The potential of tree-ring cellulose content as a novel supplementary proxy in dendroclimatology

SUPPLEMENT

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Cloudiness
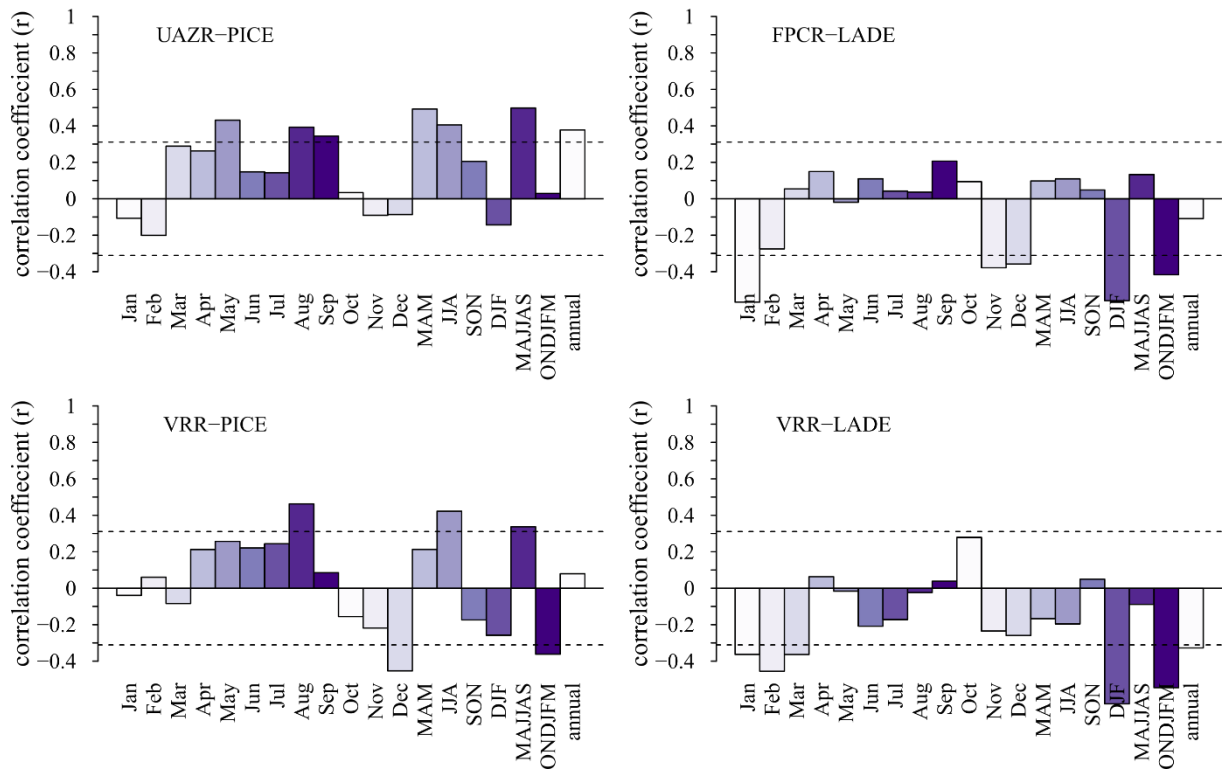
Fig. S1. Pearson's correlation coefficient for mean CC [%] and cloudiness anomalies (w.r.t. 1961-1990) for the period 1865 – 2005 A.D. UAZR and FPCR are correlated with HISTALP NW region data, whereas VRR species are correlated with the SW region dataset. The dashed horizontal lines indicate the level of significance (p < 0.05).

Sunshine
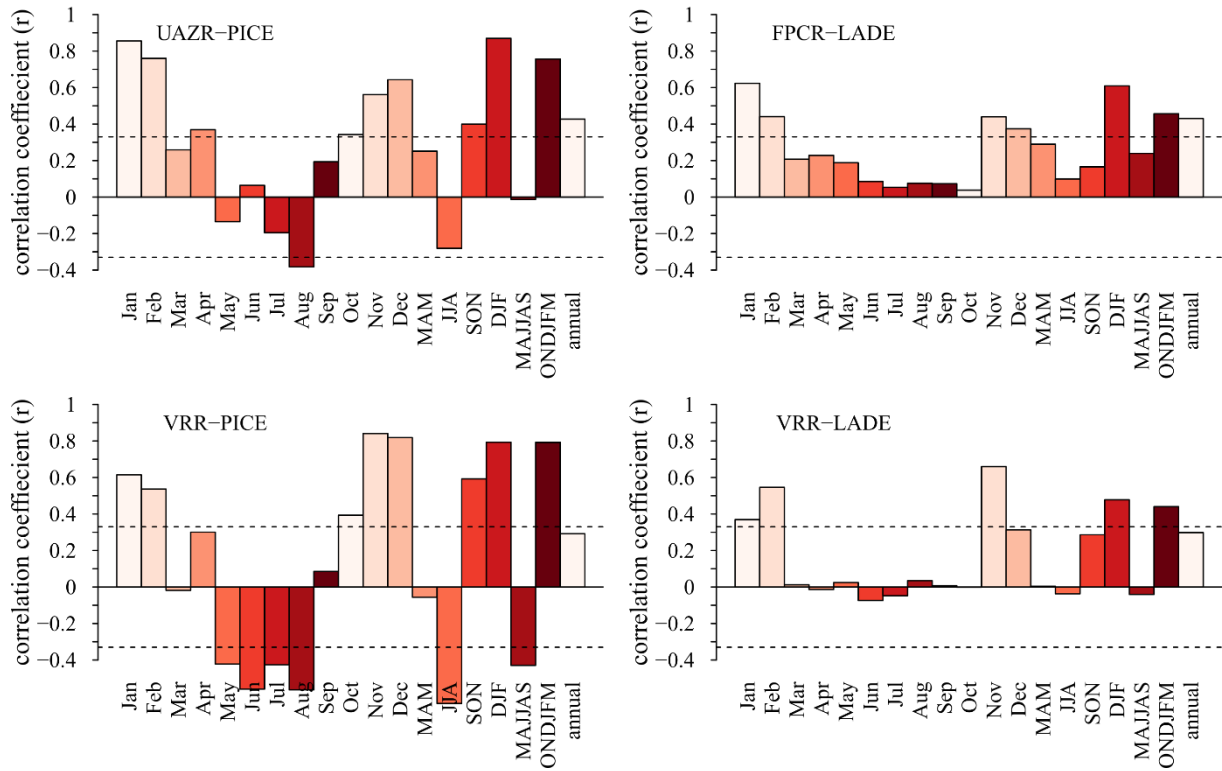
Fig. S2. Pearson's correlation coefficient for mean CC [%] and sunshine anomalies (w.r.t. 1961-1990) for the period 1865 – 2005 A.D. UAZR and FPCR are correlated with HISTALP NW region data, whereas VRR species are correlated with the SW region dataset. The dashed horizontal lines indicate the level of significance (p < 0.05)
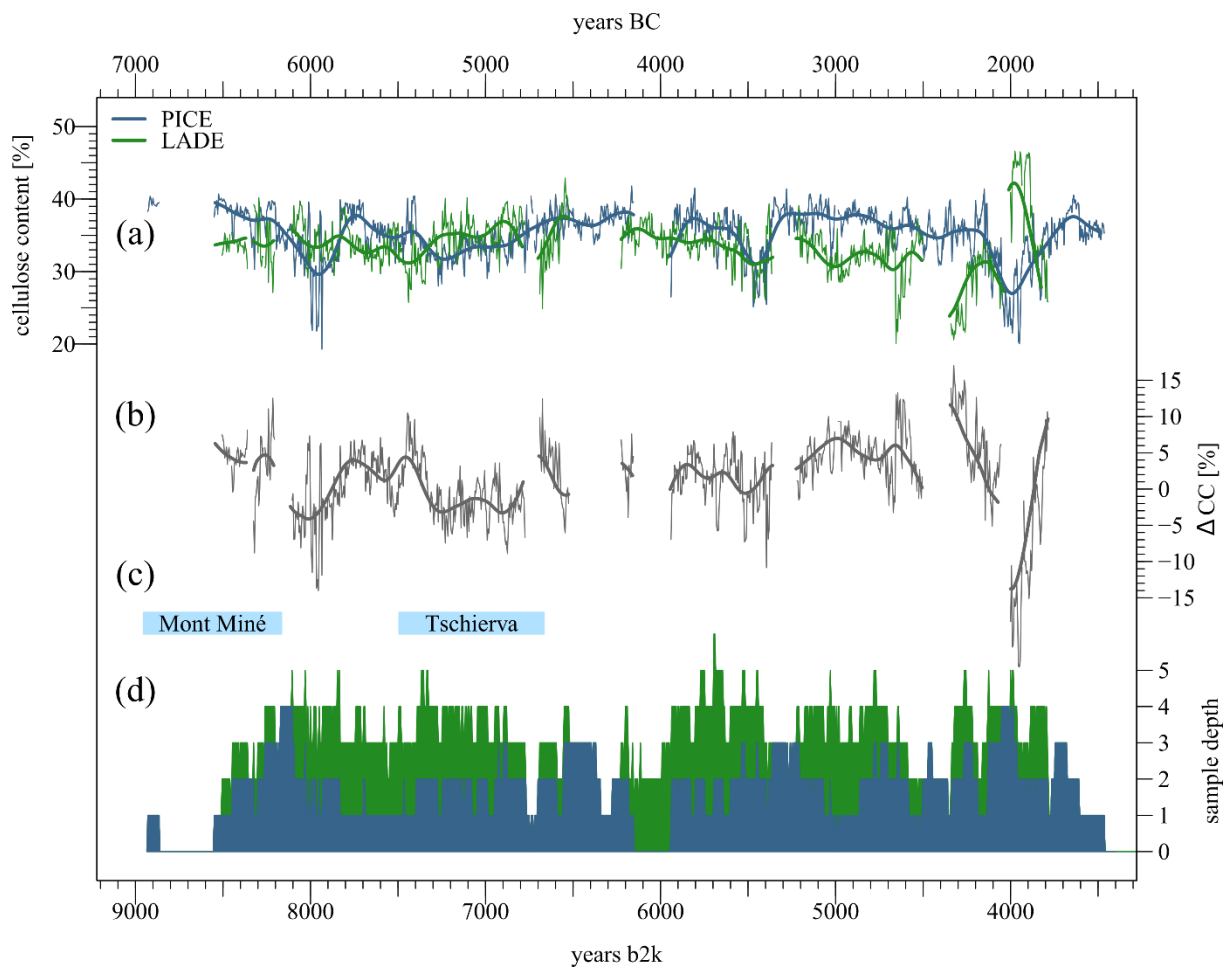
Fig. S3. Tree-species related cellulose content variability during the Holocene. Shown are (a) the mean cellulose content series for LADE (green) and PICE (blue) with corresponding smoothing lines indicating their low-frequency trends, (b) the mean difference between the species given as delta CC [%] (dark grey, on top) and (d) the sample replication (bottom) indicating the number of samples contributing to the mean cellulose content series per species. Blue rectangles (c) mark phases where wood sample stem almost exclusively from a single glacier site.
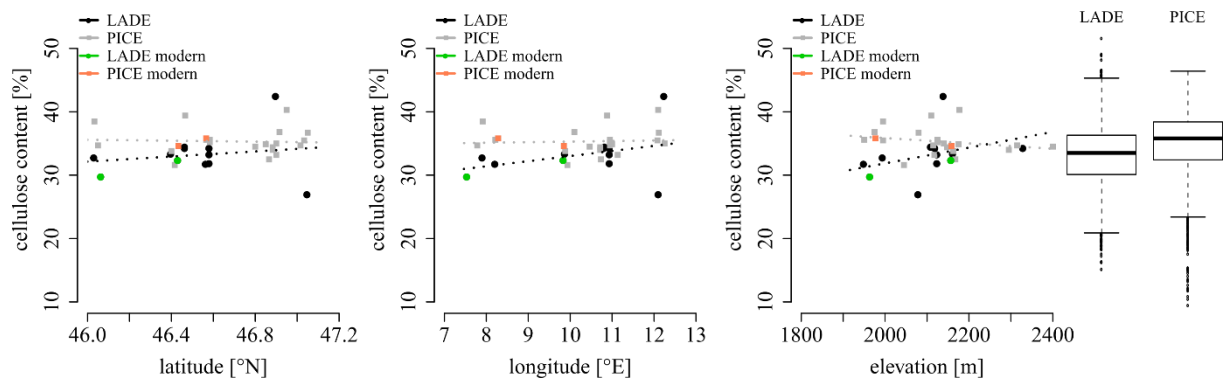
Fig. S4. Effects of site gradients in latitude (left), longitude (center) and elevation (right) on the mean α-CC [%] of both individual modern (colored) and Holocene wood samples. Mean α-CC [%] is calculated as the arithmetic mean of tree average values per site. Shown linear regressions per species are non-significant (p> 0.05). Boxplots (right) indicate the distribution of CC [%] values for the two tree species over all sites and samples.
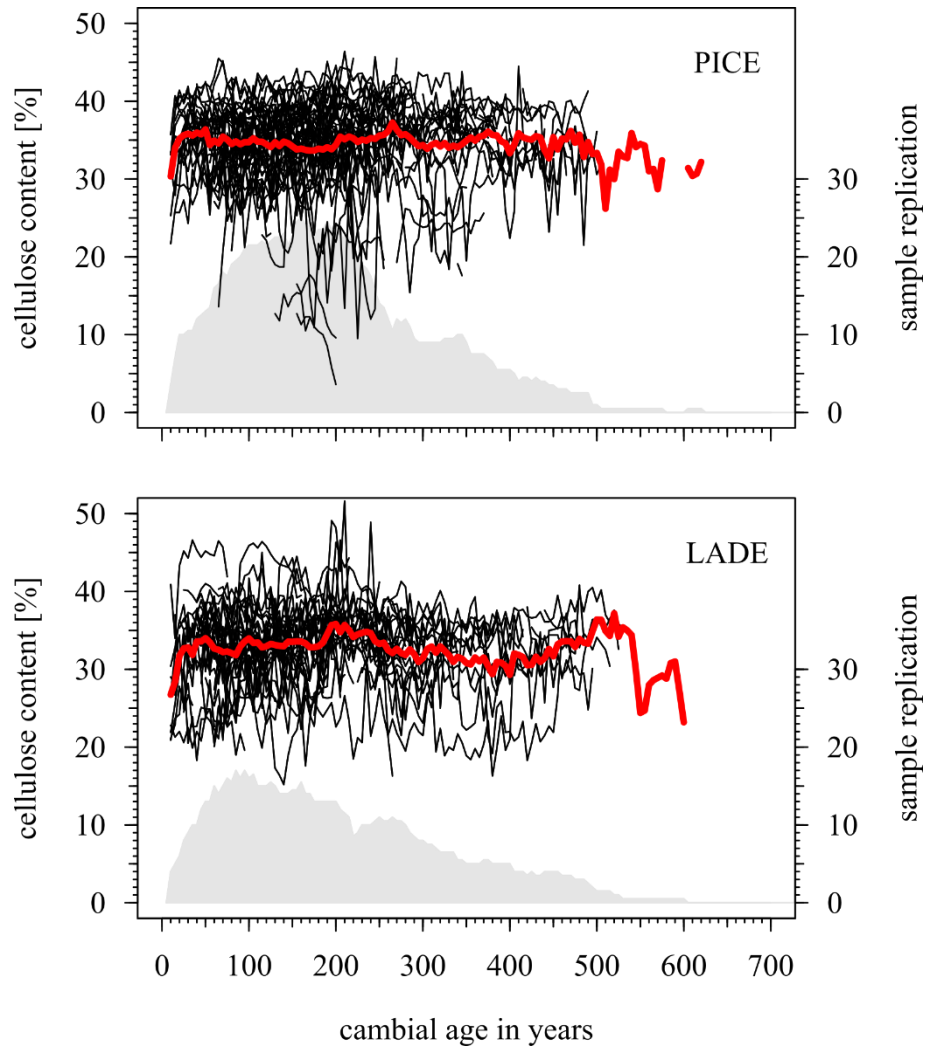
Fig. S5. Age-aligned LADE and PICE cellulose content series.