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Snowmelt runoff simulation using WetSpa model in poorly gauged catchments (Case study: Gharesoo river catchment in Iran).

Snowmelt plays an important role in soil moisture, ground-water recharge, and flood control in the most mountainous regions. Information on the timing and magnitude of melt is required for successful water resource management. A spatially distributed hydrologic WetSpa model is used to simulate river flow of Gharesoo river catchment – a large watershed with area of 4500 km^2 - in the north west of Iran. The WetSpa model uses a modified rational method to calculate runoff and a degree-day approach to estimate the snowmelt runoff based on temperature data. Model parameters which were needed for current simulation have been derived from a Digital Elevation Model (DEM), land use and soil type maps of the River basin, and observed daily meteorological data including precipitation, temperature and evaporation. In this study, the model performance, according to the Nash Sutcliffe efficiency for simulating one year of daily discharge resulting from snowmelt during spring was satisfactory. Since the model can be calibrated and validated against available MODIS snow cover maps, it can be used to simulate runoff in absence of hydrometric gauging stations which are needed for calibration and validation of hydrological models.