Bayerisches Landesamt für Umwelt

# Construction & Management of Geological Cross Sections at LfU

GST User Meeting 2023 – Kathrin Dengler



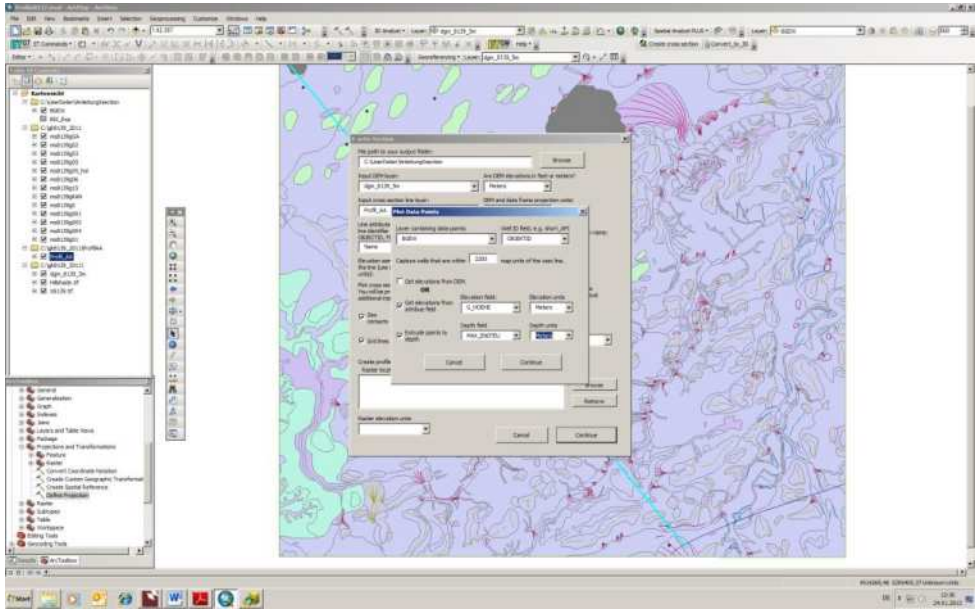
# Overview

- Construction & Storage: Previous workflows at LfU
- Requirements for the new system
- Management of geological cross sections using GST
- Open questions and issues

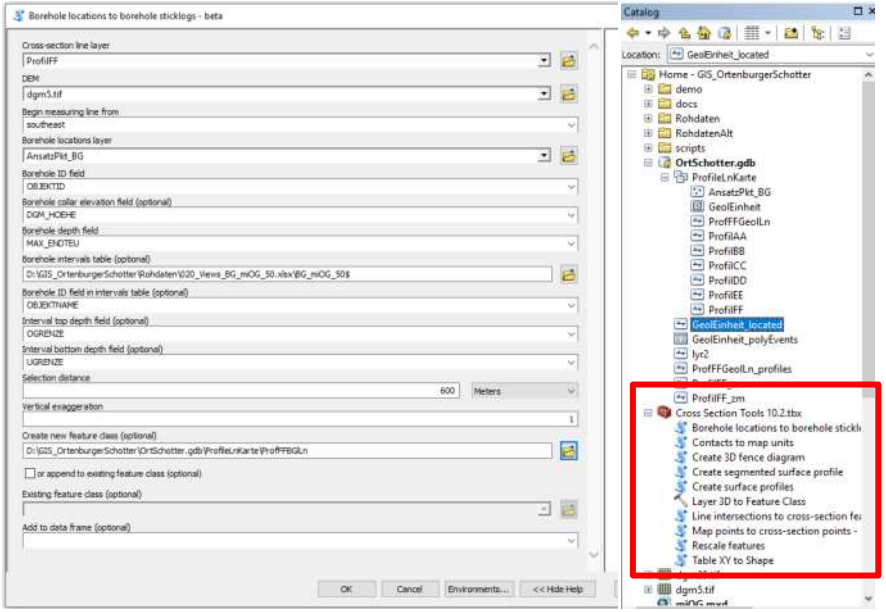


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# Previous Construction Workflows



M. Herz (2014): X-SectionTool Manual (ISGS)




M. Herz (2021): CrossSectionTool Manual (USGS)

Disadvantages:

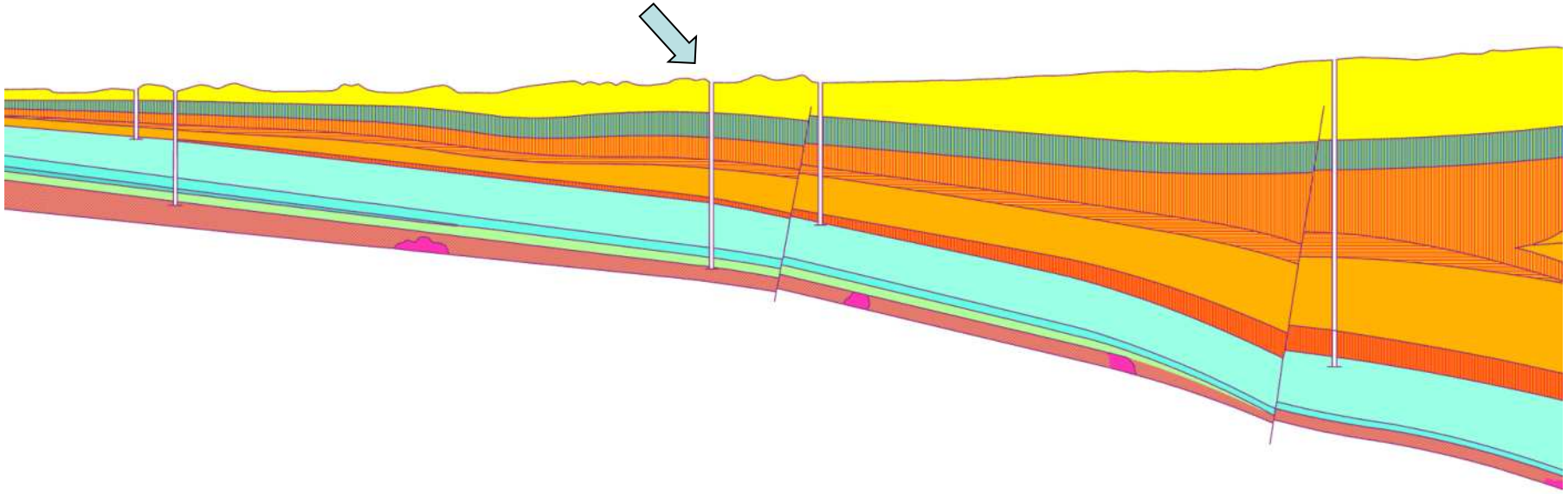
- Data preparation is time-consuming
- Compatibility with different ArcGIS versions is not guaranteed



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# Cross Section digitized by cartography

Cross Section digitized by cartography:



Section belonging to geological map of Bavaria 1:500000 (GK500)

Disadvantages:

- Data preparation is time-consuming
- Compatibility with different ArcGIS versions is not guaranteed
- Well path currently implemented as „hole“ in DEM



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# Cross Section Storage

- Previous Storage Workflow
  - No central storage location
  - No consistent data format

- Aims
  - Central storage location
  - Access for all users
  - Cross sections easy to retrieve for further use

**> System for cross section storage and data preparation is needed**



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# New system is needed

- Expectations
  - System is maintenanced
  - Easy input data preparation for constructing cross sections
  - Database connectivity
  - Cross section storage
  - Updating existing interpretations
  - 3D Visualisation

- Comparison of different systems
  - GeoDIN, GST, Move, Skua Gocad



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# Usage of GST cross section management at LfU

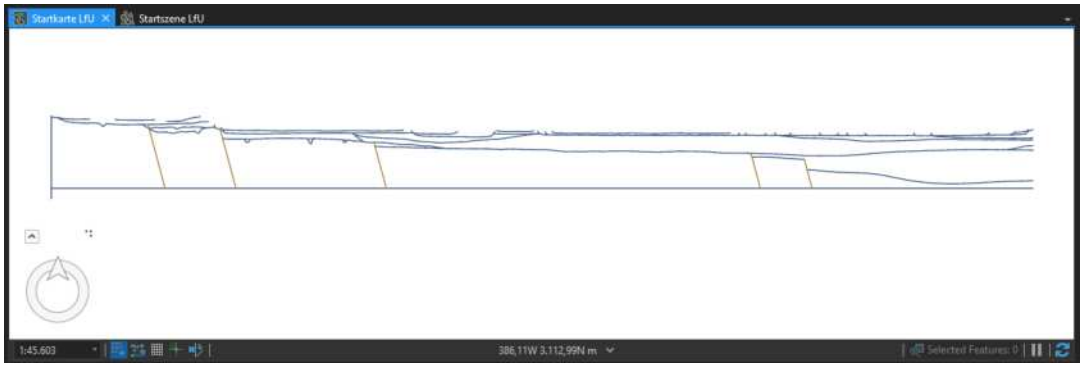
- **Cross section import & export**

cross section management

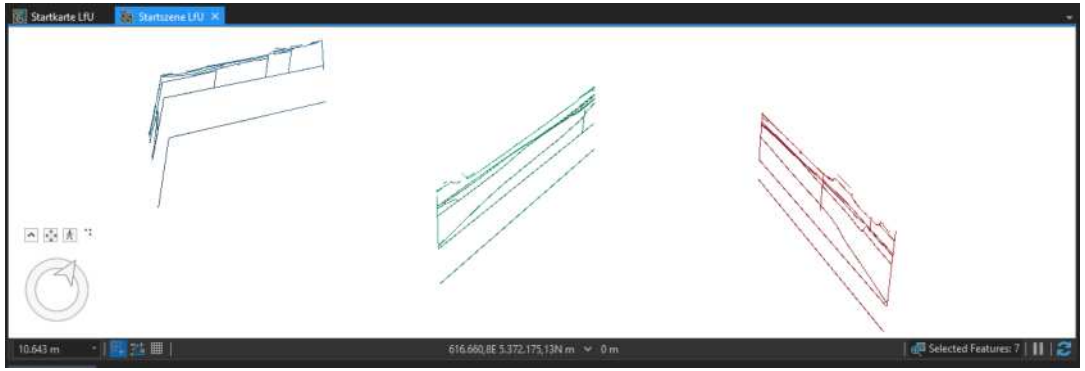


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# Import to ArcGIS and SKUA Gocad

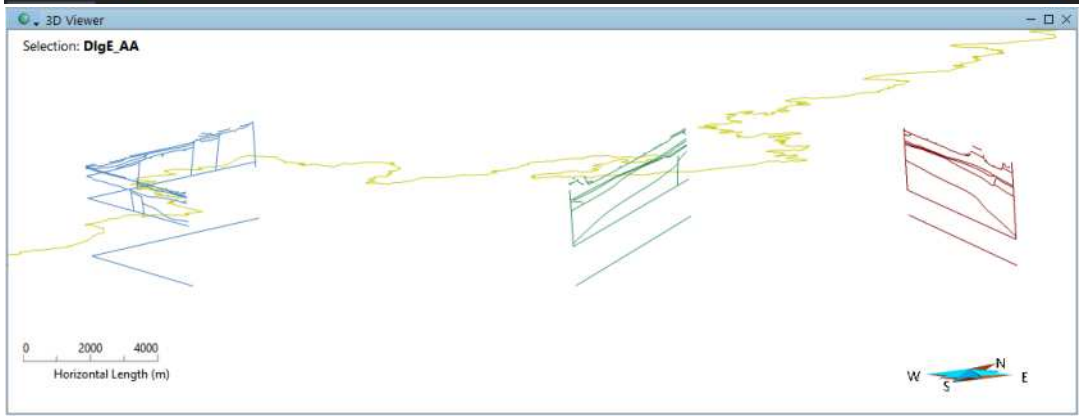



2D Shapefile




3D Shapefile

2D and 3D view in ArcGIS
10x exaggerated




Gocad Polyline

3D View in Skua Gocad
10x exaggerated



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# Usage of GST cross section management at LfU

- **Cross section import & export**
- **Updating existing cross sections**
- **3D view in GST Web**
- **Constructing new cross sections**
  - Input data from GST: wells, geological map, DEM
  - Additional data:
    - 3D subsurface models
    - Fault network
    - Contour lines
  - Export as shapefile > Cross section construction in ArcGIS

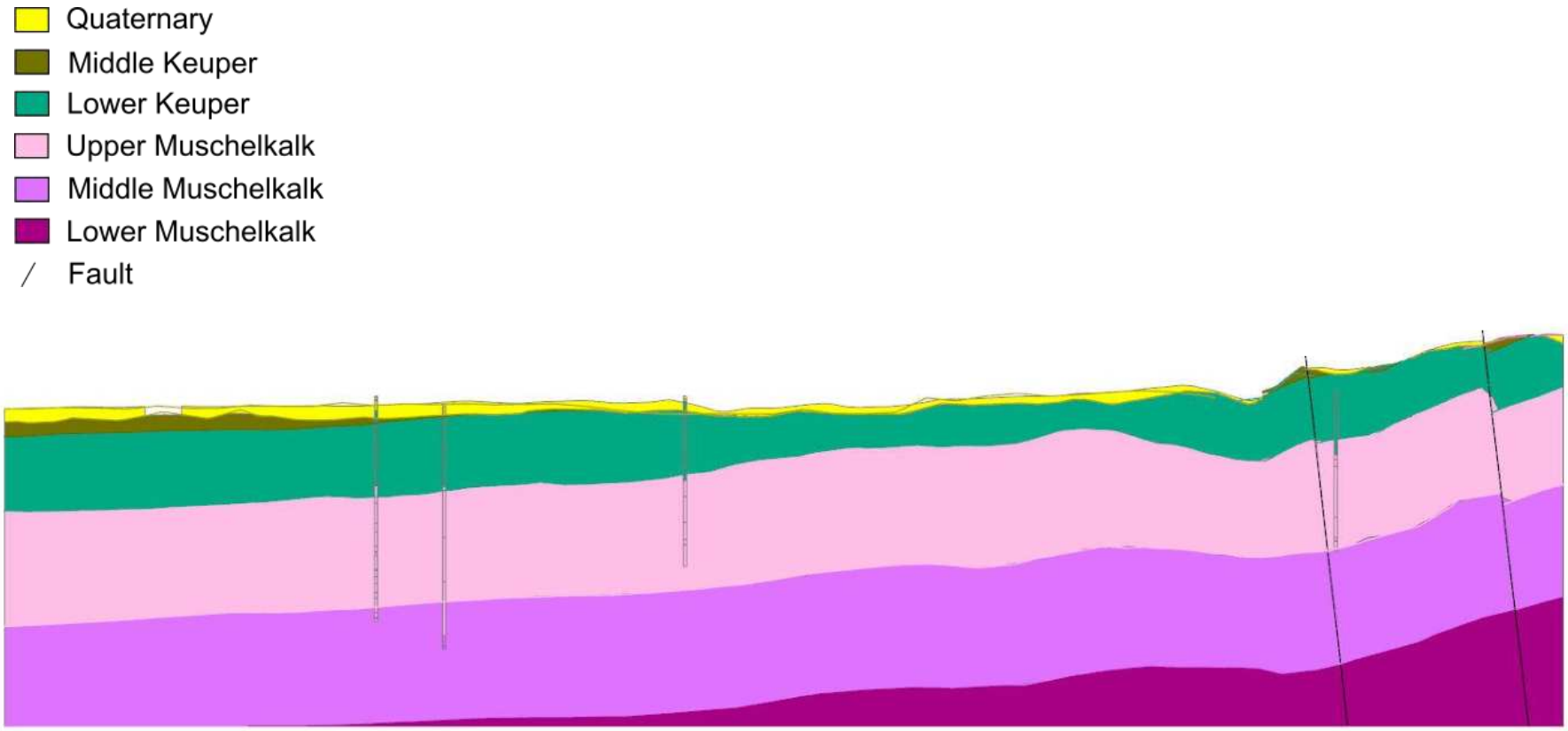
cross section management

data preparation



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# Processed input data imported to ArcGIS




5x exaggerated



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# Usage of GST cross section management at LfU

- **Cross section import & export**
- **Updating existing cross sections**
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- **Constructing new cross sections**
  - Input data from GST: wells, geological map, DEM
  - Additional data:
    - 3D subsurface models
    - Fault network
    - Contour lines
  - Export as shapefile > Cross section construction in ArcGIS
- **Well correlation plot**

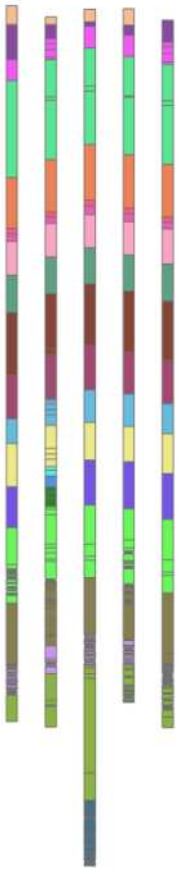
cross section management

data preparation

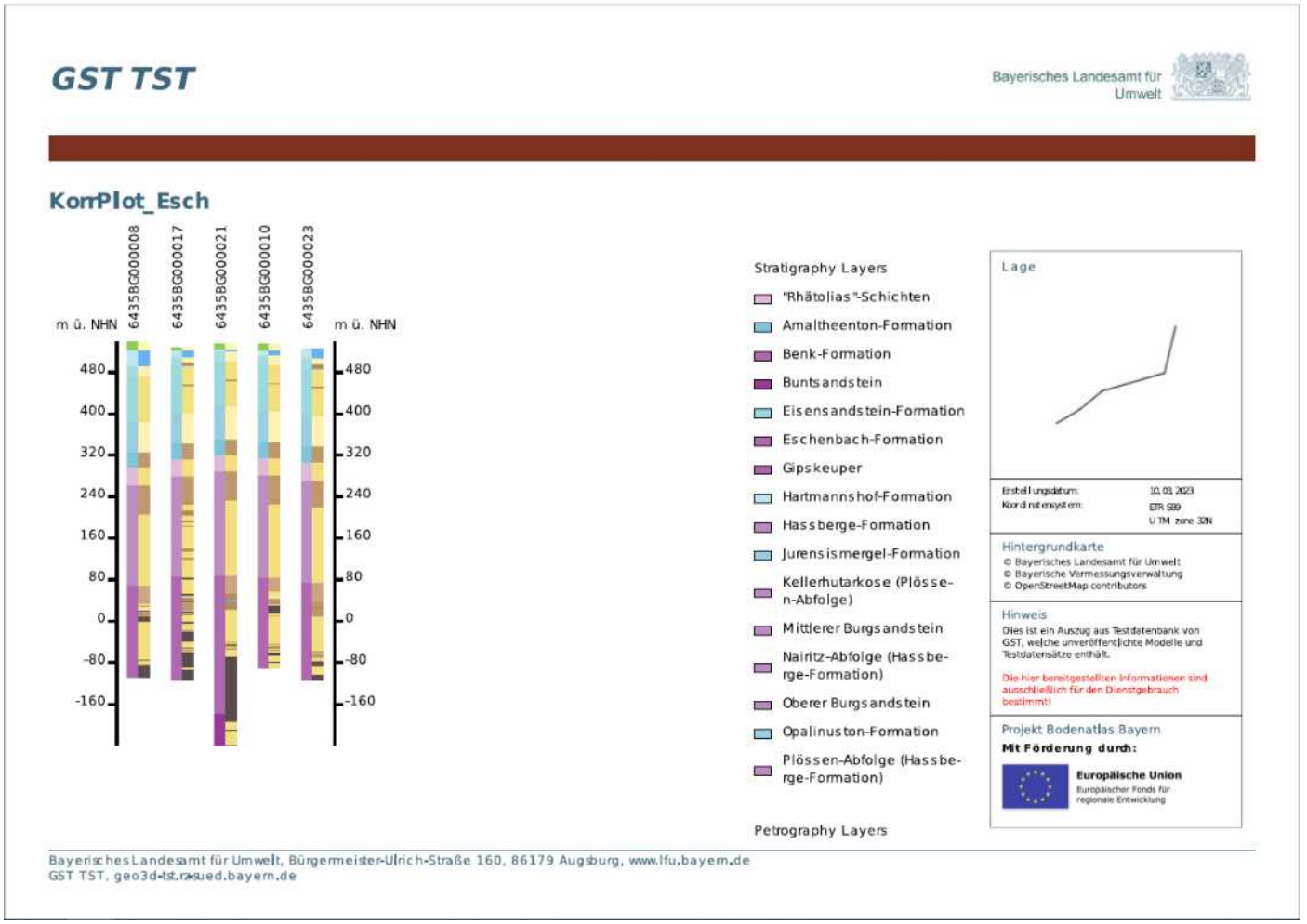


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# Well correlation plot



shapefile






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# Open Questions

- Data storage
  - Which should be used as master database? GST or File Geodatabases?
- Cross section updates
  - Who should have editing permissions?
- Well filtering
  - Selection of geologic profiles from wells possible?
  - Can/Should aggregating well markers be implemented in GST?



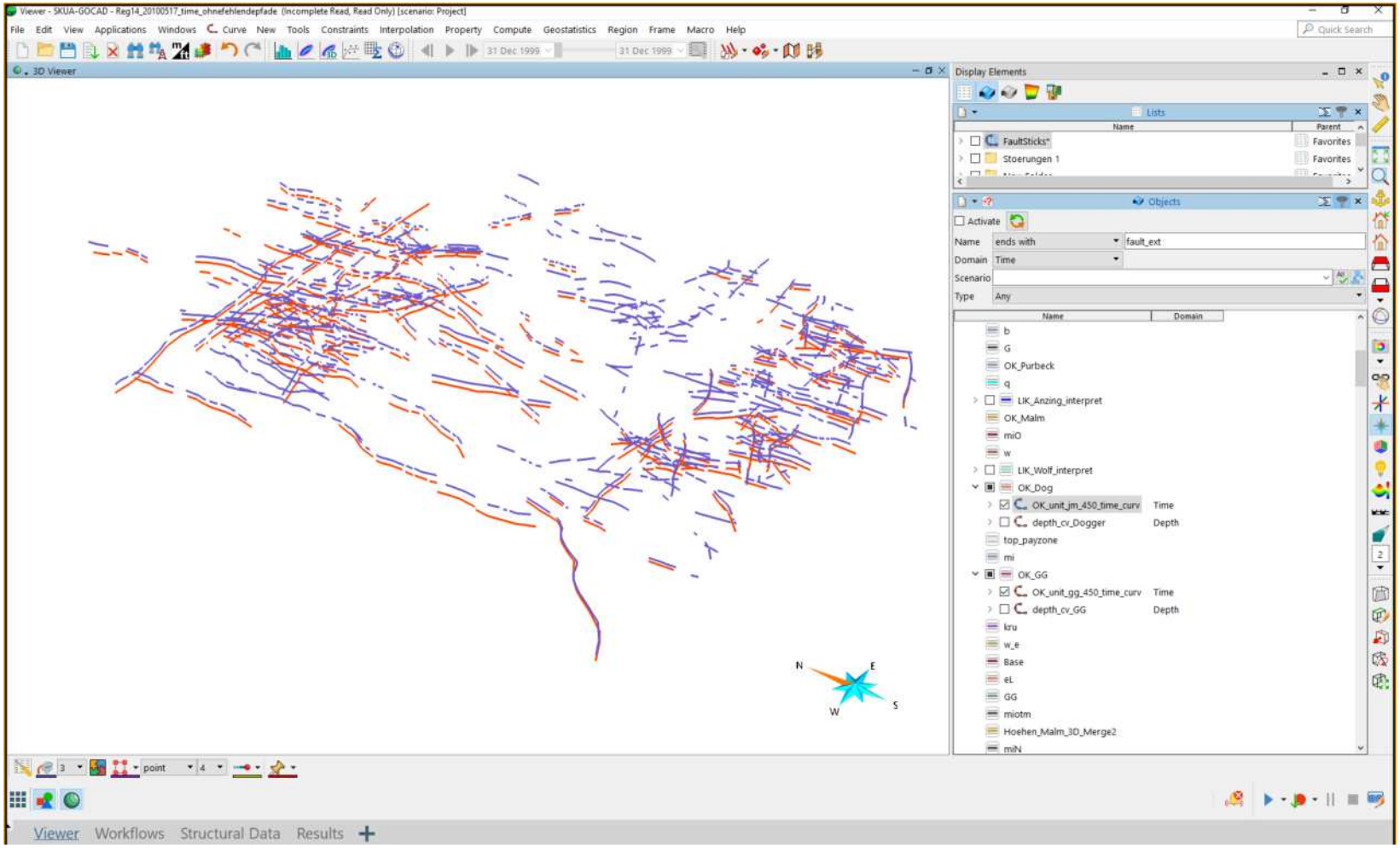
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# Take-Home-Message

- Cross section storage
- Easy data preparation for cross section construction
- Cross section export allows integration into various software for modelling
- Fast stratigraphic classification by using correlation plots

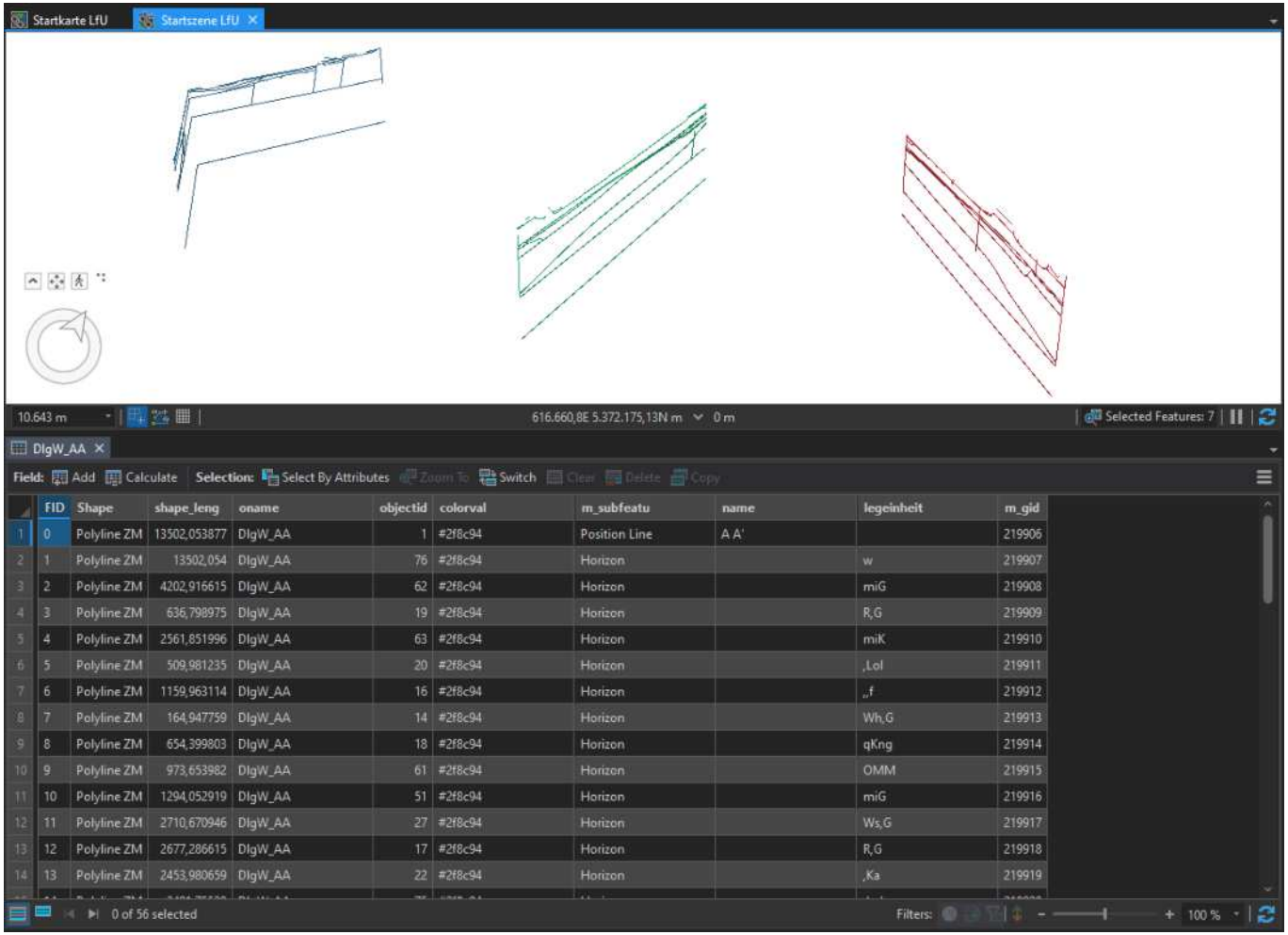


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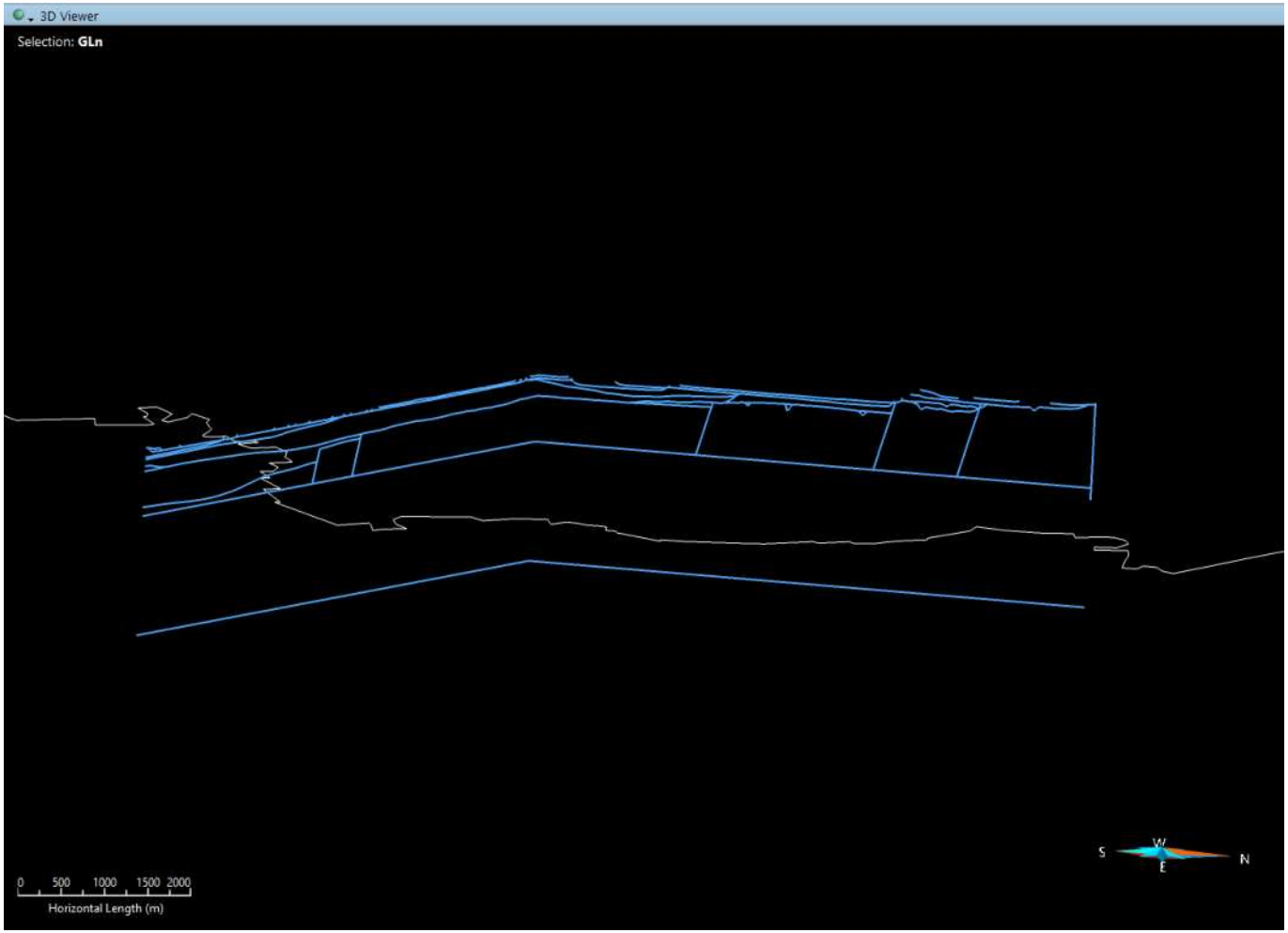



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# Gocad: Import as Polyline






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