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North Atlantic surface ocean radiocarbon reservoir age variation: links to rapid global climate change

Louise Brown (1), **William E.N. Austin** (1), Richard J. Telford (2), Ulysses S. Ninnemann (2), Lindsay J. Wilson (1,3) and Charlotte L. Bryant (4)

(1) School of Geography and Geosciences, University of St Andrews, Scotland, (2) Bjerknes Centre for Climate Research, University of Bergen, Norway, (3) Department of Geology, University of Tromsø, Norway, (4) Natural Environment Research Council Radiocarbon Laboratory, East Kilbride, Scotland (bill.austin@st-andrews.ac.uk / Fax: +44(0)1334 463949 / Phone: +44(0)1334 463988)

High resolution palaeoclimate records show that the overall warming throughout the late glacial period to the present has been punctuated by repeated cooling events on decadal to centennial timescales. Reorganisation of the North Atlantic's deep water thermohaline circulation is often considered an important factor in triggering or controlling these abrupt climate change intervals. During the Younger Dryas (YD), the most significant of these late glacial climatic coolings, a large, positive anomaly in atmospheric radiocarbon concentration ($\Delta^{14}C_{atm}$) is observed, which is not fully accounted for by changes in the production rate of ^{14}C. Another potential source of $\Delta^{14}C_{atm}$variation is the extent of carbon exchange between the atmosphere and other reservoirs, such as the deep ocean, and it has been suggested that the circulation changes which drove the YD cooling were also partially responsible for limiting air-sea CO_2 exchange and hence increasing $\Delta^{14}C_{atm}$. Reconstructions of North Atlantic surface ocean radiocarbon reservoir ages (Rt) during the Younger Dryas, based on known-age markers such as tephra horizons, demonstrate an increase in Rt from modern values of 400 y to $>$800 y, widely believed to be indicative of reduced carbon exchange between the atmosphere and the deep ocean. However, the limited temporal resolution of these measurements has thus far been insufficient to fully explore the connection between changing Rt and rapid, ocean circulation-induced climate change. Here we present the first detailed reconstruction of changing Rt in the late glacial period, from a high resolution marine sediment record north of 50˚ N. Stable isotope records and radiocarbon chronologies from cores collected in the St Kilda Basin, He-

bridean shelf, containing highly-expanded late glacial records, will be used to assess the importance and controlling mechanisms of reservoir age variation in the NE Atlantic.