ASSESSMENT OF ACTIVE TECTONICS BY QUANTIFYING GEOMORPHOLOGICAL, GEOLOGICAL AND MORPHOTECTONIC ASPECTS. THE CASE OF CRETE ISLAND, GREECE.

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ABSTRACT:

The destructive effects of earthquakes impact on many sectors of human life. It is important for decision makers to be aware in advance of areas prone to seismic hazard. Geomorphometric data derivatives that can be extracted from Digital Elevation Models (DEMs) provide information relevant to geomorphological, geological and morphotectonic features. Such information can reveal interactions between neotectonic deformation, Earth surface processes and landforms. That knowledge improves our understanding of landscape evolution and the processes that produce geodiversity. The extracted geomorphological, geological and morphotectonic information, derived via Multi-Criteria Decision Analysis (MCDA), is further examined using a Geographical Information System (GIS), providing a robust methodology for detecting and mapping zones of neotectonic deformation. The test region for this study is the island of Crete, located in the outer forearc of the Hellenic subduction zone, associated with mountainous relief and geomorphological processes that are strongly influenced by neotectonic deformation of the ground surface. This MCDA approach to mapping the spatial distribution of neotectonic activity provides a low-cost rapid reconnaissance tool for the seismic hazard component of disaster risk reduction.

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