



Universität für Bodenkultur Wien  
University of Natural Resources  
and Life Sciences, Vienna

# Research and Education in Forest Science

## Universität für Bodenkultur Wien (BOKU)

University of Natural Resources and Life Sciences, Vienna

Introduction - Msc European Forestry  
20th of January 2022

Harald Vacik  
Department of Forest and Soil Sciences  
Institute of Silviculture

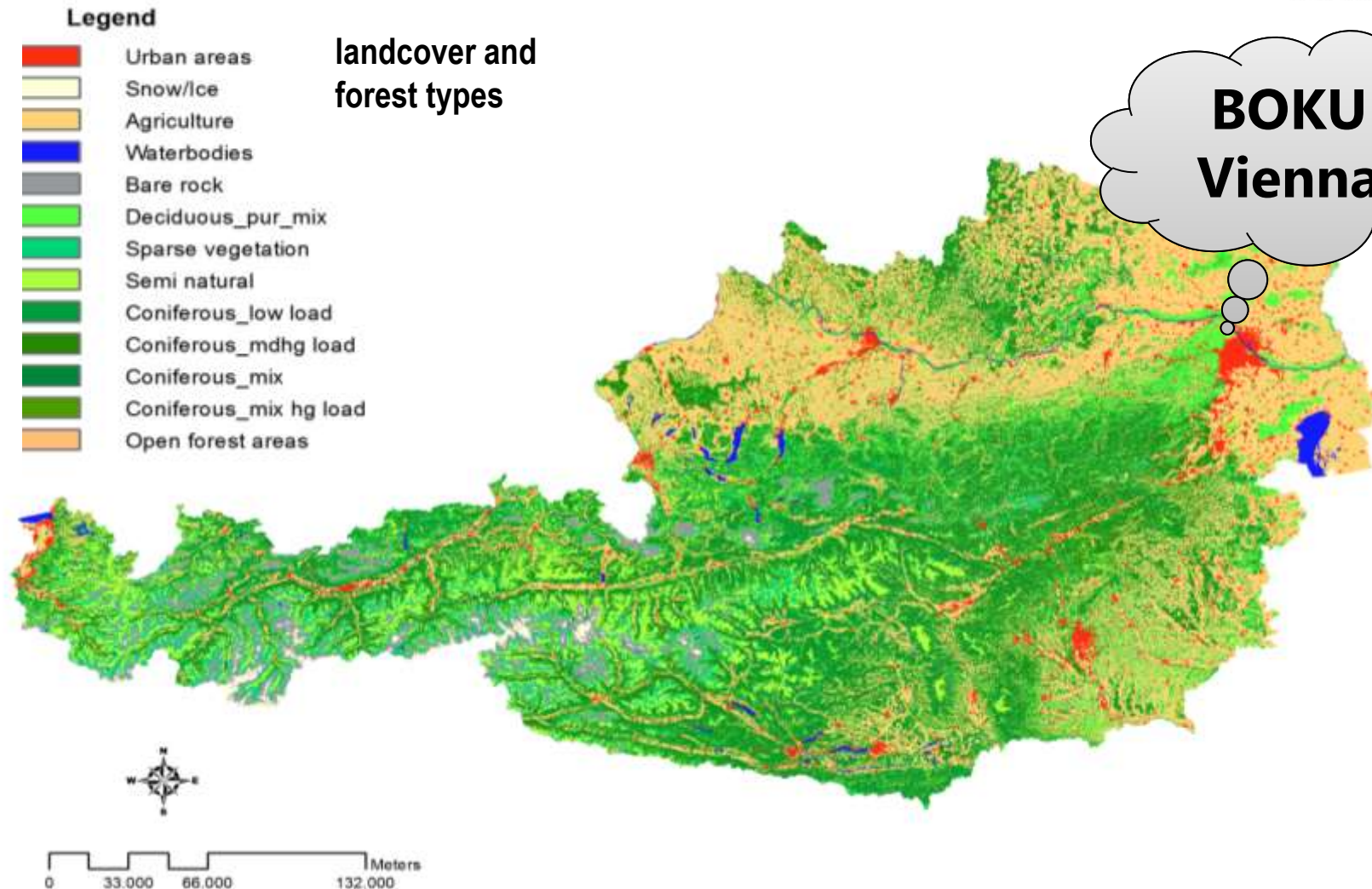




Foto: SPÖRK



# Austria – Vienna

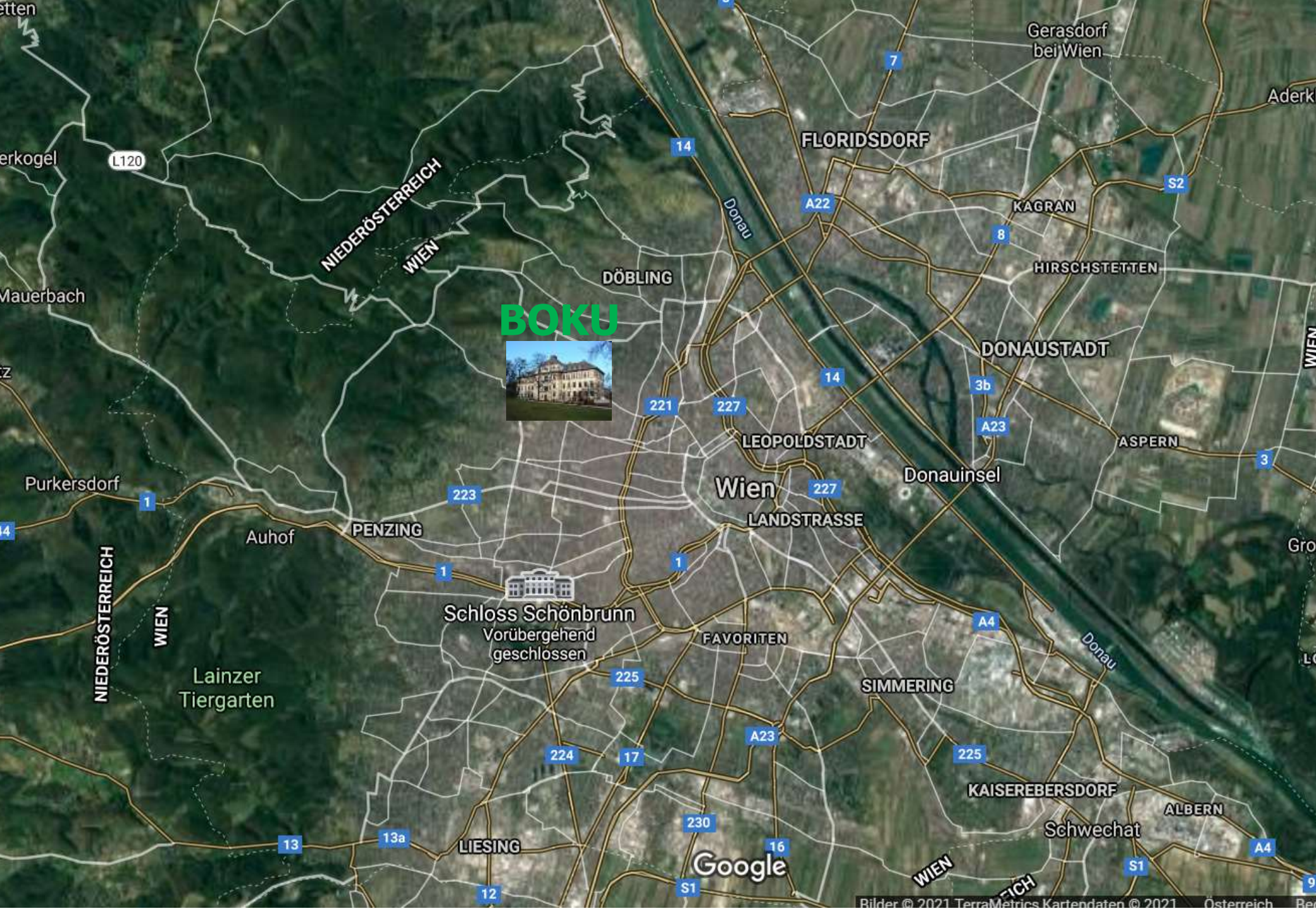




# European Beach forest in the Vienna Woods (Wienerwald)







**BOKU**



Schloss Schönbrunn  
Vorübergehend geschlossen

Google



# Universität für **B**oden**K**ultur (BOKU)



# BOKU – themes and competences



Soil and terrestrial  
ecosystems

Water –  
Atmosphere –  
Environment



Living space and  
landscape



Resources and  
societal dynamics

Development of  
the living space

Management  
natural  
resources



Renewable raw  
materials, resources  
oriented technologies

Securing nutrition  
and health

Nano sciences and  
technology



Biotechnology

Food – nutrition –  
health

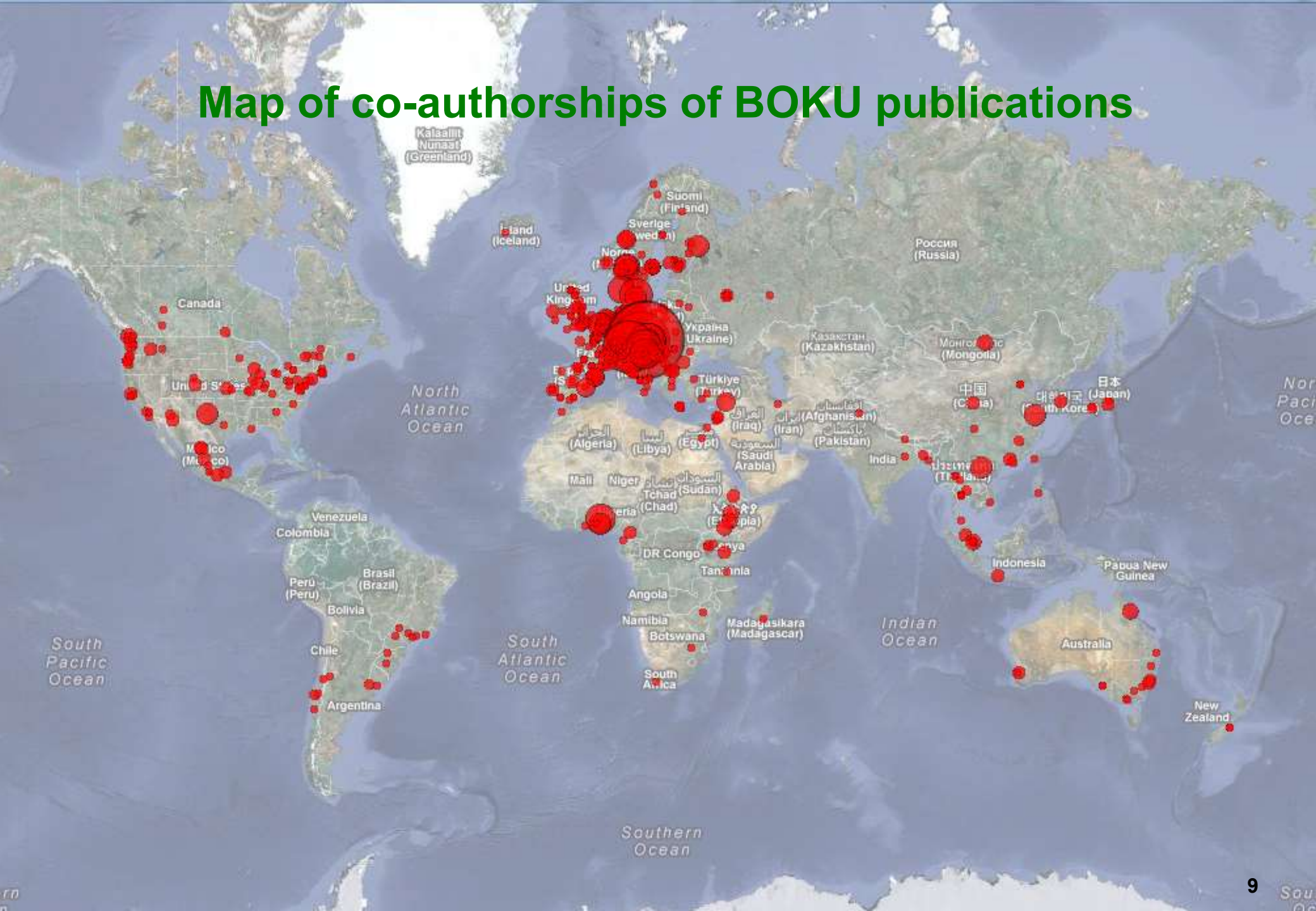


# BOKU – University of Natural Resources and Life Sciences Vienna – Facts and figures

- Founded in 1872
- ~ **12.000 students** in 8 Bachelor, 26 Master (+ several double degree programmes; 11 Master programs in English) and several PhD programs (~ 800 students); **1550 graduates** per year; students satisfaction: top ranked in Austria; 20% foreign students; Greenmetric University ranking: no. 8 world wide, 2 in education; QS World University Ranking by Subject: Rank 33
- ~ 1600 employees (full time equivalent), **2550 employees** (head count); ~700 scientists employed on a project basis; ~ 74 full professors (1/3 non Austrians), ~ 130 Assoc. Profs
- ~ **700 ongoing projects**, ~ 100 EU projects, ~ 110 FWF projects, participation in several excellence projects (FWF, COMET, Christian Doppler, Laura Bassi, WWTF, Marie Curie,...)
- ~ 100 Mio € GUF, **42 Mio € external resources** (projects; basis 2013)
- ~ **2500 scientific publications** per year (~ 690 SCI), ~ 1400 presentations per year
- Organized in 15 departments



# Map of co-authorships of BOKU publications



# Sites of BOKU

- Türkenschanze / Gregor Mendel Straße
- BOKU Site Muthgasse
- BOKU Site Tulln
- „Fourth Site“ – Research farms and forests
  - Research Farm Groß-Enzersdorf
  - Landscape planning research Essling
  - Horticulture Research Jedlersdorf
  - Forest Nursery and Arboretum Knödelhütte
  - Research Forest Heuberg
  - Water Cluster Lunz



# Site Türkenschanze



Universität für Bodenkultur Wien  
University of Natural Resources  
and Life Sciences, Vienna



# Research farms and forests

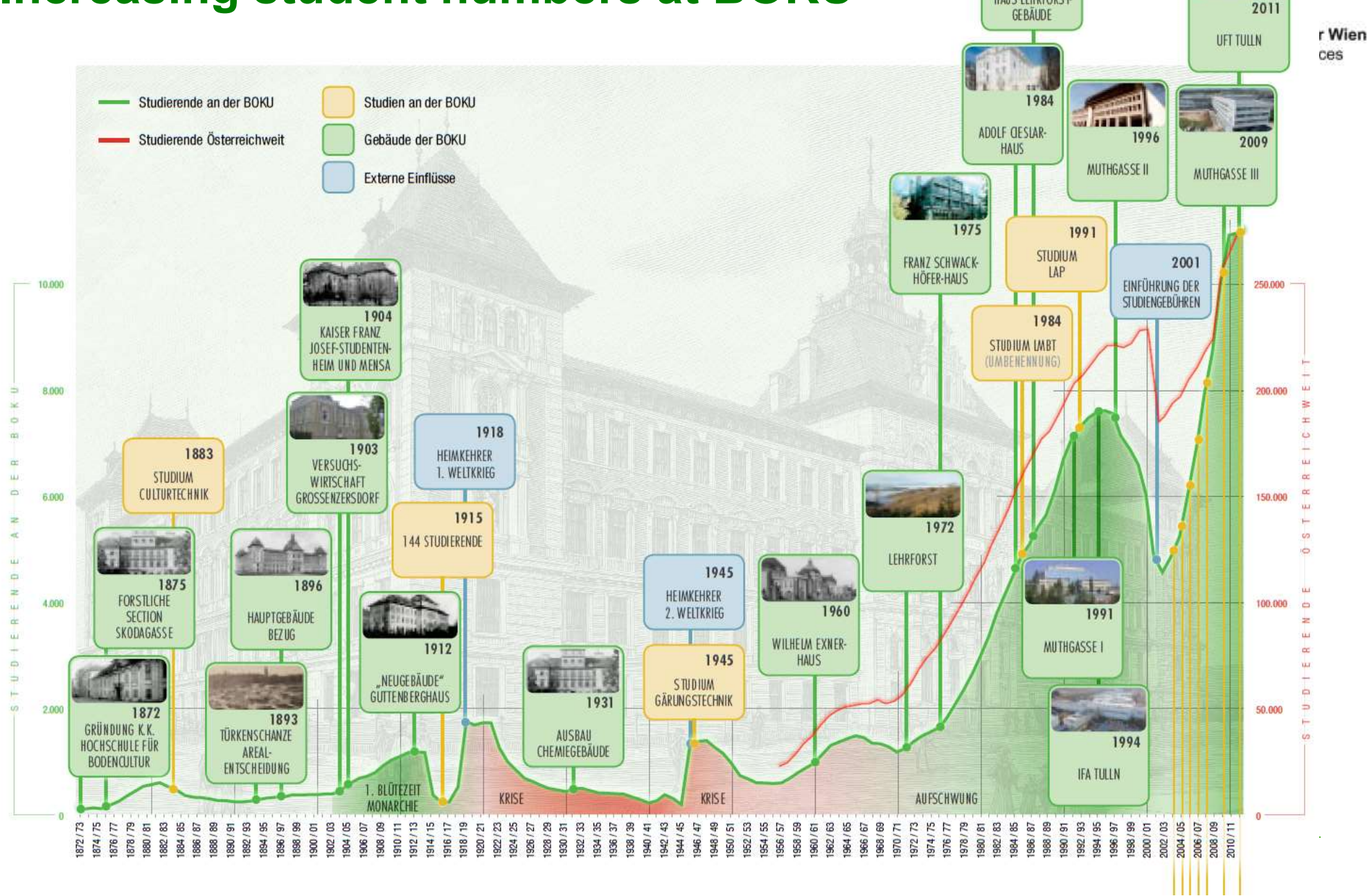


Universität für Bodenkultur Wien  
University of Natural Resources  
and Life Sciences, Vienna





# Increasing student numbers at BOKU



# BOKU - international master programs

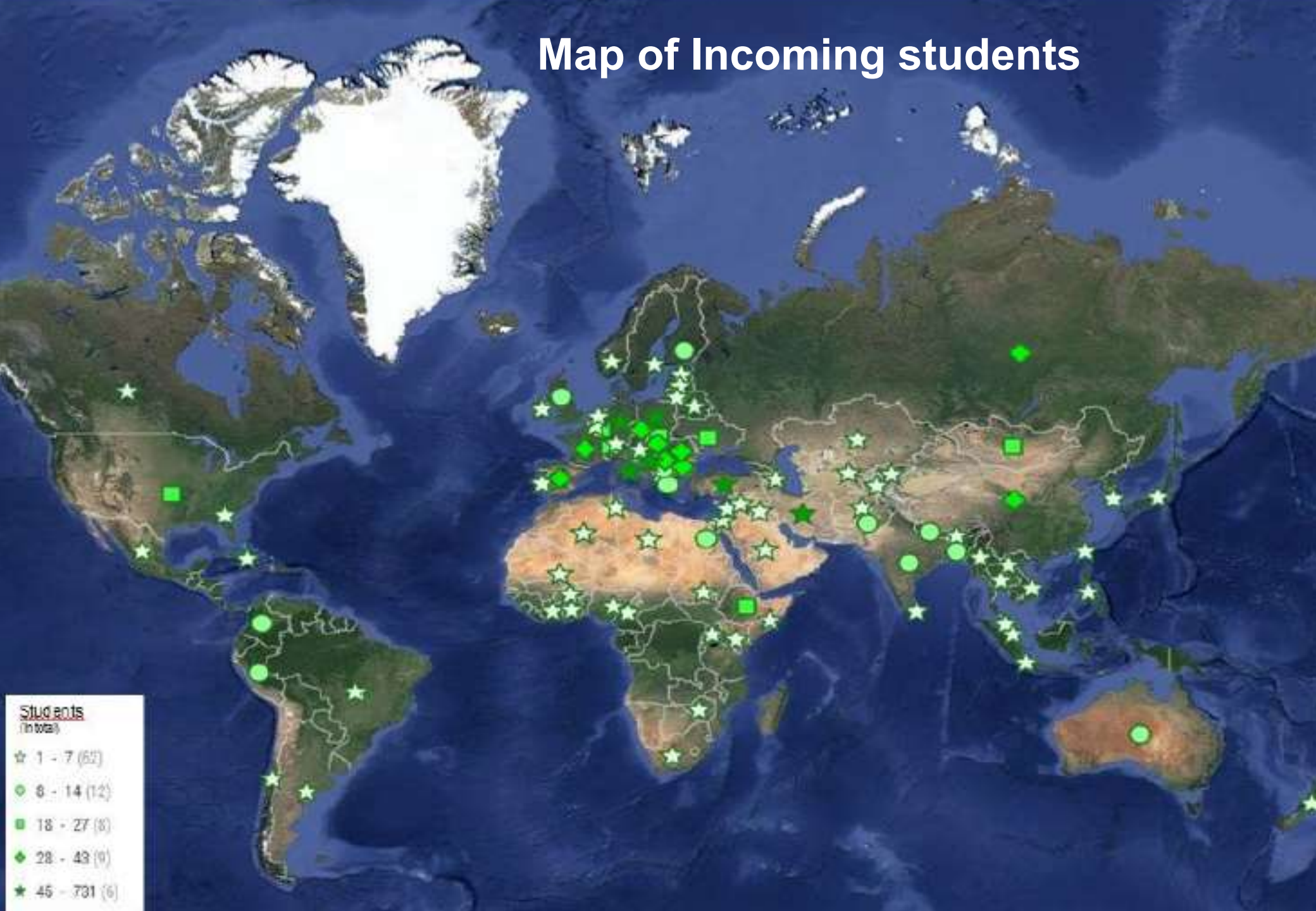
Further information : [www.boku4you.at](http://www.boku4you.at)

- Animal Breeding and Genetics
- Applied Limnology – Wetland Management
- Environmental Sciences – Soil, Water and Biodiversity
- **European Forestry**
- Horticultural Sciences
- Material and thermal utilization of renewable raw materials (German)
- **Mountain Forestry**
- **Natural Resources Management and Ecological Engineering**
- Organic Agricultural Systems and Agroecology
- Safety in the Food Chain
- Sustainability in Agriculture, Food Production, Food Technology in Danube R.
- Viticulture, Oenology and Wine Economy (in German)
- Water Management and Environmental Engineering





# Map of Incoming students





# Excursion and joint Field Camp I & Field Camp III

**28 participants**

**5 continents:** Africa, Asia, Europe, North America, Oceania

**16 countries:** Bangladesh, Belgium, Bhutan, Canada, China (incl. Hongkong), Ethiopia, France, Germany, India, Nepal, New Zealand, Pakistan, Rumania, Spain, Tanzania, USA





## Master programs related to forestry at BOKU

- provide a focused education in managing **mountain forest resources** with a global perspective
- teach students to **recognise and solve problems** in mountain forest management and conservation
- Focus on timber production within **multifunctional management**
- **integration** of engineering, socio-economics and natural sciences
- strengthen **interdisciplinary** approaches in forestry

# Learning Outcomes of Mountain Forestry

- able to describe **ecological characteristics** of mountain forest ecosystems and identify site specific limiting ecological factors
- describe natural dynamics and identify the ecological **effects of management strategies** on mountain forest ecosystems based on these specific characteristics
- able to characterize the **role of specific social and economical settings** of sustainable natural resource management of mountain regions
- able to **apply scientific methods including participatory approaches** for analyzing social and economical characteristics of mountain regions
- recognize the **role of multiple stakeholder interests** for management of mountain forests and are able to integrate these into management strategies which they develop and / or implement.
- able to identify, **develop and implement suitable methods for resource inventories** and monitoring, thereby ensuring sustainability of resource use in forests
- able to identify, develop and implement adapted and **appropriate technological methods for sustainable management** of mountain forests.
- able to **integrate ecological, socio-economical characteristics** of mountain regions
- analyse interactions between these factors and **derive management strategies for sustainable provision of multiple ecosystem services**.



# Selected courses in MSc EF study tracks

<b>Decision support systems for resource management</b>	Remote sensing and GIS in natural resource management	3	Autumn 2022
	Decision support systems	3	Autumn 2022
	Multiple criteria decision making in natural resource management	3	Autumn 2022
<b>Resource management for ecosystem services</b>	Natural resource management in mountain forests I, III	4+2	Spring 2023
	Agroforestry in mountain regions	2	Spring 2023
	Biodiversity and conservation of mountain forests	2	Spring 2023
	Natural resources management in mountainous areas III - wildlife problems	2	Spring 2023
<b>Spatial and ecological modelling</b>	Modelling of mountain forest ecosystems	2.5	Autumn 2022
	Adapting forest management to climate change	2	Autumn 2022
<b>Resource economics and policy</b>	Forest resource economics	4.5	Autumn 2022
	Innovations for sustainable forest management	4	Autumn 2022
	Mountain forest policy	4.5	Autumn 2022
<b>Silviculture and engineering</b>	Harvesting systems for mountainous regions	2	Autumn 2022
	Cable yarding project	1.5	Autumn 2022
	Road network planning	3	Spring 2023
	Field camp III - integrated forest management applications	3	Autumn 2022

# Selected courses of Msc Mountain Forestry program

<b>Introduction to mountain forestry and scientific skills</b>	<b>Field Camp I - Introduction to mountain forestry and forest sciences (2)</b> Methods of data collection, management and analysis (2)
<b>Ecology of Mountain Forests</b>	<b>Mountain forest dynamics and fire ecology (3)</b> <b>Mountain forest soils and forest nutrition (2,5)</b> Field Camp II -Concepts and methods of site ecology, forest growth and yield (3) Mountain forest climatology and headwater hydrology (2,5) <i>Biodiversity and conservation of mountain forests (2)</i> <i>Air pollution effects on forest ecosystems (3)</i> <i>Chemistry for forestry (1)</i> <i>Specific methods on soil analysis (1)</i> <i>Physical and selected chemical methods of soil analysis (4,5)</i> <i>Forest and water (3)</i>
<b>Economic and social dimensions in mountain forestry</b>	Forest resource economics (4,5) Mountain forest policy (4,5) <b>Participatory methods in development research and practice (3)</b> <b>Project management in development co-operation (2)</b> <i>Economics of multiple use forestry (1,5)</i> <i>Innovations for Sustainable Forest Management (4)</i> <i>Applied development research I (3)</i> <i>Applied development research II (3)</i> <i>Organisational behaviour and gender issues (3)</i> <i>Forest products, marketing and strategy (3)</i>



# Free selection of courses from modules of Msc Mountain Forestry program

<b>Inventory and Monitoring</b>	<p>Forest inventory (3)</p> <p>Modelling of mountain forest ecosystems (2,5)</p> <p>Remote sensing and GIS in natural resource management UE (3)</p> <p><i>Remote sensing and GIS in natural resource management VO (3)</i></p> <p><i>3P – Sampling (2)</i></p>
<b>Forest Management for goods and environmental services</b>	<p><b>Natural resource management in mountain forests (4)</b></p> <p><b>Agro forestry in mountain regions (2)</b></p> <p>The role of forests in mountain risk engineering (2)</p> <p>Forest protection (2)</p> <p><i>Protection and mitigation measures against natural hazards (3)</i></p> <p><i>Risk management and vulnerability assessment (3)</i></p> <p><i>Mountain hazard processes (6)</i></p> <p><i>Decision support systems (3)</i></p> <p><i>Multiple criteria decision making in natural resource management (3)</i></p> <p><i>Fire management in mountain forest ecosystems (2)</i></p> <p><i>Adapting forest management to climate change (2)</i></p> <p><i>Natural resources management in mountainous areas III -Wildlife problems (2)</i></p>
<b>Forest Engineering</b>	<p><b>Harvesting systems for mountainous regions (2)</b></p> <p>Field Camp III – Integrated forest management applications (3)</p> <p>Road network planning (3)</p> <p><b>Cable yarding project (1.5)</b></p> <p><i>Technology assessment (3)</i></p> <p><i>CAD - Computer aided design (1)</i></p> <p><i>Timber harvesting (1)</i></p>

# Department of Forest- and Soil Sciences

Research and scientific education in (forest-) ecosystems analysis, ecosystem modeling and management, soil use and soil protection organized by:

- Institute of Soil Science
- Institute of Forest Ecology
- Institute of Silviculture
- Institute of Forest Growth and Yield Research
- Institute of Forest Engineering
- Institute of Forest Entomology, Forest Pathology and Forest Protection
- Forest Experimental and Training Centre





# Potential fields of research

## e.g. for conducting a master thesis

- Silvicultural techniques and management of mountain forests
- Evaluating Sustainable Forest Management approaches and Harvesting techniques
- Forest Ecosystem Modeling
- Multi Criteria Decision Making and Decision Support Systems
- Biodiversity and Forest Genetics
- Forest Ecology and natural dynamics of forest ecosystems
- Forest Policy Analysis (EFI – FPNR)
- Forest Genetic and general Soil Lab
- More then 180 experimental sites
- Experimental garden and Tree Nursery “Knödelhütte”



# Research in natural reserves to understand forest dynamics and maintain biodiversity



## Legende

Wuchsgebiete

## Größenklassen

- <20 ha
- 20-50 ha
- 50-100 ha
- >100 ha

Untersuchte  
Naturwaldreservate



M. Kürsten, 2014  
NWR Stoissen

M. Kasseroler, 2011  
NWR Krimpenbachkessel

M. Rahman, 2007  
NWR Lange Leiten

S. Tschann, 2014  
NWR Saminatal

M. Götze, 2013  
NWR Hutterwald

H. Ruprecht, 2014  
ELENA

S. Becker, 2014  
NWR Dürrwald

M.B. Winter, 2009  
NWR Goldeck



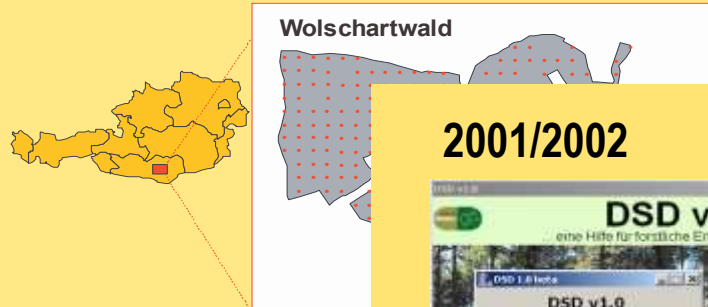


# Forest management planning and decision support systems

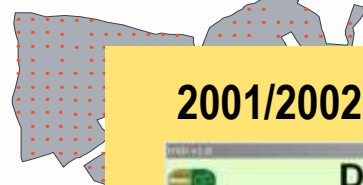


Universität für Bodenkultur Wien  
University of Natural Resources  
and Life Sciences, Vienna

1998



Wolschartwald

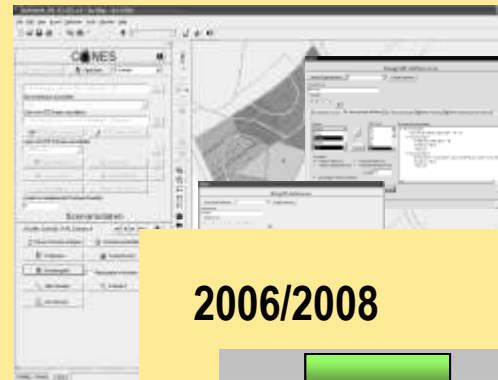


2001/2002



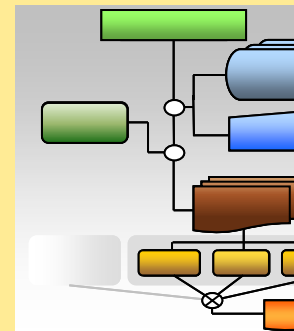
Decision Support Dobrova  
DSD v1.0 – scots pine forests

2002/2005



CONE  
timber h  
in steep

2006/2008



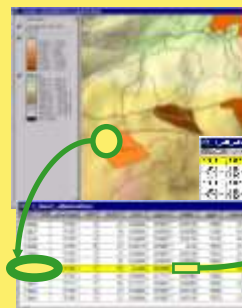
ClimChalp  
Adaption of forest management  
for coniferous forests under  
climate change

2010/2015



AFM - Toolbox  
Adaptive forest management  
under climate change

1999



SDSS Wildal

Regeneration planning for a  
sustained water yield

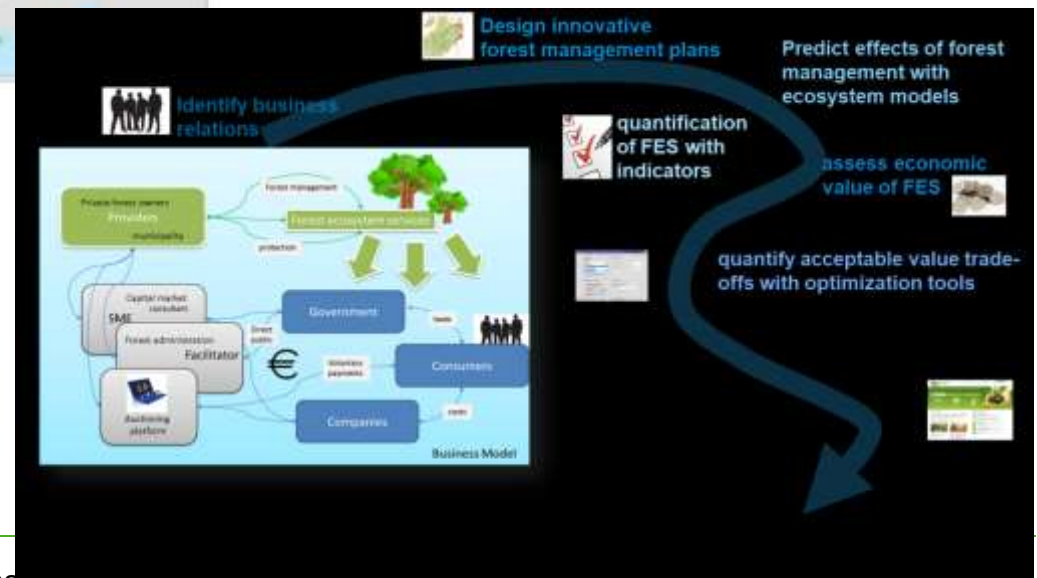
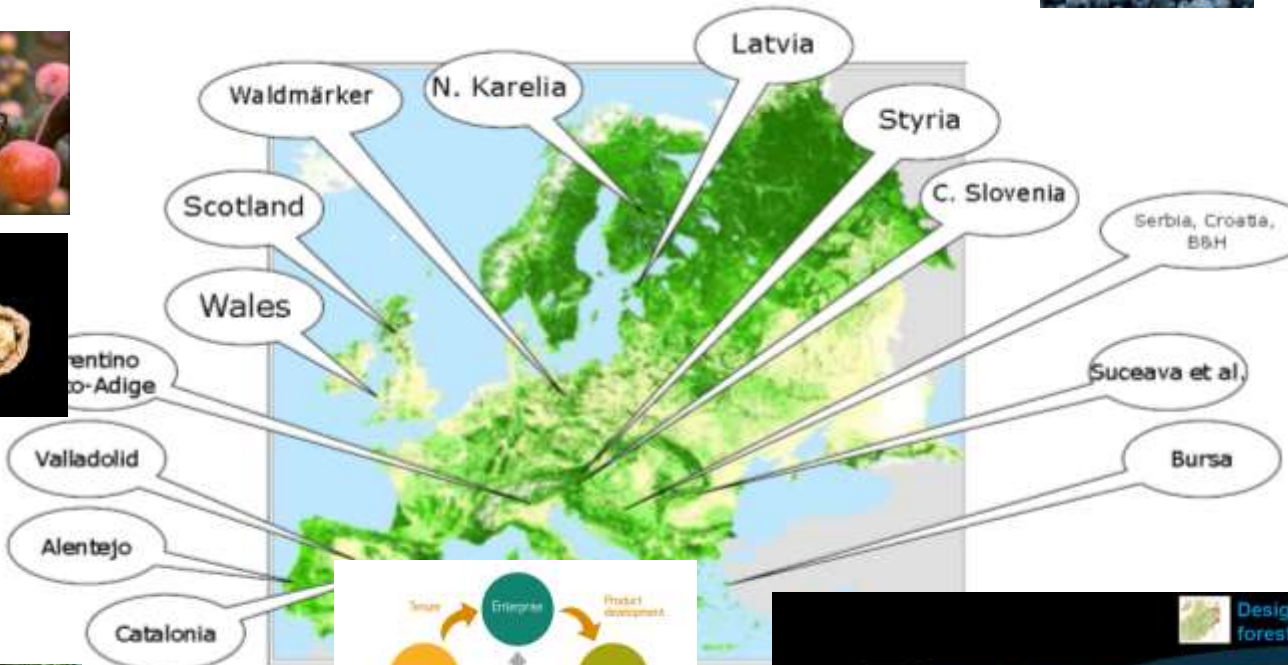
Deci  
Conv

# Sustainable Forest Management

## Non Wood Forest Products and Ecosystem Services

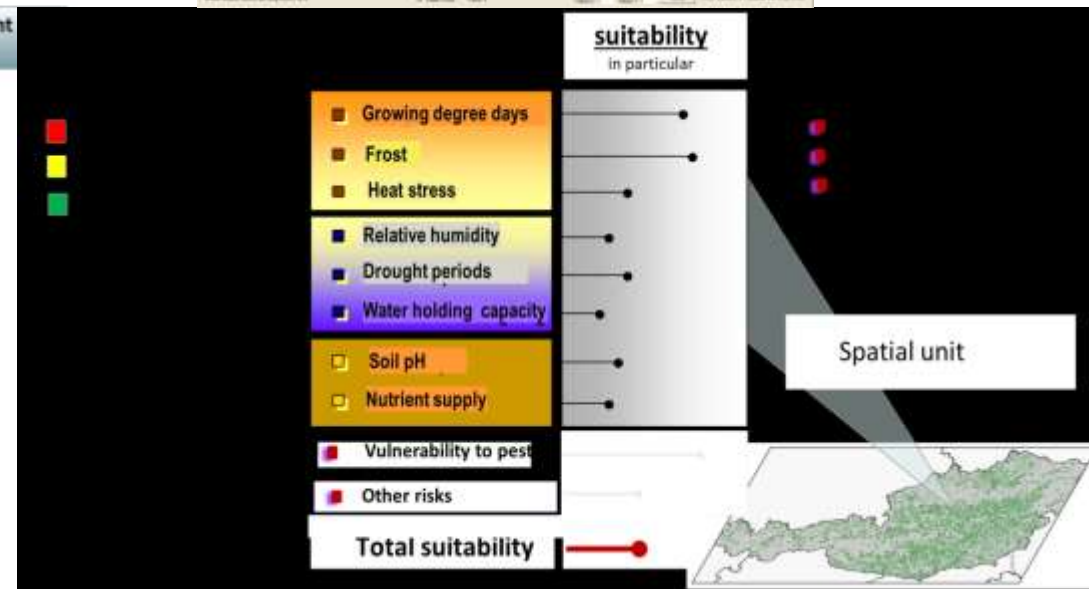
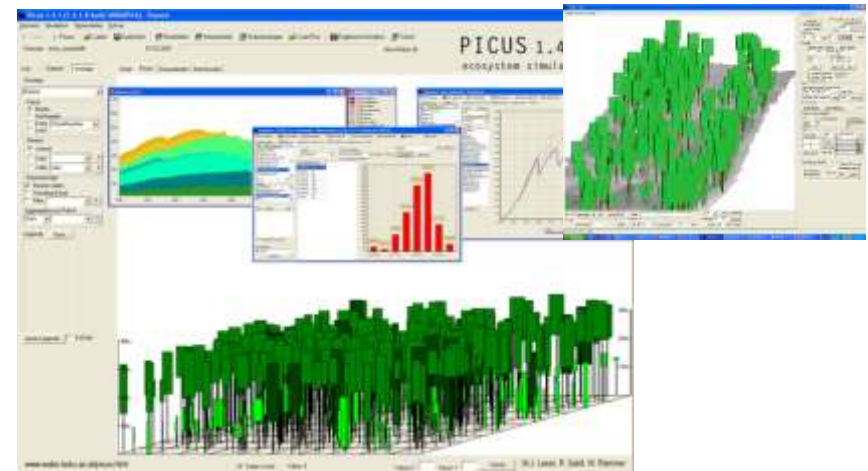
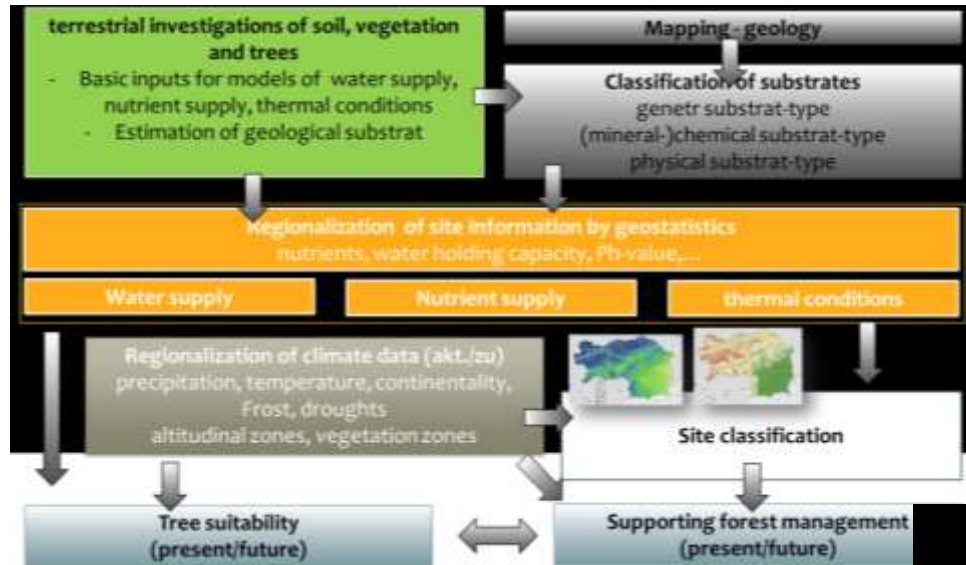


Universität für Bodenkultur Wien  
University of Natural Resources  
and Life Sciences, Vienna





# Forest site classification and tree species suitability under climate change



# Forest Fire Research in mountain ecosystems

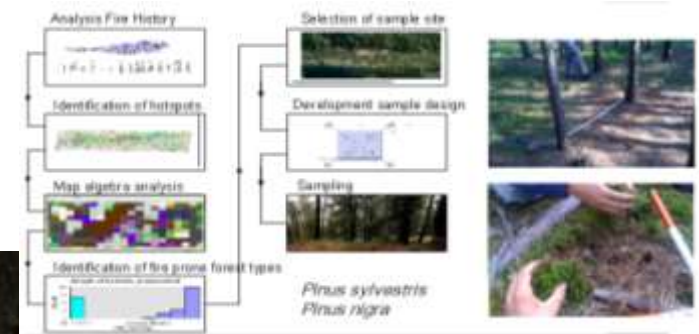


Universität für Bodenkultur Wien  
University of Natural Resources  
and Life Sciences, Vienna

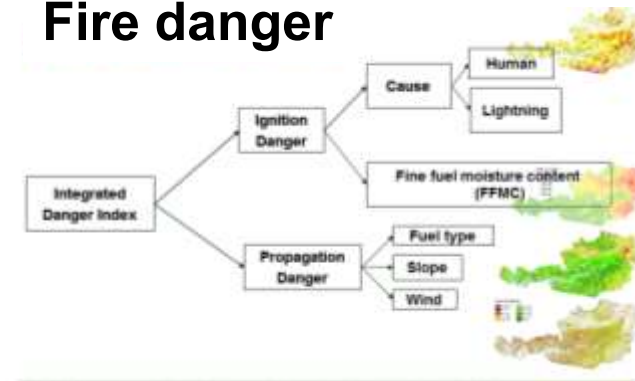
## Wildfire database



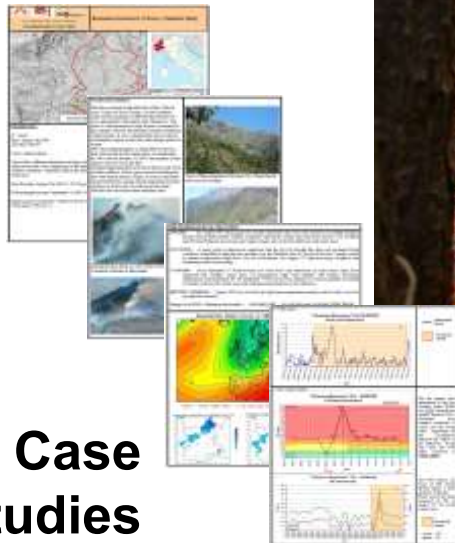
## Fuel models



## Fire danger



## Case studies





## Some master thesis topics of last years

Hoang, T.T. (2021): Analysis of the **stakeholder perceptions** and trends of forest fire occurrence in the Alpine region.

Nazari, M. (2020): Identifying successful mechanisms for the implementation of payment for **ecosystem services**

Yosef, A. B.(2019): **Growth assessment of tree species** growing in the Amhara region in Ethiopia

Delazari Deniz L. (2017): Modelling time and fuel usage in **timber transport** in mountain forestry.

Silva Andrade M. (2017): Evaluation of **drought effects** on radial stem growth of Norway spruce and Scots pine in Tyrol.

Tariyal G. (2017): Building **resilient livelihoods** towards biotic and abiotic disturbance factors in Bhutan – A community based adaptation to global change.

Ohler C. (2017) Cooperation or conflict? An analysis of global **forest governance**.

Vejnovic V. (2016) Analysis of the readiness of Serbia to effectively comply with and implement the **European Timber Regulation** (EUTR).

Yang L. (2015) Influence on nitrogen nutrition form and drought cycles on the **fine root respiration** of two tree species

# City of Vienna





# Tourist attractions (i)



**City Hall**



**Parliament**



**Burgtheater**

**Hofburg**



**State Opera**

## Tourist attractions (ii)



**St. Charles's Church**



**Belvedere Palace**



**St. Stephen's Cathedral**



**Schönbrunn Palace**



**Giant Wheel**



# Traditional food

- Wiener Schnitzel
- Tafelspitz
- Apfelstrudel
- sweet pancakes
- Sachertorte
- ...and many more ;-)



## Any other issues



- Semester starts in October
- Welcome days offered by BOKU
- Introductory Field Camp allows to get to know other intern. students
- Offer of german language courses by CIR
- FIS – research database allows to finding a supervisor for master thesis topic – please contact me <https://forschung.boku.ac.at/>
- Networking with IFSA student association <https://www.oehboku.at/oeh-boku-international-network/ifsa.html>
- Support by OEAD housing services for finding a living place, more difficult to find private rooms/flats (monthly rents 350 - 450) <https://www.oeadstudenthousing.at/en/>
- meals offered at mensa BOKU (new wooden building)
- good infrastructure regarding public transport in the city



# Center for International Relations (CIR)



find all information  
regarding VISA,  
insurances, Vienna,  
logistics online



**Welcome days for  
international students**

contact point for international students  
from MSc European Forestry programm  
Katrin Hasenhündl  
[katrin.hasenhuendl@boku.ac.at](mailto:katrin.hasenhuendl@boku.ac.at)

<http://www.boku.ac.at/en/themen-fuer-studierende/internationales/international-students-coming-to-boku/>

# Thanks for your attention!

**Institute of Silviculture  
Department of Forest and Soil Sciences  
University of Natural Resources and Life Sciences, Vienna**

**Ao.Univ.Prof DI. Dr. MAS (GIS) Harald Vacik  
Programmcoordinator of MSc European Forestry at BOKU**

**Peter Jordanstr. 82, A-1190 Wien  
Tel.: +43 1 47654-91312  
E-mail: [harald.vacik@boku.ac.at](mailto:harald.vacik@boku.ac.at)  
Web: [waldbau.boku.ac.at](http://waldbau.boku.ac.at)**

