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# Modeling of vegetation dynamics in hydrological models for the assessment of the effects of climate change on evapotranspiration and groundwater recharge

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Abstract. Vegetation affects water balance of the land surface by e.g. storage of precipitation water in the canopy and soil water extraction by transpiration. Therefore, it is essential to consider the role of vegetation in affecting water balance by taking into account the temporal dynamics of e.g. leaf area index, rooting depth and stomatal conductance in hydrological models. However until now, most conceptual hydrological models do not treat vegetation as a dynamic component. This paper presents an analysis of the effects of the application of two different complex vegetation models combined with a hydrological model on the model outputs evapotranspiration and groundwater recharge. Both model combinations were used for the assessment of the effects of climate change on water balance in a mesoscale catchment loctated in the Northeastern German Lowlands. One vegetation model assumes a static vegetation development independent from environmental conditions. The other vegetation model calculates dynamic development of vegetation based on photosynthesis, respiration, allocation, and phenology. The analysis of the results obtained from both model combinations indicated the importance of taking into account vegetation dynamics in hydrological models especially if such models are used for the assessment of the impacts of climate change on water balance components.

Full Article in PDF (PDF, 781 KB)

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