



Southernmost indications of large freshwater discharges during the Heinrich Stadials (Galicia Interior Basin, Northwest Iberian Continental Margin)

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The reconstruction of circum-Atlantic ice-sheet instabilities is of great importance to understanding the mechanisms that force abrupt climate changes.

We have used enviromagnetic and geochemical data to explore these issues, providing a continuous and well-dated record of the evolution of glacial/interglacial sedimentation in the Galician Interior Basin (GIB) during the last glacial period covering the last six Heinrich Stadials. Our results show sediments of European provenance that have been related to meltwater pre-events during the initial stages of HS1, HS2, and HS4 corroborating the Channel River depositional history. Therefore, this study provides insight into one of the potential forcing mechanisms for Heinrich Events and, by inference, for Heinrich Stadials.

The GIB records are an important element in the discussion of EIS–LIS–AMOC dynamics. Their significant distance from these ice-sheets is such that they have only recorded the most catastrophic ice shelves collapse events and/or meltwater discharges, acting as a low-amplitude filter to the interrelated dynamics and instabilities of the North Atlantic ice sheets. Our results demonstrate that European-sourced sediments arrived earlier at this site than Laurentide-sourced icebergs. This implies greater EIS freshwater discharges resulting from the deglacial activation of EIS palaeorivers for HS1 and from glacial instabilities during the course of the EIS' progression to its LGM position for HS2 and HS4. This supports the idea of synchronous collapse of the EIS and LIS. The data also suggest that these discharges acted as a positive feedback mechanism that further weakened the AMOC, accelerating LIS and EIS collapse.