



Sedimentation processes in Svalbard: A comparison between Dicksonfjorden and Kongsfjorden

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A lot of fjord and coastal studies have been executed in Svalbard, but few focused on the links between the coastal zone and the sediments found at the bottom of fjords. This master thesis combines these subjects to study the relation between coastal dynamics, sediment volumes and distribution of fjord bottom sediments. Dicksonfjorden and Kongsfjorden in Svalbard, Norway, are the main study areas. These fjords have the same resource area, but are subjected to significantly different circumstances. Dicksonfjorden is a non-glaciated fjord, where sediment transport mainly occurs via glaciofluvial rivers. Kongsfjorden is a glaciated fjord, where sediment is transported into the fjord by the glaciers. This thesis aims to characterise the sedimentation characteristics of each fjord and compares them to develop two endmember settings of a spectrum, ranging from non-glaciated to glaciated fjords. Two sediment cores from Dicksonfjorden, collected in August 2016, have been studied. One core was sampled close to the river delta slope, while the other was obtained from the middle of the fjord. To determine the characteristics of the present-day sediment and sediment flux, sediment samples have been collected from three stations in the river delta and three stations in front of the Dicksonelva delta during the summer of 2017. The river delta sediment traps were 1L in volume and located half a meter below the water level. Sampling occurred daily over a period of 2 weeks. The fjord sediment traps were also 1L in volume and were lowered to depths of 5m and 20m. Samples from these traps were collected three times over a three-week period. A detailed description of the sediment cores have been made with sedimentological logging, X-ray radiographs and high-resolution pictures of the cores. Both, the cores and the sediment trap samples have been analysed with X-ray fluorescence (XRF), grain size- and shape analysis and thermogravimetric analysis (TGA). Additionally, multisensory core logging and a combination of ^{210}Pb and AMS- ^{14}C dating was performed on the sediment cores. Many data series of Kongsfjorden are already available, but a good overview is lacking. Compiling the existing sedimentological data gives a better insight into existing data, what data is still lacking in the area and is used for characterisation of the Kongsfjorden setting. This study contributes to the sedimentological part of the project titled: "Sediment flux from source to sink – the coastal link: sharing current knowledge and establishing a consortium for future research". The project aims to increase the understanding of the role of the coastal zone in Spitsbergen fjords for sediment transfer to fjord basins, as well as the impact of changes in sediment supply on biological life.