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# Holocene environmental changes from Dicksonfjorden sediments of western Spitsbergen, Svalbard

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The last deglaciation of the Svalbard-Barents ice sheet, initiated since ∼13000 yrs BP, and subsequent warming through the Holocene prompted dramatic climate changes in the Svalbard fjords. Consequently, significant changes are expected in processes that determine the nature of sediments delivered (often en masse) to the steep fjords system, including sediment weathering, primary production in fjords and terrestrial realms, and the main domain of sediment transport (i.e. a shift from ice-rafting to glaciofluvial). This study investigates paleoenvironmental changes in the western Svalbard region using the Holocene glaciomarine sediments from Dicksonfjorden of the west Spitsbergen. We examine geochemical composition of organic (carbon and nitrogen stable isotopes) and inorganic (major and trace elements concentrations) components of core sediments from the inner part of Dicksonfjorden, where sediments are mainly derived from the late Paleozoic mixed siliciclastic-carbonate sedimentary sequences distributed on the western Spitsbergen. Based on our preliminary result, carbon isotope data exhibits an overall ∼2 ‰ positive shift since the last deglaciation, suggesting a major change in the nature of organic matter. We posit that a shift of the major source of organic matter from terrestrial plant to aquatic algae. The rising temperature likely promoted chemical weathering and thus enhanced nutrient supply for algal growth, since the early Holocene climate optimum. It is corroborated by the organic C/N ratio showing an antithetic relationship with the [U+F064]13Corg result. Principal component analysis is applied to major and trace element data, obtained by X-ray fluorescence (XRF) core scanning measurements, in order to uncover main controls on inorganic geochemistry of sediments. The result indicates that there are at least two periods marked with major changes in the inorganic sediment geochemistry, one in ∼13000 yrs BP and the other one in ∼5000 yrs BP. We will further test our hypothesis regarding environmental changes in the west Spitsbergen on additional sediment cores recovered from the adjacent fjords. Ultimately, this study aims to contribute to a more comprehensive understanding of the environmental changes since the last deglaciation in the Arctic fjords complex system.