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Bert Putzar

**Simulating Large-Scale
Morphodynamics of a Tidally
Dominated Mixed Energy Coast
Fundamentals – Applications – Limits**



Universität der Bundeswehr München

Institut für Wasserwesen

Hydromechanik und Wasserbau

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Vorwort

Die Simulation der langfristigen Morphodynamik der Küstengewässer der Nordseeküste und der Deutschen Bucht stellt eine große wissenschaftliche Aufgabe mit vielfältigen Anwendungsmöglichkeiten dar. So geht es hier zunächst einmal um die Optimierung der Unterhaltung der Bundeswasserstraßen von Elbe, Weser, Jade und Ems mit den Zufahrten zu den Häfen Hamburg, Bremerhaven, Wilhelmshaven, Emden und Leer. Dann geht es um Fragen des Küstenschutzes. Werden die Sedimente der Küsten und die davor gelagerten Watten langfristig abgetragen und so die Stabilität der Küste gefährdet oder gibt es Auflandungen, die die Küste stabilisieren. Welche Eingriffe beeinflussen diese Prozesse und wie wirkt sich der Klimawandel auf diese aus? Und schließlich geht es auch darum, die Entwicklung der Strukturgüte und die Auswirkungen auf die Ökologie besser zu verstehen.

Leider sind die die Morphodynamik beeinflussenden Prozesse sehr vielfältig und komplex ineinander verwoben. Hier sind neben den Strömungen aus Zuflüssen und astronomischen Gezeiten vor allem die Kopplung mit der Atmosphäre über den Wind und den dadurch induzierten Seegang zu nennen. Alle diese Strömungen haben einen Einfluss induzieren Sedimenttransporte, die natürlich nur dann richtig bestimmt werden können, wenn man die lokale Zusammensetzung des Bidsens überall hinreichend richtig erfasst hat.

Um sich dieser komplexen Aufgabenstellung anzunehmen, wurde das Verbundprojekt AufMOD beim BMBF beantragt und bewilligt, welches in verschiedene Teilprojekte gegliedert ist. So bestand unser Teilprojekt darin, das hydro-morphodynamische Modellsystem Telemac auf die Deutsche Bucht anzuwenden und so weit zu ertüchtigen, dass eine hundertjährige Simulation der Morphodynamik der Deutschen Bucht möglich wird. Dieses Projekt hat Bert Putzar an unserem Institut bearbeitet, hieraus ist die vorliegende Dissertation entstanden.

München, Oktober 2018

Prof. Dr. Andreas Malcherek

Simulating Large-Scale Morphodynamics of a Tidally Dominated Mixed Energy Coast

Fundamentals – Applications – Limits

Doctoral Thesis

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