

# **International Conference on Geological Engineering and Geosciences (ICGoES 2021)**

IOP Conference Series: Earth and Environmental Science  
Volume 851

Yogyakarta, Indonesia  
16 - 18 March 2021

## **Editors:**

**Tsutomu Sato  
Klaus Reicherter  
Yasuo Miyabuchi  
Subagyo Pramumijoyo  
Teuku Faisal Fathani**

**Myo Thant  
Patrick Lachassagne  
Pipat Laowattanabandit  
Nguyen Bach Thao  
Mohd Ashraf Mohamad Ismail**

ISBN: 978-1-7138-4815-8  
ISSN: 1755-1307

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

This work is licensed under a Creative Commons Attribution 3.0 International Licence.  
Licence details: <http://creativecommons.org/licenses/by/3.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2022)

For permission requests, please contact the Institute of Physics  
at the address below.

Institute of Physics  
Dirac House, Temple Back  
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481  
Fax: 44 1 17 920 0979

[techtracking@iop.org](mailto:techtracking@iop.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

Preface	
Peer Review Declaration	
Earthquake Risk Assessment of the Opak and Merapi-Merbabu Active Faults to Support Mitigation Program in Yogyakarta Province and Its Vicinity .....	1
<i>J Murjaya, S Pramumijoyo, D Karnawati, Daryono, I Meilano, P Supendi, S Ahadi, G I Marliyani, Imananta, F Syukur, D S Sianipar, A Krisno</i>	
Reviewing the Characteristics of Slip Behaviour for Megathrust Earthquake at Sumatera Using Vertical Derivative of GOCE Satellite Gravity Field .....	12
<i>Aristo, Iskandarsyah</i>	
Analysis of the Effect of Magnetotelluric Data Quality Improvement Using Rho Variance and Edit XPR Parameters in Densely Populated Areas .....	23
<i>A Widodo, W Lestari, D D Warnana, F Syaifuddin, R S Rivensky, R Z Ilmawan</i>	
Characteristic of 27th September – 7th October 2017 Earthquake Swarms in Jailolo Volcano, West Halmahera, Indonesia, Based on Hypocenter and B-Value.....	34
<i>A P Astuti, N S Arifuddin, M I Tahir, E M Elsera, M F I Massinai</i>	
Active Tectonics of the Yogyakarta Area (Central Java, Indonesia): Preliminary Findings Obtained from a Tectonic-Geomorphologic Evaluation .....	41
<i>S Pena-Castellnou, V Steinritz, G I Marliyani, K Reicherter</i>	
Spatial Modeling of Tsunami for Evacuation Planning in Ciletuh Bay, Sukabumi, West Java .....	51
<i>Dinda Z Arifah, Supriatna, Ratna Saraswati</i>	
GIS-Based Study of Tsunami Risk in the Special Region of Yogyakarta (Central Java, Indonesia) .....	60
<i>V Steinritz, S Pena-Castellnou, G I Marliyani, K Reicherter</i>	
The Physical Characteristics of the Small Volcanic Island of Tidore and Hiri to Support Disaster Management in Maluku.....	70
<i>M A Marfai, B W Mutaqin, D S Hadmoko, H Wijayanti, F Lavigne, A Faral</i>	
Geological Structures Control on the Streamflow Orientation Pattern in the Cijulang Area and Its Surroundings, Garut, West Java, Indonesia.....	78
<i>A Setianto, G Yugamaris, I W Warmada, P Bangun</i>	
Effect of Opening Depth of Oblique Weir with an Opening on River Bed Morphology .....	86
<i>H Une, T Ohmoto, K Kuranaga</i>	
Thornthwaite and Mather Water Balance Method in Indonesian Tropical Area.....	97
<i>H Hendrayana, M Widyastuti, I A Riyanto, A Nuha, M Y Widasmara, N Ismayuni, I N Rachmi</i>	
Comparison of Three Recurrent Neural Networks for Rainfall-Runoff Modelling at a Snow-Dominated Watershed .....	111
<i>K Yokoo, K Ishida, T Nagasato, A Ercan, T Tu</i>	
Stable Isotopes Changes in Groundwater: A Case Study in Mudal and Clapar Springs, West Progo.....	120
<i>R A T Listyani</i>	

3D Stratigraphic Modelling of the Bangkok Basin Using Kriging on Borehole Data.....	132
<i>B Subedi, T Kitaoka, J Kiyono</i>	
Characterization of Shallow Groundwater Chemistry in the Yogyakarta Basin, Central Java.....	140
<i>L Kämpfner, T R Rüde, D P Eka Putra</i>	
Preliminary Conceptual Model of the Arjuno Welirang Hydrogeological System, and Comparison with the Bromo Tengger: An Illustration of the Hydrogeological Systems Diversity in Volcanic Areas.....	150
<i>B Baud, P Lachassagne, H Jourde, V De Montety, A Fadillah, N Dörfliger, H Hendrayana, A Rachmansyah</i>	
Deformation Identification Using DInSAR Multi Temporal Analysis Method in Supporting Infrastructure Development (case Study of the Area Around the Nation's New Capital).....	160
<i>A Puspita, Y Prihanto, S Martha, A A Martha, A G Gultom</i>	
Estimation of Near-Surface Temperature in Suwawa Geothermal Prospect, Gorontalo, Sulawesi, Indonesia, Based on Magnetotelluric and Artificial Neural Network .....	169
<i>M Maryadi, P Bramanthy, A Zarkasyi, H Mizunaga</i>	
Estimation of the Subsurface Sedimentary Structure of Amarpura Township (Mandalay Region) Based on Microtremor Survey.....	177
<i>P S Thein, K M O Kyaw, J Kiyono, S Pramumijoyo, T T Nu, K H Khaing, W M Than, T T Win, M Thant</i>	
Analysis of the Distribution of Seawater Intrusion Using Electrical Conductivity and Total Dissolved Solid Data and Intelligence for Residents in Sayung District, Demak Regency .....	187
<i>K L Ariwibowo, A M Riski, A S Fajarulloh, T T Putranto</i>	
Soil Stiffness Identification Using Fuzzy Logic Based on Seismic Tomography and Its Relationship with Dynamic Elastic Moduli.....	200
<i>L Yufajjiru, M Maryadi</i>	
Regression Kriging Analysis for Predicting the Shallow Depth Water from Sentinel-2 Satellite Multi-Spectral Images, Study Area: Coastline of Florida, USA.....	209
<i>B G Dewanto, I Arifianto, C Suhendi, M Fittipaldi</i>	
Groundwater Potential Zones Identification in Purwobinangun, Pakem, Sleman, D.I. Yogyakarta Using Vertical Electrical Sounding (VES).....	218
<i>S B Samodra, R T Sembiring, G R Ramadhan, H A Kharis, T R Siregar</i>	
Mass Transport Modelling of Total Organic Carbon in Groundwater to Determine the Location of Petroleum Fuel Pollutant Sources in the Area of Jlagran, Yogyakarta City, Indonesia .....	226
<i>E G Manek, D P E Putra, H Hendrayana</i>	
Study of Negative Skin Friction on Floating Piles Foundation Due to Long-Term Groundwater Extraction in Semarang, Indonesia.....	242
<i>M S Tazakka, B A Tirta, M A Popang, Y A Sariska</i>	
Urban Soil Assessment Caused by Heavy Metals Contamination in Yogyakarta City, Indonesia.....	262
<i>A T Sekarningsih, W Budianta, I W Warmada, H Hinode</i>	
Petrography and Geochemistry Preliminary Study of Pucangan Serpentinite Geosite Karangasambung – Karangbolong Geopark Central Java, Indonesia .....	269
<i>Isyqi, C Ansori</i>	

The Relationship of Physical and Mineralogical Properties and Geochemical Compositions of Limestone and Its Implications to the Quality as Cement Raw Material in Gunem District, Rembang Regency, Central Java .....	276
<i>T Winarno, J Marin, Nurjayanti</i>	
Petrogenesis of Botorubuh Igneous Rocks at Gunungkidul: A Preliminary Study for Paleomagmatism Phenomenon in the Southern Beach of Yogyakarta - Indonesia .....	284
<i>Y K Sari, A D Titisari, I W Warmada, F Hakim</i>	
Textural and Mineralogical Characteristics of Sand Grains of Oyo River Deposit at Yogyakarta, Indonesia: Implications on Sedimentation and Origin.....	296
<i>I F Lubis, A D Titisari, N S Irsani</i>	
Preliminary Study of the Origin of Mafic Mineral Megacrysts in Volcanic Rocks in the Southwestern Part of Kulon Progo Mountains, Indonesia.....	305
<i>L Aryani, F Hakim, A D Titisari, G Nugraha, C A Mahardika</i>	
Reconstruction of Groundwater Level at Kumamoto, Japan by Means of Deep Learning to Evaluate Its Increase by the 2016 Earthquake.....	316
<i>K Yokoo, K Ishida, T Nagasato, Y Kawagoshi, H Ito</i>	
Effects of the Spatial and Temporal Resolution of Meteorological Data on the Accuracy of Precipitation Estimation by Means of CNN .....	324
<i>T Nagasato, K Ishida, K Yokoo, M Kiyama, M Amagasaki</i>	
Identification of Paleotsunami Deposits Using XRF and Artificial Intelligence Methods on the Southern Coast of Lebak, Banten .....	332
<i>U Rikhasanah, M R Septyandy, Supriyanto</i>	
Artificial Intelligence Approach to Depositional Facies Characterization Based on Electrical Log Data .....	342
<i>G E Putri, A Haris, M R Septyandy</i>	
Gas Geochemistry Analysis in Candradimuka Crater, Mount Lawu, Central Java, Indonesia .....	352
<i>M F Bagaskara, A D Oktaviani, R Setyadi, D A Yoga, D N Sahdarani, D T Kurniadi</i>	
Hummock Size and Alignment in Gadung Debris Avalanche Deposit, Raung Volcanic Complex, East Java, Indonesia.....	358
<i>M L A Moktikanana, H E Wibowo, E Rahayu, A Harijoko</i>	
Re-Interpretation of Distribution of Lautan Pasir Caldera-Forming Eruption Products, Bromo-Tengger Caldera Complex, East Java.....	373
<i>R M P P Gunawan, G Ikhwanushova, A Harijoko, H E Wibowo, A Setianto</i>	
Effect of Power Plant Operating Conditions on Fly Ash and Bottom Ash Composition: A Case Study from Power Plant in Lampung .....	381
<i>D A A Besari, F Anggara, H T B M Petrus, W. Astuti, W.A. Husnah</i>	
The Potential of Lithium Enrichment in Lapindo Brantas, Mount Anyar, and Buncitan Mud Volcanoes, Sidoarjo District, East Java Province.....	390
<i>N A Sari, I W Warmada, F Anggara</i>	
Assessing the Undiscovered Resources of Uranium and Thorium in Mamuju, West Sulawesi.....	400
<i>W Cakrabuana, R C Ciputra, H Syaeful</i>	

Characteristics and Utilization of Clay Minerals in Kuwu Mud Volcano, Kradenan District, Grobogan Regency, Central Java Province .....	409
<i>I G A A S Sari, I W Warmada</i>	
Ore Characterization of LSE Gold Deposit in “X” Pit, Toka Tindung Project, North Sulawesi.....	417
<i>N A Raharjanti, I W Warmada, H T B M Petrus</i>	
Ore Mineralogy of Podiform-Type Chromite Deposit in Tedubara Area and Its Vicinity, Kabaena Island, Indonesia.....	427
<i>S Septiana, A Idrus, F Zaccarini, G Garuti, L D Setijadji</i>	
A Preliminary Study of Geology and Skarn of Cemorosewu Area, Bayat, Central Java, Indonesia.....	435
<i>W N Muhammad, N I Setiawan, S Husein, M Nukman</i>	
Overpressure’s Top and Generating Mechanism in “APR” Block, North Sumatra Offshore Area.....	444
<i>A Pradana, J Setyowiyoto, B Prasetyo, W Haidar</i>	
SEM-EDS Imaging of Multi-Stage Cleat Minerals Formation in the South Walker Creek Coals, Bowen Basin.....	454
<i>A K Permana, C R Ward</i>	
An Integrated Approach Using Microtremor Data for Field Development and Reservoir Monitoring: An Example from Betung Field, Jambi.....	466
<i>R. Pascariyativa, A Haris, M S A Alwi</i>	
The Testing of Qp and QsQp Equation in Kujung I Formation, East Java, Indonesia .....	476
<i>A Sadat, A Haris, Haryono, G A Dharmawan</i>	
Reservoirs Resistivity Correction Factor in Low Resistivity Pyritic Sandstone Reservoirs.....	483
<i>S Winardi, S S Surjono, D H Amijaya, W Suryanto</i>	
Petrographic Composition of Coke Product from Batu Ayau Formation Coking Coal, Kutai Basin, Central Kalimantan.....	493
<i>M L Farhan, D H Amijaya</i>	
Pedaro Formation, Equivalent of Plover Sandstone at Savu Island, Outer Banda Arc.....	504
<i>L D Santy, A J Widiatama</i>	

## **Author Index**