Supplementary Materials for *Hierarchical spatial models for predicting tree species assemblages across large domains*
by Andrew O. Finley, Sudipto Banerjee, and Ronald E. McRoberts

1 Description of samplers from Section 4

For the non-spatial model, we update $\boldsymbol{\beta}$ using a single block Metropolis scheme. For the spatial models we use a two step Metropolis scheme to collect parameters' posterior samples. For the spatially-varying intercept models, the first step draws the set $\{\boldsymbol{\beta}, \log(\sigma^2), \text{logit}(\phi), \text{logit}(\nu)\}$ from a $p+3$ MVN proposal centered on the previously accepted parameters' posterior sample and dispersion chosen to achieve $\sim$23% acceptance rate. Following proposal, inverse transformations were applied to $\log(\sigma^2)$, $\text{logit}(\phi)$, and $\text{logit}(\nu)$ for subsequent calculation of the Metropolis target density. For example, the logit transformation for ϕ is $z_\phi = \text{logit}(\phi) = \log[(\phi - a)/(b - \phi)]$ with an inverse of $\text{logit}(z_\phi)^{-1} = b - [(b-a)/(1 + \exp(z_\phi))]$, where a and b are the upper and lower bounds on the Uniform prior. The log and logit transformation necessitate the addition of Jacobian adjustments to the Metropolis target density, which are $\log(\sigma^2)$, $\log(\phi - \phi_a) + \log(\phi_b - \phi)$, and $\log(\nu - \nu_a) + \log(\nu_b - \nu)$. The second step in the sampler updates the $\tilde{\mathbf{w}}_{\tilde{\epsilon}}$, using a single $n \times 1$ proposal from a MVN proposal density centered on the previously accepted $\tilde{\mathbf{w}}_{\tilde{\epsilon}}$ and independent dispersion value, again *hand-tuning* to achieve an appropriate acceptance rate.

A similar two step Metropolis algorithm is used for the spatially-varying coefficients models. Recall that $\mathbf{C_w}(\mathbf{0}) = \mathbf{A}\mathbf{A}'$, hence $\mathbf{A} = \mathbf{C}_{\mathbf{w}}^{1/2}(\mathbf{0})$ can be taken as any square-root of $\mathbf{C_w}(\mathbf{0})$. We assume $\mathbf{A}(\mathbf{s}) = \mathbf{A}$ and, as noted above, we assign an inverse-Wishart prior on $\mathbf{A}\mathbf{A}'$ with $\mathbf{A}$ a computationally efficient square-root (we used Cholesky). Therefore the first step draws $\{\boldsymbol{\beta}, \mathbf{A}, \text{logit}(\boldsymbol{\phi}), \text{logit}(\boldsymbol{\nu})\}$, from a multivariate normal proposal centered on the previously accepted parameters' posterior sample and dispersion chosen to maintain a healthy acceptance rate. Note, the diagonal elements of $\mathbf{A}$ are proposed as log-transformed then subsequently exponentiated to ensure the identity of $\mathbf{C_w}(\mathbf{0})$. Again, Jacobian adjustments are necessary. The Jacobian for $\mathbf{A}\mathbf{A}'$ is $2^p \prod_{i=1}^{p} a_{ii}^{p-i+1}$, where a_{ii}'s are the diagonal elements of the matrix $\mathbf{A}$, and the Jacobian for the p elements of $\boldsymbol{\phi}$ and $\boldsymbol{\nu}$ is the same as discussed in the preceding paragraph. The second step in the sampler updates the $\tilde{\mathbf{w}}_{\tilde{\epsilon}}$, again using a single $np \times 1$ proposal from a multivariate normal proposal density centered on the previously accepted $\tilde{\mathbf{w}}_{\tilde{\epsilon}}$ and independent dispersion value.

2 Parameter estimates and associated figures for additional FTGs

This section provides parameter estimates for each FTG's candidate models. Most of the parameter estimates for the red/white/jack pine FTG's candidate models are provided in the main text, with the exception of the $\mathbf{C}_{\mathbf{w}}(\mathbf{0})$'s off-diagonal elements which are given in Table 1.

Table 1: $\mathbf{C_w(0)}$ parameter credible intervals, ${}_{2.5\%}50\%{}_{97.5\%}$ percentiles, for the red/white/jack pine FTG 200 knot space-varying coefficients model.

	Intercept	PRECIP	TMAX	TMIN	SDI	SNOW
Intercept	${}_{3.96}5.14{}_{6.89}$					
PRECIP	${}_{0.15}0.51{}_{0.89}$	${}_{2.36}2.84{}_{3.12}$				
TMAX	${}_{0.17}0.35{}_{0.57}$	${}_{-0.19}-0.03{}_{0.16}$	${}_{3.62}4.31{}_{4.84}$			
TMIN	${}_{-0.36}0.30{}_{0.51}$	${}_{0.06}0.25{}_{0.58}$	${}_{-0.68}-0.34{}_{0.08}$	${}_{3.48}4.25{}_{5.82}$		
SDI	${}_{-0.23}-0.04{}_{0.13}$	${}_{-0.31}-0.18{}_{-0.01}$	${}_{-0.12}0.02{}_{0.12}$	${}_{-0.76}-0.57{}_{-0.18}$	${}_{3.31}4.03{}_{5.21}$	
SNOW	${}_{-0.55}-0.36{}_{0.15}$	${}_{-0.5}-0.25{}_{-0.1}$	${}_{0.44}0.72{}_{1.05}$	${}_{-0.04}0.47{}_{0.66}$	${}_{-0.09}0.28{}_{0.63}$	${}_{3.19}3.86{}_{5.06}$

Table 2: Parameter credible intervals, $_{2.5\%}\,50\%\,_{97.5\%}$ percentiles, for the spruce/fir FTG non-spatial and predictive process candidate model. Note, Table 3 gives $\mathbf{C_w(0)}$ for the space-varying coefficients model. All ϕ parameter values are scaled by 1.0^5.

		Spatial predictive process	
		Spatially-varying intercept	Spatially-varying coefficients
Parameter	Non-spatial	200 Knots	200 Knots
$\beta_{\text{RWJ; 0}}$	$_{-2.22}\,-2.04\,_{-1.87}$	$_{-2.78}\,-2.58\,_{-2.41}$	$_{-1.88}\,-1.66\,_{-1.45}$
$\beta_{\text{RWJ; PRECIP}}$	$_{-0.56}\,-0.42\,_{-0.27}$	$_{-0.65}\,-0.46\,_{-0.27}$	$_{-0.53}\,-0.30\,_{-0.07}$
$\beta_{\text{RWJ; TMAX}}$	$_{-1.33}\,-1.08\,_{-0.84}$	$_{-1.68}\,-1.42\,_{-1.06}$	$_{-0.98}\,-0.77\,_{-0.55}$
$\beta_{\text{RWJ; TMIN}}$	$_{-0.52}\,-0.35\,_{-0.16}$	$_{-0.78}\,-0.56\,_{-0.34}$	$_{-0.45}\,-0.21\,_{-0.04}$
$\beta_{\text{RWJ; SDI}}$	$_{1.63}\,1.78\,_{1.93}$	$_{2.13}\,2.28\,_{2.43}$	$_{1.46}\,1.58\,_{1.76}$
$\beta_{\text{RWJ; SNOW}}$	$_{-0.72}\,-0.55\,_{-0.39}$	$_{-0.94}\,-0.75\,_{-0.56}$	$_{-0.49}\,-0.31\,_{-0.05}$
σ^2	–	$_{2.71}\,3.06\,_{3.5}$	–
$\phi_{\text{RWJ; Intercept}}$	–	$_{1.88}\,2.59\,_{3.81}$	$_{0.97}\,1.17\,_{1.87}$
$\phi_{\text{RWJ; PRECIP}}$	–	–	$_{0.80}\,1.38\,_{2.74}$
$\phi_{\text{RWJ; TMAX}}$	–	–	$_{1.64}\,2.44\,_{3.71}$
$\phi_{\text{RWJ; TMIN}}$	–	–	$_{1.82}\,2.83\,_{3.91}$
$\phi_{\text{RWJ; SDI}}$	–	–	$_{0.93}\,1.44\,_{1.80}$
$\phi_{\text{RWJ; SNOW}}$	–	–	$_{1.52}\,2.17\,_{2.94}$
$\nu_{\text{RWJ; Intercept}}$	–	$_{0.24}\,0.27\,_{0.38}$	$_{0.32}\,0.40\,_{0.51}$
$\nu_{\text{RWJ; PRECIP}}$	–	–	$_{0.32}\,0.51\,_{0.64}$
$\nu_{\text{RWJ; TMAX}}$	–	–	$_{0.67}\,0.83\,_{1.18}$
$\nu_{\text{RWJ; TMIN}}$	–	–	$_{0.65}\,0.82\,_{1.22}$
$\nu_{\text{RWJ; SDI}}$	–	–	$_{0.28}\,0.35\,_{0.44}$
$\nu_{\text{RWJ; SNOW}}$	–	–	$_{0.41}\,0.49\,_{0.73}$
Eff. Range (km) $_{\text{RWJ; 0}}$	–	$_{66.38}\,88.05\,_{120.68}$	$_{154.44}\,232.52\,_{285.18}$
Eff. Range (km) $_{\text{RWJ; PRECIP}}$	–	–	$_{118.71}\,221.22\,_{327.67}$
Eff. Range (km) $_{\text{RWJ; TMAX}}$	–	–	$_{112.07}\,153.57\,_{208.78}$
Eff. Range (km) $_{\text{RWJ; TMIN}}$	–	–	$_{105.77}\,131.0\,_{181.84}$
Eff. Range (km) $_{\text{RWJ; SDI}}$	–	–	$_{144.28}\,178.44\,_{268.08}$
Eff. Range (km) $_{\text{RWJ; SNOW}}$	–	–	$_{112.94}\,138.62\,_{188.42}$

Table 3: $\mathbf{C_w(0)}$ parameter credible intervals, $_{2.5\%}\,50\%\,_{97.5\%}$ percentiles, for the spruce/fir FTG 200 knot space-varying coefficients model.

	Intercept	PRECIP	TMAX	TMIN	SDI	SNOW
Intercept	$_{3.15}\,4.16\,_{5.4}$					
PRECIP	$_{-0.12}\,0.16\,_{0.75}$	$_{3.07}\,4.65\,_{6.03}$				
TMAX	$_{-0.64}\,-0.26\,_{0.05}$	$_{-0.77}\,-0.07\,_{0.29}$	$_{4.73}\,5.52\,_{6.90}$			
TMIN	$_{-0.21}\,0.19\,_{0.47}$	$_{-0.34}\,0.016\,_{0.22}$	$_{-0.41}\,-0.10\,_{0.31}$	$_{3.25}\,3.82\,_{5.21}$		
SDI	$_{-0.31}\,-0.06\,_{0.23}$	$_{0.10}\,0.47\,_{0.80}$	$_{-0.28}\,-0.02\,_{0.23}$	$_{-0.21}\,0.12\,_{0.32}$	$_{2.42}\,3.01\,_{4.04}$	
SNOW	$_{-0.52}\,-0.13\,_{0.08}$	$_{-0.99}\,-0.64\,_{-0.33}$	$_{-0.02}\,0.49\,_{0.75}$	$_{-0.32}\,0.2\,_{0.74}$	$_{-0.01}\,0.19\,_{0.35}$	$_{2.72}\,3.28\,_{4.13}$

Table 4: Parameter credible intervals, $_{2.5\%}\,50\%\,_{97.5\%}$ percentiles, for the oak/pine FTG non-spatial and predictive process candidate model. Note, Table 5 gives $\mathbf{C_w(0)}$ for the space-varying coefficients model. All ϕ parameter values are scaled by 1.0^5.

		Spatial predictive process	
		Spatially-varying intercept	Spatially-varying coefficients
Parameter	Non-spatial	200 Knots	200 Knots
$\beta_{\text{RWJ; 0}}$	$_{-3.55}\,-3.27\,_{-2.98}$	$_{-3.94}\,-3.66\,_{-3.30}$	$_{-3.44}\,-3.22\,_{-2.96}$
$\beta_{\text{RWJ; PRECIP}}$	$_{-0.1}\,0.11\,_{0.38}$	$_{-0.29}\,-0.06\,_{0.27}$	$_{-0.61}\,-0.34\,_{-0.06}$
$\beta_{\text{RWJ; TMAX}}$	$_{0.29}\,0.76\,_{1.24}$	$_{0.84}\,1.20\,_{1.63}$	$_{0.698}\,1.15\,_{1.49}$
$\beta_{\text{RWJ; TMIN}}$	$_{-0.82}\,-0.42\,_{-0.08}$	$_{-1.02}\,-0.69\,_{-0.30}$	$_{-0.78}\,-0.37\,_{0}$
$\beta_{\text{RWJ; SDI}}$	$_{-1.84}\,-1.51\,_{-1.22}$	$_{-2.04}\,-1.72\,_{-1.45}$	$_{-1.74}\,-1.45\,_{-1.24}$
$\beta_{\text{RWJ; SNOW}}$	$_{-0.89}\,-0.54\,_{-0.21}$	$_{-1.15}\,-0.8\,_{-0.47}$	$_{-0.28}\,0.01\,_{0.42}$
σ^2	–	$_{8.79}\,11.26\,_{14.95}$	–
$\phi_{\text{RWJ; Intercept}}$	–	$_{1.69}\,2.70\,_{4.31}$	$_{0.62}\,0.749\,_{0.99}$
$\phi_{\text{RWJ; PRECIP}}$	–	–	$_{0.97}\,2.11\,_{2.74}$
$\phi_{\text{RWJ; TMAX}}$	–	–	$_{2.76}\,3.56\,_{4.30}$
$\phi_{\text{RWJ; TMIN}}$	–	–	$_{1.05}\,1.93\,_{2.7}$
$\phi_{\text{RWJ; SDI}}$	–	–	$_{1.96}\,2.75\,_{4.06}$
$\phi_{\text{RWJ; SNOW}}$	–	–	$_{1.63}\,2.37\,_{3.41}$
$\nu_{\text{RWJ; Intercept}}$	–	$_{0.41}\,0.51\,_{0.65}$	$_{0.45}\,0.53\,_{0.60}$
$\nu_{\text{RWJ; PRECIP}}$	–	–	$_{0.34}\,0.62\,_{0.79}$
$\nu_{\text{RWJ; TMAX}}$	–	–	$_{1.06}\,1.24\,_{1.42}$
$\nu_{\text{RWJ; TMIN}}$	–	–	$_{0.36}\,0.48\,_{0.72}$
$\nu_{\text{RWJ; SDI}}$	–	–	$_{0.5}\,0.60\,_{0.85}$
$\nu_{\text{RWJ; SNOW}}$	–	–	$_{0.39}\,0.57\,_{0.86}$
Eff. Range (km) $_{\text{RWJ; 0}}$	–	$_{75.25}\,111.5\,_{165.95}$	$_{315.72}\,410.96\,_{499.2}$
Eff. Range (km) $_{\text{RWJ; PRECIP}}$	–	–	$_{124.39}\,156.81\,_{277.23}$
Eff. Range (km) $_{\text{RWJ; TMAX}}$	–	–	$_{105.43}\,123.89\,_{150.55}$
Eff. Range (km) $_{\text{RWJ; TMIN}}$	–	–	$_{118.38}\,151.39\,_{243.33}$
Eff. Range (km) $_{\text{RWJ; SDI}}$	–	–	$_{84.23}\,118.42\,_{158.93}$
Eff. Range (km) $_{\text{RWJ; SNOW}}$	–	–	$_{103.68}\,130.17\,_{175.35}$

Table 5: $\mathbf{C_w}(\mathbf{0})$ parameter credible intervals, ${}_{2.5\%}50\%_{97.5\%}$ percentiles, for the oak/pine FTG 200 knot space-varying coefficients model.

	Intercept	PRECIP	TMAX	TMIN	SDI	SNOW
Intercept	${}_{7.74}9.5_{11.79}$					
PRECIP	${}_{0.62}1.04_{1.84}$	${}_{3.79}5.19_{6.28}$				
TMAX	${}_{-0.86}0.06_{0.52}$	${}_{-0.59}-0.03_{0.35}$	${}_{4.36}5.33_{6.63}$			
TMIN	${}_{-0.67}-0.26_{0.23}$	${}_{-0.19}0.06_{0.25}$	${}_{-0.53}-0.12_{0.16}$	${}_{3.32}4.16_{5.0}$		
SDI	${}_{0.2}0.87_{1.52}$	${}_{-0.20}0.45_{0.84}$	${}_{-0.38}-0.06_{0.48}$	${}_{-0.18}0.10_{0.44}$	${}_{2.77}3.3_{4.11}$	
SNOW	${}_{-1.17}-0.69_{-0.37}$	${}_{-0.29}0.06_{0.6}$	${}_{1.26}1.66_{2.1}$	${}_{0.13}0.48_{0.71}$	${}_{-0.15}-0.02_{0.26}$	${}_{3.68}4.27_{5.25}$

Table 6: Parameter credible intervals, $_{2.5\%}\,50\%\,_{97.5\%}$ percentiles, for the oak/hickory FTG non-spatial and predictive process candidate model. Note, Table 7 gives $\mathbf{C_w(0)}$ for the space-varying coefficients model. All ϕ parameter values are scaled by 1.0^5.

		Spatial predictive process	
		Spatially-varying intercept	Spatially-varying coefficients
Parameter	Non-spatial	200 Knots	200 Knots
$\beta_{\text{RWJ; 0}}$	$_{-2.31}\,-2.13\,_{-1.97}$	$_{-2.76}\,-2.51\,_{-2.30}$	$_{-2.4}\,-2.08\,_{-1.88}$
$\beta_{\text{RWJ; PRECIP}}$	$_{-0.1}\,0.00\,_{0.08}$	$_{0.05}\,0.17\,_{0.27}$	$_{-0.19}\,-0.044\,_{0.08}$
$\beta_{\text{RWJ; TMAX}}$	$_{1.07}\,1.39\,_{1.75}$	$_{1.49}\,1.80\,_{2.08}$	$_{1.15}\,1.38\,_{1.64}$
$\beta_{\text{RWJ; TMIN}}$	$_{-0.38}\,-0.12\,_{0.11}$	$_{-0.5}\,-0.21\,_{0.0}$	$_{-0.29}\,-0.03\,_{0.21}$
$\beta_{\text{RWJ; SDI}}$	$_{-1.23}\,-1.09\,_{-0.94}$	$_{-1.39}\,-1.22\,_{-1.0}$	$_{-1.21}\,-1.01\,_{-0.85}$
$\beta_{\text{RWJ; SNOW}}$	$_{-0.97}\,-0.77\,_{-0.50}$	$_{-1.15}\,-0.94\,_{-0.73}$	$_{-0.8}\,-0.48\,_{-0.21}$
σ^2	–	$_{3.32}\,3.92\,_{4.6}$	–
$\phi_{\text{RWJ; Intercept}}$	–	$_{3.03}\,3.83\,_{5.38}$	$_{1.32}\,1.73\,_{2.66}$
$\phi_{\text{RWJ; PRECIP}}$	–	–	$_{1.3}\,2.66\,_{3.5}$
$\phi_{\text{RWJ; TMAX}}$	–	–	$_{2.51}\,3.82\,_{6.39}$
$\phi_{\text{RWJ; TMIN}}$	–	–	$_{2.46}\,3.84\,_{4.87}$
$\phi_{\text{RWJ; SDI}}$	–	–	$_{1.67}\,2.18\,_{3.4}$
$\phi_{\text{RWJ; SNOW}}$	–	–	$_{1.94}\,2.54\,_{3.70}$
$\nu_{\text{RWJ; Intercept}}$	–	$_{0.44}\,0.51\,_{0.63}$	$_{0.55}\,0.65\,_{0.81}$
$\nu_{\text{RWJ; PRECIP}}$	–	–	$_{0.32}\,0.52\,_{0.71}$
$\nu_{\text{RWJ; TMAX}}$	–	–	$_{0.55}\,0.78\,_{1.3}$
$\nu_{\text{RWJ; TMIN}}$	–	–	$_{0.81}\,0.99\,_{1.3}$
$\nu_{\text{RWJ; SDI}}$	–	–	$_{0.45}\,0.54\,_{0.77}$
$\nu_{\text{RWJ; SNOW}}$	–	–	$_{0.45}\,0.58\,_{0.83}$
Eff. Range (km) $_{\text{RWJ; 0}}$	–	$_{59.45}\,78.79\,_{96.28}$	$_{133.94}\,190.51\,_{251.38}$
Eff. Range (km) $_{\text{RWJ; PRECIP}}$	–	–	$_{91.41}\,117.06\,_{192.04}$
Eff. Range (km) $_{\text{RWJ; TMAX}}$	–	–	$_{67.25}\,93.6\,_{127.03}$
Eff. Range (km) $_{\text{RWJ; TMIN}}$	–	–	$_{85.75}\,105.99\,_{147.12}$
Eff. Range (km) $_{\text{RWJ; SDI}}$	–	–	$_{94.30}\,139.37\,_{178.30}$
Eff. Range (km) $_{\text{RWJ; SNOW}}$	–	–	$_{97.15}\,125.11\,_{155.11}$

Table 7: $\mathbf{C_w}(\mathbf{0})$ parameter credible intervals, ${}_{2.5\%}50\%{}_{97.5\%}$ percentiles, for the oak/hickory FTG 200 knot space-varying coefficients model.

	Intercept	PRECIP	TMAX	TMIN	SDI	SNOW
Intercept	${}_{3.95}6.04{}_{7.89}$					
PRECIP	${}_{0.3}0.69{}_{1.38}$	${}_{2.57}3.56{}_{4.42}$				
TMAX	${}_{-1.37}-0.85{}_{-0.44}$	${}_{-0.77}-0.36{}_{0.01}$	${}_{2.94}3.81{}_{4.34}$			
TMIN	${}_{-0.71}-0.29{}_{-0.04}$	${}_{0.16}0.4{}_{0.84}$	${}_{-0.33}0.027{}_{0.28}$	${}_{2.85}3.42{}_{5.01}$		
SDI	${}_{-0.97}-0.54{}_{-0.2}$	${}_{-0.41}-0.19{}_{0.04}$	${}_{0.22}0.52{}_{0.75}$	${}_{-0.65}-0.23{}_{0.01}$	${}_{2.99}3.74{}_{4.37}$	
SNOW	${}_{-0.4}0.22{}_{0.5}$	${}_{-0.22}0.03{}_{0.34}$	${}_{0.66}1.06{}_{1.39}$	${}_{0.19}0.48{}_{1.18}$	${}_{1.04}1.31{}_{1.59}$	${}_{3.57}4.07{}_{4.66}$

Table 8: Parameter credible intervals, ${}_{2.5\%}50\%_{97.5\%}$ percentiles, for the elm/ash/cottonwood FTG non-spatial and predictive process candidate model. Note, Table 9 gives $\mathbf{C_w}(\mathbf{0})$ for the space-varying coefficients model. All ϕ parameter values are scaled by 1.0^5.

		Spatial predictive process	
		Spatially-varying intercept	Spatially-varying coefficients
Parameter	Non-spatial	200 Knots	200 Knots
$\beta_{\text{RWJ; 0}}$	${}_{-2.85}-2.6_{-2.39}$	${}_{-3.6}-3.3_{-3.09}$	${}_{-2.79}-2.43_{-2.25}$
$\beta_{\text{RWJ; PRECIP}}$	${}_{-0.14}-0.01_{0.13}$	${}_{-0.11}0.05_{0.18}$	${}_{-0.34}-0.15_{0.06}$
$\beta_{\text{RWJ; TMAX}}$	${}_{-0.05}0.28_{0.59}$	${}_{0.27}0.59_{0.8}$	${}_{0.15}0.43_{0.80}$
$\beta_{\text{RWJ; TMIN}}$	${}_{-0.24}0.05_{0.33}$	${}_{-0.19}0.09_{0.37}$	${}_{-0.26}0.10_{0.33}$
$\beta_{\text{RWJ; SDI}}$	${}_{1.58}1.79_{2.0}$	${}_{2.11}2.32_{2.6}$	${}_{1.45}1.64_{1.91}$
$\beta_{\text{RWJ; SNOW}}$	${}_{-0.44}-0.23_{-0.03}$	${}_{-0.29}-0.07_{0.19}$	${}_{-0.2}0.04_{0.29}$
σ^2	–	${}_{2.62}2.87_{3.14}$	–
$\phi_{\text{RWJ; Intercept}}$	–	${}_{10.57}13.33_{16.97}$	${}_{0.63}0.72_{0.93}$
$\phi_{\text{RWJ; PRECIP}}$	–	–	${}_{0.69}1.73_{2.98}$
$\phi_{\text{RWJ; TMAX}}$	–	–	${}_{1.69}2.39_{3.88}$
$\phi_{\text{RWJ; TMIN}}$	–	–	${}_{2.38}4.20_{5.32}$
$\phi_{\text{RWJ; SDI}}$	–	–	${}_{1.09}1.71_{2.28}$
$\phi_{\text{RWJ; SNOW}}$	–	–	${}_{2.33}4.19_{4.85}$
$\nu_{\text{RWJ; Intercept}}$	–	${}_{0.87}1.11_{1.56}$	${}_{0.38}0.43_{0.48}$
$\nu_{\text{RWJ; PRECIP}}$	–	–	${}_{0.36}0.64_{0.77}$
$\nu_{\text{RWJ; TMAX}}$	–	–	${}_{0.43}0.51_{0.82}$
$\nu_{\text{RWJ; TMIN}}$	–	–	${}_{0.61}0.97_{1.26}$
$\nu_{\text{RWJ; SDI}}$	–	–	${}_{0.32}0.42_{0.64}$
$\nu_{\text{RWJ; SNOW}}$	–	–	${}_{0.61}0.98_{1.23}$
Eff. Range (km) $_{\text{RWJ; 0}}$	–	${}_{27.96}31.42_{36.28}$	${}_{308.07}386.99_{454.25}$
Eff. Range (km) $_{\text{RWJ; PRECIP}}$	–	–	${}_{117.44}199.61_{389.28}$
Eff. Range (km) $_{\text{RWJ; TMAX}}$	–	–	${}_{89.06}127.22_{169.98}$
Eff. Range (km) $_{\text{RWJ; TMIN}}$	–	–	${}_{79.32}94.75_{136.3}$
Eff. Range (km) $_{\text{RWJ; SDI}}$	–	–	${}_{134.58}162.55_{262.82}$
Eff. Range (km) $_{\text{RWJ; SNOW}}$	–	–	${}_{83.49}98.31_{144.08}$

Table 9: $\mathbf{C_w}(\mathbf{0})$ parameter credible intervals, $_{2.5\%}50\%_{97.5\%}$ percentiles, for the elm/ash/cottonwood FTG 200 knot space-varying coefficients model.

	Intercept	PRECIP	TMAX	TMIN	SDI	SNOW
Intercept	$_{5.01}7.32_{8.26}$					
PRECIP	$_{0.83}1.02_{1.73}$	$_{3.66}5.82_{7.02}$				
TMAX	$_{0.05}0.5_{0.89}$	$_{-0.69}-0.21_{0.15}$	$_{3.51}4.26_{4.96}$			
TMIN	$_{-1.39}-0.55_{-0.24}$	$_{-0.54}-0.16_{0.14}$	$_{-0.79}-0.5_{-0.1}$	$_{2.32}2.76_{3.3}$		
SDI	$_{-1.73}-1.28_{-0.69}$	$_{-0.96}-0.58_{-0.04}$	$_{-0.29}-0.12_{0.03}$	$_{-0.4}-0.14_{0.18}$	$_{2.76}3.26_{4.39}$	
SNOW	$_{-1.17}-0.48_{-0.07}$	$_{-1.11}-0.83_{-0.58}$	$_{-0.04}0.27_{0.54}$	$_{0.11}0.44_{0.74}$	$_{0.05}0.23_{0.5}$	$_{3.32}3.92_{4.81}$

Table 10: Parameter credible intervals, $_{2.5\%}\,50\%\,_{97.5\%}$ percentiles, for the aspen/birch FTG non-spatial and predictive process candidate model. Note, Table 11 gives $\mathbf{C_w(0)}$ for the space-varying coefficients model. All ϕ parameter values are scaled by 1.0^5.

		Spatial predictive process	
		Spatially-varying intercept	Spatially-varying coefficients
Parameter	Non-spatial	200 Knots	200 Knots
$\beta_{\text{RWJ; 0}}$	$_{-0.84}\,-0.74\,_{-0.65}$	$_{-0.96}\,-0.865\,_{-0.74}$	$_{-0.77}\,-0.68\,_{-0.57}$
$\beta_{\text{RWJ; PRECIP}}$	$_{-0.33}\,-0.23\,_{-0.12}$	$_{-0.32}\,-0.18\,_{0.0}$	$_{-0.64}\,-0.41\,_{-0.19}$
$\beta_{\text{RWJ; TMAX}}$	$_{-0.24}\,-0.06\,_{0.13}$	$_{-0.24}\,-0.05\,_{0.19}$	$_{-0.09}\,0.14\,_{0.38}$
$\beta_{\text{RWJ; TMIN}}$	$_{-0.53}\,-0.39\,_{-0.24}$	$_{-0.65}\,-0.46\,_{-0.31}$	$_{-0.45}\,-0.27\,_{-0.12}$
$\beta_{\text{RWJ; SDI}}$	$_{0.189}\,0.29\,_{0.41}$	$_{0.25}\,0.38\,_{0.52}$	$_{0.21}\,0.34\,_{0.52}$
$\beta_{\text{RWJ; SNOW}}$	$_{-0.88}\,-0.75\,_{-0.61}$	$_{-1.1}\,-0.92\,_{-0.78}$	$_{-0.55}\,-0.4\,_{-0.25}$
σ^2	–	$_{2.83}\,4.14\,_{6.05}$	–
$\phi_{\text{RWJ; Intercept}}$	–	$_{0.88}\,1.22\,_{2.03}$	$_{0.815}\,1.0\,_{1.23}$
$\phi_{\text{RWJ; PRECIP}}$	–	–	$_{0.55}\,0.77\,_{1.03}$
$\phi_{\text{RWJ; TMAX}}$	–	–	$_{2.70}\,3.65\,_{5.88}$
$\phi_{\text{RWJ; TMIN}}$	–	–	$_{1.8}\,3.08\,_{3.87}$
$\phi_{\text{RWJ; SDI}}$	–	–	$_{1.27}\,1.61\,_{2.37}$
$\phi_{\text{RWJ; SNOW}}$	–	–	$_{1.87}\,2.73\,_{3.92}$
$\nu_{\text{RWJ; Intercept}}$	–	$_{0.24}\,0.30\,_{0.35}$	$_{0.39}\,0.46\,_{0.59}$
$\nu_{\text{RWJ; PRECIP}}$	–	–	$_{0.25}\,0.34\,_{0.41}$
$\nu_{\text{RWJ; TMAX}}$	–	–	$_{0.62}\,0.77\,_{1.12}$
$\nu_{\text{RWJ; TMIN}}$	–	–	$_{0.47}\,0.69\,_{0.85}$
$\nu_{\text{RWJ; SDI}}$	–	–	$_{0.43}\,0.51\,_{0.59}$
$\nu_{\text{RWJ; SNOW}}$	–	–	$_{0.36}\,0.45\,_{0.68}$
Eff. Range (km) $_{\text{RWJ; 0}}$	–	$_{114.96}\,200.57\,_{285.71}$	$_{237.15}\,295.06\,_{351.71}$
Eff. Range (km) $_{\text{RWJ; PRECIP}}$	–	–	$_{257.66}\,336.75\,_{423.74}$
Eff. Range (km) $_{\text{RWJ; TMAX}}$	–	–	$_{70.12}\,97.47\,_{126.51}$
Eff. Range (km) $_{\text{RWJ; TMIN}}$	–	–	$_{91.8}\,111.41\,_{161.06}$
Eff. Range (km) $_{\text{RWJ; SDI}}$	–	–	$_{134.11}\,182.54\,_{239.43}$
Eff. Range (km) $_{\text{RWJ; SNOW}}$	–	–	$_{82.92}\,104.86\,_{141.66}$

Table 11: $\mathbf{C_w(0)}$ parameter credible intervals, ${}_{2.5\%}50\%_{97.5\%}$, percentiles for the aspen/birch FTG 200 knot space-varying coefficients model.

	Intercept	PRECIP	TMAX	TMIN	SDI	SNOW
Intercept	${}_{4.16}5.31_{7.12}$					
PRECIP	${}_{0.41}0.71_{1.08}$	${}_{3.8}4.79_{5.67}$				
TMAX	${}_{0.35}0.74_{1.02}$	${}_{-0.18}0.09_{0.65}$	${}_{3.62}4.68_{5.39}$			
TMIN	${}_{-0.22}0.16_{0.42}$	${}_{-0.13}0.25_{0.61}$	${}_{-0.83}-0.41_{-0.13}$	${}_{2.73}3.13_{3.82}$		
SDI	${}_{-0.83}-0.45_{-0.03}$	${}_{-0.80}-0.49_{-0.26}$	${}_{-0.38}-0.15_{-0.01}$	${}_{-0.41}-0.1_{0.19}$	${}_{2.67}3.32_{3.87}$	
SNOW	${}_{-0.17}0.13_{0.45}$	${}_{-1.0}-0.51_{-0.18}$	${}_{0.73}1.18_{1.41}$	${}_{-0.38}0.03_{0.31}$	${}_{-0.2}-0.04_{0.11}$	${}_{2.62}3.34_{4.1}$