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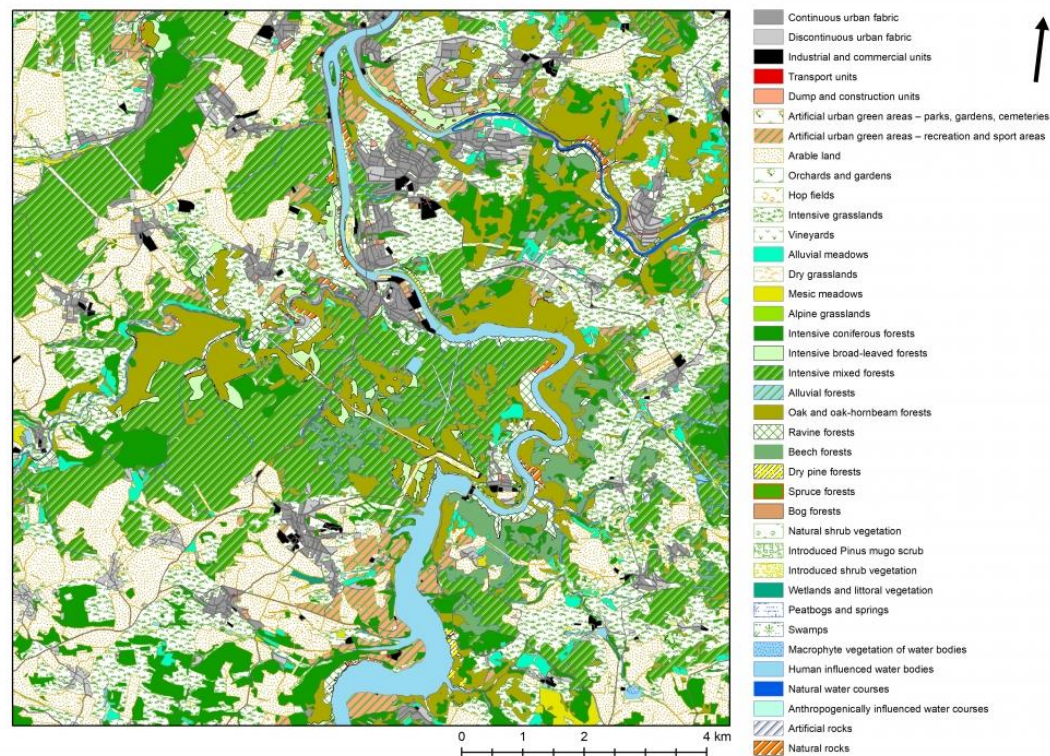
# Map of empirical critical loads of N for ecosystems in the Czech Republic and their exceedences

Tomas Chuman

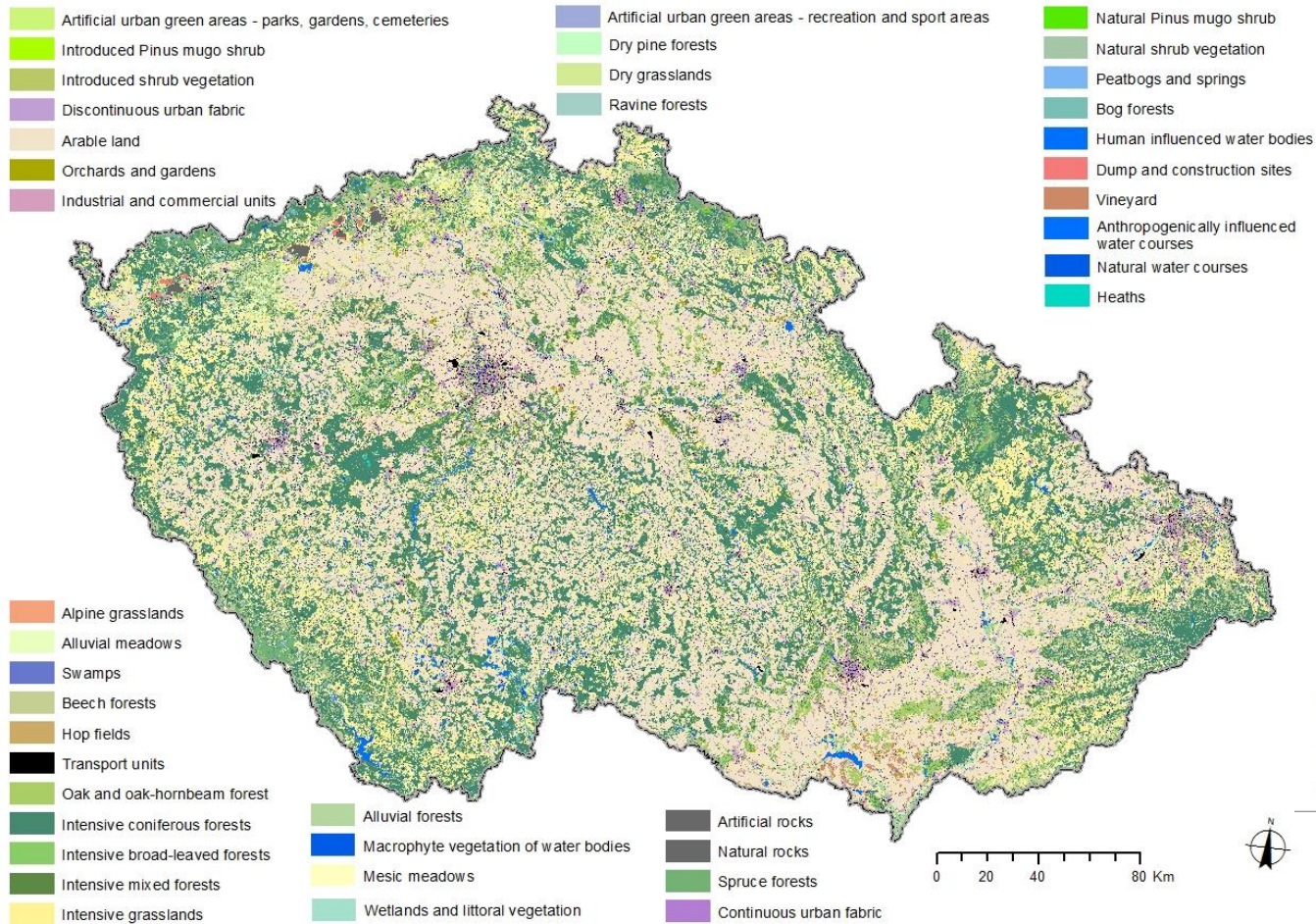
# Consolidated layer of ecosystems of the Czech Republic

## ☐ combines

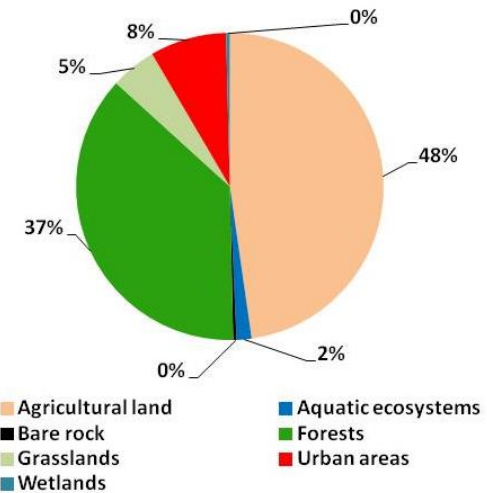
- ☐ Layer of biotopes (national mapping at scale 1:10 000 as a basis for Sites of Community Importance (SCIs) proposal)
- ☐ Base of geographic data (ZABAGED )
- ☐ Digital base of water management data (DIBAVOD )
- ☐ UrbanAtlas
- ☐ LPIS
- ☐ Land Cover



# Consolidated layer of ecosystems of the Czech Republic



Area of the Czech R. [%]



41 ecosystems



# Empirical critical loads CLempN for ecosystems

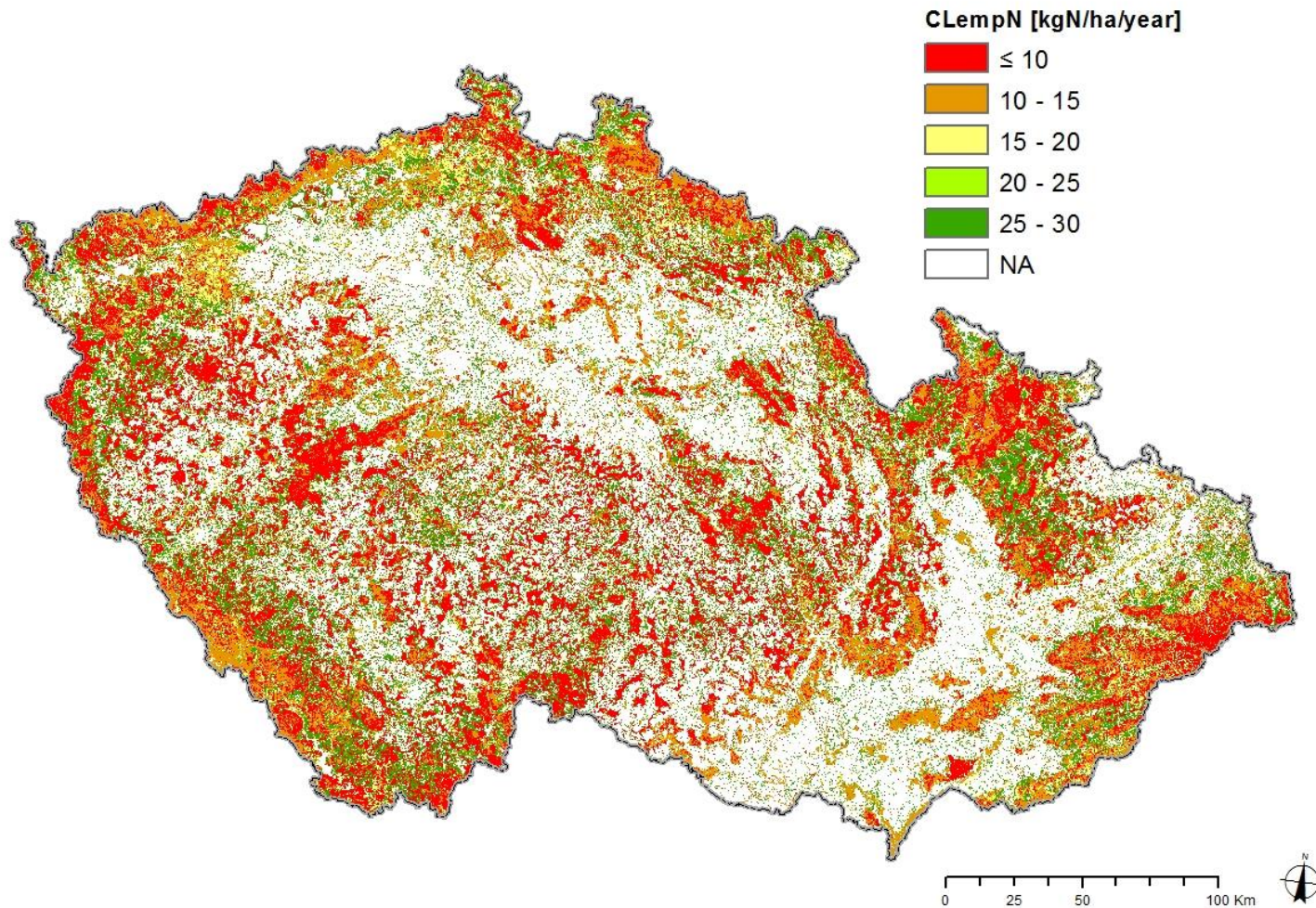
- ❑ Ecosystems converted to EUNIS habitats
- ❑ CLempN according to Bobbink, R., Hettelingh, J.P. (eds.) (2011): Review and revision of empirical critical loads and dose-response relationship.

CLE	empirical CLN [kg/ha/yr]
Alpine grasslands	
Subalpine Nardus grasslands	10_15
<b>Alpine grasslands, Snow beds, Subalpine tall grasslands</b>	<b>5_10</b>
Alluvial meadows	10_30
Swamps	NA
Beech forests	10_20
Transport units	NA
Oak and oakhornbeam forests	10_20
Intensive coniferous forests	5_15
Intensive broad-leaved forests	10_20
Intensive mixed forests	10_20
Intensive grasslands	20_30
Hop fields	NA
Alluvial forests	10_20
Macrophyte vegetation of water bodies	
<b>Macrophyte vegetation of oligotrophic lakes and pools</b>	<b>3_10</b>
Macrophyte vegetation of naturally eutrophic and mesotrophic waters	5_20
Artificial urban green areas – parks, gardens, cemeteries	NA
Mesic meadows	10_25
Wetlands and littoral vegetation	5_20
Introduced Pinus mugo scrub	NA
Introduced shrub vegetation	NA
Discontinuous urban fabric	NA
Arable land	NA
Orchards and gardens	NA

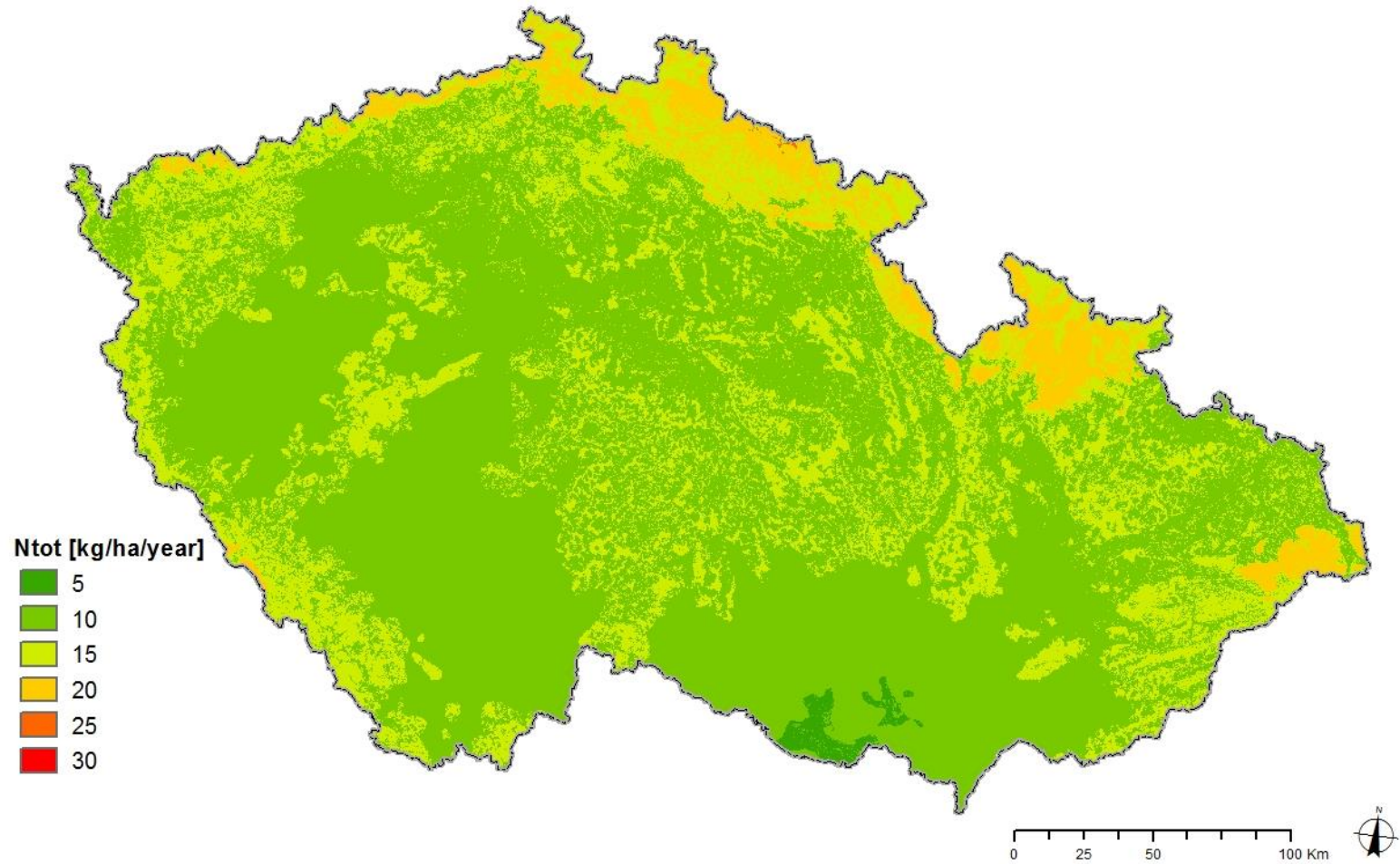
Industrial and commercial units	NA
Urban nature	NA
Natural Pinus mugo shrub	5_15
Natural shrub vegetation	5_20
Peatbogs and springs	
non calcareous, without tufa formation	5_15
calcareous, with tufa formation	15_30
Bog forests	5_20
Human influenced water bodies	NA
Artificial rocks	NA
Natural rocks	
calcareous	15_30
siliceous	5_10
Dump and construction units	NA
Spruce forests	10_15
Continuous urban fabric	NA
Artificial urban green areas – recreation and sport areas	NA
Dry pine forests	5_15
Dry grasslands	10_25
Ravine forests	15_20
Vineyards	NA
Anthropogenically influenced water courses	NA
Natural water courses	NA
Heaths	
Lowland to montane heaths	10_20
Alpine heathlands	5_15

CLempN is set for **58 %** of the land

# CLempN – mean value of the interval

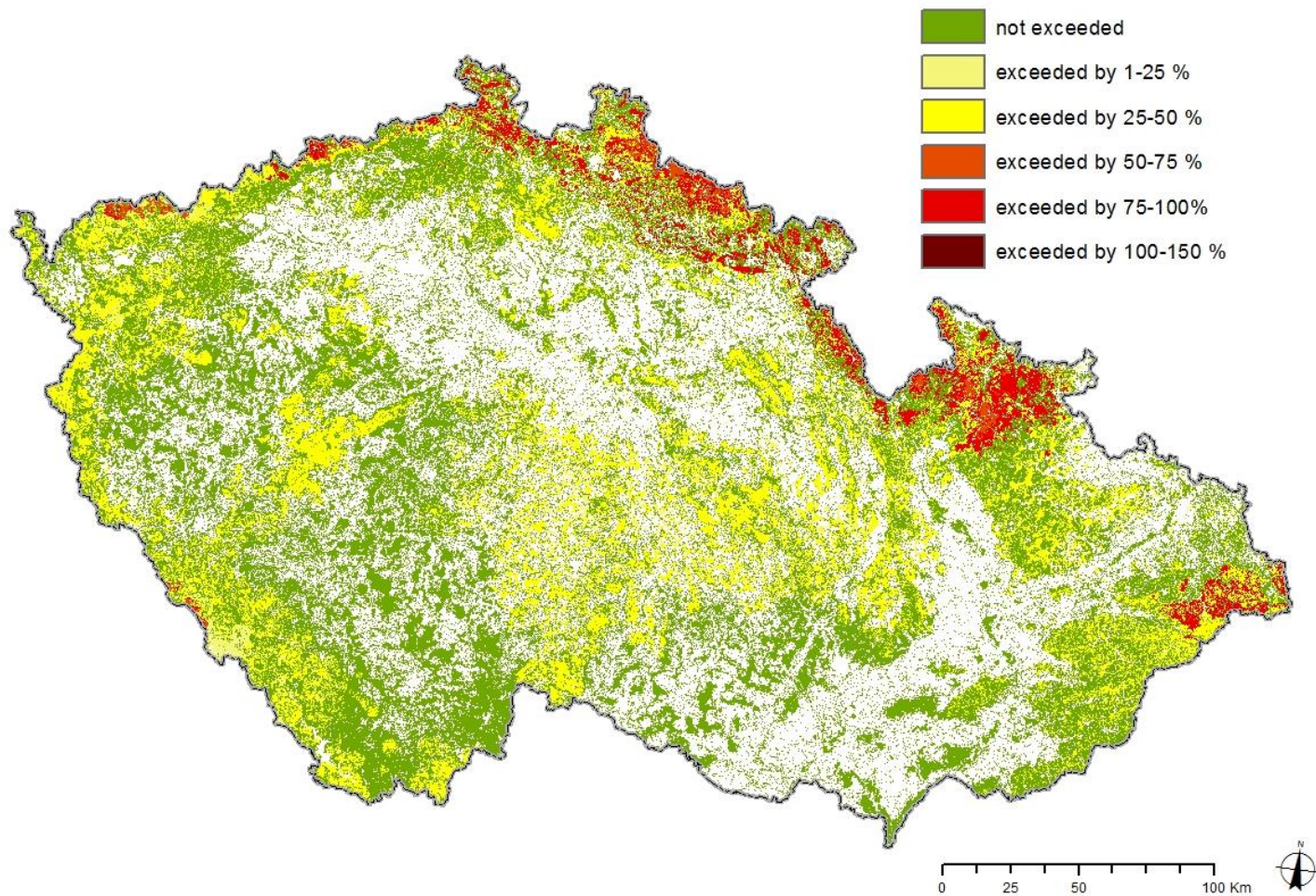


# N tot. deposition





# CLempN exceedences



# CLempN exceedences

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- **CLempN** is set for **58 %** of the land
  - exceedences of the **mean CLempN** interval value
    - not exceeded on 35 % of the area with defined CLempN
    - **exceeded on 43 %** of the area with defined CLempN
    - on 22 % of the area deposition = CLempN
    - **on 32 %** of the area with defined CLempN exceedences are **higher than 10 kg/ha/year**
  - exceedences of the **lower CLempN** interval value
    - not exceeded on 28 % of the area with defined CLempN
    - **exceeded on 60 %** of the area with defined CLempN
    - on 12 % of the area deposition = CLempN
  - exceedences of the **upper CLempN** interval value
    - not exceeded on 66 % of the area with defined CLempN
    - **exceeded on 6 %** of the area with defined CLempN
    - on 28 % of the area deposition = CLempN
-



# Most affected ecosystems

ECOSYSTEM	Area of the CR [%]	Area not exceeded [%]	Area exceeded [%]	Area deposition=Clemp
Alpine grasslands	0.03	0.03	99.97	
Alluvial meadows	2.82	100.00		
Beech forests	3.53	7.91	26.93	65.16
Oak and oakhornbeam forests	3.28	39.01	3.48	57.51
Intensive mixed forests	3.27	26.80	14.29	58.91
Intensive coniferous forests	22.38	NA	75.62	24.38
Intensive broad-leaved forests	0.54	41.21	8.08	50.71
Intensive grasslands	15.92	100.00		
Alluvial forests	1.36	31.72	8.76	59.52
Macrophyte vegetation of water bodies	0.33	97.45	2.55	
Mesic meadows	1.69	100.00		
Wetlands and littoral vegetation	0.21	96.22	3.78	
Natural <i>Pinus mugo</i> shrub	0.02	NA	100.00	
Natural shrub vegetation	0.51	35.94	64.06	
Peatbogs and springs	0.10	62.34	11.79	25.87
Bog forests	0.09	52.47	47.53	
Natural rocks	0.08	86.84	13.16	
Spruce forests	1.02	1.58	98.42	
Dry pine forests	0.20	NA	54.00	46.00
Dry grasslands	0.25	100.00		
Ravine forests	0.26	82.56	17.44	
Heaths	0.02	61.57	5.45	32.98



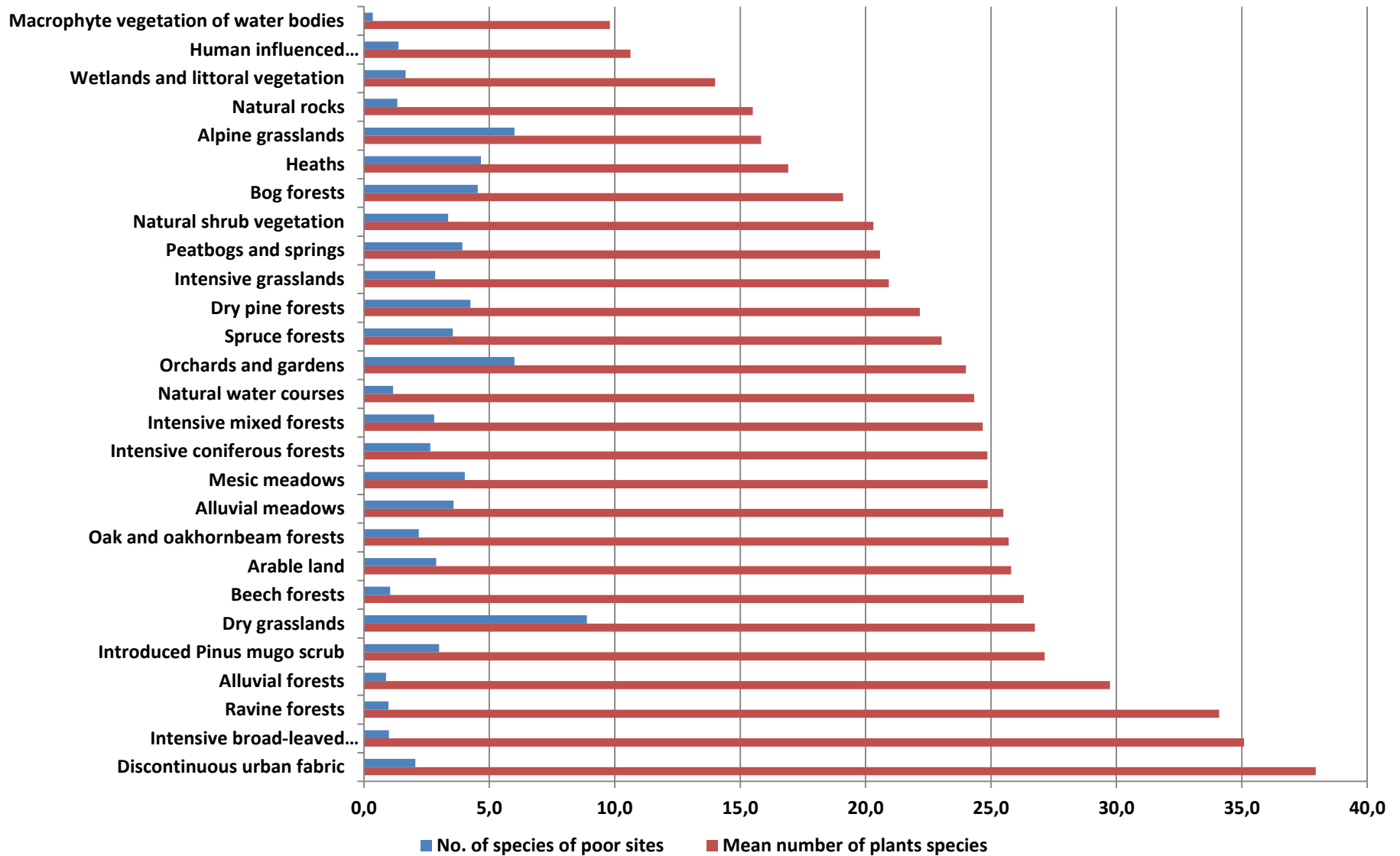
Alpine grassland –  
EUNIS - *Nardus stricta* swards



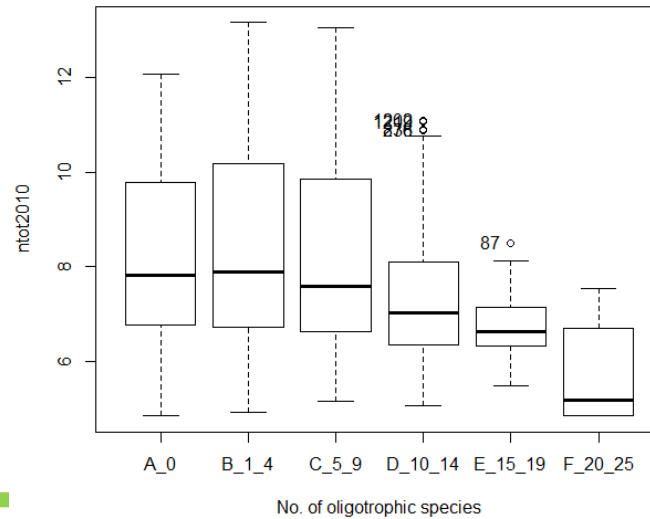
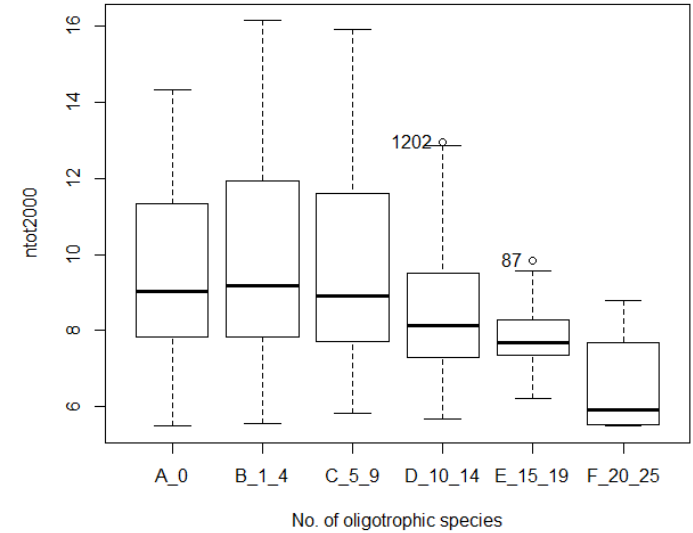
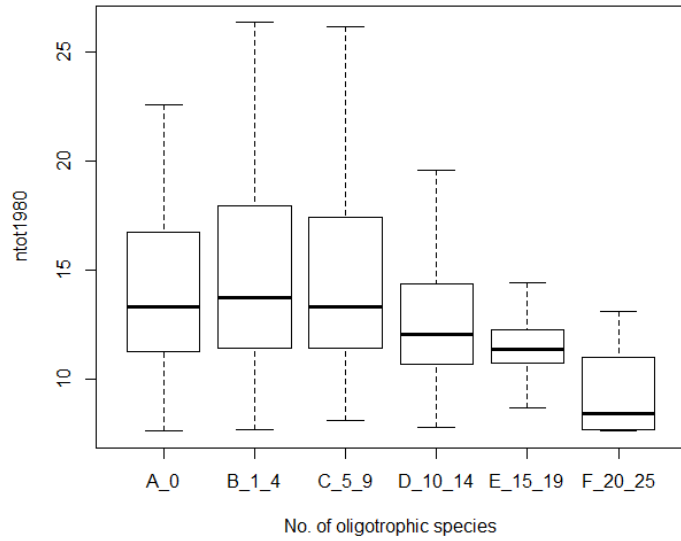
*Pinus mugo* scrub

# Species diversity

1974 phytosociological relevés from 33 ecosystems

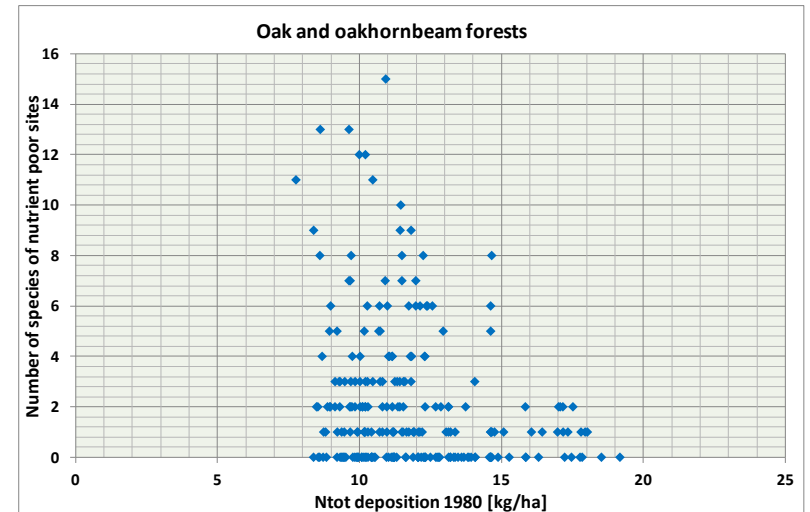
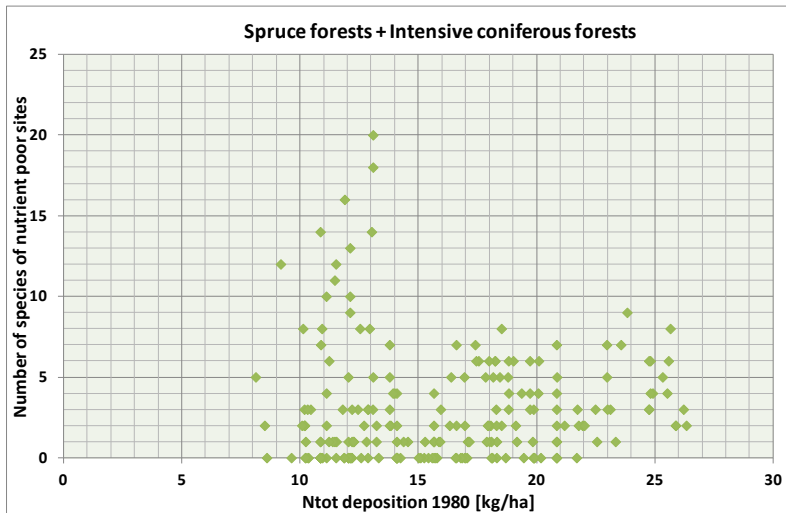
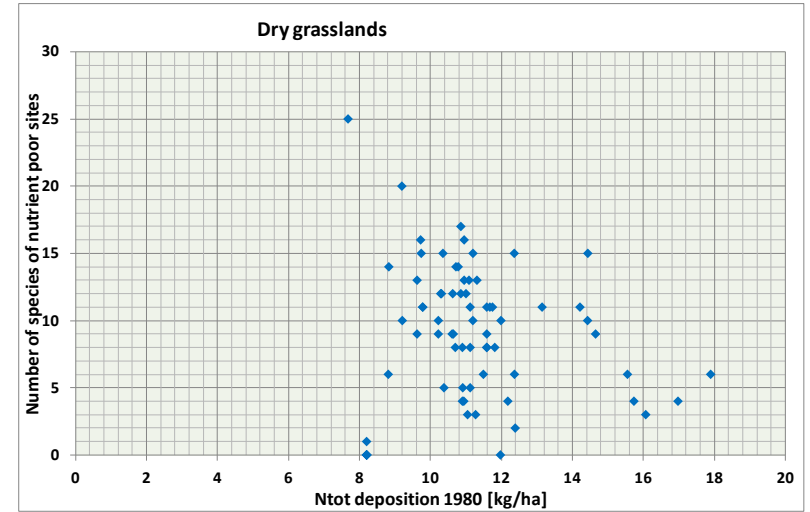
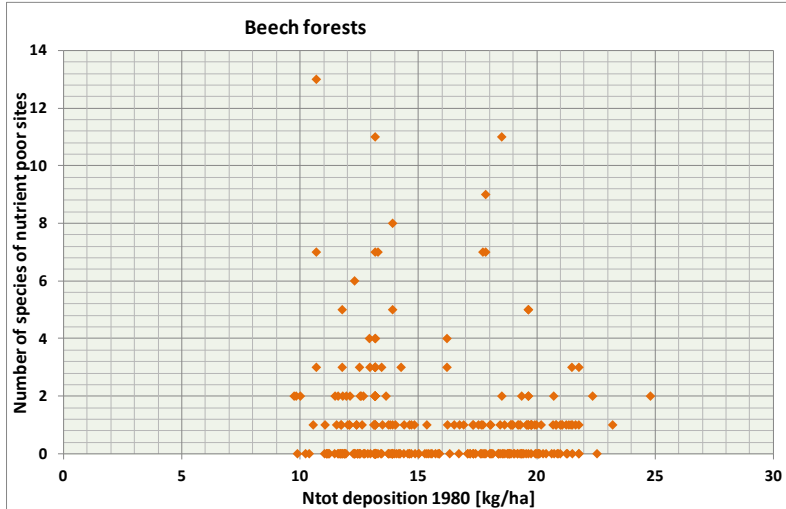


# Oligotrophic species diversity vs. N tot. deposition





# Oligotrophic species diversity vs. N tot. deposition



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**Thank you for your attention!**