

# Catherine A. Calder

Department of Statistics  
The Ohio State University  
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## Education

DUKE UNIVERSITY

Durham, NC

PhD in Statistics and Decision Sciences, May 2003  
Advisors: David Higdon, PhD and Michael Lavine, PhD

Certificate in Ecology, May 2003

MS in Statistics and Decision Sciences, May 2001

NORTHWESTERN UNIVERSITY

Evanston, IL

BA in Mathematics with honors, June 1999

## Research Interests

METHODOLOGICAL

Spatial and Spatio-temporal Statistics, Bayesian Modeling and Computation, Multivariate Analysis, Network Analysis

APPLIED

Exposure Analysis, Health Effects, Neighborhood Effects, Air Pollution, and Atmospheric Chemistry

## Experience

DEPARTMENT OF STATISTICS, THE OHIO STATE UNIVERSITY

Columbus, OH

Professor (with tenure), 2015 - present

Associate Professor (with tenure), 2009 - 2015

Associate Director, Program in Spatial Statistics and Environmental Statistics, 2004-2009

Assistant Professor, 2003 - 2009

Lecturer, June 2003 - September 2003

STATISTICAL AND APPLIED MATHEMATICAL SCIENCES INSTITUTE

Research Triangle Park, NC

Visiting Faculty Research Fellow, September 2009 - December 2009

ISDS/STATISTICAL SCIENCE, DUKE UNIVERSITY

Durham, NC

Research Assistant, August 2000 - May 2003

Teaching Assistant, August 1999 - May 2000

### Affiliations

Faculty Affiliate, Institute for Population Research, The Ohio State University

Member, Criminal Justice Research Center, The Ohio State University

Advisor, Program in Spatial Statistics and Environmental Statistics, The Ohio State University

Node Director, Research Network for Statistical Methods for Atmospheric and Oceanic Sciences (STAT-MOS)

### Awards and Honors

Duke Graduate Fellowship, 1999-2003

ASA/NSF Travel Award, 2007, 2009

The Thomas E. and Jean D. Powers Award for Excellence in the Teaching of Statistics, Department of Statistics, The Ohio State University, 2010

Young Investigator Award, Section on Statistics and the Environment, The American Statistical Association, 2013

Fellow, The American Statistical Association, 2014 (year elected)

### Publications

#### REFEREED PUBLICATIONS

- 1) **Calder, C.A.**, Holloman, C., and Higdon, D. (2002). Exploring Space-Time Structure in Ozone Concentration Using a Dynamic Process Convolution Model. In *Case Studies in Bayesian Statistics 6*, 165-176.
- 2) **Calder, C.A.**, Lavine, M., Müller, P., and Clark, J.S. (2003). Incorporating Multiple Sources of Stochasticity into Dynamic Population Models, *Ecology*, 84(6), 1395-1402.
- 3) Dunson, D.B., Holloman, C., **Calder, C.**, and Gunn, L. (2004). Bayesian Modeling of Multiple Lesion Onset and Growth from Interval Censored Data. *Biometrics*, 60(3), 676-683.
- 4) Holloman, C.H., Bortnick, S., Morara, M., Strauss, W., and **Calder, C.A.** (2004). A Bayesian Hierarchical Approach for Relating PM<sub>2.5</sub> Exposure to Cardiovascular Mortality in North Carolina. *Environmental Health Perspectives*, 112(3), 1282-1288.
- 5) Lee, H.K.H., Higdon, D.M., **Calder, C.A.**, and Holloman, C.H. (2004). Efficient Models for Correlated Data via Convolutions of Intrinsic Processes. *Statistical Modelling*, 5(1), 53-74.
- 6) Mosley-Thompson, E., Readinger, C.R.\*, Craigmile, P.F., Thompson, L.G., and **Calder, C.A.** (2005). Regional Sensitivity of Greenland Precipitation to NAO Variability. *Geophysical Research Letters*, 32, L24707, DOI:10.1029/2005GL024776.
- 7) **Calder, C.A.** (2007). Dynamic Factor Process Convolution Models for Multivariate Space-Time Data with Application to Air Quality Assessment. *Environmental and Ecological Statistics*, 14, 229-247, DOI:10.1007/s10651-007-0019-y.
- 8) Cressie, N., Buxton, B.E., **Calder, C.A.**, Craigmile, P.F., Dong, C.\*, McMillan, N.J., Morara, M., Santner, T.J., Wang, K.\*, Young, G., and Zhang, J.\* (2007). From Sources to Biomarkers: A Hierarchical

- Bayesian Approach for Human Exposure Modeling. *Journal of Statistical Planning and Inference*, 137, 3361-3379.
- 9) Li, H.\* , **Calder, C.A.**, and Cressie, N. (2007). Beyond Moran's I: Testing for Spatial Dependence Based on the SAR Model. *Geographical Analysis*, 39, 357-375.
  - 10) Wheeler, D.\* , and **Calder, C.A.** (2007). An Assessment of Coefficient Accuracy in Linear Regression Models with Spatially Varying Coefficients. *Journal of Geographical Systems*, 9, 145-166.
  - 11) Xiao, N., **Calder, C.A.**, and Armstrong, M.C. (2007). Assessing the Effect of Uncertainty on Choropleth Map Classification. *International Journal of Geographic Information Science*, 21, 121-144.
  - 12) **Calder, C.A.** (2008). A Bayesian Dynamic Process Convolution Approach to Modeling the Joint Distribution of PM<sub>2.5</sub> and PM<sub>10</sub>. *Environmetrics*, 19, 39-48, DOI: 10.1002/env.852.
  - 13) **Calder, C.A.**, Craigmile, P.F., Mosley-Thompson, E. (2008). Spatial Variation in the Influence of the North Atlantic Oscillation on Precipitation Across Greenland. *Journal of Geophysical Research - Atmospheres*, 113, D06112, DOI:10.1029/2007JD009227.
  - 14) **Calder, C.A.**, Holloman, C.H., Bortnick, S., Strauss, W. and Morara, M. (2008). Relating Ambient Particulate Matter Concentration Levels to Mortality Using an Exposure Simulator. *Journal of the American Statistical Association*, 103(481), 137-148.
  - 15) LaDeau, S.L., Marra, P.P., Kilpatrick, A.M., and **Calder, C.A.**. (2008). West Nile Virus Revisited: Consequences for North American Ecology. *Bioscience*, 58, 937-946.
  - 16) Munroe, D.K., Wolfinbarger, S.R.\* , **Calder, C.A.**, Shi, T., Xiao, N., Lam, C.Q.\* , and Li, D.\* (2008). The Relationships Between Biomass Burning, Land-Cover/Use Change, and the Distribution of Carbonaceous Aerosols in Mainland Southeast Asia: A Review and Synthesis. *Journal of Land Use Science*, 3, 161-183.
  - 17) Santner, T.J., Craigmile, P.F., **Calder, C.A.**, and Paul, R.\* (2008). Demographic and Behavioral Modifiers of Arsenic Exposure Pathways: A Bayesian Hierarchical Analysis of NHEXAS Data. *Environmental Science & Technology*, 42(15), 5607-5614.
  - 18) **Calder, C.A.**, Craigmile, P.F., and Zhang, J.\* (2009). Regional Spatial Modeling of Topsoil Geochemistry. *Biometrics*, 65, 206-215, DOI:10.1111/j.1541-0420.2008.01041.x.
  - 19) **Calder, C.A.** and Cressie, N. (2009). Kriging and Variogram Models. In the *International Encyclopedia of Human Geography*, Volume, 1, edited by R. Kitchin and N. Thrift, 49-55. Oxford: Elsevier.
  - 20) Craigmile, P.F., **Calder, C.A.**, Li, H.\* , Paul, R.\* , and Cressie, N. (2009). Hierarchical Model Building, Fitting, and Checking: A Behind-the-Scenes Look at a Bayesian Analysis of Arsenic Exposure Pathways (with discussion). *Bayesian Analysis*, 4 (1), 1-36.
  - 21) Cressie, N., **Calder, C.A.**, Clark, J.S., Ver Hoef, J.M., and Wikle, C.K. (2009). Accounting for Uncertainty in Ecological Analysis: The Strengths and Limitations of Hierarchical Statistical Modeling (with discussion). *Ecological Applications*, 19(3), 553-570.
  - 22) 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, 1-9.
  - 23) Browning, C.R., Byron, R.A.\* , **Calder, C.A.**, Krivo, L.J., Kwan, M.-P., Lee, J.-Y.\* , and Peterson, R.D. (2010). Commercial Density, Residential Concentration, and Crime: Land Use Patterns and Violence in

Neighborhood Context. *Journal of Research in Crime and Delinquency*, 47, 329-357.

- 24) **Calder, C.A.**, Berrett, C.\* , Shi, T., Xiao, N., and Munroe, D.K. (2011). Modeling Space-Time Dynamics of Aerosols Using Satellite Data and Atmospheric Transport Model Output. *Journal of Agricultural, Biological, and Environmental Statistics*, 16(4), 495-512.
- 25) LaDeau, S.L., **Calder, C.A.**, Doran, P., Marra, P. (2011). West Nile Virus Impacts in American Crow Populations are Associated with Human Land Use and Climate. *Ecological Research*, 26, 909-916.
- 26) Li, H.\* , **Calder, C.A.**, and Cressie, N. (2011). One-Step Estimation of Spatial Dependence Parameters: Properties and Extensions of the APLE Statistic. *Journal of Multivariate Analysis*, 105, 68-84.
- 27) Berrett, C.\* and **Calder, C.A.** (2012). Data Augmentation Strategies for the Bayesian Spatial Probit Regression Model. *Computational Statistics & Data Analysis*, 56, 478-490.
- 28) Krivo, L.J., Washington, H.M.\* , Peterson, R.D., Browning, C.R., **Calder, C.A.**, and Kwan, M.-P. (2013). Social Isolation of Disadvantage and Advantage: The Reproduction of Inequality in Urban Space. *Social Forces*, 92(1) 141-164.
- 29) Mangel Pflugeisen\*, B. and **Calder, C.A.** (2013). Bayesian Hierarchical Mixture Models for Otolith Microchemistry Analysis. *Environmental and Ecological Statistics*, 20(2), 179-190.
- 30) **Calder, C.A.** (2013). Spatial Exposure Modeling: Reconsidering the Data Generating Mechanism (Invited Discussion). *Environmetrics*, 24(8), 525-526. (Editor reviewed)
- 31) Tatsumi, D.\* , **Calder, C.A.**, and Tomita, T. (2014). Bayesian Near-Field Tsunami Forecasting with Uncertainty Estimates. *Journal of Geophysical Research: Oceans*, 119(4), 2201-2211.
- 32) Risser, M.D.\* and **Calder, C.A.** (2014). Regression-Based Covariance Functions for Nonstationary Spatial Modeling. To appear in *Environmetrics*. Available at <http://arxiv.org/abs/1410.1494>.
- 33) Wheeler, D. and **Calder, C.A.** (2014). Socio-Spatial Epidemiology: Residential History Analysis. To appear in the *Handbook of Spatial Epidemiology*. (Editor reviewed)

#### NON-REFEREED PUBLICATIONS

- 1) **Calder, C.A.** (2004). Efficient Posterior Inference and Prediction of Space-Time Processes Using Dynamic Process Convolutions. In the *Joint Proceedings of the Sixth International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences and the Fifteenth Annual Conference of TIES, The International Environmetrics Society*. Portland, ME. June 28 - July 1, 2004.
- 2) **Calder, C.A.** (2006). Bayesian Modeling of Exposure Pathways. *International Society for Bayesian Analysis (ISBA) Bulletin*, 13(1), 10-12.
- 3) Wheeler, D.\* and **Calder, C.A.** (2006). Bayesian Spatially Varying Coefficient Models in the Presence of Collinearity. In the *Proceedings of the Joint Statistical Meetings*. Seattle, WA. August 6-10, 2006.
- 4) **Calder, C.A.** and Cressie, N. (2007). Some Topics in Convolution-Based Spatial Modeling. In the *Proceedings of the 56th Session of the International Statistics Institute*. Lisbon, Portugal. August 22-29, 2007.
- 5) Paul, R.\* , Cressie, N., Buxton, B.E., **Calder, C.A.**, Craigmile, P.F., Li, H.\* , McMillan, N.J., Morara, M., Sanford, J., Santner, T.J., Zhang, J.\* (2007). A Bayesian Hierarchical Model of Arsenic Exposure Based on NHEXAS Data: A Comparison of US EPA Region 5 and Arizona. In the *Proceedings of the Joint Statistical Meetings*. Salt Lake City, UT. July 29 - August 2, 2007.

- 6) Munroe, D.K., Xiao, N., **Calder, C.A.**, and Shi, T. (2008). Fire-Land-Atmosphere Modeling and Evaluation for Southeast Asia. In the *Newsletter of the Global Land Project*, 3, January, 2008.
- 7) Kwan, M.-P., Peterson, R.D., Browning, C.R., Burrington, L.\* , **Calder, C.A.**, and Krivo, L.J. (2008). Reconceptualizing Sociogeographical Context for the Study of Drug Use, Abuse, and Addiction. In *Geography and Drug Addiction*, edited by Y. Thomas, D. Richardson, and I. Cheung, 445-454. Berlin: Springer-Verlag.
- 8) **Calder, C.A.** (2009). Spatial Data Assimilation for Regional Environmental Exposure Studies. In the *Proceedings of the 57th Session of the International Statistics Institute*. Durban, South Africa. August 16-22, 2009.
- 9) Beekman, C.\* , Herbei, R., **Calder, C.A.** and Allen, C. H. (2011). Bayesian Inversion for Long-path Spectroscopic Data: Estimation of Vertical Profiles for Trace Gases in the Atmosphere. Technical Report, Department of Statistics, The Ohio State University.

#### MANUSCRIPTS UNDER REVIEW

- 1) Krivo, L.J., Byron, R.A., **Calder, C.A.**, Peterson, R.D., Browning, C.R., Kwan, M.-P., and Lee, J.Y. (2014). Patterns of Local Segregation: Do They Matter for Neighborhood Crime?
- 2) Berrett, C.\* and **Calder, C.A.** (2014). Bayesian Spatial Classification. Available at <http://arxiv.org/abs/1406.3647>.
- 3) Browning, C.R. **Calder, C.A.**, Sollar, B.\* , Jackson, A.L.\* , and Dirlam, J.\* (2014). Ecological Networks and Neighborhood Social Organization.
- 4) Jia, Y.\* and **Calder, C.A.** (2014). Bilinear Mixed-Effects Models for Affiliation Networks. Available at <http://arxiv.org/abs/1406.5954>.
- 5) Browning, C.R., **Calder, C.A.**, Krivo, L.J., Mohr, A.L.\* , and Boettner, B. (2015). Socioeconomic Segregation of Activity Spaces in Urban Neighborhoods: Does Shared Residence Mean Shared Routines?

#### MANUSCRIPTS IN PREPARATION

- 1) **Calder, C.A.** and Darnieder, W.F.\* Bayesian Inference for Incomplete Marked Spatial Point Patterns.
- 2) Browning, C.R. and **Calder, C.A.** Race/Ethnic Segregation of Routine Activity Spaces among Urban Neighborhood Residents: A Multilevel Network Approach.
- 3) Risser, M.D.\* and **Calder, C.A.** Local likelihood Estimation for Covariance Functions with Spatially-Barying Parameters: the convoSPAT Package for R.

\* denotes a student co-author

## Presentations

#### INVITED TALKS/SEMINARS

Mathematics Department, Kenyon College, Gambier, OH, October 2002  
 “Assessing Sources of Uncertainty in a Dynamic Forest Model”

Department of Statistics, The Ohio State University, Columbus, OH, February 2003  
 “Exploring Latent Structure in Multivariate Spatial Temporal Processes Using Dynamic Process Convolutions”

Joint Meetings of TIES and Spatial Accuracy, Portland, ME, June 2004

“Efficient Posterior Inference and Prediction of Space-Time Processes Using Dynamic Process Convolutions”

Computational Environmetrics Conference, Chicago, IL, October 2004

“Space-Time Modeling Using Dynamic Process Convolutions”

Division of Epidemiology and Biostatistics, School of Public Health, The Ohio State University, Columbus, OH, November 2004

“A Bayesian Analysis of the Relationship Between Exposure to Fine Particulate Matter and Cardiovascular Mortality”

WNAR-International Biometrics Society/IMS Meeting, Fairbanks, AK, June 2005

“A Bayesian Hierarchical Approach to Modeling Spatial Variation in Personal Exposure to Fine Particulate Matter and Associated Cardiovascular Mortality”

National Consortium on Violence Research’s (NCOVR) workshop on Space, Networks and Social Influence: Individual and Community Level Influences on Violence, University of California, Irvine, CA, February 2006

“Exposure to Violence in Urban Neighborhoods: A Bayesian Hierarchical Approach to Multilevel Spatial Modeling”

(with Christopher Browning, Department of Sociology, Ohio State)

Joint Statistical Meetings, Seattle, WA, August 2006

“Regional Spatial Modeling of Toxic Metals in Various Environmental Media”

Quantitative Studies in Consumer Behavior Seminar, The Ohio State University, Columbus, OH, November 2006

“Spatial Variation in Exposure to Violence Across Urban Neighborhoods: A Hierarchical Bayesian Analysis”

MISR Data Users Science Symposium, Caltech, Pasadena, CA, December 2006

“Spatio-temporal Statistical Modeling of Biomass Burning and Regional Black Carbon Aerosols in Southeast Asia”

Environmental Exposure and Health Data Seminar Series, The Ohio State University, February 2007

“Bayesian Modeling of Exposure Pathways”

Joint Statistical Meetings, Salt Lake City, UT, July 2007

“Space-Time Modeling of Biomass Burning and Regional Aerosols in Southeast Asia”

56th Session of the International Statistics Institute, Lisbon, Portugal, August 2007

“Some Topics in Convolution-Based Spatial Modeling”

International Society for Exposure Assessment Conference, Durham, NC, October 2007

“Demographic and Behavioral Modifiers of Arsenic Exposure Pathways: A Bayesian Hierarchical Analysis of NHEXAS Data”

Econometrics and Statistics Seminar, Graduate School of Business, University of Chicago, Chicago, IL, November 2007

“Convolution-Based Models for Spatial and Spatio-Temporal Data”

ENAR-International Biometrics Society/IMS Meeting, Washington DC, March 2008

“Regional Spatial Modeling of Arsenic in Environmental Media: Implications for Human Exposure Assessment”

First Midwest Statistics Research Colloquium, Chicago, IL, March 2008

“A Multiscale Approach to Regional Spatial Modeling of Topsoil Geochemistry”

The International Environmetrics Society Conference, Kelowna, BC, Canada, June 2008

“Spatial Data Assimilation for Regional Environmental Exposure Studies”

Workshop on Complex Data in Economics and Finance: Spatial Models, Social Networks, and Factor Models, Stanford Institute for Theoretical Economics, Palo Alto, CA, July 2008

“Dynamic Factor Process Convolution Models for Multivariate Space-Time Data with Application to Air Quality Assessment”

ENVR Workshop on Environmetrics, NCAR, Boulder, CO, October 2008

“Multiscale Spatial Modeling of Topsoil Geochemistry”

Department of Statistics Seminar, University of Washington, Seattle, WA, November 2008

“Spatial Data Assimilation for Regional Environmental Exposure Studies”

Department of Statistics Colloquium, Virginia Tech, Blacksburg, VA, March 2009

“Multiscale Spatial Modeling of Topsoil Geochemistry”

Department of Statistics Colloquium, Texas A&M University, College Station, TX, April 2009

“Kernel-Based Models for Space-Time Data”

Sixth Workshop on Bayesian Statistics in Stochastic Processes, Bressanone/Brixen, Italy, June 2009

“Kernel-Based Models for Space-Time Data”

57th Session of the International Statistics Institute, Durban, South Africa, August 2009

“Spatial Data Assimilation for Regional Environmental Exposure Studies”

Conference on the Dynamics of Space-Time Use: Measurement, Patterns and Consequences, The Ohio State University, Columbus, OH, October 2009

“Bayesian Estimation of Individual Activity Spaces from Incomplete Activity Pattern Data”

Cary Institute for Ecosystem Studies Seminar Series, Millbrook, NY, April 2010

“Regional Spatial Modeling of Topsoil Geochemistry”

Institute for Population Research GeoHealth Seminar Series, The Ohio State University, Columbus, OH, April 2010

“Spatial Data Assimilation for Environmental Exposure Studies”

Transition Workshop, SAMSI Program on Space-time Analysis for Environmental Mapping, Epidemiology and Climate Change, RTP, North Carolina, October 2010

“Bayesian Inference for Incomplete Marked Spatial Point Patterns: Estimating Individual Activity Spaces”

Association of American Geographers Annual Meeting, Seattle, WA, April 2011

“Estimation of Individual Activity Spaces from Incomplete Activity Pattern Data”

Department of Statistics Seminar, Purdue University, West Lafayette, IN, November 2011

“Space-Time Dynamical Modeling of Aerosol Transport”

Department of Statistics Seminar, North Carolina State University, Raleigh, NC, February 2012

“Space-Time Dynamical Modeling of Aerosol Transport”

International Society for Bayesian Analysis World Meeting, Kyoto, Japan, June 2012

Invited Discussion: “Advances in Gaussian Processes”

Joint Statistical Meetings, San Diego, CA, August 2012  
“Space-Time Dynamical Modeling of Aerosol Transport”

ENVR Workshop on Environmetrics, North Carolina State University, Raleigh, NC, October 2012  
“Bayesian Probit Regression Models for Multicategory Spatial Data”

25th Anniversary Conference, Department of Statistical Science, Duke University, Durham, NC, October 2012  
“Bayesian Probit Regression Models for Multicategory Spatial Data”

Department of Statistics Seminar, Brigham Young University, Provo, UT, January 2013  
“Spatial and Network-Based Modeling of Activity Pattern Data”

ENAR-International Biometric Society Meeting, Orlando, FL, March 2013  
“Bayesian Models for Cumulative Spatio-Temporal Risk Assessment”

Workshop on Spatial Statistics, Colorado State University, Fort Collins, CO, April 2013  
“Bayesian Multicategory Spatial Modeling and Classification”

Department of Mathematics, Applied Mathematics and Statistics Colloquium, Case Western Reserve University, November 2013  
“Generalized Linear and Bilinear Mixed-Effects Models for Affiliation Networks”

ISBA World Meeting, Cancun, Mexico, July 2014  
“A Nonstationary Spatial Covariance Regression Model”

Institute for Population Research Seminar Series, The Ohio State University, October 2014  
“Mixed-Effects Models for Two-Mode Networks: Uncovering Patterns in Overlapping Routine Activity Spaces”

Department of Biostatistics, Yale University, December 2014  
“Generalized Linear and Bilinear Mixed-Effects Models for Ecological Network Analysis”

#### INVITED POSTERS

NASA Land Cover Land Use Change Program Science Team Meeting, University of Maryland, College Park, MD, October 2006  
“A Comprehensive Statistical Analysis System to Associate Local Land-Cover/Land-Use Change and Regional Aerosol Composition and Concentration”  
(with Darla Munroe, Department of Geography, Ohio State)

ICCA/EPA Workshop on Public Health Applications of Biomonitoring, Durham, NC, September 2007  
“Arsenic Exposure Pathways in Subpopulations: Bayesian Inference from NHEXAS Data”

#### CONTRIBUTED TALKS/POSTERS

Ecological Society of America’s Annual Meeting, Madison, WI, August 2001  
“Incorporating Observation Error in Density Dependence Population Models”

6th Workshop on Case Studies in Bayesian Statistics, Carnegie Mellon University, Pittsburgh, PA, September 2001  
“A Space-Time Model for Ozone Concentration Using Process Convolutions”

Joint Statistical Meetings, New York, NY, August 2002  
“Assessing Sources of Uncertainty in a Dynamic Forest Model”



ISBA Valencia Conference, Tenerife, Spain, June 2002  
“Assessing Sources of Uncertainty in a Dynamic Forest Model”

SAMSI/GSP Workshop on Spatio-Temporal Modeling, Boulder, CO, June 2003  
“Exploring Latent Structure in Multivariate Spatial Temporal Processes Using Dynamic Process Convolutions”

Joint Statistical Meetings, San Francisco, CA, August 2003  
“Exploring Latent Structure in Multivariate Spatial Temporal Processes Using Dynamic Process Convolutions”

International Workshop on Bayesian Data Analysis, University of California at Santa Cruz, Santa Cruz, CA, August 2003  
“Exploring Latent Structure in Multivariate Spatial Temporal Processes Using Dynamic Process Convolutions”

7th Workshop on Case Studies in Bayesian Statistics, Carnegie Mellon University, Pittsburgh, PA, September 2003  
“A Bayesian Dynamic Process Convolution Approach to Modeling the Joint Distribution of PM<sub>2.5</sub> and PM<sub>10</sub>”

ENAR-International Biometric Society Meeting, Pittsburgh, PA, March 2004  
“Relating PM<sub>2.5</sub> Exposure to Mortality Using an Exposure Simulator”

Joint Statistical Meetings, Toronto, Canada, August 2004  
“A Spatio-Temporal Framework for Modeling Ambient Particulate Matter Concentration Levels”

Joint Statistical Meetings, Minneapolis, MN, August 2005  
“Bayesian Modeling of Multicategory Spatial Data”

Joint Statistical Meetings, Washington, DC, August 2009  
“Kernel-Based Models for Space-Time Data”

Ninth Valencia International Meeting on Bayesian Statistics/2010 ISBA World Meeting, Benidorm, Spain, June 2010  
“Bayesian Inference for Incomplete Marked Spatial Point Patterns”

## Funding

### EXTERNAL

EPA/ACC Award #2866 (Co-PI)  
“Sources to Biomarkers: A Hierarchical Bayesian Approach for Human Exposure Modeling”  
Award Period: 09/28/04 - 03/31/09, Total Award: \$526,986

NSF SES-0528232 (Co-PI)  
“Segregation and Local Crime: An Integrated Spatial Analysis”  
Award Period: 09/15/05 - 08/31/08, Total Award: \$280,000

NASA NNG06GD31G (Co-PI)  
“A Comprehensive Statistical Analysis System to Associate Local-Land Cover/Land-Use Change and Regional Aerosol Composition and Concentration”  
Award Period: 01/01/06 - 12/31/09, Total Award: \$611,305

NSF BCS-0729466 (Co-PI)

“Dynamics of Space and Time Use: Patterns, Causes, and Consequences for Crime and Problem Behaviors”

Award Period: 01/01/08 - 12/31/10, Total Award: \$700,000

NIH R01DA025415 (Co-PI)

“(ARRA) Spatial Patterns of Social Isolation, Youthful Marijuana Use, and Sexual/HIV Risk”

Award Period: 08/01/09 - 07/31/11, Total Award: \$697,849

NIH R01HD057945 (Co-PI)

“Neighborhood Context and Adolescent Psychological and Behavioral Health”

Award Period: 08/15/09 - 06/30/13, Total Award: \$986,144

NSF DMS-0934595 (co-PI, PI of the OSU subcontract)

“CMG: Multivariate Nonstationary Spatial Extremes in Climate and Atmospherics”

Award Period: 10/01/09-09/30/10, Total Award: \$325,000 (OSU subcontract: \$38,120)

NIH R01DA032371 (Co-PI)

“Adolescent Health and Development in Context”

Award Period: 09/15/11-07/31/16, Total Award: \$1,785,428

NSF DMS-1107046 (Director of the OSU Node, Senior Personnel)

“Research Network in the Mathematical Sciences: Statistical Methods for Atmospheric and Oceanic Sciences”

Award Period: 10/01/11-09/31/16, Total Award: \$2,833,525

WT Grant Foundation (Co-PI)

“Activity Space, Social Network, and Community Influences on Adolescent Risk”

Award Period: 01/01/12-12/31/14, Total Award: \$757,074

NSF DMS-1209161 (PI)

“Bayesian Methods for Socio-Spatial Point Patterns and Networks”

Award Period: 09/15/12 - 08/31/15, Total Award: \$180,000

#### INTERNAL

Grant from the College of Mathematical and Physical Sciences, The Ohio State University (PI)

“Hierarchical Bayesian Modeling of Regional Alpine Treeline Patterns”

Award Period: 06/01/04 - 09/30/05, Total Award: approximately \$16,000

Grant from the Population and Health Targeted Investment in Excellence Initiative, The Ohio State University (Co-PI)

“The Neighborhood Context of Early Adolescent Mental and Physical Health” Award Period: 05/02/07 - 12/01/08, Award Total: \$21,006

Grant from Climate, Water, and Carbon Targeted Investment in Excellence Initiative, The Ohio State University (Co-PI)

“Atmospheric Chemistry: The Ohio River Basin”

Award Period: 09/05/07 - 09/01/08, Total Award: \$34,520

Grant from the Institute for Population Research, The Ohio State University (Co-PI)

“The Sociospatial Context of Health Disparities”

Award Period: 07/01/08 - 06/30/09, Award Period: \$33,494

Grant from the Criminal Justice Research Center, The Ohio State University (Co-PI)

“Sociospatial Exposure to Crime and Violence and Chronic Physiologic Stress among Urban Adolescents”

Award Period: 01/01/15 - 12/31/15, Award Period: \$10,000

Grant from the Institute for Population Research, The Ohio State University (PI) "Respondent Driven Sampling for Co-location Networks" Award Period: 05/15/15 - 05/14/16, Total Award: \$39,091

## Teaching

DEPARTMENT OF STATISTICS, THE OHIO STATE UNIVERSITY

Lecturer for Statistics 145 - Introduction to the Practice of Statistics: Summer 2003

Instructor for Statistics 420 - Introduction to Mathematical Statistics I: Winter 2010

Instructor for Statistics 528 - Data Analysis I: Autumn 2003, Winter 2004

Instructor for Statistics 625 - Applied Bayesian Analysis: Winter 2008, Winter 2009, Winter 2010, Winter 2011, Winter 2012

Instructor for Statistics 656 - Applied Multivariate Analysis: Spring 2005, Spring 2007, Spring 2009, Spring 2011, Spring 2012

Instructor for Statistics 662 - Environmental Statistics: Spring 2006, Spring 2008, Spring 2010

Instructor for Statistics 694 - Group Studies (Applied Bayesian Analysis): Winter 2006, Winter 2007

Co-Instructor (with Ningchuan Xiao, Geography) for Statistics 881/Geography 983 - Advanced Topics in Statistics/Special Topics in Quantitative Geography: Winter 2004

Topic: Visualization of Uncertainty in Spatial Information

Instructor for Statistics 5301 - Intermediate Data Analysis: Autumn 2012

Instructor for Statistics 6530 - Introduction to Spatial Statistics: Spring 2013, Spring 2014

Instructor for Statistics 6570 - Applied Bayesian Analysis: Spring 2013, Spring 2014

Instructor for Statistics 8410 - Capstone Applications: Autumn 2013 (with Mark Berliner and Tao Shi), Autumn 2014 (sole instructor)

Instructor for 8530 - Spatial and Spatio-Temporal Statistics: Spring 2014

ISDS, DUKE UNIVERSITY

Head Teaching Assistant, Fall 2002

Instructor for Statistics 101 - Probability and Statistical Inference: Summer 2001

Teaching Assistant for Statistics 113 - Statistics for Engineers: Fall 1999, Spring 2000

## Advising

FORMER STUDENTS

David Wheeler (co-advisor with Morton O'Kelly, Geography)  
PhD in Geography, August 2006

Thesis Title: Diagnostic Tools and Remedial Methods for Collinearity in Linear Regression Models with Spatially Varying Coefficients

Current Position: Assistant Professor of Biostatistics, Virginia Commonwealth University

Hongfei Li (co-advisor with Noel Cressie, Statistics)

PhD in Statistics, December 2007

Thesis Title: Approximate Profile Likelihood Estimation of Spatial Dependence Parameters

Current Position: Manager, Business Analytics & Mathematical Sciences, IBM Thomas J. Watson Research Center

Bethann Mangel Pflugeisen

MS in Statistics (Thesis Track), June 2010

Thesis Title: Analysis of Otolith Microchemistry Using Bayesian Hierarchical Mixture Models

Current Position: Research Associate, MultiCare Institute for Research & Innovation

Candace Berrett

PhD in Statistics, December 2010

Thesis Title: Bayesian Probit Regression Models for Spatially-Dependent Categorical Data

Current Position: Assistant Professor of Statistics, Brigham Young University

Daisuke Tatsumi (unofficial MS advisor)

MS in Statistics (Exam Track), Spring 2013

Topic: Bayesian Hierarchical Modeling for Tsunami Wave Height Forecasting

Current Position: Deputy-Director of Engineering, Administrative Office of Ports and Harbours Bureau, Ministry of Land, Infrastructure, Transport and Tourism, Japan

#### CURRENT STUDENTS

Mark Risser

PhD in Statistics (expected in Summer 2015)

Topic: Nonstationary Spatial Covariance Regression Modeling

Yanan Jia

PhD in Statistics (expected in Autumn 2015)

Topic: Statistical Modeling of Two-Mode Affiliation Network Data

Anna Mohr

PhD in Statistics (expected in Spring 2016)

Topic: Network Comparison and Multilevel Network Models

#### MEMBER, GENERAL EXAMINATION COMMITTEE

Xiaobai Li, Statistics, April 2005

David Wheeler, Geography, August 2005

Jue Wang, Civil and Environmental Engineering and Geodetic Science, October 2005

Hongfei Li (co-advisor), Statistics, March 2006

Yonggang Yao, Statistics, June 2006

Hu Wei, Geography, July 2006

Clint Roberts, Statistics, February 2007

Joshua Ash, Electrical Engineering, March 2007

Christopher Beekman, Environmental Science Graduate Program, May 2007

Li Zhang, Civil and Environmental Engineering and Geodetic Science, June 2007

Shari Modur, Statistics, November 2007

Nuo Xi, Psychology, June 2009

Candace Berrett (advisor), Statistics, July 2009  
William Darnieder, Statistics, September 2010  
Yun Tang, Psychology, February 2011  
Jesse Plasack, Epidemiology, October 2011  
Wenjun Zhang, Statistics, July 2012  
Tayler Blake, Statistics, January 2013  
Haixia Liu, Geography, March 2013  
Jingjing Yan, Statistics, November 2013  
Linchao Chen, Statistics, November 2013  
Casey Davis, Statistics, December 2013  
Xining Yang, Geography, December 2013  
Mark Risser (advisor), Statistics, March 2014  
Zachary Thomas, Statistics, April 2014  
Yanan Jia (advisor), Statistics, July 2014  
Elizabeth Petraglia, Statistics, July 2014  
Hui Yang, Statistics, December 2014

MEMBER, FINAL EXAMINATION (DEFENSE) COMMITTEE

Xiaobai Li, Statistics, March 2006  
David Wheeler (co-advisor), Geography, August 2006  
Hongfei Li (co-advisor), Statistics, August 2007  
Clint Roberts, Statistics, May 2008  
Lijia Wei, Geography, September 2008  
Christopher Beekman, Environmental Science Graduate Program, March 2010  
Candace Berrett (advisor), Statistics, September 2010  
William Darnieder, Statistics, June 2011  
Li Zhang, Civil and Environmental Engineering, December 2012  
Jesse Plascak, Epidemiology, July 2013  
Wenjun Zheng, Statistics, July 2014  
Jingjing Yan, Statistics, July 2014  
Linchao Chen, Statistics, April 2014

MENTORING

Claude Davila (with Noel Cressie, Department of Statistics), MBI Research Experience for Undergraduates (REU) Summer Program: Summer 2006

John Christensen, MBI Research Experience for Undergraduates (REU) Summer Program: Summer 2007

Erinne Kennedy, MBI Research Experience for Undergraduates (REU) Summer Program: Summer 2009;  
RUMBA Program: Winter 2010-Winter 2011

Xinru Cai, MBI Research Experience for Undergraduates (REU) Summer Program: Summer 2010

**Service**

DEPARTMENT OF STATISTICS

**Exam Committees**

Member, Master of Applied Statistics (MAS) Exam Committee: Spring 2004, Autumn 2004, Autumn 2005, Spring 2009, Spring 2010 (Chair), Autumn 2010, Spring 2011, Autumn 2011, Spring 2012, Autumn 2012, Spring 2013 (Chair), May 2013, Spring 2014, May 2014, Spring 2015, May 2015

Member, PhD Qualifier Exam I Committee: Autumn 2006, Winter 2007, Autumn 2007, Winter 2008

### **Curriculum**

Member, Curriculum Committee: AY 2005-2006, AY 2006-2007, AY 2007-2008, AY 2008-2009

Member, Online Course Development Committee: AY 2013-2014, AY 2014-2015

Member, Semester Conversion Subcommittee on Graduate Interdisciplinary Specializations, Graduate Minors, and Other Graduate Service Courses: AY 2009-2010

Member, *Ad hoc* Committee on MAS Redesign and Online Initiatives: AY 2012-2013, AY 2013-2014

Chair, Subcommittee on MAS and Online Education Subcommittee, Curriculum Committee: AY 2014-2015

### **Other**

Member, Graduate Admissions Committee: AY 2009-2010, AY 2010-2011, AY 2011-2012, AY 2012-2013, AY 2013-2014

Member, Statistics Colloquium Committee: Spring 2009, Spring 2010, Autumn 2013

Member, Department Communications Committee: AY 2010-2011, AY 2011-2012, AY 2012-2013 (Chair), AY 2013-2014 (Chair), AY 2014-2015 (Chair)

Member, Faculty Hiring Committee: AY 2012-2013

Mentor for Assistant Professor Asuman Turkmen: 2012-present

Member, Department Executive Committee: AY 2014-2015

Advisor, Program in Spatial Statistics and Environmental Statistics: 2014-present

## UNIVERSITY

### **Mathematical Biosciences Institute**

Member, Organizing Committee, Mathematical Biosciences Institute (MBI) Workshop on Uncertainty in Ecological Analysis: April 2006

Program Leader Mathematical Biosciences Institute (MBI), Summer Program in Mathematical Biology for Undergraduates: Summer 2006, Summer 2007, Summer 2009, Summer 2010

Program Leader (with Yuan Lou, Department of Mathematics), Mathematical Biosciences Institute (MBI) 2006 Summer Educational Program

### **Research Forums and Panels**

Judge, Denman Undergraduate Research Forum: May 2007, May 2008, May 2012

Member, Panel on Collaborative Science, Office of Research's Responsible Conduct of Research Program: January 2009

Judge, Division of Natural, Mathematical and Physical Sciences' Undergraduate Research Forum: April 2010

### **Seminars and Conferences**

Member, Organizing Committee, Environmental Exposure and Health Data Seminar Series: Winter 2007

Member, Organizing Committee, Conference on the Dynamics of Space-Time Use: Measurement, Patterns and Consequences, The Ohio State University, Columbus, OH: October 2009

Invited Session Chair, Conference on Nonparametric Statistics and Statistical Learning, The Ohio State University, Columbus, OH: May 2010

### **Graduate Studies**

Graduate Studies Chair, Graduate Interdisciplinary Specialization (GIS) in Geospatial Data and Analysis (GSDA): August 2008 - present

Member, University Fellowship Committee: 2012-2014

Member, SROP Panel on "Choosing the Right Graduate School": July 2014

## AMERICAN STATISTICAL ASSOCIATION

### **General**

Session Chair, Joint Statistical Meetings, New York, NY: August 2002

Session Chair, Joint Statistical Meetings, San Francisco, CA: August 2003

Invited Session Chair, Joint Statistical Meetings, Seattle, WA: August 2006

Invited Session Organizer and Chair, Joint Statistical Meetings, Vancouver, Canada: August 2010

Invited Session Chair, Joint Statistical Meetings, San Diego, CA: August 2012

### **Section on Statistics and the Environment**

Member, Student Paper Competition Committee: 2006-2008 (Committee Chair, 2008)

Member, Presentation Award Committee: 2009-2011 (Committee Chair, 2011)

Organizing Committee Member and Session Chair, ENVR Workshop on Environmetrics, NCAR, Boulder, CO: October 2010

Publications Chair Elect: 2012, Publications Chair: 2013-2014 (Elected Position)

Section Chair Elect: 2014; Section Chair: 2015 (Elected Position)

### **Section on Bayesian Statistical Science**

Member, Student Paper Competition Committee: 2010-2012, 2014 (Committee Chair, 2014)

Program Chair Elect: 2014; Program Chair: 2015 (Elected Position)

## INTERNATIONAL SOCIETY FOR BAYESIAN ANALYSIS

Applications Editor, *International Society for Bayesian Analysis Bulletin*: December 2004 - June 2007

Member, Nominating Committee: 2008

Member, Board of Directors: 2012-2014 (Elected Position)

Member, ISBA Continuing Education Committee: 2012-2013 (Committee Chair, 2012)

ISBA-SBSS Continuing Education Liaison: 2012-2013

#### OTHER PROFESSIONAL

Roundtable Discussion Leader, Womens Caucus Breakfast, ENAR-International Biometric Society Meeting, Pittsburgh, PA: March 2004

Invited Session Organizer, ENAR-International Biometric Society Meeting, Arlington, VA: March 2008

Member, Organizing Committee, Conference on Spatial Statistics: June 2013

Member, Steering Committee, Spatial Statistics Society: 2013-present

External Evaluator for Promotion and Tenure Cases: 2009, 2012, 2013 (2x)

#### EDITORIAL

Associate Editor, *Bayesian Analysis*: August 2009 - present

Associate Editor, *Annals of Applied Statistics*: June 2010 - present

Associate Editor, *Environmetrics*: January 2009 - December 2013

Associate Editor, *Biometrics*: July 2010 - July 2014

Journals Article Reviewer: *The American Statistician*; *Annals of Applied Statistics*; *Annals of the Association of American Geographers*; *Atmospheric Environment*; *Bayesian Analysis*; *Biometrics*; *Computational Statistics & Data Analysis*; *Ecological Applications*; *Ecological Modelling*; *Ecology*; *Environmental and Ecological Statistics*; *Environmental Health Perspectives*; *Environmental Science and Technology*; *Geographical Analysis*; *Journal of Computational and Graphical Statistics*; *Journal of Multivariate Analysis*; *Journal of Statistical Planning and Inference*; *Journal of Statistics Education*; *Journal of the American Statistical Association*; *Journal of the Royal Statistical Society, Series C*; *Regional Science*; *Social Forces*; *Spatial Statistics*; *Statistica Sinica*; *Statistical Science*; *Survey Methodology*; *Water Resources Research*

Proposal Reviewer (11x), National Science Foundation (NSF)

Reviewer, LA TEACH Study Final Report, Mickey Leland National Urban Air Toxics Research Center: February 2005

Member, National Science Foundation (NSF) Review Panel: April 2006, June 2008, April 2010, January 2015

Proposal Reviewer, Environmental and Human Health Programme, National Environmental Research Council (NERC) (UK): February 2007

Member, Development of Environmental Health Outcome Indicators Panel, Environmental Protection Agency (EPA): March 2007

Book Proposal Review, The Taylor and Francis Group: September 2007



Book Review, Springer: January 2008

*Ad hoc* Member, NIH Study Section on Infectious, Reproductive, Asthma and Pulmonary Conditions (IRAP), September 2014