



New insights into Triassic salt structure evolution in the Central German North Sea sector

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This study is part of a comprehensive new interpretation of seismic data from the Central German North Sea sector. It was carried out within the scope of the project “Subsurface Potentials for Storage and Economic Use in the North German Basin” (German acronym TUNB, www.bgr.bund.de). The main goal was to enhance the understanding of the Triassic geological development of the German North Sea by detailed seismic reinterpretation of several hundred 2D seismic lines and a few 3D seismic datasets.

The subsurface of the Central German North Sea sector is characterized by a complex sequence of tectonic events that span from the Permo-Carboniferous initiation of the Southern Permian Basin to the present day. The Triassic period is one of the most prominent stratigraphic intervals in this area due to alternating phases of relatively tectonic quiescence and intense tectonic activity accompanied with the development of grabens, the initiation and main activity phase of halotectonic activity, various regional and local erosional events as well as strong local and regional changes in basin subsidence over time.

The scientific work in this region in recent years was focused on paleogeographic studies and the development of comprehensive well based stratigraphic correlation. This precursor work gave us the opportunity to develop a new and detailed seismic stratigraphy for the Triassic over almost the entire central basin. This new seismic-stratigraphic concept was used to interpret most formations of the German Triassic resulting in an, compared to the rest of the Central European Basin, unique regional seismic subdivision of the Triassic.

Our results (depth and thickness maps for every seismic unit and geological cross-sections) provide new insights on the structural evolution of the study area in the Triassic, especially on the interaction of rifting, subsidence and halotectonics. However, it also raises new questions, e.g. on the evolution of the Horn Graben, as one of the major Triassic rift-structures in the North Sea. We will show aspects of strong tectonic subsidence in the Horn Graben in the Lower Triassic ($\gg 1000\text{m/ma}$) and after a relatively short phase of tectonic quiescence in the Upper Lower Triassic the initiation of salt-structures. In parts of the study area, halotectonic movements started in the Triassic, earlier than previously proposed.