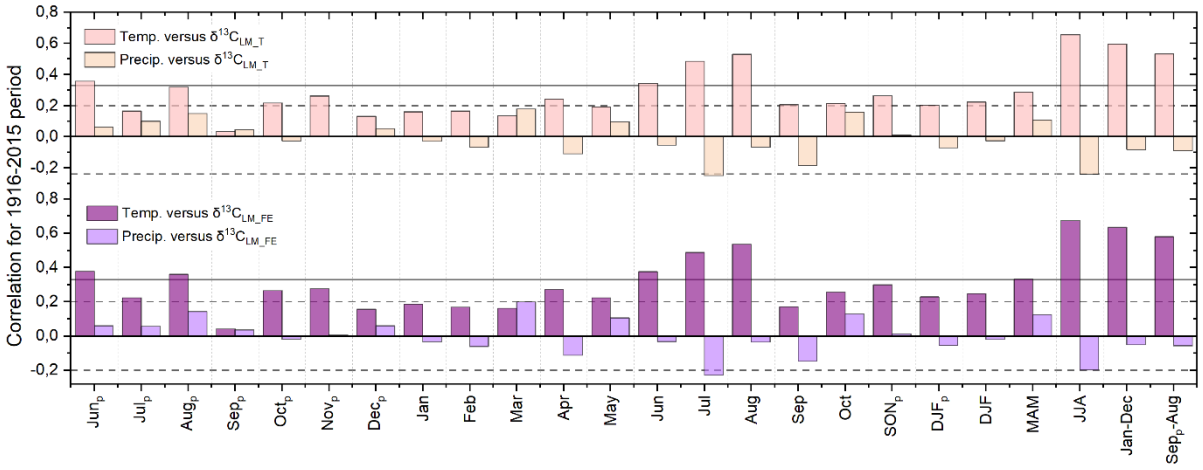
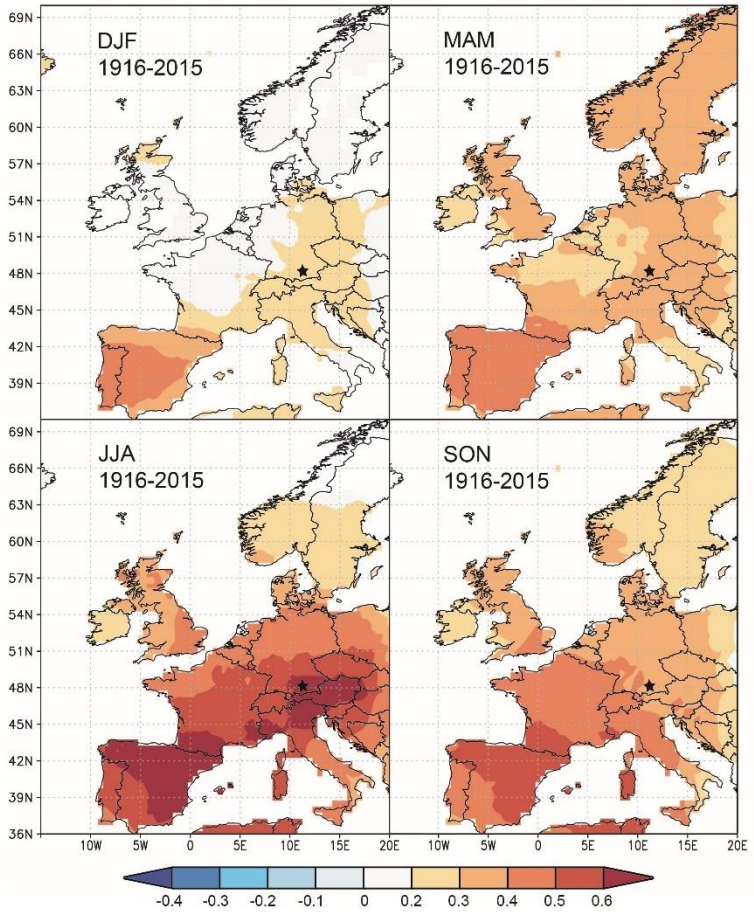
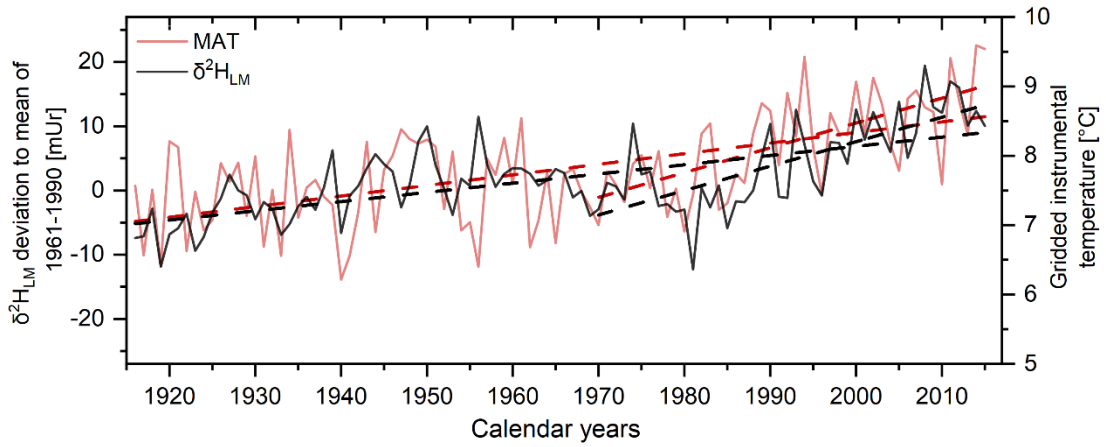


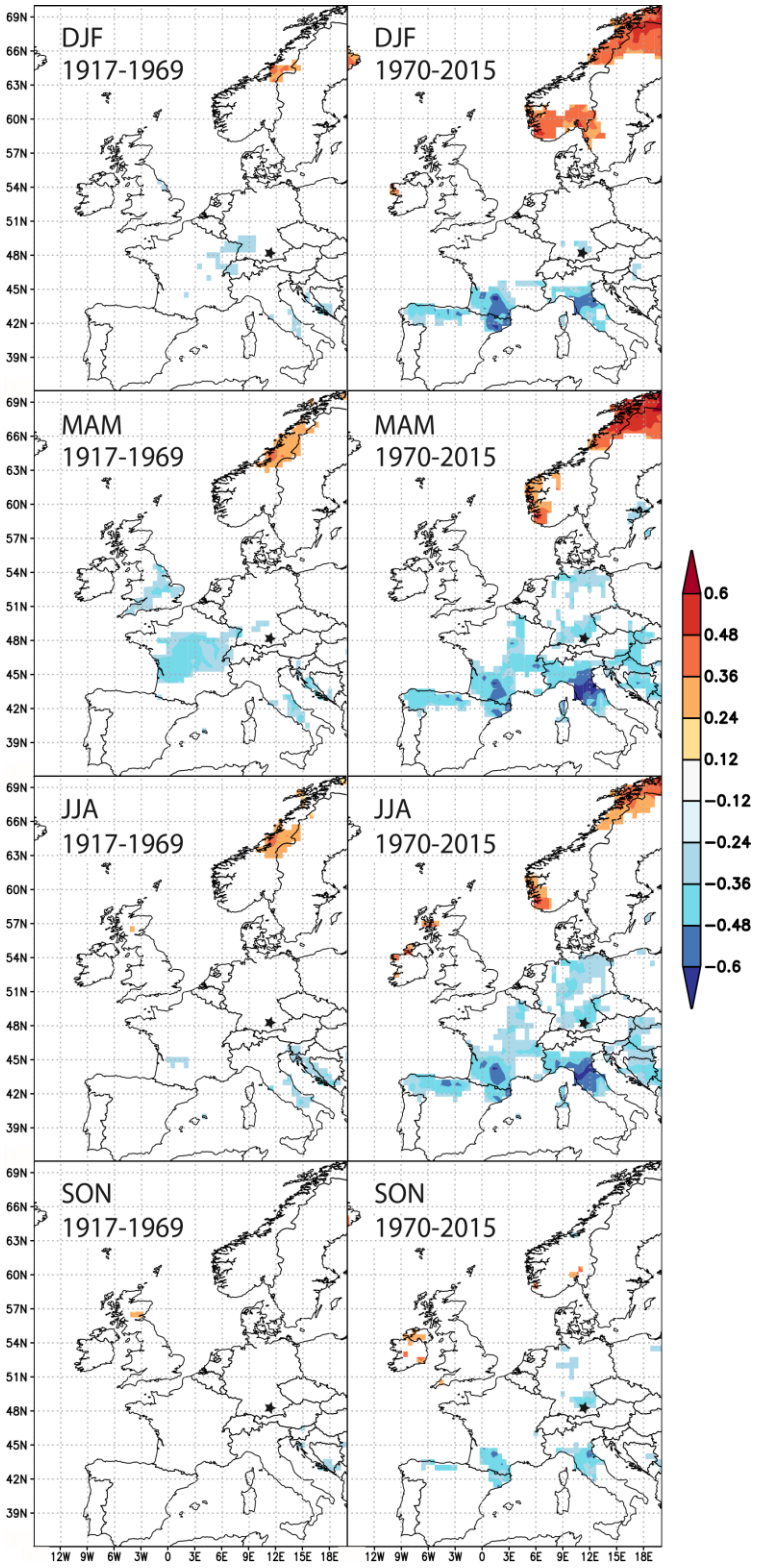
S1. Correlation coefficients between corrected $\delta^{13}C_{LM\_T}$, $\delta^{13}C_{LM\_FE}$ chronologies and local temperatures and precipitation totals from 1916 to 2015. The subscript p indicates the months of the previous year, and horizontal lines indicate the significance levels, with solid lines representing highly significant ($p < 0.001$) and dashed lines representing significant values ($p < 0.05$).



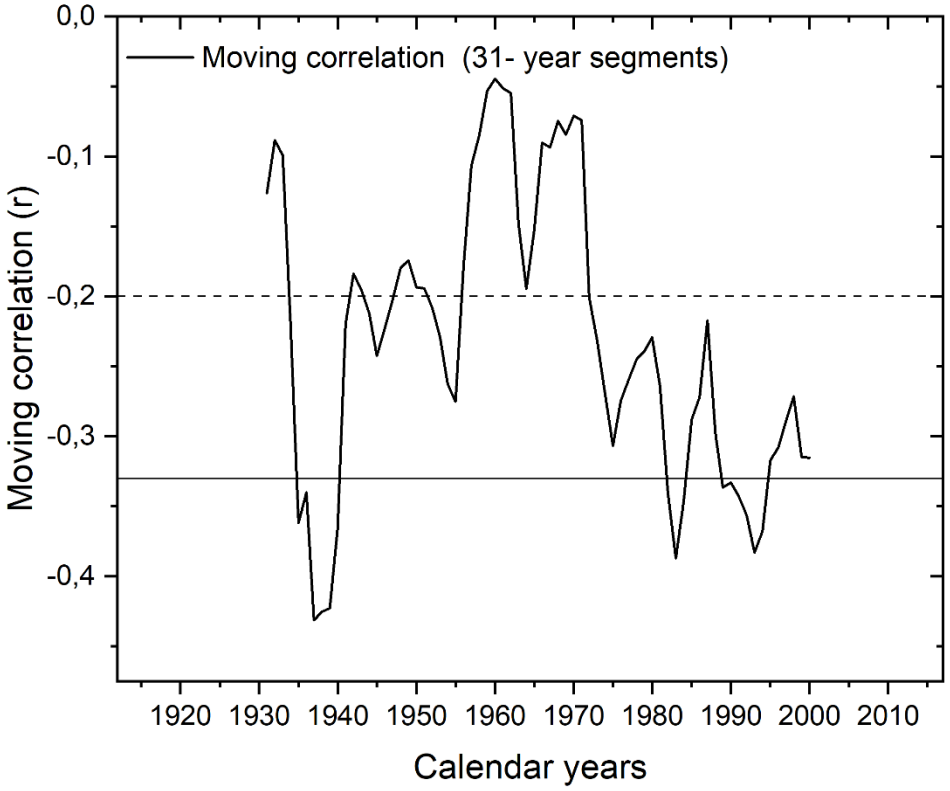
S2. Spatial correlations between winter (DJF), spring (MAM), summer (JJA), fall (SON) temperature data (CRU TS4.04), and $\delta^{13}C_{LM\_RL}$ anomalies from 1916-2015. Black star marks the Hohenpeißenberg in Germany.



S3. Gridded instrumental MAT and mean δ^2H_{LM} chronology (relative to the mean value of 1961-1990) (solid lines) over the period 1916 to 2015. Linear regression lines (dashed lines) are shown for the whole period and the period from 1970 to 2015.



S4. Spatial correlations between seasonal drought indices (CRU scPDSI 4.05early; Van Der Schrier et al., 2013) and δ^2H_{LM} values (DJF: previous year December until recent year February; MAM: March, April, May; JJA: June, July, August and SON: September, October, November temperatures) for the period 1916 to 2015.



S5. 31-year moving correlations between the seasonal drought index (CRU scPDSI 4.05early; Van Der Schrier et al., 2013) and δ^2H_{LM} values. The solid line represents highly significant and the dashed line significant values.