

Update on global and large scale ocean modelling based on the NEMO system (A.M. Treguier, G.Madec)

NEMO (Nucleus for European Modelling of the Ocean) is a state-of-the-art modeling framework for oceanographic research and operational oceanography. It allows several ocean related components of the earth system to work together or separately. This framework is intended to be interfaced with the remaining component of the earth system (atmosphere, land surfaces, ...) via the OASIS coupler. NEMO is distributed under CeCILL license. The system is developed at CNRS in Paris (<http://www.locean-ipsl.upmc.fr/NEMO>), by a consortium of European institutions: CNRS, UK Met Office, ECMWF and Mercator-Ocean.

The present release of NEMO is version 2.3. It includes three engines (or components): OPA9 (ocean model), LIM2 (Louvain-la-Neuve sea-ice model), and TOP1, a transport component based on OPA9 tracer advection-diffusion equation (TRP) and a biogeochemistry model which include two components: LOBSTER and PISCES.

Work has been done in 2006-2007 as part of the MERSEA European project project to adapt the code to a broader number of scientific and operational applications, by providing more options for handling open boundaries (radiative open boundaries, flow relaxation scheme and flather condition), by implementing a variable volume option to allow the vertical coordinate to follow the displacements of the free surface, and by a full integration of the AGRIF grid refinement package in the standard version of the code.

**New model developments planned ... (Gurvan?)**

NEMO is used by a large number of research teams in Europe and elsewhere, and by three operational centers: Mercator-Ocean, the U.K. Met Office, and INGV (Tonani et al, 2007). Mercator-ocean has a new global 1/4° system since april 2007, [http://www.mercator-ocean.fr/html/actualites/news/actu\\_psy3v2\\_en.html](http://www.mercator-ocean.fr/html/actualites/news/actu_psy3v2_en.html), which benefits from model improvements realized as part of the DRAKKAR project (Barnier et al, 2006). A new 1/12° North Atlantic model version is scheduled to replace the present prototype PSY2V2 at the end of 2007, and a 1/12° global model based on the tripolar ORCA grid is being developed as part of the MERSEA European project. Results are presented in the newsletter available on the Mercator-ocean web site. The collaboration of European operational oceanography centers is scheduled to continue, through the new project "MyOcean" submitted to the Framework 7 programme.

DRAKKAR is a network of scientific collaboration based on global and basin-scale configurations of the NEMO system. The collaboration has expanded recently: it involves French laboratories (LPO, Brest, LEGI, Grenoble, LOCEAN, Paris), Mercator-ocean, U.K laboratories (NOC Southampton, University of Reading), the IFM-Geomar in Kiel and KNMI in the Netherlands. There is also collaboration with S.I.O Moscow and the University of Alberta in Canada. The aim of the collaboration is the share model configurations, forcings fields, and coordinate sensitivity experiments (The Drakkar Group, 2007). The group meets twice a year. The next meeting, focussed on the global 1/4° model configuration, will take place in Brest in September. The DRAKKAR group is looking for funding sources at the European level (until now, groups have been supported by their respective national resources).

**Coupled modelling activities with NEMO (Gurvan?)**

## **References**

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