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### **Natural Hazards related to recent geological processes and regional evolution**

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*Abstracts*

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## **RECENT TECTONIC MOVEMENTS AT KYPARISSIAKOS GULF (SW GREECE) DEDUCED FROM ON-SHORE AND OFF-SHORE DATA**

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Kyparissiakos Gulf forms the central western part of Peloponnese oriented in the NNW-SSE direction along 45 km of length. It lies parallel to the Hellenic trench, which is developed in the Ionian Sea at a distance of about 30-40 km to the west. To the North it ends in Katakolon peninsula, where the alpine basement does not crop out, whereas to the South it ends in Kyparissia, where a large E-W fault zone has uplifted the Alpine basement at 1225 m of altitude.

All along the coastal zone of Kyparissiakos Gulf a number of E-W oblique-slip normal faults (mostly left lateral) have created an alternation of tectonic horsts and grabens. The alpine basement crops out in the uplifted horst zones, whereas the grabens are filled by post-Alpine clastic sedimentary sequences. The age of the sedimentary sequences differs in each basin. The oldest marine sediments (Upper Miocene? – Lower Pliocene) occur in the Kyparissia – Kalo Nero graben, whereas Lower Pleistocene marine deposits occur in most basins of the coastal zone with varying thickness. The throw across the E-W marginal normal faults of the basins is more than 1 km and in the case of the Kyparissia fault zone it exceeds 2.5 km, based on the vertical offset of the basal unconformity between the Alpine basement and the overlying post-alpine sediments. Throw values decrease from West to East dying out at about 15-20 km inland. Overall N-S extension is estimated between 60 – 110%, depending on the dip of the normal faults. Maximum extension values are obtained in low-angle normal faults with dips between 35-45°.

The offshore data have been obtained using bathymetric and air-gun litho-seismic profiles along the continental shelf of the Kyparissiakos Gulf with R/V AEGEON of the National Center for Marine Research. The width of the continental shelf increases from north (3.5 km) to south (6 km), whereas south of the Kyparissia fault is reduced to 2-3 km. The depth of the edge of the continental shelf varies between 95 m to the south and 140 m to the north. However, localized subsidence of several meters is observed in the Kyparissia – Kalo Nero and the Zaharo – Olympia graben segments caused by the activity of their marginal faults.

The prolongation of the onshore structures to the offshore zone can be detected in the cases of Kyparissia, Kalo Nero, Neda and Zaharo faults. Based on the offshore sections, where sedimentary sequences are observed all along the gulf, a gradual increase of thickness of the Pleistocene marine sediments is detected from south to north. A similar thickness increase of the marine Pleistocene sediments is also observed in the onshore sections of the basins-grabens. This indicates an overall tilt to the north, which is in agreement with the maximum Plio-Quaternary sediments thickness observed in Olympia basin (more than 2.5 km).

The Holocene deformation, as deduced from the offshore data, agrees with the neotectonic structure obtained from onshore studies, indicating that no significant spatial and/or temporal structural or stress change has occurred in western Peloponnese.