FLUSHING PROCESS BEHAVIOUR IN BARCELONA HARBOUR

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Abstract

In this work, flushing water process within the Barcelona harbour is analysed. The purpose is to determine the influence of the different mechanisms in the flushing process. Barcelona harbour hydrodynamics is highly influenced by the opening of a second mouth on June of 2002. First, a summary of the hydrodynamic behaviour given by a field campaign data (carried out between November and December of 2003) is done. In this campaign, hydrodynamic and meteorological data have been collected. Barotropic-driven circulation and micro tidal regimes are determined. Then, the relation between the wind-driven circulation and the integral approach of the residence time behaviour is verified. Regimes of continuous NW wind direction are related with high flushing process. A comparison in the residence time evaluation when the harbour had only one mouth is done. An expected decrease in the residence time after the second mouth opening is verified. Also, the tidal flushing component is analysed with tidal prism methods. This flushing component is low due to the micro tidal behaviour, but in some specific forcing situations the flushing tidal can be important. Therefore, according to the results, a high influence of the wind-driven circulation in the flushing process is concluded, as oppose to the baroclinic-driven and tidal-driven circulation. Finally, the best wind conditions for the harbour water flushing in the environmental point of view and future works are presented.