GEOINFORMATION FOR DISASTER MANAGEMENT 2020 (Gi4DM2020)

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PREFACE:

Across the world, nature-triggered disasters fuelled by climate change are worsening. Some two billion people have been affected by the consequences of natural hazards over the last ten years, 95% of which were weather-related (such as floods and windstorms). Fires swept across large parts of California, and in Australia caused unprecedented destruction to lives, wildlife and bush. This picture is likely to become the new normal, and indeed may worsen if unchecked. The Intergovernmental Panel on Climate Change (IPCC) estimates that in some locations, disaster that once had a once-in-a-century frequency may become annual events by 2050.

Disaster management needs to keep up. Good cooperation and coordination of crisis response operations are of critical importance to react rapidly and adequately to any crisis situation, while post-disaster recovery presents opportunities to build resilience towards reducing the scale of the next disaster. Technology to support crisis response has advanced greatly in the last few years. Systems for early warning, command and control and decision-making have been successfully implemented in many countries and regions all over the world. Efforts to improve humanitarian response, in particular in relation to combating disasters in rapidly urbanising cities, have also led to better approaches that grapple with complexity and uncertainty.

The challenges however are daunting. Many aspects related to the efficient collection and integration of geo-information, applied semantics and situational awareness for disaster management are still open, while agencies, organisations and governmental authorities need to improve their practices for building better resilience.

Gi4DM 2020 marked the 13th edition of the Geoinformation for Disaster Management series of conferences. The first conference was held in 2005 in the aftermath of the 2004 Indian Ocean earthquake and tsunami which claimed the lives of over 220,000 civilians. The 2019-20 Australian Bushfire Season saw some 18.6 million Ha of bushland burn, 5,900 buildings destroyed and nearly three billion vertebrates killed. Gi4DM 2020 then was held during Covid-19 pandemic, which took the lives of more than 1,150,000 people by the time of the conference. The pandemic affected the organisation of the conference, but the situation also provided the opportunity to address important global problems.

The fundamental goal of the Gi4DM has always been to provide a forum where emergency responders, disaster managers, urban planners, stakeholders, researchers, data providers and system developers can discuss challenges, share experience, discuss new ideas and demonstrate technology. The 12 previous editions of Gi4DM conferences were held in Delft, the Netherlands (March 2005), Goa, India (September 2006), Toronto, Canada (May 2007), Harbin, China (August 2008), Prague, Czech Republic (January 2009), Torino, Italy (February 2010), Antalya, Turkey (May 2011), Enschede, the Netherlands (December, 2012), Hanoi, Vietnam (December 2013), Montpellier, France (2015), Istanbul, Turkey (2018) and Prague, Czech Republic (2019). Through the years Gi4DM has been organised in cooperation with different international bodies such as ISPRS, UNOOSA, ICA, ISCRAM, FIG, IAG, OGC and WFP and supported by national organisations.

Gi4DM 2020 was held as part of *Climate Change and Disaster Management: Technology and Resilience for a Troubled World.* The event took place through the whole week of 30th of November to 4th of December, Sydney, Australia and included three events: Gi4DM 2020, NSW Surveying and Spatial Sciences Institute (NSW SSSI) annual meeting and Urban Resilience Asia Pacific 2 (URAP2).

The event explored two interlinked aspects of disaster management in relation to climate change. The first was geo-information technologies and their application for work in crisis situations, as well as sensor and communication networks and their roles for improving situational awareness. The second aspect was resilience, and its role and purpose across the entire cycle of disaster management, from pre-disaster preparedness to post-disaster recovery including challenges and opportunities in relation to rapid urbanisation and the role of security in improved disaster management practices.

This volume consists of 16 peer-reviewed scientific papers. These were selected on the basis of double-blind review from among the 25 full papers submitted to the Gi4DM 2020 conference. Each paper was reviewed by three scientific reviewers. The authors of the papers were encouraged to revise, extend and adapt their papers to reflect the comments of the reviewers and fit the goals of this volume. The selected papers concentrate on monitoring and analysis of forest fire (3), landslides (3), flood (2), earthquake, avalanches, water pollution, heat, evacuation and urban sustainability, applying a variety of remote sensing, GIS and Web-based technologies. Figure 1 illustrates the scope of the covered topics though the word count of keywords and titles.

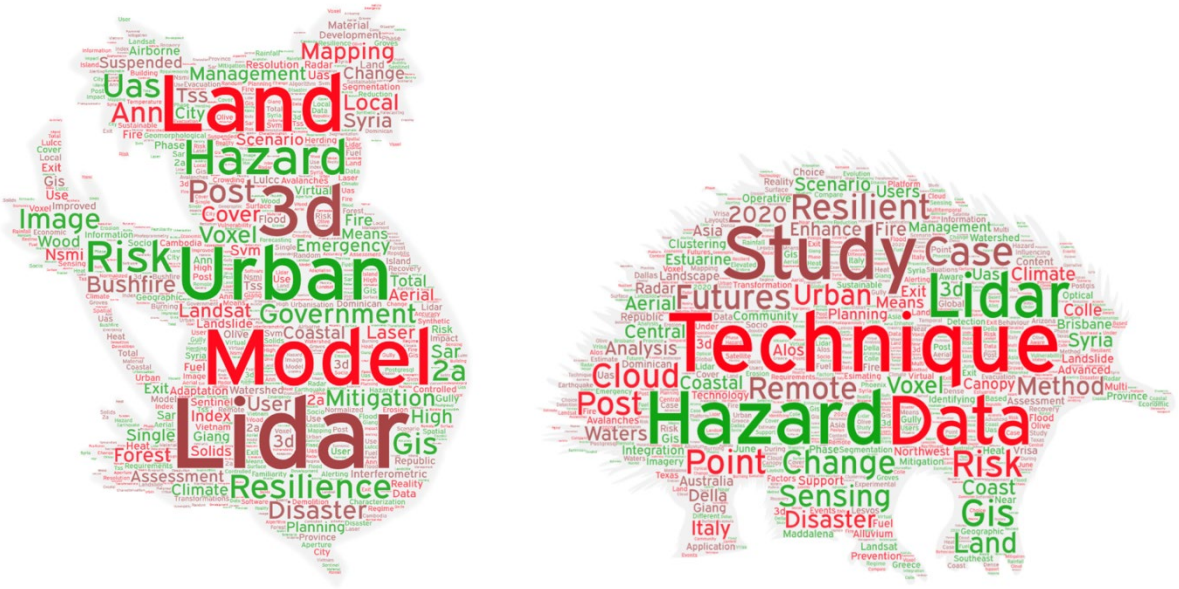

Figure 1: Word count of keywords (koala) and titles (echidna)

The Gi4DM 2020 program consisted of scientific presentations, keynote speeches, panel discussions and tutorials. The four keynotes speakers Prof Suzan Cutter (Hazard and Vulnerability Research Institute, USC, US), Jeremy Fewtrell (NSW Fire and Rescue, Australia), Prof Orhan Altan (Ad-hoc Committee on RISK and Disaster Management, GeoUnions, Turkey) and Prof Philip Gibbins (Fenner School of Environment and Society, ANU, Australia) concentrated on different aspects of disaster and risk management in the context of climate change. Eight tutorials offered exciting workshops and hands-on on: Semantic web tools and technologies within Disaster Management, Structure-from-motion photogrammetry, Radar Remote Sensing, Dam safety: Monitoring subsidence with SAR Interferometry, Location-based Augmented Reality apps with Unity and Mapbox, Visualising bush fires datasets using open source, Making data smarter to manage disasters and emergency situational awareness and Response using HERE Location Services. The scientific sessions were blended with panel discussions to provide more opportunities to exchange ideas and experiences, connect people and researchers from all over the world.

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