Crack flow as a component of risk indicator of water contamination

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Risk indicators of water contamination by agricultural activities are important tools for land management, contamination assessment, legislation on agriculture, and politics. Such risk indicators are developed for different contaminants (e.g. pesticides, pathogens, nitrogen and phosphorus) at the Canadian national level and are meant to classify different agricultural areas (1:100 000 scale) and watersheds within five risk classes (very low, low, medium, high and very high). Risk indicators must respond to land and climate characteristics and changes in agricultural management practices (crop, contaminant). Major input parameters include preferential flow (PF) components, one of them being the flow of water and contaminants through cracks, i.e. crack flow (CF). The calculation of the risk of CF is based on the water deficit contributing to crack development. Soil water deficit is calculated from the soil water balance and considers evapotranspiration, infiltration, runoff, texture, slope, etc. Most of these input parameters are available through Census of Agriculture data, climatic data, pedological reports, and pesticide registration data. The distribution of CF risks will be presented with a sensitivity analysis. Advantages and limits of the CF component will also be discussed.