

# Kick-Off Meeting KarboEx2

11. Juli 2024 - Essen

# Vorstellung Team

- > Tobias Meier
- > Subhashish Dey
- > Daniel Bücken
- > 4 Bewerber für Doktorandenstelle
  - > 1 Bewerber in Auswahl
  - > Start Anfang September

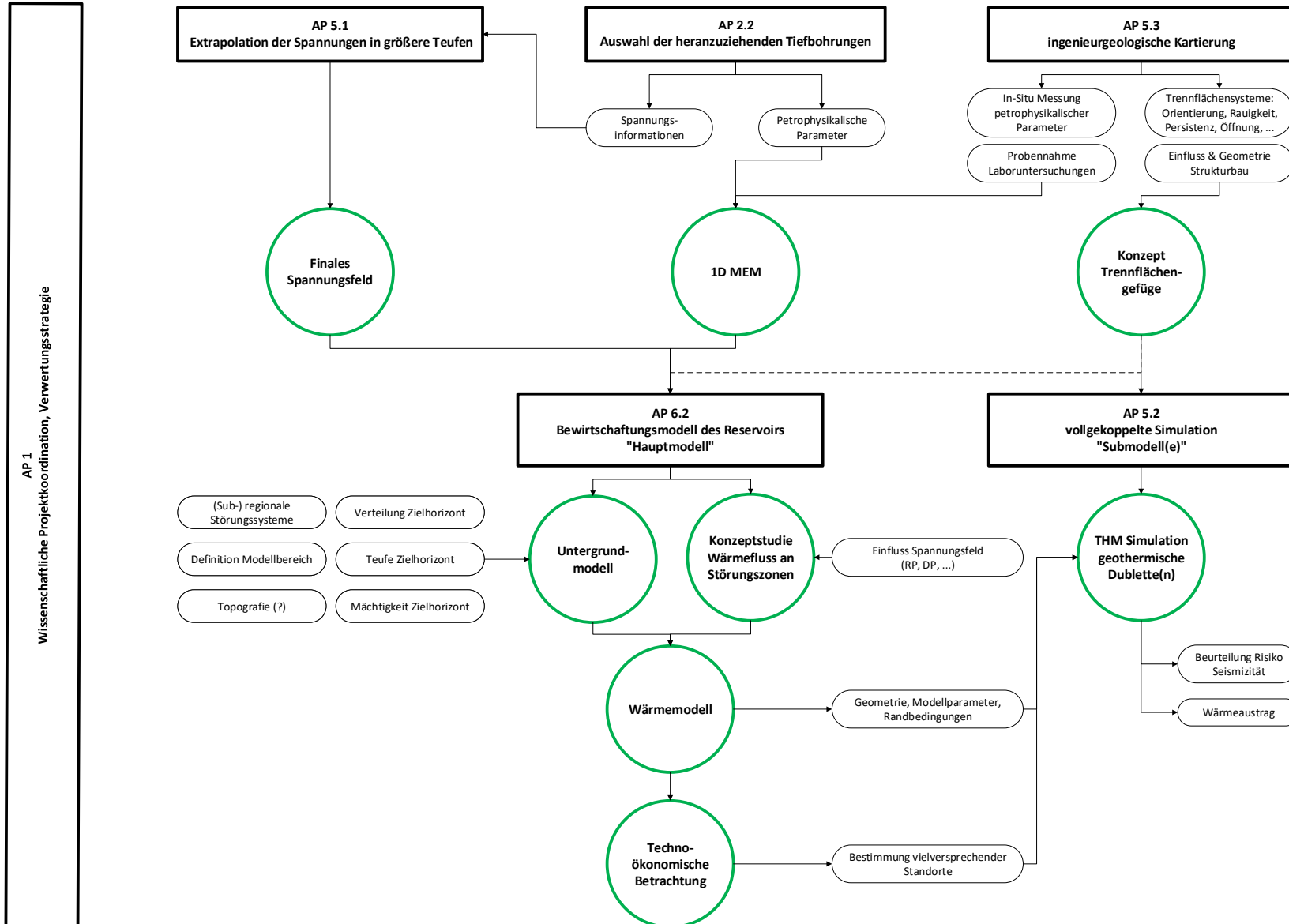


# Vorstellung Arbeitspakete

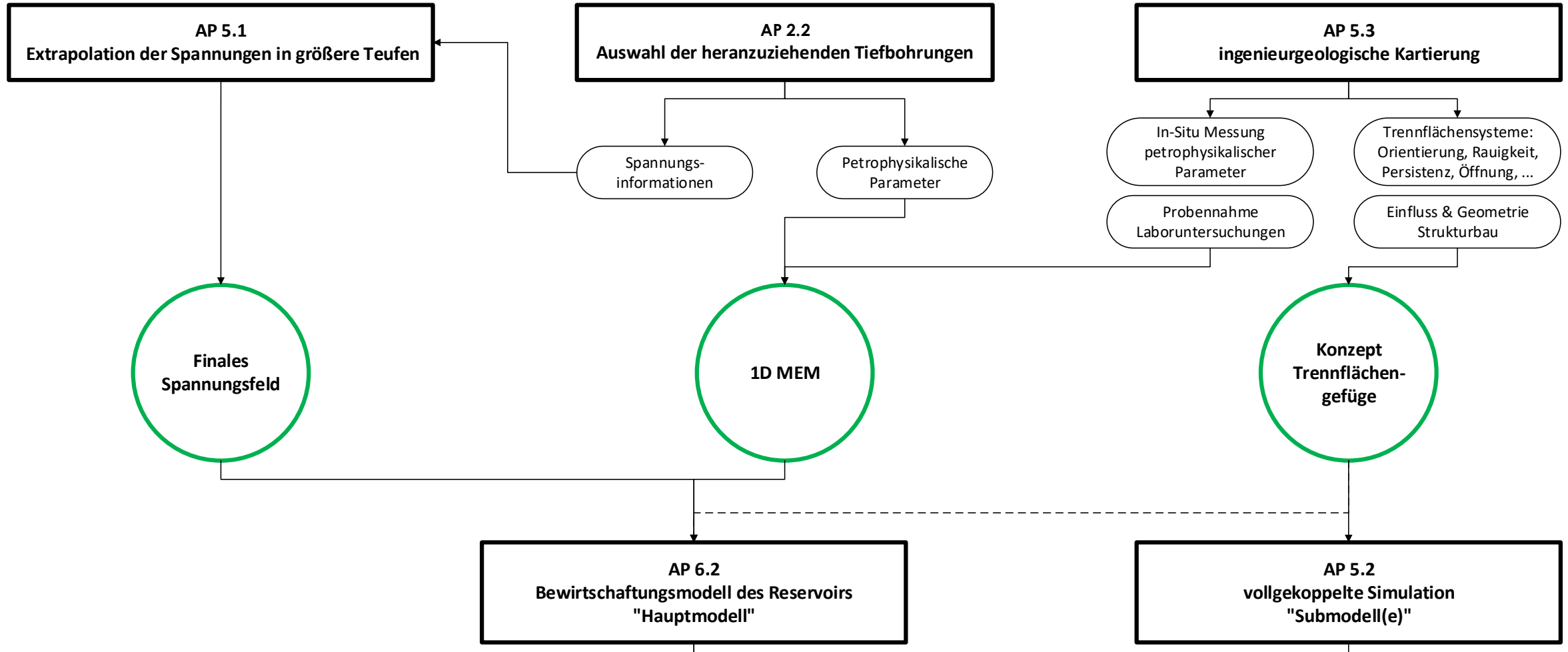
- > Projektkoordination
- > Logo KarboEx2
- > Webseite



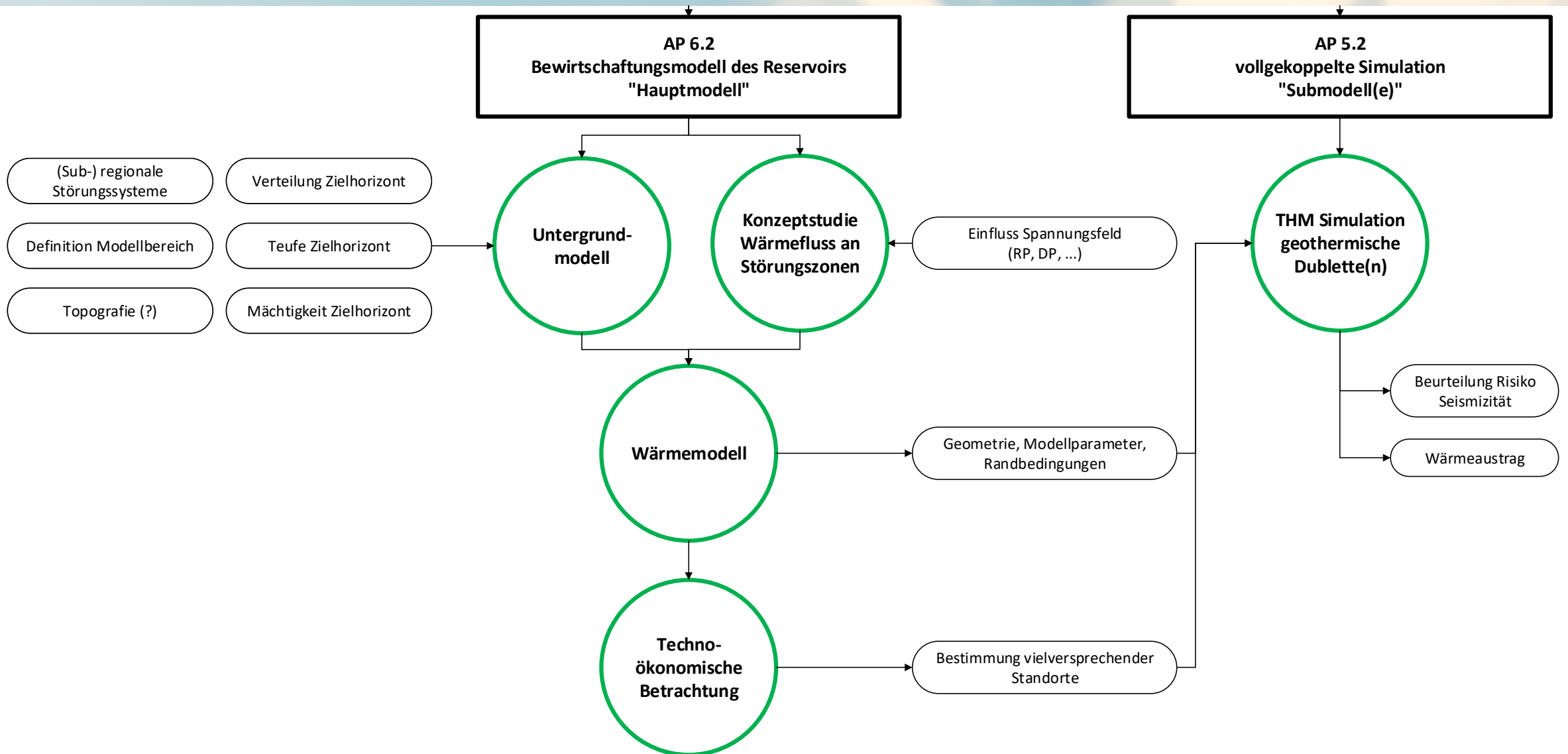
# Projektplan



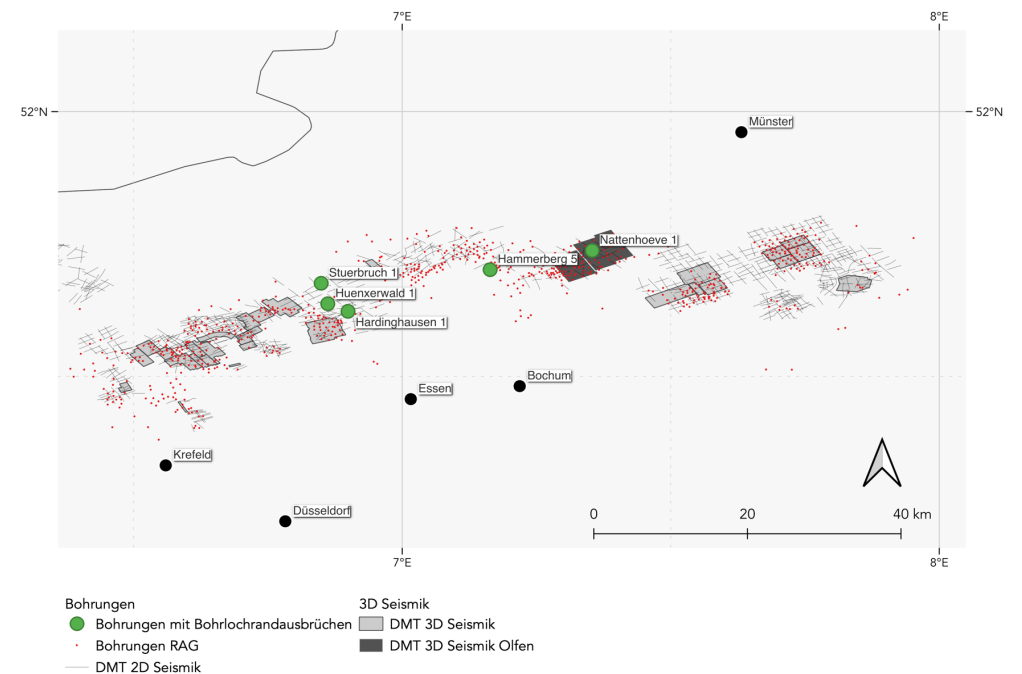
# Projektplan



# Projektplan



- > Auswahl der heranzuziehenden Tiefbohrungen
  - > basierend auf Arbeiten aus KarboEx
  - > Beratung mit GD NRW
  - > Masterplan Geothermie NRW: Bohrung in Krefeld





- > Extrapolation der Spannungen in größere Tiefen
  - > Spannungsindikatoren (Bohrungsdaten, Seismizität,...)
  - > empirische Ansätze & Korrelationen
  - > Literatur

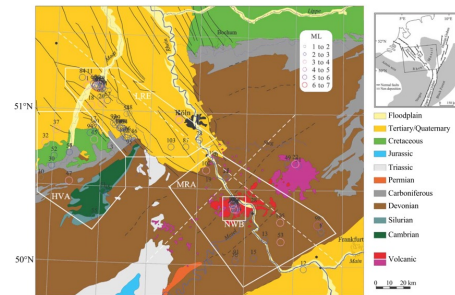


Fig. 1. Simplified geologic map of the area of investigation. The rectangle in the inset in the upper right with an overview of the Rhine Graben system in northwest Europe (after Ziegler, 1982) gives the outline of the large map. Circles show the epicenters of earthquakes used in this study. Symbol labels give the event numbers (s. Table 1). White polygons show four of the analyzed subregions. The dashed white lines indicate the trend of the two profiles shown in Fig. 2.

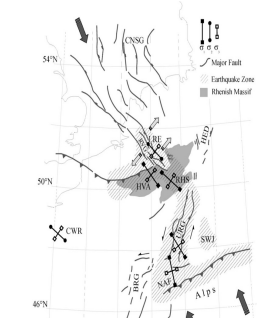
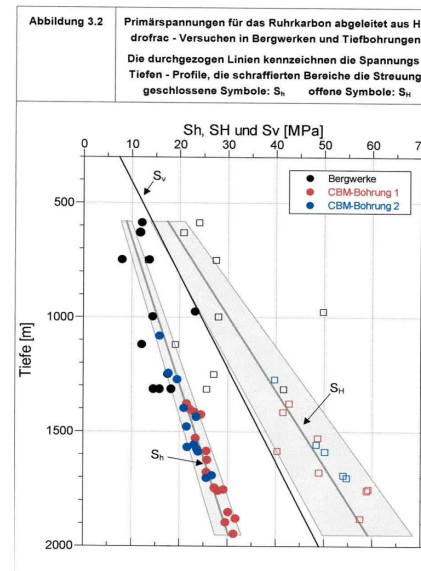


Fig. 10. Orientation of major horizontal stress directions from the inversion of earthquake data plane solutions in context with known tectonic features of the western part of the Central European rift system. Stress orientation data from inversion of the nodal plane solution (NPS) for the Central Graben (CBG) and from Friedel and Siegel (1997) for the central western region (CWR). From Sobotka et al. (1993), and for the Rhine Massif (RM) and Lower Rhine Embayment (LRE) and the Rhenish Massif (RMA) from the study. Abbreviations: CNSG = Central North Sea Graben, SWJ = West Valley Graben, RHD = Rhine Depression, SWJ = Stephan Area, RBG = Rhenish Graben. Tectonic features are modified after Meyer et al. (1997) and Van den Broek (1986).

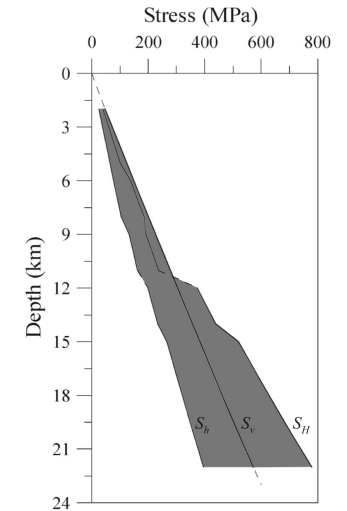
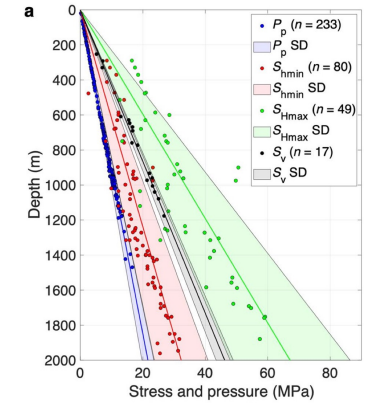


Fig. 17. Magnitudes of vertical, maximum horizontal and minimum horizontal stresses,  $S_v$ ,  $S_H$  and  $S_h$ , respectively, as function of depth.

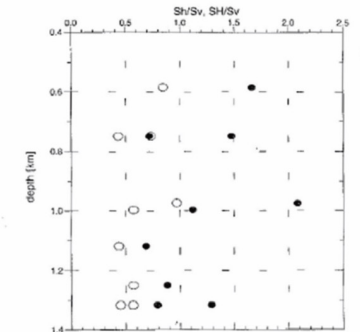
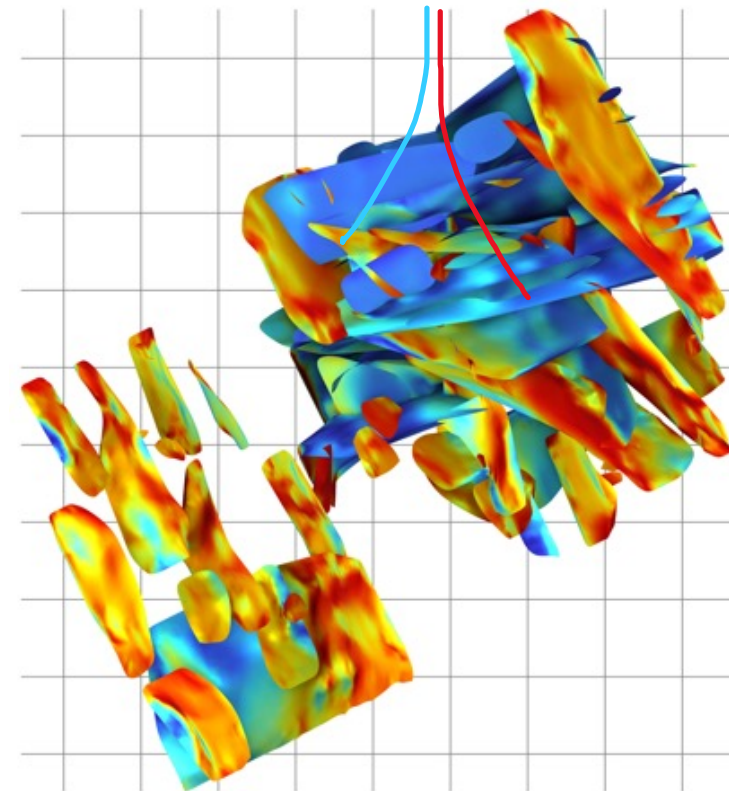


Fig. 12. Principal horizontal stresses  $S_h$  and  $S_H$  as a function of depth in various mines in the Ruhr Carboniferous, normalized with respect to the overburden stress  $S_v$  calculated for a rock density of  $2.5 \text{ g/cm}^3$ . Open symbols  $S_v$ , closed symbols  $S_H$ .

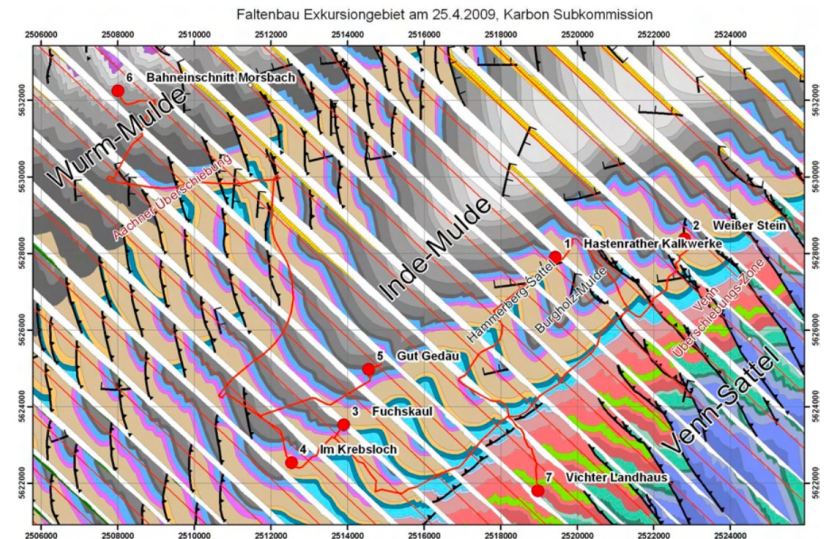
- > vollgekoppelte Simulation "Submodell(e)"
  - > basierend auf AP 6.2 Definition kleinerer, hochaufgelöster Submodelle
  - > volle THM Kopplung
  - > Bestimmung Risiko induzierter Seismizität
  - > Wärmeaustrag



- > Ingenieurgeologische Kartierung
  - > Sommer 2025, NRW & Ostbelgien
  - > Absprache mit GD NRW
  - > Aufnahme Trennflächeninventar
  - > Mögliche in-situ und Laborversuche zur Bestimmung petrophysikalischer Paratemeter, Absprache RWTH und RUB

## Stratigraphie und Fazies des späten Oberdevons und Karbons am Südost-Rand des Brabanter Massivs (Aachen/westlichstes Deutschland und Vesdre-Massiv/Ostbelgien)

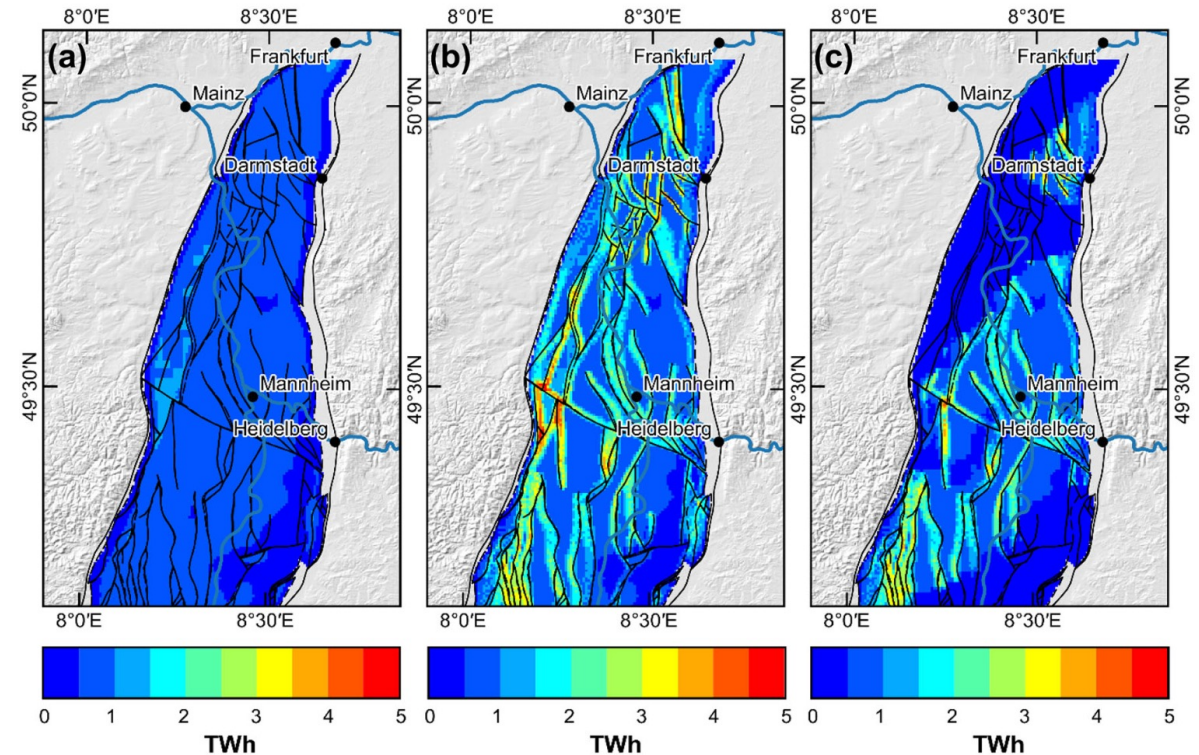
Tagung der Subkommission für Karbon-Stratigraphie  
(Stolberg-Vicht, 25.-26. April 2009)



Zusammengestellt und herausgegeben von  
HANS-GEORG HERBIG & MARTIN SALAMON

## > Bewirtschaftungsmodell Reservoir

- Regionales Hauptmodell
- Techno-ökonomische Betrachtung



Frey, M., van der Vaart, J., Bär, K., Bossennec, C., Calcagno, P., Dezayes, C., & Sass, I. (2023). Techno-economic assessment of geothermal resources in the variscan basement of the northern upper rhine Graben. *Natural Resources Research*, 32(1), 213-234.

- 5.1: Finales Spannungsfeld
- 5.2: THM Dublettenbetrieb
- 5.3: Konzept Trennflächengefüge
- 2.2 & 5.3: Petrophysikalische Parameter
- 6.2:
  - Untergrundmodell
  - Konzeptstudie Wärmefluss and Störungszonen
  - Wärmemodell
  - Techno-ökonomische Betrachtung