



Developing an event stratigraphy for Heinrich Event 4 at Eirik Drift, South of Greenland

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Heinrich events are characterised in North Atlantic sediments by horizons with increased Ice Rafted Debris (IRD) concentrations, low foraminiferal abundances, and light planktonic foraminiferal calcite $\delta^{18}\text{O}$ (meltwater dilution). They occurred quasi-periodically with a spacing of 5,000–14,000 yrs (Hemming, 2004). It is commonly believed that large iceberg/meltwater injections likely caused slowdowns of the Atlantic Meridional Overturning Circulation (AMOC). However, Stanford et al. (2011) showed, using a basin-wide reconstruction of Heinrich Event 1 (\sim 19-15 ka BP), which was based upon marine and terrestrial records on carefully scrutinised age models, that the main iceberg discharge event occurred some \sim 1000 years after the initial AMOC slowdown. The study highlighted the importance of robust chronological constraints in order to permit the development of a process understanding of the evolution of such climate events, by evaluation of statistical uncertainty and robust quantification of leads and lags in the ocean-climate system. Here, we present initial results from a marine sediment core recovered from Eirik Drift, South of Greenland, that span the time period that encompasses Heinrich Event 4 (35-45 ka BP). Today, sediments on Eirik Drift are deposited and reworked by the Deep Western Boundary Current (DWBC) and are also located beneath the pathway of the East Greenland and East Greenland Coastal Currents. Hence, Eirik Drift is a crucial monitoring site of surface and deep waters that exit the Arctic via the Denmark Strait. We here combine a proxy record for North Atlantic Deep Water (NADW) flow intensity ($\kappa_{\text{ARM}}/\kappa$) with co-registered records of surface water conditions and place these on a palaeomagnetic and teprochronologic stratigraphic framework. Given that this chronological framework is independent of environmental influences, basin-wide signal comparison is therefore permissible.

Hemming, S. R. (2004), Heinrich Events: Massive Late Pleistocene detritus layers of the North Atlantic and their global imprint, *Rev. Geophys.*, 42, 1-43.

J.D. Stanford, Rohling, E. J., Bacon, S., Roberts, A. P., Grousset, F. E. & Bolshaw, M. (2011), A new concept for the paleoceanographic evolution of Heinrich event 1 in the North Atlantic, *Quaternary Science Reviews*, 20, 1047-1066