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Modelling muddy floods in urban areas

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Muddy floods are sediment loaded runoff from agricultural land. The related flooding and mud depositions become a major problem when occuring in settling areas to cover streets, private properties, industrial areas etc. Beside of the psychological strain for the affected residents the costs for mud removal are a burden that has to be considered.
Up to now, the threat of muddy floods has poorly been considered in the planing processes of settling or industrial areas. This is because there is no adequate tool to predict the exact places where the mud is transported and where it might be deposited during flash floods. At present the structures of settlements have not been considered in digital elevation models (DEM) wich are used for erosion and deposition modelling. As these structures notably influence surface runoff, it is necessary to develop a method that integrates the elements of settlements into the DEM. We use GIS to alter DEMs with informations about settlement structures (buildings, streets, sidewalks, ditches, walls etc.) and also with information about planed constructions. This altered DEM will than be applied in an event-based soil erosion model (Erosion 3D) that is able to predict both runoff and transported sediment.
The aim of this study is to find out runoff and deposition patterns in settlements in case of flash floods, but also to test the impact of changes in the anthropogenic surface due to new constructions. Such a tool would be useful in the planning process of new settlements or industrial areas or to evaluate possible protection measures.