



Modeling the Soil Moisture Parametrization in a Snow Dominated Mountainous Region

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The study quantifies the effects of both the soil moisture accounting and the temperature index in the event based as well as the continuous simulation of a model in a snow dominated basin. Physically based watershed model parameters are required to reproduce the historical flows and forecast the stream flows. This study demonstrates that parameterization of hydrological model is a favorable approach to perform forecasting because it employs the relationship of the calibrated model parameters and those of the watershed's physical properties. With this consideration, the temperature index (degree-day) snowmelt and the soil moisture accounting models within the Hydrologic Engineering Center's hydrologic modeling system (HEC-HMS) are applied to the Upper Euphrates watershed. The versatile 14-parameter soil moisture accounting (SMA) algorithm is utilized for a better simulation and parameterization of the watershed. The methodology was exemplified by performing various independent simulations using the meteorological data and the observed stream discharges. The soil moisture parameters were calibrated and modified according to their statistical relationships with the land use for the 2002 – 2008 period, the obtained parameter set are then validated for the 2009 – 2012 period. Model outputs are evaluated in comparison to satellite derived soil moisture and snow water equivalent data. Deterministic Numerical Weather Prediction data are used together with the conceptual model to forecast runoff for the melting period of the year 2015.