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Holocene Rapid Climate Change: Pervasive Millennial-Scale Climate Variability across the North Atlantic

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Rapid climate change (RCC) during the Holocene, particularly post-dating the demise of large Northern Hemisphere ice sheets after 8000 cal. yr BP, is a global phenomenon and is almost certainly driven by long-term changes in insolation, upon which solar variability, although a weak direct forcing mechanism, is superimposed. At least five significant intervals are identified in numerous palaeoclimate records since the major 9000-8000 cal. yr RCC, within which the intensively studied 8200 cal. yr 'event' is embedded; these are: 6000-5000, 4200-3800, 3500-2500, 1200-1000 and 600-150 cal. yr BP. Most of the Holocene RCCs are associated with bipolar cooling, an expansion-intensification of high latitude circulation systems and drying-aridity at low latitudes.

Here, we present proxy-records from a fjord basin located on the Atlantic margins of NW Europe which contain evidence for these combined forcing mechanisms. Giant piston core (MD04-2832) from the main basin of Loch Sunart, Argyll, NW Scotland, is 22 m long and appears to contain a record of continuous sedimentation back to nearly 8000 cal. yr BP. Based upon the age-depth model for core MD04-2832, isotopic shifts recorded in the benthic foraminifera *Ammonia beccarii* coincide with both the rate and magnitude of the Holocene RCCs. We show that the renewal history of bottom waters in the fjord basins appear to be driven by large-scale atmospheric circulation changes that may have characterised the entire mid-latitude NE Atlantic region.