Koorosh Azizi

Curriculum Vitae

Postdoctoral Fellow | Jackson School of Geosciences
The University of Texas at Austin
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Google Scholar Profile
LinkedIn Profile

APPOINTMENTS

The University of Texas at Austin, Jackson School of Geosciences, Austin, TX

- **Postdoctoral Fellow** (06/2024 – Present)
  Advisors: Dr. Dev Niyogi, Dr. Patrick Bixler, and Dr. Jay Banner

Arizona State University, School of Sustainable Engineering and Built Environment, Tempe, AZ

- Postdoctoral Research Scholar (06/2022 – 06/2024)
  Advisors: Dr. Margaret Garcia, and Dr. John Anderies

The University of Memphis, Department of Civil Engineering, Memphis, TN

- Research Assistant (09/2017 – 05/2022)

Shahid Beheshti University, Department of Civil, Water, and Environmental Engineering, Tehran

- Research Assistant (09/2014 – 02/2017)

EDUCATION

PhD, Civil Engineering, Water Resources Engineering

The University of Memphis, Memphis, TN, USA (09/2017 – 05/2022)
Dissertation: Application of Local Knowledge for Better Characterization and Modeling of Urban pluvial flooding
Advisor: Dr. Claudio I. Meier

MSc, Civil Engineering, Water Resources Engineering

Shahid Beheshti University, Tehran, Iran (09/2014 – 01/2017)
Thesis: Optimization of Piano-Key Weirs Using Metaheuristic Algorithms
Advisor: Dr. Jalal Attari

BSc, Civil Engineering

Isfahan University of Technology, Isfahan, Iran (09/2010 – 09/2014)

MANUSCRIPTS IN PROGRESS

4. Socio-Hydrological Implications of Sustainable Water Management Transition on Urban Water Equity. In preparation for Nature, Water.
3. How do local flood stakeholders perceive flood risk? Interviews from Weeks Bay, AL and Beaumont, TX.
2. Exploring the Role of Education in Enhancing Community Resilience to Climate Change-Induced Hazards: A Strategy to Building Trust. In preparation for international journal of disaster risk reduction.
1. Three approaches for flood governance in socio-hydrology studies. In preparation for Water Resources Research.

MANUSCRIPTS UNDER REVIEW OR REVISION

1. **Azizi**, K., & Bixler, P. Perceptions and Partnerships: Insights from Flood Risk Governance in Southeast Texas Through Network Analysis. Under review, *Water Resources Research*.

PEER-REVIEWED PUBLICATIONS

13. **Azizi**, K., Barnes, J., Anderies, J., & Garcia, M. (2024). Efficient Water Conservation Programs and Equity Implications. Under Press, *Environmental research letters*.
12. **Azizi**, K., Barnes, J., Deslatte, A., Koeble, E., G., Anderies, J., & Garcia, M. (2024). Balancing Effectiveness and Equity in Sustainable Water Management Transitions: The Case of the Miami-Dade Water and Sewer Department. Under Press, *Journal of Water Resources Planning and Management.*
11. **Azizi**, K., Hornberger, G., Baggio, J., Koeble, E., Anderies, J., & Garcia, M. (2024). Identifying Conditions that Support the Provision of High-Quality and Affordable Urban Drinking Water in the US. *Journal of Water Resources Planning and Management*, *150*(8), 04024024.
10. Wiechman, A., Alonso-Vicario, S., Anderies, J.M., Garcia, M., **Azizi**, K., Hornberger, G. (2024). Institutional dynamics impact the response of urban socio-hydrologic systems to supply challenges. *Water Resources Research*, *60*(2), e2023WR035565.
9. Ebrahimi, S., **Azizi**, K., Kashani, A.R., & Ali, A. (2024). Evaluation of water quality models for hydrological variability using event-based scenarios: A case study. Evaluation of hydrological variabilities of water quality models considering event-based scenarios: A case study. *Stochastic Environmental Research and Risk Assessment*, 1-25.
8. **Azizi**, K., Diko, S., & Meier, C. I. (2023). A Citizen Science Approach to the Characterisation and Modelling of Urban Pluvial Flooding. *Water Alternatives*, *16*(1), 1.
7. **Azizi**, K., Diko, S. K., Saija, L., Zamani, M. G., & Meier, C. I. (2022). Integrated community-based approaches to urban pluvial flooding research, trends and future directions: A review. *Urban Climate*, *44*, 101237.
6. **Azizi**, K., Kashani, A. R., Ebrahimi, S., & Jazaei, F. (2022). Application of a multi-objective optimization model for the design of piano key weirs with a fixed dam height. *Canadian Journal of Civil Engineering*, *49*(11), 1764-1778.

5. Kashani, A. R., Camp, C. V., **Azizi**, K., & Rostamian, M. (2022). Multi-objective optimization of mechanically stabilized earth retaining wall using evolutionary algorithms. *International Journal for Numerical and Analytical Methods in Geomechanics*, *46*(8), 1433-1465.
4. Kashani, A. R., Gandomi, A. H., **Azizi**, K., & Camp, C. V. (2022). Multi-objective optimization of reinforced concrete cantilever retaining wall: a comparative study. *Structural and Multidisciplinary Optimization*, *65*(9), 262.
3. **Azizi**, K., & Meier, C. I. (2021). Urban Pluvial Flood Risk Assessment: Challenges and Opportunities for Improvement Using a Community-Based Approach. *In World Environmental and Water Resources Congress* 2021 (pp. 350-361). Reston, VA: American Society of Civil Engineers.
2. Kashani, A. R., Camp, C. V., Rostamian, M., **Azizi**, K., & Gandomi, A. H. (2021). Population-based optimization in hydro structural engineering: a review. *Artificial Intelligence Review*, 1-108.
1. **Azizi**, K., Attari, J., & Moridi, A. (2017). Estimation of discharge coefficient and optimization of Piano Key Weirs. In Labyrinth and Piano Key Weirs III: Proc. of the 3rd International Workshop on Labyrinth and Piano Key Weirs (PKW 2017).

PRESENTATIONS – CONFERENCE (FIRST AUTHOR ONLY)

9. **Azizi**, K., Barnes, J., Deslatte, A., Koeble, E., G., Anderies, J., & Garcia, M. (2023). Equity and Effectiveness in Sustainable Water Management Practices: Insights from Miami-Dade's Water Conservation Program. In AGU Fall Meeting Abstracts.
8. **Azizi**, K., Hornberger, G., Baggio, J., Koeble, E., Anderies, J., & Garcia, M. (2023). Identifying Key Factors for Providing High-Quality and Affordable Drinking water: A Study of U.S. Urban Water Systems. In AGU Fall Meeting Abstracts.
7. **Azizi**, K., & Meier, C. I. (2022). Improving Urban Pluvial Flooding Characterization and Modeling Through a Citizen Science Approach. In AGU Fall Meeting Abstracts (Vol. 2022, pp. H15T-1032).
6. **Azizi**, K., Meier, C.I. (2022). Citizens' contributions improve modeling of urban pluvial flood: A case study. In EWRI Congress, 2022, Atlanta.
5. **Azizi**, K., Meier, C. I., & Saija, L. (2020). Improving the Characterization of Urban Flash Floods through Application of Local Knowledge. In AGU Fall Meeting Abstracts (Vol. 2020, pp. H162-0011).
4. **Azizi**, K., Meier, C. I., & Saija, L. (2019, December). Applying the socio-hydrological approach in understanding and managing urban stormwater: A case-study in North Memphis. In AGU Fall Meeting Abstracts (Vol. 2019, pp. H11O-1732).
3. **Azizi**, K., Meier, C.I., & Saija, L. (2019). Stormwater Management at Local Level: Participatory Community-Based Strategies and Mitigation Practices. In EWRI Congress, 2019, Pittsburg.
2. **Azizi**, K., Meier, C. I., & Saija, L. (2018). Bottom-Up Planning: From Natural Disaster to Community Disaster. In AGU Fall Meeting Abstracts (Vol. 2018, pp. PA23F-1032).
1. **Azizi**, K., Attari, J., & Moridi, A. (2017). Estimation of discharge coefficient and optimization of Piano Key Weirs. In Labyrinth and Piano Key Weirs III: Proc. of the 3rd International Workshop on Labyrinth and Piano Key Weirs (PKW 2017).

INVITED TALKS AND LECTURES

4. Arizona State University, School of Sustainability. April 15, 2023. "Qualitative Comparative Analysis, Urban Drinking Water Systems Management." Tempe, AZ. Sustainability Seminars.

3. Nebez Academy. October 12, 2023. "Environmental Challenges: From Western Academic Universities' Research Trends to Kurdistan Experience." Online. Natural Sciences Seminars.

2. University of Memphis, Department of City and Regional Planning. February 12, 2023. "Community-Based Research in Urban Flood Management." Online.

1. Arizona State University, School of Sustainable Engineering and the Built Environment. "Urban Flood Risk Management: Challenges and Opportunities." Tempe, AZ. Hydrosocial Seminars.

ACADEMIC TEACHING EXPERIENCE

Arizona State University, School of Sustainable Engineering and the Built Environment

Guest Lecturer, Hydrology Fall 2022, Fall 2023

- Developed and delivered lectures on core hydrology concepts, including flood frequency analysis and hydrological modeling.
- Facilitated class discussions, engaged students with interactive teaching methods, and addressed academic inquiries.

Guest Lecturer, Sociohydrology Spring 2023

- Designed and presented course content focused on the interplay between social systems and hydrological processes.

The University of Memphis, Department of Civil Engineering, Memphis, TN, USA

Workshops On Urban Hydrological Modeling 2021-2022

Hydrology 2019-2021

- Collaborated with the professor to design and update course curriculum and materials.
- Conducted several sessions independently, facilitating class discussions and resolving student queries.
- Assisted in grading and providing constructive feedback on assignments and exams.

Hydrology Lab 2018-2020

- Led lab sessions, demonstrating practical applications of hydrology principles.
- Assisted students in conducting experiments and interpreting results.
- Collaborated in the creation and grading of lab reports.

Shahid Beheshti University, Tehran, Iran

Hydraulics, 2014 – 2016

- Created and delivered course material for undergraduates.
- Graded assignments, projects, and exams, providing constructive feedback to students.

- Adapted teaching methods to meet students' varying needs and interests, promoting interactive learning.

Hydraulic Design of Structures, 2016 – 2017

- Led lectures and class discussions, fostering an engaging and intellectually stimulating environment.
- Graded exams and projects, providing individual feedback to improve student understanding.
- Designed class materials and assignments to apply theoretical concepts into practice.

STUDENT MENTORSHIP

- Nischal Kafle (PhD)
  Urban Flood Management and Green Infrastructure. Fall 2021 – Fall 2023
  PhD, Civil Engineering, University of Memphis
- Samin Khorram (PhD)
  Watershed Modeling. Fall 2021 – Fall 2023
  PhD, Civil Engineering, University of Memphis
- Sara Alonso Vicario (PhD)
  Hydrological Analysis. Fall 2022 – Spring 2024
  PhD, Civil Engineering, Arizona State University
- Francesca Federico (PhD)
  Risk Sharing and Climate Insurance Program. Spring 2023 – Spring 2024
  PhD, Sustainability, Arizona State University
- Adam Wiechman (PhD)
  Urban Water Systems and Dynamical System. Fall 2022 – Spring 2024
  PhD, Sustainability, Arizona State University
- Karissa Gund (MS)
  Hydrological Variability and Flow Regime. Fall 2022 – Fall 2023
  MS, Civil Engineering, Arizona State University

GRANTS AND FELLOWSHIPS

- **National Science Foundation (Senior Personnel)**
  Dynamics of Integrated Socio-Environmental Systems (DISES): Closing the feedback loop: Navigating robustness-fragility tradeoffs in polycentric urban water systems (2023, not funded)
- **National Science Foundation (Senior Personnel)**
  Dynamics of Integrated Socio-Environmental Systems (DISES): A transdisciplinary, transformative citizen-science approach for enhancing understanding of, and interventions to, urban pluvial flooding (2020, not funded)
- Internal Seed Grant University of Memphis (**Senior Personnel)**

  Urban Flood Resilience in Memphis (2018) - $50000
- **Herff Graduate Fellow,** University of Memphis, Herff College of Engineering **(**2017) - $51000
- **Travel Grant,** American Geophysical Union Conference participation (2019) - $1200
- **Travel Grant,** World Environmental and Water Resources Congress Conference participation (2019) - $1000

- **Travel Grant**, American Geophysical Union Conference participation (2018) - $1200
- **Travel Grant,** World Environmental and Water Resources Congress Conference participation (2018) - $1000

PEER REVIEW ACTIVITIES

- Reviewer for Journal of Infrastructure Systems
- Reviewer for Journal of water resources planning and management
- Reviewer for Journal of flood risk management
- Reviewer for Journal of Hydrologic Engineering
- Revier for Urban Water Journal
- Reviewer for Theoretical and Applied Climatology
- Reviewer for Sustainability
- Reviewer for Urban science
- Reviewer for Urban Climate
- Reviewer for Water
- Reviewer for Journal of Hydroinformatics

PROFESSIONAL MEMBERSHIPS/AFFILIATIONS

- American Geophysical Union
- American Society of Civil Engineers

SELECTED RESEARCH PROJECTS

Local Flood Stakeholders' Perception on Flood Risk and Governance Structures | 2024 – Present

- Conducting interviews, surveys, and developing qualitative approaches for flood risk governance in socio-hydrological studies.

Community Resilience Integrated into an Earth System Science Learning Ecosystem | 2024 – Present

- Focused on key climate challenges faced by urban communities: extreme heat and extreme precipitation/flooding.
- Assessing the exposure of climate impacts, such as heating or rainfall across a city, as a function of atmospheric forcing, geography, and land cover.
- Evaluating social vulnerability of communities to understand how the same forcing can have disproportionate impacts across urban areas.
- Investigating strategic solutions by aligning downscaled geophysical data and social indicators of community resilience.

Transition Dynamics in Integrated Urban Drinking Water Systems | 2022 – 2024

- Developed dynamic modeling of integrated water supply and demand systems, merging quantitative and qualitative analyses from project collaborators.
- Conducted workshops with urban water managers for large water utility providers in the US.

Urban Flood Risk Assessment, City of Germantown, TN | 2020 – 2021

- Conducted an in-depth hydrological analysis of a storm event (June 7, 2019) and reported findings to the City of Germantown.
- Led a comprehensive project to develop a 1D-2D hydrodynamic model (PCSWMM) of a complex urban watershed spanning 749.3 ha.
- Collected data for model calibration and validation using traditional engineering methods and innovative citizen-science techniques.
- Identified vulnerabilities to pluvial flooding risk through extensive analysis of water depth and flooding extent data from reports, surveys, and interviews.

Storm Water Drainage and Flood Analysis, City of Paterno, Italy | 2019 – 2020

- Led a joint research project between the University of Memphis and the University of Catania to address flooding issues in Paterno.
- Developed a 1D-2D PCSWMM model to study the city's vulnerability to flooding.
- Identified optimal locations for Low Impact Development (LID) solutions, evaluating their potential impact on currently vulnerable areas.

Improving Urban Resilience to Flash Flooding, University of Memphis | 2018 – 2019

- Collaborated with a multi-disciplinary team of urban planners, earth scientists, and engineers to enhance urban resilience to flash flooding.
- Modeled urban watershed responses to 2- and 5-year return period rainfall events, providing critical insights into flash flooding vulnerability and risk.

Field Work in the Ozarks, Bulls Creek, Missouri | 2018 – 2019

- Conducted extensive fieldwork, including the installation of PVC piezometers in a gravel river bar.
- Executed hot-water and cold-water injection tests to ascertain flow paths.
- Conducted topographic surveys and measured stream discharge using ADCP.
- Programmed and installed temperature sensors, among other field-related tasks.

RELATED COURSEWORK

PhD, Water Resources Engineering

- Advanced Hydrology
- Eco-hydraulics and Eco-hydrology
- Advanced Hydraulics
- Analysis of Community Planning
- Urban Resilience to Flash Flooding I
- Engineering Analysis
- Urban Resilience to Flash Flooding II
- Probabilistic Methods in Engineering

MSc, Water Resources Engineering

- Advanced Mathematics
- Computation Hydraulics
- Hydraulic Design of Structures
- Sediment and Erosion Engineering
- RS & GIS Applications in Water Resources Eng
- Hydro-informatics
- Water Resource Management I & II
- Advanced Hydrodynamics

TECHNICAL SKILLS AND COMPETENCIES

Quantitative Research Skills:

- Proficient in Statistical Analysis, Survey Design & Analysis, and Data Tracking.

Qualitative Research Skills:

- Experienced in conducting User Interviews, facilitating Focus Groups, carrying out Field Studies, and practicing Ethnography.

Software Proficiency:

- Skilled in the use of SWMM, PCSWMM, HEC-RAS, HEC-HMS, IBER, FLO-2D, ArcGIS, QGIS, and AutoCAD.

Programming Expertise:

- Proficient in R, Python, MATLAB, and Julia programming languages.

Interpersonal and Cognitive Skills:

- Strong presentation and communication skills, both verbal and written.
- Proven ability in teamwork, maintaining punctuality, and demonstrating flexibility.
- Proficient in Systems Thinking and Critical Thinking with a keen intellectual curiosity.

LANGUAGES

- **English:** Fluent (spoken and written)
- **Persian:** Fluent (spoken and written)
- **Kurdish:** Native Speaker

EXTRACURRICULAR ACTIVITIES

- Arizona Hiking Club, 2022 – 2024
- UoM IM Soccer, 2017-2022