



Quaternary shorelines of the broader area of Cape Maleas – Neapolis – Elafonissos Isl. (SE Peloponnese)

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The aim of this study is to provide information about the landscape evolution of the broader area of Cape Maleas – Neapolis – Elafonissos Isl. during the Quaternary. In order to investigate the geomorphic evolution of the study area the uplifted coastal landforms, such as shore platforms, notches and remnants of marine terraces, were studied in detail through extensive field-work using topographic diagrams at a scale of 1:5,000, obtained from the Hellenic Military Geographical Service. Additionally, a spatial database was constructed derived from analogue topographic maps at various scales (1:50,000 and 1:5,000), geological maps (1:50,000 maps of IGME), aerial photographs and Google earth images using GIS techniques.

The study area is located in SE Peloponnese in a particularly tectonically active area. Geodynamic processes in the region, which is part of the Hellenic island arc, are related to the active subduction of the African lithosphere beneath the Eurasian plate. The Paleozoic basement of the study area consists of geological formations of the geotectonic units of Arna, Tripolis, and Pindus. The Alpine basement is overlain by extensive outcrops of Pliocene and Pleistocene deposits. Upper Pliocene to Lower Pleistocene formations are composed of marine – lacustrine deposits which are mainly pelites, sandstones, conglomerates, calcarenites and carbonate rocks with red algae whereas Pleistocene formations consist of fluvio-terrestrial deposits (clay, sands, loams and angular rock fragments). The Holocene deposits consist of talus cones, scree, and unconsolidated alluvial deposit, eluvial mantle materials and coastal sand dunes along the N, NE and S shoreline of Elafonissos Isl. as well as at Cape Punta. The general trend of the faults in the study area is mainly NW–SE with some secondary ones having NE–SW direction.

Along the coast between Cape Koulendi and Cape Maleas, uplifted geomorphological features were mapped, including marine terraces, shore platforms and marine notches. Remnants of Quaternary marine terraces have also been identified at several locations on the Elafonissos Isl. The marine terraces are imprinted into pre-existing Pleistocene marine - lacustrine formations and only a few of them have a thin sandstone caprock. The uplifted Quaternary marine terraces are excellent morphological markers and have been used worldwide to recognize past sea-level changes. Their correlation with the main interglacial high-stands can be done only in areas where a continuous uplift at a regional scale exists combined by dating their exposure. Selected samples were collected for OSL dating in order to correlate the terraces in space and time.

The detailed field geomorphological mapping of the study area revealed a sequence of seven to eight marine terraces, according their location, ranging in elevations from 2 to 180m. Based on the raised coastal features of the study area it becomes evident that the prevailing tectonic movement is positive (emergence) during the Pleistocene and Holocene periods. The occurrence of the terraces at different elevations supports the suggestion that the study area is composed by different tectonic blocks moving disparately.