Site and Vegetation Management Regional Ecosystem (VMRE) Map Community Descriptions

Large All-Eucalypt Site

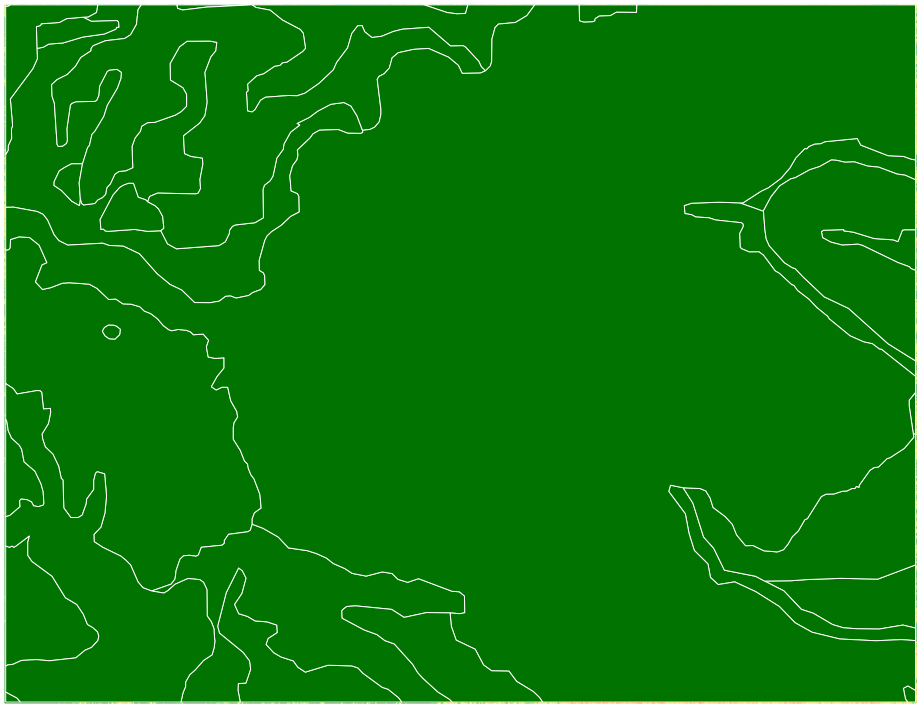

Figure S1. All-eucalypt site from the 2017 VMRE map colored by vegetation type where green represents areas dominated by eucalypt vegetation.

Table S1. Description of all-eucalypt site vegetation communities from the 2017 VMRE map.

Regional Ecosystem ID	Percent REID	Vegetation Management Class	Dominant Vegetation Community Description	Structure category	Area (km²)
11.10.1	100	No concern at present	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	Sparse	1.75
11.10.1/11.8.4	60/40	No concern at present	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	Sparse	5.58
11.10.1/11.9.2	80/20	No concern at present	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	Sparse	0.04
11.8.1	100	No concern at present	*Eucalyptus laevopinea* tall open forest on Cainozoic igneous rocks. Elevated plateaus	Mid-dense	0.74
11.8.1/11.8.2	90/10	No concern at present	*Eucalyptus laevopinea* tall open forest on Cainozoic igneous rocks. Elevated plateaus	Mid-dense	60.38
11.8.1/11.8.4	60/40	No concern at present	*Eucalyptus laevopinea* tall open forest on Cainozoic igneous rocks. Elevated plateaus	Mid-dense	6.60
11.8.2	100	No concern at present	*Eucalyptus tereticornis*, E. *melliodora* woodland on Cainozoic igneous rocks	Sparse	16.24
11.8.2/11.10.1/11.8.4	50/40/10	No concern at present	*Eucalyptus tereticornis*, E. *melliodora* woodland on Cainozoic igneous rocks	Sparse	1.31
11.8.2/11.8.4	60/40	No concern at present	*Eucalyptus tereticornis*, E. *melliodora* woodland on Cainozoic igneous rocks	Sparse	4.04

11.8.4	100	No concern at present	*Eucalyptus* melanophloia open woodland on Cainozoic igneous rocks.	Very sparse	1.51
11.8.4/11.10.1	70/30	No concern at present	*Eucalyptus* melanophloia open woodland on Cainozoic igneous rocks.	Very sparse	2.54
11.8.4/11.8.2	70/30	No concern at present	*Eucalyptus* melanophloia open woodland on Cainozoic igneous rocks.	Very sparse	4.67

All-Eucalypt Mid-dense Site

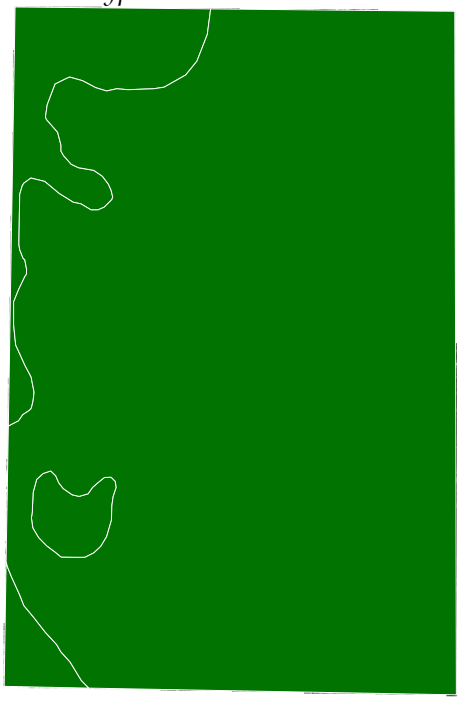

Figure S2. All-eucalypt mid-dense site from the 2017 VMRE map colored by vegetation type where green represents areas dominated by eucalypt vegetation.

Table S2. Description of all-eucalypt mid-dense site vegetation communities from the 2017 VMRE map.

Regional Ecosystem ID	Percent REID	Vegetation Management Class	Dominant Vegetation Community Description	Structure category	Area (km^2)
11.10.13a	100	Least concern	*Eucalyptus* spp. and/or *Corymbia* spp. open forest on scarps and sandstone tablelands	Mid-dense	7.61
11.10.5	100	Least concern	*Eucalyptus sphaerocarpa* +/- E. *mensalis*, E. *saligna*, tall open forest on coarse-grained sedimentary rocks. Tablelands	Mid-dense	62.90

Mixed Eucalypt Site

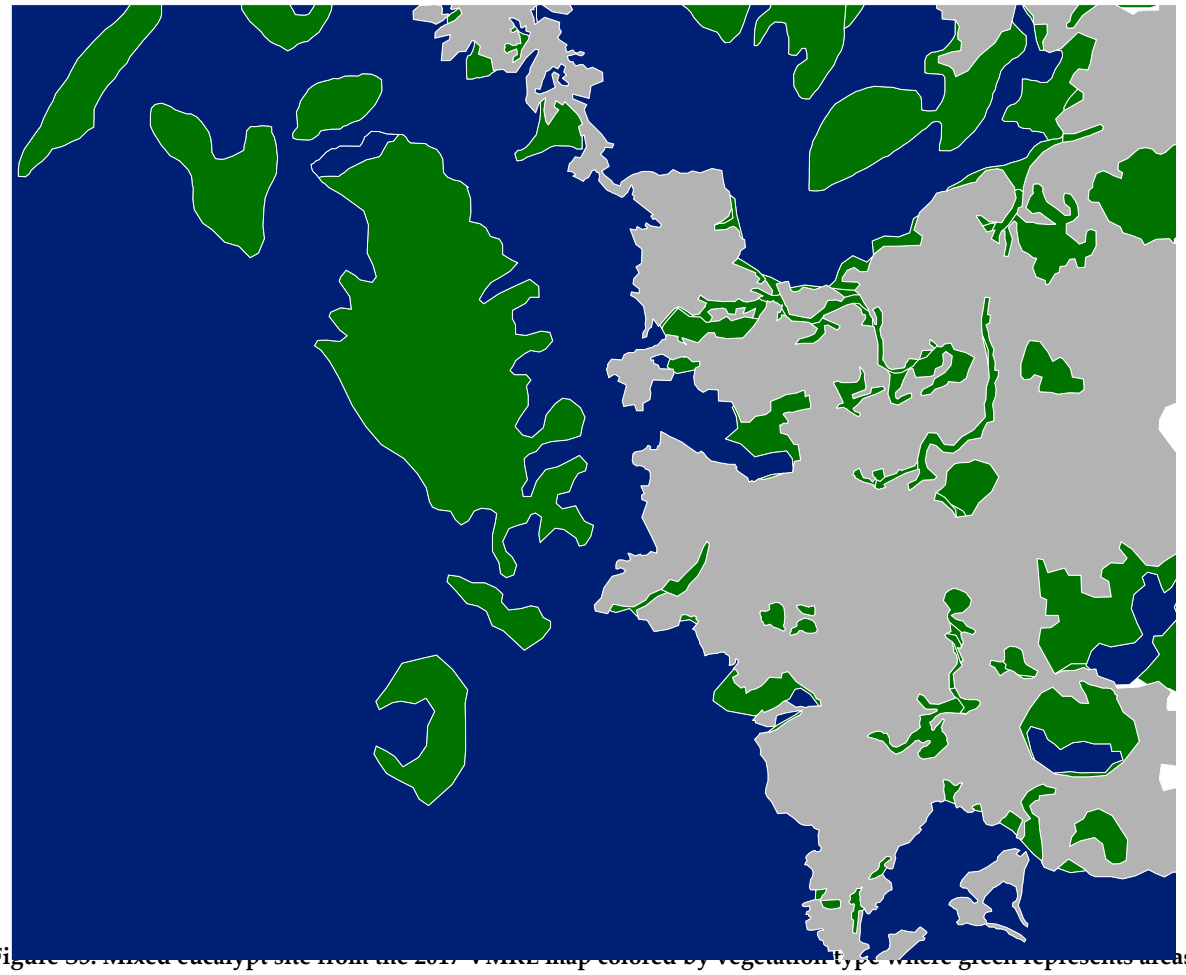

Figure S3. Mixed eucalypt site from the 2017 VMRE map colored by vegetation type where green represents areas dominated by eucalypt vegetation, blue represents areas dominated by non-eucalypt vegetation, and grey represents non-remnant areas (cleared land).

Table S3. Description of mixed eucalypt site vegetation communities from the 2017 VMRE map.

Regional Ecosystem ID	Percent REID	Vegetation Management Class	Dominant Vegetation Community Description	Structure category	Area (km^2)
8.12.12a	100	Least concern	*Eucalyptus tereticornis* and/or *Corymbia* spp. and/or E. platyphylla and/or *Lophostemon suaveolens* woodland to open forest on hill slopes on Mesozoic to Proterozoic igneous rocks	Sparse	6.08
8.12.2/8.12.3a/8.12.19	40/30/30	Least concern	Evergreen notophyll to complex notophyll vine forest of uplands, highlands and foothills, on Mesozoic to Proterozoic igneous rocks	Dense	56.40
8.12.31a	100	Least concern	*Eucalyptus* resinifera and/or E. *portuensis* and/or *E. acmenoides* and/or *Allocasuarina* spp. open forest on moist upper slopes of ranges on Mesozoic to Proterozoic igneous rocks	Mid-dense	7.86

8.12.31a/8.12.2	60/40	Least concern	*Eucalyptus* resinifera and/or E. *portuensis* and/or E. acmenoides and/or *Allocasuarina* spp. open forest on moist upper slopes of ranges on Mesozoic to Proterozoic igneous rocks	Mid-dense	1.11
8.12.32/8.12.7c/8.12.5a	50/30/20	Least concern	*Corymbia intermedia* +/- *E. portuensis* +/- *E. exserta* open forest to woodland with areas of *Allocasuarina* spp. +/- *Banksia integrifolia* open forest on high ranges, on Mesozoic to Proterozoic igneous rocks	Mid-dense	0.39
8.12.3a	100	Least concern	Evergreen to semi-evergreen, notophyll to microphyll, vine forest to vine thicket, of foothills and uplands on Mesozoic to Proterozoic igneous rocks	Dense	0.70
8.12.2/8.12.3a/8.12.19	40/30/30	Least concern	Evergreen notophyll to complex notophyll vine forest of uplands, highlands and foothills, on Mesozoic to Proterozoic igneous rocks	Dense	5.19
8.12.3b	100	Least concern	Evergreen to semi-evergreen, notophyll to microphyll, vine forest to vine thicket, of foothills and uplands on Mesozoic to Proterozoic igneous rocks	Dense	0.15
8.3.1a	100	Of concern	Semi-deciduous to evergreen notophyll to mesophyll vine forest, +/- sclerophyll emergents, fringing or in the vicinity of watercourses	Dense	0.02
8.3.3a	100	Least concern	*Melaleuca leucadendra* and/or *M. fluviatilis* and/or *Casuarina cunninghamiana* +/- *Syncarpia glomulifera* open forest, on creek banks	Mid-dense	0.01
8.3.3a/8.3.1a	80/20	Least concern	*Melaleuca leucadendra* and/or *M. fluviatilis* and/or *Casuarina cunninghamiana* +/- *Syncarpia glomulifera* open forest, on creek banks	Mid-dense	0.36
8.3.3a/8.3.5	60/40	Least concern	*Melaleuca leucadendra* and/or *M. fluviatilis* and/or *Casuarina cunninghamiana* +/- *Syncarpia glomulifera* open forest, on creek banks	Mid-dense	0.02
8.3.3a/8.3.6a	60/40	Least concern	*Melaleuca leucadendra* and/or *M. fluviatilis* and/or *Casuarina cunninghamiana* +/- *Syncarpia glomulifera* open forest, on creek banks	Mid-dense	0.02
8.3.5	100	Of concern	*Eucalyptus* platyphylla and/or *Lophostemon suaveolens* and/or *Corymbia* clarksoniana woodland on alluvial plains	Sparse	0.01
8.3.5/8.3.3a	95/5	Of concern	*Eucalyptus platyphylla* and/or *Lophostemon suaveolens* and/or *Corymbia* clarksoniana woodland on alluvial plains	Sparse	0.09
8.3.6a	100	Of concern	*Eucalyptus tereticornis* and/or *Corymbia intermedia* (or *C. clarksoniana*) and/or *C. tessellaris* +/- *Lophostemon suaveolens* open forest on alluvial levees and lower terraces	Mid-dense	0.03
8.3.6a/8.3.3a	60/40	Of concern	*Eucalyptus tereticornis* and/or *Corymbia* intermedia (or *C. clarksoniana*) and/or *C. tessellaris* +/- *Lophostemon suaveolens* open forest on alluvial levees and lower terraces	Mid-dense	0.50
non-remnant (cleared land)	100	NA	NA	NA	27.06

Non-Eucalypt Site

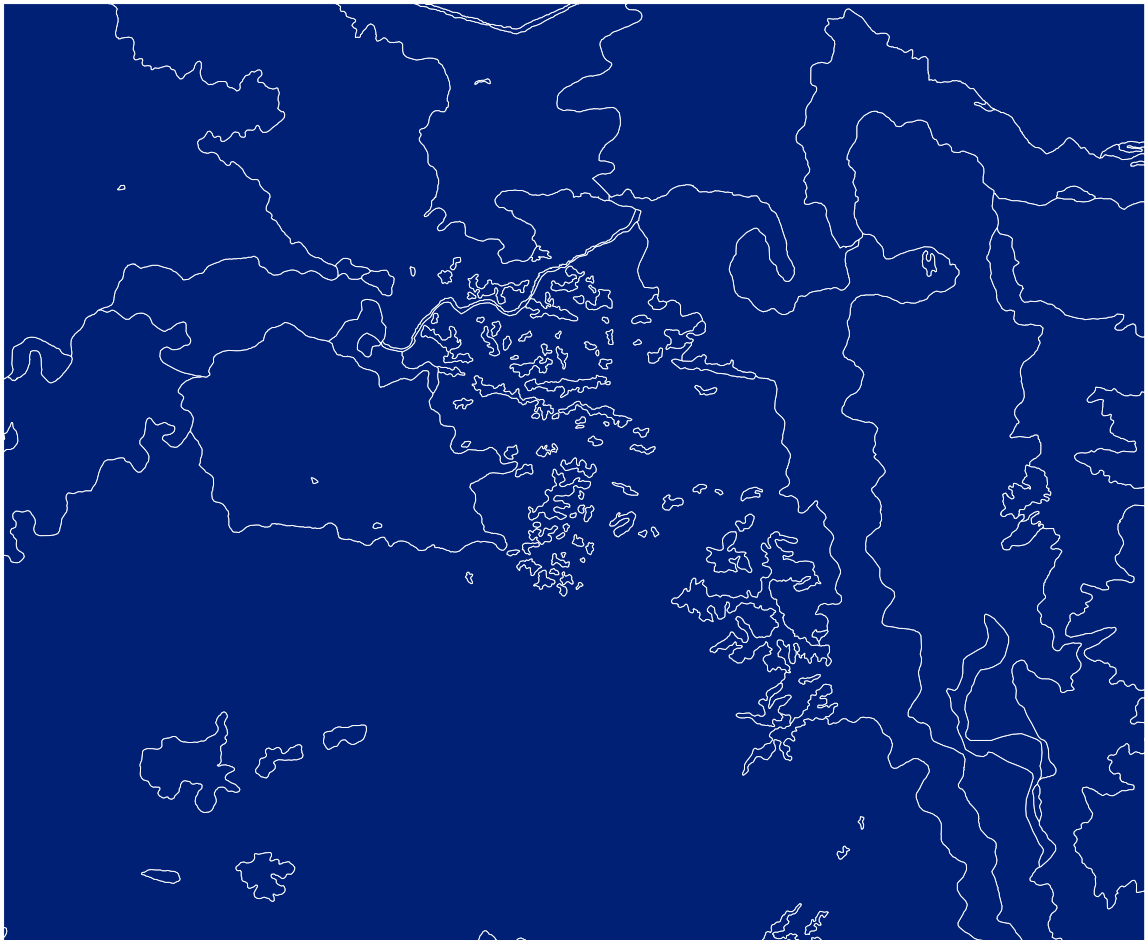

Figure S4. Non-eucalypt site from the 2017 VMRE map colored by vegetation type where blue represents areas dominated by non-eucalypt vegetation.

Table S4. Description of non-eucalypt site vegetation communities from the 2017 VMRE map.

Regional Ecosystem ID	Percent REID	Vegetation Management Class	Dominant Vegetation Community Description	Structure category	Area (km^2)
7.11.12a	100	Least concern	Simple notophyll vine forest of moist to very wet metamorphic uplands and highlands	Dense	3.41
7.11.1a	100	Least concern	Simple-complex mesophyll to notophyll vine forest on moderately to poorly drained metamorphics (excluding amphibolites) of moderate fertility of the moist and wet lowlands, foothills and uplands	Dense	7.74
7.11.26f	100	Of concern	*Allocasuarina littoralis* and *Syncarpia glomulifera* open shrubland to closed scrub or *Bombax ceiba var. leiocarpum* and *Cochlospermum gillivraei* open woodland or *Acacia* spp. shrubland on metamorphic rock pavements	Very sparse	0.052

7.12.16a	100	Least concern	Simple to complex notophyll vine forest, including small areas of *Araucaria bidwillii*, of cloudy wet and moist uplands and highlands on granites and rhyolites	Dense	50.90
7.12.16b	100	Least concern	Simple to complex notophyll vine forest, including small areas of *Araucaria bidwillii*, of cloudy wet and moist uplands and highlands on granites and rhyolites	Dense	2.24
7.12.1a	100	Least concern	Simple-complex mesophyll to notophyll vine forest of moderately to poorly-drained granites and rhyolites of moderate fertility of the moist and wet lowlands, foothills and uplands	Dense	9.78
7.12.50	100	Of concern	Simple microphyll vine-fern forest of highlands on granite and rhyolite	Dense	0.81
7.12.9	100	Of concern	*Acacia cels*a open forest to closed forest, on granites and rhyolites	Dense	0.078
7.3.17	100	Endangered	Complex mesophyll vine forest, on well-drained alluvium of high fertility	Dense	0.49
7.3.28a	100	Of concern	Rivers and streams including riparian herbfield and shrubland on river and stream bed alluvium and rock within stream beds	Other	0.03
7.3.28d	100	Of concern	Rivers and streams including riparian herbfield and shrubland on river and stream bed alluvium and rock within stream beds	Other	0.11
7.3.36a	100	Of concern	Complex mesophyll vine forest or simple notophyll vine forest of high rainfall, cloudy uplands on alluvium	Dense	0.19
7.3.49a	100	Of concern	Notophyll vine forest on rubble terraces of streams	Dense	0.02
7.8.1a	100	Least concern	Complex mesophyll to mesophyll vine forest on well-drained basalt lowlands and foothills	Dense	17.46
7.8.2a	100	Least concern	Complex mesophyll vine forest of high rainfall, cloudy uplands on basalt, including small areas of wind-sheared notophyll vine forest on ridgelines	Dense	15.62
non-remnant (cleared land)	100	NA	NA	NA	0.28

Supplementary Winter Imagery Analysis

Eucalypt Chlorophyll-a Reflectance Ratio

Receiver Operating Characteristic (ROC) Curves

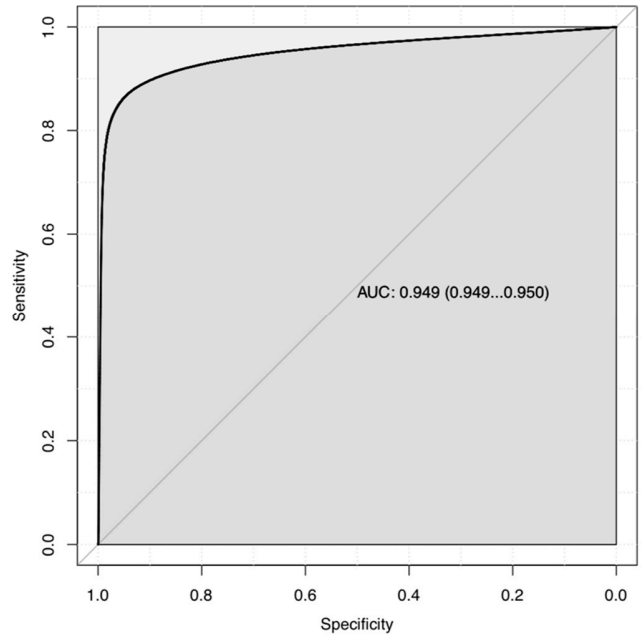

Figure S5. ROC Curve for ECARR's ability to detect eucalypt vegetation from Sentinel-2 winter imagery.

Table S5. Sentinel-2 ECARR ROC curve specificity and sensitivity for ECARR with 'best' method.

Specificity	Sensitivity	Accuracy	Negative Predictive Value	Positive Predictive Value
0.948	0.866	0.904	0.862	0.949

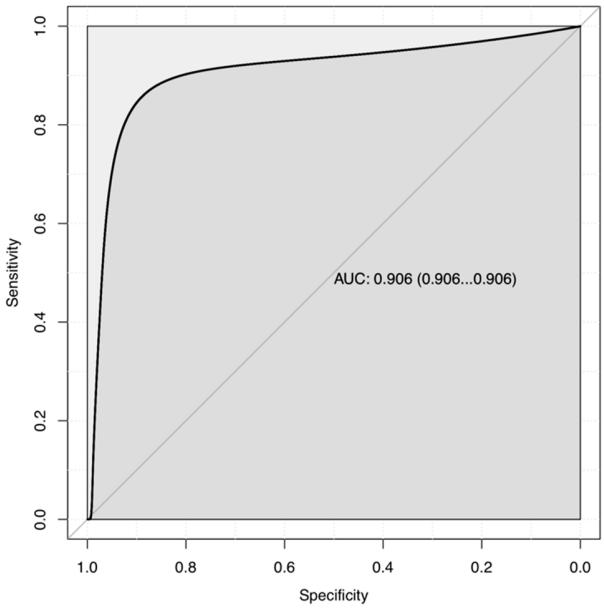

Figure S6. ROC Curve for ECARR's ability to detect eucalypt vegetation from Planet winter imagery.

Table S6. Planet ECARR ROC curve specificity and sensitivity for ECARR with 'best' method.

Specificity	Sensitivity	Accuracy	Negative Predictive Value	Positive Predictive Value
0.889	0.858	0.872	0.846	0.897

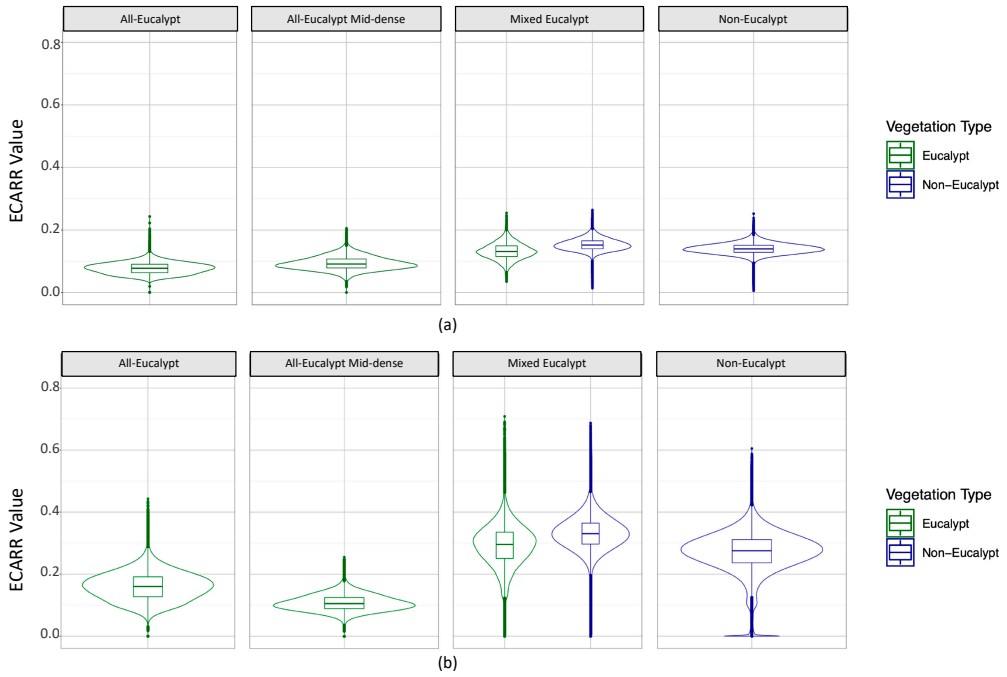

Figure S7. Violin box plots of ECARR values in winter imagery colored by vegetation type as characterized in the 2017 VMRE map with unified scale. a) ECARR values in Sentinel-2 imagery at all sites. b) ECARR values in Planet imagery at all sites.

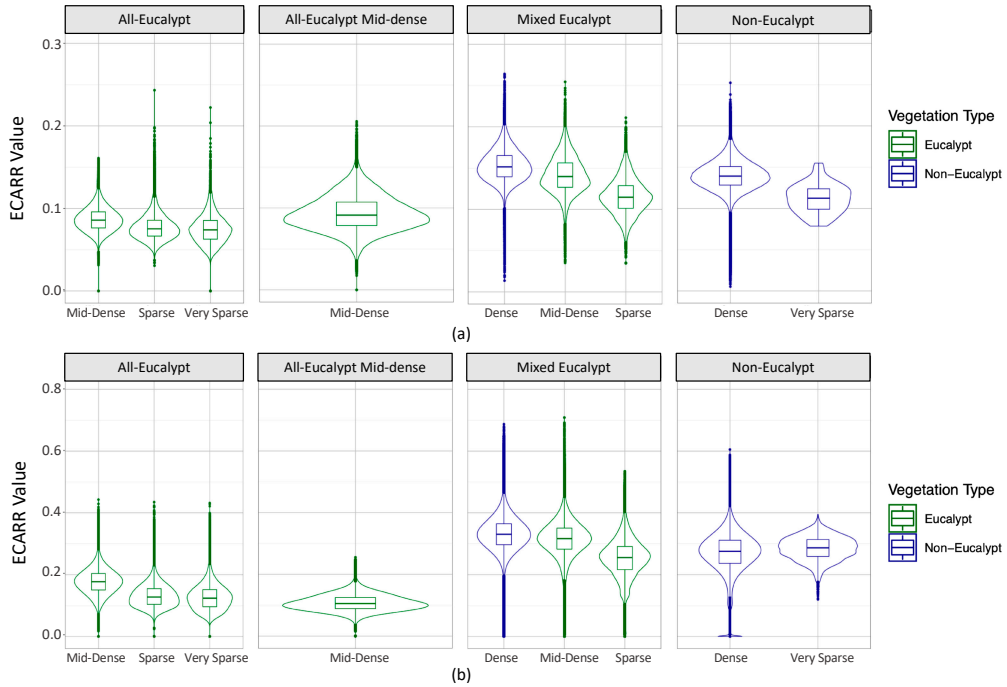

Figure S8. Violin box plots of ECARR values in winter imagery colored by vegetation type and separated by vegetation density as characterized in the 2017 VMRE map. a) ECARR values in Sentinel-2 imagery at all sites. b) ECARR values in Planet imagery at all sites.

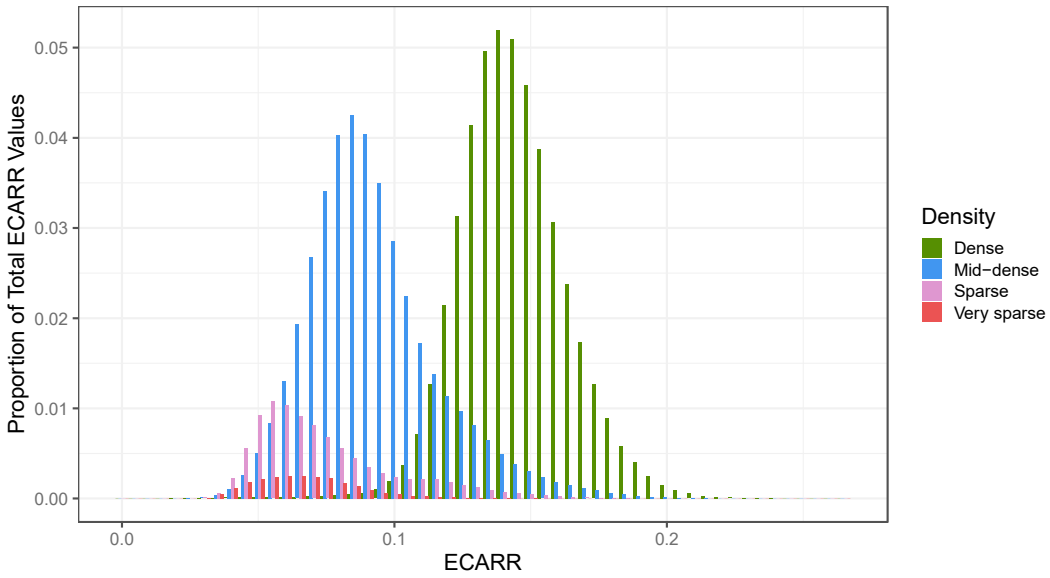

Figure S9. Sentinel-2 winter imagery ECARR value distribution across all sites colored by density structure.

Table S7. ANOVA Table (type II tests) for effect of vegetation type on ECARR for Sentinel-2 winter imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Veg Type	1	909000	1347476	0	*	0.597

Table S8. ANOVA Table (type II tests) for effect of density structure on ECARR for Sentinel-2 winter imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Density	3	908998	502989.6	0	*	0.624

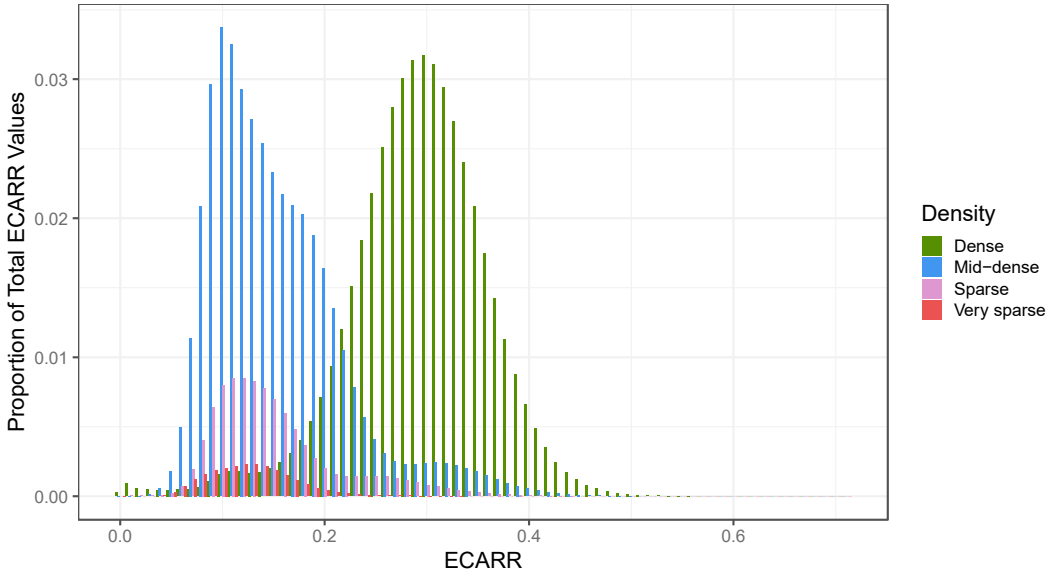

Figure S10. Planet winter imagery ECARR value distribution across all sites colored by density structure.

Table S9. ANOVA Table (type II tests) for effect of vegetation type on ECARR for Planet winter imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Veg Type	1	40218345	38447691	0	*	0.489

Table S10. ANOVA Table (type II tests) for effect of density structure on ECARR for Planet winter imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Density	3	40218343	12955457	0	*	0.491

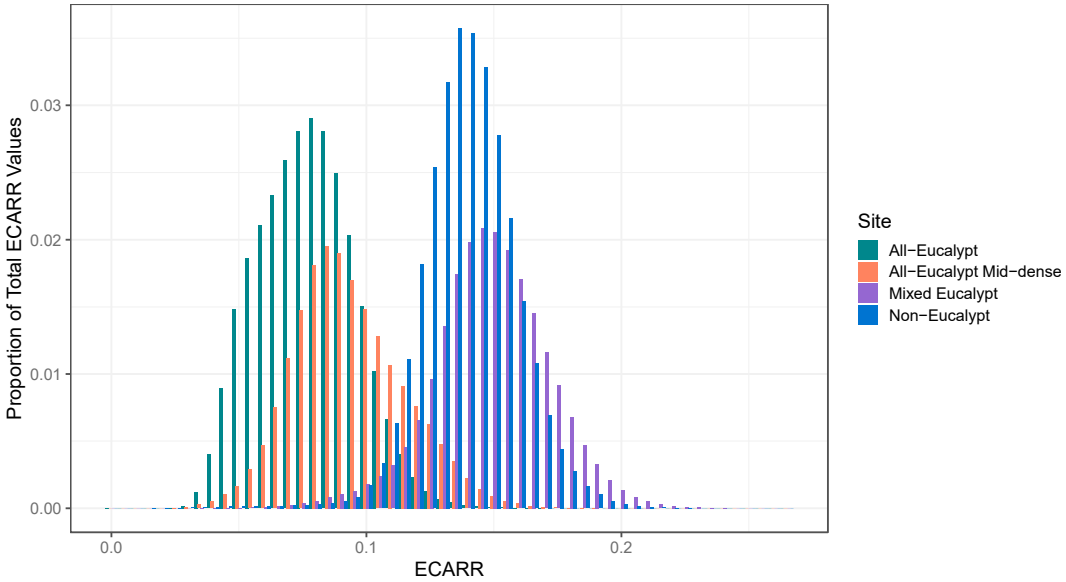

Figure S11. Sentinel-2 winter imagery ECARR value distribution across all sites colored by site.

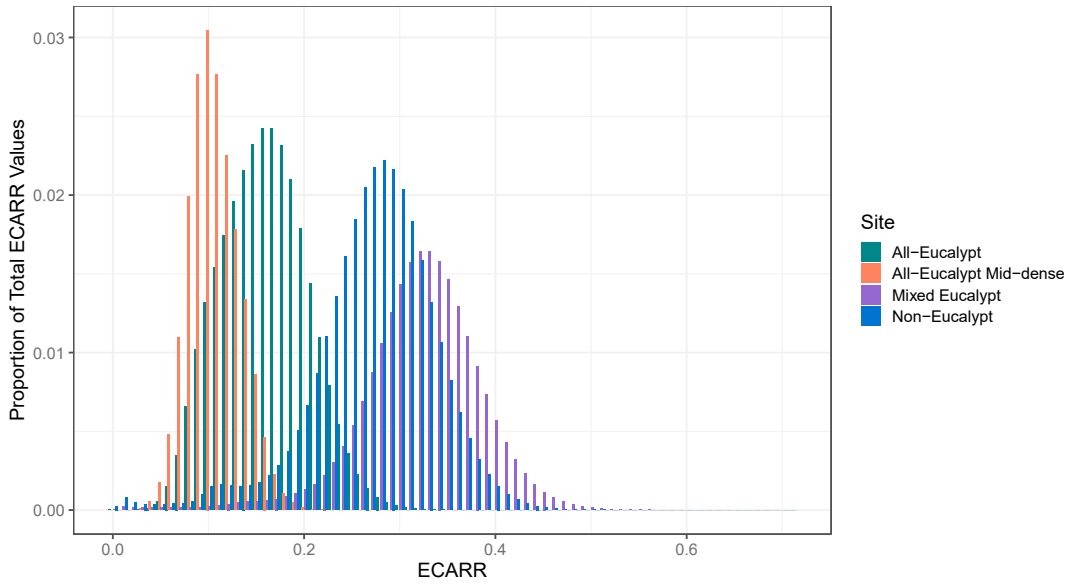

Figure S12. Planet winter imagery ECARR value distribution across all sites colored by site.

Location of 'High' ECARR Values in Mixed Eucalypt Site

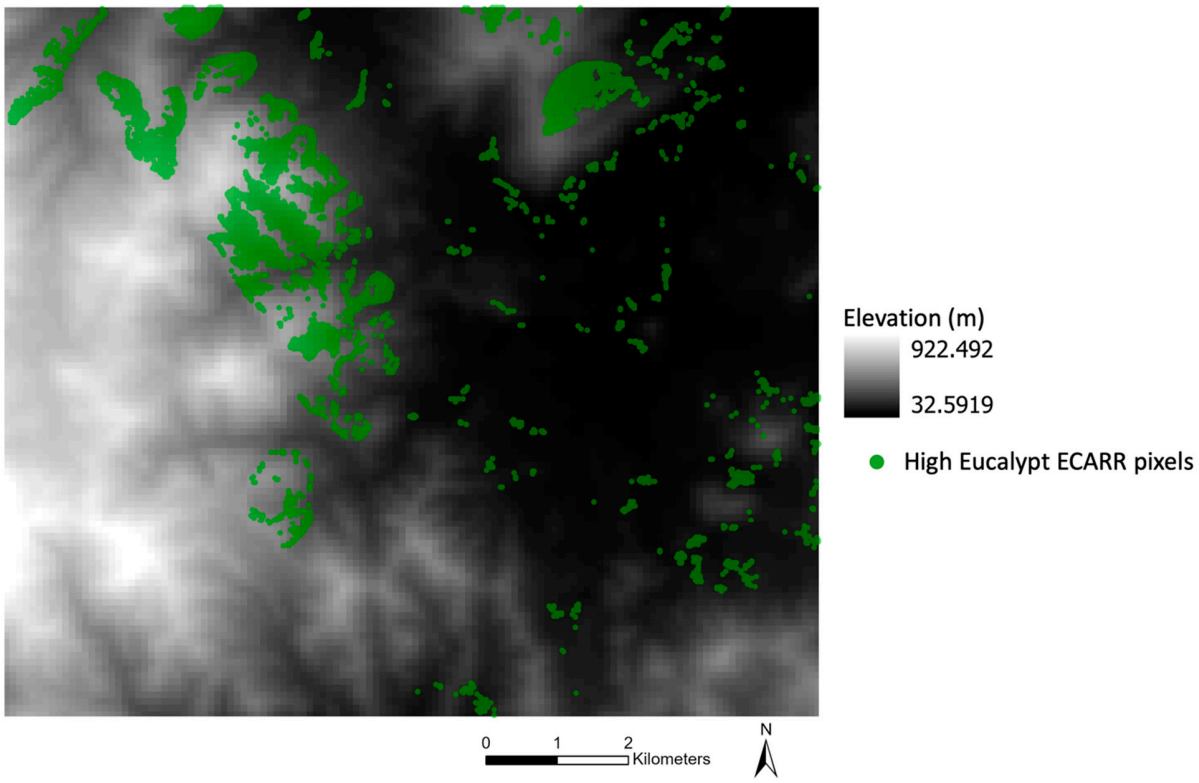

Figure S13. Mixed Eucalypt Site with Digital Elevation Model[1] **colorized with white as high elevation and black as low elevation and high ECARR values in eucalypt vegetation communities in green from Sentinel-2 winter imagery**.

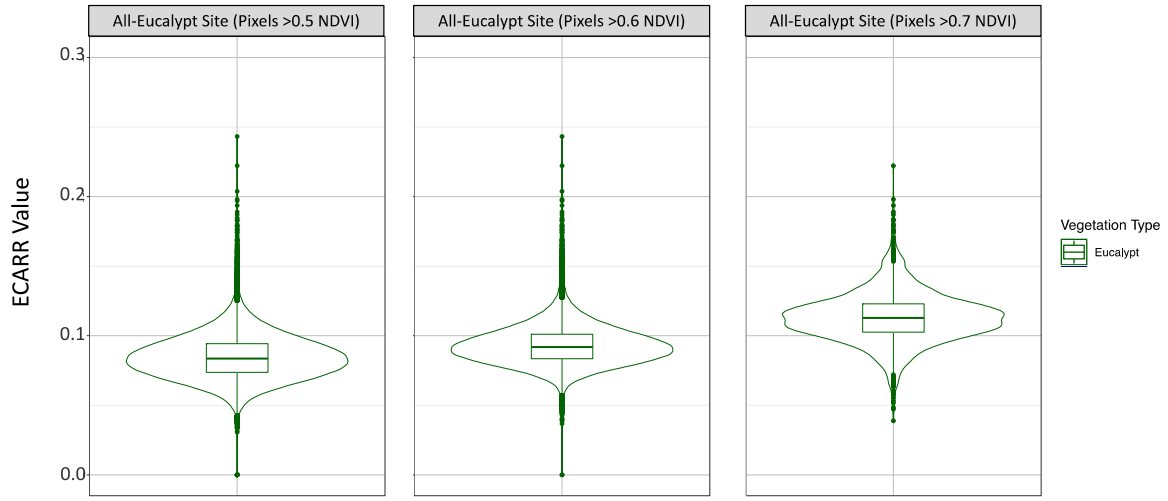

Figure S14. Violin box plots of Sentinel-2 winter imagery ECARR values in the large all-eucalypt site selected by high NDVI thresholds of that pixel.

Eucalypt Chlorophyll-b Reflectance Ratio

Receiver Operating Characteristic Curves

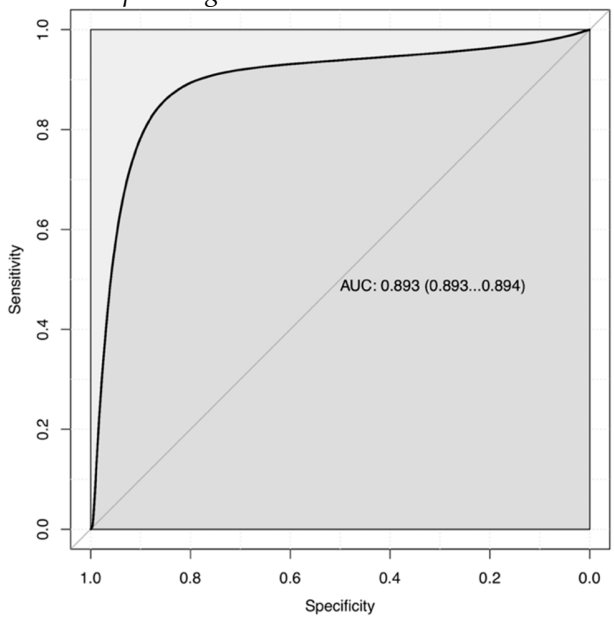

Figure S15. ROC Curve for ECBRR's ability to detect eucalypt vegetation from Sentinel-2 winter imagery.

Table S11. Sentinel 2 ECBRR ROC curve specificity and sensitivity for ECBRR on winter imagery with 'best' method.

Specificity	Sensitivity	Accuracy	Negative Predictive Value	Positive Predictive Value
0.853	0.857	0.855	0.841	0.868

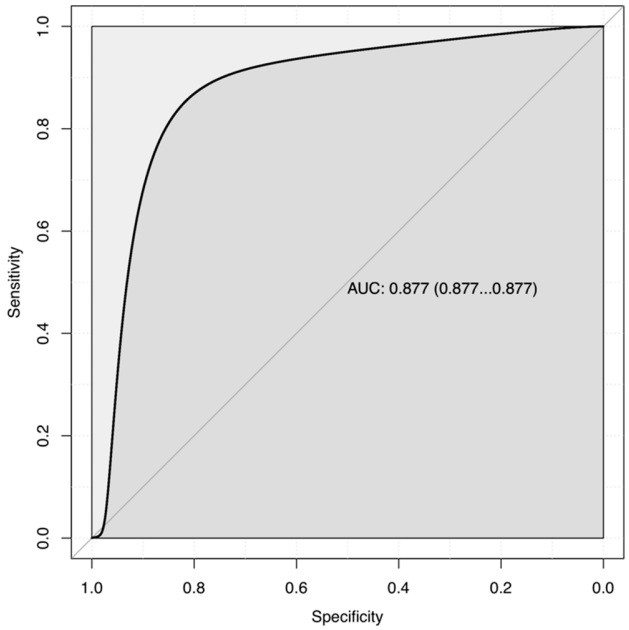

Figure S16. ROC Curve for ECBRR's ability to detect eucalypt vegetation from Planet imagery.

Table S12. Planet ECBRR ROC curve specificity and sensitivity for ECBRR on winter imagery with 'best' method.

Specificity	Sensitivity	Accuracy	Negative Predictive Value	Positive Predictive Value
0.817	0.853	0.836	0.831	0.841

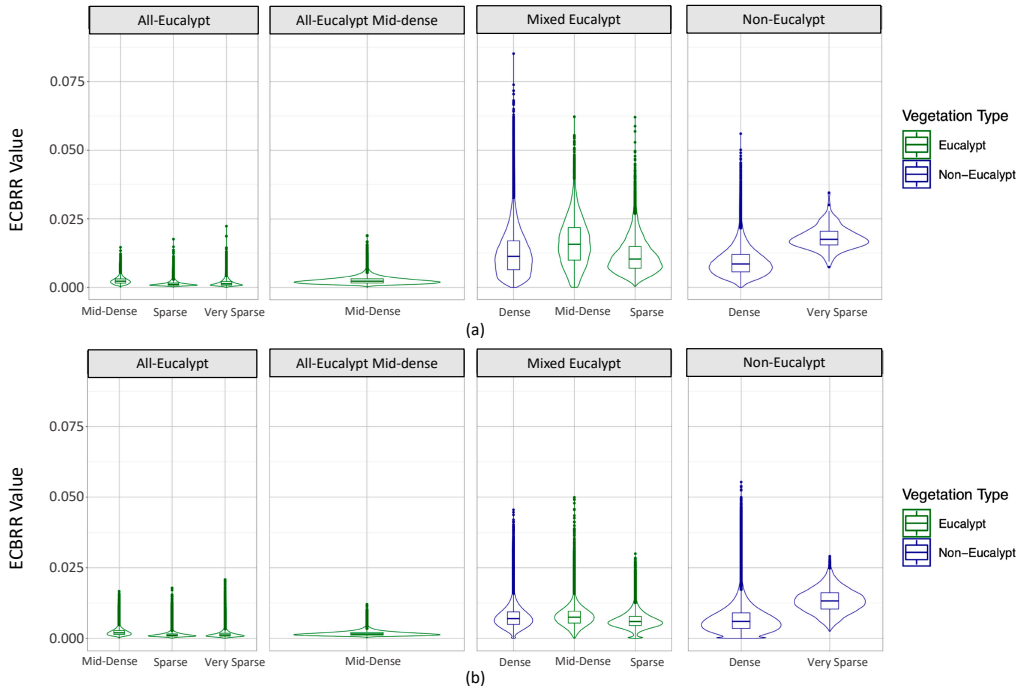

Figure S17. Violin Box plots of winter imagery ECBRR values colored by vegetation type and separated by vegetation density as characterized in 2017 VMRE map. a) ECBRR values in Sentinel-2 imagery at all sites. b) ECBRR values in Planet imagery at all sites.

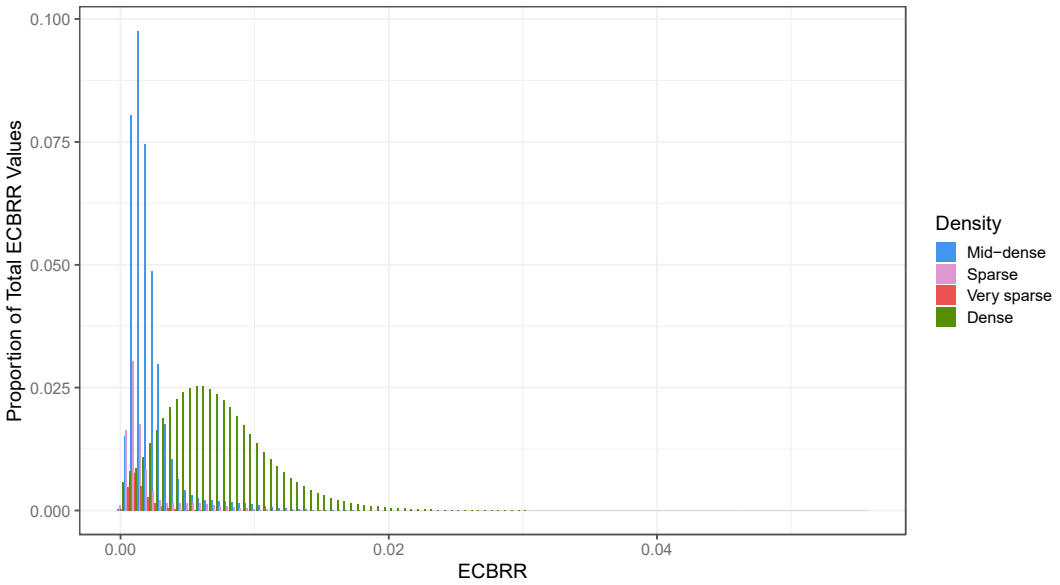

Figure S18. Sentinel-2 winter imagery ECBRR values across all sites colored by density structure.

Table S13. ANOVA Table (type II tests) for effect of vegetation type on ECBRR for Sentinel-2 winter imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Veg Type	1	908906	392769.6	0	*	0.302

Table S14. ANOVA Table (type II tests) for effect of density structure on ECBRR for Sentinel-2 winter imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Density	3	908904	131596.7	0	*	0.303

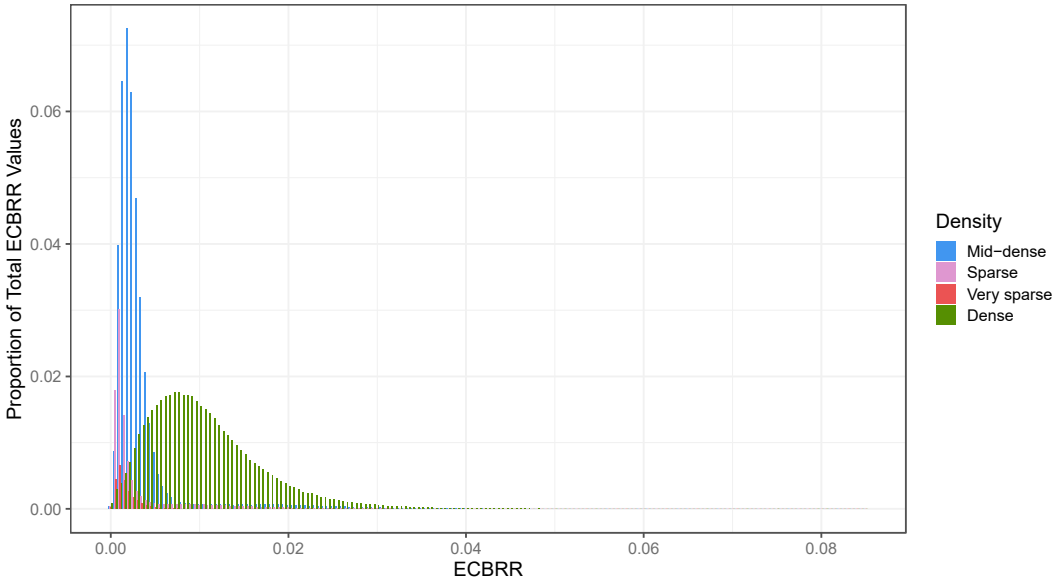

Figure S19. Planet winter imagery ECBRR values across all sites colored by density structure.

Table S15. ANOVA Table (type II tests) for effect of vegetation type on ECBRR for Planet winter imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Veg Type	1	40218340	22282946	0	*	0.357

Table S16. ANOVA Table (type II tests) for effect of density structure on ECBRR for Planet winter imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Density	3	40218338	7438729	0	*	0.357

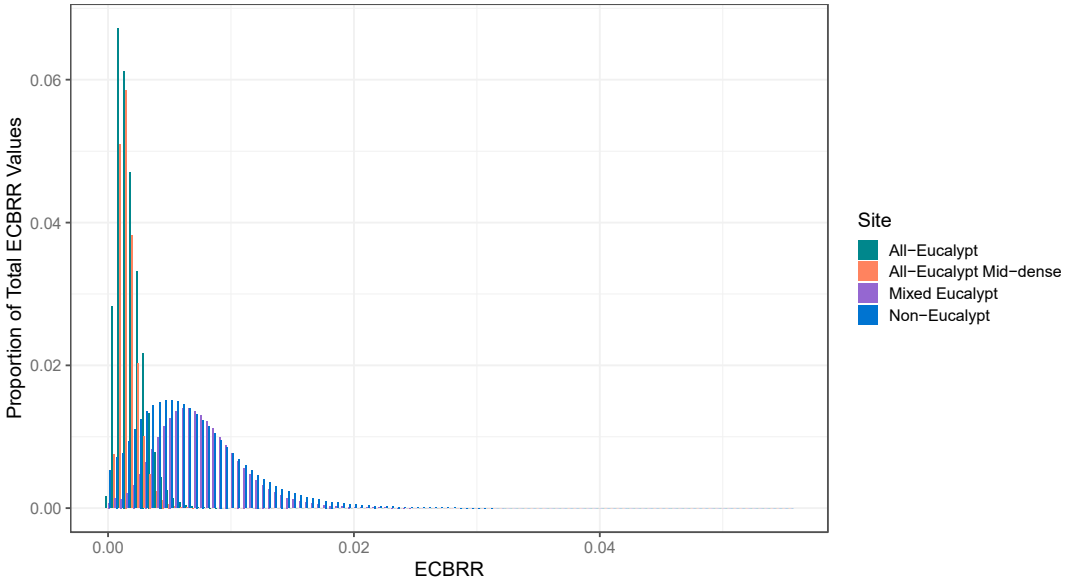

Figure S20. Sentinel-2 winter imagery ECBRR values across all sites colored by site.

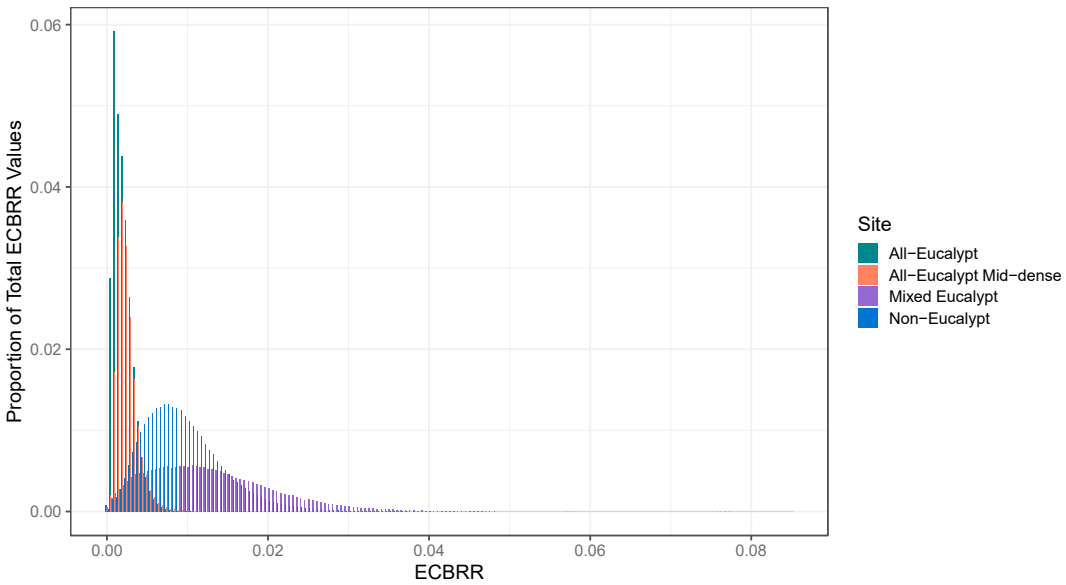

Figure S21. Planet winter imagery ECBRR values across all sites colored by site.

Location of 'High' ECBRR Values in Mixed Eucalypt Site

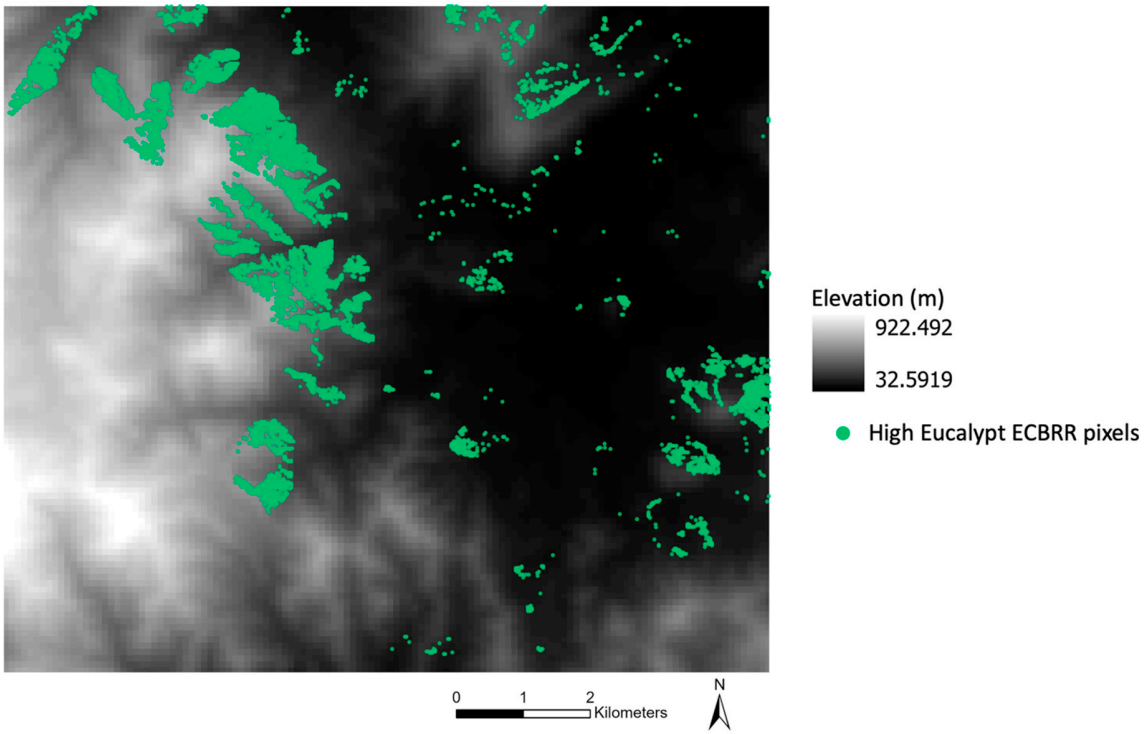

Figure S22. Mixed Eucalypt Site with Queensland Digital Elevation Model [1] **colorized with white as high elevation and black as low elevation and high ECBRR values in eucalypt vegetation communities in green from Sentinel-2 winter imagery.**

Normalized Difference Vegetation Index

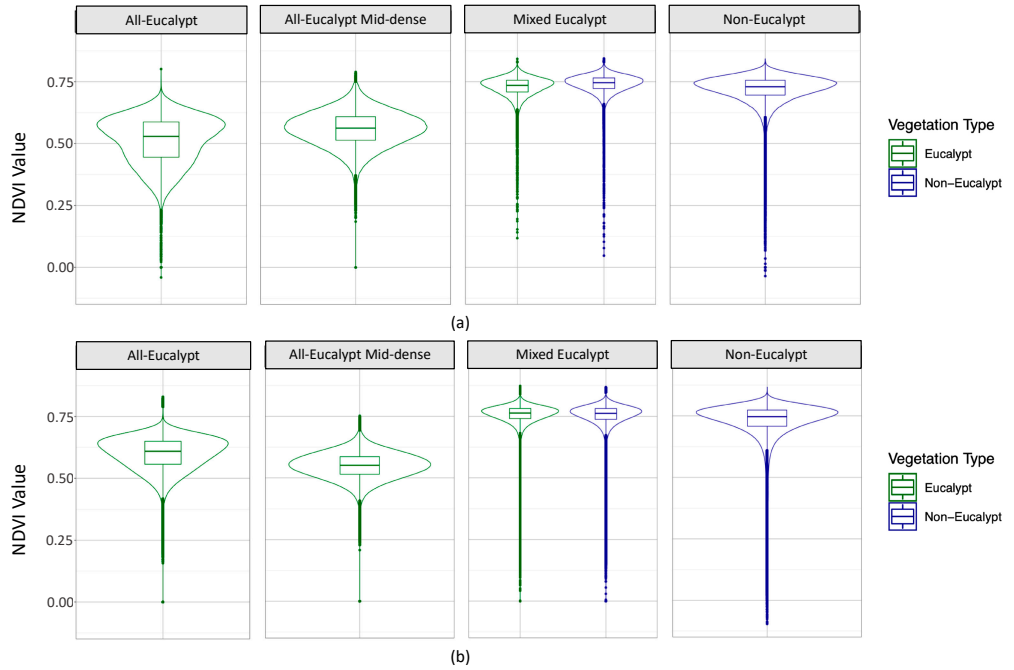

Figure S23. Violin Box plots of winter imagery NDVI values colored by vegetation type. a) NDVI values in Sentinel-2 winter imagery at all sites. b) NDVI values in Planet imagery at all sites.

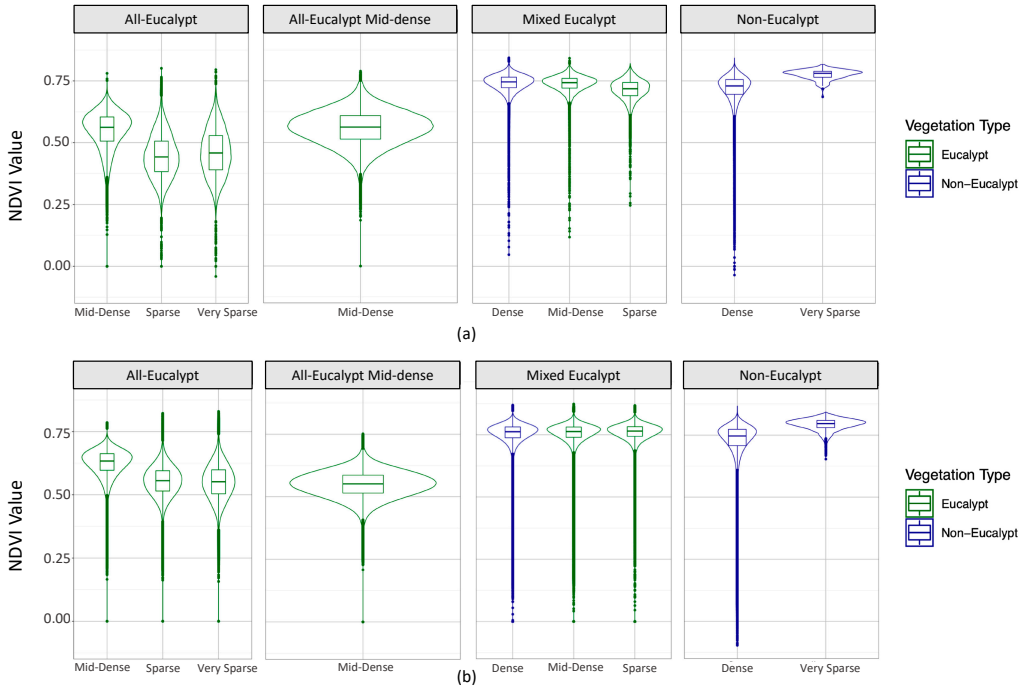

Figure S24. Violin Box plots of winter imagery NDVI values colored by vegetation type and separated by vegetation density as characterized in 2017 VMRE map. a) NDVI values in Sentinel-2 winter imagery at all sites. b) NDVI values in Planet imagery at all sites.

Late Spring/Summer Imagery Analysis Results

Eucalypt Chlorophyll-a Reflectance Ratio

Table S17. Eucalypt Chlorophyll-*a* Reflectance Ratio value ranges and mean of late spring/summer imagery for the three large sites and both satellite sensors.

Satellite	ECARR Values	Large All- Eucalypt Site	Mixed Eucalypt Site	Non-Eucalypt Site
Sentinel-2	Maximum	0.181	0.126	0.162
	Minimum	0.000	0.000	0.000
	Mean	0.066	0.072	0.094
Planet	Maximum	0.228	0.464	0.376
	Minimum	0.000	0.000	0.000
	Mean	0.070	0.222	0.212

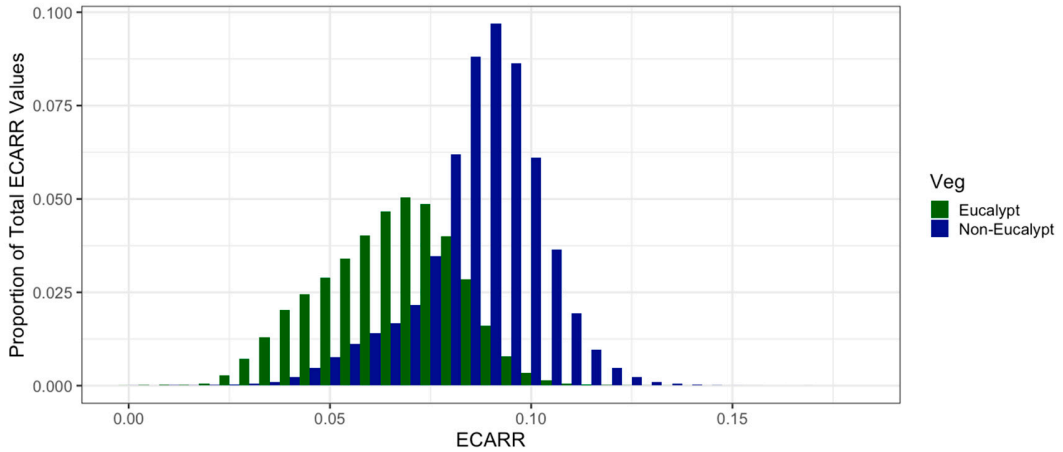

Figure S25. Sentinel-2 late spring/summer imagery ECARR values across three large sites colored by vegetation type.

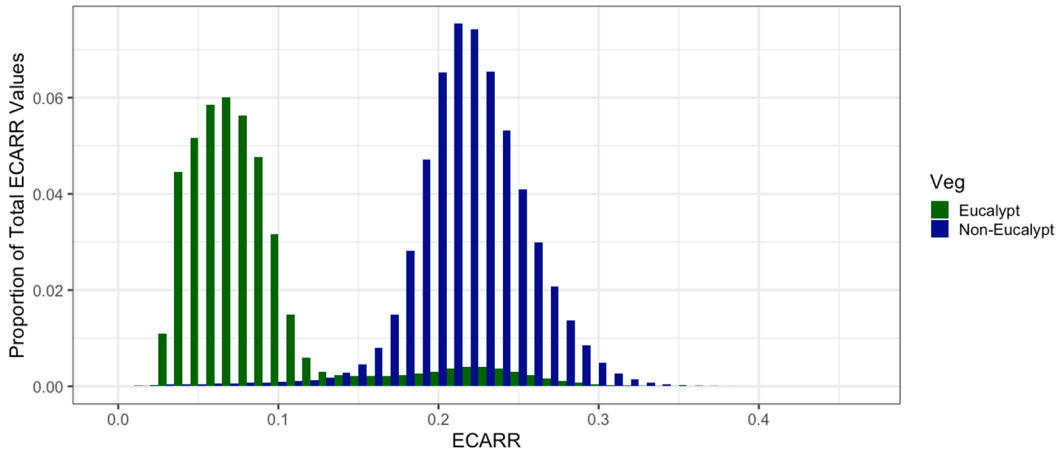

Figure S26. Planet late spring/summery imagery ECARR values across three large sites colored by vegetation type.

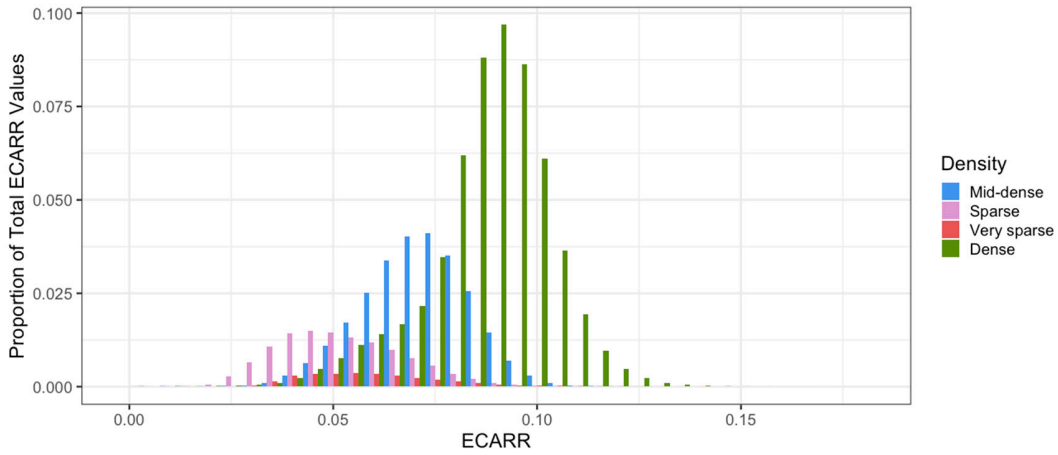

Figure S27. Sentinel-2 late spring/summer imagery ECARR values across three large sites colored by density.

Table S18. ANOVA Table (type II tests) for vegetation type on ECARR for Sentinel-2 late spring/summer imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Veg Type	1	732746	363418	0	*	0.332

Table S19. ANOVA Table (type II tests) for effect of density structure on ECARR for Sentinel-2 late spring/summer imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Density	3	732744	171830	0	*	0.413

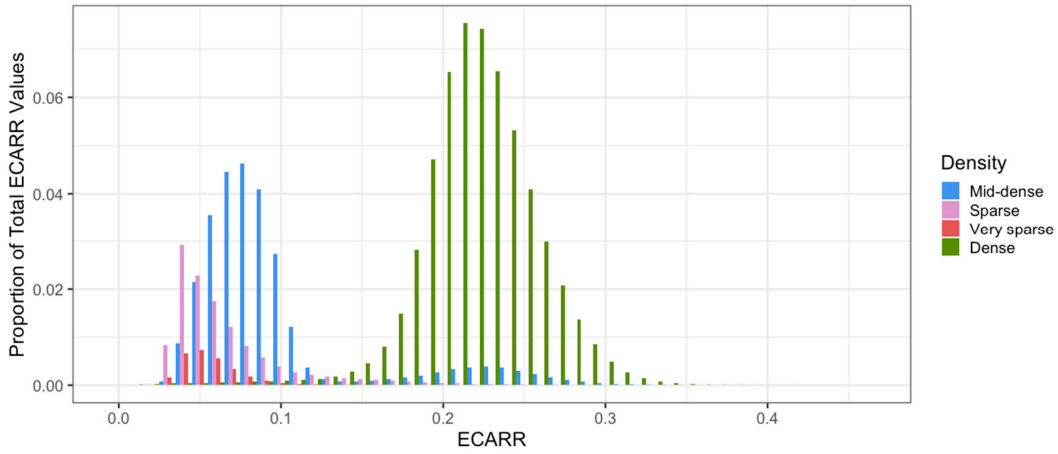

Figure S28. Planet late spring/summer imagery ECARR values across three large sites colored by density.

Table S20. ANOVA Table (type II tests) for vegetation type on ECARR for Planet late spring/summer imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Veg	1	31194010	78507094	0	*	0.716

Table S21. ANOVA Table (type II tests) for effect of density structure on ECARR for Planet late spring/summer imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Density	3	31194008	28234456	0	*	0.731

Eucalypt Chlorophyll-b Reflectance Ratio

Table S22. Eucalypt Chlorophyll-*b* Reflectance Ratio value ranges and mean of late spring/summer imagery for the three large sites and both satellite sensors.

Satellite	ECBRR Value	Large All- Eucalypt Site	Mixed Eucalypt Site	Non-Eucalypt Site
Sentinel-2	Maximum	0.024	0.015	0.034
	Minimum	0.000	0.000	0.000
	Mean	0.003	0.004	0.011
Planet	Maximum	0.010	0.029	0.023
	Minimum	0.000	0.000	0.000
	Mean	0.001	0.006	0.006

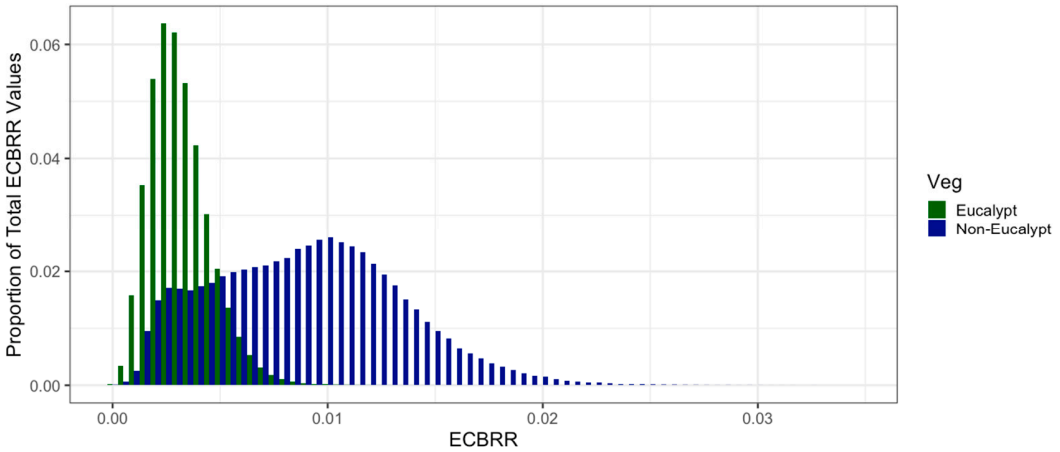

Figure S29. Sentinel-2 late spring/summer imagery ECBRR values across three large sites colored by vegetation type.

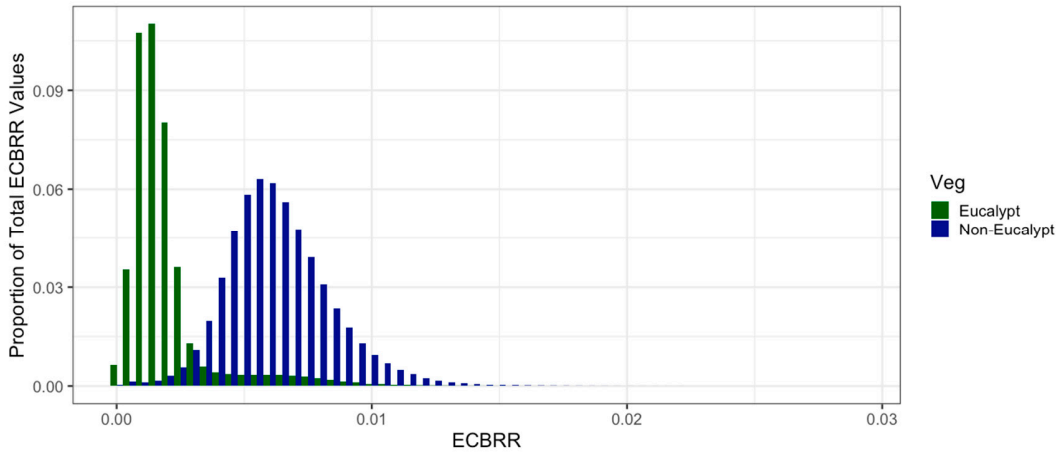

Figure S30. Planet late spring/summer imagery ECBRR values across three large sites colored by vegetation type.

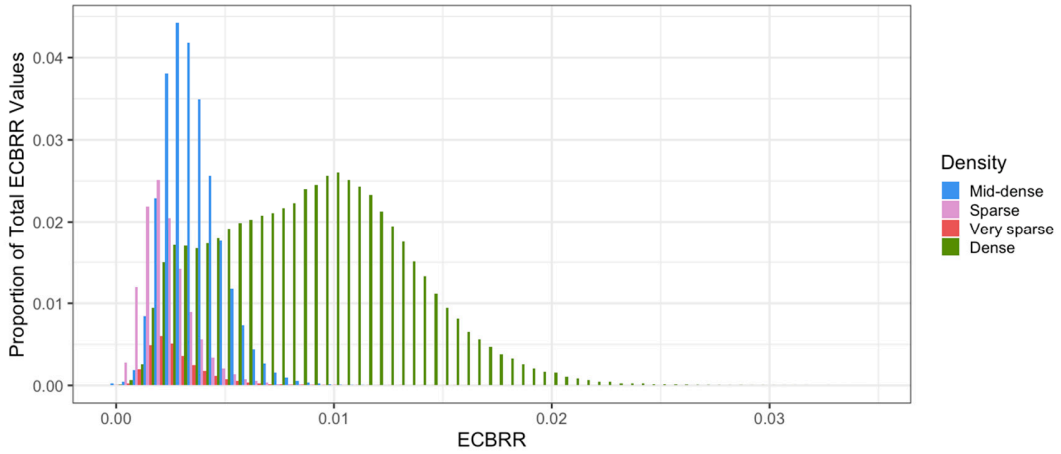

Figure S31. Sentinel-2 late spring/summer imagery ECBRR values across three large sites colored by density.

Table S23. ANOVA Table (type II tests) for effect of density structure on ECBRR for Sentinel-2 late spring/summer imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Veg Type	1	732704	496814	0	*	0.404

Table S24. ANOVA Table (type II tests) for effect of density structure on ECBRR for Sentinel-2 late spring/summer imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Density	3	732702	169557	0	*	0.410

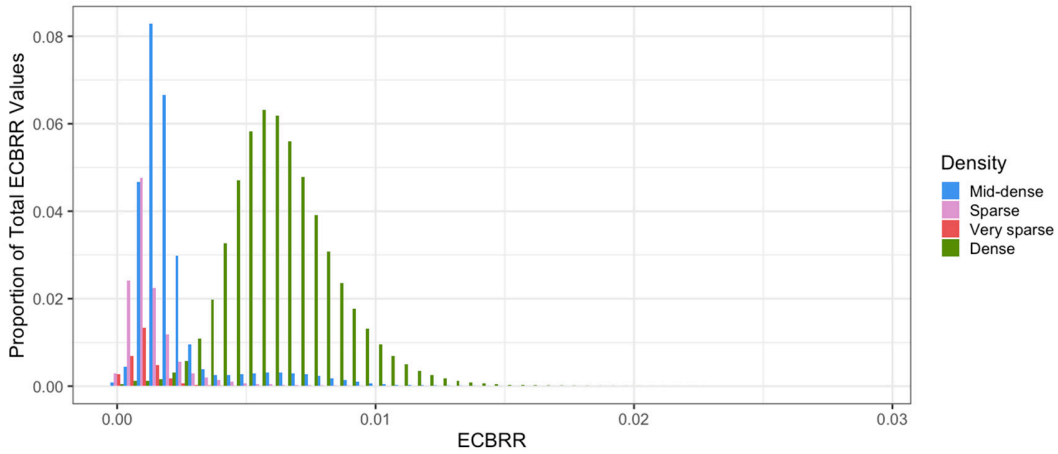

Figure S32. Planet late spring/summer imagery ECBRR values across three large sites colored by density.

Table S25. ANOVA Table (type II tests) for effect of density structure on ECBRR for Planet late spring/summer imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Veg Type	1	31194010	39408015	0	*	0.558

Table S26. ANOVA Table (type II tests) for effect of density structure on ECBRR for Planet late spring/summer imagery.

Effect	Degrees of Freedom (n)	Degrees of Freedom (d)	F	p	p<.05	Generalized Effect Size
Density	3	31194008	13720996	0	*	0.569

Table S27. Normalized Difference Vegetation Index value ranges and mean of late spring/summer imagery for the three large sites and both satellite sensors.

Satellite	NDVI Value	Large All- Eucalypt Site	Mixed Eucalypt Site	Non-Eucalypt Site
Sentinel-2	Maximum	0.810	0.770	0.853
	Minimum	0.190	0.106	-0.062
	Mean	0.534	0.599	0.720
Planet	Maximum	0.760	0.836	0.856
	Minimum	0.045	0.129	-0.768
	Mean	0.485	0.721	0.728

REFERENCES:

1. Department of Natural Resources, Mines, and E. Digital elevation model - 3 second - Queensland 2020.