Maurice F. Huguenin

Postdoctoral research associate · Physical Oceanography

Centre for Marine Science and Innovation, UNSW Sydney 2052, New South Wales, Australia

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Work experience

Swiss Federal Institute of Technology Zurich
Zurich, ZH, Switzerland

Visiting Scientist, Environmental Physics Group
*Jun. 2025 - **present***

- Continuing my postdoctoral work at the University of New South Wales
- Lecture assistant for the course CLIM1001 Introduction to Climate Change (one day/week workload)

Woods Hole Oceanographic Institution
Woods Hole, MA, United States

Visiting Scientist, Climate Variability and Change Lab
Aug. 2024 - Jun. 2025

- Continuing my postdoctoral work at the University of New South Wales
- 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 - **present***

- 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

- 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

- 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

- 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

- 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
- Writing of the thesis in LaTeX

Education

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

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. 2023 - **present***

ECR Participant *Sydney, NSW, Australia*
GIVING INPUT FOR THE AUSTRALIAN ANTARCTIC SCIENCE DECADAL PLAN (2023 - 2033) IN WORKSHOPS, SEMINARS AND SURVEYS *Jun. 2023 - **present***

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*

PhD Student Representative

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- 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 and on ORCID. My scientific publications include four as first-author and two as a co-author.

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

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.

Invited speaker for the University of Rhode Island Physical Oceanography Seminar Series
Kingston, RI, USA
PROCESSES AND DYNAMICS OF GLOBAL TO REGIONAL OCEAN HEAT UPTAKE AND VARIABILITY
28 Feb. 2025

Invited participant for the Physical Oceanography Dissertations Symposium
Līhuʻe, HI, United States
PROCESSES AND DYNAMICS OF GLOBAL TO REGIONAL OCEAN HEAT UPTAKE AND VARIABILITY
21 Oct. 2024

Woods Hole Oceanographic Institution Physical Oceanography Seminar
Woods Hole, MA, United States
PROCESSES AND DYNAMICS OF GLOBAL TO REGIONAL OCEAN HEAT UPTAKE AND VARIABILITY
1 Oct. 2024

Invited speaker for the Ocean Circulation and Climate Dynamics Colloquium
GEOMAR Kiel, online
DRIVERS AND DISTRIBUTION OF GLOBAL OCEAN HEAT UPTAKE OVER THE LAST HALF CENTURY
26 Jun. 2023

Invited speaker for the Scripps Institution of Oceanography Climate, Atmospheric Sciences, and Physical Oceanography Seminar
La Jolla, CA, United States
UNDERSTANDING THE DRIVERS OF INTERANNUAL TO MULTI-DECADAL GLOBAL AND REGIONAL OCEAN TEMPERATURE CHANGE
6 Dec. 2022

Invited speaker for the College of Oceanic and Atmospheric Sciences Seminar
Oregon State University, online
KEY ROLE OF DIABATIC PROCESSES IN CHANGING WARM WATER VOLUME VARIABILITY DURING ENSO EVENTS
17 Nov. 2020

Australian Meteorological and Oceanographic Society Annual Meeting
Darwin, NT, Australia
DIABATIC CONTRIBUTION TO OCEAN HEAT VARIABILITY DURING ENSO EVENTS, OCEAN SCIENCES MEETING (POSTER & ORAL PRESENTATION)
11 - 14 Jun. 2019

European Geophysical Union Annual Meeting
Vienna, Austria
CHANGES IN THE FREQUENCY AND PERSISTENCE OF CENTRAL EUROPEAN CIRCULATION TYPES (POSTER PRESENTATION)
9 - 12 Apr. 2019

Research proposals

NSF Office of Polar Programs
United States
SVENJA RYAN, MAURICE F. HUGUENIN & CAROLINE C. UMMENHOFER
Submitted 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
Australia
MATTHEW H. ENGLAND ET AL.
*2022 – **present***
- 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

Lecture assistant
Sydney, NSW, Australia
CLIM1001-GENS0401 COURSE INTRODUCTION TO CLIMATE CHANGE
Jun. - Aug. 2025
- Moderation of online forum discussions for 70 students for the full course period
- Marking of summary reports
- One day/week workload

A Fun Introduction to LaTeX
Sydney, NSW, Australia
CLIMATE CHANGE RESEARCH CENTRE FUN SEMINAR SERIES
25 Mar. 2024
- Lecture material available at https://github.com/mauricehuguenin/introduction_latex

Graduate teaching assistant

Sydney, NSW, Australia

CLIM1001-GENS0401 COURSE INTRODUCTION TO CLIMATE CHANGE

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

APECS	**Association of Polar Early Career Scientists,** Community member	*2022 – **present***
ACEAS	**Australian Research Council Australian Centre for Excellence in Antarctic Science,** PhD student and Postdoctoral research associate	*2022 – **present***
EGU	**European Geophysical Union,** Full member	*2018 – **present***
CLEX	**Australian Research Council Centre of Excellence for Climate Extremes,** PhD student and Associate investigator	*2018 – 2024*
AGU	**American Geophysical Union,** Full member	*2019 – 2022*
AMOS	**Australian Meteorological and Oceanographic Society,** Full member	*2017 – 2022*

Honours & Awards

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

Līhuʻe, HI, United States

PHYSICAL OCEANOGRAPHY DISSERTATION SYMPOSIUM (PODS) XIII

19 Jul. 2024

- Boston - Līhuʻe return flights and accommodation, meals & incidentals during the week-long workshop in Hawaiʻi

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

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.
- 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 abord RV Investigator .
- CLEX Research Brief: Current climate models do not project a more persistent Central European weather.

Skills

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, version control systems like git, github, Climate Data Operators (CDO)
Web	Rmd, HTML
Languages	• German (native) • English (full professional proficiency, IELTS 8.5 ≡ CEFR Level C2) • French & Spanish (limited professional proficiency)