

SURFACE RUNOFF ESTIMATION BASED ON TOTAL RAINFALL-TOTAL LOSS RAINFALL RELATIONSHIP FOR CATCHMENTS IN ISHIKARI RIVER

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One of the main objectives of research in hydrology is to improve the accuracy of surface runoff estimation for enhancing flood prediction. Rain water falling to the ground surface will infiltrate into the soil and the excess rainfall will be surface runoff. The infiltrated water is defined as loss rainfall and loss rainfall is subtracted from total rainfall (actual rainfall intensity) to obtain the surface runoff (excess rainfall intensity). The non-linearity of surface runoff phenomena in the mountainous basins based on universal lumped kinematic wave model has been studied. Current study about total rainfall-total loss rainfall relationship by using tanh fitting curve has been conducted for 65 catchments located in 27 prefectures in Japan. Hourly rainfall and hourly runoff observation data for 10 years during summer time is used as required input data. Runoff parameters in the tanh function represented by a and b parameters are utilized to estimate effective rainfall based on water holding capacity theory. The purpose of this study is to estimate surface runoff by using effective rainfall for semi-ungauged river basins at the upper catchments area in Ishikari River Basin, Hokkaido Island, Japan. The obtained results are compared to the observation data for validation purpose.

Keywords: Surface Runoff, Flood Prediction, Total Rainfall-Total Loss Rainfall, Water Holding Capacity Theory