RACHEL A. DAVIDSON

Department of Civil and Environmental Engineering, University of Delaware, DuPont Hall, Newark, DE 19716; Ph: (302) 831-4952; Fax: (302) 831-3640; rdavidso@udel.edu

EDUCATION

7/94 – 6/97 **Stanford University**, Stanford, CA, Ph.D., Civil Engineering

9/93 – 6/94 **Stanford University**, Stanford, CA, M.S., Civil Engineering

9/89 – 6/93 **Princeton University**, Princeton, NJ, B.S.E., Civil Engineering, *Summa Cum Laude*

PROFESSIONAL EXPERIENCE

8/19 – present **Associate Dean for Academic Affairs**
Chief Diversity Advocate
College of Engineering, University of Delaware, Newark, DE, USA

9/13 – present **Professor**
Department of Civil and Environmental Engineering, Univ. of Delaware, Newark, DE.
Core faculty member, Disaster Research Center, Univ. of Delaware, Newark, DE.

10/22 – 11/22 **Shimizu Visiting Professor**
Department of Civil and Environmental Engineering, Stanford Univ., Stanford, CA

9/16 – 7/19 **Associate Dean for Diversity**
College of Engineering, University of Delaware, Newark, DE, USA

9/15 – 8/16 **Interim Associate Dean for Faculty Affairs—Women in Engineering**
College of Engineering, University of Delaware, Newark, DE, USA

7/13 – 6/14 **Visiting Professor and Visiting Erskine Fellow**
Department of Civil and Natural Resources Engineering, Univ. of Canterbury, Christchurch, New Zealand

8/07 – 8/13 **Associate Professor**
Department of Civil and Environmental Engineering, Univ. of Delaware, Newark, DE.
Core faculty member, Disaster Research Center, Univ. of Delaware, Newark, DE.

7/06 – 8/07 **Visiting Assistant Professor**
Department of Civil Engineering and Engineering Mechanics, Columbia University, New York, NY.

7/00 – 8/07 **Assistant Professor**
School of Civil and Environmental Engineering, Cornell University, Ithaca, NY.

8/98 – 6/00 **Assistant Professor**
Department of Civil Engineering, University of North Carolina at Charlotte, Charlotte, NC.

9/97 – 8/98 **Post-Doctoral Research Associate**
School of Engineering, Stanford University, Stanford, CA.

HONORS AND AWARDS

- Shaw Lecturer, Department of Civil and Environmental Engineering, North Carolina State University, Raleigh, NC (2022)
- Charles Martin Duke Lifeline Earthquake Engineering Award, American Society of Civil Engineers (2019)
- Fellow, Executive Leadership in Academic Technology and Engineering (ELATE) program (2015-2016)
- Visiting Erskine Fellow, Department of Civil and Natural Resources Engineering, University of Canterbury, Christchurch, New Zealand (2014)
- Fellow, Society for Risk Analysis (2011)
- Best paper award, Society for Risk Analysis, *Risk Analysis* journal (2007)
- Best poster award, *9th International Association of Fire Safety Science Symposium* (2008)
- Chosen Most Influential Faculty Member by a Merrill Presidential Scholar, Cornell Univ. (2005)
- Dorothy Swanson Excellence in Teaching Award, Cornell Univ. College of Engrg. (2004)
- Invited participant in the National Academy of Engineering Seventh Annual Symposium on Frontiers of Engineering, Irvine, CA (3/02)
- National Science Foundation Faculty Early Career Development (CAREER) award (7/00-6/04)
- National Science Foundation Professional Opportunities for Women in Research and Education (POWRE) award (7/00-12/01)
- National Science Foundation Three-Year Graduate Fellowship (9/93-6/97)
- Earthquake Engineering Research Institute Student Paper Competition winner (1997)
- Tau Beta Pi (1991), Phi Beta Kappa (1993), Sigma Xi (1993), Phi Beta Delta (1998)

LEADERSHIP ROLES IN BOARDS AND PROFESSIONAL SOCIETIES

- President, Society for Risk Analysis (2010-11)

  SRA (www.sra.org) is the world's leading professional society dedicated to the study of risk—the methods of assessing, managing, and communicating risks facing individuals, organizations, and society. It has over 2000 members in academia, industry, government, and nonprofit organizations, drawn from many disciplines. SRA is growing and currently includes 11 international regional organizations including those in Japan, China, Latin America, Egypt, and Australia/New Zealand. Approximately 800 people typically attend the annual meeting. SRA publishes the journal *Risk Analysis* (Impact factor 2.10 in 2010).

  Chair of awards committee (2013-13), Chair of nominations committee (2012-13), Past-President and Chair of publications committee (2011-12), Chair of annual meeting planning committee (2009-10), website redesign committee member (2011-12), awards committee member (2011), nominations comm. member (2010, 2011), Councilor (officer) (2004-06).

- Editorial board member, *Earthquake Spectra,* 1/13-present.
- Chair, Executive Committee, American Society of Civil Engineers (ASCE) Technical Council of Lifeline Earthquake Engineering (TCLEE) (2011-2013). Executive Committee member (2009-12).
- Board member, National Research Council, Board on Infrastructure and the Constructed Environment (12/02-9/05)

- Co-founder and Board of Directors (2004-2010), Engineers for a Sustainable World (National org.)

PUBLICATIONS

Numbers below are used to refer to papers in the research statement and collection of selected papers
[1]graduate student working with me, [2]graduate student working with a colleague, [3]post-doc working with me
[4]post-doc working with a colleague, [5]undergraduate student

A. Peer-reviewed journal papers

1. Anyidoho[1], P., Ju[2], X., Davidson, R., and Nozick, L. 2023. A machine learning approach for predicting hurricane evacuee destination location using smartphone location data. *Computational Urban Science*, *3*(1), 30.
2. Williams[1], C., Davidson, R., Nozick, L., Millea, M., Kruse, J., and Trainor, J. 2023. Single-family housing inventory projection method for natural hazard modeling applications. *Natural Hazards* 119(1), 409-434.
3. Davidson, R. Kendra, J., Starbird, K., Nozick, L., Ewing, B., Leon-Corwin[2], M. 2023. Typology of household adaptations to infrastructure system service interruptions. *International Journal of Disaster Risk Reduction* 97, 103974.
4. Soleimani[1], N., Davidson, R., Kendra, J., Ewing, B., Nozick, L. 2023. Household adaptations to and impacts from electric power and water outages in the Texas 2021 winter storm. *Natural Hazards Review* *24*(4), 04023041.
5. Meng[2], S., Williams[1], C., Davidson, R., Taciroglu, E. 2023. Effects of roof shape and roof pitch on extreme wind fragility for roof sheathing. *Journal of Structural Engineering* *149*(7), 04023093.
6. Van Wyk[2], H., Cruz-Antonio[6], O., Quintero-Perez[6], D., Garcia[6], S. D., Davidson, R., Kendra, J., Starbird, K. 2023. Searching for signal and borrowing wi-fi: Understanding disaster-related adaptations to telecommunications disruptions through social media. *International Journal of Disaster Risk Reduction* 86, 103548.
7. Slotter[2], R., Millea, M., Trainor, J.E., Davidson, R. Kruse, J., Nozick, L. 2022. Mitigation insights from emergency managers on working with stakeholders. *Journal of Emergency Management* 21(2), 123-131.
8. Stock[5], A., Davidson, R., Kendra, J., Martins, V., Ewing, B., Nozick, L., Starbird, K., Leon-Corwin[2], M. 2022. Household impacts of interruption to electric power and water services. *Natural Hazards* 1-28.
9. Guo[2], C., Nozick, L., Kruse, J., Millea, M., Davidson, R., and Trainor, J. 2022. Dynamic modeling of public and private decision-making for hurricane risk management including insurance, acquisition, and mitigation policy. 2022. *Risk Management and Insurance Review* 25(2), 173-199.
10. Abbou[3], A., Davidson, R., Kendra, J., Martins[2], V. N., Ewing, B., Nozick, L., Cox[2], Z., Leon-Corwin[2], M. 2022. Household adaptations to infrastructure system service interruptions. *Journal of Infrastructure Systems* 28(4), 04022036.

11. Williams[1], C. J., Davidson, R. A., Nozick, L. K., Trainor, J. E., Millea, M., and Kruse, J. L. 2022. Regional county-level housing inventory predictions and the effects on hurricane risk. *Natural Hazards and Earth System Sciences*, *22*(3), 1055-1072.
12. Davidson, R. A., Kendra, J., Ewing, B., Nozick, L. K., Starbird, K., Cox[2], Z., and Leon-Corwin[2], M. 2022. Managing disaster risk associated with critical infrastructure systems: a system-level conceptual framework for research and policy guidance. *Civil Engineering and Environmental Systems* 39(2), 123-143.
13. Yang[1], K., Davidson, R., Blanton, B., Colle, B., Kolar, R., Nozick, L., Wachtendorf, T., Leonardo[2], N., Vergara[2], H., and Dresback, K. 2022. Evaluation of hurricane evacuation order plans: A Hurricane Florence case study, *Natural Hazards Review* 23(4), 05022010.
14. Anyidoho[1], P., Davidson, R., Rambha, T., Nozick, L. 2022. Prediction of population behavior in hurricane evacuations. *Transportation Research Part A: Policy and Practice* 159, 200-221.
15. Stock[5], A., Davidson, R., Trainor, J., Kruse, J., Nozick, L., Slotter[2], R. 2021. What makes homeowners consider protective actions to reduce disaster risk?: An application of the precaution adoption process model and life course theory. *International Journal of Disaster Risk Science* 12(3), 312-325.
16. Rambha, T., Nozick, L., Davidson, R. 2021. Modeling hurricane evacuation behavior using a dynamic discrete choice framework*, Transportation Research Part B*: *Methodological* 150, 75-100.
17. Rambha, T., Nozick, L., Davidson, R., Yi[2], W., Yang[1], K. 2021. A stochastic optimization model for staged hospital evacuation during hurricanes, *Transportation Research Part E: Logistics and Transportation Review* 151, 102321.
18. Soleimani[1], N., Davidson, R., Davis, C., O'Rourke, T. D., and Nozick, L. K. 2021. Multihazard scenarios for regional seismic risk assessment of spatially distributed infrastructure. *Journal of Infrastructure Systems*, *27*(1), 04021001.
19. Zou[2], Y., Stock[5], A., Davidson, R., Nozick, L., Trainor, J., Kruse, J. 2020. Perceived attributes of hurricane-related retrofits and their effect on household adoption. *Natural Hazards* 104(1), 201-224.
20. Mongold[5], E,, Davidson, R., Trivedi, J., DeYoung, S., Wachtendorf, T., Anyidoho[1], P. 2020. Hurricane evacuation beliefs and behaviour of inland vs. coastal populations. *Environmental Hazards*, DOI: 10.1080/17477891.2020.1829531.
21. Slotter[2], R., Trainor, J., Davidson, R., Kruse, J., and Nozick, L. 2020. Homeowner mitigation decision-making: Exploring the theory of planned behaviour approach. *Journal of Flood Risk Management*, *13*(4), e12667.
22. Chiew[2], E., Davidson, R., Trainor, J., Nozick, L., and Kruse, J. 2020. The impact of grants on homeowner decisions to retrofit to reduce hurricane-induced wind and flood damage. *Weather, climate, and society* 12(1), 31-46.
23. Wang[1], D., Davidson, R., Nozick, L., Trainor, J., and Kruse, J. 2020. Computational framework to support government policy-making for hurricane risk management. *Natural Hazards Review* 21(1), 04019012.

24. Yang[1], K., Davidson, R., Blanton, B. Colle, B. Dresback, K., Kolar, R., Nozick, L., Trivedi[4], J., and Wachtendorf, T. 2019. Hurricane evacuations in the face of uncertainty: Use of integrated models to support robust, adaptive, and repeated decision-making. *International Journal of Disaster Risk Reduction* 36, 101093.

25. Yang[1], K., Davidson, R., Arrietta[2], H., Kolar, R., Dresback, K., Colle, B., Blanton, B., Wachtendorf, T., Trivedi[4], J., and Nozick, L. 2019. Incorporating inland flooding into hurricane evacuation decision support modeling. *Natural Hazards* 96(2), 857-878.

26. Frimpong[2], E., Kruse, J., Howard, G., Davidson, R., Trainor, J., Nozick, L. 2019. Measuring heterogeneous price effects for home acquisition programs in at-risk regions. *Southern Economic Journal* 85(4), 1108-1131.

27. Jasour[1], Z., Davidson, R., Trainor, J., Kruse, J., and Nozick, L. 2018. Homeowner decisions to retrofit to reduce hurricane-induced wind and flood damage. *Journal of Infrastructure Systems* 24(4), 04018026.

28. Robinson[5], C., Davidson, R., Trainor, J., Kruse, J., and Nozick, L. 2018. Homeowner acceptance of voluntary property acquisition offers. *International Journal of Disaster Risk Reduction* 31, 234-242.

29. Bagriacik[1], A., Davidson, R., Hughes, M., Bradley, B., and Cubrinovski, M. 2018. Comparison of statistical and machine learning approaches to modeling earthquake damage to water pipelines. *Soil Dynamics and Earthquake Engineering* 112, 76-88.

30. Davidson, R., Nozick, L., Wachtendorf, T., Blanton, B., Colle, B., Kolar, R., DeYoung, S., Dresback[4], K., Yi[2], W., Yang[1], K., and Leonardo[2], N. 2018. An integrated scenario ensemble-based framework for hurricane evacuation modeling: Part 1 – Decision support system. *Risk Analysis*, DOI: 10.1111/risa.12990.

31. Blanton, B., Dresback, K., Colle, B., Kolar, R., Vergara[2], H., Hong[2], Y., Leonardo[2], N., Davidson, R., Nozick, L., and Wachtendorf, T. 2018. An integrated scenario ensemble-based framework for hurricane evacuation modeling: Part 2 – Hazard Modeling. *Risk Analysis*, DOI: 10.1111/risa.13004.

32. Zhu, J., Manandhar, B., Truong, J., Ganapati, N.E., Pradhananga, N., Davidson, R. and Mostafavi, A., 2017. Assessment of Infrastructure Resilience in the 2015 Gorkha Earthquake. *Earthquake Spectra* 33(S1), S147-S165.

33. Lizundia, B., Davidson, R., Hashash, Y., and Olshansky, R. 2017. Overview of the 2015 Gorkha, Nepal, Earthquake and the *Earthquake Spectra* Special Issue. *Earthquake Spectra* 33(S1), S1-S20.

34. Wang, D.[1], Davidson, R., Trainor, J., Nozick, L., and Kruse, J. 2017. Homeowner purchase of insurance for hurricane-induced wind and flood damage. *Natural Hazards*, 88(1), 221-245.

35. Yi[2], W., Nozick, L. K., Davidson, R. A., Blanton, B., and Colle, B. 2017. Optimization of the issuance of evacuation orders under evolving hurricane conditions. *Transportation Research Part B: Methodological*, 95, 285–304.

36. Yang[1], K., Davidson, R. A., Nozick, L. K., Blanton, B., and Colle, B. 2017. Scenario-based hazard trees for depicting resolution of hurricane uncertainty over time. *Natural Hazards Review* 18(3), 04017001.

37. Shan[3], X., Peng[1], J., Kesete[2], Y., Kruse, J., Davidson, R., and Nozick, L. 2016. Market insurance and self-insurance through retrofit: Analysis for hurricane risk in North Carolina. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering* 3(1), 04016012.

38. DeYoung[4], S., Wachtendorf, T., Davidson, R., Xu[2], K., Nozick, L., Farmer[5], A., and Zelewicz[5], L. 2016. A mixed method study of hurricane evacuation: Demographic predictors for stated compliance to voluntary and mandatory orders. *Environmental Hazards*, 15(2), 95-112.

39. Manzour[1], H., Davidson, R., Horspool, N., and Nozick, L. 2016. Seismic hazard and loss analysis for spatially distributed infrastructure in Christchurch, New Zealand. *Earthquake Spectra*, 32(2), 697–712.

40. Xu[2], K., Davidson, R., Nozick, L., Wachtendorf, T., and DeYoung[4], S. 2016. Hurricane evacuation demand models with a focus on use for prediction in future events. *Transportation Research A* 87, 90-101.

41. Anderson[1], D., Davidson, R., Himoto, K., and Scawthorn, C. 2016. Statistical modeling of fire occurrence using data from the Tōhoku, Japan Earthquake and Tsunami, *Risk Analysis* 36(2), 378-395.

42. Reilly[2], A., Davidson, R., Nozick, L., Chen, T., and Guikema, S. 2016. Using data envelopment analysis to evaluate the performance of post-hurricane electric power restoration activities. *Reliability Engineering and System Safety*, 152, 197-204.

43. Gao[2], Y., Nozick, L., Kruse, J., and Davidson, R. 2016. Modeling competition in a market for natural catastrophe insurance. *Journal of Insurance Issues*, 39(1), 38-68.

44. Brink[1], S., and Davidson R. 2015. Framework for comprehensive assessment of a city's natural disaster risk. *Earthquake Spectra*, 31(4), 1931–1947, November.

45. Davidson, R. 2015. Integrating disciplinary contributions to achieve community resilience to natural disasters. *Civil Engineering and Environmental Systems*, Special Issue on Resilience 32(1–2), 55–67, **invited contribution**.

46. Peng[1] J., Shan[3] X., Gao[2] Y., Kesete[2] Y., Davidson R., Nozick L., and Kruse J. 2014. Modeling the integrated roles of insurance and retrofit in managing natural disaster risk: A multi-stakeholder perspective. *Natural Hazards* 74, 1043-1068.

47. Kesete[2] Y., Peng[1] J., Gao[2] Y., Shan[3] X., Davidson R., Nozick L., and Kruse J. 2014. Modeling insurer-homeowner interactions in managing natural disaster risk. *Risk Analysis* 34(6), 1040-1055.

48. Li[1], S., and Davidson, R. 2013. Application of an urban fire simulation model. *Earthquake Spectra* 29(4), 1369-1389.

49. Li[1], S., and Davidson, R. 2013. Parametric study of urban fire spread using an Urban Fire Simulation model with fire department suppression. *Fire Safety Journal* 61, 217-225.

50. Li[2], A., Nozick, L, Davidson, R., Brown, N., Jones, D, and Wolshon, B. 2013. Approximate solution procedure for Dynamic Traffic Assignment. *ASCE Journal of Transportation Engineering* 139(8), 822-832.

51. Han[1], Y., Davidson, R., Black[1], G., and Pei, S. 2013. A regional perspective on defining seismic performance objectives for woodframe buildings. *Structural Safety* 43, 50-59.

52. Legg[1], M., Davidson, R., and Nozick, L. 2013. Optimization-based regional hurricane mitigation planning. *Journal of Infrastructure Systems* 19(1), 1-11.

53. Rathfon[1], D., Davidson, R., Bevington, J., Vicini, A., and Hill, A. 2013. Quantitative assessment of post-disaster housing recovery: A case study of Punta Gorda, Florida following Hurricane Charley. *Disasters* 37(2), 333–355.

54. Han[1], Y., and Davidson R. 2012. Probabilistic seismic hazard analysis for spatially distributed infrastructure. *Earthquake Engineering and Structural Dynamics* 41(15), 2141–2158.

55. Li[2], A., Nozick, L., Xu, N., and Davidson, R. 2012. Shelter location and transportation planning under hurricane conditions. *Transportation Research Part E* 48, 715-729.

56. Apivatanagul[3], P., Davidson, R., and Nozick, L. 2012. Bi-level optimization for risk-based regional hurricane evacuation planning. *Natural Hazards* 60(2), 567-588.

57. Vaziri[1], P., Davidson, R., Apivatanagul[3], P., and Nozick, L. 2012. Identification of hazard-consistent probabilistic earthquake scenarios for regional loss estimation. *Journal of Earthquake Engineering* 16(2), 296-315.

58. Brink[1], S., Davidson, R., and Tabucchi[1], T. 2012. Strategies to reduce durations of post-earthquake water service interruptions in Los Angeles. *Structure and Infrastructure Engineering* 8(2), 199-210.

59. Apivatanagul[3], P., Davidson, R., Blanton, B., and Nozick, L. 2011. Long-term regional hurricane hazard analysis for wind and storm surge. *Coastal Engineering* 58(6), 499-509.

60. Li[2], A., Xu, N., Nozick, L., and Davidson, R. 2011. Bilevel optimization for integrated shelter location analysis and transportation planning for hurricane events. *Journal of Infrastructure Systems* 17, 184-192.

61. Hill, A., Bevington, J., Davidson, R., Chang, S., Eguchi, R., Adams, B., Brink[1], S., Panjwani[2], D., Mills[2], R., Pyatt[2], S., Honey, M., and Amyx, P. 2011. Community-scale damage, disruption, and early recovery in the 2010 Haiti earthquake, *Earthquake Spectra, Haiti Earthquake Special Issue* 27, S431-S446.

62. Tabucchi[1], T., Davidson, R., and Brink[1], S. 2010. Simulation of post-earthquake water supply system restoration. *Civil Engineering and Environmental Systems* 27(4), 263-279. **#1 most read article in journal as of April 2012**.

63. Black[1], G., Davidson, R., Pei[2], S., and van de Lindt, J. 2010. Empirical loss analysis to support definition of seismic performance objectives for woodframe buildings. *Structural Safety* 32(3), 209-219.

64. Lee[1], S., and Davidson, R. 2010. Physics-based simulation model of post-earthquake fire spread. *Journal of Earthquake Engineering* 14(5), 670-687.

65. Lee[1], S., and Davidson, R. 2010. Application of a physics-based simulation model to examine post-earthquake fire spread. *Journal of Earthquake Engineering* 14(5), 688-705.

66. Legg[1], M., Nozick, L., and Davidson, R. 2010. Optimizing the selection of hazard-consistent probabilistic scenarios for long-term regional hurricane loss estimation. *Structural Safety* 32(1), 90-100.

67. Vaziri[1], P., Davidson, R., Nozick, L., and Hosseini, M. 2010. Resource allocation for regional earthquake risk mitigation: A case study of Tehran, Iran. *Natural Hazards* 53(3), 527-546.

68. Davidson, R. 2009. Modeling post-earthquake fire ignitions using generalized linear (mixed) models. *Journal of Infrastructure Systems* 15(4), 351-360.

69. Han[2], S., S. Guikema, S. Quiring, K. Lee, D. Rosowsky, and Davidson, R. 2009. Estimating the spatial distribution of power outages during hurricanes in the Gulf Coast region. *Reliability Engineering and System Safety* 94(2), 199-210.

70. Lee[1], S., Davidson, R., Scawthorn, C., and Ohnishi[2], N. 2008. Fire following earthquake–Review of the state-of-the-art modeling. *Earthquake Spectra* 24(4), 1-35.

71. Liu[1], H., Davidson, R., and Apanasovich, T. 2008. Spatial generalized linear mixed models of electric power outages due to hurricanes and ice storms. *Reliability Engineering and System Safety* 93(6), 897-912.

72. Liu[1], H., Davidson, R., and Apanasovich, T. 2007. Statistical forecasting of electric power restoration times in hurricanes and ice storms. *IEEE Transactions on Power Systems* 22(4), 2270-2279.

73. Çağnan[1], Z., and Davidson, R. 2007. Discrete event simulation of the post-earthquake restoration process for electric power systems. *International Journal of Risk Assessment and Management* 7(8), 1138-1156.

74. Xu, N., Guikema[3], S., Davidson, R., Nozick, L., Çağnan[1], Z., and Vaziri[2], K. 2007. Optimizing scheduling of post-earthquake electric power restoration tasks. *Earthquake Engineering and Structural Dynamics, Special Issue: Electric Power* 36(2), 265-284.

75. Xu, N., Davidson, R., Nozick, L., and Dodo[1], A. 2007. The risk-return tradeoff in optimizing regional earthquake mitigation investment. *Structure and Infrastructure Engineering* 3(2), 133-146.

76. Jain[1], V., and Davidson, R. 2007. Application of a regional hurricane wind risk forecasting model for wood-frame houses. *Risk Analysis* 27(1), 45-58. **Winner of Best Paper Award, Society for Risk Analysis**.

77. Jain[1], V., and Davidson, R. 2007. Forecasting changes in the hurricane wind vulnerability of a building inventory. *Journal of Infrastructure Systems* 13(1), 1-12.

78. Dodo[1], A., Davidson, R., Xu, N., and Nozick, L. 2007. Application of regional earthquake mitigation optimization. *Computers and Operations Research* 34(8), 2478-2494.

79. Çağnan[1], Z., Davidson, R., and Guikema[3], S. 2006. Post-earthquake restoration planning for Los Angeles electric power. *Earthquake Spectra* 22(3), 1-20.

80. Guikema[3], S., Davidson, R., and Liu[1], H. 2006. Statistical models of the effects of tree trimming on power system reliability. *IEEE Transactions on Power Delivery* 21(3), 1549-1557.

81. Davidson, R., Lembo, Jr., A., Ma, J. Nozick, L., and O'Rourke, T. 2006. Optimization of investments in natural gas distribution networks. *Journal of Energy Engineering* 132(2), 1-9.

82. Liu[1], H., Davidson, R. Rosowsky, D. and Stedinger, J. 2005. Negative binomial regression of electric power outages in hurricanes. *Journal of Infrastructure Systems* 11(4), 258-267.

83. Dodo[1], A., Xu, N. Davidson, R. and Nozick, L. 2005. Optimizing regional earthquake mitigation investment strategies. *Earthquake Spectra* 21(2), 305-327.

84. (Kumar) Jain[1], V., Davidson, R., and Rosowsky, D. 2005. Modeling changes in hurricane risk over time. *Natural Hazards Review* 6(2), 88-96.

85. Lembo, A., Davidson, R., Nozick, L., O'Rourke, T. 2003. Computing distance to nearest utility: As the crow flies vs. As the gas flows. *Cartography and Geographic Information Science* 30(4), 335-342.

86. Davidson, R., and Rivera[1], M. 2003. Projecting changes in the Carolina building inventory and their effect on hurricane risk. *Journal of Urban Planning and Development* 129(4), 211-230.

87. Davidson, R., Zhao[1], H., and Kumar[1], V. 2003. A quantitative model to forecast changes in the hurricane vulnerability of a regional building inventory. *Journal of Infrastructure Systems* 9(2), 55-64.

88. Davidson, R., Liu[1], H. Sarpong[1], I. Sparks, P., and Rosowsky, D. 2003. Electric power distribution system performance in Carolina hurricanes. *Natural Hazards Review* 4(1), 36-45.

89. Davidson, R., and Lambert[1], K. 2001. Comparing the hurricane disaster risk of coastal counties in the U.S. *Natural Hazards Review* 3(3), 132-142.

90. Davidson, R., Gupta, A., Kakhandiki, A., and Shah, H. 1997. Urban earthquake disaster risk assessment and management. *Journal of Seismology and Earthquake Engineering* 1(1), 59-70.

91. Davidson, R. 1997. A multidisciplinary Urban Earthquake Disaster Risk Index. *Earthquake Spectra* 13(2), 211-223.

B. Peer-reviewed conference proceedings

1. Soleimani, N., Davidson, R., Davis, C., O'Rourke, T., Nozick, L. 2021. Selection of multihazard-based damage scenarios for the Los Angeles water transmission network. *ASCE Lifelines Conference 2021-22*, Jan. 31-Feb. 11, 2022, Los Angeles, CA.
2. Rambha[2], T., L. Nozick, and R. Davidson. 2019. Modeling departure time decisions during hurricanes using a dynamic discrete choice framework. *98th Annual Meeting of the Transportation Research Board*, Washington, D.C.
3. Davidson, R., A. Bagriacik[1], M. Hughes, B. Bradley, and M. Cubrinovski. Modeling earthquake damage to water pipelines: a comparison of empirical methods. *Proc., 11th*

U.S. National Conference on Earthquake Engineering, June 25-29, 2018, Los Angeles, CA.

4. Davidson, R. Modeling infrastructure system risk in support of community resilience-based performance standards. *Proc., 11th U.S. National Conference on Earthquake Engineering*, June 25-29, 2018, Los Angeles, CA.
5. Peng[1], J., Kesete[2], Y., Gao[2], Y., Shan[3], X., Davidson, R., Nozick, L., and Kruse, J. 2014. Math modeling to support regional natural disaster risk management. *Proc., 10th National Conference in Earthquake Engineering*, Earthquake Engineering Research Institute, July 21-25, Anchorage, AK.
6. Peng[1], J., Shan[3], X., Davidson, R., Kesete[2], Y., Gao[2], Y., and Nozick, L. 2013. Hurricane loss modeling to support regional retrofit policymaking: A North Carolina case study, *11th International Conference on Structural Safety and Reliability*, June 16-20, New York, NY.
7. Han[1], Y., Davidson, R., Su, G., and Yuan, H. An efficient simulation-based seismic hazard analysis method, *Proc., 3rd Int. Conf. on Risk Analysis and Crisis Response*, May 22-25, 2011, Laredo, TX.
8. Brink[1], S., Davidson, R., and Tabucchi[1], T. Estimated durations of post-earthquake water service interruptions in Los Angeles, *TCLEE2009 conference (ASCE Technical Council on Lifeline Earthquake Engineering)*, June 28-July 1, 2009, Oakland, CA, Invited paper.
9. Lee[1], S., and Davidson, R. Simulation-based model of fire following earthquake. *Proc., 8th U.S. National Conf. on Earthquake Engineering, San Francisco, CA, April 18 - 22, 2006.*
10. Guikema[3], S., Xu, N. Davidson, R., Nozick, L., and Çağnan[1], Z. Optimization of crews in post-earthquake electric power restoration. *Proc., 8th U.S. National Conf. on Earthquake Engineering in San Francisco, CA, April 18 - 22, 2006.*
11. Guikema[3], S., and Davidson, R. 2004. Ridge regression and genetic algorithms for efficient simulation-based integer optimization. *Winter Simulation Conf. '04, Washington, DC, December 5-8, 2004.*
12. Davidson, R. 1998. Evaluation and use of the Earthquake Disaster Risk Index. *Proc., 6th U.S. National Conf. on Earthquake Engineering, Seattle, WA, May 31-June 4, 1998*, paper 119.

C. Technical reports

1. Slotter, R., Trainor, J., Nibbs, F., Davidson, R., Kruse, J., Nozick, L., Millea, M., Kain, D. 2019. *NSF Leading Engineering for America's Prosperity, Health, and Infrastructure (LEAP HI), Mitigation and Insurance Full Project Report: Stakeholder Perceptions of Mitigation and Insurance*, Disaster Research Center, Final Project Report #61, University of Delaware, Newark, DE.
2. Lizundia, B., Shrestha, S., Bevington, J., Davidson, R., Jaiswal, K., Jimee, G., Kaushik, H., Kumar, H., Kupec, J. Mitrani-Reiser, J., Poland, C., Shrestha, S., Welton-Mitchell, C., Tremayne, H., and Ortiz, M. 2016. *M7.8 Gorkha, Nepal Earthquake on April 25, 2015 and its Aftershocks*, EERI Earthquake Reconnaissance Team Report, Earthquake Engineering Research Institute, Oakland, CA, May, 185p.

3. Davidson, R., Kendra, J., Li[1], S., Long[2], L., McEntire, D., and Scawthorn, C. 2012. *San Bruno, California, September 9, 2010 Gas Pipeline Explosion and Fire*. Disaster Research Center, Final Project Report No. 56, Newark, DE.
4. Adams, B., Amyx, P., Bevington, J., Brink[1], S., Chang, S., Davidson, R., Eguchi, R., Hill, A., Honey, M., Mills[2], R., Panjwani[2], D., Pyatt[2], S. 2010. *Assessing Community-scale Damage, Disruption, and Early Recovery in Post-earthquake Haiti.* Disaster Research Center, Miscellaneous Report 70, Newark, DE.
5. Davidson, R. 2008. *Generalized Linear (Mixed) Models of Post-earthquake Ignitions*. MCEER technical report, MCEER-09-0004, Buffalo, NY.
6. Tabucchi[1], T., and Davidson, R. 2008a. *Post-Earthquake Restoration of the Los Angeles Water Supply System*. MCEER technical report, MCEER-08-0008, Buffalo, NY.
7. Davidson, R., and Çağnan[1]. Z. 2004. "Restoration Modeling of Lifeline Systems." *Research Progress and Accomplishments 2003-2004*, Multidisciplinary Center for Earthquake Engineering Research.

D. Book chapters and short communications

1. Davidson, R., and Nozick. L. 2018. Computer simulation and optimization. In *Handbook of Disaster Research*, 2nd ed. Springer, 331-356.
2. Xu[2], K., Nozick, L., Kruse, J., Davidson, R., and Trainor, J. 2018. Affordability of Natural Catastrophe Insurance: game theoretic analysis and geospatially explicit case study, in *GEOValue: the socioeconomic Value of Geospatial Information*, edcc, Taylor & Francis Group, LLC Baton Rouge, FL, 267-282.
3. Davidson, R. 2013. Application of remote sensing in support of regional disaster risk modeling. *Natural Hazards, Special Issue on Remote sensing contributing to mapping earthquake vulnerability and effects*, Short Communication, available online 10.1007/s11069-013-0587-0. Invited contribution.
4. Davidson, R., Liu[1], H., and Apansovich, T. 2013. Estimation of post-storm restoration times for electric power distribution systems. Chapter 8 in *Advances in Electric Power and Energy: Load and Price Forecasting in Electric Power Systems*, IEEE Press, Wiley. Invited contribution.
5. Cardona, C., Davidson, R., and Villacis, C. 1999. Understanding urban seismic risk around the world. In *Natural Disaster Management*, official commemorative volume for the International Decade for Natural Disaster Reduction (IDNDR), ed. Jon Ingleton. Leicester, England: NDM.

E. Other conference proceedings

1. Bevington, J., Hill, A., Davidson, R., Chang, S., Vicini, A., Adams, B., and Eguchi, R. Measuring, monitoring and evaluating post-disaster recovery: A key element in understanding community resilience, *ASCE Structures Congress*, April 14-16, 2011, Las Vegas, NV.
2. Bevington, J., Pyatt, S., Hill, A., Honey, M., Adams, B., Davidson, R., Brink[1], S., Chang, S., Panjwani[2], D., Mills[2], R., Amyx, P., Eguchi, R. Uncovering community disruption

using remote sensing: An assessment of early recovery in post-earthquake Haiti, *8th International Workshop for Remote Sensing for Disaster Management*, Sept. 30–Oct. 1, 2010, Tokyo, Japan.

3. Li[1], S., Davidson, R., and Lee[1], S. Comparison of a new physics-based simulation model and the Hamada equations in determining post-earthquake fire spread, *Proc., 9th National and 10th Canadian Conference on Earthquake Engineering*, July 25-29, 2010, Toronto.
4. van de Lindt, J., Rosowsky, D., Filiatrault, A., Symans, M., and Davidson, R. The NEESWood project in review, *Proc., 9th National and 10th Canadian Conference on Earthquake Engineering*, July 25-29, 2010, Toronto.
5. Davidson, R. Generalized linear (mixed) models of post-earthquake fire ignitions. *Proc., 14th World Conference on Earthquake Engineering*, October 12-17, 2008, Beijing.
6. Lee[1], S., and Davidson, R. Modeling different modes of post-earthquake fire spread. *Proc., 14th World Conference for Earthquake Engineering*, October 12-17, 2008, Beijing, Paper no. 13-0014.
7. Tabucchi[1], R., Davidson, R., and Brink[1], S. Restoring the Los Angeles water supply system following an earthquake. *Proc., 14th World Conference on Earthquake Engineering*, October 12-17, 2008, Beijing.
8. van de Lindt, J., Rosowsky, D., Filiatrault, A., Davidson, R., and Symans, M. Performance-based seismic design of mid-rise light-frame wood buildings: An overview of the NEESWood Project. *Proc., World Conference on Timber Engineering 2008*, June 2-5, 2008, Miyazaki, Japan.
9. van de Lindt, J., Filiatraut, A., Symans, M., Rosowsky, D., and Davidson, R. Towards a performance-based seismic design philosophy for woodframe construction," *Proc., 9th Canadian Conference on Earthquake Engineering, Ottawa, Ontario, June 27-29, 2007*.
10. Guikema[3], S., and Davidson, R. 2006. Modelling critical infrastructure reliability with Generalized Linear (Mixed) Models, *Proc., 8th International Conference on Probabilistic Safety Assessment and Management, New Orleans, May 14-19, 2006*.
11. van de Lindt, J., Rosowsky, D., Filiatraut, A., Symans, M., and Davidson, R. 2006. Development of a performance-based seismic design philosophy for mid-rise woodframe construction: Progress on the NEESWood project. *Proc., World Conference on Timber Engineering in Portland, OR, August 6-10, 2006*.
12. Davidson, R., Nozick, L., Dodo[1], A., and Xu, N. 2005. Equity in regional earthquake mitigation investment. *Symposium on Risk Modeling and Loss Reduction Strategies for Natural and Technological Hazards,* Part of *Ninth International Conference on Structural Safety and Reliability – ICOSSAR'05, Rome, Italy, June 19-23, 2005*.
13. Çağnan[1], Z., and Davidson, R. 2004. Post-earthquake restoration modeling of electric power systems. *Proc., 13th World Conference on Earthquake Engineering in Vancouver, BC, Canada, August 1-6, 2004*, paper no. 109.
14. Dodo[1], A., Xu, N. Davidson, R., and Nozick, L. 2004. Optimizing the selection of regional earthquake mitigation strategies. *Proc., 13th World Conference on Earthquake Engineering, Vancouver, BC, Canada, August 1-6, 2004*, paper no. 269.

15. Davidson, R., and Lambert[1], K. 2001. Comparative assessment of the hurricane disaster risk of coastal counties in the U.S. *Proc., Americas Conference on Wind Engineering–2001, Clemson, SC, June 3-6, 2001*.

16. Rivera[1], M., Davidson, R., and Zhao[1], H. 2001. Forecasting the effect of changes in building inventory and vulnerability on hurricane risk in the U.S. *Proc., Americas Conference on Wind Engineering–2001, Clemson, SC, June 3-6, 2001*.

17. Sarpong[1], I., Davidson, R. Sparks, P. Rosowsky, D., and Shaik[2], B. 2001. Performance of electric power distribution systems in recent hurricanes. *Proc., Americas Conference on Wind Engineering–2001, Clemson, SC, June 3-6, 2001*.

18. Cardona, C., Villacis, C., and Davidson, R. 2001. A project to study urban earthquake risk worldwide. *Proc., Fourth International conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics and Symposium in Honor of Professor W.D. Liam Finn, San Diego, CA, March 26-31, 2001*.

19. Davidson, R., Villacis, C., Cardona, C., and Tucker, B. 2000. A project to study urban earthquake risk worldwide. *Proc., Twelfth World Conference on Earthquake Engineering, Auckland, New Zealand, Jan. 30-Feb. 4, 2000*, paper no. 791.

20. Davidson, R. 1999. Indirect assessment of the earthquake vulnerability of a city's physical infrastructure. *Proc., Eighth Canadian Conference on Earthquake Engineering, Vancouver, British Columbia, June 13-16, 1999*, paper CAEE-172.

21. Davidson, R. 1998. Innovation in earthquake risk assessment. *Proc., First International Conference on Computer Simulation in Risk Analysis and Hazard Mitigation (Risk Analysis 98), Valencia, Spain, Oct. 6-8, 1998*.

22. Davidson, R. and Shah, H. 1997. Risk classification of megacities. *Proc., First International Workshop on Earthquakes and Mega-cities, Frankfurt, Germany, September 1-4, 1997*, organized jointly by 17 professional organizations from Europe and the USA, including the IDNDR Secretariat, IAEE, IASPEI, UNESCO, UNCRD, UNU, USGS, and WSSI. Invited paper.

23. Davidson, R., Gupta, A. Kakhandiki, A. 1996. The critical problem of urban earthquake disaster risk assessment and management. *Proc., ISET Symposium on Earthquake Effects on Structures, Plants & Machinery, Nov. 13-15, 1996, Hotel Ashoka, New Delhi, India*.

24. Davidson, R., and Shah, H. 1996. Earthquake disaster risk: A critical problem for the world's urban regions. *Proc., Pan-Pacific Hazards '96 Conference, Vancouver, Canada, July 29-Aug. 2, 1996*.

25. Davidson, R. 1996. Development of a multidisciplinary urban earthquake disaster risk index. *Proc., Eleventh World Conference on Earthquake Engineering, Acapulco, Mexico, June 23-28, 1996*, paper no. 1927.

26. Wang, F., Windeler, Jr., D., Mortgat, C., Boley, J., and Davidson, R. 1996. Seismic hazard analysis in New Zealand. *Proc., Eleventh World Conference on Earthquake Engineering, Acapulco, Mexico, June 23-28, 1996*, paper no. 886.

27. Wang, F., Davidson, R., and Bendimerad, F. 1995. Attenuation of intensity with epicentral distance in Jamaica. *Proc., Fifth International Conference on Seismic Zonation, Nice, France, Oct. 17, 1995*, 1197-1204.

28. Çakmak, A., Davidson, R., Mullen, C., and Erdik, M. 1993. Dynamic analysis and earthquake response of Hagia Sophia. *Proc*., *Sixth International Conference on Soil Dynamics and Earthquake Engineering*, 881-898.

29. Mark, R., Çakmak, A., Hill, K., and Davidson, R. 1993. Structural analysis of Hagia Sophia: A historical perspective. *Proc., Sixth International Conference on Soil Dynamics and Earthquake Engineering*, 867-880.

PRESENTATIONS AND POSTERS

A. Invited research presentations

1. Davidson, R. Regional hurricane risk management: A multi-stakeholder, multi-strategy policy analysis tool, *NIST Center for Risk-Based Community Resilience Planning, 2/23.*

2. Davidson, R. Systems modeling in search of win-win solutions to coastal resilience, North Carolina State University, *Shaw Distinguished Lectureship*, 1/23.

3. Davidson, R. Disaster research in support of public policy and interventions, *Desafios en resiliencia de infraestructura critica para Chile*, Santiago, Chile, 12/22.

4. Davidson, R. Infrastructure system resilience: Integrating engineering and societal perspectives, *Pontificia Universidad Catolica de Chile*, Santiago, Chile, 12/22.

5. Davidson, R. Simulation modeling to support government policy-making for regional disaster resilience, *SimCenter Symposium*, Austin, TX, 11/22.

6. Davidson, R. A big picture perspective on infrastructure system resilience, *Blume Center and Stanford Urban Resilience Institute Affiliates and Alumni meeting*, Stanford, CA, 10/22.

7. Davidson, R. Infrastructure system resilience: A big picture perspective. *2022 NIST-NSF Disaster Resilience Symposium*, virtual, 9/22.

8. Davidson, R. 2022. Integrating engineering risk analysis of lifelines with societal response to and implications of disruptions. *ASCE Lifelines 2021-2022 Conference*, Feb. 1, **keynote plenary address**.

9. Davidson, R. 2021. A computational framework to support government policy-making for regional disaster resilience. *Future Resilient Systems II (FRS II)* seminar, Singapore, Oct. 21.

10. Davidson, R. 2021. Energy sector resilience: Obstacles overcome and obstacles that remain. *ASCE Lifelines 2021-2022 Conference* energy sector panel discussion, April 6, **keynote address**.

11. Davidson, R. 2021. A computational framework to support government policy-making for regional disaster resilience, Urban Transformations and Regional Resilience Series, Purdue University, February 17.

12. Davidson, R. 2021. A computational framework to support government policy-making for regional disaster resilience, Structural graduate students seminar, University of Florida, March 24.
13. Davidson, R. 2020. Case studies for hurricane risk. SimCenter Recovery Workshop, University of California at Berkeley, Berkeley, CA, January 31.
14. Davidson, R. 2019. *The Integrated Scenario-Based Evacuation (ISE) Tool*. Interagency Coordinating Committee on Hurricanes (ICCOH), June 3.
15. Davidson, R. 2019. *The Integrated Scenario-Based Evacuation (ISE) Tool*. Stony Brook University, September 25.
16. Davidson, R. A. 2018. Defining and Optimizing Societal Objectives for the Earthquake Risk Management of Critical Infrastructure. Workshop on Modeling Water and Electric Power Supply Performance for Community Resilience. Los Angeles, CA: Los Angeles Department of Water and Power, January.
17. Davidson, R. 2018. Modeling infrastructure system risk in support of community resilience-based performance standards. *Proc., 11th U.S. National Conference on Earthquake Engineering*, June 25-29, Los Angeles, CA.
18. Davidson, R. 2018. A computational framework to support government policy-making for regional disaster resilience. *Invited seminar,* Duke University, November 5, 2018, Durham, NC.
19. Davidson, R. 2018. A computational framework to support government policy-making for regional disaster resilience. *Convergence of Performance-based Engineering with Urban Resilience Workshop*, October 5, 2018, Stanford, CA.
20. Davidson, R. 2018. Probabilistic framework for modeling spatially distributed infrastructure. *QuakeCORE Annual Meeting*, poster, September 2018, Taupo, New Zealand.
21. Davidson, R. 2017. Tipping points and nonlinearities in earthquake disasters: Challenges and implications for modelling. Invited keynote lecture at *QuakeCORE Annual Meeting*, September 2017, Taupo, New Zealand.
22. Davidson, R. 2017. Computational framework for modelling earthquake risk to infrastructure systems. Invited seminar, University of Canterbury, Christchurch, New Zealand.
23. Davidson, R., Nozick, L., Wachtendorf, T., Blanton, B., Colle, B., Kolar, R., DeYoung, S., Dresback, K., Yi, W., Yang, K., and Leonardo, N. *The Integrated Scenario-based Evacuation (ISE) Framework*. Old Dominion University, invited seminar, Norfolk, VA, November 7, 2016.
24. Davidson, R., Nozick, L., Wachtendorf, T., Blanton, B., Colle, B., Kolar, R., DeYoung, S., Dresback, K., Yi, W., Yang, K., and Leonardo, N. *The Integrated Scenario-based Evacuation (ISE) Framework*. University of Illinois at Urbana-Champaign, invited seminar, March 6, 2017.

25. Davidson, R. Modeling natural disaster risk management: Integrating the roles of insurance and retrofit and multiple stakeholder perspectives, GNS Science, Wellington, New Zealand, April 10, 2014.
26. Davidson, R. Optimal seismic mitigation program design for infrastructure system networks, National Lifelines Week, University of Canterbury, Christchurch, New Zealand, December 6, 2013.
27. Davidson, R. Modeling natural disaster risk management: Integrating the roles of insurance and retrofit and multiple stakeholder perspectives, Department of Civil and Natural Resources Engineering, University of Canterbury, Christchurch, New Zealand, September 20, 2013.
28. Davidson, R. Statistical modeling of post-earthquake ignitions. *Operation TOMODACHI: Fire Research, 2nd Workshop to Explore Future Japan/USA Research Collaborations,* Japan Association for Fire Science and Engineering (JAFSE) and Engineering Laboratory National Institute of Standards and Technology (NIST), July 2-4, 2012, Tokyo, Japan.
29. Li, S., Davidson, R., and Lee, S. Recent advances in post-earthquake fire modeling: an urban fire simulation model (UFS). *2011 PEER annual meeting, Fire & Lifelines Session*, Pacific Earthquake Engineering Research Center, Berkeley, CA, October 1, 2011.
30. Davidson, R. An urban fire simulation (UFS) model. *NIST: Urban and Wildland-Urban Interface (WUI) Fires: A Workshop to Explore Future Japan/USA Research Collaborations*, June 27, 2011, NIST, Gaithersburg, MD.
31. Davidson, R. A new approach to regional hurricane evacuation and sheltering. *NCEM, NWS, ECU Hurricane Workshop*, May 18-19, 2011, Greenville, NC, **invited keynote presentation**.
32. Liu, H., Davidson, R., and Apanasovich, T. Estimating electric power outages due to hurricanes and ice storms using spatial generalized linear mixed models. *ASCE Structures Congress*, April 24-26, 2008, Vancouver, BC.
33. Davidson, R. Lifeline restoration modeling: Measuring, understanding, and improving rapidity, *Multidisciplinary Center for Earthquake Engineering Research (MCEER) National Science Foundation Site Visit*, Buffalo, NY, October 2006.
34. Davidson, R., Nozick, L., Dodo, A., and Xu, N. Equity in regional earthquake mitigation investment, *Symposium on Risk Modeling and Loss Reduction Strategies for Natural and Technological Hazards,* Part of *Ninth International Conference on Structural Safety and Reliability – ICOSSAR'05*, June 19-23, 2005, Rome, Italy.
35. Davidson, R., and Çağnan, Z. Post-earthquake restoration modeling, *Multidisciplinary Center for Earthquake Engineering Research (MCEER) National Science Foundation Site Visit*, June 2004, Buffalo, NY.
36. Davidson, R. Earthquake risk around the world, *Bridging the Divide: EWF-USA National Conference*, Cornell University, Ithaca, NY, September 17-20, 2003.

37. Davidson, R., Stedinger, J., Liu, H., and Rosowsky, D. Modeling electric power distribution system outages in hurricanes, *Southeastern Electric Exchange meeting*, San Destin, FL, March 17, 2003.

38. Davidson, R., Stedinger, J., Liu, H., and Rosowsky, D. Modeling electric power distribution system outages in hurricanes, *Edison Electric Institute Mutual Assistance Conference*, Houston, TX, February 5-7, 2003.

39. Davidson, R., Rosowsky, D., Rivera, M., Zhao, H., and Huang, K. Modeling the change in hurricane losses over time, *27th Annual Hazards Research and Applications Workshop, Boulder, CO, July 2002*.

40. Davidson, R., Liu, H., Sarpong, I., Rosowsky, D., and Sparks, P. Hurricane vulnerability of electric power distribution systems in the Carolinas, *United States-New Zealand Workshop on Civil Infrastructure Systems: Management of Civil Infrastructure Systems in Multihazard Environments, Christchurch, New Zealand, October, 2001*. Sponsored by the National Science Foundation and various governmental/non-governmental agencies in New Zealand.

41. Davidson, R. Development, Application, and Extension of the Earthquake Disaster Risk Index (EDRI), *Cornell University Council 50th Annual Meeting*, Cornell University, Ithaca, NY, October 26, 2000.

42. Davidson, R., and Lambert, K. A Hurricane Disaster Risk Index, *Expert Meeting on Vulnerability and Risk Analysis and Indexing*, Geneva, Switzerland, September 2000. Sponsored by the United Nations Development Programme (UNDP) Emergency Response Division, Disaster Reduction and Recovery Programme.

43. Davidson, R., Villacis, C., Cardona, C., and Tucker, B. Understanding urban seismic risk around the world project, *Vulnerability Assessment Techniques Workshop, Charleston, SC, March 2000*. Sponsored by the Organization of American States, Unit for Sustainable Development and Environment (OAS-USDE) and the U.S. National Oceanic and Atmospheric Administration Coastal Services Center (NOAA-CSC).

44. Davidson, R. and Shah, H. 1997. Risk classification of megacities. *Proc., First International Workshop on Earthquakes and Mega-cities, Frankfurt, Germany, September 1-4, 1997*, organized jointly by 17 professional organizations from Europe and the USA, including the IDNDR Secretariat, IAEE, IASPEI, UNESCO, UNCRD, UNU, USGS, and WSSI.

45. Davidson, R. A multidisciplinary urban Earthquake Disaster Risk Index, *Earthquake Engineering Research Institute Annual Meeting, Austin, Texas, February 1997*. Presented as the Student Paper Competition winner.

46. Davidson, R., and Gupta, A. An integrated approach to earthquake disaster risk assessment and management, *United Nations University/World Seismic Safety Initiative Workshop on Urban Earthquake Disaster Mitigation, Tokyo, Japan, September 1995*.

B. Other invited presentations

1. Davidson, R. 2021. A computational framework to support government policy-making for regional disaster resilience, Future Resilient Systems II (FRS II), Singapore-ETH Zurich, October 21, invited talk.

2. Davidson, R. A review of "HAZUS development and current applications for catastrophic planning" by T. Durham with P. Johari, and D. Bausch. *Workshop on Strategic Directions for (Seismic) Risk Modeling and Decision Support, Boulder, CO, July 14-15, 2006*.
3. Davidson, R. Engineers for a Sustainable World: A new sustainability initiative, *Merrill Presidential Scholars Faculty Panel*, Cornell University, May 25, 2005.
4. Davidson, R. Engineers for a Sustainable World: Engaging engineers in reducing poverty and promoting sustainability worldwide, *University of Rochester*, February 28, 2005.
5. Davidson, R. Engineers for a Sustainable World, *Bovay Program in Engineering Ethics*, Cornell University, September 24, 2004.
6. Davidson, R., Warhaft, Z., and Clewlow, R. Engineers Without Frontiers and Cornell, *Engineering College Council meeting*, Cornell University, Ithaca, NY, April 15, 2004.

C. Other presentations and posters

1. Williams, C., Davidson, R., Nozick, L., Trainor, J., Kruse, J., Millea, M. 2022. A Changing Regional Housing Inventory and the Effects on Natural Hazard Risk. *12th National Conference on Earthquake Engineering*, Salt Lake City, UT, June 27-July 1.
2. Naeimi, S., Davidson, R. 2022. Post-earthquake Water Supply Restoration Model *12th National Conference on Earthquake Engineering*, Salt Lake City, UT, June 27-July 1.
3. Williams, C., Davidson, R., Nozick, L., Trainor, J., Kruse, J., Millea, M. 2021. Decision-Support Tool for Testing Managed Retreat Policies: A Framework. *At What Point Managed Retreat? Resilience, Relocation, and Climate Justice*, June, The Earth Institute, Columbia University.
4. Davidson, R. 2018. Probabilistic framework for modeling spatially distributed infrastructure. *QuakeCORE Annual Meeting*, poster, September 2018, Taupo, New Zealand.
5. Yang, K., Davidson, R., Nozick, L., Wachtendorf, T., Blanton, B., Colle, B., Kolar, R., DeYoung, S., Dresback, K., Yi, W., and Leonardo, N. *An Integrated Scenario-based Evacuation (ISE) Framework for Hurricane Evacuation Modeling*, Society for Risk Analysis Annual Meeting, presentation, December 12, 2016.
6. Davidson, R., Scawthorn, C., and Li, S. 2011. Post-earthquake fires in the March 2011 Japan earthquake and tsunami. *Japan and New Zealand RAPIDs and Research Needs Workshop*, February 9-10, 2012 National Science Foundation Arlington, VA. Invited poster.
7. Davidson, R., Apivatanagul, P., Nozick, L., and Wachtendorf, T. Risk-based regional hurricane evacuation planning. *Society for Risk Analysis Annual Meeting,* December 4-7, 2011, Charleston, SC.
8. Brink, S., and Davidson, R. Evolving regional natural disaster risk in the international development context. *Society for Risk Analysis Annual Meeting,* December 4-7, 2011, Charleston, SC.

9. Li, S., and Davidson, R. Urban post-earthquake fire spread modeling: Application to the 2007 Grass Valley, California fire, *10th International Symposium on Fire Safety Science*, June 19-24, 2011, College Park, MD, poster.
10. Li, A., Xu, N., Nozick, L., and Davidson, R. Integrated shelter location analysis and transportation planning for hurricane events, *2011 Solutions to Coastal Disasters Conference,* June 26-29, 2011, Anchorage, AK, poster.
11. Legg, M., Davidson, R., and Nozick, L. Resource allocation for regional hurricane risk mitigation planning, *Society for Risk Analysis Annual Meeting*, December 7, 2010, Salt Lake City, UT.
12. Davidson, R., Legg, M., Vaziri, P., Nozick, L., and Hosseini, M. Resource allocation for regional hurricane and earthquake risk mitigation, *Society for Risk Analysis Annual Meeting*, December 7, 2009, Baltimore, MD.
13. Davidson, R. Generalized linear (mixed) models of post-earthquake fire ignitions. *14th World Conference on Earthquake Engineering*, October 12-17, 2008, Beijing, poster.
14. Davidson, R., and Lee, S. Post-earthquake fire ignition and spread models. *2008 National Earthquake Conference*, April 22-26, 2008, Seattle, WA, poster.
15. Lee, S., and Davidson, R. Physics-based simulation model of post-earthquake fire spread. *9th International Association of Fire Safety Science (IAFSS) Symposium,* September 21-26, 2008, Karlsruhe, Germany, **Best Poster Award**.
16. Lee, S., and Davidson, R. Model development and sensitivity analysis of a physics-based simulation model for post-earthquake fire modeling. *National Institute of Standards and Technology*, Gaithersburg, MD, January 13, 2009.
17. Davidson, R., (Legg) Nelson, M., and Nozick, L. Long-term regional hurricane risk analysis using hazard-consistent scenarios. *Society for Risk Analysis annual meeting*, December 10-12, 2007, San Antonio, TX.
18. Liu, H., Davidson, R., and Apanasovich, T. Assessing the risk of electric power outages due to hurricanes and ice storms using spatial Generalized Linear Mixed Models, *Society for Risk Analysis Annual Meeting, Baltimore, MD, December 3-6, 2006*.
19. (Kumar) Jain, V., and Davidson, R. Projecting changes in the hurricane risk of residential wood frame structures in North Carolina. *Proc., 10th American Conference on Wind Engineering, Baton Rouge, LA, May 31-June 4, 2005*.
20. Davidson, R., Ma, J., Nozick, L., O'Rourke, T., and Lembo, Jr., A. Decision support for managed network expansion of gas services, *CORS/INFORMS Joint International Meeting, Banff, Alberta, Canada, May 16-19, 2004*.
21. Cagnan, Z., and Davidson, R. Post-earthquake lifeline service restoration modeling, *Technical Conference on Lifeline Earthquake Engineering (TCLEE), Long Beach, CA, August 10-13, 2003*.
22. Davidson, R., and Kumar, V. Regional hurricane assessment for a dynamic built environment, *Society for Risk Analysis Annual Meeting, Palm Springs, CA, Dec. 2004*.

23. Liu, H., Davidson, R., and Rosowsky, D. A model to estimate expected hurricane-related outages in electric power systems in the Carolinas, *Society for Risk Analysis Annual Meeting, New Orleans, LA, December 2002*.

25. Davidson, R., Rivera, M., and Zhao, H. Modeling the effect of building inventory and vulnerability changes on the evolution of hurricane risk in the Carolinas, *Solutions to Coastal Disasters Conference, San Diego, CA, February 2002*.

26. Davidson, R. UUSRAW risk assessment methodology: The Earthquake Disaster Risk Index, *Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters (RADIUS) Project Final Meeting, Tijuana, Mexico, October 1999*. Sponsored by the United Nations IDNDR.

27. Davidson, R. A multidisciplinary urban Earthquake Disaster Risk Index, *The 28th International Geographical Congress, The Hague, The Netherlands, August 1996*.

RESEARCH FUNDING

Total: $32,857,000

1. Large-scale CoPe: Coastal Hazards, Equity, Economic prosperity, and Resilience (CHEER)
   National Science Foundation
   PI: Rachel Davidson; Co-PIs: Linda Nozick, Sarah DeYoung, Brian Colle, Meghan Millea
   9/22 to 8/27
   $16,440,129

2. NHERI Computational Modeling and Simulation Center (SimCenter)
   National Science Foundation
   PI: Sanjay Govindjee; *Senior personnel*: Rachel Davidson
   10/21 to 9/25
   $110,320

3. SCC-CIVIC-PG Track B: An Integrated Scenario-based Hurricane Evacuation Management Tool to Support Community Preparedness
   National Science Foundation
   PI: Rachel Davidson; *Co-PI*: Tricia Wachtendorf
   1/21 to 5/21
   $50,000

4. Collaborative Research: Leveraging massive smartphone location data to improve understanding and prediction of behavior in hurricanes
   National Science Foundation
   PI: Rachel Davidson; *Co-PIs*: Sarah DeYoung, Jennifer Trivedi, Tricia Wachtendorf, Linda Nozick
   9/20 to 8/23
   $346,037

5. LEAP HI: Embedding Regional Hurricane Risk Management in the Life of a Community: A Computational Framework
   National Science Foundation
   PI: Rachel Davidson; *Co-PIs*: Joseph Trainor, Jamie Kruse, Linda Nozick
   9/18 to 8/23
   $1,999,619

6. Collaborative Research: CRISP Type 2: Defining and optimizing societal objectives for the earthquake risk management of critical infrastructure
   National Science Foundation
   PI: Rachel Davidson; Co-PIs: Bradley Ewing, James Kendra, Linda Nozick, Thomas O'Rourke, Kate Starbird
   9/17-8/21
   $2,384,680 total ($1,041,501 to UD)

7. An interdisciplinary approach to household strengthening and insurance decisions
   Department of Homeland Security, Coastal Resilience Center
   PI: Rachel Davidson; *Co-PIs*: Joseph Trainor, Jamie Kruse, Linda Nozick
   1/16 to 12/17
   $298,000 total ($129,410 to UD)

8. Collaborative research: An interdisciplinary approach to modeling multiple stakeholder decision-making to reduce regional natural disaster risk
   National Science Foundation
   PI: Rachel Davidson; *Co-PIs*: Joseph Trainor, Jamie Kruse, Linda Nozick
   9/14 to 8/17
   $554,345 total ($303,867 to UD)

9. Collaborative Research: RIPS Type 2: Quantifying disaster resilience of critical infrastructure-based societal systems with emergent behavior and dynamic interdependencies
   National Science Foundation
   Co-PIs: Judith Mitrani-Reiser, Elise Miller-Hooks, Elizabeth Petrun, Joanne Nigg; *Senior personnel*: Rachel Davidson
   9/14 to 8/17
   $2.5 million ($447,870 to UD)
10. Hazards SEES Type 2: Dynamic integration of natural, human, and infrastructure systems for hurricane evacuation and sheltering
    National Science Foundation
    PI: Rachel Davidson; *Co-PIs*: Brian Blanton, Brian Colle, Linda Nozick, Tricia Wachtendorf
    9/13 to 8/17
    $2,994,056

11. Modeling natural disaster risk management: A stakeholder perspective
    National Institute of Standards and Technology (NIST)
    PI: Rachel Davidson; *Co-PIs*: Jamie Kruse, Linda Nozick

1/10 to 12/12
$797,000

12. RAPID: Post-earthquake fires in the March 2011 Japan earthquake and tsunami
National Science Foundation
PI: Rachel Davidson
5/11 to 5/12
$45,540

13. RAPID: Assessing community-scale disruption and restoration of basic needs in post-earthquake Haiti
National Science Foundation
PI: Ronald Eguchi; *Co-PIs*: Beverley Adams (Imagecat, Inc.), Stephanie Chang (UBC); Senior personnel: Rachel Davidson, Arleen Hill *(to save administrative costs, we were not co-PIs)*
6/10 to 5/12
$40,650

14. RAPID grant: San Bruno CA Sept. 9, 2010 gas pipeline explosion and fire
National Science Foundation
PI: Rachel Davidson; *Co-PIs*: James Kendra (UNT), David McEntire (UNT)
10/10 to 9/11
$45,000

15. DRU: Integrated optimization of evacuation and mass care sheltering for hurricanes
National Science Foundation
PI: Rachel Davidson; *Co-PI*: Tricia Wachtendorf, Linda Nozick
8/08 to 7/11
$750,000

16. Methods for measuring, monitoring and evaluating post-disaster recovery
National Science Foundation
PI: Ronald Eguchi; *Co-PI*: Rachel Davidson, Beverley Adams, Stephanie Chang, Arleen Hill
9/08 to 8/10
$288,000

17. Infrastructure security and emergency preparedness
UD University Transportation Center/DelDOT
PI: Sue McNeil, C*o-PIs*: Rachel Davidson, Earl Lee, Tricia Wachtendorf, Joseph Trainor
9/08 to 8/09
$116, 947

18. Investment planning for regional natural disaster mitigation
National Science Foundation
PI: Rachel Davidson; *Co-PI*: Linda Nozick
7/06 to 6/09

$250,000

19. NEES-SG. NEESWood: Development of a performance-based seismic design philosophy for mid-rise woodframe construction
National Science Foundation, Network for Earthquake Engineering Simulation (NEES) Program
PI: John van de Lindt; *Co-PIs*: Rachel Davidson, Andre Filiatrault, David Rosowsky, Michael Symans
10/05 to 9/09
$1,240,000 ($109,000 to Davidson)

20. Water supply restoration and fire modeling
Multidisciplinary Center for Earthquake Engineering Research
PI: Rachel Davidson
10/06 to 9/07
$65,000

21. Storm preparedness and recovery for the electric power system
National Science Foundation
PI: Rachel Davidson; *Co-PIs*: Art DeGaetano, David Rosowsky
7/04 to 6/07
$380,024

22. Lifeline restoration and fire modeling for disaster response
Multidisciplinary Center for Earthquake Engineering Research
PI: Rachel Davidson
10/05 to 9/06
$72,500

23. Restoration modeling for lifelines
Multidisciplinary Center for Earthquake Engineering Research
PI: Rachel Davidson
10/04 to 9/05
$60,000

24. Optimizing post-earthquake restoration for electric power and water supply systems
President's Council of Cornell Women Affinito-Stewart Grant Program
PI: Rachel Davidson
6/04 to 5/05
$11,432

25. Restoration analysis for lifelines
Multidisciplinary Center for Earthquake Engineering Research
PI: Rachel Davidson
10/03 to 9/04
$61,000

26. Forecasting change in hurricane risk over time
    National Science Foundation
    PI: Rachel Davidson; C*o-PI*: David Rosowsky
    8/01 to 7/04
    $274,979

27. **CAREER**: Research and education in natural disaster risk
    National Science Foundation
    PI: Rachel Davidson
    7/00 to 6/04
    $275,000 ($200,000 + $75,000 matching, maximum allowed for 3 years)

28. Restoration analysis for lifelines
    Multidisciplinary Center for Earthquake Engineering Research
    PI: Rachel Davidson
    10/02 to 9/03
    $59,555

29. GIS-based decision support for gas distribution systems
    Keyspan Energy, Inc.
    Co-PIs: Thomas O'Rourke, Linda Nozick; *Senior Personnel*: Rachel Davidson, Arthur Lembo, Jr., Richard Schuler
    6/01 to 6/03
    $272,820

30. Use of scientific maps in community natural hazard mitigation decisions
    U.S. Geological Survey
    PI: Rachel Davidson
    2/01 to 12/03
    $50,000

31. POWRE: Hurricane risk modeling and forecasting
    National Science Foundation
    PI: Rachel Davidson
    9/00 to 2/02
    $25,000

HIGH-LEVEL STRATEGIC PLANNING FOR THE PROFESSION

- Invited participant and presenter, *Role of Disaster Insurance in Improving Resilience: An Expert Meeting*, Resilient America Roundtable of the National Academy of Sciences, Washington, DC, July 8-10, 2015.
- Invited participant and writer of one of 10 position papers in advance of meeting, *Large Scale Hazard Mitigation Through Innovative Planning and Implementation Strategies Symposium*, National Institute of Building Sciences (NIBS) Multi-hazard Mitigation Council, Washington, DC, January 7-8, 2013.

- Invited participant, *Japan and New Zealand RAPIDS and Research Needs Workshop*, February 9-10, 2012 National Science Foundation, Arlington, VA.
- Invited participant, National Academy of Sciences' *Summit for Managing Extreme Events*, Washington, DC, September 7-9, 2011.
- Invited participant and presenter, *NSF workshop for a cross-disciplinary program for disaster resilience, vulnerability, and risk reduction*, Arlington, VA, June 1–3, 2011.
- Invited participant, *Haiti RAPIDs and Research Needs Workshop*, Sept. 30-Oct. 1, 2010, Washington, DC.
- Invited participant, *Workshop on the Future of Interdisciplinary Research in Earthquake Engineering*, San Francisco, CA, September 6, 2007, organized by the Earthquake Engineering Research Institute, funded by the National Science Foundation.

FACULTY MENTORING

- Faculty mentor, 3 faculty in Department of Civil and Environmental Engineering, UD.
- Co-PI and mentor, National Science Foundation (NSF)-funded *Career Enhancement of Academic Women in Earthquake Engineering Research (ENHANCE)* program (CMMI-1141442, 1/15/12-12/31/13, $10,113 for UD portion ($250,000 total)). One of seven co-PIs on this recently funded program in which we will be mentoring women faculty in earthquake engineering.
- Faculty mentor, NSF-funded *Enabling the Next Generation of Hazards and Disasters Researchers* project, 6/08 to 5/10. I was one of eight faculty from around the country (the only engineer), each of whom mentored two tenure-track professors interested in disaster research. The program was created to encourage development of the next generation of disaster researchers.
- Teaching mentor for a Graduate Assistance in Areas of National Need (GAANN) Fellow in Transportation Infrastructure Engineering at the University of Delaware. I am working very closely with the Fellow, a Ph.D. student, on a sophomore-level Statics course for 3 years. Her responsibilities increased steadily from being a TA in Year 1 to having her own section in Year 3.

WORKSHOP PLANNING

- Steering committee, *ASCE Lifelines Conference 2021*, University of California, Los Angeles, February 7-10, 2021.
- Planning committee, *Mitigation and Insurance Workshop*, University of Delaware, Sept. 16, 2019.
- Steering committee, *Japan and New Zealand RAPIDS and Research Needs Workshop*, February 9-10, 2012 National Science Foundation Arlington, VA.
- Chair, Planning committee, *Society for Risk Analysis Annual Meeting*, December 2010.
- *International Workshop for an Earthquake Safer World in the 21st Century*, Kobe, Japan, 1/01. Organized by the United Nations Centre for Regional Development (UNCRD)

Disaster Management Planning Hyogo Office. In Collaboration with the UN Secretariat for the International Decade for Natural Disaster Reduction (IDNDR) RADIUS Japan Team, GeoHazards International, Hyogo Prefecture, Kobe City, and the Yomiuri Shinbun. Helped plan and lead.

- *Megacities and Earthquake Risk, a White House conference*, Washington, DC, 1/98. Helped to organize 3rd of 14 forums in Toward Natural Disaster Resistant Communities in the 21st Century series, sponsored by the Subcommittee on Natural Disaster Reduction.

ADVISING

A. Post-doctoral scholars supervised

- Rithika Dulam, UD, 1/22 to present
- Abderrahmane Abbou, UD, 3/21 to 8/21
- Casie Venable, UD, 1/21 to 5/21, co-advised with T. Wachtendorf
- Xiaojun (Gene) Shan, UD, 9/12 to 8/13
  Current position: Post-doctoral associate, Edward J. Bloustein School of Planning and Public Policy, Rutgers University
- Pruttipong (Palm) Apivatanagul, UD, 1/09 to 7/11
  Current position: Transportation & Logistics Engineer, TEAM Logistics and Transport Co., Ltd, Bangkok, Thailand
- Seth Guikema, Cornell, 10/03 to 7/05
  Current position: Associate Professor, Dept. of Industrial and Operations Engineering, University of Michigan, Ann Arbor, MI.

B. Ph.D. students supervised

Committee Chair

- Caroline Williams, UD, 2023
  Regional natural hazard risk modeling: Incorporating a dynamic housing inventory model
  Current position: AAAS Fellow
- Sina Naeimi, UD, 2023
  Post-event restoration simulation of water distribution systems: A generally applicable approach
  Current position: Postdoctoral researcher, NHERI SimCenter
- Prosper Anyidoho
  Understanding and predicting population behavior in hurricane evacuations
  Current position: Data scientist, Microsoft
- Nafiseh Soleimani, UD, 2022
  Earthquake risk to civil infrastructure systems
  Current position: Research Scientist, Risk Management Solutions
- Di Ha, UD, 2021

A logit-based stochastic user equilibrium model for the integrated scenario-based hurricane evacuation framework
Current position: Software development engineer, Amazon AWS

- Dong Wang, UD, 2018
  *A computational framework to support **g**overnment decision-making **i**n regional hurricane risk management*
  Current position: Data scientist, IQVIA
- Kun Yang, UD, 2018
  Hurricane evacuation modeling: Improvement and application of an integrated scenario-based evacuation framework
  Current position: Research Scientist, AIR Worldwide
- Jiazhen Peng, UD, 2013 (Co-thesis advisor with L. Nozick)
  Modeling natural disaster risk management: Integrating the roles of insurance and retrofit and multiple stakeholder perspectives
  Current position: Research Scientist, AIR Worldwide
- Susan Brink, UD, 2013
  Framework for a comprehensive assessment of a city's natural disaster risk with a case study for earthquake risk in Padang, Indonesia
  Current position: Post-doctoral researcher, Center for Disaster Management and Risk Reduction Technology, Geophysical Institute, Karlsruhe Institute of Technology, Karlsruhe, Germany
- Sizheng Li, UD, 2012
  Modeling urban post-earthquake and wildland urban interface fire spread and suppression
  Current position: Research Scientist, AIR Worldwide
- Selina Lee, Cornell, 2009
  Modeling post-earthquake fire spread
  Current position: Research Scientist, Validus Research, New York, NY
- Haibin Liu, Cornell, 2006
  Statistical modeling of electric power outage counts and restoration times during hurricanes and ice storms
  Current position: Founder and CEO, Armisi (educational gaming company), Guangzhou, China
- Zehra Çagnan, Cornell, 2005
  Post-earthquake restoration modeling for critical lifeline systems
  Current position: Assistant Professor, Dept. of Civil Engineering, Middle East Technical University-Northern Cyprus Campus, Cyprus
- Atsuhiro Dodo, Cornell, 2005 (Co-thesis advisor with L. Nozick)
  Optimizing regional earthquake mitigation investment strategies
  Current position: Vice President, Swiss Reinsurance Co., Japan
- Vineet Kumar Jain, Cornell, 2005
  Forecasting changes in regional hurricane risk
  Current position: Senior Vice President, Swiss Re, Bangalore, India

Committee Member and Co-Thesis Advisor (with L. Nozick, Cornell University)

- Meredith Nelson Legg, Cornell, 2011
  Resource allocation for regional hurricane mitigation planning
  Current position: Chair for Instructional Technology and Classroom Innovation, Emma Willard School, Troy, NY
- Pantea Vaziri, Cornell, 2008
  Earthquake risk mitigation: Hazard identification and resource allocation
  Current position: Catastrophe Risk Modeler, Risk Management Solutions, Inc., Newark, CA

Committee Member

- Wanxin Li, UD, 2022
- Melissa Brown de Gerena, UD DISA, 2020
- D.K. Yoon, Cornell, 2007
- Peixin Shi, Cornell, 2006
- Rebekah Green, Cornell, 2005

Host to visiting Ph.D. student

- Elnaz Peyghaleh, KNT Technical University in Tehran, Iran, 12/11-6/12
- Yeliang Han, Tsinghua University, China, 9/10-8/11

Ph.D. external examiner

- Bryann Avendano, University of Canterbury, New Zealand, in progress
- Xavier Bellagamba, University of Canterbury, New Zealand, 2019
- Alistair Davies, University of Canterbury, New Zealand, 2018

C. M.S. students supervised

Committee Chair

- Prosper Anyidoho, UD, 2021
  Prediction of time-dependent population behavior during hurricane evacuations
- Adam Bagriacik, UD, 2017
  Statistical modeling of water pipeline damage in earthquakes
- Zeinab Yahyazadeh Jasour, UD, 2017
  Homeowner decisions to retrofit to reduce hurricane-induced wind and flood damage
- Dana Anderson, UD, 2014
  Statistical models of post-earthquake ignitions based on data from the Tohoku, Japan earthquake and tsunami
- Dana Rathfon, UD, 2010
  Measuring long-term post-disaster community recovery
- Greg Black, UD, 2009

Development and application of an empirical loss analysis for woodframe buildings subject to seismic events

- Susan Brink, UD, 2009
  Simulation of post-earthquake water supply restoration: Calibration and application
- Taronne Tabucchi, Cornell, 2007
  Modeling post-earthquake restoration of the Los Angeles water supply system
- Haibin Liu, Cornell, 2003
  Analysis and modeling of electric power system outages in hurricanes
- Maria Rivera, Cornell, 2002
  A quantitative model forecasting the effect of building inventory changes on hurricane risk in the Carolinas
- Huan Zhao, Cornell, 2002
  A quantitative model forecasting changes in the hurricane vulnerability of residential wood-frame structures in North Carolina
- Isaac Sarpong, UNC Charlotte, 2005
  Performance of electric power distribution systems in North and South Carolina in recent hurricanes
- Kelly Lambert, UNC Charlotte, 2000
  A Hurricane Disaster Risk Index

Committee Member

- Ruben Ortiz, Cornell, 2004
- Haining Yin, Cornell, 2002
- Sean Gerolimatos, Cornell, 2001

D. Undergraduate research assistants

- Alexia Stock, UD, 2018-2020
  Understanding engagement as a prerequisite for the protective action decision-making process: An application of life course theory
- Emily Mongold, UD, 2019
  Coastal versus inland hurricane evacuation behavior analysis
- Celine Robinson, UD, 2016-2018, completed undergraduate thesis
  Homeowner willingness to accept a voluntary property acquisition offer to reduce hurricane losses: A statistical model
- Geoffrey Dilg, UD, 2010-2011, completed undergraduate thesis
  Modeling change in the uncertainty associated with hurricane wind speed estimates over time
- Stephanie Karas, UD, 2007-2008

E. Undergraduate and M.Eng. students advised

University of Delaware

2019-2020: about 20 undergraduates
2018-2019: about 20 undergraduates
2017-2018: about 20 undergraduates
2016-2017: about 20 undergraduates
2016-2016: about 20 undergraduates
2014-2015: about 20 undergraduates
2013-2014: (on sabbatical)
2012-2013: 23 undergradutes
2011-2012: 3 First years, 5 Sophomores, 1 Junior, 15 Seniors
2010-2011: 5 Juniors, 19 Seniors
2009-2010: 6 Sophomores, 13 Juniors, 7 Seniors
2008-2009: 9 First years, 12 Sophomores, 8 Juniors

Cornell University
2004-2005: 16 First years, 1 Sophomore, 2 Seniors, 4 M.Eng.
2003-2004: 2 Juniors, 1 Senior, 2 M.Eng.
2002-2003: 14 Sophomores, 2 Juniors
2001-2002: 17 First years, 1 M.Eng.

GRADUATE ADVISEE HONORS

- Caroline Williams, Winner, UD College of Engineering Award for Graduate Student Excellence in Service, 2022.
- Prosper Anyidoho, Winner, UD Graduate Student Hackathon, 2021.
- Emily Mongold, Recipient, National Science Foundation Graduate Research Fellowship, 2021
- Susan Brink, Alternate, American Association of University Women (AAUW) American Dissertation Fellowship, 2012-2013
- Susan Brink, Recipient, Competitive Stipend Award, Office of Graduate and Professional Education, University of Delaware, 2012-13
- Susan Brink, Recipient, National Science Foundation Graduate Research Fellowship, 2009-12
- Sizheng Li, Recipient, National PERISHIP Award, a Dissertation Fellowship in Hazards, Risk, and Disasters, 2010
- Susan Brink, Recipient, Support for International Research, Internships, and Performances for Graduate Students at the University of Delaware, 2010
- Greg Black, Recipient, Fellowship for International Research, Internships, and Performances for Graduate Students at the University of Delaware, 2009

TEACHING

A. Courses taught at University of Delaware

CIEG 315 Probability and Statistics (with Honors section)

CIEG 211	Statics (with Honors section)
CIEG 641	Risk Analysis (*new course*)

B. Courses taught at Cornell University

CEE 598	Introduction to Decision Analysis (*new course*)
CEE 492	Engineers for a Sustainable World (*new course*)
CEE 406/606	Civil Infrastructure Systems (*new course*)
CEE/ENGRI 116	Modern Structural Systems and Materials
CEE/NTRES 605	Issues in Risk Analysis (*new course*)

C. Courses taught at University of North Carolina at Charlotte

CEGR 2154	Sophomore Design Project Laboratory
CEGR 4224	Advanced Structural Analysis
CEGR 3201	Systems and Design I
CEGR 5090 D90	Engineering Risk Analysis (new course)
CEGR 3212	Computer Applications in Civil Engineering

D. Short Course Teaching and Planning

- Federal Emergency Management Agency (FEMA) Emergency Management Higher Education Project. Focus group participant to help develop a Hazards Risk Assessment college course (9/00).
- *Command and Control of Major Disasters*, UNC Charlotte Fire Safety Program (1 day; 4/00).
- *Introduction to Engineering Risk Analysis*, UNC Charlotte Continuing Educ. (1 day; 12/99).
- *Seismic Risk Assessment and Aseismic Design of Structures*, Asian Institute of Technology, Bangkok, Thailand (1 week; 4/98).

PROFESSIONAL DEVELOPMENT WORKSHOPS ATTENDED

- Excellence in Civil Engineering Education (ExCEEd) Teaching Workshop for Faculty at the University of Delaware, (12/07).
- Excellence in Civil Engineering Education (ExCEEd) Teaching Workshop, West Point, NY (8/00). Sponsored by the American Society of Civil Engineers.
- Workshop for the Advancement and Retention of Underrepresented and Minority Engineering Educators, Arlington, VA (9/99). Sponsored by the National Science Foundation.
- 6th Annual SUCCEED Coalition Conference and Workshops: Enhancing Teaching and Learning, and Women in Academic Careers Raleigh, NC (4/99).

OTHER SELECTED SERVICE

A. Professional

- Scientific Advisory Committee member, Future Resilient Systems (FRS II) programme at the Singapore-ETH Centre, 2020-present.
- Steering committee member, NSF-funded NHERI RAPID facility at the University of Washington, 2016-present.

- Invited Member, Earthquake Engineering Research Institute Reconnaissance Team Investigating the April 25, 2015 Nepal Earthquake.
- Guest Associate Editor, Special Issue of *Earthquake Spectra* on the 2015 Gorkha, Nepal earthquake.
- Reviewed journal articles for *Journal of Infrastructure Systems, Risk Analysis*, *Earthquake Spectra, Earthquake Engineering and Structural Dynamics, Natural Hazards, Fire Safety Journal, Natural Hazards Review*, *Journal of Wind Engineering and Industrial Aerodynamics, IEEE Systems Journal, International Journal of Risk Assessment and Management, Journal of Architectural Engineering, Water Resources Management, International Journal of Disaster Risk Reduction, Structural Safety, Transportation Research Part C*.
- Guest Associate Editor, *Natural Hazards Review*.
- Reviewed research proposals and reports for the National Science Foundation (11 proposal review panels plus additional individual proposals), Mid-America Earthquake Center, U.S. Civil Research and Development Foundation, Economic & Social Research Council.
- Reviewed abstracts for *9th U.S. National Conference on Earthquake Engineering/10th Canadian Conference for Earthquake Engineering*.
- Member, Earthquake Engineering Research Institute Shah Prize selection committee, 2009-2014
- Federal Emergency Management Agency (FEMA) Emergency Management Higher Education Project. Focus group participant to help with development of a Hazards Risk Assessment College Course (9/00).
- Member, SEI-ASCE Technical Council on Life-Cycle Performance, Safety, Reliability, and Risk of Structural Systems (2009-2012)
- Member, American Society of Civil Engineers (ASCE)
- Member, Earthquake Engineering Research Institute (EERI)

B. College and University, University of Delaware

- College of Engineering Chief Diversity Advocate, 2016-present
- Search committee for Disaster Science cluster hire, member, 2018-19.
- Search committee for College of Engineering Dean, member, 2017-18.
- Co-chair, Dual career working group, 2016.
- Strategic Planning Initiative, Great Debates, Grand Challenges, Big Ideas Committee, University of Delaware, 2014
- Graduate tuition policy committee, member, ad-hoc committee charged by Charlie Riordan, 8/14-6/15.
- Women in engineering graduate steering committee, University of Delaware, Faculty advisor, 2008-present.

- Laird Fellowship College selection committee, Spring 2012.
- Invited panelist, Career panel sponsored by UD Graduate Women in Engineering, 2/11.
- Search committee for National Security Cluster, member, 2010-11.
- Search committee for Disaster Research Center Director, member, 2009-10.
- Distinguished Scholars Selection committee, member, Spring 2009.
- Led UD Women in Science and Engineering Brown Bag on *Talking 9 to 5* by Deborah Tannen, 2009, 2010, 2011.
- Member, Disaster Research Center Strategic Planning Committee, Fall 2007.

C. CEE Department, University of Delaware

- Search committee for CEE Department Chair, member, 2009-10.
- Search committee for structures faculty position, member, 2008-09.
- Search committee for environmental faculty position, member, 2008-09.
- CEE undergraduate committee, member, 2007-present. Helped plan for ABET.
- Laird fellowship selection committee, member, 2010, 2011.
- 4+1 program admissions committee, member, 2010, 2011.
- Helped develop Civil Infrastructure Systems graduate field of study within CEE, University of Delaware, 2008.
- CEE website redesign committee, member, 2008.

D. Cornell University

- Founding faculty advisor, Cornell University, Engineers for a Sustainable World (formerly Engineers Without Frontiers), Fall 2001-Summer 2006.
- Member, Committee to develop new Civil Infrastructure Systems graduate concentration, Cornell University, 2004-2005.
- Member, Committee to develop new Risk Analysis, Policy, and Communication graduate field and concentration (minor for M.S. and Ph.D.), Cornell University, 2000-2002.
- Member, Faculty group of Women in Science and Engineering (WISE), Cornell University, 2000-2006.
- Participant, Faculty panel during Society of Women Engineers Prospective Candidates' Weekend for accepted female freshman engineering applicants, Cornell University, 2002, 2003, 2004, 2005.
- Participant, Faculty panel during College hosting day for prospective women students, Cornell University, 2001, 2002.