

Glaciogenic seafloor morphology and sediment records in the Hambergbukta of Storfjorden, Svalbard

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Hambergbukta is one of the tributary fjords of the Storfjorden system on the southeastern coast of Spitsbergen, Svalbard. We analysed three sediment core records together with seafloor morphological features of the Hambergbukta to investigate the currently retreating tidewater glacier (Hambergreen) and associated sedimentary environmental changes since the last deglaciation. Multi-beam echo sounder (MBES) and sub-bottom profiling (SBP) data in this fjord display glaciogenic bedforms including a terminal moraine, a multiple-crested esker, crevasse-fill ridges, streamlined glacial lineations, annual moraines, and glaciogenic debris flow deposits. Most of these glacial features result from glacial impact by the Little Ice Age (LIA) and subsequent deglaciation.

Two inner cores (901, 903) are composed of a single lithological unit (Unit 1a) characterized by the IRD-dispersed and laminated mud. The outer core (905) can be classified into four lithological units: 1) IRD-concentrated and relatively thin massive sandy mud (Unit 1b); 2) IRD-dispersed and intensively bioturbated sandy mud (Unit 2); 3) dropstone-rich and weakly bioturbated to massive gravelly sandy mud (Unit 3); 4) a semi-consolidated diamicton (Unit 4). Based on stratigraphic core correlation with the earlier investigated Storfjorden core, Units 1a and b represent post-LIA deglacial sediments. However, Unit 1b is condensed and coarser than Unit 1a. These differences between inner and outer fjords may result from the development of the terminal moraine that has played an essential role as a barrier for the inflow of ESC since the LIA. The lithological transition from Unit 4 to 2 reflects environmental changes related to the Younger Dryas (YD) and subsequent deglaciation.