



iDiv

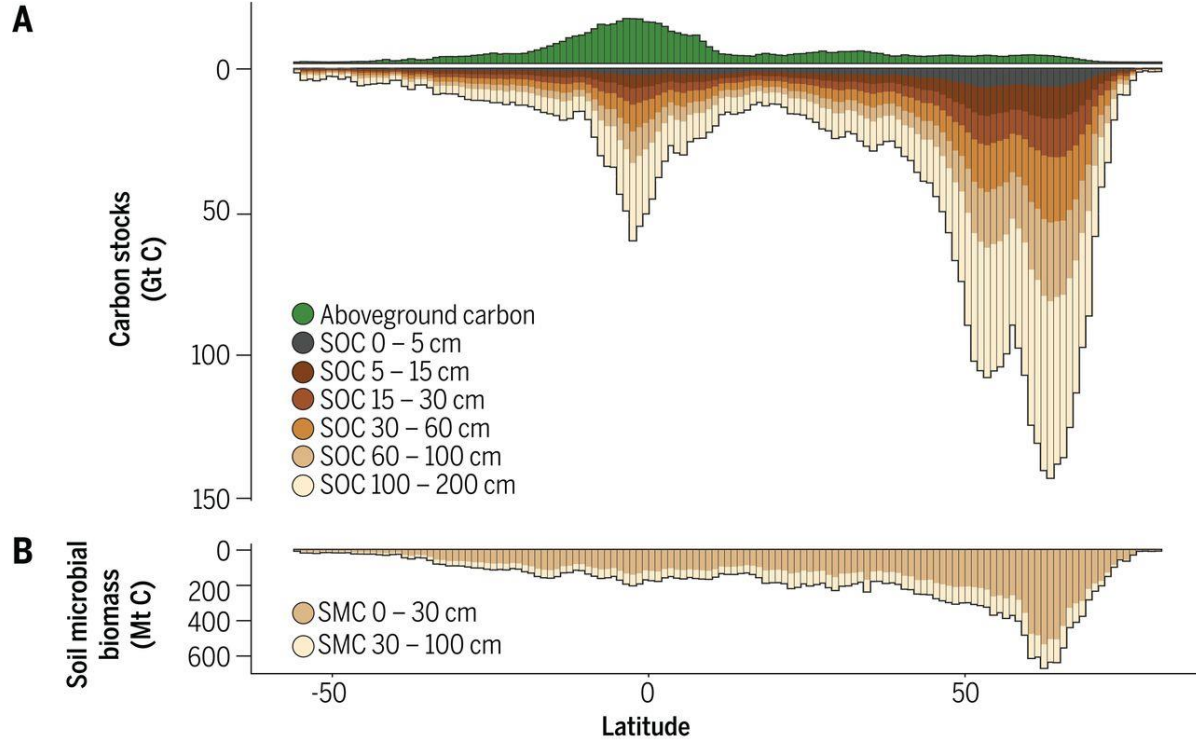
German Centre for Integrative Biodiversity Research (iDiv)
Halle-Jena-Leipzig

Microbial controls of carbon stocks across European soil systems

Linnea Smith, Nico Eisenhauer, Carlos Guerra

21 October 2021

Young Soil Researchers Forum



Crowther *et al.*, 2019, Science

Variation in patterns

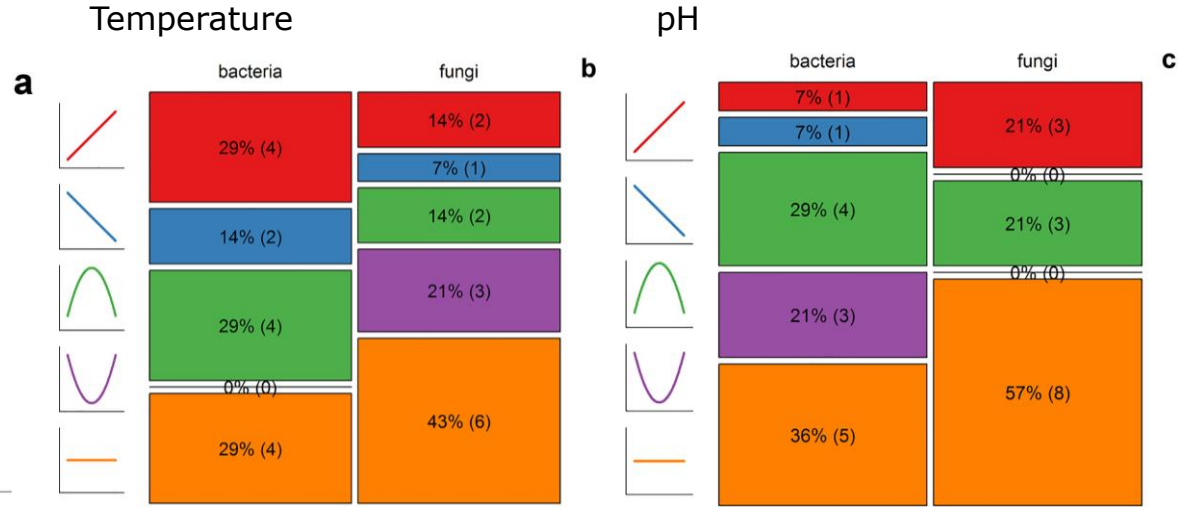
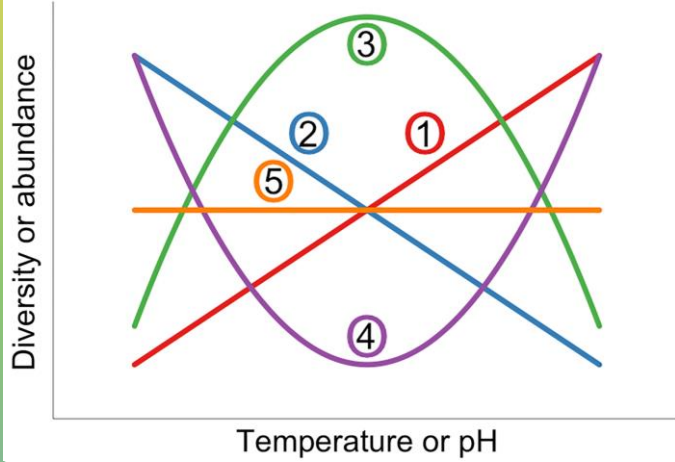


Fig. 2, Hendershot *et al.*, 2017. Ecology.

Variation in patterns

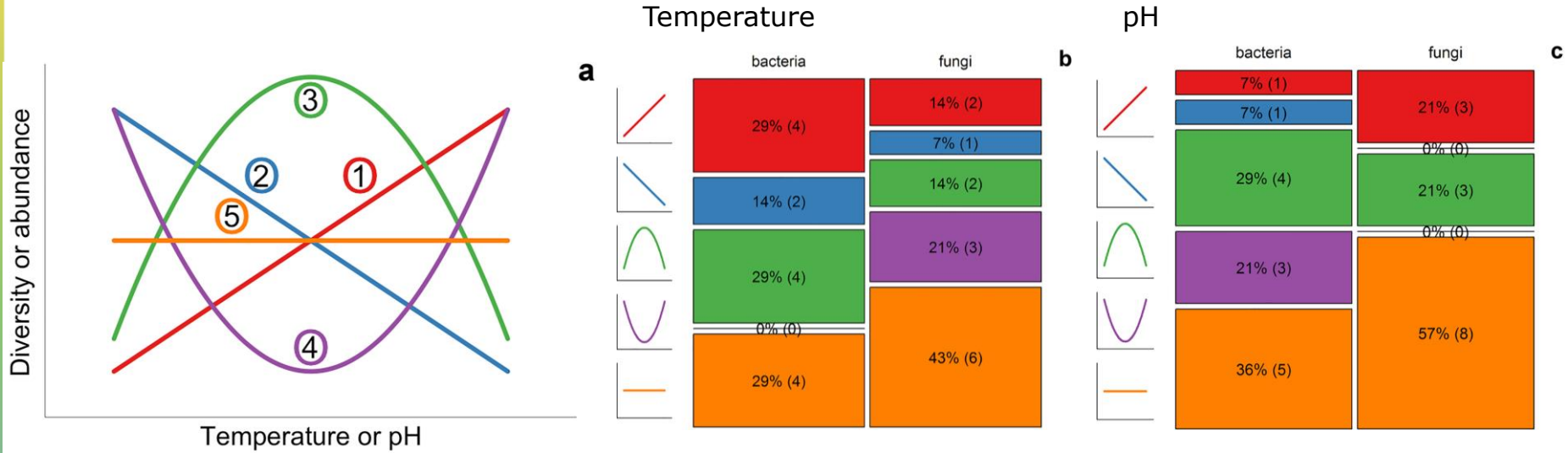
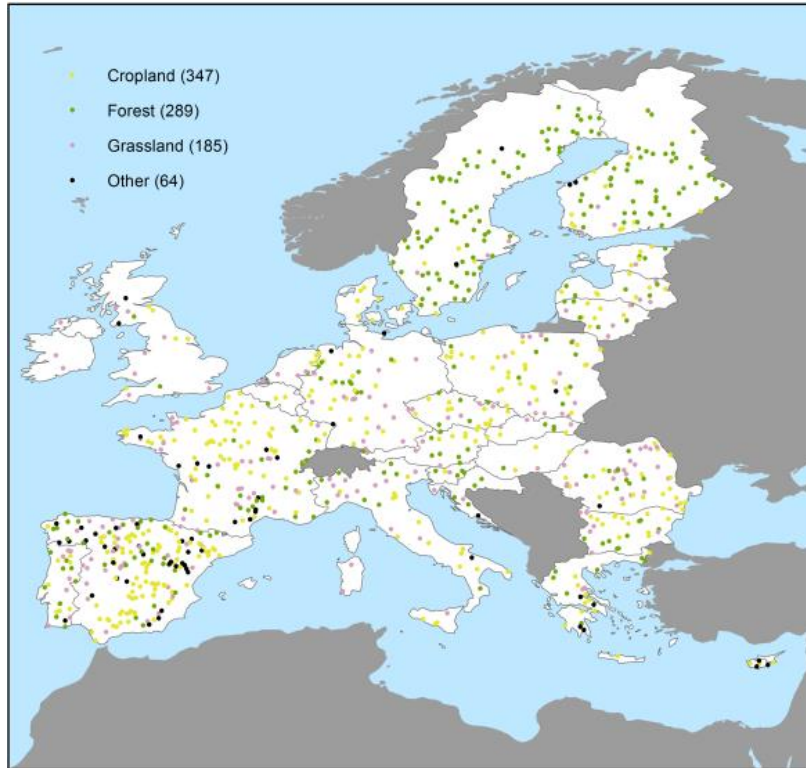


Fig. 2, Hendershot *et al.*, 2017. Ecology.

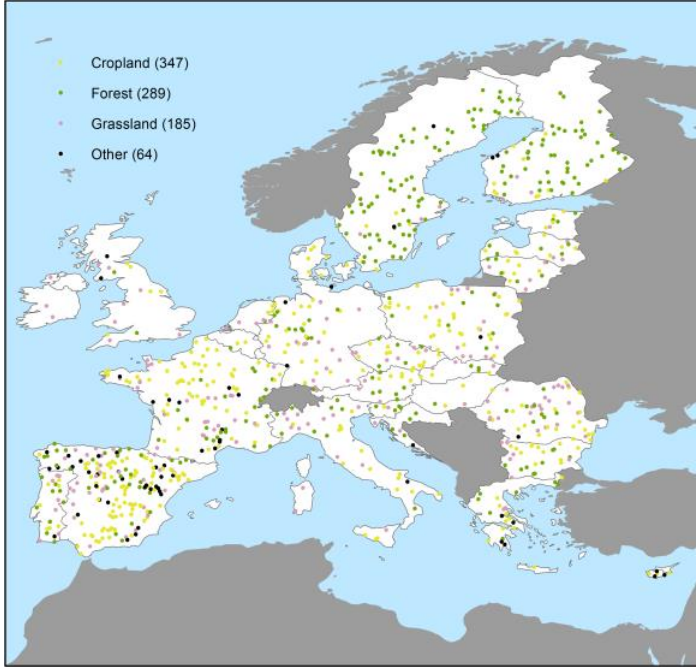
→ **Land cover type?**

Sample Sites

Land Use and Coverage Area frame Survey



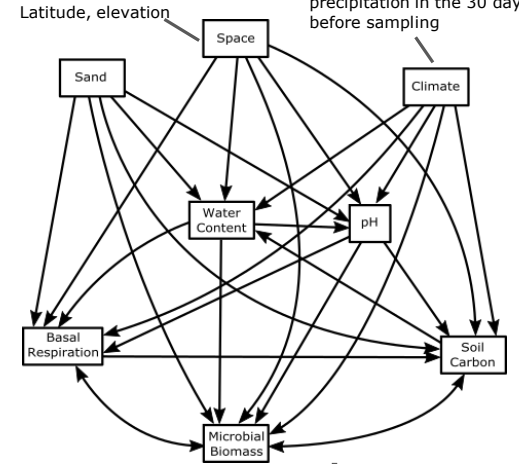
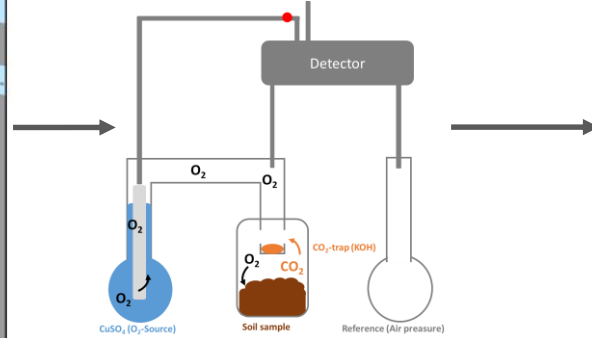
Sample Sites



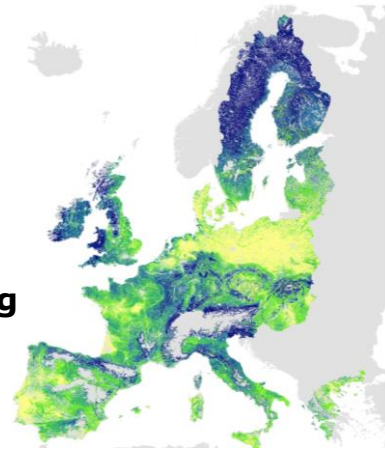
Structural Equation Modeling

Mean annual temperature and precipitation
 Mean temperature and sum of precipitation in the 30 days before sampling

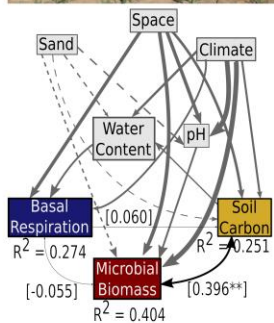
O₂ Microrespiration Substrate-induced respiration



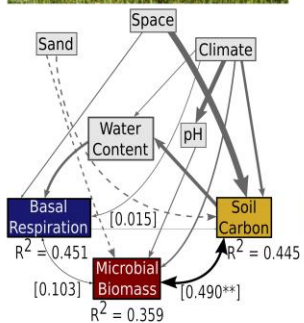
Predictive Mapping



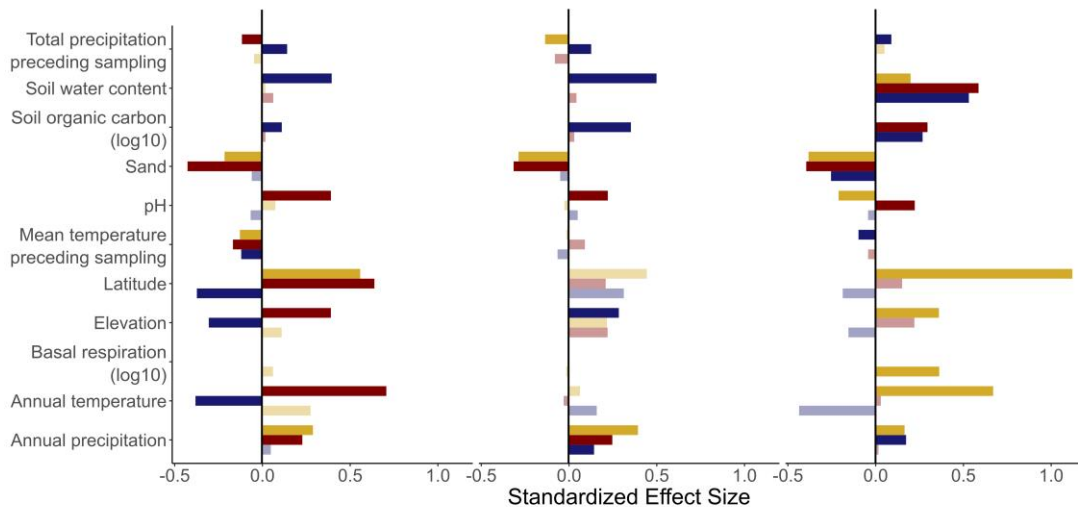
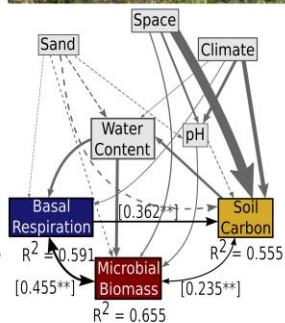
A) Cropland



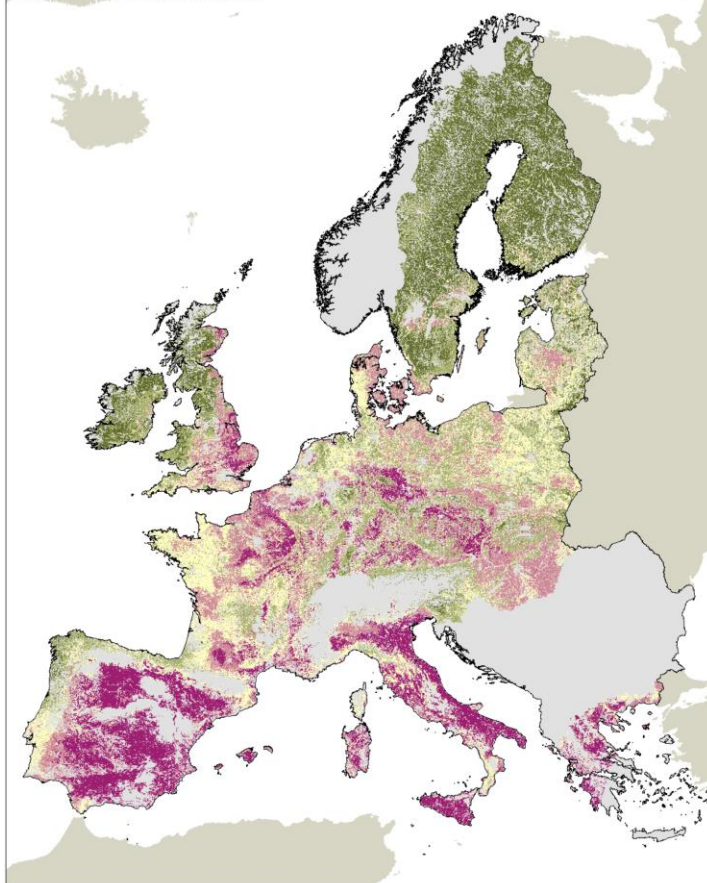
B) Grassland



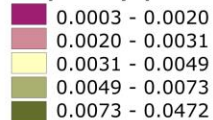
C) Forest



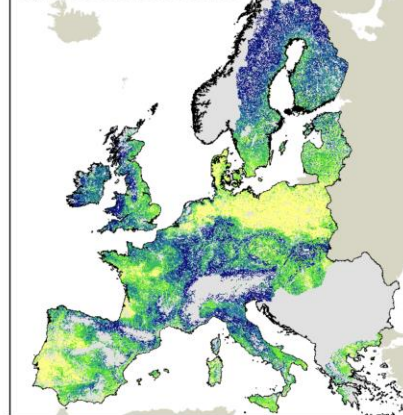
a) Respiratory quotient



Respiratory quotient

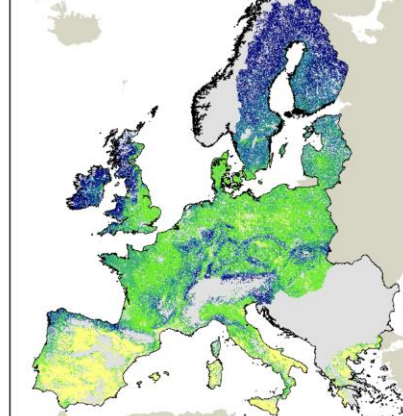


b) Microbial biomass



[$\mu\text{g C}_{\text{mic}} / \text{g soil dry weight}$]

c) Potential basal respiration

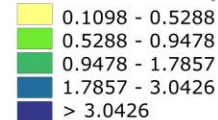


[$\mu\text{L O}_2 / (\text{h} * \text{g soil dry weight})$]

Microbial biomass



Potential basal respiration



Conclusions

- Microbial communities under different land-cover regimes subject to different environmental drivers
- Decoupling and vulnerability to climate change

Full study: Smith *et al.*, 2021. *Global Ecology and Biogeography*

Thank you to...

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