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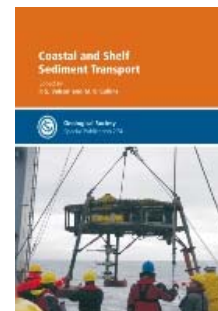
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Coastal and Shelf Sediment Transport, edited by P.S. Balson & M.B. Collins, 2007. Geological Society, London, Special Publications 274. The Geological Society Publishing House, Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath BA1 3JN, United Kingdom. Hardback, 168 pages. Price GBP 65.00; ISBN 978-86239-217-5.



This book is the 274th Special Publication of the Geological Society (SP274), one of the oldest and most well respected book series in the geosciences. The title “Coastal and Shelf Sediment Transport” is rather broad and non-descriptive, but closer inspection learns that there is a distinct common thread in the 14 papers that contribute to the book. All papers present new and improved measurement techniques and scientific approaches for the determination of rates of sediment erosion, transport and deposition in shallow-marine environments. As such, SP274 is a welcome update of some of the latest methodologies that marine scientists use to better understand the complex sediment dynamics in these environments.

The first contribution is an introduction by the editors, in which the other contributions to this book are placed within the time-space domain. This demonstrates that the book covers subjects on a wide range of spatial scales (from local, mm-cm, scale to regional scale) and temporal scales (from seconds to centuries). The chapter by Vincent takes a critical look at uncertainties in the use of Acoustic Backscatter (ABS) techniques to measure suspended-sediment concentration. The conclusion of Vincent is that ABS provides concentration estimates that are likely to be correct by less than a factor two. Bass et al. combined ABS and Optical Backscatter (OBS) techniques to improve the quality of concentration data in mixed suspensions, under the premise that ABS is more sensitive to fine size fractions and OBS is more sensitive to coarse size fractions.

Spencer et al. discuss a new method for tracking fine sediment in the marine environment, using the sorption of lanthanum onto clay minerals. Although promising, this method is at an early stage of development, and awaits field testing. Particle tracking is also the main theme of two other chapters: Black et al. present a concise, but highly valuable, review of particle tracing methods for sediment-transport studies, and Soulsby et al. provide a numerical formulation for simulating the dispersal of tagged sand particles by waves and currents. Further mathematical contributions explore bedload flux equations for tidal currents (Aldridge) and model the transport of suspended particulate matter on the scale of the entire NW European continental shelf, using the Proudman Oceanographic Laboratory Coastal Ocean Modelling System (POLCOMS; Souza et al.).

In a provocative contribution, Cooper & Pilkey review scientific approaches for quantifying longshore sediment transport in coastal environments. The authors conclude that all methods fail to grasp the spatial and temporal variability in longshore sediment drift rates in an adequate way, but instead of setting out new technical challenges they propose the rather unsatisfactory solution of using qualitative values for drift rates (small, medium and large) and the effect of longshore transport on morphological change (drift-dominated, cross-shore dominated and mixed).

Hinton & Nicholls analyse a unique 32-year long morphodynamical record of the shoreface of the Netherlands, and provide evidence that sedimentary processes in the upper, middle and

lower shoreface are coupled on different time scales. Marine bedforms are discussed in two chapters: Schmitt et al. used multibeam sonar surveys to quantify the geometry and migration of dunes around tidal sand banks in the Bristol Channel (SW England), and McDowell et al. mapped part of the surface of the Malin Sea (near Portstewart in Ireland) using side-scan sonar data. Contributions by Velegrakis et al. and Cooper & McLaren complete the book. Both papers deal with the reconstruction of bedload sediment transport pathways in shallow-marine environments. Velegrakis et al. review scientific methodologies, ranging from geomorphological and sedimentological indicators to field observation and numerical modelling approaches. One of these methods is grain-size trend analysis, which is used in the contribution by Cooper & McLaren to investigate prevailing sediment transport pathways in Carmarthen Bay (SW England).

As customary for Geological Society publications, the print and bind quality of the book are excellent, and there are no disturbing editorial slip-ups. I congratulate the editors for producing this interesting and useful collection of papers, which will undoubtedly find its way to many marine sedimentologists and, to a lesser degree, to sedimentary geologists as well. The contributions will help the first group in making an informed choice about which state-of-the-art method to use for investigating sediment transport in modern coastal and shelf environments. The second group will benefit from the scientific results obtained with these methods.

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