



Assessment the efficiency of different interpolation methods for estimation of missing rainfall data (A case study in Iran, Golestan province)

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Precipitation is one of the most important entrance parameters for a hydrological analysis of a watershed basin. Concentrated (point) rainfall measurements, unsuitable dispersion of rainfall stations and, nevertheless, lack of connection roads to some of the measurement sites, make sometimes the final interpolation for some missing data an essential task. In spite of some limitations in case of insufficient data, the field statistical methods are convenient and suitable considering their location and spatial correlation. The aim of this study is to discuss the efficiency of different interpolation methods for rainfall estimation of the missing records at some rainfall stations in north of Iran. 20 rainfall stations with 20 year recording period were selected, while 5 stations were chosen as evidence. By means of Ilwis software, in the next step, the rainfall map for Golestan province was created. This was done on the basis of the yearly precipitation of 15 stations (except 5 evidence stations). This has been done while applying 6 interpolation methods as following: Nearest Point, Kriging, Universal Kriging, Moving Surface, Moving Average and Trend Surface. Finally, the estimated values for 5 evidence stations have been compared with the evidence data. In order to conclude about the efficiency of the methods used, the statistical value of MSE and RSE has been considered. The validation showed that in our case, the Kriging method illustrated the lowest amount of errors in comparison with other methods. It is suggested to compare the methods for the other periods and other sites as well.

Keywords: Interpolation methods; missing rainfall data; yearly precipitation;

Golestan.