

Maurice F. Huguenin

POSTDOCTORAL RESEARCH ASSOCIATE · PHYSICAL OCEANOGRAPHY

Woods Hole Oceanographic Institution, Woods Hole 02543, Massachusetts, USA

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Research interests

- Large-scale physical oceanography
- Ocean-sea ice and coupled climate modelling
- Internal climate variability and its atmospheric teleconnections
- Ocean heat content
- Central European atmospheric circulation
- International Environmental Politics
- Southern Ocean and polar research voyages and field work

Work experience

Woods Hole Oceanographic Institution

Woods Hole, MA, United States

VISITING SCIENTIST, CLIMATE VARIABILITY AND CHANGE LAB

Aug. 2024 - **present**

- 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

Jun. 2023 - **present**

CENTRE FOR EXCELLENCE IN ANTARCTIC SCIENCE (ACEAS)

- Investigating the impact of 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

Jun. 2019 - May 2023

EXTREMES (CLEX)

- 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 a proposal 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

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

University of New South Wales

Sydney, NSW, Australia

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

Sep. 2017 - Jul. 2018

CLIMATE EXTREMES (CLEX)

- 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
- <https://doi.org/10.26190/unsworks/25224>
- Supervisors: : Ryan M. Holmes & 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: : Ryan M. Holmes, Matthew H. England, Iselin Medhaug & 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: Iselin Medhaug & 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

Session Co-convenor

Vienna, Austria

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

Nov. 2023 - **present**

CLIMATE: PHYSICAL, BIOGEOCHEMICAL, AND ECOSYSTEM PROCESSES

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

ECR Participant

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

Jun. 2023 - **present**

AND SURVEYS

Geophysical Research Letters

REVIEWER

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](#). My scientific publications include **four** as first-author and **one** 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*.
6. England, M. H., Li, Z., **Huguenin, M. F.**, Kiss, A. E., Sen Gupta, A. & Rahmstorf, S. (2024) Drivers of the largest ever recorded marine heat wave in the North Atlantic. *In review at Nature*.

Peer-reviewed and published:

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 national/international workshops. A full list of my presentations can be seen on my [homepage](#).

Physical Oceanography Dissertations Symposium

Līhu'e, 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

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

Memberships and communities

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

Honours & Awards

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

Boulder, CO, United States

TOWARDS ATTENDING THE EUROPEAN GEOPHYSICAL UNION ANNUAL MEETING IN 2025

Oct. 2024

- USD 700

Selected participant

Līhu'e, HI, United States

PHYSICAL OCEANOGRAPHY DISSERTATION SYMPOSIUM (PODS) XIII

Jul. 2024

- Boston - Līhu'e return flights and accommodation, meals & incidentals during the week-long workshop in Hawai'i

Best lightning presentation

Canberra, ACT, Australia

ANNUAL COSIMA OCEAN MODELLING WORKSHOP

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)

Nov. 2022

- AUD 500

Best PhD Student Presentation

Sydney, NSW, Australia

CLIMATE CHANGE RESEARCH CENTRE POSTGRADUATE REVIEWS

May 2022

- AUD 100 gift voucher

Scientia PhD Scholarship

Sydney, NSW, Australia

UNIVERSITY OF NEW SOUTH WALES

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](#).

- 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 aboard RV Investigator](#).
- CLEX research brief: [Current climate models do not project a more persistent Central European weather](#).

Professional references

Prof. Matthew H. England

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PHD SUPERVISOR AND POSTDOC ADVISOR

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Centre for Marine Science and Innovation, Level 4 Biological Sciences D26, University of New South Wales, Sydney NSW 2052, Australia

Dr. Caroline C. Ummenhofer

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POSTDOC ADVISOR

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Clark Laboratory 3rd Floor PO, Woods Hole Oceanographic Institution, Woods Hole MA 02543, United States

Skills

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

Numerical modelling

- MOM-SIS and ACCESS-OM2: setting up, creating input, running and analysing model output
- CESM12-LE and CMIP6: analysing coupled large ensemble and multi-model output

Programming languages Python (5.5 years full-time working experience), MATLAB (3 years), R (1 year), \LaTeX , bash

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

Web Rmd, HTML

- German (native)

Languages

- English (full professional proficiency, IELTS C2)

- French & Spanish (limited professional proficiency)