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Modelling the groundwater recharge of an urban area in Germany

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Groundwater recharge is an important part of the natural water cycle. This cycle is disturbed particularly in urban areas. Sealing negatively influences the hydrological and mechanical soil properties. The continued sealing of soils, mainly caused by urbanisation, will continue to reduce the infiltration of water to groundwater and increase the surface run-off. Furthermore, recent and future climate changes strongly affect the available water resources. Those changes in water availability interfere with i.e., the cultivation of land, forest management, water supply, waste water disposal and urban infrastructure. Those issues are studied in the BMBF-supported joint research project REGKLAM that deals with climate change adaptation options in the model region Dresden.
This work aims at simulating the groundwater recharge for the status quo and regionalised climate change scenarios and thus will deliver a central component to other parts of the REGKLAM project. Modelling is done using the two-dimensional hydrological model BOWAM. Current groundwater recharge models miss not only a high resolution, but also a realistic description of soil properties. Thus, it was necessary to develop a differentiated classification of soil and land use data. At present, we focus on the Quaternary aquifer of the region of Dresden, as there have been already conducted several studies that may serve as a reference for our more detailed and actual results.