[1]刘家福,吴锦,蒋卫国,等.基于泊松-对数正态复合极值模型的洪水灾害损失分析[J].自然灾害学报,2010,06:61-66.

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基于泊松-对数正态复合极值模型的洪水灾害损失分

Title: Flood disaster losses analysis based on the Poisson-lognormal compound extreme model

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摘要: 在国际紧急灾害数据库的支持下,得到了中国在1980-2008年间发生的年洪水灾害发生次数、年单次洪水灾害经济损失极大值和年洪水灾害经济总损失3个统计指标;根据复合极值理论,利用泊松-对数正态复合极值模型对洪水灾害经济损失进行了分析。研究结果表明:(1)洪水灾害经济损失遵从对数正态分布;(2)单次极值经济损失与年经济总损失具有高度相关性;(3)复合极值方法可有效地用于洪水极值重现期的重建;(4)与传统的经验频率计算方法相比,该方法能克服因资料年限短、数据不足而造成的洪灾重现周期估算困难。

Abstract: Based on the EM-DAT(OFDA/CRED) emergency disaster database,three samples of statistical data,including the number of flood disasters,the maximum economic loss in a single flood disaster and the total economic loss in floods were obtained annually from 1980 to 2008 in China.And then,according to compound extreme distribution,Poisson-lognormal compound extreme model was utilized to analyze economic losses of flood disaster.The results indicate that:(1)economic losses of flood disaster is subject to log-normal distribution;(2) a high correlation exists between single extreme economic losses and the total annual economic loss;(3)

compound extreme value method is highly effective in reconstruction of return period of extreme flood. (4) compared with the traditional experience method of calculating the frequency, the method can overcome the difficulties of estimating return period due to insufficient information on data and year number.

参考文献/REFERENCES

[1] 陈颙,史培军.自然灾害[M].北京,北京师范大学出版社,2007.
[2] EM-DAT Emergency Disasters Data Base[DB/OL].http://www.em-dat.net.
[3] 史培军.三论灾害研究的理论与实践[J].自然灾害学报,2002,11(3):1-9.
[4] 周成虎,万庆,黄诗峰,等.基于GIS的洪水灾害风险区划研究[J].地理学报,2000,55(1):15-24.
[5] Tawatchai, Tingsanchal,i Mohammed F K.Flood hazard and risk analysis in the southwest region of Bangladesh [J].Hydrological Process,2005,19:2055-2069.
[6] Colin R R,B renda J B,Am and a JW,et al. Comparison of flood hazard assessments on desert piedmonts and playas:Acase study in Ivanpah Valley,Nevada[J].Geomorphology,2009,103(4):520-532.
[7] Dutta D,Herath S,Musiake K.A mathematical model for flood loss estmiation[J].Journal of Hydrology,2003,277(1):24-49.
[8] Gareth P,Sylvain N.Use of computer models of flood inundationto facilitate communication in flood risk management [J].Environmental Hazards,2007,7(2):106-114.
[9] Neri A,Aspinall W P,Cioni R,et al. Developing an Event Tree for probabilistic hazard and risk assessment at Vesuvius [J].Journ al of Volcanology and Geothermal R esearch,2008,178(3):397-415.
[10] 周成虎.洪水灾害评估信息系统研究[M].北京:中国科学技术出版社,1993.
[11] 纪昌明,梅亚东.洪灾风险分析[M].武汉:湖北科学技术出版社,2000.
[12] 刘新立,史培军.空间不完备信息条件下的区域自然灾害风险评估[J].自然灾害学报,2000,9(1):26-32.
[13] 李继清,张玉山,王丽萍,等.洪灾综合风险结构与综合评价方法()宏观方面[J].武汉大学学报(工学版),2005,38(5):19-23.
[14] 徐高洪.洪灾损失系列线型研究[J].自然灾害学报,1996,5(1):73-78.
[15] 段春青,邱林,陈晓楠,等.基于混沌优化神经网络的洪灾损失概率分析[J].应用基础与工程科学学报(增刊),2006,14:247-251.
[16] 黄诗峰.洪水灾害风险分析的理论与方法研究[D].北京,中国科学院地理研究所,1999.
[17] 马逢时,刘德辅.复合极值分布理论及应用[J].应用数学学报,1979,2(4):366-375.
[18] 刘德辅,王莉萍,宋艳,等.复合极值分布理论及其工程应用[J].中国海洋大学学报,2004,34(5):893-920.
[19] 王莉萍.多维复合极值分布理论及其工程应用[D].青岛:中国海洋大学,2005.
[20] 董胜,刘德辅.不完整风暴增减水序列的统计分析[J].海洋通报,1999,18(6):63-70.
[21] 刘德辅,谢波涛,伍远康,等.台风诱发暴雨降水量的概率预测[J].中国海洋大学学报,2007,37(6):1027-1033.
[22] 司瑞洁,温家洪,尹占娥,等.亚洲洪水统计特征[J].科技导报,2007,25(6):60-67.