

AusCover Supersite and Data Information

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1. Introduction

The AusCover Earth Observation facility has undertaken 12 field and airborne campaigns within selected Australian biomes since January 2011 as part of the calibration and validation program to support the production of continental scale satellite based time-series of biophysical parameters. Many national and international approaches were reviewed during the development phase, and the field and airborne data collection approaches and protocols developed have been based on their suitability and adaptability to different Australian environments, while still upholding national and international standards. The data collection approaches used are presented in the AusCover Good Practice Guidelines (http://www.tern.org.au/rs/7/sites/998/user_uploads/File/pdfs/AusCoverGoodPracticeGuidelines_2015_2.pdf). Another focus was also to ensure the data collected were suitable to multiple uses and purposes to support a wide range of ecosystem science, research and environmental management activities in Australia. This document provides an overview of AusCover Supersites visited and the data collected for each of these sites.






2. General Site Information






AusCover has carried out 12 extensive airborne and field campaigns in Australia (Figure 1). Each supersite was selected to represent a dominant and/or conservation significant biome (Table 1) suitable for scaling up from field and airborne measurements to continental scale map products for calibration and validation purposes. Another focus by AusCover has been to ensure that the collection of ~~high Comments and~~ high spatial resolution field and airborne data of the selected biomes would encourage, foster and support ongoing and future research.







Figure 17.1 Map of Australia showing the location of field and airborne campaign sites carried out by AusCover since January 2011.

Table 17.1 Site name, location, data collection date, type of environment, and photos of each of the AusCover sites.

Site name	Site location	Date(s)	Environment	Site Photo
Tumbarumba	South eastern New South Wales, 100 km south west of Canberra	10-14 Jan 2011	Temperature wet sclerophyll eucalypt forest with average tree height of 40 m. <i>Eucalyptus delegatensis</i> is the dominant species. http://www.tern-supersites.net.au/supersites/tumb	
Chowilla (Calperum Mallee)	North of the River Murray floodplains north of Renmark, South Australia	30 Jan - 3 Feb 2012	Semi-arid mallee ecosystem in dune and swale system covered with an open mallee woodland upper story with a chenopod and native grass understory. http://www.tern-supersites.net.au/supersites/clpm	
Watts Creek	70 km east of Melbourne, Victoria	5-9 Mar, 13-20 Apr, 1-3, 7 May and 9-16 Sep 2012	Open forest with a eucalypt overstorey greater than 40 m in height consisting mainly of mountain ash.	
Rushworth Forest	120 km north of Melbourne, Victoria	15 Apr, 3-6 May, 31 May and 6 Jun 2012	Open forest of red iron bark, red stringybark, red box, long leaf box and grey box.	
Zig Zag Creek	Eastern Victoria 300 km east of Melbourne, Victoria	16-20 Apr 2012	Dominated by shrubby dry forest and damp forest on the upland slopes, wet forest ecosystems which are restricted to the higher altitudes and grassy woodlands, grassy dry forest and valley grassy forest ecosystems are associated with major river valleys.	

Site name	Site location	Date(s)	Environment	Site Photo
Credo (Great Western Woodlands)	Great Western Woodland 500 km north west of Perth, Western Australia	12-18 May 2012	Open woodland inter-dispersed with open, treeless areas. The main vegetation species are Salmon Gums reaching up to 20 m and Gimlet between 5-10 m, both with little understory. Salt bush and similar shrubs are also prevalent. http://www.tern-supersites.net.au/supersites/gwwl	
Robson Creek	Lamb Range in the Wet Tropics World Heritage area 25 km south west of Cairns, Queensland	9-16 Sep 2012	Upland rainforest region at 700 m elevation. Notophyll vine forest with a tall canopy at around 40 m and high species diversity. http://www.tern-supersites.net.au/supersites/fnqr/robson	
South East Queensland	Multiple sites in South East Queensland, located in the Samford Valley, Karawatha Forest, and two mangrove sites near Brisbane Airport.	21 Jan 2013 - 6 Feb 2013	Samford site: on an improved (<i>Paspalum dilatatum</i>) pasture with tall eucalypt species. Karawatha Forest: bushland with tall eucalypt species and patches of heathlands and <i>Melaleuca</i> swamps. Mangrove sites: Within Moreton Bay with <i>Avicennia marina</i> being the dominant mangrove. http://www.tern-supersites.net.au/supersites/seqp	  

Site name	Site location	Date(s)	Environment	Site Photo
Litchfield	80 km south of Darwin, Northern Territory	27 May - 2 Jun 2013	Savanna, eucalypt open forests, dominated by <i>Eucalyptus miniata</i> and <i>Eucalyptus tetradonta</i> . http://www.tern-supersites.net.au/supersites/lfld	
Alice Mulga	165 km north-northwest of Alice Springs, Northern Territory	Not visited yet, but airborne LiDAR collected	Mulga (<i>Acacia aneura</i>) canopy, which is 6.5m tall on average. http://www.tern-supersites.net.au/supersites/alic	
Warra	60 km east-southeast of Hobart, Tasmania	2-6 Feb 2015	Homogenous tall, wet <i>Eucalyptus obliqua</i> forest with wet sclerophyll / rainforest understorey. http://www.tern-supersites.net.au/supersites/wrra	
Injune	170 km northwest of Roma, central southeast Queensland	17-22 Aug 2015	Low open woodland, open woodland, woodland and open forest. Forests with <i>Eucalyptus</i> species dominate the more productive soils and <i>Callitris glaucophylla</i> occurs on the poorer sandy soils. Brigalow occurs on clay soils. Within open forests, Iron barks are frequent. https://www.ecosystem.unsw.edu.au/content/landscape-synthesis/remote-sensing/the-injune-landscape-collaborative-project	

3. Data Collection

3.1 Tumbarumba

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	9 Jan 2011	Discrete return		Las, tif
Hyper-spectral	7 April 2011	Hymap		bsq

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS Start transects	8-14 January 2011	AusCover Protocol		Database and Photos
Hemispheric photos	8-14 January 2011	For testing		Database and Images
Licor-2200	8-14 January 2011	For testing only		Database and Images
Tree Structure	8-14 January 2011	Not according to protocol		Database and Photos
Microtops AOD	7 April 2011	Coincidental with HS data capture		Database and Text
Spectrometer measurements of ground calibration targets	7 April 2011	Coincidental with HS data capture		Database and Raw Data
Other data that may be available: Vegnet; DWEL TLS	August 2014		Mick S	

3.2 Chowilla

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	31 Jan & 1 Feb 2012	Full waveform		Las, fwf, tif
Hyper-spectral	31 Jan and 1 Feb 2011	Suffered from severe turbulence during capture		bsq
Hyper-spectral	24 Sep 2013	Update processing workflow		bsq

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS Star transects	30 Jan - 3 Feb 2012	AusCover Protocol		Database and Photos
Hemispheric photos	30 Jan - 3 Feb 2012	AusCover Protocol (additional infrared photos)		Database and Images
LAI derived from Hemispheric photos	30 Jan - 3 Feb 2012	CanEye		HTML
Terrestrial Laser scanning	17-18 Dec 2012			Database and scans
Tree Structure	30 Jan - 3 Feb 2012	AusCover Protocol		Database and Photos
Microtops AOD and Ozone	30 Jan - 3 Feb 2012	AusCover Protocol		Database and text
Spectrometer measurements of ground calibration targets	30 Jan - 3 Feb 2012	AusCover Protocol		Database and Raw Data
Phenology camera data	Set up 30 Jan - 3 Feb 2012	Not yet available	Alfredo Huete	

3.3 Watts Creek

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	14 Apr 2012	Full waveform		Las, fwf, tif
Hyper-spectral	14 Apr 2012			bsq

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
Hemispheric photos	18 Apr 2012	Not AusCover Protocol		Database and Images
Course woody debris	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Field form document
Tree Structure	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Database and Site Photos
Physical and Biotic characteristics	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Field form document
Post-fire recovery	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Field form document
Ground cover	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Field form document
Litter	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Field form document
Species	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Field form document
Tree canopy health	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Field form document
Tree canopy cover	7 Mar 2012 and 16-19 Apr 2012	Not AusCover Protocol – additional field data collection protocol available		Field form document

3.4 Rushworth Forest

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	15 Apr 2012	Full waveform		Las, fwf, tif
Hyper-spectral	15 Apr 2012			bsq

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS	27 Sep 2011 – 1 Nov 2011	AusCover Protocol		Database and Photos
Hemispheric photos	31 May 2012 and 6 Jun 2012 and 8 Jun 2012 and 5 Jul 2012	Not AusCover Protocol		Database and Images
Course woody debris (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11-12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document
Tree Structure (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11-12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document
Physical and Biotic characteristics (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11-12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document
Post-fire recovery (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11-12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document
Ground cover (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11-12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document
Litter (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11-12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document
Species (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11-12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document
Tree canopy health (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11-12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document

Tree canopy cover (VIC forest inventory)	27 Sep 2011 – 1 Nov 2011 and 11- 12 Oct 2011	Not AusCover Protocol – additional field data collection protocol available		Field form document
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3.5 Zig Zag Creek

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	17 Apr 2012	Full waveform		Las, fwf, tif
Hyper-spectral	17 Apr 2012			bsq

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS	16-20 Apr 2012	AusCover Protocol		Database and Photos
Hemispheric photos	16-20 Apr 2012	AusCover Protocol		Database and Images
Phenology camera data	Set up 16-20 Apr 2012	Not yet available on portal	Alfredo Huete	
Microtops AOD and Ozone	16-20 Apr 2012	AusCover Protocol		Database and text
Spectrometer measurements of ground calibration targets	16-20 Apr 2012	AusCover Protocol		Database and Raw Data
LAI derived from Hemispheric photos	16-20 Apr 2012	CanEye		HTML
Leaf sampling	16-20 Apr 2012	Not yet available on portal	Kara Youngentob	
Course woody debris (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep 2011 and 21-24 Sep 2011.	Not AusCover Protocol – additional field data collection protocol available		Field form document
Tree Structure (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep 2011 and 21-24 Sep 2011.	Not AusCover Protocol – additional field data collection protocol available		Field form document
Physical and Biotic characteristics (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep	Not AusCover Protocol – additional field data collection		Field form document

	2011 and 21-24 Sep 2011.	protocol available		
Post-fire recovery (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep 2011 and 21-24 Sep 2011.	Not AusCover Protocol – additional field data collection protocol available		Field form document
Ground cover (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep 2011 and 21-24 Sep 2011.	Not AusCover Protocol – additional field data collection protocol available		Field form document
Litter (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep 2011 and 21-24 Sep 2011.	Not AusCover Protocol – additional field data collection protocol available		Field form document
Species (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep 2011 and 21-24 Sep 2011.	Not AusCover Protocol – additional field data collection protocol available		Field form document
Tree canopy health (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep 2011 and 21-24 Sep 2011.	Not AusCover Protocol – additional field data collection protocol available		Field form document
Tree canopy cover (VIC forest inventory)	27-29 Jul 2011, 1-5 Aug 2011, 16 Aug 2011, 25 Aug 2011, 8 Sep 2011, 12 Sep 2011 and 21-24 Sep 2011.	Not AusCover Protocol – additional field data collection protocol available		Field form document

3.6 Credo

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	15 May 2012	Full waveform		Las, fwf, tif
Hyper-spectral	15 May 2012			bsq

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS Star transects	12-18 May 2012	AusCover Protocol		Database and Photos
Hemispheric photos	12-18 May 2012	AusCover Protocol		Database and Images
LAI derived from Hemispheric photos	12-18 May 2012	CanEye		HTML
Tree Structure	12-18 May 2012	AusCover Protocol		Database and Photos
Microtops AOD and Ozone	12-18 May 2012	AusCover Protocol		Database and text
Spectrometer measurements of ground calibration targets	12-18 May 2012	AusCover Protocol		Database and Raw Data

3.7 Robson Creek

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	13 & 14 Sep 2012	Full waveform		Las, fwf, tif
Hyper-spectral	13 & 14 Sep 2012			bsq
UAV	14 Aug – 2 Sep 2015	Not yet uploaded to portal		

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS Star transects	9-16 Sep 2012	AusCover Protocol		Database and Photos
Hemispheric photos	9-16 Sep 2012	AusCover Protocol		Database and Images
LAI derived from Hemispheric photos	9-16 Sep 2012	CanEye		HTML
Licor-2200	9-16 Sep 2012	Only selected transects - Still to be uploaded	Bec to check	
CI-110	9-16 Sep 2012		Bec	Database and Images
Terrestrial Laser scanning	9-16 Sep 2012	AusCover Protocol		Database and Scans
Tree Structure	9-16 Sep 2012	AusCover Protocol, but limited by environment – height and crown dimension not possible		Database and Photos
Microtops AOD and Ozone	9-16 Sep 2012	AusCover Protocol		Database and Text
Spectrometer measurements of ground calibration targets	9-16 Sep 2012	AusCover Protocol		Database and Raw Data
Leaf sampling	9-16 Sep 2012	Not yet uploaded to portal	Kara Youngentob	

3.8 South East Queensland

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR (Karawatha Forest)	5 Oct 2013	Full waveform		Las, fwf, tif
Hyper-spectral	2 Feb 2013			bsq
Thermal (day and night time)	2 Feb 2013			tif

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS Star transects	21 Jan 2013 – 6 Feb 2013	AusCover Protocol		Database and Photos
Hemispheric photos	21 Jan 2013 – 6 Feb 2013	AusCover Protocol		Database and Images
LAI derived from Hemispheric photos	21 Jan 2013 – 6 Feb 2013	CanEye		HTML
Terrestrial Laser scanning (Karawatha Forest)	2 Apr – 2 Jun 2013 (AusCover), 29 Jul – 1 Aug 2013 (TLSIIG experiment), 8-9 Oct 2013 (coincident with ALS data acquisition), 23 Sep 2014 (OzDWEL)	AusCover Protocol		Database and Scans
Tree Structure	21 Jan 2013 – 6 Feb 2013	AusCover Protocol		Database and Photos
Microtops AOD and Ozone	21 Jan 2013 – 6 Feb 2013	AusCover Protocol		Database and Text
Spectrometer measurements of ground calibration targets	21 Jan 2013 – 6 Feb 2013	AusCover Protocol		Database and Raw Data
Thermal field measurements – Hobo sensors	2 Feb 2013	Air Temp throughout 2 Feb, and one off Temp measurements of various surfaces		Graphs and Tables

3.9 Litchfield

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	1 June 2013	Full waveform		Las, fwf, tif
Hyper-spectral	27 May 2013			bsq
UAS data		Not yet uploaded to portal	Stefan Maier	

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS Star transects	27 May - 2 Jun 2013	AusCover Protocol		Database and Photos
Hemispheric photos	27 May - 2 Jun 2013	AusCover Protocol		Database and Images
LAI derived from Hemispheric photos	27 May - 2 Jun 2013	CanEye		HTML
Terrestrial Laser scanning	27 May - 2 Jun 2013	AusCover Protocol		Database and Scans
Tree Structure	27 May - 2 Jun 2013	AusCover Protocol		Database and Photos
Licor-2200	27 May - 2 Jun 2013	AusCover Protocol – Not yet uploaded to portal	Bec to check	
Microtops AOD and Ozone	27 May - 2 Jun 2013	AusCover Protocol		Database and Text
Spectrometer measurements of ground calibration targets	27 May - 2 Jun 2013	AusCover Protocol		Database and Raw Data
Leaf sampling	27 May - 2 Jun 2013	Not yet uploaded to portal	Kara Youngentob	

3.10 Alice Springs

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	20 Sep 2014	Full waveform		Las, fwf, tif
Hyper-spectral	Capture postponed			

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
No field data collected yet because of access restrictions				

3.11 Warra

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	30 – 31 May 2014	Full waveform		Las, fwf, tif
Hyper-spectral	6 Feb 2015			bsq
UAV	2-6 Feb 2015	Not yet uploaded to portal		

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS Star transects	2-6 Feb 2015	AusCover Protocol		Database and Photos
Hemispheric photos	2-6 Feb 2015	AusCover Protocol		Database and Images
LAI derived from Hemispheric photos	2-6 Feb 2015	CanEye		HTML
Terrestrial Laser scanning	2-6 Feb 2015	AusCover Protocol		Database and Scans
Tree Structure	2-6 Feb 2015	AusCover Protocol		Database and Photos
Microtops AOD and Ozone	2-6 Feb 2015	AusCover Protocol		Database and Text
Spectrometer measurements of ground calibration targets	2-6 Feb 2015	AusCover Protocol	Not loaded yet – Bec to check. Kasper has copy if needed	Database and Raw Data
Leaf sampling	2-6 Feb 2015	Not uploaded to portal yet	Kara Youngentob	

3.12 Injune

Airborne Data:

Airborne Data Sets	Date of Collection	Comments	Data Custodian	Format
LiDAR	19-20 Aug 2015	Full waveform		Las, fwf, tif
Hyper-spectral	18-19 Aug 2015			bsq
Thermal	18-19 Aug 2015			tif

Field Data:

Field Data Sets	Date of Collection	Comments	Data Custodian	Format
SLATS Star transects	17-22 Aug 2015	AusCover Protocol		Database and Photos
Hemispheric photos	17-22 Aug 2015	AusCover Protocol		Database and Images
Terrestrial Laser scanning	17-22 Aug 2015	AusCover Protocol		Database and Scans
Tree Structure	17-22 Aug 2015	AusCover Protocol		Database and Photos
Microtops AOD and Ozone	17-22 Aug 2015	AusCover Protocol – Not yet uploaded to portal	Bec	Database and Text
Spectrometer measurements of ground calibration targets	17-22 Aug 2015	AusCover Protocol – Not yet uploaded to portal	Bec	Database and Raw Data