Geophysical Research Abstracts
Vol. 19, EGU2017-8641, 2017
EGU General Assembly 2017

Concept of a spatial data infrastructure for web-mapping, processing and service provision for geo-hazards

Elisabeth Weinke, Daniel Hölbling, Florian Albrecht, and Barbara Friedl

Department of Geoinformatics - Z_GIS, University of Salzburg, Salzburg, Austria (elisabeth.weinke@sbg.ac.at; daniel.hoelbling@sbg.ac.at; florian.albrecht@sbg.ac.at; barbara.friedl@sbg.ac.at)

Geo-hazards and their effects are distributed geographically over wide regions. The effective mapping and monitoring is essential for hazard assessment and mitigation. It is often best achieved using satellite imagery and new object-based image analysis approaches to identify and delineate geo-hazard objects (landslides, floods, forest fires, storm damages, etc.). At the moment, several local/national databases and platforms provide and publish data of different types of geo-hazards as well as web-based risk maps and decision support systems. Also, the European commission implemented the Copernicus Emergency Management Service (EMS) in 2015 that publishes information about natural and man-made disasters and risks. Currently, no platform for landslides or geo-hazards as such exists that enables the integration of the user in the mapping and monitoring process.

In this study we introduce the concept of a spatial data infrastructure for object delineation, web-processing and service provision of landslide information with the focus on user interaction in all processes. A first prototype for the processing and mapping of landslides in Austria and Italy has been developed within the project Land@Slide, funded by the Austrian Research Promotion Agency FFG in the Austrian Space Applications Program ASAP. The spatial data infrastructure and its services for the mapping, processing and analysis of landslides can be extended to other regions and to all types of geo-hazards for analysis and delineation based on Earth Observation (EO) data.

The architecture of the first prototypical spatial data infrastructure includes four main areas of technical components. The data tier consists of a file storage system and the spatial data catalogue for the management of EO-data, other geospatial data on geo-hazards, as well as descriptions and protocols for the data processing and analysis. An interface to extend the data integration from external sources (e.g. Sentinel-2 data) is planned for the possibility of rapid mapping. The server tier consists of java based web and GIS server. Sub and main services are part of the service tier. Sub services are for example map services, feature editing services, geometry services, geoprocessing services and metadata services. For (meta)data provision and to support data interoperability, web standards of the OGC and the rest-interface is used. Four central main services are designed and developed: (1) a mapping service (including image segmentation and classification approaches), (2) a monitoring service to monitor changes over time, (3) a validation service to analyze landslide delineations from different sources and (4) an infrastructure service to identify affected landslides. The main services use and combine parts of the sub services. Furthermore, a series of client applications based on new technology standards making use of the data and services offered by the spatial data infrastructure.

Next steps include the design to extend the current spatial data infrastructure to other areas and geo-hazard types to develop a spatial data infrastructure that can assist targeted mapping and monitoring of geo-hazards on a global context.