9TH EUROPEAN CONFERENCE ON 9th EMS Annual Meeting Applications of Meteorology
High resolution meteorology - applications and services

Assessment of Geostatistical Methods in Drought Monitoring Systems

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One of the essential components of drought risk management is drought monitoring and drought phenomenon has become a recurrent phenomenon in Iran in the last few decades. As the aim of construction of a drought monitoring system over Iran, in this paper according to last results that have been obtained by authors, three drought indices include China-Z index (CZI), modified CZI (MCZI), Z-Score which have high performance in detecting and measuring of drought intensity, have been calculated over 180 weather stations located in 10 separate agro-climatic zones in Iran.

For finding, evaluating and refining an appropriate interpolation method, several geostatistical methods including ordinary kriging (Spherical, Circular, Exponential, Gaussian and Linear), Inverse Distance Weighed (IDW) and Spline have been applied and all of calculated drought indices have been interpolated over 10 different agro-climatic zones. The performance of the seven mentioned methods was evaluated and compared using the monthly data and the cross-validation technique. The comparison criterions were Mean Absolute Error (MAE) and Mean Biased Error (MBE).

The results indicate that although ordinary kriging is the most accurate method but Inverse Distance Weighed and Spline have reasonable and more accurate results in several agro-climatic zones and can be used as high performance geostatistical tools for interpolation of different drought indices in Iran.

Key words: drought monitoring, drought indices, geostatistical methods, interpolation.