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Title: *Organic matter sources and sinks in high Arctic fjord*

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Knowledge of organic matter cycling is crucial for understanding functioning of marine ecosystems. High-latitude Arctic fjords have been shown to be important sites for primary production, carbon burial and CO₂ sequestration, yet little research on the organic matter cycling were conducted in high Arctic fjords. The main aim of this study was to investigate the provenance, pathways and fate of organic matter in the high Arctic fjord, Kongsfjorden, Svalbard.

In order to characterize the sources and sinks of the organic matter we studied the elemental and isotopic composition of carbon and nitrogen in marine surface sediments and water column. Samples were taken during the cruise of r/y Oceania at three stations along a gradient from the open ocean to the inner fjord's bay in 2011. Additionally, samples of riverine POM, glacial discharge, ice and living and degraded land vegetation were taken to describe local autochthonous and allochthonous end members. Our results suggest that bulk organic matter buried in the marine sediments in Kongsfjorden originates from autochthonous production. Similar $\delta^{13}\text{C}$ signatures characterized sediments at all sampling stations with mean value of $-22.56 \pm 0.29\text{‰}$. However, intensive melting of glaciers and snow cover on land in summer resulted in dominance of terrestrial, isotopically lighter organic matter in the water column. Pelagic POM at marine stations had values between -26.78 and -24.70‰ , while mean $\delta^{13}\text{C}$ for organic matter collected from all potential terrestrial sources amounts to $-25.40 \pm 0.94\text{‰}$. Results of this study are important for understanding functioning of marine ecosystems by determining origins of food sources for marine invertebrates, and subsequently for organisms occupying higher trophic levels in the food web and will allow resolving the role of high-latitude fjord environment as prominent storage site for terrestrial and marine organic matter.