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09 Forests from regional and global perspectives

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Content

1. Definition of forest
2. Deforestation
3. Timber frontier, colonization
4. Forest management: traditional vs modern
5. Forest transition

What is a ‘forest’?

Fagaras, Romania

Pekárna, Brno

What is a ‘forest’?

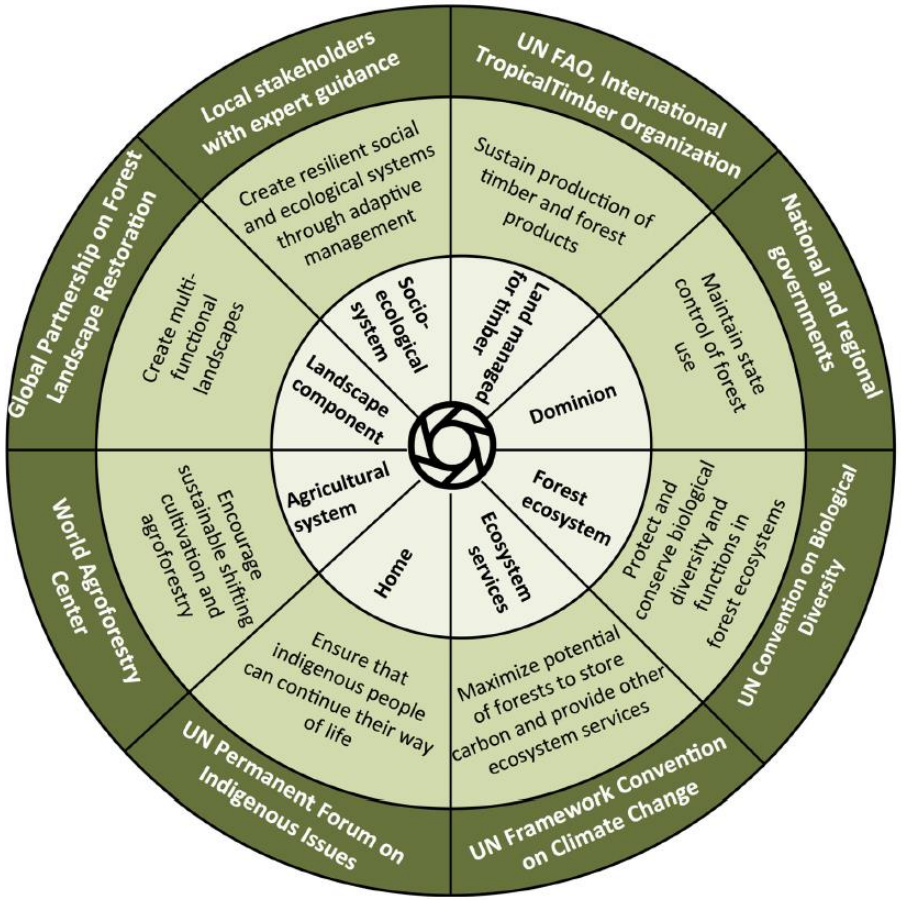


Fig. 1 Different management objectives form the basis from which a forest is conceptualized and definitions are created. The *inner circle* shows how a forest can be viewed through different lenses, emanating from the different management objectives shown in the *middle circle*. Each objective provides a perspective from which specific definitions are created. The *outermost circle* describes institutions whose mission is associated with each management objective and forest definition

forest *noun*

A2

/ˈfɒrɪst/

/ˈfɔːrɪst/

Idioms

1 ★

A2

[countable, uncountable] a large area of land that is thickly covered with trees

Oxford Advanced Learner’s Dictionary

Fig. 2 Forest definitions emerge from prevailing objectives of use and management. Since the mid-twentieth century, forest management objectives and definitions have diversified, with new ones being added to earlier more entrenched and legitimized ones. Similarly, forest management policies have broadened their objectives, focusing not only on sustainable timber production, but gradually incorporating non-timber forest products, biodiversity conservation values, ecosystem services delivery, human well-being, landscape approaches, adaptive management, and socio-ecological resilience

Chazdon et al. 2016

What is a ‘forest’?

Box 1 Forest definitions adopted by major international environmental and forestry organizations

United Nations Food and Agriculture Organization (FAO; 2000) Land with tree crown cover (or equivalent stocking level) of more than 10 % and area of more than 0.5 ha. The trees should be able to reach a minimum height of 5 m at maturity in situ. May consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground; or open forest formations with a continuous vegetation cover in which tree crown cover exceeds 10 %. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 10 % or tree height of 5 m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest

United Nations Framework Convention on Climate Change (UNFCCC; 2002) A minimum area of land of 0.05–1.0 ha with tree crown cover (or equivalent stocking level) of more than 10–30 % with trees with the potential to reach a minimum height of 2–5 m at maturity in situ. A forest may consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground or open forest. Young natural stands and all plantations which have yet to reach a crown cover of 10–30 % or tree height of 2–5 m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest

United Nations Convention on Biological Diversity (UN-CBD; 2010) A land area of more than 0.5 ha, with a tree canopy cover of more than 10 %, which is not primarily under agriculture or other specific non-forest land use. In the case of young forest or regions where tree growth is climatically suppressed, the trees should be capable of reaching a height of 5 m in situ, and of meeting the canopy cover requirement

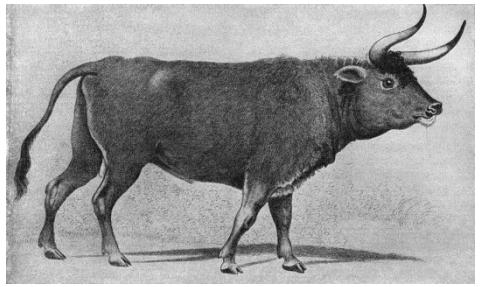
United Nations Convention to Combat Desertification (UN-CCD; 2000) Dense canopy with multi-layered structure including large trees in the upper story;

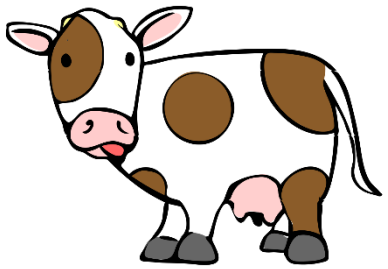
International Union of Forest Research Organizations (IUFRO; 2002) A land area with a minimum 10 % tree crown coverage (or equivalent stocking level), or formerly having such tree cover and that is being naturally or artificially regenerated or that is being afforested

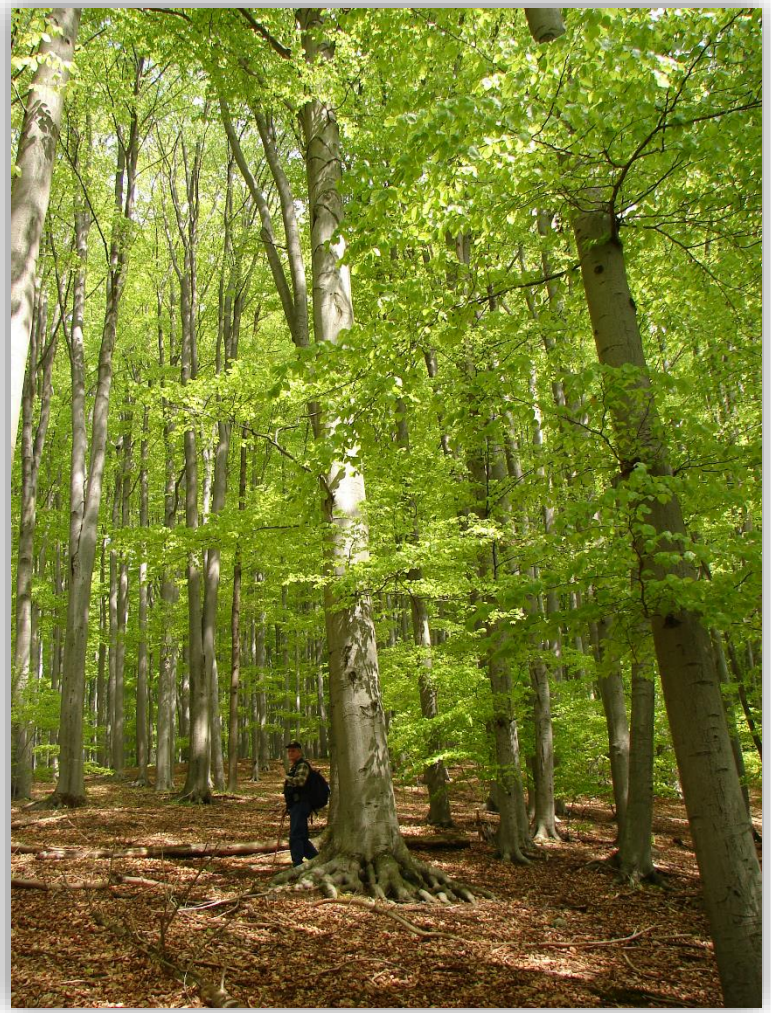
Chazdon et al. 2016

What is a ‘forest’?

open forest



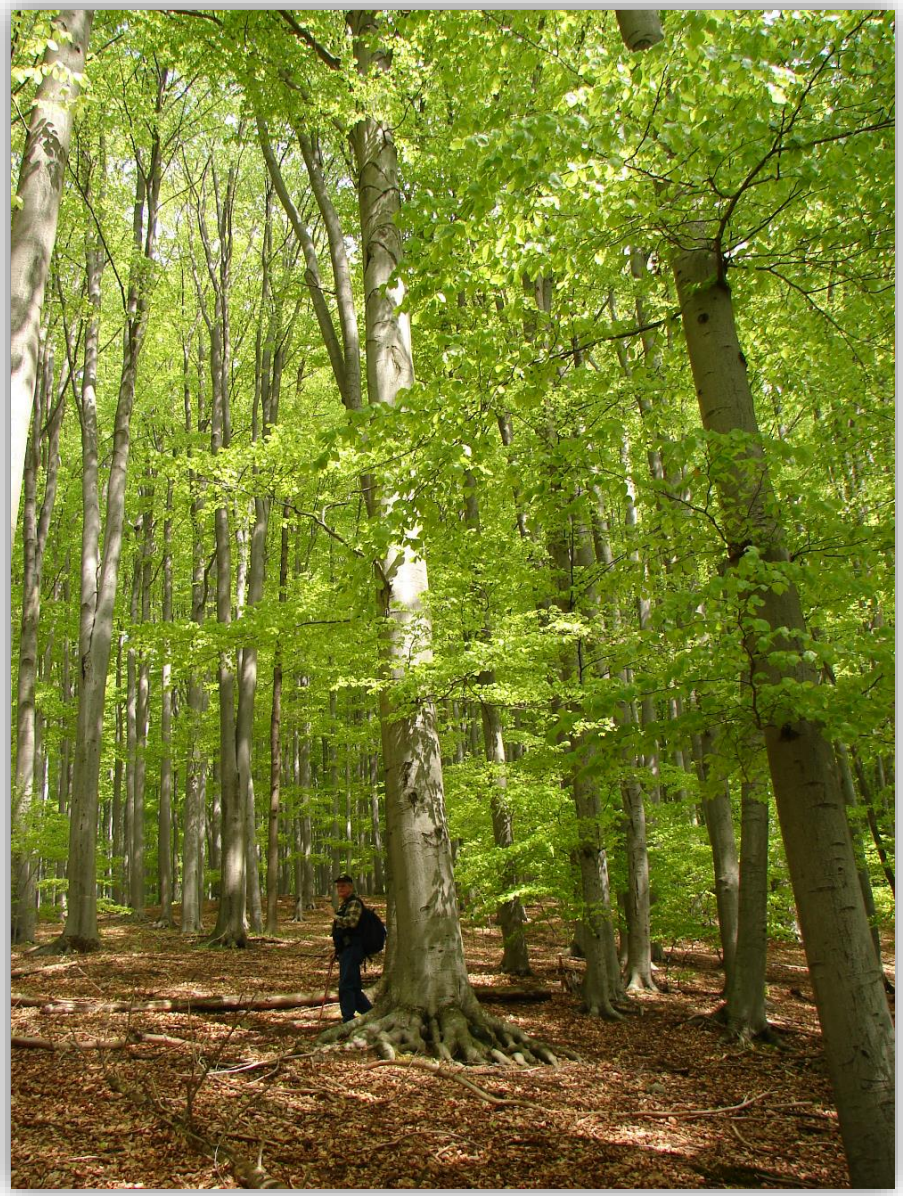




closed forest

Vera 2000

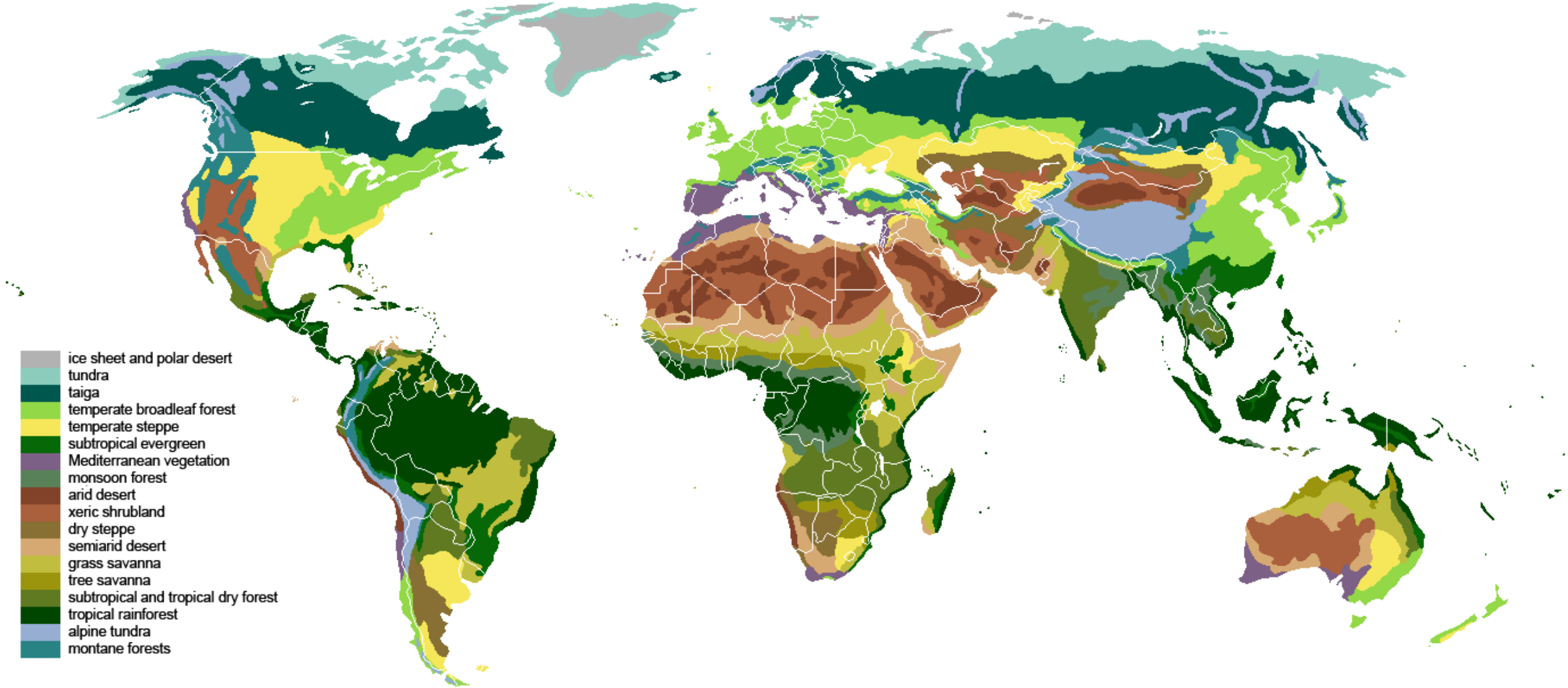
What is a ‘forest’?



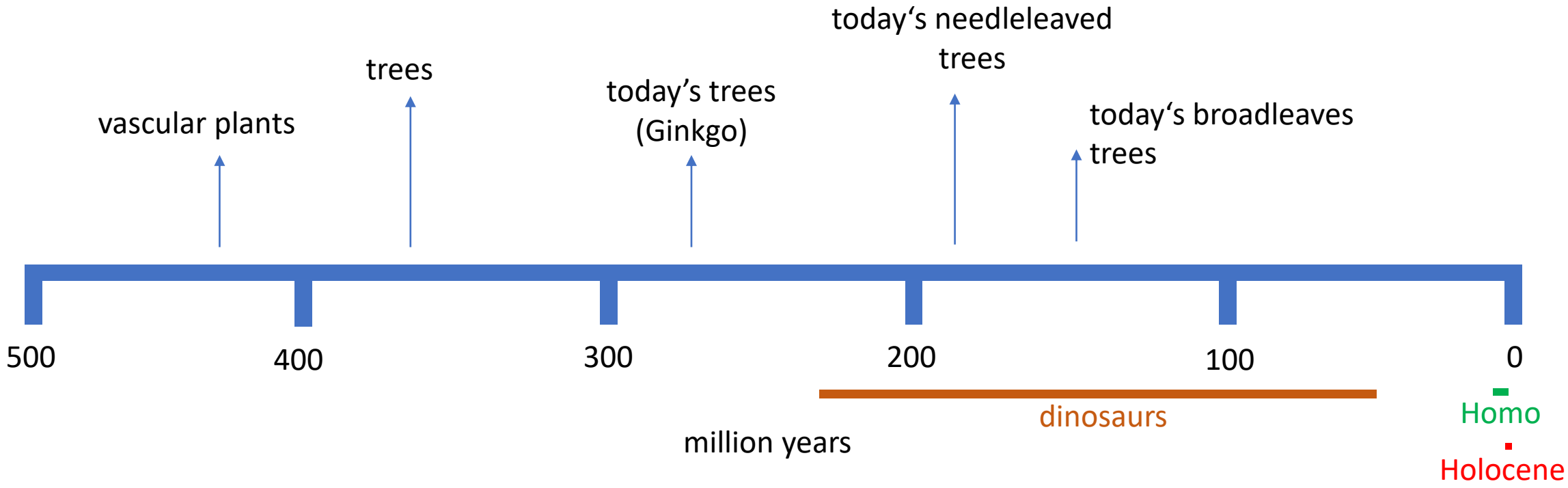
trees

herbs

Forests as ‘natural’ vegetation



Trees are long-distance runners



beech: 11-12 million years
oak: 10-12 million years
spruce: 3,5 million years

People and forests

Deforestation:

forest ⟶ non-forest

Management (incl. harvesting):

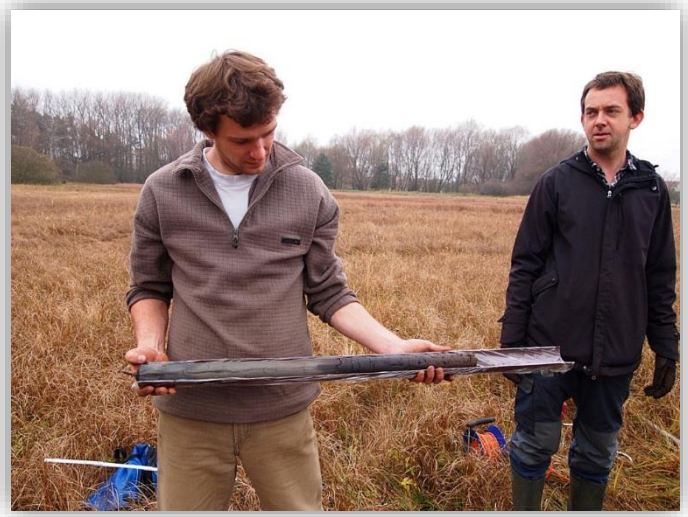
forest ⟶ modified forest

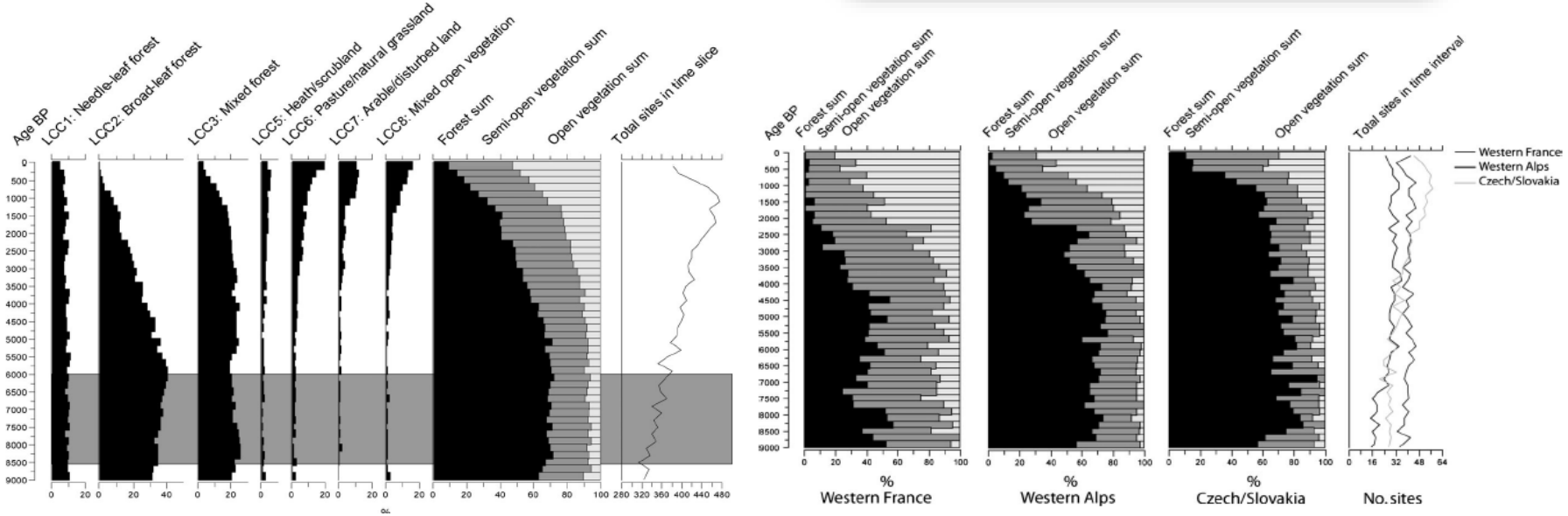
Deforestation in the Middle Ages

Sachsenspiegel, illustration from the 14th century

Deforestation in the Middle Ages

Larix





Fyfe et al. 2015

Global deforestation

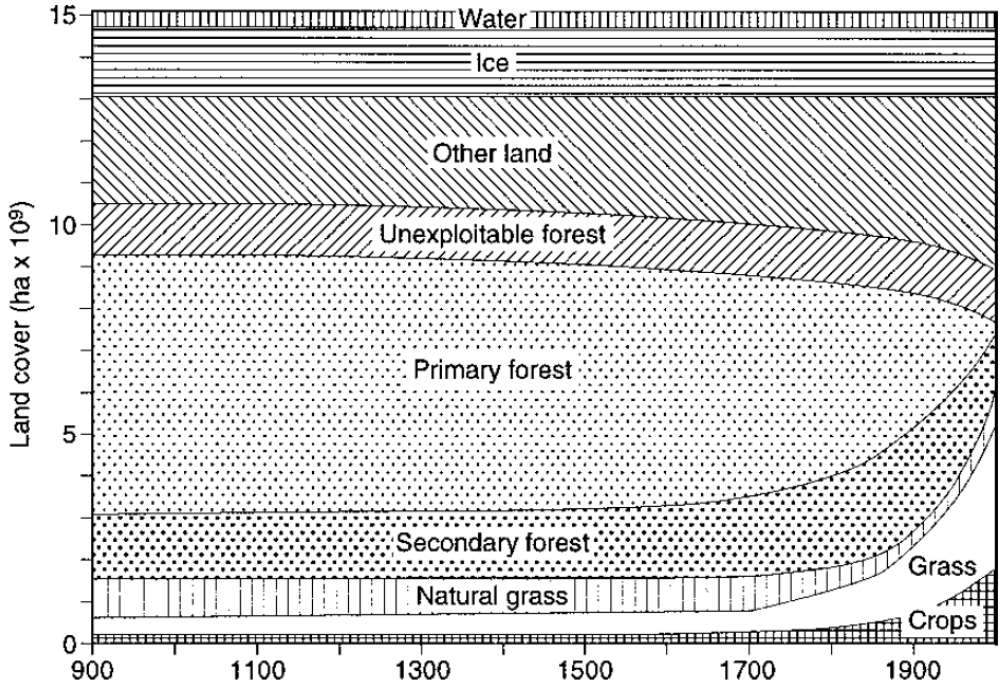


Figure 9.1 The transformation of major global land covers, AD 900–2000. (Source: after P. Buringh and R. Dudal, "Agricultural Land Use in Space and Time," in *Land Transformations in Agriculture*, ed. M. G. Wolman and F. G. A. Fournier, Scope Publication no. 32 [Chichester: John Wiley & Sons, 1987], 9–44, esp. 15.)

Williams 2003

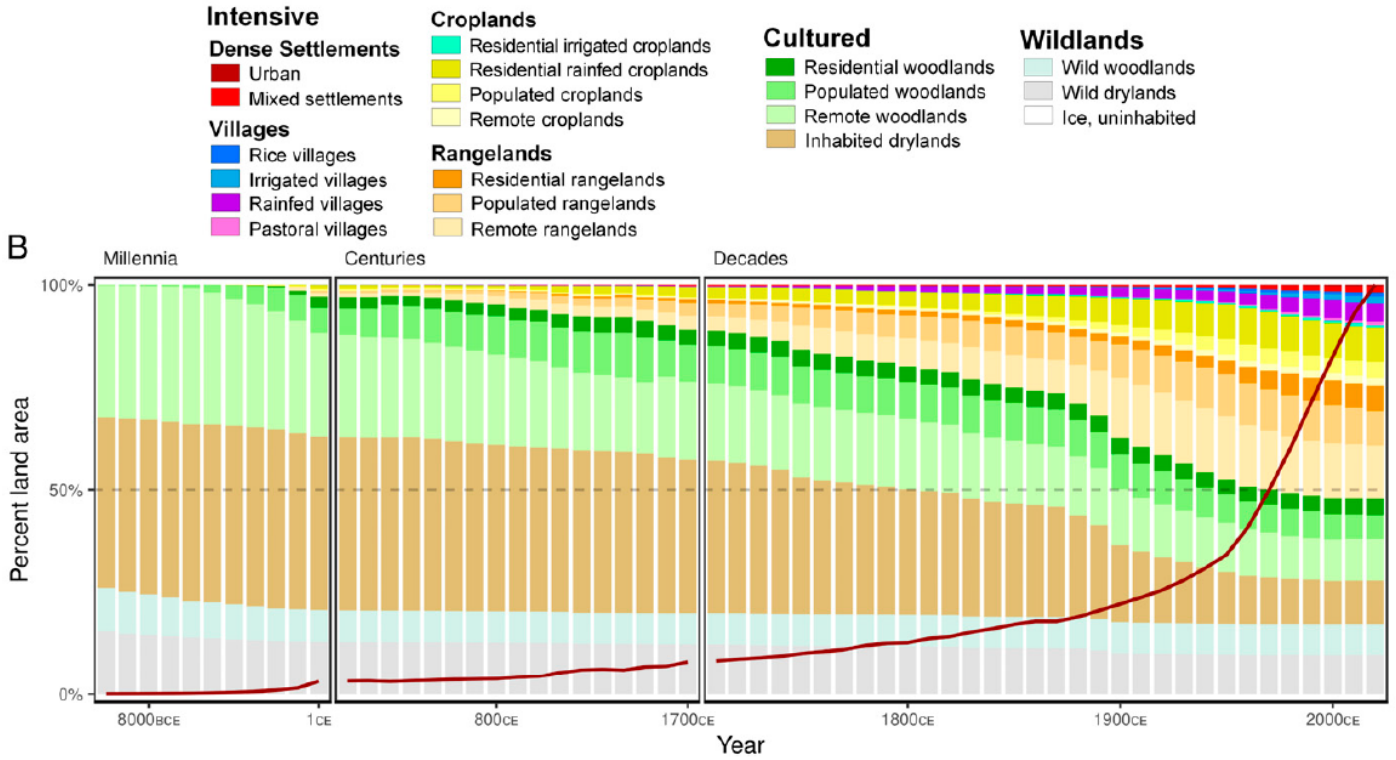
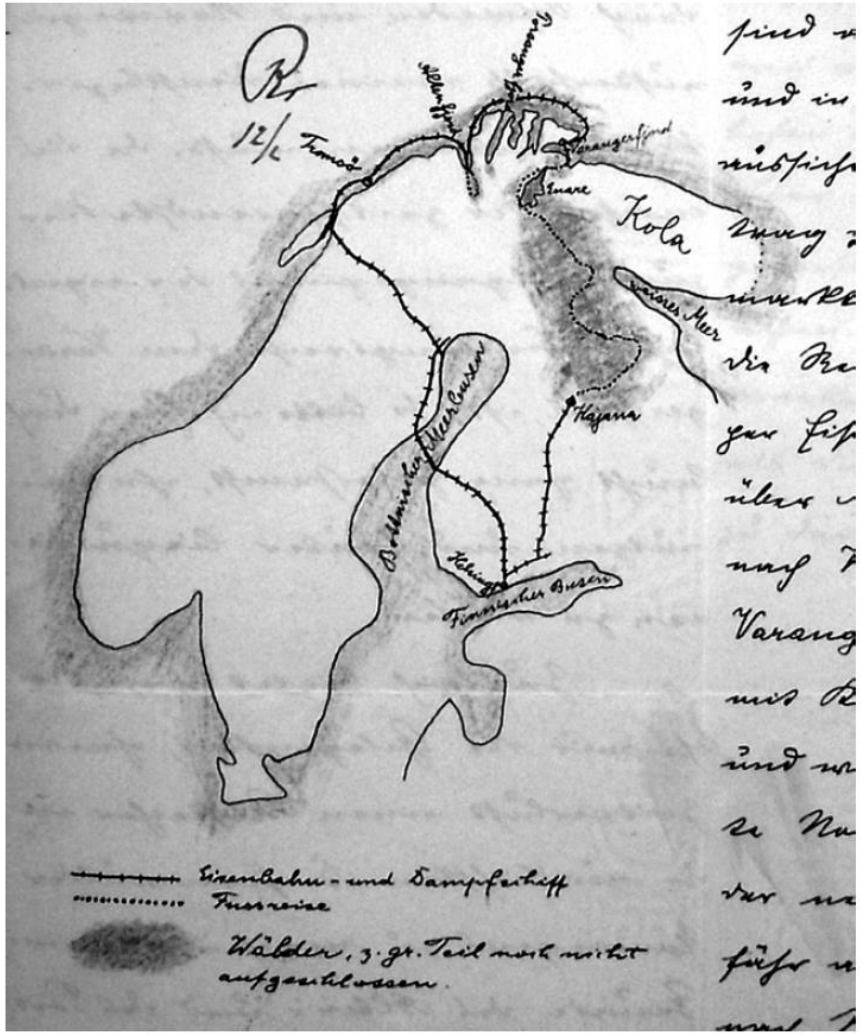


Fig. 1. Global changes in anthromes and populations 10,000 BCE to 2017 CE. (*A*) Anthrome map at 2017 CE (Eckert IV projection). (*B*) Global changes in anthrome areas, with population changes indicated by red line. Anthromes are classified using population densities and dominant intensive land use. Wildlands are defined by zero population and no intensive land use (urban + crops + grazing), Cultured anthromes have low populations and <20% intensive use, and Intensive anthromes are ≥20% intensive. Cultured and Intensive anthromes are further stratified by population densities, in persons km^{-2}, as Remote (>0 to <1), Populated (1 to <10), Residential (10 to <100), Inhabited (>0 to <100), Villages and Mixed settlements (100 to <2,500), and Urban (≥2,500). Intensive anthromes are further stratified based on their dominant intensive land use area ≥20% in order of most intensive use (urban > rice > irrigated > cropped > pastured). Woodlands combine all forest and woodland biomes (73); drylands comprise the remaining biomes, from savanna to tundra, excluding permanent ice. Global uncertainties in *SI Appendix*, Fig. S1.

Ellis et al. 2021

Timber frontier



Map of Northern Norway and Finland.

Source: Politisches Archiv des Auswärtigen Amtes (PAAA), Berlin, R 133403, Carl Metzger to Auswärtiges Amt, 5 February 1906. The map depicts Metzger's planned route for his first forestry expedition to Northern Norway and Finland in 1906. The key to the map explains the continuous line as 'railway and ship', the broken line as 'on foot' [Fussreise], and the grey [original: green] area as 'Forests, in large part not opened up yet' [Wälder, zum großen Teil noch nicht aufgeschlossen].

Table 13.1. Swedish export of timber and pulp and paper products.

	Percentage of the total export value						
	1881/85	1896/1900	1911/13	1924/25	1934/38	1951/54	1959
Timber products	40.4	42.8	26.1	22.0	13.2	11.8	8.3
Pulp and paper	4.6	8.1	17.6	27.2	28.3	30.5	22.4
Total forestry industry	45.0	50.9	43.7	49.2	41.5	42.3	30.7

Source: Fridlizius, G. (1963) Sweden's exports 1850–1960. *Economy and History* 6, 30, 55 and 76.

Table 13.2. The export of sawn timber from the province of Archangel by country (%).

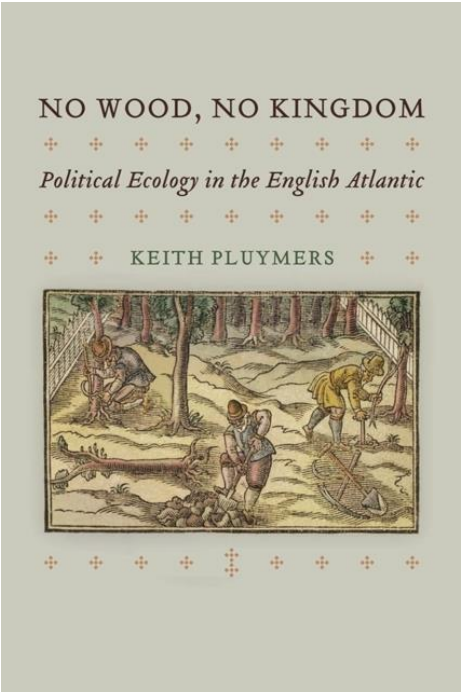
	1890	1901	1908	1909	1910	1911	1912	1913
Great Britain	73.3	66.9	61.9	59.8	59.0	60.0	55.6	61.6
France	11.8	9.0	5.8	7.5	8.0	8.4	8.6	6.1
Belgium	3.9	7.6	8.1	10.9	8.9	5.8	7.5	7.9
Holland	7.3	14.0	22.5	19.7	20.1	22.9	24.8	21.4
Germany	3.3	1.0	0.1	0.3	0.3	0.5	2.0	1.1
Spain	0.4							
Africa		0.9	0.8	1.3	2.7	1.4	0.8	1.2
Australia		0.4	0.6	0.5	0.7	0.8	0.7	0.6
Norway		0.2	0.2		0.3	0.2		0.1
Total standards	36,650	135,864	178,629	199,131	223,151	203,028	234,666	287,823

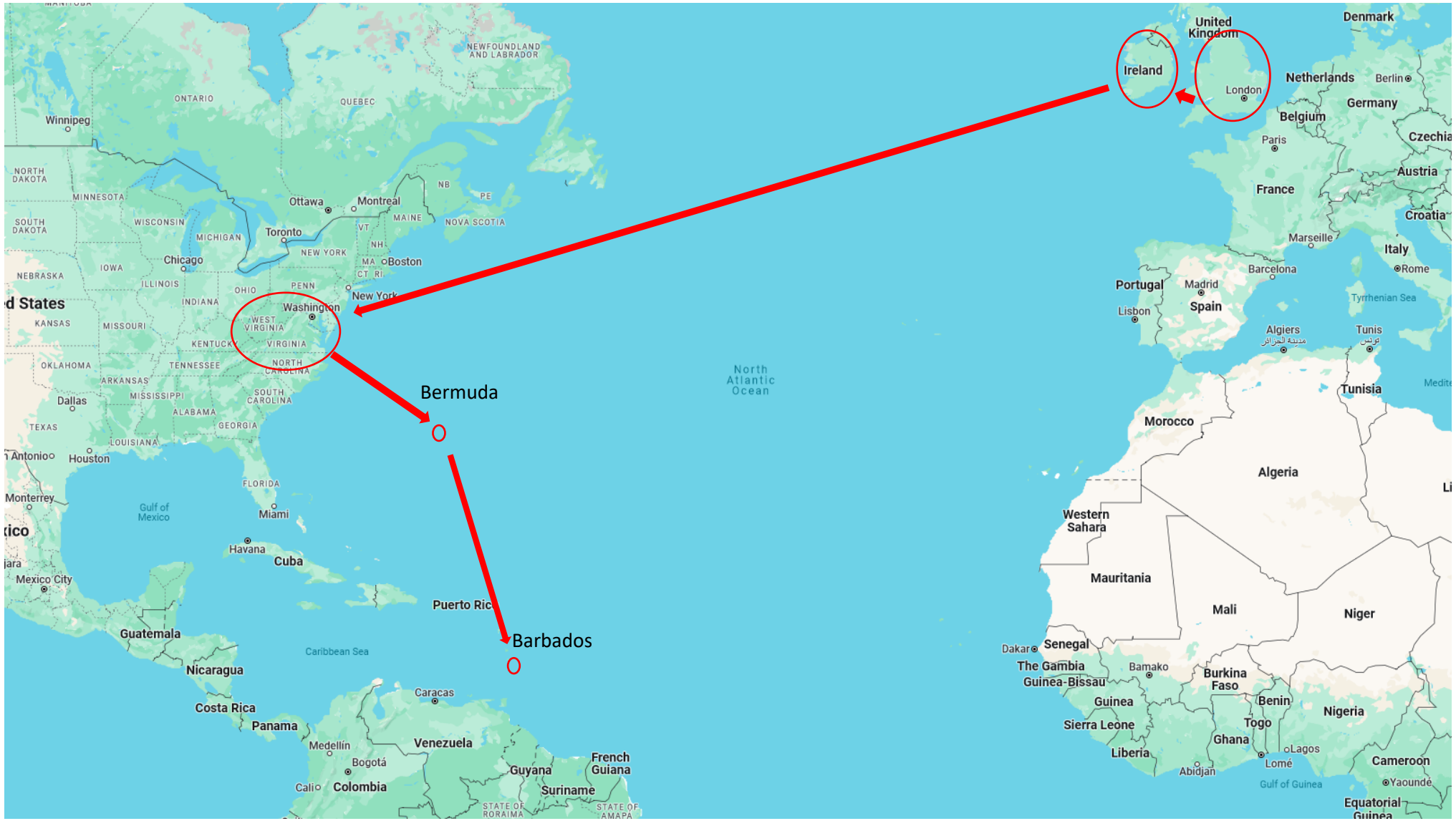
Source: Berättelser om handel och sjöfart. Archangelsk 1891–1914 (Consular and vice-consular reports for Archangel).

Lotz 2015

Björklund 2000

Timber frontier and colonialism





Pluymers 2021

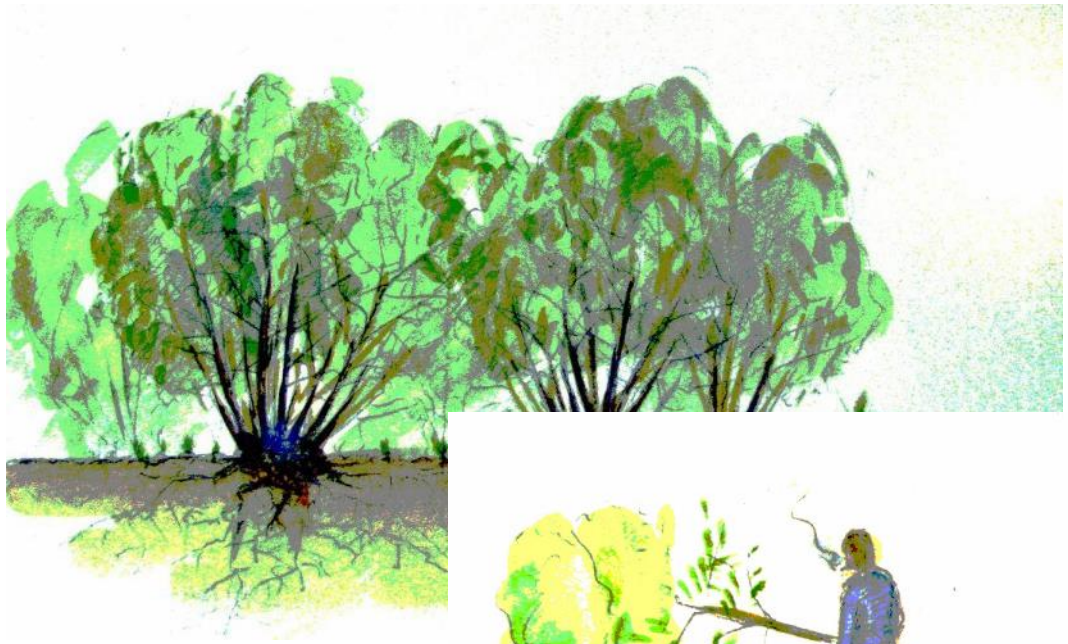
Forest management

before 19th century
traditional: harvesting + other uses

after 19th century
modern (scientific): harvesting and tree planting

Traditional management: coppicing

NPR Děvín, Pálava



Traditional management: coppicing

Děvín:

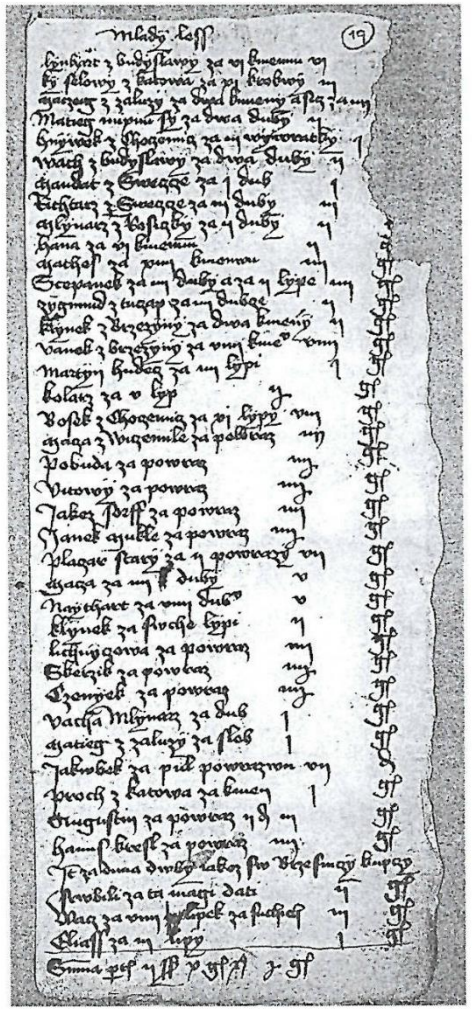
1384 urbarium

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

1692 forest conscription

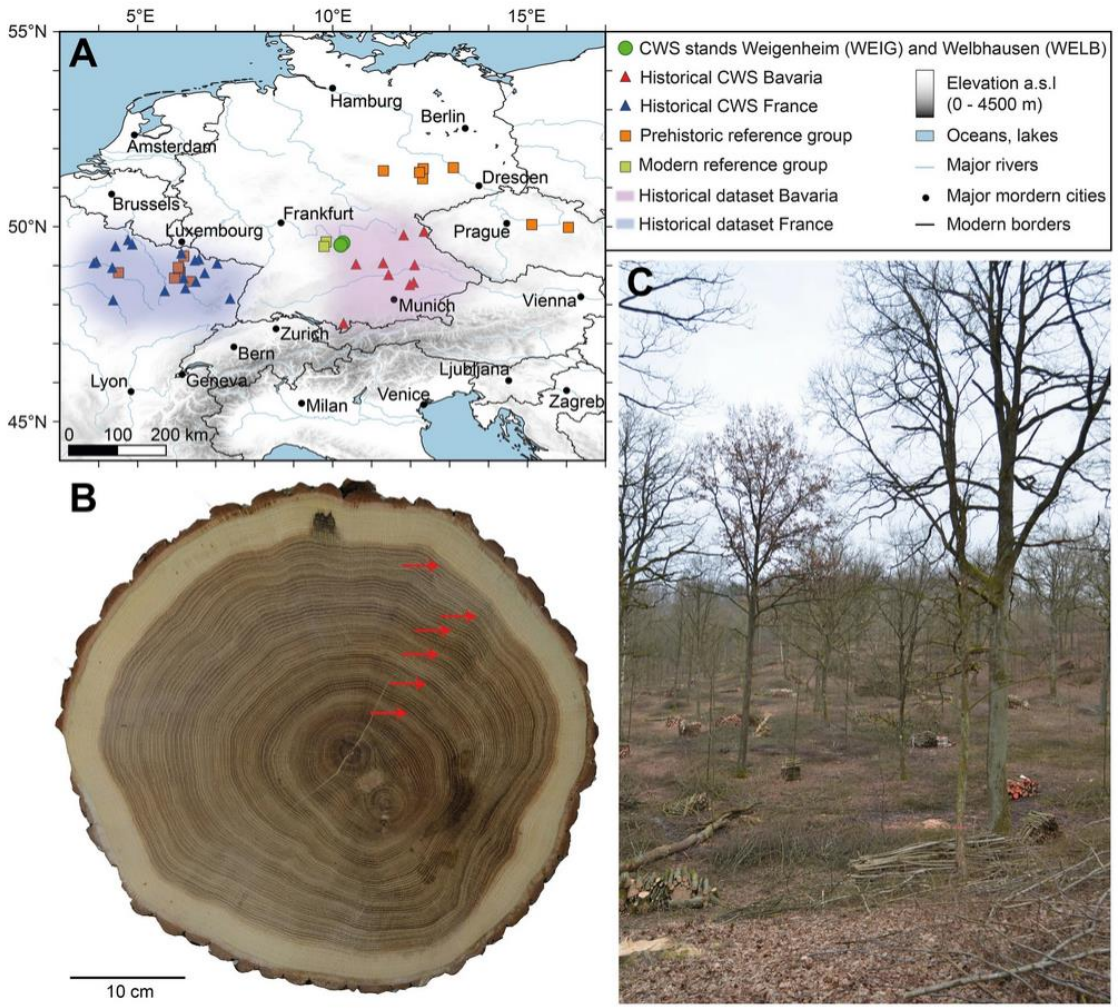
MZA F18 inv.č.7679

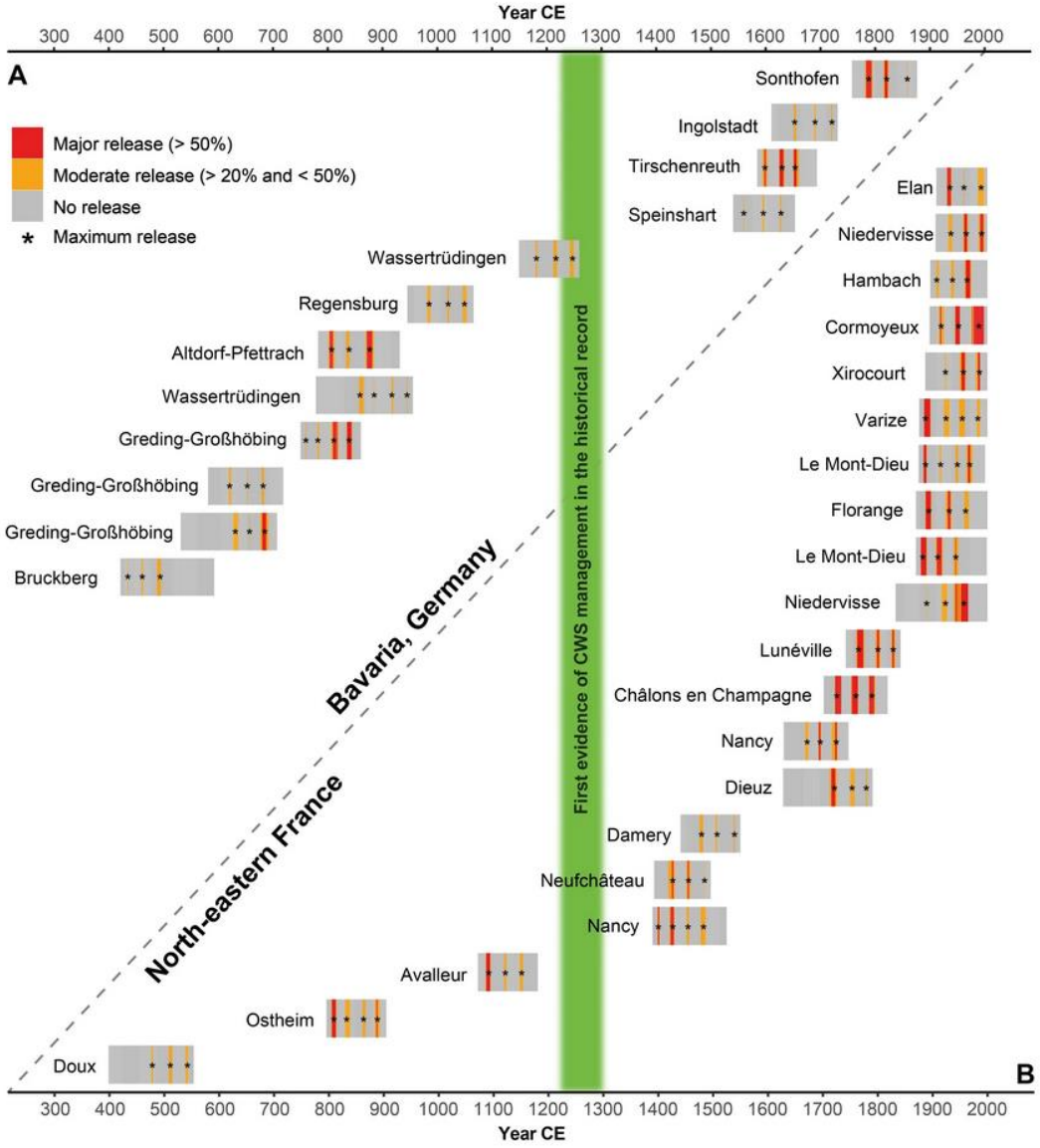
Traditional management: coppicing



Šimůnek 2003-2004

Traditional management: coppicing





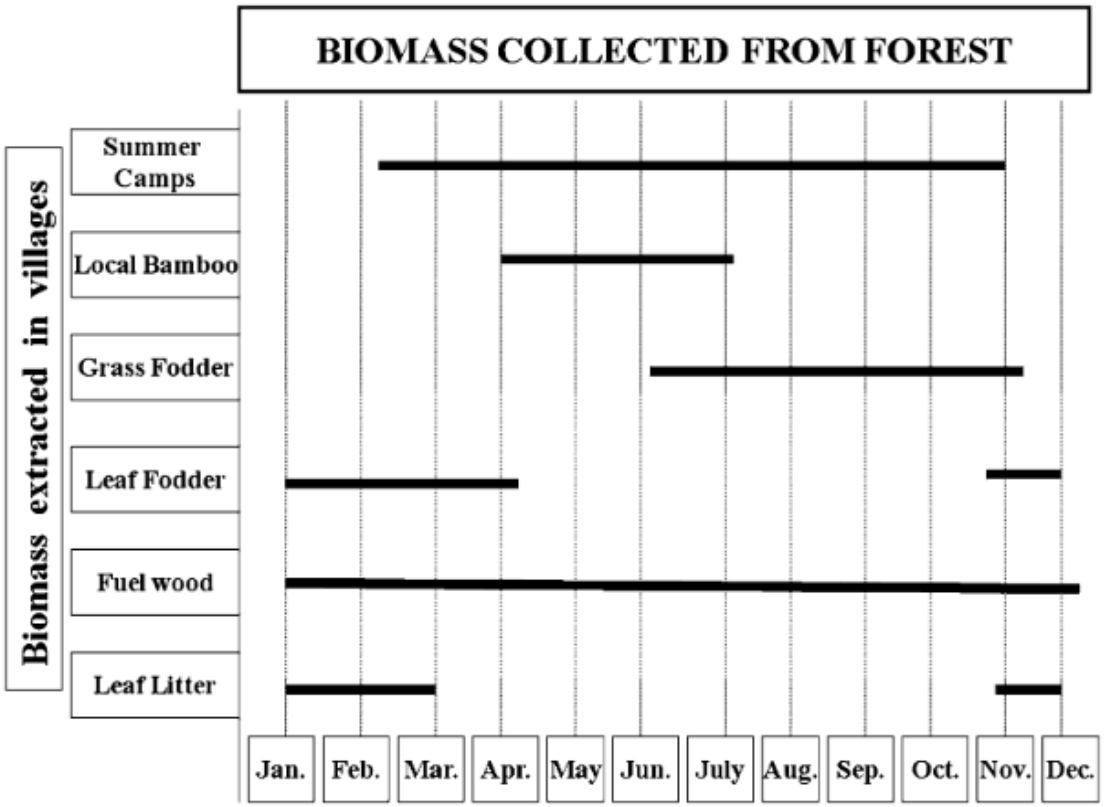
Muigg et al. 2020

Traditional management: other uses

Bürgi & Gimmi 2007

Traditional management: other uses

Fig. 1 Seasonal calendar of fodder removal by local inhabitants of Upper Kedar Valley

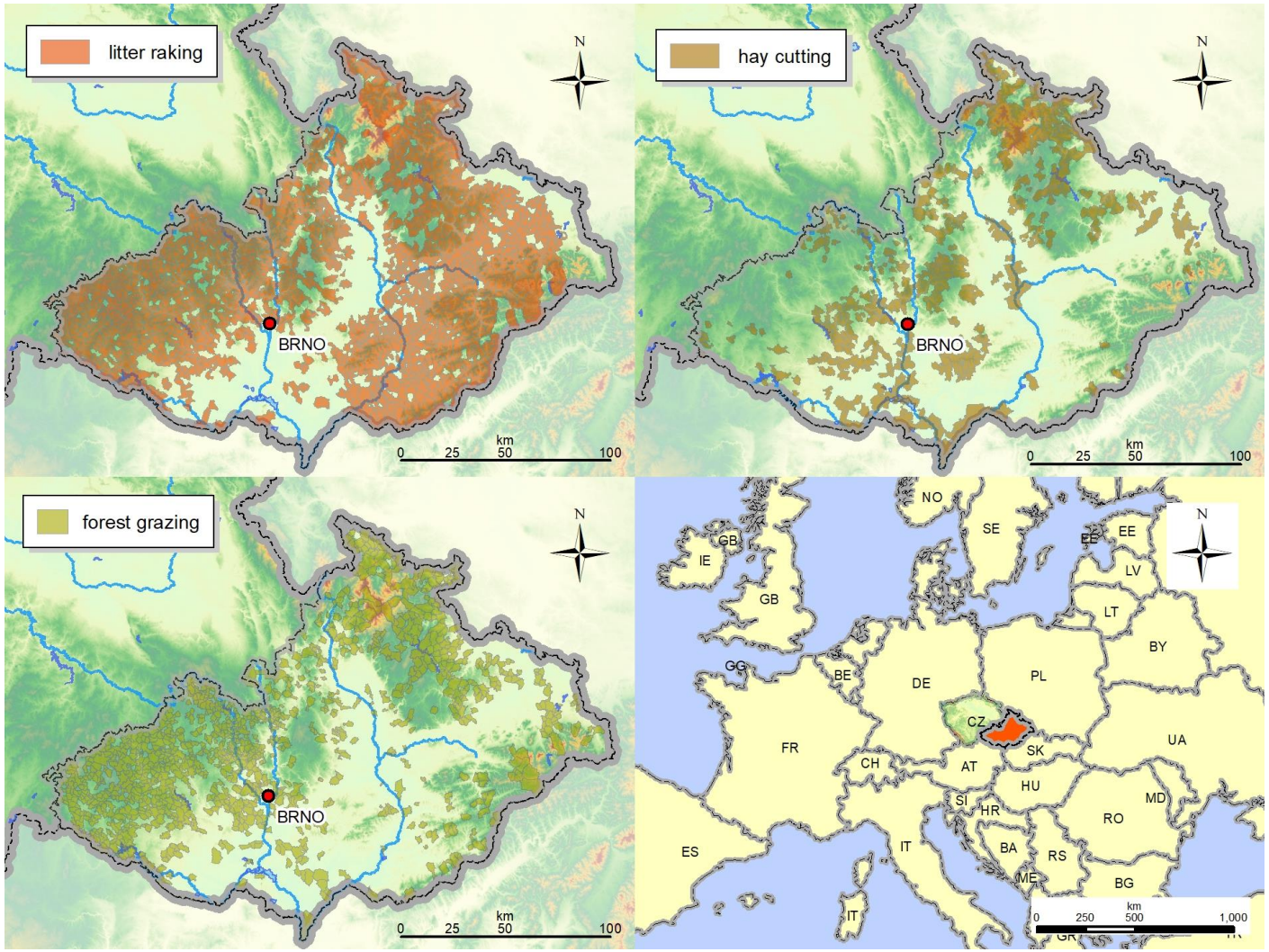


Fodder for milk producing buffalo and cattle must be collected from the steep hillsides. Grass and tree branches are often carried a considerable distance.

Dhyani et al. 2013

https://himaltrial.weebly.com/himalayan-village-life.html

Traditional management: other uses

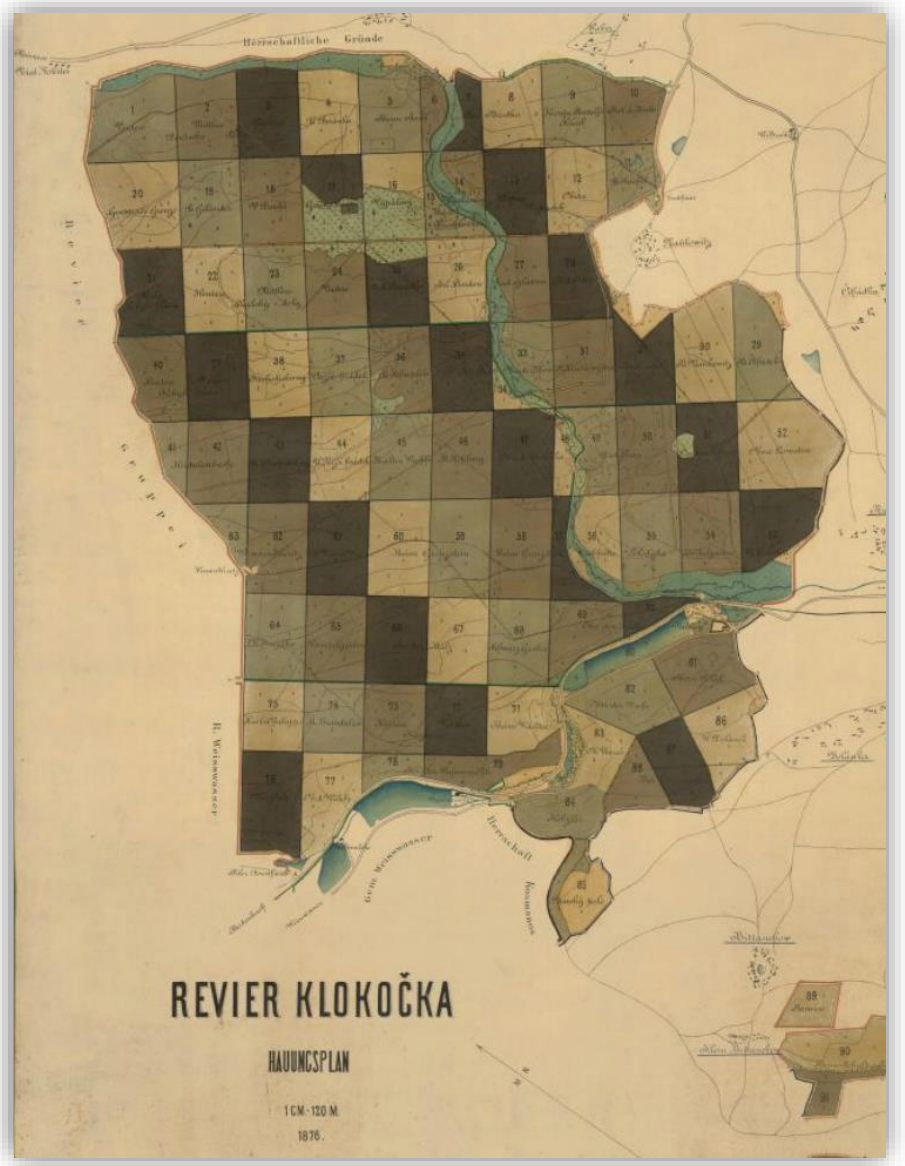


Szabó et al. 2023

Scientific forestry

harvesting, planning, planting

Scientific forestry



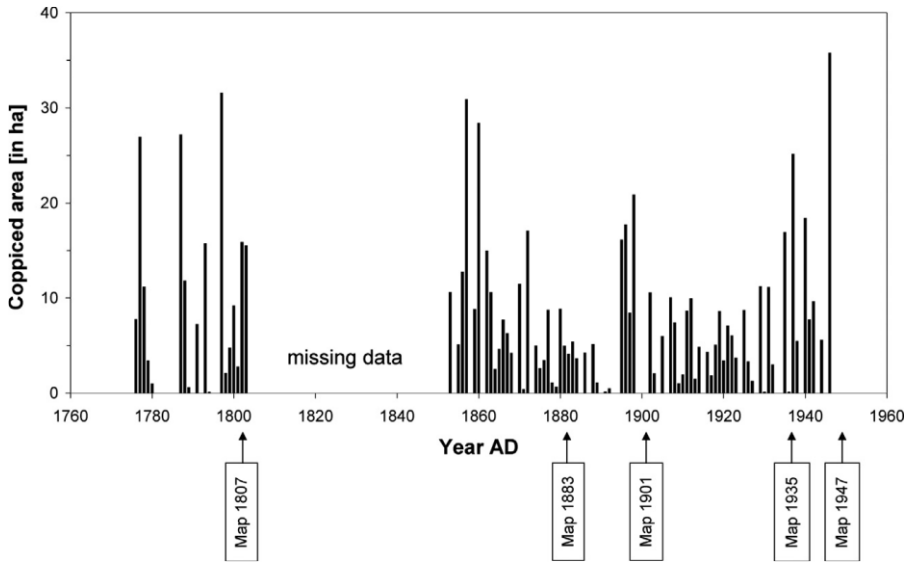
www.starelesnimapy.cz

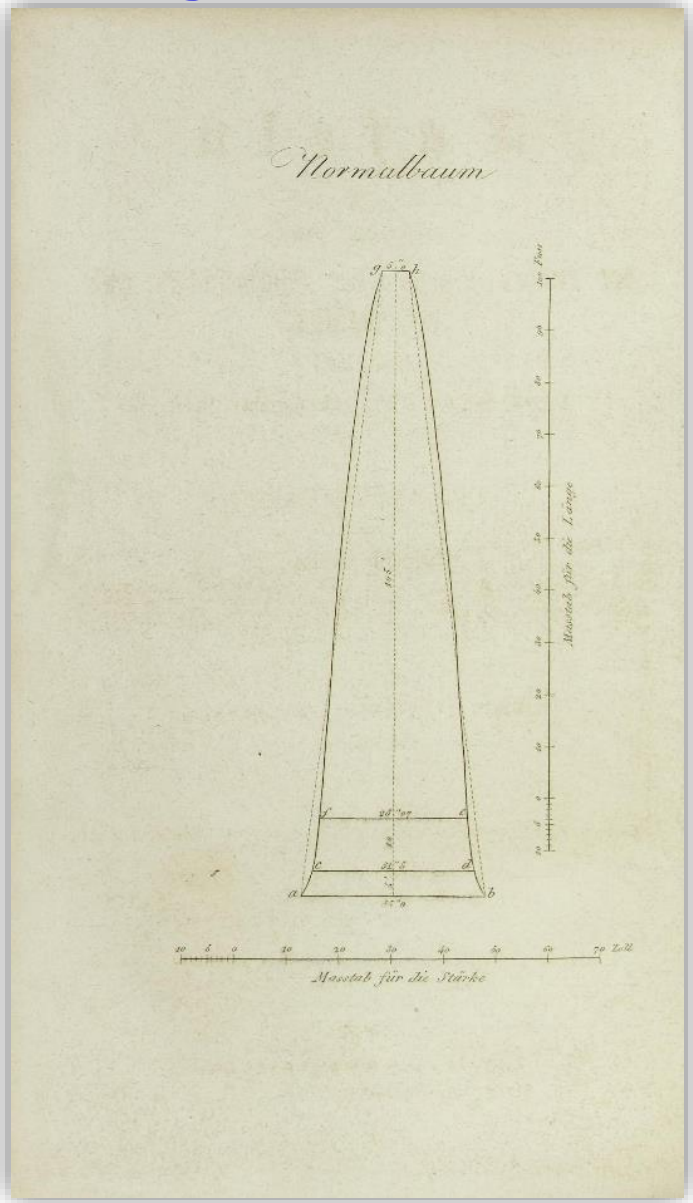
a bureaucrat‘s dream

planning 400 (!) years ahead

Scientific forestry

from area to„Normalbaum”





Scientific forestry: conflicts

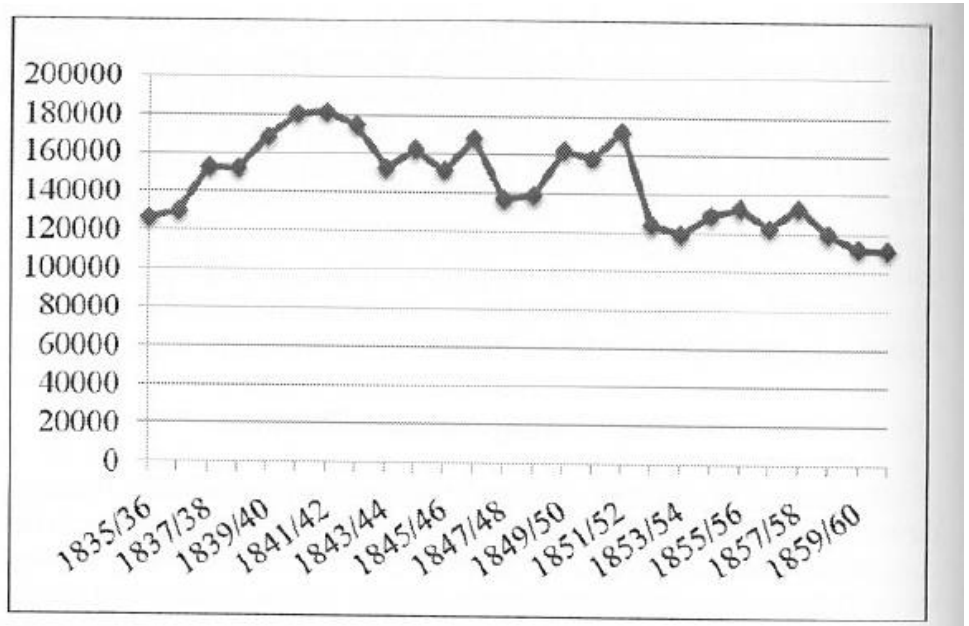


Figure 10.1: Offences against forest regulations in Bavaria (excluding the Palatinate) 1835 to 1860.
Sources: Mayr, Statistik der Gerichtlichen Polizei. Figure XXXIX.

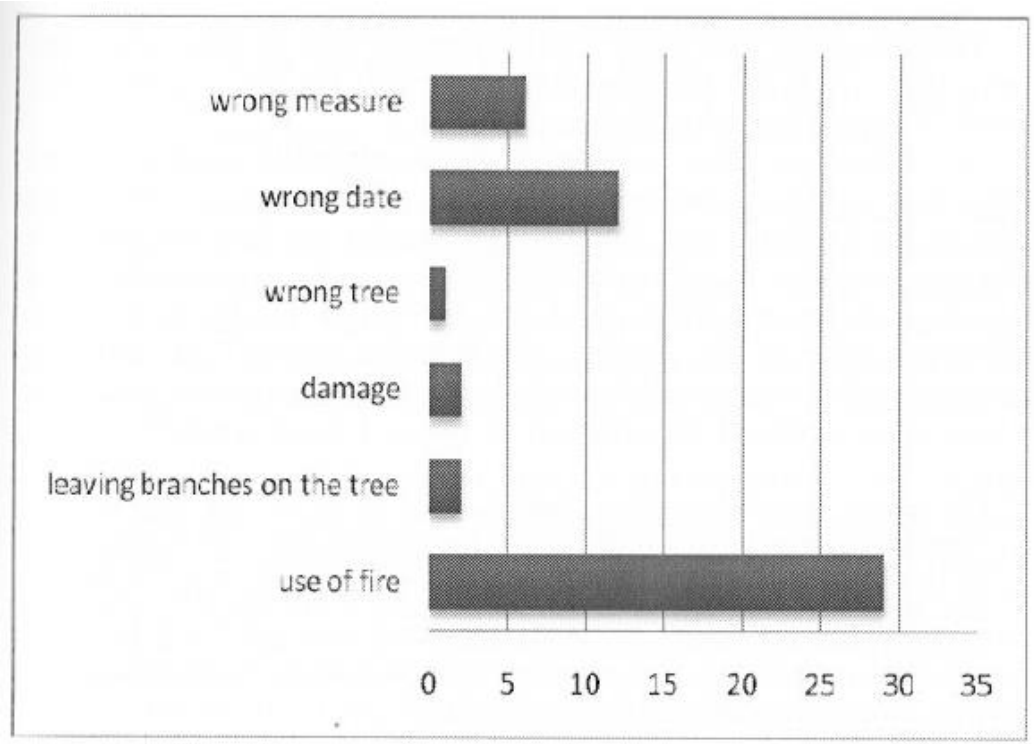


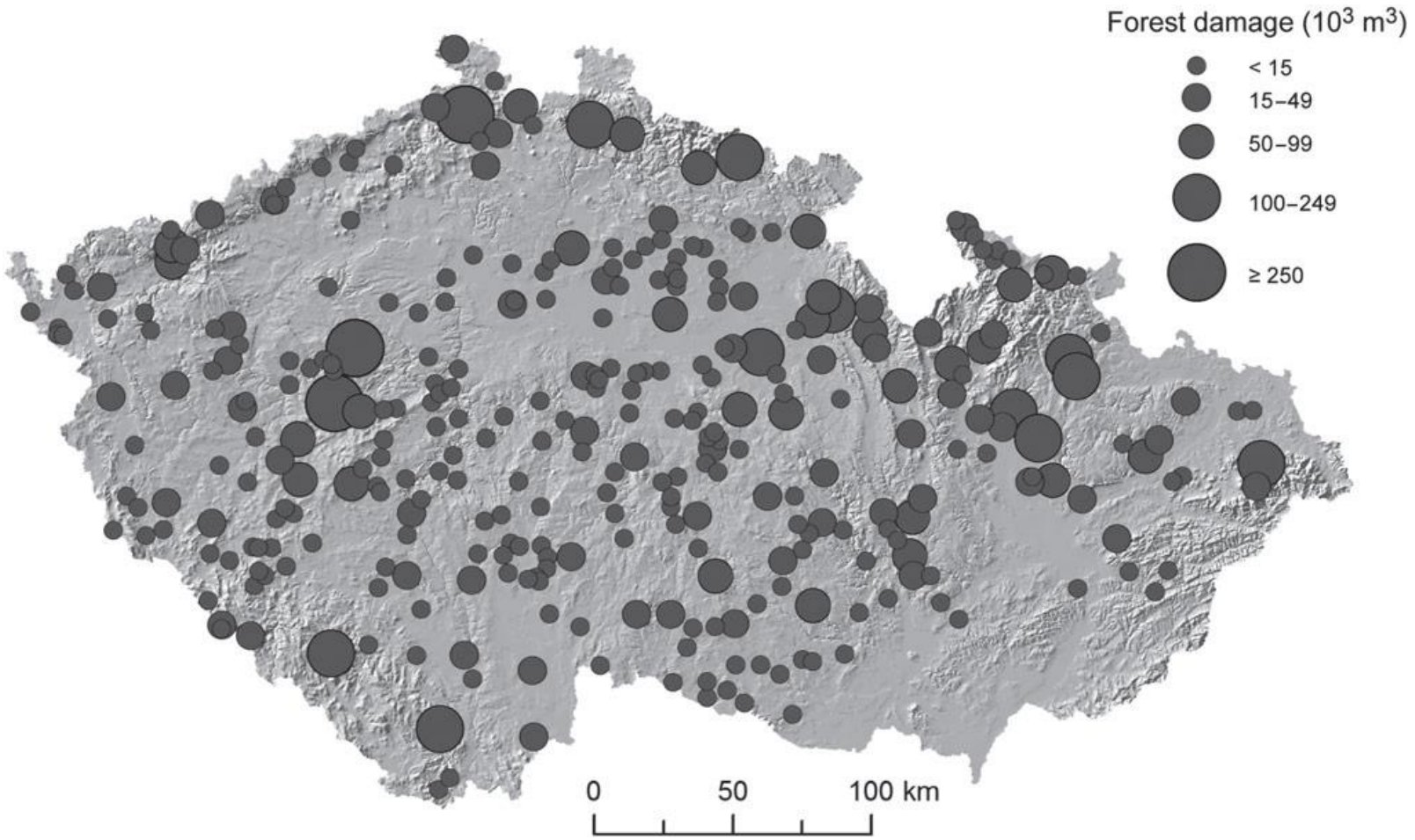
Figure 10.3: Types of forest offences, forest station Drachselsried, 1st Quarter 1830-31 (74 cases).
Sources: Bavarian State Archives Landshut County Court / Landgericht ä. O. Viechtach 1116.

Hölzl 2011

Scientific forestry: problems and limits

Windstorm in the Tatra Mountains, 2004

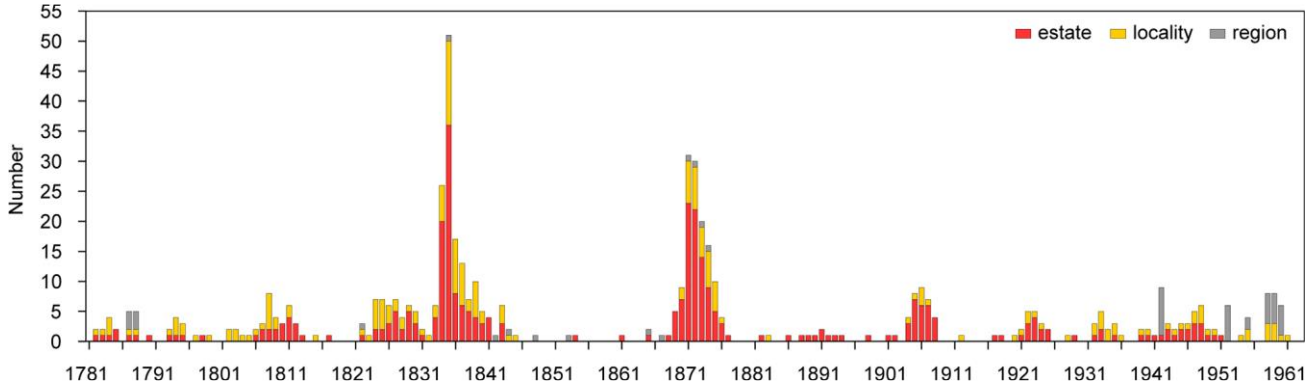
Scientific forestry: problems and limits

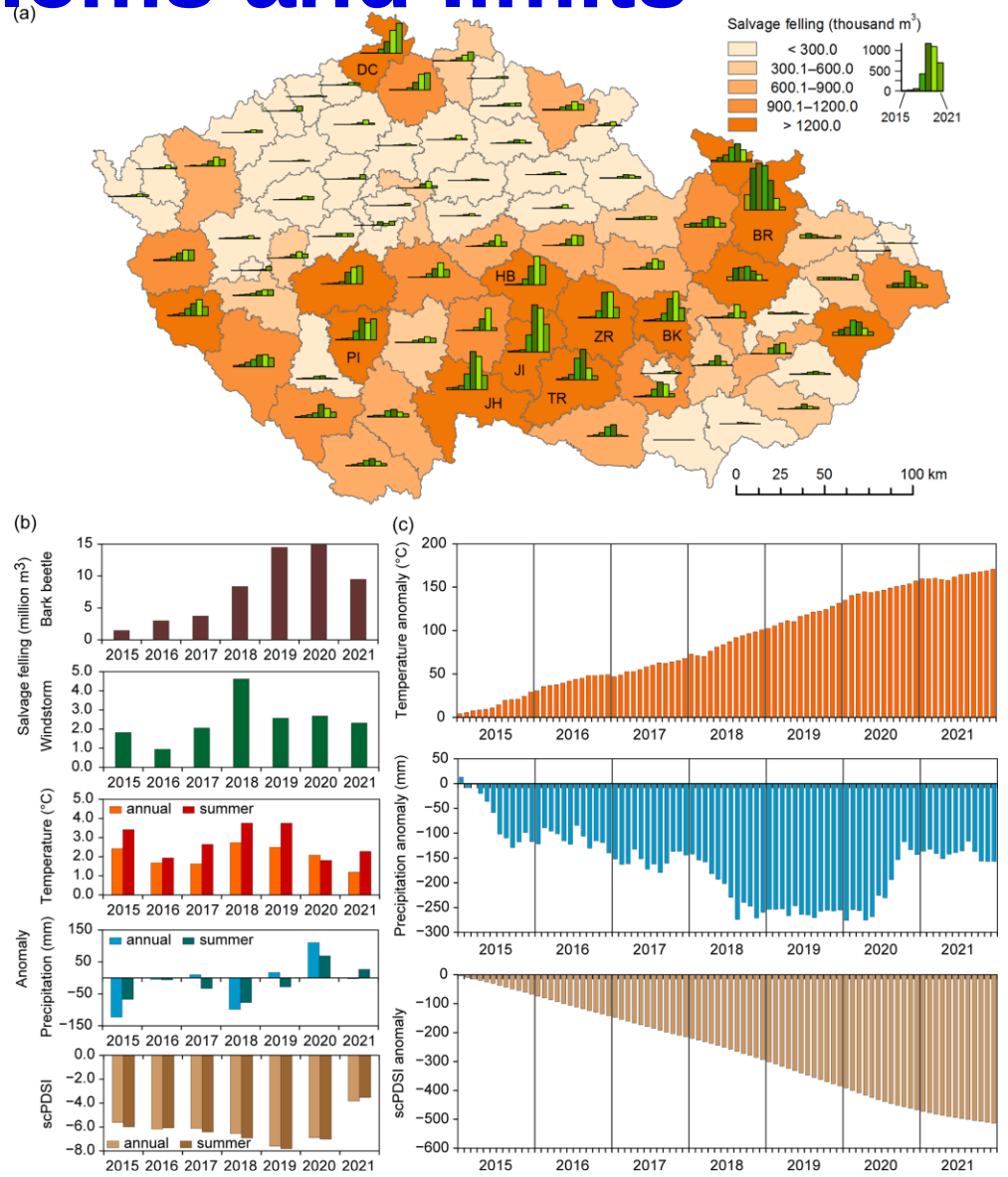


Largest windstorm of the 19th century in Central Europe: 7 December 1868

Brázdil, R. et al. 2017

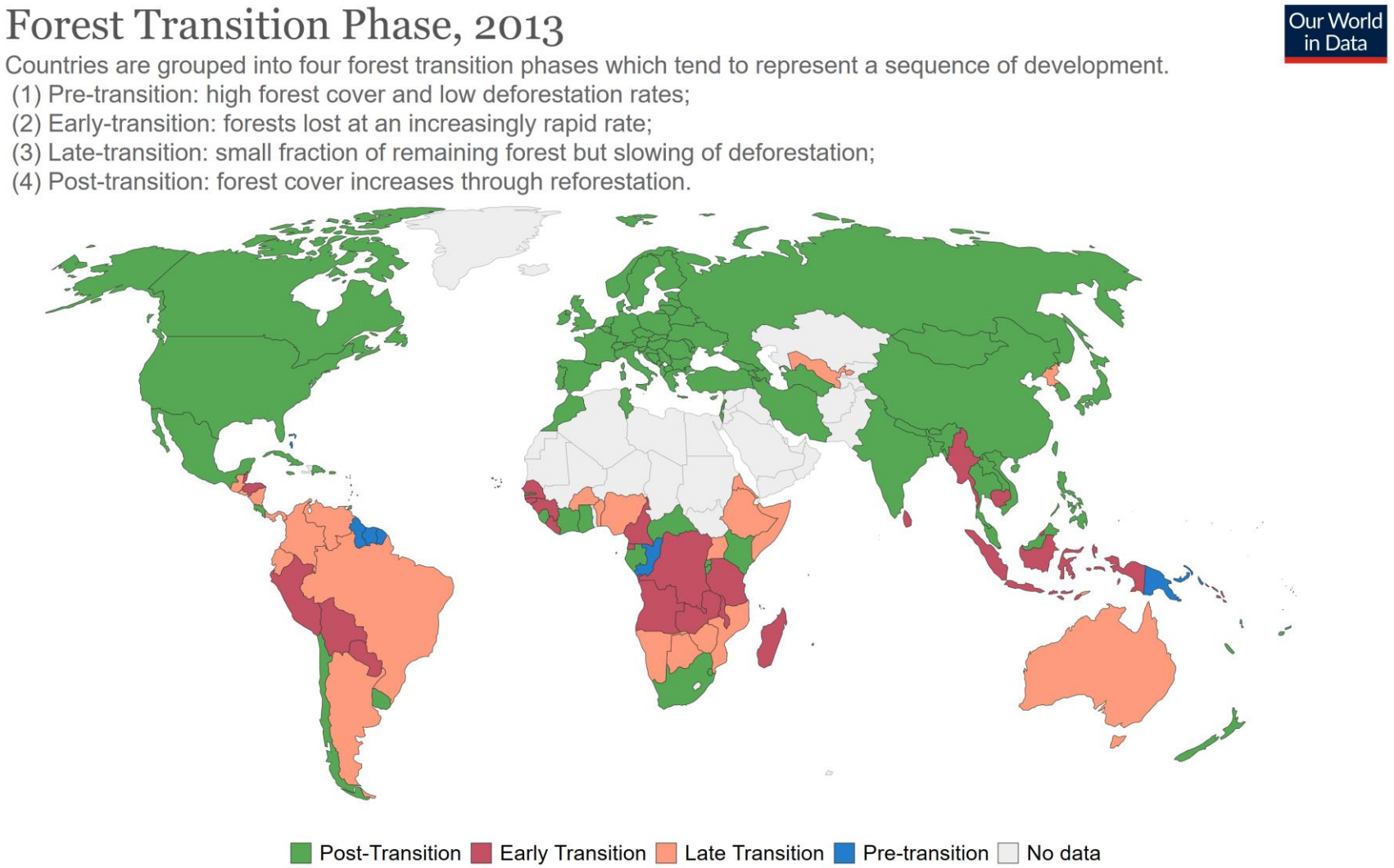
Scientific forestry: problems and limits





Brázdil et al. 2022

Forest transition



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Thank you for your attention