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Improving Spatially Distributed Regional Recharge Estimation

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Spatial and temporal variability of groundwater recharge are key factors that need to be quantified to determine the sustainability of groundwater resources. In response to the need for better estimates of groundwater recharge the WetSpass spatially distributed water balance model was developed and applied for Flanders. This model aims to simulate long-term average recharge depending on land cover, soil texture, topography and hydrometeorological parameters. The model simulates recharge iteratively connected to a groundwater model, such that the recharge estimate is also influenced by the groundwater depth and vice versa. The application of the model shows that the resulting recharge has a spatial complex pattern, depending to a large extend on the soil texture and land cover. Moreover, shallow groundwater levels in valleys cause negative recharge conditions as a result of evapotranspiration by abundant phreatophytic vegetation. For more dynamic recharge processes the WetSpa spatially distributed rainfall-runoff model can be applied. The aim of this contribution is to present WetSpass-WetSa recharge methodology and to evaluate the simulated spatially distributed recharge for Flanders on basis of baseflow time series of 67 river gauging stations distributed over Flanders.