The INTERREG project GeORG: 3D-modeling of complex tectonic structures for assessing geopotentials in the Upper Rhine Graben

GeORG project team

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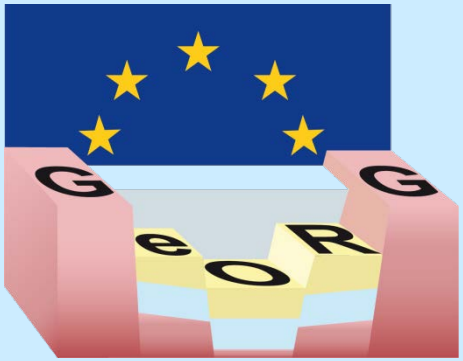
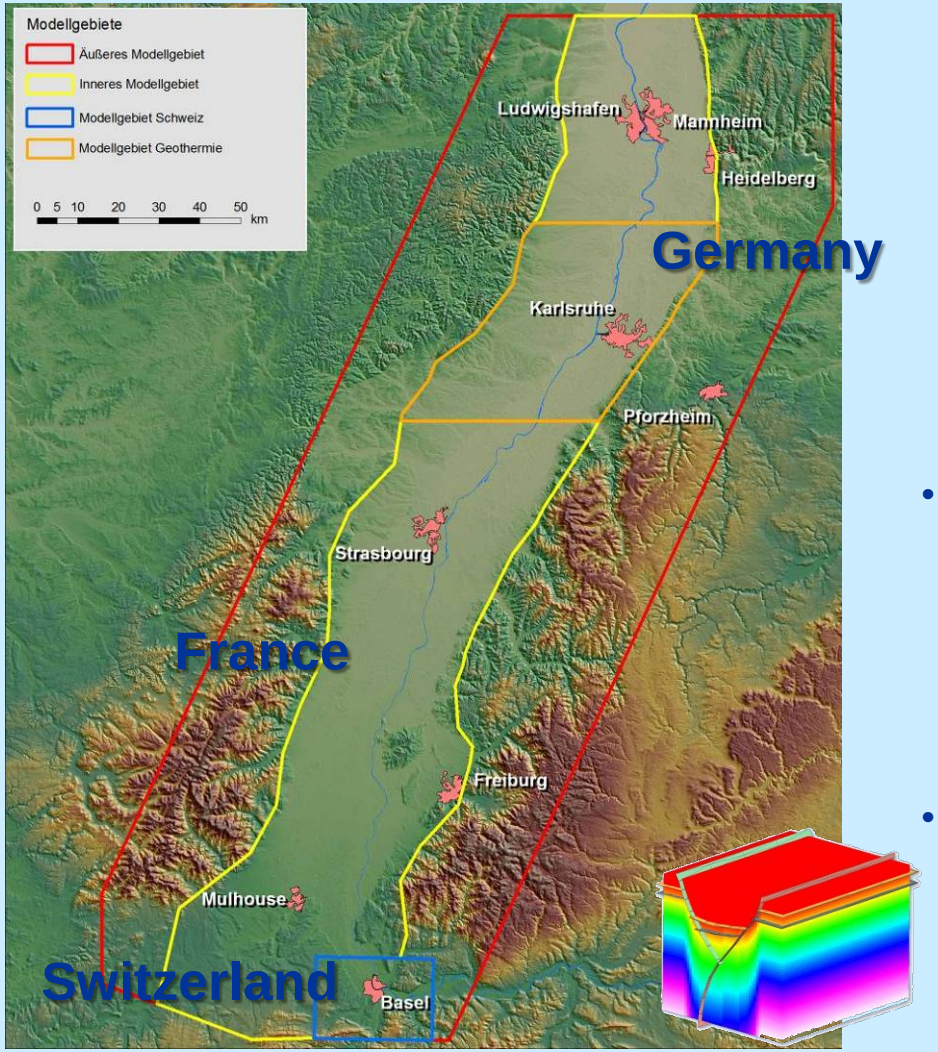
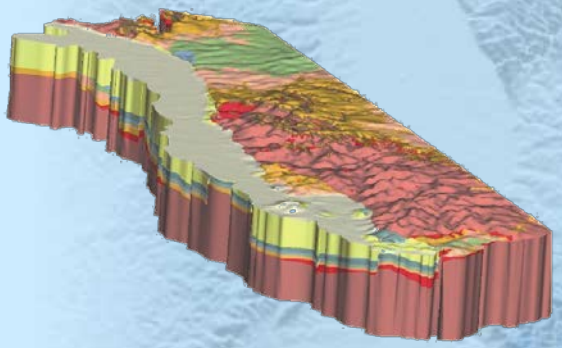
Geological Survey Baden-Württemberg



The transnational GeORG Project





- **Assessment of geopotentials:**
  - deep geothermal energy
  - CO_2 sequestration, storage of compressed air
  - deep aquifers
- **constructing a 3D geological model**

GeORG - project organization

- **EU project co-financed within the INTERREG program IV A Upper Rhine**

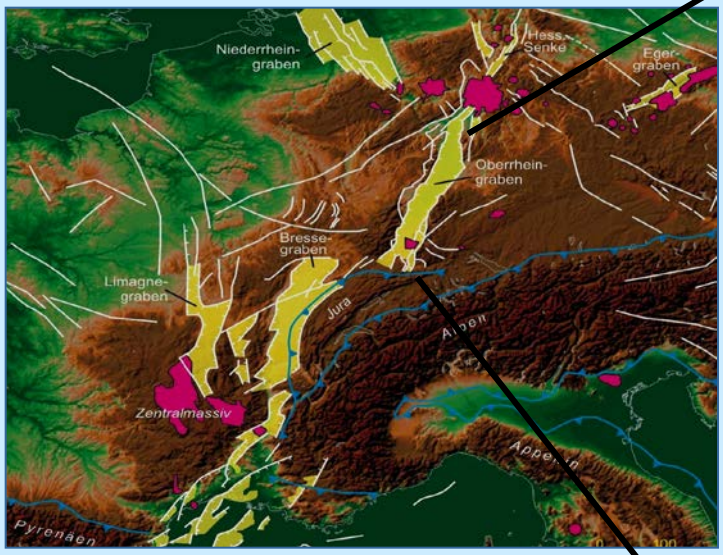
- **Running period from October, 1st 2008 to December, 31th 2012**

- **Project partners with technical participation**
  - Landesamt für Geologie, Rohstoffe und Bergbau Baden-Württemberg Regierungspräsidium Freiburg Abt.9 (project coordination)
  - Landesamt für Geologie und Bergbau Rheinland-Pfalz
  - Service Géologique Régional Alsace (BRGM Orléans)
  - Universität Basel (Abteilung Angewandte und Umweltgeologie

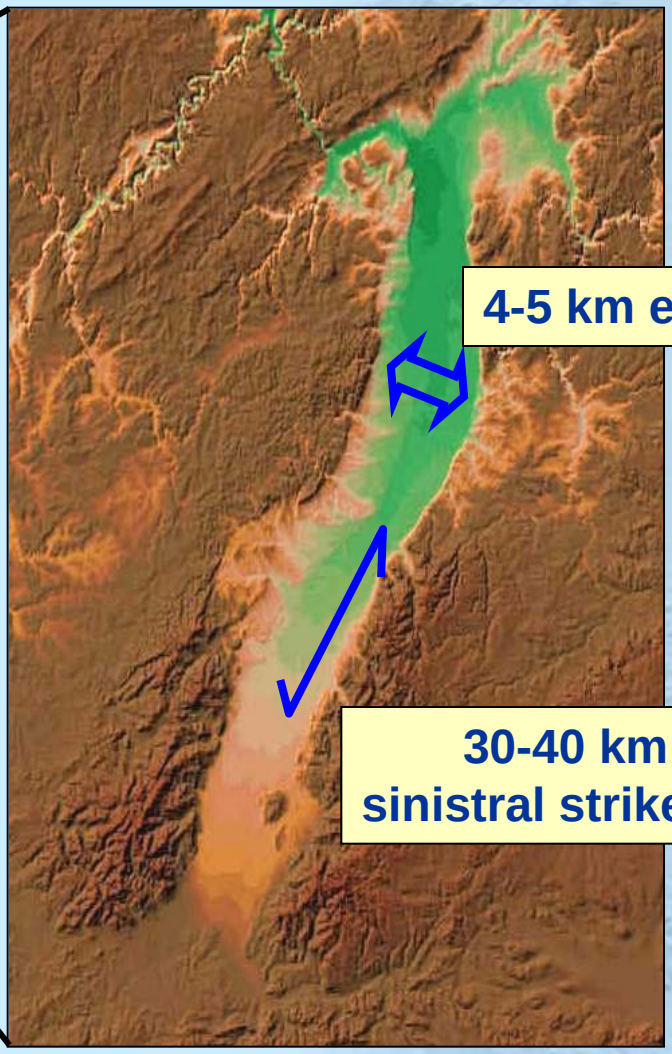
- **10 further partners providing financial or knowledge support**

Tectonic development of the Upper Rhine Graben

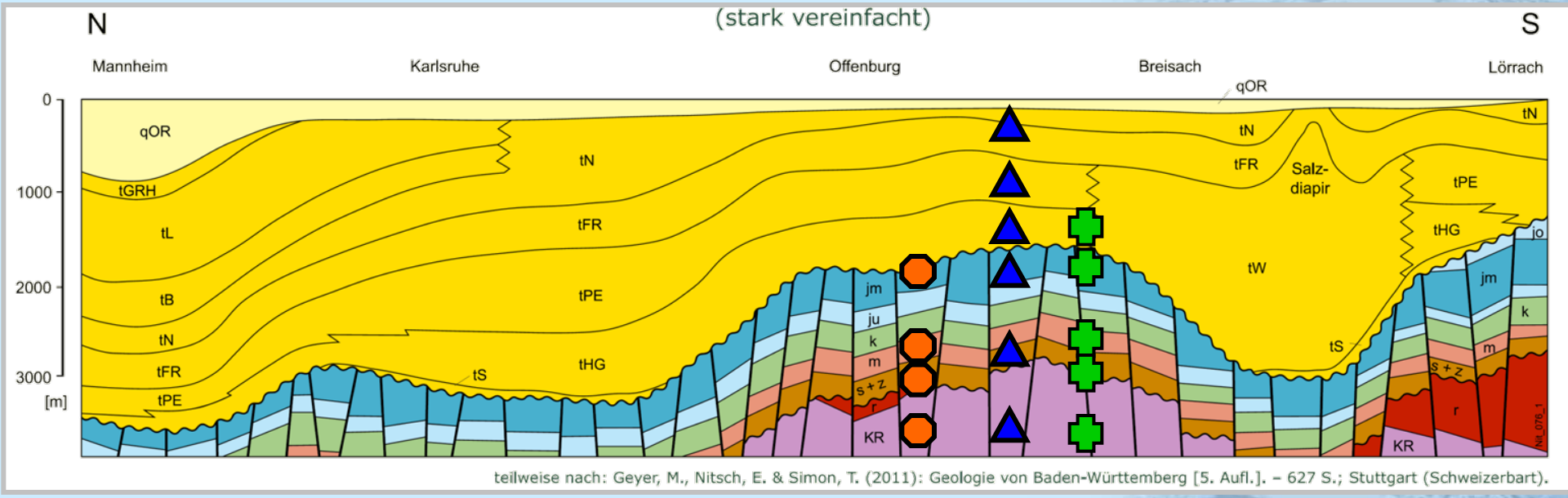
Regional setting



- European Cenozoic rift system
- rift & wrench system



Sedimentation and Geopotentials



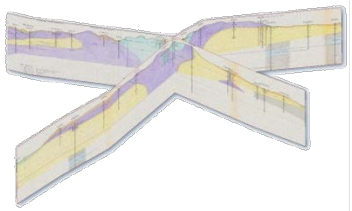
- **Cenozoic graben fill: up 5 km thick**
- **Mesozoic & Paleozoic rocks: varistic basement – Upper Jurassic**

geothermal geopotentials (hydrothermal + hot dry rock)

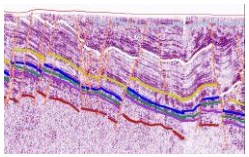
gas storage rocks

mineral waters

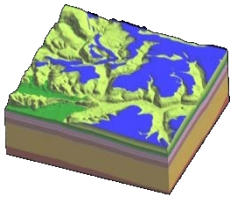
Modeling Workflow



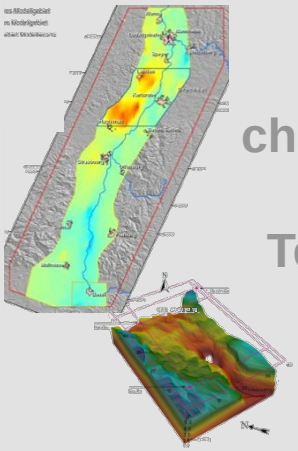
Data acquisition and harmonization



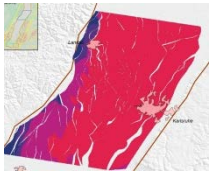
Seismic interpretation



Geological 3D-modeling



Reservoir characteristics & Temperature modeling



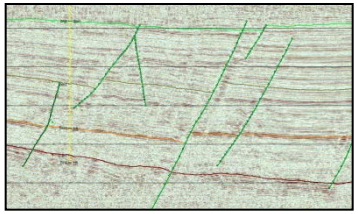
derivation of geopotentials products

Input data & harmonization

wells

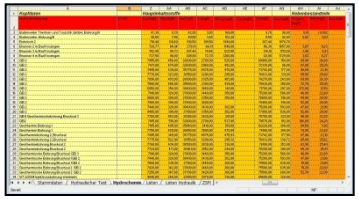
- lithology
- around 2000 wells
- various sources
- nomenclature harmonization

seismic profiles



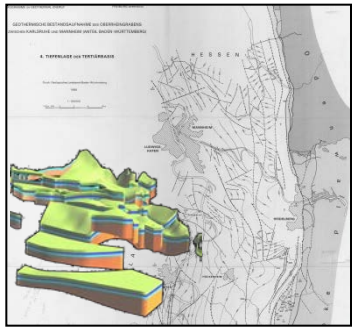
- structural architecture
- 5400km 2d seismic profiles
- oil industry
- digitization
- homogenization
- migration

parameter sets



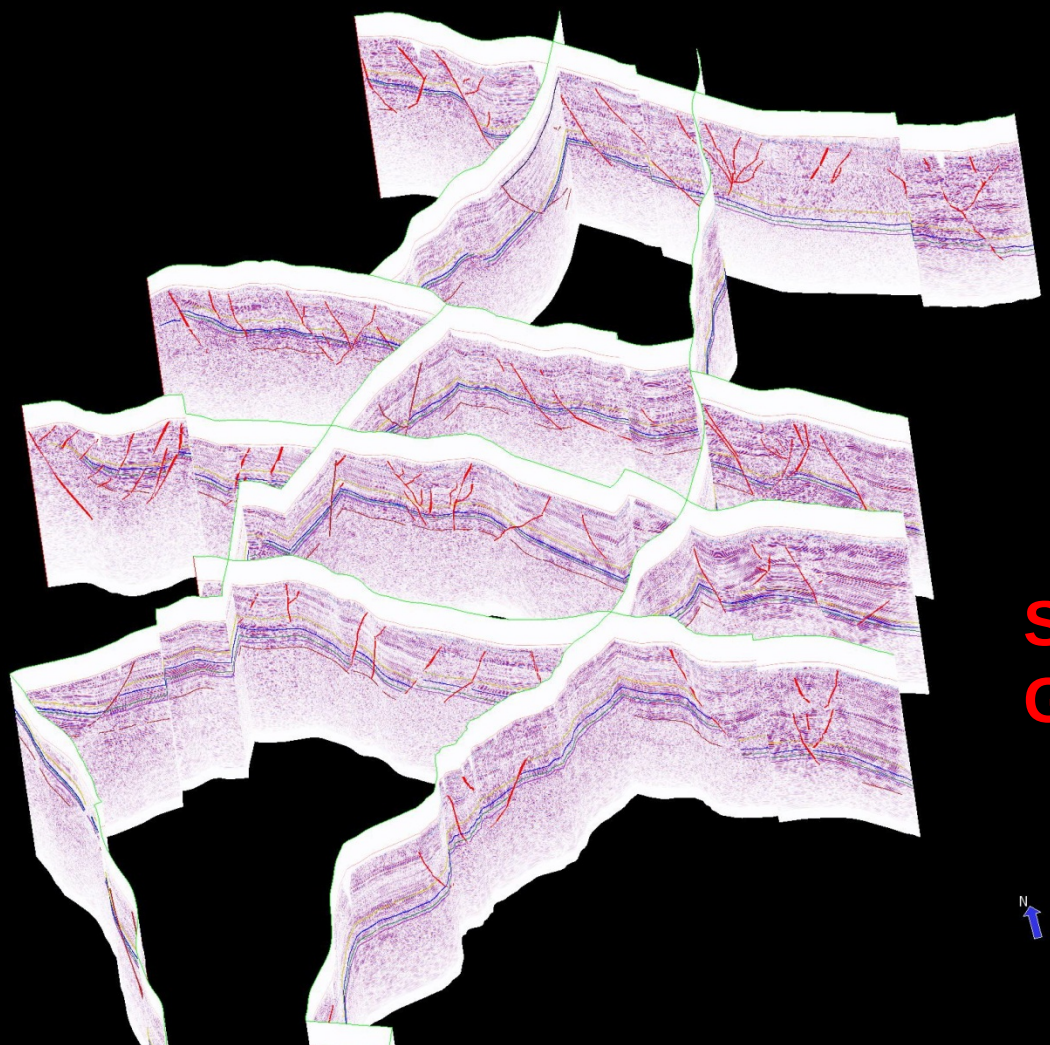
- parameters for hydrogeological/ geothermal characterization
- various sources
- unit harmonization
- corrections etc.

previous projects



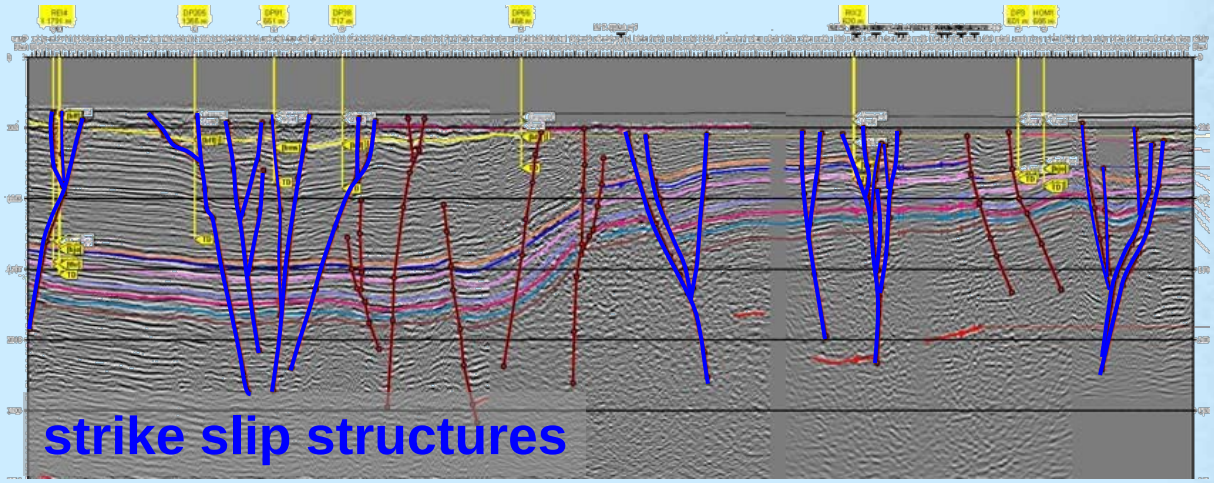
- structural architecture
- various sources
- technical harm.
- nomenclature

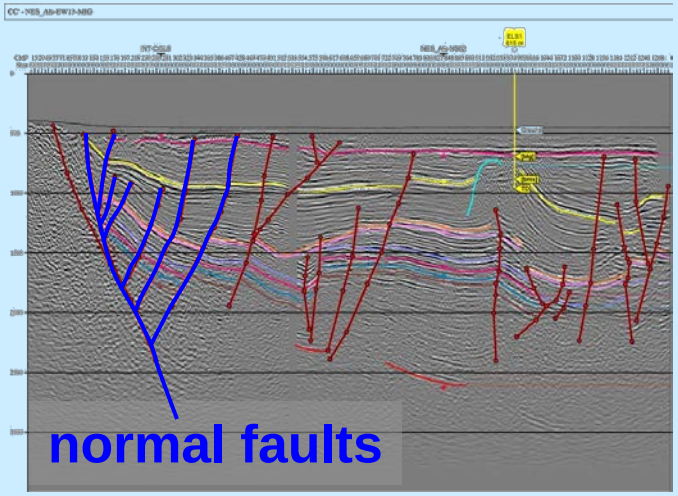
Seismic interpretation

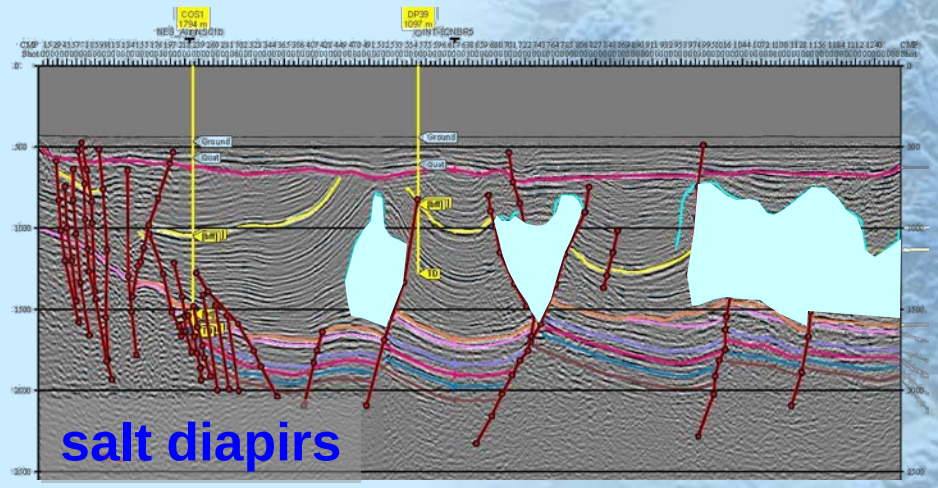


SeisVision
Gocad

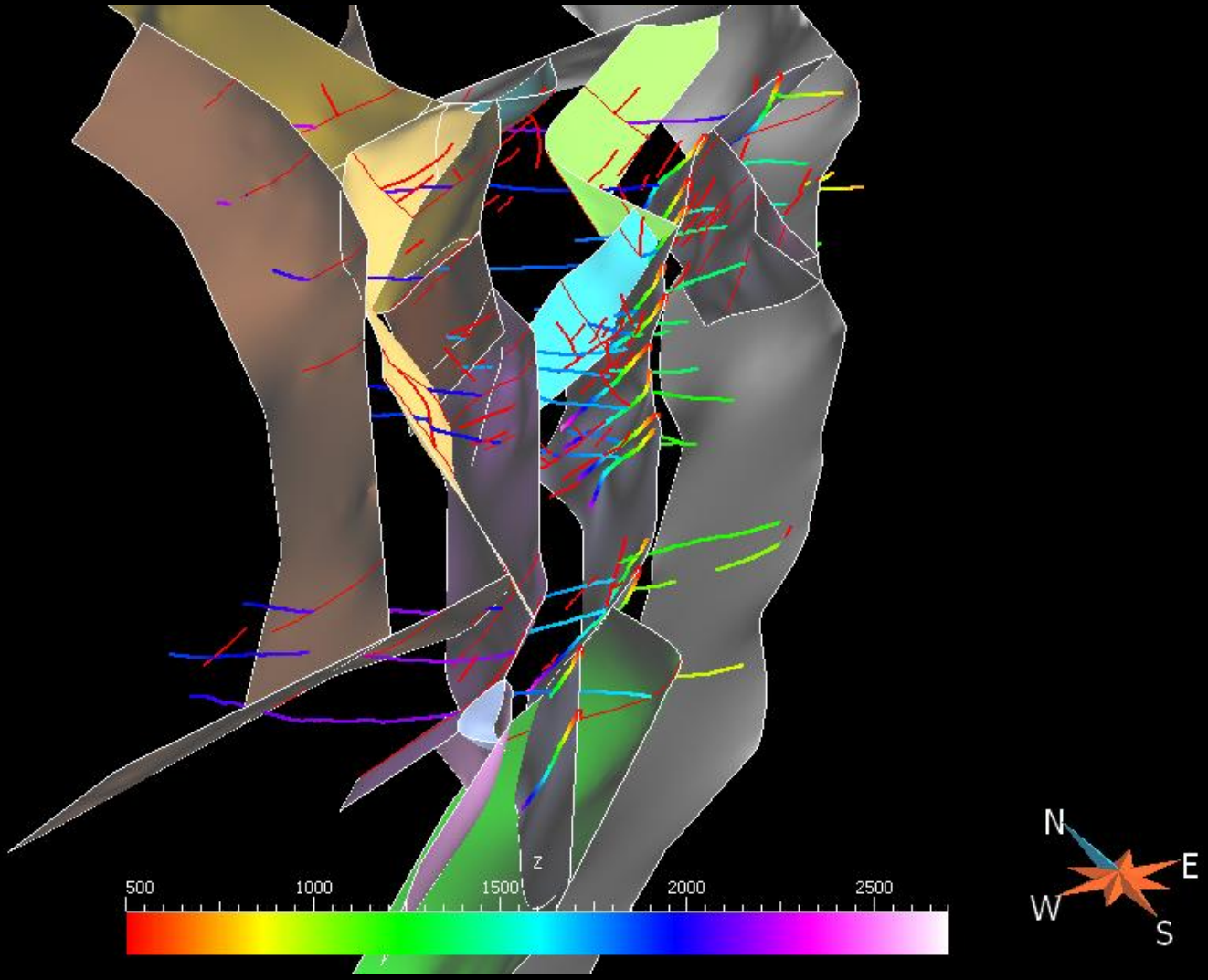
Tectonic structures in seismics



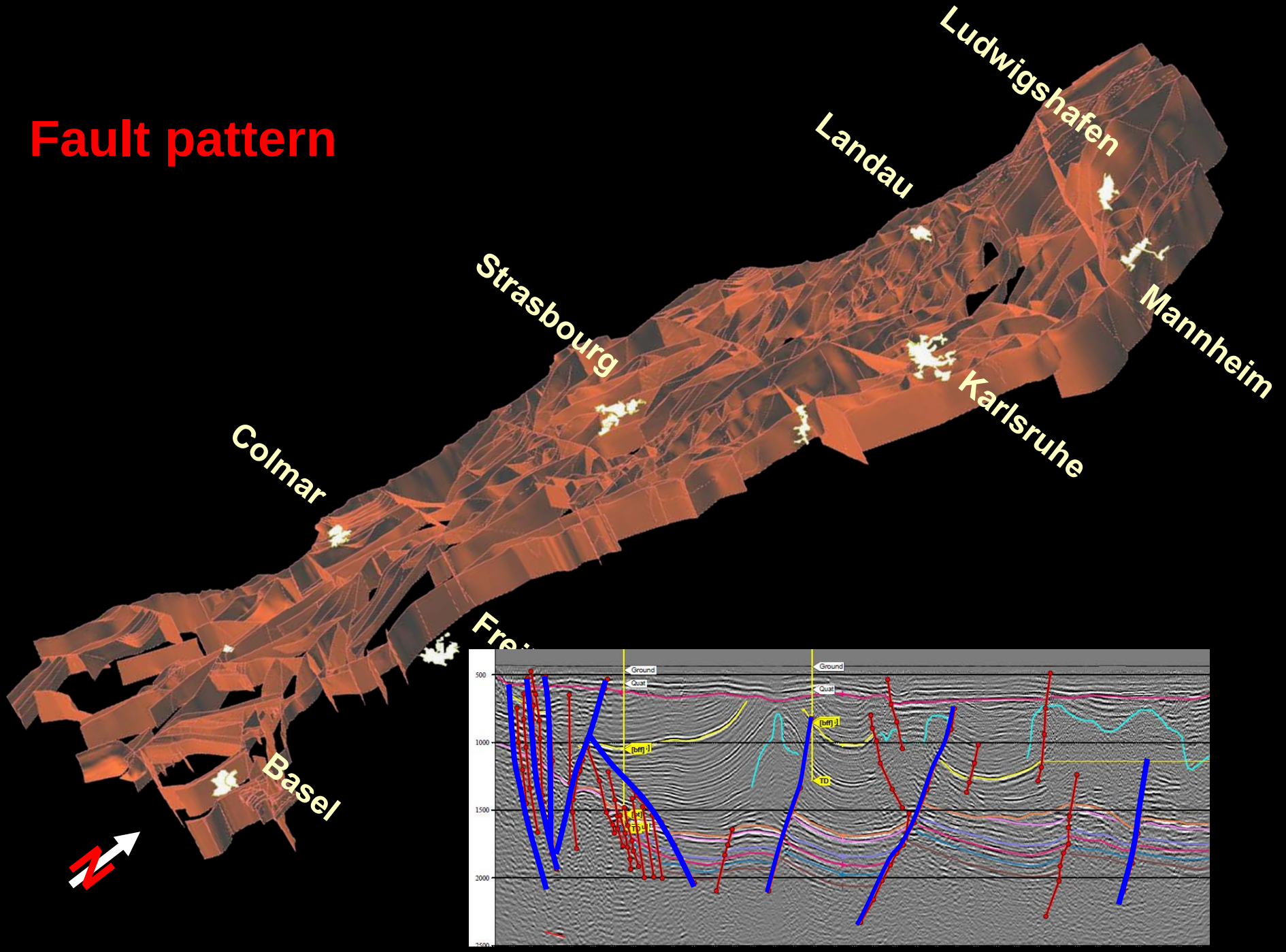


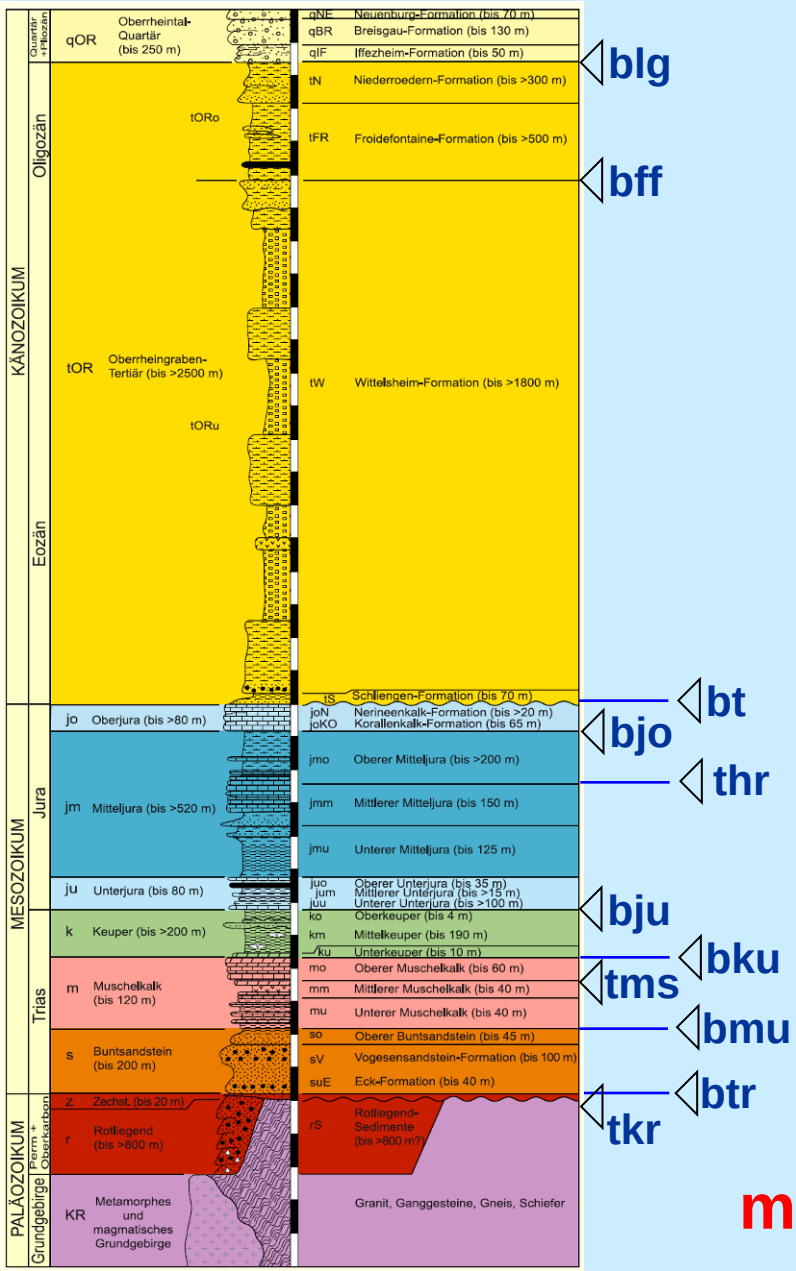


3D-modeling of faults in Gocad



Fault pattern





Horizon modeling (12)

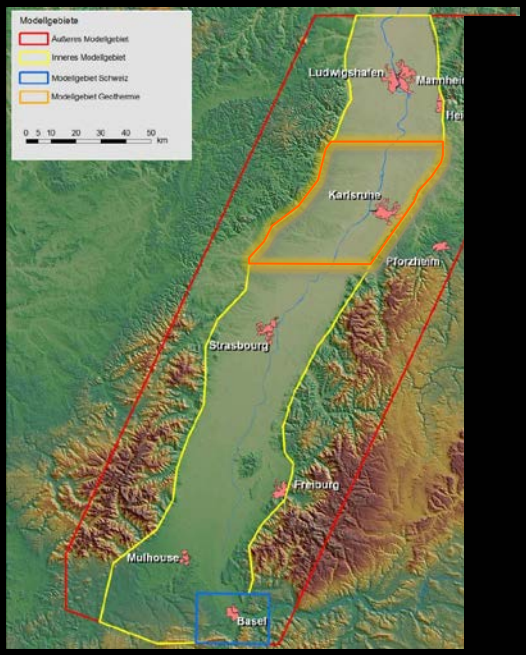
- **Cenozoic horizons (4)**
  - base unconsolidated rocks (blg)
  - base Landau Fromation (bhy)*
  - base Froidefontaine Formation (bff)
  - base Tertiary (bt)

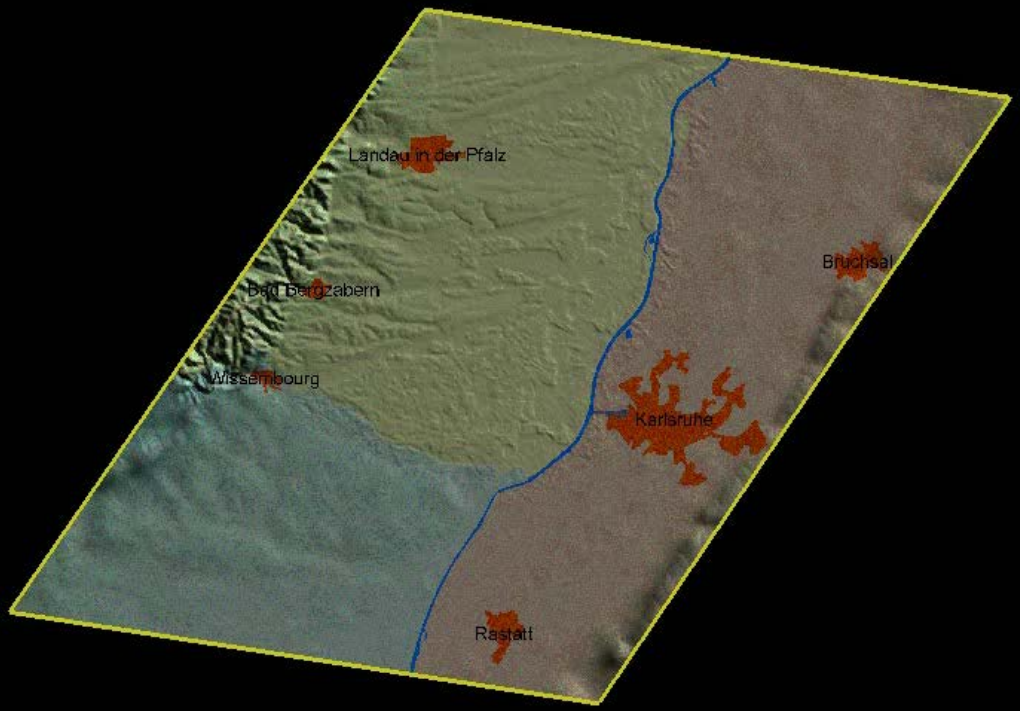
- **Mesozoic / Paleozoic horizons (8)**
  - base Upper Jurassic (bjo)
  - top Hauptrogenstein (thr)
  - base Lower Jurassic (bju)
  - base Keuper (bku)
  - top Muschelkalksalinar (tms)
  - base Muschelkalk (bmu)
  - base Trias (btr)
  - top crystalline basement (tkr)

*: only in the northern part

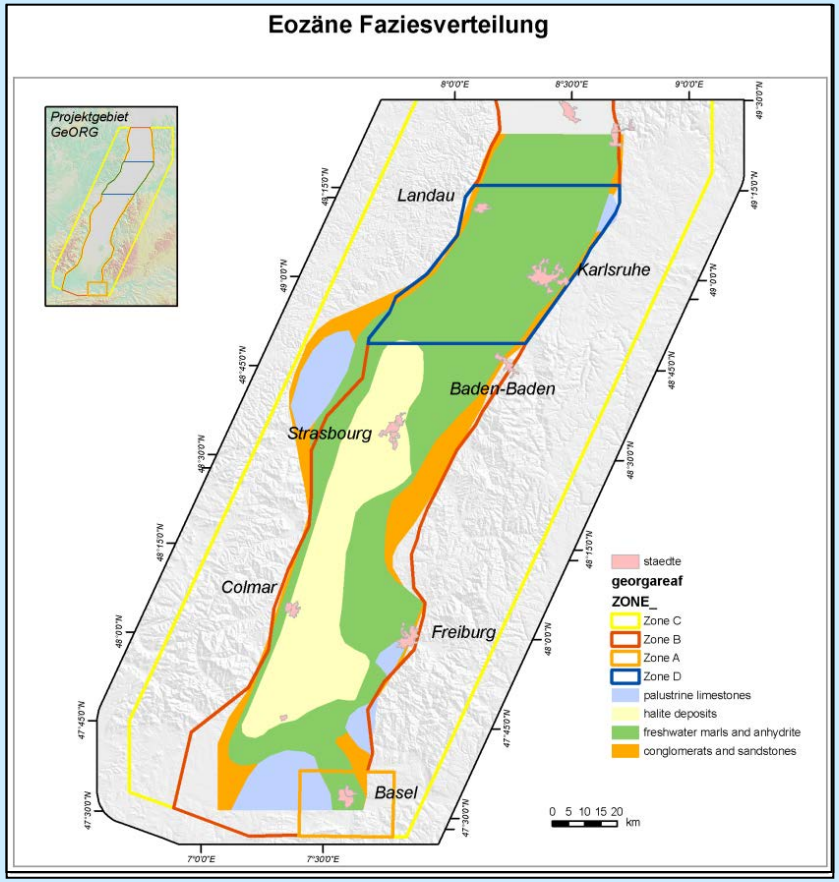
modeling from seismic sections

3D-modeling of horizons in Gocad

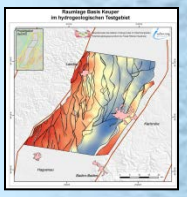
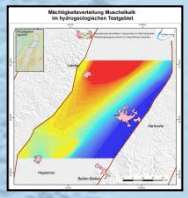




Products – Geological information



Geological information


faciesmaps
isochoremaps

WMS + WFS
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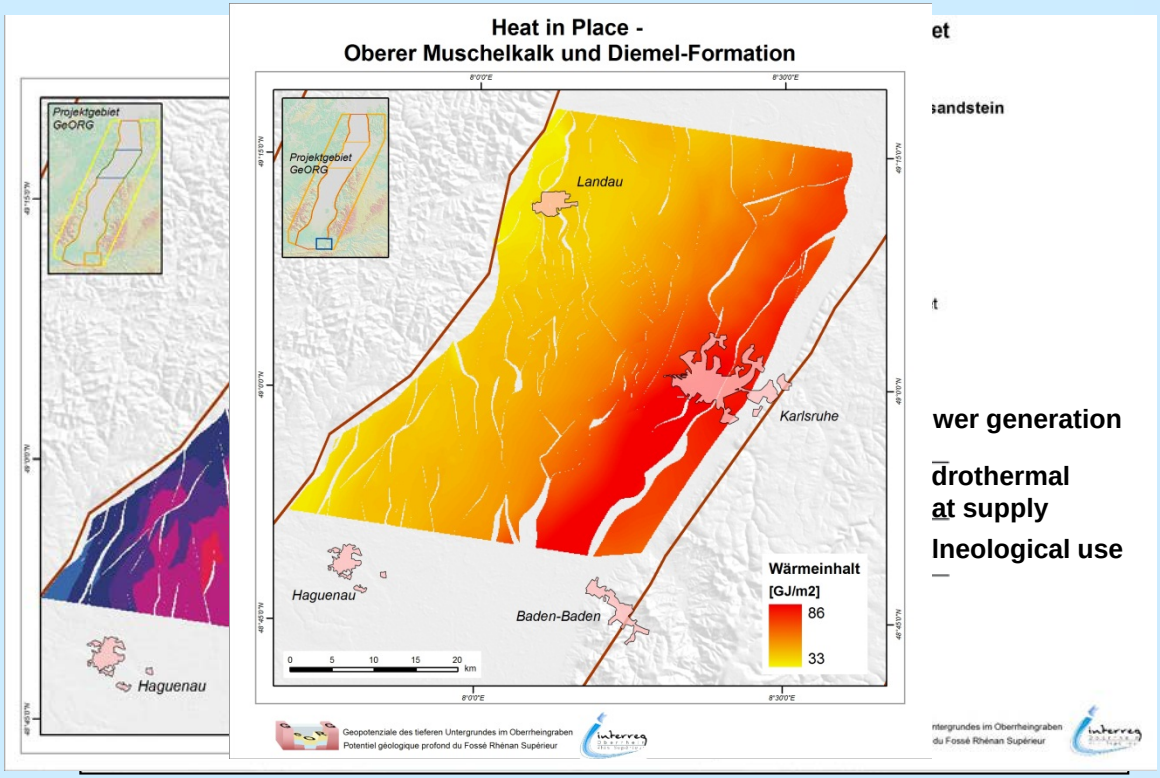
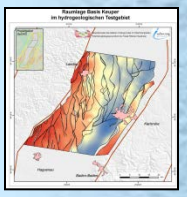
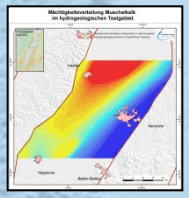
Products – Geothermal potential



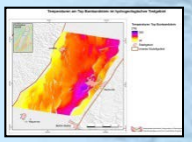
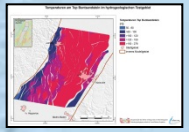
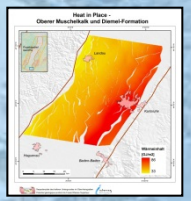
Heat in Place computation

Classification of temperatures

Geological information

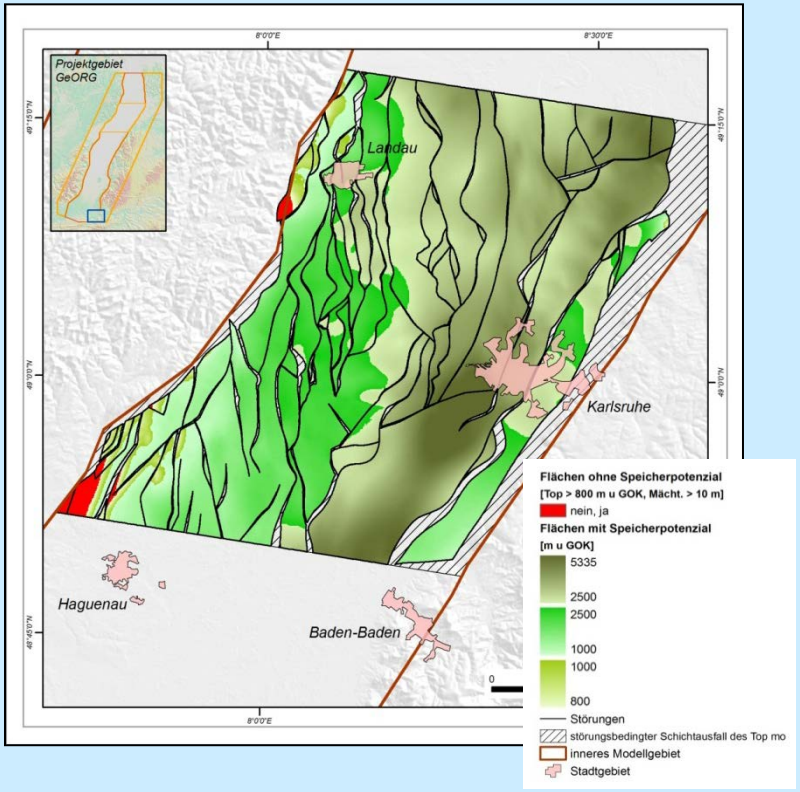




Geothermal potential

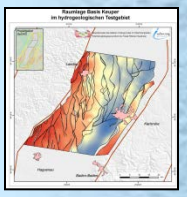
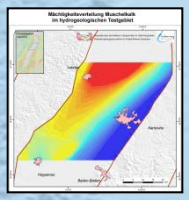




WMS + WFS
Print

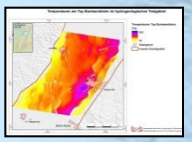
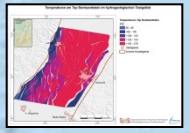
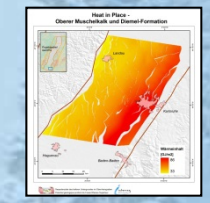
Products – CO_2 storage potential



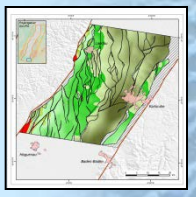
Geological information


Geothermal potential

CO_2 storage potential



WMS + WFS
Print

Further information: www.geopotenziale.eu

GeORG-Poster:
Mapping data & Information systems
Friday h. 9.00 – 13.00

Thank you very much for your attention!

Mille grazie!

Landau 2012