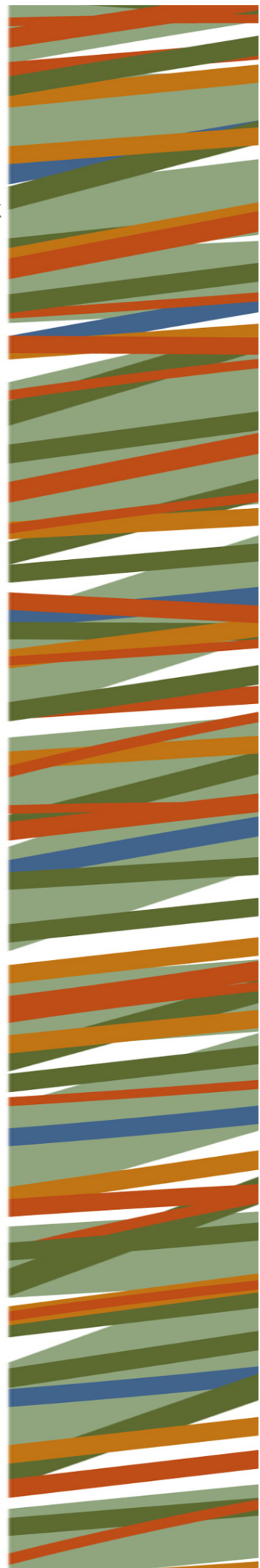




Australian SuperSite Network Facility NCRIS IV Project Plan: 2015-2016

**Delivering a Sustainable Long
Term Ecosystem Observatory
for Australia**





Matt Bradford with labelled trees in the Core 1 ha at Robson Creek, FNQ Rainforest SuperSite



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Material contained within this document has been prepared to inform internal planning for the Australian SuperSite Network. The content is not to be used or modified without prior written consent.

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Executive Summary

The Australian SuperSite Network (SuperSites) is a facility within the broader Terrestrial Ecosystem Research Network (TERN) supported primarily through the Australian Government's National Collaborative Research Infrastructure Strategy (NCRIS). As a research infrastructure Facility, the SuperSites provide both field infrastructure/support personnel and long-term ecosystem monitoring data to researchers, educators, natural resource managers and the public. The 'infrastructure' is also used to provide base-line calibration and validation data for modelling and remote sensing. Open access to SuperSites data is provided through a dedicated data portal. SuperSites was established in 2009 and its activities fall broadly into the three areas: Data Collection, Data Publication and Archiving, and Science Communication. This document provides an overview of SuperSites' purpose, key strategic aims, the facility's current resources, and priority activities which will be undertaken during the NCRIS IV phase of the Facility. The NCRIS IV period has been funded by the NCRIS2015-16 funding allocation to TERN. The available funding allows only minimal monitoring activities across the 10 SuperSites (13 plots) and is reflected in the limited range of data collected in this period.

The main priorities for SuperSites in the NCRIS IV period are: (1) securing further funding; (2) development of data storage and delivery mechanisms, (3) ongoing data publication and data archiving as stipulated in the NCRIS IV contract variation agreements, avoiding where possible gaps in the long term monitoring record (4) ongoing development of monitoring and data management protocols in conjunction with developing collaborations with comparable international terrestrial ecosystem monitoring organisations.

Purpose Statement

This document is the overarching Project Plan for the Australian SuperSite Network Facility from 1 July 2015 until 30 June 2016 that outlines the structure, objective, resources and work priorities for the year.

Supporting documents:

- TERN Umbrella Subcontract Agreement between the University of Queensland (UQ) and James Cook University (JCU) NCRIS III. Deed of Variation to the Umbrella Subcontract between the University of Queensland (UQ) and James Cook University (JCU) NCRIS IV.
- Individual Subcontracts with institutions managing the 13 nodes of the SuperSites.
- SuperSites Protocols for the NCRIS III period (Annexure 1).
- Protocols published on the SuperSites web page.

SuperSites Facility Objective and Infrastructure Design

Objective

The Australian SuperSite Network (SuperSites) seeks to understand how key ecosystems will respond to future environmental change by setting up a nationally consistent network of multidisciplinary and intensive ecosystem observatories.

Infrastructure Design

As a research infrastructure Facility, the SuperSites provide both field infrastructure/support personnel and long-term ecosystem monitoring data to researchers, educators, natural resource managers and the public. The 'infrastructure' is also used to provide base-line calibration and validation data for modelling and remote sensing. Open access to SuperSites data is provided through dedicated data portals (SuperSites Data Portal, BioAcoustic Data Portal and BioImages Data Portal (in development)).

Spatial Distribution

The spatial distribution of the 10 SuperSites is shown below in Figure 1.

Figure 1. Spatial distribution of the Australian SuperSite Network



Table 1 SuperSite Principal Investigators and Ecosystems

Principle Investigators (PIs) Deputy PIs	SuperSite Name	Ecosystem
Derek Eamus UTS James Cleverly UTS	<i>Alice Mulga SuperSite</i> (ALIC)	Arid Mulga Woodland
Wayne Meyer UoA Peter Cale ALT David Chittleborough UoA	<i>Calperum Mallee SuperSite</i> (CLPM)	Sparse Mallee Woodland, Callitris Woodland and River Floodplain
Matthias Boer UWS Elise Pendall UWS	<i>Cumberland Plain SuperSite</i> (CBLP)	Remnant Eucalypt Woodland
Michael Liddell JCU Dan Metcalfe CSIRO	<i>FNQ Rainforest SuperSite</i> (FNQR) Robson Creek node	Upland Tropical Rainforest
Michael Liddell JCU	Cape Tribulation node	Lowland Tropical Rainforest
Suzanne Prober CSIRO Craig Macfarlane CSIRO	<i>Great Western Woodland SuperSite</i> (GWWL)	Arid, Sparse Eucalypt Woodland
Lindsay Hutley CDU Stefan Maier CDU Jason Beringer UWA Jeremy Russell-Smith CDU	<i>Litchfield Savanna SuperSite</i> (LFLD)	Tropical Savanna
Peter Grace QUT Peter Grace QUT	<i>SEQ Peri-urban SuperSite</i> (SEQP) Samford node	Peri-urban Catchment Zones
Jean-Marc Hero Griffith	Karawatha Forest node	Peri-urban Eucalypt Woodland
Eva Van Gorsel CSIRO Steve Zegelin CSIRO	<i>Tumbarumba Wet Eucalypt SuperSite</i> (TUMB)	Managed Open, Wet Schlerophyll Eucalyptus Woodland
Jason Beringer UWA Jason Beringer UWA	<i>Victorian Dry Eucalypt SuperSite</i> (VICD) Whroo node	Dry Eucalypt Woodland
Stefan Arndt MU	Wombat Forest node	Dry Eucalypt Woodland
Tim Wardlaw Forestry Tas Martin Moroni Forestry Tas	<i>Warra Tall Eucalypt SuperSite</i> (WRRS)	Tall, Wet Eucalypt Woodland

NCRIS IV 2015-16 Monitoring Activities

Due to the restricted funding available for the NCRIS IV period, monitoring activities have been necessarily reduced with the understanding that gaps in data streams may be unavoidable where field instrumentation fails during the year.

Data collection during NCRIS IV 2015-16

ACTIVITY	DELIVERABLES
Phenocam details	Details of phenocameras and metadata
Vegetation Monitoring at the Core 1 ha	
<ul style="list-style-type: none">• Five point Photopoints	Images
<ul style="list-style-type: none">• Leaf Area Index (Canopy)	Data/Images
<ul style="list-style-type: none">• Phenocameras	Images
Acoustic Monitoring	
<ul style="list-style-type: none">• Acoustic Monitoring	Recordings

New Data Sets

The SuperSites monitor data posted to the SuperSites data portal with relevant metadata by the Data Librarian. An ACCESS database was developed in 2014-15 to keep an inventory of data collections and to keep a record of administration relating to the packages (QC approval by Principal Investigators). This will be maintained during the NCRIS IV period.

NCRIS IV Science Communication Activities

Priority work areas in the NCRIS IV period are:

- 1–10 science publications for individual SuperSites scientific publications
- Cross–SuperSites and cross–TERN facility publications
- Communication and website/database improvements
- Continued development of education / outreach web page that outlines current activities
- Continued delivery of joint newsletter with OzFlux and CZO Australia
- Continuation of joint protocol meetings and developments with NEON (USA)
- Engagement and linkages

These areas are broadly discussed below.

Publications

In the NCRIS IV period the Facility will:

- Publish online a technical report on vegetation monitoring protocols used at the SuperSites
- Assist in the publishing of TERN newsletters
- Publish SuperSites-OzFlux-CZO Australia Quarterly newsletters
- Produce a minimum of 1 peer reviewed publication per SuperSite
- Produce 2 or more peer reviewed cross-SuperSite publications

Communication

Priorities are to:

- Review, update and refresh our website (<http://www.tern-supersites.net.au/>) as follows:
 - update individual SuperSite website pages
 - develop pages for education and public outreach purposes

Planning Monitoring Activities Under Alternative Funding Scenarios for NCRIS VI

During 2015 – 2016 the future scale of TERN activities will be developed once the details of the \$1.3b NCRIS funding from 2017 – 2027 have been released. SuperSites are expected to contribute significantly to the development of TERN as a Terrestrial Ecosystem Observation System. As part of this process a set of core questions will be established that TERN is setting out to answer and the provision of field data to answer these questions will become part of requirement of SuperSites monitoring.

Potential proposed monitoring protocols have been suggested and these are listed below. This partially complete list of protocols has yet to be put forward and assessed by working groups. A prioritised list of monitoring activities will be developed in 2016 to allow planning for the years ahead once the quantum of funding and the TERN core science questions have been released.

Potential proposed monitoring protocols

Vegetation Monitoring

Spatial sampling for biomass and biodiversity

Coarse Woody Debris

Plant Functional Traits - Recruitment

Semi-Quantitative Estimates of Flowering and Fruiting

Understory Leaf Area Index

Plant physiology

Vertebrate Faunal Monitoring

Avifauna protocol across network

Camera trapping

Small mammal trapping

Bat acoustic monitoring

Invertebrate Faunal Monitoring

Ant monitoring - sampling and taxonomic analysis

Mosquito monitoring

Ground beetle monitoring

Geometric moth monitoring

Malaise trapping, biomass determination and storage of samples for future metabarcoding

Soil Monitoring

Spatial sampling for site characterisation

Soil array of sensors.

Soil metabarcoding/metagenomics yearly or every 5 years

Aquatic Monitoring

Bore sampling – depth/conductivity logging, chemistry

Creek sampling – multiprobe sonde, flow, chemistry

Remote sensing (with AusCover/OzFlux)

Replace all phenocameras across towers and understory

Acoustic sensors replace all across network and replicate at each site

NDVI sensors on tower

Vegnet sensors

LiDAR and Hyperspectral campaigns every 5 years

Background to the SuperSites

Foundational funding and intent

The [Australian SuperSite Network](#) (SuperSites) is a national network of multidisciplinary ecosystem observatories. The network includes ten SuperSites that each represent a significant Australian biome and covers all States and Territories (except ACT) and spans a wide range of environmental conditions.

Each SuperSite hosts an [OzFlux](#) tower, and researchers also undertake intensive collection of various ecosystem measurements including detailed data sets on flora, fauna and biophysical processes. Through this work, SuperSites aims to improve our understanding of ecosystem response to environmental change. Work underway throughout SuperSites also complements the capabilities of the [Long-Term Ecological Research Network](#) (LTERN) and in like manner the SuperSites have been established to become long-term research sites.

In 2009 the Queensland Government funded two 'Demonstrator SuperSites' with the aim of evaluating if the concept of an intensively monitored site was a useful investment for infrastructure funding in environmental science. The two SuperSites, FNQ Rainforest and SEQ Peri-urban, were evaluated as a success and based on this there was an expansion into a new network, the Australian SuperSite Network (SuperSites) during the TERN EIF period. In 2012 the SuperSites consisted of five funded SuperSites (Calperum Mallee, FNQ Rainforest, Great Western Woodlands, SEQ Peri-urban, Warra Tall Eucalypt). Subsequently five unfunded volunteer SuperSites (Alice Mulga, Cumberland Plain, Litchfield Savanna, Tumburumba Wet Eucalypt, Victorian Dry Eucalypt) joined the network. Suitability for inclusion in the network was determined by a number of factors including:

- Location in a significant representative Australian biome
- Suitable topography for an eddy covariance flux tower or a pre-existing OzFlux tower.
- Significant research investment/activity with the potential to attract state government and other external support
- Homogenous vegetation type, soil, land form and year round access
- Organised science team with a track record

The SuperSites Facility established working groups during TERN EIF to develop network wide measurement protocols.

As NCRIS funding is provided for research infrastructure and not research projects, the aim of the SuperSite investment has been to provide long-term ecosystem monitoring data streams and to provide on-site

infrastructure which can be used by external researchers and educators funded to answer research questions. The long term monitoring data streams are 'data as infrastructure' which may be used by researchers as base-line data or used for calibration and validation, modelling and other purposes.

TERN is administered by The University of Queensland (UQ) but the administration of the terrestrial plot-based components of TERN, during the EIF period, was outsourced to The University of Adelaide (UoA). These plot-based components were collectively known as the Multi-Scaled Plot Network (MSPN) and were administered by the MSPN Facility at UoA. The MSPN included five separate sub-facilities: AusPlots Forests, AusPlots Rangeland, Transects, SuperSites and LTERN. However, in July 2013, the MSPN was formally dissolved and each sub-facility became a standalone facility.

Under EIF, SuperSites received \$ 2 008 000 to fund activities until 30 June 2014. The maintenance of SuperSites from mid-2014, through to 30 June 2015 was achieved through both Collaborative Research Infrastructure Scheme (CRIS) funding (\$200k) and National Collaborative Research Infrastructure Strategy (NCRIS 2013/NCRIS III) funding (\$900k).

Funding for the NCRIS IV 2015-16 period was further reduced to \$ 720k due to large reductions in baseline funding to the NCRIS platforms including TERN. These funding sources were a continuation and therefore the use of the funding and intent remains. For the NCRIS III and NCRIS IV periods all components of the program during the EIF period that were implemented on the ground were scaled back to suit the reduced level of funding across the network with an expectation that sampling metrics will be scaled up as the funding is augmented in future iterations of TERN and SuperSites.

Significant foundational products and achievements

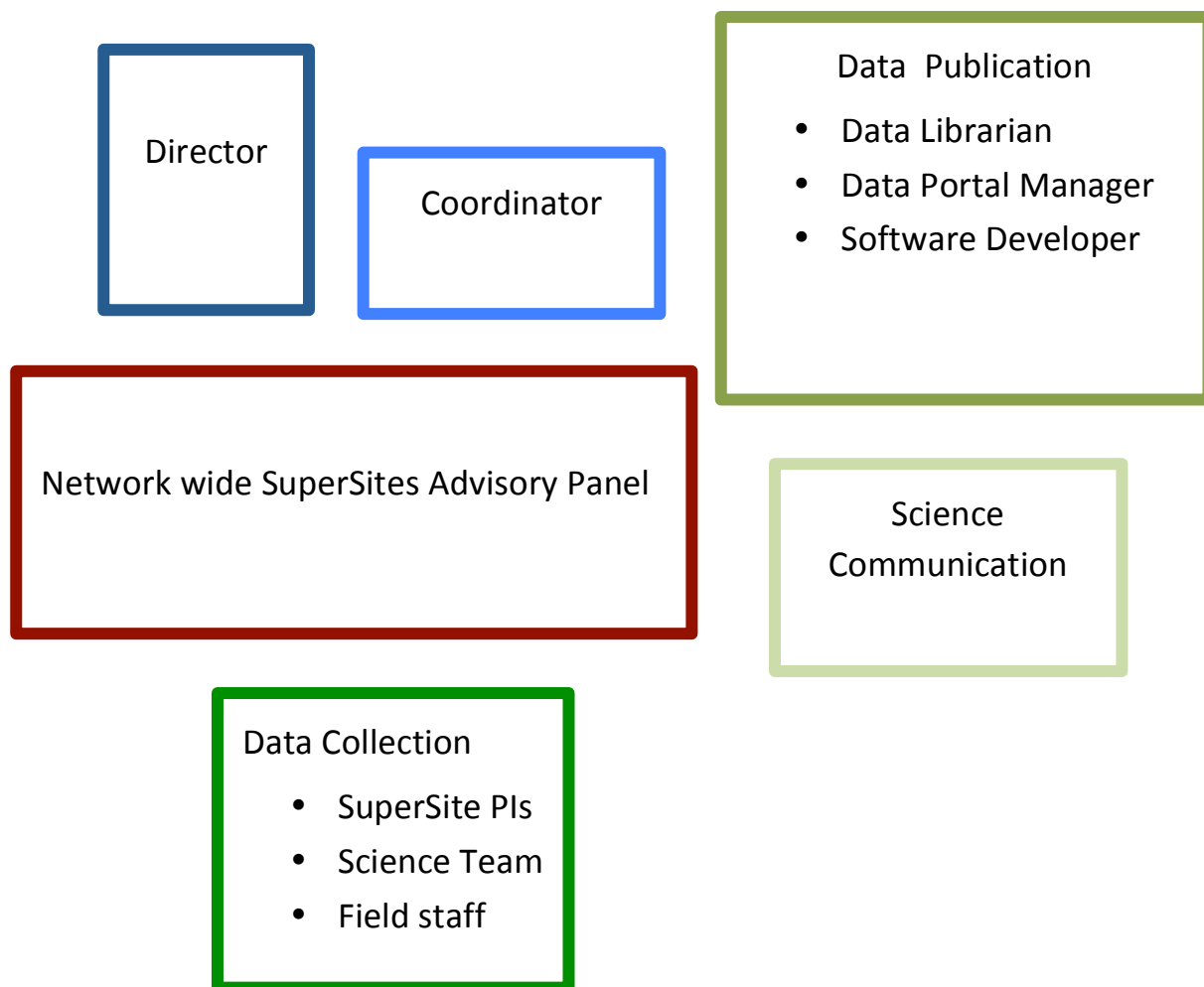
The major achievement during the foundation period has been the successful development of a 10 SuperSite (13 node) network of functioning long-term instrumented, monitoring plots with accompanying historical contextual data that is used by numerous and diverse external researchers, educators and land managers both within Australia and internationally. The SuperSites are also used for the ground validation of near-remote sensing and satellite remote sensing products. The numbers of publications and users of the SuperSites infrastructure and data continues to grow yearly. One of the strengths of the SuperSite network from the outset has been to ensure that field data is made readily available in an open-access database system and providing a strong and up to date web presence.

Facility Structure

Governance

A diagram of the organisational structure of SuperSites is provided below.

Figure 2 The organisational structure of SuperSites



Facility Personnel 2015-16

Facility Director	Assoc. Prof. Michael Liddell michael.liddell@jcu.edu.au (0.20 FTE)
Facility Coordinator	Dr Mirko Karan mirko.karan@jcu.edu.au (1.0 FTE)
Facility Data Portal Manager	Dr Alvin Sebastian (1.0 FTE)*
Data Librarian	Ms Shiela Lloyd (0.3 FTE)
Software Developer	Dr Alvin Sebastian (1.0 FTE)*
Finance	Ms Tamar Shmueli (0.10 FTE)

* Dr Alvin Sebastian currently shares the role of Facility Data Manager and Software Developer.

Affiliate Scholars

SuperSites has an agreed Affiliate Scholar process. This process was initiated and formalised in 2014 to address interest from researchers wishing to join SuperSites. The process will enable effective expansion of the network in the future when funding allows. To date, one request has been received and in this case the topography was deemed to be unsuitable for a flux tower and the Advisory Panel declined the request.

SuperSites Collaborations

Collaborations within TERN

Collaborations within TERN are associated with:

Collocated plots - AusPlots Rangelands, AusPlots Forests, Australian Transect Network, LTERN

Protocol adoption / development - AusPlots Rangelands, AusPlots Forests, LTERN, AusCover, eMAST

Field data collection - OzFlux, AusCover, AusPlots Rangelands, AusPlots Forests, eMAST

Data storage and portal development – LTERN, TDDP

Data delivery - In 2015-16 the potential for harmonising data collection with AusPlots/ATN and data delivery from the SuperSite portal to AEKOS using the Eco-informatics SHaRED tool will be investigated.



Collaborations within NCRIS

Bioplatforms Australia - Contribution of soil samples for the [Biome of Australia Soil Environments \(BASE\)](#) project. BASE is a collaborative project to create a public resource containing microbial genome information from a range of Australian soil environments. Further details in the article: Bissett, A., Fitzgerald, A. et al. 2015. Introducing BASE - The Biomes of Australian Soil Environments soil microbial diversity database. GigaScience (Submitted)

Atlas of Living Australia (ALA) - in development in 2015-16 in conjunction with LTERN. A high priority aim of LTERN and SuperSites is to apply best-practices of taxonomic nomenclature in each stage of the data collection and data publication workflow, however the use of tools that assist this is currently limited. A new linkage and collaboration is proposed in the NCRIS IV period that seeks to enhance the use of tools available from the Atlas of Living Australia and create alignment of controlled vocabularies between the field collections staff, the data portal publication team and potentially the downstream re-presentation through the ALA. This can easily be achieved by incorporating use of ALA web services for resolving species names from field data to conform to the currently recognised scientific name.

A future goal is to make SuperSites data accessible via the ALA's queryable interface to search the taxonomic coverage of SuperSites data packages (along with spatial and temporal coverage).

Collaborations external to TERN

External collaborations with existing and nascent international ecosystem monitoring programs

NEON - NEON Inc. currently manages the National Ecological Observatory Network (NEON) in the USA. Collaborations involve field data collection protocol development to maximize compatibility (NSF terminology) and aim to allow intercontinental comparisons.

The NEON Core sites closely resemble the TERN combination of SuperSites each with its OzFlux tower and the NEON Airborne Observation Platform missions are quite complimentary to the airborne missions carried out at the SuperSites by the AusCover Facility. The SuperSites, OzFlux and AusCover measurements then are generally related to the NEON measurements but differ in detail and timing.

To increase the level of compatibility between TERN and NEON monitoring, additional activities at the SuperSites in future funding rounds will be considered. The most readily implementable protocols include plant phenology and beetle pit fall trapping. We are currently using the same real-time phenocams at

several SuperSites (StarDot) and will ensure that we end up with similar approaches to data collection and archiving once the NEON standards are released. In the longer term, we plan to work with statisticians to ensure that the spatial vegetation sampling approach that the SuperSites develop is able to be used statistically alongside NEON's approach. We are likely to put a spatial soil sampling strategy in place which NEON have not done and as a result it is quite likely that our approach to spatial vegetation sampling will not be identical to NEONs. A few of the SuperSites have surface water bodies where we carry out some physicochemical sampling that is related to NEON's aquatic sampling but at a much reduced scale. We will develop this further and include the biology, looking closely at what NEON are doing.

The AusCover missions that have been flown at SuperSites are closely related to what the NEON AOP is doing but AusCover has only been resourced to carry this out once per SuperSite (in contrast there are multiple visits/year repeats with NEON missions). AusCover have done more on the ground calibration (plant leaf chemistry, leaf level spectral) than NEON and TERN has carried out extensive plant physiology which NEON has not included in their program. There is a similar approach being used to SVAT model-data assimilation between NEON and the eMAST Facility in TERN. The OzFlux Facility is working in a comparable way to NEON but the level of QC/QA that NEON are able to carry out due to the instrumental platform design and very extensive calibration facilities mean that OzFlux is not able to achieve the NEON uncertainty limit. NEON also uses many more instruments (including stable isotopes and aerosols) and has developed some specific new sensors (aspirated temperature) that OzFlux does not use. The most important issue for OzFlux is to determine what the uncertainty is associated with the fluxes and micrometeorological data to ensure that data sets can be used alongside NEON's in a meaningful way. OzFlux are using some of the same hardware as NEON (3D sonic) and where it makes sense it would seem to be sensible to do the same going forward as this will ensure that some of the data is collected using the same hardware limitations.

The aim of collaborating with NEON and other ecosystem observation networks, ensuring some measures are made in a complementary fashion, is to maximize compatibility in collected data opening up the prospects for answering some of the bigger cross continental questions.

Critical Zone Observatories (CZO) - SuperSites is assisting CZO Australia with developing a website (<http://www.criticalzone.org.au/>) and data portal (<http://www.criticalzone.org.au/knb/>) and shares a quarterly newsletter with OzFlux and CZO. This will ensure a level of complementarity as the CZO Australia develops into a functional network.

ANAE, CERN, KEON, CZEN - Continuing observation and discussions with international ecosystem monitoring networks to improve potential for collaborations.

ILTER - In 2016 SuperSites will affiliate with ILTER and share metadata to increase the visibility of SuperSite data.

DataONE - The Data Observation Network for Earth (DataONE) provides a distributed framework and sustainable cyberinfrastructure to allow open, persistent, robust, and secure access to well-described and easily discovered Earth observational data. SuperSites aims to increase the international exposure of its data using DataONE infrastructure. This has been in development in collaboration with the TERN Eco-informatics facility and all SuperSite metadata records have been available in DataONE from December 2015.

External collaborations with global scale experiments

Individual SuperSites are involved with international collaborative experiments including:

[University of Guelph Malaise Trapping program](#) FNQ Rainforest, Warra Tall Eucalypt, Calperum Mallee SuperSites)

[Nutrient Network](#) - Cumberland Plain, Great Western Woodlands

[DroughtNet](#) - Cumberland Plain, Great Western Woodlands, SEQ Peri-urban SuperSites

[Venus Earth Observation Mission](#) FNQ Rainforest, Alice Mulga, Victorian Dry Eucalypt, Tumbarumba Wet Eucalypt, Great Western Woodlands, Warra Tall Eucalypt, Calperum Mallee SuperSites

[eSMAP](#) - Litchfield Savanna SuperSite

Collaborations with Citizen Science organizations

[MicroBlitz](#) - All SuperSites are contributing soil samples to this microbial biodiversity program.

[Earthwatch](#) - Calperum Mallee SuperSite is being used for corporate (NAB) Earthwatch campaigns

[ClimateWatch](#) - Currently a ClimateWatch trail is completed for FNQ Rainforest SuperSite at the Tinaroo Environmental Education Centre and trails are in development at Karawatha Forest (SEQ Peri-urban SuperSite) and Cumberland Plain SuperSite.

[FungiMap](#) - Images of fungi from a range of SuperSites will be uploaded to FungiMap and then the Atlas of Living Australia to add to the phenological record.

Facility Resources 2015-16

National Collaborative Research Infrastructure Strategy (NCRIS) IV

The NCRIS IV funding of \$ 720 K is allocated across the SuperSites according to the number of nodes maintained:

- ALIC \$ 30 780
- CLPM \$ 30 780
- CBLP \$ 30 780
- FNQR \$ 61 560
- GWWL \$ 30 780
- LFLD \$ 30 780
- SEQP \$ 61 560
- TUMB \$ 30 780
- VICD \$ 61 560
- WRRRA \$ 30 780

In-kind contributions

SuperSite	2010-11 (\$)	2011-12 (\$)	2012-13 (\$)	2013-14 (\$)	2014-15 Cash (\$)	2014-15 In- Kind (\$)	2015-16 Cash (\$)	2015-16 In-Kind (\$)
CLPM					25625	0	5000	20625
CBLP					29092	29799	29092	29800
GWWL					41500	22500	41500	22500
FNQR					36700	125000	0	111700
SEQP					31250	20000	26250	20000
VICD					31000	39000	31000	39000
WRRRA					0	19375	0	19375
TUMB					43500	20000	43500	20000
LFLD					283500	0	68500	215000
ALIC					120000	30000	120000	30000
Total	1032000	1082000	972000	613568	642167	305674	364842	528000

APPENDIX 1 NCRIS III

2014-15 Monitoring Activities

The SuperSites are in various states of development ranging from well established sites with more than a decade of research and monitoring activities carried out on site to newly established sites where even the plots require baseline descriptions. Five of the 10 SuperSites were unfunded volunteer sites prior to the NCRIS III period.

Data collection during NCRIS III 2014-15

Data to be delivered during the NCRIS 2014-15 period was restricted by the quantum of NCRIS III funding and aimed to provide full baseline characterisations of the SuperSites and limited ecological monitoring data to complement OzFlux tower data.

ACTIVITY	DELIVERABLES
Establish Core 1 ha (if required)	
Vegetation Monitoring at the Core 1 ha	
• Complete Vascular Plant Species List	Data
• Plant Vouchering	Vouchers
• General Structure Description	Data
• Abundance, Cover and Structure	Data
• Above Ground Biomass	Data
• Photopoints	Images
• Leaf Area Index (Canopy)	Data/Images
• Phenocameras	Images
• Coarse Woody Debris	Protocol
• Plant Functional Traits - Recruitment	Protocol
(each SuperSite to develop a suitable protocol for Coarse Woody Debris and Recruitment)	
Soil/Water Monitoring (if required)	
• Initial site and soil characterisation (if required)	(Data)
• Physico-chemical analyses (soil pit + 9 cores) (if required)	(Data)
Ant Monitoring	
• Ant sampling pitfall traps	Samples
Acoustic Monitoring	
• Acoustic Monitoring	Recordings
Isotope and Plant Genetic Sampling	
• Sampling for Stable Carbon Isotope Analysis	Samples
• Plant Genetic Sampling	Samples

Avifauna Monitoring

- Bird surveys (two or more) Data
- Ornithologist developed bird survey protocol suitable Protocol

NCRIS III Education and Outreach Activities

Research Publications

1 - 10 peer reviewed publications for each SuperSite

2+ peer reviewed, cross SuperSite publications

Live data streams

Publish technical report on vegetation protocols

Education and Outreach Website

This web page is intended as an educational resource for children in primary school, high school, university and the public. Information and interactive activities are aimed at engaging these groups and introducing them to long-term monitoring carried out by SuperSites.

Web page updates

Individual SuperSite webpages were updated to ensure all TERN internal and external collaborations are acknowledged and facilities available to external researchers are included.

NCRIS III Governance Activities

Priority governance areas in the NCRIS III period for SuperSites were:

- continued SuperSites Central informal group meetings
- continued and activate participation in TERN related governance activities resulting from the Vista Advisory Review of TERN in 2014
- continued SuperSites Advisory Panel teleconference meetings
- continued Face-to-face SuperSites Advisory Panel Meeting including associated TERN Facilities
- Individual SuperSite Management Meetings

Biannual SuperSite Local Steering Committee Meetings

- These local meetings include SuperSite managers, researchers and stakeholders that oversee the development and maintenance of the SuperSite.

Establishment of SuperSite Research Committees

- These research committees review proposed research activities at each SuperSite and ensure the methods proposed will not impact adversely on the site or other researchers work; research proposed is not unnecessarily duplicating work already being done and that applications are supported by *bona fide* institutions and scientists of repute.

Quarterly SuperSite Advisory and face-to-face meetings

QA/QC documentation

Data set and file naming standards

NCRIS III Data Management Activities

Key Facility contact: Shiela Lloyd, Alvin Sebastian, Ivan Hanigan

Priority work areas in the NCRIS III period were:

- addition of new data sets and maintenance of an inventory of SuperSites data packages.
- development of Bioacoustics Data Portal in RDSI QRSIcloud
- development of image data base
- development of live data streams web page / dashboard
- Implementation of data set naming standards
- QA/QC documentation (around current protocols)
- Metacat upgrade and deliver metadata through DataOne
- continued delivery of effective SuperSites data management team

Ecosystem data for the 10 SuperSites is delivered primarily through the SuperSite data portal, with ancillary data delivered through the AusCover and OzFlux data portals. There are additional acoustic and image databases with data delivery platforms under development during 2014. The SuperSites share a data-portal system in common with LTERN and ACEAS. Linkages with LTERN were strengthened during 2013–14 by sharing database management/development personnel and holding concurrent annual meetings to address common issues.

APPENDIX 2 NCRIS III 2014-15 Science Communication Activities

Priority work areas in the NCRIS III period were:

- 1–10 science publications for individual SuperSites scientific publications
- cross–SuperSites and cross–TERN facility publications
- communication and website/database improvements
- continued development of education / outreach web page that outlines current activities
- continued delivery of joint newsletter with OzFlux
- continuation of joint protocol meetings and developments with NEON (USA)
- engagement and linkages

These areas are broadly discussed below.

Publications

In the NCRIS III period the Facility was to:

- publish online a technical report on vegetation monitoring protocols used at the SuperSites
- publish SuperSites-OzFlux Quarterly newsletters
- produce a minimum of 1 peer reviewed publication per SuperSite
- produce 2 or more peer reviewed cross-SuperSite publications

Communication

Priorities were to:

- review, update and refresh the [SuperSite website](#) as follows:
 - update individual SuperSite website pages
 - add a page for education and public outreach purposes
 - add a page highlighting live streaming of data from SuperSites
 - produce an updated version of the SuperSites Brochure (ie remove reference to the MSPN, refresh pictures)

Facility Personnel 2014-15

Facility Director	Assoc. Prof. Michael Liddell michael.liddell@jcu.edu.au (0.2 FTE)
Facility Coordinator	Dr Mirko Karan mirko.karan@jcu.edu.au (1.0 FTE)
Facility Data Portal Manager	Dr Alvin Sebastian (1.0FTE) (Mr Ivan Hannigan*)
Data Librarian	Ms Shiela Lloyd (0.5 FTE)
Software Developer	Dr Alvin Sebastian (1.0 FTE)**
Finance	Ms Tamar Shmueli (0.2 FTE)

* This position was funded by ANU but had an approximate 0.2 FTE 'in-kind' allocation to the Australian SuperSites Network, administered by James Cook University (JCU). Broadly, the role was allocated as: LTERN Data Analyst on Tues and Wed (0.4 FTE), LTERN Data Portal Management (0.4 FTE), ASN Data Analysts and Data Portal Management (0.2 FTE). Ivan was replaced in this position by Alvin when his contract was not renewed early in 2015.

** In return, the Data Portal System Administrator/Software Developer, employed through JCU provided 0.2 FTE 'in-kind' support to ANU.

APPENDIX 3 NCRIS III Facility Resources

In the calendar year 2014, SuperSites had three income streams as shown below.

From 1 January to 30 June 2015, SuperSites was resourced by NCRIS III only.

Collaborative Research Infrastructure Scheme (CRIS)

This funding was utilised to support Facility personnel based at JCU from 1 July 2014 to 31 December 2014.

CRIS Funding of \$200,000 was received.

Funds available at 1 January 2015 were \$316.

National Collaborative Research Infrastructure Strategy (NCRIS) III

The NCRIS III funding of \$900K was allocated to the SuperSite network for 2014-15.

Distributions across the 10 SuperSites were.

- ALIC \$ 51 000
- CLPM \$ 51 000
- CBLP \$ 51 000
- FNQR \$ 101 000
- GWWL \$ 51 000
- LFLD \$ 51 000
- SEQP \$ 101 000
- TUMB \$ 51 000
- VICD \$ 101 000
- WRRRA \$ 51 000

Funds available at 1 July 2015 were \$21,859.

Education Investment Fund (EIF)

The Education Investment Fund period was from 01/08/2011 to 30/06/2014.

SuperSites funded under EIF were allocated funds as follows during the 2013-14 financial year:

Institution	Funds
FNQ Rainforest SuperSite	\$ 105 000
SEQ Peri-urban SuperSite	\$ 165 000
Warra Tall Eucalypt SuperSite	\$ 0
Calperum Mallee SuperSite	\$ 33 000
Great Western Woodland SuperSite	\$ 142000

In-kind contributions

	Non EIF Cash and In-Kind Contributions			
	2010-11 (\$)	2011-12 (\$)	2012-13 (\$)	2013-14 (\$)
Total	1 032 000	1 082 000	972 000	613 568

Appendix 4 NCRIS III Reporting and Monitoring and Evaluation

Key Facility Contact: Mirko Karan

Reporting

TERN Quarterly reports

These are largely generated from the EAC reporting template, the main exception being the requirement for financial reporting on 18 January.

- Quarterly Report_1 October to 31 December: **due 18 January 2015.**
- Quarterly Report_1 January to 31 March: **due 18 April 2015.**
- Quarterly Report_1 April to 30 June: **due 18 July 2015.**

Annual Business Plans

Each year TERN central produces an Annual Business Plan relatively early in the calendar year. SuperSites contributes, edits and modifies the appropriate sections in these plans.

The TERN-wide Annual Business Plan will be for the period 1 July 2016 to 30 June 2017. At this time what resources will be provided to TERN, and hence SuperSites, during this period has not been specified by the Australian Government Department of Education.

TERN Final Report NCRIS III

This TERN-wide report summarized key activities undertaken, and outcomes generated for the NCRIS III funding-term. A draft of the report was generated by TERN Central based on previously submitted quarterly reports. Where the Facility collects additional information to showcase our strengths these were summarized and supplied in addition to the quarterly reporting template used by TERN Central.

This report was inclusive of financial acquittal statements from all institutions. Note, from 2015 Facility level audits may be established. To date, these have only occurred at the TERN Central level and the 2014 audit for the Department of Education was undertaken by KPMG. However, in the October 2014 EAC Meeting, Facility Directors were advised that from 2015 all institutions may be subject to audits.