



Coastal Vulnerability to Erosion Processes: Study Cases from Different Countries

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When natural processes affect or threaten human activities or infrastructures they become a natural hazard. In order to prevent the natural hazards impact and the associated economic and human losses, coastal managers need to know the intrinsic vulnerability of the littoral, using information on the physical and ecological coastal features, human occupation and present and future shoreline trends. The prediction of future coastline positions can be based on the study of coastal changes which have occurred over recent decades. Vertical aerial photographs, satellite imagery and maps are very useful data sources for the reconstruction of coast line changes at long (>60 years) and medium (between 60 and 10 years) temporal and spatial scales. Vulnerability maps have been obtained for several coastal sectors around the world through the use of Geographical Information Systems (GIS), computer-assisted multivariate analysis and numerical models. In the USA, "Flood Insurance Rate Maps" have been created by the government and "Coastal Zone Hazard Maps" have been prepared for coastal stretches affected by hurricane Hugo. In Spain, the vulnerability of the Ebro and an Andalusia coastal sector were investigated over different time scales. McLaughlin et al., (2002) developed a GIS based coastal vulnerability index for the Northern Ireland littoral that took into account socio-economic activities and coastal resistance to erosion and energetic characteristics. Lizárraga et al., (2001) combined beach reduction at Rosario (Mexico) with the probability of damage to landward structures, obtaining a vulnerability matrix. In this work several coastal vulnerability maps have also been created by comparing data on coastal erosion/accretion and land use along different coastal sectors in Italy, Morocco and Colombia.

Keywords: Hazard, Vulnerability, Coastal Erosion, Italy, Morocco, Colombia.