ABSTRACT

Artificial Nourishment in the catalan coast

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The proliferation of harbours and artificial groins has caused the interrumption of longshore transport and the asymmetric accumulation of sand impeding, in many cases, the recuperation after the storms. This added to the fact of the reduction of fluvial contributions, due to hydric works supplies and electrical production have decrease considerabily the availability of beach sediments. In addition, since the early sixties and with the promotion of tourism, the coastal settlements have spectaculary multiplied, increasing dramatically the impact on the seaboard. The negative effects derived from these settlements are many and complexes, since the coastal development is normaly accompanied with another assistant works that satisfy the tourist requests such as: communication channels (roadways, parkings,...), marinas, waterfront promenades, etc.. All these settlements are used to be locate the closest possible to the shoreline, occupying the internal coastal border, increasing the possibilities to be affected by coastal destructive processes.

As a consequence, mankind has seen that this essential space for his developement is disappearing and there is a latent need to mantain the beach funcionality. For this reason coastal engineery has planned defense coastal works which provide from solutions to the problem. The most frequently solutions adopted in the catalan coast have been artificial nourishments, the main principle of which is to place a certain volume of sediment to supply an existing deficit or create beach.

The present study treats the revision of the most relevant design aspects from a nourishment project and presents the most important parameters controling the durability and the most used technics for its monitoring.

On the other hand it analyzes technical features from the executed works in the catalan coast in the past decades by the elaboration of an inventary, which syntetize the most relevant features from this works .

The data analyzed show that we have invested in the catalan coast an aproximate volum that reaches the 19.000.000 m^3 , mainly in order to combat erosion processes in many beaches, with a total cost that reaches 90.000.000 €. The most used sources for this kind of works have been marine deposits, with a proportion of 60%, and secundary the terrestrial sources. There are many variables that influence on the price of the m^3, which are related between them; these are: the type of used sources, the invested volumes, the distances to travel and the time; from all of these, the volum is the main variable to determine the final price.

In order to verify the correct running of the work, is essential to do a monitoring. Nevertheless it has taken place in few beaches after its nourishment and this has involve many times an inconsequently actuation, due to the unknown of several variables that influence in the durability of the beach, and many of the works that have taken place have been emergency works (due to the storms that ravage the beach) due to the goverments interesses to generate, precipitaly, a necessay space to mantain the economical motor of our country.

In order to optimizate the type of nourishment in our coasts, one of the points that could be easily improved and makes easier this work will consist in the relization and the mantainment of a data base that incorporates the variables showed in the inventary in the annex 1, and the life span the works have been desingn for. This could allow to make more realistic and rigurous analisis from what the beach nourishment has suposed and if they have been rentable to the society. Refering to the posible exhaustment of the existent sediment sources and the ambiental restriction use, we should find new nourishment sources respectuous with the sorrounding ecosistems and also sostenibles; it would be interesting to focus this study in reciclable materials.