



## **North Atlantic inflow and ice-coverage in the central Arctic Ocean: Neogene records from the Lomonosov Ridge.**

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Due to its isolation from the broad continental margins of the Arctic Ocean, and its elevation above the surrounding abyssal plains, ice-transport is considered to be the only mechanism for delivering coarse grained material ( $> 63 \mu\text{m}$ ) to the circumpolar portions of the Lomonosov Ridge. Changes in the amount and flux rates of coarse fraction material are thereby believed to reflect variability in the form and permanence of ice coverage. Age-calibrated records from the Integrated Ocean Drilling Program's Arctic Coring Expedition document a decrease in the flux of coarse-grained material in the late Pliocene/early Pleistocene, a trend that continues until the transition between marine isotope stages (MIS) 6/7. Thus, the majority of Pleistocene glacial cycles are characterized by relatively minor variability in the coarse fraction content and may reflect deposition under conditions of perennial sea ice-coverage that developed in the late Pliocene/early Pleistocene. The subsequent increase at MIS 6 either marks a change to more dynamic ice conditions, or potentially a stronger influence exerted by a specific circumpolar ice-sheet. Increased advection of North Atlantic waters into the Arctic Ocean is a potential mechanism for destabilizing perennial ice conditions established in the late Pliocene/early Pleistocene. By integrating information on the

abundance, flux rates and provenance of ice-rafted debris with neodymium isotopes from the ACEX record, we examine the evidence to support this possible link.