



ISBA-CC: a new land surface model simulating the terrestrial carbon cycle

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The land surface model (LSM) ISBA-A-gs (Interactions between Soil, Biosphere and Atmosphere, CO₂-responsive) is specifically designed to simulate leaf stomatal conductance and Leaf Area Index (LAI) in response to climate, soil properties, and atmospheric carbon dioxide concentration. It simulates gross primary production, allowing to calculate leaf biomass and leaf area index. The growth module is modified to simulate all plant biomass pools and all terms of autotrophic respiration. The model is then coupled with a soil heterotrophic respiration parameterization in order to represent the whole terrestrial carbon cycle. The new model simulates litter and soil carbon reservoirs as well as respiration fluxes towards the atmosphere, allowing to calculate net ecosystem carbon exchange. The model is validated by comparing the simulated energy and carbon fluxes with the FLUXNET data set.