

Sompa project and work on GHG mitigation measures on peatlands and related policy instruments

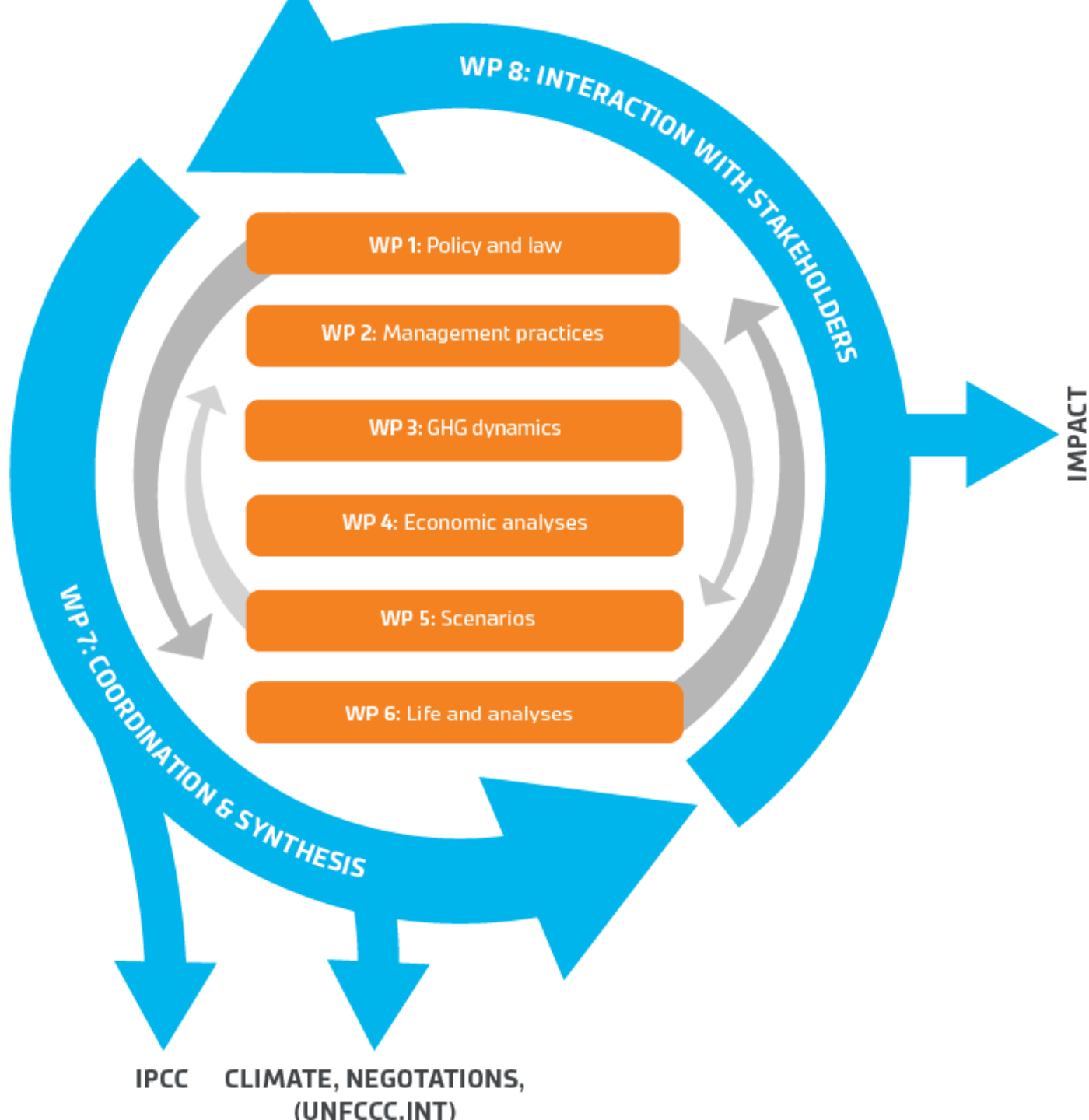
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24.9.2019

* on the behalf of the Sompa team (PI Mäkipää)



Forested and agricultural peatlands emit more than 10% of Finland's ghg emissions



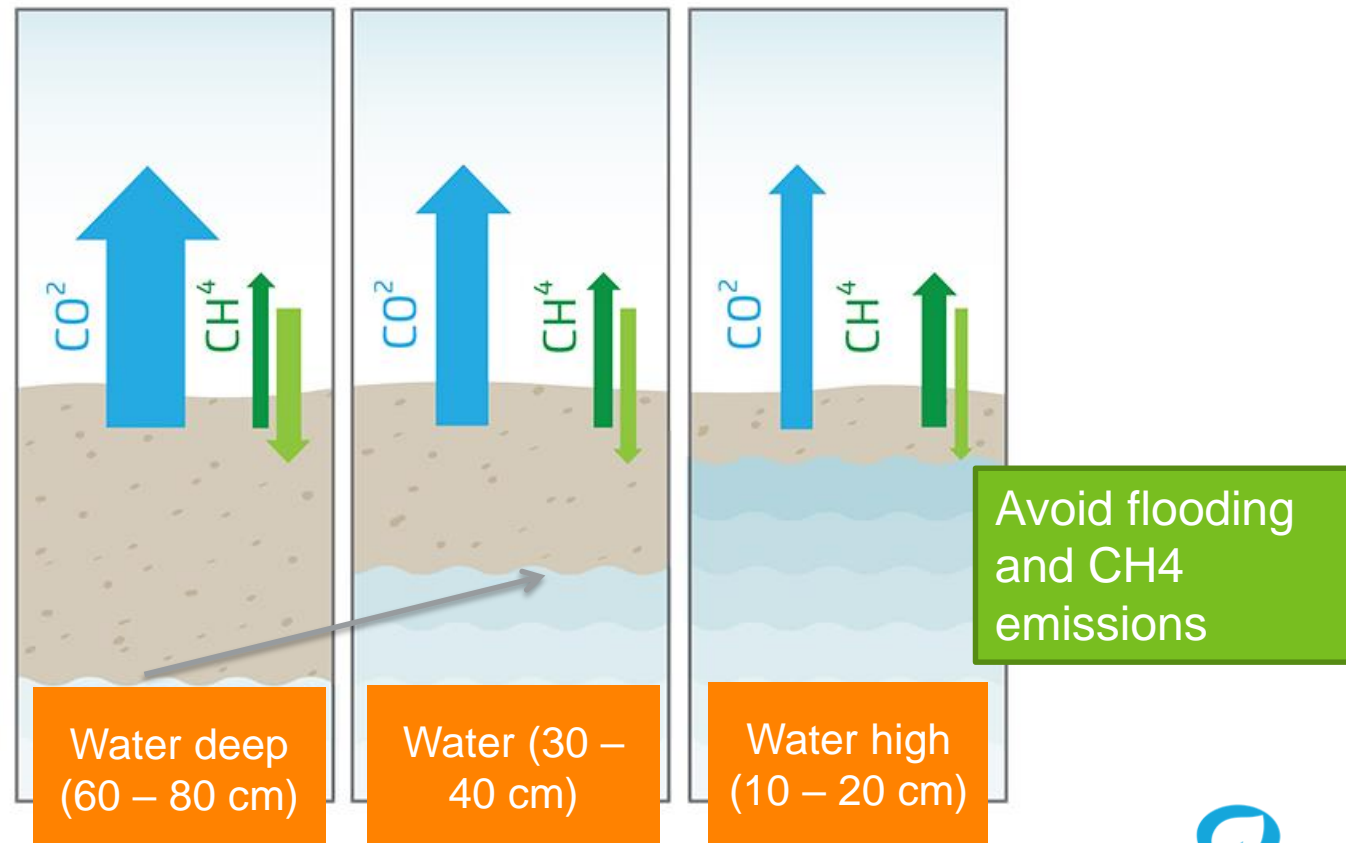
Contents

- How to reduce emissions in forests? (WP2)
- Where the emissions can be reduced? (WP3/WP5)
- How much emissions can be potentially reduced? (WP5)
- Forest policies of interest (WP1+ IBC-Carbon)

Agricultural + forested peatland soil emissions:
 $8,8 + 8,7 = 17,5$ million tons CO₂ eq.

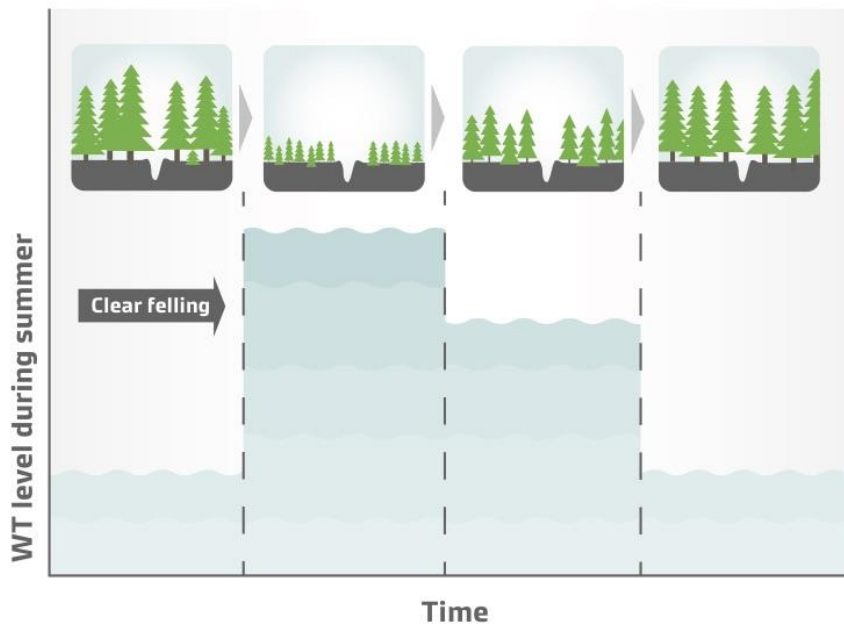
How to reduce soil emissions?

- **Stop peat decomposition**
- Increase of WTD decreases CO₂ emissions.

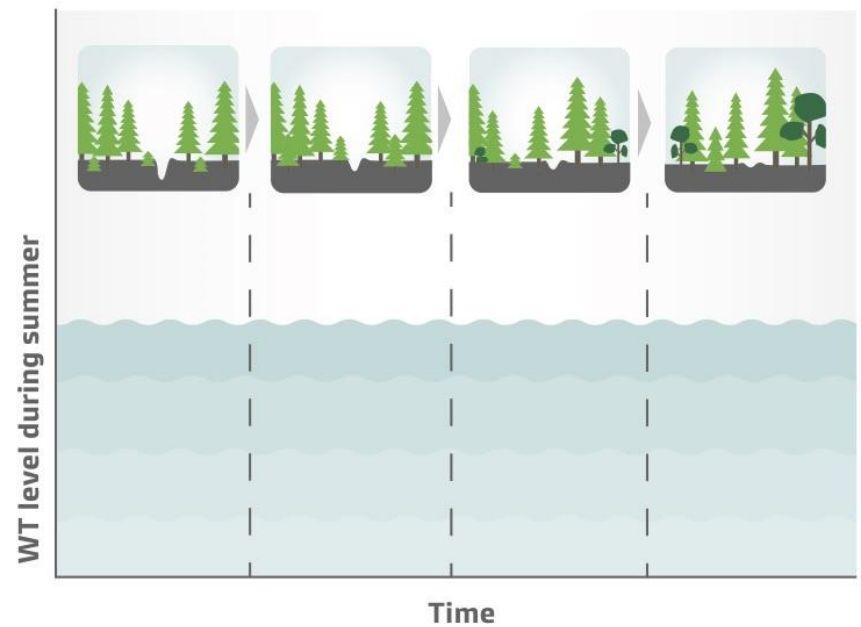


How to reduce emissions in forests

EVEN-AGED MANAGEMENT



CONTINUOUS COVER FORESTRY



Experiment to test continuous-cover forestry in drained spruce-land peat soils

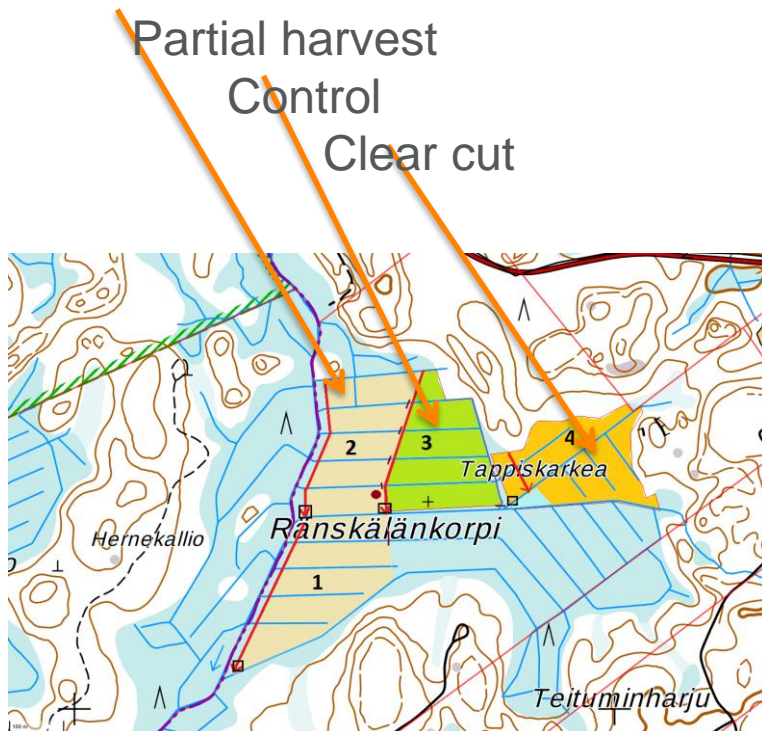
- Verify hypothesis of sufficiency of biological drainage for tree growth
- Verify emission reductions, and hypothesis of optimal WTD
- Harvest experiments:
 - Monitor WTD and soil ghg emissions
 - Monitor tree growth (TLS)
 - Monitor understorey development
- Use experiments to derive models of ghg emissions
- Implement models to process-based simulations models (WP3, see Maarit Raivonen's slides)



New intensive site: Ränskälänkorpi



- Established 2019; Harvest scheduled winter 2021.
- Eddy-covariance → NEE
- Automated chambers → continuous monitoring
- Growth & sapflow monitoring → more detailed data on tree responses



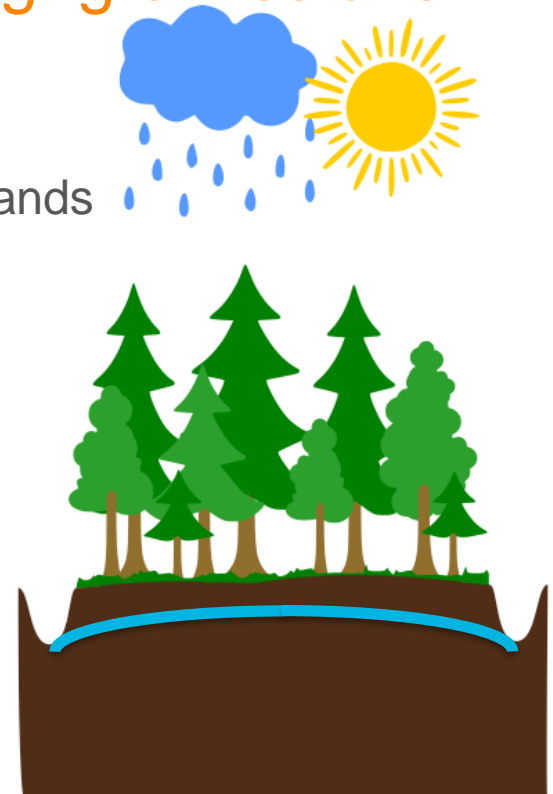
How much emissions can be reduced?

- linking hydrological simulations to ghg emissions

- Process-based model SpaFHy for drained peatlands
- Parameters
 - Leaf biomass → LAI
 - Drainage (depth & distance)
 - Soil properties (conductivity)
- Simulates water table level
- Done with python
 - Can be run in spatial grid

Soil emissions

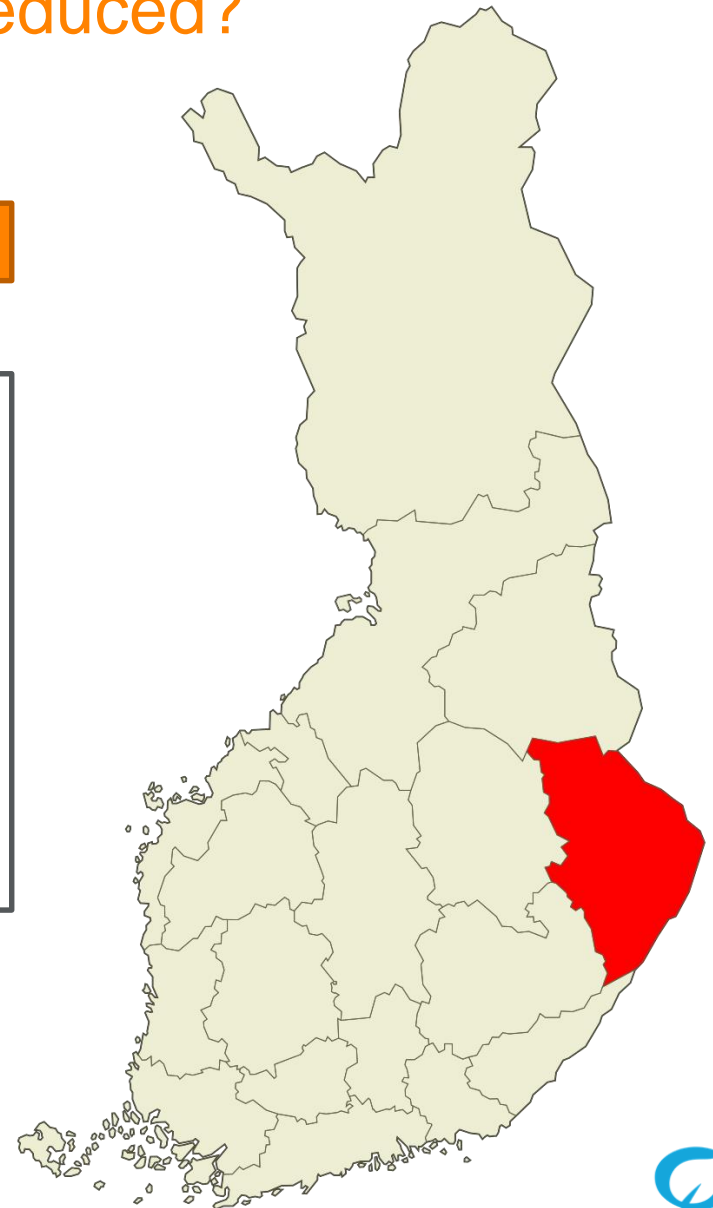
- Water table depths & **CO₂ model combined** (Ojanen et al. 2010; Ojanen et al in revision)
- **New empirical models based on ghg measurements in Sompa -sites.**



Where the emissions can be reduced?

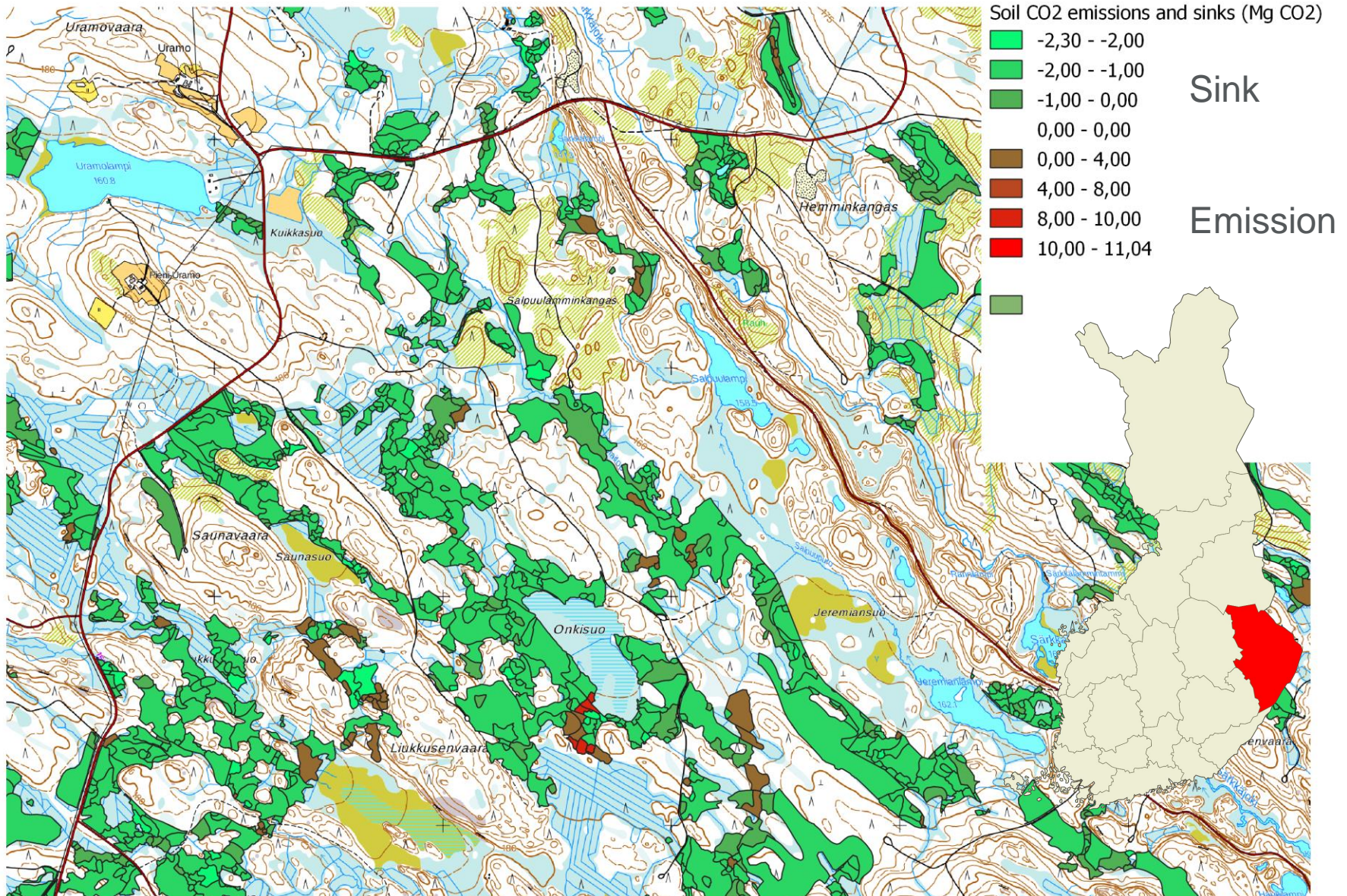
Where are the emission hot spots?

- Real management units from Metsähallitus
- 120 000 peatland forests
 - Forest cover
 - Drainage age
 - --" density
 - Site type



A Lehtonen et al.

Where the emissions can be reduced?



What is the emission **reduction potential** of drained peat soil forests in the entire Finland?

- Questions when implementing continuous cover forestry:
 - How wood supply is affected by transfer to cont. cover forestry
 - How large are the expected ghg emissions and reductions?
 - How land owner revenues are affected
- Calculations with MELA forest planning system.
- Assuming:
 - Fertile peatsoil site types for continuous cover forestry
 - Partial harvests stronger in southern Finland:
 - Spruce, south 22->12 m² & north 22->14-15 m²
 - Pine: higher basal area limits
 - Continuous-cover forestry mimicked by applying thinning from above with mature stands
- Implementation: Autumn 2019

Scenarios – final implementation later

- Two main paths:
 - Business as usual
 - Climate actions on peat soils
- Two worlds of demand:
 - Low demand
 - High demand
- Implementation:
 - After tools and methods from other work packages ready

Existing policies

- KEMERA-law: the main incentivising forest management policy tool
 - Seedling forest management
 - Young forest management
 - Small wood collection
 - Forest roads
 - **Fertilization, health**
 - Environmental effects
 - **ditch maintenance: (evaluation of the ghg effects under work in Sompä/IBC-Carbon)**
 - Nature

Ditch maintenance in Finland (km, and area ha)

Suometsien hoidon tuen työmäärät (ojakilometrit ja hankehehtaarit) vuosina 2012–2019

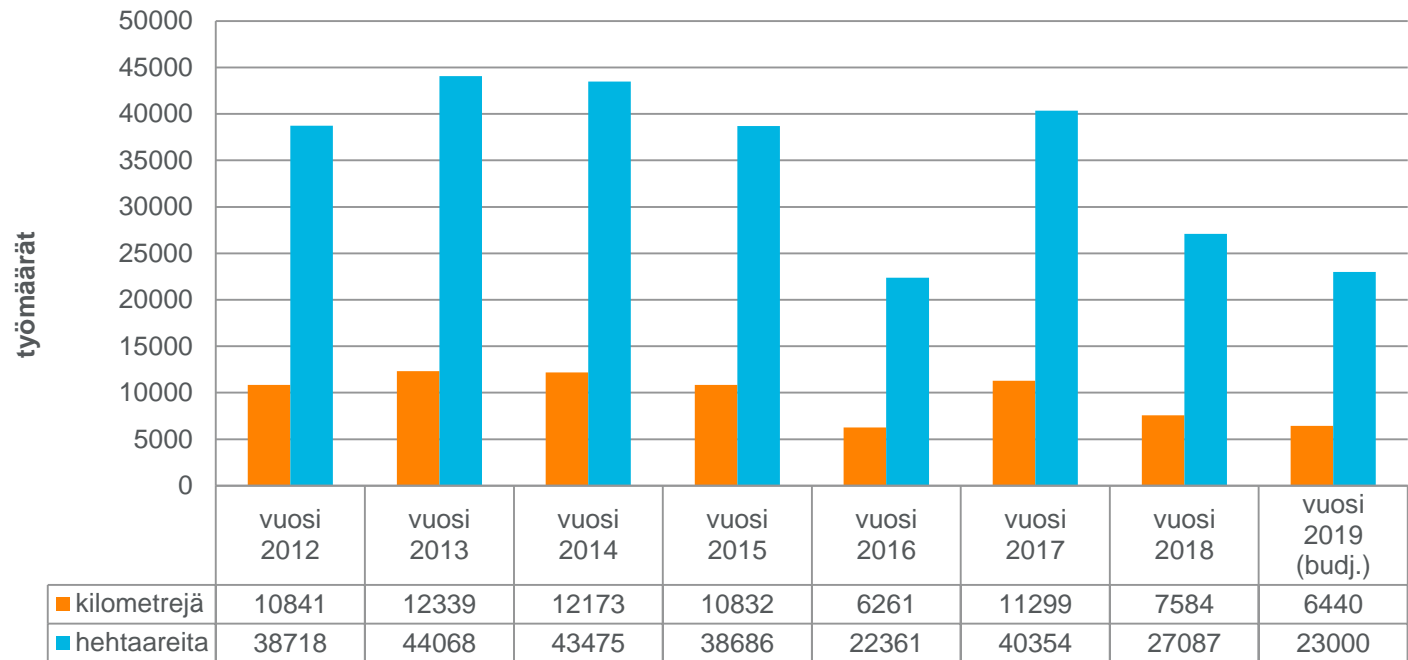


Fig. Marko Heiskanen, SYKE

New policies in the new government agenda for 2019-2020

- Sompä provides knowledge and material for the development of new policy measures in *government agenda*:
 - LULUCF climate programme
 - Guideline development
 - Forest law re-evaluation
 - KEMERA will be updated to cover mitigation
 - Develop regulation and incentives for forest C mitigation
 - Pilot LULUCF C storage markets



SOMPA Work packages and coordinators

WP 1: Policy and law

- WP1 **Kati Kulovesi**, UEF

WP 2: Management practices

- WP2 **Kristiina Regina/Raija Laiho**, Luke

WP 3: GHG dynamics

- WP3 **Timo Vesala**, UH

WP 4: Economic analyses

- WP4 **Heikki Lehtonen**, Luke

WP 5: Scenarios

- WP5 **Alexi Lehtonen**, Luke

WP 6: Life and analyses

- WP6 **Jyri Seppälä**, SYKE
- Stakeholder collaboration and societal interaction, **Kati Berninger**, Tyrsky consulting
- Consortium director **Raisa Mäkipää** and coordinator **Mikko Peltoniemi**, Luke.



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Kiitos!