yerba mate, greater than those of *Araucaria*, a symbol species of the Mixed Ombrophilous Forest. The group located in the most temperate climate of Brazil was isolated from the others. This isolated group can be verified in genetic studies that aim to know whether the populations are also genetically different. The output of this study may be used to support further improvement in breeding and conservation of species programs, currently and future use, considering the climatic changes and the anthropic pressures.

Tree-ring and response to climate variability and carbon sequestration using dendrochronology in the Sahelian Agroforestry of Niger

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Agroforestry Parklands are the predominant agro-ecosystems in West Africa where Prosopis africana and Faidherbia albida are some of key species for rural population. While these trees are resistant to external stress, their growth and regeneration depend strongly on local conditions. Meanwhile, characterizing tree response to climate variability and carbon sequestration is limited in the Sahelian Agroforestry Parklands. This study was carried out in two agroforestry parklands in the South Central Niger and purports at characterizing the response to climate variability and carbon sequestration of *P. africana* and *F. albida* trees using modern dendrochronology methods. The methodological approach consisted of sampling discs using standard dendrochronology techniques, LINTAB 6 system for ring width measurements, COFFECHA and ASTAN for respectively crossdating and standardization of chronological series. There was no significant difference in mean ring-width between the two tree species ($P \geq 0.05$). However the dynamic of cambial growth varied with tree age for both species indicating strong influence of environmental factors. *P. africana* (r1 = 0.50) expresses more dependence on annual rainfall than *F. albida* (r2 = 0.63). There was a significant difference in carbon sequestration between the two species ($P \leq 0.05$). These results can guide policy makers in the choice of adapted species to climate variability and other anthropogenic pressures in the Sahelian belt of Niger.

Estimating the impact of climate change on Brazil's planted forests sector

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Brazil has 9.85 million hectares of planted forests, grown mainly in the South and Southeast regions. These forests have species of the genera *Eucalyptus* and *Pinus*, which represent 93% of the total. In 2017, 139.83 million cubic meters of log wood for paper, cellulose and other purposes were produced, with a production value of several billions of US dollars. However, projected advances of the planted forests sector in Brazil can be directly impacted by climate change and resulting biophysical effects. Here, we quantify these impacts using GLOBIOM-Brazil, a global bottom-up partial equilibrium model of competition for land use between agriculture, forestry, and bioenergy sectors, which includes various refinements reflecting Brazil's specificities. It computes consumption and trade for 30 regions of the world; and production and land use at a 50 km grid resolution in Brazil and 250 km in other regions for the most important crops, wood, and animal products. Land use change depends on the feedback between agricultural demand and biophysical and regulatory constraints on land. Climate change impacts are incorporated in the model by climate shocks on future crop, grass and biomass productivities as projected by Global Gridded Crop Growth Models simulated for five Global Climate Models (HadGEM-ES, MIROC-ESM-CHEM, IPSL-CM5A-LR, GFDL-ESM2M, NorESM1-M) and two climate change scenarios (RCP 2.6 and RCP 8.5). Simulations through the year 2050 indicate a slight decrease of the biomass of planted forests in all Brazilian biomes but the Pampa, where the conditions for planted forests are projected to improve.

Dry of Brazil nut trees at Resex Cajari: new evidence that climate anomalies are affecting Amazonian biodiversity

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The Brazil nut (*Bertholletia excelsa* Bonp.) is among the largest trees in the Amazon. It has big canopy area, and is a deciduous species, indicating high water dependence. In order to investigate Brazil nut trees dry, after strong "2015 el nino", we evaluated occurrence and possible explanations of this drought, and relationships with climatic anomalies and nut production. We conduct semi-structured interviews with agroextractivists, and we analyzed leaves and soil near at 15 trees, with and without symptoms of dry. In the years 2015/2016, was registered the strongest El Niño in the Amazon, with an increase of more than 2 °C in the average temperature, reduction of precipitation and prolongation of the dry period. Probably, the water deficit and temperature stress caused the dry (burn) of the leaves and thin branches of the higher Brazil nut trees, observed in the Santa Rosa region, Resex Cajari-Amapá, Eastern Amazonia. The same did not occur in the young trees, in other species and in other regions. There was a drastic fall in fruit production in 2017, and negative correlation of the production with positive anomalies in the Pacific temperature, demonstrating that this species has sensitivity to climate change. Brazil nut trees can recover and sprout new leaves, but the next harvest is it impaired. The nutritional variables did not present significant relationships with trees dry. The hypothesis raised is that this may be related with hydraulic conductance problems, when occurs cavitation and loss of water molecules adhesion, after physiological stress in large trees.

For the assessment of ozone and climate change impacts on southern European forests: MITIMPACT PROJECT

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Climate change and air pollution are two significant stressors affecting forest health and vitality of European forests. Mediterranean area has been identified as one of the most prominent "Hot-Spots" in future climate change projections and is seriously affected by air pollution, in particular ozone (O_3). The MITIMPACT ALCOTRA project aims to quantify ozone impacts on forest test sites distributed in South East France and Northwest Italy, by evaluating ecosystem health and ecosystem services. The project area can be considered as a case study for the assessment of global change impacts in Mediterranean forests. This innovative aspect of the project can be useful to provide cost-effective measures for forest management in preparation to future climate conditions. Here we will introduce a new monitoring station to measure in real time O_3 concentrations together with meteorological parameters in MITIMPACT project. Based on the data obtained here, calculated several O_3 indices, especieally the effective dose of O_3 entering into the stomata so called phytotoxic ozone dose with a threshold Y (PODy), will be shown. We will discuss new appropriate thresholds to protect Mediterranean forest against the negative effect of O_3 for future climate change.