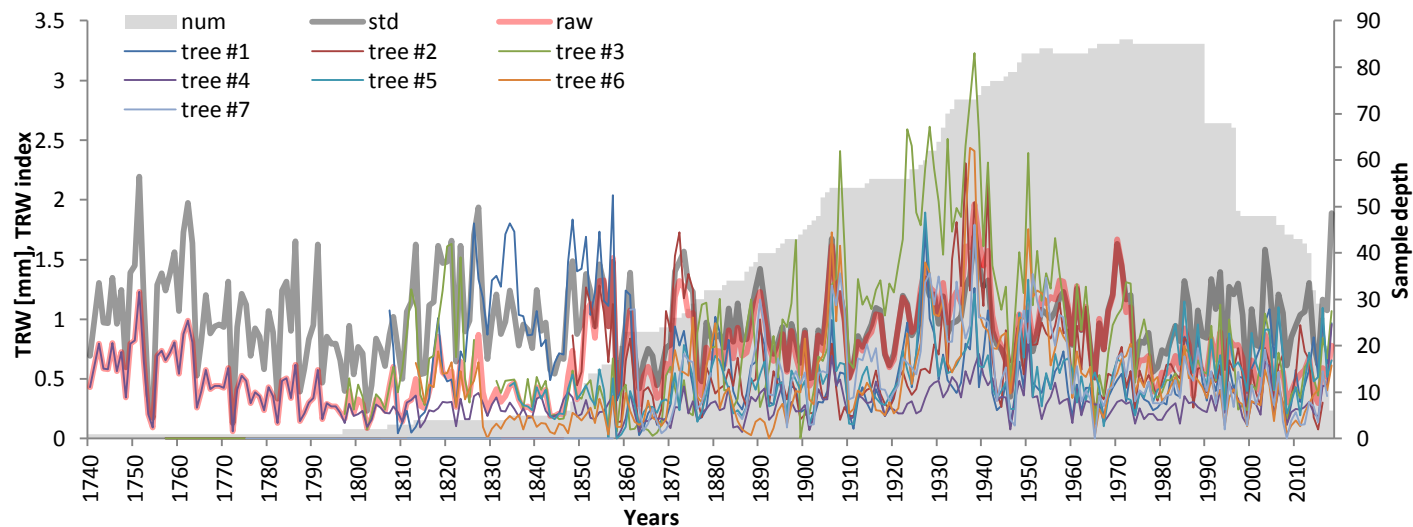
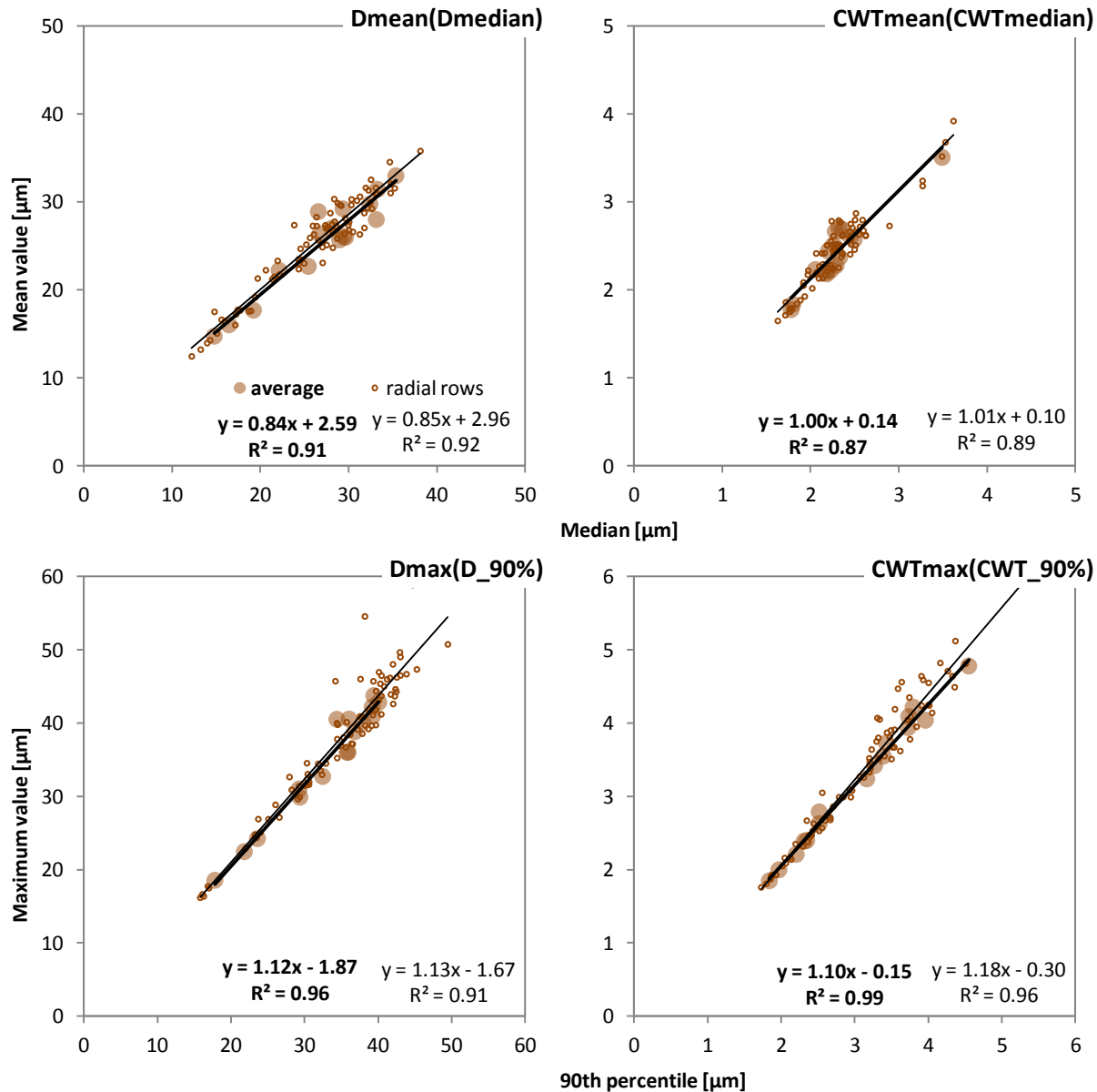


Supplementary Material

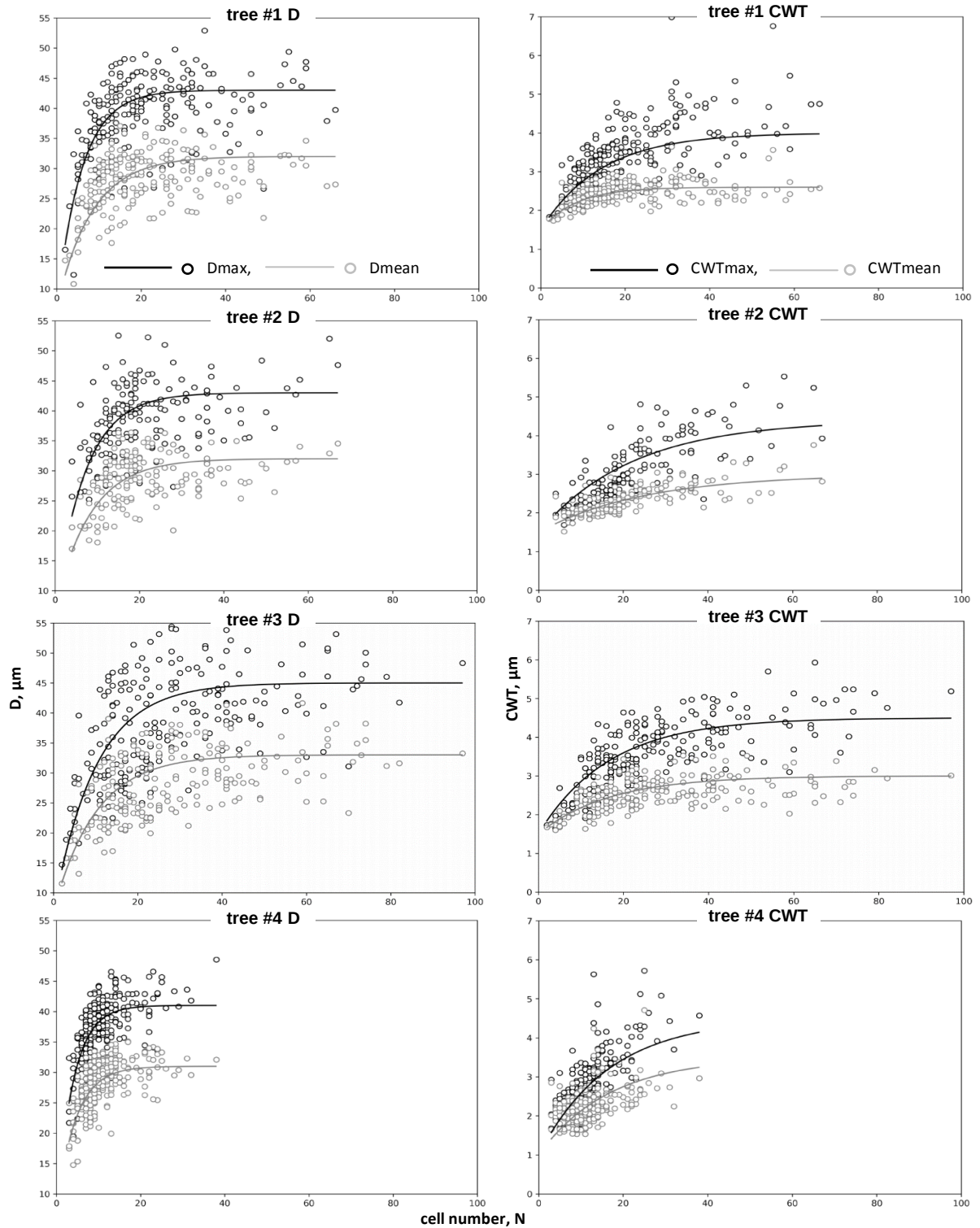


Supplementary Figure S1. TRW series of individual trees calculated from anatomical measurements (thin lines). For comparison, local chronology averaged from 86 cores is presented (red thick line, raw – measured chronology; dark grey thick line, std – standard chronology; light grey area, num – dynamics of core number)

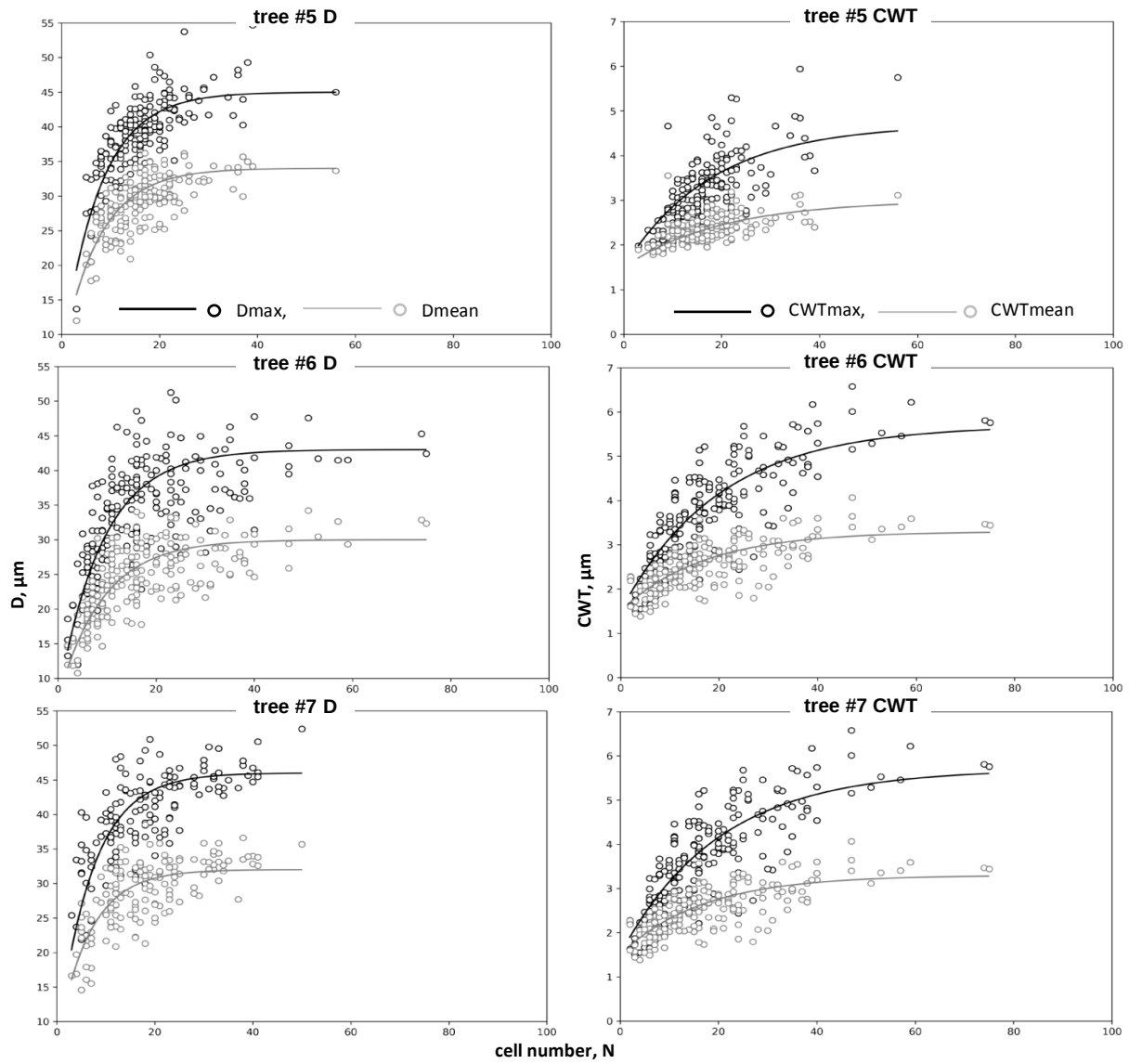


Supplementary Figure S2. Scatter plots comparing mean and median values (top row), maximum and 90th percentile values (bottom row) of radial cell diameter D (left column) and cell wall thickness CWT (right column) for subsample of 14 tree rings (2 randomly selected rings per tree). Small dots represent data of five measured radial rows of tracheids; large dots represent average tracheidograms of each tree ring. Thin lines / normal text and thick lines / bold text represent respective linear regressions

Supplementary Material



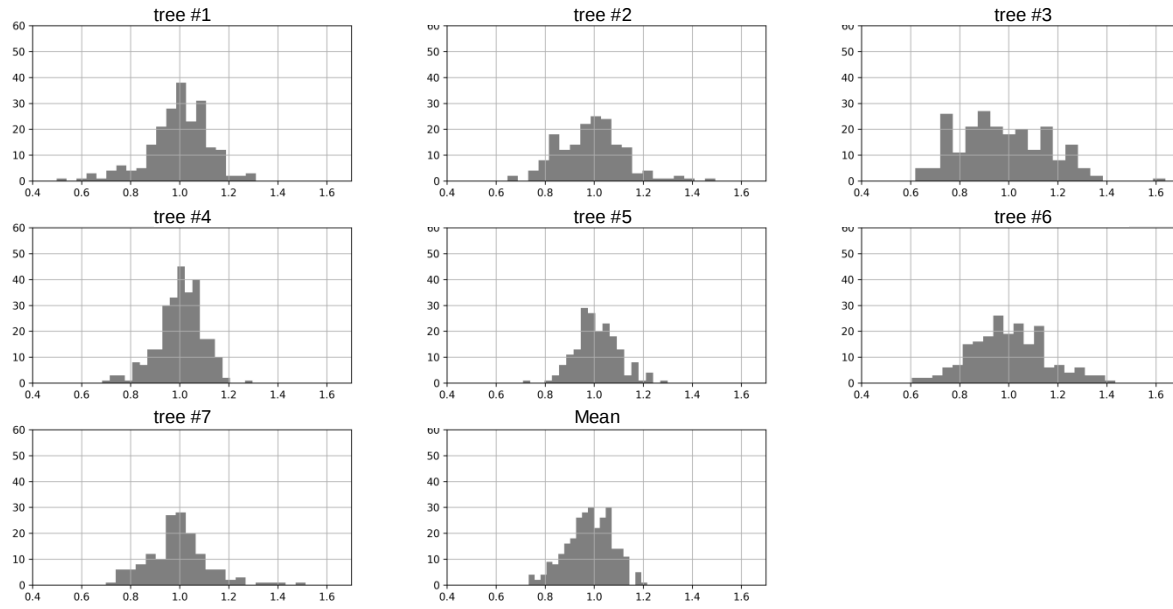
Supplementary Figure S3. Dependences of tracheid traits on cell number N for maximum & mean values of radial diameter $D_{\text{max}}(N)$ & $D_{\text{mean}}(N)$ (left panels) and cell wall thickness $CWT_{\text{max}}(N)$ & $CWT_{\text{mean}}(N)$ (right panels) for each individual tree. Markers of scatter plots (circles) represent actual tree rings; lines represent exponential functions of relationships. Data on maximum values of cell traits (D_{max} , CWT_{max}) are presented in black color; data on mean values of cell traits (D_{mean} , CWT_{mean}) are presented in grey color



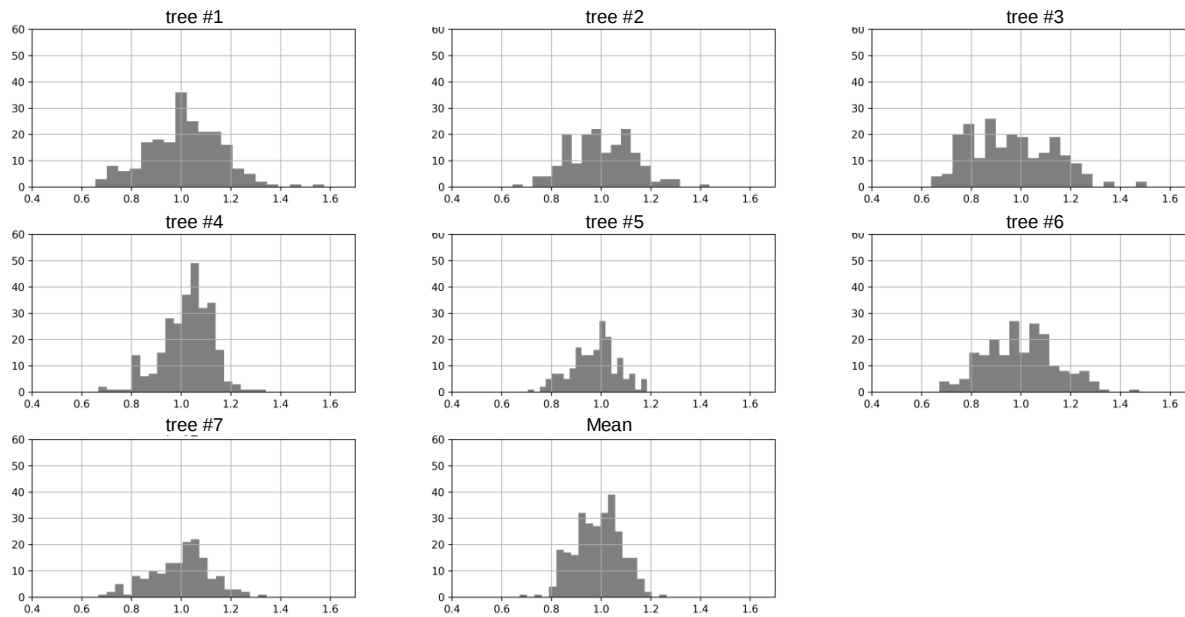
Supplementary Figure S3. Dependences of tracheid traits on cell number N for maximum & mean values of radial diameter $D_{\text{max}}(N)$ & $D_{\text{mean}}(N)$ (left panels) and cell wall thickness $CWT_{\text{max}}(N)$ & $CWT_{\text{mean}}(N)$ (right panels) for each individual tree. Continued

Supplementary Material

Dmax

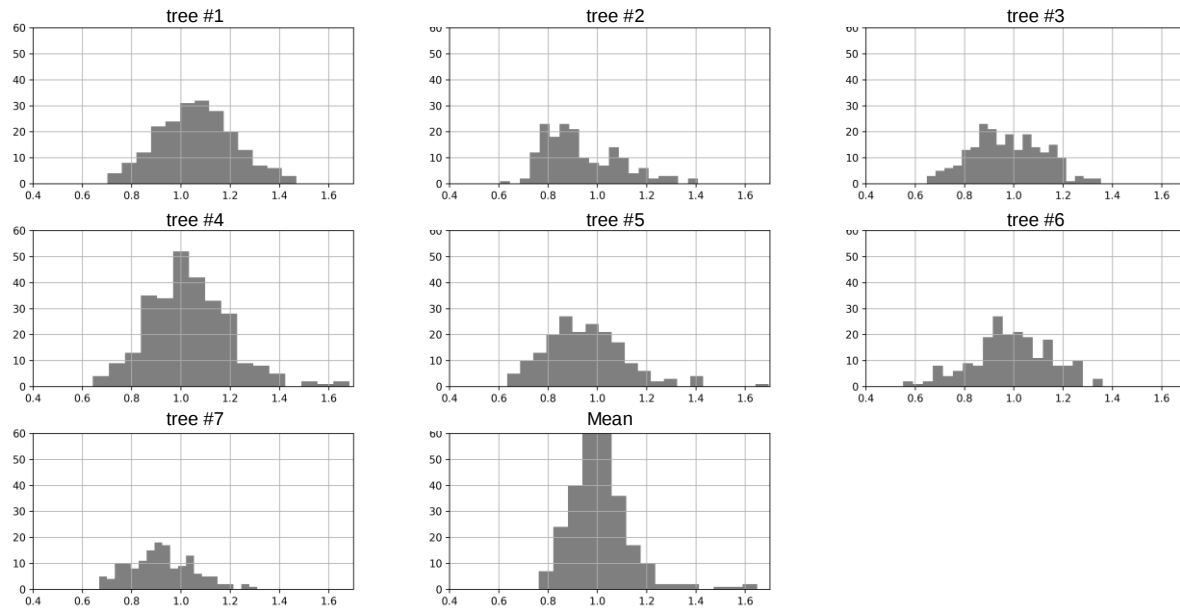


Dmean

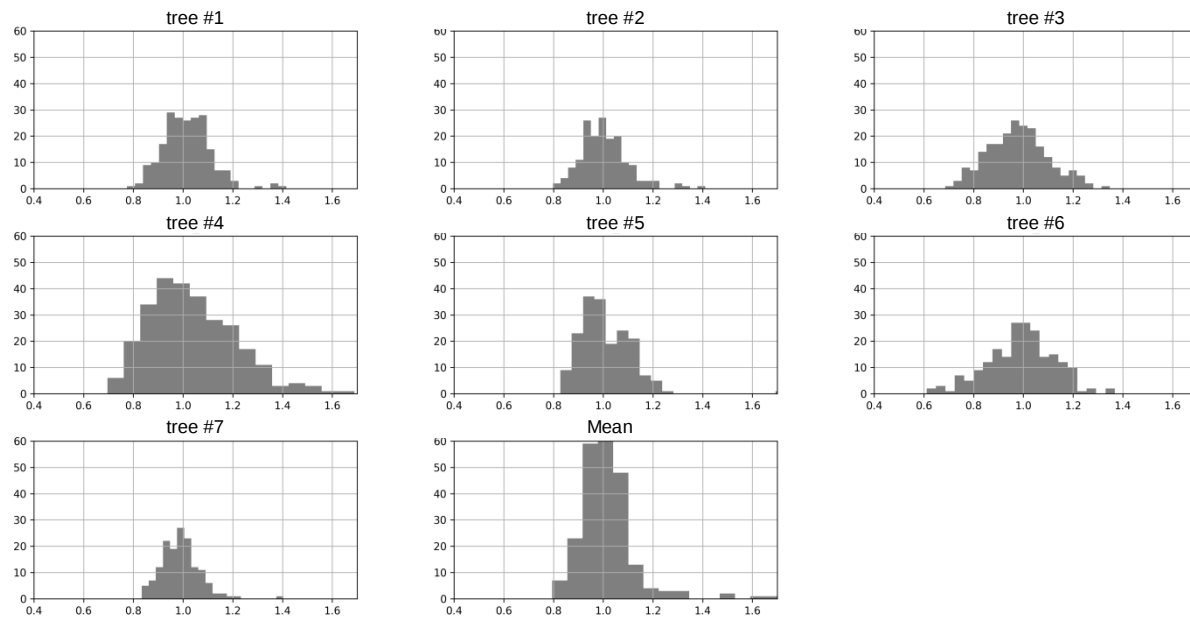


Supplementary Figure S4. Histograms of distribution frequencies for indexed anatomical characteristics of individual trees #1-7 and their averaged local chronologies (Mean)

CWTmax



CWTmean



Supplementary Figure S4. Histograms of distribution frequencies for indexed anatomical characteristics of individual trees #1-7 and their averaged local chronologies (Mean). Continued

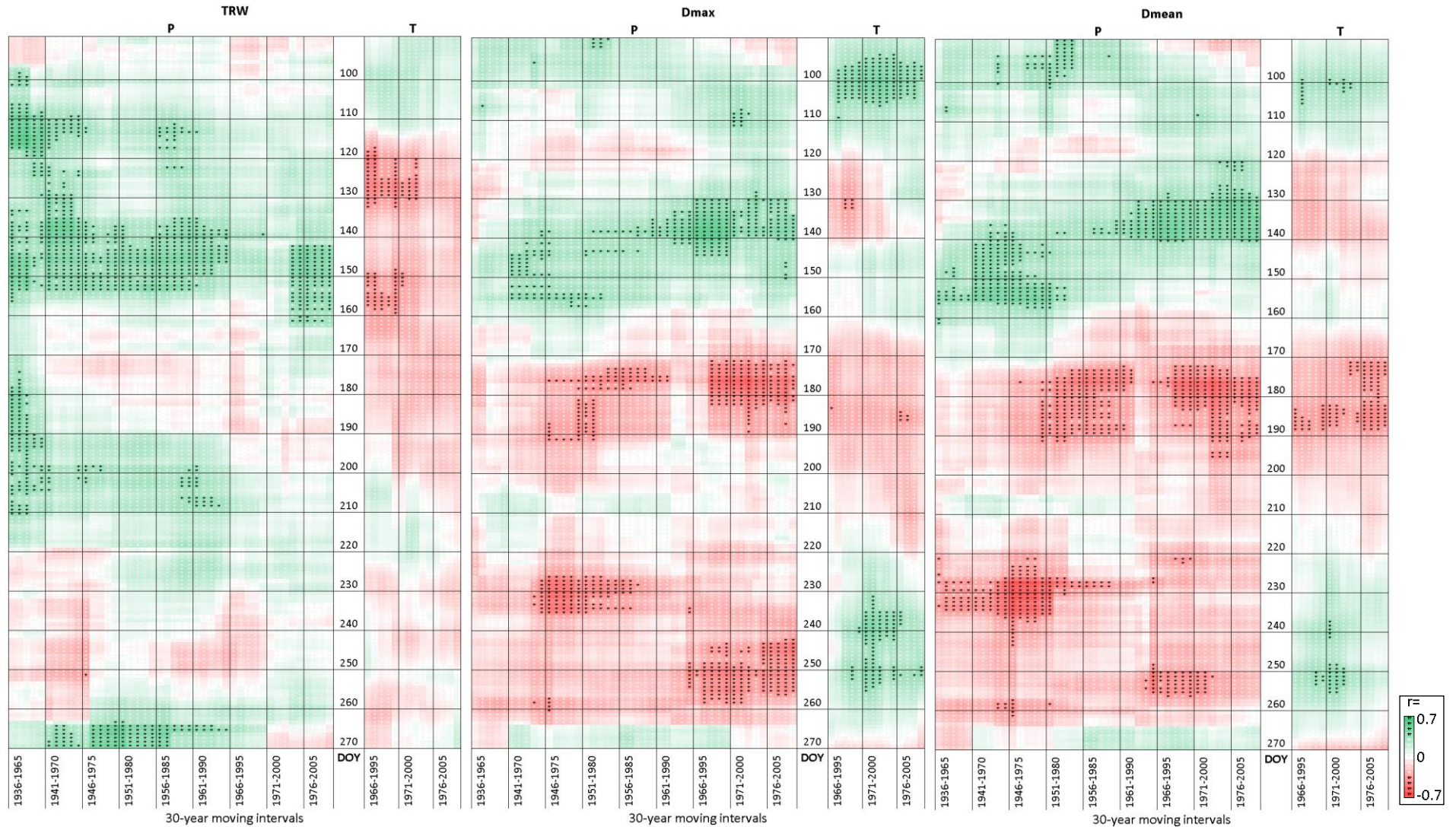
Supplementary Material

Supplementary Table S1. Statistics of raw TRW series of individual trees

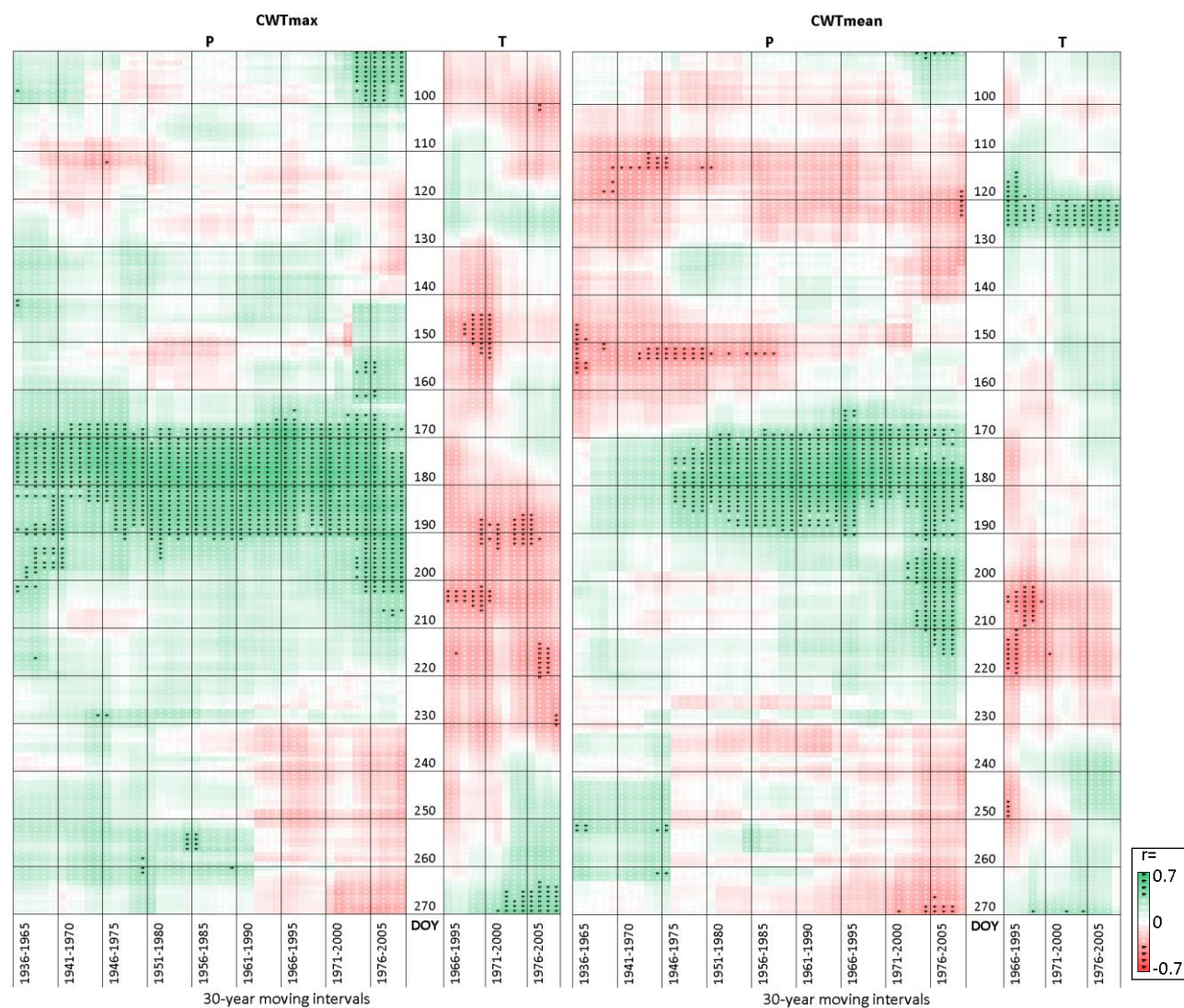
Tree	Min	Max	Mean	First Quartile	Third Quartile	Median	Standard deviation	Skewness	Kurtosis
TRW									
#1	0.03	2.04	0.61	0.31	0.83	0.50	0.41	1.18	1.17
#2	0.06	2.31	0.63	0.37	0.79	0.55	0.39	1.59	3.34
#3	0.02	3.23	0.83	0.39	1.15	0.65	0.63	1.28	1.48
#4	0.06	1.23	0.33	0.21	0.39	0.30	0.18	1.51	3.26
#5	0.04	1.90	0.50	0.31	0.62	0.47	0.27	1.43	2.96
#6	0.02	2.44	0.48	0.20	0.64	0.39	0.40	1.94	5.48
#7	0.05	1.79	0.56	0.31	0.76	0.49	0.35	0.82	0.31

Supplementary Table S2. Statistics of indexed anatomical characteristics of individual trees and their averaged local chronologies

Tree	Min	Max	Mean	First Quartile	Third Quartile	Median	Standard deviation	Skewness	Kurtosis
Dmax									
tree #1	0.50	1.31	0.99	0.94	1.08	1.01	0.13	-0.54	0.25
tree #2	0.65	1.49	0.99	0.90	1.07	0.99	0.14	0.29	-0.57
tree #3	0.62	1.64	0.97	0.84	1.11	0.95	0.18	0.27	-0.87
tree #4	0.68	1.30	1.00	0.96	1.06	1.01	0.09	-0.55	0.83
tree #5	0.71	1.30	1.01	0.95	1.07	1.00	0.09	0.15	-0.65
tree #6	0.61	1.43	1.00	0.90	1.11	0.99	0.15	0.16	-0.81
tree #7	0.70	1.51	1.00	0.93	1.05	0.99	0.13	0.40	-0.33
Mean	0.73	1.22	0.98	0.92	1.05	0.99	0.09	-0.22	-0.19
Dmean									
tree #1	0.65	1.58	1.02	0.92	1.12	1.01	0.15	0.08	-0.43
tree #2	0.64	1.44	1.00	0.90	1.09	0.99	0.13	0.09	-1.21
tree #3	0.64	1.51	0.96	0.82	1.08	0.95	0.17	0.33	-0.95
tree #4	0.67	1.34	1.02	0.96	1.09	1.04	0.10	-0.59	0.80
tree #5	0.71	1.19	0.97	0.91	1.03	0.98	0.09	-0.12	-1.25
tree #6	0.67	1.48	1.00	0.90	1.10	0.99	0.14	0.16	-0.95
tree #7	0.67	1.34	1.00	0.92	1.08	1.02	0.12	-0.14	-1.36
Mean	0.67	1.26	0.99	0.92	1.05	0.99	0.09	-0.11	-0.29
CWTmax									
tree #1	0.70	1.88	1.07	0.96	1.16	1.06	0.17	0.57	0.97
tree #2	0.61	1.41	0.94	0.81	1.05	0.90	0.16	0.45	-1.20
tree #3	0.65	1.35	0.97	0.87	1.08	0.97	0.15	0.10	-1.13
tree #4	0.64	1.94	1.04	0.93	1.13	1.03	0.18	1.11	3.51
tree #5	0.63	1.69	0.95	0.84	1.05	0.93	0.16	0.55	0.14
tree #6	0.55	1.36	0.99	0.90	1.10	0.99	0.16	-0.15	-0.94
tree #7	0.67	1.31	0.92	0.84	1.01	0.91	0.13	0.19	-1.48
Mean	0.76	1.94	1.02	0.94	1.07	1.00	0.14	2.61	11.78
CWTmean									
tree #1	0.77	1.42	1.02	0.95	1.08	1.02	0.10	0.52	0.55
tree #2	0.80	1.41	1.01	0.94	1.05	1.00	0.10	0.61	0.08
tree #3	0.69	1.35	0.98	0.89	1.05	0.98	0.12	0.19	-0.83
tree #4	0.70	2.02	1.05	0.91	1.15	1.02	0.19	1.14	2.72
tree #5	0.83	1.74	1.01	0.94	1.08	0.99	0.11	1.21	5.37
tree #6	0.61	1.37	0.99	0.90	1.07	1.00	0.13	-0.15	-0.76
tree #7	0.83	1.40	0.99	0.94	1.03	0.99	0.08	0.62	0.94
Mean	0.79	2.02	1.02	0.96	1.05	1.00	0.13	3.70	20.92



Supplementary Figure S5. Temporal stability of pine climatic response: moving 30-year correlation coefficients of indexed TRW and anatomical chronologies with the same 21-day series of precipitation and temperature as in Fig. 6. Correlations are centered within season, i.e. points at DOY 90 represent series from DOY 80 to DOY 100, etc. Values of correlation coefficients are coded with color gradient, significant correlations at $p < 0.05$ are marked with black dots (see legend)



Supplementary Figure S5. Temporal stability of pine climatic response. Continued