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Evidence for global climate reorganization during medieval times

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Coupled climate model simulations using increased tropical warm pool SSTs agree well with globally distributed marine and terrestrial proxy records, supporting the idea that changes in the tropical SSTs were an important driving mechanism for the Medieval Climate Anomaly (MCA) and the Little Ice Age (LIA). In the model, the altered tropical SSTs induce zonal and meridional shifts in tropical and extra-tropical circulation patterns, giving rise to the approximately coherent MCA-LIA hydroclimate and temperature signals seen in many proxy records. It is likely not coincidental that the tropical SST pattern that produces this apparently realistic model response is remarkably similar to a recent climate field reconstruction of MCA-LIA temperature differences. We compare the regional tropical and extra-tropical signatures of the MCA-LIA climate seen in the model results and proxy data, and describe multi-proxy evidence for a sharply bounded episode of climate change within general timeframe of the MCA, considering both proxy sensitivities and proposed dynamical mechanisms.