

邹强,周建中,周超,宋利祥,郭俊,杨小玲.基于可变模糊集理论的洪水灾害风险分析[J].农业工程学报,2012,28(5):126-132

## 基于可变模糊集理论的洪水灾害风险分析

### Flood disaster risk analysis based on variable fuzzy sets theory

投稿时间: 2011-07-01 最后修改时间: 2011-12-27

中文关键词: [洪水灾害](#), [风险评价](#), [指标化](#), [可变模糊集](#), [风险等级](#), [荆江分洪区](#)

英文关键词: [flood damage](#) [risk assessment](#) [indexing](#) [variable fuzzy sets theory](#) [flood risk grade](#) [Jingjiang flood diversion district](#)

基金项目: 国家“973”重点基础研究发展计划项目(2007CB714107); 水利部公益性行业科研专项(201001080); 高等学校博士学科点专项科研基金(20100142110012)

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中文摘要:

依据灾害系统理论,综合考虑洪水灾害系统的自然和社会属性,构建了洪水灾害风险综合评价指标体系,制定了相应指标的评价标准;在此基础上,以乡镇行政单元为基本评价单元,基于可变模糊集理论,采用可变模糊评价模型确定评价单元指标对各级指标标准区间的相对差异函数和相对隶属度,并通过变换组合参数进行综合评价,计算得到各评价单元的危险等级和易损等级,并结合风险等级分区矩阵,将研究区域划分为极高风险、高风险、中等风险、较低风险和低风险5个等级。最后,以荆江分洪区为典型研究区域,实例研究表明,该方法计算简便,评价结果可信度高,与实际调研情况一致,为洪水灾害风险评价提供了新思路,可推广到其他自然灾害的风险分析中。

英文摘要:

Based on the disaster system theory and the consideration of natural properties of hazard and environmental as well as socioeconomics of hazard-affected bodies, the primary risk assessment system and grading standard for flood diversion district were established. Then taking the towns as the basic assessment units, on the basis of variable fuzzy sets theory, the corresponding model for variable fuzzy assessment was established, which could reasonably identify the relative membership degree between the index of assessment unit and its standard interval, thus properly determine the comprehensive assessment grade of each unit by varying the parameters of the model. In this way, the flood hazard grade and flood vulnerability grade for each unit could be calculated, respectively. After that, the flood risk grade for each unit was achieved from flood hazard and vulnerability grade with the flood risk grade classification matrix, which was divided into five grades, i.e. very high, high, medium, low, and very low respectively. Finally, taking the case study in Jingjiang flood diversion district for example, the practical application showed that the method was flexible and its results fitted with the actual situations. The method can also be applied for risk assessment of other natural disasters.

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