



UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvenoot • your knowledge partner

Advisory Meeting

Department of Forest and Wood Science

Research Overview 2016



Faculty of AgriSciences



Agenda



Time slot	Topic	Person
08.30 – 09.00	Registration	
09.00 – 09.30	Welcome and overview	Pierre Ackerman & Danie Brink
09.30 – 09.45	Academic offering	Cori Ham
09.45 – 10.10	Silviculture	Ben du Toit
10.10 – 10.35	Coffee/Tea break	
10.35 – 11.00	Forest growth and yield	David Drew
11.00 – 11.25	Forest economics	Cori Ham
11.25 – 11.50	Tree improvement	Hannel Ham
11.50– 12.15	Forest engineering	Pierre Ackerman
12.15 - 13.30	Lunch	
13.30 –13.55	Wood mechanics and processing	Brand Wessels
13.55 –14.20	Wood physics	Martina Meincken
14.20 –14.45	Wood chemistry & composite products	Luvuyo Tyhoda
14.45 –	Discussion and wrap-up	Pierre Ackerman



Objective



- Share current and future research initiatives
- Explore initiatives and identify possible synergies between our research and that of industry
- Investigate collaboration opportunities along the value chain



Faculty of AgriSciences



1. Agricultural Economics
2. Agronomy
3. Animal Science
4. Conservation Ecology and Entomology
5. Food Science
- 6. Forest and Wood Science**
7. Genetics and the Institute for Plant Biotechnology
8. Horticultural Science
9. Plant Pathology
10. Soil Science
11. Viticulture and Oenology, Institute for Wine Biotechnology and the Institute for Grape and Wine Sciences

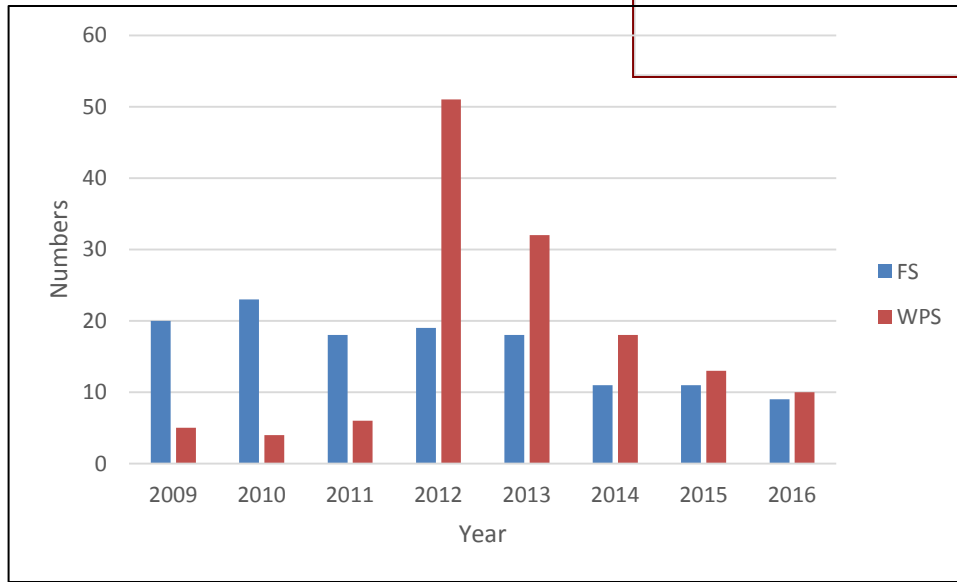
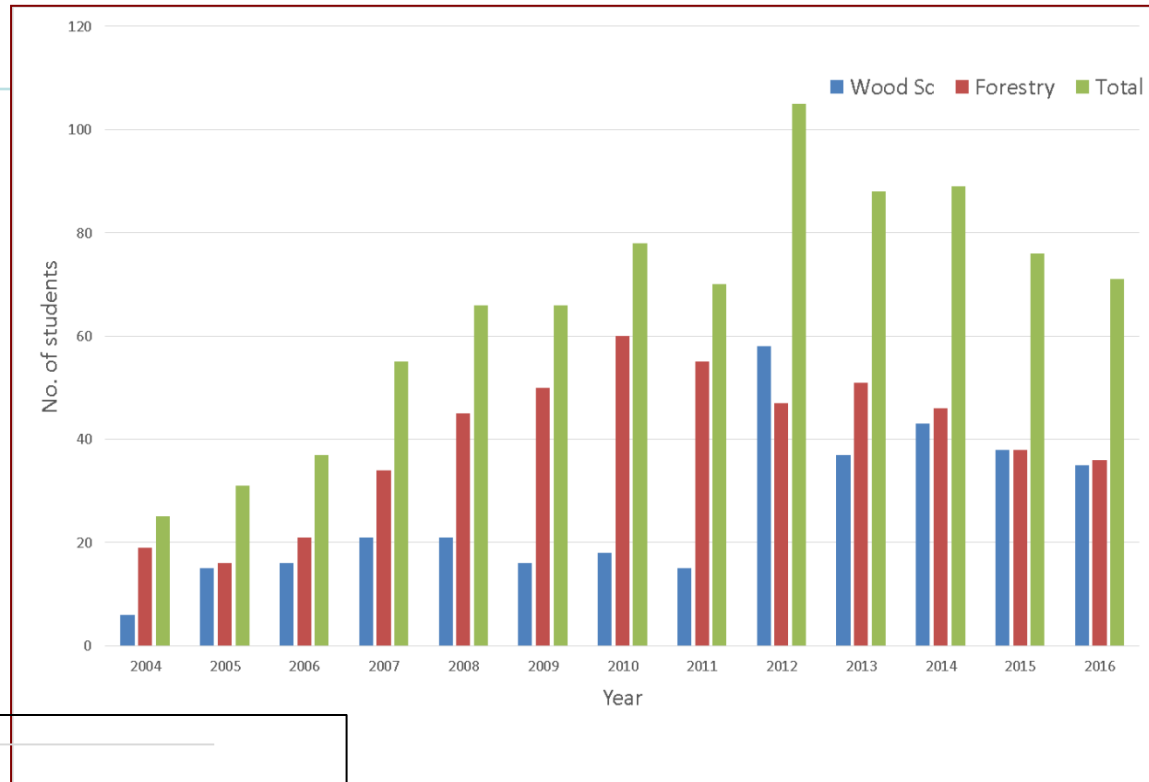


Prof Danie Brink



Undergraduate numbers & enrolments

Total undergraduate



First year intake after attrition



Undergraduate studies



Bursaries

- >60% of all students are supported one way or another through bursaries

Providers:

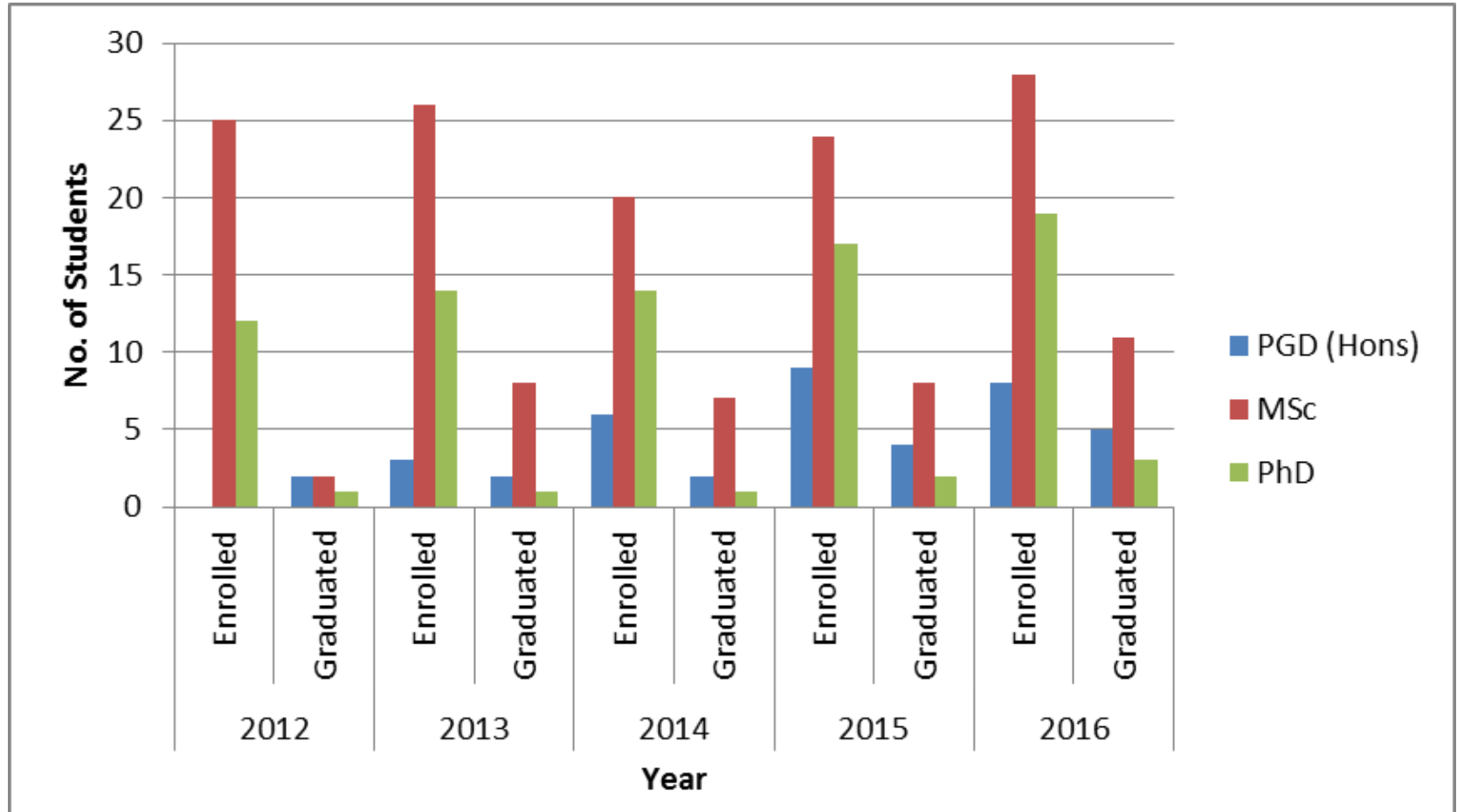
- FPMseta (25)
- Mondi, Sappi, PG Bison, HMF, NCT
- DAFF, FSA (due to change from 2017)
- SU bursary schemes to PDA's

Student numbers:

- FPMseta bursaries could not be used for 1st year intake for past two years
- Competition between faculties

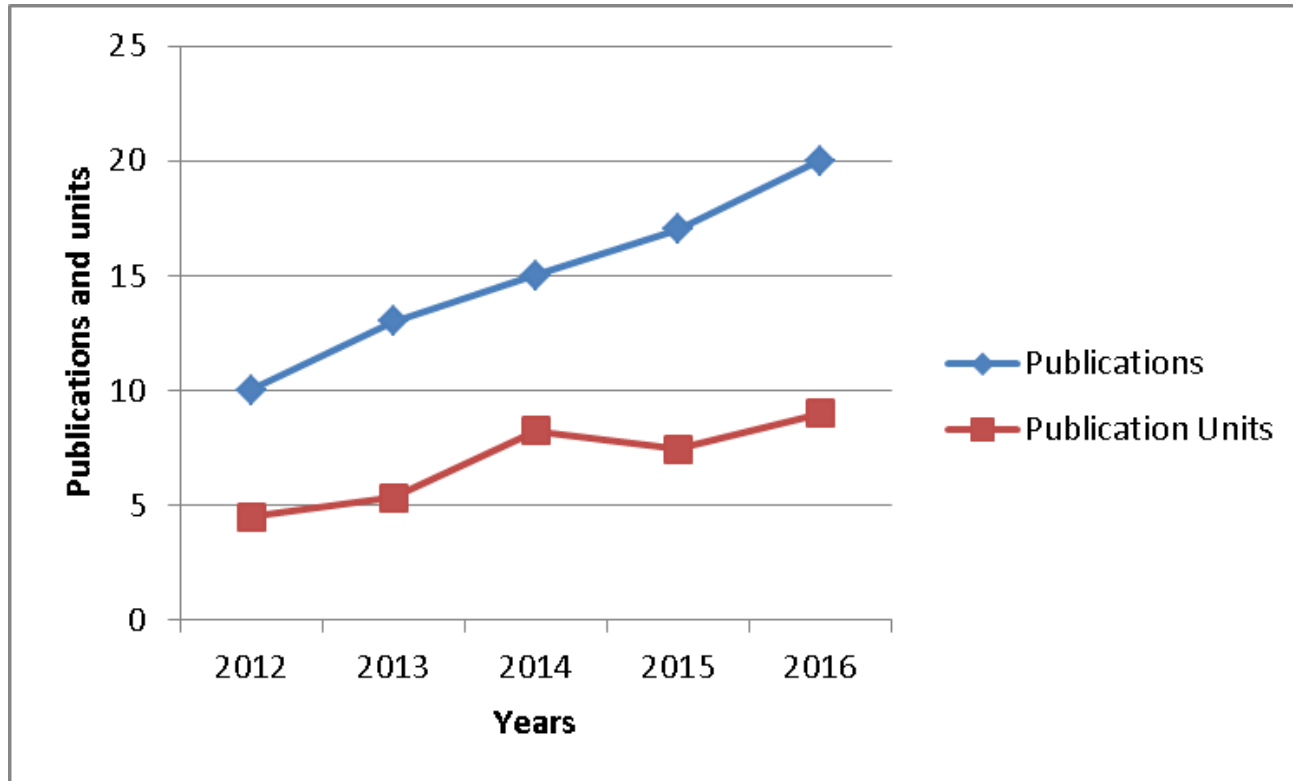


Postgraduate enrolments and graduations





Publications



924 BSc

244 Hons

243 MSc's

56 PhD/Dr

1st Hons – 1959

1st MSc – 1939

1st PhD – 1942

2006 – 6 PhD's



Teaching and research capacity



Changes in personnel

- Dave Drew (Growth and Yield)
- Hannel Ham (Tree improvement)

Retirement

- Pierre Ackerman (December 2017)

Age distribution

- Average – 46 yrs (64 – 38)
- Average – 43 yrs (50 – 38)

Qualifications

- All at PhD level apart from one and one Ass. Prof

Technical capacity

- Anton Kunneke
- Deon Malherbe
- Mark February
- Wilmour Hendrikse



Extra-ordinary Appointments



- Prof Alexander Barbu (Austria - Salzburg)
- Prof Bill Dvorak (USA)
- Prof Mike Jacobson (USA – Penn State)
- Prof Reino Pulkki (Canada - Lakehead)
- Prof Klaus von Gadow (Germany)
- Prof Walter Warkotsch (Germany)
- Prof Thomas Seifert (Germany)
- Prof Coert Geldenhuys (Consultant)
- Dr Steven Dovey (ICFR)
- Prof Paxie Chirwa (UP)
- Prof Ben Spong (USA – WV)



Expertise relative to value chain



Tree Improvement

Forest Economics



Silviculture

Forestry Development



Growth and Yield

Wood Processing



Forest Engineering

Wood Chemistry



GIS / Remote Sensing

Wood Physics





Silviculture



*Spacing trials in *P. radiata* under natural regeneration,*



*Disks representing diameter classes in fertilized and unfertilized plots in *P. radiata* fertilizer experiment*



*Prescribed burning under *P. patula* using the grid fire pattern (right)*



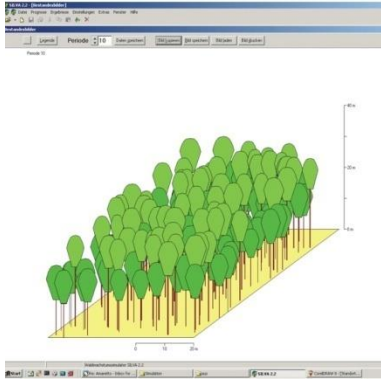
Dr Ben du Toit

Mr Deon Malherbe

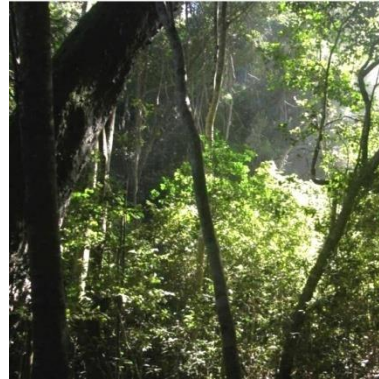
- **Plantation Silviculture**
- **Forest Eco-physiology**
- **Forest Soils and Nutrition**
- **Fire Management**



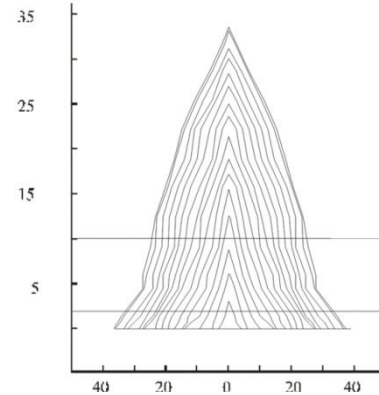
Forest Growth & Yield



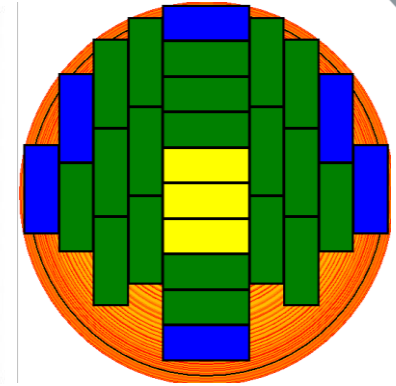
Monitoring and Simulation of Forest Growth



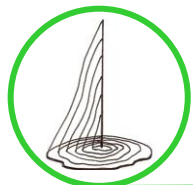
Forest Growth and Structure in Natural Forests



Dendro-ecological Analysis of climate change effects



Hybrid and process-based modelling of wood formation



Dr Dave Drew



Prof Klaus von Gadow



Prof Thomas Seifert

- **Forest and Tree Growth**
- **Growth and Environment**
- **Dendro-ecology**



Forest Engineering



Supply Chain Management



Harvesting, Product Quality and Systems Integration



Operations productivity and systems optimisation



Dr Pierre Ackerman

Prof Reino Pulkki

Prof Walter Warkotsch



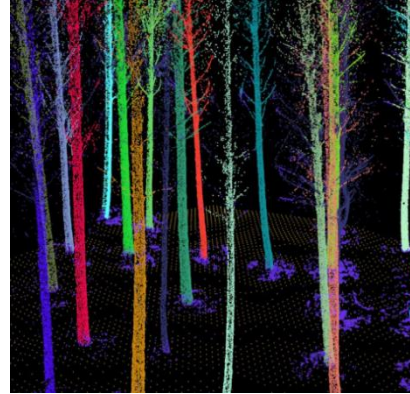
- **Supply Chain Management**
- **Operations productivity**
- **Logistics**



Forest Informatics



LIDAR for Forest Inventory



3D Object analysis



Tree growth monitor and growth and yield



your knowledge partner



Mr Anton Kunneke

- **Forest Informatics**
- **Remote Sensing**
- **Spatial Analysis**



Forest Economics



Forest Operations Accounting



Forest Valuation



Rural Forest Use



Enterprise Development



Mr Cori Ham



Prof Mike Jacobson

- **Enterprise Development**
- **Forest Operations Accounting**
- **Rural Forest Use**
- **Forest Valuation**



Forestry Development & Tree Improvement



Rehabilitation and Tree Improvement

Natural Forest Management and Utilization



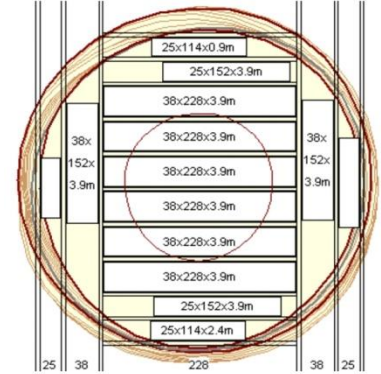
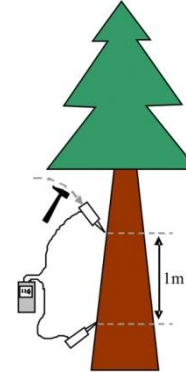
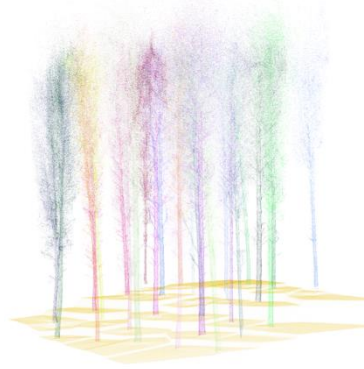
- Tree Breeding and Plant Propagation
- Ecology and Management
- Indigenous Forests and Woodlands

Ms Hannel Ham
Prof Coert Geldenhuys
Prof Bill Dvorak
Prof Paxie Chirwa

Department of Forest and Wood Science



Wood Mechanics and Processing



New SA pine saw-log management regimes for improved mechanical lumber properties

Evaluation of Standing Tree Timber Quality

Sawmill processing optimisation and lumber grading

your knowledge partner

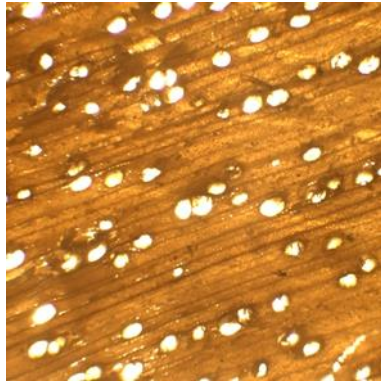


Dr Brand Wessels

- **Non destructive Timber Testing**
- **Prediction of Timber Quality**
- **Sawmill Processing**



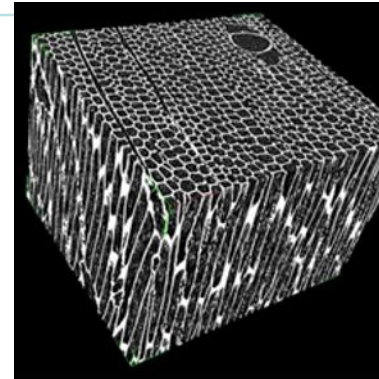
Wood Physics



Wood anatomical studies



Properties of burnt wood



Changes in wood structure of degraded wood



Bioenergy from invasive plants

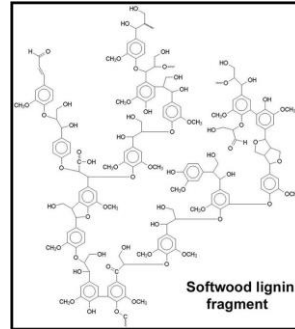


- **Surface Analysis**
- **Bio-fuels**
- **Wood Drying**

Dr Martina Meincken



Wood Chemistry and Wood composite products



Production and applications of formaldehyde-free resin
Production of phosphate based green composites from agricultural and industrial biomass residues

Pyrolytic volarisation of lignin: towards bio-based phenols and enzymatic volarisation of lignin: alternative paths towards green chemicals and coatings

Cork products from south African grown oak

Properties of South African grown eucalyptus: re-evaluating the standard for preservative treatment for poles



Dr Luvuyo Tyhoda

- **Wood Degradation and Preservation**
- **Chemical Utilization of Wood**
- **Bio-refining**



Research in the Department



- **Integration of expertise along the value chain**
- **Balance of applied and basic research**
- **International collaboration with focus on Africa**



International collaboration with Focus on Africa



NORTH AMERICA

UBC, Canada
 Laval Univ. Quebec, Canada
 Université du Québec à Montréal, Canada
 Dep. Water and Wildlife, Quebec, Canada
 FP Innovations, Canada
 Lakehead Univ. Ontario, Canada
 Rochester Inst. NY, USA
 VirginiaTech, USA
 Pennsylvania State, USA
 Yale Univ., USA
 Colorado State, USA
 North Carolina State, USA

EUROPE

Linaeus University, Sweden
 LTU, Sweden
 SLU, Sweden
 Innventia, Sweden
 VTT, Finland
 Univ. Joensuu, Finland
 Univ. Helsinki, Finland
 Univ. of Life Sciences Estonia
 Skov & Landskab, Danmark
 Nottingham, UK
 Univ. Wageningen, NL
 GAU Göttingen, Germany
 ALU Freiburg, Germany
 TU München, Germany
 Univ. Ulm, Germany

ASIA

Helmholtzzentrum
 München, Germany
 Univ. of Jena, Germany
 FH Salzburg, Austria
 Joanneum, Graz, Austria
 Univ Brno, Czech Rep.
 Leuven, Belgium
 INRA, France
 CTBA France
 CIRAD France
 Univ. Padova, Italy
 Univ. Lisbon, Portugal
 FAO, Italy

ASIA

RI Trop. For., China
 Int. C. for Bamboo & Rattan, China
 FRI Kerala, India
 Panjab Univ., India
 FFPRI, Japan
 Univ. Shizuoka, Japan
 FSI, Vietnam,
 CIFOR, Bogor, Indonesia
 Gadjah Mada, Univ., Indonesia

LATIN AMERICA

University of Parana, Brasil
 University of Sao Paulo, Brasil
 IMBRAPA, Brasilia, Brasil
 Forestal Oriental, Uruguay
 INTA Concordia, Argentina
 SALTA Univ. Argentina
 MINICO, Chile
 ARAUCO, Chile

AFRICA

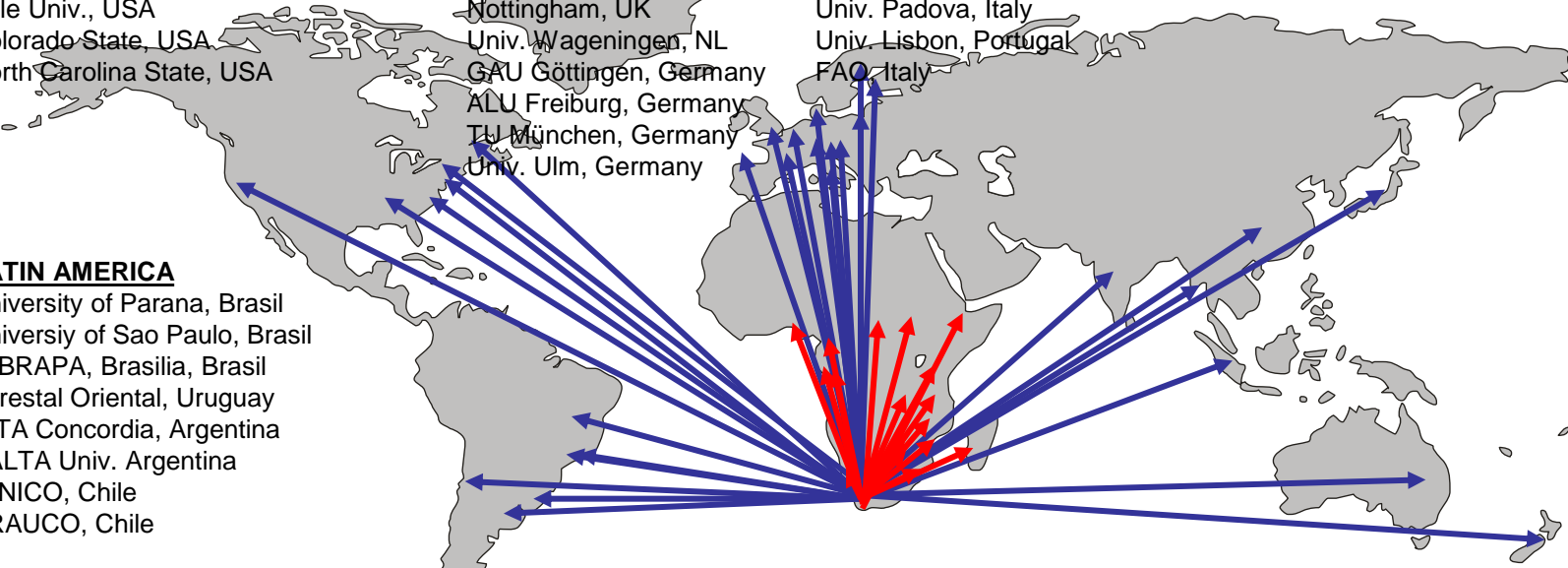
FRI Malawi
 Mzuzu Univ. Malawi
 Univ. Malawi
 Copperbelt Univ. Zambia
 UR2PI, Congo
 Univ. Swasiland
 Tropenbos, Cameroon
 CIFOR, Yaounde, Cameroon

Sekoune Univ. Dar-es-Salam,
 Tanzania
 Univ. of Gabon
 Sudan
 ICRAF, Kenia
 ANAFE, Kenia
 Univ. Lesotho
 Univ. Addis Abeba

AUSTRALASIA

CSIRO, Australia
 James Cook Univ., Australia
 ANU, Australia
 SCION, New Zealand

your knowledge partner





Strategic research at the DFWS



Global Challenges

Strategic research foci

***International
Competition***



1. Precision Forestry

Climate Change



2. Wood Quality along the Value Chain

Social Change



3. Green Buildings



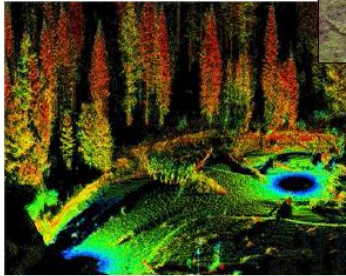
4. Resilient Sustainable Forests



5. Forest Enterprises, Products and
Markets

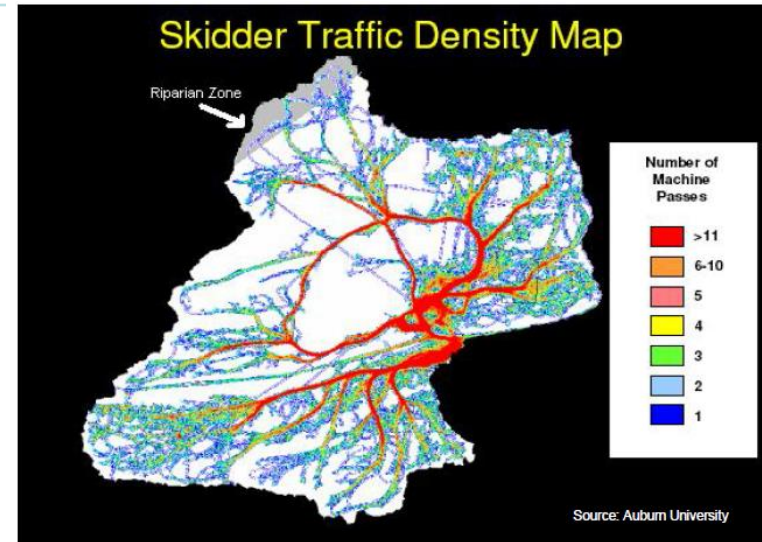


Precision Forestry

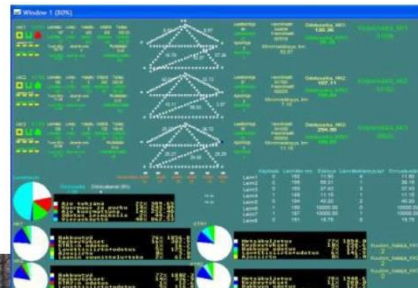


Terrestrial laser scanning

Precision Forestry Symposium – South Africa, March 2010



Precision Forestry Symposium – South Africa, March 2010



Sami Lamminen,
Kari Väätäinen,
Antti Asikainen

- Remote inventory and resource assessments
- Growth and forest operations simulation
- Supply chain optimisation



Precision Forestry Symposium 2017



“Precision Forestry – Producing More from Less. Towards optimising value in the bio-economy from data driven decisions.”

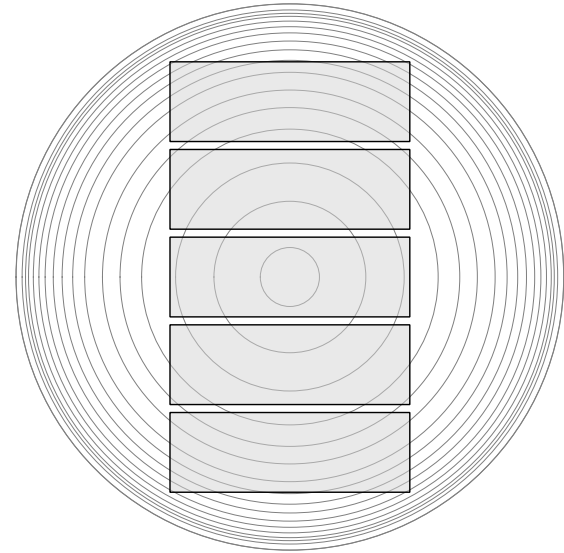
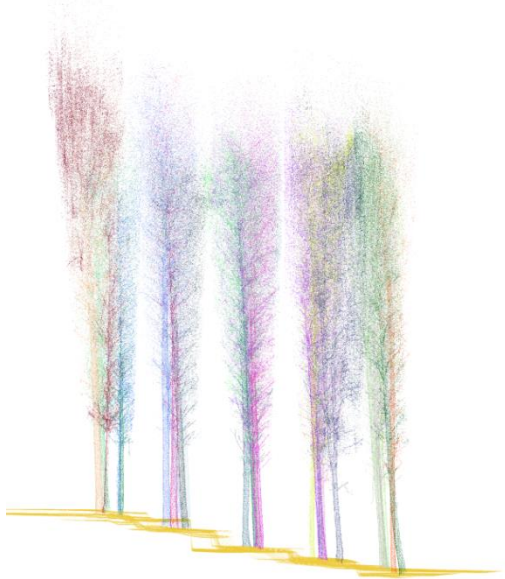
Stellenbosch University, South Africa

28 February to 2 March, 2017

<http://conferences.sun.ac.za/index.php/pf/2017/index>



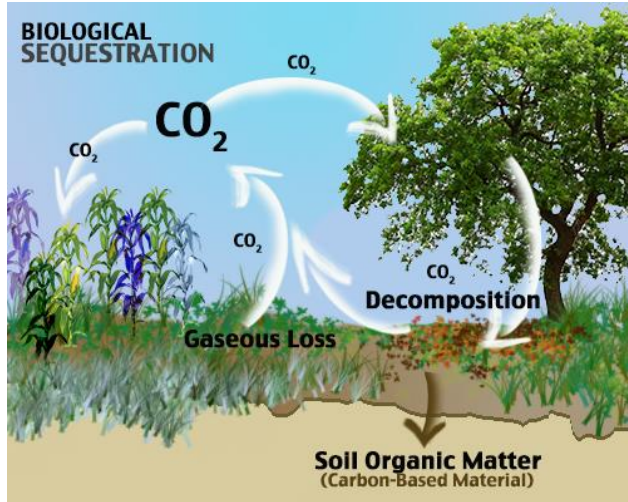
Wood Quality along the value chain



- Modelling wood properties: Tree to final product
- Non-destructive measurement
- Integrated value chain optimisation



Green Buildings



- Life cycle assessment
- Green building rating
- New product development

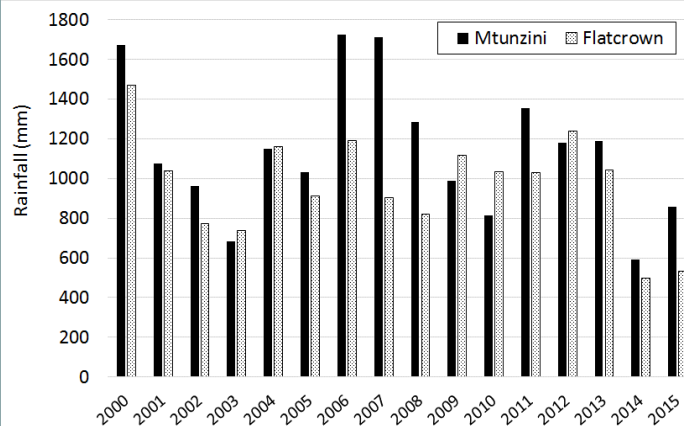
Resilient, Sustainable Forests



Resilient to fire



Water use efficient

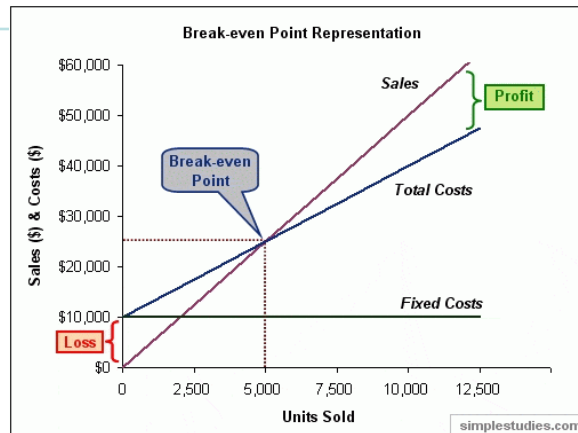


Biodiverse, sustainable & productive carbon traps

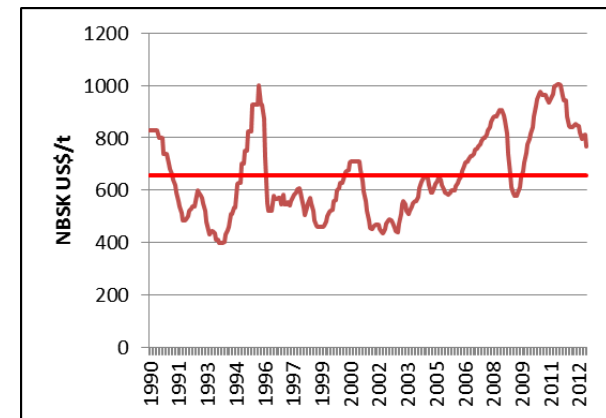




Forest Enterprises, Products and Markets



- *Forestry and forest products business*
- *New product and market trends*
- *Certification*
- *Financial analysis*
- *Forest operations accounting*



Thank You!