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In the field of Watershed Management

Comparison of the Accuracy of some Geostatistical Methods in the Zonation of Meteorological Drought in Arid Regions (Case Study: Sistan and Baluchestan Province)

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Abstract:

Drought is one of the natural disasters in arid regions, which is more important than other phenomena, both in terms of the intensity and frequency of occurrence and in terms of spatial extent and the amount of damage it causes. This study was conducted to evaluate the accuracy of statistical methods in meteorological drought zoning in Sistan and Baluchestan province. In this study, the rainfall statistics of 12 synoptic and climatological stations during the 22-year statistical period (1996-1997) were used. In order to study the drought in the mentioned statistical period, ZSI index was used and calculations were performed with the help of DIP software and for each of the stations, the drought values were plotted. For introspection, conventional curing methods were used with spherical, exponential, linear, and Gaussian models, and the reverse image distance method with capabilities 1 to 3 was used. Also, the accuracy of introspection methods to determine the best statistical method was evaluated and evaluated using the mutual evaluation method and the statistical criteria of square root of the mean square of error (RMSE) and average of absolute error (MAE). After determining the best statistical method, the drought zoning map was drawn in Arc GIS 10.4.1 software environment and Geostatistics tool and different drought classes were obtained based on ZSI drought index for the study area. The results showed that based on the mutual evaluation of statistical methods for drought zoning in the period of three months and 12 months, the method of photographing the distance with power 3, for the period of 18 months with the power of 2, for the period of 24 months with the power of one and for the period of time The 48-month-old with a power of 1 was suitable for a 6-month period of normal spherical curing with a spherical model and a 9-month period for a circular model compared to other statistical methods studied in this study. The results of drought zoning also showed that according to the ZSI meteorological drought index in the 3-month period for the 22-year statistical period studied, the drought was weak and normal, in the 6-month period, the drought was normal and the average drought was in the 9-month period. Weak drought, normal drought, moderate drought, severe drought and extreme drought have prevailed in the study area. The study of long-term drought also showed that in the 12-month period, weak, normal and moderate droughts were moderate, and in the 18-month period, the drought was normal in the study area. Also, the 24-month drought coverage area indicates weak and normal drought, and in the 48-month period, very severe drought classes, severe drought, moderate drought, and weak drought have dominated the study area.

Key words: Arid Regions, Drought, Geostatistic, Sistan and Baluchestan, GIS