



Subsidiary, but diverse: understorey vegetation depends on disruptions of the competitive hierarchy

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¹ Hochschule Weihenstephan-Triesdorf, Freising

1. Introduction
2. Calciphytic Mountain Forests (Alps)
3. Acidophytic Mountain Forests (Bohemian Massif)
4. Conclusions

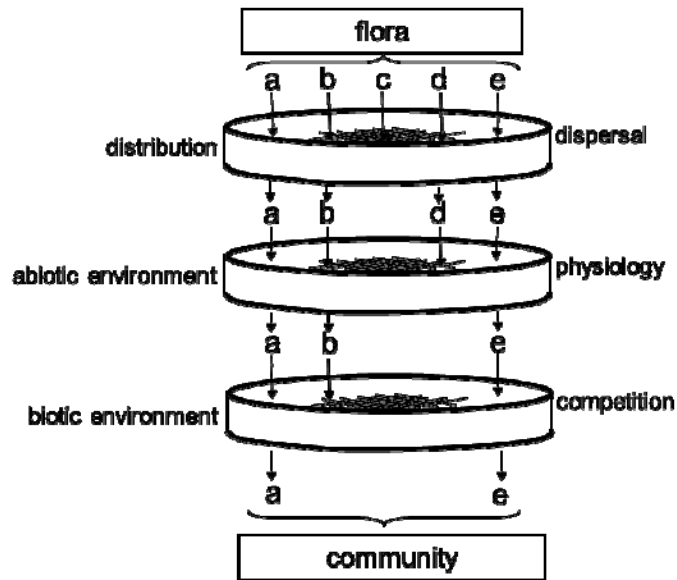


Plant species richness in forests

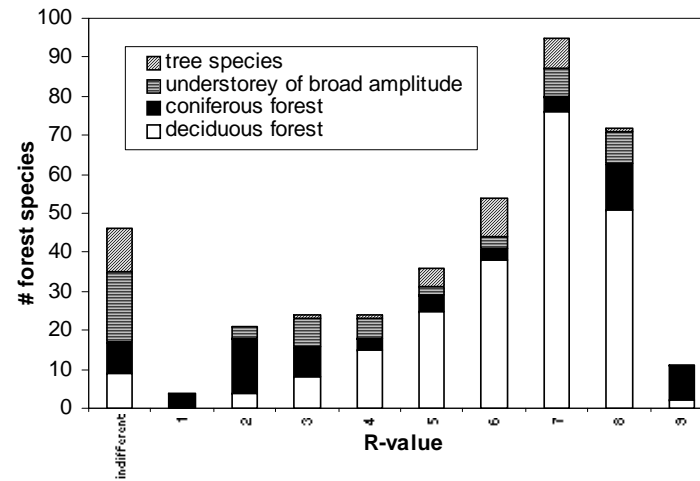
- species pool
- productivity
- disturbance
- plant size
- competitive hierarchy



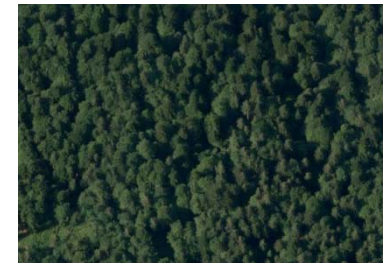
Species pool



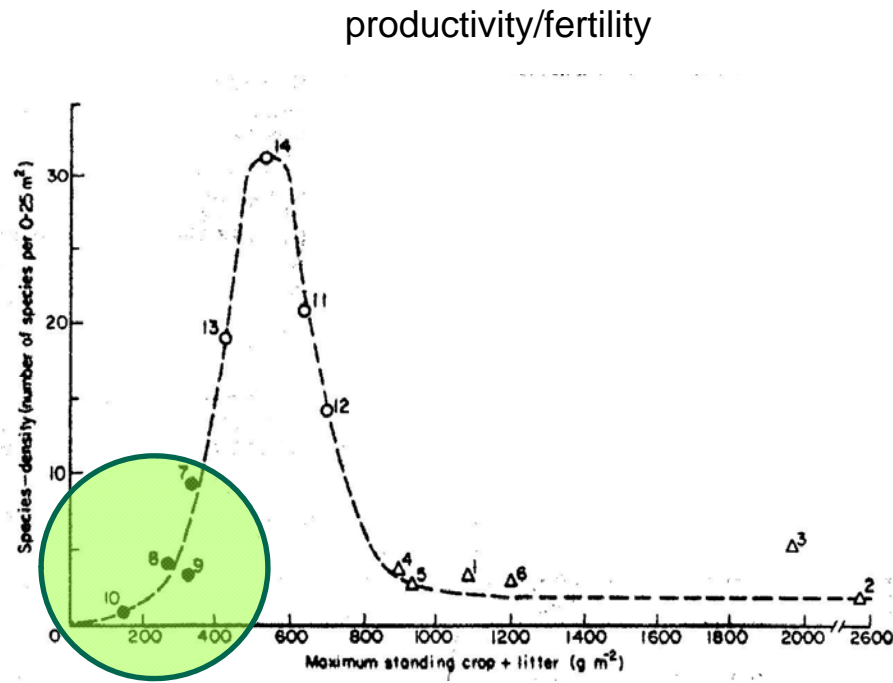
Ewald (2009): Laufener Spezialbeiträge



Ewald (2003): Folia Gebotnica

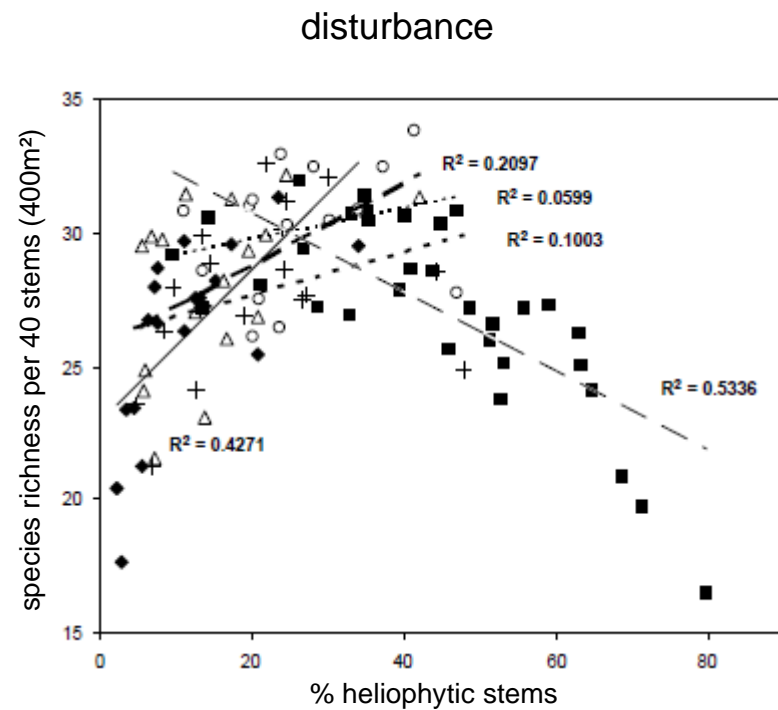


Plant species richness: a matter of humps?



woodland

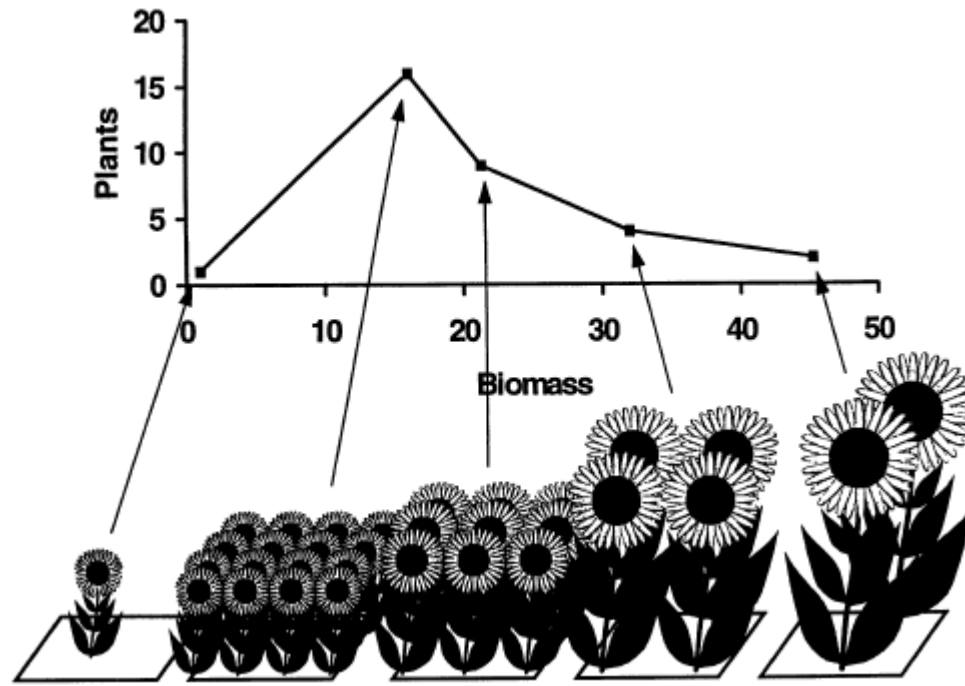
Al-Mufti et al. (1977): J. Ecol.



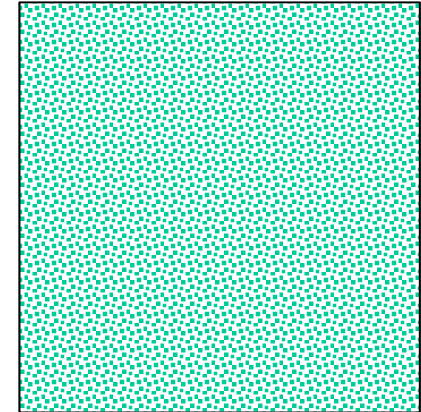
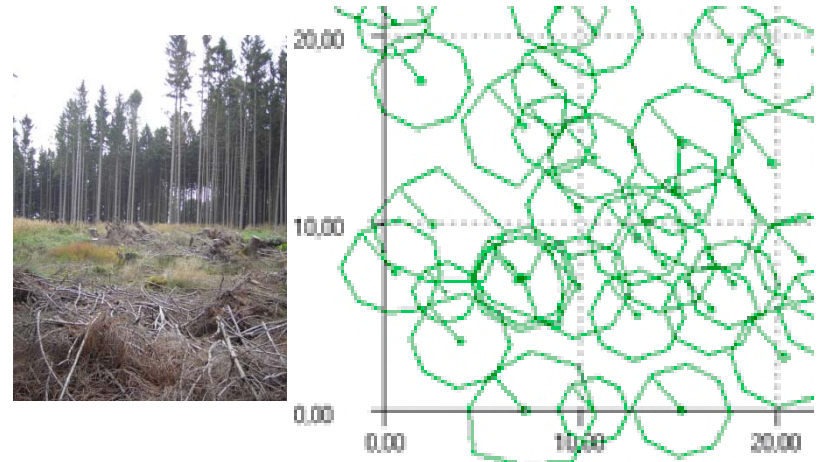
Molino & Sabatier (2001): Science



An artifact of plant size?



Oksanen (1996): J. Ecol.



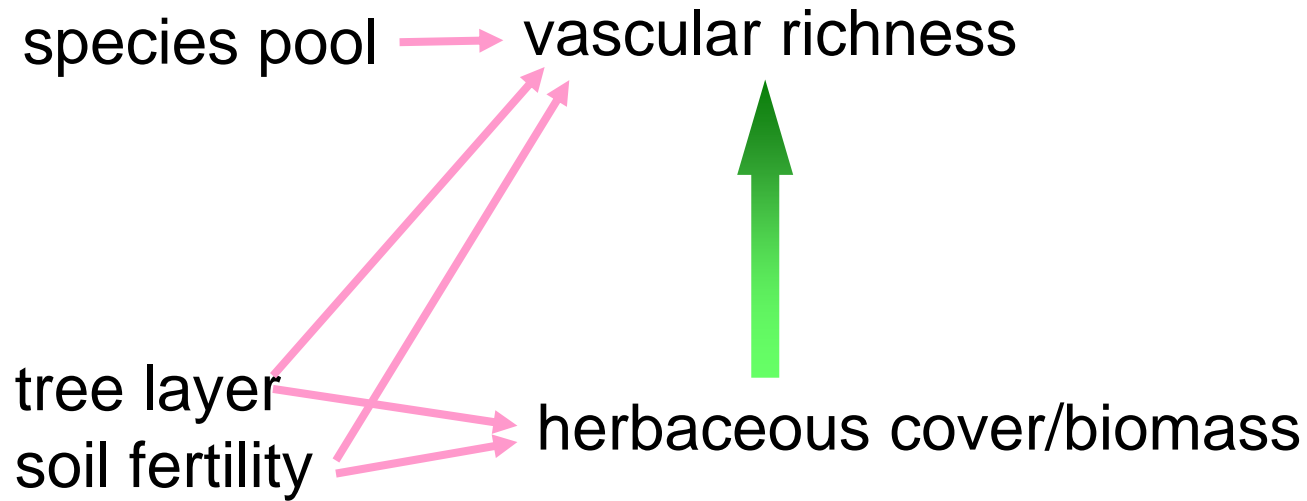


Competitive hierarchy

vertical structure
asymmetric competition
size difference
plant size
species richness

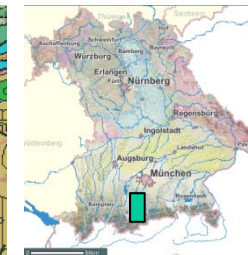
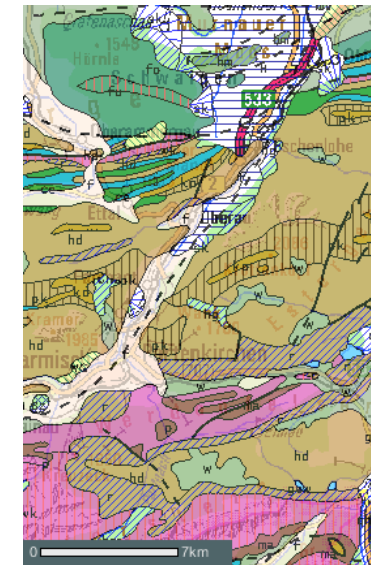
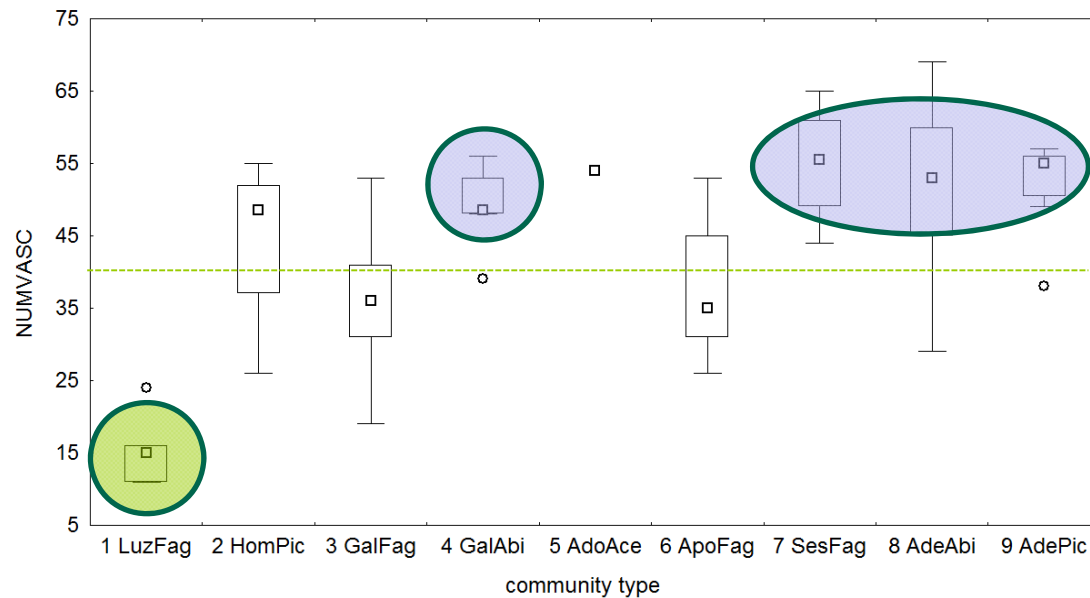
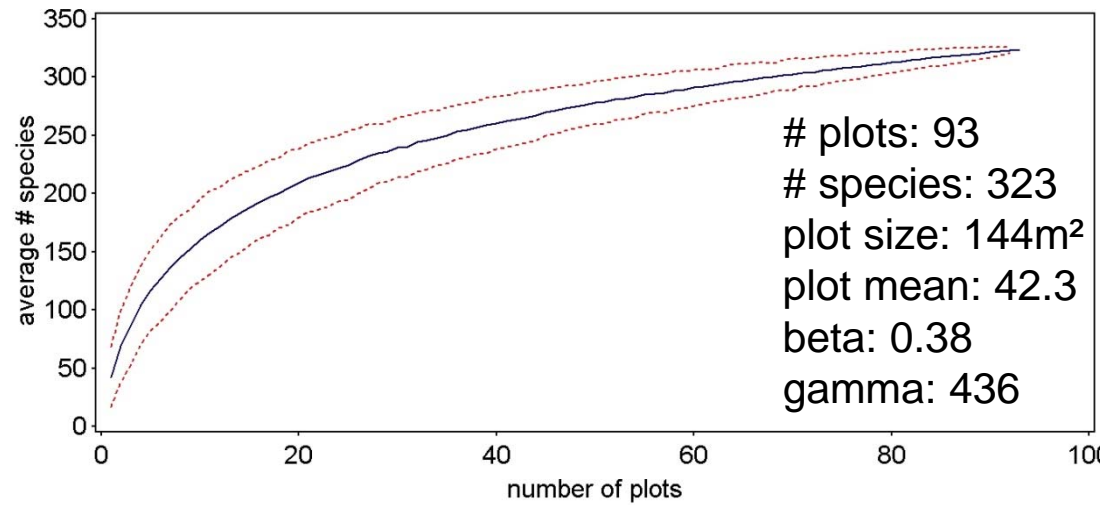


Path model



Ewald Neuschönau 2013

2. Calciphytic Mountain Forests (Alps)

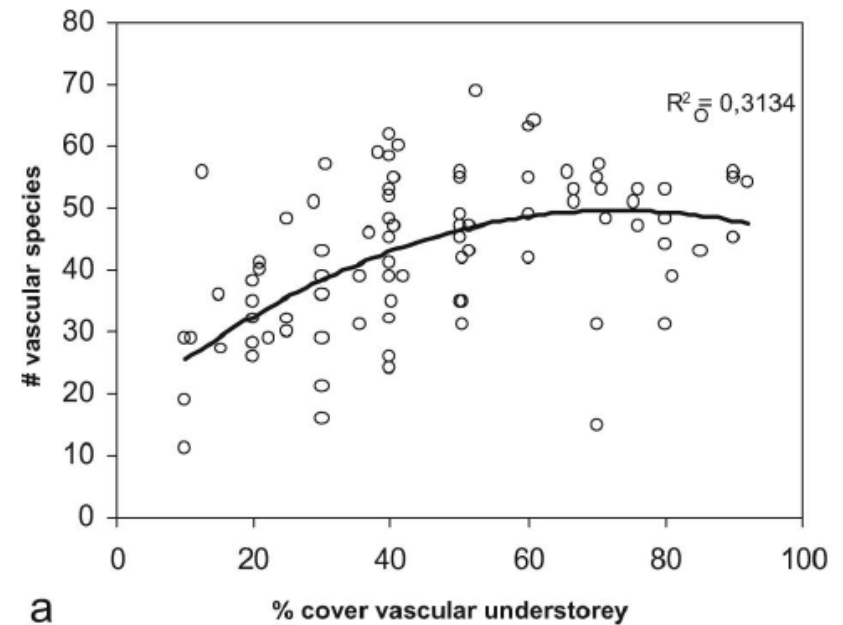
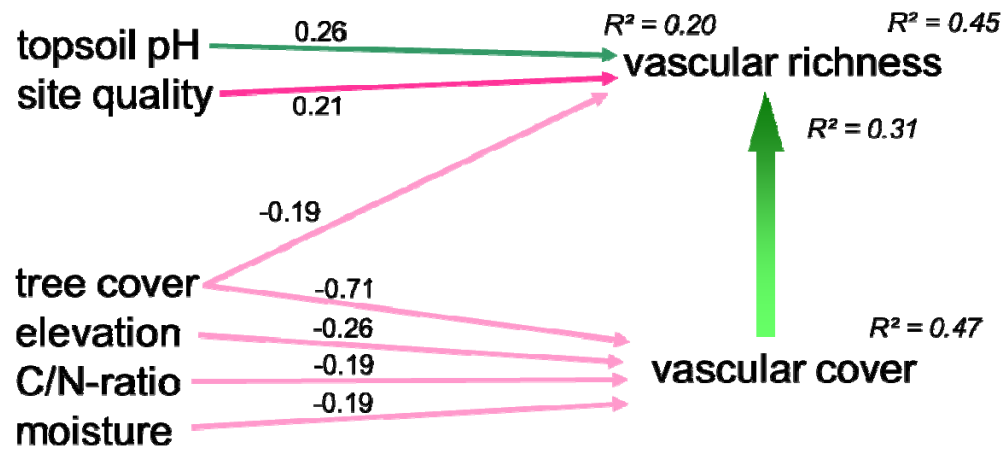


Ewald (2008): Plant biosystems
 Ewald Oldenburg 2015

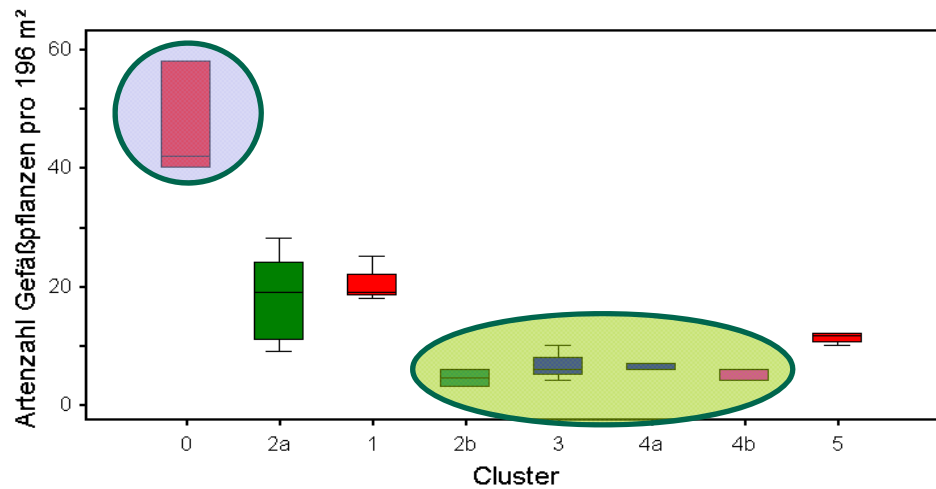
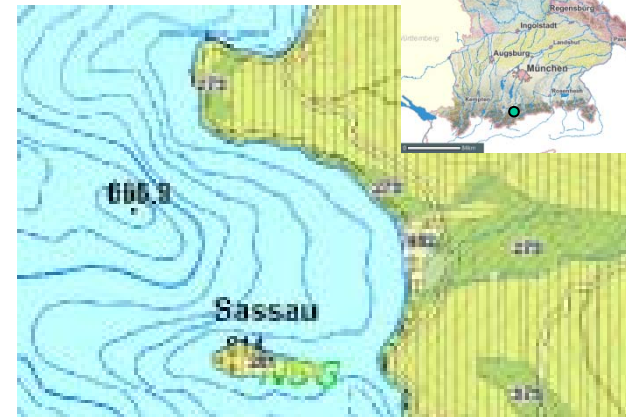
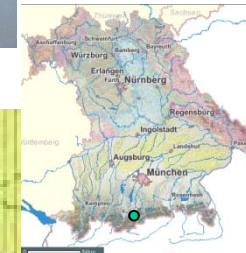
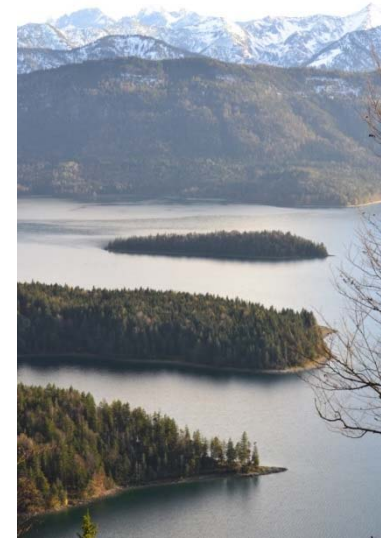
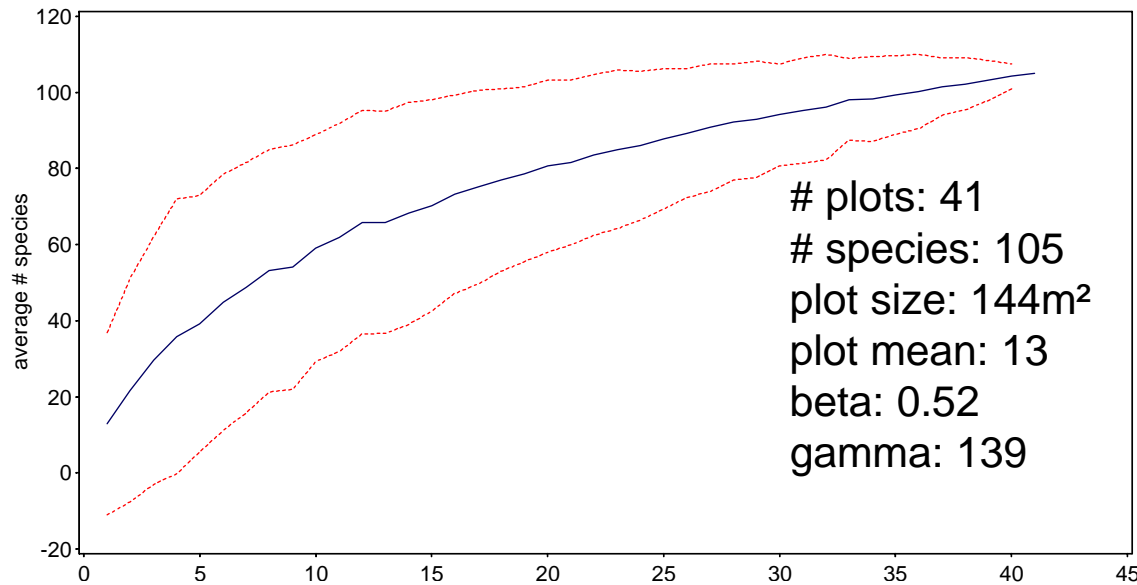




Control of species richness

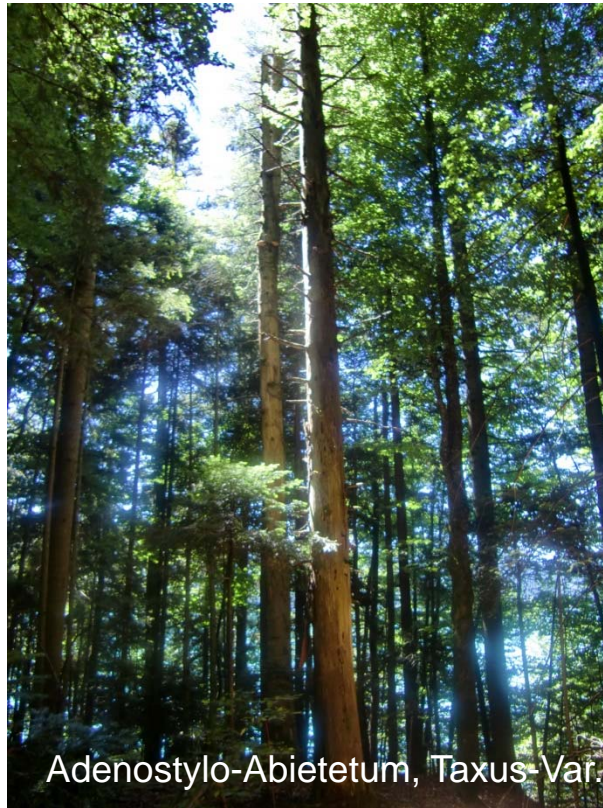


2. Calciphytic Mountain Forests (Alps)





Galio-Abietetum

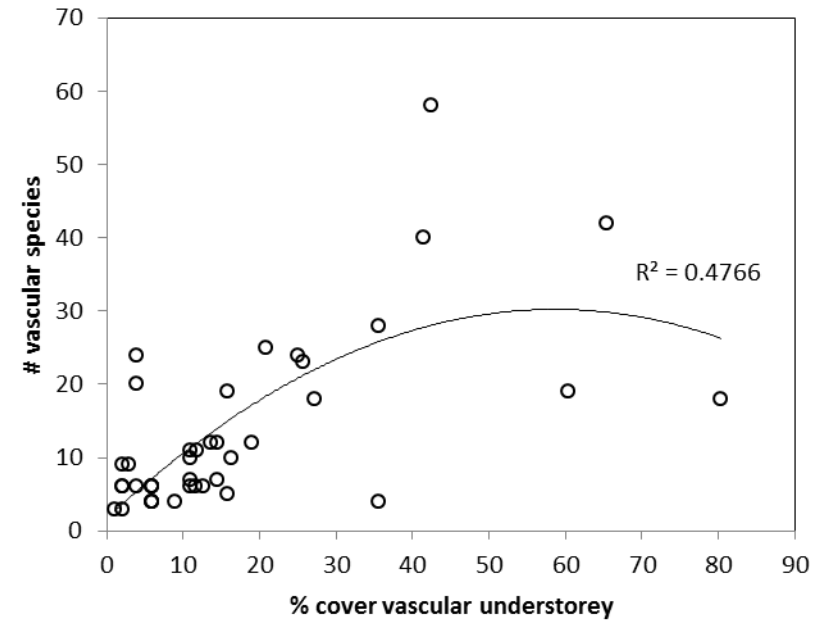
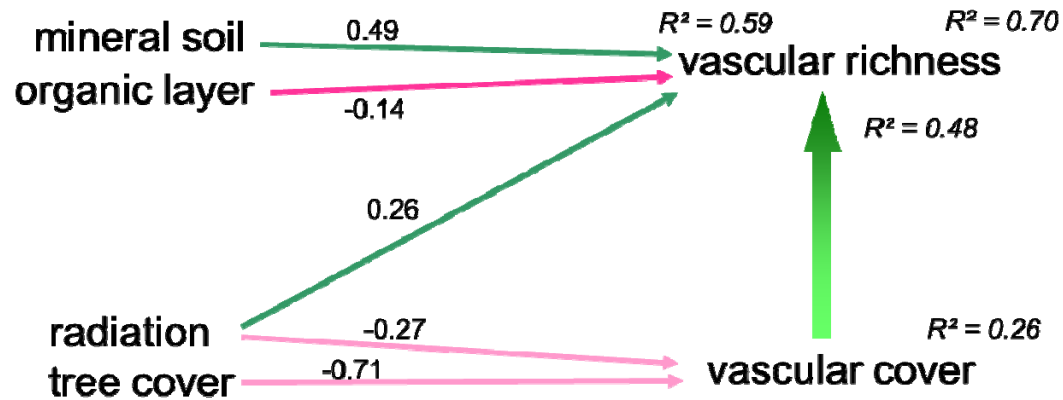


Adenostylo-Abietetum, Taxus-Var.

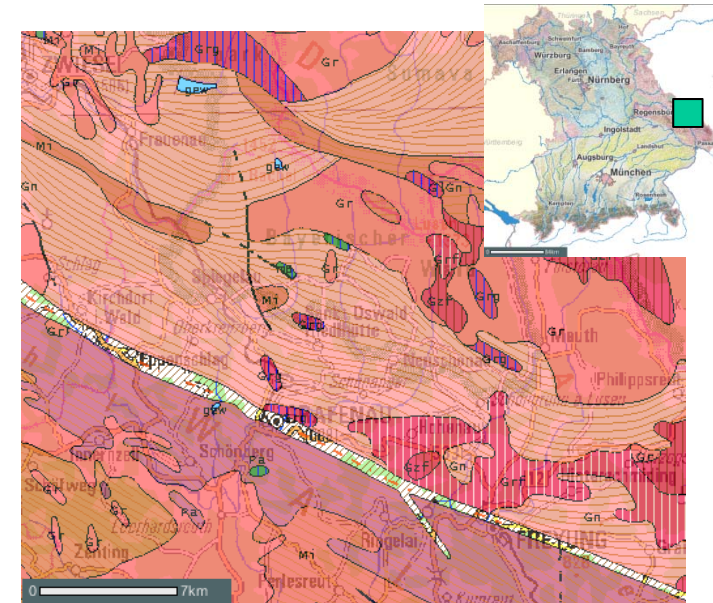
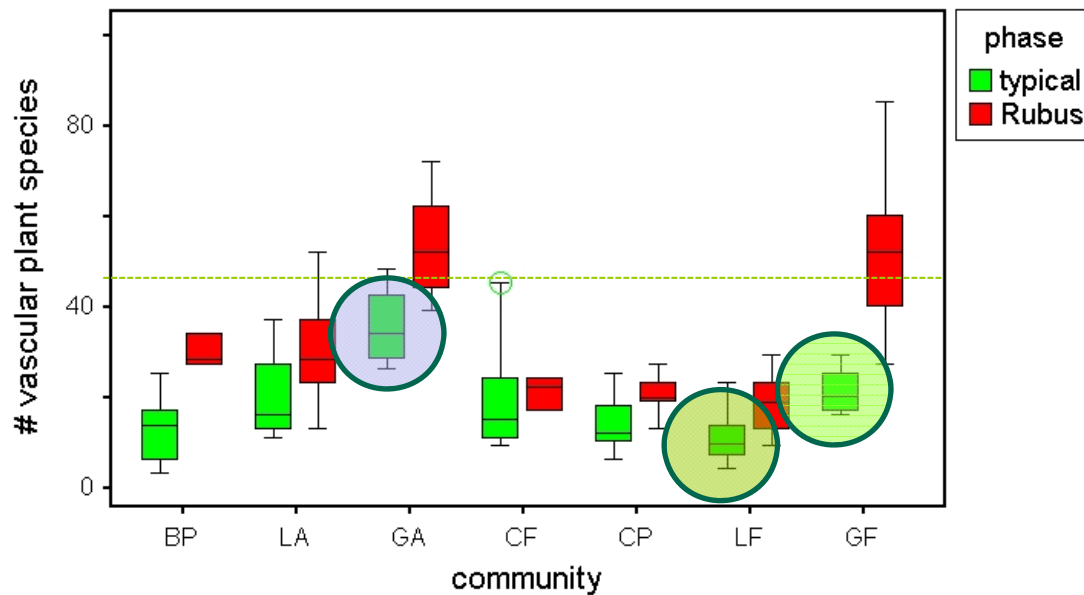
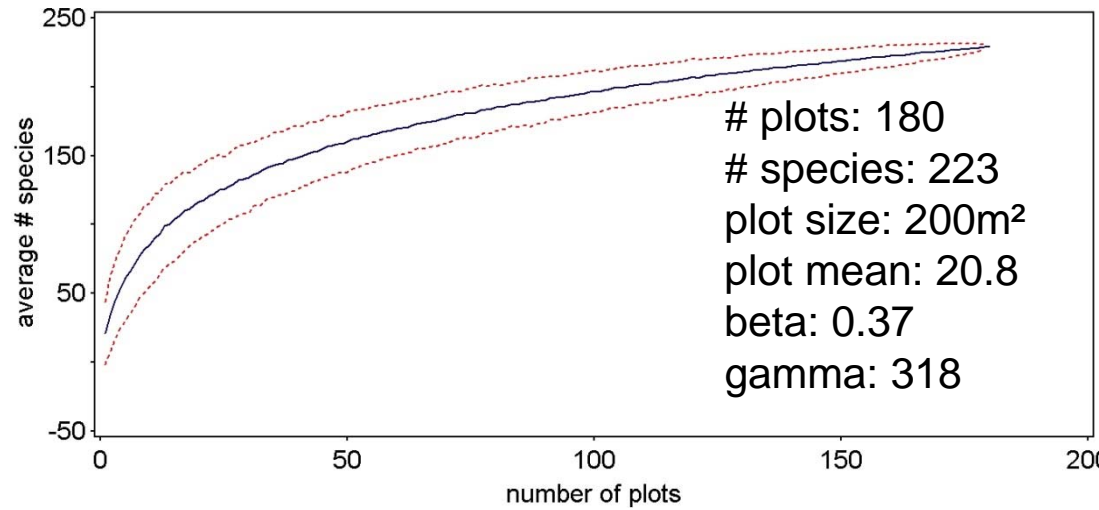


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Control of species richness

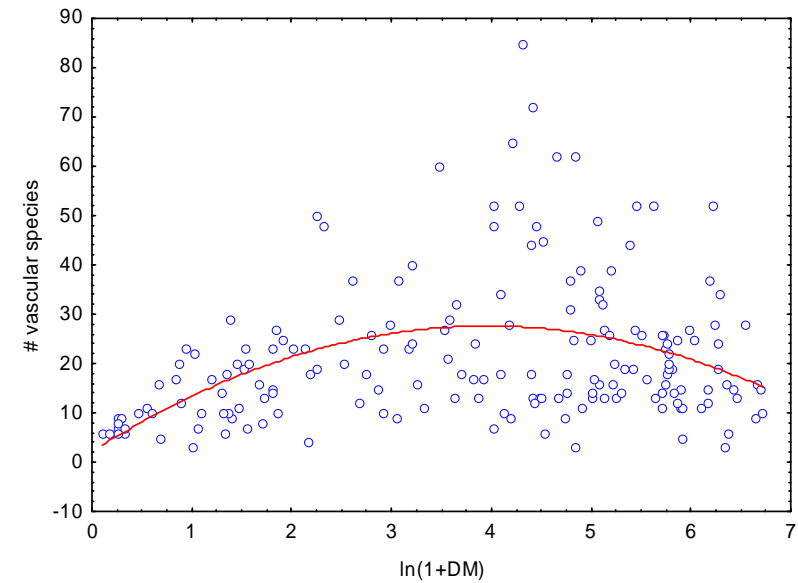
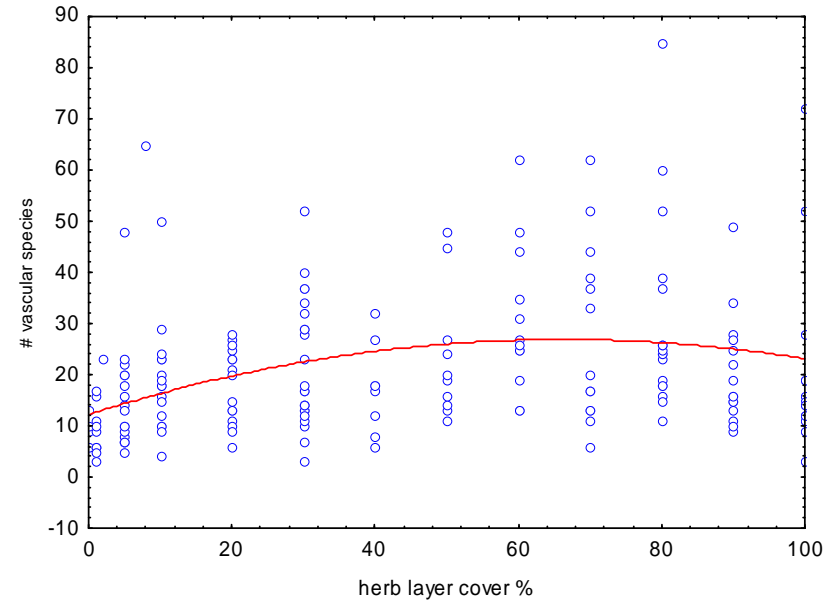
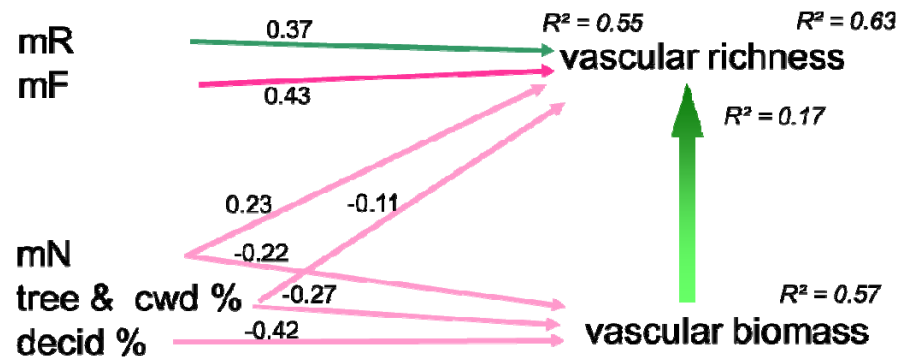


3. Acidophytic Mountain Forests (Bavarian Forest)



3. Acidophytic Mountain Forests (Bavarian Forest)

Vascular plant species richness



3. Acidophytic Mountain Forests (Bavarian Forest)





Plant species richness in temperate forests

- generalisable causal paths
- limited by understorey biomass and population size
- top-down control by tree layer
- species pool size depends on pH/base saturation

Recommendations:

1. protect special sites (key habitats)
2. allow disturbances
3. reduce tree dominance

