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Dynamics of Suspended Particulate Matter in the North Sea: Fusing Waves, Ocean Circulation and Transport Models with Remote Sensing Data

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Suspended particulate matter (SPM) in seawater determines the light penetration depth and thus is one of the key parameters regulating primary production. Knowledge of its dynamics is especially important for the coastal and shelf seas, like the North Sea where the SPM content is high. A new three-dimensional model was designed to describe the long-term dynamics of SPM. The model concept includes on-line coupling of ocean circulation model HAMSOM with SPM dynamics module developed by GKSS-BSH with a fine spatial resolution of 1.5' by 2.5'. The model is forced by waves calculated by WAM wave model on the same grid. The model includes full atmospheric forcing obtained from the regional atmospheric model REMO. Calculated SPM concentrations for the full year 2002 will be compared with remote and in-situ measurements. One focus is on the MERIS data processing in order to estimate the signal penetration depth and whereby obtain SPM vertical distributions in the surface sea layers. The signal penetration depth is a necessary parameter for satellite data assimilation into an SPM model, aiming towards a better representation of SPM dynamics.