

Evidence of relative sea level change and vertical motion of the land along the coast of Calabria inferred from maritime archaeological indicators

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ABSTRACT

Calabria is one of the most complex regions of the Mediterranean basin, which experienced large earthquakes and uplift and is still undergoing to active tectonics. Along its coasts, are located several archaeological sites of roman and pre-roman age, that can be used as powerful indicators of the relative vertical movements between land and sea since their construction. In this paper we show and discuss data on the relative sea-level change as estimated from maritime archaeological indicators of the last ~2.3 ka BP existing along the Tyrrhenian and Ionian coasts of Calabria.

The palaeo sea level has been obtained measuring the functional elevation of the significant archaeological markers. The latter is defined from the elevation of specific architectural parts of an archaeological structure with respect to the local mean sea level at that location and at the time of its construction, and provides the basis for determining sea-level change. It depends on the type of structure, its use and the local tide amplitudes. The minimum elevation of particular structures above the local highest tides can also be defined. The elevation of the investigated sites was then compared against the latest predicted sea level curve for the Holocene valid for this region. Since the Tyrrhenian coast is affected by significant and continuous vertical tectonic uplift during Pleistocene, our data show the counterbalance between coastal uplift and relative sea level change caused by the glacio-hydro-isostasy, acting since the construction of the maritime settlement. The sum of these movements determined an about null relative sea level change at Briatico. These data are in contrast with other part of the tectonically stable areas of the Mediterranean and provide the evidence that crustal uplift continued in the last 1806 ± 50 yr at a rate of 0.65 mm/yr. Conversely, the Ionian coast of Calabria

between Punta Alice and Crotona, shows archaeological indicators submerged up to -6 m. The high value of the relative sea level change in the eastern coasts of Calabria, can be addressed to the vertical regional tectonics and local effects, besides the signal caused by glacio-hydro-isostasy. These combined effects are causing a fast retreat of the coast as evidenced by the paleoenvironmental records and aerial photogrammetric data, the latter available for the last 60 years.

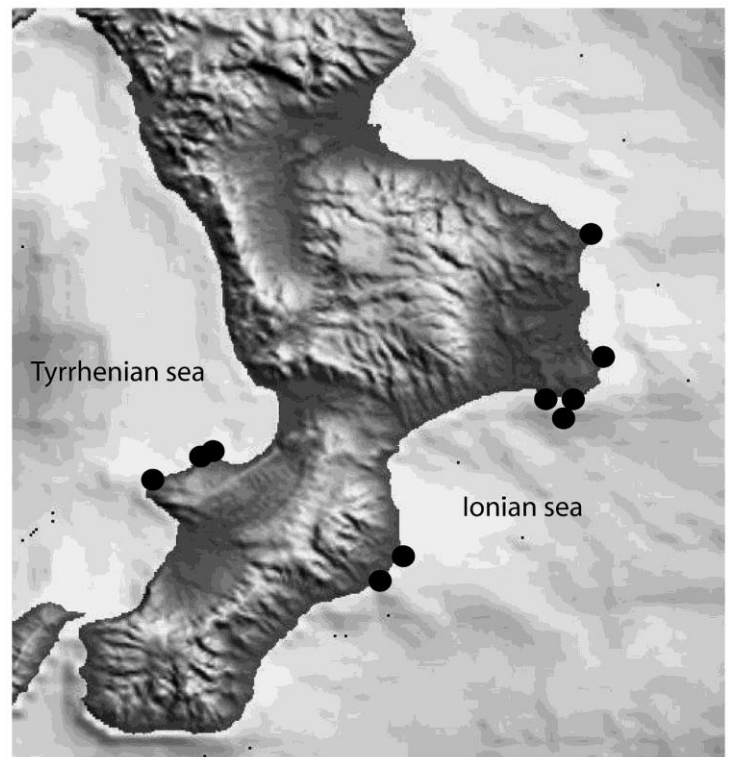


Fig. 1 - Map of the investigated sites.

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