



Influence of bathymetry in numerical models for the estimation of loads for the design of maritime structures

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Wave is used to be the main action for the design of maritime structures. Therefore, it is essential to know the wave characteristics in the location of the structure, using for this commonly numerical models for wave propagation. There are three main factors to be taken into account for the use of these numerical models: bathymetry information, location of the wave data source relative to the structure site, and the selection of the numerical models. All these factors have been taken into consideration in this research project, but its main objective is to evaluate the influence of the first of them, the bathymetry information, on the numerical models results, which have a significant impact in the estimation of the loads for the design of maritime structures. To achieve this objective, numerous numerical simulations have been carried out using four bathymetric meshes with different characteristics: according to the precision of the results of the bathymetric surveys – function of the number of sounders used – and according to the possible use of the technical to smoothen the discontinuities and instabilities of the seabed. The case of study has been Barcelona Port, located in the northeast coast of Spain, and the results of this research study show that the differences depending on the use of bathymetries with different characteristics are not negligible, reason why the characteristics of the bathymetry have a significant influence in the results of the numerical models, and therefore have to be considered. In fact, differences in the significant wave height figure has been registered around 15%, which can lead to deviations of the weight of the blocks of the main mantle about 50%, having then influence in the risks and costs of the maritime structure.