



**Faculty of Forestry and Wood Technology
Mendel University in Brno
Czech Republic**

- MENDELU
- Faculty of Forestry
- and Wood
- Technology

Mendel University in Brno

MENDELU

- A public institution with long tradition of excellence in research and teaching activities
- Established in 1919
- 5 faculties, 1 institute
- University Forest Enterprise, University Farm
- About 8 300 students



- MENDELU
- Faculty of Forestry and Wood
- Technology

Faculty of Forestry and Wood Technology

FFWT

- 12 departments
- About 200 staff members
- About 1,800 students (PhD students about 200)
- Arboristics
- Furniture design and furniture technology
- Forestry
- Landscaping
- Timber structures and wood building construction
- Wood technology and timber management



Faculty Mission



Forest - source of a unique raw material and essential element of landscape.

- education and research in **forestry** (established in 1919), **wood science** and technology, wood-based **constructions and furniture** (since 1990), **landscaping** (since 1997) and **urban forestry** and arboriculture (since 2003)
- to conduct research in the fields focusing on **production and stability of forest ecosystems**, processing and use of **wood and wood-based materials** as renewable natural resources

R&D Missions and Headlines

meets public demand
in forestry, logging, landscaping and
arboriculture

...

non-production use of landscape and
forests for leisure and regeneration,
socio-economic aspects

...

sustainable production of a renewable
material, carbon and water
management

...

care for the living environment by
furniture design & making, timber
construction

...

development and application of new
methods for wood processing
and using of wood-based products

...

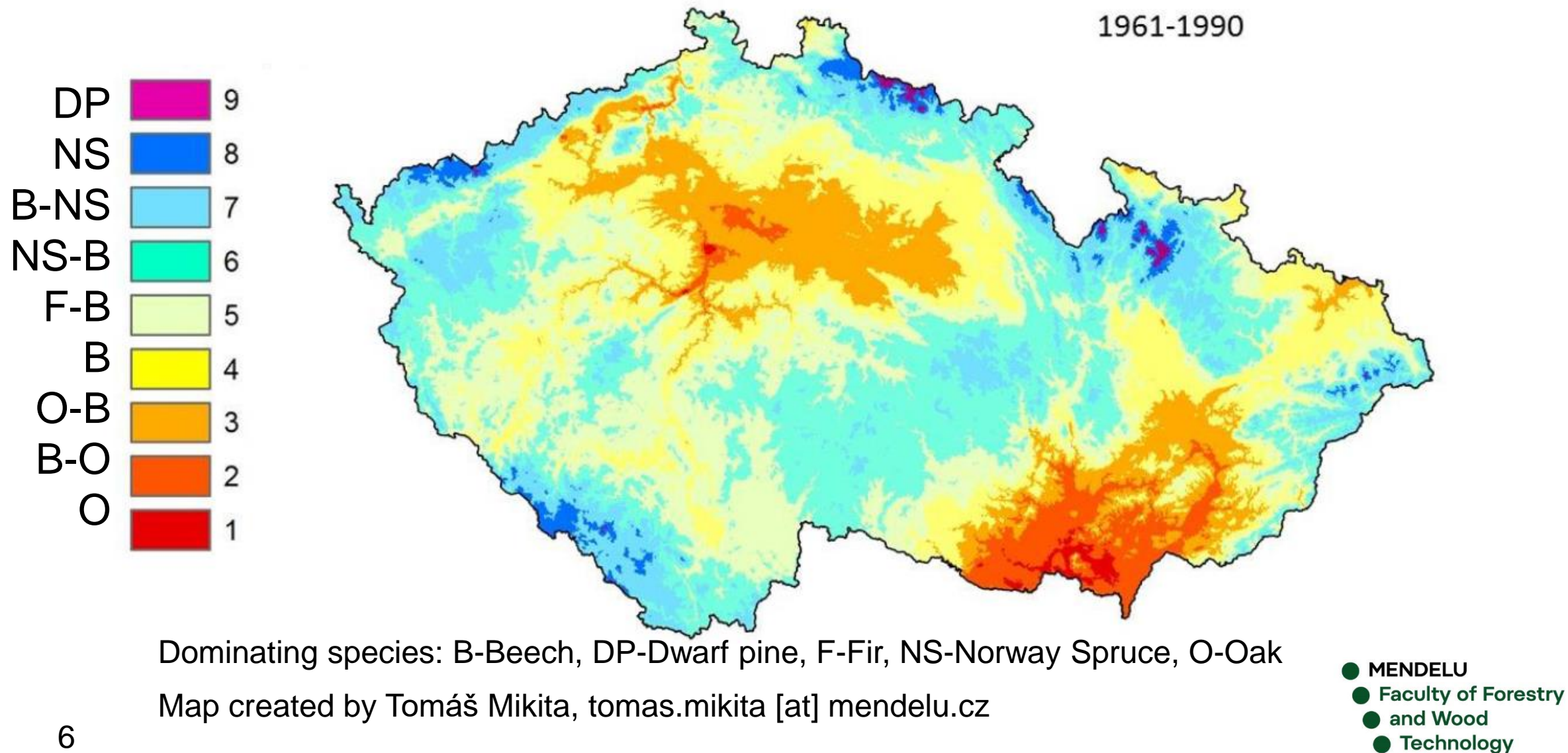
Involving molecular biology at cell
and population level, mathematical
modeling, remote sensing, artificial
intelligence, material engineering...

exporting know-how to developing
regions, expert advisor, forensic
expert institution

...

Forest vegetation zones

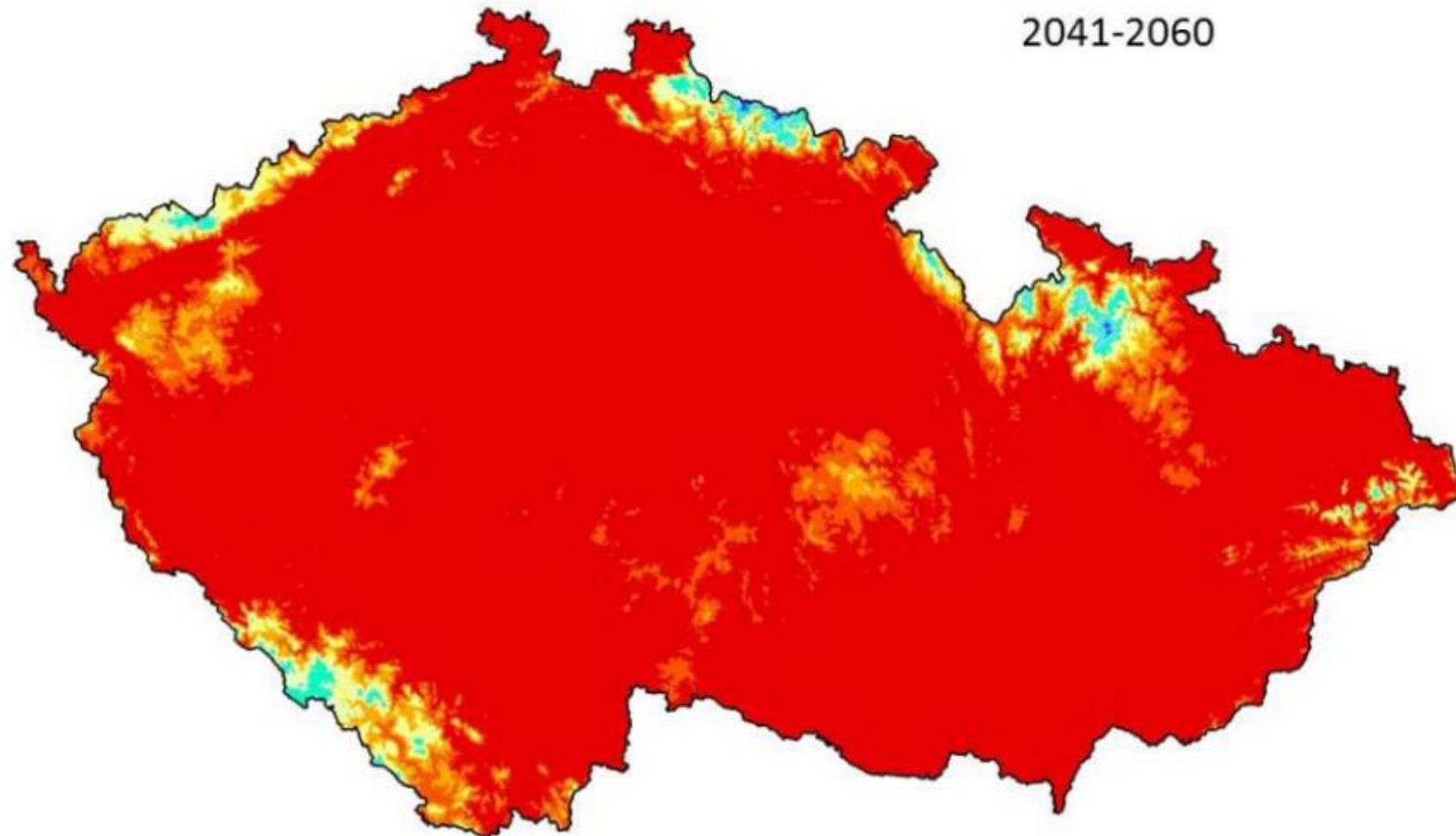
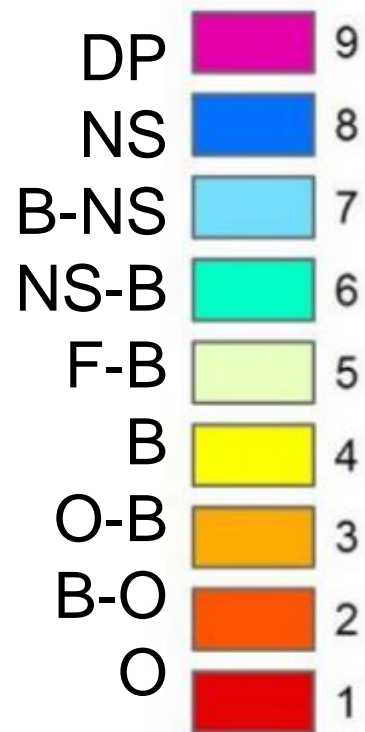
GCM –IPSL model



Forest vegetation zones

GCM –IPSL model

2041-2060



Dominating species: B-Beech, DP-Dwarf pine, F-Fir, NS-Norway Spruce, O-Oak

Map created by Tomáš Mikita, tomas.mikita [at] mendelu.cz

- MENDELU
- Faculty of Forestry
- and Wood
- Technology

Major research facilities

Phytophthora Research Centre

- Excellence research team focused on research of Phytophthora diseases
- Deeper understanding of factors affecting diversity, adaptation and hybridization processes
- Innovative technologies based on microbiology, bioinformatics, biology, ecophysiology, anatomy of plants and bioclimatology, evolutionary history of this genus and molecular mechanisms driving susceptibility and resistance
- Management and protection of European ecosystems
- <http://www.phytophthora.org/>
- Contact: Thomas Jung, thomas.jung [at] mendelu.cz



- Supported by the European Regional Development Fund
Phytophthora Research Centre Reg. No.
CZ.02.1.01/0.0/0.0/15_003/0000453



EUROPEAN UNION
European Structural and Investment Funds
Operational Programme Research,
Development and Education



Josef Ressel Research Centre in Útěchov

- Laboratories:
 - composite materials
 - protection and modification of wood
 - acoustics machining and mechanical properties of wood
 - thermal-humidity properties of materials
 - dendrochronology
 - anatomical structures of wood
 - bioanalytical laboratory
- Ccurrent research projects:
 - production of wood substitutes and composite boards
 - treatment of wood to improve its physical and mechanical properties
 - wood resistance to fungi and ageing
 - heat and moisture propagation in material whose simulations are used in the construction of wooden buildings
- Contact: [vladimir.gryc \[at\] mendelu.cz](mailto:vladimir.gryc@mendelu.cz)



Rájec – Němčice Research Facility

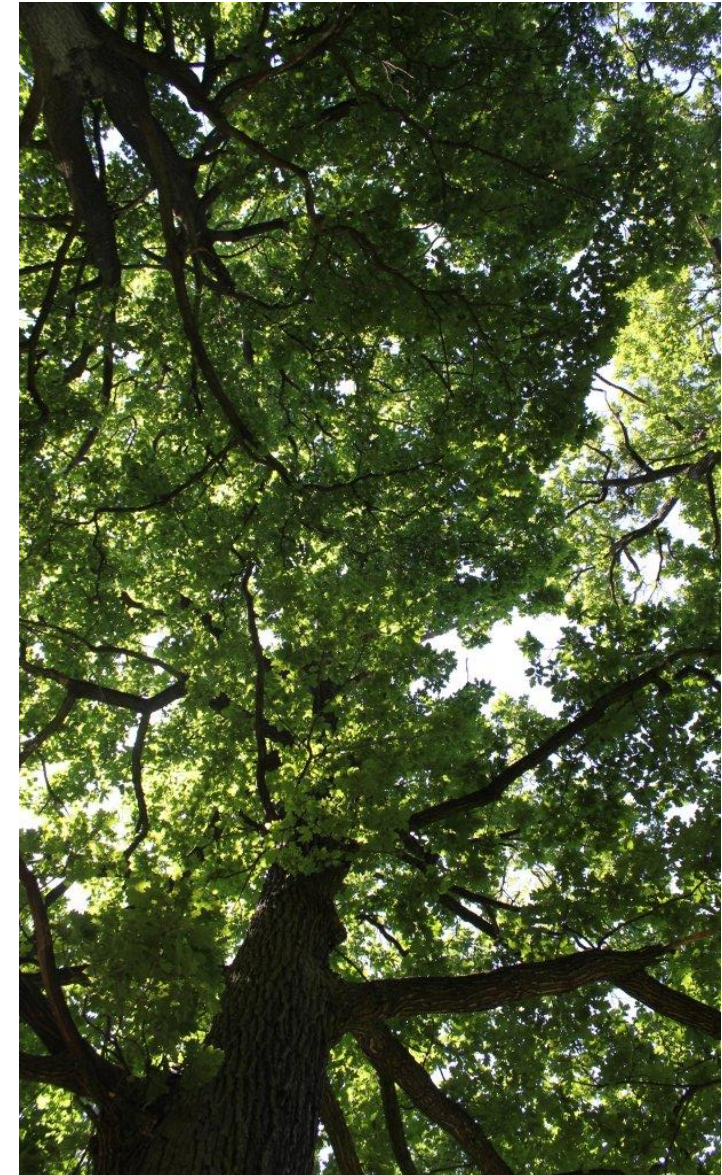
- Cooperation with CzechGlobe – Global Change Research Institute of the Czech Academy of Sciences
- Part of the international network of workplaces for long term ecological research ILTER (International Long Term Ecological Research)
- Part of the national research and development infrastructure for carbon monitoring in the Czech Republic – CzeCOS
- Long-term monitoring of energy and substance fluxes
- Researching physiological processes (photosynthesis, respiration and transpiration)
- Understanding the functioning of the spruce ecosystem as a whole and predicting its future behaviour in changing climate conditions
- Contact: Jan Světlík, [jan.svetlik \[at\] mendelu.cz](mailto:jan.svetlik@mendelu.cz)



Selected project portfolio

EXCELLENTIA - ERA-Chair: Striving for excellence in forest ecosystem research

- Aims to conduct research on
 - on climate-driven change in European forests
 - sustainability of their functions
 - methods to ensure forest stability in the following decades
 - tree predisposition to death.
 - effects of predicted future climatic scenario
- Create an excellent interdisciplinary research group engaged in Forest Ecosystem Research, under Professor Douglas L. Godbold of BOKU
- Conduct structural changes and transferring the FFWT to a modern institution
- Use the enormous potential of the University Forest Enterprise in Křtiny
- <https://excellencia.lfd.mendelu.cz/>
- Contact: Douglas L. Godbold, douglas.godbold [at] mendelu.cz
- Pavlína Pancová Šimková, pavlina.simkova [at] mendelu.cz



Adaption strategies in forestry under global climate change impact

- To strengthen research excellence in the highly demanding field of global climate change
- To create a robust research team covering whole value chain
- To team up for analyses of changes within the forest-wood value chain including higher appearance and use of the lesser-used tree/wood species (luWS)
- <https://asforclic.ldf.mendelu.cz/>
- Contact: Petr Čermák, petr.cermak.und [at] mendelu.cz



PURPEST - Plant pest prevention through technology-guided monitoring and site-specific control

- Aims to conduct research on
 - Identification of pest specific VOCs
 - Electronic noses with enhanced specificity and sensitivity
 - Functional coatings specific to pest VOCs
- Implementing sensor development into plant protection strategies
- Develop a user-friendly effective tool to detect pests during import and in the field
- Make tool available to plant health/import control professionals
- Stop import and spread of serious pests
- Policy change considering Pathogen biology, Plant ecology and stakeholder needs
- <https://cordis.europa.eu/project/id/101060634>
- Contact: Thomas Jung, thomas.jung [at] mendelu.cz



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement N°101060634.

Cross-border risk management in forestry in consequence of bark beetle calamity

- Harmonized and optimized system of adaptive forest management with target to minimize the risk at cross-border regions
- Cross-border development tools for specific management and risks control in forestry enterprises
- Good-practice examples with implemented an adaptive management and preparation of cross-border manual
- Contact: Radek Pokorný, radek.pokorny [at] mendelu.cz

- Funded by Interreg V-A Austria-Czech Republic
- ATCZ251



Forest functions in the past, present and future - what can society expect from forests under climate change?

- Ability of managed forests to provide ecosystem functions in future conditions characterized by higher drought and heatwaves occurrence – wood production and climate change mitigation in the CZ and Norway
- Potential for adaptation of important tree species
- Potential for silvicultural measures implementation
- Climate models for predictions (till 2050); remote sensing and validation of its outputs with detailed field measurements both in long-term research plots
- Contact: Jan Světlík, jan.svetlik [at] mendelu.cz

- Funded by EEA Grants
- <https://eeagrants.org/archive/2014-2021/projects/CZ-RESEARCH-0002>



Tree Dynamics: Understanding of Mechanical Response to Loading

- To develop experimentally validated complex physical model of tree dynamic response in frequency and time domain
- Relationships between detailed geometry, material and realistic loading and which allows description of influence of tree parameters on the response.
- ERC CZ
- Funded by the Ministry of Education, Youth and Science of the Czech Republic
- Contact: Jan Tippner, jan.tippner [at] mendelu.cz



Conservation of the endangered endemic *Boswellia* trees on Socotra Island (Yemen)

- Conserve the endemic *Boswellia* species on Socotra Island
- Knowledge on distribution and abundance of *Boswellia* species populations gained and their conservation status re-evaluated
- At least 5 forest nurseries, at least 2,000 newly produced *Boswellia* seedlings
- Conservation measures applied by local communities and agencies
- Contact: Petr Maděra, petr.madera [at] mendelu.cz

- Funded by Fondation Franklinia
- https://fraxinus.mendelu.cz/tropicalforestry/ceske_lesnictvi_ve_svete/jemen/conservation-of-the-endangered-endemic-boswellia-trees-on-socotra-island/



Platform of Vocational Excellence Water

- Ensure that VET is at the forefront of research and technological developments in the water sector
- Ensure that current and future water sector professionals have the work attitude, knowledge and competences that the rapid changing EU water industry demands
- Identify the existing and emerging labour market needs and enhance the responsiveness of initial and continuing VET systems to these needs
- Contact: Petr Kupec, petr.kupec [at] mendelu.cz
- <https://www.povewater.eu/>
- This project has been funded with support from the European Commission.
- Project number: n° 612632-EPP-1-NL-EPPKA2-SSA-P



University Forest Enterprise

Masarykův les Křtiny

University Forest Enterprise

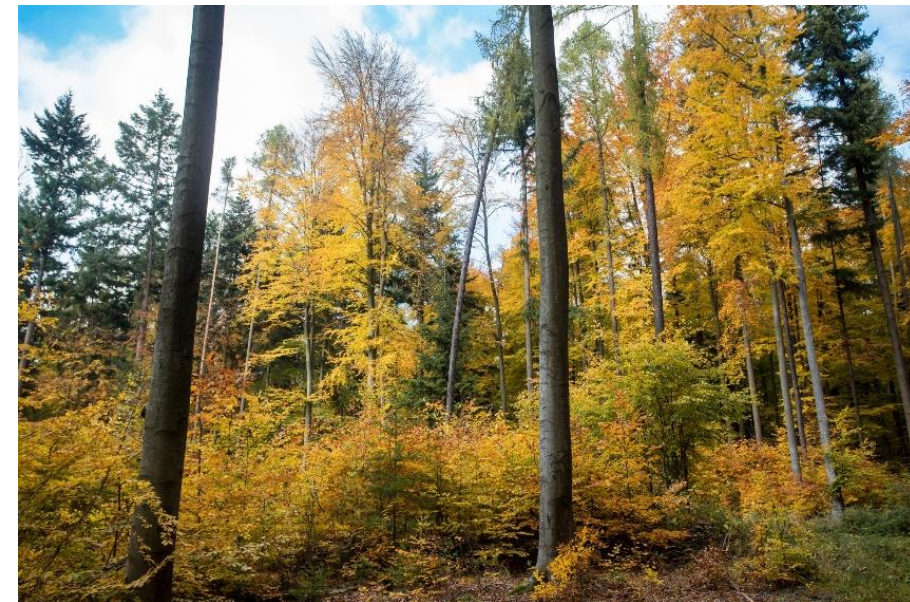
- Headquarter
- 3 forest units
- Nursery
- Sawmill
- Forest machinery developing
- Chateau Křtiny

- 3 forest arboretum – collection of 800 species from whole world, oldest est. 1928
- 60 meadows with exotic tree species
- 50 buildings with springs
- 90 memorials for important people in forestry
- 230 km of forest roads - cycleway and 880 km of walking paths



Forest management

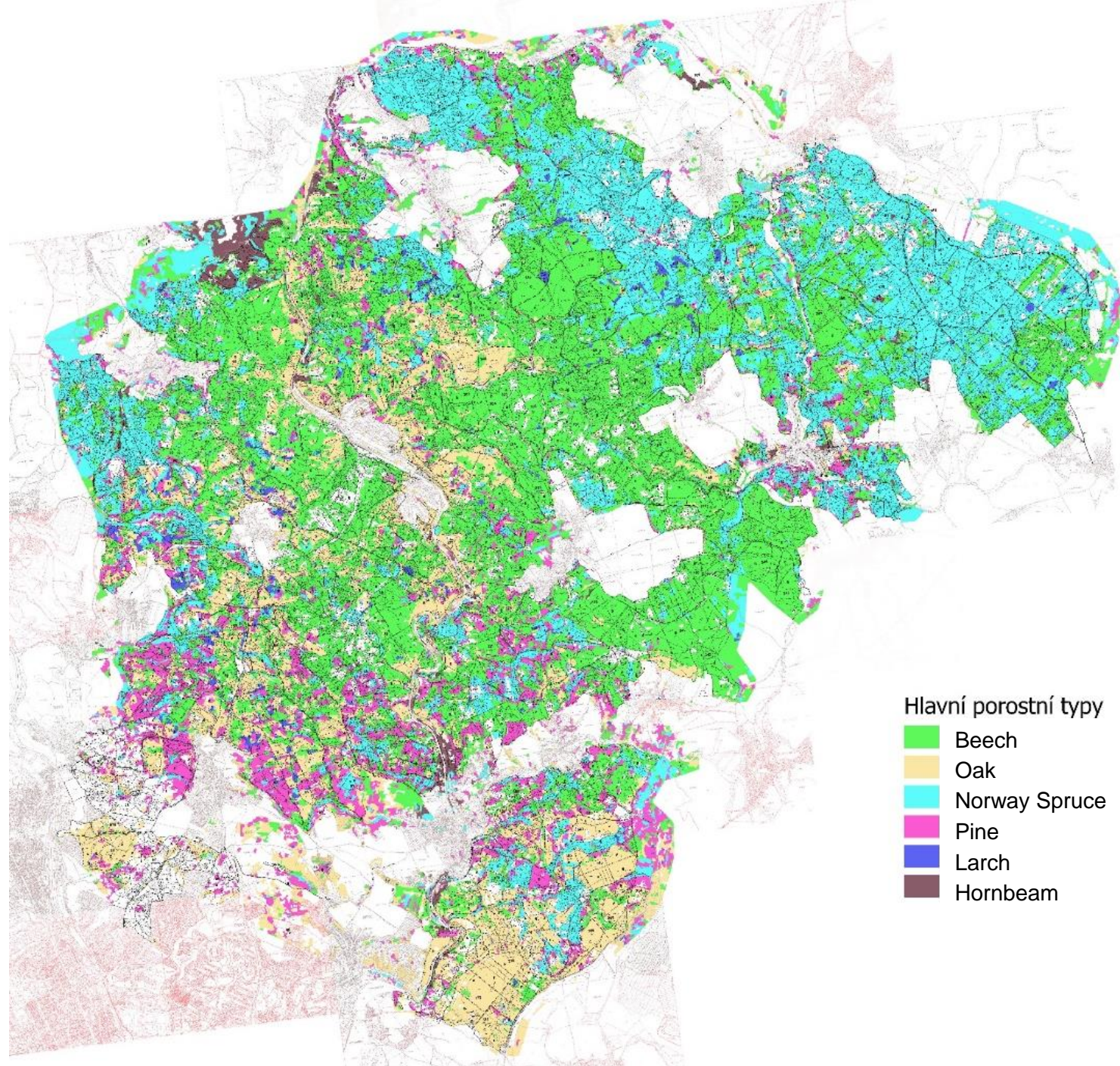
- 10.200 ha of forest area
- average rotation: 112 years, average regeneration period: 32 years
- Standing volume: 233 m³.ha⁻¹
- Harvesting volume: 74,900 m³/year
- Volume increment : 8.6 m³/ha 1 year
- 19 strict forest reserves (9 % of the forest area)
- FSC, PEFC certification



Forest composition

- Mixed forests

- Mainly mixed stands
- Conifers 40% (Norway spruce 15%, Scots pine 7%, larch 10% Douglas fir, etc.)
- Broadleaves 60% (European beech 36%, oaks 11%, hornbeam 6%, maples, ashes, etc.)



University Forest Enterprise

- „We create diversified forests for the climate change and future generations“
- Practical teaching and training in forestry
- Field laboratory for forestry research
- Sustainable multifunctional forestry management
- Organising workshops and excursions for foresters or public - forestry pedagogy for children and all generations
- Special focus on recreation function / forest aesthetics



International Networks

- International Union of Forest Research Organizations (IUFRO)
- European Forest Institute (EFI)
- Forest Stewardship Council (FSC)
- InnovaWood Network
- International Association for Landscape Ecology (IALE)
- International Forestry Students' Association (IFSA)
- ProSilva

