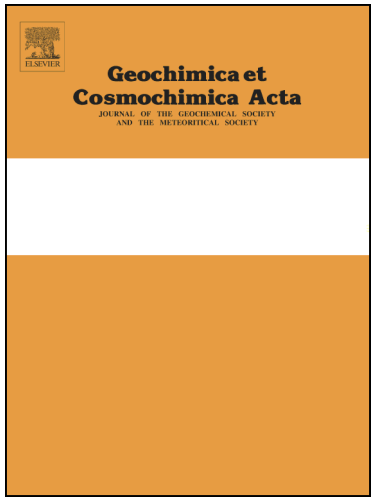

Tracing the source of ancient reworked organic matter delivered to the North Atlantic Ocean during Heinrich Events

Jens Hefter, B. David A. Naafs, Shunxin Zhang

PII: S0016-7037(17)30085-6
DOI: http://dx.doi.org/10.1016/j.gca.2017.02.008
Reference: GCA 10155

To appear in: *Geochimica et Cosmochimica Acta*

Received Date: 6 May 2016
Revised Date: 17 January 2017
Accepted Date: 8 February 2017

Please cite this article as: Hefter, J., Naafs, B.D.A., Zhang, S., Tracing the source of ancient reworked organic matter delivered to the North Atlantic Ocean during Heinrich Events, *Geochimica et Cosmochimica Acta* (2017), doi: http://dx.doi.org/10.1016/j.gca.2017.02.008

Tracing the source of ancient reworked organic matter delivered to the North Atlantic Ocean during Heinrich Events

Jens Hefter[1], B. David A. Naafs[2*], and Shunxin Zhang[3]

[1]Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Am Handelshafen 12, 27570 Bremerhaven, Germany
[2]Organic Geochemistry Unit, School of Chemistry and Cabot Institute, University of Bristol, BS8 1TS, Bristol, UK
[3]Canada-Nunavut Geosciences Office, NU X0A 0H0, Iqaluit, Canada

[*]Corresponding author: B.D.A. Naafs, tel.: +44-(0)117-9546395, e-mail: david.naafs@bristol.ac.uk

Abstract

A major effort of the geochemical and paleoclimate community has been to identify the specific sources of the ice-rafted debris (IRD) in Heinrich Layers (HLs). Although the general consensus is that the majority of the IRD originated from the Hudson area of northern Canada, the specific sources are not well constrained. Here we compare the diagnostic organic geochemical signature of HLs to that of a number of Paleozoic outcrops across the former margin of the Laurentide ice sheet.

We show that the biomarker signature of Upper Ordovician strata from Southampton and Baffin Island is compatible with that found in HLs in the Labrador Sea and North Atlantic, while the biomarker signature of other Paleozoic formations from the former margin of the Laurentide ice sheet is not. In addition to the biomarker signature, key-inorganic characteristics ($\delta^{18}O$, ε_{Nd}, and $^{87}Sr/^{86}Sr$ ratios) of these formations from Southampton and Baffin Island are consistent with those reported from HLs. The location of these formations in and around the Hudson Strait is compatible with palaeo-ice flow regimes through the Hudson Strait,