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

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The Gulf of Corinth, the northern and most active part of the present-day Corinth Rift, constitutes a natural Laboratory for morphotectonic studies as it has been long identified as a site of major importance due to the continuous tectonic deformation.

The extremely high rates of concentrated seismicity, the enduring neotectonic activity deforming the coastal region of the NW Peloponnese, the exposure of the well preserved sedimentary sequences and the evidence of the intense geomorphological processes indicate the consequences of active deformation in the Gulf of Corinth. This active deformation, resulting from the high extensional rates (reaching approx. 14 mm/yr) renders the western part of the Gulf as the most active of the Corinth Rift, arousing special interest for understanding the physical model related to fault activity and surface processes.

The NW Peloponnese is mainly characterized by extensive occurrence of post-alpine deposits of Quaternary (Ori, 1989) and alpine formations of Pindos nappe.

The combined datasets interpretation shows that the intense geomorphological processes indicate the high uplift rates towards the Psathopyrgos fault zone, denoting the effects of the most recent brittle deformation which are related to limited but abrupt change of slope values, reflecting the position of active tectonic structures.

The construction of a Digital Elevation Model (DEM) has been the basis of the current analysis as it provides a representation of the terrain's surface from which various qualitative and quantitative values may be extracted. These values may allow the evaluation of specific morphostructural elements and characterise various processes that affect the landscape.

The NW Peloponnese, characterized by a steep coastal escarpment has been primarily used for the construction of a combined DEM, which is subjected to further detection of all those geomorphic features and anomalies that indicate the ongoing active tectonic deformation and the effects of the erosional processes.

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C O N C L U S I O N S

The erosional processes are expressed not only by slow rates of grain-by-grain weathering and transportation through the fluvial systems but by instant mass failures as well. Local tectonics combined with the steep slope values, the intense seismic activity and the high rates of sedimentation in the coastal region contribute to a high-energy geodynamic environment, enching the possibility of instabilities triggering at the coastal zone. The steep slope values towards the Psathopyrgos fault zone denote the effects of the most recent brittle deformation which are related to limited but significant slope instabilities (e.g., Panagopoula landslides). Consequently, the area of the least active West Heliki fault is related to less steep slopes at the margins of the basin.

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REFERENCES


Poulimenos, G., 1992; Palyvos et al. 2007), is characterized by a steep coastal escarpment which passes abruptly to steep submarine slopes. The high extensional rates and the alpine basement of Pindos Geotectonic Unit (green colour).

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