Relative sea level changes along the coast of Rome (Italy) from InSAR and ground based data: drivers and flooding scenarios for 2100

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**Abstract**

Since the last century sea level is rising at unprecedented rates with respect to the last millennia. In the average, the Oceans are rising at 3.2 mm/yr, while the Mediterranean at 1.8 mm/yr. In the latter region, vertical tectonic movements play a key role to locally increasing the rates of sea level rise, especially along subsiding coasts, threating coastal infrastructures, heritage sites and cities. The Global Geodetic Observation System (GGOS) is supporting the observation of the natural and anthropogenic coastal changes and, in sinergy with the Intergovernmental Panel on Climate Change (IPCC) Reports (2014) on climate change predictions, marine flooding scenarios for the next decades can be provided. With this goal, we have investigated the densely populated coast near Rome, between Fiumicino and Ostia villages, which is characterized by low elevated coasts, the mouth of Tiber river and important infrastructures, like harbors and the international airport of Fiumicino.

We used and jointly analyzed the available time series of InSAR, GPS and tide gauge data to estimate the rates of land subsidence and sea level trend, to provide the relative sea level rise for this coast up to 2100. Here we show results for two estimated scenarios: *i)* regional trend projected by the IPCC RCP-4.5 and RCP 8.5 (2014) and *ii)* the Veermer and Rahmstorf (2009) dual model. For the most severe scenario, our analysis indicate that a broad area will be flooded by 2100.