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An annually resolved marine proxy record for the 8.2K cold event from the northern North Sea based on bivalve shells

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The so-called 8.2K cold event is a rapid cooling of about 6° +/- 2° recorded in the Greenland ice core record and thought to be a consequence of a freshwater pulse from the Laurentide ice sheet which reduced deepwater formation in the North Atlantic. In the Greenland ice cores the event is characterized by a maximum extent of 159 years and a central event lasting for 70 years. As discussed by Thomas et al (QSR, 2007), the low resolution and dating uncertainty of much palaeoclimate data makes it difficult to determine the rates of change and causal sequence that characterise the event at different locations.

We present here a bivalve shell chronology based on four shells of Arctica islandica from the northern North Sea which (within radiocarbon uncertainty) is coeval with the 8.2K event recorded in the Greenland ice cores. The years of death of each shell based on radiocarbon analysis and crossmatching are 8094, 8134, 8147, and 8208 yrs BP (where "present" = AD 1950), with an associated radiocarbon uncertainty of +/-80 yrs, and their longevities are 106, 122, 112 and 79 years respectively. The total length of the chronology is 192 years (8286 – 8094 BP +/- 80 yrs).

The most noticeable feature of the chronology is an ~60-year period of increasing growth which may correspond to a similar period of decreasing ice accumulation in the GRIP (central Greenland) ice core record. We tentatively suggest that this reflects increasing food supply to the benthos as summer stratification is weakened by colder seawater temperatures. Stable isotope analyses (results expected to be available when this abstract is presented), will show changes at annual and seasonal resolution, potentially giving a very detailed insight into the causal factors associated with the 8.2K event and its impact in the northern North Sea.