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U-series vs ^{14}C ages of deep-sea corals from the southern Labrador Sea: Sporadic development of corals and geochemical processes hampering estimation of ambient water ventilation ages

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Deep-sea scleractinian corals were collected with the remotely operated ROPOS vehicle off Newfounland. Fossil specimens of *Desmophyllum dianthus* were raised from coral graveyards at Orphan Knoll (∼1700m depth) and Flemish cap (∼2200 m depth), while live specimens were collected directly in overlying steep rock slopes. *D. dianthus* has an aragonitic skeleton and is thus particularly suited for U-Th dating. We obtained $>$ 70 U-series ages along with $>$ 20 ^{14}C measurements. Results display a discrete age distribution with two age clusters: a Bølling-Allerød and Holocene cluster with $>$ 20 samples, and a Marine Isotope Stage (MIS) 5c cluster with ∼50 samples. Only two samples lay outside these clusters, at $\sim$ 64 ka and at ∼181 ka. Contrary to the New England seamounts where coral presence seems to have been continue through the last 70 ka, Orphan Knoll and Flemish Cap graveyards are marked by the absence of preserved specimens from MIS 2 to MIS 4 and throughout MIS 6. For filter-feeding deep-sea corals, access to food-rich waters is essential. Hence the Holocene and MIS 5 clusters observed in the Labrador basin might represent intervals linked to high food availability, either through production in the overlying water column, more effectively in relation to particulate and dissolved organic carbon transport via an active Western Boundary Undercurrent. Comparison of ^{230}Th-ages vs ^{14}C-ages in order to document changes in ventilation ages of the ambient water masses is equivocal due to the presence of some diagenetic and/or initial ^{230}Th-excess. In addition, discrete diagenetic U-fluxes can be documented from ^{234}U/^{238}U vs ^{230}Th/^{238}U data. They point to a recent winnowing of sediment overlying the fossil corals that we link to the Holocene intensification of the Western Boundary Undercurrent, which resulted in driving Fe-Mn coatings.