ERIC TATE

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Center for Policy Research on Energy and the Environment
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Research Interests

Vulnerability indicators, flood hazards, disaster mitigation & recovery, geospatial modeling

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

Princeton University	2023-present
University of Iowa, Iowa City, IA	2011-2023
University of South Carolina, Columbia, SC	2010

Publications

Razzaghi Asl, S., Drakes, O., **Tate, E.**, Brody, S., Highfield, W., and Atoba, K. (under review). "The Influence of Scale in Modeling Social Vulnerability and Disaster Assistance." *Annals of the American Association of Geographers*.

Rahman, M.A. and **Tate, E.** (under review). "Agricultural Flood Loss in the US." *Risk Analysis*.

Al Assi, A, **Tate, E.**, Hasan, F, Mostafiz, R.B., and Friedland, C.J. (under review). "Flood Mitigation through Home Elevation: Interactions of Flood Severity, Elevation Mitigation, and Population Vulnerability in Federal Disaster Recovery." *International Journal of Disaster Risk Reduction*.

Hoover, S., and **Tate, E.** (2025). "Spatial Heterogeneity in Social Vulnerability to Flood Exposure." *Natural Hazards*.

Arenas, A., Rahman, M.A., Strong, A., and **Tate, E.** (2025). "Economic Benefits of a Rural Distributed Flood Storage System." *Progress in Disaster Science*. 26: 100422.

Tate, E., Rufat, S., Rahman, M.A., and Hoover, S. (2025). "Profiles of Social Vulnerability for Flood Risk Reduction." *International Journal of Disaster Risk Reduction*, 118: 105250.

Razzaghi Asl, S., Rahman, M.A., **Tate, E.**, Lehman, W., and Wing, O. (2025). "Social Vulnerability Correlates of Flood Risk to Crops and Buildings." *Natural Hazards*.

Aerts, J.C., Bates, P.D., Botzen, W.W., de Bruijn, J., Hall, J.W., van den Hurk, B., Kreibich, H., Merz, B., Muis, S., Mysiak, J. and **Tate, E**. (2024). Exploring the limits and gaps of flood adaptation. *Nature Water*, *2*(8): 719-728.

Wasley, E., T.A. Dahl, C.F. Simpson, L.W. Fischer, J.F. Helgeson, M.A. Kenney, A. Parris, A.R. Siders, **E. Tate**, and N. Ulibarri (2023). Ch. 31. Adaptation. In: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC.

Drakes, O. and **Tate, E.** (2022). "Social vulnerability in a multi-hazard context: a systematic review." *Environmental Research Letters*, 17(3): 033001

Carrel, M., Clore, G.S., Kim, S., Vaughan-Sarrazin, M., **Tate, E.**, Perencevich, E.N., and Goto, M. (2021). "Racial and economic disparities in healthcare utilization among Texas Veterans following Hurricane Harvey." *JAMA Network Open*, 4(12): e2138535

Wilson, B., **Tate, E.**, and Emrich, C.T. (2021). "Flood Recovery Outcomes and Disaster Assistance Barriers for Vulnerable Populations." *Frontiers in Water*, 3: 752307.

Antolini, F. and **Tate, E.** (2021). "Location matters: a framework to investigate the spatial characteristics of distributed flood attenuation." *Water*, 13(9): 2076.

Mostafiz, R. B., Friedland, C. J., Rahman, M. A., Rohli, R. V., **Tate, E.**, Bushra, N., & Taghinezhad, A. (2021). "Comparison of neighborhood-scale, residential property flood-loss assessment methodologies." *Frontiers in Environmental Science*, 448.

Tate, E., and C.T. Emrich (2021). "Assessing social equity in disasters." *Eos,* 102.

Drakes, O., **Tate, E.**, Rainey, J., and Brody, S. (2021). "Social vulnerability and short-term disaster assistance in the United States." *International Journal of Disaster Risk Reduction,* 53: 102010.

Tate, E., Rahman, A., Emrich, C.T., and Sampson, C. (2021). "Flood Exposure and Social Vulnerability in the United States." *Natural Hazards,* 106(1): 435-457.

Tate, E., Decker, V. and Just, C. (2021), "Evaluating Collaborative Readiness for Interdisciplinary Flood Research." *Risk Analysis*, 41(7): 1187-1194.

Antolini, F., **Tate, E.**, Dalzell, B., Young, N., Johnson, K., and Hawthorne, P. (2020). "Flood Risk Reduction from Agricultural Best Management Practices." *Journal of the American Water Resources Association*, 56(1): 161-179.

Spielman, S., Tucillo, J., Folch, D., Schweikert, A., Davies, R., Wood, N., and **Tate, E.** (2020). "The Evaluation of Social Vulnerability Indicators: An Examination of Social Vulnerability Index (SoVI)." *Natural Hazards*, 100(1), 417-436.

Emrich, C., **Tate, E.**, Larson, S., and Zhou, Y. (2020). "Measuring Social Equity in Flood Recovery Funding." *Environmental Hazards*, 19(3): 228-250.

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

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

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

Bitterman, P., **Tate, E.**, Van Meter, K.J., and Basu, N.B. (2016). "Water Security and Rainwater Harvesting: A Conceptual Framework and Candidate Indicators." *Applied Geography*, 76: 75-84.

Carrel, M., Young, S.G., and **Tate, E.** (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 **Tate, E.** (2016). "Unequal Recovery? Federal Resource Distribution after a Midwest Flood Disaster." *International Journal of Environmental Research and Public Health*, 13(5): 507.

Tate, E., Strong, A., Kraus, T., and Xiong, H. (2016). "Flood Recovery and Property Acquisition in Cedar Rapids, Iowa." *Natural Hazards*, 80(3): 2055-2079.

Rufat, S., **Tate, E**., Burton, C., and Maroof, A.S. (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., Muñoz, C., and Suchan, J. (2015). "Uncertainty and Sensitivity Analysis of the HAZUS-MH Flood Model." *Natural Hazards Review*, 16(3): 04014030.

Van Meter, K.J., Basu, N.B., **Tate, E.**, and Wyckoff, J. (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., Burton, C.G., Berry, M., Emrich, C.T., and Cutter, S.L. (2011). "Integrated Hazards Mapping Tool." *Transactions in GIS*, 15(5): 689-706.

Coles, A., Eosco, G., Norton, T., Ruiz, J., **Tate, E.**, and Weathers, M. (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., Cutter, S.L., and Berry, M. (2010). "Integrated multihazard mapping." *Environment and Planning B: Planning and Design,* 37(4): 646–663.

Cutter, S. L., Barnes, L., Berry, M, Burton, C., Evans, E., **Tate, E.**, and Webb, J. (2008). "A place-based model for understanding community resilience to natural disasters." *Global Environmental Change*, 18(4): 598-606.

Scawthorn, C., Blais, N., Seligson, H., **Tate, E.**, Mifflin, E., Thomas, W., Murphy, J., and Jones, C. (2006). "HAZUS-MH Flood Loss Estimation Methodology I: Overview and Flood Hazard Characterization." *Natural Hazards Review*, 7(2): 60-71.

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

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

Reports

National Academies of Sciences, Engineering, and Medicine. (2024). Constructing Valid Geospatial Tools for Environmental Justice. The National Academies Press, Washington, DC.

Bixler, R.P., Passalacqua, P., **Tate, E.**, Feldmeyer, D.F., Traore, S., Farchy, T., and Hoover, S. (2024). Final Report: Texas Flood Social Vulnerability Index (TX F-SVI). Texas Water Development Board.

National Institute of Building Sciences (2023). Natural Hazard Mitigation Needs Assessment Methodology. NIBS Multi-Hazard Mitigation Council for the Federal Emergency Management Agency.

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

Grants and Funding

External

US National Science Foundation. 2025-2029 (canceled). Co-PI for "*CHIRRP RCN: Catalyzing Flood Justice in the USA*." $19,999. With Aaron Flores (PI), and Co-PIs Beth Tellman, Antonia Sebastian, and Marccus Hendricks.

National Institute of Building Sciences. 2024-2025 (canceled). Co-PI for "*Natural Hazards Mitigation Needs Assessment*." $127,400.

Texas Water Development Board. 2022-2025. Co-PI for "*A two-stage process for a flood-specific social vulnerability index for Texas*." $135,451.01. With Patrick Bixler (PI) and Co-PI Paola Passalacqua.

The Nature Conservancy (2022). Principal Investigator for "*Agricultural Flood Loss Estimation for the Contiguous United States*." $23,313.

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 Kajsa 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 Kajsa 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

External

Sixth US National Climate Assessment: Social Systems Chapter, Contributing Author (2024-present).

National Academies of Sciences, Engineering, and Medicine: Gulf Environmental Protection and Stewardship Board. (2023-present).

Anthropocene Alliance: Vice Chair, Board of Directors (2018-present).

National Academies of Sciences, Engineering, and Medicine: Committee on Utilizing Advanced Environmental Health and Geospatial Data and Technologies to Inform Community Investment Co-Chair (2023-2024).

National Academies of Sciences, Engineering, and Medicine: Resilient America Roundtable Member (2019-2024), Co-Chair (2021-2022).

Fifth US National Climate Assessment: Adaptation Chapter, Contributing Author (2021-2023).

National Academies of Sciences, Engineering, and Medicine: Geographical and Geospatial Sciences Committee. (2021-2023).

Auburn University, National Research Traineeship Program on *Climate Resilience*: Advisory Board (2020-2023).

City of Iowa City, Iowa: Climate Action Commission (2017-2021).

Enabling the Next Generation of Hazards Researchers: Faculty Mentor (2020-2021). National Science Foundation.

National Academies of Sciences, Engineering, and Medicine: Committee on Urban Flooding in the United States (2017-2019).

Association of American Geographers: Hazards, Risks, and Disasters Specialty Group - Chair (2017-2019), Vice Chair (2015-17).

US National Climate Assessment: Adaptation and Hazards Indicators Working Group (2013-2015).

National Institute of Building Sciences: HAZUS Flood Committee (2011-2014).

Service
Internal

Princeton University, School of Public and Internation Affairs: MPA Admissions Committee (2024-2025).

Princeton University, School of Public and Internation Affairs: SPIA Curriculum Committee (2024-2025).

University of Iowa, College of Liberal Arts & Sciences: Dean's Research Advisory Board (2020-2022).

University of Iowa, Department of Geographical and Sustainability Sciences: Diversity, Equity, & Inclusion Committee (2020-2023).

University of Iowa, Department of Geographical and Sustainability Sciences: Graduate Program Committee (2013-2023).

University of Iowa, Department of Geographical and Sustainability Sciences: Director of Graduate Studies (2015-2020).

University of Iowa. Strategic Plan for 2016 to 2021: PathForward Research & Discovery Subcommittee (2018-2019).

Experience

Professor
School of Public and International Affairs, Princeton University, Princeton, NJ   2023-present

Associate Professor
Department of Geography, University of Iowa, Iowa City IA   2017-2023

Assistant Professor
Department of Geography, University of Iowa, Iowa City, IA   2011-2017

Graduate Research Associate
Department of Geography, University of South Carolina, Columbia, SC   2006-2011

Software Development Manager
Lenocker & Associates, Orange, CA   2005-2006

Project Engineer
ABS Consulting, Inc., Irvine, CA   1999-2005

Graduate Research Assistant
Department of Civil Engineering, The University of Texas, Austin, TX   1997-1999

Associate Project Engineer
Roy F. Weston, Inc., Houston and Austin, TX   1993-1998