



# Preliminary results of Soil GHG fluxes from the reference sites

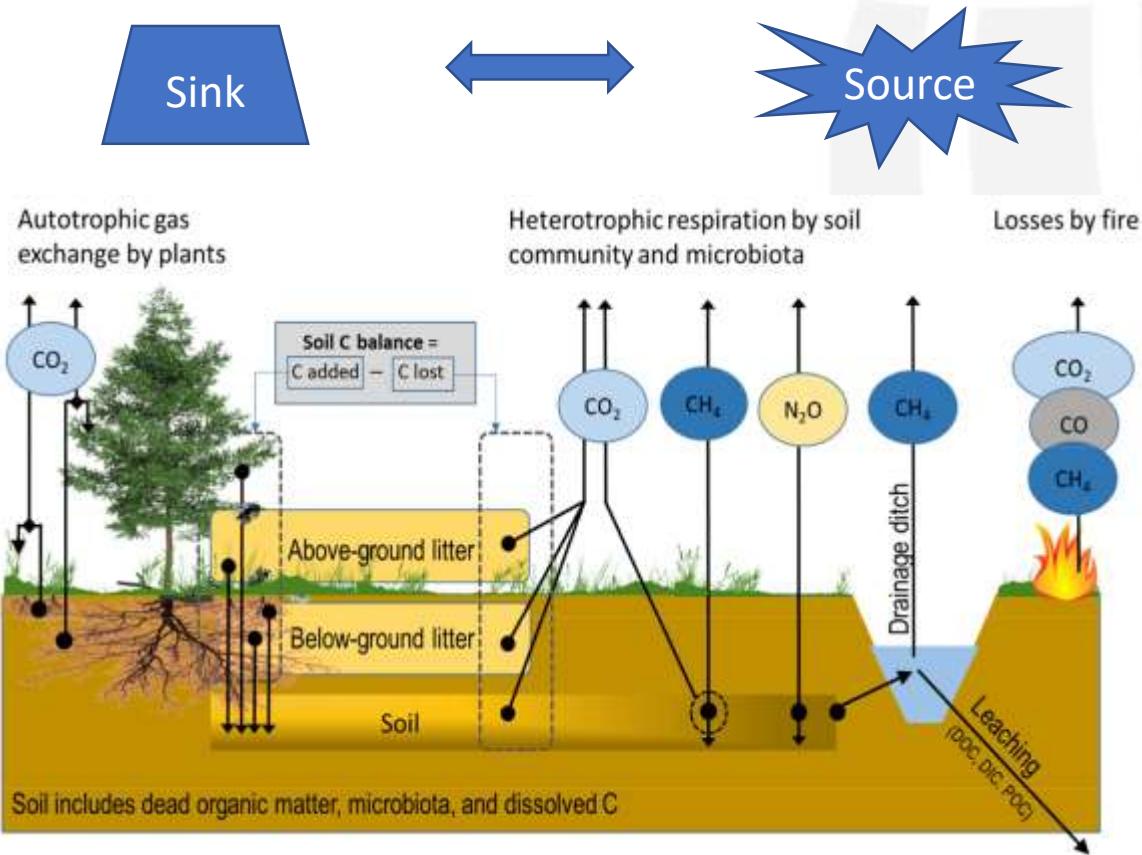
2/3/2023  
MS Team's meeting

LIFE OrgBalt, LIFE18 CCM/LV/001158

EU LIFE Programme project  
“Demonstration of climate change mitigation potential  
of nutrients rich organic soils in Baltic States and Finland”



## Drainage affects the factors controlling production and consumption of greenhouse exchange



Automatic loggers:  
Tair, Tsoil, SWC, WL.

# Forest Sites; Total = 24

Species    ▲ Birch    ▲ Black alder    ▲ Pine    ▲ Spruce    ▲ Wetland

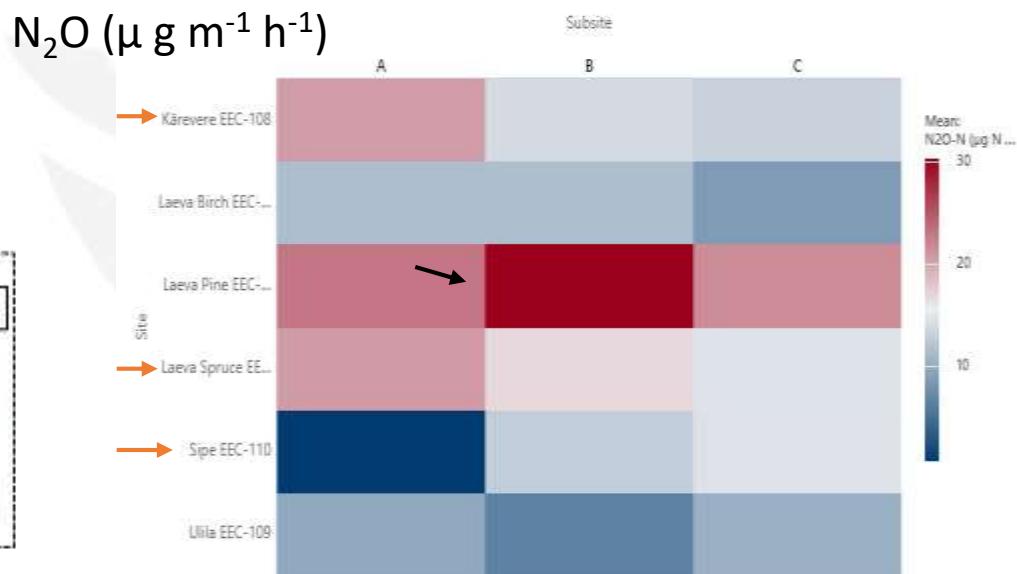
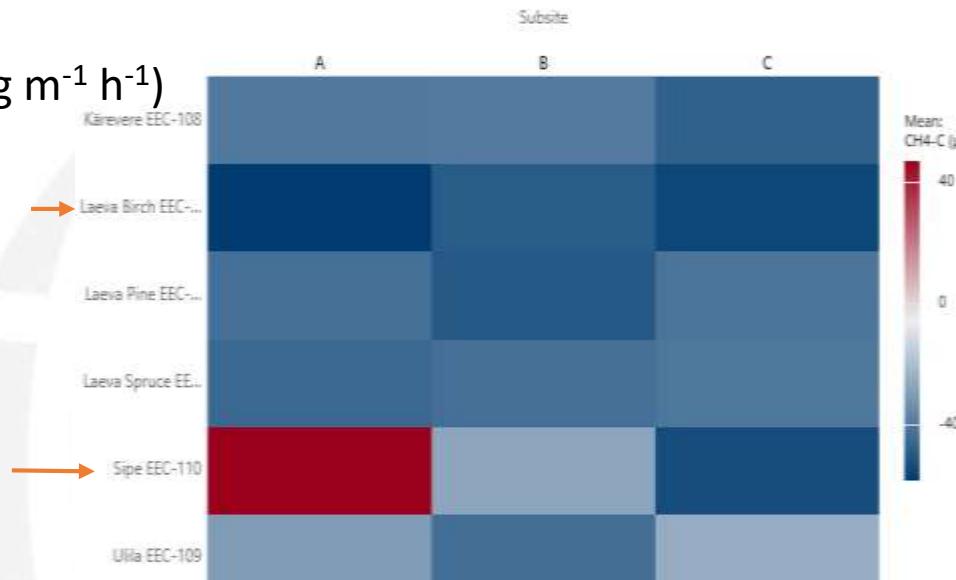
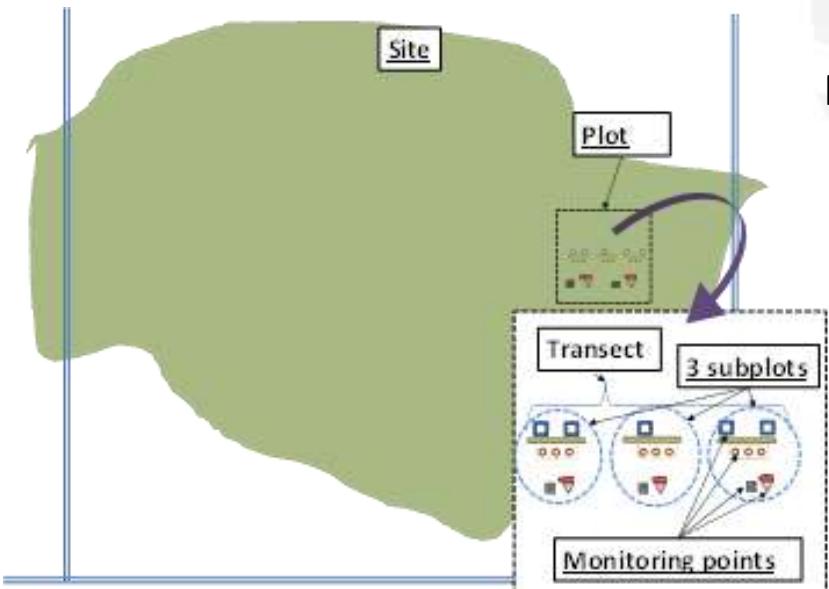


Dominant species	Common name, Site ID		Peat depth (cm)	Water table regime	Stand age
Black alder	Karevere	EEC108	20-30cm	Drained site	Mature stand
	Dubrava	LTC106	50-60	Drained site	30
	Birzgale	LVC109	>50 cm	Drained (Wet)	mature stand
Birch	Laeva	EEC106	60-70 cm	Drained site	20-40
	Ulila	EEC109	50-70 cm	Drained site	younger stand
	Dubrava	LTC105	50-60	Drained site	19-43
	S-99-9	LVC108	>50 cm	Drained site	24
	Plaviņas	LVC115	>50 cm	Drained site	mature stand
	Smiltenes Melnalkšņi	LVC111	100 cm+	Drained (Wet)	mature stand
Spruce	Kivalo	FIC308	30 -50 cm	Drained site	mature stand
	Laeva	EEC104	>50cm	Drained site	43-65
	Paroninkorpi	FIC302	>100cm	Drained site	mature stand
	Dubrava	LTC104	50-60	Drained site	70
	Ropaži	LVC104	30+ cm	Drained site	mature stand
	Viesīte otrs	LVC106	40 cm	Drained site	mature stand
Pine	Tālākā daļa	LVC113	>50 cm	Drained site	48
	Laeva	EEC105	>50cm	Drained site	40-60
	Lettosuo	FIC305	151 - 250 cm	Drained site	mature stand
	Olaine	LVC107	>21cm	Drained site	120
	S-193-27	LVC116	60 cm	Drained site	141
Reference	Iecava	LVC110	>21 cm	Drained (Wet)	mature stand
	Kirbas purvs	LVC114	>100 cm	Natural site (Wet)	None
	Sipe	EEC110	>200 cm	Naturally drained site (Wet)	None
	Žuvintas	LTC110	200cm	Undrained site	None

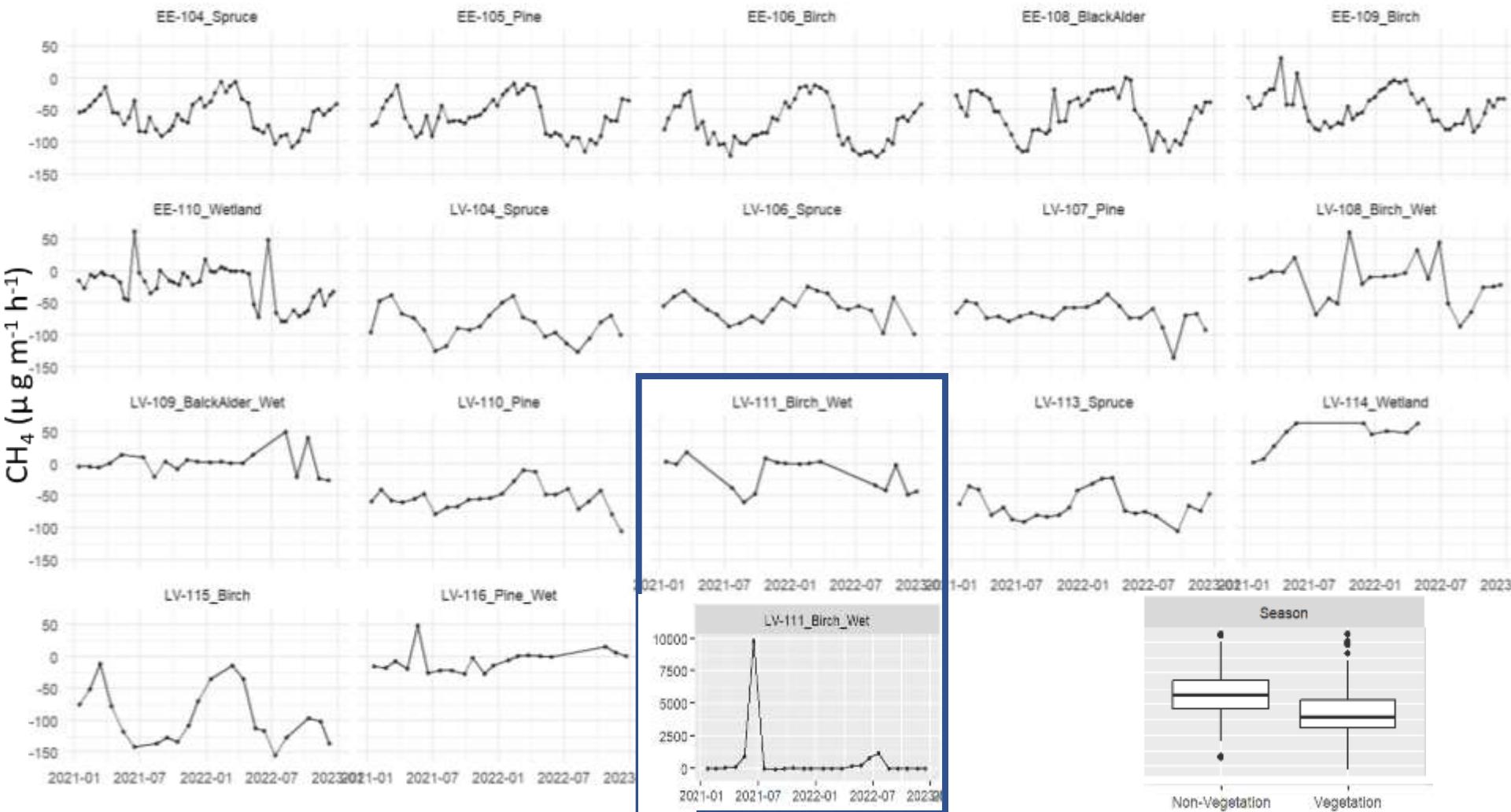
## Forest Subsite effect: $\text{CH}_4 (\mu \text{g m}^{-2} \text{ h}^{-1})$

### Subsites: A, B, C

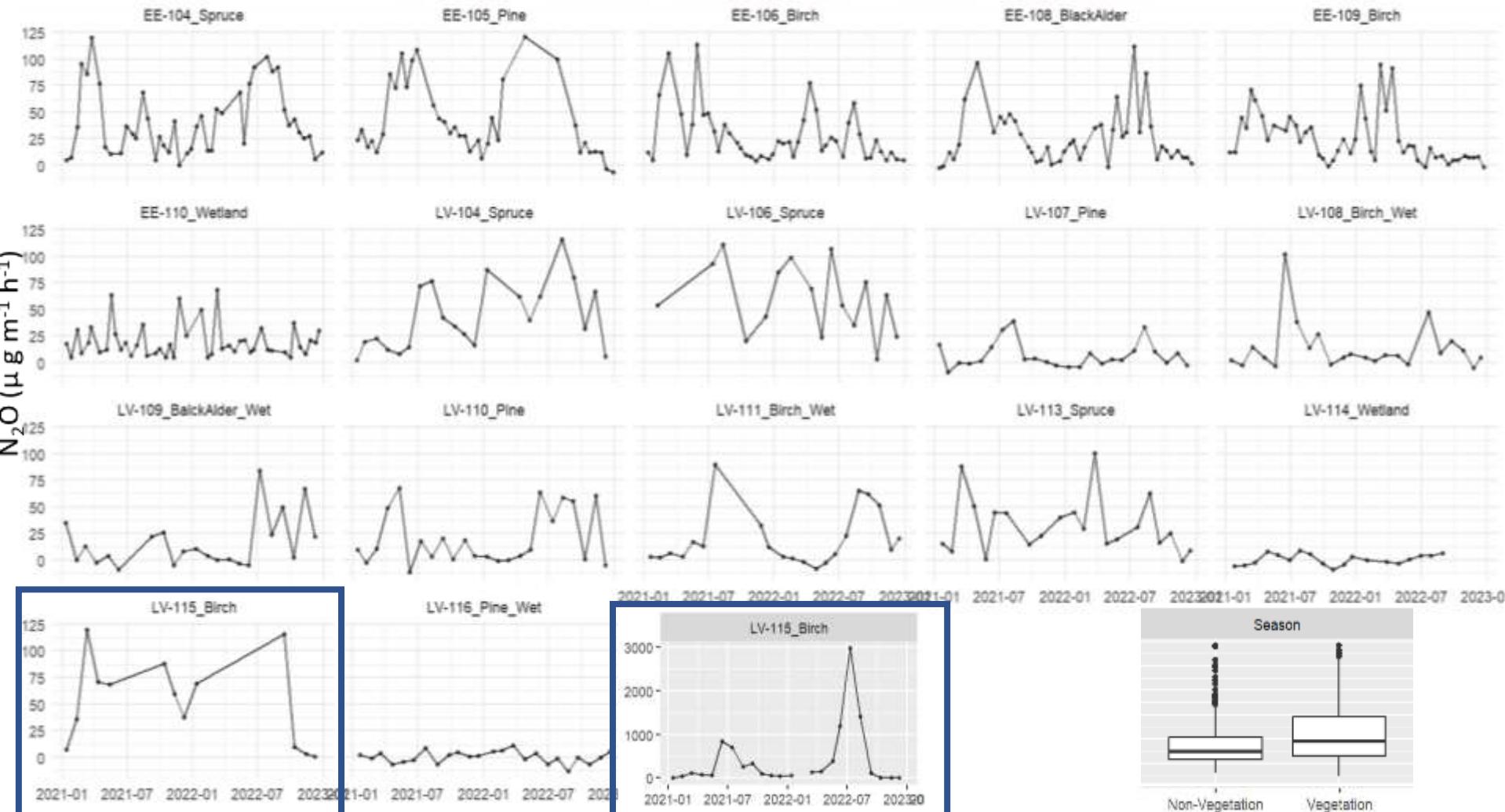
- Dark Chamber method:  $\text{CH}_4$  &  $\text{N}_2\text{O}$  flux monitoring points,  $n = 6$
- Dynamic Chamber: Heterotrophic  $\text{CO}_2$



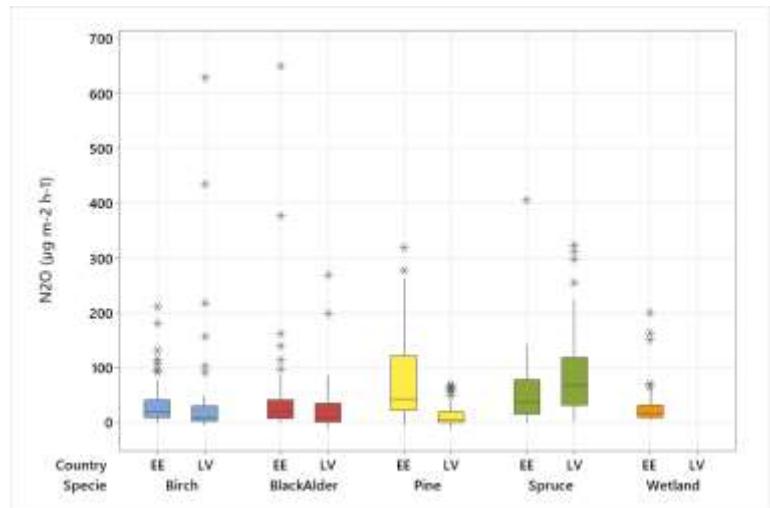
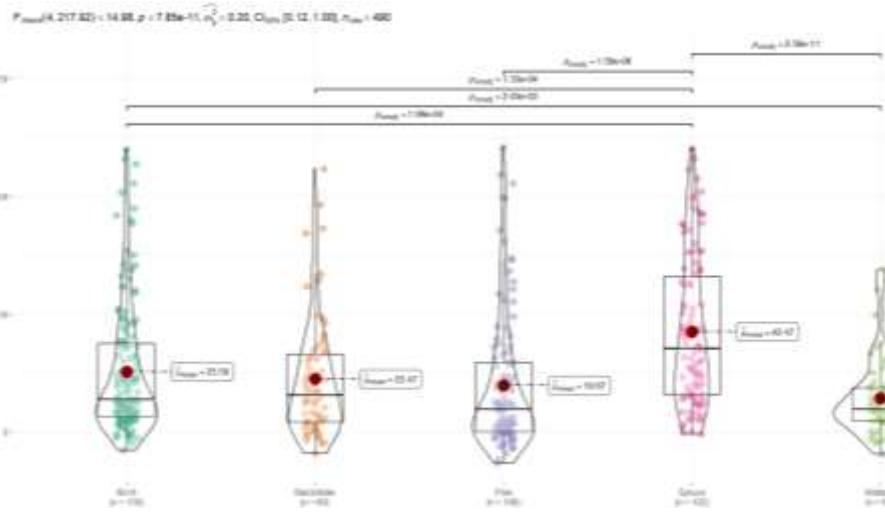
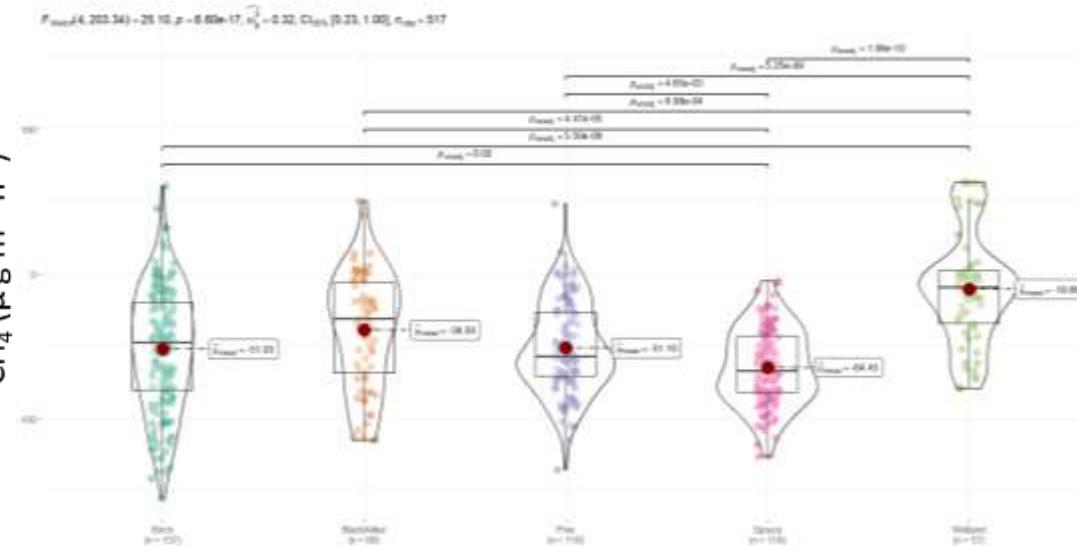
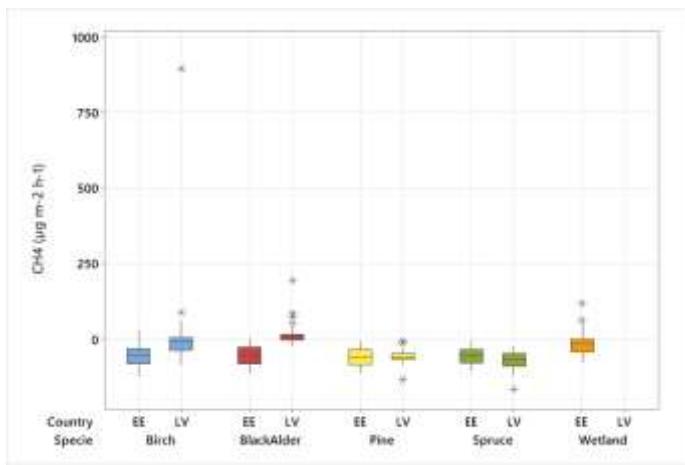
## Time series of CH<sub>4</sub> fluxes in Estonia and Latvia (2021- 2022)



## Time series of $\text{N}_2\text{O}$ fluxes in Estonia and Latvia (2021- 2022)



# Soil fluxes from different forest stands

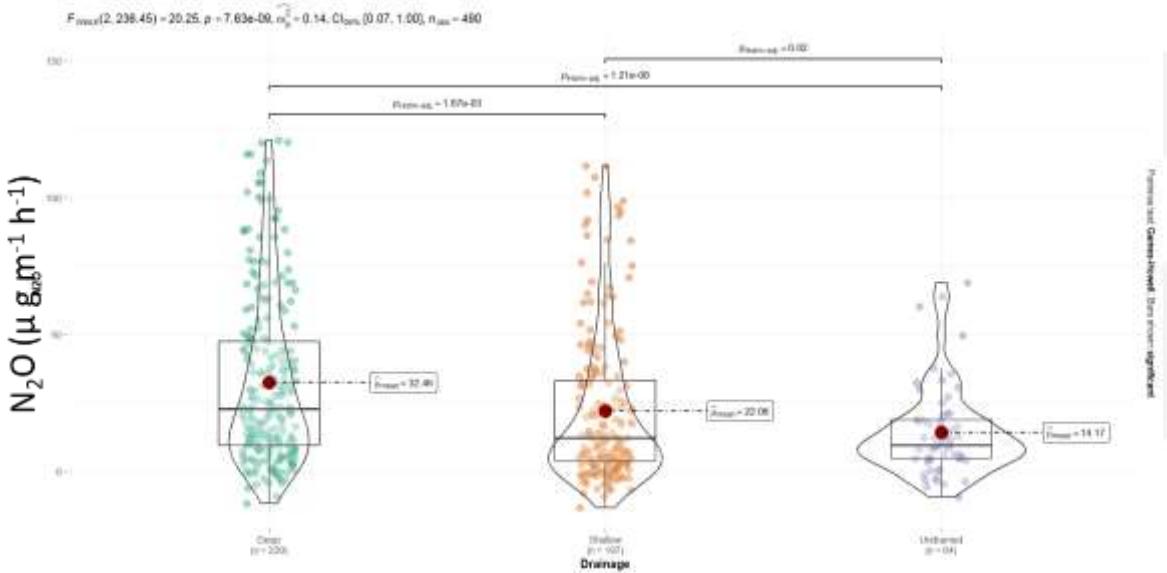
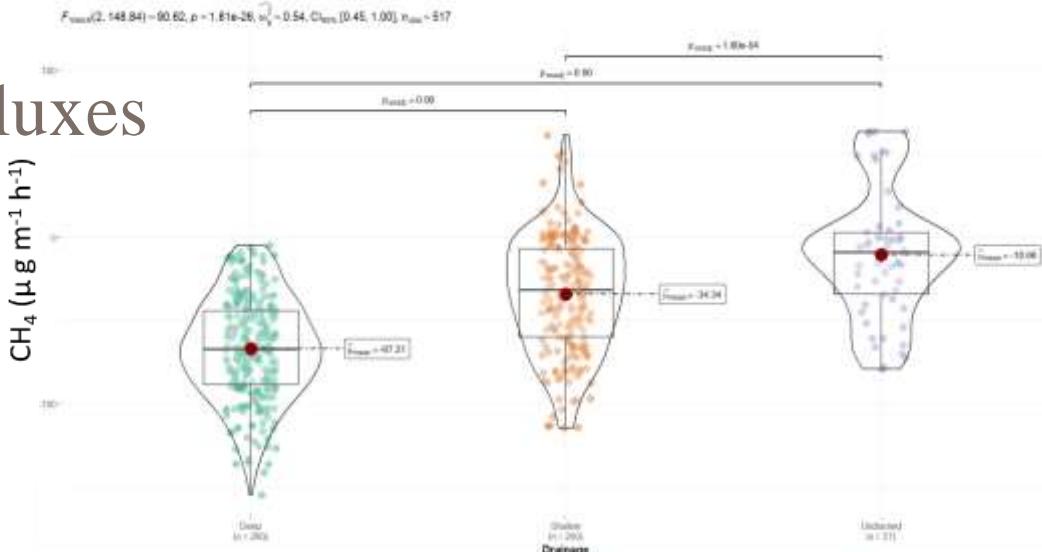


# Drainage effect of soil fluxes

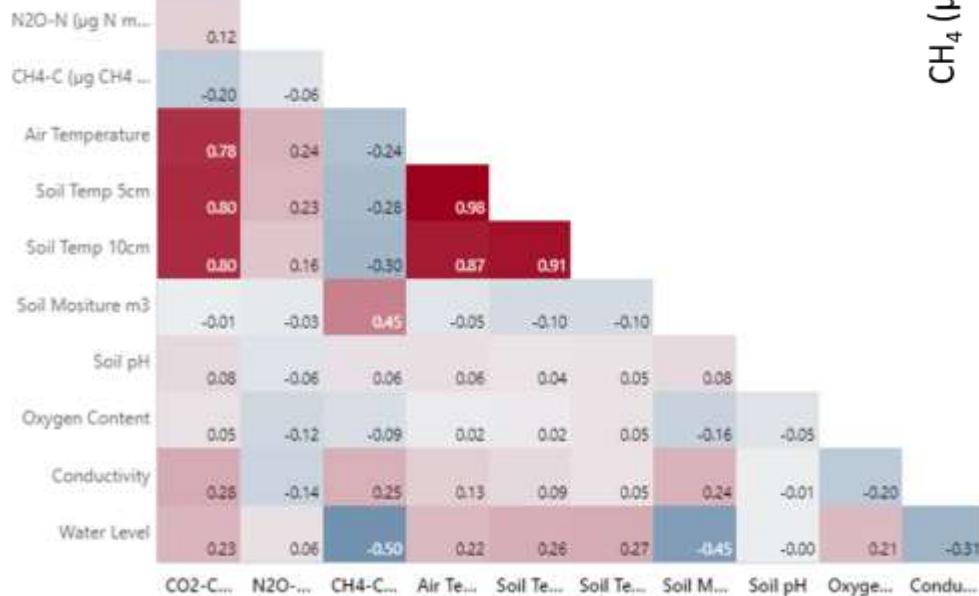
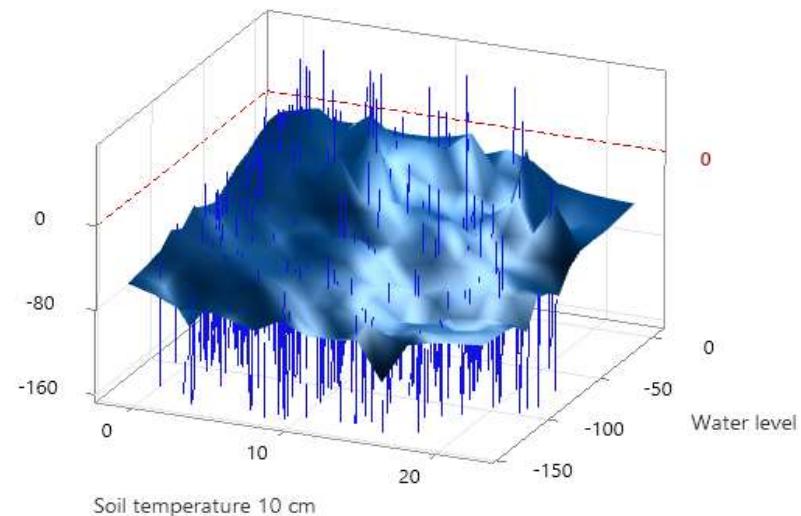
Deep drained: Water level > 30 cm

Shallow drained: Water level < 30 cm

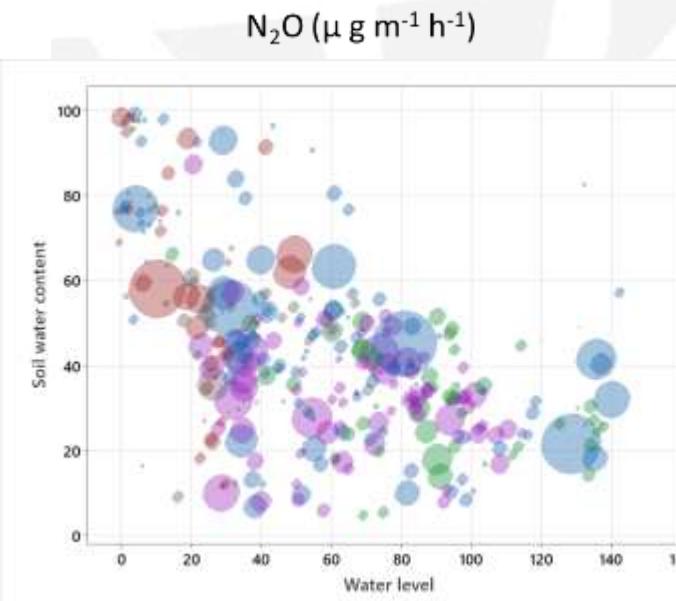
Undrained Sites: Wetland



# Environmental parameters


 $\text{CH}_4 (\mu\text{g m}^{-2}\text{ h}^{-1})$ 


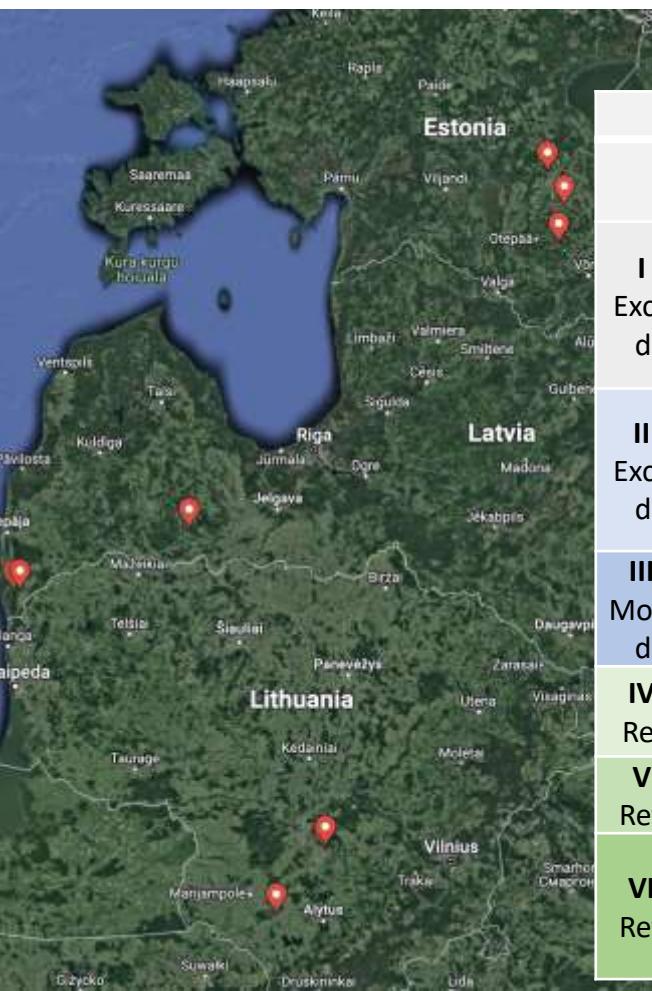
Soil temperature 10 cm


 $\text{N}_2\text{O} (\mu\text{g m}^{-2}\text{ h}^{-1})$ 

Species

- Birch
- BlackAlder
- Pine
- Spruce
- Wetland

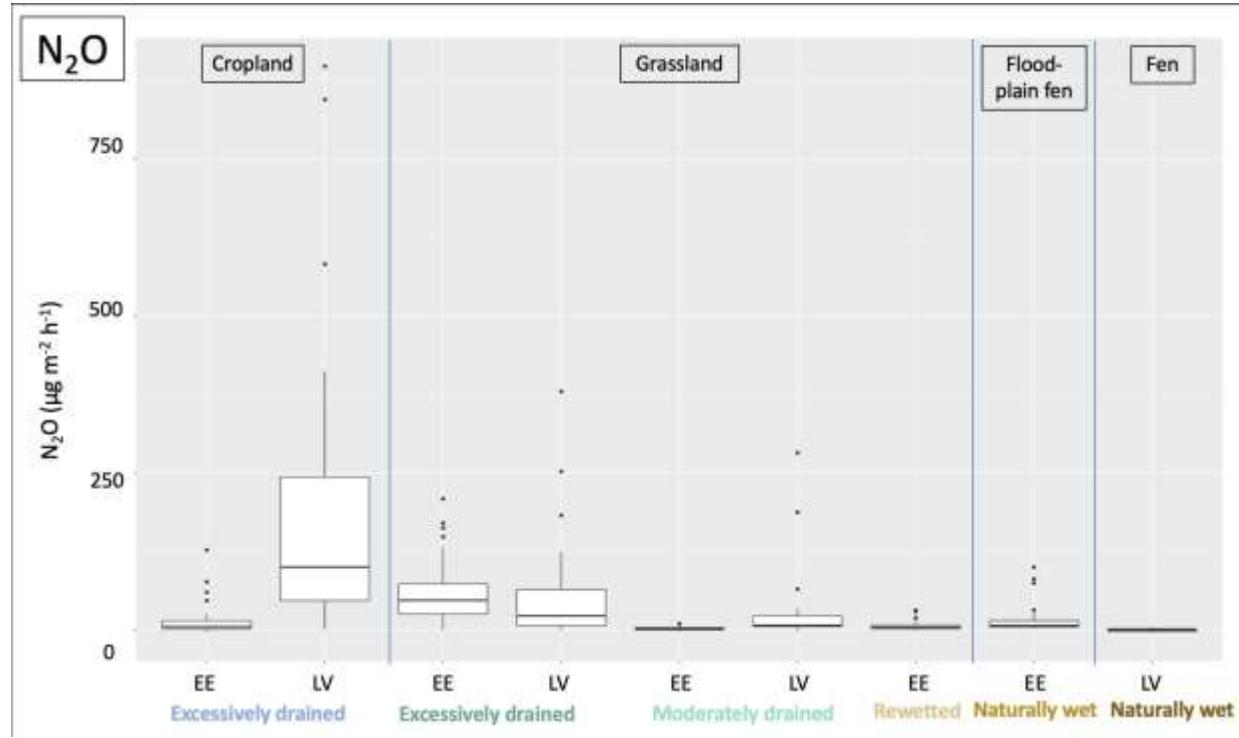
## Current status of work Arable sites grouping



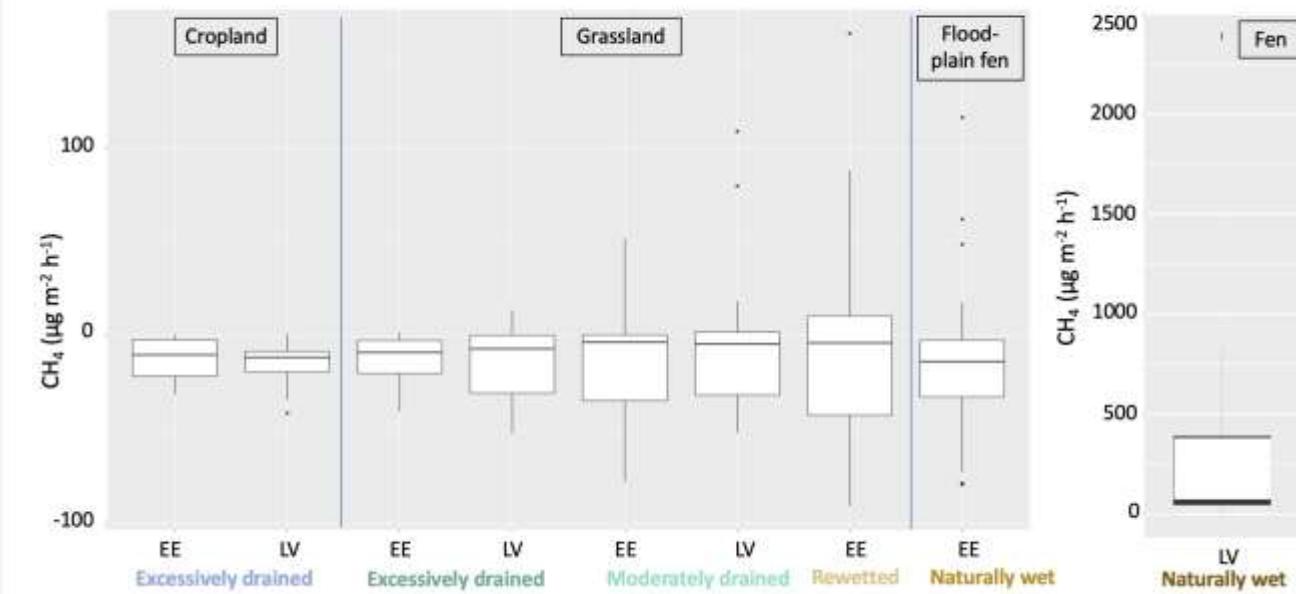
Study sites							
	Site name	Site ID	Land use type	Organic layer depth	Water table regime	Water table	Vegetation
<b>I group</b> Excessively drained	Saverna	101_EE	Cropland	~35 cm	Drained site	~45 cm	Annual
	Ziemāji ZS "Lazdiņi"	101_LV	Cropland	~30 cm	Drained site	~55 cm	Annual
	Dobilija	101_LT	Cropland	~45 cm	Drained site	~60 cm	Annual
<b>II group</b> Excessively drained	Saverna	103_EE	Grassland	~45 cm	Drained site	~60 cm	Perennial
	Lazdiņi	103_LV	Grassland	~50 cm	Drained site	~60 cm	Perennial
	Dubrava	103_LT	Grassland	~65 cm	Drained site	~50 cm	Perennial
<b>III group</b> Moderately drained	Maramaa	102_EE	Grassland	~35 cm	Drained site	~25 cm	Perennial
	Rucava	102_LV	Grassland	~35 cm	Drained site	~25 cm	Perennial
<b>IV group</b> Rewetted	Maramaa	107_EE	Grassland	>1 m	Rewetted	~30 cm	Perennial
	Žuvintas	107_LT	Grassland	>2 m	Rewetted	~10 cm	Perennial
<b>V group</b> Reference	Sipe	110_EE	Fen	>2 m	Drained site	~40 cm	Perennial
<b>VI group</b> Reference	Kirbas purvs	114_LV	Fen	>2 m	Naturally wet	~15 cm	Perennial
	Žuvintas	110_LT	Fen	>2 m	Naturally wet	~10 cm	Perennial

# Soil fluxes from Arable lands

$\text{CH}_4$



$\text{CH}_4$



## Further steps

- Include data from Finland and Lithuanian Sites.
- Lab work: soil infrared spectroscopy analysis in Silava/Luke
- Lab work: microbiology analysis in Luke
- Analyze Heterotrophic CO<sub>2</sub> flux data.
- Calculate annual Emission Factors (CO<sub>2</sub> eq h<sup>-1</sup> y<sup>-1</sup>).
- Ground water and soil profile chemical analysis.
- Above and below ground biomass (C/N storage).
- Accounting annual litter fall (C/N input into soil).
- Litter decomposition experiment results.



Question are WELCOME!