The DataViewer module a new perspective on spatial data



Department for Geoinformation

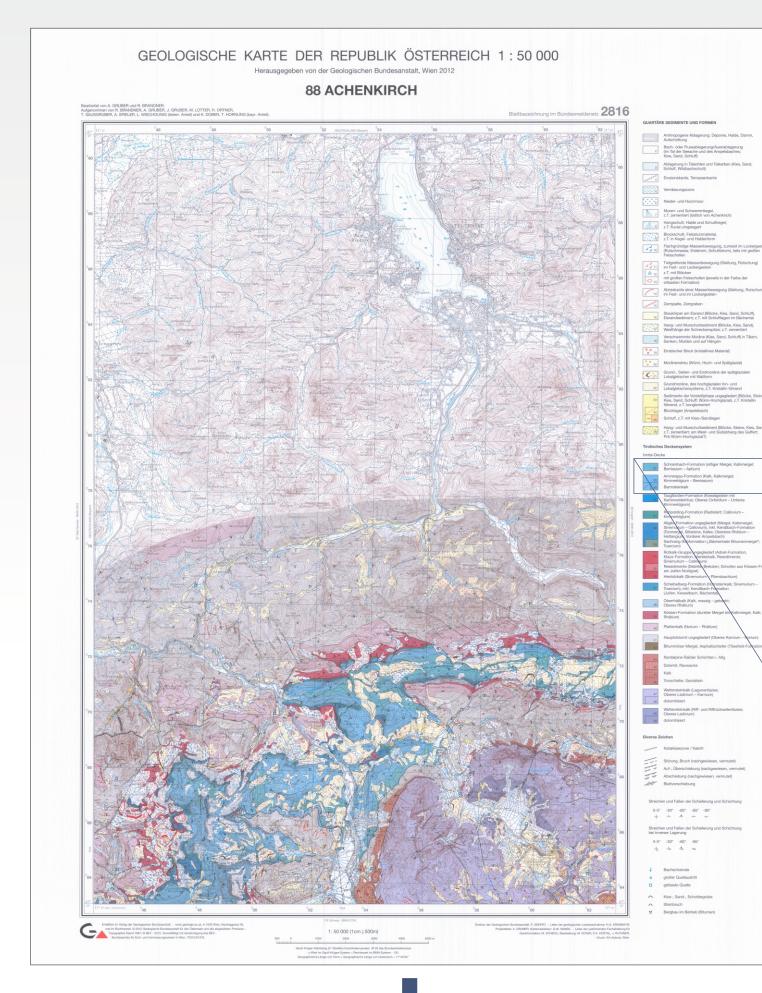
www.geologie.ac.at

Christine HÖRFARTER¹⁾, Vicky HAIDER¹⁾, Martin SCHIEGL¹⁾ & Alfred GRUBER¹⁾

What is the DataViewer module?

The DataViewer module is a part of GBA (Geological Survey of Austria) Thesaurus. Established to select and filter geological features. Those features are harmonized according to the Core Model on Geology (INSPIRE) and coded (assigned) with URIs of Thesaurus concepts. Therefore, every term in the Thesaurus which is already used for harmonizing geologic features is depictable by the DataViewer as well as the linked information referred to the data model.

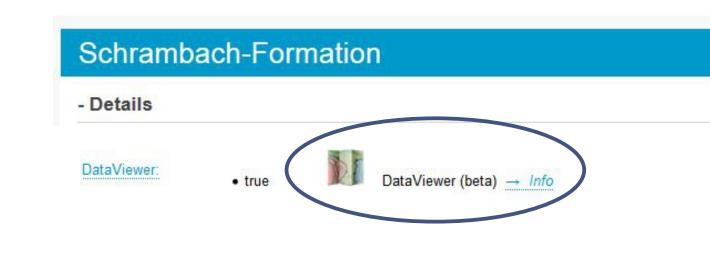
STRUCTURE the data....



Basic map information

....for DATAVIEWER visualization

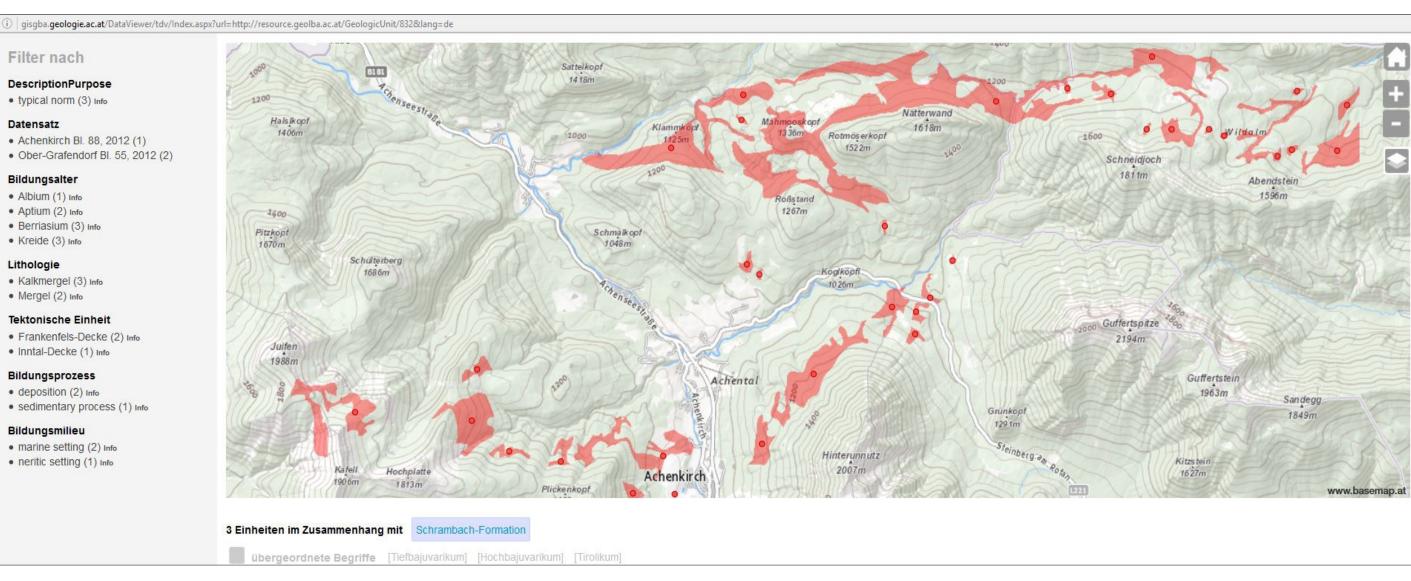
Where to find the DataViewer within the GBA-Thesaurus



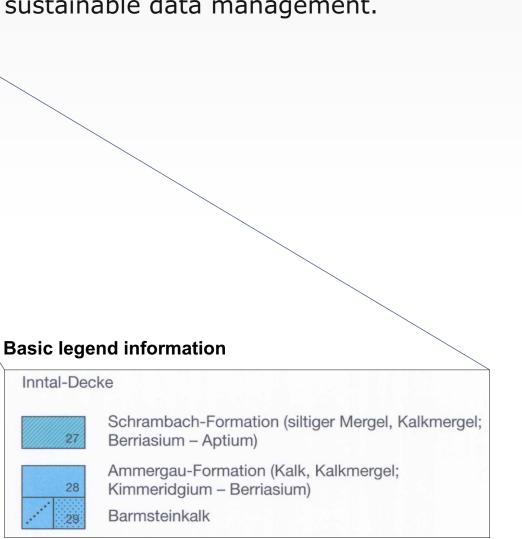
Structured data now allow building external applications like the DataViewer which evolves from the GBA-Thesaurus (**see poster presentation No. 129, Vicky Haider et al.**).

The purpose of the DataViewer tool is to provide geologists a possibility to explore the database, to understand the advantages of a sophisticated structured database and to move from the display of geological maps towards a view of geological data.

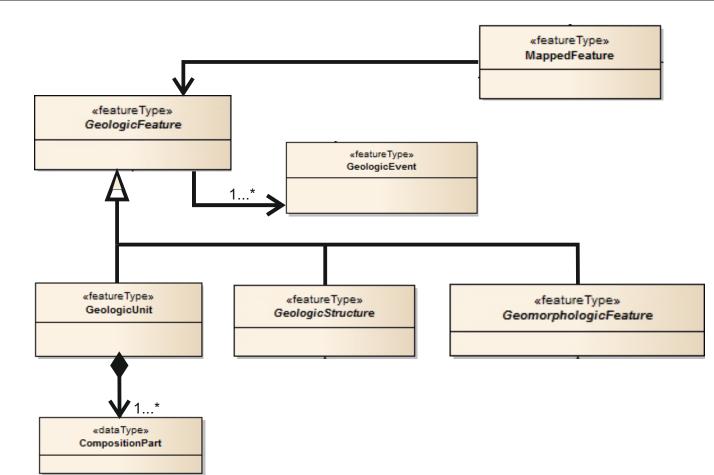
DataViewer screen shot showing the distribution of the Schrambach Formation (map sheet Gk50 88 Achenkirch) and the tectonic pattern of upright and overturned limbs referring to folds in the foot- and hangingwall of the Achental Thrust (see this convention Poster Area D, Nr. 55 - Mandl G., Brandner R. & Gruber A., 2016).



The basic geoscientific information of a geological map is visualized by geometry objects (polygons, lines, points) and a related legend. This basic information now has to be structured in a technically and semantically way to enable a sustainable data management.



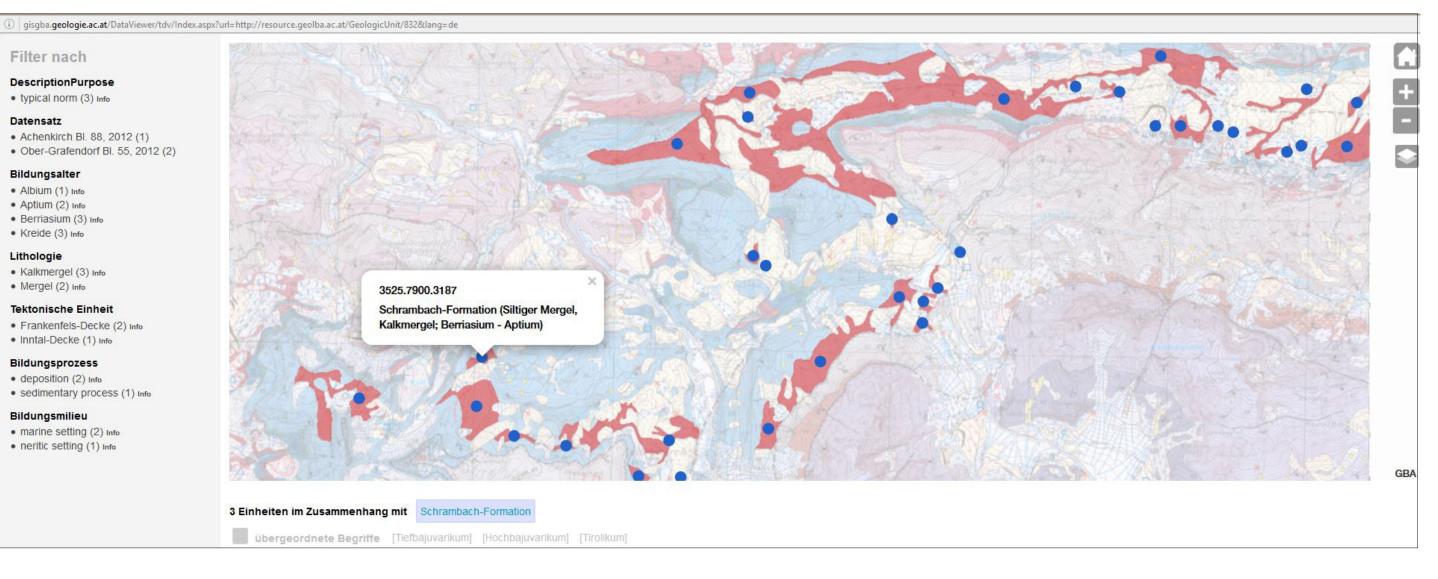
INSPIRE - Overview of the Geology core application schema



Conceptual datamodel

The INSPIRE Core Datamodel on Geology is used for the exchange and

DataViwer screen shot showing the distribution of the Schrambach Formation within map sheet Gk50 88 Achenkirch, with additional layer of geology scale 50.000. The points are ID-points showing the basic legend information.



😻 GBA Thesaurus - DataViewer



classification of spatial objects from data sets. It is related to the INSPIRE spatial data theme Geology and defined in an application schema.

The datamodel is the precondition to support compatibility and interoperability of data.



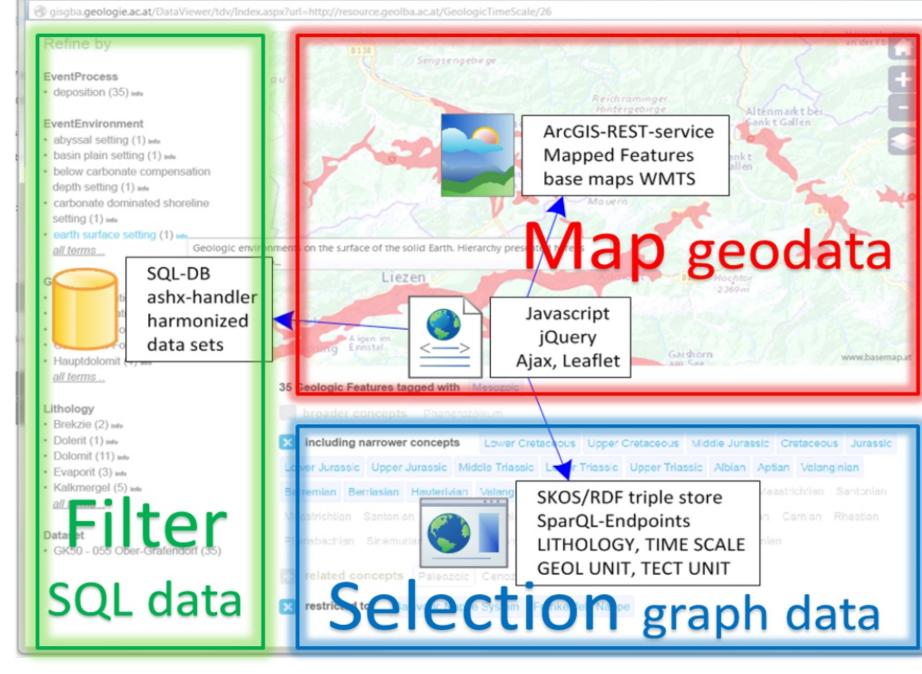
Screen shot of the GBA relational database model for geology

GE_GeologicFeature							GE_Geo	omorph	rphologicFeature			ODA Osslarisska Finhaitan (OF)			
PK <u>GF_ID</u> int			- H-I+	PK <u>GM ID</u>			int identity		ty G	GBA-Geologische Einheiten (GE) Harmonisierung - Datenmodell (obelix.C01)					
U1 L_ID varchar(20) GeologicCollectionID int varchar(255) Notes varchar(255) LEGTEXT nvarchar(500)			-#-	FK1,U1 GF_ID GeomorphologicFer Notes FK2,I1 GU_ID			atureNa	me varchar(2 varchar(2 int		Harmonisierung - Daten Neuanlage: 02.10.201: letzte Änderung: 13.08.2			heghor		
	DescriptionPurpose varchar(255) LEGKURZ nvarchar(255)			i			- 		<u> </u>	<u>۱</u>					
ŧ	: +		*						GE_DipS		1				
ĺ		GE_GeologicStru			ture			I P	РК	DS_ID	int id	int identity			
		PK FK1,U1	GS ID GF_ID GU_ID		ir	nt identity nt nt			FK1,I1	GF_ID GU_ID DipSymbolNar DipDirection	int	ar(255)			
GeologicStructureTyp DipDirection Dip Gesichert Kinematic FaultClass Notes			ir ir b v v	varchar(255) int int bit varchar(255) varchar(255) varchar(255)				Dip DipClassMin DipClassMax NormalOrient RelativeChron Notes	int int tation bit pology varch	int bit		GE CompositionPa	•		
ł			Geologic	cStructureNa		archar(255	· .	1					РК	CP ID	int identity
	GE_GeologicEvent				tity			ģ		GE GeologicUni	it	1	FK1,I1	GU_ID Lithology Protolith	int varchar(255) varchar(255)
ļ	FK1,I1	GF_ID Young	-	int varchar varchar				PK	<u>GU_</u> I	<u>D</u>	int identity	-#⊙<		Proportion CompositionPartRole Notes	varchar(255) varchar(255) varchar(255)
ł		EventProcess var EventEnvironment var		varchar ent varchar	255) 255)			Geol	ogicUnitType ogicUnitName	varchar(255) varchar(255)	r(255)	GE_GeologicUnitPart			
		Notes	Notes varchar MainAge varchar							onicUnit poundUnit	varchar(255) bit	^{char(255)} - Ħ○€		GUP ID	int identity
		MainA	ge	varchar	(255)										

Relational database model

The structure of the conceptual model has been adopted and implemented within the database structure of the Geological Survey of Austria.

This GBA internal relational database model is extensible also for further topics or more detailed information.



technical structure

Technically, the DataViewer module consists of:

- a map image shown via ArcGIS web services and an attached leaflet to show the geometry

a concept area with semantic
data from Thesaurus queries using
SPARQL endpoint

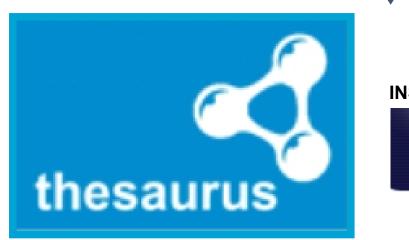
a filter bar with SQL queries
directly from the relational data
base using an ashx handler.

Summary: Usability of the DataViewer module

Select and filter

to analyze geological features according to harmonization processes.







Registry

Controlled vocabulary

To attribute and code the data we use concepts (label and URI) of the GBA-Thesaurus as well as concepts from the provided INSPIRE codelists.

GBA-Thesaurus - see poster presentation No. 129, Vicky Haider et al.

Quality controlling

to get a live feedback on content-related impacts due to modelling.

Scientific research

to compile and rework geoscientific information and usage for interpretation and homogenization especially in a crossbordering way.

Additional references: INSPIRE Thematic Working Group Geology (2013): D2.8.II.4 INSPIRE Data Specification on Geology – Draft Technical Guidelines

View of the harmonized feature dataset

EV_MainAge 👻	EV_Younger. 👻	EV_Older. 👻	EV_EventProcess 🔹	EV_EventEnvironment -	GU_GeologicUnitTyp 🗸
Kreide	Aptium	Berriasium	sedimentary process	marine setting	lithostratigraphic unit
Mesozoikum	Berriasium	Kimmeridgi um	sedimentary process	bathyal setting	lithostratigraphic unit

Final structured information (table view)

GU_GeologicUnitName 👻	GU_TectonicUnit 👻	LI01_Lithology 👻	LI01_Proportion -	LI01_CompositonPartF -	LI02_Litholog -	LI02_Propor 👻	LI02_Comp 👻
Schrambach-Formation	Inntal-Decke	Mergel	most abundant	part of	Kalkmergel	present	part of
Ammergau-Formation	Inntal-Decke	Kalkstein (Kalk)	most abundant	part of	Kalkmergel	present	part of

¹⁾Geologische Bundesanstalt, Neulinggasse 38, 1030 Wien