

# MISCELLANEA INGV

Abstracts Volume

Giornate INGV sull'ambiente marino  
INGV Workshop on Marine Environment

Rome, 26<sup>th</sup> | 27<sup>th</sup> June 2019



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51

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## Giornate INGV sull'ambiente marino INGV Workshop on Marine Environment

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Cover Multibeam sensor mounted on the INGV vessel for bathymetric surveys at Lipari island (Italy) | In copertina Sensore multibeam installato su una imbarcazione INGV per rilievi batimetrici a Lipari (©INGV)

# Relative Sea Level Rise Projections in the Mediterranean: Multi Hazard Implications and Flooding Scenarios

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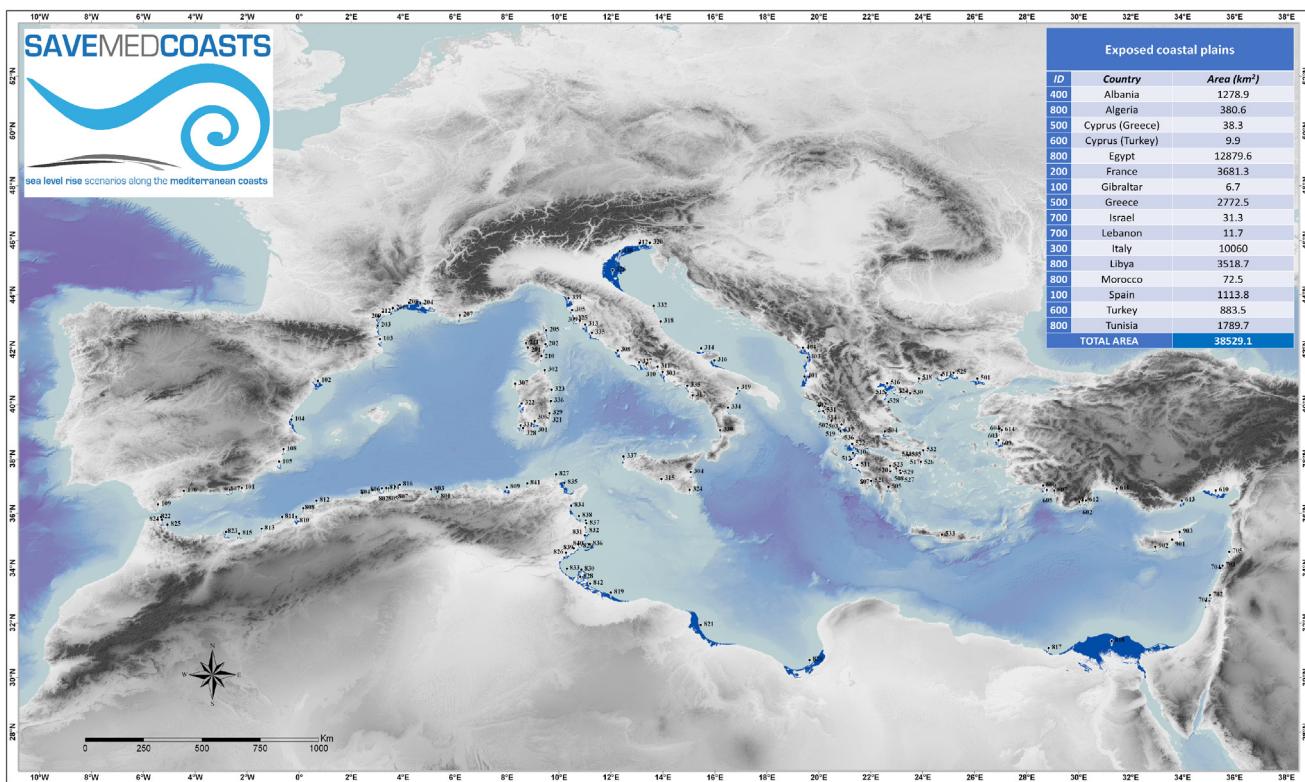
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Sea level rise (SLR) is one of the main global threats caused by climate change. Recent studies [Church et al., 2013; Vecchio et al., 2019] and the IPCC reports ([www.ipcc.ch](http://www.ipcc.ch)) show that global sea levels could rise up to 0.8-1.0 m or even more and up to 2 m by 2100. When in combination with vertical land movements (VLM) for natural or anthropogenic causes, changes in relative sea levels are particularly crucial in subsiding coasts, accelerating land flooding [Anzidei et al., 2017].

In this study, we show some results of the SAVEMEDCOASTS Project (*Sea Level Rise Scenarios along the Mediterranean Coasts*, [www.savemedcoasts.eu](http://www.savemedcoasts.eu)), funded by the European Commission (Agreement Number: ECHO/SUB/2016/742473/PREV16). The project aims at responding to natural disasters prevention for people and assets in the Mediterranean coastal zones laying at less than 2 m above sea level (Figure 1). The expected SLR rise will mainly affect the low elevated coastal plains, amplifying the effects of storm surges and tsunami.

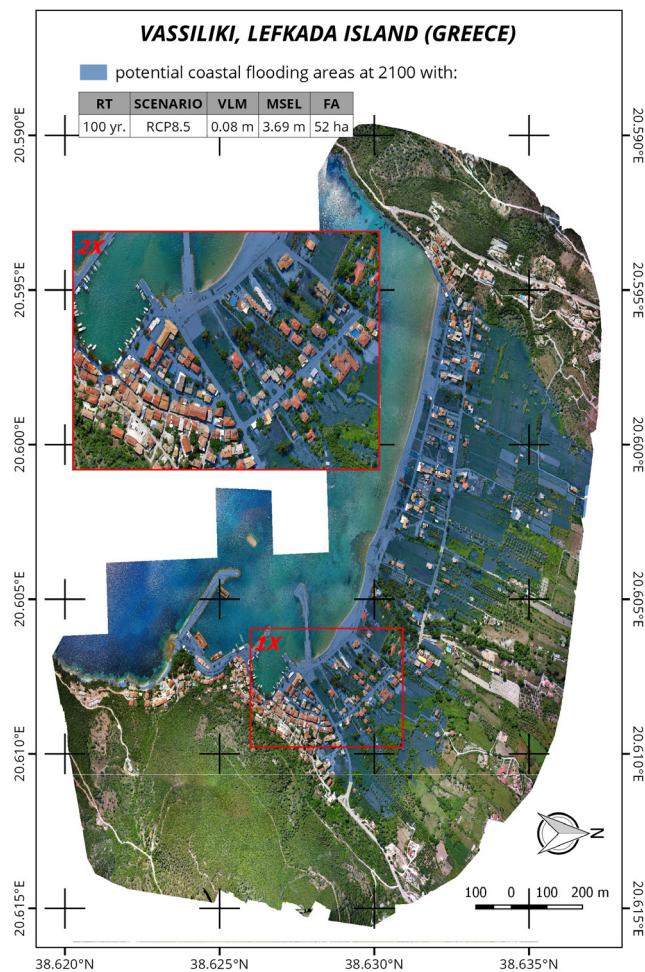
We focus on ultra high-resolution and multi-hazard – multi-temporal marine flooding scenarios expected until 2100 AD in targeted zones of the Mediterranean basin, prone to be flooded in the next decades [Lambeck et al., 2011; Anzidei et al., 2014; Antonioli et al., 2018]. In order to evaluate the potential flooding scenarios, we used the following data sets: i) the RCP4.5 and RCP8.5 climate change scenarios released by the IPCC, calibrated for the Mediterranean region; ii) ultra-high resolution Marine and Terrain Digital Models obtained from multibeam bathymetry, UAV and Lidar surveys; iii) rates of ground vertical movements and sea level trend from instrumental data (i.e. GPS and tide gauges); iv) surf-zone hydrodynamics, atmospheric and wave conditions. From the analysis of these data-sets we provide detailed multi-temporal scenarios of the expected inland extension of marine flooding due to SLR for 2100, that will exacerbate the effects of storm surges and tsunamis, in particular when in combination with land subsidence. Here we show results for the Venice lagoon, Lipari Island, Cinque Terre, Lefkada island (Figure 2) and the Nile and Rhone deltas. A first assessment of the direct and indirect economic impacts of coastal flood risk, for some of these areas, is provided. Finally, information are transferred to society, policy makers and stakeholders through a website and a Web-GIS platform populated with collected data, videos and photo galleries, project results and guidelines, to improve governance and raise community awareness towards these related hazards on coastal populations.



**Figure 1** The 163 main coastal plains of the Mediterranean region (in blue) located at <2 m above sea level, highlighted by the geospatial analysis of SAVEMEDCOASTS. In the table, the extension of the coastal zones exposed to sea level rise, are reported.

**Figure 2** Vasiliki bay, Lefkas Island (Greece).

Map of the potential flooding scenario for storm surge in a sea level rise condition for 2100 (RCP 8.5) and the return time of 100 years. The expected flooded zone corresponds to a surface of 52 ha of extension (in light blue).



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