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The sinuous form and peculiar evolution of meandering rivers has long captured the imagination of people. Today, meandering rivers exist in some of the most densely populated areas in the World, where they provide environmental and economic wealth and opportunities, as well as posing hazards. Through geological time, the ancestors of these modern meanders built deposits that are now host to mineral resources, groundwater, and hydrocarbons. This Special Publication illustrates the breadth of current research on meandering rivers and their deposits. The collection of research papers demonstrates the state of science on fluvial process–product relationships. The articles cover fundamental and applied studies of both modern and ancient rivers, are based on state-of-the-art technology, include complementary philosophical approaches, and span a wide range of spatial and temporal scales. This book includes some of the most recent advances in the study of the morphodynamics and sedimentology of meandering rivers, and is an important resource for those who want to investigate fluvial systems and their deposits.

This book presents an overview of techniques that are available to characterize sedimentary aquifers. Groundwater flow and solute transport are strongly affected by aquifer heterogeneity. Improved aquifer characterization can allow for a better conceptual understanding of aquifer systems, which can lead to more accurate groundwater models and successful water management solutions, such as contaminant remediation and managed aquifer recharge systems. This book has an applied perspective in that it considers the practicality of techniques for actual groundwater management and development projects in terms of costs, technical resources and expertise required, and investigation time. A discussion of the geological causes, types, and scales of aquifer heterogeneity is first provided. Aquifer characterization methods are then discussed, followed by chapters on data upscaling, groundwater modelling, and geostatistics. This book is a must for every practitioner, graduate student, or researcher dealing with aquifer characterization .

This book is a multidisciplinary manuscript bringing together contributions on water issues from natural and social scientists focused on water management and structures in a challenging environmental situation such as Dakhla Oasis in Egypt's western desert. The authors of this book are relevant scientists in hydrology, geology, remote sensing, agriculture, history, and sociology. It is devoted to various critical environmental topics such as geological and hydraulic structure, climate influence, underground water management, irrigation management, and human settlement. The book provides a range of new perspectives on solving different environmental problems in arid zones toward the region's sustainable development, based on the case studies and fieldwork in the Dakhla Oasis (Western Desert, Egypt). This dissertation comprises three chapters focusing on the evolution of marine sedimentary successions that formed as the fill of large submarine channel belts and their tributary systems. These channel belts serve as conduits for gravel- and sand-laden sediment gravity flows along the axes of narrow, elongate foreland basins. In the past, axial channel belts have not been widely recognized in submarine foreland basins (Mutti et al., 2003). However, recent studies have demonstrated the presence of axial channels, 3-8 km in width and > 100 km in length, in a number of marine foredeeps including the Cretaceous Magallanes Basin, southern Chile, and the Tertiary Molasse Basin, northern Austria (De Ruig and Hubbard, 2006; Hubbard et al., 2008, 2009). Additional studies have shown that similar channels are common in submarine trough-shaped basins in other convergent margin settings such as the Peru-Chile trench (Thornburg et al. 1990, Völker et al., 2006), the Hikurangi trough, offshore New Zealand (Lewis and Pantin, 2002), and the Nankai trough, offshore Japan (Fig. 1 in Moore et al., 2007), as well as in modern oceanic rift basins, such as the Maury channel in the Northeast Atlantic Rockall Basin (Cherkis et al., 1973) and the Northwest Atlantic Mid-Ocean Channel (NAMOC) in the Labrador Sea (Hesse et al., 1987, 1990; Hesse, 1989, Klauke et al., 1998). These occurrences suggest that axial channels may be common sediment transport fairways in elongate deep-water basins in a variety of tectonic settings. This thesis investigates the sedimentary evolution, stratigraphic architecture, and paleogeography of such channel systems in two distinct, yet analogous and complementary research areas: the Magallanes foreland basin in southern Chile, and the Molasse foreland basin in northern Austria. The main objectives of this study are: a) to characterize the processes of submarine sediment transport and deposition in the study areas, b) to explain the associated filling patterns of ancient submarine axial channels and their tributaries, and c) to reconstruct the paleogeography of an ancient seafloor in order to better understand deep-marine sediment dispersal patterns in narrow elongate basins. The Magallanes Basin is a retro-arc foreland basin characterized by a deep-marine filling history from the Cenomanian/ Turonian (Fildani et al., 2003; Fosdick et al., in press) to the Campanian (Chapter 3). The numerous coarse-grained submarine channel and lobe complexes of the Turonian to Campanian Cerro Toro Formation represent a large north-south oriented channel belt that funneled sediment gravity flows along the axis of the foreland basin parallel to the active thrust front (Hubbard et al., 2008). This main axial trunk channel belt was probably fed by at least one, and possibly numerous, tributary channel systems coming off the Andean mountain front to the west. Similarly, sedimentation within the Upper Austrian Molasse Basin during the late Oligocene to early Miocene was largely controlled by an axial trunk channel that was fed by a deltaic system to the west and a tributary system lying along the Inntal fault zone to the southwest (De Ruig and Hubbard, 2006). Three studies were undertaken in order to illuminate the processes and architecture of the fill of submarine foreland basin axial channels: the interaction of submarine debris flows and turbidity currents within the axial channel in the Molasse Basin (Chapter 1), the stratigraphic and architectural evolution of coarse-grained deep-water deposits in a tributary system setting in the Magallanes Basin (Chapter 2), and the paleogeography of the Magallanes Basin axial channel belt and its tributary system and the associated basin-filling pattern over time (Chapter 3). Multiple techniques were combined to achieve these goals, including field mapping, sedimentological analysis of outcrops and rock cores, interpretation of wireline logs and 3D seismic-reflection data, U/Pb dating of zircons,

This volume brings together a number of papers from two workshops with the theme, 'Rain, Rivers, Reservoirs', which considered the dynamic changes to river systems as part of natural processes, particularly changing climatic conditions. Bringing researchers from two different locations to Brazil and the UK allowed scientists to contribute to and promote, 'debate on current research...on how the planet works and how we can live sustainably on it'. This volume features a series of papers on the geoscience of modern and ancient rivers from across the world (Brazil, United States, Spain, Argentina, Canada, India and the UK), their evolution through time, their management, their deposits and their engineering, with both subsurface aquifers/hydrocarbon reservoirs (of Carboniferous, Triassic and Cretaceous age) and surface reservoirs considered.

Sediment Provenance: Influences on Compositional Change from Source to Sink provides a thorough and inclusive overview that features data-based case studies on a broad range of dynamic aspects in sedimentary rock structure and deposition. Provenance data plays a critical role in a number of aspects of sedimentary rocks, including the assessment of palaeogeographic reconstructions, the constraints of lateral displacements in orogens, the characterization of crust which is no longer exposed, the mapping of depositional systems, sub-surface correlation, and in predicting reservoir quality. The provenance of fine-grained sediments—on a global scale—has been used to monitor crustal evolution, and sediment transport is paramount in considering restoration techniques for both watershed and river restoration.

Transport is responsible for erosion, bank undercutting, sandbar formation, aggradation, gulying, and plugging, as well as bed form migration and generation of primary sedimentary structures. Additionally, the quest for reservoir quality in contemporary hydrocarbon exploration and extraction necessitates a deliberate focus on diagenesis. This book addresses all of these challenges and arms geoscientists with an all-in-one reference to sedimentary rocks, from source to deposition. Provides the latest data available on various aspects of sedimentary rocks from their source to deposition Features case studies

throughout that illustrate new data and critical analyses of published data by some of the world's most pre-eminent sedimentologists Includes more than 150 illustrations, photos, figures, and diagrams that underscore key concepts

Facies Models Revisited Sedimentology and Stratigraphy John Wiley & Sons

Encyclopedia of Geology, Second Edition presents in six volumes state-of-the-art reviews on the various aspects of geologic research, all of which have moved on considerably since the writing of the first edition. New areas of discussion include extinctions, origins of life, plate tectonics and its influence on faunal provinces, new types of mineral and hydrocarbon deposits, new methods of dating rocks, and geological processes. Users will find this to be a fundamental resource for teachers and students of geology, as well as researchers and non-geology professionals seeking up-to-date reviews of geologic research. Provides a comprehensive and accessible one-stop shop for information on the subject of geology, explaining methodologies and technical jargon used in the field Highlights connections between geology and other physical and biological sciences, tackling research problems that span multiple fields Fills a critical gap of information in a field that has seen significant progress in past years Presents an ideal reference for a wide range of scientists in earth and environmental areas of study

Sedimentary rocks contain the most important archive of environmental change through earth history. They record changing climates, the movement of plates, and the rise and fall of sea-level on timescales of a few thousand to billions of years. This fully revised and updated edition introduces the reader to sedimentology and stratigraphic principles, and provides tools for the interpretation of sediments and sedimentary rocks. The processes of formation, transport and deposition of sediment are considered and then applied to develop conceptual models for the full range of sedimentary environments, from deserts to deep seas and reefs to rivers. Different approaches to using stratigraphic principles to date and correlate strata are also considered, in order to provide a comprehensive introduction to all aspects of sedimentology and stratigraphy. The text and figures are designed to be accessible to anyone completely new to the subject, and all of the illustrative material is provided in an accompanying CD-ROM.

High-resolution versions of these images can also be downloaded from the companion website for this book at: www.wiley.com/go/nicholssedimentology.

This Proceedings contains over 260 papers on cutting-edge research presented at the 9th International Conference on Coastal Sediments 2019 (CS19), held in Tampa/St. Petersburg, Florida, USA from May 27-31, 2019. This technical specialty conference is devoted to promoting an interdisciplinary exchange of state-of-the-art knowledge among researchers in the fields of coastal engineering, geology, oceanography, and related disciplines. With the theme of 'Advancing Science & Engineering for Resilient Coastal Systems', this Proceedings covers a wide range of research topics on coastal sediment processes from nearshore sediment transport and modelling to beach processes, shore protection, and coastal management.

The Tide-Dominated Han River Delta provides a thorough analysis of a river delta in which tidal currents have reworked the river-borne sediment, generating characteristic geomorphological and sedimentological signatures in the process. Such "tide-dominated" deltas are common in the modern ocean, forming the substrate upon which entire populations are built. Furthermore, ancient examples contain enormous volumes of hydrocarbon. Despite this, tide-dominated deltas remain less well understood than their wave- and river-dominated counterparts, largely because processes within them are inherently more complex and fewer modern examples have been investigated in detail. This multi-year study by a team of experts in coastal geoscience represents the most complete documentation of a tide-dominated delta to date. Results help advance, and are applicable to, a broad range of fields within sedimentary geology, including clastic sedimentology, seismic and sequence stratigraphy, and coastal geomorphology, in addition to petroleum geology and reservoir engineering. Offers new access to results of a multi-year hydrocarbon-reservoir analogue study not available elsewhere Features 75 full-color figures and illustrations to emphasize critical aspects of the delta's sedimentology, geomorphology, and stratigraphy Provides basic data that better define what tide-dominated deltas are, how these complex systems behave over time, and why this is so Aids petroleum geologists and reservoir engineers in predicting the distribution of baffles and barriers in tide-dominated sediment bodies, helping in the successful development of reservoirs

The essential resource to an integrated approach to reservoir modelling by highlighting both the input of data and the modelling results Reservoir Modelling offers a comprehensive guide to the procedures and workflow for building a 3-D model. Designed to be practical, the principles outlined can be applied to any modelling project regardless of the software used. The author — a noted practitioner in the field — captures the heterogeneity due to structure, stratigraphy and sedimentology that has an impact on flow in the reservoir. This essential guide follows a general workflow from data QC and project management, structural modelling, facies and property modelling to upscaling and the requirements for dynamic modelling. The author discusses structural elements of a model and reviews both seismic interpretation and depth conversion, which are known to contribute most to volumetric uncertainty and shows how large-scale stratigraphic relationships are integrated into the reservoir framework. The text puts the focus on geostatistical modelling of facies and heterogeneities that constrain the distribution of reservoir properties including porosity, permeability and water saturation. In addition, the author discusses the role of uncertainty analysis in the static model and its impact on volumetric estimation. The text also addresses some typical approaches to modelling specific reservoirs through a mix of case studies and illustrative examples and: Offers a practical guide to the use of data to build a successful reservoir model Draws on the latest advances in 3-D modelling software Reviews facies modelling, the different methods and the need for understanding the geological interpretation of cores and logs Presents information on upscaling both the structure and the properties of a fine-scale geological model for dynamic simulation Stresses the importance of an interdisciplinary team-based approach Written for geophysicists, reservoir geologists and petroleum engineers, Reservoir Modelling offers the essential information needed to understand a reservoir for modelling and contains the multidisciplinary nature of a reservoir modelling project.

The thesis of Anna Alexandra Vackiner focuses on the geometric architecture and tectonic evolution of the Permian series, combining seismic interpretation (3D block), field studies in an analogue basin (Panamint Valley in California), as well as 2D restoration of representative cross sections through time in order to illustrate the complex interaction between multiphase extension, inversion and salt diapirism. It will be of major interest for exploration geologists involved in tectonically complex areas. - François Roure, August 2012 This thesis improves the understanding and localization of the Upper Rotliegend II tight gas reservoir rock facies. It provides insights into the detailed Upper Rotliegend II palaeo-topography and local tectonically induced sediment thickness changes prior to a multi-phase tectonic overprinting. The research presented in this study further focuses on the tectonically induced synsedimentary facies distribution in transtensional continental settings on the basis of a comparison with a modern field analogue, which enables a detailed analysis of the reservoir rock's distribution and its properties. The study is rounded off with an analysis of the influence of the multiphase tectonic overprinting on the mature Upper Rotliegend II reservoir rocks.

An introduction to the multidisciplinary field of hominin paleoecology for advanced undergraduate students and beginning graduate students, Early Hominin Paleoecology offers an up-to-date review of the relevant literature, exploring new research and synthesizing old and new ideas. Recent advances in the field and the laboratory are not only improving our understanding of human evolution but are also transforming it. Given the increasing specialization of the individual fields of study in hominin paleontology, communicating research results and data is difficult, especially to a broad audience of graduate students, advanced undergraduates, and the interested public. Early Hominin Paleoecology provides a good working knowledge of the subject while also presenting a solid grounding in the sundry ways this

knowledge has been constructed. The book is divided into three sections—climate and environment (with a particular focus on the latter), adaptation and behavior, and modern analogs and models—and features contributors from various fields of study, including archaeology, primatology, paleoclimatology, sedimentology, and geochemistry. Early Hominin Paleoecology is an accessible entrée into this fascinating and ever-evolving field and will be essential to any student interested in pursuing research in human paleoecology.

The topic of this book is the Origin of the Dutch coastal landscape during the Holocene. The landscape evolution is visualized in series of palaeogeographical maps and the driving mechanisms behind the environmental changes are discussed. The practice to make palaeogeographical map reconstructions in the Netherlands developed after the Second World War when a lot of regional geological and soil scientific mapping programs were carried out by government institutions and universities. These maps show when and how the surveyed sediments were formed. The palaeogeographical map reconstructions are subsequently used for the understanding and modeling of the long-term coastal evolution, coastal-management issues, landscape-archaeological purposes and for education and public information reasons. Geoarchaeological investigations play an important role in this study. Geological and palaeo-environmental data from archaeological excavations ('key sites') provided essential information for the palaeolandscape reconstructions. In the presented regional- and local-case studies of this book, examples of these sites are shown.

Published by the Geological Society on behalf of PGC Ltd. (1 hardback volume in slipcase). The 8th Conference on the Petroleum Geology of NW Europe was held in September 2015 and marked the 50th anniversary of the first commercial discovery offshore in the North Sea (West Sole, in September 1965). Its focus was '50 Years of Learning – a Platform for Present Value and Future Success' and its objective was to provide an update on discoveries, developments, technologies and geological concepts from the region. The 39 extensively illustrated technical papers cover the full width of recent activity and are divided into the following sections: Plays and fairways; Play assessment; Recent successes and learnings from failures; Infrastructure-led exploration and development; Late-life fields, re-development and the 'next life'; Onshore exploration and development. The proceedings volume follows the format of many of the previous conferences since the first in 1974. Collectively these provide a unique documentation of the discovery and development of several NW European hydrocarbon provinces. The volume will be of interest to all geoscientists involved in exploration and development in NW Europe. It provides a fascinating overview of how creativity can continue to reveal hidden resources in an area that has been called 'mature' for at least the last 20 of its 50-year history.

This chapter has summarized the important characteristics of deepwater deposits and reservoirs. These reservoirs are quite complex and variable. An understanding of the different architectural elements and their interrelations is critical to hydrocarbon recovery, because the elements exhibit different external geometries, sizes, spatial orientations, and internal sedimentary and stratigraphic features. Because of these differences, the volume of hydrocarbons and the anticipated recovery efficiency will vary by architectural element (). There are many new and awaiting opportunities for deepwater reservoirs both onshore and offshore. The US Gulf of Mexico and many other parts of the world are hot spots or emerging areas for exploration and development of vast resources of oil and gas (Fig. 11.93).

This book integrates a wide range of subjects into a coherent purview of the status of coastal marine science. Designed for the professional or specialist in coastal science, oceanography, and related disciplines, this work will appeal to workers in multidisciplinary fields that strive for practical solutions to environmental problems in coastal marine settings around the world. Examples are drawn from many different geographic areas, including the Black Sea region. Subject areas covered include aspects of coastal marine geology, physics, chemistry, biology, and history. These subject areas were selected because they form the basis for integrative investigation of salient environmental problems or perspective solutions or interpretation of historical context.

Paralic reservoirs reflect a range of depositional environments including deltas, shoreline–shelf systems and estuaries. They provide the backbone of production in many mature basins, and contribute significantly to global conventional hydrocarbon production. However, the range of environments, together with relative sea-level and sediment supply changes, result in significant variability in their stratigraphic architecture and sedimentological heterogeneity, which translates into complex patterns of reservoir distribution and production that are challenging to predict, optimize and manage. This volume presents new research and developments in established approaches to the exploration and production of paralic reservoirs. The 13 papers in the volume are grouped into three thematic sections, which address: the sedimentological characterization of paralic reservoirs using subsurface data; lithological heterogeneity in paralic depositional systems arising from the influence of tidal currents; and paralic reservoir analogue studies of modern sediments and ancient outcrops. The volume demonstrates that heterogeneity in paralic reservoirs is increasingly well understood at all scales, but highlights gaps in our knowledge and areas of current research.

This book presents the main drivers of benthic structure and processes in estuaries from the 8,000 km-Brazilian coast, assesses the influence of natural and human disturbance, and discusses their ecological importance and management needs. Estuaries are unique coastal ecosystems often with low biodiversity that sustain and provide essential ecological services to mankind. These ecosystems include a variety of habitats with their own sediment and fauna dynamics, all of them globally altered or threatened by human activities. Mangroves, saltmarshes, tidal flats and other confined estuarine systems are under increasing stress by overfishing and other human activities leading to habitat and species loss. Combined changes in estuarine hydromorphology and in climate pose severe threats to estuarine ecosystems at a global scale.

An examination of ancient and contemporary submarine landslides and their impact Landslides are common in every subaqueous geodynamic context, from passive and active continental margins to oceanic and continental intraplate settings. They pose significant threats to both offshore and coastal areas due to their frequency, dimensions, and terminal velocity, capacity to travel great distances, and ability to generate potentially destructive tsunamis. Submarine Landslides: Subaqueous Mass Transport Deposits from Outcrops to Seismic Profiles examines the mechanisms, characteristics, and impacts of submarine landslides. Volume highlights include: Use of different methodological approaches, from geophysics to field-based geology Data on submarine landslide deposits at various scales Worldwide collection of case studies from on- and off-shore Potential risks to human society and infrastructure Impacts on the hydrosphere, atmosphere, and lithosphere

Completely revised new edition, in colour for the first time, of an established undergraduate textbook in elementary sedimentology.

This book envisages a multi-proxy approach using stable isotopes, geochemical proxies, magnetic susceptibility and associated biotic events for paleoclimatic and paleoenvironmental interpretations of the Mesozoic sedimentary record of India. Mesozoic rocks of India record abnormal sea level rise, greenhouse climate, intensified volcanism, hypoxia in seawater, extensive black shale deposition, and hydrocarbon occurrence. The Mesozoic has also witnessed mass extinction events, evolution of dinosaurs, and breakdown of the supercontinent Pangea and the formation of Gondwana. Although the Mesozoic geology of India has witnessed significant progress in the last century, literature survey reveals a huge gap in knowledge regarding sequence stratigraphy, chemostratigraphy and key geological events. A synthesis of sedimentological, paleontological and chemical data is included to presenting a comprehensive understanding of the Indian Mesozoic record to students, researchers and professionals.

This book honors the career of Professor Elizabeth Gierlowski-Kordesch who was a pioneer and leader in the field of limnogeology since the 1980s. Her work was instrumental in

guiding students and professionals in the field until her untimely death in 2016. This collection of chapters was written by her colleagues and students and recognize the important role that Professor Gierlowski-Kordesch had in advancing the field of limnogeology. The chapters show the breadth of her reach as these have been contributed from virtually every continent. This book will be a primary reference for scientists, professionals and graduate students who are interested in the latest advances in limnogeologic processes and basin descriptions in North and South America, Europe, Africa, and China. *Free supplementary material available online for chapters 3,11,12 and 13. Access by searching for the book on link.springer.com

A multidisciplinary review of salt marshes, describing how they function and respond to external pressures such as sea-level rise.

The Norwegian Continental Shelf (NCS), focus of this special publication, is a prolific hydrocarbon region and both exploration and production activity remains high to this day with a positive production outlook. A key element today and in the future is to couple technological developments to improving our understanding of specific geological situations. The theme of the publication reflects the immense efforts made by all industry operators and their academic partners on the NCS to understand in detail the structural setting, sedimentology and stratigraphy of the hydrocarbon bearing units and their source and seal. The papers cover a wide spectrum of depositional environments ranging from alluvial fans to deepwater fans, in almost every climate type from arid through humid to glacial, and in a variety of tectonic settings. Special attention is given to the integration of both analogue studies and process-based models with the insights gained from extensive subsurface datasets.

This book focuses on the links between deep earth (mantle) and shallow processes in areas of active tectonics in the Arabian Plate and Surrounding Areas. It also provides key information for energy resources in these areas. The book is a compilation of selected papers from the Task Force of the International Lithosphere Program (ILP). It comprises a set of research studies from the Middle East, North Africa and the Mediterranean domain focusing on (1) the architecture, geodynamic evolution and modelling of the Red Sea rift system and its surroundings, and tectonics and sedimentation in the Gulf of Corinth, (2) the crustal architecture and georesources of the North Algerian Offshore, (3) Reservoirs, aquifers and fluid transfers in Saudi Basins, Petroleum systems and salt tectonics in Yemen and (4) Cretaceous-Eocene foreland inversions in Saudi Arabia.

This book presents a comprehensive, contemporary review of tidal environments and deposits. Individual chapters, each written by world-class experts, cover the full spectrum of coastal, shallow-marine and even deep-marine settings where tidal action influences or controls sediment movement and deposition. Both siliciclastic and carbonate deposits are covered. Various chapters examine the dynamics of sediment transport by tides, and the morphodynamics of tidal systems. Several chapters explore the occurrence of tidal deposits in the stratigraphic context of entire sedimentary basins. This book is essential reading for both coastal geologists and managers, and geologists interested in extracting hydrocarbons from complex tidal successions.

'Deep-Sea Sediments' focuses on the sedimentary processes operating within the various modern and ancient deep-sea environments. The chapters track the way of sedimentary particles from continental erosion or production in the marine realm, to transport into the deep sea, to final deposition on the sea floor.

Submarine mass movements represent major offshore geohazards due to their destructive and tsunami-generation potential. This potential poses a threat to human life as well as to coastal, nearshore and offshore engineering structures. Recent examples of catastrophic submarine landslide events that affected human populations (including tsunamis) are numerous; e.g., Nice airport in 1979, Papua-New Guinea in 1998, Stromboli in 2002, Finneidfjord in 1996, and the 2006 and 2009 failures in the submarine cable network around Taiwan. The Great East Japan Earthquake in March 2011 also generated submarine landslides that may have amplified effects of the devastating tsunami. Given that 30% of the World's population live within 60 km of the coast, the hazard posed by submarine landslides is expected to grow as global sea level rises. This elevated awareness of the need for better understanding of submarine landslides is coupled with great advances in submarine mapping, sampling and monitoring technologies. Laboratory analogue and numerical modeling capabilities have also developed significantly of late. Multibeam sonar, 3D seismic reflection, and remote and autonomous underwater vehicle technologies provide hitherto unparalleled imagery of the geology beneath the oceans, permitting investigation of submarine landslide deposits in great detail. Increased and new access to drilling, coring, in situ measurements and monitoring devices allows for ground-truth of geophysical data and provides access to samples for geotechnical laboratory experiments and information on in situ strength and effective stress conditions of underwater slopes susceptible to fail. Great advances in numerical simulation techniques of submarine landslide kinematics and tsunami propagation, particularly since the 2004 Sumatra tsunami, have also lead to increased understanding and predictability of submarine landslide consequences. This volume consists of the latest scientific research by international experts in geological, geophysical, engineering and environmental aspects of submarine mass failure, focused on understanding the full spectrum of challenges presented by submarine mass movements and their consequences.

Ichnology is the study of traces created in the substrate by living organisms. This is the first book to systematically cover basic concepts and applications in both paleobiology and sedimentology, bridging the gap between the two main facets of the field. It emphasizes the importance of understanding ecologic controls on benthic fauna distribution and the role of burrowing organisms in changing their environments. A detailed analysis of the ichnology of a range of depositional environments is presented using examples from the Precambrian to the recent, and the use of trace fossils in facies analysis and sequence stratigraphy is discussed. The potential for biogenic structures to provide valuable information and solve problems in a wide range of fields is also highlighted. An invaluable resource for researchers and graduate students in paleontology, sedimentology and sequence stratigraphy, this book will also be of interest to industry professionals working in petroleum geoscience.

Fluvial-Tidal Sedimentology provides information on the 'Tidal-Fluvial Transition', the transition zone between river and tidal environments, and includes contributions that address some of the most fundamental research questions, including how the morphology of the tidal-fluvial transition zone evolves over short (days) and long (decadal) time periods and for different tidal and

fluvial regimes, the structure of the river flow as it varies in its magnitude over tidal currents and how this changes at the mixing interface between fresh and saline water and at the turbidity maximum, the role of suspended sediment in controlling bathymetric change and bar growth and the role of fine-grained sediment (muds and flocs), whether it is possible to differentiate between 'fluvial' and 'tidally' influenced bedforms as preserved in bars and within the adjacent floodplain and what are the diagnostic sedimentary facies of tidal-fluvial deposits and how are these different from 'pure' fluvial and tidal deposits, amongst other topics. The book presents the latest research on the processes and deposits of the tidal-fluvial transition, documenting recent major field programs that have quantified the flow, sediment transport, and bed morphology in tidal-fluvial zones. It uses description of contemporary environments and ancient outcrop analogues to characterize the facies change through the tidal-fluvial transition. Presents the latest outcomes from recent, large, integrated field programs in estuaries around the world Gives detailed field descriptions (outcrop, borehole, core, contemporary sediments) of tidal-fluvial deposits Accesses new models and validation datasets for estuarine processes and deposits Presents descriptions of contemporary environments and ancient outcrop analogues to characterize the facies change through the tidal-fluvial transition

Whether the fossil record should be read at face value or whether it presents a distorted view of the history of life is an argument seemingly as old as many fossils themselves. In the late 1700s, Georges Cuvier argued for a literal interpretation, but in the early 1800s, Charles Lyell's gradualist view of the earth's history required a more nuanced interpretation of that same record. To this day, the tension between literal and interpretive readings lies at the heart of paleontological research, influencing the way scientists view extinction patterns and their causes, ecosystem persistence and turnover, and the pattern of morphologic change and mode of speciation. With Stratigraphic Paleobiology, Mark E. Patzkowsky and Steven M. Holland present a critical framework for assessing the fossil record, one based on a modern understanding of the principles of sediment accumulation. Patzkowsky and Holland argue that the distribution of fossil taxa in time and space is controlled not only by processes of ecology, evolution, and environmental change, but also by the stratigraphic processes that govern where and when sediment that might contain fossils is deposited and preserved. The authors explore the exciting possibilities of stratigraphic paleobiology, and along the way demonstrate its great potential to answer some of the most critical questions about the history of life: How and why do environmental niches change over time? What is the tempo and mode of evolutionary change and what processes drive this change? How has the diversity of life changed through time, and what processes control this change? And, finally, what is the tempo and mode of change in ecosystems over time?

Historically, submarine-mass failures or mass-transport deposits have been a focus of increasingly intense investigation by academic institutions particularly during the last decade, though they received much less attention by geoscientists in the energy industry. With recent interest in expanding petroleum exploration and production into deeper water-depths globally and more widespread availability of high-quality data sets, mass-transport deposits are now recognized as a major component of most deep-water settings. This recognition has led to the realization that many aspects of these deposits are still unknown or poorly understood. This volume contains twenty-three papers that address a number of topics critical to further understanding mass-transport deposits. These topics include general overviews of these deposits, depositional settings on the seafloor and in the near-subsurface interval, geohazard concerns, descriptive outcrops, integrated outcrop and seismic data/seismic forward modeling, petroleum reservoirs, and case studies on several associated topics. This volume will appeal to a broad cross section of geoscientists and geotechnical engineers, who are interested in this rapidly expanding field. The selection of papers in this volume reflects a growing trend towards a more diverse blend of disciplines and topics, covered in the study of mass-transport deposits.

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