

# Seth David Guikema

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University of Michigan  
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## *ACADEMIC APPOINTMENTS*

**The University of Michigan** 2015-present  
Full Professor, Industrial and Operations Engineering Department (2019-present)  
Associate Professor, Industrial and Operations Engineering Department (2015-2019)  
Graduate Program Chair, Industrial and Operations Engineering Department (2017-2019)  
Joint appointment in Civil & Environmental Engineering  
Affiliated Faculty, Michigan Institute for Computational Discovery and Engineering  
Affiliated Faculty, Michigan Center for Applied and Interdisciplinary Mathematics

**The Johns Hopkins University**, Baltimore, MD 2008-2017  
Croft Faculty Scholar (2014-2015) [Endowed chair position for Associate Professors]  
Associate Research Professor, Dept. of Geography and Environmental Engineering (2015-2017)  
Associate Professor, Department of Geography and Environmental Engineering (2014-2015) [tenured]  
Assistant Professor, Department of Geography and Environmental Engineering (2008-2014)  
Joint Appointment in the Department of Civil Engineering (2010-2015)  
Joint Appointment in the Department of Earth & Planetary Sciences (2012-2015)

**University of Stavanger**, Stavanger, Norway 2008-present  
Professor II (adjunct), Department of Industrial Economics, Risk Management and Planning

**Texas A&M University**, College Station, TX  
Adjunct Assistant Professor, Zachry Department of Civil Engineering 2008-2009  
Area Graduate Advisor for *Infrastructure Management & Security* 2006-2007  
Assistant Professor, Zachry Department of Civil Engineering 2005-2007

## *CONSULTING AND INDUSTRY APPOINTMENTS*

**One Concern Inc.**, Palo Alto, CA 2017-present  
Data Science Research Fellow

**Risk Analytics Consulting, LLC**, Ann Arbor, MI 2016-present  
President and founder

**Innovative Decisions, Inc.**, Vienna, VA 2008-2018  
Senior Analyst

## *EDUCATION*

**Cornell University**, Ithaca, NY 2003-2005  
Postdoctoral Associate, School of Civil and Environmental Engineering

**Stanford University**, Palo Alto, CA Sept. 2003  
Doctor of Philosophy, Department of Management Science & Engineering  
*Area:* Engineering Risk and Decision Analysis  
*Thesis:* Optimal Resource Allocation in an Engineering Design Team with Asymmetric Information  
*Advisor:* Professor M. Elisabeth Paté-Cornell

**Stanford University**, Palo Alto, CA June 1999  
Masters of Science, Department of Civil and Environmental Engineering (no thesis),  
Fluid Dynamics focus

**University of Canterbury**, Christchurch, New Zealand  
 Masters of Engineering by Thesis with Distinction, Department of Civil Engineering April 1999  
*Thesis: Multi-Criteria Decision Analysis for Program Planning with Application to the*  
 New Zealand Department of Conservation  
*Advisor: Dr. Mark Milke*

**Cornell University**, Ithaca, NY  
 Bachelor of Science, Department of Civil and Environmental Engineering May 1997  
 Magna Cum Laude, Concentration in Environmental Engineering

**University of Michigan**, Ann Arbor, MI 1993-1994

### ***RESEARCH INTERESTS AND EXPERTISE***

**Methodological:** predictive risk analysis; data analytics; probabilistic risk analysis; agent-based modeling; stochastic simulation; decision analysis; game theory; and economic mechanism design  
**Applications Areas:** community and regional sustainability and resilience assessment and management; human sex trafficking; urban sustainability, resilience, and equity; critical infrastructure; natural hazards risk analysis; climate change; predictive modeling of climate factors; hurricane hazards; terrorist risk analysis; food-energy-water nexus

### ***JOURNAL EDITOR AND EDITORIAL BOARD POSITIONS***

- **Area Editor for Mathematical Modeling**, *Risk Analysis* (2013-present)
- **Associate Area Editor for Mathematical Modeling**, *Risk Analysis* (2012-2013)
- **Associate Editor**, *ASCE Journal of Infrastructure Systems* (2009-2018)
- **Editorial Board**, *Journal of Integrated Security Science* (2016-present)
- **Editorial Board**, *Risk Analysis* (2011-present)
- **Editorial Board**, *Reliability Engineering & System Safety* (2010-present)
- **Editorial Board**, *ASCE Journal of Infrastructure Systems* (2007-2009)
- **Editorial Board**, *Journal of Performability Engineering* (2007-present)

### ***PROFESSIONAL RECOGNITION***

- **President-Elect**, Society for Risk Analysis (President in 2020).
- **2019 RADM Robert C Williams Engineering Literary Award (Peer-Reviewed Category)**, U.S. Public Health Service for the paper “Extreme precipitation, public health emergencies and safe drinking water in the United States” published in *Current Environmental Health Reports*
- **Best Paper Awards, Risk Analysis, 2012** [5 papers total selected as Best Papers for the year]:
  1. Guikema 2012, *Modeling Intelligent Adversaries for Terrorism Risk Assessment: Some Necessary Conditions for Adversary Models*
  2. Rothschild et al. 2012, *Adversarial Risk Analysis with Incomplete Information: A Level-k Approach*.
- **Chauncey Starr Distinguished Young Risk Analyst Award 2010:** Awarded annually to a member of the Society for Risk Analysis age 40 years or younger for outstanding achievement in science or public policy relating to risk analysis and exceptional promise for continued contributions to risk analysis.
- **Best journal paper** award for 2002 for the *Military Operations Research Society and Informs Military Applications Section*
- **Technical paper winner, Economics track**, *American Institute of Aeronautics and Astronautics Space 2001* Conference
- **Centennial Teaching Assistant**, School of Engineering, Stanford University, 2000-2001
- **Best paper** in the journal *Environmental Conservation* in 1999
- **Best paper in the Quality and Manufacturing Technology Category** at the 5<sup>th</sup> Annual New Zealand Engineering and Technology Postgraduate Conference (1998)
- **Fulbright Fellowship** to New Zealand (1998)

## **AWARDS TO MY GRADUATE STUDENT ADVISEES**

- *Julia Coxen* (PhD student, UM): Student merit award, Society for Risk Analysis, Applied Risk Management Specialty Group, 2019.
- *Tom Logan* (PhD student, UM): Rackham Predoctoral Fellowship, 2018-2019
- *Elnaz Kabir* (PhD student, UM): Best poster award, Society for Risk Analysis, 2016
- *Thomas Logan* (PhD student, JHU): Fulbright Fellowship
- *Julie Shortridge* (PhD student, JHU): National Defense Science and Engineering Graduate Fellowship (2013-2016)
- *Roshanak Nateghi* (PhD student and Postdoctoral Fellow, JHU): NSF SEES Postdoctoral Fellowship (2012-2015)
- *Andrea Staid* (PhD Student, JHU): ARCS Phd Fellowship (2012-2013)
- *Roshanak Nateghi*, Grant to attend Rice University's Future Faculty Workshop (2011)
- *Stefanie Falconi* (PhD Student, JHU): Faculty for the Future Fellowship (2011-2014)
- *Sarah LaRocca* (PhD Student, JHU): SAS and INFORMS Analytics Section Student Analytical Scholarship (2012)
- *Sarah LaRocca* (PhD Student, JHU): Best Student Paper Award, *Engineering & Infrastructure Specialty Group, Society for Risk Analysis* (2011)
- *Sarah LaRocca* (PhD Student, JHU): Chesapeake Water and Environment Student Paper Competition Winner (2011)
- *Sarah LaRocca* (PhD Student, JHU): National Science Foundation Graduate Fellowship (2010-2013)
- *Sara Piaskowy* (PhD Student, JHU): National Science Foundation Graduate Fellowship (2008-2011) and EPA Starr Graduate Fellowship (2011-2014)
- *Jacob Torres* (MS Student, TAMU): Runner up for the Best Student Paper award and winner of a Student Travel Award from the Infrastructure and Engineering specialty group of the Society for Risk Analysis, 2007
- *Shridhar Yamijala* (MS Student, TAMU): Outstanding master's degree research student for 2006-2007, Zachry Department of Civil Engineering, Texas A&M University
- *Shridhar Yamijala* (MS Student, TAMU): Best Student Paper award from the Infrastructure and Engineering specialty group of the Society for Risk Analysis, 2006
- *Seung-Ryong Han* (PhD Student, TAMU): Runner up for the Best Student Paper award and winner of a Student Travel Award from the Infrastructure and Engineering specialty group of the Society for Risk Analysis, 2006

## **JOURNAL PUBLICATIONS**

(\*) signifies a student that was an advisee at the time of the work. The underlined author is the corresponding author.

### Under Review or Revision

13. Coxen, Julia\*, S.D. Guikema, B. Carr. "Risk Analysis as a Critical Tool for Human Trafficking," submitted to *Risk Analysis* [under first review].

12. Meilin, Y., A. Wilson, F. Dominici, Y. Wang, M. Al-Hamdan, W. Crosson, A. Schumacher, S. Gujikema, S. Magzamen, J. Peel, R. Peng, and B. Anderson. "Tropical cyclone exposures and risks of emergency Medicare hospital admission for cardiorespiratory diseases in 175 United States counties, 1999–2010," submitted to *Epidemiology* [under first review].

11. Logan, T.\* S.D. Guikema. "The Heart of Community Resilience: A Framework and Approach for Measuring People's Access to Essential Services," submitted to *Risk Analysis* [under first review].

10. Williams, T.\*, S.D. Guikema, D. Brown, and A. Agrawal. "Resilience and equity: quantifying the distributional effects of development interventions in a smallholder agricultural system," submitted to *Agricultural Systems* [under first review].

9. Marasco, D., P. Murray-Tuite, S.D. Guikema, and T. Logan. "Time To Leave: An analysis of travel times during the approach and landfall of Hurricane Irma," submitted to *Natural Hazards* [under first review].

8. Williams, T\*, T. Logan, S.D. Guikema, C. Zuo, and K. Liberman. “Parks and safety: a comparative study of green space access and its inequities in five US cities,” submitted to *Landscape and Urban Planning* [under first review].
7. Logan, T.\* and S.D. Guikema. “Making Community Resilience About People: Measuring Resilience as Access to Services,” submitted to *Risk Analysis* [under first review].
6. Haig, S., N. Kotlarz, L. Kalikin, T. Chen, S.D. Guikema, J. LiPuma, L. Raskin. “The Abundance of Opportunistic Bacterial Pathogens in Municipal Drinking Water is Impacted by Dissolved Iron Concentration and Distribution System and Household Plumbing Characteristics, submitted to *Environmental Science & Technology* [under first review].
5. Johnson, C\*, S.D. Guikema, and R. Flage. “Characterising the robustness of coupled power-law networks,” submitted to *Reliability Engineering and System Safety* [under second review].
4. Aldarondo, F., T. Logan\*, and **S.D. Guikema**. “Assessing Influencing Factors for Evacuation Behavior Under Repeated Hurricanes Using Travel Time Data,” submitted to *Risk Analysis* [under first review].
3. White, A.\*, **S.D. Guikema**, and T. Logan\*. “Persistent patterns of discriminatory housing policy and inequity: A spatial analysis,” submitted to *PLOS One* [under second review].
2. G.B. Anderson, J. Ferreri, M. Al-Hamdan, W. Crosson, A. Schumacher, **S.D. Guikema**, S.M. Quiring, D. Eddelbuettel, M. Yan, and R.D. Peng. “Assessing United States county-level exposure for research on tropical cyclones and human health,” submitted to *Environmental Health Perspectives* [under first review].
1. Tonn, G.\* and **S.D. Guikema**. “Risk Factors for Unexpected 100-Year Flood Events in the Mid-Atlantic Region of the U.S.,” submitted to *Risk Analysis* [under revision after second review].

#### Published or In Press

109. Kabir, E.\*, **S.D. Guikema**, and S.M Quiring. “Probabilistic Mixture Models for Predicting Thunderstorm-Induced Power Outages,” submitted to *IEEE Transactions on Power Systems* [accepted July 2019].
108. Chen, T.\*, C. Reilly, S.D. Guikema, and P. Von Hentzenryck. “Optimizing Inspection Routes in Pipeline Network,” submitted to *Reliability Engineering and System Safety* [accepted October 2019].
107. Chen, T.Y.J.\*, **S.D. Guikema**, T. Aven, V. Washington\*, “J100-10 Risk Management Standard for Drinking Water Systems,” *Risk Analysis* [accepted October 2019].
106. Chen, T.\*, **S.D. Guikema**, and C. Daly. “Algorithms for Identifying Optimal Inspection Paths in Pipe Networks,” Submitted to *ASCE Journal of Infrastructure Systems* [accepted January 2019].
105. Shashanni, S.\*, **S.D. Guikema**, C. Zhai\*, S.M. Quiring, and J. Pinto. Multi-stage Prediction for Zero-inflated Hurricane Induced Power Outages, *IEEE Access* [Accepted October 2018].
104. Chen, T.Y.J.\*, J.A. Beekman, **S.D. Guikema**, and S. Shashaani. “Statistical Modeling in the Absence of System Specific Data – An Exploratory Empirical Analysis for Prediction of Water Main Breaks,” *ASCE Journal of Infrastructure Systems* [Accepted October 2018].
103. Hamilton, M.\*, A.P. Fischer, **S.D. Guikema**, and G. Keppel-Aleks. “Behavioral adaptation to climate change in fire-prone forests,” *WIREs Climate Change* [accepted August 2018].
102. Logan, T.\*, **S.D. Guikema**, J.D. Bricker. “Engineered climate adaptations can increase vulnerability to natural hazards,” *Nature Sustainability* [accepted August 2018].

101. Reilly, A.C., R. Dillon-Merrill, and **S.D. Guikema**. "Agent-Based Models as an Integrating Boundary Object for Interdisciplinary Research," *Risk Analysis* [accepted July 2018].
100. Kabir, E.\*, **S.D. Guikema**, and B. Kane. 2018. "Statistical Modeling of Tree Failures During Storms," submitted to *Reliability Engineering and System Safety*, Vol. 177, pp. 68-79.
99. Tonn, G.\* and **S.D. Guikema**. 2018. "An Agent-Based Model of Evolving Community Flood Risk," submitted to *Risk Analysis*. Vol. 38, No. 6, pp. 1258-1278. DOI: 10.1111/risa.12939.
98. Exam N., E. Betanzo, K.J. Schwab, T.Y.J Chen\*, **S.D. Guikema**, and D.E. Harvey. 2018. "Extreme precipitation, public health emergencies and safe drinking water in the United States," *Current Environmental Health Reports*, Vol. 4, No. 23, pp. 1011. DOI: 10.1007/s40572-018-0200-5.
97. Logan, T.\*, T.G. Williams\*, A.J. Nisbet, K.D. Liberman\*, C.T. Zou\*, and **S.D. Guikema**. 2017. "Evaluating urban accessibility: leveraging open-source data and analytics to overcome existing limitations," *Environment and Planning B: Urban Analytics and City Science*. DOI: 10.1177/2399808317736528
96. Richardson, DB, **S.D. Guikema**, and A.E.M. Cohn. 2017. "Predicting Patient Treatment Deferrals at an Outpatient Chemotherapy Infusion Center: A Statistical Approach," *JCO Clinical Cancer Informatics*, Vol. 1, pp. 1-8.
95. Staid, A.\*, C. Ver Huls, and **S.D. Guikema**. 2017. "A comparison of methods for assessing power output in non-uniform onshore wind farms." *Wind Energy*, Vol. 21, No. 1, pp. 42-52. DOI: 10.1002/we.2143
94. Reilly, A.C.\*, **S.D. Guikema**, L. Zhu, and T. Igusa. 2017. "Evolution of Vulnerability of Communities Facing Repeated Hazards," *PLOS One*, Vol. 12, No. 9. September 2017. DOI: 10.1371/journal.pone.0182719.
93. Reilly, A.\*, G.L. Tonn, C. Zhai\*, and **S.D. Guikema**. 2017. "Hurricanes and Power System Reliability-The Effects of Individual Decisions and System-Level Hardening," *Proceedings of the IEEE* [invited paper], Vol. 105, No. 7, pp. 1429-1442.
92. Shortridge, J.\*, **S.D. Guikema**, and T. Aven. 2017. "Risk assessment under deep uncertainty: a methodological comparison" *Reliability Engineering and System Safety*, Vol. 159, pp. 12-23.
91. Shortridge, J.\*, **S.D. Guikema**, and B. Zaitchik. 2017. "Robust decision making in data scarce contexts: addressing data and model limitations for infrastructure planning under transient climate change" *Climatic Change*, Vol. 140, p. 323. DOI: 10.1007/s10584-016-1845-4.
90. Schell, K.\*, J. Claro, and **S.D. Guikema**. 2017. "Probabilistic Cost Prediction for Submarine Power Cable Projects," accepted for publication in *International Journal of Electrical Power and Energy Systems*.
89. Berner, C.L.\*, A. Staid\*, R. Flage, **S.D. Guikema**. 2017. The Use of Simulation to Reduce the Domain of "Black Swans" with Application to Hurricane Impacts to Power Systems. *Risk Analysis*, Vol. 37, No. 10, pp. 1879-1897. DOI: 10.1111/risa.12742.
88. McRoberts, D.B., S.M. Quiring, and S.D. Guikema. 2016. "Improving Hurricane Power Outage Prediction Models Through the Inclusion of Local Environmental Factors," *Risk Analysis*, published online October 2016. DOI: 10.1111/risa.12728 [in press for print version].
87. Shortridge, J.\*, **S.D. Guikema**, and B. Zaitchik. 2016. "Machine learning methods for empirical streamflow simulation: a comparison of model accuracy, interpretability, and uncertainty in seasonal watersheds," *Hydrology and Earth System Science*, Vol. 20, No. 7, p. 2611. doi:10.5194/hess-20-2611-2016.
86. Garzon, J., C. Ferreira, R.A. Dalrymple, and **S.D. Guikema**. 2016. "Efficient Integration of a Storm Surge Model into a Multidisciplinary Agent Based Model Framework." *Journal of Coastal Research*, pp. 1082-1086.

85. Nateghi, R., J. Bricker, **S.D. Guikema**, and A. Bessho. 2016. "Learning from Historical Data: The Role of Seawalls and Coastal Forests in Reducing Tsunami Death and Damage Rates along the Coasts of Iwate and Miyagi Prefectures," *PLOS One*. DOI: 10.1371/journal.pone.0158375.
84. Logan, T.\*, S. McLeod, **S.D. Guikema**. 2016. "Predictive Models in Horticulture: A Case Study with Royal Gala Apples," *Scientia Horticulturae*, Vol. 9, No. 19, pp. 201-213.
83. Reilly, A.\*, R. Davidson, L. Nozick, **S.D. Guikema**, and T. Chen\*. 2016. "Using data envelopment analysis to evaluate post-hurricane electric-power restoration performance" *Reliability Engineering and System Safety* Vol. 152, pp. 197-204.
82. Reilly, A.\*, A. Staid, M. Gao, and **S.D. Guikema**. 2016. "Tutorial: Parallel Computing of Simulation Models for Risk Analysis," *Risk Analysis*, DOI: 10.1111/risa.12565.
81. Rivera-Calle, S., C.E. Del Castillo, A. Gnanadesikan, W. Balch, and **S.D. Guikema**. 2015. "Increase of coccolithophorids in the North Atlantic over recent decades," *Science*, Vol. 350, Issue 6267, pp. 1533-1537.
80. Tonn, G.\*, **S.D. Guikema**, C. Ferreira, and S.M. Quiring. 2016. "Hurricane Isaac: A Longitudinal Analysis of Storm Characteristics and the Drivers of Power Outage Risk," *Risk Analysis*, 10.1111/risa.12552.
79. Shortridge, J.\*, **S.D. Guikema**, and T. Aven. 2016. "Scenario discovery with multiple criteria: an evaluation of the robust decision making framework for climate change adaptation," *Risk Analysis*, 10.1111/risa.12582 [accepted November 2015].
78. Reilly, A.\* , A. Samuel, and **S.D. Guikema**. 2015. "Gaming the System": Decision Making by Interdependent Critical Infrastructure," *Decision Analysis*, Vol. 12, No. 4, pp. 155-172.
77. Gelyani, A.M., E.B. Abrahamsen, F. Asche, and **S.D. Guikema**. 2015. "Some considerations on how often safety critical valves should be tested," *International Journal of Business Continuity and Risk Management*, Vol. 6, No.1, pp. 59-67
76. Shortridge, J.\*, S. Falconi\*, B. Zaitchik, and **S.D. Guikema**. 2015. "Climate, Agriculture, and Hunger: Statistical Prediction of Undernourishment Using Non-Linear Regression and Data Mining Techniques," *Journal of Applied Statistics*, Vol. 42, No. 11, pp. 2367-2390.
75. Nateghi, R.\*, **S.D. Guikema**, Y. Wu\*, and B. Bruss\*. "Critical Assessment of the Foundations of Power Transmission and Distribution Reliability Metrics and Standards," *Risk Analysis*, 10.1111/risa.12401 [Accepted March 2015].
74. Aven, Terje and **S.D. Guikema**. 2015. "The Concept of Terrorism Risk", *Risk Analysis* [Accepted for Publication March 2015].
73. Staid, A.\* and **S.D. Guikema**. 2015. "Risk Analysis for Offshore Wind Farms: The Need for an Integrated Approach," submitted to *Risk Analysis*, Vol. 35, No. 4, pp. 587-593.
72. Staid, A.\*, **S.D. Guikema**, R. Nateghi. S.M. Quiring, and M. Gao. 2014. "Simulation of tropical cyclone impacts to the U.S. power system under climate change scenarios," *Climatic Change*, Vol. 127, Iss 3-4, pp. 535-546.
71. **S.D. Guikema**, R. Nateghi, S.M. Quiring, A. Reilly, M. Gao. 2014. "Predicting Hurricane Power Outages to Support Storm Response Planning," *IEEE Access*, Vol. 2, OPEN ACCESS. DOI: 10.1109/ACCESS.2014.2365716
70. Urquhart, E., B. Zaitchik, **S.D. Guikema**, B.J. Haley, E. Tayian, A. Chen, M.E. Brown, A. Huq, and R.R. Calwell. "Use of Environmental Parameters to Model Pathogenic Vibrios in Chesapeake Bay," *Journal of Environmental Informatics* [accepted September 2014].

69. Staid, A.\* , P. Pinson, and S.D. Guikema. 2014. "Probabilistic Maximum-Value Wind Prediction for Offshore Environments" *Wind Energy*. [accepted June 2014, DOI: 10.1002/we.1787]
68. LaRocca, S.\* , J. Johansson, H. Hassel, and **S.D. Guikema**. "Topological Performance Measures as Surrogates for Physical Flow Models for Risk and Vulnerability Analysis for Electric Power Systems," *Risk Analysis* [accepted July 2014].
67. **LaRocca, S.\*** and **S.D. Guikema**, "Characterizing and Predicting the Robustness of Power Law Networks," *Reliability Engineering & System Safety* [accepted July 2014].
66. Anderson, W\*, **S.D. Guikema**, B. Zaitchik, and W. Pan. "Methods for estimating population density in data-limited areas: evaluating regression and tree-based models in Peru" accepted for publication in *PLOS One* [May 2014].
65. **Nateghi, R.\***, **S.D. Guikema**, S.M. Quiring. 2014. "Forecasting Hurricane-Induced Power Outage Durations," *Natural Hazards*, Vol. 74, No. 3, p. 1795-1811.
64. **Quiring, S.M.**, A. Schumacher, and **S.D. Guikema**. 2014. "Incorporating Hurricane Forecast Uncertainty into Decision Support Applications," *Bulletin of the American Metrological Society*, Vol. 95, pp. 47-58.
63. **Urquhart, E.**, B. Zaitchik, C. Del Castillo, D. Waugh, and **S.D. Guikema**. "Uncertainty in Model Predictions of *Vibrio vulnificus* Response to Climate Variability and Change: a Chesapeake Bay Case Study," *PLOS ONE* [accepted May 2014].
62. **Francis, R.**, **S.D. Guikema**, L. Henneman\*. "Bayesian Belief Networks for Predicting Drinking Water Distribution System Pipe Breaks," *Reliability Engineering & System Safety* [accepted April 2014].
61. **Reilly, A.C.\*** and **S.D. Guikema**. "Bayesian Multiscale Modeling of Spatial Infrastructure Performance Predictions with an application to electric power outage forecasting," *ASCE Journal of Infrastructure Systems* [accepted April 2014].
60. **Shortridge, J.\*** and **S.D. Guikema**. "Public Health and Pipe Breaks in Water Distribution Systems: Analysis with Internet Search Volume as a Proxy," *Water Research* [accepted January 2014].
59. **Badr, H.** B. Zaitchik, and **S.D. Guikema**. "Statistical Predictive Models for Seasonal Rainfall Anomalies over Sahel," *Journal of Applied Meteorology and Climatology*, Vol. 53, No. 3, pp. 614-636.
58. **Nateghi, R.\***, **S. D. Guikema** and S.M. Quiring, 2014. "Power Outage Estimation for Tropical Cyclones: Improved Accuracy with Simpler Models," *Risk Analysis*, Vol. 34, No. 6, p. 1069-1078. DOI 10.1111/risa.12131.
57. Han, S-R\*, Rosowsky, D. and **S.D. Guikema**. "Estimating Fragilities for Power Distribution System Poles using Bayesian Methods and Structural Reliability Models," *Risk Analysis* [accepted June 2013, published online. DOI: 10.1111/risa.12102, pending hard copy publication].
56. **Staid, A.\***, **S.D. Guikema**, 2013. "Statistical Analysis of Installed Wind Capacity in the United States," *Energy Policy*, Vol. 60, pp. 378-385.
55. **Urquhart, E.**, M.J. Hoffman, B.F. Zaitchik, **S.D. Guikema**, E. F. Geiger. 2012. "Remotely Sensed Estimates of Surface Salinity in the Chesapeake Bay," *Remote Sensing of the Environment*, Vol. 23, pp. 522-531.
54. **Yu, O-Y.\***, A. Medina-Centina, **S.D. Guikema**, J-L. Briaud, and D. Burnett. 2012. "Integrated Approach for the Optimal Selection of Environmentally Friendly Drilling Systems," *International Journal of Energy and Environmental Engineering*, Vol. 3, No. 25 DOI: 10.118/2251-6832-3-25 (Open Source)
53. Samuel, A. and **S.D. Guikema**. 2012. "Resource Allocation for Homeland Defense: Dealing With the Team Effect," *Decision Analysis*, Vol. 9, N. 3, pp. 238-252.

52. Yu, O.-Y.\*, **S.D. Guikema**, J.-L. Briaud, and D. Burnett. 2012. "Sensitivity Analysis for Multi-Attribute System Selection Problems in Onshore Environmentally Friendly Drilling (EFD)", *INCOSE Journal of Systems Engineering*, Vol. 15, No. 2, pp. 153-171.
51. **Guikema, S.D.** and S.M. Quiring. 2012. "Hybrid Data Mining-Regression for Infrastructure Risk Assessment Based on Zero-Inflated Data," *Reliability Engineering & System Safety*, Vol. 99, pp. 178-182.
50. Lord, D. and **S.D. Guikema**, 2012. "The Conway-Maxwell-Poisson Model for Analyzing Crash Data," peer-reviewed commentary, *Applied Stochastic Models in Business and Industry*, Vol. 28, No. 2, pp. 122-127.
49. McLay, L., C. Rothschild, and **S.D. Guikema**, 2012. "Robust Adversarial Risk Analysis: A Level-*k* Approach," *Decision Analysis*, Vol. 9, No. 1, pp. 41-54.
48. **Guikema, S.D.** 2012. "Modeling Intelligent Adversaries for Terrorism Risk Assessment: Some Necessary Conditions for Adversary Models," *Risk Analysis*, Vol. 32, No. 7, pp. 1117-1121. **Selected for a Best Paper Award by Risk Analysis for 2012.**
47. Rothschild, C., L. McLay, and **S.D. Guikema**. 2012. "Adversarial Risk Analysis with Incomplete Information: A Level-*k* Approach," *Risk Analysis*, Vol. 32, No. 7, pp. 1219-1231. **Selected for a Best Paper Award by Risk Analysis for 2012.**
46. Francis, R.\*, **S.D. Guikema**, D. Lord, S. Geedipally, and S. LaRocca. 2012. "Characterizing the Performance of the Conway-Maxwell Poisson Generalized Linear Model," *Risk Analysis*, Vol. 32, No. 1, pp. 167-183.
45. Aven, T. and **S.D. Guikema**. 2011. "Whose uncertainty assessment (probability distributions) does a risk assessment report: the analysts' or the experts?" *Reliability Engineering & System Safety*, Vol. 96, No. 10, pp. 1257-1262.
44. Nateghi, R.\*, **S.D. Guikema**, and S.M. Quiring. 2011. "Comparison and Validation of Statistical Methods for Predicting Power Outage Durations During Hurricanes," *Risk Analysis*, Vol. 31, No. 12, pp. 1897-1906.
43. Cho, H.\*, F. Olivera, and **S.D. Guikema**. 2011. "Enhanced Speciation in Particle Swarm Optimization for Multi-Modal Problems," *European Journal of Operational Research*, Vol. 213, No. 1, pp. 15-23.
42. Quiring, S.M., L. Zhu, and **S.D. Guikema**. 2011. "Importance of soil and elevation characteristics for modeling hurricane-induced power outages" *Natural Hazards*, Vol. 58, No. 1, pp. 365-390.
41. Yu O.K.\*, **S.G. Guikema**, J.L. Briaud, and D. Burnett. 2011. "Quantitative decision tools for system selection in environmentally friendly drilling," *Civil Engineering and Environmental Systems*. DOI: 10.1080/10286608.2010.543280
40. Francis\*, R., S. Falconi\*&, R. Nateghi\*, and **S.D. Guikema**. 2011. "Probabilistic life cycle analysis model for evaluating electric power infrastructure risk mitigation investments," *Climatic Change*. Vol. 106, No. 1 (2011), Page 31-55. DOI: 10.1007/s10584-010-0001-9.
39. Lord, D., S.R. Geedipally, and **S.D. Guikema**. 2010. "Extension of the Application of Conway-Maxwell-Poisson Models: Analyzing Traffic Crash Data Exhibiting Underdispersion," *Risk Analysis*, Vol. 30, No. 8, pp. 1268-1276.
38. **Guikema, S.D.**, S.R. Han\*, S.M. Quiring. 2010. "Pre-Storm Estimation of Hurricane Damage to Electric Power Distribution Systems," *Risk Analysis*, Vol. 30, No. 12, pp. 1744-1752.
37. **Guikema, S.D.**, T. Aven. 2010. "Using ALARP for Terrorist Risk Analysis," *Reliability Engineering & Systems Safety*, Vol. 95, No. 8, pp. 823-827.



36. Booker, G., A. Sprintson, E. Zechman, C. Singh, and **S. Guikema**. 2010. "Efficient Traffic Loss Evaluation for Transport Backbone Networks," *Computer Networks*, Vol. 54, No. 10, pp. 1683-1691.
35. **Guikema, S.D.** and T. Aven. 2010. "Assessing Risk from Intelligent Attacks: A Perspective on Approaches." *Reliability Engineering and System Safety*, Vol. 95, No. 5, pp. 478-483.
34. Booker, G., J. Torres\*, **S.D. Guikema**, A. Sprintson, and K. Brumbelow. 2010. "Estimating Cellular Network Performance During Hurricanes," *Reliability Engineering & System Safety*. Vol. 95, No. 4, pp. 337-344.
33. Han, S.-R.\*, **S.D. Guikema**, and S.M. Quiring. 2009. "Improving the Predictive Accuracy of Hurricane Power Outage Forecasts using Generalized Additive Models," *Risk Analysis*, Vol. 29, No. 10, pp. 1443-1453.
32. **Guikema, S.D.** and J.P. Coffelt\*. 2009. "Modeling Count Data for Non-Linear, Complex Infrastructure Systems," *ASCE Journal of Infrastructure Systems*, Vol. 15, No. 3, pp. 172-178.
31. **Guikema, S.D.** and P. Gardoni. 2009. Reliability estimation for networks of reinforced concrete bridges, *ASCE Journal of Infrastructure Systems* Vol. 15, No. 2, pp. 61-69.
30. Sanchez-Silva, M., D. Rosowsky, and **S.D. Guikema**. 2009. "Decision-Based Optimization Model for Design and Operation of Transportation Networks in Seismic Regions," *Journal of Infrastructure Systems*, Vol. 15, No. 2, pp. 70-79.
29. **Guikema, S.D.** 2009. "Sustainability and Resilience in Infrastructure Design and Management in Disaster Prone Regions," *Science*, Vol. 323, No. 5919, pp. 1302. *Perspectives Paper*.
28. Torres, J.\*, K. Brumbelow, **S.D. Guikema**. 2009. "Risk Classification and Uncertainty Propagation for Virtual Water Distribution Systems," *Reliability Engineering & System Safety*, Vol. 94, No. 8, pp. 1259-1273.
27. Cho, H.\*, F. Olivera, and **S.D. Guikema**. 2009. "A Derivation of the Number of Minima of the Greiwank Function," *Applied Mathematics and Computation*, Vol. 204, No. 2, pp. 694-701.
26. Imbeah, W.\* and **S.D. Guikema**. 2009. "Managing Construction Projects Using the Advanced Programmatic Risk Analysis Model (APRAM)," *Journal of Construction Engineering and Management*, Vol. 135, No. 8, pp. 772-781.
25. **Guikema, S.D.** 2009. "Natural Disaster Risk Analysis for Critical Infrastructure Systems: An Approach Based on Statistical Learning Theory." *Reliability Engineering and System Safety*. Vol. 94, No. 4, pp. 855-860.
24. Yamijala, S.\* , **S.D. Guikema**, and K. Brumbelow. 2009. "Statistical Estimation of Water Distribution System Pipe Reliability," *Reliability Engineering & System Safety* Vol. 94, No. 2, pp. 282-293.
23. Han, S.\*, **S.D. Guikema**, S.M. Quiring, K. Lee, D. Rosowsky, and R.A. Davidson. 2009. "Estimating the Spatial Distribution of Power Outages during Hurricanes in the Gulf Coast Region," *Reliability Engineering & System Safety*, Vol. 94, No. 2, pp. 199-210.
22. Lord, D., **S.D. Guikema**, and S. Geedipally\*. 2008. "Application of the Conway-Maxwell-Poisson Generalized Linear Model for Analyzing Motor Vehicle Crashes," *Accident Analysis and Prevention*, Vol. 30, No. 3, pp. 1123-1134.
21. **Guikema, S.D.** and J.P. Coffelt\*. 2008. "A Flexible Count Data Regression Model for Risk Analysis," *Risk Analysis*, Vol. 28, No. 1, pp. 213-221.
20. Milke, M.W. and **S.D. Guikema**. 2007. "Parameterized decision analysis of a single-criterion choice between a Do-Nothing Option and an Act-Now Option," *Civil Engineering and Environmental Systems*, Vol. 24, No. 3, pp. 179-191.

19. Xu, N., **S.D. Guikema**, R.A. Davidson, L.K. Nozick, Z. Çağnan, and K. Vaziri. 2007. "Optimizing Scheduling of Post-Earthquake Electric Power Restoration Tasks," *Earthquake Engineering and Structural Dynamics*, Vol. 36, No. 12, pp. 265 – 284.
18. **Guikema, S.D.** 2007. "A Proposal for Including Technical Failure Risk in Market-Based Resource Reallocation for Spacecraft Design," *Reliability Engineering & System Safety*. Vol. 92, No. 5, pp. 653-659.
17. **Guikema, S.D.** 2007. "Formulating Informative, Data-Based Priors for Bayesian Risk Analysis," *Reliability Engineering & System Safety*. Vol. 92, No. 4, pp. 490-502.
16. Cagnan, Z., R.A. Davidson, and **S.D. Guikema**. 2006. "Post-Earthquake Restoration Planning for Los Angeles Electric Power," *Earthquake Spectra*, Vol. 22, No. 3, pp. 589-608.
15. **Guikema, S.D.**, R.A. Davidson, and H. Liu. 2006. "Statistical Models of the Effects of Tree Trimming on Power System Outages," *IEEE Transactions on Power Delivery*, Vol. 21, No. 3, pp. 1549-1557.
14. **Guikema, S.D.** 2006. "Incentive Compatible Resource Allocation in Engineering Design," *Engineering Optimization*, Vol. 38, No. 2, pp. 209-226.
13. Dillon, R.L., M.E. Paté-Cornell, and **S.D. Guikema**. 2005. "Optimal Use of Budget Reserves to Minimize Technical and Management Failure Risks During Complex Project Development," *IEEE Transactions on Engineering Management*, Vol. 52, No. 3, pp. 382-395.
12. **Guikema, S.D.** 2005. Invited Discussion of "An Estimation of the Social Costs of Landfill Siting Using a Choice Experiment" by T. Sasao, *Waste Management*, Vol. 25, No. 3, pp. 331-333.
11. **Guikema, S.D.** 2005. "A Comparison of Risk Estimation Methods for Binary Systems," *Reliability Engineering and System Safety*, Vol. 87, No. 3, pp. 365-376.
10. **Guikema, S.D.** and M.E. Paté-Cornell. 2005. "Probability of Infancy Problems for Space Launch Vehicles," *Reliability Engineering and System Safety*, Vol. 87, No. 3, pp. 303-314.
9. Paté-Cornell, M.E., R.L. Dillon, and **S.D. Guikema**. 2004. "On the Limitations of Redundancies in the Improvement of System Reliability," *Risk Analysis*, Vol. 24, No. 6, pp. 1423-1436.
8. **Guikema, S.D.** and M.E. Paté-Cornell. 2004. "Bayesian Analysis of Launch Vehicle Success Rates," *Journal of Spacecraft and Rockets*, Vol. 41, No. 1, pp. 93-102.
7. **Guikema, S.D.** and M.W. Milke. 2003. "Sensitivity Analysis for Multi-Attribute Project Selection Problems," *Civil Engineering and Environmental Systems*, Vol. 20, No. 3, pp. 143-162.
6. Dillon, R.L., M.E. Paté-Cornell, and **S.D. Guikema**. 2003. "Programmatic Risk Analysis for Critical Engineering Systems Under Tight Resource Constraints: Applying APRAM," *Operations Research*, Vol. 51, No. 3, pp. 354-370.
5. Paté-Cornell, M.E. and **S.D. Guikema**. 2002. "Probabilistic Modeling of Terrorist Threats: A Systems Analysis Approach to Setting Priorities Among Countermeasures," *Military Operations Research*, Vol. 7, No. 4, pp. 5-23.  
**Awarded "Best Paper" for 2002 by the Military Operations Research Society and INFORMS Military Applications Section.**
4. **Guikema, S.D.** and M.E. Paté-Cornell. 2002. "Component Choice for Managing Risk in Engineered Systems with Generalized Risk/Cost Functions," *Reliability Engineering and System Safety*, Vol. 78, No. 3, pp. 227-238.
3. **Guikema, S.D.** and M.E. Paté-Cornell. 2002. "The Assessment of the Effects of Biases on the Performance of a Portfolio of Missions," *International Journal of Aerospace Management*, Vol. 1, No. 4, pp. 339-351.

2. **Guikema, S.D.**, L. Ortolano, S. Ohshita, and P. Collins. 2001. "Using Simulation to Teach Negotiation Processes to Environmental Engineers," *Journal of Engineering Education*, Vol. 90, No. 4, pp. 631-635.

1. **Guikema, S.D.** and **M. Milke**. 1999. "Quantitative Decision Tools for Conservation Program Planning: Practice, Theory, and Potential." *Environmental Conservation*, Vol. 26, No. 3, pp. 179-189. **Selected as the Best Paper in the journal in 1999.**

### **CONFERENCE PUBLICATIONS**

34. Reilly, A.C., C. Zhai, and S.D. Guikema, "Strengths and limitations of Bayesian learning models in agent-based models," *Proceedings of ESREL 2018*, Trondheim, Norway.

33. Reilly, A.C., S.D. Guikema, G. Tonn, C. Zhai\*, "Infrastructure, Communities, and the Evolution of Vulnerability and Resilience Under Repeated Hazards," *Proceedings of ICOSSAR 2017*, Vienna, Austria.

32. **Chen, T.Y.J\***, **Guikema, S.D.**, Beekman, J., 2017. "Drinking Water Distribution System Asset Management: Statistical Modelling of Pipe Breaks", Pipelines 2017: Reliability and Resiliency Through Sustainable Design and Construction, The American Society for Civil Engineers

31. **Reilly, A.\*** **S. Guikema**, J. Garzon Hervas, C. Ferreira. 2016. Quantification of evolving regional vulnerability to hurricanes. Risk, Reliability and Safety: Innovating Theory and Practice: Proceedings of ESREL 2016. Glasgow, Scotland, 25-29 September 2016.

30. Staid, A\*, **S.D. Guikema**, R. Nateghi, S.M. Quiring, and M. Gao. 2014. "Simulation Methods to Assess Long-Term Hurricane Impacts to U.S. Power Systems," in *Proceedings, Probabilistic Safety Assessment and Management 12*, Honolulu, Hawaii, June 2014.

29. Tonn, G.\* and **S.D. Guikema**. 2014. "A Longitudinal Analysis of the Drivers of Power Outages During Hurricanes: A Case Study with Hurricane Isaac," in *Proceedings, Probabilistic Safety Assessment and Management 12*, Honolulu, Hawaii, June 2014.

28. **Guikema, S.D.** , R. Nateghi, and S. Quiring. 2013. "Predicting Infrastructure Loss of Service from Natural Hazards with Statistical Models: Experiences and Advances with Hurricane Power Outage Prediction," in *Proceedings, ESREL 2013*, Amsterdam, October 2013.

27. **S.D. Guikema**, R. Nateghi, and T. Aven. 2013. "Multi-hazard risk assessment: Moving beyond single, probabilistic models" in *Proceedings, ICOSSAR 2013*, New York, June 2013.

26. **S.D. Guikema**, E. Zechman. 2013. "Rationality: Does it matter in attacker-defender games?" in *Proceedings, ICOSSAR 2013*, New York, June 2013.

25. Johansson, J., S. LaRocca<sup>1</sup>, H. Hassel, and **S.D. Guikema**. 2012. "Comparing Topological Performance Measures and Physical Flow Models for Vulnerability Analysis of Power Systems," in *Proceedings, Probabilistic Safety Assessment and Management 11/ESREL 12*, Helsinki, Finland, June 2012.

24. Francis, R., **S.D. Guikema**, L. Henneman<sup>1</sup>. 2012. "Bayesian Belief Networks for Predicting Drinking Water Distribution System Pipe Breaks," in *Proceedings, Probabilistic Safety Assessment and Management 11/ESREL 12*, Helsinki, Finland, June 2012.

23. Staid, A.<sup>1</sup> and **S.D. Guikema**. 2012. "A Risk Framework for Offshore Wind Farms in Hazard-Prone Areas," in *Proceedings, Probabilistic Safety Assessment and Management 11/ESREL 12*, Helsinki, Finland, June 2012.

22. **Guikema, S.D.**, I. Udoh, J. Irish, and R. Nateghi<sup>1</sup>. 2012. "The Effects of Hurricane Surge in Power System Outage Risk Models," in *Proceedings, Probabilistic Safety Assessment and Management 11/ESREL 12*, Helsinki, Finland, June 2012.

21. Nateghi, R.<sup>1</sup> and **S.D. Guikema**. 2011. "A Comparison of Top-Down Statistical Models With Bottom-Up Methods for Power System Reliability Estimation in High Wind Events," *ASCE International Conference on Vulnerability, Risk Assessment, and Management*, April 2011. College Park, MD.
20. LaRocca, S.<sup>1</sup> and **S.D. Guikema**. 2011. "A survey of network theoretic approaches for risk analysis of complex infrastructure systems," *ASCE International Conference on Vulnerability, Risk Assessment, and Management*, April 2011. College Park, MD.
19. LaRocca, S.<sup>1</sup>, J. Cole<sup>1</sup>, **S.D. Guikema**, and E. Sanderson. 2011. "Broadening the Discourse on Infrastructure Interdependence by Modeling the "Ecology" of Infrastructure Systems," *International Conference on the Applications of Statistics in Civil Engineering*, August 2011. Zurich, Switzerland.
18. Nateghi, R.<sup>1</sup>, **S.D. Guikema**, S.M. Quiring. 2010. "Estimating Power Outage Durations During Hurricanes," *Probabilistic Safety Assessment and Management 10*, June 2010. Seattle, WA.
17. Yu, O.-Y.<sup>1</sup>, **S.D. Guikema**, J.E. Bickel, J.-L. Briaud, and D.B. Burnett. 2009. "Systems Approach and Quantitative Decision Tools for Technology Selection in Environmentally Friendly Drilling." *Society of Petroleum Engineers E&P Environmental and Safety Conference*, March 2009, San Antonio, TX.
16. Nateghi, R.<sup>1</sup>, S. Quiring, and **S.D. Guikema**. 2008. "Establishing the Link Between Climate Change, Climate Variability, and Hurricane Hazard in the U.S.," *Proceedings of the American Statistical Association*, [presented at the Joint Statistical Meeting, Denver, CO, August 2008].
15. Booker, G., A. Sprintson, C. Singh, and **S. Guikema**. 2008. "Efficient Availability Evaluation for Transport Backbone Networks," *Proceedings, 12<sup>th</sup> Conference on Optical Network Design and Modelling*, March 12-14, 2008. Catalonia, Spain.
14. Torres, J.<sup>1,2</sup>, K. Brumbelow, and **S.D. Guikema**. 2008. Risk Classification and Uncertainty Propagation for Water Distribution System Contamination Events. *2008 World Environmental & Water Resources Congress*. May 12-17, 2008. Honolulu, Hawaii.
13. **Guikema, S.D.** 2008. "Risk Analysis for Critical Infrastructure Systems: An Approach Based on Statistical Learning Theory", *Probabilistic Safety Assessment and Management 8*, May 2008, Hong Kong.
12. Brumbelow, K., J. Torres, **S.D. Guikema**, E. Bristow, and L. Kanta. 2007. "Virtual Cities for Water Distribution and Infrastructure System Research," *World Environmental and Water Resources Congress*, Tampa, FL, May 2007.
11. **Guikema, S.D.** and P. Gardoni. 2006. "Reliability Estimation for Reinforced Concrete Bridges Connected in a Network," *Probabilistic Safety Assessment and Management (PSAM) 8*, New Orleans, May 2006.
10. **Guikema, S.D.** and R.A. Davidson. 2006. "Modeling Critical Infrastructure Reliability with Generalized Linear Mixed Models," *Probabilistic Safety Assessment and Management (PSAM) 8*, New Orleans, May 2006.
9. **Guikema, S.D.** 2006. "A Brief Comparison of Life Loss Risk Due to Floods, Hurricanes, Earthquakes, and Terrorist Attacks," *Probabilistic Safety Assessment and Management (PSAM) 8*, New Orleans, May 2006.
8. **Guikema, S.D.**, N. Xu, R. Davidson, L.K. Nozick, and Z. Çağnan. 2006. "Optimization of Crews in Post-Earthquake Electric Power Restoration," *8th National Conference on Earthquake Engineering*, San Francisco, April 2006.
7. **Guikema, S.D.**, R.A. Davidson, and Z. Çağnan. 2004. "Efficient Simulation-Based Discrete Optimization," *Winter Simulation 2004*, Washington, D.C., December 5-8, 2004.
6. Paté-Cornell, M.E. and **S.D. Guikema**. 2004. "An Analysis of the Probability of Failure of New Space Launch Vehicles," *Probabilistic Safety Assessment and Management (PSAM) 7*, Berlin, Germany, June 14-18, 2004.

5. **Guikema, S.D.** and M.E. Paté-Cornell. 2003. "Bayesian Analysis of Launch Vehicle Reliability," *41st Aerospace Sciences Meeting*, Reno, Nevada, January 6-9, 2003.
4. **Guikema, S.D.** and M.E. Paté-Cornell. 2002. "Optimization of Component Reinforcement Decisions with Discrete Risk/Cost Functions," *Probabilistic Safety Assessment and Management (PSAM) 6*, San Juan, Puerto Rico, June 23-28, 2002.
3. **Guikema, S.D.** and M. E. Paté-Cornell. 2001. "The Danger of Myopic Conservatism in Risk Analysis: The Problem of Time Allocation for the Deep Space Network," *Proceedings, AIAA Space 2001 Conference*, Albuquerque, New Mexico, August 28-30, 2001. **Technical Paper Winner, Economics Track, AIAA Space '01 Conference.**
2. **Guikema, S.D.** and M. Bollinger. 2000. "The Role of Risk in DOE Environmental Cleanup Decision-Making: The Regulatory Requirements." *Proceedings, Waste Management 2000*, Tucson, Arizona, February 27-March 2, 2000.
1. **Guikema, S.D.** 1998. "Sensitivity Analysis for the Objective Function Parameters in Knapsack Optimization Problems," *Proceedings of the 5th Annual New Zealand Engineering and Technology Postgraduate Conference*, Ed. B. Teekman, P. Milliken, and N. Body. Massey University, New Zealand, pp. 275-280. **Awarded Best Paper in the "Quality and Manufacturing Technology" category.**

### **BOOK CHAPTERS**

3. Nateghi, R. <sup>1</sup>, S.M. Quiring and **S.D. Guikema**. 2010. "Estimating the Impact of Climate Variability on Cumulative Hurricane Destructive Potential Through Data Mining," in *Hurricanes and Climate Change*, Edited by J.B. Elsner, R.E. Hodges, J.C. Malmstadt, and K.N. Scheitlin. Springer, New York. (Peer-reviewed conference proceedings paper published as a book chapter)
2. **Guikema, S.D.** 2009. "Game Theory for Modeling Intelligent Threats in Reliability Analysis: An Overview of the State of the Art," *Game Theoretic Analysis of Security Threats*, Edited by V. Bier and M.N. Azaiez. Springer, New York.
1. **Guikema, S.D.** and J.P. Coffelt<sup>1</sup>. 2008. "Modeling Count Data in Risk Analysis and Reliability Engineering," in *Handbook on Performability Engineering*, Edited by Krishna B. Misra, Springer, New York.

### **STUDENT ADVISING**

#### Primary Advisor: Current

- Kaia Olsen, Ph.D. student (University of Stavanger, Norway – co-advised with Roger Flage)
- Anna White, Ph.D. student (UM)
- Valerie Washington, Ph.D student (UM – co-advised by Joi Mondisa)
- Thomas Logan, Ph.D. student (UM)
- Elnaz Kabir, Ph.D. student (UM)
- Thomas Chen, Ph.D. student (UM)
- Chengwei Zhai, Ph.D. student (UM)
- Timothy Willaims, Ph.D. student (UM)
- Caroline Johnson, Ph.D. student (University of Stavanger, Norway – co-advised with Roger Flage)
- Sara Shashaani, Postdoctoral Researcher (UM)
- Kristen Schell, Postdoctoral Researcher (UM)

#### Primary Advisor: Graduated

- Julie Shortridge, Ph.D. student, Johns Hopkins University. Current position: Assistant Professor, Virginia Tech University (Biosystems Engineering)
- Gina Tonn, Ph.D. student, Johns Hopkins University. Current position: Postdoctoral Research, University of Pennsylvania
- Allison Reilly, Postdoctoral Researcher, Johns Hopkins University and University of Michigan. Current position: Assistant Professor, University of Maryland (Civil & Environmental Engineering)

- Andrea Staid, Ph.D. student, Johns Hopkins University, Department of Geography and Environmental Engineering. Current position: Research Scientist, Sandia National Laboratory
- Laiyin Zhu, Postdoctoral Researcher, Johns Hopkins University, Department of Geography and Environmental Engineering. Current position: Assistant Professor, Western Michigan University
- Sarah LaRocca, Ph.D. student, Johns Hopkins University, Department of Geography and Environmental Engineering. Current position: Facebook.
- Royce Francis, Postdoctoral Researcher, Johns Hopkins University, Department of Geography and Environmental Engineering. Current position: Associate Professor, George Washington University.
- Roshanak Nateghi, Ph.D. student, Johns Hopkins University, Department of Geography and Environmental Engineering, 2008-2012. And NSF SEES Postdoctoral Fellow with JHU and Resources for the Future. Current position: Assistant Professor, Purdue University
- Yue (Grace) Wu, M.S. 2013, Johns Hopkins University. Current position: Laboratory Assistant, Johns Hopkins University  
Thesis: *Short Term Load Forecasting*
- Sheng Wang, M.S.E. 2010, Johns Hopkins University. Current position: Consulting Engineer, Anchor QEA, New Jersey.  
Thesis: *Comparison of Matrix-Based and Simulation-Based Fragility Methods for Reliability Analysis of Large-Scale Power Infrastructure Systems During Disasters*
- Peng Wu, M.S.E. 2009, Johns Hopkins University. Current position: Unknown.  
Thesis: *Uncertainty Modeling for Monthly Electricity Consumption in Baltimore Metropolitan Area*
- Seung-Ryong Han, Ph.D. 2008, Texas A&M University. Current position: Assistant Professor, Korea University. Graduated August 2008.  
Thesis: *Estimating Hurricane Outage and Damage Risk in Power Distribution Systems.*
- Roshan Pawar, M.S. 2007, Texas A&M University. Current position: Jacobs Consulting. Graduated August 2007.  
Thesis: *Predicting Bid Prices in Construction Projects Using Semi-Parametric Statistical Models.*
- Neethi Rajagopalan, M.S. 2007. Texas A&M University. Current position: Ph.D. student, University of Pittsburgh. Graduated August 2008.  
Thesis: *Environmental Life-Cycle Assessment of Highway Projects.*
- Shridhar Yamijala, M.S., 2007, Texas A&M University. Current position: Jacobs Consulting. Graduated August 2007.  
Thesis: *Statistical Estimation of Water Distribution System Pipe Break Risk.*
- William Imbeah, M.S. 2007. Texas A&M University. Current position: ECC, Inc. Graduated May 2007.  
Thesis: *Assessment of the Effectiveness of the Advanced Programmatic Risk Analysis and Management Model (APRAM) as a Decision Support Tool for Construction Projects.*
- ~10 M.S.E.M. students, Johns Hopkins University (2008-2012)
- ~20 M.S./M.S.E. students, Johns Hopkins University (2008-2012)
- ~20 undergraduate students, Johns Hopkins University (2008-2012)
- ~10 M.E. students, 2005-2007, Texas A&M University
- ~40 undergraduate students, 2005-2007, Texas A&M University

Co-Advisor: Graduated

- Christine Berner, Ph.D. Student, Department of Industrial Economics, Risk Management, and Planning, University of Stavanger, Norway. Graduated February 2017. Current Position: Research Scientist, DNV-GL (Stavanger, Norway).
- Ok-Youn Yu, Ph.D. student, Zachry Department of Civil Engineering, Texas A&M University. Co-advised with Jean-Louis Briaud. Graduated August 2009. Current position: Assistant Professor, Appalachian State University.  
Thesis: *Environmentally Friendly Drilling in the Oil and Gas Industry: A Systems Approach.*
- Huidae Cho, Ph.D. 2008, Texas A&M University. Graduated August 2008. Current position: Engineering Consulting. Co-advised with: Francisco Olivera.

Thesis: *On the Predictive Uncertainty of a Distributed Hydrologic Model.*

- Jacob Torres, M.S. 2008. Texas A&M University. Graduated May 2008. Current position: Engineering, Jacobs Engineering. Co-advised with Kelly Brumbelow.  
Thesis: *Analyzing Risk and Uncertainty for Improving Water Distribution System Security From Malevolent Water Supply Contamination Events.*

GBO and DQE Committees, Johns Hopkins University

- Gina Tonn, DoGEE, 2014 (DQE)
- Andrea Staid, DoGEE, 2014 (DQE and GBO)
- Francisco Munoz, DoGEE, 2013 (PhD defense committee)
- Julie Shortridge, DoGEE, 2013 (DQE and GBO)
- Yueling Loh, Applied Mathematics and Statistics, 2013 (GBO)
- Zhao, Yizhen, Economics 2013 (Dissertation Defense/GBO)
- Rivero, Sarah, Earth & Planetary Science 2013 (GBO)
- Smith, Tiffany, Earth & Planetary Science 2013 (GBO)
- Zhang, Qian, DoGEE 2013 (DQE)
- Prava, Venkat, DoGEE 2013 (DQE)
- LaRocca, Sarah, DoGEE 2012-2013 (DQE & GBO)
- Francisco Munoz, DoGEE 2012 (DQE and GBO)
- Aman Luthra, DoGEE 2012 (DQE)
- Falconi, Stefanie, DoGEE 2011-2012 (DQE & GBO)
- Nateghi, Roshanak, DoGEE 2011-2012 (DQE & GBO)
- Sitan Yang, Applied Math & Statistics 2011 (GBO)
- Urqhart, Erin, Earth & Planetary Sciences 2011 (GBO)
- MacDonald, Laura, DoGEE 2011 (DQE)
- LoPrete, Chiara, DoGEE 2011 (DQE)
- Krause, Andreas, DoGEE, 2010 (DQE)
- Fan, Lin, DoGEE, 2009 (DQE)
- Murphy, Rebecca, DoGEE, 2009 (DQE)
- Hargreaves, Jeremy, DoGEE, 2009 (DQE)
- Bindjeme, Patrick, AM&S, 2009 (GBO)

International Ph.D. Defense Committees

- Opponent, Ph.D. Defense for Henrik Hassel, Lund University, Sweden, 2010.

**FUNDED RESEARCH**

**INFEWS/T1: Understanding multi-scale resilience options for climate-vulnerable Africa** 2017-present

Sponsor: National Science Foundation (INFEWS)

Investigators: Ben Zaitchik (PI), **Seth Guikema (Co-PI)**, Sauleh Siddiqui (Co-PI)

Funding: \$2,799,021

**Workshop/Collaborative Research: Interdisciplinary Methods for Disaster Research** 2016-present

Sponsor: The National Science Foundation, Infrastructure Management and Extreme Events

Investigators: **Seth Guikema (PI)**, Lori Peek (PI)

Funding: \$48,763

**CRISP Type 2/Collaborative Research: Coordinated, Behaviorally-Aware Recovery for Transportation and Power Disruptions (CBAR-tpd)** 2017-present

Sponsor: The National Science Foundation, CRISP

Investigators: Pamela Murray-Tuite (PI), **Seth Guikema (Co-PI)**, Edward Fox (Co-PI), Kris Wernstedt (Co-PI)

Funding: \$1,126,836

**Improved Resolution Prediction of Tropical Cyclone Power Outages** 2016-present  
 Subcontract on a larger national laboratory grant under the GMLC2017 RFP (Scott Backus is PI on larger grant)  
Sponsor: US Department of Energy  
Investigators: **Seth Guikema (PI)**  
Funding: \$89,997

**Understanding human adaptation to climate change in forest ecosystems** 2016-present  
Sponsor: University of Michigan M-Cubed Program  
Investigators: Paige Fischer, **Seth Guikema**, Gretchebn Keppel-Aleks  
Funding: \$60,000

**Mobile Tree Failure Prediction for Storm Preparation and Response** 2015-present  
Sponsor: US Forest Service  
Investigators: Andrew Koesler (PI), **Seth Guikema (Co-PI/UM PI)**, Brian Kane (Co-PI), Shawn Landry (Co-PI)  
Funding: \$251,219.98 (Guikema portion)

**Hurricane Outage Prediction Model (HOPM) Phase V** 2015-present  
Sponsor: Southern Companies  
Investigators: **Seth Guikema (PI)**, Steven Quiring (PI – Texas A&M portion)  
Funding: \$35,141 (UM portion)

**Increasing Grid Resilience Through Data-Driven Modeling for Storm Outage Prediction and Long-Term Planning** 2015-2017  
Sponsor: US Department of Energy  
Investigators: **Seth Guikema (PI)**, Steven Quiring (PI on the Texas A&M portion of the project)  
Funding: \$64,752 (portion moved to the University of Michigan from JHU)

**Hazard SEES Type II: Modeling to Promote Regional Resilience to Repeated Heat Waves and Hurricanes** 2013-present  
**Interdependent Infrastructure Systems**  
Sponsor: The National Science Foundation, Civil Infrastructure Systems  
Investigators: **Seth Guikema (PI)**, Tony Dalrymple, Ben Zaitchik, Robin Dillon-Merrill, and Margaret Walls (Co-PIs)  
Funding: \$3,000,000

**CAREER: Integrated Modeling of Sustainability and Reliability for Interdependent Infrastructure Systems** 2012-2017  
Sponsor: The National Science Foundation, Civil Infrastructure Systems and Infrastructure Management and Extreme Events (Co-funded)  
Investigators: **Seth Guikema (PI)**  
Funding: \$400,000

**PIRE: USA/Europe Partnership for Integrated Research and Education in Wind Energy Intermittency: From Wind Farm Turbulence to Economic Management** 2012-2017  
Sponsor: The National Science Foundation, PIRE  
Investigators: Charles Meneveau (PI), **Seth Guikema (Co-PI)**, Rajat Mittal (Co-PI), Dennice Gayme (Co-PI), Ben Hobbs (Co-PI)  
Funding: \$4,302,110

**Drinking Water Distribution System Management Incorporating Health and Asset Risk** 2010-2015  
Sponsor: The National Science Foundation, Civil Infrastructure Systems  
Investigators: **Seth Guikema (PI)**  
Funding: \$348,152



<p><b>Multi-Scale Modeling of Interdependent Critical Infrastructure System Performance During Hurricanes</b>  <u>Sponsor:</u> The National Science Foundation, Infrastructure Management and Extreme Events  <u>Investigators:</u> <b>Seth Guikema (PI)</b>  <u>Funding:</u> \$306,615</p>	2010-2013
<p><b>International Collaboration Supplement: Multi-Scale Modeling of Interdependent Critical Infrastructure System Performance During Hurricanes</b>  <u>Sponsor:</u> The National Science Foundation, Infrastructure Management and Extreme Events  <u>Investigators:</u> <b>Seth Guikema (PI)</b>  <u>Funding:</u> \$50,000 supplement to “Multi-Scale Modeling of Interdependent Critical Infrastructure System Performance During Hurricanes”</p>	2011-2013
<p><b>Hurricane Risk Modeling Project: Phase IV</b>  <u>Sponsor:</u> A large investor-owned utility in the Gulf Coast region.  <u>Investigators:</u> <b>Seth Guikema (PI)</b>, Steven Quiring (Co-PI), David Rosowsky (Co-PI)  <u>Funding:</u> \$31,411</p>	2012-2013
<p><b>Hurricane Risk Modeling Project: Phase III</b>  <u>Sponsor:</u> A large investor-owned utility in the Gulf Coast region.  <u>Investigators:</u> <b>Seth Guikema (PI)</b>, Steven Quiring (Co-PI), David Rosowsky (Co-PI)  <u>Funding:</u> \$28,817</p>	2010-2011
<p><b>Sewer System Epidemiology and Target Tracking – Proof of Concept</b>  <u>Sponsor:</u> Johns Hopkins University Whiting School of Engineering and Applied Physics Laboratory  <u>Investigators:</u> <b>Seth Guikema (PI)</b>, Charles Young and Lynn Roberts (Co-PIs)  <u>Funding:</u> \$100,000</p>	2011-2011
<p><b>Modeling Building Downtime Due to Hurricane Impacts</b>  <u>Sponsor:</u> The National Science Foundation, Infrastructure Management and Extreme Events  <u>Investigators:</u> Judith Mitrani-Reiser (PI), <b>Seth Guikema (Co-PI)</b>, Nicolas Jones (Co-PI)  <u>Funding:</u> \$341,006</p>	2008-2011
<p><b>Climate-Induced Changes in Hurricane Winds, Surge, and Risk to Electric Power Systems</b>  <u>Sponsor:</u> The U.S. Department of Energy, Office of Biological and Environmental Research  <u>Investigators:</u> <b>Seth Guikema (JHU PI)</b>, Jennifer Irish (Texas A&amp;M PI), Steven Quiring (Co-PI)  <u>Funding:</u> \$450,000 (JHU portion \$150,000)</p>	2008-2011
<p><b>Modeling of Catastrophic Failures in Power and Communication Systems: Supporting Design, Preparation and Recovery</b>  <u>Sponsor:</u> The National Science Foundation, Power Controls and Adaptive Networks Program  <u>Investigators:</u> Chanan Singh (PI), <b>Seth Guikema (Co-PI)</b>, Alex Sprintson (Co-PI)  <u>Funding:</u> \$349,382</p>	2007-2011
<p><b>Hurricane Risk Modeling Project: Phase II</b>  <u>Sponsor:</u> A large investor-owned utility in the Gulf Coast region.  <u>Investigators:</u> <b>Seth Guikema (PI)</b>, Steven Quiring (Co-PI), David Rosowsky (Co-PI)  <u>Funding:</u> \$67,587</p>	2008-2009
<p><b>Environmentally Friendly Drilling: Systems Analysis Approach</b>  <u>Sponsor:</u> U.S. Department of Energy joint with a consortium of leading energy companies.  <u>Investigators:</u> David Burnett (overall PI), Jean-Louis Briaud (systems analysis Co-PI), Eric Bickel (Sr. Researcher), <b>Seth Guikema (Sr. Researcher)</b>  <u>Funding:</u> \$10,000 (Guikema portion only)</p>	2007-2008

**Hurricane Risk Modeling Project: Phase I**

2006-2007

Sponsor: A large investor-owned utility in the Gulf Coast region.

Investigators: **Seth Guikema (PI)**, David Rosowsky (Co-PI), Rachel Davidson (Co-PI)

Funding: \$62,056

**An Assessment of the Usefulness of Decision Analysis for Transportation Asset Management 2006-2007**

Sponsor: Texas Department of Transportation

Investigators: Paul Krugler (PI), Carols Chang (Co-PI), and **Seth Guikema (Sr. Researcher)**

Funding: \$8,000 (Guikema portion only)

**TEACHING**

University of Michigan

**IOE 802: Second Year Doctoral Seminar (Fall semesters 2017-present)**

This course provides in-depth instruction in proposal writing and presentation skills for second year PhD students in the IOE program and prepares them for their preliminary examination.

*Approximately 10 registered students [2 credit hours]*

**IOE 800: First Year Doctoral Seminar (Fall semesters 2017-present)**

This course introduces first year PhD students in IOE to the IOE PhD program and to research in IOE. It also provides instruction in literature review and library skills and in giving presentations.

*Approximately 15 registered students [1 credit hour]*

**IOE 591: Risk Analysis (Winter semesters 2017-present)**

This course is a graduate-level introduction to the theory and methods of risk analysis. It covers the foundations of risk analysis, probabilistic risk analysis, risk perception and communication, Bayesian probability, probability elicitation, integration of data and expert judgement, terrorism risk analysis, environmental health risk analysis, and infrastructure risk analysis.

*Approximately 35 registered students*

**IOE 691: Predictive Data Analytics (Fall semesters 2016-present)**

This course presents different paradigms for data-driven uncertainty modeling including Bayesian and Frequentist approaches. It then covers the main approaches within these paradigms, including parametric, semi-parametric, and non-parametric regression as well as data mining techniques. The focus is on how these methods are used draw inferences from data and build accurate predictive models based on data. Modeling is done using several different software packages.

*Approximately 20 registered.*

**IOE 460: Decision Analysis (Fall 2015, Fall 2016)**

This course gives a first introduction to decision analysis at an advanced undergraduate and introductory graduate level. The course covers decision trees, event trees, utility theory, multi-attribute utility theory, value of information, and Bayesian Belief Networks. The course uses both lectures and case studies to emphasize both the practice and theory of the methods.

*Approximately 75 registered students.*

Johns Hopkins University

**570.608: Data Analytics for Policy and Management Decision-Making (Spring 2009-2011, Fall 2012, 2014)**

This course presents different paradigms for data-driven uncertainty modeling including Bayesian and Frequentist approaches. It then covers the main approaches within these paradigms, including parametric, semi-parametric, and non-parametric regression as well as data mining techniques. The focus is on how these methods are used draw inferences from data and build accurate predictive models based on data. Modeling is done using several different software packages.

*Approximately 25-30 registered students each semester.*

**570.612: Infrastructure Modeling, Analysis, and Simulation** (Spring semester 2010, 2012; Fall 2013)  
The course covers the basics of flow modeling for potable water systems, wastewater systems, and electric power systems. It then focuses on reading, assessing, and analyzing the research literature from the infrastructure engineering area. The course is highly interactive in a discussion seminar style.  
*Approximately 20 students enrolled.*

**570.623: Foundational Literature or Risk and Decision Analysis** (Spring 2013)  
This course is a literature review and discussion course focusing the foundational literature in the areas of Bayesian probability, risk analysis, and decision analysis.  
*13 students enrolled*

**570.633: Stochastic Simulation and Game Theory** (Spring semester 2011, 2013)  
This course covers both stochastic simulation and game theory, focusing on the basics and theory of the methods as well as the applications of these models in engineering.  
*11 students enrolled 2011, 24 enrolled 2013.*

**570.497: Risk and Decision Analysis** (Once per year, 2009-present)  
An introduction to risk and decision analysis, covering basic probability, utility theory, decision trees, value of information, fault trees, event trees, environmental health risk analysis, bootstrapping, Bayesian probability modeling, risk governance frameworks, risk perception and communication, expert assessment of probabilities, and risk, trust, and democracy.  
*Approximately 25-45 registered students each semester. Taught Fall 2008-2014)*

**575.416: Introduction to Risk and Decision Analysis** (Once per year 2009-present)  
A version of 570.497 taught concurrently with 570.497 in the Engineering Professionals program. Taught as an on-line course as of Fall 2013.

Texas A&M University

**CVEN 420: Civil Engineering Systems I** (Fall 2007)  
Revised CVEN 489 from the previous fall semester. This course covers engineering risk and decision analysis at the undergraduate level.  
*32 registered students.*

**CVEN 689: Uncertainty Modeling for Engineering Management and Policy** (Spring 2007)  
Organized and taught a new PhD course focusing on uncertainty modeling. The course covered the meanings of probability, the history of probability modeling, Bayesian probability methods (analytic and computational), generalized linear models, generalized additive models, multivariate adaptive regression splines, and artificial intelligence methods.  
*9 registered students*

**CVEN 349: Civil Engineering Project Management** (Fall 2005, Spring 2007)  
Organized and taught CVEN 349, a Junior and Senior level course required for many Civil Engineering majors at Texas A&M. The focus of course revisions from my previous time teaching this course (Fall 2005) were to make this large lecture course more interactive.  
*105-120 registered students.*

**CVEN 489/689: Risk and Decision Analysis for Civil Engineers** (Fall 2006, Spring 2006)  
Significantly revised CVEN 489 from the previous spring semester. Reorganized the course as a combined undergraduate/graduate course. Revised the course content to include more material on risk perception and risk communication in large engineering projects.  
*15-30 registered students*

**INVITED TALKS (EXCLUDES CONFERENCE TALKS EXCEPT PLENARY TALKS)**

<b><u>Plenary Talk: Risk-Based Decision Support for Arctic Activities</u></b> ArcEx Conference, Tromso, Norway	October 2019
<b><u>Clark Distinguished Lecturer: Risk, Resilience, and Sustainability - The Need for Interdisciplinary Scholarship</u></b> University of Maryland	October 2019
<b><u>Plenary Talk: Exploring the risk, safety, security and resilience nexus</u></b> Society for Risk Analysis Nordic Conference, Stavanger, Norway	November 2018
<b><u>Drinking Water: From Source to Pipe to Sink to Toilet — and Back Again</u></b> Departmental Seminar, University of Michigan School of Public Health	October 2018
<b><u>Repeated Hazards and Behavioral Adaptation: Moving Beyond Static Risk Models</u></b> Purdue University Departmental Seminar, Industrial Engineering Department	October 2018
<b><u>Invited “Plenary Session” Talk: Storm Outage Forecasting: Zero-Inflation and Uncertainty</u></b> ASA/ASQ Fall Technical Conference, Orlando, Florida	October 2018
<b><u>Plenary Talk: Risk Management vs. Risk Assessment</u></b> Urban Forestry Institute, University of Florida Gulf Coast Research Center	February 2018
<b><u>Plenary Talk and Panel: Risk Analysis, An Obsolete Profession?</u></b> International Society for Risk Analysis Annual Meeting Plenary Panel	December 2017
<b><u>Power Outage Modeling: History and Perspective</u></b> Ohio State University – University of Michigan Joint Workshop on Power Outage Forecasting	August 2017
<b><u>Natural Disaster Risk Analysis in the Big Data Era</u></b> Departmental Seminar, Zurich University of Applied Sciences	May 2017
<b><u>Natural Disaster Risk Analysis in the Big Data Era</u></b> Departmental Seminar, ETH Zurich	May 2017
<b><u>Plenary Talk: Modeling the Impact of Tropical Storms on Electrical Power Systems: Lessons Learned From A Decade of Research in the U.S.</u></b> Guangdong Power Research Symposium, Guangzhou, China	Nov 2016
<b><u>Plenary Talk: Sustainability, Resilience, and Reliability in Urban Infrastructure Systems of Systems</u></b> Systems of Systems Perspectives on Critical Infrastructure Management in Response to Climate Change And Sea Level Rise, Workshop at the University of Virginia	March 2016
<b><u>Leveraging Disparate Data Sources to Study the Influences of Climate Variability and Change on Natural and Engineered Systems</u></b> Departmental Seminar, Climate and Space Science and Engineering, University of Michigan	February 2016
<b><u>Analytics for Urban Resilience, Disasters, and the Evolution of Regions Over Time</u></b> Taubman College of Architecture and Urban Planning, University of Michigan	January 2016
<b><u>Natural Hazards Modeling: From Storm Impacts to the Evolution of Regional Vulnerability Over Time</u></b> Departmental Seminar, George Washington University Department of Decision Sciences, Washington.	October 2015
<b><u>Hurricanes, infrastructure, and communities: fostering resilience &amp; sustainability through</u></b>	June 2015

**Data-driven predictive models**

Maryland Emergency Management Agency, Baltimore.

**Increasing Grid Resilience Through Data-Driven Modeling for Storm Outage Prediction and Long-Term Planning**

Department of Energy State Risk Assessment Workshop, Denver, CO

**Hurricanes, infrastructure, and communities: fostering resilience & sustainability through Data-driven predictive models**

Rand Corporation, Pittsburgh

April 2015

**Hurricanes, Climate Change, and Power System Impacts**

2nd International workshop on the application of fluid mechanics to disaster reduction: Cyclone (hurricane/typhoon/extra-tropical) modeling and damage assessment, Sendai, Japan

March 2015

**Hurricanes, Infrastructure, and Communities: Fostering Resilience & Sustainability Through Data-Driven Predictive Risk Models**

School of Community and Regional Planning, University of British Columbia

December 2014

**Hurricanes, Infrastructure, and Communities: Fostering Resilience & Sustainability Through Data-Driven Predictive Risk Models**

Department of Industrial and Operations Engineering, University of Michigan

December 2014

**Hurricanes, Infrastructure, and Communities: Fostering Resilience & Sustainability Through Data-Driven Predictive Risk Models**

Department of Civil & Environmental Engineering, Virginia Tech.

December 2014

**Predicting Electricity Outages**

U.S. Department of Energy State Energy Risk Assessment Workshop, Denver

May 2015

**Hurricanes, Infrastructure, and Communities: Fostering Resilience & Sustainability Through Data-Driven Predictive Risk Models**

Rand, Pittsburgh

April 2015

**Plenary Talk: Hurricanes, Power Systems, and System Hardening**

Southern Distribution Conference (conference for practicing power engineers)

Sept. 2014

**Overview of Johns Hopkins University Pipe Break and Leak Modeling**

Stavanger Municipality Infrastructure Office, Stavanger, Norway

April 2014

**Overview of the Guikema Research Group & Hurricanes, Power Systems, and Sustainability in a Changing Climate**

Det Norsk Veritas (DNV-GL), Oslo, Norway

April 2014

**Hurricanes, Power Systems, and Sustainability in a Changing Climate**

IBM Dublin Research Center, Dublin, Ireland

April 2014

**Hurricanes, Power Systems, and Sustainability in a Changing Climate**

Invited inaugural lecture for the Lund University Center for Societal Resilience, Lund, Sweden

March 2014

**Why We Cannot Discard Historical Data and Expertise, And Why It is Not Enough**

Petromaks Workshop, Stavanger, Norway

February 2014

**Hurricanes, Power Systems, and System Hardening**

Seminar, Energy Institute, Rutgers University

November 2013

<b>Hurricanes, Power Systems, and System Hardening</b> Departmental Seminar, Carnegie Mellon University Department of Civil & Environmental Engineering	October 2013
<b>Validation, Prediction, and Intelligent Adversary Models</b> First Annual Conference on Validation of Intelligent Adversary Models, Niagara Falls	June 2013
<b><u>Plenary Talk: Predicting the Spatial Pattern and Extent of Power Outages from Hurricanes Prior to Landfall</u></b> Maryland Emergency Management Association Annual Meeting	June 2013
<b>Hurricane Power Outage Modeling</b> Departmental Seminar, University of Connecticut Civil and Environmental Engineering Department	May 2013
<b>Hurricane Power Outage Forecasting</b> Departmental Seminar, Rensselaer Polytechnic Institute (RPI) Department of Civil Engineering	April 2013
<b>Infrastructure Risk Analysis</b> Public lecture as part of the Dean's Dream Course Series, Oklahoma State University	April 2013
<b>Data-Driven Modeling for Infrastructure Risk Analysis</b> Technical lecture as part of the Dean's Dream Course Series, Oklahoma State University	April 2013
<b><u>Plenary Talk: Hurricanes, Power Systems, and Data Analytics – a Role for Operations Researcher</u></b> Institute for Operations Research and Management Science, Maryland Chapter	March 2013
<b>Terrorist Risk Analysis: Game Theory &amp; Risk Analysis</b> USC National Center for Risk and Economic Analysis of Terrorism Events	March 2013
<b>The Rationality Assumption in Attacker-Defender Games – Does it Matter?</b> USC Game Theory and Human Behavior Group	March 2013
<b>Hurricanes, Power Systems, and Climate Change</b> New York Area Energy Economists	January 2013
<b>Hurricanes, Power Systems, and Climate Change</b> Rice University Civil Engineering Departmental Seminar	November 2012
<b>Intergenerational Risk Management Issues</b> Foundations of Risk Analysis Workshop, Salo, Italy	August 2012
<b>Infrastructure Modeling for Environmental and Disaster Assessment and Management</b> Nanjing University School of the Environment	June 2012
<b>Bad Things Happen to Good Power Systems: Models and Experiences in Forecasting Hurricane Power Outages</b> M. Gordon Wolman Seminar, Johns Hopkins University	October 2011
<b>Hurricanes, Climate Change, and Power Systems Risk</b> Department of Earth and Planetary Science Departmental Seminar, Johns Hopkins University	October 2011
<b><u>Plenary Talk: Hurricanes, Power Systems, and Climate Change</u></b> U.S. Department of Energy Biological and Environmental Systems Meeting	Sept. 2011
<b>Complex Systems Modeling and Applications</b> GIAI Conference, Johns Hopkins University	April 2011

<b>Methods for Natural Hazard Infrastructure Risk Assessment</b> Invited Talk, Risk Analytics and Statistics Groups at IBM Watson Research Center	November 2010
<b>Resource Allocation for Homeland Defense</b> Invited Talk, Discrete Mathematics and Theoretical Computer Science Workshop on Game Theory For Homeland Security.	Sept. 2010
<b>Predicting Power Outages Due to Hurricanes</b> Department of Homeland Security National Communications System Senior Leadership Briefing	December 2009
<b>Predicting Power Outages Due to Hurricanes</b> Johns Hopkins University Alumni Association presentation in New York City	December 2009
<b>Risk Analysis for Interdependent Infrastructure Systems</b> Department of Fire Science and System Safety, Lund University, Sweden	August 2009
<b>Thoughts on the ALARP Principle</b> Department of Industrial Economics, Risk Management, and Planning, University of Stavanger (Norway)	August 2009
<b>Using Statistics to Understand Complex Environment, Infrastructure, Human Interactions During Disasters</b> Biostatistics seminar series, Johns Hopkins University School of Public Health	April 2009
<b><u>Plenary Talk: Risk, Trees, and Electric Power Systems</u></b> International Society of Arborists, Tree Risk Assessment Conference, Charlotte, NC.	February 2009
<b><u>Plenary Talk: Modeling Intelligent Threats</u></b> Workshop on Vulnerability Assessment of Critical Infrastructure with Case Studies on Power Transmission Networks and Dams, University of Wisconsin, Madison.	January 2009
<b>Statistical Assessment of the Influence of Climate Change and Climate Variability on Hurricane Hazards</b> Johns Hopkins University, Department of Applied Mathematics and Statistics Departmental Seminar	November 2008
<b>Modeling Infrastructure Network Risk Using Statistical Models</b> Department of Electrical and Computer Engineering, Texas A&M University	May 2007
<b>Probabilistic Risk and Decision Modeling for Complex Energy Systems</b> Thayer School of Engineering, Dartmouth College	May 2007
<b>Modeling Count Data for Environmental Decision-Making</b> Department of Engineering and Public Policy, Carnegie Mellon University	April 2007
<b>Modeling Count Data for Infrastructure Management</b> Department of Civil and Environmental Engineering, The University of Maryland	February 2007
<b>Modeling Count Data for Environmental Decision-Making</b> Department of Geography and Environmental Engineering, Johns Hopkins University	February 2007
<b>Risk Analysis in the DHS Era: Game Theory, Bayesian Probability, and Setting Protection Priorities</b> Department of Agricultural Economics, Texas A&M University	September 2006
<b>Zachry Department of Civil Engineering, Texas A&amp;M University</b> Probabilistic Methods for Assessing and Managing Infrastructure Reliability	February 2005

<b>Probability Modeling of Count Data for Reliability Analysis</b> Department of Mathematics, U.S. Naval Academy	January 2005
<b>Risk Analysis for Complex Infrastructure Systems: Bayesian Methods and Terrorist Threat Modeling</b> Department of Civil Engineering, University of California, Berkeley	February 2004
<b>Optimal Resource Allocation in a Design Team with Asymmetric Information</b> Department of Engineering Management and Systems Engineering, George Washington University	April 2003
<b>Optimal Resource Allocation in a Design Team with Asymmetric Information</b> Ivey School of Business, University of Western Ontario	April 2003
<b>Decision and Risk Analysis for Resource Allocation</b> Saïd Business School, Oxford University	December 2002
<b>Preventing Disaster by Design: Resource Allocation in the Design Phase</b> Department of Aerospace Engineering and the Engineering Systems Division, Massachusetts Institute of Technology	April 2002

***INVITED WORKSHOP PARTICIPATION***

<b>U.S. Department of Energy Workshop (35 invited participants)</b> “Mathematical Research Challenges in the Optimization of Complex Systems”	December 2006
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***CONFERENCE ORGANIZATION SERVICE [EXCLUDES SESSION CHAIR]***

<b>Technical Program Committee Member, ESREL 2019</b> , Germany	2018-2019
<b>Technical Program Committee Member, ESREL 2016</b> , Scotland	2015-2016
<b>Technical Program Committee Member</b> and head of the infrastructure track, <i>Probabilistic Safety Assessment and Management 12</i> , Helsinki, Finland	2011-2012
<b>Mini-Symposium Chair and Organizer</b> , Infrastructure Risk and Reliability Organizing a mini-symposium on infrastructure risk and reliability for the 11 <sup>th</sup> International Conference on Application of Statistics and Probability in Civil Engineering	2011
<b>Program Committee</b> , ASCE First International Conference on Vulnerability and Risk Analysis and Management/Fifth International Symposium on Uncertainty Modeling and Analysis	2011
<b>Invited Session Co-Chair and Co-organizer</b> , National Academy of Engineering Frontiers of Engineering 2009 Symposium. Session: Infrastructure Resilience and Sustainability	2008-2009
<b>Cluster Chair</b> , Invited Cluster, INFORMS 2008 Annual Meeting, Washington, DC Cluster: Risk and Security	October 2008
<b>Panelist</b> , Society for Risk Analysis Annual Meeting, Baltimore Panel Topic: Risk Analysis for Terrorist Threats	December 2006
<b>Cluster Chair</b> , Decision Analysis Society Cluster INFORMS/Canadian Operations Research Society 2004 Joint Meeting, Banff, Canada	May 2004

***WORKSHOPS ORGANIZED***

<b>Excellence in Risk Analysis</b> <u>Location</u> : Crystal Mountain, MI	June 2018
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Co-organizer and co-sponsor (with Terje Aven) of a workshop bringing together the younger generation of leaders in the field of Risk Analysis to encourage technical development and networking. Approximately 20 participants.

**Power Outage Forecasting Workshop** August 2017

Location: Columbus, OH

Co-organizer (with Steven Quiring, Mike Beck, and Ken Buckstaff) of a workshop bringing together utility managers and engineers to learn about, discuss, and chart a path forward for power outage forecasting. Approximately 30 participants.

**Interdisciplinary Research Methods for Hazards Research** March 2017

Location: National Science Foundation, Washington DC

Co-organizer (with Lori Peek) of an NSF-sponsored workshop on methods for interdisciplinary research related to hazards. 37 participants and 5 federal observers.

**Foundations of Risk Analysis** May 2016

Location: University of Michigan

Co-organizer (with Terje Aven) of a workshop for 15 people focused on further developing the foundations of the field of risk analysis.

### ***PROFESSIONAL SERVICE***

**President-Elect**, International Society for Risk Analysis 2019-present

**Numerous NSF Review Panels (approximately 2 per year on average)** 2008-present

**President**, International Society for Risk Analysis Foundations of Risk Analysis specialty group 2016-2018

**Mentor**, NSF Next Generation of Hazards Researchers Program 2015-2016

**Chair**, International Society for Risk Analysis specialty group committee 2012-2014

**Council Member**, International Society for Risk Analysis 2011-2014

The SRA Council is the elected 16-member governing body for SRA, a organization with approximately 1700 members. Terms are 3-years.

**Chair**, International Society for Risk Analysis membership committee 2011-2012

**Council Member**, INFORMS Decision Analysis Society (DAS) 2010-2013

The Council is the elected governing body of the INFORMS DAS, a group with ~1500 members

**International Society for Risk Analysis, Specialty Group Study Lead** 2009-2010

Led an assessment of the specialty group structure of the International Society for Risk Analysis

**Chairman, Engineering & Infrastructure Specialty Group**, International Society 2007-2008

For Risk Analysis

### ***UNIVERSITY AND DEPARTMENTAL SERVICE***

**Member, Tenure and Promotion Committee**, Department of Civil and Environmental Engineering 2018-2019

**Faculty Search Committee**, School of Environment and Sustainability 2018-2019

**Graduate Program Chair**, Industrial and Operations Engineering 2017-present

**Chair, Graduate Program Committee**, Industrial and Operations Engineering 2017-present

**Chair, Graduate Advisory Committee**, Industrial and Operations Engineering 2017-present

**Ex Officio Member, Curriculum Committee**, Industrial and Operations Engineering 2017-present

**Member, College of Engineering Graduate Program Chairs Committee** 2017-present

**Steffy Lecture Committee**, Industrial and Operations Engineering 2016-present

**60th Anniversary Planning Committee**, Industrial and Operations Engineering 2016-2017

**Member, Provost's Faculty Transition Team for the School of Natural Resources** 2016-2017

**and the Environment.** Served as a member of 15-member committee that helped design the transition of the School of Natural Resources and the Environment to the new School of The Environment and Sustainability.

**Chair, Tenure and Promotion Committee**, Department of Industrial and Operations Engineering, University of Michigan 2016-2017

<b>Elected Department “Executive” Committee</b> , Department of Industrial and Operations Engineering (4 members – 1 Assistant Professor, 1 Associate Professor and 2 Full Professors. I served as the Associate Professor member)	2016-2017
<b>Committee Member, Department Chair Search Committee</b> , Department of Industrial and Operations Engineering	2016-2018
<b>Member, Tenure and Promotion Committee</b> , Department of Civil and Environmental Engineering	2016-2017
<b>Member, Tenure and Promotion Committee</b> , School of Natural Resources and the Environment	2016-2017
<b>Committee Member, 60<sup>th</sup> Murty Prize Selection Committee</b> , Department of Industrial and Operations Engineering, University of Michigan	2015-2016
<b>Committee Member, Graduate Admissions and Financial Aid</b> , Department of Industrial and Operations Engineering, University of Michigan	2015-2017
<b>Associate Director for Cities Research</b> , JHU Systems Institute	2014-2015
<b>Departmental Merger Committee</b> , Department of Geography and Environmental Engineering	2014-2015
<b>Chair, Vision Committee</b> , Department of Geography and Environmental Engineering	2013-2014
<b>Information Technology Committee</b> , Whiting School of Engineering, JHU	2013-2015
<b>Steering Committee Member</b> , Global Water Program, JHU	2009-2015
<b>Fellowship Committee</b> , Department of Geography and Environmental Engineering	2009-2012
<b>Whiting School of Engineering</b> , Undergraduate Education Vision Committee	2011-2015
<b>Senior Administrator Search Committee</b> , Department of Geography and Environmental Engineering	2010
<b>Faculty Committee Member</b> , Sustainable Hopkins Infrastructure Program	2009-2015
<b>Masters of Engineering Management Departmental Advisor</b> , Johns Hopkins University	2008-2015
<b>Program Committee Member</b> , Zanvyl Krieger School of Arts and Sciences, Advanced Academic Programs, Post-Baccalaureate Certificate in Geographic Information Systems	2008-2015
<b>Baltimore Scholars Panel</b> , Johns Hopkins University	July 2008
<b>Faculty Search Committee</b> , Zachry Department of Civil Engineering, Texas A&M Univ.	2006-2007
<b>Chief Faculty Advisor</b> , Tau Beta Pi, Texas A&M University	2006-2007
<b>Director</b> , Master’s program in Infrastructure Management and Security, Texas A&M Univ., Dept. of Civil and Environmental Engineering	2006-2007

### ***PUBLIC OUTREACH AND PUBLIC SERVICE***

<b>Mentor</b> , Future Cities (ASCE/National Engineers Week) Mentored a group of middle school students in the Future Cities competition.	2010-2012
<b>Mentor</b> , Women in Science and Engineering, Johns Hopkins University Mentored a female high school student in research on hurricanes and climate change.	2009-2010
<b>Mentor</b> , Good Science for Girls Program, Baltimore, MD Mentored first through fifth grade inner city, African-American, female students in an after-school program.	2008-2009

### ***MEDIA COVERAGE***

#### Coverage related to Hurricane Sandy (October 2012) [partial list]

- Live interview, CNN International Quest Means Business
- Live interview, Bloomberg TV
- Discovery Channel Daily Planet hour-long special (~5 minutes focused on my work)
- Good Morning America
- MSNBC on-line
- CBC Radio
- WBAL Radio
- CNBC
- NPR

### Additional Coverage

- Baltimore Sun, lead Science page article on power outage prediction modeling work, September 2012
- On-air (live) interview on The Weather Channel on hurricane power outage prediction, November 2009.
- “Model Predicts Power Outages”, *The Post Courier* (Charleston, SC), November 2, 2009.
- “University Researchers Pinpoint Expected Hurricane-Related Power Outages,” *Campus Technology*, October 29, 2009.
- “Computer Model Predicts Hurricane Power Outages,” *USA Today*, October 22, 2009
- “Researchers Can Predict Hurricane-Related Power Outages,” *Science Daily*, October 21, 2009
- “Researchers Can Predict Hurricane-Related Power Outages,” *EurkAlert*, October 20, 2009
- “Researchers Can Predict Hurricane-Related Power Outages,” *Newswise*, October 20, 2009
- “Researchers Can Predict Hurricane-Related Power Outages,” *PhyOrg.com*, October 20, 2009. With link to Youtube video produced by Texas A&M University: <http://www.youtube.com/watch?v=gcnltgtiemQ>
- “Researchers Can Predict Hurricane-Related Power Outages,” *Johns Hopkins University Gazette*, October 19, 2009
- “Predicting and Mitigating Hurricane Power Outages,” *Homeland Security Today*, October 16, 2009.
- “Researchers Develop New Analysis for Predicting Hurricane Power Outages,” *Transmission and Distribution News*, October 14, 2009
- “Model Predicts Hurricane Power Outages,” *United Press International, Science News*, October 13, 2009
- “In Disaster-Prone Areas, Construction Needs a New Approach,” *Johns Hopkins University Gazette*, March 23, 2009.

### **PROFESSIONAL AFFILIATIONS**

- |   |              |
|---|--------------|
| • Association of Environmental Engineering Professors | 2009-2017    |
| • American Society of Civil Engineers, Member         | 1995-present |
| • Tau Beta Pi and Chi Epsilon, Member                 | 1996-present |
| • Society for Risk Analysis, Member                   | 1998-present |
| • INFORMS, Member                                     | 2000-present |
| • INFORMS Decision Analysis Society, Member           | 2002-present |
| • American Statistical Association                    | 2008-present |