LIFE ORGBALT NEWSLETTER

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

IN THIS ISSUE

Abbreviations

COP28 - United Nations Climate Change Conference
CCM - Climate change mitigation
GHG - Greenhouse gas
PPC - Public and private sector cooperation

Dear reader,

Welcome to the 8th and final newsletter of the project LIFE OrgBalt. As the project is set to conclude in August, we are happy to present the work done and look forward to new collaborations.

In the last months leading up to project conclusion, we worked hard to disseminate project outcomes and recommendations for future actions. We issued another batch of articles for both professionals and the general public, as well as the final documentary describing the key results of the project. We were all happy to meet in the project final conference and present the project results in depth to stakeholders from across Europe. We are grateful for all people involved in the project for the results achieved and we hope that project outcomes will serve well to convert nutrient-rich organics soils from carbon sources to carbon sinks.

Continue reading for the final updates on the LIFE OrgBalt activities, developments, and events!

THE LIFE ORGBALT PROJECT TEAM

WHERE DO WE STAND?

During the project, practices with potential climate change mitigation benefits were introduced in nutrient-rich organic soils across 17 demonstration sites on agricultural and forestry lands, each with unique land use types, drainage conditions, and other characteristics. Data on GHG fluxes and other environmental variables had been collected in the two-year time frame in 53 monitoring sites of the project (17 demonstration sites and 36 reference sites).

The first Baltic/Finnish GHG emission factors for nutrient-rich organic soils had been developed, to improve national GHG inventories and aiding in better climate change mitigation planning in future. Proposals for sectoral strategies aim to balance environmental, climate, and economic benefits. Developed models and tools will support analyses of socio-economic impacts of climate measures in the Baltic States. And provide a functional land management model to inform landowners on implementing climate change mitigation options. Improved cross-sectoral cooperation will foster a deeper understanding of the interplay between land management, climate change, and economic development.

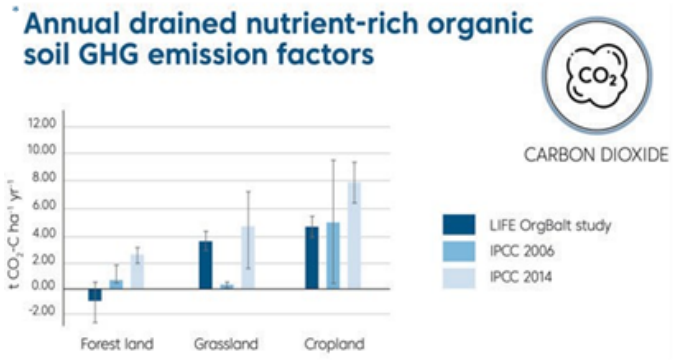
Close to accomplishment of the project work project partners are looking forward to apply and improve the outcomes of the project in new ventures for improvement of climate friendly management of nutrient-rich organic soils.

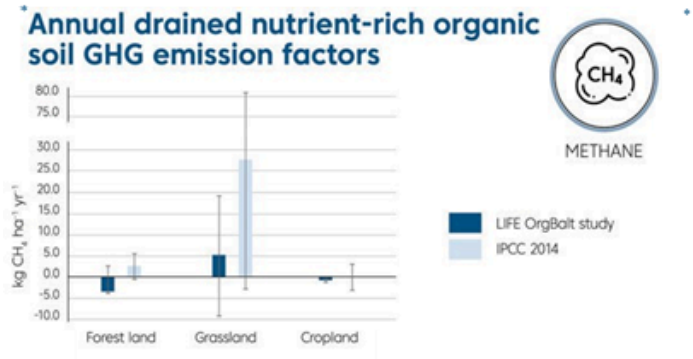
PROJECT RESULTS

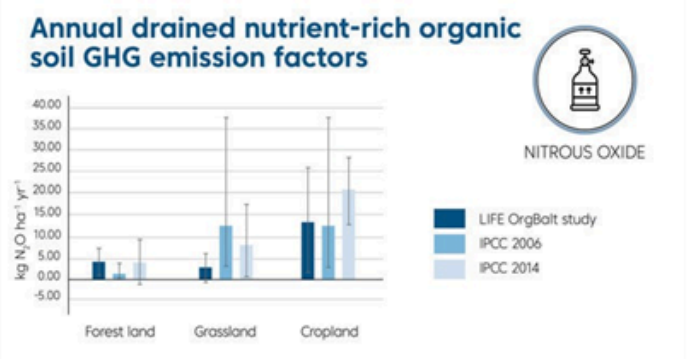
As the project comes to an end, we are proud to present to you some of the key outputs from the activities carried out over the last 5 years.

Improving GHG inventory methods

Results of 2-year GHG monitoring reveal that carbon dioxide (CO_2) and nitrous oxide (N_2O) emissions from grasslands and croplands are comparable and significantly higher than those from forests. Forest lands showed no annual net nutrient-rich organic carbon stock loss, resulting in a negative carbon dioxide equivalent factor. Considering uncertainties, the methane (CH_4) emission factors developed for drained, nutrient-rich organic soils are not significantly different from the default ones (IPCC, 2014) across all land use categories.



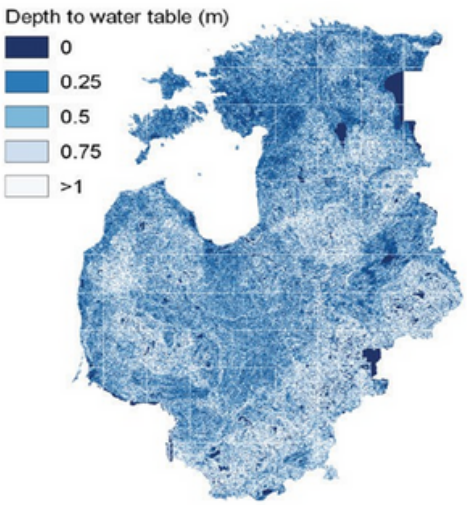




*results based on scientific manuscripts prepared for or submitted for publishing. Slight changes may occur during the publishing process.

Improving activity data – depth to water and wet area maps developed

Activity data (e.g. land use maps, management practices and conditions) is one of the most important elements of the GHG calculation and projections from organic soils, especially if changing climate conditions are considered in modelling. A set of maps as a practical tool for the planning of sustainable soil management activities, both in the forestry and agricultural sectors was developed. For example, a water table depth maps for the entire territory of the Baltic States - the single source of information that allows modelling of water accumulation sites by showing water table depth in meters (please see the map below).



Water table depth map (see also: Wet area maps for the Baltics: improved understanding of the spatial distribution of soil moisture, J.Ivanovs (LSFRI Silava), https://www.orgbalt.eu/?page_id=4180).

Climate change mitigation measures in demonstration sites

Sustainable, resilient, and cost-effective CCM management practices in selected demonstration sites were implemented. In the table below, measures and their relative climate change mitigation potential assessed in the project are shown.

Agricultural CCM measures	
Conversion of cropland to grassland	The measure with limited efficiency, but also with the smallest investments and low level of risk to reach the mitigation effect. Can be improved by implementation of controlled drainage system.
Afforestation CCM measures	
Conventional afforestation (spruce)	The measure has the best ratio of the GHG emission short- to midterm reduction effect and the potential impact of natural disturbances (the level of risk to reach the mitigation effect). Proper management should be applied during the whole rotation period. The effect can be increased by application of mineral fertilizers and wood ash.
Paludiculture - afforestation of grassland with black alder and birch	The measure can significantly reduce GHG emissions in mid- and long-term. Proper management actions can be remedial drainage system, planting trees on larger mounds. The effect can be increased by application of mineral fertilizers and wood ash.
Agroforestry - fast growing treesand grass	The measure provides the greatest short-term effect of reducing GHG emissions, but additional plant protection measures must be implemented and long-term subsidence effects on deep organic soils must be taken into account. The effect of different species and management techniques needs to be further evaluated. Amendments to the regulatory environment are necessary – permissible duration of rotation should increasing the 20–25 years or not regulated at all. The effect can be increased by application of mineral fertilizers and wood ash.
Fast growing species in riparian buffer zones	The measure provides the second largest GHG emission reduction effect in short- and midterm, but the potential for the measure's implementation is small if most of the organic soils are afforested. The measure can be recommended for implementation, but additional plant protection measures should be implemented. Selection of “animal tolerant” species will reduce the mitigation effect, but also – the risk.
Forestry CCM measures	
Application of wood ash in spruce stand	The measure with the quickest and at the same time long lasting GHG emission mitigation effect in areas with organic soils. The measure has great potential for implementation, limited only by the availability of wood ash.

Development of proposals for sectoral strategies and action plans to reduce GHG emissions from organic soils

Proposals and reports were developed to provide comprehensive and transparent information on the situation in Latvia and the project partner countries, and in the EU. Organic soil management and GHG accounting improvements are crucial for updating and adapting climate policy. The most important documents where the CCM measures can be implemented are the Common Agriculture Policy and National Climate and Energy Plans.

Tools and guidance

A simulation model was developed as a policy planning/decision support tool to evaluate the projections of GHG emissions and socio-economic outcomes of selected management measures. The simulation model is designed to reflect activity data, emission factors and current socio-economic estimates. It includes geospatial information with data on soil, water and land use related indicators in all target countries.

The public and private sector cooperation model (PPC model) was developed as a tool for climate change mitigation and sustainable soil management for landowners, rural support services, farmers' and foresters' associations. The aim of the model is to suggest innovative land management practices. The model demonstrates how these territories can be managed considering economic, social, and climate mitigation benefits.

Capacity building and public awareness

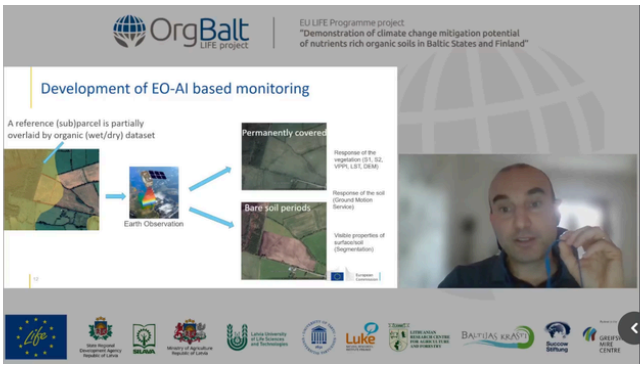
The project partners have organized workshops and training sessions with more than 500 participants total in all project countries. The project has in total organized or participated with expert presentations in more than 30 events, including the UNFCCC COP28 in Dubai. Information about the project has been disseminated in more than 37 scientific publications, 8 newsletters, and 4 short documentaries.

LATEST EVENTS

LIFE OrgBalt International Conference

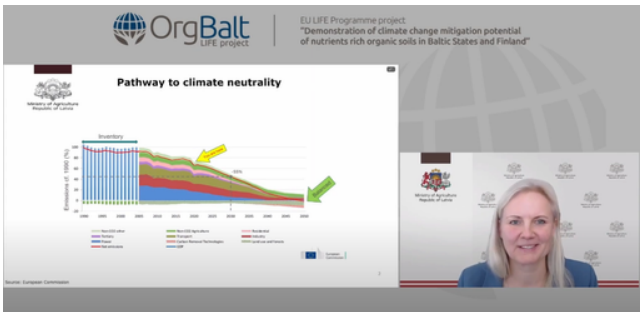
The International Conference “Climate Change Mitigation in Organic Soils in Agricultural and Forest Lands” held on June 13-14, 2024, at the University of Latvia, featured discussions on EU regulatory frameworks, GHG emission factors, and mitigation strategies. The event included expert sessions, panel discussions, and site visits, emphasizing the importance of addressing organic soils in climate change mitigation efforts. The conference attracted 190 participants, both in person and virtually, highlighting the relevance of the theme in today's context. All speaker presentations and recordings from the conference are available on project website:

Organic soils within the EU regulatory frameworks and climate related policies: current status and scientific challenges: Emanuele Lugato, European Commission – Joint Research Center



Mr. Lugato provided insight into the status and challenges of managing organic soils within the EU’s climate policies. The presentation highlighted the importance of peatlands and their role in reducing greenhouse gas emissions and explored ways how new technologies like AI can be applied for better monitoring and mapping of these ecosystems.

LIFE OrgBalt project results for developing coherent climate and environment policy for the land use sector: Dace Arāja, Ministry of Agriculture of the Republic of Latvia



The presentation by Dace Arāja described the importance of LIFE OrgBalt in the context of national policy making, outlined the status of Land Use, Land Use Change and Foresry (LULUCF) sector emissions in Latvia and future policy goals. She emphasised the need for more research in this area and outlined practices from the project to be integrated in the Latvian National Energy and Climate Plan (NECP).

Distribution of peatlands and organic soils in the Baltic Sea region: Andreas Haberl, Michael Succow Foundation/Greifswald Mire Centre

The presentation by Andreas Haberl highlighted the great responsibility for improving climate change mitigation on organic soils in the peatland-rich Baltic Sea Region, where a disproportionate share of agricultural greenhouse gas (GHG) emissions

come from drained peatlands. In total, 7% of the EU's annual GHG emissions come from drained peatlands. The presentation therefore called for the conservation of remaining pristine peatlands (mires) and the rewetting of drained sites. It concluded that improving data, communication, peatland and water management at catchment scale are essential to optimize nature-based CCM.

Overview of used joint field methodology: Jyrki Jauhiainen, Natural Resources Institute Finland (LUKE)

In this presentation, Mr. Jauhiainen explained how drained organic soils, despite being significant sources of greenhouse gas (GHG) emissions, play a crucial role in the production of food, fodder, and raw materials. The presentation then described the LIFE OrgBalt project harmonized field methods for data collection over two years, monitoring GHGs, litter, vegetation, water, temperature, and soil characteristics. This comprehensive approach allows for a more accurate understanding of carbon dynamics in these soils, contributing to effective climate change mitigation strategies.

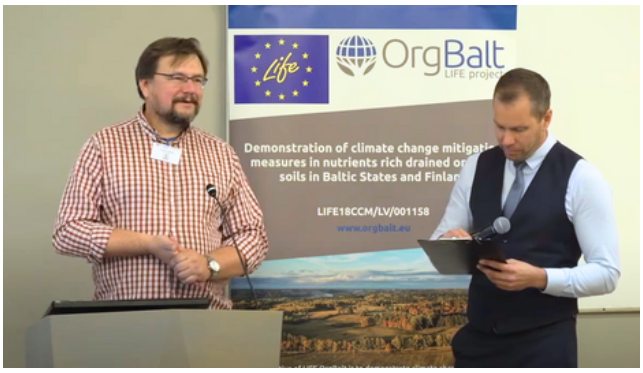
Emission factors of CO_2 in forest and agriculture lands: Aldis Butlers, Latvian State Forest Research Institute Silava

This presentation discussed the CO_2 emission factors in forest, grassland, and cropland areas, focusing on the impact of drainage on carbon flux. It presented empirical data on carbon inputs and soil CO_2 emissions over a 24-month monitoring period. The study included detailed measurements of soil and ecosystem respiration and provided recommendations for emission factors for various land types in the region.

Soil CH_4 and N_2O balance from forest and agriculture lands: Kaido Soosaar, Tartu University

The presentation discussed the balance of soil CH_4 and N_2O emissions from forest and agricultural lands, highlighting their impact on global warming. The findings were based on fieldwork conducted in Estonia, Latvia, and Lithuania, examining various forest types and grasslands, both drained and undrained. Key findings included the effects of land use and drainage on greenhouse gas emissions, with recommendations for updating regional emission factors.

Scenarios for reduction of GHG emissions from nutrients-rich organic soils: Andis Lazdiņš, Latvian State Forest Research Institute Silava

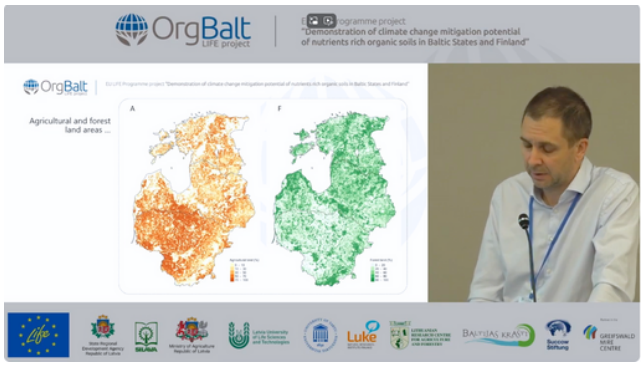


In this presentation, Andis Lazdiņš discussed the key CCM measures evaluated within LIFE OrgBalt. Afforestation, rewetting of grasslands, and application of wood ash in spruce stand were highlighted as effective methods. The presentation emphasized the importance of proper planning and management to achieve significant GHG mitigation results while balancing biodiversity and agricultural productivity goals.

Projections of GHG emissions from different land uses: Vaiva Kazanavičiūtė, Lithuanian Research Centre for Agriculture and Forestry

The presentation by Vaiva Kazanavičiūtė demonstrated the results of the calculation tool - developed to project GHG emissions based on various climate scenarios and land use types, incorporating the first Baltic/Finnish GHG emission factors compiled within the project and country-specific data. The presentation outlined several measures, such as transforming arable land into grassland, afforestation, and controlled drainage, and their effects in mitigating climate change impacts, providing detailed projections of GHG emissions and reductions under different scenarios over 50 years in Latvia and Lithuania.

Evaluation of the impact of GHG emission reduction measures and their socioeconomic implications: Aleksejs Nipers, Latvia University of Life Sciences and Technologies



The presentation demonstrates the simulation tool - a data-based tool for policy planning and decision-making at regional and national levels, evaluating the impact of climate change mitigation measures on socioeconomic indicators and GHG emission reduction for the Baltic States. A comparison of land management practices that perform well in CCM impacts as well as provide socio-economic benefits like employment or profit is considered for time frames until 2023 and 2050. The tool can also be used to find out which are the best locations for applying the climate change mitigation practices.

Panel discussion: Opportunities and challenges for the implementation of climate change mitigation measures: Kristīne Sirmā, Ministry of Agriculture of the Republic of Latvia; Johanna Vanhatalo, Ministry of Agriculture and Forestry of Finland; Kristina Simonaitytė, Ministry of Agriculture of the Republic of Lithuania; Arnis Muižnieks, Latvian Forest Owners' Association; Mārtiņš Trons, Farmers' Parliament, Latvia

The panel discussion featured policy makers and sector representatives to exchange their views on future policy development needs for nutrient-rich organic soils and climate change mitigation. Panelists from the Ministries of Agriculture of Latvia, Lithuania, and Finland discussed the challenges they currently face in achieving national targets for the LULUCF sector by 2030. Sector representatives raised concerns about the lack of financial support for farmers and landowners to implement climate change mitigation practices.

DISSEMINATION ACTIVITIES

Measurements of soil GHG fluxes within the LIFE OrgBalt project

One of the LIFE OrgBalt project key assignments is elaborating and evaluating the soil greenhouse gas (GHG) balance, especially for carbon dioxide (CO_2), and also for methane (CH_4) and nitrous oxide (N_2O). However, determining those in forests and other ecosystems on organic soils is challenging from technological and capacity perspectives: the annual soil CO_2 balance is formed using summarized CO_2 flux data over the year in monitoring and coherent data on mass-based Carbon (C) stock changes from above and below the ground. The article describes the baseline where the project partners started working on these issues. It also briefly envisages methodology, requirements for the measurements of different parameters, measuring and sampling that were done for two years, as well as calculations done within the project.

Wet agriculture and forestry (paludiculture) on rewetted peatland

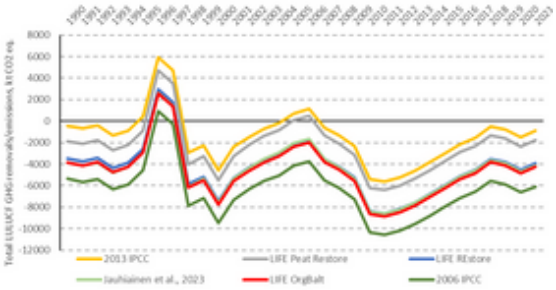
In this article, the concept of paludiculture is explained. Paludiculture involves the wet agricultural or forestry use of rewetted peatlands, aiming to preserve long-term carbon storage while maintaining productivity. This approach helps to mitigate climate change by reducing greenhouse gas emissions from drained peatlands and promoting sustainable wet land use practices.

Climate change mitigation scenarios involving improved forest management practices

The article demonstrates how forest management practices, such as riparian buffer zones, selective felling, and wood ash application are applied to bring potential climate change mitigation benefits. These measures aim to reduce greenhouse gas emissions and increase CO_2 removals by improving tree growth conditions and stabilizing groundwater levels.

Contribution of LIFE OrgBalt calculated EFs for the estimation of GHG emissions from drained nutrient-rich organic soil

The article demonstrates how the first regional GHG emission factors developed within LIFE OrgBalt are applied in a calculation tool to project emissions from different land uses, management practices, and climatic conditions. The tool also models peatland soil forest stand development and offers insights into GHG emission savings due to various management practices and land-use changes.



Opportunities and challenges of the carbon credit markets

The article explores how the carbon credit system helps to reduce greenhouse gas emissions by allowing trading of credits from projects that deal, for example, renewable energy or afforestation. Projects like LIFE OrgBalt contribute to developing new regulations and methodologies for carbon flux calculations, improving the system's credibility and effectiveness.

Short documentary on LIFE OrgBalt results

Through interviews and detailed explanations, the documentary provides an overview of the project's contributions to science and policy-making. It showcases the project's achievements in developing regionally harmonized methodologies for greenhouse gas data collection, improving our understanding of biological processes, and creating tools for assessing the impact of climate change mitigation measures implemented on nutrient-rich organic soils.

Visit the LIFE OrgBalt website to access all materials developed within the project!

THE PROJECT IN BRIEF

Duration: 08/2019 - 08/2024
Project code: LIFE18 CCM/LV/001158
Total PROJECT budget: 3 360 948 EUR
EU LIFE funding: 1 844 004 EUR

The LIFE OrgBalt project aims to improve GHG reporting data (activity data and emission factors) available for nutrient-rich organic soils. Furthermore, the project aims to identify and to demonstrate sustainable, resilient, and cost-effective climate change mitigation measures applicable in nutrient-rich organic soils and to provide tools and guidance for the elaboration, implementation, and verification of the results of climate change mitigation policies. The project is implemented by eight partners from five EU Member States – Latvia, Lithuania, Estonia, Finland and Germany and unites representatives from public administration institutions, and scientific and non-governmental organizations.

FIND OUT MORE!

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To receive our newsletter send us an email or submit a request on our project website

info@baltijaskrasti.lv

The Project "Demonstration of climate change mitigation potential of nutrient rich organic soils in Baltic States and Finland" (LIFE OrgBalt, LIFE18 CCM/LV/001158) is implemented with the financial support of the LIFE Programme of the European Union and of the State Regional Development Agency of the Republic of Latvia. www.orgbalt.eu

DISCLAIMER

LIFE OrgBalt compiled the first regional Baltic/Finnish GHG emission factors for managed nutrient-rich organic soils (current and former peatlands), which have been made available for the customary scientific review and further verification for national GHG inventories in the hemiboreal region in Finland and the Baltic countries. While the project analysed selected CCMs for drained organic soils in agriculture and forestry and developed spatial models and tools, it also identified remaining knowledge gaps. A continuation of GHG measurements and model development, as well as a broadening of the evaluated CCM measures, is recommended to bridge the remaining limitations in the after-LIFE-project period. The developed Simulation and PPC models still include limited macroeconomic considerations and external environmental impacts. Therefore, they can be used carefully in CCM strategy development for identification of gaps in climate neutrality transition policy and funding frameworks and optimised as decision-making tools when additional data are available."