Multidecadal behavior of the North Atlantic Oscillation during the last millennium

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Supplementary material
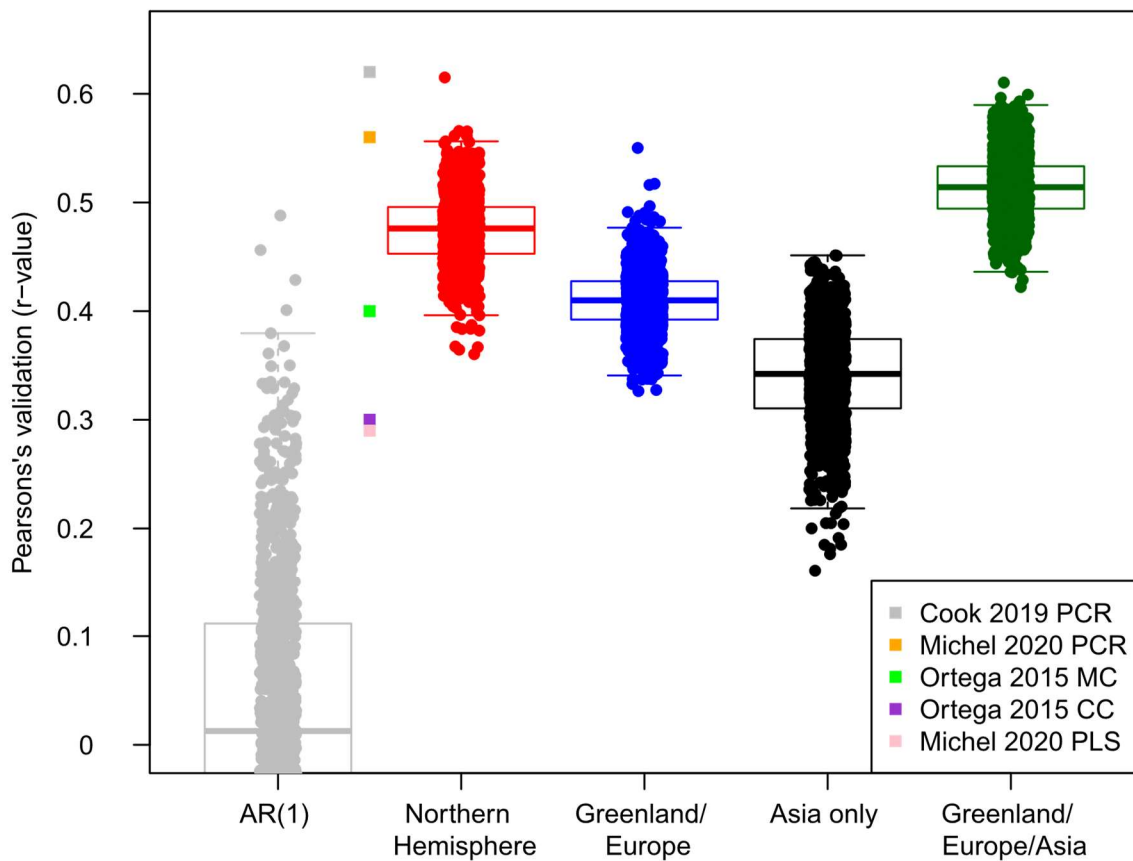
Figure S1. As in Fig. 3 but after padding the regional subsets with AR(1) noise to match the number of records in the full reconstruction.

Figure S2. Map of Iso2k records included in the analysis that spanned the full last millennium (1000–2000 CE). Shapes correspond to archive type and colors denote the Pearson's r-value of each record with the instrumental winter NAO index over the calibration-validation interval (1823–2000 CE).
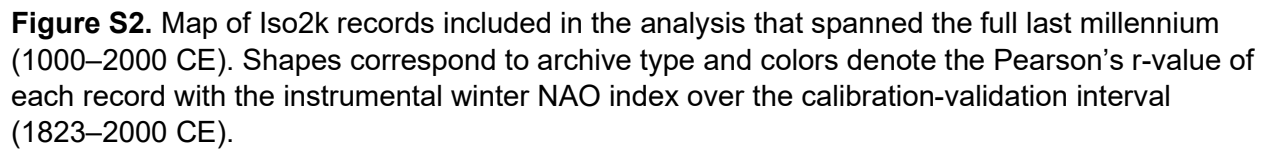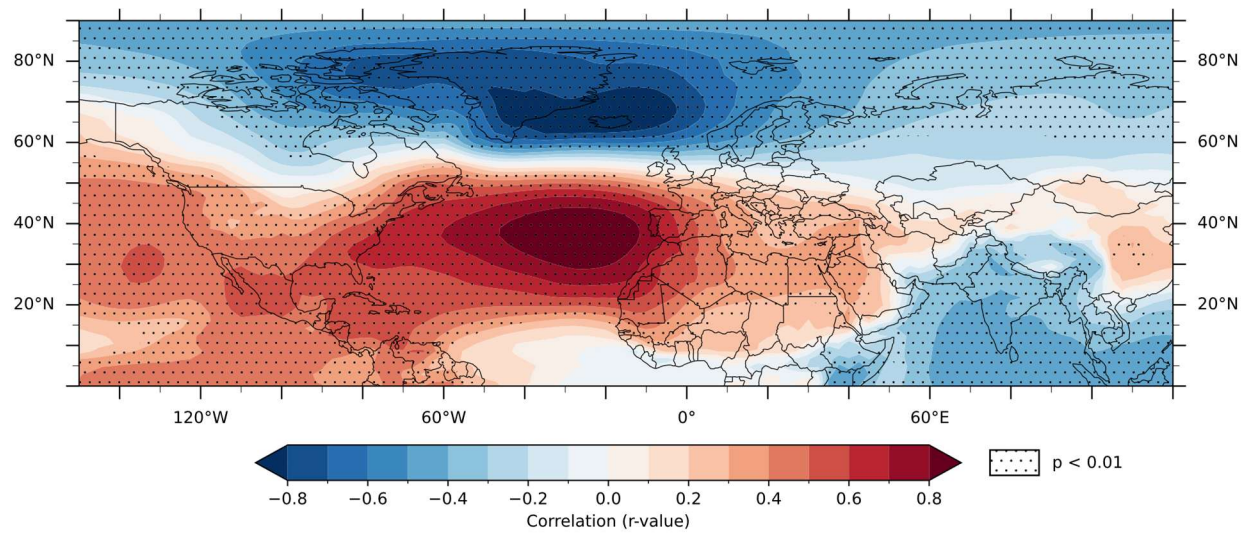
Figure S3. Winter NAO$_{iLME}$ correlations (color contours) with winter sea level pressure over the period 1823–2000 CE. Stippling denotes p <0.01.
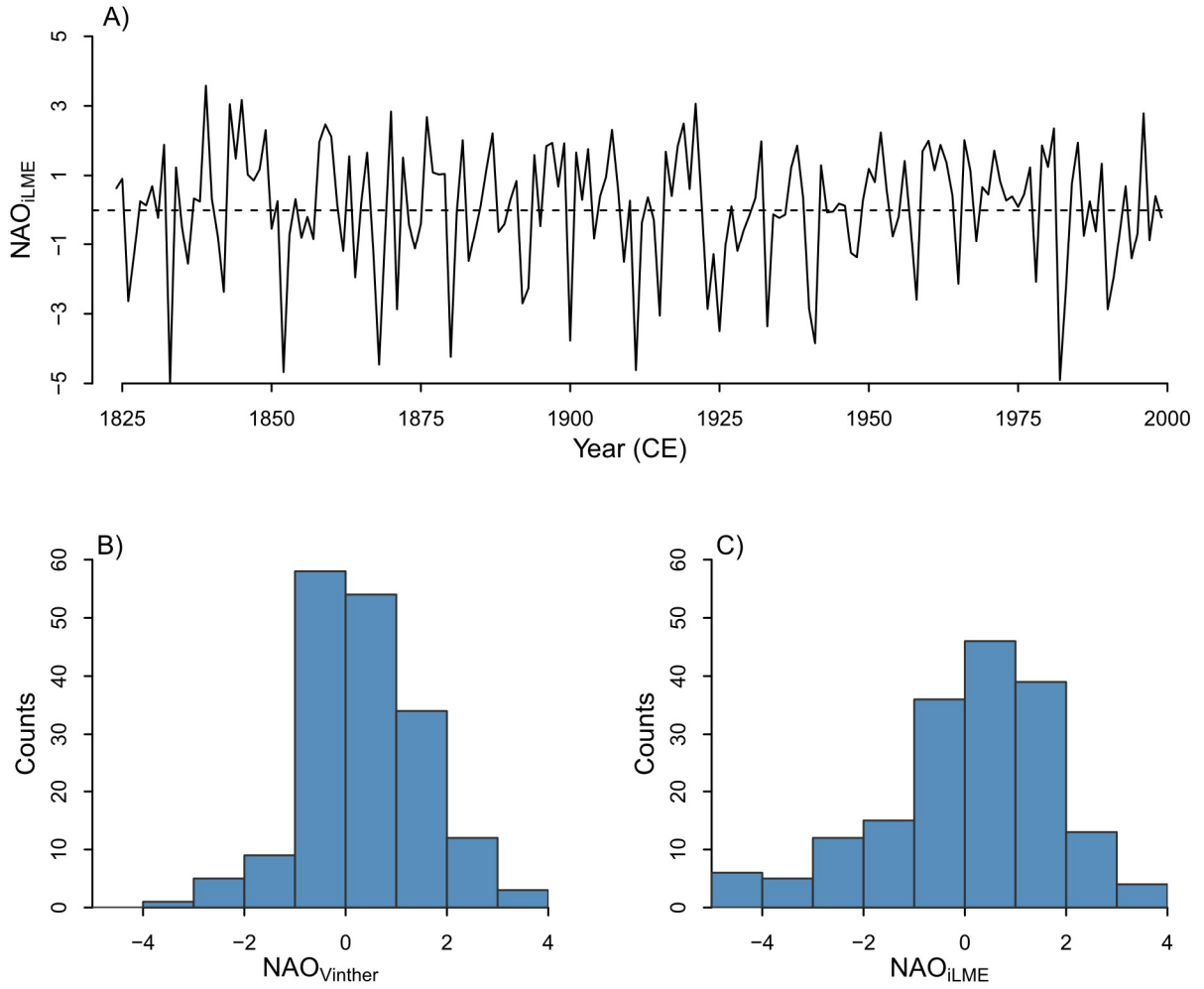
Figure S4. (a) Timeseries of the winter (DJF) NAO$_{iLME}$ index generated from the first fully forced ensemble member of the iLME CESM for the period 1823–2000 CE. (b) Histogram of NAO index values from NAO$_{Vinther}$. (c) Histogram of NAO index values from NAO$_{iLME}$ shown in panel (a).
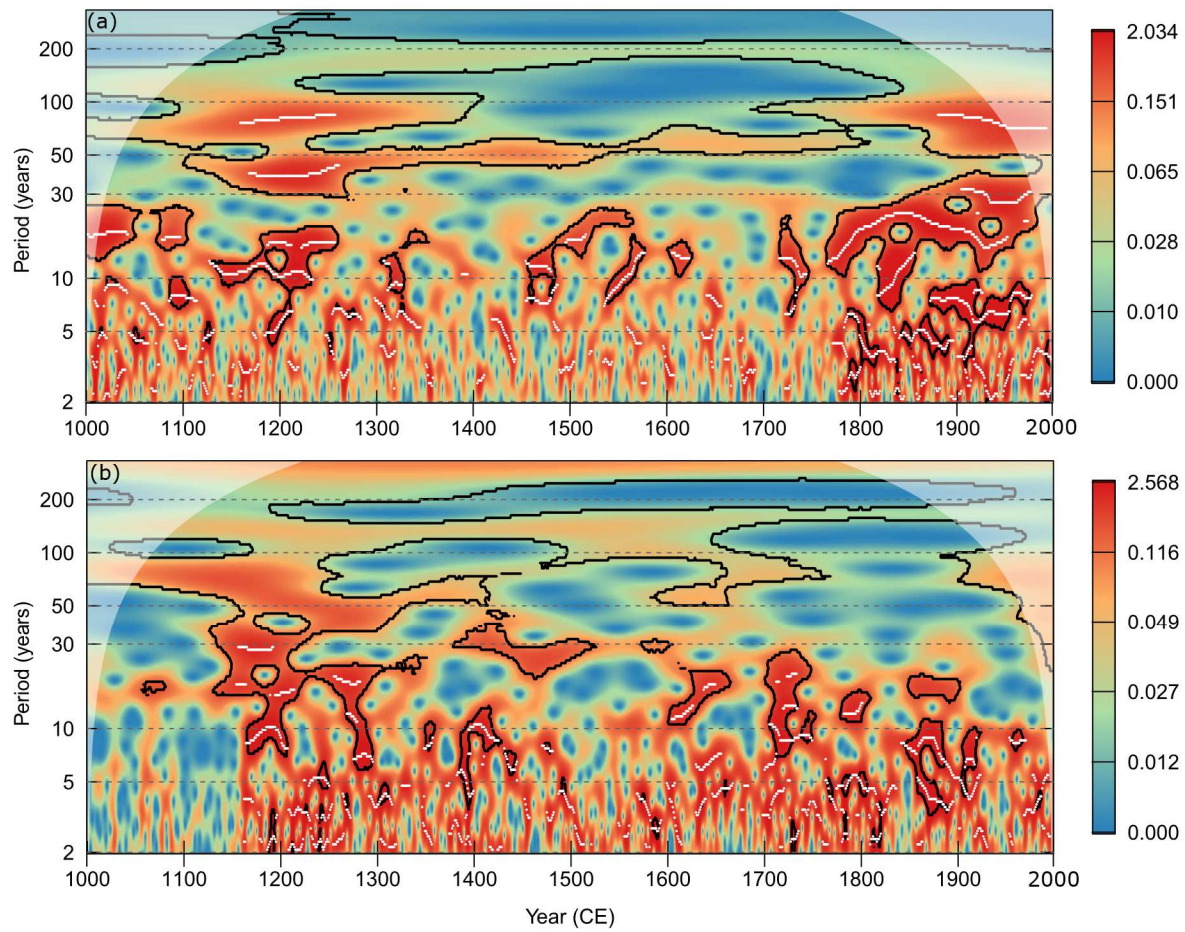
Figure S5. Wavelet decomposition of the NAO reconstructions from 1000–2000 CE using only (a) glacier ice and (b) wood cellulose records. Color contours are scaled by power quantiles. Black contours bound statistically significant power (p < 0.05) and white curves show ridges (power maxima). White envelope shows the region of influence where padding may influence the spectrum.

NDJFM monthly Lhasa winter correlation r-values				
	NAO	Temperature	Precipitation	d18O
NAO		**-0.55**	**0.46**	0.17
Temperature			0.04	0.35
Precipitation				0.19

Table S1. Winter (NDJFM) monthly correlations between $NAO_{Vinther}$ and observed temperature, precipitation amount, and $\delta^{18}O_{precip}$ for the period 1994–2006 (not continuous). Bold values indicate significant correlations at $p < 0.1$.
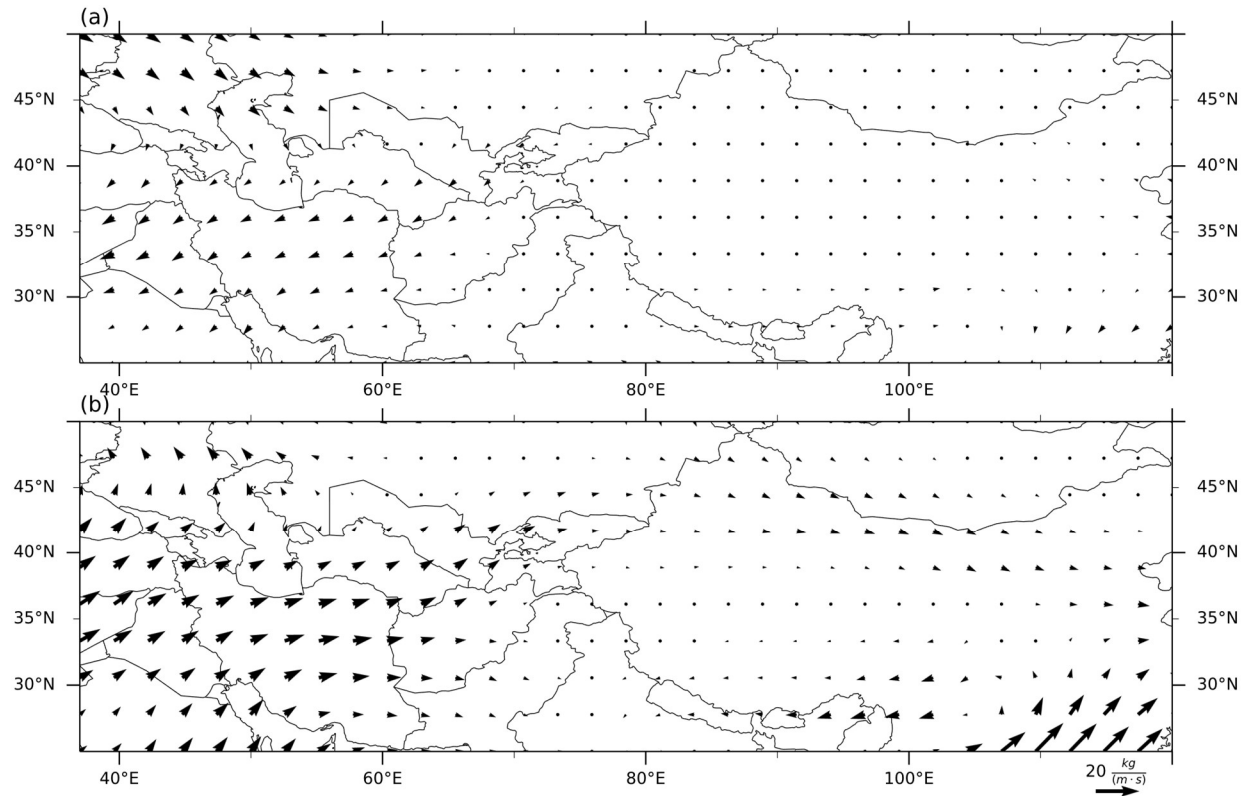
Figure S6. Winter (DJF) IVT anomalies during positive (a) and negative (b) winter NAO$_{iLME}$ years, with these defined as greater or less than one standard deviation from the mean, respectively, over the period 1823–2000 CE. Anomalies were calculated relative to the full period from 1823–2000 CE.