

Ecography

**ECOG-00867**

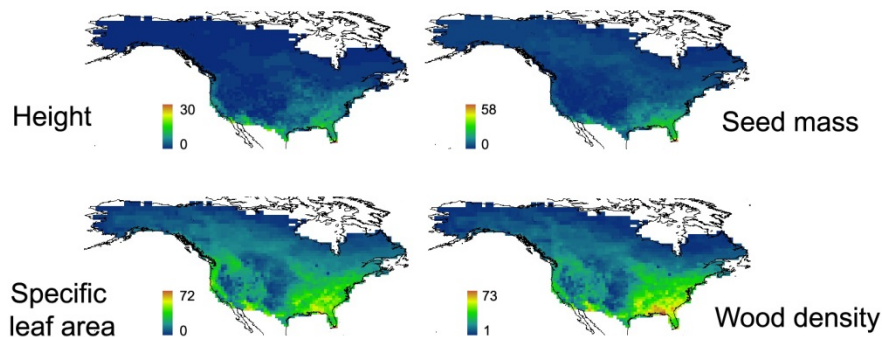
Šímová, I., Violle, C., Kraft, N. J. B., Storch, D., Svenning, J.-C., Boyle, B., Donoghue, J., Jørgensen, P., McGill, B. J., Morueta-Holme, N., Piel, W. H., Peet, R. K., Regetz, J., Schildhauer, M., Spencer, N., Thiers, B., Wiser, S. and Enquist, B. J. 2014. Shifts in trait means and variances in North American tree assemblages: species richness patterns are loosely related to the functional space. – *Ecography* doi: 10.1111/ecog.00867

**Supplementary material**

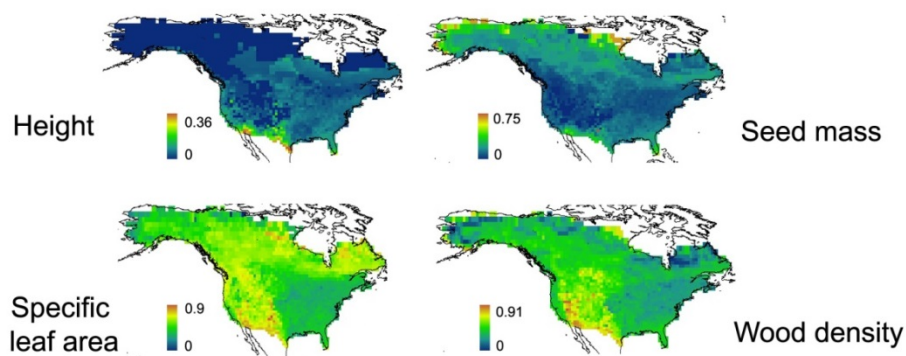
## Appendix 1- Number of species with known trait values and maps of the distribution of missing trait data.

**Table A1:** Number of species with known species-level traits.

Trait	Species-level trait values
Height	468
Specific leaf area	200
Seed mass	396
Wood density	218



**Figure A1.** Maps of distribution of species with missing trait values (absolute numbers per grid cell).



**Figure A2.** Maps of distribution of species with missing trait values proportional to the total number of species present in each grid cell.

**Appendix 2 - Relationships between means and variances of trait values.**

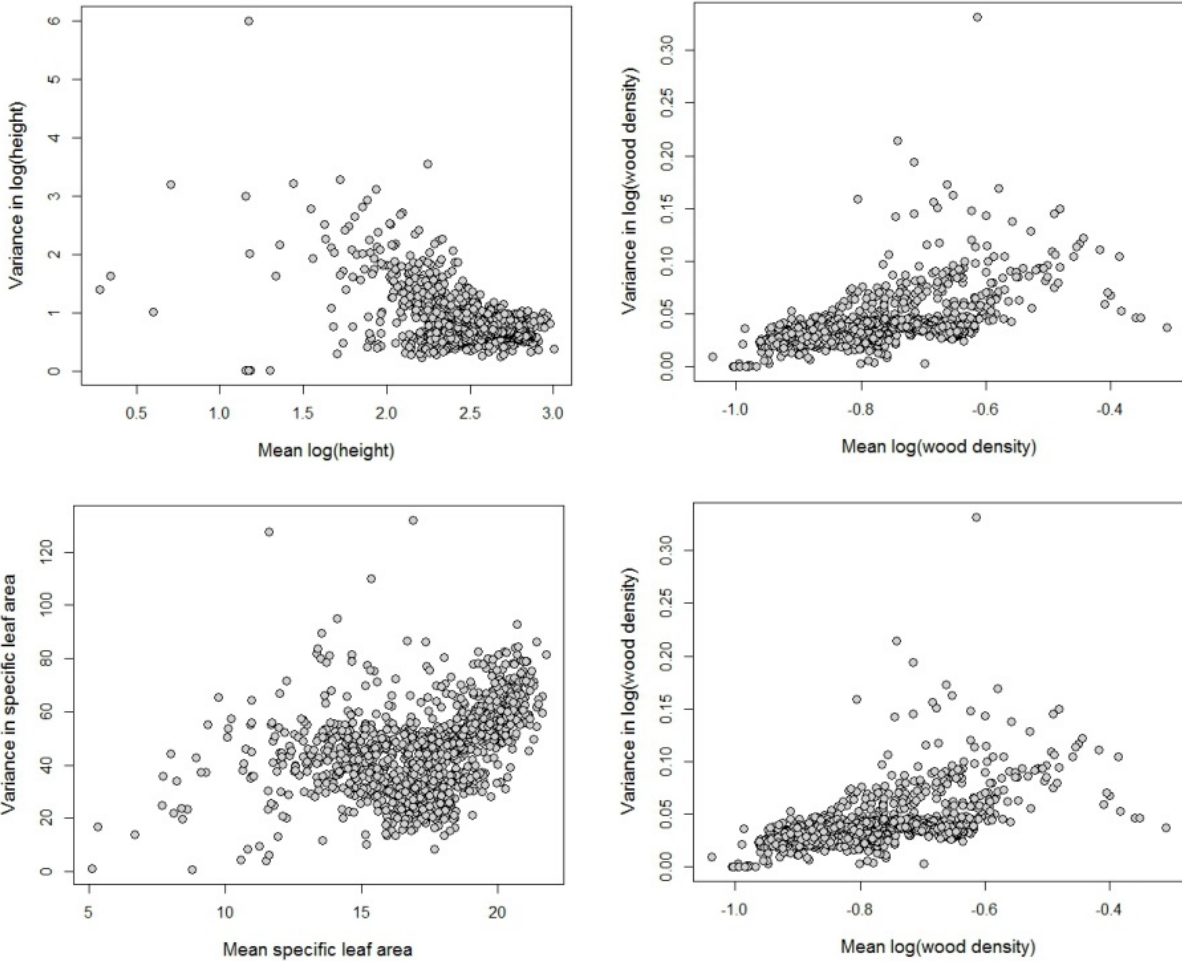


Figure B1: Relationships between means and variances of values for each trait.

### Appendix 3 - The non-standardized variance in trait values for all tree assemblages and the null model expectation plotted against the number of species.

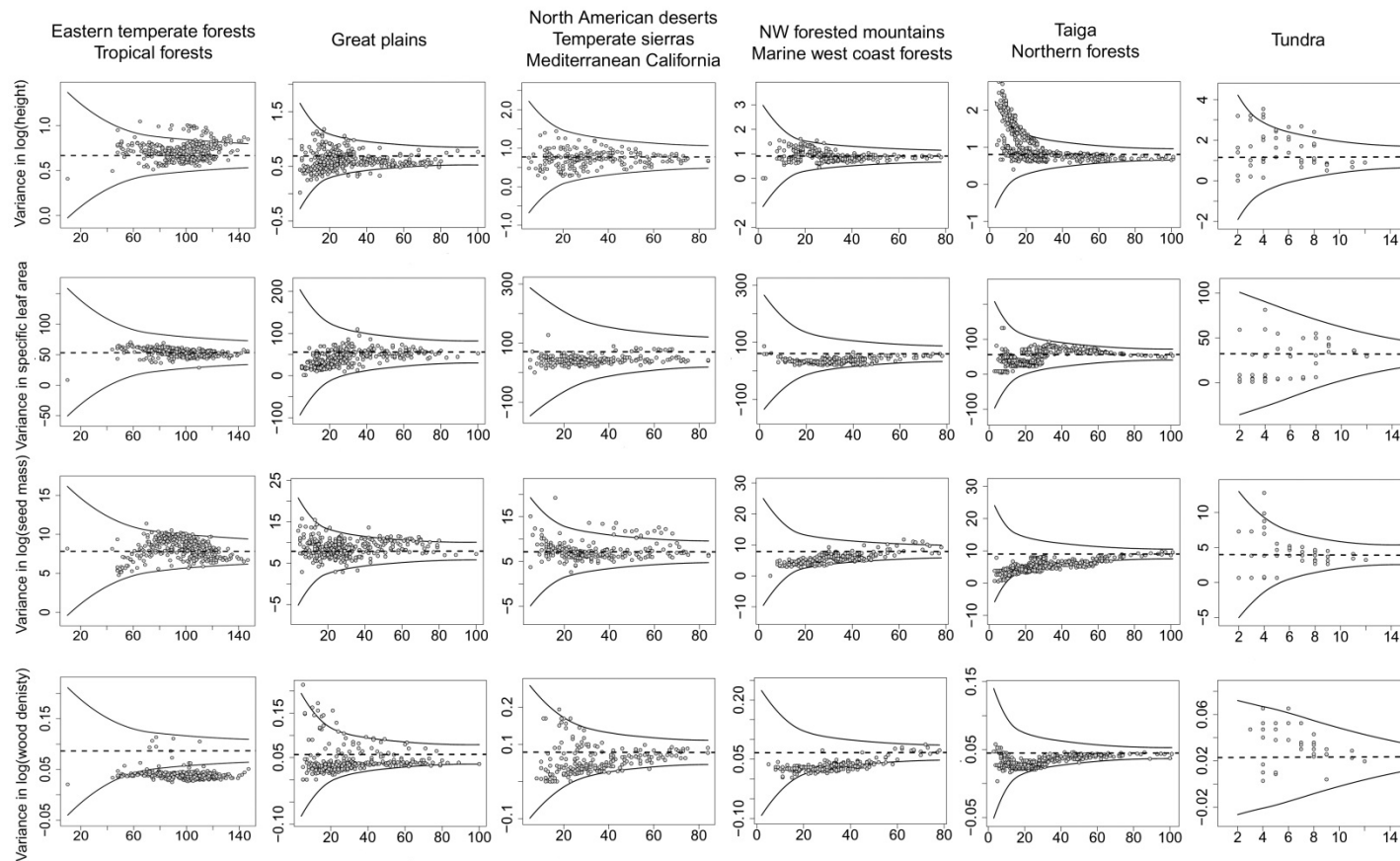


Figure C1: The non-standardized variance in trait values for all tree assemblages (for each trait and each ecoregion) plotted against the number of species in each assemblage. The null expectation (based on randomization using the unique species pool for each ecoregion) is depicted by the dashed lines representing the expected variance in trait values from the SES method, and solid lines representing confidence intervals.

## Appendix 4 – Geographic patterns of mean and variance of trait values for angiosperms.

Geographic patterns of mean and variance of trait values for angiosperms, their standardized effect sizes (SES) and the correlation of the SES values with climate and number of species.

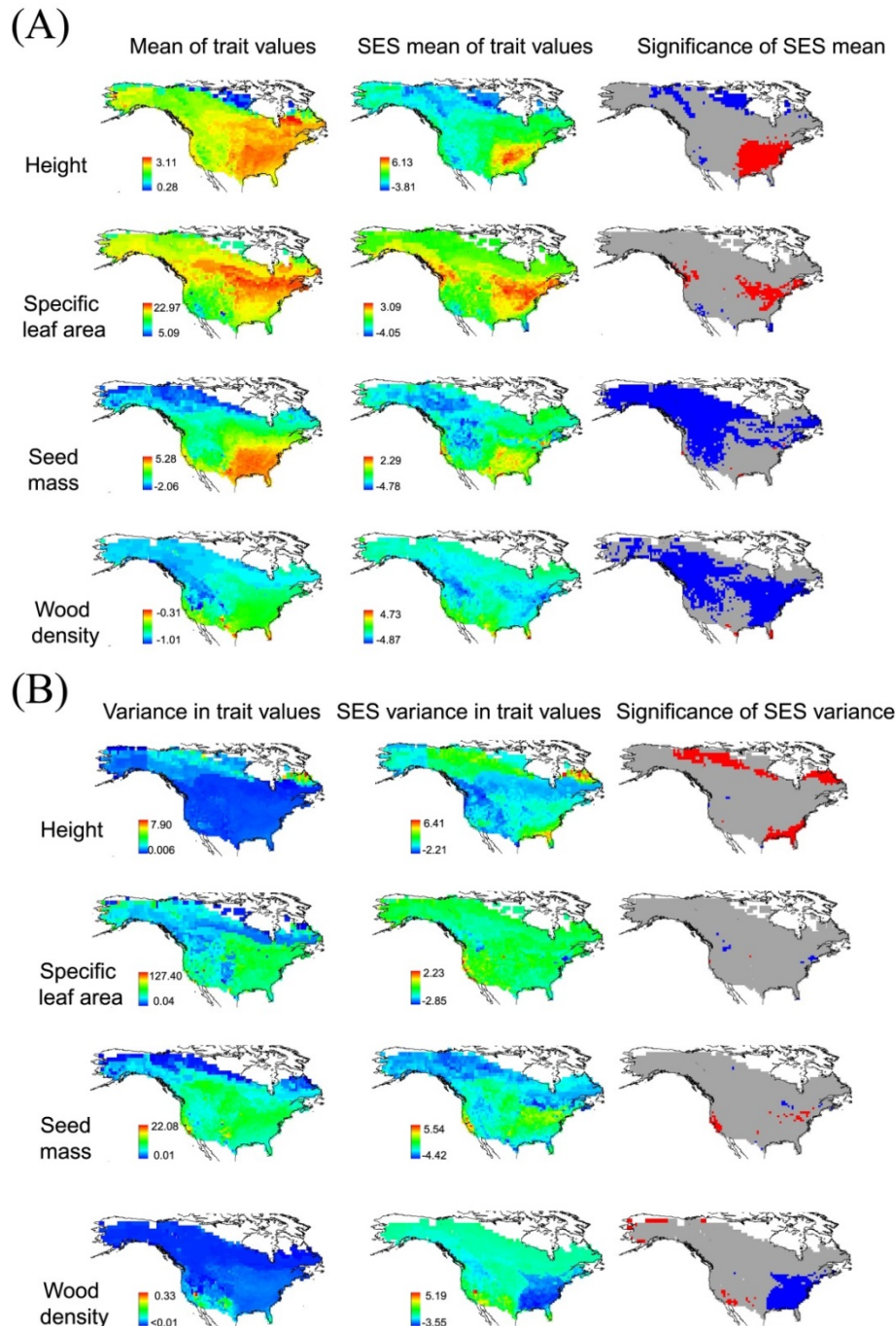


Figure D1: Geographic patterns of (A) mean and (B) variance of trait values for angiosperms: the first column represents patterns of raw (non-standardized) mean or variance in trait values, the second column shows standardized effect size of mean or variance of trait values, and the third column shows standardized effect size of mean or variance of trait values that are significantly higher (red) than expected by chance, lower (blue) than expected by chance or indistinguishable from random pattern (gray). For the randomization we used six unique species pools defined by vegetation ecoregions.

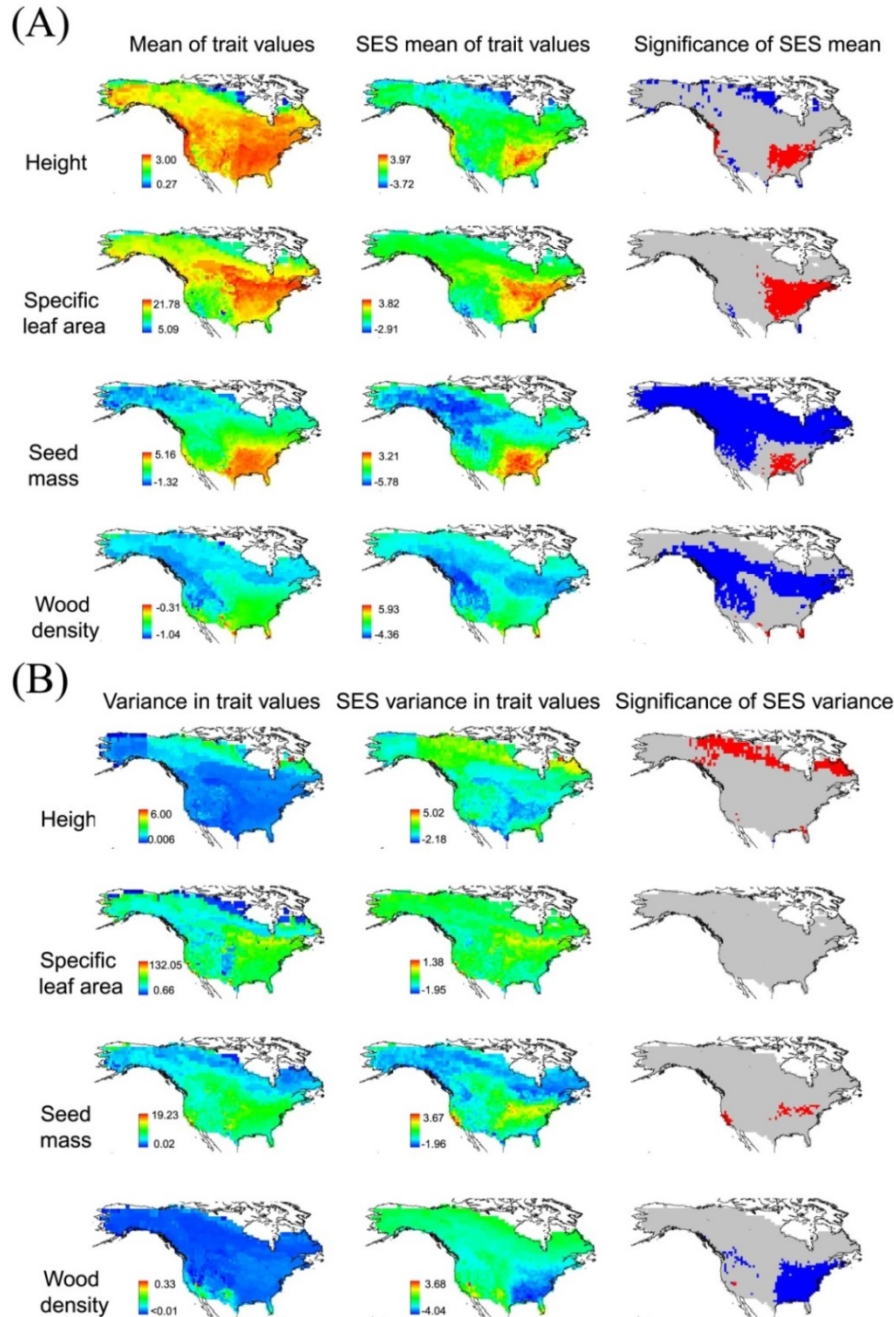
Table D1: Pearson's correlation coefficients between environmental variables and standardized effect size (SES) of means and variances in trait values of angiosperms. For the randomization we used six unique species pools defined by vegetation ecoregions. Significance ( $p < 0.05$ ) is highlighted in bold.

	Temperature	Precipitation	Temperature seasonality	Precipitation seasonality	log(Species richness)
<b>MEAN</b>					
Height	0.558	<b>0.670</b>	0.144	-0.146	<b>0.708</b>
Specific leaf area	0.049	<b>0.469</b>	-0.088	<b>-0.414</b>	<b>0.480</b>
Seed mass	<b>0.646</b>	<b>0.571</b>	-0.459	-0.215	<b>0.520</b>
Wood density	0.321	-0.127	-0.177	<b>0.386</b>	-0.149
<b>VARIANCE</b>					
Height	-0.043	0.104	0.144	-0.146	-0.012
Specific leaf area	0.091	-0.136	-0.139	0.243	-0.100
Seed mass	<b>0.504</b>	0.246	-0.376	0.037	<b>0.475</b>
Wood density	-0.158	-0.545	0.153	<b>0.559</b>	0.292



**Appendix 5 – Geographic patterns of means and variances of the trait values using the species pool of all North American trees for the randomizations.**

Geographic patterns of means and variances of the trait values, their standardized effect sizes and the significance of environmental filtering when using the species pool of all North American trees for the randomizations.



**Figure E1: Geographic patterns of (A) mean and (B) variance of trait values for all species: the first column represents patterns of raw (non-standardized) mean or variance in trait values, the second column shows standardized effect size of mean or variance of trait values using the list of all North American trees as a species pool in randomization, and the third column shows standardized effect size of mean or variance of trait values**









Figure G1: The effect of the interaction of annual precipitation and mean annual temperature on the means and variances of the traits in which the interaction term was the second best predictor in multiple regression. The lines represent the effect of annual precipitation on the variable on Y axis using the highest (red) and lowest (blue) bound of mean annual temperature. The plots were created in R using the library '*sjPlot*'.



**Appendix 8: The relationships between the number of species and climatic variables**

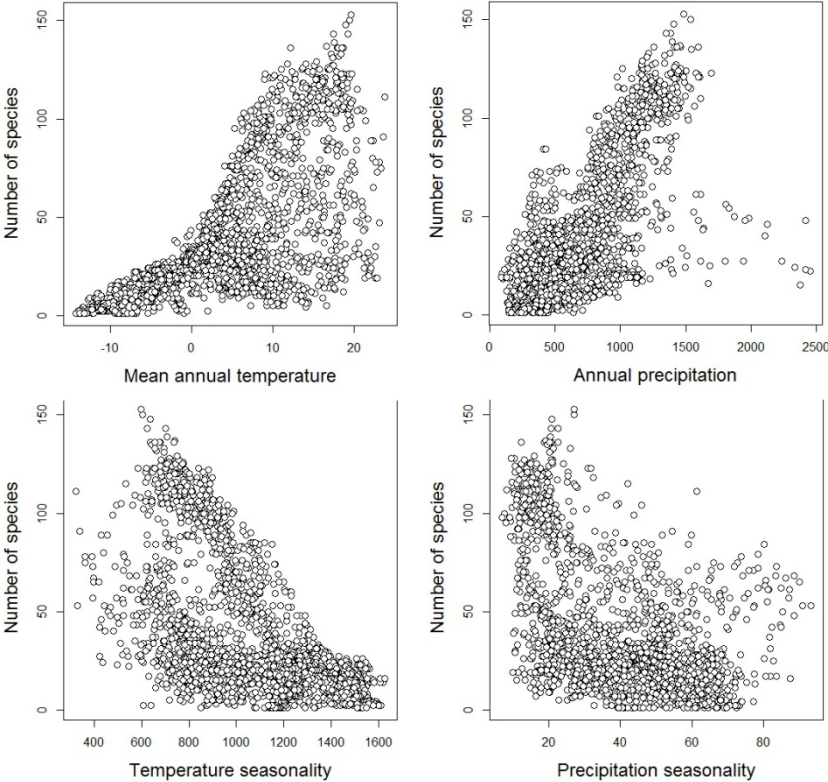


Figure H1: The relationships between the number of species and climatic variables used in the analyses.