**Additional file 3**

**Table 1** Summary statistics of the main stand variables for each forest type

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Forest type | ***N*** | | | |  | **Age** | | | |  | ***H*dom (m)** | | | |  | ***V*1 (m3∙ha–1)** | | | |  | ***G*1 (m2∙ha–1)** | | | | |
| Min | Max | Mean | Std |  | Min | Max | Mean | Std |  | Min | Max | Mean | Std |  | Min | Max | Mean | Std |  | Min | Max | Mean | Std |
| Broad-leaved mixed forest | 210 | 1650 | 795.8 | 242.5 |  | 12 | 102 | 40.0 | 13.6 |  | 9.3 | 32.5 | 17.3 | 3.3 |  | 7.1 | 268.9 | 90.8 | 45.4 |  | 1.8 | 34.6 | 14.0 | 5.8 |
| Mixed broadleaf-conifer forest | 440 | 1750 | 929.9 | 358.2 |  | 21 | 108 | 53.3 | 27.2 |  | 12.2 | 28 | 19.5 | 3.6 |  | 20.0 | 282.1 | 150.5 | 63.6 |  | 3.7 | 34.8 | 20.0 | 7.1 |
| Mongolian oak forest | 150 | 1660 | 772.4 | 301.2 |  | 13 | 65 | 31.0 | 10.6 |  | 5.42 | 23.8 | 14.2 | 3.5 |  | 3.7 | 218.2 | 65.0 | 41.2 |  | 0.9 | 32.7 | 11.0 | 5.8 |
| Larch forest | 260 | 1110 | 623.8 | 211.1 |  | 20 | 145 | 58.2 | 27.8 |  | 14.0 | 40.7 | 26.9 | 7.2 |  | 14.6 | 241.4 | 115.8 | 51.7 |  | 2.2 | 28.6 | 13.6 | 5.7 |
| Birch forest | 340 | 2100 | 815.2 | 332.5 |  | 21 | 56 | 34.7 | 8.0 |  | 11.2 | 27.6 | 17.5 | 3.6 |  | 12.6 | 119.4 | 55.3 | 25.6 |  | 2.1 | 18.1 | 9.3 | 4.0 |

where *N* indicates the number of trees per hectare; Age is the average age of dominant trees and *H*dom is the dominant height of each stand; *V*1 and *G*1 denote the stand volumes and basal areas of the initial phases of the two 5-year periods, respectively.

**Sensitivity analysis of the selected model**

Sensitivity analysis is an important step in developing models. This involves systematical testing of the behavior of the model. In the sensitivity analysis, the estimated effects of the explanatory variables on VI were investigated by varying every selected explanatory variable within its range, while fixing all the others at their respective mean values (Rohner et al. 2018). The results of the sensitivity analysis show how the explanatory variables affect VI and the effect size (OR3 Table 2). The climatic factors and the dominant height (*H*dom) have significant effects on the stand volume, which further confirms that adding climate factors and dominant height can improve the predictive ability of the model.

**OR3 Table 2** Sensitivity analysis of the selected model

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Value** | **VI** | **VI(%)** | **Variables** | **Value** | **VI** | **VI(%)** | **Variables** | **Value** | **VI** | **VI(%)** |
| GST (ºC) | 14 | 13.99 | 0 | GSP (mm) | 250 | 11.7 | 0 | *H*dom (m) | 15 | 11.7 | 0 |
| 16 | 14.49 | 3.5 | 300 | 13.1 | 11.1 | 17 | 14.5 | 23.8 |
| 18 | 14.98 | 7.1 | 400 | 15.7 | 33.9 | 19 | 17.4 | 49.5 |
| 20 | 15.48 | 10.7 | 500 | 18.5 | 57.3 | 21 | 20.7 | 77.2 |
| 22 | 15.99 | 14.3 | 600 | 21.3 | 81.3 | 23 | 24.2 | 107.1 |
| 24 | 16.49 | 17.9 | 700 | 24.2 | 106.0 | 25 | 27.9 | 139.2 |

where VI is the stand volume increment, VI(%) represents the percentage increase in stand volume.

**References**

Rohner B, Waldner P, Lischke H, Ferretti M, Thürig E (2018) Predicting individual-tree growth of central European tree species as a function of site, stand, management, nutrient, and climate effects. Eur J Forest Res 137:29-44