Dr. Beth Parker

- Director, The G^{360} Institute
- NSERC Senior Industrial Research chair in Fractured Bedrock Contamination
- Professor, School of Engineering, University of Guelph
- Associate Director, The University Consortium

Dr. Parker is a Professor in the School of Engineering at the University of Guelph and holds a Senior Industrial Research Chair in Fractured Rock Contaminant Hydrology from the Canadian Natural Sciences and Engineering Research Council (NSERC) since 2007.

Dr. Parker's main research thrusts are:

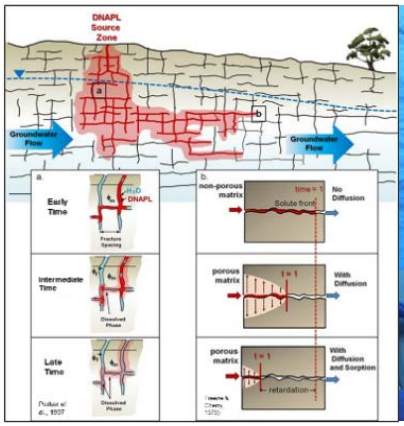
- Improving characterization, remediation, monitoring technologies and data analysis for aged industrial contaminated sites in complex hydrogeologic settings.
- High resolution data useful for Groundwater resource water including protection for private and municipal water supplies in fractured sedimentary rock.
- Evaluating water quantity and quality impacts to surface water and groundwater from natural resource extraction (i.e. mining, upstream oil and gas, permits to take water).
- Improve groundwater flow systems for understanding flow path and fluxes including Surface water interaction .

Dr. Parker began her professional career more than 30 years ago as an environmental engineer in New York State working on characterizing, monitoring and remediation of industrial-derived contaminants in groundwater, primarily in glacial and bedrock sediments. After seven years working to characterize and remediate chlorinated solvent and metal contaminants in various complex industrial environments under RCRA and Superfund legislation, she continued her education at the University of Waterloo (Ontario, Canada) where she completed her PhD in Earth Sciences in 1996 and then held Research Assistant / Associate Professor there from 1996 – 2007. In 2007 she moved her research program to the University of Guelph as a Full Professor.

In addition to the NSERC IRC awarded in 2007 as recognition of her scientific leadership with chlorinated solvent behaviour in groundwater, she received the John Hem Award from the Association of Groundwater Scientists and Engineers of the United States National Groundwater Association in 2009.

As founding director of the G^{360} Institute for Groundwater Research, she directs a large group of interdisciplinary scientists and engineers that focus on developing and implementing high resolution field methods aimed at quantifying advective and diffusive transport and associated reactive processes attenuating industrial contaminants in complex hydrogeological settings via the development of robust, process-based site conceptual models for assessing risks to receptors and appropriate monitoring and remediation designs for cost effective site management and aquifer protection.

Dr. Parker's long-term focus has been on quantifying the role of diffusion on various contaminant source zone types and plume evolution, often creating limits to cost effective remediation. This is synergistic with her long term interest in characterization of aquitards to better understand groundwater flow systems, linking recharge areas to discharge areas.



Selected Papers and Theses

Selected Publications

Cahill*, A.G., Parker, B.L., Mayer, B., Mayer, K.U., Cherry, J.A. 2017. High resolution spatial and temporal evolution of dissolved gases in groundwater during a controlled natural gas release experiment. Science of Total Environment, 622-623: 1178-1192.

Manna*, F., Walton*, K., Cherry, J.A., Parker, B.L. 2017. Mechanisms of recharge in a fractured porous rock aquifer in a semi-arid region. Journal of Hydrology, 555, 869-880.

Steelman*, C.M., Klazinga*, D., Cahill*, A.G., Endres, A., Parker, B.L. 2017. Monitoring the evolution and migration of a methane gas plume in an unconfined sandy aquifer using time-lapse GPR and ERT. Journal of Contaminant Hydrology, 205, 12-24.

Haslauer, C., Meyer*, J.R., Bárdossy, A., Parker, B.L. 2017. Estimating a representative value and proportion of true zeros for censored analytical data with applications to contaminated site assessment. Environmental Science & Technology, 51(13), 7502-7510.

Allen*, A., Borchardt, M. Kieke, B, Dunfield, K. Parker, B.L. 2017. Virus occurrence in private and public wells in a fractured dolostone aquifer in Canada. Hydrogeology Journal, 25:1117-1136.

Cahill*, A.G., Steelman*, C., Forde, O., Kuloyo, O., Ruff, S.E., Mayer, B., Mayer, K.U., Strous, M., Ryan, M.C., Cherry, J.A., Parker, B.L. 2017. Mobility and persistence of methane in groundwater in a controlled-release field experiment. Nature Geoscience, 10, 289-294.

Munn*, J. D., Coleman*, T. I., Parker, B. L., Mondanos, M. J., & Chalari, A. 2017. Novel cable coupling technique for improved shallow distributed acoustic sensor VSPs. Journal of Applied Geophysics, 138, 72-79.

Quinn*, P.M., Cherry, J.A., Parker, B.L. 2016. Depth-discrete specific storage in fractured sedimentary rock using steady-state and transient single-hole hydraulic tests. Journal of Hydrology, 542, 756-771.

Manna*, F. Cherry, J.A., McWhorter, D.B., Parker, B.L. 2016. Groundwater recharge assessment in an upland sandstone aquifer of southern California. Journal of Hydrology, 541(B), 787-799.

Filippini, M., Amorosi, A., Campo, B., Herrero Martìn, S., Nijenhuis, I., Parker, B.L., Gargini, A. 2016. Origin of VC-only plumes from naturally enhanced dechlorination in a peat-rich hydrogeologic setting. Journal of Contaminant Hydrology, 192, 129-139.

Wanner, P., Chapman*, S., Parker, B.L., Aravena, R., Hunkeler, D. 2016. Quantification of Degradation of Chlorinated Hydrocarbons in Saturated Low Permeability Sediments Using Compound-Specific Isotope Analysis (CSIA). Environmental Science and Technology, 50 (11), 5622-5630.

Meyer*, J.R., Parker, B.L., Arnaud, E., Runkel, A.C. 2016. Combining High Resolution Vertical Gradients and Sequence Stratigraphy to Delineate Hydrogeologic Units for a Contaminated Sedimentary Rock Aquifer System. Journal of Hydrology, 534, 505-523.

Coleman*, T.I., Parker, B.L., Maldaner*, C.H., Mondanos, M.J. 2015. Groundwater flow characterization in a fractured bedrock aquifer using active DTS tests in sealed boreholes. Journal of Hydrology, 528, 449-462.

Steelman*, C.M., Kennedy*, C.S., Parker, B.L. 2015. Geophysical conceptualization of a fractured sedimentary bedrock riverbed using ground-penetrating radar and induced electrical conductivity. Journal of Hydrology, 521, 433-446.

Meyer*, J. R., Parker, B. L., Cherry, J. A. 2014. Characteristics of high resolution hydraulic head profiles and vertical gradients in fractured sedimentary rocks. Journal of Hydrology, 517, 493-507.

Pehme*, P., Parker, B.L., Cherry, J.A., Blohm, D. 2014. Detailed measurement of the magnitude and orientation of thermal gradients in lined boreholes for characterizing groundwater flow in fractured rock. Journal of Hydrology, 513, 101-114.

Quinn*, P.M., Parker, B.L., Cherry, J.A. 2013. Validation of non-Darcian flow effects in slug tests conducted in fractured rock boreholes. Journal of Hydrology, 486, 505-518.

Pehme*, P.E., Parker, B.L., Cherry, J.A., Molson, J.W., Greenhouse, J.P. 2013. Enhanced detection of hydraulically active fractures by temperature profiling in lined heated bedrock boreholes. Journal of Hydrology, 484, 1-15.

Chapman* S.W., Parker, B.L., Sale, T.C., Doner, L.A. 2012. Testing high resolution numerical models for analysis of contaminant storage and release from low permeability zones. Journal of Contaminant Hydrogeology, 136-137, 106-116.

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

Parker, B.L., Cherry, J.A., Chapman*, S.W. 2004. Field study of TCE diffusion profiles below DNAPL to assess aquitard integrity. Journal of Contaminant Hydrology, 74(1-4), 197-230.

Parker, B.L., Cherry, J.A., Chapman*, S.W., Guilbeault*, M.A. 2003. Review and analysis of chlorinated solvent DNAPL distributions in five sandy aquifers. Vadose Zone Journal, 2(2), 116-137.

Parker, B.L., McWhorter, D.B., Cherry, J.A. 1997. Diffusive loss of non-aqueous phase organic solvents from idealized fracture networks in geologic media. Groundwater, 35(6), 1077-1088.

Parker, B.L., Gillham, R.W., Cherry, J.A. 1994. Diffusive disappearance of immiscible-phase organic liquids in fractured geologic media. Ground Water, 32(5), 805-820.

Recent Theses (2017-2018)

Joanna Olesiuk, May 2018, M.Sc. thesis Temporal evaluations of chlorinated solvent plumes in Guelph dolostone aquifer using complimentary physical and hydrochemistry data sets.

Donovan Capes, January 2018, M.Sc. thesis Utility of ambient groundwater temperature profiling within sealed bedrock boreholes for fracture flow characterization in seasonally dynamic environments.

Carlos Maldaner, July 2017, Ph.D. thesis: Discrete-depth measurements of natural gradient groundwater flow in fractures using borehole tracer methods.

Celia Kennedy, June 2017, Ph.D. thesis: Groundwater - surface water interactions in the Discrete Fracture Networks of bedrock rivers.

Tara Harvey, June 2017, M.Sc. thesis: Hydrogeological characterization of contaminated glacial sediments in south central Wisconsin.

Andrew Buckley, May 2017, M.Sc. thesis: Contaminant mass discharge from organic source (WI site).

Jeremy Fernandes, March 2017, M.A.Sc. thesis: Nature and extent of toluene contamination in a shallow dolostone aquifer using high resolution methods for assessing natural and anthropogenic influences.