CALEYI

Australian Plants SOCIETY NSW


pic Andre Porteners

NORTHERN BEACHES GROUP
October 2017

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Next Meeting: **7.15 pm Thursday October 5, 2017** at Stony Range Botanic Garden, Dee Why.
Presentation: Jayden Walsh."Backyard Conservation".
Supper: **Pam & Conny**

Coming Up:

2017 APS Northern Beaches walk at West Head on Sunday October 15. Details later from Penny.

2017 APS NSW Quarterly Meeting hosted by **APS North Shore Group** on **Saturday November 18, 2017** at Ku-ring-gai Wildflower Garden, 420 Mona Vale Rd, St Ives. Guest speaker Bronwen Roy will be speaking about native bees. Be sure to write this date in your diaries.

From the Editor
Please continue to send me interesting reports or photographs that the members would enjoy. Many thanks to Roger and Harry for contibutions this month.

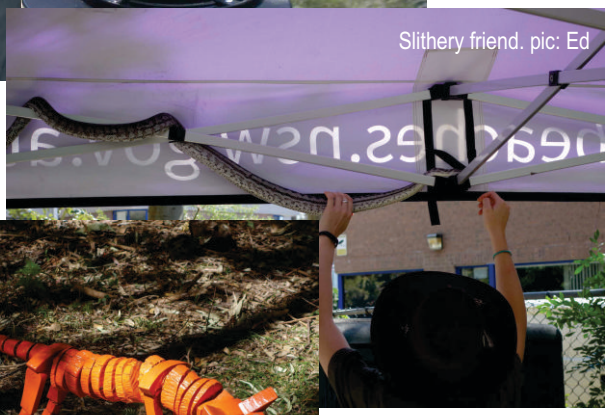
2017 STONY RANGE SPRING FESTIVAL SNAPS


Orchestra in the Range. pic Ed

Estelle & Anne coffee service. pic:Ed

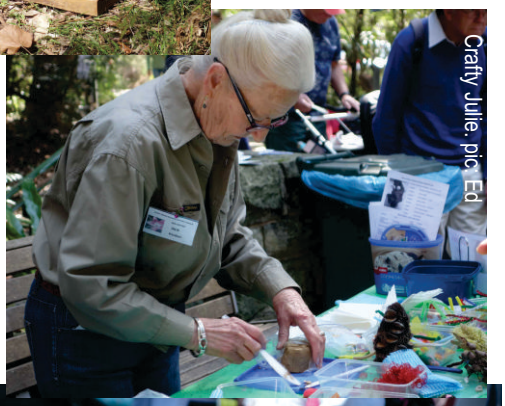
Russell advises pic. Ed

Cycling for a slushy. pic: Ed.

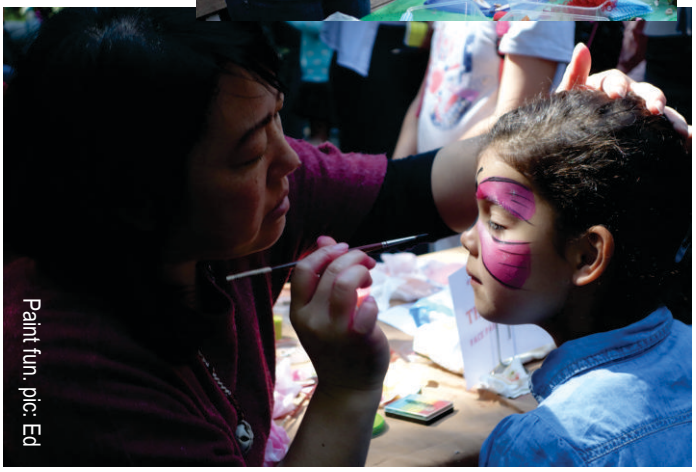


Slithery friend. pic: Ed

Ssulpture in the ranget. pic: Ed.



Crafty Julie. pic: Ed.



Paint fun. pic: Ed

ANCIENT CUMBERLAND PLAIN GIANTS WILL LIVE ON FOR HUNDREDS OF YEARS

http://www.southwestvoice.com.au September 13, 2017

Giants set to live for a few more hundreds of years: Land services officer Peter Ridgeway, Julie Sheppard of REPS and Amanda Blunt from South32 Illawarra Coal with one of the blue box eucalypts at Menangle.

Some of South West Sydney's oldest native woodland – trees more than 500 years old – has been restored.

Thanks to a collaborative campaign focused on protecting the Cumberland Plain these giants at Menangle will live on for a few more hundreds of years.

Some of them are almost two metres in width.

The Greater Sydney Local Land Services project, in partnership with South32 Illawarra coal and the Razorback Environment Protection Society (REPS), has seen extensive restoration works undertaken on a rural Menangle property in a bid to save a patch of Blue Box eucalypts estimated to be more than 500 years old.

Now they want to save more and have called on property owners to jump on the bandwagon.

Senior Land Services officer Peter Ridgeway, who has worked extensively to preserve the Cumberland Plain Woodland for the past eight years, says the Blue Box are among the oldest trees remaining in the area.

“With less than eight percent of the original woodland remaining, the Cumberland Plain is so important to protect," he said. “Large remnant trees like the ones we discovered on this property provide natural hollows to shelter native animals like owls, parrots, possums and bats.''

Mr Ridgeway said the works funded included fencing trees to stop ringbarking by horses and other measures to reverse the impacts of past damage to the trees. “This included loosening the soil with compressed air to reverse the compaction caused by years of stock and mulching and ultimately restore soil carbon and improve soil health.

“This work will extend the life of these trees by hundreds of years,” he said.

REPS secretary/convenor Julie Sheppard said the project was crucial to protecting the natural values in the Menangle region. “This is an extremely significant patch of native vegetation and it is fantastic to see landholders, commercial enterprise, the local community and government working together to ensure it is protected and preserved,” she said. “The quality of the work has been outstanding. “We are already seeing trees that were on the brink of dying flowering again and setting the scene for a new generation.”

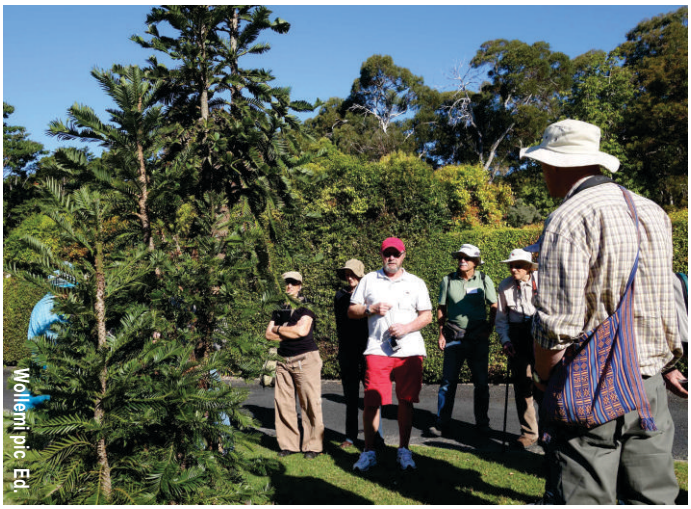
Mr Ridgeway said the trees had diameters from 1.5 to 1.92 metres. “This by far surpasses the width of any other trees in the remaining patches of Cumberland Plain,” he said.

Mr Ridgeway encouraged other landholders to contact Greater Sydney Local Land Services for advice on managing native vegetation in their own backyard. “If you are unsure of what vegetation you have on your property we have a team of experts who can provide advice and assistance in both native vegetation and weed management,” he said.

For more information contact Greater Sydney Local Land Services by phoning 1300 795 299.

APS ANNUAL GET TOGETHER COFFS HARBOUR SEPTEMBER 2/3 2017

Roger Starling


Wollemi pic. Ed.

After many of these Get Togethers that I have attended since they started I left with a very good feeling in having been to this one.

I told the Coffs president, Alison Moore, that I considered this to have been the best that I have attended.

That is not to denigrate any of the previous efforts but was I believe a natural evolvement being built on all the foregoing events and is a credit to the effort and thought that must have been spent to achieve this outcome.

However to the programme, for some of us started on the Friday evening with the President's dinner. Another regular fixture at which those present heard more about the strategic plan which stimulated lively discussions.

Next day was the official opening of the programme with the registrations and hand of the information bags and the welcome to country by Mark Flanders a local indigenous elder followed by a similar welcome to the business on hand by President Alison.

In the course of the day we were entertained and enlightened by 6 speakers, all of whom were listened to intently on various subjects with an emphasis on the rainforest which is an important subject in Coffs.

Commenced by Lawrie Smith, AM Past President of APNSA, entitled 50 Shades of Green. Next was Mark Graham on past & present and possible future of rainforests in Northern NSW.

Craig Stehn presented the Coffs Jaliigirr Project a case study of rainforest restoration near Dorrigo.

After morning tea, Dan Clarke, Conservation Officer for APS NSW, talked about the APS & the conservation programme.

Gwen Harden then gave a demonstration about Rainforest Identification and two programmes she has written for computers and smart phones. These help in identification by other characteristics than the flowers.

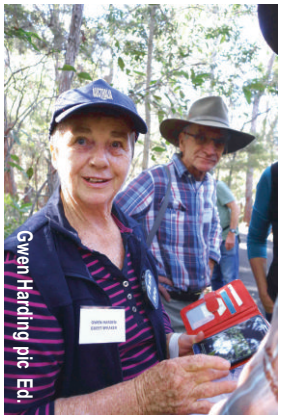
Peter Poropat also talked about rainforest identification followed closely by lunch.

The afternoon allowed us to visit the North Coast Region Botanic Gardens where small parties with their own leaders were shown round the gardens.

The same evening dinner was provided at the Rainbow room at the CeX Club at which several presentations were made by President of APS NSW John Aitken.

Sunday was taken up by visits to various places starting with a bird walk in the Botanical Garden and then with visits to various Coffs members gardens and other botanical places of interest.

I highly recommend that all members would gain much of interest by attending both Get Togethers and the gatherings that are held quarterly.


Gwen Harding pic Ed.


Dendrobiums pic. Roger.


McCabe's morning tea pic. Roger.


McCabe's shade house pic: Roger.


Tree Waratah NCRBG pic: Roger.


Cooramba Nature Reserve. pic: Ed.


Sloanea woolsii Cooramba NR. pic:Harry Loots.


Beautiful roots Eleocarpus grandis pic: Harry Loots.

REVIEW OF HISTORIC STOCK ROUTES MAY PUT RARE STRETCHES OF NATIVE PLANTS AND ANIMALS AT RISK

theconversation.com September 21, 2017 Luke S. O'Loughlin, Damian Michael, David Lindenmayer, and Thea O'Loughlin

The review will establish how individual reserves are currently being used. Although originally established for graziers, the patches of bush in the network are now more likely to be used for recreation, cultural tourism, biodiversity conservation, apiary and drought-relief grazing.

This shift away from simply moving livestock has put pressure on the government to seek "value" in the network. The review will consider proposals from individuals and organisations to buy or acquire long-term leases for particular reserves.

It is likely that most proposals to purchase travelling stock reserves would come from existing agricultural operations.

A precious national resource

Travelling stock reserves across New South Wales represent some of the most intact examples of now-endangered temperate grassy woodland ecosystems.

Our research found that changing the status or use of these reserves could seriously impact these endangered woodlands. They criss-cross highly developed agricultural landscapes, which contain very limited amounts of remnant vegetation (areas where the bush is relatively untouched). Travelling stock reserves are therefore crucially important patches of habitat and resources for native plants and animals.

This 'isnt the first time a change in ownership of travelling stock reserves has been flagged. Over the last century, as modern transport meant the reserves were used less and less for traditional droving, pressure to release these areas for conventional agriculture has increased.

Historic stock routes are still used for grazing cattle. Daniel Florance, Author provided

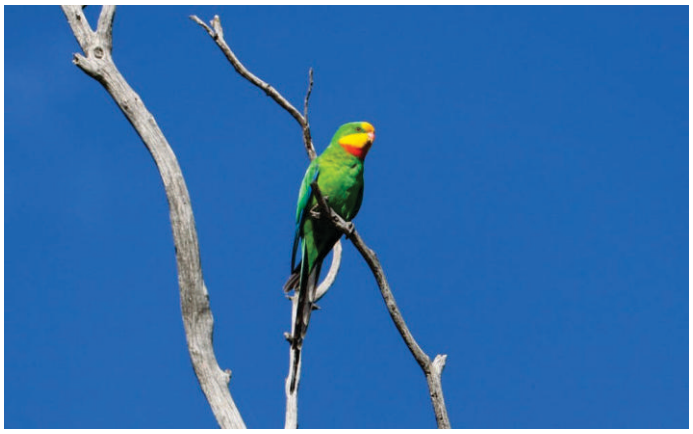
To understand what a change in land tenure might mean to the conservation values of these woodlands, we spent five years monitoring vegetation in stock reserves in comparison to remnant woodlands on private farmland.

We found that travelling stock reserves contained a higher number of native plant species, more native shrubs, and less exotic plants than woodland remnants on private land.

The higher vegetation quality in travelling stock reserves was maintained over the five years, which included both the peak of Australia's record-breaking Millennium Drought and the heavy rainfall that followed, referred to as the "Big Wet".

The take-home message was that remnant woodland on public land was typically in better nick than in private hands.

Importantly, other studies have found that this high-quality vegetation is.critical for many threatened and vulnerable native animals. For example, eastern yellow robins and black-chinned honeyeaters occur more frequently in places with more shrubs growing below the canopy.



The vulnerable superb parrot also uses travelling stock reserves for habitat. Damian Michael, Author provided

The contrast we saw between woodlands in travelling stock reserves and private land reflects the different ways they're typically managed. Travelling stock reserves have a history of periodic low-intensity grazing, mostly by cattle, with long rest periods. Woodland on active farms tend to be more intensively grazed, by sheep and cattle, often without any strategic rest periods.

The stock reserves' future

The uncertain future of travelling stock reserves casts doubt on the state of biodiversity across New South Wales.

The current review of travelling stock reserves is considering each reserve in isolation. It flies in the face of the belief of many managers, practitioners and researchers that the true value of these reserves is in the integrity of the entire network – that the whole is greater than the sum of its parts.

Travelling stock reserves protect threatened species, allow the movement of wildlife, are seed sources for habitat restoration efforts, and support the ecosystem of adjacent agricultural land. These benefits depend on the quality of the remnant vegetation, which is determined by the grazing regime imposed by who owns and manages the land.

Of course, not all travelling stock reserves are in good condition. Some are subject to high-intensity livestock grazing (for example, under longer-term grazing leases) coupled with a lack of funding to manage and enhance natural values.

Changing the land tenure status of travelling stock reserves risks increasing grazing pressure, which our study suggests would reduce ecosystem quality and decrease their conservation value.

The travelling stock routes are important parts of our ecosystem, our national heritage, and our landscape. They can best be preserved by remaining as public land, so the entire network can be managed sustainably.

This requires adequate funding for the Local Land Services, so they can appropriately manage pest animals, weeds, erosion and illegal firewood harvesting and rubbish dumping.

Travelling stock reserves are more than just The Long Paddock – they are important public land, whose ecological value has been maintained under public control. They should continue to be managed for the public good.

NEW RESEARCH UNLOCKS THE MYSTERY OF LEAF SIZE

theconversation.com September 1, 2017 Ian Wright Macquarie University

Why is a banana leaf a million times bigger than a common heather leaf? Why are leaves generally much larger in tropical jungles than in temperate forests and deserts? The textbooks say it's a balance between water availability and overheating.

But new research, published today in Science, has found it's not that simple. Actually, in much of the world the key limiting factor for leaf size is night temperature and the risk of frost damage to leaves.

As a plant ecologist, I try to understand variation in plant traits (the physical, chemical and physiological properties of their tissues) and how this variation affects plant function in different ecosystems.

For this study I worked with 16 colleagues from Australia, the UK, Canada, Argentina, the US, Estonia, Spain and China to analyse leaves from more than 7,600 species. We then teamed the data with new theory to create a model that can predict the maximum viable leaf size anywhere in the world, based on the dual risks of daytime overheating and night-time freezing.

These findings will be used to improve global vegetation models, which are used to predict how vegetation will change under climate change,

and also to better understand past climates from leaf fossils.

Conifers, which grow in very cold climates, grow thin needles less vulnerable to frost. Peter Reich

From giants to dwarfs

The world's plant species vary enormously in the typical size of their leaves; from 1 square millimetre in desert species such as common eutaxia (Eutaxia microphylla), or in common heather (Calluna vulgaris) in Europe, to as much as 1 square metre in tropical species like Musa textilis, the Filipino banana tree.

But what is the physiological or ecological significance of all this variation in leaf size? How does it affect the way that plants “do business”, using leaves as protein-rich factories that trade water (transpiration) for carbon (photosynthesis), powered by energy from the sun?

More than a century ago, early plant ecologists such as Eugenius Warming argued that it was the high rainfall in the tropics that allowed large-leaved species to flourish there.

In the 1960s and '70s physicists and physiologists tackled the problem, showing that in mid-summer large leaves are more prone to overheating, requiring higher rates of “transpirational cooling” (a process akin to sweating) to avoid damage. This explained why many desert species have small leaves, and why species growing in cool, shaded understoreys (below the tree canopy) can have large leaves.

Rainforest plants under the tree canopy can grow huge, complex leaves. Ian Wright

But still there were missing pieces to this puzzle. For example, the tropics are both wet and hot, and these theories predicted disadvantages for large-leafed species in hot regions. And, in any case, overheating must surely be unlikely for leaves in many cooler parts of the world.

Our research aimed to find these missing pieces. By collecting samples from all continents, climate zones and plant types, our team found simple “rules” that appear to apply to all of the world's plant species – rules that were not apparent from previous, more limited analyses.

We found the key factors are day and night temperatures, rainfall and solar radiation (largely determined by distance from the Equator and the amount of cloud cover). The interaction of these factors means that in hot and sunny regions that are also very dry, most species have small leaves, but in hot or sunny regions that receive high rainfall, many species have large leaves. Finally, in very cold regions (e.g. at high elevation, or at high northern latitudes), most species have small leaves.

Understanding the mechanisms behind leaf size means leaf fossils – like these examples from the Eocene – can tell us more about climates in the past. Peter Wilf/Supplied

But the most surprising results emerged from teaming the new theory for leaf size, leaf temperature and water use with the global data analyses, to investigate what sets the maximum size of leaves possible at any point on the globe.

This showed that over much of the world it is not summertime overheating that limits leaf sizes, but the risk of frost damage at night during cold months. To understand why, we needed to look at leaf boundary layers.

Every object has a boundary layer of still air (people included). This is

why, when you're cold, the hair on your arms sticks up: your body is trying to increase the insulating boundary of still air.

Larger leaves have thicker boundary layers, which means it is both harder for them to lose heat under hot conditions, and harder to absorb heat from their surroundings. This makes them vulnerable to cold nights, where heat is lost as long-wave radiation to the night-time sky.

So our research confirmed that in very hot and very dry regions the risk of daytime overheating seems to be the dominant control on leaf size. It demonstrated for the first time the broad importance of night-time chilling, a phenomenon previously thought important just in alpine regions.

Still, in the warm wet tropics, it seems there are no temperature-related limits to leaf size, provided enough water is available for transpirational cooling. In those cases other explanations need to be considered, such as the structural costs and benefits of displaying a given leaf area as a few large leaves versus many more, smaller leaves

The view from a canopy crane at the Daintree in Queensland. Peter Wilf

These findings have implications in several fields. Leaf temperature and water use play a key role in photosynthesis, the most fundamental plant physiological function. This knowledge has the potential to enrich "next-generation" vegetation models that are being used to predict regional-global shifts in plant nutrient, water and carbon use under climate change scenarios.

These models will aid the reconstruction of past climates from leaf macrofossils, and improve the ability of land managers and policymakers to predict the impact of a changing climate on the range limits to native plants, weeds and crops.

But our work is not done. Vegetation models still struggle to cope with and explain biodiversity. A key missing factor could be soil fertility, which varies both in space and time. Next, our team will work to incorporate interactions between soil properties and climate in their models.

TREES WITH "CROWN SHYNESS" MYSTERIOUSLY AVOID TOUCHING EACH OTHER

http://mymodernmet.com August 15, 2017 Kelly Richman-Abdou

f you look up toward certain types of towering trees—including eucalyptus, Sitka spruce, and Japanese larch—you may notice a unique phenomenon: the uppermost branches don't touch. Known as "crown shyness," this natural occurrence results in rupture-like patterns in the forest canopy that seem to perfectly outline the trees' striking silhouettes.

Since scientists first started studying the topic in the 1920s, crown

Photo: Dag Peak

shyness has been observed between trees of the same and different species in locations across the globe. Regardless of tree type or environment, crown shyness appears to always culminate in the same aesthetic, characterized by gaps that resemble meandering channels, zig-zagging cracks, and winding rivers.

While no one is quite sure why certain trees exhibit this unique behavior, several hypotheses have been presented by numerous scientists. One possibility is that it occurs when the branches of trees (particularly those in areas with high winds) bump into each other. Another suggested explanation is that it enables the perennial plants to receive optimal light for photosynthesis. Perhaps the most prominent theory, however, is that the gaps prevent the proliferation of invasive insects.

Whatever the reason is behind this fascinating treetop trend, one thing is clear: crown shyness is one photogenic phenomenon!

Oregon State University/Flickr

A DINOSAUR MAY HAVE HELPED TURN THIS 100-MILLION-YEAR-OLD FLOWER INTO A FOSSIL

www.sciencemag.org Sep. 21, 2017 George O. Poinar, Jr. Kenton L. Chambers

Check out this 100-million-year-old fossil. The Scientist reports that 'its a flower known as Tropidogyne pentaptera, preserved in amber from the Cretaceous period. The working hypothesis is that a dinosaur walking through a pine forest may have knocked it loose into a pool of resin, where it became fossilized.

Researchers recently published their analysis of this flower and six others with equally impressive preservation in Paleodiversity. Despite the large size of the image you see here, the flowers are quite small, from 3.5 millimeters to 5 millimeters across, and require observation under a light microscope for study.

HEAT-LOVING AUSTRALIAN ANTS BELIEVE IN DIVERSITY, HINT 74 SPECIES NEW TO SCIENCE

Science daily.com September 21, 2017 Pensoft Publishers

The previously known species Melophorus hirsutus showing its peculiar protruding eyes. With the eye shape varying within the species, there are even more startling individuals whose eyes are so pointy that they resemble ice-cream cones. Credit: Dr. Brian Heterick.

The 'furnace ants' or 'honeypot ants' present a very large genus of ants, Melophorus, confined to Australia. Long believed to be megadiverse, some scientists have even suggested that the group may contain 'well over 1000 species'. However, to this point, only 32 species and subspecies had been described.

Scientists Dr Brian Heterick of Curtin University, Dr Mark Castalanelli of Ecodiagnostics Pty Ltd and Dr Steve Shattuck of the Australian National University, funded by an internationally competitive Australian Biological Resources (ABRS) grant, set out to find the true facts.

As a result, they discovered as many as 74 new species belonging to Melophorus. In their study, published in the open access journal ZooKeys, they also provide a taxonomic key to the workers of a total of 93 species in the genus.

Among the studied ants, there are quite bizarre ones, including a species (Melophorus hirsutus) whose eyes are strangely protruding out of his head to a varying degree. In the extreme cases, the eyes are so pointy that could be likened to ice-cream cones. Named many years ago, this ant appears to be older than the rest of the examined living species. Furthermore, unlike most of them, it does not seem adapted to heat. It is confined to the wet eastern coast of Australia.

Dr Heterick spent two weeks collecting specimens in the often rugged and forbidding terrain of Western Australia, while the team also asked a number of major museum collections to loan them specimens.

The newly collected ants were placed in alcohol and subjected to genetic tests using one mitochondrial and four nuclear genes. The findings were then compared with those from physical examinations to prepare the taxonomic key -- a set of distinctive features per species that can be used to differentiate within the group.

Given the generally complex nature of these ants, the authors expect for the genus to further expand in future. They speculate that even though the numbers may increase to around 100 species, not the 'well over 1000' previously predicted, they still illustrate an incredible diversity.

The authors estimate that Melophorus arose around 35 million years ago. The closest relatives of the genus are also confined to the Australasian region with the exception of a single genus living in South America.

Furthermore, the genus is also quite astonishing thanks to another trait shared among the species. "By the way, this group of ants has a thing or two to tell those of us who get lost easily!" comments lead author Dr Brian Heterick.

“They can find their way home in a featureless landscape by means of an internal compass influenced by information gathered on earlier journeys. We are not the first species to use a computing system!"

APS QUARTERLY GATHERING HOSTED BY NORTH SHORE GROUP

18 Nov 2017 Ku-ring-gai Wildflower Garden, 420 Mona Vale Rd, St Ives.

The final APS NSW gathering for 2017 will be hosted by APS North Shore Group. The event will be at Caley’s Pavilion in the Ku-ring-gai Wildflower Garden at 420 Mona Vale Rd, St Ives.

The guest speaker will be Bronwen Roy. Bronwen is a PhD student at Western Sydney University studying the impact of pathogens on honeybees and native bees. Bronwen was the winner of the University’s 2016 Three Minute Thesis competition. She will be speaking about Australian native bees.

Our November gathering is perfect for this talk as the date is during Australian Pollinator Week which is from 12 - 19 November 2017. More information on Australian Pollinator Week will be available on www.beesbusiness.com.au closer to the date.

DRONES HELP SCIENTISTS CHECK THE HEALTH OF ANTARCTIC MOSSES, REVEALING CLIMATE CHANGE CLUES

https://theconversation.com/ September 12, 2017 Zbyněk Malenovský, Arko Lucieer

Zbyněk Malenovský has received grants from the ARC and Australian Antarctic Science. He is affiliated with the Surveying and Spatial Sciences Group at the University of Tasmania, the Centre for Sustainable Ecosystem Solutions at the University of Wollongong and the Global Change Research Institute at the Czech Academy of Sciences.

Mosses are sensitive to even minor changes in their living conditions. Sharon Robinson, Author provided

Drones are helping scientists check the health of Antarctic mosses, revealing clues on the pace of climate change.

The scientists say their method could be used for similar research in other harsh environments like desert or alpine regions.

Mosses are sensitive to even minor changes in their living conditions, and scientists traditionally tramped through difficult terrain to collect data on them.

Using the specially-designed drones is faster, kinder to the environment and delivers detailed images that satellite imagery cannot match.

Drones also allow to map much larger areas than previously possible, showing how the moss health responds to meltwater in real time.

These methods could be used for similar research in other harsh environments like desert or alpine regions.