Neil P. Swanson
Consultant

Education and Credentials

M.S., Geology, University of Utah, Salt Lake City, Utah, 2013

B.A., Geochemistry, SUNY Geneseo, Geneseo, New York, 2011

Continuing Education and Training

Python for Data Science, AI & Development, IBM (2020)

Neural Networks and Deep Learning, deeplearning.ai (2019)

Machine Learning Toolbox, DataCamp (2018)

Statistical Learning, Stanford Lagunita (2016)

Introduction to Geochemical Modeling Tools: Equilibrium and Transport Applications, Mahoney Geochemical Consulting LLC (2015)

Hazardous Waste Operations and Emergency Response 40-Hour Certification (2013; refreshers 2014–2020)

First Aid and CPR Certification (2013, 2015)

Professional Profile

Mr. Neil Swanson is a geochemist with 8 years of environmental consulting experience. He has experience with environmental geochemistry; geochemical modeling, including PHREEQC applications; organic and inorganic fate and transport; environmental forensic methods; hydrologic systems and evaluation of storm runoff models; groundwater modeling and characterization; environmental compliance; and field collection of surface water, sediment, soil, and biota. He uses R statistical software and Python to perform quantitative data analysis and prepare graphical representations of complex environmental data. Mr. Swanson is proficient in incorporating multiple lines of evidence to produce effective conceptual site models (CSMs) to aid in comprehensive site characterization and remedial design.

Relevant Experience

Data Analytics and Modeling

Optimization of Wave Buoy Monitoring Locations for Wave Field Prediction, Alaska—Implemented machine learning methods to optimize placement of wave measurement buoys to provide the most important data for wave propagation modeling to a location within a model grid where a wave energy converter (WEC) may be located. Wave field predictions allow for WECs to achieve maximized energy conversion across a wide range of ocean conditions. Further, accurate wave forecasts enable prediction of wave energy production necessary for optimal management of wave energy microgrids that can help reduce dependence on nonrenewable energy sources.

Improving the Efficiency and Effectiveness for Marine Energy Permitting: A Toolkit and Engagement for Success—Developing an easily accessible online toolkit that integrates relevant regulatory, scientific, and spatial marine energy data to increase regulators' understanding of marine energy projects, devices, and their potential environmental impacts while reducing permitting time and costs of marine energy projects.

Automating the Collection of Publically Available Data for Environmental Investigations—Served as task lead in identification of publically available groundwater use and water quality data to

719 2nd Avenue
Suite 1450
Seattle, WA 98104

206.957.0334
nswanson@integral-corp.com

support an evaluation of water distribution systems. Eliminated the need to manually access, scroll through, and download individual results through programmatic applications scripted in Python, greatly reducing time spent obtaining and piecing together data sets for analysis.

Automating Workflow for Summarizing and Reporting Per- and Polyfluoroalkyl Substances, Confidential Location—Worked with project team to establish data management and reporting workflow to automate the summarization and reporting of per- and polyfluoroalkyl substances (PFAS) results as they would be routinely received from the laboratory. Used R statistical software to take the data from the database, prepare the data for analysis, and create formatted data tables and report figures customized by sample location.

Per- and Polyfluoroalkyl Substances, Confidential Location—Provided technical support in the analysis of PFAS in groundwater and drinking water. Prepared isomer profiles of PFAS samples in support of ongoing investigations.

Third-Party Analytical Data Quality Review, Confidential Location—Worked with project team to provide extensive third-party review of 8 years of analytical chemistry data records from three laboratory instruments to identify and evaluate the impacts of improper laboratory practices. Examined raw instrument files, laboratory data packages, hard copy documentation, and the laboratory's information management system database to assess conformity with analytical methods, laboratory standard operating procedures, and best laboratory practices.

Pre-feasibility Support of a Large Open-Pit Gold Mine, Nevada—Served as task lead in the partial completion of a predictive pit lake geochemical model using Microsoft® Excel and PHREEQC software to support environmental impact evaluation of a proposed open-pit mine in Nevada. The geochemical model will be used to predict the formation of a pit lake and changes in water quality over time. Provided technical support and quality assurance checks during preparation of the humidity cell report.

Deepwater Horizon, Gulf of Mexico—Conducted quality assurance and data completeness assessments of multiple studies related to the Gulf of Mexico Deepwater Horizon accident.

Forensics and Allocation Support

Superfund Cleanup and Natural Resource Damage Assessment Allocation, Portland, Oregon—Co-leading the chemical forensics evaluation to support allocation within a sediment Superfund site involving more than 100 parties. Forensics analyses are focused on evaluating the distribution and potential sources of PCBs (congeners and Aroclors), dioxins and furans, PAHs, pesticides, and metals in the Superfund site. Analyses include mapping of chemical distributions and interpolations, chemical fingerprinting and comparison to source profiles from literature using similarity analyses, dimension-reduction techniques (principal component analysis), clustering (hierarchical, k-means, k-medoids), and linear mixing and unmixing evaluations.

Sediment Cleanup Allocation Support, Port Angeles, Washington—Led the chemical forensics evaluation to support allocation of sediment impacts at a Model Toxics Control Act site in

Port Angeles, Washington. Forensics analyses focused on PAHs, PCBs, and dioxins and furans. Analyses included chemical fingerprinting and comparison to source profiles from literature using cosine similarity, evaluation of diagnostic ratios of PAHs, and unmixing evaluations.

Former Wood Treatment Facility, Columbus, Mississippi—Performed forensic analysis, including fingerprinting and principal components analysis, to delineate potential sources of dioxins and furans onsite and offsite of a former wood treatment and storage facility located in Columbus, Mississippi, which is contaminated with creosote and pentachlorophenol.

Lower Duwamish Waterway Cost Allocation Support, Washington—Provided key technical support for site-specific cost allocation associated with cleanup of the Lower Duwamish Waterway Superfund site. Support included compilation and analysis of disparate historical data sets, including chemical fingerprinting analyses, to support the characterization and environmental distribution of metals, PCBs, and PAHs in the waterway.

Nutrient Forensic Studies, Confidential Locations, Hawaii—Conducted forensic studies to determine sources of nutrients (primarily nitrogen) to sites that were leading to NPDES permit exceedances into adjacent marine waters. Studies included the use of isotopes of nitrogen and oxygen, as well as nutrient profiles, for delineating potential sources.

Site Investigations and Remedial Action Support

Blackwell Zinc Site, Blackwell, Oklahoma—Serving as project manager for a groundwater remediation project under Oklahoma Department of Environmental Quality oversight at a former zinc smelter site. Project management responsibilities include project coordination and planning, regular correspondence regarding project status with the client and lawyers, review of monthly invoicing, coordination of project backlog, and preparation of change orders. Technical lead for evaluation of remedy performance and optimization. Provided geochemical modeling support in evaluation of remedy alternatives to increase remedy performance. Provided technical support for the completion of the groundwater remediation unit's first and second 5-year review reports. Assisted in planning the ecological habitat assessment for the Legion Park tributary according to Oklahoma regulations. Led the completion of the 2019 update to the remedial action and compliance monitoring plan. Responsible for drafting quarterly project progress reports and annual data reports for the Oklahoma Department of Environmental Quality.

Former Wood Treatment Facility, Meridian, Mississippi—Led development of the Phase II RCRA Facility Investigation report for a former wood treatment and storage facility in Meridian, Mississippi, which is contaminated with creosote and pentachlorophenol. Played a critical role in evaluating historical data collected since the facility closed in 1986 and integrating those data with data collected during the Phase II investigation (2016–2018) to define the nature and extent of facility-related contaminants of potential concern. Developed the preliminary CSM, which identified key physical, chemical, and biological processes that collectively drive site risks, to support the risk assessments and corrective measures study.

Former Wood Treatment Facility, Columbus, Mississippi—Assisted with the development of the remedial investigation report for a former wood treatment and storage facility in Columbus, Mississippi, which is contaminated with creosote and pentachlorophenol. Provided detailed data analysis and support for the development of the CSM, including direction for the development of a Leapfrog 3-dimensional model integrating all surface and subsurface chemical and physical data collected at the site. Developed the preliminary CSM, which identified key physical, chemical, and biological processes that collectively drive site risks, to support the risk assessments and corrective measures study. Led the development of the work plan for offsite soil sampling in residential yards to collect surface and subsurface soil samples for dioxins and furans using incremental sampling methodology. Provided technical support in the development of the Operable Unit 1 feasibility study and subsequent removal action work plan.

Lower Duwamish Waterway Pre-Design Studies, Washington—Led a public outreach survey to characterize waterway use activities to support refinement of sediment recovery categories for assignment of remedial technologies. The survey focus was identifying current and potential future waterway uses and activities that might disturb the sediment bed to a degree that could alter projected recovery potential and thereby inform the need for recovery category refinement.

Berry's Creek Superfund Site, Meadowlands, New Jersey—Provided project management and technical support for the RI/FS of a 12-square-mile, watershed-based Superfund site in northern New Jersey under EPA oversight. Task lead in the refinement of the water balance, including characterization of upland freshwater inputs based on multiple years of in-system measurements and optimization of a Storm Water Management Model runoff model. Utilized R Programming and Microsoft® Excel knowledge to provide data analysis and develop key graphics in support of the report text and majority of appendices (sediment, surface water, hydrodynamics and sediment transport, chemical CSM, and biological characterization). Provided field and laboratory assistance for 5 years of collection of biological samples in support of the remedial investigation, including acting as field lead for collection of fiddler crab, mud crab, grass shrimp, and *Phragmites*.

Groundwater Remediation Support at a Manufacturing Facility, Cottage Grove, Minnesota—Oversaw the drilling for multiple extraction wells using Sonic drilling methods. Performed air monitoring, characterization of soil borings, and collection of composite soil samples for chemical and geotechnical analysis to support development of the well specifications.

Emergency Response at a Bulk Chemical Storage Facility, New Orleans, Louisiana—Provided technical support for completion of the Risk Evaluation/Corrective Action Program (RECAP) onsite work plan under Louisiana Department of Environmental Quality oversight to address any contamination to soils and groundwater from a chemical spill that occurred in a bulk storage facility as a result of flooding during Hurricane Isaac. Assisted with the preparation of RECAP reports documenting the onsite and offsite results of the soil and groundwater characterization. Provided litigation support by developing figures to visually depict the spatial distribution of onsite concentrations of volatile organic compounds.

Terminal 117, Seattle, Washington—Provided field assistance during subsurface soil sampling at the Donovan Street right-of-way at the Terminal 117 early action area of the Lower Duwamish Waterway Superfund site under EPA oversight. Responsibilities included documenting field activities, collecting split soil samples, and transferring data from core log data forms to digital format. Observed procedure and documentation of soil core logging. Assisted with the compilation of appendices to the Terminal 117 data report.

Publications

Johnson, W.P., N.P. Swanson, B. Black, A. Rudd, G. Carling, D.P. Fernandez, J. Luft, J. Van Leeuwen, and M. Marvin-DiPasquale. 2014. Total- and methyl-mercury concentrations and methylation rates across the freshwater to hypersaline continuum of the Great Salt Lake, Utah, USA. *Sci. Total Environ.* 511:489–500.

Invited Presentations/Panels/Peer Reviews

Climate change and commercial real estate, CRE emerging risks. M&T Bank, Buffalo, NY. March 2019.

Great Salt Lake mercury methylation. Utah Chapter of the American Fisheries Society. April 2013.

Presentations/Posters

Whitehead, K., N. Swanson, T. Martin, and J. Durda. 2019. Where to draw the line: Determination of remedial areas by the numbers using changepoint analysis. Platform presentation at Tenth International Conference on the Remediation and Management of Contaminated Sediments, New Orleans, LA. February 11–14.

Swanson, N.P., and D. Smith. 2010. Investigating the possible reactive behavior of CFCs as sorbing tracers in low carbon content sedimentary aquifers. 4th Annual Geneseo Recognizing Excellence and Talent Day, Geneseo, NY.