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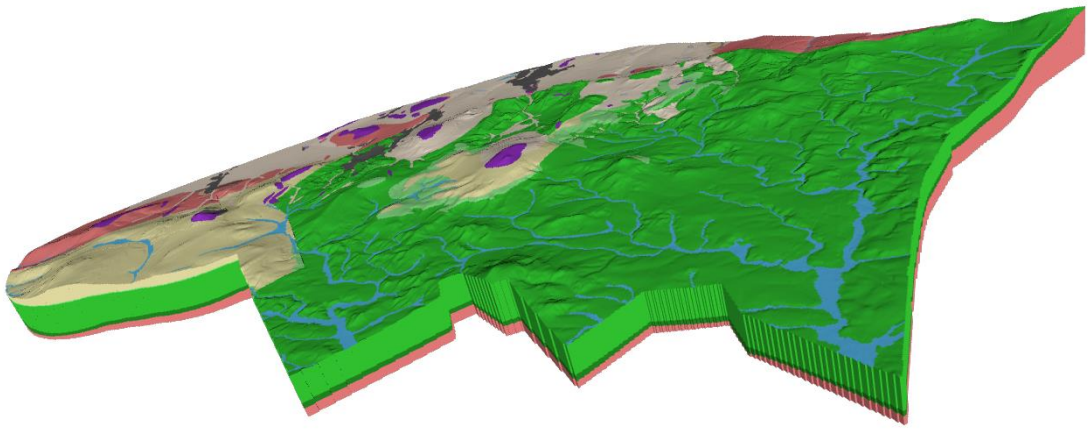
ResiBil

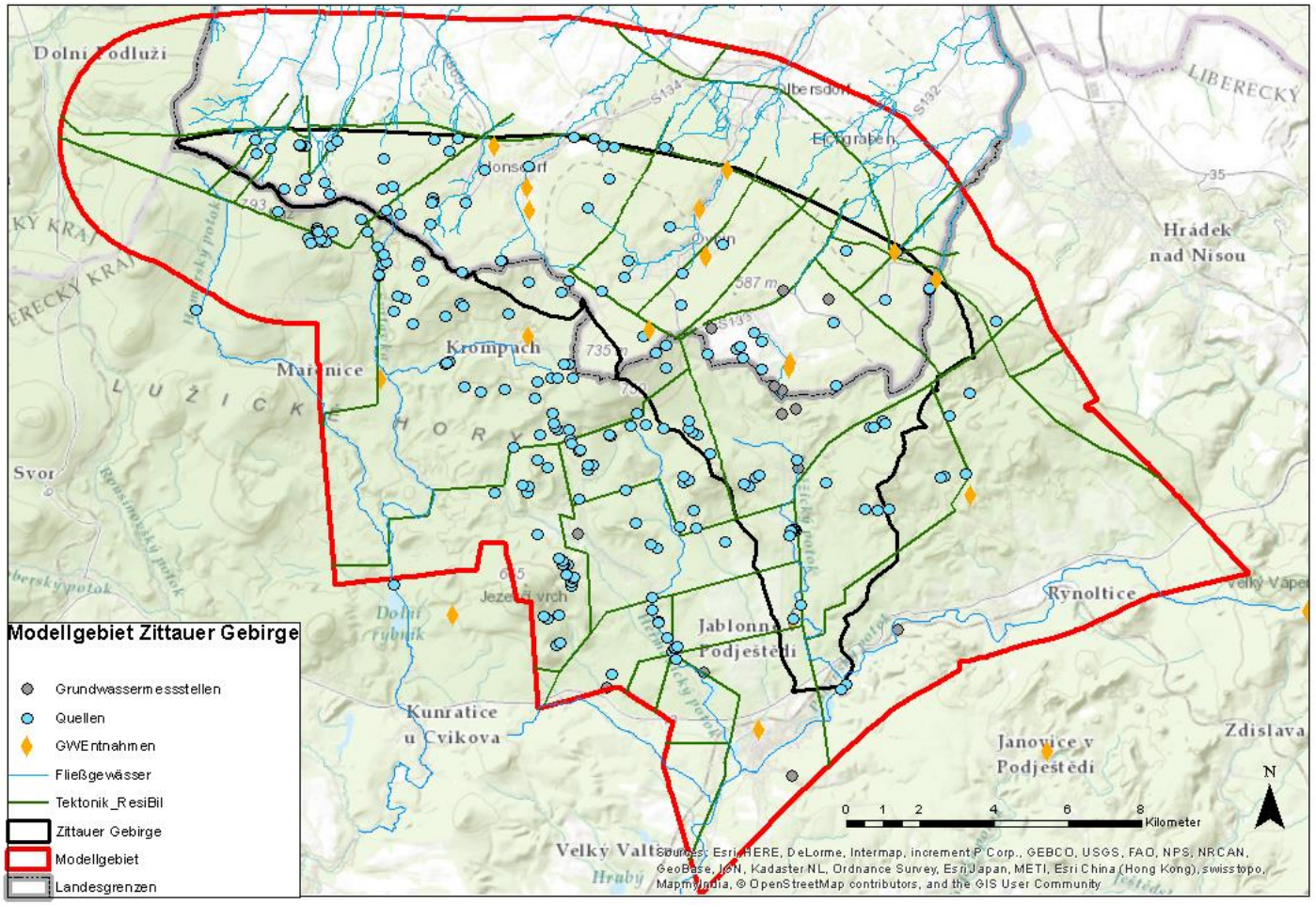
Content – Conceptual and Hydraulic model of Lückendorf-Oybin site: Methodology, results so far, expected outputs

- Methodology
  - Overview
  - Modelling structure
  - Groundwater flow modelling
- Conceptual model
- Boundary conditions
- Hydraulic model
- Results
- Expected outputs

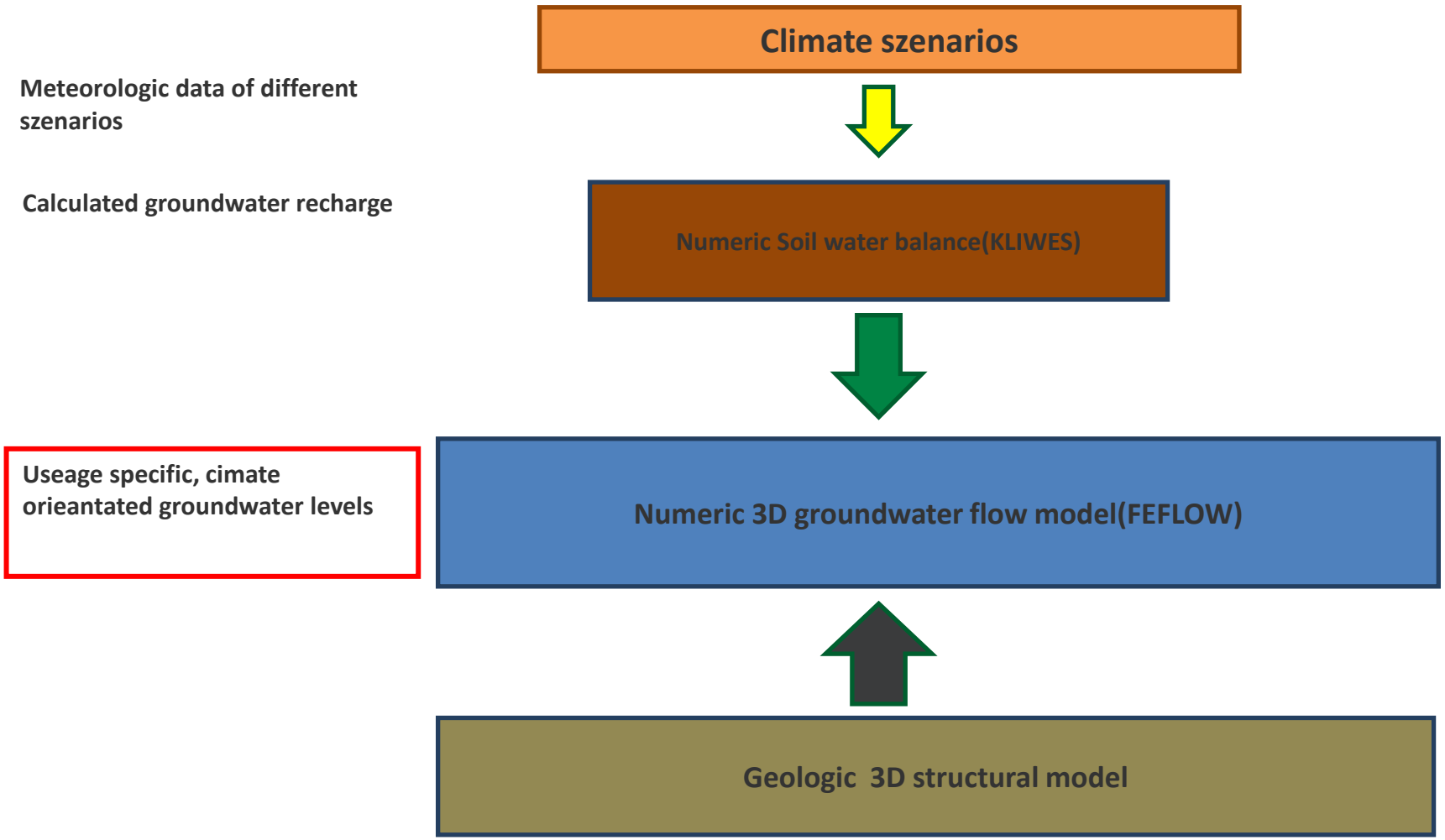


FIS Hydrogeologie, LfULG

Methodology - Overview

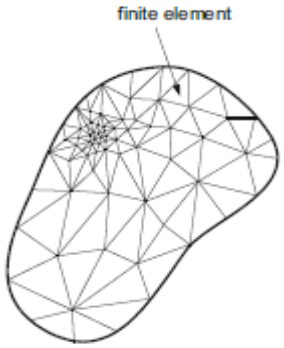


Methodology - Modelling structure

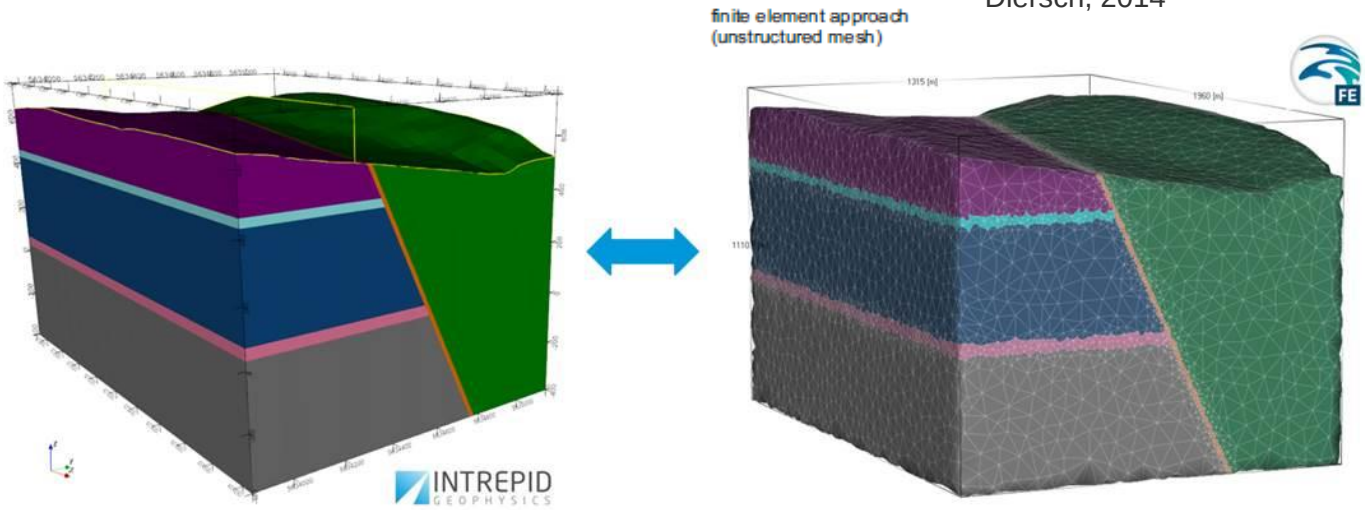


Methodology – groundwater flow modelling

- Numeric Flow Modelling with FEFLOW
- Inclined Lusatian Overtrust
- Unstructured mesh



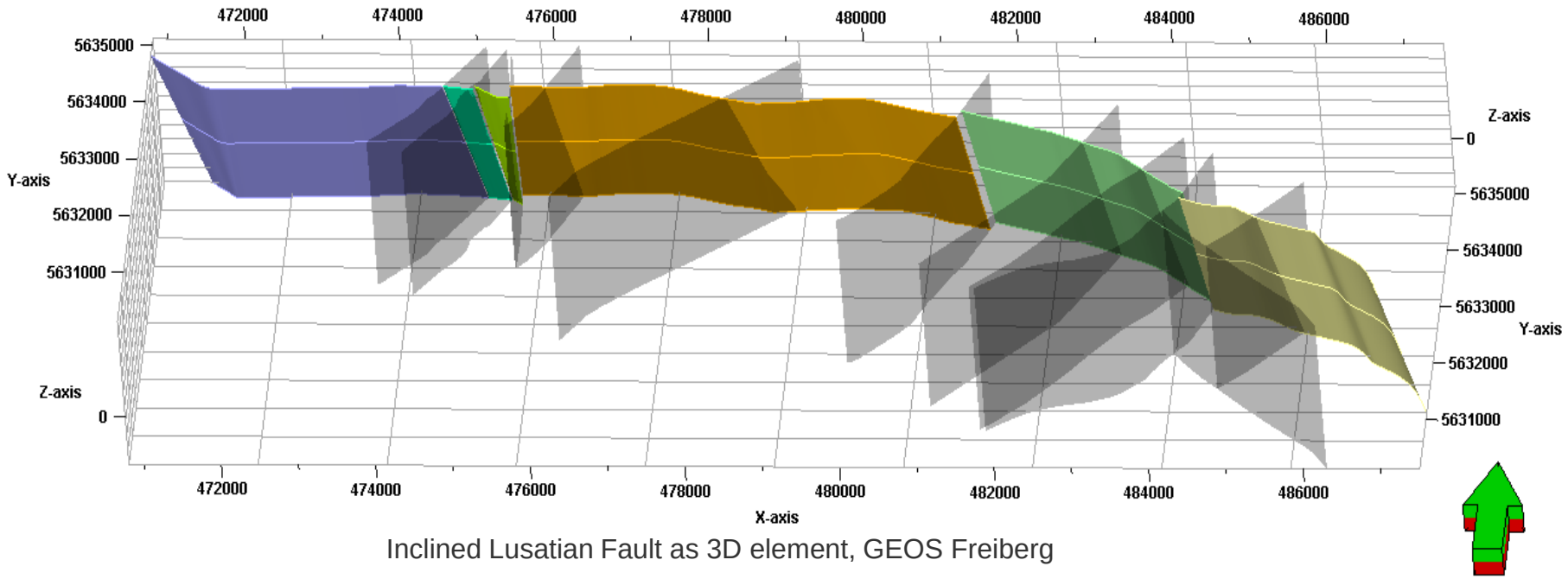
Diersch, 2014



DHI WASY

Conceptional model – Basement

- **Lusatian Overtrust: North and north – east boundary**
  - **Seperated segments by crossing faults**
- **Blocked and offset**
- **Slope of basement inclined to the south**
- **Some tertiary dykes**



Inclined Lusatian Fault as 3D element, GEOS Freiberg

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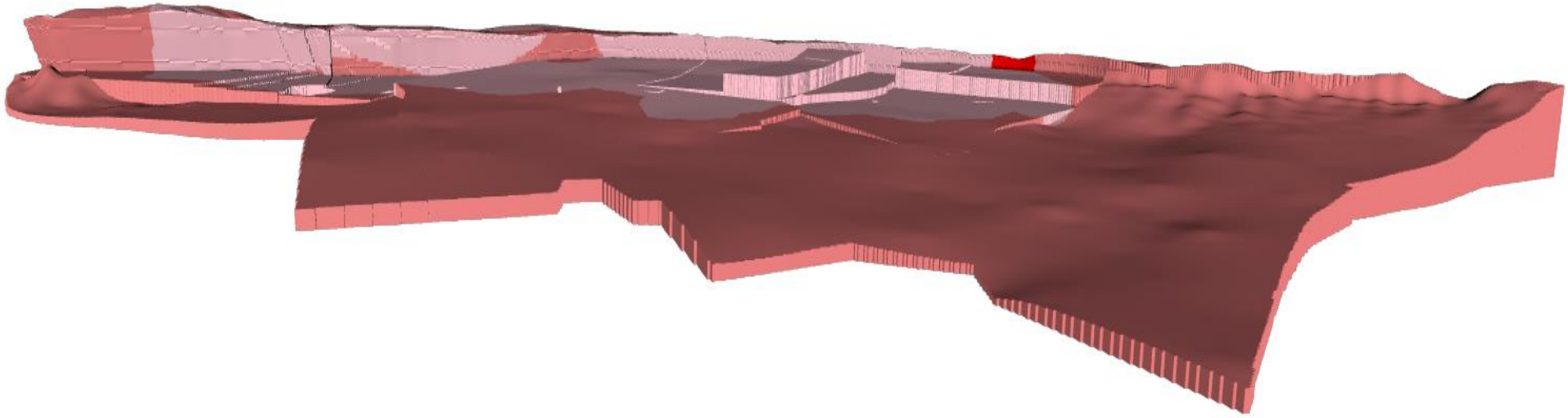

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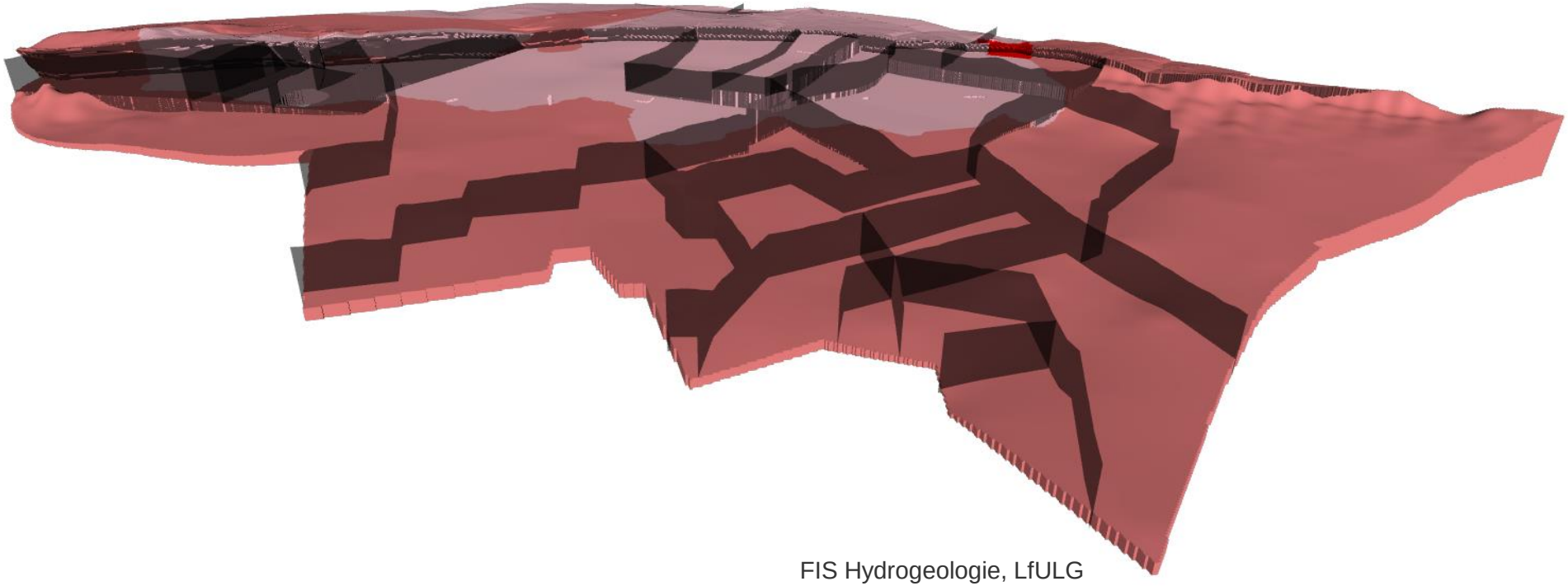

FIS Hydrogeologie, LfULG

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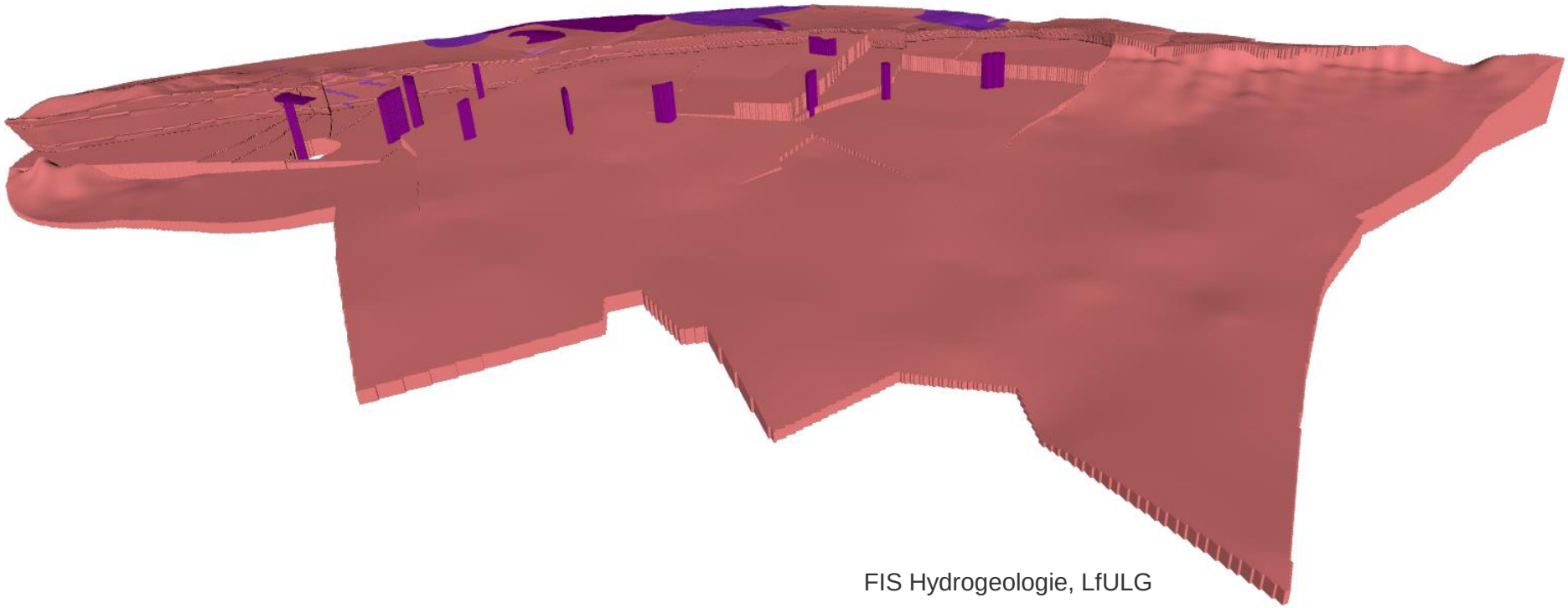
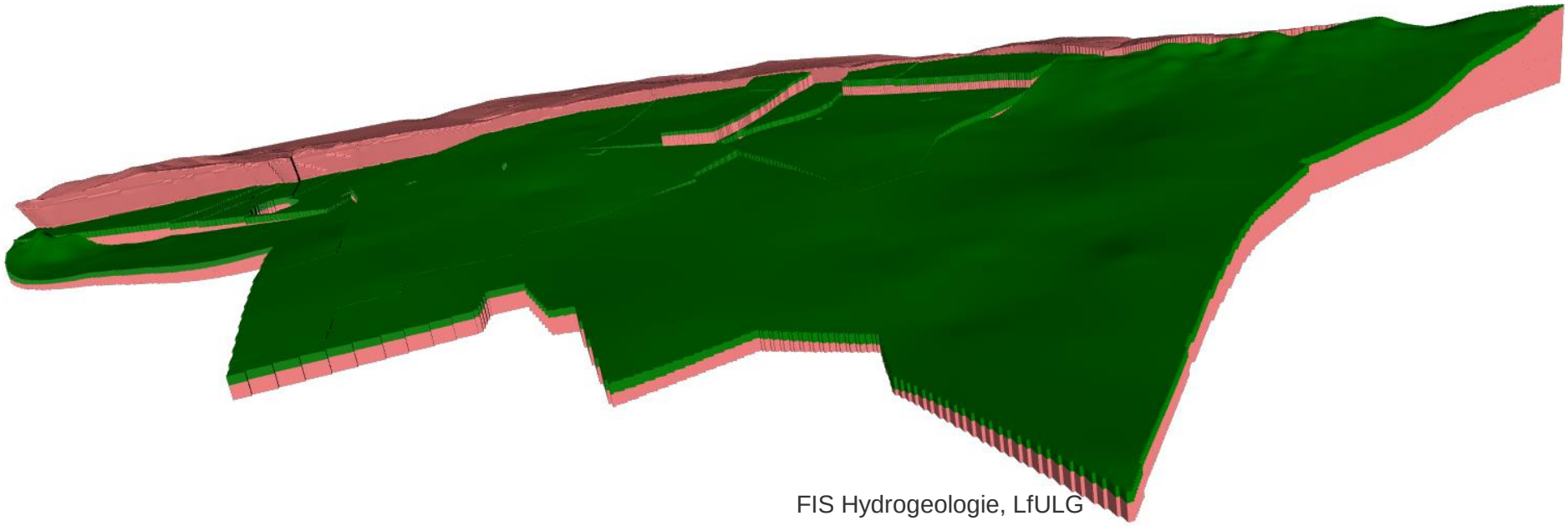


FIS Hydrogeologie, LfULG

Conceptional model – Oberhässlich Fm.

- Coarse grained sandstone sediments
  - Aquifer is blocked and offset
  - Slope inclined to the south
- Boundary: Lusatian Trust (LT)
- South – east groundwater recharge region



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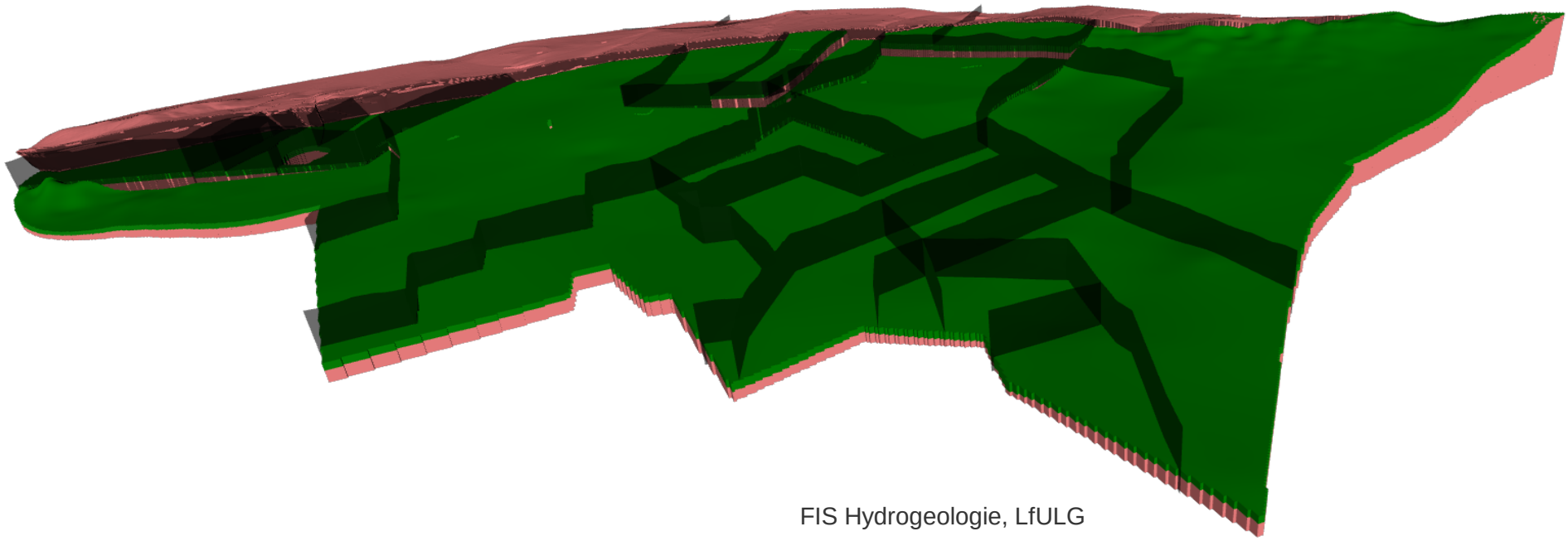
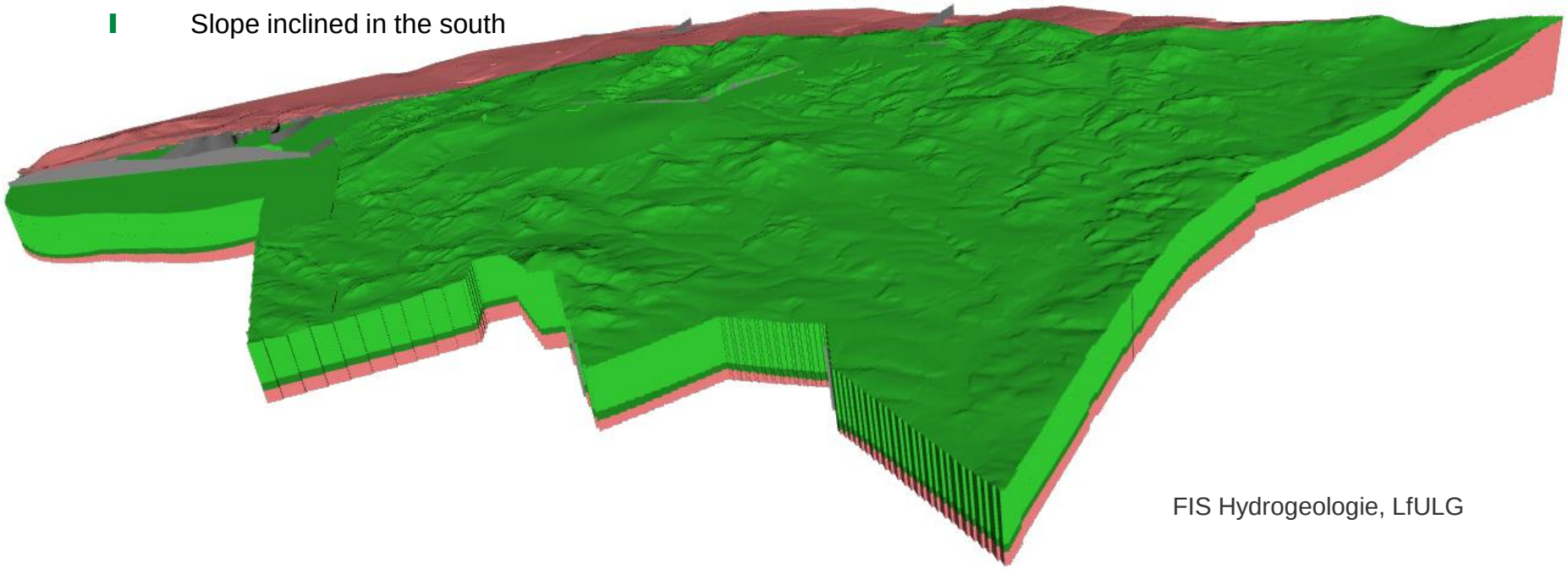


FIS Hydrogeologie, LfULG

Conceptional model – Dölzschen Fm. + Oybin Fm.

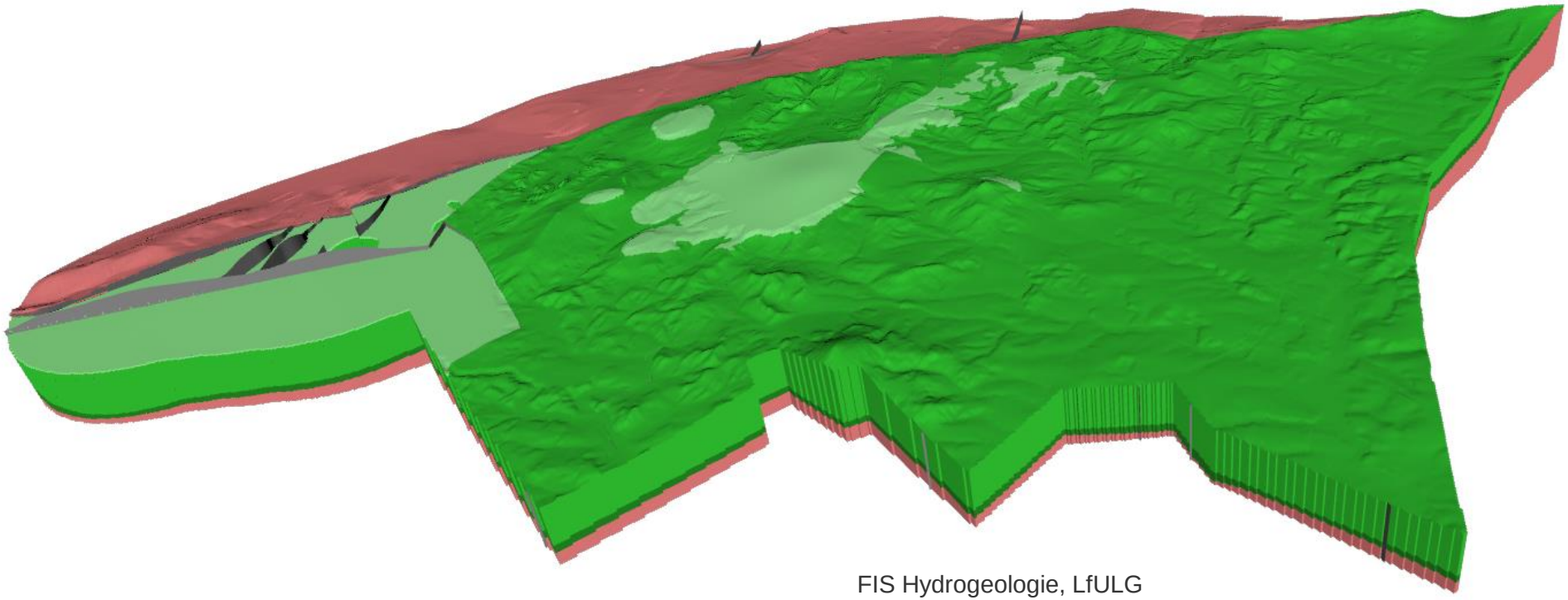
- Fine grained limestones acting as a aquitard
- Coarse grained sandstones with conglomerate enclosures
  - Blocked with offset
  - Slope inclined in the south



FIS Hydrogeologie, LfULG

Conceptional model – Lückendorf Fm.

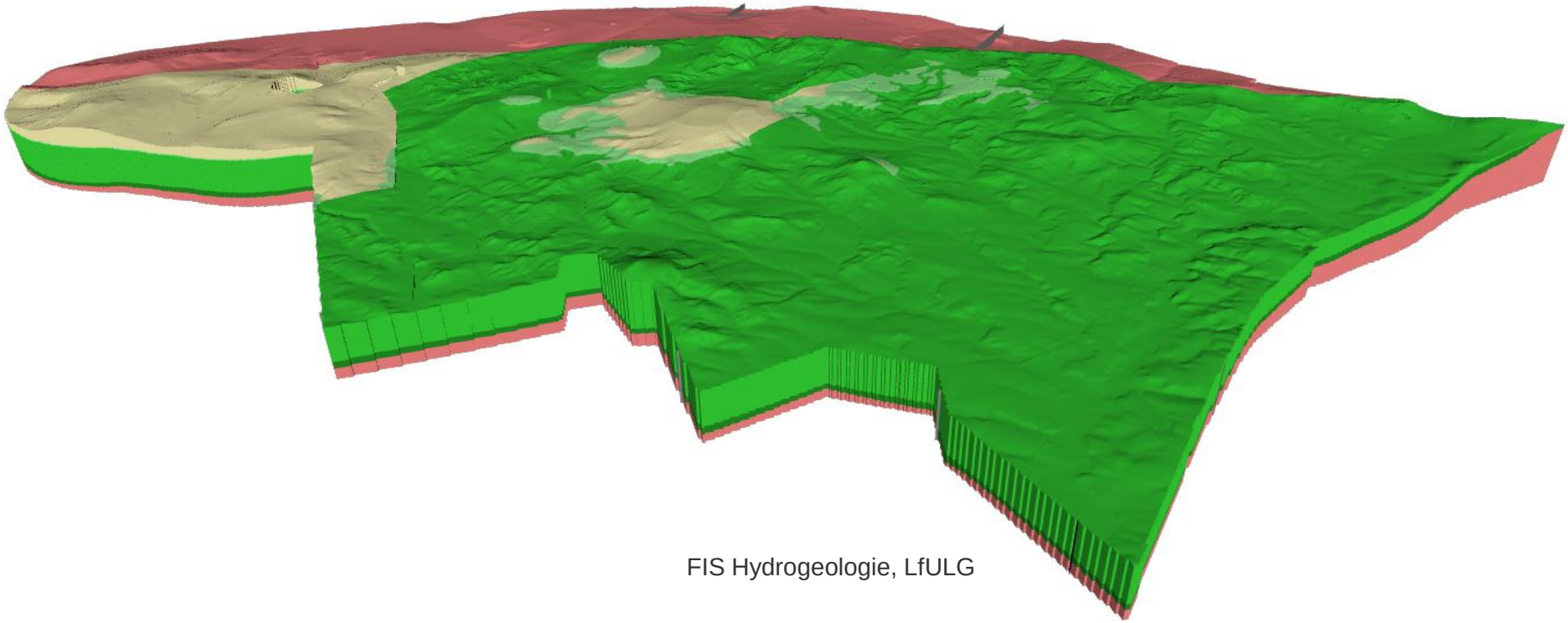
- Fine grained groundwater aquitard
  - Partly distributed in the area



FIS Hydrogeologie, LfULG

Conceptional model – Waltersdorf Fm.

- Fine till middle grained sandstones which alternate
- Partly drisributed in the hole area



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Boundary conditions - Rivers

- Rivers in Saxony and east Czech Rep. Contribute to Neiße river
- Czech rivers in the South contribute to Elbe river
- Due to high infiltation there is less runoff
- No gauging station

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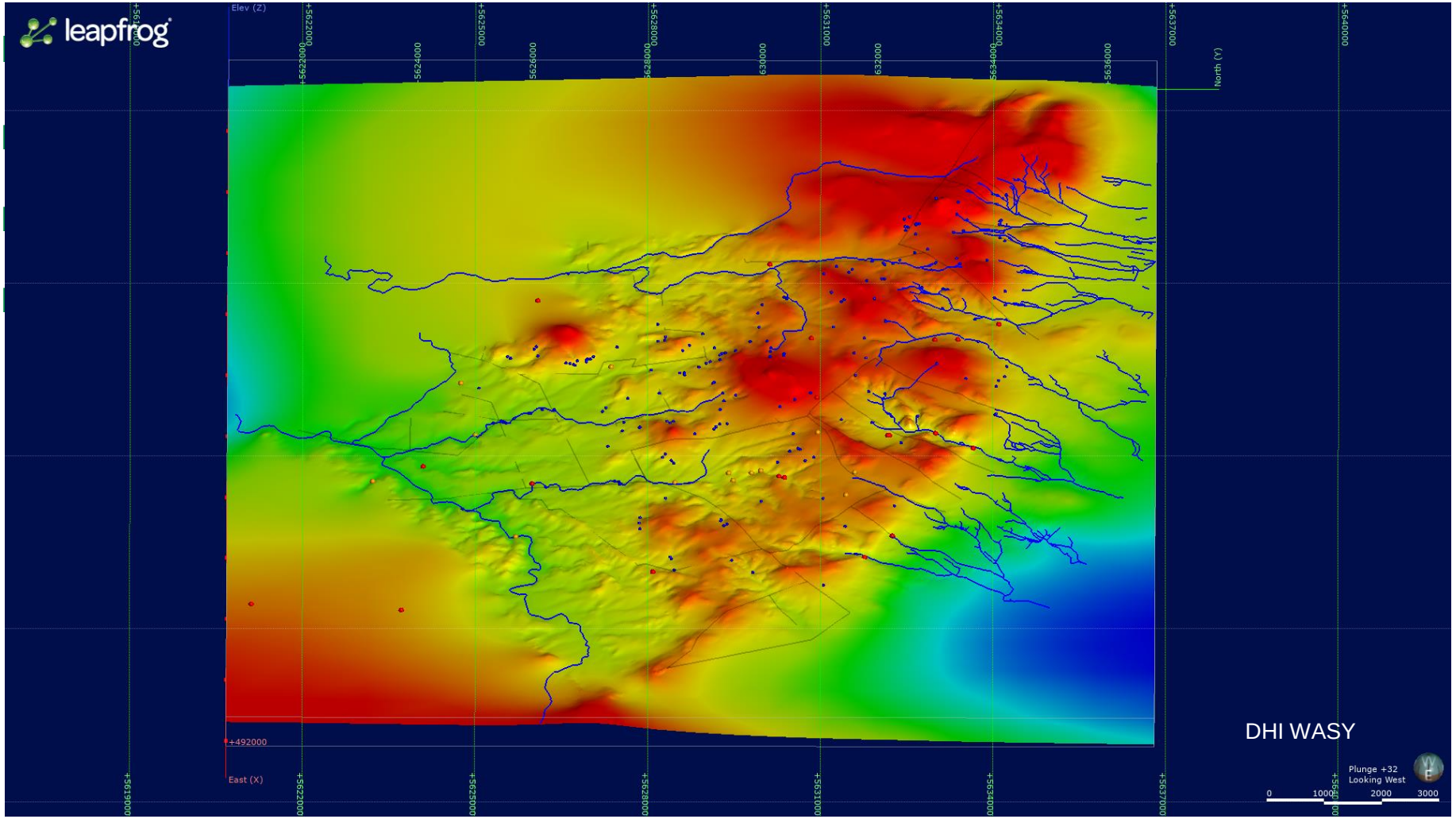
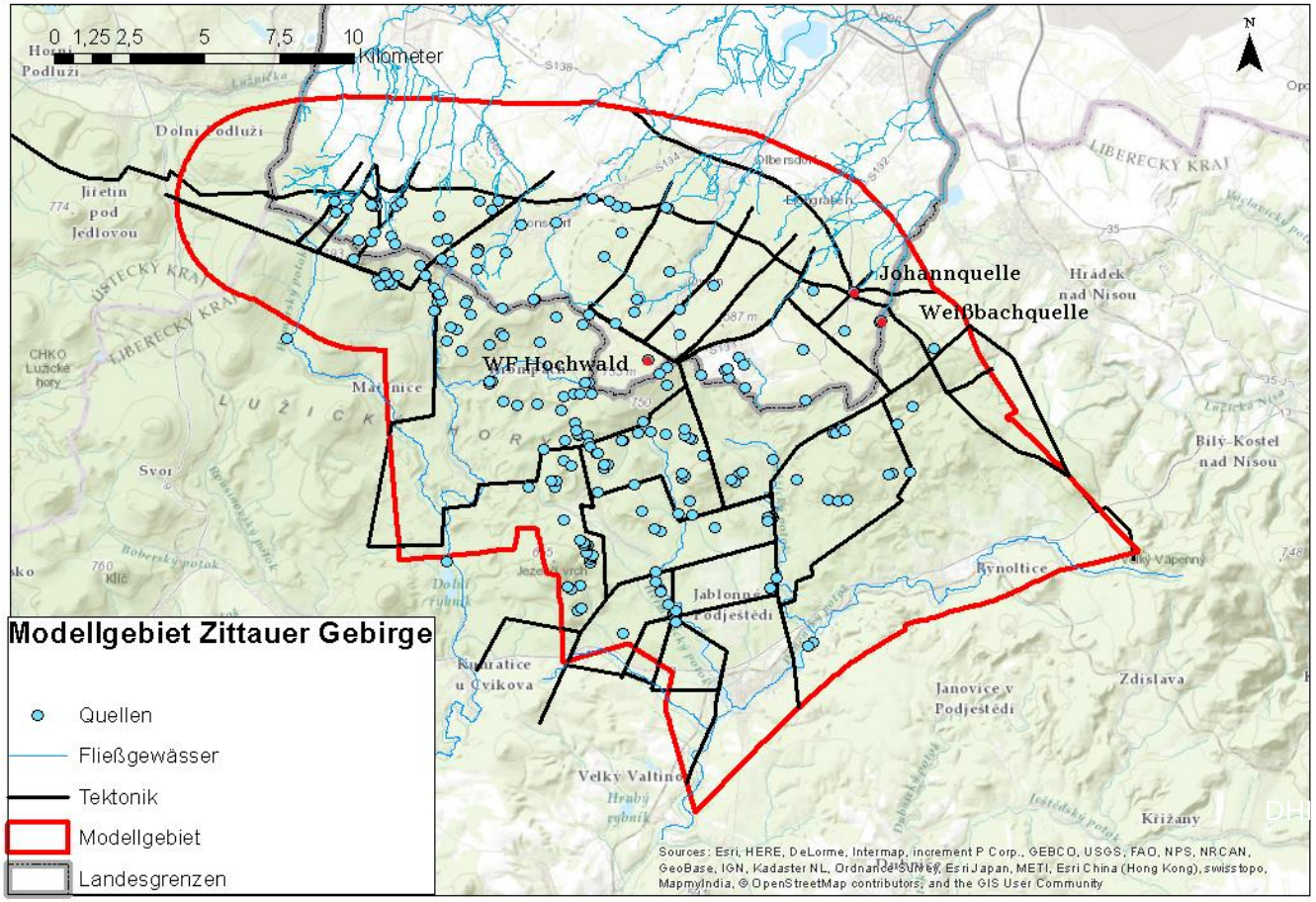
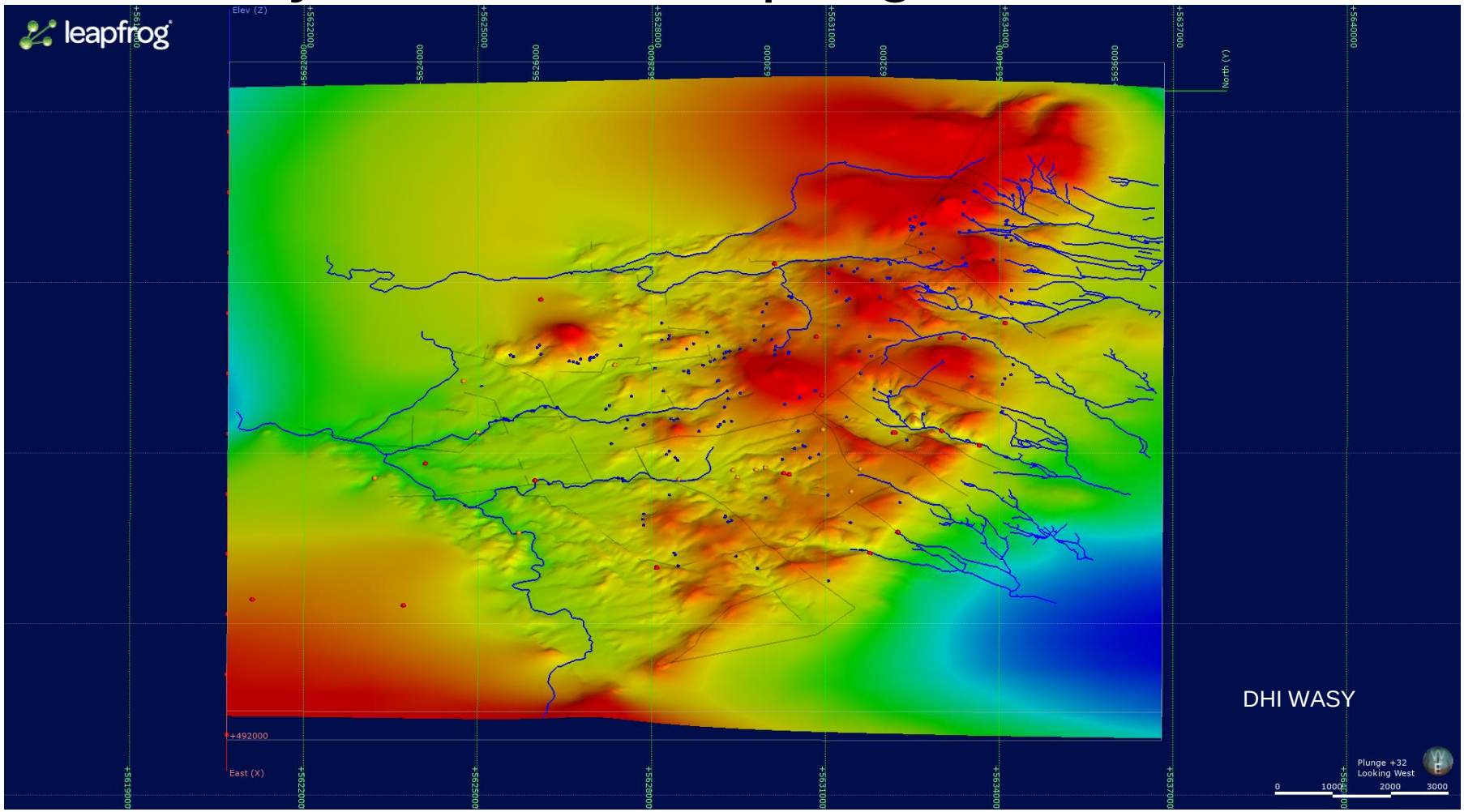
Boundary conditions - Rivers



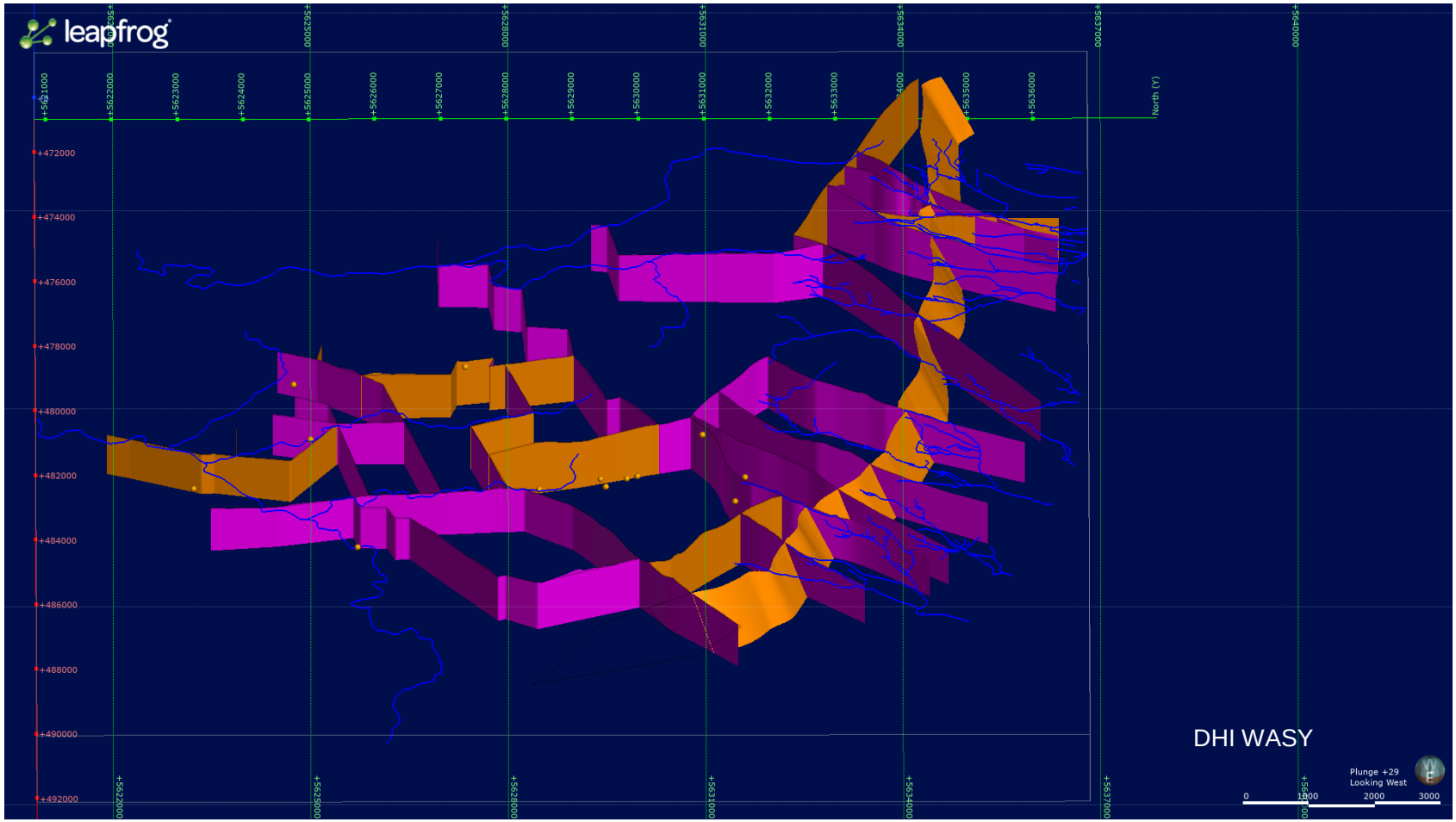
Boundary conditions - Springs



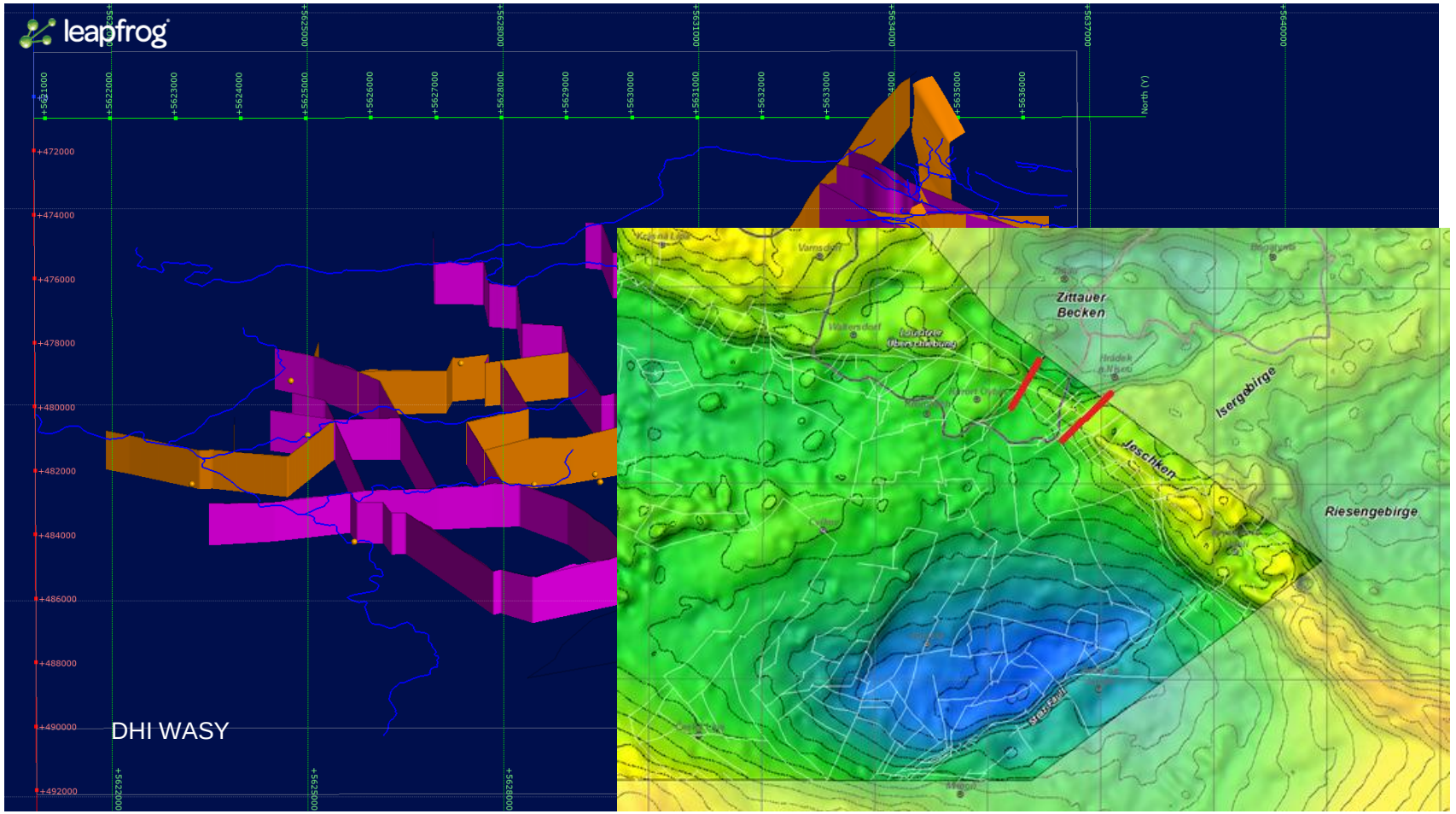
Boundary conditions - Springs



Boundary conditions - Faults

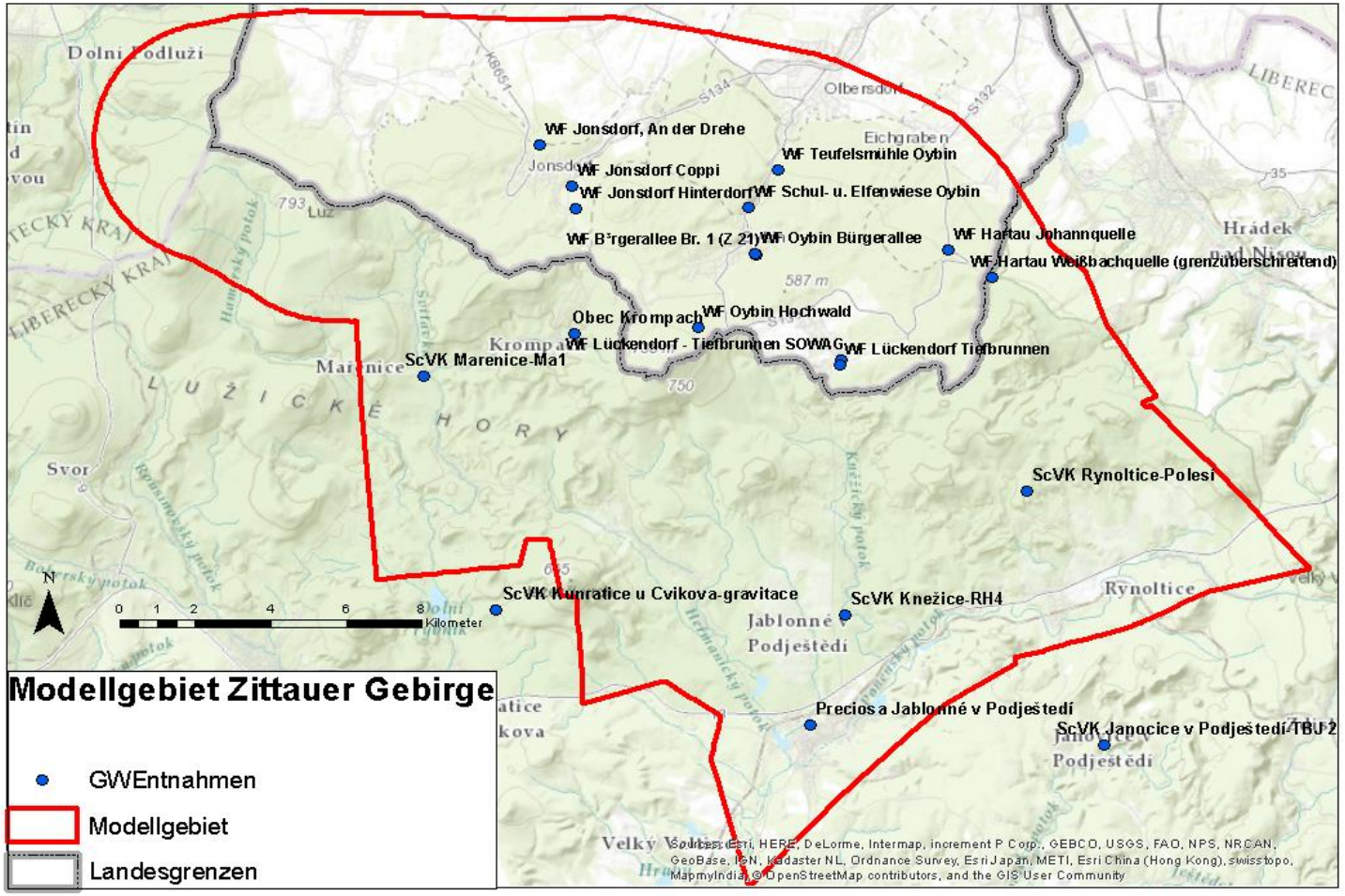


Boundary conditions - Faults

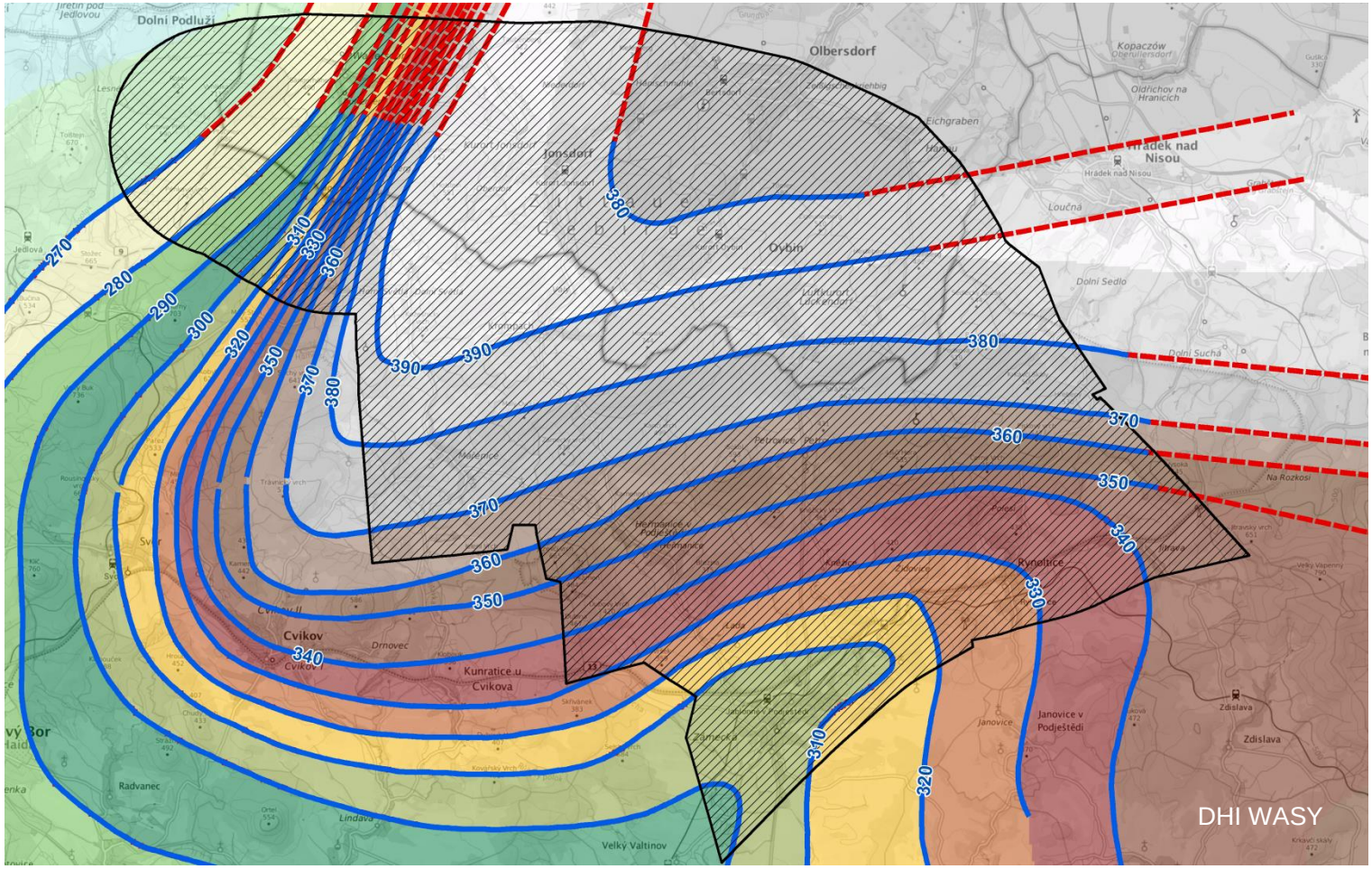


Gravimetric Map ResiBil, 2019

Boundary conditions - Abstraction



Hydraulic model



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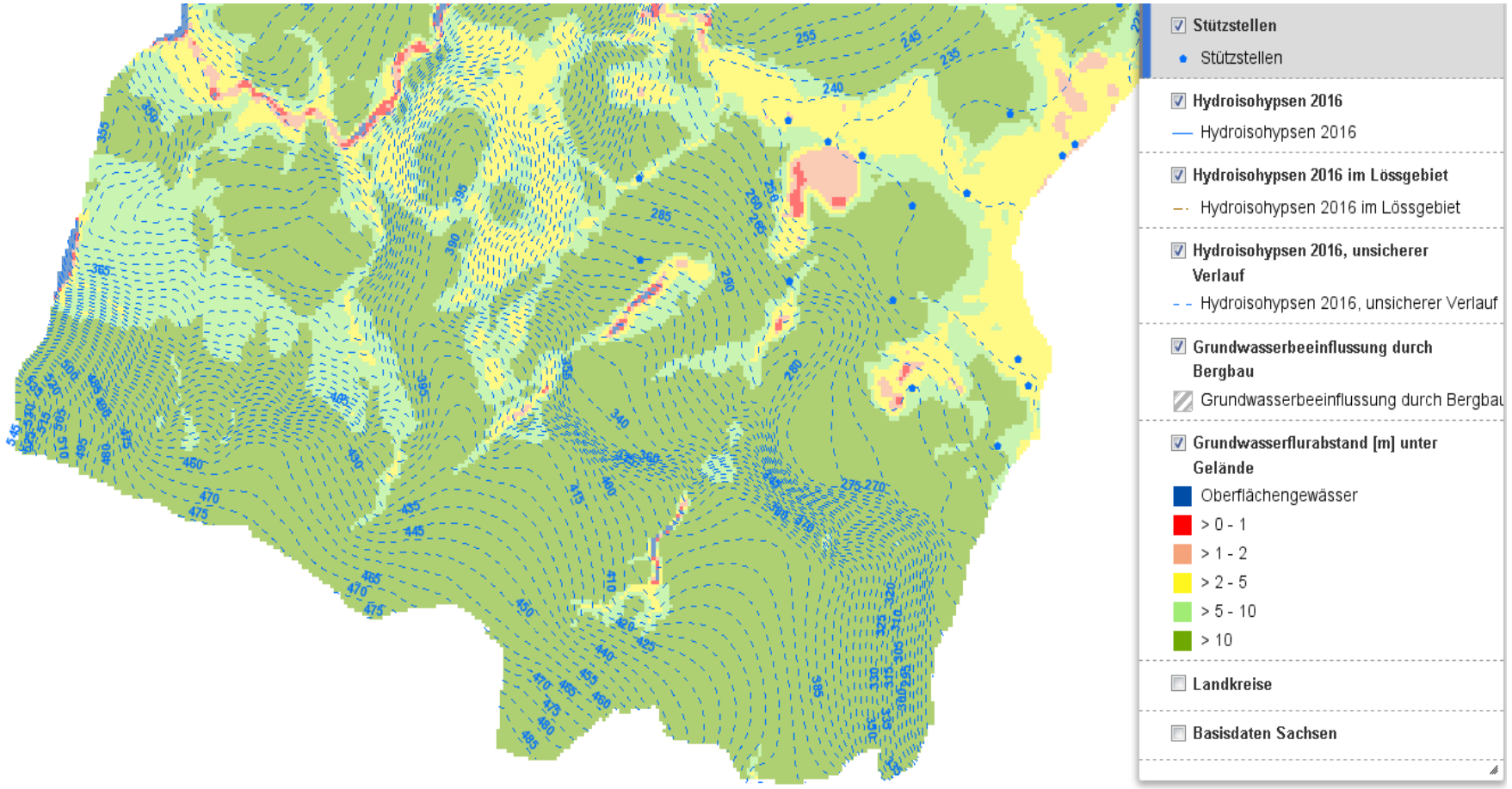
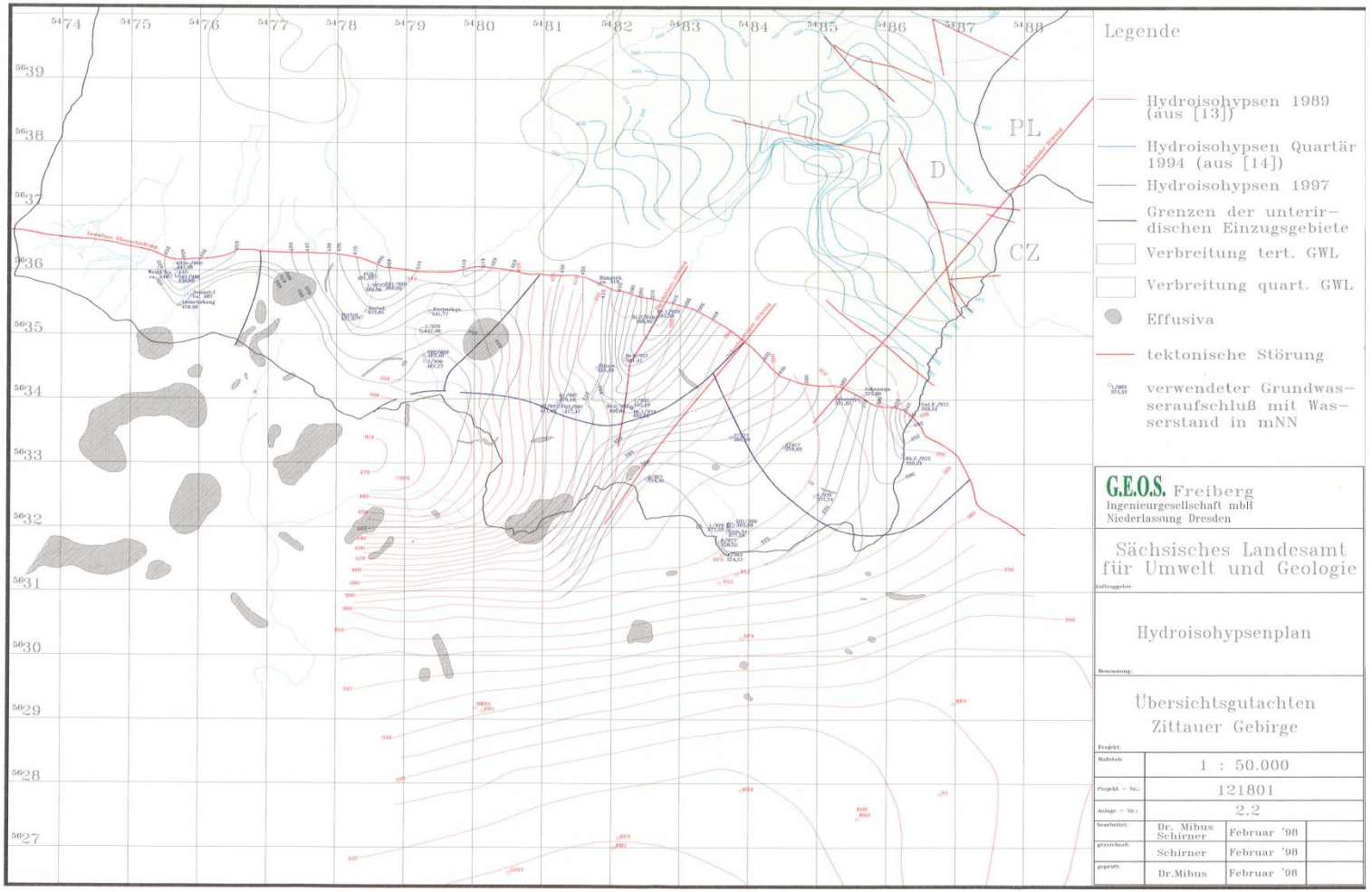


Fugro, 2017

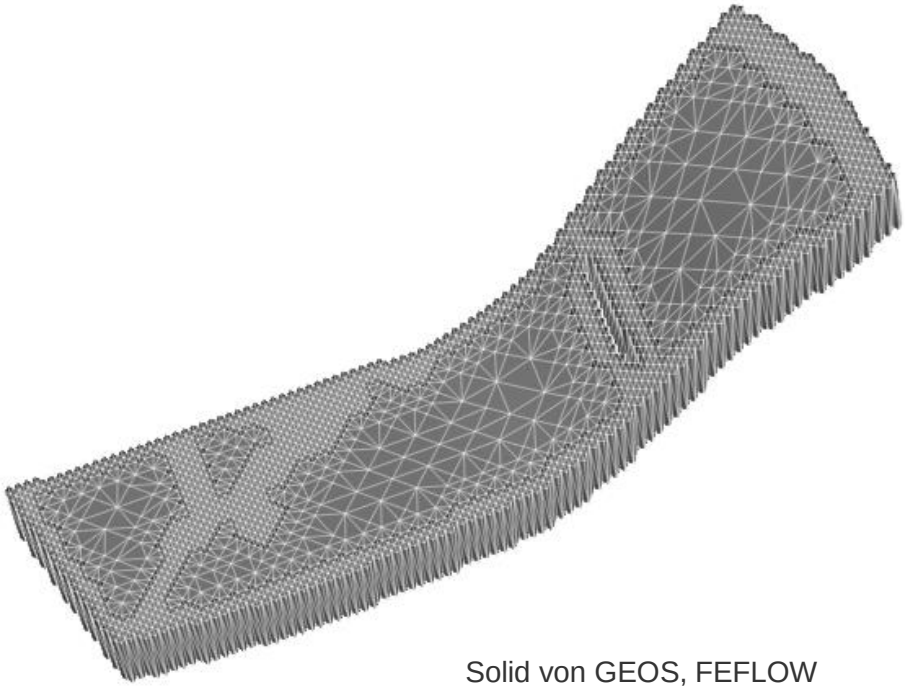
Hydraulic model



GEOS, 1998

Results

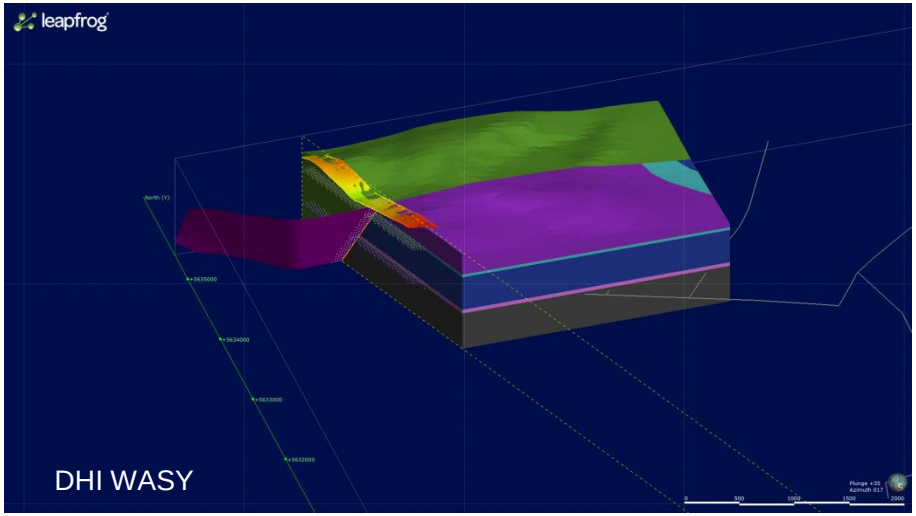
- Import HyK50 solides in FEFLOW
  - Problem: 25 m discretisation of HyK50
  - too many nodes for implementation
  - Thinning of the discretisation in hydrogeological less importent regions
- Remeshing in FEFLOW
  - Problem: Self - intersection



Solid von GEOS, FEFLOW

Expected output / problems

- Output
  - Usage specific, cimate orieantated groundwater levels
  - Groundwater mass balance in regard to climate and water abstraction
- Problems
  - Highly complex model
  - Anisotropy
  - Hydraulic Properties of the faults
  - Few monitoring wells



Thank you for your attantion!