



## **Validation of coastal ecosystem models with time series and remote sensing data in the German Bight**

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One of the challenges in marine ecosystem studies is to integrate existing monitoring information into a higher system framework such as an ecosystem model. In order to study the temporal and spatial variability of chlorophyll-a distribution in the German Bight, we present a 2D ecosystem model validated with Helgoland Roads (HR) time series data and with remote sensing data obtained from MERIS. The biological components, comprising phytoplankton-zooplankton interactions, detritus and nutrients, are coupled to a 2D transport module forced by of the General Estuarine Transport Model (GETM). The preliminary parameterization and calibration is obtained by inverse modelling using HR time-series from 2002 to 2005. By applying the empirical orthogonal function analysis (EOF), we investigate the spatial and seasonal variability of the model components. The analysis of the simulated phytoplankton distribution shows good agreement with the general understanding of coastal phytoplankton dynamics. However, the strong interannual variability could not be reproduced by the NPZD-type model. Such differences between simulation results and measurements can in part be traced back to size structure changes in the phytoplankton community. Using this knowledge we test different scenarios of bloom formation in the German Bight. Our method represents an effective pre-operation tool for testing different scenarios of bloom formation in the German Bight.