ACCESS
National Research Infrastructure

ACCESS-NRI
AUSTRALIA'S CLIMATE SIMULATOR

WORK PLAN

2025–2026

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

The Australian Government enables ACCESS-NRI through the National Collaborative Research Infrastructure Strategy, NCRIS.

ACCESS-NRI Annual Work Plan

FY2025–2026

Executive summary

The ACCESS-NRI FY2025–26 Annual Work Plan outlines the activities that will support and strengthen Australia's national climate modelling capability. This year's work spans model development, infrastructure, software and data systems as well as engagement with the research community—each contributing to our mission of delivering trusted, accessible and high-performance climate modelling tools and data.

Key priorities include the release and optimisation of new ACCESS model configurations, improvements to workflows and infrastructure for model development and deployment and enhancements to evaluation, visualisation and data standardisation tools. In parallel, we are continuing efforts to prepare the ACCESS framework for next-generation computing.

We will also invest in expanding our training, user support and outreach activities, with a strong focus on community collaboration through working groups, the annual ACCESS Community Workshop and improved user platforms. Through these activities, ACCESS-NRI continues to foster a collaborative, inclusive and technically robust foundation for climate science in Australia.

Introduction

Australia's climate simulator, ACCESS-NRI, is Australia's National Research Infrastructure (NRI) for climate modelling. Our role is to develop, maintain, and support the Australian Community Climate and Earth System Simulator (ACCESS) and to enable its use by the broader research community for high-impact science and informed decision-making.

This Annual Work Plan sets out our priorities and deliverables for FY2025–26. Activities are structured across four key areas:

1. Model development and release
2. Infrastructure
3. Software and data
4. Training and engagement

Our work is guided by the ACCESS-NRI Strategic Plan (2022–2027), which defines long-term goals to support a user-driven, collaborative and sustainable modelling ecosystem. This plan reflects ongoing partnerships with national research organisations, universities and government agencies, as well as strong international links. Many of these efforts are delivered in collaboration with major programs such as the ARC Centre of Excellence for 21st Century Weather, the National Environmental Science Program (NESP) Climate Systems Hub, Securing Antarctica's Environmental Future (SAEF), the Australian Centre for Excellence in Antarctic Science (ACEAS), the Australian Antarctic Program Partnership (AAPP), the Consortium for Ocean Sea Ice Modelling in Australia (COSIMA) and our partner organisations. The plan also ensures alignment with community needs through regular engagement, particularly via the ACCESS Community Working Groups.

Together, the activities outlined in this plan reflect our commitment to delivering high-quality models, accessible tools and inclusive support systems that enable scientific excellence and strengthen Australia's national climate modelling capability.

1. Model development and release

In 2025–26, ACCESS-NRI will continue to advance the ACCESS modelling framework through coordinated development and release activities across the atmosphere, ocean, land, sea ice, ice sheet and regional systems. Our focus remains on delivering robust, reproducible model configurations that support a wide range of scientific applications.

Planned work includes new releases across ACCESS model components and configurations, including alpha and/or beta releases of ACCESS-ESM1.6, ACCESS-AM3, ACCESS-OM3-25km, ACCESS-OM3-WOMBAT-25km, ACCESS-OM3-8km, ACCESS-CM3 and ACCESS-ESM3 (both with CABLE3), and ACCESS-ISSM. An alpha release refers to an early-stage version still under active development, while a beta release is more stable and intended for broader testing and community feedback, though not yet finalised for full production use. Table 1 outlines the planned activities that support the model development and releases over the year.

Strategic Plan 2022–2027 goals supported by these activities: *1, 2, 3 and 4*

Table 1: Model development and release activities for FY25–26

Activity	Description	Team(s)	Effort*
Ancillary suites and tools	Prepare ACCESS-ESM1.6 ancillaries for CMIP7 fast-track experiments. Work will also include ANTS-based ancillary creation for CABLE in ACCESS-AM3. *Stretch goals:* • *Generic routines for met forcings in CABLE* • *Published CABLE input data collection* • *Published CABLE forcing data collection*	Atmosphere Model and Land Model teams	0.5 FTE
ACCESS atmosphere model	Release a beta version of ACCESS-AM3. Work will also include deployment of a preliminary workflow for high resolution ACCESS-AM3 simulations. *Stretch goal:* • *Beta release of the ACCESS-AM3 model with biogeochemistry*	Atmosphere Model, Land Model and Model Release teams *Collaborators: CSIRO*	1 FTE
ACCESS coupled models	Release of ACCESS-ESM1.6, ACCESS-CM3 (alpha with CABLE3) and ACCESS-ESM3 (alpha with CABLE3) models and configurations, including those for the CMIP7 fast track submission. Work will also include the release of additional ACCESS-ESM1.5 configurations, in consultation with the Earth System Modelling Working Group. *Stretch goal:* • *Payu updates that will allow more flexibility for paleoclimate configurations*	Atmosphere, Model, Ocean Model, Land Model, Model Release and Software Transformation teams *Collaborators: CSIRO and NESP*	3 FTE

ACCESS ocean/sea-ice model	Release ACCESS-OM3-25km (beta) and ACCESS-OM3-WOMBAT-25km (beta). Work will also include testing an ACCESS-OM3-8km alpha configuration. Maintain test cases of ACCESS-OM3 at 100 km resolution that includes WW3 and WOMBAT. *Stretch goals:* • *ACCESS-OM3-25km control runs* • *ACCESS-OM3 evaluation paper*	Ocean Model and Model Release teams *Collaborators: CSIRO and COSIMA*	3 FTE
ACCESS regional atmosphere model	Continued development of the regional atmosphere model (ACCESS-rAM3). This includes improvements to include daily varying OSTIA sea surface temperatures and the ability to use global climate model initial and lateral boundary conditions. Work will also include engagement with the UKMO to incorporate ACCESS-rAM3 development into the UKMO RAS/RNS trunk. *Stretch goals:* • *ACCESS-rAM3-CABLE alpha release* • *ACCESS-rAM3 with chemistry*	Atmosphere Model, Land Model and Model Release teams *Collaborators: 21st Century Weather and the Bureau of Meteorology*	1 FTE
ACCESS regional ocean model	Scope a high-resolution regional ocean model capable of capturing coastal forcing signals with greater resolution (ACCESS-rOM3). A key priority is to develop and maintain up-to-date instructions for generating new regional domains. An Australia-wide model configuration (physics-only, without data assimilation) will be developed, with a 10-year simulation run using this configuration and added to the ACCESS-NRI Intake data catalogue. *Stretch goals:* • *Simplify Jupyter notebook instructions to set up ACCESS-rOM3* • *Alpha release of an Australia-wide configuration*	Regional & Coastal Ocean Model team *Collaborators: UNSW and 21st Century Weather*	0.5 FTE
ACCESS land model	Continued development of CABLE. This includes a new MPI implementation, addition of BIOS/BLAZE and groundwater, and code refactoring. Work will also focus on defining a release workflow for CABLE. *Stretch goals:* • *Improved CI for CABLE with support for Intel and GNU compilers and the release workflow requirements*	Land Model team *Collaborators: CSIRO*	2 FTE
ACCESS ice sheet model	Release of alpha and beta versions of the Ice-sheet and Sea-level System Model (ISSM) and the ISSM Python API. Work also includes model output standardisation (ISMIP6) and workflows for sharing of data. *Stretch goals:* • *API development and documentation of more complex analysis and visualisation* • *Establish project plan for ISSM-OM3 coupling* • *Establish project plan for ISSM-AM3 coupling*	Ice Sheet Model team *Collaborators: Monash University, UTAS and AAD*	2 FTE

Coastal modelling commons	Create a repository of scripts for use by the coastal modelling community that supports the diversity of models and applications in the regional space. This includes engagement with the community as well as the development of a model agnostic strategy for developing pre- and post-processing. *Stretch goals:* • *Model agnostic strategy that supports 3–5 different models* • *More than 1 community group's uploaded files*	Regional & Coastal Ocean Model team *Collaborators: UNSW*	0.5 FTE

*Full time equivalent (FTE) staff needed to scope, undertake, and deliver activity.

2. Infrastructure

ACCESS-NRI's infrastructure activities support the reliable release and operation of the ACCESS model suite. In 2025–26, we will enhance the systems that underpin continuous integration, model building and deployment across the community. Key priorities include a major CI/CD upgrade to improve reliability and efficiency, updates to model configuration tools such as Payu, and improvements to testing environments and data standards compliance. We will continue to manage the ACCESS-NRI merit allocation at NCI and expand our monitoring framework to track the uptake and impact of models, data and tools. Details of the infrastructure activities are listed in Table 2.

Strategic Plan 2022–2027 goals supported by these activities: *1, 2, 3, 4 and 7*

Table 2: Infrastructure activities for FY25–26

Activity	Description	Team(s)	Effort*
Model release CI/CD	Updates to the continuous integration and deployment (CI/CD) components of the model release pipeline. Priorities include a major version upgrade for the CI, improvements to the testing and production environments and support for general software deployment. *Stretch goals:* • *Connecting model deployment and configuration: smart Bot/AI*	Model Release team	1 FTE
Model configuration tools and testing	Updates and improvements to the configuration tools used in the model development and release workflows. This includes improvements to Payu and enhancements for performance testing and data standards checks. *Stretch goal:* • *Removing dependency on /g/data/access/modules from our released suites*	Model Release team	1 FTE

Model build infrastructure	Updates and improvements to the model build infrastructure. This includes an upgrade of Spack, one of the key software components used in the build workflow, updates related to the UKMO transition from MOSRS to Github and the release of the Cylc8 suites. *Stretch goals:* • *Unify Spack build infrastructure for AM3, CM3, ESM3 and rAM3* • *Spack shared instance*	Model Release team	1 FTE
Monitoring and impact tracking	Updates to the monitoring framework for tracking uptake and impact of ACCESS-NRI infrastructure on the national and international research community.	Model Release team and cross-organisation	1 FTE
ACCESS-NRI merit allocation	Management of the ACCESS-NRI merit allocation for access to NCI compute and storage resources. These resources are provided to support community members to undertake scientific simulations using ACCESS models and share community reference datasets.	Cross-organisation	0.3 FTE
Preparing for platforms outside NCI	*Stretch goal:* • *Work to begin testing our model build and software release processes across multiple platforms. This initially includes the model build, CI/CD and benchcab workflows.*	Model Release and Land Model teams	0.5 FTE

*Full time equivalent (FTE) staff needed to scope, undertake, and deliver activity.

3. Software and data

In 2025–26, ACCESS-NRI will enhance the tools and infrastructure that support ACCESS models and outputs. We will continue to support and maintain our evaluation and visualisation tools, including ESMValTool, ILAMB, benchcab, ACCESS-Vis and the ACCESS-NRI Intake Catalogue. Priorities include expanding diagnostics for ocean, atmosphere and ice sheet modelling, and improving interoperability between the Intake Catalog and our evaluation and visualisation tools.

Our data management work will focus on improving metadata consistency, standardising model outputs and ensuring datasets are governed and shared in line with FAIR principles. Additional work includes preparing models for future computing by porting the ACCESS ocean component (MOM6) to GPUs, developing public scaling guidance and supporting machine learning tools such as PyEarthTools. We will also maintain shared Conda environments to support community collaboration. Details of the planned software and data activities are listed in Table 3.

Strategic Plan 2022–2027 goals supported by these activities: *1, 2, 3, 4 and 6*

Table 3: Software and data activities for FY25–26

Activity	Description	Team(s)	Effort*
Model evaluation and diagnostics tools	Continued support for a standardised, reproducible framework for evaluating ACCESS outputs. This includes the release of ACCESS-ESM1.6 evaluation workflows using ILAMB and ESMValTool to support a CMIP7 submission, enhancing continuous deployment and testing on Gadi (COSIMA recipes, ESMValTool), developing a fully automated evaluation workflow for benchcab and performing maintenance and software upgrades as required. Work will also include finalising the conversion of the COSIMA-Recipes to Intake. *Stretch goals:* • *Deployment of the CMIP Rapid Evaluation Framework (REF) on Gadi* • *Optimisation of recipes* • *Evaluation of benchcab spatial outputs*	Model Evaluation & Diagnostics (MED) and Land Model teams *Collaborators: Bureau of Meteorology and CSIRO*	2 FTE
Model evaluation metrics	Efforts to enhance model evaluation capabilities will continue through several targeted activities. To support ocean diagnostics, ACCESS-NRI will build on the foundational work of the COSIMA community by transitioning selected COSIMA-recipes into the ESMValTool framework. This initiative responds to growing demand within the broader ESMValTool community for expanded ocean diagnostics and aims to deliver more robust and reusable workflows. Rather than a direct port, the goal is to adapt and extend COSIMA's legacy within ESMValTool's standardised, CMIP-focused environment. Work is also underway to integrate ENSO metrics into the CMIP Rapid Evaluation framework, and existing ENSO evaluation recipes will be expanded to include the Indian Ocean Dipole (IOD). *Stretch goals:* • *Establish and expand ACCESS atmosphere recipes* • *Establish and expand ACCESS ISSM recipes*	Model Evaluation & Diagnostics (MED) and cross-organisation *Collaborators: COSIMA, Atmosphere and Cryosphere Working Groups*	1 FTE
ACCESS-NRI Intake catalogue	The release and support of the ACCESS-NRI Intake tool, which enables the cataloguing and discovery of ACCESS data at NCI as well as integration with the NCI Data Collections (and NCI cataloguing tools). Priorities this year include improving interoperability between evaluation tools and the ACCESS-NRI Intake catalogue as well as integration with community cookbook environments.	Model Evaluation & Diagnostics (MED)	0.5 FTE

Data standardisation	Improving the standardisation of ACCESS model outputs is a priority. This includes updating the development and release workflows to ensure that the native model output is more consistent, developing model output specifications for ACCESS releases and CABLE and supporting post-processing tools that are used for higher levels of standardisation, such as MOPPeR. *Stretch goals:* • *Optimisation of MOPPeR v2* • *MOPPeR v2 interoperable with the Intake catalogue* • *MOPPeR v2 backward compatibility with CM2, OM2, ESM1.5* • *Manage provenance and discoverability of ancillaries*	Cross-organisation	0.5 FTE
Data releases and data management	Release and data management of ACCESS model outputs and related datasets for model evaluation (including merit-based datasets nominated by the Community Working Groups). This work also includes data management and governance support across the tools and resources used with data. *Stretch goal:* • *Plan for each model component for improving data provenance*	Cross-organisation	0.5 FTE
Data visualisation	Create high-impact visualisations to help explain the ACCESS models, data outputs and science across the community. Open access to the visualisation code and tools (wherever possible) as well as visualisation training will be outputs of this work. *Stretch goal:* • *Visualisation recipes integrated with ACCESS-NRI Intake catalogue*	Model Evaluation & Diagnostics (MED) and Outreach & Engagement teams	1 FTE
Porting ACCESS models to GPUs	Preparing ACCESS models to run on GPU architectures on HPC. This work will focus on porting and optimising MOM6, the most recent version of the ACCESS ocean component, as well as 1–2 configurations of ACCESS-OM3. *Stretch goal:* • *Porting of less frequently used features within MOM6*	Software Transformation team *Collaborators: Geophysical Fluid Dynamics Laboratory (GFDL) – NOAA*	1 FTE
Machine learning	Development and support of a machine learning cookbook for ACCESS users. Work will also support the release and maintenance of *PyEarthTools*, a community tool for reproducible machine learning for Earth system science.	Software Transformation team	0.5 FTE

Public scaling guidance	Documentation and tools to provide public scaling guidance for the ACCESS models. First models include ACCESS-OM2, ACCESS-AM2 and ACCESS-CM2.	Software Transformation team	0.5 FTE
ACCESS-NRI Conda environments	Support for community Conda environments hosted on project xp65 at NCI, including the analysis3 environment previously managed by CLEX. Work includes regular maintenance and updates as well as support for users to request additional packages.	Model Evaluation & Diagnostics (MED) and cross-organisation	0.25 FTE

*Full time equivalent (FTE) staff needed to scope, undertake, and deliver activity.

4. Training and engagement

In 2025–26, ACCESS-NRI will continue to support a broad range of training and engagement activities that connect researchers, developers and users of the ACCESS modelling system. Support for the six ACCESS Community Working Groups will continue, enabling two-way communication with ACCESS-NRI teams and improved access to HPC resources at NCI. Communication and outreach will remain a strong focus, with regular newsletters, impact stories, media releases and broader sector engagement helping to share community achievements and opportunities.

A core focus this year is delivering training through webinars, hackathons and online tutorials designed to support both new and experienced users. We will also maintain and enhance the Hive Docs and Forum platforms, including a phased review of web content to improve clarity and usability. User support will continue through the ACCESS-Hive Forum, providing a central point for help and expert guidance. Additional priorities include hosting the annual ACCESS Community Workshop in September, which also features a major training day. We will also expand our PhD internship program, moving beyond its trial phase to a full launch. Details of the planned training and engagement activities are listed in Table 4.

Strategic Plan 2022–2027 goals supported by these activities: *1, 4, 6 and 7*

Table 4: Training and engagement activities for FY25–26

Project	Description	Team(s)	Effort*
ACCESS Community Workshop	Host and support the annual ACCESS Community Workshop. Scheduled for September 2025 in Melbourne. Work will also include planning and preparations for the 2026 workshop that will be held in the following financial year.	Business team	2 FTE

Community Working Groups support	Support for the six ACCESS Community Working Groups. This includes facilitating the two-way flow of information between each Working Group and ACCESS-NRI developers and enabling access to HPC resources (compute and storage) at NCI. *Stretch goal:* • *Improve student participation*	ACCESS-NRI Working Group Liaisons	1.5 FTE
Communication	Communicating the impact and importance of ACCESS-NRI's software infrastructure and expertise for climate science researchers and decision-makers. This work includes ACCESS-NRI's regular newsletters (ACCESStory), annual Highlights Report, online communication channels, impact stories, visualisations and media releases.	Outreach & Engagement team and cross-organisation	1 FTE
Community engagement and outreach	Engagement activities that support the two-way interactions between ACCESS-NRI and our users, partners, funders and other NCRIS organisations.	Outreach & Engagement team and cross-organisation	1 FTE
ACCESS Workshop Training Day	The 2025 ACCESS Community Workshop will include a major training event. Planning and preparations for any training related events associated with the 2026 workshop will also be undertaken.	User Training team and cross-organisation	0.5 FTE
User support	Continued support for help requests received through the ACCESS-Hive Forum. This includes triaging posts and connecting users with ACCESS-NRI specialists for assistance with supported software and data, or community experts for topics outside of ACCESS-NRI's areas of expertise.	User Training team and cross-organisation	1 FTE
ACCESS user training	Training events for new and existing users. Minor events will include support for hackathons, webinars and online tutorials, with content targeted at supported models, software, data and tools.	User Training team and cross-organisation	0.5 FTE
ACCESS-NRI PhD internship program	Run an internship program to host 2–4 PhD students at ACCESS-NRI. Work this year will include support of the wrap-up stage of our trial program as well as the launch of our expanded full program.	User Training team and cross-organisation	0.4 FTE
ACCESS-Hive Docs and Forum	Continued development and support of the Hive Docs and Forum. Work will also include a review of web content across the ACCESS main site and ACCESS-Hive (Docs and Forum) to improve clarity, accessibility, and user engagement. This work will also include a phased implementation plan to address the identified improvements.	Cross-organisation	0.5 FTE

	Stretch goals: • *Update of web content with unified look and feel across websites*		
UKMO partnership	Development and adoption of procedures for access and use of licensed United Kingdom Meteorological Office (UKMO) materials. This work also includes ongoing engagement with UKMO. *Stretch goals:* • *Promote our status as a Momentum Research Partner across Australian research agencies/universities*	Cross-organisation	0.1 FTE

*Full time equivalent (FTE) staff needed to scope, undertake, and deliver activity.

Glossary

Please visit our main website for a compilation of common terms and acronyms used within this document and by the ACCESS community: https://www.access-nri.org.au/community/access-glossary/

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> *Atlas of Living Australia (2023) Atlas of Living Australia Annual Workplan 2023–24, Atlas of Living Australia, Publication Series No. 7, Canberra, Australia, pp. 19. https://doi.org/10.54102/ala.46036*

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