XVIII International Conference on Water Resources
CMWR 2010
J. Carrera (Ed)
CIMNE, Barcelona 2010

A 3-DIMENSIONAL FINITE ELEMENT MODEL OF THE CIRCULATION IN THE BAY OF BISCAY CONSIDERING TIME-VARYING WIND FIELDS.

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The goal of this work is to study the wind-induced and density-driven coupling circulation in the Bay of Biscay using a stabilized 3-dimensional finite element model, HELIKE (Maidana 2007) and (J. Blasco 2009). This model is based upon the incompressible Navier-Stokes equations for geophysical fluids. The model utilizes the two components of the Coriolis acceleration, turbulence, bottom friction, wind stresses, density gradient (baroclinic term) and free surface height (barotropic term). The latter is obtained by means of a kinematic equation, without the need of height-averaging. A stabilization method allows for the use of the same shape functions for velocity and pressure. As HELIKE is a finite element model, it can handle complex geometries, thus overcoming the difficulties faced by finite difference implementations. The forcings used are time-varying surface wind and ·3D density fields, which are the main cause of circulation on this shelf according to (Manuel González 2004). For this study we have hourly meteorological data from Meteogalicia operational models (www.meteogalicia.es) and daily density fields from AZTI operational models (www.azti.es).

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