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*A publication of SEPM Society for Sedimentary Geology*

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# *SEPM Society for Sedimentary Geology*

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# SPECIAL PUBLICATION SERIES

## SP 105 – Deposits, Architecture, and Controls of Carbonate Margin, Slope, and Basinal Settings

Edited by: Klaas Verwer, Ted E. Playton, and Paul M. (Mitch) Harris, 2013

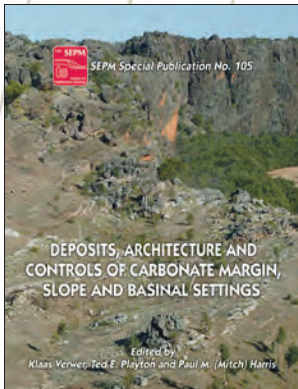
Carbonate margin, slope and basinal depositional environments, and their transitions, are highly dynamic and heterogeneous components of carbonate platform systems. Carbonate slopes are of particular interest because they form repositories for volumetrically significant amounts of sediment produced from nearly all carbonate environments, and form the links between shallow-water carbonate platform settings where prevailing in situ factories reside and their equivalent deeper-water settings dominated by re-sedimentation processes. Slope environments also provide an extensive stratigraphic record that, although is preserved differently than platform-top or basinal strata, can be utilized to unravel the growth evolution, sediment factories, and intrinsic to extrinsic parameters that control carbonate platform systems. In addition to many stimulating academic aspects of carbonate margin, slope, and basinal settings, they are increasingly recognized as significant conventional hydrocarbon reservoirs as well. The papers in this volume, which are drawn from the presentations made at the AAPG Annual Meeting in Long Beach, California (USA), in May 2012, as well as solicited submissions, provide insights into the spectrum of deposit types, stratal configurations, styles of growth, spatial architectures, controlling factors behind variations, and the hydrocarbon reservoir potential observed across the globe in these systems. The sixteen papers in this Special Publication include conceptual works, subsurface studies and outcrop studies, and are grouped into sections on conceptual works or syntheses, margin to basin development and controlling factors, architecture and controls on carbonate margins, and carbonate distal slope and basin floor development.

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## SP 104 – New Frontiers in Paleopedology and Terrestrial Paleoclimatology: Paleosols and Soil Surface Analog Systems

Edited by: Steven G. Driese and Lee C. Nordt, with assistance by Paul J. McCarthy, 2013

After initial breakthroughs in the discovery of fossil soils, or paleosols in the 1970s and early 1980s, the last several decades of intensified research have revealed the much greater role that these deposits can play in reconstructing ancient Earth surface systems. Research currently focuses on terrestrial paleoclimatology, in which climates of the past are reconstructed at temporal scales ranging from hundreds to millions of years, using paleosols as archives of that information. Such research requires interdisciplinary study of soils conducted in both modern and ancient environments. These issues and many others were discussed at the joint SEPM-NSF Workshop "Paleosols and Soil Surface Analog Systems", held at Petrified Forest National Park in Arizona in September of 2010. The papers presented in this volume are largely an extension of that workshop and cover topics ranging from historical perspectives, followed by lessons from studies of surface soil systems, with examples crossing between soils and applications to paleosols. The remainder of the volume begins with an examination of the relationship between paleosols and alluvial stratigraphy and depositional systems, and ends with three case studies of ancient soil systems. Because some readers may find the nomenclature rather "foreign" the editors have included a glossary of pedological terms at the end of this volume. These papers incorporate data from studies of surface soil systems as well as deep-time sedimentary rock successions and are designed to provide sedimentary geologists with an overview of our current knowledge of paleosols and their use in interpreting past climates, landscapes, and atmospheric chemistry.

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## SP 103 – Analyzing Thermal Histories of Sedimentary Basins: Methods and Case Studies

Edited by: Nicholas B. Harris and Kenneth E. Peters, 2013

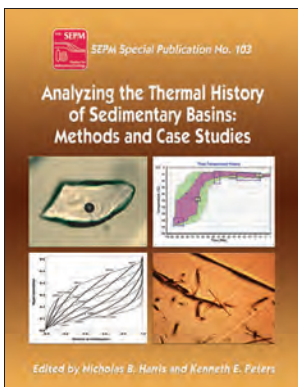
Thermal histories of sedimentary basins are critical sources of scientific and practical information. They provide us with windows into past and present tectonic processes and the configuration of the crust and mantle. Using records of present and past temperature distributions, we can identify and constrain interpretations of tectonic events, distinguish different basin types and interpret pathways of fluid flow. These insights can be used to calibrate basin and petroleum system models and to interpret and predict the distribution of minerals and petroleum, diagenesis and reservoir quality, and the geomechanical properties of rock units. This volume summarizes the current state of the art for many modern approaches used to estimate paleotemperature. Many techniques are now available based on both organic and inorganic components in the rock. Even techniques that are now many years old, such as apatite fission track analysis, have undergone significant advances in the past decade. This volume provides comprehensive reviews of the fundamental science underpinning each method and the basic principles used to interpret data, as well as case studies illustrating practical applications and the complexity of paleotemperature interpretation. Geoscientists from all sectors will find this volume to be a valuable resource in their work.

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## SPECIAL PUBLICATION SERIES

### SP 102 – Sedimentary Geology of Mars

Edited by: John P. Grotzinger and Ralph E. Milliken, 2012

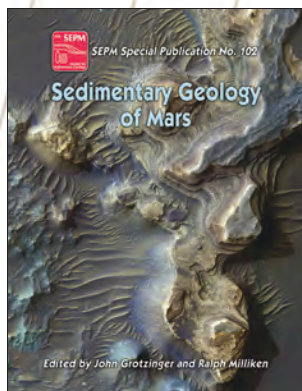
Often thought of as a volcanically dominated planet, the last several decades of Mars exploration have revealed with increasing clarity the role of sedimentary processes on the Red Planet. Data from recent orbiters have highlighted the role of sedimentary processes throughout the geologic evolution of Mars by providing evidence that such processes are preserved in a rock record that likely spans a period of over four billion years. Rover observations have provided complementary outcrop-scale evidence for ancient eolian and fluvial transport and deposition, as well as surprisingly Earth-like patterns of diagenesis that involve recrystallization and the formation of concretions. In addition, the detection of clay minerals and sulfate salts on Mars, coupled with large-scale morphologic features indicative of fluvial activity, indicate that water-rock interactions were once common on the martian surface. This is in stark contrast to the dry and cold surface environment that exists today, in which eolian processes appear to be the dominant mode for sediment transport on Mars. These issues and others were discussed at the First International Conference on Mars Sedimentology and Stratigraphy, held in El Paso, Texas in April of 2010. The papers presented in this volume are largely an extension of that workshop and cover topics ranging from laboratory studies of the geochemistry of Martian meteorites, to sediment transport and deposition on Mars, to studies of terrestrial analogs to gain insight into ancient Martian environments. These papers incorporate data from recent orbiter and rover missions and are designed to provide both terrestrial and planetary geologists with an overview of our current knowledge of Mars sedimentology as well as outstanding questions related to sedimentary processes on Mars.

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### SP 101 – Microbial Mats in Siliciclastic Depositional Systems Through Time

Edited by: Nora Noffke and Henry Chafetz, 2012

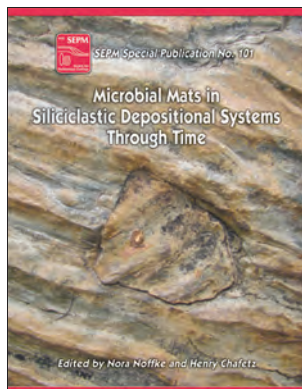
The research field on microbial mats in siliciclastic environmental settings has greatly developed since its establishment by studies of pioneering scientists such as Gisela Gerdes, Wolfgang Krumbein, Jürgen Schieber, David Bottjer and others. This SEPM Special Publication is the result of the SEPM Field Conference on Sandy Microbial Mats (modern and ancient), which was held in May 21st to 23rd, 2010 at Dinosaur Ridge, Denver, Colorado, USA. The volume presents peer reviewed individual case studies on microbial mats and on sedimentary structures (often called “microbially induced sedimentary structures—MISS”) that occur in modern and ancient marine and terrestrial environments. The conference brought together sedimentologists, microbiologists, and paleontologists from 30 countries and all five continents. Topics discussed ranged from the evolution of cyanobacteria, the detection of quorum sensing in biofilms to the taxonomy of MISS and microbial mat ecology. The talks and posters presented fossil material from 3.2 Ga old rock successions to microbial mat samples from sediments of the present day. This volume is designed to present the wide spectrum of research in this multidisciplinary scientific field, and to integrate the many different points of views and approaches.

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### SP 100 – The End-Cretaceous Mass Extinction and the Chicxulub Impact in Texas

Edited by: Gerta Keller and Thierry Adatte, 2011

One of the liveliest, contentious, and long-running scientific debates began over three decades ago with the discovery of an iridium anomaly in a thin clay layer at Gubbio, Italy, that led to the hypothesis that a large impact caused the end-Cretaceous mass extinction. For many scientists the discovery of an impact crater near Chicxulub on Yucatán in 1991 all but sealed

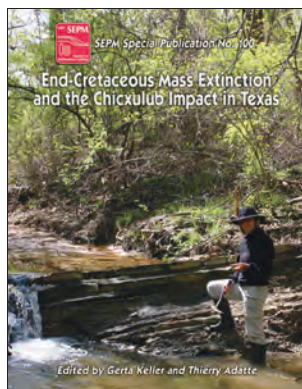
the impact-kill hypothesis as proven with the impact as sole cause for the mass extinction. Ever since that time evidence to the contrary has generally been interpreted as an impact tsunami disturbance. A multi-disciplinary team of researchers has tested this assertion in new cores and a dozen outcrops along the Brazos River, Texas. In this area undisturbed sediments reveal a complete time stratigraphic sequence containing the primary impact spherule ejecta layer in late Maastrichtian claystones deposited about 200–300 thousand years before the mass extinction. About 60 cm above this level is a submarine channel with lithified spherulerich clasts at the base followed by two to three reworked impact spherule layers and topped by sandstones. Above this channel deposit late Maastrichtian claystone deposition resumed followed by the KT boundary mass extinction. Brazos River sections thus show three events separated by time—the Chicxulub impact, the reworked spherule layers in a submarine channel, and the KTB mass extinction. In this volume a multi-disciplinary team of researchers from the USA, Switzerland, Germany, and Israel carefully documents this evidence based on paleontology, sedimentology, sequence stratigraphy, mineralogy, isotope geochemistry, trace and platinum group element geochemistry. The results are presented in a series of twelve articles with data tables and supplementary material.

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# SPECIAL PUBLICATION SERIES

## SP 99 – Application of the Principles of Seismic Geomorphology

Edited by: Bradford E. Prather, Mark E. Deptuck, David Mohrig, Berend van Hoorn and Russell B. Wynn, 2012

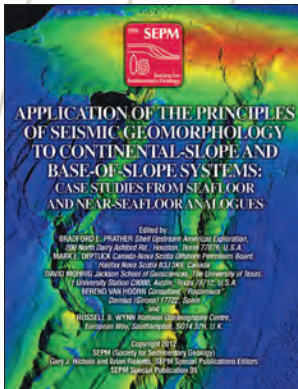
The study of near-seafloor deepwater landscapes and the processes that form them are as important to the understanding of deeply buried marine depositional systems as the study of modern fluvial environments is to our understanding of ancient terrestrial depositional systems. In fact, these near-seafloor studies follow in the great tradition established by earlier clastic sedimentologists in the use of modern systems to understand ancient environments. The acquisition and mapping of exploration 3D seismic surveys over the last few decades allows for the study of seafloor geomorphology with a spatial resolution comparable to most deepwater multibeam bathymetric tools, and represents a significant advancement that can be used to push forward general understanding of slope and base-of-slope depositional systems through the application of the emerging science of seismic geomorphology. The papers assembled for this volume demonstrate the utility of seafloor-to-shallow subsurface data sets in studying the development of submarine landscapes and their affiliated sedimentary deposits. These contributions highlight the controls of slope morphology on patterns of both sedimentation and erosion. Many of the papers also highlight the influence of pre-existing seafloor relief on confining sediment-gravity flows specific transport pathways, thereby affecting subsequent evolution of the seafloor. The understanding of depositional processes that comes from studying deepwater analogue systems remains the best way take to knowledge from one basin or system and apply confidently to another for prediction and characterization of reservoirs for exploration and production of hydrocarbons.

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## SP 98 – The Permian Rotliegend of the Netherlands

Edited by: Jürgen Grötsch and Reinhard Gaupp, 2011

More than 50 years ago, the discovery of the giant Groningen Gas Field in the subsurface of the Netherlands by NAM B.V. marked a turning point in the Dutch and European energy market initiating the replacement of coal by gas. Despite the fact that the Rotliegend dryland deposits in the Southern Permian Basin are one of Europe's most important georesources, no sedimentological overview is available to date for the subsurface of the Netherlands. This SEPM Special Publication presents for the first time such a summary of the present-day knowledge, including a comprehensive core atlas from on- and offshore wells. The latter is closely linked to the series of papers in the volume itself, essentially providing a reference handbook for "The Permian Rotliegend of the Netherlands". Progress as a result of many scientific and consultancy studies in the Rotliegend reservoirs is summarized in this volume, with contributions covering paleogeography, depositional environment, stratigraphy, diagenesis, structural geology as well as pressure and fluid distribution in the subsurface.

The title page illustrates a typical subsurface workflow to arrive at a conceptual geological model for hydrocarbon reservoirs. As a backdrop to the map of the Netherlands, a satellite image from Lake Eyre Basin in Australia is used, one of the closest present day analogues to the Southern Permian Basin depositional environments, albeit, much smaller in size (satellite image courtesy of Google Earth). Seismic cross section, depositional model, core photo, and thin section microphotograph of a good quality reservoir sandstone in the Rotliegend depict essential sources of information to develop reliable conceptual reservoir models for the subsurface. Supporting this is one of the objectives of SEPM SP 98.

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## SP 97 – From River to Rock Record: The Preservation of Fluvial Sediments and their Subsequent Interpretation

Edited by: Stephanie K. Davidson, Sophie Leleu, and Colin P. North, 2011

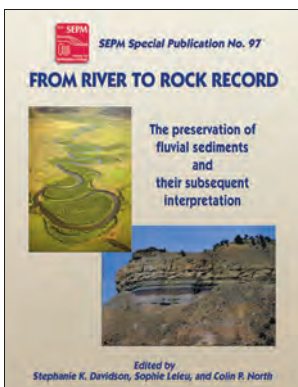
Over the last couple of decades, fluvial geomorphology and fluvial sedimentary geology have been developing in parallel, rather than in conjunction as might be desired. This volume is the result of the editors' attempt to bridge this gap in order to understand better how sediments in modern rivers become preserved in the rock record, and to improve interpretation from that record of the history of past environmental conditions. The catalyst for the volume was a conference with the same that was hosted at the University of Aberdeen School of Geosciences, in Aberdeen, Scotland, on 12-14 January 2009. The conferences brought together a broad spectrum of geomorphology and sedimentology researchers, from academia and industry. This interdisciplinary mix of experts considered and discussed ideas and examples ranging through timescales from the annual movement of individual river bars to sequence stratigraphic analysis of major sedimentary basins spanning millions of years. The articles in this volume are a mixture of novel concepts, new evaluations of the perceived wisdom about rivers and their sediments, and improved understanding derived from recent experience in interpreting the rock record. This volume usefully illustrates the current state of knowledge and will provide a stimulus for further research, particularly work that integrates geomorphological and sedimentological approaches and emphasizes cross-disciplinary communication.

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# SPECIAL PUBLICATION SERIES

## SP 96 – Mass-Transport Deposits in Deepwater Settings

Edited by: R. Craig Shipp, Paul Weimer, and Henry W. Posamentier, 2011

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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## SP 95 – Cenozoic Carbonate Systems of Australasia

Edited by: William A. Morgan, Annette D. George, Paul M. (Mitch) Harris, Julie A. Kupecz, and J.F. (Rick) Sarg, 2011

The Cenozoic carbonate systems of Australasia are the product of a diverse assortment of depositional and post-depositional processes, reflecting the interplay of eustasy, tectonics (both plate and local scale), climate, and evolutionary trends that influenced their initiation and development. These systems, which comprise both land-attached and isolated platforms, were initiated in a wide variety of tectonic settings (including rift, passive margin, and arc-related) and under warm and cool-water conditions where, locally, siliciclastic input affected their development. The lithofacies, biofacies, growth morphology, diagenesis, and hydrocarbon reservoir potential of these systems are products of these varying influences.

The studies reported in this volume range from syntheses of tectonic and depositional factors influencing carbonate deposition and controls on reservoir formation and petroleum system development, to local studies from the South China Sea, Indonesia, Kalimantan, Malaysia, the Marion Plateau, the Philippines, Western Australia, and New Caledonia that incorporate outcrop and subsurface data, including 3-D seismic imaging of carbonate platforms and facies, to understand the interplay of factors affecting the development of these systems under widely differing circumstances.

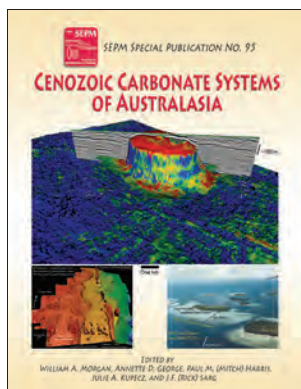
This volume will be of importance to geoscientists interested in the variability of Cenozoic carbonate systems and the factors that controlled their formation, and to those wanting to understand the range of potential hydrocarbon reservoirs discovered in these carbonates and the events that led to favorable reservoir and trap development.

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## SP 94 – Application of Modern Stratigraphic Techniques: Theory and Case Histories

Edited by: Kenneth T. Ratcliffe and Brian A. Zaitlin, 2010

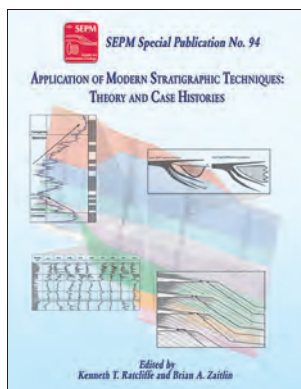
Much has been written and debated about the various methodologies applied to modern stratigraphic analysis and the ever increasing complexity of terminologies. However, there exist numerous stratigraphic techniques that are reliant upon precise, quantitative, reproducible data, rather than qualitative interpretative stratigraphic methodologies. Such stratigraphic techniques are applied in an entirely pragmatic non-biased manner within the petroleum industry to provide enhanced stratigraphic understanding of petroleum systems. The petroleum industry is a key driver behind the development of new stratigraphic techniques and a major provider of new stratigraphic data, which has resulted in several of these new techniques having been developed as a requirement to the industry. Furthermore, because techniques, such as isotope chemostratigraphy, elemental chemostratigraphy, magnetic susceptibility stratigraphy, numerical biostratigraphy and heavy mineral stratigraphy are based around precise, quantified and reproducible analytical data, they provide an independent means to test the more interpretative stratigraphic methodologies. This volume attempts an overview of stratigraphic methodologies, but largely focuses on data-generative stratigraphic techniques such as chemostratigraphy, magnetic susceptibility stratigraphy, numerical biostratigraphy and heavy mineral stratigraphy. Where appropriate, each paper discusses data generation methods including sample preparation and analytical methods as well outlining data interpretation methods. This is followed by case histories that demonstrate how those data are used to resolve stratigraphic problems, commonly using material derived from petroleum basins around the World.

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# SPECIAL PUBLICATION SERIES

## SP 93 – Geologic Problem Solving with Microfossils: A Volume in Honor of Garry D. Jones

Edited by: Thomas D. Demchuk and Anthony C. Gary, 2009

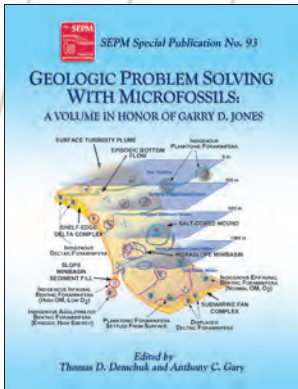
The papers presented in this SEPM Special Publication are the result of the successful SEPM Research Conference of the same name held on the campus of Rice University in Houston, Texas, during the days of March 6-11, 2005. Dr. Garry D. Jones originated the idea of a problem focused microfossil conference and he was the primary driving force during the conferences early planning until his untimely passing in May of 2004. At that time a group of Garry's colleagues carried forward his wishes for the conference through to its successful completion. More than 150 participants from 20 countries registered for the conference, and over 90 oral and poster sessions were given during the three formal days of the conference. In addition, 22 corporate and institutional sponsors donated to ensure the success of this event. After expenses, the remaining funds were passed on to SEPM, which placed the funds in the Garry Jones Memorial Grant for student research. The fund was established in Garry's memory to honor his contributions to micropaleontology. Grants are awarded from the fund to students conducting research with a substantial micropaleontological component and it is administered by the North American Micropaleontology Section (NAMS) of SEPM.

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## SP 92 – External Controls on Deep-Water Depositional Systems

Edited by: Ben Kneller, Ole J. Martinsen and Bill McCaffrey, 2009

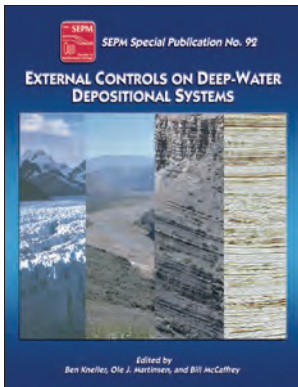
The principal objective of the meeting from which this set of papers arose was to gain an overview of the current state of knowledge of the roles and interplays of external controls on deposition in deep marine environments. By external controls we mean allocyclic or allogenic factors, i.e., those that are unrelated to the self-organization of the depositional system (autocyclic or autogenic); principal among these are climate, sea level, sediment supply, and tectonics. One of the big questions that the meeting sought to address concerned the comparability of the recent high-frequency, high-resolution record with the older, generally lower-frequency stratigraphic record of "deep time"; to what extent are the apparent differences a function of resolution, or of comparisons between a glacial and a nonglacial Earth? In fact, as the papers in this volume illustrate, the variability between individual systems, even in Late Glacial time, and the paucity of constraints on older systems makes these questions difficult to answer, but some useful conclusions can be drawn. The papers presented at the meeting were organized into themes that included: overviews of glacial sea-level change, and of climate modeling; external controls on large river-fed submarine fans, including the effects of climate and sea level on the fluvial system itself; influences of climate, sea level, and tectonics on a range of smaller modern systems; deep marine processes; the outcrop record of the pre-Pleistocene Earth; the subsurface record of the pre-Pleistocene Earth; and syntheses. The organization of the volume largely reflects this structure.

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## SP 91 – Cretaceous Oceanic Red Beds: Stratigraphy, Composition, Origins and Paleoceanographic and Paleoclimatic Significance

Edited by: Xiumian Hu, Chengshan Wang, Robert W. Scott, Michael Wagreich and Luba Jansa, 2009

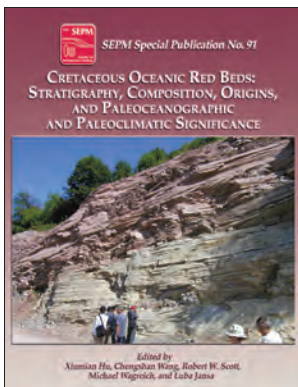
The occurrence of marine red beds has been known for at least 140 years, since Stür (1860) and Gümbel (1861) first described them from the Púchov beds in the Carpathians and the Nierental beds in the Eastern Alps. A few biostratigraphic and sedimentological studies followed, particularly in European countries. However, detailed investigations on paleoceanographic and paleoclimatic implications related to Cretaceous marine red beds were initiated by Prof. Chengshan Wang, Dr. Xiumian Hu, and their colleagues. This collection of papers resulted from two collaborative research projects funded in part by UNESCO/IUGS International Geosciences Project IGCP 463 and IGCP 494. The IGCP 463 "Upper Cretaceous Oceanic Red Beds: Response to Ocean/Climate Global Change" (2002-2006) was led by Prof. Chengshan Wang (China University of Geosciences, Beijing, China), Prof. Massimo Sarti (Università Politecnica delle Marche, Italy), Dr. Robert Scott (University of Tulsa and Precision Stratigraphy Associates, USA), and Prof. Luba Jansa (Dalhousie University, Canada). The objective of IGCP 463 was to study major paleoceanographic phenomena recorded by sedimentary sequences in the world oceans. Cretaceous deposition changed several times from widespread organic-carbon-enriched shales that indicate a dysoxic to anoxic deep ocean environment, to mostly reddish clays and marls deposited in an oxic marine environment during the Late Cretaceous.

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## SPECIAL PUBLICATION SERIES

### SP 90 – Recent Advances in Models of Siliciclastic Shallow-Marine Stratigraphy

Edited by: Gary J. Hampson, Ronald J. Steel, Peter M. Burgess and Robert W. Dalrymple, 2008

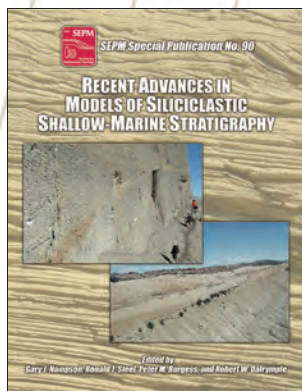
Siliciclastic shallow-marine deposits record the interface between land and sea, and its response to a variety of forcing mechanisms: physical process regime, the internal dynamics of coastal and shelfal depositional systems, relative sea level, sediment flux, tectonic setting, and climate. These deposits have long been the subject of conceptual stratigraphic models that seek to explain the interplay between these various forcing mechanisms, and their preservation in the stratigraphic record. This volume arose from an SEPM research conference on shoreline-shelf stratigraphy that was held in Grand Junction, Colorado, on August 24–28, 2004. The aim of the resulting volume is to highlight the development over the last 15 years of the stratigraphic concepts and models that are used to interpret siliciclastic marginal-marine, shallow-marine, and shelf deposits.

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### SP 89 – Controls on Carbonate Platform and Reef Development

Edited by: Jeff Lukasik and J.A. (Toni) Simo, 2008

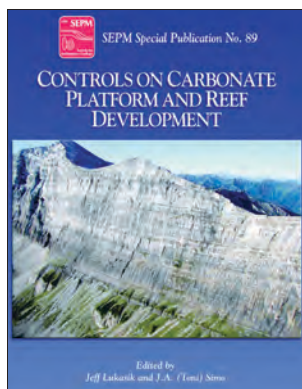
Carbonate platforms and reefs emerge, grow and die in response to intrinsic and extrinsic mechanisms forced primarily by tectonics, oceanography, climate, ecology and eustasy. These mechanisms, or controls, create the physical, biological and chemical signals accountable for the myriad of carbonate depositional responses that, together, form the complex depositional systems present in the modern and ancient settings. If we are to fully comprehend these systems, it is critical to ascertain which controls ultimately govern the “life cycle” of carbonate platforms and reefs and understand how these signals are recorded and preserved. Deciphering which signals produce a dominant sedimentological response from the plethora of physical and biological information generated from superimposed regional to global-scale controls is critical to achieving this goal. With this understanding, it may be possible to extract common time- and space-independent depositional responses to specific mechanisms that may, ultimately, be used in a productive sense. Extensive research on a wide variety of carbonate platform and reefal systems in the past few decades has provided the foundation and understanding necessary to take carbonate research to a new level. With assistance from rapidly advancing computer software and an increasing use of cross-disciplinary integration, carbonate research is shifting from description and morphological analysis towards a science that is more focused on the assessment of process and genetic relationships. The aim of this special publication is to present a cross section of recent research that shows this evolution from a variety of perspectives and scales using examples distributed throughout the Phanerozoic.

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### SP 88 – Sediment-Organism Interactions: A Multifaceted Ichnology

Edited by: Richard G. Bromley, Luis A. Buatois, Gabriela Mangano, Jorge F. Genise and Ricardo N. Melchor, 2008

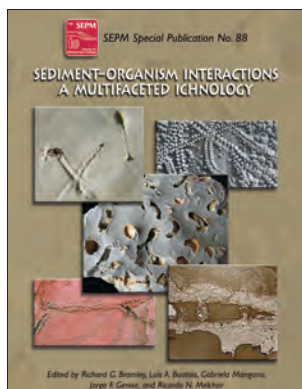
The field of Ichnology bridges the gap between the areas of paleontology and sedimentology, but has connections to many subdisciplines within these areas. Biogenic structures record the behavior of their tracemakers and provide valuable information in paleoecologic and paleoenvironmental analysis. As in situ ethologic structures, trace fossils or ichnofossils yield valuable insights into the paleoecology of ancient benthic communities and the environmental dynamics of depositional systems. Ichnology is truly a multifaceted field, and a broad selection of its facets is represented in the 28 papers of this volume. The papers are the product of Ichnia 2004, the First International Congress on Ichnology, convened by Jorge F. Genise and held from 19 to 23 April 2004 at the Museo Paleontológico Egidio Feruglio in Trelew, Patagonia, Argentina. Seven papers connected with the congress, containing ichnotaxonomy, were published separately, in *Ichnos*, volume 13, issue 4. Several symposium volumes, books, and short-course notes have been published in recent years and ichnology can be considered a particularly active research area in steady growth. The 28 papers herein are arranged in five groups that reveal the broad scope of ichnology.

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# SPECIAL PUBLICATION SERIES

## SP 87 – Cretaceous Rudists and Carbonate Platforms: Environmental Feedback

Edited by: Robert W. Scott, 2007

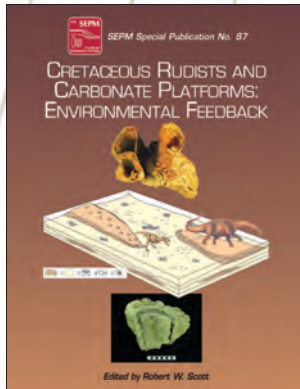
Sedimentologists, stratigraphers and paleontologists will find new data in SP 87, "Cretaceous Rudists and Carbonate Platforms: Environmental Feedback". The papers of the Proceedings of the Seventh International Congress on Rudists are organized into three themes: (1) Depositional Environments of Cretaceous Carbonates has been an overarching theme of the Working Group on Cretaceous Carbonate Platforms, Study of rudists, which produced great volumes of carbonate sediment, is central to understanding processes and reservoir prediction. Some of the world's great hydrocarbon reservoirs are rudist debris beds. (2) The Origins, Events, and Demise of Rudist Paleocommunities signal significant local and even global events in Earth systems. Rudist communities responded to oceanic anoxic events and to complex factors that lead to oxygenation of deep ocean water masses. (3) Theme Towards Rudists Taxonomy, Biogeography, and Phylogeny focuses on the paleobiology and systematics of rudists. The foundation of all interpretations of biogeography and paleoecology is solid taxonomy that is agreed upon by the majority of specialists. This is a core, ongoing scientific pursuit.

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## SP 86 – Proterozoic Geology of Western North America and Siberia

Edited by: Paul K. Link and Reed S. Lewis, 2007

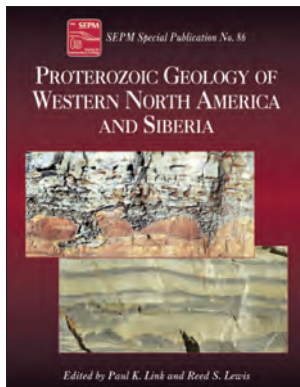
This volume is a compendium of research on the Belt Supergroup. It is an outgrowth of Belt Symposium IV, held in Salmon, Idaho, in July, 2003, in conjunction with the Tobacco Root Geological Society annual field conference. Because of the geographic extent and great thickness of the Belt Supergroup, years of work have been required before conclusions are "bona fide". The Mesoproterozoic Belt Supergroup of western Montana and adjacent areas is geologically and economically important, but it has been frustratingly hard to understand. The previous Belt Symposium volumes offer an historical view of the progress of the science of geology in the western United States. The advent of U-Pb geochronology, especially using the ion microprobe (SHRIMP) and laser-ablation ICPMS, has injected geochronometric reality into long-standing arguments about Belt stratigraphy. Several papers in this volume utilize these new tools to provide constraints on age and correlation of Belt strata (Chamberlain et al., Lewis et al., Link et al., and Doherty et al.)

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## SP 85 – Incised Valleys in Time and Space

Edited by: Robert W. Dalrymple, Dale A. Leckie and Roderick W. Tillman, 2006

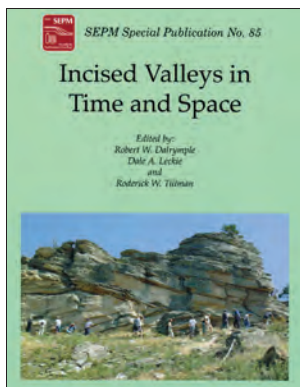
This volume grew out of two SEPM-sponsored events, an SEPM Research Conference that took place in Casper, Wyoming, in 2002 and an SEPM Research Symposium that was held at the AAPG/SEPM Annual Meeting in 2003. Several other papers have been added to broaden the range of examples presented. The theme of the volume, "Incised Valleys in Time and Space", has been chosen because of the comparison of valleys of different ages and in different settings is a valuable approach to understanding the role of the many factors that interact to create the valley and to emplace the subsequent valley-filling deposits. Each example, whether modern or ancient, represents a real-world experiment that lacks the temporal and spatial scaling issues that inhibit the application of laboratory experiments. Of course, the dependent and independent variables cannot be "controlled" in natural systems, but our ability to deduce the approximate values of these quantities (e.g., subsidence, sediment supply, climate) is increasing continually, such that semiquantitative and even quantitative estimates can be made in some cases. Almost all of the papers in the volume discuss more than a single incised valley, comparing two or more contemporaneous valleys, or valleys of different ages in the same geographic area. Such comparisons bring similarities and differences into sharper focus than any collection of individual case studies could, and highlight the relative importance of the many factors that influence the resulting sedimentary succession.

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## SPECIAL PUBLICATION SERIES

### SP 84 – Facies Models Revisited

Edited by: Henry W. Posamentier and Roger G. Walker, 2006

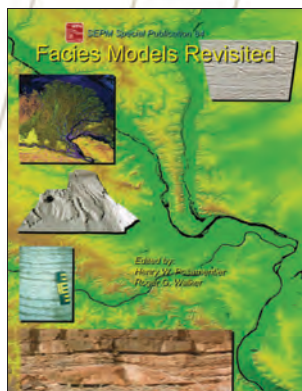
This compilation of papers is an outgrowth of technical sessions held in Calgary in 2002 (Annual Conference of the Canadian Society of Petroleum Geologists) and in Dallas in 2004 (Annual Conference of the American Association of Petroleum Geologists). These sessions, entitled *Facies Models Revisited*, were intended to capture the state of the art with respect to facies modeling in several key depositional environments. This volume is focused on clastic depositional settings including continental (aeolian and fluvial), estuarine, shoreface, deltaic, shelf, and deep water. The approach that they encouraged with the authors to follow was a first-principles rather than a model-driven approach. Their philosophy was to provide the reader with the tools and rules to create their own models rather than providing them with “canned” models or “templates”. Following this approach, they believe that geoscientists will develop better and more predictive facies of depositional models. The editors believe this volume will find a niche with both academic as well as industry and government geoscientists.

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### SP 83 – River Deltas – Concepts, Models and Examples

Edited by: Liviu Giosan and Janok P. Bhattacharya, 2005

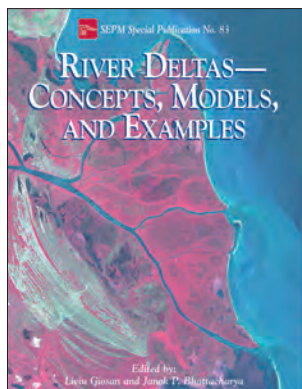
Deltas are amongst the most environmentally and economically important coastal sedimentary environments. Studies of deltas lag behind research in both fluvial and deep-water depositional systems, as well as more geomorphologically oriented land studies. This knowledge lag reflects both a reorientation of the petroleum industry in the last two decades toward deep-water systems, as well as the difficulty of working across the shoreline with the traditional tools used for oceanographic or land-based work. However, deltaic studies are experiencing a renewed focus, because of their global importance in environmental and other societal concerns. This volume stems from a special session: “Deltas: Old and New”, held at the Annual Geological Society of America conference in October 2002, that was convened to highlight these new directions in deltaic research.

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### SP 82 – The Deposition of Organic-Carbon-Rich Sediments: Models, Mechanisms, and Consequences

Edited by: Nicholas B. Harris, 2005

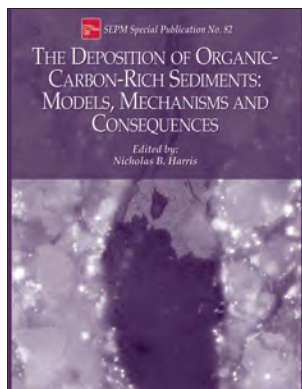
Depositional models for organic-carbon-rich sediments have been the subjects of both great interest and great controversy for many years. These sediments serve as the ultimate source of virtually all oil and gas. They also represent the interface between biological and geological processes and provide critical evidence for the state of the atmosphere and oceans. Yet despite their importance and decades of research, the origin of these sediments remains the source of vigorous disagreement. The twelve papers in this volume represent the cutting edge of research in this topic. They explore the origin of organic-carbon-rich sediments through a variety of techniques, including sedimentology, geochemistry, paleontology and computer modeling. All papers take multidisciplinary approaches to the topic, and together, they demonstrate the complex interconnected processes that trigger the deposition of organic carbon. This book will appeal to geoscientists in many disciplines, including explorers for petroleum who need models for source rock deposition, organic and inorganic geochemists who study processes in water and sediment, sedimentologists who interpret ancient deposition environments, and climatologists and oceanographers who reconstruct the behavior of the ancient atmosphere and oceans.

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# SPECIAL PUBLICATION SERIES

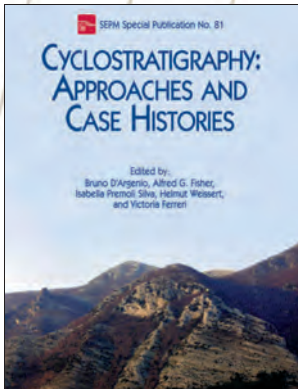
## SP 81 – Cyclostratigraphy: Approaches and Case Histories

Edited by: Bruno d'Argenio, Alfred G. Fischer, Isabella Premoli Silva, Helmut Weissert, and Vittoria Ferreri, 2004

This volume is derived from an SEPM international workshop entitled Multidisciplinary Approach to Cyclostratigraphy, organized by the editors in May 2001 and held in Sorrento (Naples, Italy). In the Introduction we offer a brief history of how concepts of orbital cyclicity and its effects on the Earth evolved, an appraisal of the present state of research, and an overview of the papers in this volume. The main body of the volume consists of the contributed studies. These include a paper on conceptual and pragmatic approaches to stratification cycles by one of the pioneers of cyclostratigraphy, Walther Schwarzacher, who, in the 1940s, discovered the hierarchical expression of orbital cycles in rocks. The other contributions are specific studies of cyclic sequences, extending from the Quaternary back to the Triassic, covering the range from continental deposits to the deep sea, and employing a wide variety of techniques for extracting and processing the information.

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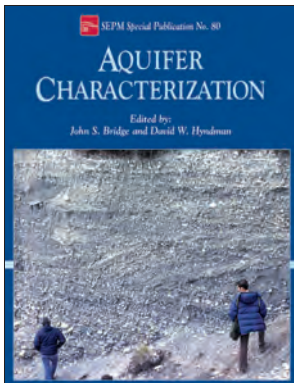
## SP 80 – Aquifer Characterization

Edited by: John S. Bridge and David W. Hyndman, 2004

The spatial variation of sedimentary aquifer properties (e.g., porosity and permeability) must be characterized in order to develop accurate models of groundwater flow and solute transport. The purpose of this volume was to bring together examples of the most recent research by sedimentologists, geophysicists, and hydrogeologists working on characterization of aquifer heterogeneity. The volume can be considered to be an outgrowth of SEPM Concepts in Hydrogeology and Environmental Geology Volume 1, entitled Hydrogeologic Models of Sedimentary Aquifers, which aimed to show how sedimentological information can be used in aquifer characterization and can thus help solve hydrogeologic problems. The papers in this volume demonstrate that integration of sedimentological and geophysical techniques for purposes of aquifer characterization are still in their infancy but that developments are promising.

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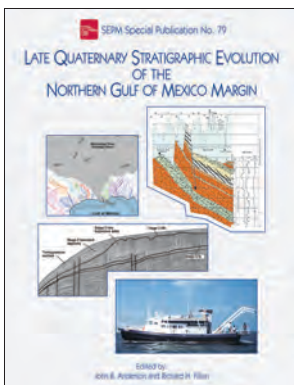
## SP 79 – Late Quaternary Stratigraphic Evolution of the Northern Gulf of Mexico Margin

Edited by: John B. Anderson and Richard H. Fillon, 2004

The northern Gulf of Mexico margin encompasses a variety of depositional settings characterized by different drainage basin size, physiography, fluvial morphology, climatic setting, and structural and diapiric activity. This, plus the abundance of long sediment cores and platform borings from oil industry activities, make it an unparalleled natural laboratory for sedimentological and stratigraphic studies and for testing sequence stratigraphic concepts. This volume contains twelve papers describing results from high-resolution stratigraphic studies of late Quaternary strata of the northern Gulf of Mexico, from the mouth of the Apalachicola River to the Rio Grande. These papers focus on fluvial response to climate and base-level change, variations in delta growth and evolution across the shelf, lowstand delta-fan evolution, the evolution of transgressive deposits on the shelf, the preservation of these deposits. The robust chronostratigraphic frameworks developed for the different study areas allows comparison of stratal geometries produced by contemporaneous depositional systems operating under identical eustatic conditions. This volume will appeal to sedimentologists and stratigraphers interested in source to sink issues, such as how various forcing mechanisms influence strata formation on continental margins.

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# SPECIAL PUBLICATION SERIES

## SP 78 – Permo-Carboniferous Carbonate Platforms and Reefs

Edited by: Wayne M. Ahr, Paul M. (Mitch) Harris, William A. Morgan, and Ian D. Somerville, 2003

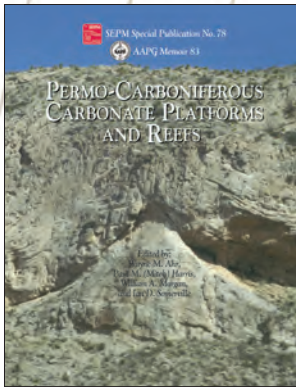
The bromide “*nothing is constant but change*” could have been coined to describe the geological history of the Permo-Carboniferous—the Mississippian, Pennsylvanian, and Permian Periods. Global tectonics, fluctuations in atmospheric and oceanic chemistry, changes in global climate, and evolutionary changes in survivors of mass extinctions created the backdrop for the shifting panorama of this remarkable time in earth history. Catastrophic extinctions during the Frasnian-Famennian crisis decimated the global plant and animal populations, leaving survivors to initially struggle through the Devonian-Carboniferous transition. The ensuing evolutionary diversification into less-populated niches was brought to an abrupt end at the close of the Permian Period by the largest of all mass extinctions. Upheavals in plate motion changed the configuration of continents and oceans during this time. Within the evolving Permo-Carboniferous “landscape,” a wide diversity of carbonate platforms and reefs flourished. They ranged in size from small mounds to mega-platforms, some of which are important mineral and petroleum reservoirs. It is the diversity which Permo-Carboniferous rocks offer that has led to their intensive study by researchers from industry and academia around the globe. This book stems mostly from presentations given at the SEPM- and IAS-sponsored research conference *Permo-Carboniferous Carbonate Platforms and Reefs*, held May 12-19, 2000 in El Paso, Texas.

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## SP 77 – Climate Controls on Stratigraphy

Edited by: C. Blaine Cecil and N. Terence Edgar, 2003

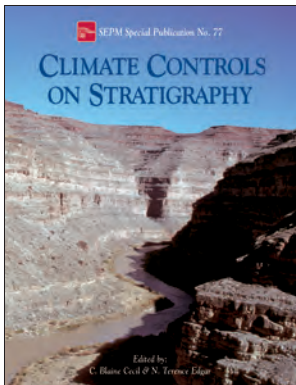
The role of climate as a primary control on stratigraphy is the cornerstone of this volume. The emphasis on climate is in distinct contrast to most previous studies, in which stratigraphic variability has been related to changes in sea level and in tectonic activity. Furthermore, the findings, derived from several years of detailed study of modern and ancient key geologic sections around the world, indicate that traditional depositional models generally do not fully explain the origin of fossil fuels. Although the results of the studies presented in this volume are intended to contribute to the disciplines of sedimentary geology and stratigraphy, the contributors recognize that their results may also contribute to a better understanding of global climate change. The theoretical background of climate control on sediment supply and stratigraphy is presented in the volume. With this background in place, detailed documentation and analysis of climate control on the lithologic variation of a single Middle Pennsylvanian.

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## SP 76 – Tropical Deltas of Southeast Asia: Sedimentology, Stratigraphy, and Petroleum Geology

Edited by: F. Hasan Sidi, Dag Nummedal, Patrice Imbert, Herman Darman, and Henry W. Posamentier, 2003

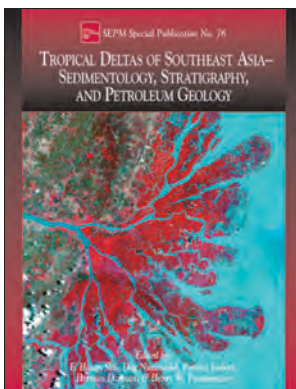
It is the objective of this volume to bring to the fore a category of deltas with which many sedimentologists and stratigraphers are, at best, vaguely familiar. It is expected that this volume also will stimulate new research on tropical deltas by highlighting how their facies and stratigraphic architectures differ from mid- and high-latitude ones, by emphasizing their significance to the global sediment budget, and by stressing their uniqueness within a petroleum systems framework. This special publication emphasizes the need for models intrinsic to tropical deltas of Southeast Asia to supplement the more conventional general models currently in vogue, based on past studies of large and small mid-latitude deltas. The papers in this book explore how the combination of these complex factors has shaped deltas in this region. Sedimentological surprises such as distributary channels floored by thick accumulations of fluid mud lend a bit of “mystery” to tropical deltas. We hope that, rather than being merely a summary of tropical deltas, this book may open the door to a new and active phase of sedimentological and stratigraphic research in tropical environments across the globe.

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# SPECIAL PUBLICATION SERIES

## SP 75 – Micropaleontologic Proxies for Sea-Level Change and Stratigraphic Discontinuities

Edited by: Hilary Clement Olson and R. Mark Leckie, 2003

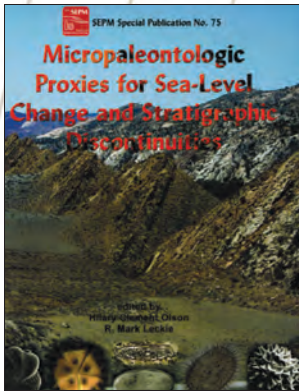
Micropaleontology and biostratigraphy play vital roles for deciphering the stratigraphic record produced by changes in relative sea level, interpreting the history of global sea-level change, and testing models for the causes of sea-level fluctuations due to the variable influences of tectonics, glacio-eustasy, and climate. The stratigraphic architecture developed in response to changing eustasy, accommodation space, and sediment supply along continental margins, in epicontinental seas, and on carbonate platforms can be interpreted using the tools of marine micropaleontology. Microfossils provide chronostratigraphic control and a wealth of paleoenvironmental information about depositional environments as well as post-depositional changes to those environments. This volume demonstrates clearly that micropaleontologic proxies of environmental change provide a powerful dimension to the interpretive potential of stratigraphic sequences produced by changes in relative sea level and eustasy. Studies in the volume range from paralic to bathyal environments, span Pennsylvanian through Holocene stratigraphy, encompass a variety of microfossil groups and include a wide spectrum of techniques and paleoenvironmental proxies. The volume has been designed for graduate students and professionals interested in a wide range of subjects.

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## SP 74 – Paleozoic Carbonates of the Commonwealth of Independent States (CIS): Subsurface Reservoirs and Outcrop Analogs

Edited by: William G. Zempolich and Harry E. Cook, 2003

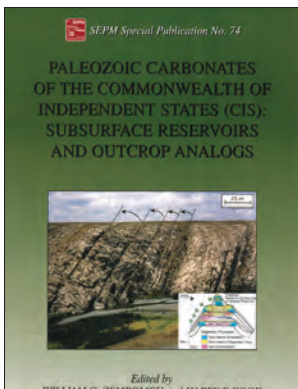
For decades virtually all of the former USSR was closed to non-Soviet bloc geologists for conducting collaborative geologic studies. This was unfortunate, inasmuch as this immense territory houses much of the earth's geological history and is estimated to have approximately 22 percent of the world's known petroleum volumes. Outside of the Russian literature and a limited number of papers and books translated into non-Russian languages, details about the petroleum resources and the evolution of carbonate rock complexes in the former USSR have been infrequent. The Paleozoic carbonate systems of the CIS are scientifically important because they include many of the world stratotype localities. Moreover, Paleozoic carbonates of the CIS provide a considerable record from which to evaluate the evolution of reef-building organisms through time, variations in paleoclimate, changes in global sea level, paleotectonics, and secular variation in the composition of ancient sea water, and primary mineralogy of marine carbonate precipitates. All of these variables have a major impact on the sedimentation, accumulation, and diagenesis of carbonate rocks, and thus a better understanding of carbonate systems of the CIS will advance our general knowledge of carbonate sedimentology and carbonate reservoirs.

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## SP 73 – Sedimentation in Continental Rifts

Edited by: Robin W. Renaut and Gail M. Ashley, 2002

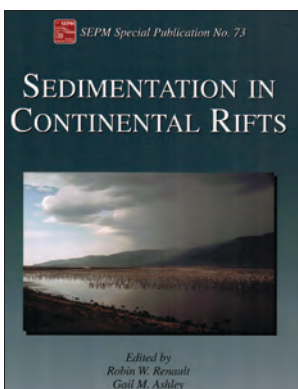
Continental rift basins have long been of interest to sedimentologists. Of all the terrestrial settings, rift basins typically provide the greatest accommodation space, and consequently have some of the longest records of continental sedimentation. These records are a product of a complex interplay between several factors that include geological structure and tectonic activity, volcanism, climate and its temporal variability, hydrology, biology and time. *Sedimentation in Continental Rifts* is a timely update on this exciting interdisciplinary field and presents new approaches and insights into tectonic and structural controls of sedimentation. Other topics included are lacustrine and fluvial depositional environments and some lesser-known settings, such as springs, wetlands, and paleosols. Several papers consider the behavior of silica in rift lakes, particularly the roles of microorganisms in silica precipitation, whereas others examine the paleoenvironmental importance of freshwater carbonates. The contents of the volume show that sedimentological research in rift basins has progressed beyond basic facies description and general models, and is now focused on understanding the integrative effects of physical, chemical and biological processes in rifts.

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# SPECIAL PUBLICATION SERIES

## SP 72 – Phanerozoic Reef Patterns

Edited by: Wolfgang Kiessling, Eric Flügel, and Jan Golonka, 2002

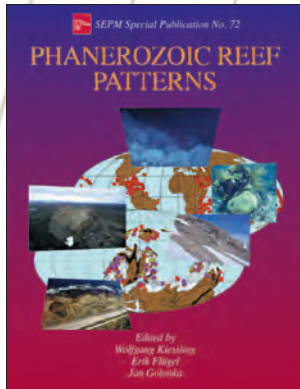
Detecting patterns and processes of ecosystem evolution is among the main challenges of an integrated earth system science in the 21st century. The evolution of reefs reflects changes triggered by evolutionary innovations and variations in global and regional controls at different scales. The prime fossil record of Phanerozoic reefs offers the opportunity to trace these patterns through space and time. *Phanerozoic Reef Patterns* presents a comprehensive and up-to-date review on the history of reef building in the last 540 million years. A selection of internationally respected reef specialists presents a database on ancient reefs that is hardly available for any other ecosystem. The thoroughly documented patterns are analyzed with respect to global change, whose impact on living reefs is intensely discussed today. *Phanerozoic Reef Patterns* stands out from recent reviews on reef evolution by its careful qualitative and quantitative approach based on a comprehensive and multifaceted databank, by the strong focus on data, by a complete and unified coverage of the Phanerozoic from the Early Cambrian to the late Neogene, by emphasizing paleogeographic reef distributions presented on 32 newly developed color maps, and by a detailed index that makes the book a valuable research tool.

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## SP 71 – Modern and Ancient Carbonate Eolianites: Sedimentology, Sequence Stratigraphy, and Diagenesis

Edited by: F.E. (Rick) Abegg, P.M. (Mitch) Harris, and David B. Loope, 2001

Carbonate eolianites had long been considered to be limited to the Quaternary, but a number of Mesozoic and Paleozoic examples have been documented in the past 15 years. Thus, an increased awareness of carbonate eolianites is required to properly interpret the rock record and to assess their spatial and temporal distribution.

The papers of this volume will help geologists to:

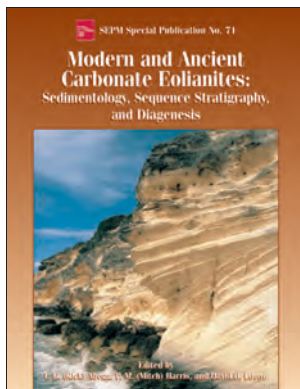
- (1) recognize carbonate eolianites and understand their preservation potential—recognitional criteria for most carbonate environments are common knowledge, but this is less true for carbonate eolianites;
- (2) understand their sedimentologic and diagenetic variability—diagenesis of carbonate eolianites has important economic considerations. Whereas Quaternary eolian limestones are commonly porous, Paleozoic and Mesozoic examples are typically tight owing to compaction;
- (3) understand the *Psilonichnus* (marginal marine) and *Scoyenia* (nonmarine) Ichnofacies—carbonate eolianites are not devoid of trace fossils;
- (4) interpret them in a sequence stratigraphic framework—interpretations of relative sea level during eolian deposition can be difficult, as differences between transgressive, regressive, and deflation-sourced eolianites are subtle. Thus, the placement of sequence boundaries within interbedded eolian and subtidal carbonate successions is not entirely straightforward.

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## SP 70 – Subsurface Geology of a Prograding Carbonate Platform Margin, Great Bahama Bank: Results of the Bahamas Drilling Project

Edited by: Robert N. Ginsburg, 2001

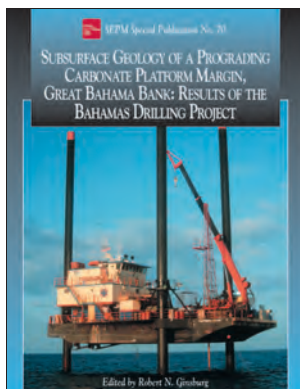
This volume will be of special interest to carbonate sedimentologists, geochemists, petroleum geologists, engineers, and seismologists. It addresses fundamental aspects of prograding carbonate platforms in a Neogene example from Great Bahama Bank. A remarkable seismic profile, which imaged the prograding margin, provided the seismic stratigraphic framework. Two continuously-cored and logged borings on the profile produced the ground truth for testing and characterizing processes: lithologies and ages of sequence boundaries; influence of sea level fluctuations on progradation, controls on impedance contrasts in carbonates; fluid flow through the submerged margin; log responses of different lithologies; and the origin, ages and depositional environments of the platform top and prograding clinothems. The new findings on diagenesis are of special interest, including complete mineral stabilization in seawater, early burial dolomitization related to sequence boundaries and how diagenesis controls sonic velocity and permeability.

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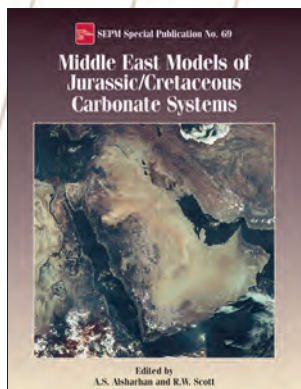
## SPECIAL PUBLICATION SERIES

### SP 69 – Middle East Models of Jurassic/Cretaceous Carbonate Systems

Edited by: A.S. Alsharhan and R.W. Scott, 2001

This volume will interest tectonic modelers, stratigraphers, sedimentologists, and explorationists. It is the product of the international conference of “Jurassic/Cretaceous Carbonate Platform-Basin Systems, Middle East Models” that was convened in December 1997 jointly by SEPM (Society for Sedimentary Geology) and the United Arab Emirates University in Al Ain, United Arab Emirates. The twenty-three papers present new data and interpretations arranged in three sections: 1) sequence stratigraphy, cyclostratigraphy, chronostratigraphy, and tectonic influences, 2) depositional and diagenetic models of carbonate platforms, and 3) hydrocarbon habitat and exploration/development case studies. New tectonic models of the Arabian Basin, new stratigraphic and sequence stratigraphic reference sections, new geochemical and source rock data, and new reservoir data are presented. New geologic models make this set of papers relevant to geoscientists working outside of Arabia also.

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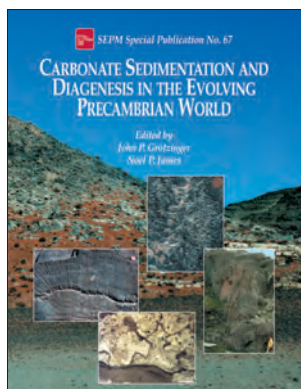
### SP 67 – Carbonate Sedimentation and Diagenesis in the Evolving Precambrian World

Edited by: John P. Grotzinger and Noel P. James, 2000

Precambrian carbonates are usually regarded as the simple cousins of the sedimentary realm, composed of stromatolites and dolostones, texturally not challenging and commonly altered beyond recognition by the vagaries of time, diagenesis and metamorphism. However, these carbonates that formed deep in time are commonly exquisitely preserved and contain within them a record of the evolving young earth. SEPM Special Publication 67 explores these aspects. Resulting from a 1997 SEPM/CSPG symposium entitled “Precambrian Carbonates,” these 18 papers demonstrate the importance of understanding these rocks, since within them is contained a record of the early ocean, atmosphere, and biosphere.

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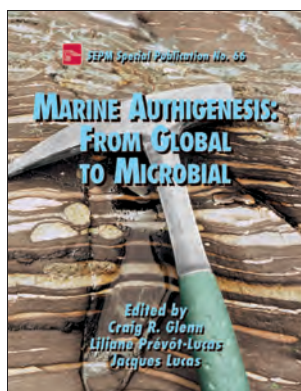
### SP 66 – Marine Authigenesis: From Global to Microbial

Edited by: Craig R. Glenn, Liliane Prevot-Lucas, Jacques Lucas, 2000

This volume is a collection of 33 state-of-the-art papers focusing on various aspects of authigenic and diagenetic marine minerals and related global elemental cycling. The commingling of the various studies of authigenic minerals in this volume, including the most recent advances in knowledge concerning the occurrence and origins of phosphorites, glauconites, dolomites, siderites, manganese-iron associations, barites, ironstones, and other marine chemical sediments/sedimentary rocks of early authigenic/diagenetic origin, is partly the result of the increasing awareness that there are many overlaps, even direct co-associations, between different authigenic minerals, both in time, space, and genesis. Taken together, this compilation represents a holistic approach towards marine authigenesis that considers the integrated whole more than the simple sum of its parts.

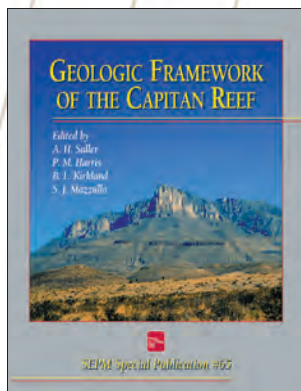
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## SPECIAL PUBLICATION SERIES



### SP 65 – Geologic Framework of the Capitan Reef

Edited by: Arthur H. Saller, Paul M. (Mitch) Harris, Brenda L. Kirkland, and Salvatore J. Mazzullo, 1999

The Capitan Formation of southeast New Mexico and west Texas contains one of the world's best exposed and most famous reefs. Depositional and diagenetic models derived from the Capitan have been used to interpret carbonate strata throughout the world. This volume contains 12 state-of-the-art papers summarizing major new research on the Capitan, putting the Capitan into a modern stratigraphic, depositional, paleontologic, and diagenetic framework.

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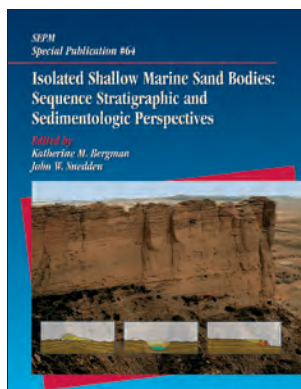
### SP 64 – Isolated Shallow Marine Sand Bodies: Sequence Stratigraphic Analysis and Sedimentologic Interpretation

Edited by: Katherine M. Bergman and John W. Snedden, 1999

Isolated shallow marine sand bodies are significant hydrocarbon reservoirs and understanding sand body genesis and geometry is critical to successful exploration and exploitation of these deposits. Recent advances in sequence stratigraphy have rekindled and refocused the discussions surrounding these important reservoirs. This volume stems from a 1995 SEPM sponsored targeted research conference that brought together the proponents of the differing interpretations to discuss facts and principles as they relate to isolated shallow marine sand bodies, using the controversial Lower Campanian Shannon Sandstone as the focus for discussion.

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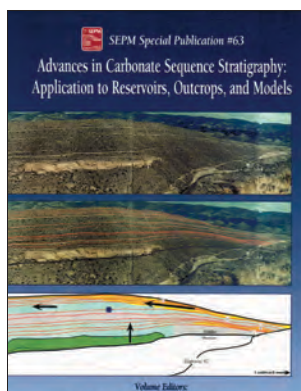
### SP 63 – Advances in Carbonate Sequence Stratigraphy: Application to Reservoirs, Outcrops and Models

Edited by: Paul M. (Mitch) Harris, Arthur H. Saller and J. A. (Toni) Simo, 1999

The SEPM Research Symposium for the 1997 AAPG-SEPM Annual Meeting in Dallas, Texas, was organized around the theme "Advances in Carbonate Sequence Stratigraphy – Application to Reservoirs, Outcrops and Models." The symposium proved to be thought-provoking and forward-looking and showed how sequence stratigraphy is influencing many aspects in our understanding of carbonates. This SEPM Special Publication contains studies that represent advances in our understanding of stratigraphy and the distribution of carbonate facies and diagenesis within a sequence stratigraphic framework. The case studies in this volume reinforce the observation that the most important factor controlling stratigraphic relationships in accommodation change, which is generally a product of variations in eustatic sea level and tectonic subsidence. The sequence stratigraphic studies included in this publication develop a better framework for interpreting depositional and diagenetic processes in carbonate strata. The subject matter falls generally into five main categories: (1) platform to basin stratigraphic correlation and facies distribution, (2) high-resolution sequence framework bridging the gap between seismic-scale and reservoir-scale stratigraphy, (3) cycle-stacking patterns and their relationship to longer-term sequences, (4) sequence stratigraphy and facies of slope and basin carbonates, and (5) paleoceanographic factors that cause variation in carbonate deposition.

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# SPECIAL PUBLICATION SERIES

## SP 62 – Numerical Experiments in Stratigraphy: Recent Advances in Stratigraphic and Sedimentologic Computer Simulations

Edited by: John W. Harbaugh, W. Lynn Watney, Eugene Rankey, Rudy Slingerland, Robert Goldstein, and Evan Franseen, 1999

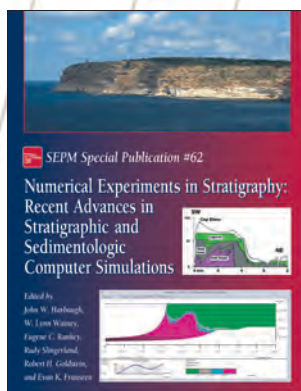
This volume presents the results derived from a three-day workshop held at the University of Kansas, Lawrence, Kansas, from May 15 through May 17, 1996. The objectives of the workshop were to document, characterize, demonstrate, and compare different computing procedures that have been utilized in simulating stratigraphic sequences. Both inverse and forward simulation modeling procedures are represented. The results of the workshop and the papers assembled here include: (1) an enhanced understanding of similarities and differences between models and modeling philosophies, (2) increased communication among modeling groups and geoscientists, (3) critical evaluation of applications and assessment of how models have been utilized, and (4) improvements and refinements in techniques for generating and describing model input and output.

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## SP 61 – Tidalites: Processes and Products

Edited by: Clark Alexander, Richard A. Davis, Jr., and Vernon J. Henry, 1998

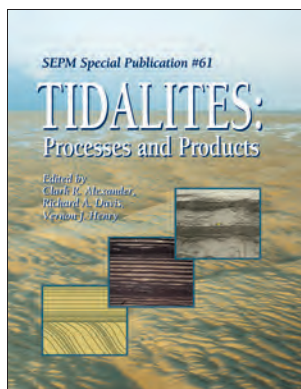
Tidal processes are important agents of sediment transport and deposition in most marine coastal zones. Recent development of better tools for recognizing tidal deposits (e.g., tidal bundles and tidal rhythmites) has also revealed that such deposits are much more common and extensive than previously thought. This volume presents the latest ideas on tidal sedimentation, including exciting new work concerning the tidal flats of the Wadden Sea, the area where modern-day studies of tidal sedimentation began; the origin, interpretation, and uses of tidal rhythmites; and the sequence-stratigraphic context of tidal sediments.

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## SP 60 – Mesozoic and Cenozoic Sequence Stratigraphy of European Basins

Edited by: Pierre-Charles de Graciansky, Jan Hardenbol, Thierry Jacquin and Peter Vail, 1998

This project was designed to build a documented chronostratigraphic and outcrop record of depositional sequences calibrated across European Basins. Data on standard stages, magnetostratigraphy, and geochronology integrated with high resolution biostratigraphy calibrate the stratigraphic position of depositional sequence boundaries. Higher order eustatic sequences show a significant increase in the number identified. A good portion of the European Mesozoic and Cenozoic succession is set in a sequence stratigraphic context with a better stratigraphic record of its bonding surfaces.

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# SPECIAL PUBLICATION SERIES

## SP 59 – Relative Role of Eustasy, Climate, and Tectonism in Continental Rocks

Edited by: Keith W. Shanley and Peter J. McCabe, 1998

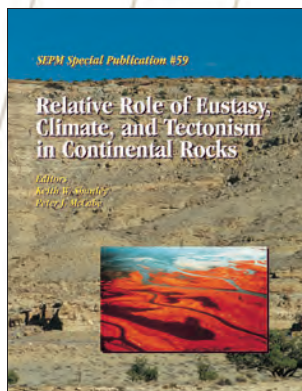
The renaissance in stratigraphy over the last two decades has been largely driven by the belief that stratigraphic packaging is determined by allocyclic controls. An understanding of the controls on stratigraphy allows us to make better predictions about the nature and geometry of strata within areas of basins where data is more limited. A special session was convened at the 1994 Denver annual meeting of the AAPG/SEPM entitled "Allocyclic controls on nonmarine stratigraphy". This session featured papers that demonstrated a wide range of approaches to developing an understanding a alluvial architecture. This volume represents a collection of these papers and as such brings together the results of research where authors have examined the relative importance of eustasy, climate, and sediment supply in determining the nature of lithologies and the style of packaging of continental strata. The hope is that readers will appreciate the complexities of nonmarine deposits and will begin to understand that the relative importance of allocyclic controls on architecture vary both in time and space.

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## SP 58 – Paleogeographic Evolution and Non-Glacial Eustasy: Northern South America

Edited by: James L. Pindell and Charles Drake, 1998

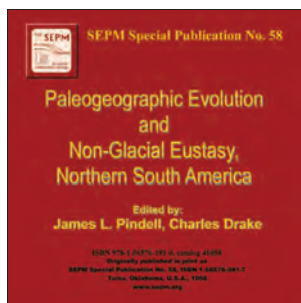
Published eustatic cycle charts commonly call for eustatic fluctuations of more the 40 m every few million years or less. These cycles are interpreted as eustatic, but, so far, waxing and waning of continental glaciations is the only known mechanism which clearly has the ability to drive such large, short-term eustatic fluctuations. High-magnitude, high-frequency "glacio-eustatic cyclicity" may be a valid concept for times of continental glaciations, but what about times when such glaciations was absent from Earth? Why do cycle charts have a similar form and style for time periods with and without glaciation? Is it that we have missed the identification of a fundamental driving cause which is as important as glaciation and which might have operated during non-glacial times? Or, is it that we are confusing local and eustatic drivers of relative sea-level change? These persistent questions, and others, continue to cast doubt on the entire subject of sequence correlatability. The papers in this book collectively address these questions.

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## SP 57 – Basin-Wide Diagenetic Patterns: Integrated Petrologic, Geochemical, and Hydrologic Considerations

Edited by: Isabel P. Montañez, Jay M. Gregg and Kevin L. Shelton, 1997

This volume contains papers, many of which were presented at the SEPM Research Conference entitled *Basin-Wide Diagenetic Patterns: Integrated Petrologic, Geochemical, and Hydrologic Considerations* which was convened May 21 to 25, 1994 at Lake Ozark, Missouri, U.S.A. Some of the issues addressed at this conference and in this volume include: factors governing the temporal evolution of hydrodynamic systems, the origin and evolution, and spatial distribution of paleoflow conduits and their diagenetic products in sedimentary basins, the nature of subsurface fluid-rock interactions, temporal and spatial distribution of the geochemistry of basinal fluids, and factors controlling heat flow in sedimentary basins.

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# SPECIAL PUBLICATION SERIES

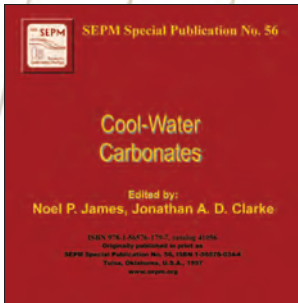
## SP 56 – Cool-Water Carbonates

Edited by: Noel P. James and Jonathan A. D. Clarke, 1997

This book is a collected series of papers on the sedimentary geology of carbonate sediments deposited on shelves and offshore banks in cool to cold oceans. Contributions come mainly from a workshop organized by Jonathan Clarke held in Geelong, Victoria from January 14 to 19, 1995. Most earth scientists have traditionally viewed carbonate sediments as warm-water deposits and interpreted them as such in most of the geological record. Yet large areas of the modern seafloor are covered with neritic carbonate sediments formed in seawater that is colder than 20°C. Such environments are not easily studied. Thus, our knowledge of cool-water carbonates has lagged far behind our understanding of their warm-water counterparts. This situation has changed somewhat as more and more investigators have braved the chill waters and rough seas. This book brings together a group of studies that illustrate the present status of our understanding and current research in a field that is in mid-life.

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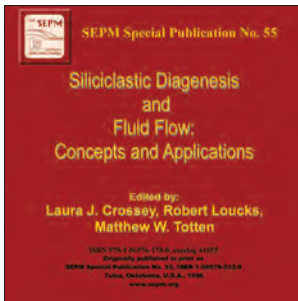


## SP 55 – Siliciclastic Diagenesis and Fluid Flow: Concept and Applications

Edited by: Laura J. Crossey, Robert Loucks and Matthew W. Totten, 1996

Research in the area of siliciclastic diagenesis has historically incorporated advances in related disciplines such as petrography and petrophysics, mineralogy, geochemistry, organic geochemistry, stratigraphy and basin analysis, and more recently, fluid flow. While the collection of papers in this publication covers a broad range of topics, an underlying theme is the importance of fluid flow in diagenetic processes. The mineralogy, texture and geochemistry of authigenic minerals provide constraints for fluid flow models, while formation waters provide modern snapshots of pore fluid evolution. Separated into two sections (Part I: Concepts and Part II: Applications), conceptual and practical applications are both represented.

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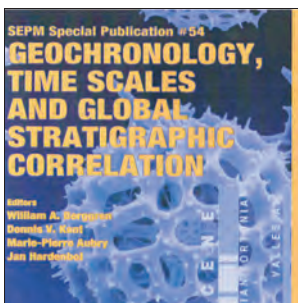
## SP 54 – Geochronology, Time Scales, and Global Stratigraphic Correlation

Edited by: William A. Berggren, Dennis V. Kent, Marie-Pierre Aubry and Jan Hardenbol, 1995

The last decade has witnessed significant advances in analytic techniques and methodologic approaches to understanding earth history. This publication is a well-constructed geochronologic framework that allows estimation of rates of geologic processes, correlation of stratigraphies, and placement of discrete events in temporal order. Resulting from a research symposium at the 67th Annual SEPM meeting in New Orleans, Louisiana, April 1993, the 16 papers of this volume represent a broad spectrum of approaches to understanding earth history and the passage of geologic time.

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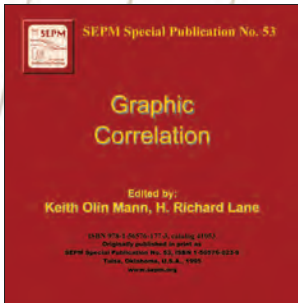
# SPECIAL PUBLICATION SERIES

## SP 53 – Graphic Correlation

Edited by: Keith Olin Mann and H. Richard Lane, 1995

An increasing number of geologists have begun to use graphic correlation because they find this robust technique provides finer stratigraphic resolution and better accuracy and precision than traditional zonations. This volume presents the graphic correlation method, recent methodological developments, and a number of technical papers exemplifying the technique. This collection of papers presents a summary of the technique as currently practiced and it should provide a starting point for those interested in high resolution stratigraphy through graphic correlation. Graphic correlation continues to develop and spread as more geologists use this important and innovative technique. Its potential is only beginning to become realized.

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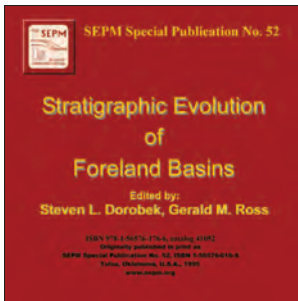
## SP 52 – Stratigraphic Evolution of Foreland Basins

Edited by: Steven L. Dorobek and Gerald M. Ross, 1994

A strong case can be made that foreland basins are where the casual links between sedimentation and tectonic events were first recognized, as evidenced by the interpretations of geologists working in classic foreland areas. This Special Publication was derived from a Research Symposium entitled "Stratigraphic Sequences in Foreland Basins" held at the AAPG-SEPM joint annual meeting on June, 1992, in Calgary, Alberta, Canada. This volume provides a well-balanced perspective of current research on foreland basin stratigraphy and also serves as another element in the evolving framework that comprises our understanding of foreland basins. Given that so many of earth's resources are found in foreland basins and that foreland basin strata often provide the only preserved record of the tectonic events that led to basin development, the impetus for continued studies of foreland basin strata should remain for many generations of geologists to come.

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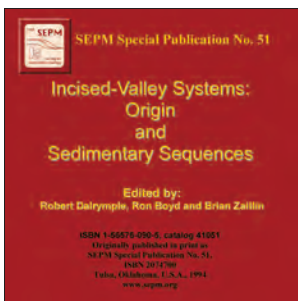
## SP 51 – Incised-Valley Systems: Origin and Sedimentary Sequences

Edited by: Robert W. Dalrymple, Ron Boyd and Brian Zaitlin, 1994

Incised valleys were not widely recognized prior to the 1980's. Most early workers forced the isolated, incised-valley deposits along an unconformity into a single continuous unit, ignored them by including them within larger stratigraphic units, or interpreted them as deltaic distributaries or non-incised fluvial channels. In the last decade, intense interest in the influence that changes in accommodation space have on stratigraphic organization has focused attention on incised-valley systems, because they are one of the most visible records of major decreases in accommodation. In practical terms, they are also a significant key to the identification of sequence-bounding unconformities. As a result, many successions have been re-examined and incised-valley fills are being found in rapidly growing numbers. This volume is an outgrowth of this widespread interest in incised-valley sedimentation. Many of the papers were initially presented at the Special Session on "Recognition and Facies of Incised Valley Fills" held at the AAPG-SEPM Annual Meeting (Calgary) in June, 1992.

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# SPECIAL PUBLICATION SERIES

## SP 50 – Sedimentology and Geochemistry of Modern and Ancient Saline Lakes

Edited by: R.W. Renaut and W.M. Last, 1994

This volume of papers grew out of a four-day symposium entitled "Sedimentary and Paleolimnological Records of Saline Lakes" held at Saskatoon, Canada in August, 1991. The aim of this Special Publication is to bring together selected papers from this conference that deal specifically with the sedimentological, inorganic geochemical, and hydrological aspects of salt lakes and their stratigraphic records. This volume is divided into four sections. The first section contains papers that deal with modern saline lakes. The second section contains papers dealing with sedimentation and diagenesis of late Quaternary salt lakes. The third and fourth sections contain papers devoted to ancient (pre-Quaternary) Lacustrine sequences.

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## SP 49 – Applications of Paleomagnetism to Sedimentary Geology

Edited by: D.M. Aissaoui, D.F. McNeill, and N.F. Hurley, 1993

Based on the 1991 SEPM Research Symposium, the results are directed towards bringing the disciplines of Paleomagnetism and sedimentary geology closer together. Advances in the field of sedimentary geology will likely result from continued development of new ideas, questioning of old dogma, and, most importantly, providing means for testing these new hypotheses. It is hoped that the union of these two disciplines will help address many fundamental geological questions, such as the perennial problems of precise age-dating, stratigraphic correlation and geometries, understanding the timing and nature of post-depositional diagenetic fabrics, and the intriguing relationship between hydrocarbons and magnetization. The reader will find an unusual diversity of research topics presented in this volume. This diversity serves as a testimony to the potential applications awaiting the sedimentary geologist willing to explore these new paleomagnetic tools.

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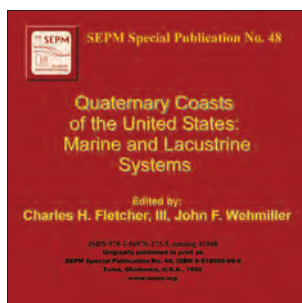
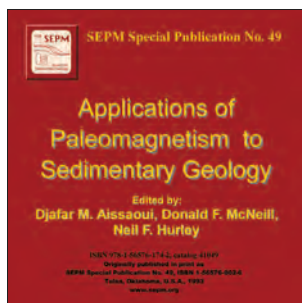
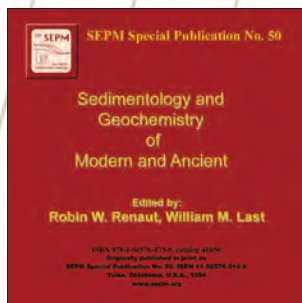
## SP 48 – Quaternary Coasts of the United States: Marine and Lacustrine Systems

Edited by: Charles H. Fletcher III and John Wehmiller, 1993

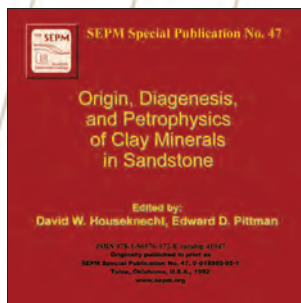
This Special Publication represents the major cumulative contribution of the Working Group of the United States of America to IGCP Project 274. The primary aims of Project 274 are to: (1) document and explain local to global variations in coastal and continental-shelf evolution, incorporating knowledge of coastal and shelf processes and environment with geodynamic, climatic, oceanographic and other data to produce local and regional models, ranging from descriptive to numerical, leading to a better understanding of interactive forces responsible for past, present and future changes to the coasts of the world; and (2) promote specified thematic studies, which are necessary to solve problems of coastal change affecting human occupation of the coastal zone. The volume contains sections on Atlantic, Pacific, Gulf and Lacustrine shorelines, covering both Holocene and Pleistocene deposits, representing a summary of decades of research into coastal and continental-shelf evolution of North America.

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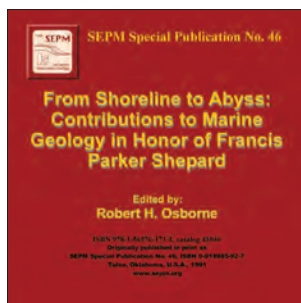


## SP 47 – Origin, Diagenesis and Petrophysics of Clay Minerals in Sandstone

Edited by: David W. Houseknecht and Edward D. Pittman, 1992

This volume grew out of a symposium held at the 27th Annual Meeting of the Clay Minerals Society in Columbia, Missouri on October, 1990. The symposium was designed to present a current synthesis of research devoted to the origin, diagenesis and petrophysics of clay minerals in sandstones. International authors demonstrate a multidisciplinary approach to interpreting the origin and diagenesis of clay minerals in sandstones and to evaluating their influence on reservoir quality. This volume bridges a gap between petrographic and geochemical researchers and reservoir geologists and engineers.

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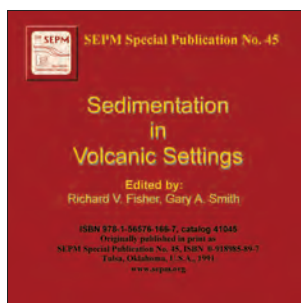


## SP 46 – From Shoreline to Abyss: Contributions to Marine Geology in Honor of Francis Parker Shepard

Edited by: Robert H. Osborne, 1991

Francis P. Shepard left a rich scientific legacy including more than 230 published papers and books primarily addressed to the study of submarine canyons and turbidity currents, continental shelves and associated sediments, coastal processes and sediments and marine physiography and tectonics. He is best remembered for his work on submarine canyons; however, his broad range of scientific interests and his remarkable ability to break new ground in each of these disciplines have served as a model for at least four generations of “Shepard” students. This new work from these Shepard students addresses problems in marine geology from the global scale to the local outcrop scale. Relationships among tectonics, eustasy and both siliciclastic and carbonate sedimentation create a unifying theme. Special topics include coastal processes, shelf and slope evolution, and submarine canyon and fan systems.

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## SP 45 – Sedimentation in Volcanic Settings

Edited by: Richard V. Fisher and Gary A. Smith, 1991

We have gained considerable experience with volcanoclastic materials over the past 30 years, but the field has undergone considerable growth in the decade following the 1980 eruption of Mount St. Helens. This eruption resulted in an accelerated research in explosive volcanic products and spurred a renewed interest in volcanoclastic materials as they relate to plate tectonic boundaries and explosive volcanism in general. Since the early 1970s a loosely defined field called “sedimentary tectonics” has emerged. A large part of the field of sedimentation and tectonics includes studies of volcanoclastic sedimentation, largely because of the direct association of tectonism, volcanism and sedimentation. This book attempts to illuminate the field and to present its salient features to sedimentologists not generally versed in volcanoclastic particles, deposits or facies.

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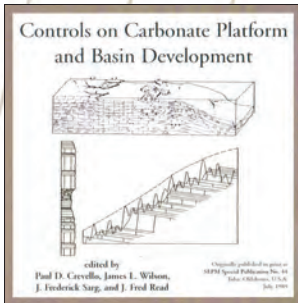
# SPECIAL PUBLICATION SERIES

## SP 44 – Controls on Carbonate Platform and Basin Development

Edited by: Paul D. Crevello, James L. Wilson, J. Frederick Sarg and J. Fred Read, 1989

This volume is derived from the SEPM Research Symposium of the same name that was formulated for the Los Angeles meetings of AAPG and SEPM in 1987. The volume covers many subjects relative to geology of carbonate platforms and adjoining slopes and basins. A preliminary section, based on principles of deposition and computer modeling studies, is followed by a group of papers devoted to examples of carbonate platforms on passive cratonal margins resulting from rifting. Some of the examples are from major platform systems around North America and the Mesozoic of Tethys. Other studies are of local and individual platform-basin systems. Examples of both ramps and rimmed platforms are included. The case histories presented span the whole of geologic time from early in the Proterozoic to the Holocene.

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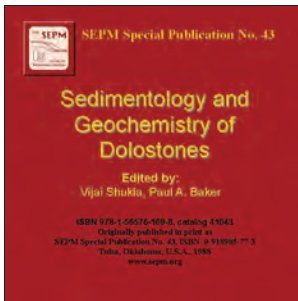


## SP 43 – Sedimentology and Geochemistry of Dolostones

Edited by: Vijai Shukla and Paul A. Baker, 1988

The need has always existed for understanding the processes of dolomitization and the origin of thick sequences of dolostones. This need becomes even more critical because pre-Cretaceous dolostones commonly host economically important deposits of natural resources and fossil fuels. This publication was derived from an SEPM Research Symposium held in Raleigh, North Carolina, on September, 1986. The volume attempts to answer the questions: How have the concepts and models presented in other publications been applied to sedimentary dolomites, Have we gained new insights and awareness into the processes of dolomitization, and many others. The principal message of this publication is, whereas enormous progress has been made in dolostone research since 1965, the subject is ripe for further study.

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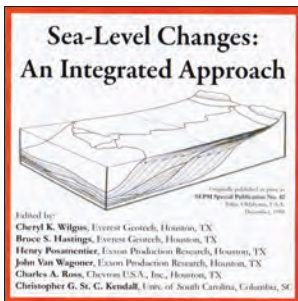
## SP 42 – Sea-Level Changes: An Integrated Approach

Edited by: C.K. Wilgus, B.S. Hastings, C.A. Ross, H. Posamentier, J. Van Wagoner and C.G. St. C. Kendall, 1988

In October 1985, SEPM sponsored a four-day conference entitled "Sea-Level Changes – An Integrated Approach." The purpose of the conference was to provide a forum for an interdisciplinary exchange of ideas on sea-level changes and to provide an opportunity for integrating various types of evidence in approaching unresolved issues. The conference was successful in bringing together scientists from industry, academia, and government, representing all of the major geosciences disciplines. Presentations of many new papers, plus significant releases of data that were previously held proprietary, provided fertile ground for discussion. This much-cited volume represents the best of the material presented at the conference. Includes the early "Vail" chart.

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# SPECIAL PUBLICATION SERIES

## SP 41 – Sea-Level Fluctuation and Coastal Evolution

Edited by: Dag Nummedal, Orrin H. Pilkey, Jr. and James D. Howard, 1987

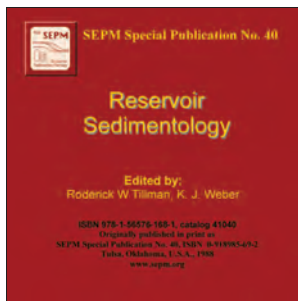
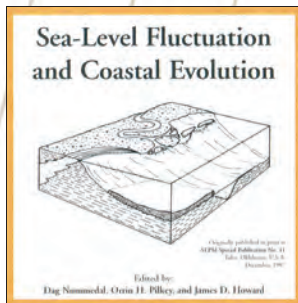
This Special Publication is the result of a symposium in honor of W. Armstrong Price held at the first SEPM Midyear Meeting at San Jose, California, on August 12, 1984. The factors controlling relative sea-level change along our shores are varied and, at best, imperfectly understood. Yet, the relative rate of change is what controls shoreline erosion, the arrangement of sedimentary facies of the coastal zone, and the character of deformities within the coastal stratigraphic record. Therefore, these papers address sea-level changes, shoreline responses, and the controls on the three-dimensional geometry of the consequent lithosomes; in short, the architecture of the coastal depositional systems.

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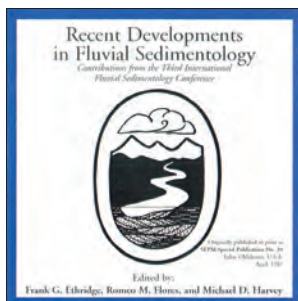
## SP 40 – Reservoir Sedimentology

Edited by: Roderick W. Tillman and Koenraad J. Weber, 1987

This volume is a collection of papers which focus on the sedimentology of siliciclastic sandstone and carbonate reservoirs. The papers were selected to show how detailed sedimentologic descriptions, when combined with engineering or other subsurface geologic techniques, yield reservoir models which may be used for reservoir management during field development and during secondary or tertiary enhanced oil recovery. In all the papers the framework for the field descriptions relies heavily of full-diameter cores. In addition to conventional 4-inch-diameter cores, frozen and rubber-sleeve cores were utilized in one or more of the studies. In addition to cores, at least one other geologic or engineering technique is integrated into each study. This integration of sedimentologic descriptions with other techniques gives rise to synergism.

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## SP 39 – Recent Developments in Fluvial Sedimentology

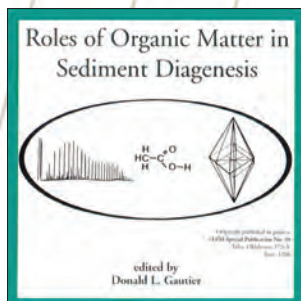
Edited by: Frank G. Ethridge, Romeo M. Flores and Michael D. Harvey, 1987

This volume brings together 36 of the manuscripts that were presented at the Third International Fluvial Sedimentology Conference hosted by Colorado State University in August, 1985. Fluvial systems and sedimentary rock sequences discussed range in age from Holocene to Precambrian and include many diverse areas. The principal objective of the volume was to document the recent developments in the application of facies analysis to the reconstruction of the architecture of fluvial systems. Reconstruction of architecture is an integral part of the overall process of basin analysis.

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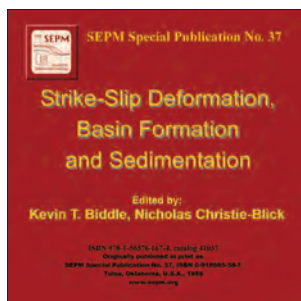


## SP 38 – Roles of Organic Matter in Sediment Diagenesis

Edited by: Donald L. Gautier, 1986

This volume is the direct result of an SEPM Research Conference held in October 1983 at Lost Valley Ranch, Colorado. The goal of the volume is to bring attention of the sedimentological community the importance of interaction of organic compounds with the inorganic sedimentary system and the degree to which organic compounds drive diagenetic systems. This volume comprises 16 reports illustrative of the scope and direction of current research in sedimentological and geochemical studies of organic/inorganic interaction.

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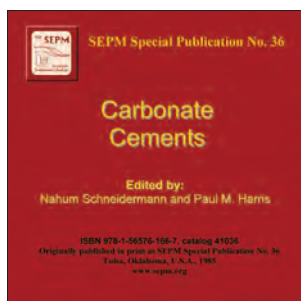


## SP 37 – Strike-Slip Deformation, Basin Formation and Sedimentation

Edited by: Kevin T. Biddle and Nicholas Christie-Blick, 1985

This Special Publication is an outgrowth of a Research Symposium held at the 1984 joint meeting of SEPM and AAPG in San Antonio, Texas. In recent years a significant body of new geological and geophysical data on strike-slip basins had been acquired, and there had been significant progress in understanding the mechanisms by which basins form and deform in strike-slip settings. This volume emphasizes the relations between deformation patterns along strike-slip faults, the mechanisms by which basins form and the configuration of sedimentary facies within such basins.

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## SP 36 – Carbonate Cements

Edited by: Nahum Schneidermann and Paul M. Harris, 1985

In the annals of carbonate sedimentology, few fields have undergone more discussion than the area of carbonate cements. Why this interest? Studies of carbonate cements provide visual gratification to carbonate petrographers and mineralogists. Economic geologists exploring for minerals and hydrocarbons worry about their effect on porosity occlusion or preservation. Inorganic geochemists are now able to precipitate carbonate cements under controlled conditions, and organic geochemists can observe their interactions with living or fossil organic matter. Students of modern carbonate environments of deposition can observe almost instantaneous cementation processes in a diverse group of environments ranging from fresh water to the deep sea floor. The SEPM Special Symposium, held at the 1983 AAPG/SEPM Annual Convention in Dallas, Texas, was designed to bring together specialists working on modern marine and fresh-water cements, on their ancient analogs and their proposed relationship to burial conditions.

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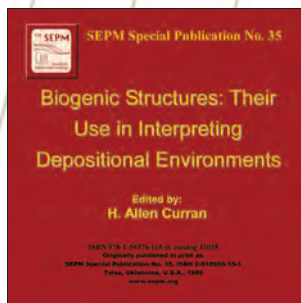
## SPECIAL PUBLICATION SERIES

### SP 35 – Biogenic Structures: Their Use in Interpreting Depositional Systems

Edited by: H. Allen Curran, 1985

Organisms of one sort or another today inhabit virtually every sediment environment on Earth, and the rock record tells us that this has been the case through the greater part of our planet's history. Furthermore, organisms leave their mark in most sedimentary settings, either directly in the form of body fossils or indirectly as biogenic structures. In addition to their often profound modifying effects on substrates, ancient biogenic structures preserve a record of organism behavioral activity in response to substrate and other paleoenvironmental controls. Thus, biogenic structures can be highly useful as facies indicators and can provide valuable clues to the interpretation of paleodepositional environments. The purpose of this volume is to present a broad spectrum of case-book examples of the use of biogenic structures in the interpretation of depositional environments.

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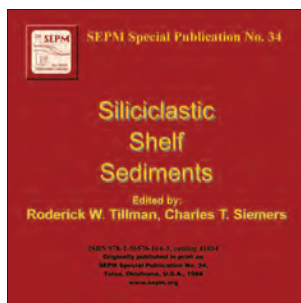


### SP 34 – Siliciclastic Shelf Sediments

Edited by: Roderick W. Tillman and Charles T. Siemers, 1984

This volume is a collection of papers which, for the most part, were included in a symposium of Shelf Sandstone deposits sponsored by SEPM at the Annual Meeting in Denver in 1980. A variety of techniques are useful in documenting shelf depositional process and sand body geometries. Among these are sedimentary structures observed in outcrops and cores, biogenic data including trace fossils, micro- and macro-fauna, detailed seismic sections, and detailed subsurface correlations. These types of data are all readily available, at least locally, for Mesozoic rocks. In studying older shelf sandstones such as those from the early Paleozoic and Precambrian, some techniques cannot be used; trace fossils are rare to absent, and it is difficult to establish the relationships of the shelf sand-bodies to the shoreline of the broad shallow seas that were common at that time.

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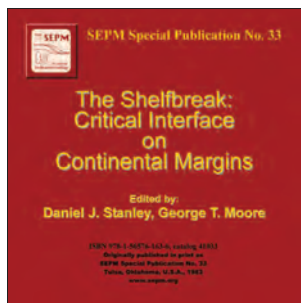


### SP 33 – The Shelfbreak: Critical Interface on Continental Margins

Edited by: Daniel Jo Stanley and George T. Moore, 1983

The shelfbreak is that point where the first major change in gradient occurs on the outermost edge of the continental shelf. Although this environment delimits the boundary between two principal and well-defined provinces, the continental shelf and slope – and thus is of the first order of importance on continental margins – it has received surprisingly little specific attention in either modern oceans or in the rock record. This volume, the first compendium dedicated specifically to the shelfbreak, was derived from an SEPM Research Symposium convened at the joint Annual Meeting of SEPM and AAPG on June 2, 1981. The material is organized in a manner to illustrate examples of the shelfbreak in both modern oceans and the rock record.

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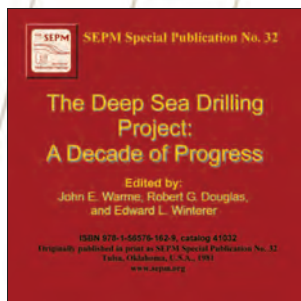
## SPECIAL PUBLICATION SERIES

### SP 32 – The Deep Sea Drilling Project: A Decade of Progress

Edited by: John E. Warme, Robert C. Douglas and Edward L. Winterer, 1981

At the present the *Glomar Challenger* has drilled over 500 holes over the world ocean, involving hundreds of scientists from dozens of countries. This volume is intended as a review of some of the important results from the most comprehensive, ambitious and successful earth-bound geologic project ever undertaken. The symposium upon which this volume originated was held April 4, 1979 at the SEPM/AAPG Annual Meeting in Houston. No comprehensive synthesis of all aspects of the DSDP has appeared, and the topic coverage in this volume is biased towards the sediments and fossils, and their significance for certain aspects of earth history – paleogeography, bathymetry, climatology, oceanography, ecology, environments – all in keeping with the audience of sedimentary geologists.

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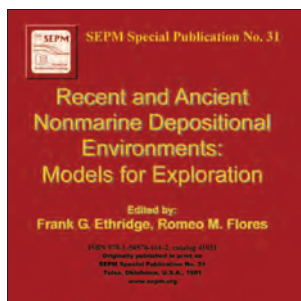


### SP 31 – Recent and Ancient Nonmarine Depositional Environments: Models for Exploration

Edited by: Frank G. Ethridge and Romeo M. Flores, 1981

This volume is a collection of papers that resulted from a symposium on Recent and Ancient Nonmarine Depositional Environments which was held in Casper, Wyoming on June 3 to 7, 1979. The nineteen papers may be divided into: (1) a review of recent and ancient nonmarine modes, (2) alluvial fan and fluvial deposits, (3) lacustrine deposits, (4) eolian deposits. Knowledge of the physical, biological and chemical characteristics and depositional environments on nonmarine sedimentary deposits has increased significantly over the last decade. Correspondingly, there has also been an increase in our ability to apply this knowledge to the exploration and exploitation of contained energy resources and minerals.

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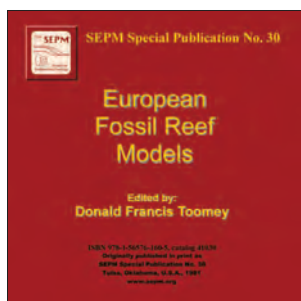


### SP 30 – European Fossil Reef Models

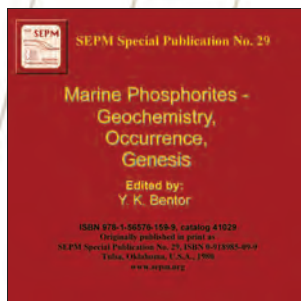
Edited by: Donald Francis Toomey, 1981

The voluminous amount of information presented in this Special Publication not only fills a gap in understanding the European approach to reef studies but also provides the necessary data base to allow us (in particular the North American geologist) to incorporate this information in our overall interpretive studies. These studies should serve as an impetus for new investigations and will broaden our understanding of the complex interrelationships that operate in the reef environment.

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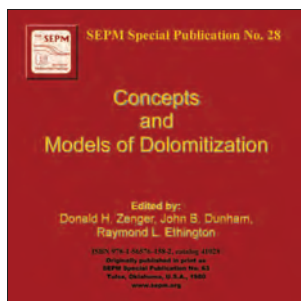


## SP 29 – Marine Phosphorites

Edited by: Y.K. Benter, 1980

During the Xth International Congress on Sedimentology, a symposium on marine phosphorites was held in Jerusalem, Israel, 9-14 July 1978. This volume contains the papers delivered at this meeting and represents the main interests inspiring the study of phosphorites at the end of the seventies. Considerable emphasis is placed now of the geochemistry of phosphorites.

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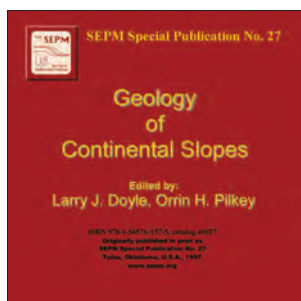


## SP 28 – Concepts and Models of Dolomitization

Edited by: Donald H. Zenger, John B. Dunham and Raymond L. Ethington, 1980

Special Publication 28 has its roots in the 22nd Annual Research Symposium of SEPM entitled *Concepts and Models of Dolomitization – Their Intricacies and Significance* held on April 3, 1979 in Houston, Texas as part of the joint annual meetings of AAPG and SEPM. The purpose of that symposium was to express the state-of-the-art of the study of the elusive process(es) of dolomitization. Most of the contributions in this volume are concerned with apparent early, near-surface dolomitization, either by hypersaline brines, by the marine-meteoritic mixing model or some variant thereof, or by both mechanisms where more than one phase or kind of dolomite exists, or where the origin of a particular dolomite is uncertain. Other models and aspects of dolomitization are treated here as well.

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## SP 27 – Geology of Continental Slopes

Edited by: Larry J. Doyle and Orrin H. Pilkey, 1979

Continental slopes are the edges of continental blocks, the zones of change from continental crust to oceanic crust. They are critical links in the chain of sedimentary processes that eventually carry sediment to the true ocean basin floor. In spite of their importance, until recently continental slopes have been largely ignored when compared with research focused on other provinces of the continental margins and deep sea. Spurred by the recognition that a key portion of the margin has been overlooked and by the extension of hydrocarbon exploration into ever deeper waters, interest in continental slopes has burgeoned. In response a special symposium was convened sponsored by SEPM and AAPG at the 1978 meeting in Oklahoma City. This volume, a result of that meeting, is comprised of papers presented at that time.

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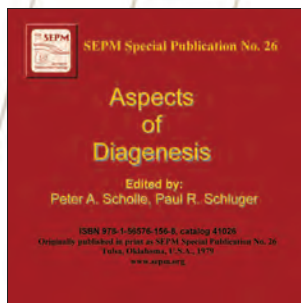
# SPECIAL PUBLICATION SERIES

## SP 26 – Aspects of Diagenesis

Edited by: Peter A. Scholle and Paul R. Schluger, 1979

There are a number of gaping holes in accumulated knowledge within the discipline of sedimentology. Perhaps one of the largest holes has been the general subject of diagenesis in clastic rocks. It was therefore fortuitous that two symposia covering various aspects of diagenesis (mainly in clastics) were presented a year apart in different parts of the country but with the same motivation – to contribute to the closing of that knowledge gap. Sedimentologists now have a fairly good idea of the what and the how of sediment deposition. What happens after the sediments are lithified has frequently been ignored. It was the aim of both editors of this publication to approach the subject from two different viewpoints. Schluger directed a symposium which looked mainly at clastic reservoirs, and Scholle presented a symposium which examined various aspects of paleotemperature control of diagenesis.

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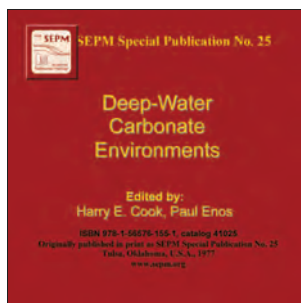


## SP 25 – Deep-Water Carbonate Environments

Edited by: Harry E. Cook and Paul Enos, 1977

The need to expand our search for energy resources into deeper marine environments makes a volume devoted entirely to deep-water carbonates most timely. It has become increasingly important to better understand deep marine environments and their transitions to shoal water settings. Of importance are the processes operating in deep-water settings and the magnitude and periodicity of these processes especially as they affect the geometry, textural character, and the overall lithologic and biologic patterns of the sediment. This volume represents contributions from researchers who have diverse perspectives. Their papers include new data on deep-water carbonate environments ranging in age from Cambrian to the present. The geologic settings of these studies are also quite varied and include modern and ancient deep open oceans, continental slopes and shelves and continental-interior basins. This volume was derived from a symposium held in Dallas, Texas, on April 8, 1975 at the joint meeting of AAPG and SEPM.

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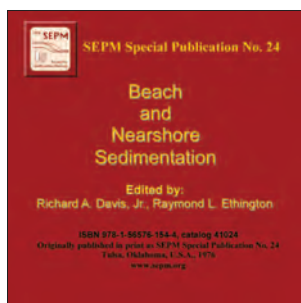


## SP 24 – Beach and Nearshore Sedimentation

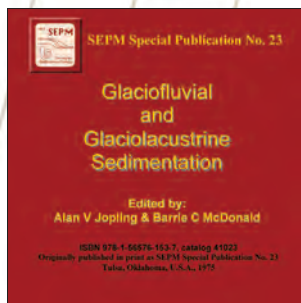
Edited by: Richard A. Davis, Jr. and R.L. Ethington, 1976

The 1975 SEPM Research Symposium was organized around the topical considerations of *Beach and Nearshore Sedimentation – Physical and Biological*. The intent was to cover the topic from the generation of processes through the mechanics of the processes, interaction of processes with sediment and culminating in distribution of sediments and structures across the environment in question. This volume, derived from that symposium, provides a wealth of data on the details on the generation, hydromechanics and sediment interaction of processes operating in beach and nearshore environments. The subject is treated in such a way as to be of considerable benefit to coastal engineers, sedimentologists and field geologists.

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# SPECIAL PUBLICATION SERIES



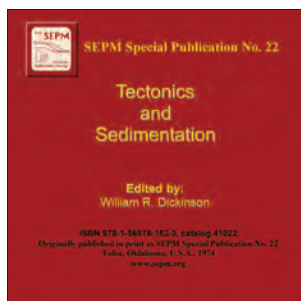
## SP 23 – Glaciofluvial and Glaciolacustrine Sedimentation

Edited by: Alan V. Jopling and Barrie C. MacDonald, 1975

This publication is the outgrowth of a symposium on *Glacial Sedimentology* that was held in Buffalo, New York, March 1972. The great interest generated in glacial phenomena during the nineteenth century had important implications and repercussions for the infant field of sedimentology. It provided its fair share of the background stimulus necessary to establish sedimentology as a separate branch of the earth sciences in the twentieth century. The time for reciprocity is now at hand; feedback from the expertise gained in the burgeoning field of sedimentology can greatly help the Quaternary specialist solve particular field problems. The last decade has witnessed a growing interest in the sedimentology of the Quaternary, and it seems appropriate now to summarize progress in the study of stratified drift, to present results of some recent studies, and to focus attention on avenues of research that should be explored in the near future.

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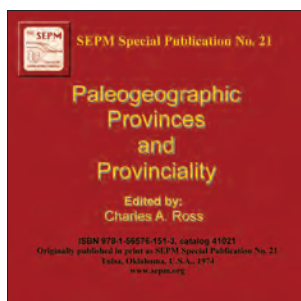
## SP 22 – Tectonics and Sedimentation

Edited by: William R. Dickinson, 1974

This volume was derived from a symposium, *Tectonics and Sedimentation* that was held at the AAPG/SEPM Annual Meeting in Anaheim, California on May 15, 1973. The obvious impetus for a collection of papers on tectonics and sedimentation at the time was the sweeping impact of the developments of plate-tectonic theory on geological concepts. Because of this emphasis, the papers assembled deal with aspects of the interplay between tectonic events and sedimentation for which or from which plate-tectonic implications can be drawn. The papers provide solid documentation of actual relations between specific regional patterns of tectonic elements and specific sedimentary sequences related to them.

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## SP 21 – Paleogeographic Provinces and Provinciality

Edited by: Charles A. Ross, 1974

Questions relating to the past distribution of faunas, floras and sediments, the meaning of distributional patterns, and causes of changes in past distributions have greatly interested many scientists for more than a century. These problems take on added importance when viewed in the context of recent theories of plate tectonics and redistribution of crustal blocks. This volume presents the results of a Research Symposium, which was given at the annual meeting of SEPM in Denver, Colorado on April 18, 1972. The resulting papers view paleogeographic provinces and provinciality over a broad spectrum. The papers are so completely diverse in their approaches to the subject that their concepts and terminologies commonly contrast strongly, the culmination of which should be the vigorous rejuvenation and reexamination of concepts and hypotheses in paleogeography and provinciality.

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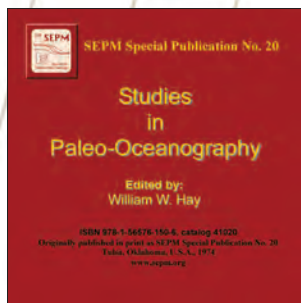
# SPECIAL PUBLICATION SERIES

## SP 20 – Studies in Paleo-Oceanography

Edited by: William W. Hay, 1974

This volume represents some of the papers presented at the SEPM Research Symposium *Geologic History of the Oceans* at the Annual Meeting, March 1971, in Houston, Texas. Knowledge of oceanic sediments has been acquired in two ways: 1) directly by sampling and observation, and 2) indirectly through seismic investigations. Until the past decade, direct sampling and observation techniques could only provide information on the surficial materials of the ocean floor. The development of the piston corer has permitted oceanographic vessels to sample the upper 20 meters, and more recently the upper 30 meters, of the ocean floor, but such cores rarely penetrate the Pleistocene and enter older sediments. Until recently, most knowledge of the deeper sedimentary materials in the ocean basins was obtained through seismic reflection studies. The purpose of this volume is to present a number of observations, ideas, interpretations, and speculations which will be of value in considering the meaning of the increasing volume of data from older deep sea deposits.

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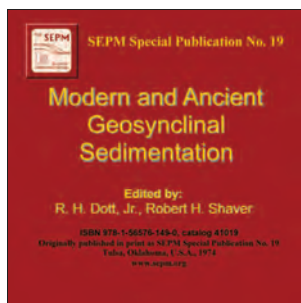


## SP 19 – Modern and Ancient Geosynclinal Sedimentation

Edited by: R.H. Dott, Jr. and Robert H. Shaver, 1974

The Kay Conference was held in Madison, Wisconsin, November 1972. This symposium volume contains the texts of papers presented at Madison. It is organized in a topical manner, and in most areas of discussion, modern analogues and ancient examples together provide a comparative basis for evaluating sedimentary models for geosynclines. In the 1970s students of both modern and ancient sediments have compiled an immense body of knowledge relevant to the geosynclinal concept. Moreover, the new theory of plate tectonics has required a complete reassessment of the geosynclines as well as orogenesis. The purpose of this volume is to evaluate by comparison of modern and ancient sediments a number of depositional models applicable to the great variety of strata seen in orogenic belts also called geosynclinal.

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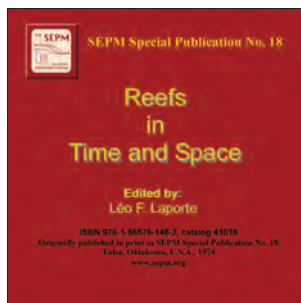


## SP 18 – Reefs in Time and Space: Selected Examples for the Recent and Ancient

Edited by: Léo F. Laporte, 1974

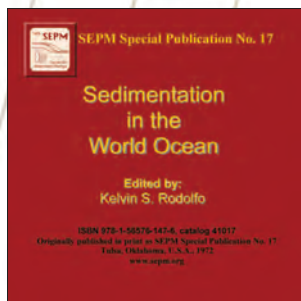
This collection of papers examines various aspects of reef form and development. Despite their variety of topic and treatment, they have two unifying elements: a fresh look at old themes and historical evolution. Although much has already been written about reefs, these papers provide interesting and important insights to our continuing understanding of them. These papers were originally part of a symposium entitled *Reef Complexes in Time and Space*, held at the annual SEPM meeting in Calgary, June 1970.

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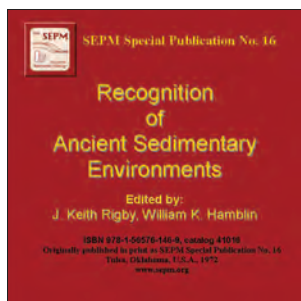


### SP 17 – Sedimentation in the World Ocean: With Emphasis on the Nature, Distribution and Behavior of Marine Suspensions

Edited by: Kelvin S. Rodolfo, 1972

The World Oceans covers the greater part of the earth's surface and is 2.5 times as large as the area of land. Nearly 84 percent of the southern hemisphere is blanketed by the oceanic waters. The continents can be thought of as huge islands in the ocean. Therefore, the oceanic processes of matter and energy transformation are of global significance. Originally presented as a series of lectures by Alexander P. Lisitzin.

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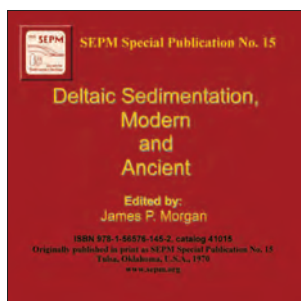


### SP 16 – Recognition of Ancient Sedimentary Environments

Edited by: J. Keith Rigby and Wm. Kenneth Hamblin, 1972.

This volume contains a series of papers presented as part of a symposium held in Dallas, Texas, April 1969, at the annual national meeting of the Society. The problem of recognizing ancient sedimentary environments in the stratigraphic record is basic to essentially every aspect of research in sedimentary rocks. The publication will summarize much of what we currently know concerning environmental interpretation.

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### SP 15 – Deltaic Sedimentation – Modern and Ancient

Edited by: James P. Morgan, 1970

This volume was based on a symposium, *Deltaic Sedimentation*, which was held at the AAPG/SEPM Annual Meeting in New Orleans, Louisiana on April 1965. Many geologists have become involved in studies of deltaic sediments and sedimentation processes. Some of the papers in this volume are based on detailed local studies of modern deltaic sedimentary sequences, on processes of deposition, and on physical and biological characteristics of the deltaic environments.

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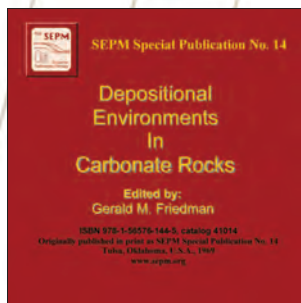
# SPECIAL PUBLICATION SERIES

## SP 14 – Depositional Environments in Carbonate Rocks

Edited by: Gerald M. Friedman, 1969

One of the principal tasks of the geologist is to determine the depositional environments in which rocks are deposited. Although regional environmental interpretations of transgressions and regressions, movements of shoreline, and gross aspects of continental and marine sedimentation have been understood since stratigraphy became an established branch of geology, only recently has the science of sedimentology come up with criteria for environmental recognition of specific outcrops, wells, or even hand samples. This observation is especially true of carbonate rocks. The papers in this volume will provide a key to the subject of recognition of depositional environments in carbonate rocks. Based on a symposium held in Los Angeles, California, on April 1967, at the joint meeting of AAPG and SEPM.

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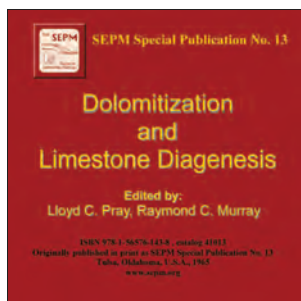


## SP 13 – Dolomitization and Limestone Diagenesis

Edited by: Lloyd C. Pray and Raymond C. Murray, 1965

In its broadest sense, diagenesis encompasses those natural changes which occur in sediments or sedimentary rocks between the time of initial deposition and the time – if ever – when the changes created by elevated temperature, or pressure, or by other conditions can be considered to have crossed the threshold into the realm of metamorphism. Deciphering the nature of diagenetic processes, and the time or times when they took place, is of critical importance for adequate geological interpretation. Papers in this volume were presented at a symposium on the diagenesis of carbonate rocks held in Toronto, Canada on May 20, 1964 at the joint meeting of AAPG and SEPM.

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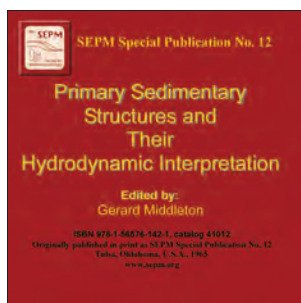


## SP 12 – Primary Sedimentary Structures and Their Hydrodynamic Interpretation

Edited by: Gerard V. Middleton, 1965

This volume contains papers presented as part of a symposium held in Toronto on May 18, 1964. These papers are mainly designed to assist the geologist, who is interested in the hydrodynamics of formation of sedimentary structures but who has little or no training in hydraulics, to become familiar with the extensive body of research which has been undertaken by hydraulic engineers interested in sediment problems.

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# SPECIAL PUBLICATION SERIES

## SP 11 – Palynology in Oil Exploration

Edited by: Aureal T. Cross, 1964

This classic summary of the state of the art in the application of palynology is a classic as it described the role of palynology as it was practically applied in the exploration for oil. It was essentially comparable to that of any other branch of paleontology. Advantages and limitations of spores, pollen, algae, miscellaneous protists of uncertain or known affinity and other similar sized microfossils utilized in palynology as stratigraphic and paleoecologic indicators are briefly reviewed. The economic value of this relatively modern scientific field to the petroleum industry may be increased and hastened by avoiding some of the pitfalls which plagued micropaleontology in its earlier years of application. Information should be developed simultaneously on the biology, ecology and stratigraphy of these organisms.

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## SP 10 – Polar Wandering and Continental Drift

Edited by: Arthur C. Munyan, 1963

This volume was an early classic during the controversial years before the general acceptance of plate tectonic theory began its rise to the forefront of global geology. The idea of continental drift was originally proposed by A. L. Wegener, *Origin of Continents and Oceans* (Braunschweig, 1922) in connection with his analysis of the origin of continents and oceans as a method to help explain anomalous distributive patterns of ancient climate zones [(Koppen-Wegener, *Die Klimate der geologischen Vorzeit* Borntraeger, Berlin 1924.)] The implications of this proposal seriously challenged many of the beliefs and theories of the constitution of the earth its physical properties tectonics and biologic developments. As a result a considerable furor of opposition arose on all counts but in particular the geophysicists alleged that drift was out of the question because the crust could not endure such forces. Others denied the need for moving the continents to explain either mountain chains or animal and plant disposition in space and time relationships. It has been attempted here to interpret the evidence in terms of two possible mechanisms a) Continental Drift and b) Polar Wandering.

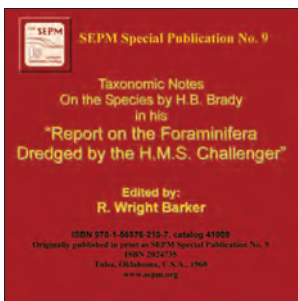
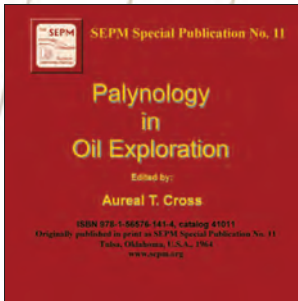
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## SP 9 – Taxonomic Notes on the Species Figured by H. B. Brady in his Report on the Foraminifera Dredged by H.M.S. Challenger During the Years 1873-1876

Edited by: R. Wright Barker, 1960

The 'Report on the Foraminifera dredged by H.M.S. Challenger, during the years 1873-1876,' by Henry Bowman Brady, needs no introduction to students of the Foraminifera. It is undoubtedly the most famous of the classic monographs in that branch of science, and has probably been quoted more frequently than any other work. The figures in the atlas, drawn on stone by A. T. Hollick from sketches by Brady and from the specimens themselves, are among the most accurate that have as yet appeared, and have been reproduced and referred to by nearly all subsequent workers. They are especially indispensable to students of Recent foraminiferal faunas, and any efforts which will enhance their utility are regarded as entirely justified.

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# SPECIAL PUBLICATION SERIES

## SP 8 – Journal of Paleontology Index

Edited by: Michael S. Chappars, Barbara Bloom, Hans E Thalmann and Wolf Maync, 1960

While today (2010) the use of digital databases is the fast and easy way to find references by author and keywords, this was of course not always the way it could be done. Periodic indexes of journals had to be painstakingly created and then published as reference works so that the next generation of researchers could more easily build on the past work. This publication represents such an effort and may still be of interest as the digital equivalents continue to display errors and holes from time to time. This 25-year index to the *Journal of Paleontology* represents the combined efforts of a number of paleontologists, students and editorial specialists working at irregular intervals in widely scattered locations, and may truly be considered a work of international cooperation and scope. Part I is a comprehensive index of subjects and authors published in Volumes 1-25 of the *Journal of Paleontology*. Part II consists of an alphabetical list of genera and species recorded or described in Volumes 1-25 of the *Journal of Paleontology*.

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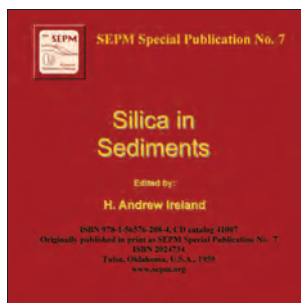


## SP 7 – Silica in Sediments

Edited by: H. Andrew Ireland, 1959

The *Symposium on Silica in Sediments* was presented in March, 1958 at the meeting in Los Angeles. The subject was selected by the Research Committee and approval of the Council then proceeded to develop the symposium and organized the papers, and later was authorized to edit and prepare the papers for publication. Cards for written questions directed at the authors of the papers were available during the presentation of the papers. The authors had an opportunity to examine the questions and later to answer them as a panel before those attending the discussion. Additional questions and replies developed between panelists and members of the audience and such were admitted to the discussion for as long a period as seemed feasible within the time available. Written answers to most of the questions were prepared later by the panelists and appear in this publication after respective articles.

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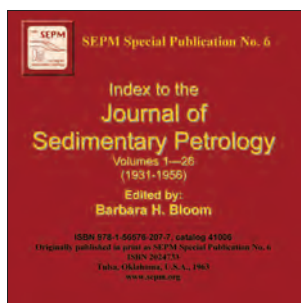


## SP 6 – Journal of Sedimentary Petrology Index

Edited by: Barbara H. Bloom, 1957

While today (2010) the use of digital databases is the fast and easy way to find references by author and keywords, this was of course not always the way it could be done. Periodic indexes of journals had to be painstakingly created and then published as reference works so that the next generation of researchers could more easily build on the past work. This publication represents such an effort and may still be of interest as the digital equivalents continue to display errors and holes from time to time. This index with is now digitized may now be quickly searched and may give a few additional "lost" references. Publication of a comprehensive index of the first 26 volumes of the *Journal of Sedimentary Petrology* was authorized by the Council of the Society of Economic Paleontologists (SEPM) at its Annual Meeting on March 31, 1957. The President of the Society, Professor Robert R. Shrock of the Massachusetts Institute of Technology, volunteered to take the responsibility for preparation of the index.

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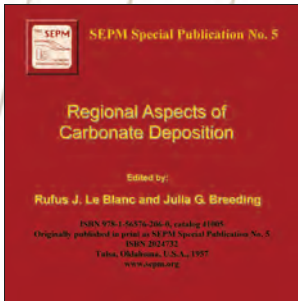
# SPECIAL PUBLICATION SERIES

## SP 5 – Regional Aspects of Carbonate Deposition

Edited by: Rufus J. LeBlanc and Julia G. Breeding, 1957

It was customary during many recent years for the Research Committee of the Society of Economic Paleontologists and Mineralogists (SEPM) to sponsor research symposia on special topics at the annual meetings. In addition to the regular Research Committee Symposium presented in 1954 at the St. Louis meeting, a special symposium was also held on "Regional Aspects of Carbonate Deposition." This carbonate symposium was organized in response to a special request by H. N. Fisk, who was president of SEPM at that time. During the symposium, special question cards were distributed to the audience and collected after each paper. These questions, together with questions and comments from the floor, formed the basis for the Panel Discussion which followed the symposium. The panel consisted of Moore, Ginsburg, Rodgers, and Walter Bucher, who presented the paper on the Bahamas in the absence of Newell. In addition, two authorities in the field of carbonate deposition, L. V. Illing and R. W. Fairbridge, were invited to join the panel and participate in the discussion.

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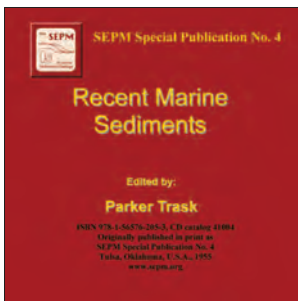


## SP 4 – Recent Marine Sediments

Edited by: Parker Trask, 1955

Part of this volume was reprinted by permission of the American Association of Petroleum Geologists, with the addition of a review of advances in the field of study of recent marine sediments since 1939. This review includes a bibliography of about 500 titles of books and articles published from 1939 to 1954. So this volume represents the current state of the art of what was known and hypothesized about modern marine sediments through 1954 and contains classic articles that have been used to expand our knowledge towards today's (2010) understanding. This report is a guide to the literature on recent marine sediments during this period between 1939 and 1954. The decision was made to prepare a selected list of 500 references including an index and three supplemental lists: 1. text books and symposia of general interest; 2. bibliographies on sedimentation, and 3. American organizations conducting investigations on recent sediments. One of the objectives in preparing the bibliography was to indicate the names and fields of interest of the people whose work was related to the study of recent marine sediments.

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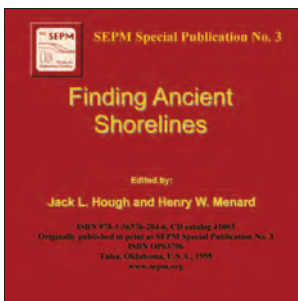


## SP 3 – Finding Ancient Shorelines

Edited by: Jack L. Hough and Henry W. Menard, 1955

For many years the primary function of the Research Committee of the Society of Economic Paleontologists and Mineralogists was to organize a symposium concerned with the most pertinent problems in sedimentary geology. This year (1955) the main theme centered on the characteristics of near shore deposition, particularly aimed toward recognition of ancient shorelines. The chairman that year was Dr. Henry W. Menard of the Navy Electronics Laboratory. Committee members selected the topic for the symposium, aided in selection of the speakers, and often participated in the program. The plan was to ask each speaker to present his paper in twenty minutes. Following the formal presentation a discussant, who has had opportunity to examine certain parts of the paper, was asked to comment. This approach led to some lively and focussed comments which benefited the entire presentation and is very interesting to read in that context. Papers included: Continental terrace sediments in the northeastern Gulf of Mexico, Sediments of the eastern Mississippi Delta, Sandless coastal terrain of the Atchafalaya Bay area, Louisiana, Sediment zones bordering the barrier islands of central Texas coast, Dynamic geology of the modern coastal region, northwest Gulf of Mexico, Particle size distribution in nearshore sediments

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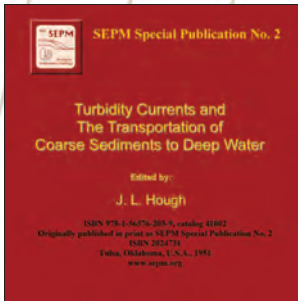
# SPECIAL PUBLICATION SERIES

## SP 2 – Turbidity Currents and the Transportation of Coarse Sediments to Deep Water

Edited by: J. L. Hough, 1951

By 1951, recent studies of the sea floor were forcing drastic revisions of many of our basic geological concepts. The concept of vertical stability of the ocean basins was being challenged by the discovery of “guyots”; sea-mounts whose flat tops, now several thousand feet beneath the sea surface, give evidence of wave truncation. The belief that the deep ocean floor was essentially a flat, featureless plain was completely discredited by the discovery of fault scarps and mountain ranges comparable in size and complexity to any of those existing on the continents. One of the most challenging of recent discoveries is the finding of relatively coarse sediments (coarse silt and sand) in deep basins and on the open ocean floor at depths of several thousand feet and many miles from land. Solution of this problem was particularly difficult because the mere occurrence of these coarse sediments violates some of the traditional opinions of the day about processes operating in the oceans. This volume contains some of the first and best documented research in this area that opened a whole new way to interpret deep water deposition.

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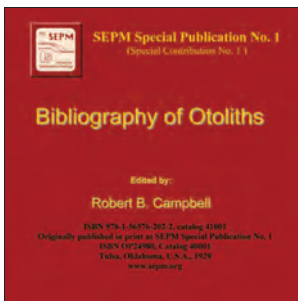


## SP 1 – Bibliography of Otoliths

Edited by: Robert B. Campbell, 1929

This special publication contains a compilation of the published articles that contain references to fossil otoliths from 1849 to 1923 and includes a list of otolith species listed in each article. It also contains a brief list of articles that describe otoliths from living species of fish from 1884 to 1905. An abstract, preface and table of contents has been added to this digital version. This was the very first special publication published by the society. It post-dates the Journal of Paleontology (1927) by two years and pre-dates the Journal of Sedimentary Petrology (1931) by two years. It is included in our new digital collection of the society's special publications for completeness and may even add a reference or two that may have been lost to those who study otoliths.

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## CSP SERIES – CONCEPTS IN SEDIMENTOLOGY AND PALEONTOLOGY

### CSP 11 – Phanerozoic Paleoclimate: An Atlas of Lithologic Indicators of Climate

By: Arthur J. Boucot, Chen Xu, and Christopher R. Scotese, with contributions by Robert J. Morley, 2013

This publication combines the interpretations of two major sets of data. One is the geophysical data that is used to interpret the position of the tectonic plates through geologic time. The other is based on a long time search of the geological literature to find, record, and evaluate the lithologic descriptions of countless reports around the globe; paying careful attention to those lithologies that have climatic implications. The introduction to this volume includes a detailed discussion of the lithologies, mineralogies and biogeographies that are considered to be the most reliable in identifying the climatic conditions existing during their formation and how they are used or not used in this compilation. Global paleoclimatic zones based on the climatically interpreted data points are identified during twenty-eight time periods from Cambrian to Miocene using paleotectonic reconstructed maps. The paleoclimate of each time period is summarized and includes a discussion of the specific referenced data points that have been interpreted to be the most reliable available for that time period and location.

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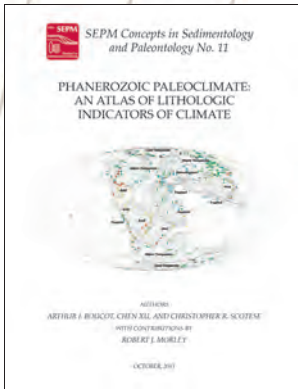
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### CSP 10 – Outcrops Revitalized: Tools, Techniques, and Applications

Edited by: Ole J. Martinsen, Andrew J. Pulham, Peter D.W. Haughton, and Morgan D. Sullivan, 2011

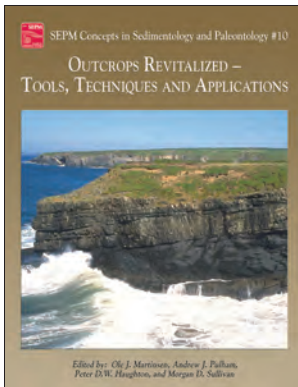
Outcrops are fundamental to everything we hope to achieve in geological understanding. They are gateways to geological processes, earth history and they help ground-truth remote sensing applications. With increasing resolution of subsurface tools and techniques, one could be forgiven in believing that outcrops have had their day and their utility is less than in the past great eras of field mapping and the development of facies models. This premise is far from the truth and this new SEPM volume illustrates how new analytical techniques are revitalizing outcrops and in the process creating a wealth of new data and fresh geological understandings. In this book you will find a compilation of the growing arsenal of outcrop tools and techniques and a consideration of future developments. This collection of papers, delivered at a SEPM Research Conference on the West coast of Ireland in the summer of 2008, is a smorgasbord of case studies, workflows, modeling, and applications which spans clastic and carbonate settings. Whatever your interest in outcrop geology and its application there is something in this volume for you. If you are seeking guidance for using new outcrop tools, looking for efficiencies in data collection or desiring new insights for old and favorite outcrops, this volume is a must have. This volume also makes an excellent reference or textbook for any group of professionals or students working or studying the new technologies that have allowed new insights from outcrops. We also consider this a superbly timed publication because many new outcrop tools are now becoming mainstream via reduced purchase and operating costs. Once you read this volume, and there are reduced prices for SEPM members and students, please share your new experiences with the authors and editors and help continue the revitalization of our shared and continually surprising outcrop library of the earth.

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### CSP 9 – Sequence Stratigraphy of Siliciclastic Systems – The ExxonMobil Methodology

Edited by: Vitor Abreu, Jack E. Neal, Kevin M. Bohacs and James L. Kalbas, 2010

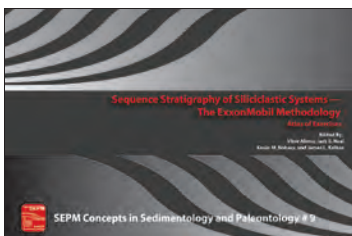
The stratigraphic concept of a depositional sequence was introduced to the scientific literature by Exxon Production Research Company (EPRCo) in the late 70s, building on the shoulders of giants like Chamberlain, Sloss and Wheeler. Since then, several papers compared and contrasted the original Exxon (and later, ExxonMobil) sequence-stratigraphic school with other approaches to subdivide the geologic record, as well as, debating the ExxonMobil model validity and impact on the community. At its core, the ExxonMobil "model" is really a stratigraphic interpretation method, which was never explicitly documented in the literature. The objective of this book is to present the ExxonMobil sequence stratigraphic method in its current form in an attempt to clarify its usage and application in diverse geologic data and depositional environments. This publication is the result of more than 3 decades of sequence stratigraphy research and application at EPRCo and at the ExxonMobil Upstream Research Company (URC). The objective is to emphasize the most important aspects of Sequence Stratigraphy – a method to guide geologic interpretation of stratigraphic data (seismic profiles, well-logs, cores and outcrops) across scales (from local to regional and global) and depositional environments (from continental to deep marine).

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# CSP SERIES - CONCEPTS IN SEDIMENTOLOGY AND PALEONTOLOGY

## CSP 8 – Carbonate Sedimentology and Sequence Stratigraphy

By: Wolfgang Schlager, 2005

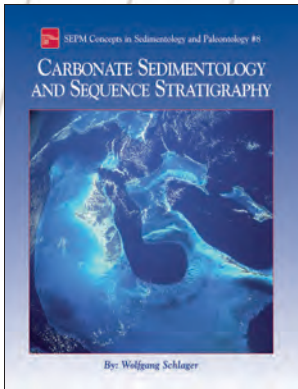
Sedimentology and stratigraphy are neighbors yet distinctly separate entities within the earth sciences. Sedimentology searches for the common traits of sedimentary rocks regardless of age as it reconstructs environments and processes of deposition and erosion from the sediment record. Stratigraphy, by contrast, concentrates on changes with time, on measuring time and correlating coeval events. Sequence stratigraphy straddles the boundary between the two fields. This book, dedicated to carbonate rocks, approaches sequence stratigraphy from its sedimentologic background. It provides enough general background, in introductory chapters and appendices, to be easily digestible for sedimentologists and stratigraphers as well as earth scientists at large.

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## CSP 7 – Siliciclastic Sequence Stratigraphy--Concepts and Applications

By: Henry W. Posmentier and George P. Allen, 1999

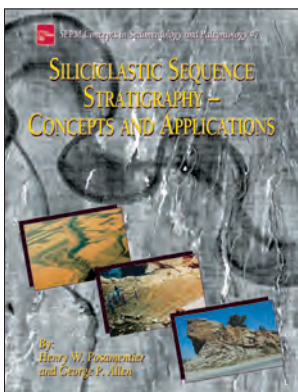
Sequence stratigraphy has experienced a virtual explosion of applications in recent years. During that time, the concepts upon which sequence stratigraphy is based have been evolving to conform to new observations as well as new types of data. This volume summarizes the current status of this discipline as it applies to siliciclastic deposits. The emphasis in this volume is on sequence stratigraphy as an "approach" to geological analysis, rather than as a model to which all data sets must conform. The expression of sequence architecture and the nature of bounding surfaces is illustrated through examples and applications drawn from a range of data types, including outcrop, core, wireline log, and 3-D seismic data. In addition, sequence expression also is illustrated using examples of modern landforms.

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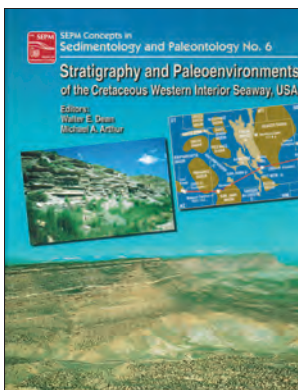
## CSP 6 – Stratigraphy and Paleoenvironments of the Cretaceous Western Interior Seaway, USA

By: Walter E. Dean and Michael A. Arthur, 1998

This volume presents the results of a coordinated, multidisciplinary study of Cretaceous carbonate and clastic rocks in cores collected along a transect across the old Cretaceous seaway that extended from the Gulf Coast to the Arctic by a team of academic, industry and U.S. Geological Survey scientists. The overall goal was to construct a subsurface transect of mid-Cretaceous strata that were deposited in the U.S. Western Interior Seaway. In particular, the papers in this volume focus on the Graneros Shale, Greenhorn Formation, Carlile Shale, and Niobrara Formation and equivalents in cores from six drillholes from western Kansas, southeastern Colorado and eastern Utah.

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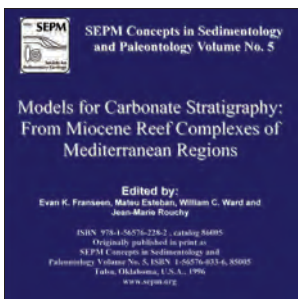
## CSP 5 – Models for Carbonate Stratigraphy from Miocene Reef Complexes of Mediterranean Regions

Edited by: Evan K. Franseen, Mateu Esteban, William C. Ward, and Jean-Marie Rouchy, 1996

Miocene carbonates are intensively explored and locally exploited for hydrocarbons in parts of the Mediterranean regions. The outcrop models presented in this publication provide excellent analogs for the highly productive Miocene carbonates from Iran, Iraq and Gulf of Suez and for smaller reservoirs in other localities. Lessons learned in the outcrops of the Mediterranean regions are applicable as well to Miocene carbonate reservoirs. The Miocene outcrops in Mediterranean regions can serve as models for the relationships between carbonate reservoirs, pre-evaporitic basinal sediments, and overlying evaporites. Additionally, the Miocene carbonate rocks exposed in the Mediterranean regions serve as important analogs for ancient carbonate-rimmed basins with or without basinal evaporites.

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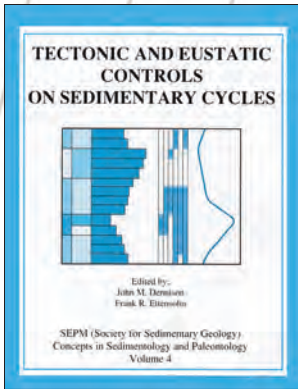
# CSP SERIES - CONCEPTS IN SEDIMENTOLOGY AND PALEONTOLOGY

## CSP 4 – Tectonic and Eustatic Controls on Sedimentary Cycles

Edited by: John M. Dennison and Frank R. Ettensohn, 1994

The collected volume begins with a brief perspective by one of the conveners, followed by articles in order of increasing stratigraphic age. Eustatic sea-level changes and tectonic warpings of basins are competing mechanisms for explaining many stratigraphic patterns. The model for sea-level changes should be developed first for a basin, since it is allocyclic and leads to a series of time bands in the strata. The residual effects should then be modeled for tectonic patterns affecting the depositional processes. Doing the reverse limits time constraints on the tectonic warping models and will blur the resolution of detailed time surfaces in the strata. Case histories of situations with both tectonic warping and time surfaces marked by sea-level events will lead to improved interpretations of earth history.

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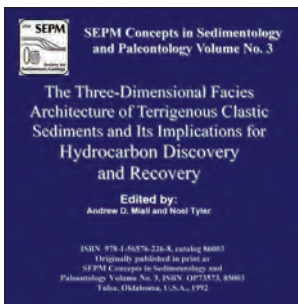


## CSP 3 – The Three-Dimensional Facies Architecture of Terrigenous Clastic Sediments and Its Implications for Hydrocarbon Discovery and Recovery

Edited by: Andrew D. Miall and Noel Tyler, 1991

While there has been much interest in recent years in concepts of sequence stratigraphy, this book focuses on stratigraphic units that are, in general, an order of magnitude smaller than sequences. A knowledge of such architectural detail is of considerable significance in the development of detailed, scaled facies models for depositional environments, and is of paramount importance in the efficient design of advanced petroleum recovery projects. This book is the outcome of a SEPM Research Symposium held at the annual meeting of the Society in San Antonio, Texas, April 1989. The intent of the meeting was to bring together modern research on facies architecture, and to apply this research to the investigation of reservoir heterogeneities and production problems.

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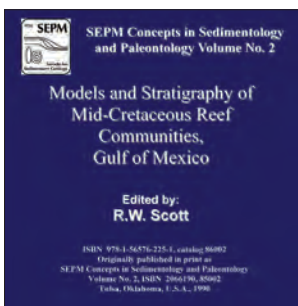


## CSP 2 – Models and Stratigraphy of Mid-Cretaceous Reef Communities, Gulf of Mexico

By: Robert W. Scott, 1990

The Cretaceous carbonate platform that encircles the modern Gulf of Mexico is one of the largest and long-lived reef tracts in the history of the Earth. During the past 25 years, numerous boreholes have penetrated these Cretaceous reefs, providing an enormous database on reef communities. The Gulf of Mexico carbonate platforms provide superb laboratories to study the growth and demise of platforms. Platform development is related to a combination of local and regional tectonics, sea level, climate, oceanic conditions, and the evolutionary stage of the biosphere. A precise chronostratigraphy is a first requirement to demonstrate the effects of these factors. The accurate timing of global and regional events is necessary to assess the cause-effect relations. Although a very accurate sequence of Cretaceous events is known from the deep oceans and even for part of the Gulf of Mexico margins, a refined scale has yet to be achieved for the thick carbonate platform sections in parts of Mexico and Central America. Furthermore, the detailed stratigraphic section of the U.S. Gulf Coast cannot be related accurately to the tectonic events of the Cordillera of Mexico and the United States.

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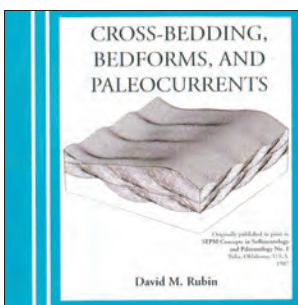


## CSP 1 – Cross-Bedding, Bedforms and Paleocurrents

By: David M. Rubin, 1987

The computer modeling that forms the basis for this publication was undertaken to relate the geometry of cross-bedding to the morphology and behavior of bedforms. Using computers for this purpose is necessary only because sedimentologists cannot adequately visualize the geometry arising when complex, changing surfaces move through space. Images range from the complicated, which will be of interest to sedimentologists who have had experience interpreting cross-bedding or studying the behavior of bedforms, to simpler illustrations the can convey an understanding of the origin of cross-bedding geometry even to those not experienced in the field.

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# SHORT COURSE NOTES

## SC 56 – Evaluating Water-Depth Variation and Mapping Depositional Facies on Great Bahama Bank – a “Flat-Topped” Isolated Carbonate Platform

Edited by: Paul M. (Mitch) Harris, Samuel J. Purkis & James Ellis, 2014

Great Bahama Bank (GBB) has long served as a frequently visited and well-studied example of a flat-topped, isolated carbonate platform. As such, GBB stands behind much of our understanding of modern processes and products of carbonate sedimentation. The geological models derived from studies on GBB are commonly used to illustrate depositional facies variations and frequently serve as reservoir analogs.

We have used Landsat TM and ETM+ imagery and an extensive set of water depth measurements to first critically evaluate the magnitude and patterns of bathymetry across GBB. We then integrated the seafloor sample data of Reijmer et al (2009) along with a small number of additional samples with the Landsat imagery compiled into ArcGIS and analyzed with eCognition to develop a depositional facies map that is more robust than previous versions. The new maps, in our opinion, can serve as a template for better characterizing GBB at all scales, highlight future research areas where “ground-truthing” is needed to further investigate facies patterns, and facilitate better use of this isolated carbonate platform as an analog for both exploration- and reservoir-scale facies analysis. As examples of information that can be extracted from the maps, we analyze the platform margins of GBB with respect to their orientation, examine the relationship between water depth and facies type, interrogate facies position and breadth across the platform top, and relook at the occurrences of whittings relative the distribution of mud on the platform.

The geospatial data for GBB are compiled into a 3.9 GB GIS database which is included on the DVD of this digital publication. The GIS contains raw data, interpretive products, and visualization examples that were produced during development of the water depth and facies maps of GBB, including the Landsat TM imagery, DEM, images developed by combining layers in the GIS, and facies and whittings maps. In addition, the Projects folder of the GIS contains files that automatically display images, maps, and DEMs with an appropriate symbology in ArcGIS version 10.1 (.mxd), ArcGIS Explorer version (Build) 1750 and 2500 (.nmf), and GlobalMapper version 14-1 (.wks).

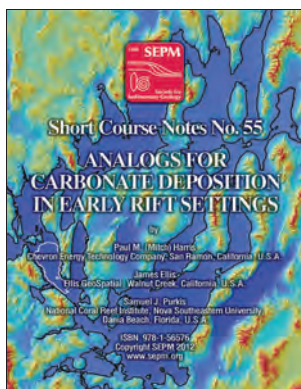
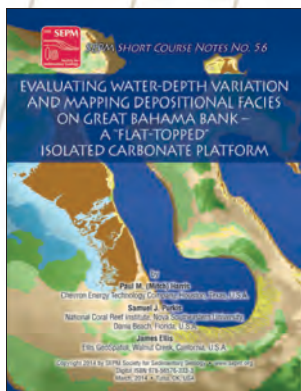
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## SC 55 – Analogs for Carbonate Deposition in Early Rift Setting

Edited by: Paul M. Harris, James Ellis & Samuel Purkis, 2012

Driven by requests to provide carbonate analogs for subsurface hydrocarbon exploration in rift settings, we have identified and described select examples, summarized them from a carbonate perspective, and assembled them into a GIS database. The analogs show a spectrum of sizes, shapes and styles of deposition for lacustrine and marginal marine settings, wherein the types of carbonates inferred from seismic and cores (emphasis on microbialites, tufas, and travertines) can be illustrated.

An introductory chapter and overviews of each analog provide the basic descriptions of the analogs and their potential application. Document folders (maps, ground photos, and images) provide additional information about the analog sites. Landsat images and DEMs delineate present and past lake/basin margins, and for several examples the shorelines representing different lake levels can be compared to illustrate changes in size, shape, and configuration that may impact the presence of carbonates. A subset of the examples illustrates the location and various styles of carbonate deposition within lacustrine and marginal marine settings.

The analogs are assembled into a GIS database accessed via ArcGIS or ArcGIS Explorer. In addition, access to portions of the database are provided by GeoPDFs that can be opened with free Adobe Acrobat Reader and by kmz's that can be opened by GoogleEarth and other online 3D globes. The intent is to make all of the data gathered for each analog site readily available to the reader, thereby making it “easy” to evaluate if the analog has value; and if so, to use the GIS as a starting point for further investigation.

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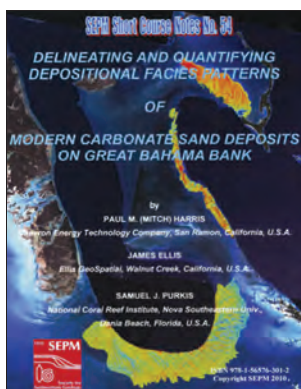
## SC 54 – Delineating and Quantifying Depositional Facies Patterns of Modern Carbonate Sand Deposits on Great Bahama Bank

Edited by: Paul M. (Mitch) Harris, James Ellis & Samuel J. Purkis, 2010

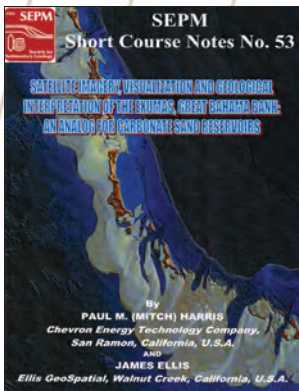
Delineating and Quantifying Depositional Facies Patterns. Processed satellite images, derived bathymetry (Digital Elevation Models), and sand body interpretation maps of three key areas of modern carbonate sand deposition on Great Bahama Bank (GBB) are organized into a GIS to develop morphometric data. The results of the sand body and sandbar interrogation imply that certain architectural properties of high-energy sand deposits are generic. We think such results broaden our perspective of the types of information that can be derived from studies of the modern and hopefully will stimulate further studies. Collectively, the sand deposits show a range of depositional facies patterns. Rimming the southern end of Tongue of the Ocean (TOTO) is the broadest expanse of “high-energy” sands found in the Bahamas characterized by narrow sandbars separated by wide, deep channels and a lack of islands. A variation of the tidal bar motif with broader and more irregular sandbars, relatively narrow channels, and few small islands occurs at the northern end of Exuma Sound (Schooners). Sands associated with tidal channels and the numerous islands of the Exumas chain along the western edge of Exuma Sound occur primarily as flood tidal deltas. An objective of this study is to move the geospatial data from a high-end GIS (GBB DVD 2) into lower cost and more readily available viewers, i.e., GeoPDF, Google Earth, animation, and ArcExplorer, to support training and improve communication. Examples of these types of files, as well as a detailed and well-illustrated summary paper and appendix, are included on GBB DVD 1.

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# SHORT COURSE NOTES

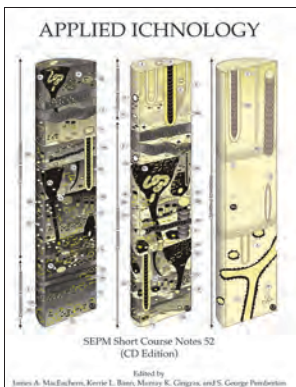


## SC 53 – Satellite Imagery, Visualization and Geological Interpretation of the Exumas, Great Bahama Bank: An Analog for Carbonate Sand Reservoirs

By: Paul M. (Mitch) Harris and James Ellis, 2009

The Exumas Islands and surrounding carbonate sand bodies of Great Bahama Bank are an important training venue, an area of interest to researchers of modern carbonates, and a valuable modern analog for understanding carbonate sand bodies in the subsurface. This DVD makes readily available a set of processed satellite images, offshore/onshore digital elevation model (DEM), and interpretation maps organized into a GIS, along with several examples of how this data can be visualized and used for geological interpretation.

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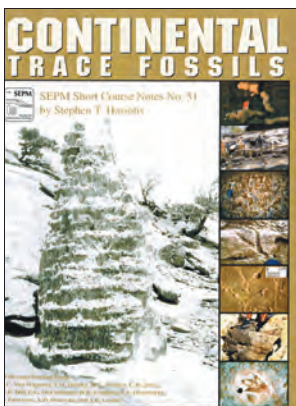
## SC 52 – Applied Ichnology

By: James A. MacEachern, Kerrie L. Bann, Murray K. Gingras and S. George Pemberton, 2007

This core workshop has been designed for sedimentologists and stratigraphers who utilize cores for interpreting depositional environments, identifying stratigraphic discontinuities, and applying high-resolution sequence stratigraphic (or other genetic stratigraphic frameworks) to the rock record. The workshop focuses on the practical applications of ichnology on sedimentologic, stratigraphic, diagenetic, and reservoir petrophysical characteristics of sedimentary successions.

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## SC 51 – Continental Trace Fossils

By: Stephen T. Hasiotis, 2002

The type, distribution, and tiering of continental tracefossils (ichnofossils) are useful tools for deciphering continental environments in both outcrop and core. This atlas presents the latest ichnological concepts and provides a comprehensive photocatalogue of nearly the entire suite of major terrestrial and freshwater trace fossils that geoscientists will encounter. The book is separated into two sections: 1) concepts and fundamental principles that explain how terrestrial and freshwater trace fossil behavior is interpreted and used to define environments of deposition; and 2) a photocatalogue of outcrop and core examples of continental trace fossils with explanations and idealized line drawings. The trace fossils are illustrated with idealized line drawings as seen in outcrop and in core. Color photographs are used to show the trace fossils as hand specimens, in outcrop, and core from different geologic formations and ages.

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# SHORT COURSE NOTES

## SC 50 – Applied Sandstone Diagenesis--Practical Petrographic Solutions for a Variety of Common Exploration, Development, and Production Problems

By: Sharon A. Stonecipher, 2000

Too often, the report on sandstone petrography and mineralogy is simply an appendix of nicely tabulated data at the end of a well report. Most petrographic reports are designed to simply answer the question “what?”—what minerals are present and in what proportions. Very rarely is there any attempt to explain “why” the observed minerals are present, and at no time is there any attempt to explain how this information can be used to solve geologic or engineering problems—the “so what.” The notes are called “Applied Diagenesis” because it looks past the “what” stage of typical diagenetic studies and examines the concept of diagenetic-stratigraphic facies to allow us to get to the “why” and “so what” stages.

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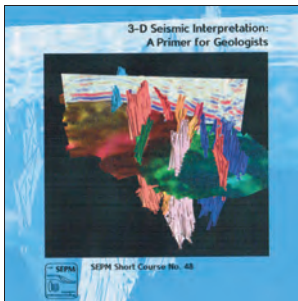
## SC 48 – 3-D Seismic Interpretation: A Primer for Geologists

By: Bruce Hart, 2000

3-D seismic technology is spreading out beyond the domain of the petroleum industry. The environmental and mining industries and academic groups are collecting and interpreting 3-D seismic data. Increasing numbers of geologists (often with little or no geophysical training) are being exposed to the technology, or results derived therefrom. Despite this interest, there are few opportunities for the practicing geologists (or engineer) to become acquainted with 3-D seismic technology at the appropriate level. This course is an attempt to fill that gap.

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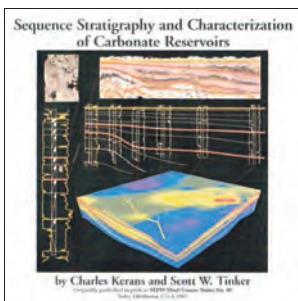
## SC 40 – Sequence Stratigraphy and Characterization of Carbonate Reservoirs

By: Charles Kerans and Scott W. Tinker, 1997

Reservoir management is an important topic in the oil industry today. Conferences, forums, short courses, and technical papers, written and attended by engineers, geologists, geophysicists, petrophysicists, and managers discuss various aspects of reservoir management. A critical component of reservoir management is the accurate characterization of the hydrocarbon asset, called reservoir characterization. The topic of this course is the process of sequence-stratigraphic interpretation and characterization of carbonate reservoirs. Because of the overwhelming mass of information most reservoir geoscientists keep up with either some aspects of sequence-stratigraphy, or some aspects of reservoir characterization, but typically not both. The authors believe that the two disciplines are so intimately related that the sequence framework should be considered a critical piece of the integrated puzzle.

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# SHORT COURSE NOTES

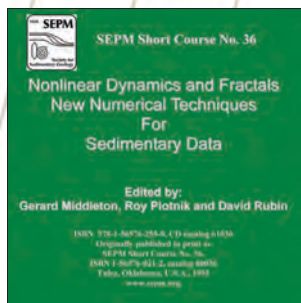
## SC 36 – Nonlinear Dynamics and Fractals: New Numerical Techniques for Sedimentary Data

By: Gerard V. Middleton, Roy E. Plotnick, and David M. Rubin, 1995

The intention of these notes is to provide sedimentary geologists with an introduction to the new techniques for analyzing experimental and observational data provided by the rapid development of those disciplines generally known as Fractals and Nonlinear Dynamics (“chaos theory”). A general introduction to a minimum of theory is given, but most of the space is devoted to show how these ideas are useful for interpreting sedimentary data. The main applications are likely to be time series or spatial profiles or two-dimensional maps or images. Sedimentary geologists deal every day with actual time series, such as measurements of current velocity or suspended concentration at a station, or with “virtual” time series, such as stratigraphic sections, well logs, or topographic profiles – yet few geologists know much about the new numerical techniques available to analyze such data.

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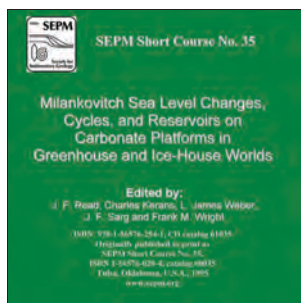


## SC 35 – Milankovitch Sea-Level Changes, Cycles, and Reservoirs on Carbonate Platforms in Greenhouse and Ice-House Worlds

By: J.F. Read, Charles Kerans, L. James Weber, J.F. Sarg and Frank M. Wright, 1995

This short course is in three parts. Part 1 examines in general terms how carbonate cycles are generated on carbonate platforms, types of carbonate cycles developed, stacking patterns, margin geometries, degree of disconformity development, and briefly overview any characteristic diagenetic effects. Part 2 examines cycles and one- and two-dimensional stacking patterns, high resolution stratigraphy, and reservoir geometry on Later Permian platforms in the Permian Basin of West Texas. Part 3 examines reservoirs formed in an ice-house world during the major Carboniferous glaciation of Gondwana, using the Middle Pennsylvanian carbonates of the Giant Aneth oil field, Paradox Basin, Utah.

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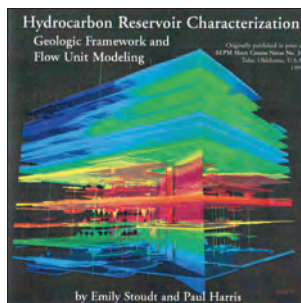


## SC 34 – Hydrocarbon Reservoir Characterization – Geologic Framework and Flow Unit Modeling

By: Emily L. Stoudt and Paul M. Harris, 1995

This collection of papers presents documentation for (1) approaches to be taken in developing a geologic framework for explaining layering, heterogeneity, and compartmentalization of a reservoir; (2) the value of outcrop data in improving understanding of reservoir performance; (3) methods for integrating, analyzing, and displaying geologic, petrophysical rock property, and engineering data to be used during field evaluation, management, and simulation; (4) geostatistical approaches that are being used to characterize the spatial distribution of reservoir properties and augment geologic descriptions, and (5) methods of displaying quantitative models of reservoir properties and reservoir simulation in three dimensions.

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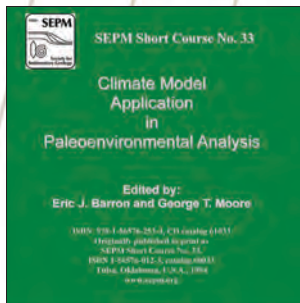
# SHORT COURSE NOTES

## SC 33 – Climate Model Application in Paleoenvironmental Analysis

By: Eric J. Barron and George T. Moore, 1994

Paleoclimatology and paleoenvironmental study are a rapidly growing area of research, in part because of the recognition that Earth history provides us with “case studies” of global change. This course is intended to broadly describe the characteristics and applications of climate models and to investigate the utility of predictive models. The course is divided into five sections: (1) introduction to the climate system and climate models, and their application in sedimentary geology, including factors governing climate on geologic time scales, (2) application of climate models to investigate specific time periods in Earth history, (3) application of climate models to predict variables of specific significance to sedimentary geology, including (a) upwelling and organic carbon deposition, (b) precipitation and evaporation patterns, (c) lacustrine environments, (d) biogeography, (e) rhythmic sediments, and (f) severe storms and storm sedimentation, (4) regional paleoenvironmental studies, and (5) frontier areas, including the simultaneous examination of multiple variables, stratigraphic reconstructions from climate models, and high spatial resolution model experiments.

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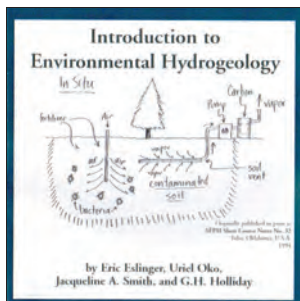


## SC 32 – Introduction to Environmental Hydrogeology

By: Eric Eslinger, Uriel Oko, Jacqueline A. Smith and G.H. Holliday, 1994

These notes have been written to supply supporting material for a “short course” introduction to environmental hydrogeology. The assumption is that most people who take the short course (or purchase the notes without taking the short course) will be geologists, although the information could be useful to engineers or other scientists who desire an introduction to environmental consulting in general, or hydrogeology in particular. The notes, and course, are an introduction - a partial survey - of some aspects of environmental geology, with particular reference to subsurface hydrogeology and remediation of sites contaminated with petroleum hydrocarbons. No claim of completeness is made. Regulatory programs vary from state to state. The regulatory framework used in the state of New York is sometimes given as an example. The reader should be aware that rules and procedures may differ in other states.

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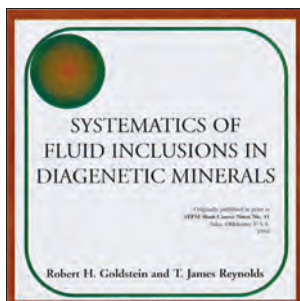


## SC 31 – Systematics of Fluid Inclusions in Diagenetic Minerals

By: Robert H. Goldstein and T. James Reynolds, 1994

The past decade has revealed significant advantages to using fluid inclusions as a means of understanding the physical and chemical history of fluids in sedimentary basins, but it also has revealed important limitations which have required that a new approach must be employed to effectively use fluid inclusions. This book is divided into six sections: (1) what fluid inclusions are and what geologic history they are capable of recording; (2) basic phase equilibria that must be known to understand the behavior of pore fluids and fluid inclusions in nature; (3) the question of validity of using fluid inclusions as records of ancient diagenetic systems is dealt with in such a way that the questions commonly asked about the limitations of the technique are addressed; (4) how to conduct a fluid inclusion study, a new petrographically based approach for conducting fluid inclusion research that is followed by methods that allow for the interpretation of compositions of pore fluids that existed in sedimentary rocks, and methods of geothermometry and geobarometry; (5) selected case histories that are designed specifically to give practice in evaluating fluid inclusion data from the diagenetic realm; and (6) a summary of the arsenal of analytical techniques that may be applied to fluid inclusions to develop additional constraints on fluid inclusion composition.

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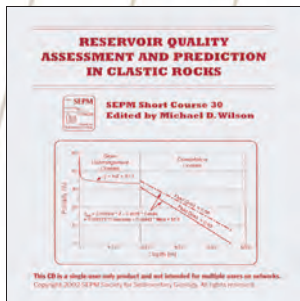
# SHORT COURSE NOTES

## SC 30 – Reservoir Quality Assessment and Prediction in Clastic Rocks

Edited by: Michael D. Wilson, 1994

This course is designed to emphasize the following topics: (1) Historical perspective on previous and current empirical, and geochemical methods of reservoir quality prediction; (2) Overview of diagenetic processes which significantly impact reservoir quality and those factors which act as major controls on those processes; (3) Proper design of a comprehensive or limited-focus predictive analysis of reservoir quality; (4) Methodologies for the accurate measurement of all major dependent and independent variables; (5) Data analysis techniques involved in quality control and the assessment of variability prior to performing multivariate regression; (6) Steps involved in the generation of a multivariate regression to insure that the model developed provides maximum accuracy using a minimum number of independent variables; (7) Case histories from a variety of settings illustrating application of the recommended approach to reservoir quality prediction.

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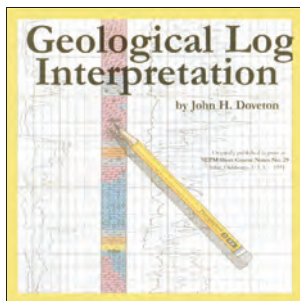


## SC 29 – Geological Log Interpretation

By: John H. Doveton, 1994

This manual was created in 1994 to assist the geologist to interpret logs. In the not too distant past, the reading of geology from wireline logs was highly interpretive. The ability of a rock to conduct electrical current or sound waves is several steps removed from traditional outcrop descriptions based on the eye and hammer. However, the range of logging measurements has expanded markedly over the years. In particular, the addition of nuclear tools has introduced log traces that reflect both rock composition and geochemistry in a more direct manner. Taken together, both new and old logs contain a host of keys to patterns of rock formation and diagenesis. The majority of books on log analysis focus on the reservoir engineering properties of formations penetrated in the borehole. The promise of potential porous and hydrocarbon-saturated rocks generally pays for both the hole and the logging run. There are many examples of common log types from a variety of sequences.

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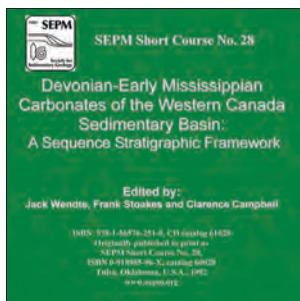


## SC 28 – Devonian-Early Mississippian Carbonates of the Western Canada Sedimentary Basin: A Sequence Stratigraphic Framework

By: Jack Wendt, Frank Stoakes and Clarence Campbell, 1992

The Devonian and early Mississippian strata in the Western Canada Sedimentary Basin include a wide diversity of shallow-water carbonate and basin filling carbonate, shale and evaporite facies. Of these, the large Devonian platform-reef complexes are the most spectacular. They occur in magnificent exposures in the Front Ranges of the Canadian Rockies and in the subsurface of Alberta. In the subsurface, these complexes pool many of the largest oil and gas accumulations in Western Canada. This short course is intended to provide a summary of Devonian and early Mississippian deposits in the subsurface of the Western Canada Sedimentary Basin. One of the major goals is to present the evolution of these strata in a sequence-stratigraphic context. The role of sea-level, tectonic and depositional controls on "stacking" and facies patterns are considered. A second major goal is to relate the occurrence of hydrocarbon pools to this sequence-stratigraphic framework.

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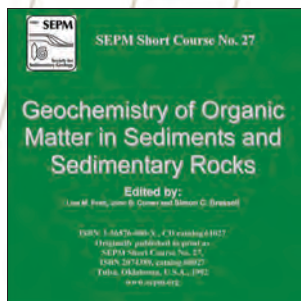
# SHORT COURSE NOTES

## SC 27 – Geochemistry of Organic Matter in Sediments and Sedimentary Rocks

By: Lisa M. Pratt, John B. Comer and Simon C. Brassell, 1992

As both researchers and educators, the authors have faced the difficult task of lecturing on the subject of organic geochemistry to an audience that is genuinely interested in but unable to keep pace with this rapidly advancing field. The technical jargon makes it difficult to become engaged with the topic of geochemistry without a major investment in background readings. This volume was written specifically for the graduate student or professional geoscientist needing a brief but reasonably comprehensive review of the potential applications of organic geochemical data to geological studies. This volume is divided into three sections. Section I, organic matter is viewed as a highly reactive constituent of soil, water column and sediment. Section II, the focus is on the molecular constituents of geological materials and their ability to record the history of changes in organic matter ranging from its biological formation, through sediment deposition and compaction, to its modification under the thermal stress of diagenesis and maturation. Section III, changes in the composition of organic matter in buried sediments are discussed in terms of chemical kinetics.

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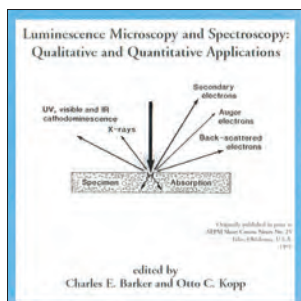


## SC 25 – Luminescence Microscopy and Spectroscopy: Qualitative and Quantitative Applications

Edited by: Charles E. Barker and Otto C. Kopp, 1991

The papers presented in this volume make it clear that luminescence microscopy and spectroscopy are being employed in an ever wider array of geological studies. The editors suggest several ways that luminescence studies can be employed or improved: (1) to assist in the integration of trace element, isotope, fluid inclusion and mineral studies using CL results to assure that the same zones and (or) mineral compositions are utilized; (2) more reliable tracing of zones whether microscopic or of regional extent; (3) better interpretation of diagenetic, mineralization and alteration events because of the control and discrimination of crosscutting relationships and subtle changes in chemistry that often become obvious using luminescence; (4) as a tool for direct detection of rare earth element deposits, Mississippi Valley type Pb-Zn ores and in some cases oil reservoirs; (5) introduction of standard materials and methods for calibrating spectrometers and possibly increasing the uniformity of subjective observations; (6) improvements in instrumentation to diminish thermal quenching effects at the same time gains are necessary in the level of activation of luminescence and in the quality of the microscopic image transmitted to the observer; (7) more efforts at experimental determination of the causes of luminescence and their interpretation relative to conditions that exist in natural systems.

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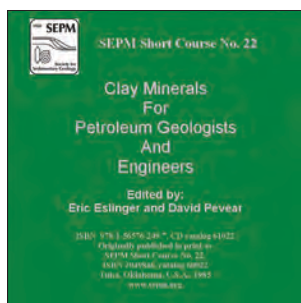


## SC 22 – Clay Minerals for Petroleum Geologists and Engineers

By: Eric Eslinger and David Pevear, 1988

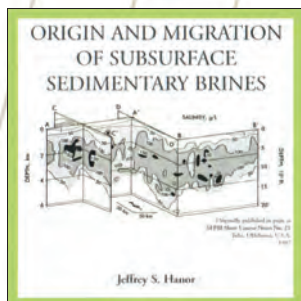
These notes provide a general introduction of clays for the uninitiated, plus a review of traditional and more recent concepts for those who already know something about clays. The concept of fundamental illite particles and the phenomenon of interparticle diffraction, relatively new concepts that are reshaping the manner of visualizing mixed-layer clays, are discussed in some detail. A discussion of shaly-sand log analysis, from a clay mineralogy perspective, is included. Isotope geology is discussed because of its potential for permitting a better understanding of temperatures and timing of diagenesis.

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# SHORT COURSE NOTES



## SC 21 – Origin and Migration of Subsurface Sedimentary Brines

By: Jeffrey S. Hanor, 1987

The topics covered in these notes have been selected to provide the general sedimentary geologist with an introduction to some of the key problems and a conversational familiarity with some of the basic techniques in this important area of sedimentary geology. A number of field examples are drawn from the Louisiana Gulf Coast, but many of the general principles will be applicable to other areas and problems.

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## SC 19 – Recognition of Fluvial Depositional Systems and Their Resource Potential

By: Romeo M. Flores, Frank G. Ethridge, Andrew D. Miall, William E. Galloway and Thomas D. Fouch, 1985

The understanding of fluvial environments and processes that operate within them as well as their products in the geological record is a recent development. During the past decade, facies analysis of fluvial rocks has been increasingly used to explore for and develop hydrocarbons, coal, uranium and metallic minerals. The rapid growth in the database on fluvial depositional systems coupled with the need to recognize the economic potential of their deposits has yielded numerous resources which deal with recognition and classification of the whole spectrum of fluvial systems, fluvial processes and their products, facies models of ancient fluvial deposits, and application of fluvial models to resource exploration and development. This notebook is an outgrowth of the burgeoning geological investigations of fluvial rocks and their associated potential. The notebook is divided into 11 chapters that cover methodology and classification of fluvial systems as well as modern and ancient deposits of alluvial fans, fan deltas, braided systems, meandering streams and anastomosed streams. In addition, application of facies modeling to exploration and development of hydrocarbons, coal and uranium is discussed for the Rocky Mountain region, Mid Continent, Gulf Coast and western China.

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## SC 18 – Paleoclimates and Economic Geology

By: Judith Totman Parrish and Eric J. Barron, 1986

Burgeoning interest in paleoclimatology has been spurred by growing awareness of the control of paleoclimates on the formation of economic deposits. In past studies, paleoclimatic patterns were derived empirically from biogeographic patterns, and to a lesser extent, from the distributions of sedimentary paleoclimatic indicators, such as coals. The problems with this approach are numerous. In early studies, the paleoclimatic patterns appeared to make very little sense because they were reconstructed on modern continental positions. Even after the acceptance of continental drift, problems arose when the paleoclimatic indicators were poorly dated or when geologists chose paleoclimatic indicators from too long a time period, during which major paleoclimatic changes could have occurred. More recently, qualitative and quantitative models of paleoclimate have proved useful for understanding the distributions of climatically significant geologic data. These models are founded on basic principles of atmospheric and oceanic circulation as applied to global paleogeography, including reconstructed plate positions. With climate models, geologists can formulate hypotheses about the paleoclimatic patterns that might be expected during the various intervals in Earth history and test those hypotheses with the paleoclimatic indicators.

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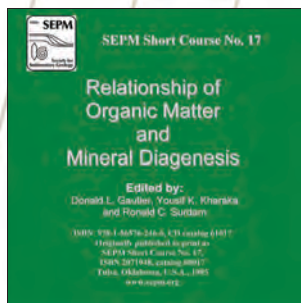
# SHORT COURSE NOTES

## SC 17 – Relationship of Organic Matter and Mineral Diagenesis

By: Donald L. Gautier, Yousif K. Kharaka and Ronald C. Surdam, 1985

This course attempts to focus on selected aspects of the organic/inorganic interaction within carbon-rich marine sediments and sedimentary rocks in potentially petroliferous basins. The course begins with a discussion of the effects of early diagenesis upon the accumulation of organic matter and ways in which the early diagenetic environment can be interpreted from evidence in ancient sediments. The course then focuses upon rock-water interaction and upon generation, distribution and significance of aqueous organic species in petroliferous basins. The final section concerns mechanisms of organic/inorganic interactions in sandstone/shale sequences, with particular emphasis upon the development of secondary porosity. The author concentrates on processes at temperatures between 80 and 200 degrees Celsius and upon the links between fine-grained hydrocarbon source beds and reservoir rocks and the transfer and redistribution of material in the subsurface.

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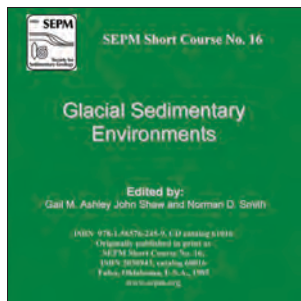


## SC 16 – Glacial Sedimentary Environments

By: Gail M. Ashley, John Shaw and Norman D. Smith, 1985

Until the early 1970s, few sedimentologists had studied glacial deposits in terms of their sedimentary facies, facies associations, and stratigraphy. Glacigenic sediments were mainly analyzed in relation to landform development and geochronology of "drifts" rather than their textures, sedimentary structures, or large-scale bedding relationships. As very few pre-Cenozoic glacigenic sequences have been recognized, and more importantly, the petroleum industry has generally assessed glacial deposits as having little hydrocarbon potential, research on glacially derived sedimentary facies has been limited. Most studies have focused on Pleistocene deposits, particularly on such problems as glacial chronology sea-level cycles, paleoclimatology, and the fossil record (including the evolution of man). This short course attempts to review recent studies of glacigenic deposits and to examine the relationships between physical processes and sediment characteristics in the glacial environment. The course discusses terrestrial glacial environments of deposition exclusively.

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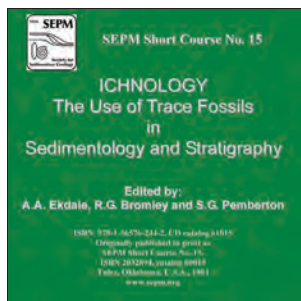


## SC 15 – Ichnology: The Use of Trace Fossils in Sedimentology and Stratigraphy

By: A.A. Ekdale, R.G. Bromley and S.G. Pemberton, 1984

Ichnology is a fascinating field of endeavor. As with science in general, it is a process of solving mysteries – in this case, mysteries of fossil behavior. In a very real sense the ichnologist is Sam Spade or Sherlock Holmes – following footprints, searching for traces of dastardly deeds, studying artifacts, attempting to reconstruct a sequence of events from subtle clues, pursuing the identity of someone (or something) long dead. Who was the culprit? What was he/she doing? Where was he/she living, working or going? Not only intellectually intriguing, ichnology also has practical application and economic importance. In today's frenzied quest for energy and mineral resources, exploration geologists value every tool that aids their search. Ichnologic observations and analyses can help the sedimentologist reconstruct ancient depositional environments, help the stratigrapher correlate sedimentary strata, help the paleontologist determine the nature of fossil communities, and help the geochemist determine the effect of organisms on sediment composition. This publication was written to serve as a comprehensive and intelligible introduction to ichnology for anyone with even rudimentary geologic training, whether or not that person enrolls in a formal course on the subject. The book emphasizes sedimentologic, stratigraphic and paleoecologic aspects of ichnology.

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# SHORT COURSE NOTES

## SC 14 – Modern and Ancient Deep Sea Fan Sedimentation

By: C. Hans Nelson and Tor H. Nilsen, 1984

This course of modern and ancient deep-sea fan sedimentation provides the framework for understanding the morphology, physiography, geometry, depositional processes and reservoir potential of deep-sea fan deposits. Focus is chiefly on the principles that control fan sedimentation and the resultant morphology of fans deposited in various types of settings. Through the comparison of modern and ancient examples of deep-sea fan sedimentation, the authors hope to increase understanding of the principal characteristics of fans. The course is divided into four parts (1) the Introduction, which covers the organization of the course and history of fan studies, (2) modern deep-sea fan deposits, (3) ancient deep-sea fan deposits, and (4) the synthesis, in which the results of the separate modern and ancient examinations of deep-sea fan deposits are synthesized into models that may be applicable to petroleum exploration.

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## SC 13 – Shelf Sands and Sandstone Reservoirs

By: R.W. Tillman, D.J.P. Swift and R.G. Walker, 1985

Shelf sandstone reservoirs are becoming a more and more common exploration target. What they are, how they may be characterized, and how they differ from shoreline and deep-water deposits in the subject of this publication. Shelf sands and sandstone reservoirs are among the more poorly understood types of sandstones. Continental, shoreline and deep water sandstones have all been studied in much more depth than have shelf sands and sandstones. However, during the last fifteen years significant progress has been made in understanding shelf sands and sandstones. Studies of modern sediments have allowed us to understand many of the depositional processes active on the shelf. This book is intended to be an up-to-date summary of shelf processes and products. The papers are intended for those new to shelf sands and sandstones as well as the shelf specialist.

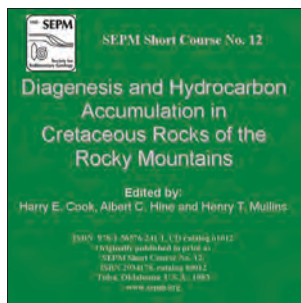
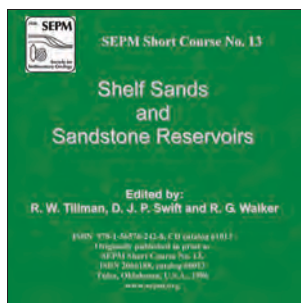
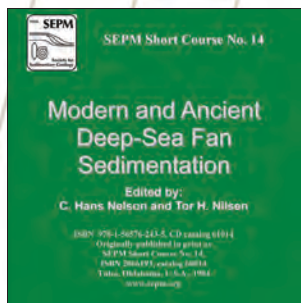
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## SC 12 – Platform Margin and Deep Water Carbonates

By: Harry E. Cook, Albert C. Hine and Henry T. Mullins, 1983

The increased need to find new energy resources in deep marine frontier environments has clearly intensified the importance and interest in deep water carbonate settings and how these settings interrelate to adjacent shoal water platform margins. Coarse-grained mass-flow deposits beyond the shelf break in terrigenous clastic environments have been known for many years to form major petroleum reservoirs, and it is likely that similar deep-water clastic facies will continue to be future exploration targets. The purpose of this short course is to improve approaches and ideas related to petroleum and mineral exploration in platform margin and deeper water carbonate environments. Emphasis is placed on understanding depositional environments, their contained facies and diagenetic patterns. Better geologic interpretation of these three elements in carbonate sedimentology and facies analysis is usually critical in petroleum exploration. These elements are also receiving wider importance in base metal exploration as many mineral deposits in carbonates are controlled by primary depositional patterns and not simply due to tectonics and/or proximity to igneous intrusions.

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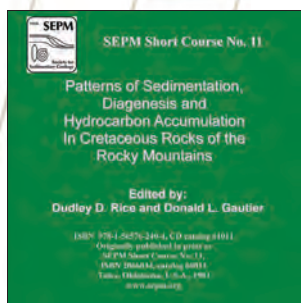
# SHORT COURSE NOTES

## SC 11 – Patterns of Sedimentation, Diagenesis and Hydrocarbon Accumulation in Cretaceous Rocks of the Rocky Mountains

By: Dudley D. Rice and Donald L. Gautier, 1983

In the Rocky Mountains from western Canada to Mexico, Cretaceous rocks are major sources and reservoirs for oil and natural gas, accounting for about 40% of the cumulative production to date. Resources estimates indicate that large amounts of hydrocarbons remain to be discovered in these rocks. The purpose of this volume is to examine the relationship of reservoir quality, resource evaluation, and exploration strategy to depositional environment, thermal maturity, and diagenetic history of Cretaceous rocks in the Rocky Mountain area. Chapters deal with the general characteristics of the Cretaceous Western Interior Basin and seaway, the application of organic geochemistry to hydrocarbon occurrence and exploration, principle aspects of diagenesis that affect reservoir quality and source-rock potential, and the five main depositional facies which can be recognized from west to east across the basin.

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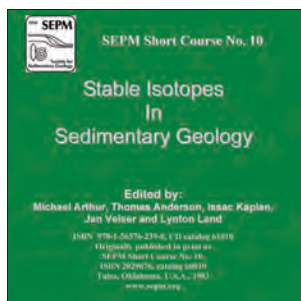


## SC 10 – Stable Isotopes in Sedimentary Geology

By: Michael A. Arthur, Thomas F. Anderson, Isaac R. Kaplan, Jan Veizer and Lynton S. Land, 1983

Stable isotope geochemistry has come into its own in the last few years as our inventory of processes and materials has improved from the result of much basic research. Stable isotope techniques should become a standard application to most studies of sedimentary rocks and depositional environments; it has much application in exploration for hydrocarbons as well as in basic research. Rapid progress depends on adequate and proper education of professionals in the techniques, the correct selection of samples, consideration of problems of interpretation, and concern for other types of data required to constrain interpretation of stable isotopic data. This text is designed to deal with the application of stable isotopes to geologic problems.

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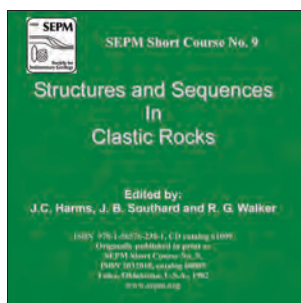


## SC 9 – Structures and Sequences in Clastic Rocks

By: J.C. Harms, J.B. Southard and R.G. Walker, 1982

These notes are for a course on the use of primary structures and stratification sequence as tools for interpretation of depositional environments. The emphasis is to provide a concise review of the factors that had led to the renaissance in clastic sedimentology during the decade leading up to 1975. The attempt is to provide an organized summary of both experimental studies and ideas on bed forms and primary sedimentary structures that was then relatively new and to show how this information could be applied to solving geologic problems. A second broad objective of the course is more philosophical, in that there is an attempt to outline some general approaches to interpretation and convey the goals of interpretation. The authors believe that there are a fairly small number of general depositional settings but that numerous environmental and process variables within each general setting lend considerable variation to the deposits themselves. The emphasis is at the scale of features and sequence that can commonly be observed in individual outcrops or cores. Interpretation begins with data collected at this level.

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# SHORT COURSE NOTES

## SC 8 – Principles and Applications of Coal Petrology

By: John C. Crelling and Russell R. Dutcher, 1980

It is the intent of this course to deal with the very broad aspects of coal petrology. In the process of doing this, the authors intend to point out many of the areas in which the science has been applied to geological and various production problems and also to suggest some areas where future work may be of value. The emphasis is to provide some basic reference materials, some procedural techniques and possibly some ideas for those of you who wish to pursue work in this area. This course is not intended to train you as a coal petrologist but rather to give you some ideas of what the capabilities and limitations of the field are, and to help you get started on your own if you wish to pursue any of these ideas to greater length.

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**List Price \$30.00 • Member Price \$18.00**

## SC 7 – How to Assess Maturation and Paleotemperatures

By: F.L. Staplin, W.G. Dow, C.W.D. Milner, D.I. O'Connor, S.A.J. Pocock, P. van Gijssel, D.H. Welte and M.A. Yüklér, 1982

The application of organic matter studies in petroleum exploration had its start with the recognition of "rank" in coal. During the period of 1900-1925, both physical and chemical methods were developed for determination of the degree of low grade metamorphism of particulate organic materials, or palynodebris in coals and other sediments. Measurements of the relative metamorphism (maturation level) which are based on physical properties are generally quick, cheap, and qualitative to semiquantitative. Those based on chemical analyses are less rapid and tend to be more quantitative. Each method has advantages and disadvantages and they often are combined. Papers included in this course consider methods based on particulate organic matter, reflectance, fluorescence, and geochemistry. A method for integrating the data into a three-dimensional model is included.

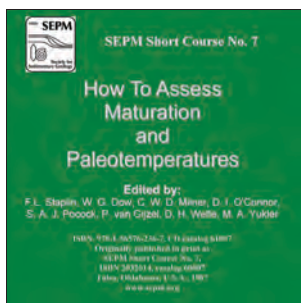
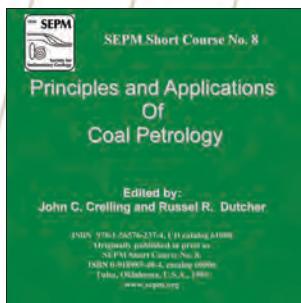
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## SC 6 – Foraminiferal Ecology and Paleocology

By: Jere H. Lipps, Wolfgang H. Berger, Martin A. Buzas, Robert G. Douglas and Charles A. Ross, 1979

Perhaps no fossil group is used as much as foraminifera for paleoecologic inference, both in academia and industry. Since the late 1960s, new concepts and much additional data have appeared that make it difficult for the casual worker not immediately concerned with foraminiferal ecology and paleoecology to stay abreast of the latest developments. In these notes, the authors summarize much of that information, or provide reference to more detailed sources. They also attempt to point out problems and other methods of dealing with them. Most paleoecologic work with foraminifera in the past has relied on direct comparison of fossil assemblages with the most similar modern assemblages, and inferring then that the environments were similar also. The method is used widely in scientific studies and in industrial applications. The result is based on the single hypothesis that the fossils are environmentally analogous to their modern counterparts. These notes present a number of alternative working hypotheses, and in some cases, examine the data to attempt to disprove them.

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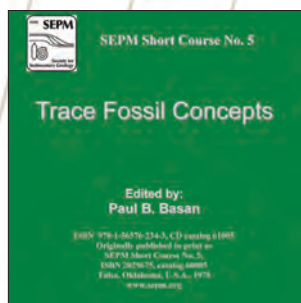
# SHORT COURSE NOTES

## SC 5 – Trace Fossil Concepts

Edited by: Paul B. Basan, 1978

The advancement of ichnological research has left in its wake a considerable volume of literature that contains many important concepts and the results of some excellent field studies. These notes try to consolidate the most salient topics of the discipline and emphasize the application of ichnological concepts and data to geological problems. In many respects, a detailed knowledge of trace fossil concepts is a matter of experience rather than education. Trace fossils, unlike other fossils, are part of the rock and, thus, they are difficult to collect and curate. As a result, interested geologists must go to the field and see a lot of trace fossils in a variety of different views, preserved under a variety of different conditions, to build a working expertise on such structures. This short course is designed to suit the needs of a diversified audience, which is made up of geologists from both academic and industrial institutions. Although the primary concern is to introduce the subject to those having little background in ichnology, the hope is to also update those geologists who already use trace fossil information in their investigations.

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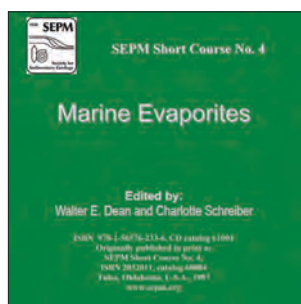


## SC 4 – Marine Evaporites

Edited by: Walter E. Dean and B. Charlotte Schreiber, 1978

Evaporites were classified on the basis of their environmental relationships, particularly with respect to the under- and over-lying sedimentary sequences. The scope of knowledge that went into establishing this classification was limited to deposits developed in cratonic (continental crust) areas of the world. The advent of the concept of sea-floor spreading, together with new data collected by the Deep Sea Drilling Project and extensive submarine seismic surveys, both on the continental margins and in the deep-sea, enables us to classify evaporitic sediments on the basis of tectonic settings as well as sediment affinities. The various divisions are in a sense artificial; the one classification readily overlaps with the other, and each of the groupings may grade through time and space.

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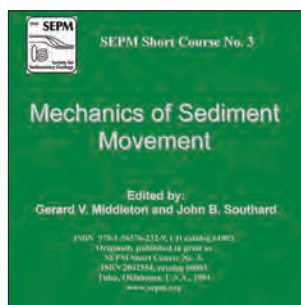


## SC 3 – Mechanics of Sediment Movement

By: Gerard V. Middleton and John B. Southard, 1984

The purpose in writing these notes has been to present a discussion of a few topics central to a physical understanding of the mechanics of sediment movement. Discussion has been confined to unidirectional flows (excluding waves) of relatively small scale (excluding Coriolis effects). A large number of topics have been not considered at all or only in passing, including one of the most important problems in sediment mechanics: theories for the prediction of bed-load and suspended-load discharge. It seemed more important to try to develop some physical insight about the elementary processes of sediment movement than to attempt to elaborate any comprehensive quantitative theories of sediment movement.

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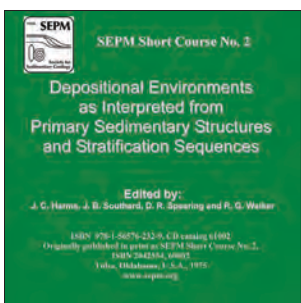


## SC 2 – Depositional Environments as Interpreted from Primary Sedimentary Structures and Stratification Sequences

By: J.C. Harms, J.B. Southard, D.R. Spearing and R.G. Walker, 1975

The focus of these notes is on the use of primary sedimentary structures and stratification sequence as tools for interpretation of depositional environment of clastic sediments, emphasizing advances in understanding that the authors judge to be important. To accomplish the primary objective, several topics have been selected. Experimental flume studies are summarized with emphasis on work which extends the understanding of distribution of bed forms over increased ranges of grain size, flow depths, or velocity. Studies of modern and ancient sedimentary sequences are used to illustrate and interpret environments of deposition. Fluvial sediments are reviewed to show how experimentally derived generalizations are applied or qualified to interpret natural environments.

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# CORE WORKSHOP NOTES

## CW 22 – Developing Models and Analogs for Isolated Carbonate Platforms – Holocene and Pleistocene Carbonates of the Caicos Platform, British West Indies

Edited by: William A. Morgan and Paul M. (Mitch) Harris, 2008

For the past 30 years, Caicos Platform has been an important area for studies of Holocene and Pleistocene carbonate successions and a destination for numerous geoscientists interested in learning about modern carbonate sedimentary systems. During the past few years there has been a renewed interest in understanding the geology of the platform, stemming in large part from recognition in the petroleum industry that more refined reservoir models of carbonate systems are needed both in exploration and development. The impetus for the workshop and the publication was a desire to bring together both present and past Caicos Platform workers with those not familiar with the Platform to share knowledge on the Holocene and Pleistocene Sedimentology, diagenesis, platform evolution, and the applicability of the platform as an analogue for ancient isolated carbonate platforms. This volume should serve as an intermediate-term documentation of research efforts and a spur for additional studies to better understand controls on sediment distribution, diagenesis, and the evolution of platform growth, furthering the Caicos Platform as an analogue for ancient, isolated, carbonate platforms.

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## CW 21 – Petroleum Plays and Systems in the National Petroleum Reserve – Alaska

Edited by: David W. Houseknecht, 2001

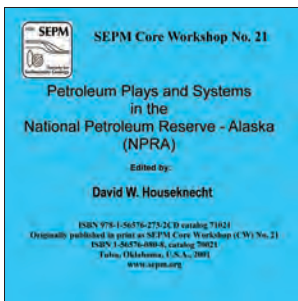
The North Slope of Alaska has re-emerged as one of the most active exploration provinces in the United States. Recent exploration successes, economic benefits of applying innovative exploration and production technologies, evolving industry demographics, rising oil and natural gas prices, and the anticipation that North Slope natural gas resources may become economically viable and marketable through a planned pipeline have stimulated a renewed intensity in leasing and exploration activity. The focus of NPRA exploration appears to include both structural and stratigraphic objectives that may include strata spanning much of the stratigraphic column. The purpose of the core workshop is to provide an opportunity to examine a large collection of core from all major stratigraphic units present in NPRA. The chapters in this volume provide a current perspective on the genesis and petroleum potential of each stratigraphic interval.

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## CW 20 – Turbidites and Associated Deep-Water Facies

Edited by: Robert D. Winn, Jr. and John M. Armentrout, 1995

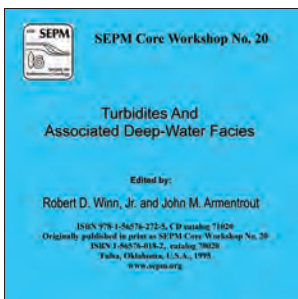
Deep-water siliciclastic reservoirs are a major high-potential play. As of December 1994, more than 170 wildcats have been drilled in the deep-water Gulf of Mexico with thirty announced discoveries. This core workshop has been assembled to examine the sediment and rocks deposited within eight slope basins of the Gulf of Mexico. The papers provide a starting point for discussions of depositional processes, facies, and reservoir and production characteristics based on observations from cores and core-photos. Turbidite is the most common word used to describe the sediment and rocks cored, but careful reading demonstrates that slumps, debris flows, high-density and low-density turbidites, and bottom-current reworked sediments are all recognized.

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# CORE WORKSHOP NOTES

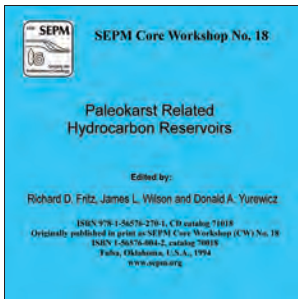


## CW 19 – Lacustrine Reservoirs and Depositional Systems

Edited by: Anthony J. Lomando, B. Charlotte Schreiber and Paul M. (Mitch) Harris, 1994

Lacustrine depositional systems are intriguing from sedimentologic, stratigraphic, and paleoclimatic perspectives. In localizing hydrocarbon source and reservoir rocks and also valuable evaporite minerals, they are also extremely important from an economic viewpoint. Lakes are dynamic systems that are susceptible to fluctuations in climate. They are also highly variable in their tectonic and depositional settings. The papers included in this volume, although not a comprehensive collection, provide coverage of a broad spectrum of modern and ancient lacustrine examples.

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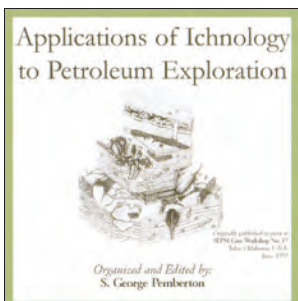


## CW 18 – Paleokarst Related Hydrocarbon Reservoirs

Edited by: Richard D. Fritz, James L. Wilson and Donald A. Yurewicz, 1993

This volume is a compilation of papers relative to paleokarst and associated reservoirs. The examples illustrate many of the rock types, and stratigraphic, structural, and paleotopographic features of carbonate strata which result chiefly from solution and collapse due to ingress of meteoric waters at and below unconformities. Examples presented here range from settings with considerable dissolution and collapse to those with significant unconformities but little evidence of meteoric alteration. It is estimated that 20 – 30% of recoverable hydrocarbons are in some way related to unconformities. Paleokarst reservoirs may also be important future reservoirs for application of horizontal drilling technology.

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## CW 17 – Applications of Ichnology to Petroleum Exploration

Edited by: S. George Pemberton, 1992

The field of ichnology (the study of animal-sediment relationships) is undergoing rapid expansion. Increased significance is being attached to trace fossils in environmental and diagenetic interpretations of rock units and in establishing basic stratigraphic frameworks. The subject, therefore, is of importance not only for ichnologists but also for invertebrate and vertebrate paleontologists, paleoecologists, sedimentologists, stratigraphers, and resource geologists. The main purpose of this workshop is: a) to introduce the basic concepts of ichnology; b) to learn how to recognize basic types of trace fossils in core; c) to place these structures in their appropriate paleontologic, sedimentologic, and stratigraphic content; and d) to integrate this data with other lines of evidence to aid in petroleum exploration.

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# CORE WORKSHOP NOTES

## CW 15 – Mixed Carbonate-Siliciclastic Sequences

Edited by: Anthony J. Lomando and Paul M. Harris, 1991

The study of carbonate-siliciclastic mixed sequences has seen an increase in the number of investigations that focus on mixed settings as part of the continuum between the carbonate and clastic end members. Cyclic deposition in mixed basins by reciprocal sedimentation has become one of the foundation blocks for sequence stratigraphy. In addition, these mixed sequences have a variety of distinctive petroleum reservoir characteristics, important for both exploration and development programs. The emphasis now is on reevaluating ancient sequences in the light of a more dynamic understanding of spatial and temporal variations and controls on these sequences. Examples in this volume are subdivided under the following headings: Shelf Wide, Coastal and Inner Shelf, Middle to Outer Shelf, Slope to Basin and Paleokarst. Many mixed sequences have been described in the literature, but understanding the controls of these sequences from a process approach is now in an adolescent stage.

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## CW 14 – Miocene and Oligocene Petroleum Reservoirs of the Santa Maria and Santa Barbara – Ventura Basins, California

Edited by: Margaret A. Keller and Mary K. McGowan, 1990

This volume presents papers that have been assembled for a Core Workshop on Miocene and Oligocene Petroleum Reservoirs of the Santa Maria and Santa Barbara – Ventura Basins, California. The main emphasis of the workshop is in the Miocene Monterey Formation, the most important petroleum reservoir in both the Santa Maria Basins and a very important reservoir in the Santa Barbara – Ventura Basin, particularly in the offshore. In addition to the Monterey Formation, core studies are also presented on the post-Monterey Sisquoc Formation and on pre-Monterey reservoirs including the Sespe, Alegria, and Vaqueros Formations.

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## CW 13 – Subsurface and Outcrop Examination of the Capitan Shelf Margin, Northern Delaware Basin

Edited by: Paul M. Harris and George A. Grover, 1989

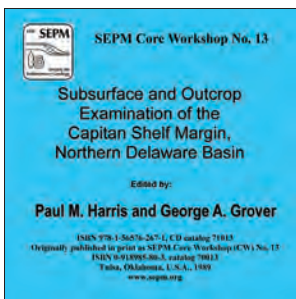
Outcrops of the Capitan reef and associated shelf and basinal strata (Late Permian, Guadalupian age) in the Guadalupe Mountains of West Texas and southeast New Mexico have long served industry, academia, and numerous geological societies as a superb training locale for better understanding carbonate, siliciclastic, and evaporite facies, and their diagenesis. The geologic model developed from the Guadalupe Mountains has proven to be an important analog for many other areas. Continued interest in the Capitan story from a wide-ranging audience, the availability of a unique core from a stratigraphic well at the northern end of the Delaware Basin and a large number of ongoing outcrop studies was the catalyst for a core workshop on the Capitan. The workshop should broaden one's view of the Capitan more so than ever before, by virtue of the combined subsurface and outcrop perspective of stratigraphic relationships, depositional facies, geologic evolution and diagenesis.

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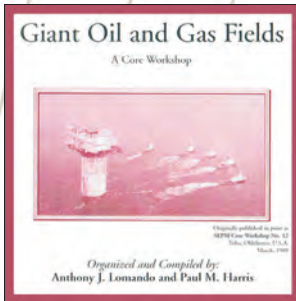
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# CORE WORKSHOP NOTES

## CW 12 – Giant Oil and Gas Fields, Volumes 1 & 2

Edited by: Anthony J. Lomando and Paul M. Harris, 1988



Giant fields tend to be grouped as a distinctive class of hydrocarbon target, but giant reservoirs are vastly different from one another with varying factors controlling rock type, facies, porosity evolution, and trap mechanism, even in adjoining reservoir zones. As such, the ideas generated from the geological analyses of these giants can be applied in many basins of the world to exploration and production targets of any size. The papers presented in these volumes are examples of giant fields from North America, the North Sea, Middle East and Indonesia. These papers also span the major range of geologic time. This sense of diversity extends through the major characteristics represented by the examples of giant reservoirs. A good mix of siliciclastic and carbonate rock types deposited in fluvial and supratidal settings down to deep marine environments can be found among these papers. Trap types range from simple and complex structural to stratigraphic and combination traps.

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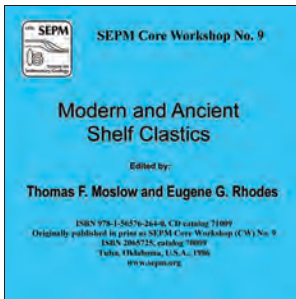
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## CW 9 – Modern and Ancient Shelf Clastics

Edited by: Thomas F. Moslow and Eugene G. Rhodes, 1986



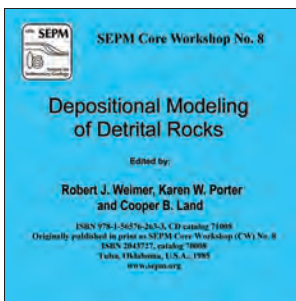
The organizers of this core workshop opted for a broad, permissive definition of shelf clastics and contributors were encouraged to focus on their own interpretations rather than force-fitting their examples to a restrictive theme. As a result, the editors assembled a selection of core examples which range from standline to shelf edge. Given the dominance of petrophysical logs in subsurface studies, contributors to the workshop worked hard to make the necessary core-to-log comparisons which were essential if geologists are to more fully utilize wireline data in facies analysis. Contributors were also encouraged to place their studies within the context of energy prospects associated with environments of deposition. Hydrocarbon potential and reservoir quality dominate these discussions. The high degree of lithofacies variability and the effect of high-energy events on shelf deposits cause sediments formed within this environment to be particularly challenging exploration targets.

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## CW 8 – Depositional Modeling of Detrital Rocks: With Emphasis on Cored Sequences of Petroleum Reservoirs

By: Robert J. Weimer, Karen W. Porter and Cooper B. Land, 1985



Studies of cores from both field and wildcat wells offer the opportunity to interpret subsurface rock sequences and relate them to surface sections, to calibrate mechanical logs with observed lithologies, and to use these data to enhance both field development drilling and wildcat exploration. The cored sequences of detrital rocks described in this core workshop are organized on the basis of depositional models, and presented sequentially down the depositional system through the continental environments to the shoreline zone, and, finally, to the shallow offshore and deeper water environments. Each of the depositional models is treated in separate sections in which diagrams, facies descriptions and terminology are presented that summarize the principal aspects of the model.

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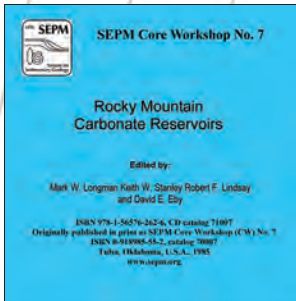
# CORE WORKSHOP NOTES

## CW 7 – Rocky Mountain Carbonate Reservoirs

Edited by: Mark W. Longman, Keith W. Shanley, Robert F. Lindsay and David E. Eby, 1985

This core workshop was organized to give geologists from across the country and around the world the opportunity to see a wide variety of carbonate reservoirs as well as some carbonate source rocks from the Rocky Mountain region. Cores displayed at the workshop range in age from Cambrian to Cretaceous and come from a number of the major oil-producing basins in the Rocky Mountains. Depositional facies represented in the cores range from sabkhas and tidal flats through algal and coral buildups to relatively deep water chalks. Dolomite and evaporite minerals are important in approximately half the cores described; the others are dominantly limestone. Porosity of many different types is discussed. Diagenesis, or lack of it, has played a major role in forming virtually all the reservoirs. Thus, the workshop offers the chance to observe and study a wide variety of depositional and diagenetic textures in a number of economically important rock units.

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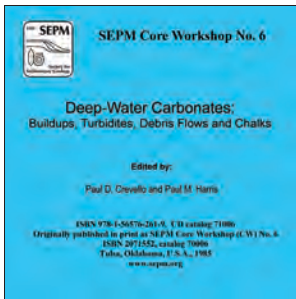


## CW 6 – Deep-Water Carbonates: Buildups, Turbidites, Debris Flows and Chalks

Edited by: Paul D. Crevello and Paul M. Harris, 1985

Deep-water carbonates represent on the few frontiers remaining for carbonate exploration and research. The last decade has experienced a rapid evolution in concepts of depositional models and diagenesis which underscores the importance of these deposits as significant reservoirs and source rocks. This workshop displayed cores selected to provide subsurface geologic examples of deep-water carbonates from a variety of depositional settings. Several papers discuss depositional models, platform-to-basin reconstructions, and diagenetic sequences that are important in the development and exploration of Paleozoic carbonate debris flow and turbidite reservoirs of the Palo Duro, Delaware and Midland Basins. Many other examples are included from several different regions.

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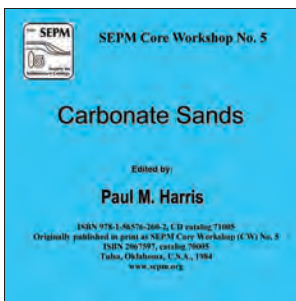


## CW 5 – Carbonate Sands

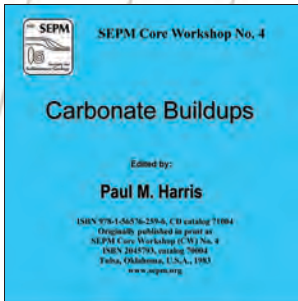
Edited by: Paul M. Harris, 1984

Carbonate sands, both skeletal and non-skeletal, have been studied by geologists as intensely as carbonate buildups. The underlying reason for the studies is the importance of those sands as significant hydrocarbon reservoirs. This core workshop is intended to provide a "hands on" look at the subsurface geologic record of carbonate sands with emphasis on lithofacies, stratigraphy of the sands and surrounding deposits, geometry of the sand deposits, diagenesis and porosity evolution, and wireline log data.

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# CORE WORKSHOP NOTES

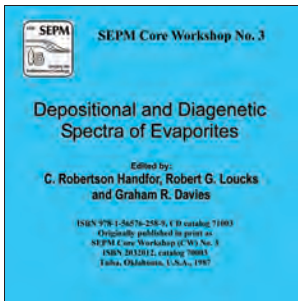


## CW 4 – Carbonate Buildups

Edited by: Paul M. Harris, 1983

Carbonate buildups have long been a focus of intense geological study. An underlying reason is the importance of carbonate buildups as significant hydrocarbon reservoirs. This core workshop is intended to provide a “hands on” look at the subsurface geologic record created by carbonate buildups with emphasis on lithofacies, stratigraphy of buildups and their surrounding deposits, geometry, “reef”-building and sediment-producing organisms, and diagenesis and porosity evolution.

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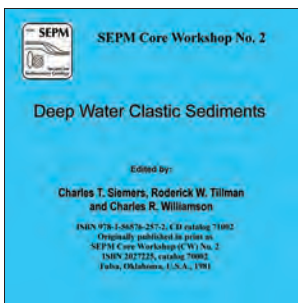


## CW 3 – Depositional and Diagenetic Spectra of Evaporites

Edited by: C. Robertson Handford, Robert G. Loucks and Graham R. Davies, 1982

Geologists do not often have an opportunity to examine evaporites, whether in outcrops as badly weathered exposures, or in the subsurface, where evaporites are not as frequently cored as other rock types. Nevertheless, evaporites are important economically (mineral resource, seals for hydrocarbons, disposal sites for radioactive wastes, etc.) and geologists are, by necessity, becoming more aware of their origins. This workshop is intended to increase awareness and provide useful information for comparison to other evaporites, all of which should eventually benefit geologists in their efforts to understand the depositional and diagenetic spectra of evaporites.

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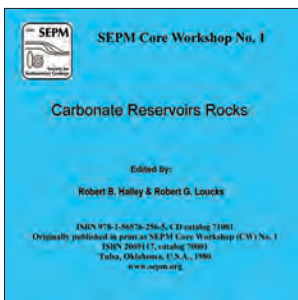


## CW 2 – Deep-Water Clastic Sediments

Edited by: Charles T. Siemers, Roderick W. Tillman and Charles R. Williamson, 1981

This core workshop on deep-water clastic sediments was organized to provide participants with an opportunity to view cores from a variety of deep water depositional settings and to demonstrate the application of process sedimentology in the interpretation of depositional environments from the study of cores and associated subsurface data. The studies assembled for presentation in the workshop have dealt with sedimentary sequences which have been interpreted as having formed by deposition of non-calcareous, clastic sediment in relatively deep water and also have been concerned principally with coarser deep-water sediments of such stratigraphic sequences because of their potential as hydrocarbon reservoirs. The notes were organized to provide written discussions of the studies in which the cores were used. In addition it was a principal objective of the organizers that each contribution contain subsurface wireline logs and extensive photographic coverage of the whole-diameter core sequences.

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## CW 1 – Carbonate Reservoir Rocks

Edited by: Robert B. Halley and Robert G. Loucks, 1980

This core workshop is the product of an effort by the SEPM Carbonate Research Group to emphasize the value of careful core interpretation to hydrocarbon exploration and production programs. Initially conceived as a small conference the format was expanded in response to strong interest from the geologic community. The end result was a workshop including 14 core displays. The notes were intended as a guide but the thorough documentation of these cores will be of interest to many others.

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# MISCELLANEOUS

## Miscellaneous

### **Atlas 1 – Sedimentary Structures and Early Diagenetic Features of Shallow Marine Carbonate Deposits**

By: Robert V. Demicco and Lawrence A. Hardie, 1994

Sedimentary structures remain a foundation for interpreting most ancient depositional environments. The product of physical, biological, or chemical processes either during or following deposition, they almost uniquely attest in the stratigraphic record to these processes. Most sedimentary structures are sufficiently complex as to defy communication by other than visual representation. Our ability to effectively utilize structures depends in large part on the visual images that we retain. An atlas with high-quality photographs can be a fundamental resource.

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### **Atlas 2 – Bedforms and Cross-Bedding in Animation**

By: David M. Rubin and Carissa L. Carter, 2006

The key to interpreting cross-stratified deposits is reconstructing the shape and motion of bedforms that deposited the bedding (a problem of pure geometry). This reconstructed history of bedform shape and motion can then be used to interpret the history of flow, sediment transport, and depositional processes (problems of physics, fluids, and sedimentology). Computer visualization is ideal for the geometrical aspects of this work, because visualizing the geometry of layers deposited by complicated bedforms that change shape and change motion can be difficult, if not impossible.

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