

Late Cenozoic Paleoenvironment and Erosion Estimates for the Northeastern Svalbard/Northern Barents Sea Continental Margin, Norwegian Arctic

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ABSTRACT

Uplift and erosion have affected many petroleum basins worldwide. One of the crucial aspects in exploring these basins is that the uplift and erosion have substantially affected the burial history and the petroleum system in terms of maturation, timing of charge, and remigration issues. In the Barents Sea, Norwegian Arctic, the uplift and erosion that are largely linked to the late Cenozoic extensive glaciations have been regarded as the primary causal for exploration disappointment. Therefore, it is important to better constrain the timing and amount of erosion to minimize the exploration risk. This study focuses on the geological evolution and paleoenvironment of the northeastern Svalbard/northern margin of the Barents Sea continental margin, related to the mid-late Cenozoic climatic (glacial and paleoceanographic) history. For the first time, the average net erosion and the average erosion rates of this margin are estimated. The objectives of this study are achieved through 2D seismic interpretation and by using a mass-balance approach (source-to-sink) to delineate the likely source areas for the sediments in the basin. Seismic stratigraphic framework is established to better understand the paleoenvironments and sedimentary processes involved. Seismic facies analysis shows an interplay between contour current and glacial-related mass-wasting processes. Isopach maps are presented for each period. The considered sediment source areas together with the corresponding average erosion and erosion rates are discussed and compared with other high-latitude margins and present-day systems.