Task 1.4

Task Title

Data infrastructure

Research Partners

Federal Office of Topography (swisstopo), University of Bern, University of Geneva

Task Objectives

A wide variety of 3D subsurface data must be compiled to quantify the potential for geothermal energy production and CO_2 storage within Switzerland, and to guide exploration and efficient exploitation. Moreover, the subsurface data need to be linked to diverse 2D surface information on groundwater protection, land use, conflicting resources, etc., to facilitate planning, licensing and monitoring. The objective of this task is to incorporate new subsurface data produced in WP1 into a digital archive in a sustainable form that is permanently accessible to institutions and industry, and that allows for modern 3D imaging and data-mining.

During the 2013-2016 project period the Swiss Geological Survey of swisstopo will continue building its Geological Information and Production System (GIPS). This will involve: developing recommendations and standards for structuring, storing and exchanging borehole data and seismic lines; digitizing existing analog maps, sections and other analog information; feeding new subsurface data from WP1 into geospatial databases; reinterpreting existing seismic lines to expand resolution of the Swiss Geophysical Atlas; constructing web-services that allow full interoperability of 3D geological information as well as visualization of 2D data and 3D models via web portal; integrating geological information of various kinds into the national spatial data infrastructure (NSDI); expanding computer storage capacity at swisstopo.

In 2015, a 1st generation 3D model (1:200'000) of the Swiss Molasse Basin based on the *Seismic Atlas of the Swiss Molasse Basin* (Sommaruga et al 2012) was completed. A higher resolution model (1:50'000), with increased detail in the shallow subsurface, improved fault modelling, additional 2D seismic interpretations and updated time-to-depth conversion will be finalized in 2016.

A professionally managed, web-based platform for the sustainable storage and exchange of geological data and models among SCCER partners, industry and institutions will be delivered, and the work will be integrated with the InterReg project GeoMol, presently conducted by swisstopo in collaboration with the geological surveys in neighboring countries.

Current Project (presented on the following page)

Geology Data Model Suite – Harmonising Geological Data in Switzerland
S. H. Brodhag, N. Oesterling, R. Baumberger

SCCER S SoE

SWISS COMPETENCE CENTER for ENERGY RESEARCH
SUPPLY of ELECTRICITY

Geology Data Model Suite
Harmonising Geological Data in Switzerland

Sabine H. Brodhag, Nils Oesterling, Roland Baumberger
swisstopo, Swiss Geological Survey, Switzerland

Introduction

The Swiss Geological Survey (SGS) is developing data models covering various thematic data describing the geological surface and sub-surface. In general, data models organise the entities of particular data sets and define their attribute values and relationships.

As the majority of geological data have close relationships and dependencies between each other, it is important to link also their data models. As result, a suite of combined data models for all relevant data of the geological surface and sub-surface is created. In combination with a technical infrastructure consisting of data bases, GIS, web-serand web-mapping tools the data models build the basis for efficiently coordinating the diverse sub-surface activities in Switzerland.
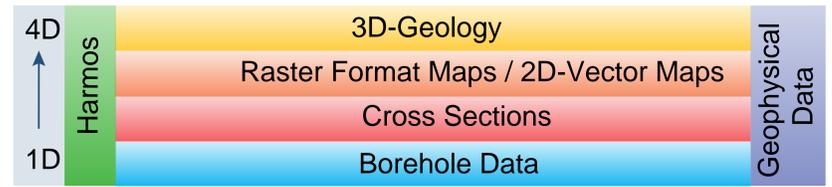
The Swiss Geological Data Model Suite (SGDMS) describes data of various spatial dimensions: Point data (drill logs), line data (cross sections, seismic surveys), 2D surface data (vector and raster maps, reports), 3D surface and volume data and with property pa-raace a parameter to 4D data (geological 3D-models) and purely semantic data (harmonised stratigraphy). The models are still under construction and some of them describe meta data instead of particular data sets itself.
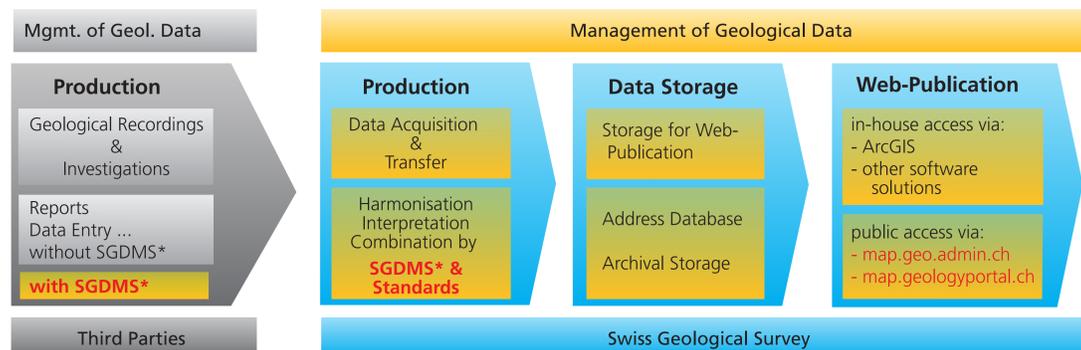

Swiss Geology Data Model Suite
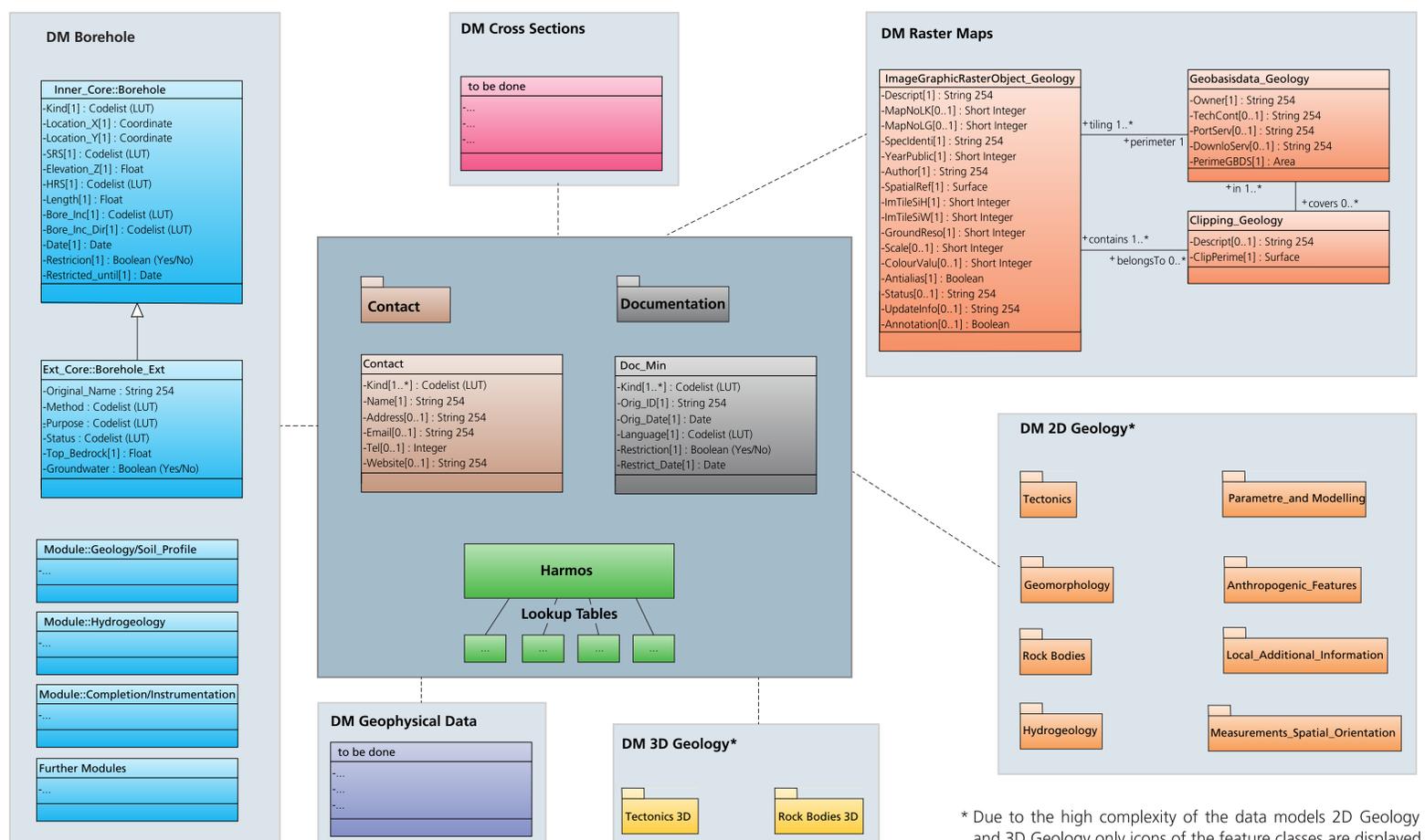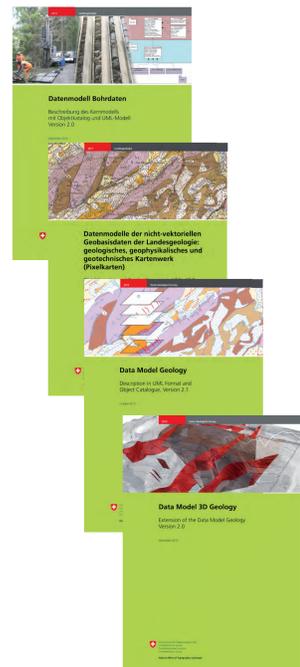
Management of Geologcial Data

The SGS is not producing field data such as drillings, mappings etc. itself but is responsible by law for storage and supply of geological data of national relevance. Therefore, various kinds data sets (analogue & digital, standardised & individual) generated for divers purposes from different sources (private sector, cantonal, federal) enter the SGS's management process.

*Swiss Geological Data Model Suite
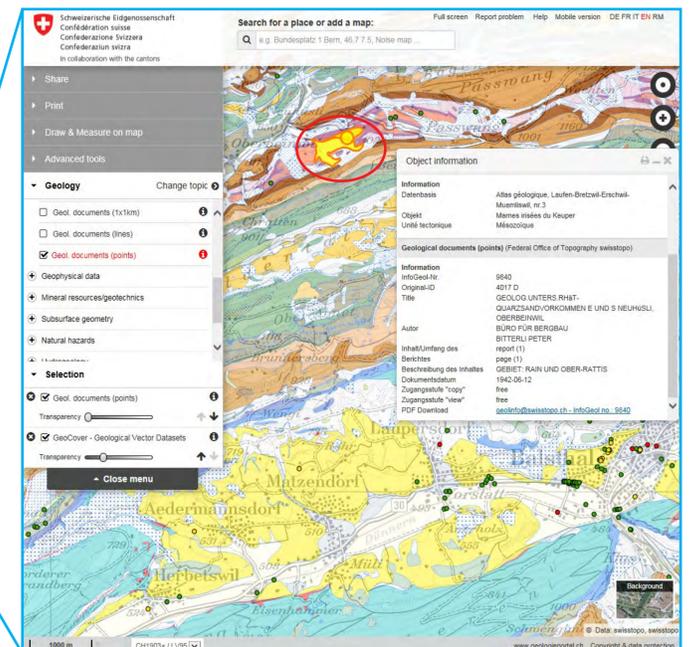
Using the data models presented above the whole lifecycle of a data set, from data capture in the field and data input to data processing, storage, data exchange, and supply, can be harmonised. Since common standards for for digital geological data are rare in Switzerland, the growing demand for sustainable data storage and defined and standardised exchange of harmonised and quality managed data can be covered by these data models.