Geophysical Research Abstracts
Vol. 21, EGU2019-289, 2019
EGU General Assembly 2019

Object-Based Landslide Identification and Characterization with UAV imagery

Efstratios Karantanellis and Vassileios Marinos

Aristotle University of Thessaloniki, Dept of Geology, Lab of Engineering Geology and Hydrogeology, THESSALONIKI, Greece (skarantanellis@gmail.com)

Landslides and rockfalls phenomena have serious dramatic impacts in society and infrastructure and lead to disastrous situations. To mitigate the effects of those disasters, precise and accurate data in emergency situations is valuable to provide knowledge to experts. Nowadays, close-range photogrammetry and individually UAV photogrammetry has become an indispensable tool for landslide experts in order to provide ultra high-resolution 3D models of the topography of the case site under examination. Due to the continuously increasing spatial resolution capability of new generation sensors, traditional pixel-based approaches are not capable to cope with the level of detail resulted from those sensors. Mostly, landslides present complex geomorphological features with great heterogeneity in their spatial, spectral and contextual properties dependent on the specific failure mechanism. Human eyes are capable to understand landslide spectral characteristics, shape and its relationship to its neighborhood such as stable areas. In the current paper, an object-based 3D approach for the automated detection of landslide hazard is presented based on detailed topographic photogrammetric point cloud. Typically, the current approach is taking the full advantage of spectral information resulted from the orthoimage and integrate the latter with the 3D properties of the Digital Surface Model (DSM) to precise identify landslide elements such as landslide scarp and depositional zone. The results show that object-based approach is closer to human interception due to integration of contextual and semantic, spectral and spatial information rather than translating pixel's spectral information solely. The current procedure provides a detailed objective quantification of landslide characteristics and automated semantic landslide modelling of the case site.