

High-resolution coastal modeling and forecasting using HPC: lessons learned from a decadal experience

Friday 12 October 2018 09:00 (30 minutes)

Estuaries and coastal zones are among the most productive ecosystems on Earth, supporting many human activities and providing multiple ecosystem services. The ability to simulate and forecast the dynamics of estuarine and coastal zones is thus essential to support the sustainable management of these regions, both for daily activities and for long-term strategies associated with climate change.

Computational forecast systems are an important asset to address these concerns by providing predictions of relevant variables, through the integration of numerical models and field data. The reliability of the forecast predictions depends however on the accuracy of the models behind them. Unstructured grid numerical models have been used for several decades to simulate coastal zones at LNEC to address the need for adequate spatial and temporal discretizations. For the past decade these models have been integrated in LNEC's forecast platform WIFF (WIFF - Water Information Forecast Framework) to predict water circulation and water quality in coastal zones, taking advantage of the resources of the Portuguese National Computational Infrastructure (INCD).

This communication summarizes and evaluates our experience of running forecast systems in the INCD. The applications range from the inundation of estuarine margins to oil spill and water contamination predictions. End-users include the Civil Protection agency, port authorities and wastewater utilities. The major focus will be performance issues (comparing grid and cloud resources), service level performance and user experience.

Primary authors: Dr OLIVEIRA, Anabela (LNEC); ROGEIRO, Joao (LNEC); AZEVEDO, Alberto (LNEC); FORTUNATO, Andre; RODRIGUES, Marta; TEIXERIA, Joana; GOMES, Jorge; DAVID, Mario; PINA, Joao; MARTINS, Joao Paulo

Session Classification: Applications and Cooperative development

Track Classification: Development of applications for supporting User Communities in the context of the EOSC.