



Thin-skinned and giant submarine landslides on the southern Storfjorden Trough Mouth Fan (Barents Sea)

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Several submarine landslides were identified on the Storfjorden Trough Mouth Fan (TMF) to the southwest of the Svalbard Islands during two recent research cruises carried out within the International Polar Year (IPY). The Spanish SVAIS and the Italian EGLACOM cruises, respectively in the summer of 2007 and of 2008, both contributed to IPY Activity 367 NICE-STREAM (Neogene ice streams and sedimentary processes on high-latitude continental margins) aimed at understanding erosion and depositional systems associated with ice streams.

Thin-skinned modern landslides, visible on both swath bathymetry data and on sub-bottom and multichannel seismic reflection profiles, are composed by a long, sharp-edged, straight channel developed downslope of the head scars, which lie on the upper-middle continental slope. Giant paleo landslides, detected only on multichannel seismic reflection profiles, are characterized by thick (up to over 200 ms thick) chaotic deposits on the lower part of the continental slope.

Both modern and paleo landslides are focused in the southern part of the Storfjorden TMF, towards the northern border of the Bear Island TMF. The area is peculiar because of the presence of a large deep-sea channel system, the INBIS channel system (Vorren et al., 1998). Channel systems in fact are rare on the Norwegian margin and confined to the INBIS and Lofoten channels. Also peculiar of this area is the presence on continental shelf of a sharp, narrow cross-shelf trough, the Kveithola Trough, which shows glacial grooves and bundles produced by fast-flowing grounded ice.

This evidence suggests to us that the abundance of basal meltwater beneath the ice, a key factor for the lubrication and motion of ice-streams, is also crucial for the inception of mass-movements along the INBIS Channel and for the genesis of the landslides identified in this sector of the margin.

References:

Vorren, T.O., Laberg, J.S., Blaumme, F., Dowdeswell, J.A., Kenyon, N.H., Mienert, J., Rumohr, J., Werner, F., 1998. The Norwegian-Greenland Sea continental margins: morphology and Late Quaternary sedimentary processes and environment. *Quat. Sci. Rev.* 17, 273-302.