

Repola J., Luoranen J., Huuskonen S., Peltoniemi M., Väänänen P., Uotila K. (2024). Biomass models for young planted Norway spruce and naturally regenerated silver birch, aspen and rowan trees. *Silva Fennica* vol. 58 no. 5 article id 24031. <https://doi.org/10.14214/sf.24031>

Supplementary file S6: Variance-covariance matrix of the fixed effects of the developed multi-response biomass model for birch.

Effect		Stem			Branch			Foliage		Stump		Roots		
		Incept	$d_s/(d_s+k)$	$\ln(h)$	Incept	$\ln(d_s)$	$\ln(h)$	Incept	$d_s/(d_s+k)$	Incept	$\ln(d_s)$	Incept	$d_s/(d_s+k)$	$\ln(h)$
Stem	Incept	0.1025	-0.2848	0.07301	0.00367	-0.00468	0.001412	0.007656	-0.01566	-0.0042	0.00632	0.00369	-0.02247	0.00388
	$d_s/(d_s+k)$	-0.2848	0.8302	-0.2263	-0.00579	0.009831	-0.00416	-0.01319	0.02882	0.003066	-0.01158	-0.00819	0.06269	-0.0127
	$\ln(h)$	0.07301	-0.2263	0.06775	5.47E-06	-0.00097	0.001152	0.000144	-0.00032	0.002168	8.8E-05	0.00135	-0.01583	0.00408
Branches	Incept	0.003667	-0.00579	5.47E-06	0.0071	-0.00313	-0.00303	0.006342	-0.01175	-0.00162	0.00126	0.0012	-0.00083	-0.00085
	$\ln(d_s)$	-0.00468	0.00983	-0.00097	-0.00313	0.05083	-0.05653	-0.00619	0.01352	0.000978	-0.00146	-0.00558	0.04394	-0.01007
	$\ln(h)$	0.001412	-0.00416	0.00115	-0.00303	-0.05653	0.07138	0.00035	-0.00076	0.000365	8.5E-05	0.00547	-0.05132	0.01313
Foliage	Incept	0.007656	-0.01319	0.00014	0.00634	-0.00619	0.00035	0.0139	-0.02804	-0.00226	0.0021	0.00018	-0.00026	-0.00011
	$\ln(d_s)$	-0.01319	0.00014	0.00014	-0.01175	0.01352	-0.00076	-0.02804	0.06126	0.004188	-0.0046	-0.00034	0.00056	0.00025
	$d_s/(d_s+k)$	-0.01566	0.02882	-0.00032	-0.01175	0.01352	-0.00076	-0.02804	0.06126	0.004188	-0.0046	-0.00034	0.00056	0.00025
Stump	Incept	-0.0042	0.00307	0.00217	-0.00162	0.000978	0.000365	-0.00226	0.00419	0.01428	-0.0106	-0.00308	0.005882	0.00072
	$\ln(d_s)$	0.006316	-0.01158	8.8E-05	0.00126	-0.00146	0.000085	0.002104	-0.0046	-0.0106	0.01057	0.00258	-0.00675	-0.00052
	$\ln(h)$	0.001412	-0.00416	0.00115	-0.00162	0.000978	0.000365	-0.00226	0.00419	0.01428	-0.0106	-0.00308	0.005882	0.00072
Roots	Incept	0.003691	-0.00819	0.00135	0.0012	-0.00558	0.005468	0.000183	-0.00034	-0.00308	0.00258	0.0816	-0.5069	0.1113
	$d_s/(d_s+k)$	-0.02247	0.06269	-0.01583	-0.00083	0.04394	-0.05132	-0.00026	0.00056	0.005882	-0.00675	-0.5069	3.7366	-0.9087
	$\ln(h)$	0.003884	-0.0127	0.00408	-0.00085	-0.01007	0.01313	-0.00011	0.00025	0.000721	-0.00052	0.1113	-0.9087	0.2361

Off diagonal blocks consist of the across equation covariances of the fixed effects, and block diagonal is variances-covariances matrix of the sub-model for the individual tree component (bold).