Stratigraphic Reservoir Characterization For Petroleum Geologists Geophysicists And Engineers Volume 61 Second Edition Developments In Petroleum Science

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LILLIANNA BRAIDEN

Carbonate Reservoir Characterization Elsevier Globally, deltas often contain major oil and gas reservoirs. The geometry, size, and internal architecture of deltas are functions of many variables related to the delta's mode of formation. A tripartite classification of deltas, into river-, wave-, and tide-dominated deltas, has been a standard for many years. However, even within each of these delta types, the distribution of properties can vary considerably depending on the delta's depositional history and the relative influence of rivers, waves, and tides. With regard to reservoir performance and optimization, perhaps the most significant difference in delta properties is in orientation and continuity of sand (reservoir) and shale (barrier) trends. Reservoir quality also varies according to the facies within the delta. To maximize hydrocarbon production, it is not sufficient to merely classify the reservoir as a delta. A complete understanding of the characteristics and variations of an individual delta's

reservoir is required for proper well placement and reservoir management. Reservoir Characterization and Potential for Improved Oil Recovery Within the Aux Vases Formation at Stewardson Field, Shelby County, Illinois Elsevier Inc. Chapters This book provides a comprehensive overview of the parameters and factors that cause heterogeneity in carbonate reservoirs, and examines how they interact with one another. It explores the various scales of heterogeneity, how they are caused, and how they can be minimized, as well as how the scales affect each other, providing practical examples in each chapter. The book concludes by discussing the effect of heterogeneity on petrophysical evaluations. As reducing heterogeneity is the only way to obtain accurate carbonate reservoir characteristics at the regional scale, the book offers an important reference guide for all geologists, engineers, and modelers working with subsurface data. Stratigraphic Reservoir Characterization for Petroleum Geologists, Geophysicists, and Engineers Elsevier Inc. Chapters The focus of this chapter has been on eolian reservoirs, with only a secondary

emphasis on description of outcrops. That is because the unique, fine-scale stratification characteristics of eolian deposits that affect their reservoir performance have been very well documented from the reservoirs themselves. Because of the likelihood of stratigraphic compartmentalization and permeability anisotropy resulting from bounding surfaces, it is very important that eolian reservoirs be characterized in detail. In addition to the effects of bounding surfaces, variations in cementation within laminae of different grain sizes result in small-scale variations in porosity and permeability, which are difficult and expensive to measure and document. This fact further emphasizes the importance of detailed reservoir characterization.

Elements of Petroleum Geology

Elsevier Inc. Chapters

Fine Reservoir Description: Techniques, Current Status, Challenges and Solutions presents studies on fine oil and gas reservoirs, covering aspects of current status and progress, content and methods/techniques, as well as challenges and solutions through literature review and case studies of reservoirs, including volcanic rocks

in the Songliao Basin, glutenite at the northwestern margin of the Junggar Basin, and sandstone in the Liaohe Basin, China. This book contains a large amount of data and illustrations. Provides a comprehensive overview of the latest advances in refined reservoir characterization for three types of reservoirs: high water cut, low permeability, and complex lithology Includes methods and techniques of fine reservoir description that are elaborated from nine aspects, such as fine stratigraphic division and correlation, fracture characterization and fine characterization of sand body Presents eight easy to use measures that are proposed to solve the problems of fine reservoir description **Stratigraphic Reservoir Characterization for Petroleum Geologists, Geophysicists, and Engineers** Stratigraphic Reservoir Characterization for Petroleum Geologists, Geophysicists, and Engineers F. Jerry Lucia, working in America's main oil-rich state, has produced a work that goes after one of the holy grails of oil prospecting. One main target in petroleum recovery is the description of the three-dimensional distribution of

petrophysical properties on the interwell scale in carbonate reservoirs. Doing so would improve performance predictions by means of fluid-flow computer simulations. Lucia's book focuses on the improvement of geological, petrophysical, and geostatistical methods, describes the basic petrophysical properties, important geology parameters, and rock fabrics from cores, and discusses their spatial distribution. A closing chapter deals with reservoir models as an input into flow simulators. *Stratigraphic Reservoir Characterization for Petroleum Geologists, Geophysicists, and Engineers* Elsevier Inc. Chapters This second volume on carbonate reservoirs completes the two-volume treatise on this important topic for petroleum engineers and geologists. Together, the volumes form a complete, modern reference to the properties and production behaviour of carbonate petroleum reservoirs. The book contains valuable glossaries to geologic and petroleum engineering terms providing exact definitions for writers and speakers. Lecturers will find a useful appendix devoted to questions and problems that can be used for teaching

assignments as well as a guide for lecture development. In addition, there is a chapter devoted to core analysis of carbonate rocks which is ideal for laboratory instruction. Managers and production engineers will find a review of the latest laboratory technology for carbonate formation evaluation in the chapter on core analysis. The modern classification of carbonate rocks is presented with petroleum production performance and overall characterizati on using seismic and well test analyses. Separate chapters are devoted to the important naturally fractured and chalk reservoirs. Throughout the book, the emphasis is on formation evaluation and performance. This two-volume work brings together the wide variety of approaches to the study of carbonate reservoirs and will therefore be of value to managers, engineers, geologists and lecturers. Springer Science & Business Media Reservoir Characterizati on is a collection of papers presented at the Reservoir Characterizati on Technical Conference, held at the Westin Hotel-Galleria in Dallas on April 29-May 1, 1985. Conference held April 29-May 1, 1985, at the Westin

Hotel—Galleria in Dallas. The conference was sponsored by the National Institute for Petroleum and Energy Research, Bartlesville, Oklahoma. Reservoir characterization is a process for quantitatively assigning reservoir properties, recognizing geologic information and uncertainties in spatial variability. This book contains 19 chapters, and begins with the geological characterization of sandstone reservoir, followed by the geological prediction of shale distribution within the Prudhoe Bay field. The subsequent chapters are devoted to determination of reservoir properties, such as porosity, mineral occurrence, and permeability variation estimation. The discussion then shifts to the utility of a Bayesian-type formalism to delineate qualitative ""soft"" information and expert interpretation of reservoir description data. This topic is followed by papers concerning reservoir simulation, parameter assignment, and method of calculation of wetting phase relative permeability. This text also deals with the role of discontinuous vertical flow barriers in reservoir engineering. The last chapters focus

on the effect of reservoir heterogeneity on oil reservoir. Petroleum engineers, scientists, and researchers will find this book of great value.

The Practice of Reservoir Engineering (Revised Edition)

Springer Nature

The concept of long periods of time being required for reservoirs to assume their present form is difficult to grasp, particularly for those individuals who track daily oil and gas production from reservoirs. However, the lengthy formative processes for hydrocarbon reservoirs can be understood, and this understanding is important for proper knowledge of why a reservoir is configured the way it is. The geologic time scale is divided into a series of time intervals that are based on significant events in the geologic record. Various temporal names applied to rock units commonly are used and must be recognized by people studying reservoirs. For a simple example, a Cretaceous reservoir rock was not deposited at the same time as a Devonian reservoir rock. The time during which a rock formed is dated by two means: absolute dating and relative dating. Absolute dating refers to the analysis of radioactive

components in a mineral (within a rock), which provides the age at which the mineral formed (solidified) in the rock. Such techniques are used mainly for igneous rocks that cool directly from magma, but some chemically precipitated minerals and cements in sedimentary rocks can be dated in this manner. More common to the study of sedimentary rocks is relative age dating, where the age of a particular rock is determined relative to its position within a stratigraphic succession. If sedimentary rocks are crosscut by datable igneous rocks, sometimes the absolute age range of deposition of the sedimentary rock can be determined. An analysis of microorganisms in sediments and sedimentary rocks can provide a useful means of establishing rock zonations (biozones) and sometimes for determining absolute age. Micropaleontology, biostratigraphy, and palynology are critical disciplines in the petroleum industry, for exploration and for reservoir characterization. In addition to providing a means for absolute dating of sedimentary rocks, high-resolution biostratigraphy and palynology can aid in (1) interpreting stratigraphic intervals and their ages on seismic

reflection profiles, (2) correlating between-well stratigraphic and temporal relationships, (3) determining sedimentation rates, and (4) determining depositional environments and changes in environments over time. Walther's law of succession of sedimentary facies is key to understanding the origin of sedimentary deposits and reservoirs. It is a fundamental principle that is the backbone of stratigraphy. Stratigraphic sequences, such as those that comprise reservoirs, exhibit systematic and somewhat predictable vertical stacking patterns that are explained by Walther's law. By understanding the vertical stratigraphy of a reservoir, one can make improved interpretations of the lateral (dis)continuity of reservoir intervals.

Reservoir Characterization and Sequence Stratigraphy of the Domengine Formation, Black Diamond Mines Regional Preserve, Northern California

Elsevier Inc. Chapters

Reservoir characterization as a discipline grew out of the recognition that more oil and gas could be extracted from reservoirs if the geology of the reservoir was understood. Prior to that awakening, reservoir

development and production were the realm of the petroleum engineer. In fact, geologists of that time would have felt slighted if asked by corporate management to move from an exciting exploration assignment to a more mundane assignment working with an engineer to improve a reservoir's performance. Slowly, reservoir characterization came into its own as a quantitative, multidisciplinary endeavor requiring a vast array of skills and knowledge sets. Perhaps the biggest attractor to becoming a reservoir geologist was the advent of fast computing, followed by visualization programs and theaters, all of which allow young geoscientists to practice their computing skills in a highly technical work environment. Also, the discipline grew in parallel with the evolution of data integration and the advent of asset teams in the petroleum industry. Finally, reservoir characterization flourished with the quantum improvements that have occurred in geophysical acquisition and processing techniques and that allow geophysicists to image internal reservoir complexities. Practical resource

describing different types of sandstone and shale reservoirs Case histories of reservoir studies for easy comparison Applications of standard, new, and emerging technologies Geological Core Analysis Springer Elements of Petroleum Geology, Fourth Edition is a useful primer for geophysicists, geologists and petroleum engineers in the oil industry who wish to expand their knowledge beyond their specialized area. It is also an excellent introductory text for a university course in petroleum geoscience. This updated edition includes new case studies on non-conventional exploration, including tight oil and shale gas exploration, as well as coverage of the impacts on petroleum geology on the environment. Sections on shale reservoirs, flow units and containers, IOR and EOR, giant petroleum provinces, halo reservoirs, and resource estimation methods are also expanded. Written by a preeminent petroleum geologist and sedimentologist with decades of petroleum exploration in remote corners of the world Covers information pertinent to everyone working in the oil and gas industry, especially

geophysicists, geologists and petroleum reservoir engineers Fully revised with updated references and expanded coverage of topics and new case studies **Stratigraphic reservoir characterization for petroleum geologists, geophysicists, and engineers** Academic Press Reservoirs described in this volume are located in the Middle East, Asia, West Africa, North and South America. The authors explore historical and alternative approaches to reservoir description, characterization, and management, as well as examining appropriate levels and timing of data gathering, technology applications, evaluation techniques, and management practices in various stages in the life of individual development projects. The giant fields discussed address issues important to reservoir description, characterization, and management from both geologic & engineering perspectives. **Reservoir Characterization of the Pontotoc Group, Robberson Field** Elsevier Inc. Chapters 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. 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.

Geophysics for Petroleum Engineers

Elsevier

In this chapter, the principles of reservoir modeling, workflows and their applications have been summarized. Reservoir modeling is a multi-disciplinary process that requires cooperation from geologists, geophysicists, reservoir engineers, petrophysics and financial individuals, working in a team setting. The best model is one that provides quantitative properties of the reservoir, though this is often difficult to achieve. There are three broad steps in the modeling process. The team needs to first evaluate the data quality, plan the proper modeling workflow, and understand the range of uncertainties of the reservoir. The second step is data preparation and interpretation, which can be a long, tedious, but essential process, which may include multiple iterations of quality

control, interpretation, calibration and tests. The third step is determining whether to build a deterministic (single, data-based model) or stochastic (multiple geostatistical iterations) model. The modeling approach may be decided by the quality and quantity of the data. There is no single rule of thumb because no two reservoirs are identical. Object-based stochastic modeling is the most widely used modeling method today. The modeling results need to be constrained and refined by both geologic and mathematical validation. Variogram analysis is very important in quality control of object-based stochastic modeling. Outcrops are excellent sources of continuous data which can be incorporated into subsurface reservoir modeling either by 1) building an outcrop “reservoir” model, or 2) identifying and developing outcrop analogs of subsurface reservoirs. Significant upscaling of a reservoir model for flow simulation may well result in an erroneous history match because the upscaling process often deletes lateral and vertical heterogeneitie s which may control or affect reservoir performance,

particularly in a deterministic model. Reservoir uncertainties are easier to manipulate by object-based stochastic models. Choosing the best realization approach for the reservoir model is the key to predicting reservoir performance in the management of reservoirs.

Reservoir Characterization and Its Application to Improved Oil Recovery from the Cypress Formation (Mississippian) at Richview Field, Washington County, Illinois

AAPG

There are different types of fluvial deposits and reservoirs. The two end-member depositional types are braided-river and fluvial-river deposits. A third type, incised valley fill, can contain either or both of these end members within the confines of the valley. In addition, fluvial deposits near the mouths of the valleys may become reworked by estuarine and tidal processes, which ultimately produce a different set of reservoir properties. The geometry, size, and reservoir characteristics of each fluvial type depend upon transportational, depositional, and postdepositional (diagenetic) processes that are controlled by several external variables, including geographic

location, sediment source areas (provenance), climate, and degree of tectonic activity. Braided-river deposits tend to be relatively coarse-grained and consist of gravel and sand, with little to no mud. Because of this, the beds tend to be laterally continuous over much or all of the width of the braidplain, although the presence of some shale beds may disrupt the continuity locally. By contrast, meandering-river deposits tend to be finer-grained, more lenticular, and partially or completely encased in floodplain shales. Depending upon the deposit's degree and type of postdepositional compaction and cementation, its porosity and permeability can be quite variable. However, in general, braided-river facies are more porous and more permeable than are meandering-river facies. A typical sequence stratigraphic stacking pattern for fluvial deposits consists of a basal erosion surface, formed during a falling stage of relative sea level, upon which sits, from the base upward, a lower braided-river deposit (deposited during early turnaround in relative sea level), a floodplain–meandering-river

system, and then lacustrine and/or estuarine/floodplain deposits of a transgressive systems tract, capped by highstand floodplain/meandering-river deposits. As a result of differences in properties, fluvial reservoirs can be expected to have quite varied performances. Any reservoir-management plan should include an evaluation of the type of fluvial reservoir and its characteristics. For example, waterflood sweep efficiency will be higher in a braided-river reservoir than in a meandering-river reservoir. Also, horizontal wells may be more efficient in a set of discontinuous meandering-river sandstones than in a more continuous and interconnected set of braided-river deposits. Seismic-reflection techniques, as well as well-log, core, and well-test analyses, all can be used to adequately define the type of fluvial reservoir and predict the recovery performance and efficiency of that reservoir.

Fine Reservoir Description

Elsevier Inc. Chapters

Stratigraphic Reservoir Characterization for Petroleum Geologists, Geophysicists, and EngineersNewnes

Stratigraphic Reservoir Characterization for Petroleum

Geologists, Geophysicists, and Engineers Elsevier Inc. Chapters

In summary, physical, biogenic, and chemical sedimentary structures are important to many aspects of reservoir characterization and should be included in every characterization, whether the analyst is using cores, borehole-image logs, or an analog outcrop. Sedimentary structures provide important information about the depositional environment of the reservoir rock, and from that information, one can determine the extent and geometry of the reservoir, its trend, and any likely impediments to hydrocarbon production. Porosity and permeability and, in particular, fluid-flow paths are also affected and guided by how the sediment grains are arranged into specific structures. Finally, one should bear in mind that some sedimentary structures can produce misleading or erroneous well-log results.

Giant Hydrocarbon Reservoirs of The World Elsevier Inc. Chapters

There are many tools and techniques for characterizing oil and gas reservoirs. Seismic-reflection techniques include conventional 2D and 3D seismic, 4D time-lapse seismic, multicompone

nt seismic, crosswell seismic, seismic inversion, and seismic attribute analysis, all designed to enhance stratigraphy/structure detection, resolution, and characterization. These techniques are constantly being improved. Drilling and coring a well provides the “ground truth” for seismic interpretation. Rock formations are directly sampled by cuttings and by core and indirectly characterized with a variety of conventional and specialized well logs. To maximize characterization and optimize production, many of these tools as possible should be employed. It is often less expensive to utilize a wide variety of tools that directly image or measure reservoir properties at different scales than to drill one or two dry holes.

Stratigraphic Reservoir Characterization for Petroleum Geologists, Geophysicists, and Engineers Elsevier Inc. Chapters Shallow marine environments, from the shoreline to the shelf edge, are complex and result in complex deposits. In turn, complex deposits translate into complex reservoirs. To maximize reservoir performance, it is imperative that we

understand the type of shallow marine deposit that makes up the reservoir. That is not an easy task, as is exemplified by the various interpretations that have been assigned to linear sandstones of the U.S. Cretaceous Western Interior Seaway. These sandstones, in both outcrop and subsurface reservoirs, have been interpreted to be offshore shelf bars or ridges, shoreface bodies, and incised valley fill. Interpreting the type of deposit is not merely an academic exercise, it is essential because each of these different types of sandstone bodies is characterized by different geometries and degrees of compartmentalization. There are numerous examples of shoreface deposits that are truncated by younger incised valley fill. Subtle variations in gamma-ray log response can be used to identify such strata. Barrier-island deposits provide a particularly challenging reservoir characterization problem. Because of the variety of sedimentary processes that can influence barrier-island formation, several different sandstone and shale geometries and trends can occur. That variation in geometries can lead to the potential for a high

degree of compartmentalization that is difficult to predict. Again, depositional-geometry prediction and well placement are facilitated by an understanding of the nature of the deposit and how it was formed.

Permian Basin Exploration and Production Strategies

Elsevier Inc. Chapters

This revised edition of the bestselling Practice of Reservoir Engineering has been written for those in the oil industry requiring a working knowledge of how the complex subject of hydrocarbon reservoir engineering can be applied in the field in a practical manner. Containing additions and corrections to the first edition, the book is a simple statement of how to do the job and is particularly suitable for reservoir/production engineers as well as those associated with hydrocarbon recovery. This practical book approaches the basic limitations of reservoir engineering with the basic tenet of science: Occam's Razor, which applies to reservoir engineering to a greater extent than for most physical sciences - if there are two ways to account for a physical phenomenon, it is the simpler that is the more useful.

Therefore, simplicity is the theme of this volume. Reservoir and production engineers, geoscientists, petrophysicists, and those involved in the management of oil and gas fields will want this edition. Stratigraphic Architecture and Reservoir Characterization of the Silurian Racine Formation, Forsyth Oil Field, Macon County, Central Illinois Elsevier Seismic attributes play a key role in exploration and exploitation of hydrocarbons. In Seismic Attributes for Prospect Identification and Reservoir Characterization (SEG Geophysical Developments No. 11), Satinder Chopra and Kurt J. Marfurt introduce the physical basis, mathematical implementation, and geologic expression of modern volumetric attributes including coherence, dip/azimuth, curvature, amplitude gradients, seismic textures, and spectral decomposition. The authors demonstrate the importance of effective color display and sensitivity to seismic acquisition and processing. Examples from different basins illustrate the attribute expression of tectonic deformation, clastic depositional systems, carbonate depositional systems and diagenesis, drilling hazards, and

reservoir characterization. The book is illustrated generously with color figures throughout. "Seismic Attributes" will appeal to seismic interpreters who want to extract more information from data; seismic processors and imagers who want to learn how their efforts impact subtle stratigraphic and fracture plays; sedimentologists, stratigraphers, and structural geologists who use large 3D seismic volumes to interpret their plays within a regional, basinwide context; and reservoir engineers whose work is based on detailed 3D reservoir models. Copublished with EAGE.

Healing Power Of Fasting To Burn Fat, Boost Energy, And Balance Hormones

• Demon Copperhead: A Pulitzer Prize Winner By Barbara Kingsolver