

## **Evaluation of the Beach Erosion Process in Varadero, Matanzas, Cuba: Effects of Different Hurricane Trajectories**

**Authors :** Ana Gabriela Diaz, Luis Fermín Córdova, Jr., Roberto Lamazares

**Abstract :** The island of Cuba, the largest of the Greater Antilles, is located in the tropical North Atlantic. It is annually affected by numerous weather events, which have caused severe damage to our coastal areas. In the same way that many other coastlines around the world, the beautiful beaches of the Hicacos Peninsula also suffer from erosion. This leads to a structural regression of the coastline. If measures are not taken, the hotels will be exposed to the advance of the sea, and it will be a serious problem for the economy. With the aim of studying the intensity of this type of activity, specialists of group of coastal and marine engineering from CIH, in the framework of the research conducted within the project MEGACOSTAS 2, provide their research to simulate extreme events and assess their impact in coastal areas, mainly regarding the definition of flood volumes and morphodynamic changes in sandy beaches. The main objective of this work is the evaluation of the process of Varadero beach erosion (the coastal sector has an important impact in the country's economy) on the Hicacos Peninsula for different paths of hurricanes. The mathematical model XBeach, which was integrated into the Coastal engineering system introduced by the project of MEGACOSTA 2 to determine the area and the more critical profiles for the path of hurricanes under study, was applied. The results of this project have shown that Center area is the greatest dynamic area in the simulation of the three paths of hurricanes under study, showing high erosion volumes and the greatest average length of regression of the coastline, from 15- 22 m.

**Keywords :** beach, erosion, mathematical model, coastal areas

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