

Upper Cretaceous depositional systems in the NE part of the Polish Basin (NE Poland) - new insight based on seismic data

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The study area located in NE Poland (vicinity of Gdańsk) belonged to a peripheral part of the Permo-Mesozoic Polish Basin. The Polish Basin underwent complete inversion in Late Cretaceous–Palaeogene times. Upper Cretaceous succession of the Polish Basin is characterized by numerous local unconformities and progradational patterns, usually associated with uplifted and eroded axial parts of the basin (KRZYWIEC et al., 2009) or compressionally reactivated salt structures (KRZYWIEC, 2006). The Upper Cretaceous succession of NE Poland is represented by the siliciclastic shelf system covered by pelagic carbonates. The Cenomanian–Santonian is represented mostly by sandstone, muddy(silty)-sandy-marly and muddy(silty)-marly facies. The Campanian–Maastrichtian is dominated mainly by carbonate-siliceous and sandy carbonate facies; gaizes (carbonate-siliceous rock containing detrital quartz and sponge spicules) are more common there. Increase of terrigenous quartz content and occurrences of lydites within the Upper Cretaceous succession are observed towards the North.

The Upper Cretaceous succession in N Poland was recently imaged by regional high-end seismic survey PolandSPAN. It is characterized by a large-scale (approx. several hundreds of meters thick) clinoforms prograding generally from the North and characterized by sigmoidal to oblique pattern. Other identified seismic stratigraphic features include numerous local unconformities underlined by reflection terminations such as toplap, downlap and onlap. Overall depositional progradational architecture with the main direction of progradation from the North towards the South indicates that the Upper Cretaceous deposits in N Poland did not develop due to inversion and uplift of the axial part of the Polish Basin i.e. due to formation of the Mid-Polish Swell that is located SW from the study area. Instead, development of the Upper Cretaceous sedimentary cover must have been related to uplift, exposure and pervasive erosion of the area located generally in the North, within the present-day Baltic Sea. Proposed model of development of syn-tectonic Late Cretaceous succession would be then similar to a model developed for the Late Cretaceous sedimentation for the offshore area located S from the Bornholm Island (KRZYWIEC et al., 2003).

ION Geophysical is thanked for providing seismic data for this study that was completed within the NCN grant No 2015/17/B/ST10/03411.

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