



A Geo-Portal for Natural Hazard Data Management, Modelling, and Visualisation

J. Trau, H. Freimark, B. Stern, C. R. Gogu and L. Hurni

Institute of Cartography, Swiss Federal Institute of Technology Zurich, Switzerland

(trau@karto.baug.ethz.ch / Phone: +41 44 633 3018)

At the ETH Zurich a Research Network on Natural Hazards (HazNETH - www.hazneth.ethz.ch) that combines expertise in Atmospheric physics, Climatology, Hydrology, Hydraulic engineering, Water management, Risk engineering, Construction engineering, Forest engineering, Engineering geology, Geotechnics, Seismology, Geodynamics, Geodesy, Cartography, Environmental social sciences and Economics has been established in 2003.

It provides a platform for trans-disciplinary projects focusing on process analyses, hazard assessment, vulnerability of technical, ecological, economic and political systems, measures for prevention and upgrading, hazard and risk assessment and mitigation. It contributes to the improvement of methods and tools for integral risk management as a base for sustainable development. A declared mandate is to develop cross-boundary avenues to explore the causal relation between different processes as well as their combined effects on our natural and social environment, and to develop tools capable of handling together phenomena acting at different time and spatial scales.

In the context of HazNETH a new concept and a geo-spatial hazard and risk information system based on an integrated database/GIS structure is being developed. This will allow researchers to build efficient systems for handling, pre-processing, and analyzing the existing huge and variable data sets from different natural hazards data as well as different natural environments in Switzerland.

Three main steps will be followed in order to create this information system: the spatial database development, an integrated hazard procedure design, and a web data query and visualization tool-set. The geo-spatial database including the entire set of natural

hazards phenomena occurring within an alpine valley will offer a platform to study the existing hazard assessment methods and enable the hazard analysis and combination of various phenomena. The intention is to improve existing hazard assessment procedures and to derive new methods. Torrent streams and debris flows phenomena were chosen to be analyzed as a first step. In parallel uncertainty analysis in hazard assessment will be developed.

In order to be accessible to a large range of experts and decision makers such as emergency organizations, public authorities and even politicians, an experimental two-level user interface is being developed: one for trained specialists, and a second based on the concept of Atlas Information Systems (AIS). The latter interface will include a visualization interface, multimedia technologies and adapted GIS functionalities in order to improve information related to hazard and risk to the general public via the World Wide Web.