



Down- and along-slope erosional and depositional processes on the NW Svalbard continental slope

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Swath-bathymetry and seismic data from the western Svalbard continental slope (between approx. 79°00'-79°45' N and 4°-9° E) reveal evidence of multiple mass movements, as well as the interaction of down- and along-slope sedimentary processes.

An 'old' slide scar in the northern parts of the study area is approx. 35 km long (in down-slope directions), at least 15 km wide and has a 30 to 60 m high headwall. It is located between about 1300 m and 3000 m water depth. The seafloor within this slide scar is irregular. However, some parts are smoothed by contouritic infill. The data indicate that slip planes were located at least at two levels, probably indicative of a multi-phase failure process.

A second, younger, slide scar is at least 35 km long, 6-8 km wide and located beyond 1400 m water depth. It merges with the older slide scar at a water depth of about 2700 m. The headwall is up to 30 m high and its morphology is relatively smooth. Also this slide scar is partly draped by contourites.

The youngest and southernmost feature related to down-slope erosion and sediment transport is the Kongsfjord Channel. Several channels/gullies start at the shelf break at approximately 250-300 m water depth and merge into the main channel at around 1400 m below sea level. The channel system can be traced over a distance of approximately 120 km, reaching maximum water depths of about 4000 m. The incision is maximum 400-500 m wide and 80 m deep. The data illustrate repeated interaction of the channel with contourite deposition. This includes relocation of the channel's axis related to the northward migration of the contourites, as well as renewed incision of contourites by activity within the channel.