

# Maurice F. Huguenin

POSTDOCTORAL RESEARCH ASSOCIATE · BIOGEOCHEMICAL MODELLING RESEARCH UNIT

GEOMAR Helmholtz Centre for Ocean Research, 24148 Kiel, Germany

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## Professional experience

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### GEOMAR Helmholtz Centre for Ocean Research Kiel

Kiel, SH, Germany

POSTDOCTORAL RESEARCH ASSOCIATE, BIOGEOCHEMICAL MODELLING RESEARCH UNIT

Oct. 2025 - **present** · 1 mos

- Investigating how mesoscale ocean eddies affect ocean heat and carbon uptake under future climate scenarios
- Setting up, preparing, compiling, running and analysing output from the Earth System Model FOCI-MOPS in 1/2° horizontal resolution

### Swiss Federal Institute of Technology Zurich

Zurich, ZH, Switzerland

VISITING SCIENTIST, ENVIRONMENTAL PHYSICS GROUP

Jun. 2025 - Aug. 2025 · 3 mos

- Continuing my postdoctoral work at the University of New South Wales and ongoing collaborations at the Woods Hole Oceanographic Institution:
  - Understanding the link between shifts in the Interdecadal Pacific Oscillation and Antarctic margin dense shelf water formation
  - Investigating the variability of Patagonian shelf conditions and their impacts on albatross breeding success
- Lecture assistant for the UNSW course CLIM1001 Introduction to Climate Change (20% workload)

### Woods Hole Oceanographic Institution

Woods Hole, MA, United States

VISITING SCIENTIST, CLIMATE VARIABILITY AND CHANGE LAB

Aug. 2024 - Jun. 2025 · 11 mos

- Continuing my postdoctoral work at the University of New South Wales with collaborations at the Woods Hole Oceanographic Institution
- Writing a National Science Foundation grant proposal as a co-principal investigator

### University of New South Wales

Sydney, NSW, Australia

POSTDOCTORAL RESEARCH ASSOCIATE, CENTRE FOR MARINE SCIENCE AND INNOVATION (CMSI) & AUSTRALIAN

CENTRE FOR EXCELLENCE IN ANTARCTIC SCIENCE (ACEAS)

Jun. 2023 - Aug. 2025 · 2 yrs 3 mos

- Investigating the impact of interannual to decadal natural climate variability on Antarctic dense shelf water formation
- Running sensitivity simulations in the 1/10° configuration of ACCESS-OM2 (which combines the MOM5.1 ocean model with the CICE5.1.2 sea ice model)

### University of New South Wales

Sydney, NSW, Australia

PHD CANDIDATE, CLIMATE CHANGE RESEARCH CENTRE (CCRC) & AUSTRALIAN CENTRE OF EXCELLENCE IN CLIMATE

EXTREMES (CLEX)

Jun. 2019 - May 2023 · 4 yrs

- Setting up, preparing, running and analysing output from ACCESS-OM2 in all three horizontal configurations (1°, 1/4° and 1/10°)
- Publishing PhD thesis chapters in high-impact scientific journals
- Presenting research outcomes at national and international workshops, seminars and conferences
- Contributing to proposals for computational time and storage on the Gadi supercomputer through the annual Australian National Computational Merit Allocation Scheme (2018 - **present**)

### Commonwealth Scientific and Industrial Research Organisation

Hobart, TAS, Australia

PHYSICAL OCEANOGRAPHY VOYAGE PARTICIPANT ON RV Investigator

May 2021 - June 2021 · 4 wks

- Recovering and re-deploying moorings at 27°S to measure property transports in the East Australian Current
- Operating, sampling and analysing Conductivity, Temperature and Depth (CTD) measurements
- Deploying Argo, Biogeochemical Argo floats and XBT probes

### MeteoSwiss/Swiss Federal Institute of Technology Zurich

Zurich, ZH, Switzerland

RESEARCH ASSISTANT

Sep. 2018 - Apr. 2019 · 8 mos

- Organising, running and planning meetings as the research project lead
- Analysing coupled climate simulation output from the single large ensemble CESM12-LE and CMIP5 models
- Scientific manuscript writing
- Publication #2 ([see below](#)) resulted from this work

### University of New South Wales

Sydney, NSW, Australia

RESEARCH INTERN, CLIMATE CHANGE RESEARCH CENTRE (CCRC) & AUSTRALIAN CENTRE OF EXCELLENCE IN

CLIMATE EXTREMES (CLEX)

Sep. 2017 - Jul. 2018 · 11 mos

- Self-organising and self-funding a research stay in Sydney to complete my Master's thesis abroad
- Designing, running and analysing sensitivity simulations in the global ocean-sea ice model MOM-SIS-025
- Giving seminar and workshop presentations
- Thesis writing in  $\LaTeX$

## Education

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### University of New South Wales

Sydney, NSW, Australia

PHD IN CLIMATE SCIENCE

Jun. 2019 - May 2023

- Thesis title: Processes and Dynamics of Global to Regional Ocean Heat Uptake and Variability
- Web link to my thesis: <https://doi.org/10.26190/unsworks/25224>
- [Two-page summary on github](#)
- Supervisors: Dr. Ryan M. Holmes & Prof. Matthew H. England

### Swiss Federal Institute of Technology Zurich

Zurich, ZH, Switzerland

MSC ETH IN ATMOSPHERIC AND CLIMATE SCIENCE

Sep. 2016 - Jun. 2018

- Thesis title: Mechanisms Driving Ocean Heat Uptake and Warm Water Volume Variability During Idealized ENSO Events
- [PDF on github](#)
- Supervisors: : Dr. Ryan M. Holmes, Prof. Matthew H. England, Dr. Iselin Medhaug & Prof. Reto Knutti
- Grade: 6. Grading scale: 6 is the highest, 1 is the lowest grade; pass mark is 4

### Swiss Federal Institute of Technology Zurich

Zurich, ZH, Switzerland

BSC ETH IN EARTH SCIENCES

Sep. 2013 - Jun. 2016

- Thesis title: Ocean Heat Storage and Implications on Sea Level Rise Using CCSM4 Model Output for 1993-2016
- [PDF on github](#)
- Supervisors: Dr. Iselin Medhaug & Prof. Reto Knutti
- Grade: 5.5

### Additional scientific training

### Australian Research Council Centre for Excellence in Antarctic Science

Triabunna, TAS, Australia

WINTER SCHOOL ON SEA LEVEL CHANGE

17 - 24 Jun. 2024

### Australian Research Council Centre for Excellence in Antarctic Science

Kioloa, NSW, Australia

AUTUMN SCHOOL ON SEA ICE - BIOLOGY TO PHYSICS

22 - 26 May 2023

### University of Tasmania, Institute for Marine and Antarctic Studies

Hobart, TAS, Australia

QUANTITATIVE MARINE SCIENCE PHYSICAL OCEANOGRAPHY COURSE

31 Jan. - 4 Feb. 2022

### Australian Research Council Centre of Excellence for Climate Extremes

Melbourne, VIC, Australia

WINTER SCHOOL ON CLIMATE MODELLING

24 - 28 Jun. 2019

## Engagement, Impact and Leadership

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### Grant Reviewer

Woods Hole, MA, United States

FOR POLAR SCIENCE EARLY CAREER COMMUNITY OFFICE (PSECCO) CONFERENCE TRAVEL GRANT APPLICATIONS

Jun. 2025

### Session Co-convener

Vienna, Austria

ORGANISING THE EUROPEAN GEOPHYSICAL UNION 2025 SESSION OS1.6 - THE SOUTHERN OCEAN IN A CHANGING

CLIMATE: PHYSICAL, BIOGEOCHEMICAL, AND ECOSYSTEM PROCESSES

Nov. 2024 - May 2025

### ECR Participant

Sydney, NSW, Australia

GIVING INPUT FOR THE AUSTRALIAN ANTARCTIC SCIENCE DECADAL PLAN (2023 - 2033) IN WORKSHOPS, SEMINARS AND SURVEYS

Jun. 2023 - Jun. 2024

### Workshop Organising Committee Member

Hobart, TAS, Australia

PLANNING THE ANNUAL AUSTRALIAN CENTRE FOR EXCELLENCE IN ANTARCTIC SCIENCE (ACEAS) WORKSHOP

Oct. - Nov. 2023

### Seminar Committee Member

Sydney, NSW, Australia

RUNNING THE MONTHLY ACEAS AND CCRC RESEARCH CENTRE SEMINARS

2022 - 2023

### Reviewer

Sydney, NSW, Australia

GEOPHYSICAL RESEARCH LETTERS

Jul. - Aug. 2022

- Finding buddies for new PhD students
- Organising practise talks for centre-wide formal PhD reviews
- Forwarding administrative information
- Organising student meetings

## Publications

I have a profile on [Google Scholar](#).

In progress:

7. Huguenin, M. F., Ryan, S., Ummenhofer, C. C., & England, M. H. (2024) Linking the recent decrease in Weddell Sea dense shelf water formation to shifts in the Interdecadal Pacific Oscillation. *In preparation*.

Peer-reviewed and published:

6. England, M. H., Li, Z., Huguenin, M. F., Kiss, A. E., Sen Gupta, A., Holmes, R. M., & Rahmstorf, S. (2024) Drivers of the largest ever recorded marine heat wave in the North Atlantic. **Nature**. <https://doi.org/10.1038/s41586-025-08903-5>.
5. Huguenin, M. F., Holmes, R. M., Spence, P., & England, M. H. (2024). Subsurface warming of the West Antarctic continental shelf linked to El Niño-Southern Oscillation. **Geophysical Research Letters**, 51, e2023GL104518. <https://doi.org/10.1029/2023GL104518>.
4. Huguenin, M. F., Holmes, R. M., & England, M. H. (2022). Drivers and distribution of global ocean heat uptake over the last half century. **Nature Communications**. 13, 4921. <https://doi.org/10.1038/s41467-022-32540-5>.
3. Huguenin, M. F., Holmes, R. M., & England, M. H. (2020). Key Role of Diabatic Processes in Regulating Warm Water Volume Variability Over ENSO Events. **Journal of Climate**. 33, 9945–9964. <https://doi.org/10.1175/JCLI-D-20-0198.1>.
2. Huguenin, M. F., Fischer, E. M., Kotlarski, S., Scherrer, S. C., Schwierz, C., & Knutti, R. (2020). Lack of Change in the Projected Frequency and Persistence of Atmospheric Circulation Types Over Central Europe. **Geophysical Research Letters**, 47. <https://doi.org/10.1029/2019GL086132>.
1. Santoso, et al. (2019). Dynamics and Predictability of El Niño-Southern Oscillation: An Australian Perspective on Progress and Challenges. **Bulletin of the American Meteorological Society**, 100, 403-420. <https://doi.org/10.1175/BAMS-D-18-0057.1>.

## Data sets and analysis code

6. Huguenin, M. F., Holmes, R. H., Spence, P. & England, M. H. (2024). ENSO-Antarctica\_data (Version 20240118) [Data set]. **Zenodo**. <https://doi.org/10.5281/zenodo.10526062>.
5. Huguenin, M. F., Holmes, R. H., Spence, P. & England, M. H. (2024). ENSO-Antarctica\_scripts (20240126\_v2) [Analysis code]. **Zenodo**. <https://doi.org/10.5281/zenodo.10570459>.
4. Huguenin, M. F., Holmes, R. H. & England, M. H. (2023). ACCESS-OM2 1° resolution global repeat decade full forcing interannual simulation data for 1972-2018 (1.0) [Data set]. **Zenodo**. <https://doi.org/10.5281/zenodo.8343648>.
3. Huguenin, M. F., Holmes, R. H. & England, M. H. (2023). ACCESS-OM2 1° resolution global repeat decade forcing control simulation data for 1972-2018 (1.0) [Data set]. **Zenodo**. <https://doi.org/10.5281/zenodo.8339578>.
2. Huguenin, M. F., Holmes, R. H. & England, M. H. (2022). Data and analysis scripts for Huguenin et al. (2022), Nature Communications (20220721\_v2) [Analysis code]. **Zenodo**. <https://doi.org/10.5281/zenodo.6873094>.
1. Huguenin, M. F., Fischer, E. M., Kotlarski, S., Scherrer, S. C., Schwierz, C., & Knutti, R. (2020) maurice-huguenin/europe\_circulation\_types: Analysis Scripts and Data (20240628\_v2) [Analysis scripts and data]. **Zenodo**. <https://doi.org/10.5281/zenodo.12578019>.

## Selected conference presentations and seminars

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I have presented my research at more than [12](#) international conferences and various domestic/international workshops and seminars. A full list of my presentations can be seen on my [homepage](#).

### Rhode Island Physical Oceanography Seminar Series

INVITED SPEAKER

*Kingston, RI, USA*

*28 Feb. 2025*

### Physical Oceanography Dissertations Symposium - PODS XIII

INVITED PARTICIPANT

*Līhu'e, HI, United States*

*21 Oct. 2024*

### Woods Hole Oceanographic Institution Physical Oceanography Seminar

INVITED SPEAKER

*Woods Hole, MA, United States*

*1 Oct. 2024*

### Ocean Circulation and Climate Dynamics Colloquium

INVITED SPEAKER

*GEOMAR Kiel, online*

*26 Jun. 2023*

### Scripps Institution of Oceanography Climate, Atmospheric Sciences, and Physical Oceanography Seminar

INVITED SPEAKER

*La Jolla, CA, United States*

*6 Dec. 2022*

### College of Oceanic and Atmospheric Sciences Seminar

INVITED SPEAKER

*Oregon State University, online*

*17 Nov. 2020*

### Australian Meteorological and Oceanographic Society Annual Meeting

POSTER & ORAL PRESENTATION

*Darwin, NT, Australia*

*11 - 14 Jun. 2019*

### European Geophysical Union Annual Meeting

POSTER PRESENTATION

*Vienna, Austria*

*9 - 12 Apr. 2019*

## Research proposals

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### NSF Office of Polar Programs

SVENJA RYAN, MAURICE F. HUGUENIN & CAROLINE C. UMMENHOFER

*United States*

*12 Dec. 2024*

- Title: Variability and Trends in Southern Hemisphere Subpolar Gyres in High-Resolution Ocean and Climate Models: Implications for Dense Water Formation and Major Antarctic Ice Shelves
- Amount of request: USD 312,862
- Project not funded.

### National Computational Merit Allocation Scheme

MATTHEW H. ENGLAND ET AL.

*Australia*

*2019 - 2024*

- Title: Past, present and future climate variability and change in the Southern Ocean
- Annual call to submit proposals for computational walltime and storage on Australia's Gadi National Computational Infrastructure
- Amount of request: typically 15 Million Service Units & 60 TB storage, varying with group size

## Teaching experience

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### Lecture assistant

CLIM1001-GENS0401 COURSE INTRODUCTION TO CLIMATE CHANGE

*Sydney, NSW, Australia*

*Jun. - Aug. 2025*

- Moderation of online forum discussions for 70 students for the full course period
- Marking of student's online performance over the duration of the course
- 20% workload

### A Fun Introduction to LaTeX

CLIMATE CHANGE RESEARCH CENTRE FUN SEMINAR SERIES

*Sydney, NSW, Australia*

*25 Mar. 2024*

- Lecture material available at [https://github.com/mauricehuguenin/introduction\\_latex](https://github.com/mauricehuguenin/introduction_latex)

### Graduate teaching assistant

CLIM1001-GENS0401 COURSE INTRODUCTION TO CLIMATE CHANGE

*Sydney, NSW, Australia*

*2019 & 2023*

- Moderation of online forum discussions for week 7: Global circulation and climate variability
- Marking of individual student and group reports

## Memberships and communities

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|       |  |                       |
|-------|--|-----------------------|
| FYORD | <b>Foster Young Ocean Researcher Development</b> , Community member  | 2025 – <i>present</i> |
| APECS | <b>Association of Polar Early Career Scientists</b> , Community member   | 2022 – <i>present</i> |
| AGU   | <b>American Geophysical Union</b> , Full member  | 2019 – <i>present</i> |
| EGU   | <b>European Geophysical Union</b> , Full member  | 2018 – <i>present</i> |
| ACEAS | <b>Australian Research Council Australian Centre for Excellence in Antarctic Science</b> , PhD student and Postdoctoral research associate | 2022 – 2025           |
| CLEX  | <b>Australian Research Council Centre of Excellence for Climate Extremes</b> , PhD student and Associate investigator                      | 2018 – 2024           |
| AMOS  | <b>Australian Meteorological and Oceanographic Society</b> , Full member   | 2017 – 2022           |

## Honours & Awards

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### Selected participant

*Scex Rouge, VD, Switzerland*

GLACIER 3000 EXCURSION BY APECS SWITZERLAND AND THE SWISS POLAR INSTITUTE

19 Jul. 2024

- Event to explore one of Switzerland's iconic Alpine sites while connecting with fellow early-career polar and alpine researchers

### Early Career Scientist's Travel Support

*Vienna, Austria*

TOWARDS ATTENDING THE EUROPEAN GEOPHYSICAL UNION ANNUAL MEETING IN 2025

10 Jan. 2025

- EUR 575 conference registration fee waiver + refund of abstract processing charge

### Polar Science Early Career Community Office (PSECCO) Conference Travel Grant

*Boulder, CO, United States*

TOWARDS ATTENDING THE EUROPEAN GEOPHYSICAL UNION ANNUAL MEETING IN 2025

2 Oct. 2024

- USD 700

### Selected participant

*Līhu'e, HI, United States*

PHYSICAL OCEANOGRAPHY DISSERTATION SYMPOSIUM (PODS) XIII

19 Jul. 2024

- Boston - Līhu'e return flights and accommodation, meals & incidentals during the week-long workshop in Hawai'i
- [Article](#) in Kaua'i Now, the local news website

### Best lightning presentation

*Canberra, ACT, Australia*

ANNUAL COSIMA OCEAN MODELLING WORKSHOP

8 Sep. 2023

- Choice of pottery

### Best PhD Student Paper published in the centre in 2022

*Lorne, VIC, Australia*

ARC CENTRE OF EXCELLENCE FOR CLIMATE EXTREMES (CLEX)

17 Nov. 2022

- AUD 500

### Best PhD Student Presentation

*Sydney, NSW, Australia*

CLIMATE CHANGE RESEARCH CENTRE POSTGRADUATE REVIEWS

13 May 2022

- AUD 100 gift voucher

### Scientia PhD Scholarship

*Sydney, NSW, Australia*

UNIVERSITY OF NEW SOUTH WALES

29 Nov. 2018

- Awarded to PhD candidates who have shown exceptional research quality, and is valued at over AUD 200,000 across four years

## Media and outreach

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A full list of my outreach activities can be seen on my [homepage](#).

- WHOI PO News: [Experiencing an International Geophysics Conference as a Postdoc](#).
- The Conversation: [Heat from El Niño can warm oceans off West Antarctica – and melt floating ice shelves from below](#). This article reached over 18,000 readers worldwide.
- The Academic Minute Podcast: [Southern Ocean Takes on the Heat of Climate Change](#).
- ABC Radio Illawarra. I was live on the 8th of Sep. 2022 to talk about my heat uptake project and its implications
- UNSW Newsroom: [Southern Ocean takes on the heat of climate change](#).
- The Conversation: [The Southern Ocean absorbs more heat than any other ocean on Earth, and the impacts will be felt for generations](#). This article reached over 46,000 readers worldwide, and was featured in [The Guardian](#) and [Science Alert](#).
- CLEX Newsletter: [Towards an increased understanding of the East Australian Current – My voyage aboard RV Investigator](#).
- CLEX Research Brief: [Current climate models do not project a more persistent Central European weather](#).

# Skills

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**Operating Systems**    Unix-based high-performance computing at the National Computational Infrastructure, Canberra, AU

- Numerical modelling**
- [MOM-SIS](#) and [ACCESS-OM2](#): setting up the model via github, performing spin-up, creating input, running sensitivity experiments and analysing model output
  - CESM12-LE and CMIP5: analysing coupled large ensemble and multi-model output

**Programming languages**    Python, MATLAB, R,  $\LaTeX$ , bash

**Tools and software**    Jupyter kernels, emacs, vim, version control systems like git, github, Climate Data Operators (CDO)

**Web**    Rmd, HTML

- Languages**
- German: native
  - English: full professional proficiency, IELTS 8.5  $\Leftrightarrow$  CEFR Level C2
  - French: limited professional proficiency
  - Spanish: limited professional proficiency