
Part III

GIS Application and Developments

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The L.08 session titled “GIS application development” took place within the Second World Landslide Forum from Thursday 10th March p.m. and 11th March a.m. It was introduced by a presentation of the received posters and followed by a series of oral presentations. Session activities were coordinated by Raffaele De Amicis (Fondazione Graphitech), Esther Hliðar Jensen (Icelandic Meteorological Office), Serafino Angelini (Litografia Artistica Cartografica, Florence).

The GIS APPLICATION DEVELOPMENTS session aimed at including research and development work regarding computerised techniques supporting geographic information so as to correctly manage and store data, even historical, and consequently identify new data analysis systems and discuss proposals supporting applied research in these fields.

Fifteen researches have been presented and these entirely fulfilled expectations. Since the subject was transversal, researches ranged in different fields although aspects related to geomatic were central. The last aspects seemed to be the main reason for the speaker to choose this session; after perusal of hundreds of researches presented during the Second World Landslide Forum it appears that the Geographical Information Systems currently involve every aspect of slope instability studies as well as geotechnical geology-engineering. It also appears that many other researches would have had an appropriate place in this session since there is a number of aspects currently related to geomatic.

Geographical information applied to Earth Sciences and thematic Cartography paves a new way in the management of events related to slope instability, landslide risks and mass movements sensu lato both in identifying the causes, reducing the risk and managing the consequences even in emergency situations through real time analysis and actions of civil defense.

In this perspective some actions concentrated on criticalities causes and a classification of the events was drawn to be used in the future for comparison and/or analysis; new techniques have also been considered for storing data close to applicative reality; other presentations described a detailed study of these events, based on new models of deterministic type and care was taken in assessing weather theory corresponded to the real development of the specific event; other researches focused on the effects that occur on the territory and its anthropic action when morphological instability occurs.

Some interesting considerations derived from this session; according to the presentations and related observations it appears that:

- Database implementation concerning landslide hazard improves the assessment of the consequence of every factor in the slope instability processes and provides a more objective analysis;
- When planning a dedicated database, the geological and engineering factors must be considerably taken into consideration since these make the theoretical models more complicated;

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- The majority of slope instability phenomena are in constant development and continuously modify the surrounding conditions: the assessment of new scenarios is essential when modifications occur;
 - Choice of the model type and of the appropriate sliding surface is an essential aspect in every risk analysis; assessment of local conditions must be necessarily a priority followed by the approach type,
 - When assessing the risk, morphodynamical features of a landslide or of a debris flow are extremely important (e.g. expected distance of debris propagation, mass movement speed and depositional area);
 - All efforts must be made so as to compile base geological cartography – which is increasingly accurate and reliable – for identifying potential areas of risk: this cartography is still considered the best tool for a specific analysis;
 - The use of LiDAR technology for producing high resolution DEM and the importance of these supports enable to remarkably accelerate a detailed field survey without influencing data quality;
 - The frequency analysis of landslide phenomena on a regional or national scale through the Land Information Systems is an essential tool for funds allocation aimed at prevention and mitigation actions.