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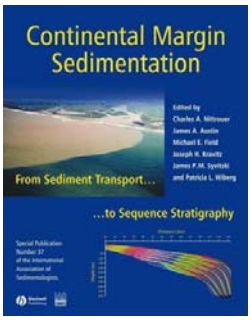

Continental Margin Sedimentation *– From Sediment Transport ... to Sequence Stratigraphy*, edited by Charles A. Nittrouer, James A. Austin Jr., Michael E. Field, Joseph H. Kravitz, James P.M. Syvitski & Patricia L. Wiberg, 2007. Special Publication 37 of the International Asociation of Sedimentologists. Blackwell Publishers. Hardback, 549 pages, 550 illustrations. Price GBP 85.00; USD 125.00; UEUR 114.80. ISBN 978-1-4051-6934-9.

The book consists of nine overview chapters which are organically related to each other, so as to cover a whole perspective of the comprehensive accumulated knowledge of the sedimentology of continental margins, with special reference to two well-studied basins, namely the tectonically active margin of northern California and the passive margin in New Jersey. While the contributions are definitely independent and focus on different aspects of the sedimentary records of these basins, they present jointly a large-scale perspective of the basins" histories and the mechanisms that helped to shape them. Such a view is needed for an objective examination of the intricate relationships between a wide range of sedimentary processes and the preserved stratigraphy developed at the outskirt of continents. Such a perspective covers several hundred thousands of years and up to several hundreds of kilometres in space.

The dedication of the book is a tribute to Joseph Kravitz, a man of infinite scope and love in science, pure-hearted, a caring leader whose determination initiated several marine-geological and geophysical research programs, and who steadfastly supported numerous research activities. This publication is an outgrowth of one of these programs, the STRATA FORmation on Margins (STRATAFORM) program.

The editorial team has labelled their introductory contribution, as humble as it may be, with an enigmatic title (*Writing a Rosetta Stone: Insights into Continental-Margin Sedimentary Processes and Strata*). This introductory text outlines the major sedimentological issues of tectonically passive and active continental margins. In addition, a brief summary of other contributions to this volume is provided to give an insight into, and prepare the required background for, the eight following chapters that deal with specific topics. With an up-to-date reference list, this 38-page summary prepares the reader for the in-depth contributions that follow. Each chapter describes briefly one major aspect of the sedimentology of continental margins and applies it to one of the reference sedimentary margins of the book.

The first chapter (*Sediment Delivery to the Seabed on Continental Margins*) by P.S. Hill et al. reviews previous works published as early as the 1930s. They clearly notice the importance of continental shelves by mentioning that these environments host 90% of the marine food resources and 20% of the world's gas and petroleum reservoirs. The deep-water sedimentary regime and bottom nepheloid layers are discussed considering the various hypothetical approaches suggested for this process. To explain the bottom-boundary-layer transport mechanism of flood sediment, the authors review, among other processes, the transport mechanism explained as a storm-driven process, which hypothesis was proposed in the early 1970s. The field data of fine-sediment transport mechanisms of the STRATAFORM programme have been grouped into the following categories: seabed, plume and bottom boundary-layer processes, which are all briefly discussed by the authors on the basis of actual observations. Based on these descriptions,

the environmental conditions of the Eel River's plumes delivering sediment to the Eel Margin (California) are described, and the results are discussed. The working hypothesis for the burial model of sediment in the basin is supported by the acoustic-backscatter observations from one of the observation sites. In order to model the wave-supported, gravity-driven mudflow mechanism of the basin, a previously published numerical model is used which suggests, among others, the importance of the across-shelf morphology in the positioning of the flood deposits.

In discussing the "*Post-Depositional Alteration and Preservation of Sedimentary Strata*," Robert Wheatcroft et al. consider the physical and biological alteration processes that affect sediments deposited at the sea-floor on the Eel River margin. This contribution deals with the detailed theoretical framework of consolidation/compaction of the sediments. The primary source of porosity field data consists of the microresistivity profiles of the sediment subcores with detailed 0.25–3 mm depth intervals. The observation revealed a high surficial porosity in the deposits, which contradicts the theory. The most likely explanation would be the time-lag required for a porosity profile perturbed by flood deposition to return to the equilibrium. More advanced long-term (several months) resistivity profiles are required to skip this time elapse challenge in a proper way. The second issue discussed in this contribution regards the various biological alteration mechanisms caused by benthic organisms which modify the marine sea-floor deposits.

Christopher Sommerfield et al. describe the "*Oceanic Dispersal and Accumulation of River Sediment*" with special reference to the late Holocene northern California shelf and slope, where the basin has an annual river delivery of 30–40 x 10^6 tons of suspended sediment. I particularly enjoyed the short discussion on the comparison of the impacts of rapid climatic signals and those with anthropogenic origin with reference to a wealth of previous publications. Based on previous research, the authors challenge the problem of hiatuses and quantify the sedimentary processes of the basin. The sedimentation patterns and rates are discussed in detail to reveal small-scale flood-produced layers. High-quality colour drawings and graphs are very helpful to clarify the description of various carbon-dated clay and silt beds.

In their discussion on "*Submarine Mass Movements on Continental Margins,"* Homa Lee et al. focus on the occurrence of submarine landslides. A brief review of various environments is followed by a statistical analysis of the frequency of submarine landslides and slope failure in each environment. In order to analyze the factors governing the occurrence of slope-stability failures, the authors review the previously published sources of such phenomena in the mobilization of sediments. The features observed during the study of the Eel margin are then checked against the scientific background to explain the high-resolution acoustic profiles in the studied area. Beautiful color prints of the suggested depositional model imposed on the bathymetric relief map of the region are of great value to explain the phenomena to students in a proper way.

Following an intensive theoretical explanation based on lab models, and in order to explain "*The Mechanics of Marine Sediment Gravity Flows*," Jeffrey Parsons et al. focus on turbidity currents and debris flows. Their study of wave-supported sediment gravity flows and estuarine fluid muds was carried out in the natural environment due to practical reasons. Such gravity flows are commonly observed on the northern California margin.

The chapter "*Seascape Evolution on Clastic Continental Shelves and Slopes*" by Lincoln Pratson et al. focuses, apparently with guidance of careful reviewers, mainly on the importance of plate-tectonic settings of the marginal basin for sea-floor morphology. Further, the impact of waves and currents on the shelf and shoreface profiles are discussed in detail, with special reference to the northern California basin and the New Jersey margin to the east. The inclusion of several conceptual illustrations is very useful for teachers in dealing with such large-scale processes in both time and space.

The study of the Eel River margin to explore "*The Long-Term Stratigraphic Record on Continental Margins*" by Gregory Mountain et al. reveals the importance of eustatic sea-level fluctuations interwoven with tectonics. A range of seismic profiles and isochron maps of sequences bounded by regional seismic unconformities clarifies the suggested stratigraphic model for the formation of the Eel continental slope. This chapter also deals with the Cenozoic

sedimentation on the New Jersey margin as a typical passive continental margin. The factors controlling the long-term development of this basin are more developed than in the Eel margin. Four Pleistocene seismic sequences are detected, which are apparently reflecting the loading and unloading effects of the Laurentide ice sheet. The study suggests further deep-sea drilling studies to unravel the accurate sequence of events on these continental margins.

The last but not least contribution "*Prediction of Margin Stratigraphy*" is presented by James Syvitski et al. Based on a predictive process/response model, the sediment-transport processes are modelled. Details of the model are discussed, with special reference to short-term sedimentary processes. The role of tectonics and subsidence are specially considered to represent the basic physics and thermodynamics of the sedimentological features of the basin while developing in the course of time.

The timing of the book's publication is great, given the still increasing interest in sequence stratigraphy among academic and petroleum-company experts. The reader will find the book very helpful in understanding and subsequently using interpretation techniques. Although this book contains research that was mainly carried out in two specific basins in the United States, the models and explanations are straightforward and easily applicable, regardless of locality and geological time scale. The substantive researcher should have an easy time using the methods for his own research. In addition, the more quantitatively advanced applied researchers will also appreciate the complete, thorough coverage on technical details and advanced discussions presented in this book.

As a handbook of sequence stratigraphy and continental shelf sedimentology, this publication provides principles and detailed explanations that underpin the correct structural interpretation of fine-grained deposits in the field. The publication creates a state-of-the-art resource to summarize and integrate the understanding of sedimentary processes associated with marine sedimentary environments on continental shelves in a time scale expanding from rapid mass particle displacement to deep burial processes. The unique quality of this book is that it contains integrated contributions on various aspects of the sedimentology of the continental shelves, as well as sequence stratigraphy, within one volume.

Designed for advanced geology students and others engaged in the interpretation of stratigraphic successions, this book is a must-have reference book, the most comprehensive, up-to-date book available on sedimentology of active and passive continental margins. This excellent book is, however, not only for advanced geology students, but also for everybody interested in the sedimentology of fine-grained deposits. It is thus a valuable resource book for applied researchers and advanced students alike.

I enjoyed reading this comprehensive, authoritative, and useful book, and I recommend it highly to others as a clearly written, well-illustrated and very informative textbook.

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