

Supplementary materials

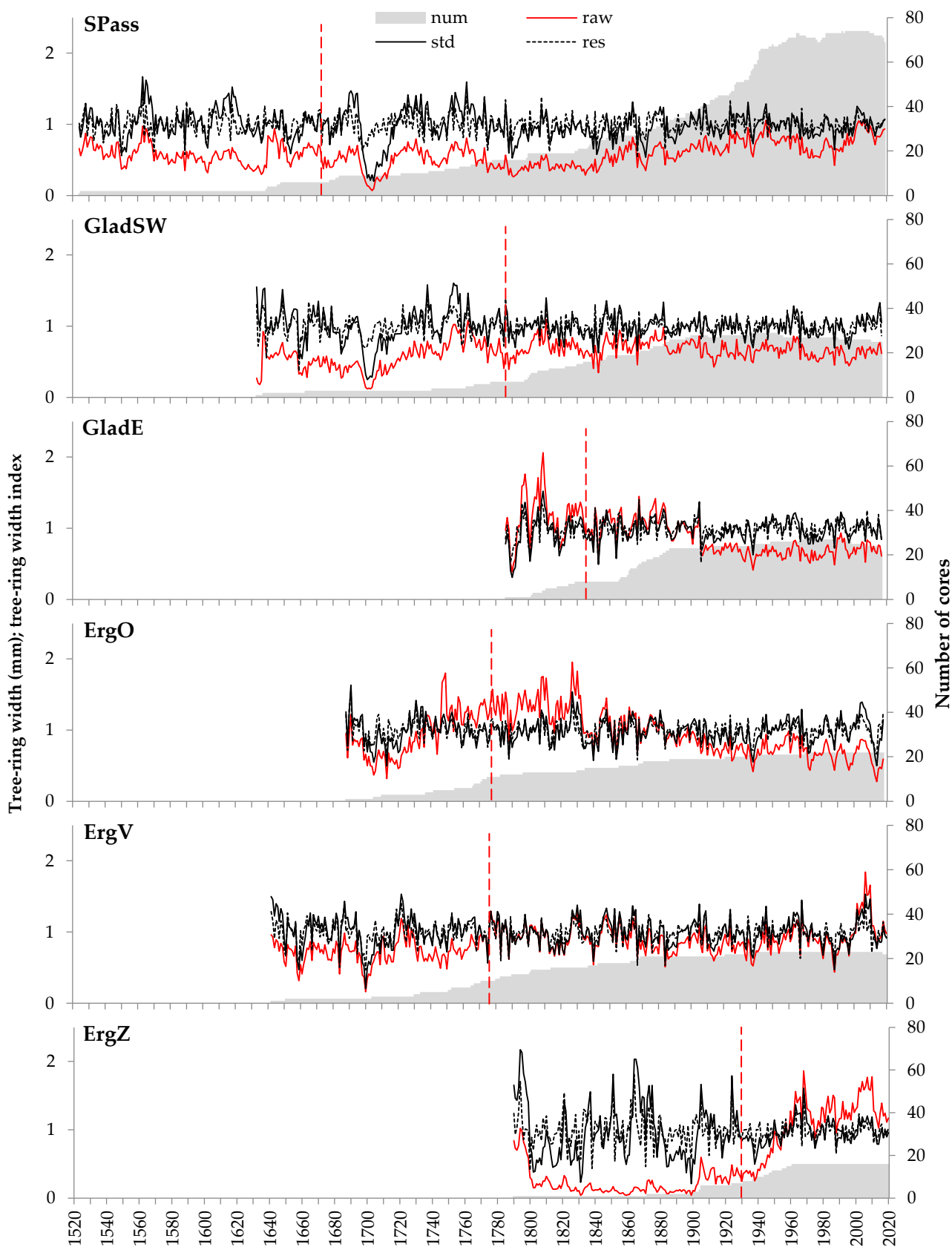


Figure S1. Tree-ring width of *P. sibirica*: raw (red lines), standard (*std*, solid black lines), and residual (*res*, dashed black lines) chronologies at each sampling site, and sample depth (grey area). Vertical dashed red lines represent year when expressed population signal EPS exceeds threshold 0.85

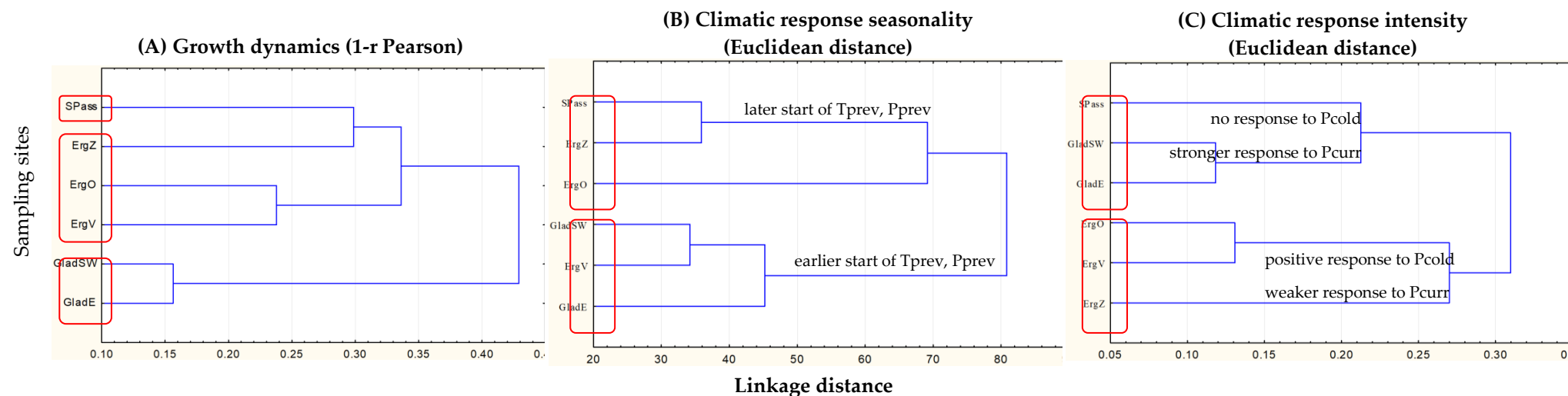


Figure S2. Hierarchical classification of local residual TRW chronologies according to **(A)** similarity of growth dynamics expressed through correlations between chronologies over the 1936–2010 period; **(B)** seasonality of climatic response expressed through starting and ending dates for climatic variables causing maximal response in pine TRW (Table 3); **(C)** intensity of climatic response expressed through values of maximal dendroclimatic correlations. Three distinctive clusters marked in (A) match the study areas; for two clusters selected arbitrarily in (B) and (C), differences between clusters significant at $p < 0.05$ are labeled.

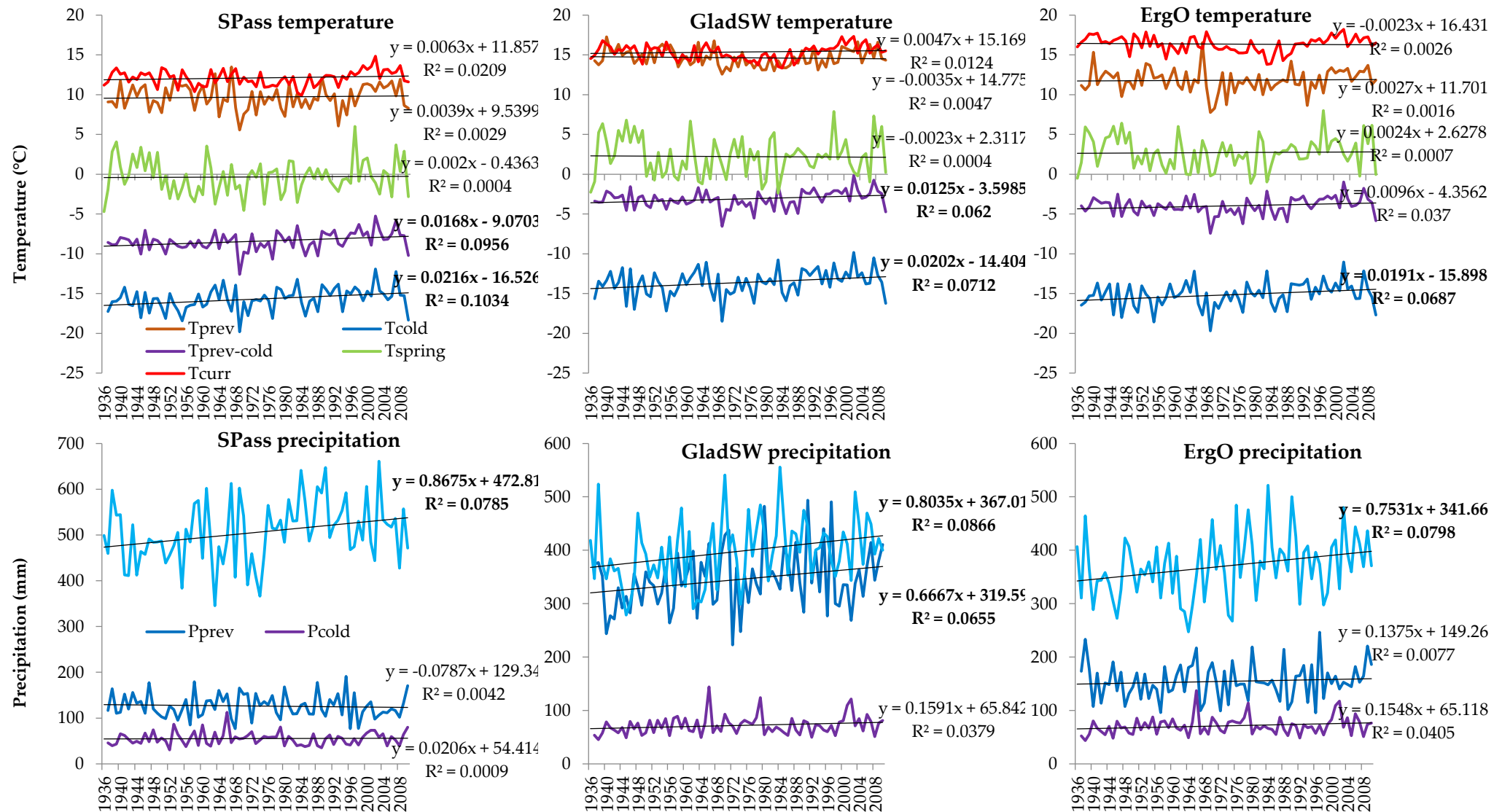


Figure S3. Long-term dynamics of seasonal climatic factors aggregated from respective grid cell series of ERA-20C daily field (1936–2010) according to the calendar dates in Table 3 for the SPass, GladE, and ErgZ sampling sites (other sites are omitted because between-site differences in climatic trends within the same area were minor due to being caused only by differences in seasonal timeframes). T, temperature; P, precipitation; *prev*, second part of previous warm season; *cold*, cold season; *spring*, early spring season; *curr*, first part of current warm season. Equations represent respective linear trends with bold-highlighted ones being significant at $p < 0.05$.