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T4b Modeling and mapping ecosystem service capacity, flow and demand with data of varying quantity and quality

Ecosystem services integrity on different phyto-ecologic zones of the Amazon State, Brazil – expert and probabilistic Bayesian model approaches

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Ecosystem Integrity (EI) can be understood as a dynamic state of natural ecosystems in which it's observed maximum capacity of resilience and self-organization of its original components that maintains many ecosystem processes related to most terrestrial biogeochemical cycles. The EI state is own of balanced systems in which one observes expressive biodiversity - functional, structural and taxonomic. EI of a given ecosystem can be considered as a proxy of biodiversity and the specific ecosystem services it provides. The objective of this work is to present the methodological approaches and the preliminary results of the integrity state of the ecosystem services for different phyto-ecologic landscape patterns of the Amazon State in Brazil. The methodological approaches consist in: (i) the generation of an ecosystem integrity spatial model, on a regional scale, based on probabilistic distribution of evidences based on learning process (dada-driven models) through the Expectation Maximization algorithm. Bayesian net has been established from an expert conceptual model that related different remote sensing dataset: Biomass (MODIS/ USGS – NASA); EVI; (iii) LAI- Leaf Area Index (MODIS/ USGS – NASA); Tree Cover (MODIS/ USGS – NASA); GPP- Gross Primary Productivity (MODIS/ USGS – NASA); (ii) model based of knowledge rules from experts and thematic data, considering the anthropic pressure and geographic isolation of differents landscape patters. Preliminary results were promising, allowing establishing correlations between EI probabilistic distribution and the expert knowledge-rules related integrity states of ecosystem services. This work is part of the ROBIN Project – Role of Biodiversity in Climate Change Mitigation - sponsored by the EU (FP7Edict.ENV.2011.2.1.4-1).

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