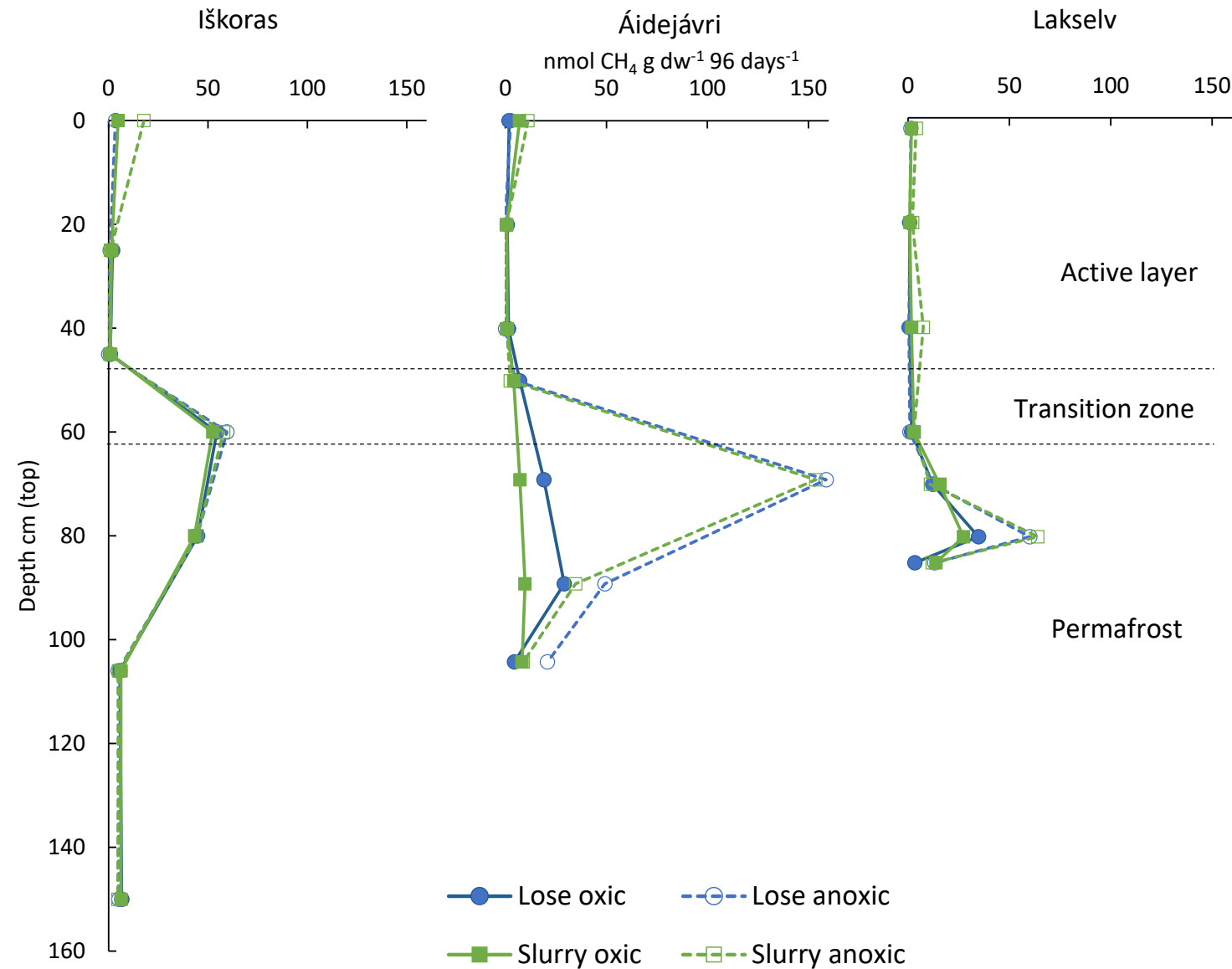
Comparison of incubation conditions in permafrost



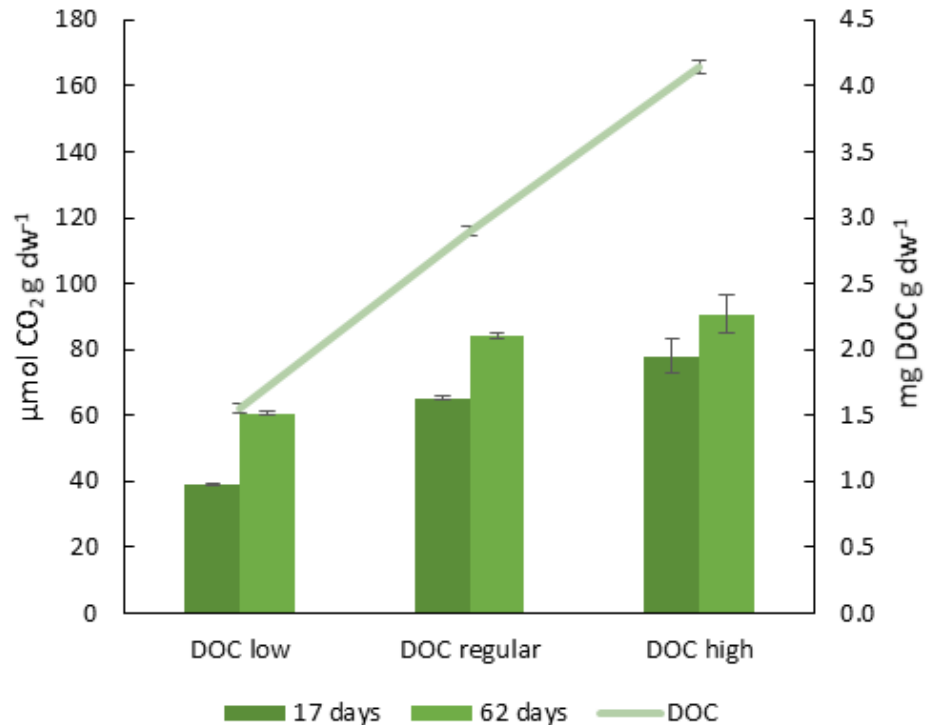
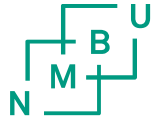
Cumulative CO₂ production over 96 days



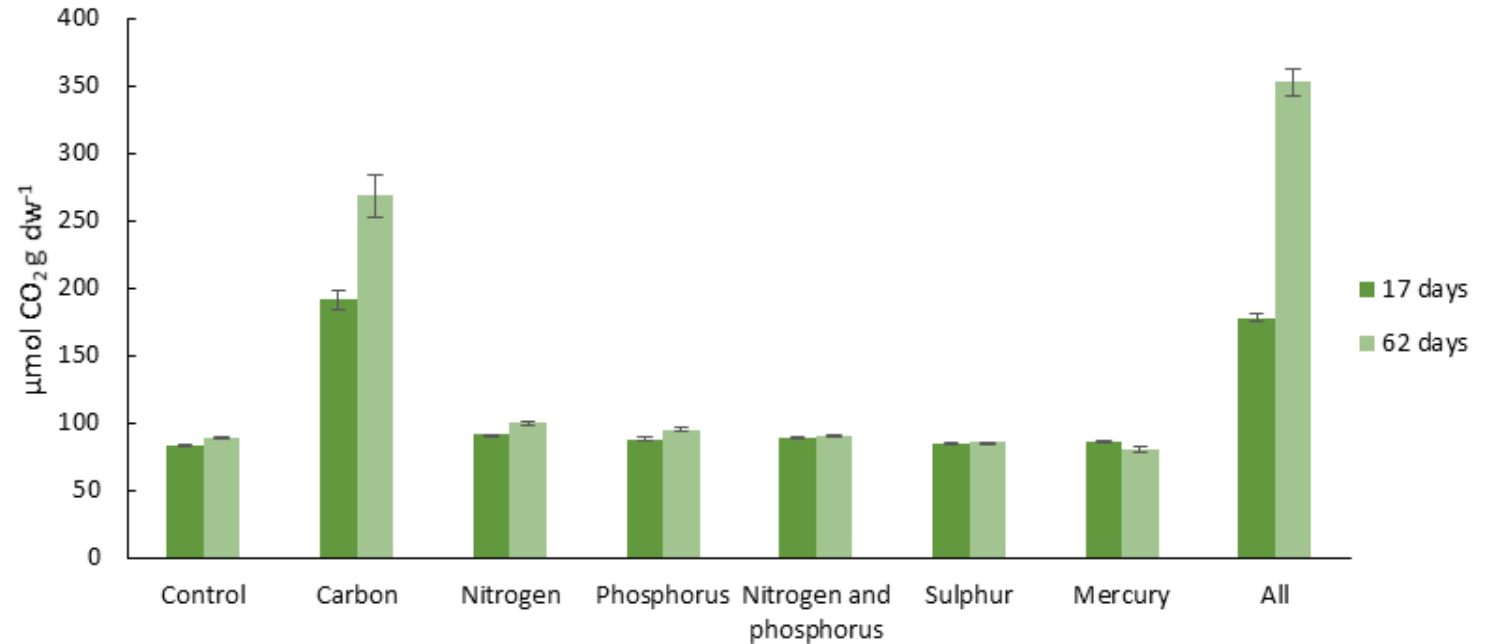
Methane



Manipulation experiments



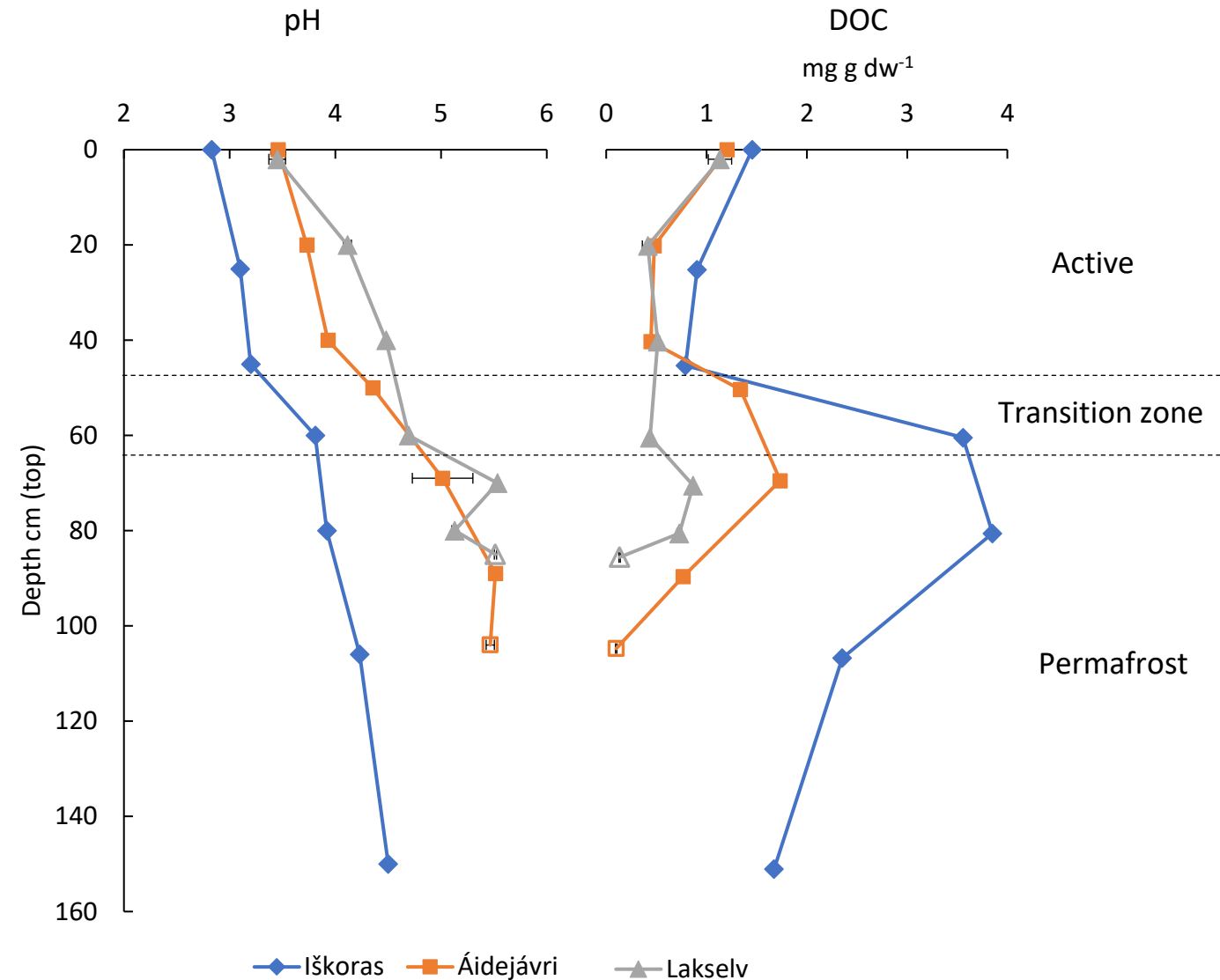
- Manipulation of initial DOC concentration in slurries after 1 h of stirring (line)
- Highest effect in the beginning



- Nutrients added to permafrost soils in 8 treatments
 - Control (no addition)
 - Carbon ($\text{C}_6\text{H}_{12}\text{O}_6$)
 - Nitrogen (NH_4^+)
 - Phosphorus (PO_4^{3-})
 - Nitrogen and phosphorus ($\text{NH}_4^+ + \text{PO}_4^{3-}$)
 - Sulphur (SO_4^{2-})
 - Mercury (Hg)
 - All ($\text{C}_6\text{H}_{12}\text{O}_6 + \text{NH}_4^+ + \text{PO}_4^{3-} + \text{SO}_4^{2-} + \text{Hg}$).
- Treatments with carbon addition affected CO_2 production

Chemical properties

- pH and DOC measured in soil slurry after 1 h of stirring



Chemical properties – C, N, P, S and Fe

