Geophysical Research Abstracts
Vol. 16, EGU2014-9780, 2014
EGU General Assembly 2014

Coastal and submarine instabilities distribution in the tectonically active SW margin of the Corinth Rift (Psathopyrgos, Achaia, Greece)

Eirini Simou (1), Dimitrios Papanikolaou (1), Vasilios Lykousis (2), Paraskevi Nomikou (1), and Emmanuel Vassilakis (1)

(1) National and Kapodistrian University of Athens, Faculty of Geology and Geoenvironment, Department of Dynamic, Tectonic and Applied Geology, (2) Institute of Oceanography, Hellenic Centre for Marine Research, Anavyssos, Greece

The Corinth Rift, one of the most active rifts in the world as local extension trending NE-SW reaches the amount of 14±2 mm/yr, corresponds to one of the largest zones of seismically active normal faulting. The formation, growth and migration southwards of the prevailing fault systems, which evolve simultaneously with the intense morphogenetic processes, are overprinted in the age, facies and thickness of the Plio-Pleistocene sequences constructing the south margin of the western Gulf of Corinth. The dominant fault blocks, defined by east-west trending, north dipping normal faults, are accompanied by several morphological features and anomalies, noticed in both the terrestrial and the marine environment. Our main aim has been to examine how the tectonic evolution, in combination with the attendant fierce erosional and sedimentary processes, has affected the morphology through geodynamic processes expressed as failures in the wider coastal area. High resolution multibeam bathymetry in combination with the available land surface data have contributed to submarine and subaerial morphological mapping. These have been used as a basis for the detection of all those geomorphic features that indicate instabilities probably triggered, directly or indirectly, by the ongoing active tectonic deformation. The interpretation of the combined datasets shows that the southwestern margin of the Corinth Rift towards Psathopyrgos fault zone is characterized by intense coastal relief and a narrow, almost absent, continental shelf, which passes abruptly to steep submarine slopes. These steep slope values denote the effects of the most recent brittle deformation and are related to coastal and submarine instabilities and failures. High uplift rates and rapid sedimentation, indicative of the regional high-energy terrestrial and submarine environment, are subsequently balanced by the transportation of the seafloor currents, especially where slope gradients decrease, disintegrating the probable slide deposits. Conversely, the nearby active -but older- tectonic structure of the Heliki fault, is related to less steep slopes. Canyons are extensive and sediment mass failures appear as retrogressive landslide scars identified near the headwalls. The mass movements evolving near the coastal and shallow marine areas may have a high tsunamigenic potential, which depends on the volumes of the mobilized materials. As a special interest has been arisen nowadays concerning risk assessment and management, the results of our study can be further evaluated from a geohazard perspective.