LIFE OrgBalt progress and what`s next – overall view

3rd Steering group meeting

February 4th, 2021, Teams

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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"

Content

WG measurements activities

- How we work (subgroups)
- Measurements protocols
- Sites establishment
- Measurements of GHG, biomass, environmental parameters
- Raw data storage

Formation of subgroup

Work package	Subgroup leader	Participant	
1) Site preparations	***Jyrki Jauhiainen***	FI: Jyrki J, EE: Kaido S	LV: Andis L, Mārtiņš V LI: Egidijus V.
2) Heterotrophic CO_2 flux monitoring	***Päivi Mäkiranta***	FI: Päivi M EE: Ain K, Kaido S	LV: Andis L, Mārtiņš V LI: Dovilė Č, Egidijus V.
3) Transparent chamber measurements (CO_2)	***Kaido Soosaar***	FI: Sanna S, Saara L EE: Ain K	LV: Andis L, Mārtiņš V LI: Egidijus V
4) Static dark chamber monitoring (incl. CH_4 & N_2O)	***Ain Kull***	FI: Päivi M EE: Thomas S	LV: Andis L, Mārtiņš V LI: Dovilė Č, Egidijus V.
5) Meteorological parameters	***Thomas Schindler***	Fi: Päivi M EE: Kaido S	LV: Mārtiņš V LI: Dovilė Č
6) Water & soil, litter sampling	***Mārtiņš Vanags-Duka***	FI: Timo P EE: Ain Kull	LV: Aldis B LI: Kęstutis A.
7) Litter production and decomposition belowground	***Raija Laiho***	FI: Tuula L EE: Ivika O	LV: Andis L, Mārtiņš V LI: Dovilė Č
8) Biomass production aboveground	***Andis Lazdiņš***	FI: Timo P EE: Ivika O	LV: Mārtiņš V LI: Olgirda B., Vaiva K
9) Data management (codes and storage)	***Aldis Butlers***	FI: Jyrki J EE: Kaido S	LV: Mārtiņš V LI: Vaiva K
10) Microbiology (New – to be formed ASAP)	***Jyrki Jauhiainen***	FI: Hannu F, Krista P EE: Mikk E	LV: LI:
11) FTIR (New– to be formed ASAP)	***Jyrki Jauhiainen***	FI: Jyrki J EE: Ain K	LV: Aldis B LI: Dovile C

Field protocols

1st step: to harmonize the field measurements technique and 2 field protocols have been developed:

1) Biomass and litter decomposition measurement protocols

2) Flux and Environmental data protocols

Supportive activities:

- Field Calibration seminar in Tartu 29-30.6.2020
- Workshop about harmonization of field measurements in Kaunas 25-26.08.20
- Many meetings and emails

Establishment of sites

By the end of January 2021 all the study sites have been selected and prepared for the field measurements.

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Ecosystem C and N balance

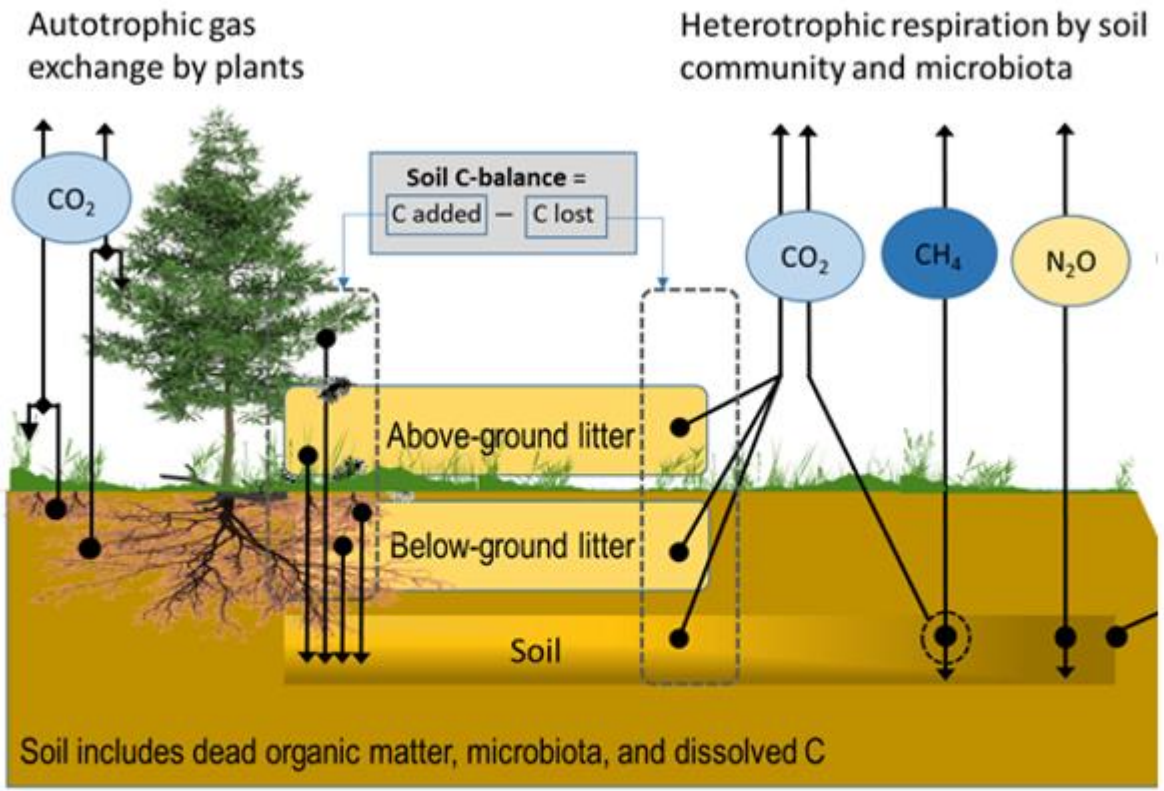
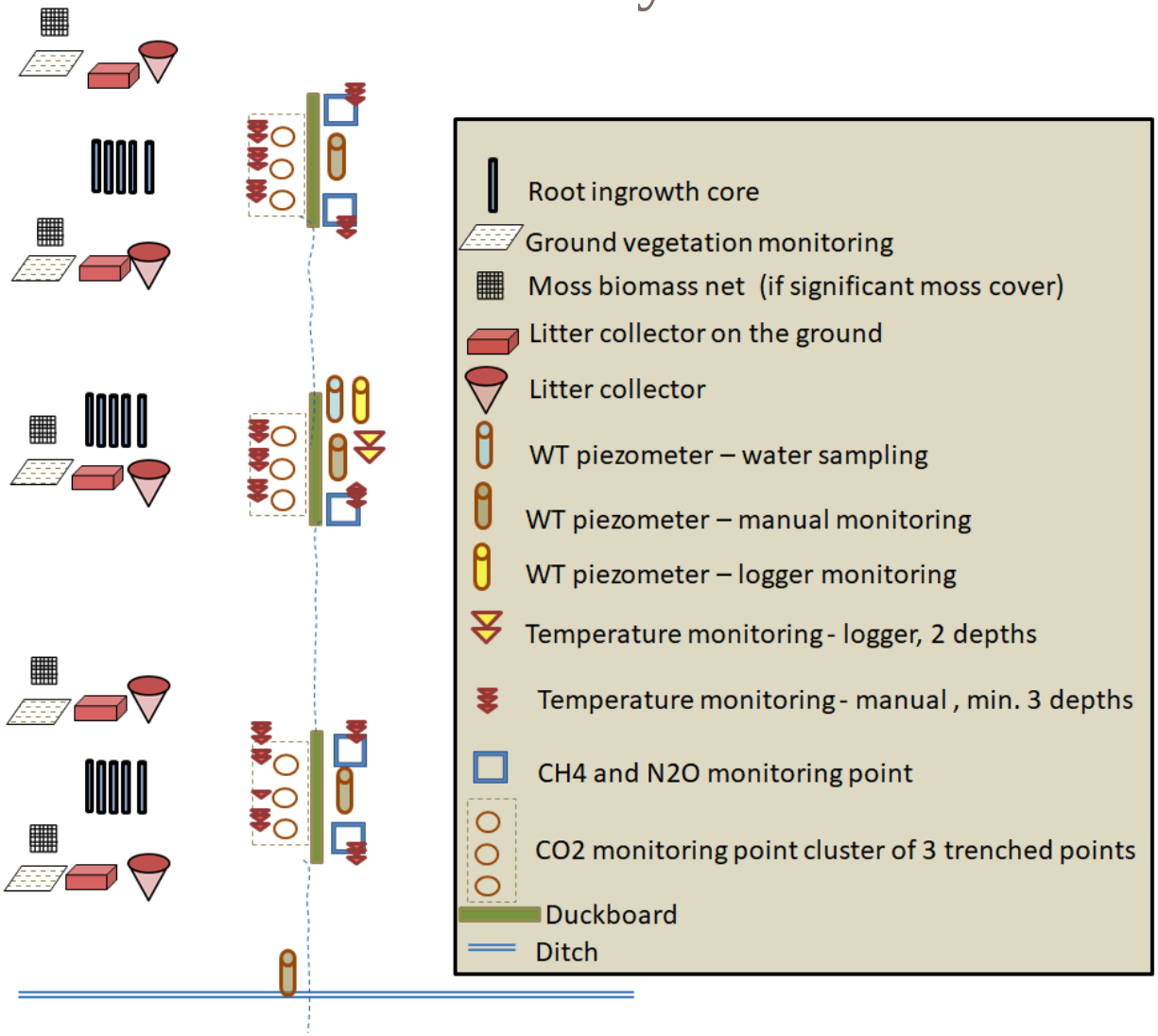


Figure 1. CO_2, CH_4, and N_2O fluxes and mass transfer components (arrows indicate flux/transfer direction) contributing to soil C-stock changes in a forest ecosystem on drained organic soil (as in IPCC, 2014), modified from Jauhiainen et al. (2019).

Basic scheme of the study site



In addition, periodically soil and water samples are taken for the chemical analyzes!

Gaseous fluxes - CH_4 & N_2O (& winter CO_2) fluxes

Monitoring with closed static chamber method: 24 months (2021-2022)

Measurements:

- In Finland: May 2020
- In Estonia and Latvia: Jan 2021
- In Lithuania: Feb 2021

Frequency (minimum)

- ❖ Winter: once per month
- ❖ Vegetation period: once every three weeks

Gaseous fluxes – heterotrophic CO_2 flux

Monitoring soil heterotrophic CO_2 fluxes on forest floor:
2 vegetation periods (2021-2022)

Gaseous fluxes – heterotrophic CO_2 flux

Monitoring soil heterotrophic CO_2 fluxes on forest floor:
2 vegetation periods (2021-2022)

Dynamic closed chamber method (EGM5(4)/Licor analyzer)
Measurements :

- Finland: spring 2020
- In Estonia, Latvia and Lithuania: spring 2021

Frequency (minimum):

❖ during the vegetation period once every three weeks

Gaseous fluxes - NEE from non-forested sites

NEE measurements from non-forested sites with transparent chamber: 2 years

Dynamic closed chamber method (EGM5(4) analyzer)

Measurements :

- In Estonia, Latvia and Lithuania: spring 2021

Frequency (minimum):

❖ during the vegetation period once every three weeks

C/N input - Annual litter production in forest ecosystems

Annual litter production will be **calculated as the sum of aboveground litter of tree stand, vascular ground vegetation and mosses and belowground litter of roots and rhizomes.**

ABOVEGROUND LITTER OF TREE STAND

- **Fine woody litter (twigs, branches)**

- **Stand foliar and cone litter**

C/N input - annual litter production

Annual litter production will be calculated as the sum of **aboveground litter** of tree stand, vascular ground vegetation and **mosses** and belowground litter of roots and rhizomes.

Moss biomass production, which is assumed to equal litter production, is measured with square shaped nets (each about 20 cm x 20 cm). Will be placed on patches of three most common moss species or moss patch types (five nets per species/patch type) at each site in the autumn of the first GHG monitoring year.

C/N input - annual litter production

Annual litter production will be calculated as the sum of **aboveground litter of** tree stand, **vascular ground vegetation** and mosses and **belowground litter of roots and rhizomes**.

- Ground vegetation biomass is harvested from six 30 x 30 cm (area = 900 cm2) areas per site, two at each GHG measurement transect. Biomass samples will be harvested during the maximum biomass in July-August.

- Fine-root production is estimated using the ingrowth-core method for peat soils. The amount of ingrown roots represents fine-root production over the incubation period, which will be generalized into annual production.

Sampling protocols

The avoid losses and harmonize the results several sampling protocols have been developed.

Site ID: EEC1101			**Date and time:**	
Person name(s):				
***Weather** conditions*	*2*			
description				
Air temp on site				
Soil Temp:	**D**	**A**	**B**	**C**
10 cm				
20 cm				
30 cm				
40 cm				
Soil moisture (5cm)				
WL manual (cm):				
Tube insight				
Tube outsight				
WL auto (B)				
Snow depth (cm)				
Chamber volume change (filled with snow or water (chamber volume and minus volume filled with snow/water)				
Vegetation description (harvesting):				
Equipm. Used (deviation from standard instrumentation):				
Remarks comments *(e.g. disturbances caused by animals/trespassers/weather; deviations from standard monitoring plan, use of extensions)*:				

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Forest environment laboratory
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VL_55 Soils sampling protocol

Sampling plan	Sample code : **OrgBalt** (Specified in testing application)
	Refference to sampling plan:
	Person responsible:

& analyses
kit
nsulation ☐ Other:

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VL_51 Water sampling protocol

Sampling plan	Sample code : **OrgBalt** (Specified in testing application)		
	Reference to sampling plan:		
	Person responsible:		
Sampling method	M07 Periodic water sampling & analyses		
Identification of equipment	Water sampling kit		
Transportation conditions	Thermal box ☐	Box without thermal insulation ☐	Other:
Atypical environmental conditions, which may affect the sample	No ☐	Observation:	
Deviations*	No ☐	Yes:	
Sampler	Name Surname:		

* Deviations, additions or exceptions to the sampling method and sampling plan

Sample identification			Sample identification		
Site ID	Subplot	Date and time	Site ID	Subplot	Date and time

Fails: VL_51_udens_nem_prot.docx Versija: 02 | Water sampling protocol | __/__

s | Date and time
)-40, 40-50

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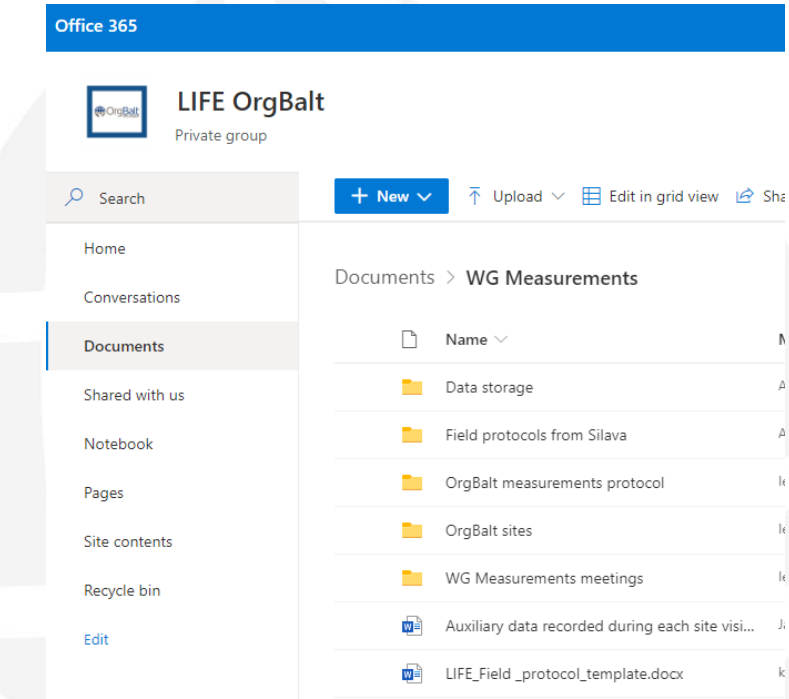
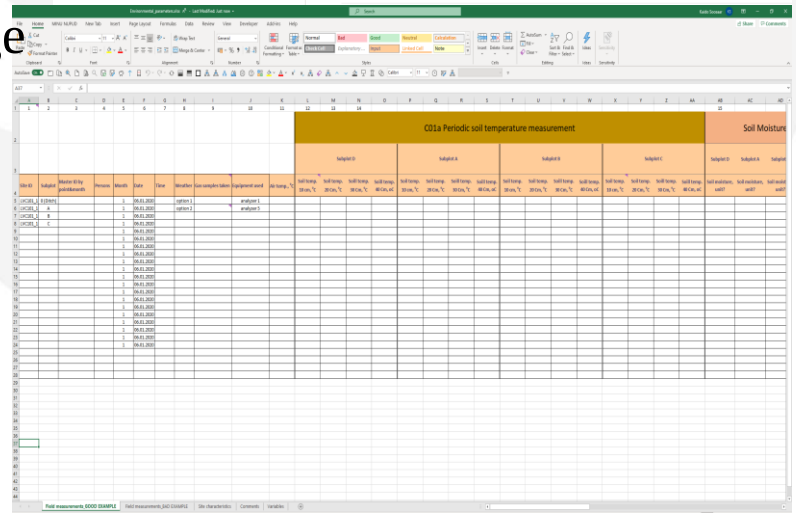
Raw data storage

- Raw data will be stored in LIFE OrgBalt SharePoint (accessible for all the partners)
- All the activities (soil sampling, water sampling, etc.) will be coded, so we know exactly from where and what has been measured.
- However, the final format of the data storage is under process
- To keep everybody updated, our working group helds monthly meetings where we cover all the needed aspects.





Thank you!
Kiitos!
Paldies!
Ačiū!
Aitäh!

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The project "Demonstration of climate change mitigation potential of nutrients rich organic soils in Baltic States and Finland" (LIFE OrgBalt, LIFE18 CCM/LV/001158) has received funding from the LIFE Programme of the European Union and the State Regional Development Agency of Latvia. www.orgbalt.eu