

Advances in Science, Technology & Innovation
IEREK Interdisciplinary Series for Sustainable Development



Zhihua Zhang · Nabil Khélifi · Abdelkader Mezghani
Essam Heggy *Editors*

Patterns and Mechanisms of Climate, Paleoclimate and Paleoenvironmental Changes from Low-Latitude Regions

Proceedings of the 1st Springer Conference of the
Arabian Journal of Geosciences (CAJG-1), Tunisia 2018

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Preface

The Mediterranean and Middle East region is located at a crossroad of global climate patterns. There is a convergence between various maritime conditions and different continental air masses from the adjacent extensive lands which leads to diverse climates over this region in view of the extreme differences in topographical features and atmospheric conditions. In spatial scale, various climate and environmental parameters vary considerably across the Mediterranean and Middle East and even within countries. In temporal scale, there are significant climate and environmental changes occurring over the past thousands of years. Generally, the Mediterranean and Middle East are characterized by hot and arid climate, already intolerable for human beings in many parts. Furthermore, global warming is causing serious water scarcity, heat waves, and other natural disasters across this region today and in the near future. In order to make suitable mitigation and adaptation measures, it is critically important to study how climate and environment in the Mediterranean and Middle East have changed across a wide range of timescales so that we can better assess the impacts of future climate and environmental changes across this region. Unfortunately, at present, the Mediterranean and Middle East have not been deeply investigated and assessed yet, compared with other regions of the world such as Europe and North America.

This proceedings volume is based on the best papers accepted for presentation during the 1st Springer Conference of the Arabian Journal of Geosciences (CAJG-1), Tunisia 2018. The book offers new climate and environmental studies by experienced researchers mainly from research institutes in the Mediterranean and Middle East region. Main topics include: paleoclimate, paleoceanographic, and paleoenvironmental evolutions, spatiotemporal patterns of climate change, sea level variabilities, and climate change impacts and migration schemes. This volume gives new insights into patterns, mechanisms, and impacts of past and future climate/environmental changes in the Mediterranean and Middle East region. Latest observation and proxy datasets included in this book fill some important gaps in the existing climate, paleoclimate, and paleoenvironmental records across the region. In particular, some various case studies are included to show how to use some state-of-the-art tools and algorithms to analyze local climate and environmental evolutions.

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Zhihua Zhang
Nabil Khélifi
Abdelkader Mezghani
Essam Heggy

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About the 1st Springer Conference of the Arabian Journal of Geosciences (CAJG-1), Tunisia 2018



The *Arabian Journal of Geosciences (AJG)* is a Springer journal publishing original articles on the entire range of Earth sciences in partnership with the Saudi Society for Geosciences. The journal focuses on, but not limited to, research themes which have regional significance to the Middle East, the Euro-Mediterranean, Africa, and Asia. The journal receives on average 2000 submissions a year and accepts around 500 papers for publication in its 24 annual issues (acceptance rate 25%). It enjoys the participation of an editorial team of 100 international associate editors who generously help in evaluating and selecting the best papers.

In 2008, Prof. Abdullah Al-Amri, in close partnership with Springer, founded the Arabian Journal of Geosciences (AJGS). In this year, the journal celebrates its tenth anniversary. On this occasion and to mark this event, the Founder and Editor-in-Chief of the AJGS Prof. Al-Amri organized in close collaboration with Springer the 1st Conference of the Arabian Journal of Geosciences (CAJG-1) in Hammamet, Tunisia, from November 12th to 15th, 2018 (www.cajg.org).

The conference was an occasion to endorse the journal's long-held reputation for bringing together leading authors from the Middle East, the Euro-Mediterranean, Africa, and Asia who work in the wide-ranging fields of Earth sciences. The conference covered all cross-cutting themes of Geosciences and focused principally on the following ten tracks:

- Track 1. Climate, paleoclimate in the conference web page, without, and paleoenvironmental changes
- Track 2. Geoinformatics, remote sensing, geodesy
- Track 3. Geoenvironmental engineering, geomechanics and geotechnics, geohazards
- Track 4. Geography, geoecology, geoarcheology, geotourism
- Track 5. Geophysics, seismology
- Track 6. Hydrology, hydrogeology, hydrochemistry
- Track 7. Mineralogy, geochemistry, petrology in the conference web page, without, and volcanology
- Track 8. Petroleum engineering and petroleum geochemistry
- Track 9. Sedimentology, stratigraphy, paleontology, geomorphology, pedology
- Track 10. Structural/petroleum/mining geology, geodynamics, marine geology

The dynamic four-day conference provided more than 450 attendees with opportunities to share their latest unpublished findings and learn the newest geoscience studies. The event also allowed attendees to meet and discuss with the journal's editors and reviewers.

More than 950 short contributing papers to the conference were submitted by authors from more than 70 countries. After a pre-conference peer review process by more than 500 reviewers, 700 papers were accepted. These papers were published as chapters in the conference proceedings by Springer.

The conference proceedings consist of ten edited volumes, each edited by the following group of *Arabian Journal of Geosciences* (AJGS) editors and other guest editors:

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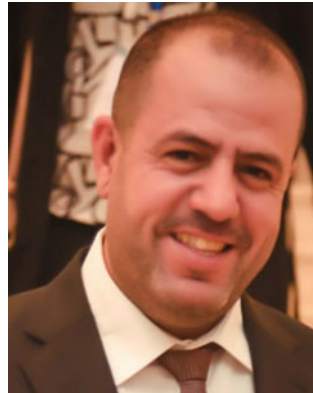
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