Monday, October 8
Poster Session 1
16:00–18:00

Poster 109

A FEASIBILITY STUDY IN COMBINING GEOSTATIONARY SATELLITE DATA WITH HYDRODYNAMICS FOR SPIM PROFILES RECOVERY

The present study deals with the fusion of ocean colour satellite data with hydrodynamic simulations of waves and currents, in order to retrieve Suspended Particulate Inorganic Matter (SPIM) concentrations in the water column. The fusion methodology involves time series analysis and combines 1D-vertical spatial clustering and temporal pattern learning through Self Organising Maps (SOM) and Hidden Markov Models (HMM) respectively. The method is able to recover not only total SPIM concentrations but also concentrations of particles in different size classes (here 1 silt/fine and 5 sand/coarse classes). A statistical knowledge base of SPIM in-depth profiles is built from a 15 months period simulation performed by a hydrosedimentary model based on a Regional Ocean Modelling System (ROMS) realistic configuration for the English Channel. This ROMS simulation is a benchmark against which results can be compared. This simulation serves also to derive SPIM synthetic measurements for the upcoming geostationary MTG/FCI satellite sensor, adding an instrumental noise to SPIM total concentration surface values, and including data gaps corresponding to nights and frequent clouds in this area. Twin experiments were then performed while computing hourly time series of SPIM vertical profiles at one geographical point located in the highly dynamic waters near the Isle of Wight. Results show that waves and currents are the main parameters needed for the recovery of the coarse particles (sands), but satellite data are required for the fine ones (silts). They also show the nowcasting of satellite data (using DINEOF for instance) dramatically increases accuracy of the silt recovery.

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