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Gas Hydrate Umberta Tinivella 2019-11-28 This Special Issue reports research spanning from the analysis of indirect data, modeling, and laboratory and geological data confirming the intrinsic multidisciplinarity of gas hydrate studies. The study areas are (1) Arctic, (2) Brazil, (3) Chile, and (4) the Mediterranean region. The results furnished an important tessera of the knowledge about the relationship of a gas hydrate system with other complex natural phenomena such as climate change, slope stability and earthquakes, and human activities.

The Anthropocene as a Geological Time Unit Jan Zalasiewicz 2019-03-07 Reviews the evidence underpinning the Anthropocene as a geological epoch written by the Anthropocene Working Group investigating it. The book discusses ongoing changes to the Earth system within the context of deep geological time, allowing a comparison between the global transition taking place today with major transitions in Earth history.

Realizing the Energy Potential of Methane Hydrate for the United States National Research Council 2009-06-30 Natural gas, composed mostly of methane, is the cleanest of all the fossil fuels, emitting 25-50% less carbon dioxide than either oil or coal for each unit of energy produced. In recent years, natural gas supplied approximately 20-25% of all energy consumed in the United States. Methane hydrate is a potentially enormous and as yet untapped source of methane. The Department of Energy's Methane Hydrate Research and Development Program has been tasked since 2000 to implement and coordinate a national methane hydrate research effort to stimulate the development of knowledge and technology necessary for commercial production of methane from methane hydrate in a safe and environmentally responsible way. Realizing the Energy Potential of Methane Hydrate for the United States evaluates the program's research projects and management processes since its congressional re-authorization in 2005, and presents recommendations for its

future research and development initiatives.

Exploration and Production of Oceanic Natural Gas Hydrate Michael D. Max 2018-10-24 This second edition provides extensive information on the attributes of the Natural Gas Hydrate (NGH) system, highlighting opportunities for the innovative use and modification of existing technologies, as well as new approaches and technologies that have the potential to dramatically lower the cost of NGH exploration and production. Above all, the book compares the physical, environmental, and commercial aspects of the NGH system with those of other gas resources. It subsequently argues and demonstrates that natural gas can provide the least expensive energy during the transition to, and possibly within, a renewable energy future, and that NGH poses the lowest environmental risk of all gas resources. Intended as a non-mathematical, descriptive text that should be understandable to non-specialists as well as to engineers concerned with the physical characteristics of NGH reservoirs and their production, the book is written for readers at the university graduate level. It offers a valuable reference guide for environmentalists and the energy community, and includes discussions that will be of great interest to energy industry professionals, legislators, administrators, regulators, and all those concerned with energy options and their respective advantages and disadvantages.

Gas Hydrates Carlo Giavarini 2011-09-06 Gas hydrates are both a huge energy resource and an environmental challenge. They have a significant impact on society because of their applications to the future of energy, protection of the environment and fuel transportation. Gas Hydrates opens up this fascinating, multidisciplinary field to non-specialists. It provides a scientific study of gas hydrates that considers their potential as an energy source while assessing the possible risk to the environment. The authors also examine the feasibility of using these natural compounds for storing and transporting gases such as methane and carbon dioxide. Diagrams and photos are used throughout Gas Hydrates to help readers understand the scientific and technical content. Each section has been designed so it can be read independently by academics and professionals in the oil and gas industry, as well as by all those with an interest in how hydrates combine to be an energy resource, an industrial challange and a geological hazard.

Sediment-hosted Gas Hydrates D. Long 2009 There is much interest in gas hydrates in relation to their potential role as an important driver for climate change and as a major new energy source; however, many questions remain, not least the size of the global hydrate budget. Much of the current uncertainty centres on how hydrates are physically stored in sediments at a range of scales. This volume details advances in our understanding of sediment-hosted hydrates, and contains papers covering a range of studies of real and artificial sediments containing both methane hydrates and CO2 hydrates. The papers include an examination of the techniques used to locate, sample and characterize hydrates from natural, methane-rich systems, so as to understand them better. Other contributions consider the nature and stability of synthetic hydrates formed in the laboratory, which in turn improve our ability to make accurate predictive models.

Climate Change Impacts on Agriculture and Food Security in Egypt El-Sayed Ewis Omran 2020-04-08 This book gathers contributions discussing climate change in Egypt from an agricultural perspective. Written by leading experts, it presents state-of-the-art insights and the latest research developments in light of the most

recent IPCC report. Focusing on identifying the specific phenomena that affect climate change in Egypt, the book also addresses the effects of climate change in Egypt, particularly examining the quality and quantity of water resources as well as the socio-economic impacts of climate change on agricultural activities. Furthermore, it explores alternative solutions to support agriculture and food security and raises awareness of adaptation and protection as the key to adapting to the risks posed by climate change. Covering the four fundamental pillars of climate change: food security, availability, access and stability, this book is a valuable resource for stakeholders involved in achieving the 2030 sustainable development goals in Egypt and all countries with similar climatic conditions. It is also a unique source of information and updates on climate change impacts for graduates, researchers, policy planners, and decision-makers.

Onshore-Offshore Relationships on the North Atlantic Margin B.T.G. Wandås 2005-06-07 This book includes a selection of oral and poster presentations from "Onshore-Offshore Relationships on the Nordic Margin Conference" held in Trondheim in 2002. The conference was jointly arranged by the Norwegian Geological Society (NGF) and the Norwegian Petroleum Society (NPF), and attempted, through different thematic sessions, to bridge the gap often noted between industry and academic research. The first part of the conference included presentations under the theme "Basement control on offshore structuring" with representative articles from that segment included in this book and covering topics that range from analysis of vertical movements of basement substrates to the deep structural architecture of the Norwegian Sea to the development of the Jan Mayen microcontinent. These papers set the scene for the second segment of the conference, "Linking uplift and erosion with subsidence and deposition", that in the present book include articles related to the Triassic to Present-day infill history in the Norwegian and northern North Seas. The last segment of the conference addressed "New challenges" with respect to natural features of the deep-water areas that necessitate particular consideration and innovation on the part of research and industry to mitigate risk and maximize returns from field development. In this book, the articles addressing this theme present analyses of the enormous submarine slides that took place during the Holocene in the Norwegian Sea, and are of particular interest to the developers of the Ormen Lange gas field; other articles address the occurrences of gas hydrates in the near sea floor and the challenges presented in identifying and protecting the Lophelia cold-water reefs in the region. * Processes creating the structural framework for the deposition and depositional patterns in the Norwegian Sea and northern North Sea * Erosion and subsequent deposition of sediments in the subsiding deep-water basins in the Norwegian Sea area and northern North Sea * Challenges the oil industry has met in the deep-water areas of the Norwegian continental shelf

Paleoclimates Thomas M. Cronin 2010 "When combined with computer model simulations, paleoclimatic reconstructions are used to test hypotheses about the causes of climatic change, such as greenhouse gases, solar variability, earth's orbital variations, and hydrological, oceanic, and tectonic processes, This book is a comprehensive, state-of-the art synthesis of paleoclimate research covering all geological timescales, emphasizing topics that shed light on modern trends in the earth's climate." --Book Jacket.

Methane Hydrates in Quaternary Climate Change James P. Kennett 2003-01-10 Recent discoveries from ice-core and marine sediments suggest that global climate systems can change from glacial to near-interglacial

temperatures within decades. In order to explain this phenomenon, the authors (all affiliated with the Department of Geological Sciences, U. of California) advance a hypothesis that suggests that the massive energy needed for these changes came for the release of "frozen" methane hydrates (clathrates) stored in marine sediments on continental margins. They argue that the release of the methane caused feedback processes that would explain the surprisingly rapid changes. Annotation copyrighted by Book News, Inc., Portland, OR.

Climate Change A Barrie Pittock 2009-03-31 It is widely accepted in the scientific community that climate change is a reality, and that changes are happening with increasing rapidity. In this second edition, leading climate researcher Barrie Pittock revisits the effects that global warming is having on our planet, in light of ever-evolving scientific research. Presenting all sides of the arguments about the science and possible remedies, Pittock examines the latest analyses of climate change, such as new and alarming observations regarding Arctic sea ice, the recently published IPCC Fourth Assessment Report, and the policies of the new Australian Government and how they affect the implementation of climate change initiatives. New material focuses on massive investments in large-scale renewables, such as the kind being taken up in California, as well as many smaller-scale activities in individual homes and businesses which are being driven by both regulatory and market mechanisms. The book includes extensive endnotes with links to ongoing and updated information, as well as some new illustrations. While the message is clear that climate change is here (and in some areas, might already be having disastrous effects), there is still hope for the future, and the ideas presented here will inspire people to take action. Climate Change: The Science, Impacts and Solutions is an important reference for students in environmental or social sciences, policy makers, and people who are genuinely concerned about the future of our environment.

The Ocean and Climate Change 2009

Carbon Sequestration for Climate Change Mitigation and Adaptation David A. N. Ussiri 2017-03-28 This book provides an understanding of the role of human activities in accelerating change in global carbon cycling summarizes current knowledge of the contemporary carbon budget. Starting from the geological history, this volume follows a multidisciplinary approach to analyze the role of human activities in perturbing carbon cycling by quantifying changes in different reservoirs and fluxes of carbon with emphasis on the anthropogenic activities, especially after the industrial revolution. It covers the role of different mitigation options – natural ecological, engineered, and geoengineered processes as well as the emerging field of climate engineering in avoiding dangerous abrupt climate change. Although the targeted audience is the educators, students, researchers and scientific community, the simplified analysis and synthesis of current and up to date scientific literature makes the volume easier to understand and a tool policy makers can use to make an informed policy decisions.

Clathrate Hydrates of Natural Gases E. Dendy Sloan Jr. 2007-09-07 Hydrate research has expanded substantially over the past decade, resulting in more than 4,000 hydrate-related publications. Collating this vast amount of information into one source, Clathrate Hydrates of Natural Gases, Third Edition presents a thoroughly updated, authoritative, and comprehensive description of all major aspects of natural gas cla

Project Management and BIM for Sustainable Modern Cities Mohamed Shehata 2018-10-30 This volume presents innovative work on innovative methods, tools and practices aimed at supporting the transition of Asian and Middle Eastern cities and regions towards a more smart and sustainable dimension. The role of the built and urban environment are becoming more pronounced in Asia and Middle East as the regions continues to experience rapid increase in population and urbanisation, which have only led to an increase in environmental degradation but also rise in energy consumption and emissions. Individual chapters covers timely topics such as sustainable infrastructure, transportation, renewable energy, water and methods supporting an innovative and sustainable development of urban areas. Real-world examples are presented to highlight recent developments and advancements in design, construction and transportation infrastructures. The volume is based on the best contributions to the 2nd GeoMEast International Congress and Exhibition on Sustainable Civil Infrastructures, Egypt 2018 – The official international congress of the Soil-Structure Interaction Group in Egypt (SSIGE).

Water for Energy and Fuel Production Yatish T. Shah 2014-05-16 This text describes water's use in the production of raw fuels, as an energy carrier (e.g., hot water and steam), and as a reactant, reaction medium, and catalyst for the conversion of raw fuels to synthetic fuels. It explains how supercritical water is used to convert fossil- and bio-based feedstock to synthetic fuels in the presence and absence of a catalyst. It also explores water as a direct source of energy and fuel, such as hydrogen from water dissociation, methane from water-based clathrate molecules, and more.

Earth: The Operators' Manual Richard B. Alley 2011-04-18 The book—companion to a PBS series—that proves humans are causing global warming and offers a path to the future. Since the discovery of fire, humans have been energy users and always will be. And this is a good thing-our mastery of energy is what separates us from the rest of the animal kingdom and has allowed us to be the dominant species on the planet. However, this mastery comes with a price: we are changing our environment in a profoundly negative way by heating it up. Using one engaging story after another, coupled with accessible scientific facts, world authority Richard B. Alley explores the fascinating history of energy use by humans over the centuries, gives a doubt-destroying proof that already-high levels of carbon dioxide are causing damaging global warming, and surveys the alternative energy options that are available to exploit right now. These new energy sources might well be the engines for economic growth in the twenty-first century.

World Atlas of Submarine Gas Hydrates in Continental Margins Jürgen Mienert 2022-01-01 This world atlas presents a comprehensive overview of the gas-hydrate systems of our planet with contributions from esteemed international researchers from academia, governmental institutions and hydrocarbon industries. The book illustrates, describes and discusses gas hydrate systems, their geophysical evidence and their future prospects for climate change and continental margin geohazards from passive to active margins. This includes passive volcanic to non-volcanic margins including glaciated and non-glaciated margins from high to low latitudes. Shallow submarine gas hydrates allow a glimpse into the past from the Last Glacial Maximum (LGM) to modern environmental conditions to predict potential changes in future stability conditions while deep submarine gas hydrates remained more stable. This demonstrates their potential for rapid reactions for some gas

hydrate provinces to a warming world, as well as helping to identify future prospects for environmental research. Three-dimensional and high-resolution seismic imaging technologies provide new insights into fluid flow systems in continental margins, enabling the identification of gas and gas escape routes to the seabed within gas hydrate environments, where seabed habitats may flourish. The volume contains a method section detailing the seismic imaging and logging while drilling techniques used to characterize gas hydrates and related dynamic processes in the sub seabed. This book is unique, as it goes well beyond the geophysical monograph series of natural gas hydrates and textbooks on marine geophysics. It also emphasizes the potential for gas hydrate research across a variety of disciplines. Observations of bottom simulating reflectors (BSRs) in 2D and 3D seismic reflection data combined with velocity analysis, electromagnetic investigations and gas-hydrate stability zone (GHSZ) modelling, provide the necessary insights for academic interests and hydrocarbon industries to understand the potential extent and volume of gas hydrates in a wide range of tectonic settings of continental margins. Gas hydrates control the largest and most dynamic reservoir of global carbon. Especially 4D, 3D seismic but also 2D seismic data provide compelling sub-seabed images of their dynamical behavior. Sub-seabed imaging techniques increase our understanding of the controlling mechanisms for the distribution and migration of gas before it enters the gas-hydrate stability zone. As methane hydrate stability depends mainly on pressure, temperature, gas composition and pore water chemistry, gas hydrates are usually found in ocean margin settings where water depth is more than 300 m and gas migrates upward from deeper geological formations. This highly dynamic environment may precondition the stability of continental slopes as evidenced by geohazards and gas expelled from the sea floor. This book provides new insights into variations in the character and existence of gas hydrates and BSRs in various geological environments, as well as their dynamics. The potentially dynamic behavior of this natural carbon system in a warming world, its current and future impacts on a variety of Earth environments can now be adequately evaluated by using the information provided in the world atlas. This book is relevant for students, researchers, governmental agencies and oil and gas professionals. Some familiarity with seismic data and some basic understanding of geology and tectonics are recommended.

Climate Change Science: A Modern Synthesis G. Thomas Farmer 2013-01-12 An introduction to the principles of climate change science with an emphasis on the empirical evidence for climate change and a warming world. Additional readings are given at the end of each chapter. A list of "Things to Know" opens each chapter. Chapters are arranged so that the student is first introduced to the scientific method(s), examples of the use of the scientific method from other sciences drawn from the history of science with an emphasis on climate science. Climate science is treated in each chapter based on the premise of global warming. Chapter treatments on the atmosphere. biosphere, geosphere, hydrosphere, and anthroposphere and their inter-relationships are given.

Natural Gas Hydrates Timothy S. Collett 2010-01-14 Hardcover plus CD

Abrupt Climate Change Peter U. Clark 2009-09 This report is part of a series of 21 Synthesis and Assessments (SAP) aimed at providing current assessments of climate change science to inform public debate, policy, and operational decisions. These reports are also intended to help develop future program research priorities. The

guiding vision is to provide the Nation and the global community with the science-based knowledge needed to manage the risks and capture the opportunities associated with climate and related environmental changes. This SAP assesses abrupt climate change events where key aspects of the climate system change faster than the responsible forces would suggest and/or faster than society can respond to those changes. Illustrations.

The Quaternary Period in the United States A.R. Gillespie 2003-12-17 This book reviews advances in understanding of the past ca. two million years of Earth history - the Quaternary Period - in the United States. It begins with sections on ice and water - as glaciers, permafrost, oceans, rivers, lakes, and aquifers. Six chapters are devoted to the high-latitude Pleistocene ice sheets, to mountain glaciations of the western United States, and to permafrost studies. Other chapters discuss ice-age lakes, caves, sea-level fluctuations, and riverine landscapes. With a chapter on landscape evolution models, the book turns to essays on geologic processes. Two chapters discuss soils and their responses to climate, and wind-blown sediments. Two more describe volcanoes and earthquakes, and the use of Quaternary geology to understand the hazards they pose. The next part of the book is on plants and animals. Five chapters consider the Quaternary history of vegetation in the United States. Other chapters treat forcing functions and vegetation response at different spatial and temporal scales, the role of fire as a catalyst of vegetation change during rapid climate shifts, and the use of tree rings in inferring age and past hydroclimatic conditions. Three chapters address vertebrate paleontology and the extinctions of large mammals at the end of the last glaciation, beetle assemblages and the inferences they permit about past conditions, and the peopling of North America. A final chapter addresses the numerical modeling of Quaternary climates, and the role paleoclimatic studies and climatic modeling has in predicting future response of the Earth's climate system to the changes we have wrought.

Early-Middle Pleistocene Transitions Geological Society of London 2005 The Early-Middle Pleistocene transition (around 1.2 to 0.5 Ma) marks a profound shift in Earth's climate state. Low-amplitude 41 ka climate cycles, dominating the earlier part of the Pleistocene, gave way progressively to a 100 ka rhythm of increased amplitude that characterizes our present glacial-interglacial world. This volume assesses the biotic and physical response to this transition both on land and in the oceans: indeed it examines the very nature of Quaternary climate change. Milankovitch theory, palaeoceanography using isotopes and microfossils, marine organic geochemistry, tephrochronology, the record of loess and soil deposition, terrestrial vegetational change, and the migration and evolution of hominins as well as other large and small mammals, are all considered. These themes combine to explore the very origins of our present biota.

Encyclopedia of Global Warming and Climate Change, Second Edition S. George Philander 2012-06-29 Prev. ed. published under title: Encyclopedia of global warming and climate change.

Life at Vents and Seeps Jens Kallmeyer 2017-11-07 Vents and seeps are the epitome of life in extreme environments, but there is much more to these systems than just black smokers or hydrocarbon seeps. Many other ecosystems are characterized by moving fluids and this book provides an overview of the different habitats, their specific conditions as well as the technical challenges that have to be met when studying them. The book provides the current state of the art and will be a valuable resource for everybody that has an

interest in such environments.

Encyclopedia of Global Warming and Climate Change S. George Philander 2008-04-22 2008 Best Reference, Library Journal "The impact of global warming is rapidly evolving. This valuable resource provides an excellent historical overview and framework of this topic and serves as a general resource for geography, oceanography, biology, climatology, history, and many other subjects. A useful reference for a wide audience of business professionals and government officials as well as for the general public; essential for both academic and public libraries." —Library Journal "This is a useful set because of the individual country entries as well as the general-audience language . . ." — Booklist (Starred Review) The Encyclopedia of Global Warming and Climate Change helps readers learn about the astonishingly intricate processes that make ours the only planet known to be habitable. These three volumes include more than 750 articles that explore major topics related to global warming and climate change—ranging geographically from the North Pole to the South Pole, and thematically from social effects to scientific causes. Key Features Contains a 4-color, 16-page insert that is a comprehensive introduction to the complexities of global warming Includes coverage of the science and history of climate change, the polarizing controversies over climate-change theories, the role of societies, the industrial and economic factors, and the sociological aspects of climate change Emphasizes the importance of the effects, responsibilities, and ethics of climate change Presents contributions from leading scholars and institutional experts in the geosciences Serves as a general resource for geography, oceanography, biology, climatology, history, and many other subjects The Encyclopedia of Global Warming and Climate Change provides a primarily nonscientific resource to understanding the complexities of climate change for academic and public libraries. READER'S GUIDE Atmospheric Sciences Climate climate and Society Climate Change, Effects Climate Feedbacks Climate Models Countries: Africa Countries: Americas Countries: Asia Countries: Europe Countries: Pacific Glaciology Government and International Agencies Institutions Studying Climate Change Oceanography Paleo-Climates People Programs And Conventions

Natural Gas Seepage Giuseppe Etiope 2015-01-30 The book offers a modern, comprehensive, and holistic view of natural gas seepage, defined as the visible or invisible flow of gaseous hydrocarbons from subsurface sources to Earth’s surface. Beginning with definitions, classifications for onshore and offshore seepage, and fundamentals on gas migration mechanisms, the book reports the latest findings for the global distribution of gas seepage and describes detection methods. Seepage implications are discussed in relation to petroleum exploration, environmental impacts (hazards, pollution, atmospheric emissions, and past climate change), emerging scientific issues (abiotic gas and methane on Mars), and the role of seeps in ancient cultures. With an updated bibliography and an integrated analysis of available data, the book offers a new fundamental awareness - gas seepage is more widespread than previously thought and influences all of Earth’s external “spheres”, including the hydrosphere, atmosphere, biosphere, and anthroposphere.

Updates in Volcanology Karoly Nemeth 2012-09-27 This book is the second volume of the Updates in Volcanology and presents review style chapters as well as stand alone research works on volcanological problems that could be used as valuable resource for both researchers and graduate research students. The book presents chapters arching over a broad field of volcanology among many are considered to be dynamically

developing subject areas such as volcano morphology, volcanic terrain evolution or volcaniclastic-hosted mineral resource analysis. The book also takes the reader to areas such as the Russian Far East or sedimentary basins in China which are very remote and generally less known for the global community. This book demonstrates the dynamic evolution of volcanology in the past decades.

Glaciers and the Polar Environment Masaki Kanao 2021-02-24 Glaciers and Polar regions provide important clues to understanding the past and present status of the Earth system, as well as to predict future forms of our planet. In particular, Antarctica, composed of an ice-covered continent in its center and the surrounding Sothern Ocean, has been gradually investigated during the last half century by all kinds of scientific branches; bioscience, physical sciences, geoscience, oceanography, environmental studies, together with technological components. This book covers topics on the recent development of all kinds of scientific research on glaciers and Antarctica, in the context of currently on-going processes in the extreme environment in polar regions.

Charting the Future of Methane Hydrate Research in the United States National Research Council 2004-11-14 Methane hydrate is a natural form of clathrate - a chemical substance in which one molecule forms a lattice around a "guest" molecule with chemical bonding. In this clathrate, the guest molecule is methane and the lattice is formed by water to form an ice-like solid. Methane hydrate has become the focus of international attention because of the vast potential for human use worldwide. If methane can be produced from hydrate, a reasonable assumption given that there are no obvious technical or engineering roadblocks to commercial production, the nation's natural gas energy supply could be extended for many years to come. This report reviews the Department of Energy's (DOE) Methane Hydrate Research and Development Program, the project selection process, and projects funded to date. It makes recommendations on how the DOE program could be improved. Key recommendations include focusing DOE program emphasis and research in 7 priority areas; incorporating greater scientific oversight in the selection, initiation, monitoring, and assessment of major projects funded by the DOE; strengthening DOE's contribution to education and training through funding of fellowships, and providing project applicants with a set of instructions and guidelines outlining requirements for timely and full disclosure of project results and consequences of noncompliance.

Climate Change: An Encyclopedia of Science, Society, and Solutions [3 volumes] Bruce E. Johansen 2017-09-15 This three-volume set presents entries and primary sources that will impress on readers that what we do—or don't do—today regarding climate change will dramatically influence what life on this planet will be like for untold numbers of generations. • Provides readers with a clearly written description of global-warming science and its role in shaping a body of knowledge regarding a worldwide issue that affects everyone • Suggests remedies for this serious problem, most notably a rapid rise in the implementation of wind power generation and a coming revolution in solar energy • Impresses on readers that what Americans and the citizens and governments of other nations around the globe do over the next decades will determine the future of this planet for many tens of thousands of years to come • Includes primary documents sourced from major scientific journals and from the many reports on recent climate change from governmental organizations, including the Intergovernmental Panel on Climate Change (IPCC) and World Meteorological Organization (WMO), both part of the United Nations; and the U.S. government's National Climate Assessment

Chemical Energy from Natural and Synthetic Gas Yatish T. Shah 2017-03-16 Commercial development of energy from renewables and nuclear is critical to long-term industry and environmental goals. However, it will take time for them to economically compete with existing fossil fuel energy resources and their infrastructures. Gas fuels play an important role during and beyond this transition away from fossil fuel dominance to a balanced approach to fossil, nuclear, and renewable energies. Chemical Energy from Natural and Synthetic Gas illustrates this point by examining the many roles of natural and synthetic gas in the energy and fuel industry, addressing it as both a "transition" and "end game" fuel. The book describes various types of gaseous fuels and how are they are recovered, purified, and converted to liquid fuels and electricity generation and used for other static and mobile applications. It emphasizes methane, syngas, and hydrogen as fuels, although other volatile hydrocarbons are considered. It also covers storage and transportation infrastructure for natural gas and hydrogen and methods and processes for cleaning and reforming synthetic gas. The book also deals applications, such as the use of natural gas in power production in power plants, engines, turbines, and vehicle needs. Presents a unified and collective look at gas in the energy and fuel industry, addressing it as both a "transition" and "end game" fuel. Emphasizes methane, syngas, and hydrogen as fuels. Covers gas storage and transport infrastructure. Discusses thermal gasification, gas reforming, processing, purification and upgrading. Describes biogas and bio-hydrogen production. Deals with the use of natural gas in power production in power plants, engines, turbines, and vehicle needs.

Abrupt Climate Change Harunur Rashid 2013-05-02 Published by the American Geophysical Union as part of the Geophysical Monograph Series, Volume 193. Abrupt Climate Change: Mechanisms, Patterns, and Impacts brings together a diverse group of paleoproxy records such as ice cores, marine sediments, terrestrial (lakes and speleothems) archives, and coupled ocean-atmosphere climate models to document recent advances in understanding the mechanisms of abrupt climate changes. Since the discovery of the Dansgaard-Oeschger events in Greenland ice cores and the subsequent discovery of their contemporary events in the marine sediments of the North Atlantic, the search for these abrupt, millennial-scale events across the globe has intensified, and as a result, the number of paleoclimatic records chronicling such events has increased. The volume highlights include discussions of records of past climate variability, meridional overturning circulation, land-ocean-atmosphere interactions, feedbacks in the climate system, and global temperature anomalies. Abrupt Climate Change will be of interest to students, researchers, academics, and policy makers who are concerned about abrupt climate change and its potential impact on society.

Economic Geology of Natural Gas Hydrate Michael D. Max 2006-07-09 This book is a companion to “Natural Gas Hydrate in Oceanic and Permafrost Environments” (Max, 2000, 2003), which is the first book on gas hydrate in this series. Although other gases can naturally form clathrate hydrates (referred to after as ‘hydrate’), we are concerned here only with hydrocarbon gases that form hydrates. The most important of these natural gases is methane. Whereas the first book is a general introduction to the subject of natural gas hydrate, this book focuses on the geology and geochemical controls of gas hydrate development and on gas extraction from naturally occurring hydrocarbon hydrates. This is the first broad treatment of gas hydrate as a natural resource within an economic geological framework. This book is written mainly to stand alone for brevity and to minimize duplication. Information in Max (2000; 2003) should also be consulted for completeness. Hydrate is a type of

clathrate (Sloan, 1998) that is formed from a cage structure of water molecules in which gas molecules occupying void sites within the cages stabilize the structure through van der Waals or hydrogen bonding.

Environmental Change Frank Oldfield 2005-08-25 Advanced non-specialist textbook explaining the significance of past and contemporary environmental and climatic change.

Gulf of Mexico Origin, Waters, and Biota Noreen A. Buster 2011-05-30 Volume 3 of Gulf of Mexico Origin, Waters, and Biota; a series edited by John W. Tunnell Jr., Darryl L. Felder, and Sylvia A. Earle A continuation of the landmark scientific reference series from the Harte Research Institute for Gulf of Mexico Studies, Gulf of Mexico Origin, Waters, and Biota, Volume 3, Geology provides the most up-to-date, systematic, cohesive, and comprehensive description of the geology of the Gulf of Mexico Basin. The six sections of the book address the geologic history, recent depositional environments, and processes offshore and along the coast of the Gulf of Mexico. Scientific research in the Gulf of Mexico region is continuous, extensive, and has broad-based influence upon scientific, governmental, and educational communities. This volume is a compilation of scientific knowledge from highly accomplished and experienced geologists who have focused most of their careers on gaining a better understanding of the geology of the Gulf of Mexico. Their research, presented in this volume, describes and explains the formation of the Gulf Basin, Holocene stratigraphic and sea-level history, energy resources, coral reefs, and depositional processes that affect and are represented along our Gulf coasts. It provides valuable synthesis and interpretation of what is known about the geology of the Gulf of Mexico. Five years in the making, this monumental compilation is both a lasting record of the current state of knowledge and the starting point for a new millennium of study.

Climate Change Chip Fletcher 2016-11-30

Gas Hydrates 2 Livio Ruffine 2018-04-16 Gas hydrates in their natural environment and for potential industrial applications (Volume 2).

Exploration of Gas Hydrates Naresh Kumar Thakur 2010-10-08 Gas hydrates are ice-like crystalline substances that form a rigid cage of water molecules and entrap hydrocarbon and non-hydrocarbon gas by hydrogen bonding. Natural gas hydrate is primarily composed of water and methane. These are solid, crystalline, ice-like substances found in permafrost areas and deepwater basins around the world. They naturally occur in the pore space of marine sediments, where appropriate high pressure and low temperature conditions exist in an adequate supply of gas (mainly methane). Gas hydrates are considered as a potential non conventional energy resource. Methane hydrates are also recognized as, an influence on offshore platform stability, a major factor in climate change contributing to global warming and a significant contribution to the ocean carbon cycle. The proposed book treats various geophysical techniques in order to quantify the gas hydrate reserves and their impact on environment. The primary goal of this book is to provide the state of art for gas hydrate exploration. The target audiences for this book are non-specialist from different branches of science, graduate students and researchers.