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River, Coastal and Estuarine Morphodynamics: RCEM 2007

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Preface

Around the world, many people live, work and recreate in river, estuarine and coastal areas, systems which are also important wildlife habitats. It is imperative to understand the physics of such systems. A key element here is morphodynamics: the mutual interaction and adjustment of landform topography and fluid dynamics involving the motion of sediment. The numerous interacting processes involved, such as large- and small-scale hydrodynamics, sediment transport dynamics, growth and decay of bed perturbations or larger bed forms, biological processes and human interferences make morphodynamics a challenging scientific issue.

The 5th IAHR-Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2007, was organised from 17 to 21 September 2007 at the University of Twente, Enschede, The Netherlands. This conference formed the follow-up of the earlier, successful, biannual conferences that were organised in Genova, Italy (1999), Obihiro, Japan (2001), Barcelona, Spain (2003) and Urbana, USA (2005). These proceedings of RCEM 2007 contain about 150 scientific papers that were presented during the conference, either as oral presentation or as poster. The papers are written by scientists, engineering consultants and water managers of universities, research institutes, consultancies and governance institutes from more than 20 countries around the world. In addition, five key-note lectures introduced the five specific topics of RCEM 2007:

- A. Longterm morphodynamics
- B. Biogeomorphology
- C. Small-scale processes and grain sorting
- D. Morphodynamic free behaviour
- E. Human interferences in morphodynamics

Topic A (Longterm morphodynamics) focuses on longterm morphodynamic evolution of tidal inlets, ebb-tidal deltas, estuaries, beaches and river channels. Several types of morphodynamic models are presented, varying from schematized conceptual and simple mathematical models to numerical process-based models, as well as field observations.

Topic B (Biogeomorphology) deals with the interaction between biology and the physical system, i.e. sediment transport and morphology. Examples are the effect of different species on mobility of sediment and erosion rates, the effect of sediment transport on growth of species, the effect of vegetation on flow characteristics and the interaction between these different processes. Most papers on biogeomorphology in these proceedings focus on estuaries, which are systems in which biogeomorphology is particularly important, due to the presence of fine sediments and many different species.

Topic C (Small-scale processes and grain sorting) focuses on various small-scale processes, such as incipient motion and mobility of grains, sediment transport processes (bed load and/or suspended load) due to currents and/or waves offshore, in the surf- and swash zone, in tidal inlets and in rivers. In addition, attention is paid to the evolution of small-scale bed forms, such as wave ripples, and to the interactions between small-scale sediment transport processes and large-scale bed forms, such as dunes, sand waves and sand banks. Moreover, specific processes that occur in non-uniform sediment, such as hiding and exposure, partial or selective transport, downstream fining and sorting over bed forms are considered explicitly.

Within topic D (Morphodynamic free behaviour) two scales can be distinguished: On the one hand, the very large scale of features such as deltas, tidal channels and tidal flats, and river channels and river meanders. On the other hand, the relatively smaller scale of different types of bed forms, such as offshore sand banks and sand waves, river dunes and anti-dunes. Different types of models, laboratory experiments and field observations are presented to describe, understand and ultimately predict the behaviour of these large and small-scale features.

Finally, Topic E (Human interferences in morphodynamics) focuses on the impact of artificial structures or other human interferences on the morphodynamics of shallow seas, coasts, estuaries and rivers. Examples are the impacts of offshore wind farms, beach and river nourishments, dredging activities, cutting off of river meanders, coastal and river groynes or artificial basins.

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The conference was organized by people from the *Department of Water Engineering and Management (WEM)* of the *University of Twente* and we thank all the people of the organization committee for their ideas and contributions in making this conference a success. At this place, we specifically want to mention René Buijsrogge and Arthur Kamst for their valuable help in all ICT-related matters, Coby van Houten-Vos, for all her work on the financial aspects of the conference, all the students of the WEM-department for their assistance during the conference and, finally, our three wonderful secretaries, Joke Meijer, Brigitte Leurink and Anke Wigger for their enormous job in preparing the conference, their careful attention to the countless important details and for making the conference run very smoothly.

Last but not least, we thank all the authors for their excellent contributions to these proceedings and all the participants for their contributions to this successful conference, either in the form of an oral presentation or poster or in the form of their attention to the presentations and contributions to the discussions.

We hope that everyone enjoys reading the proceedings and that the papers inspire you in your research or other professional activities. *See you at the 6th RCEM in 2009!*

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