

Evidence for Heinrich Events and Sea Surface Temperature Variability in the Central North Atlantic

Alyson Churchill¹, Jerry McManus², Yuxin Zhou²

¹Colby College, ²Lamont-Doherty Earth Observatory of Columbia University

During the last glacial-interglacial cycle, repeated temperature oscillations led to millennial-scale climate change events in the Northern Hemisphere. Episodes of enhanced iceberg discharge, known as Heinrich events, have been documented during some of these rapid climate oscillations, and are evidenced by at least six layers enriched in ice rafted debris in North Atlantic marine sedimentary records. However, a lack of high resolution sedimentological and sea surface temperature records from the central North Atlantic causes the relationship and timing between Heinrich events and millennial-scale climate change to remain poorly constrained. A higher-resolution study of a marine sediment core located slightly west of the Mid Atlantic Ridge, VM30-100PC (44.117 N, 32.5 W; 3,519 m), reveals distinct evidence of Heinrich events 1 and 2 based on the relationship between IRD abundance, magnetic susceptibility perturbations, and foraminifera/g. Additionally, variability in the planktonic foraminifera species assemblage reveals significantly reduced sea surface temperatures before Heinrich event 1, and supports fluctuations in the position of the Arctic Front surrounding both observed Heinrich events. Finally, preliminary isotope studies support the cooling of surface waters before Heinrich event 1, and suggest a reduced North Atlantic Deep Water contribution and a strong Southern Ocean water mass signature surrounding this ice rafting event.