GEORIOS - GIS and database management system for documentation of mass movements in Austria

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Introduction

More than 70 percent of Austria is mountainous, the geology being very heterogenic and due to multiple orogenetic processes generally complex. Especially in the young and slowly ascending Eastern Alps, the intensity of the geomorphological processes sometimes result in catastrophic hazards for population and infrastructure, causing considerable economical impacts.

Annually enormous economical damage results from mass movements in Austria and furthermore the existences of the human population are often threatened. This was recently confirmed in August 2005 in many regions of Austria. Therefore the national and regional governments need basic decision and planning fundamentals to assess the risks.

This poster describes the objectives and the workflow from analogue archive data and maps to the relational database and GIS management system.

Background

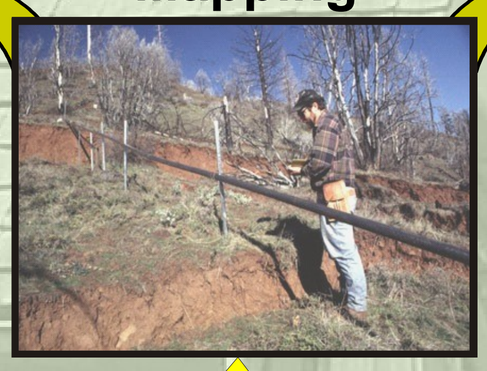
The Geological Survey of Austria represents the geo-management of the public sector of Austria. One of the main tasks is to document geogenic hazards. This is based on the National Law of Research from the year 2000 (Zit. change of the research organization law, BGBl. I, NR. 47/2000):

§ 18(2): Their tasks cover in particular:

1. **Investigations and research** within the ranges of the geosciences and geotechnics by means of appropriate state of the art technologic and scientific methods. This concerns especially the geoscientific land survey, **the collection and evaluation of geogene induced natural hazards**, **.....,**
2. **Elaboration of expertises and planning documents within these fields**;
3. **Collecting, adapting and keeping evident** the results of its investigations and research as well as documentation in these fields by the means of modern information technologies,
4. **Cooperation with the institution of the national crisis management**

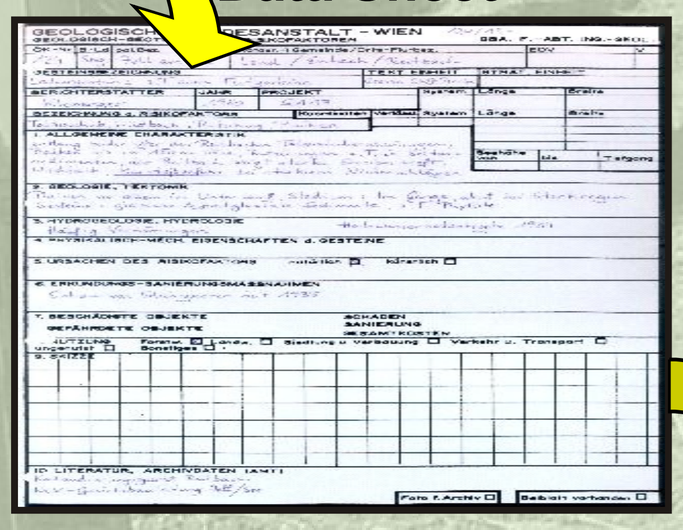
old data management system

Mapping



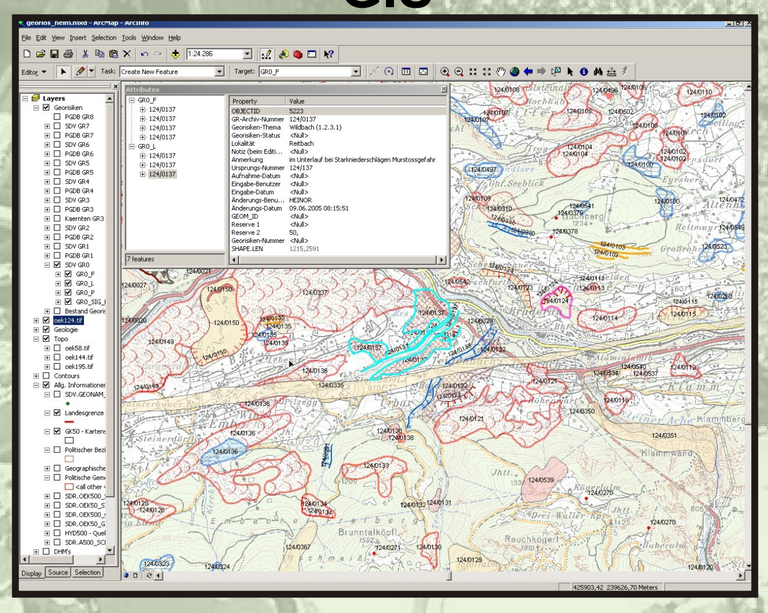
Manuscript

Data Sheet

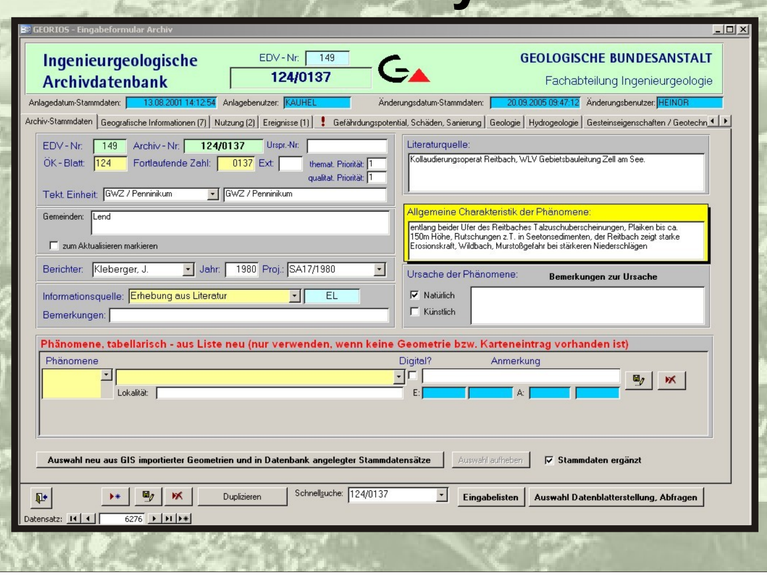


new data management system

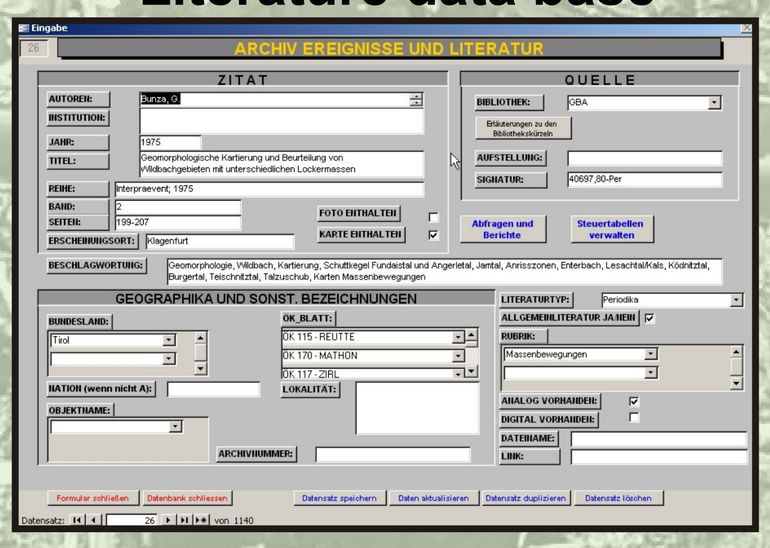
GIS



Data base system



Literature data base



GIS-based Data Management System

Since the year 2000, the Department of Engineering Geology is developing a GIS-connected relational database management system to record and document indicating-features, phenomena, documents and information of mass movements in Austria.

- The cartographic visualisation of the relevant phenomena is carried out by a geographical information system (GIS).
- By means of a relational data base system (Archive Data Base of the Department of Engineering Geology) all available data, information and documents are administrated. This system is linked with the GIS mentioned above, so that queries, search functions and evaluations are enabled from both sides, from the data base as well as from the digital map.
- Production of a literature data base about mass movements.

State of the Art

Currently the database management system contains approximately 35.000 objects (polygons, lines and points) with information to several types of mass movements (e. g. deep creeping mass movement, rockfall, landslide, soilcreep) and detailed objects (e. g. landslide scar, sliding block and other internal structures). The spatial resolutions of the resulting maps are designed for a usable scale of 1:50.000.

This basic work is very important to estimate risk and develop susceptibility maps of mass movements based upon:

(a) the digital maps of mass movement and
(b) generally available, adequate digital data with spatial resolution, such as geological maps and digital elevation models.

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