Advancing soil information - Reducing key uncertainties in greenhouse gas balances in forestry-drained peatlands

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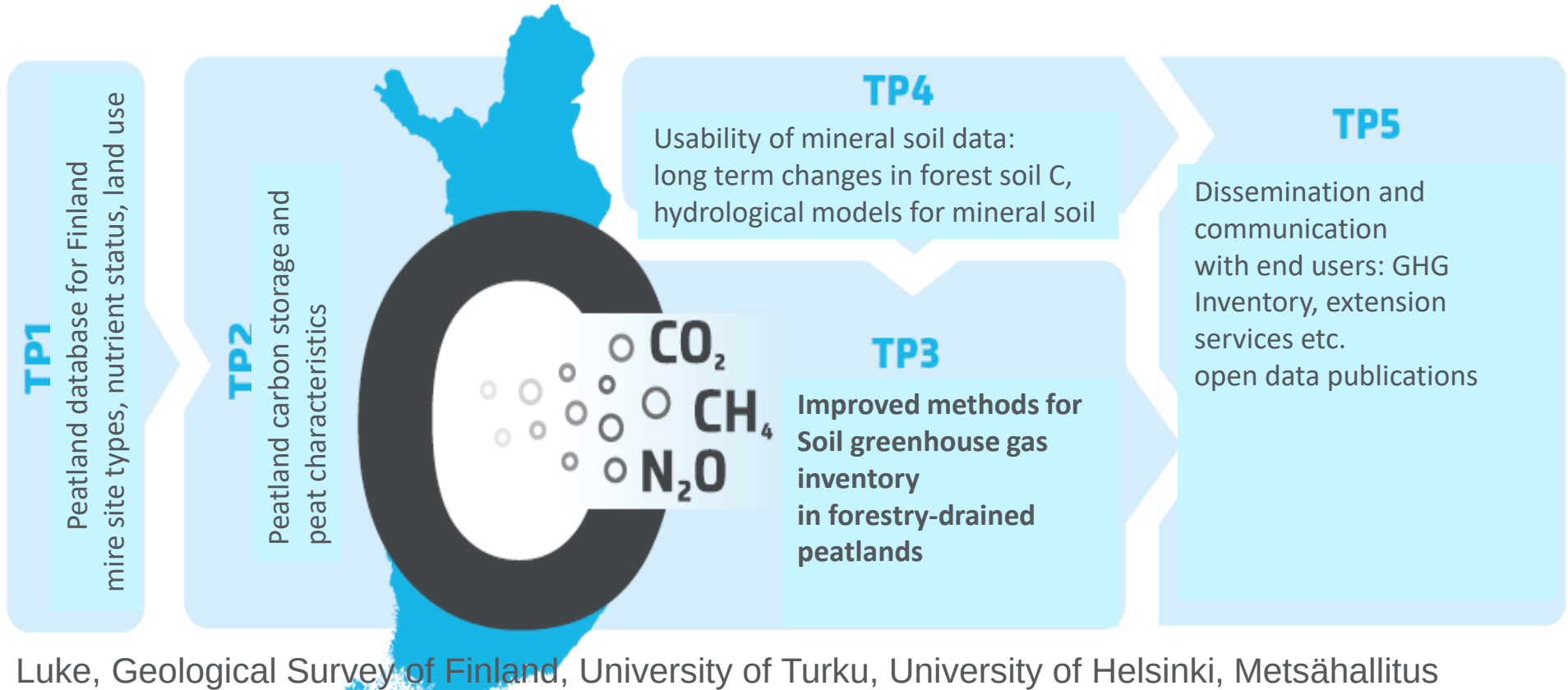
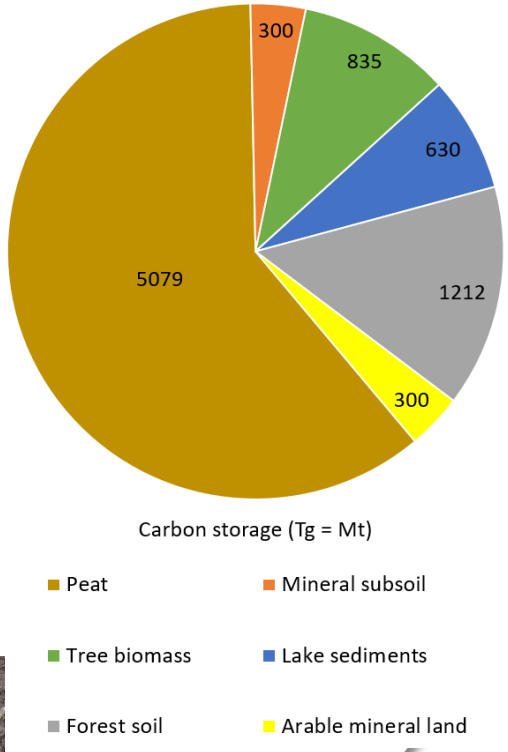
Advancing soil information MaaTi project develops and tests a set of methods that will allow to produce countrywide data and information on soils quickly and efficiently. A special emphasis will be on information on peat soils.



Luke, Geological Survey of Finland, University of Turku, University of Helsinki, Metsähallitus

Why focus on soil?

- Information on soil characteristics is needed in making decisions in agriculture, forestry and environmental management, in land-use planning, and in greenhouse gas inventory.
- The existing soil data underutilized in examining soil characteristics and processes.
- A special emphasis on information on peat soils
- Peatlands 30% of land area, 2/3 of ecosystem carbon



Turunen & Valpola 2020
Mires and Peat 26

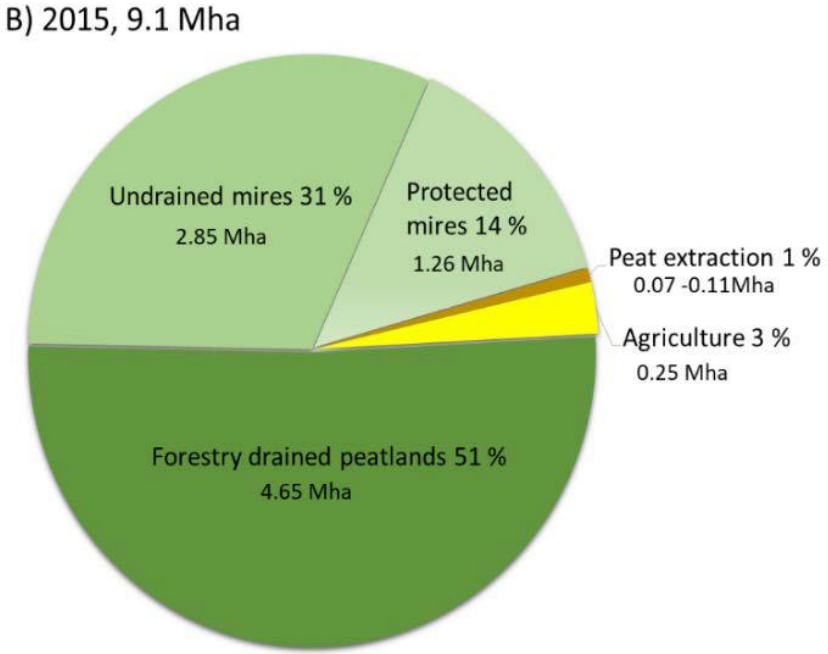
Reducing key uncertainties in greenhouse gas balances in forestry-drained peatlands

More accurate and comprehensive methods to monitor changes in carbon stocks and in greenhouse gas fluxes in peatlands

GHG Sink or Source?

1.Litter input from ground vegetation

2. Methane from ditches



Turunen& Valpola 2020. *Mires and Peat* 26.

1. Models exclude litter input from ground vegetation – soil carbon sequestration underestimated?

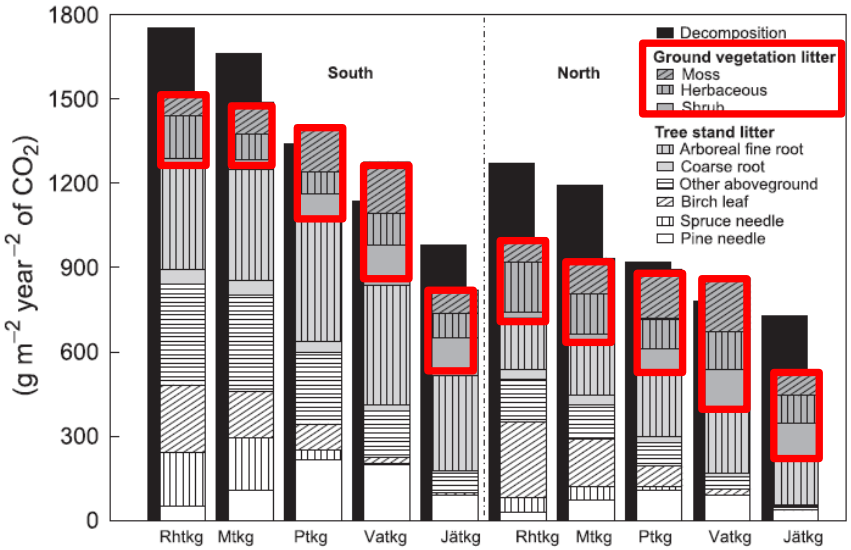
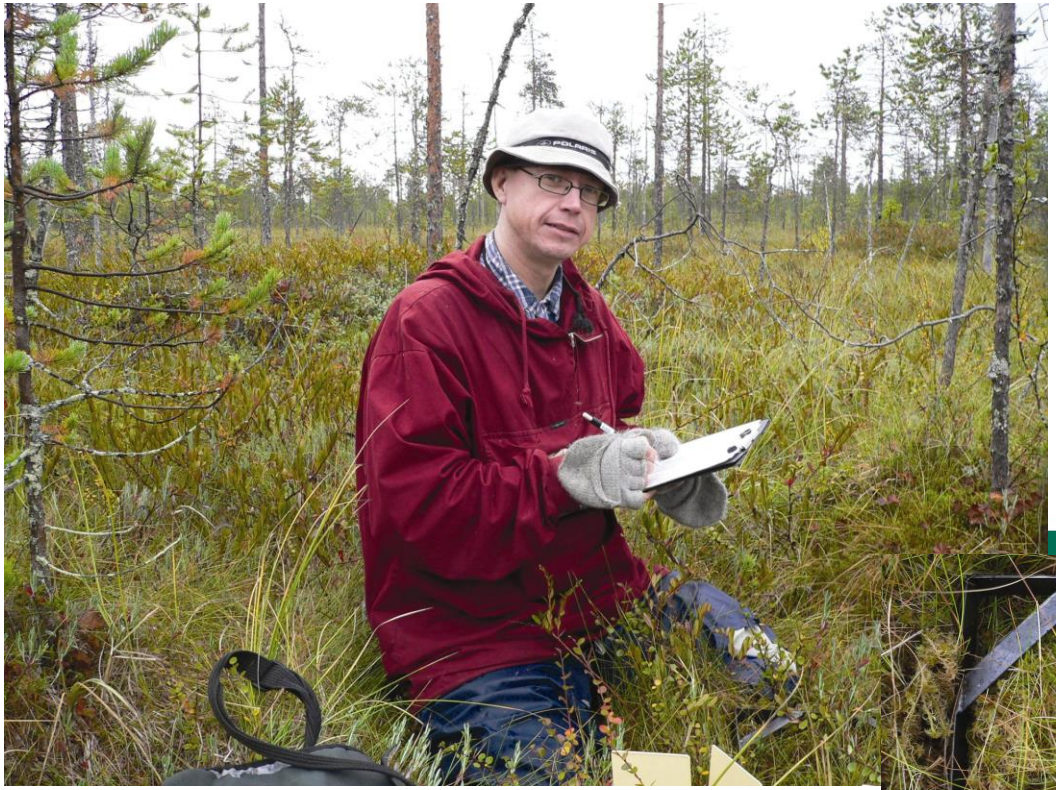


Fig. 7. The composition of mean litter production and decomposition in different site types in South and North Finland with the low fine root turnover (0.5 year^{-1}).

Ojanen et al. 2014 For Ecol Man

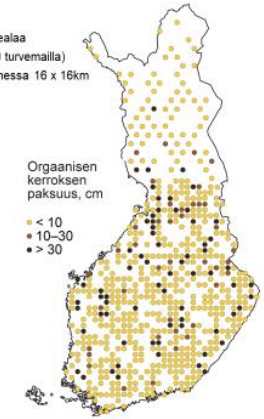
Models for litter production specific to forestry-drained peatlands

Litter production modeled by plant functional group, explained by tree stand and site types (Kostensalo et al., in progress) – upscaling country-wide NFI



BioSoilin koealaverkko on Etelä-Suomessa varsin kattava, Lapissa tyydyttiin harvempaan verkostoon hankalien kulkuyhteyksien vuoksi.
Koealoja yhteensä 630!

Yhteensä 630 BioSoil koealaa
(530 kivennäismailla, 100 turvemailla)
Koealaverkko Etelä-Suomessa 16 x 16km
ja Lapissa 32 x 24 km.



Päätyyppi	Rav_taso	Lkm
Kangas 1	1	12
Kangas 2	2	93
Kangas 3	3	239
Kangas 4	4	164
Kangas 5	5	31
Kangas 6	6	3
Kangas 7	7	6
Kangas 8	8	3
Korpi 1	1	1
Korpi 2	2	13
Korpi 3	3	31
Korpi 4	4	5
Räme 1	2	4
Räme 2	3	16
Räme 3	4	27
Räme 4	5	32
Räme 5	6	3
Avosuo 1	3	1
Avosuo 2	4	1
		685

METLA

BioSoil data collected from drained peatlands in 2006 reused

2. Methane from ditches

Ditches in forestry drained peatland

- cover ca. 2,5-3% of area
- contribute to up to 100% of CH_4 emission
- peat soil can be a CH_4 sink especially under efficient drainage

Emissions from ditches will impact whether a drained peatland is a net CH_4 sink or source

Emission factors for national conditions (Tier2-3) developed: the condition of ditches (depth, vegetated/not), time since drainage, nutrient status of the site type

Ditch network maintenance is changing along with new methods in peatland forest management, e.g., Continuous Cover Forestry

Ojanen et al. In progress

Expected outcomes

- More accurate soil data will allow development of sustainable and climate smart land-use practices.
- More comprehensive soil data and more representative models for greenhouse gas inventory will improve the accuracy and reliability of the national greenhouse gas inventory.

Luke
LUONNONVARAKESKUS

Thank you

Catch the carbon
CLIMATE SOLUTIONS IN THE LAND USE SECTOR

Nappaa hiilestä kiinni
MAANKÄYTTÖSEKTORIN ILMASTORATKAISUT