

A Simple GIS – Based Modeling of Soil Erosion and Yield in Small Basin

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Abstract: This paper proposed a simple distributed sediment prediction model by combining the USLE and transport capacity equations, and applied it in hilly area of Sichuan province to model the spatial distribution of soil erosion and transport. The main results are as follows: 1. the model established in this paper is applicable for sediment modeling in hilly area of Sichuan province; 2. with the sediment delivery ratio of 0.35, the average annual potential soil erosion is 16.8 thousands t, the erosion modulus is 675.8 t/(km² · a) in Weichenghe basin, and the modeled soil yield modulus is 238.6 t/(km² · a); 3. the Weichenghe basin is dominated by mild erosion which accounts for 68% of whole basin area, and the extremely intensive erosion accounts for less than 1%, and the intensive erosion mainly occurs at the edge of the basin where the slope is very steep; 4. the rainfall and slope effect the soil erosion more than other factors in this study area.

Key words: transport capacity; erosion intensity; USLE equation; simple model

稿 约

随着人口的增加和对山地资源需求压力的加大,山区社会经济发展和生态环境问题日趋突出,特别是不合理的人类活动和全球气候变化带来的各种山地灾害损失加重。为使山地科学研究更好地服务国家可持续发展,在建设 21 世纪新山区和实现全面建设小康社会目标中做出更大的贡献,提出本刊近期选题的重点领域如下:①山地环境演变过程与机理。主要内容:山地主要自然过程发生、发展的自然规律与机制,山地环境演变动力学,全球气候变化与山地系统响应及反馈。②山地自然资源开发与保护。主要内容:山地自然资源承载力与可持续性综合评价,山地资源优化配置及其高效利用,山地自然资源开发环境效应与保护。③山地城乡发展机制。主要内容:山地城镇化与区域发展的驱动机制,山地农村产业结构与布局,山地农村城镇建设与城乡一体化。④山地灾害形成机理与减灾。主要内容:山地灾害发生的地域背景及其形成变化规律,山区灾害潜在危险性评价与预警,山区社会经济建设与灾害综合风险管理。⑤数字山地与山地环境、灾害遥感监测评估。主要内容:现代定量山地遥感技术应用,基于山地生态系统、山地环境变化及灾害评估的数字山地信息平台 and 数字山地系统建设。⑥人山关系地域系统结构、功能与动态。主要内容:山地自然地域系统分类与评价,人山关系地域系统动力学,山地自然过程与人文过程综合研究,人山关系地域系统调控技术。热忱欢迎专家学者就以上研究内容的来稿。

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