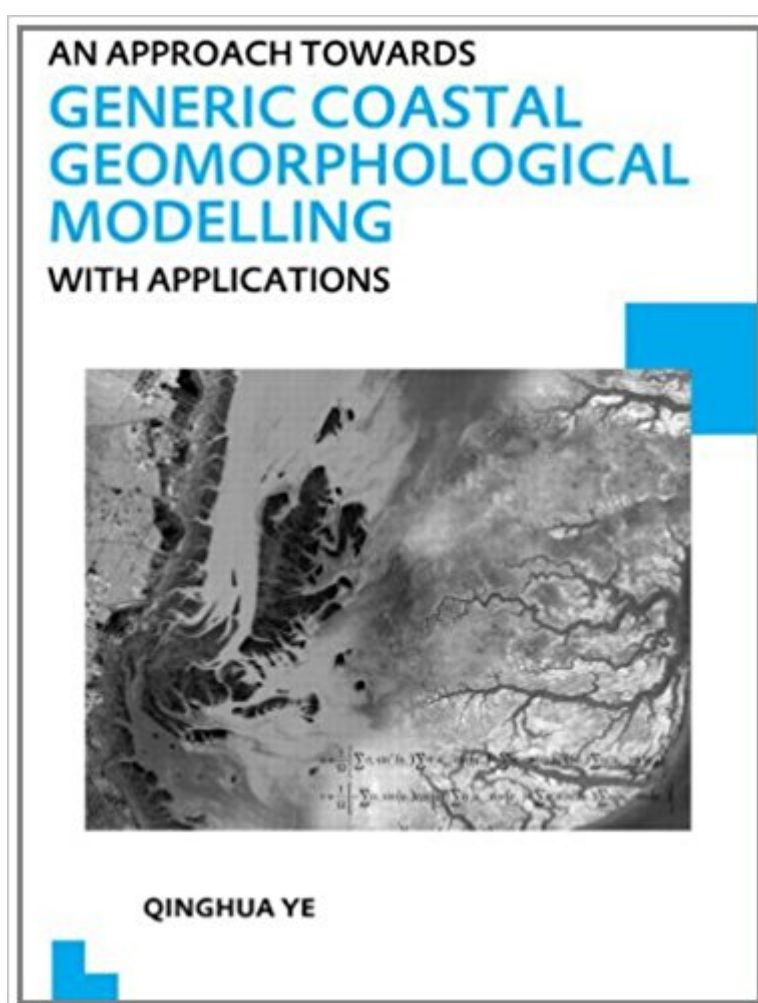The book was found

An Approach Towards Generic Coastal Geomorphological Modelling With Applications: UNESCO-IHE PhD Thesis

Synopsis

This thesis presents the development a generic morphological model for both structured and unstructured grid.Ã Â An online coupling model frame is set up by modularizing a proven 3d hydrodynamic module, a bed state description module, a sediment transport module, a bed update module, and a vegetation population dynamic module.Ã Â Since the model is embedded in the validated Delft software system, the existing hydrodynamics, water quality and bio-chemistry processes are applicable with minimum efforts in addition. Both relevant geomorphological and ecological processes and their scales are discussed.Ã Â For the morphological model, numerical algorithms are adjusted to adapt unstructured grid. An adaptable bed update algorithm and corresponding numerical schemes are analysed.Ã Â Mass conservation of morphological updating is discussed.Ã Â Afterwards a generic velocity integration algorithm is presented.Ã Â The function of the morphological model is validated against 1) analytical solutions, such as: hump migration problem, equilibrium bed slope and sediment concentration profile and 2) flume experiments, such as trench migration. For the bio-geomorphological extension part, relevant ecological processes and their scales are analyzed to build up the rationale to couple them with morphodynamic processes.Ã Â Validations of ecological processes are against the field data in Lake Veluwe.Ã Â Capability of the model has been explored for applications of two salt marsh restoration cases in United States and the large scale morphodynamics of shoreface connected radial sand ridges located in South-east China Sea. This research designs and implements a flexible bio-geomorphological modelling platform.Ã Â The validation cases show that it is capable to be a multidiscipline research tool for morphologists and ecologists / biologists.

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