Zhou M., Li C., Li Z., Yu Z., Zhou X., 2023. Stratification of vertical canopy structure to improve estimation of forest inventory attributes using airborne LiDAR data in a large subtropical region.

Supplimentary Table 1 Summary of stratification-based linear regression (log-transformed) models for estimating forest inventory attributes and their goodness-of-fit and validation statistics.

Forest type	Attrib.	Class of VFS	Number of plot	Variables and their parameter estimates of model											Goodness of fit			Validation statistic		
				a0	Hmean	hp95	Hstd	Hcv	dp50	dp75	CC	LADmean	LADstd	LADcv	CF	R^2	rRMSE (%)	MPE (%)	R^2	rRMSE (%)	MPE (%)
Chinese fir	VOL	ALL	222	2.1844	1.2828			-0.1698	-0.02447		0.5744	0.1363			1.0252	0.776	22.00	-5.1	0.719	22.84	-1.2
		OT_1/M_1	108	1.7491	1.3943			-0.2368		-0.0440	-0.06874	0.2275			1.0191	0.775	18.78	-3.9	0.777	19.36	-4.3
		UT_1	53	2.2002	1.4409		-0.1488		-0.02047		0.5407	0.1465			1.0351	0.693	24.69	-2.7	0.608	23.78	-5.2
		OT_1T_2	61	1.1796		1.2147		-0.6493		-0.0056	0.9094			-0.1328	1.0300	0.518	24.47	-6.0	0.466	25.12	-6.9
		M_2	114	1.2126		1.1870		-0.6975	-0.0078		1.1349			-0.1326	1.0308	0.729	24.20	-5.4	0.706	24.89	-4.3
	BA	ALL		1.5524	0.7169			-0.2490	-0.1321		0.5363	0.2245			1.0175	0.634	17.71	-3.5	0.545	18.33	-0.7
		OT_1/M_1		1.9548	0.5660			-0.2121	-0.0735		-0.2075		0.2112		1.0113	0.540	14.20	-2.2	0.483	14.63	-1.9
		UT_1		1.5643	0.9573		-0.2342		-0.1293		0.5137	0.2313			1.0238	0.636	21.32	-4.3	0.557	21.17	-3.5
		OT_1T_2		1.3574		0.5240		-0.5310	-0.0531		1.1922			0.0741	1.0239	0.555	20.79	-3.1	0.524	22.86	-6.1
		M_2		1.5268	0.6707			-0.3520	-0.1346		1.0469	0.1922			1.0210	0.606	20.52	-4.2	0.558	21.59	-2.4
	AGB	ALL		2.1706	1.0624		0.005269		-0.05758		0.5531	0.2091			1.0182	0.711	18.95	-3.6	0.619	20.75	-1.1
		OT_1/M_1		2.4817	0.8425			-0.09822	-0.02594		0.1989		0.1275		1.0136	0.646	16.30	-2.7	0.618	17.06	-2.3
		UT_1		1.4533		1.0510		-0.2861	0.0049		0.6156	0.1609			1.0235	0.753	19.52	-4.9	0.685	19.33	-1.3
		OT_1T_2		2.2197	0.8814			-0.1938	-0.0439		1.2110			-0.0119	1.0221	0.502	21.33	-1.9	0.411	21.93	-5.7
		M_2		1.9385	1.0918			-0.1356	-0.0798		0.8524	0.1897			1.0212	0.717	21.29	-4.2	0.690	22.17	-2.6
Masson pine	VOL	ALL	260	2.2886	1.3275			0.0494		0.0871	0.4789		0.0987		1.0168	0.843	18.57	-3.4	0.845	19.03	-3.6
		OT_1/M_1	149	1.6988		1.3380		-0.1419		0.1430	0.2788		0.1149		1.0199	0.758	18.38	-4.0	0.757	17.85	-4.6
		UT_1	38	2.3346	1.3824			0.1397	0.2985		0.6564		0.0509		1.1612	0.840	17.03	-3.3	0.759	20.39	-5.1
		OT_1T_2	36	3.9114	0.3829		0.6159		0.5440		1.4094			0.3235	1.0119	0.824	15.27	-2.2	0.759	16.67	-5.1
		$T_1T_2T_3$	37	1.0297		-1.0297		0.6991		-0.2133	0.0421			-0.0636	1.0086	0.912	13.25	-1.6	0.837	15.92	-4.8
		M_2	111	2.6445	1.0552		0.1714		0.3186		0.6905			0.1168	1.0131	0.899	17.98	-2.6	0.884	18.75	-4.0
	BA	ALL		1.3656		0.7801		-0.0609	0.3250		0.1526		0.1141		1.0156	0.706	17.18	-3.1	0.705	17.38	-3.4
		OT_1/M_1		1.9172	0.6607		0.06113		0.5040		-0.2508		0.1181		1.0172	0.567	17.12	-3.4	0.523	16.46	-5.0
		UT_1		1.4805	0.8962			0.0458	0.1463		0.8962		0.7691		1.0109	0.803	13.66	-2.4	0.743	15.37	-4.1
		OT_1T_2		1.2152		0.8122		-0.1093	0.1863		1.4341		-0.1093		1.0150	0.613	17.38	-2.8	0.511	15.52	-5.5
		$T_1T_2T_3$		0.6011		1.5278	-0.8784			0.2184	0.2856		-0.8784		1.0078	0.819	11.69	-1.5	0.706	13.44	-3.2
		M_2		0.9492		0.7689		-0.40728		0.08209	1.0034		0.04228		1.0114	0.820	15.33	-2.2	0.840	13.86	-1.1

Forest type	Attrib.	Class of VFS	Number of plot	Variables and their parameter estimates of model												Goodness of fit			Validation statistic		
				a0	Hmean	hp95	Hstd	Hcv	dp50	dp75	CC	LADmean	LADstd	LADcv	CF	R^2	rRMSE (%)	MPE (%)	R^2	rRMSE (%)	MPE (%)
Masson pine	AGB	ALL		2.5268		0.8763	0.0472		0.4264		0.1569		0.0587		1.0187	0.691	19.80	-3.7	0.694	20.67	-4.7
		OT_1/M_1		3.0672	0.7561		0.02723			0.1170	0.4558	0.05144			1.0200	0.554	19.17	-4.0	0.452	18.78	-6.0
		UT_1		2.8439	1.1646			0.3832	0.3968		0.4117			0.3832	1.0157	0.796	17.19	-3.1	0.667	21.46	-4.9
		OT_1T_2		3.2889	0.5775		0.2333		0.2709		0.8302			0.2909	1.0139	0.704	14.96	-2.6	0.544	16.59	-5.6
		$T_1T_2T_3$		1.0133		1.0133	-1.0698			0.1991	-0.1542		0.0824		1.0124	0.782	16.05	-2.3	0.615	19.68	-6.0
		M_2		2.4432		0.9069		-0.03126	0.3913		0.6086			0.06224	1.0151	0.797	19.44	-3.0	0.791	18.80	-2.2
Eucalyptus	VOL	ALL	269	0.5124		1.6917	0.04122			0.1443	-0.2538		0.3258		1.0164	0.829	17.96	-3.2	0.837	17.97	-3.1
		OT_1/M_1	212	1.1633	1.4575		0.2162			0.05610	-0.1624		0.2764		1.0153	0.837	16.54	-2.5	0.794	17.63	-3.3
		OT_1T_2	30	0.9182		1.6588	-0.2289			0.1611	0.6739		0.1934		1.0216	0.915	18.67	-4.0	0.779	21.17	-5.1
		T_1T_3	27	2.1550	0.6118		0.9783		0.3888		0.4871		0.0761		1.0123	0.862	14.06	-2.2	0.748	16.60	-3.1
		M_2	57	1.6581		1.2603		0.0464		0.2273	0.8644			0.1851	1.0179	0.895	16.84	-3.5	0.887	17.22	-2.8
	BA	ALL		-0.0241		1.1610		0.02593		0.1158	0.002044		0.2520		1.0132	0.753	16.55	-2.6	0.755	16.86	-2.7
		OT_1/M_1		0.4597	0.9629		0.1642			0.04724	-0.02499		0.2584		1.0127	0.752	15.45	-1.9	0.706	16.74	-2.5
		OT_1T_2		-0.8524		1.6131	-0.3159			0.1009	0.1969	0.3266			1.0156	0.893	16.99	-2.9	0.757	19.75	-2.3
		T_1T_3		0.2273	0.7930		0.6611			-0.0349	-0.1368	0.4347			1.0116	0.785	13.15	-2.1	0.386	20.66	-8.4
		M_2		-0.1603		1.2097		-0.0278		0.1438	0.1660	0.2828			1.0135	0.858	15.67	-2.6	0.843	15.88	-2.6
	AGB	ALL		-0.0434		1.7094		0.05746		0.1938	-0.2154		0.2552		1.0278	0.749	22.26	-5.6	0.725	23.32	-5.8
		OT_1/M_1		0.5346	1.4501		0.2261			0.1174	-0.07757		0.1943		1.0287	0.728	21.86	-5.1	0.671	23.17	-7.7
		OT_1T_2		-0.8339		2.0894	-0.2524			0.1069	-0.0891	0.3915			1.0257	0.896	22.05	-4.8	0.811	20.66	-1.5
		T_1T_3		2.7247	0.2936		1.1671		1.0704		-0.9480	0.2833			1.0184	0.784	16.90	-3.3	0.418	25.77	-14.5
		M_2		0.3012		1.5230	0.1147			0.1990	-0.0393	0.2939			1.0224	0.860	20.02	-4.3	0.841	20.26	-4.5
Broad-leaved	VOL	ALL	252	2.0000	1.3168		-0.3110			0.0595	0.9362	-0.1761			1.0578	0.629	34.85	-11.7	0.527	35.09	-11.0
		OT_1/M_1	42	2.5851	1.1901			0.2764		0.1078	0.5096			0.4694	1.0357	0.661	25.71	-6.9	0.636	26.23	-7.0
		UT_1	43	0.3112	1.6657			-0.3067	-0.3050		1.1053			-1.0719	1.0475	0.692	28.94	-9.1	0.692	29.97	-16.1
		OT_1T_2/M_2	80	0.5750		1.0451		-1.0668		0.0318	1.0182		-0.0708		1.0645	0.451	36.22	-10.9	0.402	37.12	-18.1
		UT_1T_2	40	1.6568	1.1861			-0.2146		0.0007848	0.6153			-0.2014	1.0680	0.373	35.76	-20.2	0.422	37.21	-22.4
		$T_1T_2T_3$	47	1.3488	1.4734		0.02147			0.2097	-0.8608	0.2008			1.0437	0.566	26.16	-8.2	0.410	28.66	-6.2
		M_3	130	1.4188	1.2504			-0.1735		-0.0471	0.6841			-0.3854	1.0605	0.581	34.74	-12.6	0.588	35.94	-16.8
	BA	ALL	252	1.3063	0.6648			-0.1639	-0.0493		0.6443	0.0759			1.0424	0.489	28.19	-8.5	0.445	28.57	-8.1
		OT_1/M_1	42	2.1112	0.7480			0.3810		0.0419	0.2694		0.2754		1.0216	0.600	19.91	-4.1	0.632	19.90	-5.9
		UT_1	43	-1.8089		1.2262		-1.1405	-0.3167		0.9964			-0.9500	1.0388	0.667	24.79	-7.5	0.685	24.38	-8.7
		OT_1T_2/M_2	80	0.1348		1.4111	-0.7883		0.0184		1.1335			0.0264	1.0435	0.423	29.01	-7.7	0.398	30.65	-3.1
		UT_1T_2	40	1.4547	0.7662		-0.1722			0.01129	0.7453			-0.04015	1.0632	0.231	34.06	-19.8	0.223	34.32	-21.1
		$T_1T_2T_3$	47	0.7955	0.9029			0.2699	-0.03802		-1.7765	0.5158			1.0328	0.401	21.36	-6.4	0.364	23.83	-3.5
		M_3	130	1.1897	0.6546			-0.2597		0.0035	0.6732			-0.1363	1.0492	0.435	28.90	-10.2	0.401	30.17	-14.7

Forest type	Attrib.	Class of VFS	Number of plot	Variables and their parameter estimates of model												Goodness of fit			Validation statistic		
				a0	Hmean	hp95	Hstd	Hcv	dp50	dp75	CC	LADmean	LADstd	LADcv	CF	R^2	rRMSE (%)	MPE (%)	R^2	rRMSE (%)	MPE (%)
Broad-leaved	AGB	ALL	252	2.8034	0.8004		-0.0591			0.0412	0.6800	-0.0312			1.0541	0.480	33.64	-10.9	0.414	33.49	-10.7
		OT_1/M_1	42	3.0506	1.0737			0.5148		0.0576	0.1882		0.2999		1.0270	0.624	23.45	-5.1	0.687	22.98	-9.7
		UT_1	43	-0.6692		1.5076		-0.8400	-0.2974		0.8952			-1.0636	1.0406	0.676	25.63	-7.9	0.685	25.51	-7.4
		OT_1T_2/M_2	80	0.7666		1.8092	-1.0081			0.0302	0.8808		-0.0620		1.0618	0.396	36.24	-10.5	0.367	37.33	-17.9
		UT_1T_2	40	2.7079	0.7782			-0.05147		0.02685	0.6265			-0.05377	1.0719	0.204	37.91	-22.3	0.178	39.09	-25.9
		$T_1T_2T_3$	47	2.0675	0.8129		0.6060			-0.04418	-2.0886	0.5436			1.0402	0.388	24.47	-8.1	0.354	28.32	-6.8
		M_3	130	2.6836	0.7911			0.0624		-0.0012	0.5974			-0.2224	1.0584	0.449	33.62	-11.8	0.448	34.29	-17.1