Supplementary information for: Carbon stocks in aboveground biomass for Colombian mangroves with associated uncertainties

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This supplementary material contains two tables. The first table presents all sources of information on AGB density used for estimation of national C stocks and model development. The second table presents all the statistical models tested in our analysis with corresponding results from statistical tests.

Table 1: Data sources of Aboveground biomass (AGB) used to estimation of total AGB carbon stock in Colombian mangroves and development of predictive models.

Department	Coast	Location	Coordinates X	Coordinates Y	AGB (Mg ha-1)	Source
La Guajira	Caribbean	Brazo Riito-Ranchería river delta	-72.8931	11.5578	70.98	Lema and Polanía (2007)
La Guajira	Caribbean	Valle de los cangrejos-Ranchería river delta	-72.8914	11.5588	26.78	Lema and Polanía (2007)
Magdalena	Caribbean	CGSM-Rinconada	-74.4938	10.9615	91.40	De la Peña et al. (2010)
Magdalena	Caribbean	CGSM-Aguas Negras	-74.6075	10.8089	16.10	De la Peña et al. (2010)
Magdalena	Caribbean	CGSM-Caño Grande	-74.4814	10.8619	75.80	De la Peña et al. (2010)
Magdalena	Caribbean	CGSM-Luna	-74.938	10.9071	13.80	De la Peña et al. (2010)
Magdalena	Caribbean	Chengue bay- Tayrona NNP	-74.1284	11.3178	132.10	INVEMAR (2007)
Córdoba	Caribbean	Cispatá bay-Caño Tijó 1	-75.8378	9.3566	147.50	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Tijó 2	-75.8284	9.3606	186.60	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Palermo	-75.8423	9.3525	129.70	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Grande 1	-75.8505	9.3712	153.20	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-El Claval	-75.7912	9.3874	80.20	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Garzal 1	-75.8563	9.382	122.80	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Garzal 2	-75.8588	9.3811	159.30	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-La Flotante-Caño Nisperal	-75.8029	9.3906	90.40	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Vertel-Caño el Nene	-75.8397	9.3823	151.20	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Salado 1	-75.8721	9.4155	131.70	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Ciénaga Galo	-75.8266	9.3673	101.80	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Ostional	-75.8639	9.3961	89.30	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-La Zona, Rincón el grillo	-75.8384	9.397	72.00	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-La Camaronera	-75.7914	9.3844	74.00	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Ciénaga Remediapobres	-75.8435	9.3679	133.20	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Ciénaga Soledad	-75.8464	9.3407	171.40	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Garzal 3	-75.8447	9.3954	102.10	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Grande 2	-75.854	9.3690	220.80	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Jesús Primera	-75.8439	9.3784	128.50	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño Salado 2	-75.8276	9.4183	69.30	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Angostura	-75.5885	9.4221	246.90	Bolivar et al. (In preparation)
Córdoba	Caribbean	Cispatá bay-Caño el Soldado	-75.8548	9.3557	77.70	Bolivar et al. (In preparation)
Antioquia	Caribbean	Atrato river delta	-77.1005	8.0508	178.60	Blanco et al. (2012)
Antioquia	Caribbean	Puerto Cesar - Punta Coquito	-76.7407	7.9592	41.60	Blanco et al. (2012)
Antioquia	Caribbean	Punta Yarumal-Punta Las Vacas	-76.7478	8.1111	61.60	Blanco et al. (2012)
Antioquia	Caribbean	Punta Yarumal-Punta Las Vacas 2	-76.7478	8.1111	35.00	Blanco et al. (2012)
Antioquia	Caribbean	Rionegro cove 1	-76.9292	8.5458	21.20	Blanco et al. (2012)
Antioquia	Caribbean	Rionegro cove 2	-76.9292	8.5458	43.80	Blanco et al. (2012)
Antioquia	Caribbean	Rionegro cove 3	-76.9292	8.5458	30.80	Blanco et al. (2012)
Valle del Cauca	Pacific	Málaga bay-Luisico	-77.2148	4.0678	109.60	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-Luisico-Winul	-77.2055	4.0842	45.30	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-Luisico-Cangrejal	-77.2051	4.0874	295.90	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-El Morro-Aserrío	-77.1927	4.0506	4.00	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-Corozal	-77.2678	4.0805	63.40	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-Gegenera	-77.266	4.0543	51.00	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-Valencia	-77.2523	4.1069	184.90	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-La Estancia	-77.2714	4.1035	77.00	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-Mayordomo-Manglar blanquito	-77.301	4.0420	107.50	Monsalve, A., Ramírez, G. (2015)
Valle del Cauca	Pacific	Málaga bay-Caracas	-77.268	3.9871	117.20	Monsalve, A., Ramírez, G. (2015)

Table 2: Statistical regression models tested in our analysis. AGB represents aboveground biomass (Mg/ha); BIO9 is the mean temperature of driest quarter (℃); BIO10 mean temperature of warmest quarter (℃); BIO11 mean temperature of coldest quarter (℃); BIO16 is the precipitation of the wettest quarter (mm); EVI is the enhanced vegetation index; Lat is the absolute value of latitude (decimal degrees); n is the number of observations; $R_a{}^2$ is the adjusted coefficient of determination; MSE is the mean squared error; F is the F-statistic calculated; AIC is Akaike's information criterion

Model	n	$R_a{}^2$	MSE	F	AIC
(1) $AGB = -2.210^{e+03} + 2.946^{e+00} BIO10 + 4.687^{e+00} BIO11 + 2.108^{e-01} BIO16 - 2.334^{e-01} BIO17 + 2.465^{e+02} EVI$	40	0.04163	4157	1.34	454.313
(2) $AGB = -1.876^{e+03} + 7.766^{e+00} BIO1 + 7.64^{e-02} BIO4 + 5.413^{e-03} BIO12 - 2.908^{e-00} BIO15$	43	-0.0278	4338	0.72	488.850
(3) $AGB = -3.260^{e+03} + 1.233^{e+01} BIO1 + 1.61^{e-01} BIO4 + 1.934^{e-02} BIO12 - 3.805^{e+00} BIO15 + 2.835^{e+02} EVI$	40	0.07695	4003	1.65	452.811
(4) $AGB = -1.920^{e+03} - 7.292^{e+01} Lat + 7.878^{e+00} BIO10 + 1.846^{e+00} BIO11 - 1.115^{e-01} BIO16 + 2.404^{e-02} BIO17 + 1.561^{e-02} EVI$	40	0.1288	3779	1.961	451.303
(5) $AGB = -1.372^{e+03} + 6.358^{e+00} BIO10 + 1.789^{e+00} BIO11 - 7.389^{e-02} BIO16 - 1.229^{e-01} BIO17 - 7.746^{e+01} Lat$	43	0.154	3571	2.529	481.333
(6) $AGB = -1.286^{e+03} - 9.594^{e+01} Lat + 8.621^{e+00} BIO1 + 1.161^{e-01} BIO4 - 6.145^{e-02} BIO12 - 4.687^{e-01} BIO15$	43	0.1819	3453	2.868	479.891
(7) $AGB = -2.219^{e+03} - 7.703^{e+01} Lat + 1.113^{e+00} BIO1 + 1.885^{e-01} BIO4 - 4.071^{e-02} BIO12 - 1.735^{e-01} BIO15 + 1.813^{e+02} EVI$	41	0.1762	3573	2.39	449.069
(8) $AGB = 35338.8860 - 155.9330\|Lat\| - 2490.0405 \frac{BIO1}{10} + 49.1282(\frac{BIO1}{10})^2 - 85.6399 \frac{BIO11}{10} - 0.1171 BIO12 + 0.4483 BIO15$	43	0.1975	3387	2.72	479.882
(9) $AGB = 2.546^{e+04} - 1.337^{e+02}\|Lat\| - 1.653^{e+03} \frac{BIO1}{10} + 3.743^{e+01}(\frac{BIO1}{10})^2 - 2.499^{e+02} \frac{BIO11}{10} - 9.722^{e-02} BIO12 - 2.508^{e+00} BIO15 + 2.422^{e-02} EVI$	40	0.3627	3369	2.60	447.478
(10) $AGB = -1916.5321 + 7.3424 BIO9 + 0.1126 BIO17$	43	0.1456	3607	4.58	479.110
(11) $AGB = -1.693^{e+03} - 2.897^{e+01} Lat + 7.567^{e+00} BIO9 - 4.108^{e-02} BIO17$	43	0.2072	3346	4.66	476.801
(12) $AGB = -2.391^{e+03} - 9.020^{e+00} Lat + 9.087^{e+00} BIO9 + 1.105^{e-01} BIO17 + 1.695^{e-02} EVI$	43	0.1898	3514	3.284	446.756
(13) $AGB = -1.855^{e+03} - 2.390^{e+01} Lat + 7.809^{e+00} 1 BIO9 + 9.615^{e-03} EVI$	40	0.2001	3469	4.25	445.371
(14) $AGB = -3.232^{e+02} + 1.499^{e+00} BIO9 + 5.1442 EVI$	40	-0.01318	4394	0.75	453.920
(15) $AGB = -1860.211 + 7.958 BIO9 - 22.944 Lat$	43	0.2225	3282	7.01	475.052
(16) $AGB = -423.235 + 1.943 BIO9$	43	0.01697	4149	1.72	484.202
(17) $AGB = -1.1408^{e+03} - 9.370^{e+00} BIO11 + 3.327^{e-02} BIO16 + 1.348^{e+01} BIO9 + 1.065^{e-02} EVI$	40	0.2082	3434	3.56	445.835
(18) $AGB = -2.670^{e+03} + 9.671^{e+00} BIO11 + 1.008^{e-01} BIO16 + 2.298^{e-02} EVI$	40	0.06889	4038	1.96	451.446
(19) $AGB = -822.9927 + 3.0227 BIO11 + 0.2433 BIO16 - 0.4077 BIO17$	43	0.04791	4019	1.70	484.676
(20) $AGB = -835.18954 - 20.28373 BIO11 + 0.02986 BIO16 + 14.30146 BIO9 + 8.635535 BIO1 + 0.01895 EVI$	40	0.2143	3408	3.13	446.366
(21) $AGB = 3.451^{e+04} - 2.302^{e+02} \frac{BIO11}{10} - 8.086^{e-03} BIO16 + 2.071^{e+02} \frac{BIO9}{10} 2.549^{e+03} \frac{BIO1}{10} + 4.777^{e+01}(\frac{BIO1}{10})^2 + 2.018^{e-02} EVI$	40	0.2309	3336	2.95	446.319
(22) $AGB = -9.327^{e+02} + 1.846^{e-03} BIO10^2 + 1.132^{e-02} BIO11^2 + 1.476^{e-05} BIO16^2 + 5.747^{e-05} BIO17^2 + 2.556^{e-06} EVI^2$	40	0.04177	4518	0.69	457.651
(23) $\log AGB = -249.0196 + 23.8766 \log BIO10 + 17.2434 \log BIO11 + 1.3926 \log BIO16 + 0.2169 \log BIO17 + 1.5243 \log EVI$	40	0.1954	0.614	2.89	101.484
(24) $AGB = -17786.59 + 1487.86 \log BIO10 + 1428.78 \log BIO11 + 115.81 \log BIO16 + 12.94 \log BIO17 + 87.21 \log EVI$	40	0.08968	3948	1.77	452.256
(25) $\log AGB = -191.3654 + 32.0857 \log BIO9 + 1.1316 \log BIO16 + 1.0113 \log EVI$	40	0.3028	0.532	6.65	94.038
(26) $\log AGB = -94.7756 + 21.9228 \log BIO9 - 3.2190 \log BIO16 + 0.8363 \log EVI - 1.1157\|Lat\|$	40	0.3586	0.489	6.45	91.573
(27) $\log AGB = -18.7623 + 39.9688 \log BIO9 - 3.0771 \log BIO16 + 0.7138 \log EVI - 0.8834\|Lat\| - 32.0563 \log BIO11$	40	0.353	0.493	5.26	92.761
(28) $AGB = 2071.2 - 569777.6 \frac{1}{BIO9} + 20516.4 \frac{1}{BIO16} - 333815.1 \frac{1}{EVI} + 1377.2 \frac{1}{\|Lat\|}$	40	0.2631	3196	4.48	442.959
(29) $\frac{1}{AGB} = 9.895^{e-01} - 2.836^{e-03} BIO9 - 4.386^{e-05} BIO16 - 1.638^{e-05} EVI - 9.419^{e-03}\|Lat\|$	40	0.1415	0.0014	2.61	-143.157
(30) $\frac{1}{AGB} = -0.4451 + 154.8629 \frac{1}{BIO9} - 49.9774 \frac{1}{BIO16} + 388.4439 \frac{1}{EVI} - 0.8805 \frac{1}{\|Lat\|}$	40	0.5587	0.0007	13.34	-169.773
(31) $\log AGB = -68.661 + 21.023 \log BIO9 - 5.397 \log BIO16 + 1.842 \log EVI - 11.790 \log\|Lat\|$	40	0.4507	0.419	9.00	85.375
(32) $\log AGB = -2.889^{e+01} + 1.217^{e-01} \log BIO9 + 4.858^{e-04} \log BIO16 + 2.457^{e-04} \log EVI - 1.613^{e-01}\|Lat\|$	40	0.2641	0.561	4.50	97.073
(33) $AGB = -6880.48 + 1646.40 \log BIO9 - 262.05 \log BIO16 + 98.26 \log EVI - 639.37 \log\|Lat\|$	40	0.2671	3179	4.55	442.745
(34) $AGB = -3707.820 + 256.857\sqrt{BIO9} - 1.560\sqrt{BIO16} + 1.600\sqrt{EVI} - 166.952\sqrt{\|Lat\|}$	40	0.1981	3478	3.41	446.345
(35) $\sqrt{AGB} = -1.202^{e+02} + 4.813^{e-01} BIO9 - 1.923^{e-03} BIO16 + 8.131^{e-04} EVI - 7.431^{e-01}\|Lat\|$	40	0.2531	8.62	4.30	206.338
(36) $\log AGB = 32.568 - 8256.480 \frac{1}{BIO9} + 572.760 \frac{1}{BIO16} - 6457.220 \frac{1}{EVI} + 21.747 \frac{1}{\|Lat\|}$	40	0.4675	0.406	9.56	84.130
(37) $AGB = -1.855^{e+03} + 7.809^{e+00} BIO9 + 9.615^{e-03} EVI - 2.390^{e+01}\|Lat\|$	40	0.2001	3469	4.25	445.371
(38) $\log AGB = -183.9219 + 32.6554 \log BIO9 + 1.2009 \log EVI - 2.2817 \log\|Lat\|$	40	0.3572	0.490	8.22	90.790
(39) $\log AGB = -2.532^{e+01} + 1.156^{e-01} BIO9 + 1.906^{e-04} EVI - 3.007^{e-01}\|Lat\|$	40	0.2807	0.549	6.07	95.288
(40) $AGB = -12476.98 + 2211.21 \log BIO9 + 67.12 \log EVI - 177.67 \log\|Lat\|$	40	0.2423	3286	5.16	443.200
(41) $AGB = -3980.6149 + 264.1664\sqrt{BIO9} + 1.7156\|sqrt EVI - 132.2929\sqrt{\|Lat\|}$	40	0.2199	3383	4.66	444.367
(42) $\sqrt{AGB} = -1.061^{e+02} + 4.570^{e-01} BIO9 + 5.950^{e-04} EVI - 1.295^{e+00}\|Lat\|$	40	0.2699	8.430	5.80	204.556
(43) $\log AGB = 36.254 - 8845.587 \frac{1}{BIO23} - 5303.932 \frac{1}{EVI} + 15.133 \frac{1}{\|Lat\|}$	40	0.4507	0.419	11.67	84.502
(44) $\log AGB = 12.977 - 2107.057 \frac{1}{BIO9} - 3371.758 \frac{1}{EVI}$	40	0.1931	0.615	5.67	98.980
(45) $\log AGB = -751.4362 + 8.8199 \log BIO9 + 0.7639 \log EVI$	40	0.1312	0.6626	3.94	101.936
(46) $\log AGB = -6.0469510 + 0.0361823 BIO9 + 0.0001344 EVI$	40	0.08879	0.695	2.90	103.843
(47) $\sqrt{AGB} = -2.311^{e+01} + 1.151^{e-01} BIO9 + 3.528^{e-04} EVI$	40	0.03062	11.188	1.62	214.990
(48) $\log AGB = 27.758 - -5876.246 \frac{1}{BIO9} - 3042.594 \frac{1}{BIO16} - 610.758 \frac{1}{EVI}$	40	0.2675	0.559	5.75	96.015

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