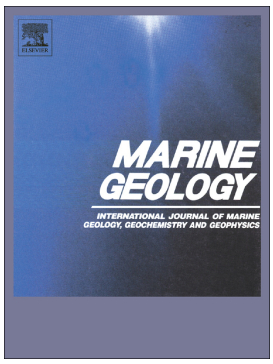

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Tove Nielsen, Antoon Kuijpers

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Glacially influenced morphodynamic features – examples from the north Faroe margin

Tove Nielsen[1] & Antoon Kuijpers[1]

[1] *Geological Survey of Denmark and Greenland (GEUS), Øster Voldgade 10, 1350 Copenhagen K, Denmark*

Abstract

High resolution reflection seismic data, subbottom profiler and side scan sonar information, together with results from sediment core studies, have been used to study various glacially influenced morphodynamic features on the northern Faroese continental margin. On the shelf and upper slope a thick, buried turbate complex has been found, which we estimate to have been formed between ca 470,000 and 120,000 yrs BP. We interpret this turbate to be the result of episodic, extensive iceberg grounding during extreme glaciation within the period MIS 12 – MIS 6 (Elster-Saale complex). Late MIS 6 is found to be the most likely age of the last episode of turbate formation as suggested by age/depth correlation with dated sediment cores from the nearby area. The origin of the iceberg turbate may be attributed to deglacial drift of deep-draft icebergs from icestream sources in the Arctic, East Greenland and/or northern Iceland. At the base of slope and adjacent deep-water area a complex of mud diapir features has been observed. Our data show that activation of these features are the result of density inversion processes caused by fine-grained, unconsolidated hemipelagic deposits being overlain by dense, glacigenic North Sea Fan (NSF) deposits. Due to sudden and fast accumulation of the fan sediments, a normal and regular compaction and dewatering of the underlying hemipelagic sediments could not occur; instead, sub-seabed sediment mobilisation took place resulting in enhanced diapir formation. A general intensification of the diapiric processes is likely related to the MIS 6 (Saalian) glacial period, as NSF-derived glacigenic debris flows reached the northern outlet of the Faroe-Shetland Channel.