An aerial photograph of a vast agricultural landscape. The foreground and middle ground consist of large, rolling hills covered in plowed, light-brown soil. A narrow, straight strip of green vegetation, possibly a ditch or a small forest, runs diagonally from the bottom left towards the center. In the distance, the landscape transitions into greener fields and a line of trees under a clear blue sky. A small, isolated structure is visible on a hill in the upper right.

Sustainable management systems within Europe and optimal use of
the agricultural landscape from the point of view of soil quality
protection and carbon sink

Bořivoj Šarapatka

Workshop, Pardubice 30. 9. 2024

Agriculture and rural development

[Home](#) [Common agricultural policy](#) [CAP in my country](#) [Sustainability](#) [Farming](#) [Inter](#)

[Home](#) > [Common agricultural policy](#)

Common agricultural policy

The common agricultural policy



European Parliament

2019-2024

TEXTS ADOPTED

P9_TA(2024)0204

Soil Monitoring and Resilience (Soil Monitoring Directive)

European Parliament legislative resolution of 10 April 2024 on the proposal for a directive of the European Parliament and of the Council on Soil Monitoring and Resilience (Soil Monitoring Law) (COM(2023)0416 – C9-0234/2023 – 2023/0232(COD))

(Ordinary legislative procedure: first reading)

List of GAEC



- **GAEC 1:** Maintenance of **permanent grassland** based on a ration PG/agricultural area (at national, regional, sub-regional, holding level) **(G)**
- **GAEC 2:** Protection of **wetland and peatland** **(New)**
- **GAEC 3:** **Ban on burning** arable stubble, except for plant health reasons **(X-C)**

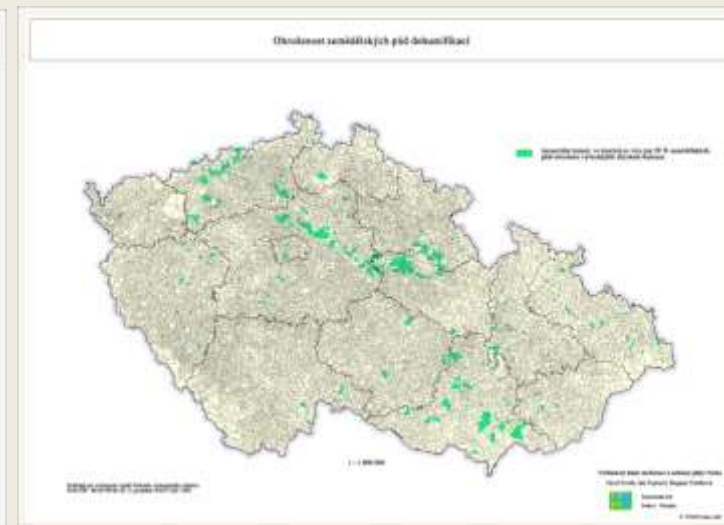
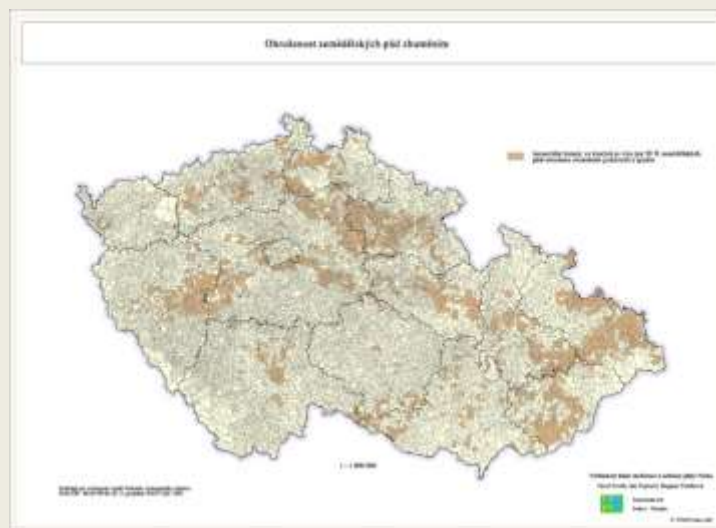
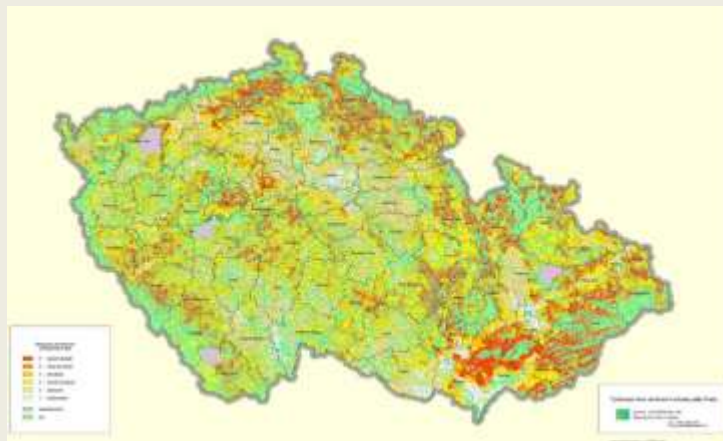


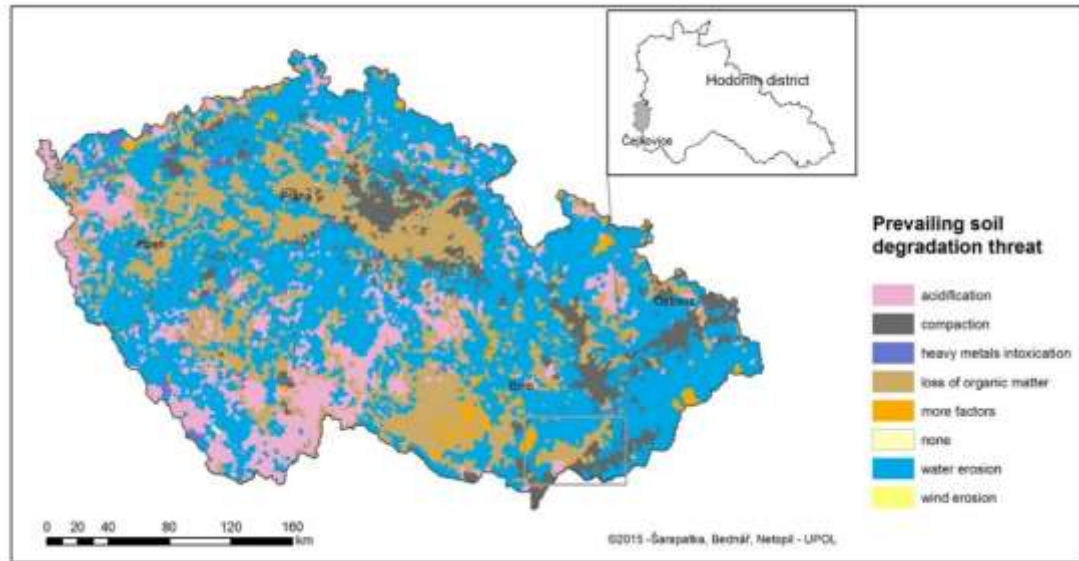
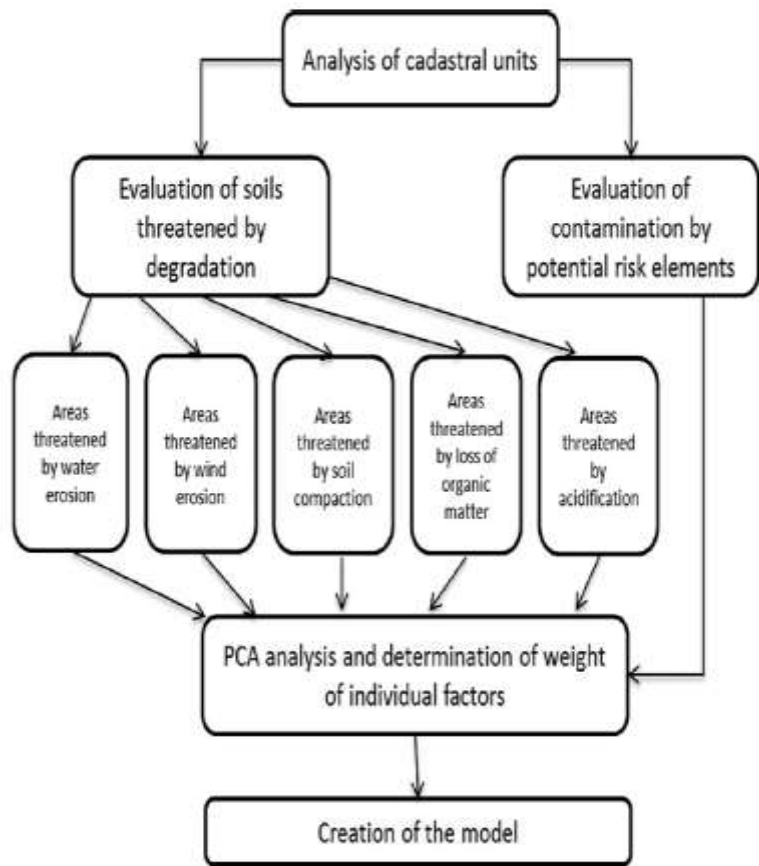
- **GAEC 4:** Establishment of **buffer strips** along water courses [minimum width of 3 meters] **(X-C)**
- **GAEC 5:** **Tillage management** reducing soil erosion risk with slope consideration **(X-C)**
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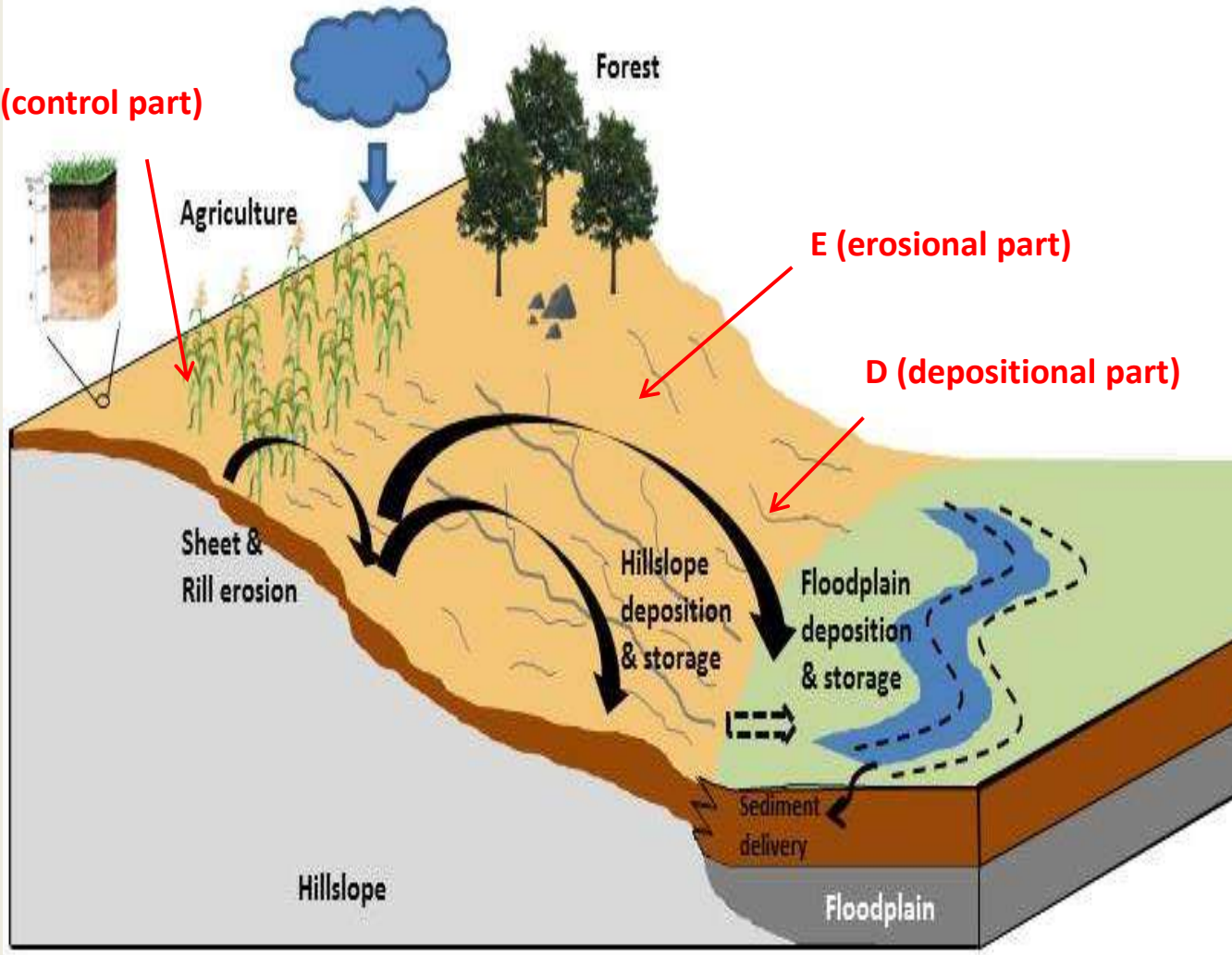
Soil degradation in the Czech Republic

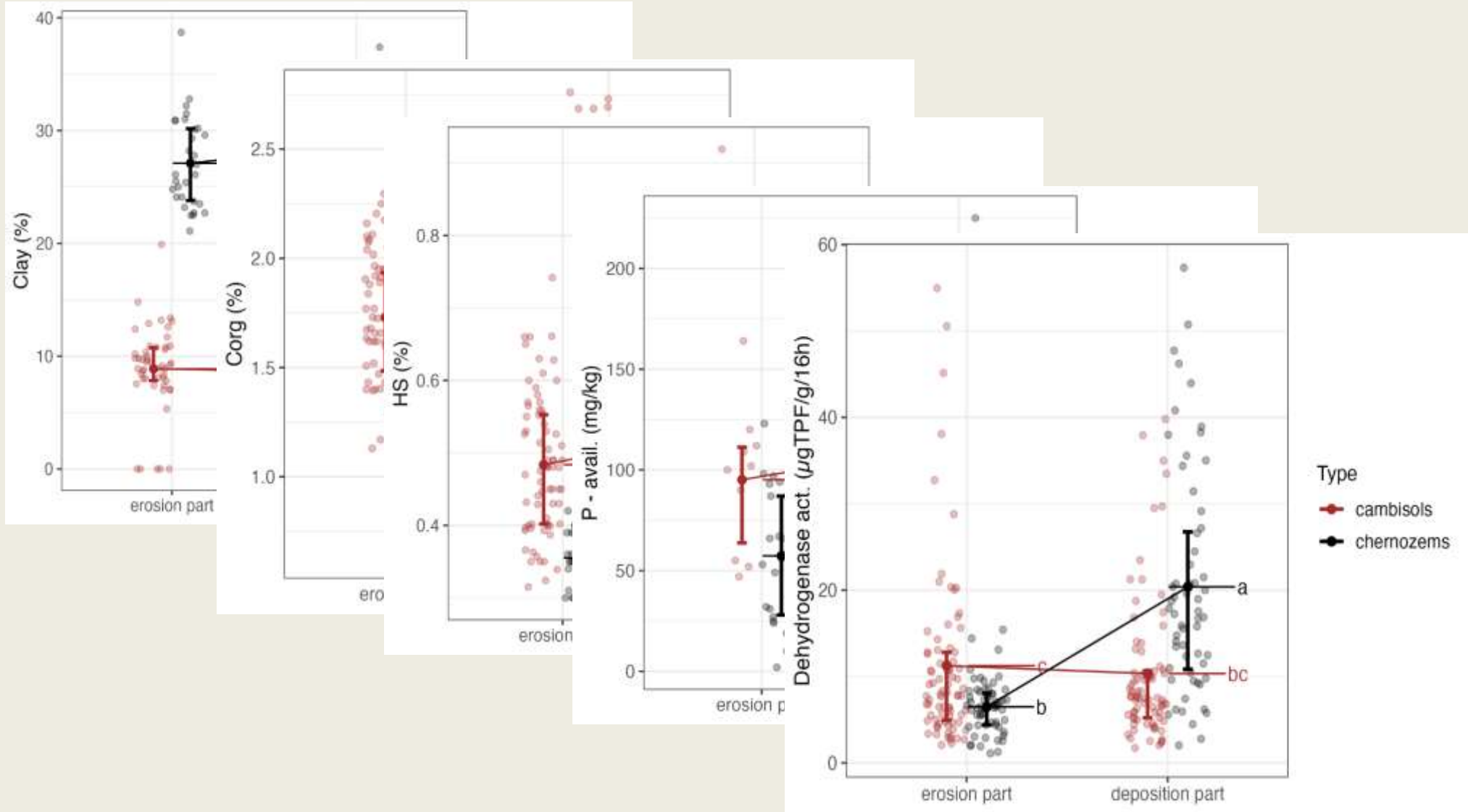


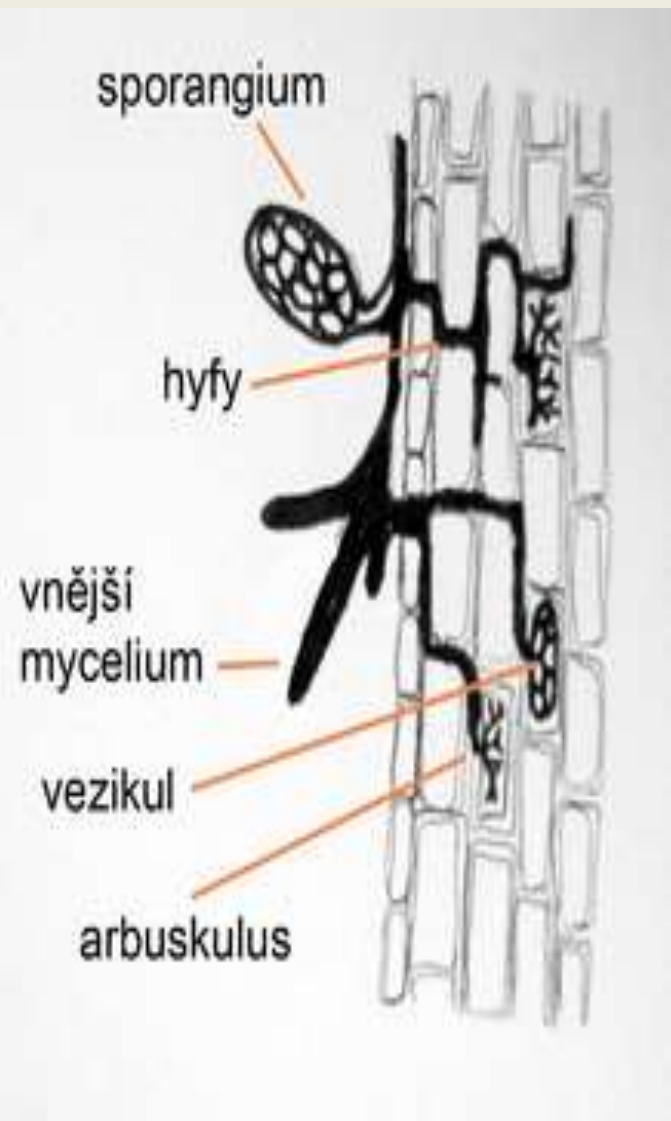


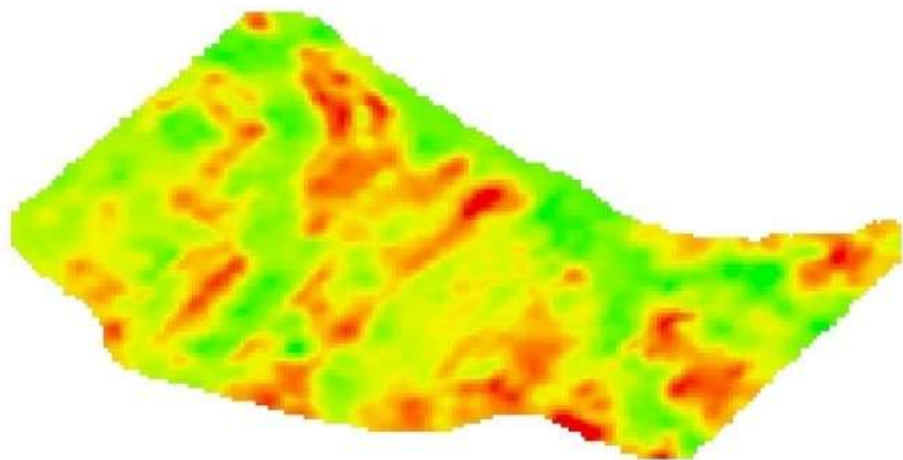
Šarapatka B., Bednář M. (2015): Assessment of potential soil degradation on agricultural land in the Czech Republic. *Journal of Environmental Quality*, 44: 154–161

C (control part)



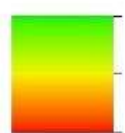






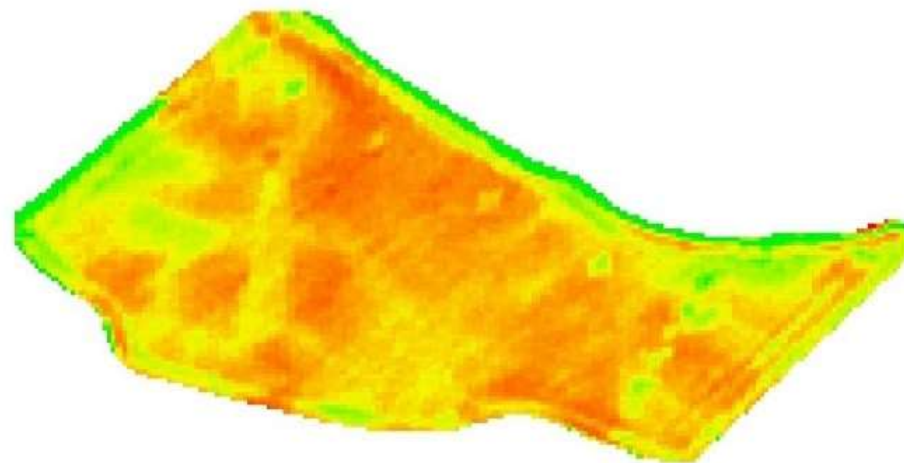
Grain yields

t/ha



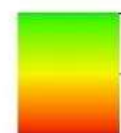
High : 6.866

Low : 3.089



EVI

Value

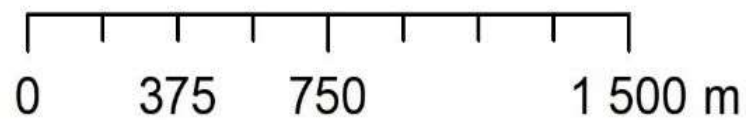


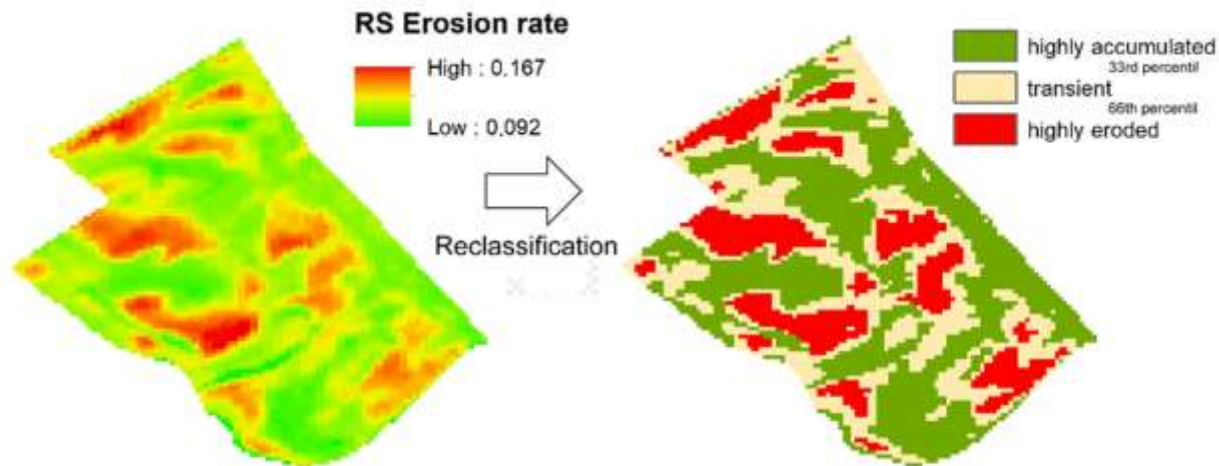
High : 0.685

Low : 0.140

Pearson Correlation: 0.397

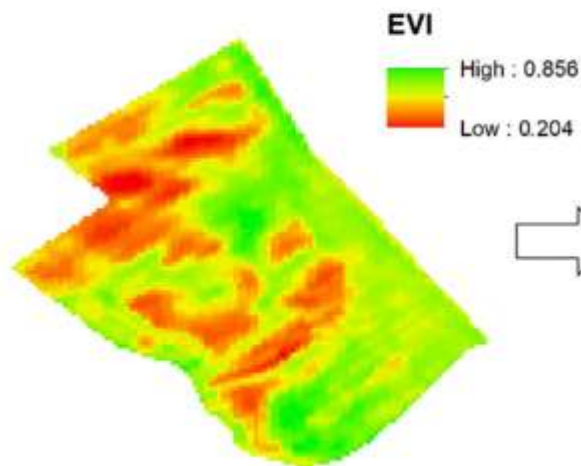
p-value: 1.829×10^{-33}





Field block: 9801/02 - 2018
winter wheat

0 250 500 1 000 m



$$\frac{avg(EVI_{highly\ accumulated})}{avg(EVI_{highly\ eroded})} = 1.248$$

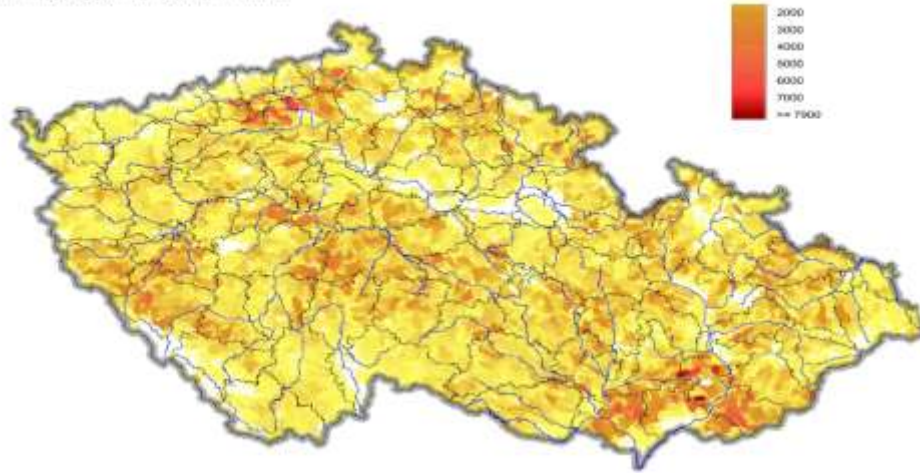
Pearson correlation: -0.535
p-value: 3.9×10^{-32}

Šarapatka, B., Bednář, M. (2021):
Agricultural production on erosion-
affected land from the perspective
of remote sensing. Agronomy
11(11), 2216,





The map of sediment yield (amount of sediment, which enters water courses and reservoirs) (t/year), within subcatchments of 4th order.

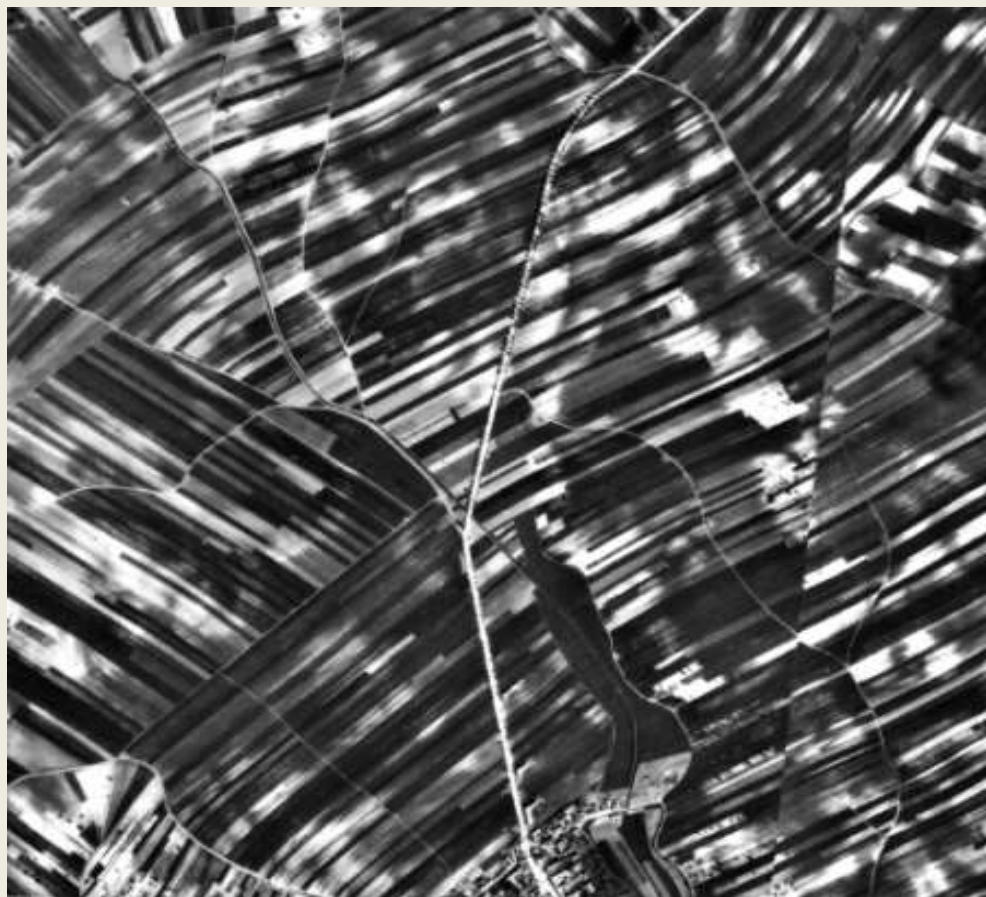


- Total annual soil loss on agricultural land - 9 085 100 t.year⁻¹
- The amount of sediment entering water courses - 3 589 500 t.year⁻¹

It is estimated that there are approximately **250 mil m³** of sediment accumulated in Czech water reservoirs



Čejkovice 1938



Čejkovice 2017



Ochrana zemědělské půdy před erozí

METODIKA
2023



1 VODNÍ EROZE.

2 EROZE TÁNÍM SNĚHU

3 VĚTRNÁ EROZE .

4 HYDROLOGICKÉ VÝPOČTY PRO ODVOZENÍ NÁVRHOVÝCH VELIČ

5 EKONOMICKÉ ASPEKTY EROZE PŮD

6 PŘÍLOHY A PRAKTICKÉ UKÁZKY POSTUPŮ, VÝPOČTŮ,

<https://knihovna.vumop.cz/>





Pásové střídání plodin

jako protierozní
a adaptační opatření
v pozemkových úpravách

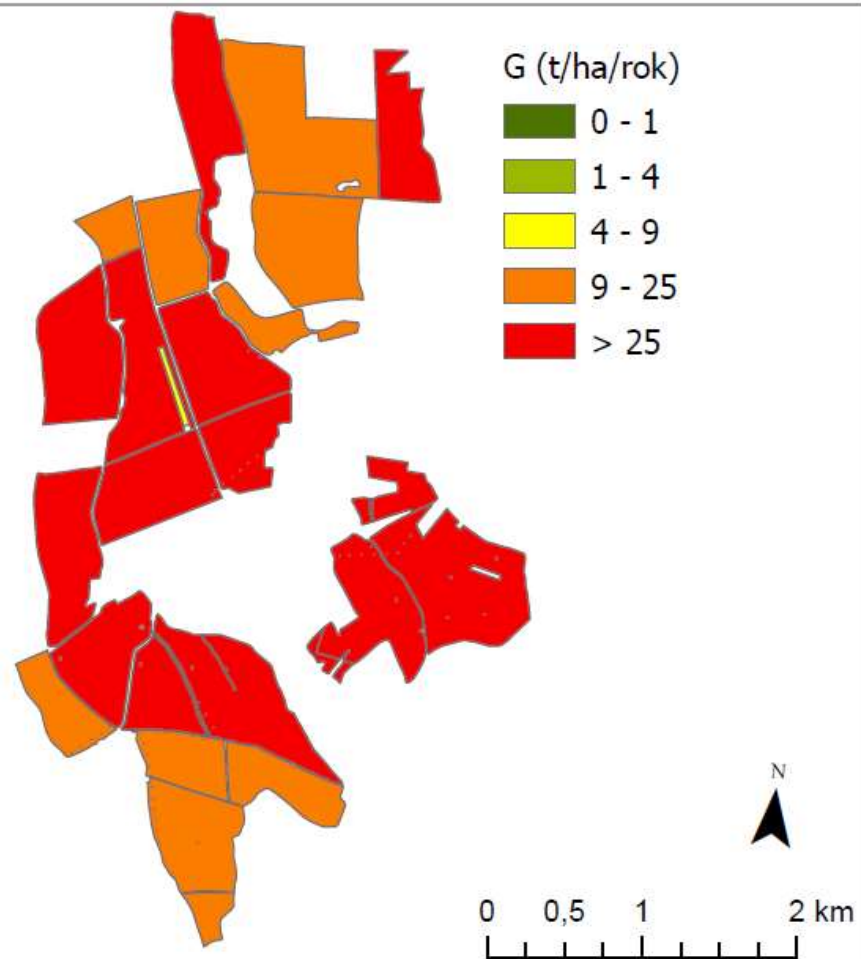
Certifikovaná metodika

Miroslav Dumbrovský, Bořivoj Šarapatka
a kolektiv

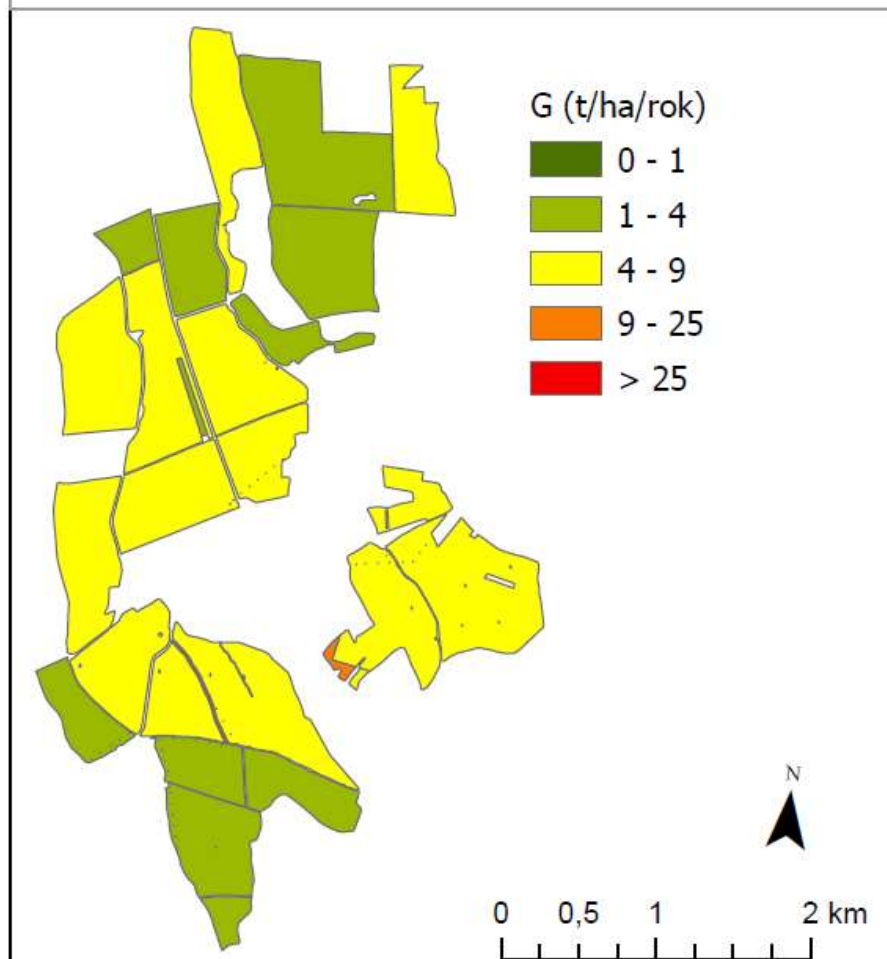




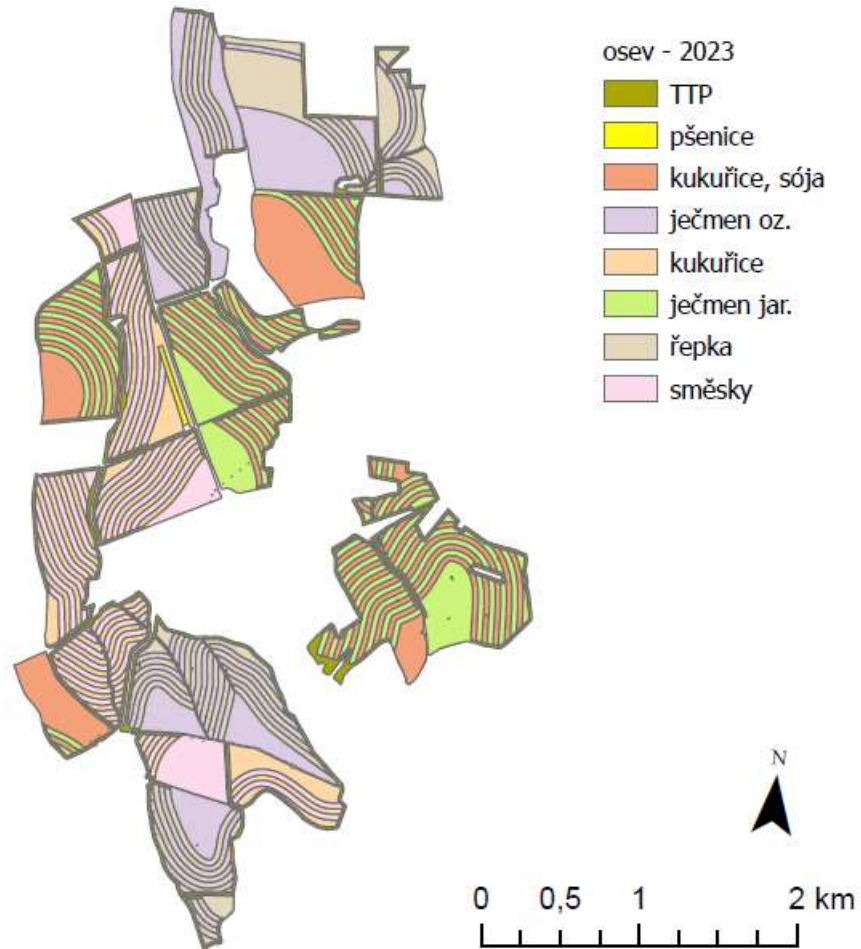
Potenciální erozní smyv (kukuřice)



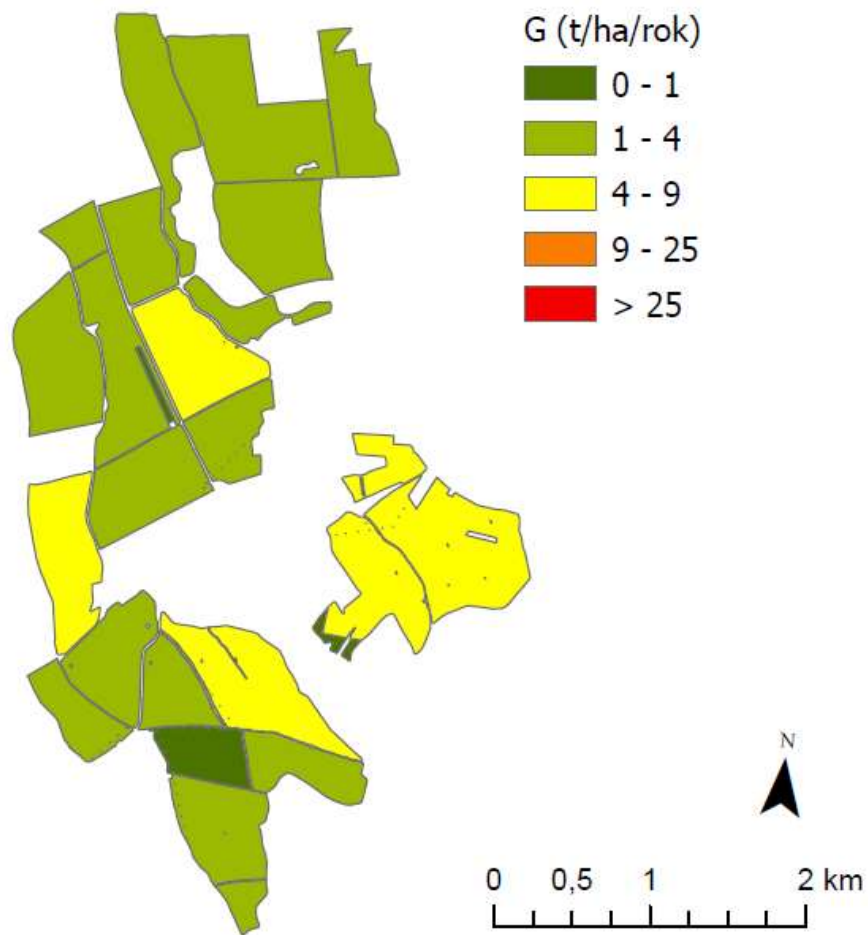
Potenciální erozní smyv (pšenice)



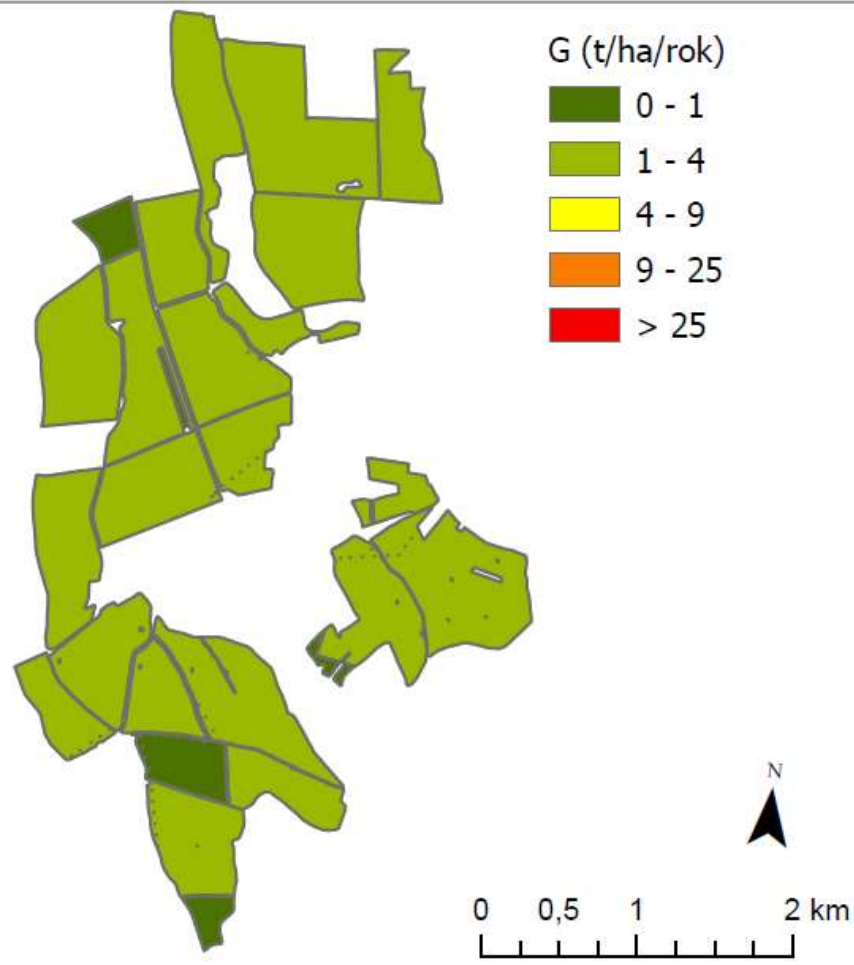
Určení geometrie pásů s osem roku 2023

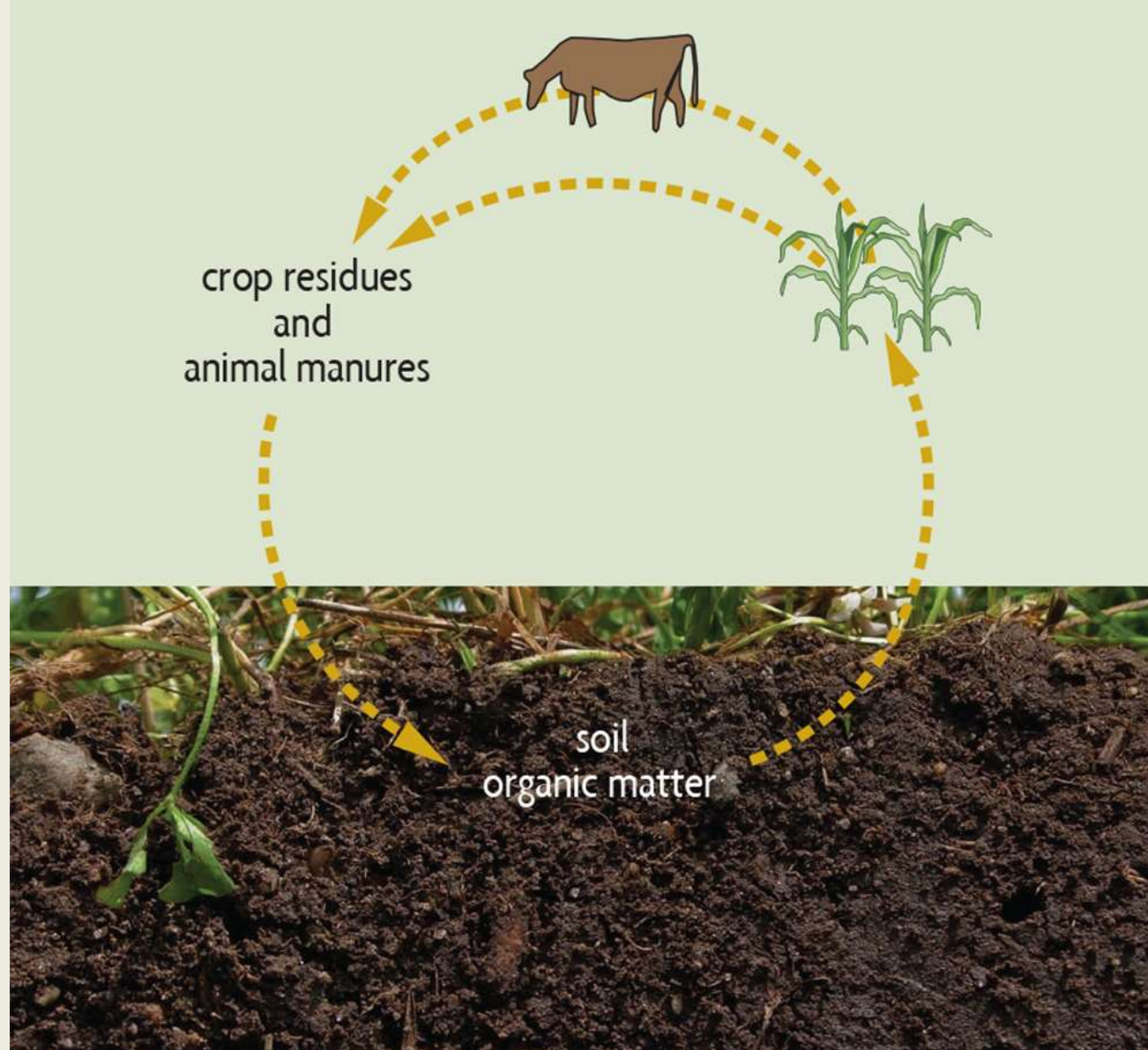


PSP - potenciální erozní smyv bez POT

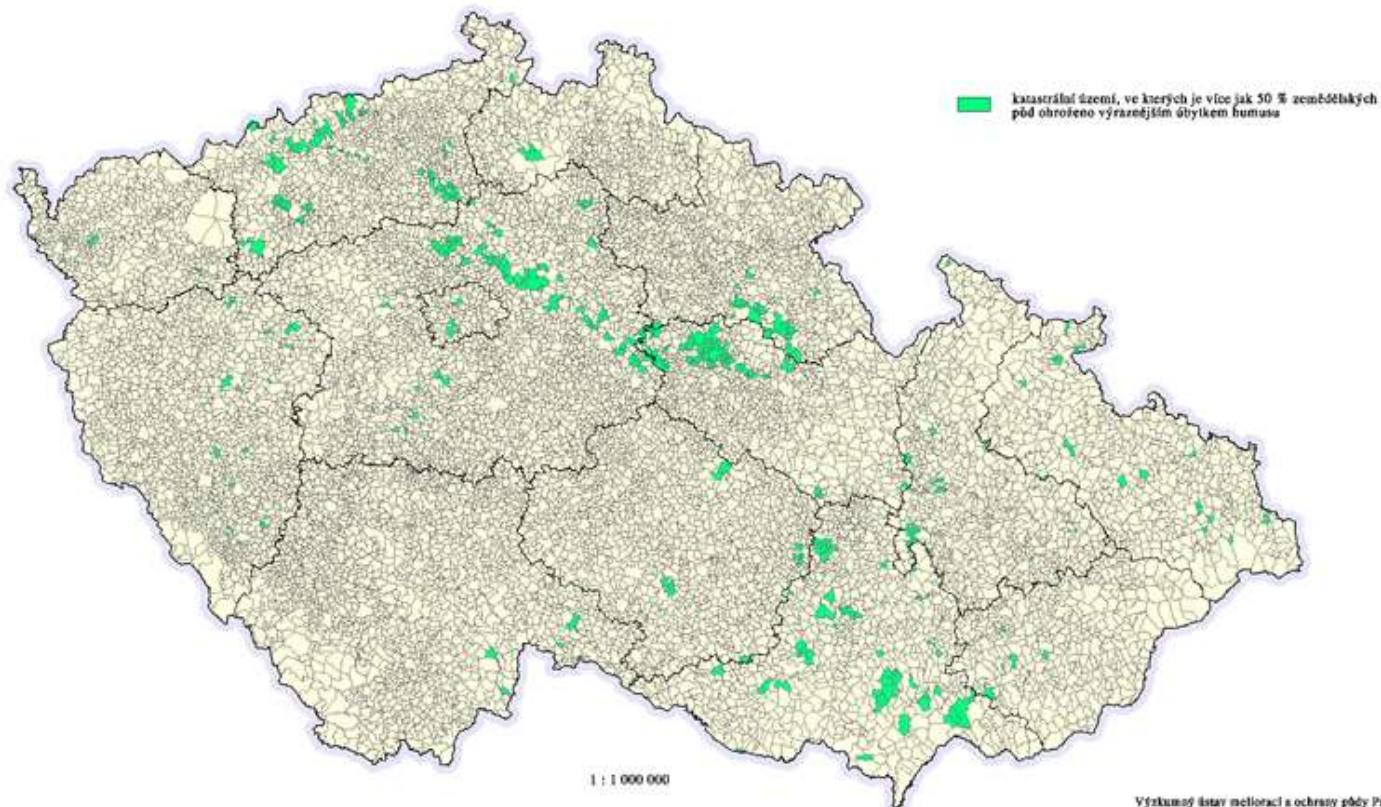


PSP - potenciální erozní smyv s POT





Ohroženost zemědělských půd dehumifikací



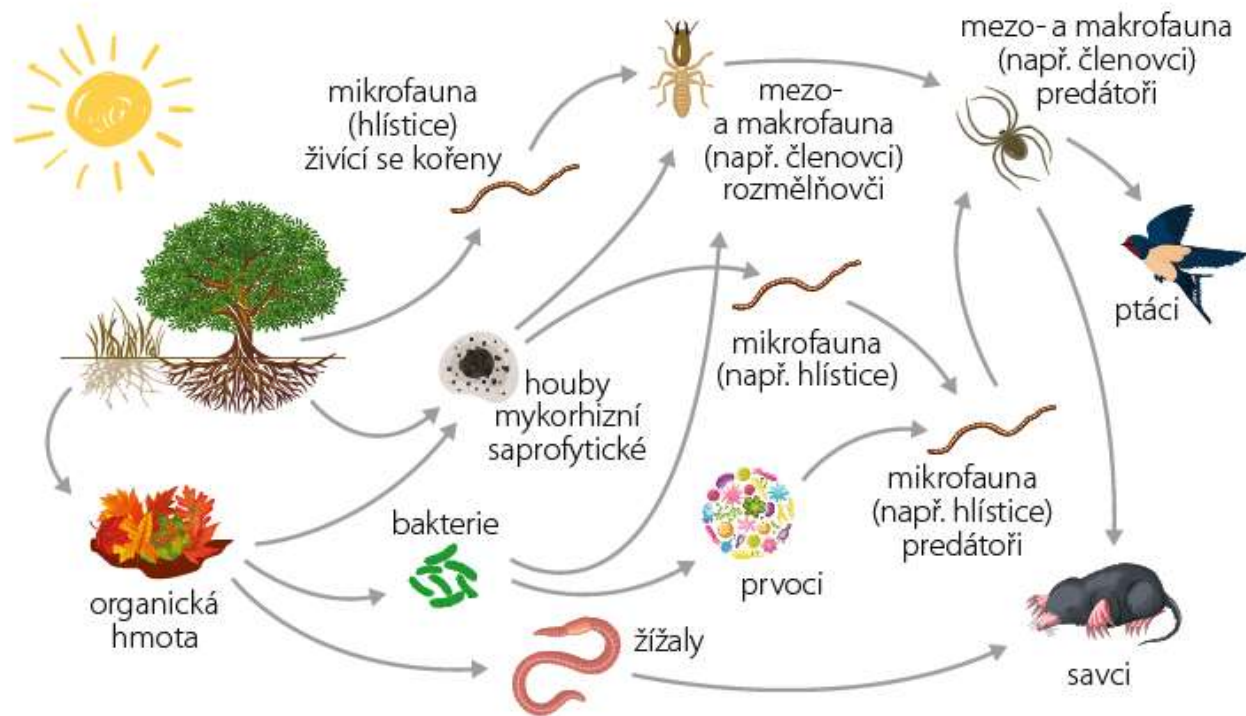
Podklad pro zobrazení vznikl telefonním výzkumem směru
MZe ČR - M-07-99-01-02 2. projektu NAZV QJ 1293

Výzkumný ústav meliorací a ochrany půdy Praha
Pavel Novák, Jan Vopravil, Dagmar Vetišková



Zabýváme se
Praha 5 - Zbraslav

© VÚMOP Praha, 2005



1. trofická
úroveň
primární
producenti

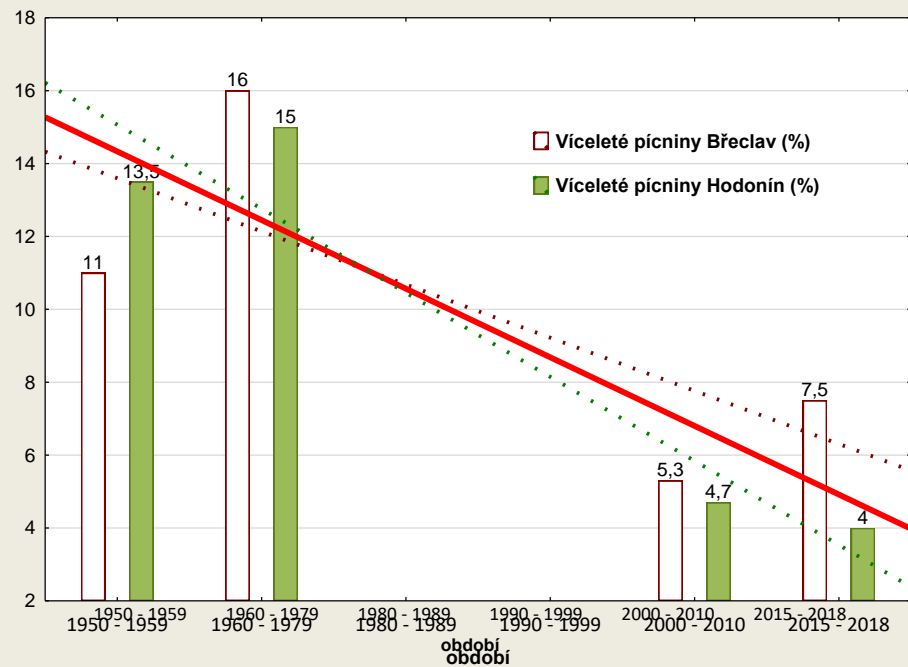
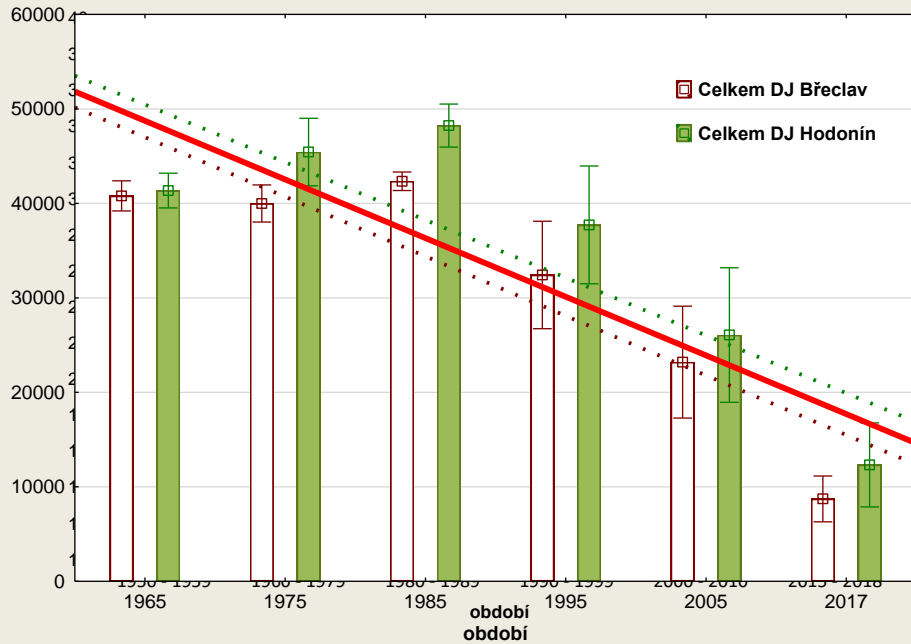
2. trofická
úroveň
dekompozitoři
mutualisti
patogenní org.
paraziti
org. živící se
kořeny

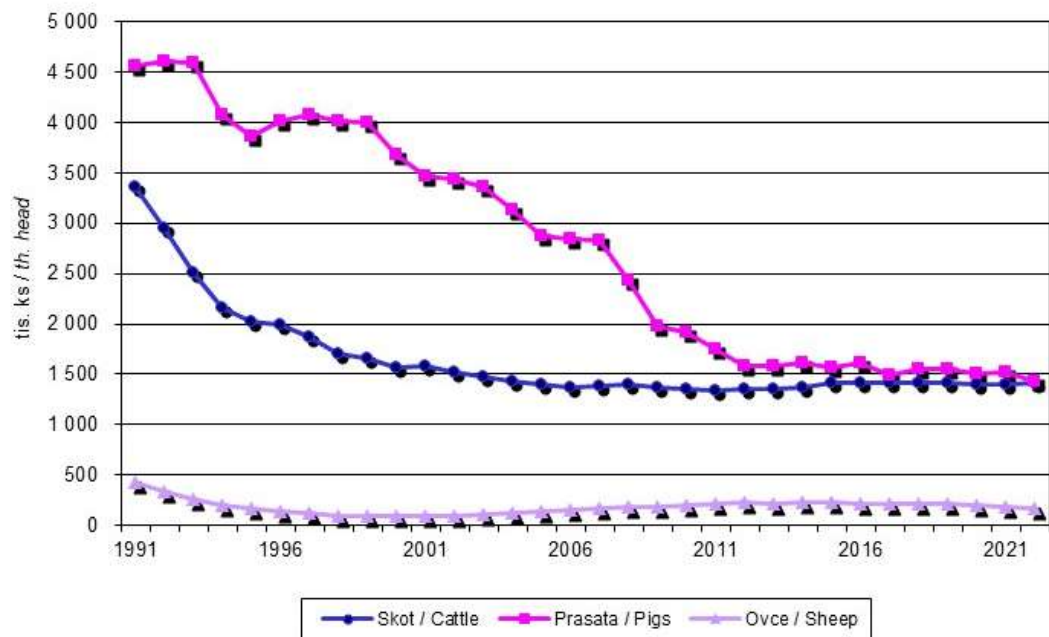
3. trofická
úroveň
rozmělnovači
predátoři
spásači

4. trofická
úroveň
predátoři
vyššího řádu

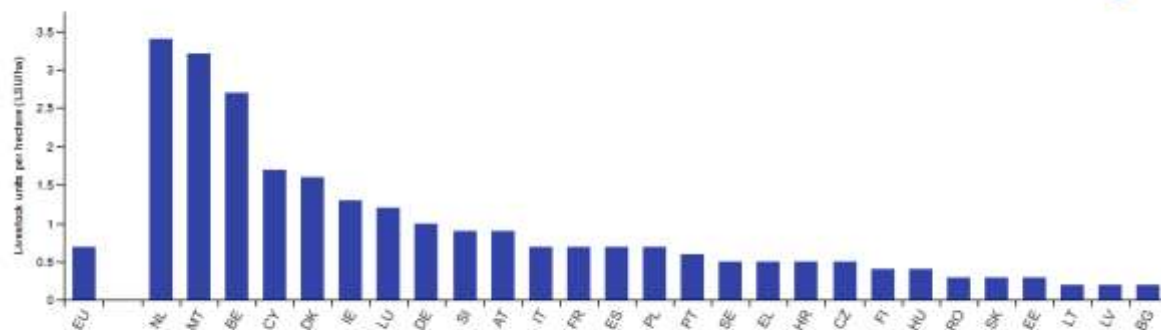
5. trofická
úroveň
predátoři
vyššího řádu

Mean; Whisker: Mean \pm SD





Livestock density, EU, 2020



Source: Eurostat (online data codes: ef_bk_main, ef_liv_main and Eurostat calculations)

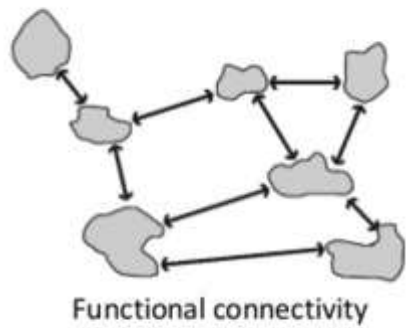
Data extracted: 03.07.2023



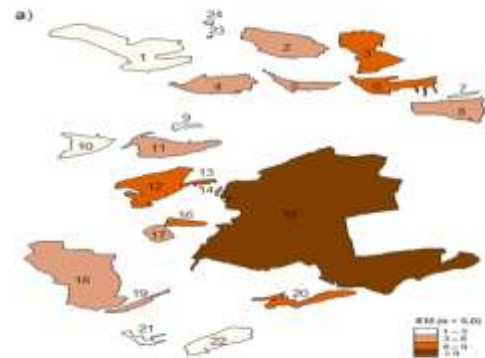
**the last 30 years - the
reduction of the flying
insect's biomass by up to
80%**

**22% threatened (in groups
up to 50% - butterflies,
dragonflies, wasps ...)**

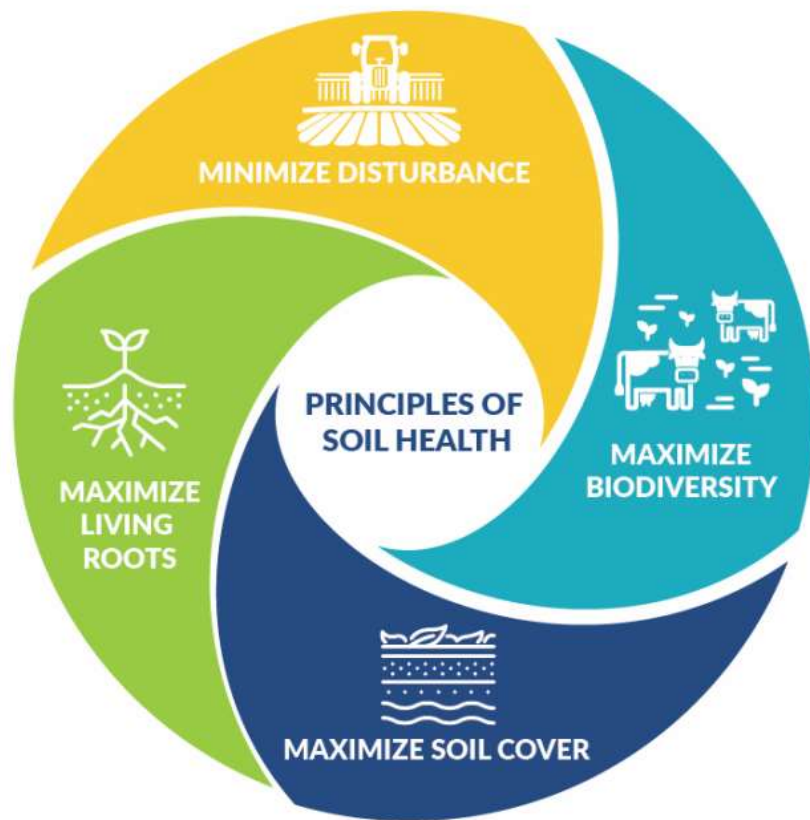
**landscape elements
from 2 – 2.5 % to 0.5 – 0.7 %**



$$S_i = A_i^c \sum_{j \neq i} \exp(-\alpha d_{ij}) A_j^b$$







Climate change

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Biodiversity and landscapes

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MINISTERSTVO ZEMĚDĚLSTVÍ

2024

METODIKA k provádění nařízení vlády č. 80/2023 Sb.,

**o stanovení podmínek provádění
agroenvironmentálně-klimatických opatření**



Financováno
Evropskou unií



Thanks for your attention



**Acknowledgements: Technology agency of the Czech Republic
(projects SS02030018 a SS06010290).**