

[1]赵安,王婷君.基于过程机理的洪灾生命损失评价模型框架初探[J].自然灾害学报,2013,01:38-44.

ZHAO An,WANG Tingjun.Process and mechanism-based preliminary study on flood life loss assessment model framework [J].,2013,01:38-44.

点击复

制

## 基于过程机理的洪灾生命损失评价模型框架初探(PDF)

《自然灾害学报》[ISSN:/CN:23-1324/X] 期数: 2013年01期 页码: 38-44 栏目: 出版日期: 2013-07-18

Title: Process and mechanism-based preliminary study on flood life loss assessment model framework

作者: [赵安<sup>1, 2</sup>](#); [王婷君<sup>3</sup>](#)

1. 江西师范大学,江西 南昌 330022;
2. 江西师范大学 鄱阳湖湿地与流域研究教育部重点实验室,江西 南昌 330022;
3. 江西财经大学,江西 南昌 330013

Author(s): [ZHAO An<sup>1, 2</sup>](#); [WANG Tingjun<sup>3</sup>](#)

1. Jiangxi Normal University, Nanchang 330022,China;
2. Key Lab of Poyang Lake Wetland and Watershed Research of Ministry of Education, Jiangxi Normal University Nanchang 330022,China;
3. Jiangxi University of Finance and Economics,Nanchang 330013,China

关键词: [洪灾生命损失](#); [回顾与问题](#); [过程机理模型框架](#)

Keywords: [flood incurred life loss](#); [review and problems](#); [process and mechanism based model framework](#)

分类号: X43

DOI: -

文献标识码: -

摘要: 21世纪以来接连发生的印度洋海啸、美国卡特里那飓风、孟加拉强热带风暴等一系列与洪水有关的自然灾害,给人类生命和财产造成了巨大损失,说明当今世界低海拔地区的洪灾脆弱性。系统回顾了目前洪灾生命损失评估采用的经验统计法与GIS分带法,发现这些研究方法忽视了造成洪灾生命损失的过程与机理,计算结果存在较大的不确定性;根据洪灾发生的过程及其生命损失的机理构建了一种新的洪灾生命损失评估模型框架。首先采用"人口吸引动态空间化GIS模型"模拟洪水期间典型时段的人口动态空间分布;其次用基于DEM和GIS网格的"环形"洪水淹没算法进行洪水演进过程的数值模拟,获得水深-流速的洪水过程时空场;接着用GIS网络分析和线性规划方法计算灾区成功转移与转移失败的人口数量及空间分布;然后用避难场所人口空间再分配模型,计算成功避难与避难失败的人口数量及空间分布;最后用建筑物倒塌和个体水中不稳的生命损失评估模型,计算用作避难场所的高层建筑物倒塌和困于水中人员的潜在生命损失。

Abstract: Consecutive flood-related natural hazards like Indian tsunami, Katrina hurricane and Bangladesh tropical storm since the 21st century have resulted in tremendous life and economic losses, indicating the vulnerability to flood in lower elevation regions around the world. This paper systematically reviewed and summarized the empirical/statistical and GIS zoning approaches adopted in flood incurred life loss assessment, and found that present approaches often result in

导航/NAVIGATE

[本期目录/Table of Contents](#)

[下一篇/Next Article](#)

[上一篇/Previous Article](#)

工具/TOOLS

[引用本文的文章/References](#)

[下载 PDF/Download PDF\(930KB\)](#)

[立即打印本文/Print Now](#)

[推荐给朋友/Recommend](#)

统计/STATISTICS

摘要浏览/Viewed 321

全文下载/Downloads 193

[评论/Comments](#)



obvious assessment uncertainty, because the factors of flood process and causal mechanism that lead to life loss were neglected. A new model framework of life loss assessment based on flood process and causal mechanism of life loss was then proposed. First, the population attraction GIS dynamic spatialization model was adopted to simulate the population dynamic distributions at typical flooding period and time; second, a DEM and GIS grid-based ring algorithm of flood inundation was applied to simulate flood process to produce flow velocity-depth dynamic fields; third, GIS network analysis and linear programming methods was utilized to generate the population distribution of successfully evacuated people and unsuccessfully evacuated people; fourth, a refuge shelter population redistribution model was employed to generate the population distribution for the successfully sheltered victims and unsuccessfully sheltered victims; finally, building collapse model and human instability model were adopted to estimate the potential flood life loss from collapsed buildings and flood-stranded population.

---

#### 参考文献/REFERENCES

-

---

备注/Memo: 收稿日期:2012-5-7;改回日期:2012-7-10。

基金项目:国家自然科学基金项目(81260449)

作者简介:赵安(1963-),男,教授,博士,主要从事地理学、GIS&RS、自然灾害、生态环境与公共卫生等研究.E-