

CLIMATE CHANGE RESEARCH CENTRE  
ANNUAL REPORT

2019



[www.ccrc.unsw.edu.au](http://www.ccrc.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.

## RESEARCH HIGHLIGHTS

- Australian wildfires will occur earlier in the year in the future: 10.1029/2019GL083699
- The most vulnerable experience the highest levels of air pollution: 10.1088/1748-9326/ab486a
- ENSO diversity is critical for managing Australia's future climate risks: 10.1175/BAMS-D-18-0057.1
- Plants do not decrease transpiration during heat extremes: 10.5194/bg-16-903-2019
- A new role for the indirect effect of aerosols: 10.1038/s41612-019-0089-1
- Varied observations help constrain climate projections: 10.1007/s00382-019-04690-8
- A new observationally-based runoff estimate: 10.5194/hess-23-851-2019
- Rainfall metrics help identify biases in extremes: 10.1088/1748-9326/ab51b6
- Humans helped cause the recent Tasman Sea marine heat wave: 10.1175/BAMS-D-18-0116.1
- The Montreal Protocol helped limit global warming: 10.1088/1748-9326/ab4874

## AWARDS & HONOURS

- Andy Pitman: Order of Australia (AO) for distinguished service as a leading researcher
- John Church: BBVA Foundation Frontiers of Knowledge Award in Climate Change
- Lisa Alexander: Royal Meteorological Society's 2018 Gordon Manley Weather Prize
- Laurie Menviel: Australian Academy of Science Dorothy Hill Medal
- Andy Pitman: Royal Society of Victoria's Medal for Excellence in Scientific Research
- Matt England: Royal Society of New South Wales' 2019 James Cook Medal
- Agus Santoso: Editor's Prize from the American Meteorological Society
- Melissa Hart, Angela Maharaj, Giovanni Di Virgilio: CASANZ Clean Air Award
- Lisa Alexander: AMOS Fellow
- Multiple student and postdoctoral awards: Annette Stellema, Rishav Goyal, Manon Sabot and Sanaa Hobeichi.

## RESEARCH OUTPUTS

Six reports and two book sections  
132 journal articles:

- 40% in top 10% most cited, 87% in SJR's top 10%
- 17 publications with student first authors
- 9 publications in *Nature* family journals

## NATIONAL & INTERNATIONAL LEADERSHIP

### CONFERENCE

- CCRC hosted the first International Conference of Paleoceanography (ICP13) in the Southern Hemisphere

### IPCC LEADERSHIP

- Jason Evans: Lead author, Intergovernmental Panel on Climate Change (IPCC) Special Report on Climate Change & Land Desertification Chapter
- Alejandro Di Luca: Lead author, IPCC 6th Assessment Report on 'Weather & climate extreme events in a changing climate'

### INTERNATIONAL LEADERSHIP

- Lisa Alexander: World Research Climate Programme (WCRP) Joint Scientific Committee; Co-Chair, WCRP Grand Challenge on Weather & Climate Extremes
- Katrin Meissner: Executive Committee & Scientific Committee for Past Global Changes (PAGES)
- Steve Sherwood: Steering Committee, WCRP Grand Challenge on Climate Sensitivity
- Matthew England: Chair, Advisory Board, European Southern Ocean Carbon & Heat Impact on Climate Project (SO-CHIC)
- Matthew England: Chair, Advisory Panel, Securing Multidisciplinary Understanding & Prediction of Hiatus & Surge Events Project UK
- Lisa Alexander: Executive Committee, International Union of Geodesy & Geophysics (IUGG), International Association of Meteorology & Atmospheric Sciences (IAMAS)
- Lisa Alexander: Chair, World Meteorological Organization (WMO) Expert Team on Sector-specific Climate Indices

- Jason Evans: WCRP Coordinated Regional Climate Downscaling Experiment (CORDEX) Science Advisory Team
- Laurie Menviel: Steering Committee, Quaternary Interglacials Working Group (QUIGS) PAGES
- Katrin Meissner: Steering Committee, Cycles of Sea-Ice Dynamics in the Earth system Working Group (C-SIDE) PAGES
- John Church: Chair, Transient Tracer-based Investigation of Circulation & Thermal Ocean Change (TICTOC) Advisory Committee
- Sarah Perkins-Kirkpatrick: Co-lead, WMO Commission for Climatology Expert team on Communication & Outreach
- Donna Green: Expert Advisory for Governing Plastic, Institute for Advanced Studies, Switzerland
- Andy Pitman: American Geophysical Union (AGU) International Committee for International Participation
- Alex Sen Gupta: Climate & Ocean Variability Predictability and Change (CLIVAR), North Western Pacific Ocean Circulation & Climate Experiment (NPOCE) Committee
- Andrea Taschetto: CLIVAR Tropical Basin Interactions Working Group
- Gab Abramowitz: Global Land & Atmosphere System Study, WCRP

### NATIONAL LEADERSHIP

- Angela Maharaj: Australian Meteorological & Oceanographic Society (AMOS), Vice President
- Andrea Taschetto: AMOS Council Member
- Andy Pitman: National Collaborative Research Infrastructure Strategy
- Andy Pitman: Review of Climate Risk Method for Regional Water Strategies NSW DPIE
- Sarah Perkins-Kirkpatrick: Co-convenor, AMOS Annual Conference.

## EDITORIAL ROLES

- Lisa Alexander: Editor-in-Chief, *Weather and Climate Extremes*
- Laurie Menviel: Co-Editor-in-Chief, *Climate of the Past*
- Jason Evans: Editor, *Journal of Climate*
- Andy Pitman: Associate Editor, *International Journal of Climatology*
- Sarah Perkins-Kirkpatrick: Associate Editor, *Scientific Reports*
- Donna Green, Katrin Meissner: Executive Editorial Board, *Environmental Research Letters*
- Steve Sherwood: Editorial Board, *Environmental Research Letters*
- Martin De Kauwe: Associate Editor, *Biogeoscience*
- Martin De Kauwe: Editorial Board, *Global Change Biology*
- Martin De Kauwe: Editorial Board, *New Phytologist*
- Agus Santoso: Editor, AGU Monograph 'El Nino Southern Oscillation in a Changing Climate'
- Alex Sen Gupta: Guest Editor, *Oceanography* 2019, special issue on 'Ocean Warming'
- Andrea Taschetto: Guest Editor of *Atmosphere on Weather and Climate Extremes*.
- Andrea Taschetto: Associate Editor of the *Journal of Southern Hemisphere Earth Systems Science*
- Gab Abramowitz: Associate Editor for *Journal of Hydrometeorology*

## PROMOTIONS

Gab Abramowitz: Associate Professor  
 Lisa Alexander: Professor  
 Martin De Kauwe: Senior Lecturer  
 Giovanni Di Virgilio: Lecturer

## VISITORS

- Stephen Griffies (GFDL)
- Ed Hawkins (University of Reading, UK)
- Michael Mann (Director, Penn State ESSC)
- Hugh Morrison (US NCAR)
- Dani Or (ETH Zürich)
- Gavin Schmidt (Director, NASA GISS)
- Joe Scutt Phillips, Secretariat of the Pacific Community
- Caroline Ummenhofer (WHOI)

## GRADUATIONS

### PhD STUDENTS

Jiawei Bao  
 Arden Burrell  
 Steefan Contractor  
 James Goldie  
 Mia Gross  
 Ned Haughton  
 Sanaa Hobeichi  
 Mathew Lipson  
 Sarah Perry

### HONOURS STUDENTS

Sebastian McKenna  
 Ritwik Misra

## MEDIA HIGHLIGHTS

- 21 stories in ABC outlets (radio/television/online)
- 5 stories in The Conversation
- 7 stories in The Guardian
- 14 stories in Fairfax Metro Media
- As Water Runs Low, Can Life in the Outback Go On? New York Times. 8/12. Andy Pitman
- Lost and Found - Toxic, ABC Radio National BluePrint. 10/08. Donna Green
- Australia's hellish heat wave and wildfires, explained Vox. 30/12. Sarah Perkins-Kirkpatrick
- Channel 10 news, CNet, NBC News - US, Bloomberg (2), Daily Mail (2), Carbon Brief, Crikey, National Geographic (2), BBC, news.com.au, Newcastle Herald (2), Sky News, The Australian (4), Vox (2), The Express - UK, Fox News, New York Post, Vice, Daily Telegraph, The Morning Show - Channel 7

## PHILANTHROPY

\$300,000 AUD donated by John Church for 2019/2020, matched by the Faculty of Science.

## ARC GRANTS & FELLOWSHIPS COMMENCING IN 2019

| NAME            | GRANT                 | GRANT ID    | AWARDED   |
|-----------------|-----------------------|-------------|-----------|
| JOHN CHURCH     | ARC Discovery Project | DP190101173 | \$419 000 |
| MARTIN DE KAUWE | ARC Discovery Project | DP190101823 | \$430 000 |
| MARTIN DE KAUWE | ARC Discovery Project | DP180101253 | \$461,000 |
| MATHEW ENGLAND  | ARC Discovery Project | DP190100494 | \$582 000 |
| LAURIE MENVIEL  | ARC Future Fellowship | FT180100606 | \$714 000 |
| ANNA UKKOLA     | ARC DECRA             | DE200100086 | \$357 000 |

## 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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