

# REMOTE SENSING AND GIS IN DISASTER MONITORING

## Second Gi4DM Symposium

Geo-information technologies are able to support management and recovery in the aftermath of manmade and natural disasters. However, disaster management also poses big challenges in all aspects of the geo-information cycle, from data collection to visualisation and communication. For the second time, the International Symposium on Geo-information for Disaster Management (Gi4DM) brought together researchers, developers, data providers and users from all over the world to discuss these challenges.

The challenges particularly result from the heterogeneity of geo-information sources, including differences in spatial reference system, scale/resolution, dimension (2D or 3D), representation (vector or raster), classification and attribute schemes, and temporal aspects. Universities, international organisations and vendors join forces to bring together researchers, developers, data providers and users from all over the world for these annual symposia. The first, held at Delft University of Technology in The Netherlands from 21st to 23rd March 2005 attracted more than three hundred participants from 59 countries (see review GIM International, June 2005). The second symposium was held from 25th to 26th September 2006 in Goa, India, under the theme "Remote Sensing and GIS Techniques for Monitoring and Prediction of Disasters", the local organising committee being led by Dr Rajawat.

### Good Information

The present symposium welcomed sixty participants from twelve countries. There were 46 full papers describing ongoing research in prediction and monitoring of natural disasters, presented during six oral sessions, and one poster session on the first day. Research topics covered included systems for early warning, use of satellite imagery for cyclone/flood monitoring, multi-sensor processing, geo-portals for data access, and accessibility of information. David Stevens elaborated on activities supported by the United Nations in providing unified systems of space-data acquisition and delivery for those affected by disasters. Dr Shailesh Nayak, Gi4DM symposium chair, presented Indian developments towards a tsunami early-warning system. This, based on twelve stations, 25 tide-gauges and satellite imagery, is able to detect and warn a population in danger within thirty minutes of an event. End-users were few among participants, but some interesting papers were presented on lessons learnt. Henrike Brecht gave one such on Hurricane Katrina. Norman Kerle discussed the earthquake in Java, Indonesia, and Sisi Zlatanova outlined a study of user requirements undertaken in The Netherlands. Chris Parker, as data provider, gave an overview of the experiences of Ordnance Survey in managing and providing data for disaster management. He discussed the three dimensions of "good information", timely, relevant and accurate, and outlined the steps Ordnance Survey was undertaking to achieve this.

### Keynotes

Keynote speaker Dr Irwin Itzkovitch, Assistant Deputy Minister, Earth Sciences Sector, Natural Resources, Canada was confident "researchers have developed the science and technology to understand the power of nature and effectively plan and mitigate" but he emphasised the importance of working together to minimise loss. Keynote speaker Shailesh Nayak shared his thoughts on global climate change, which affects India among other ways in the form of unexpected floods and cyclones. He discussed the necessity to respond to these changes using appropriate remote-sensing technology and near real-time data processing and management.

### Panel Discussion

The afternoon of the second and last day was dedicated to a panel session, the panel consisting of Dr Panigrahi (India), Dr David Stevens (UNOOSA) and Dr Norman Kerle (The Netherlands) and chaired by Dr Alain Grignon. They deliberated upon four provocative statements. Regarding the first: "Geo-specialists can deliver timely geo-information in time of disaster", it was agreed that the current status of technology was sufficient to provide end-users with geo-data. However, the establishment of Spatial Data Infrastructure at national and international level would greatly help in the supply of such data. It would aid the necessary legal and organisational agreements and could contribute greatly to the sharing and harmonisation of data. Opinions were diverse when it came to the second statement: "Quality of geo-information is sufficient for disaster management". But it was unanimously concluded that balance was required. During the initial hours after a disaster data of lesser quality could save lives and reduce damage, so that it was not feasible to wait days in order to provide trustworthy, high-quality data. Such might even confuse users with its high level of detail. It was therefore vital that user requirements be better understood. In response to the third statement: "There are mechanisms in place to make use of the necessary scientific and technical expertise after disaster", the International Charter was given as a good example of availability of expertise after a disaster. Yet co-ordination between various initiatives at local and international level was considered insufficient. This was especially true of devel-

oping countries, although some authorities in developed countries, for example in the US in the aftermath of Hurricane Katrina, also failed to react appropriately. In response to the final statement for discussion: “Geo-specialists are sufficiently involved in efforts to predict and mitigate disasters”™, the panel recognised that the geo-specialist was not directly involved in emergency response. But it found far too little emphasis on working closely with users. Capacity build-ing needed to be further strengthened and strongly enforced by governments.

## Final Remarks

While the first symposium addressed the major challenges posed by SDI and co-operation between different rescue units, the symposium in India mainly discussed availability and processing of data. It also em-phased early-warning systems, reinforcing the fact that national SDI for disaster management either did not exist or was at a very early stage. The third symposium will be held in Toronto, Canada from 23rd to 25th May 2007 ([www.cig-acsg.ca/cig2007/english/home.htm](http://www.cig-acsg.ca/cig2007/english/home.htm)). It is being organised in tandem with the hundredth National Conference of the Canadian Institute of Geomatics, celebrating its 125th anniversary. This conference will focus on use of geo-information in risk prevention and mitigation, and on methods and software tools for real-time data collection, processing and information extraction.

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