



## **A 1-year mesoscale altimetry-assimilating simulation of the biogeochemistry in the north-eastern atlantic ocean**

P. Karleskind(1), L. Mémery(1), M. Lévy(2)

(1) Laboratoire des Sciences de l'Environnement Marin, Plouzané, France, (2) LOCEAN, Paris, France

(pierre.karleskind@univ-brest.fr)

A series of cruises over a 700km x 500 km wide area has been proceeded between autumn 2000 and autumn 2001 in the North-Eastern Atlantic Ocean in order to achieve a mesoscale study of this region known to be a sink of atmospheric carbon. These cruises took place in the context of the POMME (Programme Océanographique Multidisciplinaire MesoEchelle) program, designed for the understanding of the mechanisms responsible for the subduction of modal waters and for the study of their biogeochemical properties, in relation with the mesoscale variability. This here-exposed work aims to simulate the succession of events occurring during this year of survey so as to compute global budgets of tracer fluxes and of water subduction, and to study the influence of the meso- and submeso- scale variability on these last quantities. The final goal of this study is the computation of the amount of carbon subducted in the surveyed area, and to show the influence on various physical scales on it.

The tool used to achieve this computation is the coupling of a primitive-equation model and of a biogeochemical model, which makes possible the simulation of the evolution of the ecosystem. In order to avoid drifting of the mesoscale circulation, a “soft” assimilation method is implemented, by replacing the horizontal pressure gradient by the geostrophic currents stemmed from a quasi-geostrophic altimetry-assimilating model. This method also avoids noise on vertical velocities generated by classical assimilation methods. The ecosystem is modelised by the LOBSTER model (NNPZDDOM) with the adjunction of a carbon and an oxygen compartment. The next step of this ongoing work is the coupling of a particulate module in order to evaluate deep export of carbon, in regard with the meso- and submesoscale variability.