Andrew N. Poppick

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Research Interests

Statistical applications to climate and weather, temporal nonstationarity, spectral analysis, spatial-temporal processes

Education

Ph.D., Statistics, University of Chicago, 2016
Advisor: Michael L. Stein
Dissertation: "Statistical Methods for Climatic Processes with Temporal Non-Stationarity"

B.A. (*with honors*), Statistics, University of Chicago, 2010

Professional Appointments

Carleton College, Northfield, MN
Associate Professor of Statistics, September 2023 - present
Assistant Professor of Statistics, September 2016 - 2023

Peer-Reviewed Publications

McKinnon, K. A., Poppick, A., & Simpson, I. R. (2021). Hot extremes have become drier in the US Southwest, *Nature Climate Change,* **11:** 598-604.

Schwarzwald, K., Poppick, A., Rugenstein, M., Bloch-Johnson, J., Wang, J., McInerney, D., & Moyer, E. J. (2021). Changes in future precipitation mean and variability across scales, *Journal of Climate,* **34**(7): 2741-2758.

Poppick, A. & McKinnon, K. A. (2020). Observation-Based Simulations of Humidity and Temperature Using Quantile Regression. *Journal of Climate*, **33**(24): 10691-10706.

Poppick A., Nardi, J.*, Feldman, N.*, Baker, A. H., Pinard, A. & Hammerling, D. M. (2020). A Statistical Analysis of Lossily Compressed Climate Model Data. *Computers & Geosciences*, **145**: 104599.

McKinnon, K. A. & Poppick, A. (2020). Estimating changes in the observed relationship between humidity and temperature using noncrossing quantile smoothing splines. *Journal of Agricultural, Biological, and Environmental Statistics*, **25**(3): 292-314.

McKinnon, K. A., Poppick, A., Dunn-Sigouin, E., & Deser, C. (2017). An "Observational Large Ensemble" to compare observed and modeled temperature trend uncertainty due to internal variability. *Journal of Climate*, **30**(19): 7585-7598.

Poppick, A., Moyer, E. J., & Stein, M. L. (2017). Estimating trends in the global mean temperature record. *Advances in Statistical Climatology, Meteorology and Oceanography,* **3**(1): 33-53.

Klavans, J., Poppick A., Sun, S., & Moyer, E. J. (2016). The influence of model resolution on temperature variability. *Climate Dynamics,* **48**(8): 3035-3045.

Poppick, A., McInerney, D. J., Moyer, E. J., & Stein, M. L. (2016). Temperatures in transient climates: improved methods for simulations with evolving temporal covariances. *Annals of Applied Statistics,* **10**(1): 477-505.

Poppick A. & Stein M. L. (2014). Using covariates to model dependence in nonstationary, high-frequency meteorological processes. *Environmetrics*, **25**(5): 293–305.

Discussion Papers

Poppick A. (2023). Discussion on "Saving Storage in Climate Ensembles: A Model-Based Stochastic Approach" by H. Huang, S. Castruccio, A. Baker, and M. G. Genton. *Journal of Agricultural, Biological, and Environmental Statistics,* **28**(2): 345-348.

Poppick A. & Stein M. L. (2022). Discussion on "A combined estimate of global temperature" by P. Craigmile and P. Guttorp. *Environmetrics*, **33**(3): e2718.

Book Chapters

Poppick, A., & Meyer, K. (2026+). Singular Value Decomposition and Temperature Patterns. To appear in K. Hill, K. Meyer, & K. Slyman (eds), *Climate Applications for the College Mathematics Classroom*, American Mathematical Society / Mathematical Association of America.

Poppick, A. (2026+). Empirical Orthogonal Functions and Sea Surface Temperatures. To appear in K. Hill, K. Meyer, & K. Slyman (eds), *Climate Applications for the College Mathematics Classroom*, American Mathematical Society / Mathematical Association of America.

Conference Papers and Technical Reports

Poppick A., Nardi, J.*, Feldman, N.*, Baker, A. H., & Hammerling, D. M. (2018). A Statistical Analysis of Compressed Climate Model Data. *The Fourth International Workshop on Data Reduction for Big Scientific Data (with SC18).*

Nardi, J.*, Feldman, N.*, Poppick A., Baker, A., & Hammerling, D. M. (2018). Statistical Analysis of Compressed Climate Model Data. NCAR Technical Note NCAR/TN-547+STR, 60 pp, doi:10.5065/D6HQ3XQJ.

*indicates undergraduate coauthors

Teaching Experience

At Carleton College

- STAT 120: Introduction to Statistics
- STAT 230: Applied Regression Analysis

- MATH 240: Probability
- STAT 250: Introduction to Statistical Inference
- STAT 285: Statistical Consulting
- STAT 320: Time Series Analysis

At the University of Chicago

As Instructor:

- STAT 200: Elementary Statistics

As Course Assistant:

- STAT 200: Elementary Statistics
- STAT 220: Statistical Methods and Applications
- STAT 222: Linear Models and Experimental Design
- STAT 224: Applied Regression Analysis
- STAT 244: Statistical Theory and Methods I
- STAT 343: Applied Linear Statistical Methods
- STAT 345: Design/Analysis of Experiments

Undergraduate Research Projects Supervised

- Noorah Aldaghlas, Natalie Bax, Jasmine Choi, Elena Ea, and August Williams (Winter 2024 – Spring 2024). "Studying disparities in the distribution of mortality using quantile regression" (Senior Integrative Exercise)
- Jacob Flignor, Libby Nachreiner, Yicheng Shen, and Karen Wang (Autumn 2021 – Winter 2022). "Summer of Smoke? An Extreme Value Analysis of Air Pollution In Minnesota" (Senior Integrative Exercise)
    - *First prize paper in Spring 2022 USRESP competition*
- Sarah Grier, Waleed Iftikhar, Nate Isbell, and Muyang Shi (Winter - Spring 2021). "Quantile regression with applications in temperature and agricultural analysis" (Senior Integrative Exercise)
- Trevor Freeland, Pedro Girardi, and Joseph Nardi (Autumn 2018 - Winter 2019). "A statistical analysis of changes in extreme precipitation in the coastal Carolinas" (Senior Integrative Exercise)
- Noah Feldman and Joseph Nardi (Summer 2018). "A statistical analysis of compressed climate model data"
- Melissa Bain, Caitlin Eichten, Il Shan Ng, and Lianne Siegel (Winter - Spring 2017). "Estimating the uncertainty in temperature trends due to internal climate variability" (Senior Integrative Exercise)

PhD Dissertation Committees

- Kyle McEvoy, UCLA Statistics (*primary advisor: Karen A. McKinnon*)

Presentations

Discussant for "Statistical Innovations in Climate Research: Bridging Disciplines for Earth System Understanding", August 2024. Joint Statistical Meetings, Portland

Observation-Based Simulations of Humidity and Temperature Using Quantile Regression, June 2023. The 23rd New England Statistics Symposium, Boston

Data Science and Environmental Science Panel, November 2022. NESS-NextGen Data Science Day. (presentation and panel discussion)

Future Directions of Climate Statistics, August 2022. Joint Statistical Meetings (panel discussion)

Comparing Observed Climate Variability with Climate Model Output Using "Observation-based Simulations", April 2022. Math and Statistics Colloquium, Cornell College

Machine Learning and Statistics for Climate Science, December 2021. Tutorial, Conference on Neural Information Processing Systems (NeurIPS) (with Karen McKinnon as co-presenter)

Observation-Based Simulations of Humidity and Temperature Using Quantile Regression, October 2021. Statistics seminar, University of Nebraska – Lincoln

Observation-Based Simulations of Humidity and Temperature Using Quantile Regression, August 2021. Joint Statistical Meetings

Observation-based simulations of temperature and humidity using quantile regression, February 2021. Environmental Data Science Lunch, University of Chicago

Improved observation-based simulations of temperature and humidity accounting for projected variability changes from a climate model, August 2020. Joint Statistical Meetings

Improved observation-based simulations of temperature and humidity accounting for projected variability changes from a climate model, November 2019. University of Minnesota School of Statistics Seminar, Minneapolis, MN

Statistical analysis of compressed climate model data, August 2018. CISL Visitor Program Brown Bag Seminar, National Center for Atmospheric Research, Boulder, CO. (with Joseph Nardi and Noah Feldman as primary presenters)

An 'Observational Large Ensemble' to compare observed and modeled temperature trend uncertainty due to internal variability, July 2017. American Meteorological Society Conference on Probability and Statistics, Baltimore, MD

An 'Observational Large Ensemble' to compare observed and modeled temperature trend uncertainty due to internal variability, March 2017. Ocean and Climate Physics Seminar, Lamont-Doherty Earth Observatory, Palisades, NY

Temperatures in transient climates: improved methods for simulations with evolving temporal covariances, August 2016. ENVR Student Paper Winner Topic Contributed Session, Joint Statistical Meetings, Chicago, IL

Using spectral methods to quantify changes in temperature variability across frequencies*, December 2014. American Geophysical Union Fall Meeting, San Francisco, CA (*presenting author: Andrew Poppick, first author: Shanshan Sun)

Bivariate, nonstationary, high frequency surface meteorological processes given known covariates, May 2013. Argonne National Laboratory, IL

Poster Presentations

An 'Observational Large Ensemble' to compare observed and modeled temperature trend uncertainty due to internal variability, December 2017. American Geophysical Union Fall Meeting, New Orleans, LA

Trends and associated uncertainties in the global mean temperature record, December 2016. American Geophysical Union Fall Meeting, San Francisco, CA

Temperatures in transient climates: improved methods for simulations with evolving temporal covariances, January 2016. Conference on Probability and Statistics in the Atmospheric Sciences, American Meteorological Society Annual Meeting, New Orleans, LA

Observation-based simulations of future temperatures with changes in variability predicted by a climate model, August 2015. Invited poster presentation, STATMOS Statistics in the Atmospheric Sciences, Joint Statistical Meetings, Seattle, WA

Simulating future transient climates by combining observational data with climate model information using time-varying spectral methods, December 2014. American Geophysical Union Fall Meeting, San Francisco, CA

Time-varying spectral methods for modeling projected future changes in temperature variability and producing data-driven simulations of future transient climates, September 2014. STATMOS Annual Meeting, Chicago, IL

Using covariates to model dependence in nonstationary, high frequency meteorological processes, August 2014. Invited poster session, STATMOS/NCAR Statistics in the Atmospheric Sciences, Joint Statistical Meetings, Boston, MA

Grants & Funding

Ethical Inquiry in the Classroom (EthIC) curricular grant, Carleton College, 2021 ($4,000).
For Integrating Data Ethics into the Introductory and Intermediate Statistics Classroom (with Claire Kelling)

Travel grant as Research Member participating in the program Confronting Global Climate Change long program, Institute for Mathematical and Statistical Innovation, Chicago, 2022

Ethical Inquiry in the Classroom (EthIC) curricular grant, Carleton College, 2021 ($1,200).
For developing materials for discussion of ethical issues in the statistical analysis cycle in STAT 285 (Statistical Consulting)

Computational and Information Systems Laboratory Visitor Program (CVP) travel grant, National Center for Atmospheric Research, August 2018 ($2,500)

Awards & Honors

ENVR Student Paper Competition, 2016

Awarded for the manuscript "Temperatures in transient climates: improved methods for simulations with evolving temporal covariances", presented at JSM 2016

David Wallace Award for Applied Statistics, 2015

Awarded annually by the University of Chicago Department of Statistics to two students working on applications in scientific domains

Selected Professional Service at Carleton

To the College:

- AAUP Chapter Executive Committee (2023 – present)
- Working group on reappointment appeals for faculty on continuing appointment (2025)
- Benefits Committee and Retirement Plan Investment Review Committee (2023 – present)
- Community and Civic Engagement Committee (2020 – 2023)
- Academic Standing Committee (2017 - 2019)

To the Department

- Assessment coordinator (2024 – 2025)
- Pedagogy and research seminar coordinator (2023 – 2024)
- Comps coordinator (2020 – 2023, 2025 – 2026)
- Colloquium and events organizer (2017 - 2019)
- Statistics lab assistant training (2018 – 2019, 2023 – 2025)
- Social activities coordinator (2016 - 2017)

Selected Professional Service Outside Carleton

- Associate Editor, *Journal of Agricultural, Biological, and Environmental Statistics* (2022 – present)
- Probability and Statistics Committee, American Meteorological Society (2015 - present)
- American Statistical Association Advisory Council on Climate Change Policy (2025 – present)
- Program Committee member for The 9th International Workshop on Climate Informatics (Paris, France, October 2019)
- Ad-hoc referee for submissions to: *Acta Geophysica; Advances in Statistical Climatology, Oceanography, and Meteorology; The American Statistician; Annals of Applied Statistics; Biometrika*; *Climatic Change*; *Earth System Dynamics; Environmental Data Science; Harvard Data Science Review; Journal of Agricultural, Biological, and Environmental Statistics*; *Journal of the American Statistical Association; Journal of Climate; Journal of Computational and Graphical Statistics; Journal of Hydrometeorology; Journal of Statistics and Data Science Education; NSF Climate and Large-scale Dynamics Program, NSF Atmosopheric and Geospace Sciences Program*

Other Professional Experience

Statistical Analyst at The Cambridge Group, Chicago, IL June 2010 - June 2011