作者	张彬
中文题名	青岛市大沽河流域防汛信息系统研究
英文题名	Research on Flood Management Information Systems in QingDao City's Daguhe River Basin
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中文文摘	随着计算机信息技术与水利学科的交叉融合以及数字水利、数字流域概念的提出，水利信息化已经成为这一行业领域的主要发展方向，基于海量地理信息数据库（Geo-DataBase）的地理信息系统平台（GIS）在水利科研管理中得到广泛的应用，水利工程中防汛信息系统、水资源调度管理系统、水污染防治应急系统等的需求越来越高。各种流域模型在与地理信息系统平台结合后在数据的收集、存储，提取与处理的基础上都有了很大的发展，可以更准确地模拟流域的各种水文学和水力学过程，在水利工程的规划设计、防洪减灾、水量分配等方面有更为广泛的应用。本文的研究目标是建立青岛市大沽河流域防汛信息系统。论文以模拟青岛市大沽河干流汛期洪水位变化，以及如果洪水淹没，洪水在大堤外区域的平面扩散与演进为核心，兼顾大沽河流域各种水利水文及其他社会经济信息的查询分析功能。系统在 MAPX 地理信息系统开发软件、数据库存储技术和水流数学模型的支持下，分为信息基础平台、专业计算平台和辅助决策服务平台三个层次。信息基础平台对应的是大沽河流域基本的地理信息，实时的水文信息以及其他综合性信息，是系统的数据仓库；专业计算平台一方面通过水流数学模型对一维和二维洪水进行预测预报，另一方面根据用户的需要完成所需的查询与分析功能；辅助决策平台以最直观简洁的方式向用户展示系统的输出结果。系统数据库的开发在满足系统要求的基础上完成了与青岛市雨情水情自动监测系统的对接，保证两个系统数据库的数据共享与传输，以及所有数据的完整性、安全性和准确性。系统集成了一维非恒定流模型与平面二维非恒定流水流模型，可以根据大沽河流域降雨量计算干流的水位变化以及发生溃堤后洪水的淹没过程。大沽河防汛信息系统模拟了大沽河流域 20 年一遇、50 年一遇的潮洪组合下的洪水水位，计算结果与实测资料相吻合。系统计算了 2005 年 9 月大沽河流域的两次降雨，以及流域遭受百年一遇洪水及高潮位影响的工况，结果表明大沽河流域堤防可以满足 50 年一遇的防洪要求，但是在遭遇百年一遇潮洪组合或高潮位的情况下河道下游容易发生洪水灾害。
外文文摘	With the interdiscipline of information and hydraulic engineering, and proposal of digital hydrology and watershed, hydro-information gradually turn into the main development trend in hydraulic engineering. Based on the geo-database and GIS platform as technology integration, flood control information system, water resource regulation system and water pollution control system become requirement and widely applied. The information and data, which are transferred and calculated in the digital hydrology and watershed system, could be collected, stored, extracted and transacted for advantage of more accurate simulation of hydrologic and hydrodynamic process. Therefore, the system should play an important role in engineering design, flood control, disaster mitigation and water resource allocation.This paper presents the contributions of Daguhe River Basin's Flood Management Information Systems which involves three main efficiencies ---calculating and forecasting elevation and velocity of flow in Daguhe River main channel in flood season; calculating and forecasting the flood area out of levees if bank-break occurred; enquiring and analyzing hydraulic, hydrologic, social and economic information. The system is classified by three modules as information platform, professional platform and assistant decision platform, whose technology is supported by the MAPX GIS tools, database and numerical simulation. The information platform is a data store for all integrated information in system; professional platform uses the 1-dimensional and 2-dimensional numerical models for flood calculation; assistant decision platform shows the results in a visual and brief way. The database design not only meets the demands of system development, but also makes connection to the Precipitation and Flow Automatic Inspection System in Daguhe River Basin. Accordingly, data sharing, transfer and exchange are implemented between two databases and the integrality, safety and veracity of data is in security. 1-dimensional and 2-

	dimensional numerical models are the core technology which is integrated in the system as background.The system simulated elevation of water in the case of 20-year and 50-year frequency storm and flood, and the results agree with the observation data. The system also calculated the cases of precipitation in September, 2005, and simulated 100-year frequency flood and high height of tide. The results showed that the disaster would occurred in 100-year frequency flood and high level of tide.
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