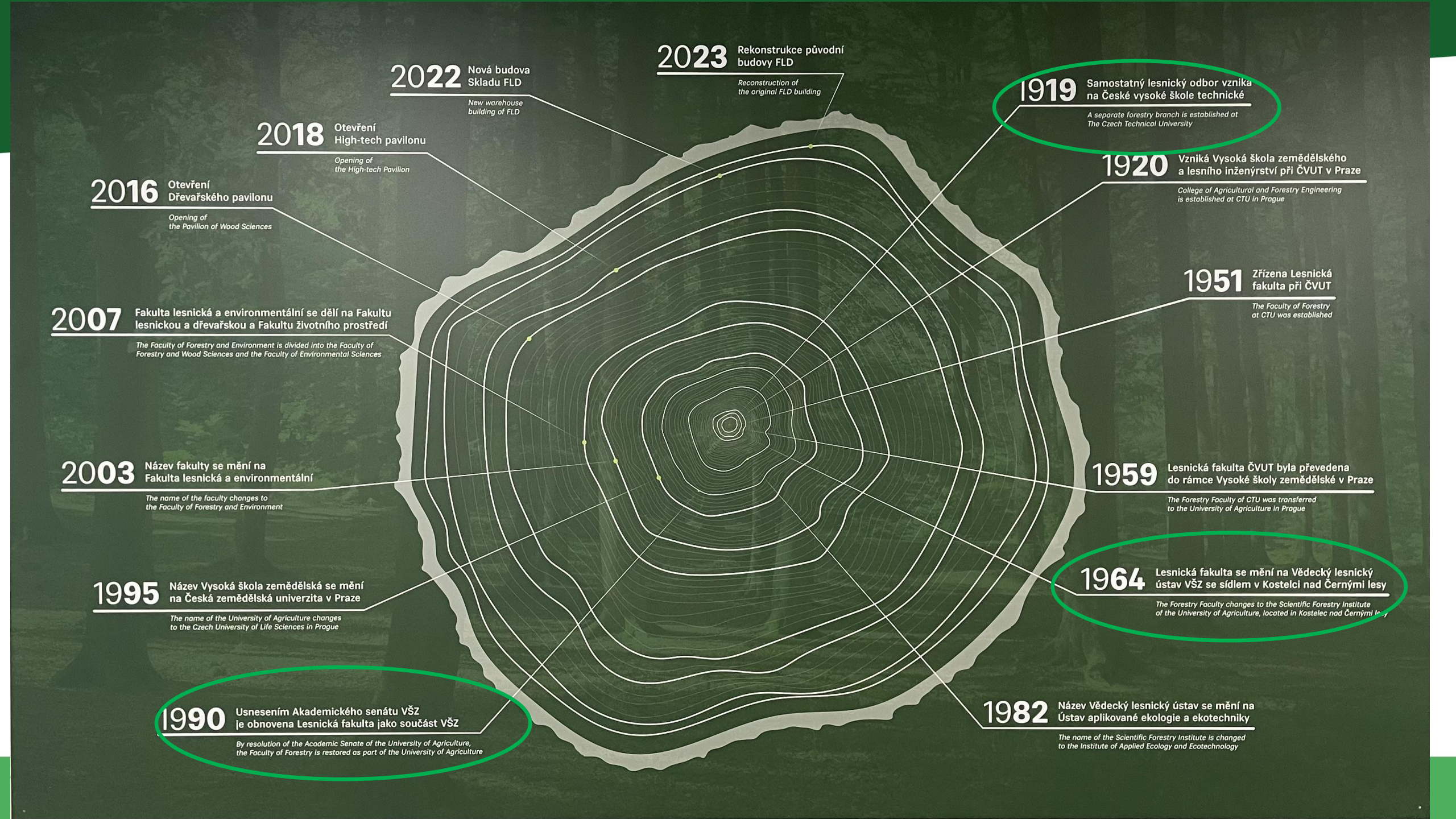
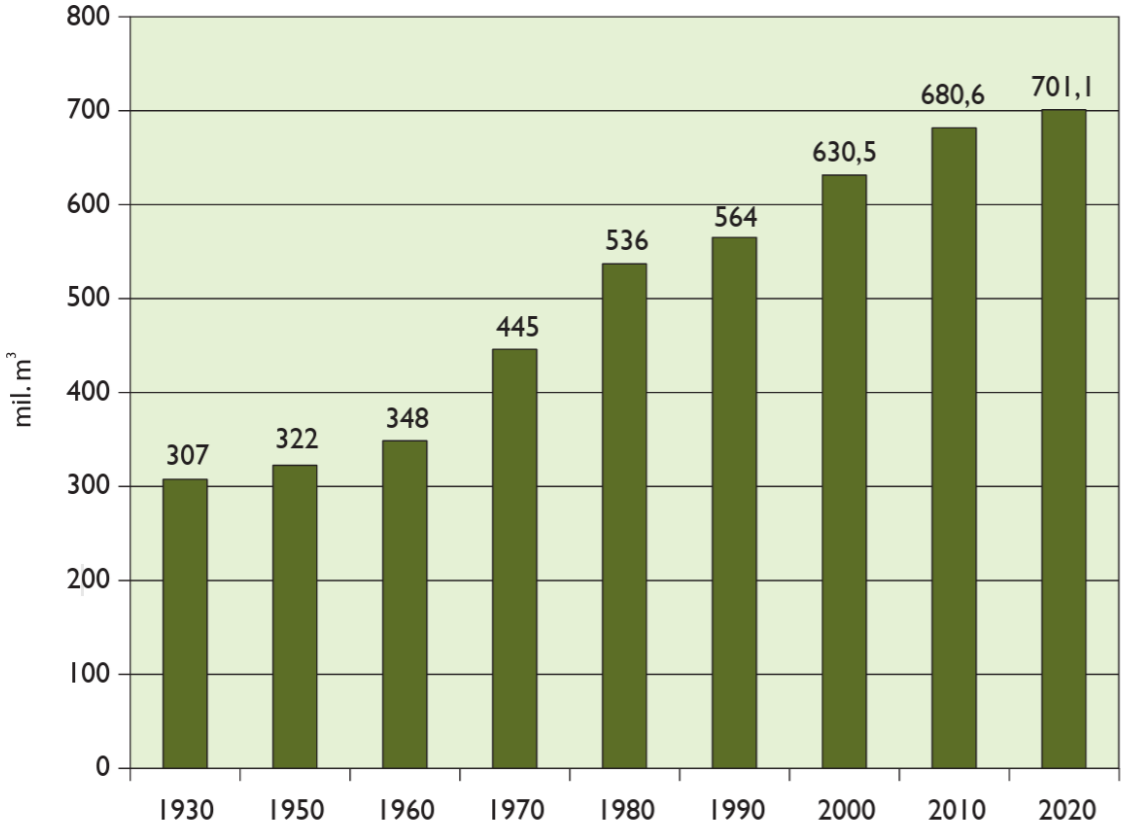
Faculty of Forestry and Wood Sciences

Forest resources in the context of climate change and increasing disturbances – education and research point of view

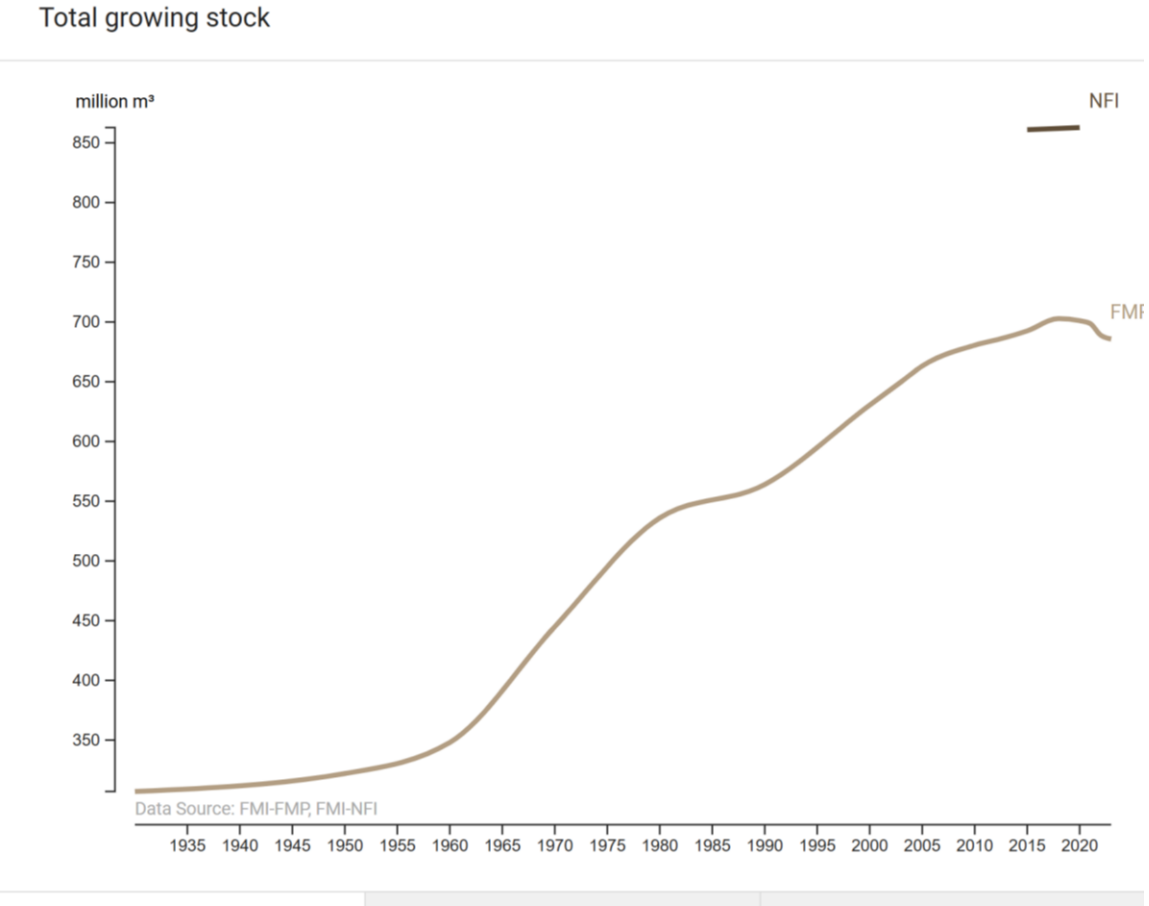
Róbert Marušák, Tomáš Hlásny

CZECH UNIVERSITY OF LIFE SCIENCES


2023 Rekonstrukce původní budovy FLD
Reconstruction of the original FLD building
2022 Nová budova Skladu FLD
New warehouse building of FLD
2018 Otevření High-tech pavilonu
Opening of the High-tech Pavilion
2016 Otevření Dřevařského pavilonu
Opening of the Pavilion of Wood Sciences
2007 Fakulta lesnická a environmentální se dělí na Fakultu lesnickou a dřevařskou a Fakultu životního prostředí
The Faculty of Forestry and Environment is divided into the Faculty of Forestry and Wood Sciences and the Faculty of Environmental Sciences
2003 Název fakulty se mění na Fakulta lesnická a environmentální
The name of the faculty changes to the Faculty of Forestry and Environment
1995 Název Vysoká škola zemědělská se mění na Česká zemědělská univerzita v Praze
The name of the University of Agriculture changes to the Czech University of Life Sciences in Prague
1990 Usnesením Akademického senátu VŠZ je obnovena Lesnická fakulta jako součást VŠZ
By resolution of the Academic Senate of the University of Agriculture, the Faculty of Forestry is restored as part of the University of Agriculture
1982 Název Vědecký lesnický ústav se mění na Ústav aplikované ekologie a ekotechniky
The name of the Scientific Forestry Institute is changed to the Institute of Applied Ecology and Ecotechnology
1964 Lesnická fakulta se mění na Vědecký lesnický ústav VŠZ se sídlem v Kostelci nad Černými lesy
The Forestry Faculty changes to the Scientific Forestry Institute of the University of Agriculture, located in Kostelec nad Černými lesy
1959 Lesnická fakulta ČVUT byla převedena do rámce Vysoké školy zemědělské v Praze
The Forestry Faculty of CTU was transferred to the University of Agriculture in Prague
1951 Zřízena Lesnická fakulta při ČVUT
The Faculty of Forestry at CTU was established
1920 Vzniká Vysoká škola zemědělského a lesního inženýrství při ČVUT v Praze
College of Agricultural and Forestry Engineering is established at CTU in Prague
1919 Samostatný lesnický odbor vznika na České vysoké škole technické
A separate forestry branch is established at The Czech Technical University

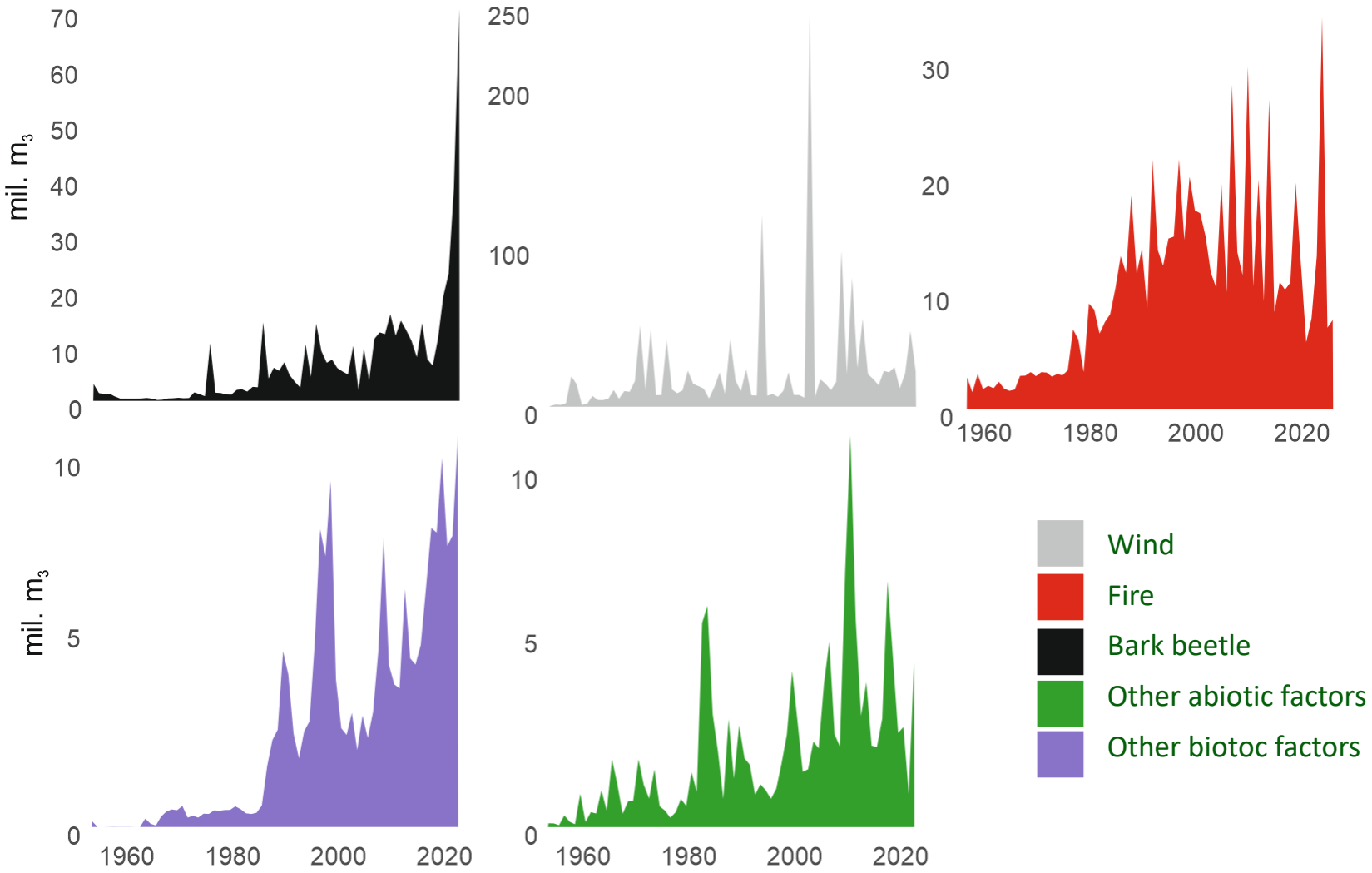


Source: Report on state of forests and forest management in the CR 2020

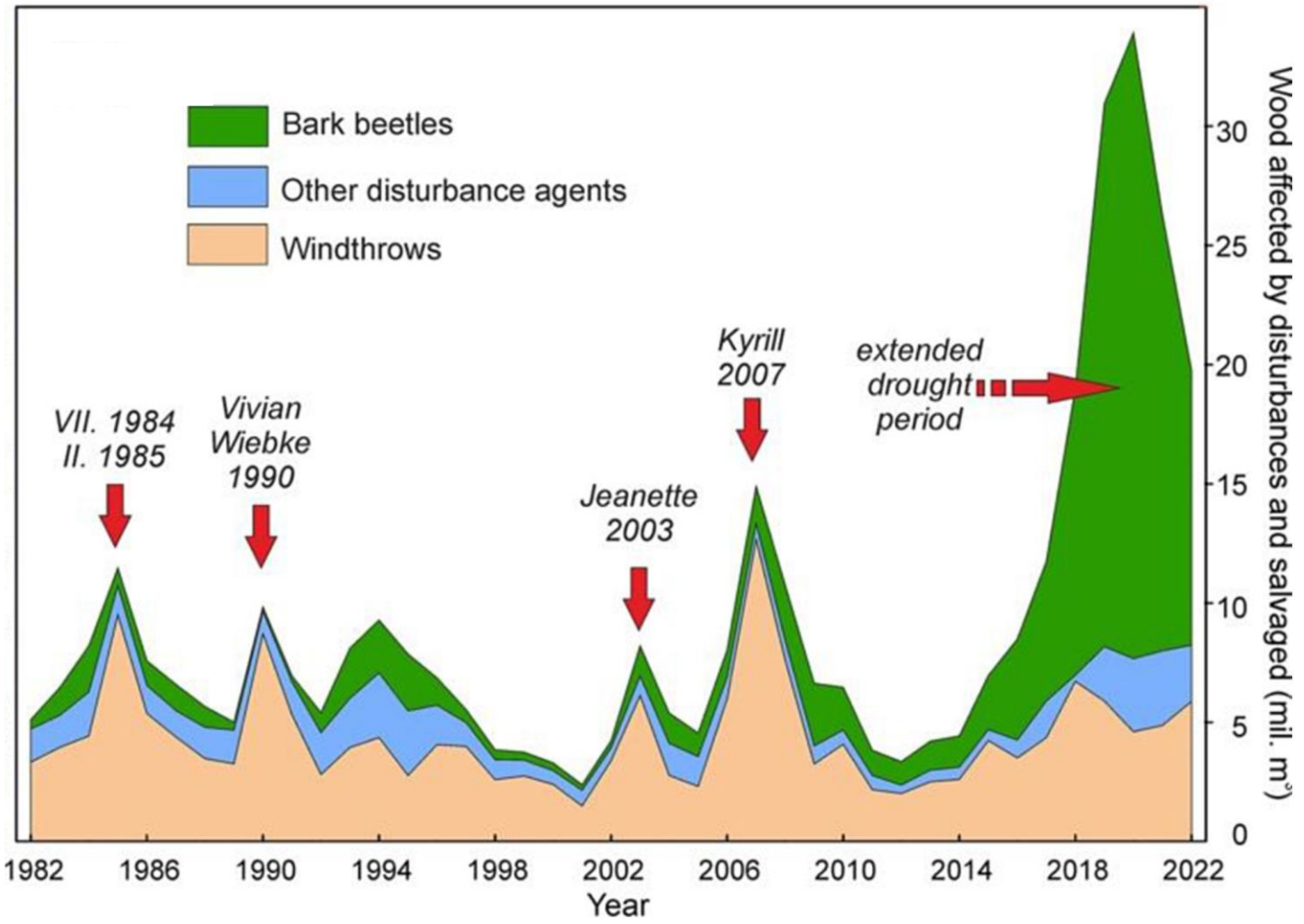


Source: National Forest Institute (info.uhul.cz)

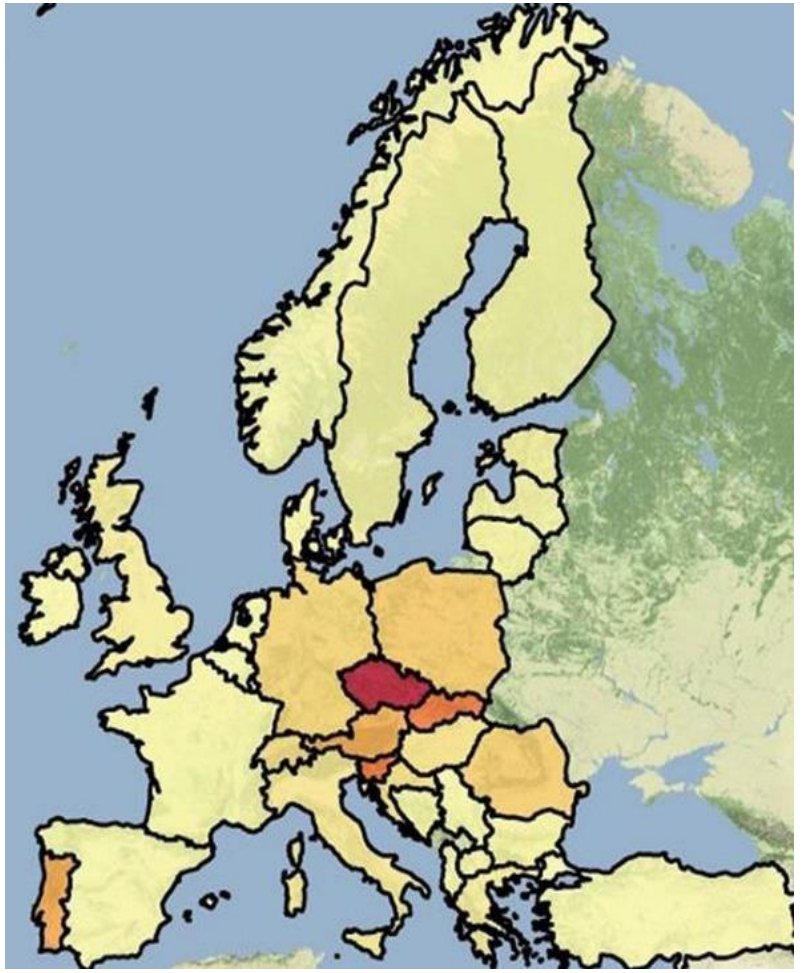
Forest damage in Europe (1950-2020)



Patacca et al. 2024, Global Change Biology



Washaya, … Hlásny, 2024, Forest Ecosystems



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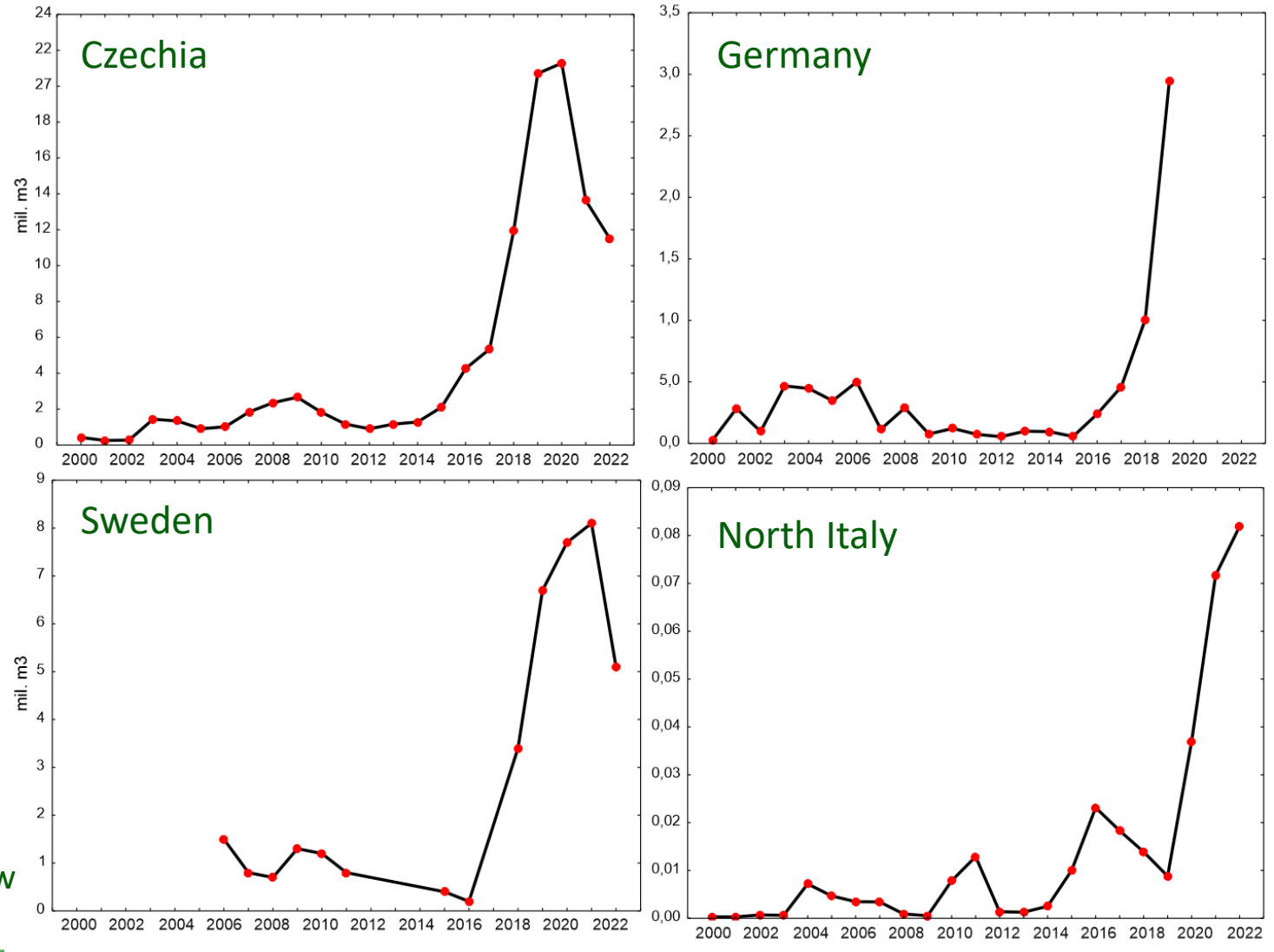
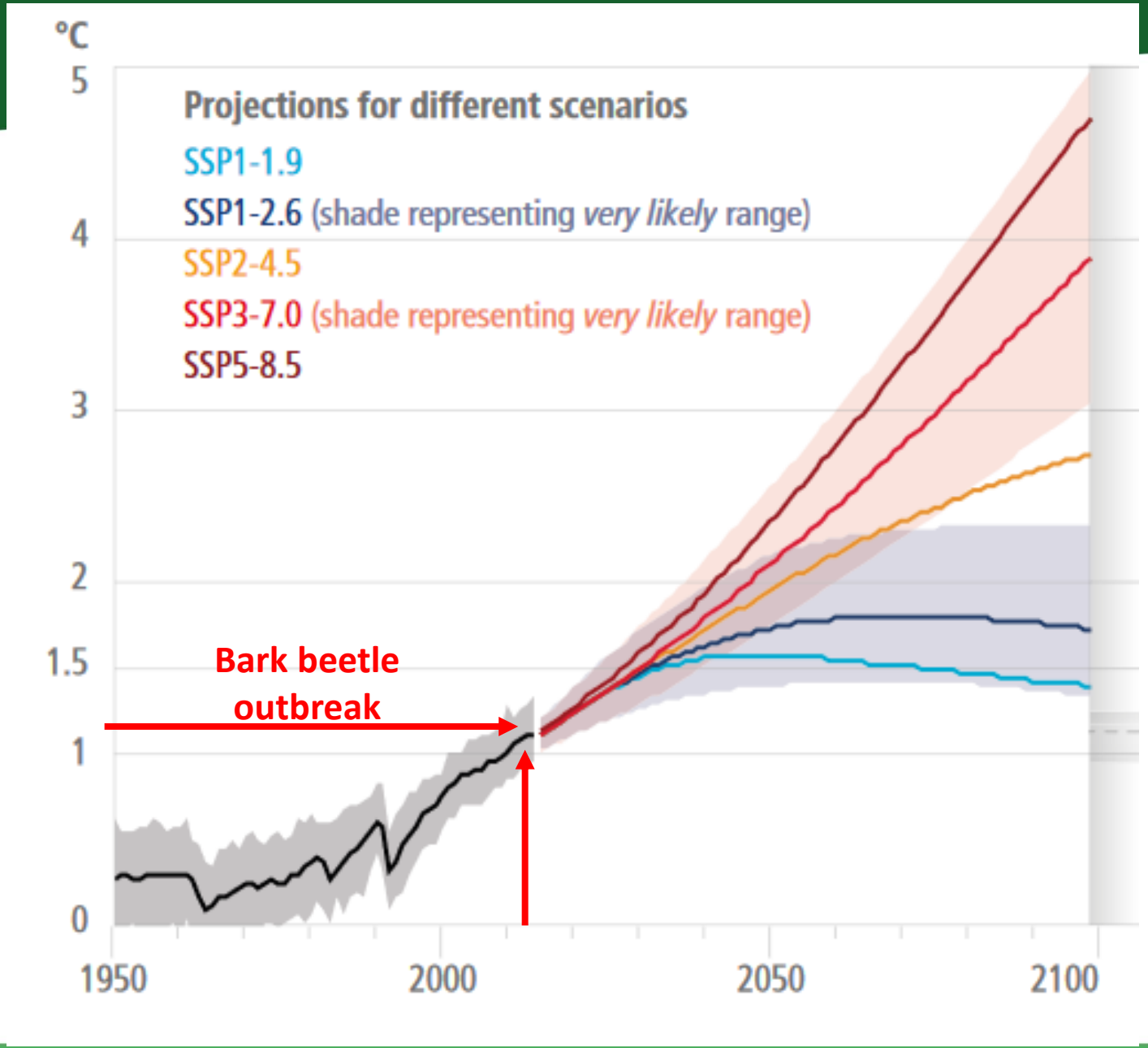


Hlásny et al. 2024, Global Change Biology, in review

We must take into account the fact that …

- … the development of forest resources in the coming decades will not mirror that of the past decades
- … the bark beetle outbreak of 2018-2022 was not an isolated event that will not occur again
- … forest management does not have the situation fully under control; decrease bark beetle infestation = false satisfaction

The 2018-2022 bark beetle outbreak occurred with a warming of just 1.3°C!



Kunžak, Czechia, August 2024, Roman Modlinger

Čierny Balog, Slovakia, 2023

https://spravy.pravda.sk/regiony/clanok/703092-kalamita-je-pre-cierny-balog-obrovskou-hrozbou-na-nieco-podobne-si-nespominaju-ani-najvacsi-pamatnici/

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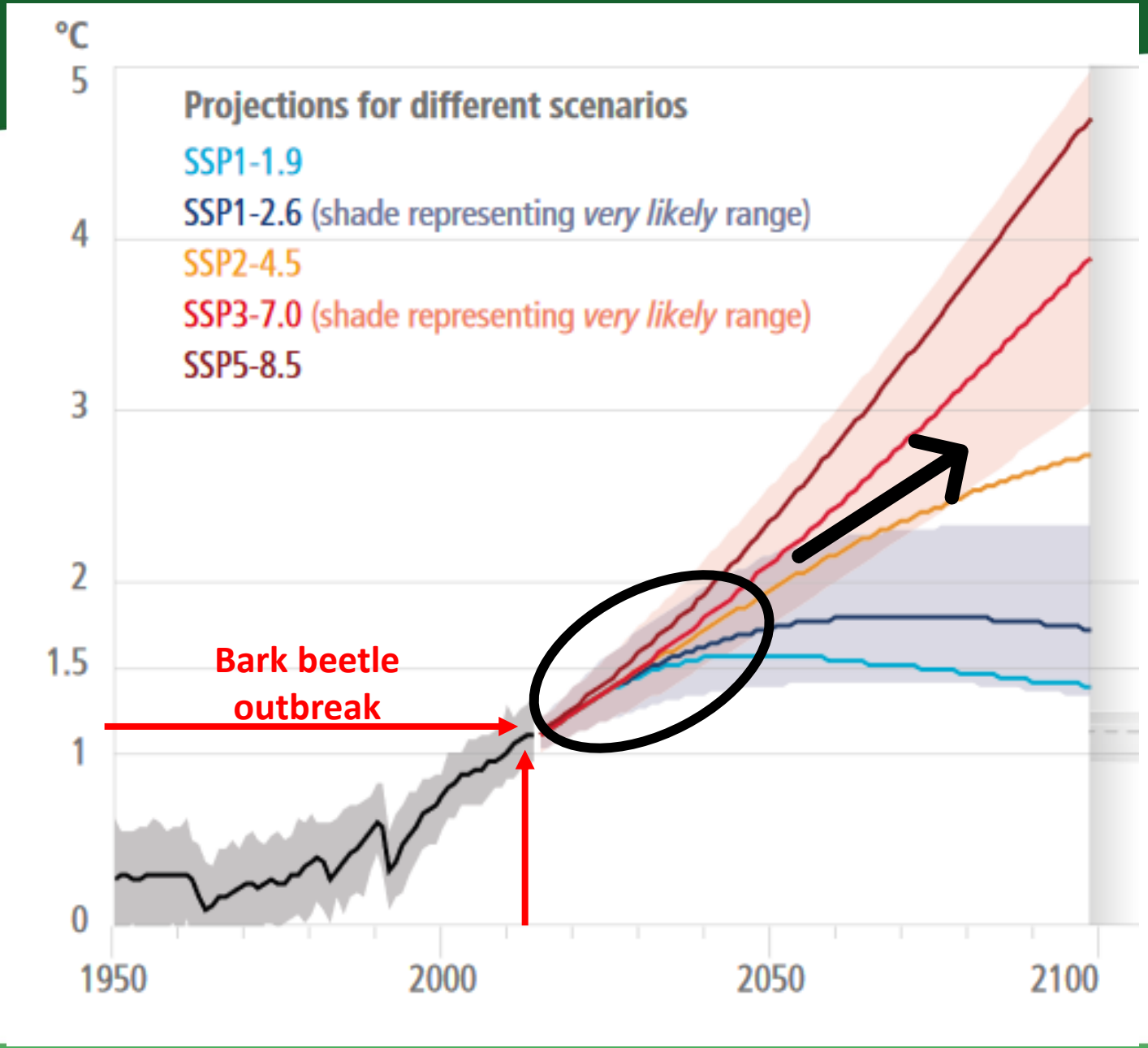
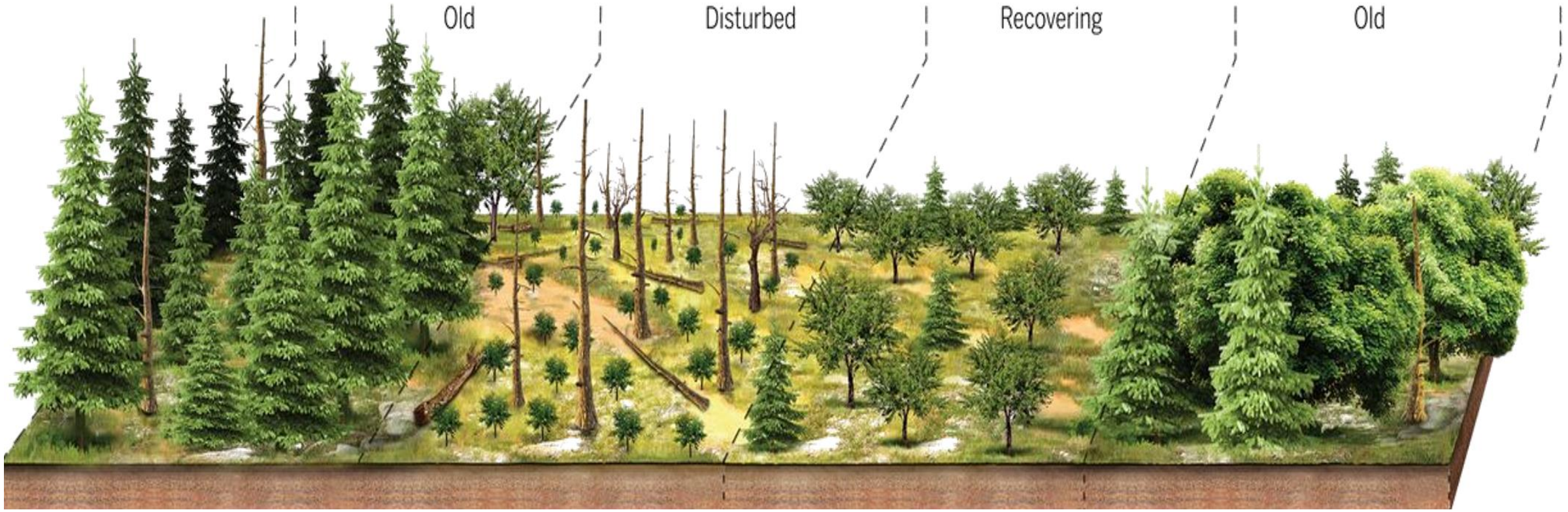
The 2018-2022 bark beetle outbreak occurred with a warming of just 1.3°C!

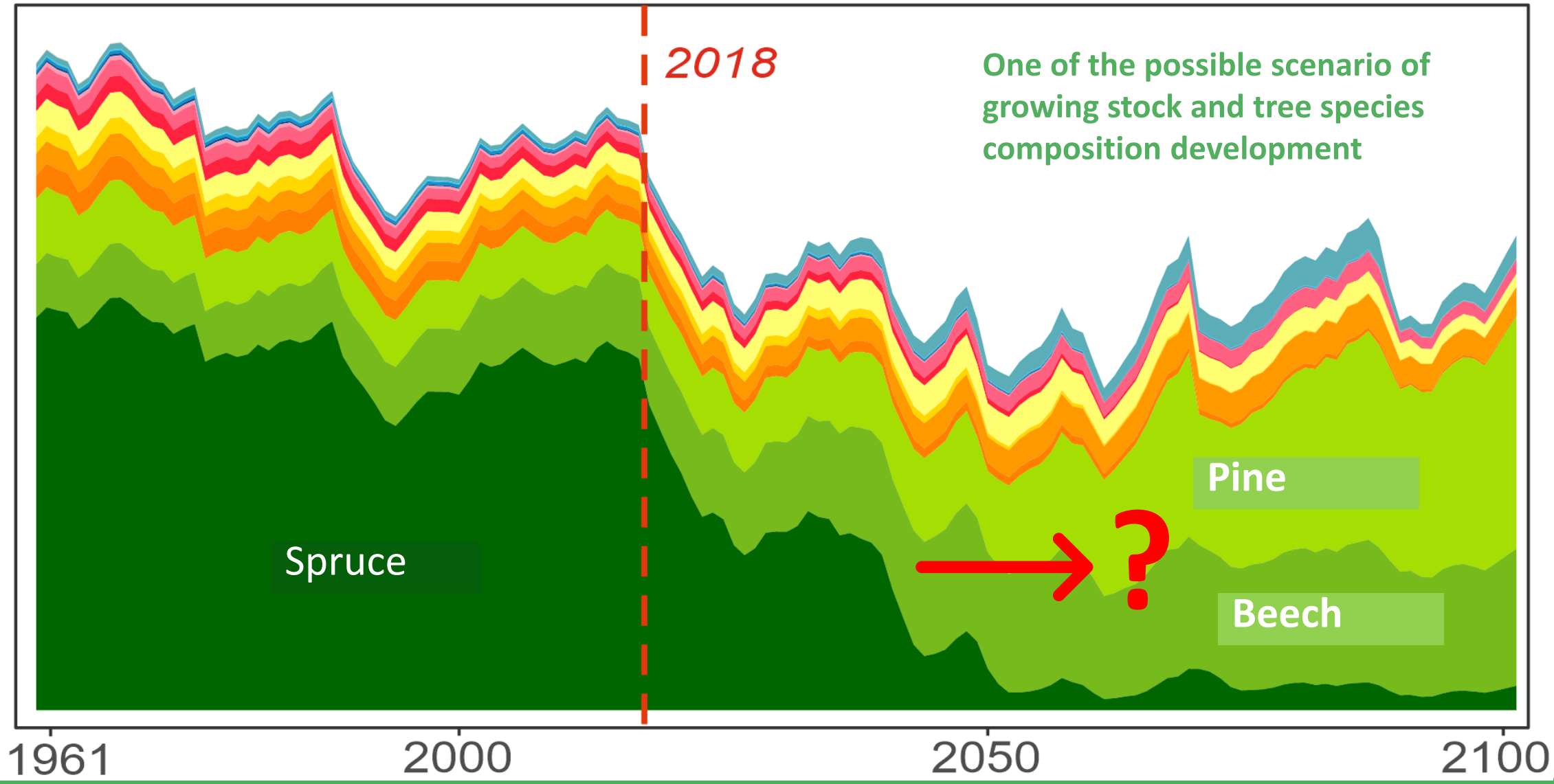
After 2030, 25-50% of years will be drier than the extreme year of 2018, which caused the bark beetle disaster





Climate change

McDowell et al. 2020, Science



Das. A., …. Hlásny, T. 2024. Environmental Modelling and Software, in review

Other factors

- Level of active adaptation of forests (state policy, owners' attitudes)
- Possible reduction of production area due to expansion of nature **conservation areas**
- "**Ecological surprises**" as new pests and pathogens
- **Pine and fir** as other potentially risky tree species
- Shift towards broadleaves significantly accelerated by ongoing wave of disasters

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Some of consequences for wood production

- **Increase** in volumes of "calamitous" (especially coniferous) wood with lower market value and technical parameters (10-30 years)
- High temporal **instability** of production, partially compensated by reduction of planned harvests
- Gradual increase in broadleaf assortments (20 years +)
- Overall shift towards **thinner** log dimensions

How to proceed

- Maximum increase the **resilience** of the forestry and timber sector to shocks such as disasters, fluctuations in wood prices, fluctuations in labor availability, etc.
- **Create** legislation and build infrastructure and human resources that will allow these shocks to be absorbed
- **Search** for new ways to effectively utilize disaster material (within a horizon of 10-30 years) and increase the production of broadleaf assortments (20-50 years)
- Use the following unstable period as an opportunity for structural changes – **every crisis is also an opportunity**

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Pan-European Forest Risk Knowledge Mechanism

- FOREST EUROPE Ministerial Conference on the Protection of Forests in Europe - The Forest Risk Facility (FoRISK) - a collaborative network and knowledge hub for pan-European countries and experts in forest risk management
- European Forest Institute
- Ministry of Agriculture of the Czech Republic
- Faculty of Forestry nad Wood Sciences CZU

Education

- Focused on forestry, silviculture and rational management of forest resources including subsequent timber utilization as a renewable natural material
- Bachelor‘s: Sustainable Forestry and Natural Resource Management
- Master‘s: Forest Science in Global Change; Wooden Structures and Wood-based Buildings
- Doctoral´s
  - **Global Change Forestry**
  - **Fire Protection of Forests, Timber and Wood-based Materials**
  - Applied Geoinformatics and Remote Sensing in Forestry
  - Forest Management
  - Forest Protection and Game Management
  - Silviculture
  - Economics and Management of Forestry and Wood Industry
  - Forest Biology
  - **Wood Processing and Forest Machinery**

Success Stories and Hands-on Projects

- **Construction Hackathon 2024 – Affordable Timber Housing Design**
  - project received recognition for both its creativity and technical execution, highlighting the potential of timber in modern urban development
- **Wooden Railway Shelter Designs** – Collaboration with CVUT
  - wooden shelter designs for railway stations – realised by the Czech Railway Authority

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- **Timber Footbridge Design**
  - wooden shelter designs for railway stations – realised by the Czech Railway Authority
- **Zabystřan Tests Wooden-Core Skis – Innovation in Sports Equipment**
  - FLD student (Czech alpine skier, Czech Olympian) - new ski prototypes featuring wooden cores

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LESOVNA


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