



Relative sea level rise and potential flooding risk for 2100 on 15 coastal plains of the Mediterranean Sea

Fabrizio Antonioli (1), Gianni Defalco (2), Lorenzo Moretti (1), Marco Anzidei (3), Davide Bonaldo (4), Sandro Carniel (4), Gabriele Leoni (5), Stefano Furlani (6), Valeria lo Presti (1), Giuseppe Mastronuzzi (7), Marcello Petitta (1), Antonio Vecchio (8), Gianmaria Sannino (1), and Giovanni Schicchitano (9)

(1) ENEA, Climate modelling, ROMA, Italy , (2) ISMAR, CNR, Oristano, Italy, (3) INGV, Rome, Italy, (4) ISMAR, CNR, Venezia, Italy, (5) ISPRA, Roma, Italy, (6) Department of Mathematics and Geosciences, University of Trieste, Italy, (7) Department of Earth and Geoenvironmental Sciences, University of Bari, Italy, (8) LESIA-Observatoire de Paris, France , (9) Studio Geologi Associati TST, Catania, Italy

The Mediterranean coasts are dynamic habitats where human activities have been going on for centuries in micro-tidal environments of about 0.40 meters (with the exception of the northern Adriatic sea and the Gulf of Gabes). For this reason, anthropic activities have been concentrated along a narrow coastline strip where any change in the sea level and coastal dynamics can easily impact on human activities.

In this work we provide estimates of potential flooding for 2100 for a series of coastal locations in the Mediterranean. Starting from the 2013 IPCC AR5 report (RCP 8.5 scenario, 600 ppm CO₂), sea level rise projections are adjusted for rates of vertical land movements (isostasy, long- and short-term tectonic rates). Namely, the ITALIAN Project RITMARE4 investigated a set of small coastal plains in the tectonic stable zones of the central and southern Adriatic sea, at the mouth of the rivers Tronto, Sangro and Pescara, and along the rocky coasts of Brindisi.

The lagoonal area of Lesina is affected by significative positive and negative vertical movements. Occasionally, sea-surge of more than 1 m has been recognized in correspondence of main sea storm (concomitance of low pressure, high tide and strong winds) determining flooding condition dangerous for human activity. As part of the Copernicus CET Project, we have -focused on the coastal plain of Valledoria and Fertilia (Sardinia, Italy), Marina di Campo (Elba Island, Italy), Granelli (Sicily, Italy), Larnaka (Cyprus), Ibiza and Mallorca (Balearic Islands, Spain); Bastia (Corse, France) and Kerennha island (Tunisia).

Different geological, tectonic and morphological situations characterize the afore mentioned sites. The objective of our multidisciplinary study is to provide sea-level scenarios for 2100 along coastal zones where touristic resorts, railways, airport and sites of natural interest can be significantly affected by possible underestimated IPCC AR 8.5 projection, also at the light of storm surge that can increase these values up to over 2 meters.

Key-words: sea level rise, Mediterranean, coastal plains