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# Soil respiration across a managed forest chronosequence in southern Sweden

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# Overarching research question

Can extended rotation lengths  
increase carbon uptake from  
managed spruce forests in  
southern Sweden?



# Step 1: measuring CO<sub>2</sub> efflux

## Partitioning the fluxes



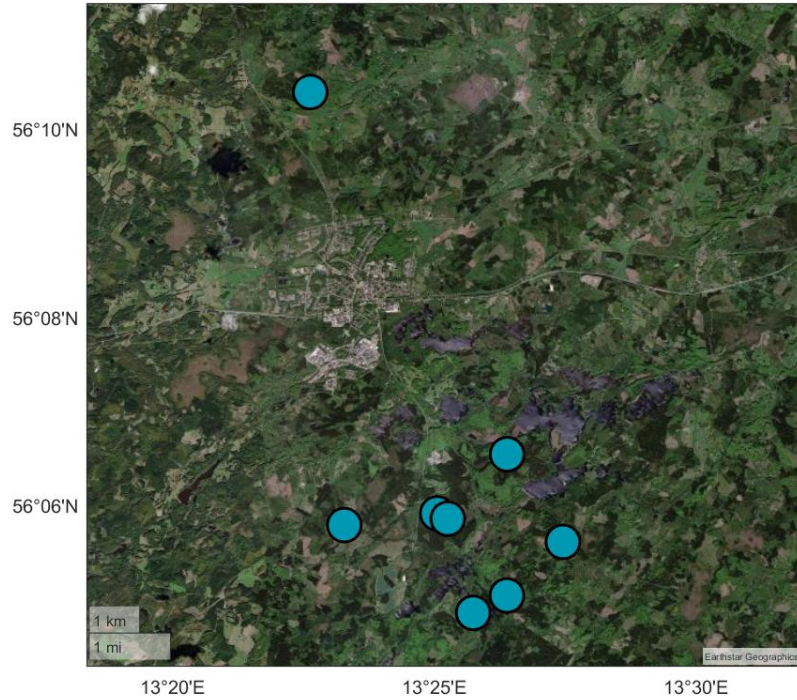
- Total soil respiration ( $R_s$ )
- Heterotrophic forest floor respiration ( $R_{ff}$ )
- Heterotrophic soil respiration ( $RH_s$ )

## Measurements

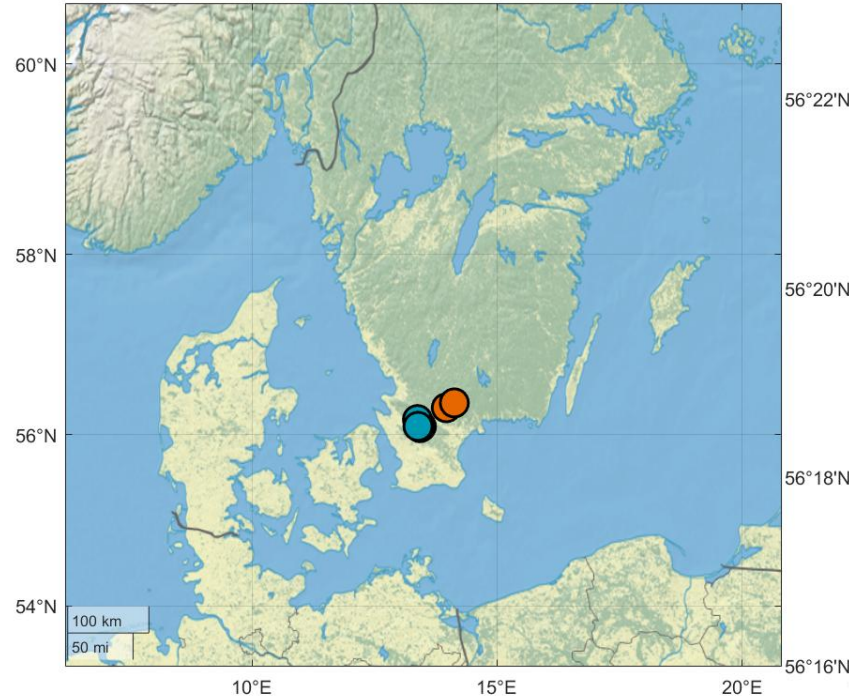


# Study area

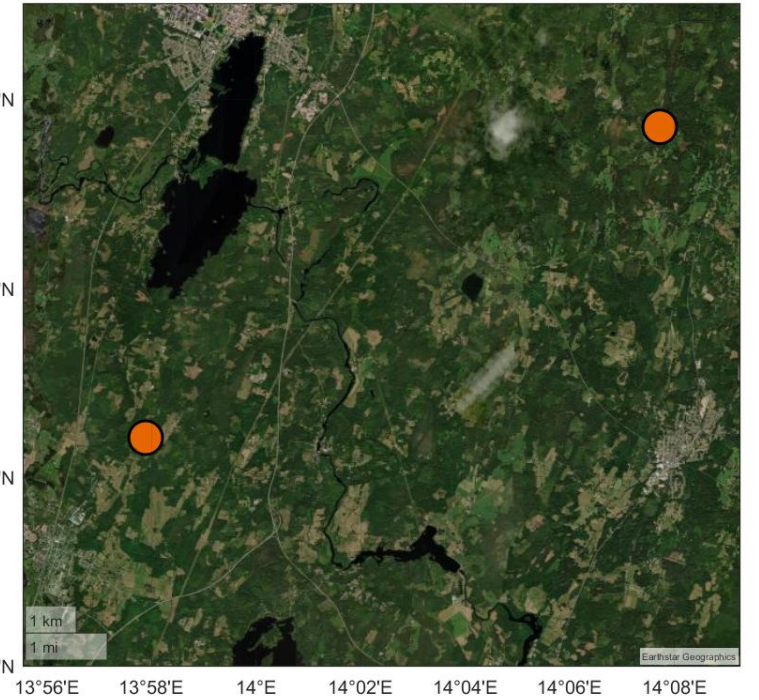
## Stand age 0-70

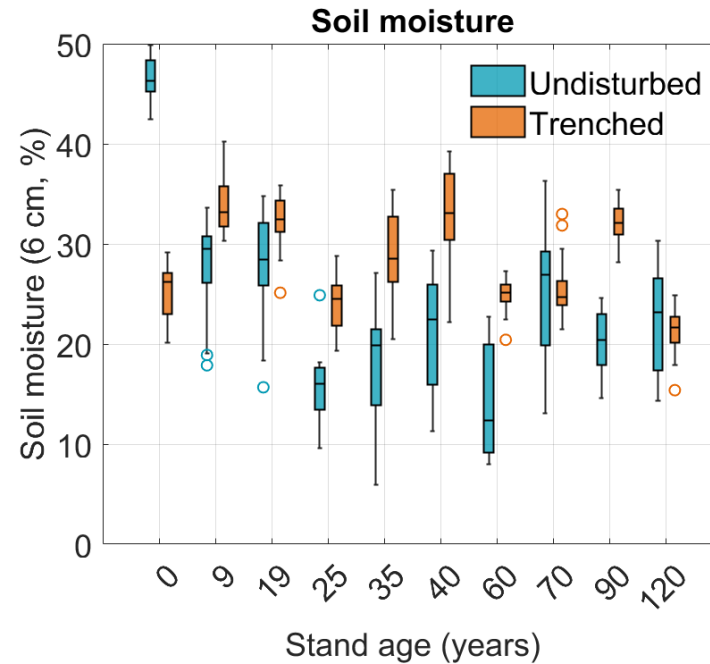
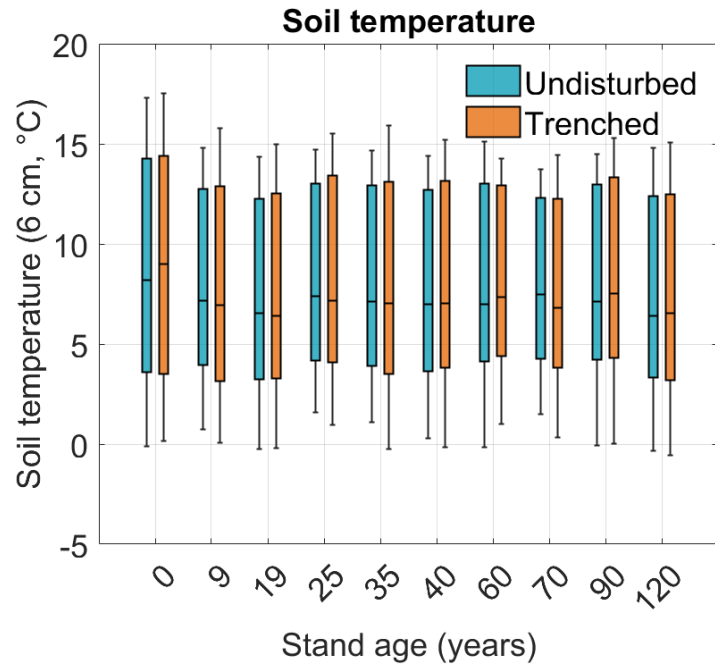
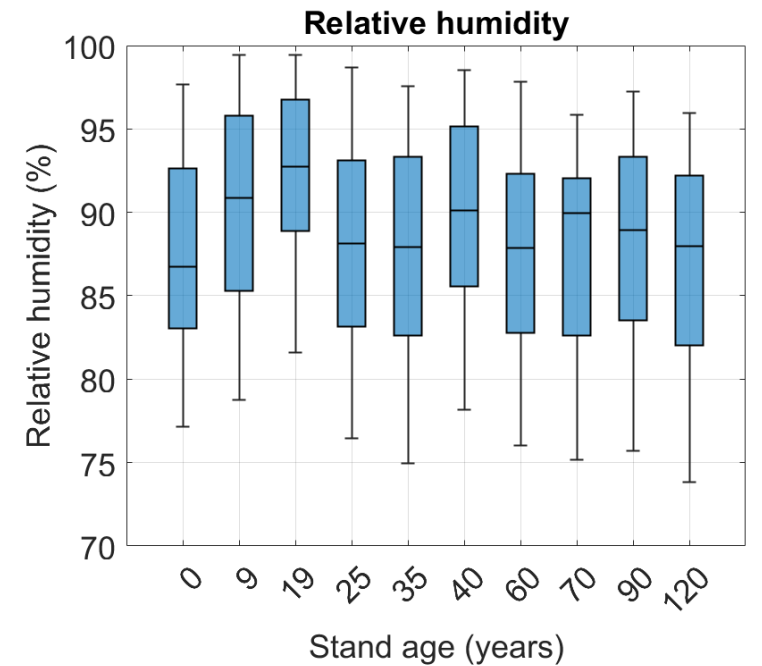
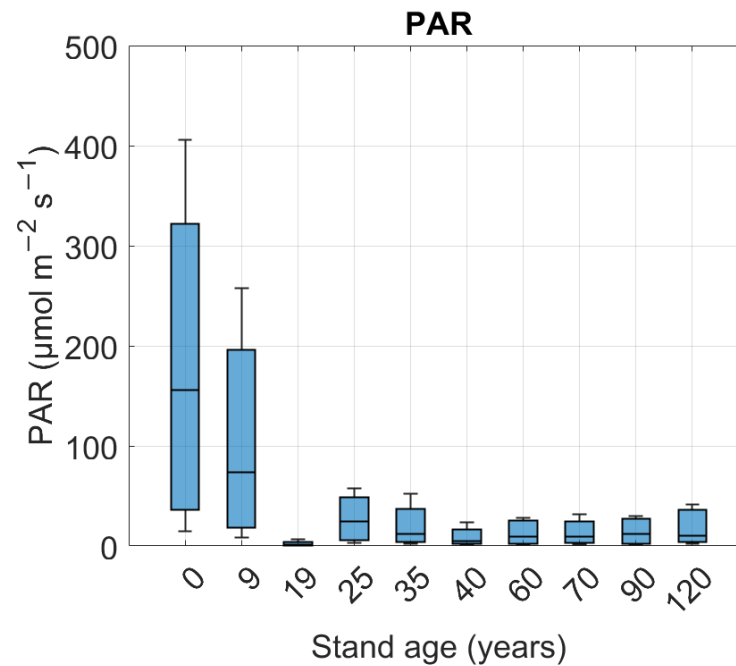
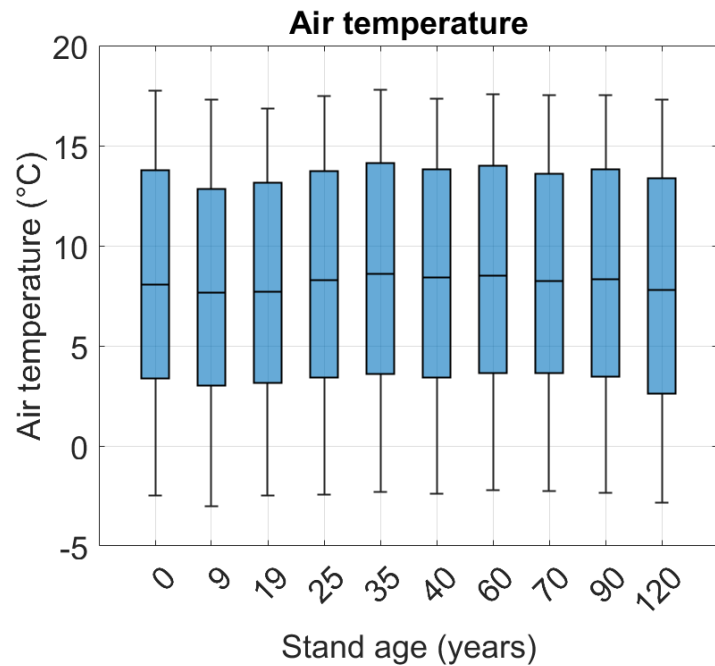


## Southern Sweden



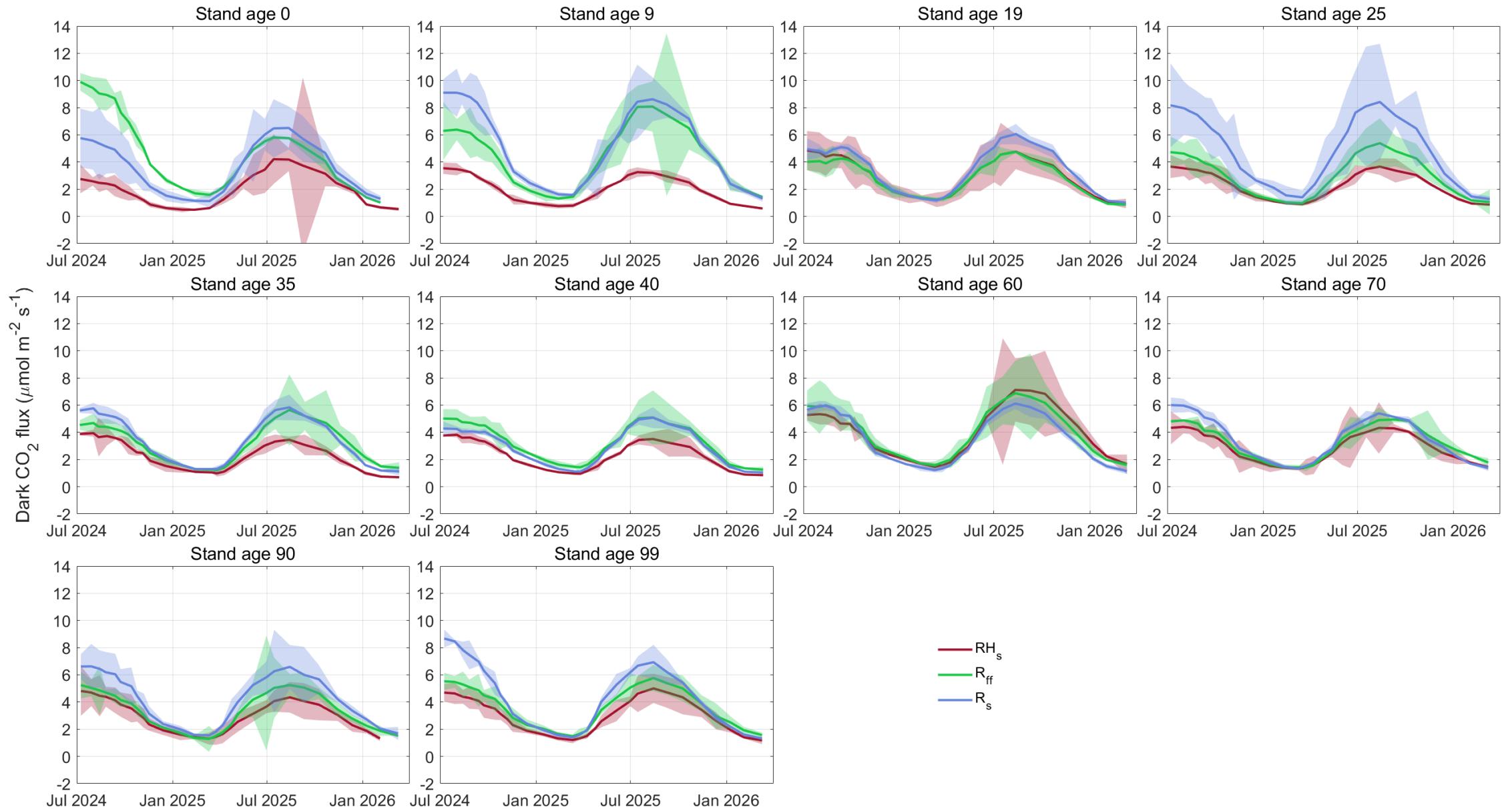
## Stand age 90-120



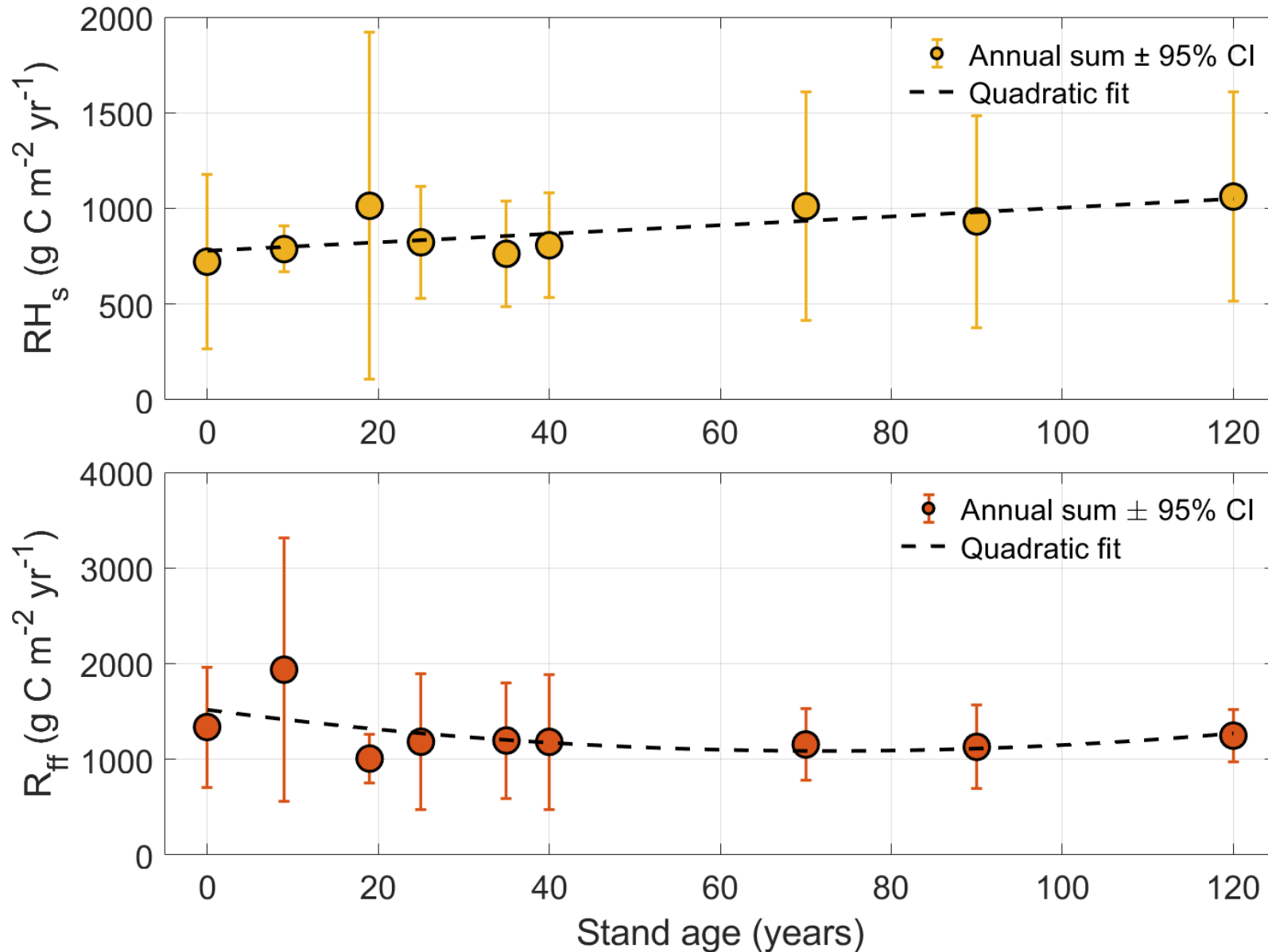


Below canopy  
meteo data to  
evaluate the  
chronosequence

# Preliminary results: soil respiration timeline

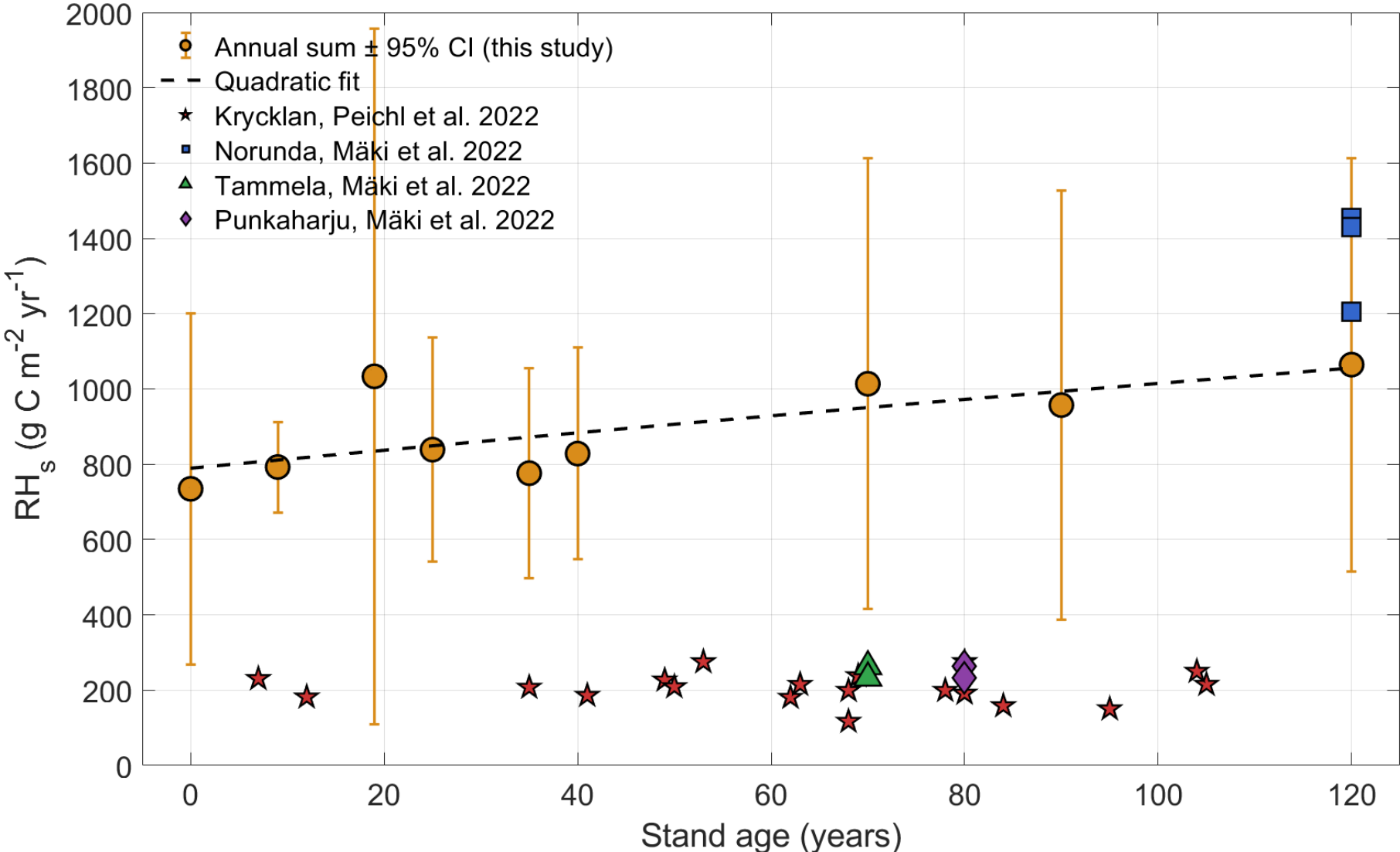


# Preliminary results: soil respiration 2025

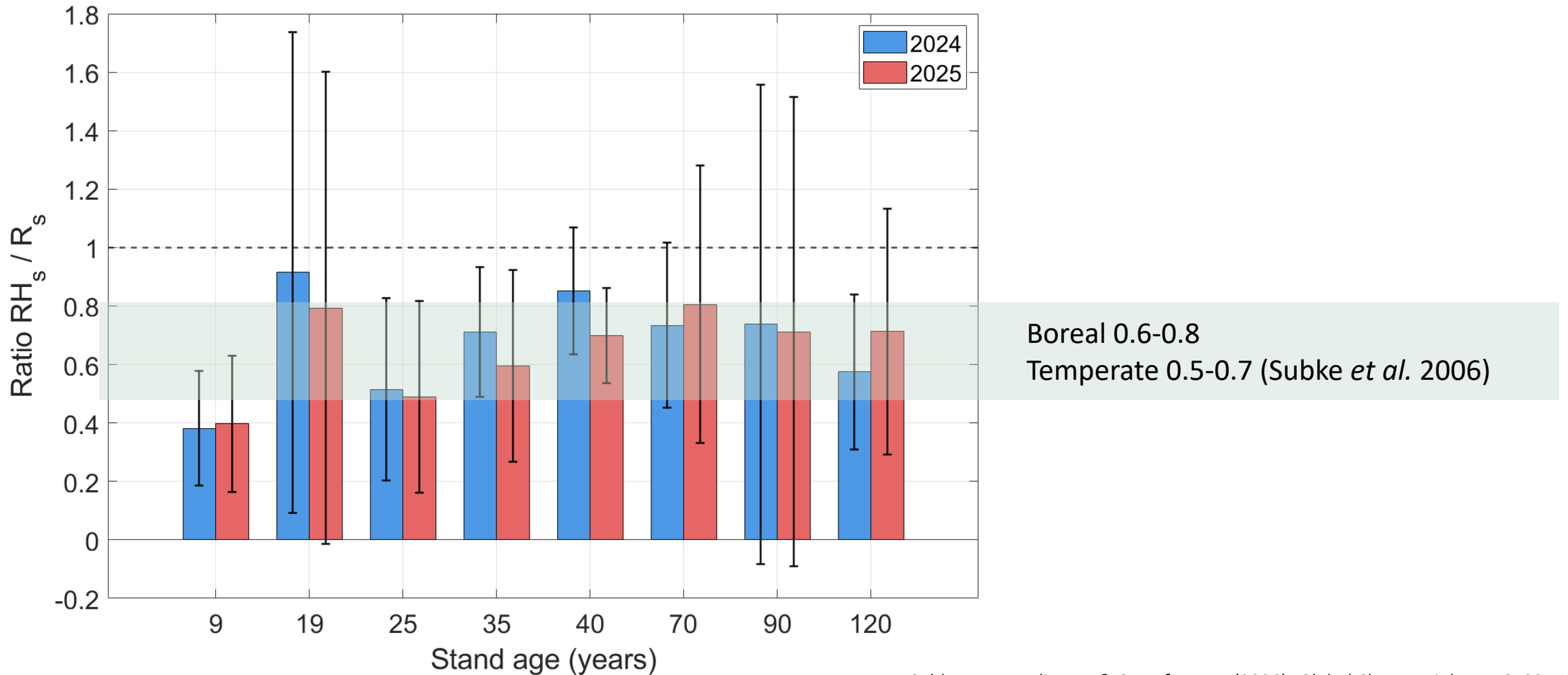


2025 annual sum of emitted carbon from heterotrophic soil respiration ( $RH_s$ ) and heterotrophic forest floor respiration ( $R_{ff}$ )

# Spruce forests in southern Sweden in comparison



# Stand development shifts soil respiration balance



# Next steps

- Carbon and Nitrogen content
- Litterfall
- Estimation of tree NPP
- Estimation of mycorrhizal and fine root NPP
- Finally: determine the variation of the net carbon ecosystem productivity from initiation to mature forests



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**Thank you**

**Contact**

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**Field sites**

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**Infrastructure &  
research environments**

ICOS, BECC and MERGE

