RANDADB: A VERSATILE MANAGEMENT SYSTEM FOR LANDSLIDE MOVEMENT MONITORING DATA

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Areas affected by landslides cover about 6 to 8% of the Swiss territory. In 1989, a preliminary inventory compiled in the canton of Valais has enumerated more than 200 slope instabilities. For more than 10 years in Valais, slope movements over sites likely to induce potential damage over inhabited areas and/or facilities, have been continuously or regularly monitored. This monitoring generates large volumes of data, especially following the use of automatic measurement devices (e.g. extensometer, GPS, weather station, etc.). The management of monitoring data, as well as dynamic information relative to monitoring network configurations, leads to the need for an efficient, structured and flexible data storage system. RandaDB is an original software application that has been designed and implemented to meet this need. It integrates a relational database with a suitable data model for the storage of 1-D and 3-D geodetic measurements, as well as descriptive data on monitoring network and other related information that are useful for data analysis (measurement campaigns, network maintenance, field observations, data corrections, pictures, maps, etc.). In addition to these functions, RandaDB offers a set of functionalities for the handling of data, including the tabulation of measurements, displacements plotting as graphs (1-D data) or stereographic representation (3-D data), and basic statistical and regression tools for checking the consistency of data. Furthermore, the integration of GIS and mapping components to the system allows dynamic and interactive map representations of 1-D and 3-D movements. The RandaDB application has been developed using the WinDev 5.5 development environment and MapObjects software. This tool is used since 2000 to insure the management of geodetics data related to the monitoring of the Randa site in the Mattertal valley (Valais, CH), where there occurred in April-May of 1991 one of the largest rockfalls recorded in Europe during the 20th century. The implementation

of RandaDB resulted in better management of monitoring through a rationalization of measurement campaigns, and better control of the quality of raw data. Further developments of the software will focus on the integration of predictive tools and the handling of new data types (e.g. meteorological, extensometric, etc.).