Geophysical Research Abstracts
Vol. 19, EGU2017-16706, 2017
EGU General Assembly 2017

Pioneer Vegetation Detection by Hyperspectral Images on Temporal Landslides: A case study of Tzengwen catchment upstream, Taiwan

Youg-Sin Cheng (1), Teng-To Yu (1), Roey Egozi (2), and Paolo Tarolli (3)

(1) Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan (zelcago@gmail.com), (2) Soil Erosion Research Station, MOAG, Israel, (3) Dept. of Land, Environment, Agriculture and Forestry, University of Padova, Italy

In the southern part of Taiwan, shallow landslides are common natural disasters i.e. in the Alishan region. One unique example is the typhoon Morakot in 2009 during which heavy rainfall triggered many scattered but massive landslides at the upstream area of Tzengwen catchment in Alishan. Landslide scars could be easily identified due to the bare soil that remained after most of the vegetation had been removed. After the event, observations made at the same area documented the establishment of few pioneer plants that started covering the bare land and survived several typhoons in the following years. This study examines the links between the pioneering vegetation and shallow landslides dynamic. High temporal resolution of satellite images, i.e. after heavy rainfall events from 2009 to 2015, were used to detect landslides. We then classified the landslides into three categorise 1) old stable landslide – no significant change in its area has been detected and quantified; 2) old dynamic landslide – landslide was growing, a major change in its area has been detected; 3) new landslide – a landslide that formed after an event. In total 159 landslides were mapped in the study area, most of them formed after typhoon Morakot ($\sim$ 50%) of which 23% landslides which had been triggered by typhoon Morakot remained dynamic and continued to grow or triggered again. The succession of pioneered vegetation, such as Arundo formosana - one of the native pioneer plants is examined with 1-m hyperspectral images taken in 2016 for the same area. To enhance the landslide volume of the slope-failure assessments, a variety of data processing have been conducted. After finalizing the atmospheric correction, the NDVI technique to remove the non-vegetation area, and the Minimum Noise Component (MNF), we expect to that certain types of vegetation would be considered as markers for landslides detection. This would allow sophisticated indirect method in order to study post event landslides dynamics or recovery rate at larger spatial scales.