



The Hinlopen Slide: A Giant, Submarine Slope Failure on the Northern Svalbard Continental Margin, Arctic Ocean

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Swath bathymetry data unveil a unique, giant, multi-phase and retrogressive submarine landslide on the passive northern Svalbard margin. The slide scar has a well developed amphitheatre-like outer escarpment, whereas the inner slide area reveals a multitude of impressive scarps and several fresh slip surfaces. The headwall heights range from a few hundreds of m to an unprecedented 1,400 m, thus more than 4 times higher than the Holocene Storegga Slide headwall heights off mid-Norway. The Hinlopen slide is a remarkable feature: from the relatively small 2,200 km² slide scar area, an estimated 1,350 km³ of Plio-Pleistocene sediment has been evacuated to the deep Arctic Nansen Basin. Also the rafted blocks in the intermediate part of the slide downslope the pronounced bottleneck are enormous. They measure up to 450 m high, and comprise a volume of c. 1.89 km³, i.e. they are at least an order of magnitude bigger than rafted blocks observed in other mass wasting areas. These numbers make the Hinlopen Slide one of the few giant submarine landslides on continental margins worldwide, and understanding its development is a challenge. The slide has not been dated yet; however, the geophysical data suggest a relatively recent process, probably Late Weichselian or later. A slide of this size is clearly considered a tsunamigenic hazard, despite the fact that no tsunami deposits have been discovered so far. Similarities with the Storegga Slide and its settings suggest that changes in sedimentation related to glacial-interglacial cycles, e.g. glacial glacigenic debris flow deposits alternated with contouritic sediments with different physical and geotechnical properties, are the most likely processes contributing to slope failure.