Geophysical Research Abstracts, Vol. 9, 11311, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-11311

A new unstructured model for the Amazon Estuary and shelf hydrodynamic modelling

F. Lyard and Y. Le Bars
LEGOS/CNRS, Observatoire Midi-Pyrénées, Toulouse, France (Florent.Lyard@cnes.fr)

The Amazon River provides the largest fresh water input and dissolved and particulate loads to the global Ocean, This very extensive input of sediments and the intense physical reworking of shelf sediments enhance is responsible for the largest source of dissolved elements to the Atlantic Ocean. The AMANDES french project focuses on the continental and ocean exchanges through the Amazon River and estuary. A 2D/3D hydrodynamic model is developed with the objectives to simulate the river flow through the multi-channel estuary and the fresh water plume circulation on the continental shelf. The river and shelf system is highly complex both for dynamics and geometry. Because of its exceptional characteristics, it is necessary to simulate the lower river flow and the coastal ocean dynamics simultaneously. The unstructured grid modelling is a privileged tool to build a realistic, multi-scale model by taking into accounts both the shelf circulation and its connection with the North Brazil Current, the macro-tidal regime and the river and estuary multi-channels flows. The T-UGOm model, the Toulouse contribution to the international initiative UGOm (Unstructured Grid Ocean models), has been implemented on the Amazon river/shelf system. In a first step, we have concentrated on the 2D dynamics, with special emphasis on local bottom friction adjustments and mangrove permeable effects on the tidal dynamics. Sensitivity studies and preliminary results are presented and discussed.