

GIS-based approaches to the sharing of disaster information

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Natural disasters cause billions of dollars of property and infrastructure damage, unexpected disruption to socio-economic activities and tragic loss of human lives each year. The importance of collecting and maintaining detailed and accurate records on disastrous events for an effective risk assessment and disaster mitigation is widely recognised. Considerable efforts have been directed towards the establishment of databases on historic disasters but many disaster databases built are primarily a set of lists of historical disaster events.

Disaster phenomena vary dramatically with both space and time. It is therefore important to integrate spatial-temporal dimensions of disaster events in a disaster database to support efficient and interactive querying and reporting operations. It is also important to make such a database readily accessible by a variety of users from government agencies, non-government organizations, research institutes and local communities, to enable effective and efficient emergency response, impact and risk assessment, and mitigation planning.

This paper presents a study that investigates effective and efficient GIS-based approaches to the representation, organisation and access of disaster information - including logical data models for representing disastrous events, the object-relational approach to database implementation, and internet-based user-interfaces for database queries and report generation. Key aspects of a disaster event, including the spatial-temporal dimensions of the hazard and its impacts, are considered in the development of data models and database implementation in order to support user-friendly querying and reporting operations. The technological strengths of geographical information systems, database management systems, and Internet-related toolboxes are leveraged for developing a prototype of a GIS-based, object-relational disaster database with an Internet-based user interface that supports multi-mode (including map-based) database queries and flexible facilities for report generation.