

# Dr. Micheline Campbell

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## Professional Summary

I have a PhD in speleothem palaeo-climatology and am currently employed as a research associate at the University of New South Wales, contributing to the Australian Research Council Discovery Project “Reconstructing Australia’s fire history from cave stalagmites.” I have strong data and field science skills and have developed a research skillset 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, and since then I have worked in the surface hydrology and palaeoclimate-water security nexus. I am hoping to continue my career in physical geography by securing a position where I can apply skills I have developed in a meaningful way and contribute to the development of the next generation of geographers.

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## 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.

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## Experience

### Research

- Jun 2021 - **Research Associate**, *School of Biological, Earth and Environmental Sciences, University of New South Wales*, Sydney, NSW, Australia.
- Contributing to the ARC Discovery Project “Reconstructing Australia’s fire history from cave stalagmites”

- Jul 2020 - **Postdoctoral Researcher**, *School of Geography, University College Dublin*,  
Jun 2021 *Dublin/Brisbane, QLD, Ireland/Australia.*
- Contributing to the project 'Using Palaeo-climate Proxies for Water Security Planning'
  - Undertook the majority of data science tasks for the development of a new database of Australian climate proxy data
- Feb 2020 - **Scientist**, *Land and Water Science Unit, QLD Dept. of Natural Resources*,  
Jul 2020 *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.
  - This was a short term 5-month contract
- Aug 2019 - **Research Assistant**, *School of Agriculture and Environment, University of*  
Dec 2019 *Western Australia, Perth, WA, Australia.*
- Miscellaneous data analysis tasks
- Aug 2014 - **PhD Researcher**, *School of Agriculture and Environment, University of*  
Jul 2019 *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 70<sup>th</sup> percentile of UWA courses.

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## Funding and Scholarships

- 2021 **Australian Institute of Nuclear Science and Engineering Early Career Researcher Grant.**
  - \$10 000
- 2018 **Australian Institute of Nuclear Science and Engineering Travel grant.**
  - \$1 000
- 2017 **Australian and New Zealand Geomorphological Group Travel grant.**
  - \$300
- 2016 **University of Western Australia Travel grant.**
  - \$1 850
- 2015–2018 **Australian Institute of Nuclear Science and Engineering Postgraduate Research Award Stipend.**
  - \$7 500pa
- 2015–2018 **Australian Institute of Nuclear Science and Engineering Postgraduate Research Award Analytical Budget.**
  - \$10 000pa
- 2014–2018 **Australian Government Research Training Program Stipend.**
  - \$26 000pa
- 2014–2015 **Snowy Hydro Ltd. Stipend.**
  - \$5 000pa
- 2014 **University of Western Australia Stipend.**
  - \$3 000

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## Publications

### Published

1. McGowan, H., Campbell, M., Callow, J. N., Lowry, A., & Wong, H. (2020). Evidence of wet-dry cycles and mega-droughts in the Eemian climate of southeast Australia. *Scientific Reports*, 10(1), 1–10. <https://doi.org/10.1038/s41598-020-75071-z>
2. McGowan, H., Callow, J. N., Soderholm, J., McGrath, G., Campbell, M., & Zhao, J. (2018). Global warming in the context of 2000 years of Australian alpine temperature and snow cover. *Scientific Reports*, 8(1), 4394. <https://doi.org/10.1038/s41598-018-22766-z>
3. Campbell, M., Callow, J., McGrath, G., & McGowan, H. (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. <https://doi.org/10.5038/1827-806X.47.2.2159>
4. Campbell, M., Callow, J. N., McGrath, G., & McGowan, H. (2017). A multimethod approach to inform epikarst drip discharge modelling: Implications for palaeo-climate reconstruction. *Hydrological Processes*, 31(26), 4734–4747. <https://doi.org/10.1002/hyp.11392>

## In Review

1. Croke, J., Vitkovsky, J., Hughes, K., Campbell, M., Sahar, A.-M., Parnell, A., Cahill, N., & Dalla Pozza, R. (2020). A palaeoclimate proxy database for water security planning. *Scientific Data, In Review*.

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## 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.

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## 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 HOB0
- 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)

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## **Service**

- Aug 2021 - **Committee Member, Australian Quaternary Association.**  
Present
- Aug 2017 - **Participant, Science in Schools Program.**  
Aug 2017 ● Travelled to a regional town to share some love for science with primary school kids
- Jan 2016 - **Co-Convenor, SEE LearnR Workshop.**  
Mar 2016
- Feb 2015 - **Postgraduate representative to the School of Earth and Environment.**  
Jul 2017 ● Led the organisation of 2 annual symposia for postgraduate students within the school.  
● Reported student concerns to the School administration  
● Support and troubleshooting for new students
- Oct 2014 - **Guest presenter, ENVT2221: Global Climate Change and Biodiversity.**  
Oct 2014 ● Presented 'Palaeo-climate and Stalagmites' for 2nd-year Biology students at UWA

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## **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

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## Professional Memberships

- Jul 2021 - Australian Quaternary Association.  
Present
- Jul 2021 - American Geophysical Union.  
Present

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## Referees