

# BULLETIN

PERSATUAN GEOLOGI MALAYSIA

EDITOR: JOY JACQUELINE PEREIRA



*Bulletin* of the  
GEOLOGICAL SOCIETY OF MALAYSIA

November 2023

No. 76





# Buletin Persatuan Geologi Malaysia

## Bulletin of the Geological Society of Malaysia

The Bulletin of the Geological Society of Malaysia (ISSN 0126-6187; e-ISSN 2637-109X), is a peer-reviewed open access interdisciplinary journal which publishes Earth Science research that addresses not only trending research areas but also high quality application topics. The scope of published articles covers engineering geology, environmental geology, geochemistry, geomorphology, geophysics, hydrogeology, mining geology, paleontology, petroleum geology, regional geology, sedimentology, stratigraphy, structural geology and tectonics.

The Bulletin supports researchers primarily focusing on Asia/SE Asia, but is not limited to this region, and publishes research papers of both scientific and technical nature that are of current interest and have potential impact on activities such as oil & gas exploration, mining, environmental issues, earthquakes, hazard assessment, disaster risk reduction and climate change adaptation. The Bulletin also promotes geological interest on subjects of a conservation nature such as geoheritage and geotourism.

The Bulletin is published twice a year (May and November) by the Geological Society of Malaysia (GSM). Digital copies are distributed to all members of the Society and can be downloaded from GSM's website. Printed copies are available at RM80.00 per copy (price exclusive of postage).

The Bulletin is indexed in the following abstracting and indexing services and databases: Scopus, MyJournal, MyCite, Ebsco, ASEAN Citation Index and AAPG Datapages.

GSM is committed to upholding standards of ethical behaviour at all stages of the publication process and we recommend the Committee on Publication Ethics (COPE) Best Practice Guidelines (<http://publicationethics.org/resources/guidelines>).

All articles published by the Bulletin are licensed under the Creative Commons Attribution 4.0 International License. No fee is imposed on authors for publishing in the journal.

For submission instructions please refer to the inner back page. For GSM membership, subscription and any enquiry concerning GSM and the Bulletin please contact:

Geological Society of Malaysia,  
c/o Department of Geology, University of Malaya,  
50603 Kuala Lumpur, Malaysia  
Tel: 603-79577036 Fax: 603-79563900  
Email: [geologicalsociety@gmail.com](mailto:geologicalsociety@gmail.com)

### Editor

Joy Jacqueline Pereira (Universiti Kebangsaan Malaysia, Malaysia)

### Assistant Editors

Baba Musta (Universiti Malaysia Sabah, Malaysia)

Meor Hakif Amir Hassan (University of Malaya, Malaysia)

Mohammed Hail Hakimi (Taiz University, Yemen)

### Editorial Board

Alfredo Lagmay (University of the Philippines, the Philippines)

Azman A. Ghani (University of Malaya, Malaysia)

Felix Tongkul (Universiti Malaysia Sabah, Malaysia)

Harry Doust (Vrije Universiteit Amsterdam, The Netherlands)

Ian Metcalfe (University of New England, Australia)

Ibrahim Komoo (Universiti Kebangsaan Malaysia, Malaysia)

Ng Tham Fatt (University of Malaya, Malaysia)

Peter R. Parham (Universiti Teknologi Malaysia, Malaysia)

Rajib Shaw (Keio University, Japan)

Robert Hall (University of London, UK)

### Editorial Management Committee

Lim Choun Sian, Muhammad Hatta Roselee, Elvaene James,  
Anna Lee, Nazatul Athirah Abdul Khalil, Wan Aida Wan Zahari

### Reviewers

Azman A. Ghani, Ian Metcalfe, James Anak Bachat, Kamilia Sharir, Khairul Arifin Bin Mohd Noh, Lim Choun Sian, Mazlan Madon, Meor Hakif Amir Hassan, Micheal Scherer, Muhammad Hatta Bin Roselee, Nur Iskandar Taib, Patrick Gou, Tad Choi, Tan Boon Kong, Teoh Ying Jia

Printed in Malaysia by  
Nets Printwork Sdn. Bhd., No. 56, Jln. PBS 14/4,  
Taman Perindustrian Bukit Serdang, 43300 Seri  
Kembangan, Selangor

# BULETIN

## PERSATUAN GEOLOGI MALAYSIA

### KANDUNGAN / CONTENTS

- 1 – 2 Editorial note: Contributing geological knowledge for sustainable development  
JOY JACQUELINE PEREIRA
- 3 – 25 3DKL v1.0: Creating the first 3D geological model of Kuala Lumpur  
MARCUS R. DOBBS, QALAM A'ZAD ROSLE, DALILA AHMAD, HELEN F. BURKE,  
MUHAMMAD EZWAN DAHLAN, JONTIH ENGGIHON, RICHARD B. HASLAM, NICHOLAS  
JACOB, KENNETH LAWRIE, A. GRAHAM LESLIE, ALVYN CLANCEY MICKEY, MUHAMMAD  
RAMZANEE MOHD NOH, SYED OMAR, NIKKI A. SMITH, STEVE THORPE
- 27 – 45 Ion adsorption-type rare earth element deposits in western Peninsular Malaysia: A  
case study in Bukit Enggang Granite, Kedah  
FAKHRUDDIN AFIF FAUZI, EDWIN JAMES, MUHAMMAD SUFI MUSA, HAMDAN ARIFFIN,  
ABDULLAH SULAIMAN, MAHAT SIBON, ABDUL HADI ABDUL RAHMAN, MUHAMMAD  
FALAH ZAHRI, AZIZAN ALI
- 47 – 53 Integrated geophysical methods used to explore geothermal potential areas in  
Sigung-Ogung, North Sumatra, Indonesia  
MUHAMAD KADRI, NORDIANA MOHD MUZTAZA, MOHD NAWAWI MOHD NORDIN,  
MUHAMMAD TAQUDDIN ZAKARIA, FARID NAJMI ROSLI, MUSTAPHA ADEEJO  
MOHAMMED, SITI ZULAIKA
- 55 – 62 Rock - soil transition during weathering of rhyolite  
JOHN KUNA RAJ
- 63 - 79 Estimation of uplift and erosion in the Miri area of northwest Sarawak, Malaysia: A  
multidisciplinary approach  
FRANZ-LUITPOLD KESSLER, WAN HASIAH ABDULLAH
- 81 – 99 Multi-phase subsidence history of the Sarawak continental margin and its regional  
significance  
MAZLAN MADON, JOHN JONG
- 101 – 129 The Kuching Formation: A deep marine equivalent of the Sadong Formation, and  
its implications for the Early Mesozoic tectonic evolution of western and southern  
Borneo  
H. TIM BREITFELD, STUART D. BURLEY, THOMSON GALIN, JULIANE HENNIG-  
BREITFELD, ROSLAN RAJALI

EDITOR: JOY JACQUELINE PEREIRA



*Bulletin of the*  
GEOLOGICAL SOCIETY OF MALAYSIA

Copyright:

Copyright 2023 by the Authors. Licensee Geological Society of Malaysia.  
The articles in the journal are open access articles distributed under the terms and conditions of the  
Creative Commons Attribution (CC-BY) License 4.0.

## **PERSATUAN GEOLOGI MALAYSIA** **Geological Society of Malaysia**

### **Council 2023/2024**

President :	Mohd Hariri Arifin
Vice President :	Meor Hakif Amir Hassan
Secretary :	Ling Nan Ley
Assistant Secretary :	Norazianti Asmari
Treasurer :	Lim Choun Sian
Editor :	Joy Jacqueline Pereira
Immediate Past President :	Ahmad Nizam Hasan
Councillors :	Abdull Halim bin Abdul Ahmad Zulqurnain bin Ghazali Cindy Simba Ngumbang Ak Kadir Mohd Shafiq Firdauz Abdul Razak Muhammad Hatta Roselee Nor Shahidah Mohd Nazer Siti Nur Fathiyah Jamaludin Tan Boon Kong

The Geological Society of Malaysia was founded in 1967 with the aim of promoting the advancement of geoscience, particularly in Malaysia and Southeast Asia. The Society has a membership of about 700 local and international geoscientists.

Published by  
Geological Society of Malaysia  
c/o Department of Geology, University of Malaya, 50603 Kuala Lumpur  
Tel: 603-79577036 Fax: 603-79563900  
Email: [geologicalsociety@gmail.com](mailto:geologicalsociety@gmail.com)  
<http://www.gsm.org.my/>

This publication  
is financed by the  
Society's Publication Fund

Printed by  
Nets Printwork Sdn. Bhd., No. 56, Jalan PBS 14/4, Taman Perindustrian Bukit Serdang,  
43300 Seri Kembangan, Selangor