Geophysical Research Abstracts
Vol. 12, EGU2010-7637, 2010
EGU General Assembly 2010

Characterization of active normal faulting and associated inundation risks based on LiDAR DTM

Rou-Fei Chen (1,4), Chih-Yu Kuo (2), Kuo-Jen Chang (3), and Yu-Chang Chan (4)

(1) Department of Geology,Chinese Culture University, Taipei, Taiwan, R.O.C.,
(roufei@earth.sinica.edu.tw,+886-227839871), (2) Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan, R.O.C., (3) Department of Civil Engineering, National Taipei University of Technology, Taipei, Taiwan, R.O.C., (4) Institute of Earth Sciences, Academia Sinica, Taipei, Taiwan, R.O.C.

Rapid, however uncontrolled, urbanization has become one of the major issues in hazard and risk management. This is certainly one of the major environmental problems in the world, today and in the coming years. In the past decade, in the reason of it is easily to demonstrate the morphological signals in active structures, the digital terrain models (DTM) have been used intensively to analyzing the landforms and its submerged structures. However, the quality of the analysis is based on the quality of the DTM, since the data provide more detail topography information and hints the submerge tectonics activity. Historical records show that severe earthquakes may have caused significant surface ruptures and mass inundation hazards around the Jinshan delta, Taipei metropolitan in northern Taiwan. Based on the newly developed LiDAR DTM to pinpoint the locations of active faulting which is not be well observed, neither documented in the study area. Based on the analysis of river profiles, locations of normal faulting with 3.3 m offset were recognized in the northwestern side of the Jinshan delta area. The overall river pattern also deciphers a sinistral strike-slip, accompanying with minor normal faulting. The DTM analysis following by in-site field verification, indicate that the normal fault system is possibly been activated. In spite of high denudation rate in Taiwan, the well preserved but minor fault scarp demonstrate is highly activity. Considering such a normal faulting event may occur in the future, we thus model the possible earthquake and the associated flooding effects in this area. Form our results, flooding areas can be determined by the LiDAR topography in conjunction with high resolution digital aerial photographs. Finally, a subsidence modeling due to normal faulting demonstrates how topographic information produced by the LiDAR technique can be accurately used for predicting future flooding hazards.