Proposed depositional scenarios of the Nise Formation on the Mid-Norwegian Continental Shelf, with focus on the Halten Terrace.

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The Late Cretaceous Nise Formation is located on the Mid-Norwegian Continental Shelf. On the Halten Terrace, the formation is generally described as a mudstone interbedded with thin sandstones and carbonate stringers. The spatial distribution, connectivity, sediment source and depositional processes of the sandstones are uncertain.

Six cores and associated thin sections of the Nise Formation on the Mid-Norwegian Continental Shelf have been described. Three of the cores are from the Halten Terrace area, and one core each are from the Vestfjorden Basin, Nyk High and the Møre/Vøring Basin transition respectively. The main focus has been on the Halten Terrace while the cores from the other areas (tens to hundreds of kilometres away from Halten) are included to compare facies, depositional environment, source of sediment, grade of bioturbation and other characteristics with those of the Halten Terrace.

An isochore map of the Nise Formation in the central part of the Halten Terrace has been constructed based on interpretation of wireline logs from approximately 280 well penetrations. The map reveals a distinct thickness increase in the central parts of the Halten Terrace, suggesting the infilling of a former sub-basin. Additionally, the map supports an eastern and/or northern sediment source, which might exclude the Greenlandic landmasses as a provenance area. The cores from the Halten Terrace, supported by additional wireline well logs, indicate that the upper parts of the formation contain a greater amount of sandstone facies compared to the lower parts. These sandstones are interpreted as densely bioturbated distal turbidites. The comparison of facies development in the cores from the different areas indicates variability in depositional systems between the areas at the time of deposition.

Different depositional scenarios of the Nise Formation on the Mid-Norwegian Continental Shelf are being developed in order to increase the understanding of the Nise Formation on the Halten Terrace. The proposed scenarios include various sediment input models and alternative depositional environments in the different areas. The scenarios mainly display marine, isolated systems.

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