Supplementary Material: Large-Area, High-Resolution Tree Cover Mapping with Multi-Temporal SPOT5 Imagery, New South Wales, Australia

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Table S1. Tree cover area for NSW grouped by vegetation formation.

Class	Sample	Formation area (% of state)	Tree cover (10^3 × ha)	Tree cover (% of formation)	Tree cover (% of state)
	Total	100	21777.8		27.11
0	Saline wetlands	0.08	18.1	26.86	0.02
1	Grasslands	1.55	40.9	3.28	0.05
2	Alpine complex	0.19	70.9	46.55	0.09
3	Freshwater wetlands	1.67	80.8	6.04	0.1
4	Arid shrublands (Chenopod subformation)	8.65	115.3	1.66	0.14
5	Heathlands	0.25	182.6	90.32	0.23
6	Rainforests	0.71	529.0	92.89	0.66
7	Forested wetlands	1.37	607.9	55.11	0.76
8	Semi-arid woodlands (Grassy subformation)	6.03	821.3	16.96	1.02
9	Arid shrublands (Acacia subformation)	11.02	1035.3	11.69	1.29
10	Wet sclerophyll forests (Shrubby subformation)	1.6	1245.2	97.11	1.55
11	Grassy woodlands	3.01	1266.5	52.34	1.58
12	Wet sclerophyll forests (Grassy subformation)	2.18	1651.7	94.32	2.06
13	Dry sclerophyll forests (Shrub/grass subformation)	3.87	2458.5	78.99	3.06
14	Cleared	37.03	2963.6	9.96	3.69
15	Semi-arid woodlands (Shrubby subformation)	14.51	4183.2	35.89	5.21
16	Dry sclerophyll forests (Shrubby subformation)	6.27	4507.3	89.43	5.61

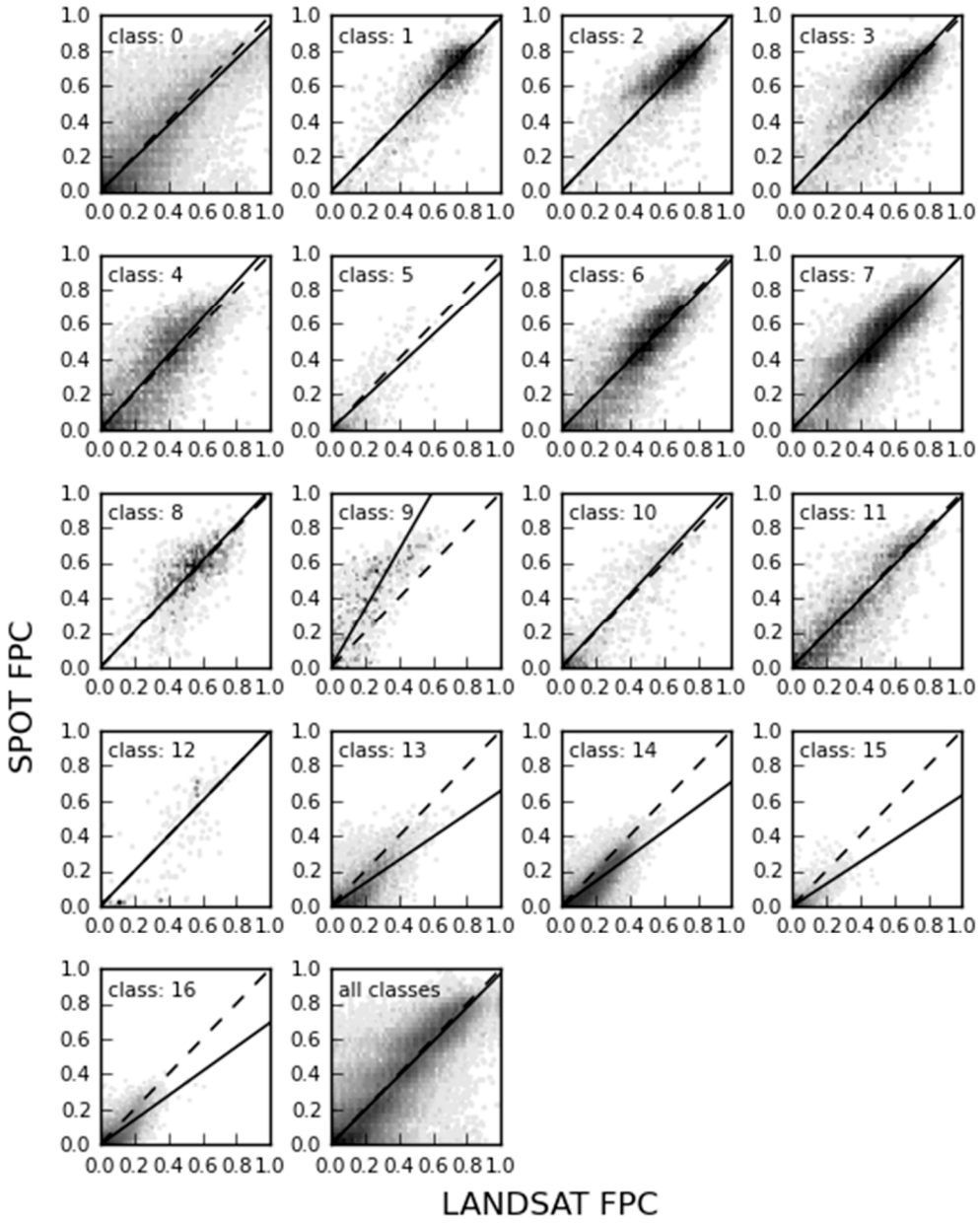

Figure S1. Predicted SPOT5 FPC compared with the predicted Landsat FPC, for the 17 vegetation formation classes listed in Table S1.

Table S2. Specifications of the lidar surveys sampled as part of the tree cover validation (MDBA SRA = Murray Darling Basin Authority Sustainable Rivers Audit, OEH WRP = Office of Environment and Heritage Wetland Recovery Project, TERN = Terrestrial Ecosystem Research Network, LPI = Land and Property Information).

Survey	Tiles	Acquisition	Instrument	Year acquired	Flying Height (Metres above Ground)	Footprint Size (m)	Mean Pulse Density (pulses/m²)	Maximum Scan Angle (Degrees)
Ballina (L0031)	1	LPI	Leica ALS50-II	2010	1982	0.63	1.7	13
Batemans Bay (L0041)	1	LPI	Leica ALS50-II	2011	1990	0.63	1.5	13
Cooma (L0053)	1	LPI	Leica ALS50-II	2011	1870	0.63	1.9	5
Coraki (L0029)	1	LPI	Leica ALS50-II	2010	2000	0.63	1.7	13
Forster (L0068)	4	LPI	Leica ALS50-II	2012	2125	0.63	1.6	13
Glenn Innes (L0017)	4	LPI	Leica ALS50-II	2009	2050	1.10	1.2	22
Grafton (L0026)	2	LPI	Leica ALS50-II	2010	2000	0.62	1.8	13
Gwydir OEH WRP	2	Fugro	Leica ALS50-II	2008	1671	0.23	3.1	20
Hawkesbury North (L0048)	5	LPI	Leica ALS50-II	2011	1987	0.62	2.0	21
Hawkesbury South (L0049)	1	LPI	Leica ALS50-II	2011	1982	0.62	1.6	13
Holbrook (L0074)	1	LPI	Leica ALS50-II	2012	1650	0.63	2.0	18
Jerilderie (L0125)	1	LPI	Leica ALS50-II	2013	1250	0.63	2.6	15
Kempsey (L0011)	2	LPI	Leica ALS50-II	2009-10	1500	0.63	1.7	21
Lithgow (L0058)	5	LPI	Leica ALS50-II	2011	1971	0.63	1.9	16
Macquarie OEH WRP	4	Fugro	Leica ALS50-II	2008	1671	0.23	3.3	20
MDBA SRA	36	Terranean	Riegl LMS-Q680	2009-10	500	0.25	6.0	40
Merimbula (L0097)	1	LPI	Leica ALS50-II	2013	1995	0.63	1.9	13
Murrumbidgee OEH WRP	14	Fugro	Leica ALS50-II	2008	1671	0.23	3.5	22
Nambucca (L0024)	1	LPI	Leica ALS50-II	2009-10	2020	0.64	1.8	13
Narooma (L0055)	4	LPI	Leica ALS50-II	2011	1998	0.63	1.6	13
Nepean East (L0046)	1	LPI	Leica ALS50-II	2011	2199	0.61	1.9	11
Nepean West (L0047)	2	LPI	Leica ALS50-II	2011	2199	0.61	2.3	12
Port Macquarie (L0063)	2	LPI	Leica ALS50-II	2012	2121	0.63	1.5	13
Singleton (L0065)	3	LPI	Leica ALS50-II	2011	2012	0.62	2.0	14
Sydney South (L0107)	2	LPI	Leica ALS50-II	2013	1828	0.63	1.8	16
Taree (L0064)	4	LPI	Leica ALS50-II	2012	2125	0.63	1.7	14
Tenterfield (L0018)	2	LPI	Leica ALS50-II	2009	2250	1.21	1.1	19
Tumbarumba TERN	3	Vekta	Leica ALS60	2011	1350	0.30	8.3	10
Ulladulla (L0042)	2	LPI	Leica ALS50-II	2011	1996	0.63	2.0	14
Warren (L0052)	1	LPI	Leica ALS50-II	2011	1756	0.63	1.5	16
Wellington (L0021)	1	LPI	Leica ALS50-II	2009	1500	0.63	1.9	21
Wonboyn (L0057)	2	LPI	Leica ALS50-II	2011	1998	0.63	1.9	13
Wooli (L0025)	2	LPI	Leica ALS50-II	2010	2000	0.63	1.8	13
Yamba (L0027)	1	LPI	Leica ALS50-II	2010	2000	0.63	1.7	13

Table S3. SPOT5 tree cover accuracy statistics using visually interpreted data as reference, grouped by catchment area. The accuracy statistics of the total sample were estimated through weighting by sampling strata (tree or non-tree Landsat pixels within each catchment area), with standard errors of the estimates in parentheses.

Area	**Landsat Tree Cover**		**Visual Interpretation (Points)**		**Tree Cover with Threshold**				**Tree Cover Extent**			
(%)	(%)	Sample	Tree	Non-tree	Overall	TPR	FPR	Users	Overall	TPR	FPR	Users
100	36.8	Total	2964	3684	87 (0.56)	75 (1.21)	7 (0.49)	85 (0.99)	88 (0.51)	73 (1.21)	4 (0.32)	90 (0.73)
31.3	32.3	Western	233	323	82 (1.52)	53 (3.39)	4 (1.13)	85 (3.47)	82 (1.41)	48 (3.39)	1 (0.60)	94 (2.41)
6.3	31.9	Border Rivers-Gwydir	228	328	90 (1.20)	84 (2.57)	7 (1.33)	82 (3.01)	93 (0.96)	82 (2.72)	3 (0.77)	92 (2.19)
6.3	70.1	Northern Rivers	281	271	93 (1.14)	93 (1.45)	7 (1.82)	96 (1.02)	95 (0.91)	95 (1.12)	4 (1.53)	98 (0.85)
10.4	27.2	Central West	227	330	91 (1.17)	78 (3.13)	5 (1.06)	85 (3.07)	92 (1.06)	77 (3.19)	3 (0.74)	91 (2.44)
5.2	39.8	Namoi	262	293	88 (1.34)	81 (2.46)	7 (1.50)	87 (2.33)	91 (1.13)	82 (2.42)	3 (0.97)	94 (1.70)
4.5	70.4	Hunter-Central Rivers	235	313	86 (1.62)	88 (2.07)	17 (2.46)	86 (2.14)	87 (1.58)	88 (2.11)	14 (2.32)	88 (2.08)
5.3	40.4	Lower Murray/Darling	136	212	82 (1.74)	57 (4.41)	8 (1.50)	74 (4.41)	82 (1.69)	58 (4.40)	8 (1.38)	76 (4.23)
10.7	23.0	Lachlan	211	344	88 (1.31)	73 (3.69)	8 (1.26)	70 (3.80)	90 (1.15)	73 (3.69)	6 (0.97)	75 (3.47)
3.0	77.7	Hawkesbury-Nepean	252	294	90 (1.50)	97 (1.04)	24 (3.31)	89 (1.86)	90 (1.47)	97 (0.96)	23 (3.29)	89 (1.85)
8.7	19.1	Murrumbidgee	247	309	90 (1.38)	83 (3.46)	8 (1.44)	73 (3.90)	93 (1.13)	81 (3.60)	4 (0.95)	83 (3.39)
0.3	62.7	Australian Capital Territory	293	262	84 (1.56)	90 (1.60)	26 (2.85)	85 (1.86)	88 (1.41)	92 (1.44)	19 (2.61)	89 (1.73)
4.4	18.8	Murray	54	154	87 (1.95)	64 (6.89)	8 (1.84)	64 (7.14)	89 (1.71)	64 (6.89)	5 (1.41)	72 (6.83)
3.7	70.0	Southern Rivers	305	251	91 (1.19)	95 (1.17)	17 (2.69)	93 (1.23)	93 (1.06)	95 (1.10)	10 (2.32)	95 (1.08)

Table S4. SPOT5 tree cover accuracy statistics using lidar products as reference, grouped by vegetation formation. The accuracy statistics were estimated through weighting by sampling strata (tree and non-tree SPOT5 pixels within each vegetation class area).

Area	**SPOT5 Tree Cover**		**Lidar Reference (Pixels)**		**Tree Cover with Threshold**				**Tree Cover Extent**			
(%)	(%)	Sample	Tree	Non-tree	Overall	TPR	FPR	Users	Overall	TPR	FPR	Users
100	27.1	Total	7,835,313	6,048,754	86	75	8	82	88	74	5	89
0.08	26.86	Saline wetlands	241,267	33,588	89	74	4	89	89	74	4	89
1.55	3.28	Grasslands	112,351	684,734	81	40	16	16	96	46	0	90
0.19	46.55	Alpine complex	65,239	104,555	89	87	9	89	92	91	6	93
1.67	6.04	Freshwater wetlands	315,422	1,180,605	78	26	14	22	89	30	3	61
8.65	1.66	Arid shrublands (Chenopod)	9060	574,552	98	58	1	4	99	59	1	62
0.25	90.32	Heathlands	605,180	216,049	78	98	82	78	79	96	72	80
0.71	92.89	Rainforests	594,819	20,645	95	97	47	98	95	96	28	99
1.37	55.11	Forested wetlands	1,021,634	453,338	79	87	33	81	81	78	14	91
6.03	16.96	Semi-arid woodlands (grassy)	182,865	306,474	74	42	7	77	75	40	4	86
11.02	11.69	Arid shrublands (Acacia)	28,475	27,614	69	26	4	79	69	25	3	83
1.6	97.11	Wet sclerophyll forests (shrubby)	639,226	126,020	97	99	46	98	98	99	43	98
3.01	52.34	Grassy woodlands	766,147	229,231	85	82	12	91	89	86	7	94
2.18	94.32	Wet sclerophyll forests (grassy)	975,285	37,050	96	98	42	98	96	98	36	98
3.87	78.99	Dry sclerophyll forests (shrub/grass)	989,283	233,247	91	93	17	97	92	93	11	98
37.03	9.96	Cleared	158,489	1,379,105	89	67	7	55	93	63	3	76
14.51	35.89	Semi-arid woodlands (shrubby)	112,630	412,288	84	80	14	77	84	78	13	77
6.27	89.43	Dry sclerophyll forests (shrubby)	1,017,941	29,659	92	93	25	98	93	94	23	98