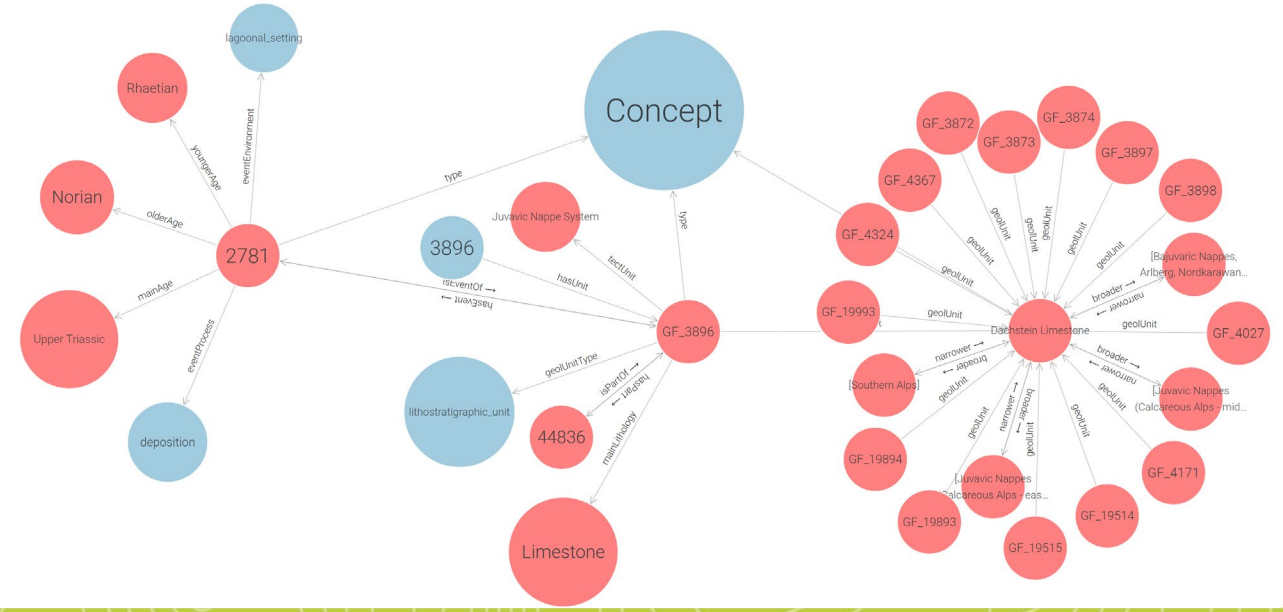
Christine Hörfarter

Scientific Vocabularies for Basic Geology in Europe

Part: Examples and Outreach



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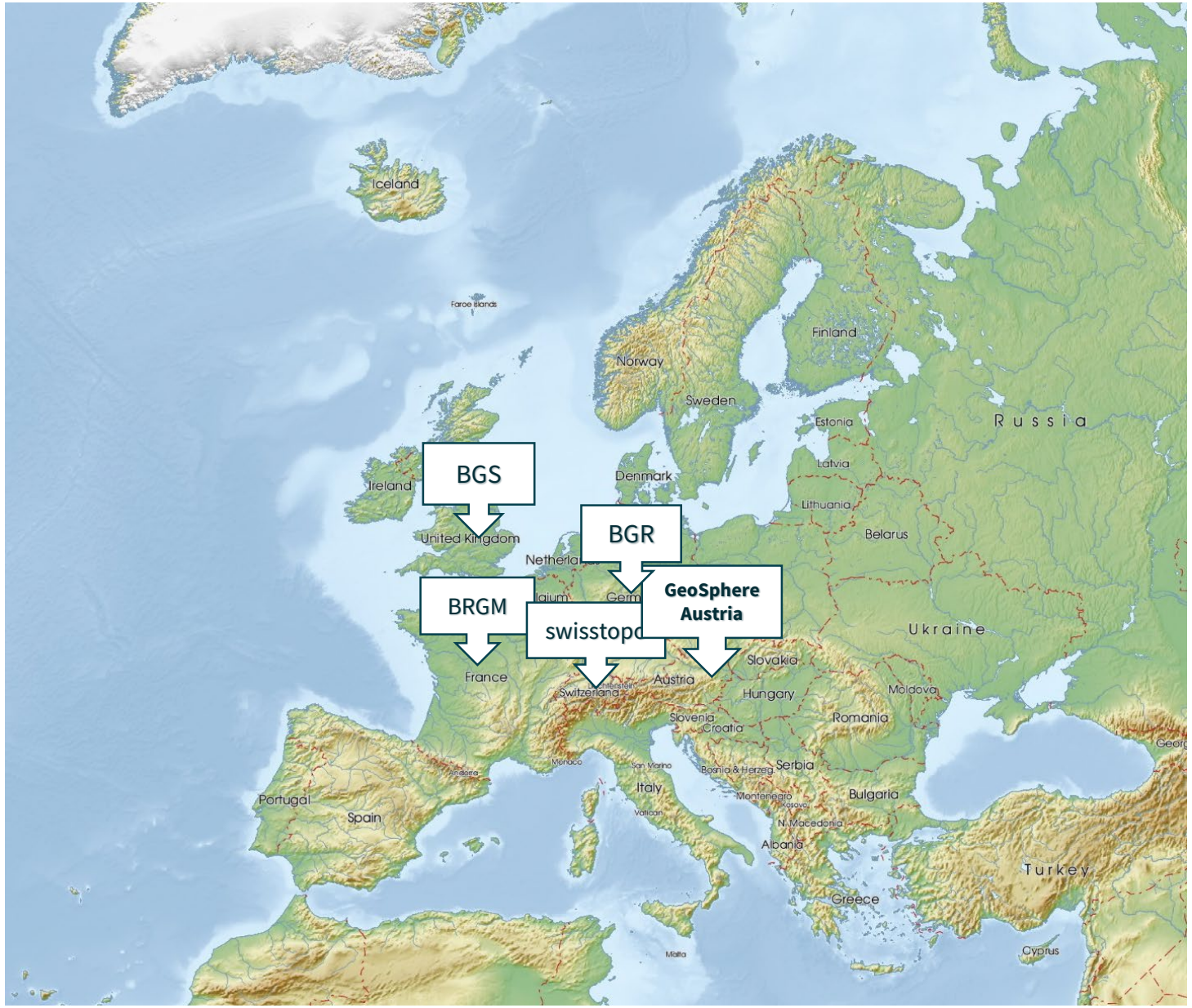
16. November 2023

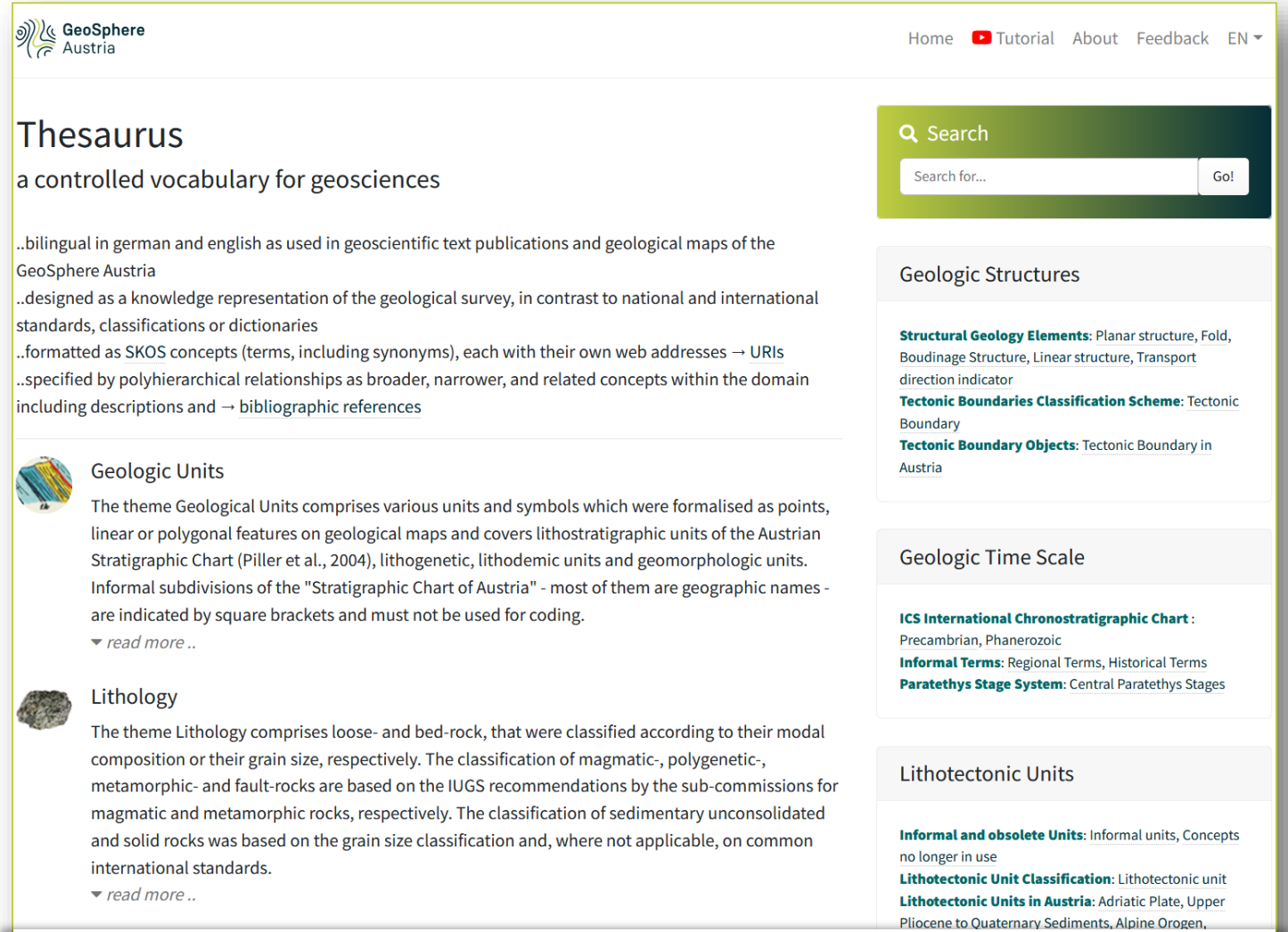
National Vocabularies - Examples in Europe



- **Federal Institute for Geosciences and Natural Resources in Germany (BGR)**
  - Lithostratigraphic Lexicon of Germany LithoLex – and the Project ConSent (Connect Semantic)
  - https://www.bgr.bund.de/DE/Themen/Geodatenmanagement/Projekte/laufend/ConSent
- **French Geological Survey (BRGM)**
  - French Geological Survey Registry Tool
  - https://data.geoscience.fr/ncl/
- **British Geological Survey (BGS)**
  - BGS Information Hub
  - https://www.bgs.ac.uk/information-hub/dictionaries/
- **Swisstopo (CH)**
  - Lithostratigraphic Lexicon of Switzerland
  - strati.ch
- **GeoSphere Austria (former Geolog.Surv.Austria)**
  - Thesaurus – a controlled vocabulary for geosciences
  - resource.geolba.ac.at !will soon be changed due to an organisational merger!

National Vocabularies - GeoSphere Austria Thesaurus - Basics

- **THESAURI** are controlled vocabularies whose concepts are linked by semantic relations following a standard structure.
- This standard structure for the GBA thesaurus is **SKOS** standard (Simple Knowledge Organization System) for vocabularies
- SKOS stands for a light weight ontology and is **based on RDF data model** (Resource description framework) with XML syntax.
- RDF is a standard model for data interchange on the Web and states that **every THING in the real world is a resource**
- A resource/concept in **SKOS-RDF** is indexed by an unique and persistent identifier called **URI (Uniform Resource Identifier)**.



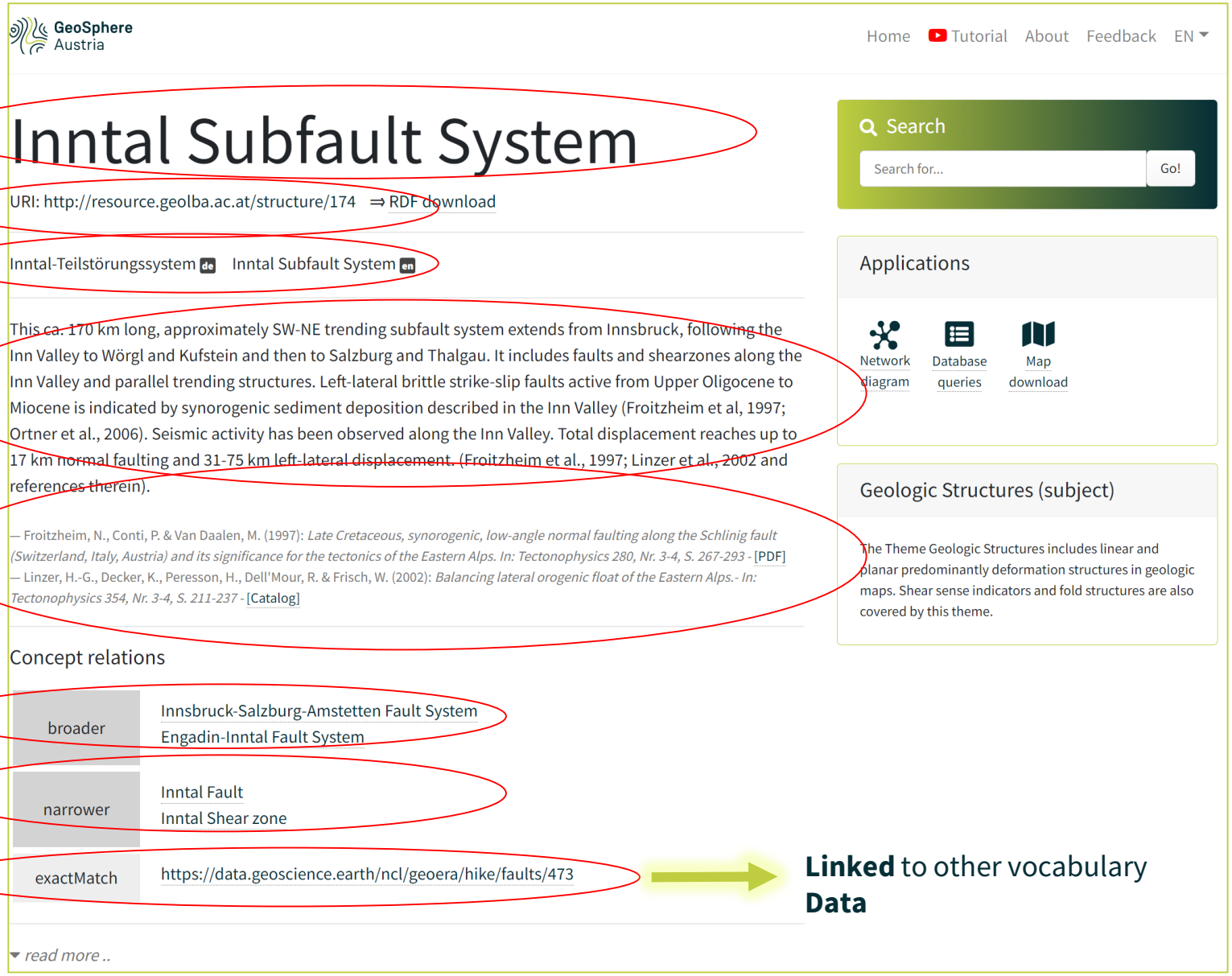
Fullfilled requirements for the use of **Linked (Open) Data** and **Semantic Web Technology** ☺

National Vocabularies - GeoSphere Austria Thesaurus – Example Tectonic Boundaries

GeoSphere Austria

SKOS-CONCEPT

- Preferred lexical label
- URI = identifier
- Synonyms, multilingual labels
- Definition
- References
- Semantic relation properties
- Mapping properties



Linked to other vocabulary **Data**

National Vocabularies - Example on European Outreach

- **The GeoERA HIKE Project Vocabulary**
  - Named fault inventory of the European Fault Database, the attributes and the hierarchical fault classification. The SKOS relations within the vocabulary itself, and with existing vocabularies and links to online sources creates an extensive network of information.
  - https://geoera.eu/projects/hike10/semanticnetwork/

Inntal Subfault System

URI https://data.geoscience.earth/ncl/geoera/hike/faults/473

Inntal-Teilstörungssystem de Inntal Subfault System en

Notation: AT-507

This ca. 170 km long, approximately SW-NE trending subfault system extends from Innsbruck, following the Inn Valley to Wörgl and Kufstein and then to Salzburg and Thalgau. It includes faults and shearzones along the Inn Valley and parallel trending structures. Left-lateral brittle strike-slip faults are active from the Upper Oligocene to the Miocene, indicated by sediment deposits described in the Inn Valley (Froitzheim et al, 1997; Ortner et al., 2006). Seismic activity has been observed along the Inn Valley. Total displacement reaches up to around 17 km normal faulting and 31-75 km left-lateral displacement. (Froitzheim et al., 1997; Linzer et al., 2002 and references therein)

— Froitzheim, N., Conti, P. & Van Daalen, M. (1997): *Late Cretaceous, synorogenic, low-angle normal faulting along the Schlinig fault (Switzerland, Italy, Austria) and its significance for the tectonics of the Eastern Alps. In: Tectonophysics 280, Nr. 3-4, S. 267-293*
— Linzer, H.-G., Decker, K., Peresson, H., Dell'Mour, R. & Frisch, W. (2002): *Balancing lateral orogenic float of the Eastern Alps.- In: Tectonophysics 354, Nr. 3-4, S. 211-237*

Concept relations

broader	Engadin-Inntal Fault System (3) Innsbruck-Salzburg-Amstetten Fault System (1)
narrower	Inntal Fault Inntal Shear zone
exactMatch	structure/174 (GBA)

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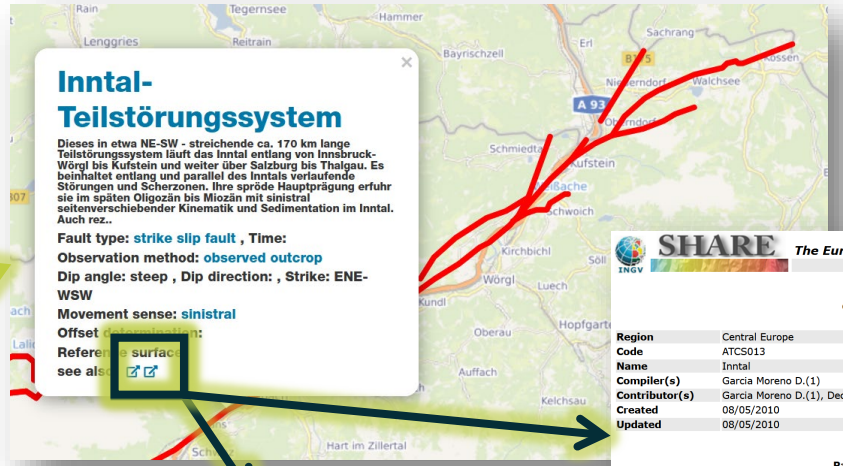
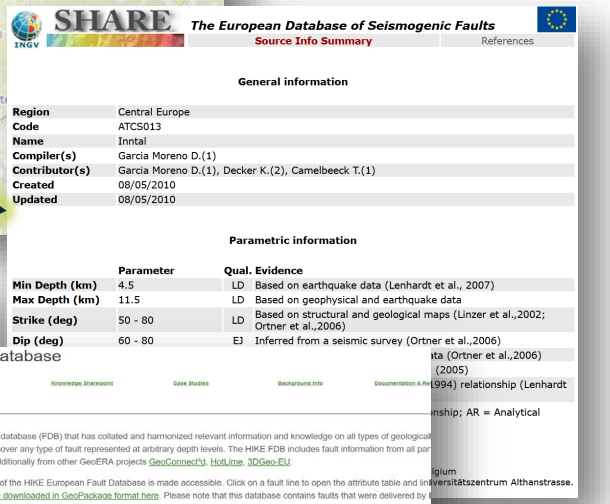
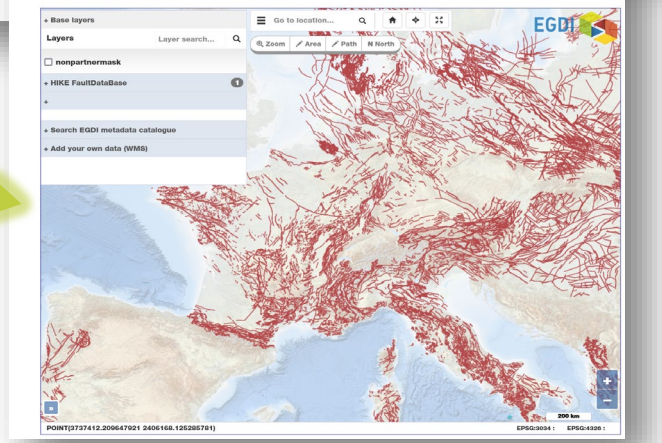
HIKE - Hazard and Impact Knowledge for Europe

The HIKE project aims to support research and assessments of induced hazards and impacts that are related to the exploitation of subsurface resources and capacities throughout Europe. This will be achieved through development, demonstration and implementation of harmonized subsurface data sets and methodologies, investigation of applied use cases, and facilitation of knowledge shared between geological surveys and stakeholders. WP-2 focuses on the development of a European fault database..
https://geoera.eu/projects/hike-2/
Download: RDF, TTL







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HIKE GeoERA

EGDI

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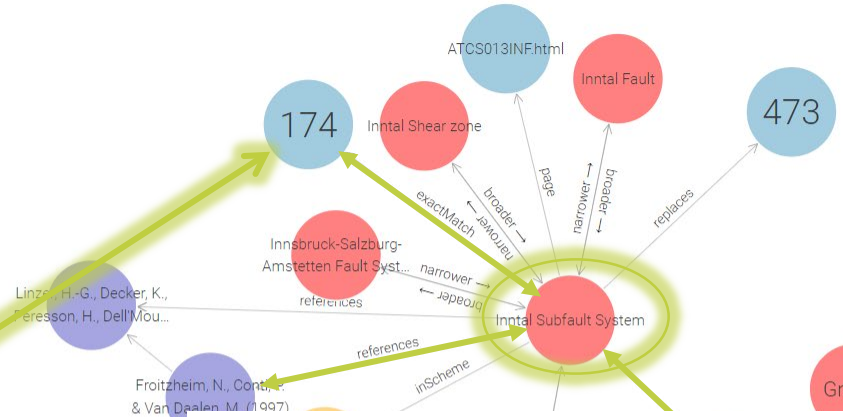
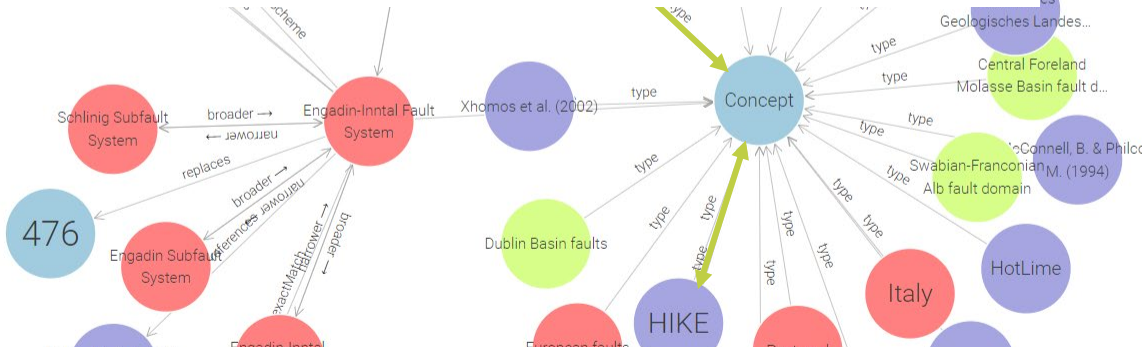
https://geoera.eu/projects/hike10/
Download: RDF, TTL

- **Graph DB Visualization**



SPARQL Protocol and RDF Query Language (to query information out of a RDF graph)



SEMANTIC NETWORK

National Vocabularies - Examples an Outreach – THANK YOU for your attention!

GeoSphere Austria

Linking of geological information

to

Enhance knowledge across borders

…and we are part of the WP7 team for

GSEU

https://eurogeosurveys.org/research/gseu/

GeoSphere Austria (former Geological Survey of Austria)

Thesaurus screen cast: https://www.youtube.com/playlist?list=PLfshul-4XQW9H-k-_Q98eRI5LHfUPGbtc

TEAMWORK

thanks to

thanks to

thanks to

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