

An Introduction To Seismic Interpretation Reflection Seismics In Petroleum Exploration 2nd Edition

Introduces practical seismic analysis techniques and evaluation of interpretation confidence, for graduate students and industry professionals - independent of commercial software products.

An Introduction to Seismology, Earthquakes and Earth Structures is an introduction to seismology and its role in the earth sciences, and is written for advanced undergraduate and beginning graduate students. The fundamentals of seismic wave propagation are developed using a physical approach and then applied to show how refraction, reflection, and teleseismic techniques are used to study the structure and thus the composition and evolution of the earth. The book shows how seismic waves are used to study earthquakes and are integrated with other data to investigate the plate tectonic processes that cause earthquakes. Figures, examples, problems, and computer exercises teach students about seismology in a creative and intuitive manner. Necessary mathematical tools including vector and tensor analysis, matrix algebra, Fourier analysis, statistics of errors, signal processing, and data inversion are introduced with many relevant examples. The text also addresses the fundamentals of seismometry and applications of seismology to societal issues. Special attention is paid to help students visualize connections between different topics and view seismology as an integrated science. An Introduction to Seismology, Earthquakes, and Earth Structure gives an excellent overview for students of geophysics and tectonics, and provides a strong foundation for further studies in seismology.

Multidisciplinary examples throughout the text - catering to students in varied disciplines (geology, mineralogy, petrology, physics, etc.). Most up to date book on the market - includes recent seismic events such as the 1999 Earthquakes in Turkey, Greece, and Taiwan). Chapter outlines - each chapter begins with an outline and a list of learning objectives to help students focus and study. Essential math review - an entire section reviews the essential math needed to understand seismology. This can be covered in class or left to students to review as needed. End of chapter problem sets - homework problems that cover the material presented in the chapter. Solutions to all odd numbered problem sets are listed in the back so that students can track their progress. Extensive References - classic references and more current references are listed at the end of each chapter. A set of instructor's resources containing downloadable versions of all the figures in the book, errata and answers to homework problems is available at: <http://levee.wustl.edu/seismology/book/>. Also available on this website are PowerPoint lecture slides corresponding to the first 5 chapters of the book.

Introduction to Petroleum Seismology, second edition (SEG Investigations in Geophysics Series No. 12) provides the theoretical and practical foundation for tackling present and future challenges of petroleum seismology especially those related to seismic survey designs, seismic data acquisition, seismic and EM modeling, seismic imaging, microseismicity, and reservoir characterization and monitoring. All of the chapters from the first edition have been improved and/or expanded. In addition, twelve new chapters have been added. These new chapters expand topics which were only alluded to in the first edition: sparsity representation, sparsity and nonlinear optimization, near-simultaneous multiple-shooting acquisition and processing, nonuniform wavefield sampling, automated modeling, elastic-electromagnetic mathematical equivalences, and microseismicity in the context of hydraulic fracturing. Another major modification in this edition is that each chapter contains analytical problems as well as computational problems. These problems include MatLab codes, which may help readers improve their understanding of and intuition about these materials. The comprehensiveness of this book makes it a suitable text for undergraduate and graduate courses that target geophysicists and engineers as well as a guide and reference work for researchers and professionals in academia and in the petroleum industry.

Covers the basic ideas and methods used in seismic processing, concentrating on the fundamentals of seismic imaging and deconvolution. Many of the seismic methods in popular use today go back to the work of some of the great scientists of past centuries. The ideas are developed from the ground up. Most chapters in the book are followed by problem sets. Some exercises are designed to supplement the material presented in the text; others are meant to stimulate classroom discussions. There are few industrial-grade illustrations. Instead, both the text and the exercises deal mostly with simple examples that often can be solved with nothing more than a pencil and paper. Each chapter is as self-contained as possible to make it easier for a reader to concentrate on topics of particular interest. The book covers such basic topics as wave motion; digital imaging; digital filtering; various visualization aspects of the seismic reflection method; sampling theory; the frequency spectrum; synthetic seismograms; wavelets and wavelet processing; deconvolution; the need for continuing interaction between the seismic interpreter and the computer; seismic attributes; phase rotation; and seismic attenuation. The last of the 15 chapters gives a detailed mathematical overview. Digital Imaging and Deconvolution, nominated for the Association of Earth Science Editors award for the best geoscience publication of 2008-2009, will be of interest to professional geophysicists as well as graduate students and upper-level undergraduates in geophysics. The book also will be helpful to scientists and engineers in other disciplines who use digital signal processing to analyze and image wave-motion data in remote-detection applications. In particular, the methods described in this book are important in optical imaging, video imaging, medical and biological imaging, acoustical analysis, radar, and sonar.

An Introduction to Seismology, Earthquakes, and Earth Structure

Understanding Amplitudes

Elements of 3D Seismology, third edition

Seismic Amplitude

First Steps in Seismic Interpretation

The Art and Science of Seismic Interpretation

Regional Geology and Tectonics: Principles of Geologic Analysis, 2nd edition is the first in a three-volume series covering Phanerozoic regional geology and tectonics. The new edition provides updates to the first edition's detailed overview of geologic processes, and includes new sections on plate tectonics, petroleum systems, and new methods of geological analysis. This book provides both professionals and students with the basic principles necessary to grasp the conceptual approaches to hydrocarbon exploration in a wide variety of geological settings globally. Discusses in detail the principles of regional geological analysis and the main geological and geophysical tools Captures and identifies the tectonics of the world in detail, through a series of unique geographic maps, allowing quick access to exact tectonic locations Serves as the ideal introductory overview and complementary reference to the core concepts of regional geology and tectonics offered in volumes 2 and 3 in the series

This book introduces readers to the field of seismic data interpretation and evaluation, covering themes such as petroleum exploration and high resolution seismic data. It helps geoscientists and engineers who are practitioners in this area to both understand and to avoid the potential pitfalls of interpreting and evaluating such data, especially the over-reliance on sophisticated software packages and workstations alongside a lack of grasp on the elementary principles of geology and geophysics. Chapters elaborate on the necessary principles, from topics like seismic wave propagation and rock-fluid parameters

to seismic modeling and inversions, explaining the need to understand geological implications. The difference between interpretation of data and its evaluation is highlighted and the author encourages imaginative, logical and practical application of knowledge. Readers will appreciate the exquisite illustrations included with the accessibly written text, which simplify the process of learning about interpretation of seismic data. This multidisciplinary, integrated and practical approach to data evaluation will prove to be a valuable tool for students and young professionals, especially those connected with oil companies.

Seismic Data Analysis Techniques in Hydrocarbon Exploration explains the fundamental concepts and skills used to acquire seismic data in the oil industry and the step-by-step techniques necessary to extract the sections that trap hydrocarbons as well as seismic data interpretation skills. It enhances the ability to interpret seismic data and use that data for basin evaluation, structural modeling of a fault, reservoir characterization, rock physics analysis, field development, and production studies.

Understanding and interpreting seismic data is critical to oil and gas exploration companies. Arming young geoscientists with a reference that covers the key principles of seismic data analysis will enhance their job knowledge, skills and performance. A fundamental grasp of seismic data enhances employability and aids scientists in functioning effectively when working with seismic data in industry. Edited by a team of petroleum geoscientists with more than 30 years of experience in hydrocarbon exploration and data analysis at O&G companies. More than 200 figures, photographs, and illustrations aid in the understanding of the fundamental concepts and techniques used to acquire seismic data

Takes an easy-to-follow, step-by-step approach to presenting the techniques and skills used to extract the geologic sections from acquired seismic data. Enhances the geoscientist's effectiveness when using seismic data for field development and other exploration and production studies

Acquisition and Processing of Marine Seismic Data demonstrates the main principles, required equipment, and suitable selection of parameters in 2D/3D marine seismic data acquisition, as well as theoretical principles of 2D marine seismic data processing and their practical implications. Featuring detailed datasets and examples, the book helps to relate theoretical background to real seismic data. This reference also contains important QC analysis methods and results both for data acquisition and marine seismic data processing.

Acquisition and Processing of Marine Seismic Data is a valuable tool for researchers and students in geophysics, marine seismics, and seismic data, as well as for oil and gas exploration. Contains simple step-by-step diagrams of the methodology used in the processing of seismic data to demonstrate the theory behind the applications Combines theory and practice, including extensive noise, QC, and velocity analyses, as well as examples for beginners in the seismic operations market

Includes simple illustrations to provide to the audience an easy understanding of the theoretical background Contains enhanced field data examples and applications

Atlas of Structural Geological Interpretation from Seismic Images

Basic seismic analysis for rock properties

Quantitative Seismic Interpretation

AAPG Methods in Exploration Series, No. 10

Pitfalls in Seismic Interpretation

Acquisition and Processing of Marine Seismic Data

Interpreting Subsurface Seismic Data presents recent advances in methodologies for seismic imaging and interpretation across multiple applications in geophysics including exploration, marine geology, and hazards. It provides foundational information for context, as well as focussing on recent advances and future challenges. It offers detailed methodologies for interpreting the increasingly vast quantity of data extracted from seismic volumes. Organized into three parts covering foundational context, case studies, and future considerations,

Interpreting Subsurface Seismic Data offers a holistic view of seismic data interpretation to ensure understanding while also applying cutting-edge technologies. This view makes the book valuable to researchers and students in a variety of geoscience disciplines, including geophysics, hydrocarbon exploration, applied geology, and hazards. Presents advanced seismic detection workflows utilized cutting-edge technologies

Integrates geophysics and geology for a variety of applications, using detailed examples Provides an overview of recent advances in methodologies related to seismic imaging and interpretation

3-D seismic data have become the key tool used in the petroleum industry to understand the subsurface. In addition to providing excellent structural images, the dense sampling of a 3-D survey makes it possible to map reservoir quality and the distribution of oil and gas. Topics covered in this book include basic structural interpretation and map-making; the use of 3-D visualisation methods; interpretation of seismic amplitudes, including their relation to rock and fluid properties; and the generation and use of AVO and acoustic impedance datasets. This new paperback edition includes an extra appendix presenting new material on novel acquisition design, pore pressure prediction from seismic velocity, elastic impedance inversion, and time lapse seismics. Written by professional geophysicists with many years' experience in the oil industry, the book is indispensable for geoscientists using 3-D seismic data, including graduate students and new entrants into the petroleum industry.

Authored by one of the world's hydrocarbon exploration experts, **Geophysical Exploration Technology: Applications in Lithological and Stratigraphic Reservoirs** presents the latest technological advancements and cutting edge techniques in reservoir theory, research and exploration. Stratigraphic and lithological reservoirs play a critical role in increasing the production from oil reserves and new hydrocarbon sources. Recent resource evaluations indicate that onshore stratigraphic and subtle reservoirs account for as much as 40% of the total remaining hydrocarbon sources globally. As a result, these reservoirs will be the most practical, potential and prevalent fields for long-lasting onshore exploration. Intended as an aid in developing an understanding of the techniques of reservoir exploration, this book presents the latest and most practical methods and technology in oil and gas exploration. It can be used as a training book for lithological stratigraphic exploration and a reference for scientific and technological personnel in the oil and gas industry.

Authored by one of the world's foremost experts in stratigraphic and lithological reservoir exploration who has more than 30 years of experience in research and instruction. Features more than 200 figures, illustrations, and working examples to aid the reader in retaining key concepts Presents the latest technological developments in

reservoir exploration techniques Integrates theory and application, arming readers with a rigorous yet practical approach to hydrocarbon exploration in stratigraphic and lithological reservoirs

The first comprehensive guide to SAC, complete with introductory materials and detailed descriptions of its most advanced features.

Geophysical Exploration Technology

An Introduction to Seismic Interpretation

An Introduction to Applied and Environmental Geophysics

Seismic Stratigraphy

Seismic Data Analysis Techniques in Hydrocarbon Exploration

Regional Geology and Tectonics: Principles of Geologic Analysis

An Introduction to Seismic Interpretation

Elements of 3D Seismology, third edition is a thorough introduction to the acquisition, processing, and interpretation of 3D seismic data. This third edition is a major update of the second edition. Sections dealing with interpretation have been greatly revised in accordance with improved understanding and availability of data and software. Practice exercises have been added, as well as a 3D seismic survey predesign exercise. Discussions include: conceptual and historical foundations of modern reflection seismology; an overview of seismic wave phenomena in acoustic, elastic, and porous media; acquisition principles for land and marine seismic surveys; methods used to create 2D and 3D seismic images from field data; concepts of dip moveout, prestack migration, and depth migration; concepts and limitations of 3D seismic interpretation for structure, stratigraphy, and rock property estimation; and the interpretation role of attributes, impedance estimation, and AVO. This book is intended as a general text on reflection seismology, including wave propagation, data acquisition, processing, and interpretation and will be of interest to entry-level geophysicists, experts in related fields (geology, petroleum engineering), and experienced geophysicists in one subfield wishing to learn about another (e.g., interpreters wanting to learn about seismic waves or data acquisition).

Hardcover plus DVD

This modern introduction to seismic data processing in both exploration and global geophysics demonstrates practical applications through real data and tutorial examples. The underlying physics and mathematics of the various seismic analysis methods are presented, giving students an appreciation of their limitations and potential for creating models of the sub-surface. Designed for a one-semester course, this textbook discusses key techniques within the context of the world's ever increasing need for petroleum and mineral resources - equipping upper undergraduate and graduate students with the tools they need for a career in industry. Examples presented throughout the text allow students to compare different methods and can be demonstrated using the instructor's software of choice. Exercises at the end of sections enable students to check their understanding and put the theory into practice and are complemented by solutions for instructors and additional case study examples online to complete the learning package.

Applications in Lithological and Stratigraphic Reservoirs

Seismic Amplitude Interpretation

Introduction to Petroleum Seismology, second edition

Seismic on Screen

Volume 1: Principles of Geologic Analysis

Seismic Data Analysis

Quantitative Seismic Interpretation demonstrates how rock physics can be applied to predict reservoir parameters, such as lithologies and pore fluids, from seismically derived attributes. The authors provide an integrated methodology and practical tools for quantitative interpretation, uncertainty assessment, and characterization of subsurface reservoirs using well-log and seismic data. They illustrate the advantages of these new methodologies, while providing advice about limitations of the methods and traditional pitfalls. This book is aimed at graduate students, academics and industry professionals working in the areas of petroleum geoscience and exploration seismology. It will also interest environmental geophysicists seeking a quantitative subsurface characterization from shallow seismic data. The book includes problem sets and a case-study, for which seismic and well-log data, and Matlab codes are provided on a website (<http://www.cambridge.org/9780521816014>). These resources will allow readers to gain a hands-on understanding of the methodologies.

An Introduction to Applied and Environmental Geophysics, 2nd Edition, describes the rapidly developing field of near-surface geophysics. The book covers a range of applications including mineral, hydrocarbon and groundwater exploration, and emphasises the use of geophysics in civil engineering and in environmental investigations. Following on from the international popularity of the first edition, this new, revised, and much expanded edition contains additional case histories, and descriptions of geophysical techniques not previously included in such textbooks. The level of mathematics and physics is deliberately kept to a minimum but is described qualitatively within the text. Relevant mathematical expressions are separated into boxes to supplement the text. The book is profusely illustrated with many figures, photographs and line drawings, many never previously published. Key source literature is provided in an extensive reference section; a list of web addresses for key organisations is also given in an appendix as a valuable additional resource. Covers new techniques such as Magnetic Resonance Sounding, Controlled- Source EM, shear-wave seismic refraction, and airborne gravity and EM techniques Now includes radioactivity surveying and more discussions of down-hole geophysical methods; hydrographic and Sub-Bottom Profiling surveying; and Unexploded Ordnance detection Expanded to include more forensic, archaeological, glaciological, agricultural and bio-geophysical applications Includes more information on physio-chemical properties of geological, engineering and environmental materials Takes a fully global approach Companion website with additional resources available at www.wiley.com/go/reynolds/introduction2e Accessible core textbook for undergraduates as well as an ideal reference for industry professionals The second edition is ideal for students wanting a broad introduction to the subject and is also designed for practising civil and geotechnical engineers, geologists, archaeologists and environmental scientists who need an overview of modern geophysical methods relevant to their discipline. While the first edition was the first textbook to provide such a comprehensive coverage of environmental geophysics, the second edition is even more far ranging in terms of techniques, applications and case histories.

This new edition of the well-established Kearey and Brooks text is fully updated to reflect the important developments in geophysical methods since the production of the previous edition. The broad scope of previous editions is maintained, with even greater clarity of explanations from the revised text and extensively revised figures. Each of the major geophysical methods is treated systematically developing the theory behind the method and detailing the instrumentation, field data acquisition techniques, data processing and interpretation methods. The practical application of each method to such diverse exploration applications as petroleum, groundwater, engineering, environmental and forensic is shown by case histories. The mathematics required in order to understand the text is purposely kept to a minimum, so the book is suitable for courses taken in geophysics by all undergraduate students. It will also be of use to postgraduate students who might wish to include geophysics in their studies and to all professional geologists who wish to discover the breadth of the subject in connection with their own work.

Elementary, conceptual, and easy to read, this book describes the methods and techniques used to estimate rock properties from seismic data, based on a sound understanding of the elastic properties of materials and rocks and how the amplitudes of seismic reflections change with those properties. By examining the recorded seismic amplitudes in some detail, we can deduce properties beyond the basic geological structure of the subsurface. We can, using AVO and other amplitude techniques, characterize rocks and the reservoirs inside them with some degree of qualitative, and even quantitative, detail. Mathematics is not ignored, but is kept to a minimum. Intended for geophysicists, seismic acquisition specialists, processors, and interpreters, even those with little previous exposure to 'quantitative interpretation', 'interpretive processing' or 'advanced seismic analysis', this book also would be appropriate for geologists, engineers, and technicians who are familiar with the concepts but need a methodical review as well as managers and businesspeople who would like to obtain an understanding of these concepts.

Seismic Interpretation: The Physical Aspects

Interpreting Subsurface Seismic Data

Seismic Attributes as the Framework for Data Integration Throughout the Oilfield Life Cycle

An Introduction to Interactive Interpretation

An Interpreter's Handbook

A Petroleum Geologist's Guide to Seismic Reflection

An overview of the current techniques used in the inversion of seismic data is provided. Inversion is defined as mapping the physical structure and properties of the subsurface of the earth using measurements made on the surface, creating a model of the earth using seismic data as input.

Those fortunate enough to hear the unique and delightful verbal presentation of "Pitfalls in Seismic Interpretation" will be gratified by this printed version of the same classic paper. Messrs. Tucker and Yorston are to be congratulated for having an extraordinary idea and for sharing it in detail with their fellow explorationists. Clearly their wisdom is born of experience, not all of which was pleasant. This work will be appreciated not only by the old-timers in the profession but by the newcomers as they gradually realize the earth's crust is not a well-ordered system and that the seismic events resulting therefrom are even less well ordered.

This book was written to be an introduction to the geologic interpretation of seismic data. Seismic interpreters can be geologists, geophysicists, and even engineers. To be effective, [it is necessary to] teach geologists (and engineers) a bit of geophysics, and geophysicists (and engineers) a bit of geology.

In this course we shall assume that all participants are familiar with the essentials of seismic prospecting. Thus A the rudiments of the field work -- spreads, sources, arrays B and digital recording -- are assumed known. So also are the C rudiments of processing -- such processes as gain recovery, D filtering, deconvolution, velocity analysis, and display. E Just as important, we shall assume that all participants F have some feeling for the realities of seismic work -- in the l(B) field, under real conditions. Elementary signal theory and the basic techniques of interpretation are also assumed known. However, for certainty, the following pre-course notes include sections reviewing basic signal theory, geophysical aspects of interpretation, and geological aspects of interpretation. These reviews are not intended to be comprehensive. Their function is solely to cover, with the minimum possible discussion, the essential features which will be assumed to be known in the course. None of the course time will be spent on the material of these pre-course notes. Participants are advised that they will not derive full benefit from the course if this background is not known. Most course participants will be already familiar with this material, and will need to do little more than read it through. If, before the course, any participant requires further discussion of signal theory in the same non-rigorous style, he will find it in other writings of the present author, particularly: "Wiggles", Journal of the CSEG, December 1965, pp.13-43.

Exploration Seismology

Introduction to Seismic Inversion Methods

Seismic Attributes for Prospect Identification and Reservoir Characterization

An Introduction to Geophysical Exploration

The ABCs of Seismic Exploration and Processing

A Primer and User's Guide

This comprehensive book deals primarily with reflection seismic data in the hydrocarbon industry. It brings together seismic examples from North and South America, Africa, Europe, Asia and Australia and features contributions from eleven international authors who are experts in their field. It provides structural geological examples with full-color illustrations and explanations so that students and industry professionals can get a better understanding of what they are being taught. It also shows seismic images in black and white print and covers compression related structures. Representing a compilation of examples for different types of geological structures, Atlas of Structural Geological Interpretation from Seismic Images is a quick guide to finding analogous structures. It provides extensive coverage of seismic expression of different geological structures, faults, folds, mobile substrates (shale and salt), tectonic and regional structures, and common pitfalls in interpretation.

The book also includes an un-interpreted seismic section for every interpreted section so that readers can feel free to draw their own conclusion as per their conceptualization. Provides authoritative source of methodologies for seismic interpretation Indicates sources of uncertainty and give alternative interpretations Directly benefits those working in petroleum industries Includes case studies from a variety of tectonic regimes Atlas of Structural Geological Interpretation from Seismic Images is primarily designed for graduate students in Earth Sciences, researchers, and new entrants in industry who are interested in seismic interpretation.

"This Memoir is the result of plans made after the first Research Symposium on Seismic Stratigraphy presented at the 1975 national convention of the American Association of Petroleum Geologists. Selected reports from technical meetings since that time are also included."--Foreword.

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.

This is the completely updated revision of the highly regarded book *Exploration Seismology*. Available now in one volume, this textbook provides a complete and systematic discussion of exploration seismology. The first part of the book looks at the history of exploration seismology and the theory - developed from the first principles of physics. All aspects of seismic acquisition are then described. The second part of the book goes on to discuss data-processing and interpretation. Applications of seismic exploration to groundwater, environmental and reservoir geophysics are also included. The book is designed to give a comprehensive up-to-date picture of the applications of seismology. *Exploration Seismology's* comprehensiveness makes it suitable as a text for undergraduate courses for geologists, geophysicists and engineers, as well as a guide and reference work for practising professionals.

Practical Seismic Data Analysis

AAPG Memoir 42, 7th Edition/SEG Investigation in Geophysics, No. 9

3-D Seismic Interpretation

A Practitioner's Guide

Processing, Inversion, and Interpretation of Seismic Data

Introduction to Seismic Interpretation

This book demystifies that art and science of seismic interpretation for those with and without formal geophysical training. For geologists to managers and investors, *The Art and Science of Seismic Interpretation* is a guide to what seismic data can be interpreted, and what it can deliver.

This book is written for advanced earth science students, geologists, petroleum engineers and others who want to 'speed' on the interpretation of reflection seismic data. It is a development of material given to students on the MSc in Petroleum Geology at Aberdeen University and takes the form of a course manual rather than a systematic textbook. It can be used as a self-contained course for individual study, or as the basis for a class programme. The book clarifies those aspects that students tend to find difficult, and provides insights through practical tutorials which aim to reinforce and deepen understanding of key topics and provide the reader with a measure of feedback on progress. Some tutorials may only involve drawing diagrams, but many are computer-aided (PC based) with graphics output to give insight into key steps in seismic data interpretation. Part I of the book covers basic ideas and it ends with an introduction to 2-D structural interpretation. Part II concentrates on the current seismic reflection contribution to reservoir studies and data.

Öz Yilmaz has expanded his original volume on processing to include inversion and interpretation of seismic data. In a series of developments in all aspects of conventional processing, this two-volume set represents a comprehensive and complete treatment of the modern trends in the seismic industry-from time to depth, from 3-D to 4-D, from 4-D to 4-C, and from isotropy to anisotropy. Useful attributes capture and quantify key components of the seismic amplitude and texture for subsequent integration with microseismic, and production data through either interactive visualization or machine learning. Although both approaches can accelerate and facilitate the interpretation process, they can by no means replace the interpreter. Interpreter "gray" is the incorporation and validation of depositional, diagenetic, and tectonic deformation models, the integration of rock physics systematics, and the recognition of unanticipated opportunities and hazards. This book is written to accompany and complement the 2018 SEG Distinguished Instructor Short Course that provides a rapid overview of how 3D seismic attributes provide a framework for data integration over the life of the oil and gas field. Key concepts are illustrated by example, showing modern workflows on interactive interpretation and display as well as those aided by machine learning.

Development Geology Reference Manual

Interpretation of Three-Dimensional Seismic Data, Seventh Edition

Practical Seismic Interpretation

The Seismic Analysis Code

2001 Distinguished Instructor Short Course