



## COASTAL SEDIMENT TRANSPORT AND MORPHOLOGY

Basic processes and models for sediment transport and bed dynamics in the coastal zone

This online course presents a broad overview of the field of coastal engineering in a number of lectures. First lecture gives a basic course in coastal hydraulics, i.e. waves and currents. Then a lecture focusing on the description of the detailed mechanisms behind sediment transport in the coastal zone is given. Having established the basic process understanding an introduction to different coastal protection schemes is given. In order to quantify the coastal phenomena in real projects, the most used numerical model types are presented in two overview lectures describing the background for numerical modelling as well as the different possible applications. Finally the course is rounded off by a discussion of how to couple the knowledge and modelling capabilities for estimating the impact of climate change on the coast.

Coastal engineering is a field where three skills are needed: 1) A basic understanding of the processes, 2) (numerical) modelling skills and 3) a thorough understanding of the context of the given project (coastal protection, morphological impact from structures, climate change, etc.).

Coastal environments are transient, continuously reshaped by the natural processes of the waves, tides, surges, erosion and deposition.

### COURSE TOPICS

- Basic terms and concepts
- Wave and currents in the surf zone
- Sediment transport mechanisms
- Coastal protection schemes
- Numerical models for coastal processes
- Overview of possible applications of different model types
- Climate change – impact on coasts
- Small exercises with answers

### TARGET GROUP AND PREREQUISITES

Students who want to look into what coastal engineering is about. Young professionals with a need for gaining a basic background for the job as a researcher or a consultant coastal engineer. Experienced engineers who feel the necessity for a brush up on their basic knowledge and that an introduction to the latest models would benefit him or her. Professionals from other branches engineering, e.g. urban, hydrology or marine engineering.

### DATE AND TIME

Online web course – 6 lectures including exercises.

### LOCATION AND VENUE

DHI, Agern Allé 5, DK-2970 Hørsholm, Denmark.

### FEES AND DISCOUNTS

Free of charge.

### THIS IS INCLUDED

Training material can be downloaded

### LANGUAGE

Lectures and training material are in English.

## RELATED COURSES

- SHORELINE MANAGEMENT- How to protect and develop our coasts!
- COASTAL DEVELOPMENT- Processes, regulations and management
- COASTAL FLOODING - ANALYSIS AND MANAGEMENT -Preparing for flooding and the impact of climate change on your coasts
- LITPACK PROCESSES 1D - Modelling longshore sediment transport and coastline evolution
- MIKE 21 FLOW MODEL HD - 2D hydrodynamic modelling using 'classic' grid
- MIKE 21 FLOW MODEL HD FM - 2D hydrodynamic modelling using flexible mesh
- MIKE 21 ST FM - Sand transport modelling using flexible mesh
- MIKE 21/MIKE 3 TR FM, MT FM, PT FM - Fine sediment modelling using flexible mesh
- MIKE 21 ST FM AND MIKE 21/3 MT FM - Sediment transport using sand (2D) and mud (2D/3D) modelling



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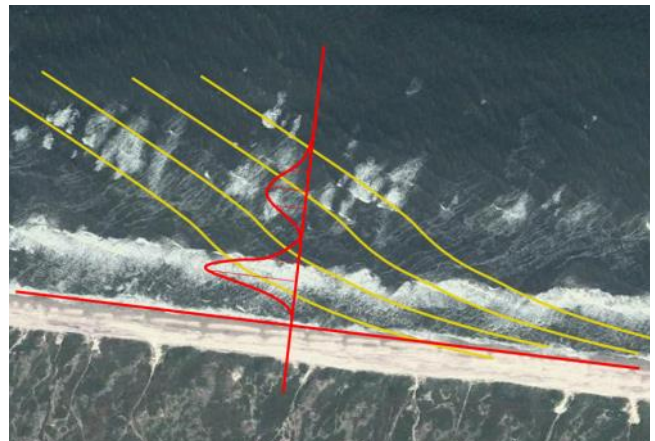
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## INSTRUCTOR

### DR NILS DRØNEN

Dr Nils Drønen is Head of Innovation in the Coastal and Estuarine Department at DHI and is responsible for developing the RDI portfolio within the Coastal and Estuarine area. He has 15 years of experience in development and application of advanced models of coastal processes and has been working as a consultant within a wide spectrum of projects.

PhD, Technical University of Denmark



Ideal West Coast, Jutland, Denmark © DHI / Photo: Google Earth © Adapted by Dr Nils Drønen, DHI

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### DHI

Agern Allé 5  
DK-2970 Hørsholm  
Denmark

+45 4516 9200 Telephone  
+45 4516 9292 Telefax  
[www.dhigroup.com](http://www.dhigroup.com)