



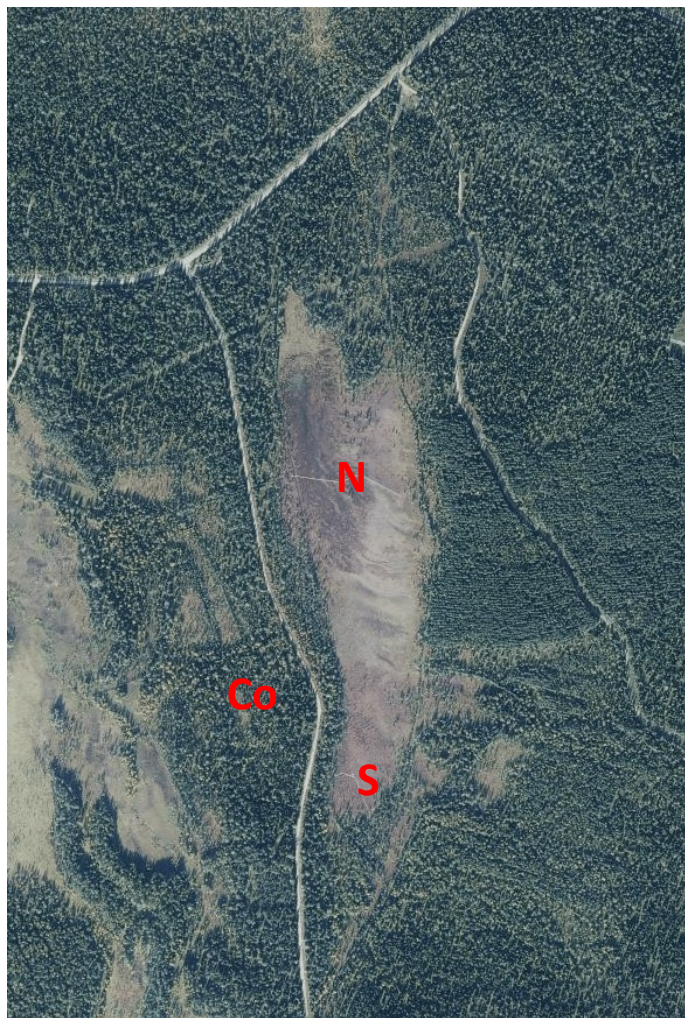
# Greenhouse gas flux measurements Finland 2023 – LIFE PeatCarbon

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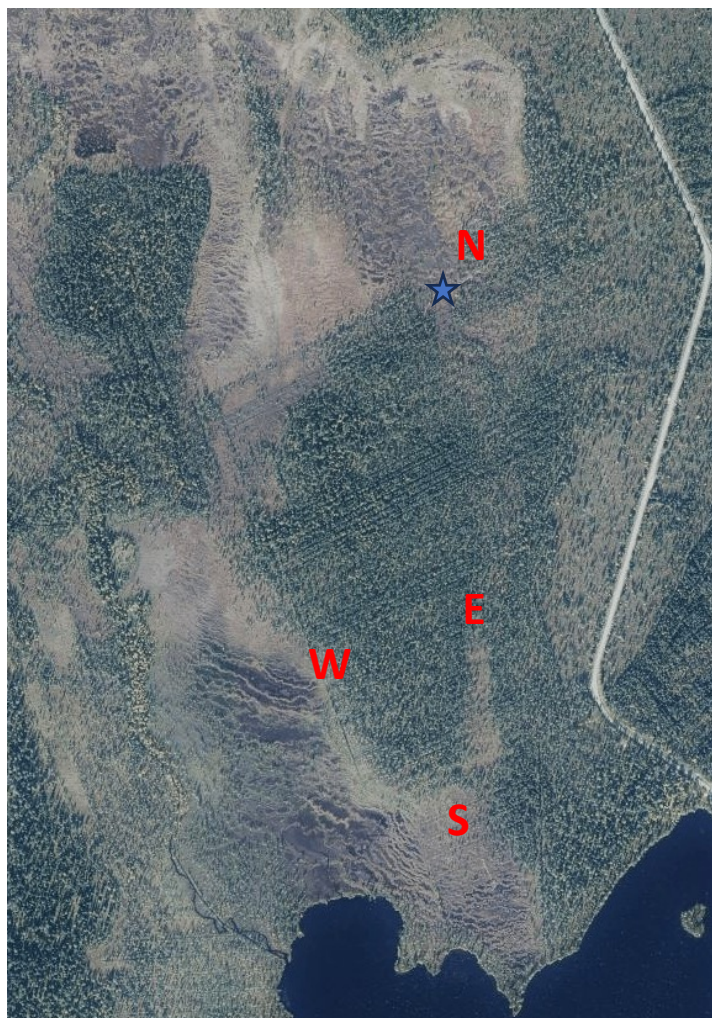




# 2023 GHG Measurements



Vällisuo



Matorovansuo

- 54 - total respiration, methane and nitrous oxide chamber measurement points (General GHG hereafter)
- 12 - heterotrophic respiration chamber measurement points
- 6 - ditch respiration points
- 24 - net ecosystem exchange (NEE) chamber measurement points
- 1 - eddy covariance (EC) tower for ecosystem level CO<sub>2</sub>
- This presentation is intended as a first look rather than an in-depth analysis, we have some processed data but no statistical analysis yet



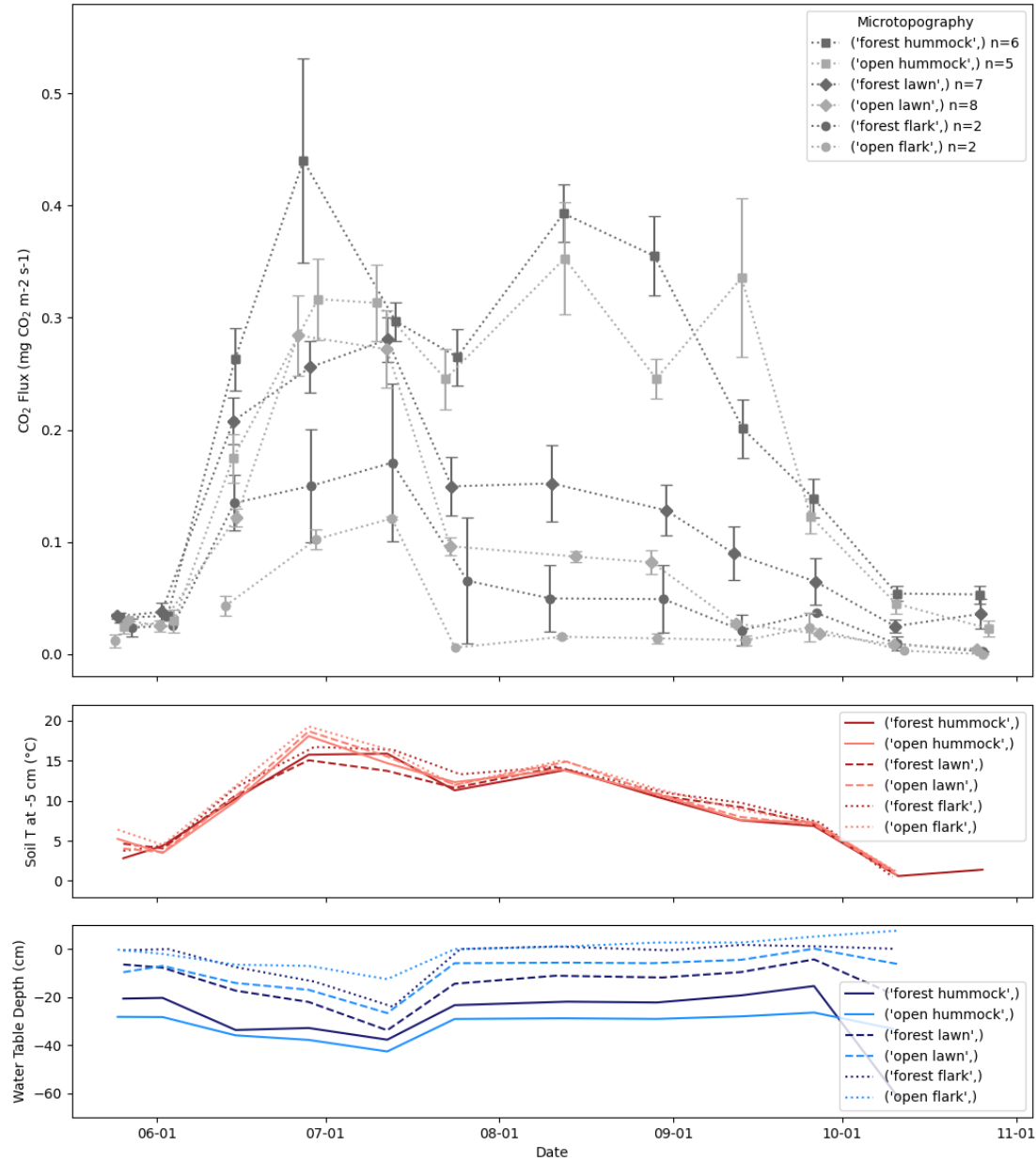
# General GHG chamber measurements

- Same plots as the snow gradient measurements I showed in the spring
- Snow free measurement schedule is every fortnight
- Total respiration ( $\text{CO}_2$ ),  $\text{CH}_4$  and  $\text{N}_2\text{O}$  measured simultaneously using twin Licors
- Various auxilliary measurements of other environmental variables
- Ditch measurement points using floating chambers

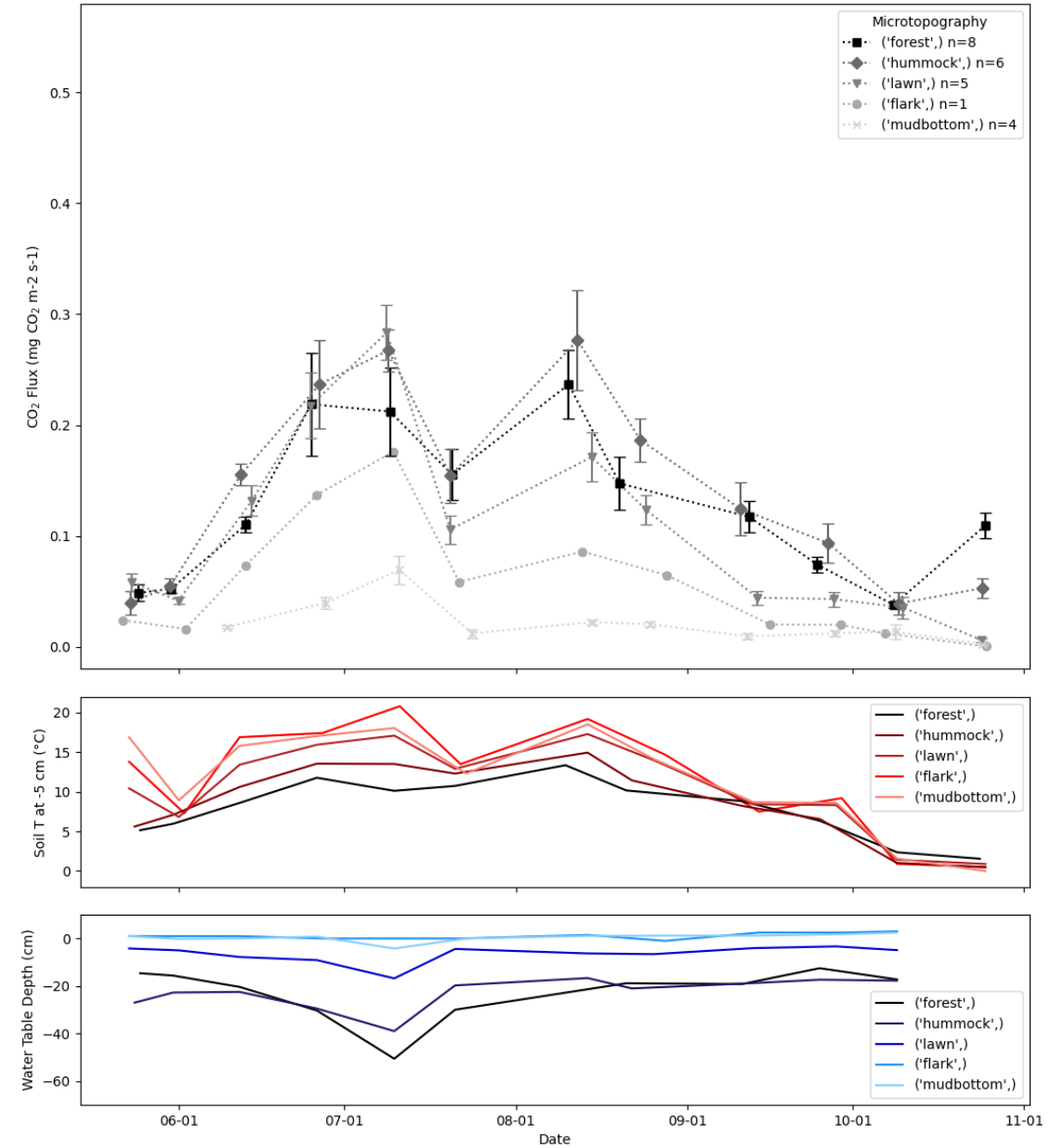


# Ecosystem respiration (autotrophic + heterotrophic)

Matorovansuo CO<sub>2</sub> chamber fluxes by microtopography



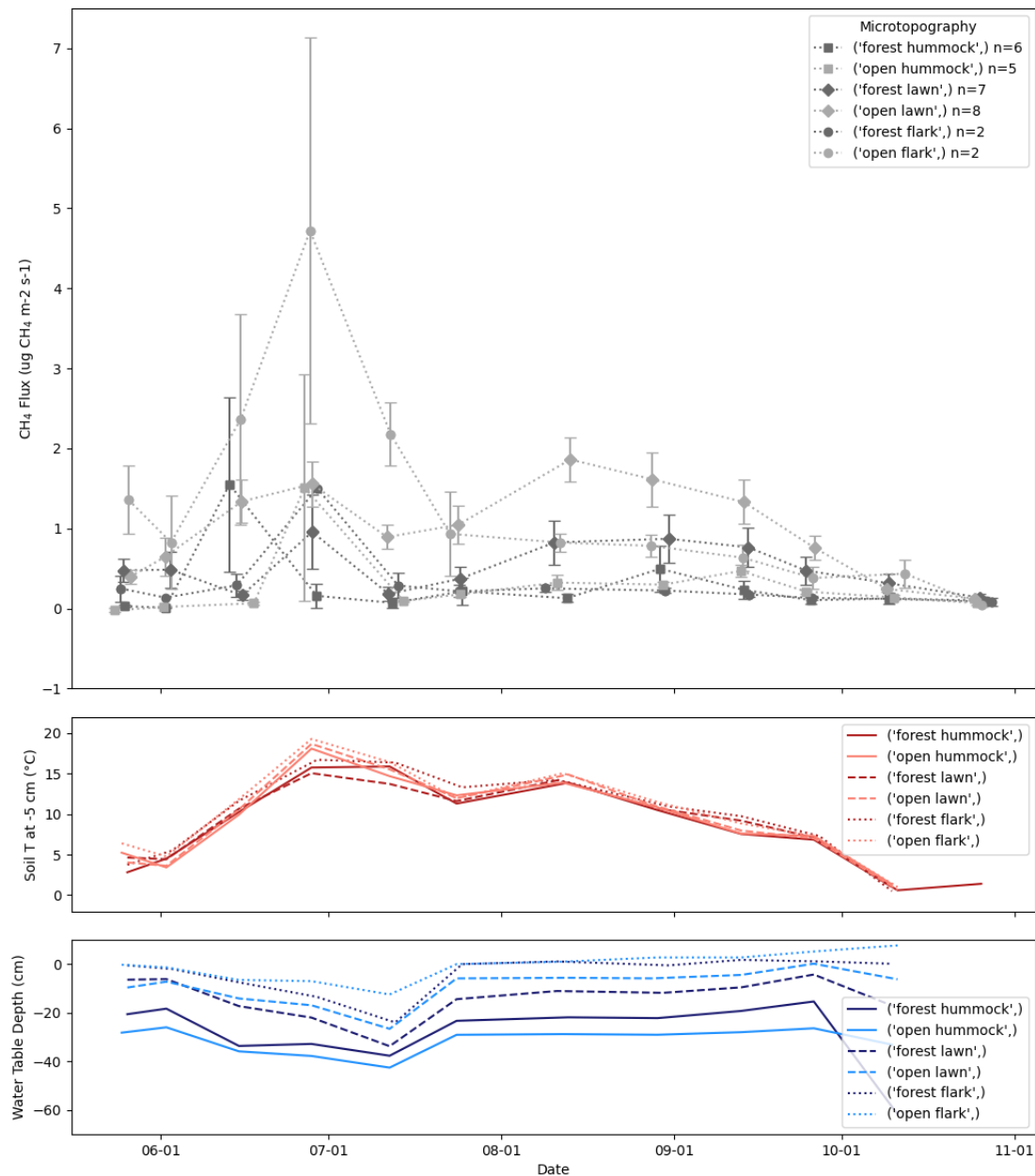
Välisuo CO<sub>2</sub> chamber fluxes by microtopography



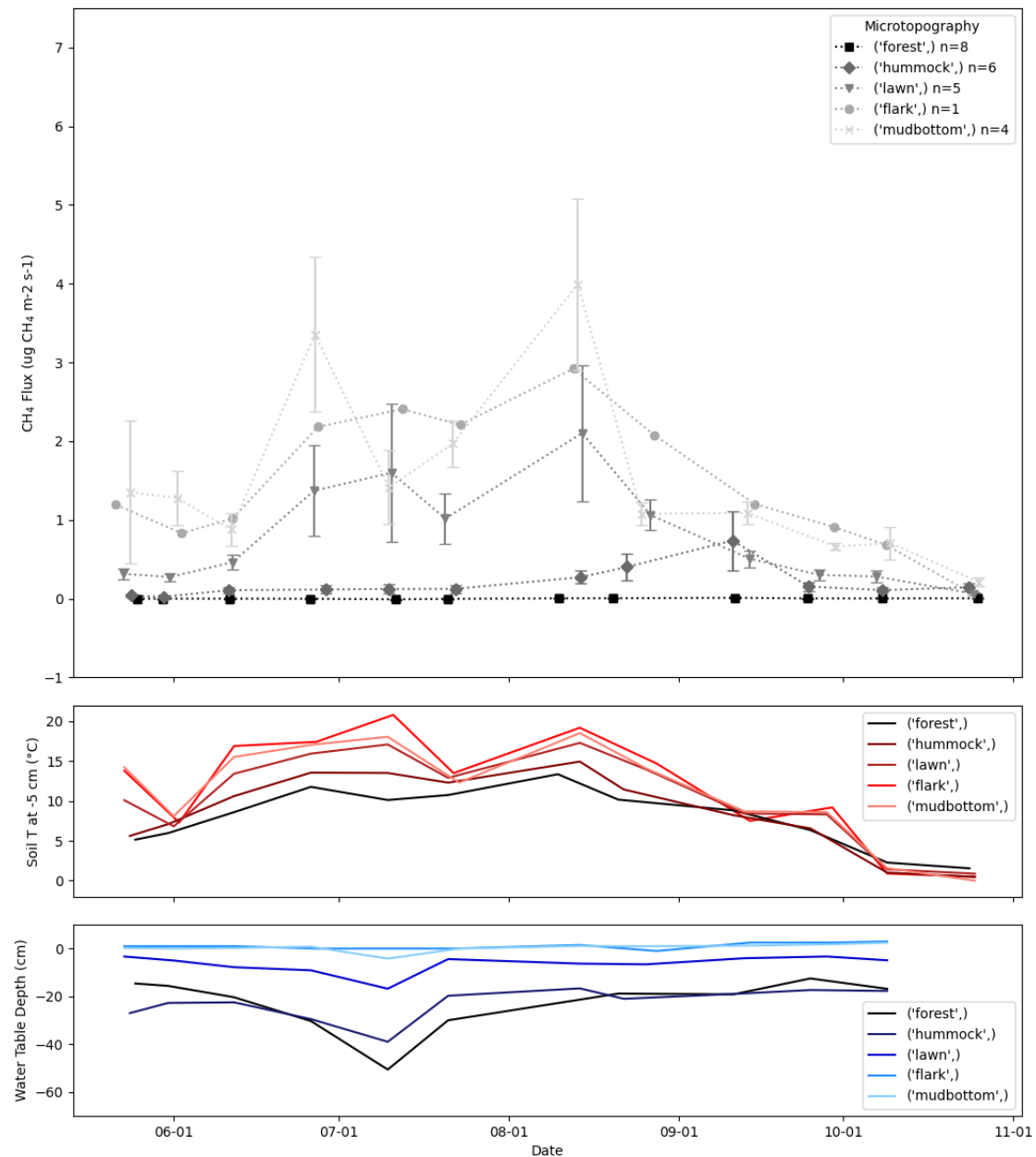


# Methane

Matorovansuo CH<sub>4</sub> chamber fluxes by microtopography



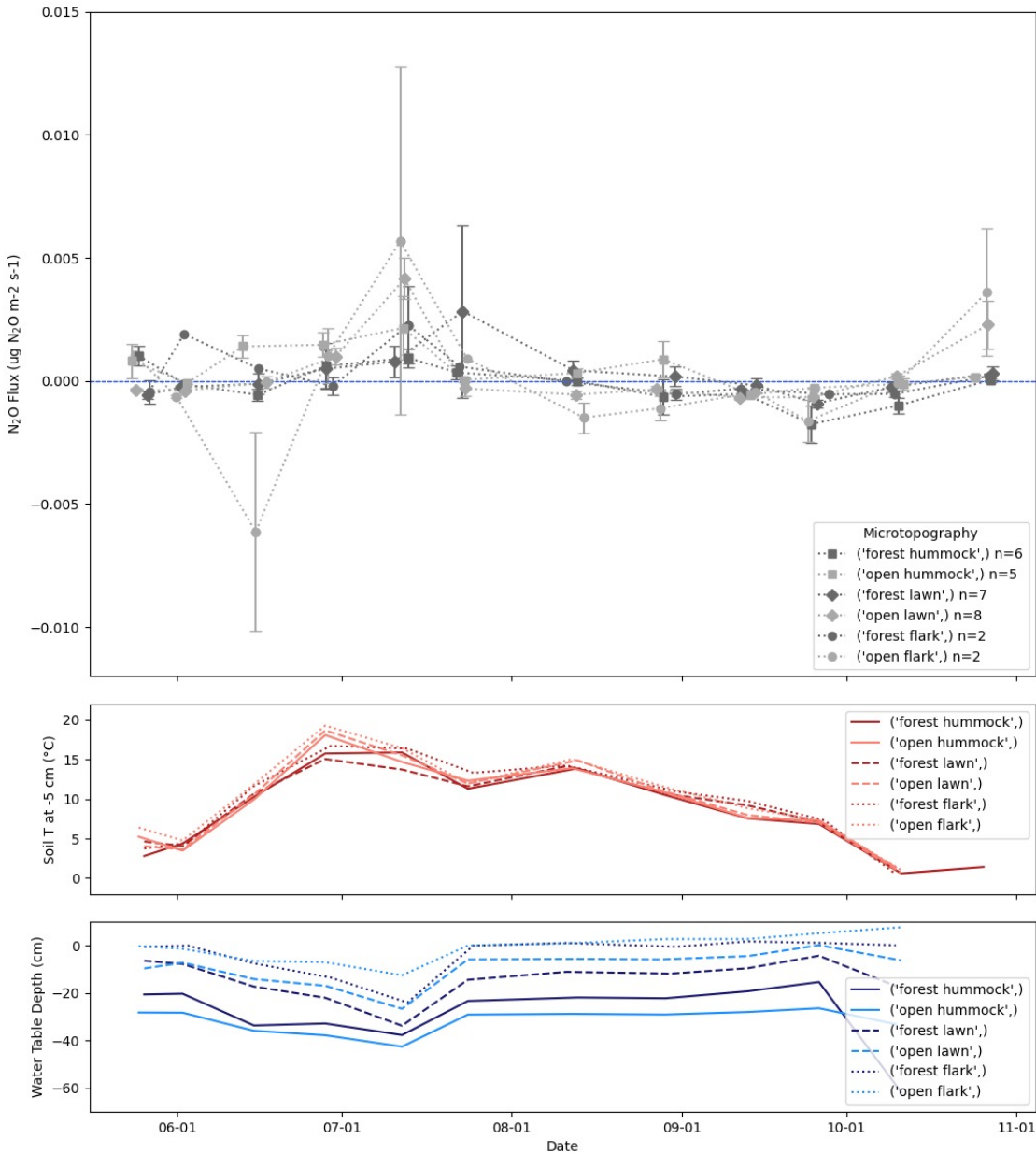
Välisuo CH<sub>4</sub> chamber fluxes by microtopography



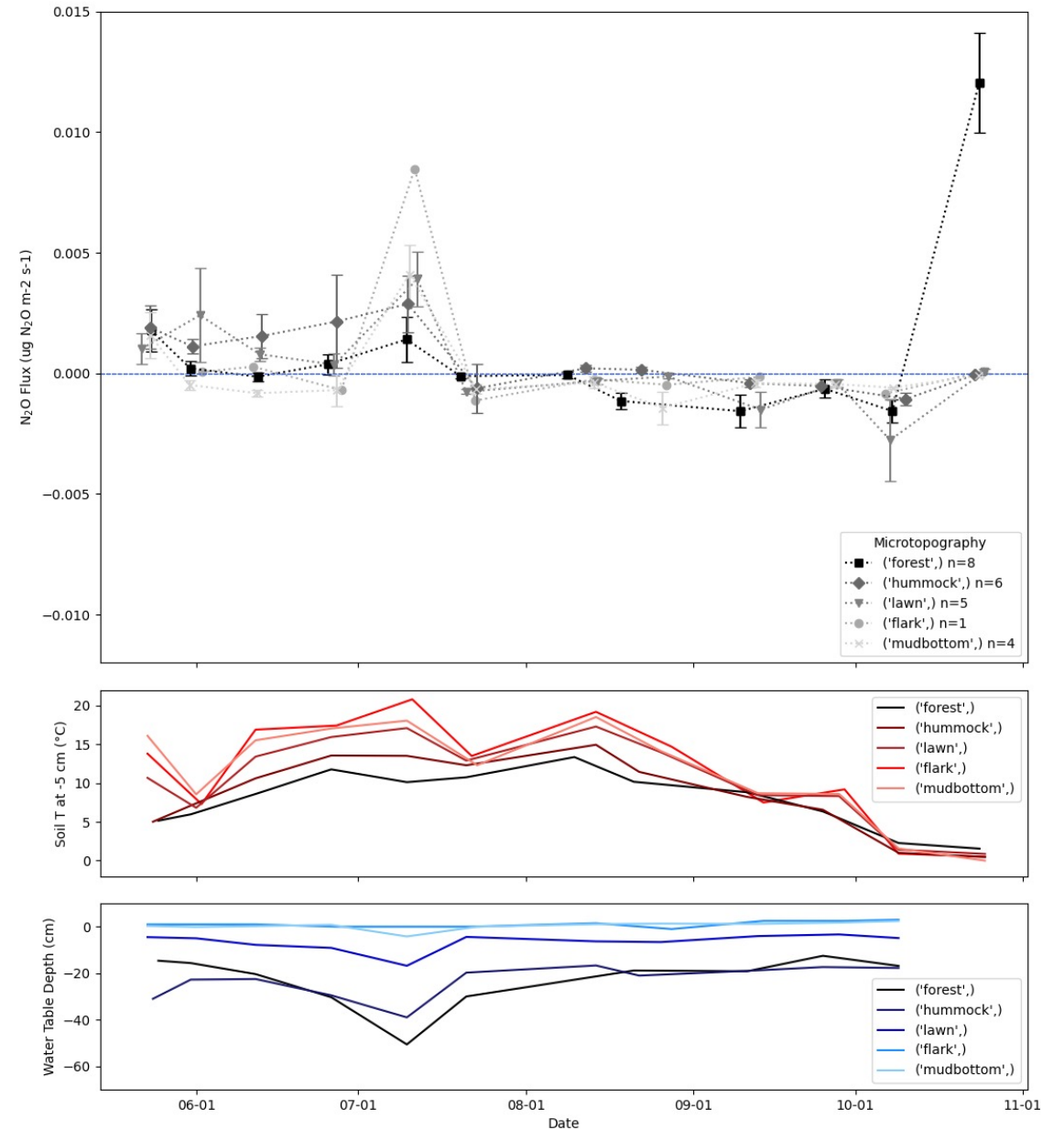


# Nitrous oxide

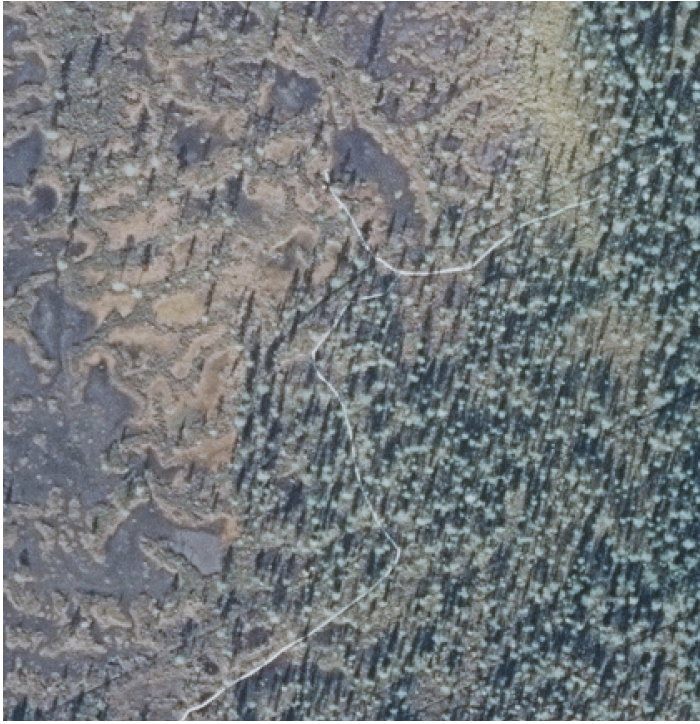
Matorovansuo N<sub>2</sub>O chamber fluxes by microtopography



Välisuo N<sub>2</sub>O chamber fluxes by microtopography



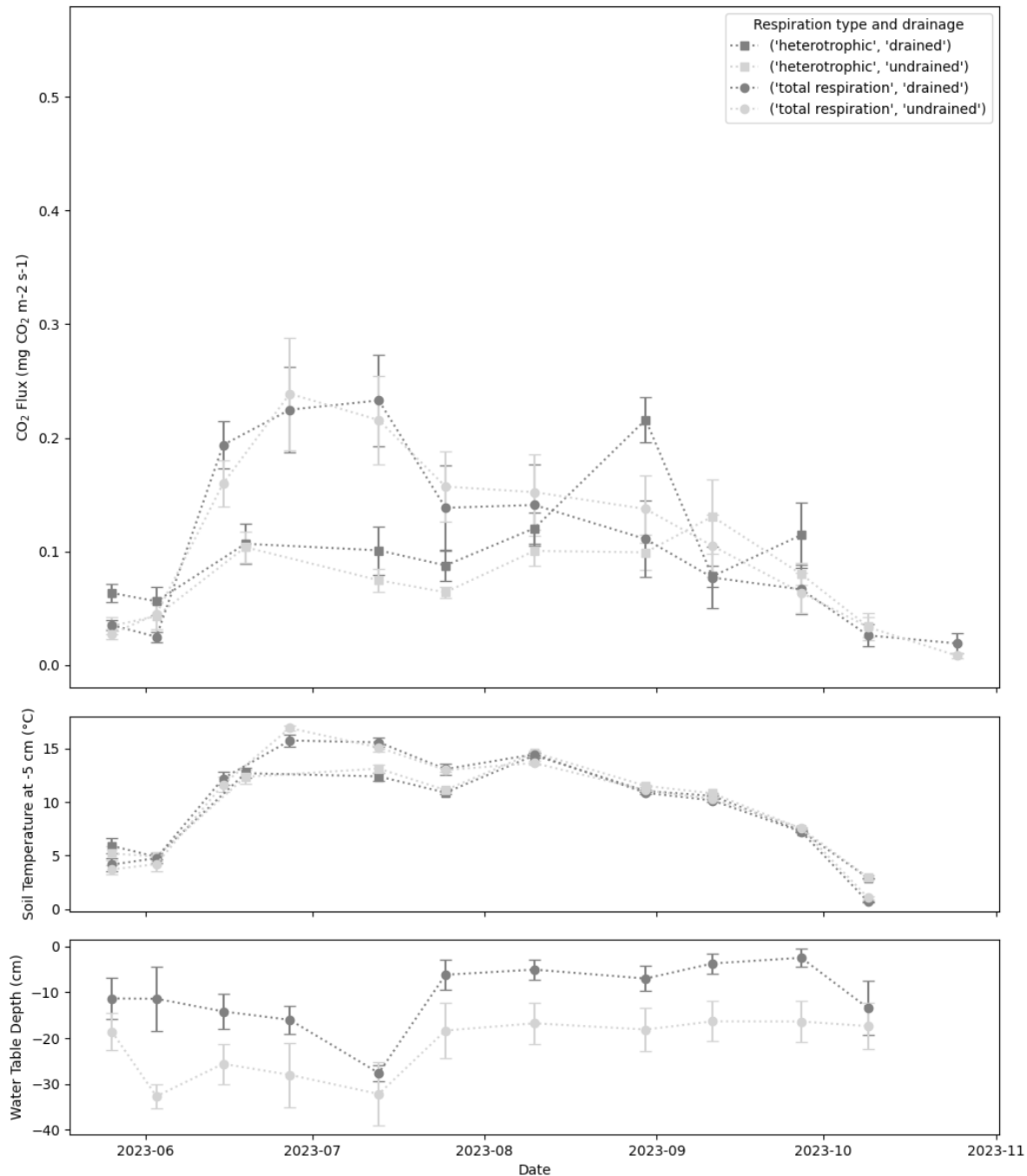




## Heterotrophic respiration measurements

- 12 plots spread along transect between open undrained mire and enclosed drained mire
- Paired by microtopography with total respiration plots





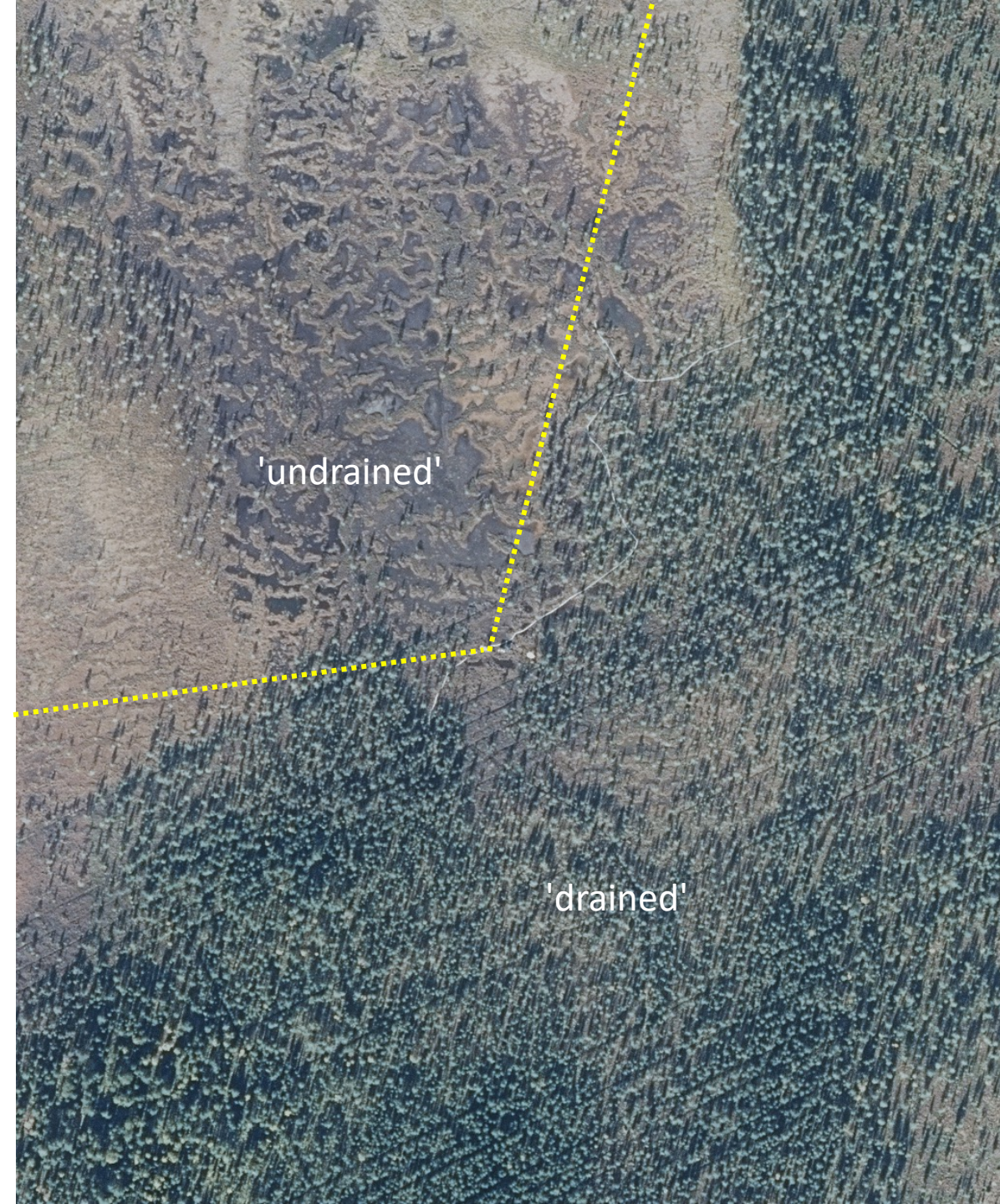
## Heterotrophic respiration

- Total respiration mostly higher than heterotrophic (especially in the early season) – as expected
- Difference seems to diminish later in the season (and even reversed!)
- Some higher soil temperatures in the conventional plots (artefact of the setup or measurement artefact)
- Heterotrophic fluxes possibly higher on drained side
- But water level is higher in drained side, this does not account for the microtopography of the plots
- The same point applies to the fluxes – a more detailed look is needed



## EC tower

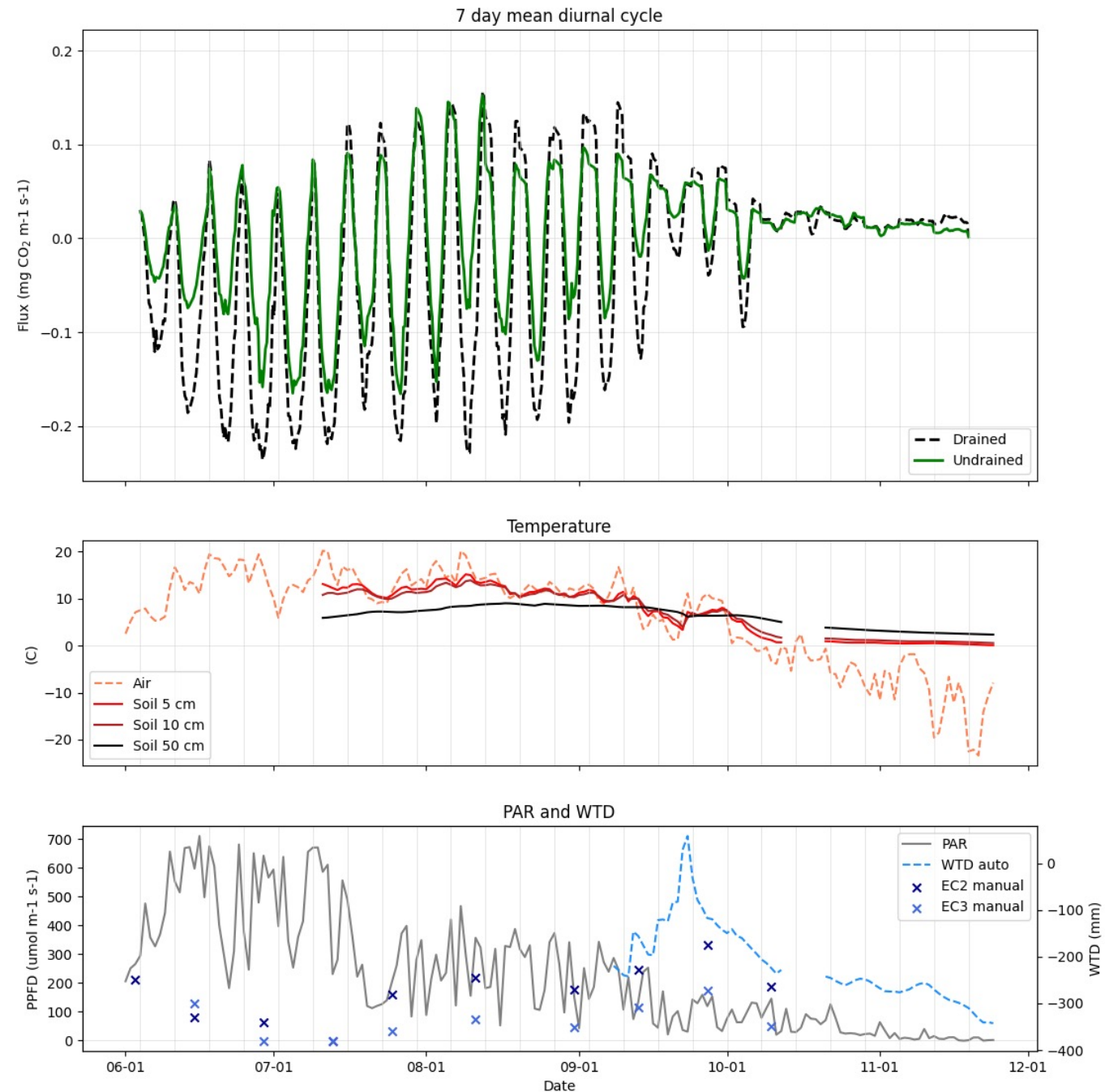
- Continuous CO<sub>2</sub> fluxes at ecosystem level
- Up and running from the beginning of June
- Wind sectors divided into drained and undrained

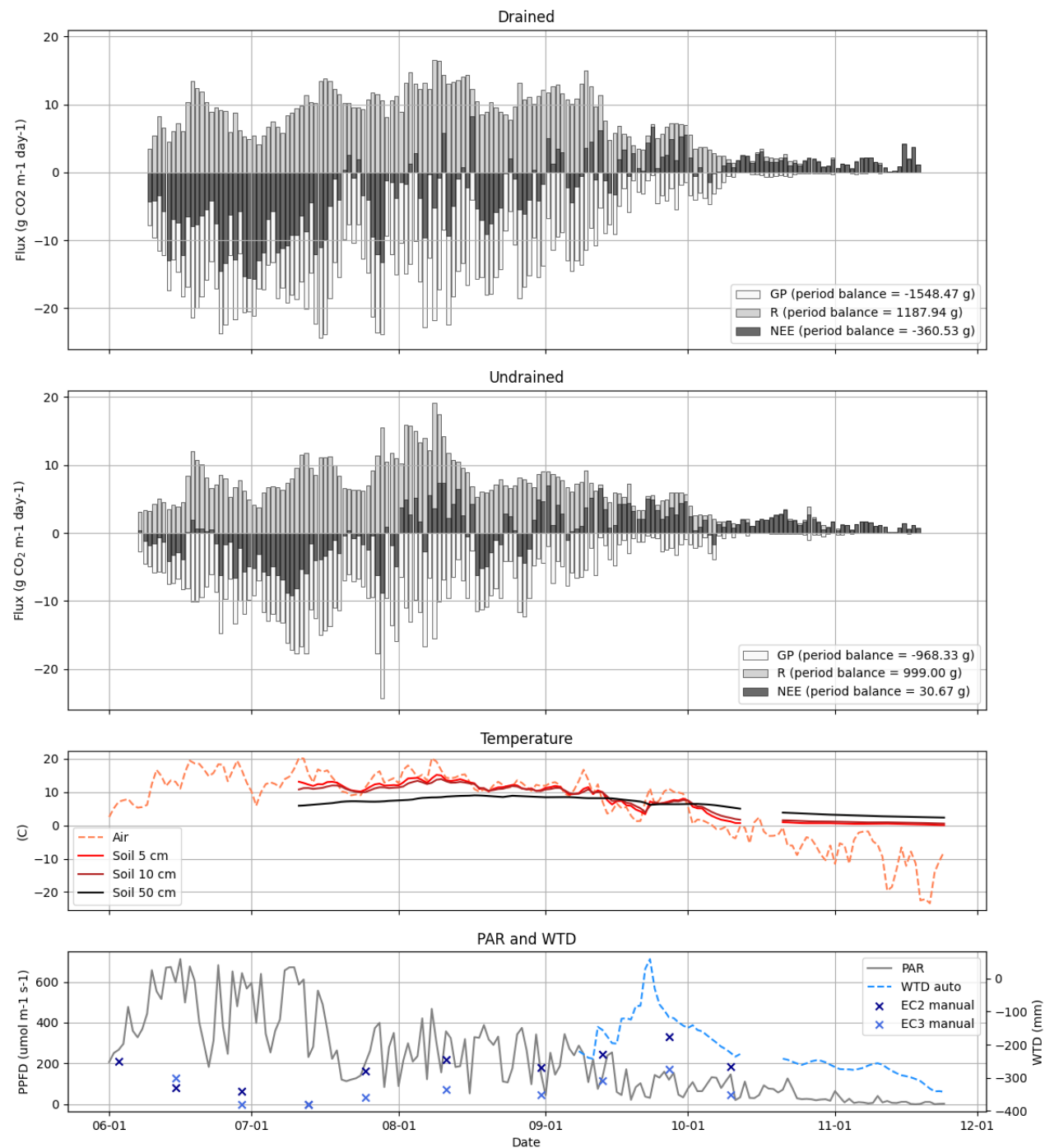




## PROVISIONAL results only

- 7 day average of diurnal cycle (displayed over the 7 days for ease of viewing)
- Open mire has lower gross photosynthesis (GP) over the whole season
- Also lower respiration
- Auxilliary measurements are daily averages



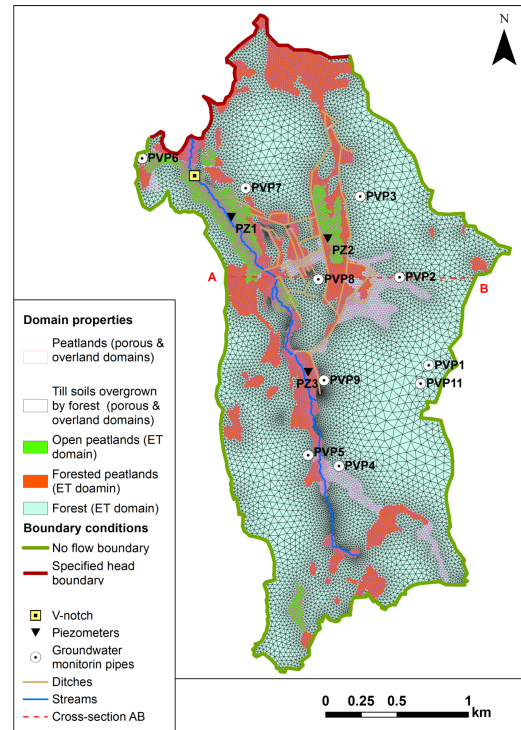


## PROVISIONAL results only

- Daily balances
- Total period balances suggest drained side may be a sink, but winter is long, and the respiration fluxes will accumulate
- Regarding undrained side, northern aapa mires fluctuate annually between sink and source depending on conditions
- With growing tree stock not surprising that drained side may prove to have a lower balance



# Hydrogeological studies in Pallas during 2023



- Improving hydrological measurement network and wireless data transfer to cloud systems
- Verifying 3D hydrogeological model to Välisuo -site
- Monitoring pre-restoration conditions with UAV and satellite imagery
- Near future activities – new ground penetrating campaign to Välisuo and Matorovansuo



