Improving estimates of surface water radiocarbon reservoir ages in the northeastern Atlantic Ocean

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Radiocarbon measurements from foraminifera in marine sediment cores are widely used to constrain age models and the timing of paleoceanographic events, as well as past changes in ocean circulation and carbon cycling. However, in order to utilise radiocarbon for these purposes a knowledge of the surface ocean radiocarbon reservoir age and how it varies in both space and time is needed. Typically, to convert a planktic radiocarbon age into a calendar age, an assumed constant reservoir age is applied. However, there is mounting evidence to suggest that this assumption of constant reservoir age through time is an oversimplification, particularly for the high latitude oceans during intervals of rapid climate change. Here we present a new high-resolution radiocarbon record from ODP Site 983 together with 230-thorium (^{230}Th) constrained sedimentation rates between tie points to improve estimates of radiocarbon reservoir age in the Northeast Atlantic Ocean. We also use published grain size data to evaluate how changing sediment flux could affect the utility of ^{230}Th normalisation to calculate sedimentation rates. With this new record we explore the impact of the calculated reservoir ages for both the age model at Site 983, as well as the palaeoceanographic implications of these reservoir age changes during intervals of rapid climate change over the past 40,000 years.