A SPATIAL STATISTICS APPROACH TO LAND USE COVER CHANGE MODELING

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ABSTRACT:

Present state of land use changes impacts global environmental changes. Land use and cover changes are complex processes and do not occur at random pattern in an area. In general, they are determined locally, regionally and globally by geographic, environmental, social, economic and political factors interacting at diverse temporal and spatial scales. Part of this complexity can be modeled by land use and cover change simulation models. An important step of simulation process in CLUE-S model is local influence of driving forces over the occurrence of a land use type. This influence is obtained by logistic regression model. A spatial lag regression model is proposed to select driving forces. This model incorporates spatial neighborhood information which is ignored by logistic regression. Based on a lineal trend scenario of land use demand, simulations of land use changes for Coxim microbasin, Mato Grosso do Sul, were generated, analyzed and compared using CLUE-S model under logistic and spatial regression approaches. The period of simulations was 2001-2011. Both approaches revealed elevated concordance, high global accuracy and Kappa index, to land use for 2004 reference year. Differences were observed for spatial distribution for land use simulations for 2011. Spatial lag regression simulation for 2011 reached less discrepancy to land use demand for that year.

TOPIC: Change detection and process modelling
ALTERNATIVE TOPIC: Land cover classification