versioning and data management in decades-lasting projects

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3D models - Federal Institute for Geosciences and Natural Resources

- engaged in deep underground economy and storage
- cavern or repository projects
- ranging in scale from regional to detailed models

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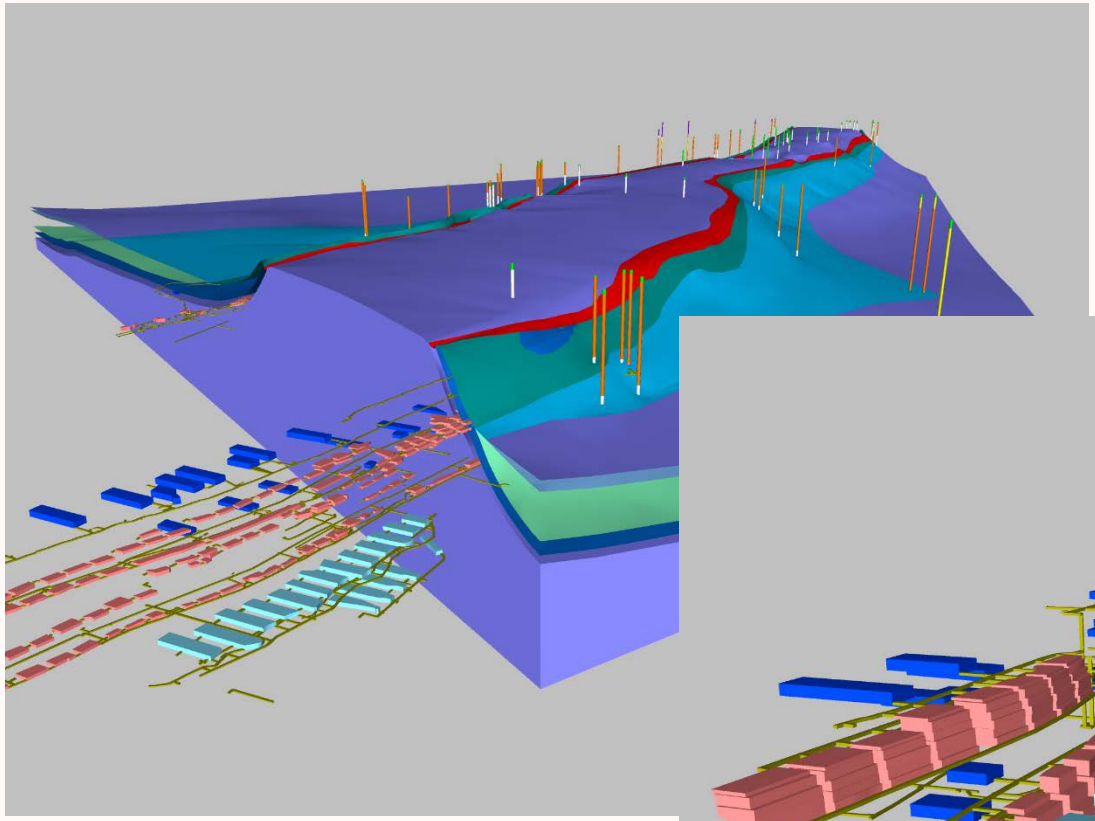
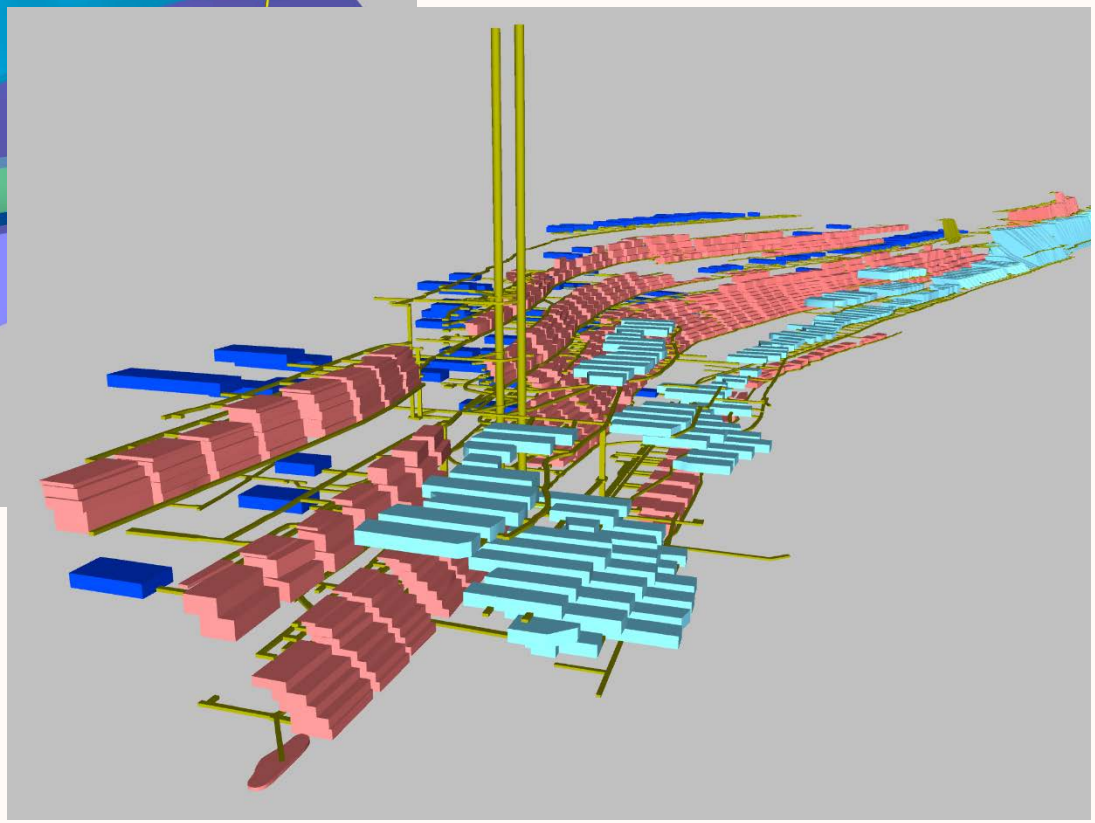


regional Model of the Stassfurt saddle
project
„dynamics of drowned or flooded salt mines and its overburden“

associated mine building model
„von Berlepsch/von Maybach



3D models - Federal Institute for Geosciences and Natural Resources

- openGEO - tool to create 3D geological models
  - software especially developed for and with the BGR
  - line-based surface models in various formats
  - generated from vertical and horizontal profiles
  - uses several different initial data formats

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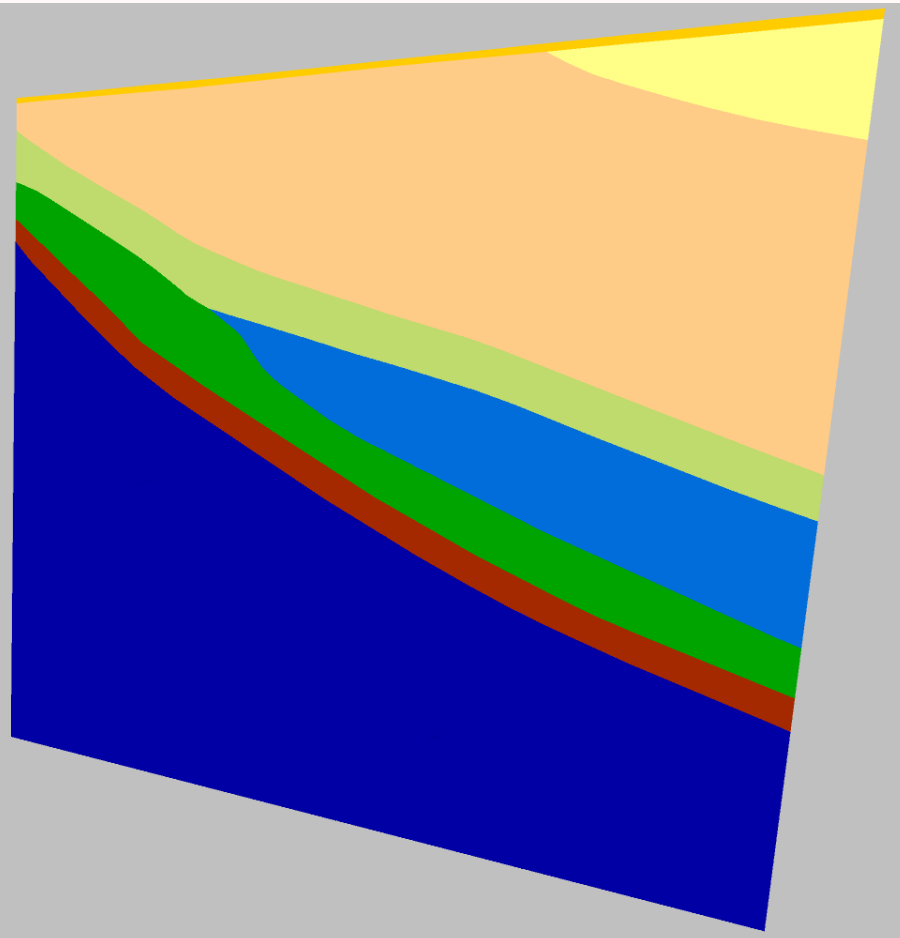

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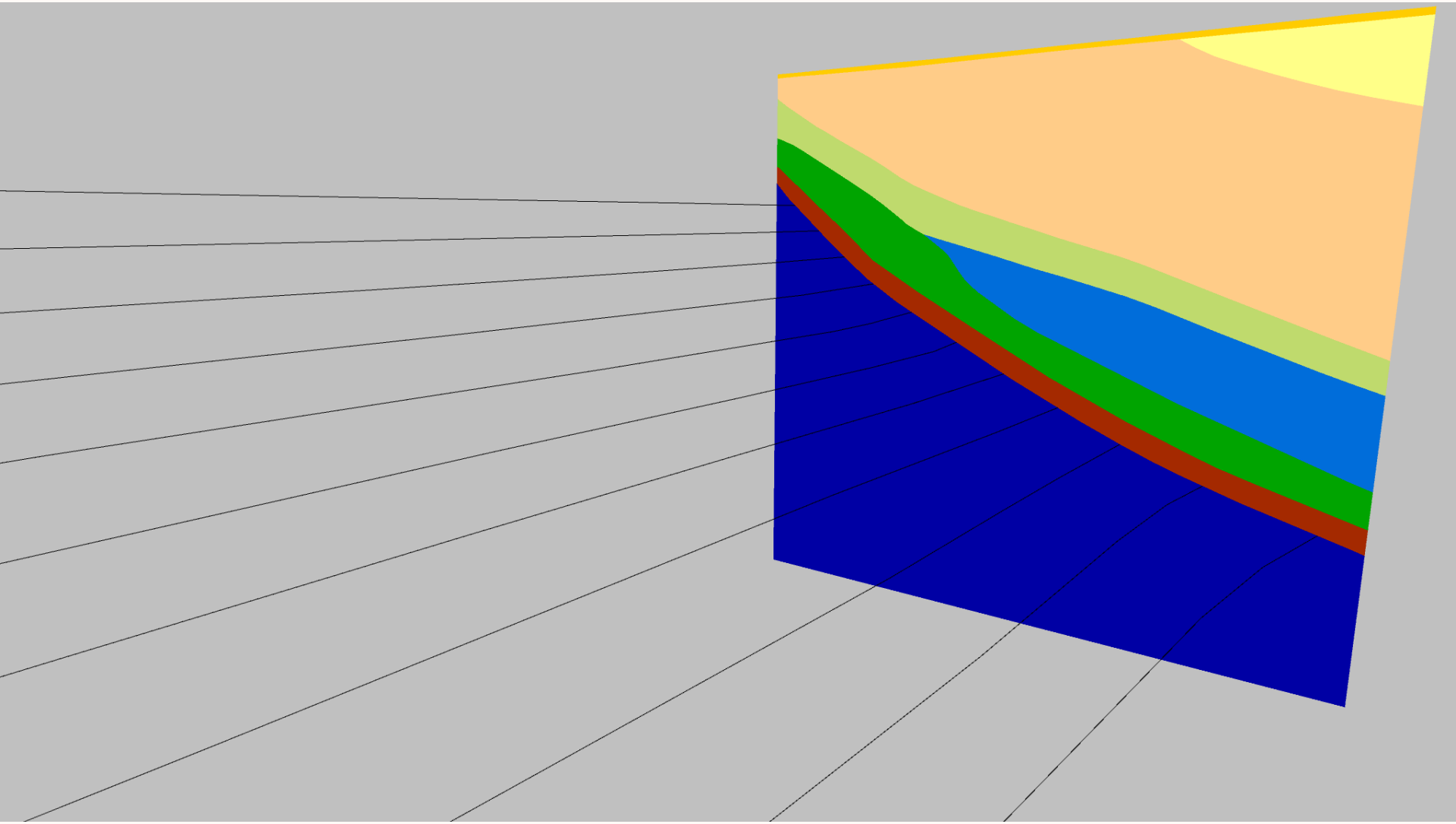

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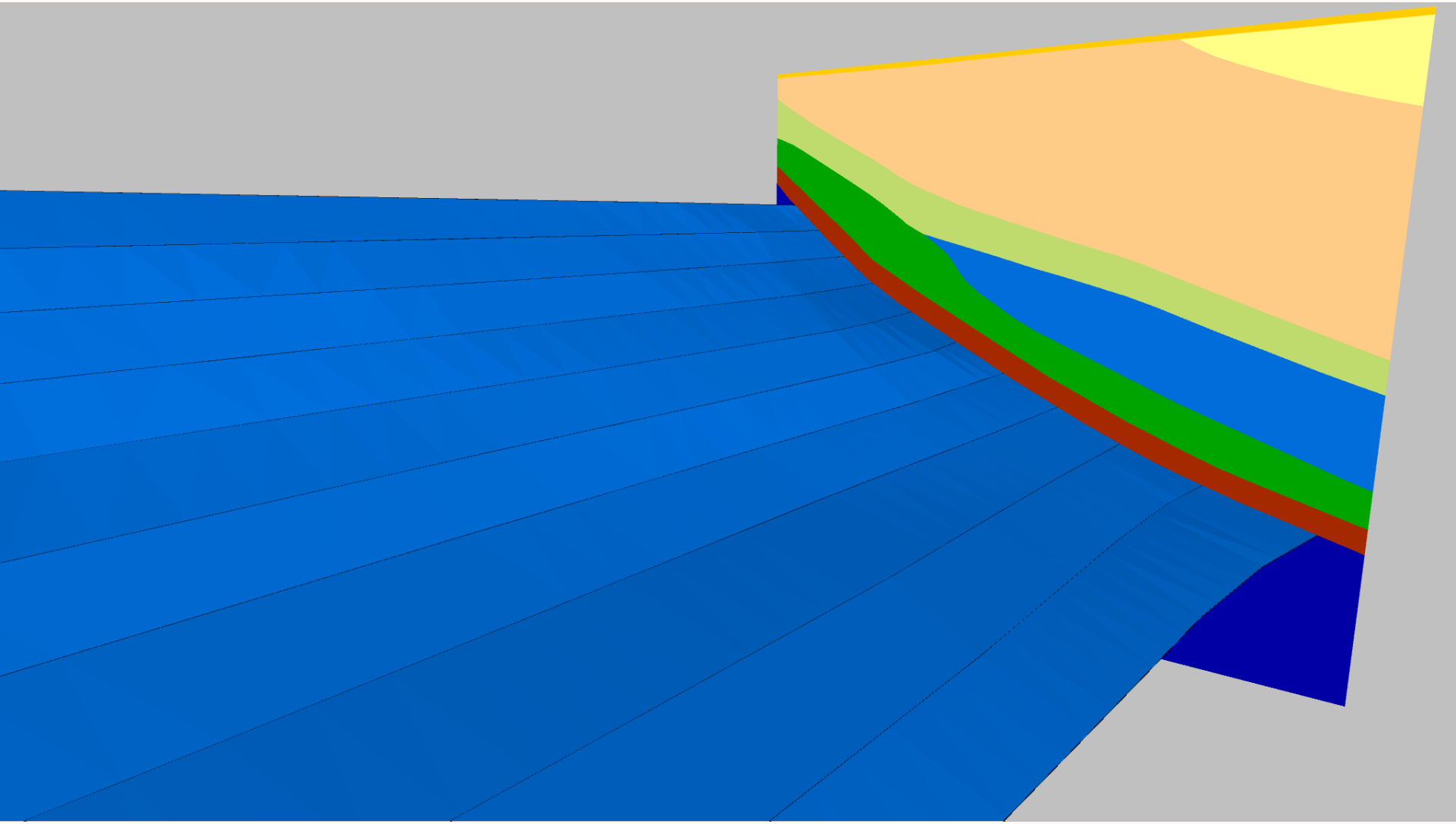

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- usage in repository projects
  - accompaniment of geological exploration
  - determine long term safety
  - plan approval procedures for approval of repositories

3D models in plan approval procedures

Why plan approval procedures?

objective to demonstrate that all legal protection goals are adhered
life, health and property are permanently protected

What's the result for 3D models?

requirements exceed those normally specified

- fully executable for several decades (**30 to 50 years**)
- transparency of the development of a model
- sustainable solutions in IT and HR

Personnel **Hardware** **Software**

3D models in plan approval procedures

personnel

- qualified personnel, available over the whole period
- expected period longer than usual employment
  ➔ tasks need to be transferred to new staff

software and hardware

- at state of the art standards
- continuous care and maintenance, throughout the period and beyond
- ongoing development of conceptual program parts of openGEO

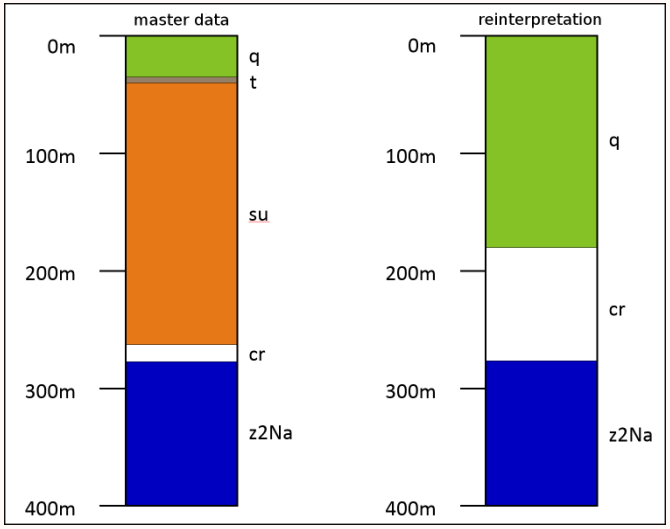
backup and historicization

- diverse and redundant backups
- historicized information, at an example of bore data

3D models in plan approval procedures

temporal storage – historicized information

3d model possesses a legal verification function
changes have to be documented and be restorable



left: interpretation as tectonic window on salt structure
right: subrosion collapsing rock mass and quaternary channel

- historicized states are stored in a database
- chronological development of the interpretation of a bore can be traced
- changes lead to the adaptation and versioning of the model

3D models in plan approval procedures

multi user – admin data

- current valid bore data stored on database server
- same state of bore data for every user
- consistency and quality assurance

metadata

- confidence levels of parts of the model
- supported by what data
- processing geologist
- valid data periods

3D models in decades-lasting projects

Conclusion

- model needs to be fully executable throughout the procedure
  → continuous care and maintenance
- backup and temporal storage
  → avoid data loss and trace development
- openGEO
  → historicized information of bore data
  → versioning of model data

Thank you for your attention!