

Estimating Tree Growth Models from Complex Forest Monitoring Data: Appendix E

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Appendix E: Table of parameter estimates

Table E1: Parameter point estimates (means) and 95% credible intervals. Asterisks indicate parameters which are significantly separated from zero. For random effects, which can never overlap zero, we use ratios of the lower credible bound to the width of the credible interval to represent a posterior's separation from zero, shown in table E2. For parameters which could overlap zero in theory (e.g. soil and other fixed effects), we consider parameters which either do not overlap zero at all or have a credible bound exactly at zero to be significant. All values given are on the standardized, unitless scale. Soil effects are marked significant if they individually do not overlap zero; some which are not marked significant may also be significantly different from each other; pairwise comparisons are not shown here. Note that here we report a mean for each soil, which matches Figure 1 in the main paper, but in the code to estimate the model we used Cohasset as a reference and estimated differences from Cohasset for the other four soils.

Fixed continuous covariate effects				
Parameter	Intercept Mean		Slope Mean	
Insolation	-0.001	(-0.003, 0.001)	0.001	(-0.001, 0.003)
Elevation	0	(-0.004, 0.003)	-0.001	(-0.003, 0.001)
Annual water deficit	0.007	(-0.005, 0.02)	0	(-0.008, 0.008)
Topographic slope	-0.002*	(-0.004, 0)	0.001	(-0.001, 0.003)
Basal area	-0.003*	(-0.005, -0.001)	0	(-0.002, 0.001)
Average size	0.026*	(0.012, 0.037)	0.009	(-0.001, 0.02)
Fixed soil effects				
Cohasset	0.029*	(0.012, 0.045)	0.011*	(0.004, 0.02)
Holland	0.025*	(0.01, 0.038)	0.007	(-0.003, 0.019)
Holland-Bighill	0.026*	(0.011, 0.039)	0.012*	(0.001, 0.023)
Holland-Musick	0.023*	(0.006, 0.041)	0.005	(-0.008, 0.019)
Jocal	0.043*	(0.022, 0.063)	0.008	(-0.023, 0.043)
Random effects				
Parameter	Intercept Mean		Slope Mean	
Year	0.018*	(0.009, 0.03)	0.008	(0, 0.017)
Compartment	0.018*	(0.008, 0.03)	0.002	(0, 0.004)
Plot	0.006*	(0.004, 0.007)	0.005*	(0.003, 0.006)
Tree	0.007*	(0.006, 0.008)	0.001	(0, 0.003)

Table E2: Ratios of lower credible bound to credible band width for random effect standard deviation parameter estimates, used to determine significance of these parameters (significant parameters marked with asterisks). Because they cannot overlap zero, we suggest this metric to capture a posterior's separation from zero. Several parameters have posteriors (and MCMC chains) that are clearly attracted to zero, while others are clearly stable away from zero. This ratio captures this behavior, with the significant parameters having both a high lower credible bound and a narrower credible interval.

	Intercept SD	Slope SD
Year	0.4060*	0.0016
Compartment	0.3864*	0.0003
Plot	1.2959*	1.1452*
Tree	3.7007*	0.0022