

REPORT

ACCESS Community Workshop 2025

Climate, weather and Earth system models play a crucial role in understanding and predicting the Earth's climate system. The annual ACCESS Community Workshop aims to provide a platform for knowledge sharing and interdisciplinary collaboration around the science that uses the ACCESS models to address the complex Earth system challenges that Australia faces.

The 2025 ACCESS Community Workshop was held over 8-12 September 2025 online and in person at Melbourne Connect, Melbourne, on Wurundjeri country.

Workshop aims and outcomes

The aims for this year's Workshop were:

- Build the ACCESS community by bringing together technical experts and researchers and enhancing existing links, especially in cross-disciplinary areas
- Provide a forum for sharing science updates and get user feedback on priorities and capability
- Encourage active participation by students and early career researchers
- Update the community on recent ACCESS-NRI activities, resources available, reporting requirements and plans
- Deliver training of ACCESS models and related software, data and tools to enhance user capabilities.



The ACCESS Community Workshop 2025 showcased remarkable breadth across climate, weather, and Earth system science disciplines. The workshop program included 75 science and technical talks, and 63 posters (+ 1min lightning presentations), spanning topics from fundamental atmospheric physics and ocean dynamics to applications in machine learning and high-resolution modelling.

We had 9 parallel sessions in cross-cutting community topics proposed by the ACCESS Community, 8 lunchtime discussions and 2 poster sessions, as well as spaces available for people to meet informally.



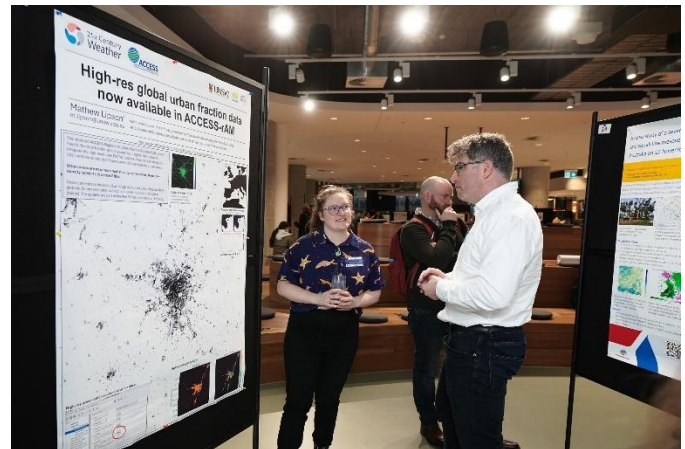
More than 63% of participants presented their work during the Workshop as talks or lightning talks or co-chaired lunchtime discussions or sessions.

The presentations and discussions explored scales ranging from submesoscale ocean processes, and convection to large-scale climate patterns affecting Australian rainfall, ENSO, and Antarctic sea-ice.

The Workshop addressed critical future challenges including carbon cycle projections, ice sheet modelling, climate sensitivity uncertainties, regional modelling capabilities and tropical-extratropical interactions.

The diversity extended to geographical focus areas—from Antarctic ice shelves and the Southern Ocean to Australian regional weather systems and global carbon budgets—demonstrating the community's integrated approach to understanding Earth's interconnected climate systems across disciplines, scales, and applications.

The workshop also provided an opportunity for ACCESS-NRI to present model development and release highlights across the teams and to receive community feedback. In addition to the Director's ACCESS-NRI Update, ACCESS-NRI had 12 presentations (9 talks, 14 lightning + posters) and co-facilitated 3 lunchtime discussions. A major focus of the 2025 workshop was continued community building and support for the community Working Groups (WGs).



Participants

We had 218 registrations for the workshop, 210 in person and 8 online from (See Appendix 1. Figure 1):

- Australian universities: University of New South Wales, University of Tasmania, Monash University, Australian National University, University of Melbourne, University of Adelaide, University of Sydney.
- National scientific organisations: CSIRO, Bureau of Meteorology, National Environmental Science Program (NESP), ARC Centre of Excellence for 21st Century Weather, Institute for Marine and Antarctic Studies (IMAS), Australian Centre for Excellence in Antarctic Science (ACEAS), Australian Antarctic Program Partnership.
- Government organisations: Australian Antarctic Division (AAD), Department of Climate Change, Energy, the Environment and Water.
- International universities and scientific institutions: National Center for Atmospheric Research (NCAR), USA and California Institute of Technology and NASA Jet Propulsion Laboratory, USA, University of Southampton.
- Research infrastructures: ACCESS-NRI, National Computational Infrastructure (NCI).

The participants included 53 research software engineers or infrastructure specialists and 165 researchers (including students).

An aim of this year's workshop was to encourage active participation by students and Early Career Researchers (ECRs). With this in mind, the Program Committee proposed to:

- Produce a flyer to encourage students and ECRs to participate, which was shared with the CWG and supervisors
- Produce clear instructions with examples to create the form for abstract submissions
- Offered travel scholarships for students and ECRs and poster prizes
- Organise a student/ECR networking event

The effect of these initiatives was clear in the number of student and ECRs participants this year compared with last year. 22% of the participants were students compared to last year's 7%, and 38% of the total were ECR's compared to last year's 35%. The same trend was observed during the ACCESS Training Day with 36% students compared to last year's 19%, and about the same percentage of early career attendees at just over 40%. (see Appendix 1 Figure 3).

Participants' experience with the ACCESS models showed that 58% of the total, use ACCESS model output and 43% run the ACCESS models while 27% of the total are model developers (see Appendix 1 Figure 4).

Program highlights

[Full Workshop program can be found here.](#)

The week kicked off with a COSIMA Hackathon and Land Surface Community Working Group on Monday (8 September) and concluded with six Community Working Group meetings on Friday (12 September).

Event	Monday 8 Sep	Tuesday 9 Sep (Day 1)	Wednesday 10 Sep (Day 2)	Thursday 11 Sep (Day 3)	Friday 12 Sep (Day 4)
COSIMA Hackathon	All day	All day			
Land Workshop	Afternoon				
ACCESS Training Day		All day			
Main Workshop			All day	All day	
Community Working Group meetings Atmosphere, Land, COSIMA, Machine learning for climate and weather, Earth System Modelling, and Cryosphere					All day

Day 1: ACCESS Training Day

The ACCESS Training Day 2025 took place on Tuesday, 9 September in Melbourne. There were 74 registrants and around 25 instructors and helpers.

We had a higher percentage of students this year, at around 36% compared to last year's 19%, and about the same percentage of early career attendees at just over 40%. This year, we ran two types of training sessions: structured and unstructured.

[Program ACCESS Training Day](#)

The structured sessions followed the traditional format, with instructors leading attendees through lecture and exercise-based content. There were 5 structured sessions:

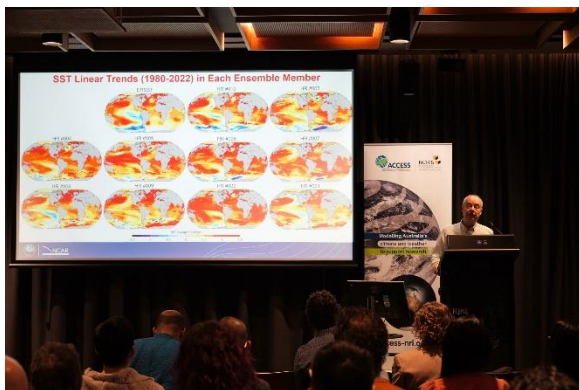
- Advanced Git
- Git workflows and GitHub best practices
- Unlocking the power of Xarray and Dask for large data analysis
- Hands-on training in machine learning models with PyEarthTools
- Evaluating ENSO in ACCESS Models for CMIP7



The unstructured sessions were new this year and involved attendees reading through documentation on how to run a selection of ACCESS models with model developers on hand to answer questions. Based on the feedback, we will likely continue to offer unstructured-style training sessions in the future.

ACCESS Community Workshop Day 2

Day 2 of the workshop opened with a welcome to country by Wurundjeri Elder Tony Garvey, followed by an ACCESS-NRI update by ACCESS-NRI Director, Andy Hogg.



Our first keynote speaker was **Gokhan Danabasoglu** (National Center for Atmospheric Research (NCAR), USA) on [High-Resolution Simulations with the Community Earth System Model \(CESM\)](#) followed by plenary talks by **Alison Bennett** (CSIRO) on [Australia's future terrestrial carbon sinks](#) and **Michael Groom** (CSIRO) on [Interpretable forecasts of ENSO phase at multi-year lead times using entropic learning](#).

This was followed by three parallel sessions, each featuring 5-6 12 min talks and 7-8 1 min lightning talks on:

Parallel session 1:

- Linking small-scale processes to large-scale climate
- Physical processes impacting Australian rainfall
- Projecting future carbon reservoirs

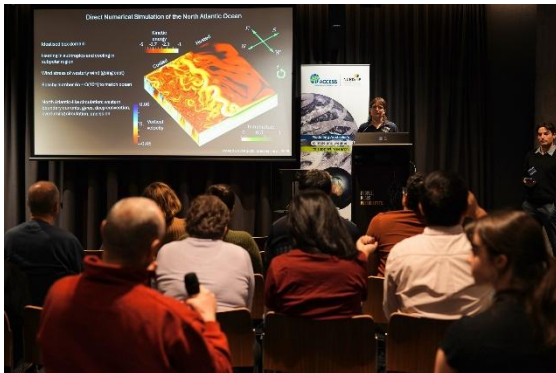
Parallel session 2:

- Modelling future climate change scenarios
- Machine learning for Earth system science
- Antarctic and Southern Ocean science, Part 1

The day also included the following lunchtime discussions:

- Improve understanding and simulations of low clouds to constrain climate projection uncertainties
- Research directions that integrate physics and biogeochemistry within regional ocean model
- Coupling between atmosphere, ocean, and ice
- Climate modelling: from model evaluations to model improvements

ACCESS Community Workshop Day 3



Day 3 was opened by **Cat Vreugdenhil** (University of Melbourne) on [Ocean convection, circulation and ice shelves: A fine-scale numerical simulation approach to modelling ocean processes](#).

The day continued with three plenary talks:

Clothilde Langlais (CSIRO) on [Modelling the reef's past and future: Upwelling, warming, and resilience in a changing climate](#)

Qinggang Gao (University of Melbourne) on [Towards enhancing climate projections through improved understanding and simulations of marine low clouds](#)

Georgina Falster (University of Adelaide) on [The role of Indo-Pacific SST variability in global drought occurrence](#)

We also had 6 plenary lightning talks from ACCESS-NRI staff and 4 lunchtime discussions on:

- Scientific frontiers in km-scale modelling
- Development and integration of open-source ice sheet modelling tools and technologies across the Australian community
- Developments for ACCESS-ESM on a post CMIP7-FASTTRACK timeline
- Let's Connect: Research Software Engineers (RSEs) in Climate and Weather Science

The Lunchtime discussion topics were proposed by the ACCESS community and selected to bring together people with shared interests across the diverse community. [Detailed summaries of the individual discussion groups can be found here.](#)

The last 3 Parallel sessions were:

- Tropical/extra tropical ocean and atmosphere processes and interactions
- High-resolution and regional modelling
- Antarctic and Southern Ocean science, Part 2



The last keynote of the Workshop was presented by **Renato Braghiere** (California Institute of Technology and NASA Jet Propulsion Laboratory, USA) on [Mind the Carbon Gap: Bridging Observations and Process-Based Understanding for Earth System Modelling Innovation.](#)

To close the plenary sessions, participants had the amazing opportunity to hear an ocean eddy during the talk by **Navid Constantinou** (University of Melbourne), **Kate Milligan** (University of Sydney), **Louise Devenish** (Monash University) and **Aaron Wyatt** (Monash University). [Dark Oceanography: A musical performance that integrates ocean science with experimental music](#) is an interdisciplinary collaboration that integrating climate science with experimental music by the School of Music and Performance at Monash University and 21st Century Weather.



Day 2 ended with a final discussion and wrap up and the announcement of the winners of the poster prizes, and announcement of selected visualisations

- **Best Student Poster:** Jemma Jeffree (ACCESS-NRI, Australian National University, 21st Century Weather): Journey to the centre of a coupled climate model
- **1st place:** Lawrence Bird (ACCESS-NRI): pyISSM - The Python API for ISSM

- **2nd place:** Elio Campitelli (Monash University): Simulating Antarctic sea ice with a surprisingly simple statistical model
- **3rd place:** Qi Cheng (Climate Change Research Centre, UNSW): AMOC weakening and ocean carbon flux changes in ACCESS-ESM
- **Most creative lightning talk:** Yuhang Liu (UTas): The Antarctic Coastal Current regulates melting of the Denman-Shackleton ice shelf

ACCESS Community Workshop Day 4: Community Working Group meetings

Day 3 of the Workshop included meetings for the six ACCESS Community Working Groups meeting: Atmosphere, Land Surface, Cryosphere, Machine learning for climate and weather, COSIMA (Ocean and sea-ice) and Earth System Modelling. The meetings included presentations, lightning talks and posters which focused on each of the CGW.



Feedback

The workshop received very positive feedback with 100% of survey responses¹ finding this year's workshop valuable. The most valuable aspects reported included the talks, opportunities for interactions and collaborations and bringing people together and learning about the latest developments across the diverse community. The mix of software/infrastructure and science talks, including the keynote speakers and cross-group parallel sessions, were also commonly noted favourably in the responses.

We also received many helpful suggestions that will help improve future workshops, including putting all the lightning talks in the plenary session, advertising the Workshop earlier, more time dedicated to updating our supported models. As announced by Andy during the Workshop, we are considering holding the ACCESS Community Workshop every two years and having smaller more focused workshops during the alternate year. We will be consulting more broadly with the community on this and will let you know about the decision by the end of the year. The ACCESS-NRI team looks forward to working with the community and incorporating this feedback into next year's event (or events).

"I really like the inter-disciplinary nature of the Workshop, and the opportunity to get a good feel for developments in modelling fields outside my own discipline"

"I loved the vibe of the workshop, the discussions, poster sessions and informal meetings brought people together and allowed them to connect"

Anonymous responses from the feedback survey



¹ Workshop survey received 41 responses.

Acknowledgements

- Thank you to our partners, ACCESS-NRI team and members of the ACCESS community for their contributions throughout the workshop and related events. Special thanks to the ACCESS-NRI organising committee Victoria Allen, Mohak Garg, Corey Hanrahan, Natalia Bateman and Jenny Fleet).
- We also thank the Program Committee members Andy Hogg (Chair, ACCESS-NRI), Adele Morrison (ANU, COSIMA), Alex Norton (CSIRO), Ariaan Purich (Monash University, ESM), Heidi Nettelbeck (ACCESS-NRI), Jemma Jefree (ANU, ESM), Julia Neme (ANU), Kitsios Vassili (CSIRO, ML), Mathew Lipson (UNSW, LWG), Poul Christoffersen (UTAS), Tennessee Leeuwenburg (Bureau of Meteorology) and Natalia Bateman (ACCESS-NRI, Communications), for their valuable contributions, time and help making this a successful workshop.
- Thanks to [Harshula Jayasuriya](#) for the photography during the workshop.

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ACCESS-NRI. Zenodo. <https://doi.org/10.5281/zenodo.17248022>

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Pages 1-13: Harshula Jayasuriya, ACCESS-NRI

APPENDIX 1: Workshop Attendees

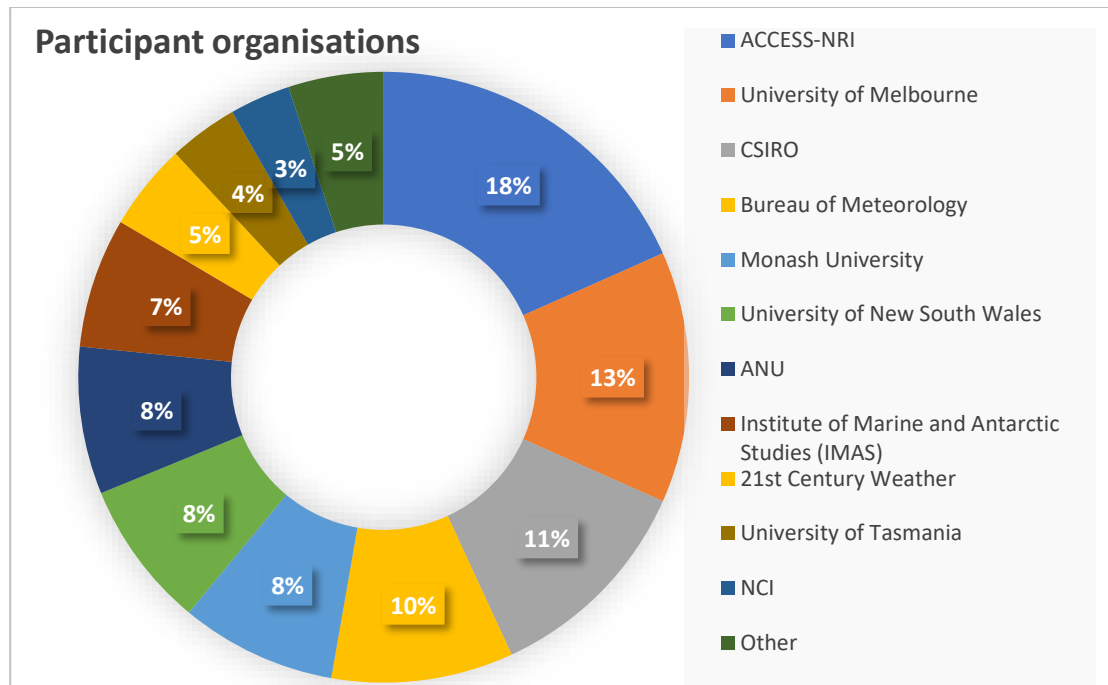


Figure 1. Reported organisations of the registered participants.

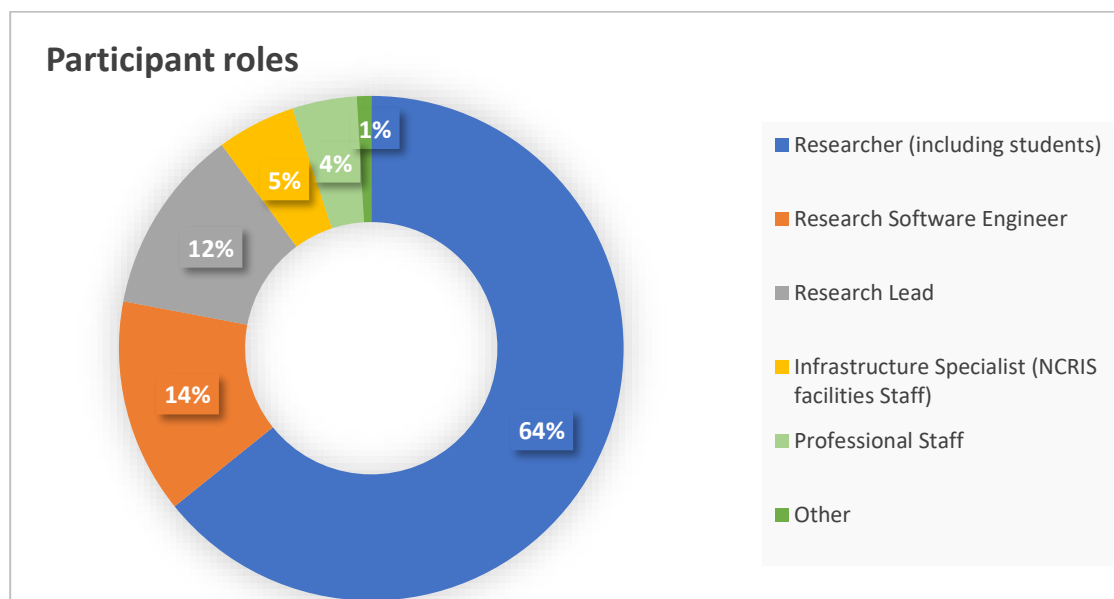


Figure 2. Reported roles of the registered participants.

Career stages

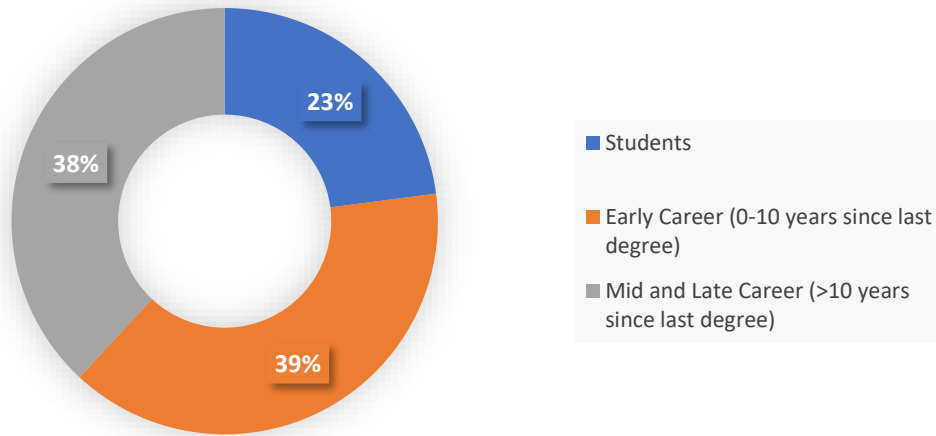


Figure 3. Reported career stages of the registered participants.

Participants experience with ACCESS

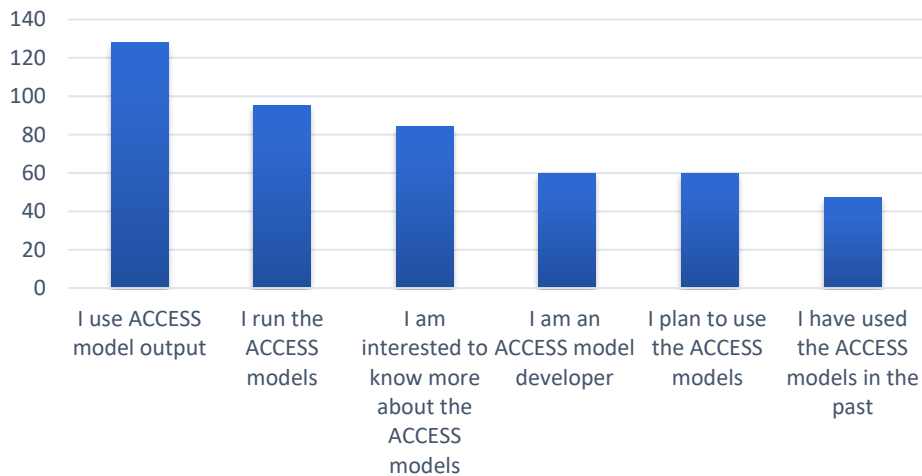


Figure 4. Reported experience with ACCESS models, components, or configurations from registered participants. Note that participants could choose multiple options to this question.

APPENDIX 2: Attendees and feedback for the ACCESS Training Day

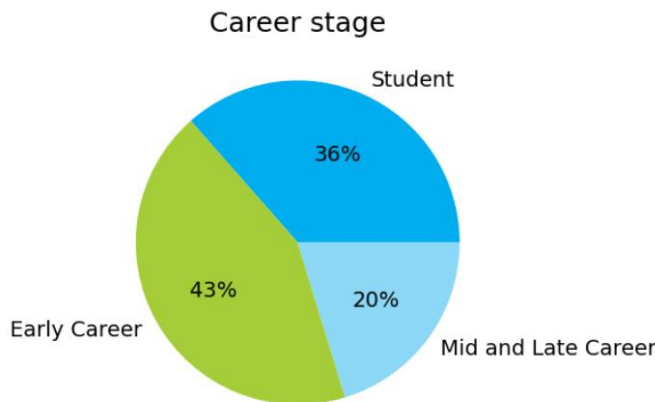


Figure 1: Distribution of career stages for Training Day registrants



Figure 2: Overall satisfaction of the Training Day based on 54 feedback survey respondents