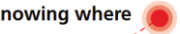




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Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Eidgenössisches Departement für Verteidigung, Bevölkerungsschutz und Sport VBS
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swisstopo

swiss
jeol viewer

viewer.swissgeol.ch

3D-Web-Viewer für geologische Daten

Nils Oesterling

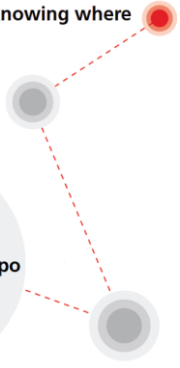
Anwendertreffen 3D-Geologie und GIS / 22.04.2026





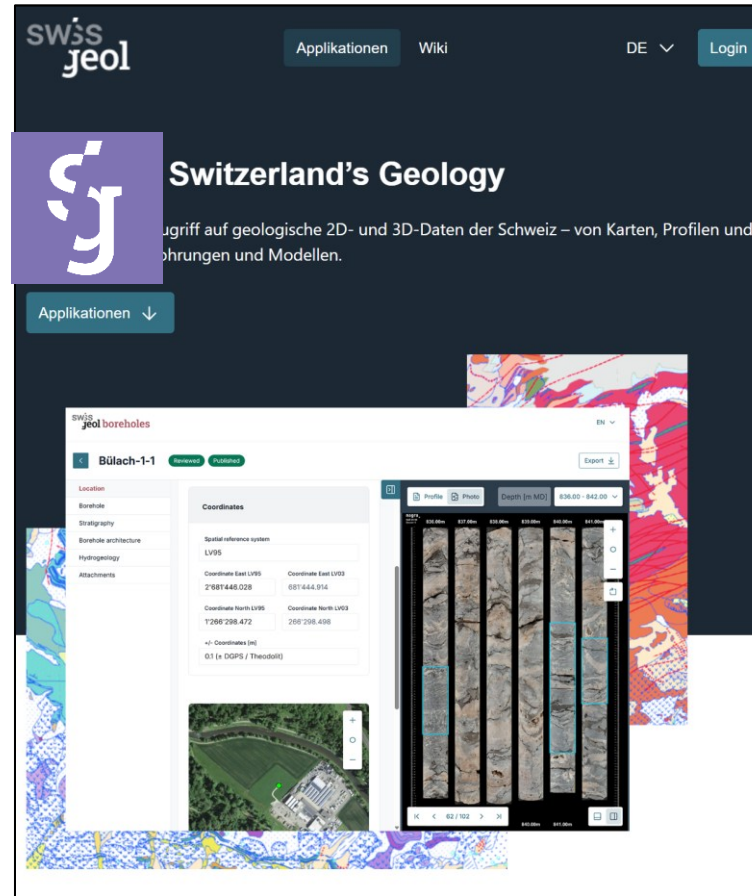
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swissgeol - Plattform

<https://swissgeol.ch/>

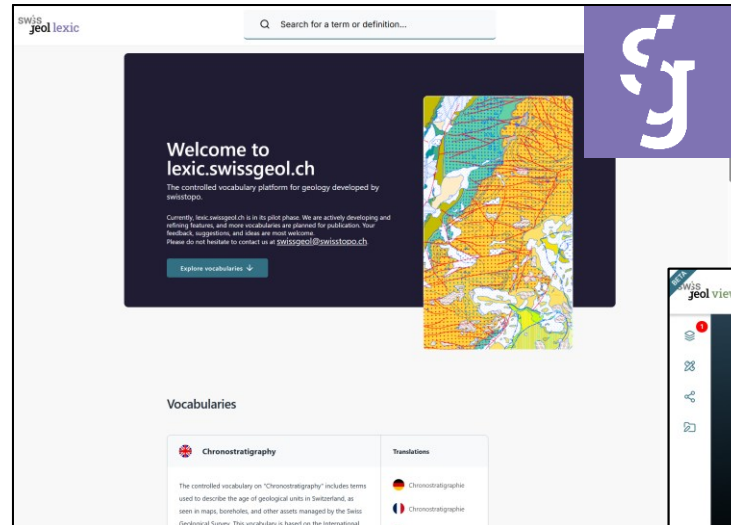


Landing page



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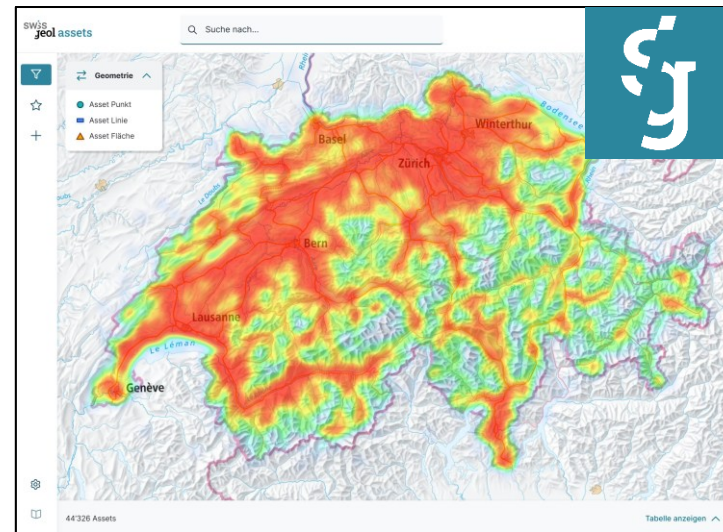


swiss
geol lexic

Controlled
Vocabulary

<https://lexic.swissgeol.ch/>

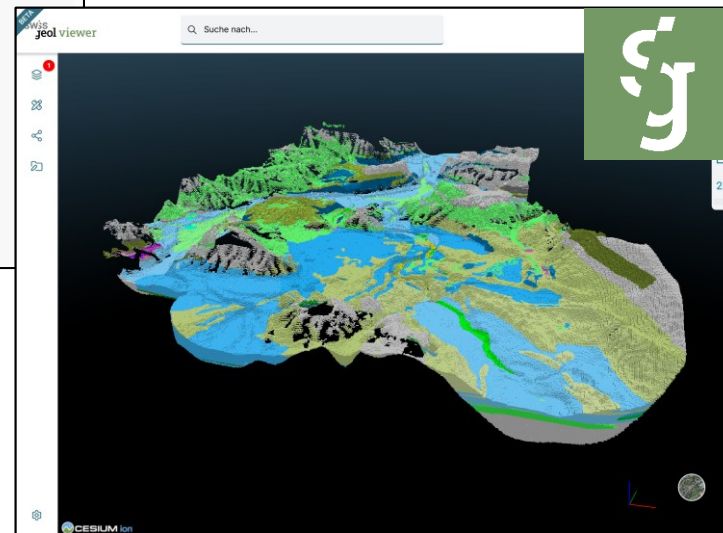
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swiss
geol assets

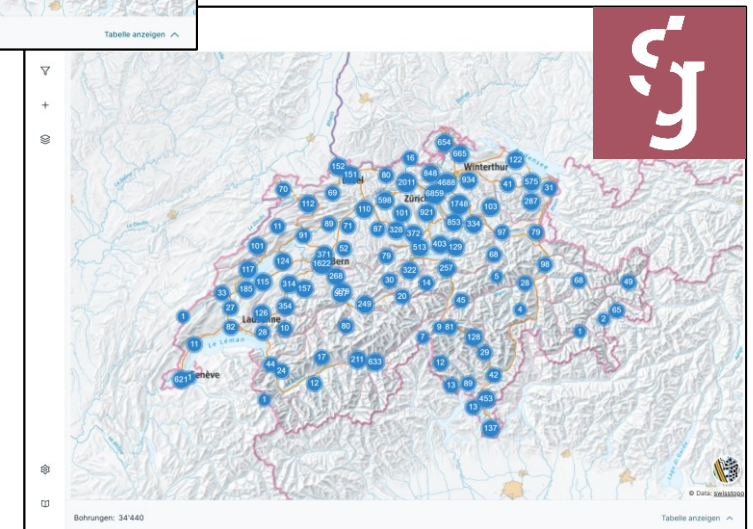
Document DB

<https://assets.swissgeol.ch/>



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3D-viewer <https://viewer.swissgeol.ch/>



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geol boreholes

Borehole DB

<https://boreholes.swissgeol.ch/>

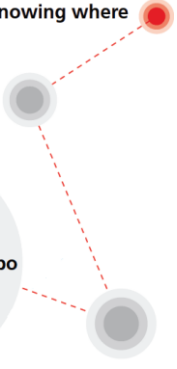




Ziele des 3D-Viewers

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- Zentraler Zugang zu geologischen Daten in der Schweiz steht bereit
 - Darstellung
 - Suche
 - Download
- Daten werden im 3D-Raum visualisiert
- 2D-/3D-Daten aus verschiedenen Quellen können kombiniert werden
- Der Quellcodes des 3D-Viewers ist als OpenSource publiziert
 - <https://github.com/swisstopo/swissgeol-viewer-suite>
 - <https://github.com/swisstopo/swissgeol-viewer-app-abbreviator>

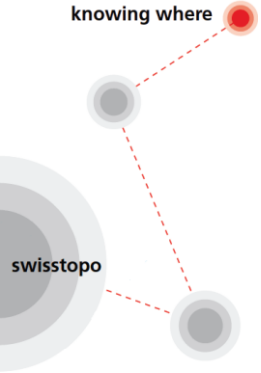




Technology stack

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Frontend:

- HTML 5
- CSS
- JavaScript / TypeScript,
- Lit
- CesiumJS
- further Libraries (jQuery, proj4js, aws-sdk, swissgeol/ui-core etc.)

Backend:

- Rust
- PostgreSQL (RDS service)
- TiTiler → Geotiff-Server

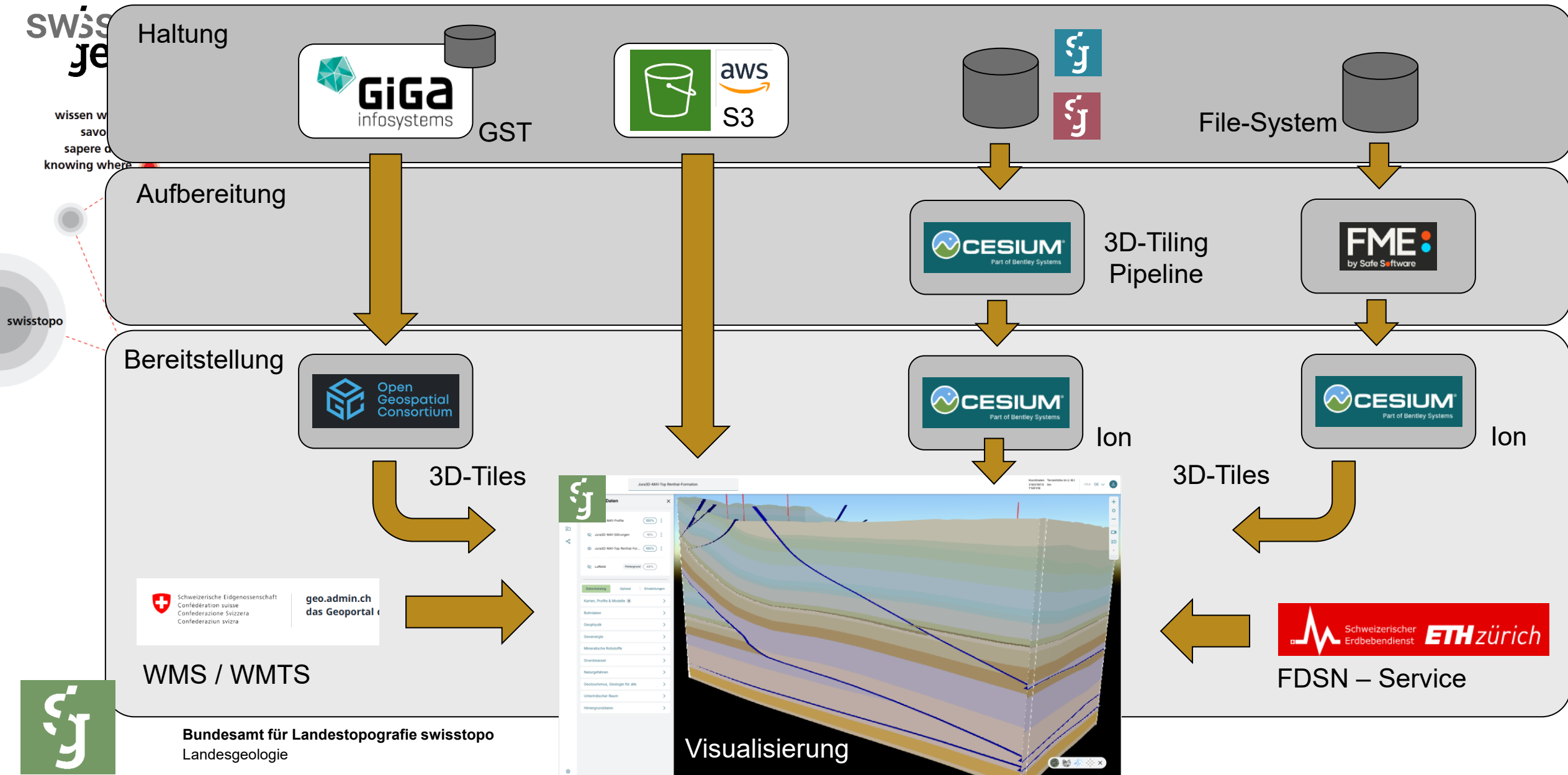
AWS-Cloud-Services:

- S3-bucket → Document storage
- RDS → DB-service
- Kubernetes → Container orchestration
- Cognito → User-management
- CloudWatch → Logging & Monitoring
- CloudFront, Shield & WAF → IT-Security
- ...

Version control and continuous integration:

- GitHub / GitHub-Actions







WMS/WMTS

<https://link.swissgeol.ch/2otsR>

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geo.admin.ch
das Geoportal

The screenshot shows the swissgeol viewer interface. The main map displays a geological map of Switzerland with various layers. The left sidebar shows the 'Data displayed' section with 'GeoCover - Vektordaten' at 70% and 'Grey map' at 100%. Below this is the 'Data Catalog' with options for 'Maps, cross-sections & models'. The 'Geological maps' section is expanded, showing a list of maps including 'GeoCover - Vektordaten', 'Geological Atlas GA25', 'Lithology 500', 'Geology 500', 'Tectonics 500', 'Groups of rocks 500', and 'Origin of rocks 500'. Other categories like 'Thematic maps', 'Historical maps', 'Sheet divisions', 'Cross-sections', and '3D models' are also visible. The right sidebar shows the 'Camera configuration' panel with settings for Height (424856.4 m AGL), Angle (0°), Pitch (-90°), and Coordinate system (LV95). The main map area shows a detailed geological map of Switzerland with labels for cities like Basel, Zurich, Bern, Lausanne, and Genève. The top of the browser window shows the URL: https://viewer.swissgeol.ch/?lang=en&lon=7.77259&lat=46.88144&elevation=425660&heading=0&pitch=-90&map=ch.swisstopo.pixelkarte-grau&map_transparency=0.00&ionToken=eyJhbGciOiJI...

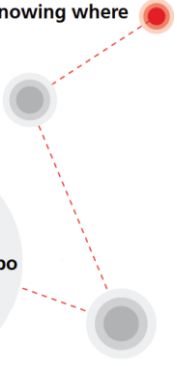
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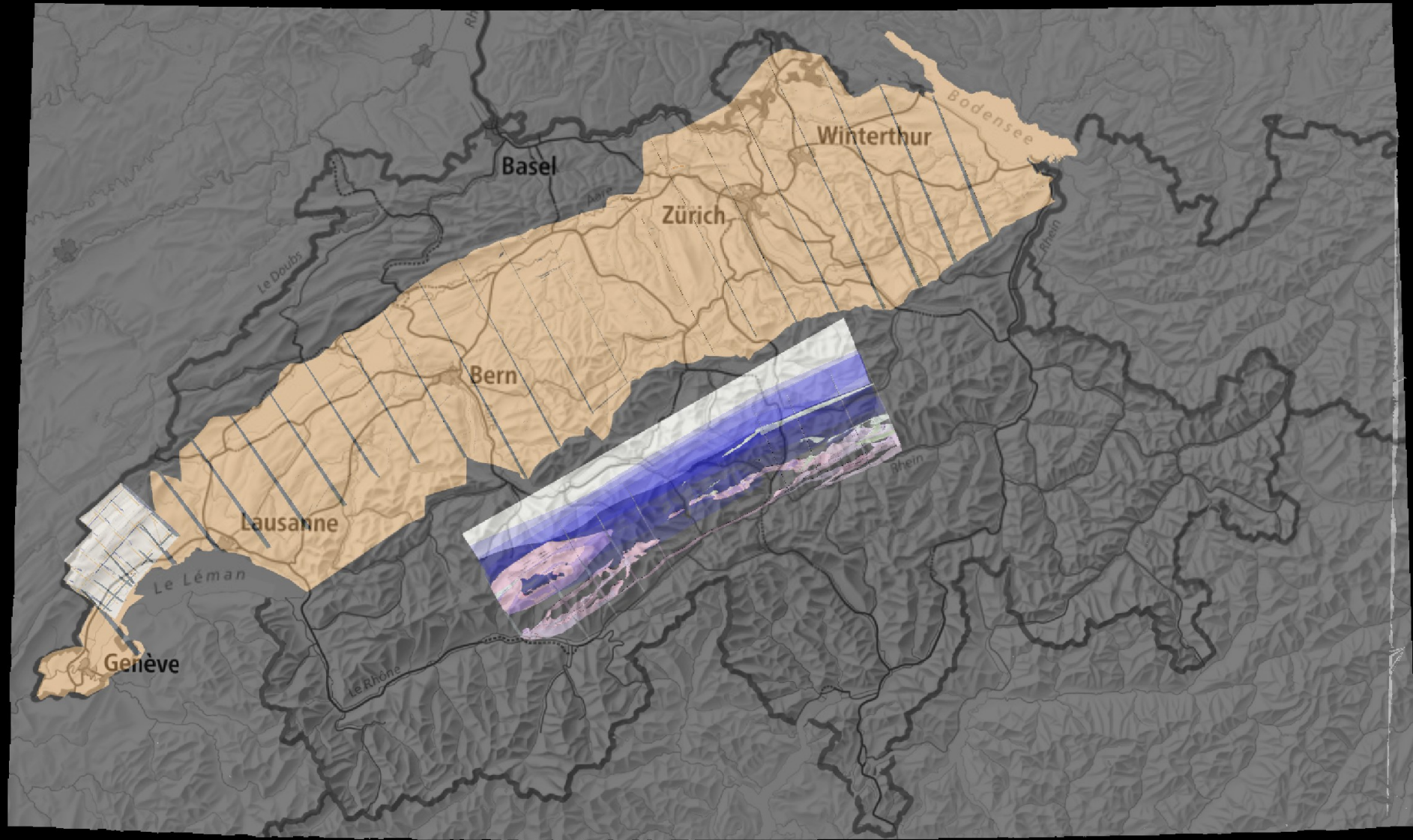
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3D Horizons (Meshes) - Übersicht





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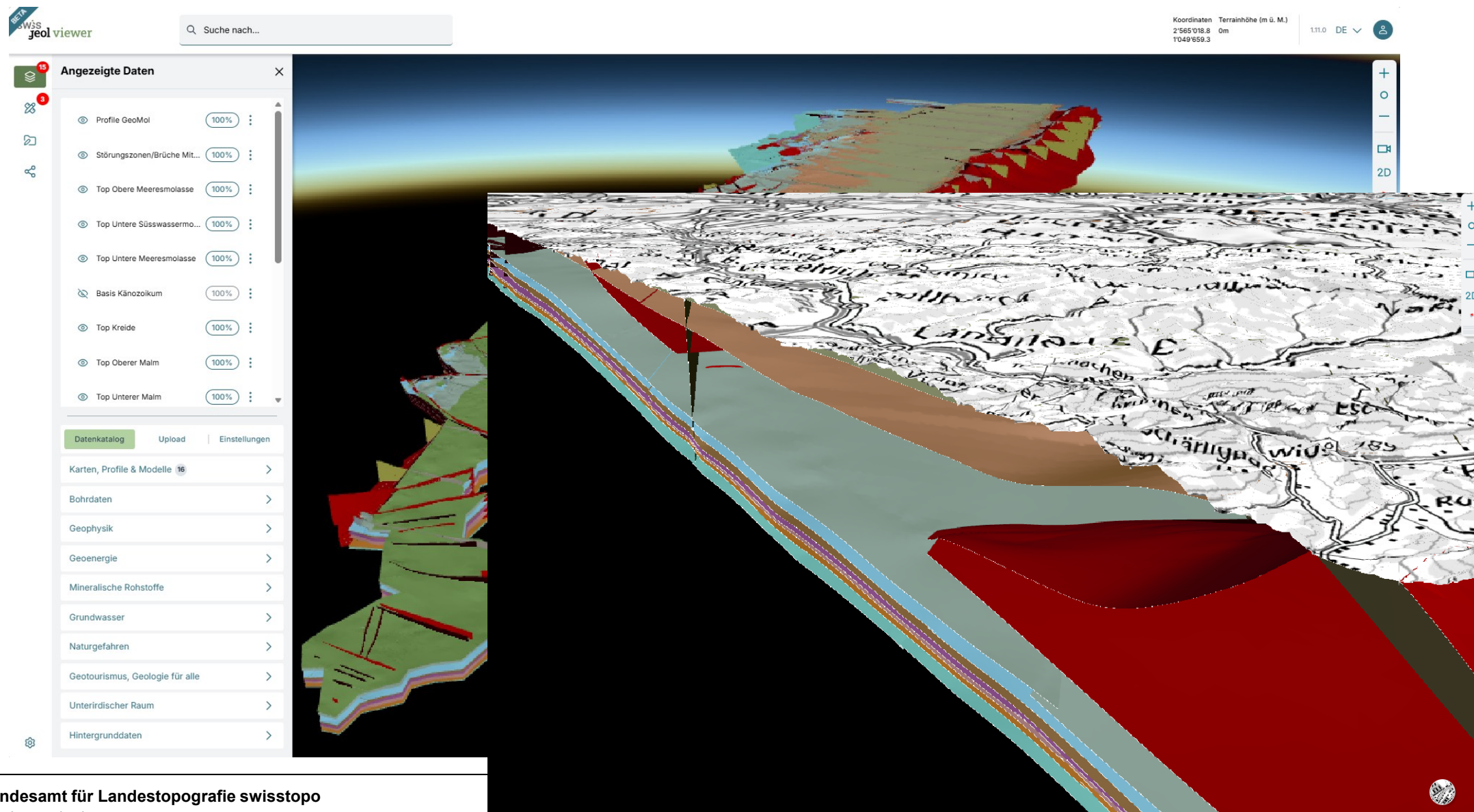
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3D Horizons (Meshes)

<https://link.swissgeol.ch/ghyGW>

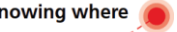
<https://link.swissgeol.ch/mCaHv>





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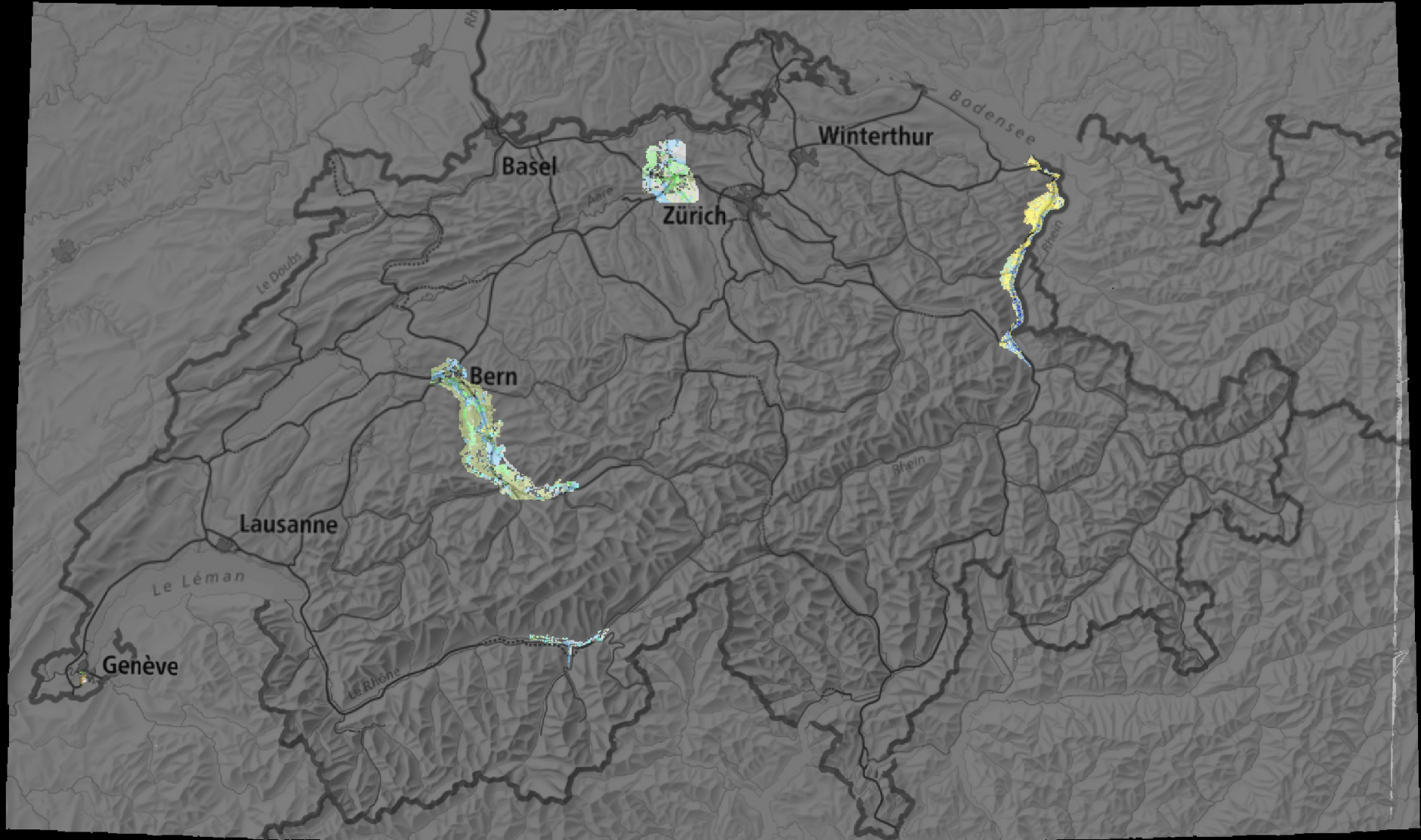
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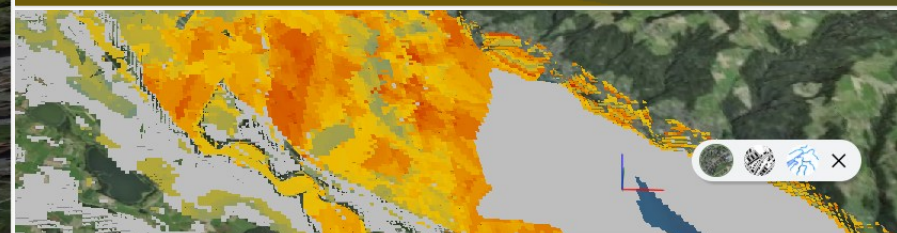
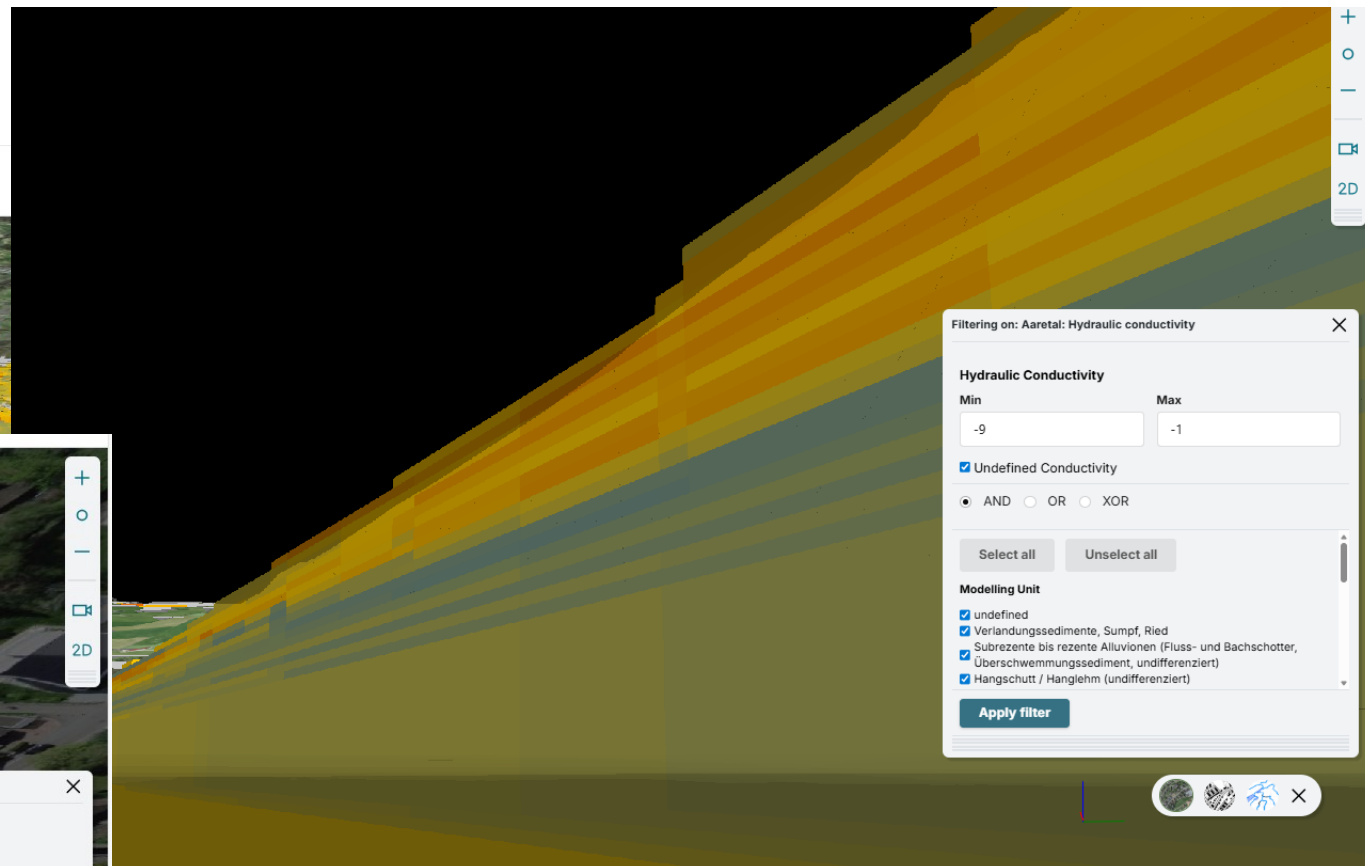
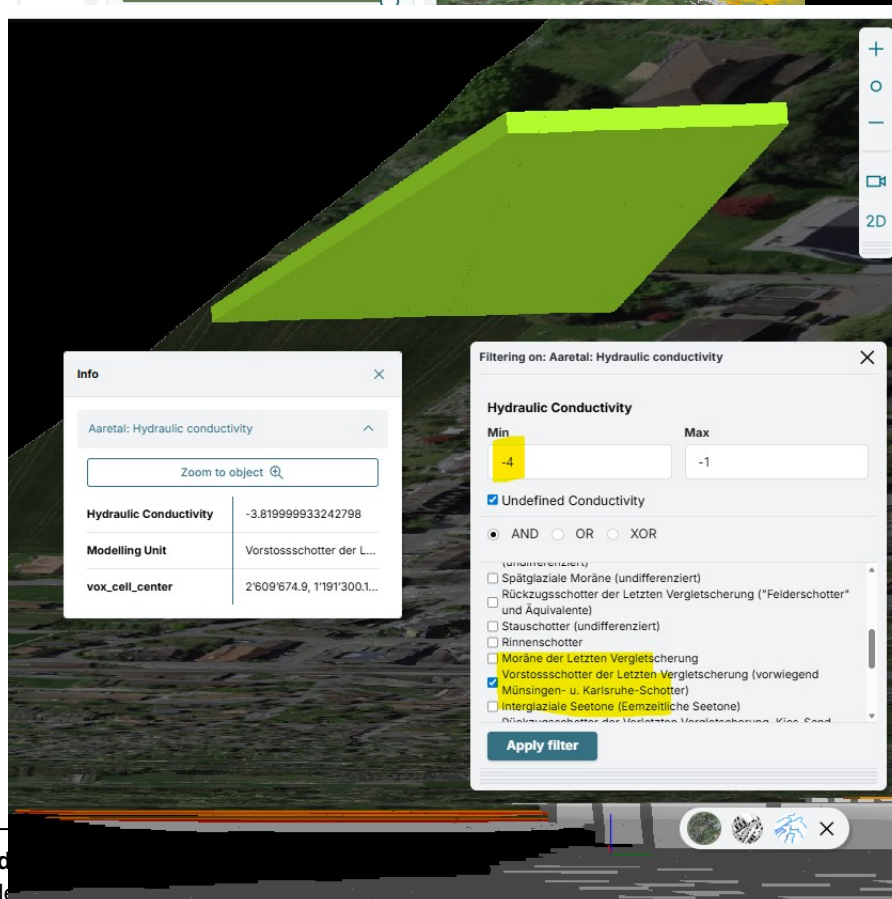
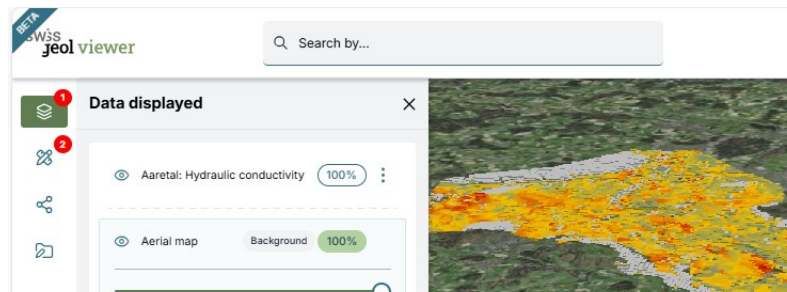


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Voxel - Übersicht

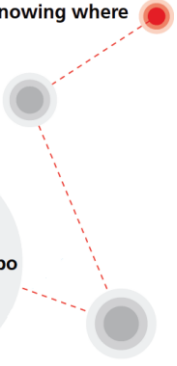




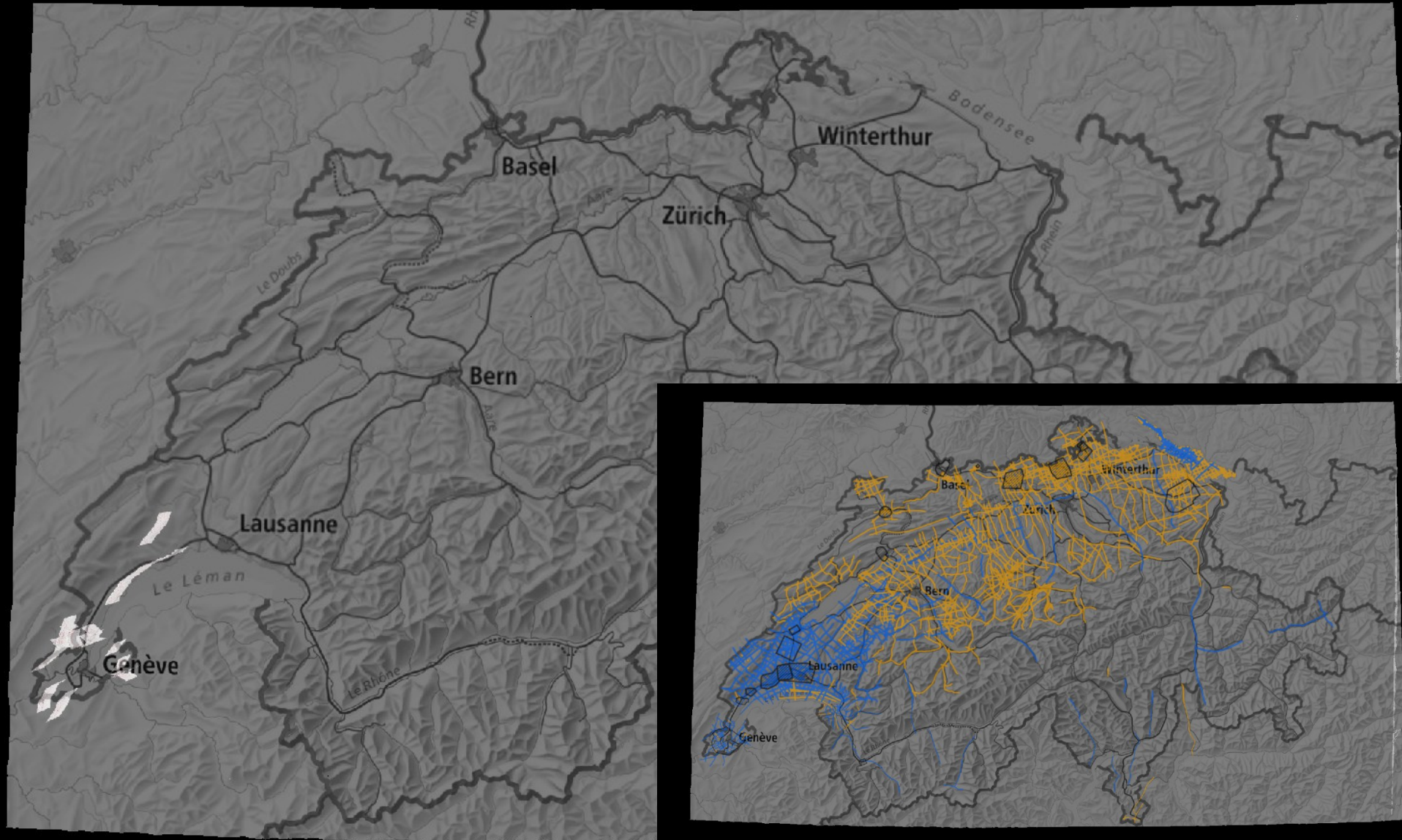


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Seismik - Übersicht





Seismik

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GiGa
infosystems

Open
Geospatial
Consortium

BETA
swiss
geol viewer

Search by...

Coordinates Terrain elevation (m AMSL)
2'486'734.3 0m
1'104'023.1

1.11.0 EN



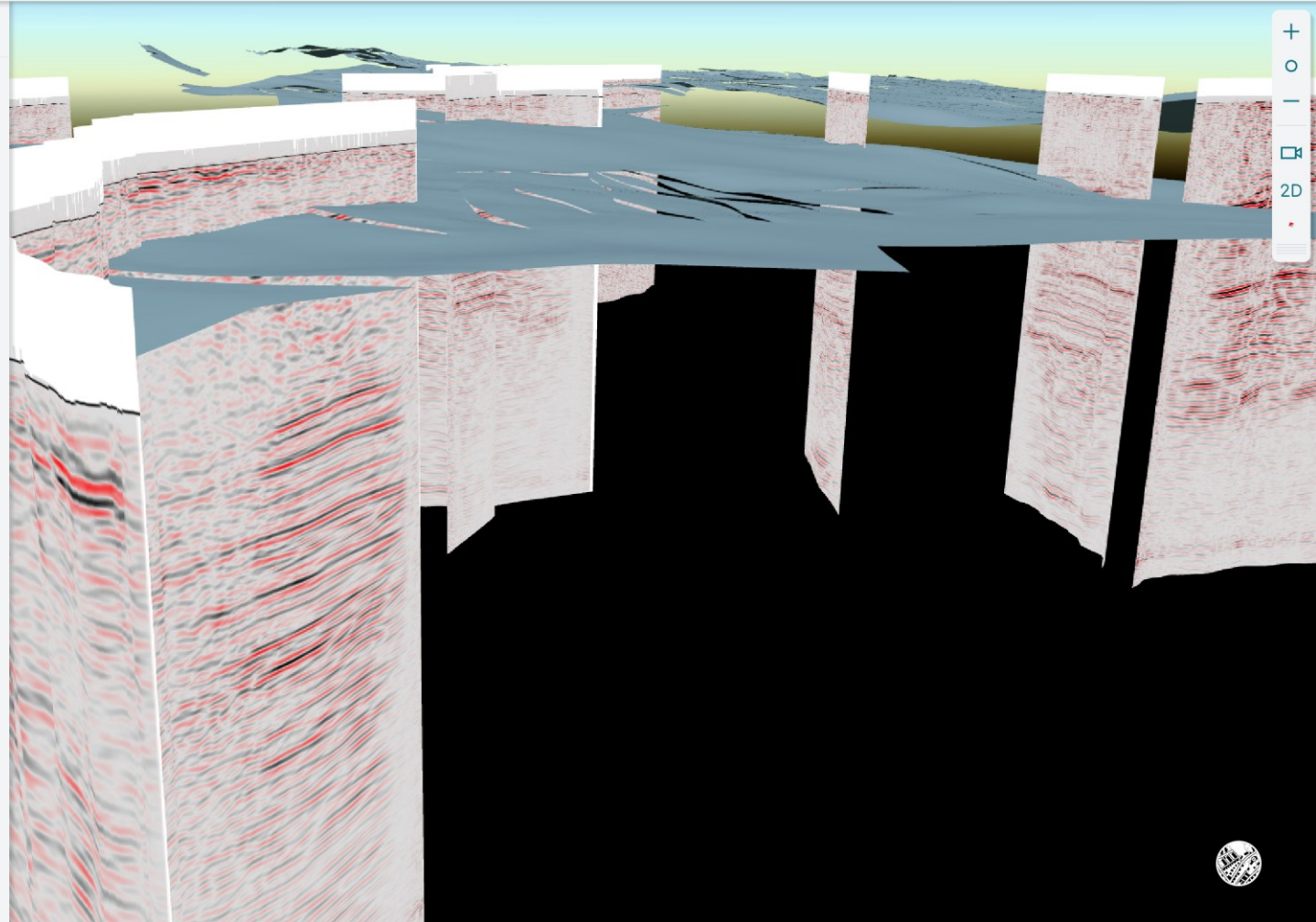
Data displayed

- 23SIG_A_012 100%
- 23SIG_A_010 100%
- 23SIG_A_007 100%
- 23SIG_A_006 100%
- 23SIG_A_003 100%
- 23SIG_A_002 100%
- 23SIG_A_001 100%

Borehole data

Geophysics 9

- 2D Reflection seismics
 - ☐ Reflection seismic
- Survey Vaud - 2EGEO21
 - ☒ 21-EGEO-001
 - ☒ 21-EGEO-002
- Survey Geneva - 23SIG_A
 - ☒ 23SIG_A_001
 - ☒ 23SIG_A_002
 - ☒ 23SIG_A_003
 - ☐ 23SIG_A_004
 - ☐ 23SIG_A_005





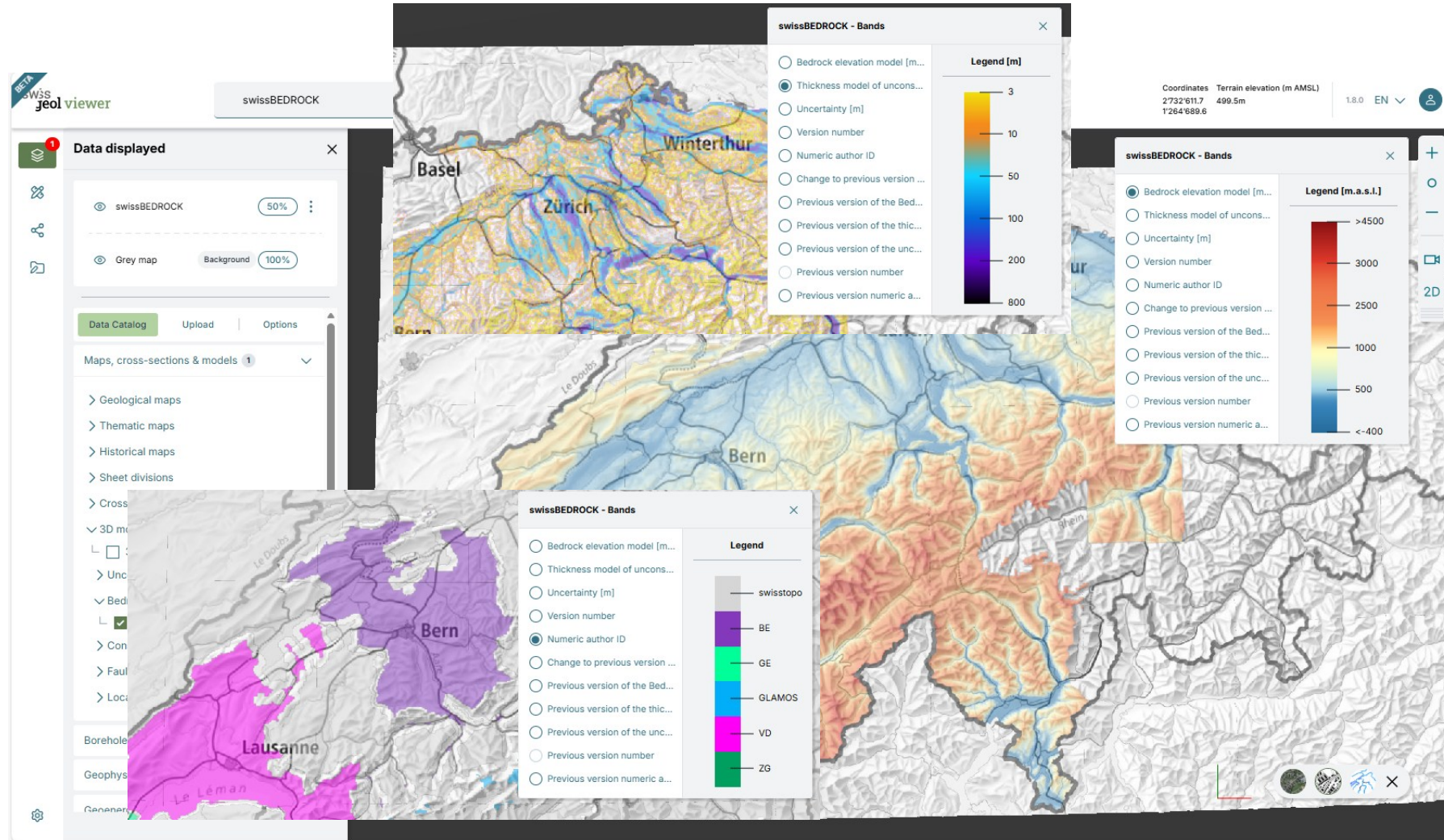
swissBEDROCK

<https://link.swissgeol.ch/G4hQs>
<https://link.swissgeol.ch/beOzX>

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swissBEDROCK

<https://link.swissgeol.ch/G4hQs>
<https://link.swissgeol.ch/beOzX>

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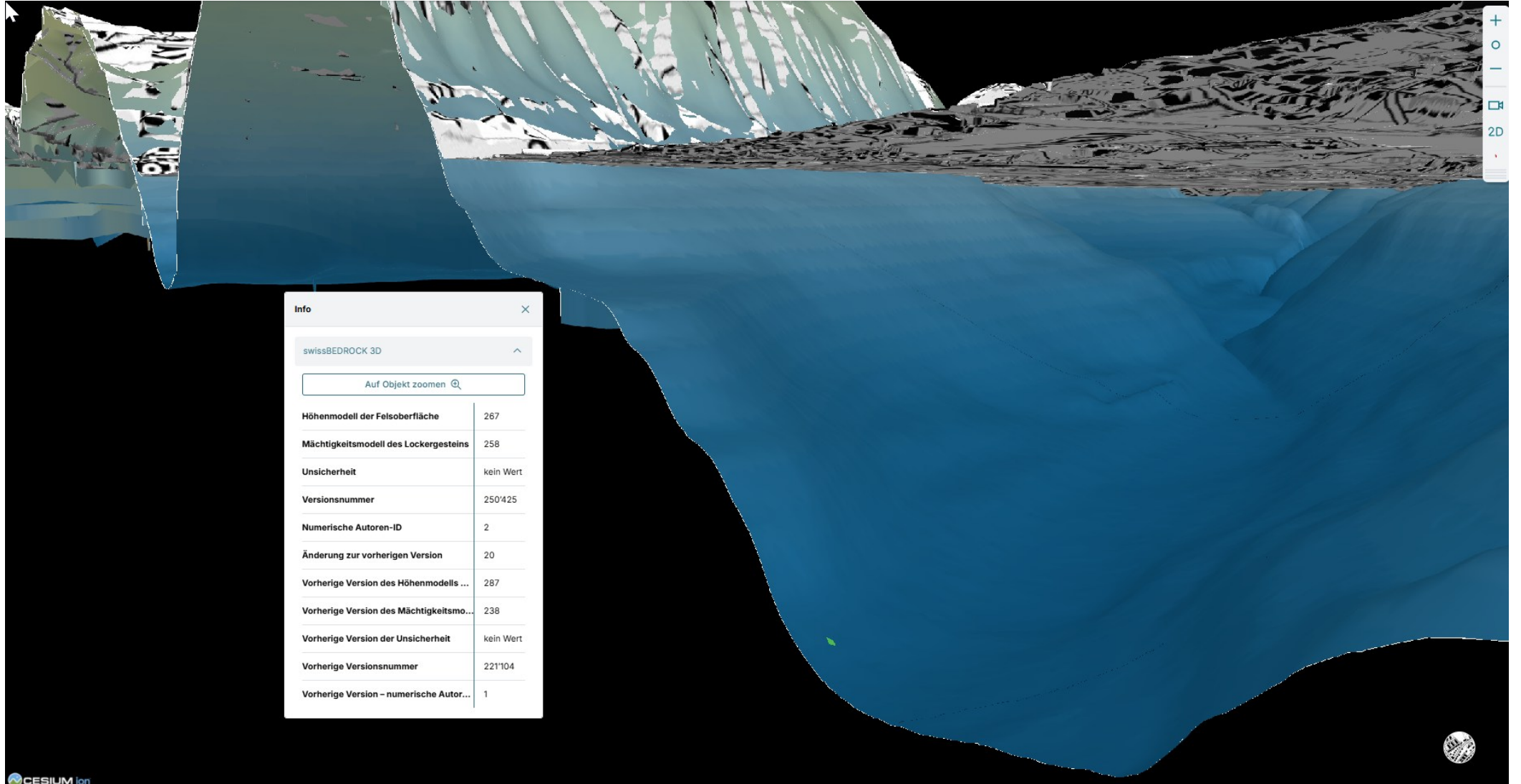
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aws
S3



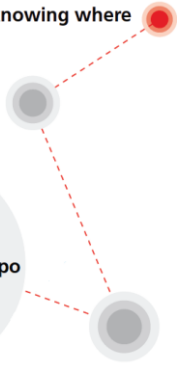


Earthquakes

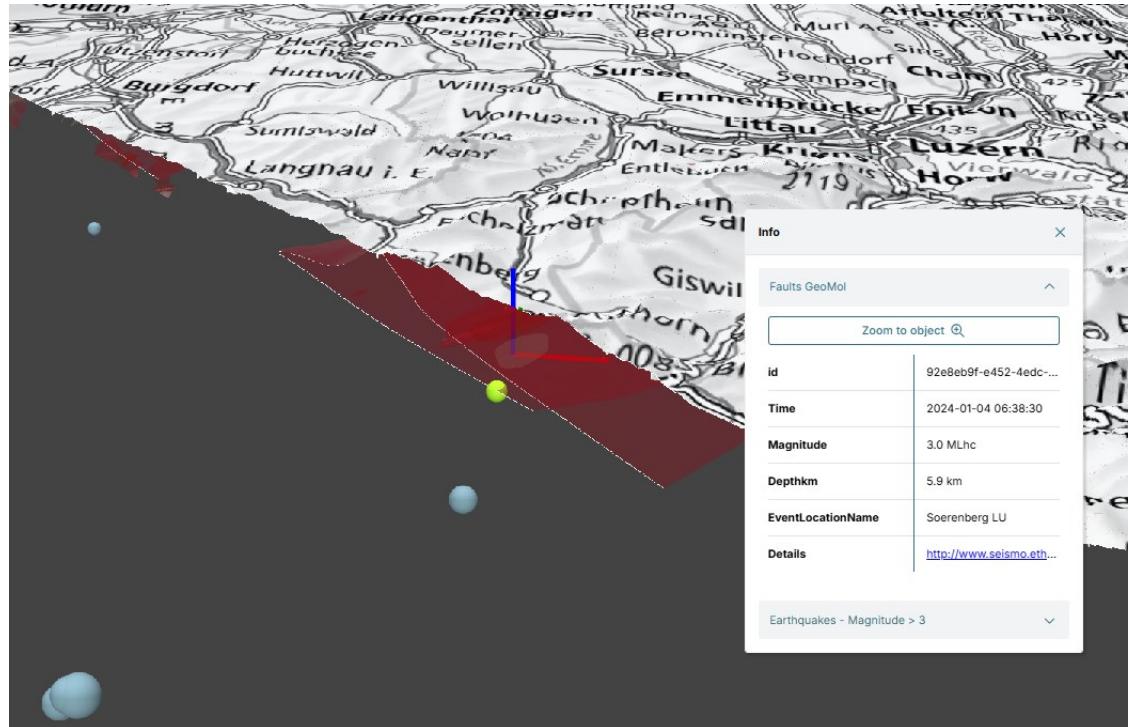
<https://link.swissgeol.ch/MSDf4>

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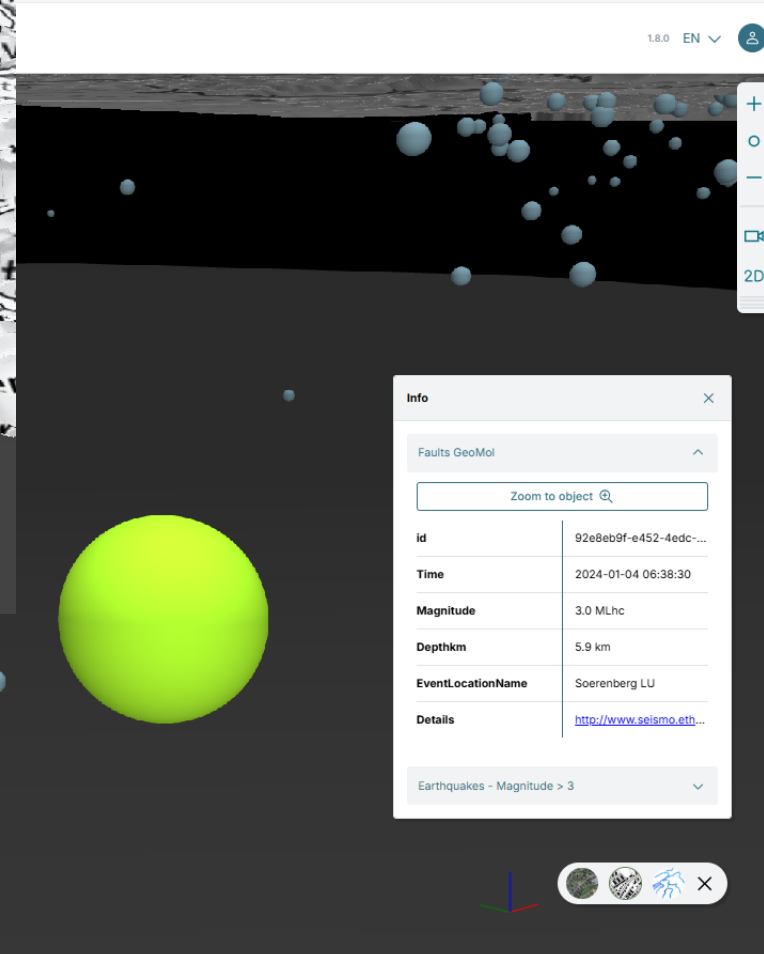
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Info	
Faults GeoMol	
Zoom to object	
id	92e8eb9f-e452-4edc...
Time	2024-01-04 06:38:30
Magnitude	3.0 MLhc
Depthkm	5.9 km
EventLocationName	Soerenberg LU
Details	http://www.seismo.eth...
Earthquakes - Magnitude > 3	



Info	
Faults GeoMol	
Zoom to object	
id	92e8eb9f-e452-4edc...
Time	2024-01-04 06:38:30
Magnitude	3.0 MLhc
Depthkm	5.9 km
EventLocationName	Soerenberg LU
Details	http://www.seismo.eth...
Earthquakes - Magnitude > 3	



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Suche

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The screenshot shows the 'swissgeol viewer' interface. On the left, a sidebar lists various data categories: Borehole data, Geophysics, Geoenergy, Mineral resources, Groundwater, Natural hazards, Geotourism, Geology for all, Underground space, and Background data. The main search bar contains 'Bern'. Below it, a list of search results is displayed, including 'Bern (BE)', 'Bern (BE) - Bremgarten bei Bern, Bern, Muri bei Bern, O...', 'Other transport Bern Matte (BE) - Bern', 'Area with fixed mobil-homes Bern-Eymatt (BE) - Bern', 'Exit Bern-Neufeld (BE) - Bern', 'Exit Bern-Ostring (BE) - Bern', 'Exit Bern-Wankdorf (BE) - Bern', and 'Exit Bern-Ostring (BE) - Bern'. A 'Geol' search filter is applied, showing a list of geological layers: 'Erratic block Geologenstein (SZ) - Morschach', 'Geological Atlas GA25', 'Geology 500', 'Geological profiles GA25', '3D geological models', 'Hydrogeological sketch', and 'Hydrogeological map 100'. The map area shows a topographic view of the Bern region with labels for 'Huttwil', 'Willisau', 'Langnau i. E.', 'Fischthal', 'Sarnen', 'Meiringen', 'Guttannen', 'Dammast', 'Münster', and 'Unterwald'. A coordinate input field shows '2501000,1118135' and a 'Recenter to 2°50'000 1°11'8'135' button. A 'Layer im viewer' dropdown menu is open, showing 'hiking' and 'Closures Hiking trails', 'Hiking trails', and 'Winter hiking trails'. A 'Layer aus map.geo.admin.ch' dropdown menu is also visible, showing 'Closures Hiking trails', 'Hiking trails', and 'Winter hiking trails'. The interface includes a 'Data displayed' section with 'Grey map' and 'Data Catalog' options, and a 'Maps, cross-sections & more' section with 'Borehole data', 'Geophysics', 'Geoenergy', 'Mineral resources', 'Groundwater', 'Natural hazards', 'Geotourism, Geology for all', 'Underground space', and 'Background data'.

Geolocation

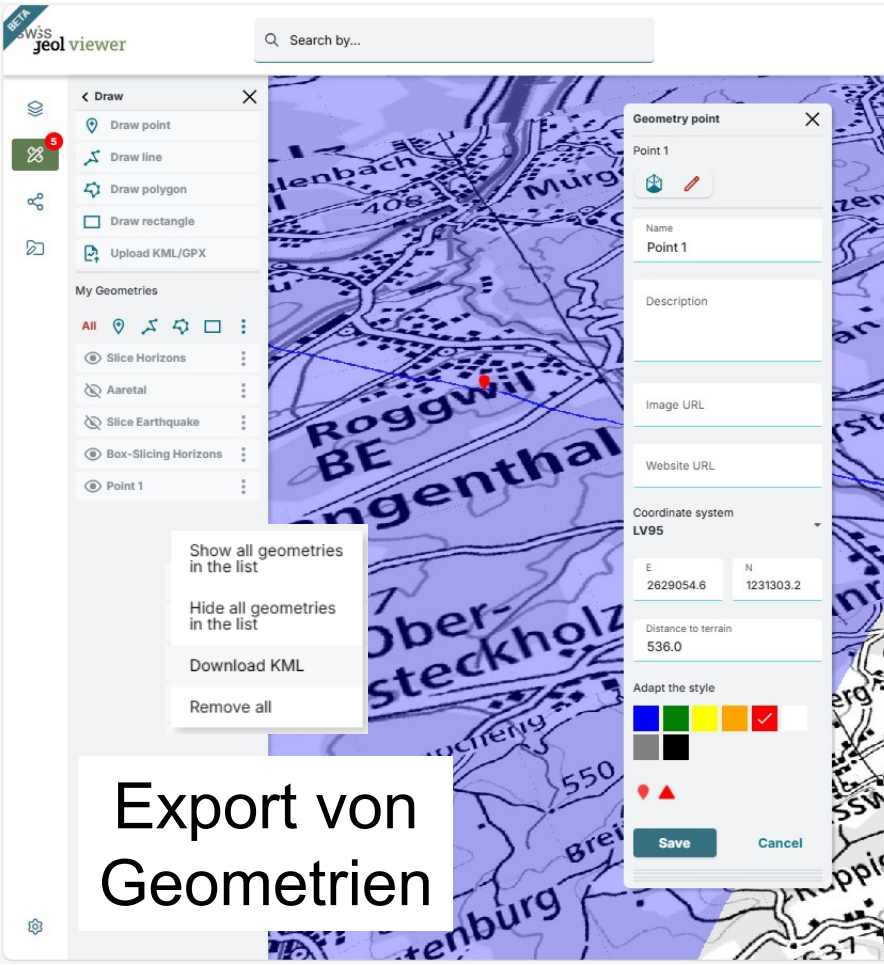
Koordinaten

Layer im viewer

Layer aus
map.geo.admin.ch



Create Geometries



Draw

- Draw point
- Draw line
- Draw polygon
- Draw rectangle
- Upload KML/GPX

My Geometries

- All
- Slice Horizons
- Aaretal
- Slice Earthquake
- Box-Slicing Horizons
- Point 1

Geometry point

Point 1

Name
Point 1

Description

Image URL

Website URL

Coordinate system
LV95

E
2629054.6

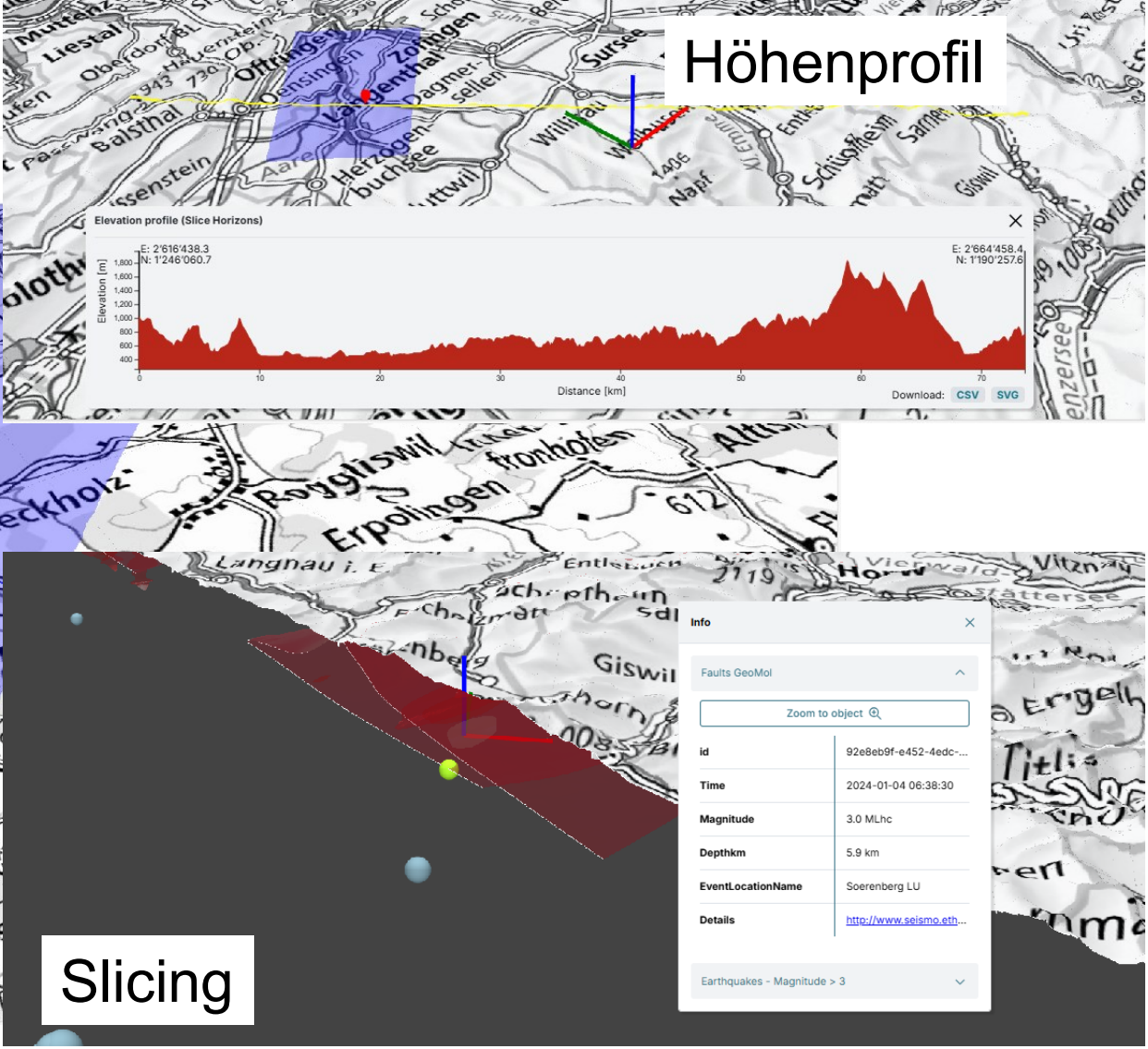
N
1231303.2

Distance to terrain
536.0

Adapt the style

Save Cancel

Export von Geometrien



Höhenprofil

Elevation profile (Slice Horizons)

E: 2'616'438.3
N: 1'246'060.7

E: 2'664'458.4
N: 1'190'257.6

Distance [km]

Download: CSV SVG

Slicing

Info

Faults GeoMol

Zoom to object

id	92e8eb9f-e452-4edc...
Time	2024-01-04 06:38:30
Magnitude	3.0 MLhc
Depthkm	5.9 km
EventLocationName	Soerenberg LU
Details	http://www.seismo.eth-...

Earthquakes - Magnitude > 3

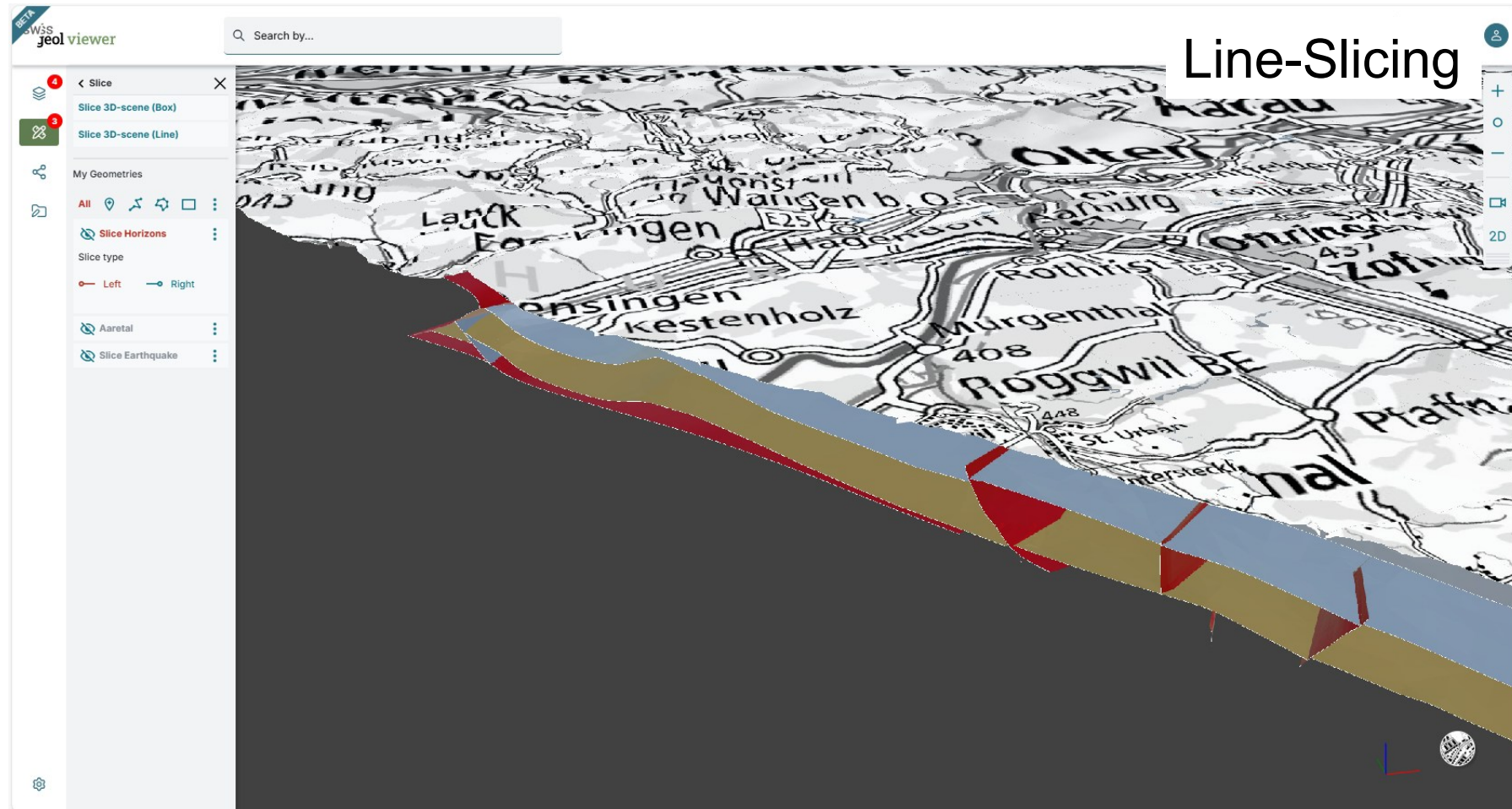


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Slicing

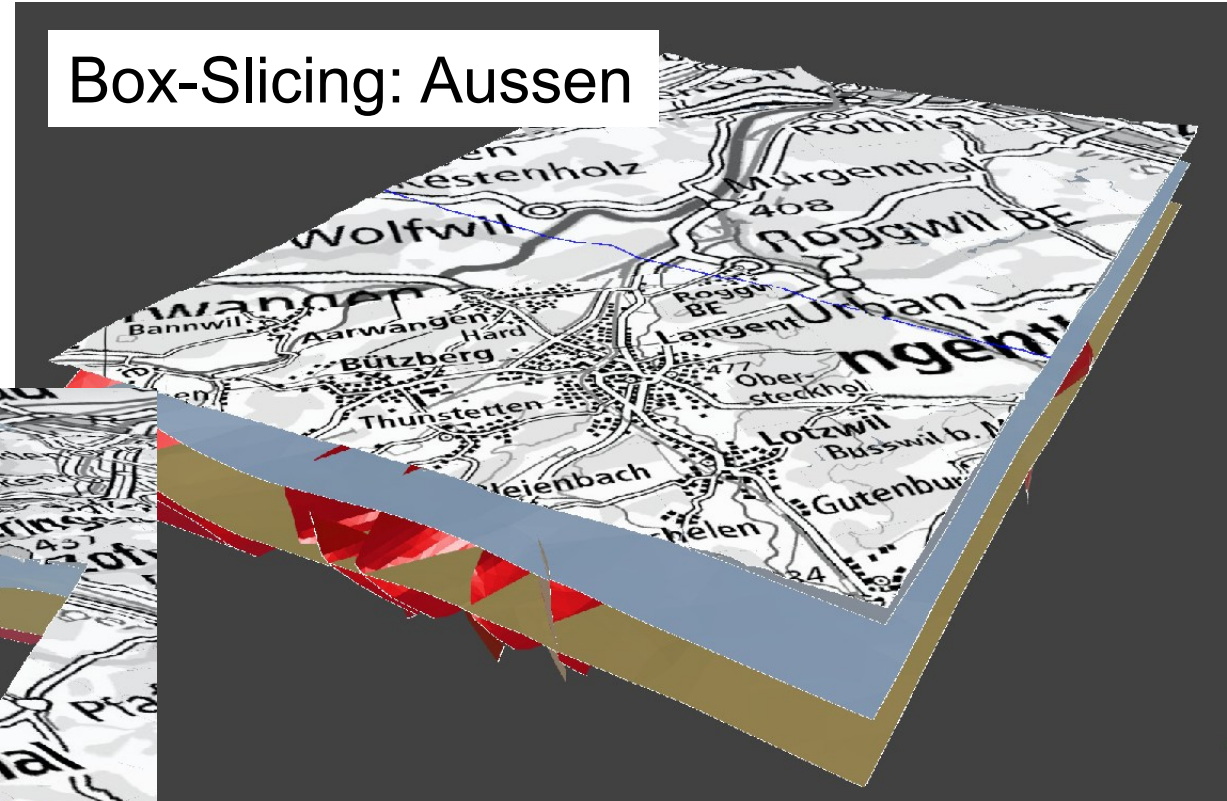
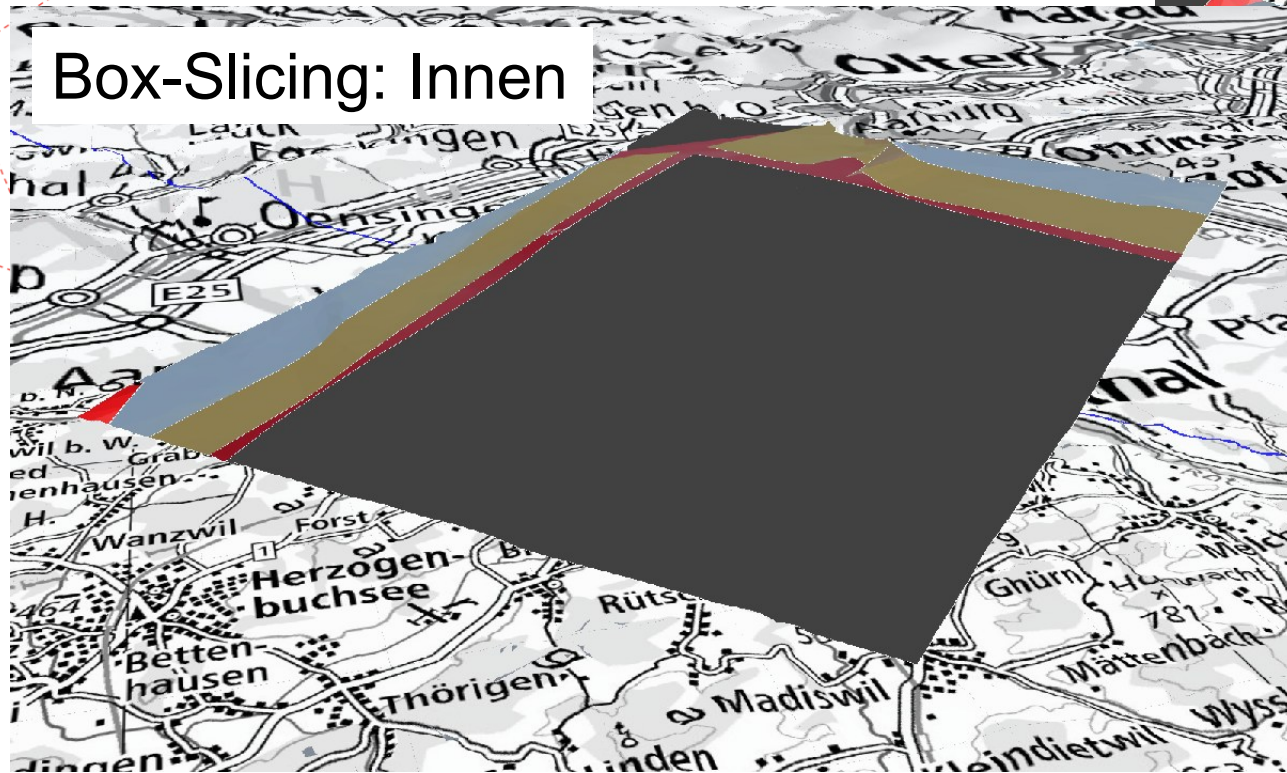


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Box-Slicing: Innen

Box-Slicing: Aussen



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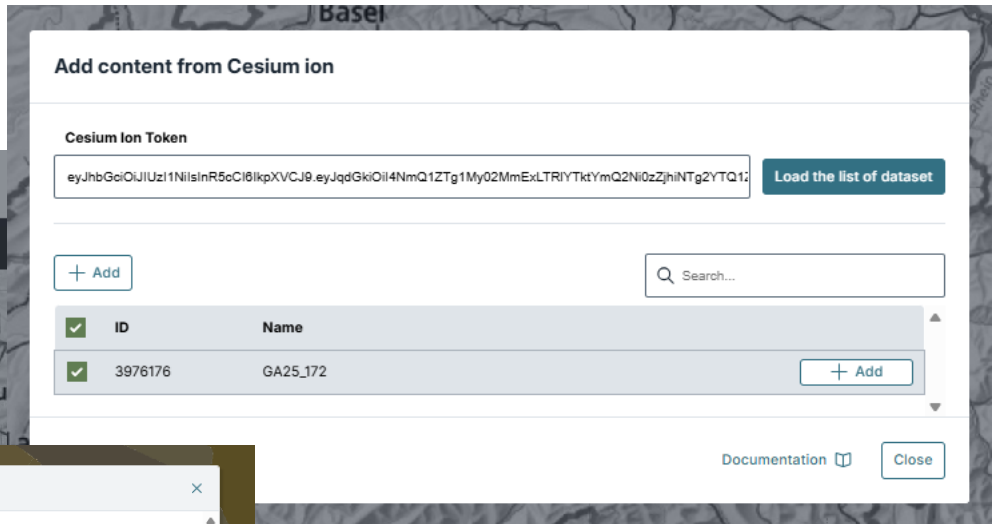
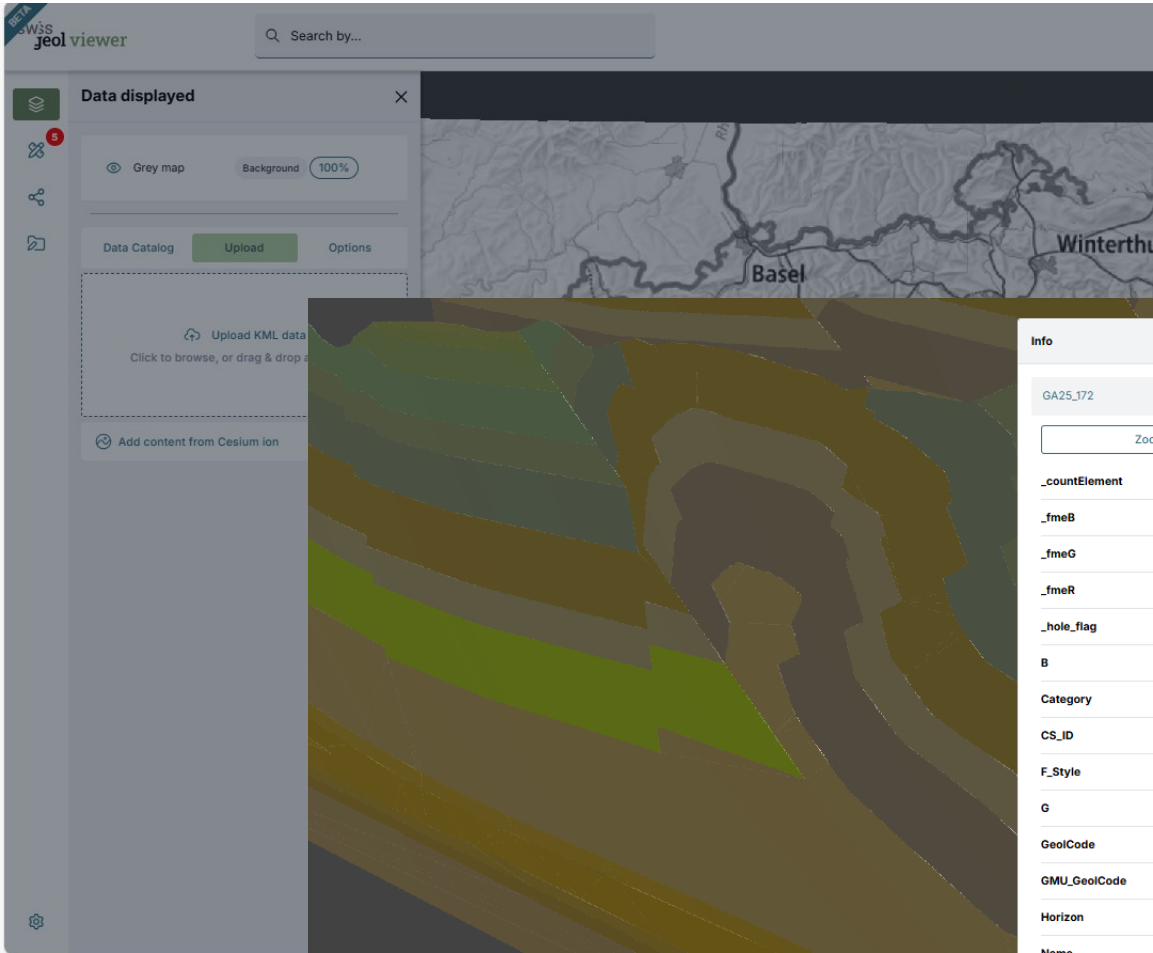
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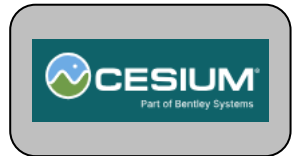
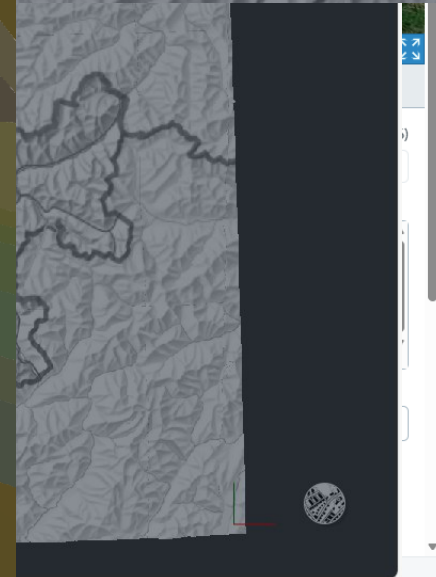
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Upload Cesium Ion data



Info	
GA25_172	
Zoom to object	
_countElement	1406
_fmeB	0.7843137254901961
_fmeG	0.5882352941176471
_fmeR	0.6862745098039216
_hole_flag	no
B	200
Category	Polygon
CS_ID	GA25_172_Plate_L_Sect...
F_Style	Stafefelegg
G	150
GeolCode	15200011
GMU_GeolCode	15200011
Horizon	2618
Name	GA25_172_Plate_L_Sect...
Profilnumm	2
Q_countSe	2
Q_timesta	20250819
R	175
Tafelnumme	I



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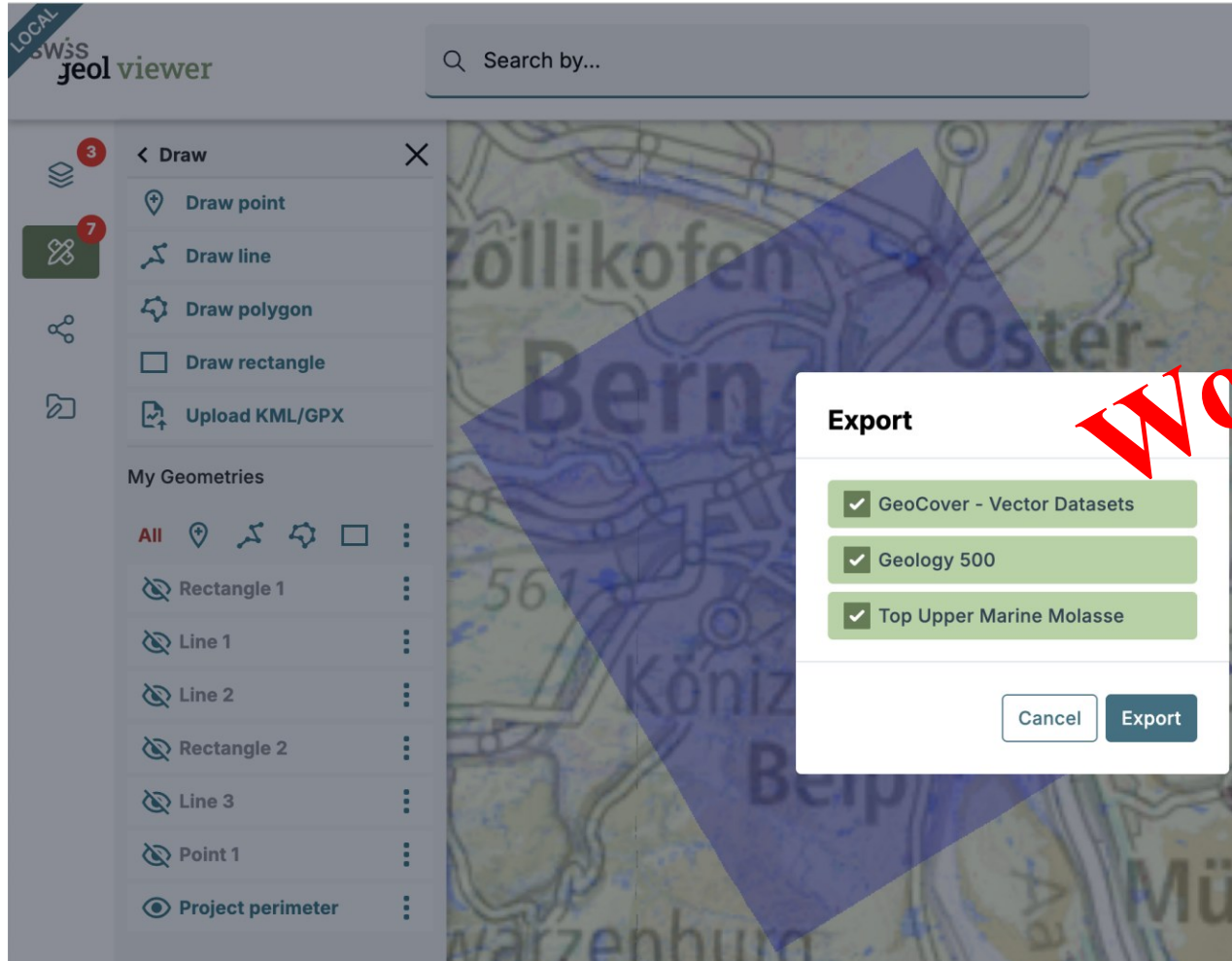


Download via OGC-API

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Work in progress



Bohrdaten

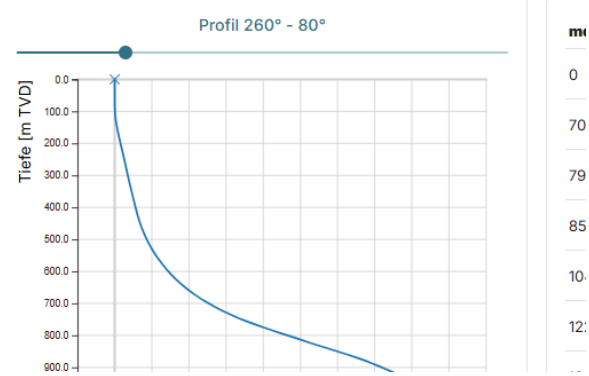
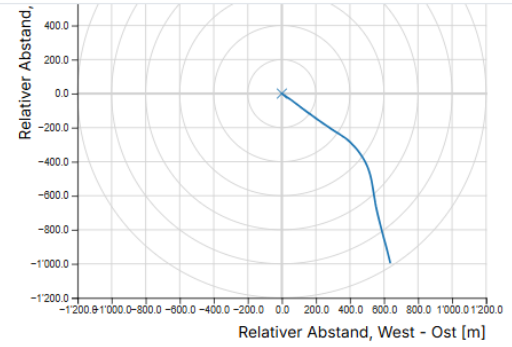


Work in progress

BIM - IFC

Montagny-2 S

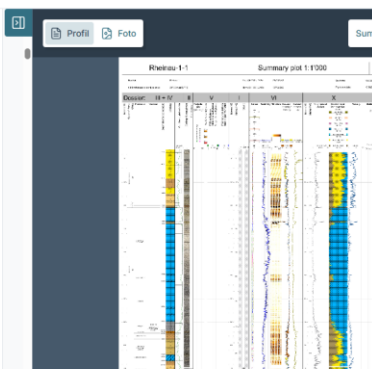
- Standort
- Bohrung
- Stratigraphie
- Bohrlocharchitektur
- Hydrogeologie
- LOG
- Anhänge



Rheinau-1-1

- Standort
- Bohrung
- Stratigraphie
- Bohrlocharchitektur
- Hydrogeologie
- LOG
- Anhänge
- Status

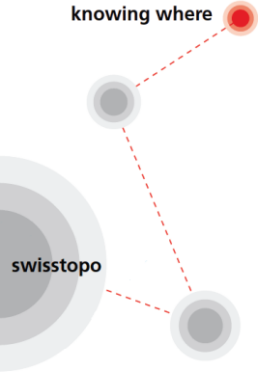
102.5 m MD	Mergelstein: sandig
102.5 m MD	
102.9 m MD	Sandstein: tonig-kalkig
102.9 m MD	
	Mergelstein: sandig





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Herausforderungen

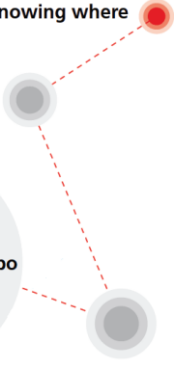
- Performance
- Dataintegration: Verschiedene Datentypen
- Eingeschränkte Ressourcen
- Unterschiedliche Bedürfnisse (intern / extern)



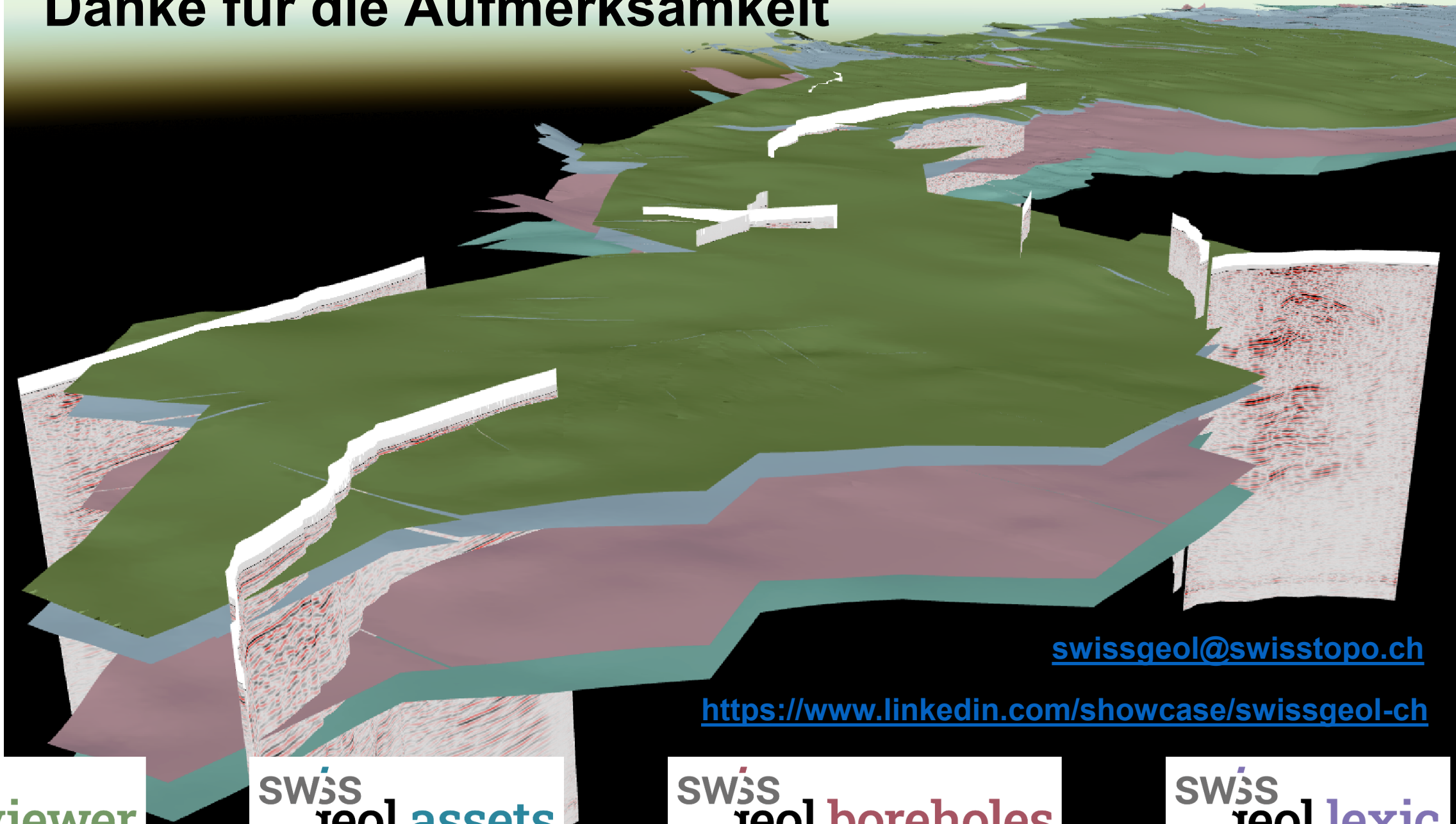


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Danke für die Aufmerksamkeit



swissgeol@swisstopo.ch

<https://www.linkedin.com/showcase/swissgeol-ch>

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geol viewer

swiss
geol assets

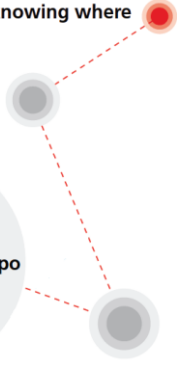
swiss
geol boreholes

swiss
geol lexic



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Links

 	https://swissgeol.ch	https://github.com/swisstopo/swissgeol-landingpage-config
 	https://assets.swissgeol.ch	https://github.com/swisstopo/swissgeol-assets-suite
 	https://boreholes.swissgeol.ch	https://github.com/swisstopo/swissgeol-boreholes-suite
 	https://lexic.swissgeol.ch	https://github.com/swisstopo/swissgeol-lexic-cv-interface
 	https://viewer.swissgeol.ch	https://github.com/swisstopo/swissgeol-viewer-suite