Remote Sensing work progress

IES and Finnish colleague described Remote Sensing Monitoring protocol for common methodology of airborne and satellite data application for project task implementation.

LIFE PeatCarbon; Greenhouse Gas Flux, Vegetation, Remote Sensing, and Hydrology Monitoring Protocols

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Overview

Life PeatCarbon aims to do a landscape scale assessment of the peatland restoration success and its climate change mitigation potential. Thus, it is essential that the vegetation, hydrology, greenhouse gas (GHG) flux, and remote sensing monitoring protocols are harmonized among the project sites. This document is based on the discussions at the Monitoring Calibration Meeting at Finnish Meteorological Institute held on March 28–30, 2023. Monitoring will be conducted at Cena and Lielais Pelēčāre peatlands (Latvia) and Vālisuo and Matorovansuo peatlands (Finland) that will be restored by ditch blocking and rewetting during the project (Fig. 1). The raised bog habitat at Cena Mire has been degraded due to peat extraction in the same peatland complex. Lielais Pelēčāre peatland has been drained for peat extraction and vegetation cover was already removed in some drained parts. Peat extraction, however, never started and the site has been naturally regenerated having up to 70-year-old trees. Water level rise will be achieved through damming. The Finnish sites are fens where the pine fen margins have been drained for forestry in late 1960s – early 1970s. These sites will be rewetted by damming ditches and returning the original tree biomass density via harvesting in winter 2024. In Latvia, also the already restored sites in Cena, Melnais Lake, and Sudas-Zviedru peatlands will be monitored. All three areas were drained for peat extraction or forestry and were restored in 2016, 2012 and 2017 respectively. The sites will be actively monitored at least the year before restoration (year 2023), halfway through the project (vegetation) and on the fourth project year (2026).

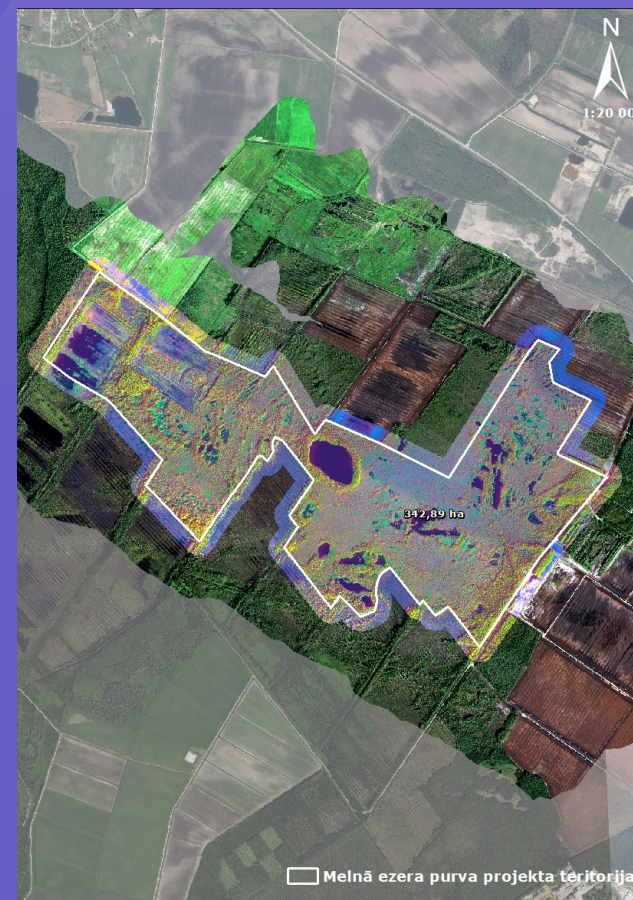# IES remote sensing progress

Collected airborne hyperspectral data over 3 project sites in Latvia
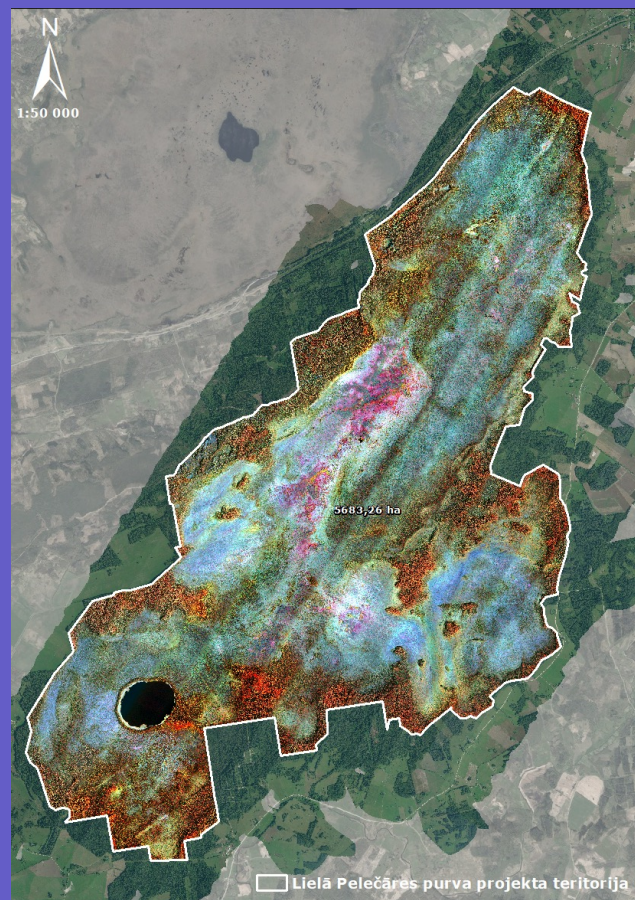
Infrared image of Lielais Pelēčāres Mire
RS data collected 16.08.2023.
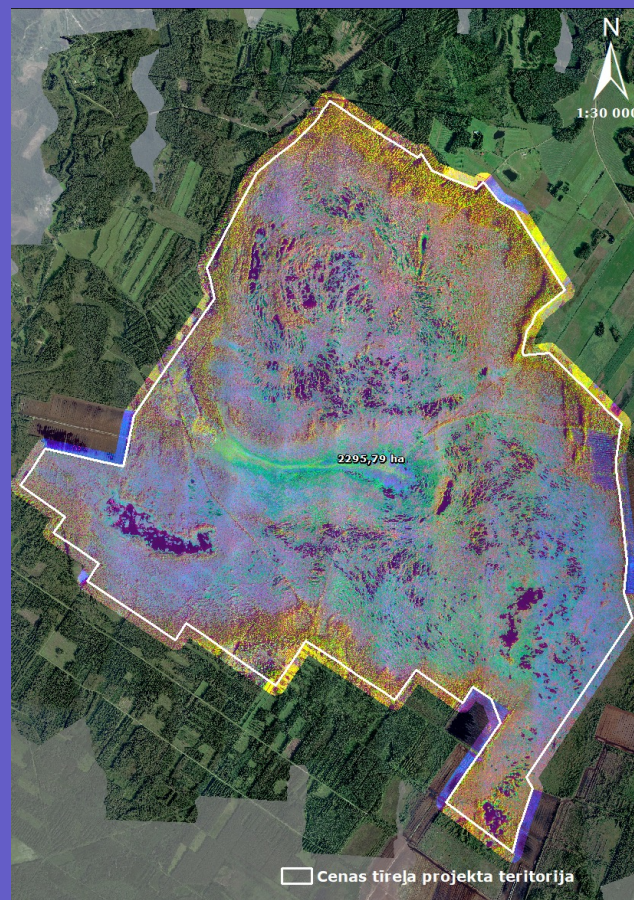
Principal component analysis image of Cena
Mire. RS data collected 16.09.2023.

Principal component analysis image of Melnais
ezers Mire. RS data collected 16.09.2023.

IES remote sensing progress

Reference information for GEST classification collected in Cena Mire (17., 19.10.2023.) and Melnais ezers Mire (02.11.2023). In Lielais Pelēčāres Mire the reference data collection is postponed to spring, 2024.

Līga Strazdiņa and Rūta Abaja (collectors of GEST reference information) working in Cena Mire 17.10.2023.
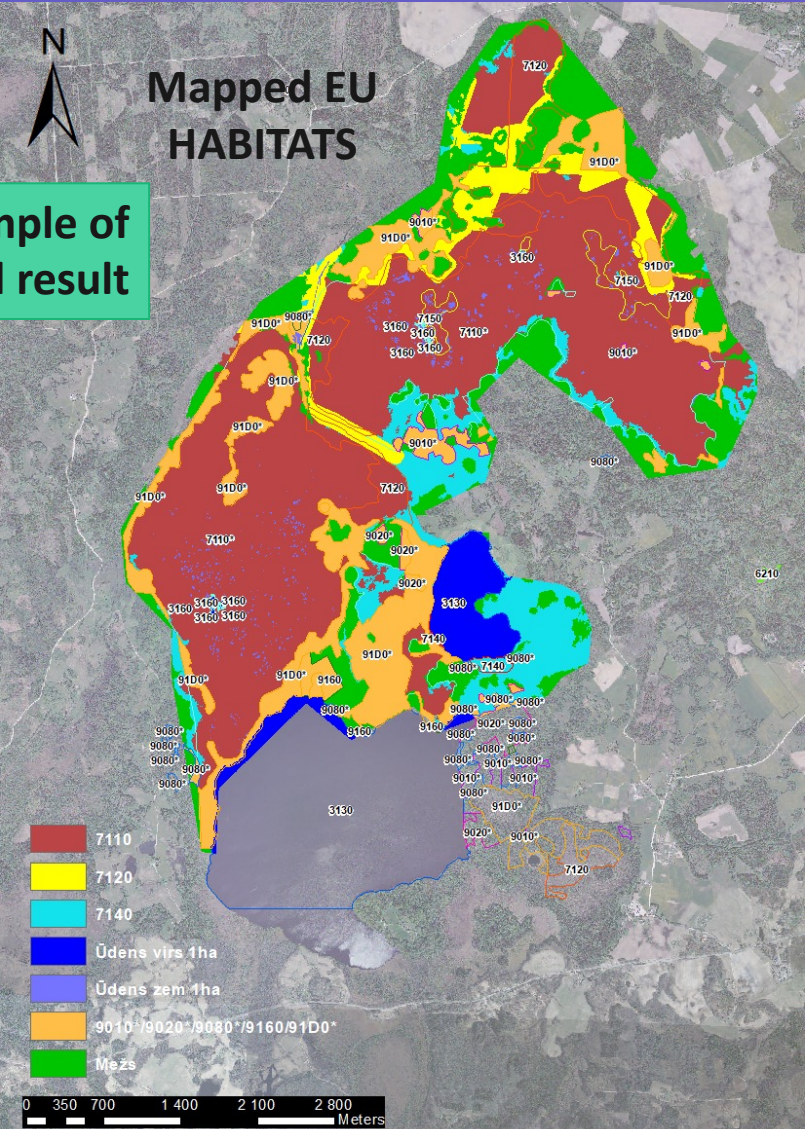Photo: M. Pakalne

Cena Mire 19.10.2023. Photo: R. Abaja

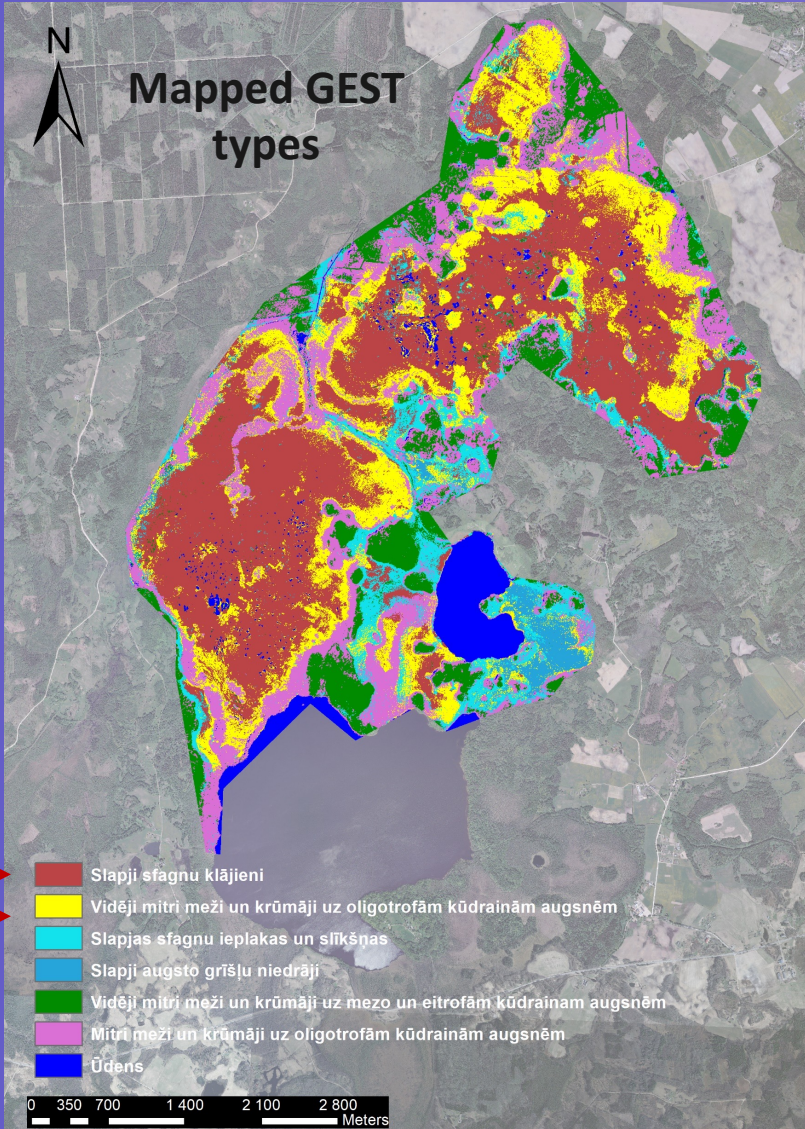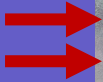Melnais Lake Mire 02.11.2023.
Photo: R. Abaja

# Development of remote sensing tool for detecting GHG fluxes in peatlands

Example of expected result

Mapped EU HABITATS

Mapped GEST types

Wet peat moss lawn

Oligotrophic peatland – moderately moist forest and shrubberies

Legend (EU Habitats):
- 7110
- 7120
- 7140
- Ūdens virs 1ha
- Ūdens zem 1ha
- 9010*/9020*/9080*/9160/91D0*
- Mežs

Legend (GEST types):
- Slapji sfagnu klājieni
- Vidēji mitri meži un krūmāji uz oligotrofām kūdrainām augsnēm
- Slapjas sfagnu ieplakas un sīkšņas
- Slapji augsto grīšļu niedrāji
- Vidēji mitri meži un krūmāji uz mezo un eitrofām kūdrainam augsnēm
- Mitri meži un krūmāji uz oligotrofām kūdrainām augsnēm
- Ūdens

Project «Attālajā izpētē balstītas SEG monitoringa metodikas izstrāde purviem» (Nr. 1-08/146/2018)
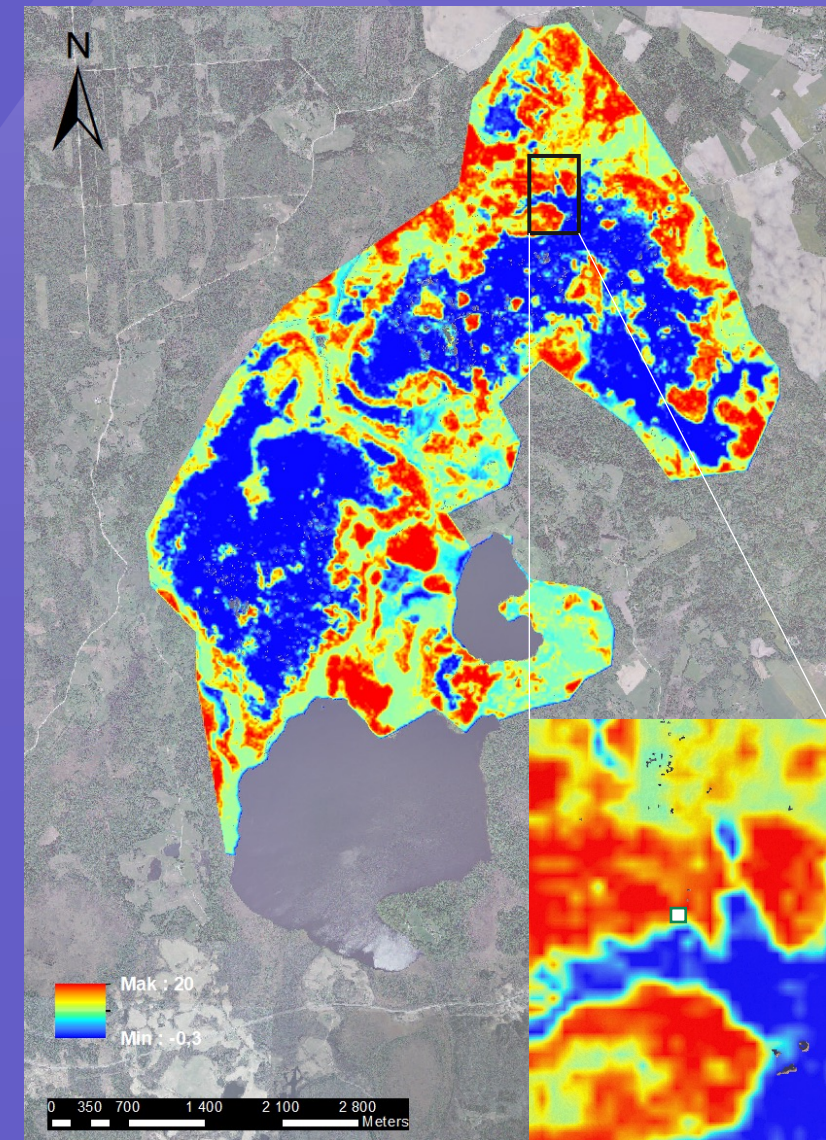
Example of expected result
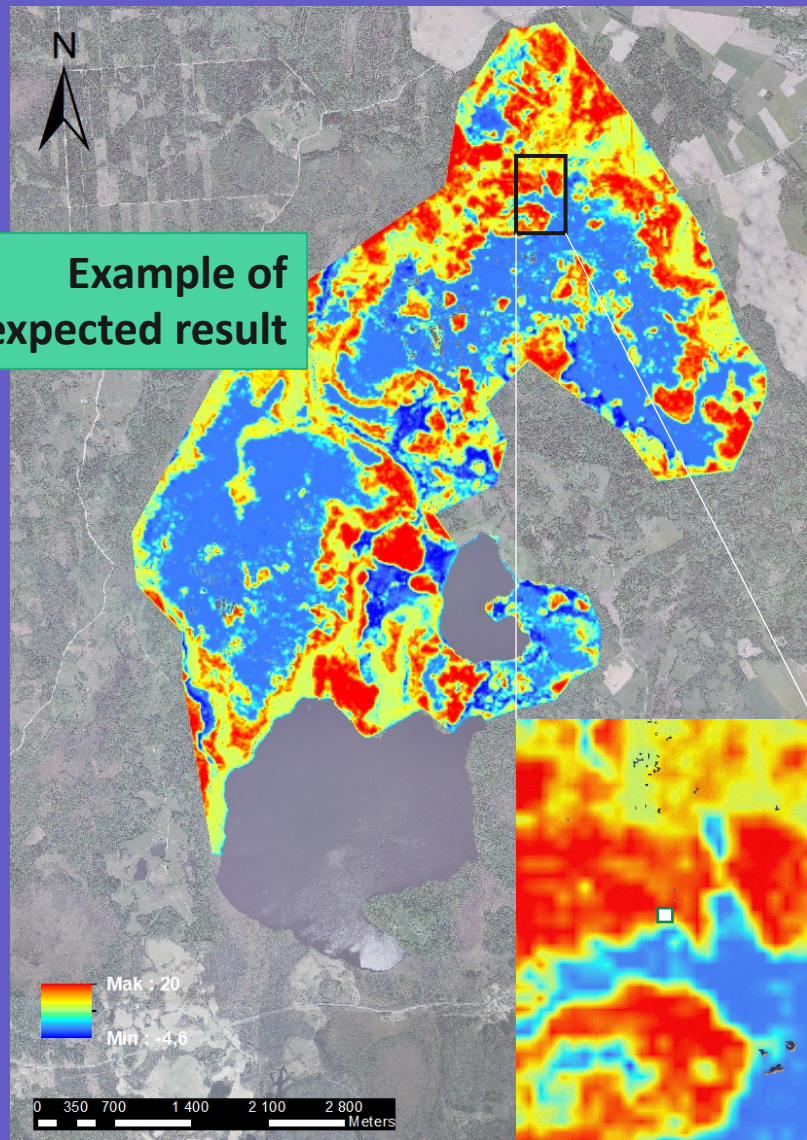
CO_2
Chamebr data: 1,86 kg/ha*h
Mapped data: 1,8 kg/ha*h
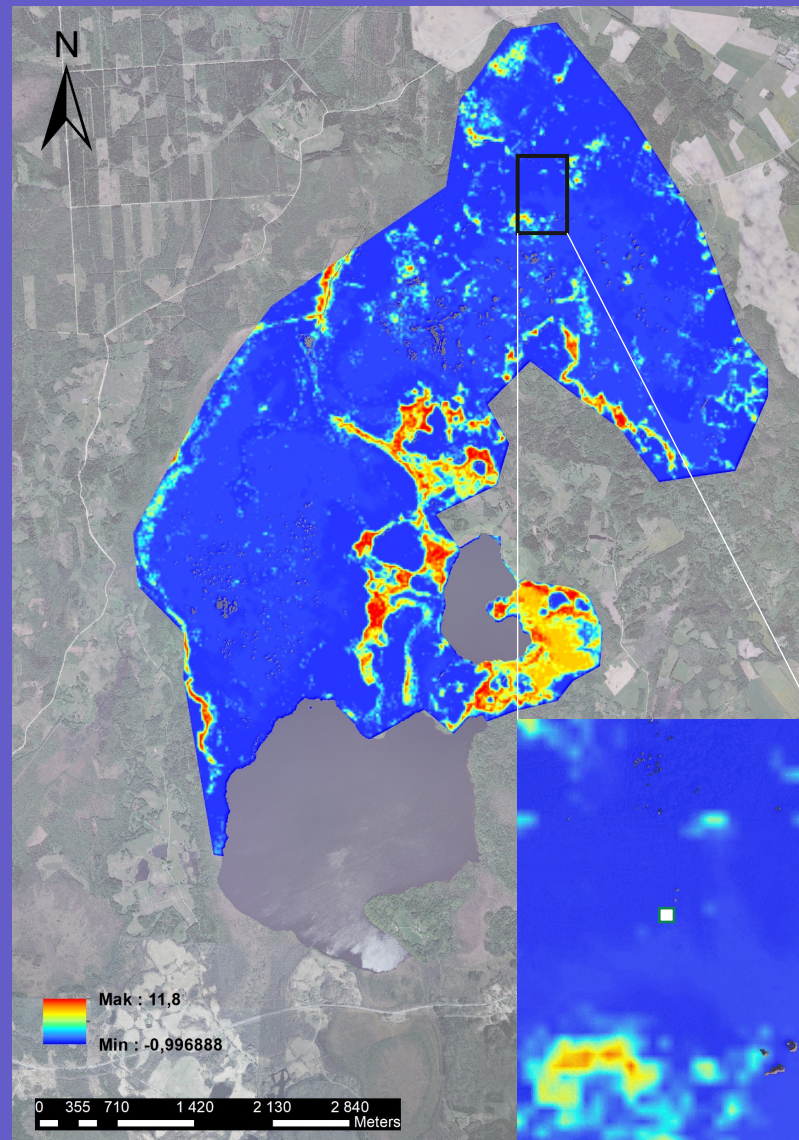
CH_4
Chamber data: 0,0008 kg/ha*h (ekv. CO2 0,02)
Mapped data: 0,007 kg/ha*h

GWP
Chamber data: 1,88 kg/ha*h
Mapped data: 1,807 kg/ha*h