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Editors

Intelligent Systems for Crisis Management

Gi4DM 2018

 Springer

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Preface

Since the 1980s, the impacts of disasters have risen rapidly affecting developed and developing countries and almost all sectors of economy at local, national, and regional levels. Several hundred million people are affected annually, and losses reached over billion USD during the last years. Governments, international organizations, and research institutions worldwide have set to work to improve disaster management in all its phases: mitigation, preparedness, relief and response, and recovery and reconstruction. Many governments have put the formation of a hazard-resistant and disaster coping society on their political agenda as an important factor of sustainable economic development and better quality of civil life. In this respect, the awareness of new geospatial technologies and their successful utilization in disaster management is becoming crucial. These technologies are emerging very fast and involve different satellite systems such as meteorological and earth observation satellites, communication satellites, and satellite-based navigation and positioning systems, that may help to improve prediction and monitoring of potential hazards, risk mitigation, and disaster management, contributing in turn to reduce losses of life and property. Global navigation satellites and earth observation satellites have already demonstrated their flexibility in providing data for a broad range of applications: weather forecasting, vehicle tracking, disaster alerting, forest fire and flood monitoring, oil spill detection, desertification monitoring, and crop and forestry damage assessment. Monitoring and management of recent natural disasters have greatly benefited from satellite imagery, such as the Indian Ocean tsunami in 2004; floods (Austria, Romania, Switzerland, and Germany in 2005); hurricanes (USA in 2005); forest fires (Portugal, France, Greece, Australia in 2005, 2008 latest in Los Angeles/California—USA); earthquakes (Pakistan in 2005, Indonesia in 2006, Wenchuan/China in 2008, Haiti 2010, and many others), etc.

Systems maintaining geospatial information are becoming more elaborate and multi-functional than ever before. Many of these systems can meet requirements for early warning and real-time response and provide suitable models for elaborated predictions, simulations, and visualizations. However, the knowledge about the full range of the application potential of geospatial technologies is the domain of specialists in the geosciences.

An international effort in this direction is the Gi4DM series of conferences, which was held for the first time in 2005 in Delft after the Indian Ocean tsunami and repeated every year in almost all parts of the world. The last Gi4DM conference held on March 18–22, 2018, in Istanbul was the reflection of the intended longer-term coordination between ISPRS and URSI, two leading global scientific societies serving complementary disciplines of interest for a wide scientific community. The conference addressed diverse topics related to methodologies and technologies within a unique forum keeping participants up to date with the latest advances in disaster management.

This book includes 12 chapters organized in four parts (Earthquake Damage Assessment, Geospatial Information for Disaster Management, Landslide Monitoring, and Natural Disasters) focusing on the intelligent use of geo-information, semantics, and situation awareness. The chapters are an extended version of the presented papers selected by the Scientific Committee according to quality, significance, and originality. The Local Organizing Committee decided for the first time in the Gi4DM book series to encourage the brightest young researchers and expand the frontiers of science in their chosen fields. Therefore, the winners of the best poster award were also invited to take part in this book (Part III, Chapter “[Remote Sensing Techniques in Disaster Management: Amynteon Mine Landslides, Greece](#)”). We are earnestly thankful to all the authors for their efforts. Hence, in this book, various application-oriented 12 examples from 8 countries of different parts of the world demonstrate the potential of this technology in the Crisis Management.

Istanbul, Turkey
Munich, Germany
Paris, France
December 2018

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