



Evaluating risks related to climate change and land use scenarios in the Italian coast: an integrated index supporting climate change adaptation.

Andrea Critto (1,2), Silvia Torresan (2,1), Elisa Furlan (1,2), Petra dalla Pozza (1,2), Melania Michetti (2), Antonio Marcomini (1,2)

(1) Ca' Foscari University of Venice, Venice, Italy (critto@unive.it), (2) Fondazione Centro-Euro-Mediterraneo sui Cambiamenti Climatici, Lecce, Italy (torresan@unive.it)

Gradually increasing sea levels and extreme events related to changing climate conditions could trigger multiple hazards for low-lying coastal areas, determining increasing inundation and erosion risk for local communities, infrastructure and ecosystems. Moreover, there is growing evidence that socio-economic dynamics (e.g. unplanned urbanization, land use and demographic changes) would increase coastal flood risk in the next decades. Understanding how natural and human-induced drivers concur to determine exposure, vulnerability and risks in coastal areas is of paramount importance for mainstreaming effective climate adaptation and risk reduction policies into coastal zone management.

In the frame of the SAVEMEDCOASTS project (www.savemedcoasts.eu), a Climate Change Coastal Vulnerability Index (CC-CVI) was developed to provide guidance and operative criteria for exposure, vulnerability and risk assessment in Mediterranean coastal areas. The overall aim of the index is to identify map and prioritize coastal areas at higher risk from climate-related hazards (sea level rise inundation and storm surge flooding) in vulnerable (flood-prone) areas, providing a knowledge base for national-scale adaptation planning and disaster risk management. The index combines a composite set of physical, environmental and socio-economic indicators representing (i) hazard-prone areas potentially inundated by sea level rise and extreme water levels in future RCP8.5 scenario; (ii) exposure, including indicators of economic, social and manufactured capitals; (iii) vulnerability, represented by indicators of geomorphic susceptibility to flooding and adaptive capacity. The CC-CVI was applied to the Italian shoreline considering a baseline scenario representing current climate and land use condition, and a future one for the 2050, integrating both climate projections and data simulating changes in the environmental and socio-economic systems.

Results of the analysis include a range of spatial vulnerability indicators and statistics allowing to rank Italian coastal provinces according to their relative vulnerability to extreme sea level scenarios. The main steps of the methodology and the applicability of results for decision-makers and risk practitioners are here presented and discussed.