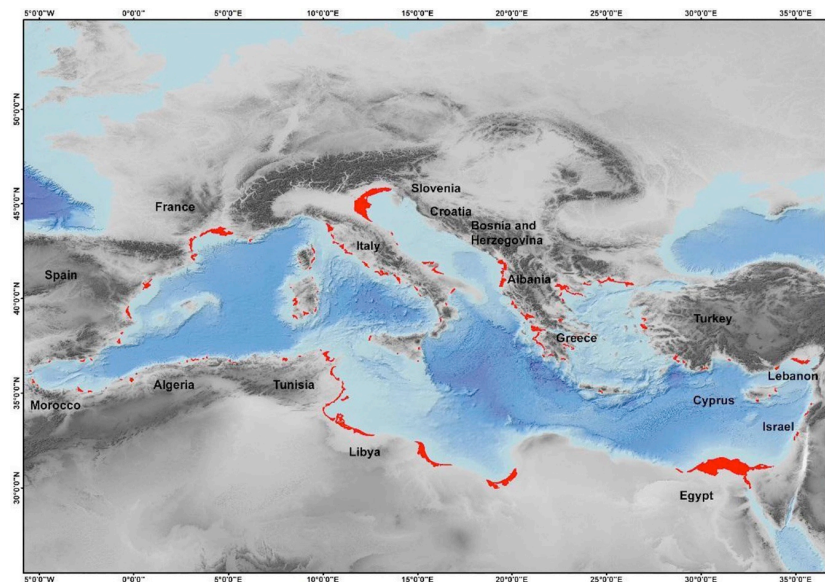


Sea level rise projections up to 2150 in the northern Mediterranean coasts

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Summary

Vertical land movements (VLM) play a crucial role in affecting the sea level rise along the coasts. They need to be estimated and included in the analysis for more accurate Sea Level (SL) projections. Here we focus on the Mediterranean basin characterized by spatially variable rates of VLM that affect the future SL along the coasts. To estimate the VLM rates we used geodetic data from continuous global navigation satellite system stations with time series longer than 4.5 years in the 1996–2023 interval, belonging to Euro-Mediterranean networks and located within 5 km from the coast. Revised SL projections up to the year 2150 are provided at 265 points on a geographical grid and at the locations of 51 tide gauges of the Permanent Service for Mean Sea Level, by including the estimated VLM in the SL projections released by the Intergovernmental Panel on Climate Change (IPCC) in the AR6 Report. Results show that the IPCC projections underestimate future SL along the coasts of the Mediterranean Sea since the effects of tectonics and other local factors were not properly considered. Here we show that revised SL projections at 2100, when compared to the IPCC, show a maximum and minimum differences of 1094 ± 103 mm and -773 ± 106 mm, respectively, with an average value that exceeds by about 80 mm that of the IPCC in the reference Shared Socio-economic Pathways and different global warming levels. Finally, the projections indicate that about 19.000 km² of the considered Mediterranean coasts will be more exposed to risk of inundation for the next decades, leading to enhanced impacts on the environment, human activities and infrastructures, thus suggesting the need for concrete actions to support vulnerable populations to adapt to the expected SL rise and coastal hazards by the end of this century.



The main coastal plains of the Mediterranean basin are underlined in red. The geospatial analysis highlights that the total area of the coastal plains of the Mediterranean region potentially prone to be flooded is about 38 529 km². The most affected countries are Egypt (12.879 km²), Italy (10.060 km²) and France (3.681 km²).

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How to cite data of Sea Level Rise (RSLR) projections for years 2030-2150 (relative to 2020) for the Mediterranean coasts

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