

Quarterly Newsletter

Issue 2, March 2013

Supersite Central Update

Welcome to Issue # 2 of the ASN/OzFlux newsletter. The start to 2013 has been hectic but productive.

A big thank you to all the Supersite principal investigators (PIs) who made it to the 2013 ASN annual face-to-face meeting in Canberra on February 18. This was a very useful exercise with PIs from all ten Supersites attending and updating progress at their respective Supersites. We also got to meet with David Tazik from the National Ecological Observation Network Inc. (NEON) who gave us an overview of NEON progress to date. David was in Canberra for the TERN Symposium to exchange memorandum of understanding documents with TERN and to start to map out how our networks can work together.

The ASN has been collaborating with NEON to ensure that our post-2014 monitoring protocols enhance, where possible, intercontinental data integration and comparability through common protocols, instrumentation, quality control measures and data handling. So far, discussions between NEON specialists and members of ASN protocol working groups have occurred around vegetation (in November) and soils protocols (in January). We hope to address faunal monitoring next. The ASN invertebrate fauna group had a successful initial meeting in December.

Some of the action items that came out of the face-to-face meeting include:

ASN-wide paper

David Ellsworth is making good progress putting an article together that will describe the ASN and use climate variability across the Supersites and limited data available so far to test the hypothesis that hydrology limits tree height. Information is still required from some Supersites on soil descriptions including texture and rooting depth where available. Any water potential data from Supersites or similar sites would also be useful to this study.

ASN Website improvements

Suggestions include:

- publishing detailed monitoring protocols and data standards, perhaps as x-wiki documents.
- setting up a common calendar where details of upcoming AusCover, AusPlot and Ecophysiology campaigns at Supersites can be detailed.
- publishing standard wording options for TERN-ASN acknowledgements in research articles as well as author affiliations.
- A current list of publications derived from Supersite infrastructure.

Protocol working groups

This year we will form working groups to develop:

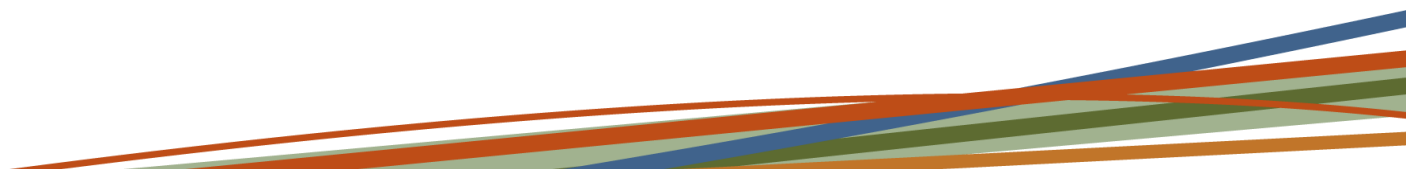
- Fauna monitoring protocols post 2014
- Audio data analysis strategy
- Vegetation canopy and understory measures - LAI / DHP /flat images.

Key Performance Indicators

Publications derived from Supersites infrastructure will be collected as well as information on collaborations, workshops, grants etc. These will be used to demonstrate that the network is producing tangible outcomes. PIs can send a list of publications to Shiela as a starting point and Mirko will send out a KPI template that may be useful for keeping track of these details. I expect we will ask for updates on a 6 monthly or yearly basis.

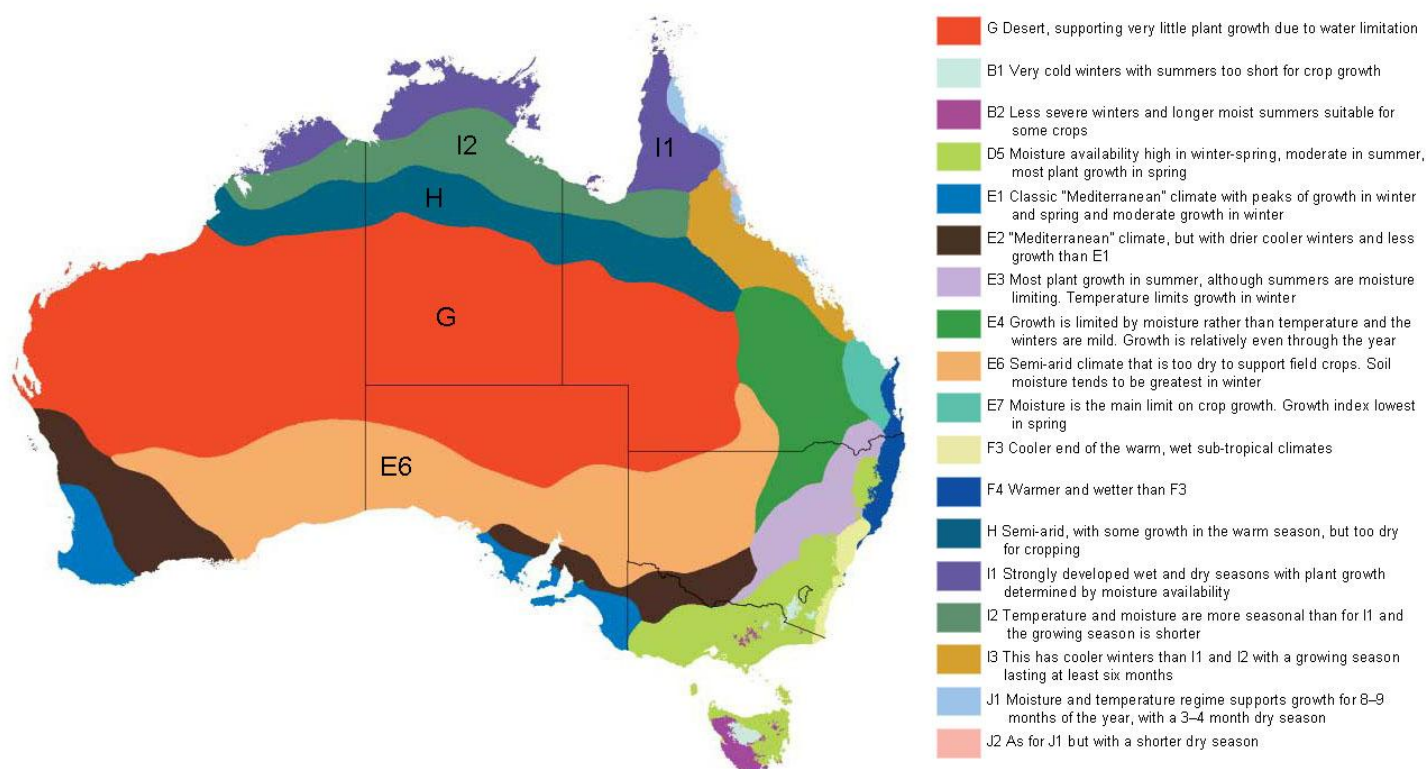
We also need to get a better handle on what our stakeholders would like us to deliver, so that we can highlight these deliverables and then point out how we are addressing these on our website as well as in funding proposals.

We will be contributing to a TERN prospectus that demonstrates to the government our outputs that among other things, have relevance to ecosystem science researchers; informs policy; public good and provide an economic benefit.



ASN 2014 onwards

As a network we need to think about the development of the ASN post 2014. This includes coming up with an agreed and clear set of criteria on which the inclusion of new Supersites will be judged. There are two aspects to this. The first aspect is to identify where the Supersite network lacks coverage. One way of identifying the gaps in our coverage could be to align the locations of Supersites with an ecoregion scheme (such as Hutchinson's Climate Zones, Hutchinson, M. F., McIntyre, S., Hobbs, R. J., Stein, J. L., Garnett, S. & Kinloch, J. (2005) Integrating a global agro-climatic classification with bioregional boundaries in Australia. *Global Ecology and Biogeography* **14**, 197-212). The second aspect to site selection, as directed by the TERN board in the EIF round, is economic - without financial support from State, Territory or industry partners new Supersites will struggle to make a convincing case for their establishment. In a future teleconference/videoconference workshop then we will work on the development of an agreed method for deciding on the location and characteristics of new Supersites added to the network. We aim to identify and develop at least two new Supersites in the next round of funding. Priority areas identified in the Roadmap for new Supersites are within managed landscapes and coastal sites (<http://www.innovation.gov.au/Science/Documents/2011StrategicRoadmapforAustralianResearchInfrastructure.pdf>).



http://www.cazr.csiro.au/connect/images/hutchinson_mcintyre_etal.jpg

AusCover data collected at the Supersites

Rebecca Trevithick gave an overview of the AusCover campaigns carried out at Supersites so far. Data that has been processed and available for upload can be accessed from the AusCover Visualisation Portal at <http://data.auscover.org.au/Portal2/>. Under the "Map Layers" tab (on the left) choose "Themes" and then "Calibration/Validation Field Data". You can then select the data that will be shown on the map e.g. Cal/Val Footprints, Hyperspectral calibration, Start Transect Summaries, Tree Structure, Hemispherical Photography etc. Some of the data sets are very large and easier to download by ftp. Contact Rebecca for details (Rebecca.Trevithick@science.dsitia.qld.gov.au)

Hyperlinks to the available AusCover data will be added to the ASN Data Portal. This will include raw EO-1 Hyperion data (<https://remote-sensing.nci.org.au/u39/public/html/hyperion/raw-australiapasses-usgs/>) that overlaps the Supersites. This satellite imagery was originally collected to validate Landsat-7 but has since been used for other purposes including hyperspectral validation of land products. This data will be used by Curtin University to create a suite of data products for AusCover.

Digital Object Identifiers

We can now offer to create DOIs for data sets on the ASN database. The DOI system provides a persistent digital identifier for digital objects or documents that is more reliable than using URLs. The use of DOIs will make citation of data sets easier and

more traceable. There are some conditions that must be abided by e.g. each digital object can only have one DOI assigned to it. For further information contact Marco at marco.fahmi@qut.edu.au.

Marco's new role with the National eResearch Collaboration Tools and Resources project

Marco Fahmi is now a little busier with a new position at the NeCTAR Biodiversity and Climate Change Virtual Laboratory (bccvl.org.au) on a 12 month project developing an "innovative, efficient, robust portfolio of integrated tools, data collections and access portals for modelling the potential responses of Australia's biodiversity to climate change through an easy-to-use, web-based platform with advanced visualizations" (<https://nectar.org.au/biodiversity-and-climate-change-virtual-laboratory>).

Daintree eclipse video

A documentary video entitled "Second Dawn" was launched at the TERN Symposium in February. It stars Marco Fahmi as one of a band of intrepid adventurers fighting through the impenetrable tropical rainforest at the Daintree Rainforest Observatory searching for ways to harness the powers of the sun and the moon to silence feathered friends, if only for a few minutes.



The documentary follows an acoustic monitoring experiment

at the FNQ Rainforest Supersite during the total eclipse last year. The study led by Michael Towsey and Jason Wimmer from QUT looked at the effect of the total eclipse on the birdsong from the forest. A hyperlink to the video will be placed on the ASN website and can be viewed on You Tube <http://www.youtube.com/watch?v=PEMbNqSh4BQ&feature=youtu.be>



OzFlux Central Update

TERN Symposium at Canberra

The annual TERN Symposium was held in Canberra at Old Parliament House from the 18th February to the 21st February. OzFlux contributed several papers, a live demonstration of a "flux tower" – i.e. a sonic anemometer and infra-red gas analyser, and a demonstration of the OzFlux Data Portal.

The 4 day extravaganza began on the Monday with a TERN-ANDS workshop designed to bring the TERN facility data managers up to speed with the transfer of metadata from the TERN facilities to the Australian National Data Service (ANDS). OzFlux already makes metadata available to organisations capable of harvesting RIF-CS files (ANDS, TERN Data Discovery Portal) but the material on data licensing and Digital Object Identifiers (DOI) was timely and useful.

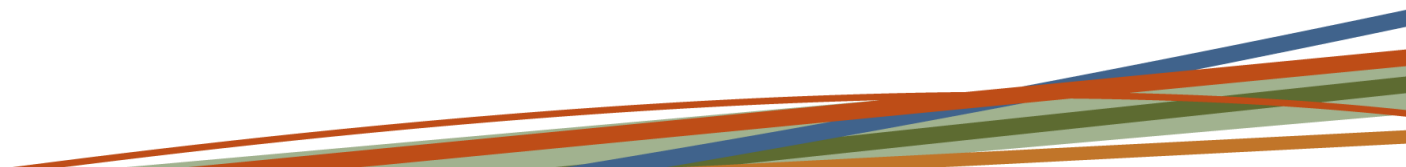
A large number of OzFlux site PIs gathered on Monday for an OzFlux meeting after the all-day ASN meeting. The main topic of discussion was the proposed data license model to be implemented on the OzFlux Data Portal. There was vigorous discussion about the proposed license model but by the end of the meeting a clear list of modifications to the proposal emerged.

There were 12 presentations that were either based on the OzFlux network or used data from the network. Highlights were the presentations by Helen Cleugh, Eva van Gorsel and Vanessa "Media Star" Haverd. Alfredo Huete's presentation showed a novel use of OzFlux data to estimate ecosystem resilience and Mila Bristow showed how flux tower data can be used to monitor the effects of land use change.

As well as presentations, the data processing workshop, and the smoozing during the Symposium dinner, there was some frantic behind-the-scenes activity to resolve the OzFlux data license issue. OzFlux met with Alison Bradshaw (TERN's license lawyer) on Tuesday to discuss options for the license and a modified proposal incorporating requests from Monday's PI meeting was ready in time for a Wednesday meeting with representatives from the TERN directorate, who agreed to take the proposal to Tim Clancy, the TERN Director. See below for a report of the progress.

Thursday was a TERN planning day, attended by Eva van Gorsel and Peter Isaac on behalf of OzFlux and much fun was had participating in the various team building exercises. Central themes for the day's discussions were the interim funding to the end of 2014, funding options beyond 2014 and integration of science efforts across facilities.

The ASN update mentions the need for performance metrics, and to identify what our end-users want. This is also true for OzFlux and so PIs will expect to see further communication over the coming weeks/months on such aspects. Important too



for OzFlux – like ASN – is to start considering what we'd like OzFlux to be if there is a TERN-3. To facilitate such discussions, Eva, Peter & I hope to instigate a series of regular (roughly monthly) phone meetings with the OzFlux PIs – watch this space!

OzFlux Data License Model

Greater accessibility to publicly funded research data is a fundamental principle of TERN and release of data to a wider audience requires a license to specify the terms and conditions under which the data can be used.

After a series of meetings at the Canberra Symposium with the OzFlux site PIs and the TERN directorate, a license model expected to be agreeable with both groups was produced. The main features of the license model are:

1. Use of a license that specifies attribution (BY), share alike (SA), non-commercial use (NC). The TERN-BY-SA-NC license was not one of the original suite of TERN licenses but has been added at OzFlux's request.
2. Use of an 18 month restricted access period to protect post-graduate student intellectual property.
3. Use of an OzFlux Fair Use data policy based on the global FluxNet example.

The license proposal was canvassed at a phone conference of OzFlux PIs (encompassing the Steering Committee) on Friday 15th March and general agreement was reached. Representatives from OzFlux met with the TERN directorate immediately after this call to discuss the proposal and again, there was general agreement for the license model.

The next step is to prepare a final version of the license model incorporating the suggestions from Friday's two phone calls and to circulate this final version to the OzFlux site PIs and the TERN directorate. This is expected to be done by the end of March with implementation into the OzFlux Data Portal slated for April.

OzFlux Data Portal Phase 2 Development

Work on Phase 2 of the OzFlux Data Portal began in February this year in collaboration with the Monash eResearch Centre, the developers of the original portal, on an ANDS funded project.

The primary goals of the Phase 2 development are to improve the usability of the data portal and to comply with TERN's requests for metadata standards. The major features of the Phase 2 development are:

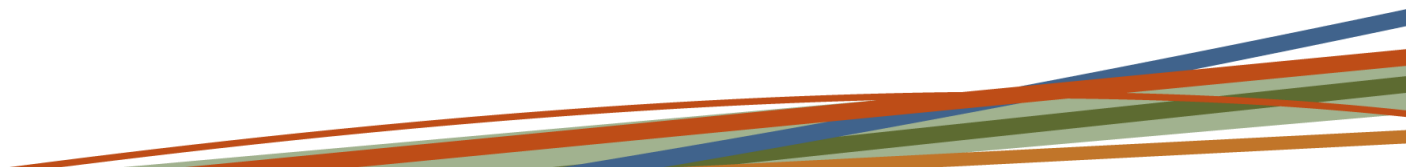
1. Map view – this will display all of the OzFlux sites on a map of Australia and New Zealand. Clicking on a marker will bring up a list of sites from which the user can click through to the data collection of interest. The general operation is similar to the TERN Data Discovery Portal.
2. Implementation of the data license – this has required some fundamental changes to the security model used by the portal to accommodate application of a restricted access period. Web pages describing the license model are also being added as well as a pop-up window asking the user to confirm that they have read and agree to the license terms and conditions and that they have read the OzFlux Fair Use data policy.
3. Implementation of metadata standards – while the original portal complied with the metadata requirements of ANDS, TERN have requested some additional metadata material to fully integrate with the TERN Data Discovery Portal.
4. Additional pages to explain portal layout, data type and format and how to access the data – the original portal was written to be used by a small group of researchers who were familiar with the data available on the portal and who understood how the portal operated. Content describing the data and the portal is being added to help lay users access the data.
5. In a similar vein to the Supersite portal where an OzFlux site is also a Supersite then links will be provided to the Supersite portal to enable users to see the enlarged suites of data that are available for that site.

Monash eResearch are approximately half way through the Phase 2 development with completion scheduled for the end of April. User Experience testing with a team of 6 people from within and outside the OzFlux community is expected to start in early April.

As part of the Phase 2 portal development, the data contained in many of the existing portals will need to be re-processed and re-submitted to the portal. The OzFlux Data Manager (Peter Isaac) will be in contact with site PIs during April and May to discuss this process.

Tower Round-up

The Warra flux tower is the latest addition to the network, bringing the number of operational sites to 28; 13 TERN-funded and 15 non-TERN funded. Darren Hocking (Monash University) and Peter Isaac joined Tim Wardlaw and Alison Phillips (both Forestry Tasmania) for the instrumentation of the 80m tower at Warra, Tasmania on Sunday 3rd March. Instrumentation, wiring to the data logger and modification of the data logger program went without major problems and measurements of



radiation, fluxes and meteorology began on Tuesday. Soil measurements will be implemented soon once 3 more soil pits are dug and a remote logger for the soil measurements established. Communications from the site to a nearby telemetry site will be by short-haul radio modem and via mobile broadband from the telemetry site, yet to be installed.

Warra will be a challenging site given the local topography. Congratulations and good luck to Tim and Alison.

OzFlux meeting 2013

We have 15 EOIs for the OzFlux meeting 2013. **If you have not submitted an EOI yet, but are considering attending the meeting, please register at**

<http://www.csiro.au/Organisation-Structure/Divisions/Marine--Atmospheric-Research/OzFlux-Meeting-Eoi.aspx>

LI-COR Data Processing Workshop Expression of Interest

LI-COR has been offering to conduct a comprehensive 3-day EC training course that covers scientific theory, system design, hands-on assembly of an EC instrument system, maintenance, data collection, and data processing just before our the OzFlux meeting in Cairns. Detailed information on course content can be found here: http://www.licor.com/env/products/eddy_covariance/training.html. While data processing with EddyPro is not the standard OzFlux processing path it is a widely used software package and certainly worth knowing. This seems like a very good opportunity to get insights in flux measurements and data processing from a different perspective. We are considering to add a 2 day course on the OzFlux data processing after the LI-COR training.

EOIs for a training course (LI-COR or OzFlux) can be submitted at

<http://www.csiro.au/Organisation-Structure/Divisions/Marine--Atmospheric-Research/OzFlux-DataWorkshop-Eoi.aspx>

Please submit the keywords LI-COR or OzFlux if you are interested in one of the courses only.

News from around the ASN and OzFlux Sites

Alice Mulga

Acoustic monitors, phenocams and Sapflux systems are now installed and running. AusPlots vegetation survey has been completed. Monitoring of ground water bores is being conducted by Flinders University.

Calperum Mallee



Vegetation and bird surveys are being carried out at six sites around the flux tower, and an additional six sites will be surveyed within the next six months. Soil samples have been collected and are ready for analysis. Ausplots have recollected vegetation data for 20 plots.

The plant physiology campaign will be conducted in March and a drilling program for 3 new

bores will be carried out over the next two months.

Phenocams and acoustic monitors are now installed and operational. A neutron probe has been added to the soil water study.

Cumberland Plains EucFACE

FACE at full concentration +150ppm (540ppm) since early February. Flux tower within FACE has been running since September, while another, 2 km away has been operational since August.

The fourth detailed plant physiology campaign has been completed. A bat survey has been completed, and acoustic monitors have been relocated to avoid background noise.

Raw data in EucFACE database will be streamed to the ASN portal.

FNQ Rainforest

The Robson Creek Node is now officially open.

The concrete slab for the flux tower has been installed; unfortunately the soil pit was destroyed during installation!

Steve Williams' group has carried out a six monthly faunal survey. Invertebrates have been sampled around rare and threatened species. The 25 ha vegetation survey, AusCover, and



plant physiology campaigns are complete. CSIRO Cosmos sensors are now running. YSI Sonde probe is being installed in the creek.

Interview with Mike Liddell for ABC Radio, February 2013 about working in Australia's large scale rain forest research plot

The CSIRO has opened up a large plot of rainforest west of Cairns in far north Queensland to scientists keen to study the unique ecosystem.

It has mapped and measured every tree in the 25-hectare plot at Robson Creek on the Atherton Tablelands.

Associate Professor Mike Liddell from James Cook University says there is great potential for studies into biodiversity, carbon storage and the impacts of climate change.

"We've got lots of instruments up there that are measuring the climate," he said.

"We're just installing a very, very big tower and the aim is to get scientists from around Australia and around the world to start using this infrastructure.

"It's set up to be collaborative infrastructure that'll help land managers.

"The amount of biodiversity is immense, so we're just scratching the surface of the invertebrate biology up there."

Associate Professor Liddell says the site has already revealed a lot about the carbon storage potential of rainforests.

"Tropical rainforests are a very big player in carbon storage, so it's interesting to find out how much these rainforests are storing," he said.

"Australia's got very little left, largely because the lower elevation stuff was removed for sugarcane."

Great Western Woodlands

The Field Study Centre is operational, and the official opening of the Supersite will take place around April/May.



AusCover campaign has been completed, and Birdlife Australia has completed two bird surveys. Acoustic sensors have been running since May 2012. Dendrometers

and phenocams have been installed, with bores due to be installed this year. Plant physiology campaign is planned for April.

Litchfield Savanna

Currently awaiting clearance from traditional owner groups to install Flux tower, but it is expected that the tower will be operational by June/July.

SEQ Peri-urban

Vegetation plot assessment at Samford has been completed.

Recent flood damage (83 m³/sec at peak) included loss of water monitoring equipment, lost communications on Flux tower, damage to soil pits and erosion problems hampering access. AusCover were unable to complete their campaign in January due to bad weather conditions.

Full flood profile data has been collected for Logan-Albert River node.

Tumbarumba Wet Eucalypt

ARA did an airborne survey in December 2012 with Eagle/Hawk and Lidar over a 5kmx5km area around the tower. The ground campaign team had fun using a super-sized sling shot for shooting branches from the trees, we collected leaves for spectral and biochemical analysis as well as leaf water content.

Victorian Dry Eucalypt

Vegnet sensors will be installed (in collaboration with CSIRO) at both Whroo and Wombat nodes.

AusPlots Forests will conduct campaign in next few months at Whroo Node.

Real-time data from phenocams can be viewed at <http://www.arts.monash.edu.au/ges/research/climate/whroo/>

Warra Tall Eucalypt



The Flux tower was erected in December 2012 and the instrumentation was installed in early March.

The official opening of the Supersite will take place in April.

Bores will be installed later this year. Bird surveys have been completed in the gradient plot. Third set of Lidar data has been captured and is now available.

New Faces



Dr Keith Bloomfield has recently joined Owen Atkin's lab, with responsibility for leading plant physiology campaigns at several of the TERN Supersites in the coming 18 months. Keith has extensive field experience, having done his PhD at Leeds University with Jon Lloyd (focusing on impacts of nutrient gradients on photosynthetic metabolism of tropical wet forest and savanna trees). He is also a Chartered Accountant (in his previous life) and thus knows how to manage numbers.

Upcoming Events

22–26 April 2013

Earth Observation and Global Environmental Change: 50 years of Remote Sensing—Progress and Prospects. 35th International Symposium on Remote Sensing of Environment, Beijing, China. Details at [ISRSE35](#).

24–28 June 2013

Asia Oceania Geosciences Society 10th Annual Meeting. Brisbane Convention & Exhibition Centre, Brisbane, Australia. Details at [AOGS2013](#).

8–12 July 2013

OzFlux meeting, Reef House Resort, Palm Cove, Cairns. Further details to be announced.

18–23 August 2013

INTECOL 2013 - the 13th International Congress of Ecology, London. Details at [INTECOL 2013](#).

19–24 August 2013

Joint AsiaFlux/HESSS3 meeting, Seoul, Korea. Further details to be announced.

8–11 October 2013

Greenhouse 2013, Adelaide. Conference on climate change science, communication and policy. Details at [Greenhouse 2013](#).

19–21 March 2014

Global Land Project 2nd Open Science Meeting, Berlin, Germany. Details at [Conference Website](#).

The next issue of the Newsletter will be published in June 2013. If you have any news articles, photos, upcoming events, etc that you would like included please email shiela.lloyd@jcu.edu.au

