



Sea level rise scenario for 2100 A.D. on the archaeological site of Motya

Roberta Ravanelli (1), Mattia Crespi (1), Lorenzo Nigro (2), Federica Spagnoli (2), Marco Anzidei (3), Federica Riguzzi (3), and Antonio Vecchio (4)

(1) Geodesy and Geomatics Division- DICEA, University of Rome La Sapienza, Rome, Italy, (2) Archaeological Expedition to Motya - Department of Oriental Studies, University of Rome La Sapienza, Rome, Italy, (3) Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy, (4) Lesia Observatoire de Paris, PSL Research University, Paris, France

Motya is an ancient Phoenician colony (IV-III millennium B.P.) located in the San Pantaleo island in the NW corner of Sicily (southern Italy). In the present work, we analyze how the climate change and consequent sea level rise have an impact on human settlements located nearby the coast, in particular how they can affect the cultural heritage which could passively suffers of its effects.

A detailed flooding scenario for 2100 is provided for the whole island from direct observations and models. The data consist of a high-resolution Digital Terrain Model generated through an Unmanned Aerial Vehicle (UAV) survey of the island; instead, the vertical land motion was estimated by analysing the data collected by three permanent Global Positioning System (GPS) stations located close to the island and the hydrometric recordings of the nearest sea level gauge located at Porto Empedocle (Sicily). The flooding scenario for 2100 was then computed by using the regional sea-level projections of the International Panel on Climate Change (IPCC). A long-term difference of about +58cm between the current coastline position and the raised coastline at 2100 A.D was found. Finally, the maximum scenario of flooding was determined by adding also the average amplitude of the short-term tidal waves, equal to +/- 30cm.