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Water storage in snow cover and runoff in experimental basins in the Jizerské hory Mountains

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The main aim of this work was to compare the results of the water storages obtained in the experimental basins in the Jizerské hory Mountains before the time of snowmelt with the total outflows, which were measured in the hydrological stations during the snowmelt period in two winter seasons with extraordinary snow depths (2005 and 2006). The snow water equivalent (measured in weekly steps), daily precipitation amount, and runoff in hourly values were the input data; the calculated runoff coefficients were the output values. The runoff coefficients from the snowmelt periods of 2005 and 2006 were compared in the Uhlířská and the Jezdecká Basins. The runoff coefficient in the Uhlířská Basin increased in 2006 from 0.636 to 0.688 (increase by 4%) and in the Jezdecká Basin it increased in 2006 from 0.660 to 0.749 (increase by 9%). It may have been the result of a bigger volume of precipitation during the snowmelt period 2006. The calculated runoff coefficients, which express the differences between the water storage obtained and the total outflow, can describe the specific characters of the experimental basins. It may be useful for the estimation of the expected inflow into water reservoirs and also for the hydrological forecasting in the foothills of the Jizerské hory Mountains. The measured data of snow cover also serve as a check, and also for the possible adjustment of the snow water equivalent generated by the model SNOW 17 – which is a part of the forecasting modelling system Aqualog. This system is in everyday use for the Elbe river forecasts in the Forecasting Centre of CHMI. The usefulness of this procedure was proved especially during the floods arising from snowmelts in last years. The model SNOW 17 has been calibrated for the catchment of the Černá Desná Stream with the Jezdecká closing profile (one of the experimental basins in the Jizerské hory Mountains). The results obtained demonstrate a very good capability of the model to duplicate the dynamics of the snow cover accumulation and thaw, if quality input data are available.

Keywords:

snow water equivalent (SWE); runoff coefficient; snowmelt; simulation of discharge

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