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Abstracts Book

Modelling Eucalyptus biomass production at regional scale in Brazil

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Among forest vegetation grown in Brazil, Eucalyptus is the most widely planted tropical hardwood genus covering approximately 5.7 million ha for an average yield of 49 m3 ha-1 yr-1. Wide differences of biomass production were observed among neighboring stands representing challenges to forestry companies to spatially estimate biomass yield in large plantation zones. The first objective of the present research was to modify the carbon allocation scheme in the process-based model Generic Decomposition And Yield Model (G'DAY), to better capture the spatial variability in growth rates of Eucalyptus as influenced by environmental constraints such as water stress. The model was parametrized and tested using experimental and long term commercial datasets in the state of São Paulo Brazil. Measured data included several variables of carbon and water fluxes and carbon stock. The calibrated model produced accurate prediction of the carbon key variables such as leaf area index, stem biomass, and gross primary production and water related variables such as plant available water and evapotranspiration. Simulating the spatial variability among commercial Eucalyptus stands at landscape scale showed reasonable prediction of plant height with r2 of 0.89 but lower level of accuracy for stem biomass. This could partially be attributed to spatial soil data differences used at regional scales which came from the Global Soil Dataset for Earth Systems Modeling dataset, at a resolution of 1 km. Testing the soil data with the use of soil type map crossed with soil profile measurements is expected to improve the soil information for higher accuracy of stem simulation at landscape to regional scale.

Keywords: Ecophysiological Modelling, G'DAY, Brazil, Regional Scale

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