Bayerisches Landesamt für Umwelt

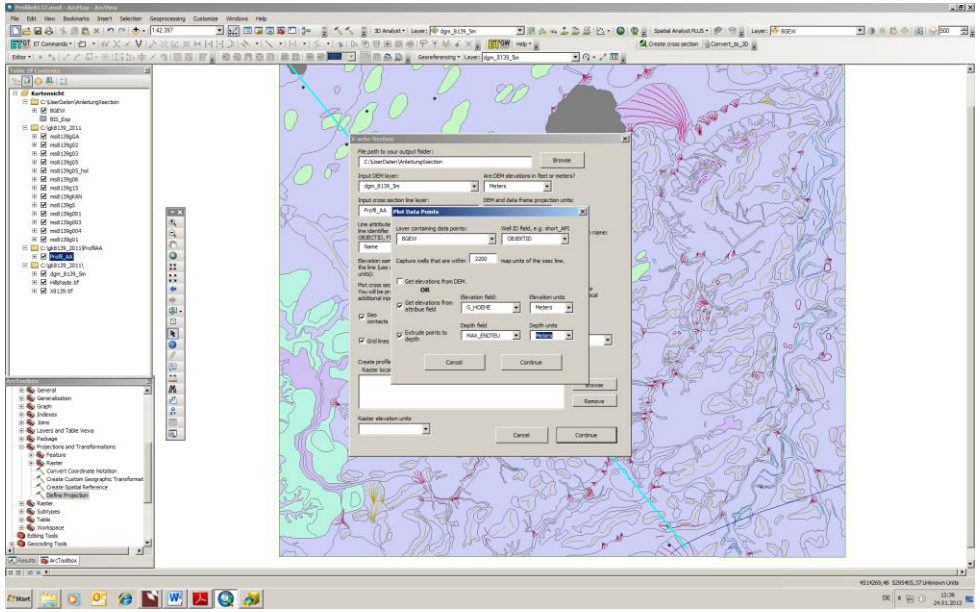
Construction & Management of Geological Cross Sections at LfU

GST User Meeting 2023 – Kathrin Dengler

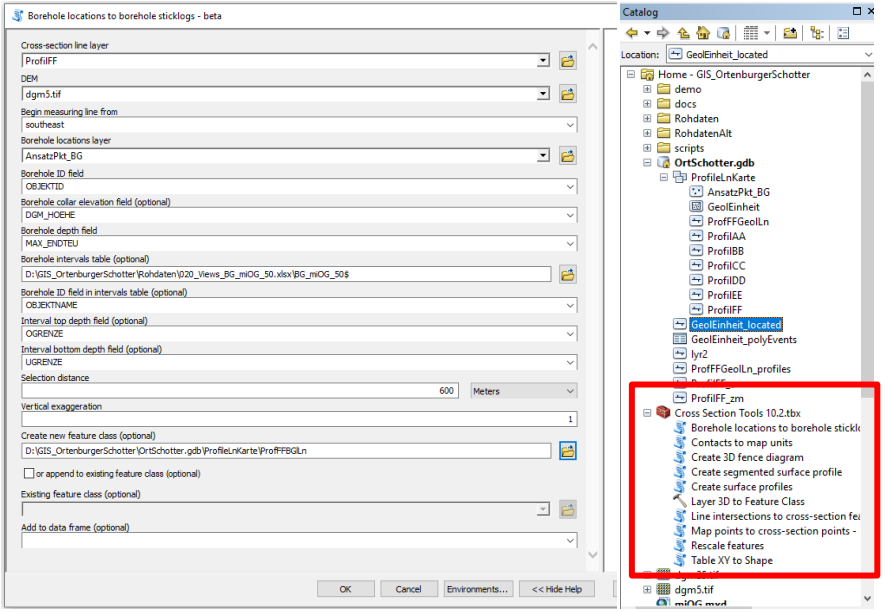
Overview

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

Previous Construction Workflows



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



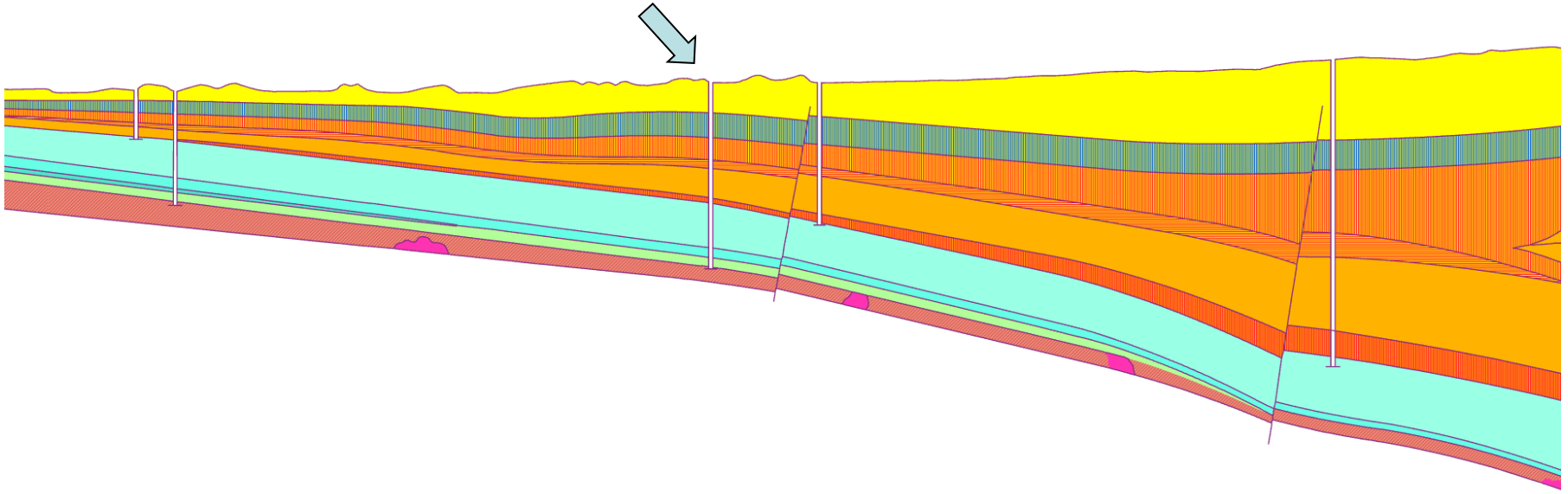
M. Herz (2021): CrossSectionTool Manual (USGS)

Disadvantages:

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

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

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

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

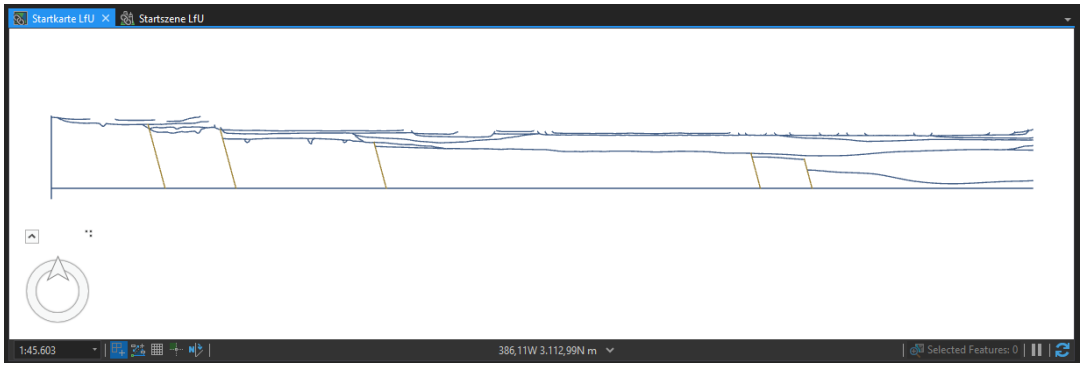
- Comparison of different systems
  - GeoDIN, GST, Move, Skua Gocad

Usage of GST cross section management at LfU

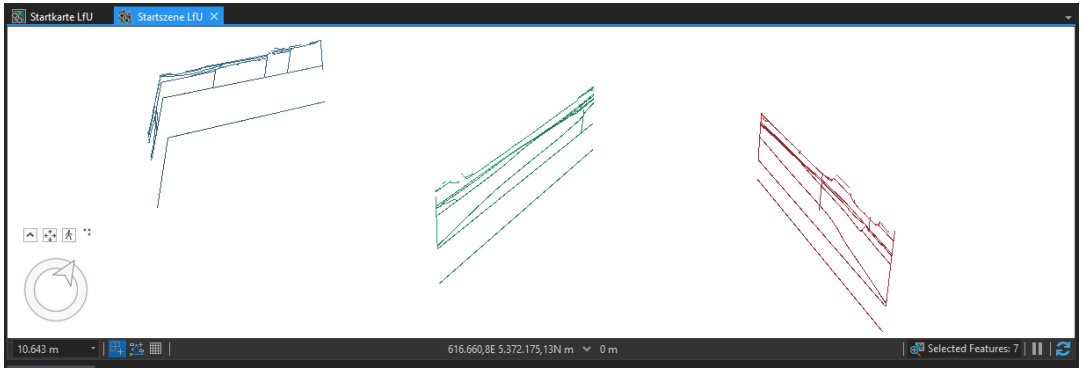
- **Cross section import & export**

cross section management

Import to ArcGIS and SKUA Gocad

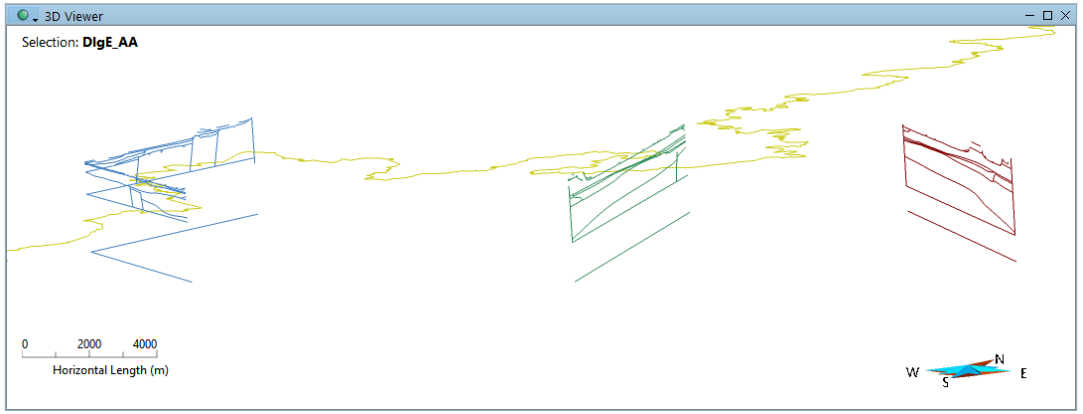


2D Shapefile



3D Shapefile

2D and 3D view in ArcGIS
10x exaggerated



Gocad Polyline

3D View in Skua Gocad
10x exaggerated

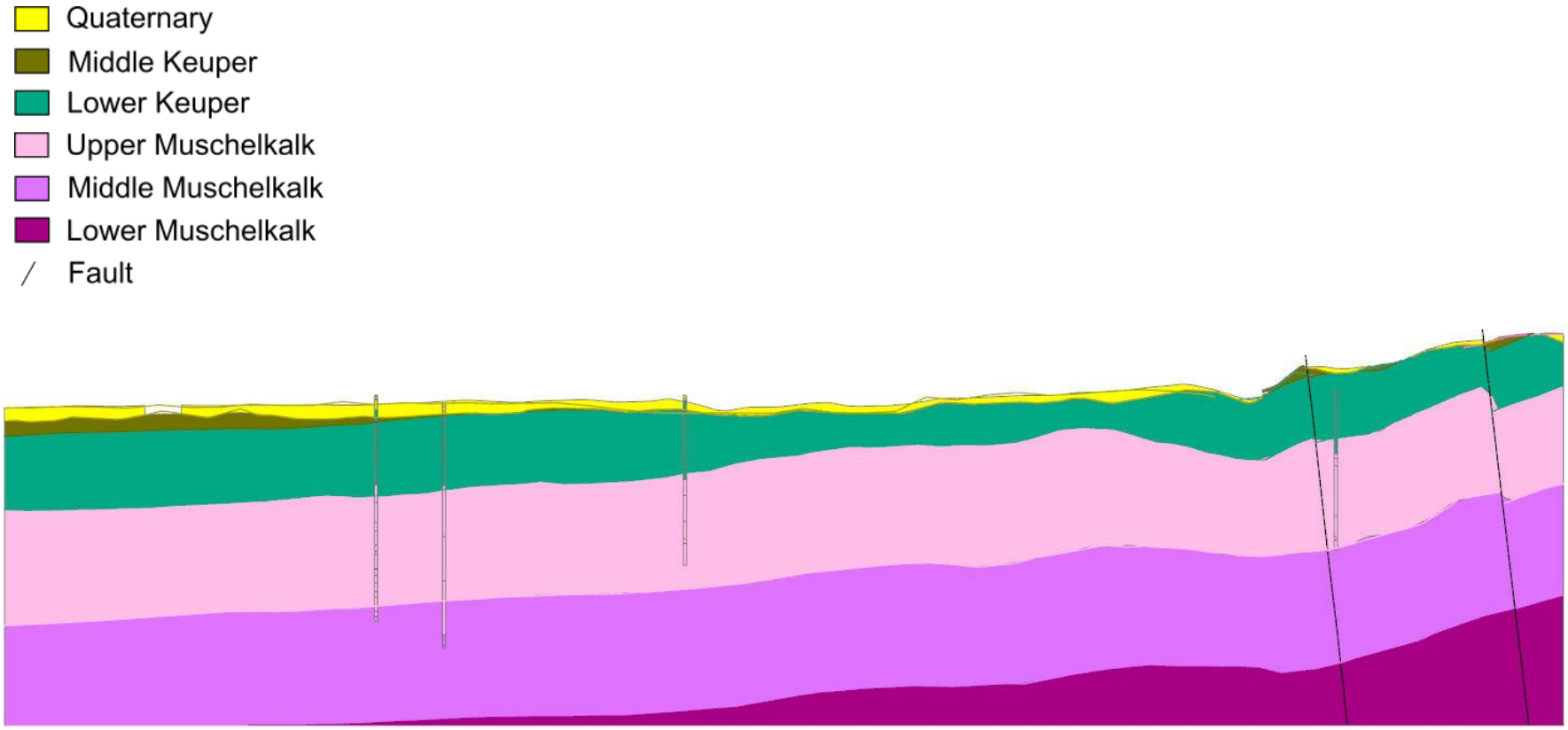
Usage of GST cross section management at LfU

- **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

Processed input data imported to ArcGIS



5x exaggerated

Usage of GST cross section management at LfU

- **Cross section import & export**
- **Updating existing cross sections**
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- **Constructing new cross sections**
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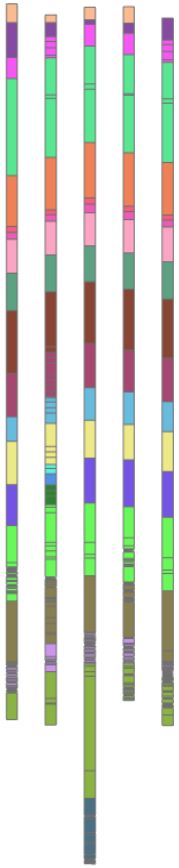
- **Well correlation plot**

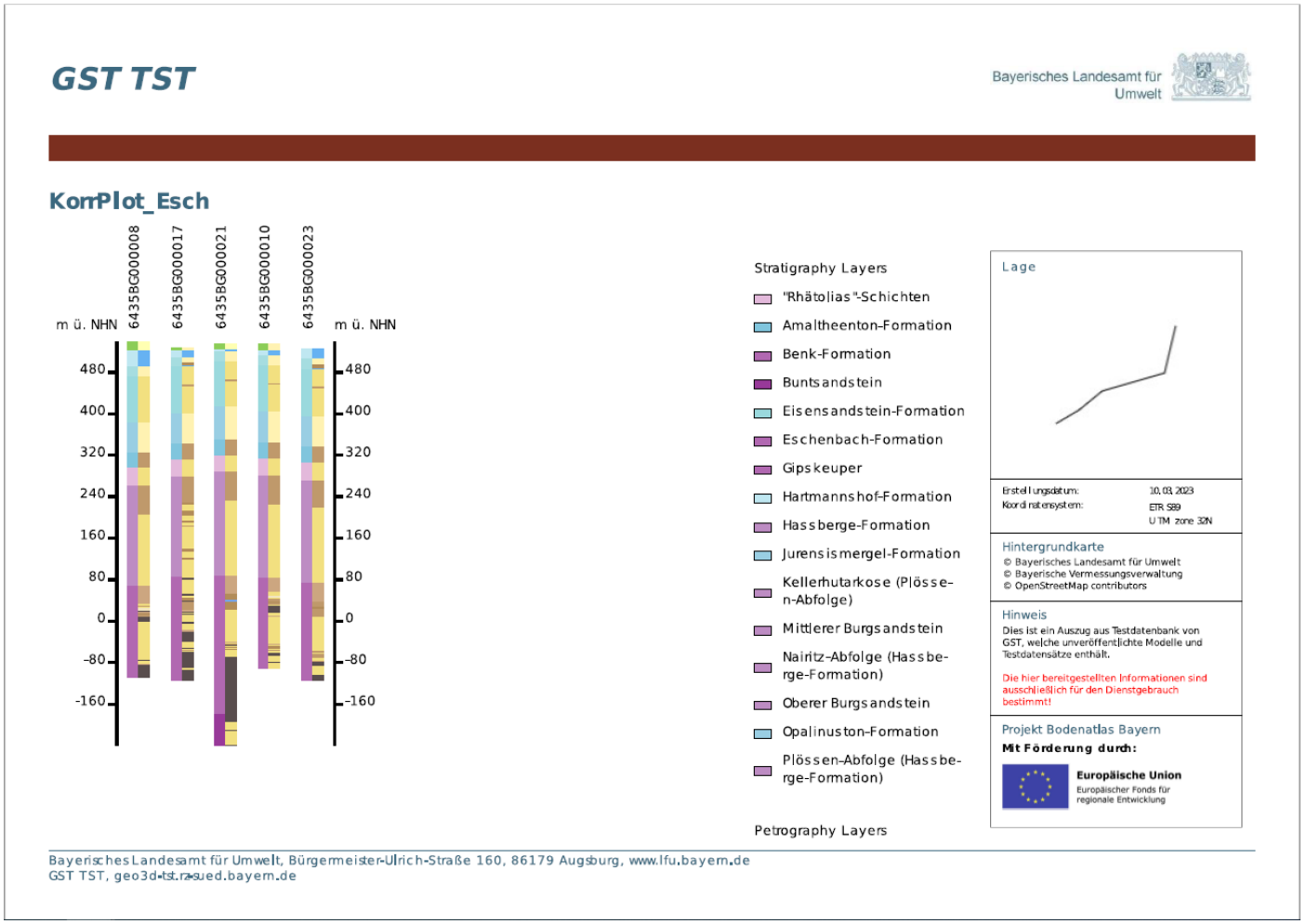
cross section management

data preparation

Well correlation plot



shapefile

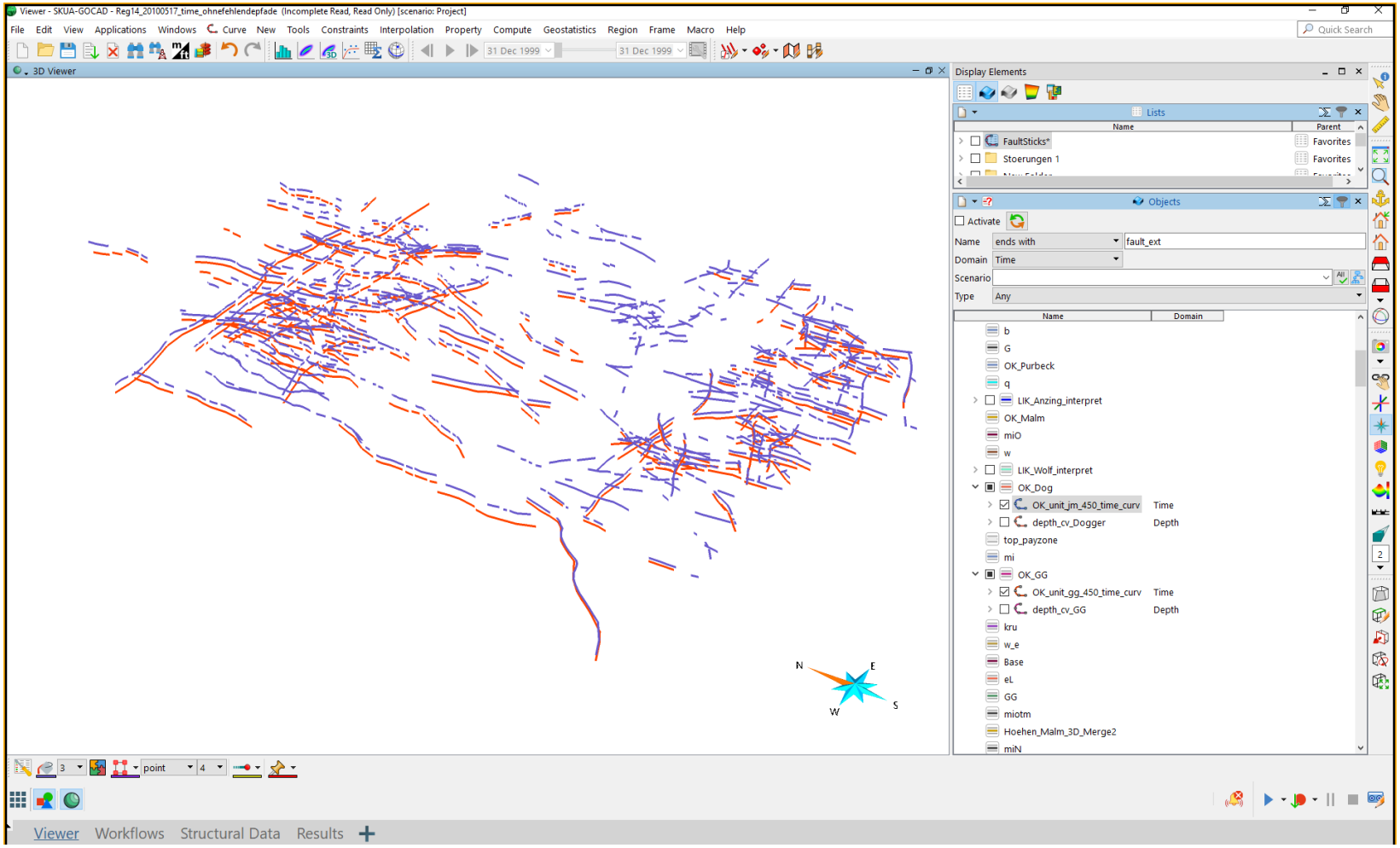


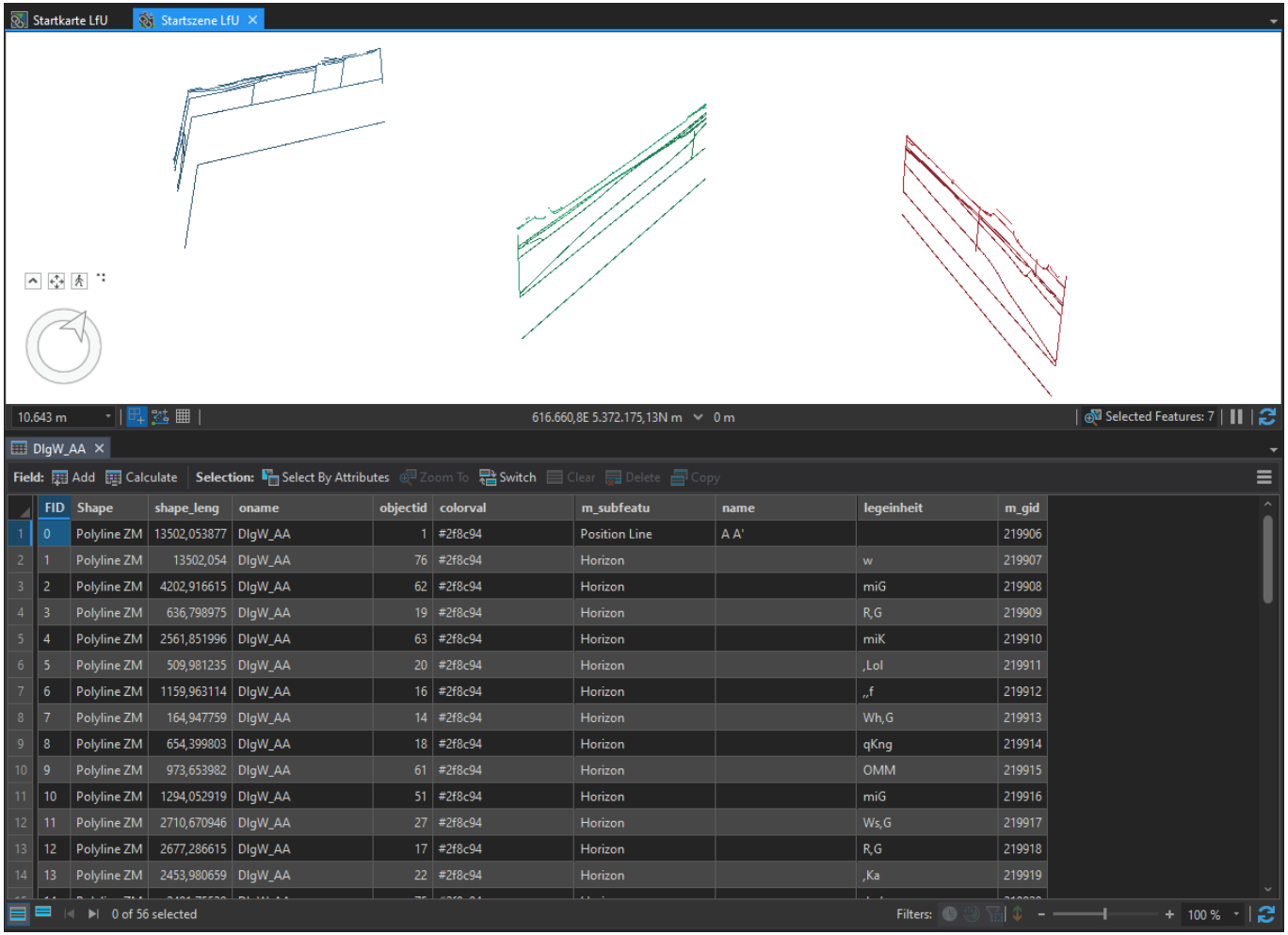
Open Questions

- 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?

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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Gocad: Import as Polyline