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**CONTACT**

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Civil and Environmental Engineering
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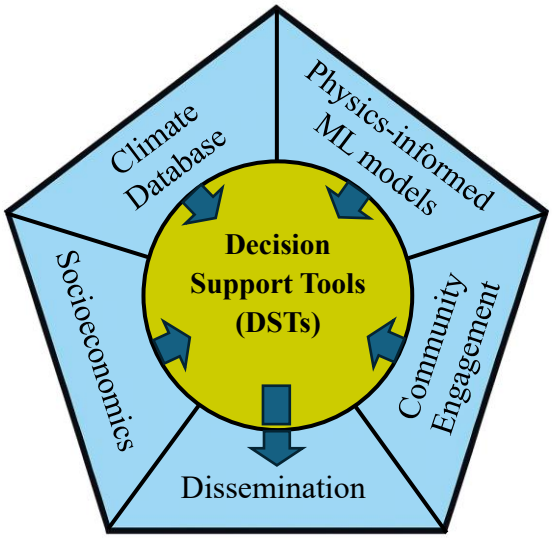
Associate Professor
Department of Civil and Environmental Engineering

Water Resources

My research focuses on improving the prediction of hydrologic and contaminant fluxes for better management of water resources, utilizing a combination of field, laboratory, and modeling approaches. Specific areas of research include watershed modeling, data science integration in water resources management, stormwater management, and development decision support tools for water resource management.




**Education**

- PhD in Water Resources Engineering, Oklahoma State University
- MS Water Resources Engineering, Karlsruhe Institute of Technology (KIT)
- B.S., Alemaya University

**Research**

- Watershed-scale hydrologic and water quality modeling
- Data science integration in water resources
- Stormwater Management
- Decision Support Systems for water resources management

## Publications

Selected publications

- Google Scholar
- Geza, M., & McCray, J. E. (2008). Effects of soil data resolution on SWAT model stream flow and water quality predictions. Journal of environmental management, 88(3), 393-406.
- Kopytkovskiy, M., Geza, M., & McCray, J. E. (2015). Climate-change impacts on water resources and hydropower potential in the Upper Colorado River Basin. *Journal of Hydrology: Regional Studies*, *3*, 473-493.
- Geza, M., Poeter, E. P., & McCray, J. E. (2009). Quantifying predictive uncertainty for a mountain-watershed model. *Journal of Hydrology*, *376*(1), 170-181.
- Shojaeizadeh, A., Geza, M., & Hogue, T. S. (2021). GIP-SWMM: A new green infrastructure placement tool coupled with SWMM. Journal of Environmental Management, 277, 111409.
- Moeini, M., Shojaeizadeh, A., & Geza, M. (2022). Supervised stacking ensemble machine learning approach for enhancing prediction of total suspended solids concentration in Urban watersheds. Journal of Environmental Engineering, 148(6), 04022026.
- Geza, M., Ma, G., Kim, H., Cath, T. Y., & Xu, P. (2018). iDST: An integrated decision support tool for treatment and beneficial use of non-traditional water supplies–Part I. Methodology. Journal of Water Process Engineering, 25, 236-246.

## Teaching

EM 331: Fluid Mechanics: The course introduces the fundamental principles governing fluid behavior, including fluid properties, hydrostatics, conservation of mass, momentum, and energy. The course prepares students for advanced studies in hydraulics and water resources engineering.

CEE437/537: Watershed hydrology: This course introduces the theory and application of hydrologic modeling to simulate watershed processes and support water resource analysis. Topics include rainfall-runoff transformation, infiltration, and flow routing. Students gain hands-on experience building, calibrating, and applying models for streamflow analysis, stormwater management, and watershed planning.

CEE 634: Surface Water Hydrology: The course covers the theory of key hydrologic processes, including precipitation, infiltration, evapotranspiration, snowmelt, and streamflow generation. It includes the application of hydrologic models to simulate watershed response under varying climatic and land use conditions.

CEE 734: Vadose zone hydrology and solute transport: The focus on the movement of water and solutes through the unsaturated zone. It covers the theory of soil-water retention, unsaturated flow, infiltration, and solute transport processes. Students apply models to evaluate vadose zone processes relevant to agriculture, contaminant fate, and groundwater recharge.

## Current research

- A scalable decision support tool (s-DST) for equitable water resources allocation and management (USGS 104g), funded by USGS (PI).
- Climate Resiliency Center for building adaptive capacity in tribal Communities along Missouri River Basin (MRB-CRC), funded by DOE (PI)
- NSF-Track 2: RII Track-2 FEC: Advancing QUAlity and Climate-Resilient Water Management with Community Partnerships and Enhanced Sensor Network (AQUA-CLIME), Funded by NSF-EPSCoR (Co-PI): Project PI: Venkataramana Gadhamshetty.
- Overcoming cover crop adoption barriers in dryland production systems by enhancing water use efficiency and soil health (Co-PI investigator at SD Mines)
- Project PI: Sutie Xu, SDSU.

## Research Team

**Faculty**

Mengistu (Stu) Geza
Stu.geza@mines.edu
Associate Professor of Civil and Environmental Engineering
Water resources engineering, data science integration, Decision Support Tools

**Graduate Students**

Susan Bastola, Ph. D student
susan.bastola@mines.sdsmt.edu
Hydrology modeling - data science integration
Decision support tools

Nisha Pokharel, Ph. D student
nisha.pokharel@mines.sdsmt.edu
Hydrology and water quality modeling
Decision support tools

**Undergraduate Students**

**Ethan Lohan: Development of tools for data processing**