Capture probability maps for addressing uncertainty: protection vs mitigation

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Abstract Decision-makers often rely on numerical groundwater models to support source water protection decisions for areas surrounding water production wells. However, model results can be associated with a high degree of uncertainty. One way to address this uncertainty is to consider an array of alternative scenarios deemed representative of the system. A simple method is proposed to combine the results from alternative scenarios into two types of capture probability maps: one focused on protection, and the other on mitigation. The proposed approach is applied to a municipal well located in a complex glacial aquifer system in Ontario, Canada. For this case, the two types of maps are found to differ substantially.

Key words uncertainty; numerical modelling; source water protection; capture zones