

Type

PhD research

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Persons involved:

Suzanne Hulscher – Promotor

Ad Reniers – Co-Promotor

Jebbe v d Werf – Supervisor

Geert Campmans – Daily supervisor

Funding

NWO-TTW: Shaping the beach

Deltares

Summary of the research

The swash zone is the part of the beach where waves run up and down the beach. It is a dynamic region characterized by turbulent flows, strong sediment transport fluxes and rapid instantaneous bed level changes. The combinations of these factors make this region difficult to study, both numerically and experimentally.

In this research existing numerical models will be validated and improved. In short, the models can be categorized into two categories: depth averaged and depth resolved models. Where depth resolved models can give added insight in depth dependency of processes (for instance how turbulent structures move from the water surface towards the bed), depth resolved models benefit from their numerical simplicity and speed. For both model types, novel sediment pickup and transport formulations will be proposed. This also includes validating and improving the hydrodynamics of the models.

The end goal is to use these models to improve large scale morphodynamical models (for instance Delft3D).

Keywords

Swash zone

Numerical modelling

Sediment transport

Coastal morphology