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Book reviews

Muddy coast dynamics and resource management Edited by B.W. Flemming, M.T. Delafontaine and G. Liebezeit, Elsevier Science, ISBN 0-444-50465-8, 308 pages, Price: EUR 133.87, USD 154.50, Available: in Europe: Elsevier Amsterdam, P.O. Box 211, 1000 AE Amsterdam, The Netherlands, in USA/Canada: Elsevier Science Inc., P.O. Box 945, Madison Square Station, New York, NY 10160-0757, USA

The disposal of mud, sand, rocks, dirt and clay—which are collectively called "sediments"—happens often, and nearly everywhere, and in huge amounts. Muddy coastal ecosystems, basically distributed along large deltas, vast expanses of mangroves, salt marshes, semi-enclosed bays, lagoons form a significant resource and support large human populations. Today, these ecosystems are not only threatened by human activities (e.g. overfishing, land reclamation and urbanization) but also by the prospect of an accelerating sea level rising in the wake of global warming. In the preface of the new book from Elsevier's "Proceedings in Marine Science" series, entitled "Muddy Coast Dynamics and Resource Management", the editors define these muddy coasts as "land–sea transitional environments commonly found along low-energy shorelines which either receive large annual supplies of muddy sediments, or where unconsolidated muddy deposits are being eroded by wave action." This book contains papers presented in the international conference "Muddy Coasts 97" held in Germany in September 1997 on the ecohydrodynamics of the muddy coast and on the study of its sediment dynamics in a sustainable development perspective. It contains 21 regional case studies from different parts of the world (e.g. Germany, United Kingdom, Portugal, US, Cameroon, Tanzania, Korea and China), providing an up-to-date review of the state of the art in muddy coast research. Papers dealing in an interdisciplinary manner with tidal hydrodynamics, sediment transport, erosion, deposition and sediment dynamics on tidal flats, primary production, nutrient fluxes and remineralization in lagoons are presented. Most papers deal with issues which are of relevance with respect to global warming and future sea level rise. The book is designated as a companion volume to the proceedings of the SCOR Working Group published under the title "Muddy Coasts of the World: Processes, Deposits and Function".

The papers are presented in five sections. Section 1 is devoted to the study of the tidal hydrodynamics and suspended particulate matter in bays and back-barrier tidal basins of Tanzania, The Wash (UK) and in the East Frisian Wadden Sea. It includes an analysis, based on time series data, of the role of these regions as a deposited environment for sediments and nutrients. Focus is put on the study of the tidal asymmetry of the flow and on its impact on the offshore sediment and particles transport. In particular, a method to estimate the suspended particulate matter concentration from the backscaterred signals of an acoustic Doppler current profilers is presented and has been found reliable. Section 2 contains papers dealing with the erosion, deposition and sediment budgets (at seasonal scales) of tidal flats. The composition (in POC, mud, sand), turnover time (by physical and biological processes) and the erodibility (in oxic and anoxic conditions) of sediments along the German coast of the East Frisian Wadden Sea are investigated from field measurements. In addition, a thorough review of the numerous formulae relating the rate of surface erosion to the bed shear stress is presented and a formula for estimating the rate of erosion from bed sediments is established for regions where measurements are unavailable. The third section focuses on the study of primary production, nutrient fluxes (dissolved inorganic nitrogen and phosphorus) and remineralization (aerobic and anaerobic) in shallow coastal lagoons of the Southern Baltic Sea (Bodden) using field and

laboratory experiments. In particular, the photosynthetic potential in primary production budgets of the underlying sediments of shallow estuary sites is demonstrated. The potential emission of atmospheric trace gases contributing to the greenhouse effect (e.g. N_2O, CH_4) and the seasonal fluxes of iron and manganese associated to the process of benthic microbial degradation of organic matter are quantified. The inorganic nutrients release at the sediment water interface, the role of sediment resuspension on this release and the impact of benthic remineralization in sustaining the water column primary production are investigated emphasizing the role of eutrophication on these last processes. Section 4 contains two papers on the sediments geochemistry. One discusses the role of the salt-marshes vegetation in the sediment chemistry (in the Tagus estuary, Portugal) and, in particular, it investigates the influence of the release of oxidants by the plant roots on the benthic remineralization process and on the immobilization of metals such as zinc and lead. The other paper analyses the composition of historically deposits with the aim of reconstructing the paleoenvironmental events in the eastern Yellow Sea. The last section contains six papers on sea level rise, land reclamation and resource management from Cameroon, China and the Waden Sea. Time series data, satellite observations and a few modelling results are analyzed in view of assessing the impact of sea level rise and human activities (e.g. urbanization, industrial development, land reclamation) on the functioning of the aquatic ecosystem (e.g. biodiversity, sediment composition) and on the evolution and hydrography of river deltas, tidal flats and salt marshes as well as to compare this impact to this normally associated with natural geological processes.

The papers presented in this book are all of high quality level, clearly written and organized including high-quality illustrations and a complete uniform bibliography. My criticism to this otherwise very good book is that the aspect ''resource management'' of the last section is not so innovative and complete as we could have hoped. The subject is treated in a very general way, the results presented are mainly derived from the interpretation of existing data and the associated recommendations are very general and are not obtained based on a thorough understanding of the dynamics of the studied area and of its specificities. This understanding can be acquired using integrated approach combining mathematical modelling and data analysis for scenarios testing and management purposes.

I recommend this survey of case studies that provide an up-to-date review of the state of the art in the dynamics of muddy coastal waters to specialists in this area, as well as to those with a more general interest in the physical and biogeochemical functioning of muddy coastal areas and in their protection.

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Coastal and estuarine fine sediment processes
Edited by W.H. McAnally and A.J. Metha, Elsevier Science, ISBN 0-444-50463-X, 540 pages. Price: EUR 179.24, USD 194.50. Available: in Europe: Elsevier Amsterdam, P.O. Box 211, 1000 AE Amsterdam, The Netherlands, in USA/Canada: Elsevier Science, P.O. Box 945, Madison Square Station, New York, NY 10160-0757, U.S.A.

Muddy coastlines are important habitats and can provide natural shoreline protection due to their ability to attenuate wave energy. Cohesive sediment transport processes in muddy coastal and estuarine areas have important effects on the economy (e.g. tourism, fisheries, harbours) and the environment (mudflats are the basis of ecologically valuable, but vulnerable coastal wetlands). Therefore, cohesive sediment transport is an important interdisciplinary research field with a wide range of applications. For instance, navigation in channels and harbours is often limited by fine sediment transport. More recently, the role of fine sediment in capturing and transporting contaminants has become a major question than can