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Performance evaluation of rain gauge network by using a probabilistic and GIS based approach: a case study

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Precipitation is a major input for planning and managing water resources development. A rain gauge network with accurate measurement capacity and appropriate density is desirable. In this study an application is presented that aims to evaluate a rain gauge network in a large watershed in Iran. Spatial variability of annual rainfall is analyzed using dimensionless variogram, and a sequential algorithm is applied to evaluate the rain gauge network. Results show that the identified network, which comprises approximately two-thirds of the rain-gauges, can achieve almost the same level of performance as the complete network for annual rainfall estimation. Furthermore, the implementation of the method within a GIS framework for determining the percentage of the study area with acceptable accuracy is presented.

Keywords: rain gauge network, Acceptable probability, Kriging, GIS