



Impact of time stability of catchment model parameters for snow simulations in Austria

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The main focus of the study is to evaluate the time stability of model parameters used to simulate snow accumulation and melt by a conceptual hydrologic model. Previous studies showed the implications of time stability of catchment model parameters for climate impact analyses. The main goal of this research is to assess the effects of different objective functions on the performance and time stability of TUW model parameters for snow simulations in Austria. TUW model is a conceptual hydrologic model that simulates snow processes by using degree-day approach and threshold air temperatures. In this study, the model is calibrated over three consecutive 10-year periods between 1981 – 2010. The runoff and snow model performance is evaluated against observed daily runoff in 213 catchments and interpolated daily snow depth from more than 700 climate stations. The results compare three different scenarios used for model calibration: (1) single objective calibration on daily runoff data, (2) single objective calibration on daily snow cover data, (3) multi-objective calibration on daily runoff and snow cover data. The model efficiency is assessed in terms of water storage changes expressed by volume error over entire simulation period. Subsequently, factors controlling time stability of model parameters are analyzed in relation to the three different calibration scenarios.