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Borehole Data Management System: a web interface for borehole data acquisition

Massimiliano Cannata¹, Milan Antonovic¹, Nils Oesterling², and Sabine Brodhag²

¹SUPSI, Istituto scienze della Terra, DACD, Canobbio, Switzerland

²Federal Office of Topography swisstopo, Wabern, Switzerland

The shallow underground is of primary importance in governing and planning the territories where we live. In fact, the uppermost 500 meters below the ground surface are interested by a growing number of anthropic activities like constructions, extraction of drinking water, mineral resources, installation of geothermal probes, etc. Borehole data are therefore essential as they reveal at specific location the vertical sequence of geological layers which in turns can provide an understanding of the geological conditions we can expect in the shallow underground. Unfortunately, data are rarely available in a *FAIR way* that as the acronym specify are Findable, Accessible, Interoperable and Reusable.

Most of the time data, particularly those collected in the past, are in the form of **static data reports** that describe the stratigraphy and the related characteristics; these data types are generally available as paper documents, or static files like .pdf or images (.ai). While very informative, these documents are not searchable, not interoperable nor easily reusable, since they require a non negligible time for data integration. Sometime, **data are archived into database**. This certainly improve the find-ability of the data and its accessibility but still do not address the interoperability requirement and therefore, combining data from different sources remain a problematic task. To enable FAIR borehole data and facilitate the different entities (public or private) management swisstopo (www.swisstopo.ch) has funded the development of a Web application named Borehole Data Management System (BDMS) [1] that adopt the **borehole data model** () [2] implemented by the Swiss Geological Survey.

Among the benefits of adopting a standard model we can identify:

- Enhance the exchange, the usage and quality of the data
- Reach data harmonization (level of detail, precise definitions, relationships and dependencies among the data),
- Establish a common language between stakeholders

The Borehole Data Management System (BDMS) was developed using the latest Free and Open Source Technologies. The new application integrates some of the today's best OSGeo projects and is available as a modular open source solution on GitHub and ready to use in a docker container

available on Docker Hub. Through two types of authorization, *Explorer* users are able to search the BDMS for specific boreholes, navigate a configurable user friendly map, apply filters, explore the stratigraphy layers of each borehole and export all the data in Shapefiles, CSV or PDF. *Editors* are able to manage in details the informations and publish the results after passing a validation process.

Links

[1] <http://geoservice.ist.supsi.ch/docs/bdms/index.html>

[2] <https://www.geologieportal.ch/en/knowledge/lookup/data-models/borehole-data-model.html>