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Flood Risk Assessment and Management
Landslides
Tsunami: From Fundamentals to Damage Mitigation
Tsunami
From Fundamentals to Damage Mitigation

Edited by

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Preface

In the last years the word “tsunami” has become familiar to most people, as many events have happened and drew the attention of both specialists and the general public because of their highly visible and spectacular actions and effects that have the potential to significantly affect society through loss of life, destruction of infrastructure and various other direct and indirect impacts.

Technically, a tsunami is a series of water waves caused by the displacement of a large volume of a body of water, typically in an ocean. Earthquakes, volcanic eruptions and other underwater explosions (including detonations of underwater nuclear devices), landslides, glacier calvings, meteorite impacts and other disturbances above or below water all have the potential to generate a tsunami.

Tsunami waves are very different from normal sea waves, because their wavelength is far longer. Wave heights of tens of metres can be generated by large events and therefore, although the impact of tsunamis is limited to coastal areas, their destructive power can be enormous and they can affect entire ocean basins; the 2004 Indian Ocean tsunami was among the deadliest natural disasters in human history with over 230,000 people killed in 14 countries bordering the Indian Ocean.

Scientists as well as governments must improve their grasp of knowledge regarding these natural hazards, as reducing the risks associated with them requires their better appreciation and understanding. This book comprises seven chapters, and covers all the main aspects related to tsunami.

The first chapter deals with the different types of tsunami and their historical data. Chapter 2 describes an inverse type solution to determine a posteriori of the tsunami waveform. One of the main problems with tsunamis is how to assess the flooding they produce, which is described in chapter 3.
Chapter 4 deals with the very important topic of Early Warning Systems. Chapter 5 not only studies the behaviour of reinforced concrete buildings under the 2011 Japanese Tsunami but puts forward a series of recommendations. One of the most damaging aspects of Tsunamis, is the damage to infrastructure and building systems, which is discussed in chapter 6, which also gives guideline measures to be taken in the future. Finally chapter 7 studies the important problem of health and related issues due to tsunami disasters.

The Editor is grateful to the Authors of these chapters, who are leading specialists in their fields and who prepared top quality material, that makes this volume a most valuable and up-to-date tool for professional, scientists and managers to appreciate the state-of-the-art in developing a fully integrated approach to tsunami risk management.

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