Structural Mapping in the Eastern Part of the Northern Norwegian Barents Sea

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ABSTRACT

During the last five years the Norwegian Petroleum Directorate has acquired more than 39 000 km of new 2D-seismic data in the northern part of the Norwegian Barents Sea. The new datasets are of much better quality than old existing seismic data. In addition to fully mapping the northern parts of the formerly disputed area, the new seismic data gives better understanding of the geological history and structural evolution in the northern Norwegian Barents Sea shelf. The area covered in this study is located north of 74°30'N, east of the Hopen Island (~ 28°E), south of the Kong Karls Land islands (79°N), and limited in the east by the delimitation line towards Russia. This includes the Sentralbanken high, the Olga basin, the Storbanken high, and the Kong Karls Land platform with its large anticlines. The study focuses on the initial timing and formation during the Mesozoic of the prominent structural highs, but also on the Paleozoic origin for most of the highs. Most of the large structural highs are defined by underlying Paleozoic/basement highs, or they can be described as inverted Paleozoic grabens/half-grabens. At the start of the Triassic most of the Paleozoic structuration was levelled out and became buried by a thick prograding Triassic succession. The initial timing of gentle doming for most of today's structural highs shows an Upper Jurassic age. Erosion of all Tertiary and most of the Cretaceous successions hamper the interpretation of the late geological history of the area, but the preserved Triassic, Jurassic and Lower Cretaceous sequences show evidence of late regional tectonic events of large magnitude.