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Decision Support System for the Management of the Shandong Peninsula, China

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Abstract : A Decision Support System (DSS) for supporting decision makers in the management of the Shandong Peninsula has been developed. Emphasis has been given to coastal protection, coastal cage aquaculture and harbors. The investigations were done in the framework of a joint research project funded by the German Ministry of Education and Research (BMBF) and the Chinese Academy of Sciences (CAS). In this paper, a description of the DSS, the development of its components, and results of its application are presented. The system integrates in-situ measurements, process-based models, and a database management system. Numerical models for the simulation of flow, waves, sediment transport and morphodynamics covering the entire Bohai Sea are set up based on the Delft3D modelling suite (Deltares). Calibration and validation of the models were realized based on the measurements of moored Acoustic Doppler Current Profilers (ADCP) and High Frequency (HF) radars. In order to enable cost-effective and scalable applications, a database management system was developed. It enhances information processing, data evaluation, and supports the generation of data products. Results of the application of the DSS to the management of coastal protection, coastal cage aquaculture and harbors are presented here. Model simulations covering the most severe storms observed during the last decades were carried out leading to an improved understanding of hydrodynamics and morphodynamics. Results helped in the identification of coastal stretches subjected to higher levels of energy and improved support for coastal protection measures.

Keywords : coastal protection, decision support system, in-situ measurements, numerical modelling
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