Column and row definitions for `table_S2.csv`: Priors and posterior means and percentiles for light-model and growth parameters.

Column definitions

Column 1: Parameter name (see Row definitions, below).

Columns 2-3: Minimum and maximum values that we considered for each parameter. The species-specific growth parameters (θ_G) were assumed to be samples from truncated lognormal distributions with the given range. All other parameters had uniform priors with the given range.

Column 4: "observed.L" refers to the observed-light growth analysis.

The remaining column names specify one of the four candidate light models (CR, CRN, CRS, and CRNS; see table 2) followed by a suffix specifying the different light and growth analyses (table 3) performed for each of the four candidate models. The suffixes are defined as follows:

L: Light model estimated in isolation (no growth data or growth parameters).

L.valid: Light-model validation. Same as "L" (above) but with data for *Liriodendron* and *Pseudotsuga* excluded.

predicted.L: Predicted-light method (table 3).

predicted.L.valid: Predicted-light validation method (table 3).

uncertain.L: Uncertain-light method (table 3) using latent-variable integration (see Appendix F, Section III).

uncertain.L.valid: Uncertain-light validation method (table 3) using latent-variable integration (see Appendix F, Section III).

uncertain.L.int: Uncertain-light method (table 3) using 'direct' integration (see Appendix F, Section IV).

Row definitions

Each row corresponds to one of four values for each parameter: the marginal posterior mean (".mu" suffix), median (".med" suffix), lower 95% credible limit (".L" suffix), and upper 95% credible limit (".U" suffix). The lower and upper credible limits are the 2.5 and 97.5 percentiles of the marginal posterior. Not all parameters were estimated in all models, so many values in the table are 'NA'. The parameter names, to which the above suffixes are appended, are defined below. See table 1 for terms not defined below.

Non-species-specific parameters

M.OT.E: Minimum value of $\bar{\rho}$ (M in equation 5) for overtopped saplings in eastern North America (ENA).

M.OT.W: M for overtopped saplings in western Oregon (WOR).

M.SE.E: M for sun-exposed saplings in ENA.

M.SE.W: M for sun-exposed saplings in WOR.

S.OT.E: Slope of $\bar{\rho}$ vs. Nbr (S_ρ in equation 5) for overtopped saplings in ENA.

S.OT.W: S_ρ for overtopped saplings in WOR.

S.SE.E: S_ρ for sun-exposed saplings in ENA.

S.SE.W: S_ρ for sun-exposed saplings in WOR.

u: Gamma-scale parameter, which determines the variance-mean relationship for ρ (equation 3).

b0, b1: Slope (b_0) and intercept (b_1) in natural log-space for the relationship between α_N and *ST* (equation 6).

c0, c1: Slope (c_0) and intercept (c_1) in natural log-space for the relationship between *M* (for overtopped saplings only) and *ST* (equation 7).

beta.N: Exponent (β_N) in equation 4.

S.G.mu, S.G.sd: Hyperparameters for lognormally distributed S_G: $\ln(S_{G,j})$ is assumed to be a sample from a normal distribution with mean S.G.mu and standard deviation S.G.sd, where $S_{G,j}$ is S_G for species *j*.

G.max.mu, G.max.sd: Hyperparameters for lognormally distributed $\overline{G}_{\max}$ (as for S.G.mu and S.G.sd, above).

alpha.G.mu, alpha.G.sd: Hyperparameters for lognormally distributed α_G (as for S.G.mu and S.G.sd, above).

r.mu, r.sd: Hyperparameters for lognormally distributed *r* (as for S.G.mu and S.G.sd, above).

Species-specific parameters

The remaining parameters are species-specific growth parameters. The following abbreviations are incorporated into the parameter names: Acru = *Acer rubrum*; List = *Liquidambar styraciflua*; Litu = *Liriodendron tulipifera*; Pipo = *Pinus ponderosa*; Pist = *P. strobus*; Pita = *P. taeda*; Psme = *Pseudotsuga menziesii*; Tsca = *Tsuga canadensis*; Tshe = *T. heterophylla*.

S.G: Initial slope of growth curve (S_G in equation 8).

G.max: Maximum mean growth rate ($\overline{G}_{\max}$ in equation 8).

alpha.G: Growth-variance parameter (α_G in equation 9).

r: Responsiveness of growth to stand quality effects (*r* in equation 10). For *Pinus ponderosa*, the parameter *r* was not estimated because this species only occurred at the Metolius River sites, where stand quality effects were not estimated (see Appendix F, Section V).