

CLIMATE CHANGE RESEARCH CENTRE  
ANNUAL REPORT

2018



[www.ccrcc.unsw.edu.au](http://www.ccrcc.unsw.edu.au)

Climate Change  
Research Centre

# OUR MISSION

THE CCRC ACTIVELY ENGAGES IN WORLD-CLASS RESEARCH FOCUSED ON CLIMATE SYSTEM SCIENCE TO HELP BETTER UNDERSTAND, PREDICT, AND ADAPT TO CLIMATE VARIABILITY AND CLIMATE CHANGE. WE ALSO EDUCATE UNSW STUDENTS, SUPPORT STEM, ENGAGE IN PUBLIC OUTREACH, AND ADVISE THE GOVERNMENT AND PRIVATE SECTORS ON CLIMATE-RELATED SCIENCE AND THE CAUSES AND CONSEQUENCES OF GLOBAL WARMING. WE ARE THE FOUNDATION FOR THE ARC CENTRE OF EXCELLENCE FOR CLIMATE EXTREMES.

## ARC CENTRE OF EXCELLENCE FOR CLIMATE EXTREMES

The ARC Centre of Excellence for Climate Extremes (CLEx), led by CCRC's Professor Andy Pitman, launched April 10, 2018.

CLEx builds on the research carried out by the earlier ARC Centre of Excellence for Climate System Science (ARCCSS) but focuses directly on extreme weather and climate events. It aims to improve our understanding of the processes that trigger these extreme events and build this understanding into climate modelling systems.

## RESEARCH HIGHLIGHTS

- Intensification of Southern Hemisphere westerlies caused early deglacial atmospheric CO<sub>2</sub> rise: 10.1029/2018GL078875
- Wind energy is a resilient source of electricity over most of Australia: 10.1088/1748-9326/aaa632
- Many climate models overamplify heat extremes over wet regions: 10.1029/2018GL079102
- Rain intensity increased over Australia during 1986-2013 compared to 1958-1985: 10.1029/2018GL078875
- Does predictability of fluxes vary between FLUXNET sites?: 10.5194/bg-15-4495-2018
- Total Antarctic ice shelf loss increases by 40% - 130% during twenty-first-century simulations: 10.1175/JCLI-D-17-0854.1
- How important is humidity to heat stress?: 10.1029/2018JD028969
- Future extreme precipitation intensity increases in the majority of CMIP5 models: 10.1175/JCLI-D-17-0683.1
- A new model of skipjack tuna movement in the tropical Pacific ocean: 10.1016/j.pocean.2018.04.007
- Tropical instability waves may impact ENSO irregularity and predictability: 10.1007/s00382-018-4217-0

## AWARDS & HONOURS

- Lisa Alexander: Outstanding Service Award, World Meteorological Organization for Climatology
- Alex Sen Gupta: Academy of Science Frederick White Medal
- Matt England: Tinker-Muse Prize for Science and Policy in Antarctica
- Jason Evans: Australian Meteorological Oceanographic Society (AMOS) Priestley Medal
- Andy Pitman: Eureka prize finalist in the category 'Leadership in Innovation and Science'
- Markus Donat: World Climate Research Programme Climate Observing System Data Prize
- Multiple student awards:
  - Nathan Cooper, Mia Gross, Sanaa Hobeichi and Manon Sabot

## RESEARCH OUTPUTS

107 journal articles:

- 33% in top 10% most cited, 90% in SJR's top 10%
- 23 publications with student first authors
- 14 publications in *Nature* family journals

## NATIONAL & INTERNATIONAL LEADERSHIP

### INTERNATIONAL DELEGATION

- CCRC hosted Her Excellency Dang Thi Ngoc Thinh, Vice President of Vietnam

### CONFERENCE

- CCRC hosted the Joint 25th AMOS National Conference and 12th International Conference for Southern Hemisphere Meteorology and Oceanography, AMOS-ICSHMO 2018

### IPCC LEADERSHIP

- Jason Evans: Lead author IPCC Report on Climate and Land
- Alejandro Di Luca: Lead author, IPCC Report on Climate Change, Weather and Climate Extreme Events Chapter

### INTERNATIONAL LEADERSHIP

- Gab Abramowitz: Chair, Global Land Atmosphere System Study, World Research Climate Programme (WCRP)
- Lisa Alexander: WCRP Joint Scientific Committee; Co-Chair, WCRP Grand Challenge on Weather, Climate Extremes
- Steve Sherwood: Steering Committee, WCRP Grand Challenge on Climate Sensitivity
- Katrin Meissner: Executive Committee, Past Global Changes (PAGES)
- John Church: Chair, Transient Tracer-based Investigation of Circulation and Thermal Ocean Change (TICTOC) Advisory Committee
- Jason Evans: Co-Chair, Global Energy and Water Exchanges (GEWEX) Hydroclimate Panel
- Lisa Alexander: GEWEX Steering Committee
- Alex Sen Gupta: Climate and Ocean Variability, Predictability, and Change (CLIVAR), North-western Pacific Ocean Circulation and Climate Experiment (NPOCE) Committee

- Lisa Alexander: Chair, World Meteorological Organization (WMO) Expert Team Sector-specific Climate Indices
- Katrin Meissner: Steering Committee, Cycles of Sea-Ice Dynamics in the Earth system (C-SIDE) PAGES
- Lisa Alexander: Executive Committee, International Association of Meteorology & Atmospheric Sciences (IAMAS)
- Lisa Alexander: Steering Committee, Analysis, Integration and Modeling of the Earth System (AIMES)
- Sarah Perkins-Kirkpatrick: Co-lead, WMO Commission for Climatology.

### NATIONAL LEADERSHIP

- Angela Maharaj: Vice President, Australian Meteorological and Oceanographic Society (AMOS)
- Gab Abramowitz: Chair, Australian Energy and Water Exchange (OzEWEX) Benchmarking Working Group
- Andy Pitman: Review of Climate Risk Method for Regional Water Strategies, Department of Planning, Industry & Environment
- Jason Evans: Central Coast Council briefing, Climate Science and the Central Coast Context
- Stephen Gray: Member, ARC Major Investments Working Group
- Andy Pitman: National Committee for Earth System Science
- Andy Pitman: National Collaborative Research Infrastructure Strategy (NCRIS)
- Sarah Perkins-Kirkpatrick: Government briefing to parliamentary secretaries, Understanding extremes
- Andrea Taschetto: AMOS Council Member

## EDITORIAL ROLES

- Lisa Alexander: Editor-in-Chief, *Weather and Climate Extremes*
- Jason Evans: Editor, *Journal of Climate*
- Agus Santoso: Associate Editor, *Journal of Climate*
- Donna Green, Katrin Meissner: Executive Editorial Board, *Environmental Research Letters*
- Steve Sherwood: Editorial Board, *Environmental Research Letters*
- Martin De Kauwe: Associate Editor, *Biogeosciences*
- Martin De Kauwe: Editorial Board, *Global Change Biology*
- Martin De Kauwe: Editorial Board, *New Phytologist*
- Laurie Menviel: Editor, *Climate of the Past*
- Andy Pitman: Associate Editor, *International Journal of Climatology*
- Gab Abramowitz: Associate Editor, *Journal of Hydrometeorology*
- Sarah Perkins-Kirkpatrick: Editor, *Weather and Climate Extremes*
- Sarah Perkins-Kirkpatrick: Associate Editor, *Scientific Reports*
- John Church: Guest Editor, *CLIVAR Special Issue on Sea Level*
- Andrea Taschetto: Guest Editor, *Atmosphere on Weather and Climate Extremes*

## VISITORS

- Martin Best, UK Met Office
- Ian Dunlop, Centre for Policy Development
- Simone Fatichi, ETH Zurich
- Helen Fricker, SCRIPPS
- Ryo Furue, JAMSTEC
- Stephen Griffies, GFDL
- Florentin Lemonnier, Sorbonne Université
- Nicola Maher, Max Planck Institute
- Gerald Meehl, UCAR
- Nagin Nazarian, MIT
- Robert Pincus, CIRES, NOAA
- Paulo Polito, University of São Paulo, Brazil
- Ivonne Radjawane, Bandung Institute of Technology
- Regina Rodrigues, Federal University of Santa Catarina
- Olga Sato, University of São Paulo, Brazil
- Elisabeth Sikes, Rutgers University
- Daithi Stone, National Institute of Water and Atmospheric Research
- Axel Timmerman, IBS Center for Climate Physics
- Caroline Ummenhofer, Woods Hole Oceanographic Institution
- Michael Wehner, Lawrence Berkeley Laboratory
- Allison Wing, Florida State University

## PROMOTIONS

Katrin Meissner: Professor  
Sarah Perkins-Kirkpatrick: Senior Lecturer  
Alex Sen Gupta: Associate Professor

## GRADUATIONS

### PHD STUDENTS

Oliver Angelil  
Maxime Colin  
Nadja Herger  
Yue Li  
Tamas Loughran  
Helen Millman  
Kaitlin Naughten  
Nidhi Nishant  
Marissa Parry  
Ariaan Purich  
Christopher Thomas

### HONOURS STUDENTS

Kate Simmonds  
Nish Su  
Nicholas Yeung

## MEDIA HIGHLIGHTS

- 25 stories in ABC outlets (radio/television/online)
- 3 stories in The Australian
- 6 stories in The Guardian
- 6 stories in Fairfax Metro Media
- Climate change to worsen urban air quality, lifting death toll. Sydney Morning Herald, Canberra Times, The Age, Brisbane Times. July 16. Jason Evans.
- Planet has only until 2030 to stem catastrophic climate change, experts warn. News 4, Citizen Digital, CNN, News 4 Oklahoma, Channel 3000. October 8. Sarah Perkins-Kirkpatrick.
- Shiny cities, fields can help cool the globe. The Australian, The Daily Telegraph, Northern Territory News, Adelaide Now, Brisbane Courier Mail, Geelong Advertiser, Herald Sun, Gold Coast Bulletin, The Mercury, Townsville Bulletin, Cairns Post, Weekly Times Now, Toowoomba Chronicle. February 1. Andy Pitman.
- CGTN (1), CNN (1), Cosmos Magazine (2), FOX23 News (1), Herald Sun (1), SBS News (2), SMH (3), Ten Daily (1), The Conversation (1), The Daily Telegraph (1), The Sun UK (1), Triple J (2), The Morning Show - Channel 7

## ARC GRANTS & FELLOWSHIPS COMMENCING IN 2018

NAME	GRANT	GRANT ID	AWARDED
ALEX SEN GUPTA	ARC Discovery Project	DP180101251	\$431 462
KATRIN MEISSNER	ARC Discovery Project	DP180100048	\$431 462
KATRIN MEISSNER	ARC Discovery Project	DP180102357	\$385 650
SARAH PERKINS-KIRKPATRICK	ARC Future Fellowship	FT180100606	\$601 504

## OUR VISION

THE CCRC IS A WORLD-LEADING RESEARCH CENTRE IN PHYSICAL AND BIOGEOCHEMICAL CLIMATE SCIENCE, EDUCATING THE AUSTRALIAN AND GLOBAL COMMUNITY ABOUT RISKS ASSOCIATED WITH CLIMATE VARIABILITY AND CHANGE.



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