

«Demonstration of climate change mitigation potential of nutrients rich organic soils in Baltic States and Finland»

7th Steering group meeting (2nd March 2023)

***ACTION E.1: Information and dissemination /
Task 2: Scientific publications***

***Summary of the progress 2022
and planned for 2023***



ACTION E.1: Information and dissemination / **Task 2: Scientific publications**





- In total 8 scientific publications were listed to be produced as a result of Project actions
- Publications aim to respond to need in data demand of the GHG inventories, verify methodological improvements of the inventories
- Peer-reviewed journals and proceedings included in Scopus or Web of Science databases, with 2 publications in journals having citation index above 50% of the sectoral average



Published 1/2

- Leppä, K. et al. Vegetation controls of water and energy balance of a drained peatland forest: Responses to alternative harvesting practices. **Agricultural and Forest Meteorology**, 2020, 295, 108198. (IF 6.424)
<https://doi.org/10.1016/j.agrformet.2020.108198>
- Upenieks, E.M. & Rudusāne, A. Afforestation as a type of peatland recultivation and assessment of its affecting factors in the reduction of GHG emissions. **Rural Development** (Periodical), 2021, 295-300. <https://doi.org/10.15544/RD.2021.052>
- Bārdule, A., Butlers, A., Lazdiņš, A., Līcīte, I., Zvirbulis, U., Putniņš, R., Jansons, A., Adamovičš, A., & Razma, Ģ. Evaluation of soil organic layers thickness and soil organic carbon stock in hemiboreal forests in Latvia. **Forests**, 2021, 12(7), 1–15. (IF 3.282)
<https://doi.org/10.3390/f12070840>
- Butlers, A., Lazdiņš, A., Kaleja, S., & Bārdule, A. Carbon budget of undrained and drained nutrient-rich organic forest soil. **Forests**, 2022, 13, 1790. (IF 3.282)
<https://doi.org/10.3390/f13111790>

Published 2/2

-  Vangas-Duka, M., Bārdule, A., Butlers, A., Upenieks, E.M., Lazdiņš, A., Purvina, D., & Līcīte, I. GHG emissions from drainage ditches in peat extraction sites and peatland forests in hemiboreal Latvia. **Land**, 2022, 11(2), 2233. (IF 4.048)
<https://doi.org/10.3390/land11122233>
-  Butlers, A. & Lazdins, A. Case study on greenhouse gas (GHG) fluxes from flooded former peat extraction fields in central part of Latvia. Research for Rural Development 2022, **Annual 28th International Scientific Conference Proceedings, 2022**, Vol 37, 44-49. <https://doi.org/10.22616/rrd.28.2022.006>
-  Līcīte, I., Popluga, D., Rivža, P., Lazdiņš, A., & Meļņiks, R. Nutrient-rich organic soil management patterns in light of climate change policy. **Civil Engineering Journal**, 2022, 10(8), 2290-2304. <https://doi.org/10.28991/CEJ-2022-08-10-017>
-  Valujeva K., Freed, E.K., Nipers, A., Jauhiainen, J., & Schulte, R.P.O. Pathways for governance opportunities: social network analysis to create targeted and effective policies for agricultural and environmental development. **Journal of Environmental Management**, 2023, 325, 116563. (IF 8.91)
<https://doi.org/10.1016/j.jenvman.2022.116563>

In progress manuscript topics summarized

Forest (management) GHG fluxes/soil carbon **3**
(tree harvest regimes, drainage, afforestation)

Forest (ecosystem) GHG fluxes/soil carbon stock **3**
(forest types, regions)

Forest (ecosystem) system functions **3**
(stem fluxes, soil microbial community, C input in litter)

Open peatland (peat extraction/abandoned) GHG fluxes **4**
(land use type comparisons, ditch GHGs, C-losses & remote sensing)

Agriculture and paludiculture & GHG fluxes/soil carbon **1**

CCM & land use planning **3**
(CCM practice comparisons, area based assessments, policies)



Under review

- Long term land surface change- and peat property-based estimation of soil carbon stock changes in nutrient-rich and nutrient-poor drained organic forest soil

In progress 1/3 (“advanced stage”)

- Greenhouse gas emissions from drained organic forest soils – synthesizing data for more site- specific emission factors for boreal and cool temperate regions. (Jauhiainen, J. et al.)
- Former peat extraction field diverse re-cultivation management strategy impact on soil greenhouse gas emissions in hemiboreal region. (Silava team)
- GIS based assessment of spatial paludiculture potential and estimated GHG mitigation potential of paludiculture measures in Latvia. (Ivanovs, J. et al.)

In progress 2/3 (from the Silava team)

- Elaboration of emission factors characterizing effect of afforestation in nutrient poor peat soils.
- Carbon input with below ground litter (fine roots) in different age forest stands with drained or naturally wet organic soils.
- Forest drainage has a positive effect on soil carbon content: a long-term perspective.
- Stem fluxes in drained and naturally wet forest stands of different age.
- LiDAR based assessment of carbon losses due to wind erosion in abandoned peatlands.
- Comparison of rewetting and flooding as alternatives for management of abandoned peat extraction sites (under early development).
- GHG emissions from drainage ditches in peat extraction sites and abandoned peatlands (under early development).
- Multi-criteria Decision-Making Analysis for Evaluation of Climate Change Mitigation Practices of Organic Soil Management in Agriculture in Baltic Sea Region Countries. (Līcīte, I. et al.)
- Policy impacts and planning tools for nutrient rich organic soil management in agriculture. (Līcīte, I. et al.)



Carbon, GHGs, & soil environment



Climate Change Mitigation & policy

In progress 3/3 (lead by Tartu team)

- GHG fluxes from drained nutrient-rich organig forest soils in temperate and boreal climate (Kamil Sardar et al.)
- Drainage impact on greenhouse gas emissions from grasslands and croplands on nutrient-rich organic soils in Baltic countries (Hanna Vahter et al.)

In progress 3/3 (lead by Luke team)

- Soil microbial community structure in different forest soil characteristics and abiotic environment conditions (Kristiina Peltoniemi et al.)
- Microbial communities in nutrient-rich organig forest soils in boreal and temperate region around the Gulf of Finland (Kristiina Peltoniemi et al.)
- Peat respiration in drained peatland forests under varying tree harvest regimes (Aino Korrensalo et al.)

Scientific publications (planned /potential)

- Biomass stock change, litter feed, and litter turnover in managed organic soils
- Mathematical tools, e.g. upgraded SUSI-simulator for estimation of carbon stock changes in boreal and temperate climates
- Organic soil characterization by infrared spectroscopy (IRS)
- GHG balance in organic soils – guidance for monitoring soil GHG fluxes and organic matter changes (based on Life OrgBalt protocols)
- Public and private sector cooperation model (PPC model) - benefits and costs of CCM practices, financing opportunities, etc. that could motivate the implementation of CCM measures
- ...

Summary

- In total 8 scientific publications were listed to be produced as a result of Project actions
- Current (03/2023) status of publishing in LIFE OrgBalt
 - Published (2019->): **8**
 - In review 2022: **1**
 - Closing to submission: **3**
 - In progress (data processing & MS drafting): **14+**
 - In plans: **many**





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”