

JOSH JACOBSON

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PROFESSIONAL EXPERIENCE

University of Colorado Boulder, Boulder, CO 2026–Now
Visiting Assistant Professor

Jupiter Intelligence, Boulder, CO 2020–2022
Data Science Consultant
Research: extreme weather events, copula models, approximate Bayesian computation
Supervisors: Steve Sain and Alexis Hoffman

EDUCATION

University of Wollongong, Wollongong, NSW 2020–2025
Ph.D. in Statistics
Thesis: *Statistical Methods for Spatio-Temporal Prediction of CO₂ Flux from Multiprocess Satellite Data*
Advisors: Noel Cressie, Andrew Zammit Mangion, and Michael Bertolacci

University of Colorado Boulder, Boulder, CO 2018–2020
M.S. in Applied Mathematics
Thesis: *Beyond Univariate Calibration: Verifying Spatial Structure in Ensembles of Forecast Fields*
Advisors: William Kleiber and Michael Scheuerer

University of Colorado Boulder, Boulder, CO 2015–2019
B.S. in Applied Mathematics (with honors)
Minors in Computer Science, Atmospheric and Oceanic Sciences

SELECTED AWARDS & FELLOWSHIPS

2025 **Winner, J.B. Douglas Postgraduate Awards**, Statistical Society of Australia, NSW Branch

2025 **Winner, Student Paper Competition**, EnviBayes Section of the International Society for Bayesian Analysis

2025 **Best Lightning Talk**, The Bayesian Young Statisticians Meeting

2024 **Best Student Presentation**, 31st Conference of The International Environmetrics Society

2021 **Allison Harcourt Best Poster Award**, Early Career & Student Statisticians Conference

2021 **Statistical Data Science Fellowship**, Australian Mathematical Sciences Institute

2020 **Graduate Fellowship**, University of Wollongong (2020–2024)

2020 **Paper of the Month Award**: August 2020, *Nonlinear Processes in Geophysics*

PUBLICATIONS

Google Scholar: https://scholar.google.com/citations?user=MIK_mtoAAAAJ

- [6] **Jacobson, J.**, Bertolacci, M., Zammit-Mangion, A., Schuh, A., & Cressie, N. (2025+). WOMBAT v2.S: A Bayesian inversion framework for attributing global CO₂ flux components from multiprocess data. *Environmetrics*, 36(8), e70052. <https://doi.org/10.1002/env.70052>
- [5] Cressie, N., Zammit-Mangion, A., **Jacobson, J.**, & Bertolacci, M. (2023). Earth's CO₂ battle: A view from space. *Significance*, 20(1), 14-19. <https://doi.org/10.1093/jrssig/qmad003>

- [4] **Jacobson, J.**, Cressie, N., & Zammit-Mangion, A. (2023). Spatial statistical prediction of solar-induced chlorophyll fluorescence (SIF) from multivariate OCO-2 data. *Remote Sensing*, 15(16), 4038. <https://doi.org/10.3390/rs15164038>
- [3] Vu, Q., Cao, Y., **Jacobson, J.**, Pearse, A. R., & Zammit-Mangion, A. (2021). Discussion on “Competition on Spatial Statistics for Large Datasets.” *Journal of Agricultural, Biological and Environmental Statistics*, 26, 614-618. <https://doi.org/10.1007/s13253-021-00464-0>
- [2] **Jacobson, J.**, Kleiber, W., Scheuerer, M., & Bellier, J. (2020). Beyond univariate calibration: Verifying spatial structure in ensembles of forecast fields. *Nonlinear Processes in Geophysics*, 27(3), 411-427. <https://doi.org/10.5194/npg-27-411-2020>
- [1] Raseman, W. J., **Jacobson, J.**, & Kasprzyk, J. R. (2019). Parasol: An open source, interactive parallel coordinates library for multi-objective decision making. *Environmental Modelling & Software*, 116, 153-163. <https://doi.org/10.1016/j.envsoft.2019.03.005>

SOFTWARE & DATASETS

WOMBAT v2.S: Workflow for attributing global CO₂ flux components from multiprocess satellite data
<https://github.com/joshhjacobson/wombat-v2s>

coSIF: Dataset of monthly, 0.05-degree cokriging predictions and standard errors for SIF over North America
<https://doi.org/10.5281/zenodo.8078592>

FTE: Workflow for verifying spatial structure in downscaled GEFS reforecast data
<https://github.com/joshhjacobson/FTE>

Parasol: Parallel coordinates visualization library for multi-objective decision-making
<https://github.com/ParasolJS/parasol-es>

TEACHING EXPERIENCE

Instructor and Course Coordinator

University of Colorado Boulder

STAT 3400: Applied Regression

Spring 2026

University of Wollongong

STAT 251: Fundamentals of Biostatistics

Fall 2025

Co-Instructor

University of Wollongong

STAT 101: Introduction to Statistics

Fall 2025

Teaching Assistant

University of Wollongong

MATH 255: Mathematics for Computing

Spring 2025

STAT 304: Stochastic Processes and Time Series Analysis

Fall 2024

STAT 332: Generalized Linear Models

Spring 2024

STAT 301: Statistical Methods for Data Science

Fall 2023

STAT 332: Generalized Linear Models

Spring 2023

University of Colorado Boulder

APPM 4350: Fourier Series and Boundary Value Problems

Fall 2018

CSCI 1320: Introduction to Programming for Engineers

Spring 2016

*Denotes presenting author(s).

Invited Presentations

- [6] ***Jacobson, J.**, Bertolacci, M., Zammit-Mangion, A., Schuh, A., & Cressie, N. (November 2025). A Bayesian hierarchical model for CO₂ flux estimation from multiprocess satellite data. *J.B. Douglas Postgraduate Awards*, Sydney, NSW.
- [5] ***Jacobson, J.**, Bertolacci, M., Zammit-Mangion, A., Schuh, A., & Cressie, N. (November 2025). Scalable Bayesian inference for global CO₂ flux attribution with WOMBAT v2.S. *Computational Statistics in Data Science Workshop*, Wollongong, NSW.
- [4] ***Jacobson, J.**, *Bertolacci, M., Zammit-Mangion, A., Schuh, A., & Cressie, N. (September 2025). WOMBAT v2.S: A Bayesian inversion framework for CO₂ flux attribution. *NASA Orbiting Carbon Observatory-2/3 Science Team Meeting*, Fort Collins, CO (via Teams).
- [3] ***Jacobson, J.**, Bertolacci, M., *Zammit-Mangion, A., Schuh, A., & Cressie, N. (September 2025). WOMBAT v2.S: A Bayesian inversion framework for CO₂ flux attribution. *NASA Orbiting Carbon Observatory-2/3 Science Team Meeting: Uncertainty Quantification Breakout*, Online.
- [2] ***Jacobson, J.**, Bertolacci, M., Zammit-Mangion, A., Schuh, A., & Cressie, N. (March 2025). A Bayesian hierarchical model for CO₂ flux estimation from multiprocess satellite data. *Seminar, Department of Statistics, University of New South Wales*, Sydney, NSW.
- [1] ***Jacobson, J.**, Harr, P., & Sain, S. (April 2023). A fully-Bayesian spatial copula model for joint-frequency analysis of extreme events. *Seminar, National Institute for Applied Statistics Research Australia (NIASRA)*, Wollongong, NSW.

Contributed Presentations

- [11] ***Jacobson, J.**, Bertolacci, M., Zammit-Mangion, A., Schuh, A., & Cressie, N. (April 2025). A Bayesian hierarchical model for CO₂ flux estimation from multiprocess satellite data. *The Bayesian Young Statisticians Meeting (BAYSM)*, Online.
- [10] ***Jacobson, J.**, Bertolacci, M., Zammit-Mangion, A., Schuh, A., & Cressie, N. (December 2024). A Bayesian hierarchical model for CO₂ flux estimation from multiprocess satellite data. *31st Conference of The International Environmetrics Society*, Adelaide, SA.
- [9] ***Jacobson, J.**, Cressie, N., & Zammit-Mangion, A. (December 2023). Spatial prediction of solar-induced fluorescence (SIF) from multiprocess satellite data. *Australian Statistical Conference*, Wollongong, NSW.
- [8] ***Jacobson, J.**, Cressie, N., & Zammit-Mangion, A. (October 2023). coSIF: Spatial statistical prediction of SIF from multiprocess OCO-2 data. *NASA Orbiting Carbon Observatory-2/3 Science Team Meeting: SIF Breakout*, Boulder, CO (via Teams).
- [7] ***Jacobson, J.**, Harr, P., & Sain, S. (January 2023). A fully-Bayesian spatial copula model for joint-frequency analysis of extreme events. *American Meteorological Society 103rd Annual Meeting*, Denver, CO.
- [6] *Hoffman, A., Sain, S., & **Jacobson, J.** (August 2022). Data Science and Applied Statistics in Climate Risk Analysis. *Joint Statistical Meetings*, Washington, D.C.

- [5] ***Jacobson, J.**, Cressie, N., & Zammit-Mangion, A. (July 2021). Multivariate spatial prediction of column-averaged carbon dioxide over North America. *Australian Mathematical Sciences Institute (AMSI) Winter School*, Online.
- [4] ***Jacobson, J.**, Cressie, N., & Zammit-Mangion, A. (July 2021). Spatial prediction of column-averaged carbon dioxide over the globe. *Australian and New Zealand Statistical Conference*, Online.
- [3] *Hoffman, A., Sain, S., & **Jacobson, J.** (January 2021). Flexible Python-based statistical workflow for flood risk estimates applied across CMIP6 models. *American Meteorological Society 101st Annual Meeting*, Online.
- [2] ***Jacobson, J.**, Kleiber, W., Scheuerer, M., & Bellier, J. (November 2019). Verification of spatial structure in ensembles of forecast fields. *Seminar, Department of Mathematics, University of Zurich*, Zurich, Switzerland.
- [1] *Raseman, W. J., ***Jacobson, J.**, & Kasprzyk, J. R. (September 2018). Interactive visualizations for multi-objective optimization problems. *Rocky Mountain Advanced Computing Consortium HPC Symposium*, Boulder, CO.

Contributed Posters

- [3] ***Jacobson, J.**, Bertolacci, M., Zammit-Mangion, A., Schuh, A., & Cressie, N. (October 2024). A multivariate Bayesian hierarchical model for global CO₂ surface flux. *ENVR Workshop on Spatial Data Science for the Environment*, Boulder, CO.
- [2] ***Jacobson, J.**, Cressie, N., & Zammit-Mangion, A. (July 2021). Multivariate spatial-dependence modelling with satellite data. *Early Career & Student Statisticians Conference*, Online.
- [1] *Hoffman, A., Sain, S., & **Jacobson, J.** (December 2020). Flexible methodology for hyperlocal flooding risk due to sea level rise. *American Geophysical Union 2020 Fall Meeting*, Online.

ACADEMIC SERVICE

Outreach Volunteer	<i>Fall 2024</i>
School of Mathematics and Applied Statistics, University of Wollongong	
Head of Postgraduate Seminar Series	<i>Spring 2024</i>
School of Mathematics and Applied Statistics, University of Wollongong	
Co-host of “Probably Novel Radio Show and Podcast”	<i>Spring 2019</i>
Radio 1190, Department of Applied Mathematics, University of Colorado Boulder	

PROFESSIONAL MEMBERSHIPS

American Geophysical Union
 American Meteorological Society
 American Statistical Association
 International Society for Bayesian Analysis
 The International Environmetrics Society