



## **On the stability of teleconnections in the North Atlantic for the late Holocene**

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The stability of the teleconnections is analyzed in the Atlantic-European region utilizing data from a 500-yr proxy-based climate reconstructions, and a long-term climate simulation with perpetual 1990 AD forcing. The observed and simulated teleconnectivity defined by the 500 hPa geopotential height fields and the related variability of temperature and precipitation are compared and interpreted in order to improve the understanding of natural climate variability on interannual to decadal time scales for the late Holocene. The focus is set to the winter and summer seasons. During winter, much of the variability is related to the North Atlantic Oscillation (NAO). The climate reconstruction shows pronounced interdecadal variations that appear to lock the atmospheric circulation in quasi-steady long-term patterns over multi-decadal periods. Different circulation patterns are persistent over several decades for the period 1500 to 1900 AD, while after 1900 AD both the winter and summer circulations show more non stationary behaviour. The 500-yr simulation shows some substantial differences, with a more unsteady behaviour of the teleconnectivity. This leads to the hypothesis that the external forcing might be partly responsible for locking specific atmospheric circulation patterns.