Introductory Foreword

The Austrian Geological Survey, as the leader of the work package 4.3 of the SafeLand project, hosted the Workshop on **"Monitoring Technologies and Early Warning Systems – Current Research and Perspectives for the Future"** in Vienna. The workshop took place during the first day of the "Area 4" meeting of the project SafeLand on February 24th to 26th, 2010.

Landslides are one of the major natural threats to human lives, settlements and infrastructure, causing enormous human suffering and property losses. As summarized by the SafeLand (http://www.safeland-fp7.eu), Europe experienced the second highest number of fatalities and the highest economic losses caused by landslides compared to other continents during the 20th century: 16,000 people lost their lives because of landslides and the material losses amounted to over USD 1.7 billion. Furthermore, the number of people affected by landslides is much larger than reported.

The best way to limit the number of casualties and avoid destruction is effective land-use planning, based especially on a good knowledge of the landslide susceptibility, hazards and risks within specific areas as a part of mitigation. However, this ideal approach is impossible in many places, due to several historical or political reasons e.g., many human settlements and infrastructure have already existed in landslide-prone areas or on dormant landslides decades before the availability of detailed hazard zone maps. Consequently in most cases it is not possible to resettle people living in such areas.

The relevance of these topics for Austria was recently highlighted in the aftermaths of the landslide event at Gschliefgraben. In late 2007, during a hazardous landslide event, 55 buildings had to be evacuated. Within the following months, more than € 10 million had to be invested for mitigation measures under the responsibility of the Torrent and Avalanche Control Survey (WLV). Today people live in their houses again and one of the most sophisticated monitoring and early warning systems of Europe is currently set up to safeguard the daily life of people concerned.

A good knowledge about structure, dynamics, triggers, history and possible magnitude of such high-risk landslides is an important prerequisite to be able to evaluate actual hazard and, eventually, to alert people before a catastrophic event takes place. This knowledge is obtainable only through a complex approach consisting of investigations coming from several different interdisciplinary methods and techniques, long-term continuous monitoring of deformation and triggering factors and by establishing early warning systems/centres. This is exactly how the project SafeLand wants to contribute.

SafeLand will develop and implement an integrated and comprehensive approach to help to guide decision-making. It will develop generic quantitative risk assessment and management tools and strategies for managing landslide risk at local, regional, European and societal scales. In addition, it will establish the baseline for the risk associated with landslides in Europe, improve our ability to forecast landslide hazards and detect hazard and risk zones.

All these issues got addressed during the workshop on **"Monitoring Technologies and Early Warning Systems – Current Research and Perspectives for the Future"** in Vienna. Seventeen scientific contributions of the project partners presented the results of the work carried out within the first year of the SafeLand project in the framework of "Area 4". They highlighted the need of innovation and technological progress in the area of landslide monitoring and early warning on an international level and presented how SafeLand will contribute to meet these needs. The session was open to the public, end-users and the scientific community.

This book contains the collection of extended abstracts summarizing the content of the talks held during this workshop.