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Areas of Expertise

- Full Stack Development
- Geospatial Analysis
- Database Design & Management
- Watershed Hydrology
- Stormwater Management
- Numerical Modeling

Services

- Historical Site Analysis
- Data Acquisition & Visualization
- Spatial & Imagery Analyses
- Data Quality Management
- Database Development

Education

- M.S., Environmental Engineering, Tufts University
- B.Eng., Environmental Engineering, Beijing Technology & Business University

Shuo Zhao, M.S.

Senior Environmental Engineer

Mr. Zhao is an environmental engineer/full stack developer specializing in enterprise-level geospatial database design and management, geospatial data analysis, and full stack web application development. His recent work includes designing and deploying a web-based database application to manage consumer product safety data that allows users to perform chemical hazard assessment. Mr. Zhao also has experience in watershed hydrology, chemical fate and transport modeling, and stormwater management. Prior to joining Gradient, he researched the effects of climate change on sediment transport during his graduate work at Tufts University.

Selected Projects

Full Stack Web Development: Developed and deployed a web application using Python to evaluate the relative impacts of different closure options for coal ash surface impoundments.

Database Design: Developed and deployed a custom web database application using Python to serve a large team of toxicologists and chemists to provide hazard and risk evaluations for over 300 ingredients in a consumer product line.

Database Design: Developed and deployed a web-based database application using Python to manage consumer product safety data that allows users to perform chemical hazard assessment.

Numerical Modeling: Used probabilistic cost modeling tools to develop a total cost distribution, cash flow forecast, and expected value for a portfolio of utility sites.

Data Visualization: Developed and maintained a web-based GIS application using ArcGIS Online to help communicate and visualize the results of multiple environmental investigations of a former industrial, urban area slated for mixed-used redevelopment. The web-based mapping tool helped key stakeholders delineate subsurface hydrocarbon and nonaqueous phase liquid (NAPL) impacts, evaluate hypothetical contaminant fate and transport pathways, and characterize potential contaminant sources at a site that was once home to a railyard, manufactured gas plants, tar and roofing plants, a scrap-metal yard, and other industrial operations.

Database Management: Built and managed comprehensive chemical databases for surface water, groundwater, soil, and fish tissue sampling using SQL to support a multi-watershed polychlorinated biphenyls (PCBs) source investigation in order to identify likely contributors of PCBs to areas where environmental concentrations are elevated.

Database Management: Built and managed SQL databases for soil, soil vapor, and groundwater sampling to support modeling of groundwater flow and contaminant migration from historical releases.

Publications

Zhao, S; Rice, J. 2022. "Digitizing the haystack: Using AI-powered text analytics." *Gradient Trends - Risk Science & Application*.