[1]张丽萍,张登荣,张锐波,等.小流域土壤水蚀强度生态预测模型及实验模拟——以神木六道沟流域为例[J].自然灾害学报,2007,02:55-59.
ZHANG Li-ping,ZHANG Deng-rong,ZHANG Rui-bo,et al.Ecological prediction model and experimental simulation of soil water erosion in small watershed：taking Liudaogou small watershed as an example[J].,2007,02:55-59.

小流域土壤水蚀强度生态预测模型及实验模拟——以神木六道沟流域为例(PDF)

《自然灾害学报》[ISSN:/CN:23-1324/X] 期数: 2007年02期 页码: 55-59 栏目: 出版日期: 1900-01-01

Title: Ecological prediction model and experimental simulation of soil water erosion in small watershed：taking Liudaogou small watershed as an example

作者: 张丽萍[1;2]; 张登荣[3]; 张锐波[4]; 杨勤科[2]
1. 浙江大学环境与资源学院, 浙江杭州310029;
2. 中国科学院水利部水土保持研究所黄土高原土壤侵蚀与旱地农业国家重点实验室, 陕西杨陵710021;
3. 浙江大学地球科学系, 浙江杭州310027;
4. 浙江大学城市学院, 浙江杭州310015

Author(s): ZHANG Li-ping[1;2]; ZHANG Deng-rong[3]; ZHANG Rui-bo[4]; YANG Qin-ke[2]
1. College of Environmental and Resources Sciences, Zhejiang University, Hangzhou 310029, China;
2. State Key Laboratory of Soil Erosion and Dryland Farming on the Loess Pateau, Institute of Water and Soil Conservation, Chinese Academy of Sciences and Ministry of Water Resources, Yangling 710021, China;
3. Department of Earth Sciences, Zhejiang University, Hangzhou 310027, China;
4. College of City, Zhejiang University, Hangzhou 310015, China

关键词: 土壤水蚀; 生态地貌单元; 制图综合; 模型; 模拟

Keywords: soil water erosion; ecological landform unit; cartographic generalization; model; simulation

分类号: S157.1

DOI: -

文献标识码: -

摘要: 本文以黄土高原陕北神木六道沟流域为例,综合考虑土壤侵蚀发生的主要下垫面因素和土地利用类型,在GIS平台上,进行制图综合生成284个不同的生态单元个体,这些单元体可以划分成83类,而较为重要的有16类,分析、计算了各主要生态单元类型的侵蚀模数;再通过全流域各类生态单元侵蚀模数的组合,模拟了全流域在雨强为2 mm/min和1.5 mm/min的场降雨土壤水蚀模数。模拟结果显示,该方法能预测不同雨强的流域土壤水蚀模数,能体现出流域土壤水蚀强度的空间差异,推得六道沟流域土壤水蚀的严重地段集中在坡度为15°~25°的荒草地、坡地和稀疏灌木草地,而并非是整个流域,这为我们有目的地规划水土保持措施提供了依据。

Abstract: The Liudaogou small watershed,which is located at crisscross region of water and wind erosions in northern loess plateau of China,is taken as a study area.According to the principle of soil erosion,we selected some main affecting factors to generate the fundamental graphs.They are landforms surface material composition,soil types,slope gradient and land use ways respectively.Based on GIS platform,cartographic generalization were conducted and the ecological landform unit is formed.In the Liudaogou small watershed,there are 285 ecological land-form units dvided into 83 kinds,in which only 16 kinds are more important. The erosion modules of different kind ecological landform units are analyzed and calculated.Through combination of erosion modules for kinds of ecological unit in whole watershed the soil water erosion modules for rainfall intensity of 2mm/m in and 1.5 mm/m in are simulated in the smallwatershed.The results show that the simulation method can predict soil swater erosion module of whole watershed under differen trainfall intensities,reflect the spatial difference of soilwater modules in the whole watershed.The most serious section of soilwater erosion is the slope land,shrubbery and grassland with gradient of 15~25 in the watershed,and is not the whole watershed.The predictive result can provide scientific basis for layout of soil and water conservation measures.

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备注/Memo: 收稿日期:2006-10-30;改回日期:2007-3-10。
基金项目:国家自然科学基金资助项目(40271071);中国科学院黄土高原土壤侵蚀与旱地农业国家重点实验室基金资助项目(10501-113)

作者简介:张丽萍(1960-),女,教授,主要从事地貌与第四纪、土壤侵蚀和水土保持等研究.E-mail:lpzhang@zju.edu.cn

更新日期/Last Update: 1900-01-01