MONASH University

EARTH MATTERS

A newsletter from the School of Earth, Atmosphere & Environment

Newsletter #2 - December 2023

A word from our Head of School

Welcome to the second edition of Earth Matters. This month, we are delighted to highlight some exceptionally impactful scientific contributions - congratulations to Ariaan Purich and Pat Rich! Our School has also garnered notable recognition, with several academics acknowledged for their excellence in scientific impact, publication, outreach, and ARC grants. Congratulations to Ailie Gallant, Peter Cawood, Harry Hendon, Andrew Gunn, Yuval Sadeh and Andrew Tomkins! This is just the beginning - discover more achievements by taking a moment to read. As the holiday period approaches, I wish you a safe and rejuvenating break, eagerly anticipating the vibrant academic year that lies ahead in 2024.

- Professor Andrew Mackintosh

All over the news

Dr Ariaan Purich's paper 'Record low Antarctic sea ice coverage indicates a new sea ice state' (summary below) has been viewed 14,000 times, was shared by over 200 news agencies and is estimated to have reached 2 billion people worldwide. Due to this, Monash University will be displaying Ariaan's graphics on an 8m wide Monash banner decorating our stall at the UN Climate Change conference (COP) meeting currently underway in Dubai.

Antarctic sea ice experienced a historic low in February, marking the third record summer sea ice minimum in seven years. A team led by Ariaan Purich, a lecturer in the School of Earth, Atmosphere & Environment, delves into this unprecedented phenomenon. The study, initiated in January, identifies three distinct periods in the sea ice record: a neutral period (November 1978 to August 2007), a high sea ice period (September 2007 to August 2016), and a current low sea ice period (since September 2016). Notably, traditional understanding of sea ice behaviour seems inadequate in the current low sea ice state. The study highlights the influence of ocean warming on the present low sea ice conditions. Despite the atmosphere's historical role, a warm subsurface ocean emerges as a consistent factor during the low sea ice period since 2016.

Subsurface ocean warming predates the 2016 sea ice decline, supporting the idea that it played a crucial role in initiating and sustaining the reduced sea ice state. The research emphasises the altered characteristics of Antarctic sea ice persistence, indicating a significant shift in the ocean's role in this new sea ice state. The sea ice coverage during the observational period has been exceptionally low this winter, expanding at a much slower rate than usual. This unprecedented phenomenon raises concerns about the changing dynamics of Antarctic sea ice, challenging previous expectations and prompting further investigation into the role of the ocean in shaping these alterations. Click here for Ariaan's article in The Conversation.

Former Prime Minister of Australia the Hon. Julia Gillard AC inspecting the banner at the United Nations COP28 meeting in Dubai. Photo Liz Ee

Celebrating the achievement of Peter Cawood

Professor Peter Cawood has not only been recognised by The Australian as one of the top Geologists in Australia, he has also been honoured as a Highly Cited Researcher for 2023 by Clarivate. Each year, Clarivate identifies a distinguished group of global research scientists and social scientists who have showcased remarkable and widespread influence in their respective fields. This select cohort plays a crucial role in advancing the frontiers of knowledge, introducing innovations that promote a healthier, more sustainable, and secure world. Attaining a position in the top 1% of citations within his field is a remarkable accomplishment, underscoring the substantial impact Peter has in his area of expertise. The excellence of his ongoing research not only reflects his personal achievements but also contributes significantly to enhancing the University's global research reputation. Congratulations to Peter for this outstanding recognition.

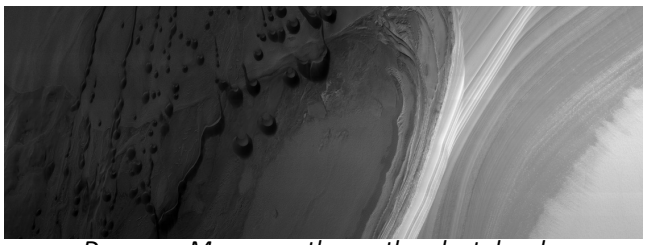
Winners at 2023 AMOS awards

The Australian Meteorological & Oceanographic Society (AMOS) Science Outreach Award, designed to honour those who excel in engaging the public with scientific concepts, has been awarded for 2023 to **Associate Professor Ailie Gallant** of School of Earth, Atmosphere & Environment. Renowned for her communication on climate change and extreme weather events, Ailie's extensive efforts include media interviews, radio hosting, and invited public talks. Her dedication to building climate literacy in diverse audiences extends beyond her academic responsibilities. Congratulations Ailie!

The prestigious Zillman Medal for 2023 has been awarded to **Dr. Harry Hendon**. Acknowledging senior scientists with transformative research contributions, the medal pays homage to Dr. John Zillman's impactful career. Dr. Hendon, whose career spans the Bureau of Meteorology and Monash University, is recognised for seminal contributions in tropical convection, Madden-Julian Oscillation, air-sea interaction, and more. His pivotal role in advancing subseasonal to seasonal prediction and mentorship in atmospheric science is highlighted, marking a distinguished career that earned him the title of Australia's top atmospheric science researcher in 2018. Dr. Hendon's influence extends globally, with his election as a Fellow of the American Geophysical Union in 2016, reflecting his significant impact on meteorological research.

Recognising bold, early-career researchers

Dr Andrew Gunn has been awarded the RCOAST Innovation award at the International Conference on Aeolian Research (ICAR). The award seeks early-career investigators who have performed outstanding work in the aeolian geomorphology and show promise in paving new paths for and within the aeolian community. Congratulations Andrew!



Dunes on Mars near the north pole, taken by HiRISE (NASA satellite imagery)

Outstanding NASA-Harvest team

Dr Yuval Sadeh, from the School of Earth, Atmosphere & Environment, is part of the outstanding NASA-Harvest team, honoured with the esteemed Arrell Global Food Innovation Award for their impactful work monitoring the war in Ukraine's effects on agriculture. These awards commend those making noteworthy contributions to creating a more sustainable, nutritious, and secure global food system. Awarded annually at $100,000, they recognise global recipients for their impact and leadership.

NASA Harvest utilises satellite data to swiftly analyse the war's impact on Ukrainian agriculture. Collaborating with Ukraine's Ministry of Agriculture, the team assesses crop planting, harvest, and yields in areas inaccessible by ground. Given Ukraine's significant role in global food production, NASA Harvest's insights are invaluable, aiding in evaluating the conflict's impact on crops and farmland, contributing to global market stability. In pursuit of their mission, NASA Harvest consistently develops tools and products, making agriculture-relevant Earth observation information accessible worldwide. Kudos to Yuval and the entire NASA Harvest team for their ground-breaking contributions.

ARC LIEF funding

The Australian Research Council's (ARC) Linkage Infrastructure, Equipment and Facilities (LIEF) scheme provides funding to eligible organisations for research infrastructure, equipment and facilities. **Dr Andrew Gunn** from School of Earth, Atmosphere & Environment is part of a project run by Griffith University that has just been awarded ARC funding for their project titled "Sediment Drilling Facility for environmental and genetic archives". This project combines versatile augers with new field spectrometers that will enable sediment extraction and rapid, in situ measurements from coastal, lake and riverine environments. The facility will include a compact geotechnical drill rig, a portable power auger with hydraulic extraction unit, a vibracorer with motorised pontoon, laser induced breakdown spectrometer and magnetic susceptibility. With access co-ordinated through the Queensland Geochronology Alliance, the new facility will enable researchers unprecedented access to field equipment required to address questions about changing ecology, landscape and climate on recent and geological timescales.

Monash Student Association Teaching Award

Dr Adam Kessler has been honoured with a Teaching Award from the Monash Student Association (MSA) for his exceptional contributions to the Faculty of Science. The MSA encourages students to nominate teaching staff who have significantly enhanced the learning environment, and Adam's dedication has earned him this well-deserved recognition. Furthermore due to his teaching excellence, Adam has been appointed as a continuing Education-focussed Lecturer in our School. Congratulations, Adam, on these well-earned accolades!

Groundwater Professional Award

Professor Ian Cartwright has been honoured with a prestigious groundwater professional award by the International Association of Hydrogeologists (IAH), recognising his enduring dedication to excellence in groundwater science and practice throughout his career. This accolade celebrates his longevity in the groundwater industry and his substantial contributions to the broader community. Ian has played a pivotal role in advancing industry knowledge by imparting wisdom through technical presentations and training initiatives. This award acknowledges his remarkable impact on the field and his invaluable contributions.

ARC Discovery Project win

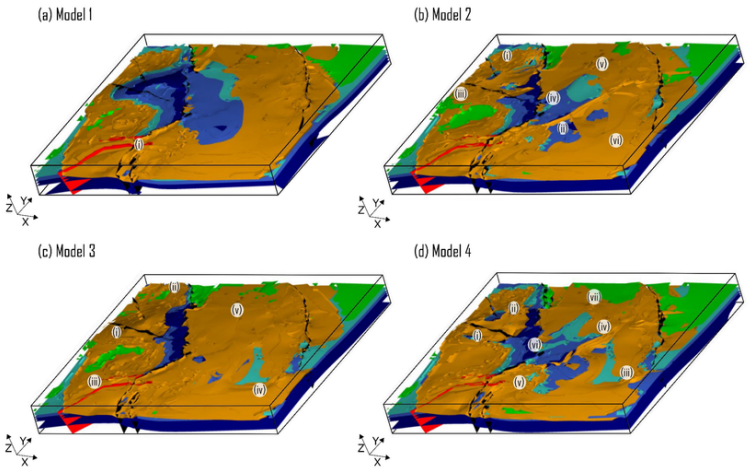
Congratulations to **Professor Andrew Tomkins** and **Dr Eleanor Green** on receiving an ARC Discovery Project. Their research focuses on understanding fluid chemistry and critical mineral enrichment in salty metamorphic belts. Several geological regions in Australia are worth billions of dollars to our economy in their contained copper-gold cobalt and uranium-rare earth element mineral deposits.

These regions will continue to be important to Australia as the world transitions to a renewable energy economy because they can provide some of the most critical metals needed for that transition: Cu, Co, rare earth elements. Their project aims to provide a fundamental quantitative understanding of the geological processes that form these deposits. They will conduct experiments to generate quantitative models of the metamorphic and structural processes that control the liberation and migration of highly saline fluids, which are ideal for transporting a large range of metals.

Keynote speaker at Geosciences event

Dr Laurent Ailleres took the stage as an invited keynote speaker at GeoBerlin's "Geosciences Beyond Boundaries - Research, Society, Future" event. His presentation, titled "The LOOP Project: towards multi-scale digital twins of geology?" was featured as part of the session focusing on "Data-driven digital twins of the subsurface and their applications."

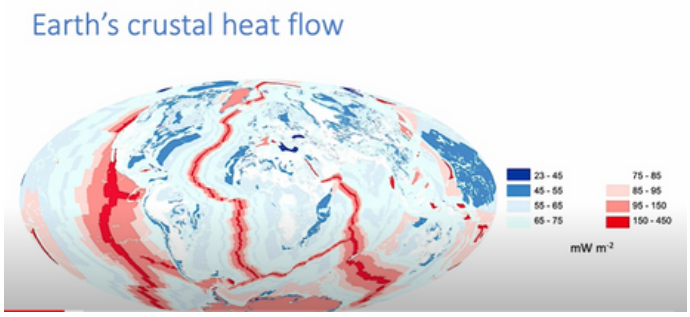
Additionally, **Dr Lachlan Grose** shared insights during this event related to Loop, specifically addressing interpolations and structural frames. This work aligns seamlessly with our ongoing efforts tied to the ARC project "Three-dimensional Bayesian Modelling of Geological and Geophysical data." It is fantastic to see our our advancements being showcased at such a prestigious event, highlighting our commitment to cutting-edge research and innovation.



These 4 models represent 3D geological models of the Tasmanian dolerite in the Hobart area testing various hypotheses related to flow direction and pre/syn faulting.

Representation at the Royal Society of Victoria

In September, **Emeritus Professor Raymond Cas** delivered a compelling talk at the Royal Society of Victoria meeting, focusing on "Climate Change: Assessing all the Natural and Human Causes." The lecture delved into the impact of various factors such as long-term geological processes, asteroid impacts, Earth's orbital behavior, volcanic emissions, biological processes, oceanographic and atmospheric circulation, and the influence of moving continents. Professor Cas also explored the effects of anthropogenic gases over the past 250 years in comparison to natural greenhouse gases. The informative session is available for viewing on YouTube.



In June, **Professor Andrew Mackintosh** took centre stage in the Howitt Lecture, addressing the topic of "Glaciers and ice sheets in a warming world". During the lecture, Andrew highlighted the research effort from the School of Earth, Atmosphere & Environment, to reconstruct historical changes in glaciers and ice sheets while enhancing predictive capabilities. The presentation featured captivating fieldwork photos and videos captured in the Southern Alps of New Zealand and Antarctica. For a full recording of his lecture, click here.

Franz Josef Glacier/Kā Roimata-a-Hine Hukatere in NZ - . The glacier now terminates where the people are standing.

ACCESS NRI workshop in Canberra

A few months back, a delegation from the School of Earth, Atmosphere & Environment participated in the yearly workshop hosted by the Australian Earth System Simulator (ACCESS-NRI). ACCESS replicates historical, current, and future climate, weather, and Earth systems. This gathering serves as a platform for the ACCESS Earth system model's user community, developers, and collaborators to come together.

Some of the School Earth, Atmosphere & Environment staff enjoying cross-university collaboration.

Andrew Mackintosh joins Bureau of International Union of Geodesy and Geophysics

Professor Andrew Mackintosh has achieved a career milestone by being appointed to a four-year term as Bureau Member of the International Union of Geodesy and Geophysics (IUGG). Andrew was elected into this international stewardship role by ~50 representatives of national science academies, following an address that he made to the IUGG Council in Berlin. As part of this position, he will serve as IUGG liaison to the Scientific Committee on Antarctic Research (SCAR), and as a member of the Standing Committee for Gender Equality in Science.

Advancing subseasonal forecasting

Dr Kim Reid and fellow scientists at the ARC Centre of Excellence for Climate Extremes are advancing subseasonal forecasting, predicting unusual weather events like rainfall or high temperatures two to six weeks ahead. This research, crucial for sectors like farming and energy production, aims to enhance planning accuracy. The study explores an innovative approach, using Integrated Water Vapour Transport (IVT) as a proxy for rainfall predictions globally. IVT, representing the flow of water vapor in the atmosphere, proved a strong indicator of moisture. By collaborating with the Australian Bureau of Meteorology and utilising the ACCESS-S2 seasonal forecasting model, researchers compared past forecasts with satellite observations.

Results indicated improved forecasting skill, particularly at one to three weeks ahead, in regions prone to atmospheric rivers and cyclones. The study suggests that leveraging IVT as an indicator could extend lead time for forecasting potentially wet weeks up to three weeks ahead, providing valuable early warnings for various sectors. Further research, including higher resolution modelling and machine learning, is needed before operational implementation. To read more, click here.

Models are better at predicting the ingredients for rainfall than the exact timing and location of the rainfall.

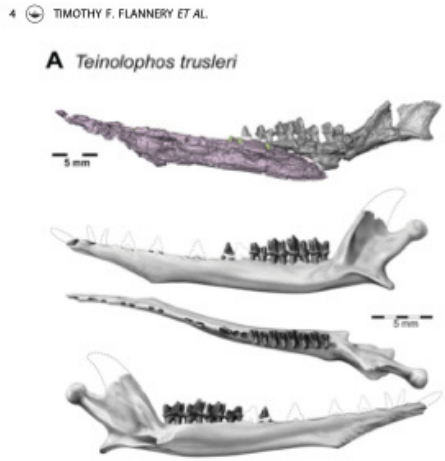
The Oldest Monotremes on the Planet

Articles showcasing **Emerita Professor Patricia Vickers-Rich** were highlighted in The New York Times in August. The pieces delve into the ground-breaking concept that the common ancestor of marsupial and placental mammals originated in the Southern Hemisphere.

The fossil record of egg-laying monotremes is notably limited. Over the past four decades, discoveries indicate a substantial evolution in their body size, ranging from shrew-sized to the largest echidnas. This transformation includes a reduction in teeth, from the ancient monotremes' dental structures to the complete tooth loss observed in contemporary forms. The oldest known monotreme in this group, Teinolophos trusleri, dates back approximately 120 million years. The species name honors Dr Peter Trusler, a former School of Earth, Atmosphere & Environment PhD student, discovered through the collaborative efforts of hundreds of volunteers near Inverloch over two decades.

Under the guidance of Professor Patricia Vickers-Rich and Mrs Lesley Kool at Monash University, along with Dr Thomas Rich from Museums Victoria, ongoing fieldwork spanning the late 1970s to the present occurs along the Bass and Otway Coasts. This initiative, named Dinosaur Dreaming, pays tribute to the Bunurong People, custodians of the land, and is supported by Parks Victoria.

A comprehensive summary, including monotreme records, was published in the Australasian Journal of Palaeontology with Dr Tim Flannery as the senior author, who completed his Masters of Science at Monash.



Teinolophos trusleri, drawn by Dr Peter Trusler

Felicity McCormack: Monash Research Talent Accelerator Fellow

Dr Felicity McCormack has been selected as a Monash Research Talent Accelerator Fellow following a successful application and interview. The Research Talent Accelerator is a two-year program supporting Level C academics at Monash University in becoming future research leaders. Participants gain essential research leadership skills, craft career plans, and engage in responsible research practices, fostering inclusivity and addressing power dynamics in methodology design. It is a wonderful opportunity for Felicity to strategically develop her career over the next two years through the guidance of this program.

PhD completions

Congratulations to **Dr Fernanda Alvarado-Neves** and **Dr Rabii Chaarani** for completing their Loop research group PhD projects. Fernanda pioneered 3D geometrical modeling for dolerite sills in Tasmania and plutons in Chile. Rabii enhanced Loop software with a structural sampling method for realistic folded geometry.

We have also had the following PhDs conferred - **Dr Joel Kumwenda**, thesis titled "Basement Architecture Of The North Australian Craton," **Dr Benjamin Hague**, thesis “Trends, Projections, And Drivers Of Frequent Coastal Flooding Under Sea-Level Rise”, and **Dr Martin Beilharz**, thesis “Understanding The Geochemical Effects Of High Pressure Fluids Within Subduction Channel Melanges”. Congratulations to the new Drs!

New to the School of Earth, Atmosphere and Environment

Stephen Gray, Chief Operations Officer ARC Centre of Excellence for 21st Century Weather

Bringing extensive experience as a research manager, Stephen has served in two previous ARC Centres of Excellence before becoming the COO of the ARC Centre of Excellence for 21st Century Weather at Monash. A staunch advocate for workplace equity, diversity, and inclusion, Stephen is dedicated to fostering a positive, wellbeing-centric culture to empower researchers at all career stages. He thrives on collaborative problem-solving, removing roadblocks, and enhancing the efficiency of multi-institutional organizations. Passionate about networking and knowledge-sharing, Stephen has been a speaker at tertiary education management conferences and has published on the relationship between academic and professional staff. Holding a Master of Tertiary Education Management from the University of Melbourne and an honors degree in social anthropology from Macquarie University, Stephen is also an accredited Team Management Profile facilitator.

New to the School of Earth, Atmosphere and Environment

Dr Levan Tielidze, Research Fellow

Levan recently completed his PhD at the Antarctic Research Centre, Victoria University of Wellington, New Zealand. His PhD won the 2023 President's Award for best Doctoral Thesis in Geography by the New Zealand Geographical Society. Levan uses remote sensing and in situ methods to study modern glaciers in linkage to ongoing climate change. His research interests also include reconstructing the dynamics of past glaciers through the tools of glacial geomorphology and cosmogenic nuclide dating. In particular, he is interested in the deglaciation dynamics of the Antarctic ice sheets, the Southern Alps of New Zealand, and the Caucasus Mountains during the Late Quaternary. Levan, who is currently in Antarctica, is working with Dr Richard Jones and Professor Andrew Mackintosh as part of the SAEF programme.

Dr Emma Cooper, Research Fellow

Emma is a (palaeo)glaciologist who recently completed her PhD at Royal Holloway University of London. During her PhD, Emma focused on using a combination of remote and field geomorphology, sedimentology, drone surveys, and terrestrial cosmogenic nuclides to understand climatic and non-climatic drivers of Patagonian Ice Sheet retreat. Emma has very recently joined Professor Andrew Mackintosh's group in the School of Earth, Atmosphere and Environment as a postdoctoral researcher, where she intends to develop these skills in the context of a new research projects.

Dr Weilin Yang, Research Fellow

Weilin is a glaciologist who obtained her PhD at the College of Urban and Environmental Sciences, Peking University in January 2023. During her PhD research, she has focused on modelling and analysing the long-term evolution of paleoglaciers and their climatic driving mechanisms, using a combination of numerical modeling, geochronology (10Be surface exposure dating), glacial geomorphology mapping, and GIS/Remote Sensing technologies. Weilin will be working on projecting global glacier mass changes and their contribution to glacial lake changes and global sea level rise working with Professor Andrew Mackintosh.

Dr Thyagarajulu Gollapalli, Research Officer

Dr Thyagarajulu recently completed his PhD from the School of Earth, Atmosphere & Environment and the Indian Institute of Technology Bombay. He uses supercomputers and numerical methods to investigate the dynamics of tectonic plate interactions along their boundaries and the resulting large earthquakes. His research interests also include seismic cycles modeling, application of ML and AI tools in geophysics, as well as high-performance computing. As a Research Officer for the School of Earth, Atmosphere & Environment, he is engaged in the development of the Underworld code and end-user interface for the broader geodynamics community, while ensuring a compliant and safe research environment.

Promotions

Andrew Giles has been appointed as a Senior Teaching Fellow. For several years Andrew (Drew) has been the unit coordinator of SCI 2030 - Indigenous Science; Science through the eyes of Australia's First Peoples', and his unit will now run twice per year including summer semester.

Rachelle Pierson has been promoted to Senior Technical Officer. Rachelle provides excellent support to a number of labs in the School and this reclassification acknowledges the increased level of complexity in her role over the past few years.

Publications

This publication list is accumulated annually. All previous publications have been communicated via email therefore these are the most recent. Representatives from our School are in bold and students are marked with *.

118) **Sanyal, S.K.**, Pukala, T., Mittal, P., **Brugger, J., Etschmann, B**., Shuster, J. (...) From biomolecules to biogeochemistry: Exploring the interaction of an indigenous bacterium with gold. Chemosphere, 339, p. 139657. https://doi.org/10.1016/j.chemosphere.2023.139657

119) Kennedy, D.M., McCarroll, R.J., Fellowes, T.E., (...), Quang, T.H., Ierodiaconou, **D. Reef, R., Carvalho, R**. Drivers of seasonal and decadal change on an estuarine beach in a fetch-limited temperate embayment. Marine Geology, 463, art. no. 107130. https://doi.org/10.1016/j.margeo.2023.107130

120) Huang, W., Gao, Y., Xu, R., (...), **Ritchie, E**., Li, S., Guo, Y. Health Effects of Cyclones: A Systematic Review and Meta-Analysis of Epidemiological Studies. Environmental health perspectives, 131(8), p. 86001. https://doi.org/10.1289/EHP12158

121) Liu, C., Zhou, S., Yu, D., **Etschmann, B**., Zhang, L. Flowsheet modelling and techno-economic analysis of CO2 capture coupled pyro-hydrolysis of CaCl2 waste for HCl acid regeneration. Journal of Cleaner Production, 419, art. no. 138195. https://doi.org/10.1016/j.jclepro.2023.138195

122) ***Hague, B.S**., Grayson, R.B., Talke, S.A., Black, M.T., Jakob, D., The effect of tidal range and mean sea-level changes on coastal flood hazards at Lakes Entrance, south-east Australia. Journal of Southern Hemisphere Earth Systems Science, 73(2), pp. 116-130. https://doi.org/10.1071/ES22036

123) ***Missen, O.P**., Mills, S.J., **Brugger, J**., Birch, W.D., Elliott, P., Crystal chemistry of zemannite-type structures: IV. Wortupaite, the first new tellurium oxysalt mineral described from an Australian locality. Mineralogical Magazine. https://doi.org/10.1180/mgm.2023.64

124) Cui, Z., **Dunkerley, D**., Zhao, J., & Wu, G.-L. (2023). Divergent successions increase soil water recharge capacity accompanied by higher evapotranspiration in alpine meadow. CATENA, 233, 107514. https://doi.org/10.1016/j.catena.2023.107514

125) Foote, A., **Handley, H**., Németh, K., (...), Griffis, R., Clerke, L., The role of phreatomagmatism in the formation of complex monogenetic volcanic systems in a low-lying coastal plain. Journal of Volcanology and Geothermal Research, 442, art. no. 107899. http://dx.doi.org/10.1016/j.jvolgeores.2023.107899

126) Mas e Braga, M., **Jones, R.S**., Bernales, J., Andersen, J.L., Fredin, O., Morlighem, M., Koester, A.J., Lifton, N.A., Harbor, J.M., Suganuma, Y. and Glasser, N.F., A thicker Antarctic ice stream during the mid-Pliocene warm period. Communications Earth & Environment, 4(1), p.321. https://doi.org/10.5067/6II6VW8LLWJ7

127) **Purich, A.**, Doddridge, E.W. Record low Antarctic sea ice coverage indicates a new sea ice state. Communications Earth and Environment, 4(1), art. no. 314. https://doi.org/10.1038/s43247-023-00961-9

128) Dou, J., Wang, C.Y., **Xing, Y**., Tan, W., Zhao, Z. Redistribution of REE in granitic bedrocks during incipient weathering: insights into the role of groundwater in the formation of regolith-hosted REE deposit. Contributions to Mineralogy and Petrology, 178(10), art. no. 69. https://doi.org/10.1007/s00410-023-02054-4

129) **Zoleikhaei, Y**., Mazumder, R., **Cawood, P.A**., De, S. Paleo-Mesoarchean magmatism and sedimentation in the northern part of the Singhbhum Craton: Evidence from zircon U-Pb-Hf, apatite U-Pb, and trace elements. Precambrian Research, 397, art. no. 107174. https://doi.org/10.1016/j.precamres.2023.107174

130) Meehl, G.A., Shields, C.A., **Arblaster, J.M**., (...), Van Roekel, L., Capotondi, A. Climate Base State Influences on South Asian Monsoon Processes Derived From Analyses of E3SMv2 and CESM2. Geophysical Research Letters, 50(17), art. no. e2023GL104313. https://doi.org/10.1029/2023GL104313

131) Hinton, E.M., **Slim, A.C**. Dynamics and containment of a viscous liquid atop a granular bed. Journal of Fluid Mechanics, 969, art. no. R3. https://doi.org/10.1017/jfm.2023.604

132) **Beckmann, J**., Winkelmann, R. Effects of extreme melt events on ice flow and sea level rise of the Greenland Ice Sheet. Cryosphere, 17(7), pp. 3083-3099. https://doi.org/10.5194/tc-17-3083-2023

133) Zakaria, M., **Sanyal, S.K**., Haque, M.I., (...), Watanabe, K., Hossain, A. Bacterial Diversity and Antibiotic Resistance Genes Associated with the Different Farming Systems of Black Tiger Shrimp (Penaeus monodon) in Bangladesh. Aquaculture Research, 2023, art. no. 6255586. https://doi.org/10.1155/2023/6255586

134) Crisp, L.J., Berry, A.J., Burnham, A.D., **Miller, L.A**., Newville, M. The Ti-in-zircon thermometer revised: The effect of pressure on the Ti site in zircon. Geochimica et Cosmochimica Acta. https://doi.org/10.1016/j.gca.2023.04.031

135) Grimes, K.F., Narbonne, G.M., Gehling, J.G., **Trusler, P.W**., Dececchi, T.A. Elongate Ediacaran fronds from the Flinders Ranges, South Australia. Journal of Paleontology. https://doi.org/10.1017/jpa.2023.45

136) **Moore, D.H., Armit, R.J**. How thick is the Strathbogie Complex? Australian Journal of Earth Sciences. https://doi.org/10.1080/08120099.2023.2254813

137) ***Huang, Q., Reeder, M.J., Jakob, C., King, M.J**., Su, C.-H. The life cycle of the heatwave boundary layer identified from commercial aircraft observations at Melbourne Airport (Australia). Quarterly Journal of the Royal Meteorological Society. https://doi.org/10.1002/qj.4566

138) **Dunkerley, D**. Recording Rainfall Intensity: Has an Optimum Method Been Found? Water 2023, 15, 3383. https://doi.org/10.3390/w15193383

139) ***Vandenburg, E.D., Nebel, O., Cawood, P.A., Capitanio, F., Miller, L., Wang, X., Raveggi, M., Jacobsen, Y** (...). The stability of cratons is controlled by lithospheric thickness, as evidenced by Rb-Sr overprint ages in granitoids. Earth and Planetary Science Letters, 621, art. no. 118401. http://dx.doi.org/10.1016/j.epsl.2023.118401

140) Rubanenko, L., **Gunn, A**., Pérez-López, S., (...), Soto, A., Lapôtre, M.G.A. Global Surface Winds and Aeolian Sediment Pathways on Mars From the Morphology of Barchan Dunes. Geophysical Research Letters, 50(18), art. no. e2022GL102610. https://doi.org/10.1029/2022GL102610

141) **Samsu, A**., Gorczyk, W., Schmid, T.C., **Betts, P.G., Cruden, A.R**., (...), **Morton, E.,** ***Amirpoorsaeed, F**., Selective inversion of rift basins in lithospheric-scale analogue experiments. Solid Earth, 14(8), pp. 909-936 https://doi.org/10.5194/egusphere-2023-411

Publications continued...

142) Zhao, T., **Cawood, P.A**., Zi, J.-W., (...), Dang, C.M., Nguyen, Q.M. Locating the Yangtze Block in Nuna: Constraints from age and isotopic data from Paleoproterozoic sedimentary rocks in the Phan Si Pan Zone, northwest Vietnam. Precambrian Research, 397, art. no. 107193. https://doi.org/10.1016/j.precamres.2023.107193

143) Marvin, M.C., Lapôtre, M.G.A., **Gunn, A**., Day, M., Soto, A. Dune interactions record changes in boundary conditions. Geology, 51(10), pp. 947-951. https://doi.org/10.1130/G51264.1

144) Hu, P., Zhai, Q., Zhao, G., **Cawood, P**., (...), Tang, Y., Liu, Y. Pre-Cryogenian stratigraphy, palaeontology, and paleogeography of the Tibetan Plateau and environs. Science China Earth Sciences. https://doi.org/10.1007/s11430-022-1127-8

145) **Abhik, S**., Lim, E.-P., Hope, P., Jones, D.A. Multiweek Prediction and Attribution of the Black Saturday Heatwave Event in Southeast Australia. Journal of Climate, 36(19), pp. 6763-6775. https://doi.org/10.1175/JCLI-D-22-0833.1

146) **Tielidze, L.G**., Charton, J., Jomelli, V., Solomina, O.N. Glacial geomorphology of the Notsarula and Chanchakhi river valleys, Georgian Caucasus. Journal of Maps, 19(1), art. no. 2261490 https://doi.org/10.1080/17445647.2023.2261490

147) Thiele, S.T., **Cruden, A.R**., Micklethwaite, S., Failure of load-bearing dyke networks as a trigger for volcanic edifice collapse. Communications Earth and Environment, 4(1), art. no. 382. https://doi.org/10.1038/s43247-023-01046-3

148) *__Baggott, K., Jacobsen, Y., Nebel, O.__, Mulder, J., __Raveggi, M., Wang, X.-Y., Vandenburg, E., Lim, H., Rogers, A., Etschmann, B., Whitmore, R., Churchus, A., & Jennings, L.__ (2024). On the virtues and pitfalls of combined laser ablation Rb–Sr biotite and U–Pb monazite–zircon geochronology: an example from the isotopically disturbed Cape Woolamai Granite, SE Australia. Geological Society, London, Special Publications, 537(1), SP537-2022-2320. https://doi.org/10.1144/SP537-2022-320

149) **Withers, M., Cruden, A.R**., Quigley, M.C. The Development of Fault Networks at the Termination of Continental Transform Faults When Their Connecting Plate Boundary Is “Misaligned”. Tectonics, 42(10), art. no. e2023TC007823. https://doi.org/10.1029/2023TC007823

150) Li, H., **O'Neill, H.S.C**., Zhang, L., Bao, X., Liu, X. The use of boron nitride to impose reduced redox conditions in experimental petrology. American Mineralogist, 108(10), pp. 1862-1870. https://doi.org/10.2138/am-2022-8577

151) Mapeo, R.B.M., Key, R.M., Moore, A.E., **Moore, J.A**., Gardiner, N.J., Robb, L.J. Syn-Bushveld “granite sheets” associated with the Molopo Farms Complex intruding into Transvaal Supergroup strata in southern Botswana. South African Journal of Geology, 126(3), pp. 337-338. https://doi.org/10.25131/sajg.126.0012

152) Capotondi, A., **McGregor, S**., McPhaden, M.J., (...), van Rensch, P., Xu, T. Mechanisms of tropical Pacific decadal variability. Nature Reviews Earth and Environment. https://doi.org/10.1038/s43017-023-00486-x

153) **Reid, K.J**., Hudson, D., King, A.D., Lane, T.P., Marshall, A.G. Atmospheric water vapour transport in ACCESS-S2 and the potential for enhancing skill of subseasonal forecasts of precipitation. Quarterly Journal of the Royal Meteorological Society. https://doi.org/10.1002/qj.4585

154) **Zhou, Z., Cartwright, I**., Morgenstern, U., Fifield, L.K. Integrating major ion geochemistry, stable isotopes (18O, 2H) and radioactive isotopes (222Rn, 14C, 36Cl, 3H) to understand the interaction between catchment waters and an intermittent river. Science of the Total Environment, 908, art. no. 167998. https://doi.org/10.1016/j.scitotenv.2023.167998

155) *__Mondol__, M.A.H., Habib, M.A., Kabir, F., (...), Kamruzzaman, M., Siddiki, U.R. Variability in episodic precipitation concentration in the Asian megacity of Dhaka, Bangladesh. Meteorology and Atmospheric Physics, 135(6), art. no. 57. https://doi.org/10.1007/s00703-023-00995-w

156) **Owen, N.D**., Cook, N.J., **Ram, R., Brugger, J.**, (...), Schmandt, D.S., Ciobanu, C.L. Pb-bearing Cu-(Fe)-sulfides: Evidence for continuous hydrothermal activity in the northern Olympic Cu-Au Province, South Australia. Precambrian Research, 398, art. no. 107225. https://doi.org/10.1016/j.precamres.2023.107225

157) **Jakob, C**., Gettelman, A., Pitman, A. The need to operationalize climate modelling. Nature Climate Change, 13(11), pp. 1158-1160. https://doi.org/10.1038/s41558-023-01849-4

158) *__Paulsen, M__., Thibault, N., Fraguas, Á., A revised calcareous nannofossil biozonation for the Lower Jurassic (Hettangian–Lower Pliensbachian) of NW Europe. Lethaia, 56(3). https://doi.org/10.18261/let.56.3

159) **Carvalho, R.C**., Woodroffe, C.D. Coastal compartments: the role of sediment supply and morphodynamics in a beach management context. Journal of Coastal Conservation, 27(6), art. no. 58. https://doi.org/10.1007/s11852-023-00984-6

160) *__Samsu, A.__, Micklethwaite, S., Williams, J.N., Fagereng, Å., **Cruden, A.R**. Structural inheritance in amagmatic rift basins: Manifestations and mechanisms for how pre-existing structures influence rift-related faults. Earth-Science Reviews, 246, art. no. 104568. http://doi.org/10.1016/j.earscirev.2023.104568

161) Lipson, M.J., Grimmond, S., Best, M., **Coutts, A., Tapper, N**., (...), Wang, Z.-H., Pitman, A.J. Evaluation of 30 urban land surface models in the Urban-PLUMBER project: Phase 1 results. Quarterly Journal of the Royal Meteorological Society. https://doi.org/10.1002/qj.4589

162) __Dunkerley, D.__ (2023). Leaf water shedding: Moving away from assessments based on static contact angles, and a new device for observing dynamic droplet roll-off behaviour. Methods in Ecology and Evolution. https://doi.org/10.1111/2041-210X.14253

163) *__Strong, J.W.D., Cruden, A.R., Cawood, P.A__., Dickin, A.P., Zircon U-Pb-Hf isotope evidence for juvenile Penokean sources (ca. 1.9 Ga) in the SW Grenville Province. Lithos, 462-463, art. no. 107420. https://doi.org/10.1016/j.lithos.2023.107420

164) Kotevski, J., Duncan, R.J., Pentland, A.H., **Vickers-Rich, P.**, (...), Evans, A.R., Poropat, S.F. A megaraptorid (Dinosauria: Theropoda) frontal from the upper Strzelecki Group (Lower Cretaceous) of Victoria, Australia. Cretaceous Research, 154, art. no. 105769. https://doi.org/10.1016/j.cretres.2023.105769

165) Foote, A., **Handley, H**., Németh, K., Remnants of a Young Monogenetic Volcanic Field and the Fragile Balance of Anthropogenic Interaction. Geoheritage, 15(4), art. no. 131. https://doi.org/10.1007/s12371-023-00897-8

Publications continued...

166) Gunn, A., Dargaville, R., **Jakob, C., McGregor, S**., Spatial optimality and temporal variability in Australia's wind resource. Environmental Research Letters, 18(11), art. no. 114048. https://doi.org/10.31223/X56Q28

167) Wang, R., Wu, S.-C., **Weinberg, R.F**., Collins, W.J., **Cawood, P.A.** Zircons reveal the history of fluctuations in oxidation state of crustal magmatism and supercontinent cycle. Science Bulletin. https://doi.org/10.1016/j.scib.2023.10.034

168) **Squire, R.J., Keays, R.R**. The role of supermountain belts and climatic controls on the genesis of copper deposits in the Kupferschiefer and the Central African Copperbelt. Mineralium Deposita. https://doi.org/10.1007/s00126-023-01227-2

169) **Carvalho, R.C**., Mueller, D., **Reef, R.** Morphological evolution of a complex drift-aligned prograded barrier. Earth Surface Processes and Landforms. https://doi.org/10.1002/esp.5732

170) Martin, A.J., L**owery, M., Hall, M., Vickers-Rich, P**., (...), Serrano-Brañas, C.I., Swinkels, P., Earliest known Gondwanan bird tracks: Wonthaggi Formation (Early Cretaceous), Victoria, Australia. PLoS ONE, 18(11 November), art. no. e0293308. https://doi.org/10.1371/journal.pone.0293308

171) Yang, Y., **Yang, W**., Li, Y., (...), Li, M., Liu, G., Reconstruction of palaeoglaciers and palaeoclimate in Zheduo Shan, Eastern Tibetan Plateau, during the Last Glacial Maximum. Quaternary International. https://doi.org/10.1016/j.quaint.2023.10.010

172) *__Zoleikhaei, Y__., Mulder, J.A., Cawood, P.A. Early Paleozoic extensional tectonics along Gondwana's northern margin: Insights from Iran. Gondwana Research, 128, pp. 106-126 https://doi.org/10.1016/j.gr.2023.10.017

173) Lane, T.P., King, A.D., Perkins-Kirkpatrick, S.E., **Arblaster, J.M., Gallant, A.J.E**(...), Raupach, T.H., Ukkola, A.M., Attribution of extreme events to climate change in the Australian region – A review. Weather and Climate Extremes, 42, art. no. 100622 https://doi.org/10.1016/j.wace.2023.100622

174) Xu, R., Lambart, S., **Nebel, O.**, (...), Zhong, H., Liu, Y., Iron isotope evidence in continental intraplate basalts for mantle lithosphere imprint on heterogenous asthenospheric melts. Earth and Planetary Science Letters, 625, art. no. 118499. https://doi.org/10.1016/j.epsl.2023.118499

175) Maunder, B.L., Kendrick, M.A., Ribeiro, J.M., **Nebel, O**. A negligible role for forearc serpentinites and mélange diapirism in contributing halogens to Mariana arc magmas. Earth and Planetary Science Letters, 625, art. no. 118498. https://doi.org/10.1016/j.epsl.2023.118498

176) **Yang, Z., Cawood, P.A**., Zi, J.-W., (...), Zhao, T.-Y., Li, J. Assembling the Proto-Yangtze Block in the late Paleoproterozoic: Constraints from a refined Magmatic-Metamorphic framework of the Cuoke Complex, SW China. Precambrian Research, 399, art. no. 107244. https://doi.org/10.1016/j.precamres.2023.107244

177) Lane, T.P., King, A.D., Perkins-Kirkpatrick, S.E., **Arblaster, J.M., Gallant, A.J.E**., (...), Raupach, T.H., Ukkola, A.M. Attribution of extreme events to climate change in the Australian region – A review. Weather and Climate Extremes, 42, art. no. 100622. https://doi.org/10.1016/j.wace.2023.100622

178) Yang, J., **Cawood, P.A.,** Yuan, X., (...), Liu, J., Du, Y. Enhanced Denudation of the Emeishan Large Igneous Province and Precipitation Forcing in the Late Permian. Journal of Geophysical Research: Solid Earth, 128(12), art. no. e2023JB027430. https://doi.org/10.1029/2023JB027430

179) McArthur, K., **McCormack, F.S.**, Dow, C.F. Basal conditions of Denman Glacier from glacier hydrology and ice dynamics modelling. Cryosphere, 17(11), pp. 4705-4727. https://doi.org/10.5194/tc-17-4705-2023

180) **McCormack, F.S.**, Roberts, J.L., Kulessa, B., Bird, L., (...), Jones, R.S., MacKintosh, A.N., McArthur, K. Assessing the potential for ice flow piracy between the Totten and Vanderford glaciers, East Antarctica. Cryosphere, 17(11), pp. 4549-4569. https://doi.org/10.5194/egusphere-2023-872

School of Earth, Atmosphere & Environment
Monash University Clayton Campus
9 Rainforest Walk, Clayton, 3168