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SPATIO-TEMPORAL VARIATIONS OF BENTHIC ACTIVITIES IN TWO CONTRASTED HIGH ARCTIC FJORDS (KONGSFJORDEN AND RIJPFJORDEN, SVALBARD)

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Arctic marine ecosystems are characterized by strong seasonality of the sea-ice cover, light and food availability. Climate change effects are enhanced in the Arctic and these changes are expected to have repercussions on the entire ecosystem functioning and carbon cycling. It is still however unclear how benthic organisms will respond to variations in food sources and environmental conditions in such environments. Rijpfjorden, a high Arctic fjord in the north of Svalbard, has a strong seasonal ice cover while Kongsfjorden, in the west site of Svalbard, is highly influenced by warm Atlantic waters inflows, and its ice cover has been decreasing over the last decade. Both fjords were studied at various seasons during the ANR-ECOTAB project which aimed at investigating how spatial and seasonal changes in vertical fluxes can impact benthic communities. For each season, the organic matter sedimenting from the water column to the seafloor was characterized (chlorophyll a, particulate organic carbon, phytoplankton carbon, zooplankton fecal pellet carbon, lipids, proteins, carbohydrates). The response of the benthos to these inputs was studied in terms of respiration (as indicator of overall benthic communities' activity), and bioturbation (as indicator of macrofauna activities).

In both systems, vertical fluxes of organic matter exhibited seasonal variations. In the sediment, organic matter quality and quantity showed stronger spatial variations (due to glacier inputs) than seasonal variations. Regarding benthic activities, although in Rijpfjorden, they exhibited seasonal variations and a strong response to changes in inputs, in Kongsfjorden, seasonal changes in respiration and bioturbation were low to null. This suggests that the benthos of Kongsfjorden, highly influenced by inputs of warm Atlantic water, may not rely on seasonal inputs of organic matter such as in Rijpfjorden and other Arctic shelves with more important ice covers.