SUPPLEMENTAL INFORMATION- BIOGEOSCIENCES

Height-diameter allometry of tropical forest trees

Feldpausch *et al.*

Table S1: Plot characteristics for sites in Africa, Asia, Australia and S. America.

Figure S1: Mean precipitation (mm) and dry season (months <100 mm) by regional clusters for the study sites in Africa, Asia, Australia and South America.

Table S2: Allometric model form and coding fit by ordinary least squares and multi-level models relating tree height (*H*) to bole diameter at 1.3 m height (*D*) and environment.

Table S3: Statistical tests using multilevel mixed-effects and ordinary least squares models to examine the log(*H*):log(*D*) relationship and percent of the variance partitioned by hierarchical structure (random slope random intercept: plot random) for tree height (*H*, m) and diameter (*D*, dm), Pan-tropical (P), Continent (C) or Region (R), environment*, and tree basal area (*A*, m2/ha) for wet to dry pan-tropical forests.

Table S4: Validation of pan-tropical, continent, regional, site-specific models. Tree height was estimated from each of the models and the median percent deviation $((H_{\text{predicted}}-H_{\text{measured}})/\ H_{\text{measured}})*100$ reported from the tree height measured in the field for wet to dry pan-tropical forests (Fm), where positive values indicate the model overestimated measured height.

Figure S2: Validation of height estimates according to multi-levels and the published Brown et al. 1989 moist forest equation for log-log a) model P, b) model RES, c) model S, d) model BrownMoist.

Figure S3a-f: Residuals from the multilevel log-log model RES versus environment and forest structure for a) basal area (A, m^2 ha^{-1}), b) mean annual precipitation (P_A, mm),) dry season (S_D, months < 100 mm), d) precipitation coefficient of variance (P_V), e) mean annual temperature (T_A,°C) and f) tree diameter (D, dm).

Table S1: Plot characteristics for sites in Africa, Asia, Australia and S. America: forest status (secondary (S), selectively logged (L), burned (B), old-growth (OG)), coordinates, mean annual precipitation (P_A, mm) precipitation coefficient of variance (P_V), dry season length (S_D, no. months <100 mm) and altitude (A_L, m a.s.l.). Sampling approach: stems sampled (*n*); sampling method (1) all stems within plot, (2) all stems in selected subplots, (3) haphazard destructively sampled trees, (4) haphazard climbed trees, (5) stems from a stratified-random selection, (6) other random selection; measurement method (1) direct (destructively sampled), (2) direct (climbed), (3) by trigonometry (clinometer/hypsometer), (4) laser range-finder, (5) measuring pole.

Country	**Plot code**	**Forest Status**	**Latitude**	**Longitude**	**P_A (mm)**	**P_V**	**S_D (months)**	**A_L (m a.s.l.)**	**Stems sampled (*n*)**	**Sampling method**	**Measurement method**	**Reference**
Africa												
Cameroon	DJK-01	OG	3.33	12.72	1624	0.57	4	666	59	5	3	Peh 2009; Lewis et al. 2009
	DJK-02	OG	3.33	12.72	1624	0.57	4	666	59	5	3	Peh 2009; Lewis et al. 2009
	DJK-03	OG	3.36	12.72	1623	0.58	4	657	66	5	3	Peh 2009; Lewis et al. 2009
	DJK-04	OG	3.36	12.73	1623	0.58	4	657	65	5	3	Peh 2009; Lewis et al. 2009
	DJK-05	OG	3.32	12.76	1625	0.57	4	673	64	5	3	Peh 2009; Lewis et al. 2009
	DJK-06	OG	3.33	12.76	1625	0.57	4	673	61	5	3	Peh 2009; Lewis et al. 2009
	MbamDje-02	OG	6.00	12.87	1593	0.74	5	779	12	1	3 & 4	Mitchard et al. 2009
	MbamDje-03	OG	5.99	12.87	1593	0.74	5	779	18	1	3 & 4	Mitchard et al. 2009
	MbamDje-06	OG	5.99	12.87	1593	0.74	5	779	6	1	3 & 4	Mitchard et al. 2009
	MbamDje-07	OG	5.98	12.87	1593	0.74	5	779	84	1	3 & 4	Mitchard et al. 2009
	MbamDje-09	OG	6.00	12.89	1593	0.74	5	770	42	1	3 & 4	Mitchard et al. 2009
	MbamDje-11	OG	6.01	12.89	1593	0.74	5	770	31	1	3 & 4	Mitchard et al. 2009
	MbamDje-14	OG	6.21	12.75	1636	0.75	5	858	38	1	3 & 4	Mitchard et al. 2009
	MbamDje-16	OG	6.22	12.75	1636	0.75	5	858	30	1	3 & 4	Mitchard et al. 2009
	MDJ-01	OG	6.17	12.83	1623	0.75	5	829	45	5	3 & 4	T. Feldpausch et al. (unpublished)
	MDJ-03	OG	5.98	12.87	1593	0.74	5	779	45	5	3 & 4	T. Feldpausch et al. (unpublished)
	MDJ-05	S	5.98	12.87	1593	0.74	5	779	40	5	3 & 4	T. Feldpausch et al. (unpublished)
	MDJ-07	OG	6.01	12.89	1593	0.74	5	770	43	5	3 & 4	T. Feldpausch et al. (unpublished)
	MDJ-10	S	6.00	12.89	1591	0.74	5	778	46	5	3 & 4	T. Feldpausch et al. (unpublished)
Gabon	DOU-01	OG	-2.60	10.58	1786	0.73	4	236	390	1	3	Reitsma 1988; Lewis et al. 2009
	EKO-01	OG	0.38	13.10	1660	0.59	4	529	430	1	3	Reitsma 1988; Lewis et al. 2009
	LOP-01	OG	-0.17	11.42	1753	0.69	4	292	385	1	3	Reitsma 1988; Lewis et al. 2009
	LWW-01	OG	-0.42	11.40	1831	0.7	4	339	14	4	2	Lewis et al. 2009

	MAK-01	OG	0.67	12.83	1643	0.61	4	531	10	4	2	Lewis et al. 2009
	OVG-01	OG	0.73	11.37	1758	0.65	4	597	473	1	3	Reitsma 1988; Lewis et al. 2009
Ghana	ASN-02	OG	6.56	-2.22	1409	0.53	5	225	12	4	2	Lewis et al. 2009
	ASN-04	OG	6.48	-2.17	1433	0.52	5	218	16	4	2	Lewis et al. 2009
	ASU-01	OG	7.14	-2.45	1212	0.58	5	270	49	5	3 & 4	T. Feldpausch et al. (unpublished)
	BFI-03	OG	7.70	-1.70	1279	0.62	5	327	43	5	3 & 4	T. Feldpausch et al. (unpublished)
	BFI-04	OG	7.71	-1.70	1279	0.62	5	327	35	5	3 & 4	T. Feldpausch et al. (unpublished)
	CAP-09	OG	4.85	-2.10	1740	0.66	4	35	16	4	2	Lewis et al. 2009
	CAP-10	OG	4.80	-2.05	1700	0.7	5	72	19	4	2	Lewis et al. 2009
Ivory Coast	MNIC65-01	OG	5.33	-4.17	1753	0.93	6	11	35	6	3	Müller and Nielsen 1965
	MNIC65-02	OG	5.33	-4.17	1753	0.93	6	11	63	6	3	Müller and Nielsen 1965
Liberia	CVL-01	OG	6.19	-8.18	1959	0.57	3	260	482	1	3	H. Wöll (see Poorter et al. 2003)
	CVL-08	OG	6.19	-8.18	1959	0.57	3	260	545	1	3	H. Wöll (see Poorter et al. 2003)
	CVL-10	OG	6.19	-8.18	1959	0.57	3	260	522	1	3	H. Wöll (see Poorter et al. 2003)
	CVL-11	OG	6.19	-8.18	1959	0.57	3	260	494	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-01	OG	5.39	-7.62	2333	0.4	1	159	335	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-02	OG	5.40	-7.62	2333	0.4	1	159	391	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-03	OG	5.39	-7.62	2333	0.4	1	159	439	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-04	OG	5.40	-7.61	2333	0.4	1	159	338	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-08	OG	5.39	-7.62	2333	0.4	1	159	340	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-10	OG	5.40	-7.59	2333	0.4	1	159	292	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-11	OG	5.39	-7.59	2333	0.4	1	159	398	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-13	OG	5.41	-7.63	2384	0.4	1	164	255	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-14	OG	5.41	-7.62	2333	0.4	1	159	407	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-15	OG	5.41	-7.61	2333	0.4	1	159	368	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-16	OG	5.40	-7.61	2333	0.4	1	159	453	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-18	OG	5.41	-7.60	2333	0.4	1	159	326	1	3	H. Wöll (see Poorter et al. 2003)
	GBO-19	OG	5.41	-7.60	2333	0.4	1	159	357	1	3	H. Wöll (see Poorter et al. 2003)

	GBO-20	OG	5.41	-7.59	2333	0.4	1	159	333	1	3	H. Wöll (see Poorter et al. 2003)
Tanzania	VTA-01	OG	-7.82	36.98	1505	0.88	6	281	64	5	3	A. Marshall et al. (unpublished)
	VTA-02	OG	-7.81	36.87	1454	0.88	7	1072	75	5	3	A. Marshall et al. (unpublished)
	VTA-03	OG	-7.77	36.89	1486	0.88	6	771	62	5	3	A. Marshall et al. (unpublished)
	VTA-04	OG	-7.74	36.91	1402	0.88	7	1127	50	5	3	A. Marshall et al. (unpublished)
	VTA-05	OG	-7.81	36.85	1454	0.88	7	1072	49	5	3	A. Marshall et al. (unpublished)
	VTA-06	OG	-7.81	36.82	1423	0.88	7	1211	53	5	3	A. Marshall et al. (unpublished)
	VTA-07	OG	-7.76	36.87	1377	0.88	7	1393	48	5	3	A. Marshall et al. (unpublished)
	VTA-08	OG	-7.76	36.87	1377	0.88	7	1393	49	5	3	A. Marshall et al. (unpublished)
	VTA-09	OG	-7.71	36.89	1402	0.88	7	1127	49	5	3	A. Marshall et al. (unpublished)
	VTA-10	OG	-7.69	36.87	1341	0.88	7	1305	54	5	3	A. Marshall et al. (unpublished)
	VTA-11	OG	-7.69	36.88	1335	0.87	7	1517	61	5	3	A. Marshall et al. (unpublished)
	VTA-12	OG	-5.09	38.62	1868	0.61	3	1021	59	5	3	A. Marshall et al. (unpublished)
	VTA-13	OG	-5.11	38.62	1868	0.61	3	1021	48	5	3	A. Marshall et al. (unpublished)
	VTA-14	OG	-5.1	38.65	1621	0.56	6	790	47	5	3	A. Marshall et al. (unpublished)
	VTA-15	OG	-4.82	38.51	1378	0.6	8	1427	40	5	3	A. Marshall et al. (unpublished)
	VTA-16	OG	-4.84	38.5	1333	0.6	8	1397	36	5	3	A. Marshall et al. (unpublished)
	VTA-17	OG	-4.82	38.5	1119	0.56	7	1779	48	5	3	A. Marshall et al. (unpublished)
	VTA-18	OG	-5.07	38.41	1664	0.7	6	1129	51	5	3	A. Marshall et al. (unpublished)
	VTA-19	OG	-7.85	36.87	1515	0.89	6	872	94	5	3	A. Marshall et al. (unpublished)
	VTA-20	OG	-7.83	36.83	1454	0.88	7	1072	115	5	3	A. Marshall et al. (unpublished)
Uganda	UgaETAM-1	OG	1.71	31.51	1330	0.42	4	1066	261	5	3 & 4	E. Mitchard (unpublished)
	UgaETAM-2	OG	1.71	31.51	1330	0.42	4	1066	195	5	3 & 4	E. Mitchard (unpublished)
	UgaETAM-7	OG	1.71	31.51	1330	0.42	4	1066	50	5	3 & 4	E. Mitchard (unpublished)
Asia												
Brunei	AND-01	OG	4.65	114.50	2989	0.26	0	33	45	5	3	Banin 2010
	BAD-01	OG	4.57	114.40	3040	0.24	0	36	41	5	3	Banin 2010
	BEL-01	OG	4.53	115.17	3387	0.14	0	381	45	5	3	Banin 2010

Cambodia	Cambodia	OG	10.93	103.40	3336	0.86	4	14	20	6	3	Hozumi et al. 1969
Indonesia	Kaliman2	OG	-0.27	116.97	1981	0.24	0	17	48	3	1	Yamakura et al. 1986
Peninsular Malaysia	Pasoh-02	OG	2.98	102.31	1978	0.3	0	135	654	6	3 & 4	Y. Iida et al. (in review)
	Pasoh-03	OG	2.98	102.31	1978	0.3	0	135	266	6	3	D. King and A. Rahman, (unpublished)
Sarawak, Malaysia	GMU-01	OG	4.02	114.80	3798	0.15	0	107	56	5	3	Banin 2010
	GMU-02	OG	4.05	114.85	3634	0.14	0	279	64	5	3	Banin 2010
	GMU-03	OG	4.15	114.88	3571	0.15	0	325	64	5	3	Banin 2010
	Lambir-01	OG	4.19	114.02	2932	0.24	0	128	444	5	3 & 4	King et al. 2009
	LMB-06	OG	4.19	114.02	2932	0.24	0	128	57	5	3	Banin 2010
	LMB-07	OG	4.19	114.02	2932	0.24	0	128	51	5	3	Banin 2010
	Semangk-01	OG	3.62	101.74	2669	0.27	0	435	317	6	3	A Kassim et al. (unpublished)
Sabah, Malaysia	DVA-01	OG	4.97	117.80	2321	0.14	0	223	40	5	3	Berry 2008
	Kinabal-01	OG	6.08	116.67	2097	0.2	0	2178	40	2	5	Aiba and Kitayama 1999
	SEP-01	OG	5.86	117.95	3098	0.37	0	44	43	5	3	Banin 2010
	SEP-02	OG	5.86	117.95	3098	0.37	0	44	51	5	3	Banin 2010
	SEP-03	OG	5.86	117.95	3098	0.37	0	44	47	5	3	Banin 2010
Thailand	Ogawa-1	OG	18.60	98.80	1085	0.84	6	313	73	3 & 6	1 & 3	Ogawa et al. 1965
	Ogawa-4	OG	13.85	99.72	1114	0.81	6	31	88	3 & 6	1 & 3	Ogawa et al. 1965
	Sabhasri-01	OG	14.51	101.95	1347	0.77	6	315	22	6		Sabhasri et al. 1968
	ThaNeal-01	OG	14.709	98.98	1838	0.86	6	505	23	6	3	Neal 1967
	ThaOgi-01	OG	14.45	101.8	1364	0.76	5	396	10	6		Ogino et al. 1967
	ThaOgi-02	OG	14.45	101.8	1364	0.76	5	396	13	6		Ogino et al. 1967
Australia												
Australia	AEP-02	OG	-17.15	145.58	2097	0.77	5	812	507	1	3	Graham et al. 2006
	AEP-03	OG	-17.10	145.60	1819	0.76	6	963	480	1	3	Graham et al. 2006
	AEP-04	L?	-17.00	145.80	2837	0.81	5	14	417	1	3	Graham et al. 2006
	AEP-09	L	-17.10	145.70	2673	0.79	5	231	456	1	3	Graham et al. 2006
	AEP-18	OG	-16.50	145.30	1669	0.86	7	757	429	1	3	Graham et al. 2006
	AEP-19	OG	-18.50	145.75	1536	0.9	7	622	461	1	3	Graham et al. 2006
	AEP-29	OG	-17.50	145.60	2230	0.75	4	817	454	1	3	Graham et al. 2006
	AEP-30	OG	-16.27	145.06	1568	0.91	7	1054	1168	1	3	Graham et al. 2006

	AEP-32	OG	-13.80	143.40	1313	1.11	7	412	421	1	3	Graham et al. 2006
	AEP-33	OG	-17.28	145.57	2160	0.76	5	714	269	1	3	Graham et al. 2006
	AEP-34	OG	-17.42	145.77	1964	0.72	6	401	276	1	3	Graham et al. 2006
	AEP-35	OG	-16.35	145.33	1823	0.89	6	193	449	1	3	Graham et al. 2006
	AEP-37	L	-21.30	148.60	1033	0.74	8	571	252	1	3	Graham et al. 2006
	AEP-38	L	-17.40	145.40	1266	0.83	8	918	345	1	3	Graham et al. 2006
	AEP-40	OG	-16.28	145.10	1568	0.91	7	871	476	1	3	Graham et al. 2006
	AEP-41	OG	-16.28	145.43	1869	0.88	7	29	323	1	3	Graham et al. 2006
	AEP-42	OG	-12.73	143.25	1846	0.93	6	148	228	1	3	Graham et al. 2006
	AEP-43	OG	-17.30	145.40	1257	0.83	8	1043	357	5	3 & 4	Graham et al. 2006
	AEP-44	OG	-16.22	145.07	1525	0.9	7	1011	412	5	3 & 4	Graham et al. 2006
	CTC-01	OG	-16.10	145.45	1980	0.9	7	384	47	5	3 & 4	J. Kemp et al. (unpublished)
	FMS-02	OG	-18.11	144.82	696	1.06	8	753	48	5	3 & 4	J. Kemp et al. (unpublished)
	KBL-01	OG	-17.77	145.54	1880	0.79	6	681	48	5	3 & 4	J. Kemp et al. (unpublished)
	KBL-03	OG	-17.69	145.53	1426	0.79	7	994	48	5	3 & 4	J. Kemp et al. (unpublished)
	KCR-01	OG	-17.11	145.60	1819	0.76	6	963	50	5	3 & 4	J. Kemp et al. (unpublished)
	RSC-01	OG	-20.16	146.54	670	0.83	10	244	50	5	3 & 4	J. Kemp et al. (unpublished)
S. America												
Bolivia	ACU-01	B	-15.25	-61.25	1264	0.66	7	247	92	5	3 & 4	T. Feldpausch et al. (unpublished)
	HCC-21	OG	-14.53	-60.74	1517	0.67	5	731	21	5	3 & 4	T. Feldpausch et al. (unpublished)
	HCC-22	OG	-14.53	-60.73	1517	0.67	5	731	26	5	3 & 4	T. Feldpausch et al. (unpublished)
	LFB-01	OG	-14.57	-60.88	1449	0.68	5	233	89	5	3 & 4	T. Feldpausch et al. (unpublished)
	LFB-02	OG	-14.58	-60.83	1457	0.68	5	246	48	5	3 & 4	T. Feldpausch et al. (unpublished)
	LSL-01	OG	-14.41	-61.14	1457	0.69	5	192	20	5	3 & 4	S. Patiño et al. (unpublished)
	LSL-02	OG	-14.41	-61.14	1457	0.69	5	192	21	5	3 & 4	S. Patiño et al. (unpublished)
	OTT-01	OG	-16.39	-61.21	1145	0.63	7	442	107	5	3 & 4	T. Feldpausch et al. (unpublished)
	OTT-03	B	-16.42	-61.19	1151	0.63	7	451	50	5	3 & 4	T. Feldpausch et al. (unpublished)
	RED-05	OG	-10.97	-65.72	1663	0.66	5	172	360	2	3	E. Arets (unpublished); M. Drescher 1998
	RED-06	OG	-10.97	-65.72	1663	0.66	5	172	344	2	3	E. Arets (unpublished); M. Drescher 1998

	RED-08	OG	-10.97	-65.72	1663	0.66	5	172	331	2	3	E. Arets (unpublished); M. Drescher 1998
	RED-09	OG	-10.97	-65.72	1663	0.66	5	172	330	2	3	E. Arets (unpublished); M. Drescher 1998
	TUC-01	OG	-18.52	-60.81	817	0.56	9	310	100	5	3 & 4	T. Feldpausch et al. (unpublished)
Brazil	ALF-01	OG	-9.60	-55.94	2350	0.7	4	260	67	5	3 & 4	T. Feldpausch et al. (unpublished)
	ALF-02	OG	-9.58	-55.92	2358	0.7	4	280	40	5	3 & 4	T. Feldpausch et al. (unpublished)
	BNT-04	OG	-2.63	-60.15	2227	0.35	1	94	38	5	3	Baker et al. 2009
	BraBAlt-01	S	-3.28	-52.40	1784	0.71	6	158	211	6	3	E. Brondizio et al. (unpublished)
	BraBAlt-02	S	-3.28	-52.40	1784	0.71	6	158	70	6	3	E. Brondizio et al. (unpublished)
	BraBAlt-03	S	-3.28	-52.40	1784	0.71	6	158	102	6	3	E. Brondizio et al. (unpublished)
	BraBAlt-06	S	-3.28	-52.40	1784	0.71	6	158	108	6	3	E. Brondizio et al. (unpublished)
	BraBAlt-07	S	-3.28	-52.40	1784	0.71	6	158	77	6	3	E. Brondizio et al. (unpublished)
	BraBAlt-08	S	-3.28	-52.40	1784	0.71	6	158	141	6	3	E. Brondizio et al. (unpublished)
	BraBAlt-13	S	-3.28	-52.40	1784	0.71	6	158	98	6	3	E. Brondizio et al. (unpublished)
	BraBAlt-14	S	-3.28	-52.40	1784	0.71	6	158	103	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-01	S	-1.10	-53.56	1812	0.53	5	256	76	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-02	S	-1.10	-53.56	1812	0.53	5	256	94	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-04	S	-1.10	-53.56	1812	0.53	5	256	53	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-06	S	-1.10	-53.56	1812	0.53	5	256	55	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-10	S	-1.10	-53.56	1812	0.53	5	256	59	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-11	S	-1.10	-53.56	1812	0.53	5	256	53	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-20	S	-1.10	-53.56	1812	0.53	5	256	94	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-24	S	-1.10	-53.56	1812	0.53	5	256	76	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-25	S	-1.10	-53.56	1812	0.53	5	256	50	6	3	E. Brondizio et al. (unpublished)
	BraBBrag-27	S	-1.10	-53.56	1812	0.53	5	256	22	6	3	E. Brondizio et al. (unpublished)
	BraBPP-01	S	-1.39	-48.87	2447	0.63	4	9	46	6	3	E. Brondizio et al. (unpublished)
	BraBPP-03	S	-1.39	-48.87	2447	0.63	4	9	83	6	3	E. Brondizio et al. (unpublished)
	BraBPP-04	S	-1.39	-48.87	2447	0.63	4	9	66	6	3	E. Brondizio et al. (unpublished)
	BraBPP-06	S	-1.39	-48.87	2447	0.63	4	9	223	6	3	E. Brondizio et al.

											(unpublished)
BraBPP-10	S	-1.39	-48.87	2447	0.63	4	9	147	6	3	E. Brondizio et al. (unpublished)
BraBPP-15	S	-1.39	-48.87	2447	0.63	4	9	394	6	3	E. Brondizio et al. (unpublished)
BraBPP-25	S	-1.39	-48.87	2447	0.63	4	9	209	6	3	E. Brondizio et al. (unpublished)
BraBTom-01	S	-2.37	-48.26	2480	0.68	5	42	32	6	3	E. Brondizio et al. (unpublished)
BraBTom-02	S	-2.37	-48.26	2480	0.68	5	42	139	6	3	E. Brondizio et al. (unpublished)
BraBTom-05	S	-2.37	-48.26	2480	0.68	5	42	27	6	3	E. Brondizio et al. (unpublished)
BraBTom-10	S	-2.37	-48.26	2480	0.68	5	42	66	6	3	E. Brondizio et al. (unpublished)
BraBTom-11	S	-2.37	-48.26	2480	0.68	5	42	121	6	3	E. Brondizio et al. (unpublished)
BraBTom-12	S	-2.37	-48.26	2480	0.68	5	42	83	6	3	E. Brondizio et al. (unpublished)
BraBTom-13	S	-2.37	-48.26	2480	0.68	5	42	69	6	3	E. Brondizio et al. (unpublished)
BraBTom-14	S	-2.37	-48.26	2480	0.68	5	42	33	6	3	E. Brondizio et al. (unpublished)
BraBTom-15	S	-2.37	-48.26	2480	0.68	5	42	66	6	3	E. Brondizio et al. (unpublished)
BraBTom-16	S	-2.37	-48.26	2480	0.68	5	42	70	6	3	E. Brondizio et al. (unpublished)
BraBTom-17	S	-2.37	-48.26	2480	0.68	5	42	68	6	3	E. Brondizio et al. (unpublished)
BraCAU	OG	-3.73	-48.29	1983	0.85	6	138	304	5	4	Asner et al. 2002, Palace et al. 2008
BraCotN	OG	-9.88	-58.42	1977	0.74	5	269	105			Nogueira et al. 2008
BraMAO	OG	-2.58	-60.12	2208	0.33	1	102	626	5	4	Lesky et al. 2005
BraPara3	S	-1.50	-48.50	2643	0.52	2	12	19			Chave et al. 2005
BraRond	OG	-8.75	-63.38	2266	0.63	3	83	8			Chave et al. 2005
BraSTM	OG	-2.86	-54.96	1993	0.45	5	82	309	5	4	Lesky et al. 2005
BraTAN	OG	-13.01	-52.39	1640	0.79	5	379	300	5	4	Lesky et al. 2005
CAX-01	OG	-1.74	-51.46	2198	0.51	4	43	20	6	3	S. Patiño and C.A. Quesada (unpublished)
CAX-02	OG	-1.74	-51.46	2198	0.51	4	43	17	6	3	S. Patiño and C.A. Quesada (unpublished)
CAX-03	OG	-1.74	-51.46	2198	0.51	4	43	73	5	3	Baker et al. 2009
DOI-01	OG	-10.57	-68.32	1911	0.56	5	203	79	5	3 & 4	T. Feldpausch et al. (unpublished)
DOI-02	OG	-10.55	-68.31	1911	0.56	5	203	60	5	3 & 4	T. Feldpausch et al. (unpublished)
FLO-01	OG	-12.81	-51.85	1613	0.79	5	371	49	5	3 & 4	T. Feldpausch et al. (unpublished)

	JRI-01	OG	-0.89	-52.19	2385	0.51	3	82	13	6	3	S. Patino and T. R. Baker (unpublished)
	JFR-01	OG	-10.48	-58.49	1881	0.75	5	293	67	5	3	T. Feldpausch et al. (unpublished)
	JFR -02	OG	-10.48	-58.49	1881	0.75	5	293	44	5	3	T. Feldpausch et al. (unpublished)
	JFR -03	OG	-10.48	-58.49	1881	0.75	5	293	67	5	3	T. Feldpausch et al. (unpublished)
	JFR -04	OG	-10.48	-58.49	1881	0.75	5	293	131	5	3	T. Feldpausch et al. (unpublished)
	JFR -05	OG	-10.48	-58.49	1881	0.75	5	293	122	5	3	T. Feldpausch et al. (unpublished)
	JFR -06	OG	-10.48	-58.49	1881	0.75	5	293	94	5	3	T. Feldpausch et al. (unpublished)
	JFR -07	OG	-10.48	-58.49	1881	0.75	5	293	197	5	3	T. Feldpausch et al. (unpublished)
	JFR -08	OG	-10.48	-58.49	1881	0.75	5	293	113	5	3	T. Feldpausch et al. (unpublished)
	JFR -09	OG	-10.48	-58.49	1881	0.75	5	293	80	5	3	T. Feldpausch et al. (unpublished)
	Juruena-10	OG	-10.48	-58.49	1881	0.75	5	293	35	5	1	Nogueira et al. 2008
	MIN-01	OG	-8.56	-72.88	1878	0.5	4	230	59	5	3 & 4	T. Feldpausch et al. (unpublished)
	NXV-02	OG	-14.70	-52.35	1498	0.81	5	289	33	5	3 & 4	T. Feldpausch et al. (unpublished)
	POR-01	OG	-10.82	-68.78	1694	0.59	5	268	76	5	3 & 4	T. Feldpausch et al. (unpublished)
	POR-02	OG	-10.80	-68.77	1694	0.59	5	268	62	5	3 & 4	T. Feldpausch et al. (unpublished)
	RST-01	OG	-9.04	-72.27	1804	0.52	4	279	18	5	3 & 4	T. Feldpausch et al. (unpublished)
	SIP-01	OG	-11.41	-55.32	1852	0.76	5	341	75	5	3 & 4	C. A. Quesada and J. Lloyd (unpublished)
	SMT-02	OG	-12.82	-51.77	1604	0.79	5	332	49	5	3 & 4	T. Feldpausch et al. (unpublished)
	TAN-02	OG	-13.09	-52.38	1640	0.79	5	379	506	5	3 & 4	T. Feldpausch et al. (unpublished)
	TAN-03	OG	-12.82	-52.36	1640	0.79	5	379	589	5	3 & 4	B. Marimon et al. (unpublished)
	TAN-04	OG	-12.92	-52.37	1654	0.79	5	381	49	5	3 & 4	B. Marimon et al. (unpublished)
	VCR-01	OG	-14.83	-52.16	1509	0.81	6	285	40	5	3 & 4	T. Feldpausch et al. (unpublished)
	VCR-02	OG	-14.83	-52.17	1509	0.81	5	280	48	5	3 & 4	T. Feldpausch et al. (unpublished)
Colombia	AGP-01	OG	-3.68	-70.30	2809	0.21	0	110	18	6	3	S. Patiño et al. (unpublished)
	AGP-02	OG	-3.68	-70.30	2809	0.21	0	110	20	6	3	S. Patiño et al. (unpublished)
	LOR-01	OG	-3.06	-69.99	2812	0.2	0	98	10	6	3	S. Patiño et al. (unpublished)
	LOR-02	OG	-3.06	-69.99	2812	0.2	0	98	14	6	3	S. Patiño et al. (unpublished)
Ecuador	BOG-01	OG	-0.70	-76.48	3166	0.16	0	264	65	5	3	Baker et al. 2009

	BOG-02	OG	-0.70	-76.47	3166	0.16	0	264	32	6	3	S. Patiño (unpublished)
	JAS-02	OG	-1.07	-77.60	3654	0.22	0	398	45	5	3	Baker et al. 2009; S. Patiño (unpublished)
	JAS-03	OG	-1.07	-77.67	3762	0.22	0	446	40	5	3	Baker et al. 2009; S. Patiño (unpublished)
	JAS-04	OG	-1.07	-77.67	3869	0.22	0	446	17	6	3	S. Patiño (unpublished)
	JAS-05	OG	-1.07	-77.67	3762	0.22	0	446	39	5	3	Baker et al. 2009; S. Patiño (unpublished)
	SUM-06	OG	-1.75	-77.63	3669	0.15	0	511	16	6	3	S. Patiño (unpublished)
	TIP-03	OG	-0.638	-76.144	3009	0.18	0	232	40	5	3	Baker et al. 2009
French Guiana	FrenchGu	OG	5.33	-53.50	2570	0.4	2	90	187	5	1	Chave et al. 2005
	NOU-01-04	OG	4.08	-52.68	3299	0.47	2	131	31	5	3 & 4	T. Feldpausch et al. (unpublished)
	NOU-02	OG	4.08	-52.68	3299	0.47	2	131	493	1	3	J. Chave et al. (unpublished)
	NOU-11	OG	4.08	-52.68	3299	0.47	2	131	454	1	3	J. Chave et al. (unpublished)
Guyana	Pibiri-1	OG	5.03	-58.62	2636	0.44	1	90	273	6	3	E. Arets et al. (unpublished)
	Pibiri-10	OG	5.03	-58.62	2636	0.44	1	90	146	6	3	E. Arets et al. (unpublished)
	Pibiri-11	OG	5.03	-58.62	2636	0.44	1	90	224	6	3	E. Arets et al. (unpublished)
	Pibiri-12	OG	5.03	-58.62	2636	0.44	1	90	109	6	3	E. Arets et al. (unpublished)
	Pibiri-13	OG	5.03	-58.62	2636	0.44	1	90	41	6	3	E. Arets et al. (unpublished)
	Pibiri-14	OG	5.03	-58.62	2636	0.44	1	90	52	6	3	E. Arets et al. (unpublished)
	Pibiri-15	OG	5.03	-58.62	2636	0.44	1	90	79	6	3	E. Arets et al. (unpublished)
	Pibiri-2	OG	5.03	-58.62	2636	0.44	1	90	222	6	3	E. Arets et al. (unpublished)
	Pibiri-3	OG	5.03	-58.62	2636	0.44	1	90	363	6	3	E. Arets et al. (unpublished)
	Pibiri-4	OG	5.03	-58.62	2636	0.44	1	90	210	6	3	E. Arets et al. (unpublished)
	Pibiri-5	OG	5.03	-58.62	2636	0.44	1	90	378	6	3	E. Arets et al. (unpublished)
	Pibiri-6	OG	5.03	-58.62	2636	0.44	1	90	199	6	3	E. Arets et al. (unpublished)
	Pibiri-7	OG	5.03	-58.62	2636	0.44	1	90	103	6	3	E. Arets et al. (unpublished)
	Pibiri-8	OG	5.03	-58.62	2636	0.44	1	90	203	6	3	E. Arets et al. (unpublished)
	Pibiri-9	OG	5.03	-58.62	2636	0.44	1	90	103	6	3	E. Arets et al. (unpublished)
Peru	ALP-11	OG	-3.95	-73.43	2772	0.18	0	129	29	5	3	Baker et al. 2009
	ALP-12	OG	-3.95	-73.44	2772	0.18	0	129	10	5	3	Baker et al. 2009
	ALP-21	OG	-3.95	-73.44	2772	0.18	0	129	28	5	3	Baker et al. 2009
	ALP-22	OG	-3.95	-73.44	2772	0.18	0	129	13	5	3	Baker et al. 2009
	ALP-30	OG	-3.95	-73.43	2772	0.18	0	129	40	5	3	Baker et al. 2009

	CUZ-01	OG	-12.58	-69.15	2081	0.55	4	198	41	5	3	Baker et al. 2009
	CUZ-02	OG	-12.58	-69.15	2081	0.55	4	198	39	5	3	Baker et al. 2009
	CUZ-03	OG	-12.50	-68.96	2081	0.55	4	197	42	5	3	Baker et al. 2009
	CUZ-04	OG	-12.56	-69.13	2081	0.55	4	198	42	5	3	Baker et al. 2009
	LAS-02	OG	-12.53	-70.08	3191	0.46	0	258	50	5	3 & 4	T. Feldpausch et al. (unpublished)
	SUC-01	OG	-3.25	-72.91	2799	0.17	0	108	43	5	3	Baker et al. 2009
	SUC-02	OG	-3.25	-72.90	2799	0.17	0	108	42	5	3	Baker et al. 2009
	SUC-03	OG	-3.25	-72.92	2813	0.17	0	112	36	5	3	Baker et al. 2009
	SUC-04	OG	-3.25	-72.89	2799	0.17	0	108	39	5	3	Baker et al. 2009
	SUC-05	OG	-3.26	-72.90	2799	0.17	0	108	41	5	3	Baker et al. 2009
	TAM-01	OG	-12.84	-69.29	2492	0.52	3	215	41	5	3	Baker et al. 2009
	TAM-02	OG	-12.84	-69.29	2492	0.52	3	215	39	5	3	Baker et al. 2009
	TAM-03	OG	-12.84	-69.28	2492	0.52	3	215	39	5	3	Baker et al. 2009
	TAM-04	OG	-12.84	-69.28	2492	0.52	3	215	14	5	3	Baker et al. 2009
	TAM-05	OG	-12.83	-69.27	2475	0.53	3	213	39	5	3	Baker et al. 2009
	TAM-06	OG	-12.84	-69.30	2536	0.52	3	208	40	5	3	Baker et al. 2009
	TAM-07	OG	-12.83	-69.26	2458	0.53	3	213	38	5	3	Baker et al. 2009
	TAM-08	OG	-12.83	-69.28	2492	0.52	3	213	40	5	3	Baker et al. 2009
	YAN-01	OG	-3.44	-72.85	2809	0.19	0	104	41	5	3	Baker et al. 2009
	YAN-02	OG	-3.43	-72.84	2809	0.19	0	104	39	5	3	Baker et al. 2009
Venezuela	ELD-01	OG	6.10	-61.40	2502	0.38	1	329	127	6	3	J. P. Veillon and S. Patiño (unpublished)
	ELD-02	OG	6.10	-61.40	2502	0.38	1	329	134	6	3	J. P. Veillon and S. Patiño (unpublished)
	ELD-03	OG	6.08	-61.40	2350	0.38	2	407	133	6	3	J. P. Veillon and S. Patiño (unpublished)
	ELD-04	OG	6.08	-61.41	2350	0.38	2	407	193	6	3	J. P. Veillon and S. Patiño (unpublished)
	RIO-01	OG	8.11	-61.69	1347	0.41	4	293	143	6	3	J. P. Veillon and S. Patiño (unpublished)
	RIO-02	OG	8.11	-61.69	1347	0.41	4	293	171	6	3	J. P. Veillon and S. Patiño (unpublished)
	SCR-04	OG	1.93	-67.04	3423	0.24	0	106	23	6	3	S. Patiño & J. Lloyd (unpublished)
	SCR-05	OG	1.93	-67.04	3423	0.24	0	106	28	6	3	S. Patiño & J. Lloyd (unpublished)
	SCR-X1	OG	1.93	-67.04	3423	0.24	0	106	69	2	3	E. Brünig et. al. (unpublished)
	SCR-X2	OG	1.93	-67.04	3423	0.24	0	106	73	2	3	E. Brünig et. al. (unpublished)

SCR-X3	OG	1.93	-67.04	3423	0.24	0	106	86	2	3	E. Brünig et. al. (unpublished)
SCR-X4	OG	1.93	-67.04	3423	0.24	0	106	96	2	3	E. Brünig et. al. (unpublished)
SCR-X5	OG	1.93	-67.04	3423	0.24	0	106	95	2	3	E. Brünig et. al. (unpublished)

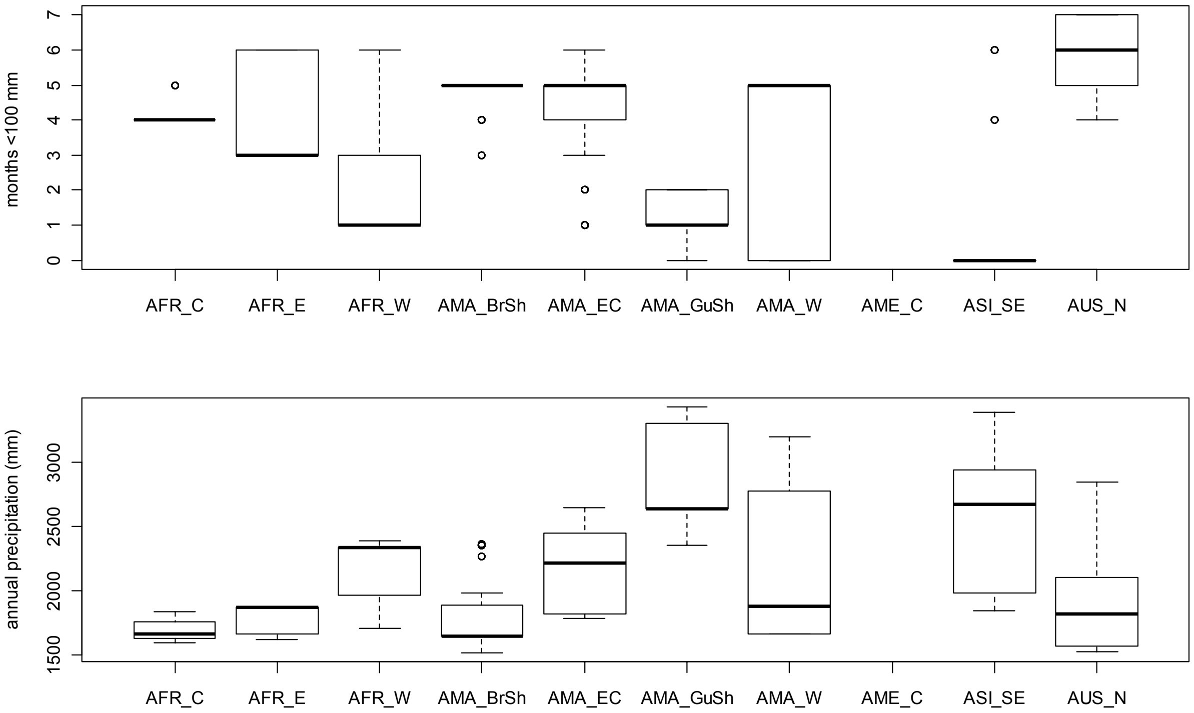


Figure S1: Mean precipitation (mm) and dry season (months <100 mm) by regional clusters for the study sites in Africa, Asia, Australia and South America.

Table S2: Allometric model form and coding fit by ordinary least squares and multi-level models relating tree height (H) to bole diameter at 1.3 m height (D) and environment (E_x: annual precipitation coefficient of variance (P_A), dry season (S_D), mean annual temperature (T_A)) and forest structure (S_x: basal area A). The fitted parameters are: a, b, c, d, e, H_{max}, where H_{max} represents the asymptotic tree height fitted by non-linear regression.

Form	*Description*	*Equation* *(P, C, R, S)*	*Equation + Structure* *(PS, CS, RS)*	*Equation + Environment* *(PE, CE, RE)*	*Equation + Environment + Structure* *(PES, CES, RES)*
1	ln	$y = a + b\ln(x)$	$y = a + b\ln(x) + S_x$	$y = a + b\ln(x) + E_x$	$y = a + b\ln(x) + E_x + S_x$
2	ln-ln	$y = \exp(a+b\ln(x))$	$y = \exp(a+b\ln(x) + S_x)$	$y = \exp(a+b\ln(x) + E_x)$	$y = \exp(a+b\ln(x) + E_x + S_x)$
3	Weibull	$y = H_{max}(1-\exp(-ax^b))$	$y = H_{max}(1-\exp(-ax^b)) + S_x$	$y = H_{max}(1-\exp(-ax^b)) + E_x$	$y = H_{max}(1-\exp(-ax^b)) + E_x + S_x$
4	Monomolecular	$y = H_{max}*(1-\exp(a-b*x))$	$y = H_{max}*(1-\exp(a-b*x)) + S_x$	$y = H_{max}*(1-\exp(a-b*x)) + E_x$	$y = H_{max}*(1-\exp(a-b*x)) + E_x + S_x$
5	Rectangular hyperbola	$y=((H_{max}*x)/(a+x))-b$	$y=((H_{max}*x)/(a+x))-b + S_x$	$y=((H_{max}*x)/(a+x))-b + E_x$	$y=((H_{max}*x)/(a+x))-b + E_x + S_x$

Type	*Description*	*Division in height-diameter relationship*	*Source*
P	Pan-tropical	none	this study
PS	Pan-tropical-Structure	forest structure	this study
PE	Pan-tropical-Environment	environment	this study
PES	Pan-tropical-Environment- Structure	environment, forest structure	this study
C	Continent	Continent	this study
CS	Continent-Structure	Continent, forest structure	this study
CE	Continent-Environment	Continent, environment	this study
CES	Continent-Environment- Structure	Continent, environment and forest structure	this study
R	Region	Region	this study
RS	Region-Structure	Region, forest structure	this study
RE	Region-Environment	Region, environment	this study
RES	Region-Environment- Structure	Region, environment and forest structure	this study
S	Site-specific	Site	this study
CCS	Continent-dry, moist, wet Classification-Structure	Continent, forest moisture class and structure	this study
RCS	Region-dry, moist, wet Classification-Structure	Region, forest moisture class and structure	this study
BrownMoist	Brown pan-tropical moist	precipitation	Brown et al. 1989
BrownWet	Brown pan-tropical wet	precipitation	Brown et al. 1989

Table S3: Statistical tests using multilevel mixed-effects and ordinary least squares models to examine the $\log(H):\log(D)$ relationship and percent of the variance partitioned by hierarchical structure (random slope random intercept: plot random) for tree height (H, m) and diameter (D, dm), Pan-tropical (P), Continent (C) or Region (R), environment*, and tree basal area (A, m²/ha) for wet to dry pan-tropical forests. Models were compared by ANOVA or likelihood ratio test. Models are presented in increasing order of complexity. See Table 3 for model coefficients.

Model code	Question, model	Model type***	Multilevel random structure	AIC	Model comparison	p
	1. Is there hierarchical structure to the data?					
1a	$\ln(H)=1$	OLS	none	49698.4	NA	NA
1b	$\ln(H)=1$	unconditional mean null	Plot	35863.1	1a vs 1b**	<0.001
1c	$\ln(H)=\ln(D)$	OLS	none	14514.7	1b vs 1c**	<0.001
1d	$\ln(H)=\ln(D)$	random intercepts	Plot	-768.3	1c vs 1d**	<0.001
P	$\ln(H)=\ln(D)$	RI, RS	Plot	-1861.2	1d vs 2m**	<0.001
	2. Do the slope and intercept of the H:D relationship differ by Continent (C), Region (*R*)?					
C	$\ln(H)=\ln(D))*C$	RI, RS	Plot	-1945.6	P2 vs C2	<0.001
R	$\ln(H)=\ln(D)*R$	RI, RS	Plot	-2027.9	C2 vs R2	<0.001
	3. Do the slope and intercept of the H:D relationship differ by Continent (C), Region (*R)* after accounting for forest structure (basal area, *A*)?					
PS	$\ln(H)=\ln(D)+A$	RI, RS	Plot	-1907.5	P2 vs PS2	<0.001
CS	$\ln(H)=\ln(D)*C+A$	RI, RS	Plot	-2031.5	PS2 vs CS2	<0.001
RS	$\ln(H)=\ln(D)*R+A$	RI, RS	Plot	-2123.7	CS2 vs RS2	<0.001
	4. Do the slope and intercept of the H:D relationship differ by Continent (C), Region (*R*) after accounting for environment*?					
PE	$\ln(H)=\ln(D)+P_V+S_D+T_A$	RI, RS	Plot	-1950.4	P2 vs PE2	<0.001
CE	$\ln(H)=\ln(D)*C+P_V+S_D+T_A$	RI, RS	Plot	-2025.7	PE2 vs CE2	<0.001
RE	$\ln(H)=\ln(D)*R+P_V+S_D+T_A$	RI, RS	Plot	-2050.5	CE2 vs RE2	<0.001
	5. Do the slope and intercept of the H:D relationship differ by Continent (C), Region (*R*) after accounting for environment+structure?					
PES	$\ln(H)=\ln(D)+A+P_V+S_D+T_A$	RI, RS	Plot	-2037.4	PE2 vs PES2	<0.001
CES	$\ln(H)=\ln(D)*C+A+P_V+S_D+T_A$	RI, RS	Plot	-2122.6	PES2 vs CES2	<0.001
RES	$\ln(H)=\ln(D)*R+A+P_V+S_D+T_A$	RI, RS	Plot	-2156.0	CES2 vs RES2	<0.001
CCS	$\ln(H)=\ln(D)*C+A+F_M$	RI, RS	Plot	-2068.9	CS2 vs CM2	<0.001
RCS	$\ln(H)=\ln(D)*R+A+F_M$	RI, RS	Plot	-2147.1	RS2 vs RM2	<0.001

* Precipitation dry season (S_D, months <100 mm), precipitation coefficient of variance (P_V), Altitude (A_L, m), mean annual temperature (T_A, °C), forest moisture class (F_M, dry, moist, wet).

**Based on likelihood ratio test, all others based on ANOVA

***Random slope, random intercept model (RS, RI)

Table S4: Validation of pan-tropical, continent, regional, site-specific models. Tree height was estimated from each of the models and the median percent deviation $((H_{predicted}-H_{measured})/ H_{measured})*100$ reported from the tree height measured in the field for wet to dry pan-tropical forests (F_M), where positive values indicate the model overestimated measured height. The multi-level model structure was random slope random intercept with random = Plot. See Table S2 for model form. Models with the lowest deviation are highlighted for dry (bold, parenthesis), moist (bold and underlined) and wet (bold) forests. *

Model	F_M class	Africa, central	Africa, E	Africa, W	Amazonia, Brazilian Shield	Amazonia, E-central	Amazonia, Guyana Shield	Amazonia, W	Asia, SE	Australia, N	Median	St. Error
P2	Dry	NA	7.1	-8.4	14.6	NA	2.8	NA	-2.3	-0.5	7.4	0.38
	Moist	-19.4	-12.3	-10.9	5.8	-3.4	-25.0	**2.5**	-21.9	-0.9	-7.5	0.16
	Wet	NA	NA	NA	NA	NA	NA	2.1	-36.6	NA	-16.6	1.37
C2	Dry	NA	6.5	3.2	16.1	NA	5.2	NA	14.0	-0.5	5.9	0.39
	Moist	-29.0	-5.9	-9.7	4.7	8.0	-30.7	-15.1	-2.5	-7.3	-9.1	0.16
	Wet	NA	NA	NA	NA	NA	NA	-2.1	-17.8	NA	-10.7	1.01
R2	Dry	NA	-4.1	9.0	10.8	NA	23.2	NA	14.1	-0.4	2.7	0.42
	Moist	-22.4	-17.2	-4.4	-0.8	-7.5	-5.5	-10.0	-2.3	-7.3	-6.7	0.15
	Wet	NA	NA	NA	NA	NA	NA	**1.4**	-17.6	NA	-8.4	1.04
PES2	Dry	NA	-2.0	-5.3	-2.3	NA	**(0.9)**	NA	**(0.7)**	3.7	-0.1	0.39
	Moist	-17.4	-5.2	7.6	-2.3	**1.5**	-15.5	-16.2	1.5	7.9	-0.4	0.15
	Wet	NA	NA	NA	NA	NA	NA	12.1	-13.0	NA	1.9	1.18
CES2	Dry	NA	**(0.3)**	0.9	**(-0.2)**	NA	5.0	NA	5.8	-3.2	-0.9	0.39
	Moist	-16.8	**-0.3**	2.4	2.2	4.3	-14.1	-12.5	1.3	1.1	-1.8	0.14
	Wet	NA	NA	NA	NA	NA	NA	11.3	-11.1	NA	2.9	1.25
RES2	Dry	NA	-4.1	2.3	4.6	NA	18.3	NA	9.7	-1.8	0.9	0.40
	Moist	**-7.7**	-7.3	-2.8	2.1	-2.7	**-3.9**	-11.7	**-0.1**	**-0.2**	-2.7	0.14
	Wet	NA	NA	NA	NA	NA	NA	6.5	-11.4	NA	0.1	1.20
RCS2	Dry	NA	-6.7	-1.8	-1.1	NA	17.4	NA	3.1	-8.3	-3.7	0.40
	Moist	-11.6	0.6	**-2.2**	4.3	-3.7	-4.1	-9.4	-0.6	1.7	-2.1	0.13
	Wet	NA	NA	NA	NA	NA	NA	4.4	**-8.7**	NA	-0.4	1.25
S2	Dry	NA	-1.4	0.1	-2.0	NA	0.1	NA	-2.1	-1.6	-1.4	0.35
	Moist	-1.6	-3.2	-3.3	-1.3	-1.2	-1.1	-0.4	-1.0	-1.5	-1.5	0.12
	Wet	NA	NA	NA	NA	NA	NA	-0.8	-0.3	NA	-0.6	0.83
BrownMoist2	Dry	NA	6.5	**(0.3)**	12.7	NA	-1.1	NA	-2.3	**(-0.3)**	3.9	0.39
	Moist	-27.6	-7.4	-7.6	**-0.1**	2.6	-35.4	-21.1	-22.6	-7.2	-12.0	0.16
	Wet	NA	NA	NA	NA	NA	NA	-4.7	-41.3	NA	-21.7	1.42
BrownWet2	Dry	NA	16.6	11.2	22.3	NA	10.1	NA	8.8	10.7	14.3	0.35
	Moist	-13.5	4.2	4.3	11.1	13.4	-20.6	-7.8	-9.4	4.5	0.3	0.15
	Wet	NA	NA	NA	NA	NA	NA	6.7	-26.1	NA	-8.3	1.26

Model	F_M class	Africa, central	Africa, E	Africa, W	Amazonia, Brazilian Shield	Amazonia, E-central	Amazonia, Guyana Shield	Amazonia, W	Asia, SE	Australia, N	**Median**	**St. Error**
P3	Dry	NA	16.8	11.8	22.6	NA	10.3	NA	9.3	10.5	**14.3**	**0.3**
	Moist	-14.0	5.2	3.9	10.9	13.0	-19.5	-7.2	-10.5	4.5	**0.1**	**0.1**
	Wet	NA	NA	NA	NA	NA	NA	9.0	-25.2	NA	**-6.7**	**1.2**
P4	Dry	NA	16.9	11.1	22.8	NA	9.8	NA	8.9	10.4	**14.3**	**0.3**
	Moist	-14.1	5.8	3.9	11.0	13.1	-19.5	-7.3	-10.6	4.5	**0.2**	**0.1**
	Wet	NA	NA	NA	NA	NA	NA	8.9	-25.9	NA	**-6.8**	**1.3**
P5	Dry	NA	16.8	11.8	22.6	NA	10.1	NA	9.0	10.4	**14.3**	**0.3**
	Moist	-14.2	5.3	3.7	10.8	13.0	-19.6	-7.2	-10.6	4.4	**0.0**	**0.1**
	Wet	NA	NA	NA	NA	NA	NA	9.3	-25.4	NA	**-6.6**	**1.2**

* NA, not applicable, no data available.

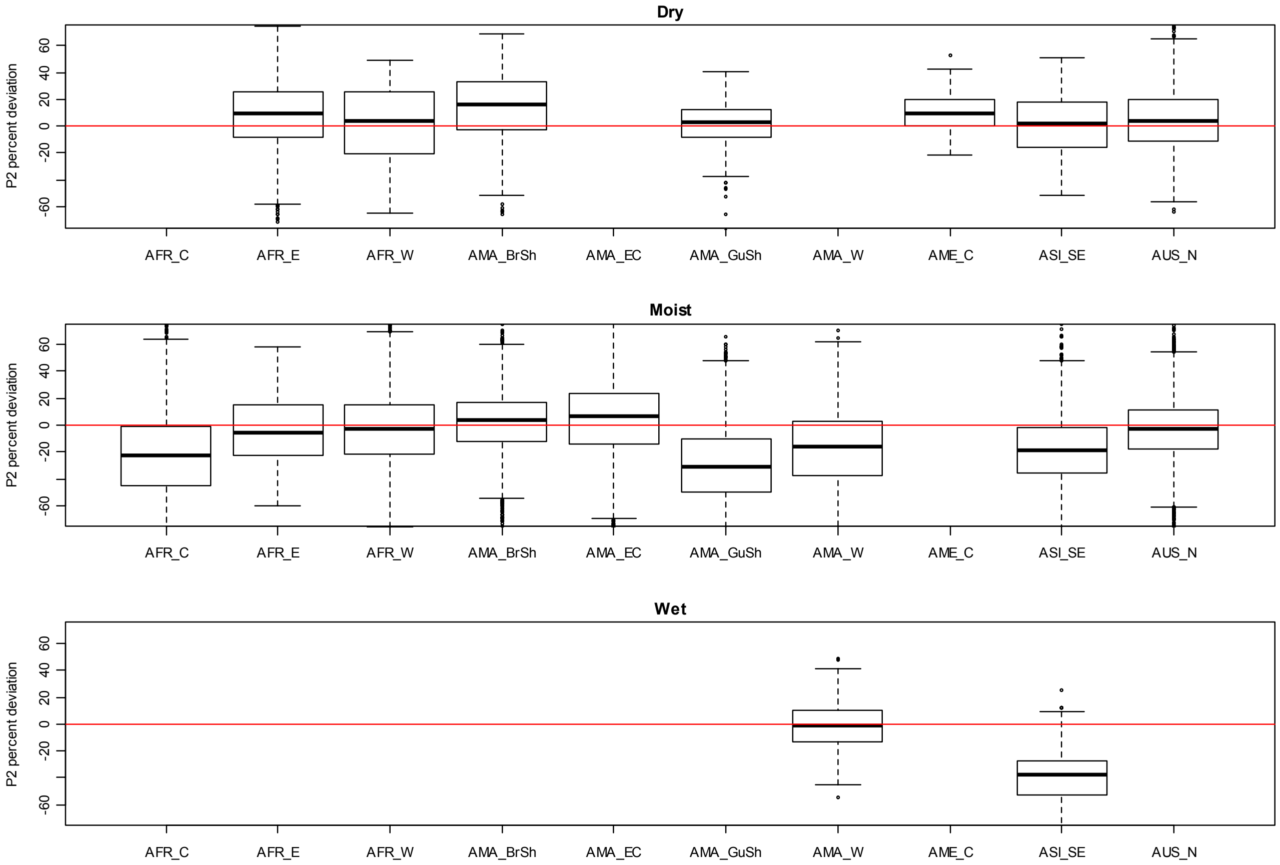
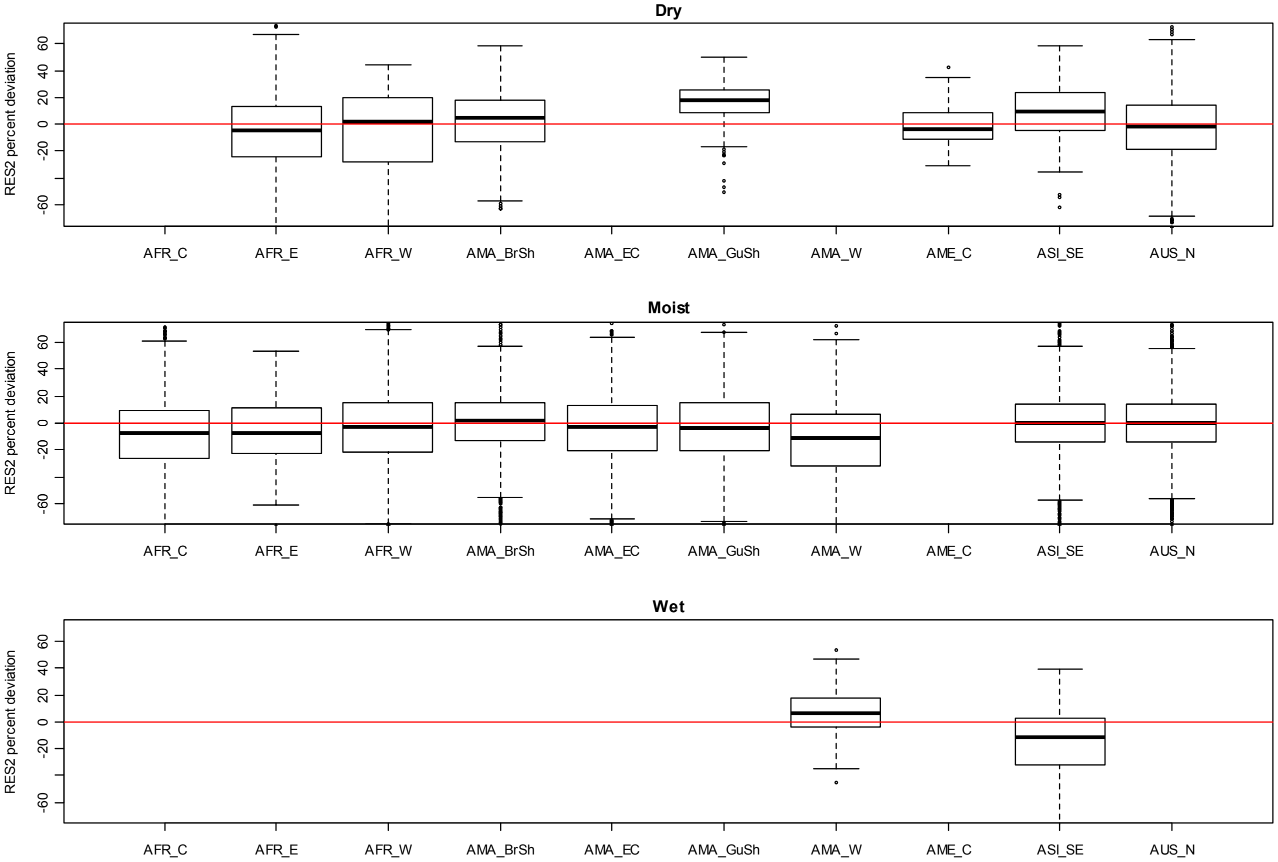

Dry
Moist
Wet
P2 percent deviation
60
40
20
0
-20
-60
AFR_C
AFR_E
AFR_W
AMA_BrSh
AMA_EC
AMA_GuSh
AMA_W
AME_C
ASI_SE
AUS_N

Figure S2a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Moist
Wet
RES2 percent deviation
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20
0
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AUS_N

Figure S2b

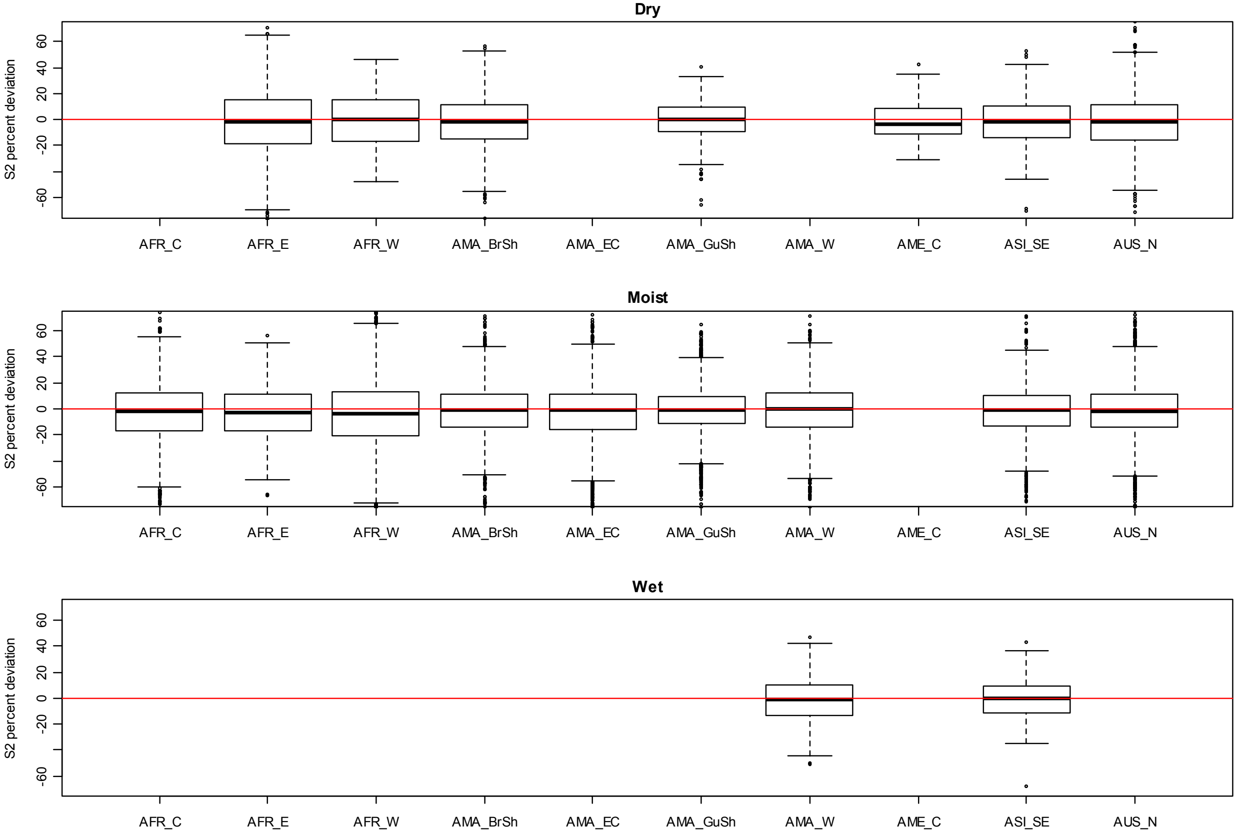
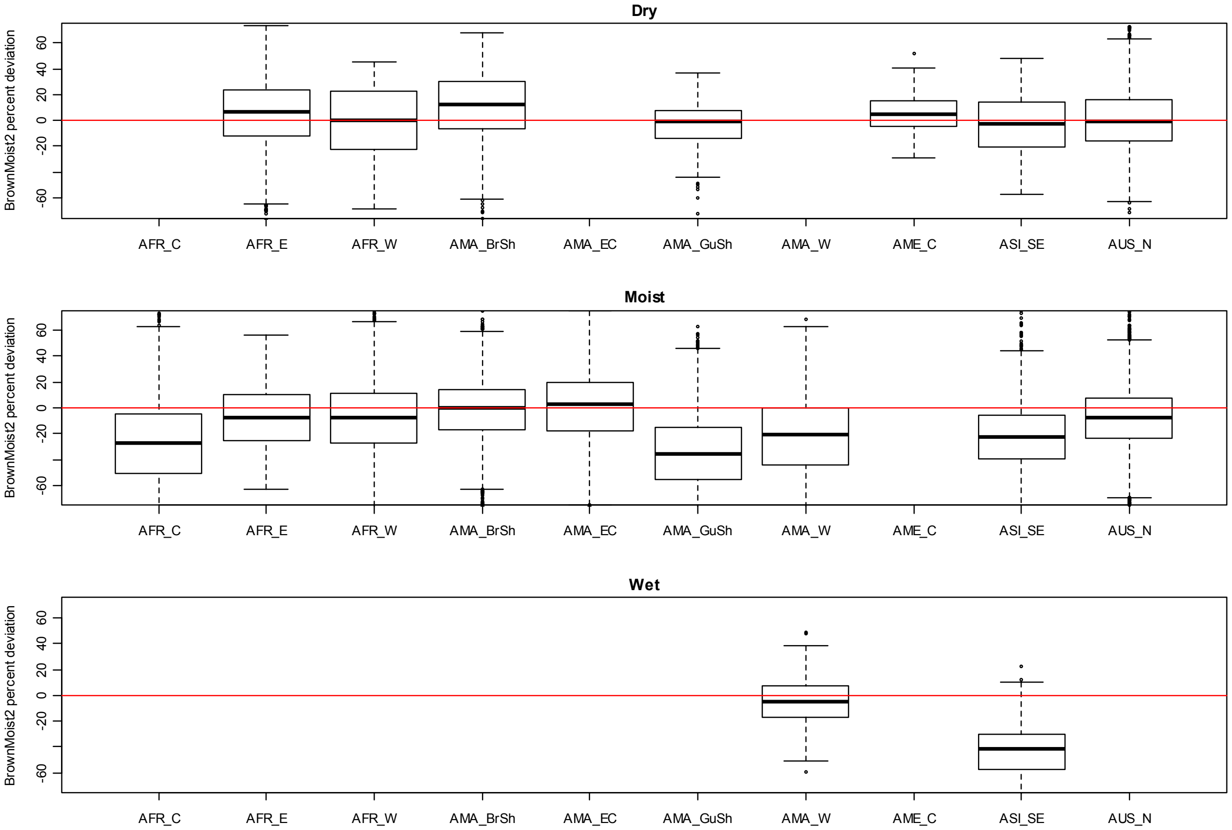

Dry
Moist
Wet
S2 percent deviation
60
40
20
0
-20
-60
AFR_C
AFR_E
AFR_W
AMA_BrSh
AMA_EC
AMA_GuSh
AMA_W
AME_C
ASI_SE
AUS_N

Figure S2c



Dry

Moist

Wet

Figure S2d

Figure S2: Validation of height estimates according to multi-levels and the published Brown et al. 1989 moist forest equation for log-log a) model P, b) model RES, c) model S, d) model BrownMoist.

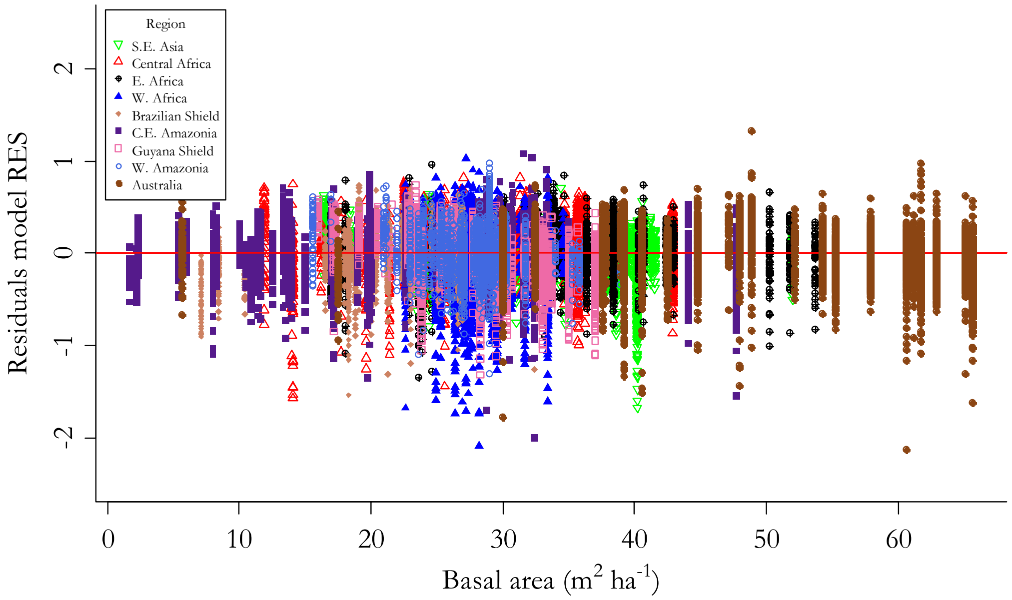


Figure S3a

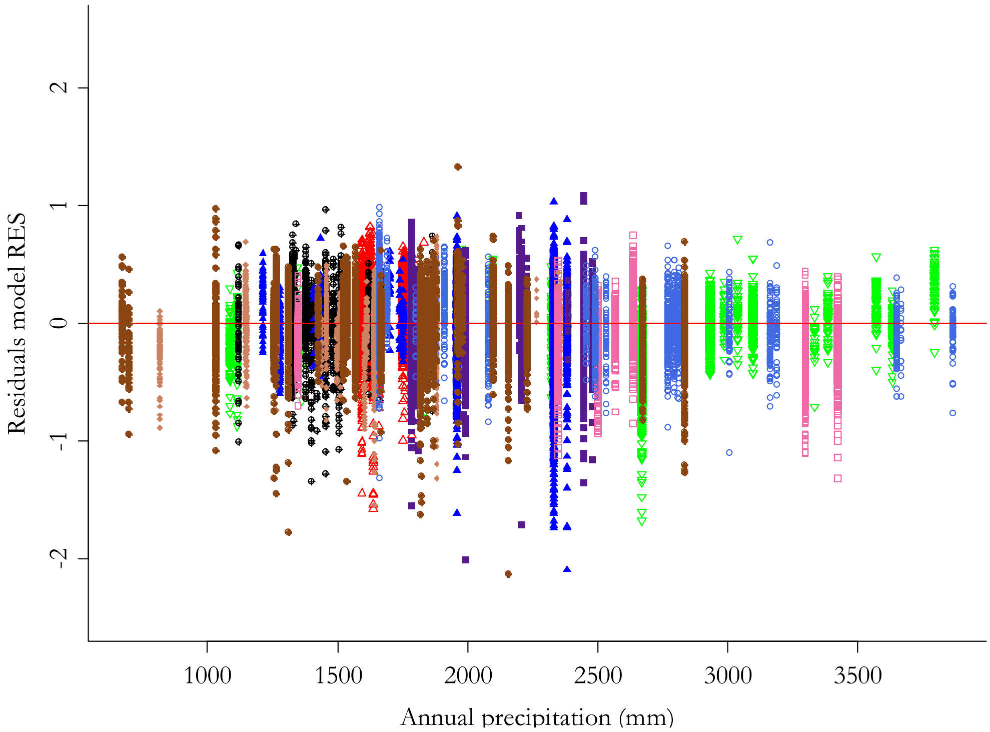


Figure S3b

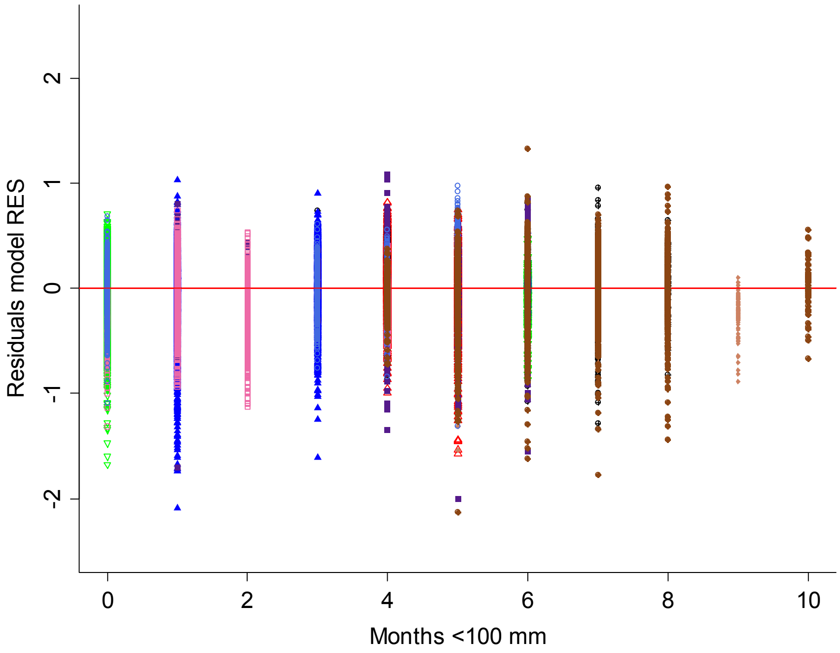


Figure S3c

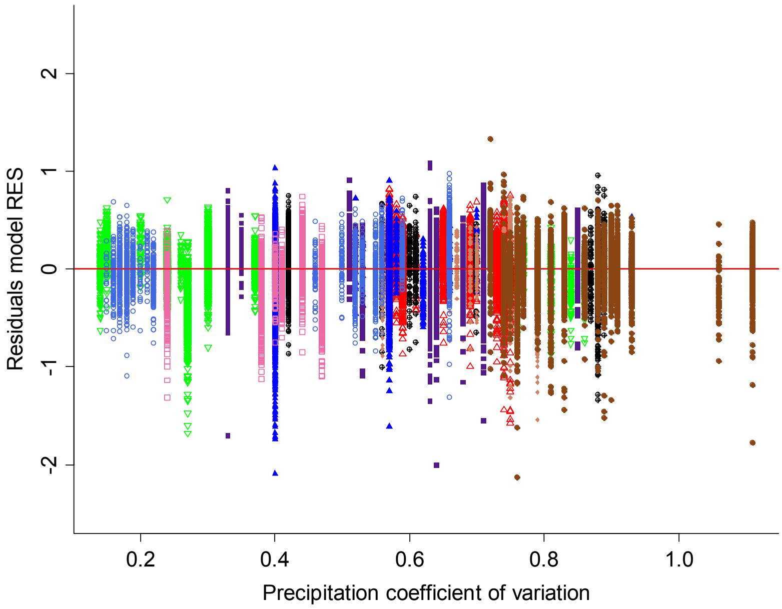


Figure S3d

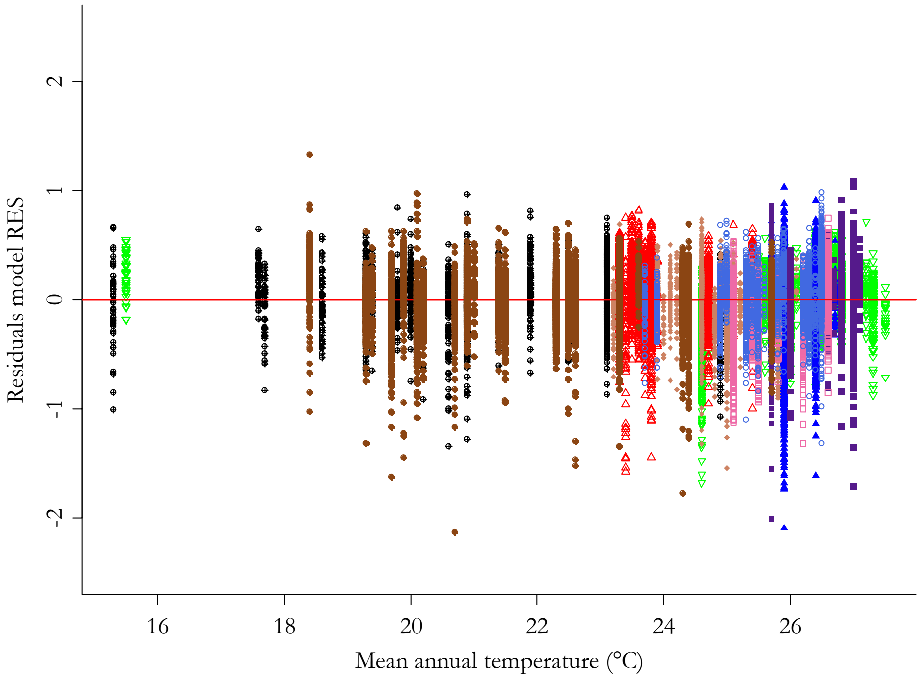


Figure S3e

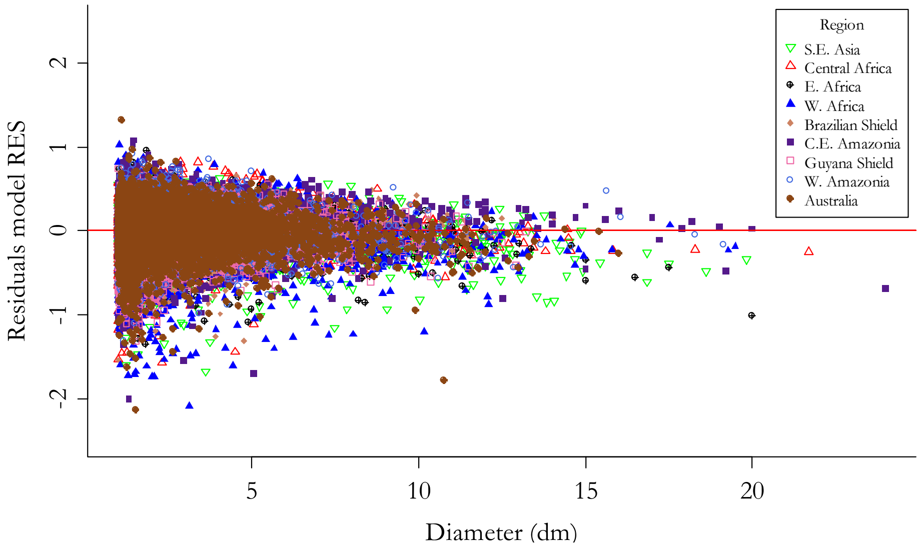


Figure S3f

Figure S3a-f: Residuals from the multilevel log-log model RES versus environment and forest structure for a) basal area (*A*, m^2 ha^{-1}), b) mean annual precipitation (P_A, mm),) dry season (S_D, months < 100 mm), d) precipitation coefficient of variance (P_V), e) mean annual temperature (T_A,°C) and f) tree diameter (*D*, dm).

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