

Vision: Generating global respect for groundwater through field research.

Mission: Enable evidence-informed groundwater resource stewardship by providing a world class research institute of excellence for training and collaboration to advance knowledge, professional practice, and policy.

Founded at the University of Guelph in 2007 by Dr. Beth Parker, Morwick G360 formulates process-based site conceptual models to inform risk to receptors and subsurface remediation designs. These models rely on comprehensive, multi-disciplinary, high resolution field data sets.

Work on several long term field research stations has led to the development of the Discrete Fracture Network (DFN) field approach for site characterization, monitoring and modeling which describes the groundwater flow and the complex behaviour of contaminant transport and fate in heterogeneous sedimentary fractured bedrock systems.

The Morwick G360 Institute conducts field-based groundwater research on 3 main topics:

- Aged industrial contaminated sites
- Potential impacts to groundwater from oil and gas development
- Groundwater resource characterization and monitoring for sustainability and ecosystem protection



Who We Are: Morwick G360 includes 14 principal investigators and employs over 50 people including post-docs, research staff, graduate students, visiting scientists and technicians. We conduct research at international field sites and have strong collaborations with projects around the globe. Morwick G360 established the Morwick Groundwater Research Centre at the University of Guelph, a facility that includes a large purpose-built building to house drilling, sampling and logging equipment, as well as a network of research boreholes and resources for technology demonstrations, knowledge transfer, teaching and community outreach. Morwick G360 manages a network of high resolution multilevel systems for groundwater monitoring and flow system research throughout the Guelph area, using the region as a model research community to conduct societally relevant groundwater research.

In association with the University Consortium for Field-Focused Groundwater Research, Morwick G360 is the focal point of a global collaboration of more than 20 institutions in 10 countries.

Research Thrusts

- Innovative high resolution discrete fracture / matrix (DFN-M) field methodology for site characterization, monitoring and process-based modeling in bedrock systems
- Groundwater flow system characterization with focus on aquitard characterization
- DNAPL source zone evolution and effects on plume behavior in fractured sedimentary rock
- Contaminant mobility and fate (i.e. organic, metals, pathogens, bacteria, and viruses)
- Groundwater contaminant transport processes emphasizing diffusion and advective interactions
- Source water protection, water resource management and vulnerability analysis
- Aquitard integrity regarding various contaminant types for source water protection/waste isolation
- Potential impacts to groundwater from upstream unconventional oil and gas development
- High resolution data acquisition, storage and analysis methods to inform site conceptual and numerical models



Morwick G360's comprehensive research infrastructure and global network of research sites is built on a clear vision within a strong collaborative framework and the successful acquisition of large collective funding from federal and provincial governments, municipalities and cities, and industries. These exceptional conditions combine to create a unique experiential education and research program involving industry standard practice and innovation on both practical and fundamental topics. There are few other academic facilities for field-focused groundwater research and education comparable to Morwick G360 anywhere in the world.

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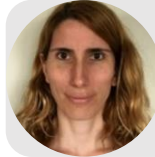
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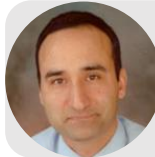
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SOE = School of Engineering
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