



## **Automatic identification of fault surfaces through Object Based Image Analysis of a Digital Elevation Model in the submarine area of the North Aegean Basin**

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The current study was focused on the seafloor morphology of the North Aegean Basin in Greece, through Object Based Image Analysis (OBIA) using a Digital Elevation Model. The goal was the automatic extraction of morphologic and morphotectonic features, resulting into fault surface extraction. An Object Based Image Analysis approach was developed based on the bathymetric data and the extracted features, based on morphological criteria, were compared with the corresponding landforms derived through tectonic analysis. A digital elevation model of 150 meters spatial resolution was used. At first, slope, profile curvature, and percentile were extracted from this bathymetry grid. The OBIA approach was developed within the eCognition environment. Four segmentation levels were created having as a target “level 4”. At level 4, the final classes of geomorphological features were classified: discontinuities, fault-like features and fault surfaces. On previous levels, additional landforms were also classified, such as continental platform and continental slope. The results of the developed approach were evaluated by two methods. At first, classification stability measures were computed within eCognition. Then, qualitative and quantitative comparison of the results took place with a reference tectonic map which has been created manually based on the analysis of seismic profiles. The results of this comparison were satisfactory, a fact which determines the correctness of the developed OBIA approach.