

Post-Doctoral position on ecosystem modelling

Title: Study the relationship between climate and the marine ecosystem using NPA (NEMO-PISCES-APECOSM)

Principal Investigator:

Dr Laurent BOPP, CNRS/IPSL/LSCE, CEN Saclay, L'Orme des Merisiers, F-91191 Gif-sur-Yvette Cedex, France, Laurent.Bopp@lsce.ipsl.fr, Ph +33 1 69 08 32 74, Fax: +33 1 69 08 30 73

Collaborators:

Dr Olivier MAURY, IRD/Thetis, CRH, Av. Jean Monnet, B.P. 171, 34203 SÃˆte cedex, France, Olivier.Maury@ird.fr, Ph: +33 4 99 57 32 28, Fax: +33 4 99 57 32 95

Dr Olivier AUMONT, IRD/LOCEAN, Centre IRD de Bretagne, BP 70, 29280 PlouzanÃ©, France, Olivier.Aumont@ird.fr, Ph.: +33 2 98 22 45 06, Fax: +33 2 98 22 45 14

Duration: 9+18 months

General goals: Present marine ecosystems are experiencing simultaneously the effects of high and increasing levels of fishing pressure (FAO, 2001) and the in depth structural modifications induced by climate changes. The unprecedented speed and magnitude of those global phenomena raise serious concerns about the very fate of marine ecosystems and their potential future (in-)ability to sustain services to human societies such as fisheries or carbon uptake and export. To answer quickly those weighty questions, it is urgent for scientists to achieve a reliable predictive capability through the development of the next generation of ecosystem models which has to embody a high degree of mechanistic details and ecological realism. The model coupling was initiated in the framework of EUROCEAN NoE (www.eur-oceans.eu) and will also be supported by MEECE (www.meece.eu). The objective is to use an integrated ocean model by coupling online three state of the art oceanic models. These models consider explicitly at physical, biogeochemical and ecosystem levels the bottom-up and top-down controls that interact, propagate and finally determine the dynamics of marine ecosystems.

Activities

1) The first task of the PostDoc will be the analysis of the end-to-end NPA ecosystem model at the scale of the global ocean over the last decades (~9months)

A simulation using this end-to-end generic ecosystem model will be performed using the ERA40 or ERA-Interim forcing fields. The results will be validated against available datasets (Satellite, WOA, Acoustic data, ...). The response of the ecosystem to major climatic signals (ENSO, IOD, ...) will be investigated. Finally, the potential impact of increasing fishing effort onto the ecosystem will be explored using the model.

2) The second planned activity is to produce simulations with the NPA ecosystem model over the next century using output from the IPSL coupled model (~18 months)

In a second step, simulations over the next century will be performed using output from the coupled climate model developed at IPSL. The objectives of this activity are 1) to describe the potential changes of the marine ecosystem to climate change, 2) to analyse the impact of these changes on carbon export and on the ocean uptake of

CO2. Ultimately, if these changes are significant, a fully coupled run of the coupled system including the ecosystem will be performed.

Location:

The postdoc will be based in Saclay (near Paris) at LSCE under the supervision of Laurent BOPP. A training period at Brest is planned for two months at the beginning of the position under the supervision of Olivier AUMONT. Several short-term trips to SÃˆte are also planned to interact with Olivier MAURY.

Eligibility:

Strong knowledge in numerical modelling, strong knowledge in usual programming languages (Fortran and C), strong knowledge in biological oceanography and ecosystem modelling. A PhD in biogeochemistry or marine ecosystem dynamics is required.