



# CMIP: a globally coordinated project to better understand climate change and its impacts

Powerful computer models allow researchers to understand the climate and Earth system. They can be used to recreate climate change and estimate its consequences.

Using supercomputers, these models create simplified approximations of the planet and simulate the processes and interactions of different parts of the Earth (oceans, land, cryosphere, biosphere and atmosphere) to provide a more comprehensive and robust understanding of the range of possible future climate scenarios.

## A global collaboration for climate: CMIP7

The Coupled Model Intercomparison Project (CMIP) is a globally coordinated effort of the World Climate Research Programme (WCRP), and a source of information to the Intergovernmental Panel on Climate Change (IPCC) assessment reports.

CMIP brings together the world's leading climate modelling centres to evaluate the different climate and earth system models used around the world.

CMIP began in 1995 and feeds into every cycle of the IPCC assessment reports. The upcoming IPCC seventh assessment report will feature new state-of-the-art CMIP7 models.

### How does the world use CMIP?

The models can produce simulations of our past, present and future climate and are used to underpin global, national and state climate projections. They help researchers understand how our climate is changing, and how it might change in the future.

More than 50 modelling centres around the world participated in the last CMIP6 with more than 100 model configurations.

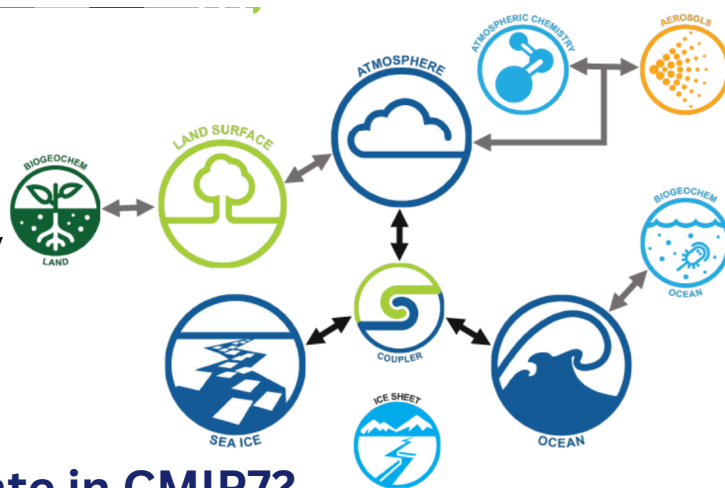
### How does Australia participate in CMIP?

Australia submits models to the project by mobilising a large-scale initiative of researchers from many disciplines and institutions, collaborating closely with software engineers. Australia submitted two model configurations (ACCESS-CM2 and ACCESS ESM 1.5) to CMIP6 with both models being in the top 10 model configurations for number of datasets downloaded.

For the current CMIP7 submission, CSIRO will lead a consortium including: Australia's climate simulator (ACCESS-NRI), the National Computational Infrastructure (NCI), the Bureau of Meteorology (BoM) and several Australian Universities, working alongside existing national and international collaborations.



Australia's climate simulator (ACCESS-NRI) is the national infrastructure that supports and develops the ACCESS modelling framework. This infrastructure is enabled by the Australian Government and hosted at the [National Computational Infrastructure \(NCI\)](#). It is the largest modelling system for the Southern Hemisphere, providing an essential unique perspective of global climate change, as the majority of climate models are developed by modelling centres in the northern hemisphere.



## Why should Australia participate in CMIP7?

CMIP provides updated national climate change projections and information to help understand how climate change will impact ecosystems, human health, the risk of tipping points, regional changes in climate, and even some financial risks.

### Benefits to Australia

- Maintains Australia's role as a credible and active program in climate research, and thus giving Australia influence in global climate negotiations.
- Creates models that represent climate processes for Australia and the Southern Hemisphere to provide more accurate projections for our region.
- Maintains existing capability and trains new modellers, to provide essential national services in climate and weather science.
- Maintains Australia's position as a pre-eminent Southern Hemisphere nation in climate science.
- Provides long-term investment in future generations of researchers and software engineers to further enhance long term viability of climate services and projections.
- Brings together and expands Australia's modelling community.
- Maintain our ability to drive research in areas important for Australia (e.g. research on the Southern Ocean).

### Global benefits

- ACCESS models provide a unique perspective on the role of the Southern Hemisphere and Antarctica on global climate
- Provision of accurate sea level and climate forecasts to regional neighbours, particularly Pacific Island States
- Comparison and evaluation of the ACCESS models against other world-leading efforts, which ultimately, improves our models.



## NEXT steps: how are we ensuring Australia's participation in CMIP7

The Australian CMIP7 consortium is working towards preparing the next Australian CMIP submission. This Consortium is a collaborative effort to deliver a successful Australian contribution. It is led by CSIRO and members include the National Computational Infrastructure (NCI), ACCESS-NRI, The Bureau of Meteorology, the National Environmental Science Program (NESP2) Climate Systems Hub, The ARC Centre of Excellence for Climate Extremes (CLEX), The ARC Centre of Excellence for Weather of the 21st Century (W21C) and the Consortium for Ocean-Sea Ice Modelling in Australia (COSIMA).

Maintaining and further developing ACCESS for Australia including participation in CMIP requires adequate long-term funding. Current funding limitations will constrain what ACCESS configurations are feasible for CMIP7 and if IPCC deadlines for the upcoming seventh assessment report can be met.

