Life, Earth & Environment

School of Environmental & Rural Science

Annual Report 2016

une
University of New England

The Life, Earth and Environment (LEE) research theme was established in 2014 as a highly active community of academics engaged in discipline-based and interdisciplinary research that spans natural, rural and constructed landscapes.

The LEE theme sits within the research portfolio of the School of Environmental and Rural Science at the University of New England and brings together the research disciplines of Botany, Earth Sciences, Ecology, Evolutionary Biology, Environmental Management, Environmental Engineering and Zoology.

Our research theme is underpinned by internationally recognised researchers with strong track records of industry collaboration and competitively funded research projects. These support our large cohort of postgraduate students.

Our theme undertakes broadly based Life, Earth and Environmental sciences focused across five Excellence in Research for Australia (ERA) areas undertaken in higher education institutions across the country, and in an international context.

Our purpose is to undertake high quality research that improves our understanding of ecosystems, earth systems and species diversity, as the means to advance ecosystem resilience, and inform management practices to ensure ongoing sustainable landscape use and restoration.

Academic Staff

The LEE Theme is comprised of 29 academic staff, 6 adjunct and emeritus academics, and 20+ postdoctoral fellows. Together these researchers supported nearly 100 Higher Degree Research (HDR) candidates in 2016, across all of the LEE research areas.

DISTINGUISHED PROFESSOR

Professor Fritz Geiser

PROFESSORS

Professor Jeremy Bruhl
Professor Caroline Gross
Professor Lalit Kumar
Professor John Paterson
Professor Nick Reid

ASSOCIATE PROFESSORS

A/Prof Nigel Andrew
A/Prof Darren Ryder
A/Prof Karl Vernes
A/Prof Brian Wilson
A/Prof Stephen Wroe

SENIOR LECTURERS

Mr Rex Glencross-Grant
Dr Paul McDonald
Dr Julian Prior
Dr Nancy Vickery
Dr Janelle Wilkes

LECTURERS

Dr Rose Andrew
Dr Phil Bell
Dr Stuart Cairns
Dr Richard Koech
Dr Kathryn Lambert
Dr Rudy Lerosey-Aubril
Dr Tommy Leung
Dr Saeed Mahini
Dr Luke Milan
Dr Romina Rader
Dr Ed Saunders
Dr Nancy Vickery

ASSOCIATE LECTURERS

Dr Kirsti Abbott

Buck Quarry (Photo: John Paterson)

Theme Leader's Review

LEE Theme researchers published more than 100 peer-reviewed scientific papers in 2016, and secured nearly $2.7M of external research funding, making our theme yet again one of the most active and productive research groups at the University of New England (UNE).

A highlight of 2016 was the completion of our new building, housing the Zoology Discipline, and the new UNE Natural History Museum that will be a huge drawcard for the university and an exciting new way for us to showcase our research to the wider New England community, and interact with them. Our very popular LEE Seminar Series once again attracted world-class researchers to UNE, and was strongly supported by academics and students alike.

Overall, UNE achieved excellent results with the Australian Research Council (ARC) in 2016, with the LEE Theme winning two Discovery Early Career Research Awards (DECRA). Late in 2016, the LEE Theme was awarded six of the 11 UNE Postdoctoral Awards granted across the university, so 2017 looks set to be a productive and exciting year for the theme.

Karl Vernes, LEE Theme Leader

Grants and Awards

LEE Theme Researchers secured more than $2.6 million in competitive research funds in 2016

The table below lists grants awarded to LEE Theme staff in 2016. Where funding commences in 2017, the funded amount is not shown, and does not contribute to the total. This table does not include funds awarded before 2016 that may be ongoing.

Lead Investigator	Project Title	Fund	awarded
Dr Romina Rader	Securing Pollination for More Productive Agriculture: Guidelines for effective pollinator management and stakeholder adoption (submitted through RIRDC)	Rural R&D for Profit	$974,998
Dr Romina Rader	The mechanisms underlying crop pollinator effectiveness in agro-ecosystems	Australian Research Council - Discovery Early Career Researcher Award (DECRA)	$372,000
Dr Phil Bell	Opalised fossils and the evolution of Australia's dinosaurs	Australian Research Council - Discovery Early Career Researcher Award (DECRA)	$353,705
A/Prof Darren Ryder	Bylong Valley Rehabilitation Review	Worley Parsons	$228,719
Dr Paul McDonald	Estimating quail and pigeon populations in NSW for use in 2017 native game bird harvest quota determination	New South Wales Department of Primary Industries - Game Licensing Unit	$150,000
Mr Julian Prior	Computer applications and data technologies can contribute to sheep industry extension	Australian Sheep Industry CRC	$120,000
A/Prof Darren Ryder	Nambucca Ecohealth	Nambucca Shire Council	$105,000
Dr Guy Ballard	Spring Baiting Project	New South Wales National Parks and Wildlife Service	$77,478
Dr Brian Wilson	Ecosystem process performance indicators	Office of Environment and Heritage	$60,000
Ms Michelle Carnegie	Undertake research on engaging women and men farmers in participatory research and extension in Myanmar	ACIAR	$50,000
Prof Jeremy Bruhl	Species descriptions, images and interactive identification key for the Eastern Australian Lepidosperma (Cyeraceae); one of Australia's largest plant genera	Bush Blitz	$40,000

Lead Investigator	Project Title	Fund	awarded
Dr Brian Wilson	Improved high-resolution carbon accounting in diverse landscapes for participation in carbon markets	CRC for Spatial Information	$23,778
A/Prof Darren Ryder	Biological monitoring of low flows in the Nymboida River 2016-2019	Clarence Valley Council	$20,583
A/Prof Darren Ryder	Environmental Water Knowledge and Research - Foodweb Theme Leadership Group	Murray-Darling Freshwater Research Centre - La Trobe University	$12,936
Dr Brian Wilson	Greenhouse gas inventory and measurement, reporting and vertification systems and processes	Commonwealth Scientific and Industrial Research Organisation	$12,484
Dr Rhiannon Smith	Determining the age and causes of red river gum dieback in the northern Murray Darling Basin	Australian Institute of Nuclear Science and Engineering	$11,675
A/Prof Karl Vernes	Determining reproductive sucess and juvenille mortality rates in spotted-tailed quolls	Holsworth Wildlife Research Endowment	$7,500
Dr Brian Wilson	Radiocarbon age of dissolved organic carbon under contrasting land uses in NSW Australia - PGRA Rubeca Fancy	Australian Institute of Nuclear Science and Engineering Post Graduate Research Award	$7,500
A/Prof Darren Ryder	Can the native Rusty Fig, *Ficus rubiginosa*, beat climate change?	Holsworth Wildlife Research Endowment	$7,500
Dr Paul McDonald	Co-operative breeding dynamics in the Noisy Miner (Manorina melanocephala)	Holsworth Wildlife Research Endowment	$7,000
Dr Paul McDonald	Re-colonization dynamics of an aggressive species: understanding population movements through gene flow and sex ratio variation in the Noisy Miner	Holsworth Wildlife Research Endowment	$7,000
A/Prof Nigel Andrew	Do bio-gradient, season and competition affect ability of native dung beetles to find and keep resources in Australia?	Holsworth Wildlife Research Endowment	$7,000
Dr Romina Rader	Quantifying the role of 'non-bee' pollinators and the ecological mechanisms underlying the effective delivery of crop pollination ecosystem services in apple orchards	Organisation for Economic Co-operation and Development Co-operative Research Program travelling research Fellowship	$6,500
Prof Nick Reid	Responses of critical-weight-range, terrestrial mammals to wild canid control.	Holsworth Wildlife Research Endowment	$6,500
		TOTAL	**$2,669,856**

2016 DECRA Success

LEE Theme researchers were successful in winning two Discovery Early Career Researcher Awards (DECRA), granted to Dr Phil Bell and Dr Romina Rader, contributing to the best result UNE has had in this highly-competitive award category to date.

Dr Bell is researching dinosaur evolution in Australia and his project will answer controversial questions about the identity and biogeographic significance of taxa in this region of Gondwana and resolve uncertainty about Australia's role in the evolution of the world's fascinating radiation of dinosaurs.

Dr Bell will be using his $353K ARC grant to apply new analysis techniques to an exciting but under-utilised fossil resource from Lightning Ridge.

With her $372K grant, Dr Rader will undertake the first comprehensive study investigating the extent to which pollinator effectiveness drives the agro-ecological pollination process nationally and globally.

Dr Rader's project will identify the factors influencing the variation in fruit quantity and quality in a model pollinator-dependent crop with the aim of building knowledge to support Australian production.

Dr Phil Bell

Dr Romina Rader collecting mango pollinators in north Queensland

LEE Theme Researchers published more than 100 peer-reviewed papers in 2016

Bell miner (Photo Paul McDonald)

Publications

LEE academics published more that 100 papers in 2016. A small selection of these appear below; see page 13 for a full list of publications.

Ledogar, J.A., et al. (2016). Mechanical evidence that *Australopithecus sediba* was limited in its ability to eat hard foods. ***Nature Communications*** 7:10596 http://doi.org/10.1038/ncomms10596

Coux C, **Rader R,** Bartomeus I, & Tylianakis JM. (2016). Linking species functional roles to their network roles. ***Ecology Letters*** 19: 762-770. http://doi.org/10.1111/ele.12612

Rader R, et al. (incl. **Gross, C**) (2016). Non-bee insects are important contributors to global crop pollination. ***Proceedings of the National Academy of Sciences*** 113: 146-151. http://doi.org/10.1073/pnas.1517092112

Attard, M.R.G., Wilson, L.A.B., Worthy, T.H., Scofield, P., Johnston, P., Parr, W.C.H., and **Wroe, S.** (2016). Moa diet fits the bill: virtual reconstruction incorporating mummified remains and prediction of biomechanical performance in avian giants. ***Proceedings of the Royal Society Series B*** 283 20160382. http://doi.org/10.1098/rspb.2015.2043

Foster E, Love J, **Rader R,** Reid N, Dillon M, & Drielsma M. (2016). Planning for metapopulation persistence using a multiple-component, cross-scale model of connectivity. ***Biological Conservation*** 195: 177-186. http://doi.org/10.1016/j.biocon.2015.12.034

Nowack J, Cooper CE, **Geiser F** (2016) Cool echidnas survive the fire. ***Proceedings of the Royal Society B*** 283: http://doi.org/10.1098/rspb.2016.0382

Madani N, Kimball JS, Nazeri M, **Kumar L,** & Affleck DLR. (2016). Remote Sensing Derived Fire Frequency, Soil Moisture and Ecosystem Productivity Explain Regional Movements in Emu over Australia. ***PLoS ONE***, 11(1), 1-11. http://doi.org/10.1371/journal.pone.0147285

Graduates

The following Doctor of Philosophy (PhD) students were supervised by LEE research staff, and graduated in 2016:

Doctor of Philosophy and Chancellor's Doctoral Research Medal

Paul Douglas Meek 'Analysis of the Functionality, Value and Constraints of Using Camera Traps for Wildlife Monitoring and Ecological Research'. Principal Supervisor: Associate Professor Karl Vernes

Doctor of Philosophy

Catie Maree Gowen 'Between a Rock and a Hard Place: Management Issues for the Endangered Brush-Tailed Rock-Wallaby, Petrogale penicillata, in North-Eastern New South Wales'. Principal Supervisor: Associate Professor Karl Vernes

Lee Ann Hally 'Systematics, Biogeography and Palaeoecology of Cambrian Series 3 Trilobites and Agnostids from East Gondwana'. Principal Supervisor: Professor John Paterson

Kathryn Teare Ada Lambert 'Quantifying the Importance of Lantana Removal, Soil Nutrient Profiles, Insect Assemblages and Bell Miner Density on Bell Miner Associated Dieback' Principal Supervisor: Dr Paul McDonald

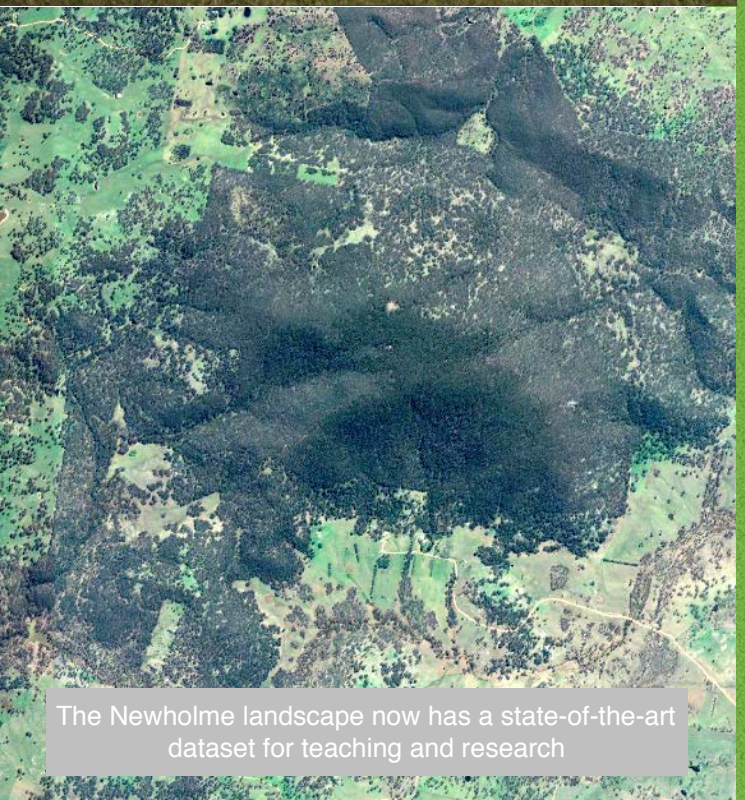
George Thomas Plunkett 'Systematics, Evolution and Ecology of Eastern Australian Species of *Lepidosperma* Labill. (Cyperaceae)'. Principal Supervisor: Professor Jeremy Bruhl

Farzin Shabani 'Modelling the Impact of Climate Change on Future Distribution of Date Palm'. Principal Supervisor: Professor Lalit Kumar

Jessica Louise Sparkes 'Quantifying Effects of Wild Dogs, Domestic Dogs and Humans on the Spread of Rabies in Australia'. Principal Supervisor: Dr Wendy Brown

LEE PhD graduates Dr Paul Meek and Dr Catie Gowen at the October Graduation Ceremony (Photo: David Elkins)

Researchers gathered with NM Group spatial scientists after successfully flying the mission to acquire the spatial data



The Newholme landscape now has a state-of-the-art dataset for teaching and research

Spatial Dataset to Transform Teaching and Research

In 2016 the LEE Theme coordinated the acquisition of a spatial dataset that will revolutionise teaching and research at UNE's Newholme Field Station. The data was gathered by UK-based NM Group which used a helicopter-mounted LIDaR unit that fires a laser 300,000 times per second and collects information about the reflected light.

The system generates a 3D "point cloud" from the returns, which allows the accurate measurement of the ground surface as well as the height of trees and other 3D features, in unprecedented detail. The light can pass through gaps in the tree canopy so allows the mapping of the ground and tree canopy accurately, to within a few centimetres.

The fly-over also produced a 5cm resolution 4-band RGB, NIR ortho-image. PhD student Arjan Wilkie, who will use this dataset and was a key driver behind its acquisition commented "The resolution is incredible; good enough to see features as small as individual tussocks in a paddock, or the tops of fence-posts."

LEE Theme Leader Associate Professor Karl Vernes said "We have diverse research at our field station ranging from the response of riparian vegetation to de-stocking, to understanding how mammal numbers relate to landscape structure and vegetation condition. All current and future projects like these will benefit from the new data. When it comes to teaching, UNE students will learn from analysing state-of-the-art remotely sensed data for a landscape they can visit within minutes of the campus."

UNE Ecology Students take to the Himalayas

In May 2016, 17 UNE students completed a 2-week field unit in Bhutan, studying the ecology and biogeography of the eastern Himalayas. This trip, on the back of a similar successful venture in 2014, gave the students a grounding in aquatic ecology, wildlife ecology, vegetation communities, and the biogeography of Bhutan and the Himalayan region.

Throughout the trip, students were immersed in the distinctive Bhutanese culture revolving around Bhutan's concept of Gross National Happiness as the primary indicator of progress. This international study tour provided UNE students with practical experience in ecological techniques, within a global educational context to further motivate them in their study.

David Mailler, a student on a past trip commented "The experience had a significant effect on my world view and how I engage with my studies. The country has a very different philosophical and economic outlook to Australia … some lessons can be learned from the Bhutanese approach to culture and environment".

The study tour was led by LEE Theme staff Karl Vernes (Wildlife), Darren Ryder (Aquatic Ecology), and Caroline Gross (Vegetation Ecology), along with Raj Rajaratnam (Biogeography) from the School of Behavioural, Cognitive and Social Sciences. In 2016, this team were successful in obtaining New Colombo Plan funding from the Australia Federal Government, allowing us to offer the unit again in 2017 at a substantial cost saving to students fortunate enough to enrol.

Photo: Karl Vernes

UNE Natural History Museum

The UNE Natural History Museum will open its doors in early 2017. Throughout 2016, museum staff and affiliates carefully relocated the collection from the old Zoology Museum, established new exhibits and set about the task of labelling specimens and developing interpretive signage. An engaging series of displays will provide a link between UNE research and the general public's interest in science.

Photos: David Waugh

LEE Publications 2016

1	Algahtany M, Kumar L, & Khormi H. (2016a). Are Immigrants More Likely to Be Involved in Criminal Activity in Saudi Arabia? *Open Journal of Social Sciences*, *4*(3), 170-186. http://doi.org/10.4236/jss.2016.43023
2	Al-Jaryian RAJ, & Kumar L. (2016a). Changing global risk of invading greenbug *Schizaphis graminum* under climate change. *Crop Protection*, *88*, 137-148. http://doi.org/10.1016/j.cropro.2016.06.008
3	Al-Jaryian RAJ, Kumar L, & Taylor S. (2016b). Modelling the current and potential future distributions of the sunn pest *Eurygaster integriceps* (Hemiptera: Scutelleridae) using CLIMEX. *Pest Management Science*, *72*(10), 1989-2000. http://doi.org/10.1002/ps.4247
4	Allen, L. & Mitchell, D. Rex (2016). A new record of the swamp wallaby, *Wallabia bicolor* (Desmarest, 1804), (Marsupialia: Macropodinae), in South Australia. The South Australian Naturalist 90: 17-23
5	Alqurashi A, Kumar L, & Al-Ghamdi K. (2016c). Spatiotemporal Modeling of Urban Growth Predictions Based on Driving Force Factors in Five Saudi Arabian Cities. *ISPRS International Journal of Geo-Information*, *5*(8), 1-19. http://doi.org/10.3390/ijgi5080139
6	Andrew NR, Ghaedi B, & Groenewald B. (2016a). The role of nest surface temperatures and the brain in influencing ant metabolic rates. *Journal of Thermal Biology*, *60*, 132-139. http://doi.org/10.1016/j.jtherbio.2016.07.010
7	Attard, M.R.G., Wilson, L.A.B., Worthy, T.H., Scofield, P., Johnston, P., Parr, W.C.H., and Wroe, S. (2016). Moa diet fits the bill: virtual reconstruction incorporating mummified remains and prediction of biomechanical performance in avian giants. *Proceedings of the Royal Society Series B.* DOI: 10.1098/rspb.2015.2043
8	Barati, A., Etezadifar, F., and McDonald, P. G. (2016) Fragmentation in eucalypt woodlands promotes nest-tree occupancy by a despotic species, the noisy miner (*Manorina melanocephala*). Austral Ecology, 41: 897–905. doi: 10.1111/aec.12382.
9	Beckmann, C, and McDonald, P. G. (2016) Placement of re-nests following predation: are birds managing risk?. *Emu* 116: 9-13.
10	Bodole C, Koech R, & Pezzaniti D. (2016d). Laboratory evaluation of dripper performance. *Flow Measurement and Instrumentation*, *50*, 261-268. http://doi.org/10.1016/j.flowmeasinst.2016.07.012
11	Bondarenco A, Körtner G, Geiser F (2016) How to keep cool in a hot desert: torpor in two species of free-ranging bats in summer. Temperature 3: 476-483
12	Chi QS, Wan XR, Geiser F, Wang DH (2016) Fasting-induced daily torpor in desert hamsters (*Phodopus roborovskii*). Comparative Physiology and Biochemistry A 199: 71-77
13	Cooper CE, Withers PC, Hardie A, Geiser F (2016) Marsupials don't adjust their thermal energetics for life in an alpine environment. Temperature 3: 484-498
14	Cotsell N, & Vernes KA. (2016b). Camera traps in the canopy: surveying wildlife at tree hollow entrances. *Pacific Conservation Biology*, *22*(1), 48-60. http://doi.org/10.1071/PC15030
15	Coux C, Rader R, Bartomeus I, & Tylianakis JM. (2016a). Linking species functional roles to their network roles. *Ecology Letters*, *19*(7), 762-770. http://doi.org/10.1111/ele.12612

16	Crea C, Ali RA, & Rader R. (2016e). A new model for ecological networks using species-level traits. *Methods in Ecology and Evolution*, *7*(2), 232-241. http://doi.org/10.1111/2041-210x.12471
17	Croft P, Hunter JT, & Reid N. (2016f). Forgotten fauna: Habitat attributes of long-unburnt open forests and woodlands dictate a rethink of fire management theory and practice. *Forest Ecology and Management*, *366*, 166-174. http://doi.org/10.1016/j.foreco.2016.02.015
18	De Palma A, Abrahamczyk S, Cruz-Lopez L, Cunningham SA, Darvill B, Diekotter T, … Farwig N. (2016a). Predicting bee community responses to land-use changes: Effects of geographic and taxonomic biases. *Scientific Reports*, *6*, 1-14. http://doi.org/10.1038/srep31153
19	DeSantis, L.R.G., Field, J., Wroe, S. (In Press). Dietary responses of Sahul (Pleistocene Australia-New Guinea) megafauna to climate and environmental change. *Paleobiology*. DOI: 10.1017/pab.2016.50
20	Doty AC, Stawski C, Law BS, Geiser F (2016) Post-wildfire physiological ecology of an Australian microbat. Journal of Comparative Physiology B: 186: 937-946
21	Doty AC, Stawski C, Currie SE, Geiser F (2016) Black or white? Physiological implications of roost colour and choice in a microbat. Journal of Thermal Biology 60: 162-170
22	Drielsma M, Foster E, Ellis M, Gill RA, Prior JC, Kumar L, … Ferrier S. (2016). Assessing collaborative, privately managed biodiversity conservation derived from an offsets program: Lessons from the Southern Mallee of New South Wales, Australia. *Land Use Policy*, *59*, 59-70. http://doi.org/10.1016/j.landusepol.2016.08.005
23	England JR, Paul KI, Herrmann T, Polglase PJ, Cunningham SC, Madhavan DB, … Perring MP. (2016a). Previous land use and climate influence differences in soil organic carbon following reforestation of agricultural land with mixed-species plantings. *Agriculture, Ecosystems & Environment*, *227*, 61-72. http://doi.org/10.1016/j.agee.2016.04.026
24	Foster E, Love J, Rader R, Reid N, Dillon M, & Drielsma M. (2016a). Planning for metapopulation persistence using a multiple-component, cross-scale model of connectivity. *Biological Conservation*, *195*, 177-186. http://doi.org/10.1016/j.biocon.2015.12.034
25	Geiser F (2016) Conserving energy during hibernation. Journal of Experimental Biology 219: 2086-2087 *JEB Classics Invited*
26	Geiser F, Gasch K, Bieber C, Stalder GL, Gerritsmann H, Ruf T (2016) Basking hamsters reduce resting metabolism, body temperature and energy costs during rewarming from torpor. Journal of Experimental Biology 219: 2166-2172
27	Gross, C.L., Fatemi, M & I.H. Simpson (2016). Seed provenance for changing climates: early growth traits of non-local seed are better adapted to future climatic scenarios, but not to current field conditions. *Restoration Ecology*, DOI: 10.1111/rec.12474
28	Hobley EU, Le Gay Brereton AJ, & Wilson B. (2017). Forest burning affects quality and quantity of soil organic matter. *Science of the Total Environment*, *575*, 41-49. http://doi.org/10.1016/j.scitotenv.2016.09.231
29	Hobley N, Baldock J, & Wilson B. (2016g). Environmental and human influences on organic carbon fractions down the soil profile. *Agriculture, Ecosystems & Environment*, *223*, 152-166. http://doi.org/10.1016/j.agee.2016.03.004
30	Hobley N, & Wilson B. (2016d). The depth distribution of organic carbon in the soils of eastern Australia. *Ecosphere*, *7*(1), 1-21. http://doi.org/10.1002/ecs2.1214
31	Hunt ER, Wang C, Booth DT, Cox SE, Kumar L, & Reeves MC. (2016). Remote Sensing of Rangeland Biodiversity. In *Land Resources Monitoring, Modeling, and Mapping with Remote Sensing* (Vol. 2, 277-307). Boca Raton, United States of America: CRC Press. Retrieved from http://e-publications.une.edu.au/1959.11/18566

32	Huynh H, Lobry de Bruyn L, Prior JC, & Kristiansen P. (2016b). Community participation and harvesting of non-timber forest products in benefit-sharing pilot scheme in Bach Ma National Park, Central Vietnam. *Tropical Conservation Science*, *9*(2), 822-902. Retrieved from http://e-publications.une.edu.au/1959.11/19248
33	Khormi H, & Kumar L. (2016e). Future malaria spatial pattern based on the potential global warming impact in South and Southeast Asia. *Geospatial Health*, *11*(3), 290-298. http://doi.org/10.4081/gh.2016.416
34	Koech R, Pires de Camargo A, Molle B, Saretta E, Frizzone JA, Benhu G, & Pezzaniti D. (2016b). Intercomparison Testing and Evaluation of Sprinklers within the INITL. *ASCE Journal of Irrigation and Drainage Engineering*, *142*(2), 04015048-1-04015048–8. http://doi.org/10.1061/(ASCE)IR.1943-4774.0000937
35	Jastroch M, Giroud S, Barrett P, Geiser F, Heldmaier G, Herwig A (2016) Seasonal control of mammalian energy balance: recent advances in the understanding of daily torpor and hibernation. Journal of Neuroendocrinology. In press
36	Körtner G, Riek A, Pavey C, Geiser F (2016) Activity patterns and torpor in two free-ranging carnivorous marsupials in arid Australia in relation to precipitation, reproduction and ground cover. Journal of Mammalogy 97: 1555-1564
37	Kumar L, Sinha P, Brown JF, Ramsey RD, Rigge M, Stam CA, … Reeves MC. (2016). Characterization, Mapping, and Monitoring of Rangelands: Methods and Approaches. In *Land Resources Monitoring, Modeling, and Mapping with Remote Sensing* (Vol. 2, 309-350). Boca Raton, United States of America: CRC Press. Retrieved from http://e-publications.une.edu.au/1959.11/18565
38	Lambert K, Kumar L, Reid N, & McDonald P. (2016a). Habitat selection by a despotic passerine, the Bell Miner (’Manorina melanophrys’): When restoring habitat through Lantana (’Lantana camara’) removal is not enough. *Ecological Management & Restoration*, *17*(1), 81-84. http://doi.org/10.1111/emr.12196
39	Lamsal P, Atreya K, Pant KP, & Kumar L. (2016c). Tourism and wetland conservation: application of travel cost and willingness to pay an entry fee at Ghodaghodi Lake Complex, Nepal. *Natural Resources Forum*, *40*(1-2), 51-61. http://doi.org/10.1111/1477-8947.12089
40	Ledogar, J.A., Smith, A.L., Benazzi, S., Weber, G.W., Spencer, M.A., Carlson, K.B., McNulty, K.P., Dechow, P.C., Grosse, I.R., Ross, C.F., Richmond, B.G., Wright, B.W., Wang, Q., Byron, C., Slice, D.E., Carlson, K.J., de Ruiter, D.J., Berger, L.R., Tamvada, K., Pryor, L.C., Berthaume, M.A,. Strait, D.S.. 2016. Mechanical evidence that Australopithecus sediba was limited in its ability to eat hard foods. Nature Communications 7:10596
41	Ledogar, J., Dechow, P.C., Wang, Q., Gharpure, P., Gordon, A.D., Baab, K.L., Smith, A. L., Weber, G.W., Grosse, I.R., Ross, C. F., Richmond, B.G., Wright, B.W., Byron, C., Wroe, S., Strait., D.S., (2016). Human feeding biomechanics: performance, variation, and functional constraints. *PeerJ*. *4*, 1-47. http://doi.org/10.7717/peerj.2242
42	Lefebvre B, El Hariri K, Lerosey-Aubril R, Servais T, & Van Roy P. (2016a). The Fezouata Shale (Lower Ordovician, Anti-Atlas, Morocco): A historical review. *Palaeogeography, Palaeoclimatology, Palaeoecology*, *460*, 7-23. http://doi.org/10.1016/j.palaeo.2015.10.048
43	Lefebvre B, Lerosey-Aubril R, Servais T, & Van Roy P. (2016b). The Fezouata Biota: An exceptional window on the Cambro-Ordovician faunal transition. *Palaeogeography, Palaeoclimatology, Palaeoecology*, *460*, 1-6. http://doi.org/10.1016/j.palaeo.2016.06.041
44	Lobry de Bruyn L, & Andrews S. (2016f). Are Australian and United States Farmers Using Soil Information for Soil Health Management? *Sustainability*, *8*(4), 1-33. http://doi.org/10.3390/su8040304
45	McDonald, K. S., Tighe, M., & Ryder, D. S. (2016). An ecological risk assessment for managing and predicting trophic shifts in estuarine ecosystems using a Bayesian network. *Environmental Modelling & Software*, *85*, 202-216.
46	McDonald, P. G., Rollins, L. A., & Godfrey, S. (2016). The relative importance of spatial proximity, kin selection and potential ‘greenbeard’signals on provisioning behaviour among helpers in a cooperative bird. *Behavioral ecology and sociobiology*, *70*(1), 133-143.
47	McEvoy, J.F., Hall, G.P. and McDonald, P.G. (2016) Evaluation of unmanned aerial vehicle shape, flight path and camera type for waterfowl surveys: disturbance effects and species recognition. *PeerJ* 4 (2016): e1831.
48	Madani N, Kimball JS, Nazeri M, Kumar L, & Affleck DLR. (2016b). Remote Sensing Derived Fire Frequency, Soil Moisture and Ecosystem Productivity Explain Regional Movements in Emu over Australia. *PLoS One*, *11*(1), 1-11. http://doi.org/10.1371/journal.pone.0147285

49	Malouff JM, Reid J, Wilkes J, & Emmerton AJ. (2015). Using the Results of Teaching Evaluations to Improve Teaching: A Case Study of a New Systematic Process. *College Teaching*, *63*(1), 3-7. http://doi.org/10.1080/87567555.2014.956681
50	Martin ELO, Lerosey-Aubril R, & Vannier J. (2016b). Palaeoscolecid worms from the Lower Ordovician Fezouata Lagerstätte, Morocco: Palaeoecological and palaeogeographical implications. *Palaeogeography, Palaeoclimatology, Palaeoecology*, *460*, 130-141. http://doi.org/10.1016/j.palaeo.2016.04.009
51	Martin ELO, Pittet B, Van Roy P, Vaucher R, Lefebvre B, Gutierrez-Marco J, … Vandenbroucke TRA. (2016b). The Lower Ordovician Fezouata Konservat-Lagerstätte from Morocco: Age, environment and evolutionary perspectives. *Gondwana Research*, *34*, 274-283. http://doi.org/10.1016/j.gr.2015.03.009
52	Matthews JK, Stawski C, Körtner G, Parker CA, Geiser F (2016) Torpor and basking after a severe wildfire: mammalian survival strategies in a scorched landscape. Journal of Comparative Physiology B: In press
53	Meek P, & Vernes KA. (2016g). Can camera trapping be used to accurately survey and monitor the Hastings River mouse ('Pseudomys oralis')? *Australian Mammalogy*, *38*(1), 44-51. http://doi.org/10.1071/AM15016
54	Mika S., Ryder D., Schmidt J., Burns A. and Vincent B. 2016. A collaborative approach to integrating science, management and communities for improving river health in coastal catchments. In G. Vietz, A. Flatley and I. Rutherford, (Eds), "8th Australian Stream Management Conference", pp 329-335, River Basin Management Society, Leura.
55	Milan, L.A. Daczko, N.R., Clarke, G.L. and Allibone, A.H. 2016. Complexity of In-situ zircon U-Pb-Hf isotope systematics during arc magma genesis at the roots of a Cretaceous arc, Fiordland, New Zealand. Lithos 264, 296-314.
56	Morid R, Delavar M, Eagderi S, & Kumar L. (2016d). Assessment of climate change impacts on river hydrology and habitat suitability of "Oxynoemacheilus bergianus". Case study: Kordan River, Iran. *Hydrobiologia*, *771*(1), 83-100. http://doi.org/10.1007/s10750-015-2617-2
57	Nie X, Feng Q, Metcalfe I, Baxter A, & Liu G. (2016c). Discovery of a Late Devonian magmatic arc in the southern Lancangjiang zone, western Yunnan: Geochemical and zircon U-Pb geochronological constraints on the evolution of Tethyan ocean basins in SW China. *Journal of Asian Earth Sciences*, *118*, 32-50. http://doi.org/10.1016/j.jseaes.2015.12.026
58	Nguyen HT, Lobry de Bruyn L, & Koech R. (2016h). Impact of hydropower dam development on agriculturally based livelihoods of resettled communities: a case study of Duong Hoa Commune in central Vietnam. *International Journal of Water Resources Development*, *32*(6), 978-996. http://doi.org/10.1080/07900627.2015.1121138
59	Nowack J, Geiser F (2016) Friends with benefits: the role of huddling in mixed groups of torpid and normothermic individuals. Journal of Experimental Biology 219: 590-596
60	Nowack J, Cooper CE, Geiser F (2016) Cool echidnas survive the fire. Proceedings of the Royal Society B 283: 20160382
61	Nowack J, Delesalle M, Stawski C, Geiser F (2016) Can hibernators sense and evade fires? Olfactory acuity and locomotor performance during deep torpor. The Science of Nature 103: 73
62	Nunn P, Kumar L, Eliot I, & McLean RF. (2016e). Classifying Pacific islands. *Geoscience Letters*, *3*(7), 1-19. http://doi.org/10.1186/s40562-016-0041-8
63	Ortega-Hernandez J, Van Roy P, & Lerosey-Aubril R. (2016i). A new aglaspidid euarthropod with a six-segmented trunk from the Lower Ordovician Fezouata Konservat-Lagerstätte, Morocco. *Geological Magazine*, *153*(3), 524-536. http://doi.org/10.1017/s0016756815000710
64	Ostevik KL, Andrew R, Otto SP, & Rieseberg LH. (2016f). Multiple reproductive barriers separate recently diverged sunflower ecotypes. *Evolution*, *70*(10), 2322-2335. http://doi.org/10.1111/evo.13027

65	Pavey CR, Burwell CJ, Körtner G, Geiser F (2016) Why is the kaluta, *Dasykaluta rosamondae*, diurnally active in winter: foraging advantages or predator avoidance in arid northern Australia? Journal of Arid Environments 133: 25-28
66	Parr., W., Wilson, L.A.B., Wroe, S., Colman, N.J., Crowther, M.S., and Letnic, M. (2016). Cranial Shape and the Modularity of Hybridization in Dingoes and Dogs; Hybridization Does Not Spell the End for Native Morphology. *Evolutionary Biology*, 171-187
67	Pearl, H., Bonney, N., Whitehead, J., Rhodes, T., Simpson, I.H., Singye, R & C.L. Gross (2016). Plant species richness, structure and life form respond to an altitudinal gradient in Central Bhutan, Eastern Himalayas. *Bhutan Ecological Society,* 2/3: 66-90
68	Pettifor A, MacPhail C, Wang J, Twine R, Daniel T, Andrew P, … Piwowar-Manning E. (2016c). HPTN 068: A Randomized Control Trial of a Conditional Cash Transfer to Reduce HIV Infection in Young Women in South Africa - Study Design and Baseline Results. *AIDS and Behavior*, *20*(9), 1863-1882. http://doi.org/10.1007/s10461-015-1270-0
69	Prado, F.B., Freire, A.R., Rossi, A.C., Ledogar, J.A., Smith, A.L., Dechow, P.C., Strait, D.S., Voigt, T., Ross, C.F. 2016. Review of in vivo bone strain studies and finite element models of the zygomatic complex in humans and non-human primates: Implications for clinical research and practice. Anatomical Record 299:1753–1778
70	Pryor, L.C., Strait, D.S., Ross, C.F., Wang, Q., Smith, A.L., Ledogar, J.A., Opperman, L., Dechow, P.C. 2016. Internal bone architecture in the zygoma of human and Pan. Anatomical Record 299:1704–1717
71	Rader R, Bartomeus I, Bommarco R, Brittain C, Carvalheiro LG, Chacoff NP, … Gemmill-Herren B. (2016d). Non-bee insects are important contributors to global crop pollination. *Proceedings of the National Academy of Sciences*, *113*(1), 146-151. http://doi.org/10.1073/pnas.1517092112
72	Rajaratnam R, Vernes KA, & Sangay T. (2016j). A Review of Livestock Predation by Large Carnivores in the Himalayan Kingdom of Bhutan. In *Problematic Wildlife: A Cross-Disciplinary Approach* (143-171). Cham, Switzerland: Springer. http://doi.org/10.1007/978-3-319-22246-2_8
73	Ramirez Cabral NYZ, Kumar L, & Taylor S. (2016k). Crop niche modeling projects major shifts in common bean growing areas. *Agricultural and Forest Meteorology*, *218-219*, 102-113. http://doi.org/10.1016/j.agrformet.2015.12.002
74	Ramírez-Chaves, H., Weisbecker, V., Wroe, S., Phillips, M.J. (2016). Resolving the evolution of the mammalian middle ear using Bayesian inference. *Frontiers in Zoology*, 13: 39
75	Ramírez-Chaves, H., Wroe, S., Selwood, L., Hinds, L., Leigh, C., Koyabu, D., Kardjilov, N., and Weisbecker, V. (2016). Mammalian development does not recapitulate suspected key transformations in the evolution of the mammalian middle ear. *Proceedings of Royal Society B*. DOI: 10.1098/rspb.2015.2606
76	Reeves MC, Washington-Allen R, Angerer J, Hunt ER, Kulawardhana RW, Kumar L, … Ramsey RD. (2016). Global View of Remote Sensing of Rangelands: Evolution, Applications, Future Pathways. In *Land Resources Monitoring, Modeling, and Mapping with Remote Sensing* (Vol. 2, 237-275). Boca Raton, United States of America: CRC Press. Retrieved from http://e-publications.une.edu.au/1959.11/18564
77	Reid J, & Wilkes J. (2016h). Developing and applying quantitative skills maps for STEM curricula, with a focus on different modes of learning. *International Journal of Mathematical Education in Science and Technology*, *47*(6), 837-852. http://doi.org/10.1080/0020739x.2016.1144814
78	Rothsey S, & Andrew NR. (2016i). Orientation of the Beach Hopper “Notorchestia” sp. (Amphipoda: Talitridae). *Journal of Crustacean Biology*, *36*(4), 475-484. http://doi.org/10.1163/1937240x-00002452
79	Rothsey S, & Andrew NR. (2016j). The Response of the Wash-Zone Amphipod, “Urohaustorius” sp. (Amphipoda: Talitridae), to Light, Gravity, Slope, and Magnetic Fields. *Journal of Crustacean Biology*, *36*(4), 485-494. http://doi.org/10.1163/1937240x-00002453
80	Ruiz Talonia, L. Reid, NCH, Gross, C.L., Whalley, R (2017). Germination ecology of six species of Eucalyptus in shrink–swell vertosols: moisture, seed depth and seed size limit seedling emergence. *Australian Journal of Botany*, in press
81	Ryder D. and Mika S. 2016. Smart rocks and sand slugs: innovative methods for modelling sediment transport in rivers. In G. Vietz, A. Flatley and I. Rutherford, (Eds), “8th Australian Stream Management Conference”, pp 466-472, River Basin Management Society, Leura.

82	Sansalone G., Colangelo P., Kotsakis T., Loy A., Castiglia R., Bannikova A.A., Zemlemerova E.D., Piras P. (In press). Evolutionary allometric trajectories constrain rates of evolution of humeral morphology within highly fossorial moles (Talpinae). Journal of Mammalian Evolution
83	Sansalone G., Kotsakis T., Piras P. (2016). *Condylura* (Mammalia, Talpidae) reloaded: New insights about the fossil representatives of the genus. Palaeontologia Electronica 19.3.54A: 1-16. palaeo-electronica.org/content/2016/1716-condylura-fossil
84	Saunders ME, Peisley RK, Rader R, & Luck GW. (2016g). Pollinators, pests, and predators: Recognizing ecological trade-offs in agroecosystems. *Ambio*, *45*(1), 4-14. http://doi.org/10.1007/s13280-015-0696-y
85	Schultz NL, Reid N, Lodge GM, & Hunter JT. (2016c). Habitat specificity analyses reveal the importance of grazing refugia for plant diversity conservation in a warm-temperate grassy ecosystem. *Applied Vegetation Science*, *19*(4), 578-588. http://doi.org/10.1111/avsc.12251
86	Shabani F, Cacho OJ, & Kumar L. (2016l). Effects of climate change on economic feasibility of future date palm production: An integrated assessment in Iran. *Human and Ecological Risk Assessment*, *22*(5), 1268-1287. http://doi.org/10.1080/10807039.2016.1162089
87	Shabani F, & Kotey BA. (2016k). Future distribution of cotton and wheat in Australia under potential climate change. *Journal of Agricultural Science*, *154*(2), 175-185. http://doi.org/10.1017/S0021859615000398
88	Shabani F, Kumar L, & Ahmadi M. (2016m). A comparison of absolute performance of different correlative and mechanistic species distribution models in an independent area. *Ecology and Evolution*, *6*(16), 5973-5986. http://doi.org/10.1002/ece3.2332
89	Shabani F, Kumar L, Nojoumian H, Esmaeili A, & Toghyani M. (2016). Projected future distribution of date palm and its potential use in alleviating micronutrient deficiency. *Journal of the Science of Food and Agriculture*, *96*(4), 1132-1140. http://doi.org/10.1002/jsfa.7195
90	Sinha P, Kumar L, & Reid N. (2016n). Rank-Based Methods for Selection of Landscape Metrics for Land Cover Pattern Change Detection. *Remote Sensing*, *8*(2), 1-19. http://doi.org/10.3390/rs8020107
91	Souter N, Johansen K, & Reid M. (2016o). Monitoring and assessment of vegetation in Australian Riverine landscapes. In *Vegetation of Australian Riverine Landscapes: Biology, Ecology and Management* (365-386). Clayton South, Australia: CSIRO Publishing. Retrieved from http://e-publications.une.edu.au/1959.11/19068
92	Sparkes J, McLeod S, Ballard G, Fleming P, Koertner G, & Brown W. (2016b). Rabies disease dynamics in naïve dog populations in Australia. *Preventive Veterinary Medicine*, *131*, 127-136. http://doi.org/10.1016/j.prevetmed.2016.07.015
93	Stawski C, Körtner G, Nowack J, Geiser F (2016) Phenotypic plasticity of post-fire activity and thermal biology of a small mammal. Physiology and Behavior 159: 104-111
94	Stawski C, Nowack N, Körtner G, Geiser F (2016) A new cue for torpor induction: charcoal, ash and smoke. Journal of Experimental Biology. In press
95	Taylor S, Drielsma M, Taylor R, & Kumar L. (2016h). Applications of Rapid Evaluation of Metapopulation Persistence (REMP) in Conservation Planning for Vulnerable Fauna Species. *Environmental Management*, *57*(6), 1281-1291. http://doi.org/10.1007/s00267-016-0681-7
96	Taylor S, & Kumar L. (2016). Global Climate Change Impacts on Pacific Islands Terrestrial Biodiversity: a review. *Tropical Conservation Science*, *9*(1), 203-223. Retrieved from http://e-publications.une.edu.au/1959.11/18925
97	Taylor S, & Kumar L. (2016l). Will climate change impact the potential distribution of a native vine (’Merremia peltata’) which is behaving invasively in the Pacific region? *Ecology and Evolution*, *6*(3), 742-754. http://doi.org/10.1002/ece3.1915
98	Tsoi, W., Ryder, D., Frazier, P and Southwell, M. (2016) Challenges To Scaling Up Site-Based Data For Assessing Environmental Water Outcomes In Floodplain Wetlands. In G. Vietz, A. Flatley and I. Rutherford, (Eds), “8th Australian Stream Management Conference”, pp 164-171, River Basin Management Society, Leura.
99	Turner JM, Geiser F (2016) The influence of natural photoperiod on seasonal torpor expression of two opportunistic marsupial hibernators. Journal of Comparative Physiology B. In press

100	Verma N, Lamb D, Reid N, & Wilson B. (2016i). Comparison of Canopy Volume Measurements of Scattered Eucalypt Farm Trees Derived from High Spatial Resolution Imagery and LiDAR. *Remote Sensing*, *8*(5), 1-16. http://doi.org/10.3390/rs8050388
101	Wacker CB, McAllan BM, Körtner G, Geiser F (2016) The functional requirements of mammalian hair: a compromise between crypsis and thermoregulation? The Science of Nature 103: 53
102	Watson, S.J., Whittaker, J.M., Halpin, J.A. Williams, S.E., Milan, L.A., Daczko, N.R, Wyman, D.A., 2016. Tectonic drivers and the influence of the Kerguelen plume on seafloor spreading during formation of the early Indian Ocean. Gondwana Research 35, 97-114.
103	Wilson, L.A.B., Hand, S.J., Lopez-Aguirre, C., Archer, M., Black, K.H., Beck, R.M.D., Armstrong, K.N., Wroe, S. (2016). Cranial shape variation and phylogenetic relationships of extinct and extant Old World leaf-nosed bats. *Alcheringa*. 40: 509-524.
104	White, M.A., Cook, A.G., Klinkhamer, A.J., Elliott, D.A. 2016. The pes of *Australovenator wintonensis* (Theropoda: Megaraptoridae): analysis of the pedal range of motion and biological restoration. PeerJ 4:e2312; DOI 10.7717/peerj.2312.
105	Wright, J, and McDonald, P. G. (2016) Bell miners: kin selected helping decisions." *Cooperative Breeding in Vertebrates–Studies of Ecology, Evolution, and Behaviour (Koenig, WD & Dickinson, J. eds). Cambridge Univ. Press, Cambridge, p*165-180.
106	Zacai A, Vannier J, & Lerosey-Aubril R. (2016p). Reconstructing the diet of a 505-million-year-old arthropod: “Sidneyia inexpectans” from the Burgess Shale fauna. *Arthropod Structure & Development*, *45*(2), 200-220. http://doi.org/10.1016/j.asd.2015.09.003

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