

# Historická ekologie českých lesů

*Péter Szabó*

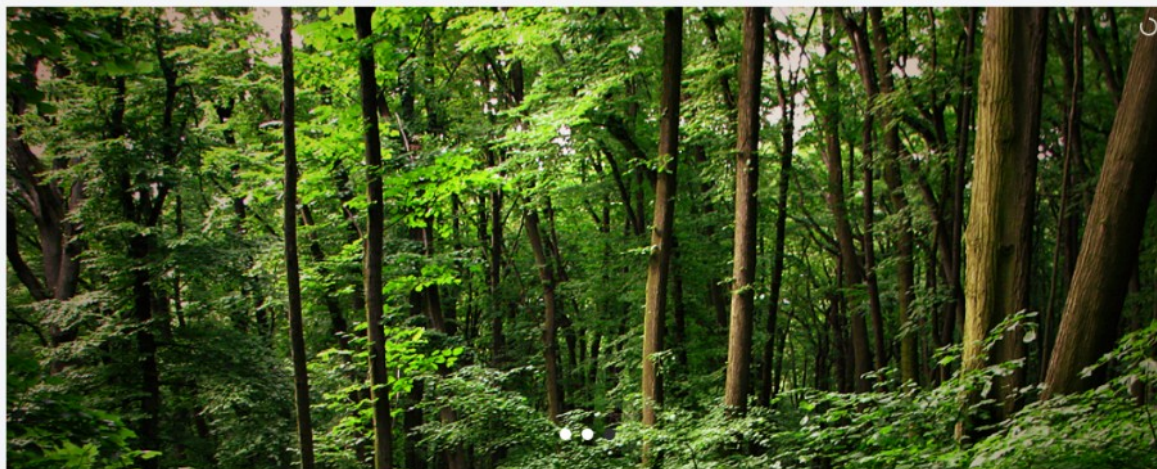
**Institute of Botany of the ASCR, v. v. i.**  
Zámek 1, CZ - 252 43 Průhonice, Czech Republic  
[www.ibot.cas.cz](http://www.ibot.cas.cz)



# About myself

- Studied linguistics and history in Budapest
- Specialization in the Middle Ages, PhD in interdisciplinary medieval studies at the Central European University
- Research interest (woodland historical ecology) lies between *history*, *archaeology* and *ecology*
  - Department of Medieval Archaeology at ELTE, Budapest, Hungary
  - Institute of Botany of the Czech Academy of Sciences, Brno, Czech Republic



[Home](#)[Project](#)[Outreach](#)[Team](#)[Results](#)[Contacts](#)[Links](#)

### **Long-term woodland dynamics in Central Europe: from estimations to a realistic model (2012–2016)**

LONGWOOD is a five-year project financed by the European Research Council (ERC –erc.europa.eu) in its Starting Grant scheme. The mission of ERC is to encourage the highest quality research in Europe through competitive funding and to support investigator-initiated frontier research. The principal investigator of the LONGWOOD project is Péter Szabó.

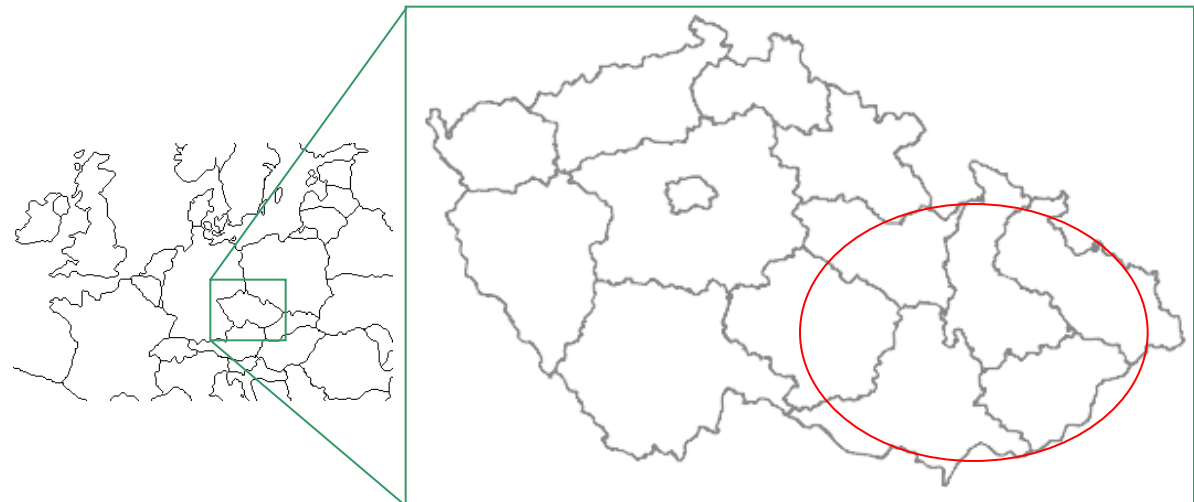
The interdisciplinary LONGWOOD project connects several disciplines that deal with past environments. Its starting point is the assumption that the vegetation of Central Europe has been directly influenced by humans for at least eight millennia; the original forests have been gradually transformed into today's agricultural landscape. However, there is more to this landscape change than the simple disappearance of woodland. Forests have been brought under various management regimes, which profoundly altered their structure and species composition. The details of this process are little known for two main reasons. The greatest obstacle is the lack of cooperation among the disciplines dealing with the subject. The second major problem is the differences in spatio-temporal scaling and resolution used by the individual disciplines. Existing studies either concern smaller territories, or cover large areas (continental to global) with the help of modelling-based generalizations rather than primary data from the past. Using an extensive range of primary sources from history, historical geography, palaeoecology, archaeology and ecology, this interdisciplinary project aims to reconstruct the long-term (Neolithic to present) patterns of woodland cover, structure, composition and management in a larger study region (Moravia, the Czech Republic, ca. 27,000 km<sup>2</sup>) with the highest spatio-temporal resolution possible. Causes for the patterns observed will be analyzed in terms of qualitative and quantitative factors, both natural and human-driven, and the patterns in the tree layer will be related to those in the herb layer, which constitutes the most important part of plant biodiversity in Europe. This project will introduce woodland management as an equal driving force into long-term woodland dynamics, thus fostering a paradigm shift in ecology towards construing humans as an internal, constitutive element of ecosystems. By integrating sources and methods from the natural sciences and the humanities, the project will contribute to a more reliable methodology for woodland management and conservation in Central Europe.

[www.longwood.](http://www.longwood.)

CZ

# Aims

- to combine historical, palaeoecological, vegetation ecological and archaeological data in GIS
- to study woodland dynamics for the past 8000 years in a well-defined, larger study region (Moravia) with the highest resolution possible
- to relate past patterns in the tree layer to patterns in the herb layer
- to analyze the role of humans in woodland dynamics
- to contribute to forest management and nature conservation policies



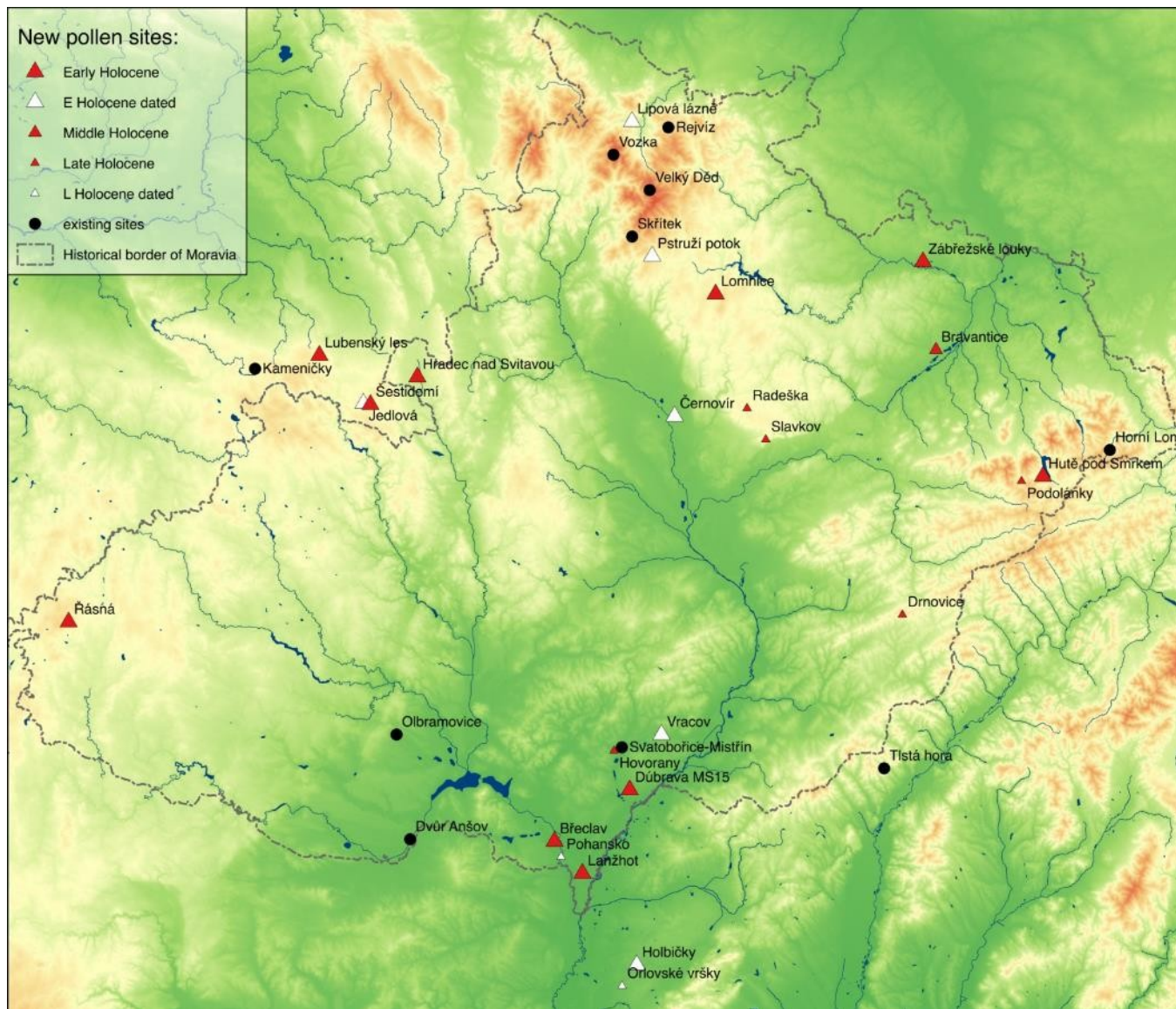
## Palaeoecology working group

- long-term vegetation dynamics: past 11,000 years
- focus on changes in woodland cover, composition and structure

## Data sources

- sedimentary pollen data (lakes and forest hollows)
- $^{14}\text{C}$  or  $^{210}\text{Pb}$  dating
- pollen productivities, quantitative vegetation reconstruction





24 new or newly dates sites, 106 new  $^{14}\text{C}$  dates



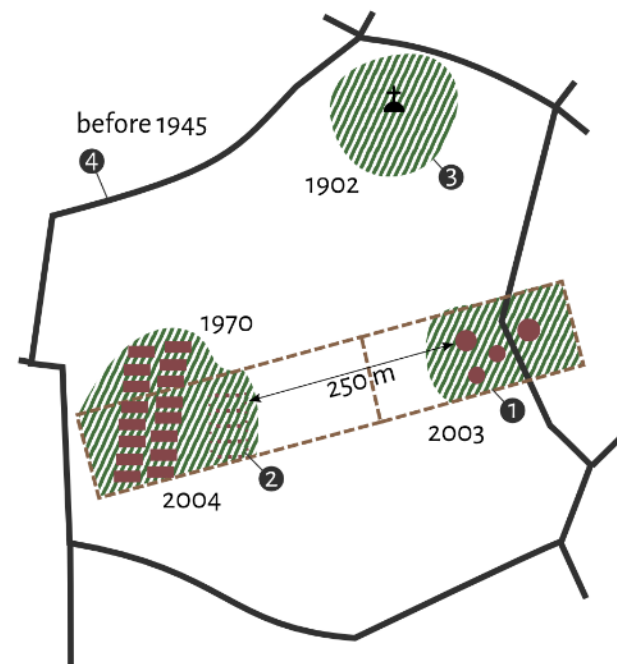
# Archaeology working group

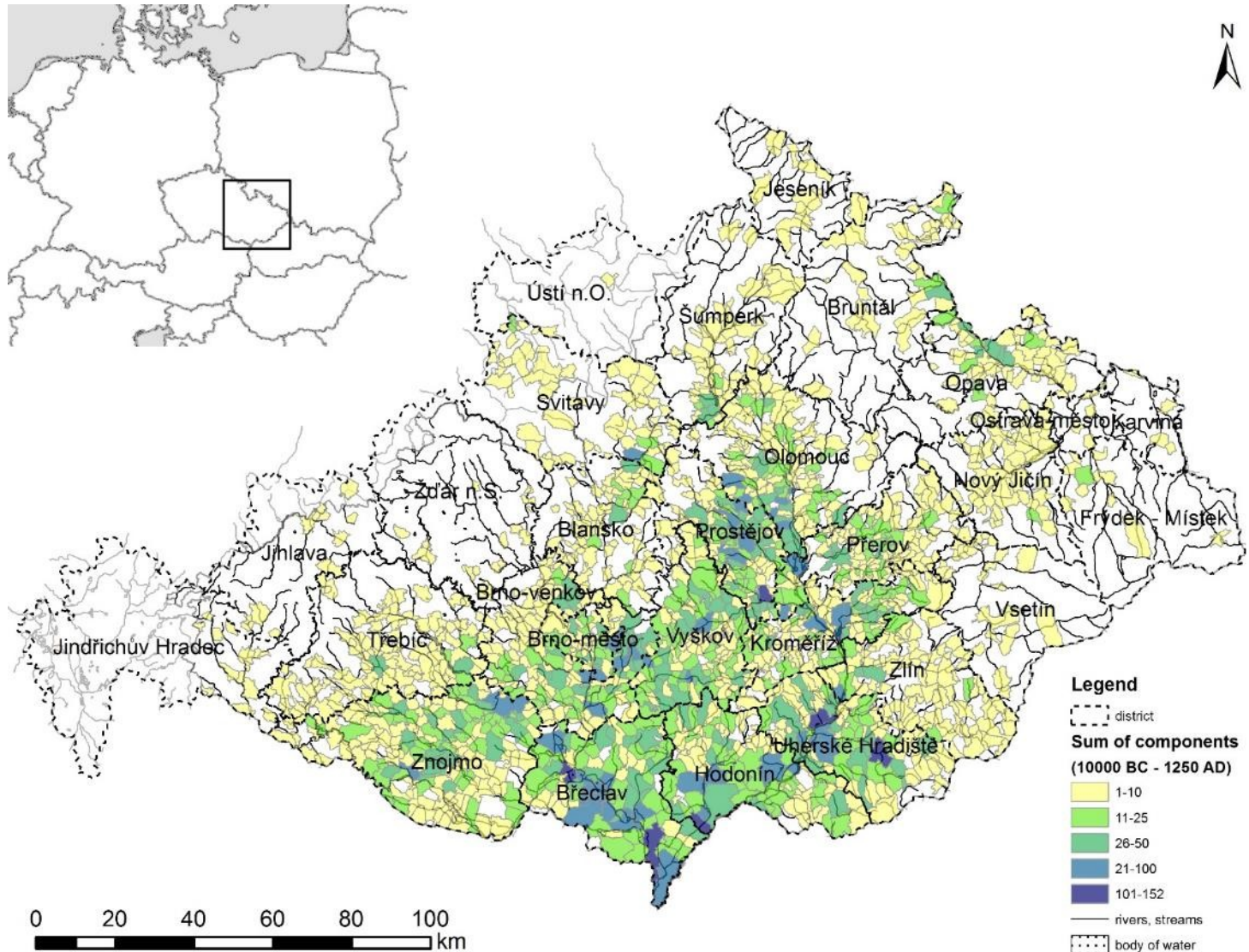
- past 8,000 years
- focus on human activities
- from coarse to precise resolution

## Data sources

- unpublished and published research reports

*Parish - Locality - Components*





19,021 archaeological components coming from  
7861 archaeological sites in 1685 civil parishes

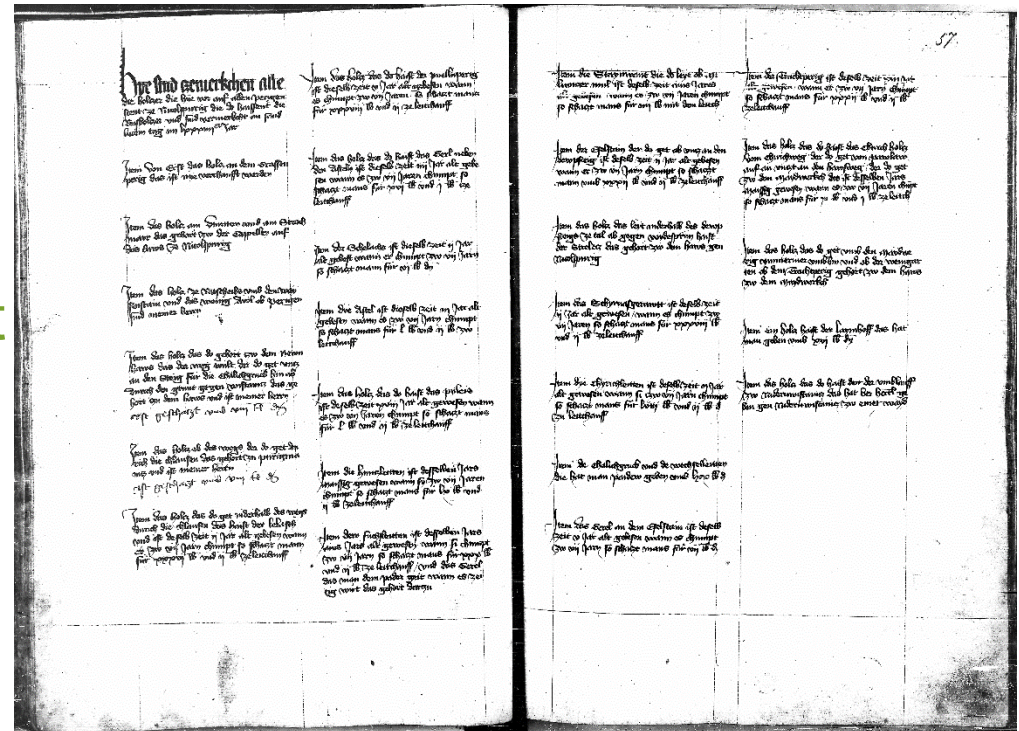


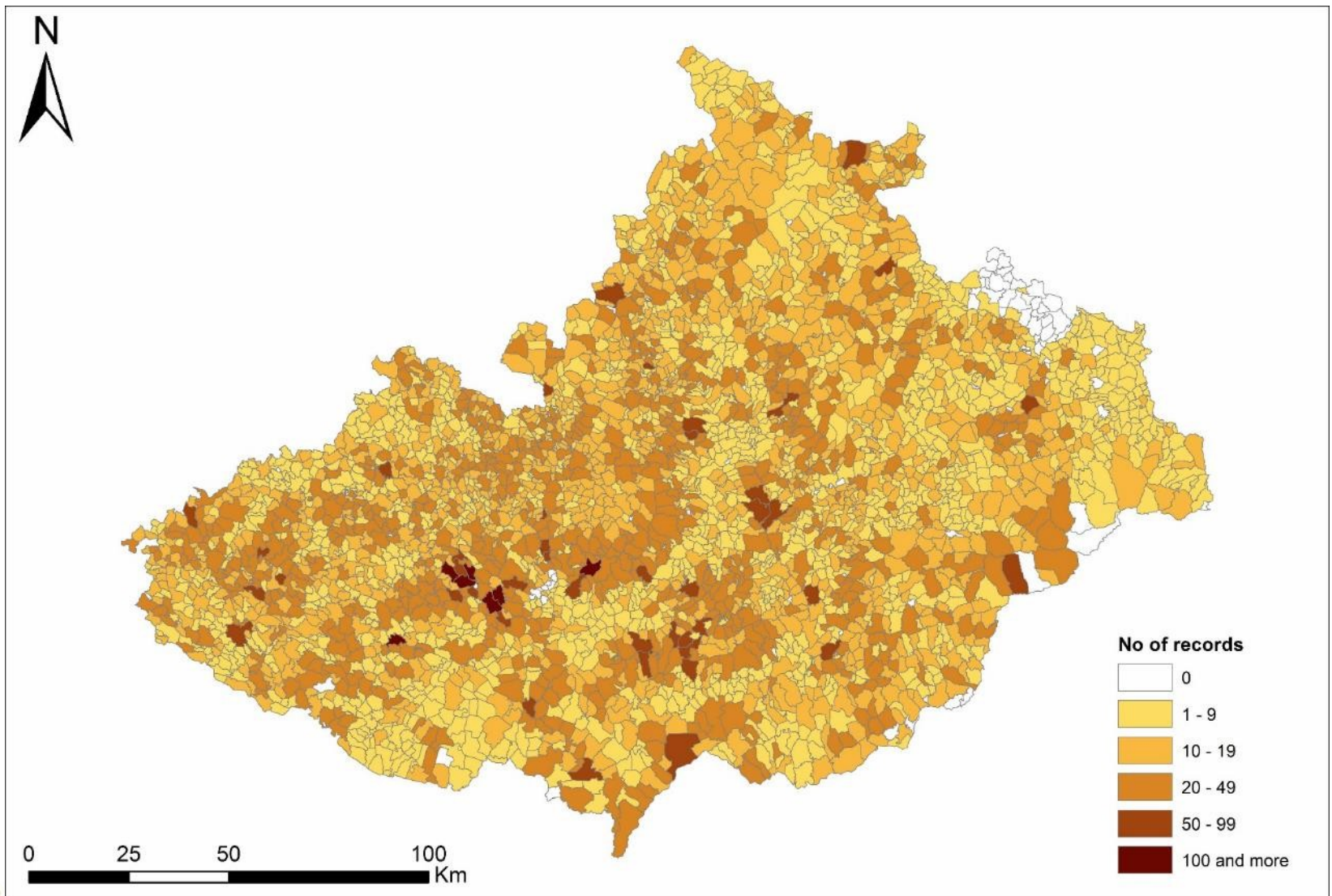
# History working group

- forest extent, management and species composition since the Middle Ages
- resolution: township (katastrální území)

## Data sources

- charters
- account books
- urbaria
- cadastres
- forest management plans





50,000 pieces of information on individual forests  
from 465 different archival sources ranging from  
the 11<sup>th</sup> to the 20<sup>th</sup> centuries

## Vegetation ecology working group

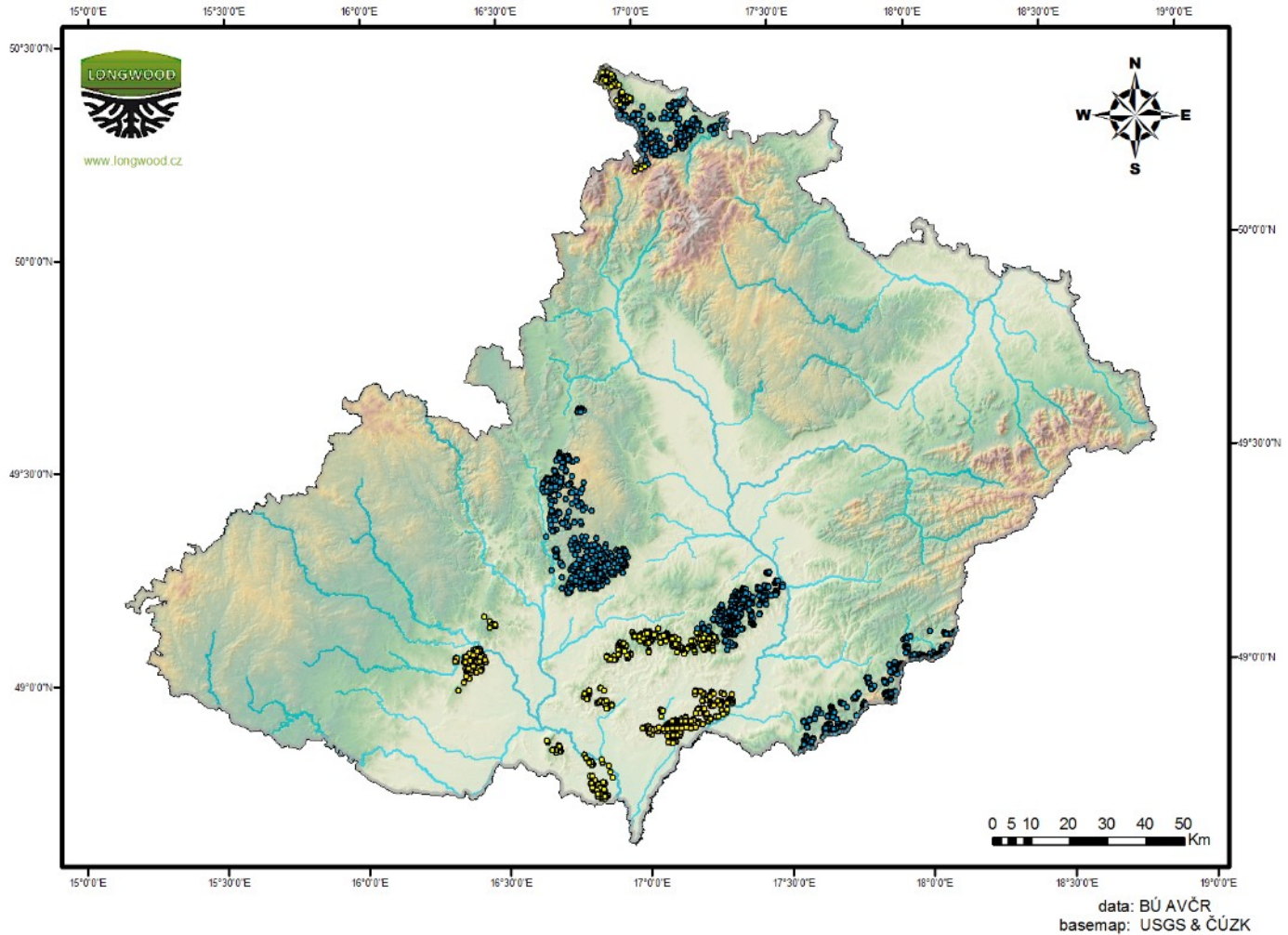
- most recent history of forests in Moravia: the past century
- focus on biodiversity, composition and individual species
- fine resolution

## Data sources

- field survey
- vegetation plot databases
- lab measurements
- GIS resources



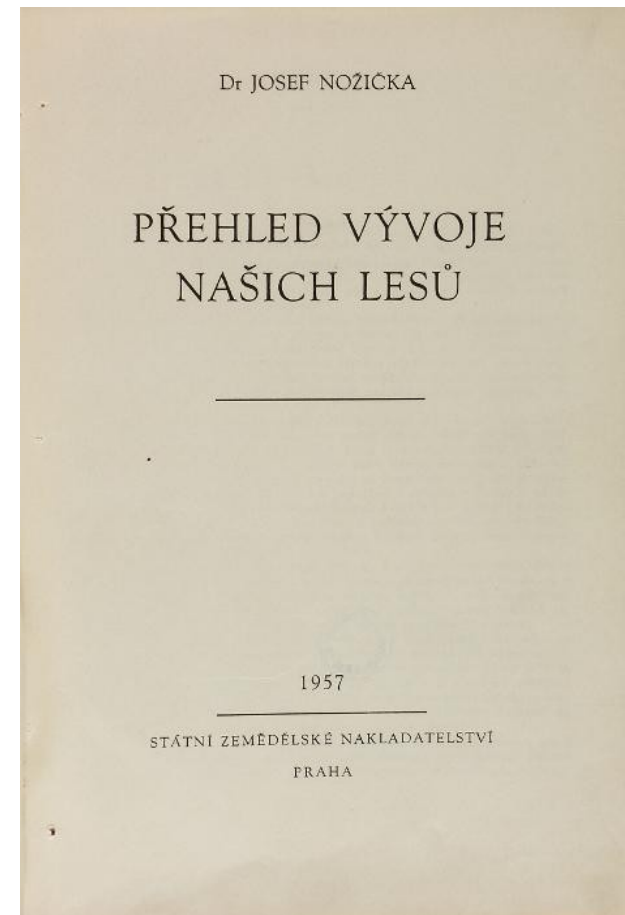
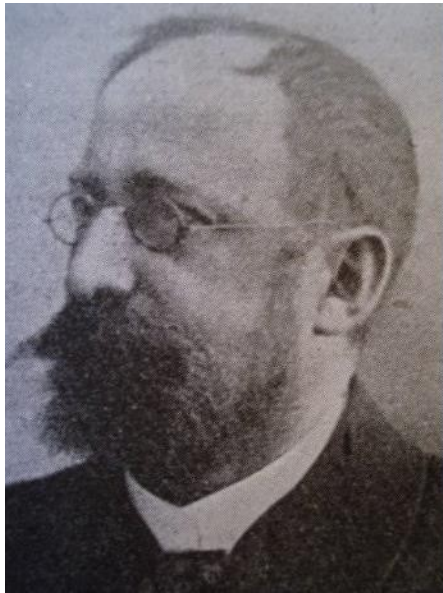
## Forest Resurvey Plots



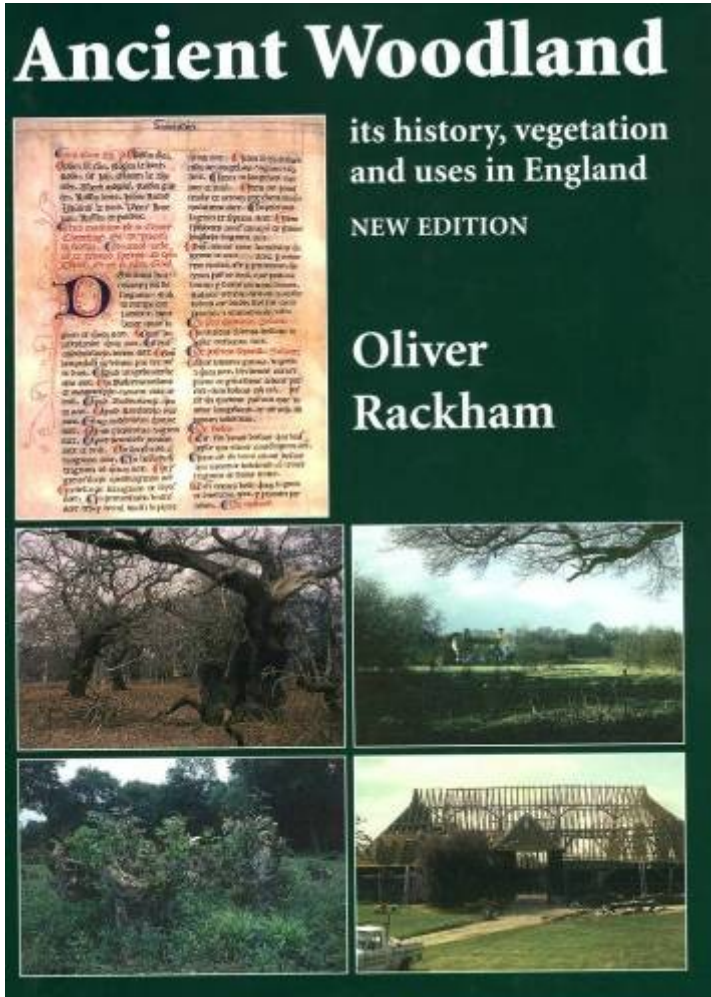
2166 semi-permanent resurveyed plots, 600 permanent plots, 168 experimental plots

# Forest history

Jan Evangelista Chadt:  
*Dějiny lesů a lesnictví*. 1913.



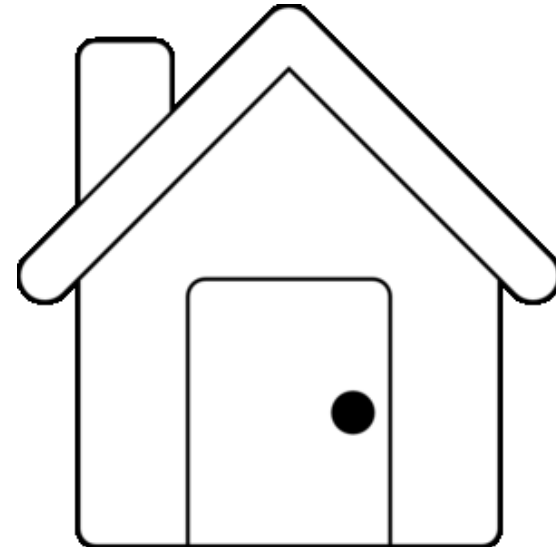
# Historical Ecology



Oliver Rackham



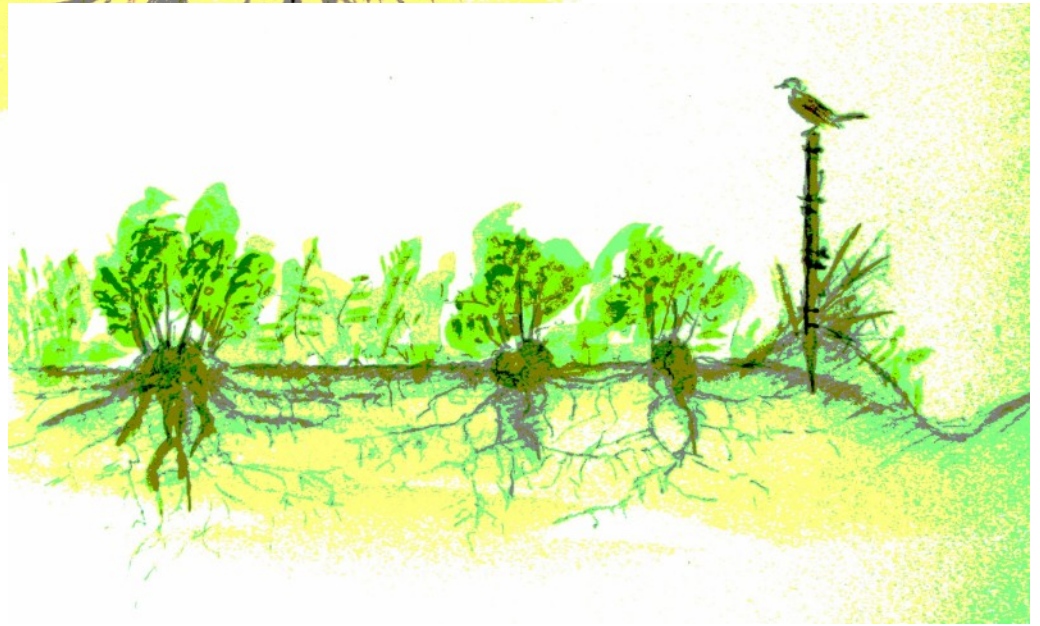
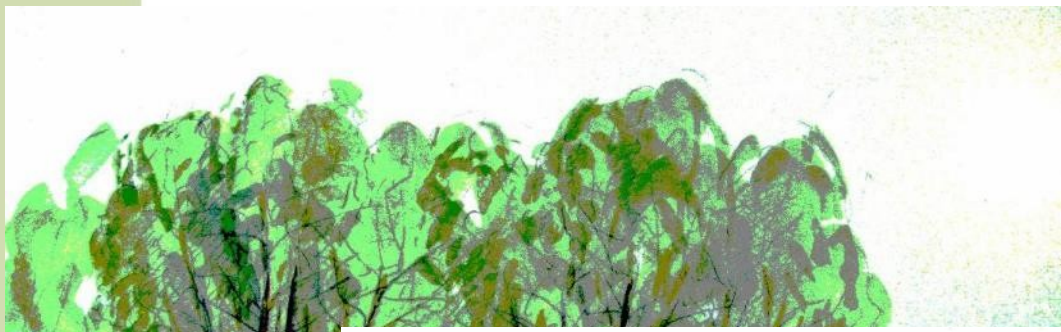
# Forms of management in lowland temperate European woodlands

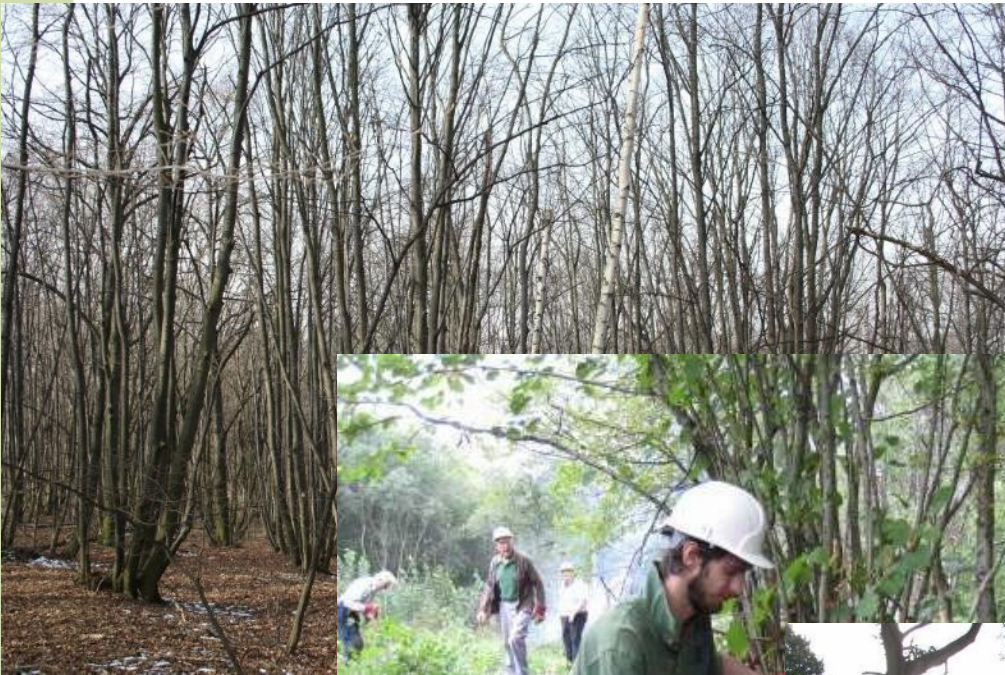












## Firewood



Martinická Bible  
ca. 1434





## Timber





**coppice-with-standards [pařezina s výstavky]**





**wood-pasture [pastevní les]**





**high forest [vysoký les]**





# Why does woodland history matter for today's forests?

1. It helps us understand current patterns and processes
2. It fosters better informed management and policy decisions
3. It places ecology, conservation and restoration in a wider (conservation and other) context



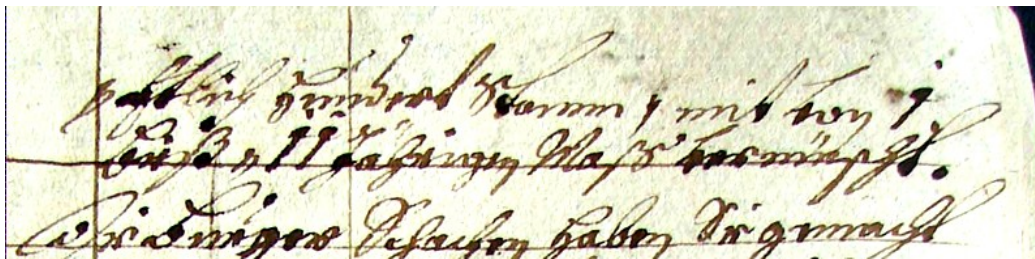
# Děvín

1. It helps us understand current patterns and processes in n

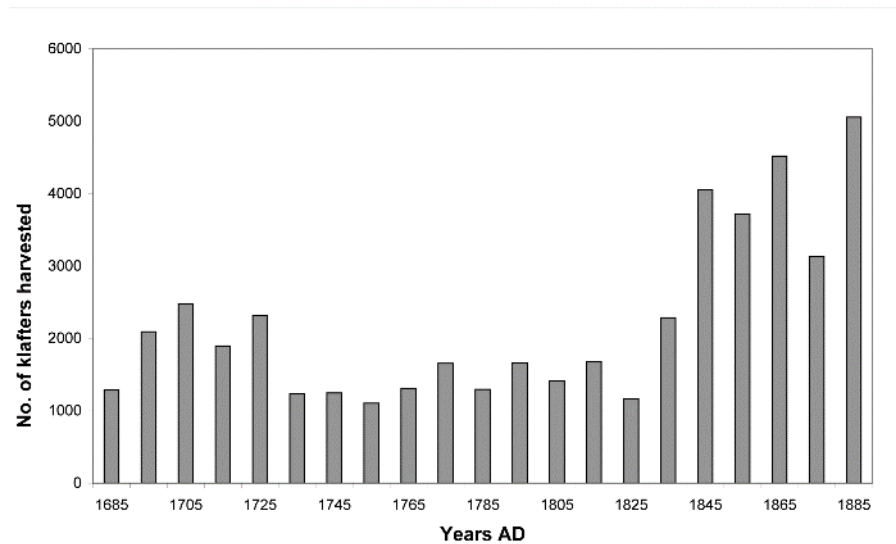
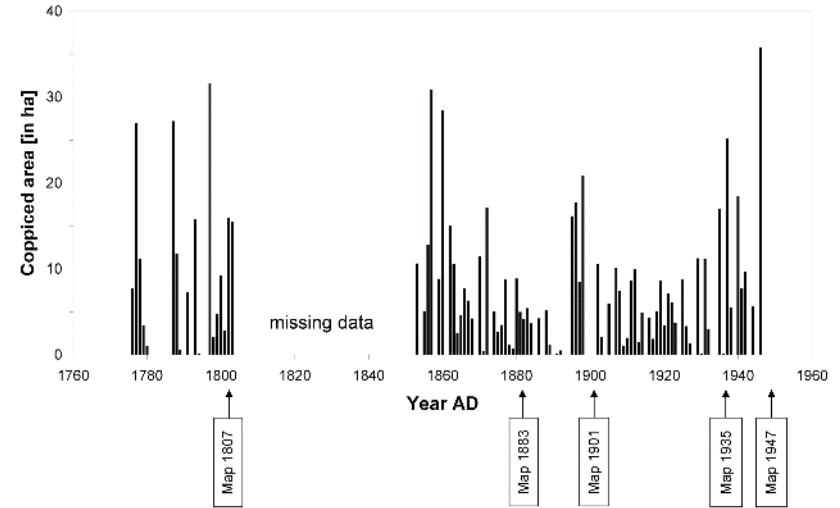
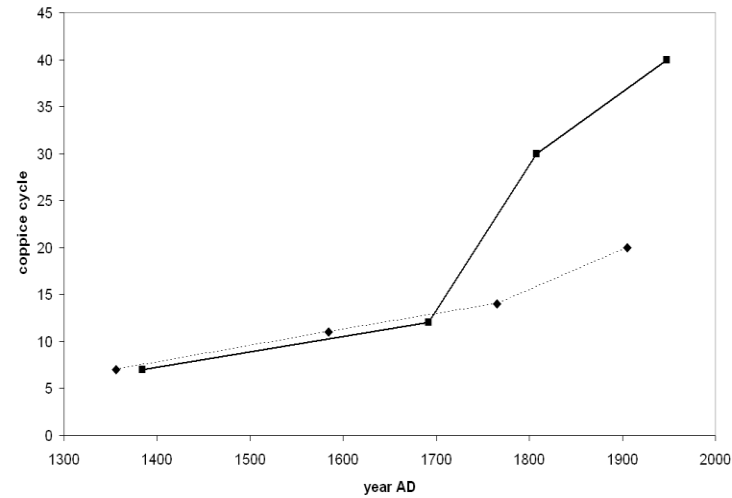
1384 urbarium:

“Das holcz, das do get niderhalb des wegs durich die Chlausen, das haist der Lelasch, und ist deselb zeit 2 jar alt gevesen; wann er zw 7 jarn chumpt, so schaczt mann für 36 lb. und 2 lb. ze leitchauff.”

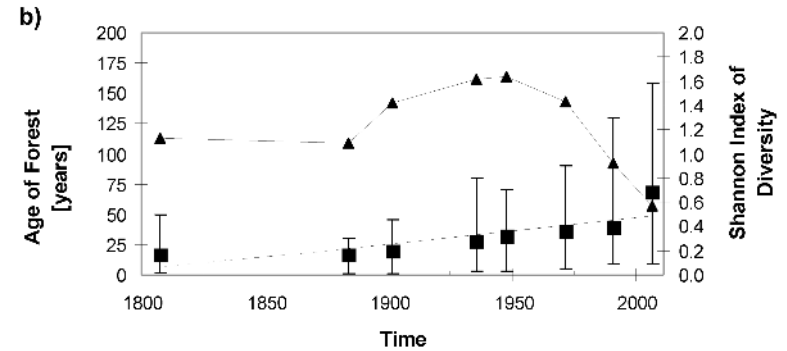
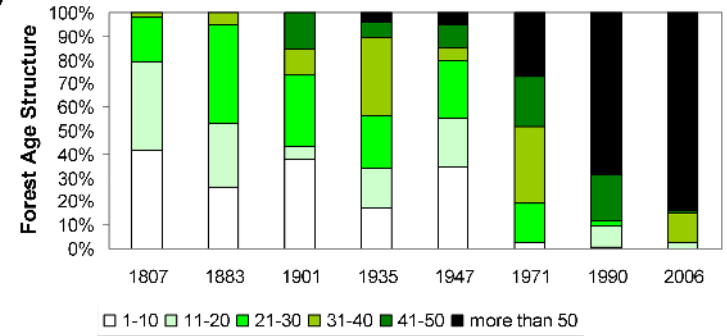
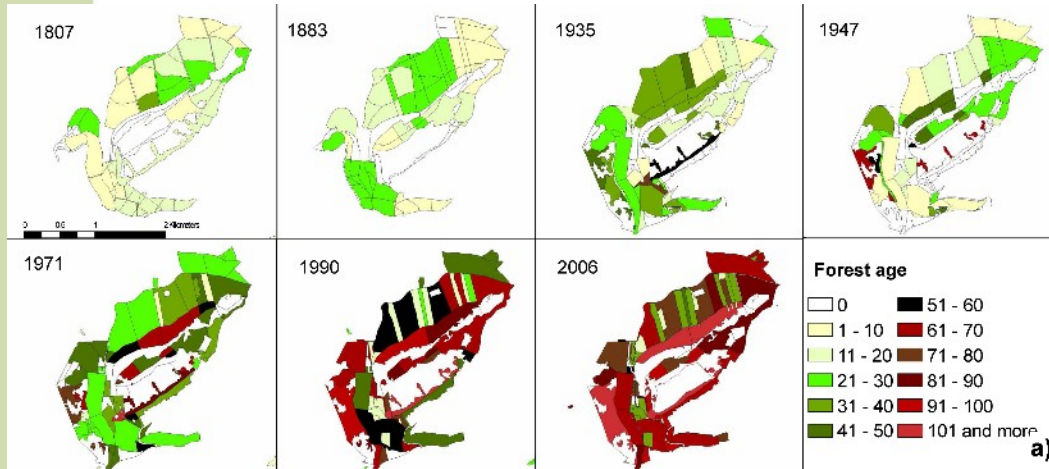
1692 woodland survey:



# Děvín



# Děvín



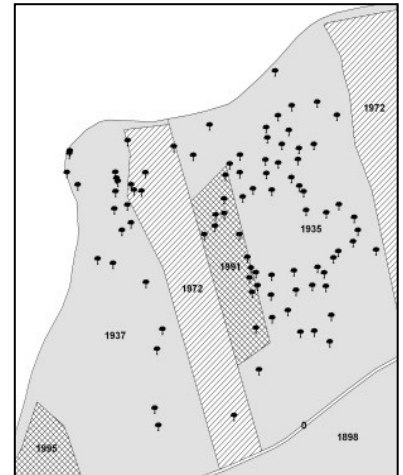
# Děvín



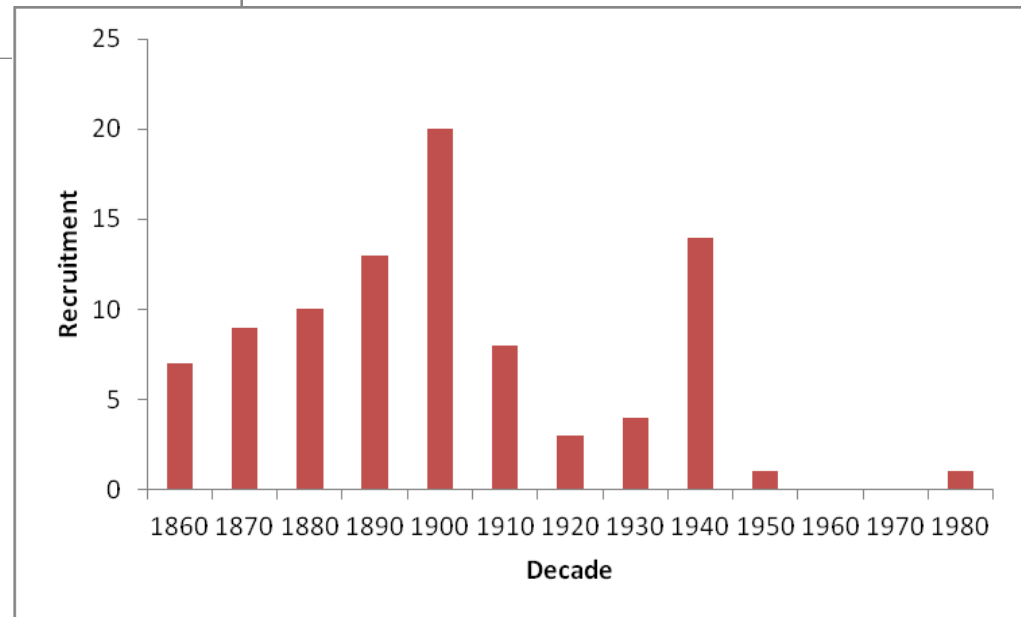
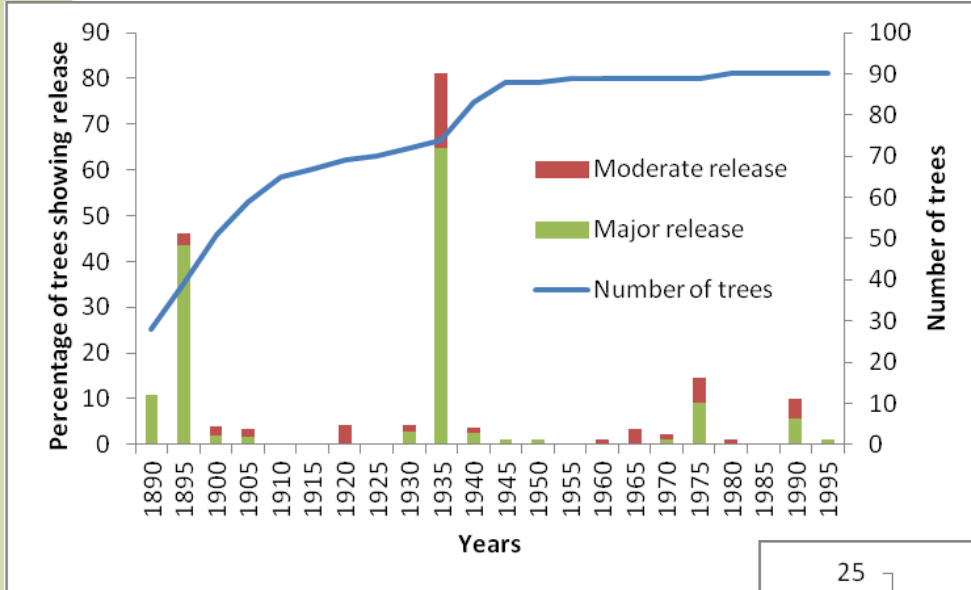
0 0,5 1 2 km



0 125 250 500m

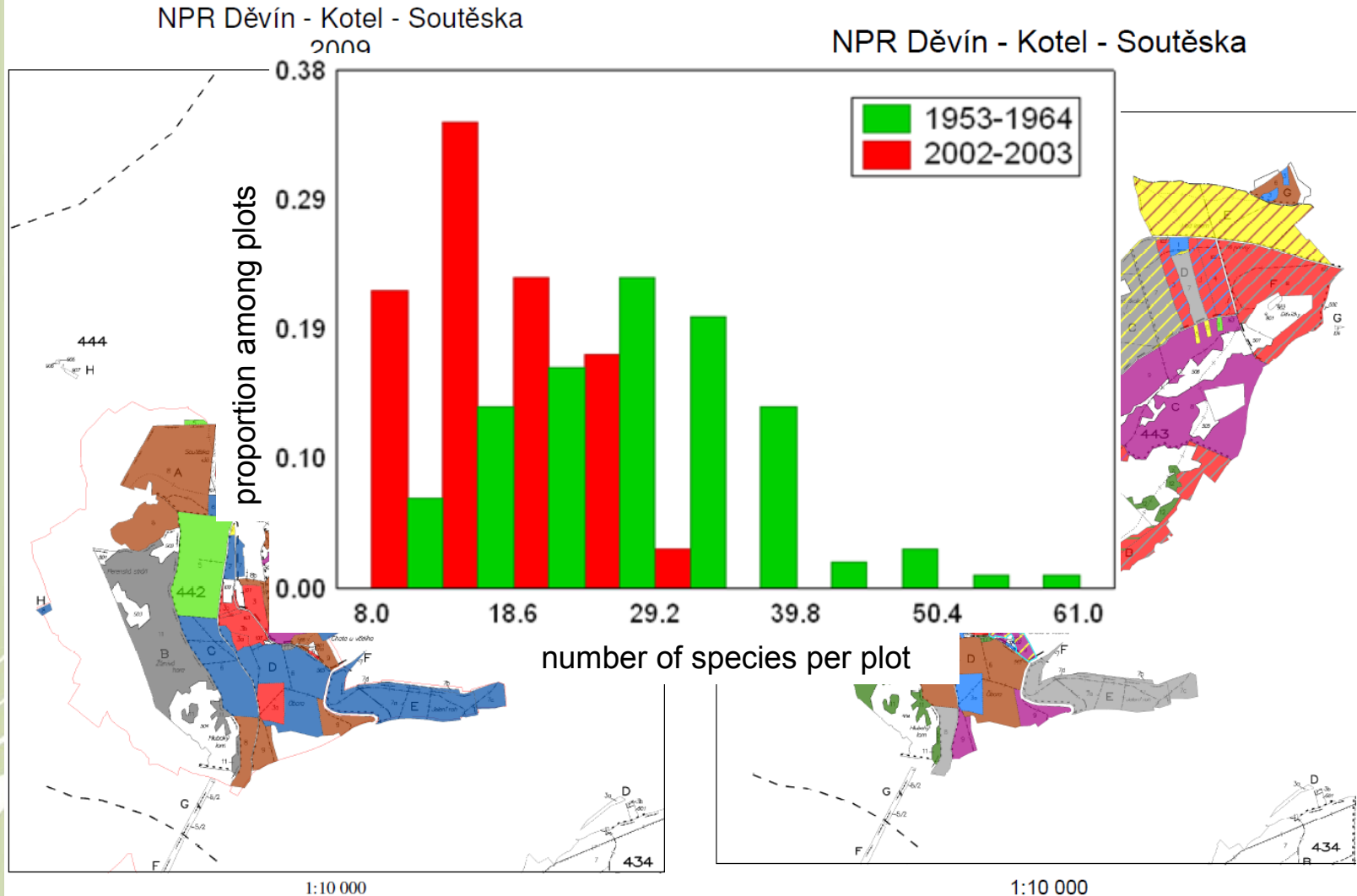


# Děvín



# Děvín

## 2. It fosters better informed management and policy decisions



# Děvín

3. It places ecology, conservation and restoration in a wider context

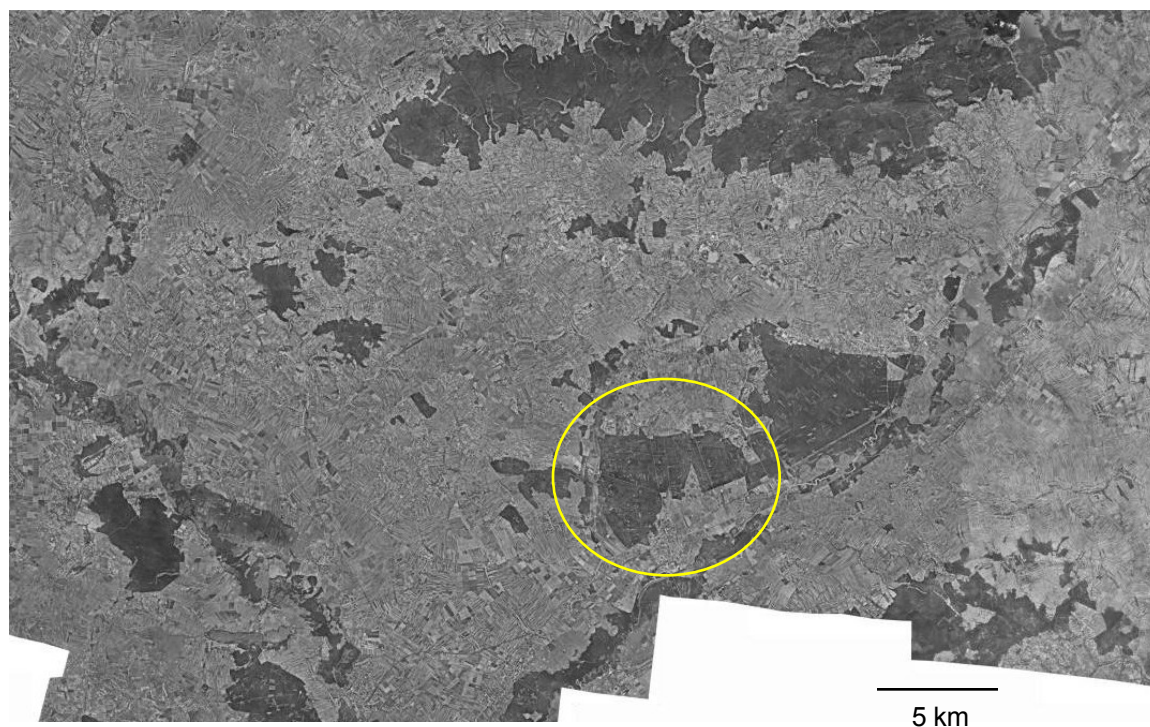


Szabó P. (2010) Driving forces of stability and change in woodland structure: A case-study from the Czech lowlands. *Forest Ecology and Management* 259: 650-656; Kopecký M., Hédli R. & Szabó P. (2013) Non-random extinctions dominate plant community changes in abandoned coppices. *Journal of Applied Ecology* 50: 79-87; and





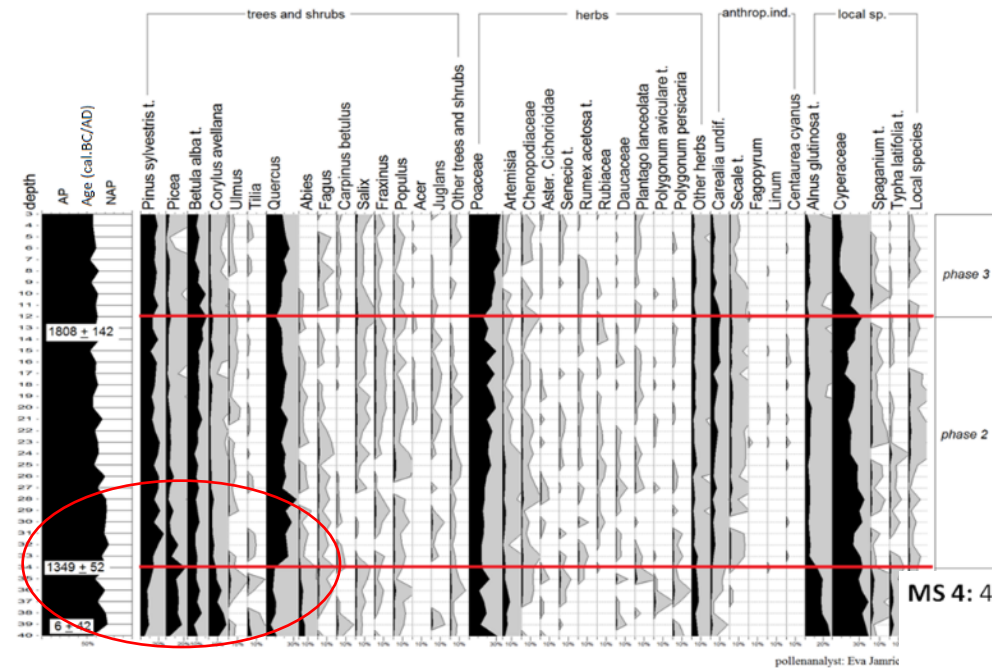
# Hodonínská Důbrava



Aerial photograph from 1953

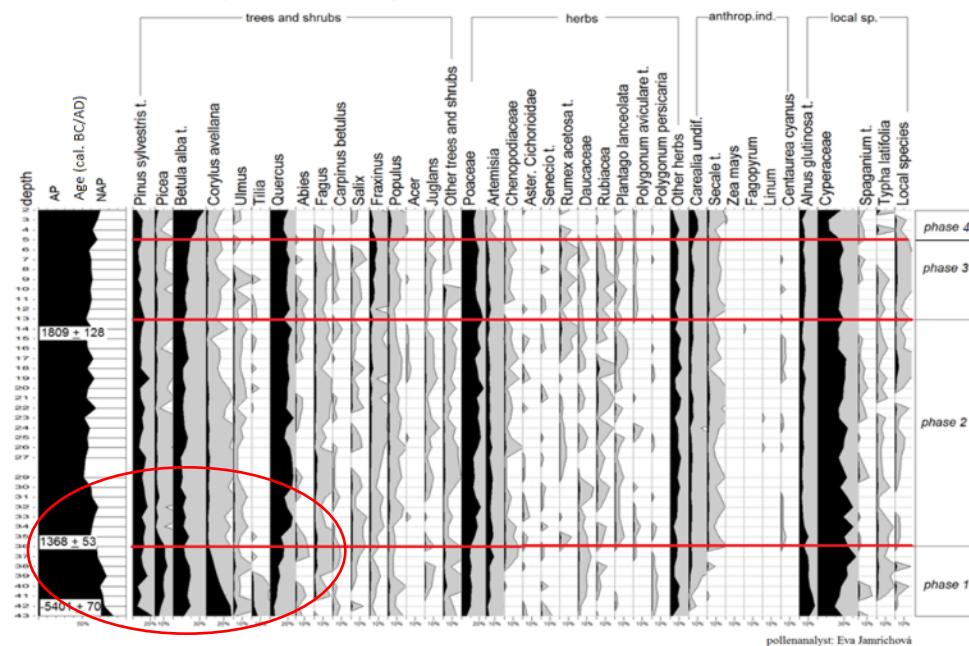


MS 3: 48° 52.387'' N; 17° 06.156'' E; 179 m a.s.l.



## Pollen analyses of two shallow profiles in the Wood

MS 4: 48° 52.085'' N; 17° 06.091'' E; 177 m a.s.l.



Jamrichová E., Szabó P., Hédl R., Kuneš P., Bobek P. & Pelánková B. (2013) Continuity and change in the vegetation of a Central European oakwood. *Holocene* 23: 46-56.



# Hodonínská Dúbrava

The name

1350: Klečka

1370: Dúbrava dicta Klečka

1509: Dúbrava Hodonská

1531: Dúbrava Hodonská + Klečka (for the last time)

1609 and on: Dúbrava



# Hodonínská Důbrava

Privilegal charter of the town of Hodonín, 1350 AD

“In Klečka, the burghers shall have the right to dry wood and grass, except for living oaks. Their herdsmen shall have the right to freely pasture their animals in the same Wood.”

[translation from Latin original]



neatum ad ipsam Preclantes, Incolisil,  
vas ipsius Villa, pro edificijs et crematione,  
De gratia tamen Nostra Speciali, herediti  
ac Successorum Nostrorum Marchionu  
Moravia, que recipi debentur cum Situ  
forestarum et silvarum, qui fuerint  
in Inbarrva dicta Kleuska, exclusis  
tantummodo lignis quercinis, que omni  
si huiusmodi debentur, duo mediana, unum

Foundation charter of the Augustinian monastery in Brno, 1370 AD  
(early modern copy)

# Hodonínská Dúbrava

## 1600 AD - urbarium

firewood, pasture, pannage, mowing among trees,  
meadows, arable in wood, ponds, strawberry collecting

Open woodland structure: mosaic of huge trees, grassland, meadows,  
ponds, even arable



# Hodonínská Dúbrava

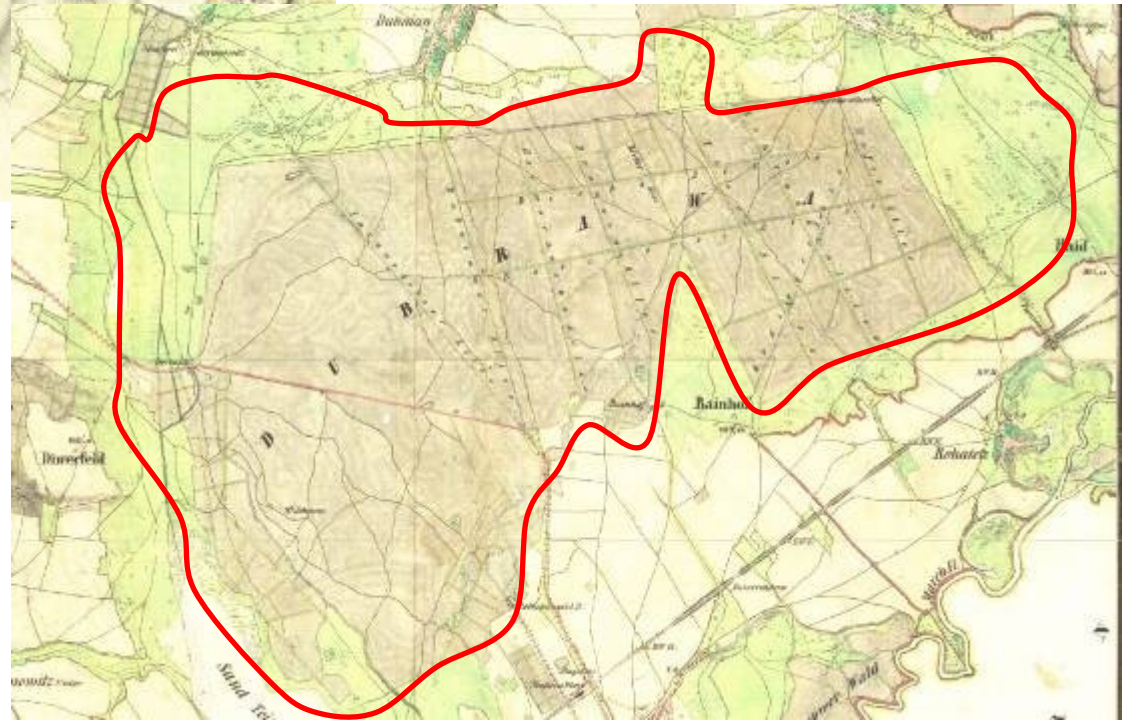
1780s: separation of woodland and pasture



# Hodonínská Dúbrava



1760s

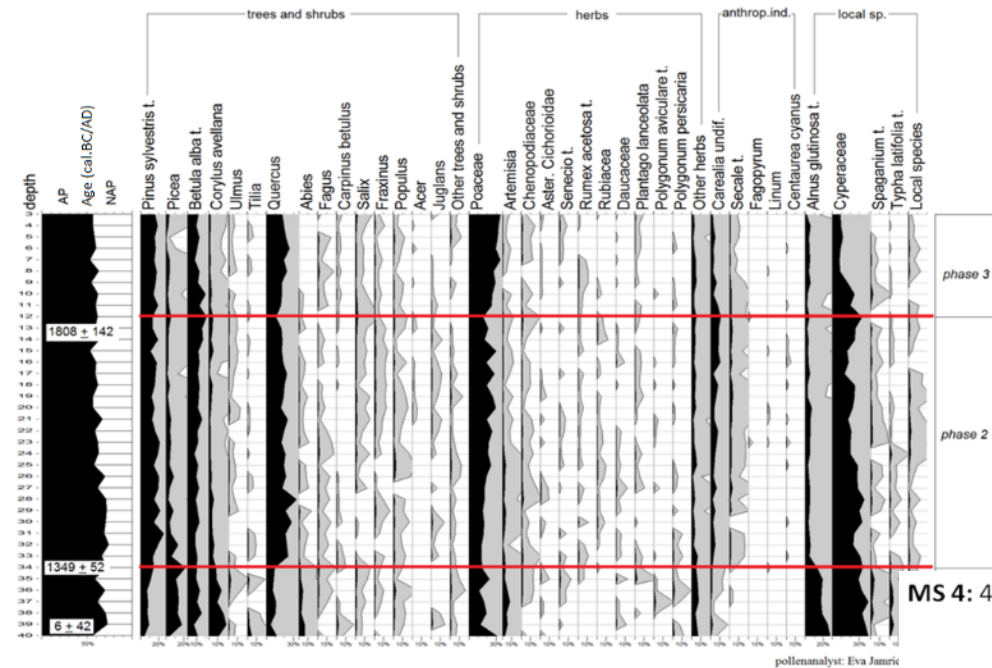


1841



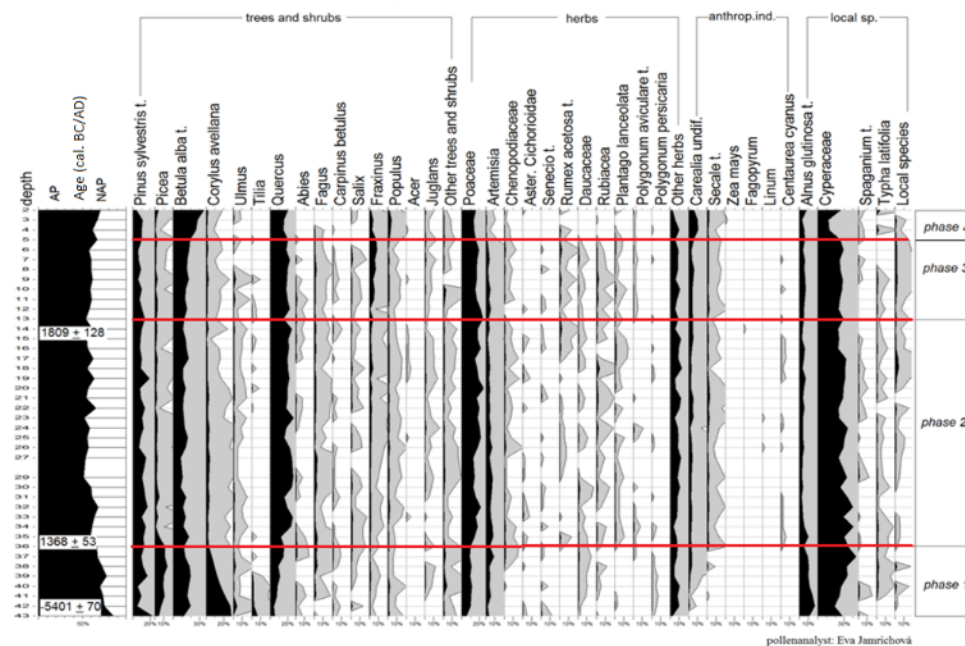


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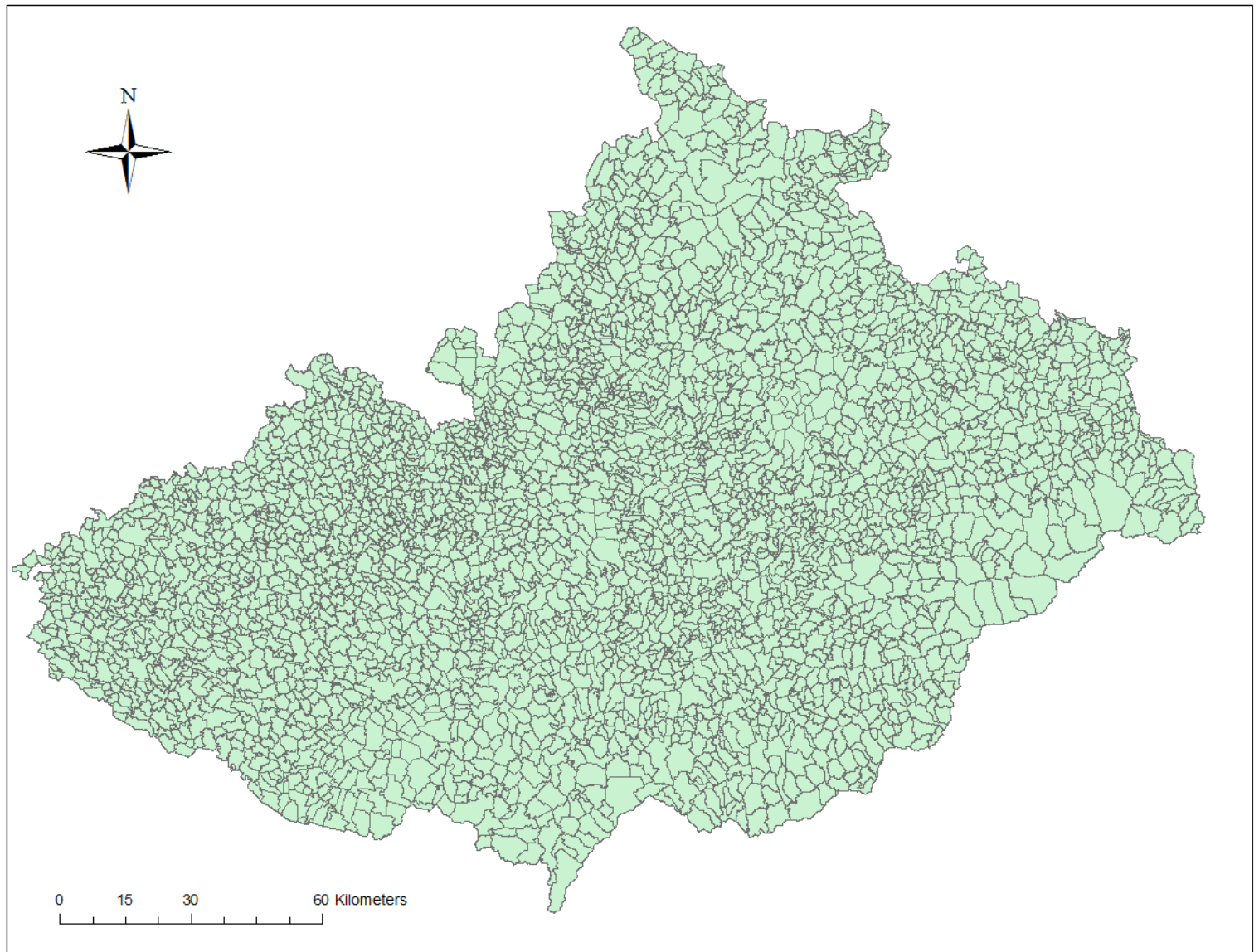
Jamrichová E., Szabó P., Hédl R., Kuneš P., Bobek P. & Pelánková B. (2013) Continuity and change in the vegetation of a Central European oakwood. *Holocene* 23: 46-56.

# LONGWOOD forest historical geodatabase

1. Tree species composition
2. Forest extent
3. Management: tree-cutting, non-tree cutting



# Area and resolution



Szabó P., Suchánková S., Křížová L., Kotačka M., Kvardová M., Macek M., Müllerová J. & Brázdil R. (2018) More than trees: the challenges of creating a geodatabase to capture the complexity of forest history. *Historical Methods*: accepted.



Zaznamy

**Author of record:** Kotačka, M.

**Cadastre:** Mikulčice Find by old name

Panství:

Localization remarks: part of cadastre, village Těšice

**Source:** Vceňovací operát

MZA v Brně  Stablní  new

Year: 1840 - 1851 modify

Falsum  chybi Lesní fase

Year (if different from source):  -

Pages:

Remarks: inv. č. 2594, sign. 2661, k. 963

Forest presence:

\* required fields  7.9.2016 12:29:26

D: {E480A05A-6DC3-44DC-8152-59311B638CF7}

Save Add new record Delete record ↕

**Forest records in cadastre**

**Forest name:**

**Area**  ha

95 jitra  358 sáhů (rak.)

0 leč (slez.)  0 teneto

Area orig:  54,7979 Area (ha)

**Management:** Coppice

Pertinentia  Silva/Rubetum  Silva

Rotation:  20 years (min)

0 years (max - optional)

Non-forest trees:

**Remarks (localization,...)**

Einzigte Klasse  
der Bezug der Gräser durch Maht und die Abweidung mit Hornwiew

**Forest type**

Broadleaved

Mix

Coniferous

Unknown

**Disturbance**

Wildfire

Wind

Biotic

**Human activities**

Burning:

Pasture:

Litter raking:

Hay cutting:

Pannage:

Charcoal burning:

Honey:

Deer reserve:

Planting:

Acorn gathering:

Wild fruit collecting:

Lime kiln:

Cone gathering:

Leaf fodder:

Save forest Add new forest Delete forest

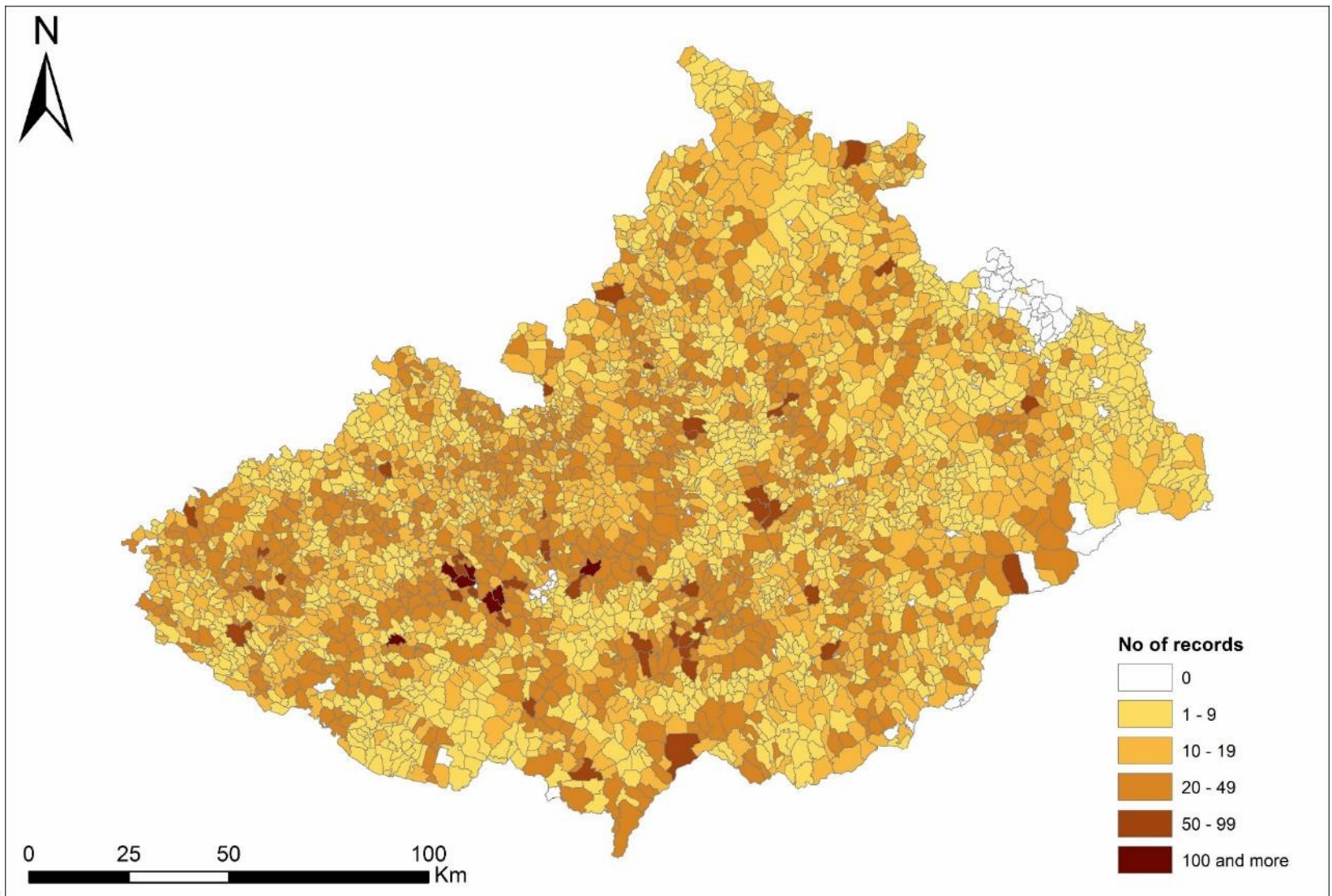
**Species composition**

Species	Standards (pcs)	Proportion	Remarks	Standar	Coppic
dub		33		<input type="checkbox"/>	<input type="checkbox"/>
jilm		33		<input type="checkbox"/>	<input type="checkbox"/>
osika		33		<input type="checkbox"/>	<input type="checkbox"/>
*				<input type="checkbox"/>	<input type="checkbox"/>

Záznam:  1 z 1 Bez filtru Vyhledávání

Hledat ID:  Search in Form Open table

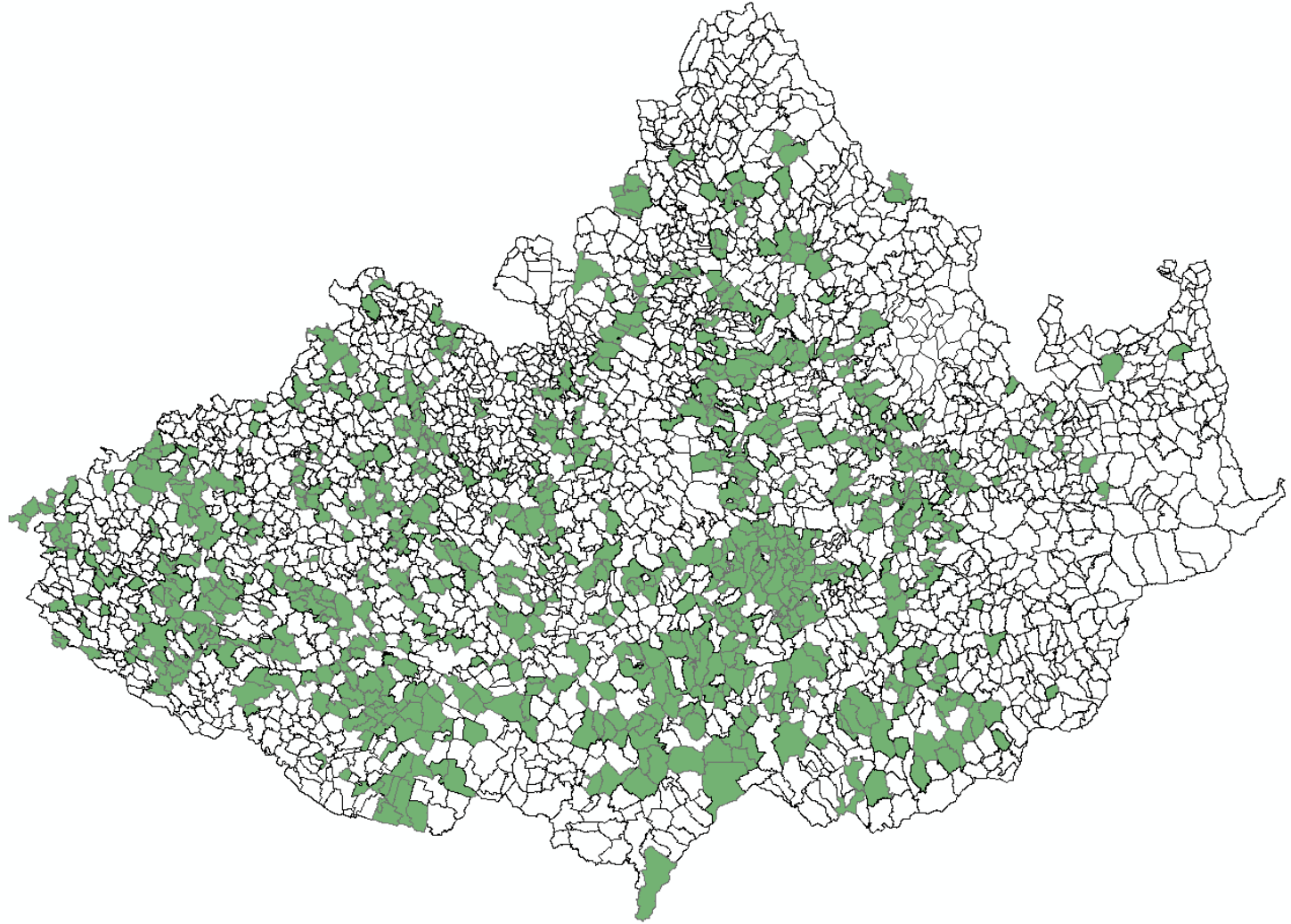
Záznam:  16555 z 18262 Bez filtru Vyhledávání



50,000 pieces of information on individual forests  
from 465 different archival sources ranging from  
the 11<sup>th</sup> to the 20<sup>th</sup> centuries

# Coppicing in the Late Middle

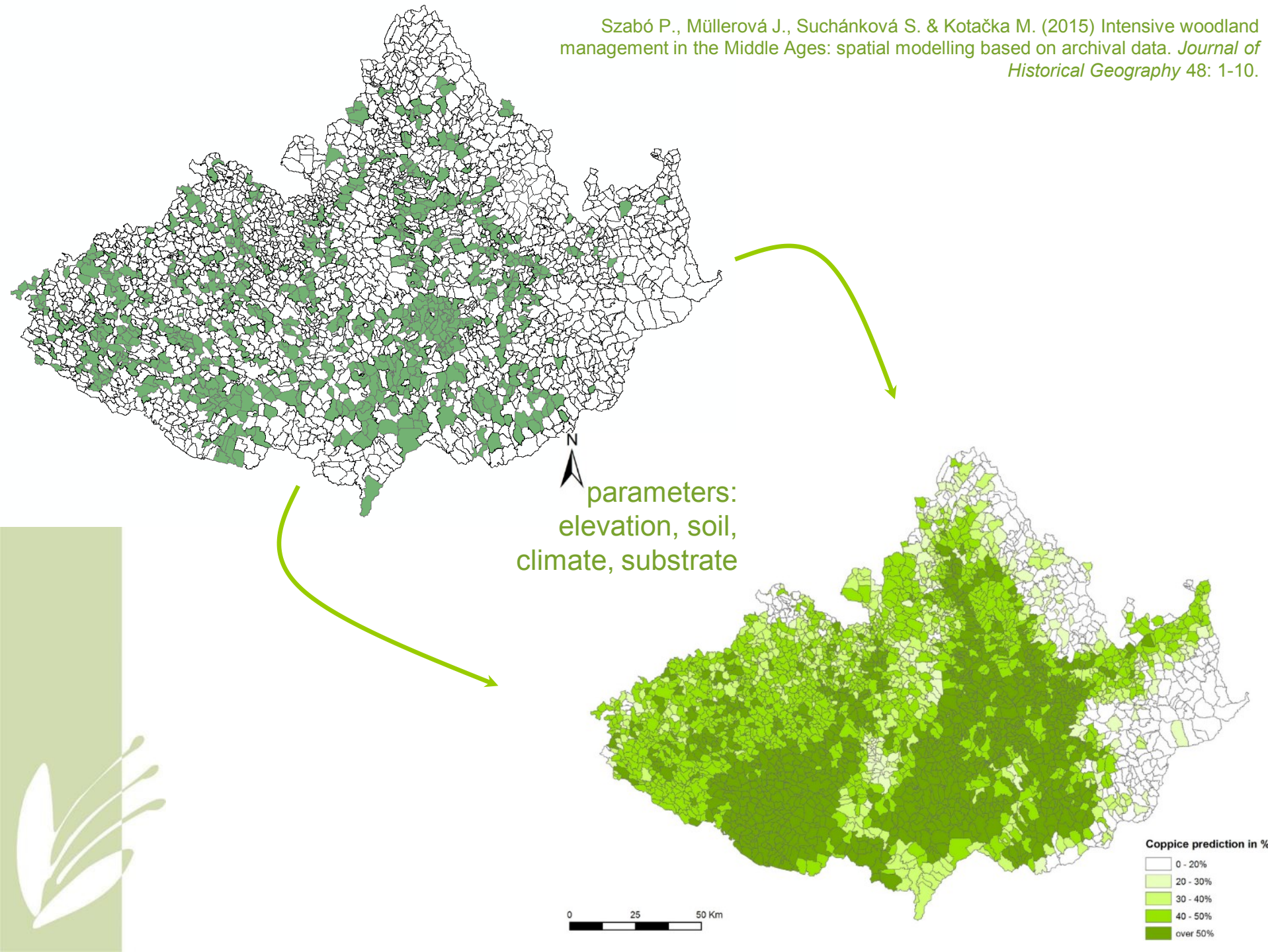
Age



*Rubetum* present in 752  
parishes

Szabó P., Müllerová J., Suchánková S. & Kotačka M. (2015) Intensive woodland management in the Middle Ages: spatial modelling based on archival data. *Journal of Historical Geography* 42: 1-10





# Moravia

## Historical forest management: 18th century

### Legend

Forest managements 18th century

For\_ha\_18



HF\_ha\_18

Cpc\_ha\_18

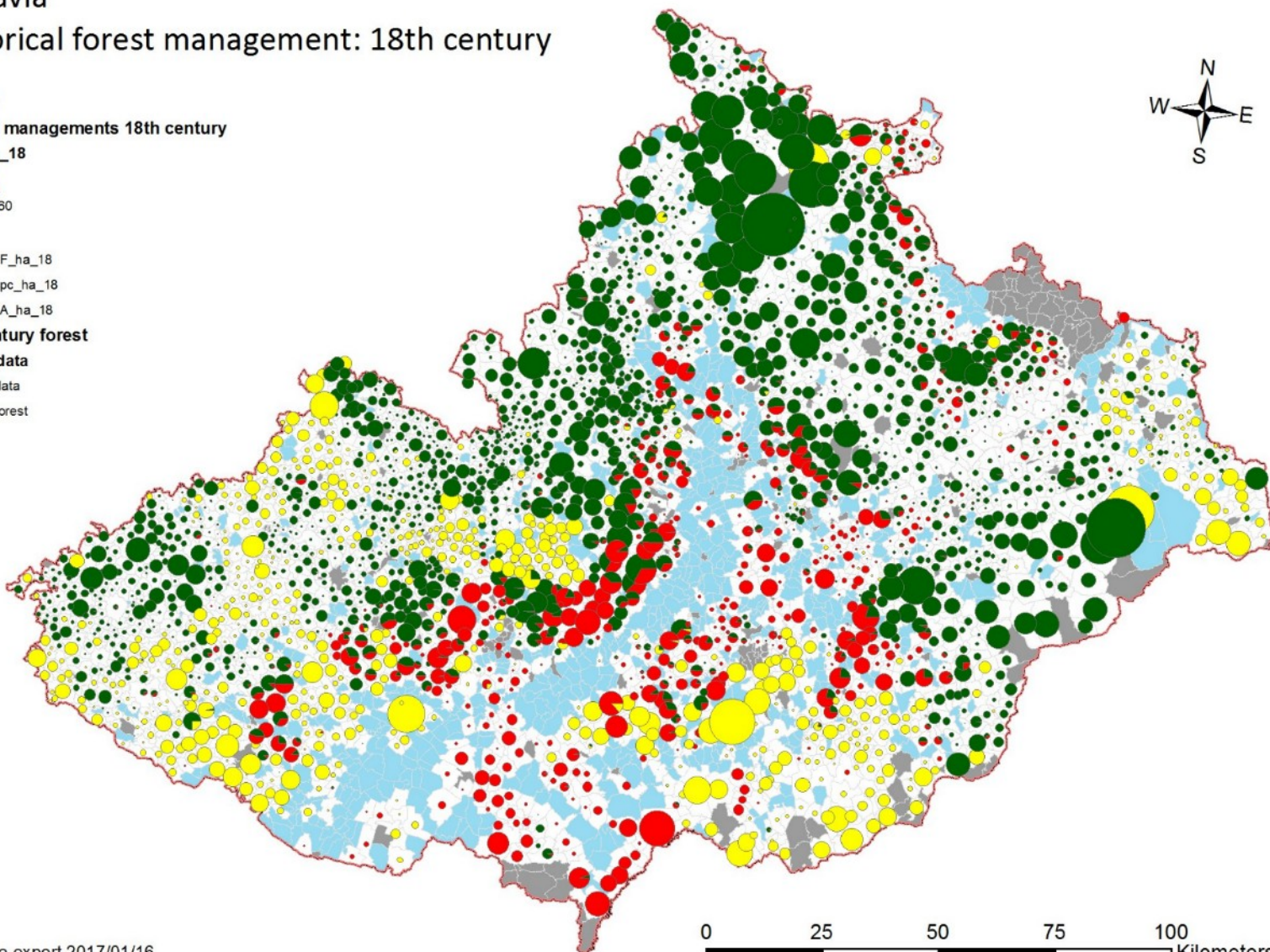
NA\_ha\_18

### 18th century forest

#### Missing data

no data

no forest



database export 2017/01/16

© Institute of Botany, The Czech Academy of Sciences

0 25 50 75 100 Kilometers

S-JTSK Křovák



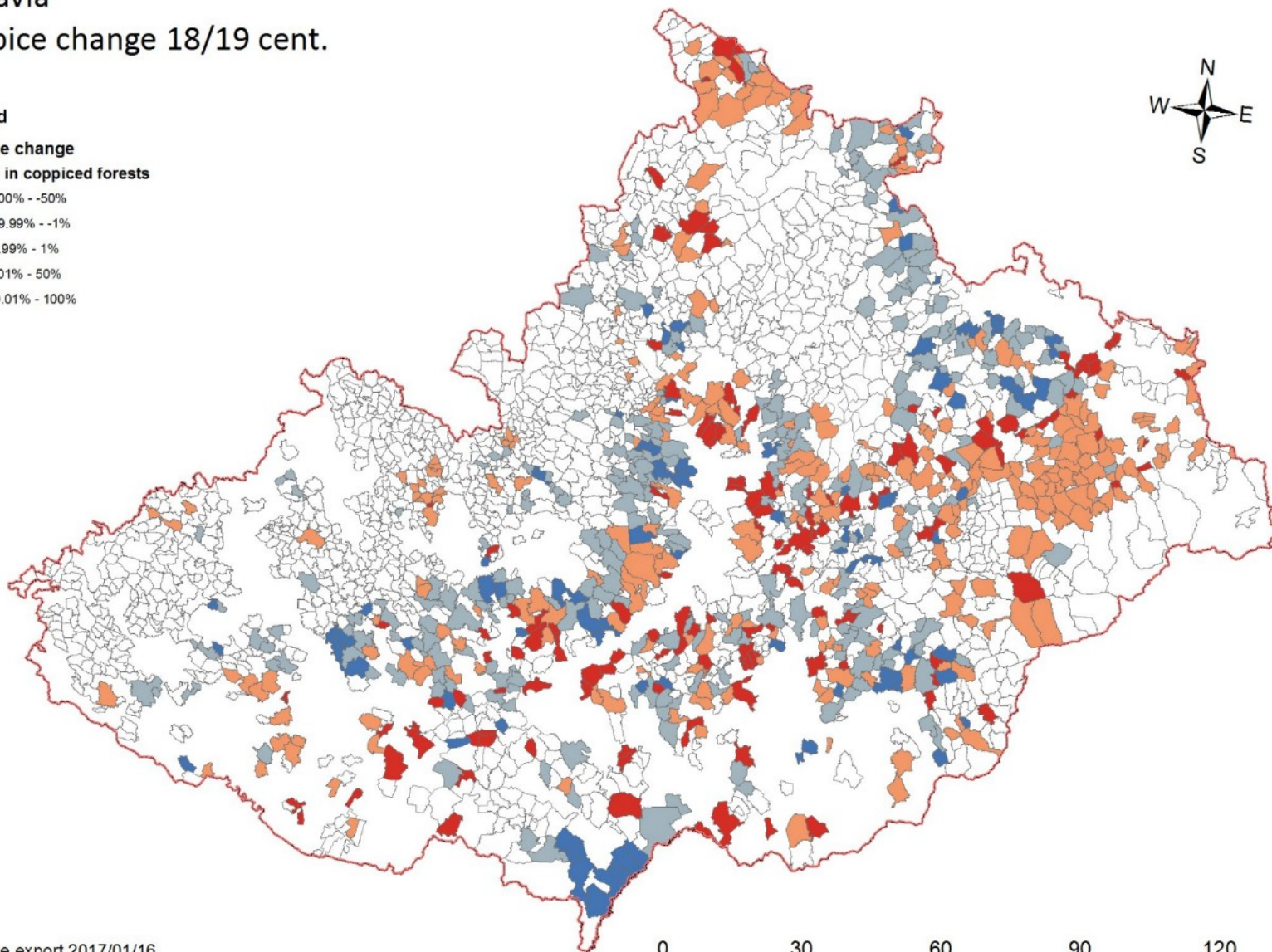
# Moravia

## Coppice change 18/19 cent.

### Legend

#### Coppice change

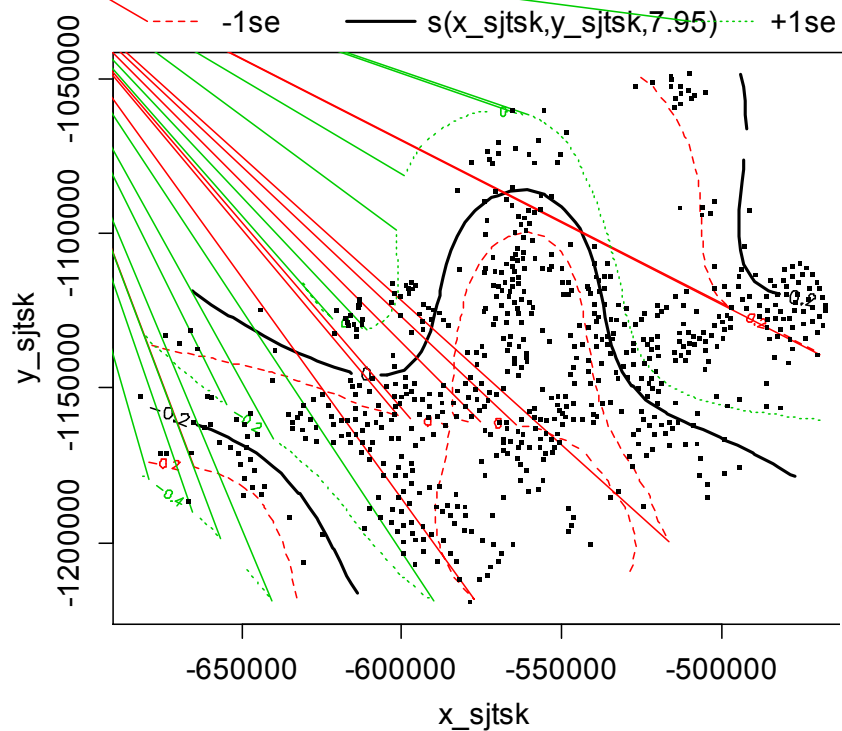
#### Change in coppiced forests



database export 2017/01/16

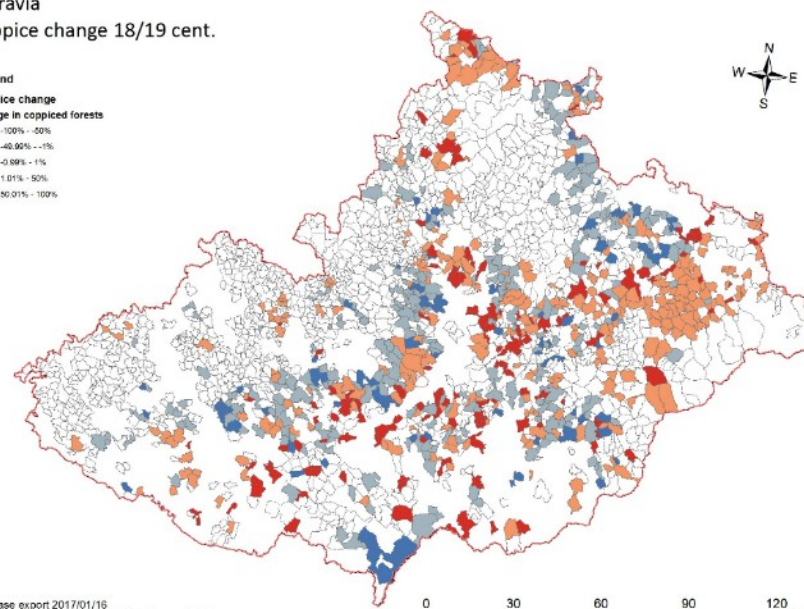
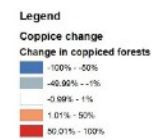
© Institute of Botany, The Czech Academy of Sciences

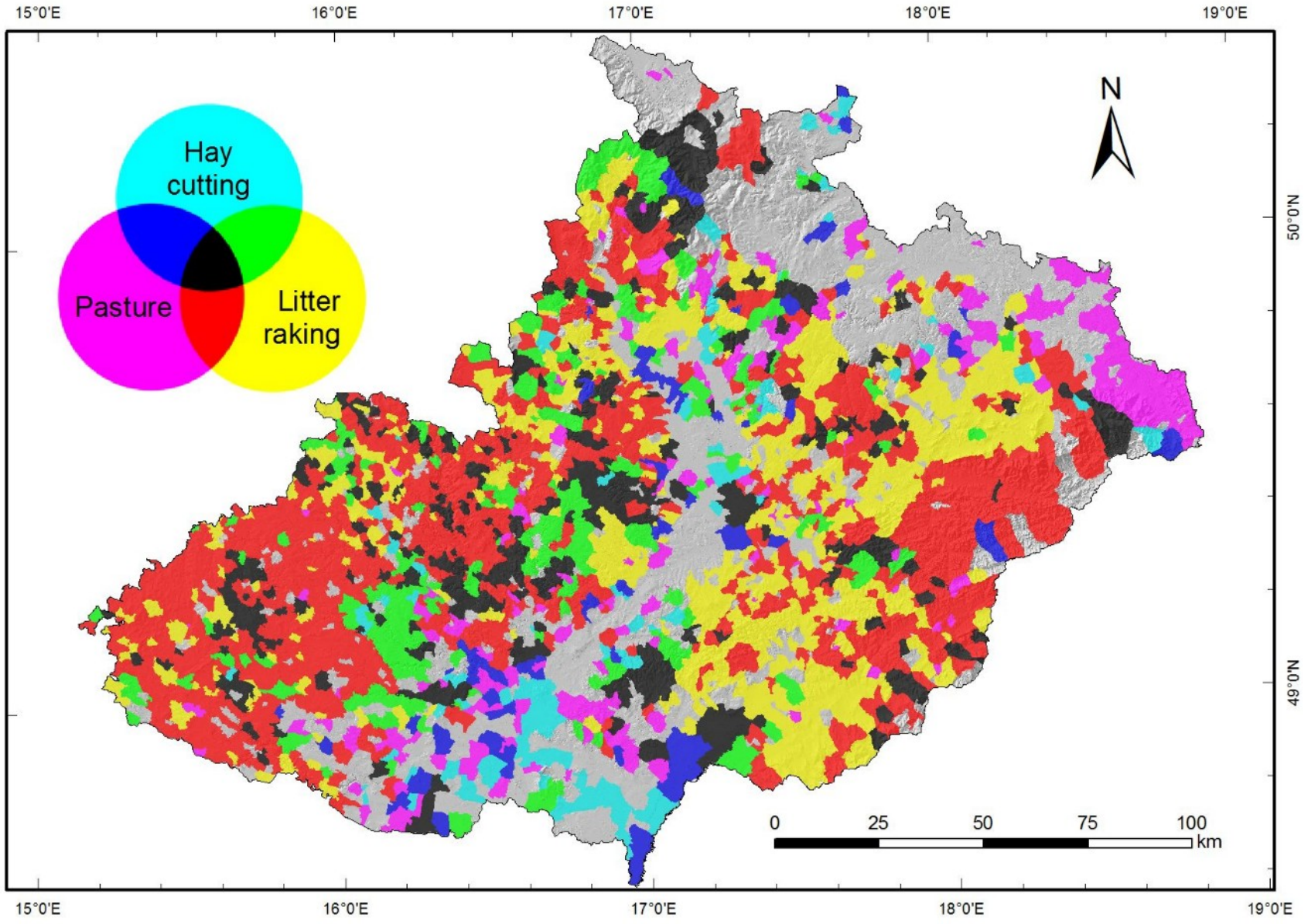
0 30 60 90 120 Kilometers

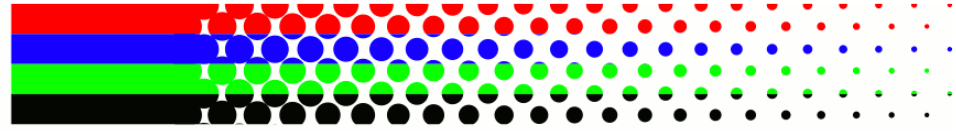


prostorová složka změny v pařezení: nárůst ve Slezsku, pokles J-Z Morava

Moravia  
Coppice change 18/19 cent.







About

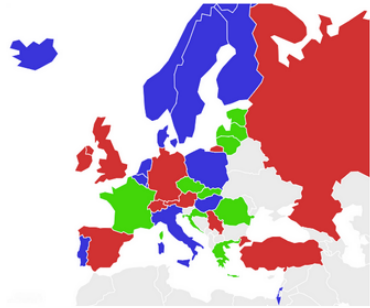
Notepad

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**Next conference**

ESEH Biennial Conference 2019 Tallinn, Estonia, 21 to 25 August 2019



**Explore our regional groups!**

**Featured news and projects**

**News**

- First Baltic Conference on the Environmental Humanities and Social Sciences (BALTEHUMS)
- Call for Proposal: Small Workshop Funding 2018
- Job Announcement: Presidential Academic Fellowship in Environmental History
- Call for Papers: European Forests – Our Cultural Heritage
- Job Announcement: Assistant Professorship in Environmental Humanities
- Call for organisers of the ESEH 2018 Summer School
- Call for Applications: Transforming Environments in Europe and North America: Narratives, Histories, Cultures
- Placing Gender. A Workshop on Gender and Environmental History

Contribute to the newsfeed!



# Environmental history in East-Central Europe



## ESEH Notepad

### **The Estonian environmental history scene: Publications, exhibitions, outreach**

The Estonian Centre for Environmental History (KAJAK) was established in 2011. Slowly but steadily, the habit of incorporating environmental perspectives into 'classical' historical research has gained a footing in Estonia. Ecocriticism and ecosemiotics already existed; the cooperation between the scholars from these fields with environmental historians has been lively and rewarding. This cooperation has borne fruit in a number of jointly organised conferences and other academic events (e.g., the EASLCE biennial conference 'Framing Nature' in 2014 and an international doctoral school 'Animals in Transdisciplinary Environmental History' in 2015, to name but a couple), plus several joint efforts resulting in publications in Estonian and in other languages, such as English, German and Russian.

## *Environment and History* – ESEH Notepad

2016/4 – Estonia

2017/1 – Croatia

2017/2 – Hungary

2017/3 – Poland

2017/4 – Russia

2018/1 – Romania

