

## **The Early to Middle Cenozoic Paleoenvironment and Erosion Estimates for the Northwestern Barents Sea**

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### **ABSTRACT**

The northwestern Barents Sea continental margin is a structurally complex area characterized by a series of basins and highs. Its Cenozoic development was influenced by: 1) the formation of the Spitsbergen fold-and-thrust belt towards the north and a pull-apart basin, the Vestbakken Volcanic Province, to the south, and 2) the subsequent rifting and opening of the Fram Strait, the deep-water gateway connecting the Norwegian – Greenland Sea and the Arctic Ocean. From this, the northwestern Barents Sea margin is suggested to have experienced a complex tectonic evolution during the Cenozoic, including compression/transpression and extension/transtension. The study area forms a part of a broad transform zone to the west of Svalbard that was initiated during the rifting and sea-floor opening between Norway and Greenland in the Paleocene-Early Eocene. Newly available 2D seismic data and magnetic data were used to better understand the tectono-sedimentary evolution of the northwestern Barents Sea margin. The seismic data shows a pronounced sequence of Paleogene - Neogene, pre-glacial sediments within the basins overlying the oceanic crust west of the transform zone. To the east, the Svalbard platform and the Stappen High includes very little Cenozoic deposits implying that these areas were subjected to erosion and probably acted as the main sediment source area for the northwestern Barents Sea margin. Updated paleoenvironment maps for this area throughout the Early - Middle Cenozoic will be reconstructed and discussed. A number of studies have addressed the uplift and erosion processes during the Cenozoic for the southwestern Barents Sea margin. However, very limited work have been presented from the northwestern Barents Sea, thus the processes of erosion, erosion estimates, and their inferred source area are still poorly understood. Therefore, we also aim to estimate the erosion and erosion rates for the Paleogene – Neogene strata and compare them to other parts of the Norwegian – Barents Sea – Svalbard margin and relevant modern systems.