Coastal, Ocean & Port Engineering Panel
Sediment Transport Short Course
27 September 2011

ENGINEERS AUSTRALIA

Coasts&Ports2011
diverse and developing

The intensive short course will cover both theoretical aspects and practical applications of the recently developed 2D open source wave model, XBEACH. XBEACH solves coupled 2D horizontal equations for wave propagation, flow, sediment transport and bottom changes, for varying (spectral) wave and flow boundary conditions and has been developed by Deltares to simulate morphological changes during storm events. The course is being led by UNESCO-IHE's Professor Dano Roelvink.

The participants will learn the background and functionalities of the XBEACH model via a series of presentations and case studies and will individually carry out their own simulation runs in order to familiarise themselves with the software. The material outlined below will be covered during the course of the day.

Background:
•XBEACH model philosophy;
•XBEACH model formulation;
•standard examples (dune erosion test Deltaflume, Overwash at Santa Rosa (Ivan), Zwin breach experiment).

Advanced functionality
•hard structures: implementation, example, developments and issues;
•multiple sediment fractions: implementation, example, developments and issues.;
•ground water flow: implementation, example, developments and issues;
•non-hydrostatic solver;
•tracers: implementation;
•output options.

Long term stationary simulations
•differences with short term approach;
•considerations for model setup;
•stationary wave solver.

Hands on case studies [Participants will undertake simulation runs on their own laptops]
•shore normal waves;
•oblique waves;
•offshore breakwaters;
•river outflow;
•WA meteorology and sediment transport patterns.

Please note again that ALL participants are encouraged to bring their laptops on the day.

Speakers

Professor Dano Roelvink

Dano has over 27 years experience in coastal modelling at Delft Hydraulics (now Deltares), Delft University and since 2005 UNESCO-IHE, where he is professor of coastal engineering and port development. He has been at the forefront of developing morphological modelling techniques incorporated in the now open source Delft3D system and has initiated the development of the open source package XBEACH for modelling of coastal impacts of extreme events.

Dr Jaap Van Thiel de Vries

Jaap has over 7 years experience in coastal modelling. He finished his PhD in 2009 on "Dune erosion during storm surges" and presently works as an advisor at Delft Hydraulics (now Deltares) and one day a week as a researcher/teacher at Delft University. He has been at the forefront of the development of the open source package XBEACH for modelling of coastal impacts of extreme events.

Cyprien Bosserelle

Cyprien is a PhD candidate at the School of Environmental Systems Engineering and the Oceans Institute at the University of Western Australia. He is researching sediment transport on perched beaches using numerical models. Prior to this, Cyprien was working as coastal modeller at ASR Ltd. In the past 2 years, Cyprien has been using XBeach for his research and is developing a faster version of the code