

Quarterly Newsletter

Issue 6, March 2014

Supersite Central Update

Welcome to Issue #6 of the SuperSites/OzFlux newsletter. Planning for the Annual Face to Face SuperSites Advisory Panel meeting is well advanced (see below). The development of the SuperSites databases has been boosted by the arrival of Alvin Sebastian and Ivan Hanigan who have both started working full-time on SuperSite and LTERN portals. One of the first improvements has been to the data store for acoustic data where the ftp upload details have been transferred to a new storage system on the National Server Program (NSP). Standardisation of dataset names and file names will be implemented within the main Metacat data portal as new data is received into the database. These will be closely aligned with the LTERN dataset naming strategies. Dataset Titles will be worded in full, and follow a standard as much as is practicable.

Dataset Title Format: **Short description of data, XYZ SuperSite, Location, Year.**

eg: Vascular Plant Data, DBH-H, Litchfield Savanna SuperSite, Focal Hectare, 2014

File Name Format: **asn_(SuperSite code)_(data type)_(optional location)_(YYYY(MM(DD)))**

or for a range: **asn_(SuperSite code)_(data type)_(optional location)_(YYYY(MM(DD)))(start)-YYYY(MMDD)(end)**

The NCRIS 2013 funding contract has finally escaped the clutches of UQ legal and a signed copy was received at JCU this month. Deliverables from SuperSites (July 2014-June 2015) under NCRIS 2013 will include vegetation surveys/LAI in the core 1Ha, avifauna surveys and acoustic sensor data streams as well as management meetings and regular updates of information to the web site. Details of the vegetation surveys required will be decided over the next few weeks. A straw man version will be sent out for comment next week.

SuperSite/LTERN Meeting, 26-27 May 2014

This year, the Annual Face to Face SuperSites Advisory Panel meeting will happen on the 26th of May at the UQ Moreton Bay Research station on North Stradbroke Island, Brisbane. This will be followed by a combined meeting with LTERN on the 27th. Some of the agenda items will cover discussion around the monitoring protocol deliverables under the NCRIS 2013 funding; a proposal to collect leaf samples from the SuperSites for a wider genomics project; development of cross-SuperSite publications; a review of the use of interns to collect data at the SuperSites; database upgrades and data standards.



OzFlux Central Update

Technical Staff joins Central Node

OzFlux welcomes 3 technical staff to the Central Node: Ian McHugh and Emma White, who share a position at Monash University, and Caecilia Ewenz who will take up a position through CSIRO.

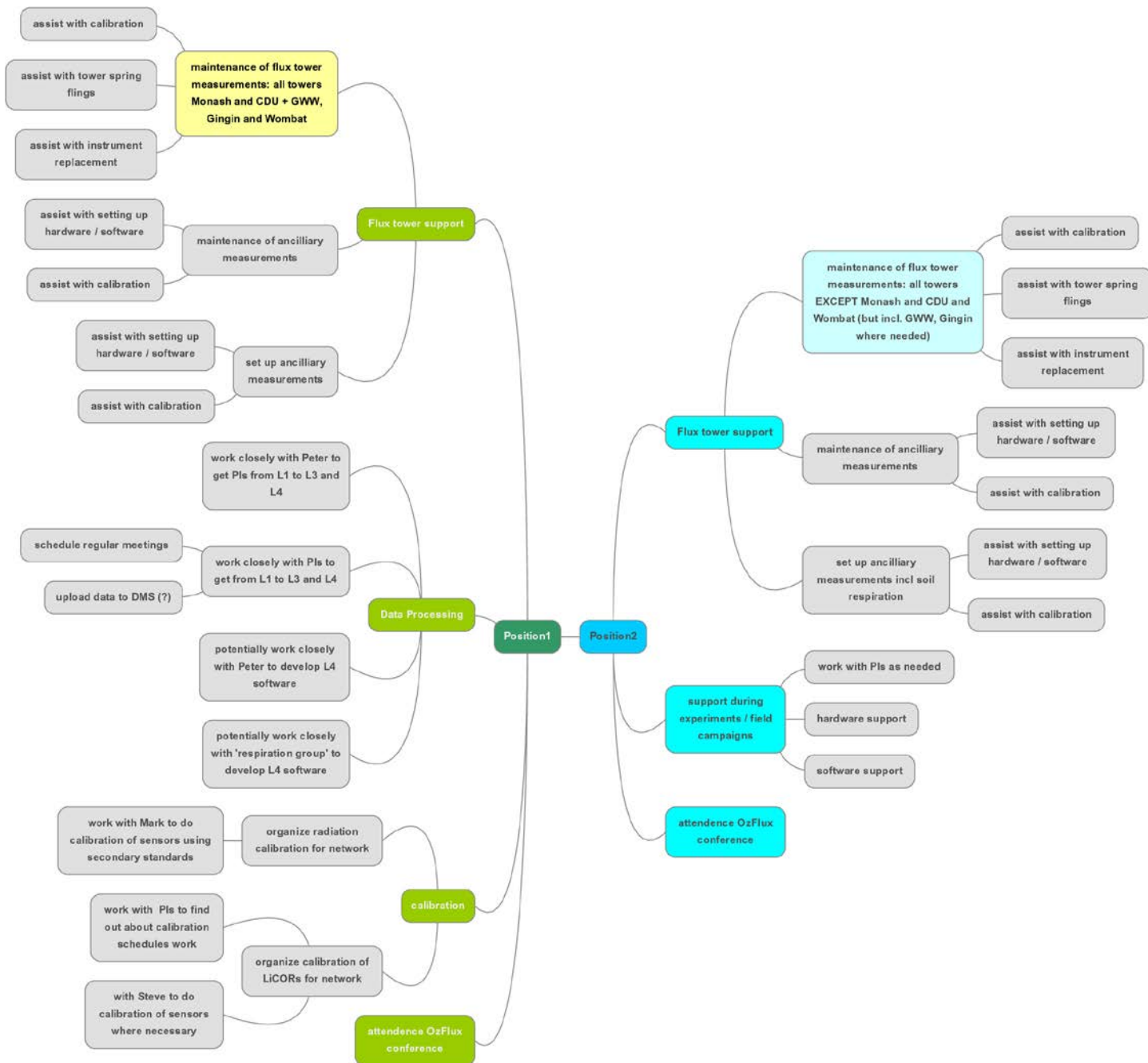
We have established the following principles to guide their day-to-day work:

- a) The technical staff will be line managed within their own institution (i.e. Monash, CSIRO).
- b) Funds are available for a total of about 1.8 FTE per year of technical support. This is being shared evenly between CSIRO and Monash.
- c) Line managers understand that the purpose of the OzFlux technicians is to provide a shared resource to all OzFlux PIs and sites – this purpose is to define the highest-level priority for these staff.
- d) The day-to-day tasks of each of the OzFlux techs will reflect the needs of the network PIs and sites, consistent with c).
- e) The OzFlux Steering Committee has the role of overseeing the annual work plan and expectations of the OzFlux technicians; this includes approving and prioritising requests from sites for assistance with field campaigns and dedicated experiments for each year.
- f) The OzFlux Central Node, together with the CSIRO/Monash-based line managers, have the responsibility of ensuring that this overall work plan is implemented via close oversight of the shared OzFlux technicians.
- g) OzFlux will endeavour to be collegial and transparent about working with, and sharing the services of, the OzFlux technicians.
- h) All OzFlux shared technicians should attend the annual OzFlux Workshop and relevant training days.

And practically speaking, the following describes how we intend for this to work operationally:

- a) Split of tasks – the figure below captures tasks for the OzFlux technicians and the split of sites/geography for each. Jason Beringer has kindly offered to also support the sites in WA. This means that both the CSIRO-based and Monash-based technical staff could be called upon to support the WA sites.
- b) Eva and Peter Isaac will work with Jason to implement a Trello-based “to do/task list” where PIs can post their needs and requirements. This can be viewed by the OzFlux Central Node, the line managers and the OzFlux PIs (consistent with 1g) above). See Trello Board for Technical Support article below the diagram for more explanation!
- c) In addition, the OzFlux technicians will endeavour to contact each of the PIs on a rolling fortnightly schedule to ensure they are aware of the support that is needed.
- d) The split of tasks between Emma and Ian, from Monash, is roughly: Emma will be handling Data processing issues and Ian providing Flux tower support.
- e) The OzFlux Steering Committee will review monthly summaries of the tasks, to ensure transparency and fairness.





Trello Board for Technical Support

A Trello board has been established to allow OzFlux site PIs to submit jobs to the Technical Support Team. The Technical Support Team consists of Emma White, Ian McHugh, Caecilia Ewenz and Peter Isaac.

If you would like to join the Trello board, sign up for a Trello account (<https://trello.com/login>). If you already have a Trello account, email the name or email address used when you established your Trello account to Peter Isaac (pisaac.ozflux@gmail.com).

Jobs can be submitted by adding a new card to the "To Do" list of the OzFlux Technical Support board. The board just covers Emma, Ian and Peter at present, until Caecilia officially starts. To help prioritise tasks, we are suggesting the following scale from 1 (highest) to 5 (lowest):

1. Work required to restore all data collection at site (eg the recent fire at Calperum).
2. Work required to restore data collection from a sensor (eg net radiometer at Warra).



3. Work required to improve quality of data being collected (eg calibration).
4. Work required to get data onto portal (eg help with processing)
5. Work required to collect ancillary data for site (eg field trips).

Please add a priority number to the card when submitting a job to the Trello board.

FluxNet Data Submission

Work continues with the submission of OzFlux data to FluxNet. The first tranche of yearly files have been harvested by FluxNet and put through their new quality control process. While problems have been identified at a small number of sites, Dario Papale of FluxNet has commented that he has been impressed by the overall quality of the OzFlux data, which he attributes to a standardised processing system.

Dario has emailed the PIs of the sites where problems have been found. Peter Isaac will be working with the PIs to correct any issues and resubmit the data to FluxNet via the OzFlux Data Portal.

OzFlux Data Portal

TERN have granted OzFlux \$50k in supplemental funding to be used for further development of the OzFlux Data Portal. The development is to include:

1. Migration of the ODP to Federal and State Government funded infrastructure (REDS and NeCTAR).
2. Installation of an OPeNDAP/THREDDS server to allow easier transfer of data from OzFlux to other TERN facilities, particularly eMAST.
3. Migrate maintenance and further development of the ODP to resources within TERN.

The migration work is almost complete and work on installing the OPeNDAP/THREDDS server is expected to begin in the next few weeks.

OzFlux Data Processing

The use of ACCESS NWP model output as a possible source of data for gap filling data sets from OzFlux towers was recently explored using a month of data from June 2012. The "proof-of-concept" was very encouraging and is being extended to cover a whole year (2012) of data at all OzFlux sites.

The ACCESS NWP model is run at 12.5 km resolution and is initialised with observations (AWS, radiosondes, satellite products) every 6 hours. CAWCR are currently supplying OzFlux with the initialisation fields followed by 5 hours of forecast data before the next initialisation field. This ties the model output very closely to the observations. Plots of the comparison between the ACCESS output and the observations for 10 tower sites have been put on the OzFlux Dropbox folder.

Data from 2010 is available from the ACCESS archive and data from 2014 onwards is available from the Bureau's OPeNDAP server. Eventually, we hope to offer data from 2010 to 2013 inclusive to site PIs via the OzFlux Data Portal and Dropbox with current data (2014 onwards) available via a Python script as part of the OzFluxQC suite.

Work also continues on implementing the Change Point Detection algorithm for determining the u^* threshold at OzFlux sites and extending the respiration functions available to include the technique of Lasslop et al (2010).



News from around the SuperSite and OzFlux networks

Alice Mulga

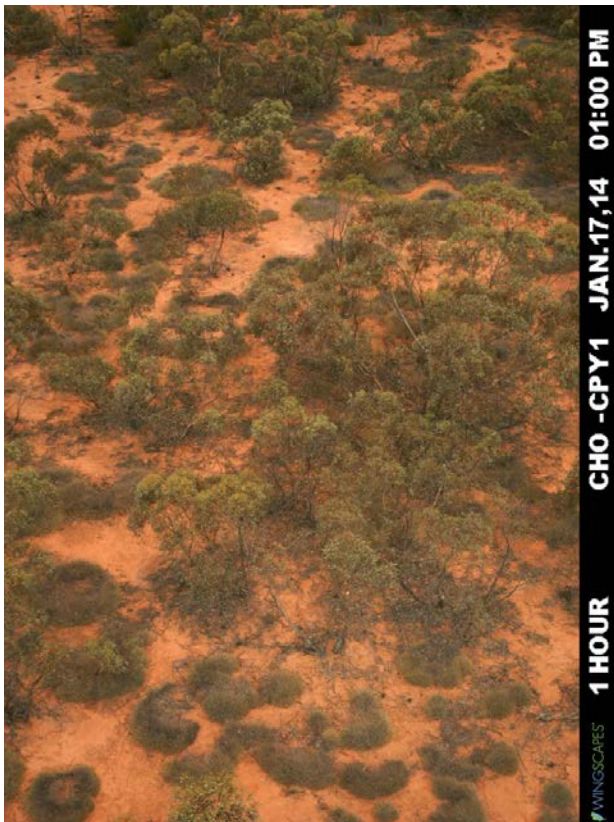
A new flux tower site was located in December to look at the ground water use of the predominant *Corymbia sp.* vegetation. A campaign in January collected DBH and H data from the core 1 ha plot, under difficult conditions. AusPlots vegetation and soil data has been made available through the data portal. The second flux tower site (hummock grasslands) received 100 mm of rain and is now showing net photosynthesis while the first flux tower site has swapped to net respiration. An AusCover campaign is to be run by the middle of the year. The final joint ASN/eMAST plant physiology field campaign run by the Atkin team under this round of funding is to be carried out in mid-July at Alice.

Calperum Mallee

Wayne and Georgia visited the site on 17 January, following on from the scorching temperatures, fire, strong winds and then more than 60mm of rain.

This was their second visit since the fire and the area looked more dramatic than it did a week after the fire.

The leaf remnants on the tree tops had now dried and died. From the top of the tower it was a sea of brown and black with the occasional island of green where the fire did not burn.



Before the fire

SD cards from the two phenocams at the top of the tower were retrieved. Both units have heat buckled covers but one has remained functional (see before and after fire images) – the fire was all over between 1 and 2pm on 17 Jan – whoosh!



After the fire

During this visit they re-established the solar panels and power to the data logger and modem, installed a new antennae to the modem, cleaned the radiometer at the top of the tower and disconnected those sensors where the wiring was burnt and power was shorting.

So far the data logger has rebooted and modem contact has been restored.

You can see some of the output at <http://calperumchowilla.wordpress.com/site-data/>

There is an opportunity to collect valuable data as the area recovers from fire damage. Bird surveys have been extended to floodplain sites. Currently compiling small mammal pitfall trap data and collecting more data post-fire. An honours student will start work in July collating historical groundwater measures.

For those interested or haven't seen first-hand here is a link to an ABC news report on the fire and flux tower at Calperum <http://www.abc.net.au/news/2014-03-05/ecosystem-research-tower-being-repaired-after-bushfire-in-malle/5299602>



Wayne visited the site on 7 March with replacement temperature, humidity and lower level wind instruments to install which should get most of the data flowing again.

There is a delay in getting suitable length replacement cabling for the CSAT (sonic anemometer) so Wayne is patching (jerry-rigging!!) a cable which, if it works, will see the site mostly functional. He has also figured out a patch and connect for the soil water sensors and is waiting on parts. Hopefully they will be connected on the next visit, after he was able to scratch among the ashes of the multiplexor and figure out which cable goes to which soil depth.

Other issues include a faulty rain gauge replacement and the guy cables have been heat affected and will have to be replaced before they corrode.

An independent assessor has been on site, now awaiting a decision from the University insurance person to advise on what financial resource there will be available.

Wayne says that "now that the inspections have been done I can focus on checking what might work, what needs replacing and hence get a better idea of likely time to get operational again. With this I can assess what will make sense in taking up your generous offers of replacement and loan equipment.

As a related process a new PhD student is gearing up to get some in-situ soil gas chambers in place to track CO₂ and perhaps other gases from burnt and unburnt areas – hopefully this event provides some opportunity to monitor change in soil respiration starting from a "burnt baseline"!

The message from Wayne: "Thanks again to those who have helped and offered support."

Cumberland Plain

The flux tower is running fine with 1 year plus of level 3 data. A new, high level, surveillance camera has been added to the tower. This camera can be programmed to focus on different areas and will be used for phenology and a mistletoe study. Teams are set up for different sampling at the new core 1 ha plot, and soil sample chemistry for the BASE project. A bird survey protocol will be completed soon. Justin Welbergen will set up an array of bat acoustic monitors, collaborating with Kyle Armstrong (Uni Adelaide). Vegetation sampling in the core 1 ha was carried out in March with the assistance of a team from the Sydney Botanical Garden. A PhD student will start a 6 month Endeavour Fellowship funded, study on ants at Cumberland with James Cook as Supervisor.

FNQ Rainforest

Robson Creek

The Robson Creek flux tower is going well. A new replacement bore was drilled to 20 m. Bird surveys,

acoustic data, stream surveys and water chemistry are being collected every month to assess sampling frequency going forward.

Cape Tribulation: Daintree Rainforest Observatory



Construction on the new accommodation and laboratory complex is progressing and will reach completion early May 2014. It is expected that the first students will be accommodated in the facility in June 2014. The facility accommodates 40 students, 8 researchers and 2 JCU staff. The 'new' DRO has on site power generation, water harvesting, and sewage treatment along with a building management system to record and control resources.

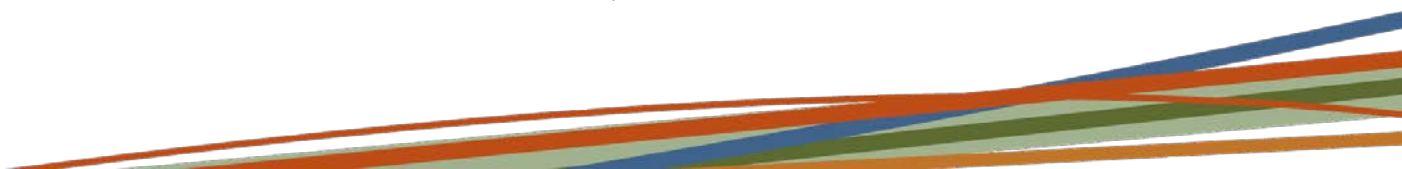
Set up of the drought experiment continues, with the installation of lysimeters; a sap flow system and automatic dendrometer bands on 60 trees; soil sensors (TRD and ceramic probes) at 1.5 m depth in 8 soil pits. Soil samples have also been taken for chemical analysis. Experimental phloem sensors have been installed on several species.

Two Masters students from Imperial College London will visit the site in April to undertake research on birds.

TV crews from the BBC and Swiss TV channel SRF have recently been filming on site.



SRF TV show host Sven talking to Alex Cheesman about the installation of lysimeters in the soil pits at the DRO



Great Western Woodlands



On January 21, 2014 a storm at Credo delivered 130 mm of rain in one event, equivalent to about half of the average annual rainfall. The event also filled the usually dry, fresh-water lakes on Credo to 4.5 m depth. The phenocam recordings of the rain event can be seen on the GWW Supersite webpage. We look forward to seeing the impacts on ecosystem fluxes.

During a recent trip to Credo the team installed 15 litter traps at each of 4 1 ha plots including the main supersite plot; took samples from the bore holes, establishing that ground water is present at depths of 30-40 m; improved data storage capacity at the tower to reduce the need for maintenance visits from two to three monthly, and undertook routine data downloads, maintenance and repairs.

Tumbarumba Wet Eucalypt

All running smoothly. We have installed wifi on site which will be useful for the sensor network work. We are gearing up towards getting THEMIS (Tumbarumba Hyperspectral Monitoring System) installed on the tower. The system has run smoothly in the lab, we are doing last tests outdoors and then it is good to go. Natalia Restrepo-Coupe will mount a pair of phenocams on the tower, it will be interesting to have these along with THEMIS.

We were told (once more) that selective logging will re-start in June. This will impact on the forest in the flux footprint but will not impact on the 1 ha core plot this time round. The 1 ha core plot might be affected by the next round of logging though.

SEQ Peri-urban

Samford: SERF

Greenhouse gas, water quality, soil and atmospheric flux monitoring continues at SERF. Monthly avian point counts and acoustic sensing also continues, including regular undergraduate ecology student visits.

Karawatha

Remote sensing studies using hyperspectral flights, focusing on two plots (including core 1 ha) are being carried out. Ground surveys were repeated in February. An honours student is currently working on relating on-ground data (including biomass) to spectral, hyperspectral and LiDAR data.

Litchfield Savanna

Researchers at Litchfield are working with a team from UNSW, led by Richard Lucas to use radar satellite to estimate biomass around Australia. While waiting on dry weather to return so they can continue with the tower installation.



Victorian Dry Eucalypt

Whroo

Field campaign conducting ground based LAI, litter fall, leaf level photosynthesis measurements, was carried out in January/February.

Wombat

Issue with flux data, so looking at possible instrument issues.



Warra Tall Eucalypt

Still within World Heritage listed area. Acoustic monitoring continuing with monitors now powered from the tower.

AusCover campaign is planned to happen in the first half of this year.

Ongoing Silvicultural trial surveys; annual floristics, bird surveys, pit fall surveys completed. Point intercept survey for extended plot is completed. Recent discussion with end user, Hydro (Lake Gordon), that would like to use flux data for carbon accounting, to work out carbon offsets for vegetation flooded in the building of the dam.

New Faces

Elise Pendall, Hawkesbury Institute for the Environment, UWS, Deputy Leader, Cumberland Plain SuperSite



Elise studies the responses of biogeochemical cycling to climate change and ecological disturbances. Her research interests centre on how linkages between aboveground and belowground ecosystem components regulate carbon, water

and nutrient cycling in grasslands, forests and crops. She uses stable isotope techniques to investigate carbon storage in soils, water losses from plants, and nitrogen turnover by soil microbes.

Upcoming Events

20-24 July 2014

ATBC 2014: The Future of Tropical Biology and Conservation. Cairns. Australia. [Details](#)

21-30 July 2014

MICMoR Summer School 2014: Examining Mountain Ecosystems in Regional to Global Environments of Carbon-cycling and Climate (EMERGE-CC). KIT/IMK-IFU, Garmisch-Partenkirchen, Germany. [Details](#)

29 August 2014

7th Annual South Australian Spatial Information Day, Adelaide, Australia. Details at [Conference Website](#)

22 Sept – 26 Sept 2012

OzFlux data processing workshop. Registration is [here](#). Please register early and pass information on! This workshop will be held in conjunction with LI-COR and we strongly suggest to also [register](#) for the companion course.

29 Sept – 1 Oct 2012

OzFlux meeting/conference. Registration (with deadline Sept 1) is [here](#). Please register early and pass information on!

28 Sept - 3 Oct 2014

Ecological Society of Australia 2014 Annual Conference, Alice Springs, Australia. Details at [Conference Website](#)

29 Sept - 2 Oct 2014

TERENO International Conference 2014 - From observation to prediction in terrestrial systems. Rheinische Friedrich-Wilhelms-Universität, Bonn, Germany. Details at [Conference website](#).

4-7 November 2014

2014 ForestSAT Conference, Riva del Garda, Italy. Details at [forestsat2014.com](#).

1-3 December 2014

AAA/ASHA 2014 Joint Conference, Culture, Climate, Change: Archaeology in the Tropics, Cairns, Queensland. Details at: [Conference website](#).

The next issue of the Newsletter will be published in June 2014. If you have any news articles, photos, upcoming events, etc that you would like included please email shiela.lloyd@jcu.edu.au