



Quickly evaluation of earthquake-triggered landslides hazard based on landslide susceptibility analysis

Xiaoli Chen (1), Chunguo Liu (2), Nana Han (3), and Jian Lan (1)

(1) Key Lab of Active Tectonics and Volcano, Institute of Geology, China Earthquake Administration, Beijing, China (04chxl@sina.com), (2) China Earthquake Networks Center, Beijing, 100045, China, (3) School of Geoscience, China University of Petroleum, Qingdao 266580, China

There is a need for models that are able to quickly predict the locations of earthquake-triggered landslides following large seismic events. With the advent of GIS technology, the Newmark (1965) block model has been widely adopted as a method that can be applied over large due to its basis in physical parameters and high accuracy of prediction. In this model, block behavior under seismic loading is determined using a balance of resisting and driving forces. Based on this principle, we evaluated the coseismic landslides hazards caused by the 2017 Jiuzhaigou, Sichuan, China, Ms7.0 earthquake, which caused 194 landslides with individual area > 700 m². Firstly, we prepared a landslide susceptibility map in the study area using critical acceleration values obtained by Newmark block model analysis. Then we comparing the landslide susceptibility map with the PGA distribution map and evaluated earthquake-triggered landslides caused by the M7.0 Jiuzhaigou earthquake. The results show that method is feasible and practicable in quickly evaluation of earthquake-triggered landslides. Comparing with using PGA alone as an index to assess the co-seismic landslides hazard after an earthquake, the method presented in this study, which considers landslide susceptibility in advance, has a big advantage of providing a more accurate result by indicating the places most likely to be subjected to landslides.