

KEVIN SCHWARZWALD

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EDUCATION

Columbia University

PhD candidate, Earth and Environmental Sciences

Master of Philosophy, Earth and Environmental Sciences

Master of Arts, Earth and Environmental Sciences

New York, NY

September 2019 – 2024 (*expected*)

October 2023

May 2021

Research Areas: climate variability, uncertainty in projections of climate and climate impacts, precipitation in East Africa, tropical convection, climate model evaluation, the use of climate projections in policy and adaptation efforts

Advisors: Lisa Goddard (†2022), Richard Seager; *Committee Members*: Mingfang Ting, Kate Marvel, Radley Horton

Peking University, Yenching Academy (北京大学燕京学堂)

Beijing, China

Master of Law in China Studies (concentration in Politics and International Relations)

July 2017

Honors: Awards for Outstanding Academic Achievement and Outstanding Contributions to the Academy

- Master's thesis: *The Relationship between Fiscal Systems and Inefficient Urban Expansion in the PRC: An Empirical Look at Prefecture-Level Urbanization*

The University of Chicago

Chicago, IL

Bachelor of the Arts (A.B.) in Physics; Public Policy (concentration in Economics)

June 2015

Honors: Graduated with General Honors, Dean's List 2011-2013, 2015, Departmental Honors in Public Policy

- Senior Thesis (Public Policy): *"The Wrong Folks Kept Winning": Protectionism and America's Trains*

ACADEMIC RESEARCH EXPERIENCE

Lamont-Doherty Earth Observatory (LDEO),

September 2019 – present

International Research Institute for Climate and Society (IRI)

Graduate Research Assistant

New York, NY

Energy Policy Institute at the University of Chicago (EPIC)

September 2017 – July 2019

Pre-Doctoral Fellow (*joint with RDCEP*)

Chicago, IL and remotely from New York, NY as NASA GISS Visiting Researcher

Center for Robust Decision-Making on Climate and Energy Policy (RDCEP)

April 2015 – July 2019

Pre-Doctoral Fellow (*joint with EPIC 2017-2019*)

Chicago, IL and remotely from New York, NY, and Beijing, China

PUBLICATIONS (peer-reviewed)

Schwarzwald, Kevin, Richard Seager, Mingfang Ting, and Alessandra Giannini. 2023. "Large-Scale Stability and the Greater Horn of Africa Long and Short Rains." *Journal of Climate* 36 (20): 7297–7317. [Link](#).

Anderson, Weston, Benjamin I. Cook, Kim Slinski, Kevin Schwarzwald, Amy McNally, and Chris Funk. 2023. "Multiyear La Niña Events and Multiseason Drought in the Horn of Africa." *Journal of Hydrometeorology* 24 (1): 119–31. [Link](#).

Schwarzwald, Kevin, and Nathan Lenssen. 2022. "The Importance of Internal Climate Variability in Climate Impact Projections." *Proceedings of the National Academy of Sciences* 119 (42). [Link](#).

Schwarzwald, Kevin, Lisa Goddard, Richard Seager, Mingfang Ting, and Kate Marvel. 2022. "Understanding CMIP6 Biases in the Representation of the Greater Horn of Africa Long and Short Rains." *Climate Dynamics* 61 (3): 1229–55. [Link](#).

Schwarzwald, Kevin, Andrew Poppick, Maria Rugenstein, Jonah Bloch-Johnson, Jiali Wang, David McInerney, and Elisabeth J. Moyer. 2021. "Changes in Future Precipitation Mean and Variability across Scales." *Journal of Climate* 34 (7): 2741–58. [Link](#).

PUBLICATIONS (selected upcoming and in prep)

Rising, James A., Azhar Hussain, Kevin Schwarzwald, and Ana Trisovic. "A Practical Guide to Climate Econometrics: Navigating Key Decision Points in Weather and Climate Data Analysis." *Under Revision at Journal of Open Source Education*. [Link](#).

Schwarzwald, Kevin, Richard Seager. "Revisiting the 'East African Paradox': Long Rain trends and variability in models and observations in the Horn of Africa." *In prep*.

CONFERENCE PRESENTATIONS

* indicates presenting author

Schwarzwald, Kevin* and Nathan Lenssen. 2023 (upcoming in December). “On the propagation of climate data uncertainty in projections of the impacts of climate change on society.” *Invited oral presentation at the AGU Fall Meeting*, San Francisco, CA.

Schwarzwald, Kevin* and Richard Seager. 2023 (upcoming in December). “Revisiting the ‘East African Paradox’: Long Rain trends and variability in models and observations in the Horn of Africa.” *Poster at the AGU Fall Meeting*, San Francisco, CA.

Schwarzwald, Kevin* and Nathan Lenssen. 2023 (upcoming in October). “Understanding the sources of climate uncertainty in projections of climate impacts.” *Poster at the WCRP Open Science Conference*, Kigali, Rwanda.

Schwarzwald, Kevin*, Richard Seager, Mingfang Ting, and Kate Marvel. 2023 (upcoming in October). “Biases in simulations of the Horn of Africa long and short rains in global climate models and their implication for future rainfall changes.” *Poster at the WCRP Open Science Conference*, Kigali, Rwanda.

Schwarzwald, Kevin* and Nathan Lenssen. 2023. “Understanding the Sources of Climate Uncertainty in Projections of Climate Impacts.” *Presentation at the EGU Annual Meeting*, Vienna, Austria.

Schwarzwald, Kevin*, Richard Seager, and Mingfang Ting. 2023. “The Moist Static Energy Seasonal Cycle and the Horn of Africa Long and Short Rains.” *Presentation at the 103rd AMS Annual Meeting*, Denver, CO.
- **Awarded** Outstanding Oral Presentation Award

Schwarzwald, Kevin*, and Nathan Lenssen. 2022. “A Complete Assessment of Climate Uncertainty in Projections of Climate Impacts.” *Poster at the AGU Fall Meeting*, Chicago, IL.

Schwarzwald, Kevin*, and Nathan Lenssen. 2022. “A Complete Assessment of Climate Uncertainty in Projections of Climate Impacts.” *Poster at the Institute for Mathematical and Statistical Innovation (IMSI) Workshop on “Economic Impacts of Climate Change”*, Chicago, IL.

Schwarzwald, Kevin*. 2022. “The sources of climate uncertainty in climate impacts studies.” *Presentation at the Interdisciplinary PhD Workshop in Sustainable Development (IPWSD)*, New York, NY.

Lenssen, Nathan, and **Kevin Schwarzwald***. 2021. “Uncertainty in Climate Impacts Projections Due to Model Internal Variability.” *Presentation at the AGU Fall Meeting*, New Orleans, LA

Schwarzwald, Kevin*, Richard Seager, Kate Marvel, Mingfang Ting, and Lisa Goddard. 2021. “Diagnosing CMIP6 Model Biases in East African Rainfall.” *Poster at the AGU Fall Meeting*, New Orleans, LA

Schwarzwald, Kevin*, Matz A Haugen, Elisabeth J Moyer, and Amir Jina. 2018. “Economic Impacts of Variability under Climate Change on Mortality Projections” *Presentation at the US CLIVAR Large Ensembles Workshop*, Boulder, CO.

Schwarzwald, Kevin*, Amir Jina, Matz A Haugen, Michael Stein, and Elisabeth J Moyer. 2018. “Integrating Changes in Temperature Variability into Climate Damage Projections.” *Poster at the AGU Fall Meeting*, Washington, DC.

Schwarzwald, Kevin*, Andrew N Poppick, and Elisabeth J Moyer. 2018. “Frequency-Dependent Changes in Temperature Variability across Global Climate Models.” *Poster at the AGU Fall Meeting*, Washington, DC.

Moyer, Elisabeth J*, **Kevin Schwarzwald**, Won Chang, David McInerney, Whitney K Huang, and Victor Zhorin. 2016. “Changes in Interannual and Interdecadal Precipitation Variability from Millennial-Scale Climate Model Runs.” *Poster at the AGU Fall Meeting*, San Francisco, CA.

SELECTED INVITED SEMINARS

“What we know (and don't know) about the future of East African rainfall”, *IRI PyCPT Training for 30 visiting scientists from Meteorological Offices across Africa*. September 15, 2023.

“On the propagation of climate data uncertainty in projections of the impacts of climate change on society” *ECS Symposium*, May 22, 2023. [Link](#).

“The Horn of Africa Rains and How We Model Them.” *UCSB Climate Hazards Center Climate Meeting*, February 10, 2023.

“The sources of climate uncertainty in climate impacts studies.” *NASA GISS Lunch Seminar*, February 23, 2022. [Link](#).

“Climate Uncertainty in Projections of the Impacts of Climate Change.” *Columbia Student Climate Symposium*, February 18, 2022.

“Process-based climate model evaluations in the Horn of Africa.” *UChicago Environmental Data Lunch*, March 22, 2021.

AWARDS, GRANTS, COMPETITIVE PROGRAMS

- CATER School on Transdisciplinary Climate Risk Adaptation and Action (Naivasha, Kenya; fully funded, including travel) *upcoming*, November 2023
 - ASciNA Young Scientist Award, **\$7500** 2023
 - Outstanding Oral Presentation Award, 103rd AMS Annual Meeting 2023
 - Center for Science and Society Seed Grants, **\$3975** total (to NENSIC, co-PI) 2021, 2022, 2023
 - ICTP Summer School on Theory, Mechanisms and Hierarchical Modeling of Climate Dynamics (Trieste, Italy; fully funded) 2022
 - Yenching Academy Dean's Research Grant, **¥5000** 2016
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TEACHING, EDUCATION, ACADEMIC SERVICE, AND OUTREACH

Graduate Teaching Assistant

EESCW2100: *Earth's Environmental Systems: Climate Systems*

January 2023 – March 2023

- Ran office hours, led labs and field trips, graded assignments for an undergraduate introductory climate science course in Columbia's Dept. of Earth & Environmental Sciences, taught by Drs. Mingfang Ting and Gisela Winckler

Graduate Teaching Assistant

CLMTGR5001: *Dynamics of Climate Variability and Change*

September 2020 – December 2020

- Ran virtual office hours, led discussions, graded assignments for an introductory climate science course in Columbia's interdisciplinary master's program in Climate and Society, taught by Drs. Alessandra Giannini and Weston Anderson
- Taught a lecture on the drivers of climate uncertainty and the interpretation of climate model output

Columbia Summer School in the Green Mountains Pre-College Program

Instructor

June 2022

- Developed course material and taught lectures on future climate projections, climate variability, and the epistemology of climate science for a high school summer program

Additional Invited Class Lectures

- "Understanding climate models and future climate change", for AEEC 3984 *Climate Risk Management* at Virginia Tech (October 2023)
- "Climate models and projections" for CLMTGR5001 *Dynamics of Climate Variability and Change* in Columbia Climate Schools' Climate & Society Master's Program, in a flipped classroom setting (*upcoming in November 2023*)

IRI's Climate Society Community Outreach (CSCO) group

July 2020 – 2022

- Participating in the IRI's education and outreach group, formed in response to the 2020 U.S. protests for racial justice
- Mentored New York, NY high school students in data science projects through the "Make With Data" project
- Co-taught class sessions on climate variability at Hamilton Grange Middle School in Harlem, New York, NY

New Era Network for Societally Integrated Climatology (NENSIC)

May 2020 – present

Co-founder, Organizer

Website: nensic.org

- Launched an interdisciplinary network designed to connect young researchers, students, and professionals working on climate issues in any field, with a focus on improving interdisciplinary communication, building informal connections, peer mentoring, and providing a venue to present work and find collaborators
- Organized and co-organized 50+ events in person and remotely for up to 30 attendees with participants from four continents, with research talks on topics such as international climate negotiations or the coordination of disaster planning in Ecuador, in addition to networking events, climate and data tutorials, and interdisciplinary job panels

History and Climate Change Workshop

January 2022 – May 2023

Student Convener

- Helped organize interdisciplinary speaker and event series connecting insights from history and paleoclimate research

Lamont-Doherty Earth Observatory Executive Committee

September 2021 – August 2022

Graduate Student Representative

- Served as a voting member of the institutional ExComm and on the Subcommittee for Climate School Governance

Reviews

- Refereed for *Nature Climate Change*; *Earth's Future*; *Journal of Climate*; *Geophysical Research Letters*; *International Journal of Climatology*; *Weather, Climate & Society*; *Geoscientific Model Development*
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OTHER EXPERIENCE

Eparque Urban Strategies

Independent Consultant (part-time)

March 2019 – July 2019

New York, NY

Yenching Global Symposium (全球青年中国论坛)*Associate Director, Logistics*

October 2015 – April 2016

Beijing, China

Technology Policy Institute*Google Policy Fellow*

July 2014 – August 2014

Washington, DC

Paris Center for Cosmological Physics*Lab Intern*

January 2014 – March 2014

Paris, France

alpS GmbH*Management Intern, Consulting Group*

August 2013 – September 2013

Innsbruck, Austria

Moser/Jaritz*Research Intern*

August 2013 – September 2013

Gmunden, Austria

INVITED AND CONTRIBUTED PRESENTATIONS

- 2023:** American Meteorological Association (AMS)'s Annual Meeting; European Geosciences Union (EGU)'s General Assembly; University of California Santa Barbara (UCSB) Climate Hazards Center; ECS Symposium; WCRP Open Science Conference (*in Kigali, upcoming*), American Geophysical Union (AGU) Fall Meeting (*upcoming, **invited abstract***)
- 2022:** AGU Fall Meeting; Institute for Mathematical and Statistical Innovation (IMSI); NASA Goddard Institute for Space Studies (GISS); ICTP Summer School on Theory, Mechanisms and Hierarchical Modeling of Climate Dynamics; Interdisciplinary PhD Student Workshop in Sustainable Development (IPWSD); Columbia Student Climate Symposium
- 2021:** AGU Fall Meeting; University of Chicago Environmental Data Science Lunch
- 2019:** US CLIVAR Large Ensembles Workshop
- 2018:** AGU Fall Meeting
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DATA TOOLS AND TUTORIALS**Weather Panel Tutorial**climateestimate.net

- In an inter-disciplinary team, co-developed a tutorial designed to introduce climate economists to working with observational climate data using python (xarray), R, or MATLAB

xagggithub.com/ks905383/xagg

- Lead developer and maintainer of **xagg**, a python package for aggregating raster data (such as gridded weather data) onto polygons (such as administrative shapefiles), using area-averaging based on the overlap between pixels, polygons

quantprojgithub.com/ks905383/quantproj

- Developer of **quantproj**, an R package for projecting weather data by using downscaled fine-scaled distributional changes in Large Ensembles and the delta method; based on the methodology of Haugen et al., 2018

Atlas of Variabilitygithub.com/RDCEP/atlas-of-variability-code-package

- Created a MATLAB package to analyze variability statistics in global climate models
 - The package was used to create the 'Atlas of Variability' – a publicly-accessible dataset of basic characteristics of climate variability for 20 commonly-analyzed variables in CMIP5-generation models
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SKILLS

Computer (Analysis): advanced proficiency in python (xarray, dask), MATLAB, R, and Excel, basic proficiency in GIS (QGIS) and Stata, experience with climate (NetCDF, nco, CMIP, etc.) and satellite data analysis (DMSP/OLS, VIIRS, etc.)

Computer (Modeling): experience in running SPEEDY, an intermediate-complexity global climate model (GCM)

Computer (Communication/Design): advanced proficiency in LaTeX, PowerPoint, Keynote, inkscape; basic proficiency in Adobe Illustrator

Language: native in German, fluent in French, basic communication skills in Mandarin Chinese

PROFESSIONAL NETWORKS

- American Geophysical Union (AGU)
- European Geosciences Union (EGU)
- Austrian Scientists & Scholars in North America (ASciNA)