



Introduction: Advances in Landslide Science

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Abstract

There had been a significant progress in the past few years on the advancement in technology, analyses methods, and simulation techniques for landslide hazard mitigation. This volume includes a few of such advancements. The entire volume include 124 papers that have been accepted through the extensive peer review process. The entire volume is included into four subthemes and the fourth theme is also subdivided into two parts. This volume includes the papers pertinent to research and studies from all over the world on advancement regarding the techniques pertinent to landslide field recognition, field and laboratory based landslide investigation techniques, numerical and physical modeling methods, landslide hazard and risk assessment as well as prediction techniques. Description of individual subtopic are presented prior to the presentation of each session.

Keywords

Landslide monitoring • Landslide inventory • Risk assessment • Physical modeling • Numerical simulation field instrumentation • Laboratory testing

Introduction

There has been a significant progress in the field of landslide science in recent years. This progress can be attributed to the development of field monitoring and remote sensing technology, development of robust devices for monitoring of landslides as well as field and laboratory testing, availability of highly precision sensors, development of large scale physical modelling facilities, development of high precision and high speed computational infrastructure, 2D to 4D numerical simulation programs, availability of high resolution remote sensing imagery and data processing capabilities, and many other factors. This volume of the Proceedings of the WLF4 will include the recent advancements made in the research and implementation pertinent to the above mentioned activities in the past couple of years.

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Papers were solicited from all over the world pertinent to the theme of the volume—advances to landslide science. A total of 187 papers were submitted for possible publication in this volume. The submissions were from professionals working both in government and private sectors as well as researchers working in academic as well as government and non-governmental research institutes all over the world. All submitted papers went through a rigorous peer review process and a paper that received at least one positive review as accepted for publication in this volume. Through the extensive review process, a total of 124 papers have been accepted and included in this volume.

The entire volume include two keynote lectures and the accepted papers that are separated into four sub-sections, as listed below:

- Landslide field recognition and identification: remote sensing techniques, field techniques etc.
- Landslide investigation: field investigation, laboratory testing etc.

- Landslide modeling: landslide mechanics and simulation models
- Landslide hazard, risk assessment and prediction: landslide inventories and susceptibility, hazard mapping methods, damage potential etc.

The first keynote lecture is pertinent to the history of earthquake induced landslides based on the database available in the past 100 years (Tiwari and Ajmera 2017). The keynote lecture introduces the factors controlling earthquake induced landslides. The second keynote lecture on the reliability based assessment of the current landslide hazard evaluation techniques (Zhang et al. 2017). The description of each sub-topic within the overall the theme of this volume are briefly described below. Each sessions are separately introduced by the session editors prior to the occurrence of the accepted papers, which are arranged in the alphabetical order of the last name of the main author.

Landslide Field Recognition and Identification: Remote Sensing Techniques, Field Techniques

Mateja Jemec Auflič from Slovenia, Netra Prakash Bhandary from Japan, Filippo Catani from Italy, A A Virajh Dias from Sri Lanka, and Ping Lu from China generously agreed to work as the conveners of this session and Mateja Jemec Auflič managed the submitted papers as a session editor. A total of 24 papers have been accepted to be included in this sub-theme. The papers, submitted from all over the world include an overview of the recent developments and research studies in landslide field recognition and identification techniques, including but not limited to various remote sensing techniques, field investigation methods as well as landslide field recognition and identification techniques both in macro and micro scale.

Landslide Investigation: Field Investigation, Laboratory Testing

Beena Ajmera from USA, Netra Prakash Bhandary from Japan, Luciano Picarelli from Italy, and Kaixi Xue from China generously worked as the conveners of this sub-theme and Beena Ajmera handled all submitted papers as the session editor. There are 26 papers accepted for publication in this sub-theme that were submitted from all over the world on the research these such as an overview of recent development at research and application of landslide investigation techniques, both in the field and laboratory levels, in situ landslide investigation methods, large and small scale

laboratory based landslide investigation methods, and laboratory testing of soils and rocks.

Landslide Modeling: Landslide Mechanics and Simulation Models

Binod Tiwari from USA, He Bin from China, Adrin Tohari from Indonesia, and Ye-Ming Zhang from China generously acted as the conveners of this sub-theme. Adrin Tohari managed the submitted papers as the session editor. A total of 22 papers were accepted in this session through an extensive peer review process. Papers submitted in this session research from all paper the world pertinent to the recent developments and research studies on physical and numerical modeling related to landslides causes, mechanism and remediation techniques.

Landslide Hazard, Risk Assessment and Prediction: Landslide Inventories and Susceptibility, Hazard Mapping Methods, Damage Potential

Conveners of this session were Snježana Mihalić Arbanas from Croatia, Basanta Raj Adhikari from Nepal, Fausto Guzzetti from Italy, Huabin Wang from China. As the number of papers submitted in this session were significantly large, the submitted papers were divided into two parts—part A and part B. part A was managed by Basanta Raj Adhikari and the part B was managed by Snježana Mihalić Arbanas as session editors. A total of 52 papers were accepted in this session after an extensive peer review process. The papers included in this session have been submitted from all over the world on the recent developments and research studies pertinent to landslide hazards, risk assessment and prediction techniques, research studies and application of LS inventories and identification of landslide susceptibility, research studies and application of various landslide hazard mapping techniques available in practice, and research studies and application of various techniques to identify the damage potential due to landslides.

Conclusion

There have been a significant advancement on the landslide science in the past few years. This volume includes a total of 124 accepted papers that cover the overall theme of the volume, which is divided into four different sub-themes. Moreover, two keynote lectures, one on the history of research on earthquake induced landslides and another on

reliability on landslide hazard assessment have also been included.

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References

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