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Title: Risk Maps based on Random Walk Modelling for Ecological Receptors

Spatially explicit exposure modelling of ecological receptors in a heterogeneously contaminated floodplain

Abstract:

It is generally recognised that exposure estimates are influenced by the spatial positions of both receptors and stressors. Nevertheless, the incorporation of spatial heterogeneity in ecological risk assessment is a relatively recent phenomenon. A spatially explicit individual-based exposure model has been developed. In this model, an individual receptor is represented by a set of algorithms that describe the processes relevant for exposure and risk assessment, e.g. movement and food intake. Movement algorithms allow the receptor to move over a raster map, thereby encountering and accumulating contamination over space and time. Spatial variation is accounted for by incorporating spatially explicit contaminant concentrations and foraging behaviour, based on habitat and diet requirements. A so-called food web approach has been followed, which takes into account feeding relationships between species. The model is applied to assess the exposure of terrestrial floodplain species to cadmium contamination in a floodplain along the river Waal in the Netherlands. It calculates life-time exposure to cadmium, from which species-specific risk can be predicted and mapped.

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