

Sediment Retention modelling – the applicability of InVEST for local territorial management and planning in Brazil

Teçá Tobi Horokoski
Marilice Cordeiro Garrastazu
Sabina Dessartre Mendonça
André Eduardo Biscaia de Lacerda
Maria Augusta Doetzer Rosot

319 Colombo, PR - Brasil - 83411-000.;horokoski@gmail.com

Key words: *USLE, Ecosystem Services, InVest, GIS*

InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs) is a promising GIS tool for ecosystem services modeling that allows for assessment of the interaction between various environmental and economic components. The Sediment Retention sub-model uses the Universal Soil Loss Equation to calculate potential soil loss, sediment retention and sediment export which can be used by decision makers for land use planning at the landscape level. We applied the Sediment Retention sub-model in an area of approximately 26,000 hectares located in Caçador, (Santa Catarina state, Brazil). The region is characterized by a sub-tropical forest with both broadleaf and conifer components (Mixed Ombrophilous Forest) and the landscape is made up of small-scale farming, commercial forests and natural forest fragments of various sizes. The aim of this study was to test the applicability of the parameters and equations used in the model in Brazil and to evaluate the results based on local data for land use planning. Minimum data required to run the model include Land Use and Land Cover (LULC) mapping, soil mapping, precipitation intensity and topography; data obtained through field work and literature review were geoprocessed in order to run the model. LULC classes were defined as: roads, urban areas, agriculture, plantation forest (at different ages), natural forest, pastureland, water and perennial crops. Spatial data was developed at a higher resolution (1:50.000), adequate for the study area. Inputs are in raster format (LULC, DEM, erosivity, erodibility), vector format (watershed and sub-watersheds), and table format (cover and management factor, management practice factor and sediment retention efficiency). The study area was divided into sub-watersheds for more detailed analysis (average area of 320 hectares) and results were delivered per hectare, per sub-watershed and per pixel. In general, the results from InVEST proved to be useful for land use planning in the study area. However, difficulty in obtaining the data necessary for running the model might deter its broader use. Specifically, in Brazil data regarding precipitation and soil mapping are only available at larger scales or derived from local studies. Our results show that InVEST will be a useful tool in informed decision making in local territorial management and planning.