Adaptation of Agro-IBIS model for *Eucalyptus* carbon budget estimation at regional levei - a case study in São Paulo State, Brazil

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Highly productive fast-growing *Eucalyptus* plantations cover more than 5 million hectares in Brazil and exhibit very dynamic carbon fluxes throughout tlieir 6-7 year rotations. These plantations quickly shift from C sources at tlie beginning of tlie rotation to large C sinks until harvest. In order to get a model simulating carbon pool and fluxes for both *Eucalyptus* plantations and otlier crops, we integrated several sub-models of tlie 2?uca/ypta-dedicated Generic Decomposition And Yield Model (G'DAY) into tlie large scale and multi-cover model Agro-IBIS (Integrated Biosphere Simulator). Tlie G'DAY model was
previously parametrized and validated using large experimental datasets obtained in commercial eucalypt plantations in the state of São Paulo. Implementing an *Eucalyptus* plantation cover type within AgroIBIS, which had no Plant Functional Type dedicated to fast-growing forest plantations, required important changes in the carbon allocation tumover sub-models. This study included three phases: (1) the computational modification of AgroIBIS; (2) the model parametrization, calibration and validation using data fromintensively monitored sites or inventories datasets; and (3) model application at regional scaleusing sets of parameters which were considered to be constant in space and/or time based on data from the local experiments, and other sets of parameters which could vary spatially. Carbon fluxes of *Eucalyptus* plantations were simulated at the regional scale, and their inter-annual and spatial variabilities were analysed. Such spatial and multiannual quantification of carbon fluxesat large scalesbrings a better understanding of these forest ecosystems on global carbon cycling, which is a prerequisite to support policy decisions.