

pollutants in unfrozen soil, however, surprisingly little is understood about mobility in a freezing environment in which behavior will be dramatically different. Processes that govern fate and transport of contaminants in unfrozen ground are discussed. Effects of freezing on that contaminant fate and transport are discussed, but remain largely unknown.

The next body of research must involve experimental investigations into full system response to identify at once the overall behaviour and the dominant factors that dictate that behaviour. This will be essential before either numerical modelling or experiments on small, isolated elements of soil can be used to identify details of system response. Full scale tests are desirable, but their size and duration make them impractical for initial parametric studies. Geoenvironmental centrifuge modeling is identified as a powerful alternative using small, short duration physical models that capture the essential self-weight driven influences missing from conventional small model testing; the groundwork to date, both with and without freezing, both with and without sorption effects, but not all together, has laid the foundation for extension of its application into research into fate and transport of contaminants in freezing ground.

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