Geophysical Research Abstracts,
Vol. 11, EGU2009-412-1, 2009
EGU General Assembly 2009

Comparing shallow water numerical models AnuGA and COMCOT for tsunami propagation and inundation at bay of Alvor, south of Portugal.

M. Fernandes and J. Luis
CIMA - Centro de Investigação Marinha e Ambiental, Universidade do Algarve, Campus de Gambelas, 8000 Faro, Portugal

In this study we present a systematic comparison between two shallow water numerical models as a function of the earthquake source parameters in near shore propagation and inundation. For the region under analysis, bay of Alvor south of Portugal, we possess a highly detailed topography as well as multi-beam bathymetric dataset that allow the construction of terrain models with a resolution of 10 m.

On one hand we have used numerical model AnuGA (Geoscience Australia), a finite volume method for the near shore wave propagation and inundation. For the propagation from source to the near shore a one-way coupling method was used, with models COMCOT (Cornell University) and SWAN (Mader). These models were run separately and the output used as initial conditions to the AnuGA's runs. There were no significant differences in inputting AnuGA with these models, but with the advantage of SWAN requiring a significantly less computational effort. On the other hand, we have used COMCOT to model the tsunami from origin to inundation.

A range of source models were used, a first concern was to assure that in both models, AnuGA and COMCOT, a similar wave entered the near shore study area. Afterwards, a comparison of the wave height and form at the -5 m bathymetric contour was performed for selected cases. A comparison of the inundation parameters, run-up and run-in, for the range of source models was made. Results indicate that COMCOT systematically presents higher inundation parameters but the differences between the models just before the shoreline are not significant. The finite volume methods presents more consistent results through out the source model ranges than the finite differences method.