

Sea Level Rise and Implications for Low-lying areas: Coastal Evolution and Impact of Future Sea Level Rise Scenarios in Mirabello Gulf - NE Crete

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Abstract : Mediterranean areas are characterized by intense seismic and volcanic activity as well as eustatic changes, the result of which is the creation of particularly vulnerable coastal zones. The most vulnerable are low-lying coastal areas, the geomorphological evolution of which are highly affected by natural processes and anthropogenic interventions. Therefore, assessing changes that take place along coastal zones is of great importance in order to enable the development of integrated coastal management plans. A characteristic case is the gulf of Mirabello in N.E Crete, where intense coastal erosion, in combination with the tectonic subsidence of the area, threatens a large part of the coastal zone, resulting in direct socio-economic impacts. The present study assesses the temporal geomorphological changes that have taken place in the coastal zone of Mirabello gulf to provide a clear frame of the coastal zone evolution over time and performs a vulnerability assessment based on the coastal vulnerability index (CVI) methodology by Thieler and Hammar-Klose, considering geological features, coastal slope, relative sea-level change, shoreline erosion/accretion rates and mean significant wave height as well as mean tide range in the area. In light of this, an impact assessment, based on three different sea level rise scenarios, is also performed and presented.

Keywords : coastal vulnerability index, coastal erosion, GIS, sea level rise

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