Candace Berrett

Professor
Department of Statistics
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Education

The Ohio State University — Columbus, OH
Ph.D. in Statistics, September 2010
Advisor: Catherine A. Calder, Ph.D.
Dissertation: "Bayesian Probit Regression Models for Spatially-Dependent Categorical Data"
M.S. in Statistics, December 2007

Brigham Young University — Provo, UT
B.S. in Actuarial Science, *cum laude*, April 2005
Minor: Mathematics

Experience

Department of Statistics, Brigham Young University — Provo, UT
Professor, September 2022 – present
Associate Chair, July 2022 – present
Associate Professor, September 2017 – August 2022
Assistant Professor, August 2010 – August 2017

Department of Statistics, The Ohio State University — Columbus, OH
Research Assistant, January 2007 – September 2009, January – August 2010

Statistical and Applied Mathematical Sciences Institute — Durham, NC
Graduate Fellow, Program on Space-time Analysis for Environmental Mapping, Epidemiology and Climate Change, September – December 2009

Center for Instructional Design, Brigham Young University — Provo, UT
Research Assistant, Evaluation and Assessment, August 2001 - May 2005

Watson Wyatt Worldwide — Boston, MA
Actuarial Analyst Intern, June – August 2004

Scholarship

Publications

Heaton, M. J., *Ingersoll, C.*, **Berrett, C.**, Hartman, B., and Sloan, C. (2021) "A Bayesian approach to real-time spatiotemporal prediction systems for respiratory syncytial virus." *Spatial and Spatio-Temporal Epidemiology*, 38, 100434. DOI:10.1016/j.sste.2021.100434.

Berrett, C., Christensen, W.F., Sain, S.R., *Sandholtz, N.G.*, *Coats, D.W.*, Tebaldi, C., and Lopes, H. (2020) "Modeling sea level processes on the US Atlantic coast," *Environmetrics*, 31(4), e2609. DOI:10.1002/env.2609.

Grimshaw, S.D., Blades, N.J., and **Berrett, C.**, (2020) "Going viral, binge watching, and attention cannibalism," *The American Statistician*, 74(4), 380-391. DOI:10.1080/00031305.2020.1774415.

Heaton, M. J., **Berrett, C.**, DeRose, J., and Bekker, M. (2020) "Spatial and covariate-varying relationships among dominant tree species in Utah," *Environmental and Ecological Statistics*, 27, 591–607. DOI:10.1007/s10651-020-00460-6.

Heaton, M. J., **Berrett, C.**, *Pugh, S.*, Evans, A., and Sloan, C. (2020) "Modeling bronchiolitis incidence rates in the presence of spatio-temporal uncertainty," *Journal of the American Statistical Association*, 115(529), 66–78. DOI:10.1080/01621459.2019.1609480.

Pugh, S., Heaton, M.J., Hartman, B., **Berrett, C.**, Sloan, C., Evans, A., Gebretsadik, T., Wu, P., Hartert, T., Lee, R. (2019) "Estimating seasonal onsets and peaks of bronchiolitis with spatially and temporally uncertain data," *Statistics in Medicine*, 38(11), 1991–2001. DOI:10.1002/sim.8081.

Risser, M.D., Berrocal, V., Calder, C.A., and **Berrett, C.** (2019) "Nonstationary spatial prediction of soil organic carbon: Implications for stock assessment decision making," *Annals of Applied Statistics* 13(1), 165–188. DOI:10.1214/18-AOAS1204.

White, P., **Berrett, C.**, Tass, E. S. N., and Findley, M. (2019) "Modeling efficiency of foreign aid allocation in Malawi," *The American Statistician*, 73(4), 385–399. DOI:10.1080/00031305.2018.1470032.

Augustine-Adams, K., **Berrett, C.**, and Rasband, J.R. (2018) "Speed matters," *Howard Law Journal*, 61(2), 239–270.

Calder, C.A. and **Berrett, C.** (2018). Invited discussion of "Computationally efficient multivariate spatio-temporal models for high-dimensional count-valued data." *Bayesian Analysis*, 13(1), 292-297. (Editor reviewed.) DOI:10.1214/17-BA1069.

Nelsen, B., *Williams, D.A.*, Williams, G.P., and **Berrett, C.** (2018) "An empirical mode-spatial model for environmental data imputation," *Hydrology*, 5(4), 63. DOI:10.3390/hydrology5040063.

Williams, D. A., Nelson, B., **Berrett, C.**, Williams, G. P., Moon, T. (2018) "A comparison of data imputation methods using Bayesian compressive sensing and empirical mode decomposition for environmental temperature data," *Environmental Modelling and Software*, 102, 172–184. DOI:10.1016/j.envsoft.2018.01.012.

Sloan, C., Heaton, M.J., *Kang, S.*, **Berrett, C.**, Wu, P., Gebretsadik, T., Sicignano, N., Evans, A., Lee, R., and Hartert, T. (2017) "The impact of temperature and relative humidity on spatiotemporal patterns and spread of annual infant bronchiolitis epidemics in the contiguous United States," *Health & Place*, 45, 46–54. DOI:10.1016/j.healthplace.2017.02.010.

Berrett, C. and Calder, C.A. (2016) "Bayesian spatial binary classification," *Spatial Statistics*, 16, 72–102. DOI:10.1016/j.spasta.2016.01.004.

Christensen, W.F. and **Berrett, C.** (2016) "Optimally smoothed maps of pollution source potential via particle back-trajectories and filtered kriging," *Chemometrics & Intelligent Laboratory Systems*, 153, 1–8. DOI:10.1016/j.chemolab.2016.02.002.

Berrett, C., Williams, G.P., Moon, T., and Gunther, J. (2014) "A Bayesian nonparametric model for temperature-emissivity separation for long-wave hyperspectral images." *Technometrics*, 56(2), 200-211. DOI:10.1080/00401706.2013.869262.

Heaton, M.J., Katzfuss, M., **Berrett, C.**, and Nychka, D.W. (2014) "Constructing valid spatial processes on the sphere using kernel convolutions." *Environmetrics*, 25(1), 2-15. DOI:10.1002/env.2251. (*2014 Wiley-TIES Environmetrics Best Paper Award*)

Berrett, C. and Calder, C.A. (2012) "Data augmentation strategies for the spatial probit regression model." *Computational Statistics and Data Analysis*, 56(3), 478–490. DOI:10.1016/j.csda.2011.08.020.

Calder, C. A., **Berrett, C.**, Shi, T., Xiao, N., and Munroe, D. (2011) "Modeling space-time dynamics of aerosols using satellite data and atmospheric transport model output." *Journal of Agricultural, Biological, and Environmental Statistics*, 16, 495–512. DOI:10.1007/s13253-011-0068-4.

Xiao, N., Shi, T., Calder, C.A., Munroe, D.K., **Berrett, C.**, Wolfinbarger, S., and Li, D. (2009) "Spatial characteristics of the difference between MISR and MODIS aerosol optical depth retrievals over mainland Southeast Asia," *Remote Sensing of Environment*, 113(1), 1–9. DOI:10.1016/j.rse.2008.07.011.

Submitted[1]

Berrett, C., *Gurney, B.*, *Arthur, D.*, Moon, T., and Williams, G. P., "A Bayesian change point model for spatio-temporal data," submitted (provisionally accepted). http://arxiv.org/abs/2105.10637.

Huch, E. and **Berrett, C.**, "Efficient estimation of the GP-P model," (under revision).

Works in Progress

Kahn, K. and **Berrett, C.** "Re-thinking Spatial Confounding in Spatial Linear Mixed Models"

Rawat, S., *Durrant, A.*, *Simpson, A.*, *Nielson, G.*, Deb, S., and **Berrett, C.** "A Bayesian Approach to Identify Change Points in Spatio-Temporal Ordered Categorical Data: An Application to COVID-19 Data"

Grants and Contracts

Co-PI, 2019, "Statistical Learning of Spatio-temporal Distributions for Disease Surveillance and Epidemiology," National Science Foundation (NSF). (Not Funded)

Co-PI, 2018-2022, "Dynamic, Spatio-temporal Modeling of Seasonal RSV Circulation to Improve Childhood Health Outcomes," National Institutes of Health (NIH). (Not Funded)

PI, 2016-2017, "PARAKEET: Performance and Reliability Assessments for Knowledge of Electronic Emissions Technology," Los Alamos National Laboratory (LANL). ($80k)

Co-PI, 2014-2017, "Spatial Uncertainty: Data, Modeling, and Communication," National Institutes of Health (NIH). ($125k)

Co-PI, 2014, "Annual Burden of Infant Bronchiolitis Epidemics in the United States," National Institutes of Health (NIH). (Not Funded)

Co-PI, 2013-2016, "Validation and Uncertainty Quantification for Large Spatio-Temporal Datasets using Parallelizable Computation," National Science Foundation (NSF). ($201k; BYU Portion: $47k)

Co-PI, 2012, "FRG: Collaborative Research: Tools and Analysis for Complex Geophysical Computer Models," National Science Foundation (NSF). (Not Funded)

Investigator, 2014-2017, "RF Sensing and Signal Processing for Monitoring Proliferation Activity," U.S. Department of Energy. (BYU Portion: $280k)

[1] Italicized name indicates a former student.

Investigator, 2015, "Nuclear Science and Engineering Nonproliferation Research Consortium," U.S. Department of Energy. (Not Funded)

Investigator, 2012, "Characterization and Separation of Non-linear Spectra from Optically Thin Materials," U.S. Department of Energy. (Not Funded)

Investigator, 2012, "RF Sensing and Signal Processing for Monitoring Proliferation Activity," U.S. Department of Energy. (Not Funded)

Consultant, 2011-2013, "Solids Identification Using Hyperspectral Imagery: Extracting Reliable Signatures from a Sea of Variability," U.S. Department of Energy.

Teaching

Department of Statistics, Brigham Young University — Provo, UT
Instructor, Stat 151/251: Introduction to Bayesian Statistics
Fall 2014 – 2016, 2019[2], 2022; Winter 2017, 2021
Instructor, Stat 240: Discrete Probability
Fall 2012 – 2015, 2017[1]; Winter 2018 – 2021
Instructor, Stat 301: Statistics and Probability for Educators
Fall 2010 – 2013
Instructor, Stat 537/637: Generalized Linear Models
Fall 2016, 2017, 2022; Winter 2011 – 2016, 2019 – 2021

Department of Statistics, The Ohio State University — Columbus, OH
Course Developer, Stat 494: Statistics in the Environmental Sciences, Winter 2010
Teaching Assistant, Stat 145: Intro to Statistics, Fall 2006, Winter 2007
Teaching Assistant, Stat 135: Elementary Statistics, Fall 2005

Mathematical Biosciences Inst., The Ohio State University — Columbus, OH
Teaching Assistant & Mentor, Summer Program in Mathematical Biology for Undergrads, Summer 2007, 2009

Presentations

Invited Talks

A Bayesian Change-Point Model for Spatio-Temporal Data
Department of Statistics, University of South Carolina, November 2021
Joint Statistical Meetings, Washington, DC, August 2022

Modeling Sea Level Processes on the US Atlantic Coast
ISBA 2020, Kunming, Yunnan, China, June 2020 (postponed to June 2021)
CMStatistics 2019, Senate House University of London, London, UK, December 2019

Spatial Statistics in R
Salt Lake City R Users Group, Intermountain Healthcare, UT, February 2019

Bayesian Spatio-Temporal Factor Analysis for Prediction
ISBIS 2017, IBM T.J. Watson Research Center, Yorktown Heights, NY, June 2017

A Bayesian Spatio-Temporal Factor Analysis Model for Predicting Coastal Sea Levels
10th ICSA International Conference, Shanghai, China, December 2016

Modeling Environmental Impacts on Bronchiolitis in the Presence of Spatial Uncertainty
Joint Statistics Meeting, Chicago, IL, August 2016
ISBA World Meeting, Sardinia, Italy, June 2016

[2] Updated curriculum.

Constructing Valid Spatial Processes on the Sphere using Kernel Convolutions
26th Annual Conference of TIES, Edinburgh, Scotland, July 2016

Bayesian Spatial Classification
Statistical Science Group, Los Alamos National Laboratory, October 2015
Department of Mathematics and Statistics, Colorado School of Mines, February 2016
Department of Mathematics and Statistics, University of New Mexico, March 2016

Spatio-Temporal Modeling of Infant Respiratory Syncytial Virus in the Presence of Spatial Uncertainty
WNAR Annual Meeting, Boise, ID, June 2015

Bayesian Probit Model for Spatially-Dependent Categorical Data
Department of Statistics, Pennsylvania State University, February 2014

Modeling Space-Time Dynamics of Aerosols Using Satellite Data and Atmospheric Transport Model Output
IBS ENAR Spring Meeting, Orlando, FL, March 2013

Bayesian Models for Multicategory Spatial Data
ISI World Statistics Congress, Dublin, Ireland, August 2011

Data Augmentation for the Bayesian Spatial Probit Regression Model
WNAR Annual Meeting, San Luis Obispo, CA, June 2011
Fourth International IMS/ISBA Joint Meeting, Park City, UT, January 2011

Bayesian Probit Regression Models and Kernel-Based Space-Time Models: Two Statistical Applications for Analyzing Land-Atmosphere Interactions for Southeast Asia
Institute for Mathematics Applied to Geosciences (IMAGe), National Center for Atmospheric Research, Boulder, CO, March 2010

Bayesian Probit Regression Models for Spatially-Dependent Categorical Data
Department of Statistics, Brigham Young University, Provo, UT, February 2010

Learning to Teach Statistics: A TA's Perspective
Joint Statistical Meetings, Denver, CO, August 2008

Contributed Talks

A Bayesian Change Point Model for Spatio-Temporal Data
Joint Statistical Meetings, Virtual, August 2021

Modeling U.S. Infant Bronchiolitis Rates in the Presence of Spatial Uncertainty
Joint Statistical Meetings, Seattle, WA, August 2015

Constructing Valid Spatial Processes on the Sphere using Kernel Convolutions
Joint Statistical Meetings, Boston, MA, August 2014

Bayesian Nonparametric Methods for Material Identification from Large Remotely-Sensed Hyperspectral Space-Time Datasets
Joint Statistical Meetings, San Diego, CA, August 2012

Bayesian Modeling of Sea-Level Rise Along the US Coast
IMS Young Researchers Meeting, San Diego, CA, July 2012

Bayesian Probit Regression for Multicategory Spatial Data
Joint Statistical Meetings, Miami, FL, August 2011

Data Augmentation Strategies for the Bayesian Spatial Probit Regression Model
Joint Statistical Meetings, Vancouver, BC, August 2010

Data Augmentation Methods for Bayesian Modeling of Spatially-Dependent Categorical Data
Joint Statistical Meetings, Washington, DC, August 2009

Characterizing the Dependence Structure of Space-Time Processes using Computer-Model Output and Sparse Observations
Joint Statistical Meetings, Salt Lake City, UT, August 2007

Talks at Sponsoring Institution

A Bayesian Change-Point Model for Spatio-Temporal Data
Department of Statistics, Provo, UT, October 2021

Bayesian Spatial Classification
Department of Statistics, Provo, UT, October 2014

A Bayesian Nonparametric Model for Temperature-Emissivity Separation of Long-wave Hyperspectral Images
Department of Statistics, Provo, UT, October 2012

Kernel-Based Spatio-Temporal Dynamical Modeling: Methods from Xu, Wikle, & Fox "Kernel-Based Spatio-Temporal Dynamical Model for Nowcasting Weather Radar Reflectivities"
Discussion Group on Space-Time Data and Modeling, Columbus, OH, May 2009

The FLAMES Project: An Example of Statistics Research at Ohio State
Graduate Information Day, Columbus, OH, January 2009

Discussion of "Bayesian Modeling of Uncertainty in Ensembles of Climate Models' by R.L. Smith, C. Tebaldi, D. Nychka, and L. Mearns"
Quarter on Statistics and Climate Change Discussion Group, Columbus, OH, May 2008

Contributed Posters

Bayesian Model-Based Spatial Classification
ISBA World Meeting, Cancun, Mexico, June 2014

Space-Time Modeling of Sea Level Rise Along the United States Coast
23rd Annual Conference of TIES, Anchorage, Alaska, June 2013

Bayesian Models for Multicategory Spatial Data
ISBA World Meeting, Kyoto, Japan, June 2012

Bayesian Nonparametric Methods for Solids Analysis of Long-wave Hyperspectral Image Data
Conference on Data Analysis, Santa Fe, New Mexico, February 2012

GLM-Based Spatial Classification
ENVR Workshop on Environmetrics, Boulder, Colorado, October 2010

Bayesian Probit Regression Models for Spatially-Dependent Categorical Data
ISBA World Meeting, Benidorm, Spain, June 2010

Data Augmentation Algorithms for the Bayesian Spatial Probit Regression Model
SAMSI Program on Space-time Analysis for Environmental Mapping, Epidemiology and Climate Change Opening Workshop, Research Triangle Park, NC, September 2009

Kernel-Based Space-Time Modeling of Computer Simulated Aerosol Optical Depth Data
Midwest Statistics Research Colloquium, Chicago, IL, March 2009

Spatial Characteristics of the Difference between MISR and MODIS Aerosol Optical Depth Retrievals over Mainland Southeast Asia
ENVR Workshop on Environmetrics, Boulder, CO, October 2008

A Statistical Framework for Synthesizing MISR AOD Data and MOZART Output
MISR Data Users Science Symposium, Pasadena, CA, December 2007

Students Supervised

Graduate Advisor

Abe Durrant (exp: 2023)
Carly Lundgreen (2022; Co-Advisor)
Brianne Gurney (2021)
David Arthur (2018)
Stephen McKechnie (2017)
Nathan Sandholtz (2016; Co-Advisor)
Alexis Cottam (2015)
Jessica Seeger Alvey (2015)
David Coats (2015; Co-Advisor)

Graduate Committee Member

Emily Liu (exp: 2023)
Connie Mui (2022)
David Teuscher (2022)
Megan Louder (2021)
Celeste Ingersoll (2020)
Jeremy Meyer (2020)
Wendy Wang (2020)
William Horton (2019)
Sierra Pugh (2018)
Matthew Goodwin (2017)
Kristina Murri (2017)
Keaton Baughan (2016)
Cameron Faerber (2016)
Sorah Kang (2015)
Andrew Brock (2014)
Matthew Heiner (2014)

Paul Sabin (2014)
Megan Denison (2013)
Devin Francom (2013)
Ariana Hedges (2013)
Noel Ellison (2012)
Jessica Olsen Langford (2012)
Brent Shepherd (2012)
Andrew Olsen (2011)

Undergraduate Research Mentor

Abby Kennedy (2023)
Emmelia Cieslewicz (2023)
Adam Simpson (2022)
Grant Nielson (2022)
Connor Greenhalgh (2021)
Adam Jensen (2021)
Grace Driggs (2020)
Kylee Badger (2020)
Clark Blatter (2020)
Marian Strong (2018; Honors Thesis Reader)
Erin Marshall (2017)
Dean Sobczak (2017)
Alex Williams (2016–2017)
David Arthur (2016)
Wyatt Clegg (2016)
Yunwoo Jang (2016)
Nathan Osbourne (2016)
Nate Garrett (2015)
Maddie Phan (2015)
Jessica Seeger Alvey (2014)
William Baumann (2012)

Service

To Sponsoring Institution

Graduate Coordinator, Department of Statistics, BYU, July 2022 – present

Chair, Belonging, Department of Statistics, BYU, September 2022 – present

Chair, Rank and Status Revision Committee, Department of Statistics, BYU, July 2022 – present

Member, Major Recruitment & Retention Committee, Department of Statistics, BYU, July 2021 – 2022

Chair, Rank and Status Committee, Department of Statistics, BYU, August 2019 – September 2020, September 2021 – 2022

Faculty Advisor, Mu Sigma Rho Student Honors Association, Summer 2014 – Summer 2021

Speaker, University Devotional, BYU, October 2020

Chair, Inspiring Learning and Mentoring Section of Unit Review, Department of Statistics, BYU, June 2020 – September 2020

Member, Dean Search Committee, College of Physical and Mathematical Sciences, BYU, September 2019 – January 2020

Member, Faculty Evaluation Committee, Department of Statistics, BYU, January 2018 – 2019, September 2022 – present

Member, Rank and Status Committee, Department of Statistics, BYU, September 2017 – October 2019, September 2022 – present

Member, Student Experience Committee, Department of Statistics, BYU, September 2017 – April 2018

Chair, Library Committee, Department of Statistics, BYU, December 2016 – June 2017

Organizer, Seminar Series Winter 2013, Department of Statistics, BYU, June 2012 – April 2013

Member, Scholarship Committee, Department of Statistics, BYU, January 2013 – May 2015

Member, Graduate Program & Actuarial Program Unit Review Subcommittees, Department of Statistics, BYU, March 2012 – December 2012

Member, Teaching & Learning Subcommittee on the Actuarial Program, Department of Statistics, BYU, July 2011 – December 2012

Co-President, Department of Statistics Graduate Student Organization, OSU, September 2007 – June 2008

Graduate Student, Program in Spatial Statistics and Environmental Statistics, OSU, April 2007 – August 2010

Member, Graduate Recruitment Committee, OSU, September 2006 – June 2007

To Profession

Chair-Elect, EnviBayes, Environmental Sciences Section, International Society of Bayesian Analysis, 2023

Associate Editor, *The American Statistician*, 2020 – present

Member, Student Paper Competition Committee, Section on the Environment, American Statistical Association, 2021 – 2024

Secretary, EnviBayes, Environmental Sciences Section, International Society of Bayesian Analysis, 2019 – 2022

Program Chair, Section on the Environment, American Statistical Association, 2021

Scientific Committee Member, Spatial Statistics 2021/3, 2020 – 2023

Speaker, Florence Nightingale Day, The Ohio State University, 2020

Program Chair Elect, Section on the Environment, American Statistical Association, 2020

Scientific Committee Member, ENVR Workshop, 2019 – 2020 (extended to 2021)

Organizing Committee Member, ENVR/EnviBayes Workshop on Bayesian Environmetrics, 2015 - 2016

Publications Chair, Section on the Environment, American Statistical Association, 2015 - 2016

Judge, WNAR Student Paper Competition, June 2015

Program Chair, Environmental Sciences Section, International Society of Bayesian Analysis, 2014 – 2015

Treasurer, Utah Chapter, American Statistical Association, 2014 - 2015

Publications Chair-elect, Section on the Environment, American Statistical Association, 2014

Judge, SBSS Student Paper Competition, January 2013

Presenter, Expanding Your Horizons Workshop, March 2012

Volunteer, United States Conference On Teaching Statistics, OSU, May 2007

Referee for several journals, including:
The American Statistician; Annals of Applied Statistics; Bayesian Analysis; Biometrics; Biostatistics; Computational Statistics and Data Analysis; Ecological Applications; Envrionmetrics; Journal of Agricultural, Biological, and Environmental Statistics; Journal of the American Statistical Association; Spatial Statistics; Statistica Sinica; Statistical Analysis and Data Mining; Statistics in Medicine; Technometrics

Awards and Honors

Early Career Teaching Award, BYU Department of Statistics, 2022

Alvin C. Rencher Award for Mentoring, BYU Department of Statistics, 2019 – 2020

Scholarship Award, BYU Faculty Women's Association, 2019

Faculty Heritage Fellowship in Statistical Science, BYU Department of Statistics, August 2016, March 2019

2014 *Environmetrics* Wiley-TIES Best Paper Award, with a travel award of $750 to present work at TIES 26th Annual Conference in Edinburgh, Scotland, 2016

Excellence in Teaching, BYU Department of Statistics Student-Voted Award, 2014

Early Career Researchers Travel Grant to attend ISBA2012 in Japan, 2012 ($500)

ASA Travel Grant to attend ISI 2011 in Dublin, Ireland, 2011 ($3000)

MCMSki Young Investigator Travel Award to attend MCMski III in Park City, UT ($500)

Craig Cooley Graduate Student Alumni Award for Outstanding Statistics Graduate Student, Department of Statistics, The Ohio State University, 2010

Whitney Award for Best Research Associate, Department of Statistics, The Ohio State University, 2009

University Fellowship, The Ohio State University, 2005–2006

Battelle Fellowship, Department of Statistics, The Ohio State University, 2005

Heritage Scholarship, Brigham Young University, 2001–2005

Organizations

American Statistical Association

- Joint Statistical Computing & Graphics Section
- Section on Statistics and Data Science Education
- Section on Statistics and the Environment (ENVR)
- Section on Bayesian Statistical Science (SBSS)
- Utah Chapter

Data Visualization Society

International Society for Bayesian Analysis

- Section on Environmental Sciences (EnviBayes)

Institute of Mathematical Statistics

The International Environmetrics Society