## Contents

*Contributors* vii  
*Preface* xi  
JOHN J. CLAGUE AND DOUGLAS STEAD

1 Landslide hazard and risk  1  
JOHN J. CLAGUE AND NICHOLAS J. ROBERTS  

2 Landslides in the Earth system 10  
OLIVER KORUP  

3 Earthquake ground motion and patterns of seismically induced landsliding 24  
NIELS HOVius AND PATRICK MEUNIER  

4 Landslides at stratovolcanoes initiated by volcanic unrest 37  
CHRISTOPHER F. WAYTHOMAS  

5 Mobility of long-runout rock avalanches 50  
TIM DAVIES AND MAURI MCSAVENY  

6 Rapid rock-slope failures 59  
REGINALD L. HERMANS AND ODVAR LONGVA  

7 Risk assessments for debris flows 71  
MATTHIAS JAKOB AND KRIS HOLM  

8 Landslides in quick clay 83  
J. KENNETH TORRANCE  

9 Controls on the distribution of major types of submarine landslides 95  
DAVID J. W. PIPER, DAVID C. MOSHER, AND D. CALVIN CAMPBELL  

10 Tsunami hazard assessment related to slope failures in coastal waters 108  
BRIAN D. BORNHOLD AND RICHARD E. THOMSON  

11 Physical impacts of climate change on landslide occurrence and related adaptation 121  
CHRISTIAN HUGGIEL, NIKOLAY KHABAROV, OLIVER KORUP, AND MICHAEL OBERSTEINER  

12 Landslides and geologic environments 134  
ROBIN FELL, DAVID STAPLEDON, AND PATRICK MACGREGOR  

13 Numerical modeling of rock-slope instability 144  
DOUGLAS STEAD AND JOHN COGGAN  

14 Remote sensing techniques and landslides 159  
DAVID PETLEY  

15 Engineering geomorphology of landslides 172  
JAMES S. GRIFFITHS AND MALCOLM WHITWORTH  

16 Developments in landslide runout prediction 187  
SCOTT MCDougall, MIKA MCKINNON, AND OLDrich HUNGR  

17 Models of the triggering of landslides during earthquakes 196  
RANDALL W. JIBSON  

18 Slow rock-slope deformation 207  
FEDERICO AGliARDI, GIOVANNI B. CROSTA, AND PAOLO FRATTINI  

19 Landslide monitoring: The role of investigative monitoring to improve understanding and early warning of failure 222  
ERIK EBERHARDT  

20 Groundwater in slopes 235  
LUCIANO PICARELLI, SERGE LEROUEIL, LUCIO OLIVARES, LUCA PAGANO, PAOLO TOMMASI, AND GIANFRANCO URCIUOLI
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Soil slope stabilization</td>
<td>Edward N. Bromhead, Seyyedmahdi Hosseyni, and Nobuyuki Torii</td>
</tr>
<tr>
<td>22</td>
<td>Rockfall characterization and modeling</td>
<td>Paolo Frattini, Giovanni B. Crosta, and Federico Agliardi</td>
</tr>
<tr>
<td>23</td>
<td>The 2006 Eiger rockslide, European Alps</td>
<td>Michel Jaboyedoﬀ, Marc-Henri Derron, Julien Jakubowski, Thierry Oppikofer, and Andrea Pedrazzini</td>
</tr>
<tr>
<td>24</td>
<td>Randa: Kinematics and driving mechanisms of a large complex rockslide</td>
<td>Simon Loew, Valentin Gischig, Heike Willenberg, Andrea Alpiger, and Jeffrey R. Moore</td>
</tr>
<tr>
<td>25</td>
<td>Characterization and management of rockslide hazard at Turtle Mountain, Alberta, Canada</td>
<td>Corey R. Froese, Marie Charrière, Florian Humair, Michel Jaboyedoﬀ, and Andrea Pedrazzini</td>
</tr>
<tr>
<td>26</td>
<td>The Åknes rockslide, Norway</td>
<td>Lars Harald Blikra</td>
</tr>
<tr>
<td>27</td>
<td>A seismometric approach for back-analyzing an unusual rockfall in the Apennines of Italy</td>
<td>Gianluca Bianchi Fasani, Carlo Esposito, Luca Lentini, Salvatore Martino, Massimo Pecci, and Gabriela Scarascia Mugnozza</td>
</tr>
<tr>
<td>28</td>
<td>Downie Slide, British Columbia, Canada</td>
<td>Katherine S. Kalenchuk, D. Jean Hutchinson, Mark Diederichs, and Dennis Moore</td>
</tr>
<tr>
<td>29</td>
<td>The 1963 Vaiont landslide, Italy</td>
<td>Monica Ghirotti</td>
</tr>
<tr>
<td>30</td>
<td>Hong Kong landslides</td>
<td>Stephen R. Hencher and Andrew W. Malone</td>
</tr>
<tr>
<td>31</td>
<td>Landslides induced by the Wenchuan earthquake</td>
<td>Masahiro Chigira, Gonghui Wang, and Xiyong Wu</td>
</tr>
<tr>
<td>32</td>
<td>Landslides on other planets</td>
<td>Marko H. K. Bulmer</td>
</tr>
<tr>
<td></td>
<td>Index</td>
<td>409</td>
</tr>
</tbody>
</table>