

# Integrated mapping and assessment of ecosystem services: examples from the Czech Republic

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LIFE Platform meeting on Ecosystem Services  
COSTING THE EARTH?  
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# Enhancing ecoSystem sERvices mApping for poLicy and Decision mAking



**Project coordinator: Benjamin Burkhard, Leibniz Universität Hannover**

EU Horizon 2020 Coordination and support action

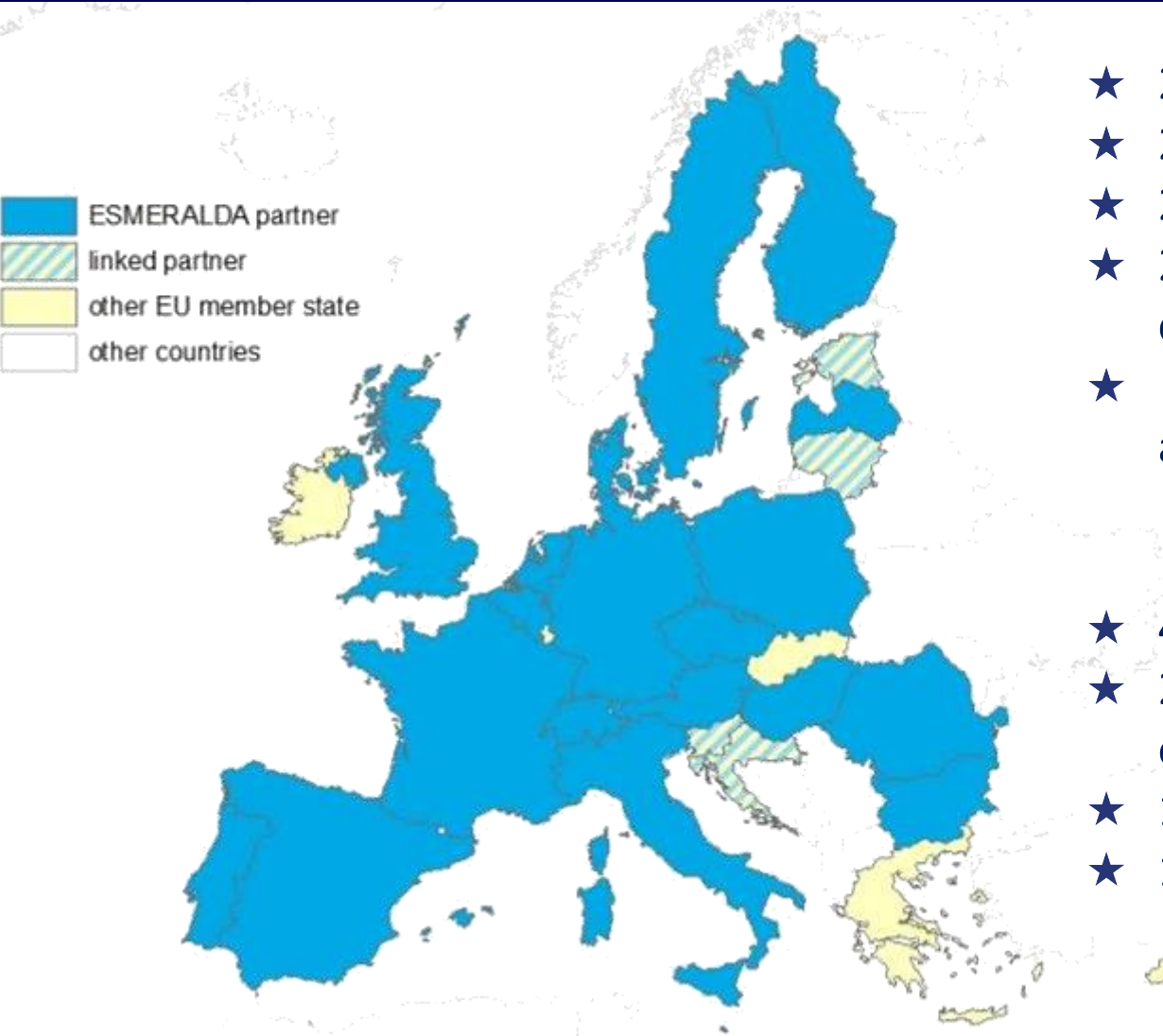


## EU Horizon 2020 topic addressed:

- ★ **Enhancing mapping ecosystems and their services**
- ★ Subcall SC5-10a-2014 of H2020-SC5-2014 call on *Growing a Low Carbon, Resource Efficient Economy with a Sustainable Supply of Raw Materials*

## ESMERALDA targets:

- ★ **Ecosystem Services (ES) mapping and assessment strategies** for EU member states
- ★ Deliver a '**flexible methodology**' for pan-European, national and regional ES mapping and assessment
- ★ Support the timely delivery by EU member states of **Action 5** of the EU Biodiversity Strategy 2020 by supporting EU MS stakeholders (i.e. national Action 5 authorities)
- ★ Promote **local ES assessments** required for spatial planning, agriculture, climate, water and nature policy
- ★ Transmit experience through **active dialogues** and **co-creation of knowledge**
- ★ **Mobilise all relevant actors**, increase participation of citizens in science and decision making
- ★ Develop a **Strategic Research Agenda (SRA)** for ES mapping and assessment throughout and beyond Horizon 2020



- ★ 25 project partners
- ★ 20 European countries
- ★ 2 linked Baltic countries
- ★ 2 linked western Balkan countries
- ★ + further member states addressed already

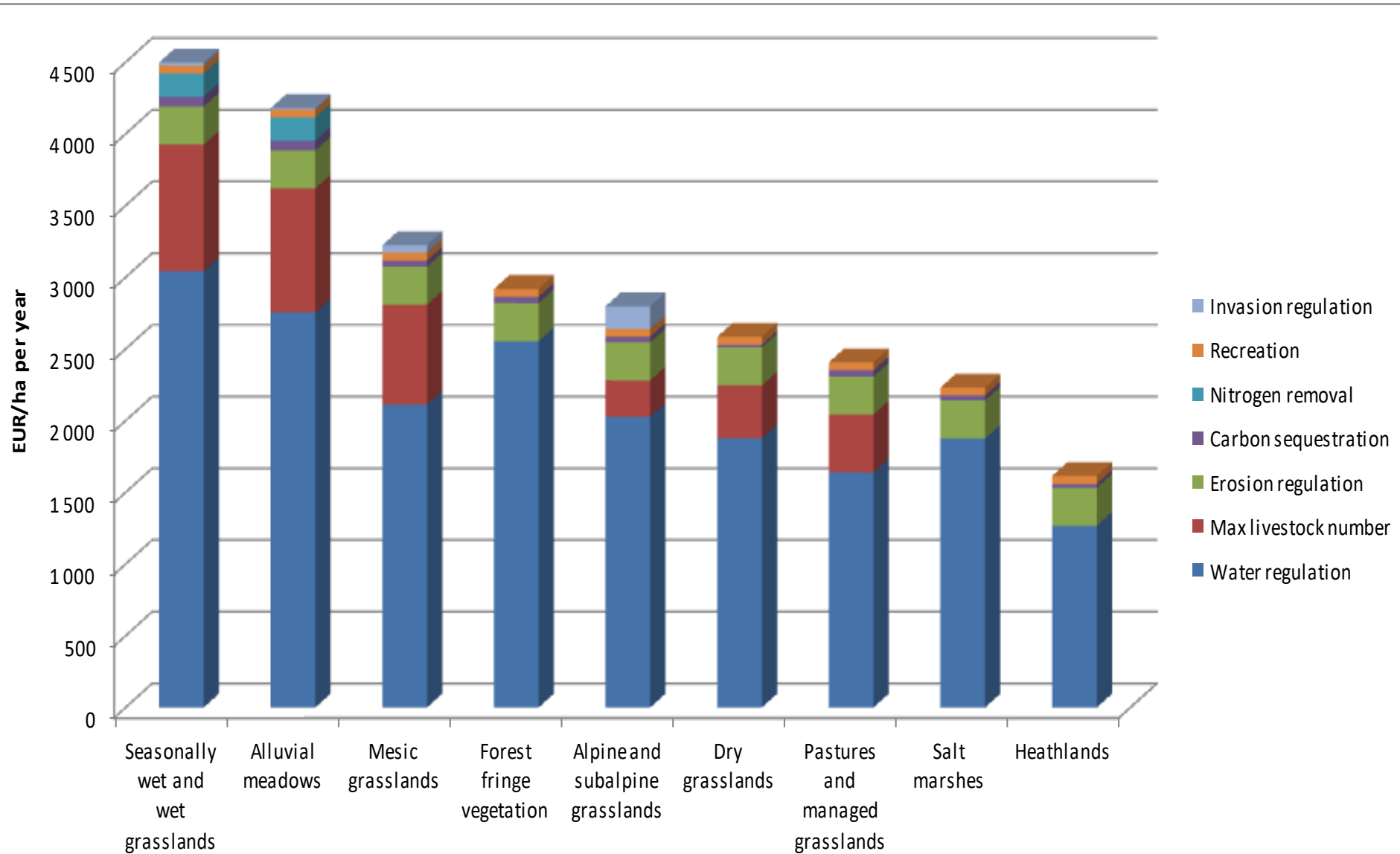
- ★ 44 % university partners
- ★ 28 % state or other superior organisations
- ★ 16 % from other academia
- ★ 12 % SMEs

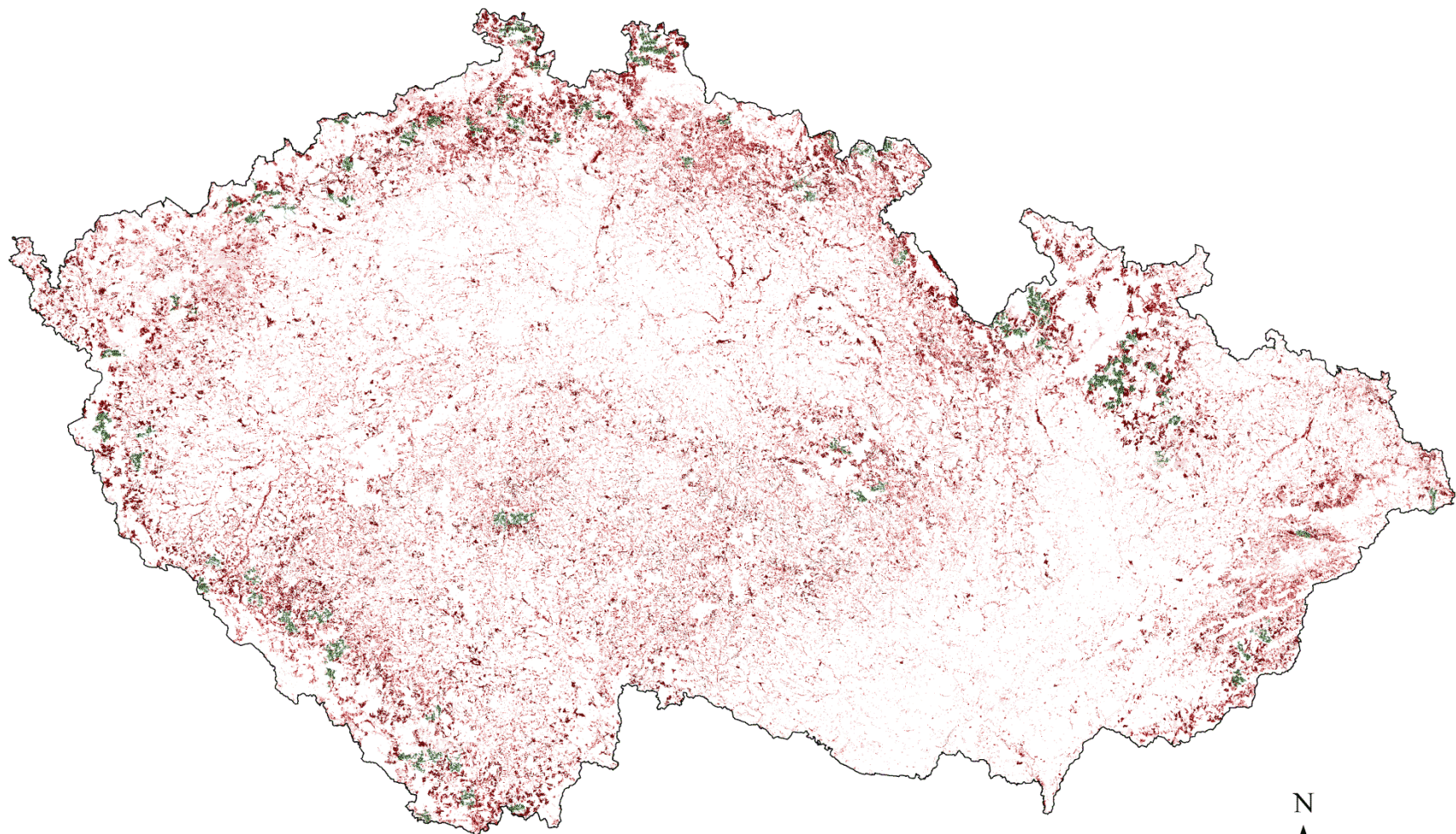
<http://www.esmeralda-project.eu/>

# Mapping and assessment of grassland ecosystem services

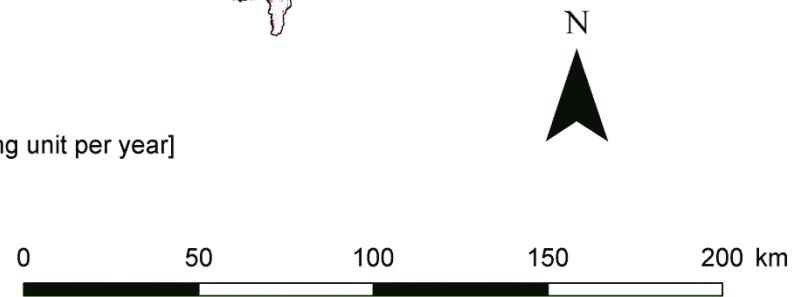
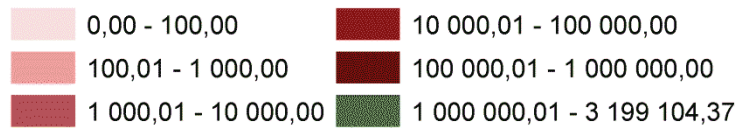
- The choice of grasslands as a model ecosystem due to the importance which grasslands play in the European Union from the perspective of biodiversity, economy and EU budget as well as due to the long in tradition in agricultural management.
- Established a habitat approach to ecosystem services assessment based on habitat mapping layer.

# Economic value of grassland ecosystem services in the Czech Republic

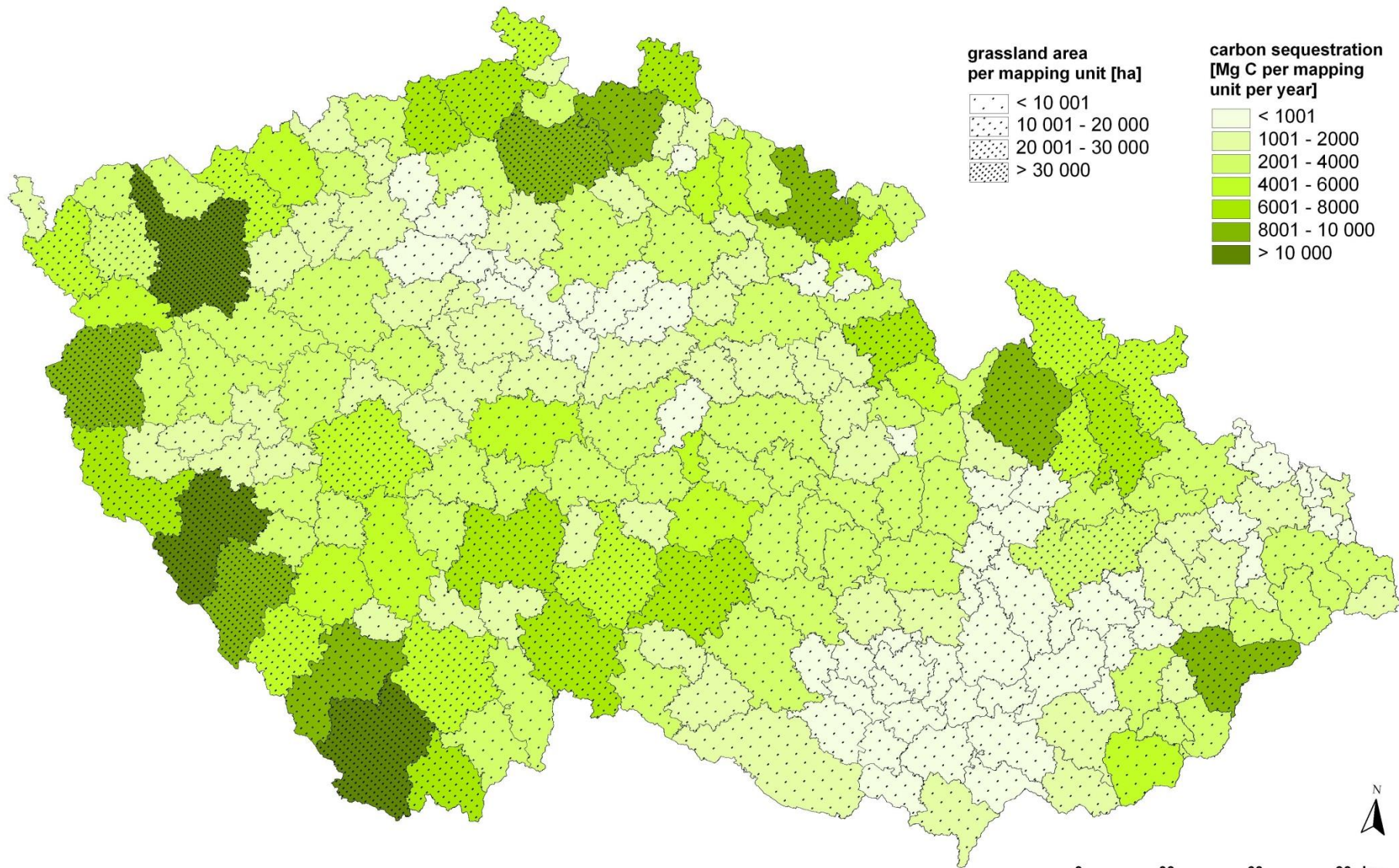




Total monetary values of grassland ecosystem services [EUR in 2010 prices per mapping unit per year]



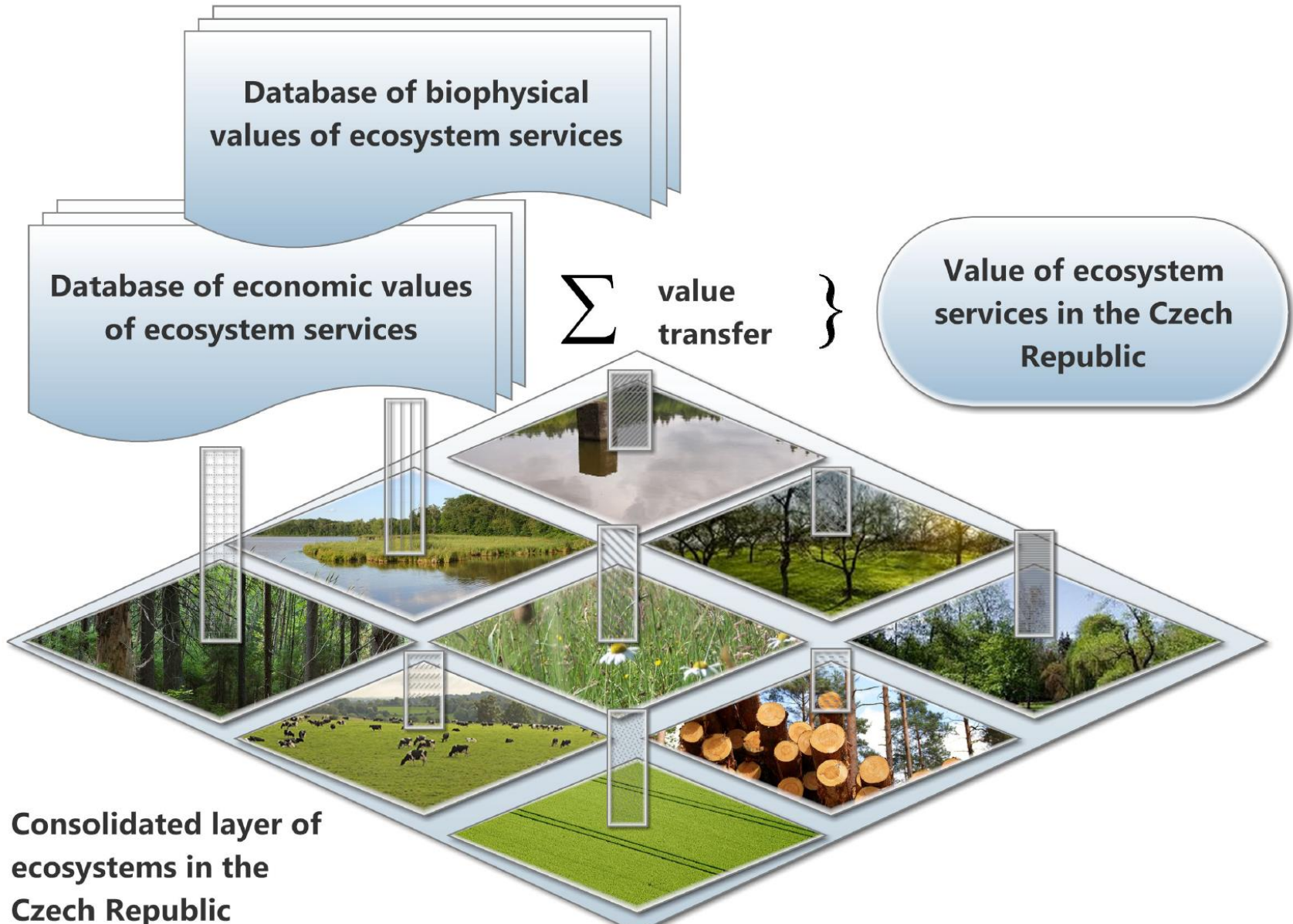
## Annex II: mapping of ecosystem services - carbon sequestration



0 30 60 90 km



# Mapping and and accounting for the value of ecosystem services at the national scale



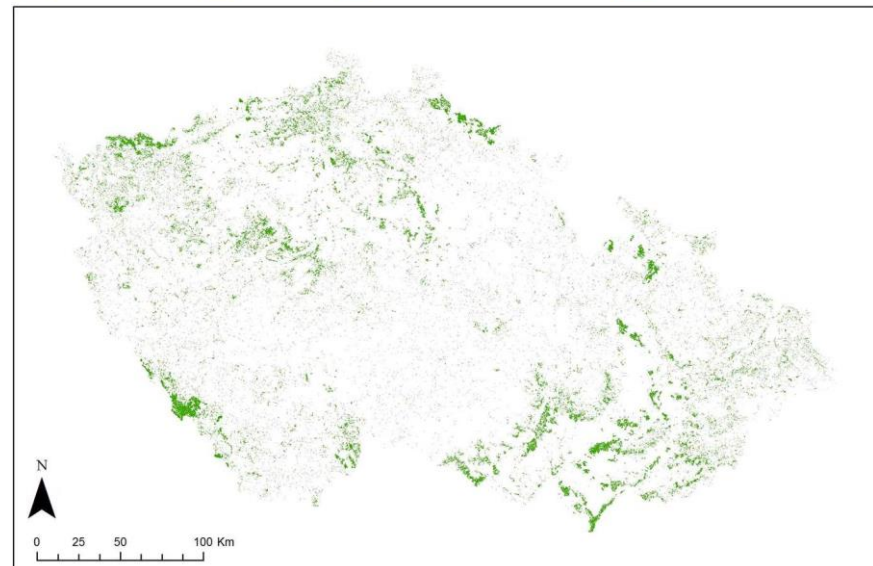
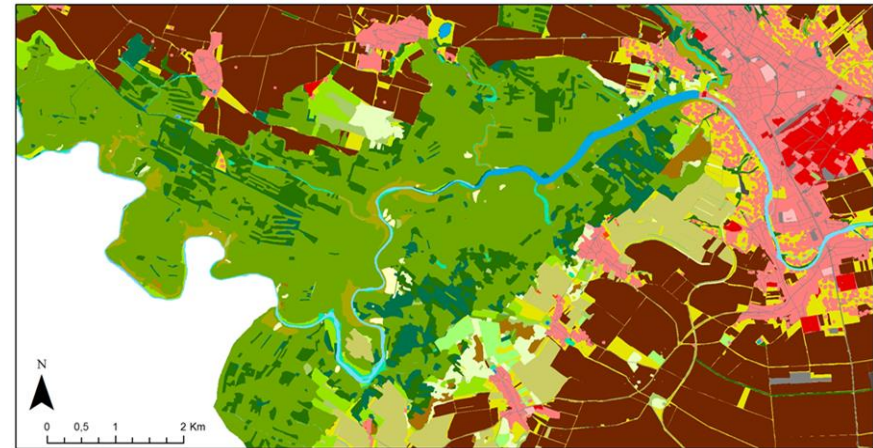
# Consolidated Layer of Ecosystems (CLEES version 1.0)

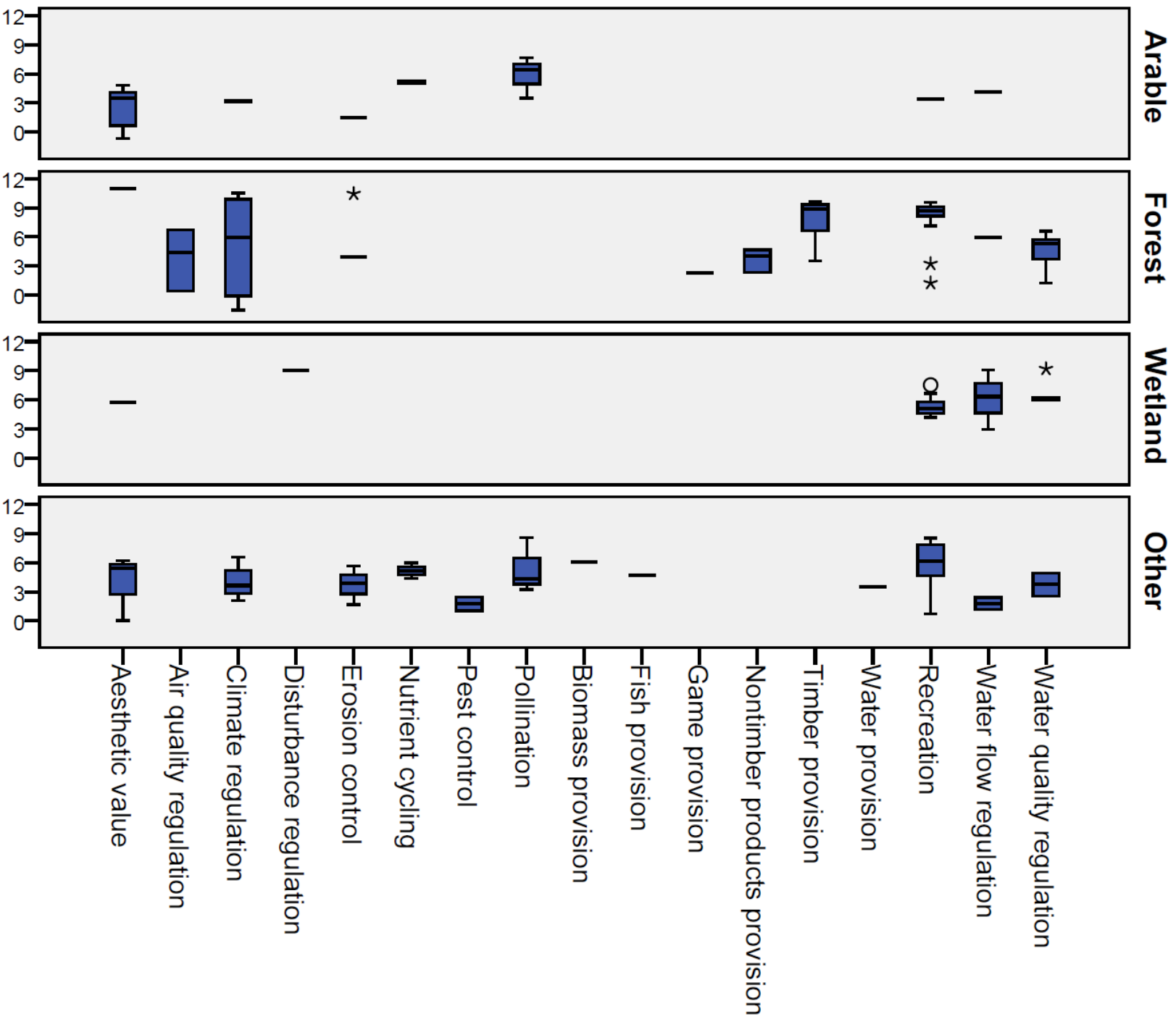
Hierarchical classification of ecosystems of the Czech Republic

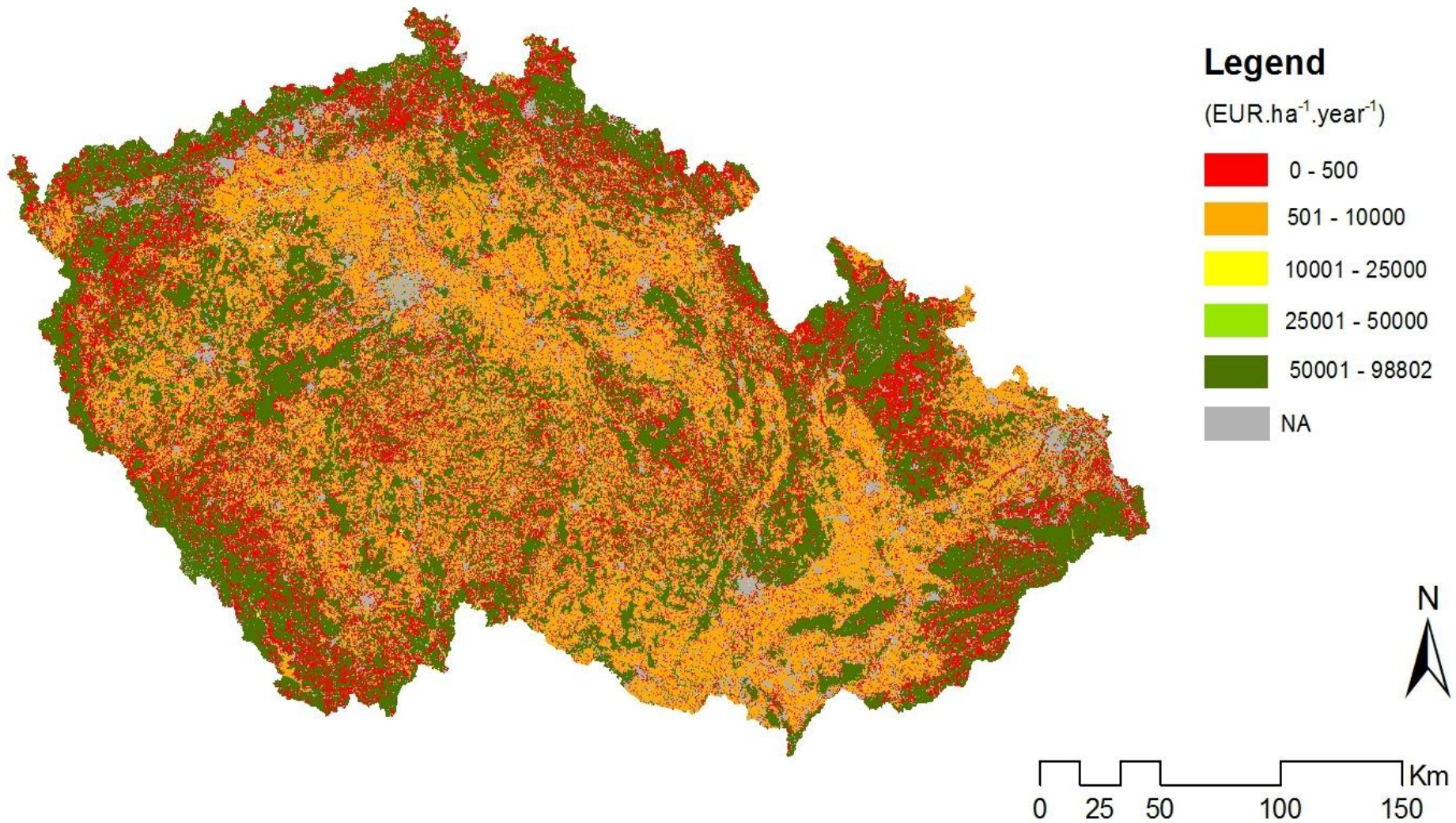
41 ecosystem categories in 6 groups

Distinguishes „natural“, „semi-natural“ and „artificial“ (human-dominated) ecosystems

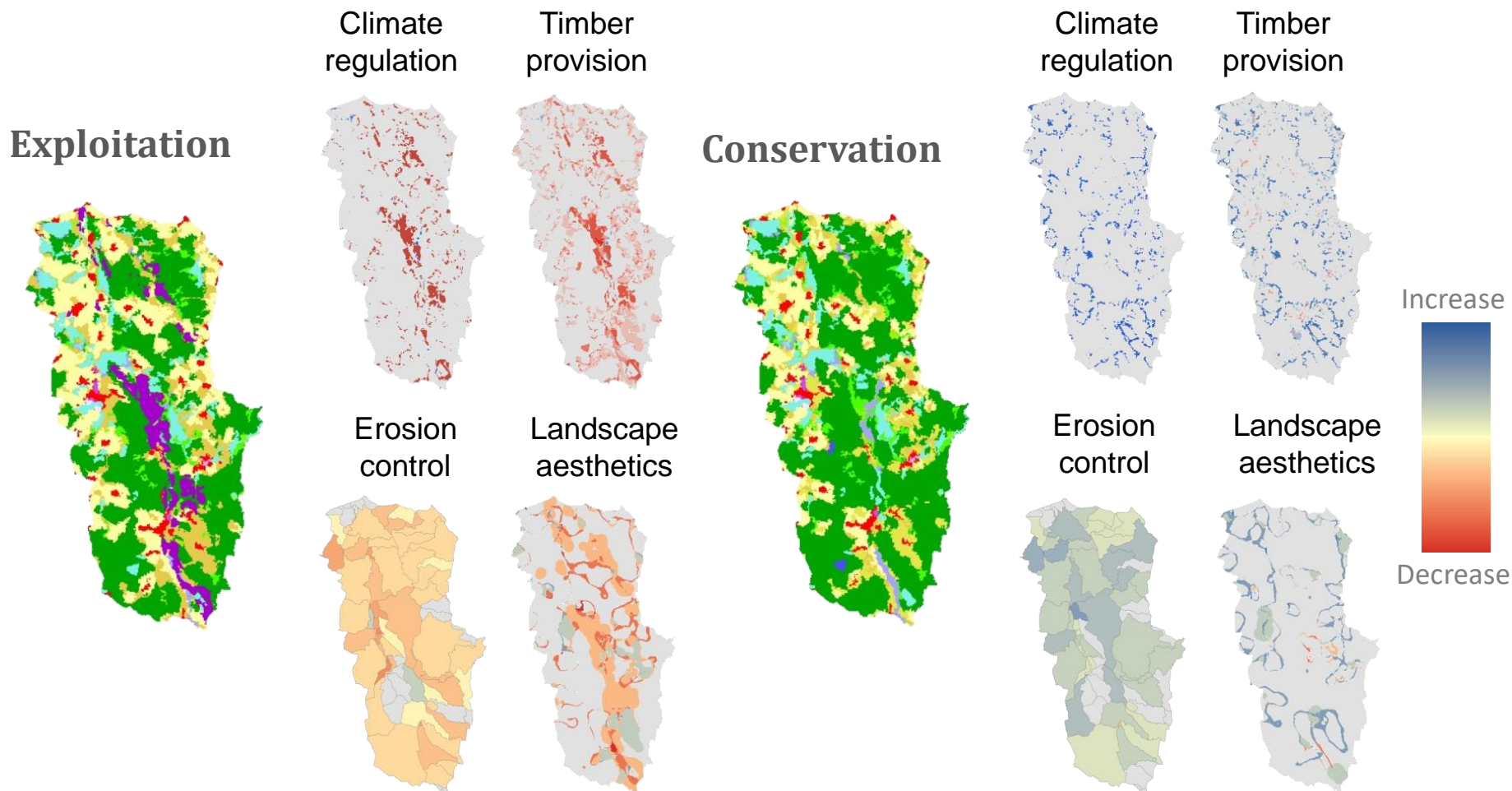
Based on a combination of different data sources (base data, habitat mapping, LPIS, Urban Atlas...)





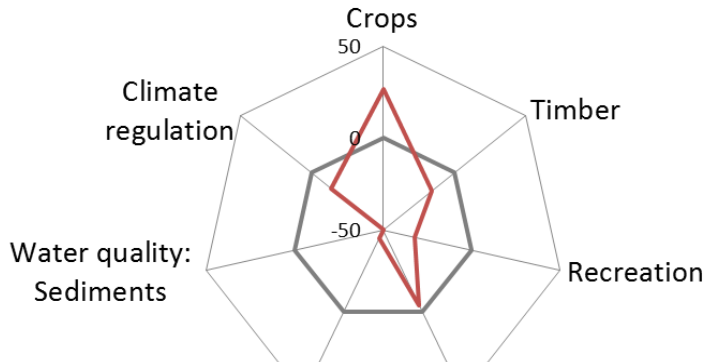


# Ecosystem services trade-offs 2006-2050, Třeboň Basin UNESCO Biosphere Reserve

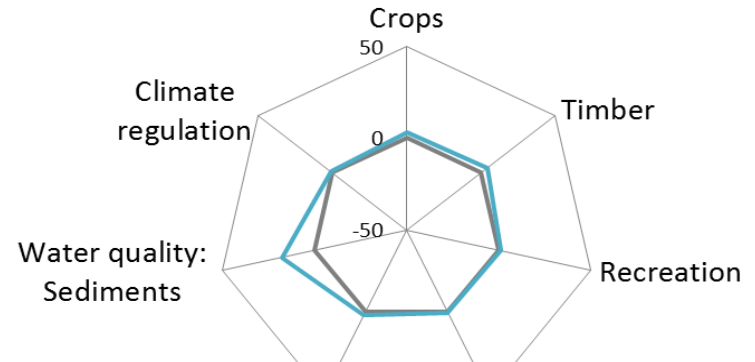


# Ecosystem service trade-offs

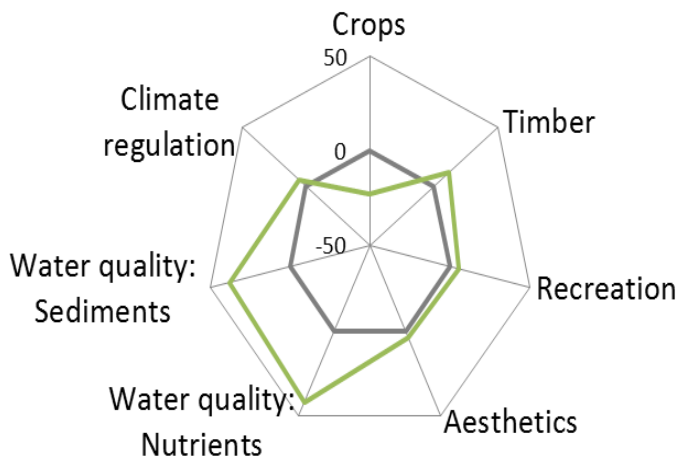
## Exploitation



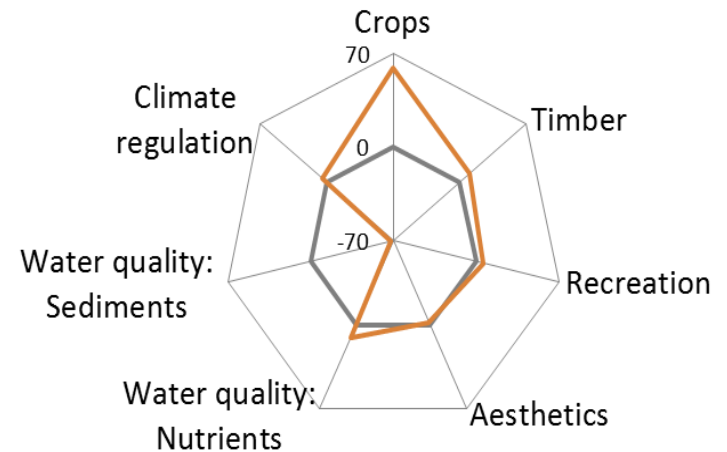
## BaU



## Conservation



## Biofuels



# Environmental security framework



Integrované hodnocení dopadů globálních změn  
na environmentální bezpečnost České republiky



## RISK ANALYSIS

Maps created within the EnviSec project

### TOTAL RISK FOR ECOSYSTEM SERVICES PROVISION

#### HOT-SPOTS AND COLD-SPOTS

#### ECOSYSTEM SERVICES

#### VULNERABILITY

#### HAZARD

The total risk for the provision of ecosystem services is expressed by assessing the risk of ecosystems that provide these services. Threat or risk sources are a combination of natural threats such as floods and erosion, and the impacts of anthropogenic activities such as urbanization and pollution. The overall risk is highest in areas where in addition to high threat, as well as greater vulnerability and where ecosystems provide valuable ecosystem services. The film was based on an analysis of partial layers sources of hazards, vulnerability and ecosystem services.

## FLOOD RISK

## BASE LAYERS

## TOOLBOXES

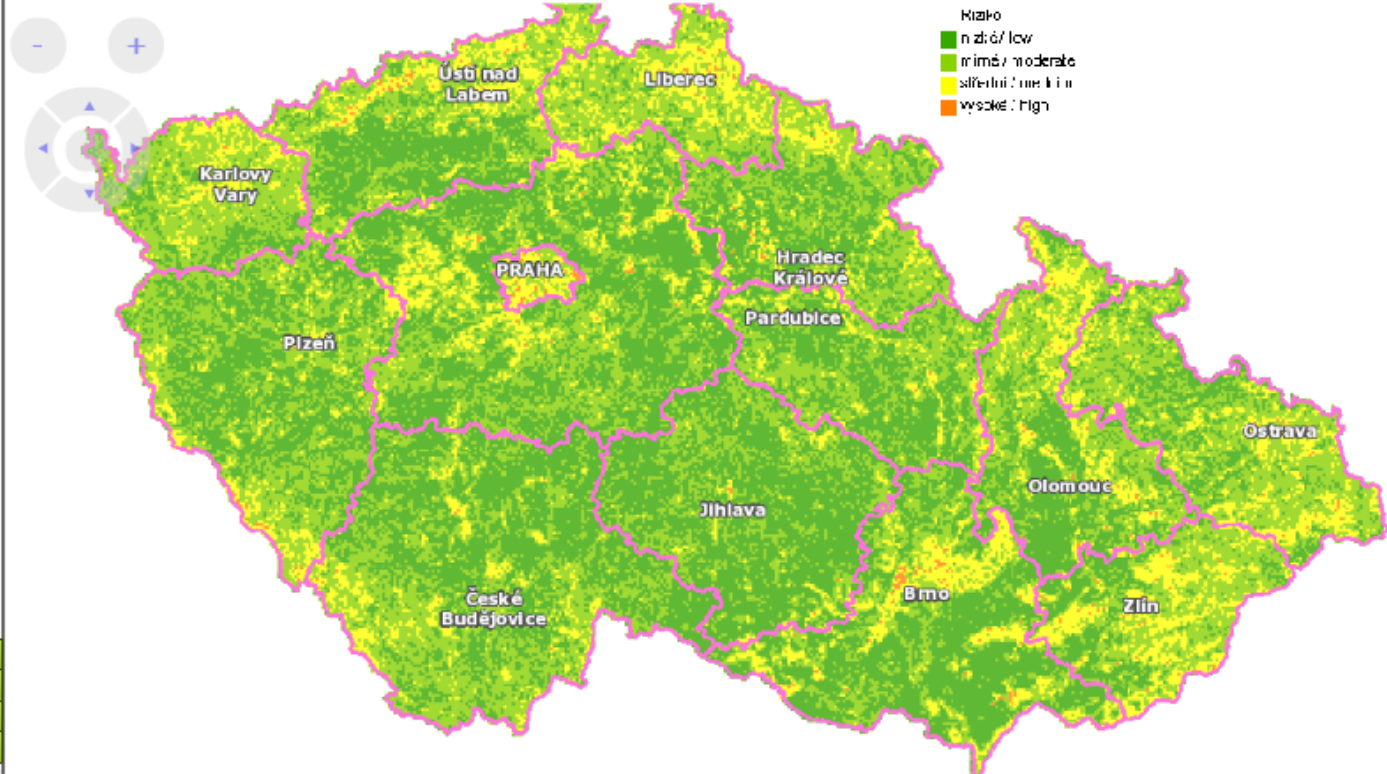
## ABOUT ENVISEC PROJECT



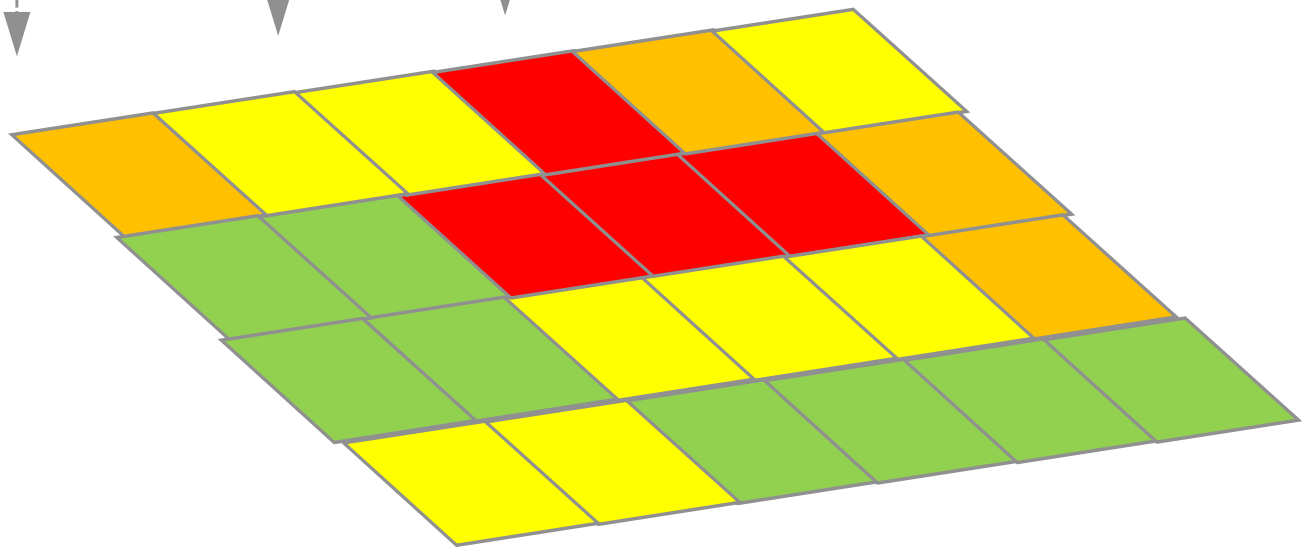
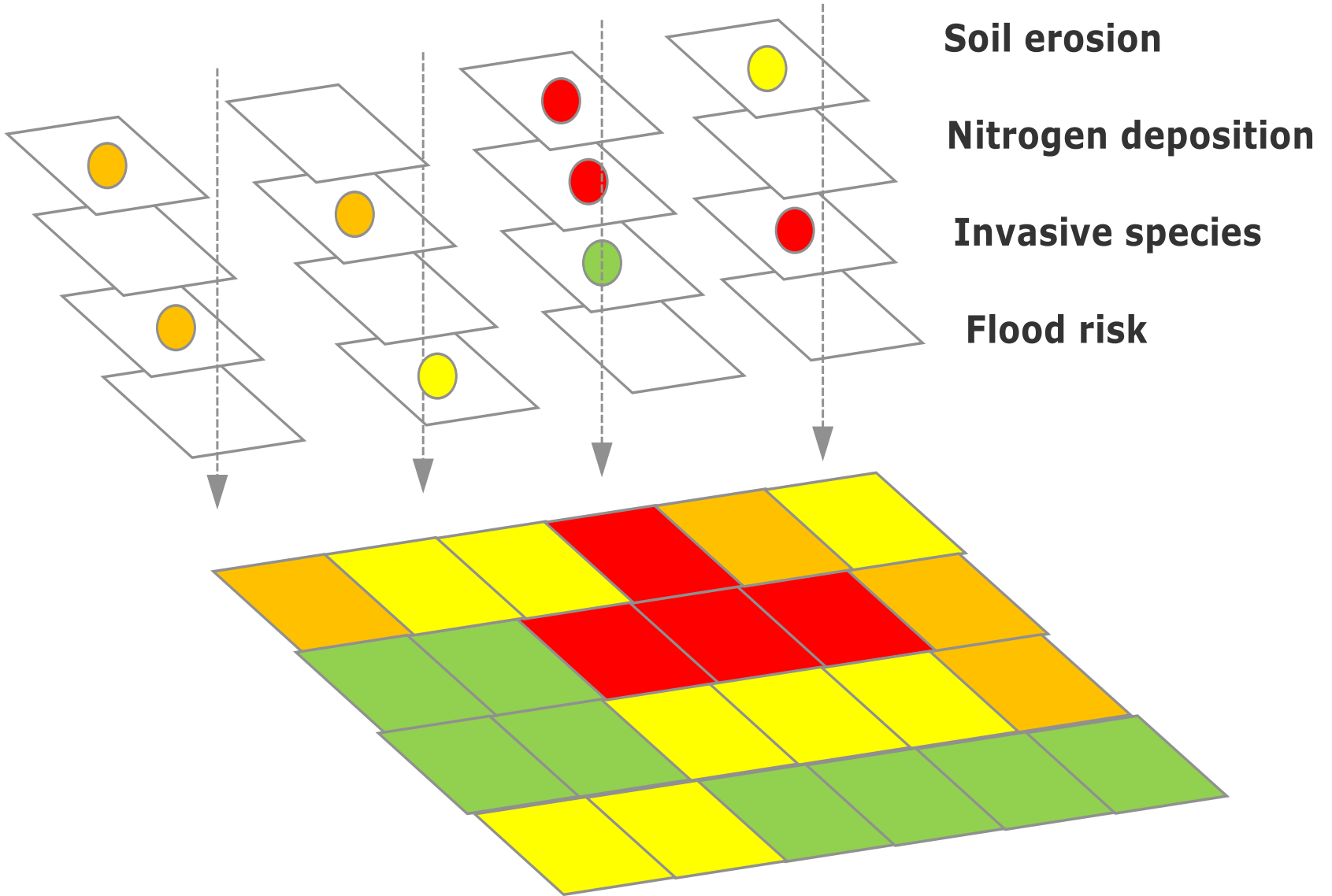
Centrum pro otázky  
životního prostředí  
Univerzita Karlova v Praze



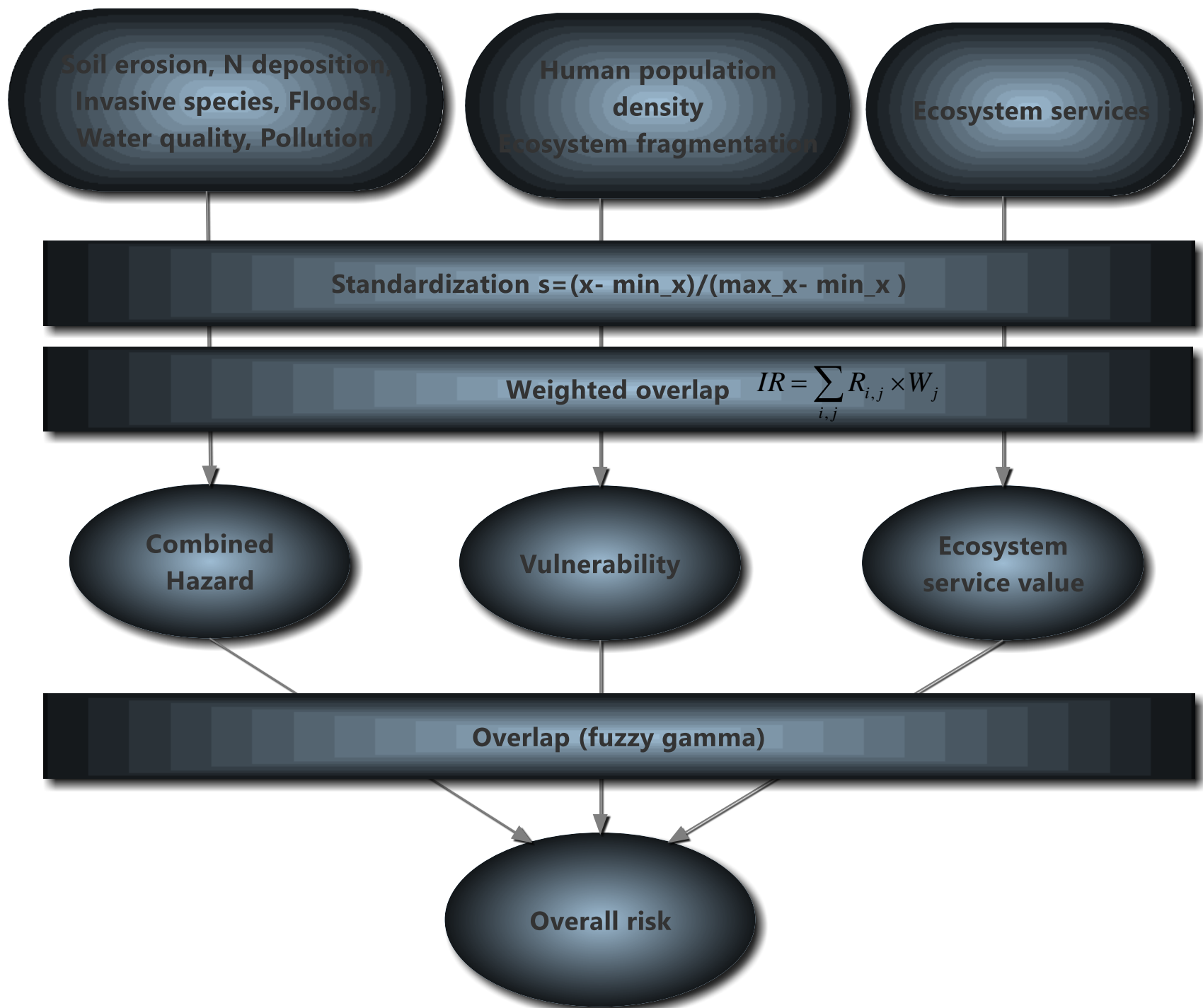
## TOTAL RISK FOR ECOSYSTEM SERVICES PROVISION



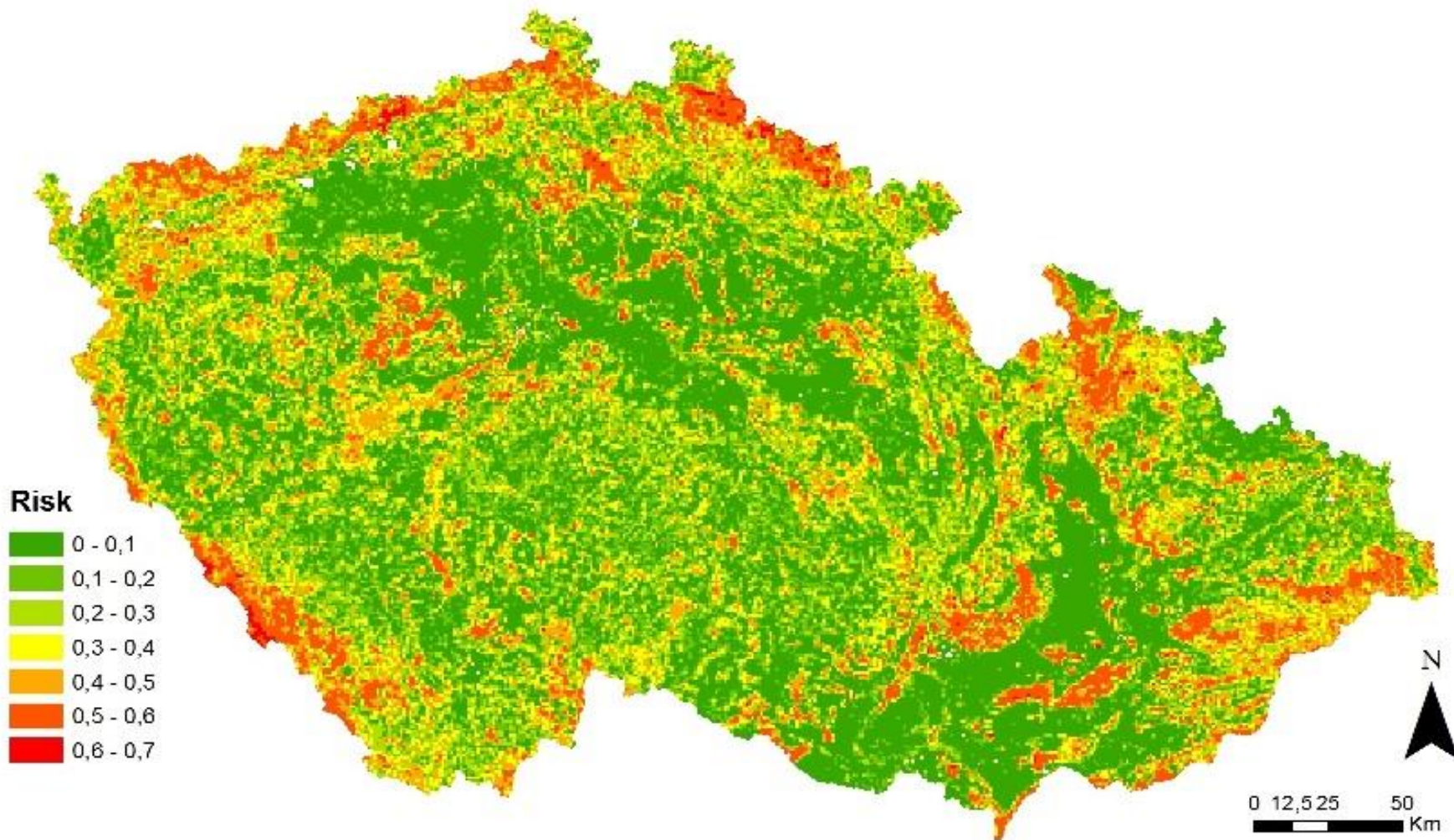
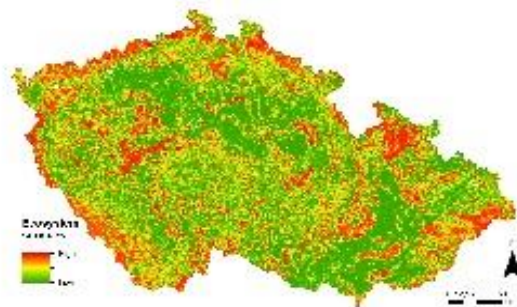
Legenda:  
nízké / low  
střední / moderate  
středně vysoké / medium  
vysoké / high







Risk	Reference	Indicator
Soil erosion	Grimm et al. (2002), Krása & Dostál (2008), Tetzlaff et al. (2013)	Average annual soil erosion (t/ha/rok)
Water quality	Brown et al. (2011), Whitehead et al. (2008)	BSK5 (mg/l)
Nitrogen deposition	Bobbink et al. (2010), EEA (2010), McClean et al. (2011)	Total annual nitrogen deposition (kg/ha/rok)
Floods	EEA (2012), TGM WRI (2011)	Frequency of flooding probability
Invasive species	Chytrý et al. (2009), Sandvik et al. (2013)	Proportion of invasive species in a habitat
Urbanisation (soil sealing)	EEA (2006), Lie et al. (2012), Wu et al. (2013)	The rate of land conversion to urban areas (productive land loss)
Pollution hazards	Faber & Wesem (2012), ME (2010), Thomsen et al. (2012),	Risk of contamination from pollution hazards



**Thank you for your attention.**

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