



3D structural model of the Central European Basin System (CEBS)

Y. Maystrenko, U. Bayer, M. Scheck-Wenderoth

GeoForschungsZentrum Potsdam, Telegrafenberg, 14473 Potsdam, Germany

A recently constructed 3D structural model of the CEBS covers the entire Northern and Southern Permian Basins including main post-Permian structural elements. The model includes six layers from the base of Upper Permian (Zechstein) to the present-day sea level. The layers of the model are following: sea water, Cenozoic, Cretaceous, Jurassic, Triassic and Upper Permian (Zechstein).

The Cenozoic is characterized by strong thickening (up to 3.5 km) within the central part of the North Sea. The thickest Cenozoic is observed within the Westholstein Trough of the Glueckstadt Graben where it reaches up to 5 km. Thickening of the Cenozoic within the Carpathian fore deep is more than 3 km and is closely related to the subduction under the Carpathians.

The thickness of the Cretaceous shows the distribution of sediments preserved after the Late Cretaceous-Early Tertiary inversion which has caused erosion of sediments along the Tornquist Zone. Additionally, the entire southern margin of the CEBS represents an erosional surface. The North Sea area is characterized by thick Cretaceous within the Moray Firth Basin, Central and Viking grabens. This is partially due to the presence of thick syn-rift Lower Cretaceous deposits.

The distribution of Jurassic sediments is very complex within the CEBS. This is especially obvious within the North Sea and surrounding areas where Jurassic sediments are present only within the graben structures. The rest of the North Sea area is characterized by very thin Jurassic cover or even absence of sediments. This complex pattern of the Jurassic is due to the Middle-Late Jurassic uplift and the Late Cretaceous-Early Tertiary inversion. The Lower Saxony Basin is characterized by a ESE-WNW striking

zone of thick Jurassic deposits with a maximum thickness between 3 and 3.9 km. A broad zone of thickened Jurassic is prominent within the Polish Basin.

The Triassic shows three centres of sedimentation in the Norwegian-Danish Basin, the Horn and the Glueckstadt grabens which are separated by the Ringkøbing-Fyn High. The thickest Triassic sediments are observed within the Glueckstadt Graben where they reach more than 9 km. The Sole Pit Basin, the Central Graben and the Rheinsberg Trough show minor thickening compared with the previously described areas. The deposition of thick Triassic sequences is a result of several pulses of extension in the Triassic.

The thickness of Upper Permian (Zechstein) reflects the present-day distribution of Zechstein salt which was mobilized during several phases of salt tectonics within the CEBS. The thickest Permian salt is present within salt walls and diapirs reaching up to 9 km in height within the deepest parts of the CEBS, such as the Fjerritslev Trough, the Polish Basin, the Central, the Horn and the Glueckstadt grabens.

Future work will focus on the 3D structural reconstruction of the CEBS development from Late Permian time until present-day.