

LIFE OrgBalt progress and what's next – overall view

3rd Steering group meeting
February 4th, 2021, Teams

Kaido Soosaar
Tartu University

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: Dovilē 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 ₂ O)	Ain Kull	FI: Päivi M EE: Thomas S	LV: Andis L, Mārtiņš V LI: Dovilē Č, Egidijus V.
5) Meteorological parameters	Thomas Schindler	FI: Päivi M EE: Kaido S	LV: Mārtiņš V LI: Dovilē 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: Dovilē 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

Biomass and litter decomposition measurement protocols draft 1

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Soil GHG balance monitoring method harmonization in LIFE OrgBalt

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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

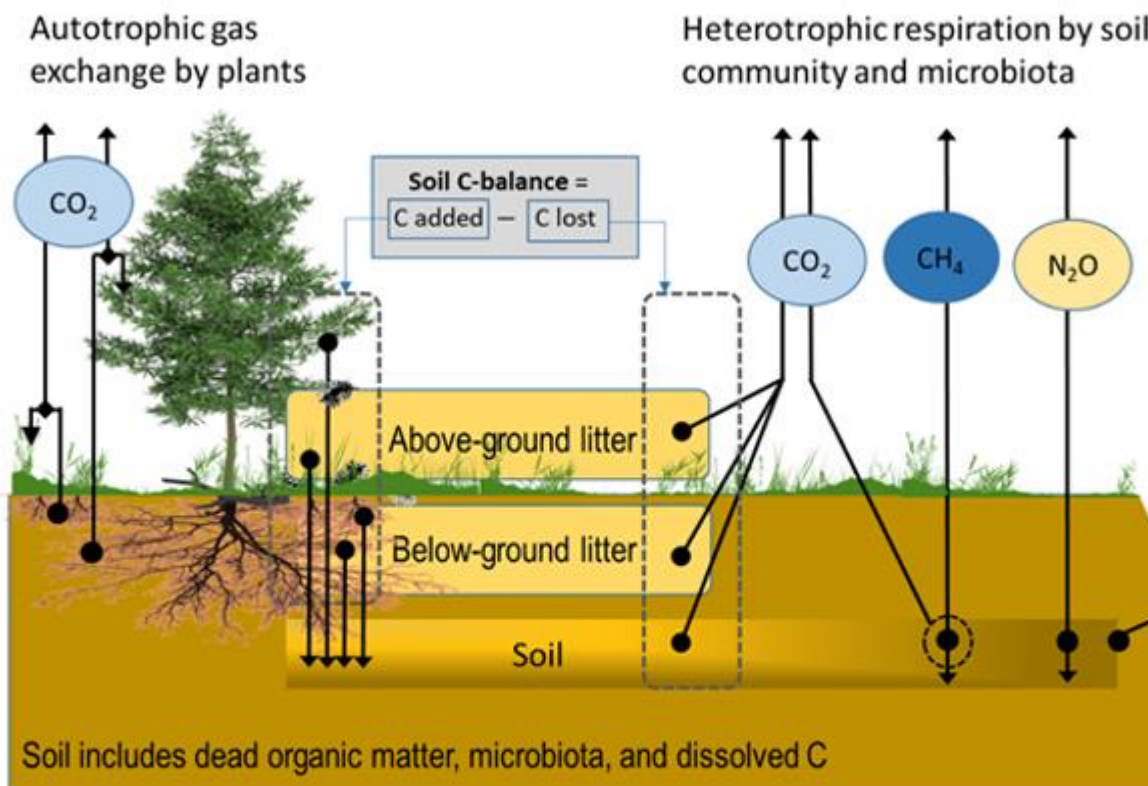
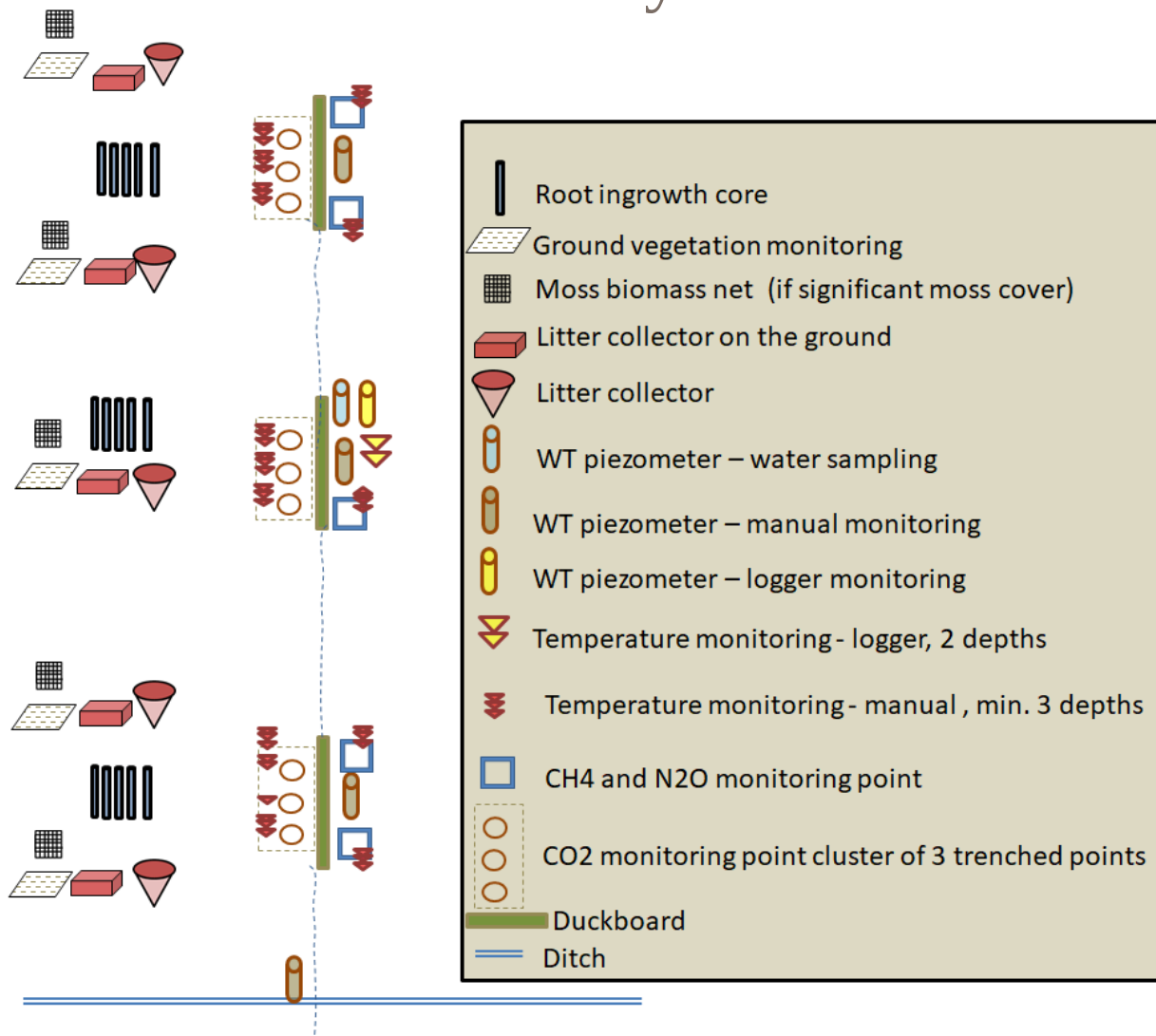


Figure 1. CO_2 , CH_4 , and N_2O fluxes and mass transfer components (arrows indicate flux/transfer direction) contributing to soil C-stock changes in a forest ecosystem on drained organic soil (as in IPCC, 2014), modified from Jauhiainen et al. (2019).

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

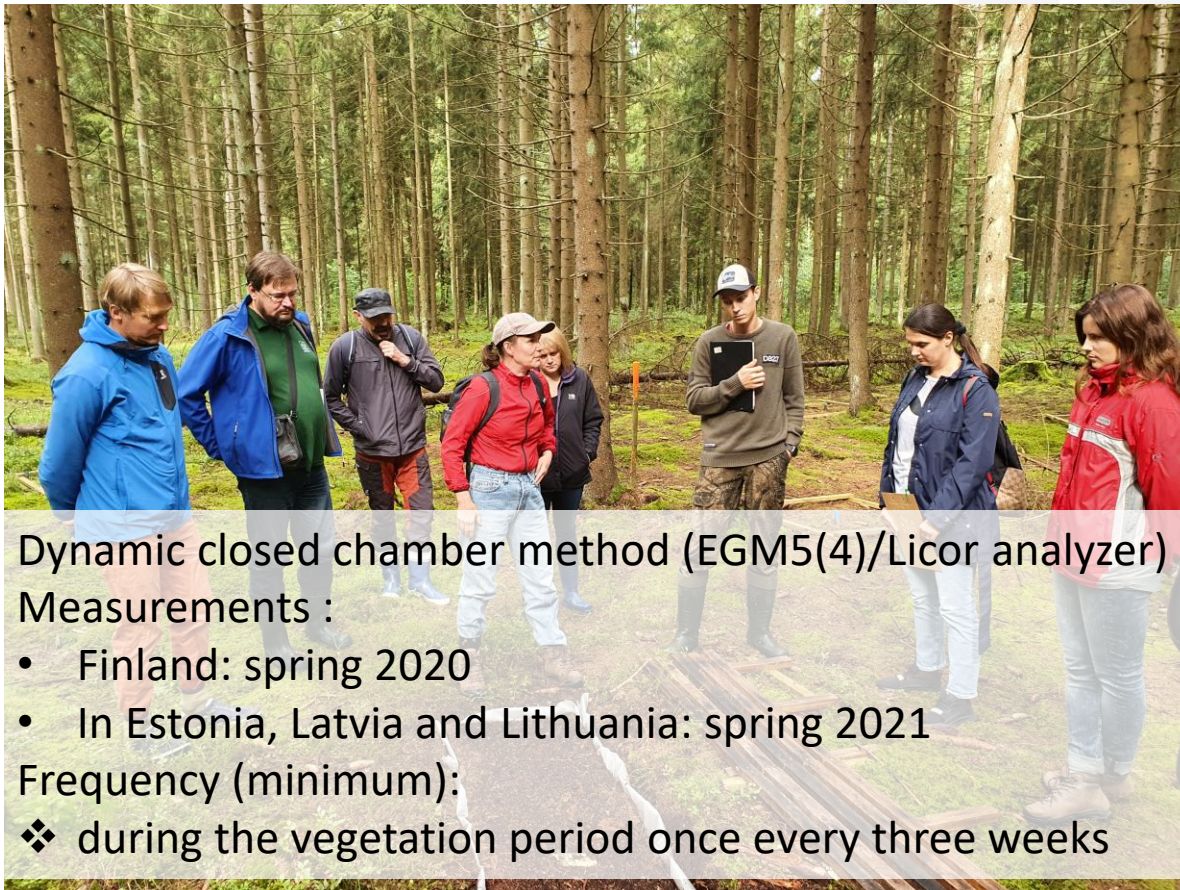
Gaseous fluxes – heterotrophic CO₂ flux

Monitoring soil heterotrophic CO₂ fluxes on forest floor:
2 vegetation periods (2021-2022)



Gaseous fluxes – heterotrophic CO₂ flux

Monitoring soil heterotrophic CO₂ fluxes on forest floor:
2 vegetation periods (2021-2022)



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 oversight				
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):				



Latvian State Forest Research Institute "SILAVA"
Forest environment laboratory
Riga street 111, Salaspils, LV - 2169

VL 55 Soils sampling protocol

Sampling plan	Sample code : OrgBalt (Specified in testing application)
	Reference to sampling plan:
	Person responsible:
& analyses g kit nsulation ☐ Other:	
Latvian State Forest Research Institute "SILAVA" Forest environment laboratory Riga street 111, Salaspils, LV - 2169	

VL 51 Water sampling protocol

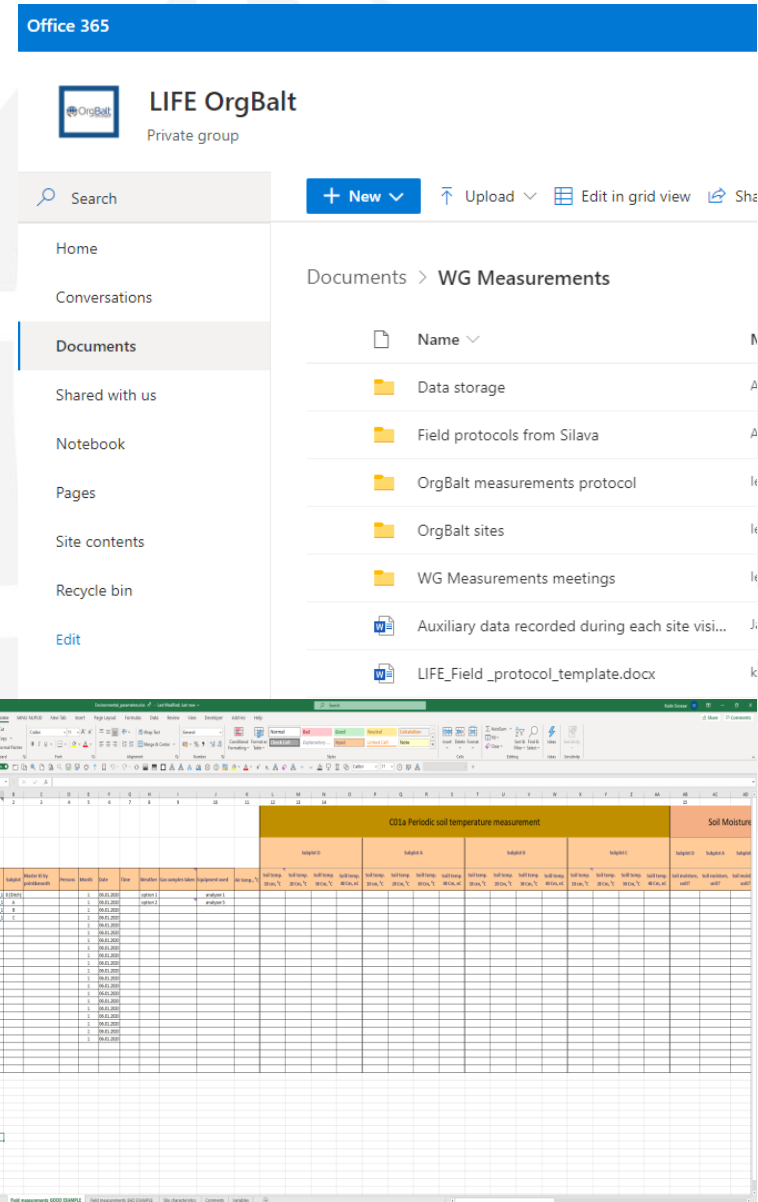


VL 51 Water sampling protocol

[illegible]

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 holds monthly meetings where we cover all the needed aspects.



The screenshot displays the SharePoint interface for the 'LIFE OrgBalt' private group. The left sidebar shows navigation options: Home, Conversations, Documents (selected), Shared with us, Notebook, Pages, Site contents, Recycle bin, and Edit. The main content area shows a document library for 'WG Measurements' with a list of folders and documents, including 'Data storage', 'Field protocols from Silava', 'OrgBalt measurements protocol', 'OrgBalt sites', 'WG Measurements meetings', 'Auxiliary data recorded during each site visi...', and 'LIFE_Field_protocol_template.docx'.

Below the SharePoint interface, a preview of a data table is shown. The table is titled 'CO2a Periodic soil temperature measurement' and 'Soil Moisture'. It has columns for 'Sample ID', 'Date', 'Location', 'Soil temperature (°C)', and 'Soil moisture (%)'. The table contains data for various samples, including 'LIFE01', 'LIFE02', 'LIFE03', 'LIFE04', 'LIFE05', 'LIFE06', 'LIFE07', 'LIFE08', 'LIFE09', 'LIFE10', 'LIFE11', 'LIFE12', 'LIFE13', 'LIFE14', 'LIFE15', 'LIFE16', 'LIFE17', 'LIFE18', 'LIFE19', 'LIFE20', 'LIFE21', 'LIFE22', 'LIFE23', 'LIFE24', 'LIFE25', 'LIFE26', 'LIFE27', 'LIFE28', 'LIFE29', 'LIFE30', 'LIFE31', 'LIFE32', 'LIFE33', 'LIFE34', 'LIFE35', 'LIFE36', 'LIFE37', 'LIFE38', 'LIFE39', 'LIFE40', 'LIFE41', 'LIFE42', 'LIFE43', 'LIFE44', 'LIFE45', 'LIFE46', 'LIFE47', 'LIFE48', 'LIFE49', 'LIFE50', 'LIFE51', 'LIFE52', 'LIFE53', 'LIFE54', 'LIFE55', 'LIFE56', 'LIFE57', 'LIFE58', 'LIFE59', 'LIFE60', 'LIFE61', 'LIFE62', 'LIFE63', 'LIFE64', 'LIFE65', 'LIFE66', 'LIFE67', 'LIFE68', 'LIFE69', 'LIFE70', 'LIFE71', 'LIFE72', 'LIFE73', 'LIFE74', 'LIFE75', 'LIFE76', 'LIFE77', 'LIFE78', 'LIFE79', 'LIFE80', 'LIFE81', 'LIFE82', 'LIFE83', 'LIFE84', 'LIFE85', 'LIFE86', 'LIFE87', 'LIFE88', 'LIFE89', 'LIFE90', 'LIFE91', 'LIFE92', 'LIFE93', 'LIFE94', 'LIFE95', 'LIFE96', 'LIFE97', 'LIFE98', 'LIFE99', 'LIFE100'.

Thank you!
Kiitos!
Paldies!
Ačiū!
Aitäh!

Nettosuoritetuotteen puhtausaste, 1. päivä 2020



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