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The Resource Information System (RIS): A web application for mineral resource data of Switzerland

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The Resource Information System (RIS) is a freely accessible web-based information system providing data on occurrences and extraction sites of mineral resources in Switzerland (Fulda et al. *this volume*). It includes data on gravel, sand, cement raw materials, brickyard raw materials, crushed rocks, natural stone, gypsum and salt, all of which are currently extracted in Switzerland. Furthermore, the RIS also contains data on currently not produced mineral resources like energy resources, industrial minerals (except salt and gypsum) and metals (cf. Fig. 1).

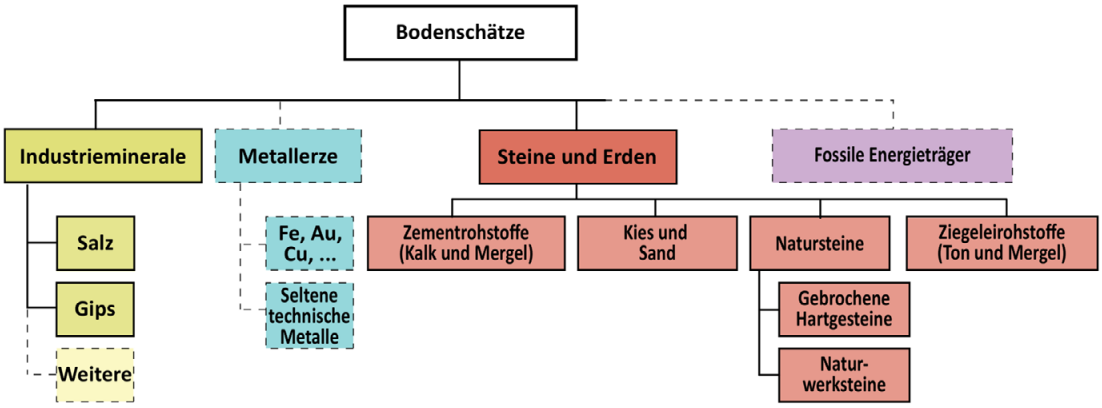

Figure 1. The RIS includes data on all mineral resource groups while the main focus is on raw materials which are currently extracted in Switzerland (boxes with solid lines). Figure by swisstopo (swisstopo 2017a).

Map viewer application

The data of the RIS is published on two platforms. Firstly, on the RIS map viewer application (map.georessourcen.ethz.ch), where all available data can be accessed, and secondly – for overview purposes – as a condensed version on the federal geodata portal map.geo.admin.ch (cf. Fulda et al. *this volume*). The objects on the two platforms are two-way linked, i. e. the object information of a quarry on map.geo.admin.ch links to the same object on map.georessourcen.ethz.ch, and vice versa. Complementary to map.geo.admin.ch, the RIS map viewer provides the following functionalities: 1) by clicking on a point of interest a data window is shown which contains data on the exploited resources, geology, operational information and literature references as well as photos of sites and rock samples (cf. screenshot in Fig. 2), and 2) advanced filtering, i. e. objects can be shown/hidden depending on the exploitation status (both, current and past periods of time), the importance of sites, or the material (rock group, lithology, minerals and elements).

Data management

The data of RIS is managed with a custom web application that has been developed by the Georesources Switzerland Group. Besides functionality for searching and editing data entries, the application features a simple method for tracking changes.

Technical architecture and interfaces

The RIS is based on a model-view-controller pattern, a commonly used architecture to build web applications. This architecture separates the data layer (data storage and retrieval) from the presentation layer (e. g. user interface for back- and frontend) and the application logic, a controller that processes in- and outputs. The data structure is based on the data model for raw materials developed by our group and the data model «Geology» published by swisstopo (swisstopo 2017b). The controller serves data to both, a backend view where editors can manage the data and to a frontend view where mineral resource data is published on a map interface (map.georessources.ethz.ch). A JSON module pushes the data to map.geo.admin.ch and other web applications for synchronization. Front- and backend views of the RIS are built upon different open source web services and libraries (e.g. the swisstopo GeoAdmin API, Leaflet, and Bootstrap). The business logic is written in PHP; the data is stored in a PostgreSQL database with the PostGIS extension for storage of spatial data. QGIS applications can directly be connected to the PostgreSQL database with read/write access.

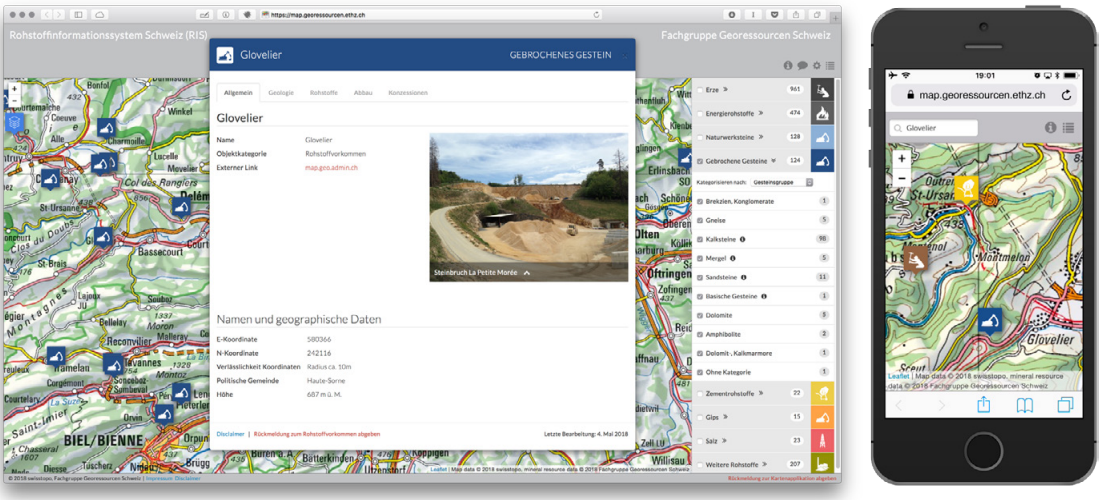

Figure 2. Desktop and mobile version of map.georessourcen.ethz.ch. Here in focus: Glovelier, an active quarry for crushed rocks in the canton of Jura.

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