

provide detailed information on structural and sedimentary features related to these processes. To study Carboniferous fold-thrust belt in the basement of Wielkopolska (Variscan externides), an analysis of directional data acquired with six-arm dipmeter from c. 40 exploratory petroleum wells has been undertaken. The preliminary results revealed that the dominant structural trends related to the latest stages of inversion of external Variscan basins present within the basement of the Fore-Sudetic homocline are NW-SE to WNW-ESE, that is the same as in the West Sudety Mts. The folds are recumbent, NE-verging structures, with local axial-plane cleavage. Their recumbent attitude is probably due to late tilting on a slope of the uplifted Leszno-Wolsztyn basement high. Apart of well data, also cores could be very effectively used for studies of development and inversion of sedimentary basins. Sedimentological and structural studies of cores from c. 20 wells provided new information of various aspects of development of the Variscan externides. The preliminary results have revealed a relatively intense deformation of the Carboniferous succession in the south of the area and its considerable decrease towards the north. The inversion of the southern part of the basin involved thrust tectonics, as confirmed by extensive stratigraphic duplications. On the other hand, the Carboniferous rocks in the northern part of the basin bear no clear evidence of thrusting and tight fold-

ing. The contrasting tectonic styles observed in the southern vs northern parts of the Carboniferous basin may reflect a transition from the overthrust Variscan accretionary prism to the fore-land basin only weakly deformed under transpressional regime. According to preliminary palaeontological data, the final inversion of the Carboniferous basin seems to have taken place not earlier than in the Late Westphalian. It may overprint, however, effects of the previous deformation events that are suggested by the presence of a stratigraphic gap between the Namurian A and Westphalian in the southern part of the basin.

Apart from geophysical data and cores also outcrops could provide important data necessary for better understanding of formation and inversion of sedimentary basins. Recently completed outcrop studies of selected formations from the Moravo-Silesian segment of the Variscan externides proved that they were subjected to at least four or three stages of deformations.

Acknowledgements

P. Aleksandrowski, L. Kurowski and S. Mazur (Wrocław University), J. Gutowski and S. Wybraniec (Polish Geological Institute), as well as S. Strzyżewska-Konieczna and J. Żaba (Silesian University) are thanked for providing results of their work that were incorporated in this paper.

Late Cretaceous Strike-slip Tectonics and Sedimentation within the SW Baltic Sea and Their Relationship to the Inversion of the Mid-Polish Trough

Piotr KRZYWIEC¹ and Regina KRAMARSKA²

¹ Polish Geological Institute, ul. Rakowiecka 4, 00-975 Warsaw, Poland

² Polish Geological Institute, Marine Geology Branch, ul. Kościarska 5, 80-328 Gdańsk, Poland

The SW Baltic Sea occupies area where crustal-scale regional tectonic zones of different age merge and overlap, creating a complex tectonic pattern (Fig. 1). This pattern influenced the evolution of the Mesozoic sedimentary basin in this area. Interpretation of new high-resolution seismic data from the SW Baltic Sea provided new information both on modes of the Late Cretaceous inversion of this part of the Danish – Polish Mesozoic basin system as well as on relationship between tectonic processes and syn-tectonic depositional systems (Kramarska et al., 1999; Krzywiec et al., 2002). Within the Bornholm – Darłowo Fault Zone, located between the Koszalin Fault and Christiansø Block, both strike-slip and reverse faulting took place during the inversion-related activity. The faulting was related to reactivation of extensional pre-Permian fault system. Syn-tectonic sedimentary features include a prominent,

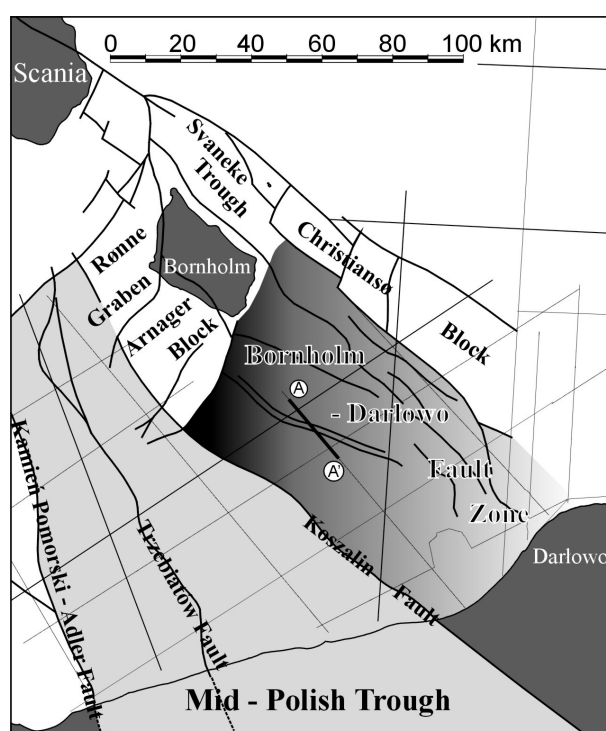


Fig. 1. Tectonic map of the Bornholm – Darłowo Fault Zone (according to Kramarska, Krzywiec & Dadlez, 1999, modified and supplemented). Thin lines: shallow high-resolution seismic lines, A – A': location of seismic from Fig. 2.

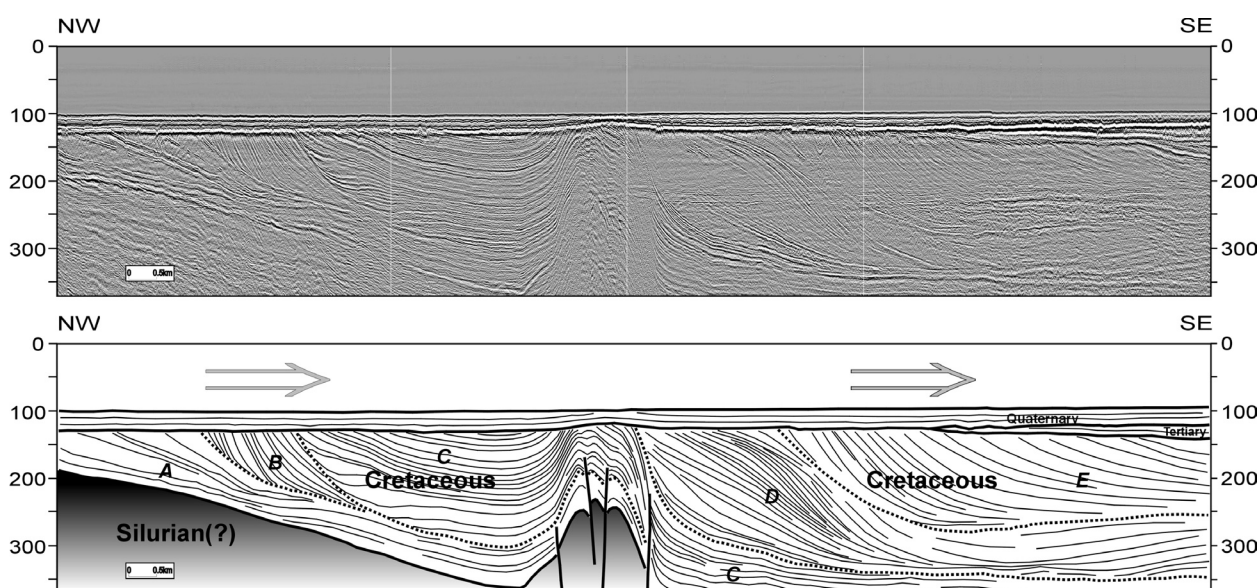


Fig. 2. Seismic example of Upper Cretaceous depositional and tectonic architecture related to inversion and strike-slip movements within the Bornholm – Darłowo Fault Zone. See Fig. 2 for location. Dotted lines: boundaries of identified depositional units A, B, C, D, and E. Note prominent progradational pattern developed within the syn-inversion Upper Cretaceous succession. Arrows – general direction of progradation for the entire Upper Cretaceous inversion-related complex.

generally S- and SE-directed, progradational depositional system with the major source area provided by uplifted basement blocks, in particular by the Bornholm Block (Fig. 2). Development of the identified depositional sequences could be related to episodes of inversion-related tectonic activity and/or eustatic sea-level changes. Closer to the Christiansø Block some syn-tectonic deposition also took place and resulted in subtle thickness changes within the hinge zones of inversion-related growth folds. Lack of significant sediment supply from the inverted and uplifted offshore part of the Mid-Polish Trough suggests that in this area NW-SE – located marginal trough parallel to the inversion axis of the Mid-Polish Trough did not form, and that uplifted Bornholm Block played by far

more prominent role for development of syn-inversion depositional successions.

References

- KRAMARSKA R., KRZYWIEC P. and DADLEZ R., 1999. Geological map of the Baltic Sea bottom without Quaternary deposits. Państwowy Instytut Geologiczny, Gdańsk – Warszawa.
- KRZYWIEC P., KRAMARSKA R. and ZIENTARA P., 2002. Strike-slip tectonics within the SW Baltic Sea and its relationship to the Mid-Polish Trough inversion – evidence from high-resolution seismic data. Tectonophysics, (in press).

Miocene Reactivation of the Inherited Foreland Fault Zones and Its Influence on Development of the E Polish Carpathian Foredeep Basin

Piotr KRZYWIEC¹, Barbara RYZNER-SIUPIK², Janusz SIUPIK² and Zenon BORYS²

¹ Polish Geological Institute, ul. Rakowiecka 4, Warsaw, 00975, Poland

² Polish Oil & Gas Company, BG "GEONAFITA", ul. Asnyka 6, Jasło, 38-300, Poland

Miocene Carpathian Foredeep basin (CFb) developed in front of the Carpathian orogenic wedge, at the junction area between the East European (Precambrian) and Palaeozoic Platforms (see e.g. Krzywiec, 2001 for recent summary and further references). Its development was to a large degree controlled by structure of the foreland plate, especially by reactivated NW-SE trending basement faults related to Mesozoic history of the Mid-Polish Trough. Various genetically linked extensional and com-

pressional features are present both within the basement as well as sedimentary infill of the E CFb. Systems of normal faults of total offset in range of 2.5km that define the so-called Wielkie Oczy Graben dominate in the most eastern part of the basin. Their formation was associated with subduction and flexural extension of the foreland plate beneath the Carpathians. Within the hangingwall, compressional deformations (hangingwall-vergent backthrusts) related to slight inversion of basement