



Dr. Jessica Meyer

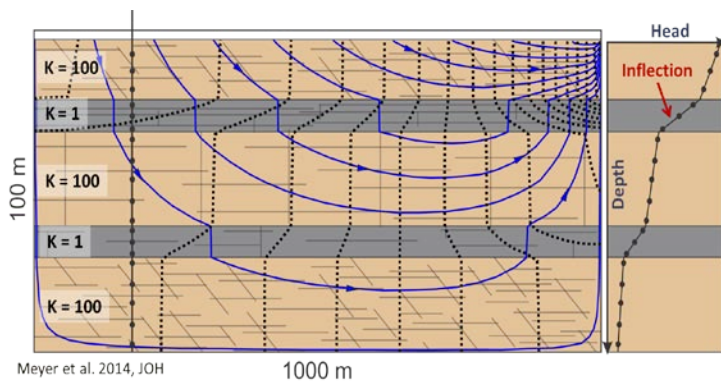
- Assistant Professor, Department of Earth and Environmental Sciences, University of Iowa
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Dr. Meyer started as an Assistant Professor in the Department of Earth and Environmental Sciences at the University of Iowa in August 2018. Previously, she was a senior research associate with the G³⁶⁰ Institute for Groundwater Research.

Characterizing the flow system is essential to nearly every hydrogeological investigation, from determining contaminant impacts at a water supply well to understanding groundwater-surface water interactions. Flow system characterization is quantitative description of flow path attributes (e.g., three-dimensional trajectory, associated groundwater residence time, evolution of biogeochemical conditions). Quantification of these attributes is challenging for 3 main reasons, 1) generally, they cannot be directly observed; 2) measurements of hydrogeologic properties and processes are typically sparse compared to the subsurface volume of interest; and 3) the primary data collection instrument, a well or borehole, fundamentally alters the flow system of interest. As a field based, physical hydrogeologist Dr. Meyer looks for creative ways to collect and interpret field data to overcome these challenges and provide insight into natural flow system conditions.

Dr. Meyer's approach to groundwater studies involves three broad strategies: 1) prioritizing data collection from continuous cores, temporarily sealed boreholes, and high resolution, depth discrete multilevel systems (MLSs) to be most representative of flow system conditions away from the altered condition of the borehole, 2) collecting field data at the highest spatial and temporal resolutions possible to reduce uncertainty, 3) collecting numerous, complementary field data sets to provide multiple lines of evidence to constrain interpretations and conclusions. Currently, Dr. Meyer is applying this approach to advance quantitative characterization of sedimentary rock flow systems in three ways 1) using hydraulic head profiles as a fundamental diagnostic tool for flow system characterization, 2) defining the relationship between hydraulic conductivity contrasts and stratigraphy, and 3) advancing our understanding of bedrock aquitards.

Dr. Meyer also has interest and experience in developing relational data management structures for hydrogeological data and improving geological logging for hydrogeological studies. In addition to her research experience, Dr. Meyer has 15 years of experience managing multi-faceted field based research programs at active industrial sites.



Papers and Theses

Publications

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Meyer, J.R., B.L. Parker, and J.A. Cherry. 2008. Detailed hydraulic head profiles as essential data for defining hydrogeologic units in layered fractured sedimentary rock. *Environmental Geology*, 56(1): 27-44, DOI: 10.1007/s00254-007-1137-4.

Theses

Buckley, A., 2017. Contaminant Mass Distribution of a Mixed Organic Contaminant Plume Downgradient of an Aged DNAPL Source Zone in Sedimentary Rock. MASC Thesis, University of Guelph, Guelph, Ontario, 86 pp.

Ribeiro, L.A.F.S., 2016. Constraining a Discrete Fracture Network Static Model for the Tunnel City Group Sandstones in Cottage Grove-WI using Outcrops and Boreholes. MASC Thesis, University of Guelph, Guelph, Ontario, 98 pp.