



Exponent®

Engineering & Scientific Consulting

Alex Guittard

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Professional Profile

Alex Guittard specializes in geology, environmental science, geochemical analysis, water chemistry, and environmental data science. With expertise in physical and chemical processes, fate and transport mechanisms, and advanced data analytics, he supports litigation and regulatory projects through detailed geochemical assessments, modeling, and visualization. He applies statistical techniques, including regression analysis, multivariate methods, and non-parametric statistics, to analyze complex datasets for robust environmental evaluations.

Alex works with clients in environmental consulting, legal, and industrial sectors, assisting with groundwater and surface water assessments, contamination studies, and regulatory compliance. He has developed Python-based tools for PFAS and trace metal analysis, integrating regression models, geospatial heat maps, and EPA-standard statistical approaches such as Kaplan-Meier, ROS, and MLE. His expertise extends to interactive mapping, charge balance corrections, Eh-pH and Piper-Stiff diagrams, and environmental database management. He also has hands-on experience in trace metal laboratory analysis and fieldwork as a geotechnician.

Academic Credentials & Professional Honors

M.S., Construction Engineering, Ecole De Technologie Superieure, 2016

B.S., Geosciences, University of Franche-Comté, 2012

Prior Experience

Staff Geologist II, Haley and Aldrich, 2023 - 2025

Portfolio Manager, Emanation Capital, 2020 – 2023

Bookkeeper, KMC Canada, 2018 - 2019

Engineering Designer, EXP Services, 2017 – 2018

Lab Technician, Agat Laboratories, 2016 - 2017

Grad Student, University of Quebec, 2013 - 2016

Publications

Alexandre Guittard, Michel Baraer, Jeffrey M McKenzie, Bryan G Mark, Alejo C Rapre, Jeffrey Bury, Mark Carey, Kenneth R Young. Trace metal stream contamination in a post peak water context: lessons from the cordillera Blanca, Peru. ACS Earth and Space Chemistry 2020; 4,4, 506-514.

Alexandre Guittard, Michel Baraer, Jeffrey M McKenzie, Bryan G Mark, Oliver Wigmore, Alfonso Fernandez, Alejo C Rapre, Elizabeth Walsh, Jeffrey Bury, Mark Carey, Adam French, Kenneth R Young. Trace-metal contamination in the glacierized Rio Santa watershed, Peru. Environmental Monitoring and Assessment 2017; 189, 1-16.

Presentations

Alexandre Guittard, Michel Baraer, Jeffrey M McKenzie, Bryan G Mark, Alfonso Fernandez, E Walsh, A Santos Perez. Spatiotemporal variability and differentiation between anthropogenic and natural contamination of heavy metals of surface water: a case study in the Cordillera Blanca, Peru. Poster presentation, AGU Fall Meeting 2015, San Francisco, CA, 2015.

Alexandre Guittard, Michel Baraer, Jeffrey Mckenzie, Bryan G Mark, Oliver Henry Wigmore, Alfonso Fernandez. Spatiotemporal variability of heavy metals contamination of surface water: a case study in the Cordillera Blanca, Peru. Talk, Joint assembly AGU-GAC-MAC-CGU, Montreal, Canada, 2015.

Guittard, A., Baraer, M., McKenzie, JM., Walsh, E. and Mark, B. Current and future trace metals amounts in the Santa River. Poster presentation, Foro Internacional Glaciares: retos de la investigación al servicio de la sociedad en el marco del cambio climático, Huaraz, Peru, 2013.

Project Experience

- Assessed impacts to water quality from data center cooling operations. Specifically, performed comprehensive hydro-geochemical analysis for Pacific Northwest datacenters, including charge imbalance calculations, Eh-pH (Pourbaix) diagrams to predict species stability and redox conditions, and Piper-Stiff diagrams to characterize water types. Evaluated concentration cycles through examination of sulfate, nitrate, and potassium to identify water sources and assess corrosion potential and scaling tendencies within these engineered systems.
- Conducted fingerprinting analysis of PFAS to distinguish background from point sources of contamination. Used Python and R for statistical analysis and visualization of PFAS and inorganic contaminants, including radar plots, regression analyses and multivariate statistics to identify background fingerprints at a regional scale.
- Evaluated PFOA and PFOS concentrations in soil for real estate development. Implemented EPA-standard statistical methods for handling complex environmental datasets with censored values (data below detection limits), including Kaplan-Meier survival analysis, Regression on Order Statistics (ROS), and Maximum Likelihood Estimation (MLE).
- Prepared maps to evaluate PFAS distribution and patterns. Developed interactive mapping solutions with Python Folium and Geopandas libraries integrating shapefiles and geojson files. Automated plot mass production and georeferenced them on different basemaps to then export as html outputs easily shareable with clients.
- Developed tools to expedite document review and data analysis. Developed a Python-based solution for identifying duplicate documents using hashing algorithms to generate unique identifiers for each document, reducing review time.

- Led a five-person team effort in database development and QA/QC with Python implementation to look for duplicate entries. Developed tools to export tables from PDFs to Excel, streamlining the process to reduce 'copy paste' errors.
- Co-authored technical memoranda covering water quality assessments, regulatory standards, stormwater system evaluations, and septic systems.
- Wrote comprehensive literature reviews on arsenic and lead contamination for sites in Northern California as well as supplemental materials on best inorganic laboratory analytical practices for analyzing trace metals in water.
- Experienced in optimizing and calibrating mass spectrometers (ICP-MS), optic emission spectrometers (ICP-OES), and atomic absorption spectrometers (AAS) for trace metal analysis in water and soil. Also trained on matrix, spectral, polyatomic and isobaric interferences. Experienced in operating cavity ringdown spectrometers (CRDS) for water isotope analysis.
- Conducted geotechnical field work for tunnel settlement monitoring and shoring inspections, including data collection, instrument installation, drilling and coring supervision, and detailed rock logging while maintaining rigorous documentation and safety standards.