

The tectonomorphic analysis on the Gulf of Corinth (Boeotia, Greece) using the ValleyMorph Tool

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Understanding the geomorphic development of a tectonically active landscape can help better assess seismic hazards. One such earthquake prone region is the tectonically active rift in the easternmost extension of the Gulf of Corinth in Boeotia, Greece. The conventional tectonomorphic analysis of a geographical region consists of tedious manual extraction of the Transverse topographic symmetry (T)-factor ratio which determines basin tilt and differential uplift due to tectonic activity. Hence, researchers depend on visual approximations of aerial photographs and satellite imagery on a limited number of watersheds therefore subjectively performing statistical analyses to determine the T-factor values. The ValleyMorph Tool is a Python-based ArcGIS extension presented by Dr. Heidi Daxberger in response to these traditional methods of basin analysis. This automated alternative claims to effectively extract tectonomorphic indices through manipulation of Digital Elevation Models. This study is aimed to study the adaptability, efficiency and accuracy of the ValleyMorph Tool through its application on the tectonically active region in the Gulf of Corinth, Greece. The T-factor results produced in this research were presented in asymmetry vector maps and polar plots. When compared with manually extracted results from a previous study, the asymmetry vectors maps showed a positive correlation whereas the polar plots displayed no correlation. Possible recommendations and further research opportunities are mentioned in this research.