Do melting glaciers impact carbon burial in Greenlandic fjords?

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Fjord systems are crucial for the burial and long-term storage of organic carbon (OC), contributing significantly to global blue carbon sequestration. Despite their importance, Greenland's fjords remain underrepresented in global carbon budgets, even though accelerated melt of the Ice She*et al*ters these ecosystems through increased freshwater discharge and iceberg calving, ultimately leading to glaciers retreating inland. This study compares organic carbon burial rates (OCBRs) in two neighbouring Greenland fjords—Nuup Kangerlua, influenced by marine-terminating glaciers (MTGs), and Ameralik, dominated by land-terminating glaciers (LTGs)—to explore the effects of both types of glaciers on sediment carbon dynamics. Since subglacial discharge-driven upwelling in Nuup Kangerlua (MTG) has been shown to support higher summer phytoplankton blooms, we expected higher sediment organic carbon content and burial in this MTG fjord. However, our observations show higher OC content in sediments of Ameralik's (LTG) outer and mid fjord section and a similar OCBR in both fjords. This unexpected finding may be linked to differences in pelagic grazing pressure, organic carbon transport, and sediment preservation mechanisms. The findings call for further research to unravel the complex interactions between primary production, organic carbon transport, and preservation processes in different glacial fjord systems.

Keywords
Blue Carbon; Greenlandic Fjords; Glaciers; Sub-Arctic