

Quarterly Newsletter

Issue 9, December 2014

SuperSite and OzFlux Update

Welcome to Issue #9 of the SuperSites/OzFlux newsletter. As usual it has been a very busy, but productive quarter. We are now a funded network of 10 SuperSites (13 nodes) with all contracts finally signed off on and invoicing underway.

Funding situation for 2015-16

NCRIS and TERN are waiting on the government's decision for the 2015-16 funding allocation. The NCRIS debrief on 16 December did not finalise the release of the \$150m NCRIS budget allocation for 2015-16. It is expected that this will be finalised in early February 2015.

Industry focus

A meeting with Greg Gilbert – science and research advisor to the Minister for Industry, highlighted the need to realign TERN to more applied outcomes. and to demonstrate the existing relevance to industry. Potential for events to be run next year to highlight TERN's utility for environmental assessments, food production, ecotourism, green tape reduction and sustainability.

A meeting of the TERN executive is planned to discuss how TERN's relationship with industry can be highlighted and developed for the next round of funding.

Cross-SuperSite Publications

Research articles using data from more than a single SuperSite are starting to appear and will increasingly demonstrate the benefits of a network using standard methods. The cross-SuperSite articles to date are:

(2014) Donohue, R.J., Hume, I.H., Roderick, M.L., McVicar, T.R., *et al.*

Evaluation of the remote-sensing-based DIFFUSE model for estimating photosynthesis of vegetation.

Remote Sensing of Environment 155: 349-365. [doi: 10.1016/j.rse.2014.09.007](https://doi.org/10.1016/j.rse.2014.09.007)

(2014) Ma, X., Huete, A., Yu, Q., Restrepo Coupe, N., Beringer, J., *et al.*

Parameterization of an ecosystem light-use-efficiency model for predicting savanna GPP using MODIS EVI.

Remote Sensing of Environment, 154: 253-271. [doi: 10.1016/j.rse.2014.08.025](https://doi.org/10.1016/j.rse.2014.08.025)

(2014) Shi, H., Li, L., Eamus, D., Cleverly, J., *et al.*

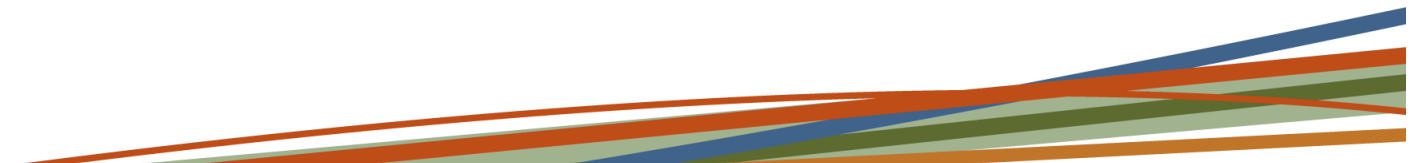
Intrinsic climate dependency of ecosystem light and water-use-efficiencies across Australian biomes

Environmental Research Letters 9: 104002 [doi: 10.1088/1748-9326/9/10/104002](https://doi.org/10.1088/1748-9326/9/10/104002).

SuperSite Central Update

CZO Adelaide meeting

In September Mike Liddell presented a SuperSites talk to those attending a Critical Zone Observatories (CZO) Symposium held in McLaren Vale (part of the CSIRO OCE Cutting Edge Science series). It was evident that the CZOs have a much bigger focus on soils/hydrology than SuperSites and that in general TERN is a bit light on hydrology - relative to where it should be in a dry continent. SuperSites can play a part in making a bigger push to integrate soils and water in TERN. SuperSites (with adequate funding) could move towards detailed soil mapping, geophysics, GPR & shallow seismic refraction for soil profile, EM mapping, electric resistivity tomography and multiple bores (horizontal and vertical) to follow ground water flow fields. Mike will be finding out more about how international CZOs are run during study leave in January when he will visit NEON and CZO networks in the USA, then going on to visit a CZO site in Greece.



Visits to SuperSites

Mike Liddell and Mirko Karan are progressively visiting all the SuperSites to get a clear picture of arrangements at the different sites including set up and management of plots, to ensure a level of consistency across the network.

Ecophysiology Workshop

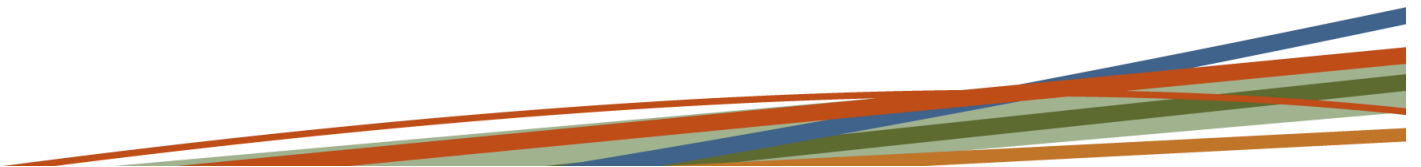
A number of SuperSite PIs attended a Plant Ecophysiology workshop at Macquarie University, Sydney to discuss the data collected at the SuperSites by Owen Atkin's team. One of the issues covered was how to share physiological data with eMAST but retain provenance and associated usage metrics required for reporting to the department. The result is that data from Owen's partly eMAST funded collection will be released following paper preparation to eMAST's plant trait database (ePLANT). Related data (dbh, height) will be served as required for model development etc from the SuperSite database but only metadata for collections such as these will reside on ePLANT. Going forward, specialised ecophysiology data that is collected at SuperSites will be deposited in ePLANT.

International Visitors to SuperSite Central

The **Henan Academy of Sciences**, China visited Mike at SuperSite Central in Cairns in November. No immediate collaboration potentials. but an indication that the SuperSites are becoming more visible internationally.



KEON visit FNQ Rainforest SuperSite- Cape Tribulation 3-4 December



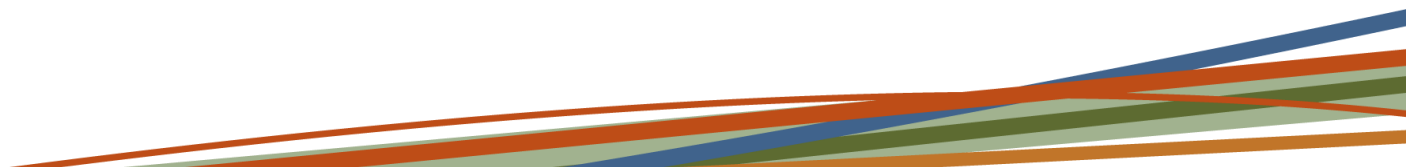


Tim Clancy, Mike Liddell and Mirko Karan accompanied a Korean delegation, Professor Ohseok Kwon and 7 of his colleagues (mostly with a background in ecological data management) visited TERN central and the Cape Tribulation node of the FNQ Rainforest SuperSite, looking for insights into how TERN and the SuperSites were developed to help inform their own Korean Ecological Observatory Network.



Database development

Work continues on the development of the SuperSites-LTERN image data portal for phenocam, LAI and photopoint images. The acoustic data portal is in the final stages of preparation for the comparison of software solutions to .wav file delivery and analysis.



OzFlux Central Update

OzFlux Governance

OzFlux has a new Associate Director: Congratulations to James Cleverly who has been voted in democratically!

Data Processing Workshop and OzFlux Conference

The annual OzFlux Data Processing Workshop and OzFlux Conference were held back to back in Alice Springs from September 22 to October 2. We had a wonderful venue and good views onto the mountain ranges. We were immersed into a landscape about which we were to learn more during the workshop and the conference.

The data workshop was well attended, we had a few new people joining us – and it was good to see a few well known faces as this confirms that there is something new to learn and the workshop also just simply provides a time slot to get some numbers crunched without getting distracted by the usual.

This year we were lucky to have George Burba and Israel Begashaw joining us from LI-COR Biosciences. They provided us with background information on instruments, applications, data analysis, and techniques for getting the best out of our data.

Peter Isaac tirelessly helped everyone getting to grips with OzFlux QC and helped everyone push their data to the next level. Some even got their data processed up to level 5. That meant that Peter spent all days and most or all evenings processing, processing and processing.

James Cleverly and Eva van Gorsel gave presentations on partitioning. Both presentations pointed out that more often than not one size fits all is not going to work and that creative thinking is needed to get reliable estimates of carbon uptake and respiration.

The conference was held over 3 days. The format followed the previous years with updates from the tower sites and science talks. There was a further shift from infrastructure to science talks which is great to see. The third day should have seen us on a trip to Derek and James' sites - unfortunately this did not happen. A quick reschedule brought us to Stanley Chasm. On the way there we stopped and James gave us a great overview over the ecosystem we saw and the ecosystems we should have seen. In Stanley Chasm we had a nice shady spot to sit and plotted over future funding possibilities and with greater success over a future special issue and possible contributions to such. More on this in:

Special Issue OzFlux

With seven titles submitted thus far, the OzFlux special issue to be submitted to *Biogeosciences* is progressing nicely. The deadline for titles and abstracts has been extended to 28 February 2015, with the expectation that completed papers will be submitted to the journal by late August.

email distribution server

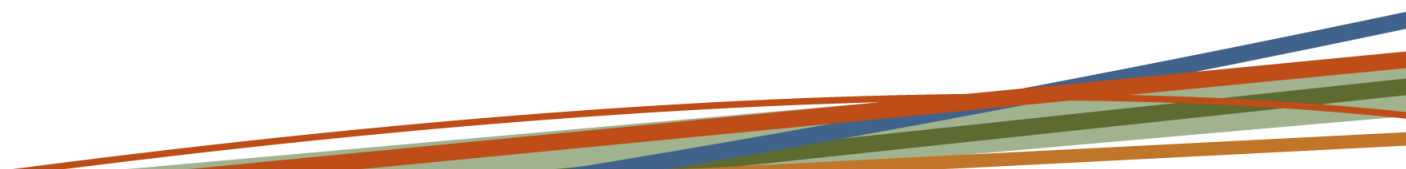
An email distribution server (listserv) has been established to facilitate communication across the network and provide a space for posting announcements relevant to the flux community. To subscribe, submit your email address at <http://listserv.uts.edu.au/mailman/listinfo/ozflux>.

Peter travels to AGU

Peter is in America to represent OzFlux in talks with Fluxnet, the regional networks and NEON. In particular he is attending a small meeting with people involved in the regional flux networks to discuss a strategy to propose an 'eddy covariance standard' to WMO. This discussion has already started between our European and American colleagues and WMO has signalled interest. Peter has kindly offered to travel to AGU on short notice – and who would be better suited for this discussion.

Given that Peter is at the AGU

We don't get his contributions in for this newsletter. This is a shame as he has great news around the THREDDS server, but good news can also be served cold.



News from around the SuperSite and OzFlux networks

Alice Mulga

Derek Eamus and James Cleverly delivered presentations at the recent ESA Conference.

James also presented at the Rangelands Symposium on 21 November.

Recent visitors to the site included: Eva van Gorsel and Georgia Koerber who assisted in the collection of branch samples for anatomy studies by Nadia Santini. George Burba and Israel Begashaw (LiCor) visited both EC towers and the core plot.

A field trip was conducted in November to collect LAI measurements and litterfall, establish photopoints, and establish field sites for new personnel that were introduced last quarter (Tonantzin Tarin Terrazas and Rachael Nolan).

LiDar flight was carried out on 19 September by ARA.

Calperum Mallee

All monitoring going well. Bore has been installed in the mallee site to 30 m with concurrent soil sampling. This was the limit of available equipment. Still in the Blanchetown clay layer and not in the water table. Expect groundwater to be at 30 - 45 m. The first SuperSite / Earthwatch program will be run at Calperum in April/May 2015 with a NAB corporate program planned.

A drone flight was carried out (post-fire) in the core 1 ha to map the locations of the centres of the mallee trees before canopy regrowth obscures the view.

Honours students are working on stable isotopes in the mallee and floodplain and the historic data from the floodplain bores. Environmental water releases are underway into the floodplain.

Cumberland Plain

Tree species inventory is now complete and a second vegetation survey was carried out in November.

Restoring the Cumberland Plain Woodland one seed at a time. As part of a new project to restore the Cumberland Plain's grassy woodlands, Greening Australia are developing what is possibly Australia's largest ground layer native seed production area (SPA). For more information see the [Greening Australia](#) website



Part of the Cumberland Plain Ant reference collection (J. Cook).

FNQ Rainforest

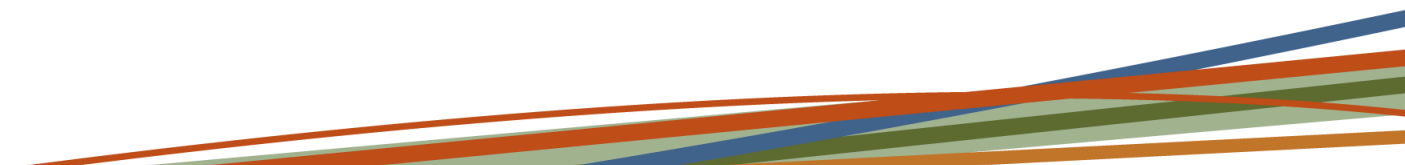
Cape Tribulation: Daintree Rainforest Observatory

Three avifauna monitoring sites were established in October 2014. Two standardised surveys were conducted at each site in October with Earthwatch volunteers. Next sampling is scheduled for late wet season/early dry season 2015.

Start of Drought Experiment has been delayed.

Recent activities on site included:

- Assoc Prof Geoffrey Morse (San Diego University) and Prof Ben Normark (University of Massachusetts) carried out a 20 day project on scale insects;
- Work on the DRO herbarium and the DRO insect collection is ongoing;
- Plant physiology work by Dr Raymond Dempsey (JCU) for the Cernusak group; Dr Lucas Cernusak and Dr Alex Cheesman (both JCU), and Meisha Holloway-Phillips and Hilary Stuart-Williams (both ANU);
- Plant physiology and drought experiment Dr Yoko Ishida, Deborah Apgaua (JCU) and Prof Jon Lloyd (Imperial College, UK);
- Transition Support Group visit - this is a group that looks after indigenous students from Cape York that board and study at high schools in Cairns;
- Two German interns onsite for 4 weeks;
- Five day entomology writing workshop- insect invasions;
- Four day plant physiology writing workshop- water isotopes in plants;
- Conservation Volunteers Australia onsite for 3 days- tree tagging, measuring revegetation plot trees;
- eResearch team onsite installing fibre optic cable into the forest- now have WiFi at the bottom and top of the crane;



- All systems bar above canopy phenocam sensors working fine. LAI and vegetation sampling completed bar heights in the 1 ha plot.

Robson Creek

Paper on Floristics, stand structure and above ground biomass of a 25 ha rainforest plot in the Wet Tropics of Australia has now been published (see Recent Publications for full details).

Recent activities include:

- Dry season ant survey completed;
- Annual coarse woody debris completed by School for Field Studies in November;
- Collection of fertile voucher specimens - now have 130 of the 209 tree species vouchered. Moving on to the 270 species in the focal hectare;
- End of dry season photographs taken;
- A table of functional traits is being assembled. We are attempting to measure wood density of all species on the 25 ha plot;
- Vegetation structure description completed;
- LAI to be completed before the first storms;
- Monthly fruit phenology and fortnightly bird surveys are ongoing;
- All sensor systems are running fine.

Tamara Taylor (PhD candidate) Griffith University/CSIRO is currently working on a project entitled "The impact of myrtle rust on the fleshy-fruited Myrtaceae of Queensland".

22 members of the Tablelands Walking Club recently visited the site, as did 14 people on a QNPWS field trip.

A very successful Robson Creek Open Day was held on 8 December, with 31 people attending and climbing the tower for a view of the rainforest from above the canopy. The Open Day was followed by the FNQ Rainforest SuperSite management meeting.



Dan Metcalfe (Deputy PI, FNQ SuperSite) at the top of the Robson Creek tower, Robson Creek Open Day.

Great Western Woodlands

First run of ant surveys has been completed. Drought plots have been set up.

SEQ Peri-urban

Samford: SERF

OzFlux sensors are now in place. Survey of Samford Valley being undertaken with the aim of upscaling from SuperSite across the Valley.

Dave Tucker has taken over from Remke and will look after majority of fieldwork.

Karawatha Forest

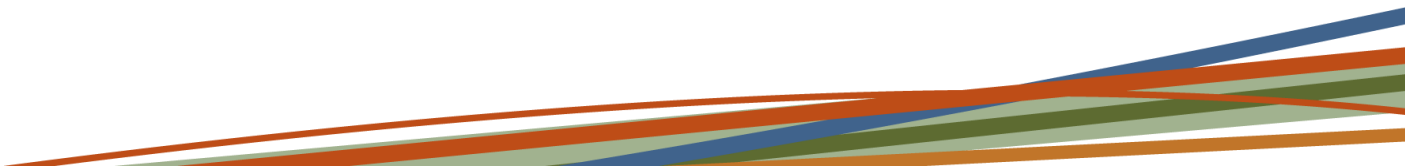
1 ha plot on top of PPBio plot has been set up and all vegetation sampling is complete. Working with colleagues at SCQ University to get LiDAR data for all 30 Karawatha plots.

Ant surveys were carried out during the Spring.

The SM3 acoustic recorder is now installed.

Tumbarumba Wet Eucalypt

In the last quarter the Core 1 ha has been set up; LAI cover photography completed and additional LAI measurements taken with the plant canopy analyser. Photopoint images have been collected. The bird survey plots have been established with the first survey coming up.



Litchfield Savanna

Final part of construction of tower has now been completed. Next phase is to install instrumentation on the tower. Ant and bird surveys will be carried out in 2015.

Victorian Dry Eucalypt

Whroo

Ant traps have been installed.

Wombat

Survey for biomass plots due to commence soon.

Warra Tall Eucalypt

Delegates to the COMLAND (Commission on Land Degradation and Desertification) / Environmental Institute of Australian and New Zealand Annual Conference visited Warra as part of a pre-conference tour.

Core 1 ha plot - Weekly collection of insects in malaise trap for Global Malaise Study (University of Guelph) and monthly collection of insects in four flight-intercept traps are ongoing in the core 1 ha plot. Summer sampling of ants was completed.

Flux-tower - Installed an EC100 electronics box (on loan from Campbell Scientific) to enable recommencement of flux measurements.

Hydrology - Issued a new contract with Entura (Hydro subsidiary) to collate and quality control data collected (via telemetry) from the three gauged streams in Warra.

Wildfire Chronosequence - Ben Fest (UMelb) collected soil samples from additional replicate plots along an *E. obliqua* time-since-last-fire chronosequence. Porosity measurements made on the samples will be used to support conclusions in a study on soil methane fluxes.

Silvicultural Systems Trial - completed 12-month sampling of beetles for the 10-year post-harvest measurement of the Aggregated Retention treatments. This completes the 10-year post harvest sampling of all treatments in the SST. Ongoing monthly sampling of pit-fall traps in the control plots of the SST. Sorting, mounting and databasing beetles collected from the control plots of the SST continues. Completed 10 year post-harvest surveys of birds in the aggregated retention treatments and annual survey of birds in control plots.

Recent Publications

Bradford, M, Metcalfe, D J, Ford, A, Liddell, M & McKeown, A (2014) Floristics, stand structure and above ground biomass of a 25 ha rainforest plot in the Wet Tropics of Australia. *Journal of Tropical Forest Science* **26(4)**: 543-553.

Chen C, Eamus D, Cleverly J, Boulain N, Cook, P, Zhang, L, Cheng, L & Yu, Q (2014) Modelling vegetation water-use and groundwater recharge as affected by climate variability in an arid-zone Acacia savanna woodland. *Journal of Hydrology* **519**: 1084-1096. doi: 10.1016/j.jhydrol.2014.08.032.

Baker, T P, Jordan, G J, Steel, E A, Wardlaw, T. J, Fountain-Jones, N M, Baker, S C (2014) Microclimate through space and time: microclimate variation at the edge of regeneration forests over daily, yearly and decadal time scales. *Forest Ecology and Management*, **334**: 174-184.

Hingston, A B, Jordan, G J, Wardlaw, T J, Baker, S C (2014) Bird assemblages in Tasmanian clearcuts are influenced by age of eucalypt regeneration but not by distance from mature forest. *Global Ecology and Conservation*, **2**: 138-147.

New Faces

Steve Zegelin, CSIRO, Deputy Leader, Tumbarumba Wet Eucalypt SuperSite

Steve Zegelin has taken on the role of Deputy Leader for Tumbarumba Wet Eucalypt SuperSite.

Anne Griebel, The University of Melbourne

Anne is a PhD Student at the Department of Forest and Ecosystem Science at Melbourne University and is working on monitoring at the Wombat node of the Victorian Dry Eucalypt SuperSite.

David Tucker, QUT, SEQ Peri-urban SuperSite

David has joined the QUT Healthy Ecosystems and Environmental Monitoring team within the Institute for Future Environments working on the vegetation monitoring at the Samford node of the SEQ Peri-urban SuperSite. David is a part-time PhD candidate with a research background in terrestrial ecological surrogacy, presently focussing on traditional multi-metric measures and novel acoustic metrics of ecological condition.



Upcoming Events

1-6 March 2015

APAN 39th Conference, Fukuoka, Japan. Details at: [Conference website](#).

12-16 April 2015

Australian Rangeland Society 18th Biennial Conference, Alice Springs. See [Website](#) for details.

22-26 June 2015

Statistical Ecology and Environmental Monitoring 2015 Conference, Queenstown, New Zealand. Details at: [Conference website](#).

The next issue of the Newsletter will be published in March 2015. If you have any news articles, photos, upcoming events, etc that you would like included please email shiela.lloyd@jcu.edu.au

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