PhD position in Ocean Modelling

The Marine Research Centre (MARE) of the University of Liège (ULg) (Belgium) is offering a Ph.D. grant in the framework of the FaCE-It project (Functional biodiversity in a Changing sedimentary Environment: Implications for biogeochemistry and food webs in a managerial setting), financed by the Belgian Science Policy (Belspo) in the frame of the BRAIN program. The project is coordinated by Steven Degraer and Ilse De Mesel (Royal Belgian Institute of Natural Science – DO Nature) and is in collaboration with Karline Soetaert, Jan Vanaverbeke, Tom Moens (UGent, marine biology research group), Gert Van Hoey (Institute for Agricultural and Fisheries research; Aquatic environment and quality) and Marilaure Grégoire, A. Capet, JM. Beckers, E. Delhez, A. Barth (ULg MARE).

FaCE-It aims at understanding the impact of a changing sedimentary environment on the benthic ecosystem functioning (*i.e.* biogeochemical cycling and food webs) of the Southern Bight of the North Sea (SBNS) from the local scale to those larger scales in which managers are interested in for the implementation of the MSFD. More specifically, the project will investigate the impact of the hardening, resulting mainly from the installation of offshore wind farms, and fining, resulting from multiple human activities (e.g. aggregate extraction) on the biogeochemistry and foodweb structure at local and larger scales.

The PhD thesis will be targeted towards the implementation of a tri-dimensional (3D) hydrodynamical-sediment transport model of the SBNS. The candidate will have to run the model in order to understand the processes that govern the distribution of the suspended particulate matter and seafloor sediment grain size and, to differentiate the impact of natural versus anthropogenic forcings (e.g. aggregates extraction, wind farms). Based on case studies of extraction sites derived from the literature, the model will simulate and scale the impact of aggregate extraction on seafloor integrity and hydrographical conditions (Descriptors 6 and 7, Marine Framework Strategy Directive). The PhD candidate will have to upgrade the hydrodynamical model by adding a representation of some specific sediment processes (e.g. diagenesis, biodeposition by filter feeders) based on local modelling and experiments performed in the project. This model upgrade will allow scaling up the impact of substrate modifications on the biogeochemistry, benthic functionality and food webs. Information derived from the model will be used to propose new indicators relevant for the MFSD.

Requirements for application:

- M.Sc. in engineering, physical science, earth and environmental sciences or equivalent.

- Above-average knowledge of Unix and FORTRAN90, and experience with supercomputers are welcome

- Good knowledge in English.

Duration: Four years from early 2016.

The candidate will collaborate with a team of scientists from different fields of oceanography (biological, chemical, sedimentology, modelling).

The candidate should send as soon as possible **by e-mail** his/her curriculum vitae, a covering letter of motivation, together with two references (name and email address), to Marilaure Grégoire (email: mgregoire@ulg.ac.be).

Applications will be considered until the position is filled.