NET PRIMARY PRODUCTION OF FOREST ECOSYSTEMS USING A BIOGEOCHEMICAL MODEL ASSOCIATED WITH REMOTELY SENSED DATA

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This work is intended to test and to evaluate how a regional biogeochemical model is able to represent the major processes of the hydrologic and carbon cycles of forest ecosystems of coniferous, growing up in three different climatic areas in Brazil. The model, named FORECOS, uses Leaf Area index, LAI, as the main input variable representing the vegetation. LAI is generally accepted as being the most important variable characterizing the exchange of energy and mass between forest ecosystems and the atmosphere. There is substantial work done showing that LAI can be estimated from remotely sensed data, on the basis of the correlation that exists between LAI and vegetation index, obtained by rationing between spectral bands of optical sensors such as the Thematic Mapper (LANDSAT TM) and the NOAA-AVHRR. Simulation and sensitivity analysis on some critical parameters were used to test the suitability of the model to represent the processes of mass and energy transfer described by the model. By using digital classification procedures, patterns of vegetation were identified that should correspond to variations on LAI values, although "in situ" measurements could not be taken at this step. The results that come out from the classification suggest that within the simulations is felt to be valid. The results showed that the model was able to represent the relative differences for both the hydrologic and the carbon cycles, for the three sites chosen.

Validation with measurements of some state variables and independent variables related to net primary production and hydrology could not be done at this step either, and is to be pursued as this research goes on.