Contents

Part I Keynote

1 Urban Landslides: Challenges for Forensic Engineering Geologists and Engineers ............................................. 3
S.F. Burns

2 Large-Scale Thematic Geological Mapping of Moscow Area ........... 11
Victor Osipov

3 Remote Sensing Role in Emergency Mapping for Disaster Response ..... 17
Piero Boccardo and Fabio Giulio Tonolo

4 Underground Urban Development: An Overview ................... 25
Eduardo F.J. De Mulder, C.C. Derk F. Van Ree and Kenny Wang

Part II Aggregates: The Most Widely Used Raw Material

5 A Study of Fine Aggregate Properties and Their Effect on the Quality of Cementitious Composite Materials ............................ 33
Revekka Fournari, Ioannis Ioannou and Dimitris Vatyliotis

Isabel Fernandes, Maria dos Anjos Ribeiro, Helena Martins, Maarten Broekmans, Ian Sims, Philip Nixon and Fernando Noronha

7 Environmental Impact and Sustainability in Aggregate Production and Use ................................................................. 41
S.W. Danielsen and E. Kuznetsova

8 Contrast Behavior of Sandstone from Mount Nemrut (Adiyaman-Turkey) After the Accelerated Weathering Tests ............... 45
Tamer Topal and Burcu Ertas Deniz

9 The ReAVA Project: Assessment of the Potential Alkali-Reactivity of Volcanic Aggregates from Azores Islands ............................... 51
Sara Medeiros, João Carlos Nunes, Tetsuya Katayama, Isabel Fernandes, António Santos Silva, Vidália Miranda and Dora Soares
10 Potential Reactivity to Alkalis of Portuguese Volcanic Aggregates for Concrete
Violeta Ramos, Isabel Fernandes, Fernando Noronha, Tetsuya Katayama, Dora Soares and António Santos Silva

11 Production of Lightweight Aggregates from Phosphate Washing Plant Sludge
Emna Fakhfakh, Imen Khiari, Walid Hajjaji, Mounir Medhioub, Fernando Rocha, Alberto López-Galindo and Fakher Jamoussi

12 Some Variations in Petrography of South African Karoo Dolerites and the Effects Thereof on Aggregate Properties
Robert Leyland

13 Environmental Issues Connected to the Quarry Lakes and Chance to Reuse Fine Materials Deriving from Aggregate Treatments
Sara Castagna, Giovanna Antonella Dino, Manuela Lasagna and Domenico Antonio De Luca

14 The Aggregates from Tunnel Muck and their Use as Secondary Raw Material: The Case Study of Turin Underground
Rossana Bellopede, David Colaiacomo, Paola Marini, Pierpaolo Oreste and Oscar Radis

15 Alkali Aggregate Reaction for Concrete Made with Tunnel Muck: Experimental Investigations
Rossana Bellopede, Marco Francini, Paola Marini, Alessandra Migheli, Enrico Moretti and Pierpaolo Oreste

16 Mix Design Parameters of Restoration Mortars: The Effect of Aggregate Characteristics
Maria Amenta, Ioannis Karatasios, Anna Kalagri, Pagona Maravelaki-Kalaitzaki and Vassilis Kilikoglou

17 Treatment and Exploitation of Waste Coming from Quarry Industries: Reuse as Aggregate
Giovanna Antonella Dino and Massimo Marian

18 The Effect of Feldspar, Mica and Clay Minerals on Compressive Strength of Mortar
Atiye Tugrul, Selahattin Hasdemir and Murat Yılmaz

19 Petrographic Examination of Mortar Bars of Swedish Aggregates Exposed to RILEM AAR2
Karin Appelquist, Jan Trägårdh, Magnus Döse and Mattias Göransson

20 Risk Assessment of Swedish Concrete as a Construction Material in Relation to Naturally Occurring Radiation from Different Aggregates
Magnus Döse
Contents

21 Aggregate Quality Mapping of Sustainable Substitutes for River Sand for Concrete Production in Eastern Botswana ................................. 107
Mattias Göransson, Lena Persson, Vincent Lekula
and Onkgopotse Ntibinyane

22 Influence of Geological Characteristics on Mechanical Properties of Crushed Stone Aggregates Produced from Meta-Volcanic Rocks in Finland ................................................................. 111
Torppa Akseli and Seppo Leinonen

23 Los Angeles and Micro-Deval Values of Volcanic Rocks and Their Use as Aggregates, Examples from Hungary ............................. 115
Ákos Török

24 Polished Stone Value of Volcanic Rocks Used as Aggregates: A Case Study from the Bohemian Massif, Czech Republic .................. 119
Kateřina Krutilová and Richard Přikryl

Part III Analysis and Control of Ground Deformations by Remote Monitoring

25 Land Subsidence Due to Deep Groundwater Withdrawal in Northern Yangtze River Delta Area ................................................. 125
Guang-ya Wang, Dan Zhang, Jin-shun Feng,
Ming-zhu Chen and Wei-hua Shan

26 Observing Dam’s Movements with Spaceborne SAR Interferometry ................................................................. 131
Milan Lazecký, Daniele Perissin, Wang Zhiying, Lei Ling and Qin Yuxiao

27 Deformation Monitoring Using Ground-Based SAR Data ................. 137
Michele Crosetto, Oriol Monserrat, Guido Luzi,
Maria Cuevas and Núria Devanthéry

28 Map and Monitoring Slow Ground Deformation in NW Italy Using PSI Techniques ................................................................. 141
Davide Notti, Claudia Meisina, Francesco Zucca,
Alessio Colombo and Luca Paro

29 Integrated Use of Advanced InSAR and GPS Data for Subsidence Monitoring ................................................................. 147
G. Bitelli, F. Bonsignore, S. Del Conte, F. Novali,
I. Pellegrino and L. Vittuari

30 Observation of Expansive Clay Movement with DInSAR .................. 151
M. Kurka and K.H. Gutjahr

31 Analysis of a Subsidence Process by Integrating Geological and Hydrogeological Modelling with Satellite InSAR Data .............. 155
Francesca Bozzano, Carlo Esposito, Stefania Franchi, Paolo Mazzanti,
Daniele Perissin, Alfredo Rocca and Emanuele Romano
32 Satellite and Terrestrial Radar Interferometry for the Measurement of Slope Deformation .......................... 161
Tazio Strozzi, Hugo Raetzo, Urs Wegmüller, Jessica Papke, Rafael Caduff, Charles Werner and Andreas Wiesmann

33 Satellite and Ground-Based Interferometric Radar Observations of an Active Rockslide in Northern Norway ................. 167

34 The Ligosullo (UD, Italy) Landslide, Revisiting of Past Data and Prospects from Monitoring Activities .................. 171
Luca Gandolfo, Alessandro Brunetti, Francesca Bozzano, Antonio Bratus, Enrico Busnanto, Mario Floris, Rinaldo Genevois, Paolo Mazzanti and Federico Saporito

35 Advanced Characterization of a Landslide-Prone Area by Satellite a-DInSAR ........................................ 177
Alfredo Rocca, Paolo Mazzanti, Francesca Bozzano and Daniele Perissin

36 Integration of Geotechnical and Remote Monitoring Systems for the Analysis and Control of Ground Deformation in Marble Quarrying (Apuan Alps, Italy) ........................................ 183
Riccardo Salvini, Claudio Vanneschi, Domenico Gulli, Federico Forchione, Silvia Riccucci and Mirko Francioni

37 Terrestrial SAR Interferometry Monitoring of Natural Slopes and Man-Made Structures .................................. 189
Paolo Mazzanti, Francesca Bozzano, Alessandro Brunetti, Carlo Esposito, Salvatore Martino, Alberto Prestininzi, Alfredo Rocca and Gabriele Scarascia Mugnozza

38 Monitoring Swelling Soils in Eastern Paris (France) Through DinSAR and PSI Interferometry: A Synthesis ................ 195
B. Deffontaines, F. Kaveh, B. Fruneau, A. Arnaud and J. Duro

Part IV Building Stones & Ornamental Rocks—Resource Evaluation, Technical Assessment, Heritage Designation

39 A Global Heritage Stone Province in Association with the UNESCO World Heritage City of Salamanca, Spain .......... 205
Dolores Pereira and Barry Cooper

40 Characterization of the Natural Variability of Macael Serpentinite (Verde Macael) (Almería, South of Spain) for Their Appropriate Use in the Building Industry ........................................ 209
Rafael Navarro, Dolores Pereira, Ana Gimeno and Santiago del Barrio

41 Some Examples of Heritage Stones from Australia .................. 213
Barry Cooper
<table>
<thead>
<tr>
<th></th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>Granites from South West England: A Global Heritage Stone Resource</td>
<td>219</td>
</tr>
<tr>
<td></td>
<td>Marker Brian</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>The Karst Region of Slovenia: A Potential Global Heritage Stone Province</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>Sabina Kramar, Breda Mirtič, Ana Mladenović, Mojca Bedjanič,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boštjan Rožič and Andrej Šmuc</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>The Natural Stone in the Historic Buildings of the City of Granada (Southern Spain). Features as a Possible Candidate for the Designation of “Global Heritage Stone Province”</td>
<td>229</td>
</tr>
<tr>
<td></td>
<td>Rafael Navarro, Josefina Sánchez-Valverde and José Manuel Baltuille</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Petrographic, Physical–Mechanical and Radiological Characterisation of the Rosa Beta Granite (Corsica-Sardinia Batholith)</td>
<td>233</td>
</tr>
<tr>
<td></td>
<td>S. Cuccuru and A. Puccini</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Changes in Marble Quality After Sodium Sulphate Crystallization and Long-Lasting Freeze-Thaw Testing</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td>Tatiana Durmeková, Peter Ružička, Miroslav Hain and Mária Čaplovičová</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Assessment of Potential Natural Stone Deposits</td>
<td>243</td>
</tr>
<tr>
<td></td>
<td>Hannu Luodes, Heikki Sutinen, Paavo Härma, Heikki Pirinen and Olavi Selonen</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>P-T-XCO2 Pseudosection Modelling of Talc-Magnesite Soapstone</td>
<td>247</td>
</tr>
<tr>
<td></td>
<td>Seppo Leinonen</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Adnet ‘Marble’, Untersberg ‘Marble’ and Leitha Limestone—Best Examples Expressing Austria’s Physical Cultural Heritage</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>Beatrix Moshammer, Christian Uhlir, Andreas Rohatsch and Michael Unterwurzacher</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>The Wiborg Granite Batholith—The Main Production Area for Granite in Finland</td>
<td>259</td>
</tr>
<tr>
<td></td>
<td>Paavo Härma, Olavi Selonen and Hannu Luodes</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Methods for Evaluating the Natural Stone Weathering Condition in Selected Historical Buildings Within the Project “Efficient Use of Natural Stone in the Leningrad Region and South–East Finland”</td>
<td>263</td>
</tr>
<tr>
<td></td>
<td>Nike Luodes, Hannu Luodes, Heikki Pirinen, Paavo Härma, Heikki Sutinen, Aleksei Shkurin and Claudio De Regibus</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Granites of the Verbano-Cusio-Ossola District (Piedmont, Northern Italy): Possible Candidates for the Designation of “Global Heritage Stone Province” and a Proposal of a Geotouristic Route.</td>
<td>267</td>
</tr>
<tr>
<td></td>
<td>Alessandro Cavallo and Giovanna Antonella Dino</td>
<td></td>
</tr>
</tbody>
</table>
53 Building Stone Evaluation Applied to Weathered Granites—The Example of *Amarelo Real* Granite (Northern Portugal) .................. 273
LMO Sousa and JMM Lourenço

54 Production of Granitic Press Rollers in Finland .................. 279
Arto Peltola, Olavi Selonen and Paavo Härnä

55 The Uses of Natural Stone in the Building of Canberra, Australia’s National Capital City ........................................ 283
Wolf Mayer

56 Fire on the Rocks: Heat as an Agent in Ancient Egyptian Hard Stone Quarrying ....................................................... 291
Tom Heldal and Per Storemyr

57 Environmental Background in Apricena Quarries (Apulia, Southern Italy) ........................................ 297
Alessandro Reina and Maristella Loi

58 Size Effect in Flexural Strength Test on Dimension Stones ........ 303
Rossana Bellopede, Paola Marini and Lorenzo Collaro

59 CE-Marking of Natural Stone—Practical Application and Solutions in Sweden ....................................................... 309
Linus Brander and Björn Schouenborg

60 Hierarchical Approaches Toward Safeguarding Heritage Building Stone Resources in England and Wales .................. 313
Ian A. Thomas and Barry J. Cooper

61 The Relation Between the Petrographic, Physico-Mechanical Properties and the Use of Some Deposit Paving in Algeria ........... 319
Chentout Malika, B. Alloul and D.J. Belhai

Part V Communicating Engineering Geology with Urban Planners

62 Geohazard Studies for Urban Planning in the Santiago Metropolitan Region, Chile: Some Lessons for Future Interactions Between Engineering Geoscientists and Urban Planners in Developing Countries .......................... 327
Sergio A. Sepúlveda, Sofía Rebolledo, Ximena Bórquez, Joel Prieto and Juan A. Muñoz

63 A Decision Support System Suggestion for the Optimum Railway Route Selection ....................................................... 331
C. Gökceoğlu, H.A. Nefesioglu and N. Tanyıldız

64 Communication of Geological Information in Planning of Urban Areas ................................................................. 335
Marker Brian
65 The Use of a Spatial Multi—Criteria Technique for Urban Suitability Assessment, Due to Extensive Mass Movements. The Case Study of Vitalic Village, Kimi, Euboea, Greece           339
P. Tsangaratos, D. Rozos, I. Ilia and K. Markantonis

66 Communicating Applied Geoscientific Expertise to Rural and Urban Planners: Some Lessons Learned            345
Eduardo F.J. De Mulder

67 Urban Engineering Geological Maps for Bradford, UK            351
M.G. Culshaw and K.J. Northmore

68 The COMCOM Process: Informing and Transforming Communities in the Developing World Through Geotechnical Information           355
Lionel E. Jackson Jr., Mike Ellerbeck and Fernando Munoz Carmona

69 3D Mapping of Geological Base Data and Its Utilization for Urban Planning in Straubing, Germany           359
Silvia Beer, Gerhard Lehrberger and Kurosch Thuro

Part VI Complexity in Hazard and Risk Assessment

70 Geotechnical Basis for Building Instability and Failure: Case Study from Lagos, Nigeria          365
Ibrahim Adewuyi Oyediran and Julius Omotayo Famakinwa

71 Applying the Disruption Index Procedure to Evaluate the Urban Seismic Risk in the Mt. Etna Area (Italy)          371

72 Environmental Impact Assessment of Geological Processes in Russia.          375
Kharkina Marina, Barykina Olga and Shanina Viyaleta

73 Complexity in Seismic Risk Assessment at Different Levels with GIS Technology Application          381
Nina Frolova, Jean Bonnin, Valery Larionov and Aleksander Ugarov

74 Landslide Susceptibility of the La Catola Torrent Catchment Area (Daunia Apennines, Southern Italy): A New Complex Multi-step Approach          387
Gioacchino Francesco Andriani, Giuseppe Diprizio and Vito Pellegrini

75 Microzonation of Gölbaşi Special Environmental Protection Area with Respect to Geoenvironmental Criteria          393
Şüle Tüdeş, Derya Polatkan and Kadriye Burcu Yavuz

76 The Role of Rockfall Protection Barriers in the Context of Risk Mitigation: The Case of the Autonomous Province of Bolzano          397
Govoni Laura and Claudia Strada
88 Earthen Dike Leakage at the Dead Sea ............................ 461
Damien Closson and Najib Abou Karaki

89 Mapping of Salt Consolidation and Permeability Using MASW Method in the Dead Sea Sinkhole Problem .................. 465
Michael Ezersky and Anatoly Legchenko

90 Subsurface Dams as a Solution for Supplementary Recharge and Groundwater Storage in Karst Aquifers in Arid Areas ....... 471
Zoran Stevanovic

91 Analysis of Condition of Underground Cavities, Odessa (Ukraine) ...... 475
Olena Dragomyretska, Oleksandr Dragomyretskyy and Mikhail Skipa

92 Facing Engineering Problems in the Fragile Karst Environment ......... 479
Mario Parise, Damien Closson, Francisco Gutiérrez and Zoran Stevanovic

93 Geological and Geophysical Techniques for the Identification of Subterranean Cavities ........................................ 483
Pietro Pepe, Vincenzo Martimucci and Mario Parise

94 Engineering Geological Characterization of the Antalya Karstic Rocks ....................... 489
Sopaci Evrim and Akgün Haluk

95 Tectonics versus Karst Relationships in the Salento Peninsula (Apulia, Southern Italy): Implications for a Comprehensive Land-Use Planning ........................................... 493
Vincenzo Festa, Antonio Fiore, Maria Nilla Miccoli, Mario Parise and Luigi Spalluto

96 Problems with Caves During Tunneling in Dinaric Karst (Croatia) ....... 497
Mladen Garašić and Davor Garašić

97 Sinkholes and Land Use Regulation in South Africa ..................... 503
G.J. Heath and S. Constantinou

98 Geophysical Investigation to Delineate Hazardous Cavities in Al-Hassa Karstic Region, Kingdom of Saudi Arabia .......... 507
Tareq Abdallatif, Abdel-Samad A.B. Khafagy and Ashraf Khozym

99 Environmental Aspects of Proposed Engineering Solution for Inter-basin Transfer in East Herzegovina ......................... 515
Marina Cokorilo, Zoran Stevanovic and Vesna Ristic Vakanjac

100 General Engineering-Geological Principles of Karst Risk Assessment . . 521
Victor Khomenko, Alexander Potapov and Vladimir Tolmachev

101 Assessing Karst Hazards for a Nuclear Power Plant Site, Southern Appalachian Mountains, U.S.A. ......................... 525
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Current Status and Strategic Planning of Sinkhole Collapses in China</td>
<td>529</td>
</tr>
<tr>
<td></td>
<td>Mingtang Lei, Yongli Gao and Xiaozhen Jiang</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>Validation of Rated Sinkhole Span for Building in Covered Karst Areas</td>
<td>535</td>
</tr>
<tr>
<td></td>
<td>Stanislav Makhmatov and Mikhail Utkin</td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>Potential Karst Collapse Assessment Along a Bridge Foundation of High-Speed Rail, Anshan, China</td>
<td>539</td>
</tr>
<tr>
<td></td>
<td>Xiaozhen Jiang, Mingtang Lei and Yongli Gao</td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>Uncertainties in the Application of Rock Mass Classification and Geomechanical Models for Engineering Design in Carbonate Rocks</td>
<td>545</td>
</tr>
<tr>
<td></td>
<td>Gioacchino Francesco Andriani, Mario Parise and Giuseppe Diprizio</td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>Karst Remediation in the Variant to the National Road 9 Between Cascais and Abuxarda, Portugal</td>
<td>549</td>
</tr>
<tr>
<td></td>
<td>Bernardo P.B. Monteiro, João Azevedo, Isabel Caspurro and Paulo Durão</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>Sinkhole Field Above Karst Caves: Detection and Analysis Through Integrated Techniques</td>
<td>553</td>
</tr>
<tr>
<td></td>
<td>Stefano Margiotta, Sergio Negri, Mario Parise and Tatiana A.M. Quarta</td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>Evaluating the Potentialities of Hydro-stratigraphic, Geomorphological and Geophysical Analyses to Detect Underground Cavities</td>
<td>559</td>
</tr>
<tr>
<td></td>
<td>Stefano Margiotta, Sergio Negri, Mario Parise and Tatiana A.M. Quarta</td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>With the Rich Experience Gained in the Construction of Motorways We are Planning the Course of the 5th European Railway Corridor Crossing the Classical Karst (Slovenia)</td>
<td>563</td>
</tr>
<tr>
<td></td>
<td>Martin Knez, Mitja Prelovšek and Tadej Slabe</td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>Experience of Quantitative Assessment of Karst Risk in Russia</td>
<td>567</td>
</tr>
<tr>
<td></td>
<td>Vladimir Yolkin</td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>Study on Groundwater System Effect of Tunnel Drainage Control in Karst Valley</td>
<td>571</td>
</tr>
<tr>
<td></td>
<td>Xiaoguang Jin, Yayong Li, Hongwei Liu and Yuan Jin</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>Safeguarding of Assets Roads and Protection of Land in the Valley of Aquaresi. Deepening and Widening of the Studies the Area Subject to Risk Sinkhole. Proposal for Monitoring. (Italy: Sardinia)</td>
<td>577</td>
</tr>
<tr>
<td></td>
<td>Mureddu Alessio and Corda Angelo Salvatore</td>
<td></td>
</tr>
<tr>
<td>113</td>
<td>Challenges of Renewable Energy Source Utilisation at Section of Future Highway E-763 Belgrade-Southern Adriatic Across Karst Plateau of Pešter Plateau (Western Serbia)</td>
<td>581</td>
</tr>
<tr>
<td></td>
<td>Milenic Dejan, Stevanovic Zoran, Dragisic Veselin, Vranjes Ana and Savic Nevena</td>
<td></td>
</tr>
</tbody>
</table>
114 Some Considerations on 3-D and 2-D Numerical Models for the Assessment of the Stability of Underground Caves
Lollino Piernicola, Parise Mario and Vattano Marco

115 Speleological and Hydrogeological Factors of Urbanization and Development of Road Network on Mountain Zlatibor (Western Serbia)
Milenic Dejan, Djuro Milankovic, Nenad Doroslovac, Bojan Doncev and Marina Jovanovic

116 Engineering Problems in Karst: Three Case History
Vigna Bartolomeo and Marchionatti Federico

117 Karst Risk Assessment for Underground Engineering: Comparison of the KarstALEA Method with a Random Karst Distribution Approach
Marco Filipponi

118 The Role of Tectonic Structures and Density-Driven Groundwater Flow for Salt Karst Formation
Peter Huggenberger, Ali Zidane, Eric Zechner and Daniel Gechter

Part IX Excavation in Potentially Asbestos-Bearing Rocks: Methodologies for Risk Evaluation and Safety Management

119 Asbestiform Amphiboles in a Serpentinite Quarry in Operation, Province of Córdoba, Argentina
L. Lescano, A. Bonalumi, P. Maiza, J. Sfragulla and S. Marfil

120 Geological and Analytical Procedures for the Evaluation of Asbestos-Related Risk in Underground and Surface Rock Excavation
Francesco Turci, Roberto Compagnoni, Fabrizio Piana, Luca Delle Piane, Maura Tomatis, Bice Fubini, Sergio Tallone, Stefano Fuoco and Massimo Bergamini

121 The Asbestos Risk in Meta-Ophiolitic Rocks: A Protocol for Preliminary Field and Laboratory Investigations During Geological Mapping
Marescotti Pietro, Crispini Laura, Poggi Eugenio, Capponi Giovanni and Solimano Monica

Sara Bini and Giorgio Grassano
Part X Experiences and Potentialities of Data-Driven Modeling in Earth Science Issues

123 Variational Data Assimilation with TELEMAC. Proof of Concept for Model State Correction on the Berre Lagoon 3D-Model .............. 633
S. Ricci, A. Piacentini, A. Weaver, R. Ata and Nicole Goutal

124 Developing an Adequate Approach to Model the Geotechnical Parameters for Reducing the Ventures of Underground City Development ................................................................. 639
Mei Dong, Christoph Neukum, Hui Hu and Rafiq Azzam

125 Calculation of Water Retention Curves of Rock Samples by Differential Evolution ................................................................. 643
Maria C. Caputo, Sabino Maggi and Antonietta C. Turturro

126 Data Mining and Data-Driven Modelling in Engineering Geology Applications ................................................................. 647
Angelo Doglioni, Annalisa Galeandro and Vincenzo Simeone

127 Predicting Landslide Displacements by Multi-objective Evolutionary Polynomial Regression .................................................. 651
Angelo Doglioni, Giovanni B. Crosta, Paolo Frattini, Nicola L. Melidoro and Vincenzo Simeone

128 Data-Driven Analysis of Discharge Variations at Mercure Spring South Italy ................................................................. 655
Salvatore Grimaldi, Giuseppina Cristino, Angelo Doglioni, Gianpietro Summa and Vincenzo Simeone

Part XI Geohazard in Urban Scenarios: Forecasting and Protective Monitoring

129 Landslide Processes of Active Phase of under Conditions of Technogenesis with the Example of Pridneprovsk Industrial Region of Ukraine ................................................................. 663
T.P. Mokritskaya and V.M. Shestopalov

130 Discussion on Geological Hazards Caused by Exploitation of Deep Groundwater in North China ................................................. 667
Xiuyan Wang and Lin Sun

131 Assessment of Geo-hazards Triggered by both Natural Events and Human Activities in Rapidly Urbanized Areas ................................. 675
A. Kaitantzian, C. Loupasakis and D. Rozos

132 Pre-identification of Staging Areas for Probable Earthquake of Tehran (Municipality No.5) Using OWA Method .......................... 681
Bahram Mohaghegh, Fatemeh Mahshadnia and Shabnam Aghnianejad
133 Application of Laser Scanning for Monitoring Coastal Cliff Instability in the Pozzuoli Bay, Coroglio Site, Posillipo Hill, Naples


134 The Use of UAV to Monitor and Manage the Territory: Perspectives from the SMAT Project

S. Farfaglia, G. Lollino, M. Iaquinta, I. Sale, P. Catella, M. Martino and S. Chiesa

135 GNSS Hardware and Software Solutions for Environmental Hazards

Nicola Perfetti, Luigi Fiorentini, Gianluca Molinelli, Luca Pasquini, Giuseppe Perrucci, Alberto Pettinari, Patrizio Buscemi and Doriano Zanette

136 The Use of Micro-UAV to Monitor Active Landslide Scenarios

L. Torrero, L. Seoli, A. Molino, D. Giordan, A. Manconi, P. Allasia and M. Baldo

137 A Geotechnical Monitoring Project for Early Warning: The Monte Stregone Landslide

Mauro Battaglio, Mario Lovisolo and Thierry Rosset

138 Rockfall Analysis During Emergency Scenarios

Luca Lanteri, Daniele Bormioli, Michele Morelli, Furio Dutto, Daniele Giordan and Andrea Manconi

139 The Kostanjek Landslide in the City of Zagreb: Forecasting and Protective Monitoring

Martin Krkač, Snježana Mihalić Arbanas, Željko Arbanas, Sanja Bernat and Kristijan Špehar

140 Risk Analysis of a Major Pit Slope Failure at the Batu Hijau Open Pit Mine Operation PT Newmont Nusa Tenggara

Y. Adriansyah, D. Muslim and Z. Zakaria

Part XII Geo-Hydrological Risk and Town and Country Planning

141 Landslide Risk Reduction—Complementary Routes to Learning

Jerome V. De Graff, Malcolm G. Anderson and Elizabeth Holcombe

142 Recovery Measures of the Erosion Features: Some Examples in Brazil

Cláudia Marisse dos Santos Rotta and Lázaro Valentin Zuquette

143 The Use of Risk Information in Spatial Planning in Europe: Examples from Case Study Sites in Italy and Romania with a Focus on Flood and Landslide Hazards

Kathrin Prenger-Beminghoff and Stefan Greiving
144 Scenarios of Land Cover Change and Landslide Susceptibility: An Example from the Buzau Subcarpathians, Romania

Žiga Malek, Veronica Zumpano, Dagmar Schröter, Thomas Glade, Dan Balteanu and Mihai Micu

743

145 Material Intrusion as a Key Factor for the Physical Vulnerability of the Built Environment to Debris Flows

Bruno Mazzaroni, Silvia Simoni, Jan Kobald, Omar Formaggioni and Cristiano Lanni

747

146 Analysis of Hydrological and Landslide Hazards at Castellammare Del Golfo (Northern Sicily)

Maria Sabatino, Antonio Bambina and Salvatore Monteleone

753

147 Geo-hydrological Risk Mitigation Measures and Land-Management in a Highly Vulnerable Small Coastal Catchment

Pierluigi Brandolini and Andrea Cevasco

759

148 Geotechnical Study of Urban Soil and Subsoil of Fez City (N. Morocco) and Natural Risk Mapping Using Geographic Information System (GIS)

Sidi Mohamed El Boumeshouli, Abderrahim Lahrach, Abdel-Ali Chaouni and Benoît Deffontaines

763

149 Implementation of Landslide Susceptibility in the Perugia Municipal Development Plan (PRG)

F. Fiorucci, G. Antonini and M. Rossi

769

150 Integrating Natural Hazards in Spanish and Italian Land Use Planning

Jesús Garrido, Alejandro L. Grindlay, Salvatore Martino, Alberto Prestininzi and Gabriele Scarascia Mugnozza

773

151 Landslide Occurrences During the High-Intensity Rainfall Event of March–April 2013 in the Emilia-Romagna Region (North Apennines, Italy)

Marco Pizziolo, Matteo Bernardi, Giovanna Daniele, Mauro Generali and Daniela Piacentini

777

152 Challenges in Assessing and Managing Geo-hydrological Risk Related to Natural and Anthropogenic Pressures in Alpine Ski Resorts

Carmen de Jong, Franco Previtali and Gloria Carletti

781

153 A Flood Can Point Out Improper Land-Use Planning: The Case of Alessandria Town (Piedmont, Northern Italy)

Fabio Luino

787

154 Comparison Between Flooded Areas and Flood-Risk Areas. Case of Var Department (France)

Esposito Christophe, Jean-Louis Ballais and Chave Sylvain

793
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>Flash Flood Events and Urban Development in Genoa (Italy):</td>
<td>F. Faccini, F. Luino, A. Sacchini and L. Turconi</td>
</tr>
<tr>
<td></td>
<td>Lost in Translation</td>
<td></td>
</tr>
<tr>
<td>797</td>
<td></td>
<td></td>
</tr>
<tr>
<td>156</td>
<td>Observations and Seismic Response Analysis of Urban Landslide</td>
<td>Toshitaka Kamai and Issei Doi</td>
</tr>
<tr>
<td></td>
<td>Induced by the 2011 off the Pacific Coast of Tohoku Earthquake</td>
<td></td>
</tr>
<tr>
<td>805</td>
<td></td>
<td></td>
</tr>
<tr>
<td>157</td>
<td>Search and Assessment of Decompression Zones in Landslide</td>
<td>Oleksandr Dragomyretskyy, Olena Dragomyretska and Mikhail Skipa</td>
</tr>
<tr>
<td></td>
<td>Slopes of the North-West Coast of the Black Sea (Ukraine)</td>
<td></td>
</tr>
<tr>
<td>811</td>
<td></td>
<td></td>
</tr>
<tr>
<td>158</td>
<td>Geo-hydrological Risk Management on the Amalfi Coast:</td>
<td>Antonio Caruso, Giuseppe Esposito, Santina Scarpino and Pasquale Versace</td>
</tr>
<tr>
<td></td>
<td>The Village of Atrani Emergency Plan</td>
<td></td>
</tr>
<tr>
<td>815</td>
<td></td>
<td></td>
</tr>
<tr>
<td>159</td>
<td>Climate Change, Landslide Risk Assessment and Adaptation Policies:</td>
<td>Daniele Spizzichino, Alessio Capriolo and Fiorina Di Gioia</td>
</tr>
<tr>
<td></td>
<td>The Urban Area of Ancona Municipality</td>
<td></td>
</tr>
<tr>
<td>821</td>
<td></td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>Engineering Geological Analyses for Hazard Assessment</td>
<td>Andrea Cevasco and Pantaleone De Vita</td>
</tr>
<tr>
<td></td>
<td>of the Urbanized, Relict Lemeglio Coastal Landslide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Eastern Liguria, Italy)</td>
<td></td>
</tr>
<tr>
<td>827</td>
<td></td>
<td></td>
</tr>
<tr>
<td>161</td>
<td>Landslides in Urban Areas of Luxembourg, Caused by Weak Rheatian Clay</td>
<td>Stefan Van Baars, Miguel Bautista and Rolf Becker</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>831</td>
<td></td>
<td></td>
</tr>
<tr>
<td>162</td>
<td>The Urban Flooding Early Warning System of the Greater Turin</td>
<td>Roberto Cremonini, Davide Tiranti and Secondo Barbero</td>
</tr>
<tr>
<td></td>
<td>(North-Western Italy) Based on Weather-Radar Observations</td>
<td></td>
</tr>
<tr>
<td>837</td>
<td></td>
<td></td>
</tr>
<tr>
<td>163</td>
<td>Population Exposed to Landslide and Flood Risk in Italy</td>
<td>Alessandro Trigila, Carla Iadanza, Michele Munafò and Ines Marinosci</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>843</td>
<td></td>
<td></td>
</tr>
<tr>
<td>164</td>
<td>A Cost Effective Methodology for the Rapid Evaluation</td>
<td>Stefano Morelli, Alessandro Battistini, Samuele Segoni, Goffredo Manzo,</td>
</tr>
<tr>
<td></td>
<td>of the Flood Susceptibility Along Anthropized Rivers</td>
<td>Leonardo Ermini and Filippo Catani</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>165</td>
<td>The Role of Geophysics in Urban Landslides Studies: Two Case Histories in Rome</td>
<td>Valeria Eulilli, Fernando Ferri and Luca Maria Puzzilli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>853</td>
<td></td>
<td></td>
</tr>
<tr>
<td>166</td>
<td>The Role of Fieldwork in Courses Developed to Avoid Accidents and</td>
<td>Erica Akemi Goto and Jefferson Lima de Picanço</td>
</tr>
<tr>
<td></td>
<td>Disasters in São Paulo City, Brazil</td>
<td></td>
</tr>
<tr>
<td>857</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
167 The 1773 Cava de’ Tirreni Flash Flood (Southern Italy), an Opportunity to Further Enhance the Use of Documentary Sources as Hazard and Risk Assessment ........................................ 861
Eliana Esposito, Sabina Porfido, Crescenzo Violante, Giuseppe Tranfaglia, Flavia Molisso, Salvo Mazzola, Marco Sacchi, Gaetana Santoro and Efisio Spiga

168 Reactivation of Old Inclinometers to Monitor a Slow Landslide in Roma Urban Area: Reliability of Old and New Measurements ........................................ 865
Amanti Marco, Paolo Maria Guarino and Luca Maria Puzzilli

169 Landslide Risk Assessment in the Reconstructed Bridge Area (Rostov-on-Don, Russia) ............................................................. 869
Batrak Gleb and Galitskaya Irina

170 Landside Problem and Its Investigations in Miskolc (Hungary) ....... 873
Mariann Vámos, Péter Görög and Balázs Vásárhelyi

Part XIV Mapping Urban Subsurface for Geohazard Assessment and Risk Management

171 A 3D Geological Model for Christchurch City (New Zealand): A Contribution to the Post-earthquake Re-build ........................................ 881
John G. Begg, Katie E. Jones, Mark S. Rattenbury, David J.A. Barrell, Razel Ramilo and Dick Beetham

172 Collapse Susceptibility Mapping Using SRTM Data Obtained from Topodata Project ................................................................. 885
José Augusto Lollo, Jaime M. Cabrera Vivanco and Juliano Suman Curti

173 Geological Modeling in the Urban Subsurface Using the Microtremor Array Survey ................................................................. 893
Takao Sasaki, Hisaya Sawano, Hiroshi Shimizu, Abdol Halim, Tatsuro Matsuoka, Yukhiro Mizuochi, Hisao Hayashi and Atsushi Tanase

174 A Model of Como (N Italy) Urban Subsurface: A Multidisciplinary Tool for Hydraulic, Hydrogeologic and Subsidence Risk Management. . 899
M.F. Ferrario, L. Bonadeo, F. Brunamonte, F. Livio and A.M. Michetti

175 Zoning of Bereznyaki Urban Area (Perm Krai, Russia) According to the Geohazard Degree ......................................................... 903
Osipov Victor, Mamaev Yuri, Yastrebov Alexei and Eremina Olga

176 Identification of Ground Engineering Hazards in London Through the Use of Predictive 4D Geomodelling Tools ................................ 907
Richard C. Ghail, Skipper Jacqueline and Philippa J. Mason

177 Assessment of Karst-Suffosion Hazard Along the Routes of Designed Metro Lines in Moscow ..................................................... 913
Aleksandr Anikeev, Nadezda Anismanova, Irina Kozhevnikova and Irina Kozlyakova
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>178</td>
<td>The Map of Radon Hazard of Moscow</td>
<td>Petr Miklyaev, Tatiana Petrova and A.V. Klimshin</td>
</tr>
<tr>
<td>179</td>
<td>Engineering Geological Zoning of Moscow by the Conditions for Subsurface Construction</td>
<td>Irina Kozlyakova, Oleg Mironov and Olga Eremina</td>
</tr>
<tr>
<td>180</td>
<td>3-Dimensional Geological Mapping, Applications to Urban Geological Environment</td>
<td>Oleg Mironov</td>
</tr>
<tr>
<td>182</td>
<td>Structural-Geodynamic Mapping with Using the Geostatistical Analysis of the Platform Areas on the Example of Moscow</td>
<td>Makeev Vladimir, Karfidova Ekaterina and Dorozhko Anastasia</td>
</tr>
</tbody>
</table>

**Part XV Off-Fault Coseismic Surface Effects and Their Impact in Urban Areas**

| 183  | Geochemical and Geomorphological Analyses on Liquefaction Occurred During the 2012 Emilia Seismic Sequence | Alessandra Sciarra, Barbara Cantucci, Nasser Abu Zeid, Carmela Vaccaro and Fedora Quattrocchi |
| 185  | Simulation of Off-Fault Surface Effects from Historical Earthquakes: The Case of the City of Thessaloniki (Northern Greece) | Anastasia Kiratzi, Zafeiria Roumelioti, Alexandros Chatzipetros and George Papanastasiou |

**Part XVI Remote Sensing Applications for the Detection, Monitoring, Modeling, and Damage Assessment of Critical Structures and Complex**

| 186  | Integrations of Multiple Observations to Estimate Hydraulic Parameters in Choushui River Fluvial Plain of Central Taiwan | Chih-Heng Lu, Chuen-Fa Ni, Chung-Pai Chang, Jiuin-Yee Yen and Wei-Chia Hung |
187 Characterization of Longwall Mining Induced Subsidence by Means of Automated Analysis of InSAR Time-Series ........................................ 973
Jean Pascal Iannacone, Alessandro Corsini, Matteo Berti, Jessica Morgan and Giacomo Falorni

188 Geological Application of UAV Photogrammetry and Terrestrial Laser Scanning in Marble Quarrying (Apuan Alps, Italy) ............ 979
Riccardo Salvini, Silvia Ricucci, Domenico Gulli, Riccardo Giovannini, Claudio Vanneschi and Mirko Francioni

189 Ground Settlement Assessment in Urban Areas Through SBAS-DInSAR Measurements: The Case Study of Roma (Italy) .... 985
Manuela Bonano, Fabiana Calò, Michele Manunta, Maria Marsella, Silvia Scifoni, Alberico Sonnnessa and Vincenzina Tagliafierro

190 Satellite Techniques: New Perspectives for the Monitoring of Dams .... 989
Marco Corsetti, Michele Manunta, Maria Marsella, Silvia Scifoni, Alberico Sonnnessa and Chandrakanta Ojha

191 Monitoring Land Subsidence in the Tokyo Region with SAR Interferometric Stacking Techniques .............................................. 995
Paolo Pasquali, Alessio Cantone, Paolo Riccardi, Marco De Filippi, Fumitaka Ogushi, Masayuki Tamura and Stefano Gagliano

Part XVII Surface Fault-Rupture Hazard in Urban Areas

192 Characterisation of Surface Fault Rupture for Civil Engineering Design ................................................................. 1003
Clark Fenton and Juliet Kernohan

193 The Contribution of Airborne LiDAR Data to the Assessment of Surface Faulting Hazard for Lifelines Crossing Active Faults: An Example from the Central Apennines, Italy ............. 1009
Riccardo Civico, Daniela Pantosti, Stefano Pucci and Paolo Marco De Martini

194 Microzonation of the Liwa City on the Great Sumatera Active Fault and Giant Ranau Volcanic Complex in South Sumatera, Indonesia .... 1015
Asdani Soehaimi, Dicky Muslim, Ir Kamawan and Robby Setia Negara

195 Surface Faulting Hazard in Italy: Towards a First Assessment Based on the ITHACA Database ..................................................... 1021
Luca Guerrieri, Anna Maria Blumetti, Valerio Comerci, Pio Di Manna, Alessandro Maria Michetti, Eutizio Vittori and Leonello Serva

196 Ground Fracturation in Urban Area: Monitoring of Land Subsidence Controlled by Buried Faults with InSAR Techniques (Ciudad Guzmán: Mexico) ........................................ 1027
Carlo Alberto Brunori, Christian Bignami, Francesco Zucca, Gianluca Groppelli, Gianluca Norini, Norma Davila Hernández and Salvatore Stramondo
Contents

197 Active Normal Faulting and Large-Scale Mass Wasting in Urban Areas: The San Gregorio Village Case Study (L’Aquila, Central Italy). Methodological Insight for Seismic Microzonation Studies ........................ 1033
Stefano Gori, Emanuela Falcucci, Giuseppe Di Giulio, Marco Moro,
Michele Saroli, Maurizio Vassallo, Andrea Ciampaglia,
Paolo Di Marcantonio and Domenico Trotta

198 The Origin of Scarps in Urban Areas Affected by Active and Capable Normal Faulting: Only Faults? Examples from the 2009 L’Aquila Earthquake Region (Central Italy) ................................. 1037
Emanuela Falcucci and Stefano Gori

199 Repeated Major Episodes of Tectonic Deformation, Lateral Spread and Liquefaction in Christchurch During the Canterbury Earthquake Sequence of 2010–2011 ......................... 1043
Sjoerd Van Ballegooy, Kelvin Berryman, Bruce Deam and Mike Jacka

Part XVIII The Seismic Microzonation: Input Data, Methodology, and Impact on Planning

200 Geo-engineering Aspects of the Van Earthquakes (Turkey) of October and November 2011 and Associated Geotechnical Damages ................................................. 1053
Resat Ulusay, Halil Kumsar and Ömer Aydan

201 The Characteristics of 2011 Simav Earthquake (Turkey) with an Emphasis on Geotechnical Damage ................................................................. 1059
Halil Kumsar, Erhan Ar and Ömer Aydan

202 Ground Zoning Map of the Piedmont Region (NW Italy): Methodology and Preliminary Results .................................................................................. 1065
Gianluigi Perrone, Armando Riccardo Gaeta, Davide Tiranti,
Paola Cadoppi and Gianfranco Fioraso

203 A New Empirical Method to Predict Liquefaction-Induced Lateral Spread ........................................................................................................ 1071
Nilsun Hasançebi, Reşat Ulusay and K. Önder Çetin

204 Evaluation of the Ground Motion Amplification at Poggio Picenze (Italy) .............................................................. 1077
Nicola Tarque, Carlo G. Lai, Francesca Bozzoni, Enrico Miccadei,
Tommaso Piacentini, Guido Camata and E. Spacone

205 A Methodology for Advanced Seismic Microzoning Using 2D Analyses: The Case Study of Barberino di Mugello, Florence, Italy .................. 1081
Claudia Madiai, Johann Facciorusso, Elisa Gargini,
Giovanni Vannucchi and Massimo Baglione

206 Seismic Microzonation in a Small Municipality: The Canazei Case Study (Trentino, N Italy) ................................................................. 1085
Floriana Pergalani, Massimo Compagnoni, Giuseppe Di Capua,
Daniela Famiani, Andrea Franceschini and Alfio Viganò
<table>
<thead>
<tr>
<th>Page</th>
<th>Title and Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>207</td>
<td>The Seismic Site Characterization of Palazzo Centi in L’Aquila City Centre: The Case Study of a Historical Building Damaged by the April 6th 2009 Earthquake</td>
</tr>
<tr>
<td>208</td>
<td>Local Seismic Response in the Southern Part of the Historic Centre of L’Aquila</td>
</tr>
<tr>
<td>209</td>
<td>The Experience of Seismic Microzonation in Lazio Region (Italy) Mountain Municipalities</td>
</tr>
<tr>
<td>210</td>
<td>Soil Liquefaction During the Emilia, 2012 Seismic Sequence: Investigation and Analysis</td>
</tr>
<tr>
<td>211</td>
<td>Soil Liquefaction Analyses in a Test-Area Affected by the 2012 Emilia-Romagna Earthquake (Italy)</td>
</tr>
<tr>
<td>212</td>
<td>Seismic Microzonation of the Cassino Plain</td>
</tr>
<tr>
<td>213</td>
<td>The ShakeMap and the Emilia-Lombardia 2012 Earthquake</td>
</tr>
<tr>
<td>214</td>
<td>A GIS-Based Tool for Reliability Assessment of Seismic Microzonation Studies According to Italian Instructions and Criteria</td>
</tr>
<tr>
<td>215</td>
<td>The High Damaging Mw 5.1 Lorca 2011 Earthquake: Possible Role of Local Seismic Amplification</td>
</tr>
<tr>
<td>216</td>
<td>Parametric Numerical Study of Observed Amplification Effects on the Colle di Roio Limestone Ridge (Central Italy)</td>
</tr>
</tbody>
</table>
The Seismic Microzonation of San Gregorio Through a Multidisciplinary Approach. Seismic Amplification in a Stiff Site

Giuseppe Di Giulio, Sara Amoroso, Deborah Di Naccio, Emanuela Falucci, Stefano Gori, Salomon Hailemikael, Maurizio Vassallo, Andrea Ciampaglia, Gaetano De Luca, Alfredo Del Grosso, Paolo Di Marcantonio, Katia D’Onofrio, Massimiliano Porreca, Domenico Trotta, Fabio Villani and Giuliano Milana

V_S and N_SPT Measures for Seismic Characterization of Soils

Giovanna Vessia, Mario Luigi Rainone and Patrizio Signanini

On the Performances of Site Parameters for Soil Classification

Rodolfo Puglia, Dario Albarello, Lucia Luzi, Dino Bindi, Maria Rosaria Gallipoli, Marco Mucciarelli, Giuseppe Naso, Francesca Pacor and Edoardo Peronace

Local Seismic Response in a Large Intra-mountain Basin as Observed from Earthquakes and Microtremor Recordings: The Avezzano Area (Central Italy)

Daniela Famiani, Paolo Boncio, Fabrizio Cara, Rocco Cogliano, Giuseppe Di Giulio, Antonio Fodarella, Giuliano Milana, Stefania Pucillo, Gaetano Riccio and Maurizio Vassallo

Analytical and Experimental Investigation of the Frequency Content of Ground Motions Recorded in Bucharest During Strong Vrancea Earthquakes

Iolanda-Gabriela Craifaleanu and Elena-Andreea Calarasu

Diezma Landslide (Southern Spain): Geological Model and Seismic Response

José Delgado, Jesús Garrido, Carlos López-Casado, Luca Lenti, Salvatore Martino and F. Javier Sierra

A New Step for Seismic Microzonation Studies in Italy: Standards for Data Storage and Representation

Bruno Quadrio, Fabrizio Bramerini, Sergio Castenetto and Giuseppe Naso

Cross-Correlation Analysis of Seismic Noise Data in the Fucino Plain (Central Appennines, Italy)

Maurizio Vassallo, Giuseppe Di Giulio, Fabrizio Cara, Rocco Cogliano, Daniela Famiani, Antonio Fodarella, Stefania Pucillo, Gaetano Riccio and Giuliano Milana

Shear-Wave Velocity Reconstruction via Unconventional Joint Analysis of Surface Waves: A Case Study in the Light of Some Theoretical Aspects

Giancarlo Dal Moro, Velio Coviello and Gabriele Del Carlo

A Brief Method for Evaluation of the Liquefaction Susceptibility in Bucharest Area

Mihaela Stânciucu
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>227</td>
<td>Evaluate on Geological Environment Quality in Pengzhou Baishui and Bailu River Basin</td>
<td>Sheng Luo, Xiaobing Kang, Mo Xu and Na Ning</td>
<td>1187</td>
</tr>
</tbody>
</table>

**Part XIX Underground Urban Development**

| 228  | The Development of Linked Databases and Environmental Modelling Systems for Decision-Making in London | K R Royse, S H Bricker, C R Jackson, A Kingdon and A G Hughes                                   | 1195        |
| 229  | Effect of Thermal Change by Ground Source Heat Pumps on Groundwater and Geoenvironment in the Late Pleistocene Terrace Area of Tokyo, Japan | Takato Takemura, Ayako Funabiki, Atsunori Kaneki, Yoshiharu Ito, Shoichiro Hamamoto, Takeshi Saito and Toshiko Komatsu | 1201        |
| 230  | Planning for Underground Development: Principles and Problems         | Marker Brian                                                                                     | 1205        |
| 231  | Investigation of Geological Limitations for Subway Tunneling in Ahvaz City, Iran | Arash Barjasteh                                                                                  | 1209        |
| 233  | 10 Dimensions Town Planning Research Project                         | Pierre Duffaut and Monique Labbé                                                                | 1219        |
| 234  | Is There a Role for Subsurface Lease in Urban Development toGain Community Support? | C.C.D.F. Van Ree, M. Halstead and A.E. Warning                                                   | 1223        |

**Part XX Urban and Land Planning Versus Risks Resilient Management**

| 235  | Spatial Planning Measures for the Enhancement of Urban Resilience Against Flooding Risk | Enrique J. Calderón and Javier Diez                                                             | 1233        |
| 236  | Direct and Indirect Impact of Landslide on Environment               | Toni Nikolic                                                                                     | 1237        |
| 237  | Risk Analysis for Swelling Clays to Buildings is South Madrid, Spain | Carlos Delgado Alonso-Martirena, Félix Escolano Sánchez and Javier Ángel Ramírez Masferrer       | 1243        |
| 238  | Various Approaches to Risk Assessment in Urban Development           | Galitskaya Irina and Batrak Gleb                                                                | 1247        |
239 The Importance of a Proper Risk Management Plan for a Safe Use of the Underground Space in Densely Urbanised Areas.  
**Two Case Histories**  
Giuseppe M. Gaspari, Domenico Parisi and Giuseppe Astore  
1251

Part XXI Construction Materials

240 Usability of Pyroclastic Rocks as Construction Materials;  
**Example from Nigeria**  
O.P. Aghamelu and C.O. Okogbue  
1259

241 Study of the Water Effects on the Tensile Strength and Cracking Processes of Molded Gypsum  
Louis Ngai Yuen Wong and Ming Chuan Jong  
1263

242 Slope's Design for Quarry's Remediation Using Ground Materials of Piraeus Subway Excavation  
M. Chatziangelou, B. Christaras, K. Botsou and Em. Malliaroudakis  
1269

243 Use of Dune Sand as an Alternative for River Sand for Construction Industry in Sri Lanka  
U. de S. Jayawardena and H.M.L. Indratilaka  
1277

244 Asbestiform Amphiboles in a Marble Quarry: A Case Study from the Province of Córdoba (Argentina)  
Francisco Locati, Leticia Lescano, Juan Murra, Silvina Marfil, Pedro Maiza and Edgardo Baldo  
1281

245 An Experimental Study for Evaluating the Disintegration Behavior of Clay-Bearing Rocks under Field Conditions  
Tej P. Gautam and Abdul Shakoor  
1285

246 Methods to Increase Effectiveness of Injective Chemical Stabilisation of Loess Soils  
Abramova Tamara and Larionova Nina  
1289

247 Experimental Study on Rock Deterioration by Repetition of Freezing and Thawing, and by Repetition of Dry and Wet in Cold Region  
Yoshihiko Ito, Yuki Kusakabe and Shuji Anan  
1293

248 The Pinhole Test for Dispersive Soil Identification  
Amrita Maharaj and Philip Paige-Green  
1299

249 Dust from Mineral Extraction: Regulation of Emissions in England  
Marker Brian  
1305

250 Industrial Chance to Recover Residual Sludge from Dimension Stones in Civil and Environmental Applications  
Giovanna Antonella Dino, Paolo Clemente, Manuela Lasagna, Iride Passarella, Franco Ajmone Marsan and Domenico Antonio De Luca  
1309
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>251</td>
<td>The District Tourism Lake of Castel Volturno: An Example of Territorial Requalification of Abandoned Quarries</td>
<td>1315</td>
</tr>
<tr>
<td></td>
<td>Marina Maura Calandrelli and Roberto Calandrelli</td>
<td></td>
</tr>
<tr>
<td>252</td>
<td>The Effect of Temperature and Moisture Content on the Behaviour of Pyritic Fill: Development of an In Situ Monitoring System</td>
<td>1321</td>
</tr>
<tr>
<td></td>
<td>Amy J. Taylor, John C. Cripps and Samuel D Clarke</td>
<td></td>
</tr>
<tr>
<td>253</td>
<td>Investigations into the Self-Healing of Desiccation Cracks in Compacted Clays</td>
<td>1327</td>
</tr>
<tr>
<td></td>
<td>John C. Cripps and Krishna K. Parmar</td>
<td></td>
</tr>
<tr>
<td>254</td>
<td>Study of Moisture and Cement Rates Influence on Hydraulic Conductivity of a Stabilized Sandy Soil by Means of a Factorial Design of Experiments</td>
<td>1333</td>
</tr>
<tr>
<td></td>
<td>F.C. Loch and O.J. Pejon</td>
<td></td>
</tr>
<tr>
<td>255</td>
<td>Weathering of Pyritic Clay in the Vicinity of Concrete Undergoing Thaumasite Sulphate Attack</td>
<td>1337</td>
</tr>
<tr>
<td></td>
<td>J.C. Cripps, F. Abubaker, C.J. Lynsdale and A.J. Taylor</td>
<td></td>
</tr>
<tr>
<td>256</td>
<td>An Investigation of Noise Effects on Natural Heritage and Historic Building Materials</td>
<td>1343</td>
</tr>
<tr>
<td></td>
<td>Adil Binal</td>
<td></td>
</tr>
</tbody>
</table>

Part XXII Aquifer Vulnerability and Springs/Wells Protection Zones

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>257</td>
<td>Wellfields under Heavy Urban Pressure—Monitoring, Simulation, Maintenance</td>
<td>1349</td>
</tr>
<tr>
<td></td>
<td>Algirdas Klimas and Marius Gregorauskas</td>
<td></td>
</tr>
<tr>
<td>258</td>
<td>Groundwater Protection for Human Consumption and Its Integration in Regional Planning: Gpz Method</td>
<td>1353</td>
</tr>
<tr>
<td></td>
<td>A. Jiménez-Madrid, C. Martinez and F. Carrasco</td>
<td></td>
</tr>
<tr>
<td>259</td>
<td>Vulnerability of Mountain Springs Affect by Climatic Change: A New Method in a Porous Media Aquifer in Regione Automa Valle d’Aosta</td>
<td>1357</td>
</tr>
<tr>
<td></td>
<td>Gianpierno Amanzio, Enrico Suozzi and Marina De Maio</td>
<td></td>
</tr>
<tr>
<td>260</td>
<td>Natural Occurrence of Sulphates in Ground and Surface Waters in Aosta Plain (Italy)</td>
<td>1361</td>
</tr>
<tr>
<td></td>
<td>Marina De Maio, Laura Pia Lodi and Enrico Suozzi</td>
<td></td>
</tr>
<tr>
<td>261</td>
<td>Hydrochemistry Applied to Water Supply System: A Case Study from a Brazilian Urban Area</td>
<td>1365</td>
</tr>
<tr>
<td></td>
<td>Sandra Gabas Garcia, Giancarlo Lastoria and Cavazanna Guilherme Henrique</td>
<td></td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>262</td>
<td>Effects of Peri-Urban Occupation in the Recharge Area of the Guarani Aquifer in São Carlos, São Paulo, Brazil</td>
<td>Geisy Candido da Silva, Denise Balestrero Menezes and Marcilene Dantas Ferreira</td>
</tr>
<tr>
<td>263</td>
<td>Global Warming in the Alps: Vulnerability and Climatic Dependency of Alpine Springs in Italy, Regione Valle d’Aosta and Switzerland, Canton Valais</td>
<td>Gianpiero Amanzio, Davide Bertolo, Marina de Maio, Laura Pia Lodi, Luca Pitet and Enrico Suozzi</td>
</tr>
<tr>
<td>264</td>
<td>The Importance of Monitoring for the Determination of Aquifer Vulnerability and Spring Protection Areas</td>
<td>C. Banzato, M. Governa, M. Petricig and B. Vigna</td>
</tr>
<tr>
<td>265</td>
<td>Vulnerability Assessment of Mazzoccolo Spring Aquifer (Central Italy), Combined with Geo-Chemical and Isotope Modeling</td>
<td>Giuseppe Sappa, Sibel Ergul and Flavia Ferranti</td>
</tr>
<tr>
<td></td>
<td>Author Index</td>
<td></td>
</tr>
</tbody>
</table>
Engineering Geology for Society and Territory - Volume 5
Urban Geology, Sustainable Planning and Landscape Exploitation
Lollino, G.; Manconi, A.; Guzzetti, F.; Culshaw, M.;
Bobrowsky, P.T.; Luino, F. (Eds.)
2015, XXXV, 1400 p. 748 illus., 616 illus. in color. In 2 volumes, not available separately., Hardcover
ISBN: 978-3-319-09047-4