CURRICULUM VITAE

Lily L. Kraft
Department of Civil and Environmental Engineering
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Summary

Doctoral candidate with experience in research concerning the intersection of hydrology and socioeconomics in relation to flood insurance and the development of spatial statistical model frameworks to quantify flood losses. Additional experience investigating historically under-served communities and their risk factors for flood losses. Strong skills in both qualitative and quantitative research methods concerning flood insurance, natural hazards, and policy. Passionate about bridging the communication and research gap between hydrologic engineering, insurance and other climate resiliency measures, and communities. Committed to developing and expanding mutually beneficial and fruitful collaborations between the scientific community, policymakers, and stakeholders.

Education

December 2024 **PhD in Water Resources Engineering, University of Iowa**
Graduate Research Fellow at IIHR – Hydroscience and Engineering
Research Area: Socio-economic impacts of flooding, statistical modeling of flood losses, flood insurance and recovery
Advisor: Gabriele Villarini, Princeton University
Thesis: Investigating the Intersection of Hydrology and Socioeconomics Through Insured Flood Losses
GPA: 3.96/4.0

2021 **MS in Civil Engineering, University of Wisconsin – Madison**
Advisor: Paul Block
Committee: Paul Block, Elizabeth Maroon, Daniel Wright
Thesis: **Development and Application of Statistical Seasonal Forecasts for Reservoir Optimization in the Tekezé Basin, Ethiopia**

2019 **BS in Mechanical Engineering, Michigan Technological University**
Spanish Minor
NCAA DII Athlete: Nordic skiing, cross country, track and field

Research Experience

2021-Present ***Doctoral Level Research Fellow***, University of Iowa, Iowa City, IA

- Developed spatial statistical modeling frameworks of insured flood losses to various communities, conditioned on key hydrologic and socio-economic indicators.
- Evaluated the effect of high-resolution hydrologic models on statistical flood loss model skill.
- Investigated the potential changes in future insured flood losses under climate change and population growth for Houston, Texas.

- Assessed the intersection between climatological and economic factors associated with the 2019 Midwest flood event.
- Performed a national assessment of past flood losses to Native American communities and their participation in the National Flood Insurance Program.
- Collected a database of information regarding the Hazard Mitigation Plans of over 60 federally recognized Native American Tribes.

2019-2021 ***Master Level Research Assistant***, University of Wisconsin-Madison, Madison, WI

- Developed statistical seasonal forecasts of precipitation and streamflow based on El Niño Southern Oscillation for the Tekezé Basin, Ethiopia.
- Created reservoir models representative of the Tekezé Dam.
- Performed reservoir optimization based on developed forecasts to maximize seasonal hydropower output and minimize dry conditions.

2018-2019 ***Undergraduate Research Assistant***, Michigan Technological University, Houghton, MI

- Generated 3-D mesh networks for hydrodynamic modeling of Lake Superior.
- Performed analysis on reservoir elevation in relation to energy consumption for water distribution systems in rural, international communities.
- Assisted in graduate student manuscript editing for hydrodynamic research.

Relevant Software Experience

- Extensive experience with R, particularly statistical modeling
- Programming experience in Python, Matlab, Javascript
- Proficient in QGIS and ArcGIS
- Experience with HEC-HMS and HEC-RAS
- Basic knowledge of HTML, PHP, and PostgreSQL
- Basic knowledge of WRF-Hydro
- Proficient in Microsoft Excel, Word, Powerpoint

Grants and Awards

2023 **Graduate Engagement Corps Fellowship** – University of Iowa.

- Attended workshops and collaborated with community educators to conduct equitable, community-based research initiatives.

2021 **Iowa Recruitment Fellowship**– University of Iowa.

Peer-Reviewed Publications

In Review or In Revision:

2024 Kraft, L., Villarini, G., Janssen, B., A National Assessment of Federally Recognized Tribes' Participation in the National Flood Insurance Program (*Working Title), TBD*.

2023 **Kraft, L.**, Villarini, G., Czajkowski, J., Zimmerman, D., Amorim, R., Developing a Spatial Regression Model Framework for Insured Flood Losses in Houston, Texas, *Nature Sustainability.* (Submitted).

Published:

2023 **Kraft, L.**, Villarini, G., Czajkowski, J., Characterizing the 2019 Midwest Flood: A Hydrologic and Socio-economic Perspective, *Weather, Climate, and Society.*

2020 **Kraft, L.**, Barkdoll, B., Effects of reservoir elevation on energy consumption in water distribution systems, *Urban Water Journal*

Conference Presentations

2023 **Kraft, L.**, Villarini, G., Czajkowski, J., Zimmerman, D., Amorim, R., *Developing a Spatial Regression Model Framework for Insured Flood Losses in Houston, Texas.* American Geophysical Union, San Francisco, California, USA

2022 **Kraft, L.**, Villarini, G., Czajkowski, J., *Characterizing the 2019 Midwest Flood: A Hydrologic and Socio-Economic Perspective,* American Geophysical Union, Chicago, Illinois, USA

2021 **Kraft, L.**, Block, P. (June 7–11), *Development and Application of Statistical Seasonal Forecasts for Reservoir Optimization in the Tekezé Basin, Ethiopia.* Environmental and Water Resources Congress (EWRI), Virtual event, USA

Invited Talks

Jan. 2024 **Iowa Flood Center Meeting,** *"Flood losses within Tribal Communities".* Presentation. IIHR, Iowa City, IA

Jul. 2023 **Iowa Flood Center Meeting,** *"Developing a statistical modeling framework for insured flood losses in Houston, Texas".* Presentation. IIHR, Iowa City, IA

Apr. 2022 **Iowa State Legislature,** *"Characterizing the 2019 Iowa Flood".* Poster Session. Iowa Legislative Breakfast, Des Moines, IA

Apr. 2022 **Iowa Flood Center Meeting,** *"Characterizing the 2019 Midwest Flood: A Hydrologic and Socio-Economic Perspective".* Presentation. IIHR, Iowa City, IA

Teaching Experience

University of Iowa, Department of Educational Psychology, Iowa City, IA
S 2024 Graduate Teaching Practicum

University of Wisconsin-Madison, Department of Mechanical Engineering, Madison, WI
S 2021 Teaching Assistant, ME231 Geometric Modeling
F 2020 Teaching Assistant, ME231 Geometric Modeling
S 2020 Teaching Assistant, ME370 Energy Systems Laboratory

Michigan Technological University, Department of Physiology, Houghton, MI
S 2017 Teaching Assistant, Introduction to Nordic Skiing

Synergistic Activities

- **(2021-2024)** Providing community education on flood risk and the ongoing work of the Iowa Flood Center at various public events
- **(2023)** Served as the graduate student representative for the University of Iowa Civil Engineering Faculty Hiring Committee
- **(2022-2023)** Represented STEM graduate students in the University of Iowa Graduate and Professional Student Government
- **(2022-2023)** Served as treasurer for the University of Iowa Graduate Student Senate
- **(2021)** Organized and lead workshops on gender equity in academia (interactive event for graduate students)