



Reexamination of the geological structure of the North German Basin in Lower Saxony

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The North German Basin (NGB), as part of the Southern Permian Basin in Europe, extends from the North Sea, across Denmark, the Netherlands through Northern Germany, to Poland. It contains sediments from the Lower Permian to the Quaternary, and experienced a minimum subsidence of 2000 m from the Permian to the Mesozoic. This was followed by uplift during Late Cretaceous–Early Cenozoic inversion.

The hundreds of meters thick and mobile Zechstein salt of Late Permian was remobilized in several phases to form complex salt structures. The salt moved laterally and vertically thus creating salt pillows and tall asymmetrical salt diapirs, some of which broke through the overburden until they were exposed at the paleo-surface. Salt structures influenced both the sedimentation and structural style throughout the NGB.

Within the joint project TUNB (Deeper Underground North German Basin), 2-D/3-D seismic datasets, borehole data, structural maps and the existing 3-D geological model of Lower Saxony, will be used to create a new, detailed, geological 3-D model of the Lower Saxony part of the NGB. This allows new insights into the interplay between salt tectonics, sedimentation and tectonic movement, and in particular may help to resolve issues regarding the influence of the Zechstein salt on the sediment distribution.

We show the different structural styles of important reservoir formations for, e.g., hydrocarbons, geothermal energy and gas storage, such as the Middle Buntsandstein, Rhaetkeuper, Middle Jurassic, and Lower Cretaceous, especially related to salt structures.