عنوان مقاله:

Applying Geostatistical Methods for Analyzing Regional Flood Frequency in North of Iran (Case Study: Mazandaran Catchments)

محل انتشار:

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نویسندگان:

M. R. Yazdani - *Desert Studies College, Semnan University, Semnan, Islamic Republic of Iran*.

Z. Sheikh - *Desert Studies College, Semnan University, Semnan, Islamic Republic of Iran*.

خلاصه مقاله:

In Iran, applying geostatistics to regional analysis is said to be in its early stages. The fundamental principle of this technique emphasizes the interpolation of hydrological variables in physiographical, instead of geographical, spaces. This paper deals with the adaptation, application, and comparison of two regional analysis methods based on geostatistics. In this study, data from ۳۸ gauging stations located in the north of Iran were used to investigate the performance of geostatistical methods in two physiographical spaces. Two multivariate analysis methods, namely, Canonical Correlation Analysis (CCA) and Principal Components Analysis (PCA), were used to identify physiographical spaces. Gaussian and exponential models were selected as the best theoretical variogram models in CCA and PCA spaces, respectively. Ordinary and simple kriging geostatistical estimators were also used for regional estimations in both physiographical spaces. Using the interpolation methods in CCA and PCA spaces, regional flood estimations were made for different return periods (۱۰, ۲۰, ۵۰, and ۱۰۰ years). Finally, performance of both models was studied using five statistical indices. The results showed that both methods had similar and satisfactory performance; however, regional estimations in CCA had higher accuracy and less uncertainty than those in PCA-space. Furthermore, the results indicated that the ordinary kriging method had better performance than the simple kriging method in both spaces and the best interpolation efficiency was observed in the CCA space.

کلمات کلیدی:

Interpolation, kriging, Physiographical space, Principle Component Analysis (PCA)