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# The Arctic Ocean in response to millennial time scale paleoceanographic changes during the last glaciation, 70-25 years BP

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The climate and paleoceanography of the last Glaciation were deeply affected by up to 25 abrupt temperature fluctuations generally known as Dansgaard-Oeschgwer events. The events have been documented worldwide, but the strongest and most abrupt fluctuations have been recorded from the Nord Atlantic and Nordic Seas indicating that their origin should be sought in this region. The events are generally linked to changes in deep water formation in the Nordic Seas and North Atlantic, disrupting the thermohaline circulation. Nevertheless, Dansgaard-Oeschger events have so far not been recorded north of the convection areas in the central Nordic Seas, and it is not known if they influenced the water exchange through the Fram Strait and thus affected the Arctic Ocean.
We have studied gravity core JM05-31GC from the eastern Fram Strait at 80°N (785 m water depth) to reconstruct paleoceanographic changes in relation to the rapid climate changes of the Dansgaard-Oeschger (DO) events during marine isotope stages 4-2 (70-20 kyr BP). The core site is located within the path of the north flowing Atlantic Water at the very entrance to the Arctic Ocean. The results show millennial time scale changes in subsurface and bottom water temperatures, in the distribution of planktonic and benthic foraminifera in sediment grain size, in the content of ice rafted debris (IRD), and in the stable isotope values. In JM05-31GC, the interstadials are characterized by relatively high surface and low bottom water temperatures, low content of IRD and well-ventilated bottom water. Stadials are characterized by presence of icebergs, decreasing surface water and increasing bottom water temperatures. Ventilation decreased during Heinrich events and most stadials. The results show that the Dansgaard-Oeschger events strongly affected the water exchange between the Nordic Seas and the Arctic Ocean. The exchange of subsurface and intermediate water was similar to today during interstadials with strong flow of Atlantic Water at the surface flowing into the Arctic Ocean. During stadials and Heinrich events the Atlantic water subducted below the polar surface water well south of the Fram Strait and continued into the Arctic Ocean as a slow-flowing, poorly ventilated Atlantic Intermediate Water mass.