The SAVEMEDCOASTS-2 WebGIS: a Decision Support System for Sustainable Coastal Management against Sea Level Rise

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Keywords: WebGIS; Subsidence; Sea Level Rise; Storm surges; Mediterranean; SAVEMEDCOASTS; SAVEMEDCOASTS-2

Abstract: Here we show a webGIS application developed for the SAVEMEDCOASTS-2 project (Sea Level Rise Scenarios along the Mediterranean Coasts 2, www.savemedcoasts2.eu), funded by the European Commission under the umbrella of the Directorate-General for Civil Protection and Humanitarian Aid Operations (DG-ECHO). The main objective of SAVEMEDCOASTS-2 is the prevention of natural and human-induced disasters along the Mediterranean coasts, which are highly exposed to the combined effect of Sea Level Rise (SLR) and land subsidence. The webGIS focuses on the interactive visualization and analysis of multi-temporal coastal flooding scenarios up to 2100 due to the cumulative effects of Relative Sea Level Rise (RSLR), astronomical tides and storm surges in specific study areas located in the Mediterranean basin, namely the Ebro Delta (Spain), the Rhone Delta (France), the Chalastra Plain (Greece), the Venice Lagoon and Metaponto (Italy). Scenarios are based on the Fifth Assessment Report released by the Intergovernmental Panel on Climate Change (2019) for the Representative Concentration Pathways RCP2.6 and RCP8.5, high-resolution topography and rates of vertical land movements provided by geodetic data.
The platform also includes a preliminary assessment of cascading effects on the study areas as a consequence of the expected RSLR, to provide a quantitative evaluation of the effects on the coastal zone to support policymakers and land planners in defining and prioritizing adequate adaptation or mitigation measures. More specifically, the webGIS is equipped with dedicated dashboard apps. By selecting predefined input parameters through user-friendly

controls, each study area is examined by: (1) a quick view and exploratory analysis of flooding risk scenarios, (2) the interactive comparison between permanent and temporary flooding spatial extents, and finally (3) the explanatory analysis of the expected time series and damage-water level curves concerning relevant indicators of coastal flooding risk.
In conclusion, such apps unlock a deeper understanding of coastal ecosystem vulnerabilities with unprecedented details, making the webGIS a mature and robust decision support tool that can effectively manage both spatial and temporal dimensions of global warming-related issues within an integrated platform and definitively address scientists, decision-makers and citizens towards sustainable coastal planning and management.