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3D Seismic Analysis of Buried Slide Deposits in the SW Vøring Basin, Mid-Norwegian Margin

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Sediments on the Norwegian deep water margin have failed repeatedly during the last 2,5 Ma. This region has seen some of the largest submarine mass wasting events on continental margins worldwide. Considering the increased interest of the hydrocarbon industry in deep-water areas, there is a need to better understand slide deposits, slide development and areas prone to failure. The development of the Ormen Lange gas field in the Storegga Slide headwall area has been a showcase of assessing slope stability in hydrocarbon frontier areas. This integrated project led to a better comprehension of the Late Pliocene / Pleistocene evolution of the mid-Norwegian margin and its frequent slide activity. The slide mechanism is likely related to a distinct depositional environment of the glacial-interglacial cycles. Slide deposits may constitute a major geohazard for exploration and development of seafloor and sub-seafloor resources.

Two 3-D seismic data sets from the southwestern part of the Vøring Basin on the mid-Norwegian continental margin have been used to analyze the upper part of the Naust Formation ($\sim$ 0.5 to 0.2 ma) showing a number of chaotic units interpreted as slide deposits. A seismic stratigraphy with four main units has been established (unit 1-4). The two oldest units (unit 1 and 2) are dominated by glacial debris-flow deposits formed during glacial maxima when the Fennoscandian ice sheet reached the shelf edge. Parts of unit 2 are later deformed by younger slide events. The two youngest units (unit 3 and 4) are characterized as slide material and are related to the Vigrid Slide and the Sklinnadjupet Slide. Unit 3 shows compressional structures formed by well-consolidated deposits that have been broken up and pushed on top of rather undisturbed sediments. Less consolidated deposits are deformed by compression, which resulted in the formation of folded structures. Deposits in unit 4 show that the slide can be associated with a complex flow process and the development of general shear zones that separate zones of sediments with varying degrees of deformation. Slide deposits within the different zones may have been deposited at different times or may have moved at different velocities in one mega-event. The Sklinnadjupet Slide was probably triggered just after the Vigrid Slide. The Sklinnadjupet Slide has probably developed retrogressively and filled in the upper part of the Vigrid Slide.