KEVIN SCHWARZWALD

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Interdisciplinary climate researcher helping inform climate impacts projections and decision-making under uncertainty

EDUCATION

Columbia University   New York, NY
PhD candidate, Earth and Environmental Sciences   September 2019 – 2024 (*expected*)
Master of Philosophy, Earth and Environmental Sciences   October 2023
Master of Arts, Earth and Environmental Sciences   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*
- Study Abroad: Paris, France

ACADEMIC RESEARCH EXPERIENCE

International Research Institute for Climate and Society (IRI),   September 2019 – present
Lamont-Doherty Earth Observatory (LDEO)
Graduate Research Assistant   New York, NY
- Current projects include: the present and future of rainfall dynamics in East Africa, understanding the sources of climate uncertainty in projections of the societal impacts (agriculture, mortality, etc.) of climate change, and building tutorials and python tools to make climate data more accessible to end users

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 GISS Visiting Researcher
- Conducted interdisciplinary research on how climate variability will impact society (agricultural yields, mortality, energy consumption) and how to improve weather projections used in climate impacts studies, with Prof. Amir Jina
- Adapted latest downscaling and bias-correction methods to impacts studies, sensitivity tested common economic damage functions to climate variability changes, quantified effect of internal climate uncertainty on climate damages
- Advised on the use of climate model and observational data in economics and policy applications

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
- Researched changes in precipitation and temperature variability from synoptic to inter-decadal timescales in global climate models in Prof. Elisabeth Moyer's climate statistics group
- Co-organized a weekly interdisciplinary speaker series on energy and environmental themes attended by ~25 young researchers and students to foster collaboration across geophysics and economics research communities

PUBLICATIONS

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* (Early Online Release). 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.

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.

AWARDS, GRANTS, COMPETITIVE PROGRAMS

- CATER School on Transdisciplinary Climate Risk Adaptation and Action (Naivasha, Kenya; fully funded, including travel)	November 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

TEACHING, EDUCATION, ACADEMIC SERVICE, AND OUTREACH

Graduate Teaching Assistant
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
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

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

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   *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

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*

OTHER EXPERIENCE

Eparque Urban Strategies   March 2019 – July 2019
Independent Consultant (part-time)   New York, NY
-   Conducted policy and data analysis to support economic and urban development projects in developing countries in Africa and Asia; analyzed household and business survey data (including geographic information), edited policy briefs for consideration by local governments, researched disaster resiliency and agricultural development

Yenching Global Symposium (全球青年中国论坛)   October 2015 – April 2016
Associate Director, Logistics   Beijing, China
-   In a 10-person team, designed and organized the inaugural edition of a 4-day conference on China's role in the world
-   Organized transportation and activities for 200 attendees from 50 countries; organized team communications

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

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

xagg   **github.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

quantproj   **github.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 Variability   **github.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

SKILLS

Computer (Analysis): advanced proficiency in python (xarray, dask), MATLAB, R, and Excel; basic proficiency in GIS (QGIS) and Stata; experience with high-performance computing (code optimization, parallel processing, batch scheduling, etc.), bash scripting; 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, professionally 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)