Nora L. S. Fahrenbach

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RESEARCH INTERESTS

Climate dynamics | Large-scale atmospheric circulation | Climate variability | Aerosol-climate interactions | Monsoons | Nature-based solutions for carbon capture | Land use change | Atmosphere-biosphere interactions

EDUCATION

ETH Zürich, Zurich, Switzerland Sep. 2023 - present
Ph.D. in Climate Dynamics *Supervisor: Robert Jnglin Wills*
- Ph.D. on the climate and circulation response to reforestation

University of Edinburgh, Edinburgh, UK Sep. 2018 - July 2023
Integrated M.Sc. in Geophysics and Meteorology *Classification: 1st*
- Master's thesis on the anthropogenic aerosol influence on multi-decadal Australian monsoon trends
- Bachelor's thesis on the climate response to COVID-19-related aerosol emission reductions

Lessing-Gymnasium, Frankfurt, Germany Sep. 2010 - July 2018
Abitur with advanced courses in Mathematics and Physics *Overall grade: 1,0 (equivalent to A*)*

RESEARCH EXPERIENCE

Center for International Climate Research (CICERO), Norway July 2022
Research Internship in the Climate System Group *Host: Bjørn Samset*
- Topic: Influence of anthropogenic aerosols on past Australian precipitation trends

Potsdam Institute for Climate Impact Research, Germany July 2021
Research Internship at the Department of Earth System Resilience *Host: Nico Wunderling*
- Topic: Early-warning signals for critical transitions in the Amazon rainforest

Leibniz-Institute for Atmospheric Physics, Germany June 2021
Research Internship at the Department of Optical Soundings and Sounding Rockets *Host: Gerd Baumgarten*
- Topic: Long-term trends and sub-seasonal variability of noctilucent clouds

Potsdam Institute for Climate Impact Research, Germany May - June 2020
Research Internship at the Department of Complexity science *Host: Anders Levermann*
- Topic: Modelling of ice sheet dynamics

Goethe University Frankfurt, Germany June 2018
Research Internship at the Department of Experimental Atmospheric Research *Host: Joachim Curtius*
- Topic: Experimental measurements of atmospheric trace gases

AWARDS AND HONOURS

EGU conference funding, University of Edinburgh April 2023
Awarded travel support to attend the EGU 2023 conference in Vienna as an undergraduate student (£ 450)

Go Abroad fund, University of Edinburgh June 2022
Financial award from the University of Edinburgh to support international academic internships (£ 450)

EGU conference funding, University of Edinburgh May 2022
Awarded travel support to attend the EGU 2022 conference in Vienna as an undergraduate student (£ 450)

Class Medals in Meteorology, University of Edinburgh 2018–2020
Award for best overall performance in the courses 'Earth Dynamics", 'Meteorology: Earth and Environment" and "Meteorology: Weather and Climate"

PUBLICATIONS

2024

- **Fahrenbach, N. L. S.**, Bollasina, M. A., Samset, B. H., Cowan, T. and Ekman, A. M. L. (2024): Asian Anthropogenic Aerosol Forcing Played a Key Role in the Multidecadal Increase in Australian Summer Monsoon Rainfall. *Journal of Climate*, 37, 895–911, https://doi.org/10.1175/JCLI-D-23-0313.1

2023

- **Fahrenbach, N. L. S.** and Bollasina, M. A. (2023): Hemispheric-wide climate response to regional COVID-19-related aerosol emission reductions: the prominent role of atmospheric circulation adjustments. *Atmospheric Chemistry and Physics*, 23(2), 877-894. https://doi.org/10.5194/acp-23-877-2023

PRESENTATIONS

Institute for Atmosphere and Environment at Goethe University Frankfurt Aug 2023
Aerosol impact on long-term trends in Australian monsoon rainfall *(Invited seminar)*

Climate Dynamics group at University of St. Andrews May 2023
What caused the multi-decadal increase in Australian monsoon rainfall? *(Invited seminar)*

Australian Bureau of Meteorology May 2023
Past trends in Australian monsoon rainfall: internally generated or human-caused? *(Invited seminar)*

EGU Conference 2023 April 2023
What caused the multi-decadal increase in Australian monsoon rainfall? *(Highlight talk)*

Fourth biennial workshop on the regional climate response to aerosol March 2023
Unveiling the culprit: Are aerosols to blame for the Australian monsoon increase? *(Talk)*

Contemporary Climate Group at the University of Edinburgh March 2023
Causes of long-term trends in Australian monsoon rainfall *(Invited seminar)*

Climate response to Asian Anthropogenic Aerosol emissions meeting June 2022
Aerosol impact on past Australian rainfall *(Talk)*

EGU Conference 2022 May 2022
Climate response to COVID-19 aerosol emission reductions *(Talk)*

Climate response to Asian Anthropogenic Aerosol emissions meeting March 2022
Teleconnections of Asian aerosols and the role of internal variability *(Talk)*

WORKSHOPS AND PROFESSIONAL TRAINING

Climate science speakers training, Force of Nature July 2023
Training about writing and delivering speeches about climate science-related topics

Climate science outreach training, Force of Nature May - June 2023
Training about eco-anxiety and how to transform this eco-anxiety into climate action

Workshop on regional climate responses to aerosol, CICERO institute, Norway March 2023
Organised by the Center for International Climate Research (CICERO) in Oslo, Norway and the CATHY aerosol project

Machine learning online course, University of Houston, USA May 2020
Acquired expertise in supervised and unsupervised machine learning during the course "Machine learning essentials for seismic interpretation"

SERVICE AND TEACHING

Peer reviewer for Journal of Geophysical Research: Atmospheres since 2023

Co-supervising a Master's thesis, ETH Zürich Sep. 2023 - Jan. 2024
Supervision of a Master student working on forced and Unforced components of the sea surface temperature pattern effect on historical precipitation trends

Geophysics degree representative, University of Edinburgh 2019-2020, 2021-2023
Volunteered as a degree representative to communicate feedback between students and staff while also providing academic support to younger students

Co-supervising a Bachelor's thesis, University of Edinburgh Sep. 2022 - May 2023
Day-to-day supervision and programming support of a Bachelor's student studying the relationship between ENSO and Australian wildfires

COMPUTATIONAL SKILLS

Programming and Data Processing: Python (advanced), NCL (intermediate), CDO/NCO (intermediate), bash scripting (intermediate), FORTRAN (beginner)

Developer Tools: Jupyter Notebooks, PyCharm, Visual Studio Code, GitHub

Climate Models: Experience performing simulations with the MetOffice Unified Climate Model (HadCM3) on remote servers

Typesetting and Microsoft Programs: LaTEX, Word, PowerPoint, Excel