

Coral Li/Mg records of tropical Atlantic intermediate water warming at the end of the Little Ice Age

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The Little Ice Age (LIA) to Industry Era transition is the most recent cold to warm transition in the Holocene, therefore it is a potential analogue for future climate change. To assess the role of Atlantic Meridional Overturning Circulation (AMOC) change in this warming and its wider climatic implications, characterisation of ocean temperature at multidecadal to centennial timescales is required. Here, the Li/Mg ratio recorded along the main branch of a scleractinian coral *Enallopsammia rostrata* is used to explore the temperature change in the tropical Atlantic over the last 600 years. The coral was live-collected at ~1500 m water depth in 2013, with the oldest parts dating back to ~1430 CE using radiocarbon techniques. Our Li/Mg derived temperature record shows a ~1.7 °C warming of intermediate waters at the end of the LIA. This intermediate water warming is larger than that predicted by models and coincided with a proposed reduction of AMOC. The potential mechanisms of intermediate water warming are (i) a deepening and warming of the tropical Atlantic thermocline in response to reduced AMOC and/or (ii) the southward retreat of Antarctic Intermediate Water (AAIW).