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Web-Based Spatial Decision Support System andWatershed Management with a Case Study

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ABSTRACT

In order to maintain a proper balance between development pressure and water resources protection, and also to improve public participation, efficient tools and techniques for soil and water conservation projects are needed. This paper describes the development and application of a web-based watershed management spatial decision support system, WebWMPI. The WebWMPI uses the Watershed Management Priority Indices (WMPI) approach which is a prioritizing method for watershed management planning and it integrates land use/cover, hydrological data, soils, slope, roads, and other spatial data. The land is divided into three categories: Conservation Priority Index (CPI) land, Restoration Priority Index (RPI) land, and Stormwater Management Priority Index (SMPI) land. Within each category, spatial factors are rated based on their influence on water resources and critical areas can be identified for soil conservation, water quality protection and improvement. The WebWMPI has user-friendly client side graphical interfaces which enable the public to interactively run the server side Geographic Information System to evaluate different scenarios for watershed planning and management. The system was applied for Dry Run Creek watershed (Cedar Falls, Iowa, US) as a demonstration and it can be easily used in other watersheds to prioritize crucial areas and to increase public participation for soil and water conservation projects.

KEYWORDS

Web-Based SDSS, Watershed Management, GIS

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