

Ponsar Stéphanie

Royal Belgian Institute of Natural Sciences

Author(s): Stéphanie Ponsar, Patrick Luyten and Dries Van den Eynde

Affiliation(s) : Royal Belgian Institute of Natural Sciences, Operational Directorate Natural Environment, Belgium

Estimation of model error prior to long term simulations of climate change impact on storm surges and waves at the Belgian Continental Shelf

The CORDEX.be project is a BRAIN-be project of the Belgian Science Policy Office, grouping 8 Belgian universities or scientific institutes, executing research on global climate change impacts, to create a coherent scientific basis for climate services in Belgium. One of the objectives of the project is to produce high resolution climate simulations for Belgium of the Representative Concentration Pathways studied in the 5th Coupled Model Inter-comparison Project. As such, it constitutes the Belgian contribution to the worldwide CORDEX project, which aims at providing regional climate simulations from global climate models. Local impacts of climate change will be estimated on urban climate, crop production, vegetation emission and storm surges and waves.

To study the impact of global climate changes on storm surges and waves, long term (90 years) simulations will be conducted for three scenarios. In the Belgian Coastal Zone, the impact on sea surface elevation will be examined by performing simulations with the regional ocean model COHERENS while the WAM model will be applied to assess the effects on waves. To evaluate the changes in simulated storm surges and wave climate, it is important to estimate the model accuracy on beforehand. Therefore, prior to the long term simulations, the model error will be evaluated during the evaluation period 1981-2010. This evaluation run can at the same time be used to tune the models for the meteorological forcing that will be used for the long term simulations, to optimize the model accuracy. A comparison of simulated variables to observed ones will be reported, based on the computation of root mean square error, model bias, correlation coefficient and scatter index.

Keywords: model validation, climate change, storm surges, waves, Belgian Continental Shelf