



Comparison the PERSIANN model with interpolation methods to estimate daily precipitation (A case study: North-Khorasan, Iran)

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Precipitation plays an important role in many applications based on climatic parameters. Many studies in the field of hydrology, hydrometeorology and agriculture employ rain-gauge (such as synoptic and climatologic stations) data. Precipitation characteristics, such as rainfall intensity and duration, usually exhibit significant spatial variation, even within small watersheds; however rain gauge network density cannot provide desirable cover. Nearly all related studies use interpolation methods for locations without rain gauge data. Many studies have shown that estimated error is usually high when using usual interpolation methods. Employing satellite data with high spatial and temporal resolution can provide accurate precipitation estimation. PERSIANN (Precipitation estimation from remotely sensed information using artificial neural network) model works based on the ANN (artificial Neural Network) system which uses multivariate nonlinear input-output relationship functions to fit local cloud top temperature (T_b) to pixel rain rates (R). In this study, PERSIANN model and two interpolation methods (Kriging & IDW) are employed to estimate precipitation cover for North-Khorasan between the years 2006 until 2008. Results show better correlation between PERSIANN output and station data than the other two interpolation methods. While correlation coefficient for Kendal's test is 0.805 between model and Bojnord Station data, this coefficient is 0.488 for IDW and 0.565 for Kriging method.

Keywords

PERSIANN medel, IDW, Kriging, Interpolation methods, Precipitation estimation