

UAS-BASED PHOTOGRAMMETRY FOR 3D-MAPPING AND REDUCTION OF LANDSLIDE RISK IN TECTONICALLY ACTIVE AREAS: THE CASE OF CHIOS ISLAND (GREECE)

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ABSTRACT

The North Aegean islands are characterized by particular geodynamic and seismotectonic regime and by great amount of natural disasters. Recent earthquakes in Greece, testify that North Aegean region is seismically active. An earthquake can increase the chances and the frequency of landslides for an area. On Chios island, along the Chios-Kardamyla Road, and specifically in the region from Mersinidi to Myliga area, there is a significant thrust between Paleozoic clastic and Triassic carbonaceous formations. In this area many landslides have occurred. The regime, the crucial differentiations of the environment and human activities can lead to extensive damage. Thus, it was necessary to identify the hazardous areas and the specific places aggravated by earthquakes or considered as dangerous to landslides. This study presents the procedure followed for: (a) Evaluation of existing geological, geotectonic, hydrogeological, seismotectonic and geotechnical data, (b) UAV mapping and creation of Digital Surface Models (DSM); (c) Geological-Tectonic mapping for the wider area; (d) Research of discontinuous tectonic deformation that the formations have undergone; (e) Research of the hydrogeological conditions of the area and determination of the role of groundwater in rock and soil movements; (f) Geotechnical mapping of the formations; (g) Recording and processing of the measurements of the geometrical features of the structures in the area. All the data above in combination with the extracted plans for rockfall and rock slides, the simulation models of rockfalls, the results of drillings along the specific section of the road and the causes of slidings, led to the suggestion of appropriate countermeasures for landslides.

Keywords: SfM, landslides, rockfalls, 3D-modeling, tectonics.