Lauryn Spearing, PhD

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EDUCATION

The University of Texas at Austin, Cockrell School of Engineering August 2021
Doctor of Philosophy in Civil Engineering
Specialization: Sustainable Systems, Water Resources Engineering, Construction Engineering & Project Management
Certificate in Engineering Education

The University of Texas at Austin, Cockrell School of Engineering December 2019
Masters of Science in Civil Engineering GPA: 4.0/4.0
Specialization: Sustainable Systems

The University of Texas at Austin, Cockrell School of Engineering May 2017
Bachelor of Science in Civil Engineering with High Honors GPA: 3.9/4.0
Business Foundations Certificate
Study Abroad, Freiburg, Germany

AWARDS & HONORS

- National Science Foundation Graduate Research Fellowship, 2018-2021
- MIT Civil and Environmental Engineering Rising Stars Program, 2021
- Editor's Choice Paper, Journal of Water Resources Planning and Management for Issue 147 (5), 2021
- Best Poster Competition, Engineering Project Organization Conference, 2020
- Bill Archer Graduate Policy Fellowship, 2019
- Texas National Security Network Fellowship, 2019
- Cockrell School Multi-Year Fellowship, 2018-2021

PUBLICATIONS

JOURNAL PAPERS (Published)

10. **Spearing, L.**, Bakchan, A., Hamlet, L., Stephens, K., Kaminsky, J., and Faust, K. (2022). "Comparing Qualitative Analysis Techniques for Construction Engineering and Management Research: The Case of Arctic Water Infrastructure." *Journal of Construction Engineering and Management Special Collection on Research Methodologies. 148* (7). https://ascelibrary.org/doi/epdf/10.1061/%28ASCE%29CO.1943-7862.0002313

9. Stephens, K., Powers, C., Robertson, B., **Spearing, L.**, Collier, J., Tich, K., and Smith, W.R. (2022). "Building More Resilient Communities: Communication and Organizing Practices in a Community-Wide Wildfire Evacuation Drill in the U.S." *Journal of Contingencies and Crisis Management.* http://doi.org/10.1111/1468-5973.12402

8. Tiedmann, H., **Spearing, L.**, Sela, L., Kaminsky, J., Katz, L., Kinney, K., Kirisits, M., and Faust, K. (2022). "Modeling in the COVID-19 Pandemic: Overcoming the Water Sector's Data Struggles to Realize the Potential of Hydraulic Models." *Journal of Water Resources Planning and Management, 148* (6). https://doi.org/10.1061/(ASCE)WR.1943-5452.0001561

7. Berglund, E. Z., Buchberger, S… **Spearing, L**…Yang, E. (2022). "Effects of the COVID-19 Pandemic on Water Utility Operations and Vulnerability." *Journal of Water Resources Planning and Management. 148* (6). https://doi.org/10.1061/(ASCE)WR.1943-5452.0001560

6. **Spearing, L.**, Tiedmann, H., Sela, L., Nagy, Z., Kaminsky, J., Katz, L., Kinney, K., Kirisits, M., and Faust, K. (2021). "Human-Infrastructure Interactions during the COVID-19 Pandemic: Understanding Water and Electricity Demand Profiles at the Building-Level." *Environmental Science and Technology Water. 1* (11). https://doi.org/10.1021/acsestwater.1c00176

5. Berglund, E. Z., Thelemaque, N., **Spearing, L.**, Faust, K. M.,… Kadinski, L. (2021). "Water and Wastewater Systems and Utilities: Challenges and Opportunities during the COVID-19 Pandemic." *Journal of Water Resources Planning and Management, 147* (5). https://doi.org/10.1061/(ASCE)WR.1943-5452.0001373 ***Editor's Choice, Issue 147(5)***

4. **Spearing, L.**, Stephens, K., and Faust, K. (2021). "Shelter Shopping: Where the Built Environment and Social Systems Meet." *International Journal of Disaster Risk Reduction, 58.* https://doi.org/10.1016/j.ijdrr.2021.102161

3. **Spearing, L.**, Thelemaque, N., Kaminsky, J., Katz, L., Kinney, K., Sela, L. and Faust, K. (2020). "Implications of Social Distancing Policies on Drinking Water Infrastructure: An Overview of the Challenges to and Responses of US Utilities during the COVID-19 Pandemic." *Environmental Science and Technology Water, 1.* https://doi.org/10.1021/acsestwater.0c00229

2. **Spearing, L.**, Dias, F., Faust, K., and Bhat, C. (2020). "Determining Multi-level Drivers of Perceiving Undesirable Taste and Odor in Tap Water: A Joint Modeling Approach." *Journal of Water Resources Planning and Management, 147* (3). https://doi.org/10.1061/(ASCE)WR.1943-5452.0001326

1. **Spearing, L.**, and Faust, K. (2020). "Cascading System Impacts of the 2018 Camp Fire in California: The Interdependent Provision of Infrastructure Services to Displaced Populations." *International Journal of Disaster Risk Reduction, 50.* https://doi.org/10.1016/j.ijdrr.2020.101822

JOURNAL PAPERS (Under Review)

4. **Spearing, L.**, Mehendale, P., Albertson, L., Kaminsky, J., and Faust, K. (202x). "Improving Water Infrastructure Systems in Alaska: Identifying Vulnerabilities at the Intersection of Social, Natural, and Physical Systems." (Under Review)

3. LaPatin, M., Poleacovschi, C., Nguyen, L., Barrens, S., **Spearing, L.**, Padgett-Walsh, K., Feinstein, S., Rutherford, C., Vaziri, B., and Faust, K. (202x). "Engineering in a Crisis: Observing Students' Attitudes of Macroethics During Pandemics and Natural Disasters." (Under Review)

2. Brown, M., **Spearing, L.**, Roy, A., Kaminsky, J., and Faust, K. (202x). "Drivers of Declining Water Access in Alaska." *Environmental Science and Technology Water*. (Under Review)

1. LaPatin, M., **Spearing, L.**, Tiedmann, H., Hacker, M., Kavvada, O., Giorda, M., Danielou, J., and Faust, K. (202x). "Controversy in Energy Construction Projects: How Social Systems Impact Project Performance." (Under Review)

JOURNAL PAPERS (In Progress)

5. **Spearing, L**., Faust, K. and Katz, L. (202x). "Achieving Pipe Parity by Considering Organizational Constraints: Understanding Sustainable Water Technology Adoption in the Chemical Industry." (In Progress)

4. LaPatin, M., Ritsch, N., **Spearing, L.**, Armanios, D., Pierce, S., and Faust, K. (202x). "Co-Designing more Effective Operations, Maintenance and Management of Water Infrastructure in the Arctic." (In Progress)

3. Thelemaque, N., **Spearing, L.**, Faust, K., and Kaminsky, J. (202x). "Vulnerabilities of Small and Medium Water Utilities during the COVID-19 Pandemic." (In Progress)

2. Tiedmann, H., **Spearing, L.**, Stephens, K., Castellanos, S., and Faust, K. (202x). "Implications of Water Utilities' Decision-Making in Response to Extreme Events." (In Progress)

1. LaPatin, M., **Spearing, L.**, Tiedmann, H., Hacker, M., Kavvada, O., Giorda, M., Danielou, J., and Faust, K. (202x). "Modeling the Costs of Social Controversy in Wind Energy Construction Projects." (In Progress)

CONFERENCE PROCEEDINGS (Peer-Reviewed)

9. **Spearing, L.**, Nweye, K., Tiedmann, H., Nagy, Z., Sela, L., and Faust, K. (2022). "Water Demand and Human Behavior during Compounding Disasters: The Case of Winter Storm Uri and the COVID-19 Pandemic." World Environmental and Water Resources Congress, Atlanta, Georgia, USA. (Accepted)

8. **Spearing, L.**, Thelemaque, N., Araya, F., Kaminsky, J., and Faust, K. (2022). "Connecting Pre-existing Characteristics of Water Utilities to Impacts during the COVID-19 Pandemic." Construction Research Congress, Arlington, Virginia, USA. https://doi.org/10.1061/9780784483954.026

7. Thelemaque, N., **Spearing, L.**, Faust, K. and Kaminsky, J. (2022). "Water Utilities and the COVID-19 Pandemic: A Review of Pandemic-Related Research." Construction Research Congress, Arlington, Virginia, USA. https://doi.org/10.1061/9780784483954.052

6. LaPatin, M., **Spearing, L.**, Tiedmann, H., Kavvada, O., Giorda, M., Daniélou, J., Hacker, M. and Faust, K. (2022). "A Framework for Measuring the Cost of Controversy Surrounding Energy Construction Projects." Construction Research Congress, Arlington, Virginia, USA. https://doi.org/10.1061/9780784483978.077

5. LaPatin, M., **Spearing, L.**, Tiedmann, H., Kavvada, O., Giorda, M., Daniélou, J., Hacker, M. and Faust, K. (2021). "Why Do Energy Projects Fail? Understanding How Controversy Impacts Construction Projects." Int. Construction Specialty Conference, Virtual.

4. **Spearing L.,** Osman, K., Faust, K.M., and Armanios, D. (2020). "Systems Vary, Affordability Should Not: Trends of Water Sector Affordability Based on City Attributes." Construction Research Congress, Tempe, Arizona, USA.

3. Stephens, K. K., Powers, C. J., **Spearing, L.**, Collier, J., Tich, K., & Robertson, B.W. (2020). "Building more resilient communities: Communication and organizing practices in disaster preparedness." Int. Communication Association (ICA) Conference, Gold Coast, Australia.

2. Araya, F., Osman, K., **Spearing, L.**, and Faust, K.M. (2019). "Assessing the Influence of Household Characteristics on Water Conservation Behaviors in Austin, Texas." Int. Construction Specialty Conference, Montreal, Quebec, Canada.

1. Faure, J., Faust, K., Khwaja, N., O'Brien, W., Hale, W., **Spearing, L.** (2019). "Construction Engineering and Inspection (CE&I) Costs in the Texas Department of Transportation." Int. Construction Specialty Conference, Montreal, Quebec, Canada.

PRESENTATIONS*

**bold indicates presenting author*

CONFERENCES

Spearing, L., Thelemaque, N., Araya, F., Kaminsky, J., and Faust, K. "Connecting Pre-existing Characteristics of Water Utilities to Impacts during the COVID-19 Pandemic." Construction Research Congress, Arlington, Virginia, USA. March 12, 2022.

Nikki, R., Spearing, L., and **Osman, K.** "Panel: COVID, Water Infrastructure, and Equity" International Symposium on Sustainable Systems and Technology (ISSST). June 22, 2021.

Araya, F., **Osman, K., Spearing, L**., and Faust, K. "Assessing the Influence of Household Characteristics on Water Conservation Behaviors in Austin, Texas" Int. Construction Specialty Conference, Montreal, Quebec, Canada, June 14, 2019.

Faure, J., Faust, K., Khwaja, N., O'Brien, W., Hale, W., **Spearing, L.** "Construction Engineering and Inspection (CE&I) Costs in the Texas Department of Transportation" Int. Construction Specialty Conference, Montreal, Quebec, Canada, June 14, 2019.

POSTERS

Spearing, L. Thelemaque, N., Kaminsky, J., Katz, L., Kinney, K., Kiristis, M., Sela, L., and Faust, K. "Understanding How Social Distancing has Impacted US Water Utilities during the COVID-19 Pandemic" Engineering Project Organization Conference. October 22, 2020. ****Winner of the poster competition***

Spearing, L., Thelemaque, N., Tiedmann, H., Landsman, M., Palmer, E., Jarma, D., and **Kong, E.** "Implications of Social Distancing Policies on Municipal Water Quality." The University of Texas COVID-19 Conference. November 11, 2020.

OTHER PRESENTATIONS

Spearing, L. "Cascading Impacts of COVID-19 on Water Infrastructure Systems." Texas Water Research Network Invited Speaker. May 19, 2021.

Spearing, L. "The Cascading Impacts of Disasters: How Disaster-Induced Population Changes Impact Cities." The George Washington University Engineering Management and Systems Engineering Invited Seminar Series. November 13, 2020.

Spearing, L. and **Kong, E.** "Social Distancing and Water Infrastructure." Capital Area American Water Works Association. August 21, 2020.

Spearing, L., and **Saindon, K.** "Public Perceptions of Drinking Water in Mexico City" National Autonomous University of Mexico: Water for Everyone Workshop, Mexico City, Mexico, March 29, 2019.

FUNDED RESEARCH

GRANT WRITING EXPERIENCE

- Capturing Indigenous Knowledge to Co-Design more Effective Operations, Maintenance and Management of Water Infrastructure in the Arctic *(Successfully Funded; NSF Award #2127353*)
- NSF Graduate Research Fellowship Program *(Successfully Funded; NSF Award #DGE-1610403*)
- Recognizing and Retaining Beneficial Changes from the Pandemic on the Workforce *(Construction Industry Institute)*

SPONSORED PROJECTS

**Managed these projects from Aug 2021-Dec 2021 while the lead PI was on family leave*

- NSF Award # 2022666: Collaborative Research: Water Infrastructure in the Arctic: Vulnerabilities at the Intersection of Social, Natural and Physical Systems *(2020- Present)* *
- NSF Award #2127353: Capturing Indigenous Knowledge to Co-Design more Effective Operations, Maintenance and Management of Water Infrastructure in the Arctic *(2021- Present)* *
- NSF Award #1926330: Institutions in Student Organizations: Cultivating Cultures of Ethical Engineering *(2021-Present)* *
- NSF Award #DGE-1610403: Graduate Research Fellowship *(2018-2021)*
- NSF Award # 2032434: Implications of Social Distancing Policies on Water Infrastructure *(2020- 2021)*
- ENGIE Lab GRIDEN: The Cost of Controversy on a Project: Incorporating Valid Stakeholders Throughout Project Lifecycles *(2020-2021)*

TEACHING AND MENTORING EXPERIENCE

MENTORING SUPERVISION

Graduate Students

- LaPatin, Michaela, 2021-2022: Ethics in Engineering Education
- Brown, Meredith, 2021-2022: Understanding Water Access Decline in Alaska
- Tiedmann, Helena, 2021-2022: The Cost of Controversy in Energy Projects
- Tariq, Miriam, 2022: Improving Water Operations in Rural Alaska

Undergraduate Students

- Powell, Cassidy, 2019-2021: Reconciling Spatial Inequity within Centralized Water Infrastructure Systems
- Mehendale, Prachi, 2021-2022: Water Infrastructure Vulnerabilities in Alaska
- Verses, Liam, 2021-2022: Water Infrastructure Vulnerabilities in Alaska
- Shah, Sahil, 2020: Social Distancing and Water Infrastructure
- O'Hanlon, Cristina, 2020: Shelter Shopping: Understanding Shelter Occupancy Throughout Displacement (Graduates Linked with Undergraduates in Engineering Program)

TEACHING EXPERIENCE AND TRAINING

- Graduate Certificate in Engineering Education
- Spring 2022: CE 395R Methods for Project Analysis – Designed and taught qualitative methods module, including a homework assignment and test questions, UT Austin
- Spring 2019- Spring 2021: ARE323K Project Management and Economics – Guest lecturer in over five class sessions, including a supervised teaching practicum, UT Austin
- Spring 2016: CE 311S Engineering Statistics Course – Class Tutor (with office hours), UT Austin

RESEARCH EXPERIENCE

The University of Texas at Austin – Austin, Texas September 2021 –Present
Postdoctoral Researcher, Supervisors: Dr. Lynn Katz and Dr. Kasey Faust

- Manage two NSF funded research projects while the PI is on family leave, ensuring milestones are met
- Support, mentor, and train graduate and undergraduate students simultaneously
- Use interdependency analyses to understand sociotechnical water infrastructure challenges in rural Alaska
- Study the interface between organizational and technical systems in the chemical industry during water technology adoption to achieve pipe parity

National Science Foundation – Austin, Texas August 2018 – August 2021
The University of Texas at Austin
Graduate Research Fellow, Supervisor: Dr. Kasey Faust
Dissertation: The Cascading Impacts of Disasters: How Disaster-Induced Population Changes Impact Water Infrastructure Systems and the Built Environment (completed August 2021)
Master's Thesis: Determining Multi-level Drivers of Perceiving Undesirable Taste and Odor in Tap Water: A Joint Modeling Approach (completed December 2019)

- Researched infrastructure management under population dynamics uncertainty
- Performed mixed methods research, including content analysis, econometric modeling, and systems modeling, to understand how to improve the level of service users receive from their water systems
- Analyzed changes in water and electricity demand profiles in Austin, Texas during the COVID-19 pandemic
- Studied water utilities' experiences during COVID-19 through qualitative content analysis of interviews
- Investigated the provision of shelter and other critical infrastructure services to people displaced by the Camp Fire in California through semi-structured interviews with stakeholders and analysis of shelter demand data

Bill Archer Fellowship Program – Washington, D.C. May 2019 – August 2019
The University of Texas System
Graduate Fellow

- Competitively selected as one of forty University of Texas System students for a Washington, D.C., internship and academic fellowship program
- Developed a policy brief about funding for water utilities in areas that receive people displaced by disasters
- Workshopped the brief with employees in Congress and executive organizations which led to a bill being drafted by the Senate Committee on the Environment and Public Works
- A bill, S.3590 - Drinking Water Infrastructure Act of 2020, including my policy recommendation to provide federal funding for water utilities in hosting cities was introduced in Congress

Center for Transportation Research – Austin, Texas February 2016 – April 2017
The University of Texas at Austin
Undergraduate Research Assistant, Supervisor: Dr. Chandra Bhat

- Conducted research on how autonomous vehicles interact with infrastructure
- Employed ArcMap and Texas Department of Transportation (TxDOT) data to help develop a program that optimized the transportation of windmills across Texas while complying with regulations

PROFESSIONAL EXPERIENCE

Center for Strategic & International Studies – Washington, D.C. June 2019 – July 2019
Research Intern

- Led the research and design of a policy brief about innovative water management technologies, such as artificial intelligence, aimed to reduce water loss in light of increased water scarcity issues
- Collaborated with international security experts on a project about misinformation in the judicial system
- Provided technical support on a research report about the inland waterways system in the United States

Huitt-Zollars – Dallas, TX June 2017 – June 2018
Roadway Engineer

- Collaborated with a team to engineer roadway designs, consisting of alignments, profiles, and project layouts
- Developed detailed project plans with Microstation and generated submittals for the client
- Created and managed budgets and schedules for large roadway projects
- Facilitated public meetings, fielding questions and concerns about projects to set expectations for the public

Jones and Carter – Austin, TX June 2016 – August 2016
Land Development Engineering Intern

- Drafted pond layouts, drainage maps, and preliminary plans in AutoCAD for multiple projects
- Collaborated with a site development team to prepare submittals for site plans and subdivision applications

Tenaris – Bay City, TX June 2015 – July 2015
Assistant Project Manager/Estimator

- Coordinated with vendors to order materials during the construction of a seamless piping plant

SERVICE AND LEADERSHIP

Projects with Underserved Communities – Austin, TX September 2021 – Present
Alumni Advisor

- Advise undergraduate teams as they design and plan international service projects
- Participate in panel sessions to provide advice about project planning and implementation

Ann Richards School for Young Women – Austin, TX January 2019
Guest Speaker

- Spoke to the 8th grade students about research on water conservation and discussed my experiences in engineering to encourage young women to pursue STEM fields
- Assisted students with their project about water sustainability in Texas through group discussions

Total City Sports Volleyball – Austin, TX October 2019
Volunteer Coach

- Coached financially accessible volleyball workshops for 2^{nd}-6^{th} grade girls
- Led drills and taught volleyball techniques through step-by-step demonstrations

Projects with Underserved Communities – Tamil Nadu, India August 2015 – June 2016
Scheduling Manager

- Designed a community center for women and children in a rural village in southern India
- Spent five weeks on-site facilitating the building construction
- Oversaw the schedule of design and construction in Microsoft Project to ensure the project stayed on time
- Corresponded with community members about details of the project during the design phase and on-site