



New Developments in Environmental Science and Geoscience

**Proceedings of the International Conference on
Environmental Science and Geoscience (ESG 2015)**

Vienna, Austria, March 15-17, 2015

Edited by

Nikos Mastorakis
Cornelia Aida Bulucea

NEW DEVELOPMENTS in ENVIRONMENTAL SCIENCE and GEOSCIENCE

**Proceedings of the International Conference on Environmental Science
and Geoscience (ESG 2015)**

**Vienna, Austria
March 15-17, 2015**

NEW DEVELOPMENTS in ENVIRONMENTAL SCIENCE and GEOSCIENCE

**Proceedings of the International Conference on Environmental Science
and Geoscience (ESG 2015)**

**Vienna, Austria
March 15-17, 2015**

Copyright © 2015, by the editors

All the copyright of the present book belongs to the editors. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the editors.

All papers of the present volume were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.

Series: Energy, Environmental and Structural Engineering Series | 33

ISSN: 2227-4359

ISBN: 978-1-61804-283-5

NEW DEVELOPMENTS in ENVIRONMENTAL SCIENCE and GEOSCIENCE

**Proceedings of the International Conference on Environmental Science
and Geoscience (ESG 2015)**

**Vienna, Austria
March 15-17, 2015**

Organizing Committee

Editors:

Professor Nikos E. Mastorakis, Technical University of Sofia, Bulgaria
Professor Aida Bulucea, University of Craiova, Romania

Program Committee:

Prof. Bharat Doshi, John Hopkins University, Maryland, USA
Prof. Gang Yao, University of Illinois at Urbana - Champaign, USA
Prof. Lu Peng, Luisian State University, Baton Rouge, LA, USA
Prof. Y. Baudoin, Royal Military Academy, Brussels, Belgium
Prof. F.Rigas, School of Chemical Engineering, National Technical University of Athens, Greece.
Prof. S. Sohrab, Northwestern University, IL, USA
Prof. A. Stamou, National Technical University of Athens, Greece
Prof. A. I. Zouboulis, Dept. of Chemistry, Aristotle University of Thessaloniki, Greece
Prof. Z. A. Vale, ISEP - Instituto Superior de Engenharia do Porto Rua Antonio Bernardino de Almeida, Portugal
Prof. M. Heiermann, Dr., Department of Technology Assessment and Substance Flow, Potsdam, Germany
Prof. I. Kazachkov, National Technical University of Ukraine (NTUU KPI), Kyiv, Ukraine
Prof. A. M.A. Kazim, UAE University, United Arab Emirates
Prof. A. Kurbatskiy, Novosibirsk State University, Department of Physics, Russia
Prof. S. Linderoth, Head of Research on Fuel Cells and Materials Chemistry at Riso National Laboratory. Denmark
Prof. P. Lunghi, Dipartimento di Ingegneria Industriale, University degli Studi di Perugia, Italy
Prof. J. Van Mierlo, Department of Electrotechnical Engineering and Energy Technology (ETEC) Vrije Universiteit Brussel, Belgium
Prof. Pavel Loskot, Swansea University, UK
Prof. N. Afgan, UNESCO Chair Holder, Instituto Superior Tecnico, Lisbon, Portugal
Prof. F. Akgun, Gebze Kocaeli, Turkey
Prof. Fernando Alvarez, Prof. of Economics, University of Chicago, USA
Prof. Mark J. Perry, Prof. of Finance and Business Economics, University of Michigan-Flit, USA
Prof. Biswa Nath Datta, IEEE Fellow, Distinguished Research Prof., Northern Illinois University, USA
Prof. Panos Pardalos, Distinguished Prof. Director, Center for Applied Optimization, University of Florida, USA
Prof. Gamal Elnagar, University of South Carolina Upstate,Spartanburg, SC, USA
Prof. Luis Tavares Rua, Cmte Guyubricht, 119. Conj. Jardim Costa do Sol. Atalaia, Brazil
Prof. Igor Kuzle, Faculty of electrical engineering and computing, Zagreb, Croatia
Prof. Maria do Rosario Alves Calado, University of Beira Interior, Portugal
Prof. Gheorghe-Daniel Andreescu, "Politehnica" University of Timisoara, Romania
Prof. Jiri Strouhal, University of Economics Prague, Czech Republic
Prof. Morris Adelman, Prof. of Economics, Emeritus, MIT, USA
Prof. Germano Lambert-Torres, Itajuba,MG, Brazil
Prof. Jiri Klima, Technical faculty of CZU in Prague, Czech Republic
Prof. Goricanec Darko, University of Maribor, Maribor, Slovenia
Prof. Ze Santos, Rua A, 119. Conj. Jardim Costa do Sol, Brazil
Prof. Ehab Bayoumi, Chalmers University of Technology,Goteborg, Sweden
Prof. Robert L. Bishop, Prof. of Economics, Emeritus, MIT, USA
Prof. Glenn Loury, Prof. of Economics, Brown University, USA
Prof. Patricia Jota, Av. Amazonas 7675, BH, MG, Brazil
Prof. S. Ozdogan, Marmara University, Goztepe Campus, Kuyubasi, Kadikoy, Istanbul, Turkey
Prof. Prof. Jian Wang, Los Alamos National Laboratory, Los Alamos, NM, USA
Prof. Bruno Capaccioli, Universita di Bologna, Bologna, Italy
Prof. Ernst D. Schmitter, University of Applied Sciences Osnabrueck, Germany
Prof. Corina Carranca, University of Algarve, Portugal

Prof. Hing-Ho Tsang, Swinburne University of Technology, Melbourne, Australia
Prof. Paolo Budetta, University of Naples Federico II, Naples, Italy
Prof. Rui Pedro Juliao, Universidade Nova De Lisboa, Lisboa, Portugal
Prof. Victor M. Castano, Universidad Nacional Autonoma de Mexico, Mexioc City, Mexico
Prof. S. V. Dinesh, Siddaganga Institute of Institute of Technology, Tumkur, India
Prof. C. C. Sorrell, University of New South Wales, Sydney, Australia
Prof. Efthimios Karymbalis, Harokopio University, Athens, Greece
Prof. Belkheir Hammouti, Mohammed Premier University, Oujda, Morocco
Prof. Ismail Rakip Karas, Karabuk University, Turkey

Additional Reviewers

Jose Flores	The University of South Dakota, SD, USA
Abelha Antonio	Universidade do Minho, Portugal
Lesley Farmer	California State University Long Beach, CA, USA
Takuya Yamano	Kanagawa University, Japan
Miguel Carriegos	Universidad de Leon, Spain
Francesco Zirilli	Sapienza Universita di Roma, Italy
George Barreto	Pontificia Universidad Javeriana, Colombia
Eleazar Jimenez Serrano	Kyushu University, Japan
Tetsuya Yoshida	Hokkaido University, Japan
Philippe Dondon	Institut polytechnique de Bordeaux, France
Genqi Xu	Tianjin University, China
M. Javed Khan	Tuskegee University, AL, USA
Xiang Bai	Huazhong University of Science and Technology, China
Dmitrijs Serdjuks	Riga Technical University, Latvia
Hessam Ghasemnejad	Kingston University London, UK
José Carlos Metrôlho	Instituto Politecnico de Castelo Branco, Portugal
João Bastos	Instituto Superior de Engenharia do Porto, Portugal
Tetsuya Shimamura	Saitama University, Japan
Imre Rudas	Obuda University, Budapest, Hungary
Konstantin Volkov	Kingston University London, UK
Frederic Kuznik	National Institute of Applied Sciences, Lyon, France
James Vance	The University of Virginia's College at Wise, VA, USA
Angel F. Tenorio	Universidad Pablo de Olavide, Spain
Sorinel Oprisan	College of Charleston, CA, USA
Santoso Wibowo	CQ University, Australia
Jon Burley	Michigan State University, MI, USA
Kazuhiko Natori	Toho University, Japan
Shinji Osada	Gifu University School of Medicine, Japan
Francesco Rotondo	Polytechnic of Bari University, Italy
Deolinda Rasteiro	Coimbra Institute of Engineering, Portugal
Alejandro Fuentes-Penna	Universidad Autónoma del Estado de Hidalgo, Mexico
Moran Wang	Tsinghua University, China
Bazil Taha Ahmed	Universidad Autonoma de Madrid, Spain
Andrey Dmitriev	Russian Academy of Sciences, Russia
Masaji Tanaka	Okayama University of Science, Japan
Matthias Buyle	Artesis Hogeschool Antwerpen, Belgium
Kei Eguchi	Fukuoka Institute of Technology, Japan
Zhong-Jie Han	Tianjin University, China
Valeri Mladenov	Technical University of Sofia, Bulgaria
Ole Christian Boe	Norwegian Military Academy, Norway
Yamagishi Hiromitsu	Ehime University, Japan
Stavros Ponis	National Technical University of Athens, Greece
Minhui Yan	Shanghai Maritime University, China

Table of Contents

<u>Environmental Impact Test in Thermal Power Plants; Experimental and CFD Evaluation of Burning Alternative Fuels</u>	11
<i>Jesús M. Blanco, Lakhdar Remaki, Francisco Peña</i>	
<u>Urban Planner – Model for Land Use Suitability Assessment</u>	19
<i>Jaroslav Burian, Jan Brus, Stanislav Stastny</i>	
<u>Safety of Critical Facilities</u>	27
<i>Dana Prochazkova</i>	
<u>Flash Flood on July 21, 2014 in the Vratna Valley</u>	34
<i>P. Pekarova, V. Bacova Mitkova, P. Miklanek</i>	
<u>Development of Land Use in the Morava River Floodplain During the Past 175 Years</u>	39
<i>Vilém Pechanec, Ivo Machar, Helena Kilianová</i>	
<u>Model Parameters Estimation in Two River Basins in Slovakia and Korea</u>	43
<i>Pavol Miklanek, Hyosang Lee, Pavla Pekárová, Michal Danko</i>	
<u>Measuring Devices for Visualization of WJM and AWJM Technologies Physical Factors</u>	47
<i>Peter Poor, Michal Simon, Lídia Sobotová, Monika Karkova</i>	
<u>The Water Temperature Simulation in the Morava River Basin Watercourses</u>	53
<i>Dana Halmova, Pavla Pekarova, Jan Pekar, Katarina Kucarova</i>	
<u>Measurement Results of Longitudinal Dispersion Coefficient in Urban Sewer Networks under Dry Weather Conditions</u>	57
<i>Marek Sokáč, Yvetta Velísková</i>	
<u>Grey Water System Application – Water Savings and Use in the Hotel Building</u>	61
<i>Martina Rysulová, Daniela Káposztásiová, Zuzana Vranayová</i>	
<u>Infiltration Efficiency of Percolation Facility for its Safety Operation</u>	65
<i>Gabriel Markovič, Daniela Káposztásiová, Zuzana Vranayová</i>	
<u>Migration of Travel Time in a Common-Shot Gather by Structural Similarity</u>	70
<i>Hernando Castañeda M., José Luciano Maldonado, Rómulo Sandoval F.</i>	
<u>Taking Account of Covariance Estimation Uncertainty in Spatial Sampling Design for Prediction with Trans-Gaussian Random Fields</u>	79
<i>Gunter Spöck, Jürgen Pilz</i>	
<u>Authors Index</u>	99