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## **Reassessment of Storegga event: second major landslide recognized GEOMAR study suggests more frequent large submarine landslides on the Norwegian shelf**

**01 March 2023 / Kiel.** Submarine landslides have a large tsunami potential and occurred on the central Norwegian shelf more frequently in the past than previously thought. This is shown by a study led by GEOMAR Helmholtz Centre for Ocean Research Kiel, published in the journal *Nature Communications Earth & Environment*. The scientists investigate the Nyegga landslide off the coast of Norway, an event that is first described in this publication. The submarine landslide occurred in the same area as the well-known Storegga event 8,150 years ago. The new findings suggest that approximately one-third of the seafloor material missing – previously attributed to the Storegga event – was removed by the Nyegga event 20,000 years ago. This raises questions about the frequency of large submarine landslides and their associated tsunami hazard.

The Storegga event is one of the largest submarine landslides known in the world and is located off the coast of Norway. It occurred about 8,150 years ago, after the end of the last ice age, and triggered a massive tsunami that devastated the coasts of the North Atlantic and what was then the North Sea. Previously, it was assumed that the slide displaced all of the sediments deposited during the last ice age, along a distance of about 300 kilometers. The volume of sediments moved during the slide has been estimated at around 2,400 to 3,200 cubic kilometers – a mass that would be enough to cover all of Germany with seven to nine meters of sediment.

Now, scientists from GEOMAR Helmholtz Centre for Ocean Research Kiel and the University of Bergen, Norway have discovered that much of the seafloor sediment moved 12,000 years earlier, after the peak of the last Ice Age. Thus, the Nyegga landslide, named by the researchers after the Nyegga area where they discovered the first evidence of the event, had already occurred about 20,000 years ago. The geophysicists and geologists are able to demonstrate that about one-third of the material that slid, about 1,000 cubic kilometers, can be attributed to the Nyegga landslide. They published this surprising finding in the journal *Nature Communications Earth & Environment*.

The Storegga landslide is therefore smaller than previously thought. Above all, however, submarine mass movements on the central Norwegian shelf are more complex and more frequent than previously thought. Conventional wisdom was that such large submarine slope failures occurred in connection with glacial cycles. According to this view, the unstable material deposited by the melting glaciers was removed by a single landslide and transported into the deep sea. This assessment must now be reevaluated.

"The Storegga event is one of the best-studied mega-slides in the world, and much of our understanding of large-scale landslides and related tsunami generation can be traced back to it," says Dr. Jens Karstens, marine scientist in the Geodynamics Research Unit at GEOMAR and lead author of the study. "The results of our study show that some previous concepts might be too simplistic and are therefore of great importance for the assessment of geohazards related to landslides at continental margins."

The new findings are based on ship-based echosounder surveys collected during a 2012 research cruise and the examination of dozens of sediment cores at the University of Bergen.

Age dating and sedimentological investigations revealed unusual depositional profiles in seven of the sediment cores that could not be explained by the previous landslide history. Evidence of an earlier landslide event in the echosounder data has now allowed the researchers to explain the depositional layers with the Storegga event and the much earlier Nyegga landslide. Seismic reflection surveys independent of the study show the deposition of a variety of large landslide events in deeper sedimentary layers. Further research is now needed to provide a more precise geological understanding of these older events and better assess the hazard potential of large submarine landslides.

**Publication:**

Karstens, J., Hafliðason, H., Berndt, C., Crutchley, C. J., (2023), Revised Storegga Slide reconstruction reveals two major submarine landslides 12,000 years apart. Nature, communications earth & environment, doi: <https://doi.org/10.1038/s43247-023-00710-y>

**Links:**

[www.geomar.de](http://www.geomar.de) GEOMAR Helmholtz Centre for Ocean Research Kiel  
<https://www.uib.no/en> University of Bergen

**Images:**

At [www.geomar.de/n8849](http://www.geomar.de/n8849) images are available for download.

**Kontakt:**

Ann Kristin Montano (GEOMAR, Communication and Media), Tel.:+49 0431 600-2811,  
[media@geomar.de](mailto:media@geomar.de)