

## Dr Georgina Maja Falster

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### **CURRENT AFFILIATION (COMMENCED SEPTEMBER 2019)**

Department of Earth and Planetary Sciences  
Washington University in St. Louis

*Postdoctoral research associate using water isotope proxy records to investigate changes in tropical ocean-atmosphere circulation during the past 2000 years.*

Supervisor: A/Prof. Bronwen Konecky

### **EXPERTISE & STRENGTHS**

- Stable water isotopes, and their application to understanding climate systems
- Measuring and interpreting clumped and stable isotopic composition of carbonates
- Multi-archive multi-proxy palaeoclimate reconstructions
  - Particularly strong understanding of Common Era and Last Glacial-Interglacial Transition climates
- Meta-analysis of large observational datasets
- Communication of scientific results to people at all levels (from topic experts to non-scientists)
- Strong and capable field worker
- Collaboration, including ongoing international projects
- Working remotely and independently
- Expert R user (details below)

### **EDUCATION**

2015-2019

**The University of Adelaide, Australia**

PhD in Sciences

Advisors: Jonathan Tyler, John Tibby

Thesis title: Reconstructing Australia's late Quaternary climates from the geochemistry of lake sediments and snail shells.

2008-2011

**The University of Adelaide, Australia**

B.Sc (First Class Honours) in Geology

Undergraduate Average GPA 6.6 (Australian scale)

Honours thesis title: Geochronological and sedimentological constraints on the evolution of the lower Cuddapah Basin, India.

### **SCHOLARSHIPS & AWARDS**

2019

Dean's Commendation for Doctoral Thesis Excellence

2019

Multiple competitive travel awards to attend AGU Fall Meeting, INQUA 2019, ICP13, and the US CLIVAR Water Isotopes and Climate Workshop

2019, 2017

Fame-Lab Australia national semi-finalist

*National science communication competition*

2017

Esther Bright Prize (from Soroptimist International of Adelaide)

*To attend the Advanced Climate Dynamics Course in Norway*

2017

Australian Institute of Nuclear Science & Engineering (AINSE) International Travel Scholarship + University of Adelaide Research Abroad Scholarship

*To spend time in the Heidelberg University clumped isotope laboratory*

2016

Geological Society of Australia prize for best student presentation (oral)

*At the Australian Earth Sciences Convention*

2016	Adelaide University Graduate Union R. C. Heddle Award <i>Travel scholarship awarded annually to one doctoral candidate at Adelaide Uni</i>
2016	Walter and Dorothy Duncan Trust Award <i>Travel grant to attend the 5<sup>th</sup> PAGES Open Science Meeting</i>
2015-2019	AINSE Postgraduate Research Award <i>Annual stipend plus support to prepare and analyse samples at the Australian Nuclear Science and Technology Organisation (radiocarbon lab)</i>
2015-2019	Australian Postgraduate Award <i>Federal government funding to support postgraduate training for students of exceptional research potential</i>
2014	CRC LEME scholarship <i>For outstanding research in regolith science</i>
2011	AusIMM-Playford Trust Honours Scholarship <i>For one outstanding student entering a full-time geoscience Honours year in Australia</i>
2010	James Barrans Scholarship <i>For highest-achieving student in third-year geology subjects at Adelaide Uni</i>
2009	Glenn Scotford Prize <i>For outstanding academic achievement in second year geology at Adelaide Uni</i>

#### PEER-REVIEWED PUBLICATIONS

- Konecky, B., N. McKay, O. Churakova, L. Comas-Bru, E. Dassié, K. DeLong, **G. Falster**, M. Fischer, M. Jones, L. Jonkers, D. Kaufman, G. Leduc, S. Managave, B. Martrat, T. Opel, A. Orsi, J. Partin, H. Sayani, E. Thomas, D. Thompson, J. Tyler, N. Abram, A. Atwood, J. Conroy, Z. Kern, T. Porter, S. Stevenson, L. von Gunten, Iso2k Project Members. 2020. The Iso2k Database: A global compilation of paleo- $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  records to aid understanding of Common Era climate. *Earth System Science Data* 12, 2261-2288.
- **Falster, G.**, S. Delean, J. Tyler. 2018. Hydrogen peroxide treatment of natural lake sediment prior to carbon and oxygen stable isotope analysis of calcium carbonate. *Geochemistry, Geophysics, Geosystems*.
- **Falster, G.**, J. Tyler, K. Grant, J. Tibby, C. Turney, G. Jacobsen, A. P. Kershaw. 2018. Millennial-scale variability in south-east Australian hydroclimate between 30,000 and 10,000 years ago. *Quaternary Science Reviews* 192, 106-122.
- Collins, A., S. Patranabis-Deb, E. Alexander, C. Bertram, **G. Falster**, R. Gore, J. Mackintosh, P. Dhang, D. Saha, J. Payne, F. Jourdan, G. Backe, G. Halverson, B. Wade. 2015. Detrital mineral age, radiogenic isotopic stratigraphy and tectonic significance of the Cuddapah Basin, India. *Gondwana Research* 28(4), 1294-1309.

#### SUBMITTED OR IN-PREPARATION MANUSCRIPTS

- **Falster, G.**, B. Konecky, M. Madhavan, S. Stevenson, S. Coats. 2021. Imprint of the Pacific Walker Circulation in global precipitation  $\delta^{18}\text{O}$ . (submitted to *Journal of Climate*).
- Churakova (Sidorova), O., V. Myglan, M. Fonti, O. Naumova, A. Kirdeyanov, I. Kalugin, V. Babich, **G. Falster**, E. Vaganov, R. Siegwolf, M. Saurer. 2021. Aridity in the Russian Altai: modern 4°C summer air temperature increase and drastic decrease of precipitation over the past 1500 years. (submitted to *PNAS*).
- Konecky, B., N. McKay, **G. Falster**, S. Stevenson, M. Fischer, A. Atwood, D. Thompson, M. Jones, K. DeLong, J. Tyler, B. Martrat, E. Thomas, J. Conroy, S. Dee, L. Jonkers, O. Churakova (Sidorova), Z. Kern, T. Opel, H. Sayani, Iso2k Project Members. 2021. Temperature-driven changes in the global water cycle during the Common Era. (in preparation for *Nature*).

- **Falster, G.**, J. Tyler, A. Chivas, F. Dux, R. Drysdale, T. Kluge. 2021. Environmental controls on the clumped and stable isotope ratios of land snail shells in Australia. (in preparation for *EPSL*)

## SELECTED OTHER PUBLICATIONS

\*\*denotes invited conference submission.

- **Falster, G.**, B. Konecky, S. Coats, S. Stevenson. 2021. 'Pacific Walker circulation variability during the last millennium reconstructed from a network of water isotope proxy records'. *EGU General Assembly*, virtual (accepted for virtual PICO presentation).
- **\*\*Falster, G.**, B. Konecky, M. Madhavan, S. Stevenson, S. Coats. 2020. 'Fingerprinting the Pacific Walker Circulation using precipitation  $\delta^{18}\text{O}$ '. *AGU Fall Meeting*, virtual (oral presentation).
- **Falster, G., B. Konecky**, N. McKay, A. Atwood, J. Conroy, M. Fischer, M. Jones, L. Jonkers, S. Stevenson, D. Thompson, J. Tyler, 2019. 'New insights into spatial and temporal dynamics of the global water cycle from the Iso2k database'. *AGU Fall Meeting*, San Francisco (oral presentation).
- **Falster, G., L. Armbrecht**, L. Missiaen, 2019. 'Under the Southern Cross: 13<sup>th</sup> International Conference on Paleoceanography'. *Past Global Changes Magazine* 27(2), 87.  
**Falster, G., G. Simpson**, H. Ye. 2019. 'Testing the link between southern Australian aridity and variability in the global carbon cycle'. *13th International Conference on Paleoceanography*, Sydney (poster).
- **Falster G.**, J. Tyler, T. Kluge, F. Dux, R. Drysdale, A. Chivas, J. Tibby, L. Reed. 2018. 'Leaving a trail: reconstructing past climates from stable and clumped isotope analysis of snail shells.' *Australasian Quaternary Association biennial meeting*, Canberra (oral presentation)
- **Falster, G.**, J. Tyler, K. Grant, J. Tibby, C. Turney, G. Jacobsen, A. P. Kershaw. 2018. 'Millennial-scale variability in south-east Australasian hydroclimate between 30,000 and 10,000 years ago.' *Southern Hemisphere Assessment of PalaeoEnvironments (SHAPE) workshop*, Wollongong (poster and short oral presentation)
- **Falster, G.**, J. Tyler, K. Grant, J. Tibby, C. Turney, G. Jacobsen, A. P. Kershaw. 2017. 'Coherent millennial-scale variability in southern Australasia during the Last Glacial Period.' *5<sup>th</sup> PAGES Open Science Meeting*, Zaragoza (poster)
- **Falster, G.** 2017. 'A report on the inaugural workshop for the Last Glacial Maximum in the Southern Hemisphere (SHeMax) project.' *Quaternary Australasia* 43, 33-36
- **Falster, G.**, J. Tyler, J. Tibby, C. Barr, K. Grant, A. P. Kershaw. 2016. 'Hydroclimate variability in southern Australia during the Last Glacial Period: a multi-proxy record from Lake Surprise.' *Australasian Quaternary Association biennial meeting*, Auckland (oral presentation)
- **Falster, G.**, J. Tyler, J. Tibby, C. Barr, K. Grant, A. P. Kershaw. 2016. 'Climate variability in southern Australia during the Last Glacial Period: a multi-proxy record from Lake Surprise.' *Australian Earth Sciences Convention*, Adelaide (oral presentation)
- **Falster, G.**, J. Tyler, J. Tibby, C. Barr, K. Grant, A. P. Kershaw. 2015. 'Climate variability in southern Australia during the last glacial-interglacial transition: toward new insights from lake sediments using conventional and clumped isotope geochemistry.' *XIX INQUA Congress*, Nagoya (poster)

## INVITED SEMINARS

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| 2021 | 'Imprint of the Pacific Walker circulation in global precipitation $\delta^{18}\text{O}$ '. <i>University of Adelaide, Department of Earth Sciences seminar series.</i>                            |
| 2018 | 'Millennial-scale variability in south-east Australian hydroclimate between 30,000 and 10,000 years ago'. <i>Australian National University, Research School of Earth Sciences seminar series.</i> |

## SKILLS SUMMARY

### Data analytical

Post-graduate and/or post-doctoral experience in

- Advanced use of state-of-the-art data frameworks (e.g. [LiPD files](#)) in R and Python
- Analysis and interpretation of large (hundreds to thousands of records) datasets, including modern observational data and multi-proxy palaeoclimate datasets
- Advanced analysis of static and time-series data in R, including ordination, generalised additive models, regression analysis, spectral analyses, Bayesian age-depth modelling, cross-correlation, causality analysis, machine learning, analysing climate reanalyses (netCDFs), and incorporation of chronological uncertainty into statistical analyses
- Basic analysis of climate model (iCESM) outputs in R and Python
- Morphology and geomorphology mapping of seafloor features

### Field and laboratory

Post-graduate experience in

- Clumped isotope analysis of carbonate
- Stable isotope analysis of carbonate and organic matter
- Lake sediment, tree ring, water, soil, and vegetation sampling
- High-resolution XRF core scanning
- Quantitative XRF and XRD on sediment samples
- Deriving concentrated pollen samples from lake sediment, for radiocarbon dating
- LA-ICP-MS analysis of zircons
- Stratigraphic logging and sampling in remote locations
- Oil & gas drill site operations in remote locations

### Software

- R (expert), Python (learning), ArcGIS (advanced), QGIS (intermediate), Adobe Illustrator (advanced), Microsoft Office, Zoom, Adobe Connect, Google Drive suite

### Other skills and knowledge

- German language: passable written and oral with a bit of practice
- Water sports: competed at Australian state and national level in open water swimming and surf life saving
- Violin: trained in classical violin. Participated in various Australian Youth Orchestra programs
- Australian manual drivers licence, motorcycle licence, boat licence
- Current First Aid certificate

## WORKSHOPS ATTENDED

*\*denotes workshop with competitive selection process*

2021*	LinkedEarth PaleoHackathon (Pyleoclim) workshop, virtual
2019*	'Water cycle in a 1.5° warmer world: interdisciplinary approaches' joint Early Career Research workshop, San Francisco, USA
2019	US CLIVAR Water Isotopes and Climate Workshop, Boulder, USA
2018	'Southern Hemisphere Assessment of PalaeoEnvironments' workshop, Wollongong, Australia
2017*	Advanced Climate Dynamics Course 'The Dynamics of the Seasonal Cycle', Rondane National Park, Norway
2017*	GeoChronR training workshop, Northern Arizona University, USA

- 2017\* 3<sup>rd</sup> Past Global Changes (PAGES) Young Scientists Meeting, Zaragoza, Spain
- 2017 ‘Numerical Analysis of Palaeoenvironmental Research’ with Gavin Simpson, Adelaide, Australia
- 2016\* 15<sup>th</sup> annual Swiss Climate Summer School, Grindelwald, Switzerland
- 2015 ‘Advanced Isotope Geochemistry Course’, University of Wollongong, Australia.

### **RELEVANT EMPLOYMENT HISTORY**

- 2018-2019 Geoscience Australia, Environmental Geoscience Division  
*Marine geoscientist in the National Earth and Marine Observations branch*  
*Graduate geoscientist*
- 2014-2017 The University of Adelaide  
*Demonstrator and teaching assistant during field trips and weekly practicals for various geology and environmental science undergraduate subjects*
- 2012-2014 Santos Limited  
*Graduate geologist, with rotations in Sedimentology & Petrology, Unconventional Resources and Exploration, and Geology Operations. Onshore wellsite geologist, responsible for on-site data acquisition and quality control.*

### **SERVICE TO PROFESSION**

- 2021 Session convener: ‘Water Isotope Systematics: Improving Modern and Paleoclimate Interpretations’, AGU Fall Meeting, December 2021
- 2020-present Member of the PAGES Early Career Network Science Cluster
- 2020-present Member of the Scientific Program Committee for the Past Global Changes (PAGES) Young Scientists Meeting (to be held in Morocco in 2021 [hopefully])
- 2019-present Reviewer for *Geophysical Research Letters*, *Journal of Limnology*, *Boreas*, NSF Paleoclimate Program (GEO directorate)
- 2018-present Regional Representative (Oceania) for the PAGES Early Career Network
- 2016-2019 Treasurer of the Australasian Quaternary Association (AQUA)  
- Member of local organising committee for the 2018 AQUA Biennial Conference

### **PROFESSIONAL MEMBERSHIPS**

- 2019-present American Geophysical Union
- 2015-present Australasian Quaternary Association