Appendix D: Model convergence diagnostics

Scale reduction factors (Gelman and Rubin 1992, Gelman and Hill 2009) were less than 1.1 for all fitted parameters (Figure D1). Visual inspection of traceplots indicated convergence.

Table D1: Definition of parameters and model notation for Figure D1.

Parameter	Definition	Notation in figures
α_i	spatial random effect for for knot i	`alpha.i` where `i` is the numeric knot id
γ_x	climate effect for covariate x	`beta.x` where `x` is the numeric climate covariate id
β_{0t}	random effect for year t on the intercept	`int_yr.t` where `t` is the numeric year id
$\bar{\beta_0}$	mean intercept	`int_mu`
β_1	density-dependent effect	`beta_mu`
$\sigma^2_{\beta_0}$	variance of year random effect	`sig_yr`
σ^2_η	variance of spatial random effect	`sig_a`

References

Gelman, A., and J. Hill. 2009. Data analysis using regression and multilevel/hierarchical models. Cambridge University Press, Cambridge.

Gelman, A., and D. B. Rubin. 1992. Inference from Iterative Simulation Using Multiple Sequences. Statistical Science 7:457–472.

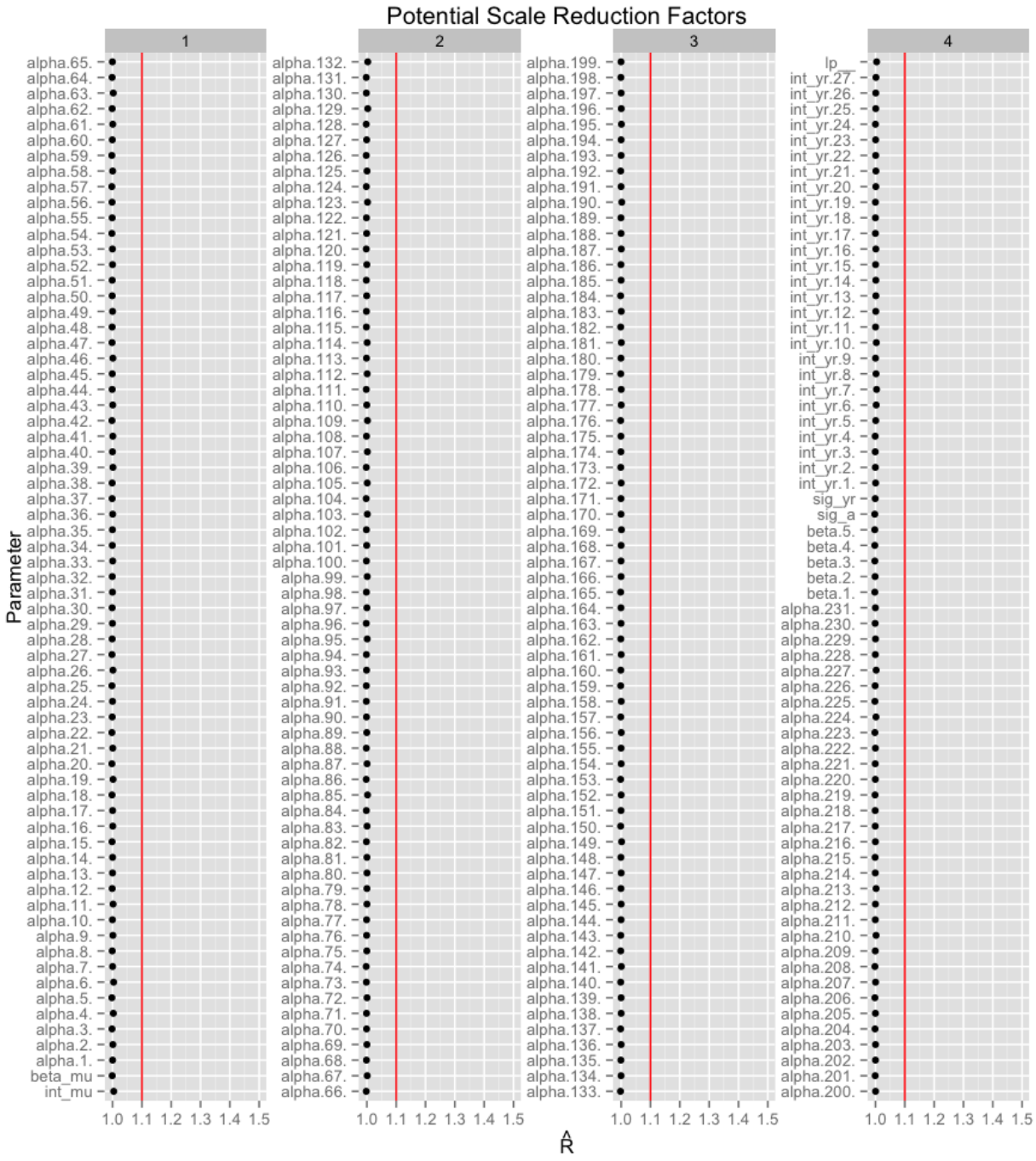

Figure D1: Scale reduction factors for each parameter ($\hat{R}$, points) and the unacceptable level of 1.1 shown in red.