

**Petruța Carmen Caragea**  
**Professor, Department of Statistics**  
**Iowa State University**

**Curriculum Vitae**

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**EDUCATION**

<b>Ph.D., Statistics</b>	University of North Carolina, Chapel Hill, NC	May 2003
<b>M.S., Statistics</b>	University of North Carolina, Chapel Hill, NC	May 2002
<b>B.S., Applied Mathematics</b> Diploma de Licenta	University of Bucharest Bucharest, Romania	July 1997
<b>Licensed, Mathematics and Physics</b> Diploma de Bacalaureat	Mircea cel Batran National College Constanța, Romania	July 1993

**WORK EXPERIENCE**

Associate Chair	Department of Statistics Iowa State University, Ames, Iowa	2014–present
Visiting Faculty	Department of Applied Probability and Statistics University of California at Santa Barbara	Fall 2010
Professor	Department of Statistics Iowa State University, Ames, Iowa	2018–present
Associate Professor	Department of Statistics Iowa State University, Ames, Iowa	2009–2018
Assistant Professor	Department of Statistics Iowa State University, Ames, Iowa	2003–2009

**TEACHING AND INSTRUCTION**

• COURSES TAUGHT AT IOWA STATE UNIVERSITY

- STAT 520: *Statistical Methods III* (Graduate level, M.S. and Ph.D. *core course*) –  
Fall 2014 (blended on-campus/online course)
- STAT 551: *Time Series Analysis* (Graduate level elective)  
Fall 2006, Fall 2008, Fall 2009, Fall 2011
- STAT 506: *Statistical Methods for Spatial Data* (Graduate level elective) – Spring 2004
- STAT 401: *Statistical Methods for Research Workers* (Graduate service level)  
Fall 2003, Fall 2004, Fall 2006 and 2013 (blended on-campus/online course),  
Fall 2007, Spring 2014 (on-campus)  
Fall 2014, Summer 2014, Fall 2015, Summer 2016, Summer 2017 (online)
- STAT 587: *Statistical Methods for Research Workers* (Graduate service level)  
Summer 2019, Spring 2020 (online)
- STAT 406: *Statistical Methods for Spatial Data* (Graduate service level)  
Spring 2004, Spring 2006, Spring 2008

- STAT 326: *Introduction to Business Statistics II* (Undergraduate service level)  
Spring 2009, Spring 2010, Spring 2011, Fall 2011, Fall 2012, Fall 2015  
(Instructor and Coordinator)
- STAT 226: *Introduction to Business Statistics I* (Undergraduate service level)  
Spring 2005, Spring 2008, Spring 2009,  
Spring 2017, Spring 2019 (Instructor and Coordinator),  
Fall 2017, Spring 2018, Fall 2018, Spring 2020 (Coordinator)
- COURSES TAUGHT AT THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
  - STAT 23: *Statistics and Data Analysis* (Undergraduate service level)–Fall 1998
  - MATH 22: *Calculus for Business and Economics* (Undergraduate service level)–  
Fall 2001, Summer 2002
  - STAT 11: *Introduction to Statistics* (Undergraduate service level)–Fall 1999

## GRADUATE STUDENT ADVISING

- CURRENT STUDENTS
  1. Johny, Manju, Ph.D.
  2. Kyveryga, Peter, M.S. (online degree). Expected graduation: Fall 2020.
- PAST STUDENTS
  1. Lewis-Beck, Colin, Ph.D.; co-advised with J. Niemi. Fall 2018; “*Modeling Crop Phenology Using Remotely Sensed Data*”
  2. Seo, Yeonjung, Ph.D; co-advised with M. Kaiser. Spring 2018; “*Selection and Assessment of Bivariate Markov Random Field Models.*”
  3. Sabrowsky, Justin, M.S., Fall 2018; “*A Frequentist vs. Bayesian Approach for Comparing two Time Series.*”
  4. Johnson, Margaret, Ph.D., Summer 2017; “*Methods for Analysis and Uncertainty Quantification for Processes Recorded Through Sequences of Images.*”
  5. Johny, Manju, M.S., Spring 2017; “*A functional ANOVA approach to Detecting Changes in Soil Moisture and Temperature.*”
  6. Fortin, Dan, Ph.D., Fall 2015; “*Contributions to modeling spatially indexed functional data using a reproducing kernel Hilbert space framework.*”; co-advised with Z. Zhu.
  7. Osthus, David, Ph.D., Summer 2015; “*Applications of and extensions to state-space models.*”
  8. Johnson, Margaret, M.S., Fall 2013; “*Statistical Models for Global Phenological Phenomena.*”
  9. Bramer, Lisa, Ph.D., Summer 2013; “*Methods for Modeling and Forecasting Wind Characteristics.*”; co-advised with M. Kaiser
  10. Hadler, Jeremy, M.S., Summer 2013: “*Analyses of Users Visual Attention Based on Eye-Tracking Data.*”
  11. Fahrenholtz, Rachel, M.S., Spring 2012: “*Investigating Soil Moisture and Temperature in Montane Meadow Systems.*”
  12. Bramer, Lisa, M.S., Fall 2010: “*Spatial Dependence and Prediction of the Mean Soil Moisture Value for Remote Sensing Validation.*”

13. Zhang, Li, M.S., Spring 2009: “*Properties of the S-value as a Statistic Measuring Spatial Dependence.*”
14. Fan, Xing, M.S., Spring 2006: “*A Statistical Comparison of the Freezing Process in Two Genotypes of Corn Kernels.*”
15. Elci, Okan Ümit, M.S., Fall 2004: “*Modeling the Maize Pollen Dispersion Process.*”

- MENTORING

- Siegfried, Wilmina, Graduate student in the Department of Statistics, part of the Preparing Future Faculty Program (2013-2014)
- Larson, Nicholas, Undergraduate intern, VIGRE program, Summer 2004.

- Member in over 50 Ph.D. and 40 M.S. thesis committees.

## PUBLICATIONS, REFEREED († indicates student advisees)

1. Johnson, M.†, **Caragea P.C.**, Meiring, W., Jeganathan, C., Atkinson, P.M., **2019**. Bayesian Dynamic Linear Models for Estimation of Phenological Events from Remote Sensing Data. *Journal of Agricultural, Biological and Environmental Statistics*. **24(1)**,1–24.
2. Vaziri G.J., Johnny M.M., **Caragea P.C.**, Adelman J.S. **2018** Social context affects thermoregulation but not activity level during avian immune response. *Behavioral Ecology*
3. Stanfill, B.A., Reehl, S.M., Johnson, M.†, Browning, N.D., Mehdi, L.B., **Caragea, P.C.**, Bramer, **2018**. L.M., Quantitative Mapping of Nanoscale Chemical Dynamics in Sub-Sampled Operando (S)TEM Images Using Spatio-Temporal Analytics. *ChemCatChem*, **10**, 3115–3120.
4. Simma, B., Polthanee A., Goggi, S., Polthanee, A., Siri, B., Promkhambut, A., **Caragea, P.C.**, **2017**. Wood Vinegar Seed Priming Improves Yield and Suppresses Weeds in Dryland Direct-seeding Rice under Rainfed Production. *Agronomy for Sustainable Development*, **37:56**
5. Osthus, D.†, Hickmann, K., **Caragea P.C**, Higdon, D., DelValle, S., **2017**. Forecasting Seasonal Influenza with a State-Space SIR model. *Annals of Applied Statistics*, **11(1)**: 202-224.
6. Sherwood, J.A., Debinski, D.M., **Caragea, P.C.**, Germino, M., **2017**. Effects of Experimentally Reduced Snowpack and Passive Warming on Montane Meadow Plant Phenology and Floral Resources. *Ecosphere*, **8(3)**.
7. Fuentes-Ramirez, A., Mudrak, E., **Caragea, P.C.**, Holzapfel, C., Moloney, K., **2015**. Assessing the Impact of Fire on the Spatial Distribution of *Larrea tridentata* in the Sonoran Desert, USA *Oecologia*, **178(2)**, 473–484.
8. **Caragea, P.C.**, Berg, E.J., **2014**. A Centered Bivariate Spatial Regression Model for Binary Data with an Application to Presettlement Vegetation Data in the Midwestern United States. *Journal of Agricultural, Biological and Environmental Statistics*, **19(4)**, 453–471.
9. Osthus, D.†, **Caragea, P.C.**, Higdon, D., Morley, S.K., Reeves, G.D., and Weaver, B.P., **2014**. Dynamic Linear Models for Forecasting of Radiation Belt Electrons and Limitations on Physical Interpretation of Predictive Models, *Space Weather*, **12**, 426–446.
10. Bramer, L.†, Hornbuckle, B., **Caragea, P.C.**, **2013**. How Many Measurements of Soil Moisture within the Footprint of a Ground-based Microwave Radiometer are Required to Account for Meter-scale Spatial Variability?, *Vadose Zone Journal*, **12(3)**.
11. Kyveryga, P., **Caragea, P.C.**, Kaiser, M.S., Blackmer, T.M., **2013**. Predicting Risk from Reducing Nitrogen Fertilization Using Hierarchical Models and On-Farm Data, *Agronomy Journal*, **105(1)**, 85–94.

12. Schmidt, N., O'Neal, M., Anderson, P., Lagos, D., Voegtlin, D., Bailey, W., **Caragea, P.C.**, Cullen, E., DiFonzo, C., Elliott, K., Gratton, C., Johnson, D., Krupke, C., McCornack, B., O'Neil, R., Ragsdale, D.W., Tilmon, K., Whitworth, J., **2012**. Spatial Distribution of *Aphis glycines* (Hemiptera: Aphididae): A Summary of the Suction Trap Network, *Journal of Economic Entomology*, **105(1)**: 259–271.
13. Khanal, S., Anex, R., Gelder, B., Dixon, P., **Caragea, P.C.**, **2012**. Cropping Pattern Choice with Proximity to Ethanol Production and Animal Feeding Operations. *Biofuels, Bioproducts and Biorefining Journal*, **6(4)**: 431-443.
14. Kaiser, M.S., **Caragea, P.C.**, Furukawa, K., **2012**. Centered Parameterizations and Dependence Limitations in Markov Random Field Models. *Journal of Statistical Planning and Inference*, **142(7)**: 1855-1863.
15. Kyveryga, P., Blackmer, T.M. and **Caragea, P.C.**, **2011**. Categorical Analysis of Spatial Variability in Economic Yield Response of Corn to Nitrogen Fertilization. *Agronomy Journal*, **103(3)**: 796-804.
16. Hughes, J.P., Haran, M. and **Caragea, P.C.**, **2011**. Markov Random Field Models for Binary Data on a Lattice. *Environmetrics*, **7**: 857–871.
17. **Caragea, P.C.**, Kaiser, M.S., **2009**. Autologistic Models with Interpretable Parameters. *Journal of Agricultural, Biological and Environmental Statistics*, **14(3)**: 281–300.
18. Kaiser, M.S., **Caragea, P.C.**, **2009**. Exploring Dependence with Data on Spatial Lattices. *Biometrics*, **65(3)**: 857–865.
19. Nordman, D.J., **Caragea, P.C.**, **2008**. Point and Interval Estimation of Variogram Models using Spatial Empirical Likelihood. *Journal of the American Statistical Association*, **103**: 350–361.
20. Goggi, A.S., **Caragea P.C.**, Pollak L., McAndrews G., DeVries M., Montgomery K., **2008**. Seed Quality Assurance in Maize Breeding programs: tests to explain variations in maize (*Zea mays* L.) Inbreds and Populations. *Agronomy Journal*, **100**: 337–343.
21. **Caragea, P.C.**, Smith, R.L., **2007**. Asymptotic Properties of Computationally Efficient Alternative Estimators for a Class of Multivariate Normal Models. *Journal of Multivariate Analysis*, **98(7)**: 1417–1440.
22. Goggi, A.S., Sanchez, H.L., **Caragea, P.C.**, Clark, C., Westgate, M., Arritt, R., **2007**. Gene Flow in Maize Fields with Different Local Pollen Densities. *International Journal of Biometeorology*, **51(6)**: 493–503.
23. Thorp, K.R., Batchelor, W.D., Paz, J.O., Steward, B.L., **Caragea, P.C.**, **2006**. Methodology to Link Production and Environmental Risks of Precision Nitrogen Management Strategies in Corn. *Agricultural Systems*, **89(2-3)**: 272–298.
24. Goggi, A.S., **Caragea, P.C.**, Sanchez, H.L., Westgate, M., Clark, C., Arritt, R., **2006**. Statistical Analysis of Outcrossing between Adjacent Maize Grain Production Fields. *Field Crops Research*, **99(2-3)**: 147–157.
25. Holland, D.M., **Caragea, P.C.**, Smith, R.L., **2004**. Trends in Rural Sulfur Concentration. *Atmospheric Environment*, **38**: 1673–1684.

## PROCEEDINGS, REFEREED

1. Kyveryga, P., Blackmer, T., **Caragea, P.C.**, 2008. Using Soil and Terrain Attributes to Delineate Management Zones in Corn Yield Response to Nitrogen Fertilization. *Proceedings of the 9th Conference on Precision Agriculture*. 20-23 July, Denver, Colorado.
2. Guan, J., Kaiser, M. S., **Caragea, P. C.**, Tylka, G. L., Nutter Jr, F. W. (2005, June). Improving the relationship between IKONOS satellite image intensity and soybean yield as affected by SCN using geostatistics. *Phytopathology*, **95(6)**: S162-S163.

## PROCEEDINGS, NONREFEREED

1. **Caragea, P.C.**, Kaiser, M.S. 2006., Detection of Temporal Changes in Spatial Dependence. *Proceedings of the International Workshop on Spatio-Temporal Modelling (METMA3)*. Pamplona: Instituto de Estadística de Navarra: 101-104.
2. **Caragea, P.C.**, Smith, R.L. 2002., Approximate Likelihoods for Spatial Processes. *Proceedings of the American Statistical Association*.

## PAPERS, UNDER REVIEW

1. Lewis-Beck, C.†, Niemi, J., **Caragea, P.C.**, Hornbuckle, B., Walker V., A Nonlinear Hierarchical Model for Monitoring Crop Growth. *Under review by JABES*.
2. Osthus, D.†, **Caragea P.C.**, Higdon, D., Weaver, B., Multiscale Dynamic Linear Models for Space Weather Forecasting. *Under review by Technometrics*.

## PAPERS, IN PREPARATION

1. Johnson, M.†, Braverman, A., **Caragea, P.C.**, Spatial Data Analyses in Decentralized Distributed Data Systems.
2. Johnson, M.†, **Caragea, P.C.**, Bramer, L., Stanfill, B., Reehl, S., Models for Quantifying Dendrite Growth in Lithium Batteries using Scanning Transmission Electron Microscopy Images.
3. Johnson, M.†, **Caragea, P.C.**, Reparametrizations of Bayesian Fourier-form Dynamic Linear Models for Efficient Gibbs Sampling and Model Selection.
4. McCombs, A., Debinski, D., Reinhart, K., Germino, M., **Caragea, P.C.**, The effect of warming temperatures on meadow-wide nectar resources and implications for plant-pollinator communities.
5. Bramer, L.†, **Caragea, P.C.**, Kaiser, M.S., Combining process and stochastic models to improve wind speed forecasts.
6. Roy, V., **Caragea, P.C.**, Kaiser, M.S., Kyveryga, P., Hierarchical statistical models for the analysis of on-farm agricultural trials of fungicide use in soybeans.
7. Poutre, H., Goggi, S., **Caragea, P.C.**, Detrimental effects of late-season frost on seed vigor of corn hybrids with different seed oil and protein content.
8. Bramer, L.†, Kaiser, M.S., **Caragea, P.C.**, Spatial models for wind speed and direction at a wind farm level.
9. Fortin, D.†, Zhu, Z., **Caragea, P.C.**, A principal component model for spatially dependent functional data.
10. **Caragea, P.C.**, Kaiser, M.S., The S-value for Non-Gaussian data on spatial lattices.
11. Kaiser, M.S., **Caragea, P.C.** and Nordman, D.J., Modeling binary spatial data. *Monographs on Statistics and Applied Probability*.

## INVITED PRESENTATIONS

- CONFERENCES AND WORKSHOPS\*

1. **Caragea, P.C.**, Bramer, L., Kaiser, M.S., July 2014, Joint Statistical Meetings, Boston. *Improving wind speed and direction forecasts by combining process and stochastic spatio-temporal models*. Presented by Bramer, L.
2. **Caragea, P.C.**, Chockalingam J., Meiring, W. and Atkinson, P., September 2013, 15th IAMG Conference, Madrid, Spain, *A space-time model for remote sensing of vegetation phenology*. Presented by Atkinson, P.
3. **Caragea, P.C.**, March 2013, SAVI Environmental Workshop, SAMSI, North Carolina. *Modeling Space-Time Variation in the Satellite-Derived Chlorophyll Index Over Southern India*.
4. **Caragea, P.C.**, October 2012, ENVR Workshop “Spatial Modeling and Inference for Environmental Science”, North Carolina State University. *Analysis of Areal Data: Should a Model with (Spatial) Dependence be Considered?*
5. **Caragea, P.C.**, August 2011, *Spatio-temporal models for a Satellite Derived Chlorophyll Index*, The 58th World Statistics Congress of the International Statistical Institute, Dublin, Ireland.
6. **Caragea, P.C.**, July 2011, *Taking a Closer Look at Plant Dynamics Using the Univariate and Bivariate Centered Autologistic Models*, The Joint Statistical Meetings, Miami, Florida.
7. **Caragea, P.C.**, July 2011, *Monitoring Plant Dynamics using the Centered Autologistic Model*, Third North American Regional Meeting La Crosse, Wisconsin (TIES), La Crosse, Wisconsin.
8. Hughes, J., Haran, M., **Caragea, P.C.**, June 2011, *Autologistic Models for Binary Data on a Lattice*, International Chinese Association, 20-th Applied Statistics Symposium, New York. Presented by Hughes, J.
9. **Caragea, P.C.**, June 2010, *Combining Process and Stochastic Models to Improve Wind Speed Forecasts*, The 21th Annual Conference of The International Environmetrics Society (TIES), Margarita Island, Venezuela.
10. Smith, E., Huang, L., Weaver, B., **Caragea, P.C.**, April 2008, *Statistics projects at Hy-Vee*, Iowa ASA Chapter meeting.
11. Nordman, D.J. and **Caragea, P.C.**, August 2006, *Recent advances in resampling methods for complex data structures*, The Joint Statistical Meetings, Seattle. Presented by Nordman, D.J.
12. **Caragea, P.C.**, March 2005, *Modeling global covariance structures using local information*, 2005 ENAR Spring Meeting, Austin, Texas.
13. Kaiser, M.S., **Caragea, P.C.**, Kyoji Furukawa, June 2004, *Centering the effects of neighbors in Markov random field models*, The Graybill Conference on Spatial Statistics: Agricultural, Ecological, and Environmental Applications, Colorado State University. Presented by Kaiser, M.S.

\* All presentations given by P. C. Caragea, unless noted otherwise.

• DEPARTMENTAL SEMINARS

1. **Caragea, P.C.**, December 2019, *Statistical Challenges and Advances related to Monitoring, Forecasting and Classifying Phenological Behavior using Remotely Sensed Data*
2. **Caragea, P.C.**, January 2017, *Spatial Structure and Areal Data*, Department of Applied Mathematics and Statistics, Colorado School of Mines.
3. **Caragea, P.C.**, January 2013, *Bivariate Spatial Regression Models for Binary Data*, Department of Mathematics, Tulane University.
4. **Caragea, P.C.**, November 2012, *Bivariate Conditionally Specified Regression Models for Binary Data with Spatial Dependence*, Fox School of Business, Temple University.
5. **Caragea, P.C.**, April 2012, *Searching for Greenness Indices with Spatial and Temporal Models*, Department of Statistics, University of Missouri-Columbia.
6. **Caragea, P.C.**, November 2010, *Taking a closer look at plant dynamics using the Univariate and Bivariate Centered Autologistic Models*, Department of Applied Probability and Statistics, University of California at Santa Barbara.
7. **Caragea, P.C.**, October 2010, *Analysis of Areal Data: Should a Model with (Spatial) Dependence be Considered?*, Think Spatial Center, University of California at Santa Barbara.
8. **Caragea, P.C.**, December 2008, *Monitoring successions and plant dynamics in abandoned agricultural fields using the Centered Autologistic Model*, Department of Statistics, University of Wisconsin at Madison.
9. **Caragea, P.C.**, October 2008, *Modeling succession in abandoned agricultural fields using the Centered Autologistic Model*, Department of Statistics, University of Virginia.
10. **Caragea, P.C.**, March 2008, *Interpretability and bivariate extensions of the centered autologistic model*, Department of Statistics, Penn State University.
11. **Caragea, P.C.**, November 2006, *Incorporating covariates in the autologistic model*, Department of Statistics, University of Iowa.
12. **Caragea, P.C.**, October 2004, *A collection of problems in spatial statistics and an application of standard (and non standard) tools to an environmental problem*, Department of Community and Regional Planning, Iowa State University.
13. **Caragea, P.C.**, March 2004, *Three alternative estimators for spatial parameters*, Department of Community and Regional Planning, Iowa State University.
14. **Caragea, P.C.**, January 2003, *Approximate likelihoods for spatial processes*, Department of Statistics, Purdue University.
15. **Caragea, P.C.**, January 2003, *Approximate likelihoods for spatial processes*, Department of Statistics, Iowa State University.
16. **Caragea, P.C.**, January 2003, *Approximate likelihoods for spatial processes*, Department of Statistics, Colorado State University.
17. **Caragea, P.C.**, February 2003, *Approximate likelihoods for spatial processes*, Department of Biostatistics, Johns Hopkins University.
18. **Caragea, P.C.**, February 2003, *Approximate likelihoods for spatial processes*, Department of Statistical Sciences, Southern Methodist University.
19. **Caragea, P.C.**, February 2003, *Approximate likelihoods for spatial processes*, Department of Mathematical Sciences, Clemson University.
20. **Caragea, P.C.**, March 2003, *Approximate likelihoods for spatial processes*. Department of Mathematics, California State University, Fullerton.
21. **Caragea, P.C.**, March 2003, *Approximate likelihoods for spatial processes*, Department of Statistics, North Carolina State University.

## CONTRIBUTED PRESENTATIONS († indicates student advisees)

1. Johny, M.<sup>†</sup>, **Caragea, P.C.**, Debinski, D., Sherwood, J., August 2018, *A Functional ANOVA Approach to Detecting Changes in Soil Moisture and Temperature*. The Joint Statistical Meetings, Vancouver, Canada. Topic Contributed Poster, presented by Johny, M.
2. Lewis-Beck, C.<sup>†</sup>, Niemi, J., **Caragea, P.C.**, Hornbuckle, B., Walker, V., July 2018, *A Nonlinear Hierarchical Model for Modeling Crop Growth in the US Corn Belt*. International Geoscience and Remote Sensing Symposium (IGARRS), Valencia, Spain. Oral presentation by Hornbuckle, B.
3. Johny, M.<sup>†</sup>, **Caragea, P.C.**, Debinski, D., Sherwood, J., May 2018, *A Functional ANOVA Approach to Detecting Changes in Soil Moisture and Temperature*. Conference on Predictive Inference and Its Applications, Iowa State University, Ames, IA. Poster presented by Johny, M.
4. Lewis-Beck, C.<sup>†</sup>, **Caragea, P.C.**, Niemi, J., Hornbuckle, B., Walker, V., March 2018, *Modeling Crop Phenology in the US Corn Belt Using SMOS Vegetation Optical Thickness Data*. Microwave Radiometry and Remote Sensing of the Environment (MicroRad), Cambridge, MA. Poster presented by Walker, V.
5. Lewis-Beck, C.<sup>†</sup>, Niemi, J., **Caragea, P.C.**, Hornbuckle, B., Walker, V., May 2018, *A Nonlinear Hierarchical Approach for Modeling Crop Growth in the US Corn Belt*. Kansas State University Conference on Applied Statistics in Agriculture, Manhattan, KS. Oral presentation by Lewis-Beck, C.
6. Stanfill, B., Johnson, M.<sup>†</sup>, Reehl, S., **Caragea, P.C.**, Bramer, L., August 2017, *Quantification of Sparsely Sampled Atomic-Scale Phenomena Using a Spatio-Temporal Mixture Model*. The Joint Statistical Meetings, Baltimore, MD. Contributed talk presented by Stanfill, B.
7. McCombs, A., Debinski, D., Germino, M., Reinhardt, K. and **Caragea, P.C.**, October 2016, *Simulating expected changes in pollinator resources as a function of climate change*. 13th Biennial Scientific Conference of the Greater Yellowstone Ecosystem, Jackson, WY. Contributed talk presented by McCombs, A.
8. Johnson, M.<sup>†</sup>, **Caragea, P.C.**, Bramer, L.M., Stanfill, B., Reehl, S., August 2016, *Modeling temporal dependence to improve learning algorithms for streaming data*. The Joint Statistical Meetings, Chicago, IL. Contributed poster presented by Johnson, M.<sup>†</sup>.
9. Johnson, M.<sup>†</sup>, **Caragea, P.C.**, March 2016, *Dynamic Linear Models for Phenophase Identification in Remotely Sensed MTCI data*. ENVR/EnviBayes Workshop on Bayesian Environmetrics, Ohio State University. Contributed poster presented by Johnson, M.
10. Johnson, M.<sup>†</sup>, **Caragea, P.C.**, August 2015, *Dynamic Linear Models for Phenophase Identification in Remotely Sensed MTCI Data*, The Joint Statistical Meetings, Seattle, WA. Contributed talk presented by Johnson, M.<sup>†</sup>.
11. Osthus, D.<sup>†</sup>, **Caragea, P.C.**, Higdon, D., Morley, S.K., Reeves, G.D., and Weaver, B.P., March 2014, *Electron Flux, Solar Wind Speed, Sunspots, and Dynamic Linear Models*, Conference on Data Analysis, Santa Fe. Contributed poster presented by Osthus, D.<sup>†</sup>.
12. Osthus, D.<sup>†</sup>, **Caragea, P.C.**, Higdon, D., Morley, S.K., Reeves, G.D., and Weaver, B.P., November 2013, *Electron Flux, Solar Wind Speed, Sunspots, and Dynamic Linear Models*, ASA Iowa Chapter Meeting, Ames, IA. Poster presented by Osthus, D.<sup>†</sup>.
13. Johnson, M.<sup>†</sup>, **Caragea, P.C.**, November 2013, *Statistical Models for Global Phenological Phenomena*, ASA Iowa Chapter Meeting, Ames, IA. Poster presented by Johnson, M.<sup>†</sup>.

14. Johnson, M.<sup>†</sup>, **Caragea, P.C.**, August 2013, *Statistical Models for Global Phenological Phenomena*, The Joint Statistical Meetings, Montreal, Canada. Contributed poster presented by Johnson, M.<sup>†</sup>.
15. Sherwood, J., Debinski, D.M., **Caragea, P.C.**, Fahrenholtz, R. and Germino, M., August 2013, *Experimentally Simulating Climate Change in a Montane Meadow Via Reduced Snowpack and Passive Warming: soil and plant responses*, 98th Annual Meeting of the Ecological Society of America, Minneapolis, Minnesota. Oral presentation by Debinski, D.
16. Fortin, D.<sup>†</sup>, **Caragea, P.C.**, Zhu, Z., *Principal component model for spatially dependent functional data*, October 2012, ENVR Workshop "Spatial Modeling and Inference for Environmental Science", North Carolina State University. Poster presented by Fortin, D.<sup>†</sup>.  
**Awarded Best Student Poster Award.**
17. Bramer, L.<sup>†</sup>, **Caragea, P.C.**, Kaiser, M. *A Model for the Bias of Meteorological Wind Speed and Direction Forecasts*, October 2012, ENVR Workshop "Spatial Modeling and Inference for Environmental Science", North Carolina State University. Poster presented by Bramer, L.<sup>†</sup>.
18. Meiring, W., **Caragea, P.C.**, Chockalingam, J., Atkinson, P., October 2012, *Modeling Space-Time Variation in the Satellite-Derived Chlorophyll Index Over India*, ENVR Workshop "Spatial Modeling and Inference for Environmental Science", North Carolina State University. Poster presented by Meiring, W.
19. Kyveryga, P., **Caragea, P.C.**, Kaiser, M., and Blackmer, T., October 2012, *Predicting Risk of Reducing Nitrogen Fertilization Using Hierarchical Models and On-Farm Evaluation Data*, ASA, CSSA, and SSSA 2012 International Annual Meetings, Cincinnati, OH. Contributed talk presented by Kyveryga.
20. Kyveryga, P., **Caragea, P.C.**, Kaiser, M., Nordman, D. and Blackmer, T., October 2010, *The Dilemma of Reducing Nitrogen Fertilizer Rate for Corn: Data Analysis of On-Farm Trials*, ASA, CSSA, and SSSA 2010 International Annual Meetings, Long Beach, CA. Poster presentation presented by Kyveryga.
21. Hughes, J., Haran, M., **Caragea, P.C.**, August 2010, *Autologistic Models for Binary Data on a Lattice*, The Joint Statistical Meetings, Vancouver, Canada. Contributed talk presented by Hughes.
22. Bramer, L.M.<sup>†</sup>, **Caragea, P.C.**, Kaiser, M.S., *A Hierarchical Bias Model for Improvement of 80m Wind Speed Ensemble Forecasts*, The Joint Statistical Meetings, Vancouver, Canada. Contributed talk presented by Bramer<sup>†</sup>.
23. Bramer, L.M.<sup>†</sup>, Hornbuckle, B., **Caragea, P.C.**, December 2009, *An optimal soil moisture sampling scheme for scaling and remote sensing validation*, AGU Fall Meeting, San Francisco. Contributed Poster presented by Bramer<sup>†</sup>.
24. Lim, K., Gongora, C., **Caragea, P.C.**, Leandro, L., June 2009, *Effect of planting density, SCN population, and soil pH on soybean root rot*, North Central Division Meeting of the American Phytopathological Society, Ames, IA. Poster presentation by Lim.
25. Bramer, L.M.<sup>†</sup>, **Caragea, P.C.**, August 2009, *Development of a soil moisture sampling scheme based on scale and validation problems*, The Joint Statistical Meetings, Washington, D.C. Contributed talk presented by Bramer<sup>†</sup>.
26. **Caragea, P.C.** and Kaiser, M.S., August 2008, *Introducing the S-value: an exploratory tool for spatial dependence on a lattice*, The Joint Statistical Meetings, Denver, Colorado. Contributed talk.

27. Grubh, K., Schulte, L., **Caragea, P.C.**, Palik, B.J., August 2008, *Mapping pre-Euro-American vegetation in the Midwest Driftless Area*, 93-rd ESA Annual Meeting, Milwaukee, Wisconsin. Contributed talk presented by Grubh.
28. Kyveryga, P., Blackmer, T., **Caragea, P.C.**, July 2008, *Using soil and terrain attributes for delineating management zones in corn yield response to nitrogen fertilization*, 9-th International Conference on Precision Agriculture, Denver, Colorado. Contributed talk.
29. **Caragea, P.C.** and Kaiser, M.S., March 2008, *Introducing the S-value: an exploratory tool for spatial dependence on a lattice*, 2008 ENAR Spring Meeting, Arlington, Virginia. Contributed talk.
30. Berg, E.J. and **Caragea, P.C.**, March 2008, *Bivariate models and covariates for spatially correlated binary data*, 2008 ENAR Spring Meeting, Arlington, Virginia. Contributed talk.
31. Kyveryga, P., Blackmer, T., **Caragea, P.C.**, November 2007, *Classifying spatial variability in corn yield response to nitrogen fertilization by using soil and terrain attributes*, ASA-CSSA-SSSA International Annual Meetings, New Orleans, Louisiana. Contributed poster presented by P. Kyveryga.
32. **Caragea, P.C.**, June 2007, *A practical approach to analyzing large scale nonstationary spatial data*, TIES North American Regional Meeting, University of Washington, Seattle. Contributed talk.
33. Nordman, D.J. and **Caragea, P.C.**, September 2006, *An empirical likelihood method for variogram estimation*, International Workshop on Spatio-Temporal Modelling (METMA3), Pamplona, Spain. Poster presentation by D. J. Nordman.
34. **Caragea, P.C.** and Kaiser, M.S., April 2006, *Exploring dependence with spatial lattice data*, 32nd Annual Spring Lecture Series, Fayetteville, Arkansas. Contributed talk.
35. **Caragea, P.C.** and Kaiser, M.S., September 2006, *Detection of temporal changes in spatial dependence*, International Workshop on Spatio-Temporal Modelling (METMA3), Pamplona, Spain. Contributed talk.
36. Nordman, D.J. and **Caragea, P.C.**, August 2006, *A spatial blockwise empirical likelihood*, Ninth Meeting of New Researchers in Statistics and Probability, Seattle. Contributed talk by D.J. Nordman.
37. **Caragea, P.C.**, August 2006, *Nonstationary processes viewed as locally stationary processes*, Ninth Meeting of New Researchers in Statistics and Probability, Seattle. Contributed talk.
38. Schmitz, J., Myers, D.J., Paquette, K.M., **Caragea, P.C.**, April 2006, *The effect of soy protein hydrolysate on curing properties of phenol formaldehyde resin*, 97th American Oil Chemists Society Conference, St Louis, MO. Poster presentation by J. Schmitz.
39. **Caragea, P.C.**, Kaiser, M.S., Furukawa, K., March 2006, *Parametrization of spatial models and stability of estimators*, 2006 ENAR Spring Meeting, Tampa, Florida. Contributed talk.
40. DeVries, M., Goggi, S., Fan, X., **Caragea, P.C.**, November 2005, *Freezing characteristics of maize seeds during a frost event*, ASA-CSSA-SSSA International Annual Meetings, Salt Lake City, UT. Contributed talk by M. DeVries.
41. **Caragea, P.C.**, August 2005, *A model for corn pollen dispersion*, The Joint Statistical Meetings, Minneapolis, Minnesota. Contributed talk.
42. Haddad, M.A., **Caragea, P.C.**, July 2005, *Exploratory spatial data analysis of the distribution of student performance and some of its correlates*, Computers in Urban Planning and Urban Management, London, UK. Poster presentation by M.A. Haddad.

43. **Caragea, P.C.**, December 2004, *Alternative estimation of spatial parameters for large data sets*, SemStat2004, Germany (European Mathematical Society Summer School): Statistics of Spatio-Temporal Systems. Contributed talk.
44. **Caragea, P.C.**, Smith, R.L., August 2004, *Likelihood approximations in spatial statistics*, COMPSTAT 2004–16th Symposium of the International Association for Statistical Computing, Prague, Czech Republic. Contributed talk.
45. Holland, D. M., **Caragea, P.C.**, Smith, R.L., July 2003, *Trends in rural sulfur concentrations*, International Conference on Environmental Statistics and Health, Santiago de Compostela, Spain. Contributed talk by D. Holland.
46. **Caragea, P.C.**, Smith, R.L., July 2003, *Three alternative estimators for spatial parameters*, The Joint Statistical Meetings, San Francisco. Contributed talk.
47. **Caragea, P.C.**, Smith, R.L., October 2002, *Approximate likelihoods for spatial processes*, Frontiers of Statistics Conference, Texas A&M. Poster presentation.
48. **Caragea, P.C.**, Smith, R.L., August 2002, *Approximate likelihoods for spatial processes*, The Joint Statistical Meetings, New York. Contributed talk.
49. **Caragea, P.C.**, Smith, R.L., June 2002, *Approximate likelihoods for spatial processes*, Southern Regional Conference on Statistics (SRCOS), Natchez, Mississippi. Poster presentation.
50. D. Holland, **Caragea, P.C.**, Smith, R.L., June 2001, *Trends in rural sulfur concentration*, Southern Regional Conference on Statistics (SRCOS), St. Augustine, Florida. Poster presentation.

## ACADEMIC HONORS AND AWARDS

- American Statistical Association, Section on Statistics and the Environment, *Best Student Poster Award* won by Dan Fortin at the 2012 biannual ENVR Workshop “Spatial Modeling and Inference for Environmental Science”. Co-authors **Caragea, P.C.** and Zhu, Z.
- National Center for Environmental Research, 2005 Level III Scientific and Technological Achievement Award (STAA) for the paper “Regional Trends in Rural Sulfur Concentrations” by Holland, D.M., **Caragea P.C.** and Smith R.L. — for *accomplishing an unusually notable research effort*
- American Statistical Association, Section on Statistics and the Environment *Best Student Paper Award*, The Joint Statistical Meetings, New York, August 2002
- *R.L. Anderson Student Paper Award*, Southern Regional Conference on Statistics (SRCOS), Natchez, Mississippi, June 2002
- *Teaching Award*, Department of Statistics, UNC at Chapel Hill, Fall 2001
- *R.L. Anderson Student Paper Award*, Southern Regional Conference on Statistics (SRCOS), St. Augustine, Florida, June 2001

## FUNDING

1. *Bayesian models for image segmentation in electron microscopy video streams*, Subcontract from PNNL, **PI**, May-July 2017, \$7,828. *Funded one statistics graduate student.*
2. *Models for image segmentation in electron microscopy video streams to monitor electrochemical performance of Lithium batteries.*, Subcontract from PNNL, **PI**, 2016–2017. \$42,833. *Funded one statistics graduate student.*
3. *Temporal Modeling in Integrated Predictive Analytics Methodologies for Streaming Data.*, Subcontract from PNNL, **PI**, 2016. \$21,307. *Funded one statistics graduate student.*
4. Online course development grant from Iowa State University to develop a stand-alone online version of Stat 401 aimed at students with majors in Agriculture, Biology and Life Sciences, 2014. \$12,000. Additional funding for course improvement for Summer 2015, \$4,000.
5. *Hierarchical Statistical Models for the Analysis of Nn-farm Agricultural Trials of Fungicide Use in Soybeans* from Iowa Soybean Association, **PI**, 2014–2015. \$24,683. *Summer support for PI and co-PIs.*
6. *Analyses of Data Collected in On-Farm Replicated Strip Trials using Hierarchical Model and Bayesian Statistical Analysis* from Iowa Soybean Association, **PI**, 2011–2012. \$27,806. *Summer support for PI and co-PIs.*
7. *Wind Forecast Model Validation and Improvement for the Central US* from U.S. Department of Energy, **CoPI**, 2009–2010. \$250,000. *Funded summer support for PI Gallus, W., and co-PIs Caragea, P.C. and Tackle, G.; also funded two meteorology graduate students and one statistics graduate student.*
8. *Statistical Analysis for the Effects of Management Practices, Soil, and Weather on Corn Yield Differences in Normal Minus 50 On-Farm Nitrogen Trials in Iowa* from Iowa Soybean Association, **PI**, 2009–2010. \$38,160. *Summer support for PI and co-PIs.*
9. *Research Consulting Agreement between Hy-Vee and Iowa State University* from Hy-Vee Corporation, 2007–2009. **PI**, \$149,103.51. *Summer support for PI Caragea and funded three statistics graduate students.*
10. *Developing Statistical Methodology for Analyzing Spatial Variability in Crop Yield Response to Various Inputs* from Iowa Soybean Association, 2007. **PI**, \$10,327. *Summer support for PI.*
11. *Spatial Analysis for Local Public Finance Decision Support* — University Research Grant, ISU. 2005–2006. Joint with M.A. Haddad (Department of Community and Regional Planning). \$11,600. *Summer support for PIs.*
12. International Travel Award, Iowa State University, to attend the 58th World Statistics Congress of the International Statistical Institute, Dublin, Ireland. \$1,000. August 2011.
13. Travel award from the NSF to attend 9-th NRC in Seattle, August 2006.
14. Travel award from the European Union to attend SemStat, December 2004.

## COLLABORATIVE ACTIVITIES AND TECHNOLOGY TRANSFER

As a natural complement to my research in the theory and application of methods for analyzing data with dependence, I have established collaborations with colleagues and students at Iowa State and elsewhere. My collaborative work spans a large range of application areas, examples include:

- Ecology
- Natural Resource Ecology and Management
- Agronomy
- Geography
- Geological and Atmospheric Sciences
- Agricultural and Biosystems Engineering
- Community and Regional Planning
- Economics
- Psychology
- Education
- Sociology and Sustainable Agriculture

In the above areas, the collection, analysis and interpretation of geo-spatial and/or temporal information is central to the research. Projects range from designing spatial sampling schemes for precision agriculture, plant population management or disease spread, to spatial or spatio-temporal analysis of data regarding the effects of climate change on plant populations in Iowa and around the globe, soil moisture, inventory forecast, wind energy production, cognition and brain activity, or water quality.

My collaborative efforts extend beyond the realm of the analysis of data with dependence. Such examples include projects related to *food quality and nutrition, marketing strategies, customer satisfaction surveys, individual learning patterns, or plant breeding*. Although most of my collaborative research is related to projects originated by ISU faculty or students, some projects address the needs of local organizations, such as the supermarket chain HyVee or Iowa Soybean Association.

## **ELECTED AND APPOINTED POSITIONS**

- American Statistical Association, Section on Statistics and the Environment
  - Past Chair, 2014. Elected position
  - Chair, 2013. Elected position
  - Chair Elect, 2012. Elected position
- American Statistical Association, Committee on Award of Outstanding Statistical Application
  - Chair: 2010–2012
  - Member: 2007–2009
- American Statistical Association, Section on Statistics and the Environment
  - Program Chair: 2010. Elected position
  - Chair elect: 2008, 2009. Elected position
- Associate Editor, Journal of Agricultural, Biological and Environmental Statistics, 2011–2015

## **OTHER PROFESSIONAL ACTIVITIES**

- External letter writer for promotion and tenure cases
- Review panelist for the National Science Foundation
- Review panelist for the Connecticut Institute of Water Resources
- Organizer for the invited session “Exploring the frontiers of spatial statistics”, 75th Anniversary of the Statistical Laboratory, June 3-5, 2009
- Represented the VIGRE site at the Department of Statistics at ISU at the Seattle VIGRE Workshop, April 2006, University of Washington
- Wrote and graded theory and methods questions for the M.S. exam, 2006 and 2009, Ph.D exam in 2015 and 2017
- Participated in the Iowa-NASA-NSGIC Data Integration Workshop, April 20, 2005, Ames, Iowa

## **EDITORIAL**

- Reviewer for the following journals:
  - Annals of Applied Statistics
  - Statistica Sinica
  - Biometrics
  - Annals of Applied Probability
  - Weather and Forecasting
  - IEEE Power Engineering Letters
  - Journal of The American Statistical Association

- Journal of Statistical Computation and Simulation
- Environmental and Ecological Statistics
- Environmental Modeling and Software

## DEPARTMENTAL AND UNIVERSITY SERVICE

- Departmental Committees

- 2019-2020: Member of Admissions Committee
- 2018-2019: Chair of one Faculty Search committee, Member of Admissions Committee, Honors and Awards Committee, Seminar Scheduling Committee
- 2017-2018: Member of the Admissions Committee, Honors and Awards Committee; Chair of Exam Appeal Committee
- 2016-2017: Member of the Honors and Awards Committee
- 2015-2016: Member of the Advisory Committee to the Chair, of the Distinguished Lectures Committee
- 2014-2015: Chair of the Honors and Awards Committee; Member of a Faculty Search Committee
- 2013-2014: Chair of the Honors and Awards Committee; Chair of the Sustainability Committee; Member of the Exam Committee, of the Lecturer Search Committee and of the Chair Search Committee
- 2012-2013: Member of the Honors and Awards Committee, of the Exam Committee, of the Sustainability Committee
- 2011-2012: Member of the Advisory Committee to the Chair, of the Exam Committee, of the Sustainability Committee
- 2010-2011: Chair of the Faculty Search Committee, Member of the Sustainability Committee
- 2009-2010: Chair of the Diversity Committee, Member of the Honors and Awards Committee, of the Sustainability Committee, STATCOMM advisor (a graduate student organization which offers statistical advice and expertise free of charge to governmental and nonprofit groups in the local community)
- 2008-2009: Chair of the Diversity Committee, Member of Exam Committee
- 2007-2008: Member of the Exam Committee, of the Memorial Lectures Committee, of the Faculty Search Committee
- 2006-2007: Chair of the Seminar Committee (Fall semester), Member of the Faculty Search Committee
- 2005-2006: STATERS Advisor, Member of the Social Committee
- 2004-2005: Member of the Social Committee
- 2003-2004: Member of the Social Committee, of the Diversity Committee

- University Committees

- 2017-2020: Member of the pool of faculty eligible to serve on the Faculty Review Board
- 2013–2014: Advisory committee member to assist the Plant Sciences Institute (PSI) in developing a new research investment model
- 2007–2010: College of Liberal Arts and Sciences Assembly representative
- 2004–2005: Departmental international liaison to the College of Arts and Sciences