



The Kongsfjorden Trough Mouth Fan, W-Spitsbergen: Mid – and Late Weichselian chronostratigraphy

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The high-latitude Kongsfjorden Trough-Mouth Fan (TMF), situated on the continental margin west of Svalbard was fed by the Kongsfjorden paleo-ice stream system. A placement, which is ideally suited for recording glacial advances to the shelf break and thereby the development of the Svalbard Ice Sheet through time. During a marine geological survey in 2010, a regional seismic grid was established, consisting of 17 high-resolution seismic TOPAS profiles. There was also retrieved a 12.65 meter long sediment core from the southern part of the Kongsfjorden TMF at 846 m water depth. Our preliminary conclusion fits well with the earlier proposed glacial geological models, which indicates that during the Weichselian glacial (117 – 11.6 ka), paleo-ice streams from the west coast of Spitsbergen advanced to the continental shelf-break three times. Based on the TOPAS seismic data there have been identified three different sequences (generations) of glaciogenic debris flows (GDF) separated by acoustically laminar layers. Each GDF sequence (generation) is inferred to represent an advance to the shelf break. The sediment core GS10-164-09PC penetrate the youngest GDF sequence and terminates at the top of the second youngest GDF sequence, and thus allowing us to study the last two advances in greater detail than previously available. The upper half of the core displays a very varied depositional character, with layers comprising ice rafted debris (IRD) interbedded with hemipelagic sediments. The interval between 2 – 5 m has been dated with AMS ¹⁴C. An anomalous layer (at 270-335 cm), which can be correlated with the youngest GDF sequence, have been estimated to have an age between 23.3 – 25 ka, and is interpreted to comprise sediments from the last glacial maximum (LGM). The lower half of the core appears visually fairly homogenous, and have been interpreted to consist mainly of glaciomarine IRD rich sediment related to the second advance during the mid-Weichselian, estimated to have occurred from about 50 – 65 ka.