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Sea surface temperatures in the North Atlantic Ocean from 30ka to 10ka

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Some of the most striking features of the Late Pleistocene interval are the rapid changes in climate between warmer interstadial and cold stadial periods which, when coupled, are termed Dansgaard-Oeschger (D-O) events. This shift between warm and cold climates has been interpreted to result from changes in the thermohaline circulation (Broecker et al., 1985) triggered by, for instance, freshwater input from the collapse of the Laurentide ice sheet (Zahn et al., 1997). However, a recent study suggests that major ice rafting events cannot be the 'trigger' for the centennial to millennial scale cooling events identified over the past 500kyr (Barker at al., 2015). Polar planktic foraminiferal and lithogenic/terrigenous grain counts reveal that the southward migration of the polar front occurs before the deposition of ice rafted debris and therefore the rafting of ice during stadial periods. Based upon this evidence, Barker et al. suggest that the transition to a stadial state is a non-linear response to gradual cooling in the region. In order to test this hypothesis, our study reconstructs sea surface temperature across D-O events and the deglaciation in the North Atlantic between 30ka and 10ka using Mg/ Ca paleothermometry in *Globigerina bulloides* at ODP Sites 980 and 983 (the same sites as used in Barker et al., 2015) with an average sampling resolution of 300 years. With our new record we evaluate the timing of surface ocean temperature change, frontal shift movement, and ice rafting to investigate variations in the temperature gradient across the polar front over D-O events.

References:

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