

Table S1. The results of band, vegetation index, texture and forest parameters.

Pearson correlation coefficients and  $R^2$  between CC, S, BA, and AGB and variables derived from L8 and S2A data. The order of variables in the table are bands, vegetation indices, BTE, MTE, and PTE of L8 and S2A. Textures are defined and labeled using window\_direction\_band\_texture features. Correlation is the correlation obtained by the Pearson method, and the value with \_\_\_\_ in the  $R^2$  column is the optimal solution.

Parameter	Sensor	Variables	Correlation	$R^2$
CC	L8	B6	−0.57***	<u>0.3293</u>
		EVI <sub>2</sub>	−0.4***	0.0233
		BTE_3_0_B6_mean	−0.47***	0.2214
		MTE_3_B6_mean	−0.45***	0.2020
		PTE_13_90_correlation	0.35**	0.1192
	S2A	B11	−0.26*	0.0659
		RDVI <sub>2</sub>	−0.54***	0.3156
		BTE_13_135_B8_mean	0.41***	0.1689
		MTE_9_B11_correlation	0.42***	0.1794
		PTE_13_135_mean	−0.31*	0.0973
S	L8	B5	0.41***	0.1690
		DVI	0.45***	0.1991
		BTE_7_0_B3_contrast	0.55***	0.3042
		MTE_7_B4_contrast	0.49***	0.2281
		PTE_3_90_variance	0.45***	0.2033
	S2A	B3	0.74***	0.5472
		RDVI <sub>2</sub>	−0.4***	0.4003
		BTE_3_0_B2_entropy	0.83***	<u>0.6846</u>
		MTE_3_B2_homogeneity	−0.8***	0.6360
		PTE_13_0_correlation	−0.55***	0.2974
BA	L8	B6	−0.42***	0.1791
		DVI	−0.41***	0.1693
		BTE_3_0_B6_mean	−0.38**	0.1553
		MTE_3_B6_mean	−0.38**	0.1558
		PTE_13_45_correlation	0.47***	0.2189
	S2A	B11	−0.48***	0.2312
		DVI <sub>2</sub>	−0.48***	<u>0.2949</u>
		BTE_3_0_B11_mean	−0.48***	0.2339
		MTE_3_B11_mean	−0.46***	0.2109
		PTE_13_0_entropy	0.28*	0.0782
AGB	L8	B6	−0.48***	0.2285
		DVI	−0.41***	0.1680
		BTE_3_0_B6_mean	−0.44**	0.1899
		MTE_3_B6_mean	−0.44**	0.1953
		PTE_11_45_correlation	0.45***	0.2004
	S2A	B11	−0.55***	0.3054
		DVI <sub>2</sub>	−0.46***	<u>0.3199</u>
		BTE_3_0_B11_mean	−0.52***	0.2755
		MTE_5_B11_mean	−0.45***	0.1984
		PTE_11_45_correlation	0.33**	0.1079

\*\*\* Correlation is significant at the 0.001 level. \*\* Correlation is significant at the 0.01 level. \* Correlation is significant at the 0.05 level.

Table S2. The results of VI and forest parameters.

Summary of the results of the optimal vegetation indices obtained using screening different sensors after adding weights to the bands, and the value with \_\_\_\_ in the  $R^2$  column is the optimal solution.

Parameter	Sensor	BAND_VI	$m$	$R^2$	RMSE
CC	L8	NDVI5-6	0.1	0.3420	0.4621
		RVI5-6	0.9	0.3582	0.3175
	S2A	NDVI12-3	0.1	0.3523	0.0475
		RVI12-3	0.3	<u>0.3639</u>	0.0460
S	L8	NDVI5-6	0.1	0.4801	0.0409
		RVI5-6	0.1	0.4889	0.0305
	S2A	NDVI3-11	1	0.5426	0.0379
		RVI3-11	0.1	<u>0.5570</u>	0.0038
BA	L8	NDVI6-5	1	0.4992	0.0602
		RVI6-5	0.7	0.6298	0.0452
	S2A	NDVI12-5	0.1	0.6718	0.0097
		RVI12-5	0.3	<u>0.6766</u>	0.0219
AGB	L8	NDVI6-5	1	0.5288	0.0602
		RVI6-5	0.3	0.6432	0.0190
	S2A	NDVI12-5	0.1	0.6942	0.0093
		RVI12-5	0.7	<u>0.6987</u>	0.0489

Table S3. The results of CTI and forest parameters.

Summary table of optimal CTI results, and the value with \_\_\_\_ in the  $R^2$  column is the optimal solution.

Parameter	Sensor	BAND_TI	$m$	Size	Angle	Feature	$R^2$	RMSE
CC	L8	NDTI6-5	0.1	3	45	Mean	0.5632	0.0111
		RTI6-5	0.7	3	45	Mean	<u>0.5800</u>	0.0479
	S2A	NDTI4-3	0.3	11	135	Correlation	0.3161	0.2992
		RTI4-3	0.7	11	135	Correlation	0.2663	2.6458
S	L8	NDTI6-3	0.6	9	45	Correlation	0.3768	0.6730
		RTI4-2	0.7	3	45	Variance	0.5207	0.4168
	S2A	NDTI3-2	0.1	3	0	Second Moment	0.6921	0.0103
		RTI3-2	0.9	3	0	Second Moment	<u>0.6937</u>	0.0535
BA	L8	NDTI2-3	0.9	5	135	Correlation	0.2111	0.7256
		RTI7-4	0.6	3	45	Mean	<u>0.5425</u>	0.0722
	S2A	NDTI12-8A	0.1	3	0	Mean	0.4473	0.0427
		RTI12-8A	0.1	3	0	Mean	0.2129	2.1430
AGB	L8	NDTI6-3	0.1	5	135	Correlation	<u>0.2628</u>	1.0329
		RTI5-2	0.1	5	45	Variance	0.2486	0.6419
	S2A	NDTI4-8	0.4	3	0	Correlation	0.2344	2.0048
		RTI6-8A	0.9	5	0	Variance	0.2499	0.7172

Table S4. The results of MTI and forest parameters.

Summary table of optimal MTI results, and the value with \_\_\_\_ in the  $R^2$  column is the optimal solution.

Parameter	Sensor	BAND_TI	$m$	Size	Feature	$R^2$	RMSE
CC	L8	NDTI6-5	0.1	3	Mean	0.5769	0.0112
		RTI6-5	0.3	3	Mean	<u>0.5924</u>	0.0202

S	S2A	NDTI4-3	0.1	13	Correlation	0.4048	0.0960
		RTI6-3	0.7	9	Variance	0.3132	7.4706
	L8	NDTI6-2	0.1	13	Correlation	0.3345	0.0474
		RTI6-2	0.5	13	Correlation	0.3446	0.1461
	S2A	NDTI3-2	0.1	3	Second Moment	0.6367	0.0107
		RTI3-11	0.9	3	Entropy	<u>0.6437</u>	0.0513
	BA	NDTI7-4	0.1	3	Mean	0.6075	0.0207
		RTI7-4	0.3	3	Mean	<u>0.6227</u>	0.0377
		NDTI4-8A	0.5	5	Correlation	0.4726	0.4262
		RTI4-3	0.7	9	Entropy	0.4940	1.3407
	AGB	NDTI7-4	0.1	3	Mean	0.6080	0.0207
		RTI7-4	0.7	3	Mean	<u>0.6233</u>	0.0941
	S2A	NDTI5-8	0.1	3	Correlation	0.4264	8.1103
		RTI7-5	0.3	3	Contrast	0.4915	0.5663

Table S5. The results of PTI and forest parameters.

Summary of the results of the optimal PTIs. Per1 and Per2 contain the amount of information after principal component analysis for the main and secondary texture features, respectively. And the value with \_\_\_\_ in the  $R^2$  column is the optimal solution.

Parameter	Sensor	BAND_TI	$m$	Size	Angle	Per1(%)	Per2(%)	$R^2$	RMSE
CC	L8	NDTI6-4	0.4	5	0	61.6534	57.6852	0.3759	4.8485
		RTI3-4	0.7	3	135	69.2332	65.1292	0.5159	2.8574
	S2A	NDTI12-8A	0.9	13	90	82.0817	74.1906	0.7000	3.5158
		RTI8A-3	0.9	7	135	74.6949	88.0945	<u>0.7344</u>	4.0799
S	L8	NDTI3-2	0.9	7	45	60.9091	63.6910	0.5988	3.0842
		RTI5-4	0.5	5	45	65.6281	59.0795	0.5493	4.1997
	S2A	NDTI4-5	0.3	3	0	93.6493	82.4615	0.7230	1.4555
		RTI4-8	0.1	5	45	92.7594	83.2894	<u>0.7435</u>	0.0942
BA	L8	NDTI7-2	0.4	5	45	55.2540	62.4738	0.4964	1.9469
		RTI3-4	0.2	3	135	61.5875	60.0869	0.4261	6.2962
	S2A	NDTI12-3	0.1	7	135	73.2039	88.0945	0.6430	0.3739
		RTI11-3	0.5	7	135	67.4230	88.0945	<u>0.6544</u>	0.8214
AGB	L8	NDTI7-2	0.1	9	45	60.2844	59.5888	0.4701	1.0054
		RTI7-4	0.9	5	135	61.7050	63.3313	0.4431	3.9080
	S2A	NDTI11-6	0.6	9	135	69.2553	75.8701	0.6846	3.8379
		RTI11-4	0.7	9	90	68.1722	89.1878	<u>0.6991</u>	3.2687