NETWOODRESIST – An international network of open laboratories between Europe and Latin America to develop new tools on wood adaptative traits on drought stress and climatic change studies

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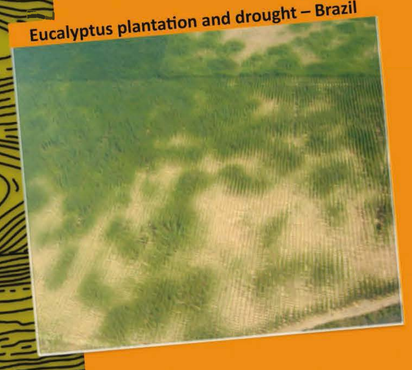
NETWOODRESIST - CONTEXT

Rio Negro, Argentina

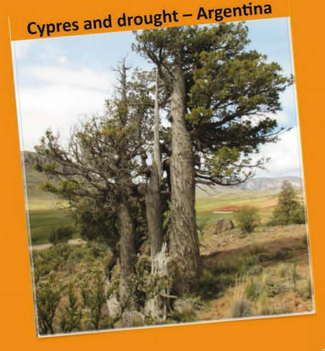
Life is conditioned by climate variates as available light energy, temperature and water. These parameters are particularly critical for tree species which are immobile and long-lived. Global warming is responsible for significant changes to the annual cycle of tree development as well as for tree growth decay and mortality events all around the world. As a fundamental indicator for climate, ecosystem and environment, wood variability, as expressed in tree-rings, is useful for studies on climate change.

Basic studies and development of new tools able to measure wood adaptative traits, our goal, are crucial for different purposes such as climate reconstruction, better understanding of tree adaptation to abiotic stresses, sustainable forest production, and wood transformation according to different end-using.

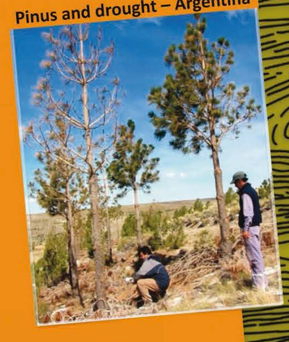
Eucalyptus plantation and drought – Brazil



Cypres and drought – Argentina



Pinus and drought – Argentina



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NETWOODRESIST - OBJECTIVES

Our goal is to create an international network between Europe and Latin America of open laboratories and to reinforce EU and LAC researchers' access to infrastructure and common expertise on the development and testing of innovative tools/methods for measurement of wood adaptative traits.

The founders are leaders in their respective research area as ecophysiology, wood chemistry, quantitative genetics, wood technology, and 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 accross wood formation and wood properties consequences.

Nothofagus forest – Argentina

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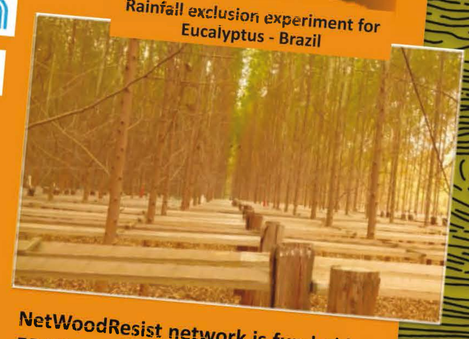
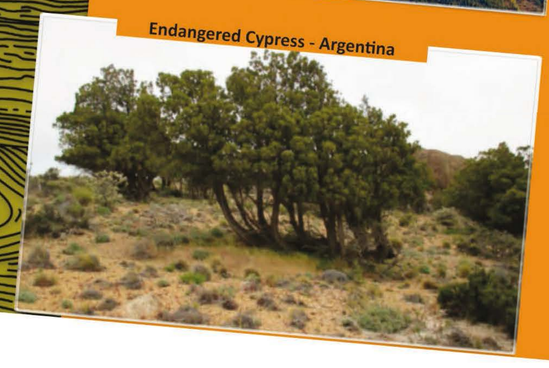
Rainfall exclusion experiment for Eucalyptus - Brazil



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 with 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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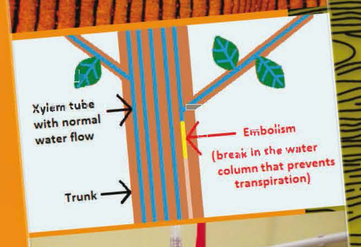
NETWOODRESIST - TOOLS AND DEVELOPEMENT

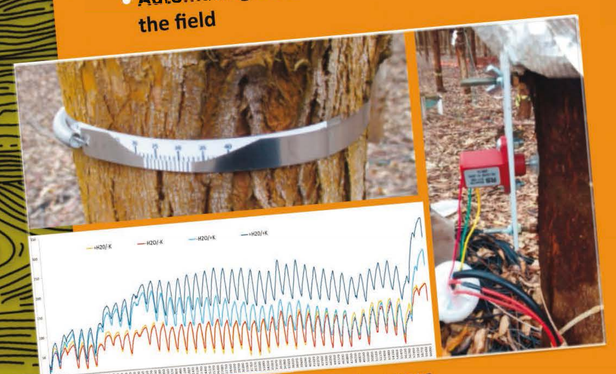
Example of tools we apply in studies of forest responses to drought stress:

- Cavitation resistance measured by Embolitron tool
- Wood density and dendrochronology by X-Ray microdensitometry
- Wet chemistry of wood compounds (extractives, lignin, ceilulose)
- 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



Embolitron tool



Dendrometric surveys

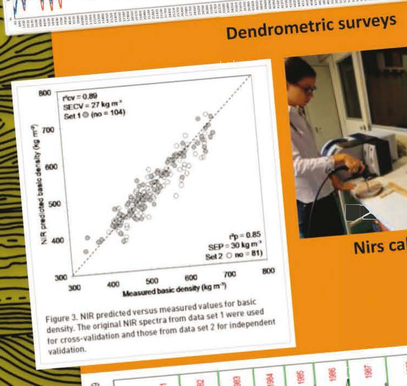
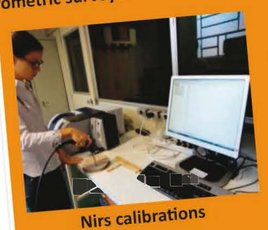
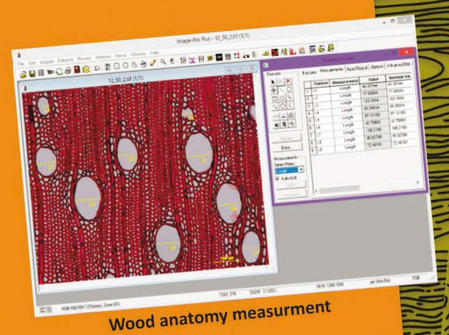


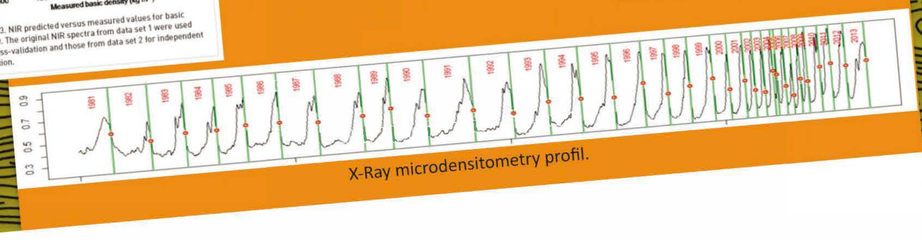
Figure 3. NIR predicted versus measured values for basic density. The original NIR spectra from data set 1 were used for cross-validation and those from data set 2 for independent validation.



Nirs calibrations



Wood anatomy measurment



X-Ray microdensitometry profil.

NETWOODRESIST - DEVELOPMENT OF NETWOORK

Potencial partners could be included

- EU: France (Amap, B&sef, Biowooeb, 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 Tecnologico 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 mains 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 submitted to second call of Eranet-Lac Program, H2020, Agropolis, ...

C. maculata 25 years old - Brazil

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Conception: Cirad, Martine Dupontal, March 2016