

Dr Georgina Maja Falster

Personal information

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Websites [Google Scholar](#); [personal research website](#)

Research foci Climate of the Common Era, water cycle variability and extremes, tropical Pacific dynamics, Australian climate, statistical methods for understanding climate processes

Research tools Climate observations, climate model outputs, water isotopes, paleoclimate proxy data, advanced numerical models, R, Python

Professional appointments

- 2021– **Australian Research Council Centre of Excellence for Climate Extremes Research Fellow**, *Research School of Earth Sciences, Australian National University, Australia.*
Member of the Australian National University Institute for Climate, Energy & Disaster Solutions
Using observational data, palaeoclimate proxy data, and model simulations to investigate the nature & drivers of Australian droughts.
- 2019–2021 **Postdoctoral Research Associate**, *Department of Earth and Planetary Sciences, Washington University in St. Louis, USA.*
Using water isotope observations, proxy records, and model simulations to investigate forced and internal variability in ocean-atmosphere circulation.
- 2018–2019 **Marine Geoscientist**, *Geoscience Australia, Australia*

Education

- 2015–2019 **PhD in Climate Science**, *The University of Adelaide, Australia*
Thesis: Reconstructing Australia's late Quaternary climates from the geochemistry of lake sediments and snail shells
Awarded Dean's Commendation for Doctoral Thesis Excellence
- 2008–2011 **Bachelor of Science with First Class Honours**, *The University of Adelaide, Australia*
Majors: Environmental Geoscience, Geology, Ecology

Publications

**denotes paper lead by one of my students*

Journal articles in review

- Vaiglova, P., H. Kierdorf, C. Witzel, **G. Falster**, R. Joannes-Boyau, Y. Wang, J. Wu, I. Williams, B. Knowles, Y. Wu, P. Bangsgaard, L. Yeomans, T. Richter, H. Darabi: Long-distance transport of animals underpinned ritual feasting at the onset of the Neolithic in southwestern Asia. *In review at Nature Human Behaviour.*
- Holgate, C., **G. Falster**, Z. Gillett, P. Goswami, M. Grant, S. Hobeichi, D. Hoffman, X. Jiang, C. Jin, X. Lu, M. Mu, J. Page, T. Parker, E. Vogel, N. Abram, J. Evans, A. Gallant, B. Henley, J. Kala, A. King, N. Maher, H. Nguyen, A. Pitman, S. Power, S. Rauniyar, A. Taschetto, A. Ukkola: Physical Mechanisms of drought development, intensification and termination: an Australian review. *In review at Communications Earth and Environment.*

- *Cho, P., **G. Falster**, D. Bolster, M. Berke, M. Müller: Influence of the Indian Walker Circulation on $\delta^{18}\text{O}_\text{p}$ and precipitation variability in the Indian Ocean Basin. *In review at JGR Atmospheres*.
- Published peer-reviewed journal articles**
- Nov. 2024 **Falster, G.**, S. Coats, N. Abram: How Unusual Was Australia's 2017–2019 Tinderbox Drought? *Weather and Climate Extremes* **46**, 100734. [Link to publication](#).
- Sep. 2024 **Falster, G.**, N. Wright, N. Abram. A. Ukkola, B. Henley: Potential for historically unprecedented Australian droughts from natural variability and climate change. *Hydrology and Earth System Science* **28**, 1383-1401. [Link to publication](#)
- Mar. 2024 Devanand, A., **G. Falster**, Z. Gillett, S. Hobeichi, C. Holgate, C. Jin, M. Mu, T. Parker, S. Rifai, K. Rome, M. Stojanovic, E. Vogel, N. Abram. G. Abramowitz, S. Coats, J. Evans, A. Gallant, A. Pitman, S. Power, S. Rauniyar, A. Taschetto, A. Ukkola: Australia's Tinderbox Drought: an extreme natural event likely worsened by human-caused climate change. *Science Advances* **10**, eadj3460. [Link to publication](#)
- Nov. 2023 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. Curakova (Sidorova), Z. Kern, T. Opel, H. Sayani, Iso2k Project Members: Globally coherent water cycle response to temperature change during the past two millennia. *Nature Geoscience* **16**, 997-1004. [Link to publication](#)
- Aug. 2023 **Falster, G.**, B. Konecky, S. Coats, S. Stevenson. Forced changes in the Pacific Walker Circulation over the past millennium. *Nature* **662**, 93-100. [Link to publication](#)
- May 2022 Churakova-Sidorova, O., V. Myglan, M. Fonti, O. Naumova, A. Kirilyanov, I. Kalugin, V. Babich, **G. Falster**, E. Vaganov, R. Siegwolf, M. Saurer: Modern aridity in the Altai-Sayan mountain range derived from multiple millennial proxies. *Scientific Reports* **12**(1), 1-10. [Link to publication](#)
- May 2021 **Falster, G.**, B. Konecky, M. Madhavan, S. Stevenson, S. Coats: Imprint of the Pacific Walker Circulation in global precipitation $\delta^{18}\text{O}$. *Journal of Climate* **34**(21), 8579-8597. [Link to publication](#)
- Sep. 2020 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: 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. [Link to publication](#)
- Sep. 2019 Khider, D., J. Emile-Geay, N. McKay, Y. Gil, D. Garijo, V. Ratnakar...**G. Falster**...[see paper for full author list]: PaCTS 1.0: a crowdsourced reporting standard for paleoclimate data. *Paleoceanography and Paleoclimatology* **34**(10), 1570-1596. [Link to publication](#)
- Aug. 2018 **Falster, G.**, S. Delean, J. Tyler: Hydrogen peroxide treatment of natural lake sediment prior to carbon and oxygen stable isotope analysis of calcium carbonate. *Geochemistry, Geophysics, Geosystems* **19**(9), 3583-3595. [Link to publication](#)
- Jul. 2018 **Falster, G.**, J. Tyler, K. Grant, J. Tibby, C. Turney, G. Jacobsen, A. P. Kershaw: Millennial-scale variability in south-east Australian hydroclimate between 30,000 and 10,000 years ago. *Quaternary Science Reviews* **192**, 106-122. [Link to publication](#)

- Dec. 2015 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: Detrital mineral age, radiogenic isotopic stratigraphy and tectonic significance of the Cuddapah Basin, India. *Gondwana Research* **28**(4), 1294-1309. [Link to publication](#)

Journal articles in advanced stages of preparation

- **Falster, G.**, G. Abramowitz, C. Hughes, P. Treble, S. Hobeichi, C. Jin, M. Bird, A. Cauquoin, B. Dixon, R. Drysdale, C. Gould-Whaley, N. Munksgaard, B. Proemse, J. Tyler, M. Werner, C. Tadros: Monthly precipitation isotopes across Australia predicted using machine learning. *In preparation for PNAS* [expected submission March 2025].
- *Perlmutter, F., **G. Falster**, B. Konecky, N. McKay: Incorporating chronological uncertainty into a globally distributed, multi-archive network of water isotope proxy records. *To be submitted to Geochronology* [expected submission June 2025]

Invited journal articles in preparation

- **Falster, G.**, B. Konecky, S. Stevenson, S. Coats, C. Pfleger: The Pacific Walker Circulation: past, present, and future variability. *WIREs Climate Change* [invited review article, to be submitted June 2025]

Selected non-traditional publications

- Apr. 2024 **Falster, G.** and PAGES Early-Career Network Steering Committee Members: What defines an "early-career researcher" in the paleosciences? *PAGES Magazine* **32**(1). [Link to article](#).
- Dec. 2023 **Falster, G.**: Big Air Circle Ballad. *Consilience* **15**. [Link to publication](#)
Poem summarising my research into the long-term behaviour of the Pacific Walker Circulation: [Link to a recording of the poem](#)
- Mar. 2023 Laepple, T., H. Goosse, R. Hebert, N. Kaushal, L. Jonkers, **G. Falster**: 2k-CVAS Topical Science Meeting: Centennial Climate Variability at regional scale in models and reconstructions. Workshop report in PAGES Magazine. [Link to article](#).
- Aug. 2019 Amirebrahimi, S., K. Picard, N. Quadros, **G. Falster**: Multibeam Echo Sounder Data Acquisition in Australia and Beyond. Geoscience Australia Records 2019/08. [Link to report](#) (cited 4 times)
- Jul. 2017 **Falster, G.**: A report on the inaugural workshop for the Last Glacial Maximum in the Southern Hemisphere (SHeMax) project. *Quaternary Australasia* **34**, 33-36. [Link to publication](#)

Selected conference presentations

****Denotes invited/solicited conference submission**

- Apr. 2024 ****Falster, G.**, B. Konecky, S. Stevenson, S. Coats: New insights into the Pacific Walker Circulation from an 800-year-long water isotope-based reconstruction ensemble. *Solicited presentation in "The atmospheric water cycle: processes, dynamics, isotopic tracers, and characteristics" session at EGU General Assembly, Austria*.
- Feb. 2024 **Falster, G.**, S. Coats: Assessing rainfall deficits during the 2017-2019 eastern Australian drought, in the context of previous observations. *Australian Meteorological and Oceanographic Society Conference, Australia* (oral).
- Dec. 2023 **Falster, G.**, B. Konecky, S. Stevenson, S. Coats: Anthropogenic impacts on the Pacific Walker Circulation: not quite what we expected. *AGU Fall Meeting, USA* (oral).

- Apr. 2023 **Falster, G.**, H. Sayani, A. Orsi, H. McGregor, N. Kaushal, L. Jonkers, M. Jones, B. Henley, S. Eggleston, A. Atwood: Phase 4 of PAGES 2k: Hydroclimate of the Common Era. *EGU General Assembly, Austria* (oral; given in lieu by N. Kaushal).
- Dec. 2022 **Falster, G.**, B. Konecky, S. Stevenson, S. Coats: Volcanoes 1, Humans 0: New Reconstruction Elucidates Forced Response of the Pacific Walker Circulation over the Past 800 Years. *AGU Fall Meeting, USA* (oral).
- Nov. 2022 ****Falster, G.**, N. Wright, S. Coats, N. Abram: No anthropogenic change in the frequency or severity of Australian multi-year droughts compared with the past millennium. *Australian Research Council Centre of Excellence for Climate Extremes Annual Meeting, Australia* (oral).
- Dec. 2021 **Falster, G.**, B. Konecky, S. Stevenson, S. Coats: Multi-method, multi-proxy reconstructions of the Pacific Walker Circulation through the last millennium. *AGU Fall Meeting, virtual* (oral).
- Dec. 2020 ****Falster, G.**, B. Konecky, M. Madhavan, S. Stevenson, S. Coats: Fingerprinting the Pacific Walker Circulation using precipitation $\delta^{18}\text{O}$. *Invited talk in "The atmospheric water cycle: processes, dynamics, isotopic tracers, and characteristics" session at the AGU Fall Meeting, USA* (oral).
- Dec. 2019 **Falster, G.**, B. Konecky, N. McKay, A. Atwood, J. Conroy, M. Fischer, M. Jones, L. Jonkers, S. Stevenson, D. Thompson, J. Tyler: New insights into spatial and temporal dynamics of the global water cycle from the Iso2k database. *AGU Fall Meeting, USA* (oral).
- Nov. 2018 **Falster G.**, J. Tyler, T. Kluge, F. Dux, R. Drysdale, A. Chivas, J. Tibby, L. Reed: Leaving a trail: reconstructing past climates from stable and clumped isotope analysis of snail shells. *Australasian Quaternary Association biennial meeting, Australia* (oral).

Honours and awards

Invited seminars

- Oct. 2024 University of Sydney, School of Geosciences
- Apr. 2024 University of Cambridge, Department of Geography
- Mar. 2024 Pal(a)eoPERCS Global Early Career Researcher online seminar series
[Link to recording](#)
- Mar. 2023 Past Global Changes (PAGES) Topical Science Meeting, Potsdam.
- Sep. 2022 Paleoclimate Advances Webinar Series, CESM Paleoclimate Working Group. [Link to recording](#).
- Mar. 2022 Australian National University, Research School of Earth Sciences.
- Dec. 2021 LinkedEarth Town Hall, AGU Fall Meeting.
- Jun. 2021 University of Hawai'i, International Pacific Research Center.
- Sep. 2021 Lamont-Doherty Earth Observatory, Biology & Paleo Environment Division.
- Jul. 2021 PAGES 2k Network Online Seminar Series. [Link to recording](#).
- Mar. 2021 University of Adelaide, Department of Earth Sciences.
- Sep. 2018 Australian National University, Research School of Earth Sciences.

Competitive Research Funding

- 2025–2028 Australian Research Council Discovery Early Career Researcher Award (DECRA) DE250100071 "Quantifying Australia's long-term risk of rainfall extremes".
AU\$438,335
- 2023–2024 Combined grant from Chinese National Academy of Sciences and Swiss Academy of Sciences to fund workshop "Global-scale hydroclimate synthesis of the Common Era" and preceding

training event "PAGES Databases: Creation and Analysis"—to be held in London, September 2024.

US\$12,000

2023 Australian Institute of Nuclear Science & Engineering (AINSE) Early Career Researcher Grant ALNGRA2205 "Understanding the nature and drivers of spatial and temporal variability in the isotopic composition of precipitation across Australia".

AU\$10,000

2022–2023 Grant from Future Earth (under Past Global Changes) to fund Topical Science Meeting "Centennial climate variability at regional scales in models and reconstructions", held in Potsdam, March 2023.

2015–2019 AINSE Postgraduate Research Award ALNSTU11873

AU\$45,000

Selected academic awards & scholarships

2023 Australian Research Council Centre of Excellence for Climate Extremes prize for best paper published by an early-career researcher

2022 EarthCube Early Career Researcher award

2019 University of Adelaide Dean's Commendation for Doctoral Thesis Excellence

2019 Awarded competitive travel grants 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

Science communication competition

2017 Esther Bright Prize (from Soroptimist International of Adelaide)

Merit-based award to fund international conference attendance

2017 Australian Institute of Nuclear Science & Engineering (AINSE) International Travel Scholarship + University of Adelaide Research Abroad Scholarship

Merit-based awards for international collaborations and laboratory work

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

Merit scholarship awarded annually to one doctoral candidate at The University of Adelaide

2016 Walter and Dorothy Duncan Trust Award

Merit-based award for international conference attendance

2015–2019 Australian Postgraduate Award

Federal funding to support postgraduate training for students of exceptional research potential

2014 Cooperative Research Centre for Landscape Evolution scholarship

For outstanding undergraduate research in physical geography

2011 AusIMM-Playford Trust Honours Scholarship

Awarded to the three most outstanding students entering an earth science Honours year in South Australia

2010 James Barrans Scholarship

For the highest-achieving student in final-year earth science subjects at The University of Adelaide

Scientific leadership, service, and outreach

Scientific leadership

2021– Past Global Changes (PAGES) 2k Network Coordinator

Planning and facilitating global collaborations to better understand hydroclimate variability of the past 2000 years

2021– PAGES Early Career Network Steering Committee

Supporting research and development activities of >800 early-career palaeoclimate scientists

- 2020– Reviewer for US NSF Paleoclimate Program (GEO directorate and P4CLIMATE) & Australian Research Council (Future Fellowships)
- 2020–2022 Scientific Program Committee for the PAGES Young Scientists Meeting

Service to academic community

- 2023– Australian Research Council Centre of Excellence for Climate Extremes (ARC CLEX) Early Career Researcher Committee chair
- 2022– Australian National University Research School of Earth Sciences Seminar Committee
- 2021– Session chair/convenor at major international conferences
Including “Water Isotope Systematics: Improving Modern and Paleoclimate Interpretations” at AGU Fall Meeting; “Studying the climate of the last two millennia” at EGU General Assembly; “Terrestrial hydroclimates: towards quantification and climate model comparisons” at INQUA Congress
- 2019– Reviewer for *Nature Geoscience, Nature Communications, Journal of Hydrology, Geophysical Research Letters, Journal of Limnology, Boreas, Journal of Climate, Paleoceanography, Paleoceanography and Paleoclimatology, Climate of the Past, Communications Earth & Environment.*
- 2022 Australian National University Engagement Committee
- 2022–2023 ARC CLEX Culture & Diversity Committee
- 2022–2023 Mentor at Australian National University Women+ in STEM Leadership Conference
- 2020–2022 PAGES Open Science Meeting Diversity Committee
- 2016–2019 Australasian Quaternary Association (AQUA) Treasurer
- 2018 AQUA Biennial Conference local organising committee

Outreach, policy, public science writing, and other contributions

- Apr. 2024 Conversation article about the possibility of Australian megadroughts. [Link to article](#)
- Feb. 2024 Co-author of annual Australian 'The State of Weather and Climate Extremes 2023' report
[Link to report](#)
- 2023– Participant in 'Letters to a Pre-scientist' pen pal program
- Dec. 2023 EGU Climate Division invited blog post about the Pacific Walker Circulation. [Link to blog post](#)
Shortlisted for EGU Best Blog Post of 2023
- Aug. 2023 Conversation article about the Pacific Walker Circulation and its influence on Australian extreme weather. [Link to article](#)
- Aug. 2023 Pacific Walker Circulation explainer videos and article, including expected impacts on Australians. [Explainer article](#), [summary of research paper](#), and [‘human interest’ story about why I study climate science](#).
- Jun. 2023 Submission to Australian Government Climate Change Authority Issues Paper. [Link to submission](#)
- May 2022 Keynote speaker at the Australian National University Research School of Earth Sciences Student Convention
- Sep. 2021 Panellist on Washington University in St. Louis 'Climate Conversation: Extreme Weather Events' public Q&A event
- Dec. 2018 Australian National Youth Science Forum 'Speed Date a Scientist' program
- Aug. 2018 Australian National Science Week: exhibitor at 'Science in ACTION' school event

Media presence

Domestic (Australian) and international radio, television, and online media presence regarding various climate science topics, including:

- The tropical Pacific Ocean and its influence on weather and climate (Australia in particular);

- Nature and causes of Australian droughts;
- Individual extreme weather events;
- Long-term climate variability.

Teaching and supervision

Undergraduate and postgraduate teaching

- 2022– Australian National University EMSC1006 – *The Blue Planet*.
First-year undergraduate course providing a broad introduction to Earth system science, with typical enrolment ~160-180 students. I teach approximately ¼ of this course, through a mix of lectures, tutorials, and practicals. I also co-lead a two-day field trip, including field lectures and supervision/mentoring of teaching assistants. My average Student Evaluation of Learning and Teaching (SELT) score for overall teaching quality is 4.5 out of 5.
- 2022– Australian National University EMSC3019 – *Coral Reef Field Studies*.
Third-year intensive field course providing students with advanced knowledge of coral reef environments – limited to 20 students. I teach approximately 1/3 of this course, with most content delivered in the field (on the Great Barrier Reef). This takes the form of ~4 hours of formal lectures, as well as ad hoc student education throughout the week. My average SELT score for overall teaching quality is 4.9 out of 5.
- 2023– Australian National University EMSC4122 – *Analytical Methods* (guest lecturer).
Postgraduate course in laboratory methods for physical geography. I teach advanced water isotope systematics, analysis of water isotopes, and use of water isotopes for understanding water cycle processes.
- 2023 ARC Centre of Excellence for Climate Extremes Winter School.
Intensive course for Australian climate science graduate students (~70 attendees). I co-taught one day of the winter school, focussed on past climate variability (lectures and two practical activities).
- 2019 Washington University in St. Louis EPSc486 – *Paleoclimatology* (guest lecturer).
Advanced paleoclimatology course for postgraduate students & fourth-year undergraduate students. I prepared and delivered course material covering the last deglaciation.

Undergraduate tutoring

- 2015–2018 The University of Adelaide.
Tutor and teaching assistant various physical geography subjects.

Undergraduate researcher supervision

- 2024– Dine Yoo, The Australian National University
Earth science, Honours, co-supervisor
- 2024–2025 Moss Thompson, The Australian National University
Earth science, Honours, co-supervisor
- 2023– Bridget Leibold, The Australian National University
Climate dynamics, undergraduate research intensive, primary supervisor
- 2023 Ashley Huang, The Australian National University
Climate dynamics, Honours, co-supervisor (awarded First Class Honours)
- 2023 Lachie Nicholls, The Australian National University
Climate dynamics, undergraduate research intensive, primary supervisor
- 2021–2022 Anastasia-Filia Morfiadakis, The Australian National University
Earth science, undergraduate research intensive, primary supervisor
- 2021–2022 Flora Perlmutter, Washington University in St. Louis
Earth science, undergraduate research intensive, primary supervisor (won department prize for best thesis; now PhD student at Dartmouth)

PhD supervision

- 2023– Oliver Medd, The Australian National University (Earth science, PhD, associate supervisor)

Developing and applying novel dendrochronological methods to understand snowgum dieback in the Australian alpine region

2023– Jarrah Harrison, The University of Melbourne (Climate science, PhD, associate supervisor)
Developing and testing novel data assimilation algorithms for direct integration of palaeoclimate and climate model data, at monthly temporal resolution

2022– Patrick Cho, University of Notre Dame (Earth science, PhD, associate supervisor)
Quantifying and understanding the imprint of the Indian Walker Circulation on precipitation isotopic variability in the Indian Ocean basin

Professional development

2024 Australian National University (ANU) Exploring Learning and Teaching course
2023 ANU Science, Health and Medicine Colloquium 'The Human Face of Teaching'
2022–2023 ANU Research School of Earth Sciences Education Forum

Academic and professional development

Scientific workshops & short courses

†denotes event with competitive selection process

Apr. 2023 Lake System Modelling workshop, virtual
Feb. 2021 †LinkedEarth PaleoHackathon (Pyleoclim) workshop, virtual
Oct. 2019 US CLIVAR Water Isotopes and Climate workshop, Boulder, USA
Dec. 2019 † Early Career Researcher workshop 'Water cycle in a 1.5° warmer world: interdisciplinary approaches', San Francisco, USA
Oct. 2018 'Southern Hemisphere Assessment of PalaeoEnvironments' workshop, Wollongong, Australia
Sep. 2017 †Advanced Climate Dynamics Course 'The Dynamics of the Seasonal Cycle', Rondane National Park, Norway
Aug. 2017 †GeoChronR Development Workshop, Northern Arizona University, USA
May 2017 †3rd Past Global Changes Young Scientists Meeting, Zaragoza, Spain
Mar. 2017 'Numerical Analysis for Palaeoenvironmental Research' with Gavin Simpson, Adelaide, Australia
Sep. 2016 †15th annual Swiss Climate Summer School, Grindelwald, Switzerland
Aug. 2015 Advanced Isotope Geochemistry Course, University of Wollongong, Australia

Learned society membership

2019– American Geophysical Union
2022– European Geosciences Union
2023– Australian Meteorological and Oceanographic Society

Referees

Contact details available on request.