عنوان مقاله:

uncertainty of geographic boundaries in gis-based soil loss model

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خلاصه مقاله:

Soil loss can be important factor for dam management because it decreases the storage capacity of dam and deteriorates water-quality in reservoir. Recently, study for GIS-based soil loss model is in progress to assess soil loss amounts of basin, but available many geographic features don’t represent real-world phenomena efficiently. GIS vector data that are based on spatial analysis represents realworld phenomena with point, line and polygon features. The location of each feature and the representation of geographic boundaries should be in accord with real-world phenomena, but constructed vector data are not inclined to represent real-world phenomena efficiently. These problems occur especially to the boundary of polygon feature among point, line, and polygon features. Researchers using these data don't easily identify the inexact process of geographic boundaries and apply these data into spatial analysis without doubt. In this study, we introduced three types of geographic boundaries and evaluated efficient representation methods using data that are applied to extract input factor of soil loss model. We considered rainfall erosivity factor and topographic factors as a gradual change type, which is in accord with real-world phenomena. Although the soil map for the calculation of soil erodibility factor shows a large change type in real world, we considered soil map as an abrupt change type in existing study. To advance the uncertainty of geographic boundaries in soil map, we applied fuzzy logic approaches and compared it with the result of conventional method as an abrupt change type. We also analyzed soil loss amounts in according to soil erodibility factor (existing method & advanced method as fuzzy logic approaches) and could get different soil loss within 500m, which is the boundary limit of fuzzy membership function.

کلمات کلیدی:

Uncertainty, Geographic boundary, Fuzzy logic, GIS, Soil loss model