

Matthew Preisser

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EDUCATION

University of Texas at Austin

Aug. 2018 – May 2025

- PhD, Civil Engineering: March 2025 Defense, May 2025 Graduation
- *Dissertation: Description, prediction, & prescription of compounding hazards on society*
- Master's Degree, Environmental and Water Resource Engineering: Dec. 2021
- Master's Degree, Public Affairs: Dec. 2021
- *Thesis: Intersecting near real-time fluvial and pluvial inundation estimates with sociodemographic vulnerability to quantify a household flood impact index*

Auburn University

Aug. 2014 – May 2018

- Bachelor's Degree, Biosystems Engineering, minors in Sustainability Studies & German: May 2018
- *Thesis: Anaerobic digestion of food waste and poultry litter for biogas production*
- Alabama Society of Professional Engineers Outstanding Student of the Year (2018)
- Auburn University Biosystems Engineering Outstanding Student of the Year (2018)

PROFESSIONAL APPOINTMENTS

Postdoctoral Researcher

Aug. 2025 - Present

Department of Civil, Environmental and Geomatic Engineering

ETH Zurich

- Advisor: Dr. Paola Passalacqua

Graduate Research Assistant

Aug. 2018 – May 2025

Maseeh Dept. of Civil, Architectural and Environmental Engineering *University of Texas at Austin*

- Advisor: Dr. Paola Passalacqua
- Committee: Dr. R. Patrick Bixler, Dr. Matt Bartos, & Dr. Stephen Boyles
- Primary Funding: NSF GRFP, NASA FINESST
- Research Collaborations, DoE SETx-IUFL, PlanetTexas2050, & NASA ATX Climate Atlas

GIS Research Analyst

Jun. 2018 – Aug. 2018

NASA DEVELOP

Marshall Space Flight Center

- Advisors: Dr. Jeffrey Luvall & Dr. Robert Griffin
- *Assessing Water Quality in Thailand's Chao Phraya Watershed by Modeling Sediment Conc.*
- Primary Funding: NASA DEVELOP and SSAI

Undergraduate Research Fellow

Jan. 2017 – May 2018

Department of Biosystems Engineering

Auburn University

- Advisor: Dr. Brendan Higgins
- *Waste products for algae and biogas and sustainable energy production*
- Primary Funding: Auburn University Honors College

UNDER REVIEW AND IN PREPARATION PUBLICATIONS

2. **Preisser, M.** and Passalacqua, P. (2026). Socio-Hydrology Modeling Captures How Inequalities Impact Community Flood Resilience. *Water Resources Research* (Under Review).
1. Rosenheim, N., Mezei, L., **Preisser, M.**, Brelsford, C., Bixler, R. P., Meyer, F., and Passalacqua, P. (2026). Social Vulnerability Indices: Exploring Assumptions and Limitations. *Global Environmental Change* (Under Review).

PEER REVIEWED PUBLICATIONS

6. **Preisser, M.** and Passalacqua, P. (2025). Remote Sensing Improves Multi-Hazard Flooding and Extreme Heat Detection by Fivefold Over Current Estimates. *AGU Advances* 6.2, AV001667. DOI: 10.1029/2025AV001667.
5. Bixler, R. P., Paul, S., Bhakta, D., Farchy, T., Olson, J., **Preisser, M.**, and Passalacqua, P. (2023). Adaptive Governance for Disaster Risk Reduction. *Handbook on Adaptive Governance*. Edward Elgar Publishing, pp. 233–251. ISBN: 978-1-80088-824-1. DOI: 10.4337/9781800888241.00026.
4. **Preisser, M.**, Passalacqua, P., Bixler, R. P., and Boyles, S. (2023). A Network-Based Analysis of Critical Resource Accessibility during Floods. *Frontiers in Water* 5. DOI: 10.3389/frwa.2023.1278205.
3. **Preisser, M.**, Passalacqua, P., Bixler, R. P., and Hofmann, J. (2022). Intersecting Near-Real Time Fluvial and Pluvial Inundation Estimates with Sociodemographic Vulnerability to Quantify a Household Flood Impact Index. *Hydrology and Earth System Sciences* 26.15, pp. 3941–3964. DOI: 10.5194/hess-26-3941-2022.
2. Bixler, R. P., Paul, S., Jones, J., **Preisser, M.**, and Passalacqua, P. (2021). Unpacking Adaptive Capacity to Flooding in Urban Environments: Social Capital, Social Vulnerability, and Risk Perception. *Frontiers in Water* 3. DOI: 10.3389/frwa.2021.728730.
1. Chaump, K., **Preisser, M.**, Shanmugam, S. R., Prasad, R., Adhikari, S., and Higgins, B. (2019). Leaching and Anaerobic Digestion of Poultry Litter for Biogas Production and Nutrient Transformation. *Waste Management* 84, pp. 413–422. DOI: 10.1016/j.wasman.2018.11.024.

SOFTWARE PACKAGES

- SVInsight** | *Open-source tool for estimating social vulnerability indices* [Github: v1.1.2](#)
- pygeoflood** | *Near-real-time tool for estimating fluvial, pluvial, and coastal flooding* [Github: Beta](#)

GRANTS AND FELLOWSHIPS

Total Grants and Fellowships Received (2018-Present): \$274,750

7. Consortium of Universities for the Advancement of Hydrologic Science Hydroinformatics Fellow
 - *Building out a near-real-time compound inundation python package*
 - Team: Dr. Paola Passalacqua and Mark Wang
 - Obligated Funding: \$5,000 total, \$2,500 to Preisser
 - Period: April 2024 – Feb. 2025
6. NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST) Fellow
 - *Application of Earth Observation Data in Multi-Layer Network Analysis of Flood Hazards, Social Vulnerability, and Risk*
 - Advisor: Dr. Paola Passalacqua
 - Obligated Funding: \$100,000
 - Period: Aug. 2022 – Sept. 2024
5. National Science Foundation Graduate Research Internship Program (GRIP) Fellow
 - *USGS National Land Imaging Program Public Affairs and Science Communication Internship*

- Mentor: Timothy Stryker
 - Obligated Funding: \$5,000
 - Period: Sept. 2019 – Aug. 2022
4. National Science Foundation Graduate Research Fellow (NSF-GRFP)
 - *Incorporating flood mapping with social disparities to identify at risk communities during extreme weather events*
 - Advisor: Dr. Paola Passalacqua
 - Obligated Funding: \$150,000
 - Period: May 2020 – Aug. 2020
 3. Strauss Center’s Brumley Next Generation Fellowship
 - *Visualizing climate change threats in relationship to power generation capabilities in India*
 - Mentor: Dr. Joshua Busby
 - Obligated Funding: \$5,000
 - Period: Sept. 2019 – May 2020
 2. Supplemental Professional Development and Travel Grants
 - UT Civil, Architectural, and Environmental Engineering Kolodzey Travel Grant: \$1,000
 - UT Division of Diversity and Engagement Professional Development Award (2023): \$250
 - UT Dean’s Prestigious Supplement Fellowship (2019-2023): \$11,000
 1. Pre-2018 Academic Scholarships
 - Birdsong Endowed Engineering Scholarship (2017)
 - Fred A. Kummer Endowed Scholarship (2015)
 - Hop King Endowed Scholarship (2015)
 - Auburn University Presidential Academic Scholarship (2014-2018)

HONORS AND AWARDS

- Civil Engineering Symposium 2nd Place Poster (2021)
- Patagonia Sustainability Case Competition International Top 10 Finalist (2019)
- Auburn University Biosystems Engineering Outstanding Student of the Year (2018)
- Alabama Society of Professional Engineers Outstanding Student of the Year (2018)
- Inducted into Phi Beta Kappa Society (2018)
- Mark A. Spencer Creative Mentorship Award (2018)
- Semi-Finalist for the Fulbright Scholarship (2018)
- ReNUWIt Best Overall Research Poster (2017)
- Nominated for the Truman and Udall Scholarships (2017)
- Inducted into Tau Beta Pi Honor Society (2016)

PROFESSIONAL SERVICE AND VOLUNTEERING

Journal Reviews

Frontiers in Water, Hydrological Processes, International Journal of Urban Sustainable Development, International Journal of Digital Earth, International Journal of Disaster Risk Reduction, Journal of Infrastructure Systems, Risk Analysis.

AGU Outstanding Presenters Advisory Group <i>Representative, advisory group for student & early career presenter award program</i>	Mar. 2026 – Present
AGU Council <i>Elected representative, advising leadership committee on scientific affairs</i>	Jan. 2023 – Present
AGU H3S Committee <i>Treasurer of Hydrology Section Student Subcommittee</i>	Jan. 2022 – Dec. 2024
AGU Thriving Earth Exchange Community Science Fellowship <i>Coordinated a team of volunteers to address flood and lead related issues</i>	Mar. 2021 – Mar. 2022
NASA DEVELOP Ambassador <i>Program ambassador corps representative</i>	Aug. 2018 – May 2019

MENTORING EXPERIENCE

Graduate Students

- Alessandro Derighetti, Master's Thesis, Civil and Environmental Engineering, 2026
 - * *Understanding the role of spatial rainfall patterns on streamflow generation in the Swiss Alps*
 - * Co-advisor: Dr. Harsh Beria

Undergraduate Students

- Thomas Rüegg, Bachelors of Civil Engineering, Bachelor's Thesis, ETH Zürich, 2026
- Sahara Tassin, UT Austin Environmental Science Institute REU 2024
- Bailey Hardage, NASA ATX Climate Atlas Program UT Austin, Sept. 2023 – May 2024

INVITED PRESENTATIONS

2. Passalacqua, P., **Preisser, M.**, and Wang, M. "Acute on Chronic Stressors in Communities: When Flooding Is Not the Only Issue" – AGU Annual Meeting, NH23A-2272, Dec. 2024. (Oral).
1. Passalacqua, P., **Preisser, M.**, Wang, M., Bixler, P., Hooks, A., Hofmann, J., Haselbach, L., Moftakhari, H., Evans, H., Thies, C., and Maidment, D. "Preparing for Future Floods: Leveraging Remotely Sensed Data, Modeling, and Social Science Information in a Multilayer Network Approach" – AGU Annual Meeting, H46D-01, Dec. 2022. (Oral).

PRESENTATIONS

16. **Preisser, M.** and Passalacqua, P. "Adaptive Capacity Disparities: Capturing Resiliency Inequalities in Socio-Hydrological Systems" – AGU Annual Meeting, GC079, Dec. 2025. (Poster).
15. **Preisser, M.** and Passalacqua, P. "Remote sensing improves multi-hazard flooding and extreme heat detection by fivefold over current estimates" – AGU Annual Meeting, NH011, Dec. 2025. (Oral).
14. **Preisser, M.** and Passalacqua, P. "The Compounding Impacts of Hydro-Meteorological Hazards on Society" – ZHydro, ETH Zurich, Zurich, Switzerland, Nov. 2025. (Oral).
13. **Preisser, M.** and Passalacqua, P. "Missing Hazards: Improving detection and delineation methods of multi-hazard events and assessing their impact on vulnerable populations" – AGU Annual Meeting, GC31V-0118, Dec. 2024. (Poster).
12. Wang M. **Preisser, M.** and Passalacqua, P. "Near Real-Time Compound Flood Inundation Python Package" – AGU Annual Meeting, NH41D-2342, Dec. 2024. (Poster).

11. **Preisser, M.**, Passalacqua, P., and Bixler, P. “A network-based disaster resilience metric for estimating individuals’ loss of access to critical resources during flooding” – EGU Annual Meeting, Vienna, Austria, Apr. 2023. (Oral).
10. **Preisser, M.**, Passalacqua, P., Bixler, P., Kamath, H., and D., N. “Multiple hazards from multiple satellites: Analyzing exposure to cascading hazards using daily Earth observation data from the past decade” – AGU Annual Meeting, NH33D-0822, Dec. 2023. (Poster).
9. Karimaghaei, S., Passalacqua, P., **Preisser, M.**, and Bixler, P. “Identifying Morphological Hot Spots and Social Vulnerabilities along the Gulf Coast using Remote Sensing” – AGU Annual Meeting, EP15B-1087, Dec. 2022. (Poster).
8. **Preisser, M.**, Passalacqua, P., and Bixler, P. “Helping Those Who Need It Most: Open Access Tool for Modeling Flood Hazards and Community Adaptive Capacity in Near-Real Time” – AGU Annual Meeting, H55M-0745, Dec. 2022. (Poster).
7. **Preisser, M.**, Passalacqua, P., and Bixler, P. “Interconnecting Networks of Social Vulnerability, Resource Access, and High-Resolution Inundation to Quantify Household Flood Impact” – AGU Annual Meeting, H55V-0993, Dec. 2021. (Poster).
6. Newman, T., Wu, Z., Reed, B., Stryker, T., and **Preisser, M.** “Assessing COVID-19 environmental impacts through remote sensing” – AGU Annual Meeting, U012-05, Dec. 2020. (Oral).
5. **Preisser, M.**, Moler, N., Benedict, K., Shapiro, C., Straub, C., and Stryker, T. “Expanding the Societal Benefits of Earth Observations through Leading Practices for Public Private Partnerships” – AGU Annual Meeting, SY003-0002, Dec. 2020. (Poster).
4. **Preisser, M.**, Passalacqua, P., and Bixler, P. “A Multiplex approach to integrate social vulnerability into urban flood mapping” – AGU Annual Meeting, H139-0015A, Dec. 2020. (Poster).
3. Garcia, K., **Preisser, M.**, and Nauman, C. “Assessing Water Quality in Thailand’s Chao Phraya Watershed by Modeling Sediment Concentration and Urban Footprint” – AAG Annual Meeting, Washington DC, Apr. 2019. (Poster).
2. Garcia, K., **Preisser, M.**, and Nauman, C. “Assessing Water Quality in Thailand’s Chao Phraya Watershed by Modeling Sediment Concentration and Urban Footprint” – Wernher von Braun Memorial Symposium, University of Huntsville, Apr. 2019. (Poster).
1. **Preisser, M.** and Higgins, B. “Anaerobic digestion of poultry litter and food waste for biogas production” – National Conference of Undergraduate Research, University of Oklahoma, Apr. 2019. (Poster).

CONVENED SESSIONS AND TOWN HALLS

7. Patterson, E., Akerele, A., Fields, M., Ellis, E., Roy, T., and **Preisser, M.** “Epic Fails and Bumpy Trails: Owning and Learning from the Messy Side of Geoscience”, H12I, 2025.
6. **Preisser, M.** and Miralha, L. “Hydrology Student, Postdoc, and Early Career Flash Talk Geoburst Session” – American Geophysical Union Annual Meeting, H12I, 2025.
5. Miralha, L., Peterson, D., **Preisser, M.**, Akerele, A., Che, Y., and Lerbeck, J. “Intersections in Science Roundtable: Building Cross-Disciplinary Connections for Early Career Researchers” – American Geophysical Union Annual Meeting, AGU Learning Session, 2024.
4. Ellis, E., Becker, P., Price, A., and **Preisser, M.** “Communicating Science Beyond the Paper: Thinking Outside the Boxplot” – American Geophysical Union Annual Meeting, INV13A, 2023.

3. Peterson, D., Miralha, L., Lerbeck, J., **Preisser, M.**, and Allen, J.
 “Where and How Can AGU Assist? Discussion About the Future of Early-Career and Student Members Within AGU” – American Geophysical Union Annual Meeting, TH33G, 2023.
2. **Preisser, M.**, Jha, A., Ali, J., Sui, X., and Adelsperger, S. “Building Your Network: Sharpening the Soft Skills of Science” – American Geophysical Union Annual Meeting, TH43B, 2023.
1. Patterson, J., Miralha, L., and **Preisser, M.** “Building Your Network: AGU-H3S Networking” – American Geophysical Union Annual Meeting, TH13D, 2022.

ADDITIONAL WORK EXPERIENCE

GIS Analyst Intern <i>HDR Engineering</i>	Mar. 2019 – Aug. 2019 <i>Austin, Texas</i>
Sustainability Senior Student Associate <i>University of Texas at Austin Office of Sustainability</i>	Aug. 2018 – May 2019 <i>Austin, Texas</i>
ReNUWIT REU Program <i>Colorado School of Mines: Advised by Dr. Tzahi Cath</i>	May 2017 – July 2017 <i>Golden, Colorado</i>
DoE SULI Intern <i>Energy & Environment. Directorate, Pacific Northwest National Lab</i>	May 2016 – July 2016 <i>Seattle, Washington</i>
Engagement and Outreach Intern <i>Auburn University Office of Sustainability</i>	Aug. 2015 – May 2018 <i>Auburn, Alabama</i>