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Research Interests

Vulnerability indicators, flood hazards, geospatial modeling, uncertainty analysis

Education

Ph.D., Geography 2011
University of South Carolina, Columbia, SC. Advisor: Susan Cutter
Dissertation: *Indices of Social Vulnerability to Hazards: Model Uncertainty and Sensitivity*

M.S., Environmental & Water Resources Engineering 1999
The University of Texas, Austin, TX. Advisor: David Maidment
Thesis: *Floodplain Mapping Using HEC-RAS and ArcView GIS*

B.S., Environmental Engineering 1994
Rice University, Houston, TX.

Teaching

University of Iowa, Iowa City, IA 2011-present
University of South Carolina, Columbia, SC 2010

Refereed Publications

* Denotes a UI geography student

Emrich, C., **E. Tate**, S. Larson, Y. Zhou (in press). "Measuring Social Equity in Flood Recovery Funding." *Environmental Hazards*.

Antolini, F. *, **E. Tate**, B. Dalzell, N. Young, K. Johnson, and P. Hawthorne (in revision). "Flood Risk Reduction from Agricultural Best Management Practices." *Journal of the American Water Resources Association*.

E. Tate (2019). "Déjà Vu All Over Again: Trends in Flood Drivers Point to Continuing Vulnerability." *Environment*, 61(5): 50-56.

Rufat, S., **E. Tate**, C. Emrich, and F. Antolini* (2019). "How Valid are Social Vulnerability Models?" *Annals of the American Association of Geographers*, 109(4), 1131-1153. DOI: 10.1080/24694452.2018.1535887

Tate, E., Decker, V. and Just, C. (2018), Evaluating Collaborative Readiness for Interdisciplinary Flood Research. *Risk Analysis*. DOI: 10.1111/risa.13249

Burton, C., S. Rufat, and **E. Tate** (2018). Social Vulnerability. In *Vulnerability and Resilience to Natural Hazards*, eds. S. Fuchs and T. Thaler, 53-81. Cambridge: Cambridge University Press.

- Bitterman, P.*, **E. Tate**, K.J. Van Meter, and N.B. Basu (2016). "Water Security and Rainwater Harvesting: A Conceptual Framework and Candidate Indicators." *Applied Geography*, 76: 75-84.
- Carrel, M., S.G. Young*, and **E. Tate** (2016). "Pigs in Space: Determining the Environmental Justice Landscape of Swine Concentrated Animal Feeding Operations (CAFOs) in Iowa." *International Journal of Environmental Research and Public Health*, 13(9): 849.
- Muñoz, C.* and **E. Tate** (2016). "Unequal Recovery? Federal Resource Distribution after a Midwest Flood Disaster." *International Journal of Environmental Research and Public Health*, 13(5): 507.
- Tate, E.**, A. Strong, T. Kraus, and H. Xiong* (2016). "Flood Recovery and Property Acquisition in Cedar Rapids, Iowa." *Natural Hazards*, 80(3): 2055-2079.
- Rufat, S., **Tate, E.**, C. Burton, and A.S. Maroof* (2015). "Social Vulnerability to Floods: Review of Case Studies and Implications for Measurement." *International Journal of Disaster Risk Reduction*, 14(4): 470-486.
- Tate, E.**, C. Muñoz*, and J. Suchan* (2015). "Uncertainty and Sensitivity Analysis of the HAZUS-MH Flood Model." *Natural Hazards Review*, 16(3): 04014030.
- Van Meter, K.J., N.B. Basu, **E. Tate**, and J. Wyckoff* (2014). "Monsoon Harvests: The Living Legacies of Rainwater Harvesting Systems in South India." *Environmental Science & Technology*, 48(8): 4217-4225.
- Tate, E.** (2013). "Uncertainty Analysis for a Social Vulnerability Index." *Annals of the Association of American Geographers*, 103(3): 526-543.
- Tate, E.** (2012). "Social vulnerability indices: a comparative assessment using uncertainty and sensitivity analysis." *Natural Hazards*, 63(2): 325-347.
- Tate, E.**, C.G. Burton, M. Berry, C.T. Emrich, and S.L. Cutter (2011). "Integrated Hazards Mapping Tool." *Transactions in GIS*, 15(5): 689-706.
- Coles, A., G. Eosco, T. Norton, J. Ruiz, **E. Tate**, and M. Weathers (2011). "Mapping local knowledge of climate change and hazards to inform research, practice, and policy in the Americas." *Gestión y Ambiente*, 14(2): 45-58.
- Tate, E.**, S. L. Cutter, and M. Berry (2010). "Integrated multihazard mapping." *Environment and Planning B: Planning and Design*, 37(4): 646-663.
- Cutter, S. L., L. Barnes, M. Berry, C. Burton, E. Evans, **E. Tate**, and J. Webb (2008). "A place-based model for understanding community resilience to natural disasters." *Global Environmental Change*, 18(4): 598-606.
- Scawthorn, C., N. Blais, H. Seligson, **E. Tate**, E. Mifflin, W. Thomas, J. Murphy, and C. Jones (2006). "HAZUS-MH Flood Loss Estimation Methodology I: Overview and Flood Hazard Characterization." *Natural Hazards Review*, 7(2): 60-71.

Scawthorn, C., P. Flores, N. Blais, H. Seligson, **E. Tate**, S. Chang, E. Mifflin, W. Thomas, J. Murphy, C. Jones, and M. Lawrence (2006). "HAZUS-MH Flood Loss Estimation Methodology II. Damage and Loss Assessment." *Natural Hazards Review*, 7(2): 72-81.

Tate, E., D. Maidment, F. Olivera and D. Anderson (2002). "Creating a Terrain Model for Floodplain Mapping." *Journal of Hydrologic Engineering*, 7(2): 100-108.

Reports

National Academies of Sciences, Engineering, and Medicine. (2019). Framing the Challenge of Urban Flooding in the United States. The National Academies Press, Washington, DC.

Tate, E. et al. (2015). National Flood Hazard Layer–Hazus-MH Integration Proof of Concept Report. Risk MAP CDS HAZUS Modernization Phase 1, Task 4. Federal Emergency Management Agency.

Christiansen, L. et al. (2014). The University of Iowa Biomass Energy Sustainability Index: A decision-making tool for the University of Iowa Biomass Partnership Project. Leopold Center Completed Grant Reports. Paper 492.

Solis, P. et al. (2011). Climate Change and Hazards in the Americas: International Interdisciplinary Research Directions and Opportunities. Washington, DC: Association of American Geographers.

Cutter, S. L., L. Barnes, M. Berry, C. Burton, E. Evans, **E. Tate**, and J. Webb (2008). Community and regional resilience: Perspectives from hazards, disasters, and emergency management. CARRI Research Report 1. Oak Ridge National Lab: Community and Regional Resilience Initiative.

Grants and Funding

External

US Department of Housing & Urban Development. 2019-2022. PI for "Cost Effectiveness of CBDG-DR: Flood Mitigation and Vulnerable Populations." \$850,000. With Co-PIs Aaron Strong, Carol Friedland, Melanie Gall, Chris Emrich, and Liz Hollingworth.

US National Science Foundation. 2016-2021. Co-PI for "*NRT-INFEWS: Paths to sustainable food-energy-water systems in resource-limited communities*." \$2,999,869. With David Cwiertny (PI), and Co-PIs Michelle Scherer, Craig Just, and Gabrielle Villarini.

US Department of Housing & Urban Development. 2016-2021. Co-I for "*Iowa Watershed Approach for Urban and Rural Resilience*." \$6,471,876. With Larry Weber (PI), and Co-PIs Craig Just, Julie Kearney, Valerie Decker, Ibrahim Demir, Keith Schilling, Allen Bradley, Christopher Jones, and Witold Krajewski.

Center for Global and Regional Environmental Research. 2016-18. Principal Investigator for "*Quantifying Salinization Vulnerability of Municipal Water Supplies from Winter Road Maintenance: A Case Study in Eastern Iowa*." \$34,103.

The Nature Conservancy (2015-17). Principal Investigator for "*Economic Benefits of Agricultural Practices Flood Loss Estimation for the Middle Cedar River Watershed*." \$47,017. With Nathan Young (Co-PI).

US National Science Foundation, WSC Category 1 (2015-2018). Senior Personnel for "Decision Processes, Climate Change, and Water Resources in the Agricultural Midwest." \$599,383. With Adam Ward (PI), Co-PIs Kajsja Dalrymple and Scott Spak, and Co-Investigators Sara Mitchell, Heather Sander, Ananya Sen Gupta, and Aaron Strong.

NiyamIT (2014-15). Principal Investigator for "*Proof of Concept: Linking HAZUS-MH and the NFHL.*" \$23,497.

US National Science Foundation, Infrastructure Management and Extreme Events (2013-2017). Principal Investigator for "*Measuring Social Vulnerability -- Reducing Uncertainty and Validating Indicators.*" \$166,840.

US National Science Foundation, Dynamics of Coupled Natural and Human Systems (2012-2016). Co-Principal Investigator for "*Monsoon Harvests: Assessing the Impact of Distributed Storage Tanks on the Vulnerability of Subsistence-Level Agriculture in Tamil Nadu, India.*" \$249,919. With Nandita Basu (PI) and Craig Just (Co-PI).

US National Science Foundation, Graduate Research Fellowship. 2008-2011. "*An Integrated Approach to Hazards Vulnerability Assessment.*" \$121,500.

Internal

University of Iowa, Water Sustainability Initiative Seed Grant. 2016. Principal Investigator for "*Public Engagement through the Peoples' Weather Map.*" \$4,648.

University of Iowa, Water Sustainability Initiative Seed Grant. 2014-15. Co-Principal Investigator for "*Water Sustainability: Indicators and Governance.*" \$4,992. With Kajsja Dalrymple (Co-PI) and Aaron Strong (Co-PI).

University of Iowa, Old Gold Fellowship. 2012-2013. "*A Sensitivity Analysis of the HAZUS Flood Model.*" \$6,000.

University of Iowa, Center for Global and Regional Environmental Research. 2012. Co-Principal Investigator for "*Flood Recovery in Cedar Rapids.*" \$6,417. With Aaron Strong (Co-PI).

University of South Carolina, Graduate School Fellowship, 2006-2010, \$32,000.

Service

Resilient America Roundtable (2019-present). National Academies of Sciences.

Climate Action Commission (2017-present). City of Iowa City, Iowa.

Committee on Urban Flooding in the United States (2017-2019). National Academies of Sciences.

Director of Graduate Studies (2015-2019). University of Iowa, Department of Geographical and Sustainability Sciences.

Co-Director, Hazards, Risks, and Disasters Specialty Group (2015-2017). Association of American Geographers.

Receiver Council (2015-16). William Averette Anderson Fund. <http://billandersonfund.org/>.

Adaptation and Hazards Indicators Working Group (2013-2015). National Climate Assessment. Developing a framework and indicators for adaptive capacities and action in the context of climate change hazards.

HAZUS Flood Committee (2011-2014). National Institute of Building Sciences. Federal advisory board for the development of the HAZUS-MH flood loss estimation software.