Deconstructing Heinrich events from the European margin

S.N.B. Leigh (1,2), R.M. Ellam (3) and **W.E.N. Austin** (1)

(1) School of Geography & Geosciences, University of St Andrews, Scotland, (2) Now at Natural Environment Research Council, United Kingdom, (3) Scottish Universities Environmental Research Centre, East Kilbride, Scotland (bill.austin@st-andrews.ac.uk / Fax: +44(0)1334 463949 / Phone: +44(0)1334 463988)

The proposed growth of the last British ice sheet (BIS) through marine isotope stage three (MIS3) and its expansion across the shelf seas of NW Europe during MIS2 provides an excellent opportunity to test the relative contribution of BIS ice rafted debris (IRD) into Heinrich layers (HL) adjacent to the European margin. We present results from IMAGES giant piston core MD95-2006 from the Hebridean margin of NW Scotland, highlighting the very different IRD contributions associated with HL4 (MIS3) and HL2 (MIS2). Radiogenic isotope measurements of the bulk sediment and IRD components enable us to differentiate between geological source regions. These IRD 'events' are framed within the context of pronounced Dansgaard-Oeschger (D-O) oscillations, which at this latitude in the North Atlantic can be tracked through marked stadial-interstadial climate shifts. We use surface ocean temperature proxies to correlate the MD95-2006 record directly to the Greenland ice cores $\delta^{18}O$ record and then transfer the NGRIP chronology to constrain the timing and abruptness of the IRD events. During MIS3, when the BIS was reduced in size, we show that HL4 contains no 'precursor' events of European origin. During MIS 2, when the BIS reached it's maximum, we see evidence around HL2 for candidate 'precursor' events of European origin. We speculate that European ice sheet dynamics, through ice-ocean interactions, may play a significant role in the intensification of Northern Hemisphere glacial maxima.