

ARC Centre of Excellence for the Weather of the 21st Century Strategic Plan

21st
Century
Weather

The logo consists of three overlapping, teardrop-shaped elements: a red one at the top, a blue one at the bottom left, and a grey one at the bottom right.

ARC Centre of Excellence

Acknowledgement of Country

We acknowledge Aboriginal and Torres Strait Islander people as the traditional custodians of the lands where we work, study and live. They have been studying Australia's weather for millennia. We pay our respects to Elders past and present, and recognise their unique and continuing connection to the land, skies, waters, plants and animals.



ARC Centre of Excellence



WHO WE ARE

How will our weather be re-shaped by climate change? The **ARC Centre of Excellence for the Weather of the 21st Century** is a major seven-year initiative funded by the **Australian Research Council** to answer this question. We conduct fundamental research with real-world applications and provide governments, businesses and communities with the foundational knowledge to plan their climate action.

Our Centre is a consortium of 24 partners led by **Monash University** in partnership with **The University of Melbourne, The University of New South Wales, The Australian National University**, and the **University of Tasmania**. Our partners include major national and international research organisations as well as federal and state government departments and Australian businesses.

Our research, engagement, partner integration, and leadership and training programs work in unison to achieve our objectives. We will discover and communicate the key influences on Australia's future weather resources and high-impact weather events while training the first generation of weather change scientists ready to apply their knowledge to the challenges ahead.



Strategic Plan



Our Vision


We envisage a global society effectively adapting to a warming world and transitioning to net zero based on improved understanding and new knowledge of weather change provided by our Centre

Our Purpose

To create the scientific knowledge and technology necessary for robust, evidence-based decision-making in response to weather change.

Our Values

We are an inclusive community striving for excellence, innovation and high scientific integrity. We work collegiately and support each other. Respect and openness underpin all we do.

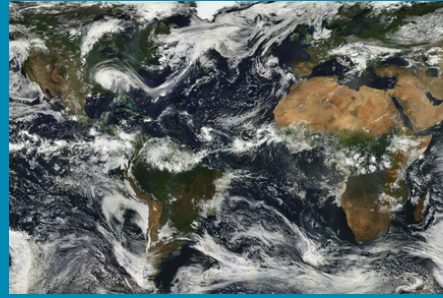


Objectives



Research

Advance understanding of weather-climate interactions and build the capacity to make actionable predictions of weather change for Australia.



Technology

Transform Australia's weather and climate research capability by developing ultra-high-resolution climate modelling.



Societal Impact

Enable Australian businesses, governments, and communities to make evidence-based decisions related to weather change.



Training

Train the first generation of weather change scientists to help businesses, governments, and communities manage risk, and revolutionise Australia's ability to plan its future.

OUR RESEARCH

Weather Systems: Identification, Characteristics, and Dynamics of Weather Systems

CLIMATE VARIABILITY AND WEATHER SYSTEMS

Tropical Sea Surface Temperatures and Weather Systems

Monsoon Variability and Weather Systems

Upscale Impact of Weather Systems

Tropical-extratropical cyclone interactions

WEATHER RESOURCES

Availability and Reliability of Australian Weather Resources

Future Weather and Health Weather Resources

Energy Weather Resources in Climate Models

The Coastal Wind Resource

WEATHER SYSTEMS IN A WARMER WORLD

Warming Patterns, Weather Systems and Australian Weather

Ocean and Atmospheric Mesoscale Systems in a Warmer World

The Future of Warm and Wet Conditions

Mesoscale Characteristics of Storms in a Warmer World

HIGH IMPACT WEATHER

Future Changes in Short-Duration Precipitation Extremes

Heatwave Processes in the Atmosphere and Ocean

Understanding Weather Risks to Key Resources in a Changing and Variable Climate

Modelling Science: Design and Application of Kilometre-Scale Global and Regional Models

IMPACT THROUGH SCIENCE

GOAL

- Identify and understand the key mechanisms behind weather change and its effects on our weather resources and high-impact weather events

APPROACH

- Build a research program that creates and integrates new knowledge about circulation change
- Apply a weather-systems approach to understanding the local effects of climate change
- Combine the latest climate and weather observations with ultra-high resolution research models and data science
- Implement a research agenda that has relevance to real-world applications

OUTCOMES

- A portfolio of world-leading weather change science
- The best science well connected to decision-making through a series of Assessment Reports on weather change science, weather resources, and high-impact events in Australia
- The recognition of 21st Century Weather as an international leader in weather change science



CHRISTIAN JAKOB

Director

“Achieving future climate resilience requires us to transform our thinking of climate change to one of weather change.”

IMPACT THROUGH RESEARCH INFRASTRUCTURE

GOAL

- Transform the key tools used for weather and climate research

APPROACH

- Build next generation ultra-high resolution global and regional modelling systems for weather change research
- Develop next generation observational and model analysis tools, applying an optimal blend of Human and Artificial Intelligence
- Create and apply innovative best-practice approaches to sharing data, models, and analysis tools

OUTCOMES

- Advanced climate modelling systems for the weather and climate science community
- Advanced data analysis tools based on the latest data science, shared with all



(C) National Computational Infrastructure (NCI)

21st
Century
Weather

ARC Centre of Excellence



ANDY HOGG

Chief Investigator & Director,
ACCESS-NRI

“The Centre will provide a transformational change to Australia’s climate modelling capability.”

IMPACT THROUGH PARTNERSHIPS



GOAL

- Provide governments, businesses and communities with the knowledge and people to plan effectively for the effects of weather change

APPROACH

- Develop a dedicated Partner Integration Program to engage partners in all aspects of the Centre's activities
- Carry out application-informed research on weather resources and change

OUTCOMES

- Centre partners that are deeply engaged in Centre activities
- An increase in the breadth and depth of our Industry and Government Partnerships
- Our partners interact with our research using innovative approaches and tools



NERILIE ABRAM

Deputy Director, Partnerships

"We will build a firm understanding of the past, present and future of our nation's weather resources through a research centre with deep industry and government partnerships."

IMPACT THROUGH ENGAGEMENT

GOAL

- Become Australia's leading voice on weather-change science, weather resources, and high-impact weather

APPROACH

- Develop a Centre-wide Engagement and Impact Program that is deeply woven into the fabric of our research
- Regularly engage stakeholders, ranging from the general public to policymakers, in dialogue about research
- Build a dedicated program that engages schools in weather and climate change education

OUTCOMES

- Significantly enhanced weather change literacy in industry, government, and the wider community
- The Centre is the go-to destination for businesses, governments, and communities when they seek expert knowledge on the changing nature of weather resources and high-impact weather
- A cohort of Centre Alumni at all career levels, ready to communicate the importance of weather change research to a wide range of audiences



SARAH PERKINS-KIRKPATRICK

Deputy Director, Engagement

“Our ambition is to not only to inform and influence, but drive the conversation on the future of our weather resources and high-impact weather events.”

IMPACT THROUGH TRAINING AND LEADERSHIP



GOAL

- Develop the first generation of weather change scientists at all career levels

APPROACH

- Deploy an integrated training and leadership program led by a dedicated Associate Director
- Provide individualised training analyses and subsequent training plans for graduate students and early-career researchers that include placements in industry and government
- Implement a leadership training program for mid-career and senior Centre researchers

OUTCOMES

- A new generation of weather and climate scientists fully aware of the societal and industry need for weather change information and ready to apply their formidable multi-disciplinary skills and deep scientific understanding to providing it

21st
Century
Weather

ARC Centre of Excellence



MELISSA HART

Associate Director, Training and Leadership

“The training and leadership program will ensure that professional development is a fundamental part of the fabric of the centre.”

IMPACT THROUGH OPERATIONS AND CULTURE

GOAL

- Create a Centre of exemplary scientific integrity with a culture that embodies our values, embraces diversity, and has structures that enable our purpose

APPROACH

- Facilitate an empowered operations team equipped with digital tools that support collaboration, reduce institutional barriers and relieve administrative burden on researchers
- Build and utilise an online collaboration platform that enables all Centre participants to work collaboratively outside of traditional silos
- Run workshops, events, and meetings that enable regular face-to-face interaction to drive research innovation and build a cohesive culture
- Demonstrate and operationalise a clear commitment to equity, diversity, inclusion, and wellbeing

OUTCOMES

- A healthy, purpose-led, values-based organisation with a strong sense of community that transcends institutional barriers
- A true team-based approach to all we do. Operations staff, communications professionals and research software engineers work hand-in-hand with researchers to fulfil the Centre's ambitions



21st
Century
Weather

ARC Centre of Excellence



STEPHEN GRAY

Chief Operating Officer

"21st Century Weather is an inclusive community striving for excellence, innovation and high scientific integrity."

Contact Us



X (TWITTER)

<https://twitter.com/21CWeather>



LINKEDIN

<https://www.linkedin.com/company/21stcenturyweather>



WEBSITE

<https://www.21centuryweather.org.au/>



EMAIL

hello@21centuryweather.org.au

