



**GiGa**  
infosystems

## **GST User Meeting 2024**



## Webex Meetings

- \* Everyone is muted by default
- \* We welcome to see your face, but it is not a must
- \* Raise your hand if you want to ask an immediate questions
- \* Use “Questions & Answers” or “Chat” to ask a general question; will be answered later
- \* Easy chat/Further questions during break



## Disclaimer

- \* We are not geologists/geoscientists, we may use wrong terms
- \* We demonstrate with possibly wrong examples here and there
- \* We are happy if you correct us or provide us with real data we can use and show
- \* We can provide guidance to achieve nice results with your data, don't hesitate to ask



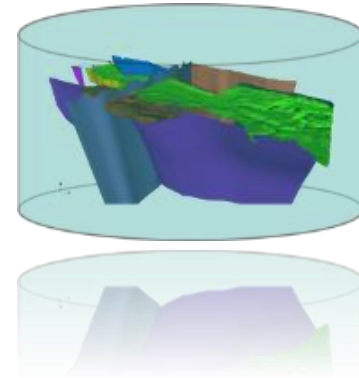
## Agenda

- \* 9.00 – 10.30 Developments of 2023, Paul Gabriel
- \* 10.40 – 11.00 Using GIS with GST – OGC API, Georg Semmler
- \* 11.00 – 11.15 Discussion/Break
- \* 11.15 – 11.45 Updates on GST[AR], Björn Wiczorek
- \* 12.00 – 13.00 Future Developments – Ideas –Feedback, Paul Gabriel



# GiGa infosystems

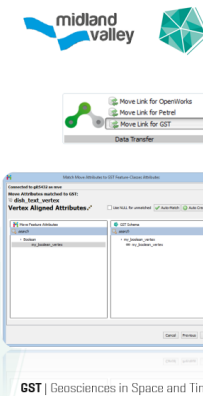
- \* Team of 8  
[2.5 Backend, 1.5 Desktop, 3 Web, 1 DevOps]
- \* **Oracle Partner, GIS Award**
- \* Cooperation with
  - \* TU Bergakademie Freiberg
  - \* Petex [MOVE]



In [app plugin](#)

## Move link to GST

- \* Direct save/load models to GST
- \* define Project Extents to be used for the current session
- \* work with features from GST (retrieve, lock/unlock, save edits, upload and delete)
- \* view a summary of work undertaken during the session



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## Developments in 2023

- \* HLNUG, Hesse, with SaaS
- \* Niedersachsen Wasser with SaaS
- \* LAGB, Saxony Anhalt, with SaaS
- \* TU Bergakademie with SaaS

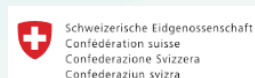


# Developments in 2023

- \* Main developments with LfU Bavaria, swisstopo and LfULG Saxony, nagra and BGE:
  - \* **3d tiles export**
  - \* **Improved OBJ, KML/Collada export**
  - \* **Mechanism for defining a stratigraphic order**
  - \* **Mesh simplification**



Bayerisches Landesamt für  
Umwelt



Bundesamt für Landestopografie swisstopo

LANDESAMT FÜR UMWELT,  
LANDWIRTSCHAFT  
UND GEOLOGIE







## Developments in 2023

- \* Main developments with LfU Bavaria, swisstopo and LfULG Saxony, nagra and BGE:
  - \* **Borehole info dialog rework**
  - \* **Download SEG Y as GeoTIFF**
  - \* **Extension of Borehole metadata**
  - \* **Borehole filter**



## Developments in 2023

- \* Main developments with LfU Bavaria, swisstopo and LfULG Saxony, nagra and BGE:
  - \* **ResqML import and export**
  - \* **IFC import and export**
  - \* **Addition of seismographic data**
  - \* **netCDF import**
  - \* **Timestamp support for Attributes**
  - \* **Stable API**



## Developments in 2023 – GST[AR]

- \* More features on GST[AR] for Android
- \* Themes support
- \* QR Code Support
- \* Simple news system
- \* Endpoint creator



## **GST Desktop**

- \* Stratigraphic Sorting
- \* New Download options and formats
- \* Distinct Feature Types
- \* Improved Histogram
- \* Improved Error Messages for connection errors
- \* Improved Feature Class handling

# Stratigraphic Sorting



- \* Yet no full stratigraphic table
- \* More flexible by allowing:
  - \* To Use Themes as sort base
  - \* To Use Attribute as sort base
- \* Smaller improvements



# Stratigraphic Sorting

**Theme Editor**

Within this dialog you can create, edit, delete Themes. A Theme can be matched via the **Property Name Match** field to a feature attribute/object property. You can even import and export Themes from and to Gocad compatible formats.

**Hint:** Some actions are available via a right click on the list of Themes.

**Hint:** If you want to match feature properties/simplex properties, you need to edit **Color Maps**

Theme Name: Stratigraphy

Property Name Match: stratigraphy

Access Level: Public

Color Scheme: <custom>

Color	Value	Label	Order
Dark Blue	Archaean	Archaean	0
Brown	Cretaceous	Cretaceous	1
Purple	Devonian	Devonian	2
Teal	Miocene	Miocene	3
Magenta	Ordovician	Ordovician	4
Light Green	Paleogene	Paleogene	5
Orange	Permian	Permian	6
Yellow	Proterozoic	Proterozoic	7

No Match (NoData case)

Label: NoData

Overlays native object color

**Theme Editor**

Within this dialog you can create, edit, delete Themes. A Theme can be matched via the **Property Name Match** field to a feature attribute/object property. You can even import and export Themes from and to Gocad compatible formats.

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**Hint:** If you want to match feature properties/simplex properties, you need to edit **Color Maps**

Theme Name: Stratigraphy

Property Name Match: stratigraphy

Access Level: Public

Color Scheme: <custom>

Color	Value	Label	Order
Yellow	Miocene	Miocene	7
Orange	Paleogene	Paleogene	28
Light Green	Cretaceous	Cretaceous	70
Purple	Triassic	Triassic	200
Red	Permian	Permian	250
Brown	Devonian	Devonian	360
Light Green	Silurian	Silurian	415
Teal	Ordovician	Ordovician	440

No Match (NoData case)

Label: NoData

Overlays native object color



# Stratigraphic Sorting

Browse feature class: paul.sax

Theme:  
**Stratigraphy**

Match String: "stratigraphy" -> Match on: "stratigraphy"

Select	o name text	Lock	Geometry Hull	Alias: Age age float 8 bytes	Alias: Stratigraphy stratigraphy text
<input type="checkbox"/>	01_dd_Kreide	free	yes	70,6	Cretaceous
<input type="checkbox"/>	02_dd_Doehlener_Becken	free	yes	40,4	Paleogene
<input type="checkbox"/>	03_dd_Riesenstein-Granit	free	yes	265,8	Permian
<input type="checkbox"/>	04_dd_Markersbacher_Granit	free	yes	270,6	Permian
<input type="checkbox"/>	05_dd_Stolpener_Granit	free	yes	284,4	Permian
<input type="checkbox"/>	06_ddl_Gneise	free	yes	15,97	Miocene
<input type="checkbox"/>	07_dd_Porphyririte	free	yes	391,8	Devonian
<input type="checkbox"/>	08_dd_Diorite	free	yes	3200	Archaean
<input type="checkbox"/>	09_dd_Hauptgranit	free	yes	260,4	Permian
<input type="checkbox"/>	10_dd_Monzonit	free	yes	455,8	Ordovician
<input type="checkbox"/>	11_dd_Monzodiorit	free	yes	228,7	Triassic
<input type="checkbox"/>	12_dd_Elbtal-Schiefergebirge	free	yes	426,2	Silurian
<input type="checkbox"/>	13_dd_Osterzgebirge	free	yes	850	Proterozoic
<input type="checkbox"/>	14_dd_Lausitzer_Granodiorit	free	yes	1200	Proterozoic

Object name:

Object appearance

Red:

Green:

Blue:

Transparency [%]:

Hide default columns

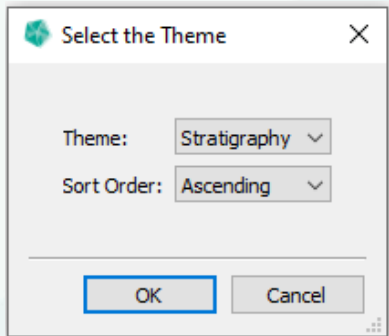
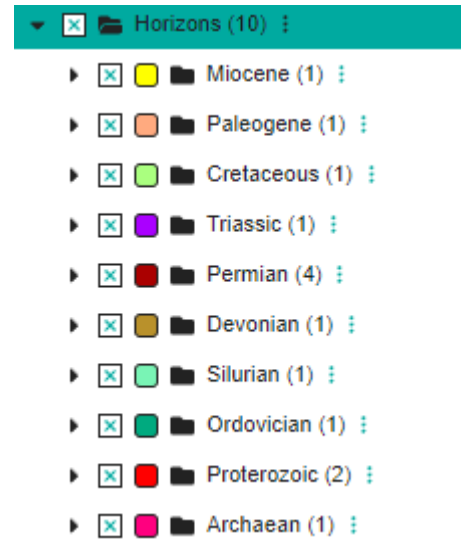
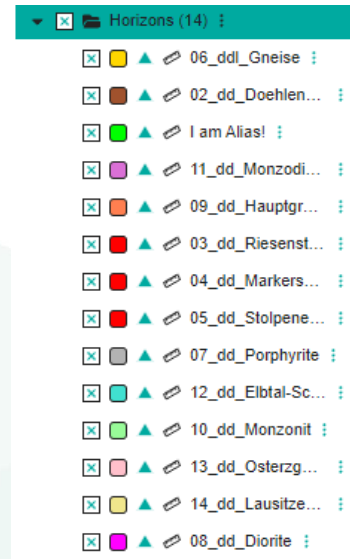
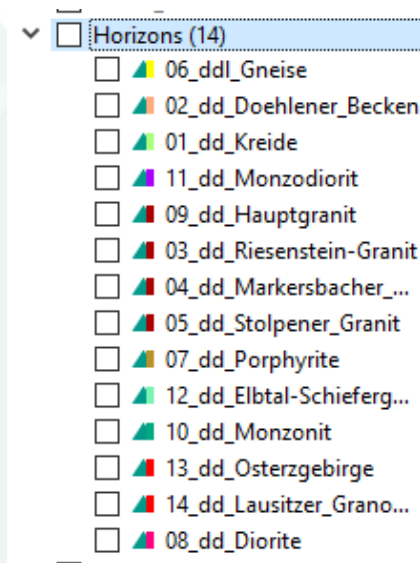
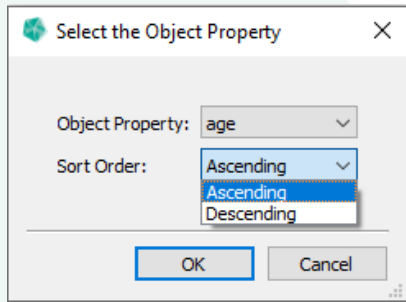
Features ... 814d  
34 paul Upload into: paul.sax 814d  
35 paul Add Feature Class ... 814d  
36 paul Edit Feature Class ... 814d  
37 paul Snapshot Feature Class... 814d  
38 paul Transform SRS of Feature Class... 217f  
39 paul Apply theme as feature color 217f  
40 paul Manage Color Schemes ... 258f  
41 paul Color Maps 217f  
42 paul Class Selection 217f  
43 paul Chown Highlighted Classes... 814d  
44 paul Delete Highlighted Classes 814d  
45 paul Export Highlighted Classes ... 814d  
46 paul Apply theme as feature color for highlighted classes ... 258f  
47 paul Import Classes from file ... 814d  
48 paul Show Selection 814d  
49 paul Show Query 814d  
50 paul Show TaskManager 464f  
51 paul Refresh 814d  
52 paul.shapefile\_upload\_collection | Line EPSG:314f

dd\_Stolpen-Klotzscher-Sto...  
dd\_Westlausitz-Meissen  
Horizons (14)  
01\_dd\_Kreide  
02\_dd\_Doehlener\_Bec...  
03\_dd\_Riesenstein-Gr...  
04\_dd\_Markersbacher...  
05\_dd\_Stolpener\_Gra...  
06\_ddl\_Gneise  
07\_dd\_Porphyririte  
08\_dd\_Diorite  
09\_dd\_Hauptgranit  
10\_dd\_Monzonit  
11\_dd\_Monzodiorit  
12\_dd\_Elbtal-Schieferg...  
13\_dd\_Osterzgebirge  
14\_dd\_Lausitzer\_Grano...

Property values ...  
Remove  
Rename...  
Sort Child Nodes By Name  
Sort By Object Property Recursively...  
Sort By Theme Recursively...  
Preload "Horizons"  
Collapse "Horizons"  
Create Section of "Horizons" in original color



# Stratigraphic Sorting





# Segmentation – Isosurfaces



- \* Similar to isolines
- \* “a surface that represents points of a constant value within a volume”
- \* Works via themes
- \* Implemented for stratigraphic grids and voxets
- \* Can be created via web
- \* Can be used as visualization mode
- \* Extensive property transport



# Segmentation – Isosurfaces

Edit Colormaps

cooper  
demotemp\_suva  
geologic\_k  
Geologie  
geom2  
liag\_temperatur\_mean\_ergebnis  
nagra\_3d\_trace  
prop\_b  
prop\_c  
prop\_v  
radon (<https://www.lung.mv-regierung.de/date>)  
radon disc <https://www.lung.mv-regierung.de/>  
radonpotential\_gm  
rainbow  
smeheia  
smeheia 3d  
temp111  
temperature  
thermalconductivity11  
trace\_3d  
trace\_data2d  
trace\_data\_gstsup557  
unit  
unit\_cont  
unit\_id  
unit\_new  
unit\_t  
volve

**Color Map Editor**  
Within this dialog you can create, edit, delete Color Maps. A Color Map can be matched via the **Property Name Match** field to a feature property/simplex property. You can even import and export Color Maps from and to Gocad compatible formats.  
**Hint:** Some actions are available via a right click on the list of Color Maps.  
**Hint:** If you want to match feature attributes/object properties, you need to edit **Themes**

Color Map Name: unit\_new  
Property Name Match: unit  
Access Level: Public  
Color Scheme: <custom>

Color	Value	Label	Order
	1	Quartaer	1
	2	OSM	2
	3	OMM	3
	4	USM	4
	5	Siderolithikum	5
	6	Felsenkalke	6
	7	Schwarzbach	7
	8	Villigen	8
	9	Wildeggen	9
	10	Oberer Donner	10

Edit via Clipboard ... Remove Add

No Data Color:

Remove  Discrete  Continuous  Transparent for Grids

Close



# Segmentation – Isosurfaces

**Download Models** [x]

**SETTINGS**

File format: SRS

IFC: CH1903 / LV03 – Swiss CH1903 / LV03

**SELECT MODEL S**

Select all models you want to download. A zip file containing those models will be created.

- Elevation Grid
- Elevation Grid with Texture
- SGRID
- solid-normal-test
- Bavaria
- Smeaheia Dataset
- Volve

Segmentation

Choose the property that will determine the boundaries between segments within a grid.

Model: DEMO properties      Color Map: unit\_new

Advanced Options

Define shift values by which the model will be translated along the x-, y-, and z-axis.

X: 0      Y: 0      Z: 0

Preserve model structure

[Prepare ZIP File](#)

**DEMO PROPERTIES**

Mode: Single Slice

Settings

U: 76

V: 44

W: 26

Legend for unit\_new

Quartaer	Felsenkalk	Herrenwis
OSM	Schwarzbach	RestDogger
OMM	Villigen	Opalinuston
USM	Wildegg	Lias
Siderolithikum	Oberer Dog...	NDV





# Segmentation – Isosurfaces

The screenshot shows the BIMvision 2.27.7 software interface. The main window displays a 3D model of a segmented volume, likely representing a geological or urban structure, with isosurfaces. The interface includes a top menu bar with options like DATEI, ANSICHT, OBJEKTE, ABSCHNITTE, BEMESSUNG, ÄNDERUNGEN, and PLUGINS. Below the menu is a toolbar with various tools for viewing and manipulating the model, including zoom, pan, and rotation. The right-hand panel shows the IFC structure and properties of the selected 'Quartier' element.

IFC Struktur	Typ	Name	Beschreibung
Projekt		Undefined project exp...	
Baustelle		Undefined site export...	
Gebäude		Quartier	
Bauelement ...			
Baueleme...	Quartier		
Gebäude	OSM		
Bauelement ...			
Gebäude	OMM		

Name	Wert	Einheit
<b>Element Specific</b>		
Guid	f59d6e97-74de-44f5-b833-b0d8dbdf8b5	
IfcEntity	IfcBuildingElementProxy	
Name	Quartier	
<b>Attributes-Quartier</b>		
class label	Quartier	
class value	1	
colormap name	unit_new	
fullpath	/SGRID/resqml/DEMO_properties/unit_new/Quartier	
m_gid	24270	
oname	DEMO properties	
property name	unit	
unit_from_json	Quartier	
whatever	42	

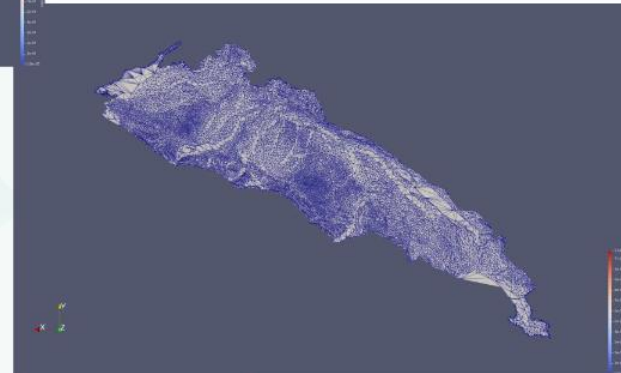
# Mesh simplification



- \* Simplify meshes on download
- \* Option to keep the border, avoids shrinking



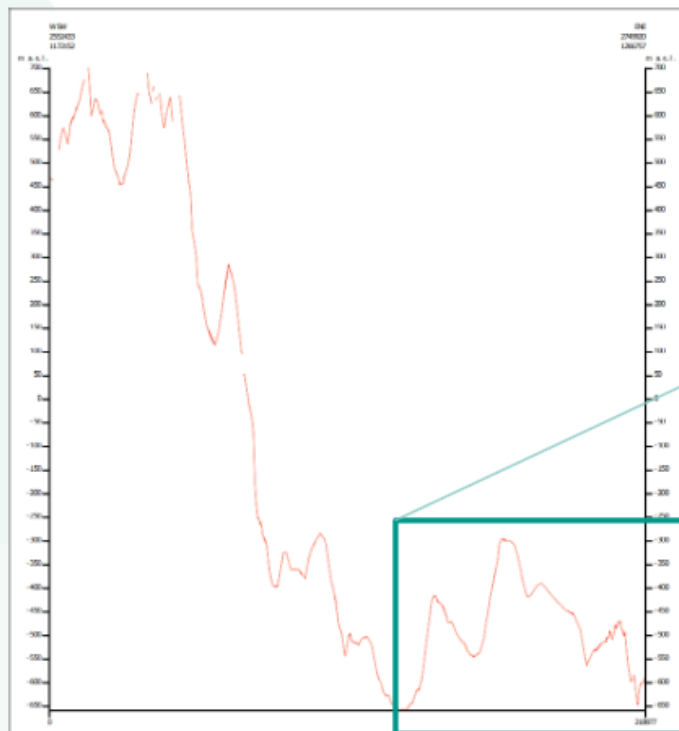
100%



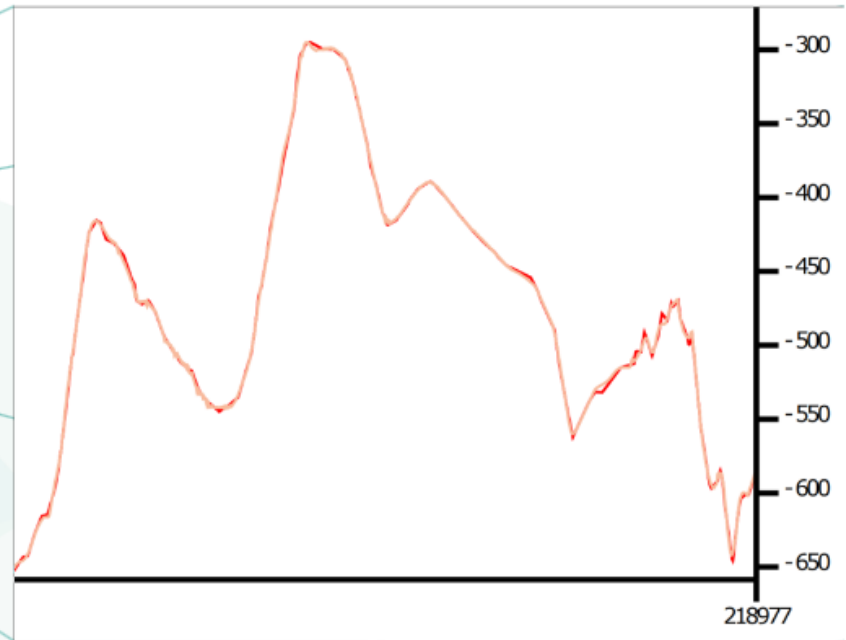
1%, runtime: < 1 min



# Mesh simplification



100% vs 10%



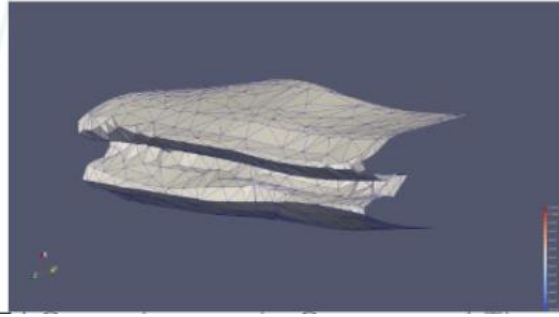
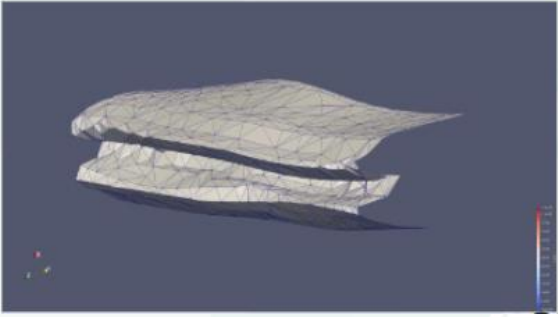
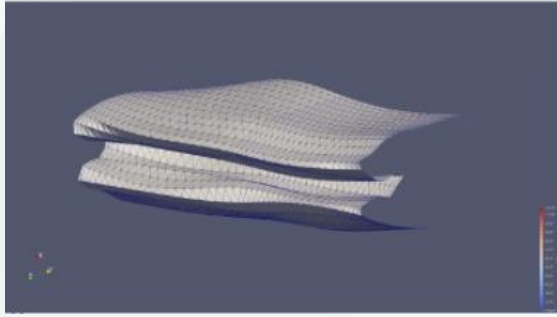
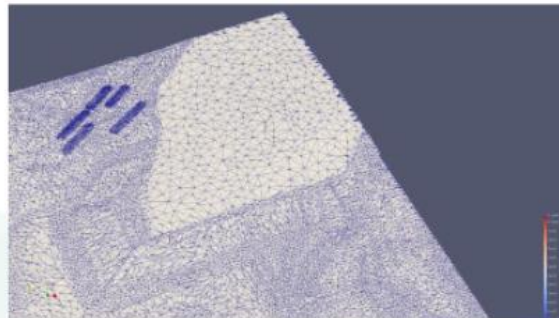
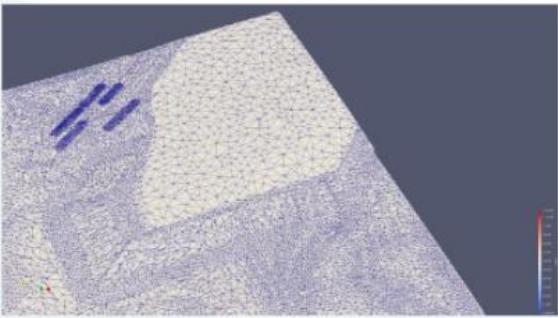
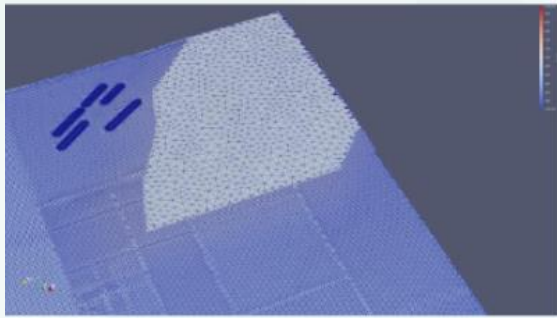
# Mesh simplification



## Input

## Full

## Keep



# Borehole info dialog

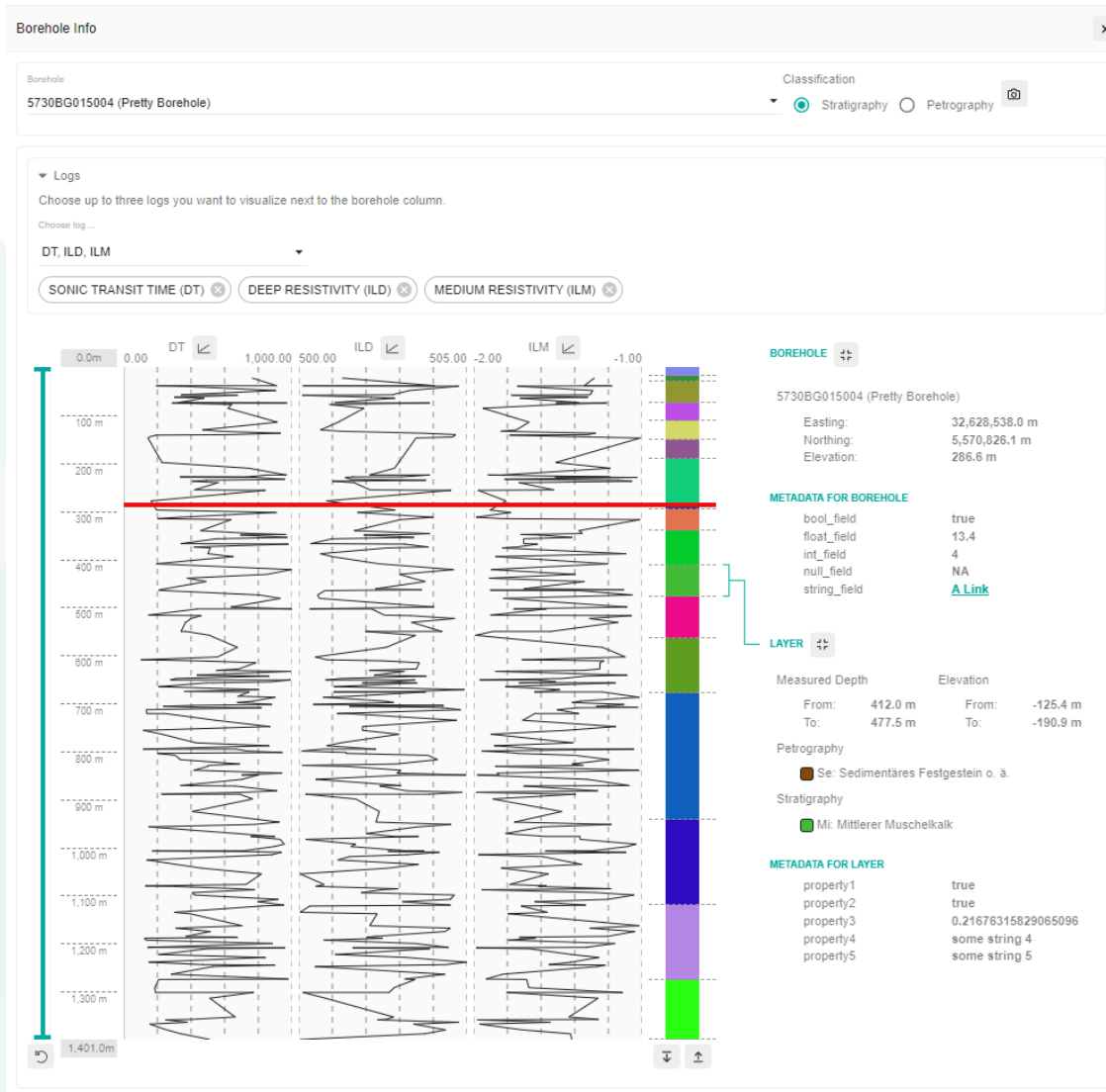


- \* Extended to display the complete borehole
- \* Single layers can be selected
- \* Additional metadata allows for more information
- \* Logs can be provided as LAS files from external sources or in database
- \* Search boreholes





# Borehole info dialog





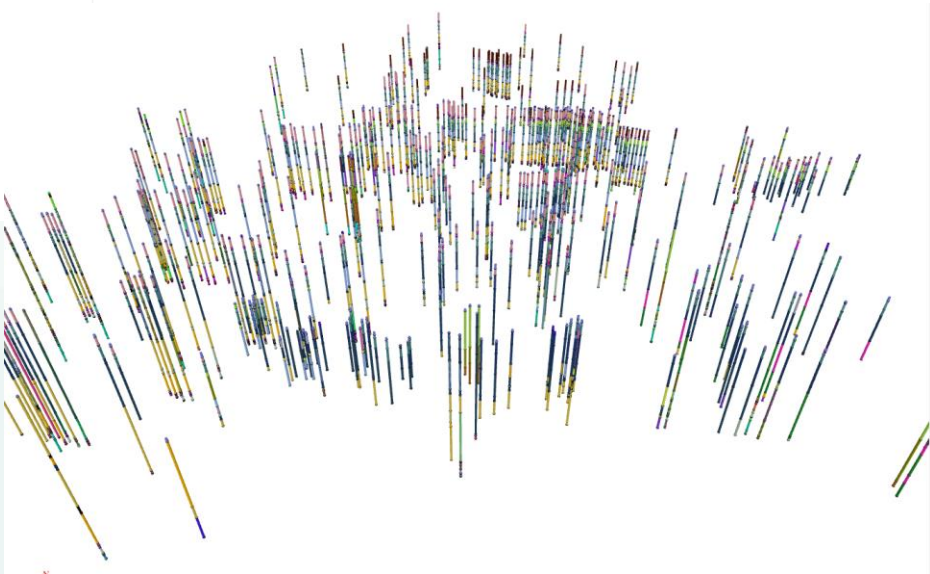
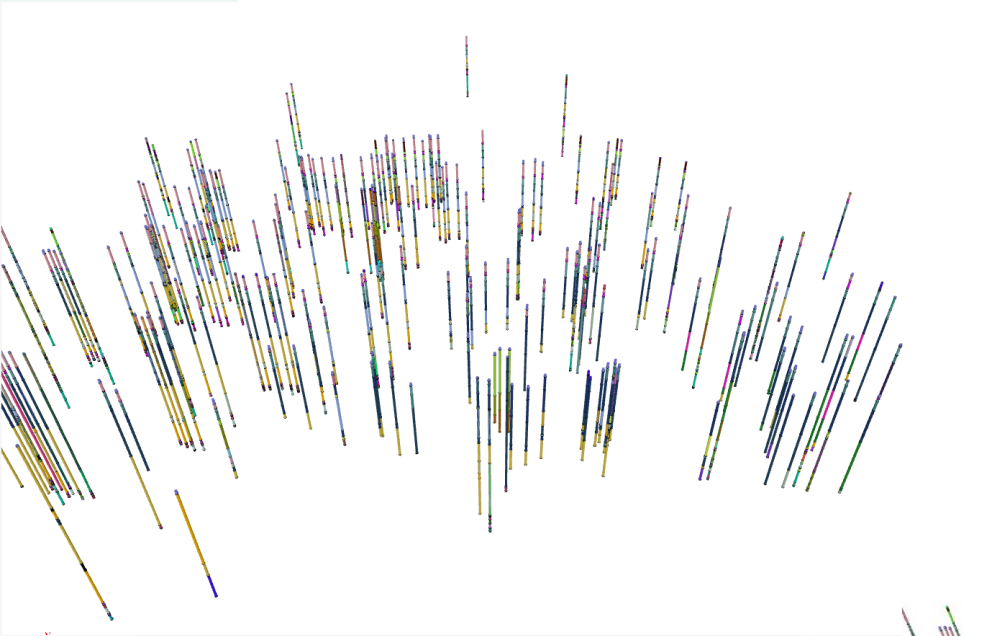
# Borehole filters

- \* Search for boreholes with id or name, petrography, stratigraphy or total length

The image displays two screenshots of a 'Query tool' interface. The left screenshot shows the 'Query rules' section with a dropdown menu for 'Borehole Length' open, listing options like 'Petrography', 'Stratigraphy', and 'Borehole'. The right screenshot shows the 'Query rules' section with a rule defined: 'Borehole Length > 2000'. Below the right screenshot, a legend shows 'All Boreholes (802)' and 'Boreholes > 2000 (368)'.



# Borehole filters



# Seismographic data



- \* Can be added in GST Web
- \* Allows on the fly visualization
- \* Supports FDSN Event 1.1 and 1.2
- \* Supports Custom format of Seismologieverbund Mitteldeutschland



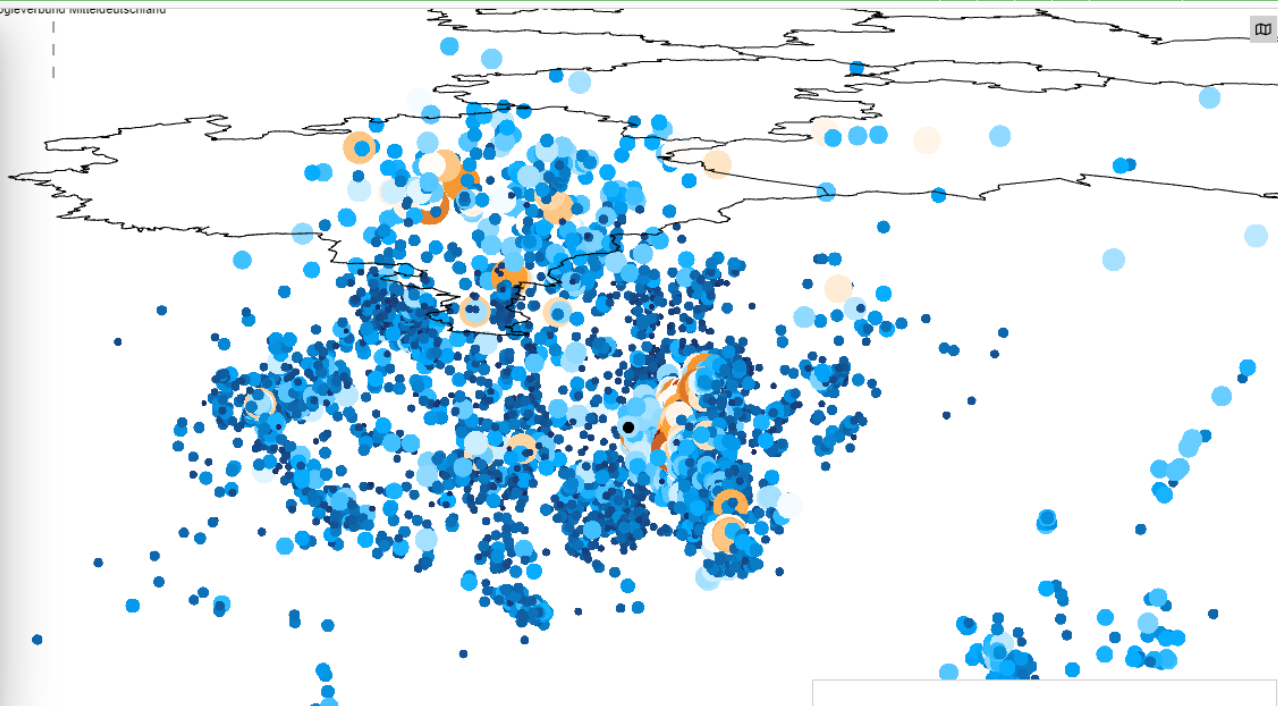
**Object information**

### 3d portal LfULG

Name	Value
Easting	315,188.3 m
Northing	5,568,863.8 m
Height	-7,200.0 m
FEHLER_RW	2
MAG_ML	1.2
ERG_ID	6308026
ERGTIME_MEZ	Jun 1, 2014, 6:15:00 PM
FEHLER_MAG	0.3
ERGTIME_UTC	Jun 1, 2014, 4:15:00 PM
FEHLER_TIEFE_IN_M	2700
FEHLER_HW	2.3

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Erdbebedaten (2)

Maps

- TopPlusOpen
- OpenStreetMap
- TopPlusOpen Graustufen

Earthquakes

- Seismologieverbund Mitteldeuts...

Themes

No Color Theme

Easting: -  
Northing: -  
Exaggeration: 1.0

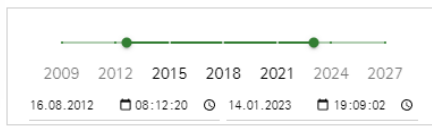
Current Domain: Depth  
Coordinate System: ETRS\_1989\_UTM\_Zone\_33N

Navigation

Left mouse button: Rotate  
Middle mouse button: Zoom

**Edit Color Map**

	0	<input type="checkbox"/>	<input type="button" value="+"/>
	0.25	<input type="checkbox"/>	<input type="button" value="+"/>
	0.5	<input type="checkbox"/>	<input type="button" value="+"/>
	0.75	<input type="checkbox"/>	<input type="button" value="+"/>
	1	<input type="checkbox"/>	<input type="button" value="+"/>



**Earthquakes**

Shape: Circle

Filter by Time

Property: ERGTIME\_UTC

Size Mapping

Property: MAG\_ML

Lower Bound: -0.9 Upper Bound: 4.2

Min Size: 5 Max Size: 42

Color Mapping

Property: MAG\_ML

Color Map: BlueWhiteOrangeRed

Limit Color Range to filtered Points

# New formats



- \* Added 3d tiles
  - \* allows direct use with e.g. Cesium
- \* Added ResqML v2.0
  - \* Import and Export
- \* Added IFC v4.2
  - \* Import and Export
- \* netCDF
  - \* Import
- \* GeoH4
  - \* Import
- \* Custom Smeaheia Horizon format
  - \* Import

## GST Web Misc

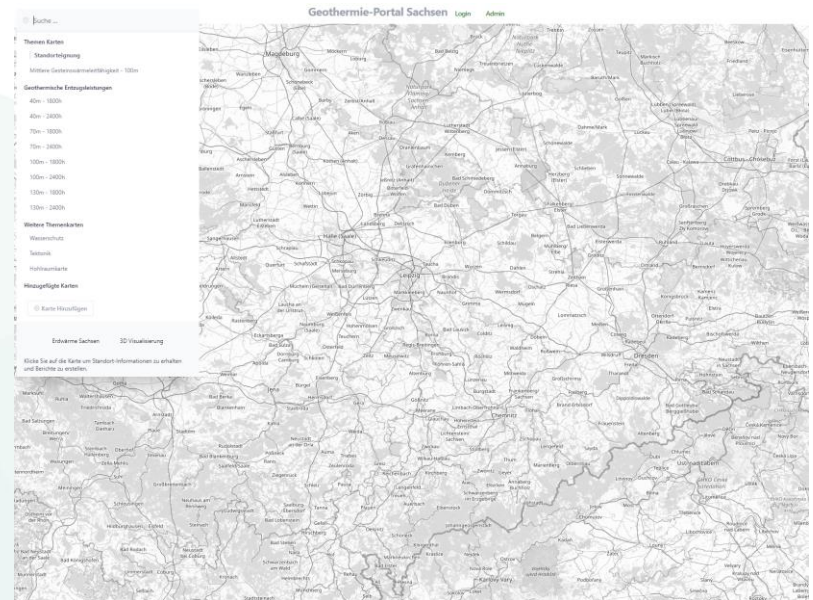


- \* SGrid Cell lines can be toggled
- \* SGrids can be visualized with segmentation
- \* More default settings for view
- \* Performance improvements
- \* Bugfixes

# Informationsportal Erdwärme Sachsen



- \* Contract with LfULG Saxony
- \* Project runtime: Jan 2024 – Aug 2024
- \* Implementation of an Information portal for geothermal energy
- \* Several prepared maps
- \* Incorporation of WMS
- \* Generation of reports
- \* Address search
- \* Admin area to change texts
- \* Based on Geoplasma project







**Questions?**

**Remarks?**

**Wishes?**



# **Georg Semmler (GiGa infosystems)**

## **Access GST from GIS via OGC API**



# **Björn Wieczoreck (GiGa infosystems) Updates on GST[AR]**

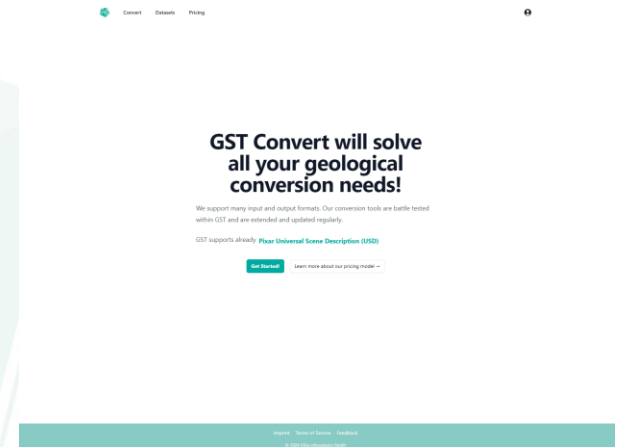


**One more thing ...**



## GST Convert (as a Service)

- \* Easy to use web application allowing to transform between 3d file formats and coordinate systems
- \* Features all file formats GST supports: Gocad Ascii, ResqML, IFC ...
- \* Features same coordinate systems as GST
- \* Free to use with basic functionality
- \* GST Users will get 90 days for free
- \* Registered users keep their data private





## **GST Convert (as a Service)**

- \* Will also support (late 2024)
  - \* segmentation/iso surface generation
  - \* Simplification of geometries
  - \* API access to be included in other software
  - \* Encryption of data
  - \* Share files with others
  - \* 3d preview



# GST Convert (as a Service)

## 1. Choose the Source Dataset

### Upload new dataset

Supported formats: STL (stl), Geopackage (GPKG) (gpkg), NetCDF 4 (nc4), IFC v4.2 (ifc), OBJ (obj), Isatis Grid (hd), Simple Feature Standard (SFS) (sfs), ResqML v2.0 (epc, h5), GoCAD ASCII (ts, pl, so, vs, vo, gs, sg, w/o extension), ESRI Shapefile (shp, shx, dbf, prj, sbn, sbx, ain, aih, ixr, mxs, atx, shp.xml, cgp, qix)



05\_dd\_Stolpener\_Granit.ts (193.27 KB)

Choose one or more other files to upload as a dataset  
or drag and drop

Upload

3.28 MB of 1.07 GB (0.31%)

### Or choose one of the existing datasets:

01\_dd\_Kreide.ts

Created at 13.3.2024, 16:15:35 · Contains 1 geometry · Gocad



Showing 1 to 1 of 1 datasets





# GST Convert (as a Service)

## 1. Choose the Source Dataset

05\_dd\_Stolpener\_Granit.ts

Created at 13.3.2024, 23:33:53 · Contains 1 geometry · Gocad

Choose different dataset

## 2. Choose the Geometries you want to convert

Choose all or a few of the following geometries to convert.

05\_dd\_Stolpener\_Granit

Tin · Spatial

Properties: temperature (Float64, Vertex)

## 3. Conversion

Format

ResqML v2.0

Input SRS

DHDN / 3-degree Gauss-Kruger zone 5 (EPSG:31469)



Output SRS

ETRS89 / UTM zone 33N (EPSG:25833)



Convert and Download





# GST Convert (as a Service)

## These are your datasets

05\_dd\_Stolpener\_Granit.ts

Created at 13.3.2024, 23:33:53 · Contains 1 geometry · Gocad

Convert



01\_dd\_Kreide.ts

Created at 13.3.2024, 16:15:35 · Contains 1 geometry · Gocad

Convert





## **GST Convert (as a Service)**

Try at: <https://convert.giga-infosystems.com/>



## **GST Convert (as a Service)**

- \* Register with your email address
- \* Confirm mail address via link
- \* Let us know and we upgrade you to premium for 90 days



## **GST Convert (as a Service)**

- \* Subscription model on monthly basis
- \* Credit based use
- \* We collect statistics which functions are being used [no personal information]



## Provisional Roadmap 2024

- \* Improvements on borehole logs (colors, min, max)
- \* Create interactive correlation plots
- \* Flatten horizon functionality
- \* Export boreholes to IFC, LAS
- \* Finish Infoportal Geothermie



## Provisional Roadmap 2024

- \* Desktop (pre)View tab (2D map±sections OR simple 3D)
- \* Store colors on Points / Simplexes
- \* SEG Y info Dialog
- \* Multiple borehole classifications
- \* Dynamic coloring in GST Web
- \* Predefined borehole filters



## Provisional Roadmap 2024

- \* Support of different borehole sets (shallow, deep, geothermal, etc pp)
- \* Integration with Gocad, ArcGIS, QGIS
- \* Basic feature manipulation
  - \* e.g. move 300m higher [ $z = z + 300$ ]
- \* Your input ...



**Thank you!**







**Questions?**

**Remarks?**

**Wishes?**

A decorative graphic in the top right corner consisting of several overlapping teal-colored triangles and polygons of varying shades, creating a layered, geometric effect.

# Thank you!

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