



SPIRMADBOIS project

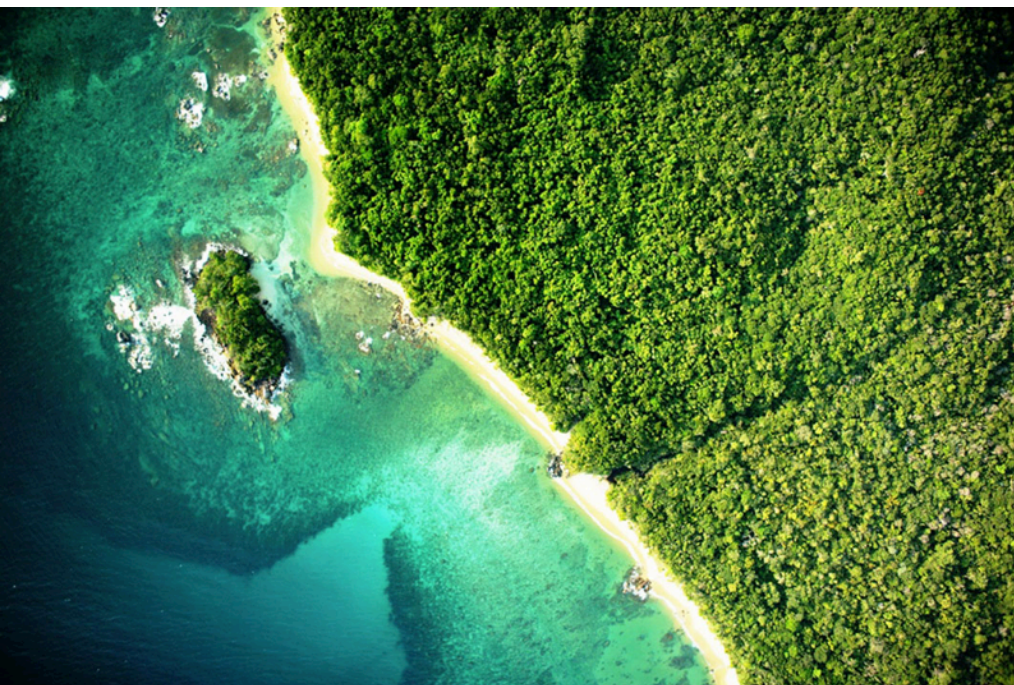
Use of NIRS for a sustainable management of forest resource in Madagascar

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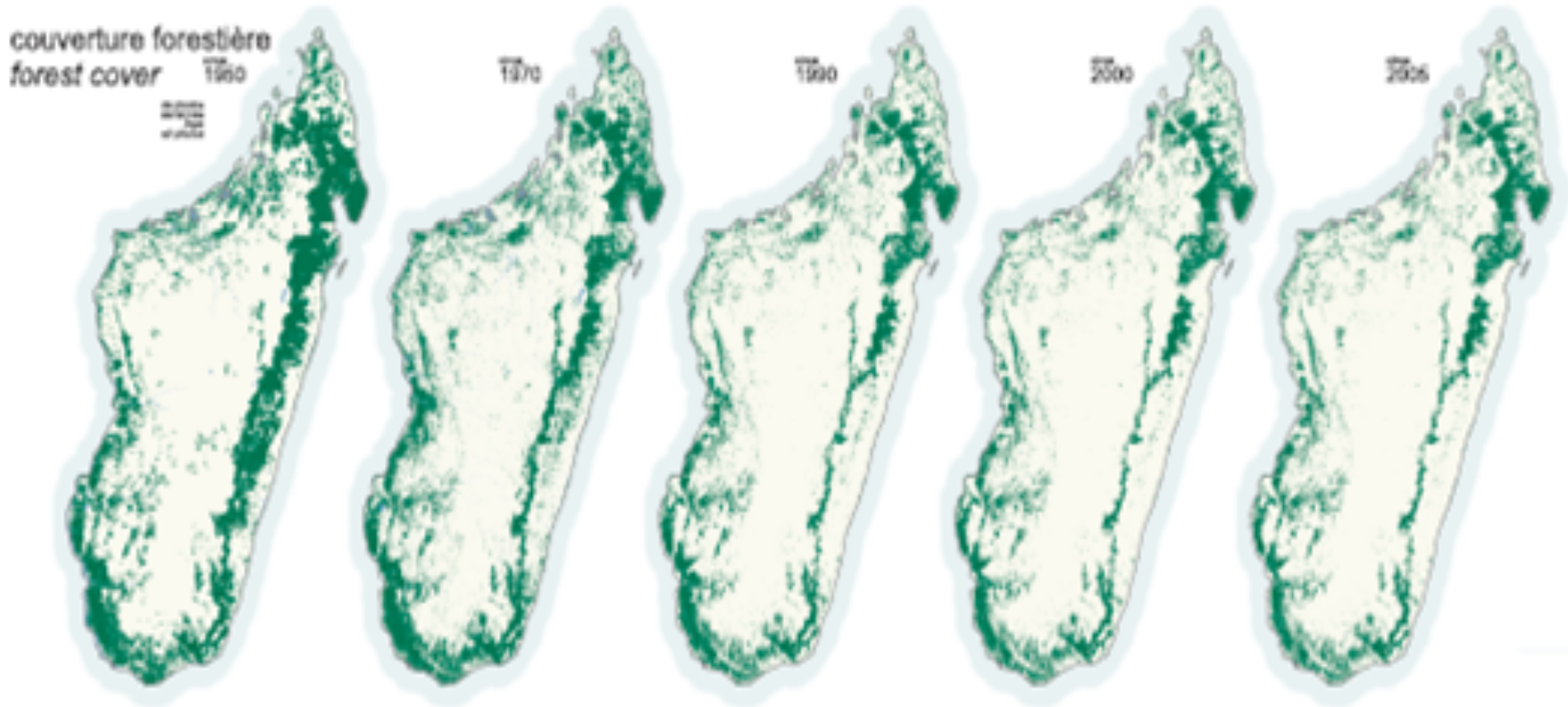


can paying 4 global ecosystem services reduce poverty?
les paiements pour les services écosystémiques globaux peuvent-ils réduire la pauvreté?





+ Estimates of forest cover over years



Source : MEFT (2009)



Some research objectives of the lab

- The search for alternative species previously considered as secondary, to avoid total extinction of precious wood species such as rosewood (*Dalbergia* sp.)
- Knowledge of wood properties to choose species adapted for different uses, and ensure the sustainability (both biological and strength)

+ Objectives of SPIRMADBOIS project

- Establish a NIRS calibration model to estimate the Malagasy wood properties: Density (x-ray), lignin, cellulose, hemicellulose, extractives, natural durability, energetic properties
 - Native natural species
 - Eucalypts
- Establish a NIRS calibration model to determine the geographical origin of a species
 - Eucalypts
- Establish a xylarium

+ Wood sampling

Native species

- Radial variation :
 - 60 native species * >6 trees





■ Longitudinal variation:

- 3 native species * 3 sites * 9 trees





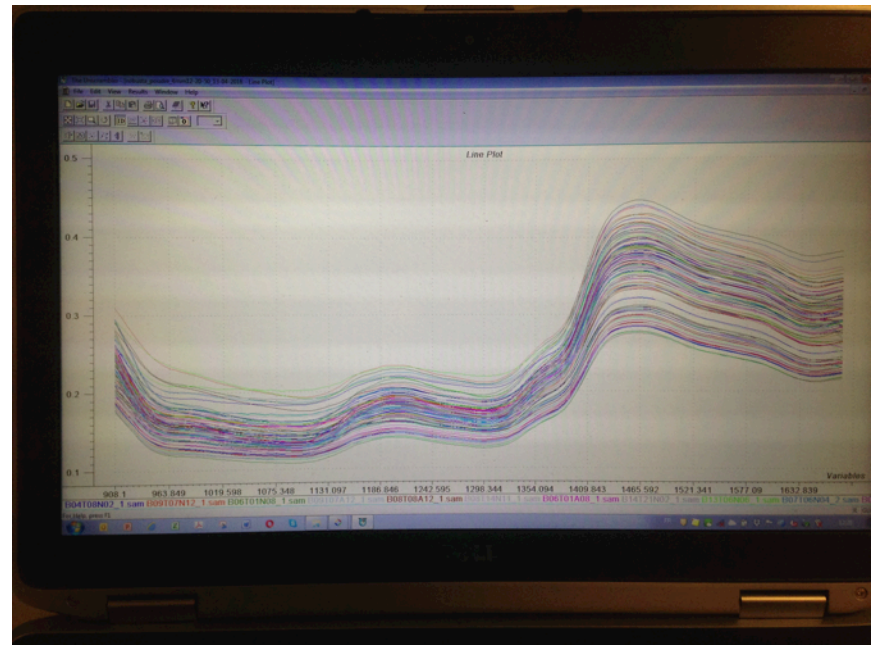
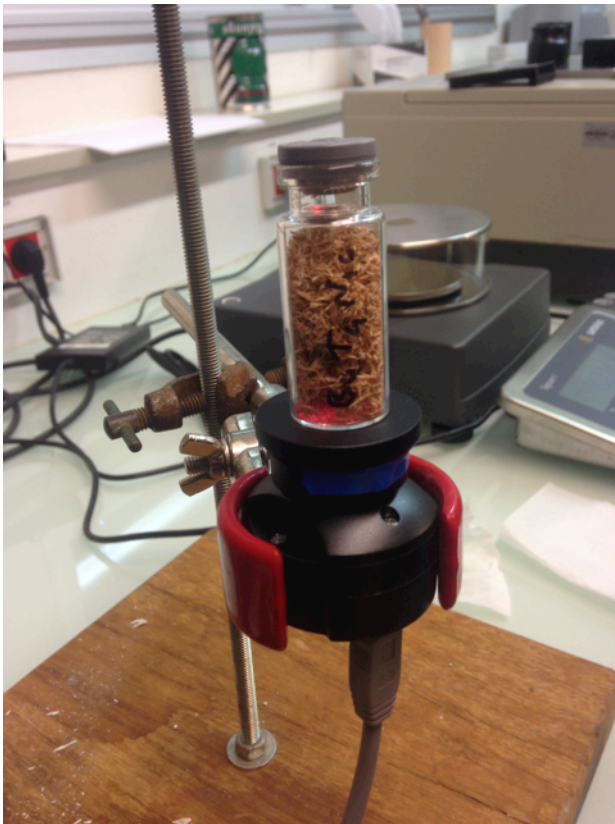
Eucalypts

- 1 specie from plantaion (*Eucalyptus robusta*) * 12 sites * 3 ages * 3 trees/age class
- Multispecies Eucalypts from Congo, Senegal, Madagascar, Brazil (3000 samples)



+ NIRS

■ Acquisition Viavi MicroNIR



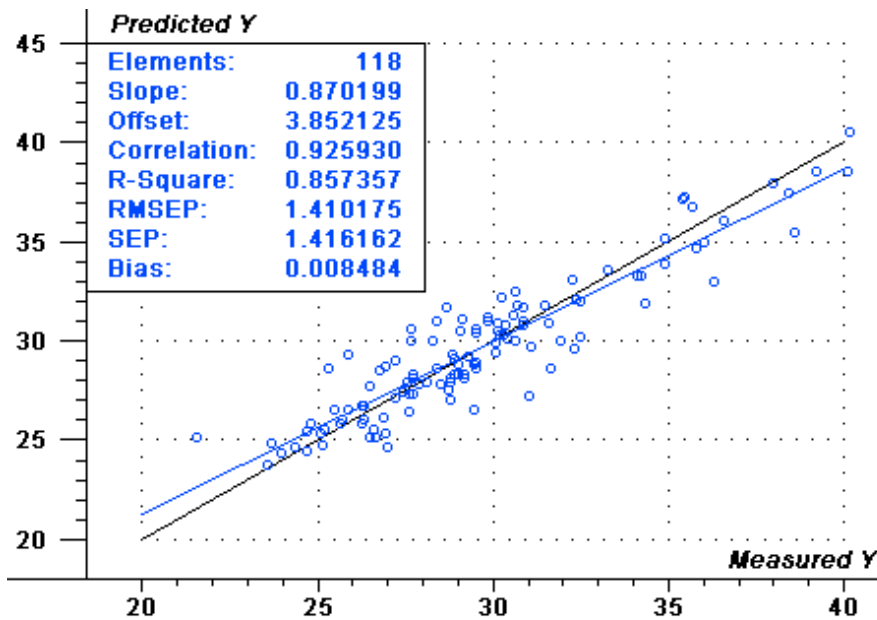
+ Xylarium

- 900 species (collaboration with FOFIFA)



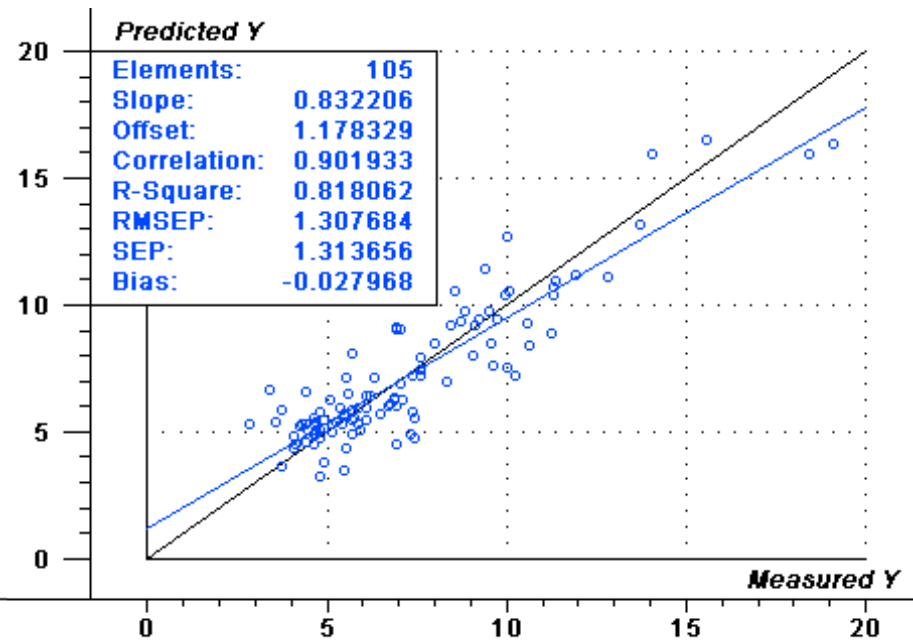
+ Some preliminary results

- Chemical compounds/ *Eucalyptus robusta* (with MicroNIR / ESSA)



RESULT2, (Y-var, PC): (LK,6)

Klason lignin, RPD = 2.7

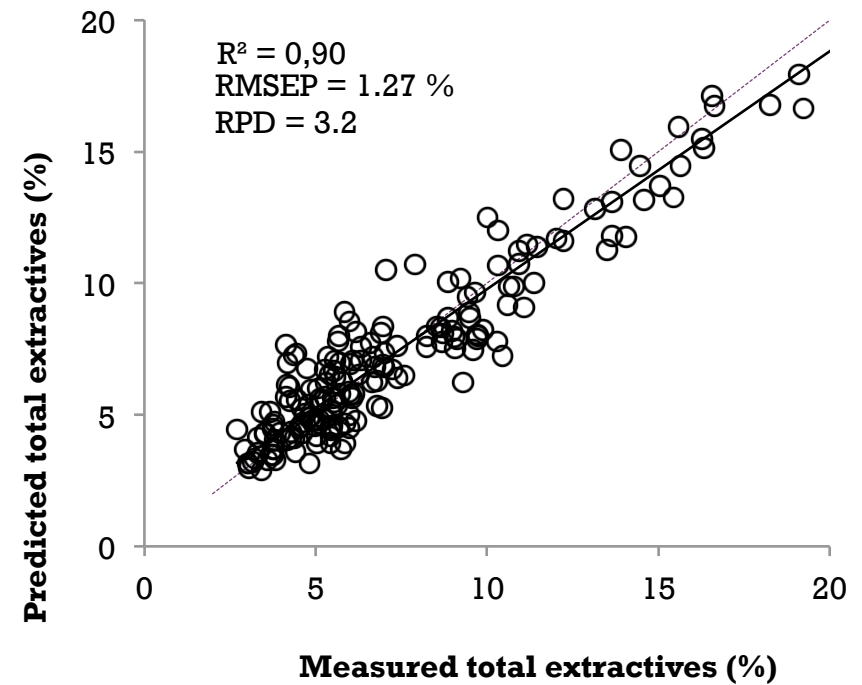
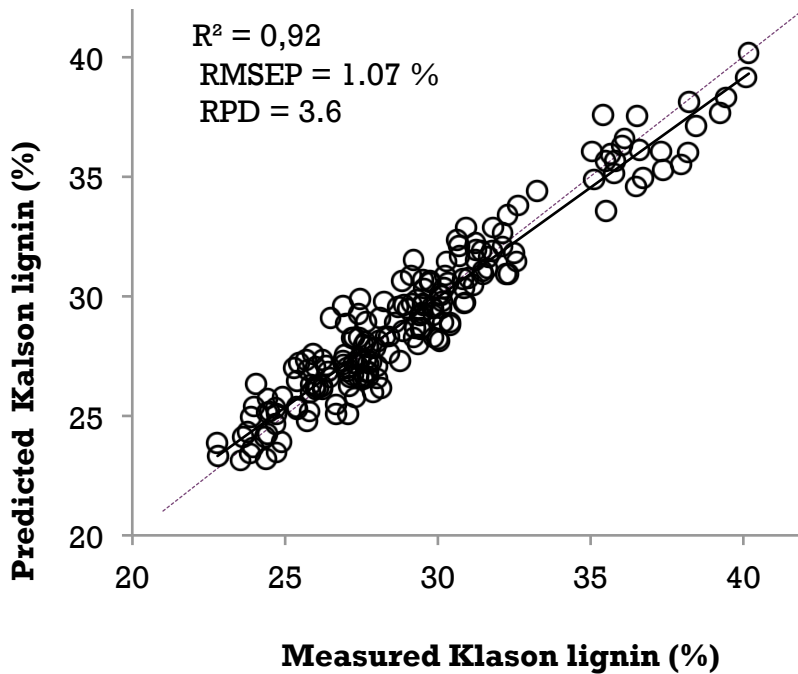


RESULT7, (Y-var, PC): (extractives,5)

Extractives, RPD = 2.9

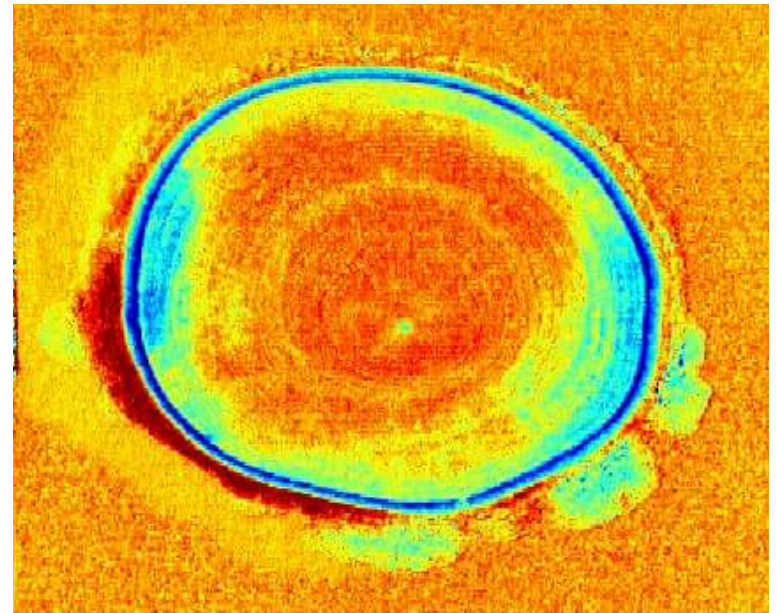
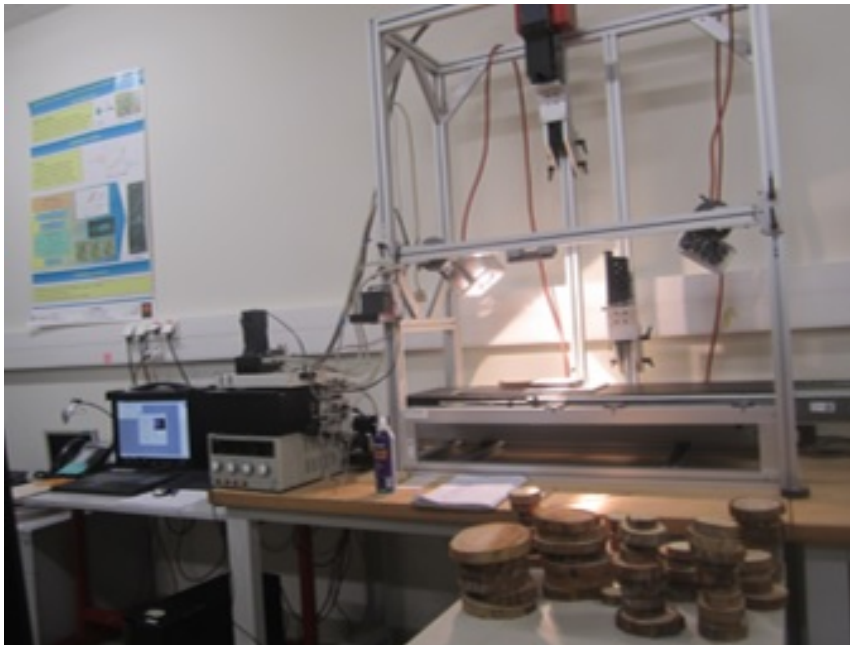


■ Chemical compounds/ Multiple eucalypts species (with Brucker Tango/ ESALQ)





- Hyperspectral analysis (Camera SWIR 1000-2500 nm / IRSTEA Montpellier)



+ Perspectives

- Project still ongoing
- New opportunity for a new research project about identification of precious wood (rosewood and ebony) funded by FED/EU:
 - Wood anatomy (Faculty of Science)
 - DNA barcoding (University of Zurich)
 - NIR, FR-IR techniques?

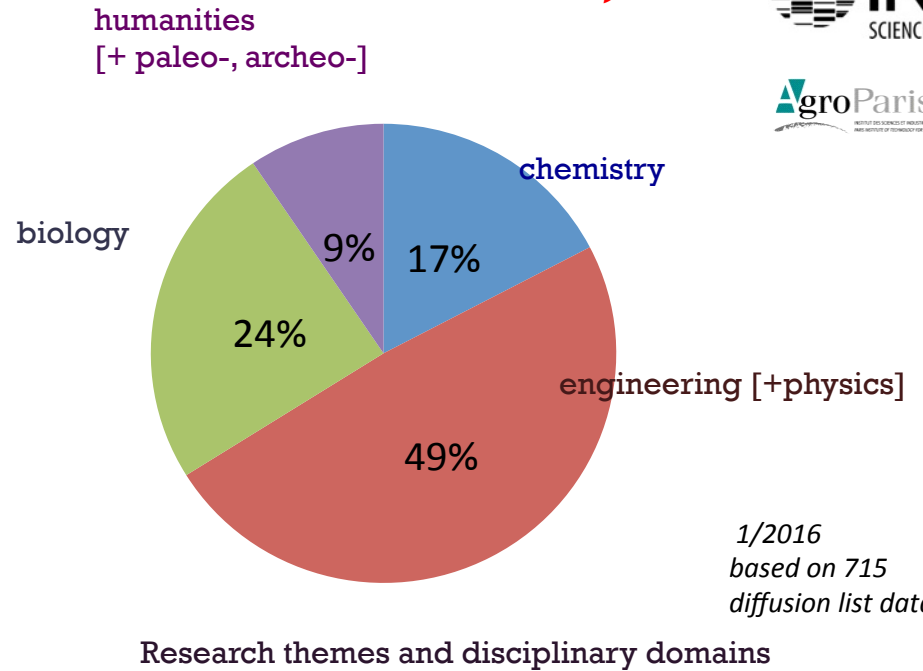
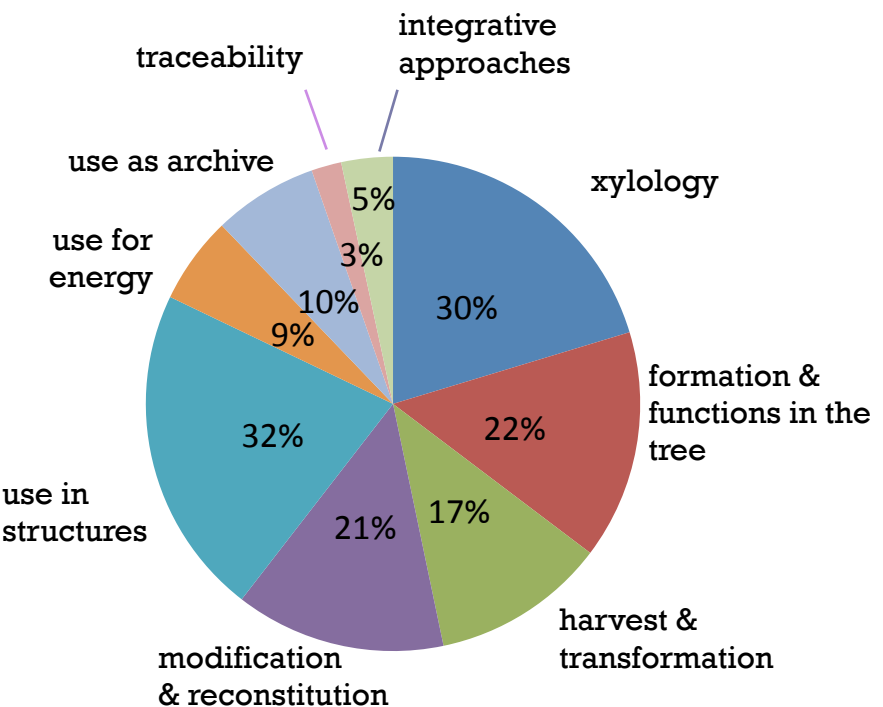
French research group on Wood science (GDR 3544)

<http://www6.inra.fr/gdr-sciences-du-bois/>



- Started 2012 - supported by CNRS, Ministry of Culture, INRA
- Coordination of wood research and education in France,
- Promotion of exchanges between French groups
- Relay for international networks (COST actions, IUFRO...)
- Annual meetings: Montpellier 2012, Paris 2013, Nancy 2014, Clermont-Fd 2015, Bordeaux 2016... + thematic meetings
- Training schools: Nantes 2014, Egletons 2015, Nantes 2016, Mont-de-Marsan 2017

→ **Communication mostly in French (little overlap with other networks & activities)**



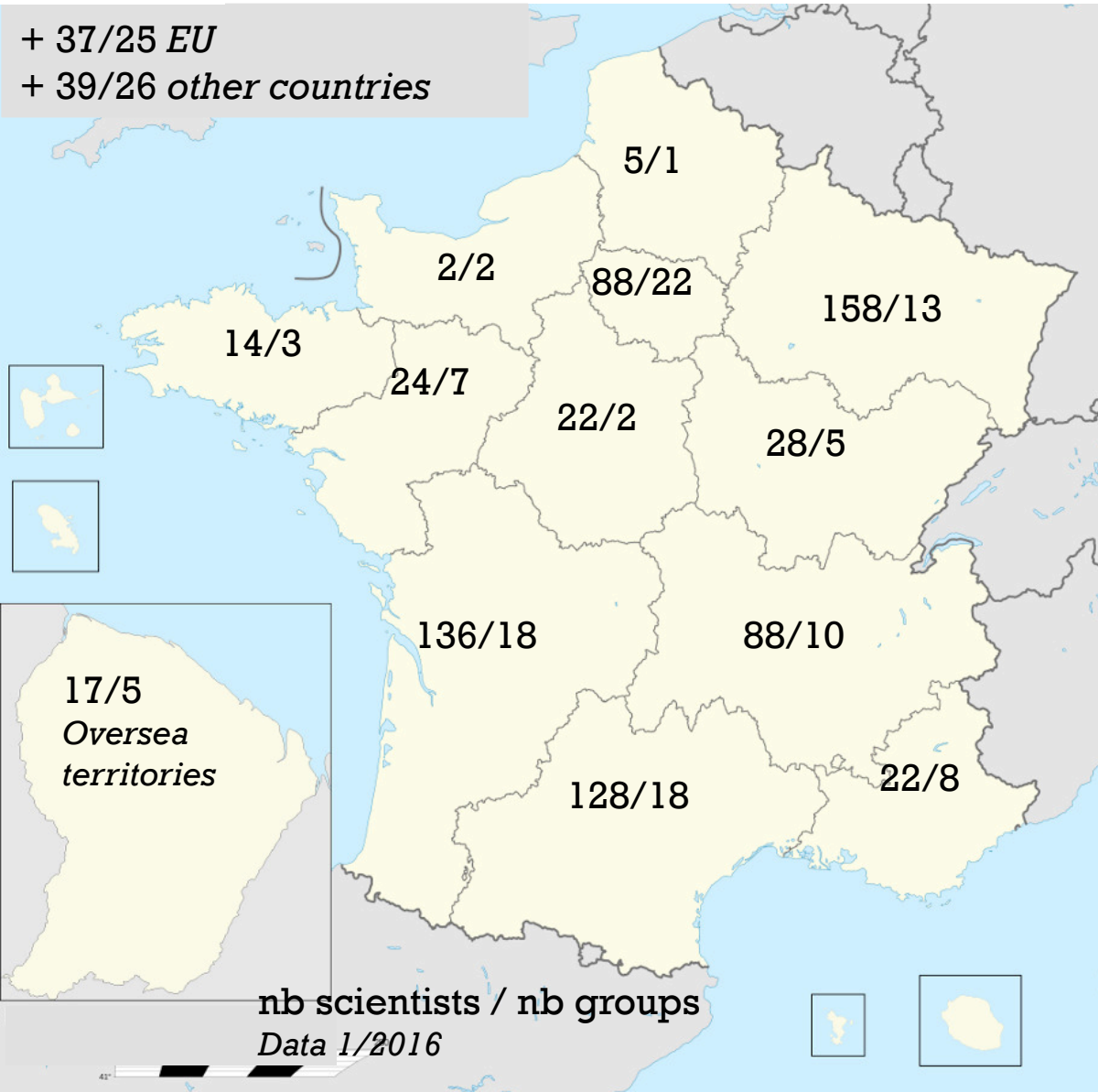
1/2016
based on 715
diffusion list data

Research themes and disciplinary domains



Participation to GDR3544

Members of the diffusion list, incl. students, technical staff, 'for info' ...



In 2015:

- 730 scientists in 100 groups + 75 abroad
- 40% in 9 groups of 20+ (LERMaB, BioWooEB, FCBA, PIAF, I2M, LERFoB, Pascal, AGPF, LMGC)
- 1/2 groups of 1-2



Thank you

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