Geophysical Research Abstracts
Vol. 14, EGU2012-11590, 2012
EGU General Assembly 2012

Coastal erosion impacts under climate change scenarios at the regional scale in the North Adriatic Sea

A. Critto (1,2), V. Gallina (1,2), S. Torresan (1,2), J. Rizzi (1,2), A. Zabeo (1,2), S. Carniel (3), M. Sclavo (3), A. Marcomini (1,2)

(1) Impacts on Soil and Coast Division, Euro-Mediterranean Centre for Climate Change (CMCC), Venice, Italy (torresan@unive.it), (2) Department of Environmental Sciences, Informatics and Statistics, University Ca' Foscari Venice, Venice, Italy (critto@unive.it), (3) Institute of Marine Science, National Research Council (ISMAR-CNR), Venice, Italy (mauro.sclavo@ismar.cnr.it)

Global climate change is likely to pose additional pressures on coastal ecosystems by accelerating sea level rise, storms, flooding and erosion. Specifically, coastal erosion is an issue of major concern for estuarine and deltaic coastal areas and ecosystems and it is expected to increase in size and magnitude due to climate change forcing. Accordingly, the use of climate change scenarios in the assessment of coastal erosion risks could improve the development of sustainable adaptation strategies.
In order to analyze the potential consequences of climate change on coastal erosion processes and evaluate the related impacts on coastal receptors (i.e. beaches, river mouths, wetlands and protected areas), a Regional Risk Assessment (RRA) methodology was developed and applied to the North Adriatic coast (Italy).
Climate induced hazards were analyzed by means of regional hydrodynamic models that provide information about the main coastal erosion stressors (i.e. increases in mean sea-level, changes in wave height and variations in the extent of sediments deposition at the sea bottom) under climate change scenarios (i.e. regional climate projections). Site-specific environmental and socio-economic indicators (e.g. vegetation cover, geomorphology, sediment budget, protection level, population density and wetland extension) and hazard metrics were aggregated in the RRA methodology in order to develop exposure, susceptibility, risk and damage maps that identify and prioritize hot-spot areas and vulnerable targets at the regional scale.
Future seasonal exposure maps of coastal erosion at the regional scale depict a worse situation in winter and autumn for the future period 2070-2100 and highlight hot-spot exposure areas surrounding the Po River Delta. Moreover, risk maps highlighted that the receptors (i.e. exposure units) at higher risk to coastal erosion are beaches, wetlands and river mouths with relevant percentages of the territory characterized by higher risk scores. These maps allowed to establish relative priorities for intervention, to identify hot-spot areas and to provide a basis for the definition of coastal adaptation and management strategies. The main results of the RRA in the North Adriatic area are here presented and discussed.