

# David C. Lafferty

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## Education

### University of Illinois Urbana-Champaign

Jan. 2019 – May 2024

*Ph.D in Atmospheric Science*

### Ruprecht-Karls-Universität Heidelberg

Sep. 2016 – Oct. 2018

*M.Sc. in Physics*

### University of Glasgow

Sep. 2012 – May 2016

*B.Sc. in Physics*

## Experience

### Cornell University

Sep 2024 – Present

*Postdoctoral Associate, Department of Biological & Environmental Engineering*

- Advisor: Vivek Srikrishnan
- Research Topics: power systems vulnerability to climate change, machine learning for environmental model calibration, climate risk

### Amazon

May 2024 – July 2024

*Research Scientist, World Wide Sustainability*

- Advisor: Maggie Zarekarizi
- Research topics: climate risk

### University of Illinois Urbana-Champaign

Jan 2019 – May 2024

*Graduate Research Assistant, Department of Climate, Meteorology, & Atmospheric Sciences*

- Advisor: Ryan Sriver
- Research topics: climate risk, coupled climate-environmental systems uncertainty analysis

### Lawrence Livermore National Laboratory

May – Aug 2022

*Graduate Summer Student Intern, Climate Sciences*

- Advisor: Hsi-Yen Ma
- Research topic: atmospheric feature tracking for precipitation extremes

### Ruprecht-Karls-Universität Heidelberg

Nov 2017 – Oct 2018

*Graduate Research Assistant, Institute for Theoretical Physics*

- Advisor: Alexander Rothkopf
- Research topic: heavy-ion collision phenomenology

## Peer-Reviewed Publications

7. (*in prep.*) **Lafferty, D.C.**, Hartke, S.H., Sriver, R.L., Ullrich, P.A., Srikrishnan, V., Varying sources of uncertainty in risk-relevant climate projections over the United States
6. (*submitted*) **Lafferty, D.C.**, Grogan, D.S., Zuidema, S., Haqiqi, I., Alipour, A., Sriver, R.L., Keller, K., Combined climate and hydrologic uncertainties shape projections of future soil moisture in the eastern United States. *Earth's Future* (2025) [[10.22541/essoar.173878030.00737104/v1](https://doi.org/10.22541/essoar.173878030.00737104/v1)]
5. Wu, WY., Ma, HS., **Lafferty, D.C.**, Feng, Z., Ullrich, P., Tang, Q., Golaz, JC., Galea, D., Lee, HH., Assessment of Storm-Associated Precipitation and its Extremes using Observations and Climate Model Short-Range Hindcasts. *JGR Atmospheres* 129, e2023JD039697 (2024) [[10.1029/2023JD039697](https://doi.org/10.1029/2023JD039697)]
4. **Lafferty, D.C.** & Sriver, R.L., Downscaling and bias-correction contribute considerable uncertainty to local climate projections in CMIP6. *npj Clim. Atmos. Sci.* 6, 158 (2023). [[10.1038/s41612-023-00486-0](https://doi.org/10.1038/s41612-023-00486-0)]

3. Srikrishnan, V., **Lafferty, D.C.**, Wong, T.E., Lamontagne, J.R., Quinn, J.D., Sharma, S., Nusrat, J.M., Herman, J.D., Sriver, R.L., Morris, J.F., Lee, B.S., Uncertainty analysis in multi-sector systems: Considerations for risk analysis, projection, and planning for complex systems. *Earth's Future* 10, e2021EF002644 (2022). [\[10.1029/2021EF002644\]](https://doi.org/10.1029/2021EF002644)
2. **Lafferty, D.C.**, Sriver, R.L., Haqiqi, I., Hertel, T.W., Keller, K., Nicholas, R.E., Statistically bias-corrected and downscaled climate models underestimate the adverse effects of extreme heat on U.S. maize yields. *Commun Earth Environ* 2, 196 (2021). [\[10.1038/s43247-021-00266-9\]](https://doi.org/10.1038/s43247-021-00266-9)
1. **Lafferty, D.** & Rothkopf, A., Improved Gauss law model and in-medium heavy quarkonium at finite density and velocity, *Phys. Rev. D* 101, 056010 (2020). [\[10.1103/PhysRevD.101.056010\]](https://doi.org/10.1103/PhysRevD.101.056010)

## Selected Presentations

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\* denotes oral presentation; † denotes poster presentation

13. (invited) \*What drives uncertainty in local climate risk estimates across the United States?, *Earth & Atmospheric Sciences Department Seminar, Cornell University, Ithaca, NY.* (2025)
12. †Combined climate and hydrologic uncertainties shape projections of future soil moisture extremes, *AGU Fall Meeting, Washington, DC.* (2024) [\[Poster\]](#)
11. (invited) \*Combined climate and hydrologic uncertainties shape projections of future soil moisture across the United States, *Cornell Energy Water & Resources Systems Seminar, Ithaca, NY.* (2024) [\[Slides\]](#)
10. \*Downscaling and bias-correction contribute considerable uncertainty to local climate projections in CMIP6, *AGU Fall Meeting, San Francisco, CA.* (2023) [\[Slides\]](#)
9. †Pre-calibrating a simple soil moisture model to facilitate uncertainty analysis, *AGU Fall Meeting, San Francisco, CA.* (2023) [\[Poster\]](#)
8. †Do downscaling and bias-correction alter the uncertainty decomposition of climate projections? *AGU Fall Meeting, San Francisco, CA.* (2023) [\[Poster\]](#)
7. †Diagnosing the importance of climate uncertainty for sectoral analyses, *MultiSector Dynamics Workshop, Davis, CA.* (2023) [\[Poster\]](#)
6. (invited) \*The challenges of generating and using local-scale climate information, *Biological & Environmental Engineering Department Seminar, Cornell University, Ithaca, NY.* (2023) [\[Slides\]](#)
5. (invited) \*Uncertainty in Natural Systems Components of MultiSector Dynamics Systems, *Workshop on Uncertainty Characterization & Quantification in MultiSector Dynamics Research, Snowmass, CO.* (2023)
4. †Downscaling and bias-correction contribute considerable uncertainty to local climate projections in CMIP6, *Interdisciplinary Workshop on Weather and Climate Extremes, Clemson, SC.* (2023) [\[Poster\]](#)
3. \*Uncertainty in the Representation of Climate Extremes Across Downscaled and Bias-Corrected CMIP Model Ensembles, *AGU Fall Meeting, Chicago, IL.* (2022) [\[Slides\]](#)
2. \*Characterizing uncertainties in the crop switching decision problem for U.S. agriculture, *AGU Fall Meeting, Virtual.* (2021) [\[Recording\]](#)
1. †Statistically bias-corrected and downscaled climate models underestimate the adverse effects of extreme heat on U.S. maize yields, *AGU Fall Meeting, Virtual.* (2021) [\[Poster\]](#)

## Service

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- **Mentor** to [Climatematch Academy](#) students, 2024
- **Board Member** of the MultiSector Dynamics Working Group on Uncertainty Quantification and Scenario Development, 2021-2023
- **Mentor** to first year graduate students in the Department of Atmospheric Sciences at the University of Illinois, 2020-2023
- **Secretary** of the [Department of Atmospheric Sciences Graduate Student Organization](#), 2021-2022
- **Co-Chair** of the [Midwest Student Conference on Atmospheric Research](#) at the University of Illinois, 2020

## Awards & Honors

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| • Ogura Outstanding Graduate Student Research Paper Award  | 2024        |
| • AGU Outstanding Student Presentation Award   | 2023        |
| • Best Graduate Student Poster, Midwest Student Conference on Atmospheric Research   | 2021        |
| • University of Illinois Liberal Arts & Sciences COVID-19 Impact Award   | 2020        |
| • ( <i>team</i> ) Award for Advancing Reproducible Geospatial Research<br>UCGIS-CyberGIS Center at University of Illinois Urbana-Champaign | 2019        |
| • DAAD Study Scholarship for Graduates of All Disciplines  | 2016 – 2018 |

## Skills

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**Languages:** Python (numpy, scipy, xarray, dask, zarr, rioxarray, JAX, pyMC, geopandas, scikit-learn), R, Julia, GitHub, Mathematica,  $\text{\LaTeX}$ , shell scripting

**Expertise:** Climate science, uncertainty quantification, risk analysis, Bayesian statistics, differentiable modeling, data visualization, science communication, technical writing