



Coastal dynamics studies for evaluation of hazard and vulnerability for coastal erosion. case study the town La Bocana, Buenaventura, colombian pacific

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The analysis of the hazard and vulnerability in coastal areas caused for erosion is based on studies of coastal dynamics since that allows having a better information detail that is useful for decision-making in aspects like prevention, mitigation, disaster reduction and integrated risk management. The Town of La Bocana, located in Buenaventura (Colombian Pacific) was selected to carry out the threat assessment for coastal erosion based on three components: i) magnitude, ii) occurrence and iii) susceptibility. Vulnerability meanwhile, is also composed of three main components for its evaluation: i) exposure ii) fragility and iii) resilience, which in turn are evaluated in 6 dimensions of vulnerability: physical, social, economic, ecological, institutional and cultural. The hazard analysis performed used a semi-quantitative approach, and an index of variables such as type of geomorphological unit, type of beach, exposure of the surfing coast, occurrence, among others. Quantitative data of coastal retreat was measured through the use of DSAS (Digital Shoreline Analysis System) an application of ArcGIS, as well as the development of digital elevation models from the beach and 6 beach profiles strategically located on the coast obtained with GNSS technology. Sediment samples collected from these beaches, medium height and wave direction were used as complementary data. The information was integrated across the coast line into segments of 250 x 250 meters. 4 sectors are part of the coastal area of La Bocana: Pianguita, Vistahermosa, Donwtown and Shangay. 6 vulnerability dimensions units were taken from these population, as well as its density for exposure, wich was analyzed through a multi-array method that include variables such as, land use, population, type of structure, education, basic services, among others, to measure frailty, and their respective indicator of resilience. The hazard analysis results indicate that Vistahermosa is in very high threat, while Donwtown and Pianguita are in a medium hazard. Particularly these two sectors have the mayor population density and the biggest hotel development and services infraestructure; meanwhile Shangay was scored with low hazard because the wave action has no direct impact on it. Vulnerability analysis suggest that the sector of Shangay has a very high vulnerability status because it is a sector that does not have any basic services and have low levels of schooling, meanwhile Downtown, Vistahermosa and Pianguita are in the average of vulnerability. Additionally, it was determined that in recent years the sector of Vista hermosa the erosion rates are up to -xx m yr-1, while in other sectors the regression of the coastline can be associated with local tidal peaks that occur during April and October, while other months of the year are typically for recovery and stability processes.