

Dr. Micheline Campbell

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Professional Summary

I have a PhD in palaeo-climatology and am currently working in hydrological sediment and nutrient transport. I have strong data science skills and have developed research skills applicable to a broad range of topics within the environmental sciences. My PhD research focused on stalagmite-based climate proxy records and associated karst geomorphology and groundwater hydrology, while my current position with the Queensland Department of Natural Resources, Mining, and Energy has a strong focus on field experiments and hypothesis testing. I am hoping to further my scientific career by securing a position where I can continue to use the skills I have developed, broaden my skill set, and return to teaching and engaging with undergraduate and postgraduate students.

Education

- Aug 2014 - **PhD (Geography)**, *School of Agriculture and Environment, The University of Western Australia*, Perth, Western Australia, Australia.
- **Thesis: Speleothem-based palaeo-climate research: Methodology, applications, and insight from the Snowy Mountains, southeast Australia**
 - Supervisors: JN. Callow, H. McGowan, G. McGrath, H. Wong
- Jul 2013 - **BA (Hons, 1st Class) (Geography)**, *School of Geography, Planning, and Environmental Management, The University of Queensland*, Brisbane, QLD, Australia.
- **Thesis: The Drip Hydrology of a Speleothem from the Yarrangobilly Caves, NSW, Australia**
 - Supervisors: H. McGowan, JN. Callow
- Feb 2010 - **BA (Geography and Spanish)**, *The University of Queensland*, Brisbane, QLD, Australia.

Experience

Research

- Feb 2020 - **Scientist**, *Land and Water Science Unit, QLD Dept. of Natural Resources, Mining and Energy*, Rockhampton, QLD, Australia.
- Analysed sugar cane trash trial data in relation to nutrient and sediment transport.
 - Found that a significant proportion of the variation of sediment transported in cane paddock runoff can be described by soil type and cane trash cover.

Aug 2019 - **Research Assistant**, *School of Agriculture and Environment, University of Western Australia*, Perth, WA, Australia.

- Miscellaneous data analysis tasks

Aug 2014 - **PhD Researcher**, *School of Agriculture and Environment, University of Western Australia*, Perth, WA, Australia.

- Developed two new palaeo-climate proxy records for south east Australia
- Showed that the climate of the LIG had similar significant periodicities to present, suggesting our long term climate patterns (e.g. PDO) will continue as temperatures increase with climate change.
- Used social network analysis to advance our understanding of methodologies applied in the speleothem palaeo-climate proxy community and the development of the field over time.
- Demonstrated that LA-ICP-MS and LA-ICP-AES of trace elements in speleothem calcite produce comparable results

Teaching

2018 **Tutor: Geographies of a Global City**, *School of Agriculture and Environment, The University of Western Australia*, Perth, WA, Australia.

2018 **Course Co-Coordinator and Lecturer: Catchment and River Processes**, *School of Agriculture and Environment, The University of Western Australia*, Perth, WA, Australia.

2014–2018 **Tutor: Catchment and River Processes**, *School of Agriculture and Environment, The University of Western Australia*, Perth, WA, Australia.

Teaching contributions include the delivery and creation of content for undergraduate and masters level units, both in the classroom/laboratory and in the field. Catchment and River Processes, which I taught into since its inception at UWA, consistently achieved high student ratings, including in 2018 when it received a score of 3.7/4. This placed it in the 70th percentile of UWA courses.

Funding and Scholarships

2018 **Australian Institute of Nuclear Science and Engineering Travel grant**.
○ \$1000

2017 **Australian and New Zealand Geomorphological Group Travel grant**.
○ \$300

2016 **University of Western Australia Travel grant**.
○ \$1850

2015–2018 **Australian Institute of Nuclear Science and Engineering Postgraduate Research Award Stipend**.
○ \$7500pa

2015–2018 **Australian Institute of Nuclear Science and Engineering Postgraduate Research Award Analytical Budget**.
○ \$10000pa

- 2014–2018 **Australian Government Research Training Program Stipend.**
 - o \$26000pa
- 2014–2015 **Snowy Hydro Ltd. Stipend.**
 - o \$5000pa
- 2014 **University of Western Australia Stipend.**
 - o \$3000

Publications

Published

1. Campbell, M, J Callow, G McGrath, and H McGowan (May 2018). Co-authorship analysis of the speleothem proxy-climate community: working together to tackle the big problems. *International Journal of Speleology* **47**(2), 165–172.
2. McGowan, H, JN Callow, J Soderholm, G McGrath, M Campbell, and Jx Zhao (Dec. 2018). Global warming in the context of 2000 years of Australian alpine temperature and snow cover. *Scientific Reports* **8**(1), 4394.
3. Campbell, M, JN Callow, G McGrath, and H McGowan (Dec. 2017). A multimethod approach to inform epikarst drip discharge modelling: Implications for palaeo-climate reconstruction. *Hydrological Processes* **31**(26), 4734–4747.

In Review

1. McGowan, H, M Campbell, JN Callow, A Lowry, and H Wong (In Review). Evidence of multi-decadal wet-dry cycles and mega-droughts in the Eemian warm climate epoch, southeast Australia.

In Preparation

1. Campbell, M and H Wong (In Preparation). LA-ICP-AES to analyse trace elements in speleothems.
2. Campbell, M, JN Callow, H McGowan, H Wong, and G McGrath (In Preparation). Solar forcing of mid-latitude terrestrial hydroclimate over the past 6.5 ka.

Conference Presentations

Talks

- Feb 2017 **A geophysical approach to inform epikarst drip discharge modelling: Implications for palaeo-climate reconstruction**, *Australian and New Zealand Geomorphological Group 17th Biennial Conference, Greytown, New Zealand*, Campbell, M., Callow, J.N., McGrath, G.S., McGowan, H.A.

Posters

- Apr 2018 **Climate patterns in South-east Australia: the Last Interglacial vs. the last 2K**, *20th EGU General Assembly, Vienna, Austria*, Campbell, M., Callow, J.N., McGowan, H.A., McGrath, G.S., Wong, H.
- Feb 2017 **First Insights of the Eemian Hydroclimate of the Snowy Mountains, Australia**, *Australian and New Zealand Geomorphological Group 17th Biennial Conference, Greytown, New Zealand*, Campbell, M., Wong, H., McGrath, G.S., McGowan, H.A., Callow, J.N.

Dec 2016 **First Insights of the Eemian Hydroclimate of the Snowy Mountains, Australia**, *American Geophysical Union, Fall Meeting, San Francisco, USA*, Campbell, M. Wong, H., McGrath, G.S., McGowan, H.A., Callow, J.N.

Skills

Statistical

Statistical Software.

- R (advanced)

Statistical Methods.

- Time series analysis
- Hypothesis testing
- Social network analysis
- Linear models
- Generalised linear models
- Numerical modelling

Field

Surveying.

- Total station
- Real time kinematic

Electrical Resistivity Tomography.

- Deployment
- Data processing and analysis

Environmental Data Loggers.

- Onset HOBO
- In-Situ Rugged Troll
- Driptych Stalagmate

Environmental Sampling.

- Isotopes in water
- Nutrients in water
- Soil profiling

Other

Software.

- Python (fundamental awareness)
- ArcGIS (novice)
- Microsoft Suite (advanced)
- LaTeX (novice)
- Rmarkdown (intermediate)

Service

Aug 2017 - **Participant, Science in Schools Program.**

Aug 2017 ○ Travelled to a regional town to share some love for science with primary school kids

- Feb 2015 - **Postgraduate representative to the School of Earth and Environment.**
- Jul 2017 o Led the organisation of 2 annual symposia for postgraduate students within the school.
 o Reported student concerns to the School administration
 o Support and troubleshooting for new students
- Mar 2016 - **Co-Convenor, SEE LearnR Workshop.**
- Jan 2016 o Organised a short series of 'Introduction to R' courses for the students and staff of the School of Earth and Environment
- Oct 2014 - **Guest presenter, ENVT2221: Global Climate Change and Biodiversity.**
- Oct 2014 o Presented 'Palaeo-climate and Stalagmites' for 2nd-year Biology students at UWA

Professional Development

- 2020 Advanced R Workshop. The University of Queensland, Australia
- 2020 Intermediate R Workshop. The University of Queensland, Australia
- 2018 Weathering Climate Change: How have humans coped with climate change-and how will we continue to do so. The University of Western Australia, Australia
- 2018 Masterclass in Creating Opportunities and Developing your Research Skills. The University of Western Australia, Australia
- 2016 Synthesis II - From dynamics of structure to function of complex networks. TU Dresden, Germany
- 2016 Water on Earth: origin, reservoirs, and its global cycle. The University of Western Australia, Australia
- 2016 Fundamentals of the analysis of networks. The University of Western Australia, Australia
- 2014 Writing and publishing in scientific journals. The University of Western Australia, Australia

Referees