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Abstract

At a global scale, there is high and growing concern about the effects that the observed and predicted climate variability will have on forest ecosystems in the 21st century. Climatic variations directly affect the rate of tree growth and indirectly determine the frequency, magnitude and type of forest disturbances. Based on a tree-centered approach, this doctoral plan proposes to study in detail the potential responses of Nothofagus pumilio to environmental changes, associated with global warming. Indeed, the general objective of this research work is to analyze the radial tree growth in response to climatic variations in the Patagonian forest, both on hourly, interannual and longer-term time scales. The hypothesis being tested suggests that the temperature variations and the availability of humidity in the soil interact with each other, modulating the radial growth of woody species. It also argues that temperature is the main factor that controls the onset of xylogenesis, but it covaries with humidity throughout the growing season. In this way, variations in type, dimension and arrangement of wood tissues are influenced by climate variations. As part of the methodology to be used, real time monitoring will be carried out to study wood formation and environmental variables, in conjunction with retrospective dendrochronological analysis of radial growth. Valid estimates of native forests response to climate and variability will also be provided in different time scales. The tree-centered approach, which guides this doctoral thesis, represents a valuable contribution to estimate changes in Argentine forests' growth and structure, in a context of climate change.