Spatial Data Management and Analysis System for Flood Hazard Mitigation of Poyang Lake Watershed, China

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Abstract

Flood hazard Prevention and mitigation of Poyang Lake watershed is an emergent environmental problem because Poyang Lake watershed is one of the regions exposed most frequently to flood hazard in China. In order to meet the need of disaster reduction decision making of Poyang Lake watershed, Spatial Data Management and Analysis System of China Land Territory (not include islands in South Sea of China)for Flood Hazard Mitigation(short for SMAS-FHM) has been established making use of the methodology of spatial database technology based on Oracle9i&ArcSDE9. This paper, probes into designing and implementation of multi-resources and scales massive spatial database management system about flood hazard, and integral management between hazard thematic data and spatial data. Especially, a bitmap index adapted to primal TM/ETM+ image has been put forwards and realized to accelerate data search in the spatial database, which is turned out to be efficient and effective. Based on carrying out experiment, this paper has been also researched the key issues, including massive spatial data and flood hazard thematic data organization and storage, spatial index creating, spatial data searching, and flood hazard analysis models realizing and their effective organizing, such as flooding areas computing, 3-dimension flooding simulation, refuge location selection, refugee evacuation path analysis and relief material dispensing. Finally, important applications of SMAS-FHM in flood hazard mitigation have been also discussed for Poyang Lake watershed.

Keywords

Poyang Lake watershed, flood hazard, massive spatial database, bitmap index, decision making system, Geographic Information System (GIS)