

David B. Mayfield, M.S., DABT, BCES

Senior Toxicologist

dmayfield@gradientcorp.com



Mr. Mayfield is a board-certified toxicologist working in Gradient's Seattle, Washington office. He specializes in both human health and ecological toxicology and risk assessment. Mr. Mayfield's main interests include examining environmental exposures and resulting toxic effects of chemical agents. His primary responsibilities include reviewing and interpreting toxicity literature and data, performing quantitative exposure and dose-response analyses, and applying this information to evaluate site-specific or chemical-specific risks. He has authored and presented on a variety of topics, including site-specific ecological risk assessment, metals and PAH toxicology, and exposure science. He received his M.S. in Environmental Health from the University of Washington and was certified as a Diplomate of the American Board of Toxicology (DABT) in 2008.

Representative Projects

Site Environmental Risk Assessments: Conducted numerous environmental risk assessments at US and international industrial sites. Developed field programs for collecting water quality, soil quality, and biological characteristics to evaluate the nature and extent of contamination. Assessed human and ecological health risks from exposure to a variety of inorganic and organic substances.

Ecological Soil Cleanup Levels Workshop: Participated in a workshop to provide regulators with the novel methods and processes to develop ecologically based soil clean-up values. The workshop focused on methods to incorporate bioavailability, normalize toxicity thresholds, evaluate species sensitivity, and incorporate natural background values. Recommendations were summarized in a series of journal publications (e.g., Mayfield *et al.*, 2014).

Chemical Product Evaluation: Providing ongoing support to a City chemical reduction program. Specifically, evaluated the hazard (to human and ecological receptors) and exposure potential (e.g., persistence and bioaccumulation properties) of numerous pesticide and herbicide products. These evaluations were used to identify and prioritize products for the chemical reduction program.

Dose-Response Assessment: Provided an independent review of published benchmark dose (BMD) modeling analyses in support of developing a scientifically justifiable reference dose (RfD) for the chemical sulfolane. Reviewed study data from several sources, performed benchmark dose modeling for multiple toxicological data sets and health effect endpoints and provided the results in a summary report. The analysis will be used as technical support for the development of a health protective groundwater cleanup level.

Fish Tissue Concentration Analysis: Developed a database of speciated arsenic measurements in fish and seafood (i.e., inorganic As, As^{III}, As^V, and organic As forms). Compiled arsenic concentrations from a variety of literature reviews and governmental databases. Prepared a summary of arsenic levels in fish and seafood and the distribution across different US regions, focusing on inorganic arsenic. This analysis was intended to inform the risk assessment implications of estimating dietary intake of inorganic arsenic from fish and seafood.

Areas of Expertise

- General Toxicology
- Metals Toxicology
- Environmental Site Investigation
- Ecological Risk Assessment
- Human Health Risk Assessment
- Dose-response Analysis
- Exposure Analysis

Education

M.S., Environmental Health (Toxicology),
University of Washington

B.S., Biology, University of Kansas

Diplomate of the American Board of
Toxicology

Selected Presentations and Publications

Mayfield, DB; Lewis, AS; Bailey, LA; Beck, BD. 2015. "Properties and Effects of Metals." In *Principles of Toxicology: Environmental and Industrial Applications, Third Edition*. (Eds: Roberts, SM; James, RC; Williams, PL). Wiley, Hoboken, NJ, p283-307.

Mayfield, DB; Fairbrother, A. 2015. "Examination of Rare Earth Element Concentration Patterns in Freshwater Fish Tissues." *Chemosphere* 120:68-74.

Mayfield, DB; Johnson, MS; Burris, JA; Fairbrother, A. 2014. "Furthering the Derivation of Predictive Wildlife Toxicity Reference Values for Use in Soil Cleanup Decisions." *Integrated Environ. Assess. Manag.* 10(3):358-371.

Mayfield, DB; Fairbrother, A. 2013. "Efforts to Standardize Wildlife Toxicity Values Remain Unrealized." *Integrated Environ. Assess. Manag.* 9(1):114-123.

Mayfield, DB; Robinson, S; Simmonds, J. 2007. "Survey of fish consumption patterns of King County (Washington) recreational anglers." *J. Exp. Anal. Environ. Epidemiol.* 17:604-612.



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600 Stewart Street, Suite 1900, Seattle, WA 98101 | 206-267-2920