Relation between water-use efficiency and nutrient availability in European semi-natural ecosystems

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Motivation

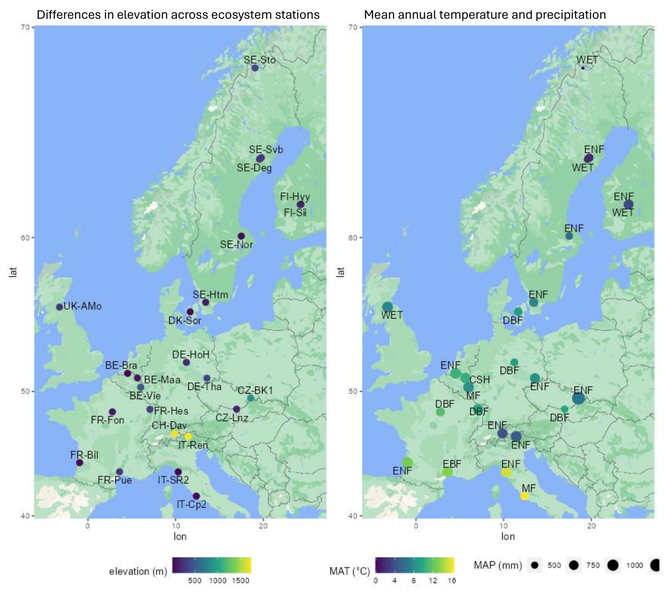
- Plant ecosystems respond to immediate meteorological conditions but their performance is also modulated by nutrient availability (NA) over longer time scales
- This preliminary analysis evaluates the existing variation in NA across selected stations and the feasibility to identify relationships between ecosystem performance and NA

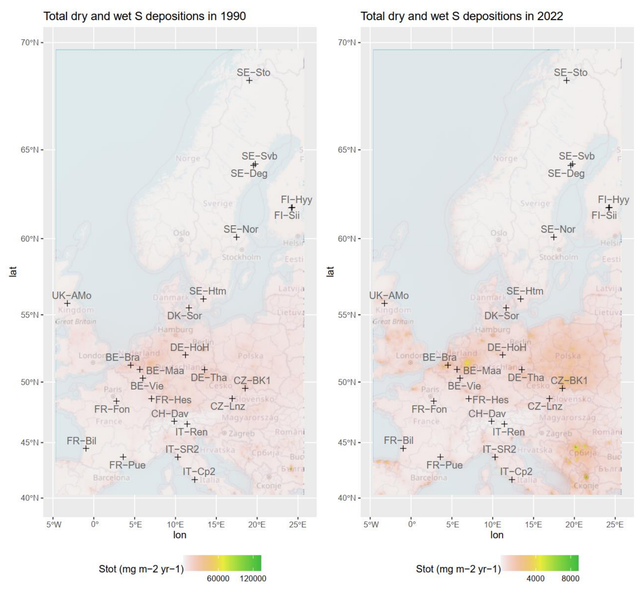
Methods

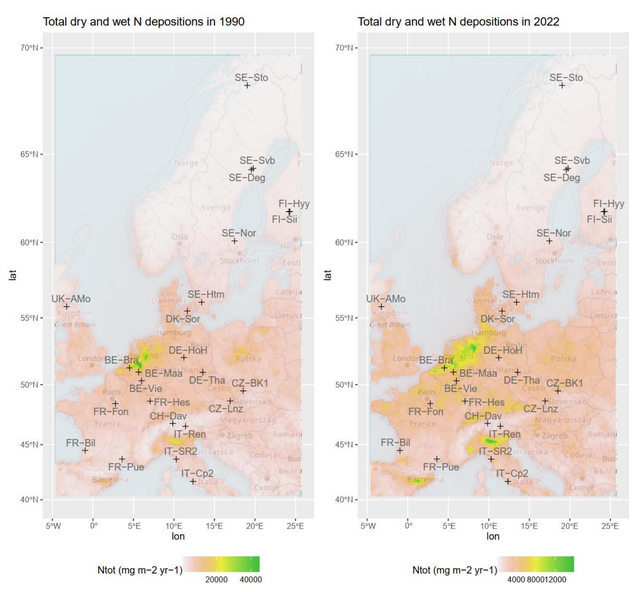
- All seminatural Class 1 & 2 ICOS ecosystem stations were selected for the analysis
- Underlying WUE is used as an indicator of ecosystem fitness and performance
- Leaf nutrient analysis is available for all Class 1 & 2 ICOS ecosystem stations (unified sampling protocol)
- Wet and dry S and N depositions come from public EMEP MSC-W model results (www.emep.int)

Summary

- We show that the network samples across a gradient of meteorological conditions and contrasting S and N depositions
- While total deposition load decreased considerably since 1990 there are still large spatial differences
- Out of four analyzed leaf nutrients (C, N, P, Ca), WUE_u positively scaled mainly with N and Ca





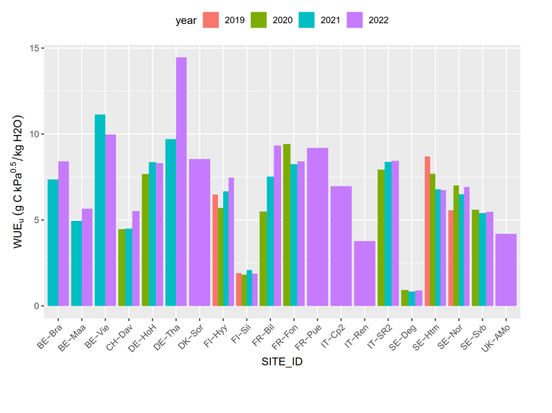


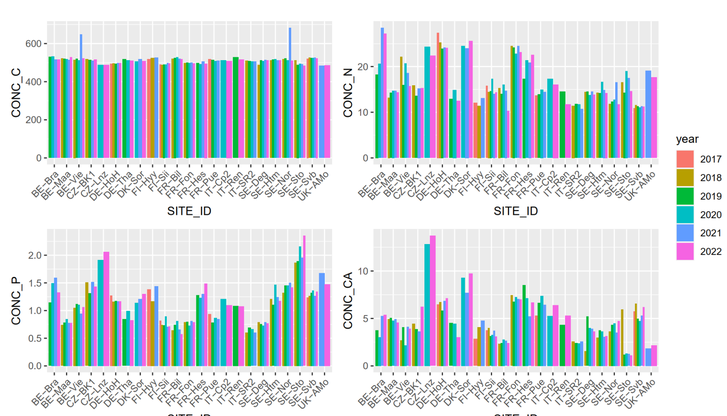
Ecosystem types

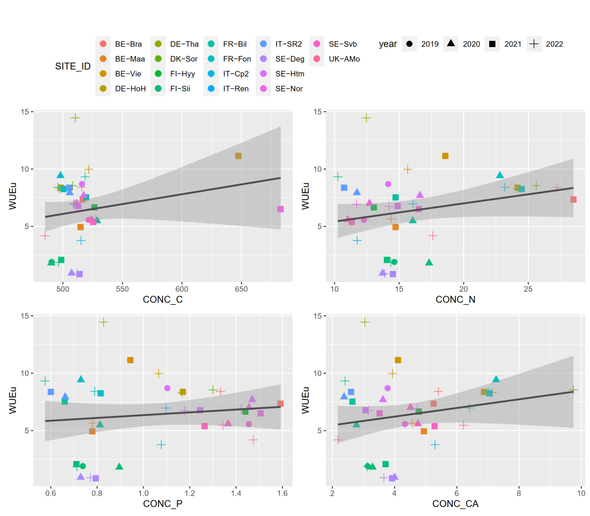
- Closed shrubland: Be-Maa
- Deciduous broadleaf: 5 (FR, DK, DE, CZ)
- Evergreen broadleaf: Fr-Pue
- Evergreen needleleaf: 11 (IT, SE, FR, DE, CZ, BE, FI, CH)
- Mixed forest: BE-Vie, IT-Cp2
- Wetland: FI-Sii, SE-Deg, SE-Sto, UK-AMo

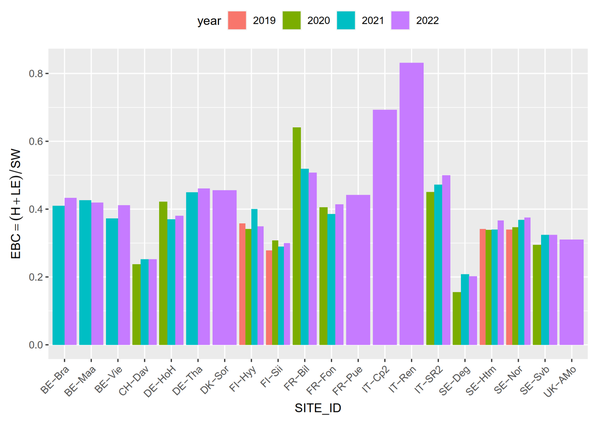
Occurence of species across sites

- 8 sites: *Picea abies*
- 4 sites: *Carpinus betulus*, *Fagus sylvatica*, *Eriophorum vaginatum*, *Pinus sylvestris*, *Quercus petraea*









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