

3-D GEOLOGICAL MODELLING OF THE PERMO-CARBONIFEROUS THROUGHGS IN NORTHERN SWITZERLAND

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Context

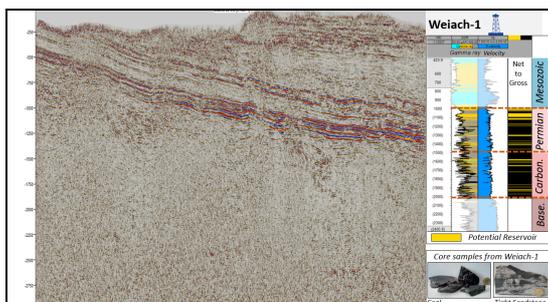
A clear-cut understanding of the nature and evolution of subsurface geological structures is critical for successful geo-energy-related prospecting. The nature and structural characteristics of most Late Paleozoic basins in the Northern Alpine Foreland related to the Post-Variscan orogeny are typically uncertain and often poorly constrained. This arises from the complexity of their deep structure buried by thick Mesozoic and Cenozoic sediments, coupled with the masking effect of the younger tectonic events and the scarcity of boreholes penetrating the entire interval down to the crystalline basement. Fortunately, the Weiach-1 borehole penetrating one of these grabens reveal the potential for source rock and tight reservoir units. Migration of hydrocarbons from these grabens may pose a danger for geothermal exploration and geological storage targeting the younger basin series. Hence, the proposed MSc thesis seeks to constrain the geometry and internal architecture of Pre-Mesozoic Grabens in Northern Switzerland.

Objectives and Methods

This project aims at reconstructing a robust 3-D geological model of the Permo-Carboniferous grabens in the Northern Switzerland area. A grid of 2-D seismic profiles, borehole data and gravity data is available for this purpose. Classical seismic interpretation and seismic geomorphology technique constrained by a robust seismic attribute workflow, geological modelling and inversion of gravity data will aid in reconstructing the 3-D structure of the graben. Emphasis will be placed on analysing the internal facies of these grabens to understand the nature of the graben-fill. Ultimately, a 3-D conceptual geological model enacting the evolution of the graben based on the observed structural styles and deformation phases will be constructed.

Literature

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- Eruteya, O.E., Omodeo-Salé, S., Guglielmetti, L., Moscariello, A. (2019). New insights into the configuration of Permo-Carboniferous Grabens in St Gallen, Northern Switzerland and its Implication on Geo-Energy Prospectivity. *AAPG European Regional Conference 2019, Vienna (Austria)*



WEB sites

<http://unige.ch/ge-rgba>

This MSc project is part of a larger research programme known as UNCONGEO sponsored by the Swiss Confederation and several Cantons. The successful candidate will be invited to participate to meetings with the research partners, national and international conferences, which will help to build his professional network.

Choice of orientation : (supprimer les orientations qui ne conviendraient pas)

- 1) Sedimentary, Environmental and Reservoir Geology