



Risk analysis for high groundwater levels focussed on residential buildings in Dresden, Germany

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In several cities around the world, problems with rising groundwater levels were reported, but up to now, losses caused by high groundwater levels have been neglected in loss assessment studies. However reliable loss assessments are necessary to evaluate the cost-effectiveness of mitigating measures like groundwater withdrawal and drainage.

The city of Dresden in Germany has initiated the research project “MULTISURE - Development of Multisequential Mitigation Strategies for Urban Areas with Risk of Groundwater Flooding” which aims at the development of assessment methods for the hazard, the damage potential and the risk due to interactions of riverine and groundwater flooding.

The Flood Loss Estimation MOdel for the private sector - FLEMOps has been adapted for high groundwater levels and was successfully validated on the micro- and meso-scale. FLEMOps is based on empirical flood loss data which has been collected after the flood in the Elbe- and Danube-catchments in 2002. It is a rule based model which takes into account several impact factors besides the water depth, such as building type and quality as well as contamination and precaution.

Losses due to high groundwater levels to residential buildings in Dresden were modelled for the extreme flood in 2002 and for six groundwater-scenarios which are related to a 100 year flood of the Elbe in Dresden. The estimated losses between 5 and 65 million Euros depending on the scenario and its boundary conditions stress the relevance of the risk due to high groundwater levels. The results are visualised as risk maps according to the European flood directive.