**The Late Cretaceous tectono-sedimentary evolution of northern Poland – study based on regional seismic data**


## ABSTRACT

The aim of this PhD dissertation, based on two articles published in peer-reviewed journals, was to formulate a coherent model of the Late Cretaceous tectono-sedimentary evolution of the northern part of the Polish Basin, by integrating geological and geophysical data. Detailed seismostratigraphic interpretations, carried out in northern Poland, were based on regional geo-seismic transects, consisting mainly of unique, high-resolution, regional seismic profiles of the PolandSPAN™ seismic survey, calibrated by geophysical, stratigraphic and lithological data from several deep boreholes. The Upper Cretaceous succession (including the upper Albian) was divided into 5 seismostratigraphic units; then seismic facies were characterized. One of the key results is a new interpretation of the Upper Cretaceous depositional architecture of the study area. So far, the Upper Cretaceous in the study area has been analyzed almost exclusively using unevenly distributed boreholes. Only occasionally its analyzes were supported by seismic profiles. As a result, regional mapping of the Upper Cretaceous succession above the basement of the East European Craton was commonly based on the classic, layer-cake model, assuming simple correlations of stratigraphic divisions between boreholes, usually maintaining their constant thicknesses. Interpretation of data from the PolandSPAN™ survey revealed a hitherto unknown mid-Cretaceous regional unconformity, clinoforms and other seismic features (lateral thickness changes, numerous local discontinuities and erosional incisions) incompatible with the previously used model. As a result of the conducted analyses, a new tectono-sedimentary model of the Late Cretaceous evolution of the shelf basin of northern Poland was proposed. Two systems of contour currents (N–S and NW–SE) were identified, which developed along the edges of structures formed in the Late Cretaceous – Palaeogene. The development of the mid-Cretaceous regional unconformity revealed by the PolandSPAN™ data has been tentatively linked to progressive lithospheric buckling during sub-Hercynian tectonic movements.



**Keywords:** regional seismic data, seismic stratigraphy, bottom currents, depositional architecture, tectono-sedimentary model, inversion tectonics, Polish Basin, Mid-Polish Anticlinorium, Upper Cretaceous.