Russell Goebel

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Education

PhD in Statistics · *Boston University* 2019–2026
Dissertation: *Bayesian Change-of-Support Modeling for Remote-Sensing Data: Scalable Inference Across Spatial Resolutions*
Advisor: Luis Carvalho

BA in Statistics · *Western Washington University* 2015–2019
Minor: English

Research Interests

Bayesian spatial modeling; change-of-support methods; scalable inference for large spatial datasets; spectral and low-rank approximations to spatial processes; longitudinal and mixed-effects modeling in health research.

Publications

Peer-Reviewed Articles

- Canter, B. E., Goebel, R., Kulkarni, V., Mak, W., Falvey, J., & Boockvar, K. (2024). Associations between eating, mobility, and toileting functional dependence and COVID-19 symptoms. *Journal of the American Medical Directors Association*, 25(2), 342–347.
- Holmes, L. G., Goebel, R. J., Hollingue, C., Zhu, S., Zhang, H., Shan, W., … & Rothman, E. F. (2023). Reductions in depression and anxiety among autistic adults participating in an intervention to promote healthy relationships. *The American Journal of Occupational Therapy*, 77(2), 7702185070.
- Amador, R., Goebel, R., Noordzij, J. P., Bhatt, N. K., Cohen, S., Daniels, K., … & Krisciunas, G. P. (2023). A systematic review and meta-analysis of neuromodulators to treat chronic airway hypersensitivity. *American Journal of Otolaryngology*, 44(3), 103815.
- Goebel, R., Schmaltz, A., Brackett, B. A., Wood, S. A., & Noguchi, K. (2023). Modeling and forecasting percent changes in national park visitation using social media. *Journal of Forecasting*, 42(6), 1502–1518.

Under Review

- Goebel, R. (2025). Bayesian downscaling of satellite-derived solar-induced chlorophyll fluorescence. *Under review at Journal of the Royal Statistical Society: Series C*.

Conference Presentations

- Goebel, R. (December 2024). *Bayesian Downscaling of Satellite-Derived Solar-Induced Chlorophyll Fluorescence*. Poster presented at the American Geophysical Union Annual Meeting, Washington D.C.

Developed Software

CRAN Packages

- **VisitorCounts** — Modeling and forecasting of park visitor counts using social media data and on-site counts. Decomposes trend and seasonal components via Singular Spectrum Analysis to produce short-term forecasts and percent-change estimates. CRAN

Research Packages

- **fastblm** — Fast Bayesian linear model fitting for large spatial datasets, using conjugate gradient, Woodbury, or sparse Cholesky methods with optional Lanczos standard errors and support for linear constraints. GitHub
- **spatintegrate** — Integrates functions over spatial geometries (e.g. from the sf package). Useful for constructing spatial design matrices with different bases and for area-to-area kriging. GitHub

Research Experience

Doctoral Research in Applied Statistics · *Boston University* 2019–2026

- Developed a Bayesian modeling framework for spatial change-of-support and downscaling of remotely-sensed Solar Induced Chlorophyl Fluorescence, with emphasis on scalable inference across multiple spatial resolutions.
- Designed and implemented an R package supporting reproducible and computationally efficient workflows for applied scientists working with large geospatial datasets.

Clinical and Applied Research Collaborations · *Boston University*

- Longitudinal mixed-effects modeling of weekly depression and anxiety outcomes for a six-session psychoeducational intervention among autistic adults; led analysis resulting in publication in the *American Journal of Occupational Therapy*.
- Fixed-effects meta-analysis using inverse-variance weighting to pool cough frequency, severity, and quality-of-life outcomes across randomized controlled trials of neuromodulators for chronic airway hypersensitivity; resulted in publication in the *American Journal of Otolaryngology*.
- Multiple logistic, linear, and ordinal regression with multiple imputation by chained equations (MICE) to assess associations between pre-COVID functional dependence, symptom burden, and post-COVID functional decline in skilled nursing facility residents; resulted in publication in *JAMDA*.

Consulting Experience

Lead Statistical Consultant · *Boston University Statistical Consulting* 2021–2023

- Oversaw graduate consulting teams across more than 50 interdisciplinary projects spanning a wide range of university domains, including clinical research, epidemiology, life sciences, forensic science, anthropology, and marketing.
- Advised collaborators on study design, power analysis, statistical analysis planning, and interpretation of results for non-statistical audiences.
- Methods deployed across engagements included regression and GLMs, mixed-effects models, survival analysis, meta-analysis, multiple imputation, sensitivity analyses, and exploratory data analysis.
- Prepared technical reports and presented findings to collaborators across disciplines.

Teaching Experience

Instructor of Record & Teaching Assistant · *Boston University* 2019–2025

- Instructor of record for undergraduate calculus.
- Teaching assistant for undergraduate and graduate courses in statistics and mathematics, including linear algebra and data science.
- Delivered invited seminar on reproducible statistical research using R Markdown.

Awards & Honors

Outstanding Teaching Fellow Award · *Department of Mathematics and Statistics, Boston University* 2021

Leadership & Professional Service

President, BU Chapter of the ASA (BUSCASA) · *Boston University* 2022–2024

- Led executive board and organized programming connecting students with academic and industry statisticians.
- Coordinated seminars and professional development events focused on applied and reproducible statistical practice.

Technical Expertise

Statistical Methods: Bayesian modeling; longitudinal and mixed-effects models; regression and GLMs; survival analysis; meta-analysis; multiple imputation; sensitivity analysis; experimental design; spatial modeling.

Programming: R, Python, MATLAB; reproducible workflows (R Markdown, Quarto); version control (Git).