Development of the Brazilian Operational Ocean Forecast System with the OOF$_\varepsilon$ Python engine for model ROMS

Martinho Marta-Almeida (1), Mauro Cirano (2), Janini Pereira (2), and Manuel Ruiz-Villarreal (3)

(1) CESAM, Universidade de Aveiro, Portugal, (2) Instituto de Física, Dep. Física da Terra e Meio Ambiente, Universidade Federal da Bahia, Salvador, Brasil, (3) Instituto Español de Oceanografía, Centro Oceanográfico A Coruña, Muelle de Animas sn 15001 , A Coruña, Galicia, España

The first implementation of an automatic operational ocean modeling system of the brazilian oceanic region was created and is under continuous development. The operational system is a joint effort between a group of institutions in a research and development consortium called Oceanographic Modelling and Research Network (with Portuguese acronym REMO). Among the objectives of this network is the contribution for a better understanding of the ocean, including mesoscale, shelf and tidal circulation, and to provide oceanographic forecasts for the Brazilian shelf/slope as support of the activities of the oil industry.

The model underwent through a 9.5 years spinup being forced at the boundaries with climatological data from global simulations of the model OCCAM$_{1/4}$, and at surface with data from NCEP (first 9 years) and GFS 1°. The operational stage started at the 1st of July 2009 and is producing daily analysis and 5 days forecasts. Currently the model uses OCCAM$_{1/12}$ boundary climatologies and GFS 0.5° surface forcings. The ocean model being used is the Regional Ocean Modeling System, ROMS, an advanced and robust rapidly evolving comunity-code model. ROMS has been applied in deterministic simulations in a wide range of space and time scales and oceanic systems types.

In terms of technical operations, the task needed for the operational ocean model to run, like the creation of inputs files, extraction of atmospheric data, as well as the control of the successfulness of the simulations and all the operational flow, is done with OOF$_\varepsilon$ (Operational Ocean Forecast Engine), a collection of Python modules prepared to perform all the work required for the operational modeling system, including data visualisation. Due to its design, OOF$_\varepsilon$ requires almost no human intervention, and except for some initial refinements and performance issues, OOF$_\varepsilon$ is now working in a totally automatic manner.