

# Indian Geological Sequences

## Salient Features and Major Events

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VOLUME:

EDITION: 1

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FORMAT: Paperback

PAGES: c. 604

PRIMARY AUDIENCE: Students, researchers and professionals in earth science

Thema Value: Geology, geomorphology & the lithosphere

## A holistic, integrative, innovative record of the geological evolution of India and surrounding countries as told through precisely dated isochronous sequence timelines

### Description

**Indian Geological Sequences: Salient Features and Major Events** focuses on the first ever differentiation of the entire Indian record into a five-tier hierarchical succession of geological sequences five giga, 12 mega, 25 1st order, 68 2nd order and over 100 3rd order ones as its basic skeleton. Using the developed grid of sequence timelines, the diverse interdisciplinary geological manifestations on the broad tectonostratigraphically homogenous supraregion of GTM (Gondwanian Tethyan Margin from Arabia to Australia) have been mutually integrated towards chronicle of events with precision never ever realized earlier. The giga-sequences GS-I to GS-IV comprising eight mega-sequences MS-I to MS-VIII deal with the Precambrian in brief.

Within GS-V ( $\approx$  635 ma onward), the MS-IX ( $\approx$  635-444 ma), and MS-XII ( $\approx$  61.6 onward) include orogenies while MS-X ( $\approx$  444-259 ma) and MS-XI ( $\approx$  259-61.6 ma) are dominated by dismemberment tectonics. The prime focus is on the correlation of events across scores of sedimentary basins from outcrop to subsurface, onshore to offshore, marine to non-marine, shallow to deep water, plant to animal, micro- to macrofossils, and Proto-Paleo-Neotethys to Indian Ocean.

Among the major Phanerozoic events time precised are the  $\approx$  500 ma Acantha Zone mega MFS accretion of the then alien Tethys Himalaya to the Indian margin, and the  $\approx$  50 ma P8 Zone mega MFS impingement of India on Asia while the important dismemberment events include the  $\approx$  159 ma late Middle Oxfordian Orientalis Zone Schilli Subzone 1st order MFS initiation of the Indian Ocean which culminated in steps with oceanic separation of Sri Lanka from Antarctica at the  $\approx$  107 ma early Middle Albian Dentatus Zone mega MFS,  $\approx$  90 ma 1st order SB initiation of separation of Madagascar so also of Mascaranes basin, Central Indian basin and Wharton basin, separation of Greater Seychelles from India at the  $\approx$  64.5 ma intra Danian 2nd order Quadratus Zone MFS and  $\approx$  24 ma Complanata Zone MFS thrusting due south of Greater Himalaya upon Lesser Himalaya.

**Indian Geological Sequences: Salient Features and Major Events** is a valuable reference for researchers and scientists of both academia and exploration industry in the field of Earth Sciences.

### Key Features

# Table of contents

## **Section I**

Giga-sequences GS-I to GS-IV (Mostly Precambrian up to the base of Vendian)

1. Introduction – rationale, holistic composite chronicle, cratonic framework and outline of the presentation
2. Pre-Archean and mostly Archean record
3. Proterozoic excluding basal ~ 2500-2350 ma Paleoproterozoic and ~ 635-541 ma Vendian

## **Section II**

Himachalian and Muthian mega-sequences

1. Giga-sequence GS-V
2. Muthian mega-sequence Silurian – Intra Permian (~444-259 ma)

## **Section III**

Late Permian onward geological span

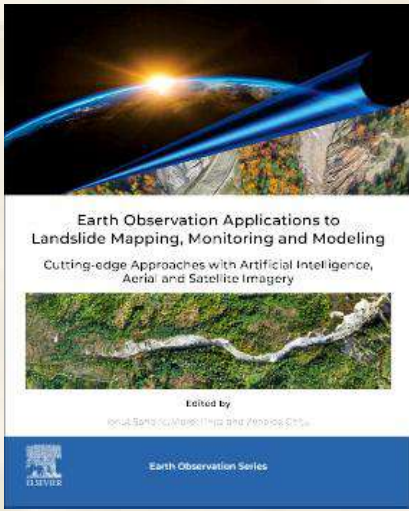
1. GSV-MSXI-NT Neotethyan mega-sequence (~259-61.6 ma)
2. Mega-sequence GSV-MSXII-HL Himalayan mega-sequence (Cenozoic)

## **Section IV**

1. Sequence stratigraphic context to hydrocarbon source rocks in the Indian Phanerozoic geological record

## **Section V**

1. Conclusions



# Earth Observation Applications to Landslide Mapping, Monitoring and Modeling

Cutting-edge Approaches with Artificial Intelligence, Aerial and Satellite Imagery

Edited by : Ionut Sandric, Faculty of Geography, University of Bucharest, Bucharest , Romania; Viorel Ilinca, Geological Institute of Romania, Bucharest, Romania and Zenaida Chitu, National Meteorological Administration, Bucharest, Romania

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VOLUME:

EDITION: 1

PUB DATE: November 2024

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PAGES: c. 372

**PRIMARY AUDIENCE:** Geologist, geomorphologists, researchers and practitioners working in environmental modelling and remote sensing  
Environmental engineers and government and NGOs working on prevention of landslides

**Thema Value:** Geophysics

## A new reference featuring the state-of-the-art earth observation applications and algorithms for landslide mapping and monitoring

### Description

*Earth Observation Applications to Landslide Mapping, Monitoring and Modeling: Cutting-edge Approaches with Artificial Intelligence, Aerial and Satellite Imagery* focuses on the application of drone and satellite imagery for landslide mapping, monitoring, and modeling. The topics covered include the use of ultrahigh spatial resolution imagery acquired by UAVs (Unmanned Aerial Vehicles) for mapping and predicting landslide activity, the use of satellite imagery for monitoring landslide activity, the assimilation of EO (Earth Observation) data into landslide susceptibility and hazard prediction models, and the building of landslide inventories. The primary objective of this book is the advancement of the scientific understanding and application of technologies to address a variety of areas related to landslide mapping and monitoring for robust and sustainable development. *Earth Observation Applications to Landslide Mapping, Monitoring and Modeling* be useful for PhD students, postdoctoral researchers, professors, and scientists in geoscience.

### Key Features

- Recent developments in landslide monitoring and mapping algorithms
- Provides clear and detailed case studies and methods that can be easily replicated and implemented in landslide monitoring systems
- Provides detailed methods for applying research to landslide monitoring and mapping

# Table of contents

## Section 1: Introduction

1. A review of UAV-based data applications for landslide mapping and monitoring
2. A review of the state-of-the-art use of satellite Earth observation data for landslide mapping and monitoring

## Section 2: Satellite data in landslide mapping and monitoring

3. On the use of the EGMS data for studying landslides in Great Britain
4. Deciphering the kinematics of urban landslides through SAR imagery analysis
5. Artificial intelligence applications for landslide mapping/monitoring on satellite EO data
6. Mapping landslides on Earth, Moon, and Mars using satellite imagery and deep learning techniques

## Section 3: Drone applications for landslide mapping and monitoring

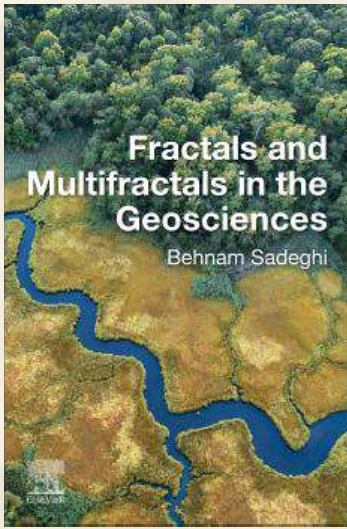
7. Landslide volume and runoff monitoring using UAV photogrammetry
8. Landslide 3D reconstruction and monitoring using oblique and nadiral drone aerial imagery
9. Geomorphic monitoring and assessment of debris flows using drone-based structure from motion
10. Machine learning and object-based image analysis for landslide mapping using UAV-derived data
11. Estimating kinematic uncertainties of landslides using UAV time series
12. Detailed landslide kinematics mapping using short-term UAV time-series. Case study: Livadea landslide, Romania

## Section 4: EO data assimilations in landslide susceptibility, hazard mapping and risk assessment

13. Building landslide inventory with LiDAR data and deep learning
14. Landslide susceptibility mapping using machine-learning algorithms and earth observation data
15. Microwave remote sensing for investigating hydrological preconditions triggering landslides: a case study: Ialomita Subcarpathians, Romania
16. Use of UAV imagery for the detection and measurement of damages to road networks in landslide areas

## Section 5: Future challenges and future outlook

17. Mapping the existing challenges and pathway forward



# Fractals and Multifractals in the Geosciences

Behnam Sadeghi, CSIRO Mineral Resources, Australian Resources Research Centre (ARRC), Kensington, Australia and Earth and Sustainability Science Research Centre, School of Biological, Earth and Environmental Sciences, University of New South Wales, Australia

**ISBN:** 9780323908979

**VOLUME:**

**EDITION:** 1

**PUB DATE:** May 2024

**PRICE:** 3795 Kč

**FORMAT:** Paperback

**PAGES:** c. 286

**PRIMARY AUDIENCE:** Mathematical geoscientists, geostatisticians, exploration geochemists, urban and environmental geochemists, applied geochemists, computational geoscientists, data analysts, and GIS professionals, mining engineers, petroleum engineers, exploration geophysicists, mining and petroleum industry decision-makers and stakeholders

**Thema Value:** Mathematics, Geology, geomorphology & the lithosphere, Chemistry

## Extensively reviews fractal and multifractal models in geoscience exploration and the uncertainties linked to geochemical anomalies

### Description

*Fractals and Multifractals in the Geosciences* details the application of a wide range of multifractal methods, including many novel ones developed by the author, along with the assessment of uncertainty in sample classification and stability of spatial patterns. This book also provides criteria for selection of the most effective combination of data pre-processing and multifractal modeling to extract desired features or signals in the data. The book specifically aims to introduce, apply, and test novel multifractal models that account directly for changes in relationships between variables, as well as the effects of distance between samples and the source of anomalous metal contents in geoscience samples. Linked to this will be assessment of the effects of different pre-processing of data prior to application of the models and quantification/model uncertainty in geochemical anomaly maps, associated with sample classification and spatial interpolation. Gaussian simulations such as Sequential Gaussian Simulation and Monte Carlo Simulation will be applied to the new multifractal models developed and a suite of existing models, including (simulated) concentration-area, spectrum-area, singularity and other models.

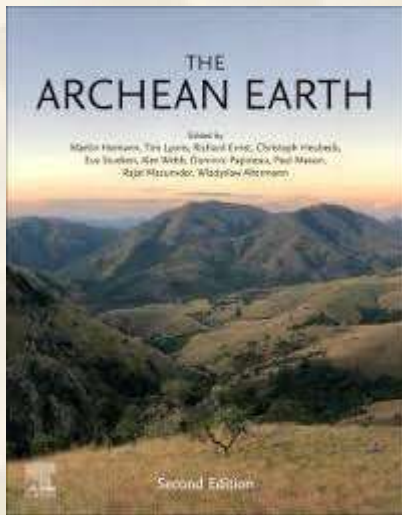
*Fractals and Multifractals in the Geosciences* will be invaluable for mathematical geoscientists, geostatisticians, exploration, applied, urban and environmental geochemists, computational geoscientists, data scientists, and GIS professionals who need to better understand fractal geometry, along with its theory and applications in geochemical anomaly classification to generate maps that are helpful for decision-making for follow-up sampling and explorations.

### Key Features

- Provides a comprehensive overview of the use of fractal and multifractal modeling methods, with a detailed assessment of uncertainty quantification in samples and classified models
- Specifically includes novel multifractal models, as well as uncertainty quantification and decision-making methods for use in geosciences and especially geochemistry
- Includes case studies showing the application of the fractal and multifractal methods detailed in the book

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1. The theory of fractal geometry
2. Introduction: characterising and mapping anomalies
3. Geochemical datasets
4. Novel multifractal classification models
5. Effectiveness and uncertainty in geochemical anomaly classification models
6. Spatial uncertainty in categorising geological data
7. General discussion and conclusions



# The Archean Earth

Edited by : Martin Homann, University College London, UK; Blue Marble Institute of Science, Seattle, Washington, USA; Timothy W. Lyons, University of California, USA; Richard E. Ernst; Christoph Heubeck, Friedrich-Schiller-Universität Jena, Germany; Eva Stueeken, University of St Andrews, UK; Alex Webb, Freie Universität Berlin; Dominic Papineau, Chinese Academy of Sciences, China; Rajat Mazumder, Department of Applied Geosciences, German University of Technology in Oman, Muscat, Oman; and School of Natural Sciences and Engineering, National Institute of Advanced Studies, IISc Campus, Bengaluru, India; Paul RD Mason, Utrecht University and Wladyslaw Altermann, South African Committee for Stratigraphy, Pretoria

**ISBN:** 9780323955478

**VOLUME:**

**EDITION:** 2

**PUB DATE:** December 2025

**PRICE:** 5690 Kč

**FORMAT:** Paperback

**PAGES:** c. 892

**PRIMARY AUDIENCE:** Academics, graduate students and researchers focusing on Earth history, Geobiology, Astrobiology, and all aspects of the Earth Science including tectonic and atmospheric evolution, environmental ecosystems, as well as Earth's biogeochemical cycles. Industrial experts (e.g. at mining companies), geography and Earth sciences lecturers.

**Thema Value:** Geology, geomorphology & the lithosphere

## Focuses on Earth's geological history, covering geobiology, tectonic and atmospheric evolution, environmental context of the first ecosystems, and Earth's biogeochemical cycles

### Description

*The Archean Earth: Tempos and Events, Second Edition* is a process-based reference book that focuses on the most important events in early Earth, bringing together experts across Earth Sciences to give a comprehensive overview of the main events of the Archean Eon, as well as of the rates at which important geological and geobiological processes occurred in the same time interval. Over the last two decades, significant progress has been made in our understanding of the processes and events on the early Earth corresponding to advances in the analytical technologies and the continuing efforts of many colleagues that pursue their passion of unravelling the Archean rock record.

The book addresses the origin of the Earth, succeeding impact events, and the evolution of the early Earth, covering topics such as Archean tectonics, volcanism, generation of continental crust, and the ongoing debate about the onset of plate tectonics; the evolution and models for Earth's hydrosphere and atmosphere; the Archean atmosphere and chemical sedimentation; and sedimentation through Archean time; among others. Each topic is well-illustrated and includes a closing commentary at the end of each chapter, leading up to the final chapter which blends the major geological events and rates at which important processes occurred into a synthesis, postulating a number of "event clusters" in the Archean when significant changes occurred in many natural systems and geological environments

### Key Features

- Provides a comprehensive introduction and overview on early Earth, highlighting the Archean Eon in the context of the larger time scales
- Presents detailed descriptions of the main processes, events, and rates that occurred throughout the Archean
- Offers an assessment of the first habitable environments, the preserved morphological and geochemical traces of early life, and the impact it had on Earth's biogeochemical cycles

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## Chapter 1. FORMATION OF A HABITABLE PLANET

- 1.1. Introduction
- 1.2. Earth's Formation and First Billion Years
- 1.3. Setting the stage: Building and maintaining a habitable world and the early conditions that could favor life's beginnings on Earth and beyond
- 1.4. Early Impacts: Processes and the Terrestrial Record
- 1.5 Our Solar System Neighborhood: Three Diverging Tales of Planetary Habitability and Windows to Earth's Past and Future
- 1.6. What the Zircon Record Reveals About the Habitability of the Hadean Earth

## Chapter 2. EVOLUTION OF EARTH'S INTERIOR

- 2.1. Introduction
  - 2.2. Archean Mantle Heat Transport and Thermal Evolution
  - 2.3. Generation and Preservation of Archean Lithosphere and Crust
  - 2.4. Mantle Differentiation, Mixing and Interior-Exterior Exchange
- ## Chapter 3. ARCHEAN MAGMATISM, TECTONICS AND CONTINENTAL CRUST

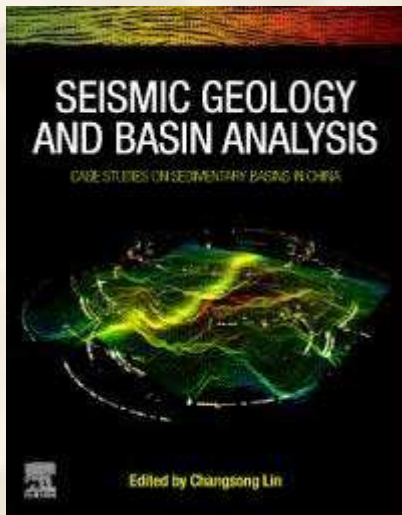
- 3.1. Introduction
- 3.2. Archean to Mesozoic-Cenozoic Seismic Crustal Structure: Implications for Geological and Biological Evolution
- 3.3. Archean Greenstones and Evolving Tectonic Regimes on Earth
- 3.4. Towards quantification of the style of Archean plate tectonics from paleo-plate boundary features
- 3.5. Archean Greenstone Belts: Records of Pre-/Non-Plate Tectonics
- 3.6. Komatiites: their geochemistry and origins
- 3.7 Record of Archean and earliest Proterozoic Large Igneous Provinces (LIPs) and their mafic dyke swarms
- 3.8. The PalaeoPlates compilation of Earth's crustal blocks: Implications for continental growth, recycling, and preservation, and for global paleogeographic reconstructions in Archean and Proterozoic time
- 3.9. Additional aspects on the Archean magmatic and tectonic record

## Chapter 4. ATMOSPHERIC EVOLUTION AND BIOGEOCHEMICAL CYCLES

- 4.1. Introduction
- 4.2. Oxygenating Earth
- 4.3. Evolution of the Archean Atmosphere
- 4.4. Iron formations: Unique archives to reconstruct the Precambrian Earth
- 4.5. Ephemeral subaerial environments, paleosols, and life on land: consequences for early continental weathering and global biogeochemistry
- 4.6 Evolving weathering processes during the Archean Eon
- 4.7. Evolution of Earth's Biogeochemical Cycles
  - 4.7.1. Metal sources and sinks
  - 4.7.2. Biogeochemical nitrogen cycling on the Archean Earth
  - 4.7.3. Phosphorus bioavailability
  - 4.7.4 Archean Methane Cycling and Life's Co-Evolution: Intertwining Early Biogeochemical Processes and Ancient Microbial Metabolism

## Chapter 5. EVOLUTION OF LIFE AND ARCHEAN GEOBIOLOGY

- 5.1. Introduction, Archean cherts?
- 5.2. Biosignatures and tests of biogenicity in the early rock record
- 5.3. Origins of Archean organic matter
- 5.4. Microbial Mats in the Siliciclastic Rock Record
- 5.5. Occurrence and Biogenicity of Archean Stromatolites and Microbial Mats



# Seismic Geology and Basin Analysis

## Case Studies on Sedimentary Basins in China

Edited by : Changsong Lin, Professor of Geology, China University of Geosciences, Beijing, China

ISBN: 9780323959094

VOLUME:

EDITION: 1

PUB DATE: July 2024

PRICE: 3889 Kč

FORMAT: Paperback

PAGES: c. 440

**PRIMARY AUDIENCE:** Students and researchers in petroleum geology; oil and gas industry

**Thema Value:** Petroleum technology, Energy industries & utilities, Volcanology & seismology

## Comprehensive coverage on the basic principles of seismic geology, basin analysis and seismic data calibrated with well log, cores and outcrop profiles

### Description

*Seismic Geology and Basin Analysis: Case Studies on Sedimentary Basins in China* introduces the principles, approaches and techniques needed to solve problems using seismic data calibrated with well log, cores and outcrop profiles. The book emphasizes the adoption of seismic techniques into basin analysis and broadens the usage of seismic data in geological research which may be referred to as "seismic geology." The principle of the book is mainly summarized from a series of case studies in different basins in China. In addition, through this book readers can understand the primary characteristics and basin fill evolution of major petroleum basins around the world.

When starting research on a basin, researchers and professionals are confronted with how to reveal the general architecture of basin fills and depict three-dimensional geometry, and the internal architecture of subsurface depositional bodies and their arrangement, hence this book is a great tome on necessary areas of exploration.

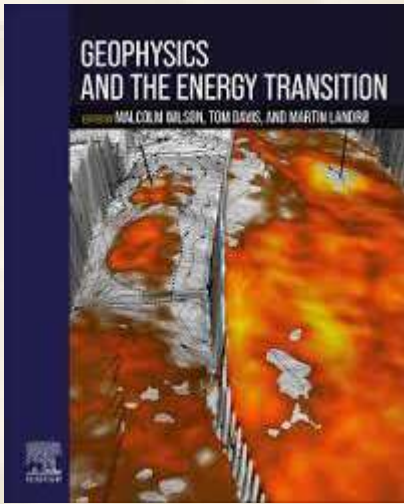
### Key Features

- Examines the adoption of seismic techniques into basin analysis and broadens the usage of seismic data in geological research
- Includes seismic, well log, core and outcrop data, as well as high resolution 3D seismic profiles and slices
- Features case studies to further illustrate principles and approaches described in the book, which can be applied to similar basins around the world

# Table of contents

**Part 1:** 1. Introduction 2. Seismic stratigraphic surface and basin architecture 3. Seismic facies and basin paleogeography 4. Basin paleo-structure analysis

**Part 2: Case Studies** 5. Unconformity and basin architecture 6. Paleosubstratal geomorphology and tectonosedimentology 7. Siliciclastic sequence stratigraphy and basin fill dynamics 8. Carbonate platform architecture and depositional evolution



# Geophysics and the Energy Transition

Edited by : Malcolm Wilson, Consultant, Geophysics and CCS; Tom Davis, Professor Emeritus, Colorado School of Mines Department of Geophysics and Martin Landro, Department of Electronic Systems, Norwegian University of Science and Technology, Trondheim, Norway

**ISBN:** 9780323959414

**VOLUME:**

**EDITION:** 1

**PUB DATE:** November 2024

**PRICE:** 3495 Kč

**FORMAT:** Paperback

**PAGES:** c. 536

**PRIMARY AUDIENCE:** Energy industry, graduate students and researchers from geophysics, geology and petroleum engineering

**Thema Value:** Geophysics

## Covers the role of Geophysics in the new energy transition through advanced integrated technologies and case studies from different geological provinces

### Description

Geophysics and the Energy Transition involves four sections: What is the Energy Transition and why storage so important; selecting sites for storage; advanced monitoring technology; and moving forward to integrating Carbon Capture and Storage (CCS) within the Energy Transition. Geophysics will also play a role in finding and developing alternatives to fossil fuels such as natural hydrogen and geothermal using much of the knowledge gained from the CO<sub>2</sub> storage industry. To provide the public and others with the confidence to move forward with a structured and cost-effective energy transition, this book provides the necessary evidence that we can store CO<sub>2</sub> safely and effectively and use this as a significant component of the energy transition. We can also find and store new energy sources.

Geophysics and the Energy Transition is written by experts in the field who have practiced the science and engineering associated with the subsurface for years. CCS is an integral component of the new energy transition but the application of Geophysics in the future will extend well beyond CCS if we are going to transition successfully to a carbon neutral environment. Science, engineering, and technology applications are important for site selection, characterization and monitoring to assure safe storage in the subsurface and energy sustainability in the future.

### Key Features

- Presents an overview of the available technology, along with specific applications and scenarios in which to use the technology
- Features case studies to provide practical applications for those geoscientists and engineers in the energy industry
- Includes an overview to provide context for the energy transition

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## **Section 1 - The energy transition**

1. Introduction to the energy transition
2. Economic enablement of carbon capture and sequestration for the low carbon energy transition
3. A survey of carbon capture and sequestration (or storage) cost and storage
4. Energy transition: a reservoir engineering perspective
5. Preventing CO<sub>2</sub> from fossil fuels from reaching the atmosphere
6. Critical reservoir parameters for safe, secure, and long-term storage: lessons of the past for selection of permanent geological storage sites

## **Section 2 - Integration of disciplines and technologies to ensure effective CCS**

7. The need for integrated reservoir characterization in carbon capture and storage
8. CO<sub>2</sub> messes with rock physics
9. The geochemistry of carbon capture and storage with implications for hydromechanical feedbacks and geophysical monitoring
10. The geomechanics of carbon storage

## **Section 3 - The role of geophysics in developing successful CCS projects**

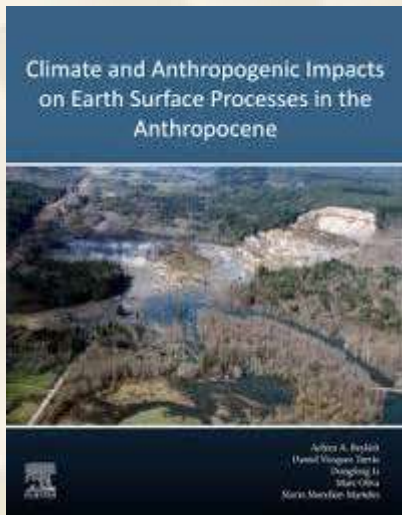
11. Geophysical technologies for CO<sub>2</sub> monitoring
12. Advances in coupled passive and active seismic monitoring for large-scale geologic carbon storage projects
13. New tools for quantitative data interpretation

## **Section 4 - New site studies using advanced geophysical technologies**

14. Multiwell DAS VSP monitoring of a small-scale CO<sub>2</sub> injection: experience from the Stage 3 Otway Project
15. Next generation geophysical sensing: exploring a new wave of geophysical technologies for the energy transition
16. The Aquistore deep saline carbon dioxide storage project: learnings in three key areas for planned deep saline storage projects
17. New carbon capture and storage projects in the Williston Basin

## **Section 5 - Moving forward**

18. The challenges of energy transition and opportunities for geophysicists
19. Opportunities for open-source software and open science in carbon capture and storage
20. Advanced geophysics used in CO<sub>2</sub> storage



# Climate and Anthropogenic Impacts on Earth Surface Processes in the Anthropocene

Edited by : Achim Beylich, Geomorphological Field Laboratory, Norway; Daniel Vázquez Tarrío, PhD in Geology from the University of Oviedo., Department of Geo-Hazards & Climate Change, IGME, CSIC, Spain; Dongfeng Li, Peking University, China; Marc Oliva, Universitat de Barcelona, Spain and Mario Morellón Marteles, Universidad Complutense de Madrid, Spain

**ISBN:** 9780443132155

**VOLUME:**

**EDITION:** 1

**PUB DATE:** September 2024

**PRICE** 3395 Kč

**FORMAT:** Paperback

**PAGES:** c. 326

**PRIMARY AUDIENCE:** Researchers in geology, geomorphology, and Earth surface processes-related fields needing a comprehensive overview of the impact on these processes during the Anthropocene, Upper-level undergraduates, graduates and academics studying earth surface processes at institutions around the world

**Thema Value:** Geology, geomorphology & the lithosphere

## Comprehensively evaluates climate change and human-led effects on Earth surface processes that shape our landscapes

### Description

Climate and Anthropogenic Impacts on Earth Surface Processes in the Anthropocene outlines our current understanding of the effects of ongoing and accelerated environmental changes on Earth surface processes and details the systematic and quantitative methodology on the actual drivers of these processes. This book covers various geomorphological process domains and a wide range of terrestrial surface environments on Earth. It provides a broad spectrum of advanced techniques and methods of data collection and generation, together with various approaches and methods of data analysis and geomorphologic modelling.

This book is a valuable resource for upper-level undergraduates, graduates, and academics studying Earth surface processes, as well as researchers and professionals in needing a comprehensive overview of Earth surface process change and influence during the Anthropocene

### Key Features

- Comprehensively covers climatic and anthropogenic drivers of earth surface processes, including detection and quantification techniques
- Includes the latest research and suggestions for adapted and sustainable mitigation and management strategies
- Includes worked examples and case studies of anthropogenic and climate influences on Earth surface processes

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## *Block 1 Changing Earth Surface Processes*

### **Section 1 Introduction**

1. Global environmental change: from past to present
2. Drivers of earth surface processes
3. The Anthropocene

### **Section 2 Detection and quantification of Earth surface processes**

4. Sedimentary records of Global Environmental Change
5. Landform record
6. Dating techniques
7. Remote sensing
8. Process monitoring
9. Conclusive remarks about technical issues and improvements on the identification of 'Global environmental change'

## *Block 2 Climatic and anthropogenic drivers of earth surface processes*

### **Section 3 Climate impacts on earth surface processes**

10. Glacial and periglacial processes
11. Hillslope and mass-wasting processes
12. Fluvial processes
13. Aeolian processes
14. Estuaries and deltas
15. Coastal processes (cliffs, beaches, barriers, coastal dunes...), and wetlands
16. Karst processes
17. Considerations on the inherent complexities of disentangling anthropogenic and natural signals in landscape changes

### **Section 4 Anthropogenic impacts on earth surface processes**

18. Glacial and periglacial processes
19. Hillslope and mass-wasting processes
20. Fluvial processes
21. Aeolian processes
22. Estuaries and deltas
23. Coastal processes (cliffs, beaches, barriers, coastal dunes...), and wetlands
24. Karst processes
25. Conclusive remarks highlighting key global problems

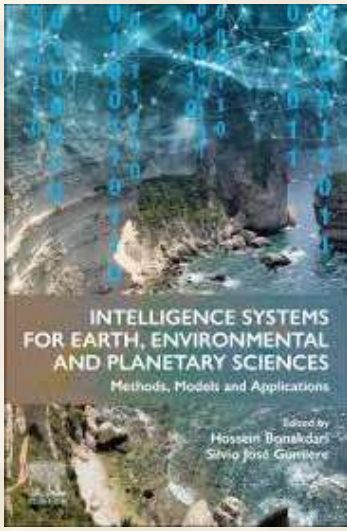
## *Block 3 The temporal and spatial scales*

### **Section 5 The (relative) role of climate and anthropogenic impacts on earth surface processes**

26. Through the Anthropocene: Sediment-routing at the global scale in the Anthropocene / The sediment cascade in the Anthropocene
27. Today
28. Future outlook, prediction, modelling

### **Section 6 Suggestions for adapted and sustainable mitigation and management strategies**

29. (Sub)polar regions
30. Mountain areas
31. Karst environments
32. River systems (river restoration/rehabilitation)
33. Estuaries and deltas
34. Beaches, dunes and coastal areas, and wetlands



# Intelligence Systems for Earth, Environmental and Planetary Sciences

## Methods, Models and Applications

Edited by : Hossein Bonakdari, Associate Professor, Department of Civil Engineering, Faculty of Engineering, University of Ottawa, Ottawa, Ontario, Canada and Silvio José Gumiere, Ph.D., Department of Soil Sciences, Laval University, Quebec City, Canada

**ISBN:** 9780443132933

**VOLUME:**

**EDITION:** 1

**PUB DATE:** August 2024

**PRICE:** 3495 Kč

**FORMAT:** Paperback

**PAGES:** c. 270

**PRIMARY AUDIENCE:** Graduate

students and post-graduate professionals in the field of applied sciences, earth, environmental and planetary sciences

**Thema Value:** Operational research, Enterprise software, Earth sciences

## A practical guide to implementing machine learning and neural networks in Earth and Environmental sciences

### Description

*Intelligence Systems for Earth, Environmental and Planetary Sciences: Methods, Models and Applications* provides cutting-edge theory and applications of modern-day artificial intelligence and data science in the Earth, environment, and planetary science fields. The book is divided into three sections: (i) Methods, covering the fundamentals of intelligence systems, along with an introduction to the preparation of datasets; (ii) Models, detailing model development, data assimilation, and techniques in each field; and (iii) Applications, presenting case studies of artificial intelligence and data science solutions to Earth, environmental, and planetary sciences problems, as well as future perspectives.

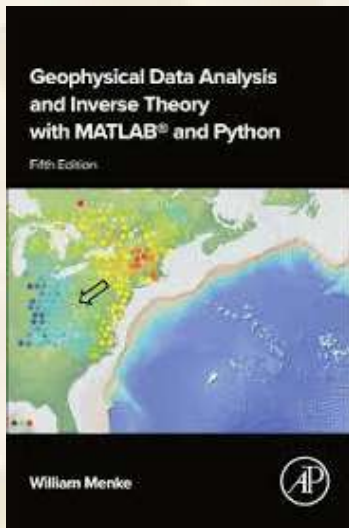
*Intelligence Systems for Earth, Environmental and Planetary Sciences* will be of interest to students, academics, and postgraduate professionals in the field of applied sciences, Earth, environmental, and planetary sciences and would also serve as an excellent companion resource to courses studying artificial intelligence applications for theoretical and practical studies in Earth, environmental, and planetary sciences.

### Key Features

- Facilitates the application of artificial intelligence and data science systems to create comprehensive methodologies for analyzing, processing, predicting, and management strategies in the fields of Earth, environment, and planetary science
- Developed with an interdisciplinary framework, with an aim to promote artificial intelligence models for real-time Earth systems
- Includes a section on case studies of artificial intelligence and data science solutions to Earth, environmental, and planetary sciences problems, as well as future perspectives

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1. Smart techniques for Earth, environmental and planetary sciences
2. Data preparation processes
3. Meta-heuristic algorithms for Earth, environmental and planetary sciences
4. Standard to Advanced version of meta-heuristic algorithms
5. The application of machine learning and evolutionary computational techniques
6. Case studies of applications of evolutionary computational techniques
7. Future applications



# Geophysical Data Analysis and Inverse Theory with MATLAB® and Python

William Menke, Professor of Earth and Environmental Sciences, Columbia University

ISBN: 9780443137945

VOLUME:

EDITION: 5

PUB DATE: February 2024

PRICE: 2737 Kč

FORMAT: Paperback

PAGES: c. 330

PRIMARY AUDIENCE:

Seismologists, geophysicists, volcanologists, geodesists, geodynamicists, tectonophysicists, rock physicists, and geochemists. Environmental scientists and engineers, reservoir engineers, acousticians, hydrologists, oceanographers, atmospheric scientists, and remote sensing experts

**Thema Value:** Geophysics

## An in-depth review of inverse theory and tomography as it is practiced by geophysicists that features Python and MATLAB problem sets

### Description

*Geophysical Data Analysis and Inverse Theory with MATLAB or Python, Fifth Edition* is a revised and expanded introduction to inverse theory and tomography as it is practiced by geophysicists. The book demonstrates the methods needed to analyze a broad spectrum of geophysical datasets, with special attention given to those methods that generate images of the earth. Data analysis can be a mathematically complex activity, but the treatment in this volume is carefully designed to emphasize those mathematical techniques that readers will find the most familiar and to systematically introduce less-familiar ones. A series of "crib sheets" offer step-by-step summaries of methods presented.

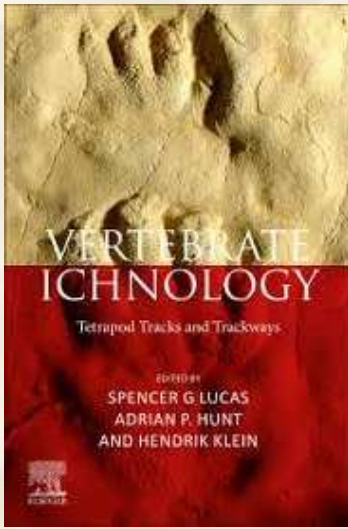
Utilizing problems and case studies, along with MATLAB and Python computer code and summaries of methods, the book provides professional geophysicists, students, data scientists and engineers in geophysics with the tools necessary to understand and apply mathematical techniques and inverse theory.

### Key Features

- Includes material on probability, including Bayesian influence, probability density function, and metropolis algorithm
- Offers detailed discussions of the application of inverse theory to seismological, gravitational, and tectonic studies
- Provides numerous examples, color figures, and end-of-chapter problems to help readers explore and further understand the presented ideas
- Includes both MATLAB and Python examples and problem sets

# Table of contents

1. Getting started with Matlab® or python
2. Describing inverse problems
3. Using probability to describe random variation
4. Solution of the linear, normal inverse problem, viewpoint 1: the length method
5. Solution of the linear, normal inverse problem, viewpoint 2: generalized inverses
6. Solution of the linear, normal inverse problem, viewpoint 3: maximum likelihood methods
7. Data assimilation methods including gaussian process regression and kalman filtering
8. Nonuniqueness and localized averages
9. Applications of vector spaces
10. Linear inverse problems with non-normal statistics
11. Nonlinear inverse problems
12. Monte carlo methods
13. Factor analysis
14. Continuous inverse theory and tomography
15. Sample inverse problems
16. Applications of inverse theory to solid earth geophysics
17. Important algorithms and method summaries



# Vertebrate Ichnology

## Tetrapod Tracks and Trackways

Edited by : Spencer G Lucas, Stratigrapher and Paleontologist, New Mexico Museum of Natural History, Albuquerque, New Mexico, USA; Adrian Hunt P, Paleontologist, Flying Heritage and Combat Armor Museum, USA and Hendrik Klein, Independent Researcher, Saurierwelt Palaontologisches Museum, Germany

ISBN: 9780443138379

VOLUME:

EDITION: 1

PUB DATE: December 2024

PRICE: 4490 Kč

FORMAT: Paperback

PAGES: c. 908

**PRIMARY AUDIENCE:**

Palaeontologists and geologists, teaching professors and other researchers working in trace fossils and related fields, including university and graduate students, Geological surveys, and sedimentologists

**Thema Value:** Biology, life sciences, Palaeontology

## A comprehensive reference and analysis of global vertebrate trace fossils

### Description

*Vertebrate Ichnology: Introduction, History, Methodology and Devonian-Neogene Tetrapod Tracks* is a complete review and analysis of vertebrate trace fossils, including how vertebrate trace fossils inform our understanding of major evolutionary events. It covers all aspects of the vertebrate trace fossil record including tetrapod footprints, fish traces and other trails, burrows, nests and more. Each record is reviewed by prominent experts with extensive illustrations and can be used as a tool to solve problems of vertebrate biochronology and biogeography. Megabiases in the record are identified, and trace fossils applied to analysis and the understanding of major events in the evolutionary history of vertebrates.

This is a useful daily reference for paleontologists and geologists; and teaching professors or other researchers working in trace fossils and related fields, including university and graduate students.

### Key Features

- Fully covers all aspects of the vertebrate trace fossil record through review and analysis
- Includes not only footprints, but all other kinds of vertebrate traces, bringing to the forefront relatively understudied vertebrate trace fossils
- Written by the most active and informed experts on vertebrate trace fossils for an up-to-date and authoritative reference

# Table of contents

1. Introduction

**Section 1. The ichnology of locomotion**

2. Tetrapods

3. Fish

**Section 2. The ichnology of consumption**

4. Regurgitalites

5. Consumulites

6. Coprolites

7. Gastroliths

**Section 3. The ichnology of habitation and reproduction**

8. Vertebrate burrows

9. Nests

10. Ichnology of reproduction (e.g., tracks showing mating or display)

**Section 4. Synthesis (analyzes the vertebrate trace fossil record, its strengths and weakness and application to understanding vertebrate evolutionary history)**

11. Megabiases in the fossil record of vertebrate traces

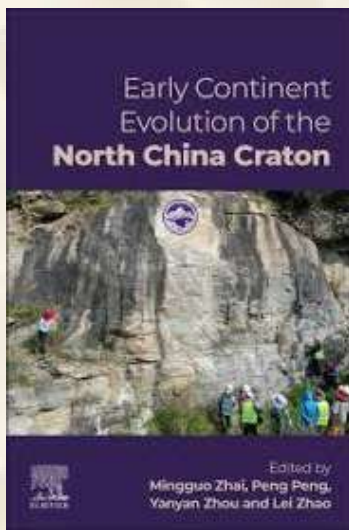
12. Ichnofacies

13. Ichnology and biochronology

14. Ichnology and biogeography

15. Traces and major evolutionary events in vertebrate history

16. Prospectus and issues in vertebrate ichnology



# Early Continent Evolution of the North China Craton

Edited by : Mingguo Zhai, Professor, State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, University of Chinese Academy of Sciences, Beijing, China; Peng Peng, Professor, China-Brazil Joint Geoscience Research Center, Institute of Geology and Geophysics, University of Chinese Academy of Sciences, Beijing, China; Yanyan Zhou, Associate Professor, State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, University of Chinese Academy of Sciences, Beijing, China and Lei Zhao, Associate Professor, State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, University of Chinese Academy of Sciences, Beijing, China

ISBN: 9780443138898

VOLUME:

EDITION: 1

PUB DATE: March 2024

PRICE: 3128 Kč

FORMAT: Paperback

PAGES: c. 310

**PRIMARY AUDIENCE:** Academics, upper-level students and researchers in Geology including Precambrian Geology, Geochronology, and Geophysics

**Thema Value:** Palaeontology, Geology, geomorphology & the lithosphere

## Discusses the tectono-thermal regimes of the early continental crust in the North China Craton (NCC), from the Hadean to the early Paleoproterozoic

### Description

*Early Continent Evolution of the North China Craton* discusses the tectono-thermal regimes of the early continental crust in the North China Craton (NCC), from the Hadean to the early Paleoproterozoic, reconstructing the evolutionary framework and facilitating comprehensive understanding of the early continent evolution of the NCC. The book systematically summarizes the Neoarchean metamorphism of the NCC and discusses the implications for the tectonic models of the NCC through compiling evolutionary information of the Hadean to the early Paleoproterozoic sequences in the NCC.

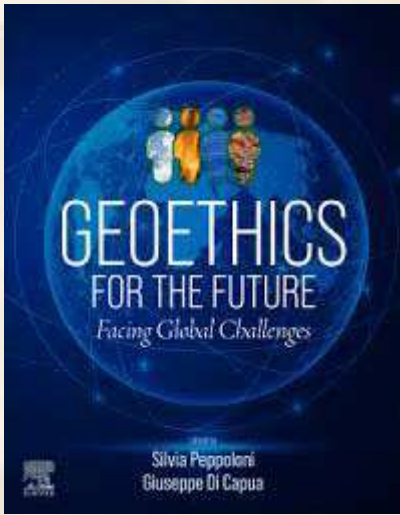
Researchers, academics, and students in geology (especially Precambrian Geology), geomorphology, geophysics, and geological engineering will benefit from using this book in applying tectonic models to other cratonic blocks globally, and will understand evolutionary information of the largest and oldest cratonic block in China.

### Key Features

- Completely covers all key issues and research frontiers of the early continental evolution of the North China Craton (NCC), from the Hadean to the early Paleoproterozoic
- Systematically summarizes the Neoarchean metamorphism of the NCC and discusses the implications for tectonic models
- Includes discussion on controversial views on tectonic regimes of the NCC during the Archean to early Paleoproterozoic, with objective conclusions

# Table of contents

1. Introduction to the early continental evolution of the North China Craton (NCC)
2. General generation and growth of Precambrian continental crust
3. Precambrian outline of the North China Craton
4. Oldest continental rocks in Hadean-Paleoarchean in the North China Craton
5. Magmatic evolution and recycling for Mesoarchean continental crust of the North China craton
6. Neoproterozoic continental evolution in the North China Craton
7. Neoproterozoic metamorphism of the North China Craton
8. Lithospheric evolution during the 2.5–2.1 Ga critical period following the Neoproterozoic cratonization
9. The early plate tectonics: from vertical differentiation to horizontal accretion



# Geoethics for the Future

## Facing Global Challenges

Edited by : Silvia Peppoloni, Istituto Nazionale di Geofisica e Vulcanologia (INGV), Rome, Italy International Association for Promoting Geoethics (IAPG), Italy and Giuseppe Di Capua, Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy

ISBN: 9780443156540

VOLUME:

EDITION: 1

PUB DATE: July 2024

PRICE: 3390 Kč

FORMAT: Paperback

PAGES: c. 402

**PRIMARY AUDIENCE:** Researchers, professionals, academics, graduate students, and undergraduates in geosciences and especially geoethics

**Thema Value:** Environmental economics, Environmental science, engineering & technology

## An up-to-date and comprehensive reference on geoethics across the geosciences

### Description

*Geoethics for the Future: Facing Global Challenges* offers a set of points of view on highly topical issues in geosciences and beyond, including societal relevance of geosciences, georesources, sustainable development, geoeducation, georisks, data, as well as philosophical, legal, political, scientific considerations about anthropogenic global changes and the Anthropocene, enabling readers to acquire multifaceted knowledge on topics of global relevance in the 21st Century. This book explores topics vital to our historical moment and the future of human societies, through the analyzes by scholars with different disciplinary backgrounds, emphasizing the need for new cultural and scientific frameworks to address global issues. It aims to foster multidisciplinary and transdisciplinary approaches for problem-solving, by integrating diverse knowledge and visions to effectively tackle urgent global challenges.

Serving as a significant milestone in geoethics, this book provides academics, researchers and students with insights into the ethical and societal dimensions of various challenges arising from human impact on the Earth system.

### Key Features

- Covers upcoming and current key topics, and emphasizes the urgency to find reference frameworks and effective solutions to the issues associated with them.
- Includes multifaceted analyses on relevant topics, by leveraging the cross-cutting contributions of experts to address urgent, global, and complex issues related to human-Earth system interaction.
- Provides an indispensable basis for discussion to guide scientists in considering their own responsibilities and to highlight the societal relevance of the geosciences.
- Discusses philosophical, ethical, social, political, economic, legal, and theological aspects of geoscience, technological applications, and anthropogenic impacts on physical environment through the lens of geoethics, in time of profound planetary changes.
- Bridges the geosciences, social sciences, and humanities, aiming to address the socio-ecological crisis from multiple perspectives and with greater effectiveness.

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Acknowledgments

Introduction

## **Overture: Grounding Geoethics through Philosophical Analyses**

1. The divergent philosophical and scientific accounts of the root of human ethics

2. Order and Place in Environmental Ethics and Aesthetics

3. The Relationship Between Human and Nature in Modern Culture

## **Geoethics and the Anthropocene: Defining an Ethical Framework for Earth System Governance**

4. Making Sense of the Anthropocene: Facts, Meanings, Implications

5. Etiology of the Ecological Crisis: Building New Perspectives for Human Progress Through Geoethics

6. Geoethics and the Anthropocene: Five Perspectives

7. Challenging Buzzideas: Global Challenge Phrases Undermining Ethical Action

8. From Biophilia to Geophilia: A Challenging but Necessary Expansion

9. Geoethics in the Anthropocene: Law as a game changer

10. Matters of Environmental Politics to Inform Geoethics

11. Geoethical Thinking as Geogovernance: A Geopolitical Theology Perspective

12. Historic Perspectives for Responsible Earth System Governance

13. Earth system governance: A governance perspective on geoethics

## **Empowering the Geoscience-Society Interface with Geoethical Perspectives**

14. Geoscience for Earth Stewardship, Sustainability and Human Well-being: A conceptual framework for integrating planet, prosperity and people

15. Geoscience-society interface: How to improve dialogue and build actions for the benefit of human communities

16. The Key Groups of Interest in Geoscience for Sustainability

17. Significance and Insights from Indigenous Communities in Latin America: Cultural and Societal Factors and Challenges in UNESCO Global Geoparks

18. Delivering Critical Raw Materials: Ecological, Ethical and Societal Issues

19. Critical Minerals and Rare Earths Elements: Ethical and Societal Considerations

20. The Future of Mining: Technical Progress and Its Implications

21. Strategic planning towards sustainable urban planning models? The case of municipal directors in Denmark

22. Multi-hazard analyses and their implications for the defense of society against natural phenomena

23. Responsible volcano risk management

24. Risk Communication in a Rapidly Evolving Environment: The Ethical and Societal Challenges

## **Geoethics to Shape New Educational Models for Future Planetary Citizens**

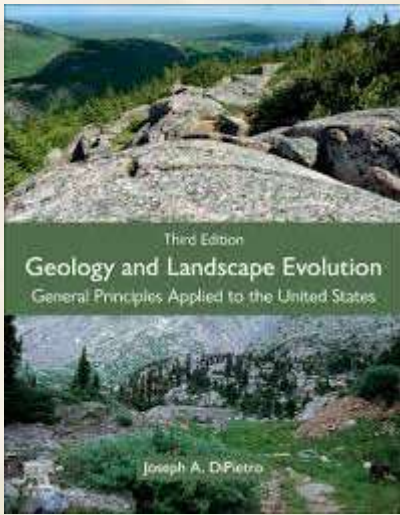
25. Geoscience Education: Changing Paradigms

26. A global geoscientific skills gap is threatening a sustainable future

27. Educating on Sustainable Development in Latin America: Lights and Shadows

28. Effective Strategies, Data, and Tools for Teaching Geoethics

29. Engaging the climate crisis with art



# Geology and Landscape Evolution

## General Principles Applied to the United States

Joseph A. DiPietro, University of Southern Indiana, Evansville, USA

**ISBN:** 9780443158964

**VOLUME:**

**EDITION:** 3

**PUB DATE:** June 2024

**PRICE:** 3395 Kč

**FORMAT:** Paperback

**PAGES:** c. 660

**PRIMARY AUDIENCE:** Students and researchers in geology, geography, tectonics, and environmental science

**Thema Value:** Geology, geomorphology & the lithosphere

### The updated edition explores general concepts on how landscape evolves, applying those concepts to the geology and landscape of the United States

#### Description

*Geology and Landscape Evolution: General Principles Applied to the United States, Third Edition* is an accessible text that balances interdisciplinary theory and applications within the physical geography, geology, geomorphology and climatology of the United States. The vast diversity of terrain and landscape across the United States makes this an ideal tool for geoscientists worldwide who research the country's geological and landscape evolution. The book provides an explanation of how landscape forms and how it evolves. This edition is fully updated with 3 additional sections: Geologic and Tectonic Processes and Provinces; Surface Processes and Provinces; and Compressional Mountain Systems.

Rather than limiting the coverage specifically to tectonics or to the origin and evolution of rocks with little regard for the actual landscape beyond general desert, river, and glacial features, this book concentrates specifically on the origin of the landscape itself, with specific and exhaustive references and examples from across the United States. The book goes on to apply those concepts to specific examples throughout the United States, making it a valuable resource for understanding theoretical geological concepts through a practical lens.

#### Key Features

- Presents the complexities of physical geography, geology, geomorphology and climatology of the United States through an interdisciplinary, highly accessible approach
- Offers hundreds of figures, maps and photographs that capture the systematic interaction of land, rock, rivers, glaciers, global wind patterns and climate, including Google Earth images
- Provides a thorough assessment of the logic, rationale, and tools required to understand how to interpret landscape and the geological history of the Earth
- Features exercises that conclude each chapter, aiding in the retention of key concepts
- Includes 3 new sections and 8 additional chapters, as well as major updates to chapters throughout

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1. Introduction to Landscape Evolution

## **PART 1 - COMPONENTS, FORCING AGENTS, AND MECHANISMS**

2. Component: Rock/Sediment Type
3. Component: Structural Form
4. Forcing Agent: The Tectonic System
5. Forcing Agent: The Climate System
6. Forcing Agent: Isostasy
7. Forcing Agent: Sea Level Change
8. Mechanisms That Impart Change to Landscape

## **PART II – REGIONAL LANDSCAPE, GEOLOGY, AND TECTONICS**

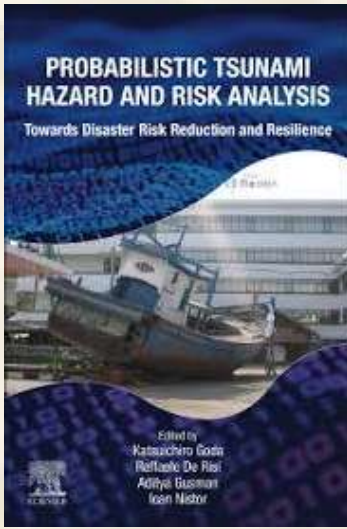
9. Physiographic Regions and Provinces
10. River Systems
11. Glaciated Landscape
12. Tectonic Setting and Distribution of Rock
13. Rock Successions and Tectonic Provinces
14. Active Geology
15. Structural Provinces

## **PART III – LANDSCAPE AND GEOLOGY OF STRUCTURAL PROVINCES**

16. Paths To Landscape Evolution
17. Nearly Flat-Lying Sedimentary Layers
18. Crystalline-Cored Mid-Continent Anticlines and Domes
19. Foreland Deformation Belts
20. Hinterland Deformation Belts
21. Young Volcanic Rocks of the Cordillera
22. Normal Fault Systems
23. Cascade Volcanic Arc System
24. California Strike-Slip System

## **PART IV – MOUNTAIN BUILDING**

25. Early Theories on The Origin of Mountain Belts
26. Keys to the Interpretation of Geological History
27. Growth and Gravitational Collapse of a Convergent Orogen
28. The Appalachian Orogen



# Probabilistic Tsunami Hazard and Risk Analysis

## Towards Disaster Risk Reduction and Resilience

Edited by : Katsuichiro Goda, Associate Professor, Departments of Earth Sciences and Statistical and Actuarial Sciences and Canada Research Chair in Multi-Hazard Risk Assessment, Western University, Canada; Raffaele De Risi, Associate Professor in the School of Civil, Aerospace and Design Engineering at Bristol University, United Kingdom.; Aditya Riadi Gusman, Tsunami Scientist at the GNS Science, New Zealand. and Ioan Nistor, Professor of Hydraulic and Coastal Engineering, Department of Civil Engineering, University of Ottawa, Canada

ISBN: 9780443189876

VOLUME:

EDITION: 1

PUB DATE: October 2024

PRICE: 4245 Kč

FORMAT: Paperback

PAGES: c. 582

**PRIMARY AUDIENCE:** Professors, researchers and students at post grad level and above in the field of Earth scientists, engineers, geographers, workers in risk management, finance, economics, and data science, engineers, Upper undergraduate students, graduate students

**Thema Value:** Geology, geomorphology & the lithosphere

## An invaluable resource for those seeking to understand tsunami hazard assessment and work towards risk reduction

### Description

*Probabilistic Tsunami Hazard and Risk Analysis: Towards Disaster Risk Reduction and Resilience* covers recent calls for advances in quantitative tsunami hazard and risk analyses for the synthesis of broad knowledge basis and solid understanding of interdisciplinary fields, spanning seismology, tsunami science, and coastal engineering. These new approaches are essential for enhanced disaster resilience of society under multiple hazards and changing climate as tsunamis can cause catastrophic loss to coastal cities and communities globally.

This is a low-probability high-consequence event, and it is not easy to develop effective disaster risk reduction measures. In particular, uncertainties associated with tsunami hazards and risks are large. The knowledge and skills for quantitative probabilistic tsunami hazard and risk assessments are in high demand and are required in various related fields, including disaster risk management (governments and local communities), and the insurance and reinsurance industry (catastrophe model).

### Key Features

- Focuses on fundamentals on probabilistic tsunami hazard and risk analysis
- Includes case studies covering a wide range of applications related to tsunami hazard and risk assessments
- Covers tsunami disaster risk management

# Table of contents

1. Introduction of Probabilistic Tsunami Hazard and Risk Analysis - Towards Disaster Risk Reduction and Resilience

**Section 1: Fundamentals of Probabilistic Tsunami Hazard and Risk Analysis**

2. Tsunami Generation

3. Tsunami Propagation and Runup

4. Tsunami Effects on Built Environment

5. Probabilistic Tsunami Hazard and Risk Assessments

6. Tsunami Disaster Risk Reduction and Management

**Section 2: Advanced Topics and Applications related to Probabilistic Tsunami Hazard and Risk Analysis**

7. Historical Tsunami Records and Paleo Tsunamis

8. Informing Megathrust Tsunami Source Models with Knowledge of Tectonics and Fault Mechanics

9. Tsunamis Triggered by Splay Faulting

10. Tsunami Hazard from Subaerial Landslides

11. Dense Tsunami Monitoring System

12. Machine Learning Approaches for Tsunami Early Warning

13. Global Tsunami Hazards and Risks

14. Probabilistic Tsunami Hazard Assessment for New Zealand

15. Tsunami Hazard and Risk in the Mediterranean Sea

16. Tsunami Hazard Assessment in Chile

17. Uncertainty in Empirical Tsunami Fragility Curves

18. Analytical Tsunami Fragility Curves

19. Modeling and Uncertainty in Probabilistic Tsunami Hazard and Risk Assessment

20. Multi-hazard Risk Assessments

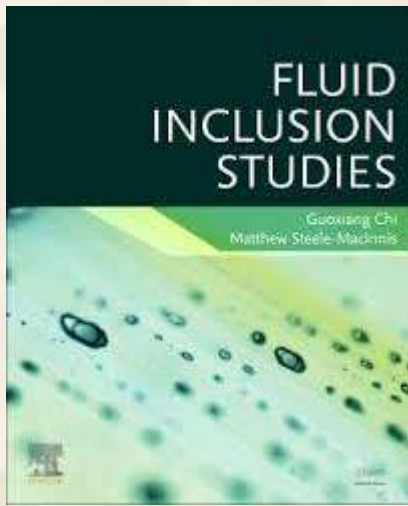
21. Dynamic Agent-based Evacuation

22. Sea Level Rise and Tsunami Risk

23. Long-term Tsunami Risk Considering Time-dependent Earthquake Hazard and Nonstationary Sea Level Rise

24. Digital Twin Paradigm for Coastal Disaster Risk Reduction and Resilience

Appendix



# Fluid Inclusion Studies

Guoxiang Chi, University of Regina, Canada and Matthew Steele-Mcinnis, University of Alberta, Canada

**ISBN:** 9780443190988

**VOLUME:**

**EDITION:** 1

**PUB DATE:** September 2024

**PRICE:** 3195 Kč

**FORMAT:** Paperback

**PAGES:** c. 412

**PRIMARY AUDIENCE:** Earth Scientists, Geologists, individuals working in the mining industry and oil and gas industry

**Thema Value:** Environmental economics, Environmental science, engineering & technology

## Provides practical guides for beginners of fluid inclusion study

### Description

Fluid inclusions are samples of paleo-fluids entrapped in minerals and can provide indispensable information about the compositions of the fluids, and the temperature and pressure conditions of the host mineral formation. The principles are well established and generally easy to understand; however, many researchers underestimate the complexities of the subject and make some common mistakes in data collection and interpretation. On the other hand, some researchers overestimate the difficulties and uncertainties in practice and tend to downplay the usefulness of fluid inclusions. *Fluid Inclusion Studies* aims to help readers overcome these problems by providing a comprehensive analysis of the foundational principles and demonstrating how these principles should be followed in practice, through examples of study methods and applications.

This book is a powerful tool in the field of the Earth science. *Fluid Inclusion Studies* aims to provide a practical guide for beginners of fluid inclusion study and includes chapters that highlight the diverse applications of fluid inclusions in a wide variety of geologic settings and processes.

### Key Features

- Includes down-to-earth discussions of common pitfalls in fluid inclusion studies allowing scientists to avoid mistakes in actual studies
- Features a problem-oriented approach that makes it easy for scientists to pinpoint problems and solutions
- Includes various applications of fluid inclusions, from mineral and oil–gas deposits, through magmatic–hydrothermal, sedimentary– diagenetic and metamorphic systems, structural analysis, to environmental studies

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## **PART 1 Principles**

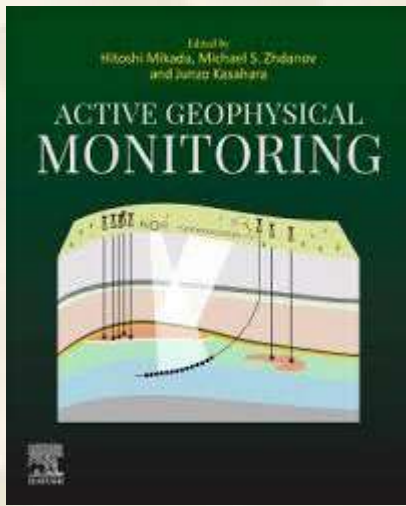
1. Geofluids
2. Classification of fluid inclusions
3. Genesis of fluid inclusions
4. Phase analysis
5. General principles and approaches of fluid inclusion study

## **PART 2 Methods**

6. Sample selection and preparation
7. Fluid inclusion petrography
8. Microthermometry
9. Melt inclusions
10. Chemical analysis of fluid inclusions
11. PVTX modelling
12. Data presentation and interpretation

## **PART 3 Applications**

13. Application in mineral deposits
14. Application in diagenesis and oil and gas deposits in sedimentary basins
15. Application in magmatic systems
16. Application in metamorphic systems
17. Application in structural geology
18. Other applications of fluid inclusions



# Active Geophysical Monitoring

Edited by : Hitoshi Mikada, Emeritus Professor of Geophysics, Kyoto University, Japan; Michael S. Zhdanov, University of Utah and Junzo Kasahara, Visiting Professor, Shizuoka University, Japan  
Principal investigator for the geothermal project, Shizuoka University, Japan

**ISBN:** 9780443214240

**VOLUME:**

**EDITION:** 3

**PUB DATE:** October 2025

**PRICE:** 4245 Kč

**FORMAT:** Paperback

**PAGES:** c. 642

**PRIMARY AUDIENCE:** Researchers and professionals in geophysics, including geodesy, seismology, disaster migration, and exploration geology, Graduate students in geophysics

**Thema Value:** Geophysics

## Provides a strategic and systematic overview of the latest technological developments in methods for active geophysical monitoring and their application cases

### Description

*Active Geophysical Monitoring* covers the praxis of active geophysical monitoring in a broad range of applications, including CCUS, hydrocarbon/geothermal reservoir development and management, groundwater, earthquake monitoring, and more. The editors and contributing authors thoroughly examine the latest developments and technologies in this new edition.

The text begins with an in-depth overview of active geophysical monitoring, followed by a close look at active targets and the latest technology. The theory of data analysis and interpretation follows in detail. The text closes with 15 case histories in signal processing as well as carbon capture and storage.

This updated edition is an invaluable resource for geophysicists employing a range of monitoring applications.

### Key Features

- Explains the general concepts of active geophysical monitoring and the relevant historical background
- Describes worldwide efforts of active geophysical monitoring and provides a perspective view on worldwide development
- Updated for the last decade's development and the latest technologies

# Table of contents

## **Section 1: General Concepts and Historical Review**

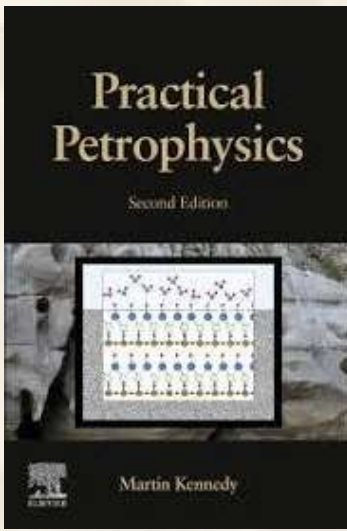
1. General Concept of Active Geophysical Monitoring
2. Active monitoring targets

## **Section 2: Theory and Technology of Active Monitoring**

3. Technology of Active Monitoring
4. Theory of Data Analysis and Interpretation
5. Signal Processing in Active Monitoring and case histories

## **Section 3: Case Histories**

6. Regional Active Monitoring Experiments



# Practical Petrophysics

Martin Kennedy, University of Otago, Christchurch, Christchurch, New Zealand

**ISBN:** 9780443223037

**VOLUME:**

**EDITION:** 2

**PUB DATE:** December 2024

**PRICE:** 3655 Kč

**FORMAT:** Paperback

**PAGES:** c. 534

**PRIMARY AUDIENCE:** Sub-surface professionals, but it is particularly suitable for end users of petrophysical interpretations (e.g., Petroleum Geologists, Reservoir Engineers, Static Model builders). Recommended reading in geoscience and petroleum engineering classes.

**Thema Value:** Materials science

## Covers all aspects of practical petrophysics including the tools and techniques in building petrophysical models

### Description

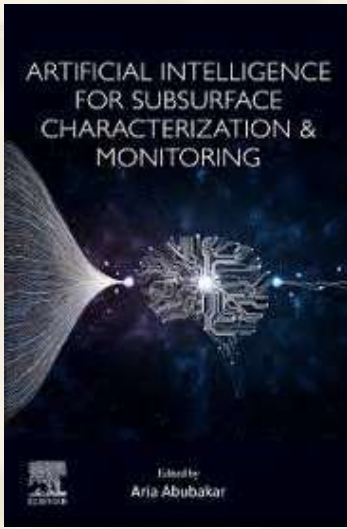
*Practical Petrophysics, Second Edition, Volume 62* provides a comprehensive overview of building a petrophysical model. All aspects from the principles of data acquisition through analysis to reporting are covered. This is not intended to be a review of specific tools and measurements, nor is it simply a recipe book. The book aims to teach the fundamental principles that underlie the commonly used tools and techniques but also to encourage pragmatism and avoid reading too much into what is always imperfect data.

### Key Features

- Includes a new chapter on underground storage of carbon dioxide and other net zero applications
- Covers new information on digital core analysis and density-neutron methods
- Includes a new chapter on fractured reservoirs, including models, evaluation, and geomechanics

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1. Introduction
2. Petrophysical Properties
3. Core and Other Real Rock Measurements
4. Logs Part I: General Characteristics and Passive Measurements
5. Logs Part II: Porosity, Resistivity and Other Tools
6. Introduction to Log Analysis: Shale Volume and Parameter Picking
7. Log Analysis I: Porosity
8. Log Analysis II: Water Saturation
9. Hydrocarbon Corrections
10. Fluid Distribution
11. Permeability Re-visited
12. Complex Lithology
13. Thin Bed Pays: Dealing with the Limitations of Log Resolution
14. Geophysical Applications
15. Underground Storage of Carbon Dioxide and other 'Net-Zero' applications
16. Fractured Reservoirs
17. High Angle Wells



# Artificial Intelligence for Subsurface Characterization and Monitoring

Edited by : Aria Abubakar, Head, Data Science and Scientific Advisor, Digital Subsurface Solutions, Schlumberger Ltd, Texas, USA

ISBN: 9780443235177

VOLUME:

EDITION: 1

PUB DATE: January 2025

PRICE: 3795 Kč

FORMAT: Paperback

PAGES: c. 270

**PRIMARY AUDIENCE:** Geophysics; petrophysics; geology; petroleum engineering. Geophysicists: process seismic data to provide seismic images used for energy resource exploration. Petrophysicists: process and interpret wellbore data used for energy resource exploration. Geoscientists: integrate and analyze geoscience data of different measurements. Reservoir engineers: analyze data for recovering hydrocarbon from subsurface reservoirs

**Thema Value:** Petroleum technology, Energy industries & utilities

## Demonstrates how deep learning accelerates the process of subsurface characterization & monitoring and provides an end-to-end solution

### Description

*Artificial Intelligence for Subsurface Characterization and Monitoring* provides an in-depth examination of how deep learning accelerates the process of subsurface characterization and monitoring and provides an end-to-end solution. In recent years, deep learning has been introduced to the geoscience community to overcome some longstanding technical challenges. This book explores some of the most important topics in this discipline to explain the unique capability of deep learning in subsurface characterization for hydrocarbon exploration and production and for energy transition. Readers will discover deep learning methods that can improve the quality and efficiency of many of the key steps in subsurface characterization and monitoring.

The text is organized into five parts. The first two parts explore deep learning for data enrichment and well log data, including information extraction from unstructured well reports as well as log data QC and processing. Next is a review of deep learning applied to seismic data and data integration, which also covers intelligent processing for clearer seismic images and rock property inversion and validation. The closing section looks at deep learning in time lapse scenarios, including sparse data reconstruction for reducing the cost of 4D seismic data, time-lapse seismic data repeatability enforcement, and direct property prediction from pre-migration seismic data.

### Key Features

- Focus on deep learning applications for geoscience provides a one-stop reference for deep learning applications for geoscience.
- Comprehensive examples of the state-of-art techniques throughout the subsurface characterization workflow provide readers with a chance to familiarize themselves with deep learning applications not only in their own field of expertise but also in other relevant fields.
- All applications come with realistic field dataset examples so that readers can learn what to expect in real life.

# Table of contents

## **Part I Deep learning for data enrichment**

1. Rejuvenating legacy data by digitizing raster logs
2. Information extraction from unstructured well reports

## **Part II Deep learning applied to well log data**

3. Well log data QC and processing
  4. Automatic well marker picking
  5. Automatic log interpretation
- Part III Deep learning applied to seismic data
6. Intelligent processing for clearer seismic images
  7. Seismic interpretation with improved quality and efficiency

## **Part IV Deep learning for data integration**

8. Automatic seismic-well tie
9. Rock property inversion and validation

## **Part V Deep learning in time lapse scenarios**

10. Time-lapse seismic data repeatability enforcement
11. Direct property prediction from premigration seismic data



# Data Analytics and Artificial Intelligence for Earth Resource Management

Edited by : Deepak Kumar, Research Scientist Center Of Excellence in Weather & Climate Analytics, Atmospheric Sciences Research Center (ASRC) & Amity Institute of Geoinformatics and Remote Sensing (AIGIRS) University at Albany, State University of New York, NY USA; Tavishi Tewary, Assistant Professor Jaipuria Institute of Management, Noida Uttar Pradesh India and Sulochana Shekhar, Professor and Dean, Central University of Tamil Nadu (CUTN) School of Earth Sciences, CUTN Bridge, Neelakudi, Tamil Nadu, India

ISBN: 9780443235955

VOLUME:

EDITION: 1

PUB DATE: November 2024

PRICE: 3795 Kč

FORMAT: Paperback

PAGES: c. 284

PRIMARY AUDIENCE:

Academicians, AI or Big-Data researchers, data scientists, data analysts, practitioners, and engineers in earth resource management, Also relevant to several industries and academic departments, including: Geography and Earth Sciences Departments, Computer Science and Engineering Departments, Civil and Infrastructure Engineering Departments, Environmental management and conservation, Mining and mineral exploration, Oil and gas industry, Business and Economics Departments, Mathematics and Statistics Departments

**Thema Value:** Geology, geomorphology & the lithosphere, Enterprise software, Operational

## A detailed exploration of data analytics and artificial intelligence for effective and sustainable earth resource management

### Description

*Data Analytics and Artificial Intelligence for Earth Resource Management* offers a detailed look at the different ways data analytics and artificial intelligence can help organizations make better-informed decisions, improve operations, and minimize the negative impacts of resource extraction on the environment. The book explains several different ways data analytics and artificial intelligence can improve and support earth resource management. Predictive modeling can help organizations understand the impacts of different management decisions on earth resources, such as water availability, land use, and biodiversity.

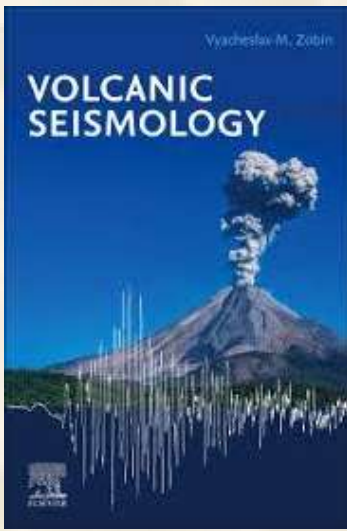
Resource monitoring tracks the state of earth resources in real-time, identifying issues and opportunities for improvement. Providing managers with real-time data and analytics allows them to make more informed choices. Optimizing resource management decisions help to identify the most efficient and effective ways to allocate resources. Predictive maintenance allows organizations to anticipate when equipment might fail and take action to prevent it, reducing downtime and maintenance costs. Remote sensing with image processing and analysis can be used to extract information from satellite images and other remote sensing data, providing valuable information on land use, water resources, and other earth resources.

### Key Features

- Provides a comprehensive understanding of data analytics and artificial intelligence (AI) for earth resource management
- Includes real-world case studies and examples to demonstrate the practical applications of data analytics and AI in earth resource management
- Presents clear illustrations, diagrams, and pictures that make the content more understandable and engaging

# Table of contents

- Data analytics and artificial intelligence in Earth resource management
- Data analytics enabled by the Internet of Things and artificial intelligence for the management of Earth's resources
- Data preprocessing techniques for earth resource management
- Artificial intelligence for sustainable stewardship of Earth resources
- Advancing earth resource management through AI enhanced early warning systems and crisis communication
- Artificial intelligence for analytical evaluation of landslide vulnerability
- Socioeconomic and environmental impacts analysis for climate resilient Earth resource management
- Data analytics for drought vulnerability under climate change scenarios
- Natural Language Processing for Earth resource management: a case of H<sub>2</sub> Golden Retriever research
- Artificial intelligence in efficient management of water resources
- Groundwater potential zone evaluations for improving resource management with spatial analysis approach
- Future trends in computational data analytics and artificial intelligence for Earth resource management



# Volcanic Seismology

Vyacheslav M Zobin, Research Professor, Center for Volcanological Research,  
Colima University, Mexico

**ISBN:** 9780443238932

**VOLUME:**

**EDITION:** 4

**PUB DATE:** October 2024

**PRICE:** 3895 Kč

**FORMAT:** Paperback

**PAGES:** c. 632

**PRIMARY AUDIENCE:**

Seismologists, Volcanologists,  
Geophysicists Scientific and university  
researchers, administrators of  
scientific centers.

**Thema Value:** Geophysics,  
Volcanology & seismology

## An invaluable reference on the nature and appearance of the seismic events associated with volcanic activity

### Description

Vyacheslav M. Zobin's *Introduction to Volcanic Seismology* has steadily grown over time, offering a deeper look at the latest developments in volcanic seismology with each edition. As such, this new, fully updated fourth edition is simply titled *Volcanic Seismology* in a nod to the comprehensive nature it has achieved.

*Volcanic Seismology, Fourth Edition*, covers all aspects of volcano seismology, specifically focusing on the latest studies and developments. This new edition expands to include recent seismic events in Kilauea (2018), La Soufriere (2020), and Hunga Tonga (2022).

This book begins with an introduction and review of the fundamentals of volcanic seismology. After setting this foundation, several case studies in volcano-tectonic earthquakes are reviewed. This is followed by a detailed look at earthquake swarms, source properties and origins, and volcanic tremors. Different seismic signals are closely examined. The author then explores effusive and explosive activity along with lava dome growth and destruction. The book closes with an in-depth look at seismic monitoring as well as the natural seismicity of geothermal structures within volcanic environments.

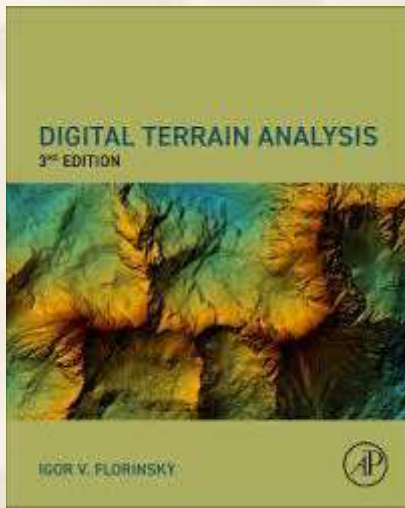
This essential text provides seismologists, volcanologists, and geophysicists a comprehensive review of all aspects of volcanic seismology.

### Key Features

- Presents updated global case studies to provide real-world applications
- Delivers illustrations alongside detailed descriptions of volcanic eruptions
- Includes essential information that students and practitioners need to understand the essential elements of volcanic eruptions

# Table of contents

1. Introduction
2. Seismicity at Volcanoes
3. Fundamentals of Volcanic Seismology
4. Origin of Volcano-tectonic Earthquakes
5. Volcano-tectonic Earthquakes at Basaltic Volcanoes: Case Studies
6. Volcano-tectonic Earthquakes at Andesitic Volcanoes: Case Studies
7. Volcano-tectonic Earthquakes at Dacitic Volcanoes: Case Studies
8. General Properties of Volcano-tectonic Earthquake Swarms
9. Source Properties of Volcano-tectonic Earthquakes
10. Significant Volcano-tectonic Earthquakes and their Role in Volcanic Processes
11. Origin of Eruption Earthquakes
12. Volcanic Tremor
13. Seismic Signals Associated with Pyroclastic Flows, Rockfalls, and Lahars
14. Seismic Signals Associated with Volcanic Explosions
15. Long-period and Very-long-period Seismic Signals at Volcanoes
16. Swarms of micro-earthquakes associated with effusive and explosive activity at volcanoes
17. Seismic accompaniment of the lava dome growth and destruction
18. Acoustic waves generated by volcanic eruptions
19. Seismic Monitoring of Volcanic Activity and Forecasting of Volcanic Eruptions
20. Seismic Activity at Dormant Volcanic Structures: A Problem of Failed Eruption
21. The Seismic Signals Associated with The Natural Seismicity of Geothermal Structures Within Volcanic Environment



# Digital Terrain Analysis, Third Edition

Igor Florinsky, Principal Research Scientist, Institute of Mathematical Problems of Biology, The Keldysh Institute of Applied Mathematics, Russian Academy of Sciences, Pushchino, Russia

**ISBN:** 9780443247989

**VOLUME:**

**EDITION:** 3

**PUB DATE:** January 2025

**PRICE:** 3665 Kč

**FORMAT:** Hardback

**PAGES:** c. 456

**PRIMARY AUDIENCE:** Researchers and advanced students in

geomorphometry, geoinformatics, geomorphology, soil science, geology, polar science, and glaciology

**Thema Value:** Agricultural science, Environmental science, engineering & technology, Operational research, Sedimentology & pedology, Enterprise software

## Overviews the principles, methods, and applications of digital terrain analysis and modeling in the context of soil science and geology

### Description

*Digital Terrain Analysis, Third Edition* synthesizes knowledge on methods and applications of digital terrain analysis and geomorphometry in the context of multi-scale problems in soil science, geology, and polar research. Divided into four parts, the book examines the main concepts, principles, and methods of digital terrain modeling, methods for analysis, modeling, and mapping of spatial distribution of soil properties, techniques for recognition, analysis, and interpretation of topographically manifested geological features, and finally, polar research. This new release provides a theoretical and methodological basis for understanding and applying geographical modeling techniques.

### Key Features

- Presents an integrated and unified view of digital terrain analysis in both soil science and geology
- Includes a rigorous description of the mathematical principles of digital terrain analysis
- Provides both a theoretical and methodological basis for understanding and applying geographical modeling
- Contains a new section on Digital Terrain Modeling in polar research, as well as updated information, methods, and figures from previous editions

# Table of contents

1. Digital terrain analysis: past and present

## **Part I: Principles and Methods of Digital Terrain Modeling**

2. Topographic surface and its characterization
3. Digital elevation models
4. Calculation methods
5. Errors and accuracy
6. Filtering
7. Universal spectral analytical modeling
8. Mapping and visualization

## **Part II: Digital Terrain Modeling in Soil Science**

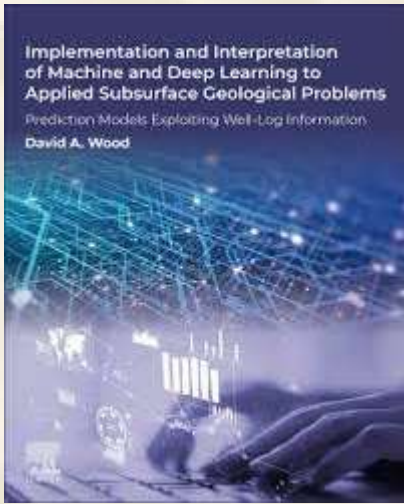
9. Influence of topography on soil properties
10. Adequate resolution of models
11. Predictive soil mapping
12. Analyzing relationships in the topography–soil system

## **Part III: Digital Terrain Modeling in Geology**

13. Folds and folding
14. Lineaments and faults
15. Accumulation zones and fault intersections
16. Global topography and tectonic structures

## **Part IV: Digital Terrain Modeling in Glaciology and Polar Research**

17. Glacier motion and evolution
18. Crevasses
19. Catastrophic glacier events
20. Antarctic oases
21. Concluding remarks and pending problems



# Implementation and Interpretation of Machine and Deep Learning to Applied Subsurface Geological Problems

Prediction Models Exploiting Well-Log Information

David A. Wood, Owner/Consultant, DWA Energy Limited, UK

**ISBN:** 9780443265105

**VOLUME:**

**EDITION:** 1

**PUB DATE:** March 2025

**PRICE:** 3772 Kč

**FORMAT:** Paperback

**PAGES:** c. 430

**PRIMARY AUDIENCE:** Geoscience and subsurface engineering are the main disciplines. Petroleum and energy operating companies, such as exploration and development geologists (for modeling, data mining, and interpretation), petrophysicists and well-log analysts (for dataset interpretation), and machine and deep learning analysts (for geological and model implementation insight). Industry service providers, such as energy service-company modelers and data analysts (for product optimization and development). Graduate students, post-doctoral researchers, and other academic researchers

**Thema Value:** Energy industries & utilities, Enterprise software, Earth

## Covers implementation methods and requirements to apply and interpret machine learning methods for sub-surface geoscience and engineering problems

### Description

*Implementation and Interpretation of Machine and Deep Learning to Applied Subsurface Geological Problems: Prediction Models Exploiting Well-Log Information* explores machine and deep learning models for subsurface geological prediction problems commonly encountered in applied resource evaluation and reservoir characterization tasks. The book provides insights into how the performance of ML/DL models can be optimized—and sparse datasets of input variables enhanced and/or rescaled—to improve prediction performances. A variety of topics are covered, including regression models to estimate total organic carbon from well-log data, predicting brittleness indexes in tight formation sequences, trapping mechanisms in potential sub-surface carbon storage reservoirs, and more.

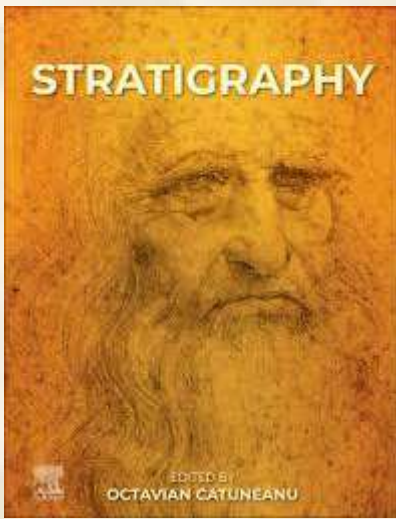
Each chapter includes its own introduction, summary, and nomenclature sections, along with one or more case studies focused on prediction model implementation related to its topic.

### Key Features

- Addresses common applied geological problems focused on machine and deep learning implementation with case studies
- Considers regression, classification, and clustering machine learning methods and how to optimize and assess their performance, considering suitable error and accuracy metric
- Contrasts the pros and cons of multiple machine and deep learning methods
- Includes techniques to improve the identification of geological carbon capture and storage reservoirs, a key part of many energy transition strategies

# Table of contents

1. Regression models to estimate total organic carbon (TOC) from well-log data
2. Predicting brittleness indexes in tight formation sequences
3. Classifying lithofacies in clastic, carbonate, and mixed reservoir sequences
4. Permeability and water saturation distributions in complex reservoirs
5. Trapping mechanisms in potential sub-surface carbon storage reservoirs
6. The accurate picking of formation tops in field development wells
7. Assessing formation loss of circulation risks with mud-log datasets
8. Delineating fracture densities and apertures using well-log image data
9. Determining reservoir microfacies using photomicrograph and computed tomography image data
10. Characterizing coal-bed methane reservoirs with well-log datasets



# Stratigraphy

Edited by : Octavian Catuneanu, Professor, Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton, Alberta, Canada

**ISBN:** 9780443265365

**VOLUME:**

**EDITION:** 1

**PUB DATE:** March 2026

**PRICE:** 3955 Kč

**FORMAT:** Hardback

**PAGES:** c. 472

**PRIMARY AUDIENCE:**

Graduate/post-graduate students, academics, and professional geologists and geophysicists, who require a proper understanding of stratigraphy in order to correlate sedimentary successions.

Stratigraphic correlation has a wide range of applications, from academic to industry purposes

**Thema Value:** Sedimentology & pedology, Stratigraphy

## An up-to-date and comprehensive guide to the theory and practice of stratigraphy

### Description

*Stratigraphy* provides a comprehensive review of various stratigraphy types in a consistent, systematic manner. Each chapter includes definitions, concepts, practical applications, and case studies. The book begins with an overview of the discipline's historical principles. Subsequent chapters delve into specific types of stratigraphy: lithostratigraphy (lithology), biostratigraphy (fossil content), chemostratigraphy (geochemical properties), magnetostratigraphy (magnetic polarity), chronostratigraphy (absolute age), cyclostratigraphy (relationship to astronomical forcing), allostratigraphy (lithological discontinuities), and sequence stratigraphy (stratal stacking patterns). This structured approach makes the book a convenient reference for quickly reviewing and comparing different stratigraphy types.

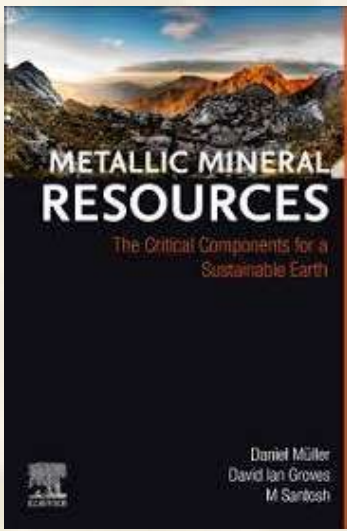
Each chapter follows a consistent outline, making the text accessible and easy to navigate. This invaluable reference links theory with practice, and provides critical insights into the practical workflow that enables stratigraphic correlation in diverse geological contexts. The systematic presentation ensures that readers can efficiently compare and contrast the different stratigraphy types, enhancing their ability to integrate different stratigraphic methods in order to unravel the full array of physical and temporal complexities of the 3D stratigraphic framework.

### Key Features

- Provides a comprehensive resource for university instructors and students, as well as a guide to the workflow and practical applications of stratigraphy
- Reviews the development of stratigraphy over the last 550 years, from the formulation of 'first principles' in the Renaissance through to the modern state-of-the-art
- Presents all main types of stratigraphy as defined by the specific stratal attributes employed to delineate and correlate stratigraphic units and bounding surfaces
- Discusses key topics at the forefront of current stratigraphic research that describe the full array of physical and temporal complexities of the 3D stratigraphic framework
- Illustrates all concepts and case studies with high-quality, full-color diagrams, outcrop photographs, and subsurface well data and seismic images

# Table of contents

1. Introduction
2. Lithostratigraphy
3. Biostratigraphy
4. Chemostratigraphy
5. Magnetostratigraphy
6. Chronostratigraphy
7. Cyclostratigraphy
8. Allostratigraphy
9. Sequence stratigraphy
10. Discussion and conclusions



# Metallic Mineral Resources

## The Critical Components for a Sustainable Earth

Daniel Müller, Consulting Geologist, Santiago de Chile, Chile; David Ian Groves, Economic Geologist, Honorary Professor at China University of Geosciences Beijing, and Emeritus Professor at the University of Western Australia. and M. Santosh, Honorary Professor at the University of Adelaide, Australia, foreign expert and Professor at the China University of Geosciences, Beijing, China, and Emeritus Professor at the Faculty of Science, Kochi University, Japan

ISBN: 9780443265624

VOLUME:

EDITION: 1

PUB DATE: September 2024

PRICE: 3885 Kč

FORMAT: Paperback

PAGES: c. 448

**PRIMARY AUDIENCE:** Post-graduates, faculty, and professionals in geoscience, economic geology, mining and exploration industries, energy industries, and those working towards strategies for sustainability

**Thema Value:** Agribusiness & primary industries, Geology, geomorphology & the lithosphere, Chemistry of minerals, crystals & gems

### A comprehensive resource on critical metallic resources for sustainable development with special emphasis on their nature, genesis, exploration, and more

#### Description

*Metallic Mineral Resources: The Critical Components for a Sustainable Earth* introduces the heterogeneous distribution of metal resources as well as the industrial use of metals. The main chapters then work systematically through abundant metal systems, scarce critical metal systems, rare critical metal systems, trace critical metal systems, and precious metal systems. The book wraps with a close examination of temporal distribution of mineral resources and an insightful discussion of the future of mineral resources. Researchers and engineers in economic geology and mining and exploration industries will find themselves returning to this key reference for years to come.

*"The authors are world renown geoscientists who have a combined 120 years of successful international industry and award-winning academic experience which brings remarkable and diverse skill sets required for this very timely and highly relevant publication.*

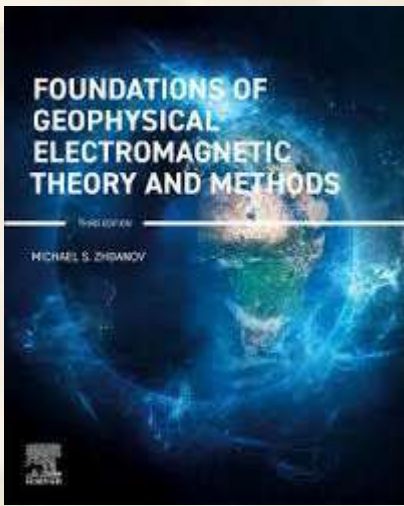
*Metallic Mineral Resources is meticulously edited and this review took much longer than normal due to the tremendous amount of information and research to be adsorbed and processed. Each chapter has logical format, excellent figures and tables allowing the reader to systematically follow the various themes and discussions. The book is unique in that a broad range of disciplines and geopolitics are drawn on to emphasize the current and future metal supply and demand issues. The authors have succeeded admirably in describing and highlighting in great detail, the critical components for a sustainable earth, at a time when these issues are now more relevant than ever before."* Douglas J. Kirwin, *Ore Geology Reviews*

#### Key Features

- Describes how mineable and economic metal concentrations form and are preserved in the Earth's upper crust
- Documents how they are discovered by systematic mineral exploration at a variety of scales
- Discusses how to educate the public on the scarcity of natural metal resources and the issues concerning the nexus between the energy transition and potential exhaustion of critical metals

# Table of contents

1. Introduction
2. Heterogeneous Distribution of Metal Resources
3. Industrial Use of Metals
4. Abundant Metal Systems
5. Scarce Critical Metal Systems
6. Rare Critical Metal Systems
7. Trace Critical Metal Systems
8. Precious Metal Systems
9. Temporal Distribution of Metallic Mineral Resources
10. The Future of Metallic Mineral Resources and their Exploration



# Foundations of Geophysical Electromagnetic Theory and Methods

Michael S. Zhdanov, Department of Geology and Geophysics, University of Utah, Salt Lake City, USA

ISBN: 9780443276828

VOLUME:

EDITION: 3

PUB DATE: April 2026

PRICE: 7290 Kč

FORMAT: Paperback

PAGES: c. 780

**PRIMARY AUDIENCE:** Graduate students, faculty, scientists, and engineers in Geophysics, Physics, Computer Science, and Remote Sensing, most specifically, those focusing on electromagnetic theory

**Thema Value:** Geology, geomorphology & the lithosphere, Geophysics

## Presents a comprehensive treatise on theoretical and applied electromagnetic geophysics

### Description

*Foundations of Geophysical Electromagnetic Theory and Methods, Third Edition* provides a comprehensive treatment of electromagnetic (EM) theory and its applications in geophysics. This updated edition incorporates more than a decade of advances in theoretical developments, numerical modeling, and practical EM surveying while maintaining the clarity and rigor of previous editions. The book begins with an introduction to field theory, including the differential calculus of vector fields and foundational principles underlying classical electromagnetic formulations. It then reviews the core elements of EM theory, covering Maxwell's equations, models of EM induction in the Earth, and the behavior of electromagnetic fields in heterogeneous media.

Subsequent chapters address the inversion and imaging of EM data, discussing the theory of ill-posed inverse problems, regularization strategies, electromagnetic inversion methodologies, and migration techniques used to construct subsurface images. The volume then turns to applied geophysical methods, examining the electromagnetic properties of rocks and minerals, the generation and measurement of EM fields, and survey techniques across a range of domains, including direct current, induced polarization, natural-field EM, controlled-source EM, and marine and airborne EM methods. A set of case studies illustrates the practical use of EM methods in geophysics, including mineral and energy resource exploration.

### Key Features

- Presents theoretical and methodological foundations of geophysical field theory
- Illustrates the current state-of-the-art in EM geophysical technology
- Discusses the practical aspects of EM exploration for mineral and energy resources, including a variety of diverse case studies

# Table of contents

## **Part I. Introduction to Field Theory**

1. Differential Calculus of Vector Fields and Differential Forms.
2. Foundations of Field Theory.

## **Part II. Foundations of Electromagnetic Theory**

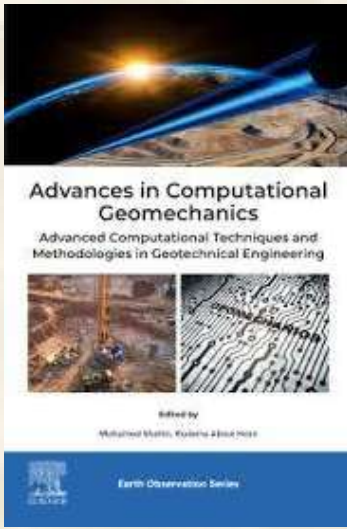
3. Electromagnetic Field Equations.
4. Models of Electromagnetic Induction in the Earth.
5. Electromagnetic Fields in Horizontally Stratified Media.
6. Electromagnetic Fields in Inhomogeneous Media.

## **Part III. Inversion and Imaging of Electromagnetic Field Data**

7. Principles of Ill-posed Inverse Problem Solution.
8. Electromagnetic Inversion.
9. Electromagnetic Migration.

## **Part IV. Geophysical Electromagnetic Methods**

10. Electromagnetic Properties of Rocks and Minerals.
11. Generation and Measurement of Electromagnetic Fields in Geophysical Applications.
12. Direct Current and Induced Polarization Methods.
13. Magnetotelluric and Magnetovariational Methods.
14. Electromagnetic Methods in the Frequency and Time Domains.
15. Marine Electromagnetic Methods.
16. Airborne Electromagnetic Methods.
17. Case histories. Appendices



# Advances in Computational Geomechanics

## Advanced Computational Techniques and Methodologies in Geotechnical Engineering

Edited by : Mohamed Shatin, Professor, Geotechnical Engineering, Curtin University, Australia and Rodaina Aboul Hosn, Assistant Professor of Geotechnical Engineering, Australian University, Kuwait

ISBN: 9780443277085

VOLUME:

EDITION: 1

PUB DATE: March 2026

PRICE: 3675 Kč

FORMAT: Paperback

PAGES: c. 484

**PRIMARY AUDIENCE:** Graduate students, academics, researchers, and professionals in geotechnical engineering, civil engineering, and related fields

**Thema Value:** Geology, geomorphology & the lithosphere, Operational research, Enterprise software, Earth sciences

## Provides valuable insights and practical knowledge on the latest advancements and applications of computational geomechanics

### Description

*Advances in Computational Geomechanics: Advanced Computational Techniques and Methodologies in Geotechnical Engineering* provides a comprehensive overview of cutting-edge computational methodologies in geotechnical engineering. The first part examines stochastic, probabilistic, and reliability analyses in geotechnical engineering, covering stochastic methods, probabilistic approaches to soil characterization, reliability analysis in geotechnical design, and risk assessment and management in geotechnical projects. The second part delves into artificial intelligence (AI) and machine learning applications in geotechnical engineering, including machine learning algorithms for geotechnical data analysis, AI-based predictive models for soil behavior and properties, AI in geotechnical risk and decision-making, and data-driven approaches for soil classification and site characterization.

The third part focuses on numerical modeling and analysis techniques, such as the Finite Element Method (FEM), Finite Difference Method (FDM), Discrete Element Method (DEM), and explores hybrid numerical methods and future directions in computational geomechanics. This book serves as a valuable resource for geotechnical engineers, researchers, and practitioners seeking to leverage advanced computational tools for geomechanical analyses and design.

### Key Features

- Examines a wide range of topics, covering contemporary computational geomechanics and the latest advancements in geotechnical engineering
- Reviews both theoretical foundations and practical insights
- Provides real-world case studies and examples to illustrate the practical applications of discussed methodologies
- Integrates knowledge from various disciplines, making it relevant to a broad audience within geotechnical engineering and beyond

# Table of contents

## **Part I: Numerical Modelling and Analysis**

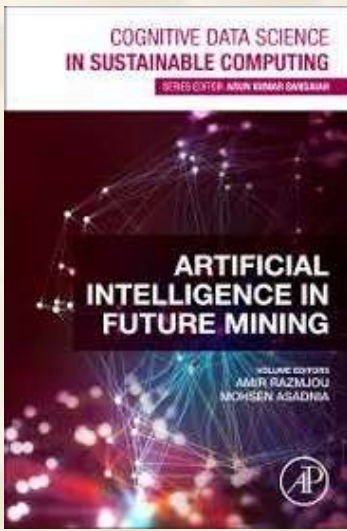
1. Finite Element Method (FEM) and Finite Difference Method (FDM)
2. Discrete Element Method (DEM) and DEM-FEM Coupling
3. Emerging Computational Techniques
4. Hybrid Numerical Methods and Future Directions

## **Part II: Stochastic, Probabilistic and Reliability Analyses**

5. Stochastic Methods in Geotechnical Engineering
6. Probabilistic Approaches to Soil Characterization
7. Reliability Analysis in Geotechnical Design
8. Risk Assessment and Management in Geotechnical Projects

## **Part III: Artificial Intelligence and Machine Learning**

9. Machine Learning Algorithms for Geotechnical Data Analysis
10. AI-Based Predictive Models for Soil Behavior and Properties
11. AI in Geotechnical Risk and Decision-Making
12. Data-Driven Approaches for Soil Classification and Site Characterization



# Artificial Intelligence in Future Mining

Edited by : Amir Razmjou, Amir Razmjou is an Associate Professor at Edith Cowan University and the Leader of the Mineral Recovery Research Centre (MRRRC). and Mohsen Asadnia, Professor, Mechatronics-Biomechanics and an ARC DECRA Fellow, Macquarie University, Australia

ISBN: 9780443289118

VOLUME:

EDITION: 1

PUB DATE: January 2025

PRICE: 3449 Kč

FORMAT: Paperback

PAGES: c. 420

**PRIMARY AUDIENCE:** Academics, researchers, and industry professionals in fields that intersect with mining, engineering, and AI/data science, Mining industry, government agencies, industry organizations/associations, AI researchers

**Thema Value:** Geology, geomorphology & the lithosphere, Agribusiness & primary industries

## Deepens understanding of how artificial intelligence is changing the future of mining for the better

### Description

*Artificial Intelligence in Future Mining* explores the latest developments in the use of artificial intelligence (AI) in mining and how it will impact the industry's future. The application of data science and artificial intelligence in future mining involves using advanced technologies to optimize operations, improve decision-making, and enhance safety and sustainability in the industry. After a brief history of AI in mining, the book's editors look closely at different AI techniques used. Chapters explore ocean mining, brine mining, and urban mining. With an eye towards sustainability, the editors then review the future of wastewater mining and green mining.

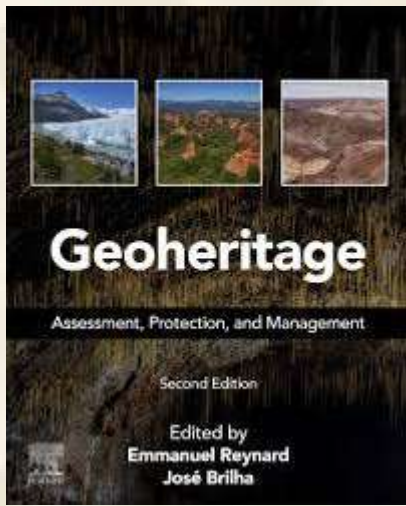
The book wraps up with chapters on safety and risk, resource planning, and a larger discussion of the opportunities and challenges of mining with AI in the future. This book is a must-have for researchers and professionals who find themselves at the intersection of mining, engineering, and data science.

### Key Features

- Provides high-level analyses as well as practical insights and real-world examples on the impact of AI on future mining
- Includes case studies on the application of data processing, the Internet of Things, and artificial intelligence in environmental sensing
- Provides in-depth discussion of the future implications of AI on the mining industry at the end of each chapter

# Table of contents

1. The Evolution of AI in Mining: A Historical Overview
2. AI-Powered Techniques for Improved Continental Mining
3. The Future of Ocean Mining with Artificial Intelligence
4. Revolutionizing Brine Mining through AI-Assisted Techniques
5. Urban Mining and AI: Challenges and Opportunities
6. Wastewater Mining: A New Frontier for AI in Mining
7. Green Mining with AI: A Path to Sustainability
8. Enhancing Safety and Minimizing Risk in Mining Processes with AI
9. AI-Assisted Resource Planning and Management in Mining
10. The Future of the Mining Industry with Artificial Intelligence: Opportunities and Challenge



# Geoheritage

## Assessment, Protection, and Management

Edited by : Emmanuel Reynard, University of Lausanne, Switzerland and José Brilha, University of Minho, Portugal

ISBN: 9780443289972

VOLUME:

EDITION: 2

PUB DATE: August 2025

PRICE: 3449 Kč

FORMAT: Paperback

PAGES: c. 752

**PRIMARY AUDIENCE:** Students, researchers and professionals in the geosciences, conservation, and sustainable tourism, geologists, environmentalists, conservationists, etc.

**Thema Value:** Geology, geomorphology & the lithosphere, Environmental science, engineering & technology

**Comprehensively covers the state of knowledge of geodiversity, geoheritage, geoconservation and their links with society, highlighting the importance of preserving and showcasing our planet's unique geological features through conservation efforts**

### Description

Geoheritage: Assessment, Protection, and Management, Second Edition provides a comprehensive exploration of geoheritage, beginning with an introduction to geodiversity and progressing to the characterisation of *in situ* and *ex situ* geoheritage, its protection and sustainable use. It also offers advanced concepts and methodologies for site assessment, mapping, conservation, visualisation and management, and features 12 case studies spanning five continents.

Authored by 75 experts from 22 countries, this edition includes nearly 200 figures and maps. New chapters expand the scope of the first edition to address geoheritage's links to biodiversity, climate change, natural hazards, ecosystem services, education and cities.

This essential resource is perfect for geoscientists and students in the fields of geodiversity, geoheritage, geoconservation and geotourism, as well as professionals involved in nature conservation, protected areas and geoparks.

### Key Features

- 24 thematic chapters based on conceptual, methodological and applied research carried out by academics and practitioners
- 12 case studies from Africa, Asia, the Middle East, South and North America, Europe, Australia, and Antarctica
- Over 200 colour images and maps of geoheritage sites

# Table of contents

## **Introduction**

Geoheritage: A multidisciplinary and applied research topic

1. Geodiversity: The Backbone of Geoheritage and Geoconservation
2. Methods for Assessing Geodiversity
3. Geodiversity and Biodiversity Linkages in Theory, Practice, and Nature Conservation
4. Geodiversity, Ecosystem Services and Geosystem Services
5. Geodiversity Action Plans – A Method to Structure, Inform and Record Geodiversity Management

## **Geoheritage**

6. Geoheritage: Inventories and Evaluation
7. The Specificities of Geomorphological Heritage
8. Fossils, Heritage and Conservation: Managing Demands on a Precious Resource
9. Geoheritage and Museums
10. The Landscape and the Cultural Value of Geoheritage
11. Challenges Concerning Geoheritage in Urban Areas
12. What geoheritage Tells Us About Climate Change, and What We Can Do About It
13. Geoheritage and Geohazards
14. Geomining Heritage as a Tool to Promote the Social Development of Rural Communities
15. GSSPs as International Geostandards and as Global Geoheritage

## **Geoheritage and Conservation**

16. The Conservation of Geosites: Principles and Practice
17. Geoheritage Conservation and Environmental Policies: Retrospect and Prospect
18. Geoheritage and World Heritage Sites

## **Uses of Geoheritage**

19. The Interplay of Geoheritage: Outdoor Experiences Through Education and Communication
20. Geoheritage: Getting the Message Across. What message and to whom?
21. GDigital Geovisualisation Technologies Applied to Geoheritage Management
22. Geoheritage and Geotourism
23. Geoheritage and Geoparks

## **Case Studies**

24. Potential Geoheritage Sites in Ethiopia: Challenges of Their Promotion and Conservation
25. Geocultural Heritage in Southeastern Tunisia
26. Geodiversity and Geoconservation in Land Management in Tasmania – A Top-Down Approach
27. Geoheritage Evaluation of Caves in Korea: A Case Study of Limestone Caves
28. Geoheritage Conservation and Geotourism in India: Prospects and Challenges
29. Geodiversity, Geoconservation and Geotourism in China's Geoparks
30. Geoconservation in Iran, a Case Study of Namakdan Salt Caves
31. Managing Conservation, Research, and Interpretation of Geoheritage Assets at Florissant Fossil Beds National Monument, Colorado, USA
32. Varvite Park, a Brazilian Initiative for the Conservation and Interpretation of Geoheritage
33. IUGS Geological Heritage Sites in Argentina. State-of-the-Art and Perspectives for the Geoconservation of Iguazú Falls and Perito Moreno Glacier
34. Techniques for monitoring geosites in Spain for effective geoconservation
35. Geoheritage and Geoconservation in Antarctica: Challenges and Advances in a Special Territory



# Fossils and Earth Time

## Evolution and Biostratigraphy

Edited by : Felix Gradstein, Professor Emeritus, Oslo University, Norway and visiting Research Fellow, University of Portsmouth, UK; Jan Zalasiewicz, Emeritus Professor, Palaeobiology, University of Leicester, UK; Mark Williams, Palaeontologist, University of Leicester, UK and Anna Wałkowska, Professor of Earth Sciences, AGH University of Science and Technology, Poland

ISBN: 9780443290923

VOLUME:

EDITION: 1

PUB DATE: December 2025

PRICE: 2709 Kč

FORMAT: Paperback

PAGES: c. 274

PRIMARY AUDIENCE: Earth

scientists and particularly paleontologists and other geoscientists interested in processes that took place in geologic time, as well as students working with biostratigraphy and the geological timescale

**Thema Value:** Geology, geomorphology & the lithosphere, Meteorology & climatology, Palaeontology

## Details the evolution and biostratigraphy of micro- and macrofossil groups in the Phanerozoic Era

### Description

*Fossils and Earth Time: Evolution and Biostratigraphy* presents an in-depth examination of both micro- and macrofossils, showcasing their evolution and biostratigraphy throughout the Phanerozoic Era. The book meticulously explores various fossil groups that have influenced Earth's history. It integrates paleontological data with geological context and biostratigraphic principles, elucidating the intricate relationship between fossil assemblages and Earth's dynamic past. This resource is invaluable for those studying geology, paleontology, or investigating the spatial and temporal distribution across Earth's history.

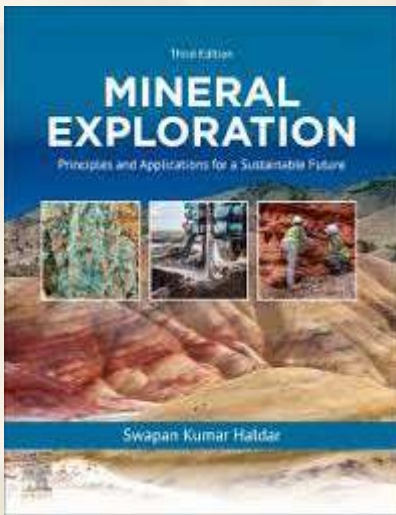
The book delves into the significance of fossils as vital biostratigraphic tools, enabling precise dating and correlation of sedimentary rocks across different regions and continents. It offers up-to-date information, making it an essential reference for researchers and professionals. The comprehensive coverage of fossil groups and their geological implications provides readers with a thorough understanding of Earth's evolutionary timeline. Practical applications and case studies further enhance its utility for academia and industry alike.

### Key Features

- Covers the evolution of fossil groups and accompanying data in deep time, improving insights into geological developments
- Provides a concise overview and data on index taxa and zonation in major fossil groups, allowing for the understanding of spatial and temporal distribution of rock units
- Aligns with the linear Geological Time Scale for continuity of major events, such as mass extinctions and significant changes in Earth's environments

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3. Graptolites
4. Chitinozoans
5. Conodonts
6. Ammonoidea
7. Ostracods
8. Calcareous Nannofossils Mesozoic
9. Calcareous Nannofossils Cenozoic
10. Planktonic Foraminifera Jurassic
11. Planktonic Foraminifera Cretaceous
12. Planktonic Foraminifera Cenozoic
13. Smaller benthic Foraminifera
14. Larger Foraminifera
15. Radiolarians
16. Dinoflagellates
17. Plants, Spores and Pollen
18. Cretaceous Micro Crinoids
19. Dinosaurs and Early Mammals
20. Three Major Mass Extinctions and Evolutionary Radiations in their Aftermath
21. Gaia - The future of the Field



# Mineral Exploration

## Principles and Applications for a Sustainable Future

Swapan Kumar Haldar, Emeritus Scientist, Department of Applied Geology and Environmental System Management, Presidency College, Kolkata, India and Exploration Consultant, Hindustan Zinc Limited, Hindustan Copper Limited, and ESSO Standard Eastern Inc., India

**ISBN:** 9780443298738

**VOLUME:**

**EDITION:** 3

**PUB DATE:** January 2026

**PRICE:** 3955 Kč

**FORMAT:** Paperback

**PAGES:** c. 520

**PRIMARY AUDIENCE:** Geology, Applied Geology, and Mining. More specifically Geologists, Geoscientists, Geophysicists, Geochemists, Drilling Engineers, Mining Engineers, Smelting and Refining Engineers, Environmental Scientists

**Thema Value:** Chemistry, Geology, geomorphology & the lithosphere

## Helps readers discover the latest innovations in mineral exploration and their support in a sustainable future

### Description

*Mineral Exploration: Principles and Applications for a Sustainable Future, Third Edition* presents the current state of mineral exploration, along with innovations that will power a sustainable future. Sections cover economic mineral deposits, photogeology, remote sensing, and geographic information systems. This is followed by a review of exploration geology, geochemistry, and geophysics. Next, from a more practical perspective, are chapters on sampling methods, mineral resources, ore reserve estimation, and statistical and geostatistical applications. Other topics include exploration modeling, mineral economics, and mineral processing. Looking ahead, the book closes with chapters on environmental system management for green energy and machine learning and artificial intelligence in mineral exploration.

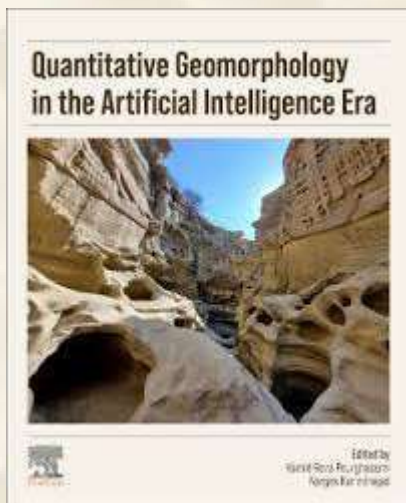
This leading text offers researchers and engineers the latest knowledge and understanding in mineral exploration with ample resources for sustainable development efforts.

### Key Features

- Provides in-depth reviews of strategic and rare earth minerals that power 21st century technology
- Includes sub-terrestrial and extra-terrestrial sources of minerals, providing an overview of alternative sources of minerals on earth and beyond
- Examines sustainable exploration and development in service of global Sustainable Development Goals

# Table of contents

1. Mineral Exploration
2. Economic Mineral Deposits and Host Rocks
3. Photogeology, Remote Sensing, and Geographic Information System in Mineral Exploration
4. Exploration Geology
5. Exploration Geochemistry
6. Exploration Geophysics
7. Sampling Methods
8. Mineral Resource and Ore Reserve Estimation
9. Statistical and Geostatistical Applications in Geology
10. Exploration Modeling
11. Mineral Economics
12. Elements of Mining
13. Mineral Processing
14. Environmental System Management of Mineral Resources for Green Energy and Sustainable Development
15. Mineral Exploration Case Histories
16. Machine Learning & Artificial Intelligence in Mineral Exploration



# Quantitative Geomorphology in the Artificial intelligence Era

## Applications of AI for Earth and Environmental Change

Edited by : Hamid Reza Pourghasemi, Professor, Department of Natural Resources and Environment Engineering, College of Agriculture, Shiraz University, Shiraz, Iran and Narges Kariminejad, PhD Researcher, Department of Natural Resources and Environment Engineering, College of Agriculture, Shiraz University, Shiraz, Iran

**ISBN:** 9780443300363

**VOLUME:**

**EDITION:** 1

**PUB DATE:** December 2025

**PRICE:** 3989 Kč

**FORMAT:** Paperback

**PAGES:** c. 536

**PRIMARY AUDIENCE:**

Geomorphologists, geologists, Remote Sensing users and especially those using GIS, environmental and geoscience scientists

**Thema Value:** Geology, geomorphology & the lithosphere

## **Focuses on a holistic understanding of the use of AI for quantitative geomorphology, enabling better understanding of changes in the physical Earth environment**

### **Description**

*Quantitative Geomorphology in the Artificial Intelligence Era: Applications of AI for Earth and Environmental Change* focuses on bridging the gaps in this emerging discipline, it delves into the complex interplay between landforms and the processes that shape them, offering innovative solutions through AI and data-driven methods. The book addresses the standards, quality assessment of data, spatial and temporal analysis tools, and rigorous validation techniques in geomorphology. It uses computational intelligence as a pivotal tool alongside GIS, remote sensing, and other advanced technologies. Readers will find a holistic resource that fosters collaboration and knowledge exchange among geological fields, aiming to address geomorphological challenges, hazards, and solutions. By harnessing AI, GIS, remote sensing, machine learning, and geophysical techniques, it offers new dimensions to existing assessment methods and techniques.

### **Key Features**

- Applies quantitative geomorphology techniques to different geological topics through interdisciplinary practices
- Addresses the use of high and very-high resolution satellite imagery in geomorphic research for monitoring and assessment of quantitative geomorphology
- Provides guidance on quantitative techniques for assessing anthropogenic influences on natural materials and Earth processes

# Table of contents

## **Part I. Foundational Quantitative Geomorphology: Introduction, theory and advances in quantitative geomorphology**

1. Surface morphology and related Earth-surface processes
2. The integration of multiple data to understand the evolution of the landscape through large time scales (geological time) and the adaptation of species (living beings and plants) to such changes
3. Math for geomorphologists
4. Quantitative Geomorphology: mechanics and chemistry landscape
5. Digital Terrain Analysis: Principles and Applications
6. Quantitative Geomorphometry: Concepts, Software, Applications
7. Understanding landscape evolution and interactions with the environment through quantitative methods
8. Understanding of how processes are correlated and what the data can tell us about the correlations and feedback processes
9. Why and how to quantify processes
10. AI and big data in quantitative geomorphology
11. Theoretical, experimental, and quantitative geomorphology

## **Part-II - The application of quantitative techniques to hot topics in geomorphology**

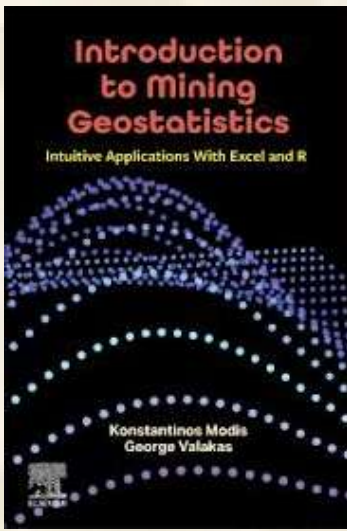
12. Past, present, and future environmental changes
13. Climate, tectonics, and regional structure, interactions between tectonic and surface processes
14. Anthropogenic geomorphology
15. Geomorphic hazards or Environmental multi-hazard
16. Geodiversity, bio geomorphology, predict species distribution, changes in biodiversity, and their adaptation to climate
17. Tectonics and/or anthropogenic processes
18. Effect of extreme methodological events or climate change on geomorphological processes and hazards
19. The role of quantitative Geomorphology in the development of urban and rural settlements
20. Landform classification
21. Scale, scaling laws and fractal applications to quantitative geomorphology
22. Use, advantages and limitations of big data and advanced technologies in quantitative geomorphology research

## **Part-III - Advanced Quantitative Geomorphology**

23. Geomorphological indices
24. Landscape evolution models (LEM)
25. Quantitative geomorphology modelling, mapping, and its spatial-temporal variability
26. Applications to quantitative geomorphology to Risk management
27. Geophysical detection of surface and under surface landforms using AL ERA
28. Sensibility of the data quality in quantitative geomorphology
29. Impacts of climate change on geomorphological processes and hazards (e.g., UAV photogrammetry, TLS, ALS, etc.)
30. Application of high and very-high spatial and temporal resolution satellite multispectral and stereo imagery in geomorphic research (e.g., Worldview, Geoeye, Dove, etc.)
31. Survey of the degradability in the desert area using AL ERA
32. Quantitative analysis of watershed geomorphology using AL ERA

## **Part-IV –Tools in advanced quantitative geomorphology**

33. GIS, remote sensing, and spatial modelling methods and applications, sedimentary records, and dating.
34. Multi-criteria GIS analysis in geomorphic susceptibility modelling
35. Artificial intelligence including Machine learning and Deep learning algorithms



# Introduction to Mining Geostatistics

## Intuitive Applications With Excel and R

Konstantinos Modis, Professor, National Technical University of Athens, Athens, Greece and George Valakas, Senior Researcher, School of Mining and Metallurgical Engineering, National Technical University of Athens (NTUA), Greece

ISBN: 9780443314803

VOLUME:

EDITION: 1

PUB DATE: November 2025

PRICE: 3449 Kč

FORMAT: Paperback

PAGES: c. 414

**PRIMARY AUDIENCE:** Under and post-graduates, faculty, and site engineers in mining or related mining industries.

**Thema Value:** Agribusiness & primary industries, Geology, geomorphology & the lithosphere

### An accessible presentation of the theory and practice of mining geostatistics, based on visualization and numerous case studies

#### Description

*Introduction to Mining Geostatistics: Intuitive Applications with Excel and R* is a practical and accessible guide to geostatistical techniques in mineral exploration, with a strong focus on reserves estimation. Designed for students, researchers, and industry professionals, this book blends fundamental concepts of theory with hands-on applications, using Excel and R to simplify complex analyses.

Key topics include:

Essential Statistical Foundations – Master core data analysis techniques for ore reserves estimation.

Sampling Strategies & Error Analysis – Minimize uncertainty and improve data reliability.

Spatial Analysis & Kriging – Use variograms, covariance functions, and Kriging algorithms to estimate unknown values from borehole data.

Multivariate Geostatistics – Model interdependent variables to enhance accuracy and predictive power.

Stochastic Simulation – Explore alternative estimation methods for risk assessment and scenario analysis.

Reserve Classification & Reporting – Understand global classification systems and key reserve estimation parameters.

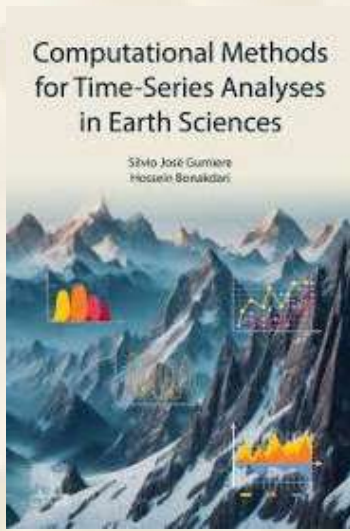
Filled with real-world case studies and practical examples, this book bridges theory and application, making geostatistics intuitive and approachable. Whether you're optimizing exploration projects, improving resource estimates, or conducting economic risk assessments, this guide equips you with the tools to make informed decisions.

#### Key Features

- Includes templated spreadsheet examples and exercises in Excel and R for accessible understanding
- Provides geometric instead of algebraic representation wherever possible
- Detailed visualization of geostatistics theory throughout the chapters

# Table of contents

1. Introduction to ore reserves estimation
2. Essential statistics and exploratory data analysis
3. Introduction to sampling and relevant errors
4. The stochastic model of estimation
5. Variograms and the structural analysis of a Random Function
6. Fitting theoretical models of variograms
7. Estimation of in situ resources
8. Verifying the accuracy of the estimation model
9. Multivariate geostatistics
10. Simulation of a Random Function
11. Classification schemes
12. Case studies



# Computational Methods for Time-Series Analyses in Earth Sciences

Silvio José Gumiere, Ph.D., Department of Soil Sciences, Laval University, Quebec City, Canada and Hossein Bonakdari, Associate Professor, Department of Civil Engineering, University of Ottawa, Ontario, Canada

**ISBN:** 9780443336317

**VOLUME:**

**EDITION:** 1

**PUB DATE:** July 2025

**PRICE:** 3887 Kč

**FORMAT:** Paperback

**PAGES:** c. 714

**PRIMARY AUDIENCE:** Advanced educational echelons, encompassing upper-level undergraduates, graduates, postdoctoral experts, and researchers within Earth and planetary sciences

**Thema Value:** Operational research, Enterprise software, Geology, geomorphology & the lithosphere, Earth sciences

## Systematically explores the application of computational and Machine Learning techniques in R to analyze and predict environmental phenomena

### Description

*Computational Methods for Time-Series Analyses in Earth Sciences* bridges the gap between theoretical knowledge and practical application, offering a deep dive into the utilization of R programming for managing, analyzing, and forecasting time-series data within the realm of Earth sciences. It systematically unfolds the layers of data manipulation, graphical representation, and sampling to prepare the reader for complex analyses and predictive modeling from the basics of signal processing to the nuances of machine learning. It presents cutting-edge techniques, such as neural networks, kernel-based methods, and evolutionary algorithms, specifically tailored to tackle challenges, and provides practical case studies to aid readers with utilizing the techniques covered.

*Computational Methods for Time-Series Analyses in Earth Sciences* is a valuable resource for scientists, researchers, and students delving into the intricacies of Earth's environmental patterns and cycles through the lens of computational analysis and guides readers through various computational approaches to deciphering spatial and temporal data.

### Key Features

- Focuses on the use of R for time-series analysis and the application of these methods directly to Earth and environmental datasets
- Integrates Machine Learning techniques, enabling readers to explore advanced computational methods for forecasting and modeling
- Includes case studies with real-world applications, providing readers with examples on how to translate computational skills into tangible outcomes

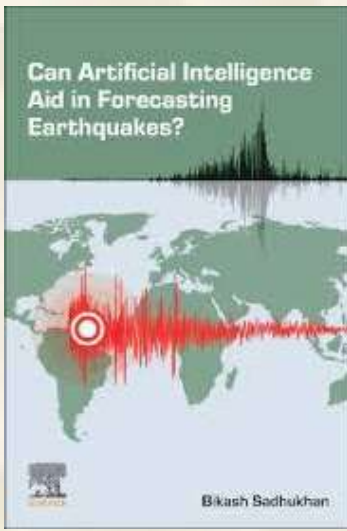
# Table of contents

## **Section 1: Theory and Computational Methods**

1. Introduction to R: Data manipulation, graphics, and sampling
2. Time series analysis for earth sciences with R
3. Signal processing with R for earth sciences.
4. Spatial Analyses with R for earth sciences
5. Deterministic modelling with R for earth sciences
6. Machine learning with R for earth sciences

## **Section 2: Case of Studies and Applications**

7. Predicting Sandy Soils' Hydraulic Properties and Drainage Capacities with Neural Networks
8. Prognostication of Real-Time Hourly Precipitation using Kernel-based Techniques
9. Integrating Upstream Runoff and Local Rainfall for Real-Time Flood Prediction
10. Pre-diagnosis of Flooding Using Real-Time Monitoring of Climate Parameters
11. Comparing Local vs. External Data Analysis for Forecasting
12. Evolutionary Kernel Extreme Learning Machine for Real-Time Forecasting
13. A Stochastic AI Method for Predicting Climatic Variables' Spatio-Temporal Changes Under Future Climates – Data Preparation and Preprocessing
14. A Novel AI Stochastic Approach for Predicting Spatio-Temporal Variables and Changes Under Future Climate Conditions: Google Earth Engine's Benefits and Challenges; An Intro to SOILPARAM APP
15. A Novel AI Stochastic Method for Predicting Changes in Space and Time: Linear Modeling
16. A Novel AI Stochastic Method for Predicting Changes: Nonlinear Modeling
17. A Combination of Satellite Observations and Machine Learning Technique for Terrestrial Anomaly Estimation



# Can Artificial Intelligence Aid in Forecasting Earthquakes?

Bikash Sadhukhan, Associate Professor in the Department of Computer Science and Engineering at Techno International New Town, Kolkata, West Bengal, India

**ISBN:** 9780443383434

**VOLUME:**

**EDITION:** 1

**PUB DATE:** September 2025

**PRICE:** 3449 Kč

**FORMAT:** Paperback

**PAGES:** c. 320

**PRIMARY AUDIENCE:** Primarily researchers and academics involved in the fields of geophysics, seismology, and data science

**Thema Value:** Enterprise software, Volcanology & seismology, Operational research, Earth sciences

## An in-depth analysis of the latest thinking on the applicability of artificial intelligence in earthquake forecasting and early warning systems

### Description

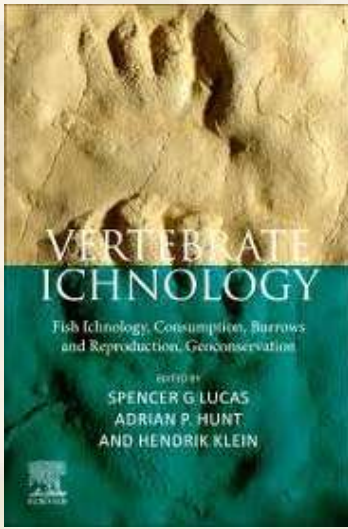
*Can Artificial Intelligence Aid in Forecasting Earthquakes?* explores the potential of AI in revolutionizing earthquake forecasting and early warning systems. This book delves into the latest advancements in computational intelligence, rule-based approaches, machine learning, and deep learning algorithms. By examining the evolution of research and the current state of earthquake early warning systems, the author sheds light on the data typically used in seismic forecasting. Other significant points include an analysis of various AI techniques for earthquake prediction and early warning, a discussion on the advantages and limitations of AI-based forecasting, and future implications for the field.

### Key Features

- Explores innovative advancements in artificial intelligence for earthquake forecasting and prediction and how these techniques, especially deep learning algorithms, could eventually outperform other methods
- Compares various AI methods, including computational intelligence, rule-based approaches, machine learning, and deep learning algorithms
- Offers insights into the latest advancements in seismic data analysis, helping readers navigate complexities such as interpreting seismic signals and integrating diverse datasets

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1. Introduction
2. Earthquake Early Warning systems
3. Evolution of Earthquake Forecasting Research
4. Data Used in Earthquake Prediction
5. AI Techniques for Earthquake Prediction
6. Application of AI Techniques for Earthquake Forecasting
7. Advantages and Limitations of AI-Based Earthquake Prediction
8. Conclusions



# Vertebrate Ichnology

## Tracks and Trails, Consumption, Digging and Reproduction, Geoconservation

Edited by : Spencer G Lucas, Stratigrapher and Paleontologist, New Mexico Museum of Natural History, Albuquerque, New Mexico, USA; Adrian Hunt P, Paleontologist, Flying Heritage and Combat Armor Museum, USA and Hendrik Klein, Independent Researcher, Saurierwelt Palaontologisches Museum, Germany

**ISBN:** 9780443383519

**VOLUME:**

**EDITION:** 1

**PUB DATE:** August 2025

**PRICE:** 4520 Kč

**FORMAT:** Paperback

**PAGES:** c. 778

**PRIMARY AUDIENCE:** Advanced students, graduates, academics, researchers, and professionals in the fields of Earth and Planetary sciences, especially paleontology, ichnology, and geoconservation

**Thema Value:** Meteorology & climatology, Palaeontology

## A detailed exploration of the vertebrate trace fossil record through consumption, reproduction, and geoconservation in Earth's history

### Description

*Vertebrate Ichnology: Fish Ichnology, Consumption, Burrows and Reproduction, Geoconservation* is a comprehensive and meticulously researched review and analysis of the entire vertebrate trace fossil record, shedding light on lesser-known vertebrate traces beyond footprints. From vertebrate burrows to the ichnology of reproduction, each chapter provides valuable insights and up-to-date information. The book explores a wide range of topics, including consumption through coprolites, dentalites, regurgitalites, and other trace fossils that are evidence of vertebrate predation and consumption.

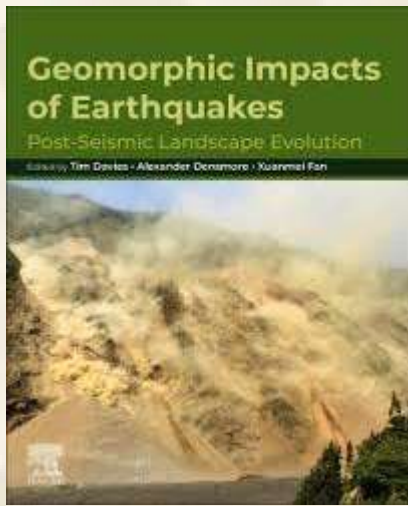
This authoritative reference provides students, researchers, and professionals in the field of Earth and Planetary sciences with updated information on the geological heritage of vertebrate ichnosites and their importance in geoconservation efforts.

### Key Features

- Explores diverse aspects of vertebrate ichnology, including fish imprints, gregarious behavior evidence, and detailed analyses of vertebrate consumption through various trace fossils
- Provides comprehensive coverage of vertebrate burrows, the ichnology of reproduction, and the geological heritage of vertebrate ichnosites
- Written by leading experts in vertebrate trace fossils, ensuring an authoritative and up-to-date reference for researchers, academics, and professionals in the field
- Includes over 100 detailed and striking figures

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1. Fish Trails and Imprints
2. Analyzing Coprolites: Different Methods for the Study of Coprolites
3. Dentalites
4. Regurgitalites
5. Consumulites
6. Coprolites
7. Gastroliths
8. Pabulites, Digestilites, Micturalites and Other Trace Fossil Evidence of Predation and Consumption
9. Vertebrate Burrows
10. The Ichnology of Reproduction in Fossil Tetrapods
11. Vertebrate Ichnosites as Geological Heritage: a Global Synthesis of Best Practices in Geoconservation
12. The Quaternary record of vertebrate tracks and trackways
13. Walk the world and beyond: Hominin tracks and trackways
14. Evidence from fossil vertebrate tracks of gregarious behavior, ichnopathologies and locomotion



# Geomorphic Impacts of Earthquakes

## Post-Seismic Landscape Evolution

Edited by : Tim Davies, Professor, School of Geological Sciences, University of Canterbury, New Zealand; Alexander Densmore, Deputy Head, Department of Geography, Durham University, UK and Xuanmei Fan, Chengdu University of Technology, China

ISBN: 9780443403750

VOLUME:

EDITION: 1

PUB DATE: September 2026

PRICE: 3199 Kč

FORMAT: Paperback

PAGES: c. 381

**PRIMARY AUDIENCE:** Academics, students, scientists, engineers, hazard/risk analysts in the field of Earth Sciences (especially geomorphology, geology, natural hazards, etc.) who need to understand and explain landforms and the events that form them, to anticipate and quantify future landscape dynamics, and to assess hazards and risks for land-use planning

**Thema Value:** Geology, geomorphology & the lithosphere, Geophysics

## Summarizes our knowledge of the nature, extent, and duration of earthquake impacts on the landscape, extending beyond initial impact and fault ruptures

### Description

*Geomorphic Impacts of Earthquakes: Post-Seismic Landscape Evolution* summarizes the full range of landscape alterations that can result from large earthquakes, ranging from slope instability and river aggradation to prograded coastlines. The book underpins the consequences of major earthquakes, which are increasing as Earth's population burgeons and climate and anthropogenic effects are ongoing. Although the damage to society that results directly from the shaking and ground rupture in large earthquakes is well known, the consequential effects of seismicity on the landscape causes earth surface deformations and hazards that are only now being fully understood.

This book will help readers professionally engaged in the Earth sciences be better prepared to assess the full range of natural hazards that threaten particular locations, and to work out how to evaluate their contribution to societal risks.

### Key Features

- Explicitly addresses the variety of processes and landforms resulting from the geomorphic cascade that is triggered by large earthquakes
- Provides the reader with a basis of geomorphic process knowledge to underpin the ability to foresee the impacts of ground shaking and fault rupture on landscapes
- Links seismo-geomorphic processes to hazards resulting from the impact of those processes to analyze the impacts of these processes on society

# Table of contents

## **Section A - Fundamentals**

1. Introduction: Tectonics, Earthquakes, and Landforms: The Big Picture
2. Large Earthquakes – Spatio-Temporal Distribution and Aftershocks
3. Coseismic Ground Motion
4. Rock Fracture and Ground Failure
5. Earth Surface Processes
6. Seismotectonic-Geomorphic Event Cascades

## **Section B – Tectonic Processes and Morphologies**

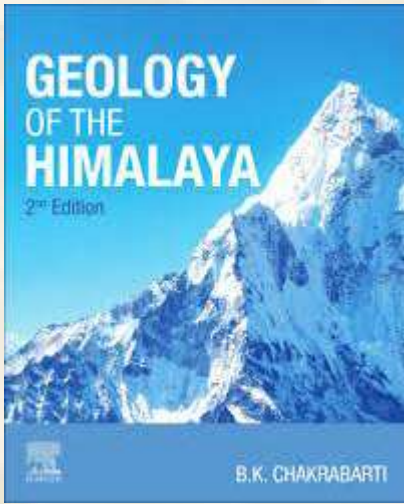
7. Fault Trace Processes
8. Slope Failure Processes
9. Coseismic Landslides and Rockfalls, Paraseismic Landslides, Source and Deposit Morphologies
10. Liquefaction and lateral spreading
11. Fluvial Responses to Fault Offset and Uplift, and to Sediment Inputs
12. Glacial Processes and Impacts
13. Coastal Processes and Impacts
14. Marine Processes
15. Post-Earthquake Sediment and Fluxes
16. Geomorphic Indicators of Past Earthquakes
17. Climate Change Influences on Earthquake Geomorphology
18. Anthropic Influences on Earthquake Geomorphology

## **Section C - Case Studies**

19. 1999 Chichi earthquake, Taiwan (remote sensing and analysis, and fluvial impacts)
20. 2008 Wenchuan earthquake, China (remote sensing and analysis, post-seismic debris flows, and river aggradation)
21. 2011 Tohoku earthquake (unexpected magnitude, geomorphic evidence of prior events, and tsunami)
22. 2015 Gorka earthquake, Nepal (mass movements and societal impacts)
23. 2016 Kaikoura earthquake (multiple fault ruptures, landslides and fluvial impacts)

## **Section D – Conclusion**

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25. Summary and Future Perspectives



# Geology of the Himalaya

B.K. Chakrabarti, Emeritus Director, Geological Survey of India, India

**ISBN:** 9780443405273

**VOLUME:**

**EDITION:** 2

**PUB DATE:** April 2026

**PRICE:** 3770 Kč

**FORMAT:** Paperback

**PAGES:** c. 482

**PRIMARY AUDIENCE:** Students, postgraduates, early career researchers, academics, and professionals in the Earth and Planetary Sciences, who need a comprehensive and contemporary analysis of tectonic processes with a specific focus on the Himalayan region

**Thema Value:** Geology, geomorphology & the lithosphere

## Provides the most sophisticated metamorphic and igneous rock data collected across various Himalayan geographic sectors

### Description

*Geology of the Himalaya, Second Edition* presents sophisticated, structural, metamorphic, and igneous rock data across various Himalayan geographic sectors, with a focus on Precambrian and Cenozoic tectonics and the tectonic evolution of the Himalayas that challenges traditional concepts and presents cutting-edge geological insights. This revised edition delves into the metamorphic and igneous rock data of the Himalayan geographic sectors, providing detailed analyses of petrography, metamorphism, structure, mineralization, and regional tectonic research. By incorporating recent geological inputs, the book justifies a paradigm shift in our understanding of Himalayan orogeny, offering a fresh perspective on the region's geological evolution.

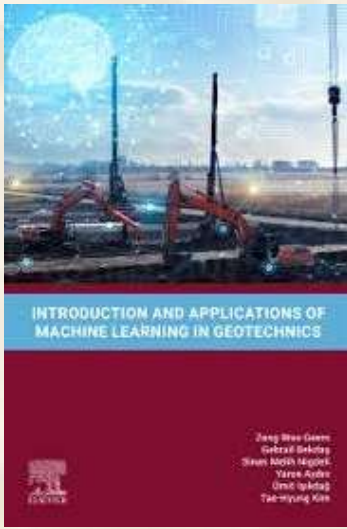
Readers will better understand the geological diversity and structure of the Himalayan belt, along with new techniques that have applications in a host of global geological settings. In addition, users will learn about the geological diversity and structure of the Himalayan belt and new techniques that have broad applications in global geological settings.

### Key Features

- Features a vast amount of geological research data collected in the Himalayas over the past 50 years
- Presents analysis and interpretation techniques to aid scientists in conducting fieldwork and research
- Provides the latest information on geodynamic concepts, from isostasy over continental collision to feedback mechanisms between tectonics and climate
- Focuses on Precambrian and Cenozoic tectonics and the holistic tectonic evolution of the Himalayas, offering new insights and perspectives that challenge existing paradigms
- Authored by a recognized global expert on the geology of the Himalayan belt with decades of experience

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# Introduction and Applications of Machine Learning in Geotechnics

Zong Woo Geem, Department of Smart City, Gachon University, South Korea; Gebrail Bekdas, Researcher in Mechanic, Istanbul University, Cerrahpaşa, Turkey; Sinan Melih Nigdeli, Researcher, Mechanics, Istanbul University, Cerrahpaşa; Yaren Aydın, Research Assistant, Mechanics, Istanbul University, Cerrahpaşa; Ümit Işıkdağ, Professor of Construction Informatics, Department of Architecture, Mimar Sinan Fine Arts University, Turkey and Tae-Hyung Kim, Professor, Department of Civil Engineering, National Korea Maritime and Ocean University, South Korea

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**PRIMARY AUDIENCE:** Graduate students, faculty, researchers, and engineers in geotechnical engineering, civil engineering, geology and geophysics

**Thema Value:** Earth sciences, Geology, geomorphology & the lithosphere, Operational research, Enterprise software

## Provides a comprehensive source of knowledge and applications for artificial intelligence methods in geotechnics

### Description

*Introduction and Applications of Machine Learning in Geotechnics* offers a comprehensive exploration of machine learning methodologies and their diverse applications in geotechnical engineering. The book begins with a detailed review of machine learning methods tailored for geotechnical applications, setting the foundation for subsequent chapters. Regression models are utilized to predict shear wave velocities while optimization-based approaches are employed to determine the optimal dimensions of reinforced concrete (RC) retaining walls. The book further explores the identification of gravelly soil through optimized machine learning models and predicts stress-strain responses using data from simple shear tests.

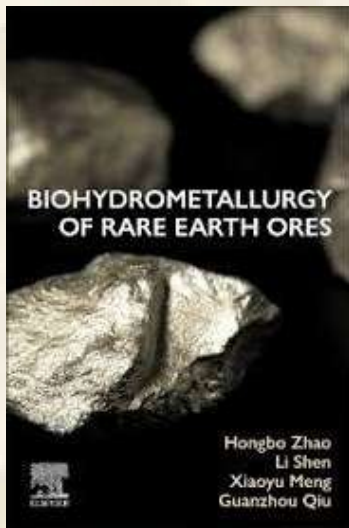
Additionally, it outlines the forecasting of liquefaction events triggered by seismic activities and estimates the uniaxial compressive strength of soil using machine learning techniques. The prediction of vertical effective stress and specific penetration resistance is examined to enhance soil characterization and geotechnical analyses. The book's authors provide valuable insights for geotechnical engineers and researchers seeking to leverage advanced computational tools for enhanced geotechnical assessments and design processes.

### Key Features

- Provides a systematic overview of machine learning and optimization applications in geotechnical engineering
- Demonstrates real-world implementations for soil classification, seismic response, and structural–geotechnical interaction
- Introduces interpretable and explainable AI methods for transparent engineering decision-making
- Emphasizes sustainable and data-driven solutions through hybrid modeling and metaheuristic optimization

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# Biohydrometallurgy of Rare Earth Ores

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**PRIMARY AUDIENCE:** Researchers, engineers, and graduate students in Mining, Minerals Processing and Extractive Metallurgy (including biomining/biohydrometallurgy), REEs recovery and utilization

**Thema Value:** Industrial chemistry & chemical engineering, Agribusiness & primary industries, Geology, geomorphology & the lithosphere

## Explores innovative bioleaching techniques and sustainable recovery methods for extracting rare earth elements from ores

### Description

*Biohydrometallurgy of Rare Earth Ores* offers an in-depth exploration of innovative bioleaching techniques for the extraction of rare earth elements that is critical for various high-tech applications. The book begins with foundational concepts in bioleaching, explaining how microorganisms and their metabolites can facilitate the extraction of REEs from ores. Further sections examine different biological approaches, including the use of native and genetically improved microorganisms, and highlight the role of coordination chemistry in enhancing leaching processes. The text also delves into comparative analyses of chemical versus bioleaching methods, emphasizing the advantages of biological techniques in terms of efficiency and environmental sustainability.

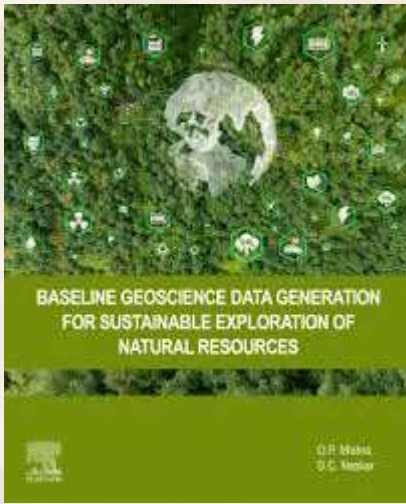
Additionally, the book addresses the environmental impacts of bioleaching practices, providing a holistic view of the sustainability of these methods while also detailing the recovery processes of REEs from bioleaching solutions and exploring various methods such as inorganic and organic precipitation, biosorption, and the utilization of waste-derived metabolites. It will serve as a valuable resource for researchers, practitioners, and industry professionals interested in the sustainable extraction of rare earth elements.

### Key Features

- Presents advanced biomining and biohydrometallurgy techniques that utilize microorganisms and their metabolites for the clean extraction of rare earth elements
- Offers eco-friendly alternatives to conventional chemical leaching methods
- Examines the challenges associated with extracting rare earth elements from low-grade ores
- Provides insights into efficient and sustainable practices that can mitigate environmental risks while maximizing resource recovery
- Compiles and analyzes extensive research findings and practical applications related to ion-adsorption type rare earth ores

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# Baseline Geoscience Data Generation for Sustainable Exploration of Natural Resources

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**FORMAT:** Paperback

**PAGES:** c. 442

**PRIMARY AUDIENCE:** Graduate students, educators, researchers, and engineers in Geophysics, Geology, Environmental Science, Geospatial Science, and those involved with the exploration of rare earth elements and critical minerals

**Thema Value:** Geophysics, Agribusiness & primary industries, Geology, geomorphology & the lithosphere, Volcanology & seismology

## Provides a comprehensive resource on advanced geophysical techniques for exploration and management

### Description

*Baseline Geoscience Data Generation for Sustainable Exploration of Natural Resources* offers a comprehensive examination of the critical role that baseline geoscience data plays in the sustainable exploration of natural resources. The book highlights the importance of global geophysical mapping as a catalyst for mineral exploration, providing an overview of various geophysical techniques essential for generating baseline data. It explores advanced methodologies in potential field surveying, geoelectrical surveying, electromagnetic techniques, and remote sensing, underscoring their applications in sustainable resource management. The text also examines geospatial surveying techniques, including GIS and GPS, and introduces innovative drone-based geoscientific surveying methods that enhance data collection efficiency.

Additionally, the book covers seismic surveying techniques and marine mineral resource exploration, offering a global perspective on national geophysical mapping programs and their significance in mineral exploration. The discussion on emerging technologies, including artificial intelligence and machine learning, emphasizes the need for ethical considerations in resource exploration. Through case studies and practical applications, readers gain insights into effective data acquisition planning and strategies for utilizing geophysical applications in mineral exploration.

### Key Features

- Focuses on diverse geoscientific mapping techniques with the corresponding efficacies of different mapping techniques and methodologies to manage natural resources, such as groundwater and minerals of different categories, including critical minerals with minimal environmental impacts
- Details real-world examples showcasing geophysical investigations in association with geological and geochemical mapping techniques in natural resource exploration
- Provides detailed explanations of seismic, magnetic, gravity, and electromagnetic, and geophysical well logging exploration methods for sustainable exploitation of natural resources.

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