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Recent environmental dynamics and vertical carbon flux in two contrasting fjords in Auyuittuq National Park, Baffin Island

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Interest in diatoms' ability to capture atmospheric carbon has intensified in recent decades, marked by the rapid increase in anthropogenic greenhouse gas (GHG) emissions. Ocean acidification, a critical consequence of GHG emissions, raises pressing questions about the future capacity of photosynthetic organisms to regulate ocean carbon and their role in mitigating the effects of global warming. The Arctic Ocean, and more specifically Baffin Bay and the coastal area east of Baffin Island, is a key region in the global climate system. This sector is a major passage through which the Arctic Ocean discharges large amounts of cold water and ice into the North Atlantic, transporting macro and micronutrients, trace metals, oxygen, carbon, and microorganisms, thereby contributing to the dynamics of thermohaline circulation. A better understanding of the effects of accelerated glacier melt from Baffin Island on carbon sequestration in these coastal environments is therefore essential for refining climate models and predictions. This project aims to compare two contrasting fjords in Auyuittuq National Park: Coronation, which has a marine-terminating glacier, and North Pangnirtung, which has a land-terminating glacier. The objective is to assess the influence of glacial melt on the productivity and capacity of diatom communities to capture and sequester carbon. The paleoceanographic approach, based on biogeochemical analyses of sediments (carbon and nitrogen isotopes, composition and abundance of diatom assemblages), will make it possible to retrace environmental dynamics of the recent past. Accelerated glacial melt is expected to enrich the environment with nutrients, stimulating biological productivity and carbon sequestration, effects that are particularly pronounced in Coronation Fjord due to the proximity of the glacier to the sea front.