Geophysical Research Abstracts
Vol. 19, EGU2017-11146, 2017
EGU General Assembly 2017

InteractInteraction mechanism of emergency response in geological hazard perception and risk management: a case study in Zhouqu county

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China is one of few several natural disaster prone countries, which has complex geological and geographical environment and abnormal climate. On August 8, 2010, a large debris flow disaster happened in Zhouqu Country, Gansu province, resulting in more than 1700 casualties and more than 200 buildings damaged. In order to percept landslide and debris flow, an early warning system was established in the county. Spatial information technologies, such as remote sensing, GIS, and GPS, play core role in the early warning system, due to their functions in observing, analyzing, and locating geological disasters. However, all of these spatial information technologies could play an important role only guided by the emergency response mechanism. This article takes the establishment of Zhouqu Country's Disaster Emergency Response Interaction Mechanism (DERIM) as an example to discuss the risk management of country-level administrative units.

The country-level risk management aims to information sharing, resources integration, integrated prevention and unified command. Then, nine subsystems support DERIM, which included disaster prevention and emergency data collection and sharing system, joint duty system, disaster verification and evaluation system, disaster consultation system, emergency warning and information release system, emergency response system, disaster reporting system, plan management system, mass prediction and prevention management system.

At last, an emergency command platform in Zhouqu Country built up to realize DERIM. The core mission of the platform consists of daily management of disaster, monitoring and warning, comprehensive analysis, information release, consultation and decision-making, emergency response, etc. Five functional modules, including module of disaster information management, comprehensive monitoring module (geological monitoring, meteorological monitoring, water conservancy and hydrological monitoring), alarm management module, emergency command and disaster dispatching management module are developed on the basis of this platform. Based on the internet technology, an web-based office platform is exploited for the nodes scattered in departments and towns, which includes daily business, monitoring and warning, alarm notification, alarm recording, personnel management and update in disaster region, query and analysis of real-time observation data, etc.

The platform experienced 3 years' test of the duty in flood period since 2013, and two typical disaster cases during this period fully illustrates the effectiveness of the DERIM and the emergency command platform.