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Netwoodresist

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NETWOODRESIST - CONTEXT



Rio Negro, Argentina

Life depends on climate variables such as light energy, temperature and water. These parameters are particularly critical for sessile plants, and especially for long-lived tree species. All around the world, global climate change is responsible for significant variation of tree development, affecting annual cycle, growth decay and mortality events. Therefore, wood variability as expressed in tree-rings, is a fundamental indicator for climate, ecosystem and environment, and thus, can be used for climate change studies.

We aim to perform basic studies and develop new tools able to measure wood adaptative traits. They can be used for different purposes such as reconstructions of past climate conditions, better understanding of tree adaptation to abiotic stresses and climatic changes, sustainable forest production, and wood transformation according to different end-using.

Eucalyptus plantation and drought – Brazil



Cypres and drought – Argentina



Pinus and drought – Argentina



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NETWOODRESIST - OBJECTIVES

Our goal is to create an international network of open laboratories between Europe and Latin America. Moreover, we aim to reinforce EU and LAC researchers' access to infrastructure and common expertise, in the objective to develop and test innovative tools/methods for wood adaptive traits measurement.

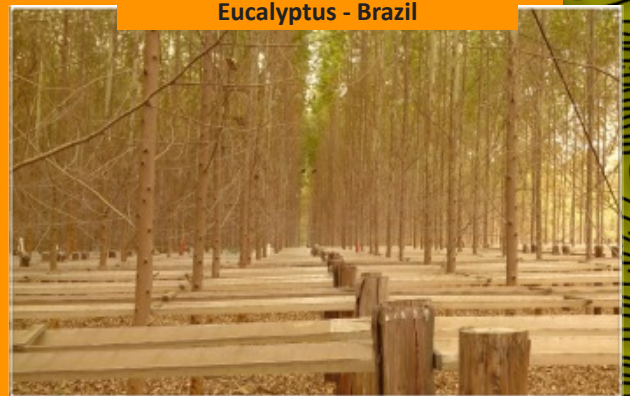
The founders are leaders in their respective research area such as ecophysiology, wood chemistry, quantitative genetics, wood technology. They belong to the following institutions: INTA Bariloche and Tandil, National University of Misiones (Argentina), ESALQ-USP (Brazil), INRA Val de Loire (France), CIRAD (France), University of Lisboa (Portugal).

They are involved in studies on tree adaptation to climate changes across wood formation and wood property impact.

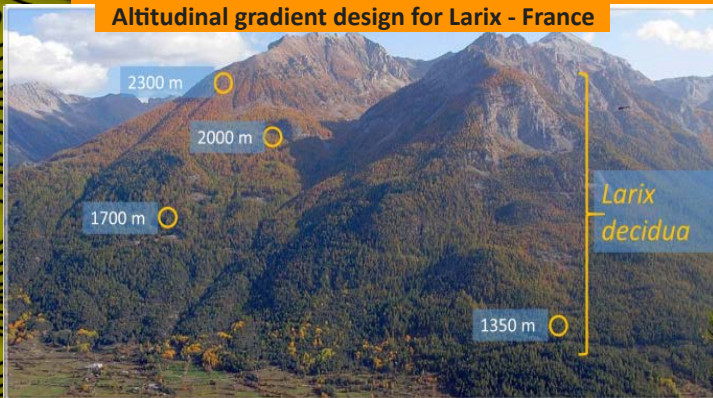
Nothofagus forest – Argentina



Rainfall exclusion experiment for Eucalyptus - Brazil



Altitudinal gradient design for Larix - France



Endangered Cypress - Argentina



NetWoodResist network is funded by ERANet-LAC Program, for Latin America and the Caribbean countries joint innovation and research activities, related to current national or international projects (Topwood EU Marie Sklodowska- Curie RISE, Consortium Studium Centre Val de Loire, Empir Region Centre Val de Loire, Fapesp, Agropolis-Capes, Cofecub-Capes...).



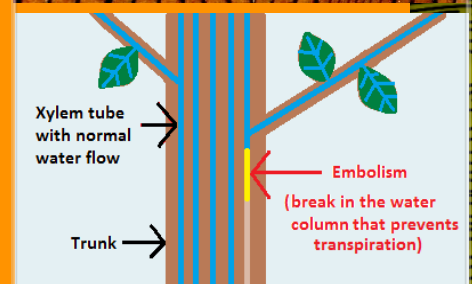
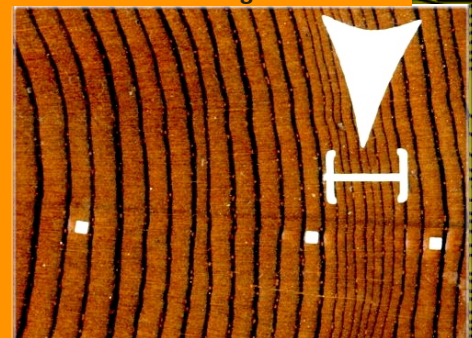
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NETWOODRESIST - TOOLS AND DEVELOPEMENT

Example of tools we apply in studies of forest responses to drought stress:

- Cavitation resistance measured by Emboliton tool
- Wood density and dendrochronology by X-Ray microdensitometry
- Wet chemistry of wood compounds (extractives, lignin, cellulose)
- Wood chemicals in micro-samples by pyrolysis analysis
- Near InfraRed Spectroscopy applied for wood
- Cambial actiity, wood anatomy and cell-wall ultrastructure
- Field experiment in natural forests and plantations
- Automatic growth monitoring, application tools in the field

Tree rings



Emboliton tool



Dendrometric surveys

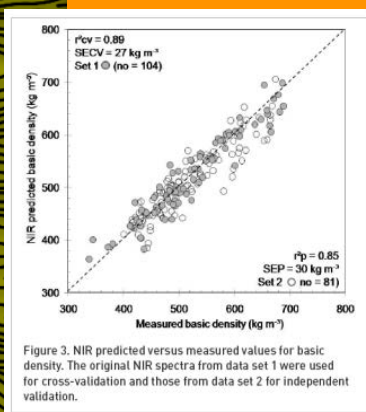
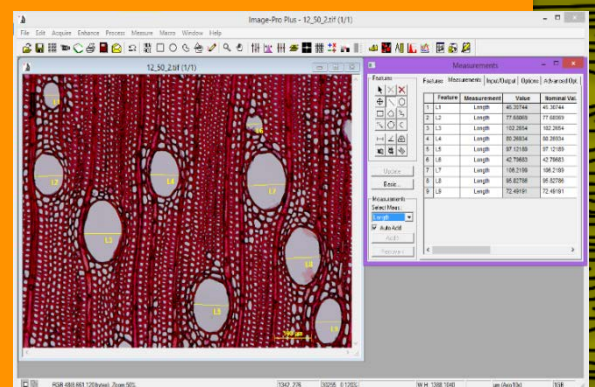


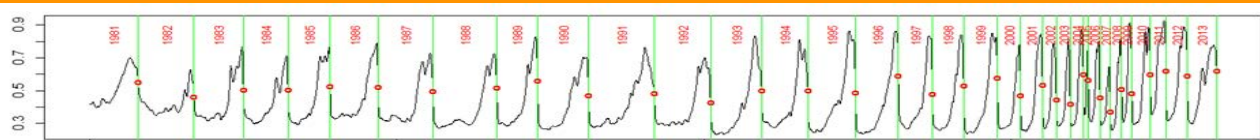
Figure 3. NIR predicted versus measured values for basic density. The original NIR spectra from data set 1 were used for cross-validation and those from data set 2 for independent validation.



Nirs calibrations



Wood anatomy measurement



X-Ray microdensitometry profil.

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NETWOODRESIST - DEVELOPMENT OF NETWORK

Potential partners could be included

- EU: France (Amap, B&sef, Biowoeb, Eco&Sols, Ecofog, Piaf, Biogeco, Lerfob, U. Bordeaux), Portugal (Utad), Austria (Boku), España (Maderas)
- LA: Argentina (University of Buenos Aires, UNCPBA Tandil, U. of Río Negro, INTA Montercarlo-Misiones, Parque Tecnológico Misiones, CCT Conicet Mendoza), Chile (U. of Talca), Mexico (U. of A.M. Iztapalapa), Brazil (U. Federal de Lavras, Embrapa Florestal, IPEF)
- Africa: University of Lomé (Togo), U. of Antananarivo, ESSA-Forêts (Madagascar)

Key dates and main objectives for development of the Network and activities

- Eranet-Lac funding NetWoodResist from 04-2015 to 10-2016
- Agreement of Network signed by founders before 10-2016
- Potential projects to be submitted to Eranet-Lac Program calls, H2020, Agropolis, ...

C. maculata 25 years old - Brazil



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