

How do arbuscular vs. ectomycorrhizal trees and site-specific variations affect soil organic matter pools?

Andrea Koplitz-Weißgerber



Dr. Alix Vidal



Dr. Carsten W. Mueller



Dr. Franz Bruegger



Tarquin Netherway

Project overview

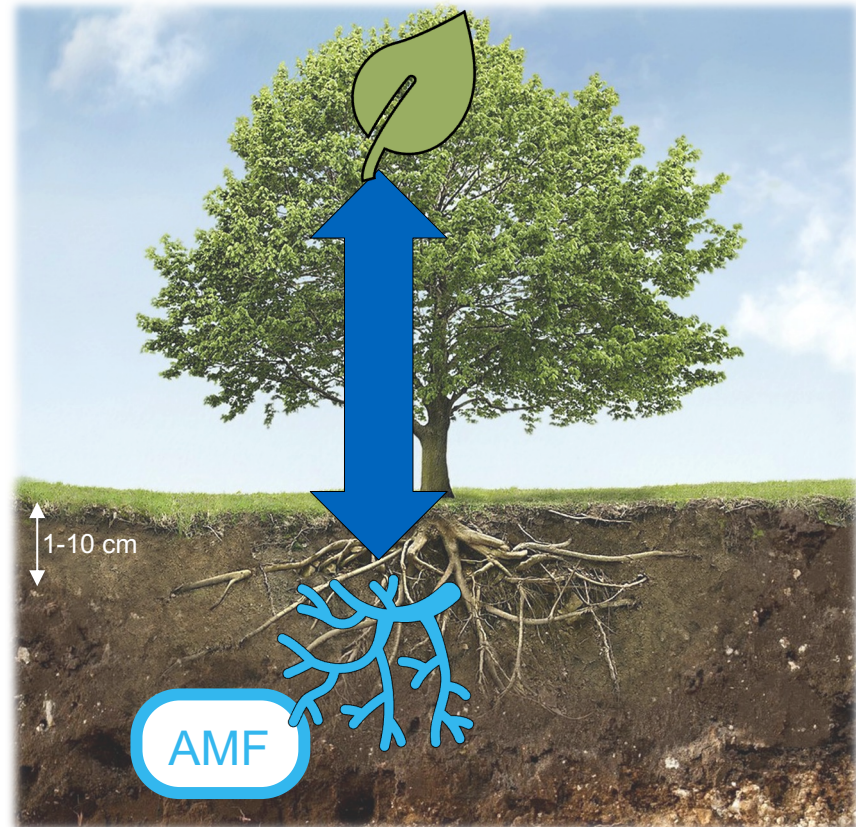
Interaction of mycorrhizal type
with plant functional traits
→ distinct cycling & dynamics



Cereal Crop Fields

AMF:

→ Fast degradation of SOM
→ More **MAOM**



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Project overview

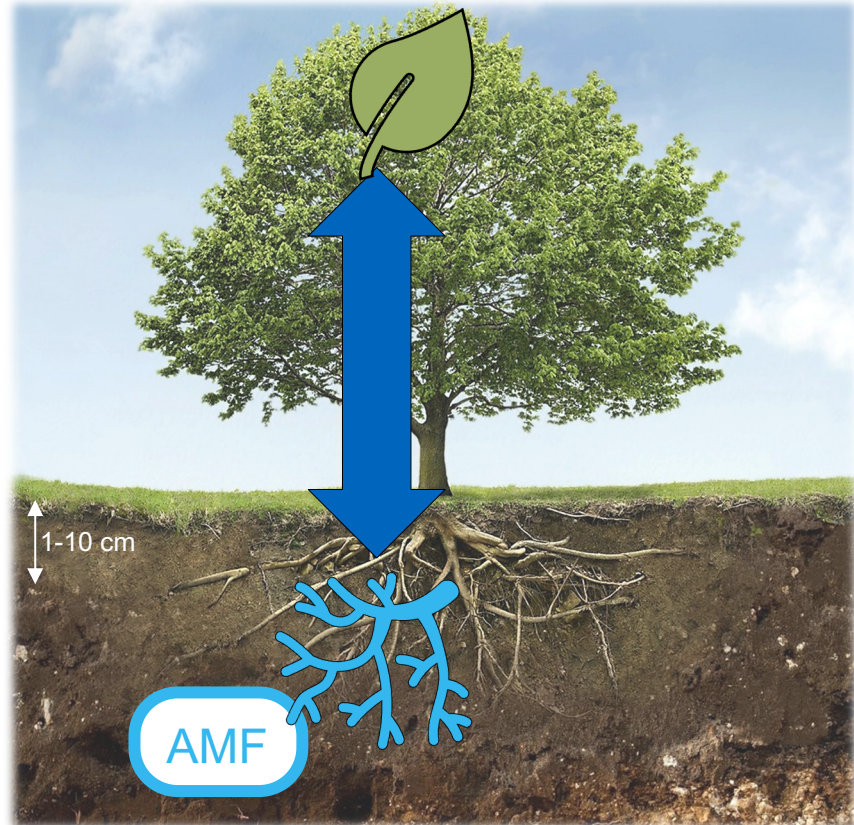
Interaction of mycorrhizal type
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Fraxinus excelsior
European Ash

AMF:

→ Fast decomposition of SOM
→ More **MAOM**

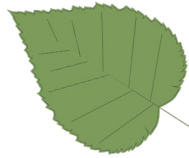


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Project overview

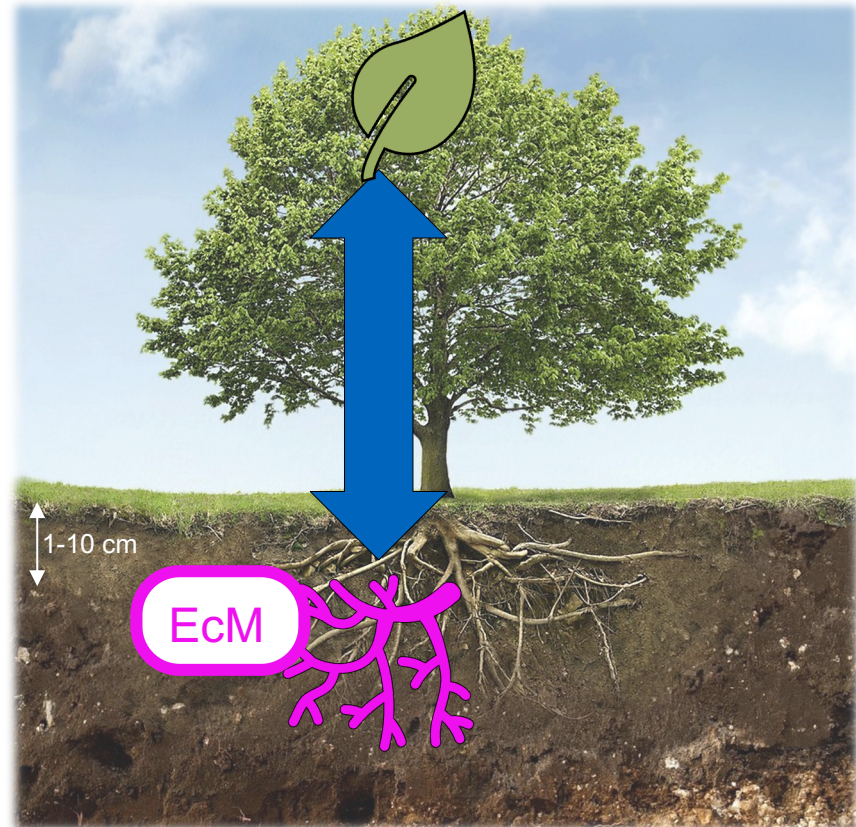
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Betula pendula
Silver birch

EcM:

→ Slow decomposition of SOM
→ More **POM**



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Project overview

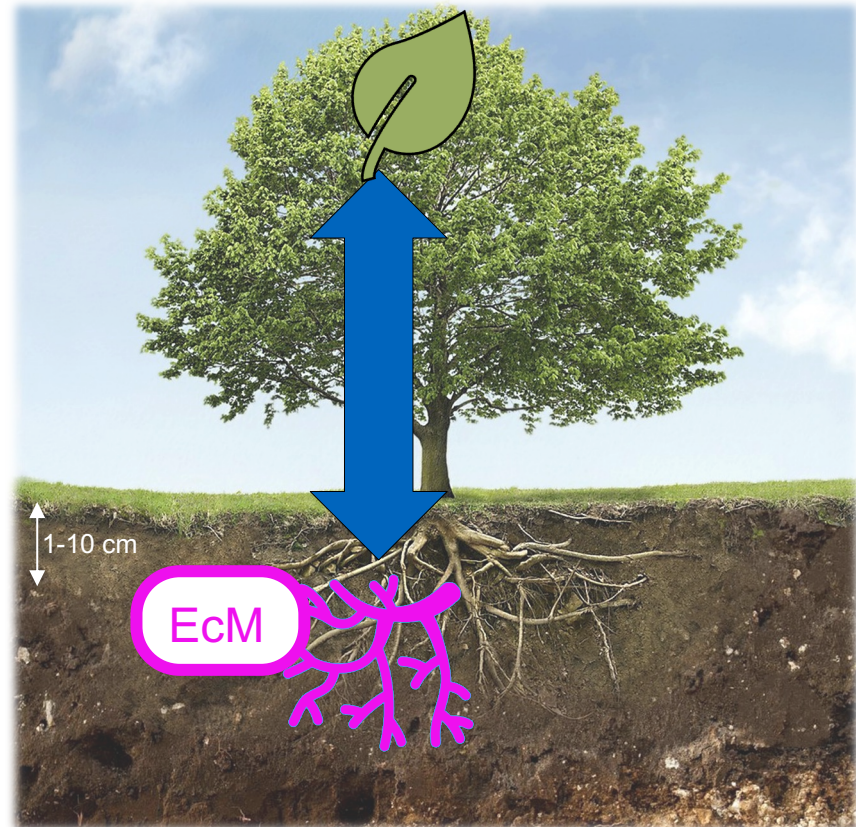
Interaction of mycorrhizal type
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**Mixed Mature
Broadleaf Patches**

EcM dominated association

→ Higher fungal biomass
→ More **POM**



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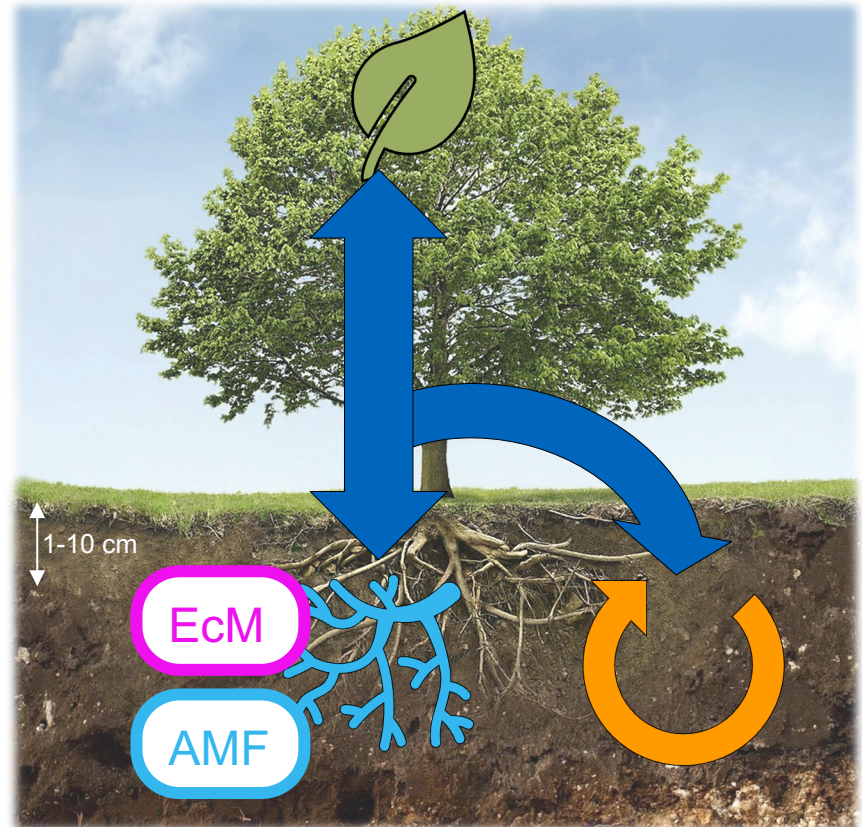


Project overview

Interaction of mycorrhizal type
with plant functional traits
→ distinct cycling & dynamics

Influencing structure & function
of soil microbial communities

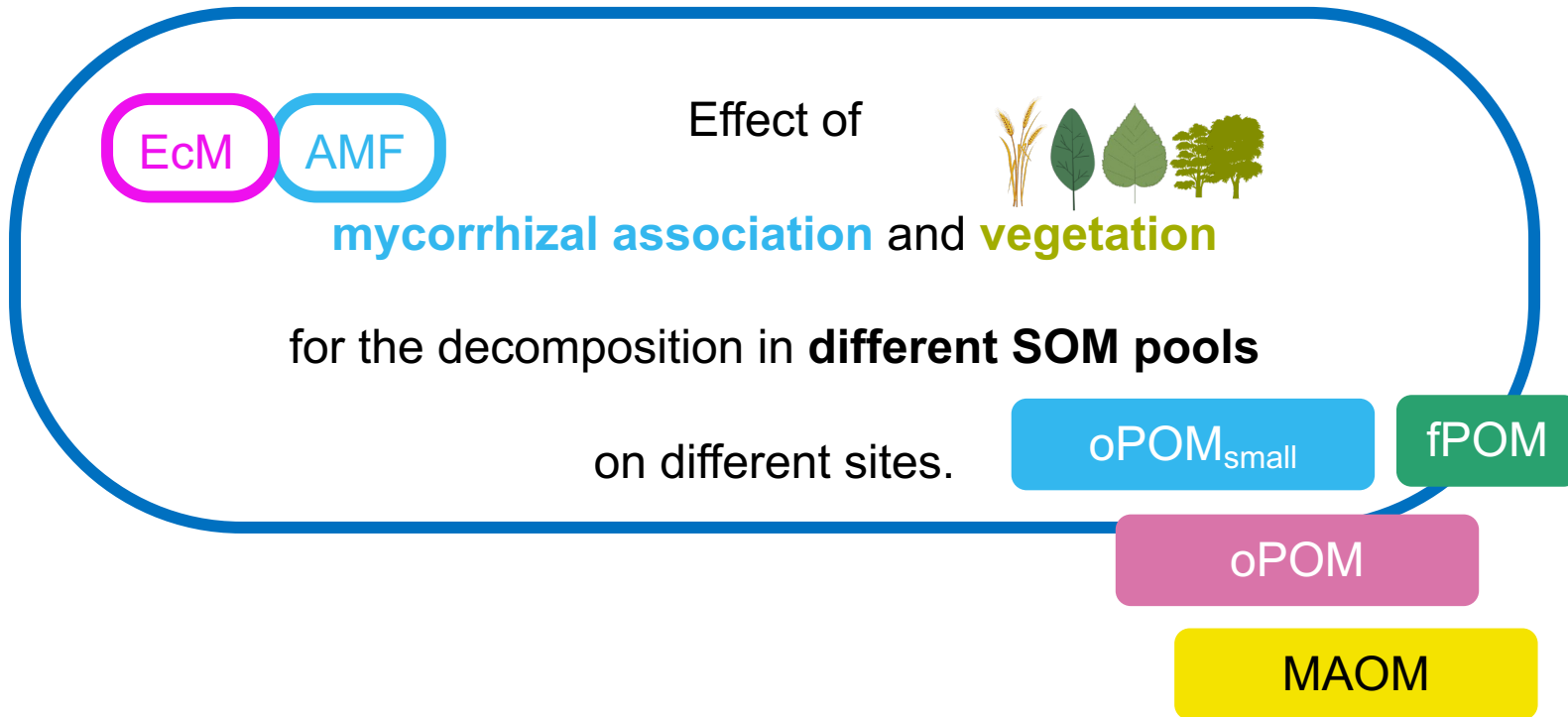
Influencing soil properties &
soil organic matter pools



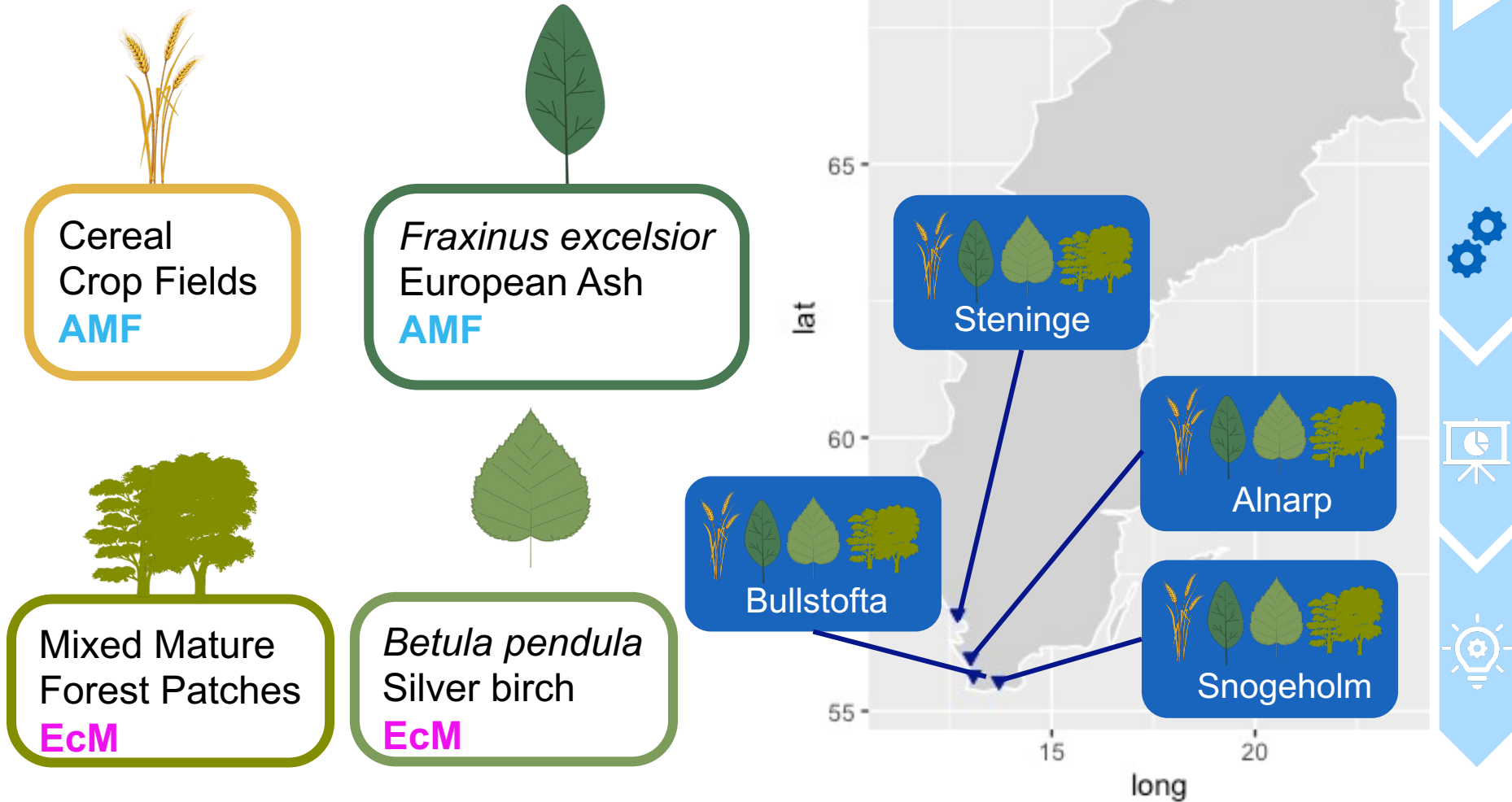
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Specific Hypothesis



Location and Sampling



Fractionation and analyses

- Density fractionation (Sodium Polytungstate; 1.8 g m^{-3})
- Wet sieving
- 5 fractions (SOM Pools)

fPOM

oPOM

oPOM_{small}

MAOM

MAOM_{small}

mass distribution



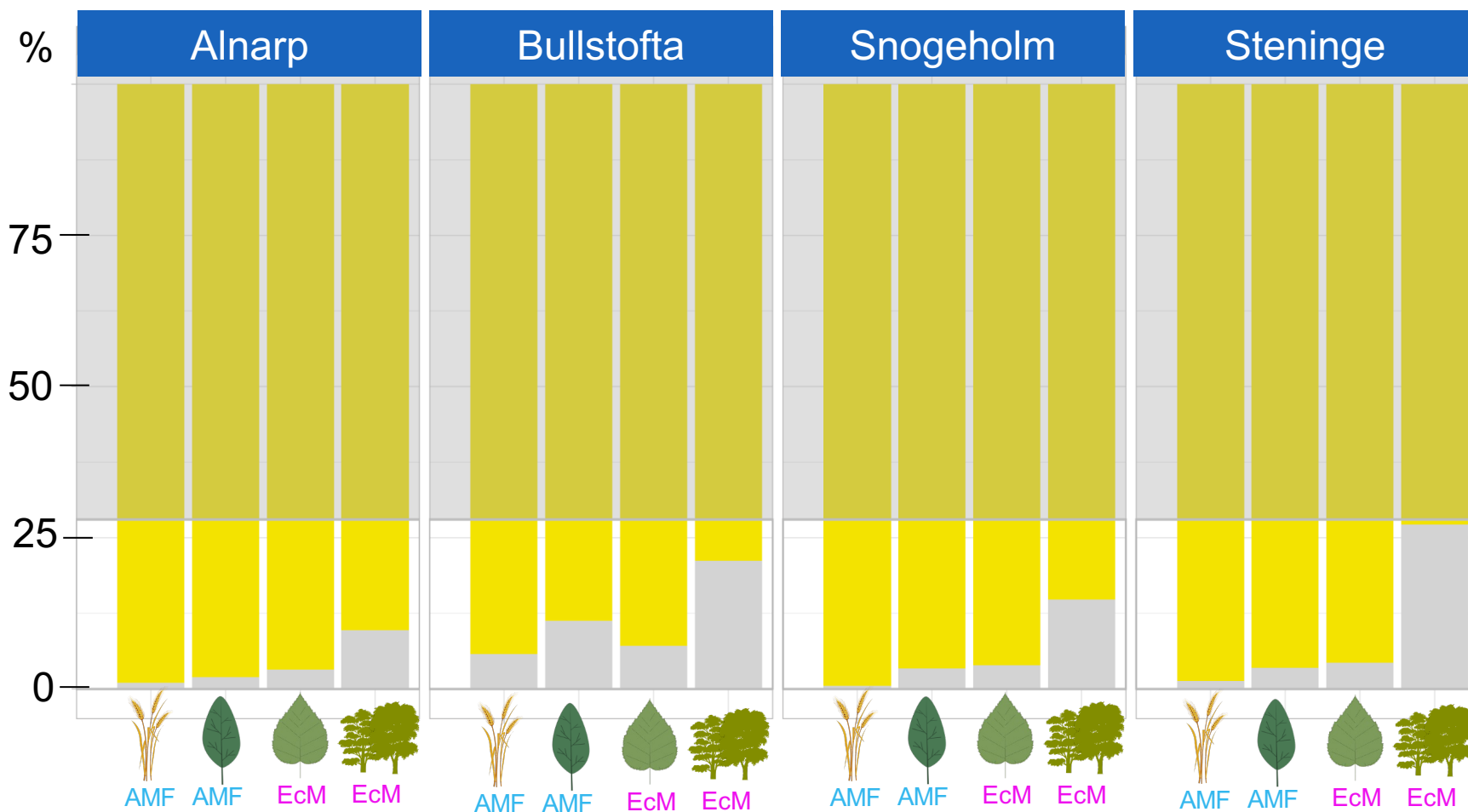
$\delta^{13}\text{C}$ and C and N content



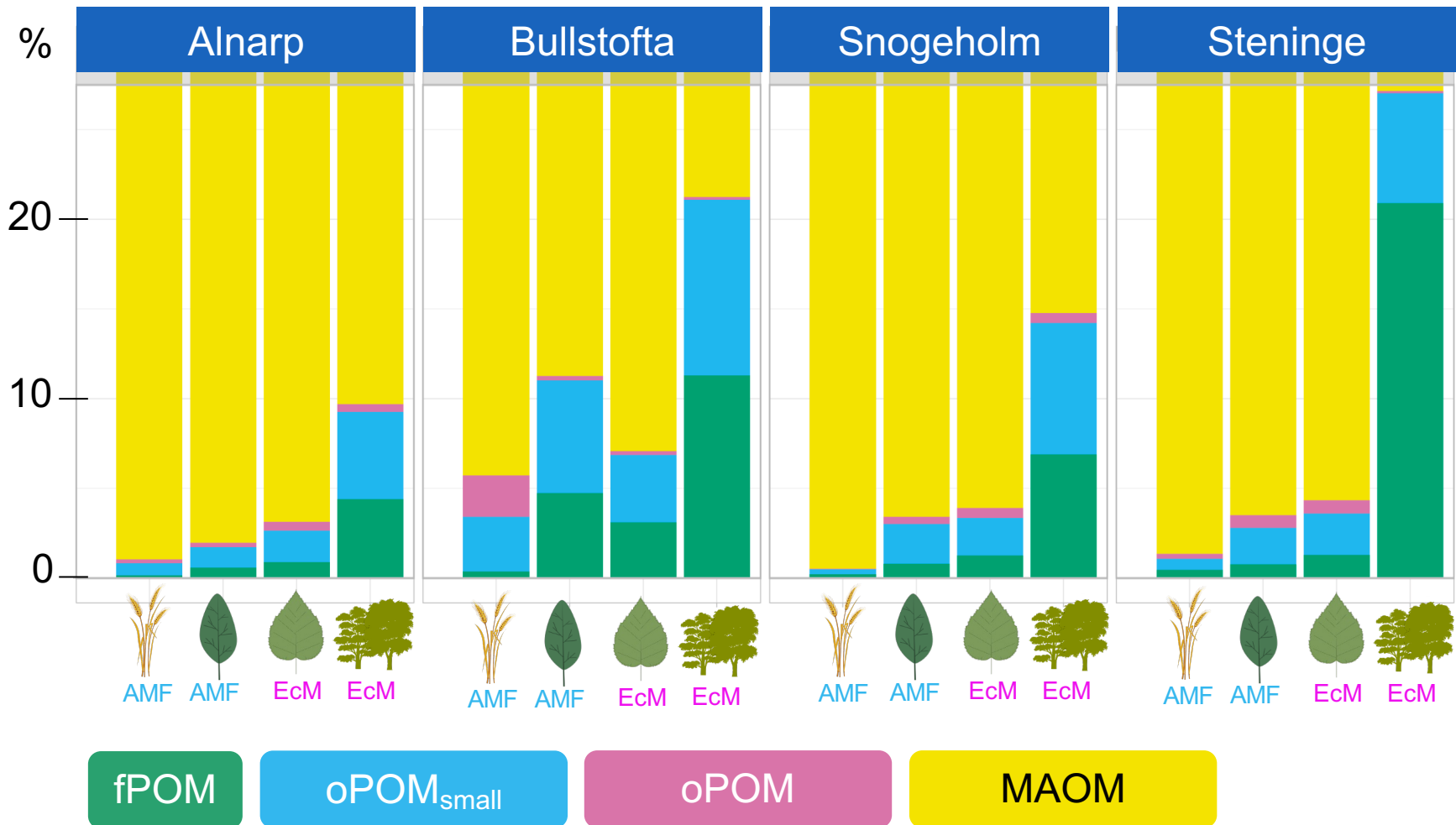
Preliminary Results

POM

MAOM

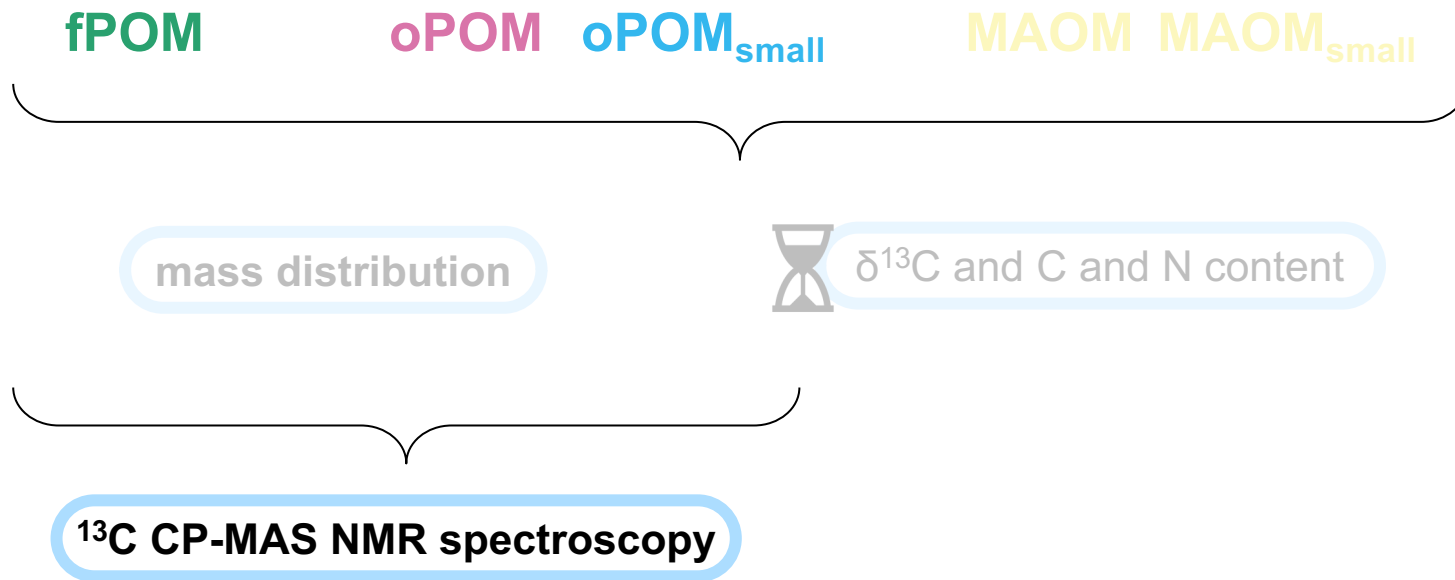


Preliminary Results



Fractionation and analyses

- Density fractionation (Sodium Polytungstate; 1.8 g m^{-3})
- Wet sieving
- 5 fractions (SOM Pools)



Preliminary Results

oPOM_{small}

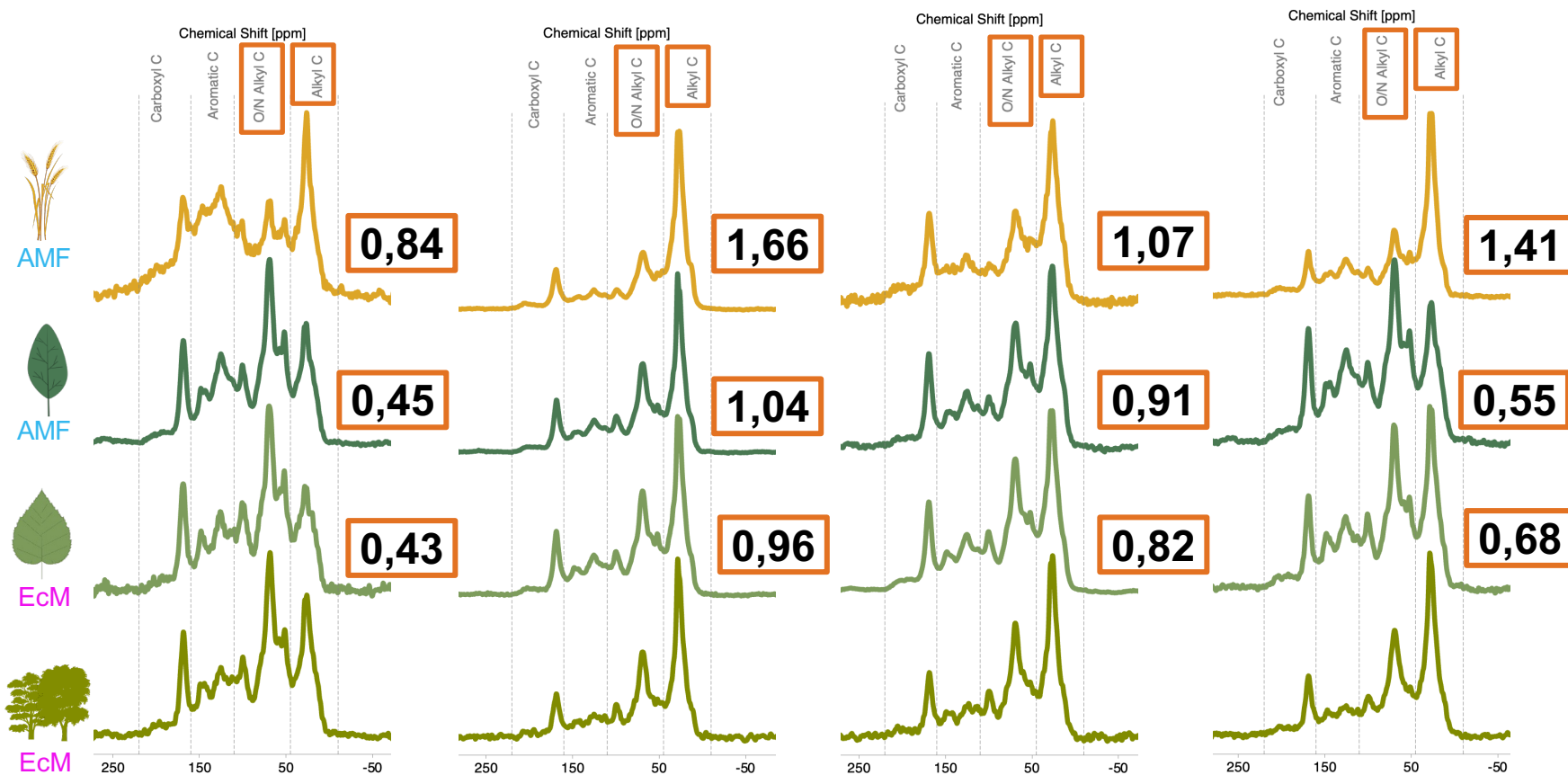
$$\frac{\text{Alkyl C}}{\text{O/N Alkyl C}}$$

Alnarp

Bullstofta

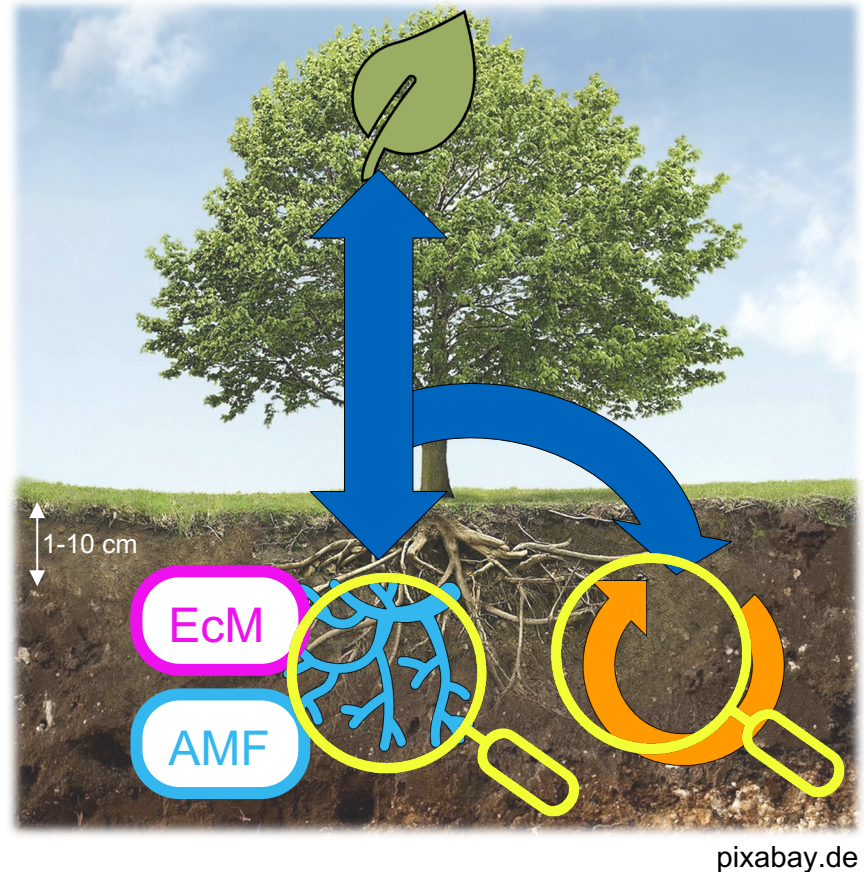
Snogeholm

Steninge



Conclusions and Outlook

- Different POM distribution between AMF & EcM systems
- Driven by tree functional traits and site variations
- Different decomposition of SOM



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References

- Witzgall et al.: Particulate organic matter as a functional soil component for persistent soil organic carbon. Nature Communications. 2021; 12 (1): 4115.
- Baldock et al.: Assessing the extent of decomposition of natural organic materials using solid-state ^{13}C NMR spectroscopy. Soil Research. 1997; 35: 1061-1084.
- Netherway et al.: Biotic interactions with mycorrhizal systems as extended nutrient acquisition strategies shaping forest soil communities and functions. Basic and Applied Ecology. 2021; 50: 25-42.

