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Ocean variability in the subpolar North Atlantic over the last 1000 years using high-resolution paleoclimate marine records

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Decadal-scale SST changes were reconstructed over the last millennium from two marine cores, MD99-2275 and RAPiD-21-3K, respectively located North and South of Iceland, along the path of the MOC (Meridional Overturning Circulation) to improve our undertanding on the role of this critical region in the global climate system. SSTs during the MCA (Medieval Climatic Anomaly) in both records show similar features with a marked MCA/LIA transition, suggesting the North Atlantic subpolar gyre as a strong dynamic link during this period of presumably enhanced advection of warmer waters to the North. In contrast, during the LIA (Little Ice Age), SSTs in the polar front region, North of Iceland, indicate a pronounced cooling towards present while hardly detectable South of Iceland. Based on our data and available proxy-based reconstructions, we then explored the role of tropical-extratropical teleconnections, in particular the climatic linkages between the tropical Pacific and Atlantic MOC, using atmosphere-ocean coupled model simulation results.