

GHG EMISSIONS

CLIMATE CHANGE

FORESTRY

OTHER LANDUSE

CARBON SEQUESTRATION AND STORAGE?

BIODIVERSITY?

OTHER SERVICES?

C-NEUT project  
2022-2024

# Achieving carbon neutrality at the regional level: Integrated evaluation of emission and biodiversity targets

Martin Forsius  
Research professor  
Finnish Environment Institute Syke  
martin.forsius@syke.fi



Funded by the European Union –  
NextGenerationEU

Sustainable Growth  
Programme for Finland

Finnish  
Environment Institute



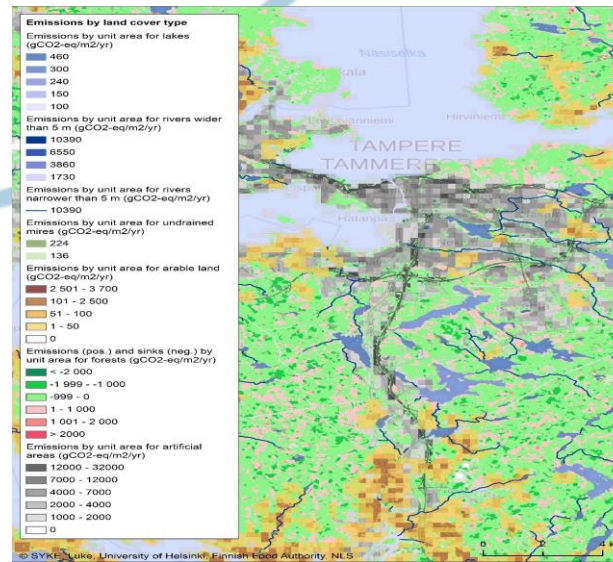
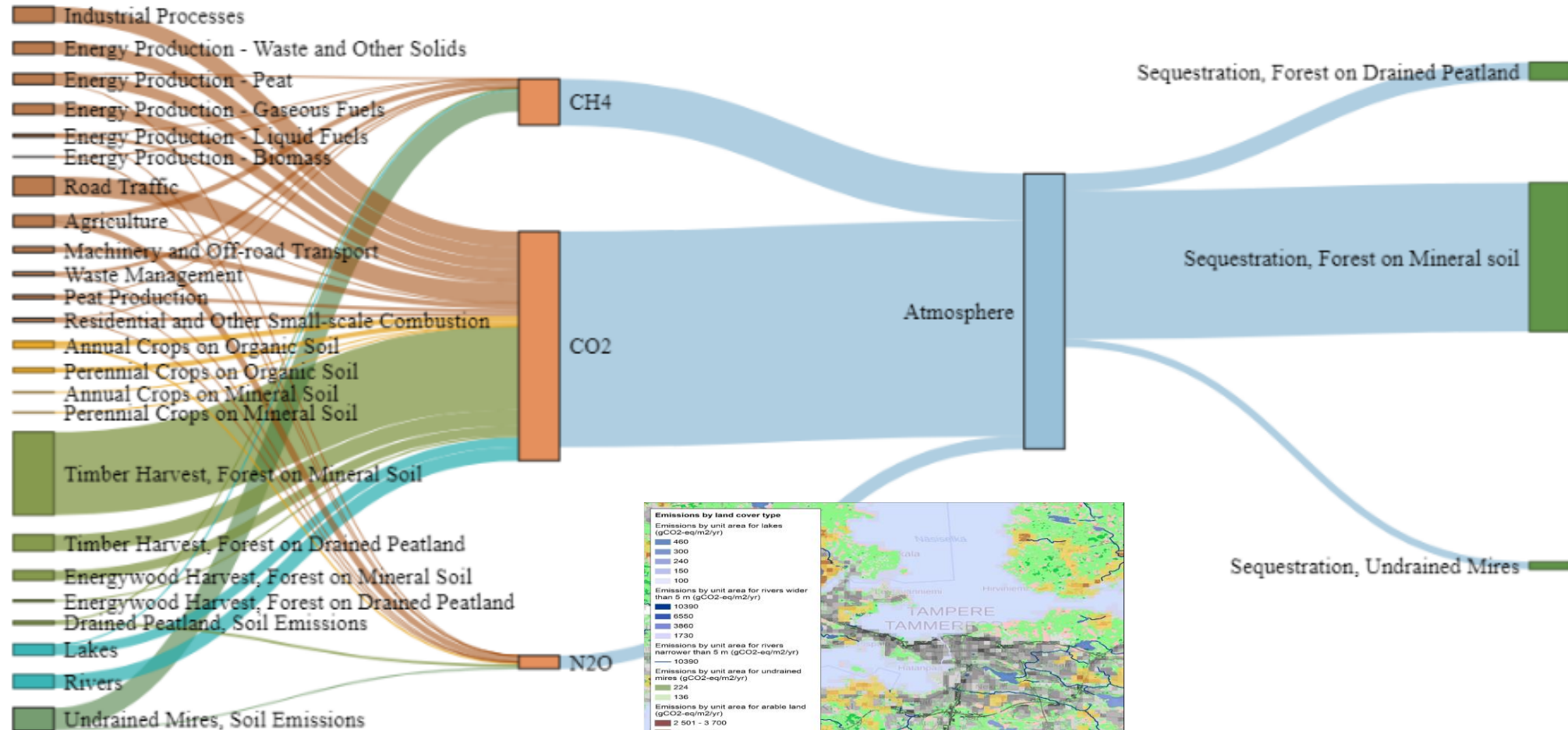
FINNISH METEOROLOGICAL INSTITUTE

# Background

- Climate Act: Finland carbon neutral by year 2035 after which greenhouse gas (GHG) emissions should be negative.
  - The landuse sector (LULUCF) was for the first time a GHG emission source in 2021 in Finland.
  - Growth of forests is decreasing.
  - EU biodiversity strategy: 30% of land area should be protected, of which 10 % strictly protected.
  - Proposal of Finnish Nature Panel: Implement additional protection of forested areas so that the 10% target is reached in each administrative region (Fi. maakunta).
- 
- Integrated evaluation of targets → optimal/win-win solutions.
  - Impacts of protection measures on carbon sinks and storages.
  - Net GHG budgets for different scenario combinations.

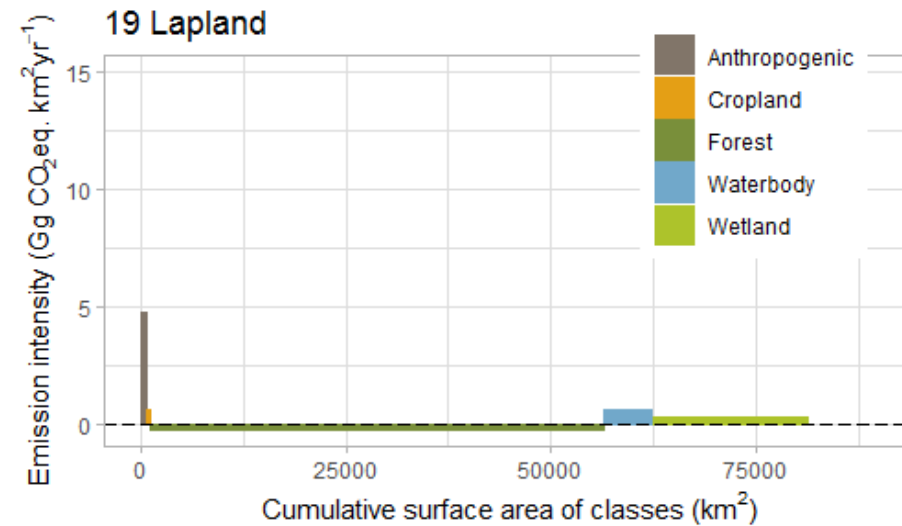
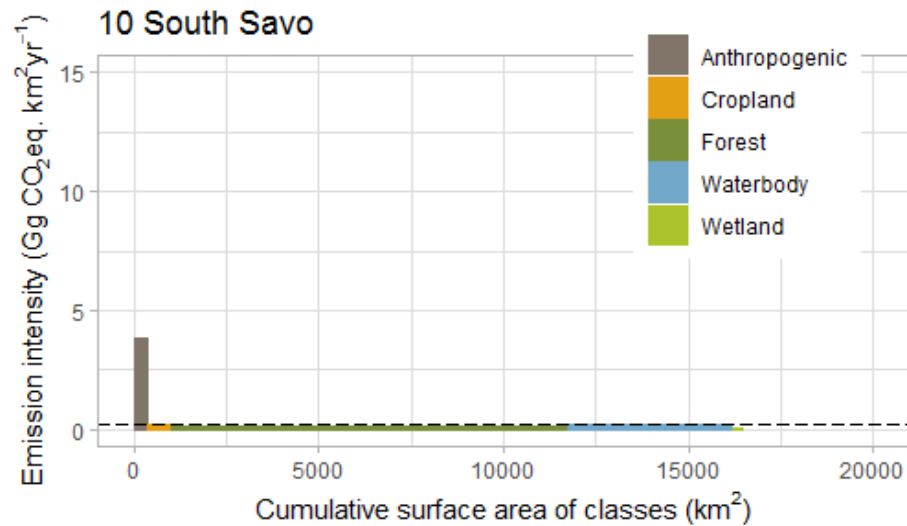
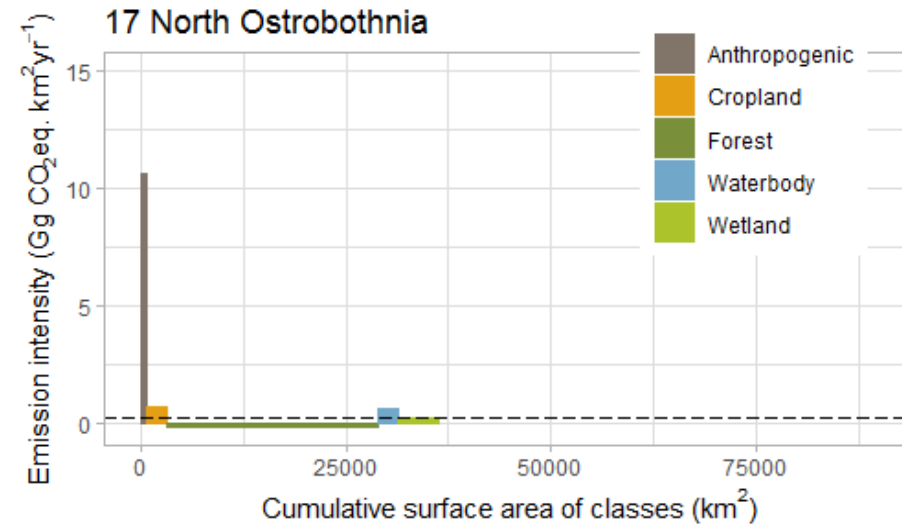
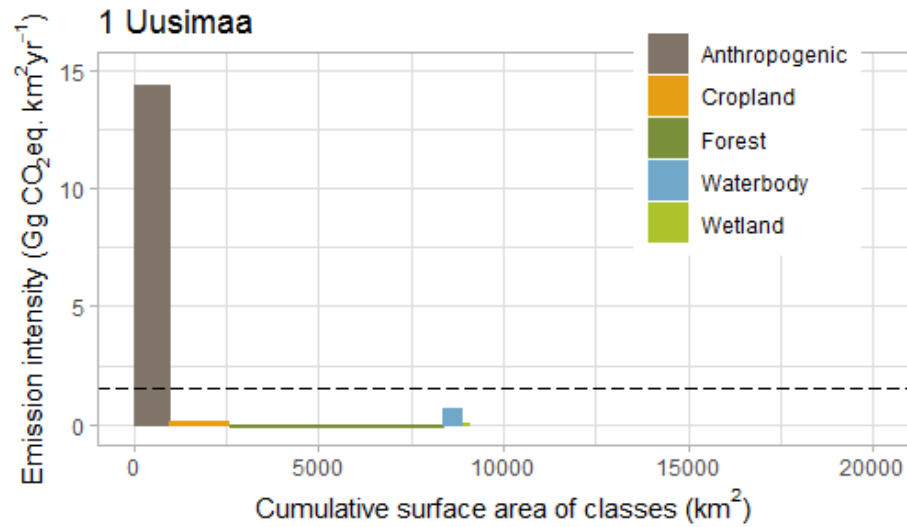


# Current greenhouse gas balance in Finland for land cover classes



Holmberg et al. 2023  
<https://doi.org/10.1007/s13280-023-01910-8>

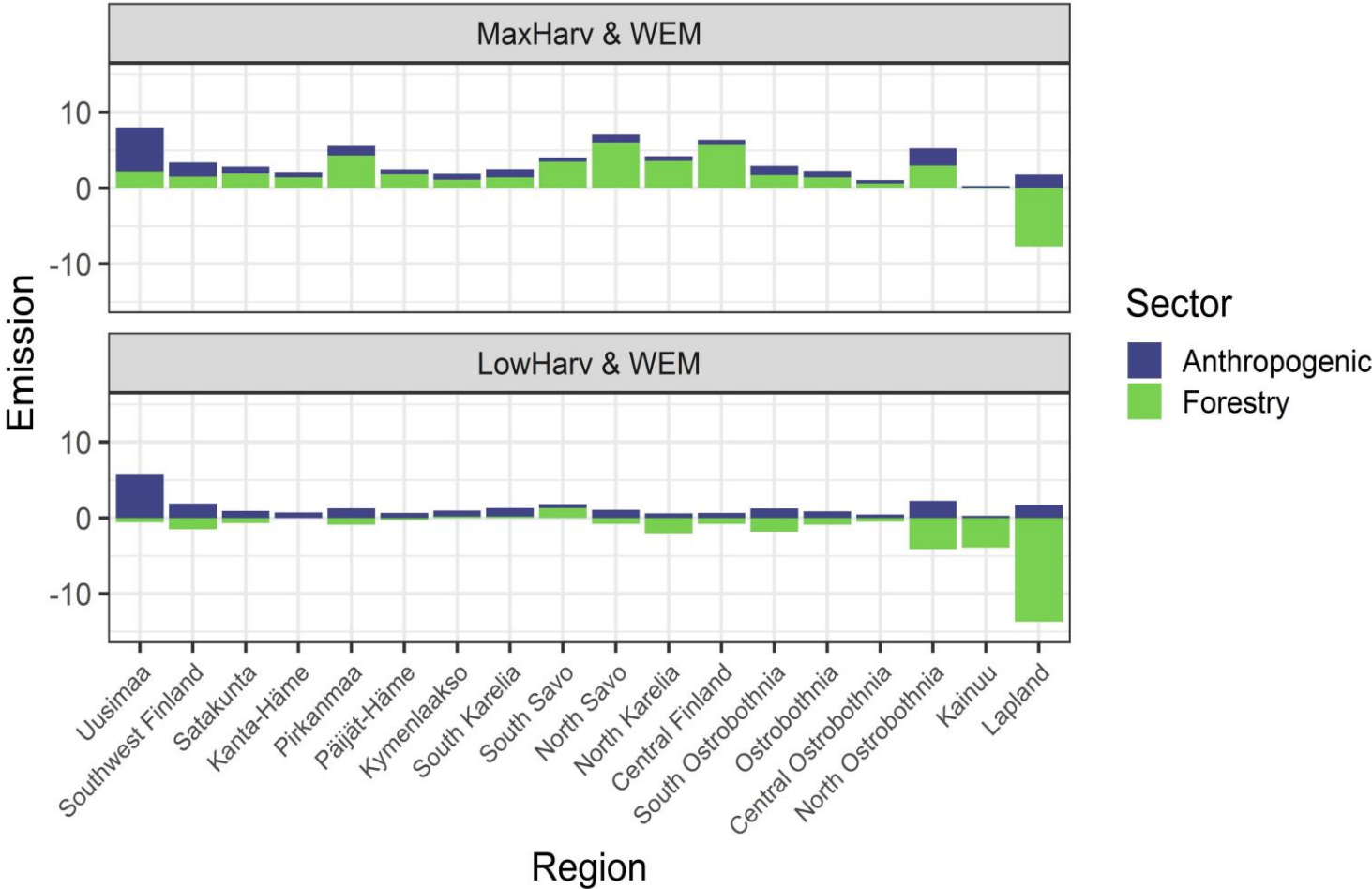
# GHG emission intensity vs. area of landcover classes in different regions



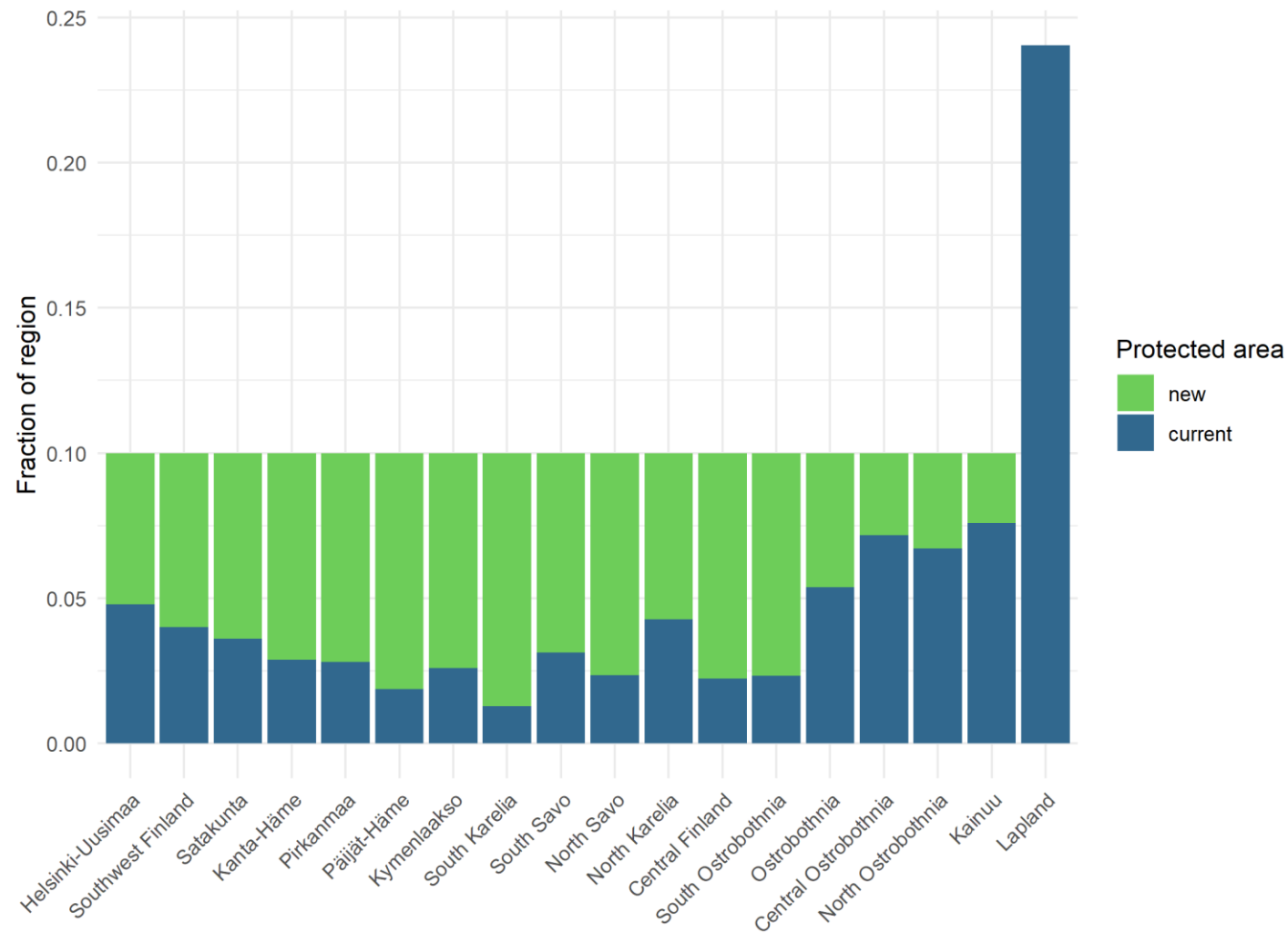
# Net GHG emissions in year 2050 in 18 regions of Finland

Two forest harvesting scenarios and WEM scenario for anthropogenic GHG emissions assumed

b) 2050 Net GHG emission (TgCO<sub>2</sub>eq.yr<sup>-1</sup>)



# Fraction of new protected forested area needed in the 18 regions to reach the regional 10% protection target (Zonation model prioritisation)

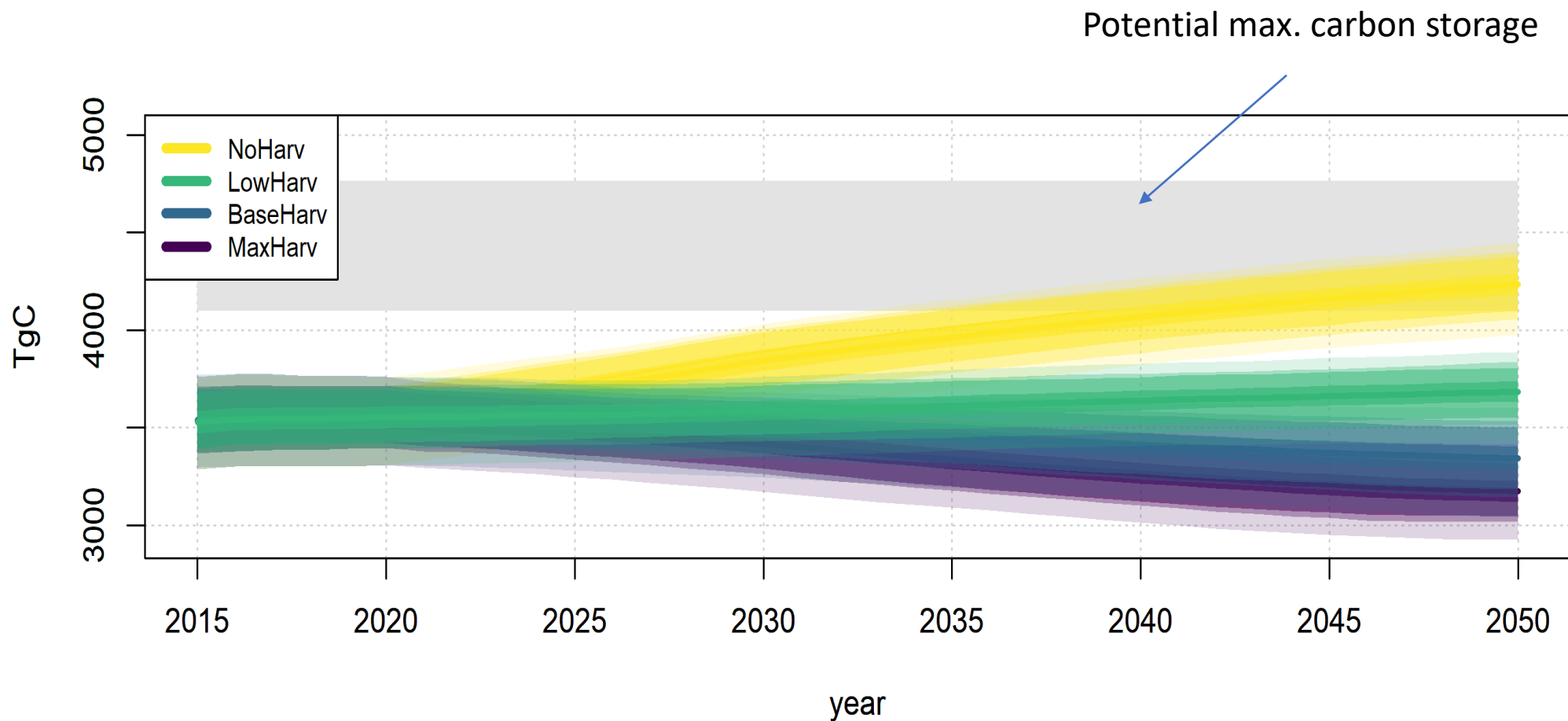


Forsius et al. 2023

<https://doi.org/10.1007/s13280-023-01860-1>

# Development of carbon storage of Finnish forests assuming different harvesting scenarios

PREBAS model, present climate assumed



Forsius et al. 2023

<https://doi.org/10.1007/s13280-023-01860-1>



## CONCLUSIONS

- ✓ **Integrated evaluation of climate and biodiversity targets enables development of cost-efficient measures.**
- ✓ Detailed spatially explicit information available.
- ✓ Large differences in regional potential to reach carbon neutrality → planning and cooperation needed.
- ✓ Present and potential new protected forested areas are important carbon storages and sinks.

More information/special issue:

<https://link.springer.com/journal/13280/volumes-and-issues/52-11>

