

Perception and understanding of microbial transport through soils and associated risks

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Transport of wastewater contaminants through and across soils, associated or not with erosional processes have been evaluated both using stochastic and mechanistic models. Large scale (i.e. from field to watershed) processes are usually stochastically modeled. Many elements of mechanistic modeling have been identified and assessed at small scales. Given that both chemical and microbial contaminants commonly arrive to lands in organic waste matrices any risk assessment must incorporate soil as transfer matrix and organic waste as modifier and include the impact of biotic and abiotic parameters as modifiers relevant for long term risks. The extent to which understanding of proximate causes obtained at various discrete scales, may be combined to assess the potential for bacterial transport through the vadose zone following land application of organic waste is still an open question. We present here a review of the current knowledge relating land application of wastes, microbial transport, survival, and eventually risks as seen through the lens of different disciplines involved in germaine research. Regulatory implications will be discussed.