

# Kate Saunders

LECTURER

Queensland University of Technology (QUT)

+61 7 3138 9952 | [kate.r.saunders@qut.edu.au](mailto:kate.r.saunders@qut.edu.au) | [katerobsau](#) | [katerobsau](#)

## About me

- Primary research interests are statistical climatology and associated problems
- Topics include; statistical post-processing, climate extremes, compound events and quality control
- University lecturer with a preference courses about probability and statistics
- Postdoctoral research was in improving statistical post-processing methods for compound events forecasts
- Postgraduate research was in extreme value theory with climate applications
- PhD Thesis submitted October 2018, Graduation Ceremony April 2019
- Passionate about R programming, data visualisation and data ethics

## Employment and Education

### Lecturer (3 year fixed term contract)

Brisbane, Australia

QUEENSLAND UNIVERSITY OF TECHNOLOGY

Jan 2021 - Present

- Lecturer with courses including Statistical Data Analysis (MXN500) and Quantitative Methods in Science (SEB133)
- Lecturing responsibilities include: Unit coordination, and organising curriculum, teaching and assessment materials for the unit
- Research Interests: Statistical climatology, Statistical Post-processing, Compound Risk Assessment, Climate Extremes, Quality Control

### Postdoctoral Researcher

Delft, Netherlands

DELFT UNIVERSITY OF TECHNOLOGY

Oct. 2018 - Oct. 2020

- Collaborated on a joint project with Koninklijk Nederlands Meteorologisch Instituut (KNMI)
- Project Title: Probabilistic forecasts of extreme weather utilizing advanced methods from extreme value theory
- Research Interests: Statistical Post-processing, Compound Events, Multivariate Weather Forecasting, Multivariate Scoring
- Lecturer in Probability and Statistics for Aeronautical Engineers (WI2180LR-II)

### Doctor of Philosophy

Melbourne, Australia

THE UNIVERSITY OF MELBOURNE

Mar. 2014 - Oct. 2018

- Thesis Advisors: Prof. Peter Taylor, Prof. David Karoly and Dr. Alec Stephenson
- Thesis Title: An Investigation of Australian Rainfall using Extreme Value Theory
- Research Interests: Extreme Value Theory, Statistics, Max-stable Processes, Rainfall Extremes, Extremal Dependence, Quality Control

### Graduate Researcher

Melbourne, Australia

COMMONWEALTH SCIENTIFIC INSTITUTE OF TECHNOLOGY (CSIRO)

Feb. 2012 - Feb. 2014

- Research Interests: Natural Disaster Modelling, ie. Floods, Tsunamis, Sea Level Rise, Computational Fluid Dynamics

### Bachelor of Science (Honours I in Mathematics)

Brisbane, Australia

THE UNIVERSITY OF QUEENSLAND

Jul. 2010 - Jun. 2011

- Thesis advisors: Prof. Tony Roberts
- Thesis title: Mean First Passage Time for Discrete Periodic Networks

### Bachelor of Science

Brisbane, Australia

THE UNIVERSITY OF QUEENSLAND

Feb. 2007 - Jun. 2010

- Major in mathematics

## Publications

### Quality control and bias adjustment of crowd sourced wind speed observations

In Submission

QUARTERLY JOURNAL OF THE ROYAL METEOROLOGICAL SOCIETY

2021

- J. Chen, K. R. Saunders, and K. Whan

### Redefining Southern Australia's Climatic Regions and Seasons

JOURNAL OF SOUTHERN HEMISPHERE EARTH SYSTEMS SCIENCE

2021

- S. Fiddes, A. Pepler, K. R. Saunders, and P. Hope
- DOI: 10.1071/ES20003

## Attribution of the Australian Bushfire Risk to Anthropogenic Climate Change

NATURAL HAZARDS EARTH SYSTEM SCIENCES

2021

- G. J. van Oldenborgh, F. Krikken, S. Lewis, N. J. Leach, F. Lehner, K. R. Saunders, M. van Weele, K. Haustein, S. Li, et al.
- DOI: 10.5194/nhess-21-941-2021

## A Regionalisation Approach for Rainfall based on Extremal Dependence

EXTREMES

2020

- K.R. Saunders, A.G. Stephenson, AG and D.J. Karoly
- DOI: 10.1007/s10687-020-00395-y

## An Investigation of Australian Rainfall Using Extreme Value Theory

PHD THESIS

2018

- K.R. Saunders
- Identifier: <http://hdl.handle.net/11343/220318>

## The Winning Entry for the EVA2017 Competition for Spatiotemporal Prediction of Extreme Rainfall using Generalized Extreme Value Quantiles

EXTREMES

2018

- A.G. Stephenson, K. Saunders and L. Tafakori
- DOI: 10.1007/s10687-018-0321-0

## The Spatial Distribution of Rainfall Extremes and the Influence of El Niño Southern Oscillation

WEATHER AND CLIMATE EXTREMES

2017

- K. Saunders, A.G. Stephenson, P.G. Taylor, and D. Karoly
- DOI: 10.1016/j.wace.2017.10.001

## Assessing Sea Level Rise Risks to Coastal Floodplains in the Kakadu Region, Northern Australia, using a tidally-driven hydrodynamic model

MARINE AND FRESHWATER RESEARCH

2016

- P. Bayliss, K. Saunders, L. Dutra, L. Melo, J. Hilton, M. Prakash, F. Woolard
- DOI: 10.1071/MF16049

## Application of Smoothed Particle Hydrodynamics for Modelling Gated Spillway Flows

APPLIED MATHEMATICAL MODELLING

2014

- K. Saunders, M. Prakash, P.W. Cleary and M. Cordell
- DOI: 10.1016/j.apm.2014.05.008

## Supervision Experience

---

### Jiyu Chen - Masters Thesis

*Utrecht University*

PRIMARY CO-SUPERVISORS: KATE SAUNDERS AND KIRIEN WHAN AT KNMI, WITH UNIVERSITY CO-SUPERVISOR: JASON FRANK

2020

- Project Title: Quality control and verification of citizen science wind observations
- Paper in submission for Quarterly Journal of the Royal Meteorological Society
- KNMI also provided additional funding to produce a quality controlled dataset and an R Package

### Kieran Maguire - Undergraduate Project

*The University of Melbourne*

CO-SUPERVISORS: KATE SAUNDERS AND PETER TAYLOR

2016

- Project Title: Identifying spurious inhomogeneities in daily rainfall observations
- The technical report from this project was shared with the Bureau of Meteorology

## Grants

---

### Research Support Scheme (\$15,000 AUD)

*ACEMS*

APPLICANTS: DR. BORIS BERANGER (UNSW), DR. KATE SAUNDERS (TU DELFT) AND DR. ALEC STEPHENSON (CSIRO)

2020

- Grant Title: Modelling of Environmental and Climate Extremes
- This grant is to foster collaboration between ACEMS Research Fellows and Associate Investigators
- As corona prevents international travel this funding went into stasis
- This funding can now be used for domestic travel but rolling lockdowns have made this difficult

## R Consortium Grant (\$6,000 USD / \$8,200 AUD)

R Consortium

APPLICANTS: DR. JACKON KWOK (UOM) AND DR. KATE SAUNDERS (TU DELFT)

2020

- Grant Title: Interactive Visualisations in R via R-to-JavaScript-transpilation
- This grant funds the development of projects that help the R community
- This is part one of a two part proposal
- RConsortium has encouraged submission of the second part after the completion of the first set of milestones.

## Scholarships, Awards and Prizes

### Finalist for the Harry Otten Prize in Meteorology

European Meteorological Society

1ST PRIZE: €25,500 (\$40,000 AUD), 2ND/3RD PRIZE: €5,000 (\$8,000 AUD)

2021

- Final announcement to be made at the September Meeting of the European Meteorological Society
- Joint applicant with Dr. Kirien Whan at KNMI

### Laureate Fellowship: Postgraduate Researcher Award

The University of Melbourne

\$30,000 AUD PER ANNUM

2014 – 2018

- Awarded in lieu of the Australian Postgraduate Award (\$25,000 AUD per annum)

### Postgraduate Top Up Scholarship

CSIRO

\$10,000 PER ANNUM

2015 – 2018

- Awarded to outstanding graduates to undertake postgraduate research

### Science Abroad Travelling Scholarship

The University of Melbourne

\$1,500 AUD IN TOTAL

2016

- Awarded to outstanding graduates to undertake research abroad

## Other Academic Activities

### INVITED TALKS

#### Bureau of Meteorology Research Seminar

Virtual

BUREAU OF METEOROLOGY

April, 2021

- Second Wind: Extending the official wind speed records with citizen science observations

#### Machine Learning in the Netherlands (ML in NL)

Amsterdam, Netherlands

PICNIC DATA SCIENCE

April, 2020 (Cancelled Due to Corona)

- Examining our Implicit Assumptions when Clustering

#### Probability Seminar

Newcastle, UK

NEWCASTLE UNIVERSITY

March, 2020 (Cancelled Due to Corona)

- Changing Spatial Dependence of Heatwaves

#### Extremes TiDE Seminar Series

Tilburg, Netherlands

TILBURG UNIVERSITY

February, 2019

- A Regionalisation Approach for Extremes

### WORKSHOP ORGANISATION

#### Statistical Post-Processing Workshop

TU Delft, Netherlands

JOINT WORKSHOP BETWEEN KNMI AND TU DELFT

2019

- Inaugural workshop designed to foster collaboration between statistics and climate researchers

#### German Climate and Energy College Retreat

Hidden Vale, Victoria

MEMBERS OF THE EXTENDED COLLEGE COMMUNITY

2018

- A workshop to promote knowledge sharing between PhD students

#### Applied Probability Group Retreat

Lorne, Victoria

UNIVERSITY OF MELBOURNE RESEARCHERS

2017

- An internal workshop to share new research ideas in applied probability

### JOURNAL REFEREEING

Weather and Climate Extremes, Environmetrics, Extremes, Spatial Statistics, Stochastic Networks

### CONTRIBUTION TO PROMOTING WOMEN IN STEM AND GENERAL DIVERSITY

#### ACEMS Equity and Diversity Committee

Australia

CHAIR (NEWLY APPOINTED)

2021

- ACEMS is underpinned by a commitment to equal opportunity and diversity

## Reboot STEMM Workshop

VOLUNTEER PARTICIPANT

- Involved in think-tank discussion with early- and mid-career researchers (EMCRs)
- Helped co-design a strategy for a more inclusive and diverse way of defining, recognising and rewarding success

## An Introduction to Web Scraping using Rvest

INVITED PRESENTATION FOR R-LADIES ROTTERDAM

- R-Ladies' is a diversity initiative, whose aim is to help empower underrepresented minorities within the R community.

## Women in mathematics panel discussion on affirmative action

EVENT ORGANISER AND PANEL CHAIR

- International Womens' Day Event #BeBoldForChange

## A Celebration of Dr. Alison Harcourt (Order of Australia)

EVENT JOINT ORGANISER WITH GALA CAMACHO FERRARI

- International Womens' Day Event #MakItHappen

## MENTORING

### Grabbing your Audience's Attention: Advice on Giving Talks

ACEMS SEMINAR SERIES

- Mentoring talk live streamed across ACEMS university nodes

## COMMITTEE POSITIONS

### Postgraduate Student President

STATISTICS AND MATHEMATICS STUDENT SOCIETY (STAMPS)

- Some events run include: National Science Week Events, Careers Panel, Social Events

## Outreach & Science Communication

---

### ART EXHIBITION

#### ClimArt: R Package

WITH PROF. DAVID KAROLY

- Produced code that visualises climate observations and how these observations are changing.
- These visualisations were used in an exhibition called Climate Change versus Art.

### POPULAR SCIENCE ARTICLES

#### Is Usain Bolt the greatest athlete of all time? That's not what the numbers say

K. SAUNDERS AND A.G. STEPHENSON

- Article statistics: 20,609 Readers, 275 Shares

#### Explainer: was the Sydney storm 'once-in-a-century'?

K. SAUNDERS, D. KAROLY AND P.G. TAYLOR

- Article statistics: 8591 Readers, 80 Shares

### SCHOOLS

#### Maths like a Mathematician

ACEMS MATHSCRAFT

- Initiative to work with schools to teach mathematical style thinking to students

#### Mathematicians in Schools

CSIRO INITIATIVE

- Presented my research in schools to help students understand how maths is used in the real world

## Affiliations

---

- Member of the QUT Centre for Data Science
- Member of the European COST Action for compound events (Damocles)
- Associate Investigator with Australian Centre of Excellence in Mathematical and Statistical Frontiers (ACEMS)
- German Climate and Energy College (Alumni)

Virtual

2021

Rotterdam, Netherlands

2019

University of Melbourne

2016

University of Melbourne

2015

University of Melbourne

2019

University of Melbourne

2015 – 2016

The Conversation

2017

The Conversation

2015

Multiple locations

2015 - 2017

Mentone Girls' Grammar School

2012 - 2013