

**Bei Chu, Ph.D.**  
Project Scientist



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**Expertise**

- Programming and tool development
- Environmental data analysis, statistics, and research
- Agrochemical fate and transport modeling

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**Summary**

Ms. Chu is a project scientist with five years of experience. She has expertise in agrochemical fate and transport modeling, soil science, programming, and data analysis. She has conducted agrochemical fate and transport modeling; performed statistical analysis for various environmental projects; and developed automation tools for data processing, visualization, and analysis.

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**Professional Experience**

**Technical Consultation and Allocation/Litigation Support (2019–Ongoing)**

Confidential Client, Multnomah County, Oregon

TIG Environmental provides technical expert support for environmental liability assessment and cost allocation for the remediation of sediments in the Portland Harbor Superfund Site, and for the associated Natural Resource Damages claims. The harbor has been the site of numerous industrial and manufacturing operations for more than a century, including shipbuilding, petroleum storage and distribution, metal salvaging, and electrical power generation. Technical support for this project includes research, sampling, and forensic analysis to determine the specific contaminants associated with activities or facilities. The project also includes evaluating potential historical contaminant sources, determining contaminant fate and transport, and chemical fingerprinting polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs).

Ms. Chu provides support on data visualization, data evaluation, data management, outlier analysis, hypothesis testing, fingerprinting type visualization, and multivariate analyses such as principal compPCA. Tools she uses include PowerBI, R, ProUCL, and Access.

**Technical Consultation and Litigation Support (2019–Ongoing)**

Confidential Client, New Jersey

TIG Environmental provides technical and litigation support for environmental liability assessment related to sediment remediation at a complex urban river Superfund site in northern New Jersey. Investigative services performed include acquisition of historical records, conducting witness testimonies, reviewing environmental data, and developing expert technical reports for the identification and assessment of potentially responsible parties (PRPs) who contributed to the contamination of the Superfund site. Contaminant source identification involves evaluation of the historical operations of hundreds of PRPs at upland sites, fate and transport analysis, and investigation and mapping of historical direct and indirect sewer discharges. TIG Environmental manages a database and client accessible data visualization platform encompassing all historical sampling data collected at the Superfund site.

Ms. Chu provides support on data cleaning, data evaluation, and developing R codes to mine relationship patterns between different analytes among large amounts of data.

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**Expert Consultant for Sediment and Uplands Cleanup Cost Allocation (2019–Ongoing)**

Confidential Client, New York

TIG Environmental provides litigation support to a private client participating in a Superfund site allocation. The site includes nearly two miles of waterway in a heavily industrialized area of New York state. Contamination at the site includes PCBs and other chemicals, but PCBs are the primary chemicals of concern. After an initial remedial design phase was completed, regulatory agencies required additional investigation of the study area. Findings from the investigation increased the estimated remedial cost nearly seven-fold. The client retained TIG Environmental's services for PRP identification and investigation, sampling and data analysis, and expert witness testimony for anticipated cost allocation for remediation of sediments. Since 2019, TIG Environmental evaluated and investigated documents for PRP sites to gather evidence of historical releases related to operations, developed a conceptual site model of the relationships between PRP operations and the contaminated waterway, conducted soil and sediment sampling, and completed forensic data analysis to identify sources of PCB contamination. TIG Environmental also provided and continues to maintain data visualization tools to assist the client in strengthening the connection between contamination in the waterway and adjacent PRPs, identifying PRPs that may not be responsible for contamination, and identifying additional discharge points that may be associated with additional PRPs

Ms. Chu provides support on generating R-based fingerprinting plots for forensics analysis and drafting Power BI data visualization tool for the project site.

**Technical Consultant for Environmental Liability Assessment and Cost Allocation (2019–Ongoing)**

Confidential Shipyard Site, Whatcom County, Washington

TIG Environmental is providing technical expert support for environmental liability assessment and cost allocation for the remediation of contamination at a shipyard site under an Agreed Order with Washington State Department of Ecology (Ecology). TIG Environmental's client is corporate successor to a former owner and operator of a facility on the site. TIG Environmental is producing technical evaluations of historical and current operations on the site and developing forensic and statistical analyses to identify contaminants attributable to the different types of operations at the site. Based on the results of these technical evaluations and analyses, TIG Environmental is developing an allocation strategy and methodology to estimate potential allocable shares to each owner and operator associated with the Site. TIG Environmental is assisting client's counsel with developing early cash-out settlement strategies to negotiate with the party performing the remediation.

Ms. Chu provides support on analyzing the relationships between analyte concentrations within the site, generation of report figures, and technical report writing.

**Environmental Scientist (2015–2019)**

Arcadis US, Syracuse, New York

Ms. Chu modeled agrochemical fate and transport in soil, infiltration in vegetated slopes, calculated estimated environmental concentration in ground and surface water using tools including PestDF, KinGUI, LEACHP, PWC, PRZM, SPAW. She identified soil and ecoregion similarities between North

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America and Europe using ArcGIS and ENASGIPS package; conducted statistical analysis support on various projects, including trend analysis, hypothesis testing, regression analysis, calculation of UCL and UTLs. Tools used include: Systat, MiniPad, ProUCL, R, @Risk, Access, Excel. Further, she developed scripts in R to calculate area-weighted BCA 95% UCLs and other automation tools; assessed product compliance for products to be exported to China and provided Chinese language translation support; performed data analysis on a pesticide use pattern survey using WesVar; and provided data QC support on daily fire debris removal and disposal hauling tickets.

**Post-doctoral Research Associate (2012–2015)**

Lincoln University, Jefferson City, Missouri

Ms. Chu researched enhanced dissipation of selected herbicides in a simulated organic matrix biobed for a system to control on-farm point-source pollution and the long-term effects of different cropping systems on selected enzyme activities.

**Graduate Research Assistant (2006–2011)**

University of Missouri, Columbia, Missouri

Ms. Chu conducted research on sorption, desorption and one-dimensional transport models of veterinary antibiotics in agroforestry buffer, grass buffer, and cropland soils.

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**Academic  
Qualifications**

Ph.D. in Soil Science, University of Missouri, 2011  
ME in Environmental Science, Jinan University, 2006  
BE in Pulp and Paper Making, Nanjing Forestry University, 2004

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**Professional  
Training**

- Good Laboratory Practices (GLP) training
- Data scientist training from Datacamp.com (on-going)

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**Publications  
and  
Presentations**

Chu, B., & Eivazi, F. “Enhanced dissipation of selected herbicides in a simulated organic matrix biobed: A system to control on-farm point-source pollution.” *Journal of Environmental Quality* 47, no. 2 (2018): 221–227.

Chu, B., Chen, X., Li, Q., Yang, Y., Mei, X., He, B. & Tan, L. “Effects of salinity on the transformation of heavy metals in tropical estuary wetland soil.” *Chemistry and Ecology* 31, no. 2 (2015): 186–198.

Chu, B., Goyne, K. W., Anderson, S. H., Lin, C. H., & Lerch, R. N. “Sulfamethazine sorption to soil: vegetative management, pH, and dissolved organic matter effects.” *Journal of Environmental Quality* 42, no. 3 (2013): 794–805.

Chu, B., Anderson, S. H., Goyne, K. W., Lin, C. H., & Lerch, R. N. “Sulfamethazine transport in agroforestry and cropland soils.” *Vadose Zone Journal* 12, no. 2 (2013).

Chu, B., Goyne, K. W., Anderson, S. H., Lin, C. H., & Udawatta, R. P. “Veterinary antibiotic sorption to agroforestry buffer, grass buffer and cropland soils.” *Agroforestry systems* 79, no. 1 (2010): 67–80.

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Li, Q. S., Bei Chu, Lei Shi, J. H. Fang, and S. S. Cai. "Heavy metal distribution in tidal wetland soils and its effect on reclamation in the Pearl River Estuary." *Journal of Agro-Environment Science* 26, no. 4 (2007): 1422–1426.