

## Supplementary material

### 60-yr record of stem xylem anatomy and related hydraulic modification under increased summer drought in ring- and diffuse-porous temperate broad-leaved tree species

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**Table S1:** Explained variance on different levels in the hierarchy of the models.  $R^2_{\text{marg}}$ : marginal  $R^2$  (variance explained by the fixed effects);  $R^2_{\text{cond}}$ : conditional  $R^2$  (variance explained by fixed and random effects together); calculated both for the full model and for species/wood type specific subsets (values for TRW or ring-porous species refer to the full year rings). The large discrepancy between overall explained variance and species/wood type-specific values indicates the size of the effect of species/wood type.

| Species/Woodtype         | Hydr. w. vessel diam. |                     | Vessel density      |                     | Pot. conductivity   |                     | Tree ring width     |                     |
|--------------------------|-----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|                          | $R^2_{\text{marg}}$   | $R^2_{\text{cond}}$ | $R^2_{\text{marg}}$ | $R^2_{\text{cond}}$ | $R^2_{\text{marg}}$ | $R^2_{\text{cond}}$ | $R^2_{\text{marg}}$ | $R^2_{\text{cond}}$ |
| <i>F. sylvatica</i>      | 0.148                 | 0.854               | 0.191               | 0.846               | 0.146               | 0.885               | 0.198               | 0.854               |
| <i>A. platanoides</i>    | 0.154                 | 0.852               | 0.178               | 0.724               | 0.128               | 0.895               | 0.165               | 0.869               |
| <i>A. pseudoplatanus</i> | 0.074                 | 0.876               | 0.111               | 0.756               | 0.059               | 0.888               | 0.046               | 0.906               |
| <i>F. excelsior</i> EW   | 0.142                 | 0.832               | 0.012               | 0.716               | 0.244               | 0.772               | 0.104               | 0.908               |
| <i>F. excelsior</i> LW   | 0.075                 | 0.356               | 0.009               | 0.197               | 0.015               | 0.031               |                     |                     |
| <i>Q. petraea</i> EW     | 0.121                 | 0.749               | 0.018               | 0.234               | 0.150               | 0.653               | 0.058               | 0.984               |
| <i>Q. petraea</i> LW     | 0.016                 | 0.067               | 0.146               | 0.492               | 0.004               | 0.017               |                     |                     |
| <b>All</b>               | <b>0.951</b>          | <b>0.973</b>        | <b>0.885</b>        | <b>0.955</b>        | <b>0.909</b>        | <b>0.970</b>        | <b>0.195</b>        | <b>0.906</b>        |

**Table S2:** Stand and species averages  $\pm$  standard errors for the four analysed wood anatomical variables, tree ring width and basal area increment.

| Variable                                                               | Species                  | Wood type | Stand 1           | Stand 2           | Stand 3           | Overall           |
|------------------------------------------------------------------------|--------------------------|-----------|-------------------|-------------------|-------------------|-------------------|
| A <sub>lumen</sub> (%)                                                 | <i>F. sylvatica</i>      | all       | 23.61 $\pm$ 0.89  | 25.14 $\pm$ 2.32  | 26.54 $\pm$ 1.05  | 25.10 $\pm$ 0.89  |
| A <sub>lumen</sub> (%)                                                 | <i>A. platanoides</i>    | all       | 13.92 $\pm$ 0.98  | 12.04 $\pm$ 0.78  | 14.91 $\pm$ 1.21  | 13.58 $\pm$ 0.66  |
| A <sub>lumen</sub> (%)                                                 | <i>A. pseudoplatanus</i> | all       | 9.31 $\pm$ 0.53   | 8.62 $\pm$ 0.94   | 9.95 $\pm$ 0.53   | 9.29 $\pm$ 0.40   |
| A <sub>lumen</sub> (%)                                                 | <i>F. excelsior</i>      | earlywood | 36.45 $\pm$ 0.85  |                   | 35.70 $\pm$ 1.04  | 36.08 $\pm$ 0.65  |
| A <sub>lumen</sub> (%)                                                 | <i>F. excelsior</i>      | latewood  | 5.60 $\pm$ 0.47   |                   | 5.96 $\pm$ 0.98   | 5.78 $\pm$ 0.51   |
| A <sub>lumen</sub> (%)                                                 | <i>Q. petraea</i>        | earlywood | 34.13 $\pm$ 1.62  | 33.45 $\pm$ 1.32  | 32.80 $\pm$ 1.81  | 33.46 $\pm$ 0.87  |
| A <sub>lumen</sub> (%)                                                 | <i>Q. petraea</i>        | latewood  | 18.30 $\pm$ 4.74  | 10.50 $\pm$ 1.04  | 10.59 $\pm$ 1.10  | 13.13 $\pm$ 1.82  |
| VD (n mm <sup>-2</sup> )                                               | <i>F. sylvatica</i>      | all       | 102.26 $\pm$ 2.28 | 121.15 $\pm$ 7.22 | 122.57 $\pm$ 4.85 | 115.33 $\pm$ 3.72 |
| VD (n mm <sup>-2</sup> )                                               | <i>A. platanoides</i>    | all       | 49.66 $\pm$ 0.89  | 44.32 $\pm$ 2.79  | 52.76 $\pm$ 2.10  | 48.80 $\pm$ 1.66  |
| VD (n mm <sup>-2</sup> )                                               | <i>A. pseudoplatanus</i> | all       | 30.64 $\pm$ 1.09  | 24.14 $\pm$ 0.70  | 31.77 $\pm$ 1.44  | 28.85 $\pm$ 1.08  |
| VD (n mm <sup>-2</sup> )                                               | <i>F. excelsior</i>      | earlywood | 9.56 $\pm$ 0.70   |                   | 9.40 $\pm$ 0.36   | 9.48 $\pm$ 0.37   |
| VD (n mm <sup>-2</sup> )                                               | <i>F. excelsior</i>      | latewood  | 16.62 $\pm$ 0.53  |                   | 16.42 $\pm$ 1.90  | 16.52 $\pm$ 0.93  |
| VD (n mm <sup>-2</sup> )                                               | <i>Q. petraea</i>        | earlywood | 6.77 $\pm$ 0.97   | 5.45 $\pm$ 0.28   | 5.18 $\pm$ 0.51   | 5.80 $\pm$ 0.39   |
| VD (n mm <sup>-2</sup> )                                               | <i>Q. petraea</i>        | latewood  | 87.01 $\pm$ 10.4  | 62.38 $\pm$ 7.95  | 79.37 $\pm$ 9.19  | 76.25 $\pm$ 5.65  |
| D <sub>h</sub> (μm)                                                    | <i>F. sylvatica</i>      | all       | 64.71 $\pm$ 1.53  | 62.09 $\pm$ 3.41  | 64.29 $\pm$ 1.62  | 63.70 $\pm$ 1.30  |
| D <sub>h</sub> (μm)                                                    | <i>A. platanoides</i>    | all       | 70.80 $\pm$ 2.63  | 69.16 $\pm$ 2.81  | 69.25 $\pm$ 2.57  | 69.57 $\pm$ 1.47  |
| D <sub>h</sub> (μm)                                                    | <i>A. pseudoplatanus</i> | all       | 75.30 $\pm$ 2.97  | 80.50 $\pm$ 4.06  | 74.53 $\pm$ 3.56  | 76.78 $\pm$ 2.03  |
| D <sub>h</sub> (μm)                                                    | <i>F. excelsior</i>      | earlywood | 236.10 $\pm$ 8.25 |                   | 233.93 $\pm$ 6.13 | 235.02 $\pm$ 4.86 |
| D <sub>h</sub> (μm)                                                    | <i>F. excelsior</i>      | latewood  | 125.64 $\pm$ 5.61 |                   | 123.96 $\pm$ 2.94 | 124.80 $\pm$ 3.00 |
| D <sub>h</sub> (μm)                                                    | <i>Q. petraea</i>        | earlywood | 297.65 $\pm$ 11.1 | 303.39 $\pm$ 11.0 | 308.28 $\pm$ 12.9 | 303.11 $\pm$ 6.35 |
| D <sub>h</sub> (μm)                                                    | <i>Q. petraea</i>        | latewood  | 111.48 $\pm$ 5.39 | 116.34 $\pm$ 6.62 | 121.54 $\pm$ 5.19 | 116.45 $\pm$ 3.27 |
| K <sub>p</sub> (kg m <sup>-1</sup> Mpa <sup>-1</sup> s <sup>-1</sup> ) | <i>F. sylvatica</i>      | all       | 29.60 $\pm$ 2.29  | 30.79 $\pm$ 5.06  | 32.81 $\pm$ 2.43  | 31.07 $\pm$ 1.90  |
| K <sub>p</sub> (kg m <sup>-1</sup> Mpa <sup>-1</sup> s <sup>-1</sup> ) | <i>A. platanoides</i>    | all       | 22.20 $\pm$ 3.16  | 18.74 $\pm$ 2.45  | 22.60 $\pm$ 3.47  | 21.02 $\pm$ 1.72  |
| K <sub>p</sub> (kg m <sup>-1</sup> Mpa <sup>-1</sup> s <sup>-1</sup> ) | <i>A. pseudoplatanus</i> | all       | 16.56 $\pm$ 2.05  | 17.92 $\pm$ 3.30  | 17.10 $\pm$ 2.45  | 17.19 $\pm$ 1.43  |
| K <sub>p</sub> (kg m <sup>-1</sup> Mpa <sup>-1</sup> s <sup>-1</sup> ) | <i>F. excelsior</i>      | earlywood | 630.87 $\pm$ 48.1 |                   | 598.19 $\pm$ 39.4 | 614.53 $\pm$ 29.8 |
| K <sub>p</sub> (kg m <sup>-1</sup> Mpa <sup>-1</sup> s <sup>-1</sup> ) | <i>F. excelsior</i>      | latewood  | 21.50 $\pm$ 3.17  |                   | 22.28 $\pm$ 4.52  | 21.89 $\pm$ 2.60  |
| K <sub>p</sub> (kg m <sup>-1</sup> Mpa <sup>-1</sup> s <sup>-1</sup> ) | <i>Q. petraea</i>        | earlywood | 949.95 $\pm$ 93.0 | 972.74 $\pm$ 103  | 946.90 $\pm$ 79.3 | 956.53 $\pm$ 49.5 |
| K <sub>p</sub> (kg m <sup>-1</sup> Mpa <sup>-1</sup> s <sup>-1</sup> ) | <i>Q. petraea</i>        | latewood  | 63.70 $\pm$ 29.1  | 23.99 $\pm$ 2.27  | 20.09 $\pm$ 2.95  | 35.93 $\pm$ 10.5  |
| TRW (mm)                                                               | <i>F. sylvatica</i>      | all       | 209.94 $\pm$ 18.5 | 136.50 $\pm$ 20.3 | 176.18 $\pm$ 16.6 | 174.21 $\pm$ 12.7 |
| TRW (mm)                                                               | <i>A. platanoides</i>    | all       | 192.23 $\pm$ 38.6 | 149.30 $\pm$ 31.5 | 179.22 $\pm$ 20.3 | 170.72 $\pm$ 16.2 |
| TRW (mm)                                                               | <i>A. pseudoplatanus</i> | all       | 198.06 $\pm$ 25.3 | 276.78 $\pm$ 22.0 | 182.88 $\pm$ 27.4 | 219.24 $\pm$ 17.3 |
| TRW (mm)                                                               | <i>F. excelsior</i>      | all       | 171.92 $\pm$ 7.73 | ±                 | 208.06 $\pm$ 31.0 | 189.99 $\pm$ 16.2 |
| TRW (mm)                                                               | <i>Q. petraea</i>        | all       | 124.60 $\pm$ 23.2 | 147.32 $\pm$ 13.9 | 188.68 $\pm$ 22.5 | 153.53 $\pm$ 13.0 |
| BAI (cm <sup>2</sup> yr <sup>-1</sup> )                                | <i>F. sylvatica</i>      | all       | 28.63 $\pm$ 2.30  | 15.20 $\pm$ 1.81  | 23.39 $\pm$ 2.24  | 22.41 $\pm$ 1.87  |
| BAI (cm <sup>2</sup> yr <sup>-1</sup> )                                | <i>A. platanoides</i>    | all       | 20.65 $\pm$ 3.81  | 15.16 $\pm$ 3.95  | 21.21 $\pm$ 4.46  | 18.75 $\pm$ 2.40  |
| BAI (cm <sup>2</sup> yr <sup>-1</sup> )                                | <i>A. pseudoplatanus</i> | all       | 23.08 $\pm$ 3.50  | 31.33 $\pm$ 3.31  | 23.38 $\pm$ 3.22  | 25.93 $\pm$ 2.06  |
| BAI (cm <sup>2</sup> yr <sup>-1</sup> )                                | <i>F. excelsior</i>      | all       | 20.26 $\pm$ 1.57  |                   | 27.25 $\pm$ 4.95  | 23.75 $\pm$ 2.71  |
| BAI (cm <sup>2</sup> yr <sup>-1</sup> )                                | <i>Q. petraea</i>        | all       | 18.71 $\pm$ 3.38  | 16.01 $\pm$ 1.91  | 23.77 $\pm$ 3.03  | 19.50 $\pm$ 1.75  |

**Table S3:** Parameter estimates of the `glmmTMB`-based mixed effects models for hydraulically weighted vessel diameter, vessel density, potential hydraulic conductivity and tree ring width. Given are the parameter estimates with their standard errors, 95% confidence intervals and p-values based on 2500 parametric bootstrap samples. For the variance model, the given coefficients for species effects and vessel count  $n$  are on the  $\ln(\text{variance})$ -scale. Models were fit with treatment contrasts using *Fagus sylvatica* and Stand 1 as baseline levels. Accordingly, the intercept and overall effects of all continuous predictors refer to the combination of these two factor levels, and the other factor levels/interaction coefficients refer to differences from that baseline (and hence differ from the manually calculated contrasts displayed in Fig. 4 and 6). Stars indicate significance level (\*,  $p < 0.05$ ; \*\*,  $p < 0.01$ ; \*\*\*,  $p < 0.001$ ).

| Model                     | Effect | Term                                       | Estimate       | Std.Err.                 | Lower CI | Upper CI | p-value     |        |             |
|---------------------------|--------|--------------------------------------------|----------------|--------------------------|----------|----------|-------------|--------|-------------|
| ln(D <sub>b</sub> )       | Fixed  | (Intercept)                                | 4.164          | 0.024                    | 4.118    | 4.210    | < 0.001 *** |        |             |
|                           |        | <i>A. platanoides</i>                      | 0.038          | 0.031                    | -0.022   | 0.097    | 0.242       |        |             |
|                           |        | <i>A. pseudoplatanus</i>                   | 0.137          | 0.028                    | 0.081    | 0.192    | < 0.001 *** |        |             |
|                           |        | <i>F. excelsior</i> EW                     | 1.254          | 0.032                    | 1.191    | 1.315    | < 0.001 *** |        |             |
|                           |        | <i>F. excelsior</i> LW                     | 0.612          | 0.033                    | 0.547    | 0.674    | < 0.001 *** |        |             |
|                           |        | <i>Q. petraea</i> EW                       | 1.495          | 0.029                    | 1.438    | 1.553    | < 0.001 *** |        |             |
|                           |        | <i>Q. petraea</i> LW                       | 0.548          | 0.032                    | 0.486    | 0.607    | < 0.001 *** |        |             |
|                           |        | Stand 2                                    | -0.001         | 0.024                    | -0.048   | 0.045    | 0.959       |        |             |
|                           |        | Stand 3                                    | -0.016         | 0.021                    | -0.055   | 0.024    | 0.433       |        |             |
|                           |        | CWB(curr.GS)                               | 0.006          | 0.002                    | 0.002    | 0.010    | 0.003 **    |        |             |
|                           |        | CWB(curr.GS): <i>A. platanoides</i>        | -0.001         | 0.002                    | -0.006   | 0.003    | 0.529       |        |             |
|                           |        | CWB(curr.GS): <i>A. pseudoplatanus</i>     | 0.002          | 0.002                    | -0.002   | 0.006    | 0.382       |        |             |
|                           |        | CWB(curr.GS): <i>F. excelsior</i> EW       | -0.003         | 0.002                    | -0.008   | 0.001    | 0.154       |        |             |
|                           |        | CWB(curr.GS): <i>F. excelsior</i> LW       | -0.014         | 0.006                    | -0.025   | -0.003   | 0.011 *     |        |             |
|                           |        | CWB(curr.GS): <i>Q. petraea</i> EW         | -0.009         | 0.003                    | -0.015   | -0.004   | < 0.001 *** |        |             |
|                           |        | CWB(curr.GS): <i>Q. petraea</i> LW         | -0.003         | 0.012                    | -0.026   | 0.021    | 0.798       |        |             |
|                           |        | CWB(prev.winter)                           | 0.007          | 0.002                    | 0.002    | 0.012    | 0.0032 **   |        |             |
|                           |        | CWB(prev.winter): <i>A. platanoides</i>    | -0.006         | 0.003                    | -0.011   | 0.000    | 0.038 *     |        |             |
|                           |        | CWB(prev.winter): <i>A. pseudoplatanus</i> | -0.008         | 0.003                    | -0.014   | -0.003   | 0.0008 ***  |        |             |
|                           |        | CWB(prev.winter): <i>F. excelsior</i> EW   | -0.011         | 0.003                    | -0.016   | -0.005   | < 0.001 *** |        |             |
|                           |        | CWB(prev.winter): <i>F. excelsior</i> LW   | -0.016         | 0.006                    | -0.028   | -0.004   | 0.013 *     |        |             |
|                           |        | CWB(prev.winter): <i>Q. petraea</i> EW     | -0.012         | 0.003                    | -0.018   | -0.005   | < 0.001 *** |        |             |
|                           |        | CWB(prev.winter): <i>Q. petraea</i> LW     | -0.043         | 0.014                    | -0.071   | -0.017   | 0.002 **    |        |             |
|                           |        | CWB(prev.GS)                               | 0.008          | 0.002                    | 0.004    | 0.012    | < 0.001 *** |        |             |
|                           |        | CWB(prev.GS): <i>A. platanoides</i>        | -0.008         | 0.002                    | -0.013   | -0.004   | 0.0008 ***  |        |             |
|                           |        | CWB(prev.GS): <i>A. pseudoplatanus</i>     | -0.007         | 0.002                    | -0.012   | -0.003   | 0.0016 **   |        |             |
|                           |        | CWB(prev.GS): <i>F. excelsior</i> EW       | -0.001         | 0.002                    | -0.006   | 0.004    | 0.648       |        |             |
|                           |        | CWB(prev.GS): <i>F. excelsior</i> LW       | -0.011         | 0.006                    | -0.022   | 0.000    | 0.042 *     |        |             |
|                           |        | CWB(prev.GS): <i>Q. petraea</i> EW         | -0.013         | 0.003                    | -0.019   | -0.008   | < 0.001 *** |        |             |
|                           |        | CWB(prev.GS): <i>Q. petraea</i> LW         | -0.005         | 0.012                    | -0.028   | 0.017    | 0.648       |        |             |
|                           |        | DBH                                        | 0.046          | 0.020                    | 0.007    | 0.085    | 0.017 *     |        |             |
|                           |        | DBH: <i>A. platanoides</i>                 | -0.036         | 0.030                    | -0.097   | 0.023    | 0.219       |        |             |
|                           |        | DBH: <i>A. pseudoplatanus</i>              | -0.035         | 0.026                    | -0.087   | 0.014    | 0.188       |        |             |
|                           |        | DBH: <i>F. excelsior</i> EW                | -0.038         | 0.037                    | -0.109   | 0.036    | 0.290       |        |             |
|                           |        | DBH: <i>F. excelsior</i> LW                | -0.014         | 0.045                    | -0.101   | 0.074    | 0.748       |        |             |
|                           |        | DBH: <i>Q. petraea</i> EW                  | -0.003         | 0.029                    | -0.057   | 0.055    | 0.926       |        |             |
|                           |        | DBH: <i>Q. petraea</i> LW                  | -0.050         | 0.035                    | -0.119   | 0.019    | 0.155       |        |             |
|                           |        | Year                                       | -0.041         | 0.016                    | -0.073   | -0.009   | 0.010 **    |        |             |
|                           |        | Year: <i>A. platanoides</i>                | 0.065          | 0.022                    | 0.023    | 0.108    | 0.004 **    |        |             |
|                           |        | Year: <i>A. pseudoplatanus</i>             | 0.062          | 0.021                    | 0.021    | 0.102    | 0.002 **    |        |             |
|                           |        | Year: <i>F. excelsior</i> EW               | 0.065          | 0.030                    | 0.005    | 0.121    | 0.036 *     |        |             |
|                           |        | Year: <i>F. excelsior</i> LW               | 0.045          | 0.037                    | -0.028   | 0.115    | 0.228       |        |             |
|                           |        | Year: <i>Q. petraea</i> EW                 | 0.034          | 0.020                    | -0.007   | 0.072    | 0.104       |        |             |
|                           |        | Year: <i>Q. petraea</i> LW                 | 0.034          | 0.026                    | -0.016   | 0.083    | 0.185       |        |             |
|                           |        | Random                                     | Tree/woodtype: | random intercept         | 0.072    | 0.007    | 0.058       | 0.086  | < 0.001 *** |
|                           |        |                                            |                | random slope for DBH     | 0.013    | 0.005    | 0.005       | 0.022  | < 0.001 *** |
|                           |        |                                            |                | cor(DBH~Int.)            | 0.483    | 0.265    | -0.059      | 0.930  | 0.078       |
|                           |        |                                            |                | Year: random intercept   | 0.009    | 0.001    | 0.007       | 0.011  | < 0.001 *** |
|                           |        | Residual                                   | var:           | (Intercept)              | -4.926   | 0.106    | -5.142      | -4.727 | < 0.001 *** |
|                           |        |                                            |                | <i>A. platanoides</i>    | -1.214   | 0.099    | -1.411      | -1.019 | < 0.001 *** |
|                           |        |                                            |                | <i>A. pseudoplatanus</i> | -1.477   | 0.105    | -1.679      | -1.274 | < 0.001 *** |
|                           |        |                                            |                | <i>F. excelsior</i> EW   | -2.911   | 0.174    | -3.250      | -2.556 | < 0.001 *** |
|                           |        |                                            |                | <i>F. excelsior</i> LW   | -0.115   | 0.146    | -0.398      | 0.172  | 0.446       |
|                           |        |                                            |                | <i>Q. petraea</i> EW     | -3.164   | 0.218    | -3.593      | -2.728 | < 0.001 *** |
|                           |        |                                            |                | <i>Q. petraea</i> LW     | 2.912    | 0.103    | 2.716       | 3.122  | < 0.001 *** |
|                           |        |                                            |                | ln(n)                    | -1.278   | 0.069    | -1.412      | -1.142 | < 0.001 *** |
| AR1 lag 1 autocorrelation | 0.945  |                                            |                | 0.017                    | 0.900    | 0.967    | < 0.001 *** |        |             |

Table S3 (continued):

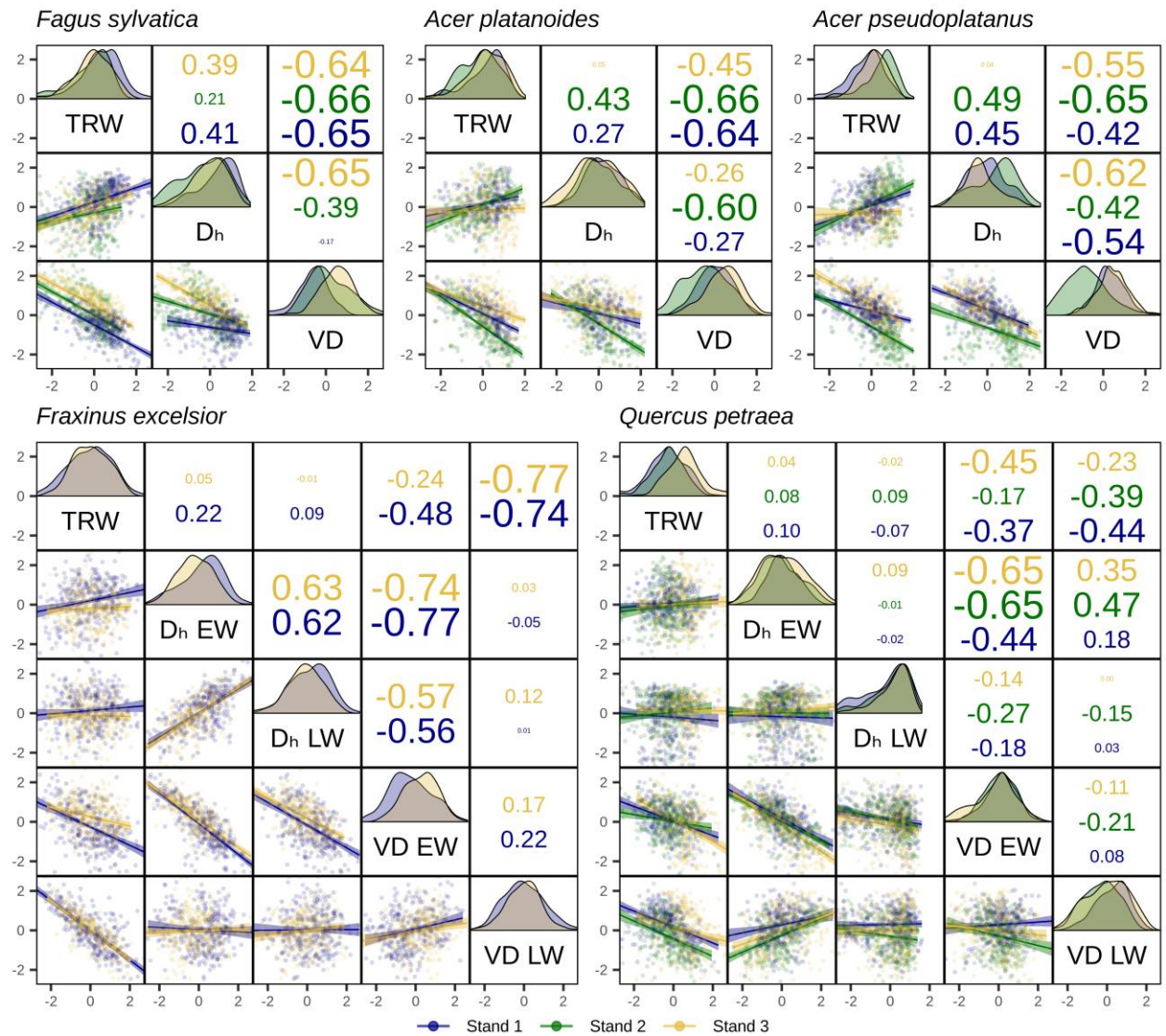
| Model    | Effect                          | Term                                       | Estimate | Std.Err. | Lower CI | Upper CI | p-value     |
|----------|---------------------------------|--------------------------------------------|----------|----------|----------|----------|-------------|
| ln(VD)   | Fixed                           | (Intercept)                                | 4.705    | 0.048    | 4.614    | 4.798    | < 0.001 *** |
|          |                                 | <i>A. platanoides</i>                      | -0.776   | 0.062    | -0.893   | -0.649   | < 0.001 *** |
|          |                                 | <i>A. pseudoplatanus</i>                   | -1.279   | 0.057    | -1.391   | -1.168   | < 0.001 *** |
|          |                                 | <i>F. excelsior</i> EW                     | -2.427   | 0.066    | -2.557   | -2.297   | < 0.001 *** |
|          |                                 | <i>F. excelsior</i> LW                     | -1.983   | 0.066    | -2.106   | -1.854   | < 0.001 *** |
|          |                                 | <i>Q. petraea</i> EW                       | -2.951   | 0.061    | -3.070   | -2.835   | < 0.001 *** |
|          |                                 | <i>Q. petraea</i> LW                       | -0.619   | 0.062    | -0.741   | -0.496   | < 0.001 *** |
|          |                                 | Stand 2                                    | -0.104   | 0.050    | -0.201   | -0.008   | 0.043 *     |
|          |                                 | Stand 3                                    | 0.011    | 0.041    | -0.068   | 0.089    | 0.810       |
|          |                                 | CWB(curr.GS)                               | -0.013   | 0.006    | -0.023   | -0.002   | 0.024 *     |
|          |                                 | CWB(curr.GS): <i>A. platanoides</i>        | -0.023   | 0.005    | -0.033   | -0.014   | < 0.001 *** |
|          |                                 | CWB(curr.GS): <i>A. pseudoplatanus</i>     | -0.012   | 0.005    | -0.022   | -0.003   | 0.010 **    |
|          |                                 | CWB(curr.GS): <i>F. excelsior</i> EW       | 0.011    | 0.006    | -0.001   | 0.023    | 0.065       |
|          |                                 | CWB(curr.GS): <i>F. excelsior</i> LW       | -0.029   | 0.013    | -0.055   | -0.004   | 0.022 *     |
|          |                                 | CWB(curr.GS): <i>Q. petraea</i> EW         | 0.011    | 0.008    | -0.004   | 0.025    | 0.161       |
|          |                                 | CWB(curr.GS): <i>Q. petraea</i> LW         | -0.010   | 0.010    | -0.029   | 0.009    | 0.317       |
|          |                                 | CWB(prev.winter)                           | -0.007   | 0.006    | -0.019   | 0.005    | 0.255       |
|          |                                 | CWB(prev.winter): <i>A. platanoides</i>    | -0.004   | 0.006    | -0.016   | 0.008    | 0.525       |
|          |                                 | CWB(prev.winter): <i>A. pseudoplatanus</i> | 0.004    | 0.006    | -0.008   | 0.015    | 0.525       |
|          |                                 | CWB(prev.winter): <i>F. excelsior</i> EW   | 0.018    | 0.008    | 0.003    | 0.032    | 0.017 *     |
|          |                                 | CWB(prev.winter): <i>F. excelsior</i> LW   | 0.032    | 0.014    | 0.004    | 0.061    | 0.023 *     |
|          |                                 | CWB(prev.winter): <i>Q. petraea</i> EW     | 0.018    | 0.010    | -0.001   | 0.037    | 0.065       |
|          |                                 | CWB(prev.winter): <i>Q. petraea</i> LW     | -0.023   | 0.012    | -0.047   | 0.001    | 0.062       |
|          |                                 | CWB(prev.GS)                               | -0.022   | 0.006    | -0.033   | -0.011   | < 0.001 *** |
|          |                                 | CWB(prev.GS): <i>A. platanoides</i>        | 0.008    | 0.005    | -0.002   | 0.018    | 0.122       |
|          |                                 | CWB(prev.GS): <i>A. pseudoplatanus</i>     | 0.002    | 0.005    | -0.007   | 0.012    | 0.597       |
|          |                                 | CWB(prev.GS): <i>F. excelsior</i> EW       | 0.017    | 0.006    | 0.005    | 0.029    | 0.008 **    |
|          |                                 | CWB(prev.GS): <i>F. excelsior</i> LW       | 0.021    | 0.013    | -0.004   | 0.047    | 0.100       |
|          |                                 | CWB(prev.GS): <i>Q. petraea</i> EW         | 0.004    | 0.008    | -0.011   | 0.020    | 0.565       |
|          |                                 | CWB(prev.GS): <i>Q. petraea</i> LW         | 0.005    | 0.010    | -0.015   | 0.025    | 0.616       |
|          |                                 | DBH                                        | -0.096   | 0.046    | -0.186   | -0.008   | 0.030 *     |
|          |                                 | DBH: <i>A. platanoides</i>                 | 0.064    | 0.072    | -0.072   | 0.207    | 0.346       |
|          |                                 | DBH: <i>A. pseudoplatanus</i>              | 0.062    | 0.068    | -0.070   | 0.194    | 0.374       |
|          |                                 | DBH: <i>F. excelsior</i> EW                | 0.099    | 0.095    | -0.090   | 0.290    | 0.306       |
|          |                                 | DBH: <i>F. excelsior</i> LW                | 0.045    | 0.103    | -0.159   | 0.245    | 0.666       |
|          |                                 | DBH: <i>Q. petraea</i> EW                  | 0.081    | 0.066    | -0.046   | 0.214    | 0.199       |
|          |                                 | DBH: <i>Q. petraea</i> LW                  | 0.240    | 0.065    | 0.110    | 0.368    | < 0.001 *** |
|          |                                 | Year                                       | 0.114    | 0.040    | 0.037    | 0.194    | 0.005 **    |
|          |                                 | Year: <i>A. platanoides</i>                | -0.112   | 0.055    | -0.218   | -0.007   | 0.039 *     |
|          |                                 | Year: <i>A. pseudoplatanus</i>             | -0.129   | 0.055    | -0.235   | -0.023   | 0.016 *     |
|          |                                 | Year: <i>F. excelsior</i> EW               | -0.137   | 0.079    | -0.292   | 0.017    | 0.082       |
|          |                                 | Year: <i>F. excelsior</i> LW               | -0.068   | 0.086    | -0.237   | 0.099    | 0.437       |
|          |                                 | Year: <i>Q. petraea</i> EW                 | -0.101   | 0.050    | -0.202   | -0.006   | 0.038 *     |
|          |                                 | Year: <i>Q. petraea</i> LW                 | -0.112   | 0.050    | -0.211   | -0.015   | 0.024 *     |
| Random   | Tree/woodtype: random intercept |                                            | 0.122    | 0.019    | 0.084    | 0.159    | < 0.001 *** |
|          |                                 |                                            | 0.021    | 0.014    | 0.001    | 0.060    | < 0.001 *** |
|          |                                 |                                            | -0.552   | 0.374    | -0.958   | 0.586    | 0.330       |
|          |                                 |                                            | 0.037    | 0.004    | 0.029    | 0.044    | < 0.001 *** |
| Residual | var:(Intercept)                 |                                            | -4.134   | 0.113    | -4.364   | -3.923   | < 0.001 *** |
|          | var: <i>A. platanoides</i>      |                                            | -0.355   | 0.107    | -0.556   | -0.139   | < 0.001 *** |
|          | var: <i>A. pseudoplatanus</i>   |                                            | -0.457   | 0.113    | -0.681   | -0.237   | < 0.001 *** |
|          | var: <i>F. excelsior</i> EW     |                                            | -1.291   | 0.182    | -1.640   | -0.936   | < 0.001 *** |
|          | var: <i>F. excelsior</i> LW     |                                            | 0.942    | 0.154    | 0.648    | 1.249    | < 0.001 *** |
|          | var: <i>Q. petraea</i> EW       |                                            | -1.069   | 0.225    | -1.504   | -0.617   | < 0.001 *** |
|          | var: <i>Q. petraea</i> LW       |                                            | 1.467    | 0.113    | 1.258    | 1.698    | < 0.001 *** |
|          | var:ln(n)                       |                                            | -1.017   | 0.072    | -1.156   | -0.875   | < 0.001 *** |
|          | AR1 lag 1 autocorrelation       |                                            | 0.956    | 0.012    | 0.921    | 0.969    | < 0.001 *** |

Table S3 (continued):

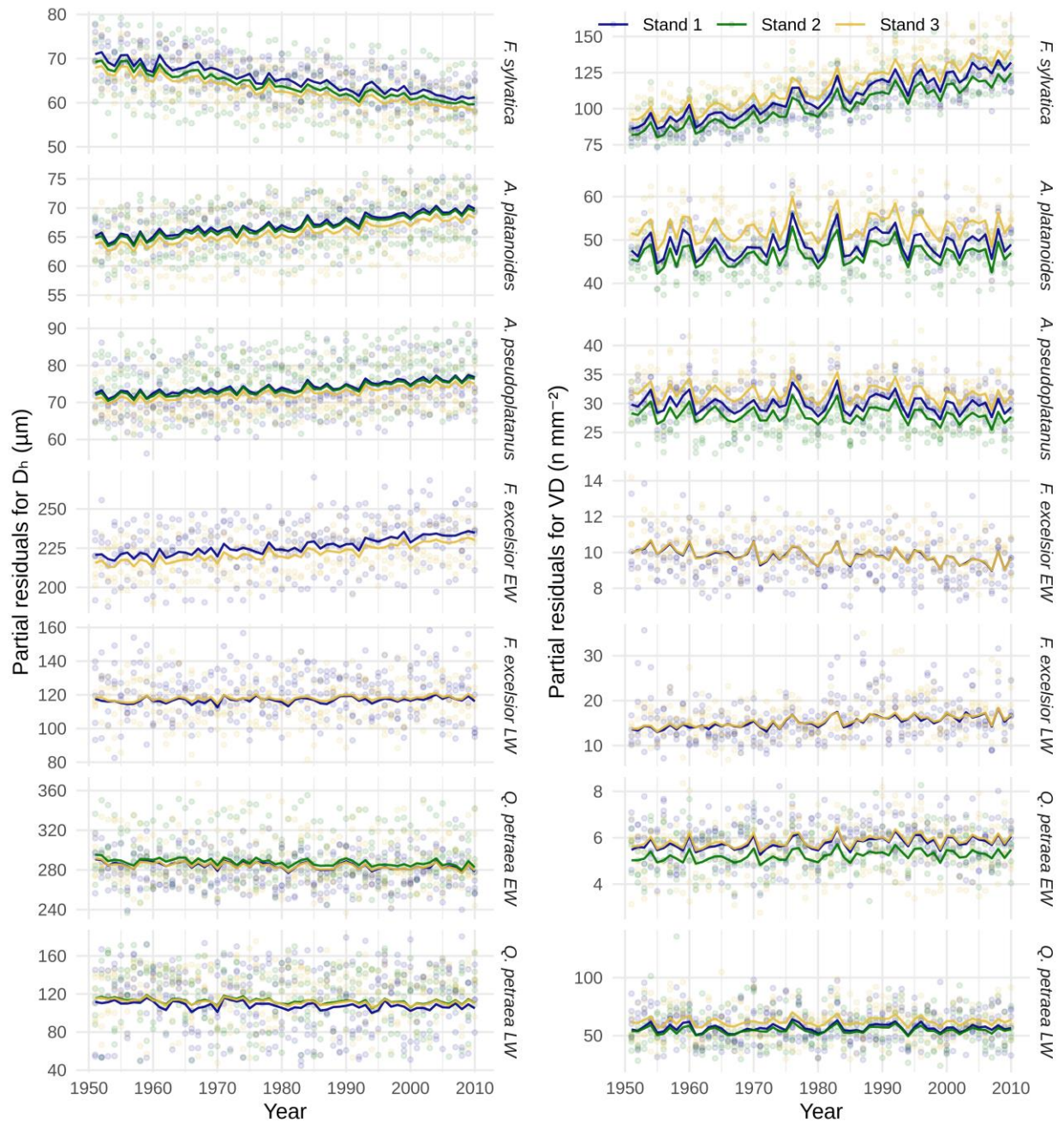
| Model    | Effect | Term                                       | Estimate | Std.Err. | Lower CI | Upper CI | p-value     |
|----------|--------|--------------------------------------------|----------|----------|----------|----------|-------------|
| ln(Kp)   | Fixed  | (Intercept)                                | 3.412    | 0.074    | 3.270    | 3.559    | < 0.001 *** |
|          |        | <i>A. platanoides</i>                      | -0.504   | 0.099    | -0.701   | -0.311   | < 0.001 *** |
|          |        | <i>A. pseudoplatanus</i>                   | -0.675   | 0.088    | -0.849   | -0.496   | < 0.001 *** |
|          |        | <i>F. excelsior</i> EW                     | 2.909    | 0.101    | 2.711    | 3.101    | < 0.001 *** |
|          |        | <i>F. excelsior</i> LW                     | -0.772   | 0.103    | -0.979   | -0.578   | < 0.001 *** |
|          |        | <i>Q. petraea</i> EW                       | 3.323    | 0.093    | 3.144    | 3.508    | < 0.001 *** |
|          |        | <i>Q. petraea</i> LW                       | -0.562   | 0.098    | -0.759   | -0.373   | < 0.001 *** |
|          |        | Stand 2                                    | -0.064   | 0.075    | -0.212   | 0.087    | 0.377       |
|          |        | Stand 3                                    | -0.102   | 0.062    | -0.220   | 0.024    | 0.103       |
|          |        | CWB(curr.GS)                               | 0.022    | 0.006    | 0.009    | 0.034    | < 0.001 *** |
|          |        | CWB(curr.GS): <i>A. platanoides</i>        | -0.036   | 0.007    | -0.049   | -0.020   | < 0.001 *** |
|          |        | CWB(curr.GS): <i>A. pseudoplatanus</i>     | -0.017   | 0.007    | -0.031   | -0.002   | 0.022 *     |
|          |        | CWB(curr.GS): <i>F. excelsior</i> EW       | -0.020   | 0.008    | -0.036   | -0.005   | 0.012 *     |
|          |        | CWB(curr.GS): <i>F. excelsior</i> LW       | -0.110   | 0.025    | -0.159   | -0.062   | < 0.001 *** |
|          |        | CWB(curr.GS): <i>Q. petraea</i> EW         | -0.041   | 0.009    | -0.057   | -0.023   | < 0.001 *** |
|          |        | CWB(curr.GS): <i>Q. petraea</i> LW         | -0.040   | 0.024    | -0.087   | 0.005    | 0.083       |
|          |        | CWB(prev.winter)                           | 0.018    | 0.008    | 0.003    | 0.032    | 0.022 *     |
|          |        | CWB(prev.winter): <i>A. platanoides</i>    | -0.018   | 0.009    | -0.036   | 0.000    | 0.049 *     |
|          |        | CWB(prev.winter): <i>A. pseudoplatanus</i> | -0.029   | 0.009    | -0.046   | -0.011   | 0.002 **    |
|          |        | CWB(prev.winter): <i>F. excelsior</i> EW   | -0.030   | 0.010    | -0.049   | -0.011   | 0.002 **    |
|          |        | CWB(prev.winter): <i>F. excelsior</i> LW   | -0.066   | 0.028    | -0.120   | -0.012   | 0.018 *     |
|          |        | CWB(prev.winter): <i>Q. petraea</i> EW     | -0.030   | 0.011    | -0.050   | -0.008   | 0.008 **    |
|          |        | CWB(prev.winter): <i>Q. petraea</i> LW     | -0.066   | 0.028    | -0.118   | -0.009   | 0.023 *     |
|          |        | CWB(prev.GS)                               | 0.007    | 0.006    | -0.006   | 0.020    | 0.252       |
|          |        | CWB(prev.GS): <i>A. platanoides</i>        | -0.030   | 0.008    | -0.045   | -0.016   | < 0.001 *** |
|          |        | CWB(prev.GS): <i>A. pseudoplatanus</i>     | -0.030   | 0.007    | -0.043   | -0.015   | < 0.001 *** |
|          |        | CWB(prev.GS): <i>F. excelsior</i> EW       | 0.008    | 0.008    | -0.008   | 0.025    | 0.332       |
|          |        | CWB(prev.GS): <i>F. excelsior</i> LW       | -0.041   | 0.026    | -0.092   | 0.009    | 0.114       |
|          |        | CWB(prev.GS): <i>Q. petraea</i> EW         | -0.049   | 0.009    | -0.068   | -0.031   | < 0.001 *** |
|          |        | CWB(prev.GS): <i>Q. petraea</i> LW         | -0.019   | 0.023    | -0.062   | 0.026    | 0.390       |
|          |        | DBH                                        | 0.120    | 0.073    | -0.024   | 0.260    | 0.107       |
|          |        | DBH: <i>A. platanoides</i>                 | -0.109   | 0.112    | -0.339   | 0.109    | 0.318       |
|          |        | DBH: <i>A. pseudoplatanus</i>              | -0.098   | 0.098    | -0.284   | 0.093    | 0.329       |
|          |        | DBH: <i>F. excelsior</i> EW                | -0.052   | 0.137    | -0.320   | 0.219    | 0.722       |
|          |        | DBH: <i>F. excelsior</i> LW                | 0.035    | 0.158    | -0.275   | 0.333    | 0.861       |
|          |        | DBH: <i>Q. petraea</i> EW                  | -0.015   | 0.103    | -0.207   | 0.188    | 0.870       |
|          |        | DBH: <i>Q. petraea</i> LW                  | -0.093   | 0.111    | -0.311   | 0.121    | 0.401       |
|          |        | Year                                       | -0.077   | 0.060    | -0.194   | 0.039    | 0.214       |
|          |        | Year: <i>A. platanoides</i>                | 0.171    | 0.081    | 0.015    | 0.333    | 0.034 *     |
|          |        | Year: <i>A. pseudoplatanus</i>             | 0.132    | 0.076    | -0.020   | 0.279    | 0.086       |
|          |        | Year: <i>F. excelsior</i> EW               | 0.124    | 0.110    | -0.097   | 0.341    | 0.258       |
|          |        | Year: <i>F. excelsior</i> LW               | 0.135    | 0.129    | -0.111   | 0.396    | 0.284       |
|          |        | Year: <i>Q. petraea</i> EW                 | 0.083    | 0.073    | -0.065   | 0.217    | 0.266       |
|          |        | Year: <i>Q. petraea</i> LW                 | 0.197    | 0.079    | 0.044    | 0.355    | 0.013 *     |
| Random   |        | Tree/woodtype: random intercept            | 0.218    | 0.023    | 0.171    | 0.261    | < 0.001 *** |
|          |        | Tree/woodtype: random slope for DBH        | 0.062    | 0.017    | 0.025    | 0.093    | < 0.001 *** |
|          |        | Tree/woodtype: cor(DBH~Int.)               | 0.334    | 0.251    | -0.124   | 0.867    | 0.151       |
|          |        | Year: random intercept                     | 0.029    | 0.004    | 0.021    | 0.036    | < 0.001 *** |
| Residual |        | var:(Intercept)                            | -2.791   | 0.109    | -3.011   | -2.585   | < 0.001 *** |
|          |        | var: <i>A. platanoides</i>                 | -0.880   | 0.103    | -1.085   | -0.678   | < 0.001 *** |
|          |        | var: <i>A. pseudoplatanus</i>              | -1.061   | 0.107    | -1.270   | -0.854   | < 0.001 *** |
|          |        | var: <i>F. excelsior</i> EW                | -2.652   | 0.181    | -2.997   | -2.290   | < 0.001 *** |
|          |        | var: <i>F. excelsior</i> LW                | 0.905    | 0.150    | 0.618    | 1.203    | < 0.001 *** |
|          |        | var: <i>Q. petraea</i> EW                  | -2.803   | 0.221    | -3.238   | -2.368   | < 0.001 *** |
|          |        | var: <i>Q. petraea</i> LW                  | 2.060    | 0.111    | 1.845    | 2.288    | < 0.001 *** |
|          |        | var:ln(n)                                  | -1.269   | 0.071    | -1.406   | -1.129   | < 0.001 *** |
|          |        | AR1 lag 1 autocorrelation                  | 0.931    | 0.016    | 0.893    | 0.956    | < 0.001 *** |

**Table S3 (continued):**

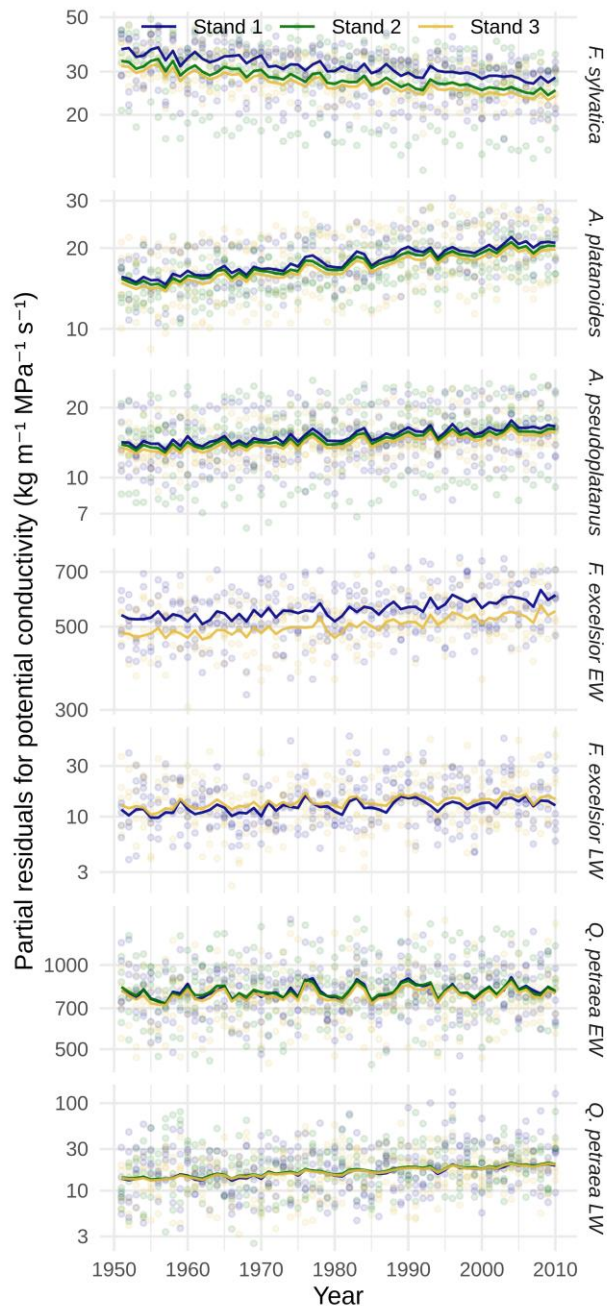
| Model    | Effect | Term                                       | Estimate | Std.Err. | Lower CI | Upper CI | p-value     |
|----------|--------|--------------------------------------------|----------|----------|----------|----------|-------------|
| TRW      | Fixed  | (Intercept)                                | 2.096    | 0.162    | 1.773    | 2.421    | < 0.001 *** |
|          |        | <i>A. platanoides</i>                      | -0.314   | 0.192    | -0.678   | 0.068    | 0.116       |
|          |        | <i>A. pseudoplatanus</i>                   | -0.122   | 0.173    | -0.478   | 0.211    | 0.498       |
|          |        | <i>F. excelsior</i>                        | -0.076   | 0.192    | -0.454   | 0.309    | 0.691       |
|          |        | <i>Q. petraea</i> EW                       | -0.724   | 0.182    | -1.073   | -0.364   | < 0.001 *** |
|          |        | Stand 2                                    | 0.298    | 0.179    | -0.057   | 0.650    | 0.102       |
|          |        | Stand 3                                    | 0.235    | 0.159    | -0.088   | 0.530    | 0.149       |
|          |        | CWB(curr.GS)                               | 0.185    | 0.035    | 0.118    | 0.252    | < 0.001 *** |
|          |        | CWB(curr.GS): <i>A. platanoides</i>        | -0.039   | 0.031    | -0.095   | 0.023    | 0.230       |
|          |        | CWB(curr.GS): <i>A. pseudoplatanus</i>     | -0.150   | 0.028    | -0.206   | -0.095   | < 0.001 *** |
|          |        | CWB(curr.GS): <i>F. excelsior</i> EW       | -0.083   | 0.029    | -0.138   | -0.024   | 0.005 **    |
|          |        | CWB(curr.GS): <i>Q. petraea</i> EW         | -0.145   | 0.025    | -0.194   | -0.096   | < 0.001 *** |
|          |        | CWB(prev.winter)                           | -0.014   | 0.038    | -0.088   | 0.063    | 0.705       |
|          |        | CWB(prev.winter): <i>A. platanoides</i>    | -0.025   | 0.039    | -0.100   | 0.051    | 0.536       |
|          |        | CWB(prev.winter): <i>A. pseudoplatanus</i> | -0.023   | 0.035    | -0.093   | 0.050    | 0.502       |
|          |        | CWB(prev.winter): <i>F. excelsior</i> EW   | -0.064   | 0.036    | -0.132   | 0.008    | 0.090       |
|          |        | CWB(prev.winter): <i>Q. petraea</i> EW     | -0.007   | 0.032    | -0.069   | 0.053    | 0.822       |
|          |        | CWB(prev.GS)                               | 0.182    | 0.036    | 0.112    | 0.252    | < 0.001 *** |
|          |        | CWB(prev.GS): <i>A. platanoides</i>        | -0.059   | 0.031    | -0.119   | 0.004    | 0.059       |
|          |        | CWB(prev.GS): <i>A. pseudoplatanus</i>     | -0.014   | 0.029    | -0.073   | 0.044    | 0.628       |
|          |        | CWB(prev.GS): <i>F. excelsior</i>          | -0.073   | 0.030    | -0.133   | -0.013   | 0.018 *     |
|          |        | CWB(prev.GS): <i>Q. petraea</i>            | -0.129   | 0.026    | -0.180   | -0.078   | < 0.001 *** |
|          |        | DBH                                        | 0.451    | 0.201    | 0.064    | 0.851    | 0.024 *     |
|          |        | DBH: <i>A. platanoides</i>                 | 0.065    | 0.303    | -0.567   | 0.670    | 0.830       |
|          |        | DBH: <i>A. pseudoplatanus</i>              | -0.405   | 0.293    | -0.988   | 0.186    | 0.158       |
|          |        | DBH: <i>F. excelsior</i>                   | -0.053   | 0.372    | -0.787   | 0.666    | 0.858       |
|          |        | DBH: <i>Q. robur</i>                       | -0.232   | 0.270    | -0.748   | 0.295    | 0.386       |
|          |        | Year                                       | -0.581   | 0.157    | -0.888   | -0.277   | < 0.001 *** |
|          |        | Year: <i>A. platanoides</i>                | 0.132    | 0.208    | -0.282   | 0.544    | 0.526       |
|          |        | Year: <i>A. pseudoplatanus</i>             | 0.707    | 0.211    | 0.275    | 1.105    | < 0.001 *** |
|          |        | Year: <i>F. excelsior</i>                  | 0.211    | 0.288    | -0.354   | 0.798    | 0.468       |
|          |        | Year: <i>Q. petraea</i>                    | 0.379    | 0.184    | 0.016    | 0.737    | 0.043 *     |
| Random   |        | Tree: random intercept                     | 0.384    | 0.057    | 0.266    | 0.484    | < 0.001 *** |
|          |        | Tree: random slope for DBH                 | 0.333    | 0.055    | 0.217    | 0.432    | < 0.001 *** |
|          |        | Tree: cor(DBH~Int.)                        | -0.024   | 0.225    | -0.468   | 0.417    | 0.866       |
|          |        | Year: random intercept                     | 0.242    | 0.025    | 0.194    | 0.290    | < 0.001 *** |
| Residual |        | var:(Intercept)                            | -1.677   | 0.076    | -1.833   | -1.539   | < 0.001 *** |
|          |        | var: <i>A. platanoides</i>                 | -0.250   | 0.106    | -0.468   | -0.047   | 0.019 *     |
|          |        | var: <i>A. pseudoplatanus</i>              | -0.424   | 0.110    | -0.638   | -0.217   | < 0.001 *** |
|          |        | var: <i>F. excelsior</i>                   | -0.692   | 0.125    | -0.939   | -0.457   | < 0.001 *** |
|          |        | var: <i>Q. petraea</i>                     | -1.971   | 0.225    | -2.473   | -1.621   | < 0.001 *** |
|          |        | AR1 lag 1 autocorrelation                  | 0.843    | 0.018    | 0.805    | 0.874    | < 0.001 *** |



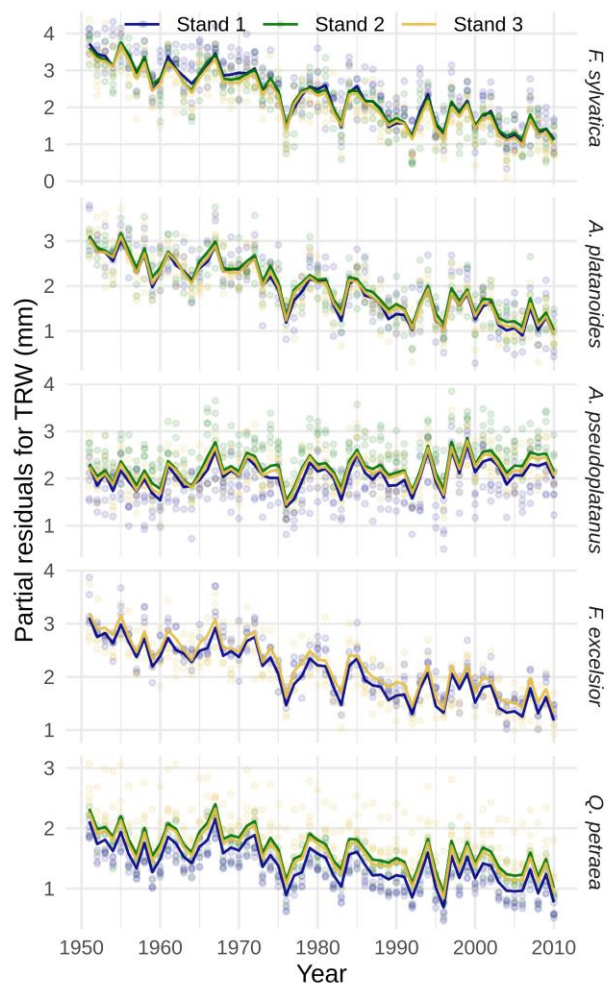
**Figure S1:** Site-wise correlations between tree ring width (TRW), hydraulically weighted vessel diameter ( $D_h$ ) and vessel density (VD) of the three forest stands. Shown are the observed raw data overlain with simple linear regression fits (lower triangle), Pearson correlation coefficients (upper triangle) and stand-wise density plots (diagonal). Upper three panels: diffuse-porous species; lower two panels: ring-porous species (wood anatomical traits separated into early- and latewood).



**Figure S2:** Long-term trends in hydraulically-weighted mean vessel diameter ( $D_h$ ,  $\mu\text{m}$ ; left side) and vessel density (VD,  $\text{n mm}^{-2}$ ; right side) of the five species based on linear mixed effects model predictions. The ring-porous species have been differentiated for wood type (early wood and latewood). Shown are the partial residuals for the two variables after factoring out individual size effects, overlain with the average predictions per site.



**Figure S3:** Long-term trends in potential conductivity ( $K_p$ ,  $\text{kg m}^{-1} \text{MPa}^{-1} \text{s}^{-1}$ ) of the five species based on linear mixed effects model predictions. The ring-porous species have been differentiated for wood type (early wood and latewood). Shown are the partial residuals for  $K_p$  after factoring out individual size effects, overlain with the average predictions per site.



**Figure S4:** Long-term trends in tree ring width (TRW, mm) of the five species based on linear mixed effects model predictions. The ring-porous species have been differentiated for wood type (early wood and latewood). Shown are the partial residuals for TRW after factoring out individual size effects, overlain with the average predictions per site.