



Assimilation of remotely sensed snow observations into a distributed hydrological model

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Accurate forecasting of snow properties is important for effective flood warning system using current model-based forecasting approaches. The moderate resolution imaging spectroradiometer (MODIS) flown on the NASA Terra satellite can provide snow properties like snow cover extent (SCE) and Snow Surface Temperature (SST) over large areas with high spatial and temporal resolution. Using data assimilation technique, remotely sensed data of SCE and SST can be implemented for updating the internal variables of hydrological models and reducing the uncertainty of input parameters. In this study, a simple Kalman filter was used to assimilate remotely sensed data of SCE and SST into a hydrologic model, Snowmelt Runoff Model (SMR), over the Karoun basin in Iran. The SMR model was applied in a distributed way to demonstrate the use of satellite data of SCE and SST for short-term runoff forecasting. During the snowmelt periods 20012 to 2005, daily runoff forecasts were made for the Karoun basin (Iran) using modeling with data assimilation and were compared with observation data of river discharge. Evaluation of the runoff forecasts reveals good agreement with the measurements, confirming the usefulness of the selected data processing and assimilation scheme for operational use.

Keyword: Data assimilation, distributed hydrological modeling, snow cover extent, snow surface temperature.