Preface

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Gi4DM 2015 marks the 10th edition of the Geoinformation for Disaster Management series of conferences. The first conference in 2005 was held in the aftermath of the 2004 Indian Ocean earthquake and tsunami which claimed the lives of over 220000 civilians. While Geoinformatics has a long been used in disaster management and monitoring, it was the enormity of the 2004 natural disaster that prompted GIS researchers, vendors and users to investigate and develop tools for holistic disaster management.

In the past decade, the increased research and development has proven the indispensable value of Geoinformation and Geoinformatics in disaster response, management, and monitoring and relief coordination. This value was amply demonstrated during the Hurricane Katrina (2005), Sichuan Earthquake (2008), Haiti Earthquake (2010), Tohoku Earthquake and Tsunami (2011) to name but a few well reported natural disasters in this time. In this time spatial data acquisition technologies have also experienced many improvements. Some of these technologies include laser scanning, mobile mapping and mapping using UAVs. The result of these improvements has been very high resolution imagery and point clouds acquired over very short periods or in near real-time.

The nine previous editions of Gi4DM conferences were held in the Netherlands, (March 2005), in Goa, India, (September 2006), Toronto, Canada, (May 2007), Harbin, China (August 2008), Prague, Czech Republic (January 2009), Toronto, Italy (February 2010), Antalya, Turkey (May 2011), the Netherlands (December, 2012) and Hanoi, Vietnam (December 2013). Gi4DM 2015 has been organized in cooperation with different international bodies such as ISPRS, UNOOSA, ICA, ISCRAM, FIG, IAG, OGC and WFP and supported by national organizations such as GIN (the Netherlands) and CIG (Canada). Since 2008, Gi4DM is coordinated by the Joint Board of Geospatial Information Societies (JB GIS) ad-hoc Committee on Risk and Disaster Management. Gi4DM 2015 was held as part of Geospatial Week 2015 which has been organized by the ISPRS.

The fundamental goal of the Gi4DM has been to provide a forum where disaster managers, stakeholders, researchers, data providers and system developers can discuss challenges, share experience, discuss new ideas, demonstrate technology. The conferences have also sought to look forward and consider future research directions and study how risk and disaster management activities can be better supported.

The volume consists of 14 peer-reviewed scientific. These were selected on the basis of double-blind review from among the 19 papers submitted to the Gi4DM conference. Each paper was reviewed by two scientific reviewers. The authors of the papers were encouraged to revise, extend and adapt their papers to fit the goal of this volume.
The selected papers are organized in four themes: Risk management, Crisis management, Coordination of Disaster Response and Monitoring.

The choice of the themes is informed by the use of Geoinformation in the various stages of disasters, incidents or crises. Risk management describes the activities involved in the prediction of disasters and the resulting costs of disasters. Cost is here measured in loss of human life, property, assets, etc. The purpose of risk management is firstly to measure the impact of a disaster and secondly to find ways to reduce the impact. Three papers have been contributed for this theme by Aarsen et al., Sheikhian et al., and Caprioli et al. Aarsen et al. investigate mitigation of the loss of electrical power during a natural disaster. They discuss a spatial database of solar panels that can be integrated to serve as a backup power system during a power out. By using existing knowledge of fault lines, Sheikhian et al. use granular computing to predict the vulnerabilities of the city of Tehran, Iran, to earthquakes. Caprioli et al. explore the use of UAVs to map cliff faces and predict rock falls which can be a threat to human.

When a disaster has occurred what is then needed is a management of the crisis. Crisis management sets out the organizational and public activities that should take place once a disaster happens. Its purpose is to minimize the costs identified during risk management. Three papers have been contributed for this theme by Corbane et al., Roller et al. and Lucas et al. Corbane et al. present a common framework for recording disaster damage and loss data in the European Union. Roller et al. study the interoperable sharing of data during a crisis, in this case a flooding. This work should be read together with that of Aarsen et al. as they are to some extent complimentary. Lucas et al. propose automatic methods to generate remediation plans and navigation information in the

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aftermath of an industrial accident. The methods are demonstrated using data from Kolontar red mud dam failure (2010) in Hungary.

A parallel activity during crisis management is the coordination of disaster response. Coordination response aims to obtain synergy of all organizations involved in responding to a disaster. One way of achieving this synergy is by ensuring that all responders are aware of each other's actions. Three papers have been submitted for this theme by Linyao et al., Demir et al. and Bandrova et al. Linyao et al. investigate more intelligent ways of data sharing and tasking different responders during a disaster. Demir et al. propose a general conceptual approach for disaster and emergency management system. The concept of the system is intended for use by the Istanbul Governorship Provincial Disaster and Emergency Directorate and designed to coordinate responders in the event of an explosion at an industrial facility. Bandrova et al. consider the education of children to respond to natural disasters by using GIS tools.

After a disaster event, the regions affected have to be monitored. The purpose of monitoring is to assess the damage and identify other hazards that may have been triggered (for example fires after an earthquake). For this theme five papers were received, namely Nakagawa et al., Fernandez et al., Lucas et al, Kuldeep and Garg, and Gueye et al. Nakagawa et al., propose a web based mobile system for asset management of Sabo (the control of erosion and sediment) facilities. Fernandez et al., investigated the monitor of a landslide using a UAV system in Jaen, Spain. Lucas et al investigated the faster generation of orthophotos for disaster response. Kuldeep and Garg studied the role of satellite imagery and GIS for flood mapping. Finally, Gueye et al. present the cartographic strategy for the Early Warning Directorate (EWD) of Economic Commission of West African States (ECOWAS) and discuss its future implementation.

The papers summarized here consider different forms of natural hazards, namely flooding, earthquakes, rock falls, and landslides. The papers also draw from disaster management in different parts of the world. As the prevalence of natural disasters is different from region to region, having this perspective is important. Various modern techniques of data acquisition, including mobile devices, UAVs, etc., are also presented. Overall, together create a picture of problems that are topical in the use of Geoinformation for the management of disasters and the general approaches used to solve these problems.

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