35th IAS Meeting of Sedimentology: Book of Abstracts

Advances in Natural Hazards and Hydrological Risks: Meeting the Challenge

Colorado River Basin Water Management

The 35th International Meeting of Sedimentology supported by the International Association of Sedimentologists is an annual conference with global impact among the community of sedimentary geologists. Original scheduled at June 2020, the 35 the IAS Meeting of Sedimentology was postponed to June 21-25, 2021, and will be held virtually. The main convenor, Ondřej Bábek, is an employee of Palacký University Olomouc.

The Messina Strait Bridge

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This book gathers the proceedings of the 2nd International Workshop on Natural Hazards (NATHAZ’19), held in Lajes do Pico, Pico Island, Azores in 2019. Natural hazards constitute the threat of a naturally occurring event having a negative effect on human beings. These effects are often called natural disasters. Among the natural hazards and potential disasters to be considered are: earthquakes, volcanic eruptions, landslides, subsidence, floods, droughts and coastal erosion. In addition, there are anthropogenic hazards that occur as a result of human interactions with the environment. They include technological hazards, which occur due to exposure to hazardous substances in the environment. Grasping the behaviour of natural systems requires a comprehensive understanding of climatology, geology and hydrology data and dynamics. Thus, it is important to conduct hazard and risk assessment studies for meaningful hazard mitigation. Further, the book demonstrates that an accurate understanding of natural systems and interactions between engineering and natural resources is of vital significance to the entire socio-economic sector. This volume offers an overview of natural hazards in model regions in Europe, America, and Atlantic islands. Providing new insights on the characterisation, assessment, protection and modelling of geological hazards, water systems, urban areas and coastal zones, it represents a valuable resource for all researchers and practitioners in the fields of Geosciences, Hydrology, Water Resources, Natural Hazards, Environments and Engineering. Main topics include: 1. Natural Hazards and Disasters 2. Sustainable Water Systems and Climate Change 3. Technological Hazards and Engineering Design

**Petroleum Systems in the Southern Gulf of Mexico**

A thorough knowledge of geology is essential in the design and construction of infrastructures for transport, buildings and mining operations; while an understanding of geology is also crucial for those working in urban, territorial and environmental planning and in the prevention and mitigation of geohazards. Geological Engineering provides an inte

**Energy: Its Use and the Environment**

Here is an engaging overview of the development of, definition of, and approach to modern geotourism, a growing movement to help sustain and showcase the distinctive geographical characteristics of many places around the world. This volume provides a clear conceptual framework with illustrative examples from all corners of the world to better understand abiotic nature-based tourism. The volume looks at the establishment and effective management of the over 140 UNESCO geoparks around the world and other travel and tourism destinations of interest for their significant historical, cultural, and frequently stunning physical attributes. With studies from a selection of geotourist areas, the volume explores urban geotourism, mining heritage, geomorphological landforms, geoheritage (based on cultural and historical interest), roadside geology of the U. S., community engagement and volunteer management programs, and much more. There is even a chapter on space and celestial geotourism.

**Subaqueous Mass Movements and Their Consequences**

Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions contains invited, keynote and theme lectures and regular papers presented at the 7th International Conference on Earthquake Geotechnical Engineering (Rome, Italy, 17-20 June 2019). The contributions deal with recent developments and advancements as well as case histories, field monitoring, experimental characterization, physical and analytical modelling, and applications related to the variety of environmental phenomena induced by earthquakes in soils and their effects on engineered systems interacting with them. The book is divided in the sections below: Invited papers Keynote papers Theme lectures Special Session on Large Scale Testing Special Session on Liquefact Projects Special Session on Lessons learned from recent earthquakes Special Session on the Central Italy earthquake Regular papers Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions provides a significant up-to-date collection of recent experiences and developments, and aims at engineers, geologists and seismologists, consultants, public and private contractors, local
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national and international authorities, and to all those involved in research and practice related to Earthquake Geotechnical Engineering.

**Biodiversity Enrichment in a Diverse World**

In the last one hundred years, a number of catastrophic events associated with rockslide dam formation and failure have occurred in the mountain regions of the world. This book presents a global view of the formation, characteristics and behaviour of natural and artificial rockslide dams. Chapters include a comprehensive state-of-the-art review of our global understanding natural and artificial rockslide dams, overviews of approaches to rockslide dam risk mitigation, regional studies of rockslide dams in India, Nepal, China, Pakistan, New Zealand, and Argentina. Rockslide dams associated with large-scale instability of volcanoes are also examined. Detailed case histories of well-known historic and prehistoric rockslide dams provide examples of investigations of rockslide dam behaviour, stability, and characteristics. The formation and behaviour of rockslide-dammed lakes ("Quake Lakes") formed during the 2008 Wenchuan Earthquake, China are also comprehensively summarised. The formation, sedimentology and stability of rockslide dams is examined in several analytical papers. An analysis of break-out floods from volcanogenic lakes and hydrological methods of estimating break-out flood magnitude and behavior are reviewed. The use of remote sensing data in rockslide-dammed lake characterisation is explored and a new approach to the classification of rockslide dams is introduced. Finally, a unique section of the book summarises Russian and Kyrgyz experience with blast-fill dam construction in two papers by leading authorities in the technology. The volume contains 24 papers by 50 authors from 16 countries including most of the recognised world authorities on the subject.

**Climate Change 2007 - Impacts, Adaptation and Vulnerability**

This monograph presents the state of art of the geologic knowledge about the Spanish coast obtained through scientific research in the last 30 years. From a general point of view, coasts are the most quickly changing systems of the Earth. This is critical, since many human resources, such as the main part of economic and social activities, are located in the coastal areas. Especially in the case of Spain these coasts include cities, wide industrial areas (including harbor complexes), important ecologic systems, and our main economic resource: tourism. Understanding the dynamic functioning of each element of this coast is vital for correct future coastal management, so as to solve problems derived from bad plans developed in the last decades of the twentieth century. This is a valuable text for advanced graduate students and coastal researchers, which connects the specific dynamic functioning of the main Spanish coastal environments and their relationships with human activities.

**Natural and Artificial Rockslide Dams**

**Iron Ores and Iron Oxide Materials**

This book provides the multidisciplinary reading audience with a comprehensive state-of-the-art overview of research and innovations in the relationship between iron ores and iron ore materials. The book covers industrial sectors dealing with exploration and processing of iron ores as well as with advanced applications for iron ore materials and therefore entails a wide range of research fields including geology, exploration, beneficiation, agglomeration, reduction, smelting, and so on, thus encouraging life cycle thinking across the entire production chain. Iron remains the basis of modern civilization, and our sustainable future deeply depends upon our ability to satisfy the growing demand for iron and steel while decoupling hazardous emissions from economic growth. Therefore, environmental sustainability aspects are also broadly addressed. In response to socioeconomic and climatic challenges, the iron ore sector faces, this book delivers a vision for the new opportunities linked to deployment of the best available, innovative and breakthrough technologies as well as to advanced material applications.
South-Eastern Section of the Geological Society of America

Recent studies of past climate and streamflow conditions have broadened understanding of long-term water availability in the Colorado River, revealing many periods when streamflow was lower than at any time in the past 100 years of recorded flows. That information, along with two important trends—a rapid increase in urban populations in the West and significant climate warming in the region—will require that water managers prepare for possible reductions in water supplies that cannot be fully averted through traditional means. Colorado River Basin Water Management assesses existing scientific information, including temperature and streamflow records, tree-ring based reconstructions, and climate model projections, and how it relates to Colorado River water supplies and demands, water management, and drought preparedness. The book concludes that successful adjustments to new conditions will entail strong and sustained cooperation among the seven Colorado River basin states and recommends conducting a comprehensive basinwide study of urban water practices that can be used to help improve planning for future droughts and water shortages.

The Geotourism Industry in the 21st Century

29th European Symposium on Computer Aided Chemical Engineering

This book - Biodiversity Enrichment in a Diverse World - considered biodiversity (plants, animals, fungi, and microbes) from three different angles: genetics, species, and ecosystems. The relationships between them are complex and it looks at these aspects from different angles and also various interventions at different levels. The scientific approach of the book demonstrates that the three levels are closely inter-connected and action is therefore needed to conserve and protect the systems if the benefits provided to human life will continue to be available. However, conservation of the biological diversity is essentially an umbrella term for traditional species, relationship to human health, ecosystem conservation and the need to manage the human use of the species and ecosystems in a sustainable way.

Landscapes and Landforms of Spain

Now in its eighth edition, this bestselling text continues to blend clarity of explanation with depth of coverage to present students with the fundamental principles of soil mechanics. From the foundations of the subject through to its application in practice, Craig’s Soil Mechanics provides an indispensable companion to undergraduate courses and beyond. New to this edition: Rewritten throughout in line with Eurocode 7, with reference to other international standards Restructured into two major sections dealing with the basic concepts and theories in soil mechanics and the application of these concepts within geotechnical engineering design New topics include limit analysis techniques, in-situ testing, and foundation systems Additional material on seepage, soil stiffness, the critical state concept, and foundation design Enhanced pedagogy including a comprehensive glossary, learning outcomes, summaries, and visual examples of real-life engineering equipment Also new to this edition is an extensive companion website comprising innovative spreadsheet tools for tackling complex problems, digital datasets to accompany worked examples and problems, a password-protected solutions manual for lecturers covering the end-of-chapter problems, weblinks, extended case studies, and more.

The Geology of Iberia: A Geodynamic Approach

This book studies geothics in Latin America and offers comprehensive research on geoethics and geoeducation. Its respective chapters explore geoethics in relation to UNESCO geoparks, mining activities in Latin America, natural hazards and risk management. Geoethics is a key discipline in the field of Earth and Planetary Sciences, and not only includes scientific, technological, methodological and social-cultural aspects, but also addresses the need to consider appropriate protocols, scientific integrity issues and a code of good practice when
studying the abiotic world. The position of Latin America’s recently created geoethics  
associations is based on protection of the environment, together with a reassurance that the  
balance of nature and the rights of human beings to enjoy it will be preserved.

**Earthquake Geotechnical Engineering for Protection and Development of  
Environment and Constructions**

This book provides an attractive and informative overview of Colombian landscapes and their  
geological evolution, including comprehensive descriptions of seventeen key selected sites in  
the country. It provides insight into the geomorphological diversity of Colombian landscapes  
characterized by climatic and topographic variation. The book covers the essence of the  
landscapes in the country: coastal features, mud volcanoes, desertic geoforms, snow covered  
peaks, active volcanoes, deeply incised canyons and subdesertic valleys. It contributes  
knowledge and understanding into Colombian landscapes and prospects.

**Rock Engineering and Rock Mechanics: Structures in and on Rock Masses**

A strong foundation in reservoir rock and fluid properties is the backbone of almost all the  
activities in the petroleum industry. Petroleum Reservoir Rock and Fluid Properties offers a  
reliable representation of fundamental concepts and practical aspects that encompass this vast  
subject area. The book provides up-to-date coverage of vari

**Geological Engineering**

Biochar is the carbon-rich product when biomass (such as wood, manure or crop residues) is  
heated in a closed container with little or no available air. It can be used to improve agriculture  
and the environment in several ways, and its stability in soil and superior nutrient-retention  
properties make it an ideal soil amendment to increase crop yields. In addition to this, biochar  
sequestration, in combination with sustainable biomass production, can be carbon-negative and  
therefore used to actively remove carbon dioxide from the atmosphere, with major implications  
for mitigation of climate change. Biochar production can also be combined with bioenergy  
production through the use of the gases that are given off in the pyrolysis process. This book is  
The first to synthesize the expanding research literature on this topic. The book's  
interdisciplinary approach, which covers engineering, environmental sciences, agricultural  
sciences, economics and policy, is a vital tool at this stage of biochar technology development.  
This comprehensive overview of current knowledge will be of interest to advanced students,  
researchers and professionals in a wide range of disciplines.

**30th European Symposium on Computer Aided Chemical Engineering**

Explains the factors which determine and control the engineering properties of  
soils—particularly volume change, deformation, strength and permeability. New to this edition:  
expanded coverage of residual and tropical soils, environmental aspects of soil behavior,  
material on partly saturated soils, revised treatment of direct or coupled hydraulic, chemical,  
thermal and electrical flows through soil.

**3D, 4D and Predictive Modelling of Major Mineral Belts in Europe**

The evolution of geological cartography in Cuba in its more than 135 years of history has been  
possible through the consultation of numerous archival reports, publications, maps and personal  
interviews with different authors and geologists of vast experience. A brief critical analysis is  
made of the increase in the degree of geological knowledge of the country since the elaboration  
of the Geological Sketch of the Cuban Island at a scale of 1: 2 000 000 (Fernández de Castro,  
1883), first of Cuba and of Ibero-America, until the most recent Digital Geological Map of Cuba  
at scale 1: 100 000 (Pérez Aragón, 2016). Cuba and its surroundings are a geological mosaic  
in the southeast corner of the North American plate with rocks from many different origins,
from Proterozoic to Quaternary, extended along the southern border of the plate. From the Eocene, this belt has been dissected by several great faults, related to the development of some great oceanic depressions (Cayman trough and Yucatan basin). The fossil record of Cuba, which covers approximately the last 200 million years of life on Earth, is rich in very varied fossils, witnessing a wide diversity of organisms, both animals and plants, that inhabited the Antillean and Caribbean region; and that constitute the inheritance of the biological diversity that the current Cuban archipelago exhibits. As a result of the preparation of the Cuban Metallogenic Map at scale 1:250,000, forty-one models and eight sub-models of metallic mineral deposits were identified. These models, of descriptive-genetic type, together with the analysis of their spatial distribution and their relationship with geology, allowed the identification and mapping of ten mineral systems, linked to the geodynamic environments present in the Cuban territory. Cuba has large deposits of limestone, loam, dolomite, kaolin, gypsum and anhydrite, rock salt, marbles, sands and clays of different types, zeolites, peat, therapeutic peloids and many more. There are manifestations of decorative and precious rocks such as jasper, jadeite, different varieties of quartz and even xylolaps. A compilation of geochemical data of oceanic basalt samples from previous works, together with data of analyzed samples during this study in order to discuss geochemical criteria based on immobile element (proxies for fractionation indices, alkalinity, mantle flow and subduction addition), provide a comprehensive ophiolite classification according to their tectonic setting. This book addresses different facets of the geological knowledge of Cuba: history of its cartography, marine geology, fossil record, stratigraphy, tectonics, classification of its ophiolites, quaternary deposits, metallogeny and minerageny.

Geologic Excursions in Southwestern North America

This book presents the results of the major EU project Promine. For the first time there is now a European database available on mineral deposits, as well as 3D, 4D and predictive models of major mineral belts in Europe: Fennoscandia (Skellefteå and Vihanti-Pyhäșalmi), the Fore-Sudetic basin (Kupferschiefer deposits in Poland and Germany), the Hellenic belt in northern Greece, and the Iberian Pyrite belt and Ossa Morena zone in Spain and Portugal. The book also describes the modelling techniques applied and how different types of software are used for three- and four-dimensional modelling. Furthermore, fundamental descriptions of how to build the database structure of three-dimensional geological data are provided and both 2D and 3D predictive models are presented for the main mineral belts of Europe.

Volcanic Rocks and Soils


Engineering Geology for Tomorrow’s Cities

Taking a new global approach, this unique book provides an updated review of the geology of Iberia and its continental margins from a geodynamic perspective. Owing to its location close to successive plate margins, Iberia has played a pivotal role in the geodynamic evolution of the Gondwanan, Rheic, Pangea, Tethys s.l. and Eurasian plates over the last 600 Ma of Earth’s history. The geological record starts with the amalgamation of Gondwana in the Neoproterozoic succeeded by the rifting and spreading of the Rheic ocean; its demise, which led to the amalgamation of Pangea in the late Paleozoic; the rifting and spreading of several arms of the Neotethyan ocean in the Mesozoic Era and their ongoing closure, which was responsible for the Alpine orogeny. The significant advances in the last 20 years have attracted international research interest in the geology of the Iberian Peninsula. This volume presents the most comprehensive, and updated description of the Alpine cycle in Iberia. This volume focuses in
the different geological events during the Alpine orogeny as well as the lithological succession. This book is of interest not only for scientists of Portugal and Spain but also for geoscientists searching for analogies for oil and gas as well as tourists visiting the main mountain ridges of Iberia such as the Pyrenees.

**South-Central Section of the Geological Society of America**

This comprehensive and up-to-date reference work and resource book covers state-of-the-art and state-of-the-practice for bridge engineering worldwide. Countries covered include Canada and the United States in North America; Argentina and Brazil in South America; Bosnia, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Greece, Macedonia,

**Discovering AutoCAD 2015**

Volcanic Rock Mechanics includes papers and special lectures of the 3rd International Workshop on Volcanic Rocks, Rock Mechanics and Geo-Engineering in Volcanic Environments, which was held within the framework of the Congress Cities on Volcanoes-6 Tenerife 2010 (Puerto de la Cruz, Tenerife, Spain, 31 May 4 June 2010). The book is a comprehensive

**Critical Mineral Resources of the United States**

The Landscapes and Landforms of Spain provides an informative and inviting overview of the geology and geomorphology of Spain. It incorporates a diverse range of topics, ranging from the fiery landscapes of the Canary Islands and its volcanic formations to the glacial scenery of the Pyrenees. The book devotes attention to granite landforms, karst terrains, coastal dunes and marshes, as well as to heritage and conservation, with the objective of offering the reader a comprehensive insight into the Spanish geological setting. The book presents readers with the opportunity to explore Spanish landforms in detail through its highly illustrated pages and maps, making this an appealing text on the subject field.

**GEOLOGICAL ENGINEERING.**

**Landscapes and Landforms of Colombia**

As the importance and dependence of specific mineral commodities increase, so does concern about their supply. The United States is currently 100 percent reliant on foreign sources for 20 mineral commodities and imports the majority of its supply of more than 50 mineral commodities. Mineral commodities that have important uses and face potential supply disruption are critical to American economic and national security. However, a mineral commodity’s importance and the nature of its supply chain can change with time; a mineral commodity that may not have been considered critical 25 years ago may be critical today, and one considered critical today may not be so in the future. The U.S. Geological Survey has produced this volume to describe a select group of mineral commodities currently critical to our economy and security. For each mineral commodity covered, the authors provide a comprehensive look at (1) the commodity’s use; (2) the geology and global distribution of the mineral deposit types that account for the present and possible future supply of the commodity; (3) the current status of production, reserves, and resources in the United States and globally; and (4) environmental considerations related to the commodity’s production from different types of mineral deposits. The volume describes U.S. critical mineral resources in a global context, for no country can be self-sufficient for all its mineral commodity needs, and the United States will always rely on global mineral commodity supply chains. This volume provides the scientific understanding of critical mineral resources required for informed decisionmaking by those responsible for ensuring that the United States has a secure and sustainable supply of mineral commodities.
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**Gold and Base Metal Deposits in the Mexican Altiplano, States of Zacatecas and San Luis Potosi, Central Mexico**

This book presents a hands-on, activity-based approach to the use of AutoCAD as a drafting tool--complete with techniques, tips, shortcuts, and insights that improve efficiency. Topics and tasks are carefully grouped to lead students logically through the AutoCAD command set, with the level of difficulty increasing steadily as skills are acquired through experience and practice. Straightforward explanations focus on what is relevant to actual drawing procedures, and illustrations show exactly what to expect on the computer screen. This edition features updates for the latest release of AutoCAD, projects, and test questions for each chapter. Lessons are broken down into tasks listed at the beginning of each section, introducing students to the AutoCAD commands using a structured, intuitive approach and helping students anticipate what information will be needed at each new phase of the learning process. General Procedure boxes appear as new commands are introduced, providing a simple overview of basic command procedures in a step-by-step format. Detailed graphics appear throughout the text, demonstrating what students should expect to see on their screens and encouraging self-paced study. Drawing problems appear at the end of the chapter, helping students apply newly learned techniques immediately to realistic drawing situations. This includes drawing suggestions, timesaving tips, and explanations of how to use techniques in actual situations. High-quality working drawings accompany end-of-chapter drawing problems, appearing in a large, clearly dimensioned format on each right-hand page. This includes mechanical, architectural, civil, and electrical drawings. Bonus drawing projects appear in Appendix A, giving students additional review and practice.

**Geoethics In Latin America**

The 29th European Symposium on Computer Aided Process Engineering, contains the papers presented at the 29th European Symposium of Computer Aided Process Engineering (ESCAPE) event held in Eindhoven, The Netherlands, from June 16-19, 2019. It is a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students, and consultants for chemical industries. Presents findings and discussions from the 29th European Symposium of Computer Aided Process Engineering (ESCAPE) event

**Handbook of International Bridge Engineering**

Rock Engineering and Rock Mechanics: Structures in and on Rock Masses covers the most important topics and state-of-the-art in the area of rock mechanics, with an emphasis on structures in and on rock masses. The 255 contributions (including 6 keynote lectures) from the 2014 ISRM European Rock Mechanics Symposium (EUROCK 2014, Vigo, Spain, 27-29 Ma

**Biochar for Environmental Management**

Hardcover plus CD

**Volcanic Rock Mechanics**

The challenges facing submarine mass movement researchers and engineers are plentiful and exciting. This book follows several high-profile submarine landslide disasters that have reached the world’s attention over the past few years. For decades, researchers have been mapping the world’s mass movements. Their significant impacts on the Earth by distributing sediment on phenomenal scales is undeniable. Their importance in the origins of buried resources has long been understood. Their hazard potential ranges from damaging to apocalyptic, frequently damaging local infrastructure and sometimes devastating whole coastlines. Moving beyond mapping advances, the subaqueous mass movement scientists and practitioners are now also focussed on assessing the consequences of mass movements, and the measurement and modelling of events, hazard analysis and mitigation. Many state-of-the-art examples are
Petroleum Reservoir Rock and Fluid Properties

"Interpreting a geological setting for the purposes of engineering design and construction requires knowledge of geological engineering and engineering geology, leading to integrated engineering solutions which take into account both ground conditions and environment. This textbook, extensively illustrated, covers the subject area of geological engineering in four sections: 1. Fundamentals: soil mechanics, rock mechanics and hydrogeology; 2. Methods: site investigations, rock mass characterization and engineering geology mapping; 3. Applications: foundations, slope stability, tunnelling, dams, reservoirs and earth works, and 4. Geohazards: landslides, earthquake hazards and prevention and mitigation of geological hazards. The book can serve as a basic reference work for practising engineering geologists, geological and geotechnical engineers, geologists, civil and mining engineers and those professionals involved in design and construction of foundations, tunneling, earth works and excavations for infrastructures, buildings, mining operations, etc. As a textbook it develops an extensive teaching programme of geological engineering and is designed for undergraduate and postgraduate students and academics. Covering basic concepts up to the newest methodologies and procedures used in geological engineering. The book is illustrated with many educational working examples and graphical materials"--Provided by publisher.

Fundamentals of Soil Behavior

Summing up knowledge and understanding of engineering geology as is applies to the urban environment at the start of the 21st century, this volume demonstrates that: working standards are becoming internationalised; risk assessment is driving decision-making; geo-environmental change is becoming better understood; greater use of underground space is being made; and IT advances are improving subsurface visualization. --

The Spanish Coastal Systems

The Climate Change 2007 volumes of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) provide the most comprehensive and balanced assessment of climate change available. This IPCC Working Group II volume provides a completely up-to-date scientific assessment of the impacts of climate change, the vulnerability of natural and human environments, and the potential for response through adaptation. Written by the world's leading experts, the IPCC volumes will again prove to be invaluable for researchers, students, and policymakers, and will form the standard reference works for policy decisions for government and industry worldwide.

Geology of Cuba

30th European Symposium on Computer Aided Chemical Engineering, Volume 47 contains the papers presented at the 30th European Symposium of Computer Aided Process Engineering (ESCAPE) event held in Milan, Italy, May 24-27, 2020. It is a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students, and consultants for chemical industries. Presents findings and discussions from the 30th European Symposium of Computer Aided Process Engineering (ESCAPE) event. Offers a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students, and consultants for chemical industries.

Craig's Soil Mechanics

Volcanic rocks and soils show a peculiar mechanical behaviour at both laboratory and in-situ
scale due to their typical structural characters. Volcanic rocks and soils contains keynote lectures and papers from the International Workshop held in Ischia (Italy), 24-25 September 2015. The book deals with recent developments and advancements, as well as case histories, in the geotechnical characterization and engineering applications related to volcanic formations. It covers a variety of themes, including: • Geotechnical characterization under both static and cyclic/dynamic loading conditions, with special regard to structural properties at different scales (microstructural features; field and laboratory characterization; construction materials); • Geotechnical aspects of natural hazards (slope stability; seismic risk); • Geotechnical problems of engineering structures (foundations; embankments; excavations and tunnels). Volcanic Rocks and Soils is of interest to scientists and practitioners in the fields of rock and soil mechanics, geotechnical engineering, engineering geology and geology.

**Geological Engineering**

This book describes the enormous depth of work carried out since the early 1970s on the Messina Strait Bridge, up to the recent award of the detailed design and construction contract. This important work has included extensive studies, concepts and design developments, with far reaching applications, which have all confirmed the feasibility of this

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