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Glacial sedimentation on the Nares Abyssal Plain, southwestern N-Atlantic, signals frequent hyperpycnal meltwater flow from the Laurentide Ice Sheet

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Hyperpycnal flow processes presumably played a significant role during deglacial warming episodes when explaining low ocean overturning sensitivity when compared to meltwater injection into the surface layer (1,2).
High-frequency and limited dimensions (< 0.1 m) characterize silty turbidites deposited at 5600-5900 m water depth on the Nares Abyssal Plain (NAP), southwestern N-Atlantic. High-amplitude fluctuations of solid-phase aluminum and manganese illustrate frequent glacial sedimentation activity. Isolated turbidite calcium carbonate and organic carbon peaks in a 7-m long piston core similarly point to frequent, i.e. between 16 ($CaCO_3$) and 24 (Corg), depositional events. With a glacial age less than 70,000 yrs BP (3), this number of depositional events may be compared to the number (25) of D/O events of the last glaciation. Fast, episodic sedimentation is further signaled by sediment dewatering features.
Pollen confirm sediment sources at latitudes north of Florida. Mica dominance supports density plume processes favoring transport of this flat and light mineral, and typically reflects higher latitude provenance. Mica-bearing rocks are widespread along the north-eastern American continental margin. The presence of Mn-rich micro-nodules may be traced to glacial lake sources.
Similarly as adjacent Sohm Abyssal Plain deposits (4), the glacial NAP sediments (hyperpycnites) thus were derived from the NE-American Laurentide Ice Sheet region, mainly by hyperpycnal flow southward entrained by the Deep Western Boundary Current (DWBC). This possibly also included meltwater plumes from icebergs drifting along the south-eastern US seaboard (5). NAP silt dispersal changes illustrate a late glacial deepening of the DWBC depth stratum.

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