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Surface Modeling as a Tool for Reconstruction of the Palaeogeography in the Carpathian Foredeep (SE Poland)

The Carpathian Foredeep is one of the most important areas of petroleum exploration in Poland. During the Miocene time in the area of the present Eastern Polish Carpathians Foreland the foredeep basin existed which was created due to loading of the overthrusting Carpathians. Before this episode the area was intensively eroded. The Palaeogene morphology was sharp, diversified and it had an important influence on sedimentation of the Miocene sequences.

Reconstruction of Miocene palaeomorphology in the Carpathian Foredeep seems to be possible due to dense grid of seismic lines. On the basis of the seismic and well data the map of the present top of the sub-Miocene surface was constructed. The present authors due to surface modeling procedure uplifted this area by burial value caused by the overthrusting Carpathians. The surface resulted from this operation was the pre-Miocene image in the Late Palaeogene. The maximum height amplitude exceeded 2000 m and depth of valleys reached 1000 m. Such differentiation had to influence on the architecture of sediments infilling space of accommodation. The surface modeling procedure enabled to follow step by step the burial phenomena of the foredeep and observe the evolution of palaeogeography. Palaeomorphological images resulting from such procedure give the rise to speculations on the sedimentological conditions in the Carpathian Foredeep and formation of the lithological traps for gas.