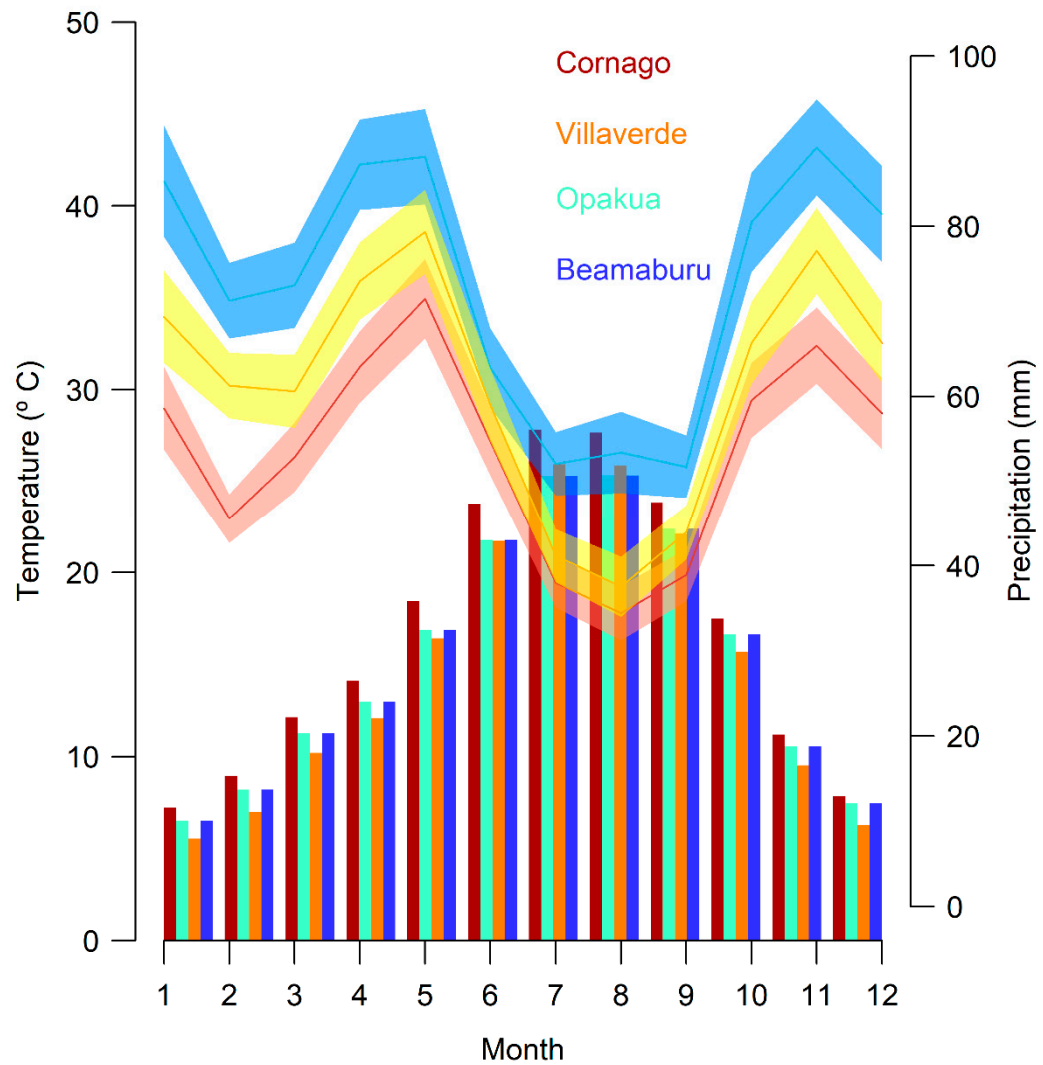
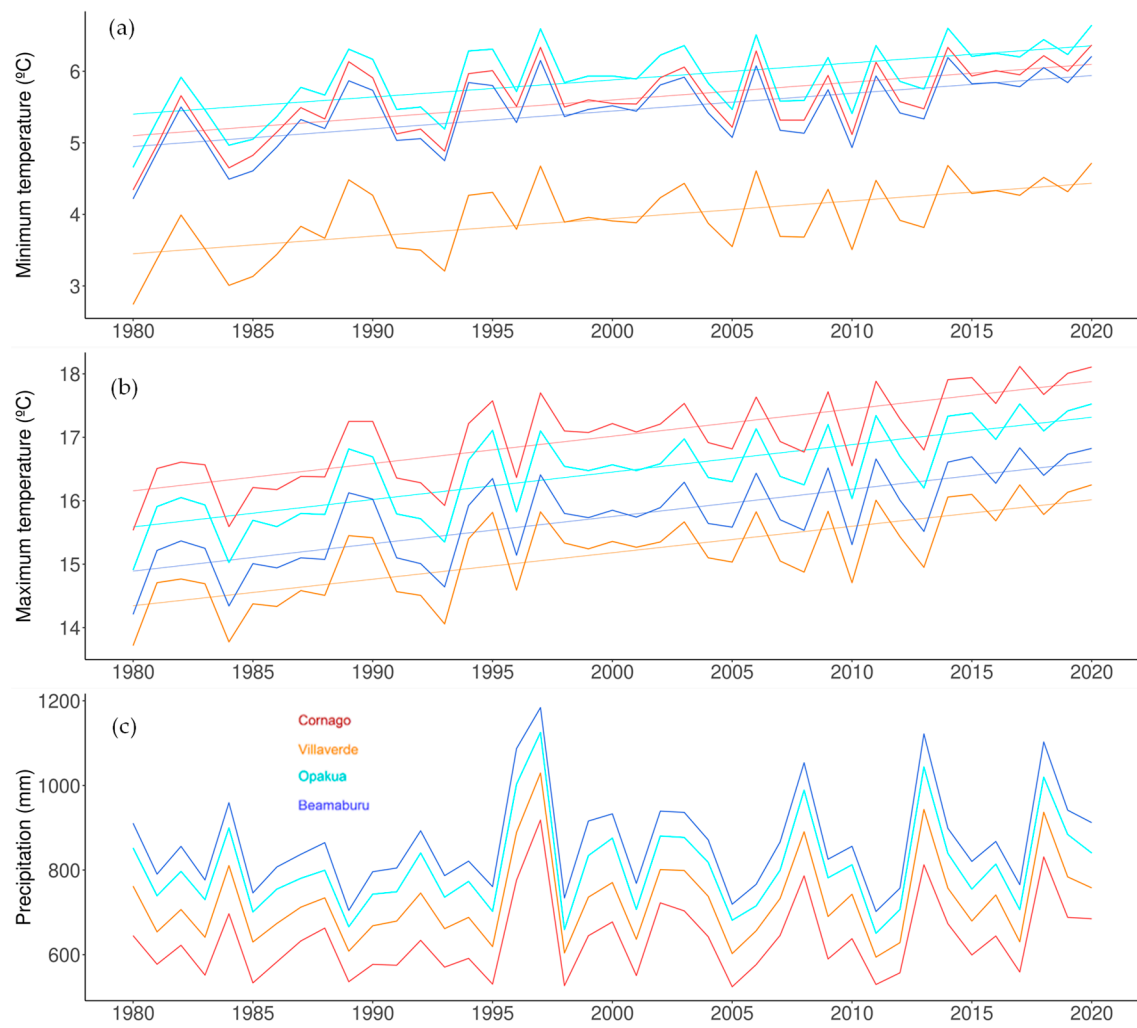


## Supplementary Materials



**Figure S1.** Monthly mean maximum temperatures (bars) and precipitation (lines) in the four studied Douglas fir sites according to the CRU climate dataset. The Beamaburu and Opakua site are represented by the same dark blue line in the case of the temperature. Note that the Cornago site is subjected to drier and warmer conditions than the rest of the sites.



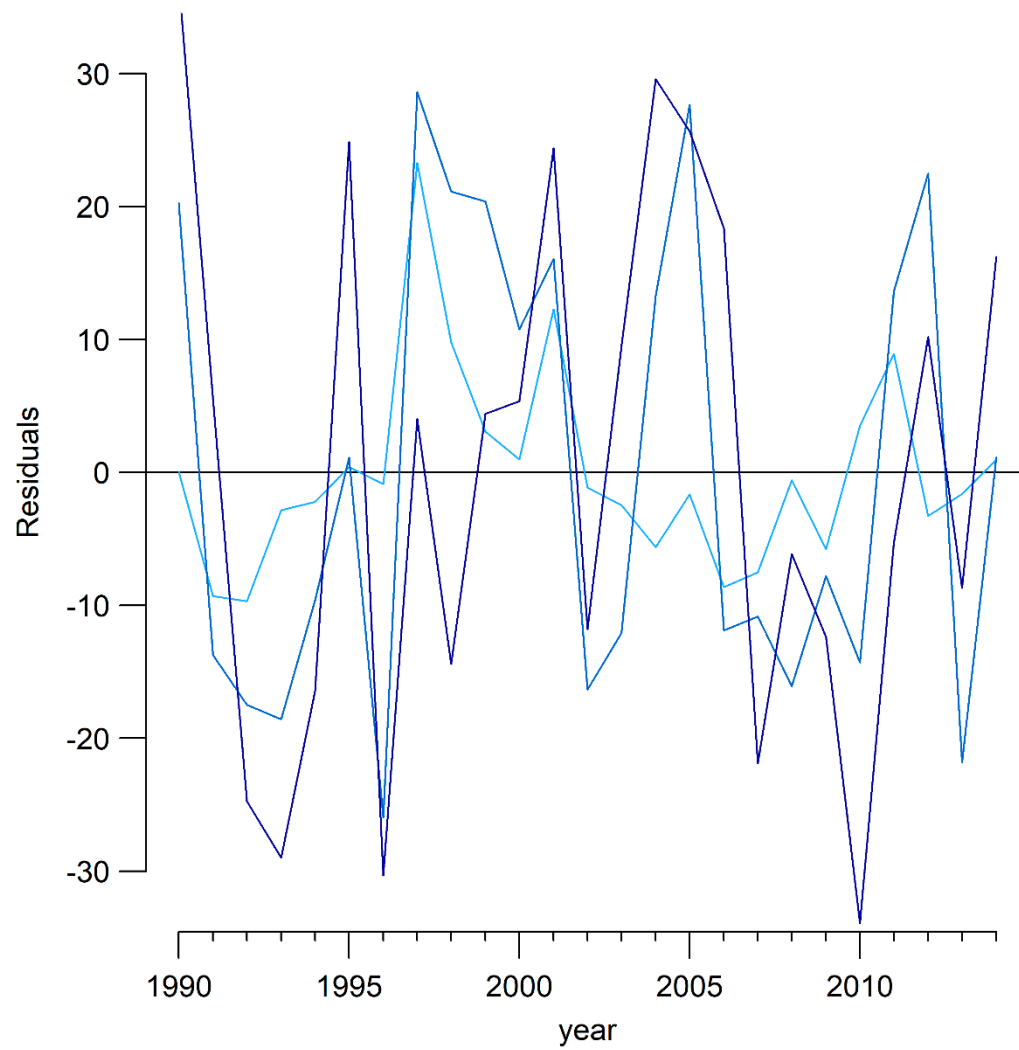
**Figure S2.** Trends in annual climate data (a, mean minimum temperature; b, mean maximum temperature; c, precipitation). Lines indicate significant ( $p < 0.05$ ) trends.

**Table S1.** Potential linear mixed-effect models proposed to study growth trajectories and response to climate of Douglas fir. The ten models with the lowest AIC are shown. Variables' abbreviations: df, degrees of freedom; SPEI, 3-month August SPEI; Tmax, August maximum maximum temperature. The  $\Delta$ AIC represent the different in AIC between each model and the "best" (the one with the lowest AIC) model, and the relative weight is the probability that the model with the lowest AIC is the best model.

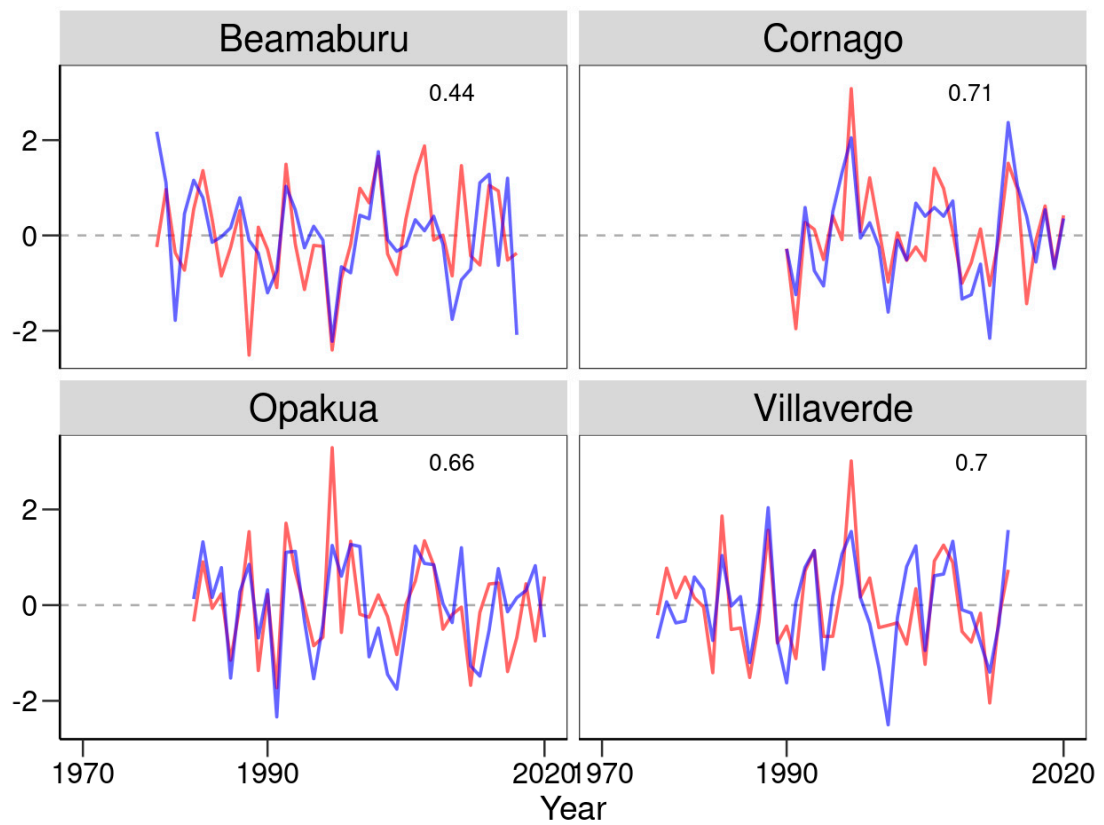
(Intercept)	Age	Site	SPEI	Tmax	Age : Site	SPEI : Site	Tmax : Site	df	$\Delta$ AIC	weight
34.276	5.740	+	-0.487	-2.481	+	+	+	19	0.000	0.951
34.208	6.000	+	0.074	-1.376	+	+		16	7.006	0.029
34.165	6.143	+	0.771		+	+		15	7.970	0.018
34.095	6.370	+	1.297	-1.376	+			13	14.238	0.001
34.090	6.380	+	1.389	-1.563	+		+	16	14.912	0.001
34.226	5.935	+		-1.957	+			12	15.033	0.001
34.053	6.509	+	1.977		+			12	15.212	0.000
34.230	5.916	+		-2.223	+		+	15	16.095	0.000
34.271	5.792	+			+			11	19.867	0.000
34.341	5.483	+	-0.551	-2.527		+	+	16	116.342	0.000

**Table S2.** Statistics of the fits of the VS model ( $r$ , Pearson correlation coefficient; Glk, Gleichläufigkeit and RMSE, root-mean-square error).

Site	Period	$r$ ( $p$ )	Glk (%)	RMSE
Beamaburu	1978–2015	0.436 (0.003)	65.20	0.195
Opakua	1981–2021	0.656 (0.001)	80.00	0.156
Villaverde	1976–2014	0.696 (0.001)	76.92	0.163
Cornago	1990–2021	0.708 (0.001)	87.50	0.155



**Figure S3.** Residual variation in minimum (light blue), mean (blue) and maximum (dark blue) wood density.



**Figure S4.** Simulated (red lines, model) and observed (blue lines, crn) series of ring-width indices in each site.