



Submarine Mass Movement in the North Sea Fan

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The Glaciated European Margin has been affected by recurrent climate-related episodes of growth and retreat of the ice sheets during the Quaternary; and has also experienced repeated slope failure in the past 1 Ma. The North Sea Fan (NSF) is located at the mouth of the cross-shelf trough Norwegian Channel, and is one of the largest trough-mouth fans on the glaciated European margin. The study area presented here is situated on the northern flank of the NSF adjacent to the Storegga Slide.

Three-dimensional (3D) seismic data combined with swath bathymetry data and 2D seismic lines have been used to study mass movement processes occurring in the region. The high spatial resolution provided by the seismic data has allowed a detailed geomorphological analysis of depositional and erosive structures. The use of spatial analysis tools of a geographical information system (GIS) enhances the geomorphological interpretation. Merging of bathymetric, shaded-relief and amplitude maps has proven to be particularly efficient in showing sedimentary features indicating mass movement processes.

In addition to the exposed Storegga Slide, the buried Tampen and the Møre slides are two of the largest slides on the Norwegian Margin with areas larger than 15,000 km². However, due to the fact that the Holocene Storegga Slide cuts the original eastern extent of both slides, it is impossible to calculate their full original extension. The lower buried slide of the two, the Møre Slide, shows a complex geometry in the study area, suggestive that the sediments were remoulded by a succession of multiple events. This is supported by evidence such as contrasting transport directions and erosive features within the slide deposits. Subsequently, the area was affected by the Tampen Slide whose transport reflected the complex geometry of the pre-existing topography. A topographic high resultant of the Møre Slide deposits causes changes in flow direction, thickness and internal fabric of the Tampen Slide deposits.