

Katherine S. Nelson

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RESEARCH INTERESTS

Sustainable development; social vulnerability; sustainable agriculture; rurality; landscape diversity; flood adaptation; hierarchical Bayesian modeling; spatial analysis and GIS; scaling relationships

APPOINTMENTS

2024 - present	Associate Professor, School of Natural Resources, University of Missouri
2018 - 2024	Assistant Professor, Department of Geography and Geospatial Sciences, Kansas State University
2011 - 2013	Lab Manager and Senior Scientist, Nano Research Facility, Washington University in St. Louis
2010 - 2011	Research Scientist, Nano Research Facility, Washington University in St. Louis

EDUCATION

2018	Ph.D. in Environmental Engineering, Vanderbilt University
2009	M.S. in Environmental Engineering, Washington University in St. Louis
2006	B.S. in Environmental Engineering, University of Oklahoma

GRANTS

Funded (Total of ~\$8.9M, ~\$2.9M as PI or co-PI)

2025-27	CAFNR Joy of Discovery Seed Grants, “From page to desktop. Developing an AI-assisted data extraction workflow for long-term historic agricultural data.”, Aug 2025 – July 2027, \$17,766 (PI)
2024-29	NSF-CAREER, “Unraveling simplification traps: Understanding pathway dependencies constraining potential for crop diversification and resilience of agricultural systems.”, Aug 2024 – July 2029, \$521,387 (PI)
2024-25	NSF CRISES, “Planning: CRISES: Building Collective Action for Sustainable Habitats”, Sept 2024 – Aug 2025, \$100,000 (co-PI)
2023-26	Kansas State University Game-changing Research Initiation Program (GRIP), “Towards a Global Food Systems Data Hub: Seeding the Center for Sustainable Wheat Production”. July 2023 – May

- 2026, **\$950,000** (co-PI)
- 2023-24 Kansas State University Game-changing Research Initiation Program (GRIP), “Grid-integrated renewable energy and decarbonization for Kansas agriculture”. July 2023 – June 2024, **\$100,000** (co-PI)
- 2022-24 North Central Region - Sustainable Agriculture Research & Education (NCR-SARE) Graduate Student Grant, “Does Community Well-Being Matter in Landscape Management of U.S. Farming Systems?”, Sept 2022 – Aug 2024, **\$14,501** (Faculty PI, Jean Francois - graduate student investigator.)
- 2021-25 NSF EPSCoR Major Initiatives to Improve Research Infrastructure (RII Track-2 FEC), “BioWRAP (Bioplastics With Regenerative Agricultural Properties): Spray-on bioplastics with growth synchronous decomposition and water, nutrient, and agrochemical management for enhanced field crop production”, Aug 2021 – Jul 2025, **\$5,999,428** (Key participant: Socioeconomic impacts and rural sustainability lead.)
- 2022-26 US Department of Agriculture – Foundational and Applied Science Program, “Irrigation at the new 100th Meridian: Adaptation to manage climate risks and preserve water resources in the Eastern Kansas River Basin”, Aug 2022 – Jul 2026. **\$750,000** (co-PI)
- 2020-21 Kansas State University Global Food Systems – Seed Grants, “Quantifying agricultural and social vulnerability to climate change in the Eastern Kansas River Basin to inform decision-making”, Aug 2020 – Jul 2021. **\$45,324** (co-PI)
- 2019-24 US Department of Agriculture – Foundational and Applied Science Program, “Agricultural landscape management for improved sustainability: Quantifying relationships, barriers and opportunities”, July 2020 – April 2024, **\$499,949** (PI)
- 2019-21 Kansas State University Center for Engagement and Community Development – Engagement Incentive Grants, “Building Our Sustainable Future through Community Engagement”, July 2019 – July 2021, **\$7,000** (PI)
- 2019-20 Kansas State University – University Small Research Grants, “Understanding the Influence of Scale on Characterization of the Social Vulnerability of High Flood Risk Populations”, July 2019 – July 2020, **\$4,240** (PI)
- 2017 Nashville Metro Water Services, “Converting Vulnerable Landscapes to Resilient and Sustainable Community Assets”, March 2017 – December 2017, **\$62,500** (Key participant)
- 2017-18 U.S. Coast Guard, “Elizabeth M Accident Evaluation Simulation”, August 2017 – July 2018, **\$98,000** (Key participant)

PUBLICATIONS

Peer-Reviewed Journal Articles (* Indicates equal co-authorship, † Indicates student or post-doc mentee)

1. Madin, M. †, **Nelson, K.**, Sanderson, M., & Moley, L. (2025). A synthesis of factors influencing sustainable agriculture practices adoption among rural farmers: A scoping review. *Journal of Rural Studies*, 120, 103853. <https://doi.org/10.1016/j.jrurstud.2025.103853>

2. Francois, J. [†], **Nelson, K.**, Burchfield, E., & Rissing, A. (2025) Contexts of crop selection decisions shape changing agricultural landscape diversity in the United States. *Agriculture and Human Values*. <https://doi.org/10.1007/s10460-025-10764-7>
3. **Nelson, K. S.** (2025). Where scale matters for social vulnerability indices: a multiyear analysis of the US. *International Journal of Disaster Risk Reduction*, 105513. <https://doi.org/10.1016/j.ijdr.2025.105513>
4. Rode, O., Mather, M., Oliver, D. C., **Nelson, K.**, Reed, V., Moore, T., & Pratap, S. (2025) A Framework Tool that Applies Weight-of-Evidence Integration to the Analysis of Existing Datasets to Guide Freshwater Conservation. *Frontiers in Freshwater Science*, 3, 1520312. <https://doi.org/10.3389/ffwsc.2025.1520312>
5. Madin, M. [†], **Nelson, K.**, & Moley, L. (2025). Projecting biodegradable mulch suitability: A GIS multicriteria analysis. *Journal of Cleaner Production*, 145565. <https://doi.org/10.1016/j.jclepro.2025.145565>
6. Madin, M.[†], Goodin, D., Moley, L., & **Nelson, K.** (2025). Environmental Factors Related to Biophysical Suitability and Agronomic Effects of Biodegradable Mulch Applications: Benchmarking Key Variables using Machine Learning. *Environmental Challenges*, 101105. <https://doi.org/10.1016/j.envc.2025.101105>
7. Sen, R., Sharda, V., Zambreski, Z. T., Onyekwelu, I., & **Nelson, K. S.** (2024). Effects of future climate on suitability of major crops in Eastern Kansas River Basin. *Journal of Water and Land Development*, 145-157. <http://dx.doi.org/10.24425/jwld.2024.151800>
8. Fischer, A.[†], Hutchinson, J.M.S., & **Nelson, K.** (2024). Where is rural? An analysis of the agreement between quantitative measures of rurality. *Journal of Rural Studies*, 111, 103424. <https://doi.org/10.1016/j.jrurstud.2024.103424>
9. Francois, J. R.[†], **Nelson, K. S.**, & Burchfield, E. K. (2024). Linking Diversity–Productivity Conditions of Farming Systems with the Well-Being of Agricultural Communities. *Sustainability*, 16(16), 6826. <https://doi.org/10.3390/su16166826>
10. Francois, J. R.[†], & **Nelson, K. S.** (2024). Examining the State of Community Well-Being at the Intersection of Rurality and Agricultural Engagement in the Contiguous United States. *International Journal of Community Well-Being*, 1-29. <https://doi.org/10.1007/s42413-024-00210-7>
11. Burchfield, E. K., Crossley, M. S., & **Nelson, K. S.** (2024). Rotational complexity across US counties is currently insufficient to observe yield gains in major crops. *Environmental Research Letters*, 19(4), 044024. [10.1088/1748-9326/ad300b](https://doi.org/10.1088/1748-9326/ad300b)
12. Madin, M.[†], **Nelson, K.**, Fatema, K., Schoengold, K., Dalal, A., Onyekwelu, I., ... & Norouzi, S. S. (2024). Synthesis of current evidence on factors influencing the suitability of synthetic biodegradable mulches for agricultural applications: A systematic review. *Journal of Agriculture and Food Research*, 101095. <https://doi.org/10.1016/j.jafr.2024.101095>
13. Madin, M.[†] & **Nelson, K.S.** (2023). Effects of landscape simplicity on crop yield: A reanalysis of a global database. *PLOS One*. 18(12), <https://doi.org/10.1371/journal.pone.0289799>.
14. **Nelson, K.S.** & Burchfield, E. (2023). Defining Features of Diverse and Productive Agricultural Systems: An Archetype Analysis of U.S. Agricultural Counties. *Frontiers in Sustainable Food Systems*. <https://doi.org/10.3389/fsufs.2023.1081079>
15. **Nelson, K. S.***, & Nguyen, T. D.* (2023). Community assets and relative rurality index: A multi-

dimensional measure of rurality. *Journal of Rural Studies*, 97, 322-333. <https://doi.org/10.1016/j.jrurstud.2022.12.025>

16. **Nelson, K. S.**, Nguyen, T. D., Francois, J. R.[†], & Ojha, S.[†] (2023). Rural sustainability methods, drivers, and outcomes: A systematic review. *Sustainable Development*, 1 – 24. <https://doi.org/10.1002/sd.2471>
17. **Nelson, K.S.***, Appuhamilage, B.M.^{†*}, & Yao, B.^{†*}. (2022). Higher landscape diversity associated with improved crop production resilience in Kansas-USA. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/ac7e5f>
18. Sikorsky, K., Sharp, R., Fefer, J., **Nelson, K.**, & Shivley, R. (2022). The use of drones for recreational impact monitoring of public lands. *Journal of Park and Recreation Administration*. doi:10.18666/JPra-2022-11429
19. **Nelson, K.S.*** & Burchfield, E.K.* (2021). Landscape Complexity and U.S. Crop Production. *Nature Food*, 2(5), 330-338. <https://doi.org/10.1038/s43016-021-00281-1>
20. **Nelson, K. S.**, & Molloy, M.[†] (2021). Differential disadvantages in the distribution of federal aid across three decades of voluntary buyouts in the United States. *Global Environmental Change*, 68, 102278. <https://doi.org/10.1016/j.gloenvcha.2021.102278>
21. Burchfield, E. K., & **Nelson, K. S.** (2021). Agricultural yield geographies in the United States. *Environmental Research Letters*, 16 054051, <https://doi.org/10.1088/1748-9326/abe88d>
22. **Nelson, K.S.***, Nguyen, T.D.* , Brownstein, N.[†], Garcia, D.[†], Walker, H.[†], Watson, J.[†], & Xin, A.[†] (2021). Definitions, measures, and uses of rurality: A systematic review of the literature. *Journal of Rural Studies*, 82, 351-365, <https://doi.org/10.1016/j.jrurstud.2021.01.035>.
23. **Nelson, K. S.**, & Camp, J. (2020). Quantifying the Benefits of Home Buyouts for Mitigating Flood Damages. *Anthropocene*, 100246. <https://doi.org/10.1016/j.ancene.2020.100246>
24. Camp, J.* , **Nelson, K.***, Philip, C. E., Moravec, M.[†], Scheffler, D. W., & Johnson, P. (2020). Utilizing Agent-Based Modeling to Evaluate Operational Impacts of an Incident and Possible Alternatives on US Waterways. *Transportation Research Record*, 0361198120941504. <https://doi.org/10.1177/0361198120941504>
25. Burchfield, E.K., **Nelson, K.S.**, & Spangler, K. (2019). The impact of agricultural landscape diversification on U.S. crop production. *Agriculture, Ecosystems & Environment*. <https://doi.org/10.1016/j.agee.2019.106615>
26. Gillespie-Marthaler, L., **Nelson, K.**, Baroud, H., & Abkowitz, M. D. (2019). Selecting Indicators for Assessing Community Sustainable Resilience. *Risk Analysis*. <https://doi.org/10.1111/risa.13344>
27. **Nelson, K.**, Gillespie-Marthaler, L., Baroud, H., Abkowitz, M., & Kosson, D. (2019). An integrated and dynamic framework for assessing sustainable resilience in complex adaptive systems. *Sustainable and Resilient Infrastructure*, 1-19. <https://doi.org/10.1080/23789689.2019.1578165>
28. Gillespie-Marthaler, L., **Nelson, K.S.**, Baroud, H., Kosson, D. S., & Abkowitz, M. D. (2018). An Integrative Approach to Conceptualizing Sustainable Resilience. *Sustainable and Resilient Infrastructure*. <https://doi.org/10.1080/23789689.2018.1497880>
29. **Nelson, K. S.** & Burchfield, E.K. (2017). Effects of the Structure of Water Rights on Agricultural Production During Drought: A Spatiotemporal Analysis of California’s Central Valley. *Water Resources* August 2025

30. **Nelson, K. S.**, Camp, J. V., Philip, C. E., & Abkowitz, M. D. (2017). Agent-Based Model of Navigable Inland Waterway Tow Operation Procedures. *Transportation Research Record: Journal of the Transportation Research Board*, (2611), 11-18.
31. Dundon, L. A., **Nelson, K. S.**, Camp, J., Abkowitz, M., & Jones, A. (2016). Using Climate and Weather Data to Support Regional Vulnerability Screening Assessments of Transportation Infrastructure. *Risks*, 4(3), 28.
32. **Nelson, K. S.**, Abkowitz, M. D., & Camp, J. V. (2015). A Method for Creating High Resolution Maps of Social Vulnerability in the Context of Environmental Hazards. *Applied Geography*, 63, 89-100.
33. Wu, L., Luderer, M., Yang, X., Swain, C., Zhang, H., **Nelson, K. S.**, ... & Pan, D. (2013). Surface Passivation of Carbon Nanoparticles with Branched Macromolecules Influences Near Infrared Bioimaging. *Theranostics*, 3(9), 677.
34. Wu, L., Cai, X., **Nelson, K. S.**, Xing, W., Xia, J., Zhang, R., ... & Shen, B. (2013). A Green Synthesis of Carbon Nanoparticles from Honey and their use in Real-Time Photoacoustic Imaging. *Nano Research*, 6(5), 312-325.

Datasets

1. **Nelson, Katherine**, & Nguyen, Tuan. (2025). *Community assets and relative rurality index (v2)* [Data set]. <https://doi.org/10.5281/zenodo.13850429>
2. **Nelson, Katherine S.** & Goodman, Colin (2023). *Multiscale Social Vulnerability in U.S. (1.0.0)* [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.8072143>
3. Burchfield, Emily K.; **Nelson, Katherine S.** (2023). *County-level Estimates of Landscape Complexity and Configuration in the Coterminous US*. Ag Data Commons. <https://doi.org/10.15482/USDA.ADC/1529163>.
4. **Nelson, Katherine**, & Nguyen, Tuan. (2022). *Community assets and relative rurality index (1.0.0)* [Data set]. In *Community assets and relative rurality index: A multi-dimensional measure of rurality (1.0.0, Vol. 97, pp. 322–333)*. Zenodo. <https://doi.org/10.5281/zenodo.8072187>

Book Chapters, Conference Proceedings, Reports and Other Publications

1. Nirmal Gelal, Hande Küçük McGinty, Aastha Gautam, Moumita Sen Sarma, Nico Giordano, Sanaz Norouzi, Claudio Dias da Silva Jr, Jean Ribert Francois and **Katherine Nelson**. (2025). *From Field to Graph: A Semantically Rich Graph-Based Framework for Sustainable Wheat Production*. The Thirteenth International Conference on Knowledge Capture (K-CAP 2025).
2. Gelal, N., Gautam, A., Norouzi, S. S., Giordano, N., Silva Jr, C. D. D., Francois, J. R. [†], Andersen Onofre, K., **Nelson, K.**, Hutchinson, S., Lin, X., Welch, S., Lollato, R., Hitzler, P. & McGinty, H. K. (2025). *Building Knowledge Graphs Towards a Global Food Systems Datahub*. AAAI 2025 Workshop on A Translational Institute for Knowledge Axiomatization (TIKA-2025). *arXiv preprint arXiv:2502.19507*.
3. **Nelson, K.S.** (2021). *Mitigating flood risk to support small town development: A story map for Paxico, Kansas*. <https://storymaps.arcgis.com/stories/e4cabd52b3f54511820e3d58b3cbe498>
August 2025

4. **Nelson, K.S.**, Weiderstein, T. [†] & Mahlmeister, K. [†] *Changes in land cover and associated runoff between 1990 and 2016 in the Wildcat Creek Watershed*. Report to the City of Manhattan office of Community Development.
5. **Nelson, K. S.** (2020). California Drought, 2012-2016. In B.K. Paul (ed.), *Natural Hazards and Disasters: From Avalanches and Climate Change to Water Spouts and Wildfires (40)*. ABC-CLIO.
6. **Nelson, K. S.** (2018). *Towards Quantitative Assessment of Vulnerability, Resilience, and the Effects of Adaptation on Social-Environmental Systems* (Doctoral dissertation, Vanderbilt University).
7. Gunda, T., **Nelson, K.S.**, & Patel, N. (2018). *Sustainable Development: It's as easy as F-E-W (2017-2)*. Teaching Case Study. Annapolis: National SocioEnvironmental Synthesis Center. <https://www.sesync.org/sustainable-development-it%E2%80%99s-as-easy-as-f-e-w-2017-2>
8. **Nelson, K. S.**, Camp, J. V., Philip, C. E., & Abkowitz, M. D. (2015, September). *Navigable Inland Waterway Transportation Modeling: A Conceptual Framework and Modeling Approach for Consideration of Climate Change Induced Extreme Weather Events*. Paper presented at the World Association for Waterborne Transport Infrastructure (PIANC) Smart Rivers 2015 Conference, Buenos Aires, Argentina. Retrieved from http://www.pianc.org.ar/_stage/pdf/papers_sr2015/123_paper_Nelson_USA_7.pdf
9. **Nelson, K. S.**, Winter, P., Shokeen, M., Wang, S., & Berezin, M. Y. (2014). Nanoparticles for Bioimaging. *Nanotechnology for Biomedical Imaging and Diagnostics: From Nanoparticle Design to Clinical Applications*, 151-192. John Wiley & Sons.
10. Giammar, D.E., **Nelson, K.S.**, Noel, J. D., & Xie, Y. (2010). *Water Chemistry Effects on Dissolution Rates of Lead Corrosion Products*. Water Research Foundation Report 4064. Retrieved from <http://www.waterrf.org/PublicReportLibrary/4064.pdf>

PAPERS UNDER REVIEW

Rode, O., Mather, M., Oliver, D. C., **Nelson, K.**, Kuck, S., Moore, T., & Pratap, S. (2025) A tale of three fish: comparing quantitative responses of thoughtfully-selected common and uncommon native taxa can guide conservation.

Francois, J. [†], **Nelson, K.**, Joslin, A. (2025) Exploring Farmers' Considerations for Community Well-Being in On-Farm Management Decisions Across Diversifying and Simplifying Farming Contexts.

Chavez Reyes, D. [†], **Nelson, K.**, & Zipper, S. (2025) Variability of an adaptive capacity index to construction method and socio-economic context.

Francois, J. [†], **Nelson, K.**, & Burchfield, E. (2025) Core Attributes of Farmers and Contexts Explaining the Consideration of Community Well-Being into Farm Management Decisions.

Keller, A., Kimball-Rhines, C., Leng, D., McIntosh, T.L., **Nelson, K.** (2025) Reconciling the potential and pitfalls of deep learning paradigms in social-ecological systems research

PRESENTATIONS

Paper Presentations (presenting author in bold font)

- 2025 **Nelson, K.**, Chavez Reyes, D. (2025, September). *Projecting possible downstream impacts of water futures on farm community socioeconomic conditions*. Nebraska Water Conference, Omaha, NE.
- Kuck, S.**, M. E. Mather, D. Oliver. K. Nelson, and T. Moore. (2025, August). *Introducing a process for interrogating existing datasets to guide conservation*. American Fisheries Society. San Antonio, TX. (HONORABLE MENTION for the 2025 Skinner Award)
- Chavez Reyes, D.**, Nelson, K., Zipper, S. (2025, July) .*Variability of an adaptive capacity index to construction method and socio-economic context*. Paper presentation hosted by 50th Annual Natural Hazards Research and Application Workshop, Broomfield, CO.
- Nelson, K.** & Bean, B. (2025, March). *Consistency in the relationship between landscape diversity and crop yields*. American Association of Geographers (AAG) Annual Conference, Detroit, MI.
- Francois, J.R.**[†] & Nelson, K. (2025, March). *Aligning Values with Practice: An analysis of Drivers and Barriers of Crop Diversity Management in Agricultural Landscapes*. American Association of Geographers (AAG) Annual Conference, Detroit, MI.
- Madin, M.**[†], Nelson, K., & Moley, L. (2025, March). *Prospects for biodegradable mulch suitability and adoption for agriculture applications under current and future climate scenarios*. American Association of Geographers (AAG) Annual Conference, Detroit, MI.
- Kuck, S.**, S. Pratap, M. E. Mather, D. Oliver. K. Nelson, T. Moore, and O. Rode. (September, 2025). *Extracting management and conservation insights from biodiversity monitoring data: Uncommon fish in Kansas*. Annual Kansas Cooperative Fish and Wildlife Research Unit Meeting. Manhattan, KS.
- 2024 **Francois, J.R.**[†] & Nelson, K. (2024, June). *Beyond the Farms: Setting the Stage of Agricultural Decision-Making for Sustainable Futures*. Agriculture, Food, and Human Values Society (AFHVS) Annual Conference, Syracuse, NY.
- Nelson, K.** & Nguyen, T. (2024, April). *Perceptions of well-being during the COVID-19 pandemic associated with varying rural community features*. American Association of Geographers (AAG) Annual Conference, Honolulu, HI. (virtual)
- Francois, J.R.**[†] & Nelson, K. (2024, April). *Understanding the Diversification Trajectories of U.S. Agricultural Landscapes through a Qualitative Comparative Analysis*. American Association of Geographers (AAG) Annual Conference, Honolulu, HI. (virtual)
- Francois, J.R.**[†] & Nelson, K. (2024, March). *Examining Farmers' Perspectives On Community Considerations In Agricultural Decision-Making In The United States*. K-State Graduate Research, Arts, and Discovery (GRAD) Forum, Manhattan, KS.
- Rode, O.**, M. E. Mather, D. Oliver. K. Nelson, T. Moore, V. Reed, S. Pratap, and S. Kuck. 2024. *How a monitoring dataset, an adaptive management framework, and ecological comparisons of selected fish groups can guide restoration*. Kansas Natural Resource Conference. Manhattan, KS.

- 2023 **Chavez, D.**[†] & Nelson, K. (2023, October). *Adaptive Capacity in Kansas: An Uncertainty Analysis*. Great Plains/Rocky Mountains Division of the American Association of Geographers (AAG) Annual Meeting, Sioux Falls, SD.
- Nelson, K.**, Burchfield, E. (2023, March). *Defining features of diverse and productive agricultural systems*. American Association of Geographers (AAG) Annual Conference, Denver, CO.
- Madin, M.**[†], Nelson, K., Schoengold, K., Dalal, A., Onyekwelu, I., Rayan, R., Saki, S., & Fatema, K. (2023, March). *Systematic review of biodegradable mulch film site suitability and adoptions among farmers*. American Association of Geographers (AAG) Annual Conference, Denver, CO.
- Francois, J.**[†] & Nelson, K. (2023, March). *Examining the State of Community Well-being at the Intersection of Rurality and Agricultural Engagement in the Contiguous United States*. American Association of Geographers (AAG) Annual Conference, Denver, CO.
- 2022 **Nelson, K.S.**, Burchfield, E., Rissing, A., Cowan, J., Francois, J.R.[†] (2022, December). *Features of Diverse and Productive Agricultural Systems: Biophysical and Human Dimensions of Crop Production in US Counties*. A Community on Ecosystem Services (ACES) Annual Conference, Arlington, VA.
- Nelson, K.S.** (2022, October). *Shining light on the black box: a simple approach to merge flood modeling and local knowledge*. Kansas Association of Mappers (KAM) Conference, Manhattan, KS.
- Nelson, K. S.** (2022, February). *Community Assets and Relative Rurality Index: A Continuous Multi-dimensional Measure of Rurality*. Annual Meeting of the American Association of Geographers (AAG), New York City, NY. (virtual attendance)
- Francois, J.**[†], Ohja, S.[†], & Nelson, K.S. (2022, February). *Rural Sustainability Methods, Drivers, and Outcomes: A Systematic Review*. Annual Meeting of the American Association of Geographers (AAG), virtual.
- 2021 **Nelson, K. S.** (2021, April). *Characterizing Uncertainty in the Intersection of Social Vulnerability and Flood Risk*. Annual Meeting of the American Association of Geographers (AAG), Seattle, WA. (virtual attendance)
- 2020 **Nelson, K. S.** & Molloy, M.[†] (2020, April). *The Socio-demographic Landscape of Three Decades of FEMA Buyouts*. Annual Meeting of the American Association of Geographers (AAG), Denver, CO. (cancelled due to COVID)
- 2019 **Nelson, K. S.** & Molloy, M.[†] (2019, October). *The Socio-demographic Landscape of Three Decades of FEMA Buyouts*. Annual Meeting of the Great Plains/Rocky Mountain Division of the American Association of Geographers (AAG), Lawrence, KS.
- Nelson, K. S.**, Burchfield, E. K., & Spangler, K. (2019, April). *Exploring the Impacts of Agricultural Landscape Diversity on Yields in the U.S. Using Bayesian Spatiotemporal Modeling*. Annual Meeting of the American Association of Geographers (AAG), Washington D.C.
- Burchfield, E. K.**, Nelson, K. S., & Spangler, K. (2019, April). *Impacts of agricultural diversification on U.S. crop production*. US-IALE (International Association for Landscape Ecology) Annual Meeting, Fort Collins, CO.
- 2018 **Nelson, K. S.** (2018, October). *Exploring the Impacts of Agricultural Landscape Diversity on Yields in the U.S. Using Bayesian Spatiotemporal Modeling*. Annual Meeting of the Great Plains/Rocky

- Mountain Division of the American Association of Geographers Association of American Geographers (AAG), Manhattan, KS.
- Nelson, K. S.** (2018, April). *Examining the Sustainable Resilience of an Urban System*. Association of American Geographers (AAG) Annual Meeting, New Orleans, LA.
- 2017 **Nelson, K. S. & Camp, J.V.** (2017, December). *Converting Vulnerable Landscapes to Resilient Community Assets*. Annual Meeting of the Society for Risk Analysis (SRA), Arlington, VA.
- Nelson, K. S., Dundon, L. A., & **Abkowitz, M. D.** (2017, June). *Quantifying Social Resilience and Evaluating Climate Change Adaptation Strategies*. 3rd Climate Change Adaptation Conference (ECCA), Our Climate Ready Future, Glasgow, Scotland. (*Presented by Dundon.*)
- Gillespie-Marthaler, L.**, Nelson, K. S., & Abkowitz, M. D. (2017, June). *Indicators for Assessing and Achieving Resilient and Sustainable Communities*. 26th Annual Conference of the Society for Risk Analysis – Europe (SRA-E), Lisbon, Portugal.
- Nelson, K. S.**, Camp, J.V., Philip, C. E., & Abkowitz, M. D. (2017, January). *Agent-Based Model of Navigable Inland Waterway Tow Operation Procedures*. 96th Annual Meeting of the Transportation Research Board (TRB), Washington D.C.
- 2016 **Nelson, K. S. & Burchfield, E. K.** (2016, November). *Does the Structure of Water Rights Impact Agricultural Production During Droughts? A Spatiotemporal Analysis of California's Central Valley* Association for Public Policy Analysis & Management (APPAM) 38th Annual Fall Research Conference, Washington D.C.
- Nelson, K. S.**, Camp, J. V., Philip, C.E., & Abkowitz, M.D. (2016, June). *Navigable Inland Waterway Traffic Model for Evaluation of Tow Operation Procedures in the Context of Extreme Weather Events*. Student Honor Panel of the 4th Biennial TRB-CMTS Research & Development Conference, Washington D.C.
- 2015 **Nelson, K. S.**, Abkowitz, M. D., & Camp, J. V. (2015, April). *A Method for Creating High Resolution Maps of Social Vulnerability*. Association of American Geographers (AAG) Annual Meeting, Chicago, IL.
- 2009 **Giammar, D. E.**, Nelson, K. S., Noel, J. D., & Xie, Y. (2009, June). *Formation and Stability of Solid-Phase Lead Corrosion Products in Drinking Water Distribution Systems*. AWWA Annual Conference and Exposition, San Diego, CA.
- Giammar, D. E.**, Nelson, K. S., Noel, J. D., & Xie, Y. (2009, March). *Influence of water chemistry on the stability of lead-containing phases present in drinking water distribution systems*. Paper presented at the 237th ACS National Meeting, Salt Lake City, UT. (March 22-26, 2009).
- 2008 **Nelson, K. S. & Giammar, D. E.** (2008, April). *The Influence of Water Chemistry on the Dissolution Rate of a Lead Phosphate Corrosion Product*. Paper presented at the Joint Meeting of the Missouri Water Environment Association and the Missouri Section of the American Water Works Association, Osage Beach, MO.

Poster Presentations (presenting author in bold font, † Indicates student or post-doc mentee)

- 2024 **Madin, M.** †, Nelson, K., & Moley, L. (2024, October). *Estimating Scenarios of BDM Biophysical Suitability: A GIS-Based MCE Analysis*. Kansas State University Research and the

State, Manhattan, KS.

Francois, J.[†]; Nelson, K. S. (2024, October). *Exploring Farmer Attributes for Sustainable Agricultural Practices*. Great Plains/Rocky Mountains Division of the American Association of Geographers (AAG) Annual Meeting, Orem, UT.

Kuck, S., S. Pratap, M. E. Mather, D. Oliver. K. Nelson, T. Moore, and O. Rode. 2024. *Extracting management and conservation insights from biodiversity monitoring data: Uncommon fish in Kansas*. Annual Kansas Cooperative Fish and Wildlife Research Unit Meeting. Manhattan, KS.

- 2023 **Chavez, D.[†]** & Nelson, K. (2023, November). *Assessment of Adaptive Capacity in Kansas: An uncertainty analysis*. Kansas Governor's Water Conference, Manhattan, KS.
- Madin, M.[†]** & Nelson, K. (2023, October). *Modeling Future Scenarios of Sustainable Agricultural Innovations Adoption: An MCE Analysis of Biodegradable Mulch Suitability*. Great Plains/Rocky Mountains Division of the American Association of Geographers (AAG) Annual Meeting, Sioux Falls, SD. (Best Poster Award.)
- Nelson, K.** (2023, October). *Uncertainty in landscape diversity measures arising from land use misclassification errors*. DA3 - Digital Ag & Advanced Analytics Symposium, Manhattan, KS.
- Chavez, D.[†]** & Nelson, K. (2023, March). *High resolution dasymetry of socio-demographic variables to better understand adaptive capacity in Kansas*. American Association of Geographers (AAG) Annual Conference, Denver, CO.
- Lopez, A., **Williams, S. Tasnim, M.**, Cheney, W., Hubbard, C., & Nelson, K. (2023, March). *Rural decline and renewal in Kansas*. American Association of Geographers (AAG) Annual Conference, Denver, CO.
- Rode, O.**, Reed, V., Mather, M., Moore, T., Nelson, K., Madin, M.[†], Francois, J.[†], & Krueger, L. (2023, February). *Hybrid Digital-Empirical Approaches Can Advance Sustainability of Aquatic Ecosystems: Merging GIS and Local Fish Habitat Data to Aid Watershed Conservation*. Kansas Natural Resources Conference, Manhattan, KS.
- 2022 **Madin, M.[†]** & Nelson, K.S. (2022, February). *Landscape diversity and sustainable agriculture production*. Annual Meeting of the American Association of Geographers (AAG), virtual.
- 2021 Chavez, D.R.[†] & **Nelson, K.S.** (2021, December). *Agricultural Community Adaptive Capacity in Kansas*. American Geophysical Union (AGU) Annual Meeting, New Orleans, LA. (virtual attendance)
- Ohja, S.[†]**, Francois, J.[†] and Nelson, K.S. (2021, September). *Rural Sustainability Methods, Drivers, and Outcomes: A Systematic Review*. Annual Meeting of the Great Plains/Rocky Mountain Division of the American Association of Geographers (AAG), Lincoln, NE.
- 2020 **Nelson, K.S.** (2020, March). *Reviewing the Structure and Function of Self-Described Living Labs*. Community Engagement Symposium – Student Success and the Public Good, Kansas State University, Manhattan, KS. (online only due to COVID)
- 2018 **Nelson, K. S.** (2018, December). *The Value of Flood Mitigating Ecosystem Services Provided by a Home Buyout Program*. American Geophysical Union (AGU) Annual Meeting, Washington D.C.

- 2017 **Burchfield, E.K.** & Nelson, K.S. (2017, July). *Using R-INLA to understand institutional moderators of drought*. useR! Conference, Brussels, Belgium.
- 2016 **Gillespie-Marthaler, L.** & Nelson, K. S. (2016, December). *Resilience, Sustainability, and Vulnerability: Multi-Scale, Dynamic Interactions within Complex Systems and an Integrative Assessment Method*. Society for Risk Analysis (SRA) Annual Meeting, San Diego, California.
- Gillespie-Marthaler, L. & **Nelson, K. S.** (2016, November). *Resilience, Sustainability, and Vulnerability: Multi-Scale, Dynamic Interactions within Complex Systems and an Integrative Assessment Method*. Association for Public Policy Analysis & Management (APPAM) 38th Annual Fall Research Conference, Washington D.C. (*Presented by Nelson.*)
- 2014 **Nelson, K. S.** (2014, February). *Environmental Justice Considerations Involving Rail Transport of Hazardous Materials*. Logistics, Trade and Transportation (LTT) Symposium, Gulfport, Mississippi.

Invited Presentations

- 2022 Nelson, K. S. (2022, November). *Landscape complexity, crop yields, and associated contextual factors in U.S. agriculture*. Geography & Atmospheric Science's Colloquium Series, University of Kansas.
- Nelson, K. S. (2022, September). *Landscape complexity, crop yields, and associated contextual factors in U.S. agriculture*. Plant Pathology Seminar Series, Kansas State University.
- 2021 Nelson, K. S. (2021, September). *Urban Flood Resilience: A look at the issues and paths forward*. Civil Engineering Graduate Seminar Invited Lecture Series, Kansas State University.
- 2020 Nelson, K. S. (2020, February). *Landscape Composition, Configuration, and US Crop Production*. Ecology and Evolutionary Biology (EEB) Seminar Series, Kansas State University.
- 2019 Nelson, K. S. (2019, March). *Costs and Benefits of Flood Adaptation Strategies in Nashville, TN*. Presentation at the Regional Conference of the American Planning Association, Manhattan, KS.
- 2018 Nelson, K. S. (2018, October). *Challenges in Adapting to Urban Flooding*. Natural Resources and Environmental Sciences (NRES) Seminar Series, Kansas State University.

FELLOWSHIPS & AWARDS

- 2024 Nominee for Outstanding Graduate Faculty Mentor, Kansas State University
- 2019 - 2020 Civic Engagement Fellow, Kansas State University
- 2015 - 2016 Oak Ridge Institute for Science and Education (ORISE) Graduate Research Fellowship, U.S. Army Corps of Engineers Research Participation Program, May 2015 – October 2016, \$60,000
- 2013 - 2018 Harold Stirling Vanderbilt Graduate Honor Fellowship, Vanderbilt University

2006 - 2008	National Science Foundation Graduate Teaching Fellow in K-12 Education, Washington University in St. Louis
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TEACHING

Courses Taught

2025	ENV_SC 4600W (MU): Sustainability Science Problem Solving (Writing Intensive) Upper-level undergraduate writing intensive, capstone course focused on application of systems thinking skills and frameworks to solving complex real-world issues.
2021, 2023	GEOG 833 (KSU): Seminar in Sustainability Science, Thought, and Approaches Upper-level graduate course on concepts, frameworks, and analytical approaches in sustainability science.
2020, 2022, 2024	GEOG 728 (KSU): Programming for Geospatial Analysis - R Upper-level cross-listed graduate and undergraduate course in use of R for spatial data analysis and modeling.
2019 - 2024	GEOG 360 (KSU): Sustainability Concepts and Issues Undergraduate introductory course in sustainability concepts and systems thinking. (Online and in-person)
2018 – 2019, 2022 – 2024	GEOG 508 (KSU): Introduction to Geographic Information Systems Cross-listed graduate and undergraduate course in application of GIS to problem solving. (Online and in-person)
2019, 2022	GEOG 821 (KSU): Research and Professional Development in Geography Master’s level introductory seminar on research methods and professionalization in Geography.

Additional Training

2025	Environmental Data Science Summit: The Future of AI in Conservation & Management, National Center for Ecological Analysis and Synthesis workshop and “unconference”.
2019 - 2020	Civic Engagement Fellow training program, Kansas State University
2017	Funded Participant, National Socio-Environmental Synthesis Center (SESYNC) Short Course “Teaching Socio-Environmental Synthesis with Case Studies”
2016	Certificate in College Teaching, Vanderbilt University Center for Teaching
2016	Assistant Instructor, Geospatial Technologies (K-12 teacher professional development), Metropolitan Nashville Public Schools
2013	Teaching Assistant, Introduction to Environmental Engineering (undergraduate lecture course), Department of Civil & Environmental Engineering, Vanderbilt University

2006 - 2008	National Science Foundation Graduate Teaching Fellow in K-12 Education (part-time co-teacher), Environmental Science, Gateway Middle School, St. Louis Public School District
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ADVISING, MENTORING & RESEARCH SUPERVISION

PhD Advisor

2022 – present	Denise Chavez Reyes (KSU), Charis Chiu (MU), Chunyun Tang (MU)
2021 – 2025	Michael Madin (KSU – Dissertation: “Modeling Future Scenarios of Sustainable Agricultural Innovations Adoption: An MCE Analysis of Biodegradable Mulch Suitability” , Currently a postdoc at Kansas State University)
2021 – 2025	Jean Ribert Francois (KSU – Dissertation: “Harvesting well-being: An exploration of community considerations in farming decisions across diverse social-ecological contexts”, Currently a postdoc at Auburn University)

Graduate Research Assistants

2025	Jean Ribert Francois (PhD-KSU), Michael Madin (PhD-KSU), Denise Chavez Reyes (PhD-KSU), Charis Chiu (PhD-MU), Garima Srivastava (PhD-MU), Chunyun Tang (MU)
2024	Jean Ribert Francois (PhD-KSU), Michael Madin (PhD-KSU), Denise Chavez Reyes (PhD-KSU), Amariah Fischer (PhD-KSU), Charis Chiu (PhD-MU), Aidan David – Pennington (MS-MU)
2023	Jean Ribert Francois (PhD), Michael Madin (PhD), Denise Chavez Reyes (PhD), Mobashsira Tasnim (MS), Amariah Fischer (PhD), Mostafa Sadeghnejad (PhD)
2022	Jean Ribert Francois (PhD), Michael Madin (PhD)
2021	Jean Ribert Francois (PhD), Dong Luo (PhD)
2019 – 2020	Michael Molloy (MS)

Undergraduate Research Assistants

2025	Carter Beck, Jared Smith
2024	Katie Janzen, Skyler Medlin, Garrett Splichal
2021 – 2022	Kevin Johnson
2019 – 2020	Colin Goodman
2018 – 2019	Travis Wiederstein, Katie Malhmeister

Graduate Student Committees

Current	Denise Chavez Reyes (KSU Geography – Co Chair, PhD), Shreya Ojha (KSU Geography, PhD), Nicole Kuchеров (KSU Entomology, PhD)
2025 Graduates	Jean Ribert Francois (PhD, KSU Geography – Co Chair), Michael Madin (PhD, KSU Geography – Co Chair)
2024 Graduates	Daniel Ornelas (Masters, Landscape Architecture), Amariah Fischer (PhD, Geography)
2023 Graduates	Nathan Brownstein (MS, Geography), Rintu Sen (MS, Biological & Agricultural Engineering), Sierrah Haas (MPH, Veterinary Medicine), Rebecca Lima (PhD, Geography), Victoria Reed (Biological & Agricultural Engineering), Zach Abell (Masters, Regional and Community Planning)
2022 Graduates	Huang Xing (MRCP, Landscape Architecture and Regional and Community Planning)
August 2025	Katherine S. Nelson CV, 13

2021 Graduates	Caleb Whitehouse (MRCP, Landscape Architecture and Regional and Community Planning)
2020 Graduates	Kristen Sikorsky (MS, Park Management and Conservation), Allyssa Gray (MRCP, Landscape Architecture and Regional and Community Planning)
2019 Graduates	Bryan Frenette (PhD, Biology)

SERVICE

Outreach

- 2024 Guest Speaker, MU-School of Natural Resources, Graduate Seminar.
- 2023 Participant in FEMA Risk Management Directorate's (RMD) Future of Flood Risk Data (FFRD) Initiative.
- 2021 Community Scientist, *Mitigating flood risk for small town economic and community development. Paxico, Kansas*. AGU Thriving Earth Exchange (volunteer community science projects to solve local challenges related to natural resources, climate change and natural hazards). <https://storymaps.arcgis.com/stories/e4cabd52b3f54511820e3d58b3cbe498>
- Co-organizer and speaker, *Wildcat Creek Panel Series: Know your Watershed, Support your Watershed, Love your Watershed, Sunday in the Stream!*, and *Water Fest*. Hosted by Prairiewood with support from Kansas State University Libraries and Kansas State University Department of Geography & Geospatial Sciences.
- 2020 Guest Speaker, *Interdisciplinary environmental science for sustainable agriculture and beyond*, KAWSE Career Chats, Kansas State University.
- Volunteer co-Presenter/Instructor, *Urban Development and Climate Change*. An interactive online workshop for middle school students, 2020 GROW/EXCITE Virtual Summer Workshop, KAWSE, Kansas State University.
- Guest Speaker, *The Academic Job Market, Job Talks, and Application Materials*. A discussion with the Rural Resources Resiliency NSF Research Training program fellows, Kansas State University.
- 2019 Guest Speaker, *Wildcat Creek Watershed as a Living Laboratory*. Presentation at the 14th Annual Sustainability Dialogue – 'Climate Change and Storm Water Management', Kansas State University.
- Guest Speaker, *What does a geographer do?* A discussion on interdisciplinary research and career paths, Kansas Louis Stokes Alliance for Minority Participation (KS-LAMP) Pathways to STEM summer research program.
- 2016 Volunteer Instructor, *Simplifying Complexity: The Wild World of Human-Environment Interactions*, Tennessee Women in Science, Technology, Engineering & Research (TWISTER) STEM conference for girls in 9th to 12th grades.

Professional and University Service

Journal Reviewer for: *One Earth*, *Methods in Ecology and Evolution*, *Global Change Biology*, *Housing and Policy Debate*, *Environmental Research: Climate*, *Geographical Review*, *Journal of Environmental Management*, *Frontiers in Sustainable Food Systems*, *Rural Sociology*, *Environmental Research Letters* ([IOP Trusted Reviewer](#)), *Sustainable Development*, *Global Environmental Change*, *Agricultural Systems*, *Journal of Rural Studies*, *Current Opinion in Environmental Sustainability*, *PLOS One*, *Water Resources Research*, *Sustainable and Resilient Infrastructure*, *Sustainability*, *Water*, *Urban Science*, *Cities*, *Applied Geography*, *Resources*, *Land*

Funding Agency Reviewer for: Kansas State University Small Research Grants Program, NSF Geography and Spatial Sciences Program, NSF Smart and Connected Communities, ORAU Ralph E. Powe Junior Faculty Enhancement Awards Program, NSF Human-Environment and Geographical Sciences, USDA-NIFA

Conference Sessions Chaired/Organized: *Agriculture* - 2018 Annual meeting of the Great Plains/Rocky Mountain Division of the American Association of Geographers (AAG), *Geographies of climate impacts* – 2018 AAG Annual Meeting, *Natural Resource Use and Management* - 2019 AAG Annual Meeting, *New perspectives on vulnerability to hazards* – 2021 AAG Annual Meeting, *Geographies of Sustainable Agricultural Transformation and Adaptation 1 & Geographies of Sustainable Agricultural Transformation and Adaptation 2 & New Perspectives on Agricultural Development* – 2023 AAG Annual Meeting, 7 GFASG-organized hybrid sessions – 2024 AAG Annual Meeting

Professional Association Leadership: Faculty board member at-large (conference organization sub-committee and awards sub-committee), *Geographies of Food and Agriculture Specialty Group* of the American Association of Geographers (GFASG-AAG) (2023-2025)

University Committees and Service: MU Research Council (2025-present), MU Universities Council on Water Resources (UCOWR) delegate (2025-present), Missouri Water Center Associate Director (2024-present), MU-SNR Sustainability Certificate Coordinator (2024-present), KSU Arts and Sciences Interim Associate/Assistant Dean of Research search committee (2022-2023), KSU Department of Geography & Geospatial Sciences Graduate Admissions and Awards committee (2021-2024), KSU – UCGIS delegate (2021-2024)

MEDIA/TRADE PUBLICATION COVERAGE

- 2022 Center for ESG Research: [Resilience? A comparative study of the policy responding to the COVID-19](#)
- 2021 Samachar Central: [Diverse landcover boosts yields for major U.S. crops, study finds](#)
Phys.org: [Diverse landcover boosts yields for major U.S. crops, study finds](#)
Futurity: [DIVERSITY MAY BOOST US WHEAT AND CORN CROP YIELDS BY 20%](#)
Mirage News: [Diverse landcover boosts yields for major U.S. crops, study finds](#)
Anthropocene Magazine: [First-of-its-kind study shows that diverse landscapes could boost US crop yields by 20%](#)
Agricultural Biodiversity Weblog: [Brainfood: Food system, Transformation of, Climate change effects on, Pandemic and, Future of, Effect of Green Revolution on, Mesoamerican CWR, Moroccan crop diversity, USA crop diversity, GM, Environmental behaviours](#)
NIFA UPDATE: [Diverse Landcover Boosts Yields for Major U.S. Crops](#)
Grist: [This Louisiana neighborhood is retreating in the face of climate change](#)
- 2020 Phys.org: [Study finds that proactive home buyouts provide financial benefits, reduce flood damage, and protect homeowners](#)

PROFESSIONAL AFFILIATIONS

Association of American Geographers (AAG)

American Geophysical Union (AGU)

TECHNICAL EXPERTISE

R (Statistical Programming Language)

ArcGIS

NetLogo