Jordan Brook | CV

24c Bindaree St – Greenslopes – Australia

📱 +61 425 551 011 • ✉ j.brook@uq.edu.au

Passionate radar scientist with a particular interest in severe weather and data assimilation. Strong computational and physical sciences background with catastrophe modelling experience for insurance.

Education and Employment

Ongoing Positions

Research Scientist, Bureau of Meteorology
Radar data assimilation | *2023 – Current*

Adjunct Research Fellow, University of Queensland
Student supervision and field work | *2023 – Current*

Academic Qualifications

Doctor of Philosophy, University of Queensland
Atmospheric Sciences, | *2019 – 2023*

Bachelor of Science (Honours), University of Queensland
Geographical Sciences Major, GPA: 7.0, Thesis awarded a mark of 98% | *2018*

Bachelor of Science, University of Queensland
Physics and Computational Science Dual Major, GPA: 6.125 | *2015 – 2017*

Academic Awards

Dean's Award for Outstanding PhD Thesis
Awarded by the University of Queensland and nominated by thesis examiners, | *2023*

Australian Postgraduate Award Scholarship
Post-graduate research funding awarded by the Australian Government, | *2019 - 2023*

University of Queensland Excellence Scholarship
Awarded based on academic and leadership achievements, | *2015 – 2018*

Dean's Commendation for Academic Excellence
Recognising outstanding academic performance, | *2015 & 2018*

Australian Students Prize
Awarded to the 500 highest achieving secondary school graduates, ATAR 99.85, | *2015*

Research Publications

- Soderholm, J., M. Kumjian, **J. Brook**, A. Peterson, A. Protat, J. Brimelow, S. Tromel and M. Kunz, 2024: *Measuring hail-like trajectories and growth with the Hailsonde*, Bull. Am. Meterol. Soc., *Under Review*

- Protat, A., V. Louf and **J. Brook**, 2024: *SWIRL: The First Australian Operational Radar-Based 3D Wind Analysis System*, J. Atmos. Ocean Technol., https://doi.org/10.1175/JTECH-D-23-0155.1

- **Brook, J.**, A. Protat, J. Soderholm, H. McGowan and R. Warren, 2024: *A radar-based hail climatology of Australia*, Mon. Weather Rev., https://doi.org/10.1175/MWR-D-23-0130.1

- A. Guyot, **J. Brook**, A. Protat, K. Turner, J. Soderholm, N. McCarthy and H. McGowan, 2023: *Segmentation of polarimetric radar imagery using statistical texture*, Atmos. Meas. Tech., https://amt.copernicus.org/articles/16/4571/2023/

- **Brook, J.**, A. Protat, J. Soderholm and H. McGowan, 2023: *The Effects of Spatial Interpolation on Dual-Doppler 3D Wind Retrievals*, J. Atmos. Ocean Technol., https://doi.org/10.1175/JTECH-D-23-0004.1

- **Brook, J.**, A. Protat, J. Soderholm, R. Warren and H. McGowan, 2022: *A Variational Interpolation Method for Gridding Weather Radar Data*, J. Atmos. Ocean Technol., https://doi.org/10.1175/JTECH-D-22-0015.1.

- Protat, A., V. Louf, J. Soderholm, **J. Brook** and W. Posonby, 2022: *Three-way calibration checks using ground-based, ship-based, and spaceborne radars*, J. Atmos. Meas. Tech., https://amt.copernicus.org/articles/15/915/2022/amt-15-915-2022.html

- **Brook, J.**, A. Protat, J. Soderholm, J. Carlin, H. McGowan and R. Warren, 2021: *HailTrack - Improving Radar-Based Hailfall Estimates by Modelling Hail Trajectories*, J. Appl. Meteor. Clim., https://doi.org/10.1175/JAMC-D-20-0087.1

- Dowdy, A. , J. Soderholm, **J. Brook**, A. Brown, and H. McGowan, 2020: *Quantifying hail and lightning risk factors based on long-term observations around Australia*, J. Geophys. Res. Atmos., 125, 2020JD033101, https://doi.org/10.1029/2020JD033101

- Soderholm, J.S. , K.I. Turner, **J. Brook**, T. Wedd, and J. Callaghan, 2019: *High-Impact Thunderstorms of the Brisbane Metropolitan Area*, J. South. Hemisphere Earth Syst. Sci., 69, 239-251, https://www.publish.csiro.au/es/es19017

- Downes, S.M., C. Langlais, **J. Brook**, and P. Spence, 2017: *Regional Impacts of the Westerly Winds on Southern Ocean Mode and Intermediate Water Subduction*, J. Phys. Oceanogr., 47, 2521–2530, https://doi.org/10.1175/JPO-D-17-0106.1

Conference Presentations

- **Brook, J.**, C. Bishop*, A. Protat, 2024: *Pre-Emptive Forecasting with the Ensemble Transform Kalman Filter*, International Symposium on Data Assimilation 21-25 Oct., Kobe, Japan. *Presenting Author*.

- **Brook, J.**, A. Protat, J. Soderholm, C. Potvin, H. McGowan, 2024: *Beyond the blur: Variational techniques for radar gridding and 3D wind retrieval*, AMS Radar Conference 28 Aug.-01 Sep., Minneapolis, USA

- **Brook, J.**, A. Protat, J. Soderholm, H. McGowan, 2023: *Radar perspectives on thunderstorm dynamics and associated hazards*, Science-industry workshop on severe convective storms, 3-4 Aug., Sydney

- **Brook, J.**, A. Protat, M. Curtis, J. Soderholm, 2024: *Recent advances in radar-based 3D wind retrievals*, AMOS Annual Conference 5-9 Feb., Canberra

- **Brook, J.**, A. Protat, J. Soderholm, H. McGowan, R. Fortune, 2022: *A radar-based Hail Climatology of Australia*, AMOS Annual Conference 28 Nov. - 1 Dec., Adelaide

- **Brook, J.**, A. Protat, J. Soderholm, H. McGowan, R. Fortune, 2022: *A radar-based Hail Climatology of Australia*, North American Workshop On Hail & Hailstorms 20 - 22 September, Online

- **Brook, J.**, A. Protat, J. Soderholm, V. Louf, H. McGowan, 2022: *Unlocking Unprecedented Detail in Weather Radar Imagery*, 11th European Radar Conference, 29 Aug. - 2 Setp., Locarno, Switzerland.

- **Brook, J.**, A. Protat, J. Soderholm, H. McGowan, R. Warren, 2022: *A Variational Interpolation Method for Gridding Weather Radar Data*, 13th International Conference on Southern Hemisphere Meteorology and Oceanography 8 - 12 February, Online

- **Brook, J.**, A. Protat, J. Soderholm, V. Louf, H. McGowan, 2021: *Unlocking Unprecedented Detail in Weather Radar Imagery*, Annual BoM Research and Development Workshop, 8 - 11 November, Online. *Winner: Best Poster Presentation*

- **Brook, J.**, A. Protat, J. Soderholm, H. McGowan, R. Warren, 2019: *HailTrack: Modelling Hail Trajectories Using Weather Radar Data*, 39th AMS Radar Conference, 16 - 20 September, Nara, Japan. *Runner up for Best Student Poster*

- **Brook, J.**, A. Protat, J. Soderholm, J. Carlin, H. McGowan, 2018: *Computationally Estimating Hail Trajectories*, North American Workshop On Hail & Hailstorms, 14 - 16 August, Boulder, CO., USA

Relevant Experience

Field Campaigns

Research Voyage IN2019V06
Research Vessel Investigator   *Oct 2019 – Dec 2019*

I was a part of a six-week voyage aimed at taking observations of the daily cycles of convective storms in Australia's far northern waters. My role was to take periodic atmospheric soundings and assist with radar operations aboard the ship.

Large Hail Formation and Trajectories Campaign (LIFT)
German Research Foundation   *Jun 2024 – Jul 2024*

I was an invited participant of this field campaign aimed at collecting in-situ observations of hail trajectories using world-first "Hailsonde" instruments.

In-situ Collaborative Exp. for the Collection of Hail In the Plains (ICECHIP)
National Science Foundation   *May 2025 – Apr 2025*

I am an invited participant of this recently-funded international field campaign for collecting hail measurements in the United States. My current roles involve organizing sonde deployment strategy in the lead up to the experiment.

Industry Experience

Catastrophe Modeller
Guy Carpenter & Company, LLC   *Oct 2021 – Mar 2022*

In this role I developed a proprietary catastrophe model for insurance losses due to hail damage across Australia. I also provided meteorological analysis and advice on other perils such as cyclone and flood to clients and the company.

Industry Funded Research Scientist
Industry Partnership between UQ and Guy Carpenter & Company, LLC   *Jan 2019 – Jul 2019*

In this position I took the principal scientific/software development role in developing an Australia-wide, radar-based, thunderstorm climatology for application in the insurance industry.

Projects and Internships

Australian Unified Radar Archive (AURA)
Software Developer and Maintainer   *Jan 2023 – Current*

I have contributed important software for AURA's processing pipeline, including the gridding, azimuthal shear, and K_{dp} algorithms. Applying these codes to many centuries of historic radar data has taught me invaluable lessons on writing reliable and efficient code. Access here: https://dx.doi.org/10.25914/40KE-NM05

ACCESS Modelling
Bureau of Meteorology   *May 2023 – Current*

I have been involved in running, experimenting and altering versions of our operational weather forecasting model ACCESS. This includes observation monitoring of the operational suite, experimenting with radar data assimilation techniques, and other duties within the Data Assimilation working group.

Antarctic Climate and Ecosystems Research Council
Physical Oceanography Research Scholar   *Nov 2016 – Feb 2017*

In this role I worked on global ocean/atmosphere models to determine the effects of climate change on carbon sequestration and subduction in the Southern Ocean.

Academic References

Prof. Hamish McGowan
Professor, School of Earth and Environmental Sciences, UQ   *h.mcgowan@uq.edu.au*

Dr. Alain Protat
"Radar Science and Nowcasting" Team Leader, The Bureau of Meteorology   *alain.protat@bom.gov.au*